Extended Manual for

DB25-D, DB40-D & GD-88

V3.2, July 12th, 2024

Please note that some of the features described within this Extended Manual are available in digital mode whereas other features are available in analog mode only. Besides that, not all radios do have the very same features. Our flagship radio, the Radioddity DB40-D does come with the most features. In order to easy identify those differences, we do use the following icons throughout this manual:

Described functionality is only available for digital DMR channels

Described functionality is only available for analog channels

The described function/feature is only available for the Radioddity DB25-D.

The described function/feature is only available for the Radioddity DB40-D.

The described function/feature is only available for the Radioddity GD-88.

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About Radioddity

'You, our friend, and customer, are our focus'

At Radioddity, customers are important to us. As a customer, your time and money are important to you. When you buy radios online, you face a dilemma: buy from a reputable website at a high price, or try to save money by choosing a dealer who may or may not offer quality goods, service, and advice. At Radioddity.com, you do not have to choose between low prices and a secure shopping experience. Whether you are buying from us for the first time or a seasoned amateur radio operator, we always hope that with our products, prices, content, and sources, you will find exactly what you need. In recent years, Radioddity has better met the needs of wireless device buyers by creating a secure shopping experience. We do this by offering the highest quality products at an affordable price and providing you with first-class service. You deserve no less.

Our promise: to give you the best shopping experience

Strong partnerships enable us to offer you the latest technology and outstanding value for money under the Radioddity brand name. Our thoughtful and responsive customer service teams help us deliver on our promise to you and meet your everyday needs even better.

Whether providing you with the latest and greatest DMR and analog radios, accessories, and related products, providing outstanding technical support, or by working with the leaders of the amateur radio industry to develop helpful content to assist you with your purchase: Your concerns are our concerns.

We want to connect you with high quality radios at low prices. If, in your opinion, we do not honor this promise in any way, please let us know by e-mail:

support@radioddity.com

1 Disclaimer

This document is intended as an enhanced version of the manual that comes with the radio. It does describe all those details, that are required to know in order to get the most out of your Radioddity DB25-D, DB40-D or GD-88.

For those new to DMR we advise to look at the document our engineers prepared for them. Check the corresponding blog-entry for more details.

https://www.radioddity.com/blogs/all/radioddity-getting-on-air-with-your-dmr-radio

Those of you already familiar with analog and DMR operations, may just jump to chapter 16 Quickstart for common use cases starting on page 217. However, and although this manual is quite comprehensive, we do advise you to read it all through. Especially DMR-operations may fail very easily if not all needed parameters are set up as required.

In case something does not work as you´d expect it to, restart with a fresh and new codeplug that only contains the minimum data required for the functionality you think that is failing. If you still cannot get it working as expected, such minimal codeplug and precise step by step instructions on how to reproduce your issue makes it much easier for our support staff to get your issue sorted out. Our support is available via support@radioddity.com only. If you find anything that needs correction or should be added, please let us know via the very same email address.

Windows™, Linux™ and OS X™ are the properties of their respective owners. Should any trademark attribution be missing, mistaken or erroneous, please contact us as soon as possible for rectification.

Not all functionality is available in both operating modes of the radio and for all three radios. For easier identification of those functionality, we used the following icons:


Described functionality is only available for digital DMR channels


Described functionality is only available for analog channels


The described function/feature is only available for the Radioddity DB25-D.


The described function/feature is only available for the Radioddity DB40-D.


The described function/feature is only available for the Radioddity GD-88.

Parameter names, as displayed on the screen of the Radioddity DB25-D, DB40-D or GD-88 are written ***bold&italic.***

2 Revision history of this document

We are constantly trying to update our manuals according to changes resulting of new firmware or CPS versions. If you miss any aspect in this document or believe that something has been described incorrectly or in a misleading way, please feel free to give us feedback at support@radioddity.com. We will try our best to make the next version of this document of even more added value for you.

Revision	Changes	released
V3.2	• Updated Release Notes for the CPS	2024-07-12
V3.1	• Updated Firmware Release Notes for Radioddity DB25-D, DB40-D, GD-88 and the corresponding CPS • Updated details on encryption • Minor Additions and updates	2024-06-20
V3.0	• Added chapter for the Radioddity DB40-D • Updated Firmware Release Notes for Radioddity DB25-D, DB40-D and Radioddity GD-88 • Minor Additions and updates	2023-09-23
V2.2	• Updated Firmware Release Notes for Radioddity DB25-D and Radioddity GD-88 • Description of new features (such as Talker Alias and analog DTMF) • Minor Additions and updates	2023-07-12
V2.1	• Updated Firmware Release Notes for Radioddity DB25-D, Radioddity GD-88 and CPS • Description of new features (GD-88 only) • Minor Additions and updates	2022-10-26
V2.0	• Additional chapters and parameters for the Radioddity GD-88 • Differentiation between Radioddity DB25-D and Radioddity GD-88 wherever required • Rearrangement of some chapters/parts • Minor additions and corrections	2022-07-01
V1.1	• Added release notes for new firmware • more precise description on how to use the promiscuous mode • replaced ‘band’ by ‘VFO’ to be more precise when referring to one of the two VFOs (A and B) • Minor additions and corrections	2022-03-11
V1.0	• Initial version which now has the original manual (that comes with the radio) merged with our previous Addendum resulting in this extended manual for the Radioddity DB25-D	2022-02-01

3 Product safety and RF exposure for portable radios

Before using the radio, please read this manual carefully. It contains important instructions for the safe and proper use of the radio and operating instructions for compliance with the limits of RF energy exposure in accordance with applicable national and international standards.

3.1 Notes on the use of the radio

Please read the following quick start guide, as failure to comply with these rules can be dangerous or in violation of the law.

1. Observe local regulations before using this radio, as improper use may violate the law.
2. Turn off the radio before approaching flammable or potentially explosive atmospheres.
3. Do not charge or replace the battery in flammable or potentially explosive atmospheres.
4. Turn the radio off before you come near any areas with explosives.
5. Do not use a radio whose antenna is damaged, as touching the damaged antenna may result in injury.
6. Do not try to disassemble the radio; any maintenance work should be carried out by qualified technicians.
7. To prevent electromagnetic interference issues, turn the radio off in locations that have signs displaying similar instructions to 'Do not use wireless devices' or 'Turn cell / mobile phones off' such as inside hospitals and healthcare facilities.
8. Do not place the radio in the area of airbag deployment in vehicles so equipped.
9. Do not store the radio in direct sunlight or hot areas.
10. When transmitting with the radio, keep the antenna at least 5cm away from your body or face.
11. If the radio emits any smoke or burning smells, switch the radio off immediately and disconnect it from the car's battery and contact your dealer.
12. Do not transmit for long periods as this may damage the radio or cause it to become hot enough to cause injury.

3.2 Maintenance and Cleaning

To ensure the best performance and prolong working life, please acquaint yourself with the following for maintenance and cleaning.

3.2.1 Maintenance

1. Please do not scratch or puncture the device with hard or sharp object.
2. Please do not place the device under direct solar radiation or in an environment which can corrode electronic circuits.
3. Please do not carry the device by its antenna, headset or programming cable.
4. Please make sure the Speaker-Microphone / K1 plug is covered when not in use.
5. Opening or modifying the device will void any warranty.
6. Any firmware not intended to be used with the device will void any warranty.

3.2.2 Cleaning

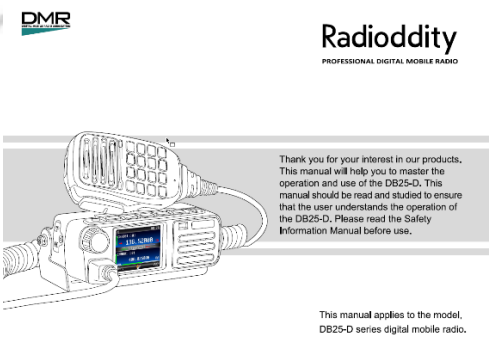
1. Please clean your device regularly by using a dry clean cloth or soft brush to wipe the dust off the surface.
2. The keypads, control knob and housing of the device may become dirty from use. Please use nonwoven wipes to clean them. Do not use chemicals to clean it such as detergent, alcohol, spray, or petroleum products, on the device surface or printed labels. Chemicals can damage the housing, display, and remove the printing on the labels. Before powering on the radio, please make sure the device is dry completely.

4 What is in the box?

Thank you for choosing a Radioddity DB25-D, DB40-D or GD-88 radio. We recommend that you first check the delivery contents listed in the following tables and keep the packaging for later storage. If something is missing or damaged, please contact your dealer immediately.

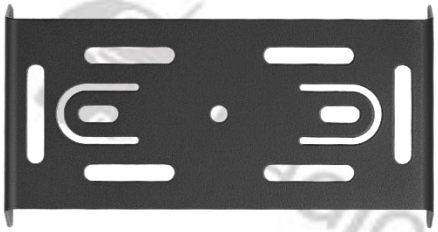
4.1 Bill of materials for Radioddity DB25-D

Item	Picture
Radioddity DB25-D Mobile Radio	
DC Power-cable	
Speaker Mic	
Mini GPS Antenna ***Remark:*** *active GPS-antennas are not supported*	

Item	Picture
Mounting Bracket	
Rack mounting Screws (2)	
Programming Cable	
Box manual	

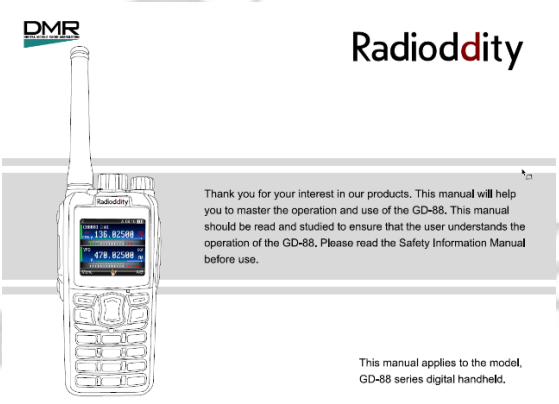
4.2 Bill of materials for Radioddity DB40-D

Item	Picture
Radioddity DB40-D Mobile Radio	
Speaker Microphone	
DC Power-cable (for use with cigarette lighter socket)	
Mini GPS Antenna ***Remark:*** *The radio does also support active GPS-antennas connected to the GPS-port.*	
Bluetooth antenna	
Bluetooth PTT-Button	

Item	Picture
Bluetooth Handsfree Earset	
Spacer (pull over Earpiece to assure MIC-hole will not be covered by the skin)	
USB charging cable for BT-accessories	
Mounting Bracket	
Rack mounting screws, M4 with 6.5mm of remaining thread (4)	
Programming Cable (FTDI-based)	
Box manual	

4.3 Bill of materials for Radioddity GD-88

Item	Picture
Radioddity GD-88 Handheld Radio	
Dual-Band Antenna	
Li-Po Battery, 3000 mAh	
Charging Base	
Power Supply (Type depending on country of sales)	

Item	Picture
Belt Clip	
Hand strap	
Programming Cable	
Box Manual	

Notes: *Further accessories for your radio are available at:*

https://www.radioddity.com/

5 Prepare radio for operation

5.1 Radioddity DB25-D Preparation

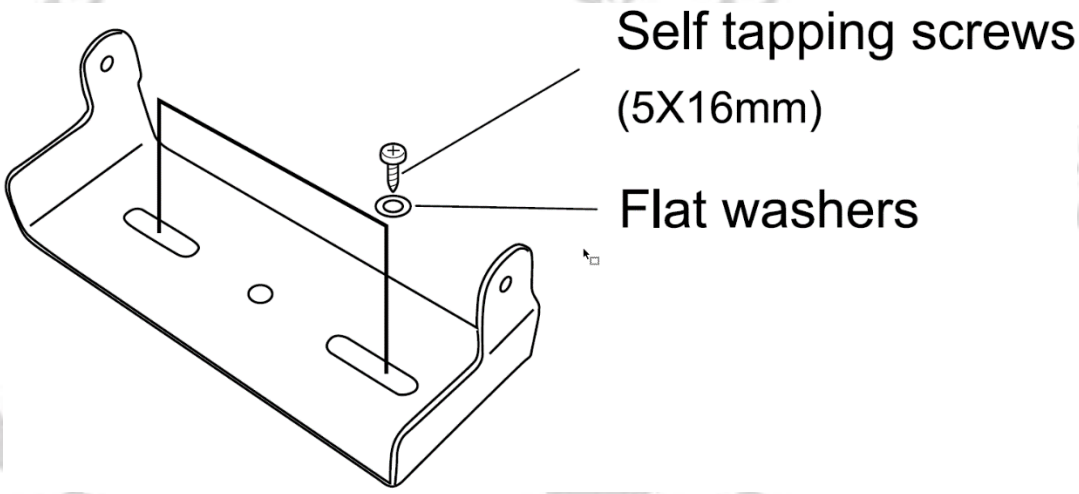
5.1.1 Radioddity DB25-D preparation and mounting

For sake of your own and passenger's safety, please find a safe and convenient position in order to prevent any damage caused by moving car. Check about suitable and allowed positions with the manufacturer of your car. Choose a mounting location within the driver's reach that allows a view of the radio and the road ahead. The small size makes this more of a possibility than larger under dash radios. Typical under dash installations rely on devices with direct functions and controls. 2 step controls are harder to perform while keeping your eyes on the road. You can consider installing the radio in front of the front passenger seat below the panel section or the car trunk. This will prevent your knees and legs crashing the radio in case of an emergency brake. You should install it with good ventilation and avoiding the direct sunlight. Keep it away from locations with inflating airbags.

1. Install the mounting bracket to the car using self-taping screws and flat washers (2 pcs of each kind).

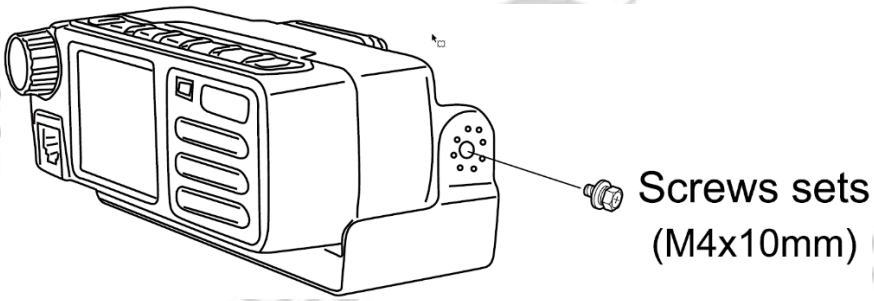
   - Screws can be put upside down (under the dashboard mounting) or upwards the mounting bracket.

   - When installing the mounting bracket, please make sure the screw side edge with slots on the bracket are facing backwards.

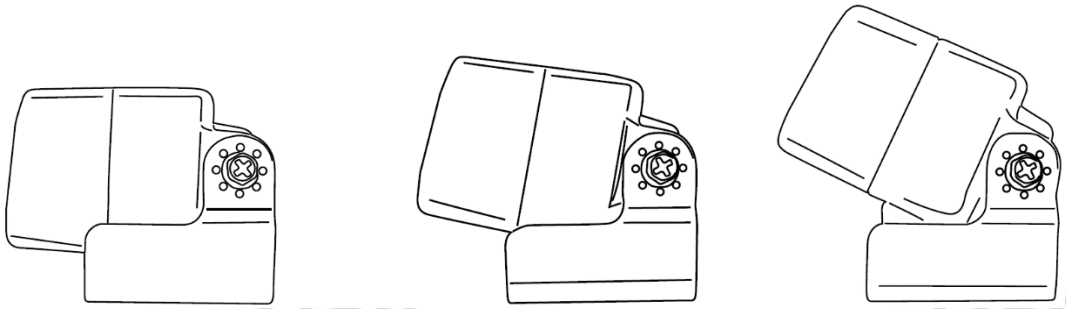


2. Next take the radio body and mount it between the two side wings of the mounting bracket. Secure the radio body to the mounting bracket using the two supplied M4 x 10mm Rack mounting screws including their fixed washers.

3. Please make sure all the screws are tight to prevent the radio's firm hold from being lost due to vibrations in the car.



4. With the rotatable fixed point on the left and right sides of the Mounting Bracket, it can tilt the main body at an appropriate angle.

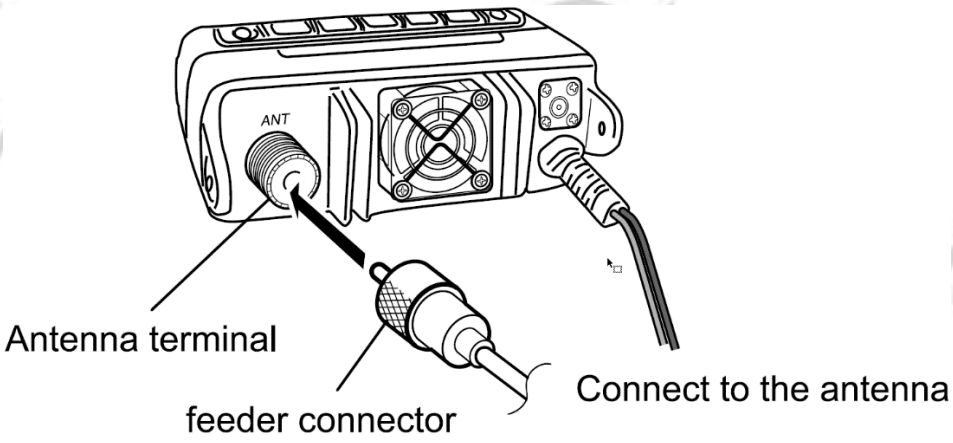


Notes:	*The backside of your radio may become really hot. Please make provisions that sufficient air can circulate and that the backside is never been touched by anyone.*

5.1.2 Radioddity DB25-D Antenna connection

Before operation, you must first install a properly matched antenna for the optimal transmit coverage. The radio will have best performance if the appropriate antenna is properly installed. A low loss coaxial feeder line with 50 Ω impedance is used to match the input impedance of the radio. If the transmission impedance of the feeder line is less than 50 Ω the antenna connection will reduce the effectiveness of the antenna system, and will cause interference to the nearby radio and television receivers, radio receivers and other electronic devices, and even damage the radio.

Notes:	*If transmitting without an antenna or other matched load line, it could damage the* Radioddity *DB25-D. The antenna must be connected to the radio before transmitting. All base stations should be equipped with lightning arrester to reduce the risk of fire, electric shock, or radio damage.*



5.1.3 Radioddity DB25-D power supply options

5.1.3.1 Mobile Operation

The radio comes with a cigarette-style plug. After connecting a proper antenna this allows immediate use within a car but due to often bad electrical connections between the cigarette lighter socket and the cigarette plug, we recommend to use a fused, but direct wiring to the car´s battery.

The vehicle battery must have a nominal rating of 12 V. Never connect the Radioddity DB25-D to a 24V battery. Be sure to use a 12 V vehicle battery that delivers sufficient current. If the current to the DB 25-D is insufficient the display may darken during transmission or transmitting output power may drop excessively.

Notes:	*If the car battery is not fully charged or when the engine is switched off but the battery is still not fully charged, the battery may discharge and there will not be enough power to start the car. Please avoid using the radio in such situations.*

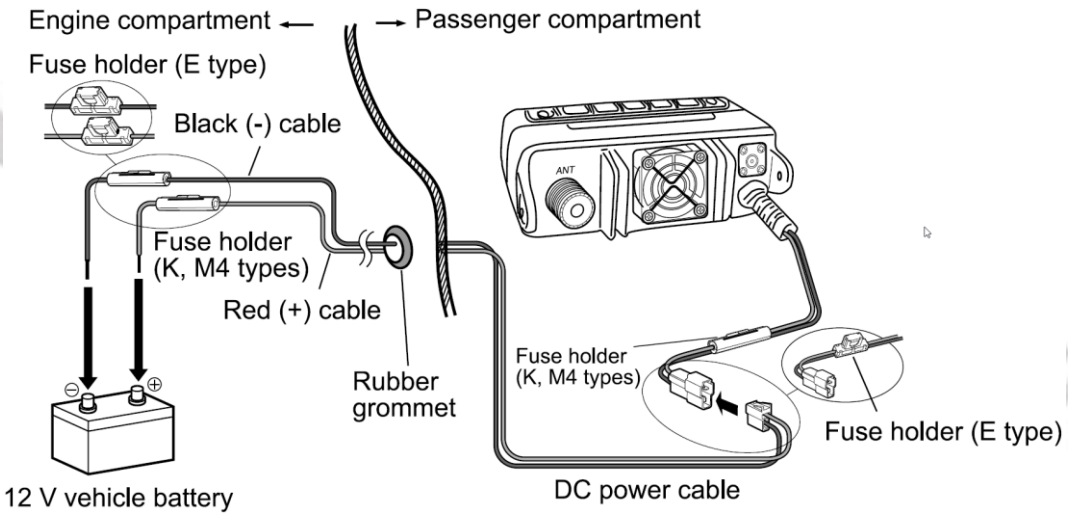
1. Route the DC power cable supplied with the Radioddity DB25-D directly to the vehicle's battery terminals using the shortest path from the transceiver We suggest you do not use the cigarette lighter socket as some cigarette lighter sockets introduce an unacceptable voltage drop that may cause the radio to turn off or reboot when starting a transmission. The entire length of the cable must be dressed so it is isolated from heat, moisture, and the engine secondary (high voltage) ignition system/cables. If you use a noise filter, the metal parts of the car shall be fitted with an insulator to prevent it from touching the car.

2. After installing the cable, in order to avoid the risk of damp, please use heat-resistant tape to tie together with the fuse box. Do not forget to reinforce the whole cable.

3. Confirm the correct polarity of the connections, then attach the power cable to the battery terminals: Red connects to the positive (+) terminal and black connects to the negative (-) terminal.

4. Reconnect any wiring removed from the negative terminal.

5. Connect the DC power cable to the transceiver's power supply connector. Press the connectors firmly together until the locking tab clicks. Additional clip-on ferrites applied to the power cable and close to the radio will prevent any HF radiation to enter the power supply lines.



Notes: *If you use the* Radioddity *DB25-D for a long period and the vehicle battery is not fully charged or when the car engine is OFF, the car battery may become discharged and will not have sufficient power left to start the vehicle. Avoid using the Radioddity DB25-D in these conditions.*

5.1.3.2 Base Station Operation

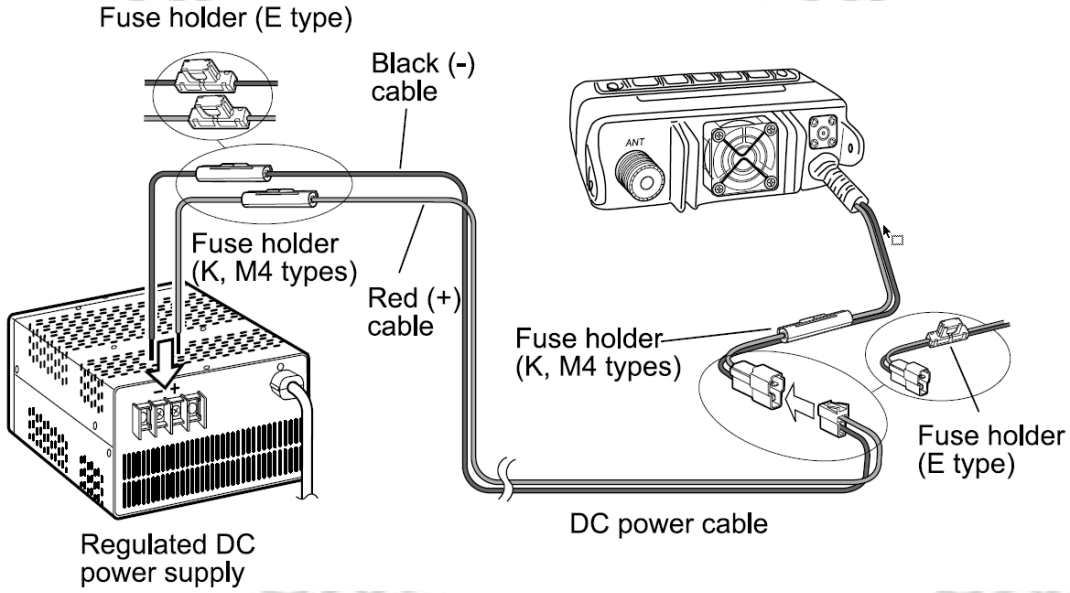
In order to use the Radioddity DB25-D for fixed station operation you will need a separate 13.8 V DC power supply (not included). Please contact your local dealer about it. The recommended current capacity of your power supply should be at least 5 A.

Notes: *Before connecting the DC power to the* Radioddity *DB25-D, be sure to switch the DC power supply OFF. Do not plug the DC power supply into an AC outlet until you make all connections.*

1. Make sure that both, the Radioddity DB25-D and DC power supply are off.

2. Connect the DC power cable to the regulated DC power supply and ensure that the polarity is correct. (Red: positive; Black: Negative}. Use the supplied DC power cable to connect the Radioddity DB25-D to a regulated power supply. Do not substitute a cable with smaller gauge wires.

3. Connect the radio's DC power connector to the connector on the DC power cable. Press the connectors firmly together until the locking tab clicks. Additional clip-on ferrites applied to the power cable and close to the radio will prevent any HF radiation to enter the power supply lines.



4. Connect a properly matched dual-band (2m/70cm) antenna to the radio's antenna port.

5.1.4 Replace fuse

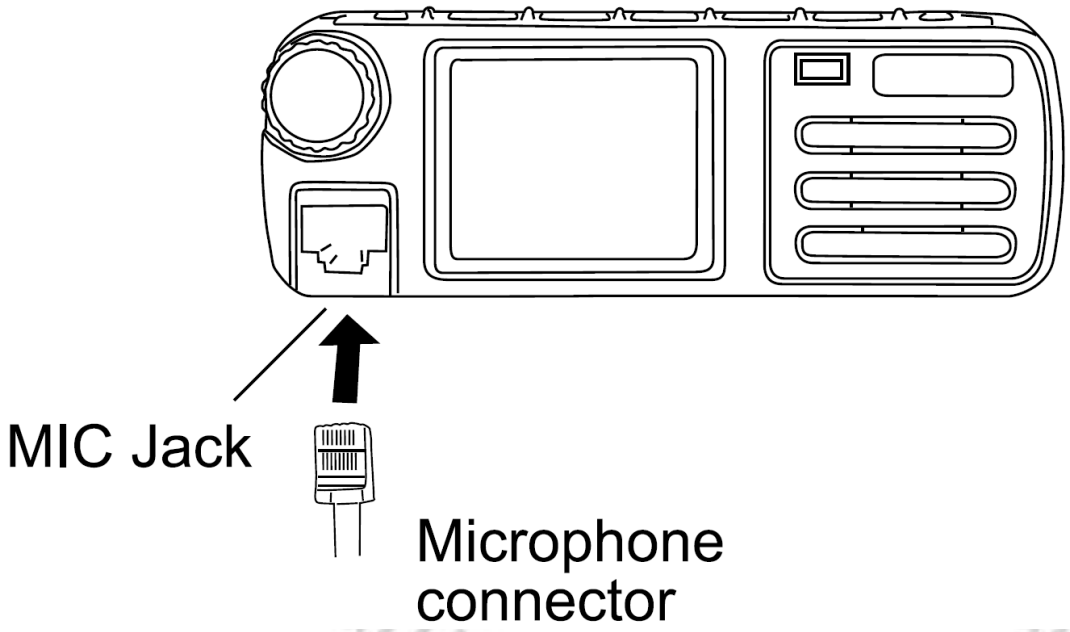
If the fuse is blown, please find out the cause and then solve the problem. After the problem is fixed then replace the fuse. But if after re-installation the fuse is still blown, please disconnect the power cord and contact the local authorized dealer or authorized service center for assistance.

Fuse position	Fuse rated current
Radio (in DC cable)	5 A
DC power cord	10 A

Notes: *Please use only the specified type and the rated value of the fuse; otherwise, it might damage the radio.*

5.1.5 Connect Speaker Microphone

1. Please insert the provided speaker microphone to the Mic jack on the left side of the radio to allow voice communication. Push in the connector until you hear a click sound from the locating plate in place.

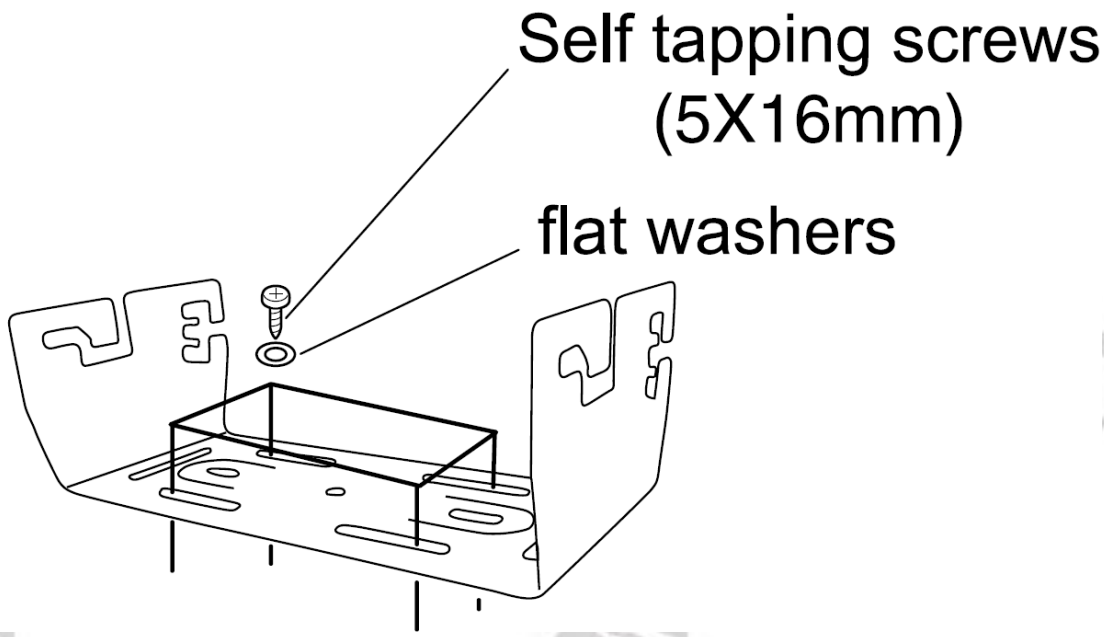


5.2 Radioddity DB40-D Preparation

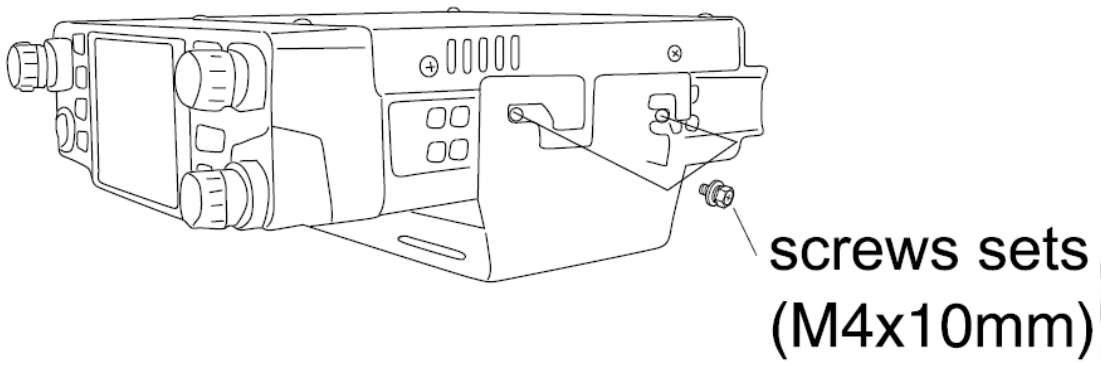
5.2.1 Radioddity DB40-D preparation and mounting

For sake of your own and passenger's safety, please find a safe and convenient position in order to prevent any damage caused by moving car. Check about suitable and allowed positions with the manufacturer of your car. Choose a mounting location within the driver's reach that allows a view of the radio and the road ahead. The small size makes this more of a possibility than larger under dash radios. Typical under dash installations rely on devices with direct functions and controls. 2 step controls are harder to perform while keeping your eyes on the road. You can consider installing the radio in front of the front passenger seat below the panel section or the car trunk. This will prevent your knees and legs crashing the radio in case of an emergency brake. You should install it with good ventilation and avoiding the direct sunlight. Keep it away from locations with inflating airbags.

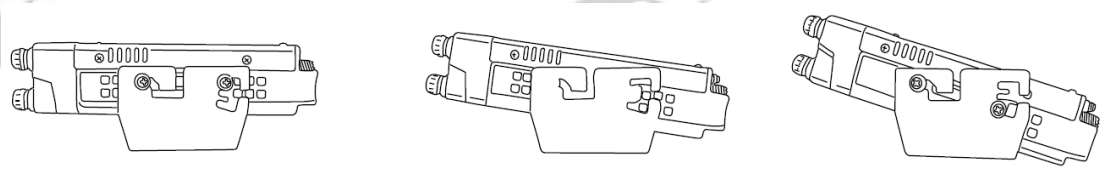
1. Install the mounting bracket to the car using self-taping screws (4 screws).
   - Screws can be put upside down (under the dashboard mounting) or upwards the mounting bracket.
   - When installing the mounting bracket, please make sure the 3 screw slots on the bracket side edge are facing backwards.



2. Next take the radio body and hold it between one of the three angle combinations of the mounting bracket side wings. Secure the radio body to the mounting bracket using the four supplied M4 x 10mm Rack mounting screws including their fixed washers.
3. Please make sure all the screws are tight to prevent the radio's firm hold from being lost due to vibrations in the car.



4. With the rotatable fixed point on the left and right sides of the Mounting Bracket, it can tilt the main body at an appropriate angle.

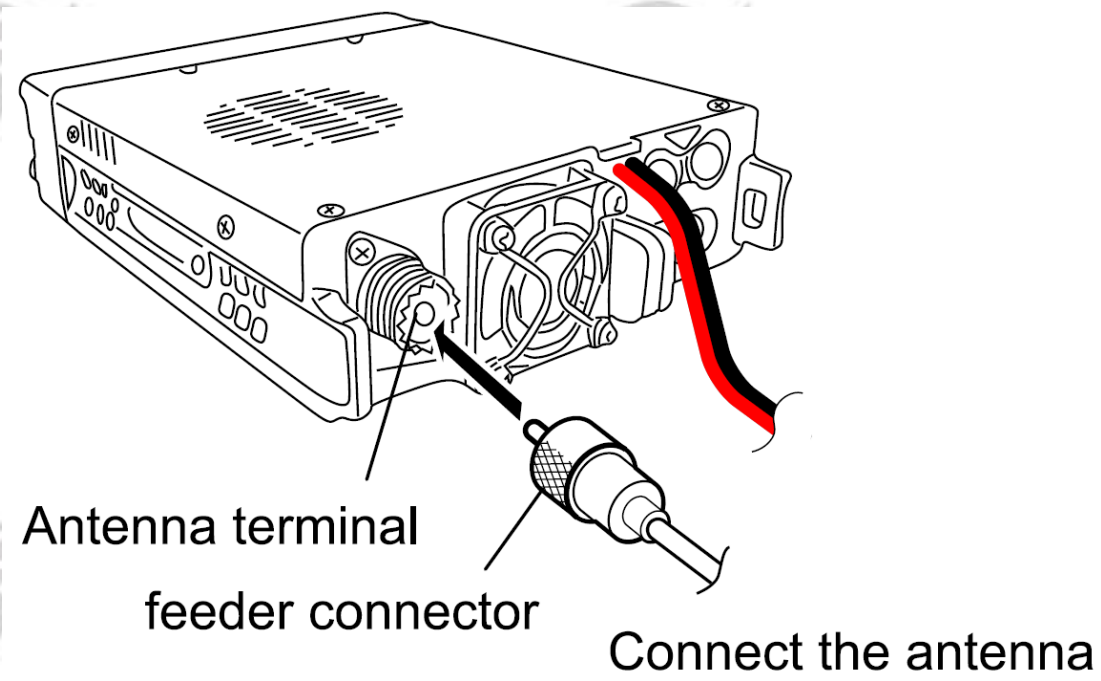


Notes:	*The backside of your radio may become really hot. Please make provisions that sufficient air can circulate and that the backside is never been touched by anyone.*

5.2.2 Radioddity DB40-D Antenna connection

Before operation, you must first install a properly matched antenna for the optimal transmit coverage. The radio will have best performance if the appropriate antenna is properly installed. A low loss coaxial feeder line with 50 Ω impedance is used to match the input impedance of the radio. If the transmission impedance of the feeder line is less than 50 Ω the antenna connection will reduce the effectiveness of the antenna system, and will cause interference to the nearby radio and television receivers, radio receivers and other electronic devices, and even damage the radio.

Notes:	*If transmitting without an antenna or other matched load line, it could damage the* Radioddity *DB40-D. The antenna must be connected to the radio before transmitting and capable to withstand an output power of more than 40 W. All base stations should be equipped with lightning arrester to reduce the risk of fire, electric shock, or radio damage.*



5.2.3 Radioddity DB40-D power supply options

5.2.3.1 Mobile Operation

The vehicle battery must have a nominal rating of 12 V. Never connect the Radioddity DB40-D to a 24V battery. Be sure to use a 12 V vehicle battery that delivers sufficient current. If the current to the DB40-D is insufficient the display may darken during transmission or transmitting output power may drop excessively.

Notes:	*If the car battery is not fully charged or when the engine is switched off but the battery is still not fully charged, the battery may discharge and there will not be enough power to start the car. Please avoid using the radio in such situations.*

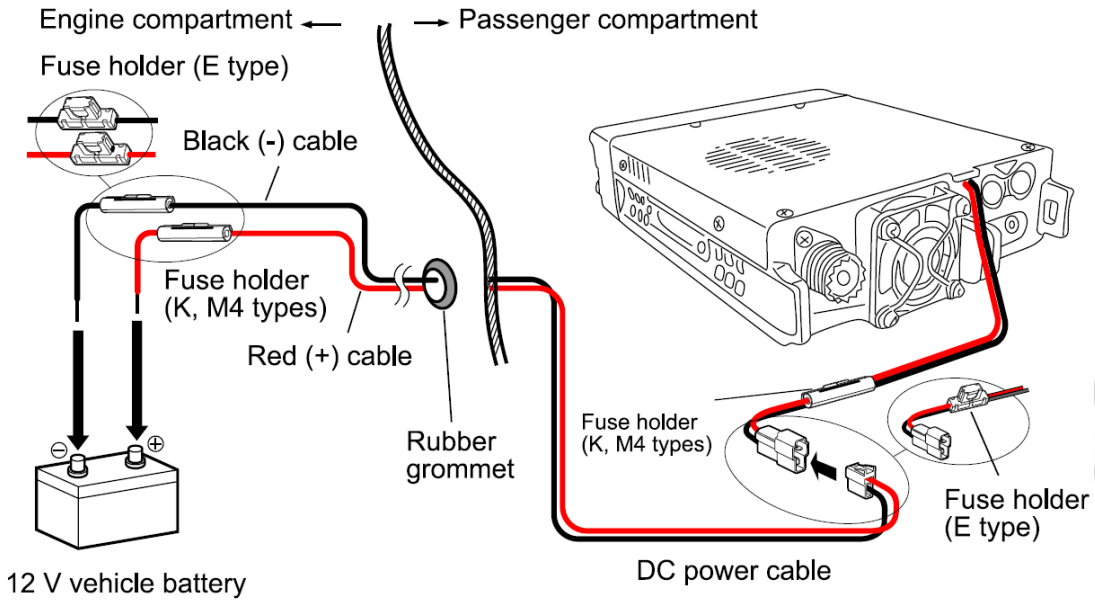
1. Route the DC power cable supplied with the Radioddity DB40-D directly to the vehicle's battery terminals using the shortest path from the transceiver. The entire length of the cable must be dressed so it is isolated from heat, moisture, and the engine secondary (high voltage) ignition system/cables. If you use a noise filter, the metal parts of the car shall be fitted with an insulator to prevent it from touching the car. DO not route the power cord in parallel with the antenna cable.

2. After installing the DC power cable, in order to avoid the risk of damp, please use heat-resistant tape to tie together with the fuse box. Do not forget to reinforce the whole cable.

3. Confirm the correct polarity of the connections, then attach the power cable to the battery terminals: Red connects to the positive (+) terminal and black connects to the negative (-) terminal.

4. Reconnect any wiring removed from the negative terminal.

5. Connect the DC power cable to the transceiver's power supply connector. Press the connectors firmly together until the locking tab clicks. Additional clip-on ferrites applied to the power cable and close to the radio will prevent any HF radiation to enter the power supply lines.



Notes: *If you use the* Radioddity *DB40-D for a long period and the vehicle battery is not fully charged or when the car engine is OFF, the car battery may become discharged and will not have sufficient power left to start the vehicle. Avoid using the Radioddity DB40-D in these conditions.*

5.2.3.2 Base Station Operation

In order to use the Radioddity DB40-D for fixed station operation you will need a separate 13.8 V DC power supply (not included). Please contact your local dealer about it. The recommended current capacity of your power supply should be at least 12 A.

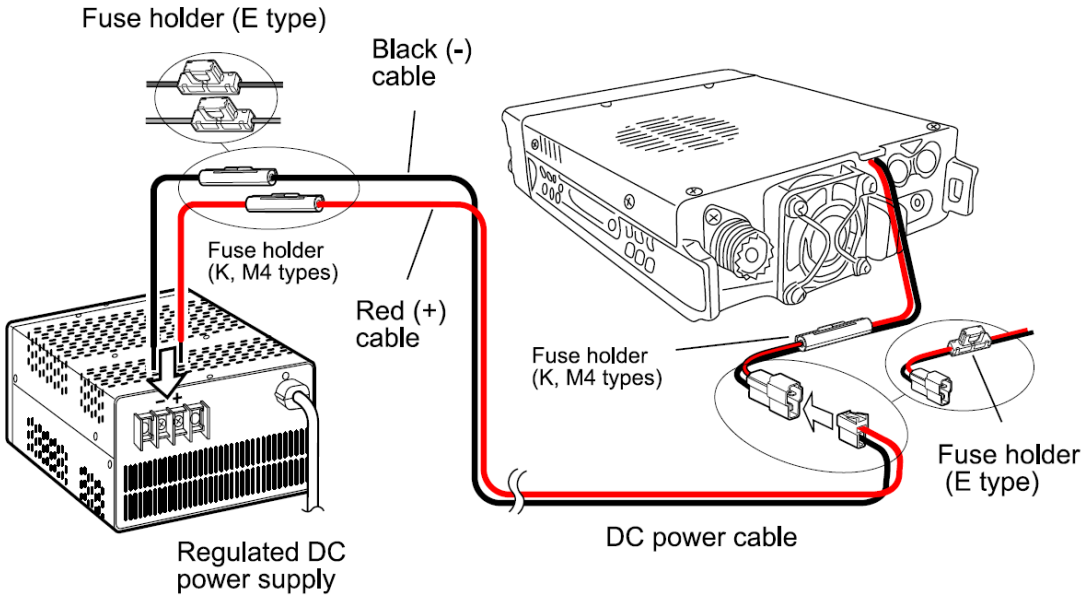
Notes: *Before connecting the DC power to the* Radioddity *DB40-D, be sure to switch the DC power supply OFF. Do not plug the DC power supply into an AC outlet until you make all connections.*

1. Make sure that both, the Radioddity DB40-D and DC power supply are off.

2. Connect the DC power cable to the regulated DC power supply and ensure that the polarity is correct. (Red: positive; Black: Negative}. Use the supplied DC

power cable to connect the Radioddity DB40-D to a regulated power supply. Do not substitute a cable with smaller gauge wires.

3. Connect the radio's DC power connector to the connector on the DC power cable. Press the connectors firmly together until the locking tab clicks. Additional clip-on ferrites applied to the power cable and close to the radio will prevent any HF radiation to enter the power supply lines.



4. Connect a properly matched dual-band (2m/70cm) antenna to the radio's antenna port.

5.2.4 Replace fuse

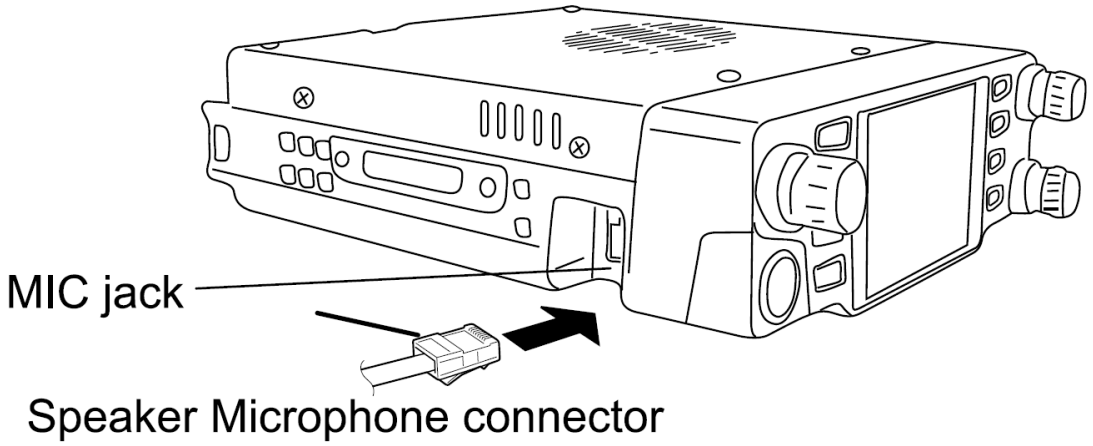
If the fuse is blown, please find out the cause and then solve the problem. After the problem is fixed then replace the fuse. But if after re-installation the fuse is still blown, please disconnect the power cord and contact the local authorized dealer or authorized service center for assistance.

Fuse position	Fuse rated current
Radio (in DC cable)	15 A
DC power cord	20 A

Notes: *Please use only the specified type and the rated value of the fuse; otherwise, it might damage the radio.*

5.2.5 Connect Speaker Microphone

1. Please insert the provided speaker microphone to the Mic jack on left side of the radio to make voice communication. Press the connector until you hear a click sound from the locating plate in place.



5.3 Radioddity GD-88 Preparation

Before using the Radioddity GD-88 for the very first time, please make sure that the supplied antenna has been mounted to the radio and that the supplied battery has been fully charged and mounted to the radio.

5.3.1 Mount GD-88 Antenna

1. Screw the threaded SMA-m end of the antenna into the top antenna SMA-f port on the main body.

2. Tighten the antenna clockwise.

> ***Notes***: *If transmitting without an antenna or other matched load line, it could damage the* Radioddity *GD-88. The antenna must be connected to the radio before transmitting. Do not hold the antenna with your hand, as this will reduce the radio performance.*

5.3.2 Charge Radioddity GD-88 battery pack

When the battery is used for the first time, a low battery alarm may alert. Please turn the radio off and charge the battery firstly.

> ***Notes***: *Please only use the designated battery pack and charging equipment for charging.*

Please charge as follows:

2. Plug the power supply connector into the jack on the back of the charger.

3. Plug the charger power supply into a power outlet.

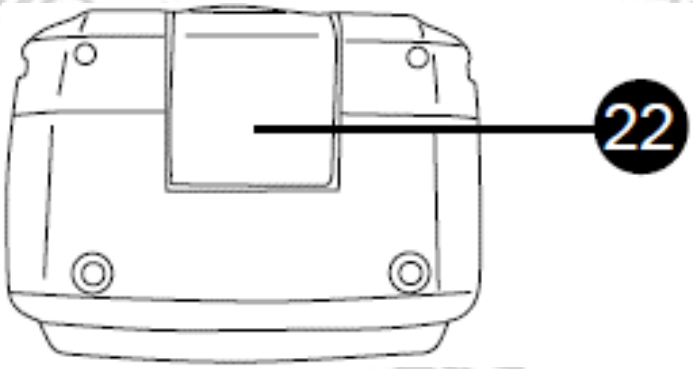
4. Install the battery or the radio (turned off!) with the battery into the charger.

5. Observe the charger LED indicators to know the current charging status:

Charger LED Indicators	Current Status
● Red	Charging
● Green	Standby (No load) or fully charged

5.3.3 Install Radioddity GD-88 battery pack

Slide in the battery with its two noses sliding into the notches underneath the blank metal piece on the backside of the radio. Firmly push it down on its lower end. Finally close the battery latch (22) until you hear a 'click'.



To remove the battery, turn off the radio, clip open the battery latch and then remove the battery by lifting it up, starting with the bottom side. Next carefully move it off the upper metal. Avoid breaking the battery noses.

5.3.4 Install Radioddity GD-88 hand strap and belt clip

1. Take out the hand strap and mount it to the radio using the eyelet just above the blank metal piece on the backside of the radio.

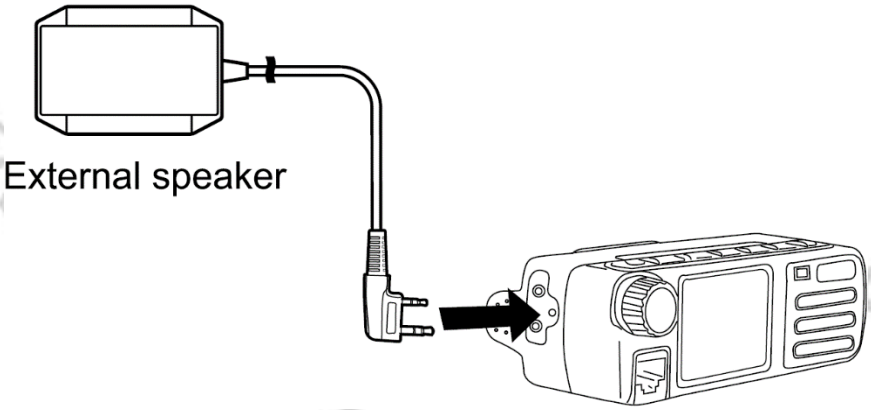
2. Take out the belt clip and two screws from the equipped bag.

3. Align the belt clip mounting holes with the threaded holes on the main unit, insert screws, and carefully tighten the screws to hold the belt clip.

5.4 Accessories connection

5.4.1 External speaker/headset and microphone

Please connect a speaker with 8 Ω impedance or a suitable headset. A 2.5 mm mono TRS plug or a K1-style plug with a 2.5 mm and 3.5 mm TRS plug can be used to connect an external speaker.

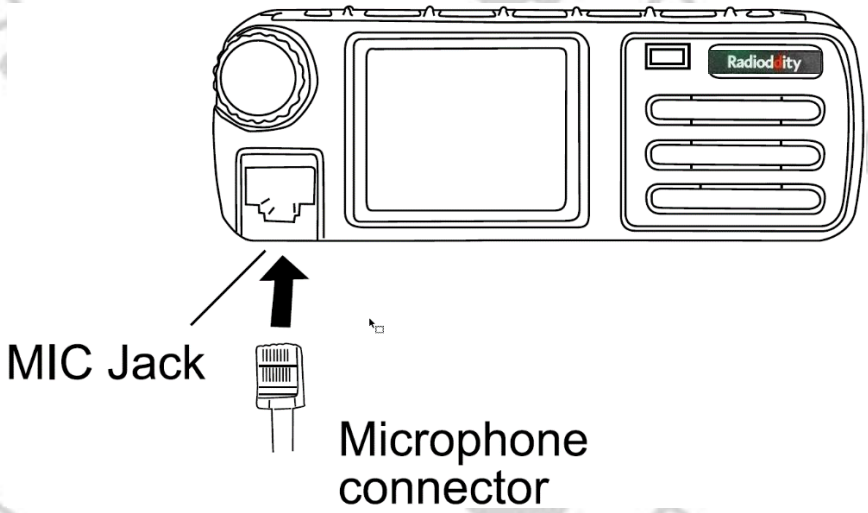


The radio has two jacks (K1 style) for speaker and microphone. Please refer to the instructions to determine how to use an external speaker or headset and microphone accessory. On the Radioddity DB25-D those are on the left side and covered by a small door that´s fastened to the radio with a screw. On the Radioddity GD-88 those ports are on the right side and covered by a rubber cover.

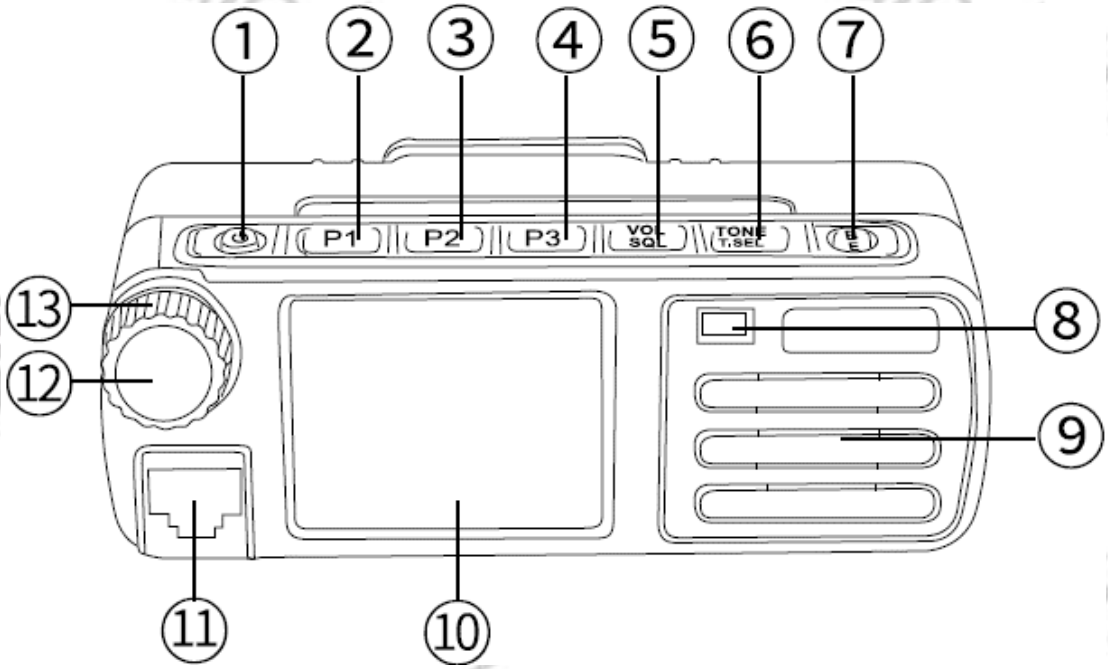
> ***Notes***: *More details on this K1 style connector are to be found in Chapter 17.5 K1 connector on page 227.*

5.4.2 Radioddity DB25-D Speaker-Microphone

Please insert the provided Speaker-Microphone (with built-in speaker) to the RJ45 jack on left side of the radio to make voice communication. Press the connector until you hear a click sound from the locating plate in place.



