BAOFENG DM-1801

Programming Guide

PREFACE

Thank you very much for choosing our BAOFENG Dual Band Digital DMR and Analog two way radio. This radio adopts the latest advances in technology, providing reliable communication in today's demanding communication environment.

This radio offers both DMR digital and analog communication, introduces innovative DMR digital processing system to achieve SMS, high-audio quality and digital encryption. It offers great stability, and reliability, together with long distance communication as well as fashionable design and compact exterior lines. This radio has Text Messaging, Recording, Voice Message, Digital Encryption, Emergency Alarm, Analog DTMF; CTCSS/CDCSS encode/decode functions.

PROGRAMMING NOTES

When programming the radio, start by reading the factory software data, and then rewrite this data with your frequency etc., to a new saved code plug, otherwise errors may occur.

You can use the programming cable with a PC to program the frequency, channel type, power etc. you programming must comply with your FCC (or other country) license certification.

European Users should note that operation of this unit in Transmit mode requires the operator to have a valid Amateur Radio License from their respective Countries Amateur Radio Licensing Authority for the Frequencies and Transmitter Power levels that this Radio transmits on. Failure to comply may be unlawful and liable for prosecution. At this subject, refer to the "EU" specification guide 2014/53/EU.

PROGRAMMING GUIDE

The programming software and code plug programming guide are available for download from BAOFENG website:
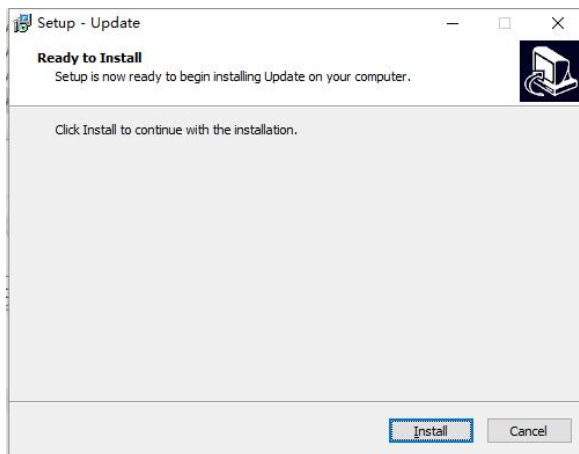
https://www.baofengradio.com

When programming this radio for the first time, it is recommended you first READ the radio with the software and then save this file for future reference as it contains the default programming and settings. In addition, after you READ this radio with software, first make you programming and frequency changes, and then write the edited file to your radio.

You will need the programming cable to connect your radio to your computer for programming.
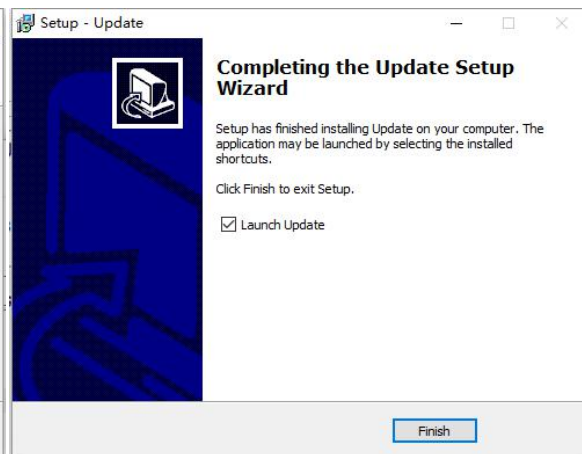
To perform firmware upgrade, Press SK1 and SK2 key then turn on the power and volume switches to enter firmware upgrade mode.