5.5 Radioddity DB25-D radio controls

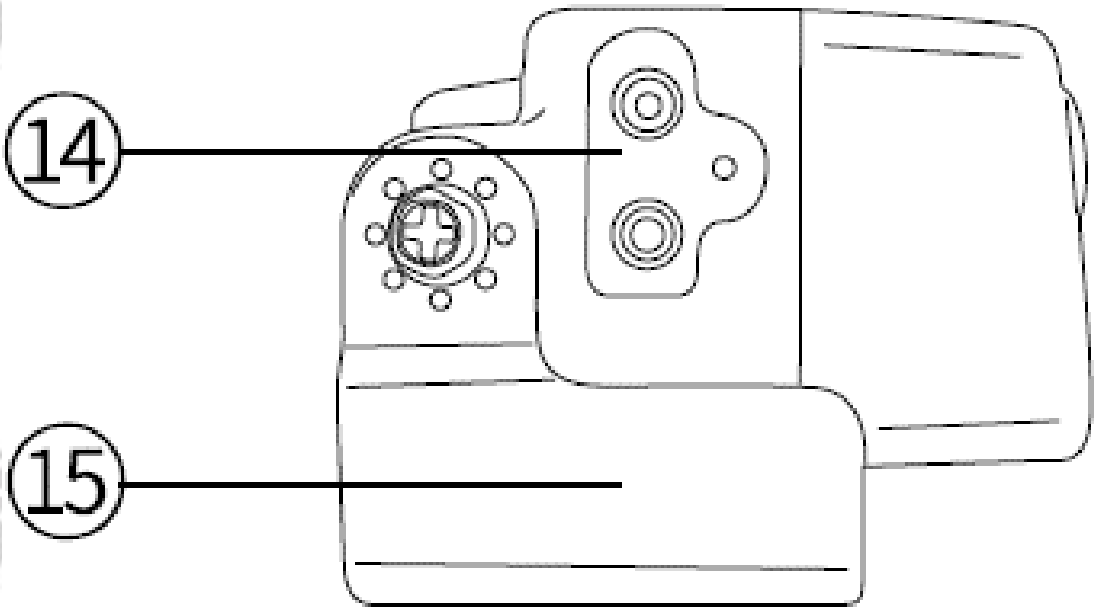


5.5.1 Parts description & function applications

No.	Part Name	Function description and applications
1	[⏻] Power Switch	Press and hold it for more than 3 sec to turn the radio on or off.
2	P1	Programmable function key 1
3	P2	Programmable function key 2
4	P3	Programmable function key 3
5	[VOL/SQL] key	1) Short press to set the volume of the VFO with the '➡' icon. 2) In analog mode, long press to set the squelch level of the VFO with the '➡' icon.
6	[TONE/T.SEL]-key	1) In analog mode, short press and rotate it to select the signaling type of the VFO with the '➡' icon. 2) 2) After selecting the signaling type, long press it to change the signaling code / frequency. TX/RX signaling code/frequency can be set.
7	[B/E] key	1) In Standby, short press to switch between VFO A and VFO B. The VFO with the '➡' icon is the main VFO for transmitting or menu set. 2) For operating the VFO with the '➡' icon, in menu mode, short press to return to the previous level, and long press to exit menu mode. 3) In Standby, long press to enter the Channel-Edit mode of the main VFO with the '➡' icon.
8	LED indicator	Used to indicate the RX/TX status, etc.
9	Speaker	Used to receive audio from others
10	TFT display	Display various working states, and combine with visual icons for easy use and operation
11	RJ45 (MIC) connection port	Connect the original Speaker-Microphone to this port
12	[Menu]-key [OK]-key [Select]-key	1) In standby, short press to access the menu of the main VFO with the '➡' icon 2) In the current menu mode, short press to be [Menu]-key or [OK]-key for parameter selection and confirmation.
13	ENC selection knob	In standby, rotate the knob to operate and set frequency, channel, menu selection and parameters etc. of main VFO with '➡' icon.

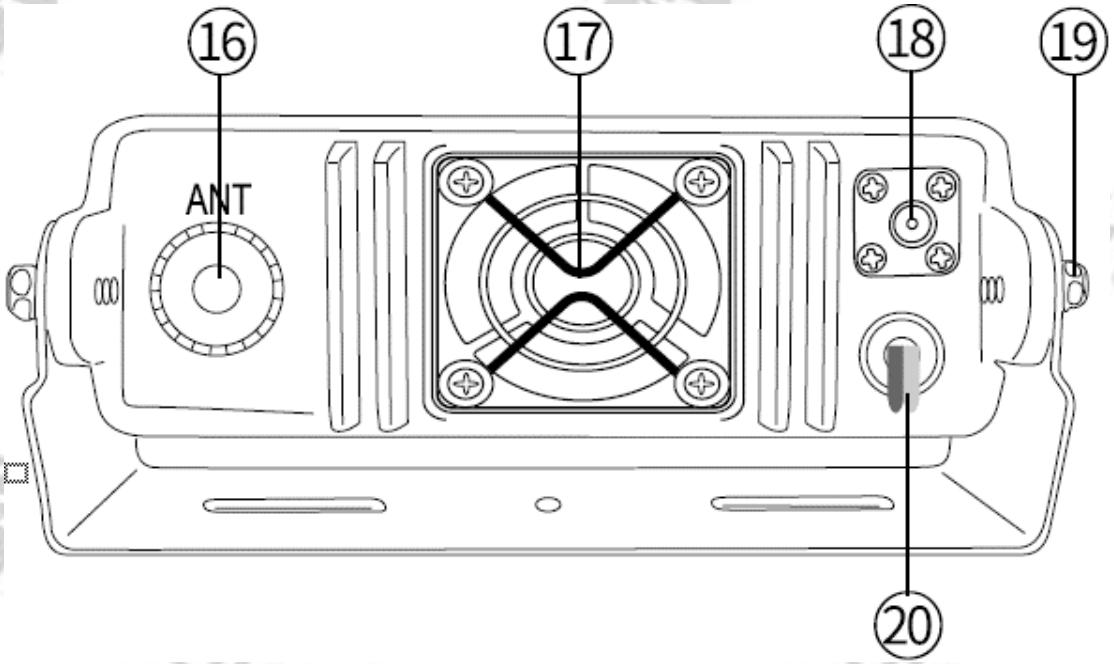
Notes: *For convenient use, there are programmable [P]-keys for definition of various functions.*

5.5.2 Left side of DB25-D



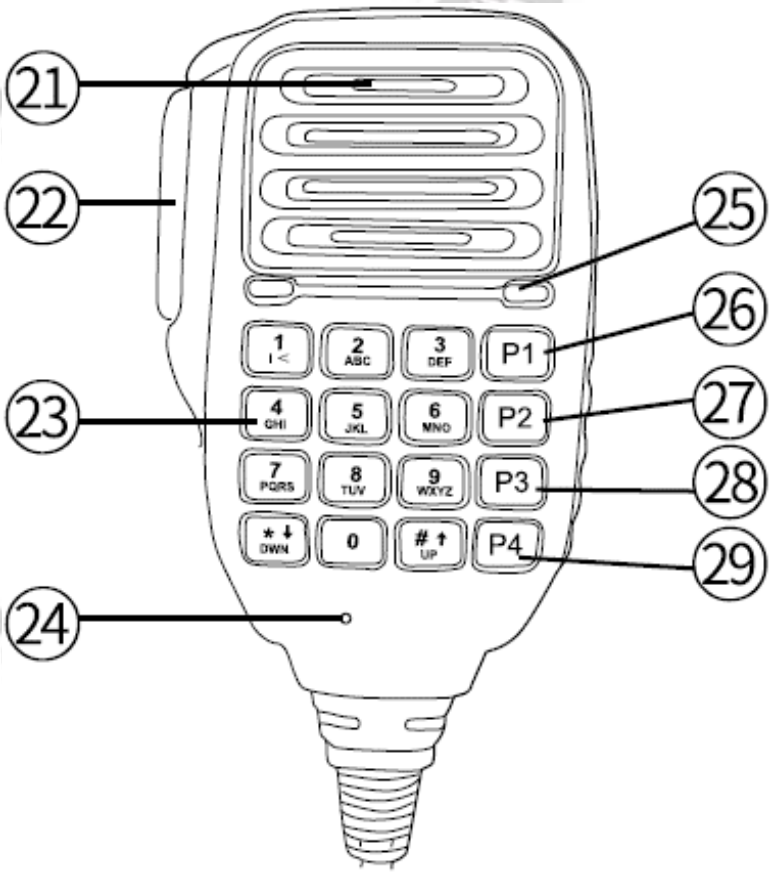
No.	Part Name	Function description and applications
14	SP/MIC jacket	1) For external accessories connection, such as earpiece, speaker. 2) Connect the programming cable here to get connection with the PC for data programming.
15	Mounting Bracket	For fixing the radio at some place.

5.5.3 Rear panel of DB25-D



No.	Part Name	Function description and applications
16	Antenna port	Install the external antenna to this port. In TX testing, please install a dummy load to replace the antenna. The antenna or dummy load should be with 50 Ω impedance.
17	Heat Sink	Cool the internal power tube to avoid too high temperature to damage the related components
18	GPS antenna port	Install the GPS antenna to this port for GPS receiving.
19	Rack mounting screws	Loosen the left and right screws to set the correct viewing angle, then re-fasten them.
20	External power cable	Carefully check the polarity (Red: **+**, Black: **-**) and power ratings (13.8 V DC +/- 15%) of the power supply before connecting to the radio.

5.5.4 Speaker Microphone of DB25-D

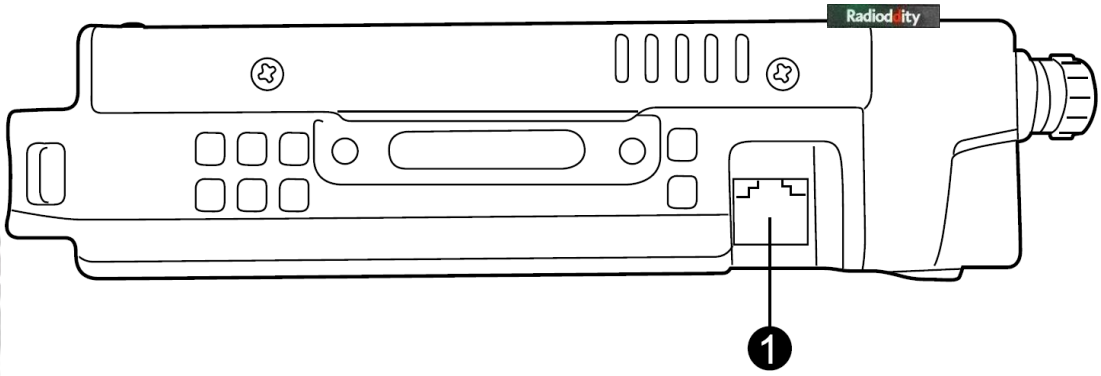


No.	Part Name	Function description and applications
21	The Speaker-Microphone	Used to receive audio from others (Audio output options can be set from the menu option)
22	[PTT]-key	Press and then speak in to the microphone to transmit; Release it to receive.
23	Numerical Keypad	Used to input frequency / channel number / DTMF-code, alias, ID and SMS
24	MIC	Speak to the microphone when pressing the [PTT]-key to transmit; (3-5 cm away from the mouth)
25	LED indicator of the Speaker-Microphone	In transmitting, LED lights red; if operating on Speaker-Microphone keypad, LED light will be always on.
26	MIC P4	Programmable function key 4 / DTMF-Code A
27	MIC P5	Programmable function key 5 / DTMF-Code B
28	MIC P6	Programmable function key 6 / DTMF-Code C
29	MIC P7	Programmable function key 7 / DTMF-Code D

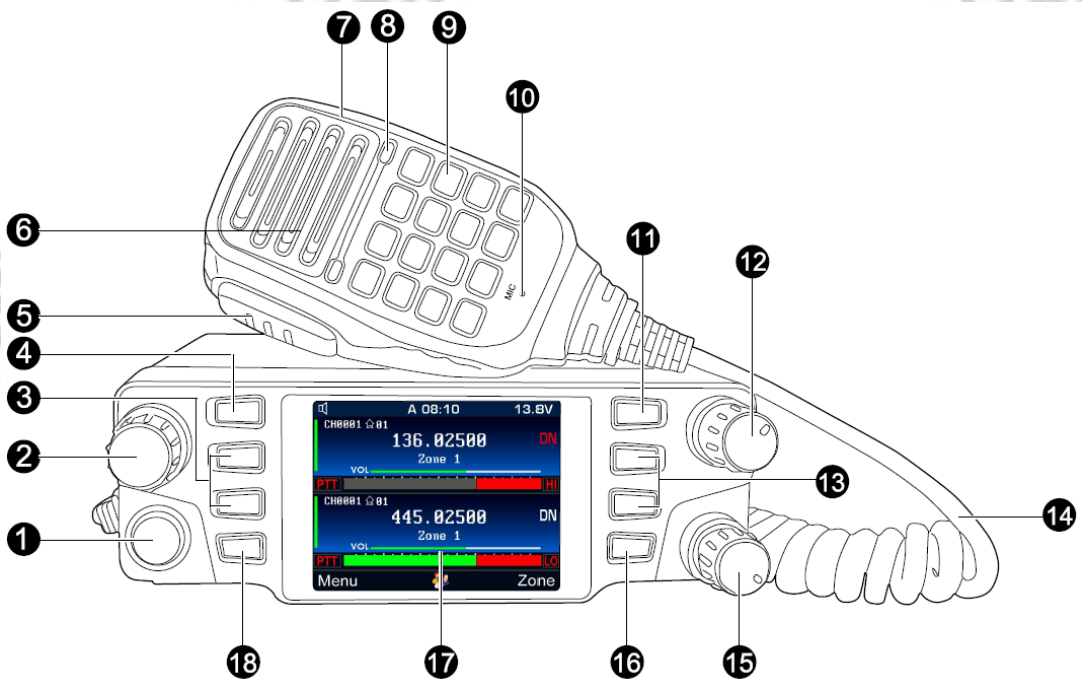
Notes: *For convenient use, there are programmable [P]-keys for definition of various functions.*

5.5.5 Radioddity DB40-D Speaker-Microphone

Please insert the provided Speaker-Microphone (with built-in speaker) to the RJ45 jack on left side of the radio to make voice communication. Press the connector until you hear a click sound from the locating plate in place.



5.6 Radioddity DB40-D radio controls



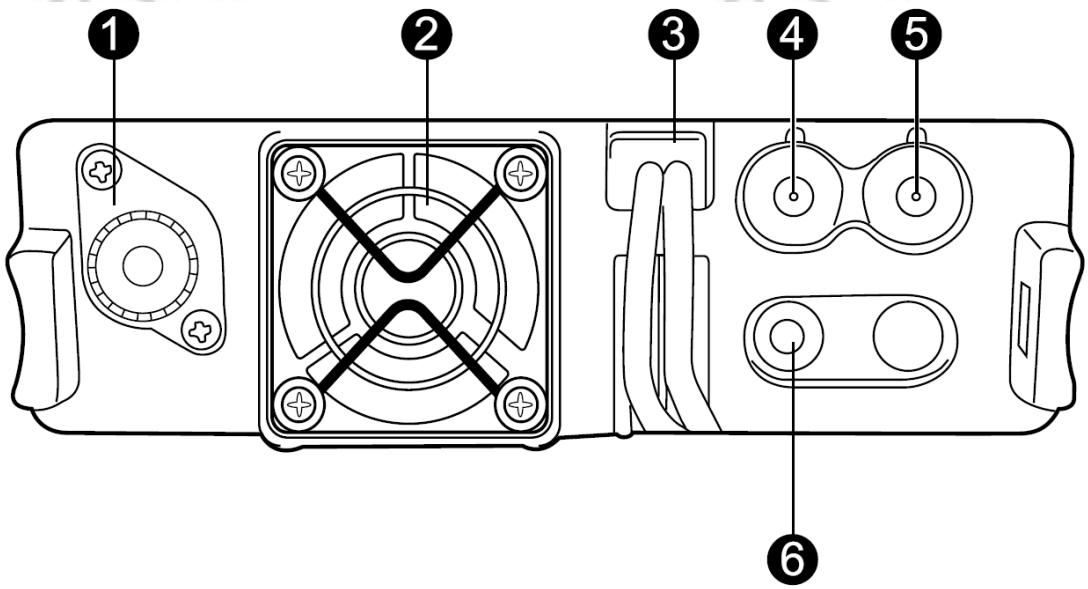
5.6.1 Parts description & function applications

No.	Part Name	Function description and applications
1	[⏻] Power Switch	Press and hold it for more than 3 sec to turn the radio on or off.
2	[ENC] selection knob	(1) Applies to channel, frequency and menu operations of the VFO marked with 'PTT' (2) Short-press for MENU, Select, OK (3) Long press for EditChannel

No.	Part Name	Function description and applications
3	PF1/ PF2	Programmable function keys
4	[ ]	Programmable function key ([Offhook]-key)
5	[PTT] key	Press and then speak in to the microphone to transmit; Release it to receive.
6	Speaker	Used to receive audio from others
7	Speaker Microphone	Used to receive audio from others (Audio output options can be set from the menu option)
8	LED indicator	Used to indicate the RX/TX status, etc.
9	Numerical Keypad	Used to input frequency / channel number / DTMF-code, alias, ID and SMS
10	MIC	Speak to the microphone when pressing the [PTT]-key to transmit; (3-5 cm away from the mouth)
11	[ ]	(1) Programmable function key ([Onhook]-key) (2) To enter IAP-mode, keep depressed while powering on the radio
12	VFO A volume / frequency adjustment knob and VFO A selection	Turn the knob clockwise to increase the audio output volume of VFO A, and turn the knob counterclockwise to reduce the audio output volume In the standby state, short press to select VFO A, and press PTT key to TX or operate the set frequency of that VFO. Long press to switch between Channel mode and VFO mode for VFO A.
13	PF3 / PF4	Programmable function keys
14	Cord for Speaker Microphone	It is scalable with flexibility.
15	VFO B volume / frequency adjustment knob and VFO B selection	Turn the knob clockwise to increase the audio output volume of VFO B, and turn the knob counterclockwise to reduce the audio output volume In the standby state, short press to select VFO B, and press PTT key to TX or operate the set frequency of that VFO. Long press to switch between Channel mode and VFO mode for VFO B.
16	Back key Zone key Edit key	(1) In menu operation, use as the return key (2) In standby, short press to enter into Zone list (3) In standby, long press to enter EditChannel of currently selected VFO
17	TFT display	Display various working states, and combine with visual icons for easy use and operation
18	Menu key / Select Key / OK Key	(1) In standby, short press to access the menu of the current VFO (2) In the current menu mode, short press to select the current menu item

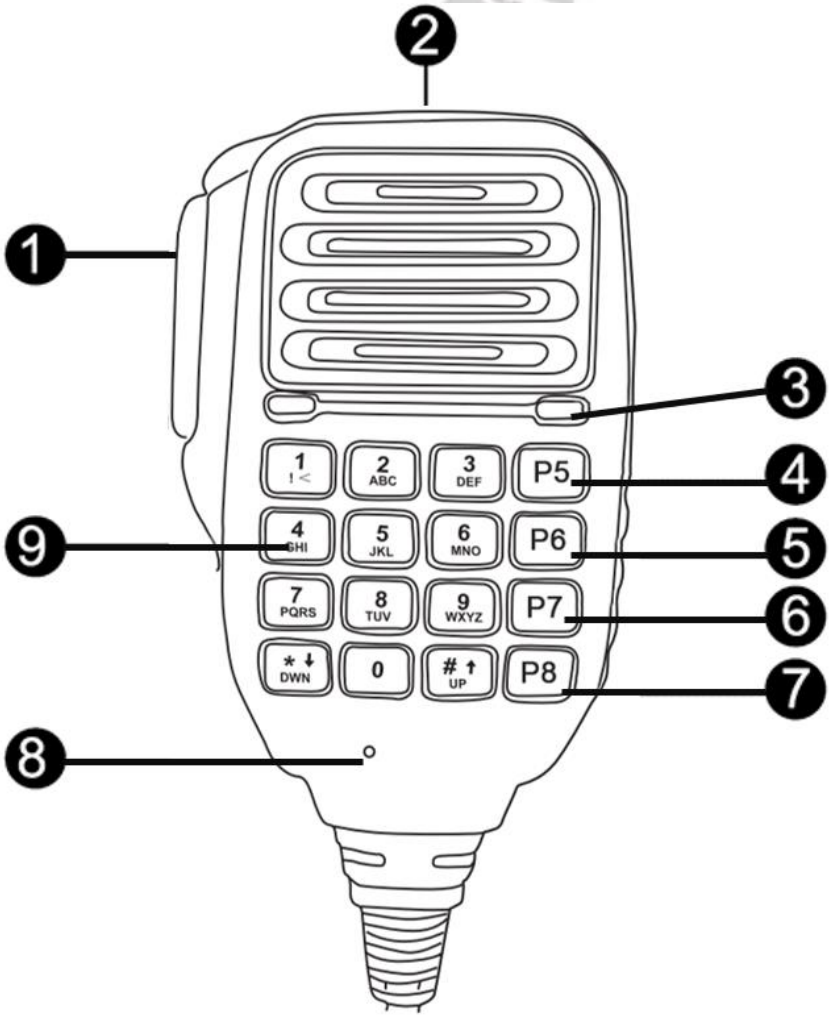
Notes: *For convenient use, there are programmable [P]-keys for definition of various functions.*

5.6.2 Rear panel of DB40-D



No.	Part Name	Function description and applications
1	Antenna port	Install the external antenna to this port. In TX testing, please install a dummy load to replace the antenna. The antenna or dummy load should be with 50 Ω impedance.
2	Cooling fan	When radio reaches the preset temperature, please start the cooling fan to quickly reduce the temperature to avoid damage to the radio parts.
3	External power cable	Carefully check the polarity (Red: +, Black: -) and power ratings (13.8 V DC +/- 15%) of the power supply before connecting to the radio.
4	GPS antenna port	Install the GPS antenna to this port for GPS receiving. Active GPS antennas are supported by the DB40-D.
5	Bluetooth Antenna	Connect the Bluetooth antenna to this port
6	Speaker	Connect 1 or 2 external speakers for better sound effects (if needed). A 3.5mm (1/8') TRS jack is required. Please see instructions to learn how to use the speaker.

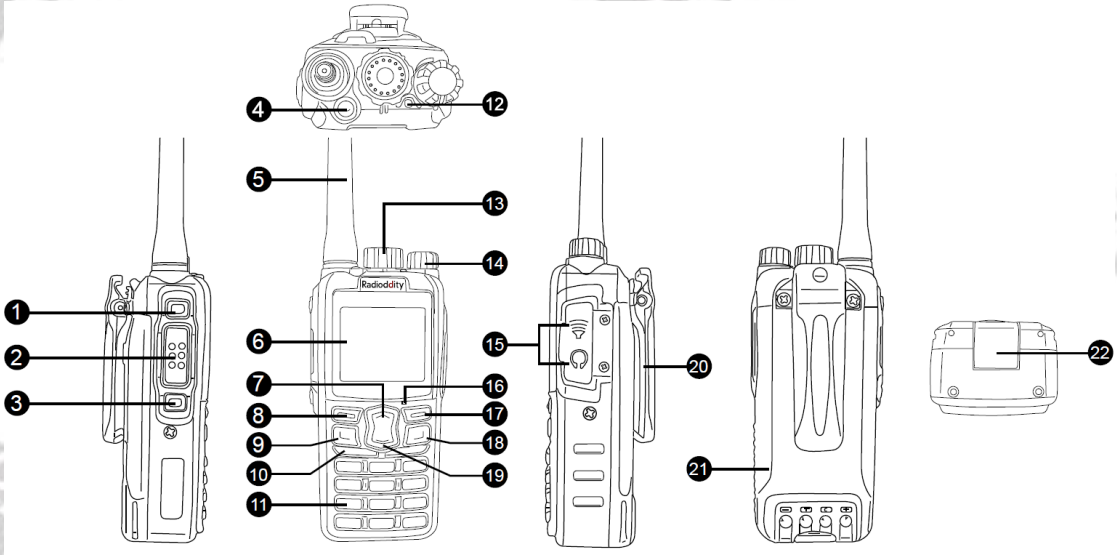
5.6.3 Speaker Microphone of DB40-D



No.	Part Name	Function description and applications
1	[PTT]-key	Press and then speak in to the microphone to transmit; Release it to receive.
2	The Speaker-Microphone	Used to receive audio from others (Audio output options can be set from the menu option)
3	LED indicator of the Speaker-Microphone	In transmitting, LED lights red; if operating on Speaker-Microphone keypad, LED light will be always on.
4	MIC P5	Programmable function key P5 / DTMF-Code A
5	MIC P6	Programmable function key P6 / DTMF-Code B
6	MIC P7	Programmable function key P7 / DTMF-Code C
7	MIC P8	Programmable function key P8 / DTMF-Code D
8	MIC	Speak to the microphone when pressing the [PTT]-key to transmit; (3-5 cm away from the mouth)
9	Numerical Keypad	Used to input frequency / channel number / DTMF-codes, alias, ID and SMS

Notes: *For convenient use, there are programmable [P]-keys for definition of various functions.*

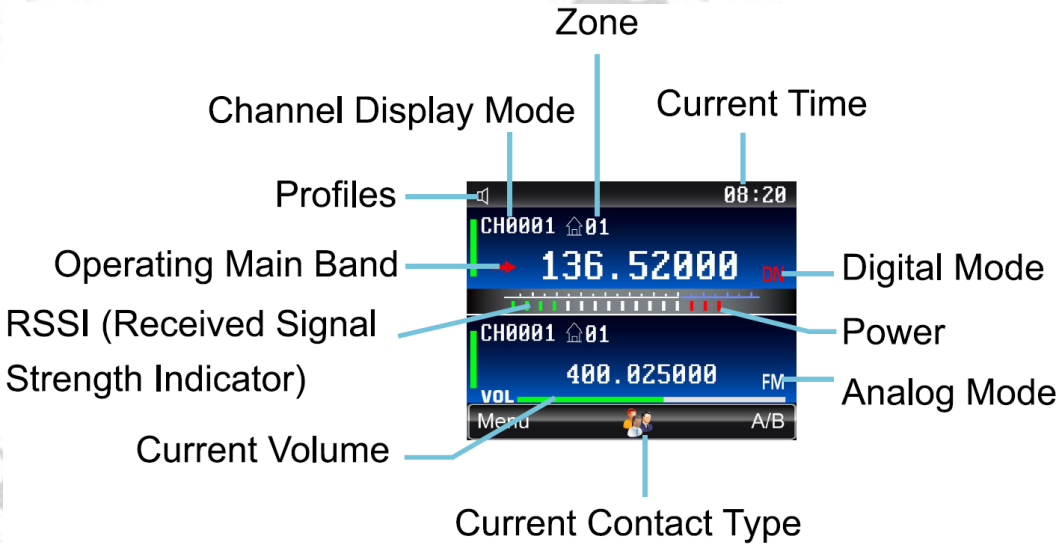
5.7 Radioddity GD-88 radio controls



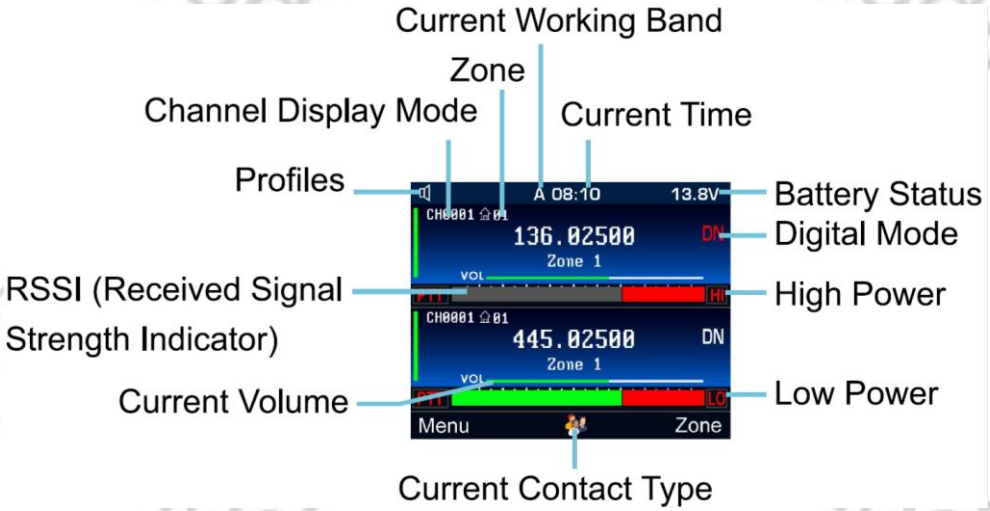
No.	Part Name	Function description and applications
1	[P2]	Programmable function key 2
2	[PTT]	Press and then speak in to the microphone to transmit; Release it to receive.
3	[P1]	Programmable function key 2
4	[P3]	Programmable function key 3
5	Antenna	Install the supplied dual-band antenna to this port. In TX testing, please install a dummy load to replace the antenna. The antenna or dummy load should be with 50 Ω impedance.
6	TFT display	Display various working states, and combine with visual icons for easy use and operation
7	[Up]-key	Increase (Up) the frequency, channel, menu, etc.
8	[Menu]-key / [Select]-key / [OK]-key	1) In standby, short press to access the menu of the current VFO 2) In the current menu mode, short press for parameter selection and confirmation. 3) Long press (3sec) to input the channel number and call up the desired channel
9	[P4] 	Programmable function key 4 (sometimes also called 'the green button')
10	Speaker	Used to receive audio from others
11	Numeric Keypad	Used to input frequency / channel number, alias, ID, and SMS
12	LED indicator	Used to indicate the RX/TX status, etc.
13	Channel selector [ENC]	Operate VFO A/B according to CTRL display and used to set frequency, channel, menu selection and parameters

No.	Part Name	Function description and applications
14	Power switch / Volume control	1) Turn the radio On/Off 2) Choose the proper volume level for your needs
15	Speaker / Mic jack	1) For external accessories connection, such as earpiece, speaker. 2) Connect the programming cable here to get connection with the PC for data programming.
16	Microphone	Speak to the microphone when pressing the [PTT]-key to transmit (3-5 cm away from the mouth)
17	[A/B] CTRL (VFO A/B) selection / Back key / Edit key	1) In standby, short press to choose the desired VFO A or B (CTRL will be displayed on the left in the middle line of the corresponding VFO. 2) In menu operation, use as the return key. 3) In standby, long press to enter the settings of the currently selected channel.
18	[VFO A/B TX selection] Key 	1) In standby, short press to choose the desired VFO A or B for transmitting. '**PTT**' will be displayed on the left in the bottom line of the VFO selected for transmitting 2) In standby, long press to switch between Channel Display Mode and VFO Mode for the current operating VFO (indicated by '**CTRL**' on the left in the middle line of that VFO)
19	[Down]-key	Decrease (Down) the frequency, channel, menu, etc.
20	Belt clip	Used to clamp the radio to a belt
21	Battery pack	Used to provide power to the radio
22	Battery latch	Used to fasten the battery to the radio unit

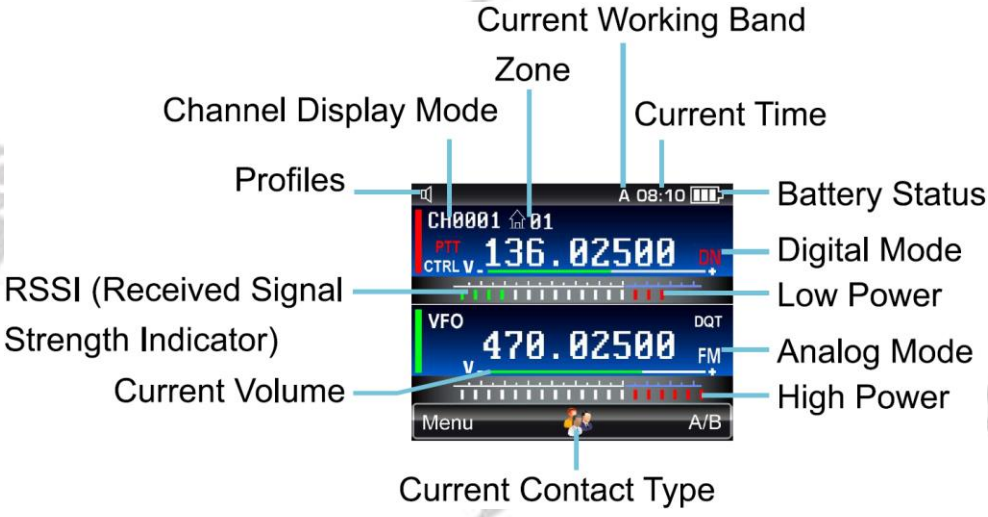
5.8 Radioddity DB25-D display



5.9 Radioddity DB40-D display

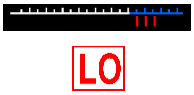


5.10 Radioddity GD-88 display



5.11 Status Icons

In part, the shown icons differ, based on the actual radio model.

Icon	Icon description	Functional description
	High Power	6 red bars indicate high power
	Low Power	3 red bars indicate low power
	Standby	White bars indicate the radio being in Standby Mode
	RSSI	In RX mode, the more green bars, the stronger the signal
	Keylock	Appears when the keypad is locked
	Battery Status 	The more bars, the larger the remaining battery capacity and vice versa
	Monitor	Appears when analog monitor is on
	Promiscuous	Appears when Promiscuous mode is on
	VOX	Appears when VOX is on
	GPS 	Appears when GPS is on (red, if not sufficient GPS satellites received; green as soon as GPS position found)
	GPS 	
	APRS	Appears when the selected channel has been assigned a APRS reporting channel as well.
	Scan	Appears when SCAN is on
	Emergency Mode	Appears when the radio is in emergency mode.
	Encryption	Appears when Encryption is on
QT	CTCSS	Appears when CTCSS is on
DQT	DCS	Appears when Normal DCS is on
DQI	DCS-I	Appears when Reverse DCS is on
	Prompt Tone on	Appears when profile is in standard mode
	Prompt Tone Off	Appears when profile is in silent mode

Icon	Icon description	Functional description
	Talk Around	Appears when the radio is in Talk Around Mode
	Roaming	Appears when Roaming is on
	Roaming Lock	For locking current channel in Roaming
	Offset Frequency Negative direction	Appears when RX frequency is higher than TX frequency
	Offset Frequency Positive direction	Appears when TX frequency is higher than RX frequency
DN	Digital Mode	VFO setup for digital mode
FM	Analog Mode	VFO setup for analog mode
DN	Digital/Analog Mode	VFO setup for digital/analog auto RX mode. Digital Mode is for main TX
DN	Analog/Digital Mode	VFO setup for analog/digital auto RX mode. Analog Mode is for main TX
	Operating VFO 	VFO selected for menu operations and transmit
CTRL	VFO for menu 	VFO selected for menu operations
PTT PTT	VFO for TX 	VFO selected for transmissions
	TimeSlot 1	Indicates the working slot of current frequency or channel
	TimeSlot2	
	Zone	Indicates the working zone of current frequency or channel
VFO	Variable Frequency Mode	Indicates working in frequency mode, frequency can be input via numerical keypad
	SMS	Appears when received a new message.
A	VFO A selected 	Radio menu applies to VFO A
B	VFO B selected 	Radio menu applies to VFO B
A/R → B/T	VFO A/B Repeat Mode 	VFO A for receiving and VFO B for transmitting
A/TR ↔B/TR	VFO A/B Repeat Mode 	VFO A or B for receiving and VFO B for transmitting
B/R → A/T	VFO A/B Repeat Mode 	VFO B for receiving and VFO A for transmitting

Icon	Icon description	Functional description
/	Mandown	Mandown detection activated
	DTMF	DTMF mode is active
/	Bluetooth	Bluetooth available. If icon is solid, a BT Earpiece has been connected
	Bluetooth PTT	Bluetooth PTT paired

5.11.1 Transmit / Receiving Icons

The following icon appears on the radio screen to indicate the radio status.

Mode	Type	Icon	Radio status
	Private call		Sending a Private Call
			Receiving a Private Call
	Group Call		Sending a Group Call
			Receiving a Group Call
	All Call *		Sending an All Call *
			Receiving an All Call *
			Sending an analog transmission
			Receiving an analog transmission

*) Not used by ham operators

5.11.2 LED Indicators

LED indicator	Radio status
	Receiving
	Transmitting
Fast Flashing green	Scanning
Fast Flashing red	Low battery alert

5.12 Keypad operations

Please follow the key operation described below to simplify the instructions and avoid unnecessary duplication.

Instruction	Operation
Press the [XXX] button	Short press the button and release it quickly
Press and hold [XXX] button	Long press and hold down the button for 3 seconds or more
Rotate the [ENC] knob Use [▲/▼]-keys on GD-88	Select set options

5.12.1 Keys and ENC (channel Selector) operation

The following keys can be used to quickly achieve the desired function.

Key	Status	Operation	Description
	Standby	Long Press (3 sec)	Power On /Off
[ENC] 	Standby	Short Press	Access to the Menu
		Long Press	[Keylock] or [Unlock]
	In Menu Mode	Long Press	[Confirm] or [Menu]
[ENC]	Standby	Rotate	Select channel, frequency, and other parameters
	In Menu Mode		Select Menu and other setting parameters
	Channel Edit Mode		Select programming items or other parameters
	Edit (SMS)		Move the editing position of the blinking cursor to the left or right
[Px]	Standby	Short Press	Preset function based on configuration
		Long Press	Preset function based on configuration
[VOL/SQL] 	Standby	Short Press	For adjusting the output volume
		Long Press	In analog mode, adjust the squelch level
[TONE / T.SEL] 	Standby	Short Press	In analog mode, choose signaling type
		Long Press	To select signaling code / frequency after selecting the signaling type, and thereafter short press of [TONE/T.SEL] to choose signaling code / frequency for RX / TX
[B/E] 	Standby	Short Press	Select the operated VFO A/B to make a call or menu operation
		Long Press	Operations for Channel/VFO-Attributes, storage, and other parameters
	Menu Mode	Short Press	Back to the previous level

5.13 Main functions description

The chapter does describe the main functions of the radio. Some of them are only available in analog operating mode (FM), others are only available in digital operating mode (DMR) and a few of them are in common for both operating modes.

5.13.1 Common functions

Function	Description
Zone	A zone Is a group of channels. Support end users to build and expand zones by themselves.
VFO Mode	In VFO mode, the user can directly input the required frequency using the numeric keyboard of the Speaker-Microphone
Channel	Support end users to build and expand channels by themselves. Memory is handled dynamically
Power	The power level is for the transmission output power level of the current channel, which can be set to high or low power.
Emergency Alarm	Emergency alarm has the highest priority.
Scan	When the terminal scans a signal on a channel, It will stay on the channel to listen, to understand the current activity status of the relevant team members.
VOX	If VOX is On, when the voice is detected to reach the transmission condition by the microphone, it will be transmitted automatically. The user can initiate a call without pressing the [PTT]-key.
Busy Channel Lockout	Busy channel lockout (BCL) prohibits transmission and prevents interference with other users when the radio is receiving traffic.
TOT	When a transmission times out, the radio will automatically terminate the transmission and issue a warning sound. The user can Initiate a call without pressing the [PTT]-key.
Keyboard Lock	Keypad lock is used to lock keys to prevent Inadvertent key operation. The radio may be set to automatic or manual lock mode.

5.13.2 Analog Functions

Function	Description
Analog channel call	An analog call is a call on an analog channel.
Narrow / Wide Band	Working bandwidth for the radio (Narrow band: 12.5 kHz, Wide band: 25 kHz)
Squelch Level	It is the signal strength required to adjust the received signal. Normally the higher squelch level, the higher received signal strength is required. Settable squelch level is from O - 9. Level 0 is normally open, and there is background sound from the speaker once the radio is on. Level 9 is the highest and the required received signal strength is the strongest.
Busy Channel Lockout	If it is ON, when received the carrier signal, it is prohibited to transmitting when pressing the [PTT]-key.
Monitor	Monitor allows the user to open the receiver squelch manually to listen to on-channel signals.
CTCSS	CTCSS code for RX radio must be same as TX radio, so that the audio can be received successfully
DCS	DCS code for RX radio must be same as TX radio, so that the audio can be r11ceived successfully

5.13.3 Digital Functions

Function	Description
Private call	Private call is a one-to-one call.
Group call	Group call is a one-to-many call.
All call	All call is a call to all contacts on the current digital channel. Not used by ham operators.
Talk Around	When the repeater fails to work or the radio exceeds the coverage of the repeater, it can communicate off-line (RX & TX at the same frequency) to communicate
Roaming Setting	Roam Mode, RSSI Set, Connect Check Timer, Connect Recheck Timer, Connect Timer
Roaming	When the radio moves from one site to another, it will automatically find the next available site through roaming.
Recording	Record any received and/or transmitted audio
DTMF RX/TX reminder	Used as the TX PTT prompt tone and RX prompt tone before receiving the audio signal.
TDMA direct mode	TDMA direct mode Is used to divide a direct channel (simplex) into two TimeSlots lo allow efficient channel usage. Multiple parties may share the channel without interference depending on slot setting.

5.14 Using the numeric keypad

The numeric keypad of the Speaker-Microphone / the radio can be used to input frequencies/channel numbers, user alias or ID or SMS. Almost all characters require pressing a key for several times (up to 30 times).

5.14.1 Alphanumerical input of characters

Keypad	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Note
1	,	。	?	!	:	;	、	“	”	‘	’	(	)	《	》																"PY" input mode
	.	,	’	?	!	-	(	)	@	/	:	_	;	+	&	%	*	=	〈	〉	$	[	]	{	}	~	^	‘	#	|	"AB" / "ab" input mode
2	A	B	C																												
3	D	E	F																												
4	G	H	I																												
5	J	K	L																												
6	M	N	O																												
7	P	Q	R	S																											
8	T	U	V																												
9	W	X	Y	Z																											
0	Note: in the digital editing mode, a short press of this key enters the value of "0", while long press enters the symbol "+" in the digital, English and Chinese editing mode.																														
*	Note: in the digital, English and Chinese editing mode, a short press of this key enters the "*" symbol, and a long press enters a "space".																														
#	Note: in the editing mode of Numbers, English and Chinese, a short press of this key inputs the symbol "#", while a long press switches between the editing input mode of English, Numbers, Chinese (pinyin) (" AB "in upper case," ab" in lower case," 12 "in figure," PY "in Chinese pinyin)																														

5.14.2 Programmable Function keys

There are more than 25 different functions that may be assigned to the programmable [P]-keys. For more details on how to program these keys, please check chapter 12.6 Preset Keys on page 141.

6 Basic Operation

6.1 Turning the radio On/Off

ON: Make sure the power supply is connected correctly, long press the [⏻] key or turn the volume knob clockwise until you hear a 'click' to power on the radio till a 'Beep sound' is heard (if turned on). After power on, the Radioddity logo and 'Powering On' text is shown on the display. The radio is now in standby-mode.

OFF: Long press the [⏻] key or turn the volume knob counterclockwise until you hear a click to power off the radio.

6.2 Adjust Volume

For adjusting the volume on your Radioddity DB25-D, short press the [VOL/SQL]-key , after the volume level is displayed in the upper right of the active VFO, rotate the [ENC] button clockwise (increase) or counterclockwise (decrease) to adjust the volume. Alternatively press the ENC-knob and keep it depressed whilst then turning the knob to adjust the speaker volume. The green volume scroll bar in the middle of the display will change according to the volume level. The volume setting applies to both VFOs A and B. To store the setting, just press the ENC-knob as long as the current volume-setting is blinking.

For adjusting the volume on your Radioddity DB40-D, turn the volume knob of the corresponding VFO clockwise (increase) or counterclockwise (decrease) to adjust the volume. The green volume scroll bar of the selected VFO will change according to the volume level. The volume settings for VFO A and B may be set independent from each other.

For adjusting the volume of the VFO that´s currently marked as 'CTRL' on your Radioddity GD-88, turn the volume knob clockwise (increase) or counterclockwise (decrease) to adjust the volume. The green volume scroll bar of the selected VFO will change according to the volume level. The volume settings for each VFO A and B may be set independent from each other.

6.3 Adjust Squelch

The '➡' icon displayed left to the channel name of the upper VFO A or the lower VFO B indicates the selected VFO. The squelch level for both VFOs, A and B may be set separately by accessing the menu or long press the [VOL/SQL]-key. In general, higher squelch levels do require the received signal strength to be stronger. Settable squelch level range is from '0, 1 - 9'. Level 0 is normally open, and there is background sound from the speaker

once the radio is on. Level 9 is the highest level and the required received signal strength is the strongest.

'**PTT**' displayed to the lower left of the channel name of the upper VFO A or the lower VFO B indicates the selected VFO. The squelch level for both VFOs, A and B may be set separately by accessing the menu. In general, higher squelch levels do require the received signal strength to be stronger. Settable squelch level range is from '0, 1 - 9'. Level 0 is normally open, and there is background sound from the speaker once the radio is on. Level 9 is the highest level and the required received signal strength is the strongest.

'**CTRL**' displayed left to the channel name of the upper VFO A or the lower VFO B indicates the selected VFO. The squelch level for both VFOs, A and B may be set separately by accessing the menu. In general, higher squelch levels do require the received signal strength to be stronger. Settable squelch level range is from '0, 1 - 9'. Level 0 is normally open, and there is background sound from the speaker once the radio is on. Level 9 is the highest level and the required received signal strength is the strongest.

6.4 Switch VFOs

In Standby Mode, press the [B/E]-key to switch between VFOs A and B for operation and settings. The current operable and settable VFO shows the '➡' icon left to the channel name.

Notes: *If single VFO display is selected , you will see either VFO A or VFO B.*

In Standby Mode, bush the corresponding VFO-Button to select either VFO A or B for operation and settings. The current operable and settable VFO shows the '**PTT**' icon in the lower left to the channel name.

Notes: *If single VFO display is selected , you will see the least selected VFO A or B without any further indication by means of '**PTT**'.*

In Standby Mode, press the [A/B]-key to switch between VFOs A and B for operation and settings. The current settable VFO shows '**CTRL**' on the left side in the middle line, whereas the current operable VFO is indicated by '**PTT**' left to the channel name and can be changed using the [VFO A/B TX selection]-key.

6.5 Busy Channel Lockout

When the '➡' icon, '**PTT**' or 'CTRL' is shown left to the channel name you may set the Busy Channel Lock of the currently selected VFO A or B separately to On or Off by accessing the menu. If it is 'On', when receiving a carrier signal, it is not possibe to transmit when pressing the [PTT]-key.

6.6 Wide/ Narrow Band

When the '➡' icon (DB25-D), '**PTT**' (DB40-D) or 'CTRL' (GD-88) is shown left to the channel name you may set the bandwidth of the currently selected VFO A or B by accessing the menu.

6.7 DTMF for analog mode

In analog mode the radio allows to transmit so called DTMF-codes. Valid DTMF-codes are 0...9,*,# and A...D. Those DTMF codes are generated by transmitting two different audio frequencies at the very same time Those audio frequencies are defined by the column and the row of the DTMF code to be transmitted.

frequency	1209 Hz	1336 Hz	1477 Hz	941 Hz
697 Hz	1	2	3	A
770 Hz	4	5	6	B
852 Hz	7	8	9	C
941 Hz	*	0	#	D

As two audio tones are transmitted at the very same time, this technique is called **D**ual**T**one**M**ulti**F**requency (abbreviated as DTMF) encoding.

In order to activate DTMF encoding, long press '1' on the numerical keypad. From now on all keys of the numerical keypad will trigger the generation of their corresponding DTMF codes. Active DTMF-mode is indicated by the DTMF-icon in the upper right area of the VFO that´s been selected for PTT. To deactivate DTMF encoding, long press '1' on the numerical keypad or wait for about 10 seconds until the icon is no longer visible.

It is also possible to transmit DTMF-codes without prior activation of the DTMF-mode. Just press the PTT-key and keep it depressed whilst additionally pressing one of the below listed keys. The assignment of the keys is as follows:

DTMF-code	DB25-D key	DB40-D key	GD-88 key
0...9	0...9	0...9	0...9
*****	*	*	*
#	#	#	#
A	P4	P5	P2
B	P5	P6	P1
C	P6	P7	Rocker key UP
D	P7	P8	Rocker key DOWN

Notes: *The programmable keys P4, P5, P6 and P7 are not available as long as DTMF-mode is active on a* Radioddity DB25-D*.*
The programmable keys P5, P6, P7 and P8 are not available as long as DTMF-mode is active on a Radioddity DB40-D*.*
The programmable keys P1 and P2 are not available as long as DTMF-mode is active on a Radioddity *GD-88.*
Firmware versions released prior to 2023 do not support DTMF for analog mode.

6.8 CTCSS / DCS

When the '➡' icon, '**PTT**' or 'CTRL' is shown left to the channel name you may set the CTCSS and DCS signaling of the currently selected VFO A or B separately by accessing the menu.

1. In standby, press the [Menu]-key to access the menu and choose '***Parameters***' → '***Signaling***'.

2. In standby, long press the [B/E]-key (DB25-D), [ENC] (DB40-D) or [A/B]-key (GD-88) to access the Channel-Attributes, and choose '***RX/TX signaling***' / '***Rx/Tx SubType***'.

3. In standby, press the [TONE/T.SEL]-key, and then choose the required signaling. This is only possible with the Radioddity DB25-D .

   (1) **Choose the signaling type**: single click the [TONE/T.SEL]-key to choose from QT , DQT, DQI or none. The signaling icon will display at the upper right of the current VFOs channel.

   (2) **Choose the signaling code / frequency**: long press the [TONE/T.SEL]-key to display the current signaling code/frequency at the upper right of current VFOs channel, rotate the [ENC] button to choose the desired signaling code/frequency and press the [Menu]-key to confirm your selection. Or press the [TONE/T.SET]-key to set RX (R:XXXX) or TX (T:XXXX) signaling code/ frequency.

6.9 Channel Selection

The desired working channel can be selected as follows:

1. When the '➡' icon, '**PTT**' or 'CTRL' is shown left to the channel name of VFO A or B, rotate the [ENC] knob or use the [▲/▼] to select the desired channel.

2. When the '➡' icon, '**PTT**' or 'CTRL' is shown left to the channel name of VFO A or B, input the desired channel number by using the numerical keypad.

3. When '**CTRL**' is shown left to the channel name of VFO A or B. press the [Menu]-key for 3 seconds. A dialog box and total channels of current zone pops up, to enter the desired channel number through the numerical keypad.

6.10 Switch between VFO and Channel Mode

In Standby Mode, when the '➡' icon is shown left to the VFO A or B, access the 'MENU → Local Set → DisplayMode' and choose ***VFO Mode*** as Display Mode.

In Standby Mode, when '**PTT**' is shown in the lower left to the VFO A or B, long press the volume-key of the current VFO to switch the display mode between ***VFO Mode*** and ***Channel Mode***.

In Standby Mode, when '**CTRL**' is shown left to the VFO A or B, long press the [VFO A/B TX selection]-key to switch the display mode between ***VFO Mode*** and ***Channel Mode***.

6.11 VFO Frequency Set

In Standby Mode, when the '➡' icon, '**PTT**' or 'CTRL' is shown left to the VFO A or B and the current VFO is in VFO mode, the desired frequency can be entered through the numeric keypad. For example, for 438.237500 MHz, directly input

[4] [3] [8] [2] [3] [7] [5] [0] [0]

using the numeric keyboard.

> ***Notes***: *The current frequency can be increased / decreased by turning the [ENC] knob. For more details on editing a channel please refer to chapter 10.12 Channel Edit on page 113.*

6.12 Zone / Channel Selection

When the '➡' icon, '**PTT**' or 'CTRL' is shown left to the current VFO A or B, the following two methods can be used to select the desired zone, channels switching and zone name modification or editing.

1. Programming one of the keys for the [Zone] switching feature.
2. Select the [Zone] item by accessing 'Menu → Zone&Channel'

6.13 Monitor

In Standby Mode or before pressing the [PTT]-key to transmit, press the preset [Monitor]-key to monitor channel activity, or receive weak signals, or confirm whether the current channel is free. An active Monitor- or Permanent Monitor-function is indicated by the symbol '((·))' on the top most display line.

6.14 Permanent Monitor

In Standby Mode, press the preset [Permanent Monitor]-key to continuous monitor the current channel activity. Permanent Monitor is same as Monitor feature, which is allowing you to monitor the channel to make sure it is not occupied before transmitting; their difference is once Permanent Monitor is on, the radio will always be in this monitor mode, till you exit it. An active Monitor- or Permanent Monitor-function is indicated by the symbol '((·))' on the top most display line.

6.15 Promiscuous Mode

If you haven´t assigned a proper RX-group to the selected channel, you may still monitor all activity that is taking place on the specified channel and its assigned TimeSlot by means of activating the so-called Promiscuous mode.

To do so, define one of the programmable keys for [Promiscuous]. Whenever you press that preset key promiscuous mode will be turned On/Off. Active promiscuous mode is indicated by the icon left to the TimeSlot icon of a digital channel. If VFO A and VFO B both have been selected a digital channel, promiscuous mode is active for both VFOs.

Only those traffic that is been received from the currently selected digital channel and its assigned TimeSlot will be monitored. If you do want to monitor both TimeSlots, setup one channel with TimeSlot 1 and another channel with TimeSlot 2. Select one of those channels for VFO A and the other one for VFO B. Now activate promiscuous mode. Both VFOs will now be in promiscuous mode. As soon as there is traffic been identified by one of the VFOs, those will be heard. Only one VFO can be heard at the very same time.

If the currently active TalkGroup is NOT a member of the RX Group that´s assigned to the selected channel or even no RX Group is assigned to the selected

channel and promiscuous mode is not activated, you will not be able to hear any activity on the currently selected channel.

If the currently active TalkGroup is NOT a member of the RX Group that´s assigned to the selected channel or even no RX Group is assigned to the selected channel but Promiscuous mode IS activated, you will be able to hear any activity that´s going on for that channel, as long as it will be received on the very same TimeSlot as assigned to the currently selected channel.

***Notes**: If you are unable to assign 'Promiscuous' to your* Radioddity *GD-88, then you are not using our latest CPS. Older versions of our CPS are not capable of assigning it.*

6.16 Repeater / Talk Around

When the repeater fails to work, or the radio exceeds the coverage of the repeater but within the call range of other radio users, press the preset [Repeater / Talk Around]-key or actively set 'Menu → Parameters → Slot/Repeat → Repeat/off' to 'Talkaround' and press the [PTT]-key to continue the communication. This is the so-called Talk Around function.

6.17 Emergency Alarm

The emergency alarm function is mainly used in an emergency situation. Pressing the preset [Emergency Alarm On/Off]-key will make an emergency alarm call or stop sending an emergency alarm call.

There are 3 Emergency Alarm modes supported:

1. Emergency Alarm
2. Emergency Alarm & Call
3. Emergency Alarm & Voice

An alarm is a type of non-voice signaling that can trigger a prompt to another radio. This function refers to the alarm behavior of the radio after it is activated. The following types of alarms are possible:

Disable The radio will not send an alarm signal.

Standard The radio can send the alarm signal with voice & visual prompts.

Mute The radio sends alarm signaling without audio or visual prompts, and will not alert to any received audio.

Mute with voice The radio sends alarm signaling without audio or visual prompts, but can send signal to the eligible channels.

***Notes:** Not used within amateur radio networks*

6.18 Scan On/Off

When the '➡' icon, '**PTT**' or 'CTRL' is shown left to the current VFO A or B, turn scan On/Off by the following two ways.

1. Turn scan On/Off by programming a [Scan On/Off]-key.

2. Actively select 'Menu → Scan → Scan -> Scan On/Off' to turn it On or Off.

6.19 Roaming On / Off

If necessary, turn roaming On or Off by the following two ways.

1. Turn roaming On/Off by programming a [Roaming On/Off]-key.

2. Actively select 'Menu → Scan → Scan -> RoamScan On/Off' to enable/disable roaming.

Notes:	*Make sure the 'Scan List' is pre-selected before turning on the 'Scan' or 'Roaming' feature. Otherwise, none of the scan types will be enabled.* *The radio will work in VFO A as default when 'Roaming' is enabled.* *When 'Roaming' is enabled, the radio will start to scan all repeater channels in the 'scan list' (TX/RX with different RX- and TX-frequency), and the non-repeater channels in the 'scan list' (RX/TX with same frequency) will not be scanned. If there is no repeater channel in the scan list, the radio will exit the roaming after scanning the current 'scan list';* *When 'Scan' is enabled, the radio will open all the receivable channels in the 'scan list'.*

6.20 Pilot tone / Burst tone

Analog repeaters often do require to be activated by sending a so called pilot or burst tone to the repeater.

To do so, define one of the programmable [P]-keys for one of the supported pilot tones [700 Hz, 1000 Hz, 1200 Hz, 1400 Hz, 1450 Hz, 1750 Hz or 2100 Hz]. Whenever you press that preset key the assigned pilot tone will be send. When assigning one of the burst tones / pilot tones to short press of a programmable [P]-key, the long-press function will not be available. So best would be to assign pilot tones / burst tones only to long-press of programmable [P]-keys.

Notes:	*Firmware versions released prior to October 2022 only support the 1750 Hz pilot tone.*

7 Using the radio menu

Set various functions and parameters by accessing the main menu and submenu of the radio. The menu function options supported by the Radioddity DB25-D, DB40-D and GD-88 are shown in the table below.

The programmable [P]-keys are function shortcut keys, for specific functions and may be pre-programed using the Radioddity CPS.

Icon	Main Menu Item	Available setting items
	Contacts	Contact List, New contact, Manual Dial, Ham contacts, Ham Group Contacts
	Message	Create Msg, Common Msg, Inbox, Outbox, Draftbox
	Call Log	Dialed Numbs, Received Calls, Missed Calls
	Scan	Scan (On/Off), Scan List, Scan Mode, Roam Setting
	Zone&Channel	Zone List, Chn List
	Local Set	Language, Keypad Lock, Back Light, LEDs, Display Mode, VOX, Channel Sw, ABRepeat, Semi Repeater Mode, Factory Reset,
	Parameters	TOT, Power, Slot/Repeat Setting, Sleep Mode, EncLevel, Sq Level, Band, BCLO, Signaling, Ctcss Tail
	Tone Set	Profiles, Key Tone, Power Tone, Msg Tone, P Call Tone, G Call Tone, Alert Tone, FM Call Tone / PowerOn Tone
	Appendix	GPS, FM Radio, Time, DMR DTMF, Headset+Speaker HandMic+Speaker, APRS, BT
	Record	Record Set, Record List, Clear Record, Space Info
	Device Info	Radio ID, RX Group List, CH contact, Version, Alias
	Edit Channel	Edit the parameters of the current VFOs channel or activated VFO-mode.

7.1 Accessing the menus and operations

Access the main menu and submenu options to set or browse various parameters (like message checking, editing, and sending, etc.) through the following operations and steps. Some of the menus may be enabled or disabled using the Radioddity CPS.

Icon	description
	Indicates an On (green) /Off (red) switch
	Indicates a selected and executed items
	Indicates to enter the next submenu option

1. In Standby Mode, press the [Menu]-key to access the menu.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to select the desired 'Main Menu' item, and press the [Select]-key to enter the submenu
3. Rotate the [ENC] knob or use the [▲/▼]-keys to select the desired submenu item, and press the [Select]-key to enter

or

1. Rotate the [ENC] knob or use the [▲/▼]-keys to select and set the current parameter and press the [Select]-key to confirm the setting and return to the previous level.

or

1. Press the [Select]-key to select 'On' or 'Off'.
2. Press the [Back]-key to return to the previous level.
3. If needed, continue to browse other menus by repeating the above steps or return to the 'Main Menu' for other operations.

***Notes**: No matter where the '➡' icon, '**PTT**' or 'CTRL' is shown left to the current VFO A or B, the setting for some of the parameters applies to both VFOs.*
For more details, please check chapter 5.13 Common functions on page 56.

8 Placing a PTT Call

To ensure an optimal transmission, hold the Microphone in a vertical position at one to two inches (2.5 to 5.0 cm) away from the mouth. Noisy environments may require a closer distance or lifting up your voice.

In order to compensate network latency times, leave a short pause after pressing the [PTT]-key but before beginning your actual voice communication. After your communication and before releasing the [PTT]-key, do the very same again. In order to allow other stations to join a conversation, also do not start your transmission immediately after the other station did release its PTT.

8.1 High / Low power

In Standby Mode, if needed, when the '➡' icon, '**PTT**' or 'CTRL' is shown left to the current VFO to be set, change radio output power by one of the following two ways:

1. Press the preset [High/Low Power option]-key to switch between high and low power. The 'red' indicator at the bottom of the screen of the current VFO will change according to the set power level.

2. Access 'MENU → Parameters → Power' through the menu to set the output power level of the radio. After setting, the 'red' indicator at the bottom of the screen of the current VFO will change according to the set power level.

> ***Notes***: *High power allows further communication distances. Low power allows closer communication distances. If you use your radio with a hotspot, set it to low power. For more details, please check also chapter 13.9 High / Low power on page 179.*

8.2 Select the transmitting VFO

In Standby Mode, long press the [B/E] , the Volume knob corresponding to the VFO or [A/B]-key to switch between VFO A and B for the desired transmission, and the current transmitting VFO will have the '➡' icon, '**PTT**' or 'CTRL' is shown left to the current VFO.

8.3 Receive and answer to a digital radio call

Private calls, Group calls, and All calls can be made to the preset contacts on the current digital channel (All call rights need to be allowed by the Radioddity CPS), and the methods for initiating and receiving all types of calls are the same. Each digital channel can be preset using the Radioddity CPS with a 'transmission contact' for Private Call, Group Call or All Call contact. Analog Calls do not require a Contact or RX-Group.

Call Type	Operation method	
	Make a call	Receive a Call
Private Call	In Standby Mode, press the [PTT]-key to initiate the call. When a Private Call is initiated, the screen displays: 	When a Private Call is received, the screen displays: 
Group Call	When a Group Call is initiated, the screen displays: 	When a Group Call is received, the screen displays: 
All Call *	When an All Call is initiated, the screen displays: 	When an All Call is received, the screen displays: 

*) Not used within amateur radio networks

If the 'Tx Begin Tone' and 'TX End Tone' for Private and Group Calls are activated (currently only possible at the radio itself), when pressing the [PTT]-key of the Speaker-Microphone to make a call, a short prompt tone will be heard indicating that the call is in progress. You can speak into the MIC. Upon release of the [PTT]-key, a short beep sound will be heard indicating that your radio is now is ready for receiving.

If 'Rx Begin Tone' and 'Rx End Tone' for Private and Group Calls are activated (currently only possible at the radio), when the other station transmits, you will hear a short prompt tone indicating that the current channel is in receiving mode. As soon as the other station ends its transmission, you will hear a short beep, indicating that the channel is now idle again and waiting for your answer.

***Notes**: For more details, please check chapter 10.8 Tone Set on page 101.*

8.4 Initiate a digital radio call

If necessary, a call can be initiated by any of the following ways.

1. Rotate the [ENC] knob or use the [▲/▼]-keys to select any of the preset channels, and then press the [PTT]-key of the Speaker-Microphone to initiate the call.

2. Access the 'Contact' list through the menu, or press the preset [Contact]-key to access the Contact list. Then select the desired contact by rotating the [ENC] knob, and finally press the [PTT]-key of the Speaker-Microphone to initiate the call.

3. Access 'Contacts' through the menu and select 'Manual Dial' to input the user DMR ID using the numeric keypad of Speaker-Microphone within the dialog box popping up on the radio screen. This is used for Private Calls only.

Notes: *For more details, please check chapter 10.1 Contacts on page 74.*

8.5 Talker Alias

Talker Alias (TA) is used to send a fixed text, such as call sign or call sign & name. The maximum length within the Radioddity DV25-D, DB40-D and GD-88 is limited to transmit 16 ISO 8bit characters which do represent the CPS-setting for 'Radio Name'.

This allows the receiving station to see those text without the need of a bulky DMR ID database to be stored in the radio.

Notes: *Special characters such as ä, ö, ü, ß, ... are not supported.*
This feature requires at least firmware 909E.D4.EARSAB.017 (Radioddity DB25-D) and B49E.D64.EHRSAB.007 (Radioddity GD-88).
For more details, please check chapter 10.11 Device *Info on page 111.*

8.6 Receive and answer to an analog radio call

Rotate the [ENC] knob or use the [▲/▼]-keys to select any of the preset analog channels, and then press the [PTT]-key of the Speaker-Microphone to initiate the call to all users. The TFT display screen shows . When receiving a call from other operators on the current analog channel or when the Monitor function is activated, the TFT display screen shows .

Notes: *If the transmitter is configured for CTCSS or DCS encoding, the other station can successfully decode the audio only if using the same CTCSS/DCS code.*
For more details, please check chapter 13.28 CTCSS sub audio and DCS signaling on page 192.

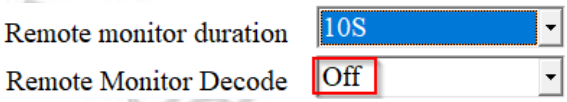
9 Special DMR functions

Use our Radioddity CPS software to enable/disable and preset any of the Preset Buttons with one of the following functions.

> ***Notes***: *For more details on how to program the Preset Keys, please check chapter 12.6 Preset Keys on page 141*

9.1.1 Remote monitor

Preset to prohibit the radio from being remotely monitored by others or allow other users to remote monitor for the set time for continuing to keep the MIC and transmitter on (Time range is from 10s - 120s).

> ***Notes:*** *To avoid misuse, we advise to disable this parameter using the CPS.*
>
> 
>

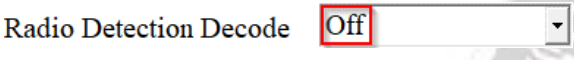
9.1.2 Remote Kill

Preset to prohibit the radio from receiving 'Remote Kill' command sent by other users; or allow the other users to receive and process the 'Remote Kill' command to disable the radio. This function can be used to disable the radio when it is stolen or lost.

> ***Notes:*** *To avoid misuse, we advise to disable this parameter using the CPS.*
>
> 
>

9.1.3 Radio Detection

Preset to prohibit or allow the radio from being remotely detected whether the radio is in communication range or active state without any prompt.

> ***Notes:*** *To avoid misuse, we advise to disable this parameter using the CPS.*
>
> 
>

9.1.4 Radio Revive

Preset to restrict the radio from receiving 'Radio Revive' command sent by other users; or allow the radio to receive and process the 'Radio Revive' command to activate it remotely. This function can be used to enable the radio when it is lost and found.

9.1.5 Call Alert

Preset to prohibit or allow the radio from receiving alert tone to ask for calling back when you are free.

9.1.6 GPS

Turn on/off GPS and position report feature to report the position information to the preset designated channel and TalkGroup at the preset intervals.

9.1.7 Record

Preset to prohibit or allow the recording for any of receive, transmit, receive + transmit voice.

9.1.8 DTMF

Preset to enable or disable sending a DTMF prompt tone sequence (max 11 codes) when pressing the [PTT]-key to transmit in order to achieve the effect of phone ring.

9.1.9 Encryption

Preset to encrypt the voice transmission of the digital channels. The encryption is a software-based scrambling solution for preventing eavesdropping. The receiver radio must have the very same encryption method, level, alias, and value as the transmitter radio to decrypt the encrypted voices from each other.

> ***Notes***: *Within amateur radio networks, Encryption is not used as it is not allowed. For more details, please check chapter 10.7 Parameters* *on page96.*

10 The radio Menu functions in detail

The various functions, applications and parameter configurations of the radio can be checked and set by menus, if those have been enabled using the Radioddity CPS.

10.1 Contacts

The contacts provide the 'address book' for the radio. Each entry corresponds to an alias or ID used to initiate a call, as well as operations and advanced DMR functions.

10.1.1 Contact list

1. Press the preset [Contacts]-key to access the menu.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Contacts*** and press the [OK]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to select the ***Contact list*** → press the [OK]-key to confirm → select the desired contact

   (1) Press the [PTT]-key to initiate a call

   (2) Press the [Select]-key to choose from the following options, depending on the call type of the selected contact

Contact of call type Group Call

(1)*SendMsg* → press the [Select]-key → Edit SMS → rotate the [ENC] knob or use the [▲/▼]-keys to choose the option of ***SendMsg*** (Send Message), ***InsertComMsg*** (Insert Common Message), ***Save*** or ***Exit Editor*** → press the [Select]-key to confirm → return back to the previous level.

(2)Edit (contact) → Press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the option of ***Number***, ***Name, Type*** or ***Save*** → press the [Select]-key to input the number and name or Save → press the [OK]-key to confirm → return to the previous level.

Contact of call type Private Call

(1)Application → press the [Select]-key → Rotate the [ENC] knob or use the [▲/▼]-keys to choose either ***Radio Check***, ***Call Alert***, ***Remote Mon.***(Monitor), ***Radio Disable*** or ***Radio Enable*** → press the [Select]-key to send→ 'OK' or 'Fail' text pops up on the screen → press the [Back]-key to return to the previous level.

(2)Edit (contact) → Press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose either ***Number***, ***Name***, ***Type*** or ***Save*** → press the [Select]-key to input the number, name, or type (Call Type) and press the [OK]-key to confirm and return to the previous level → finally select ***Save*** → press the [OK]-key to confirm → 'Contact Saved' pops up on the screen → return to the previous level.

(3)Delete → press the [Select]-key → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm the deletion or press the [Back]-key to cancel the deletion → return back to the previous level;

(4)SendMsg → press the [Select]-key to Edit a SMS → rotate the [ENC] knob or use the [▲/▼]-keys to choose either ***SendMsg*** (Send Message), ***InsertComMsg*** (Insert Common Message), ***Save*** or ***ExitEditor*** → press the [Select]-key to confirm the selected option → return to the previous level.

(5)Detail -> press the [Select]-key to show any details for that contact as found in the Ham contacts

10.1.2 New Contact

1. Press the preset [Contacts]-key to access the contact

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Contacts*** and press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***New Contact***, press the [Select]-key to choose from one of the following options:

(1)**Number** → press the [Select]-key → input the numbers using the numeric keypad of the Speaker-Microphone → press the [OK]-key to confirm → return back to the previous level.

(2)**Name** →press the [Select]-key →edit interface → input the characters using the numeric keypad of the Speaker-Microphone → press the [OK]-key to confirm → return back to the previous level.

(3)**Type** → rotate the [ENC] knob or use the [▲/▼]-keys to choose a Call Type either ***Group Call*** or ***Private Call*** → press the [OK]-key to confirm → return back to the previous level

(4)**Save** → press the [OK]-key to confirm → Return back to the previous level.

10.1.3 Manual Dial

1. Press the preset [Contacts]-key to access the contact

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Contacts*** and press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to select the Manual Dial, press the [Select]-key to enter the interface for keying in the ID.

3. Input the ID using the numeric keypad of the Speaker-Microphone.

   (1) Press the [PTT]-key to initiate a call;

   (2) Press the [OK]-key and Rotate the [ENC] knob or use the [▲/▼]-keys to make following options:

   - **Application** → press the [Select]-key → Rotate the [ENC] knob or use the [▲/▼]-keys to choose either ***Radio Check***, ***Call Alert***, ***Remote Mon.***(Monitor), ***Radio Disable*** or ***Radio Enable*** → press the [Select]-key to send→ 'OK' or 'Fail' text pops up on the screen → press the [Back]-key to return to the previous level.

   - **SendMsg** → press the [Select]-key to Edit a SMS → rotate the [ENC] knob or use the [▲/▼]-keys to choose either ***SendMsg*** (Send Message), ***InsertComMsg*** (Insert Common Message), ***Save*** or ***ExitEditor*** → press the [Select]-key to confirm the selected option → return to the previous level.

10.1.4 Ham Contacts

The Radioddity DB25-D, DB40-D and GD-88 can permanently store up to 300.000 HAM contacts within its internal memory.

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Contacts*** and press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to select the ***Ham Private Contacts***, press the [Select]-key to enter the Ham Private Call Contacts List.

3. Choose the desired private contact by rotating the [ENC] knob, the selected contact ID number will display at the top left of the screen and the serial No of the contact displays at the upper right.

   or

   Long press and hold the [MENU]-key for 3 seconds, a dialogue window pops up.

- Input the first few digits of the private contact ID to search using the numeric keypad of the Speaker-Microphone → press the [OK]-key to confirm → the display shows the search results → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired ID.

4. Press the [PTT]-key to initiate a private call or press the [Select]-key, rotate the [ENC] knob or use the [▲/▼]-keys to choose from the following options:

   (1) ***Application*** → press the [Select]-key → Rotate the [ENC] knob or use the [▲/▼]-keys to choose either ***Radio Check***, ***Call Alert***, ***Remote Mon.***(Monitor), ***Radio Disable*** or ***Radio Enable*** → press the [Select]-key to send→ 'OK' or 'Fail' text pops up on the screen → press the [Back]-key to return to the previous level.

   (2) ***SendMsg*** → press the [Select]-key to Edit a SMS → rotate the [ENC] knob or use the [▲/▼]-keys to choose either ***SendMsg*** (Send Message), ***InsertComMsg*** (Insert Common Message), ***Save*** or ***ExitEditor*** → press the [Select]-key to confirm the selected option → return to the previous level.

   (3) ***Details*** → press the [Select]-key → the display shows ID, nick name, name, city, province, country etc. information → press the [Back] to return to the previous level.

Notes:	*The '128 Bytes' records mode must be selected first before writing a Ham Private Contacts list to the radio, so that all details like name, city, province, country, etc. information will be imported. However, the import of that data requires a long writing time (about an hour). Make sure the radio keeps normal power supply during the writing process (GD-88: Fully charge the battery before starting the write-process). If '16 Bytes' records mode is selected before writing Ham Private Contacts list, only the contact ID and Nick name will be imported. This mode has a shorter writing time of just about 15 minutes. Make sure the radio keeps normal power supply during the writing process.*

10.1.5 Ham Group Contacts

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Contacts*** and press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to select the ***Ham Group Contacts***, press the [Select]-key to enter the Ham Group Call Contacts. Up to 20,000 HAM group contacts can be added.

3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose from the following options:

   (1) Ham Rx Group → press the [Select]-key to turn the option ON / Off.

(2) Choose the desired HAM group contact by rotating the [ENC] knob, then the selected contact ID number will be displayed at the top left of the screen.

(3) Long press and hold the [MENU]-key for 3 seconds, a dialogue window pops up on the interface.

- Input the first few digits of the private contact ID to search using the numeric keypad of the Speaker-Microphone → press the [OK]-key to confirm → the display shows the search results → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired ID.

4. Press the [PTT]-key to initiate a group call.

5. Press the [Back]-key to return to the previous level.

10.2 Message

The Radioddity DB25-D, DB40-D and GD-88 can receive and send text messages (SMS) from and to other radios. Those are text messages within the DMR network. Sending/receiving of text messages to/from normal mobile phone networks is not supported.

Various options can be used to send SMS messages.

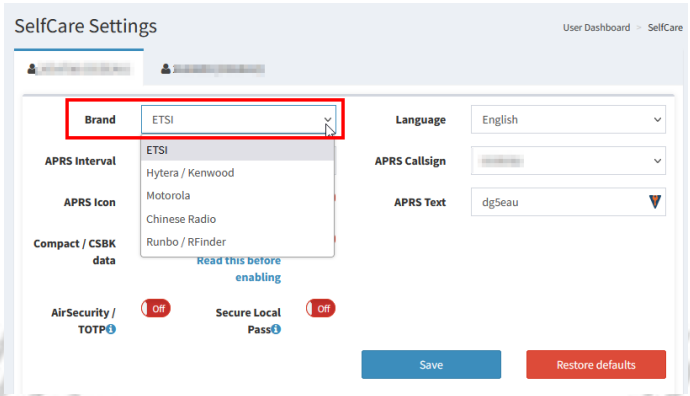
Notes:	*Hold and long press the '#' key for 3 seconds to change the Input modes in writing and editing messages and other processes. The input modes are AB (uppercase), ab (lowercase), 12 (numerical digits) and PY (Chinese).* *In the process of searching contacts or inputting ID numbers to send SMS, a call is initiated whenever the [PTT]-key is pressed.*

10.2.1 Network support for short messages

Not all DMR-based networks do support sending such short text messages. Some networks may require additional settings for your account. As an example, the currently largest DMR network, Brandmeister network, requires the brand of radio associated with the DMR ID to be assigned.

For your Radioddity DB25-D, DB40-D or GD-88 set it to 'ETSI'.

However, the DMR network does not guarantee a SMS will be successfully delivered.



10.2.2 CreateMsg

1. Press the preset [SMS]-key to access the menu.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Message*** and press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to ***CreateMsg*** and press the [Select]-key to enter the message editing interface.

3. After editing, press the [OK]-key to choose from one of following options:

   (1) **SearchLinkman** → rotate the [ENC] knob or use the [▲/▼]-keys to choose the contact → press the [PTT]-key of the Speaker-Microphone to initiate a call or press the [Select]-key to send the message → 'MSG SENDING' pops up on the screen → press the [Back]key to return to the previous level.

   (2) **WriteNumber** → input the contact number using the numeric keypad of the Speaker-Microphone → press the [OK]-key to send the → 'MSG SENDING' pops up on the screen → press the [Back]key to return to the previous level.

   (3) **InsertComMsg** (Insert Common Message) → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired message → press the [OK]-key → the inserted text is added to the text → edit or press the [OK]-key to return to the previous level.

   (4) **Save** → press the [Select]-key to save the message to the Draftbox → return to the previous level.

   (5) **ExitEditor** → press the [Select]-key to return to the previous level.

10.2.3 Common Messages CommMsg

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Message*** and press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to select ***CommMsg*** and press the [Select]-key to enter the common message list or 'Empty! Do you want Add?' text pops up on the screen.

3. In common message list → rotate the [ENC] knob or use the [▲/▼]-keys to select the desired message → press the [Select]-key and choose from one of the following options:

   - **Display** → Press the [Select]-key to display the full message → Press the [Back]-key to return to the previous level.

- **AddCommMsg** → press the [Select]-key → input the message using the numeric keypad of the Speaker-Microphone → press the [OK]-key → choose either **Save** or **ExitEditor** → press the [Select]-key → return to the previous level.

- **Edit** → press the [Select]-key → edit the message using the numeric keypad of the Speaker-Microphone → press the [OK]-key → choose either **Save** or **ExitEditor** → press the [Select]-key → return to the previous level.

- **Delete** → press the [Select]-key → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel the deletion → return back to previous level.

- **Send** → Press the [Select]-key → edit SMS and press the [Select]-key to either ***Search*** a contact or WriteNumber to manually key in the receiver ID using the numerical keypad of the Speaker-Microphone → press the [OK]-key to send the message → return to the previous level.

Notes:	*If there are no Common Messages, you should pre-program those using the* Radioddity *CPS software first or add them into 'CommMsg'.*

10.2.4 Inbox

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Message*** and press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to ***Inbox***, and press the [Select]-key to choose from one of the following options:

   (1) ***Inbox*** list → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the received message → press the [Select]-key to display the full message → press the [Select]-key to perform one of the following options:

   - **Reply** → press the [Select]-key → edit SMS → rotate the [ENC] knob or use the [▲/▼]-keys to choose an option of either ***SendMsg***, ***InsertComMsg*** or ***ExitEditor*** → press the [Select]-key to confirm the selected option.

   - **Forward** → Press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose an option of either ***Search*** or ***WriteNumber*** → Press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the contact or input the ID number using the numeric keypad of the Speaker-Microphone → Press the [OK]-key to send the SMS.

   - **Edit** → press the [Select]-key to make changes to the message → Press the [OK]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose

from one of the options of either ***SearchLinkman***, ***WriteNumber***, ***InsertComMsg*** or ***Save***.

- ***Delete*** → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

(2) ***Delete All*** → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

10.2.5 Outbox

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Message*** and press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to ***Outbox*** and press the [Select]-key to choose from one of the following options:

   (1) ***Outbox*** list → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose one of sent messages → press the [Select]-key to display the full message → press the [OK]-key to choose from one of the following options:

   - **Search** → rotate the [ENC] knob or use the [▲/▼]-keys to search the contact → press the [PTT]-key to initiate a call or press the [Select]-key to send the message → the message sending status pops up on the screen.

   - **WriteNumber** → input the contact number using the numeric keypad of the Speaker-Microphone → press the [OK]-key to send the message → the message sending status pops up on the screen.

   - **InsertComMsg** (Insert Common Message) → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired message → press the [OK]-key → the inserted text is added to the text → edit or press the [OK]-key to return to the previous level.

   - **Save** → press the [Select]-key to save the message → return to the previous level.

   - **Delete** → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel the deletion → return back to previous level.

   - **ExitEditor** → press the [Select]-key to return to the previous level

   (2) Delete All → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

10.2.6 Draftbox

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Message*** and press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to ***Draftbox***, and press the [Select]-key to choose from one of the following options:

   (1) ***Draftbox*** list → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the message → press the [Select]-key to display full message → press the [OK]-key to perform the following options:

   - ***Search*** → rotate the [ENC] knob or use the [▲/▼]-keys to search the contact → press the [PTT]-key to initiate a call or press the [Select]-key to send the message → the message sending status pops up on the screen.
   - ***WriteNumber*** → input the contact number using the numeric keypad of the Speaker-Microphone → press the [OK]-key to send the message → the message sending status pops up on the screen.
   - ***InsertComMsg*** (Insert Common Message) → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired message → press the [OK]-key → the inserted text is added to the text → edit or press the [OK]-key to return to the previous level.
   - ***Save*** → press the [Select]-key to save the message → return to the previous level.
   - ***Delete*** → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel the deletion → return back to previous level.
   - ***ExitEditor*** → press the [Select]-key to return to the previous level

   (2) Delete All → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

10.3 Call Log

Information for recent dialed calls, received calls and missed calls can be checked by users thru Call Log menu. Call logs help to manage the recent call activities.

10.3.1 Dialed Calls (DialedNumbs)

Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***CallLog*** and press the [Select]-key to enter.

Rotate the [ENC] knob or use the [▲/▼]-keys to ***DailedNumbs*** and press the [Select]-key to choose from the following options:

(1) ***DialedNumbs*** list → press the [Select]-key → Rotate the [ENC] knob or use the [▲/▼]-keys to choose the number/contact → press the [Select]-key to choose between the following options:

- ***View*** → Press the [Select]-key to check the dialed number → Press the [Back]-key to return to the previous level.
- ***TimeOfCall*** → press the [Select]-key to display the call time and duration information → press the [Back]-key to return to previous level.
- ***SendMsg*** → Press the [Select]-key to edit the message → Press the [OK]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose option of either ***SendMsg***, ***InsertComMsg***, or ***ExitEditor*** → Press the [Select]-key to confirm the selected option → Return to the previous level.
- ***Delete*** → 'Are you sure?' text pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

(2) ***Delete All*** → 'Are you sure?' text pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

10.3.2 Received Calls

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***CallLog*** and press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to ***ReceivedCalls*** and press the [Select]-key to choose from the following options:

(1) ***ReceivedCalls*** list → press the [Select]-key to enter → rotate the [ENC] knob or use the [▲/▼]-keys to choose the number/contact → press the [Select]-key to choose from the following options:

- ***View*** → Press the [Select]-key to check the dialed number → Press the [Back]-key to return to the previous level.
- ***TimeOfCall*** → press the [Select]-key to display the call time and duration information → press the [Back]-key to return to previous level.
- ***SendMsg*** → Press the [Select]-key to edit the message → Press the [OK]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose option of either ***SendMsg***, ***InsertComMsg***, or ***ExitEditor*** → Press the [Select]-key to confirm the selected option → Return to the previous level.

- ***Delete*** → 'Are you sure?' text pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

(2) ***Delete All*** → 'Are you sure?' text pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

10.3.3 Missed Calls

- Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***CallLog*** and press the [Select]-key to enter.
- Rotate the [ENC] knob or use the [▲/▼]-keys to ***MissedCalls*** and press the [Select]-key to choose from one of the following options:

(1) ***MissedCalls*** list → press the [Select]-key to enter → rotate the [ENC] knob or use the [▲/▼]-keys to choose the number/contact → press the [Select]-key to choose from the following options:

- ***View*** → Press the [Select]-key to check the dialed number → Press the [Back]-key to return to the previous level.
- ***TimeOfCall*** → press the [Select]-key to display the call time and duration information → press the [Back]-key to return to previous level.
- ***SendMsg*** → Press the [Select]-key to edit the message → Press the [OK]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose option of either ***SendMsg***, ***InsertComMsg***, or ***ExitEditor*** → Press the [Select]-key to confirm the selected option → Return to the previous level.
- ***Delete*** → 'Are you sure?' text pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

(2) ***Delete All*** → 'Are you sure?' text pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

10.4 Scan

Scan, Scan list, Scan Mode and Roaming of the radio can be enabled or disabled by following options.

10.4.1 Scan

1. Press the preset [Scan On/Off]-key to turn the scan On or Off

2. Hold and long press the Radioddity GD-88 [▲/▼]-key to turn on scan, and press any key to turn if off

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys in order to select ***Scan*** and press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to ***Scan*** and press the [Select]-key to enter.
3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose from the following options:

   (1) ***Select List*** → press the [Select]-key to enter → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired scan list → press the [Select]-key to confirm the selection → 'Set OK!' pops up on the screen → return to the previous level.

   (2) ***Scan On/Off*** → press the [Select]-key to turn it On or Off.

   (3) **RoamScan On/Off** → press the [Select]-key to turn it On or Off.

10.4.2 Scan List

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys in order to select ***Scan*** and press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to ***Scan list*** and press the [Select]-key to enter.
3. Rotate the [ENC] knob or use the [▲/▼]-keys to the desired scan list and press the [Select]-key to enter the list.
4. Rotate the [ENC] knob or use the [▲/▼]-keys for below options:

   (1) Choose one of the channels, press the [Select]-key to choose from the following options:

   - ***Set Prior*** → press the [Select]-key to set the channel to be priority → 'Prior is Set' pops up on the screen → return to the channel list, where the current channel is additionally marked with a P.
   - ***Cancel Prior*** → press the [Select]-key to cancel the priority channel → 'Cancelled' pops up on the screen → Return to the channel list, where the 'P' letter disappears on current channel.
   - ***Channel Del*** → press the [Select]-key to delete the channel from the scan list → Return to the channel list.

(2) ***Channel Add*** → press the [Select]-key → select zone → select channel to be added → press (OK) to confirm your selection → return to previous level. ***Zone list*** → rotate the [ENC] knob or use the [▲/▼]-keys to choose the Zone → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired channel → press the [Select]-key to add the selected channel and return to the scan list.

10.4.3 Scan Mode

1. Press the preset [Scan Mode]-key to choose the scan mode.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys in order to select *Scan* and press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to ***Scan Mode*** and press the [Select]-key to enter.

(1) ***Carrier*** - when the radio receives a HF carrier signal while scanning, it will stay at the current channel for a short time until the carrier signal disappears and continue to scanning.

(2) ***Time*** - when the radio receives a HF carrier signal while scanning, it will stay at the current channel for a preset short period (time range is 5...20 sec) and continue with scanning once the preset period is up.

(3) ***Search*** - when the radio receives a HF carrier signal while scanning, it will stay at the current channel and exit the scanning, unless you restart it.

Notes:	*Before any scan mode is selected, please make sure the 'Scan List' is preset in advance, otherwise the scan feature is unable to be activated. When the scan is On, the radio will start to scan all the receivable channels in the list.*

10.4.4 Roam Setting

Roaming and Roam Mode can be enabled or disabled by the following two ways:

1. Press the preset [Roam On/Off]-key to turn the roaming On/Off.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys in order to select *Scan* and press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to ***Roam Setting*** and press the [Select]-key to choose from one of the following options:

(1) **Roam Mode** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose from one of the modes ***Auto***, ***Manual*** or ***RSSI*** → press the [Select]-key to confirm the selection and return to the previous level.

Roaming Mode	Description
Auto	Once searching an available repeater from the scan list, the radio will lock to the current available repeater and pause auto roaming. Then, it will connect with the available repeater according to the preset Connect Check Timer. If the connection fails after the preset Connect Time is used up, it will restart the strong signal Auto roaming search.
Manual	Users can manually roam to the next available repeater. Once it is on, all repeater channels in the scan list will be waken up to search the nearest available repeaters until finds an available one. Every time the nearest available repeater is found, a Connect Recheck Timer (Repeater Check Timer) will be enabled. Users can also lock the repeater by short pressing the [OK/Select]-key. The next available repeater is not necessarily the one with the largest RSSI value in the channels of the scan list.
RSSI (Strong Signal Roaming)	Once a repeater in the channels of the scan list with RSSI more than preset RSSI threshold value is searched by RSSI mode, the radio will lock to the current channel and pause the strong signal auto roaming. Then it will connect with the current repeater according to the preset Connect Check Timer. If the connection fails after the preset Connect lime is used up, it will restart the strong signal Auto roaming search.

(2) **RSSI Set** → press the [Select]-key to display the current RSSI threshold value → rotate the [ENC] knob or use the [▲/▼]-keys to adjust the desired value → press the [OK]-key to confirm the modification → 'Set Ok!' pops up on the screen and return to the previous level.

Threshold values: Maximum: - 90 dBm
Minimum: - 125 dBm
Increment: -1 dBm

Notes: *The received signal strength (RSSI threshold value) is settable. If the RSSI mode is enabled and the searched repeater RSSI value is more than the preset threshold, the repeater's transmitting signal coverage will be automatically recognized as good, and then the radio will suspend RSSI roaming. The stopped repeater is not necessarily the one with the largest RSSI value in the channels of the scan list.*

(3) ***ConnectChk Timer*** → press the [Select]-key to display the current time value (second) → rotate the [ENC] knob or use the [▲/▼]-keys to adjust the desired connect check time → press the [OK]-key to confirm the modification → 'Set Ok!' pops up on the screen and return to the previous level.

Timer values:	Maximum:	255s
	Minimum:	0s
	Increment	1s

Notes: *When the nearest available repeater is searched by Manual Roaming, the radio will immediately start timing according to the preset dwell time value. If the available repeater is not confirmed by pressing the [OK]-key within the preset time, once the timer reaches the preset time, the radio will stop roaming; or restart roaming to find the next available repeater.*

(4) **ReChkTimer** → press the [Select]-key to display the current time value(second) → rotate the [ENC] knob or use the [▲/▼]-keys to adjust the desired recheck time → press the [OK]-key to confirm the modification → 'Set Ok!' pops up on the screen and return to the previous level.

Timer values:	Maximum:	255s
	Minimum:	0s
	Increment	1s

Notes: *When the available repeaters are searched by Auto roaming or RSSI roaming, the radio is confirmed to lock at the currently available repeater and the roaming is paused. Then, the radio will transmit signals at regular intervals based on the preset Connect ReCheck timer to connect with the current repeater. If it fails to connect with the currently available repeater in preset Connect timer of transmission (set on the Connect timer table), the radio will restart Auto Roaming or RSSI Roaming to search any nearest available repeater.*

(5) **ConnectTime** → press the [Select]-key to display the current connect time → rotate the [ENC] knob or use the [▲/▼]-keys to adjust the desired connect times → press the [OK]-key to confirm the modification → 'Set Ok!' pops up on the screen and return to the previous level.

Timer values:	Maximum:	10s
	Minimum:	1s
	Increment	1s

Notes: *No matter which roaming mode is selected, in searching, each repeater channel in the scan list will try to connect with nearby available repeaters based on the preset Connect times. If the pause channel fails to find the available repeaters within the preset Connect times, it will continue to scan the next repeater channel from the list till it finds an available one.*

10.4.5 Precautions for roaming

1. Before any roaming mode is selected, please make sure the 'Scan List' is preset in advance, otherwise the scan feature is unable to be activated.

2. When the roaming is activated, the radio will confirm the activation with 'OK' been shown on the display and the icon for scanning/roaming being initially displayed in white color. It then starts to scan all repeater channels (TX/RX channels with different TX- and RX-frequencies) only. It will not scan channels with same TX/RX frequency. As long as the scanning does not hit any of the repeaters listed in the roaming list, the screen will remain black.

3. When the roaming is activated, if there are no TX/RX channels with different TX- and RX-frequencies (repeater channels) in the scan list, after scanning the current selected scan list, it will exit the roaming function.

4. In roaming searching, if VFO A is indicated with '➡' icon or '**CTRL**' when [PTT]-key is pressed, the radio will stop roaming and return back to preset Scan reply/transmit Mode to initiate a call. It will continue to roam after the [PTT]-key is released.

5. When roaming is on, the radio defaults to scan in the main VFO (VFO A). When the main VFO (VFO A) is in roaming, channel selection is prohibited. However, menu accessing and setting of main VFO (VFO A) can still be made by selecting VFO A.

6. When the main VFO (VFO A) is in roaming, channel and VFO operation and menu accessing and setting of VFO B still can be made by selecting VFO B.

10.5 Zones & Channel

The following two ways can be used to select and switch in Zones and channels:

1. Press the preset [Zone switch]-key to switch to another zone.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to select ***Zone & Channel*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys for the desired zone and press the [Select]-key to enter.

3. Rotate the [ENC] knob or use the [▲/▼]-keys for the desired channel and press the [Select]-key to choose from the following options:

   (1) **Select** → press the [Select]-key → change to the selected zone and channel → return to the standby interface.

(2) **Modify Name** → press the [Select]-key → modify the channel name → press the [OK]-key to confirm and return to the previous level.

10.6 Local Set

If the basic operation and functions of the menu are allowed by software to set and check, below functions are available thru accessing the ***Local Set*** menu.

10.6.1 Language

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose the ***Language*** and press the [Select]-key to enter.
3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired Language and press the [Select]-key to change.
4. 'Lang is Set' pops up on the screen and return back to the previous level.

10.6.2 Keypadlock

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***KeypadLock*** and press the [Select]-key to enter.
3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose the option of ***AutoLock SW*** or ***ManualLock SW*** and press the [Select]-key to switch it On / Off.
4. Press the [Back]-key to return to the previous level.

10.6.3 Backlight

1. Press the preset [BackLight Auto/On/Off]-key.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***BackLight*** and press the [Select]-key to choose from the following options:

   (1) ***BL switch*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose option of ***BL ON***, ***BL OFF*** or ***Auto*** → press the [Select]-key to confirm → return to the previous level.

(2) ***Brightness*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to select desired brightness between 0 and 6 → press the [OK]-key to confirm → 'Lightness is Set' pops up on the screen → return to the previous level.

(3) ***DelayTime*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to select a value between 10 and 60 → press the [OK]-key to confirm → 'Set OK!' pops up on the screen → return to the previous level.

10.6.4 LED indicator (LEDs)

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***LEDs*** and press the [Select]-key to enter.
3. Press the [Select]-key to switch it On or Off.
4. Press the [Back]-key to return to the previous level.

Notes:	*If the LED indicator is OFF, it will not light in receiving and transmitting.* *If the LED indicator is On, it will light in receiving and transmitting.*

10.6.5 DisplayMode

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***DisplayMode*** and press the [Select]-key to enter.
3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose from the following options:

(1) ***CHN+Name*** → press the [Select]-key for the display to show the channel number and the name associated to it → 'DispMode is Set' pops up on the screen → return to previous level.

(2) ***CHN+FREQ*** → press the [Select]-key for the display to show the channel number and the frequency assigned to it →'DispMode is Set' pops up on the screen → return to previous level.

(3) ***CHN*** → press the [Select]-key for the display to show just the channel number →'DispMode is Set' pops up on the screen → return to previous level.

(4) ***VFO Mode*** → press the [Select]-key → VFO Mode is activated -> return to standby screen.

> ***Notes***: *This may also be accomplished by assigning a function key to [VFO] and pressing that function key. For more details, please check chapter 12.6 Preset Keys on page 141.*

(5) ***S/D Mode*** → Press the [Select]-key to switch it On or Off → press the [Back]-key to return to the previous level

Alternativey you can assign one of the programmable function keys for 'Dual Watch'.

> ***Notes***: *For single VFO display, the switch should be to its On-position (green). For dual VFO display, the switch should be to its Off-position (red).*
>
> *If Dual VFO-mode is selected, only part of the Talker Alias data can be displayed. Whereas if single VFO mode is selected more Talker Alias data can be displayed.*

10.6.6 VOX

1. Press the preset [VOX On/Off]-key to turn it On / Off.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***VOX*** and press the [Select]-key to choose from the following options:

   (1) **Vox Switch** → press the [Select]-key to turn it On or Off.

   (2) **Vox Level** → press the [Select]-key → Rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired level between 1 and 12 → press the

[Select]-key to confirm → 'Level is Set' pops up on the screen → return to the previous level.

(3) **Vox Delay** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired level between 1 and 4 seconds → press the [Select]-key to confirm → 'Vox is Set' pops up on the screen -> return to the previous level.

Notes: *If VOX is on, when the audio amplitude reaches the preset level, the radio will automatically initiate a call without pressing the [PTT]-key. The higher the sensitivity level, the smaller the required audio amplitude to trigger VOX. The lower the sensitivity level, the higher the required audio amplitude to trigger VOX.*

10.6.7 Channel Sw

If the radio is in idle state, you may the channel to be used may be selected by means of the [ENC] knob. Therefore, the ***Channel Sw*** needs to be turned On

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Channel Sw*** and press the [Select]-key to choose from the following options:

   (1) **Channel Sw** → press the [Select]-key to turn it On or Off.

Notes: *Whenever the channel switch is Off, rotating the [ENC] knob may not be used to select a channel or choose a frequency.*

10.6.8 ABRepeat

The Radioddity GD-88 comes with two totally independent VFOs. This allows the radio to also operate as a repeater. Crossband-, cross mode- as well as hybrid- and even digital-repeating are all possible. In general, there are two channel definitions required to use the repeating functionality.

1. Press the preset [Relay On /Off]-key to turn the repeater-functionality of the GD-88 On or Off.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***ABRepeat*** and press the [Select]-key to choose from the following options:

(1)***A/B RepeatSw*** → Press the [Select]-key to switch repeater-mode On or Off for the currently selected channel → press the [Back]-key to return to the previous level

(2)***A/B ListenSw*** → Press the [Select]-key to turn monitoring of the currently selected channel On or Off → press the [Back]-key to return to the previous level. The parameter is only evaluated by the radio firmware if ***A/B RepeatSw*** is turned On.

(3)***A RepeatMode*** → Press the [Select]-key to choose for VFO-A from

OFF The currently selected channel is not in repeater-mode.

Tran_Rx The currently selected channel is supposed to be part of a repeater-setup and RX is only enabled if the channel is in repeater-mode.

Tran_Tx The currently selected channel is supposed to be part of a repeater-setup and TX is only enabled if the channel is in repeater-mode.

TranRxTx The currently selected channel is supposed to be part of a repeater-setup and RX and TX are both enabled if the channel is in repeater-mode.

(4)***B RepeatMode*** → Press the [Select]-key to choose for VFO-B from

OFF The currently selected channel is not in repeater-mode.

Tran_Rx The currently selected channel is supposed to be part of a repeater-setup and will act as the RX input channel.

Tran_Tx The currently selected channel is supposed to be part of a repeater-setup and will act as the TX output channel.

TranRxTx The currently selected channel is supposed to be part of a repeater-setup and may act as RX input and as TX output channel.

10.6.9 SemiRepeaterMode

This option is only available if 'SemiRepeaterMode' has been previously enabled using the CPS and a digital simplex channel has been selected for the current VFO.

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***SemiRepeaterMode*** and press the [Select]-key to choose from the following options:

① ***Channel SemiRepeaterMode*** → press the [Select] key to switch SemiRepeaterMode on or off for the currently selected channel, press the [Back] key to return to the previous menu level

② ***Voice Sw*** → press the [Select] key to switch the local monitor function (loudspeaker) on or off when using the ***SemiRepeaterMode***, press the [Back] key to return to the previous menu level.

If ***Voice Sw*** is turned on, the received and retransmitted signal can also be heard through the radio's speaker.

③ ***VFO Select*** → press the [Select] key → Turn the [ENC] knob or use the [▲/▼] keys to select between the following options or press the [Back] key to return to the previous menu level

- ***Close***: The send function of the ***SemiRepeaterMode*** is turned off.
- ***VFO A***: The relay function is activated for the current VFO A channel
- ***VFO B***: The relay function is activated for the current VFO B channel

④ ***Rx RSSI Threshold*** → press the [Select] key before using the [ENC] knob or the [▲/▼] keys to set the received field strength (RSSI) value required to activate the ***SemiRepeaterMode***. This can be between -125dBm and -90dBm → press the [Select] button to save the selected value → the TFT display will show 'Set OK!' and return to the previous menu level.

⑤ ***Freq U Transmit Power*** → press the [Select] key, then use the [ENC] knob or the [▲/▼] keys to set the output power (in the case of a UHF channel) between 1W and 20W → press the [Select] key to save the selected value → the TFT display will show 'Set OK!' and return to the previous menu level

⑥ ***Freq V Transmit Power*** → press the [Select] key, then use the [ENC] knob or the [▲/▼] keys to set the output power (in the case of a VHF channel) between 1W and 20W → press the [Select] key to save the selected value → the TFT display will show 'Set OK!' and return to the previous menu level

Notes: *The higher the set transmission power, the more the transmission range.*

10.6.10 Factory Reset

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Local Set*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Factory Reset*** and the display shows 'Are you sure restore factory settings?' after pressing the [Select]-key.

3. Press the [OK]-key to confirm the factory reset, or press the [Back]-key to cancel.

> ***Notes***: *If you restore the factory settings, the radio will be restored with those settings that have previously been saved using the* **Radioddity** *CPS as your radios factory settings. All data will be overwritten by those as saved for the factory reset procedure. You can change your preferred "factory settings" with the Radioddity CPS at any time. Thus, this "Factory Reset" is not a real reset of the radio. For more details, please check chapter 11.3 Factory* **Reset** *on page 123.*

10.7 Parameters

If it is allowed by software, TOT, Power Setting, Repeater Setting, High / Low Power, TimeSlot, Repeater settings, Power Saving mode, etc. can be set and/or checked through the Parameters menu.

10.7.1 TOT

The Call Time is for limiting the time of each call, which can be used to avoid affecting the normal communication of other users due to a long-lasting transmission of the radio.

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***TOT*** and press the [Select]-key to enter.

3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose the ***Call Time(s)*** between Off, 20...500 sec. and press the [OK]-key to confirm.

4. 'Calltime is set' pops up on the screen and the radio returns to the previous level.

TOT time: Maximum: 500s
Minimum: 20s
Increment: 10s

10.7.2 Power

1. Press the preset [High/Low Power option]-key to switch the power between high and low.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Power*** and press the [Select]-key to choose between ***High Power*** and ***Low Power*** and press the [Select]-key to confirm.

3. 'Power is set' pops up on the screen → return to the previous level.

10.7.3 Slot/Repeat

The Slot/Repeat setting is set according to the channel type of the currently selected channel (duplex repeater with different TX/RX frequencies or simplex hotspot with TX and RX being both the same frequency).

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose from the following options:

   If the currently selected channel is setup with different RX/TX frequencies (typically duplex repeater):

   (1) ***Repeat TS*** → press the [Select]-key to enter

   - rotate the [ENC] knob or use the [▲/▼]-keys to choose between either ***Slot 1*** or ***Slot 2*** → press the [Select]-key to confirm → 'Set OK!' pops up on the screen → return to the previous level.

   - *Repeat/Off* → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose either ***Repeater mode*** or ***Talkaround*** → press the [Select]-key to confirm → 'Set OK!' pops up on the screen → return to the previous level.

> ***Notes***: *For more details, please check chapter 6.16* Repeater / Talk Around *on page 65.*
> *The functionality may* also be accomplished by pressing the preset [Scan On/Off]-key to turn the scan On or Off.

   If the currently selected channel is setup with same RX/TX frequencies (typically simplex hotspot):

   (1) ***Slot/Repeat*** → press the [Select]-key to enter

   - ***Rx DirectSlot*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose option of either ***ON***, ***Slot 1*** or ***Slot 2*** → press the [Select]-key to confirm → 'Set OK!' pops up on the screen → return to the previous level.

   - ***Tx DirectSlot*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose option of either **TurnOn DCDM Mode** (or,

depending on model, just **ON**), ***Slot 1*** or ***Slot 2*** → press the [Select]-key to confirm → 'Set OK!' pops up on the screen → return to the previous level.

> ***Notes***: *Fullduplex repeaters in general do use the very same TimeSlot for TX as well as for RX. That´s why there is no differentiation of* ***Rx TimeSlot*** *and* ***Tx TimeSlot*** *for those.*
> *Most simplex (same RX and TX-frequency) hotspots do not support the TDMA TimeSlot technique and thus require the* ***Rx TimeSlot*** *and* ***Tx TimeSlot*** *both to be set to DualChannelDirectMode/On.*

10.7.4 Sleep Mode

As the Radioddity GD-88 is powered by a battery with limited capacity, it is advisable to make best use of the battery´s capacity. Therefore, the radio has special functionalities for saving power and lengthen the battery life.

When the radio is on standby and without any operations, it can be set a delay time for entering sleep mode automatically.

Users can set the duty cycle (waketime : sleep time) of the power-saving mode. The smaller the ratio, the lower the power consumption. A higher ratio may result in a receiving delay or missed calls. So, it is suggested to set the duty cycle based on its actual use. The set duty cycle is only effective when sleep mode is turned On.

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***SleepMode*** and press the [Select]-key to choose from the following options and procedures:

   (1) ***SlpMode Sw*** → press the [Select]-key to turn it On or Off.

   (2) ***Delay Time*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the delay time between 10 and 60 seconds → press the [OK]-key to confirm → 'Set OK!' pops up on the screen and returns to the previous level.

   (3) ***Duty cycle*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose one of the options ***1:1***, ***1:2*** or ***1:4*** and press the [Select]-key to confirm → 'Set OK!' pops up on the screen and returns to the previous level.

10.7.5 Encryption (EncLevel)

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***EncLevel*** and press the [Select]-key to choose the desired encryption level of either ***None***, ***Low***, ***Mid, High, Enhance*** or ***AES256*** press the [Select]-key to confirm.

3. 'Set Ok!' pops up on the screen and returns to the previous level.

Notes: *If it is allowed by CPS software, enabling this function will help to prevent other users from eavesdropping without authorization. However, encryption is not a necessary requirement for receiving and transmitting. The receiver radio must have the same encryption method, level, alias, and values as the transmitter radio to decrypt the encrypted voices from each other. The encryption options for the* Radioddity DB25-D, DB40-D *and* Radioddity GD-88 *are compatible with each other.*

Using *encryption* is not allowed In Amateur radio networks.

10.7.6 Squelch Level (SQ level)

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose the ***SQ Level*** and press the [Select]-key to enter.

3. Rotate the [ENC] knob or use the [▲/▼]-keys to select the desired ***Level 1...12*** or normally open (***Level 0***), and press the [Select]-key to confirm.

4. 'Sq level is set' pops up on the screen and the radio returns to the previous level.

10.7.7 Wide / Narrow Band (Bandwidth)

1. Access the menu, press the [Menu]-key and Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Band*** and press the [Select]-key to enter.

3. Rotate the [ENC] knob or use the [▲/▼]-keys to select the desired ***Narrow*** bandwidth or ***Wide*** bandwidth and press the [Select]-key to confirm.

4. 'Set Ok' pops up on the screen and the radio returns to the previous level.

10.7.8 Busy Channel Lockout (BCLO)

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***BCLO*** and press the [Select]-key to enter.

3. Press the [Select]-key to turn the **Busy** Channel Lockout **On** or **Off**, or press the [Back]-key to return to the previous level.

10.7.9 Signaling

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Signaling*** and press the [Select]-key to enter.

3. Rotate the [ENC] knob or use the [▲/▼]-keys to select the choose from the following options and procedures:

   (1) ***RX Subaudio*** → press the [Select]-key to choose from the following options:

   - ***Signaling off*** → press the [Select]-key to turn off the CTCSS/DCS code → 'Set Ok' pops up on the screen and returns to the previous level.
   - ***CTCSS*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the CTCSS code → press the [Select]-key to confirm → 'Set Ok' pops up on the screen and returns to the previous level.
   - ***DCS*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the DCS code → press the [Select]-key to confirm → 'Set Ok' pops up on the screen and returns to the previous level.
   - ***DCS Reverse*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the DCS Reverse code → press the [Select]-key to confirm → 'Set Ok' pops up on the screen and returns to the previous level.

   (2) ***TX Subaudio*** → press the [Select]-key to choose from the following options:

   - ***Signaling off*** → press the [Select]-key to turn off the CTCSS/DCS code → 'Set Ok' pops up on the screen and returns to the previous level.
   - ***CTCSS*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the CTCSS code → press the [Select]-key to

confirm → 'Set Ok' pops up on the screen and returns to the previous level.

- ***DCS*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the DCS code → press the [Select]-key to confirm → 'Set Ok' pops up on the screen and returns to the previous level.
- ***DCS Reverse*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the DCS Reverse code → press the [Select]-key to confirm → 'Set Ok' pops up on the screen and returns to the previous level.

10.7.10 CTCSS Phase Reverse (Ctcss Tail)

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Parameters*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***CtcssTail*** and press the[Select]-key to enter.
3. Choose one of the options ***55Hz***, ***120***°, ***180***° or ***240***° and press the [Select]-key to confirm.
4. 'Set OK!' pops up on the screen and returns to the previous level.

10.8 Tone Set

If It is allowed by the Radioddity CPS software, set and check the prompt tones by accessing the Tone Set menu.

10.8.1 Profiles

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Tone Set*** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Profiles*** and press the [Select]-key to enter.
3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***General*** or ***Silent***, and press the [Select]-key to confirm the selection.
4. 'Profile is set' pops up on the screen and returns to the previous level.

10.8.2 Key Tone (KeyTone)

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Tone Set*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***KeyTone*** and press the [Select]-key to choose from the following options and procedures:

   (1) ***KeyRingSW*** → press the [Select]-key to turn it on or off.

   (2) ***KeyRingStat*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the Key Tone level between 01 and 13→ press the [OK]-key to confirm → 'Keytone is set' pops up on the screen and returns to the previous level.

10.8.3 Power Tone

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Tone Set*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***PowerTone*** and press the [Select]-key to choose from the following options and procedures:

   (1) ***LowBatToneSW*** → press the [Select]-key to turn it on or off.

   (2) ***LowBatTone*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the Low Battery Tone level between 01 and 13→ press the [OK]-key to confirm → 'Tone is set' pops up on the screen and returns to the previous level.

10.8.4 Message Tone (MsgTone)

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Tone Set*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***MsgTone*** and press the [Select]-key.

3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose the Message Tone ring type between ***Off***, ***Ring 1***, ***Ring 2***, ***Ring 3***, ***Ring 4*** and ***Ring 5*** → press the [Select]-key to confirm → 'RingType is set' pops up on the screen and returns to the previous level.

10.8.5 Private Call Ring Tone (PCallTone)

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Tone Set*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***PCallTone*** and press the [Select]-key to choose from the following options and procedures:

   (1) ***PCallSW*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose from one of the options of ***Rx Begin Tone***, ***Rx End Tone***, ***Tx Begin Tone*** or ***Tx End Tone*** → press the [Select]-key to tick or untick the option → press the [Back]-key to return to the previous level.

   (2) ***PCallTone*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the Private Call Tone ring type between ***Off***, ***Ring 1***, ***Ring 2***, ***Ring 3***, ***Ring 4*** and ***Ring 5*** → press the [Select]-key to confirm → 'Tone is set' pops up on the screen and returns to the previous level.

10.8.6 Group Call Ring Tone (G Call Tone)

3. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Tone Set***, and then press the [Select]-key to enter.

4. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***GCallTone*** and press the [Select]-key to choose from the following options and procedures:

   (1) ***GCallSW*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose from one of the options of *Rx Begin Tone*, *Rx End Tone*, *Tx Begin Tone*, *Tx End Tone* → press the [Select]-key to tick or untick the option → press the [Select]-key to confirm or the [Back]-key to return to the previous level.

   (2) ***GCallTone*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the Group Call Tone ring type between ***Off***, ***Ring 1***, ***Ring 2***, ***Ring 3***, ***Ring 4*** and ***Ring 5*** → press the [Select]-key to confirm → 'Tone is set' pops up on the screen and returns to the previous level.

10.8.7 Alert Ring Tone (AlertTone)

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Tone Set*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***AlertTone*** and press the [Select]-key to enter.

3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose the Alert Ring Tone between ***Off***, ***Ring 1***, ***Ring 2***, ***Ring 3***, ***Ring 4*** and ***Ring 5*** → press the [Select]-key to confirm.

4. 'Tone is set' pops up on the screen and returns to the previous level.

10.8.8 FM Call Tone / Power On Tone

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Tone Set*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***FM Call Tone / Power On Tone*** and press the [Select]-key to enter.

Press the [Select]-key to turn the ***PwrOnTone*** On or Off.

10.9 Appendix

If it is allowed by CPS software you may set and check GPS, FM Radio, Time, DTMF, HeadSet+Speaker and APRS by accessing the Appendix menu.

10.9.1 GPS

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Appendix*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***GPS*** and press the [Select]-key to choose from the following options and procedures:

   (1) ***GPS Switch*** → press the [Select]-key to turn GPS On or Off;

   (2) ***GPS Serial Data*** / **Upload SW** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose from one of the options of ***GPGGA***, ***GPGSA***, ***GPSV***, ***GPRMC*** → press the [Select]-key to tick or untick the option → press the [Back]-key to return to the previous level.

Notes:	*All these options should be checked for APRS to work as expected.* *GPGGA: Global Positioning System Fix Data* *GPGSA: GPS DOP and active satellites* *GPSV: GPS Satellites in view* *GPRMC: Recommended minimum specific GPS/Transit data*

   (3) ***GroupInfo*** → press the [Select]-key to enter the following options and procedures:

   - ***GPS Map*** → press the [Select]-key to display the rough distance between the Radioddity DB25-D, DB40-D or GD-88 and other stations → rotate the [ENC] knob or use the [▲/▼]-keys to choose between ***GroupMap*** and ***Location*** → press the [Back]-key to return to the previous level.

   - ***GPS RXMsgs*** → press the [Select]-key to display the list of received APRS messages → rotate the [ENC] knob or use the [▲/▼]-keys to choose the

received message → press the [Select]-key to display the full APRS data (date, time, longitude, latitude, altitude, speed) that had been received → press the [Back]-key to return to the previous level.

- ***GPS Location*** → press the [Select]-key to display the location information (date, time, longitude, latitude, altitude, speed) of the Radioddity DB25-D, DB40-D or GD-88 → rotate the [ENC] knob or use the [▲/▼]-keys to check GPS / GL received satellites information and signal strength (white: empty signal, red: weak signal, light blue: available signal) → press the [Select]-key to return to the previous level.