1. Firmware Update

1.1. Install the Update tool software (software name Update v1.0.4.3) and run the setup.exe file.
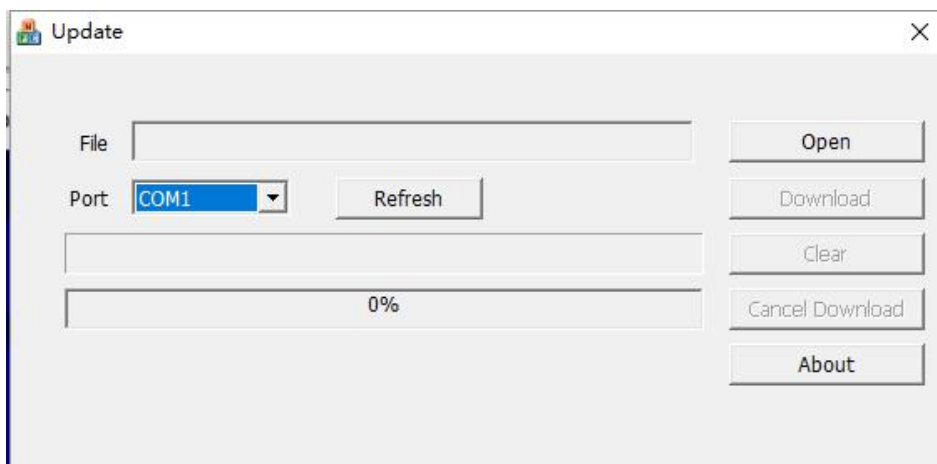

Picture 1: Update Install   **Picture 2: Update Install**

1.2. Firmware Update Operation

1) Use the programming line to connect the machine to the computer.

2) Click the update software on the computer and select the correct serial port.

3) Press and hold SK1 and SK2 to turn on the light, then the green light will be on.

4) Click on the upgrade software to "Open" and load the upgrade package.

5) Click the "Download" of the upgrade software and wait for the upgrade to succeed.
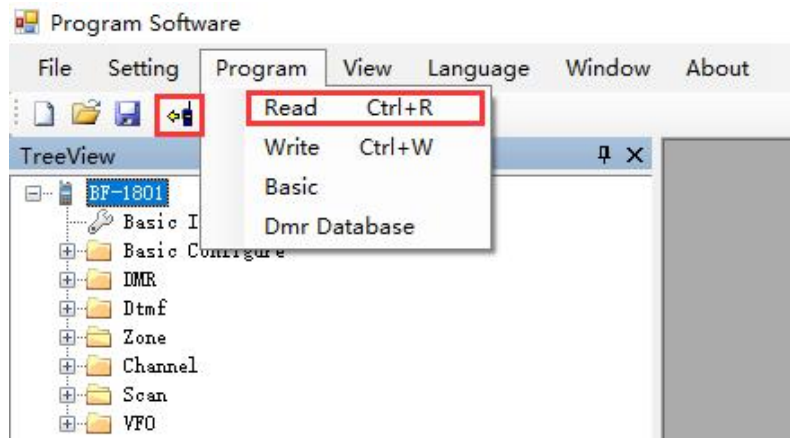
6) Shut down and reopen.

Picture 3: Firmware update

2. Programming the DM-1801

NOTE:

If you need to configure this product parameter yourself, please follow the steps below!

Before programming your radio, read the current information from the radio to your PC to create an initial CPS template and at the same time backup the factory data for future use.