- ***Clear RXMsg*** → press the [Select]-key to delete the received messages and return to the previous level.

(4) ***GPS Upload Chn*** → press the [Select]-key to check ***Zone***, ***Chn*** and ***SendGap*** information → press the [Back]-key to return to the previous level.

(5) ***Calibrator*** → press the [Select]-key to choose from the following options:

- ***Auto*** → press the [Select]-key to turn the Auto-function On / Off.

- ***Manual*** → press the [Select]-key → Display Time zone and offset compared to UTC (Coordinated Universal Time) → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired time zone → press the [Select]-key to confirm → return to the previous level.

Notes:	*GPS needs to be allowed by software. Some GPS functions must be preset by software before use. For some GPS functions the radio location must be identified successfully before use. Some GPS functions require other users to have GPS functionality and their location been successfully identified as well before use. The GPS Distance calculation or the use of some functions is for reference only, which may cause errors due to some unexpected or environmental reasons.*

Notes:	*Because reception of GPS also requires some power from the battery it should be turned off whenever not required.*

10.9.2 FM Radio

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Appendix*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***FM Radio*** and press the [Select]-key to display the FM radio frequency information.

3. Rotate the [ENC] knob or use the [▲/▼]-keys to manually select the FM radio frequency or seek the FM radio frequency automatically.

4. Press the [Back]-key to exit the FM radio mode and return to the previous level or press the [OK]-key to choose from the following options and procedures:

   (1) ***Save*** → press the [Select]-key to save the current FM radio channel.

   (2) ***FMList*** → press the [Select]-key to display the list of saved FM radio frequencies → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired frequency → press the [Select]-key to select one of the following options:

   - ***Delete*** → press the [Select]-key to delete the current FM radio frequency or press the [Back]-key to cancel.
   - ***Play*** → press the [Select]-key to play the current FM radio frequency or press the [Back]-key to cancel.

   (3) ***TuneMode*** → press the [OK]-key to choose from the following options and procedures:

   - ***Manual*** → press the [Select]-key to select the manual tuning mode → 'Mode is set' pops up on the screen and returns to the previous level.
   - ***Auto*** → press the [Select]-key to select the automatic tuning mode → 'Mode is set' pops up on the screen and returns to the previous level.

10.9.3 Time

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Appendix*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Time*** and press the [Select]-key to choose from the following options and procedures:

   (1) ***Date*** → press the [Select]-key to display the date and year → rotate the [ENC] knob or use the [▲/▼]-keys to change the cursor position (between year, month and day) or input the desired date and year using the numeric keypad of the Speaker-Microphone → press the [OK]-key to confirm → 'Date is set' pops up on the screen and returns to the previous level.

   (2) ***Time*** → press the [Select]-key to display the time → rotate the [ENC] knob or use the [▲/▼]-keys to change the cursor position (minutes and hours) or input the desired time using the numeric keypad of the Speaker-Microphone → press the [OK]-key to confirm → 'Time is set' pops up on the screen and returns to the previous level.

   (3) ***DateForm*** → press the [Select]-key → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired date form (***Y/M/D***, ***M/D/Y*** or ***D/M/Y***)→ press the [Select]-key to confirm → 'Date is set' pops up on the screen and returns to the previous level.

(4) ***Use GPS datetime*** → press the [Select]-key to turn date and time synchronization with received GPS data On or Off.

> ***Notes:*** ***Use GPS datetime*** *is effective only when GPS function is on and successfully positioned.*

10.9.4 DMR DTMF

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Appendix*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***DTMF*** and press the [Select]-key to choose from the following options and procedures:

   (1) ***DTMF Switch*** → press the [Select]-key to turn it on or off.

   (2) ***DTMF Volume*** → press the [Select]-key to display the current local volume → Rotate the [ENC] knob or use the [▲/▼]-keys to adjust the volume between Off, 01...12 → press the [OK]-key to confirm → 'Set OK!' pops up on the screen and returns to the previous level.

> ***Notes:*** *The specified DTMF code tone is only used as an alert tone to the local radio and reminds the user to receive the call. The DTMF code must be preset by CPS software. Notes: For more details, please check chapter 12.9.12 DTMF Volume on page 150, 12.9.13* DTMF ON/Off *on page 150 and 12.9.14* DTMF code *on page 150.*
> *Since 2023 the radios also do support analog DTMF. This is explained in detail within chapter 6.7,* DTMF for analog mode *on page 61.*

10.9.5 Headset+Speaker / HandMic+ Speaker

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Appendix*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Headset+Speaker*** / ***HandMic+Speaker*** and press the [Select]-key to enter.

3. Rotate the [ENC] knob or use the [▲/▼]-keys to choose from one of the options of ***OFF***, ***LoudSpeaker***, ***MicroSpeaker***, ***HandMic***, ***Loud+Mic Spkr***, ***Spk+HeadSet*** ***or Headset*** and press the [Select]-key to confirm.

4. 'Set Ok!' pops up on the screen and returns to the previous level.

Notes: *If **Off** is selected, there is audio output from the external speaker, but no audio output from the Speaker-Microphone.*
*If **LoudSpeaker** mode is selected, there is only audio output from the external speaker*
*If **MicroSpeaker** mode is selected, there is audio output from the Speaker-Microphone, but no audio output from the external speaker.*
*If **HandMic** mode is selected, there is no audio output from the* Radioddity *DB40-D speaker, but audio output from the Speaker-Microphone only.*
*If **Loud+Mic Spkr** mode is selected, both the external speaker and the Speaker-Microphone have audio output. This mode is the recommended audio output mode to be used with the* Radioddity *DB25-D.*
*If **Spk+HeadSet** (factory default) mode is selected, there is audio from the* Radioddity *GD-88 speaker and the plugged in headset accessory.*
*If **Headset** mode is selected, there is no audio output from the* Radioddity *GD-88 speaker, but audio output from the inserted headset.*

10.9.6 APRS

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Appendix*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***APRS*** and press the [Select]-key to choose from the following options:

   (1)***APRS Type*** → press the [Select]-key to change the modes for APRS signaling → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired APRS Type from either ***None***, ***Analog APRS***, ***DMR APRS*** or ***DMR+Analog APRS*** → press the [OK]-key to confirm your selection -> 'Set OK!' pops up on the screen and returns to the previous level.

   (2)***Analog APRS*** → press the [Select]-key to change the parameters for analog APRS → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired parameter → press the [Select]-key to select one of the following options :

   - ***PTT Upload*** → press the [Select]-key to change the behavior on PTT-press → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired Upload mechanism from either ***Close***, ***TX Start*** or ***TX End*** → press the [Select]-key to confirm → 'Set OK!' pops up on the screen and returns to the previous level.

   - ***Upload Power*** → press the [Select]-key to change the output power for APRS upload → rotate the [ENC] knob or use the [▲/▼]-keys to choose between ***Low Power*** and ***High Power*** → press the [Select]-key to confirm → 'Set OK!' pops up on the screen and returns to the previous level.

   - ***Upload Frequency*** → press the [Select]-key to display the current transmit frequency → rotate the [ENC] knob or use the [▲/▼]-keys to position the cursor within the input field → input the frequency using the numeric

keypad → press the [OK]-key to confirm → 'Set OK!' pops up on the screen and returns to the previous level.

- ***Upload Path*** → press the [Select]-key to display the current Upload Path → rotate the [ENC] knob or use the [▲/▼]-keys to position the cursor within the input field → input the desired Upload Path using the numeric keypad of the Speaker-Microphone → press the [OK]-key to confirm → 'Set OK!' pops up on the screen and returns to the previous level.

- ***Upload Text*** → press the [Select]-key to display the current Upload Text → rotate the [ENC] knob or use the [▲/▼]-keys to position the cursor within the input field → input the desired Upload Text using the numeric keypad of the Speaker-Microphone → press the [OK]-key to confirm → 'Set OK!' pops up on the screen and returns to the previous level.

(3) ***DMR APRS*** → press the [Select]-key to change the parameters for digital APRS → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired parameter → press the [Select]-key to select one of the following options :

- ***APRS Message*** → press the [Select]-key to display the list of received APRS messages → rotate the [ENC] knob or use the [▲/▼]-keys to choose the received message → press the [Select]-key to display the full APRS data (date, time, longitude, latitude, altitude, speed) that had been received → press the [Back]-key to return to the previous level.

> ***Notes***: *If yet no APRS message had been received, 'Commsg empty' pops up on the screen and returns to the previous level.*

- ***Delete APRS Msg*** → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion → return back to previous level.

(4) ***Timer*** → press the [Select]-key to select the interval for regular APRS beacon transmissions → Rotate the [ENC] knob or use the [▲/▼]-keys to choose in 30s intervals between ***OFF***, ***30s*** and up to ***7650s*** and press the [OK]-key to confirm → 'Set OK!' pops up on the screen and the radio returns to the previous level.

(5) ***Beacon*** → press the [Select]-key to change the location source to be used for the beacon transmission → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired source between ***Preset Beacon*** and ***GPS Beacon*** → press the [OK]-key to confirm your selection -> 'Set OK!' pops up on the screen and returns to the previous level.

> **Notes**: If an APRS reporting channel is assigned to the currently selected channel, the APRS icon ▷ will be shown in the upper line of the display.

10.9.7 BlueTooth

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Appendix*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose ***BlueTooth*** and press the [Select]-key to choose from the following options:

   (1) ***BlueTooth Sw*** → Press the preset [Record On/Off] key to turn it on / off.

   If Bluetooth is turned on, further parameters may be selected:

   (2) ***BT Earset*** → press the [Select]-key → Select ***Earset Scan*** to scan for available and supported earsets → next select one of the found earsets → depending on the earset, you may hear a confirmation sound. Now all further audio output is routed to the paired BT earset.

   (3) ***BT PTT*** → press the [Select]-key → Select PTT Scan to scan for available and supported BT buttons → next select one of the found BT buttons. Now PTT can be activated by pressing the paired BT button

   (4) ***Mic Gain*** → press the [Select]-key → choose the desired Microphone Gain by rotating the [ENC] knob → press [Select] key → 'Set OK!' pops up on the screen and the radio returns to the previous level.

   (5) ***Volume Gain*** → press the [Select]-key → choose the desired Volume Gain by rotating the [ENC] knob → press [Select] key → 'Set OK!' pops up on the screen and the radio returns to the previous level.

10.10 Record

If it is allowed by CPS software to set and check recording list, clear record, space info about recording by accessing the Record menu.

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Record*** and then press the [Select]-key to enter.

2. Rotate the [ENC] knob or use the [▲/▼]-keys to make following options:

   (1) ***Record Set*** → press the [Select]-key -+ Rotate the [ENC] knob or use the [▲/▼]-keys to choose between the options ***RX record SW*** and ***TX record SW*** → press the [Select]-key to turn the selected option On or Off → press the [Back]-key to return to the previous level.

   (2) ***Record List*** → press the [Select]-key to display the recording list → rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired recording (they are named as follows: <ascending number>_<R/T><DMR_ID>) and press the [Select]-key to choose from the following options:

- ***Play*** → press the [Select] to play the selected recording → return to the previous level after finishing playing.
- ***Delete*** → press the [Select]-key → 'Are you sure?' pops up on the screen → press the [Ok]-key to confirm the deletion or press the [Back]-key to cancel the deletion and return to the previous menu level
- ***Information*** → press the [Select]-key to display the detailed information of the recording.

(3) ***Clear record*** → press the [Select]-key → 'Are you sure?' pops up on the screen → press the [OK]-key to confirm deletion or press the [Back]-key to cancel deletion and return to the previous level.

(4) ***Space Info*** → press the [Select]-key to display the total recorded time and total recordable time information → press the [Back]-key to return to the previous level.

Notes:	*More than 100h of recording time is possible, depending on the remaining memory allocation of the radio.*

10.11 Device Info

If it is allowed by CPS software, set and check Radio ID, Rx Group List, CH Contact (channel contact), Version and Talker Alias by accessing Device Info menu.

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose **Device Info** and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to choose from the following options:

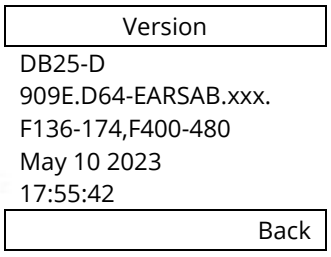
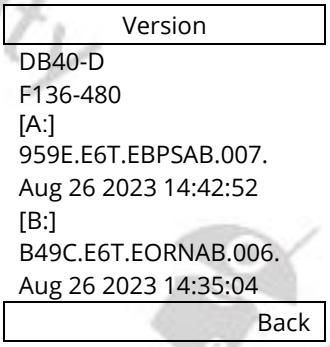
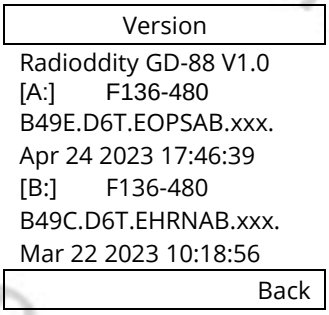
(1) ***Radio ID*** → press the [Select]-key to display the Radio ID (DMR ID) → input the desired ID with the numeric keypad of the Speaker-Microphone → press the [OK]-key to save → 'Set OK!' pops up on the screen and returns to the previous level.

(2) ***RXGrouplist*** → press the [Select]-key to display the RX-group list (name in top line) and its members of the currently selected channel → Rotate the [ENC] knob or use the [▲/▼]-keys to check details → press the [Back]-key to return to the previous level.

(3) ***CH contact*** → press the [Select]-key to display the contact information (ID, Name, Call Type) of the contact associated with the currently selected channel → press the [Back]-key to return to the previous level.

(4) ***Version*** → press the [Select]-key to display the Model Number, Frequency Range (F136-174,F400-480), firmware version and version date and time → press the [Back]-key to return to the previous level.

Since version B49E.D64.EHRSAB.007 of the Radioddity GD-88 firmware, displayed information for the GD-88 differs between the A- and B-part. As the Radioddity DB25-D does not have two firmware parts that are independent from each other, the display for the DB25-D does not have such differentiation.

DB25-D, DB40-D	DB40-D	GD-88
		

***Notes**: Depending on the* Radioddity *model and its production run, there may be slight differences in the display of the firmware version even if the very same firmware had been used. However, the stated date and time are unique to each file. Never mix files that are not intended for your radio. As for the* Radioddity *DB40-D and* Radioddity *GD-88 only use file-pairs that have been distributed by* Radioddity *within the very same archive.*

(5) ***Alias*** → press the [Select]-key to get to the Talker Alias settings for transmit (Tx) and receive (Rx) → Turn the [ENC] knob or use the [▲/▼] keys to select between the following two options.

- ***Tx Alias Setting*** → press the [Select]-key to enter the submenu for the TX settings of Talker Alias.
  - ***Tx Alias Switch*** → press the [Select]-key to activate or deactivate the transmission of Talker Alias during Transmit.
  - ***Tx Alias Type*** → press the [Select]-key to enter the submenu for selecting the encoding to be used for transmitting Talker Alias. You may choose between UTF-7, UTF-8 and UTF-16 encoding.
  - ***Tx Alias Name*** → press the [Select]-key to enter the submenu for specifying your personal Talker Alias. A maximum length of 16 characters is currently supported. The content of this parameter is identical to the 'Radio Name' within the Basic Parameters when using our CPS. See chapter 12.2.1, Radio Name on page 127 on how to alter the 'Radio Name'.

- ***Rx Alias Setting*** → press the [Select]-key to enter the submenu for the RX settings of Talker Alias.

- ***ID*** → press the [Select]-key to disable the decoding of received Talker Alias data. Selecting this option will disable 'Talker Alias ON'. Only data as available within the internal DMR ID database will be displayed.
- ***Talker Alias+ID*** → press the [Select]-key to enable the decoding of received Talker Alias data whilst also checking the data as available within the internal DMR ID database. Both data (if available) will be displayed about 1 second each in alternating mode.
- ***Talker Alias*** → press the [Select]-key to enable the decoding of received Talker Alias data only. Selecting this option will disable the other two options. Only Talker Alias data will be displayed.

The Taker Alias will be displayed using green color with the label 'ALIASNAME' underneath the Talker Alias data as shown on the following picture.

Notes: *Talker Alias is only supported within DMR networks. Talker Alias is only available up from firmware 909E.D4.EARSAB.017 (Radioddity DB25-D) and B49E.D64.EHRSAB.007 (Radioddity GD-88).*
Within the Brandmeister DMR network the TX generation of Talker Alias should not be activated as Talker Alias inband data is generated automatically by the Brandmeister network.
If dual VFO-mode is selected, only part of the Talker Alias data can be displayed. Whereas if single VFO mode is selected more Talker Alias data can be displayed. For more details on the display mode see chapter 10.6.5 DisplayMode *on page 92.*

10.12 Channel Edit

It is supported to check and modify the parameters of Channel or VFO mode by accessing the ***Channel Edit*** mode.

1. In Standby Mode, press and hold the [B/E]-key for 3 seconds to enter the ***Channel Edit*** mode.

or

1. Access the menu, press the [Menu]-key and rotate the [ENC] knob or use the [▲/▼]-keys to choose ***Channel Edit***, and then press the [Select]-key to enter.
2. Rotate the [ENC] knob or use the [▲/▼]-keys to select the one of the listed parameters.

3. Press the [Select]-key to light up the cursor and enter the editing mode.
4. Rotate the [ENC] knob or use the [▲/▼]-keys to choose the desired value and press the [Select]-key to confirm and save.
5. Press the [Back]-key to return to the previous level.

***Notes**: Press the [Back]-key to return to the previous level.*

Parameter	Possible Values
Channel Attribute	Digital/Analog/RX:D/A-TX:A/TX:D/A-RX:D
FreqStep ⏚	5kHz/6.25kHz/10kHz/12.50kHz/25kHz/50kHz/100kHz
RX Frequency	In the available range of the radio
TX Frequency	In the available range of the radio
Power	High/Low
RxTS ⏚	Time Slot 1 / Time Slot 2
TxTS ⏚	Time Slot 1 / Time Slot 2
RxCCe ⏚	Color Code 0 ...15
TxCC ⏚	Color Code 0 ...15
Alarm* ⏚	Alarm: ON/Alarm: OFF
CallAlert* ⏚	ON/OFF
PCallType* ⏚	PATCS/OACSU
MsgType ⏚	PATCS/OACSU
Permission ⏚	Impolite/Polite to CC/Polite To all
Rx Group ⏚	OFF/<*self-defined RX-Groups*>
Encpty ⏚	Enc: OFF/<*self-defined Encryption alias* >
Contact ⏚	Contact: OFF/<*self-defined Contacts* >
Emergency* ⏚	Emergency: OFF//<*self-defined Digital Alarm lists*>
DMR APRS ⏚	APRS reporting slot (1...8/OFF)
Bandwidth ~	Wide/Narrow
TxSubType ~	Signaling Off/CTCSS/DCS/DCS Reverse
TxSubItem ~	The signal codes of CTCSS, DCS and DCS Reverse
RxSubType ~	Signaling Off/CTCSS/DCS/DCS Reverse
RxSubItem ~	The signal codes of CTCSS, DCS and DCS Reverse
ScanList	OFF/<*self-defined scan lists*>
Rx Only	Limit the channel to only receive (ON/OFF)
SaveVFO**	Save setting to currently selected VFO
Save2CurChn*	Save setting to currently selected channel
Save2SelChn	Save settings after selecting target channel from list

*) Not available for digital VFO mode

**) Only available in VFO mode

***Notes**: FreqStep is only available for digital VFO mode*

11 Prepare for using the CPS

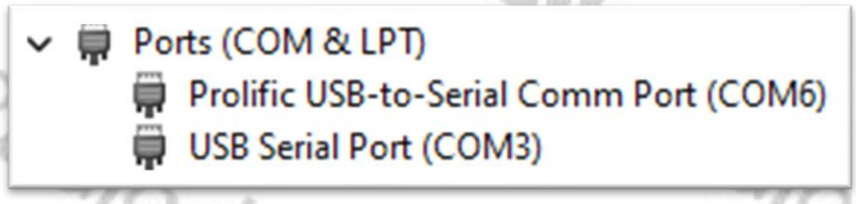
The most convenient way to setup your radio is my using the CPS supplied by Radioddity.

11.1 Install device driver

The programming cable shipped with your Radioddity DB25-D, DB40-D or GD-88 adds an additional virtual COM-port to your system. It does include a small chip that converts signals to and from the USB-side into serial signals to and from the K1 / RJ45 style connector.

As soon as you plug in the USB side of the cable to your PC, you should hear the 'USB device connected'-sound on your PC. In case your Windows system is not able to automatically install the required driver, you will see an entry, similar to

within Windows device manager. However normally after a few seconds, Windows has automatically loaded and installed the required driver and you should see an entry, depending on the chip used within the programming cable, similar to



In case the device driver did not install automatically, we have prepared a download link on our Radioddity DB25-D, DB40-D and Radioddity GD-88 support pages.

Internally the signals of the cable are connected as follows:

Signal name	K1
Radio RXD	3.5 mm sleeve
Radio TXD	2.5 mm ring
GND	2.5 mm sleeve

You may also use this cable for most of our analog radios that come with a combined 2.5 mm and 3.5 mm TRS K1-style jack.

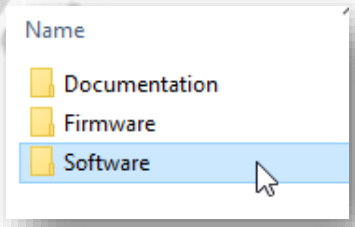
The Radioddity DB40-D does not have such K-socket. That´s why the programming cable shipped with the Radioddity DB40-D does have a RJ45-plug which fits into the RJ45-socket at the left side of the radio. The Radioddity DB40-D may only be programmed via this RJ45 socket.

Signal name	RJ45
Radio RXD (Data to Radio)	2
Radio TXD (Data from Radio)	5
Signal Ground	6

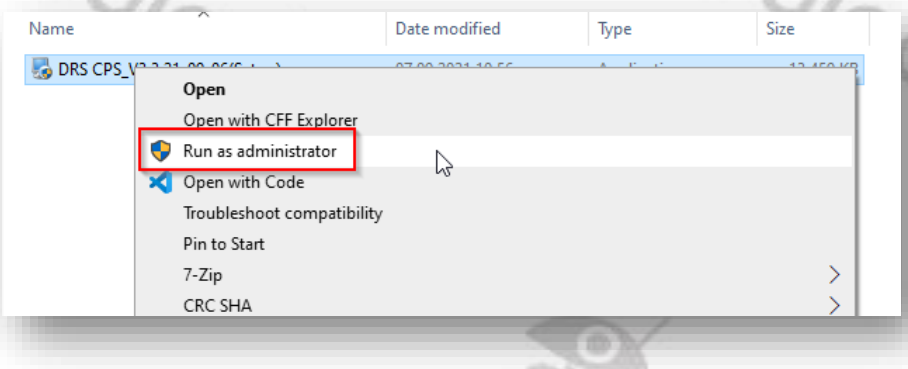
Notes: *Only virtual ports COM1…COM8 are currently supported by the* Radioddity *CPS and IAP.*

11.2 Install CPS

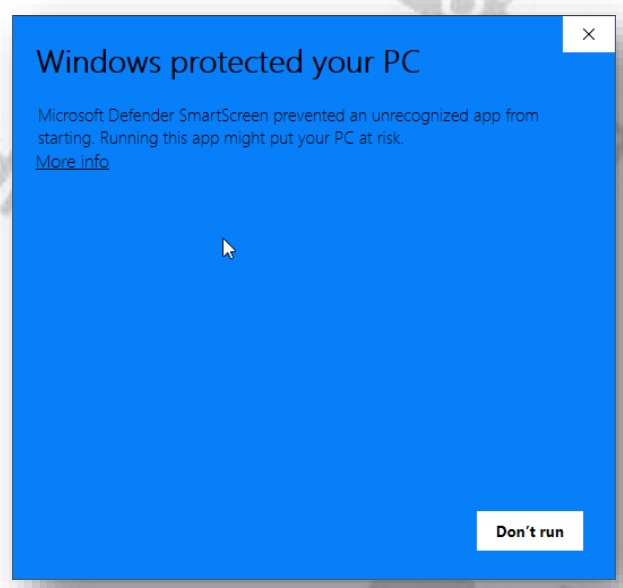
Download the current Radioddity CPS version for your radio from our support area. After downloading, unpack the archive into a temporary directory of your choice. Navigate to the subfolder named 'Software'.



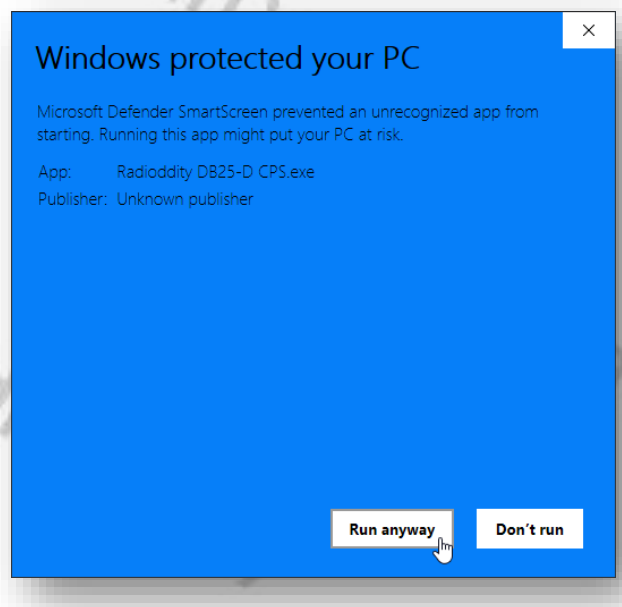
In there, you find the CPS-installer. Execute the installer with admin rights by invoking 'Run as administrator' to start the CPS installation process.



Due to the fact, that the executable isn´t signed, Windows may give you a popup-warning.

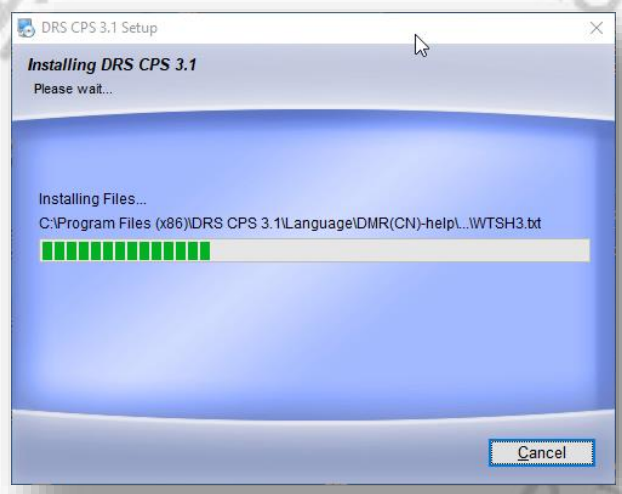


Click on the underlined 'More info' and continue by clicking on 'Run anyway'.

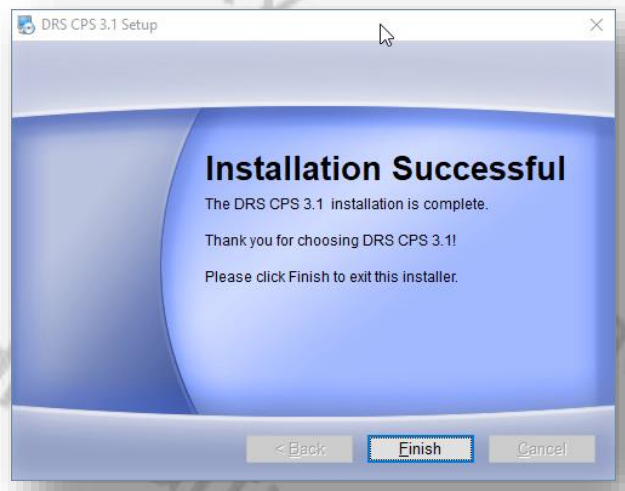


An additional confirmation dialog will follow, asking 'Do you want to allow this app from an unknown publisher to make changes to your device?'. Confirm this dialog by clicking 'Yes'.

Follow the standard installation procedure by mostly clicking on 'Next'.

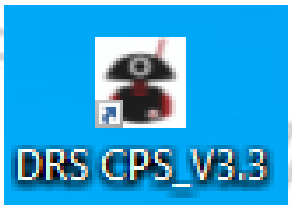


After a while, the installation process finishes with

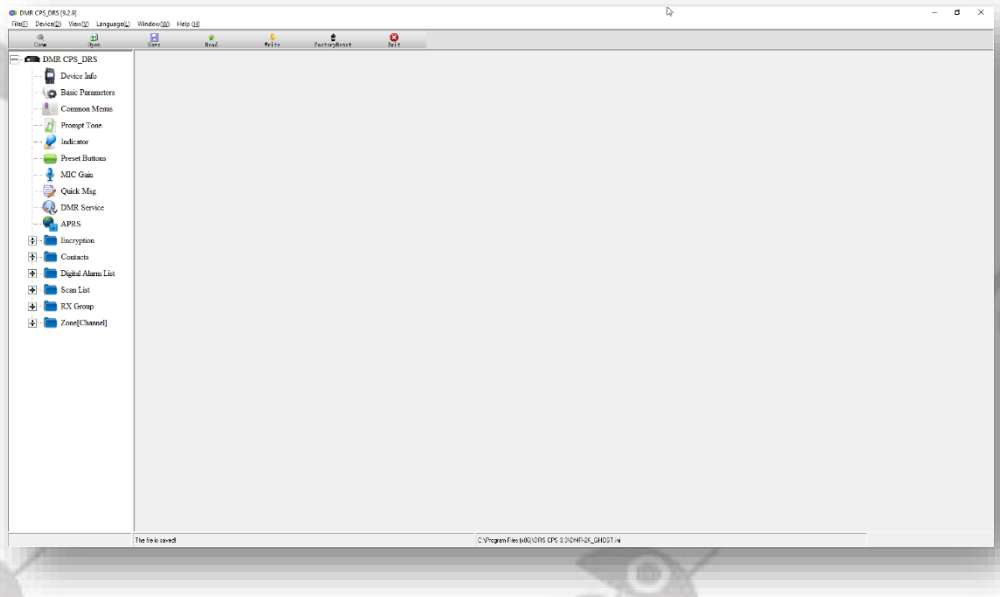


Click 'Finish' to confirm the completion of the installation process.

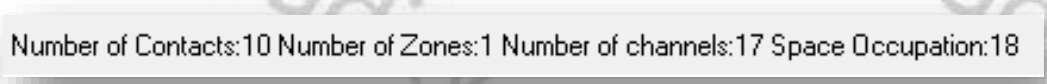
11.3 Start CPS



During installation of the CPS, a shortcut had been placed on your desktop. Double click on that shortcut to start the CPS. As the CPS has never been used before, it will be preloaded with certain default data. Whenever you start the CPS again, the last settings will automatically be preloaded. However, we do advise to regularly make backup copies of the current settings. Those settings are often also called 'codeplug'.



Within the bottom line of the CPS, you are presented a bunch of statistical data, such as: Number of Contacts, Number of Zones and Number of channels



Whenever changes to parameters have been made, the complete setting ('codeplug') must be written back to the radio. But we will come to that later.

Notes:	*Codeplugs of different radio models, such as the* Radioddity *DB25-D, DB40-D or GD-88 are not exchangeable with each other due to different hardware specifications of the radio models. Codeplugs of the same radio model are of course exchangeable.*

11.3.1 Special functions

Some of the computers keyboard function keys have been assigned special functionality within the CPS.

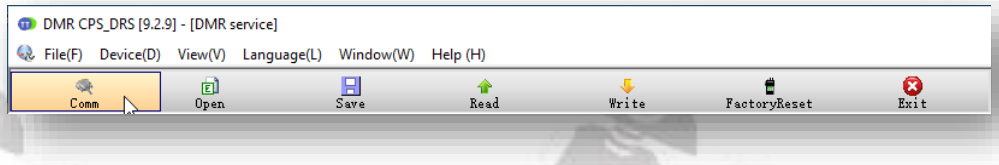
Key	Function
F1	Turn Toolbar On/Off
F2	Turn Navigation bar On/Off
F3	Turn Status bar On/Off
F4	Font
F5	Background Color
F6	Font Color
F7	English
F8	Chinese
F9	Stack-up
F11	Tile horizontal
F12	Tile Vertical
Ctrl+O	Read codeplug from file (File → Open)
Ctrl+S	Write codeplug to file (File → Save)
Ctrl+X	Exit CPS (File → Exit)
Ctrl+K	Radio COM-port (Device → Comm)
Ctrl+R	Transfer data from radio to CPS (Device → Read)
Ctrl+W	Transfer data from CPS to radio (Device → Write)

11.3.2 Safe factory settings to a file

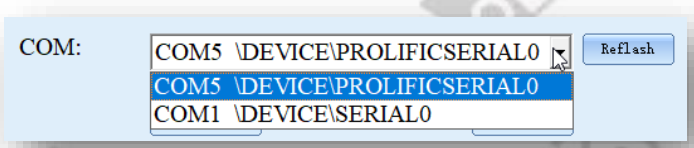
Before you start making your first changes, transfer the data from your radio to your PC and safe them as 'factory settings' for later use. It is always advisable to have the original factory settings at hand.

11.3.3 Connect to the radio

Make sure, that your radio is connected with the supplied programming cable to your Windows machine. Start by clicking on 'Comm' within the toolbar.



You will then be presented a list of COM-ports identified on your Windows machine. This is required before any 'Read'- or 'Write'-Operation from/to the radio.

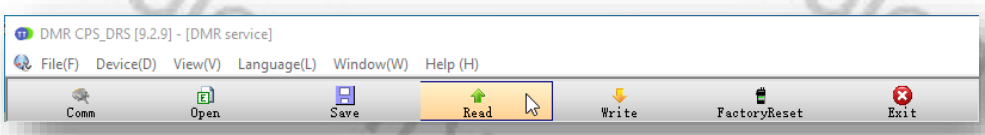


Select the COM-port that does represent your connected programming cable.

Notes: *Only COM-port 1…8 are currently supported.*

11.3.4 Read codeplug from DB25-D, DB40-D or GD-88

To read the current codeplug as stored on the radio, click on 'Read' within the toolbar to start the transfer of data from the Radioddity DB25-D, DB40-D or GD-88 to the PC.

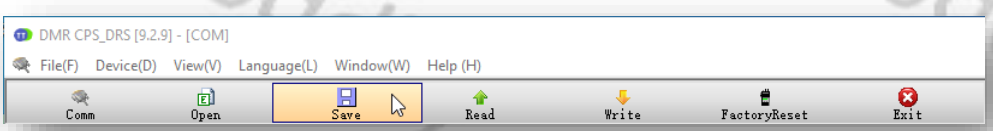


The radio will display 'Flash Read' whilst data is been transferred from the radio to the CPS.

As soon as all data has been transferred from the radio to the PC, the text 'Flash Read' will disappear.

11.3.5 Safe codeplug to file (Safe as)

If this is the first time you used the READ-function, we advise to first safe the data to a file of your choice, such as 'Factory setting of my radio'. To do so, click on the 'Save' button within the toolbar.

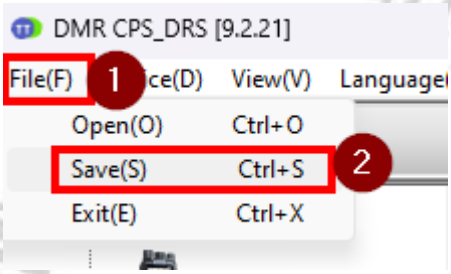


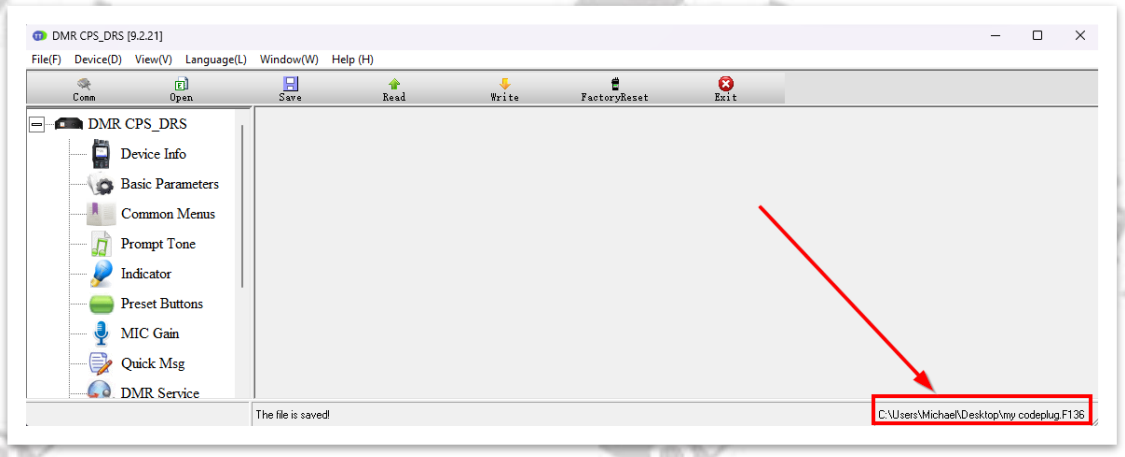
A normal file dialog will follow that allows to specify the filename and location to be used.

11.3.6 Safe codeplug to same file as before (Safe)

The name of the currently loaded codeplug file is displayed in the bottom line of our CPS.

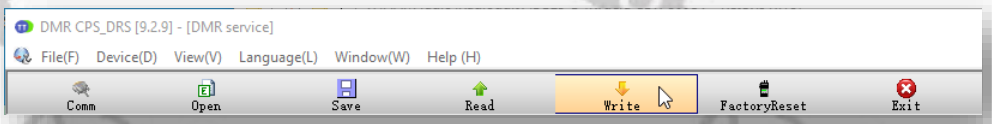
If you click on 'File → Save(S)' or just hit 'Ctrl-S' the current settings will be saved to the very same file, as specified in the bottom line of the CPS screen.



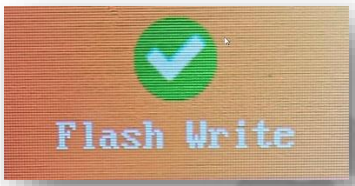


11.3.7 Write codeplug to DB25-D, DB40-D or GD-88

Whenever you have made any changes to your current codeplug, using the CPS and want those changes to become active on the radio, you need to write the changed codeplug back to the radio. To do so, just click on the button, named 'Write' in the toolbar.



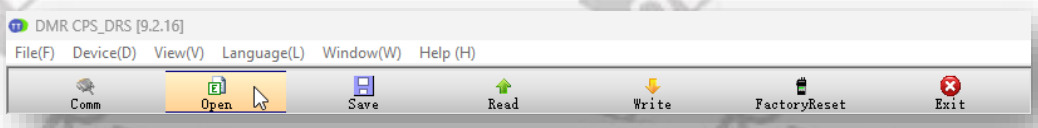
The Radioddity DB25-D, DB40-D or GD-88 will display 'Flash Write' whilst data is been transferred from the CPS to the radio.



As soon as all data has been transferred from the CPS to the Radioddity DB25-D, DB40-D or GD-88, the text 'Flash Write' will disappear.

11.3.8 Open existing codeplug

Codeplugs that have previously been saved to a file can be loaded into the CPS at any time. To do so, click on the 'Open' button within the toolbar.



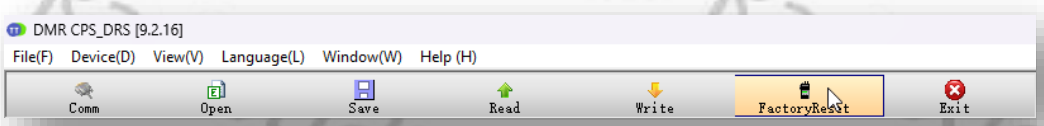
A normal file dialog will follow.

11.3.9 Factory Reset

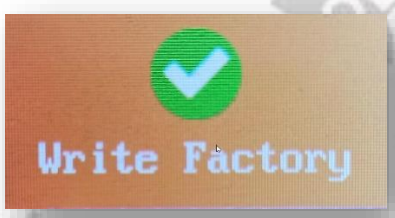
The FactoryReset-functionality is slightly different to what you may be used to with other radios. Whilst it is activated on the Radioddity DB25-D, DB40-D or GD-88 itself, using 'MENU → Local Set → FactoryReset', the settings that will then be restored to the radio may be predefined using the FactoryReset-functionality within the CPS.

To do so, just open your favorite codeplug (the one you want to become the 'Factory-defaults' one) within the CPS. Then, instead of writing it to the Radioddity DB25-D, DB40-D or GD-88 using the normal 'Write'-function, click on the 'FactoryReset' button within the toolbar in order to have the codeplug being written to the radio, similar to the normal 'Write'-function. But this time it will be

saved to a special area within the radio memory for later use with the FactoryReset-function of the radio itself.

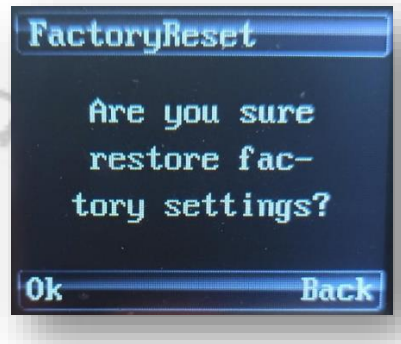


The radio will display 'Write Factory' whilst data is been transferred from the CPS to the Radioddity DB25-D, DB40-D or GD-88.



As soon as all data has been transferred from the CPS to the Radioddity DB25-D, DB40-D or GD-88, the text 'Write Factory' will disappear.

If you later on do activate the FactoryReset on the radio by using 'MENU → Local Set → FactoryReset', you will first be asked if you are sure to restore the factory-settings.



Confirm by pushing the MENU-knob.

Now the settings previously stored as factory-defaults will be restored. You will see a couple of screens (Recovering, Clearing..., This is Set) on your Radioddity DB25-D, DB40-D and Radioddity GD-88.

The complete process takes about 15 seconds, depending on the size of the factory-defaults codeplug you previously saved to the radio.

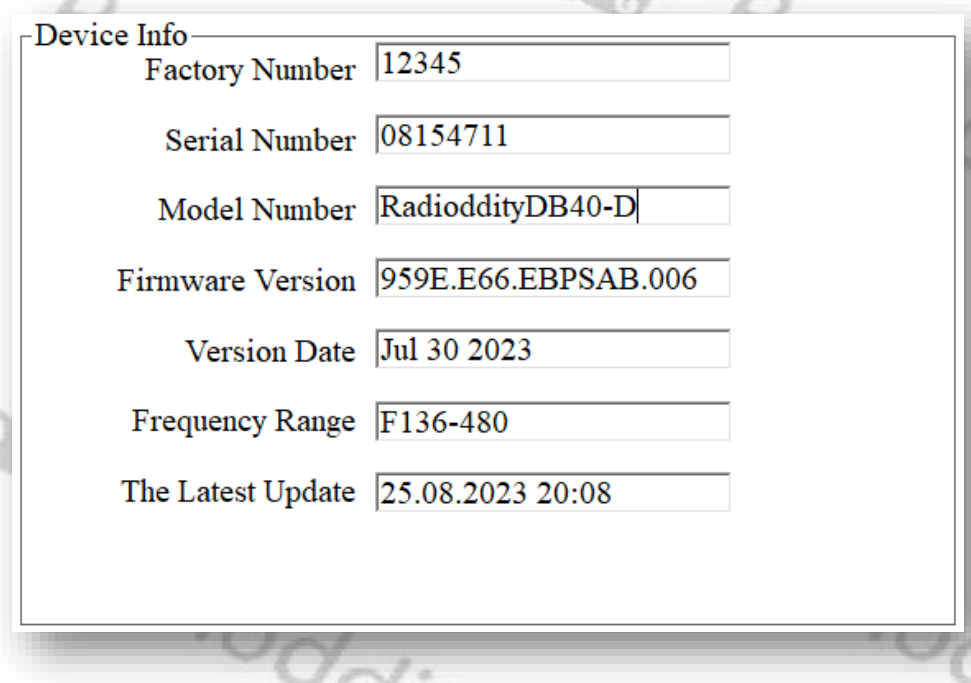
12 Using the CPS to make changes to your settings

In total there are currently 16 menus, each of those will be explained in full detail within an own sub chapter of this manual. Some of those menus are needed just once whilst others are needed more often.

Our CPS (although it is the very same as for the Radioddity DB25-D, DB40-D and GD-88) will present additional parameters as soon as a Radioddity DB25-D, DB40-D or GD-88 configuration has been read.

12.1 Device Info

This menu mainly refers to the general information of the device as provided by the manufacturer.



12.1.1 Factory Number

With this number, Radioddity can track the selling country or area of the product.

Notes:	*Data will only be shown in the CPS after the codeplug has been read from the* Radioddity *DB25-D,* Radioddity *DB40-D or* Radioddity *GD-88 to the CPS.*

12.1.2 Serial Number

A string to identify the individual device.

Notes:	*Data will only be shown in the CPS after the codeplug has been read from the* Radioddity *DB25-D,* Radioddity *DB40-D or* Radioddity *GD-88 to the CPS.*

12.1.3 Model Number

A string to indicate the radio model.

Notes:	*You may find other radios looking similar to the* Radioddity *or GD-88 with even sharing the very same 'Model Number'. Be careful as to not use any firmware or CPS with your* Radioddity *DB25-D, DB40-D or GD-88 that had not downloaded from our website as this may void any warranty.* *Valid Data will only be shown in the CPS after the codeplug has been read from the* Radioddity *DB25-D,* Radioddity *DB40-D or* Radioddity *GD-88 to the CPS.*

12.1.4 Firmware Version

It refers to the program-controlled software version. It indicates the non-editable version of firmware.

Notes:	*Data will only be shown in the CPS after the codeplug has been read from the* Radioddity *DB25-D,* Radioddity *DB40-D or* Radioddity *GD-88 to the CPS.*

12.1.5 Version Data

It is to indicate the date of firmware version from the manufacturer.

12.1.6 Frequency Range

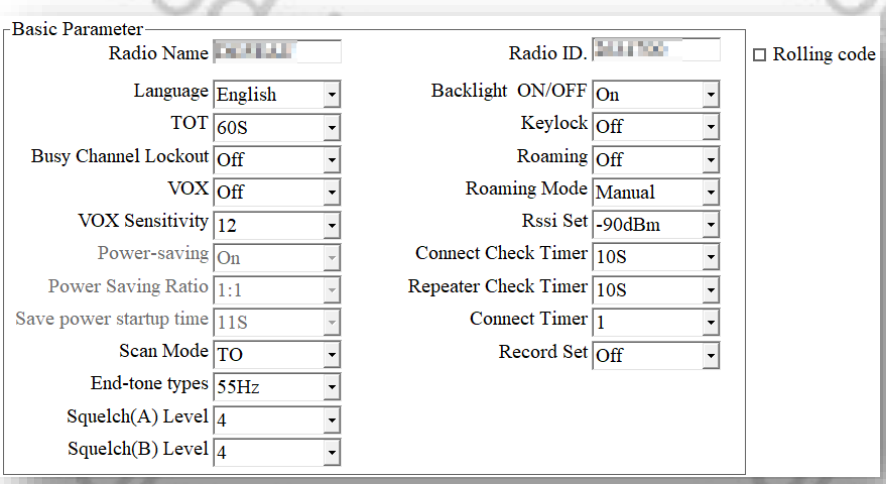
Refers to the device working frequency range.

12.1.7 The Latest Update

This displays the time and date when the codeplug has last been written to the Radioddity DB25-D, Radioddity DB40-D or Radioddity GD-88.

12.2 Basic Parameters

Before starting your first QSO with your new Radioddity DB25-D, DB40-D or GD-88, do not forget to setup your Radio ID (DMR ID) and your Radio Name (Call Sign). You find those parameters at the very top of the 'Basic Parameters'.



12.2.1 Radio Name

This field represents the name of your radio. And the name can be found on the menu settings of your radio. It can be composed by numbers, symbols, letters, Chinese characters, space, and special characters etc., with a maximum of 16 characters. HAM operators would use their call sign or their Talker Alias. The content of this field will be used for transmitting Talker Alias data.

12.2.2 Language

Users can select a preset language from the device setting as menu display language for the Radioddity DB25-D, DB40-D or GD-88.

Options: English
Chinese
Default: ***English***

12.2.3 TOT

TOT as abbreviation for Time-Out-Timer defines the longest time allowed for each transmission.

Options: Maximum: 500s
Minimum: 20s
Increment: 10s
Default: ***300s***

12.2.4 Busy Channel Lockout

In literature, this parameter is often abbreviated as BCL. Users are allowed to turn the Busy Channel Lockout on or off.

Options: On Turn on the busy channel lockout. The radio will be forbidden to transmit when receiving signals to protect the call quality of other users on this frequency.
Off Turn off the busy channel lockout. The radio is allowed to transmit while receiving signals.

Default: ***Off***

12.2.5 VOX

Users are allowed to turn VOX on or off. With VOX turned on, once the microphone detects audio, the radio will automatically transmit.

Options: On Users don't have to press [PTT] to transmit.
Off Users need to press [PTT] to transmit.

Default: ***Off***

12.2.6 VOX Sensitivity

This is used to adjust the VOX sensitivity level. There are 12 levels, where level 1 is the lowest and level 12 is the highest. It is recommended to choose a suitable level to avoid triggering of VOX accidentally or having difficulty to trigger VOX at all. Some elements, such as component type, using surroundings, speaking volume of the user and so on, should be considered so as to choose the most suitable level to achieve the best performance.

Options: Maximum: 12
Minimum: 1
Stepping: 1

Default: ***4***

12.2.7 Power-saving

As the radio is operated by a battery with limited capacity, it is advisable to make best use of its capacity. Therefore, the Radioddity GD-88 has 3 additional parameters: 'Power-saving', 'Power Saving Ratio' and 'Save power startup time'. In order to activate the power-saving function, also called 'Sleep Mode', it needs to be turned to 'On'

Options: On Power-saving mode (Sleep Mode) is activated
Off Power-saving mode (Sleep Mode) is deactivated

Default: ***On***

12.2.8 Power Saving Ratio

Users can set the duty cycle (waketime : sleep time) of the power-saving mode. The smaller the ratio, the lower the power consumption. A higher ratio may result in a receiving delay or missed calls. So, it is suggested to set the duty cycle based on its actual use. The set duty cycle is only effective when sleep mode is turned On.

Default: ***1:1***

12.2.9 Save power startup time

When the radio is on standby and without any operations, it can be set a delay time for entering sleep mode automatically.

Default: ***10 s***

12.2.10 Scanmode

Users can enable this function according to the working environment and actual needs to set scan mode, so as to improve scan efficiency.

Scan mode options: CO: Carrier Off scan: Once radio receives a scanned signal over the air, it will stay on that channel until signal disappears, and then continue to scanning.

TO: Time-Out scan: Once the radio receives a scanned signal over the air, it will stay on that channel for a preset time (5/10/15/20s). Once time is over, it will continue to scan.

SE: Seek scan: Once the radio receives a scanned signal over the air, it will stay on that channel and stop scanning until you re-activate to scanning.

default: ***CO***

Notes:	*Whilst VFO A is selected, VFO B will no longer be monitored during scanning. Whilst VFO B is selected, VFO A will no longer be monitored during scanning. The non-selected VFO is used for the scanning process.*

12.2.11 End-tone types

Users can enable this function according to the working environment and actual needs to set the end-tone type after [PTT] has been released, so as to facilitate the receiver to turn off its speaker in advance.

End-tone options: 55HZ
120°
180°
240°
Default: ***55HZ***

12.2.12 Squelch (A) Level

When receiving a carrier signal and its strength reaches the preset squelch level, the audio circuit will be turned on. This setting is for the upper (A) channel).

Selection range:	Maximum value:	9	
	Minimum value:	1	
	Increment:	1	
	Squelch circuit off	0	(audio circuit normally open)
Default:		***4***	

Notes: *The higher the squelch level value is set, the stronger the carrier signal needs to be.*

12.2.13 Squelch (B) Level

When receiving a carrier signal and its strength reaches the preset squelch level, the audio circuit will be turned on. This setting is for the lower (B) channel).

Selection range:	Maximum value:	9	
	Minimum value:	1	
	Increment:	1	
	Squelch circuit off	0	(audio circuit normally open)
Default:		***4***	

Notes: *The higher the squelch level value is set, the stronger the carrier signal needs to be.*

12.2.14 Radio ID

You can program a unique ID to identify your radio. The other radios can use that ID to call you. For example, to initiate a private call or send a text message.

ID editable range: Max: 16776415
Minimum: 1
Increment: 1

Default: ***<empty>***

> ***Notes:*** *If the radio is used for DMR amateur radio, this is the place to setup your DMR ID.* ***Never ever use a DMR ID that is not assigned to you.***

12.2.15 Rolling Code

This feature is for companies using larger quantities of the Radioddity DB25-D, DB40-D or GD-88 to ease mass-setup of radios. If the checkbox is ticked the specified 'Radio ID.' will get increased by one on each 'write' of the codeplug.

12.2.16 Backlight ON/OFF

Users can enable this feature based on working environment and their actual needs. It will help to save battery power, and prolong battery life.

Options: Off — Screen Background Light is on the darkest condition.
On — Screen lights on.
Auto — Screen Background will turn off automatically if there is no operation within 1 minute.

Default: ***On***

12.2.17 Keylock

User can lock or unlock the keypads according to their actual needs.

Options: Off — Turn off keylock feature.

Auto — Keypad will be locked automatically if there is no operation within 1 minute. Long press the Menu-key (normally the channel knob) to unlock the keyboard.

Manual — Long press the Menu-key (normally the channel knob) to lock or unlock the keyboard.

Auto&Manual — Keypad will be locked automatically if there is no operation within 1 minute. Long press the Menu-key to lock or unlock the keyboard.

Default: ***Off***

12.2.18 Roaming

Roaming is similar to what you may be used with your smartphone when you move from one area to another area, thus leaving coverage of one repeater and entering coverage of another repeater. Often the field strength (Strong RSSI Priority) is, what drives the decision on which repeater to use for your conversation. Digital and analog channels should not be mixed within one list.

Users can enable this function according to the working environment and their actual needs to specify if the radio should directly start roaming after booting up.

Options: Off Do not start roaming after booting up.
On Start roaming after booting up.

Default: ***Off***

Notes: *The function may be assigned to one of the function keys. For more details, please check chapter 12.6 Preset Keys on page 141.*

Precautions for roaming

1. Before any roaming mode is selected, please make sure the **Scan List** has been preset in advance, otherwise it is not possible to activate scanning or roaming.

2. When roaming is activated, the radio will scan all repeater channels (TX/RX inter-frequency) only. It will not scan simplex channels with same TX/RX frequency.

3. When roaming is activated, if there is no TX/RX inter-frequency channel (repeater channels) in the scan list, after scanning the current selected scan list, it will exit the roaming function.

4. In roaming searching, if the [PTT]-key is pressed, the radio will stop roaming and return back to preset Scan reply/transmit Mode to initiate a call. It will continue to roam after [PTT]is released.

5. When roaming is on, the radio defaults to scan in the main VFO (VFO A). When the main VFO (VFO A) is in roaming, channel selection is prohibited. However, menu accessing and setting of main VFO (VFO A) still can be made by selecting the proper VFO, or by initiating a call on the active VFO.

6. When the main VFO (VFO A) is in roaming, channel and VFO operation and menu accessing & setting of VFO B still can be made by selecting the proper VFO. And VFO B can remain in standby or normal receiving mode, and can initiate a call on the active VFO.

12.2.19 Roaming Mode

Users can enable this function according to the working environment and their actual needs.

options:	Auto	Once searching an available repeater from the scan list, the radio will lock to the current available repeater and pause auto roaming. Then, it will connect with the available repeater according to the preset Connect Check Timer. If the connection fails after the preset Connect Time is used up, it will restart the strong signal Auto roaming search.
	Manual	Users can manually roam to the next available repeater. Once it is on, all repeater channels in the scan list will be waken up to search the nearest available repeaters until an available one has been found. Every time the nearest available repeater is found, a Connect Re-check Timer (Repeater Check Timer) will be enabled. Users can also lock the repeater by short pressing the [OK/Select]-key. The next available repeater is not necessarily the one with the largest RSSI value in the channels of the scan list.
	Strong RSSI Priority	Once a repeater in the channels of the scan list with RSSI more than preset RSSI threshold value is searched by RSSI mode, the radio will lock to the current channel and pause the strong signal auto roaming. Then it will connect with the current repeater according to the preset Connect Check Timer. If the connection fails after the preset Connect Time is used up, it will restart the strong signal Auto roaming search.

Default: ***Auto***

12.2.20 RSSI Set

When the radio is set for 'Auto' roaming scan and scanned the largest RSSI value of the members of the [Scan/Roam list], it will lock to the current member channel with the largest RSSI value and stop the strong signal automatic roaming. Then the radio will trigger the 'Repeater Check Timer' for handshake confirmation with the current channel repeater based on the preset connect times. If a handshake is not confirmed with the repeater within the preset connect times, the radio will restart the strong signal automatic roaming search for a repeater with the largest RSSI in the member list.

RSSI values:	Maximum:	- 90 dBm
	Minimum:	- 125 dBm
Recommendation :		***- 100 dBm***

Notes:	*The received signal strength (RSSI threshold value) is settable. If the RSSI mode is enabled and the searched repeater RSSI value is more than the preset threshold, the repeater's transmitting signal coverage will be automatically recognized as good, and then the radio will suspend RSSI roaming.* *The stopped repeater is not necessarily the one with the largest RSSI value in the channels of the scan list.*

12.2.21 Connect Check Timer

When the nearest available repeater is searched by Manual Roaming, the radio will immediately pause at the repeater channel based on your preset connect check timer. If the available repeater is not confirmed by pressing the [OK]-key within the preset time, once the timer reaches the preset time, the radio will stop roaming; or restart roaming to find the next available repeater.

Timer values:	Maximum:	255s
	Minimum:	0s
Recommendation:		***60S***

12.2.22 Connect Repeater Check Timer

When the available repeaters are searched by Auto roaming or RSSI roaming and the radio confirmed to lock at the currently available repeater then the roaming is paused. Now, the radio will transmit signals at regular intervals based on the preset Connect Repeater Check Timer to connect with the current repeater. If it fails to connect with the currently available repeater in preset **Connect Time** of transmission (defined by **Connect Time**), the radio will restart Auto Roaming or RSSI Roaming to search any nearest available repeater.

Timer values:	Maximum:	255s
	Minimum:	0s
Recommendation:		***60S***

12.2.23 Connect Time

No matter which roaming mode is selected, in searching, each repeater channel in the scan list will try to connect with nearby available repeaters based on the preset Connect Time. If the pause channel fails to find the available repeaters within the preset Connect Time, it will continue to scan the next repeater channel from the list till it finds an available one.

Connect Time: Maximum: 10
Minimum: 1
Recommendation: ***3***

12.2.24 Record Set

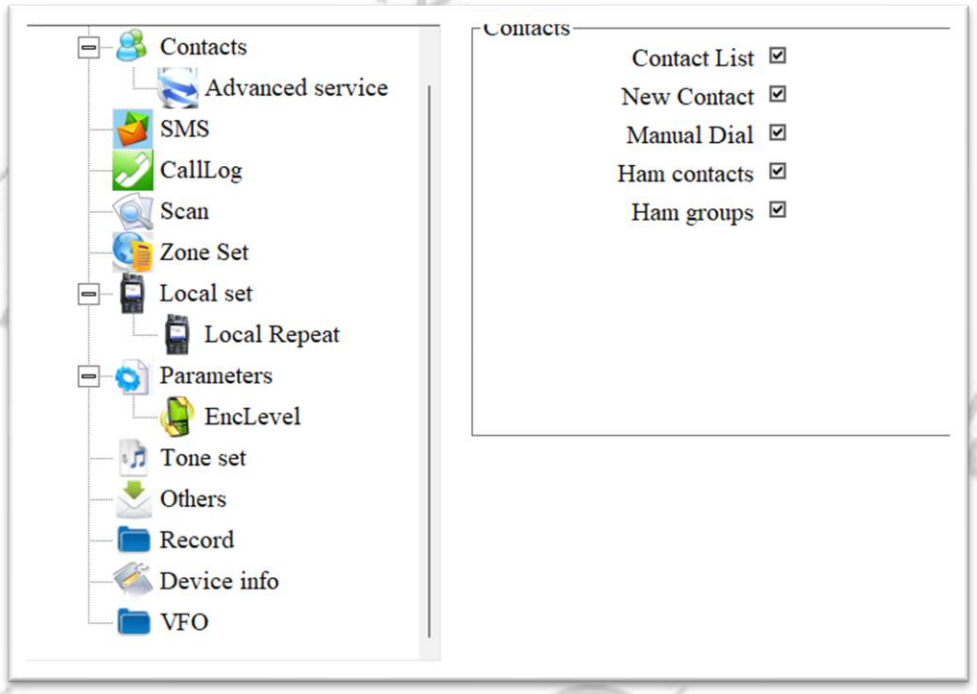
Users can enable this function according to the working environment and their actual needs to set recording functions.

Options: Off Close the recording.
RX Record the received voice whenever radio is receiving
TX Record the voice call whenever radio is transmitting
TX/RX Record the transmitting and receiving voice call

Default: ***OFF***

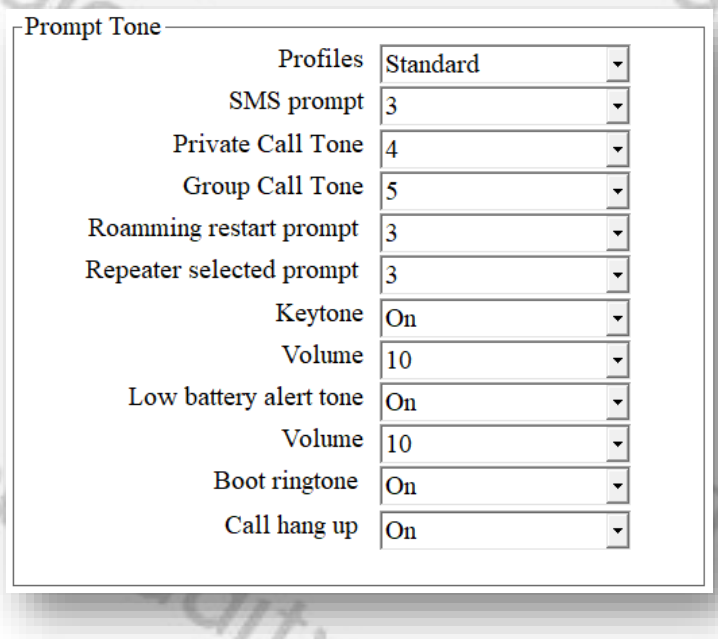
12.3 Common Menus

Users can disable or enable some menu options to show on the radio screen, to prohibit or allow users to check and operate the menu items from the radio screen menu. Users can tick '☑' the various boxes next to the option, to allow users to check or program the corresponding menu item.



12.4 Prompt Tone

You can turn on or off all sounds and prompt tones thru this parameter, or just set partial prompt tones of specific radio parameters.



12.4.1 Profiles

Select a predefined audio profile.

Mode Options: Standard All prompt tones of radio parameters are on
Silent All prompt tones of radio parameters are off
Default: ***Standard***

12.4.2 SMS prompt

Once receiving a message, the message Tone will be heard if this option is selected.

Mode Options: off, 1~5
Default: ***3***

12.4.3 Private Call Tone

Once receiving a private call, the Private Call Tone will be heard if this option is selected.

Mode Options: off, 1~5
Default: ***4***

12.4.4 Group Call Tone

Once receiving a group call, the Group Call Tone will be heard if this option is selected.

Mode Options: off, 1~5
Default: ***5***

12.4.5 Roaming restart prompt

Users can select the 'Roaming restart prompt' option to play a prompt whenever the radio restarts roaming.

Mode Options: off, 1~5
Default: ***3***

12.4.6 Repeater lock prompt

Users can use the 'Repeater lock prompt' option to play this prompt when the radio scanned for a repeater and locked to it.

Mode Options: off, 1~5
Default: ***3***

12.4.7 Keytone

You can turn on or off 'Keytone' thru this parameter.

Options: On Turn on Keytone
Off Turn off Keytone
Default: ***On***

12.4.8 Keytone volume

You can increase or decrease the 'Keytone volume' thru this parameter.

Volume Range: Maximum: 13
Minimum: 1
Increment: 1
Default: ***10***

12.4.9 Low Battery Alert tone

After setting it to 'On', a low battery alert will be heard when the battery voltage is less than a factory preset battery power level, which reminds you to charge or change the battery pack.

Options: On Turn on Low Battery Alert
Off Turn off Low Battery Alert
Default: ***On***

12.4.10 Low Battery Alert volume

You can choose the volume of the 'Low Battery Alert' with this parameter.

Volume Range: Maximum: 13
Minimum: 1
Increment: 1
Default: ***10***

12.4.11 Boot ringtone

User could turn on or off the tone for radio power ON through this parameter.

Options: On Turn on the power on prompt tone
Off Turn off the power on prompt tone
Default: ***On***

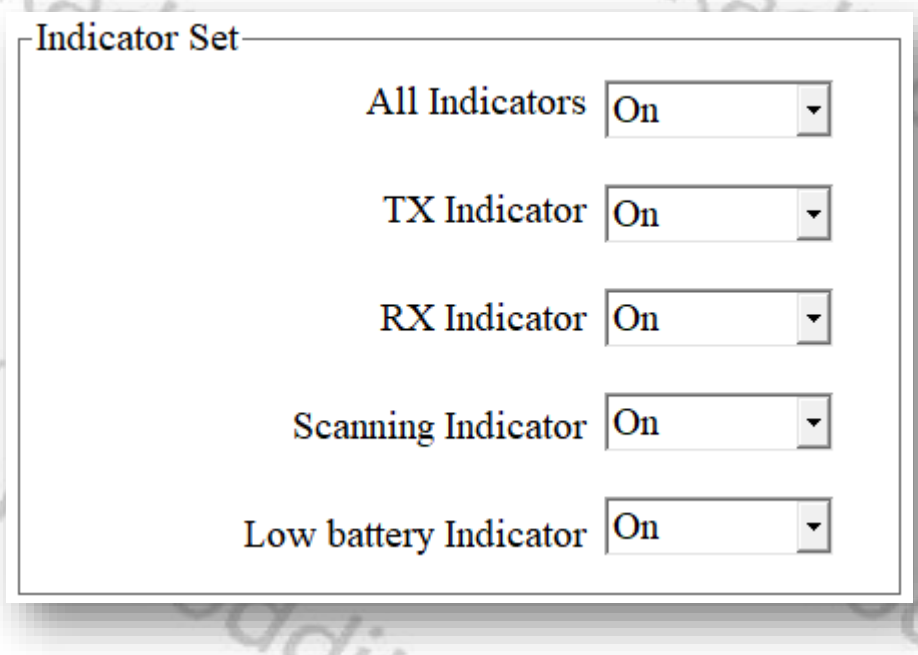
12.4.12 Call hang up

This parameter is only been evaluated in digital mode. Depending on the settings of 'DMR Service' -> 'Group call hang time' and 'Private call hang time', a sound will be played (if this parameter is set to on), whenever the corresponding time period has exceeded.

Options: On Turn on Call hang up
Off Turn off Call hang up
Default: ***On***

12.5 Indicator

You can enable or disable some status indicators thru this menu.



12.5.1 All Indicators

You can activate or disable all working status indicators of the radio thru this parameter.

Options: On Turn on all working status indicators of the radio
Off Turn off all working status indicators of the radio

Default: ***On***

12.5.2 TX Indicator

You can activate or disable the working status of the LED indicator for transmitting thru this parameter.

Options: On LED indicator is on when the radio is transmitting
Off LED indicator is off when the radio is transmitting

Default: ***On***

12.5.3 RX Indicator

You can activate or disable the working status of the LED indicator for receiving a signal thru this parameter.

Options: On LED indicator is on when the radio is receiving
Off LED indicator is off when the radio is receiving
Default: ***On***

12.5.4 Scanning Indicator

You can activate or disable the working status of the LED indicator for scanning thru this parameter.

Options: On LED indicator is on and flashing when the radio is scanning
Off LED indicator is off when the radio is scanning
Default: ***On***

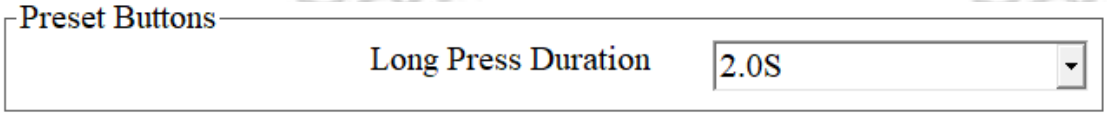
12.5.5 Low battery Indicator

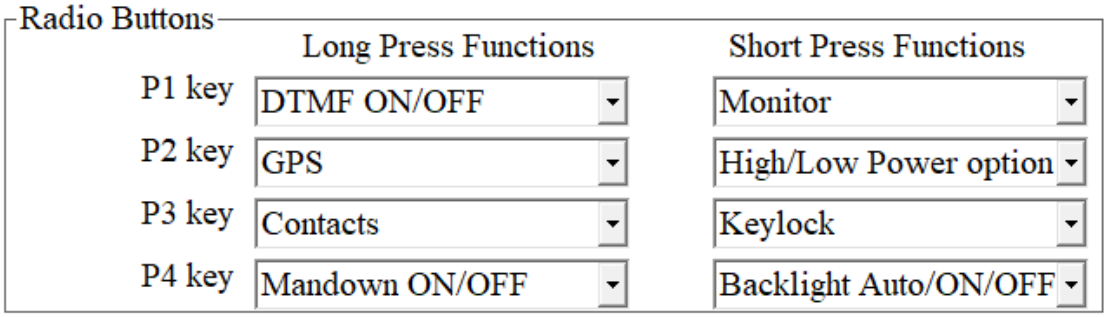
You can activate or disable the working status of the LED indicator for battery voltage being less than the preset battery power level with this parameter.

Options: On LED indicator is on and flashing when the battery voltage is less than preset battery power level
Off LED indicator is off when the battery voltage is less than preset battery power level
Default: ***On***

12.6 Preset Keys (programmable function keys)

Users can define the programmable function keys within this menu. Depending on the radio either P1...P7 (Radioddity DB25-D), PF1...PF4, P5...P8, Offhook, Onhook (Radioddity DB40-D) or P1...P4 (Radioddity GD-88) or are available to be assigned with special functions.





12.6.1 Long Press Duration

You can trigger different functions depending on Long Press or Short Press of a programmable function key. The minimum duration that identifies a long press is defined by this parameter.

Options: Longest: 5.0s
Shortest: 0.5s
Increment: 0.5s
Default: ***2.0s***

Possible settings are as listed in the following paragraph.

Notes:	*Short Press: press and release quickly* *Long Press: press and hold for the 'Long Press Duration' time length*

12.6.2 Available Function for the Preset Keys

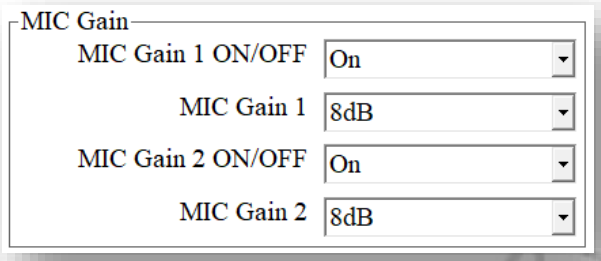
Type	Feature	Description
	Undefined	Preset Key is not assigned to any special function
	High /Low Power	Allows users to switch between high power and low power
	Backlight Auto/ON/OFF	Turn on and off the radio screen backlight
	Keylock	To lock or unlock the radio keypads
	VOX ON/OFF	To turn VOX feature of the radio On and Off
	Zone Switch	To change from the selected zone to a new zone
	Scan On/Off	Enable or disable radio scanning feature
	Scan Mode	Select the desired scan mode´(switch between SE, TO and CO mode)
	Repeater / Talk Around	Switch between Repeater and Talk Around Mode
	Emergency Alarm ON/OFF	Make an emergency alarm call or stop sending an emergency call. ***Notes**: Not used within HAM radio networks*
	Encryption On/Off	Turn radio encryption On or Off. ***Notes:** Not allowed within HAM radio networks*
	Contacts	Access to contact list to make a call or activate any other additional call feature
	SMS	Access to Message items
	Radio Revive	Remotely revive a disabled (killed) radio. (Being available only if enabled on target radio)
	Radio Detection	Detect and confirm if the radio is within reach without sending any indication or making visual inspection. (Being available only if enabled on target radio)
	Radio Kill	Disable a target radio remotely, which can protect stolen or missed radios being used by others. (Being available only if enabled on target radio)
	Remote Monitor	Remotely activate Mic and Transmitter of a target radio, and create a call silently without sending any indication or visual inspection message to the target radio, etc. (Being available only if enabled on target radio)
	Monitor	Turn On/Off the radio RX squelch circuit. Receive weak analog signals
	Permanent Monitor	Permanent Monitor is same as Monitor feature, which is allowing you to monitor the channel to make sure it is not occupied before transmitting; their difference is once Permanent Monitor is on, the radio will always be in this Monitor mode, till you exit it.
	1750Hz	To transmit a 1750 Hz signal (analog pilot tone)
	DTMF On/Off	To turn DTMF on or off
	Roam On/Off	To turn Roaming scan On or Off

Type	Feature	Description
	GPS	To turn GPS On or Off
	Record On/Off	To turn recording On or Off
	Mandown On/Off	To turn the Mandown function On or Off
	Relay On/Off	To turn the Repeater-mode On or Off
	Relay monitor On/Off	To turn Repeater monitoring On or Off
	700 Hz	To transmit a 700 Hz signal (analog pilot tone)
	1000 Hz	To transmit a 1000 Hz signal (analog pilot tone)
	1200 Hz	To transmit a 1200 Hz signal (analog pilot tone)
	1400 Hz	To transmit a 1400 Hz signal (analog pilot tone)
	1450 Hz	To transmit a 1450 Hz signal (analog pilot tone)
	2100 Hz	To transmit a 2100 Hz signal (analog pilot tone)
	Promiscuous	Turn Promiscuous mode On or Off
	Menu	Press assigned Preset Key to access the menu without pushing the [ENC] knob
	Up	Emulating the Speaker-Microphones Up-Key
	Down	Emulating the Speaker-Microphones Down-Key
	Back	Emulating the back key of the radio base on one of the Speaker-Microphones programmable keys
	DQT/QT	Switch between QT, DQT and DQI and no signaling QT is the equivalent to CTCSS DQT is the equivalent to DCS DQI is the equivalent to DCS-inverted
	A/B	Emulating the B/E key of the radio base on one of the Speaker-Microphones programmable keys
	Volume	Emulating the Volume key of the radio base on one of the Speaker-Microphones programmable keys
	VFO	Turn VFO mode On or Off
	Dual Watch ON/Off	Turn display of both VFOs On or Off

12.7 Mic Gain

You can turn the gain for the Microphone-signal on or off and set the MIC gain level of the Radioddity DB25-D, DB40-D or GD-88.

MIC Gain 1 refers to a microphone attached to the K1-socket of the radio and requires also MIC Gain 2 to be in its 'On'-position. MIC Gain 2 refers to the Speaker-Microphone that comes with the DB25-D as well as with the DB40-D and is connected via the front RJ45-Socket or the built-in microphone of the GD-88.



12.7.1 MIC Gain 1 ON/OFF

MIC Gain 1 is only active, if MIC Gain 1 and MIC Gain 2 are both turned on.

Options: On Turn on MIC Gain 1 feature.
Off Turn off MIC Gain 1 feature.
Default: ***On***

12.7.2 MIC Gain 1

The transmitted radio microphone audio level will be amplified in accordance with the setup gain ratio of ' MIC Gain 2' plus those of ' Mic Gain 1'.

Option: Maximum: 20 dB
Minimum: 0 dB
Stepping: 4 dB
Default: ***8 dB***

Notes: *This option is effective ONLY when the status of the MIC Gain 1 and MIC Gain 2 are both 'ON'.*

12.7.3 MIC Gain 2 ON/OFF

You can turn on or off the MIC Gain 2 feature of the microphone attached to the RJ45-socket at the front of the Radioddity DB25-D, DB40-D or the built-in microphone of the Radioddity GD-88. With the parameter turned 'On', the transmitted radio microphone audio level will be amplified in accordance with the

setup gain ratio of ' MIC Gain 2'. It is advisable to align the gain for the same total volume level heard by the receiving station as other stations. Within the DMR Brandmeister network, the parrot functionality is ideal for checking the own volume level.

Options: On Turn on MIC Gain 2 feature.
Off Turn off MIC Gain 2 feature.
Default: ***On***

12.7.4 MIC Gain 2

The transmitted audio of the Speaker-Microphone that´s connected to the front RJ45-socket of the Radioddity DB25-D, DB40-D or the built-in microphone of the GD-88 2will be amplified according to value defined by 'MIC Gain 2'.

Option: Maximum: +43 dB
Minimum: 0 dB
Stepping: 1 dB
Default: ***8 dB***

Notes: *This option is effective ONLY when 'MIC Gain 2 ON/OFF' is set to 'ON'.*

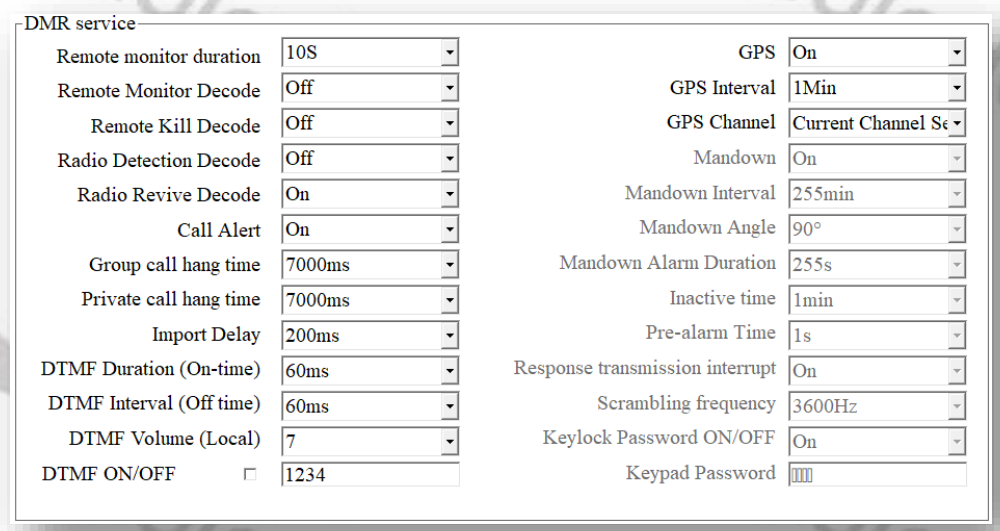
12.8 Quick Msg

The users can pre-program up to 100 messages (depending on firmware release; newer releases are limited to 16 messages as the RAM-space is used for AES256 encryption), each message content can be up to 40 characters. Valid characters include alphanumeric characters, spaces, and special characters. Users can access the function through the Message menu function.

Serial Number	Quick Msg(Max=40Bytes)
1	Testmessage sent from Radioddity DB40-D
2	Hello, this is <enter call sign here>
3	vy 73 de <enter name here>
4	
5	The quick brown fox jumps over the lazy
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

12.9 DMR Service

Users are allowed to turn on or off the advanced services through DMR Services, if required.



12.9.1 Remote monitor duration

By programming, users can program how long the radio will keep the microphone and transmitter on after it receives the remote monitor command from another radio. No visual or audio indication will be shown to your radio.

Options: Maximum: 120s
Minimum: 10s
Stepping: 10s
Default: ***10s***

Notes:	*The functionality may also be accomplished by pressing the preset [Scan On/Off]-key to turn the scan On or Off.*

12.9.2 Remote Monitor Decode

It allows the radio to receive and deal with the 'Remote Monitor' command. The radio will activate the microphone and transmitter and send the audio activities of the surroundings for the specific time programmed after receiving the 'Remote Monitor' command. No indication will be shown.

Options: On Allow other users to activate and start remote monitor function
Off Do not allow users to access to the remote monitor function
Default: ***Off***

Notes:	*The function may be assigned to one of the function keys. For more details, please check chapter 12.6 Preset Keys on page 141.*

12.9.3 Remote Kill Decode

It allows the radio to receive and deal with the 'Remote Kill' command. The radio will be forbidden to be used, which would be useful to protect a stolen or missing radio from being used by others.

Options: On Allow and accept to be killed by other radios
Off Forbid to be killed by others
Default: ***Off***

Notes:	*The function may be assigned to one of the function keys. For more details, please check chapter 12.6 Preset Keys on page 141.*

12.9.4 Radio Detection Decode

Users or base station operators can send a 'Radio Detection' command to a target radio to see whether it is active in the system, and without showing any indications.

Options: On Allow and accept to be detected by other radios
Off Forbid other radios to detect this radio
Default: ***Off***

Notes:	*The function may be assigned to one of the function keys. For more details, please check chapter 12.6 Preset Keys on page 141.*

12.9.5 Radio Revive Decode

It allows the radio to receive and deal with the 'Radio Revive' command, and activate itself to be used again.

Options: On Allow and accept to be revived by other radios
Off Forbid other radios to revive this radio
Default: ***Off***

> ***Notes***: *The function may be assigned to one of the function keys. For more details, please check chapter 12.6 Preset Keys on page 141.*

12.9.6 Call Alert

It allows the radio to receive and deal with the 'Call Alert' command, and will reply to it at its convenience.

Options: On Allow the radio to receive the call alert command
Off Forbid the radio to receive call alert command
Default: ***Off***

12.9.7 Group Call Hang Time

The duration that the radio will reply back to a received call or continues the transmitted Talk within a Group Call of the received or transmitted digital Group ID. This allows to answer on a call, although the active TalkGroup is not selected within the current channel, but is a member of the RX group that is associated with the current channel. After the specified time has expired, the channel will transmit to the designated contacts (digital group) as programmed for the current channel.

Options: Maximum: 7000 ms
Minimum: 0 ms
Increment: 500 ms
Default: ***3000 ms***

12.9.8 Private Call Hang Time

The free time for Talk Around Private Call after releasing [PTT]-key, which can prevent more calling when you press [PTT] to transmit every time. In this period, as the channel is free, other radios can still transmit. After the specified time has expired, the channel will transmit to the designated contact as programmed for the current channel.

Options:	Maximum:	7000 ms
	Minimum:	0 ms
	Increment:	500 ms
Default:		***3000 ms***

12.9.9 Import Delay

By setting this parameter, user can set the duration time from the [PTT] pressed to the first DTMF code sent, when radio call is issued.

Options:	Maximum:	500 ms
	Minimum:	50 ms
	Increment:	10 ms
Default:		***200 ms***

12.9.10 DTMF Duration (On-time)

To change the duration of each DTMF code send by setting this parameter.

Options:	Maximum:	500 ms
	Minimum:	50 ms
	Increment:	10 ms
	Recommendation:	100 ms
Default:		***60 ms***

12.9.11 DTMF Interval (Off-time)

To change the time interval between the end of each DTMF code and the next DTMF code by setting this parameter.

Options:	Maximum:	500 ms
	Minimum:	50 ms
	Increment:	10 ms
	Recommendation:	100 ms
Default:		***60 ms***

12.9.12 DTMF Volume

To adjust the volume of local playback sound of the DTMF code issued by the radio, by setting this parameter.

Options:	Maximum:	12
	Minimum:	off
	Increment:	1
	Recommendation:	8
Default:		***7***

12.9.13 DTMF ON/Off

If the parameter is enabled, by checking the box, the specified DTMF-string will be send out by the radio in advance when [PTT] is pressed. The DTMF codes are specified in the input field besides the checkbox.

Default: ***unticked***

> ***Notes:*** *This parameter is in no way related to the DTMF options available when operating in analog mode. See chapter 6.7* DTMF for analog mode *on page 61 for more details on those.*

12.9.14 DTMF code

By setting this parameter, users can make the radio send out a set of maximum 4 DTMF codes in advance when [PTT] is pressed, so as to achieve the effect of a phone ring.

DTMF code supports 11-character (0-9, ABCD*#) composition.

Default: ***1234***

> ***Notes:*** *Enabling and disabling of that function may be assigned to one of the function keys. For more details, please check chapter 12.6 Preset Keys on page 141.*

12.9.15 GPS

By setting this parameter, users can activate/deactivate the GPS module.

Options:	Off	deactivate GPS
	On	activate GPS
Default:	***Off***	

> ***Notes:*** *The function may be assigned to one of the function keys. For more details, please check chapter 12.6 Preset Keys on page 141.*

12.9.16 GPS interval

Once the GPS feature is activated, the Radioddity DB25-D, DB40-D or GD-88 will send the GPS data whenever the 'GPS interval' has elapsed.

Options: Max: 250 min
Min: Off (No interval)
Default: ***1 min***

12.9.17 GPS channel

Once GPS activated, the Radioddity DB25-D, DB40-D or GD-88 will send the GPS data to others from the appointed channel. It can be any digital channel including the channel selected by channel selector.

Default: ***off***

12.9.18 Mandown

By setting this parameter, the Mandown alarm can be turned On or Off.

Default: ***On***

12.9.19 Mandown Interval

By setting this parameter, the user can make the Radioddity GD-88 still send out the alarm at a certain interval before it exits the mandown state.

Recommended: ***5 min***

12.9.20 Mandown Angle

By setting this parameter, when the Angle between the falling and the horizontal surface of the Radioddity GD-88 is less than this parameter, an alarm will be given.

Recommended: ***60°***

Notes: When the radio is perpendicular to the ground, it is 90°.

12.9.21 Mandown Alarm Duration

By setting this parameter, user can specify the length of time for the Radioddity GD-88 to send a mandown alarm in the analog channel.

Recommended: ***10 s***

Notes:	*The alarm duration of the digital channel is configured by the parameters of the digital alarm list corresponding to the channel.*

12.9.22 Inactive Time

This option and its value are not applicable for the Radioddity DB25-D, DB40-D or the GD-88. Please ignore it.

12.9.23 Pre-alarm Time

This option and its value are not applicable for the Radioddity DB25-D, DB40-D or the GD-88. Please ignore it.

12.9.24 Response transmission interrupt

This option and its value are not applicable for the Radioddity DB25-D, DB40-D or the GD-88. Please ignore it.

12.9.25 Scrambling frequency

This option and its value are not applicable for the Radioddity DB25-D, DB40-D or the GD-88. Please ignore it.

12.9.26 Keylock Password On/Off

This option and its value are not applicable for the Radioddity DB25-D, DB40-D or the GD-88. Please ignore it.

12.9.27 Keypad Password

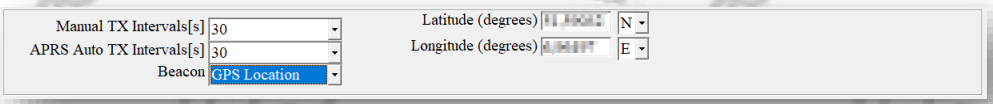
This option and its value are not applicable for the Radioddity DB25-D, DB40-D or the Radioddity GD-88. Please ignore it.

12.10 APRS

The APRS (Automatic Packet Reporting System) protocol has first been used back in the early 80s and got lot of extensions since then. Within amateur radio and in combination with a GPS receiver it is mainly used to publish the current geographic position to a repeater or an iGate whereas those do forward the information to other sites, such as https://aprs.fi. More details on APRS to be found at http://www.aprs.org/.

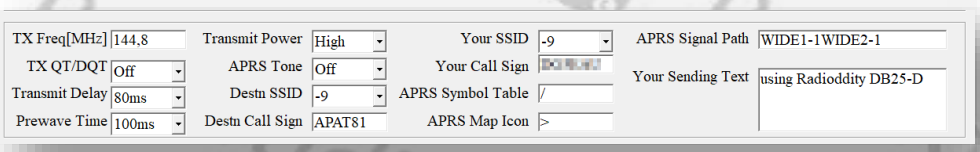
The Radioddity DB25-D, DB40-D and Radioddity GD-88 are all capable of analog and digital transmission of GPS position data (called 'APRS beacon') using the APRS

protocol. Those parameters in common are specified within the topmost block of the APRS parameters.



12.10.1 Analog APRS

For Analog APRS data, check which frequency and further parameters are to be used for your region. Within the CPS, those settings required for analog APRS are specified within the following block:



> ***Notes:*** *Analog APRS may be assigned to a channel as 'APRS(A)'. However, analog APRS only works when assigned to an analog channel.*

12.10.2 Digital APRS

For Digital APRS a DMR network is required and the APRS-message is sent to a certain TalkGroup either as Private or as Group call, depending on the DMR network and country/region. A total of 8 possible Digital APRS settings may be defined. Within the channel definition one of those 8 digital APRS settings or the analog APRS setting may be selected for APRS reporting of the specific channel.

No	Report Channel	APRS TG	Report Slot	Call Type	PTT
1	Current channel	0	Current Slot	Private call	Off
2	Current channel	0	Current Slot	Private call	Off
3	Current channel	0	Current Slot	Private call	Off
4	Current channel	0	Current Slot	Private call	Off

12.10.3 Manual TX Interval[s]

When using analog APRS, an APRS packet (beacon) will be send out on the very first use of the [PTT]-key. This also triggers the 'Manual TX Interval timer'. As long as the timer has not reached its specified value, new APRS packets will not be send

when [PTT] gets depressed. This APRS packet transmission is independent of the specified 'APRS Auto TX Intervals'.

Interval period:	Maximum:	255
	Minimum:	0
	Increment:	1
Recommended:		***30***

12.10.4 APRS Auto TX Intervals[s]

It makes little sense to transmit the current position too often. This parameter defines the interval at which the current position is to be transmitted via APRS protocol.

Interval period:	Maximum:	7650
	Minimum:	0
	Increment:	30
Recommended:		***120***

12.10.5 Beacon

If the Radioddity DB25-D or DB40-D is mainly used as a radio station at home, we advise to not use GPS but set the GPS-data within the APRS protocol to the fixed location as specified with the parameters 'Latitude' and 'Longitude'.

Options:	Fixed Location
	GPS Location
Recommended:	***GPS Location***

Notes:	*If set to 'Fixed location', the color of the icon indicating the GPS-status will remain 'red'. If set to 'GPS Location', the icon indicating the GPS-status will initially be colored 'red'. As soon as the GPS receiver has been able to receive at least 3 satellites, the color of the icon will change to 'green'.*

In order to set your radio for a fixed position you not only need to set the 'Beacon'-Parameter for 'Fixed location', but you also need to specify the longitude and latitude of your location. Those numbers need to be added as degrees and minutes in decimal form. Depending on the operating system settings you may need to use the '.' or the ',' to separate the degrees and the minutes from each other. However, they will get displayed with a comma in between. For negative values you need to change the orientation ('S' instead of 'N' or 'W' instead of 'E').

12.10.6 Latitude (degrees)

Latitude and Longitude define an exact position on earth. The parameters 'Latitude' and 'Longitude' are used when 'Fixed Location' had been selected for the APRS functionality. To get the required numbers for latitude and longitude you may want to use a service such as https://www.latlong.net/ which allows even to enter a full address and not just the city.

Default: ***0***

Notes: *This parameter is mandatory if using APRS with a 'Fixed Location'.*

12.10.7 Longitude (degrees)

Longitude and Latitude define an exact position on earth. The parameters 'Latitude' and 'Longitude' are used whenever 'Fixed Location' has been selected for the APRS functionality.

Default: ***0***

Notes: *This parameter is mandatory if using APRS with a 'Fixed Location'.*

12.10.8 TX Freq [MHz]

The frequency specified with this parameter for analog APRS is totally independent of the selected channels frequency. The APRS beacon is transmitted using 1200 Baud AFSK. The frequency data within the following table is subject to change without prior notice.

Region	Frequency
Argentina, Uruguay	144.9300 MHz
Australia	145.1750 MHz
Austria (test)	433.8000 MHz
Brazil	145.5700 MHz
Chile	144.3900 MHz
China	144.6400 MHz
Colombia	144.3900 MHz
Europe	144.8000 MHz
Germany	432.5000 MHz
Indonesia	144.3900 MHz
Japan	144.6400 MHz
Malaysia	144.3900 MHz
Netherlands (test)	430.5125 MHz
New Zealand	144.5750 MHz
North America	144.3900 MHz
Russia	144.8000 MHz
South Africa	144.8000 MHz
Taiwan	144.6400 MHz
Thailand	145.5250 MHz

Default: ***0***

12.10.9 TX QT/DQT

It may be required to setup CTCSS or DCS whenever transmitting your position on analog APRS to a repeater or iGate. This parameter is normally 'off' (no CTCSS/DCS used), but may be assigned any of the supported CTCSS frequencies or DCS/DCS-I values. See Appendix A for supported CTCSS frequencies and DCS/DCS-I values.

Default: ***Off***

12.10.10 Transmit Delay

The two parameters 'Transmit Delay' and 'Prewave Time' are responsible for the delay between automatic [PTT] activation (for analog APRS) and the actual transmission of the APRS beacon.

Delay period:	Maximum:	5100 ms
	Minimum:	0 ms
	Increment:	20 ms
Recommended:		***80 ms***

12.10.11 Prewave Time

The two parameters 'Transmit Delay' and 'Prewave Time' are responsible for the delay between automatic [PTT] activation (for analog APRS) and the actual transmission of the APRS beacon.

Time period:	Maximum:	2550ms
	Minimum:	0ms
	Increment:	10ms
Recommended:		***100 ms***

12.10.12 Transmit Power

The output power for analog APRS can be set to either High or Low.

Options:	High	Use 20W output power whenever a stronger signal is required to enhance the transmit range.
	Low	Use the 5W option for short range communication
Default:	***High***	

12.10.13 APRS Tone

If you want to hear the transmitted APRS packet (AFSK modulated) you may set this parameter to 'On'.

Options:	Off
	On
Default:	***Off***

12.10.14 Destn SSID

The specified digit will be appended to the destination call sign

Value: Maximum: -15
Minimum: 0
Increment: -1
Default: ***0***

12.10.15 Destn Call Sign

This parameter is required to specify the destination call sign and may not be left empty for analog APRS.

Recommended: ***APAT81***

12.10.16 Your SSID

To further specify the type of station that sends out an APRS beacon, 15 SSIDs have been assigned as follows:

SSID	Definition
0	Your primary station usually fixed and message capable
-1, -2, -3, -4	generic additional station, digi, mobile, wx, etc.
-5	Smartphone user
-6	Satellite or special operations (Camping)
-7	walkie talkies, HT's or other human portable
-8	boats, sailboats, RV's or second main mobile
-9	Primary Mobile (usually message capable)
-10	internet, iGate, echolink, winlink, AVRS, APRN, etc.
-11	balloons, aircraft, spacecraft, etc.
-12	APRStt, DTMF, RFID, devices, one-way trackers, etc.
-13	Weather station
-14	Truckers or generally full-time drivers
-15	generic additional station, digi, mobile, wx, etc.

The specified digit will be appended to your own call sign as specified within the parameter 'Your Call Sign'.

Value: Minimum: 0
Maximum: -15

Recommended:
-9 For using your Radioddity DB25-D or DB40-D in a car
-14 For using your Radioddity DB25-D or DB40-D in a truck
-7 For using your Radioddity GD-88 handheld

12.10.17 Your Call Sign

This parameter is also mandatory for analog APRS as it does specify your own call sign.

Default: ***<empty>***

12.10.18 APRS Symbol Table

Initially APRS supported just 192 different symbols. This has recently been enhanced to several thousands. The selected 'APRS Symbol Table' in combination with the selected 'APRS MAP Icon' define the symbols that will be used within sites such as https://aprs.fi to visually show the type of station at its current location. More details on that topic to be found at http://www.aprs.org/symbols.html. Recommended setting for 'APRS Symbol Table': '/'.

Recommended: ***/***

Notes: *This parameter is only relevant for analog APRS*

12.10.19 APRS Map Icon

Initially APRS supported just 192 different symbols. This has recently been enhanced to several thousands. The selected 'APRS Symbol Table' in combination with the selected 'APRS Map Icon' defines the symbol that will be used within sites such as https://aprs.fi to visually show the type of station at its current location. More details on that topic to be found at http://www.aprs.org/symbols.html . The recommended setting for 'APRS Map Icon' will lead to a car being displayed on sites such as https://aprs.fi.

Examples:	k	Truck
	[	Human person
Recommended:	**>**	***Car*** 
	[	***Human person***  (to be used with Radioddity GD-88)

Notes: *This parameter is only relevant for analog APRS*

The following table lists the resulting icons according to the selected 'APRS Symbol Table' in combination with the selected 'APRS Map Icon'.

Table	!	‘	#	$	%	&	'	(	)	*	+	,	-	.	/	0
/																
\																

Table	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?	@
/																
\																

Table	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
/																
\																

Table	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_	`
/																
\																

Table	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
/																
\																

Table	q	r	s	t	u	v	w	x	y	z	{	|	}	~		
/																
\																

By selecting the 'APRS Symbol Table' and 'APRS Map Icon', you define the resulting icon that will be displayed on APRS service pages such as https://aprs.fi. The following table list the most used icons and their corresponding 'APRS Symbol Table', 'APRS Map Icon' and 'SSID' that are applicable for your DB25-D, DB40-D and GD-88.

Notes: *We advise not to take any other combinations besides those listed below.*

Description	APRS Symbol Table	APRS Map Icon	Icon	SSID
Human Person (with HT)	/	[		-7
Car	/	>		-9
Truck	/	k		-14
Station	/	K		0

12.10.20 APRS Signal Path

This parameter defines the path your APRS beacon packets should take.

Recommended: WIDE1-1WIDE2-1

Notes:	*There is no space or ',' between 'WIDE1-1' and 'WIDE2-1'. This parameter is only relevant for analog APRS*

12.10.21 Your Sending Text

Within this field a maximum of 60 alphanumeric characters may be defined. Those text will become part of the APRS beacon and will be displayed alongside the call sign on maps such as https://aprs.fi.

Recommended: ***using Radioddity DB25-D*** or

using Radioddity DB40-D or

using Radioddity GD-88

12.10.22 No

A total of 8 digital APRS reporting channel definitions are possible for digital APRS. For each of those definitions, you may specify a different 'Report Channel', 'APRS TG', 'Report Slot', 'Call Type' and 'PTT' setting.

Notes:	*This parameter is only relevant for digital APRS*

12.10.23 Report Channel

You may either specify a specific channel out of all channels that are within your various zone definitions or just use the current channel whenever APRS beacon data is to be transmitted.

Default: ***Current channel***

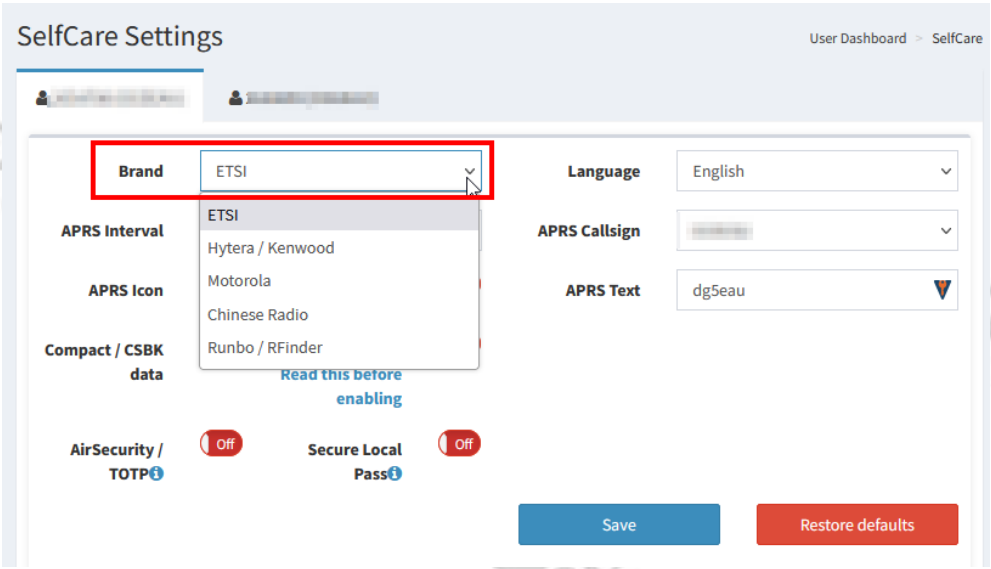
Notes:	*The current firmware only allows digital APRS reporting on the same timeslot as the current channel. We are planning to remove this limitation. Thus for now, best leave this setting on 'Current channel'.*

12.10.24 APRS TG

In digital APRS the APRS data will be transmitted to the TalkGroup, specified by this parameter. The TalkGroup is depending on the network that is used by the defined APRS channel. The following table lists some of those TalkGroups as found on the DMR Brandmeister network. Normally the selected TimeSlot doesn´t matter but the Call Type is 'Private Call'

Country/Area	TalkGroup (TG)
Australia	505999
Austria	232999
France	208999
Germany	262999
Greece	202999
Hungary	216999
Ireland	272999
North America	310999
Norway	242999
Poland	260099
Portugal	268999
United Kingdom	234999

Hints: *If you are using Brandmeister network, make sure you do set the Brand to ETSI within the Brandmeister SelfCare Settings.*



12.10.25 Report Slot

As digital APRS makes use of DMR repeaters we need DMR Tier 2 with its support for TimeSlots. This parameter defines the TimeSlot to be used for transmitting your APRS beacon data. You may either specify a specific TimeSlot or just use the TimeSlot of the currently selected digital channel.

Hints:	*In Europe it is advised to use TimeSlot 2 for transmitting digital APRS data.*

Default: ***Current Slot***

Notes:	*The current firmware only allows digital APRS reporting on the same timeslot as the current channel. We are planning to remove this limitation. Thus, for now best leave this setting on 'Current slot'.*

12.10.26 Call Type

Depending on the digital network used by the specified APRS channel, the transmission of the APRS beacon is either established as a 'Private Call' or as a 'Group Call'. Check with your digital network provider on the required setting. As for digital DMR Brandmeister network, APRS calls are transferred as 'Privat Call'.

Default: ***Private call***

12.10.27 PTT

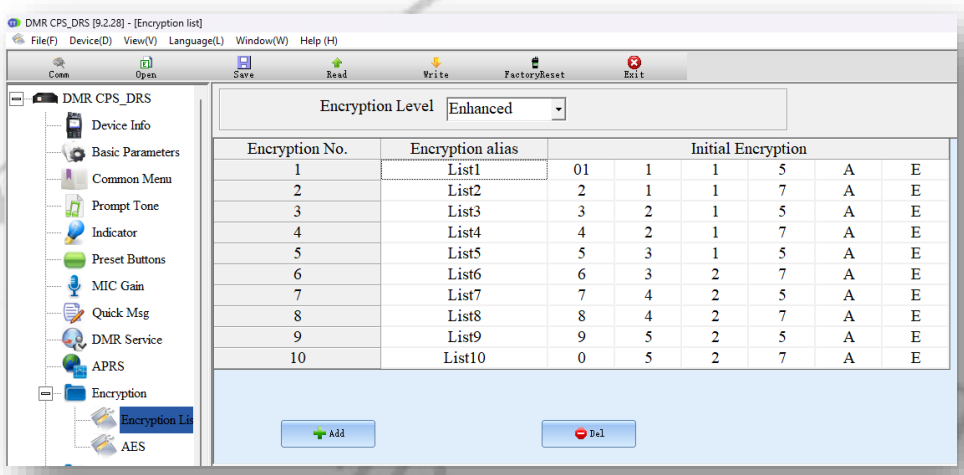
Define if [PTT] should trigger the transmission of an APRS beacon

Options: Off Do not send an APRS beacon when radio is keyed up
On Send an APRS beacon when radio is keyed up

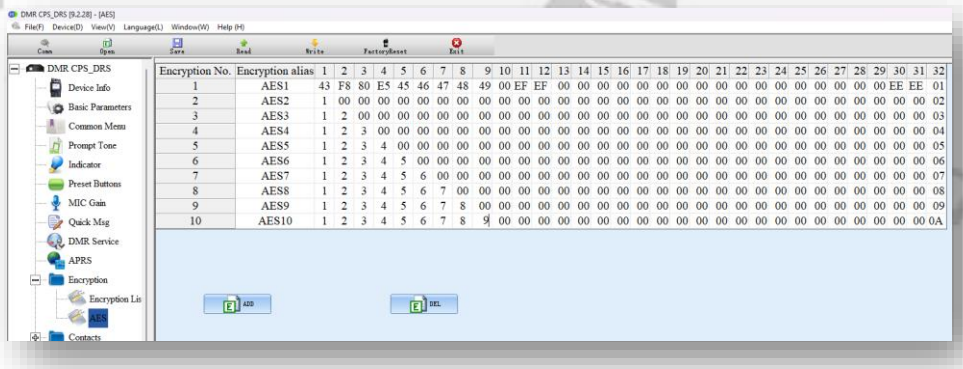
Default: ***Off***

12.11 Encryption

Users are allowed to define a maximum of 10 encryption key names and their encryption key values. The encryption level (low, middle, high, enhanced and AES256) of all radios should be programmed to be the same. Otherwise, the encryption value can't be used. If the encryption level is programmed to be 'off', this function can't be used. It is not possible to use different encryption levels within the very same codeplug.



If the Encryption Level is set to AES, the actual encryption key values are defined within the 'AES' submenu underneath the Encryption menu.



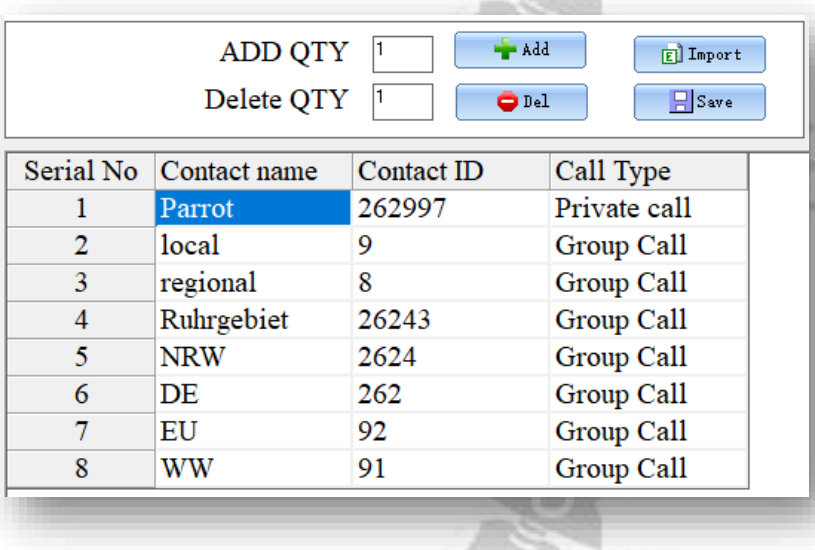
Notes: *Except for AES256, this feature only works with radios of same brand and model.*

Using *encryption* is not allowed In Amateur radio networks.

12.12 Contacts

12.12.1 Contact list

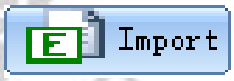
It is convenient for users to create, modify, edit, add and delete digital Contacts in the current channel, or to copy ham contacts or Ham groups to the contact list, which is convenient for you to call an associated contact or TalkGroup on a specified channel for communication. If necessary, you can create, modify, edit, add, delete the contacts and groups that are in your 'Contact list'. The capacity of this contact list can reach up to 2000 private contacts or groups, including 'Contact name' (call sign or TalkGroup), 'Contact ID' (DMR ID) and 'Call Type' (mainly 'Private Call' or 'Group Call').



Serial No	Contact name	Contact ID	Call Type
1	Parrot	262997	Private call
2	local	9	Group Call
3	regional	8	Group Call
4	Ruhrgebiet	26243	Group Call
5	NRW	2624	Group Call
6	DE	262	Group Call
7	EU	92	Group Call
8	WW	91	Group Call

You may grab lists of currently available TalkGroups as follows:

- Brandmeister network (BM):
  https://www.pistar.uk/dmr_bm_TalkGroups.php
  or via the BM API at https://api.brandmeister.network/v1.0/groups/
- Thank God It´s Friday (TGIF) network:
  https://www.pistar.uk/dmr_tgif_TalkGroups.php
- DMR+ network: https://www.pistar.uk/dmr_dmr+_TalkGroups.php



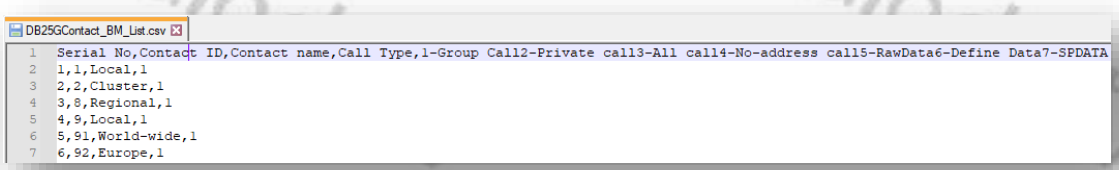
If you press the button 'Import', you will be directed to the default file path of the system, and you can directly import a CSV file of digital contacts. For your convenience we have included a sample file 'contacts 2000.csv '. This sample file has a couple of sample contacts their 'Serial No', 'Contact ID', 'Contact name' and 'Call Type', whilst the following assignment is valid for the different call types:

Call Type #	Call Type
1	Group call
2	Private call
3	All call
4	No-address call
5	RawData
6	Define Data
7	SPDATA

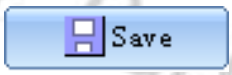
Normally only Call Type 1 (Group call) and Call Type 2 (Private call) are used. If you need to update the imported contacts CSV file, you need to re-import the updated digital contacts CSV file to replace the previously imported contacts. Call Types 3...7 are not supported within HAM radio networks.

The format of the CSV file is as follows:

Serial No,Contact ID,Contact name,Call Type



Notes: *We advise to not use Excel but some plain text editor to edit CSV files such as https://notepad-plus-plus.org/.*



What 'Import' is for getting CSV file data into the CPS is 'Save' for storing it into a CSV file. If you press the 'Save' button, you will be directed to the default file path of the system in order to directly save the current content of your 'Contact list' to a CSV file of your choice.

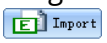
To manually add one or more records ('Serial No's) to the 'Contact list', first specify the total number of records you want to add within the field labeled 'ADD QTY' before you push the button '+ Add'. Be careful as to not exceed the maximum number of allowed records.

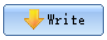
To manually delete one or more records ('Serial No's) from your current 'Contact list', first specify the total number of records you want to delete within the field labeled 'Delete QTY', then position the cursor at the Serial No you want to start the delete-process at before you push the button '- Del'. Be careful as to not try deleting more records than actually do exist.

To save the 'Contact list' to the radio, click on 'Write' within the top menu selection of the CPS. Do not forget to do that.

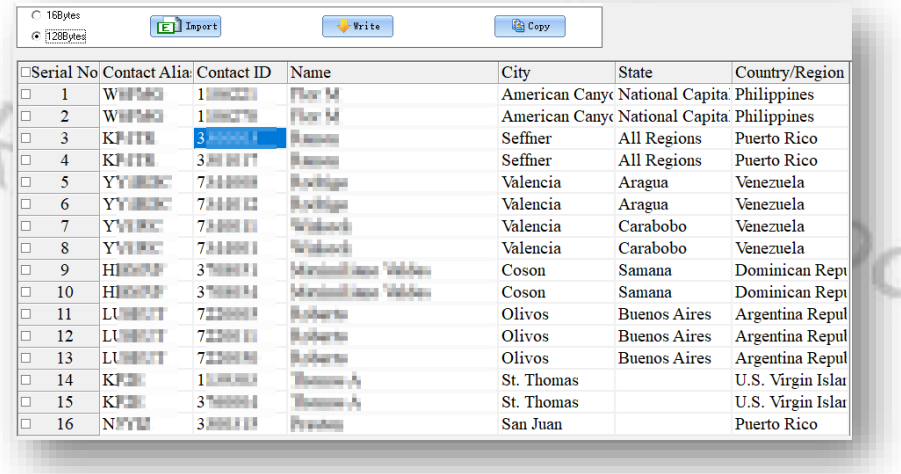
12.12.2 Ham contacts

The 'Ham contacts' is mainly used for high-end users or amateur groups. At the same time, it allows users to create, modify, edit, add and delete the ham contacts list through a CSV file, or download the CSV file of the ham contacts from a designated website or other ways directly import or copy it to the CSV file and then import. This 'Ham Contacts' can hold up to 300,000 Contacts with details such as 'Contact Alias' (call sign), 'Contact ID' (DMR ID), 'Name' (Name of operator), 'City', 'State/Province' and 'Country'.

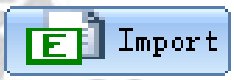
Notes: *Getting the Ham contacts into the radio is a 2-step process,*
1. 

sorted Ham contacts from a file to the CPS
2. 

the Ham contacts from the CPS to the radio



Serial No	Contact Alia	Contact ID	Name	City	State	Country/Region
1	W	1	Flor M	American Canyo	National Capita	Philippines
2	W	1	Flor M	American Canyo	National Capita	Philippines
3	K	3	Ramon	Seffner	All Regions	Puerto Rico
4	K	3	Ramon	Seffner	All Regions	Puerto Rico
5	Y	7	Rodrigo	Valencia	Aragua	Venezuela
6	Y	7	Rodrigo	Valencia	Aragua	Venezuela
7	Y	7	Wolcott	Valencia	Carabobo	Venezuela
8	Y	7	Wolcott	Valencia	Carabobo	Venezuela
9	H	3	Maximiliano Valdes	Coson	Samana	Dominican Repu
10	H	3	Maximiliano Valdes	Coson	Samana	Dominican Repu
11	L	7	Roberto	Olivos	Buenos Aires	Argentina Repul
12	L	7	Roberto	Olivos	Buenos Aires	Argentina Repul
13	L	7	Roberto	Olivos	Buenos Aires	Argentina Repul
14	K	1	Thomas A	St. Thomas		U.S. Virgin Islar
15	K	3	Thomas A	St. Thomas		U.S. Virgin Islar
16	N	3	Pedro	San Juan		Puerto Rico



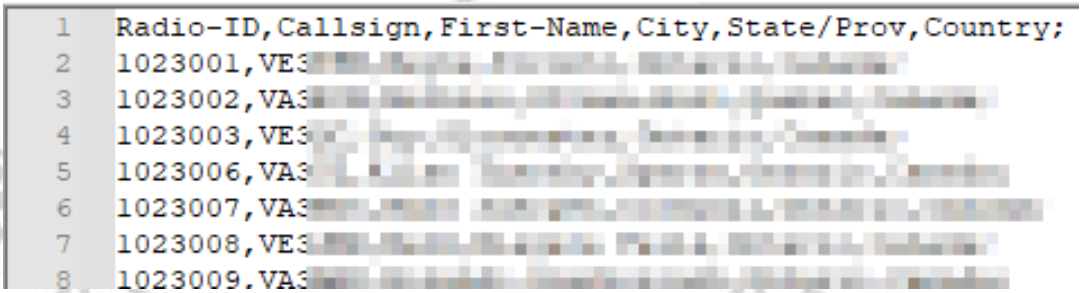
If you press the 'Import' button, you will be directed to the default file path of the system in order to directly import a CSV file of digital contacts. For your convenience we have included a sample file 'Ham contacts_ALL_20200505193301 max 200000.csv ' within the installation directory of the Radioddity CPS. This

sample file has more than 160000 records with their 'DMR ID', 'Call sign', 'Full name', 'City', 'State/Province' and 'Country'.

If you need to update the imported contacts CSV file, you need to re-import the updated digital contacts CSV file to replace the previously imported contacts.

The format of the CSV file is as follows:

Radio-ID (DMR ID),Alias (Call sign),Name,City,State/Province,Country;



***Notes**: The 'HAM contacts' CSV-Format does not require a serial number like the normal 'Contact List'.*
We advise to not use Excel but some plain text editor to edit CSV files such as https://notepad-plus-plus.org/.
The file needs to be sorted with ascending DMR IDs.

When you have imported the digital contacts CSV file, you can press the 'Write' button to write the list to the radio. Only The 'Ham contacts' will be written to the radio. This is the only way to write the 'Ham contacts' to the radio.

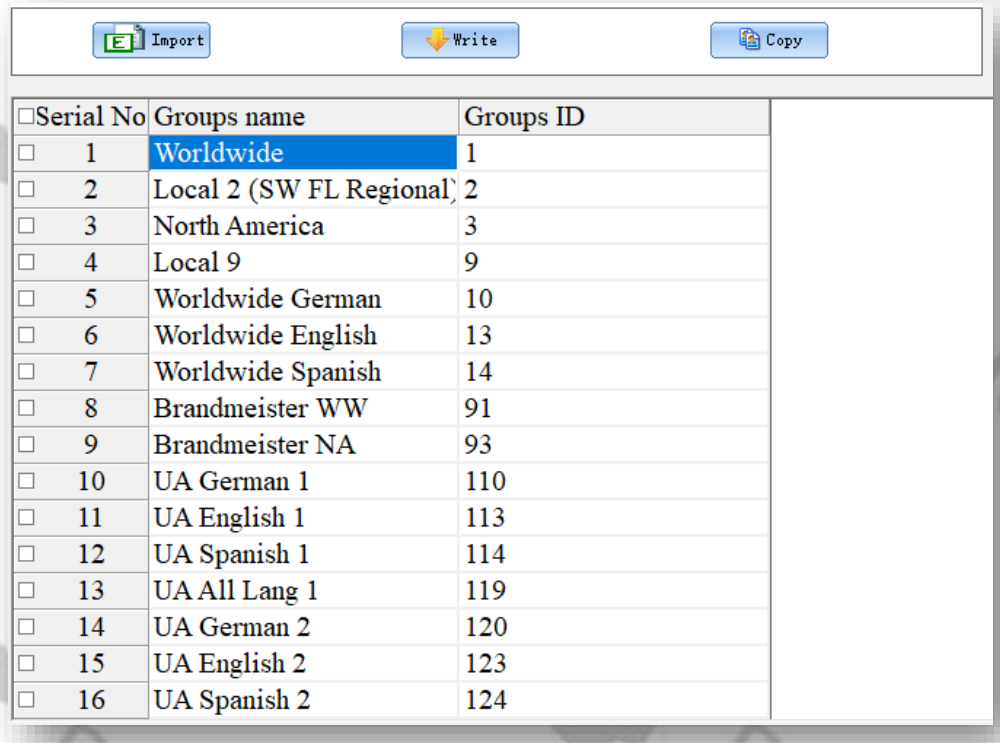
Tip: You can choose what information and details to write using these two options:

◉ 16Bytes ○ 128Bytes	Choose this option, to just write the 'Contact ID' (DMR ID) and the 'Contact alias' (call sign) of the ham contact to the radio. This option significantly minimizes the time to write the contacts to the radio.
○ 16Bytes ◉ 128Bytes	Choose this option, to write all details of the ham contacts including 'Contact ID' (DMR ID), 'Contact alias' (call sign), Name, City, State, Country/Region and address etc. to the radio. This is very convenient for the user to browse and view detailed contact information. However, this option significantly increases the required time to transfer the contact details to the radio. For 200.000 Ham contacts this currently takes about an hour.

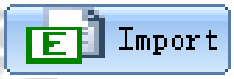
When you have imported the digital contacts CSV file, you can select your desired friend contacts from it, and then tick '☑' in the '☐' box next to serial number. After all the required contacts have been selected, press the 'copy' button to copy the name and number of the selected contacts to the 'Contacts list' which make it more convenient for you to call an associated contact on a specified channel for communication. Once copy successes, 'Has copied to Contacts list successfully' will pop up. If necessary, you can modify, create, edit, add, delete contacts in the contacts list. The 'Contacts list' capacity can be up to 2000 private contacts (or TalkGroups) including name, number and call attributes.

12.12.3 Ham groups

The ham groups is mainly used for high-end users or amateur groups. At the same time, it allows users to create, modify, edit, add and delete the ham groups through the CSV file, or download a CSV file of the ham groups through a designated website or other ways directly import or copy it to a CSV file and then import. 'Ham groups' can hold up to 20,000 groups, including details such as digital group name (TalkGroup Name) and Group ID (TalkGroup ID).



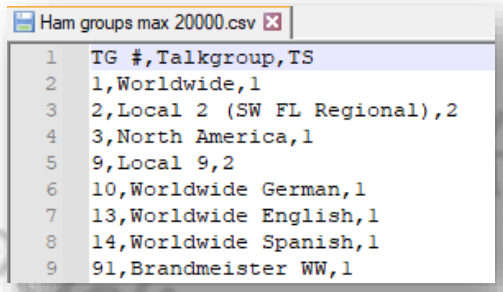
☐Serial No	Groups name	Groups ID
☐ 1	Worldwide	1
☐ 2	Local 2 (SW FL Regional)	2
☐ 3	North America	3
☐ 4	Local 9	9
☐ 5	Worldwide German	10
☐ 6	Worldwide English	13
☐ 7	Worldwide Spanish	14
☐ 8	Brandmeister WW	91
☐ 9	Brandmeister NA	93
☐ 10	UA German 1	110
☐ 11	UA English 1	113
☐ 12	UA Spanish 1	114
☐ 13	UA All Lang 1	119
☐ 14	UA German 2	120
☐ 15	UA English 2	123
☐ 16	UA Spanish 2	124



If you press the 'import' button, you will be directed to the default file path of the system in order to directly import a CSV file of Ham groups. If you need to update the imported 'Ham group' CSV file, you need to re-import the updated 'Ham group' CSV file to replace the previously imported 'Ham groups'.

The format of the CSV file is as follows:

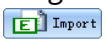
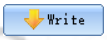
TG #,TalkGroup,TS



Notes:	*The 'HAM Groups' CSV-Format does not require a serial number like the normal 'Contact List'.* *We advise to not use Excel but some plain text editor to edit CSV files such as https://notepad-plus-plus.org/.*

When you have imported the ham groups CSV file, you can select your desired groups from it, and then tick '☑' in the '☐' box next to serial number. After all the required groups have been selected, press the 'Copy' button to copy the Groups name and Groups ID of the selected ones to the 'Contact list' which is convenient for you to call an associated group on a specified channel for communication. Once copy has completed, 'Has copied to Contacts list successfully' will pop up. Then, you can check the 'Contact list'. If necessary, you can modify, create, edit, add, delete contacts and groups within the 'Contact list'. The 'Contact list' capacity can be up to 255 private contacts, including Contact name, Contact ID and Call Type.

After you have imported the 'Ham groups' CSV file, you can press the button 'Write' to transfer the data to the radio. Only the hams groups will be written to the radio. This is the only way to write 'Ham groups' to the radio.

Notes: *This function only applies to the digital 'Group call' type.*
Getting the Ham groups into the radio is a 2-step process,
1.  *Ham groups from a file to the CPS*
2.  *the Ham groups from the CPS to the radio*

12.13 Digital Alarm List

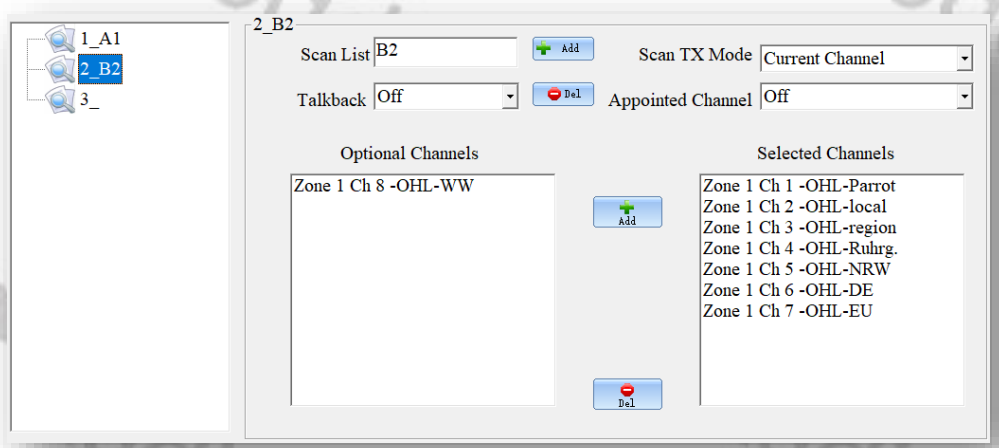
The user can create, modify, edit, or delete the set of alarm system in the digital alarm list. The digital alarm system list is the signaling protocol used to communicate in an emergency in digital mode. Up to 4 digital alarm systems can be created

Serial	List name	Alarm type	Alarm mode	Alarm Channel	Impolite Attempts	Emergent MIC Duration
1	A1	Standard	Emergency Alarm	Off	2	6S
2	A2	Standard	Emergency Alarm	Off	2	6S
3	A3	Standard	Emergency Alarm	Off	2	6S
4	A4	Standard	Emergency Alarm	Off	2	6S

Notes: *The alarm type cannot be set as disable. This function only applies to digital mode.*

12.14 Scan List

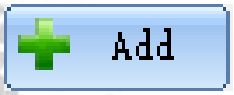
A Scan/Roaming list can be associated with each channel. Once scan is 'On', this Scan/Roaming list will be monitored for activity on the current channel. If Roaming is turned 'On' within the 'Basic Parameters' menu, the radio will scan the repeater channels on the roaming list to search for an available repeater station. To perform a roaming scan, the list must contain repeater channels. Every channel can only enable either scan or roaming scan. A maximum of 250 groups of scan lists can be setup, with a maximum of 50 members per group.



Notes: *When Scanning is turned on and VFO A is currently selected, the radio will no longer monitor VFO B. When Scanning is turned on and VFO B is currently selected, the radio will no longer monitor VFO A.*

12.14.1 Scan List

The user can edit, rename, or delete the name of the scan/roaming list. The maximum length of the Scan list name may need exceed 10 characters, using letters, numbers, spaces and special marks. Leaving the name empty is not allowed. It is possible, to set up a maximum of 250 San lists, each containing up to 50 Channels.



Press the button '+ Add' to add a new scan list with the name specified by the input field 'Scan List' to the existing scan lists. The total number of scan lists will increase by 1.

Mark one of the existing scan lists. Its name will be displayed in the input field 'Scan List'. Now press the button '- Del' to delete than scan list from the existing scan lists. The total number of scan lists will decrease by 1.

12.14.2 Talkback

The feature allows the user to press [PTT]-key to transmit on the current received channel, during scanning or within 3s after the received signal has disappeared.

Options: On Activate Talkback
Off Deactivate Talkback. Talkback/reply will be based on the setting of 'Scan TX Mode'.

Default: ***Off***

Notes: *When the talkback is set 'ON', the setting of 'Scan TX Mode' will be ignored. When the talkback is set 'Off', the setting of 'Scan TX Mode' will be evaluated.*

12.14.3 Scan TX Mode

During scanning process, it is allowed to initiate a call or reply back on the current channel by pressing the [PTT]-key when a scanned signal disappeared or scanning stops.

Options:	Current channel	Transmit only in the initial channel before the scan starts.
	Last Operated Channel	Transmit only in the last operated channel where the radio stays lastly or scan stops.
	Appointed channel	Transmit only on the selected channel.
default:	***Appointed channel***	

Notes:	*The 'Scan TX Mode' is only valid when 'Talkback' function set 'off' or after scanned signal disappears within 3s.*

12.14.4 Appointed Channel

To select a specific channel out of all channels that are within your various zone definitions for transmitting and replying during scanning. When set to 'Off', the channel won't be available for transmitting and replying during scanning.

Default: ***Off***

Notes:	*The setting is only used, when the 'Scan TX Mode' is set to 'Appointed Channel'.*

12.14.5 Optional Channel

Displays all available channel members that can be added to the scan/roaming list.

Notes:	*When you add a member shown in the 'Optional Channels' window to the scan/roaming list, the selected channel member information will no longer appear in the 'Optional Channels' window, unless you delete the channel member from the 'Selected Channels' window.*

12.14.6 Selected Channels

Lists all channel members selected and added to the scan/roaming list. You can add up to 50 channel members. You can review the available scan/roaming list member information in the 'Selected Channels' window. You can also remove any of the channel members from the 'Selected Channels' window, and the removed channel members will no longer participate in any activity of the scan/roaming list members. Any available channel can optionally be associate to the scan/roaming list.

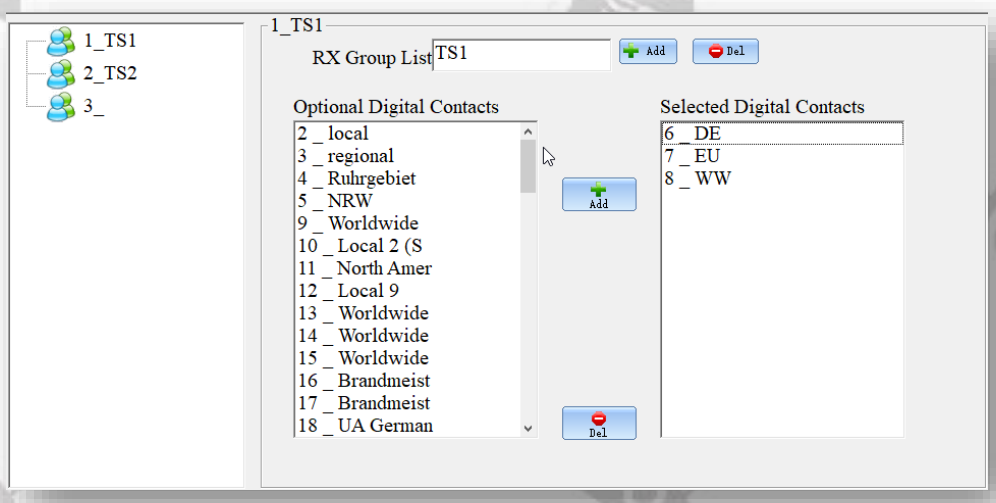
Click on one of the members within the 'Optional Channels' window and press the button '+ Add' to add that member from the 'Optional Channels' window to the 'Selected Channels' window.

Click on one of the members within the 'Selected Channels' window and press the button '- Del' to remove that member from the 'Selected Channels' window. It will then be listed within the 'Optional Channels' window.

Notes: *When you remove members of the 'Selected Channels' windows from the scan/roaming list, the information of that channel will no longer be displayed in 'Selected Channels' windows but they will again be listed within the 'Optional Channels' windows.*

12.15 RX Group

An RX Group needs to be setup for the user to listen to group calls to members with the same configuration. You can set or select any TalkGroup from the available lists (1-250) as a 'RX Group List' (up to 100 RX Group Lists).



Within the Channel settings a RX Group should be assigned to each channel.

If the currently active TalkGroup is NOT a member of the 'RX Group' that´s assigned to the selected channel or even no 'RX Group' is assigned to the selected channel (setting 'off' for 'RX Group' of the selected channel) and promiscuous

mode is not activated, you will not be able to hear any activity on the currently selected channel.

If the currently active TalkGroup is a member of the 'RX Group' that´s assigned to the selected channel, you will hear all activity that´s going on for the TalkGroups of the 'RX Group' assigned to the currently selected channel (as long as they are received within the very same TimeSlot as the selected channel).

Notes:	*This feature is available only in digital mode.*

12.16 Zone [Channel]

Zone is a collection of channels. The user can customize the zone and channel capacity according to the actual needs. A zone supports 1~3999 digital or analog channels.

Users can edit, modify and delete the zone name. A maximum of 10 characters can be entered. Valid characters include numbers, symbols, letters, spaces and special characters.

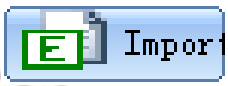
Notes:	*When editing channel information, the user can select digital or analog channels based on the type of channels.*

13 Setup of channels

A channel is defined by several parameters. Some of them apply both, to analog as well as digital channels, others apply to analog or digital channels only. This chapter do explain all those parameters in more detail.

Above the list of channels within a zone, you find four buttons and two input fields.

13.1 Import channels from CSV-file



If you press the 'Import' button, you will be directed to the default file path of the system in order to directly import a CSV file containing a list of channels.

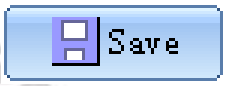
The format of the CSV file is as follows:

```
Z-1,CH mode,CH Name,RX Freq,TX Freq,Power,RX Only,Alarm ACK,Prompt,PCT,RX TS,TX TS,RX CC,TX CC,Msg Type,TX Policy,RX Group,Encryption List,Scan List,Contacts,EAS,Relay Monitor,Relay mode,Bandwidth,RX QT/DQT,TX QT/DQT,APRS
```

```
1  Z-1,CH mode,CH Name,RX Freq,TX Freq,Power,RX Only,Alarm ACK,Prompt,PCT,RX TS,TX TS,RX CC,TX CC,Msg Type,TX Policy,RX Group,Encryption List,Scan
   List,Contacts,EAS,Relay Monitor,Relay mode,Bandwidth,RX QT/DQT,TX QT/DQT,APRS
2  1,Digital,OHL-Parrot,438.23750,430.63750,High,Off,Off,Off,Patcs,Slot 2,Slot 2,1,1,Unconfirmed Data,Impolite,RXgrp2,Off,Off,Parrot,Off,Off,Off,12.5,Off,Off,1
3  2,Digital,OHL-lokal,438.23750,430.63750,High,Off,Off,Off,Patcs,Slot 2,Slot 2,1,1,Unconfirmed Data,Impolite,RXgrp2,Off,Off,lokal,Off,Off,Off,12.5,Off,Off,1
4  3,Digital,OHL-region,438.23750,430.63750,High,Off,Off,Off,Patcs,Slot 2,Slot 2,1,1,Unconfirmed Data,Impolite,RXgrp2,Off,Off,regional,Off,Off,Off,12.5,Off,Off,
5  4,Digital,OHL-DE,438.23750,430.63750,High,Off,Off,Off,Patcs,Slot 1,Slot 1,1,1,Unconfirmed Data,Impolite,RXgrp1,Off,Off,Germany,Off,Off,Off,12.5,Off,Off,1
```

> ***Notes:*** *As the above format as well as the sample are probably not readable at all, you may want to just hit the 'Save' button (see next paragraph for details) and check the resulting file as it does contain the header line as well as the data for the current channels. Whenever importing Digital-Mode channels, be sure that referenced entries for 'RX Group', 'Scan List', 'Contacts' and others have already been created before starting the import process.*
> *We advise to not use Excel but some plain text editor to edit CSV files such as https://notepad-plus-plus.org/.*

13.2 Export channels into CSV-file



What 'Import' is for getting CSV file data into the CPS is 'Save' for storing it into a CSV file. If you press the 'Save' button, you will be directed to the default file path of the system in order to directly save the current content of your selected zone 'Channels' to a CSV file of your choice.

13.3 Add channels

To manually add one or more records ('channels'), first specify the total number of records you want to add within the field labeled 'ADD QTY' before you push the button 'Add'. Be careful as to not exceed the maximum number of allowed records.

Delete channels

To manually delete one or more records ('Channels') from your current 'Contact list', first specify the total number of records you want to delete within the field labeled 'Delete QTY', then position the cursor at the line number you want to start the delete-process at, before you push the button 'Del'. Be careful as to not try deleting more records than actually do exist.

13.4 Z-1

The number within this column of the channel definition is just an internal number and designates the position of that channel within the selected zone. Currently it is not possible to alter a channels position, except if you use the 'Import' and 'Safe' functions and resort the channels within a CSV file. Whenever a channel is been deleted, all other channels following to the position that got deleted will be shifted upwards and such getting decreased 'Z-1' numbers.

13.5 CH mode

User could choose the current channel working mode from the following options.

Possible modes:	Analog	Channel will become an analogue channel
	Digital	Channel will become an analogue channel
	A&D,TX-A	Channel can receive both digital and analogue signal, but will transmit analogue
	A&D,TX-D	channel can receive both digital and analogue signal, but will transmit digital
Default:	***Analog***	

13.6 CH Name

The display will show channel the channel name. Users can create, edit, rename or delete the channel name. The maximum length for the channel name is 10 characters. Those can be numbers, symbols, letters, space or Chinese characters.

13.7 RX Freq

Users can set the channels receive frequency (in MHz). The possible frequency depends on the available frequency ranges of the Radioddity DB25-D, DB40-D or GD-88.

In 'Digital' mode, the Radioddity DB25-D, DB40-D and GD-88 do not support simplex DMR Tier 1 operation with different TX and RX frequency. Whenever the RX and TX frequencies are different, the channel will be defined as a repeater channel (using DMR Tier 2), using TimeSlots to communicate with the repeater.

13.8 TX Freq

Users can set the channels transmit frequency (in MHz). The possible frequency depends on the available frequency ranges of the Radioddity DB25-D, DB40-D or GD-88.

In 'Digital' mode, the Radioddity DB25-D, DB40-D and GD-88 do not support simplex DMR Tier 1 operation with different TX and RX frequency. Whenever the RX and TX frequencies are different, the channel will be defined as a repeater channel (using DMR Tier 2), using TimeSlots to communicate with the repeater.

13.9 Power

For each channel the transmit output power can be set independently. You can edit it through programmable buttons of short key or long key (H/L Power) or the menu for power function ('Menu' -> 'Parameters -> 'Power').

Options:	High	Use high output power whenever a stronger signal is required to enhance the transmit range.
	Low	Use the low option for short range communication
Default:	***High***	

13.10 RX Only

Each of the channels defined within a zone may be set for receive only.

Options:	On	Limit the channel to only receive
	Off	Transmitting and receiving is possible for that channel
Default:	***Off***	

13.11 Alarm

Users can decide to show a visual notification when they received an alarm call. If the function is disabled, the radio will not respond when it receives an alarm call. This option is based per channel.

Options:	Off	Disable decoding of alarm call
	On	Enable decoding of alarm call
Recommended:	***Off***	

13.12 Prompt

The radio will not respond when it receives an alarm call. The call prompt is requesting the receiver either to call back the transmitter when they can communicate. It is only available in the channel to receive the call tone. This option is based per channel.

Options: Off Disable alarm call prompt
On Enable alarm call prompt
Recommended: ***Off***

13.13 PCT (Private Call Type)

This function sets the Private Call Type of the current channel either to PATCS (Press And Talk Call Setup) or OACSU (Off Air Call Set Up).

Options: PATCS There is no need to give the radio a respond, they can send the voice to the radio directly.
OACSU It needs to give the radio a respond, then it will send the voice to the radio.
Default: ***PATCS***

Notes: *This parameter is only available in digital mode.*

13.14 RX TS

The Radioddity DB25-D, DB40-D and GD-88 are all based on TDMA technology and can divide a 12.5kHz channel into two alternate TimeSlots.

When operating a digital repeater or duplex-hotspot with the Radioddity DB25-D, DB40-D or GD-88, normally the digital repeater does have a TX-frequency different to its RX-frequency and uses DMR Tier 2 for transmission. DMR Tier 2 makes uses of the TimeSlot technique, allowing two separate information channels to be transmitted using the very same physical channel. Normally the TimeSlots (TS) for TX and RX must be set to the very same TimeSlot, either 1 or 2.

Whereas, when operating a simplex station (such as a simplex hotspot), normally, DMR Tier 1 is in place. DMR Tier 1 does not make use of those TimeSlots.

Whenever TX and TX-frequency are identical (which is the case in simplex mode), a third option 'On' (for direct simplex mode) becomes available for such channel.

Options: Slot 1 Use DMR Tier 2, TimeSlot 1 for RX
Slot 2 Use DMR Tier 2, TimeSlot 2 for RX
On Use DMR Tier 1 for RX without any TimeSlots
Default: ***On***

Notes: *This parameter is only available in digital mode.*

13.15 TX TS

The use of this parameter is identical to 'RX TS', except that it refers to the transmit mode of the DB25-D, DB40-D and GD-88.

Options: Slot 1 Use DMR Tier 2, TimeSlot 1 for TX
Slot 2 Use DMR Tier 2, TimeSlot 2 for TX
On Use DMR Tier 1 for TX without any TimeSlots

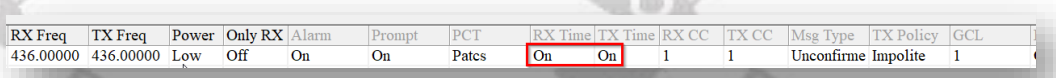
Default: ***On***

Notes: *This parameter is only available in digital mode.*

13.15.1 DMR use with a simplex hotspot

Most Ham operators nowadays do have their own personal hotspot. Some of those hotspots do support 'full duplex', others only support 'simplex' operation. In order to successfully use a simplex hotspot with your Radioddity DB25-D, DB40-D or Radioddity GD-88, the digital channel definition needs to be different than for duplex repeaters or duplex hotspots. Whilst duplex-systems use DMR Tier 2, simplex systems do use DMR Tier 1 or Tier 2 but requiring to use just one fixed TimeSlot (often TS 2).

In order to instruct the radio to use DMR Tier 1 (which is only possible when TX and RX frequency are both the same), select the option 'On' for 'RX TS' and 'TX TS' within the channel definition.



RX Freq	TX Freq	Power	Only RX	Alarm	Prompt	PCT	RX Time	TX Time	RX CC	TX CC	Msg Type	TX Policy	GCL
436.00000	436.00000	Low	Off	On	On	Patcs	On	On	1	1	Unconfirme	Impolite	1

All other required parameters are identical to those of a duplex channel.

Notes: *The option to set 'RX TS ' and 'TX TS' to 'On' is only available if RX and TX frequency are both the same and 'CH Mode' is set to 'Digital' (as typical for simplex hotspots).*

13.16 RX CC (Color Code)

Users can assign a color code for a RX channel. The channel Color Code can be same or different, but a repeater can have only one Color Code.

A single Color Code is used to identify a single system. Different Color Codes are used to identify multiple systems sharing the same frequency. This feature can be switched between channels using the same operating frequency but with different Color Codes. Normally the Color Code for RX and TX must be set to the very same value.

Option range: Maximum: 15
Minimum: 0
Increment: 1

Default: ***1***

13.17 TX CC (Color Code)

Users can assign a color code for a TX channel. The channel Color Code can be same or different, but a repeater can have only one Color Code.

A single Color Code is used to identify a single system. Different Color Codes are used to identify multiple systems sharing the same frequency. This feature can be switched between channels using the same operating frequency but with different Color Codes.

Normally the Color Code RX and TX must be set to the very same value.

Option range: Maximum: 15
Minimum: 0
Increment: 1

Default: ***1***

Notes:	*This parameter is only available in digital mode.*

13.18 Msg Type

This parameter allows user to decide which message type to be used when they send a message to another radio.

Options:	Unconfirmed data	When the radio received the message from the transmitter, it will not reply.
	Confirmed data	When the radio received the message from the transmitter, it will reply automatically.

Default: ***Unconfirmed data***

Notes:	*This parameter is only available in digital mode.*

13.19 TX Policy

The Transmit Limit is represented by the TX Policy. It feres to the behavior when pressing the [PTT]-key at the radio. The activity status of the current channel determines how the radio will react.

Options:	Impolite	Regardless of the current channel activity, pressing the [PTT]-Key immediately triggers a transmission.
	Polite to CC	Regardless of the channel being available, if the Color Code (CC) matches, pressing the [PTT]-Key will trigger a transmission.
	Polite to ALL	Only of the current channel is available, pressing the [PTT]-Key will trigger a transmission.

Default: ***Impolite***

13.20 RX Group

In order to be able to receive a group call within the channel, a 'RX Group' should be defined and assigned to the channel. Only those groups, that are listed with their Digital Contact (TalkGroup ID) within the assigned 'RX Group' may be heard when listening to the channel. If set to 'Off' you will not hear any group calls on this channel, unless the group ID is the same as the TX Contact ID (TalkGroup ID). This function is used to receive more than just the group selected by the specified entry of the 'Contact List' when listening to the channel.

Default: ***Off***

13.21 Encryption List

Users can use this feature to encrypt the selected digital channels. Encryption is a kind of software based scrambling solution and not very reliable, thus only to prevent eavesdropping. Part of the transmitted signal and user identification is not encrypted. The receiver must have the same encryption key and encryption type and level as the transmitter, in order to decrypt the encrypted voice calls and receive encrypted data. You can enable or disable the encryption of the channel by using a short press or by long press custom button ('Encryption On/Off'). The radio uses the encryption settings of the selected channel to transmit encrypted signals, but the receiver does not need to do so. The encrypted channel is still capable for receiving a clear transmit signal (After decryption).

Before using an 'Encryption List' please configure its key ID and digital encryption key initialization, otherwise it will use the default values.

Default: ***Off***

Notes:	**Using encryption is not allowed In Amateur radio networks.**

13.22 Scan List

A predefined 'Scan List' may be assigned to the channel. During the scan, all members on the specified list will be scanned for activity. If the parameter is set to 'Off', the scan function on this channel will be disabled, (Including auto scan).

Notes:	If set to 'Off', auto scan will be disabled.

13.23 Contact

Each digital channel may be assigned a specific Contact. Whenever the [PTT]-key is pressed, the radio will start to transmit a call on the selected channel and targeted to the specified contact our group. If a group call is initiated and another Contact ID (group ID) is already active within that channel, the call will be terminated to signal that a call may currently not be initiated.

If this parameter is set to 'Off', a call on the channel will not be possible, making it a RX-only channel. Only those Contacts, defined within the 'Contact list' may be selected.

Notes: This parameter is only available in digital mode.

13.24 EAS (Emergency Alarm System)

Connect all available digital emergency systems to this channel for emergency usage. To disable the use of the digital Alarm List, select 'Off'.

Before using the Emergency Alarm System, it needs to be defined within the 'Digital Alarm list'.

Notes: This parameter is only available in digital mode. Digital Alarm systems are not supported within Ham radio networks.

13.25 Relay Monitor

Users can set the radio to output the received signal to the speaker during the repeating operation. The option applies only for the specific channel.

Options:	On	Received signal will be heard if matching the specified settings for digital RX-Group
	Off	No voice will be heard
Default:	***Off***	

13.26 Relay mode

The user can set the working mode of the current channel when the channel is in relay mode.

Options:	Off	The channel may not be used for Relay operation.
	Only RX	Only receive is enabled when the channel is in relay mode.
	Only TX	Only transmitting is enabled when the channel is in relay mode.
	RX and TX	Receive and transmitting are enabled when the channel is in relay mode.
Default:	***Off***	

13.26.1 Crossband analog to analog

Input channel: Set one channel for Ch Mode 'A&D, TX-A' and set it for Relay mode 'Only RX' or 'Rx and TX'. The frequency specified for RX will be used for either cross repeating the analog signal received.

Output channel: Set another channel for Ch Mode 'Analog'

Operation: Select one of those two channels for VFO A and select the other channel as VFO B. The analog signal as received on the selected input channel will be repeated on the selected output channel. On the top line of the display, you will see either A ->B (if VFO A is the input channel and VFO B is the output channel) or B ->A (if VFO B is the input channel and VFO A is the output channel)

Sample settings (only relevant parts shown):

Z-3	CH mode	CH Name	RX Freq	TX Freq	Power	RX Only	TX Policy	RX Group	Relay Monitor	Relay mode
1	A&D,TX-A	1_X-A2A	144.10000	144.10000	High	Off	Impolite	Off	On	Only RX
2	Analog	3_X-A2A	433.10000	433.10000	High	Off	Impolite	Off	On	Only TX

The Radioddity DB40-D/GD-88 will receive on VFO-A (144.100 MHz) and transmit the received signal on VFO-B (433.100 MHz), acting as an analog crossband-repeater.

Notes: *If a channel is set for CH mode of 'Analog', Relay mode will not be available for that channel. That´s why it needs to be set to 'A&D, TX-A' for cross-band repeating to work.*
Do not forget to activate Repeater-Mode as described in chapter 10.6 Local Set - ABRepeat on page 93. The upper display line should state 'A->B'.

13.26.2 Crossband digital to analog

Input channel: Set one channel for Ch Mode 'Digital' and set it for Relay mode 'Only RX' or 'Rx and TX'. The frequency specified for RX will be used for analog cross repeating the digital signal received. Only those digital signals will be repeated that match the settings for RX TS and RX CC.

Output channel: Set another channel for Ch Mode 'Analog'

Operation: Select one of those two channels for VFO A and select the other channel as VFO B. The analog or digital signal as received on the selected input channel will be repeated on the selected output channel.

Sample settings (only relevant parts shown):

Z-4	CH mode	CH Name	RX Freq	TX Freq	Power	RX Only	PCT	RX TS	TX TS	RX CC	TX CC	Msg Type	TX Policy	RX Group	Contacts	Relay Monitor	Relay mode
1	Digital	1_X-D2A	144.10000	144.10000	High	Off	Patcs	Slot 1	Slot 1	1	1	Unconfirme	Impolite	Off	Off	On	Only RX
2	Analog	3_X-D2A	433.10000	433.10000	High	Off	Patcs	Slot 1	Slot 1	1	1	Unconfirme	Impolite	Off	Off	Off	Only TX

The Radioddity DB40-D/GD-88 will digitally receive on VFO-A (144.100 MHz), TS 1, CC1 and analog transmit the received signal on VFO-B (433.100 MHz), acting as a digital to analog crossband-repeater.

Notes: *If 'Relay Monitor' is turned on for the input channel, only those signals will be* monitored that do match the RX-group settings.
Do not forget to activate Repeater-Mode as described in chapter 10.6 Local Set - ABRepeat on page 93. The upper display line should state 'A->B'.

13.26.3 Crossband analog to digital

Input channel: Set one channel for Ch Mode 'A&D, TX-D' and set it for Relay mode 'Only RX' or 'Rx and TX'. The frequency specified for RX will be used for cross repeating the analog signal received.

Output channel: Set another channel for Ch Mode 'Digital' and for Relay mode 'Only TX' and its required settings for TX TS and TX CC and Contact.

Operation: Select one of those two channels for VFO A and select the other channel as VFO B. The analog or digital signal as received on the selected input channel will be repeated on the selected output channel

Sample settings (only relevant parts shown):

Z-5	CH mode	CH Name	RX Freq	TX Freq	Power	RX Only	PCT	TX TS	RX CC	TX CC	Msg Type	TX Policy	Contacts	Relay Monitor	Relay mode
1	A&D,TX-	1_X-A2D	144.10000	144.10000	High	Off	Patcs	Slot 1	1	1	Unconfirme	Impolite	Off	On	Only RX
2	Digital	3_X-A2D	433.10000	433.10000	High	Off	Patcs	Slot 1	1	1	Unconfirme	Impolite	Contact 1	On	Only TX

The Radioddity DB40-D/GD-88 will analog receive on VFO-A (144.100 MHz) and digitally transmit the received signal on VFO-B (433.100 MHz), TS 1, CC1 acting as an analog to digital crossband-repeater.

Notes: *If no contact has been selected for the digital output channel, repeating will fail and a message, stating 'No Contact' will be displayed on the radio screen.*

Do not forget to activate Repeater-Mode as described in chapter 10.6 Local Set - ABRepeat on page 93. The upper display line should state 'A->B'.

13.26.4 Crossband/Crossmode digital/analog to analog

Input channel: Set one channel for Ch Mode 'A&D, TX-A' and set it for Relay mode 'Only RX' or 'Rx and TX'. The frequency specified for RX will be used for either cross repeating a digital or an analog signal received. Only those digital signals will be repeated that match the settings for RX TS and RX CC.

Output channel: Set another channel for Ch Mode 'Analog'

Operation: Select one of those two channels for VFO A and select the other channel as VFO B. The analog or digital signal as received on the selected input channel will be repeated on the selected output channel.

Sample settings (only relevant parts shown):

Z-6	CH mode	CH Name	RX Freq	TX Freq	Power	RX Only	PCT	RX TS	TX TS	RX CC	TX CC	Msg Type	TX Policy	Relay Monitor	Relay mode
1	A&D,TX-	1_X-DA2A	144.10000	144.10000	High	Off	Patcs	Slot 1	Slot 1	1	1	Unconfirme	Impolite	On	Only TX
2	Analog	3_X-DA2A	433.10000	433.10000	High	Off	Patcs	Slot 1	Slot 1	1	1	Unconfirme	Impolite	Off	Off

The Radioddity DB40-D/GD-88 will receive analog/digital on VFO-A (144.100 MHz) and analog transmit the received signal on VFO-B (433.100 MHz) acting as an analog/digital to analog crossband-repeater.

Whenever an analog signal is been received, only the channel name will be shown on the left of the receiving VFO.

Whenever a digital signal is been received, the DMR ID of the received station will be shown on the left of the receiving VFO. Depending on the use of DMR ID Data and/or Talker Alias, additional details may be shown.

Notes: *If 'Relay Monitor' is turned on for the input channel, only those signals will be* monitored that do match the RX-group settings.
Do not forget to activate Repeater-Mode as described in chapter 10.6 Local Set - ABRepeat on page 93. The upper display line should state 'A->B'.

13.26.5 Crossband/Crossmode analog/digital to digital

Input channel: Set one channel for Ch Mode 'A&D, TX-D' and set it for Relay mode 'Only RX' or 'Rx and TX'. The frequency specified for RX will be used for either cross repeating a digital or an analog signal received. Only those digital signals will be repeated that match the settings for RX TS and RX CC.

Output channel: Set another channel for Ch Mode 'Digital' and the required settings for TX TS and TX CC.

Operation: Select one of those two channels for VFO A and select the other channel as VFO B. The analog or digital signal as received on the selected input channel will be repeated on the selected output channel.

Sample settings (only relevant parts shown):

Z-7	CH mode	CH Name	RX Freq	TX Freq	RX Only	RX TS	TX TS	RX CC	TX CC	Msg Type	TX Policy	RX Group	Contacts	Relay Monitor	Relay mode
1	A&D,TX-D	1_DA2D	144.10000	144.10000	Off	Slot 1	Slot 1	1	1	Unconfirme	Impolite	RX all	Off	On	Only RX
2	Digital	3_DA2D	433.10000	433.10000	Off	Slot 1	Slot 1	1	1	Unconfirme	Impolite	Off	Contact 1	On	Only TX

The Radioddity DB40-D/GD-88 will receive analog/digital on VFO-A (144.100 MHz), CC 1, TS 1 and digital transmit the received signal on VFO-B (433.100 MHz) with the CC, TS and Contact as specified acting as an analog/digital to digital crossband-repeater.

Whenever an analog signal is been received, only the channel name will be shown on the left of the receiving VFO	Whenever a digital signal is been received, the DMR ID of the received station will be shown on the left of the receiving VFO. Depending on the use of DMR ID Data and/or Talker Alias, additional details may be shown.
	

Notes: *If a channel is set for CH mode of 'Analog', Relay mode will not be available. That´s why it needs to be set to 'A&D, TX-D'.*
If no contact has been selected for the digital output channel, repeating will fail and a message, stating 'No Contact' will be displayed on the radio screen.
If 'Relay Monitor' is turned on for the input channel, only those signals will be monitored that do match the RX-group settings.
Do not forget to activate Repeater-Mode as described in chapter 10.6 Local Set - ABRepeat on page 93. The upper display line should state 'A->B'.

13.26.6 Crossband digital to digital

Input channel: Set one channel for Ch Mode 'A&D, TX-D' and set it for Relay mode 'Only RX' or 'Rx and TX'. The frequency specified for RX will be used for either cross repeating the digital signal received. Only those digital signals will be repeated that match the settings for RX TS and RX CC.

Output channel: Set another channel for Ch Mode 'Digital' and the required settings for TX TS and TX CC.

Operation: Select one of those two channels for VFO A and select the other channel as VFO B. The analog or digital signal as received on the selected input channel will be repeated on the selected output channel.

Sample settings (only relevant parts shown):

Z-8	CH mode	CH Name	RX Freq	TX Freq	Power	RX Only	PCT	RX TS	TX TS	RX CC	TX CC	Msg Type	TX Policy	RX Group	Contacts	Relay Monitor	Relay mode
1	Digital	1_X-D2D	144.10000	144.10000	High	Off	Patcs	Slot 1	Slot 1	1	1	Unconfirmed	Impolite	RX all	Off	On	Only RX
2	Digital	3_X-D2D	433.10000	433.10000	High	Off	Patcs	Slot 1	Slot 1	1	1	Unconfirmed	Impolite	Off	G12345	On	Only TX

The Radioddity DB40-D/GD-88 will receive digital on VFO-A (144.100 MHz), CC 1, TS 1 and digital transmit the received signal on VFO-B (433.100 MHz) with the CC, TS and Contact as specified acting as a digital to digital crossband-repeater.

The DMR ID of the received station will be shown on the left of the receiving VFO. Depending on the use of DMR ID Data and/or Talker Alias, additional details may be shown.

The transmitted DMR ID will be shown on the left of the transmitting VFO.

Notes: *If no contact has been selected for the digital output channel, repeating will fail and a message, stating 'No Contact' will be displayed on the radio screen.*
If no contact has been selected for the digital output channel, repeating will fail and a message, stating 'No Contact' will be displayed on the radio screen.
If 'Relay Monitor' is turned on for the input channel, only those signals will be monitored that do match the RX-group settings.
Do not forget to activate Repeater-Mode as described in chapter 10.6 Local Set - ABRepeat on page 93. The upper display line should state 'A->B'.

13.26.7 Same Frequency Repeater digital to digital

The Radioddity DB40-D/GD-88 comes with a special feature called 'Same Frequency Repeater', abbreviated as 'SFR'. This functionality allows a single Radioddity DB40-D/GD-88 to act as a DMR-repeater for a specific frequency and a specific TalkGroup. This function is ideal for flexible emergency networks as multiple Radioddity DB40-D/GD-88 allow to setup a kind of mesh-network. Whilst receiving on one TimeSlot, the radio transmits the very same signal on the very same frequency but on the other TimeSlot. So, RX TS1 → TX TS2 and RX TS2 → TX TS1. As the Radioddity DB40-D/GD-88 has two fully independent VFOs (A and B) it is required to setup two SFR-channels with one of them using TX TS1 and RX TS1 and the second one using TX TS2 and RX TS2 in order to allow SFR. Both VFOs do share the same frequencies for TX and RX, the same ColorCode for TX and RX, the same digital contact (of type Group Call) and the same RX-Group containing at least that digital contact.

Then assign VFO A the SFR-channel with TX TS1 and RX TS1 and VFO B the SFR-channel with TX TS2 and RX TS2.

If you have multiple Radioddity DB40-D and/or Radioddity GD-88, set all of them up the very same way. Normal, non-SFR-capable dual VFO DMR radios should also be setup the same.
Single-VFO radios such as the Radioddity GD-73 may of course only monitor one SFR-channel at a time. So, if there is already a QSO ongoing, that single VFO-radio may need to select the proper SFR-channel whenever only one of the two SFR-channels is within coverage. But if the radio is located in the middle of two DB40-D/GD-88 (thus hearing one Radioddity DB40-D/GD-88 TX on TS1 and hearing the other Radioddity DB40-D/GD-88 TX on TS2) it may select either SFR-channel.

Sample settings (only relevant parts shown):

Z-9	CH mode	CH Name	RX Freq	TX Freq	RX Only	PCT	RX TS	TX TS	RX CC	TX CC	Msg Type	TX Policy	RX Group	Contacts	Relay Monitor	Relay mode
1	Digital	SFR-TS1	144.10000	144.10000	Off	Patcs	Slot 1	Slot 1	1	1	Unconfirmed	Impolite	RX all	G12345	On	RX and TX
2	Digital	SFR-TS2	144.10000	144.10000	Off	Patcs	Slot 2	Slot 2	1	1	Unconfirmed	Impolite	RX all	G12345	On	RX and TX

The corresponding Radioddity DB25-D configuration for those two required SFR-channels would be as follows (only those parameters are shown that are of relevance). Keep in mind that the Radioddity DB25-D is not capable of acting as a repeater using SFR. But of course it can be a station within a Radioddity DB40-D/GD-88 based SFR mesh-network.

Z-1	CH mode	CH Name	RX Freq	TX Freq	Power	PCT	RX TS	TX TS	RX CC	TX CC	RX Group	Contacts	APRS
1	Digital	SFR_TS1	433.10000	433.10000	Low	Patcs	Slot 1	Slot 1	1	1	RX-SFRgrp	SFR-Group	Off
2	Digital	SFR_TS2	433.10000	433.10000	Low	Patcs	Slot 2	Slot 2	1	1	RX-SFRgrp	SFR-Group	Off

13.27 Bandwidth

For each channel it is possible to specify the working bandwidth for TX and RX frequency. Narrow band has a bandwidth of 12.5 kHz whereas Wide band has a bandwidth of 25 kHz. In digital mode, the channel bandwidth is set for 12.5 kHz regardless of what´s displayed and cannot be changed or adjusted.

13.28 CTCSS sub audio and DCS signaling

For analog channels the Radioddity DB25-D, DB40-D and GD-88 support a total of 51 CTCSS (Continuous Tone Coded Sub audio Squelch) frequencies and 103 normal DCS codes and additional 103 inverted DCS codes. CTCSS is often also called PL tone (PL® for Private Line, a trademark of Motorola) or just tone squelch.

A DCS (Digital-Coded Squelch) - often also called DPL (Digital Private Line) -code in fact is a 134.4 bps (sub-audible) bitstream of 12 data bits followed by 11 check bits. This allows to detect and correct up to 3 buggy bits. The last 3 data bits are a fixed '001', this leaves 9 code bits (512 possibilities). Those are represented as 3-digit octal numbers. The Telecommunications Industry Association (TIA) has standardized 83 DCS codes.

13.28.1 Supported CTCSS frequencies

62,5	67,0	69,3	71,9	74,4	77,0	79,7	82,5
85,4	88,5	91,5	94,8	97,4	100,0	103,5	107,2
110,9	114,8	118,8	123,0	127,3	131,8	136,5	141,3
146,2	151,4	156,7	159,8	162,2	165,5	167,9	171,3
173,8	177,3	179,9	183,5	186,2	189,9	192,8	196,6
199,5	203,5	206,5	210,7	218,1	225,7	229,1	233,6
241,8	250,3	254,1	*All figures in Hz*				

13.28.2 Supported DCS codes

0nn	1nn	2nn	3nn	4nn	5nn	6nn	7nn
D017N	D114N	D205N	D306N	D411N	D503N	D606N	D703N
D023N	D115N	D212N	D311N	D412N	D506N	D612N	D712N
D025N	D116N	D223N	D315N	D413N	D516N	D624N	D723N
D026N	D122N	D225N	D325N	D423N	D523N	D627N	D731N
D031N	D125N	D226N	D331N	D431N	D526N	D631N	D732N
D032N	D131N	D243N	D332N	D432N	D532N	D632N	D734N
D036N	D132N	D244N	D343N	D445N	D546N	D645N	D743N
D043N	D134N	D245N	D346N	D464N	D565N	D646N	D754N
D047N	D143N	D246N	D351N	D465N		D654N	
D050N	D145N	D251N	D356N	D466N		D662N	
D051N	D152N	D252N	D364N			D664N	
D053N	D155N	D255N	D365N				
D054N	D156N	D261N	D371N				
D065N	D162N	D263N					
D071N	D165N	D265N					
D072N	D172N	D266N					
D073N	D174N	D271N					
D074N		D274N					

13.28.3 Supported DCS-I values (reverse DCS)

0nn	1nn	2nn	3nn	4nn	5nn	6nn	7nn
D017I	D114I	D205I	D306I	D411I	D503I	D606I	D703I
D023I	D115I	D212I	D311I	D412I	D506I	D612I	D712I
D025I	D116I	D223I	D315I	D413I	D516I	D624I	D723I
D026I	D122I	D225I	D325I	D423I	D523I	D627I	D731I
D031I	D125I	D226I	D331I	D431I	D526I	D631I	D732I
D032I	D131I	D243I	D332I	D432I	D532I	D632I	D734I
D036I	D132I	D244I	D343I	D445I	D546I	D645I	D743I
D043I	D134I	D245I	D346I	D464I	D565I	D646I	D754I
D047I	D143I	D246I	D351I	D465I		D654I	
D050I	D145I	D251I	D356I	D466I		D662I	
D051I	D152I	D252I	D364I			D664I	
D053I	D155I	D255I	D365I				
D054I	D156I	D261I	D371I				
D065I	D162I	D263I					
D071I	D165I	D265I					
D072I	D172I	D266I					
D073I	D174I	D271I					
D074I		D274I					

13.29 RX SQ

The user can select decoder type or decoder value of CTCSS, DCS or DCS-I when the radio receives the effective carrier signal. The function can avoid the interference of the same frequency or independent carrier signal.

Options:

QT	Only if the CTCSS decoding frequency of the DB25-D, DB40-D or GD-88 is consistent with the CTCSS frequency of the transmitting radio, squelch will be opened.
DQT	Only if the DCS decoding value of the DB25-D, DB40-D or GD-88 is consistent with the DCS encoding of the transmitting radio, squelch will be opened on the DB25-D, DB40-D or GD-88.
Reverse DQT	Only if the DCS inverted decoding value of the DB25-D, DB40-D or GD-88 is consistent with the DCS inverted encoding of the transmitting radio, squelch will be opened on the DB25-D, DB40-D or GD-88.
Off	Squelch will be opened regardless of the CTCSS, DCS or DCS-I values received from the transmitting radio.

Default: ***Off***

13.30 RX QT/DQT (RX CTCSS/DCS)

Depending on the option selected as 'RX SQ', this is the place to specify the CTCSS frequency or DCS/DCS-I code.

Default: ***Off***

13.31 TX SQ

The user can select ^the encoder type or encoder value of CTCSS, DCS or DCS-I when the radio transmits the effective carrier signal. The function can avoid the interference of the same frequency or independent carrier signal.

Options:

QT	Only if the CTCSS encoding frequency of the DB25-D, DB40-D or GD-88 is consistent with the CTCSS frequency of the receiving radio, squelch on the receiving radio will be opened.
DQT	Only if the DCS encoding value of the DB25-D, DB40-D or GD-88 is consistent with the DCS encoding of the receiving radio, squelch on the receiving radio will be opened.
Reverse DQT	Only if the DCS inverted encoding value of the DB25-D, DB40-D or GD-88 is consistent with the DCS inverted decoding of the receiving radio, squelch on the receiving radio will be opened. DCS inverted values are displayed as 'DxxxI'.

Off	Squelch will be opened regardless of the CTCSS, DCS or DCS-I values received from the transmitting radio.

Default: ***Off***

13.32 TX QD/DQT (TX CTCSS/DCS)

Depending on the option selected as 'TX SQ', this is the place to specify the CTCSS frequency or DCS/DCS-I code.

Default: ***Off***

13.33 APRS

Specify the APRS channel to be used when transmitting the APRS beacon. Either one of the 8 digital APRS channels or the analog APRS definition may be assigned for APRS of this channel.

Options: maximum: 8
Minimum: 1
Increment: 1

APRS(A)	Transmit the APRS beacon using analog APRS
Off	Turn off APRS for this channel

Default: ***Off***

> ***Notes:*** *Analog APRS ('APRS(A)') is currently only possible if the channel is an analog channel as well (CH Mode set to 'analog').*

14 Firmware Update

14.1 Firmware update

In general, an update of the PC-software (CPS) or the radio-firmware should only be done if it is really required, following the golden rule

'**If it isn´t broken, don´t fix it!**'.

Notes: Prior to performing a firmware update, save the current codeplug to a file. After doing so, the firmware update may be applied. Finally, the previously saved codeplug should then again be written to the radio using the corresponding CPS.

All Firmware updates for the Radioddity DB25-D, DB40-D and GD-88 do come with official Radioddity 'Release Notes'. Please do not share any archives within social media groups. Never use any firmware or software that you have not downloaded from our official website www.radioddity.com .

Please carefully read our 'Release Notes',
then decide if the update is of added value for your personal needs
before starting to update your radio.

14.2 Install program for firmware update

To install the IAP-updater, just unzip the archive you downloaded from Radioddity support and double click on the file, named 'IAP(setup).exe'. This will install the firmware update program on your Windows machine and place a shortcut on your desktop.

Notes: *Only COM-port 1...8 are currently supported by the* Radioddity *IAP.*

14.3 Perform Firmware update

In order to perform a firmware update, the radio needs to be put into firmware upgrade mode first. To do so:

1. Make sure that your Radioddity DB25-D or Radioddity DB40-D is connected to a constant 12V power supply. If you are going to update a Radioddity GD-88, make sure that the battery of your Radioddity GD-88 is fully charged.
2. Turn off the radio
3. Close the CPS (in case it had been running) in order to make sure the virtual COM-port of your programming cable is not occupied.

4. Connect your Radioddity DB25-D, DB40-D or GD-88 via the supplied programming cable to your Windows PC

5. All radios do have a special mechanism to enter the so called 'IAP-mode'. In general, it does require to press a special key and keep it depressed.

Radio	key
Radioddity DB25-D	[P1]
Radioddity DB40-D	[⌒]
Radioddity GD-88	upper side key [P2]

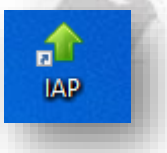
6. Additionally turn on the radio either by turning the volume key clockwise (Radioddity GD-88) or by pressing the [⏻]-key (Radioddity DB25-D / DB40-D).

7. The status-LED of your Radioddity DB25-D or Radioddity GD-88 will constantly light up red. The Radioddity DB40-D does not have such status-LED.

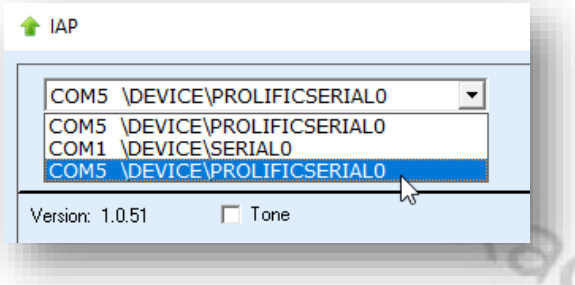
8. On the Radioddity DB25-D, the display will stay blank and backlight will be on, regardless of your normal settings. On the Radioddity GD-88/DB40-D a special screen will be displayed with either 'IAP_A' or 'IAP_B' shown in the top line. On the Radioddity DB40-D the backlight will be minimal whenever in IAP-mode.

9. Release the [P1]-key (Radioddity DB25-D), [⌒]-key (Radioddity DB40-D) or the upper side key [P2] (Radioddity GD-88).

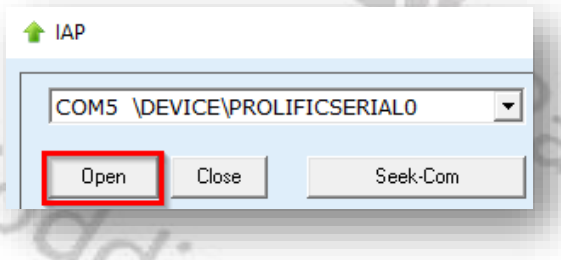
10. Now start the IAP-updater



11. Choose the virtual COM-port that does represent your programming cable

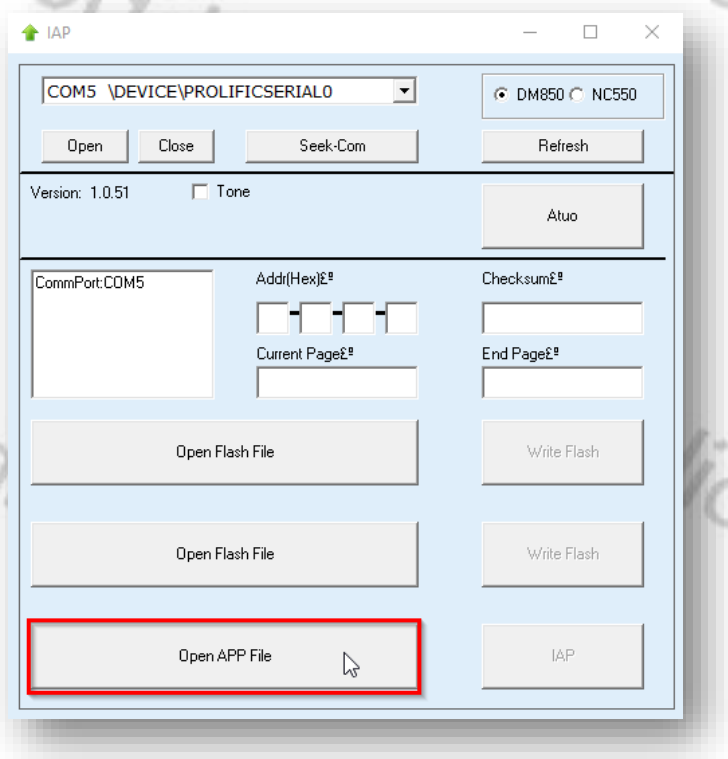


12. Click on 'Open'



13. If the IAP-updater can connect to your Radioddity DB25-D, DB40-D or GD-88, it will output 'IAP Successfully'. If it isn´t able to connect to the radio, it will stay on 'CommPort:COMx' (where 'x' represents the selected virtual COM-port number of your programming cable). If you forgot to shut down the CPS, you will get a 'The COMM port is occupied or doesn't exit!' error.

14. Next click on the button 'Open APP file'.



15. Now navigate to the path that does contain the update file that is intended to be transferred to the Radioddity DB25-D, DB40-D or GD-88, such as:

'959E.E66.EBPSAB.007 2023-12-01 01.12.34 (A).bin'.

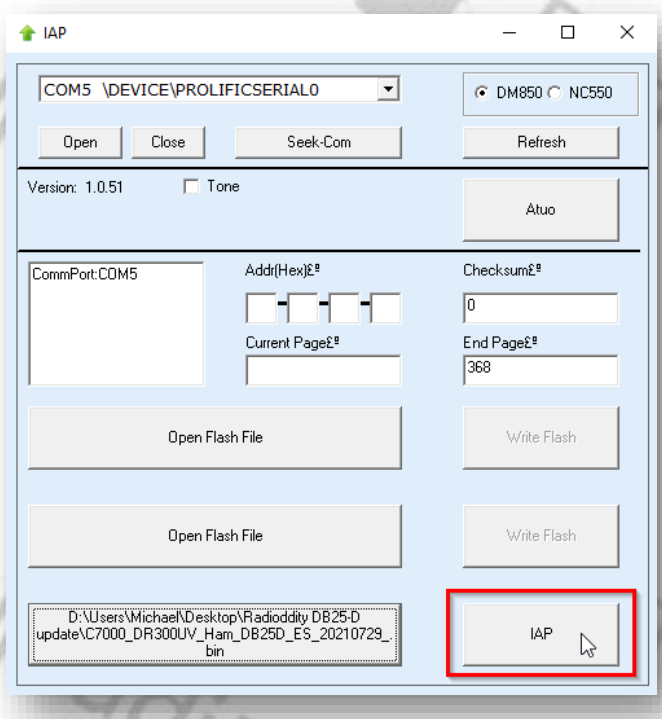
> ***Notes***: *Do not use update files intended for other radios, even if those radios may be looking like the* Radioddity *DB25-D, DB40-D or GD-88. Using files not intended to be used for a* Radioddity *DB25-D, DB40-D or GD-88 may result in a loss of any warranty.*

16. Whereas a firmware update for the Radioddity DB25-D consists of just one single file, the Radioddity DB40-D and Radioddity GD-88 both do require two separate files, one for each independent VFO (A and B). To select the target VFO (IAP) for the file, long press the very same key as used for entering the IAP-mode

Radio	key
Radioddity DB25-D	[P1]
Radioddity DB40-D	[⌒]
Radioddity GD-88	upper side key [P2]

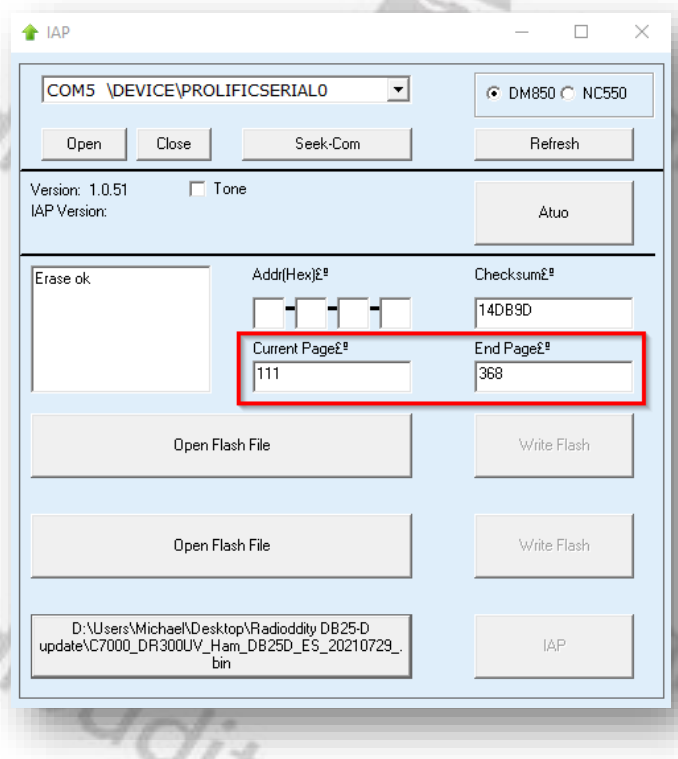
In order to switch between 'IAP_A' and 'IAP_B'. The firmware files normally end on '(A)' and '(B)'. Make sure that you always write the A-file to IAP-A and the B-file to IAP-B. During firmware update of the Radioddity GD-88 A-part, the status-LED will just constantly light red and the page-counter and the address-field on the radio display will be updated. During firmware update of the Radioddity GD-88 B-part, the status-LED will flash red/green but neither page-counter nor the Address-field of the radio display will be updated. During firmware update of the Radioddity DB40-D B-part, the page-counter nor the Address-field of the radio display will be updated.

17. To start the actual update process, click on the 'IAP' button.



Whilst updating the A-part on a Radioddity DB40-D or Radioddity GD-88 you will see an ascending counter on the radio. Whilst updating the B-part on a Radioddity DB40-D or Radioddity GD-88 there will not be such counter on the radio due to technical reasons. However, the IAP-program itself will report on the success of the B-update.

18. Do not press any key on the radio, do not remove power, just wait until the radio has finished the update process and turns off! During the update process, the status-LED will flash green and red and the application shows the progress by the increasing number of 'Current Page'. The progress is also indicated on the Radioddity GD-88 during update of 'IAP_A'. The progress will not be indicated on the Radioddity GD-88 during update of 'IAP_B' but only on the IAP update program.

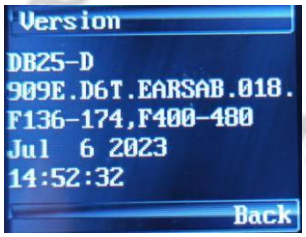
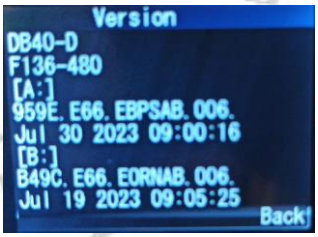


19. As soon as the update has finished on the Radioddity DB25-D or DB40-D, the radio will automatically shut down, whereas the Radioddity GD-88 will state the following on its screen 'Status: Rec Done!'. If you have just updated one of the two GD-88 VFOs it is now time to select the second VFO (long press of the upper side key) and update it with its corresponding firmware file as well. After you have updated both VFOs of the Radioddity GD-88 turn off the radio.

20. You may now normally power on the radio again.

21. To check which firmware version currently is installed, click: MENU → Device Info → Version

22. The output will look similar to:

DB25-D	DB40-D	GD-88
		

***Notes**: Depending on the* Radioddity *model and its production run, there may be slight differences in the display of the firmware version even if the very same firmware had been used. However, the stated date and time are unique to each file. Never mix files that are not intended for your radio. As for the* Radioddity *GD-88 and* Radioddity *DB40-D only use file-pairs that have been distributed by* Radioddity *within the very same archive.*

14.4 Black, white or scrambled screen after firmware update

It might happen, that your radio - after applying the firmware update - does show a black, white or even scrambled screen when turned on instead of the normal startup logo. Don´t worry, this is due to the fact that we do have slightly different hardware revisions out in the field that are covered by the very same firmware. In order to get rid of the black, white or scrambled screen after updating, please proceed as follows:

1. turn off the radio
2. press the green button and keep it depressed
3. turn on the radio and wait about 2 seconds for the startup logo to be displayed
4. If the startup logo is not displayed properly on the complete screen, please start over again. Depending on the production batch, you may need to go through steps 2...4 up to 5 times.

This is a one-time procedure. As soon as the startup logo is displayed as expected, you are done and it will not be required when again turning on the radio.

***Notes**: This procedure is only required for* Radioddity *GD-88 showing a white, black or scrambled screen after the firmware update.*
Do not try out the procedure if your radio is not affected.

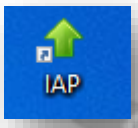
14.5 Update failed

In case the update failed due to a bad programming cable or an empty battery, don´t worry, but just power cycle the radio and restart the update process.

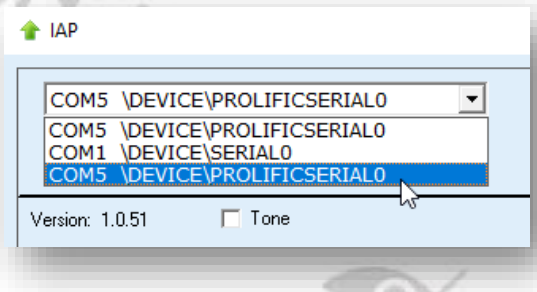
14.6 Perform Flash update

Normally BIN-files are used to update the radio with the radio being in IAP-mode. Sometimes we also do provide FLASH-files for updating parts of the radio that are not accessible using the normal IAP-mode. In order to update the radio with a FLASH-file, the radio needs to be in normal operating mode.

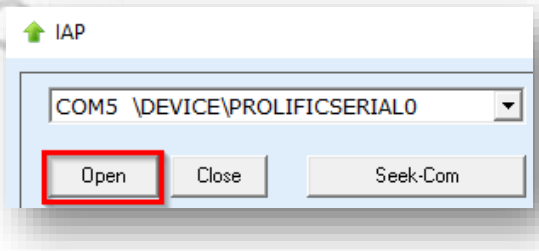
1. Start the IAP-updater



2. Choose the virtual COM-port that does represent your programming cable

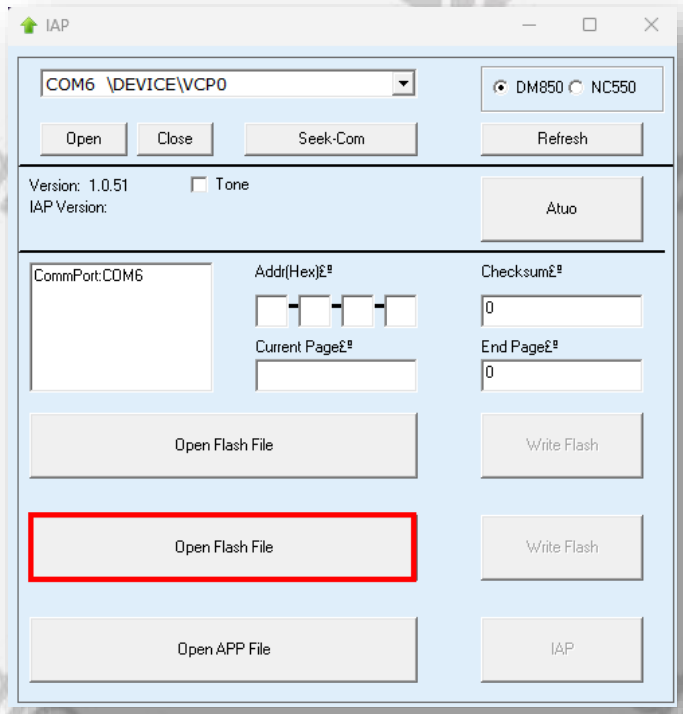


3. Click on 'Open'



4. If the IAP-updater can connect to your Radioddity DB25-D, DB40-D or GD-88, it will output 'IAP Successfully'. If it isn´t able to connect to the radio, it will stay on 'CommPort:COMx' (where 'x' represents the selected virtual COM-port number of your programming cable). If you forgot to shut down the CPS, you will get a 'The COMM port is occupied or doesn't exit!' error.

5. Next click on the button 'Open Flash File'.

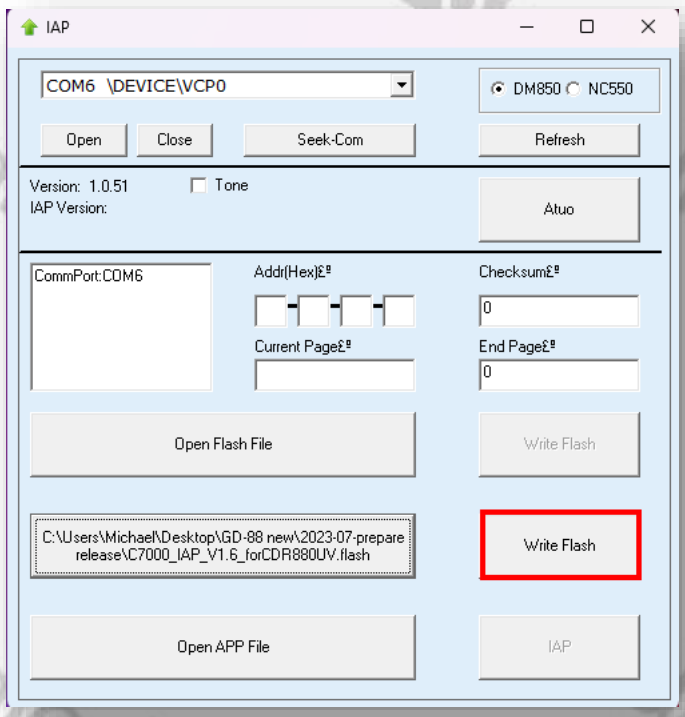


6. Now navigate to the path that does contain the flash file that is intended to be transferred to the Radioddity DB25-D, DB40-D or GD-88, such as:

   'C7000_IAP_V1.6_for_GD-88.flash'.

Notes:	*Do not use flash files intended for other radios, even if those radios may be looking like the* Radioddity *DB25-D, DB40-D or GD-88. Using files not intended to be put on a* Radioddity *DB25-D, DB40-D or GD-88 may result in a loss of any warranty.*

7. Make sure that the radio is in normal operating mode and not in IAP-mode. Then start the actual update process, click on the 'Write Flash' button.



Whilst updating the radio you see an ascending counter on the radio.

8. Do not press any key on the radio, do not remove power, just wait until the radio has finished the update process and returns back to normal idle state of the display.

9. Now power cycle the radio once in order for the update to become effective.

15 Release notes

The following tables list the details that had been changed with new versions of the firmware. In general, previous updates are included in the latest one.

> ***Attention:*** *Never update your radio unless it is really required or with other words '**Don´t fix it, if it isn´t broken**'! This cannot be stressed often enough. Only take those firmware as found on our support pages. Before performing an update, double check that the firmware on our support page has not been withdrawn. All Firmware updates for the Radioddity DB25-D, DB40-D and GD-88 do come with 'Release Notes'.*
>
> **Please carefully read the 'Release Notes'**

15.1 Firmware Release notes for DB25-D

15.1.1 DB25-D firmware as of June 20th, 2024

revision	Changes	released
909E.D6*.EARSAB.018 MAY 9 2024 11:00:01 *) '4' , '6' or 'T' depending on the production batch	• Fixed 'white screen' issue caused on some radios when updating with the firmware as of July 6th 2023 • Decreased the number of predefined QuickMsgs to 16 • Added additional encryption options, including AES256* • *At least DRS CPS_V3.3 CPS 9.2.28 is required to edit the codeplug*	2024-06-20

*) **Using encryption is not allowed In Amateur radio networks.**

15.1.2 DB25-D firmware as of July 6th, 2023

revision	Changes	released
909E.D*.EARSAB.018 Jul 6 2023 14:52:32 *) '4' , '6' or 'T' depending on the production batch	• DMR ID data now properly displayed • TalkerAlias-data now displayed correctly • TX of Analog DTMF now fully supported • Radio menu may be operated even during an active QSO • Improved reaction timing when changing the volume • DMR-audio level aligned to analog-audio level • Lowest audio volume level decreased • If no RX-Group is assigned to a channel ('RX group' set to 'OFF'), traffic for the talkgroup assigned to the channel will now still be received • 'RXGroupList' menu within 'Device Info' now displayed correctly • No powercycle required after writing the codeplug to the radio in order to make the GPS menu available again • Values within 'Channel Edit' are now displayed correctly • Option naming within Talker Alias RX Setting streamlined	2023-07-06

15.1.3 DB25-D firmware as of November 23rd, 2022

revision	Changes	released
909E.D4.EARSAB.018	• DMR ID data now properly displayed (no more display of wrong DMR database data) • Assignment of 1450 Hz Pilot tone now fixed (also requires at least CPS 3.3 DMR CPS_DRS [9.2.16]) • minor fixes within the Talker Alias display • 'Dual Watch' added as option to be assigned for a programmable function key. This results to the very same functionality as the switch for Single or Dual VFO display mode found within the radio menu at 'Local Set → DisplayMode → S/D mode' • support for programming cable based on FTDI-chip	2022-11-23

15.1.4 DB25-D firmware as of October 25th, 2022

revision	Changes	released
909E.D4.EARSAB.017	• Talker Alias (TA) now supported. • Besides 1750 Hz, the radio now also supports pilot tones / burst tones of 700 Hz, 1000 Hz, 1400 Hz, 1450 Hz and 2100 Hz (requires newest CPS release for support of those) • 'TimeOfCall' label now displayed in English instead of Chinese • After changing a contact of call type 'Private Call' to 'Group Call', it is now possible again to change it back to 'Private Call • 'If a menu had been selected and a call comes in, the menu remains selected and navigation within the menu is still possible	2022-10-25

15.1.5 DB25-D firmware as of December 11th, 2021

revision	Changes	released
909E.D4.EARSAB.014	• Additional icon whenever promiscuous mode is active • Memory assignment for channels and zones now handled dynamically • APRS now also transmits whenever under simulation. • Added a volume control method: ➢ Do not push down the knob, turn the knob to change the channel ➢ Push down the knob, turn the knob to change the volume	2021-12-11

15.1.6 DB25-D firmware as of September 2nd, 2021

revision	Changes	released
909E.D4.EARSAB.008	• Improved single VFO display (full screen now utilized) • Factory reset reverts to the factory settings saved from the CPS • Record number / max record number no longer displayed during transfers	2021-09-02

15.1.7 Initial DB25-D firmware as of May 12th, 2021

revision	Changes	released
909E.D4.EARSAB.007	• This has been the initial release	2021-05-12

15.2 Firmware Release notes for DB40-D

15.2.1 DB40-D firmware as of June 20th, 2024

revision	Changes	released
959E.E6T.EBPSAB.007 Jun 7 2024 10.18.37 (A) B49C.E6T.EORNAB.006 Jun 7 2024 11.06.56 (B)	• Decreased the number of predefined QuickMsgs to 16 • Added additional encryption options, including AES256* • *At least DRS CPS_V3.3 CPS 9.2.28 is required to edit the codeplug*	2024-06-20

*) **Using encryption is not allowed In Amateur radio networks.**

15.2.2 Initial DB40-D firmware as of August 5th, 2023

revision	Changes	released
959E.E6T.EBPSAB.007 Aug 26 2023 14.42.52 (A) B49C.E6T.EORNAB.006 Aug 26 2023 14.35.04 (B)	This has been the initial release	2023-08-26

15.3 Firmware Release notes for GD-88

15.3.1 GD-88 firmware as of June 20th, 2024

revision	Changes	released
B49E.D6x.EOPSAB.018 2024-06-07 11.51.27 (A) B49C.D6x.EHRNAB.010 2024-01-15 17.03.01 (B)	• Decreased the number of predefined QuickMsgs to 16 • Added additional encryption options, including AES256* • *At least DRS CPS_V3.3 CPS 9.2.28 is required to edit the codeplug*	2024-06-20

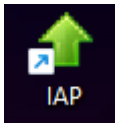
*) **Using encryption is not allowed In Amateur radio networks.**

15.3.2 GD-88 firmware as of May 23rd, 2024

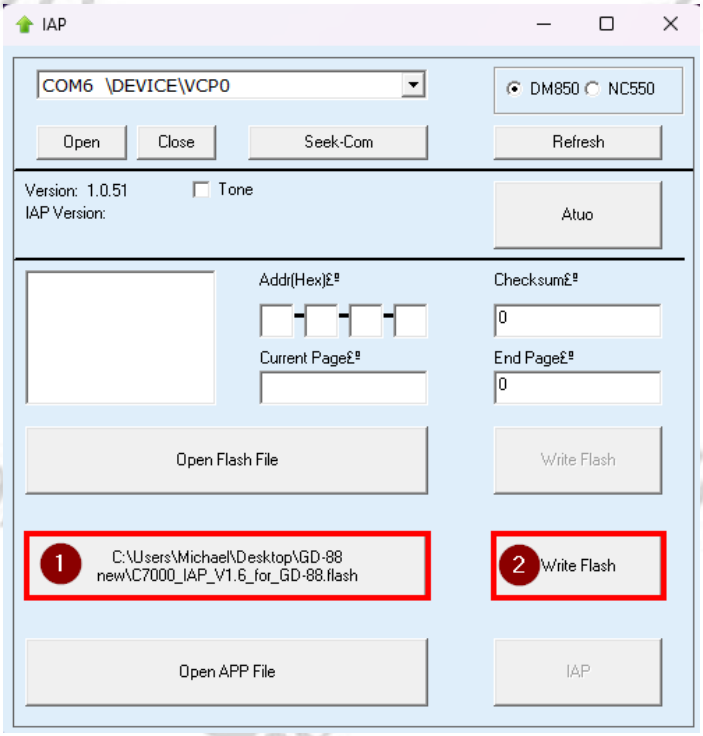
revision	Changes	released
B49E.D6x.EOPSAB.017 2024-05-10 09.28.23 (A) B49C.D6x.EHRNAB.010 2024-01-15 17.03.01 (B)	• Lowest audio volume on analog FM RX significantly decreased • active ROAMing no longer freezes the radio • If no RX-Group is assigned to a channel, only traffic for the assigned TalkGroup will now still be heard • Promiscuous-Icon again displayed on active promiscuous-mode • No time lag when scan-mode is active • It is now possible to set a channel for 'RX Only=ON' • For Simplex DMR operation using DualChannelDirectMode, DCDM may now be selected on the radio as well as within the CPS (CPS: TX TS and RX TS set to 'ON') • Improved timing for volume control and radio menu • Values within 'Channel Edit' are now displayed correctly • DMR reporting channel now also available within Channel Edit menu • Setting of 'RX Only' now also available within Channel Edit menu • Option naming within Talker Alias RX Setting streamlined	2024-05-23

15.3.3 GD-88 firmware as of September 12th, 2023 (withdrawn)

revision	Changes	released
B49E.D6*.EOPSAB.017 2023-06-27 11.41.51 (A) B49C.D6*.EHRNAB.010 2023-6-27 11.47.32 (B) *) '6' or 'T' depending on the production batch	**Remark**: The FLASH-file is written to the radio using IAP with the radio in normal operation-mode. • 'RX Only' now working as expected • Improved Roaming functionality • Option naming within Talker Alias RX Setting streamlined • Fix the bug of no receiving group • Active promiscuous mode again indicated by the icon • No freeze or stuck in scanning mode • Fix the issue that the volume was too low or too high	2023-09-12



Before updating IAP_A and IAP_B, please write the included FLASH-file to the radio using the IAP-application but with the radio in normal operation-mode (NOT IAP-Mode!).



15.3.4 GD-88 firmware as of March 30th, 2023

revision	Changes	released
B49E.D6*.EOPSAB.013 2023-03-27 14.46.07 (A) B49C.D6*.EHRNAB.008 2023-03-22 10.18.56 (B) *) '6' or 'T' depending on the production batch In case you get a white screen after updating your GD-88 with this firmware, please: 1. turn off the radio 2. press the green button and keep it depressed 3. turn on the radio and wait about 2 seconds for the startup logo to be displayed If this fails, just repeat the 3 steps. This is a one-time procedure. As soon as the startup logo is displayed as expected, you are done and it will not be required when again turning on the radio. **Do not downgrade radios to a firmware prior to the one as of March 30th, 2023 as that might brick your radio.**	• 'VFO-B Unprogrammed'-bug fixed • TX of Analog DTMF now fully supported • TalkerAlias-data now displayed correctly • Radio menu may be operated even during an active QSO • Improved reaction timing when changing the volume • Single VFO-mode is now possible and utilizes the complete screen (to turn it on/off: MENU → Local Set → DisplayMode → Single Mode). Active Single Mode will disable switching between VFO-A and VFO-B. • DMR-audio level aligned to analog-audio level • If no RX-Group is assigned to a channel, traffic for the assigned talkgroup will now still be received • 'RXGroupList' menu within 'Device Info' now displayed correctly • No power cycle required after writing the codeplug to the radio in order to make the GPS menu available again • Current entry of menu or submenu and the total number of entries are displayed in the upper right corner above each other • Icons updated • Current RX group and Zone displayed during RX as long as DMR ID database has not been uploaded to the radio or active station is not listed within the uploaded DMR ID database	2023-03-30

15.3.5 GD-88 firmware as of November 21st, 2022

revision	Changes	released
B49E.D66.EHPSAB.010 2022-11-19 (A) B49C.D66.EHRNAB.005 2022-11-11 (B) ***This firmware has been withdrawn due to incompatibility with newer production batches***	• DMR ID data now properly displayed (no more display of wrong DMR database data) • Assignment of 1450 Hz Pilot tone fixed (does require at least CPS 3.3 DMR CPS_DRS [9.2.16]) • minor fixes within the Talker Alias display • support for programming cable based on FTDI-chip	2022-11-21

15.3.6 GD-88 firmware as of October 28th, 2022

revision	Changes	released
B49E.D64.EHRSAB.007 2022-10-27 (A) B49C.D64.EHRNAB.005 2022-10-28 (B)	• Talker Alias (TA) now supported • Besides 1750 Hz, the radio now also supports pilot tones / burst tones of 700 Hz, 1000 Hz, 1400 Hz, 1450 Hz and 2100 Hz (requires newest CPS release for support of those) • Improved behavior of 'Zone Switch' P-key	2022-10-28

15.3.7 Initial GD-88 firmware as of June 6th, 2022

revision	Changes	released
B49E.D64.EHRSAB.005.	This has been the initial release	2022-06-30

15.4 CPS Release notes

The following table lists the details that had been changed with new versions of the CPS.

15.4.1 CPS software [9.2.31] as of July 12th, 2024

revision	Changes	released
CPS 3.3 DMR CPS_DRS [9.2.31]	• Screen Resolutions higher than 1920x1080 are now finally supported.	2024-07-12

15.4.2 CPS software [9.2.30] as of June 20th, 2024

revision	Changes	released
CPS 3.3 DMR CPS_DRS [9.2.30]	• Decreased the number of QuickMsgs to 16 • Added additional encryption options * • Added required input fields for those radios supporting AES256 * **This CPS version is mandatory for those Radioddity DB25-D, DB40-D and GD-88 radios that do support AES256**	2024-06-20

*) **Using encryption is not allowed In Amateur radio networks.**

15.4.3 CPS software as of August 1st, 2023

revision	Changes	released
CPS 3.3 DMR CPS_DRS [9.2.24]	• Added required functionality to support Radioddity DB40-D	2023-08-01

15.4.4 CPS software as of November 11th, 2022

revision	Changes	released
CPS 3.3 DMR CPS_DRS [9.2.16]	• 1450 Hz Pilot tone P-key assignment fixed • 'Dual Watch' added as option for P-key assignments. This corresponds to the very same functionality as the switch for Dual/Single VFO display mode as found under 'Local Set → DisplayMode → S/D mode' within the Radioddity DB25-D radio menu • support for programming cable based on FTDI-chip	2022-11-04

15.4.5 CPS software as of October 20th, 2022

revision	Changes	released
CPS 3.3 DMR CPS_DRS [9.2.15]	• Besides 1750 Hz, the CPS now also supports pilot tones / burst tones of 700 Hz, 1000 Hz, 1400 Hz, 1450 Hz and 2100 Hz • No more crash (‘Error 6’) if screen resolution exceeds 1080x1920	2022-10-20

15.4.6 CPS software as of July 1st, 2022

revision	Changes	released
CPS 3.3 DMR CPS_DRS [9.2.11]	• Functionality for full support of Radioddity GD-88 added • If radio APRS beacon is set for ‘Fixed Location’, specified latitude and longitude values are now transmitted correctly via APRS • No more ‘Run time error 6 ‘ • CPS no longer crashes if closed via click on the 'X' in the upper right corner of the application	2022-07-01

15.4.7 CPS software as of September 6th, 2021

revision	Changes	released
CPS 3.3 DMR CPS_DRS [9.2.9]	• New function 'FactoryReset' for saving personal factory defaults to the radio • Additional 'Group call hang time' of 30s and 60s • Startup logo exchanged	2021-09-06

15.4.8 CPS software as of August 17th, 2021

revision	Changes	released
CPS 3.2 DMR CPS_DRS [9.2.1]	• No more unwanted changes of parameters • Additional shortcut 'Ctrl+S' for saving the codeplug to the PC • Display of readable text instead of codeplug block numbers within the communications window • Update of built-in help texts • Headlines in channel definitions shortened and no longer truncated • Renaming of 'GCL' to 'RX Group' within channel settings • Correction of popups • Proper display of APRS(A) within channel settings • Using 'Del' within the 'Contact list' now deletes, starting at the current cursor position	2021-08-17

15.4.9 Initial CPS software as of June 1st, 2021

revision	Changes	released
CPS 3.1 DMR CPS_DRS [9.1.178]	This has been the initial release	2021-06-01

16 Quickstart for common use cases

This chapter is rather intended for those users, new to HAM-radio. If you are familiar with analog ham-radio but new to DMR, we suggest to take a closer look at the document we did prepare some time ago (not specific for the DB25-D, DB40-D or GD-88 but most topics are applicable for the Radioddity DB25-D, DB40-D and GD-88 as well. You find the document via our Blog entry at:

https://www.radioddity.com/blogs/all/radioddity-getting-on-air-with-your-dmr-radio

The next subchapters describe the most common use cases for the Radioddity DB25-D, DB40-D and GD-88. Only those CPS menus that are mandatory for the specific operation mode will be covered in the explanations.

If you do not understand all specified parameters that are mandatory for a certain use case, we advise you to read the corresponding paragraphs of this manual. Yes, this extended manual is quite comprehensive, but it is intended to make it easier for you to get the best results out of your Radioddity DB25-D, DB40-D, and GD-88.

16.1 Simplex analog FM operation with other station

In order to setup the radio for simplex analog FM operation, follow these steps:

1. Add a new zone via 'Zone[Channel]' → '+Add' and give it a 'Zone Name' of 'simplex FM'. The new zone will be created and will already contain a channel of either 'CH mode' being 'analog' or 'digital'.

2. Setup the channel for 'CH mode' being 'Analog'.

3. Give the channel a 'CH Name' of some name, e.g., 'FM simplex'.

4. Set both frequencies 'RX Freq' and 'TX Freq' to the very same value (e.g., 145.500 MHz or 432.100 MHz). You may choose any frequency that is allowed for your type of ham radio license, for analog FM operation and not occupied by some other station. Make sure the other station you want to call is setup for the very same simplex frequency.

> ***Notes:*** *Do not use GMRS-frequencies or other frequencies that are not allowed to be used for analog FM with an output power higher than allowed for the specific frequency band.*

5. Set the output 'Power' to 'Low' if the other station is close to yours. If the other station is some miles away, you may need to set it to 'High'.

6. Set 'Scan List' to 'off' in order to avoid unexpected behavior.

7. Set Bandwidth to either '12.5' or '25' (kHz), depending on your personal requirements. If unsure on that one, set it for '12.5' (kHz).

8. Optional, set 'RX QT/DQT' and 'TX QT/DQT' for any CTCSS or DCS encoding that might be required for connection to the other station. If unsure, set both parameters to 'Off' for not using any CTCSS/DCS decoding and encoding. That will at least allow you to hear the other station, regardless of its CTCSS/DCS settings.

> ***Notes:*** *Within a future version of the CPS the names of those two parameters will be changed to 'RX CTCSS/DCS' and 'TX CTCSS/DCS'.*

9. Set APRS to 'Off' for now

Write your settings to the radio. Do not forget to switch to Zone 'simplex FM' and select Channel 'FM simplex' at your Radioddity DB25-D, DB40-D or GD-88. Now you are ready for your very first simplex analog FM QSO.

16.2 Duplex analog FM operation with a local analog FM-repeater

First, collect all information that is available for your local FM repeater that you want to connect to. Best source for such is to check with your local HAM radio club or some other local ham operator.

You will need the following details:

- TX frequency of repeater (becomes your RX frequency of your radio)
- RX frequency of repeater (becomes your TX frequency of your radio)
- Any CTCSS or DCS encoding or decoding required?
- Pilot tone required? Which frequency (e.g., 1750 Hz)?

In order to setup the radio for operating your local FM repeater, follow these steps:

1. Add a new zone via 'Zone[Channel]' → '+Add' and give it a 'Zone Name' of 'duplex FM'. The new zone will be created and will already contain a channel of either 'CH mode' being 'analog' or 'digital'.
2. Setup the channel for 'CH mode' being 'Analog'.
3. Give the channel a 'CH Name' of some name, e.g., 'DB0OHL rpt' (with DB0OHL being the call sign of your local repeater).
4. Set the 'RX Freq' equal to the TX-frequency of your local repeater.
5. Set the 'TX Freq' equal to the RX-frequency of your coal repeater.
6. Set the output 'Power' to 'Low' if the local repeater is close to your location. If the local repeater is some miles away, set it to 'High'.
7. Set 'Scan List' to 'off' in order to avoid unexpected behavior.

8. Set Bandwidth to '12.5' (kHz).

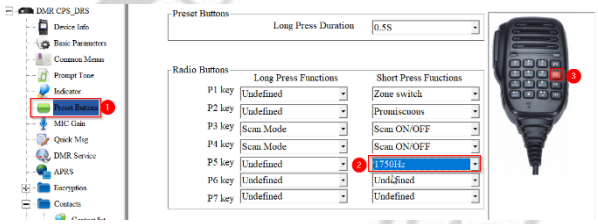
9. Optional, set 'RX QT/DQT' and 'TX QT/DQT' for any CTCSS or DCS encoding that might be required for connection to the local repeater. If unsure, set both parameters initially for 'Off' for not using any CTCSS/DCS decoding and encoding. That will at least allow you to hear the local repeater.

> ***Notes:*** *Within a future version of the CPS the names of those two parameters will be changed to 'RX CTCSS/DCS' and 'TX CTCSS/DCS'.*

10. Set Encryption to 'Off'

11. Set APRS to 'Off' for now

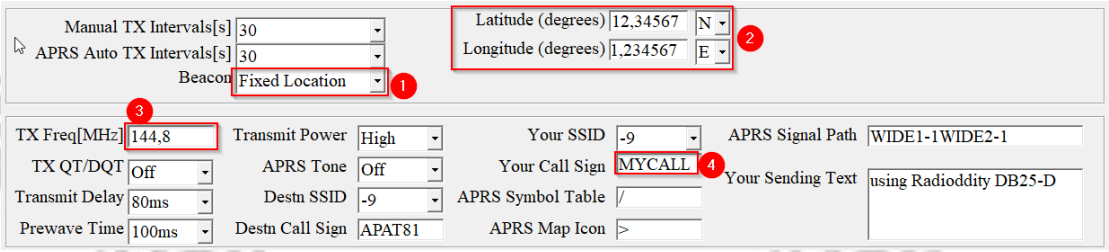
12. If a pilot tone is required to activate the repeater, assign the Pilot tone function [1750Hz] to one of the programmable [P]-keys.



13. Write your settings to the radio. Do not forget to switch to Zone 'duplex FM' and select channel 'DB0OHL rpt' (or equivalent) at your Radioddity DB25-D, DB40-D or GD-88. Now you are ready for your very first QSO routed via your local repeater.

16.3 Analog FM operation including analog APRS

Using analog APRS does require a bunch of settings to be made within the APRS menu of the Radioddity CPS. For initial testing, we advise to use a beacon with a fixed location (1) representing the latitude and longitude (2) of your current QTH. This will make the APRS system available immediately after power up. If you set the beacon for 'GPS Location' (1) you need to wait until the GPS receiver of your Radioddity DB25-D, DB40-D or GD-88 has successfully established a connection to at least 3 satellites. This will be indicated by a green sign / in the middle of the topmost line of the radios display.

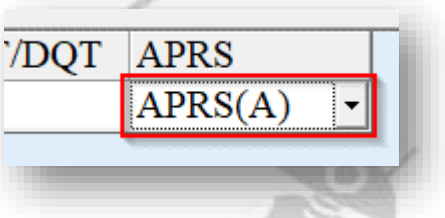


Furthermore, set the analog APRS reporting frequency (3) according to your local requirements. For the US that frequency is 144.3900 MHz, for Europe it is 144.8000 MHz. For all other countries see the details on 'TX Freq [MHz]' regarding that parameter.

Of course, also define your call sign (4) to be used for APRS-reporting. The defined SSID will automatically be added to your call sign. For details on the other parameters, please refer to the chapter on APRS within this addendum.

For analog APRS to work, an analog channel needs to be selected and 'APRS (A)' needs to be assigned as 'APRS' reporting channel for that analog channel.

Z-4	CH mode	CH Name	RX Freq	TX Freq	Power	RX Only	Alarm ACK	Prompt	PCT	RX TS	TX TS	RX CC	TX CC	Msg Type	TX Policy	RX Group	Encryption List	Scan List	Contacts	EAS	Bandwidth	RX QT/DQT	TX QT/DQT	APRS
1	Analog	FM simplex	144.50000	144.50000	High	Off	On	On	Patcs	On	On	1	1	Unconfirmed Data	Impolite	Off	Off	Off	local	Off	25	Off	Off	APRS(A)



Notes:	*Only analog channels are supported by analog APRS.* *Only digital channels are supported by digital APRS.*

16.4 Simplex digital DMR operation with other station

In order to setup the radio for simplex digital DMR operation, follow these steps:

1. Within the 'Contacts' menu define a 'Contact Name' with the corresponding 'Contact ID' (DMR ID) of the other station you plan to call. Set the 'Call Type' to 'Private Call'.

Serial No	Contact name	Contact ID	Call Type
1	John Doe	1234567	Private call

2. Add a new zone via 'Zone[Channel]' → '+Add' and give it a 'Zone Name' of 'simplexDMR'. The new zone will be created and will already contain a channel of either 'CH mode' being 'analog' or 'digital'.

3. Setup the channel for 'CH mode' being 'Digital'.

4. Give the channel a 'CH Name' of some name, e.g., 'DMRsimplex'.

5. Set both frequencies 'RX Freq' and 'TX Freq' to the very same value (e.g., 433.45000 MHz). You may choose any frequency that is allowed for your type of ham radio license, for digital DMR operation and which is not occupied by some other station. Make sure the other station you want to call is setup for the very same simplex frequency.

6. Set the output 'Power' to 'Low' if the other station is close to yours. If the other station is some miles away, set it to 'High'.

7. Set 'PCT' to 'Patcs'

8. Set ‘RX TS’ and ‘TX TS’ both to ‘On’ in order to not use TDMA for dividing the channel into 2 slots

9. Set ‘RX CC’ and ‘TX CC’ both to the very same value as the other station

10. Set ‘TX Policy’ to ‘Impolite’

11. Within the field ‘Contacts’ of the channel definition select the private contact as defined.

12. Set Encryption to ‘Off’

13. Set APRS to ‘Off’ for now

Write your settings to the radio. Do not forget to switch to Zone ‘simplexDMR’ and select channel ‘DMRsimplex’ at your Radioddity DB25-D, DB40-D or GD-88. Now you are ready for your very first simplex digital DMR QSO with the selected station.

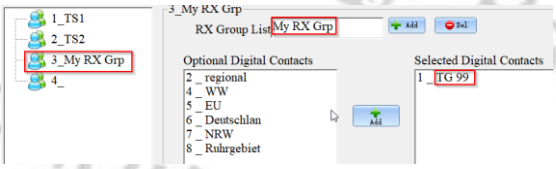
16.5 Simplex digital DMR operation with a Single-HAT hotspot

In order to setup the radio for simplex digital DMR operation, follow these steps:

1. Within the ‘Contacts’ menu define a TalkGroup (‘Contact Name’) with the corresponding ‘Contact ID’ (DMR ID) you plan to use. Set the ‘Call Type’ to ‘Group Call’. e.g.

Serial No	Contact name	Contact ID	Call Type
1	TG 99	99	Group Call

2. Next Create an RX Group that does contain the previously created TalkGroup. e.g.



3. Add a new zone via ‘Zone[Channel]’ → ‘+Add’ and give it a ‘Zone Name’ of ‘simplex HS’. The new zone will be created and will already contain a channel of either ‘CH mode’ being ‘analog’ or ‘digital’.

4. Setup the channel for ‘CH mode’ being ‘Digital’.

5. Give the channel a ‘CH Name’ of some name, e.g., ‘HS TG 99’.

6. Set both frequencies ‘RX Freq’ and ‘TX Freq’ to the very same value (e.g., 433.45000 MHz). You may choose any frequency that is allowed for your type of ham radio license, for digital DMR operation and which is not occupied by some other station. Make sure the simplex hotspot is setup for the very same simplex frequency.

7. Set the output 'Power' to 'Low' as your hotspot is quite likely very close to your Radioddity DB25-D, DB40-D or GD-88.

8. Set 'PCT' to 'Patcs'

9. Set 'RX TS' and 'TX TS' both to 'On' in order to not use TDMA for dividing the channel into 2 slots.

10. Set 'RX CC' and 'TX CC' both to the very same value as your hotspot (normally '1').

11. Set 'TX Policy' to 'Impolite'

12. Set 'RX Group' to the previously defined RX group 'My RX Grp'.

13. Within the field 'Contacts' of the channel definition select the TalkGroup as previously defined (e.g., 'TG 99').

14. Set Encryption to 'Off'

15. Set APRS to 'Off' for now

Write your settings to the radio. Do not forget to switch to Zone 'simplex HS' and select channel 'HS TG 99' at your Radioddity DB25-D, DB40-D or GD-88. Now you are ready for your very first simplex digital DMR QSO using your hotspot.

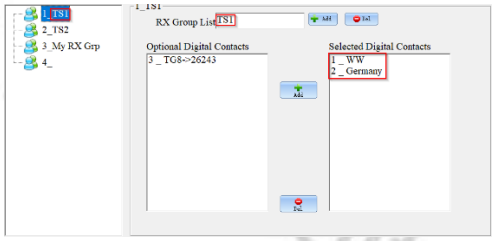
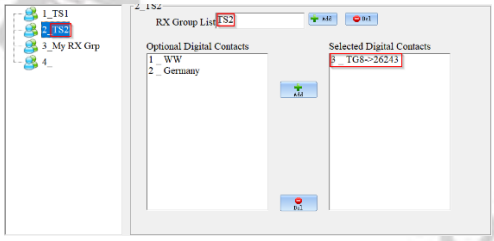
16.6 Duplex digital DMR operation with a Dual-HAT hotspot

In order to setup the radio for duplex digital DMR operation, follow these steps:

1. Within the 'Contacts' menu define a 'Contact Name' with the corresponding 'Contact ID' (DMR ID) of the other station or TalkGroup you plan to call. Set the 'Call Type' to the required Call Type. Normally other stations require a Private Call, whereas TalkGroups require a Group Call. e.g.

Serial No	Contact name	Contact ID	Call Type
1	WW	91	Group Call
2	Germany	262	Group Call
3	TG8->26243	8	Group Call
4	Parrot	262997	Private call

2. Next Create at an RX Group that does contain the previously created TalkGroup(s). We advise to create two RX-groups, one acting as a container for all TalkGroups that you statically assigned (using your hotspot configuration program and or DMR-network dashboard) to your hotspots TimeSlot 1 (name that one 'TS 1') and the second RX-group for those TalkGroups that will require TimeSlot 2 according to your hotspot configuration (name that one 'TS 2' accordingly). e.g.

RX-Group 'TS 1'	RX-Group 'TS 2'
	

3. Add a new zone via 'Zone[Channel]' → '+Add' and give it a 'Zone Name' (e.g. name it 'Duplex HS'. The new zone will be created and will already contain a channel of either 'CH mode' being 'analog' or 'digital'.

4. Setup the channel for 'CH mode' being 'Digital'.

5. Give the channel(s) a 'CH Name' of some name, e.g., 'HS Parrot, 'HS Germany', 'HS WW', 'HS TG8', ...

Z-3	CH mode	CH Name
1	Digital	HS Parrot
2	Digital	HS Germany
3	Digital	HS WW
4	Digital	HS TG8

6. Set the 'RX Freq' and 'TX Freq' to the values required by your duplex hotspot.

7. Set the output 'Power' to 'Low' as even the hotspot normally just has an output power of a few mW and you are close to it.

8. Set 'PCT' to 'Patcs'

9. Set 'RX TS' and 'TX TS' both to the required TimeSlot(s).

10. Set 'RX CC' and 'TX CC' both to the value required by your local repeater.

11. Set 'TX Policy' to 'Impolite'

12. Within the field 'Contacts' of the channel definition select one of the contacts as defined.

13. Assign the previously assigned RX-Group(s) to the channel(s). Make sure, that the contact you assigned in the previous step (if of Call Type 'Group Call') is also a member of the specific RX-Group.

14. Set Encryption to 'Off'

15. Set APRS to 'Off' for now

Write your settings to the radio. Do not forget to switch to Zone 'My Hotspot' and select channel 'HS WW' at your Radioddity DB25-D, DB40-D or GD-88. Now you are ready for your very first digital DMR QSO via your duplex hotspot.

The following shows an example of those main parameters (not all possible parameters are shown).

Z-3	CH mode	CH Name	RX Freq	TX Freq	Power	PCT	RX TS	TX TS	RX CC	TX CC	Msg Type	TX Policy	RX Group	Contacts	APRS
1	Digital	HS Parrot	430.01250	430.01250	Low	Patcs	Slot 1	Slot 1	1	1	Unconfirme	Impolite	RXgrp1	Parrot	Off
2	Digital	HS Germany	430.01250	430.01250	Low	Patcs	Slot 1	Slot 1	1	1	Unconfirme	Impolite	RXgrp1	Germany	Off
3	Digital	HS WW	430.01250	430.01250	Low	Patcs	Slot 1	Slot 1	1	1	Unconfirme	Impolite	RXgrp1	WW	Off
4	Digital	HS TG8	430.01250	430.01250	Low	Patcs	Slot 2	Slot 2	1	1	Unconfirme	Impolite	RXgrp2	regional	Off

Write your settings to the radio. Do not forget to switch to Zone 'Duplex HS' and select channel 'HS WW' at your Radioddity DB25-D, DB40-D or GD-88. Now you are ready for your very first digital DMR QSO via your duplex hotspot.

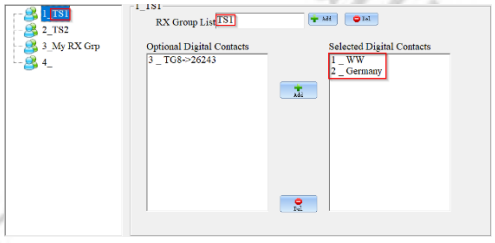
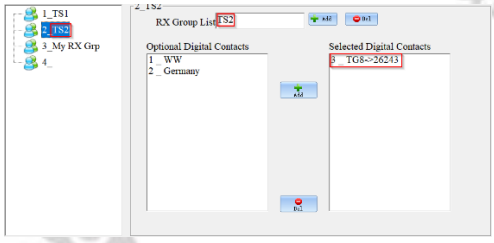
16.7 Digital DMR operation with digital repeater

In order to setup the radio for duplex digital DMR operation, follow these steps:

1. Within the 'Contacts' menu, define a 'Contact Name' with the corresponding 'Contact ID' (DMR ID) of the other station or the TalkGroup you plan to call. Set the 'Call Type' to the required Call Type. Normally other stations require a Private Call, whereas TalkGroups require a Call Type of Group Call. e.g.

Serial No	Contact name	Contact ID	Call Type
1	WW	91	Group Call
2	Germany	262	Group Call
3	TG8->26243	8	Group Call
4	Parrot	262997	Private call

2. Next Create at an RX Group that does contain the previously created TalkGroup(s). We advise to create two RX-groups, one acting as a container for all TalkGroups that do require TimeSlot 1 (name that one 'TS 1') and the second RX-group for those TalkGroups requiring TimeSlot 2 (name that 'TS 2' accordingly). e.g.

RX-Group 'TS 1'	RX-Group 'TS 2'
	

3. Add a new zone via 'Zone[Channel]' → '+Add' and give it a 'Zone Name' (e.g. name it according to the local repeater's call sign you plan to use, e.g., 'DB0OHL'. The new zone will be created and will already contain a channel of either 'CH mode' being 'analog' or 'digital'.

4. Setup the channel for 'CH mode' being 'Digital'.

5. Give the channel(s) a ‘CH Name’ of some name, e.g., ‘OHL WW’, ‘OHL-German’, ‘OHL-TG8’, ‘OHL-Parrot, ….

Z-1	CH mode	CH Name
1	Digital	OHL-WW
2	Digital	OHL-German
3	Digital	OHL-TG8
4	Digital	OHL-Parrot

6. Set the ‘RX Freq’ and ‘TX Freq’ to the values required by your local repeater.
7. Set the output ‘Power’ to ‘Low’ if your location is close to the local repeater. If you are not able to hit the repeater with the ‘Low’ setting, change it to ‘High’.
8. Set ‘PCT’ to ‘Patcs’
9. Set ‘RX TS’ and ‘TX TS’ both to the required TimeSlot(s).
10. Set ‘RX CC’ and ‘TX CC’ both to the value required by your local repeater.
11. Set ‘TX Policy’ to ‘Impolite’
12. Within the field ‘Contacts’ of the channel definition select one of the contacts as defined.
13. Assign the previously assigned RX-Group(s) to the channel(s). Make sure, that the contact you assigned in the previous step (if of Call Type ‘Group Call’) is also a member of the specific RX-Group.
14. Set Encryption to ‘Off’
15. Set APRS to ‘Off’ for now

Write your settings to the radio. Do not forget to switch to Zone ‘My Hotspot’ and select channel ‘HS WW’ at your Radioddity DB25-D, DB40-D or GD-88. Now you are ready for your very first digital DMR QSO via your duplex hotspot.

The following shows an example of those main parameters (not all possible parameters are shown).

Z-1	CH mode	CH Name	RX Freq	TX Freq	Power	PCT	RX TS	TX TS	RX CC	TX CC	TX Policy	RX Group	Contacts	APRS
1	Digital	OHL-WW	438.23750	430.63750	High	Patcs	Slot 1	Slot 1	1	1	Impolite	TS1	WW	Off
2	Digital	OHL-German	438.23750	430.63750	High	Patcs	Slot 1	Slot 1	1	1	Impolite	TS1	Germany	Off
3	Digital	OHL-TG8	438.23750	430.63750	High	Patcs	Slot 2	Slot 2	1	1	Impolite	TS2	TG8->26243	Off
4	Digital	OHL-Parrot	438.23750	430.63750	High	Patcs	Slot 2	Slot 2	1	1	Impolite	TS2	Parrot	Off

17 Connectivity

The Radioddity DB25-D, DB40-D as well as the Radioddity GD-88 have various sockets for connecting power, antennas, speaker-microphone, programming cable and other accessories. Their internal connections are as follows:

17.1 Power connector of DB25-D and DB40-D

The connector is of a so-called T-type and often used within cars for 2pin connections. Your Radioddity DB25-D or DB40-D comes with the proper counterpart, connected to a plug that does fit in a car´s cigarette lighter socket in order to power your radio within seconds, without the hassle of any specific wiring for your car.

Attention**: **Do not power the DB25-D or DB40-D with more than 13.8V DC.

17.2 Battery connector of GD-88

The battery is connected to the radio via a 2-pin spring-type connector that seals with the battery.

Attention**: **Do not charge the radio while operating as such may cause damage to the charger.

17.3 HF Antenna connector

The below table does show the socket type for connecting an antenna (Radioddity GD-88) or an antenna cable (Radioddity DB25-D and Radioddity DB40-D.

Radio	Socket type	for plug of type
Radioddity DB25-D	sma-f(emale)	sma-m(ale)
Radioddity DB40-D	SO 239	PL 259
Radioddity GD-88	SO 239	PL 259

Do not mount an antenna (without a cable) directly to the Radioddity DB25-D or Radioddity DB40-D as radiated HF may have a negative impact on the radio´s operation and may also influence your car's electronics. Make sure the antenna is matched for 2m & 70cm frequency band.

***Notes:** If using an external switching power supply for operating the* Radioddity *DB25-D or* Radioddity *DB40-D at home, make sure that the cable for the antenna and for the power supply are routed as far away from each other as possible. If you encounter sudden reboots of the radio, put an additional clip-on ferrite on the power cable, close to the radio.*

17.4 GPS antenna connector of DB25-D and DB40-D

Socket of type SMA-female, requiring antenna with plug of type SMA-male. The GPS antenna that comes with the Radioddity DB25-D and DB40-D is a passive one and absolutely sufficient for use with the Radioddity DB25-D and DB40-D.

If you plan to add an external antenna to the Radioddity DB25-D or DB40-D you need to make sure that sufficient signal input level gets to the Radioddity DB25-D or DB40-D. This will more or less require the use of an active GPS antenna. The option of active antennas often requires a DC voltage coupled from the radio via the antenna line to the GPS antenna. The Radioddity DB25-D does not provide such DC coupling. If your active GPS antenna comes with an external power supply, it should work. However, we do not recommend to use any other GPS antenna than the passive one that came with the Radioddity DB25-D. The Radioddity DB40-D is prepared to also support active GPS antennas with the required power coupled within the signal line to operate their built-in amplifier.

17.5 K1 connector of DB25-D and GD-88

At the left side of the Radioddity DB25-D and on the right side of the Radioddity GD-88 there is a K1 socket with the following pin assignment:

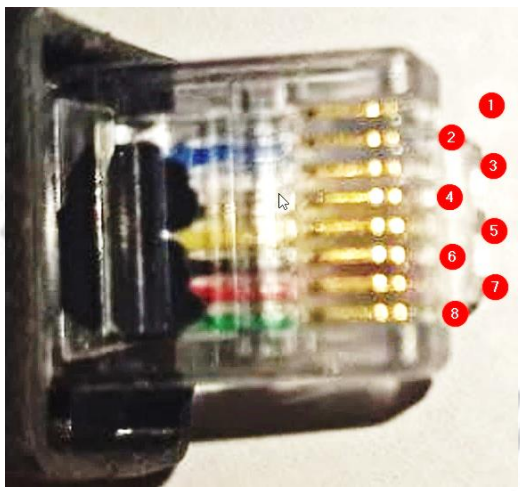
Signal name	K1
PTT / Radio RXD (Data to Radio)	3.5 mm sleeve
Microphone+	3.5 mm ring
+5V via 100 Ω	3.5 mm tip
GND	2.5 mm sleeve
Radio TXD (Data from Radio)	2.5 mm ring
Speaker+	2.5 mm tip

Thus, an external speaker needs to have a 2.5mm TRS-plug with its ring not being connected. The +5V line of the K1 socket is not capable of driving any electronics.

17.6 RJ45 Speaker-Microphone connector of DB25-D and DB40-D

The Speaker-Microphone is connected via its RJ45-plug to the RJ45-socket of the Radioddity DB25-D and DB40-D.

The RJ45 socket may also be used for programming the radio. It is based on 3.3 V signals. The transmission speed is 115.2 kbaud. The Radioddity DB40-D may only be programmed via this RJ45 socket.



Signal name	RJ45	Color	Speaker-Microphone*
Power Off (if connected to GND)	1	Grey	n.c.
PTT/Radio RXD (Data to Radio)	2	Blue	5
Microphone Audio	3	White	3
Cable Shield / analog ground	4	Silver	4
Radio TXD (Data from Radio)	5	Yellow	n.c.
Signal Ground	6	Black	6
+8V	7	Red	7
Speaker Audio	8	Green	8

*) Stated numbers as found on the internal PCB of the Speaker-Microphone

18 Technical specifications

All of the following technical specifications are subject to change without further notice.

18.1 General specifications of the DB25-D

Parameter	VHF	UHF
Frequency	136...174 MHz	400...480 MHz
Frequency Stability	±2.5 ppm	
Type	Dual band, Dual standby, Dual mode	
Digital mode	TDMA 2-TimeSlot technology (Tier 1 and Tier 2)	
Digital vocoder	AMBE+2™	
Digital agreement	ETSI-TS 102 361-1, -2, -3	
Zones	16	
Channel Capacity	Up to 4000 (250 Channels per Zone)	
PLL Channel Spacing	12.5 kHz / 25 kHz	
Operating Temperature	-20° C ... +60° C	
Antenna Impedance	50 Ω	
Rated Voltage	13.8 V DC ±10%	
Current Consumption	Standby: 0.1 A	
	Receive: 0.3 A	
	Transmit: 3 A	
Dimension (H x W x D)	121.5 mm x 65.5 mm x 42.5 mm	
Weight (without microphone)	1500 g	
Compatible With American Military Standard (MIL-STD-810C/D/E)		

18.2 Receiver of the DB25-D

Parameter	VHF	UHF
Frequency Range	136...174 MHz	400...480 MHz
Channel Spacing	12.5 kHz / 25 kHz	
Operating Bandwidth	≤±5 kHz @ 12.5 kHz / ≤±7 kHz @ 25 kHz	
Frequency stability (-20 °C ... +25 °C)	± 1.5 ppm	
IFs	51.550 MHz	
FM modulation Type	12.5 kHz: 11KOF3E / 25 kHz: 16KOF3E	
Sensitivity (12 dB SINAD)	0.25 µV @ 12.5 kHz / 0.2 µV @ 25 kHz	
Squelch Selectivity	0.2 µV @ 12.5 kHz / 0.15 µV @ 25 kHz	
Analogue sensitivity	0.3 µV / 0.25 µV	
Digital sensitivity (5 % BER)	0.25 µV / 0.2 µV	
Intermodulation	≥70 dB	
Adjacent Channel Selectivity	≥65 dB @ 12.5 kHz / ≥70 dB @ 25 kHz	
Spurious rejection	65 dB	
Image Rejection	≥70 dB	
Rated audio	500 mW	
Audio Distortion @ rated audio	≤5 %	
FM hum & noise	-40 dB @ 12.5 kHz / -45 dB @ 25 kHz	
Audio response	+1 dB, -3 dB	
Conducted / radiated emission	-57 dBm	

18.3 Transmitter of the DB25-D

Parameter	VHF	UHF
Frequency Range	144...148 MHz	420...450 MHz
Channel Spacing	12.5 kHz / 25 kHz	
Frequency stability (-20°C, +25°C)	± 1.5 ppm	
Low Power	5 W	5 W
High Power	20 W	20 W
FM modulation Type	12.5 kHz: 11KOF3E / 25 kHz: 16KOF3E	
Modulation restriction	±2.5 dB @ 12.5 kHz / ± 5 dB @ 25 kHz	
FM hum & noise	-40 dB @ 12.5 kHz / -45 dB @ 25 kHz	
Conducted / radiated emission	-36 dBm < 1GHz / -30 dBm > 1 GHz	
Adjacent channel selectivity	-60 dB @ 12.5 kHz / -65 dB @ 25 kHz	
Maximum Deviation	≤±2.5 kHz @ 12.5 kHz ≤±5.0 kHz @ 25 kHz	
Spurious Emission	≤65 dB below carrier	
Modulation Distortion	≤5 % (300...3000 Hz)	
Audio Response	+1 dB, -3 dB	
Audio Distortion	3%	
4FSK digital modulation	12.5 kHz data: 7K60F1D and 7K60FXD	
	12.5 kHz audio:7K60F1E and 7K60FXE	

18.4 General specifications of the DB40-D

Parameter	VHF	UHF
Frequency	136...174 MHz	400...480 MHz
Type	Dual band, Dual standby, Dual mode	
Digital mode	TDMA 2-TimeSlot technology (Tier 1 and Tier 2)	
Zones	16	
Channel Capacity	Up to 4000 (250 Channels per Zone)	
PLL Channel Spacing	12.5 kHz / 25 kHz	
Operating Temperature	-20° C ... +60° C	
Antenna Impedance	50 Ω	
Rated Voltage	13.8 V DC	
Dimension (H x W x D)	138 mm x 160 mm x 41 mm	

18.5 Receiver of the DB40-D

Parameter	VHF	UHF
Frequency Range	136...174 MHz	400...480 MHz
Channel Spacing	12.5 kHz / 25 kHz	
Frequency stability (-20 °C ... +25 °C)	± 1.5 ppm	
Analogue sensitivity	0.3 µV / 0.25 µV	
Digital sensitivity (5 % BER)	0.25 µV / 0.2 µV	
Intermodulation	65 dB	
Adjacent Channel Selectivity	60 dB @ 12.5 kHz / 65 dB @ 25 kHz	
Spurious rejection	65 dB	
Rated audio	500 mW	
Audio Distortion @ rated audio	3 %	
FM hum & noise	-40 dB @ 12.5 kHz / -45 dB @ 25 kHz	
Audio response	+1 dB, -3 dB	
Conducted / radiated emission	-57 dBm	

18.6 Transmitter of the DB40-D

Parameter	VHF	UHF
Frequency Range	136...174 MHz	400...480 MHz
Channel Spacing	12.5 kHz / 25 kHz	
Frequency stability (-20°C ... +25°C)	± 1.5 ppm	
Low Power	25 W	25 W
High Power	40 W	40 W
Modulation restriction	±2.5 dB @ 12.5 kHz / ± 5 dB @ 25 kHz	
FM hum & noise	-40 dB @ 12.5 kHz / -45 dB @ 25 kHz	
Conducted / radiated emission	-36 dBm < 1GHz / -30 dBm > 1 GHz	
Adjacent channel selectivity	-60 dB @ 12.5 kHz / -65 dB @ 25 kHz	
Audio Response	+1 dB, -3 dB	
Audio Distortion	3%	
FM modulation	12.5kHz: 11KOF3E	
	25kHz: 16KOF3E	
4FSK digital modulation	12.5 kHz data: 7K60F1D and 7K60FXD	
	12.5 kHz audio: 7K60F1E and 7K60FXE	
	12.5kHz data and audio: 7K60F1W	
Digital vocoder	AMBE+2™	
Digital agreement	ETSI-TS 102 361-1, -2, -3	

18.7 General specifications of the GD-88

Parameter	VHF	UHF
Frequency	136...174 MHz	400...470 MHz
Type	Dual band, Dual standby, Dual mode, Dual VFO	
Digital mode	TDMA 2-TimeSlot technology (Tier 1 and Tier 2)	
Digital vocoder	AMBE+2™	
Digital agreement	ETSI-TS 102 361-1, -2, -3	
Zones	16	
Channel Capacity	Up to 4000 (250 Channels per Zone)	
PLL Channel Spacing	12.5 kHz / 25 kHz	
Operating Temperature	0° C ... +40° C	
Antenna Impedance	50 Ω	
LiPo Battery	7.4V / 3000 mAh	
Rated Voltage	DC 7.4V	
Dimension (H x W x D)	125 mm x 60 mm x 39 mm	
Weight	317 g	
Battery: The average battery life under 5/5/90 duty cycle, and using carrier squelch and TX high power with 3000mAh LiPo battery Analog: 15 hours / Digital: 23 hours		

18.8 Receiver of the GD-88

Parameter	VHF	UHF
Frequency Range	136...174 MHz	400...480 MHz
Operating Bandwidth	≤±5 kHz @ 12.5 kHz / ≤±7 kHz @ 25 kHz	
Frequency stability (-20°C ... +25°C)	± 1.5 ppm	
IFs	mixing 45 MHz in segment A mixing 51.550 MHz in segment B	
FM modulation Type	12.5 kHz: 11KOF3E / 25 kHz: 16KOF3E	
Analogue sensitivity	0.3 µV / 0.25 µV	
Digital sensitivity (5 % BER)	0.25 µV / 0.2 µV	
Intermodulation	65 dB	
Adjacent Channel Selectivity	≥60 dB @ 12.5 kHz / ≥65 dB @ 25 kHz	
Spurious rejection	65 dB	
Rated audio	500 mW	
Audio Distortion @ rated audio	3 %	
FM hum & noise	-40 dB @ 12.5 kHz / -45 dB @ 25 kHz	
Audio response	+1 dB, -3 dB	
Conducted / radiated emission	-57 dBm	

18.9 Transmitter of the GD-88

Parameter	VHF	UHF
Frequency Range	136...174 MHz	400...480 MHz
Frequency stability (-30°C ... +25°C)	± 1.5 ppm	
Low Power	2.5 W	2.5 W
High Power	7.0 W	7.0 W
FM modulation Type	12.5 kHz: 11KOF3E / 25 kHz: 16KOF3E	
Modulation restriction	±2.5 dB @ 12.5 kHz / ± 5 dB @ 25 kHz	
FM hum & noise	-40 dB @ 12.5 kHz / -45 dB @ 25 kHz	
Conducted / radiated emission	-36 dBm < 1GHz / -30 dBm > 1 GHz	
Adjacent channel selectivity	-60 dB @ 12.5 kHz / -65 dB @ 25 kHz	
Maximum Deviation	≤±2.5 kHz @ 12.5 kHz ≤±5.0 kHz @ 25 kHz	
Spurious Emission	≤65 dB below carrier	
Audio Response	+1 dB, -3 dB	
Audio Distortion	3%	
4FSK digital modulation	12.5 kHz data: 7K60F1D and 7K60FXD	
	12.5 kHz audio:7K60F1E and 7K60FXE	
	12.5 kHz data and audio:7K60F1W	

19 Certification

The Radioddity DB25-D, DB40-D and Radioddity GD-88 are all certified according to FCC part 90. They may also be sold in the European Community as all of them are also conformant to the European regulations. This is attested by the following certificates.

19.1 CE certificate for DB25-D

Below you find a copy of the CE certificate for our Radioddity DB25-D mobile radio.

Type Examination Certificate

USA: TCB, ISED: FCB
Japan: RCB, OFCA: FCB, IMDA: CAB
Notify Body RED Directive 2014/53/EU
Notify Body EMCD Directive 2014/30/EU

BACL Bay Area Compliance Labs Corp.

DIRECTIVE 2014/53/EU
EU TYPE EXAMINATION CERTIFICATE
NOTIFIED BODY: 1313

Certificate No.:	B21120313
Date of Issue:	2021-12-22
Manufacturer:	SAIN3 LLC 36 Berkley Drive, Newark, DE 19702, United States
Trade Name:	Radioddity
Product Designation:	DB25-D, DB20-D
Product Description:	Digital Mini Mobile Radio

Essential Requirements		Examined Documentation	Results
RED Article 3.1(a)	Safety	Technical documentation & Test report	Conform
RED Article 3.1(a)	Health	Technical documentation & Test report	Conform
RED Article 3.1(b)	EMC	Technical documentation & Test report	Conform
RED Article 3.2	Radio	Technical documentation & Test report	Conform
RED Article 3.3	Delegated Acts	Technical documentation & Test report	Not Applicable

This EU-Type Examination Certificate is issued in according with Annex III, Module B of Council Directive 2014/53/EU of 16 April, 2014 and is only valid in conjunction with the attached Appendixes.

The scope of EU Type Examination only relates to the submitted documentation.

Marking: The product shall be marked with the CE marking as required in the Council Directive 2014/53/EU

Number of Appendixes to this certificate: 1

CE

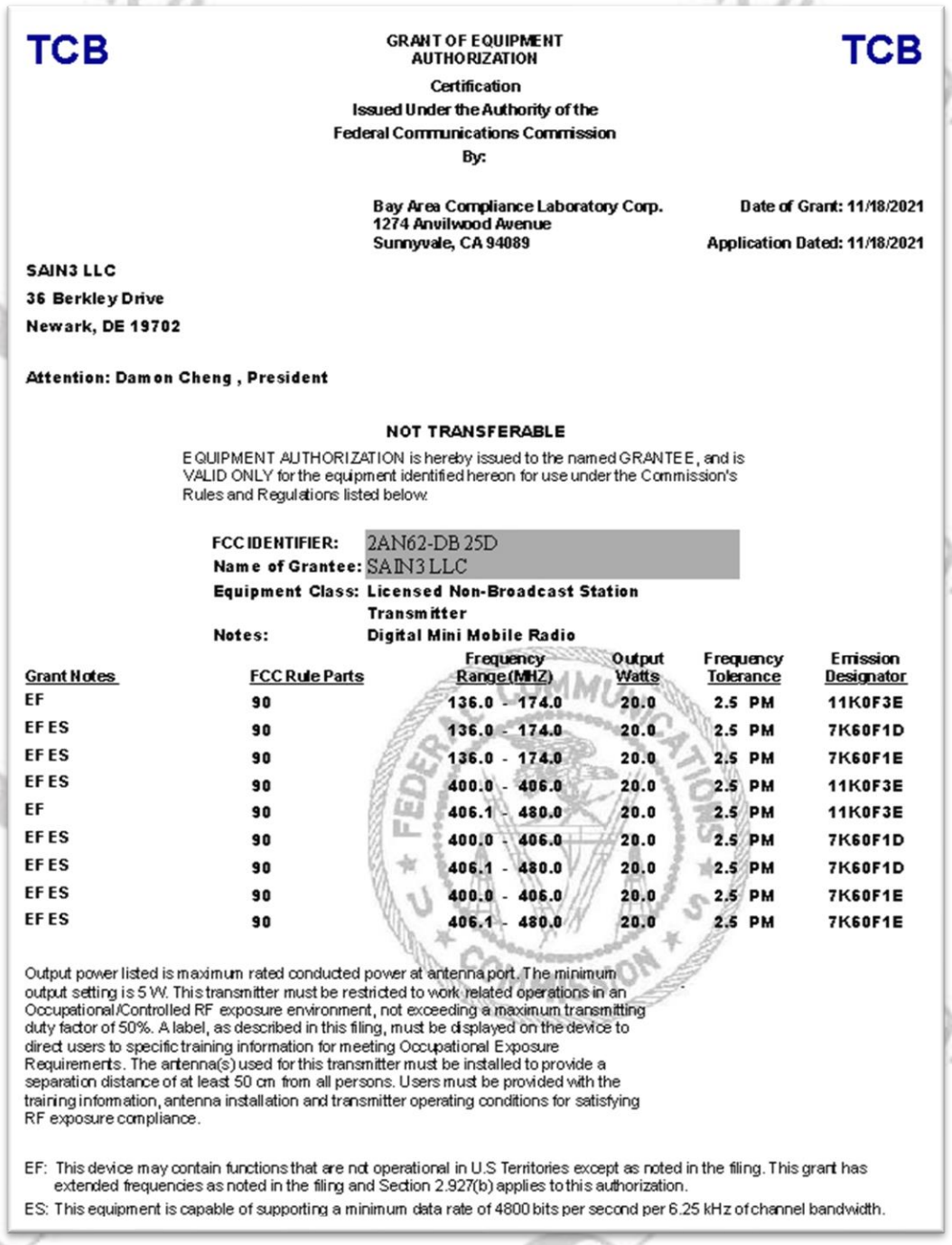
Authorized by: Jimmy Xiao

Jimmy Xiao
Certifier

Bay Area Compliance Laboratories Corp. (BACL)
1274 Anvilwood Avenue, Sunnyvale, CA 94089, USA
Tel: 1 (408) 732-9162 Fax: 1 (408) 732-9164 Web: www.baclcorp.com

19.2 FCC part 90 approval for DB25-D

Below you find a copy of the FCC part 90 approval for our Radioddity DB25-D mobile radio.



TCB

GRANT OF EQUIPMENT AUTHORIZATION

Certification

Issued Under the Authority of the

Federal Communications Commission

By:

TCB

Bay Area Compliance Laboratory Corp.
1274 Anvilwood Avenue
Sunnyvale, CA 94089

Date of Grant: 11/18/2021

Application Dated: 11/18/2021

SAIN3 LLC
36 Berkley Drive
Newark, DE 19702

Attention: Damon Cheng , President

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2AN62-DB25D
Name of Grantee: SAIN3 LLC
Equipment Class: Licensed Non-Broadcast Station Transmitter
Notes: Digital Mini Mobile Radio

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
EF	90	136.0 - 174.0	20.0	2.5 PM	11K0F3E
EF ES	90	136.0 - 174.0	20.0	2.5 PM	7K60F1D
EF ES	90	136.0 - 174.0	20.0	2.5 PM	7K60F1E
EF ES	90	400.0 - 406.0	20.0	2.5 PM	11K0F3E
EF	90	406.1 - 480.0	20.0	2.5 PM	11K0F3E
EF ES	90	400.0 - 406.0	20.0	2.5 PM	7K60F1D
EF ES	90	406.1 - 480.0	20.0	2.5 PM	7K60F1D
EF ES	90	400.0 - 406.0	20.0	2.5 PM	7K60F1E
EF ES	90	406.1 - 480.0	20.0	2.5 PM	7K60F1E

Output power listed is maximum rated conducted power at antenna port. The minimum output setting is 5 W. This transmitter must be restricted to work related operations in an Occupational/Controlled RF exposure environment, not exceeding a maximum transmitting duty factor of 50%. A label, as described in this filing, must be displayed on the device to direct users to specific training information for meeting Occupational Exposure Requirements. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 50 cm from all persons. Users must be provided with the training information, antenna installation and transmitter operating conditions for satisfying RF exposure compliance.

EF: This device may contain functions that are not operational in U.S Territories except as noted in the filing. This grant has extended frequencies as noted in the filing and Section 2.927(b) applies to this authorization.

ES: This equipment is capable of supporting a minimum data rate of 4800 bits per second per 6.25 kHz of channel bandwidth.

19.3 CE certificate for DB40-D

Below you find a copy of the CE certificate for our Radioddity DB40-D mobile radio.

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MiCOM Labs

CERTIFICATE of EXAMINATION

Certificate Validation

NOTIFIED BODY EU-TYPE EXAMINATION CERTIFICATE

AGCC3093-EU / *23 Aug 2023* / Rev B

Radio Equipment Directive (RED) 2014/53/EU

MiCOM Labs Inc., Notified Body Number 2280 declares, on the basis of the assessment of the tests and the technical documentation provided by the applicant that the following product complies with the essential requirements of the above noted Directive.

Product Name:
Digital/Analogue Vehicle Radio

Approval Holder Name:
SAIN3 LLC

MICOM Labs, Inc. INCORPORATED JAN. 25, 2002 CALIFORNIA

CE

Gordon Hurst, Product Certifier

This Certificate is Issued under the Authority of:
MiCOM Labs Inc., 575 Boulder Court, Pleasanton, California 94566, USA
Notified Body Number: 2280

Doc - Cert v24q

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AGCC3093-EU

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MiCOMLabs

Notified Body EU-Type Examination Certificate

AGCC3093-EU / 23 Aug 2023 / Rev B

for Radio Equipment Directive (RED) 2014/53/EU

Product Name:

Digital/Analogue Vehicle Radio

Product Model Numbers: **DB40-D**

Brand Name: **Radioddity**

Approval Holder: **SAIN3 LLC**, 36 Berkley Drive Newark Delaware 19702 United States

Product Manufacturer: **FUJIAN NEW CENTURY COMMUNICATIONS CO., LTD**, NO.1 FENGSHOU RD., ZHAOFENG IND. ZONE FENGZE DISTRICT, QUANZHOU, FUJIAN, CHINA

Standards

Group	Name
Article 3.1(a) Health & Safety	EN IEC 62311:2020
	EN 50665:2017
	EN IEC 62368-1:2020+A11:2020
Article 3.1(b) Electromagnetic Compatibility	EN 301 489-1 V2.2.3
	EN 301 489-5 V2.2.1
	EN 301 489-17 V3.2.4
	EN 301 489-19 V2.2.1
Article 3.2 Effective Use of Spectrum	EN 300 086 V 2.1.2
	EN 300 219 V 2.1.1
	EN 300 113 V3.1.1
	EN 300 328 V2.2.2
	EN 303 413 V1.2.1

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MICOM Labs, 575 Boulder Court, Pleasanton, California 94566, USA
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Notified Body EU-Type Examination Certificate

AGCC3093-EU / 23 Aug 2023 / Rev B

for Radio Equipment Directive (RED) 2014/53/EU

Annex 1 to EU-Type Examination

EU-Type examination on the essential requirements
Article 3

Article 3.1 - a) Health and Safety	Assessed
Article 3.1 - b) Electromagnetic compatibility	Assessed
Article 3.2 - Effective use of radio spectrum	Assessed
Article 3.3 - a) interworks with Accessories/Chargers	Not Applicable
Article 3.3 - b) interworks with Radio Networks	Not Applicable
Article 3.3 - c) can connect to interfaces	Not Applicable
Article 3.3 - d) does not harm the network, misuse network resources	Not Applicable
Article 3.3 - e) privacy protections	Not Applicable
Article 3.3 - f) fraud protections	Not Applicable
Article 3.3 - g) emergency services access	Not Applicable
Article 3.3 - h) assist users with disabilities	Not Applicable
Article 3.3 - i) integrity of software	Not Applicable

Description of Apparatus	
Company Name	**SAIN3 LLC**
Certification No.	**AGCC3093-EU**
Issue Date / Rev	**23 Aug 2023 / Rev B**
Equipment Description	**Digital/Analogue Vehicle Radio**
Hardware Version	**3.0**
Firmware Version	**V1.0**

Doc - Cert v24g

MICOM Labs, 575 Boulder Court, Pleasanton, California 94566, USA
Tel: +1 (925) 462-0304, Fax: +1 (925) 462-0306, Web: www.micomlabs.com
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Notified Body EU-Type Examination Certificate

AGCC3093-EU / 23 Aug 2023 / Rev B

for Radio Equipment Directive (RED) 2014/53/EU

Emission Information

Technology	Frequency MHz		Emission Designator	RF Power		
	From	To		Max	Type	Field Strength
VHF	136	174	F3E	46.93dBm	Conducted	–
UHF	400	480	F3E	45.94dBm	Conducted	–
Bluetooth BR/EDR	2402	2480	F1D,G1D	-0.70dBm	EIRP	–
Bluetooth BLE	2402	2480	F1D	-1.66dBm	EIRP	–
GPS	1575.42	1575.42		–	–	–

Technical Construction File Details: (Documents Reviewed)

Technical Report(s):
rticle 3.1(a) Health & Safety:
AGC02415230703EH02
AGC02415230703ES01
Article 3.1(b) Electromagnetic Compatibility:
AGC02415230703EE01
Article 3.2 Effective Use of Spectrum:
AGC02415230703EE11
AGC02415230703EE23
AGC02415230703EE04
AGC02415230703EE06
AGC02415230703EE24

Supporting Documentation:
Service Agreement
Agent Authorization
EU Application
EU Declaration of Conformity
Label and its Location
Risk Assessment
User Manual
Construction Equality Declaration
Authorization Letter_original to new
CE statement

Scope

This EU-Type Examination Certificate is given in respect of compliance of radio spectrum use Article 3 Paragraph 2 of the RED Directive 2014/53/EU. The scope of the evaluation and this certificate relates only to those items identified in 'Annex 1 to EU - Type Examination Certificate' for the specific product and Certificate number referenced above.

EU Type Examination was performed according to Module B: EU-type examination procedure per Annex III the Directive on the essential requirements in Article 3, for the specific product and Certificate Number referenced above.

This EU Type Examination Certificate is based upon the review of the Technical Documentation and supporting evidence for the adequacy of the technical design solution, it is only valid in conjunction with the attached Annexes. The scope of this statement relates to a single sample of the apparatus identified above and of the submitted documents only.

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Notified Body EU-Type Examination Certificate

AGCC3093-EU / 23 Aug 2023 / Rev B

for Radio Equipment Directive (RED) 2014/53/EU

Annex 2 to EU-Type Examination
Obligations of the Applicant

Ref RED 2014/53/EU Article 10 - Obligations of manufacturers

1. When placing their radio equipment on the market, manufacturers shall ensure that it has been designed and manufactured in accordance with the essential requirements set out in Article 3.

2. Manufacturers shall ensure that radio equipment shall be so constructed that it can be operated in at least one Member State without infringing applicable requirements on the use of radio spectrum.

3. Manufacturers shall draw up the technical documentation referred to in Article 21 and carry out the relevant conformity assessment procedure referred to in Article 17 or have it carried out. Where compliance of radio equipment with the applicable requirements has been demonstrated by that conformity assessment procedure, manufacturers shall draw up an EU declaration of conformity and affix the CE marking.

4. Manufacturers shall keep the technical documentation and the EU declaration of conformity for 10 years after the radio equipment has been placed on the market.

5. Manufacturers shall ensure that procedures are in place for series production to remain in conformity with this Directive. Changes in radio equipment design or characteristics and changes in the harmonised standards or in other technical specifications by reference to which conformity of radio equipment is declared shall be adequately taken into account.

When deemed appropriate with regard to the risks presented by radio equipment, manufacturers shall, to protect the health and safety of end-users, carry out sample testing of radio equipment made available on the market, investigate, and, if necessary, keep a register of complaints, of non-conforming radio equipment and radio equipment recalls, and shall keep distributors informed of any such monitoring.

6. Manufacturers shall ensure that radio equipment which they have placed on the market bears a type, batch or serial number or other element allowing its identification, or, where the size or nature of the radio equipment does not allow it, that the required information is provided on the packaging, or in a document accompanying the radio equipment.

7. Manufacturers shall indicate on the radio equipment their name, registered trade name or registered trade mark and the postal address at which they can be contacted or, where the size or nature of radio equipment does not allow it, on its packaging, or in a document accompanying the radio equipment. The address shall indicate a single point at which the manufacturer can be contacted. The contact details shall be in a language easily understood by end-users and market surveillance authorities.

8. Manufacturers shall ensure that the radio equipment is accompanied by instructions and safety information in a language which can be easily understood by consumers and other end-users, as determined by the Member State concerned. Instructions shall include the information required to use radio equipment in accordance with its intended use. Such information shall include, where applicable, a description of accessories and components, including software, which allow the radio equipment to operate as intended. Such instructions and safety information, as well as any labelling, shall be clear, understandable and intelligible.

The following information shall also be included in the case of radio equipment intentionally emitting radio waves:

(a) frequency band(s) in which the radio equipment operates;
(b) maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operates.

9. Manufacturers shall ensure that each item of radio equipment is accompanied by a copy of the EU declaration of conformity or by a simplified EU declaration of conformity. Where a simplified EU declaration of conformity is provided, it shall contain the exact internet address where the full text of the EU declaration of conformity can be obtained.

10. In cases of restrictions on putting into service or of requirements for authorisation of use, information available on the packaging shall allow the identification of the Member States or the geographical area within a Member State where restrictions on putting into service or requirements for authorisation of use exist. Such information shall be completed in the instructions accompanying the radio equipment. The Commission may adopt implementing acts specifying how to present that information. Those implementing acts shall be adopted in accordance with the advisory procedure referred to in Article 45(2).

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Notified Body EU-Type Examination Certificate

AGCC3093-EU / *23 Aug 2023* / Rev B

for Radio Equipment Directive (RED) 2014/53/EU

11. Manufacturers who consider or have reason to believe that radio equipment which they have placed on the market is not in conformity with this Directive shall immediately take the corrective measures necessary to bring that radio equipment into conformity, to withdraw it or recall it, if appropriate. Furthermore, where the radio equipment presents a risk, manufacturers shall immediately inform the competent national authorities of the Member States in which they made the radio equipment available on the market to that effect, giving details, in particular, of the noncompliance, of any corrective measures taken and of the results thereof.

12. Manufacturers shall, further to a reasoned request from a competent national authority, provide it with all the information and documentation in paper or electronic form necessary to demonstrate the conformity of the radio equipment with this Directive, in a language which can be easily understood by that authority. They shall cooperate with that authority, at its request, on any action taken to eliminate the risks posed by radio equipment which they have placed on the market.

Ref RED 2014/53/EU Article 11 - Authorised representatives

1. A manufacturer may, by a written mandate, appoint an authorised representative.

The obligations laid down in Article 10(1) and the obligation to draw up technical documentation laid down in Article 10(3) shall not form part of the authorised representative's mandate.

2. An authorised representative shall perform the tasks specified in the mandate received from the manufacturer. The mandate shall allow the authorised representative to do at least the following:

(a) keep the EU declaration of conformity and the technical documentation at the disposal of national market surveillance authorities for 10 years after the radio equipment has been placed on the market;

(b) further to a reasoned request from a competent national authority, provide that authority with all the information and documentation necessary to demonstrate the conformity of radio equipment;

(c) co-operate with the competent national authorities, at their request, on any action taken to eliminate the risks posed

Article 19 General principles of the CE marking

1.The CE marking shall be subject to the general principles set out in Article 30 of Regulation (EC) No 765/2008.

2.On account of the nature of radio equipment, the height of the CE marking affixed to radio equipment may be lower than 5 mm, provided that it remains visible and legible.

Article 20 Rules and conditions for affixing the CE marking and the identification number of the notified body

1.The CE marking shall be affixed visibly, legibly and indelibly to the radio equipment or to its data plate, unless that is not possible or not warranted on account of the nature of radio equipment. The CE marking shall also be affixed visibly and legibly to the packaging.

2.The CE marking shall be affixed before the radio equipment is placed on the market.

3.Member States shall build upon existing mechanisms to ensure correct application of the regime governing the CE marking and shall take appropriate action in the event of improper use of that marking.

MICOM Labs, 575 Boulder Court, Pleasanton, California 94566, USA
Tel: +1 (925) 462-0304, Fax: +1 (925) 462-0306, Web: www.micomlabs.com

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19.4 CE certificate for GD-88

Below you find a copy of the CE certificate for our Radioddity GD-88 handheld radio.

67568C4CE55E4E478277F6CFE77E123B

MiCOM Labs

CERTIFICATE of EXAMINATION

Certificate Validation

NOTIFIED BODY EU-TYPE EXAMINATION CERTIFICATE

AGCC1985-EU / 1 Jul 2022 / Rev A

Radio Equipment Directive (RED) 2014/53/EU

MiCOM Labs Inc., Notified Body Number 2280 declares, on the basis of the assessment of the tests and the technical documentation provided by the applicant that the following product complies with the essential requirements of the above noted Directive.

Product Name:
Digital Mobile Radio

Approval Holder Name:
SAIN3 LLC

MICOM Labs, Inc. INCORPORATED JAN. 25, 2002 CALIFORNIA

CE

Gordon Hurst, Product Certifier

This Certificate is Issued under the Authority of:
MiCOM Labs Inc., 575 Boulder Court, Pleasanton, California 94566, USA
Notified Body Number: 2280

Doc - Cert v2.4q

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MiCOMLabs

Notified Body EU-Type Examination Certificate

***AGCC1985-EU* / *1 Jul 2022* / Rev A**

for Radio Equipment Directive (RED) 2014/53/EU

Product Name:

Digital Mobile Radio

Product Model Numbers: GD-88

Brand Name: **Radioddity**

Approval Holder: **SAIN3 LLC**, 36 Berkley Drive Newark Delaware United States 19702

Product Manufacturer: **SAIN3 LLC**, 36 Berkley Drive Newark Delaware United States 19702

Standards

Group	Name
Article 3.1 a) Health and Safety	EN 62209-2:2010
	EN 50566:2017
	EN IEC 62368-1:2020+A11:2020
Article 3.1 b) Electromagnetic compatibility	EN 301 489-1 V2.2.3
	EN 301 489-5 V2.2.1
	EN 301 489-19 V2.1.1
	EN 55032:2015/A11:2020
	EN IEC 61000-3-2:2019
	EN 61000-3-3:2013/A1:2019
	EN 55035:2017/A11:2020
Article 3.2 Effective use of radio spectrum	EN 300 086 V 2.1.2
	EN 300 219 V 2.1.1
	EN 300 113 V3.1.1
	EN 303 345-1 V1.1.1
	EN 303 345-3 V1.1.1
	EN 303 413 V1.1.1

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MICOM Labs, 575 Boulder Court, Pleasanton, California 94566, USA
Tel: +1 (925) 462-0304, Fax: +1 (925) 462-0306, Web: www.micomlabs.com
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MiCOMLabs

Notified Body EU-Type Examination Certificate

***AGCC1985-EU* / *1 Jul 2022* / Rev A**

for Radio Equipment Directive (RED) 2014/53/EU

Annex 1 to EU-Type Examination

EU-Type examination on the essential requirements
Article 3

Article 3.1 - a) Health and Safety	Assessed
Article 3.1 - b) Electromagnetic compatibility	Assessed
Article 3.2 - Effective use of radio spectrum	Assessed
Article 3.3 - a) interworks with Accessories/Chargers	Not Applicable
Article 3.3 - b) interworks with Radio Networks	Not Applicable
Article 3.3 - c) can connect to interfaces	Not Applicable
Article 3.3 - d) does not harm the network, misuse network resources	Not Applicable
Article 3.3 - e) privacy protections	Not Applicable
Article 3.3 - f) fraud protections	Not Applicable
Article 3.3 - g) emergency services access	Not Applicable
Article 3.3 - h) assist users with disabilities	Not Applicable
Article 3.3 - i) integrity of software	Not Applicable

Description of Apparatus

Company Name	**SAIN3 LLC**
Certification No.	**AGCC1985-EU**
Issue Date / Rev	**1 Jul 2022 / Rev A**
Equipment Description	**Digital Mobile Radio**
Hardware Version	**2.0**
Firmware Version	**V22.2.12**

MICOM Labs, 575 Boulder Court, Pleasanton, California 94566, USA
Tel: +1 (925) 462-0304, Fax: +1 (925) 462-0306, Web: www.micomlabs.com

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MiCOMLabs

Notified Body EU-Type Examination Certificate

AGCC1985-EU / 1 Jul 2022 / Rev A

for Radio Equipment Directive (RED) 2014/53/EU

Emission Information

Technology	Frequency MHz		Emission Designator	RF Power		
	From	To		Max	Type	Field Strength
VHF	136MHz	174MHz	F3E	38.45dBm	Conducted	–
UHF	400MHz	480MHz	F3E	38.45dBm	Conducted	–
GPS	1575.42MHz	1575.42MHz		–	–	–
GLONASS	1602MHz	1602MHz		–	–	–
FM	87.5MHz	108MHz		–	–	–

Technical Construction File Details: (Documents Reviewed)

Technical Report(s):
Article 3.1a) Health and Safety:
AGC02415220502EH01
AGC02415220502ES01
Article 3.1b) Electromagnetic compatibility:
AGC02415220502EE02
AGC02415220502EE01
Article 3.2Effective use of radio spectrum:
AGC02415220502EE24
AGC02415220502EE23
AGC02415220502EE14
AGC02415220502EE06

Supporting Documentation:
Service Agreement
Agent Authorization
EU Application
EU Declaration of Conformity
Label and its Location
Original certificate
Risk Assessment
Construction Equality Declaration
Original authorization

Scope

This EU-Type Examination Certificate is given in respect of compliance of radio spectrum use Article 3 Paragraph 2 of the RED Directive 2014/53/EU. The scope of the evaluation and this certificate relates only to those items identified in 'Annex 1 to EU - Type Examination Certificate' for the specific product and Certificate number referenced above.

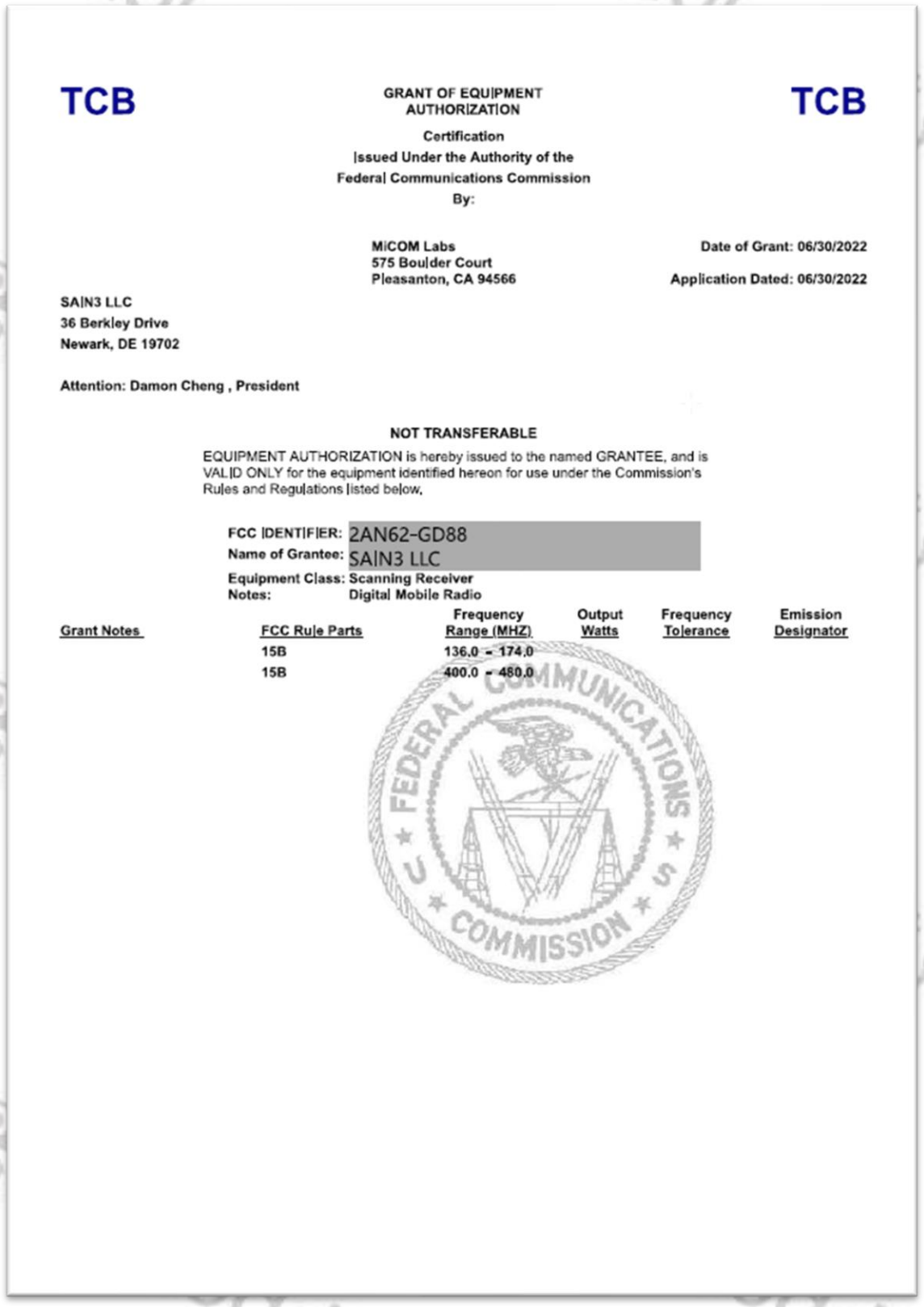
EU Type Examination was performed according to Module B: EU-type examination procedure per Annex III the Directive on the essential requirements in Article 3, for the specific product and Certificate Number referenced above.

This EU Type Examination Certificate is based upon the review of the Technical Documentation and supporting evidence for the adequacy of the technical design solution, it is only valid in conjunction with the attached Annexes. The scope of this statement relates to a single sample of the apparatus identified above and of the submitted documents only.

MICOM Labs, 575 Boulder Court, Pleasanton, California 94566, USA
Tel: +1 (925) 462-0304, Fax: +1 (925) 462-0306, Web: www.micomlabs.com

19.5 FCC part 90 approval for GD-88

Below you find a copy of the FCC part 90 approval for our Radioddity GD-88 handheld radio.



TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

MiCOM Labs
575 Boulder Court
Pleasanton, CA 94566

Date of Grant: 06/30/2022

Application Dated: 06/30/2022

SAIN3 LLC
36 Berkley Drive
Newark, DE 19702

Attention: Damon Cheng , President

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2AN62-GD88
Name of Grantee: SAIN3 LLC
Equipment Class: Scanning Receiver
Notes: Digital Mobile Radio

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15B	136.0 - 174.0			
	15B	400.0 - 480.0			

TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

MiCOM Labs
575 Boulder Court
Pleasanton, CA 94566

Date of Grant: 06/30/2022
Application Dated: 06/30/2022

SAIN3 LLC
36 Berkley Drive
Newark, DE 19702

Attention: Damon Cheng , President

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2AN62-GD88
Name of Grantee: SAIN3 LLC
Equipment Class: Licensed Non-Broadcast Transmitter Held to Face
Notes: Digital Mobile Radio

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
EF ES	90	136.0 - 174.0	6.9183	1.08 PM	11K0F3E
EF ES	90	136.0 - 174.0	6.8865	1.096 PM	7K64F1D
EF ES	90	136.0 - 174.0	6.6527	0.965 PM	7K64F1W
EF ES	90	400.0 - 480.0	6.7143	1.083 PM	11K0F3E
EF ES	90	400.0 - 480.0	6.9343	1.091 PM	7K69F1D
EF ES	90	400.0 - 480.0	6.6069	0.999 PM	7K69F1W

Power listed is max conducted. This device must be restricted to work related operations in an Occupational/Controlled RF exposure Environment, not exceeding a maximum transmitting duty factor of 50%. All qualified end-users of this device must have the knowledge to control their exposure conditions and/or duration to comply with the Occupational/Controlled SAR limit and requirements Body-worn operating configuration is limited to the specific belt-clip supplied, End-users must be informed of the body-worn operating requirements for satisfying RF exposure compliance. The highest reported SAR values for head and body worn accessory exposure conditions are 3.03 W/kg and 5.82 W/kg, respectively.

EF: This device may contain functions that are not operational in U.S Territories except as noted in the filing. This grant has extended frequencies as noted in the filing and Section 2.927(b) applies to this authorization.

ES: This equipment is capable of supporting a minimum data rate of 4800 bits per second per 6.25 kHz of channel bandwidth.

20 Common problems and how to solve them

Problem	Solution
Radio fails to power on 	Check power supply, check inline fuse of power cable GD-88 check that the battery is fully charged
Channel selector knob does no longer allow to switch between the channels	Turn on Channel Switch: MENU (press knob) → Local Set → Channel Sw → SELECT (press knob to change setting) When the indicator turns GREEN, you have again assigned the Channel select function to the knob.
Do not want to be interrupted by activity on second channel (which is not selected) 	Turn off Dual-Channel mode: MENU (press knob) -> Local Set -> DisplayMode -> S/D Mode Sw -> MENU (press knob to change setting) When the indicator turns GREEN, you have set it for Single Channel Mode Display. When the indicator turns RED, you have set it for Dual Channel Mode Display.
Contact details not shown during conversation 	Make sure that the Ham contacts have been imported from a CSV file, sorted by ascending DMR IDs. If you want all details, make sure you did the 128 bytes/record import and turn off Dual-Channel mode: MENU (press knob) -> Local Set -> DisplayMode -> S/D Mode Sw -> MENU (press knob to change setting) When the indicator turns GREEN, you have set it for Single Channel Mode Display. When the indicator turns RED, you have set it for Dual Channel Mode Display.
Activities on even not selected VFO does activate squelch	Turn off any scan mode as the scanning feature requires the unselected VFO.
Message 'The COMM port is occupied or doesn't exit!' or 'DATA MISTAKE' when trying to connect the radio with the CPS or the IAP	Currently the CPS as well as the IAP only support virtual COM-ports 'COM1' up to 'COM8'. You may change the assigned virtual COM-port using the device manager of your Windows-OS.
Sometimes a 'Run time error 6' is been thrown	Make sure you did install the CPS as administrator in order to avoid such. Get our newest CPS. Besides that, the screen resolutions should not exceed 1920x1080.

Problem	Solution
Analog APRS does not work	Analog APRS currently only works if an analog channel has been selected, the proper analog APRS settings have been applied and an analog iGate is within RF-coverage. Make sure 'Analog APRS' or 'DMR+Analog APRS' is selected at the radio within the menu 'Appendix → APRS → APRS Type'
Digital APRS does not work	Digital APRS only works if a digital channel has been selected and the proper TalkGroup has been assigned for the defined reporting channel. Make sure 'DMR APRS' or 'DMR+Analog APRS' is selected at the radio within the menu 'Appendix → APRS → APRS Type'
Cannot use the radio with my local simplex hotspot	If it is pistar-based and single-hat, you need to set both, 'TX TS' and 'RX TS' to 'On' within the corresponding channel definitions of our CPS.
Radio reboots whenever I press [PTT] 	• Use an external antenna (suitable for the 2m and 70cm band) connected via an antenna cable to the radio. • Use clip-on ferrites and place one of those on the power cord, close to the radio body. • Route the power cord and antenna cable separate as far away from each other. • Directly wire the radio to the car battery without using the cigarette lighter socket. Often the connection between a cigarette-lighter plug and its socket causes such issue whenever a higher current is drawn. • Make sure the battery is fully charged and provides sufficient voltage and power
If analog VFO-mode is selected, transmitting is not possible	Check the setting of RXOnly using the Channel-Edit function as described in chapter 10.12 Channel Edit on page 113.
I do not understand those CPS parameters such as RX Time, TX Time, GCL	You are using an old version of our CPS. Please update the radio firmware and install the newest CPS. Both to be found in our support area for the Radioddity DB25-D, DB40-D and GD-88.
Cannot communicate with the radio	Make sure the radio is turned on and the supplied programming cable is plugged in on both, the radio and the PC. Make sure the driver is installed.

Problem	Solution
Cannot hear the local DMR-repeater	For each TalkGroup that you do want to operate, you will need a separate channel. Each digital channel should have a reference to a specific Contact (TalkGroup) and to a so-called RX-group that also does have the channels TalkGroup as a member. Ham operators often do place all TalkGroups that are assigned to TimeSlot 1 within one TalkGroup and all TalkGroups that are assigned to TimeSlot 2 within another RX-group. If there is no RX-group assigned to a channel, you will only be able to receive direct calls to your own DMR ID and calls to the TalkGroup assigned to the current channel.
Whenever I try to TX on a digital channel I get a 'BS failed' message on the radio screen	'BS Failed' stands for 'Base Station failed' and can have various reasons: • Wrong TX frequency • Wrong RX frequency • Wrong Color Code • No Contact (and its Call Type) defined for the active channel • Addressed TimeSlot currently occupied by another caller • DMR repeater out of coverage • The radio had incorrectly programmed an analog repeater for digital mode
I cannot enter the radio menu by using the channel knob	Make sure that you have not activated the keypad lock. To unlock, long press the [ENC] button.
When operating in analog mode and releasing the [PTT] there is a delay of about 30 seconds before I can hear someone else.	Check if your currently selected channel is also a member of a Scan List and you have activated automatic scanning. The described behavior does happen, whenever you have scanning activated and there is no more signal detected on the currently selected channel and thus starting the scanning process again. Depending on the number of channels that are member of the scan-list it may take some seconds until the channel in question will be checked again. Scanning an analog channel takes significantly longer, than scanning a digital channel.
In analog mode I am missing a lot of DCS tones	The radio does support all 83 codes as standardized by the Telecommunications Industry Association plus additional 20 DCS codes. If it is not within those codes as listed in chapter 13.28 CTCSS sub audio and DCS signaling on page 192 it is not supported.

Problem	Solution
When editing the parameters of the VFO marked with PTT the parameters of the other VFO get changed	When editing parameters using the radio menus, the changes do apply to those VFO that´s marked with 'CTRL'. Make sure to select the proper VFO for 'CTRL' using the 'A/B' key.
I am not able to TX to my Hotspot using DMR-mode	Make sure the setting for 'TimeSlot' of the corresponding channel is set either to the required TimeSlot (for duplex hotspots) or to 'ON' for simplex hotspots.
The Radioddity DB25-D, DB40-D is OFF whenever I power on my car 	The Radioddity DB25-D, DB40-D does keep its last power state upon loss of power. If the radio had been turned on before power loss, it will automatically turn on again as soon as the power is back. If it had been turned off before power loss, it will stay off, even if power is back.
Every time I need to set the audio volume of my Radioddity DB25-D, DB40-D 	The actual audio volume highly depends on the audio volume of the transmitting station. However, if you do change the volume settings on your Radioddity DB25-D, DB40-D by hitting the [VOL]-key, turning the [ENC]-knob, then do not forget to press the [ENC]-knob to permanently store the setting into the radio.
The [ENC]-knob for channel selection does not work	Channel selection has been disabled by the user. To reenable the channel selection do the following: MENU → Local Set → Channel Sw → Select (the switch-icon should turn GREEN to allow using the ENC-knob for selecting a channel)
Function assigned to a programmable [P]-key does not work	Functions only available when an analog channel is selected do not work on digital channels. Functions only available for digital channels do not work on analog channels. If a pilot tone / burst tone has been assigned to short press of a programmable [P]-key, the long press function for that very same [P]-key is no longer available.
My radio came with a codeplug already installed, is it a used radio?	No, you did not at all get a used radio. We do ship the DB25-D, DB40-D and GD-88 with a preconfigured sample codeplug that has, for your convenience, also been written to the radio as 'factory reset' codeplug. This sample codeplug contains various sample settings that should give you an idea on the various operating modes.

Problem	Solution
When updating IAP-B on my DB40-D / GD-88 the counter does not show any progress. 	The DB40-D and GD-88 do have two CPUs: One for VFO-A and the other one for VFO-B. When updating the, you will need to update the firmware for both CPUs, A and B. Each of them needs to get its own update binary file. Make sure that you always write the A-file to IAP-A and the B-file to IAP-B. Whilst updating the A-part you will see an ascending counter on the radio. Whilst updating the B-file there will not be such counter on the radio due to technical reasons. However, the IAP-program will report on the success of the B-update.
After performing a firmware update on my GD-88 DMR-channels evoked on VFO-B no longer have a contact assigned to them 	In general, we advise to read the current codeplug from the radio and store it on your PC before you do any firmware update of the radio. After the firmware update has completed, write back the previously stored codeplug to the radio. This does ensure that your previous settings will be working as expected.
I want to reset the radio but cannot find any hint on how to do so.	The radio does not have any possibility to perform a real reset. However, it does have a built in functionality, called 'factory reset'. Whenever you trigger that factory reset (on the radio) the current codeplug will be replaced by a codeplug that has previously been saved as the 'factory reset' codeplug (see Factory Reset  on page 95 and on page 123 for more details on that).
After performing a firmware update, VFO-B keeps displaying 'Unprogrammed' 	Prior to performing a firmware update, save the current codeplug to a file. After doing so, the firmware update may be applied. Finally, the previously saved codeplug should then again be written to the radio using the CPS.
After performing a firmware update only a white screen is shown on startup. 	This is due to the fact that we do have slightly different hardware revisions out in the field that are covered by the very same firmware. Chapter 14.4, Black, white or scrambled screen after firmware update on page 201 does describe the procedure to get rid of the white screen.
After downgrading the radio only a black screen is shown on startup 	Never downgrade the radio to a firmware version prior to the one that had been released March 30th, 2023.
How to reset the radio to factory default settings?	There is no such real factory default setting. Please check chapter 11.3 Factory Reset on page 123 for more details.

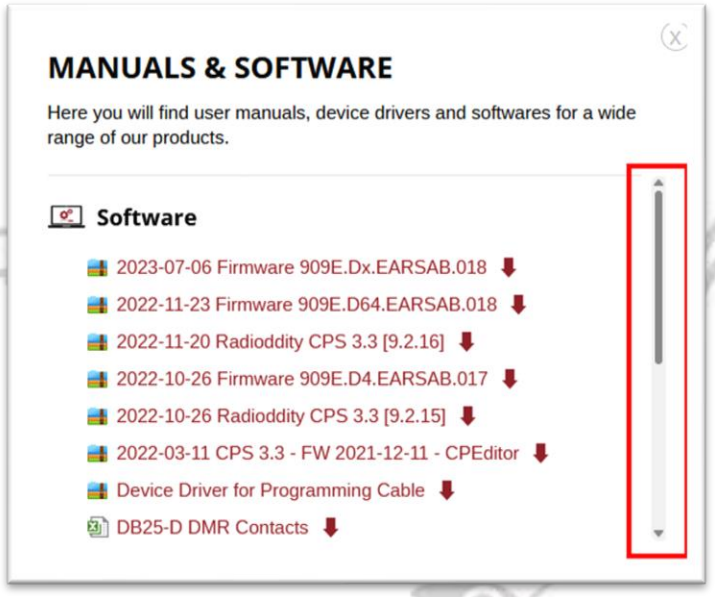
Problem	Solution
After doing an update a black screen is shown when power cycling the radio 	Repeat the update-procedure and make sure that you do select the proper IAP_A and IAP_B and the firmware-file corresponding to that IAP.
Is the radio capable of receiving analog APRS ??	The radio is not yet capable of receiving analog APRS data. However, we are constantly working on improving the radio. In the past features such as analog DTMF or talker alias have been added free of charge for our customers. We will continue that route. The DB25-D, DB40-D and GD-88 all come with the very same user menu and share the very same CPS. Features we add for one of those radios will, whenever that´s technically possible, also be added to the other radios.

21 Where to find support material

Please kindly note that all the firmware, software, and user manuals can be found in the Support area of our official website by following these steps:

https://www.radioddity.com/ → Support → Radioddity → click on the appropriate radio model

As for the Radioddity DB25-D the resulting support page will look similar to the following:



As soon as any new file becomes available (such as firmware updates, updated manuals or others), it will be published within our support area.

Notes:	*The 'Manual' section is underneath the 'Software' section. Use the red scroll bar to the right to navigate there.*

We would like to thank all Radioddity customers for their constructive feedback.

If you do find any bug in the radio's firmware, our CPS, this documentation or if you are missing a feature, you would have expected, write an email to support@radioddity.com. In general, the software- and firmware-updates for your Radioddity DB25-D, Radioddity DB40-D and Radioddity GD-88 are free of charge. Using a CPS or a firmware not originating from Radioddity may void your warranty.

Thank You for Shopping at Radioddity!

FIND TUTORIALS, SUPPORT AND MORE AT:

https://www.radioddity.com/

https://www.facebook.com/radioddity

https://www.youtube.com/c/Radioddityradio