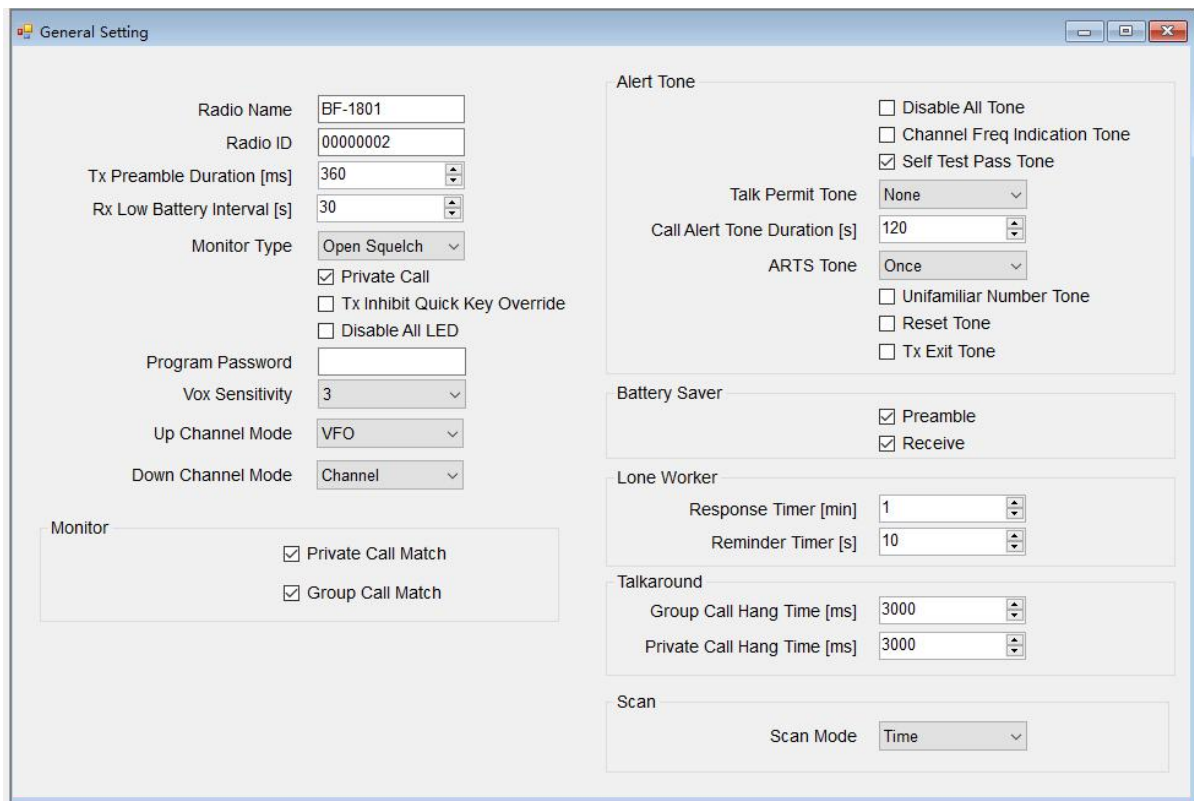When reading or writing data from or to the DM-1801, the software offers various possibilities:

Picture 4: Read data

2.1 Read data

To read in all frequency settings as well as further settings from your DM-1801 radio, use this option.

3. General setting

The DM-1801 radio supports quite a bunch of general settings. To get there use 'Edit' -> 'General Setting'
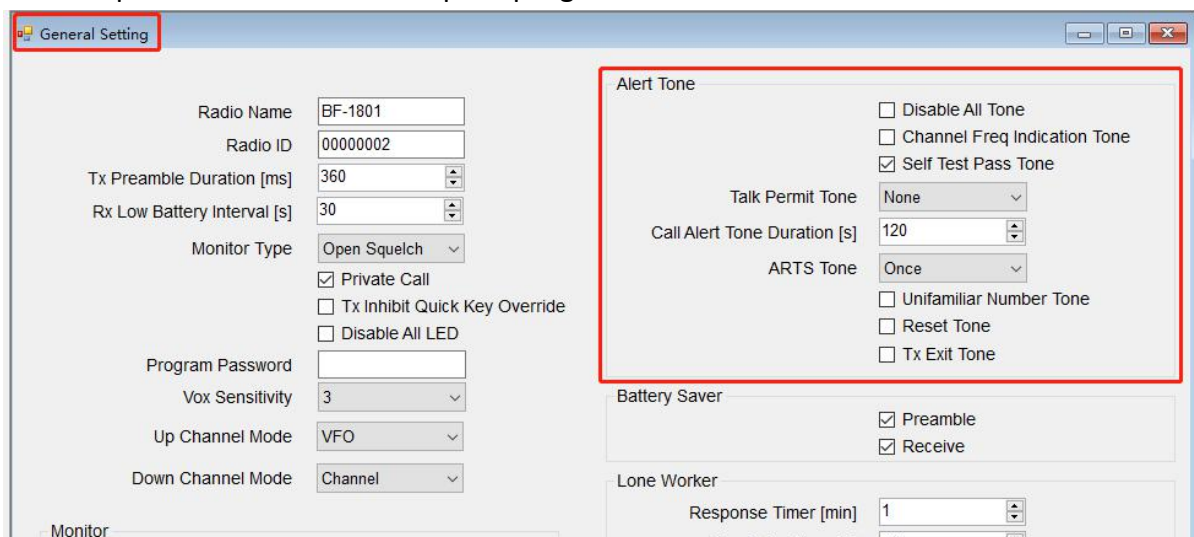
Picture 5: General Setting

The following topics described those parameters used more often.

3.1 Alert Tone

The four parameters refer to tone prompts given in certain cases.

Picture 6: Alert Tone

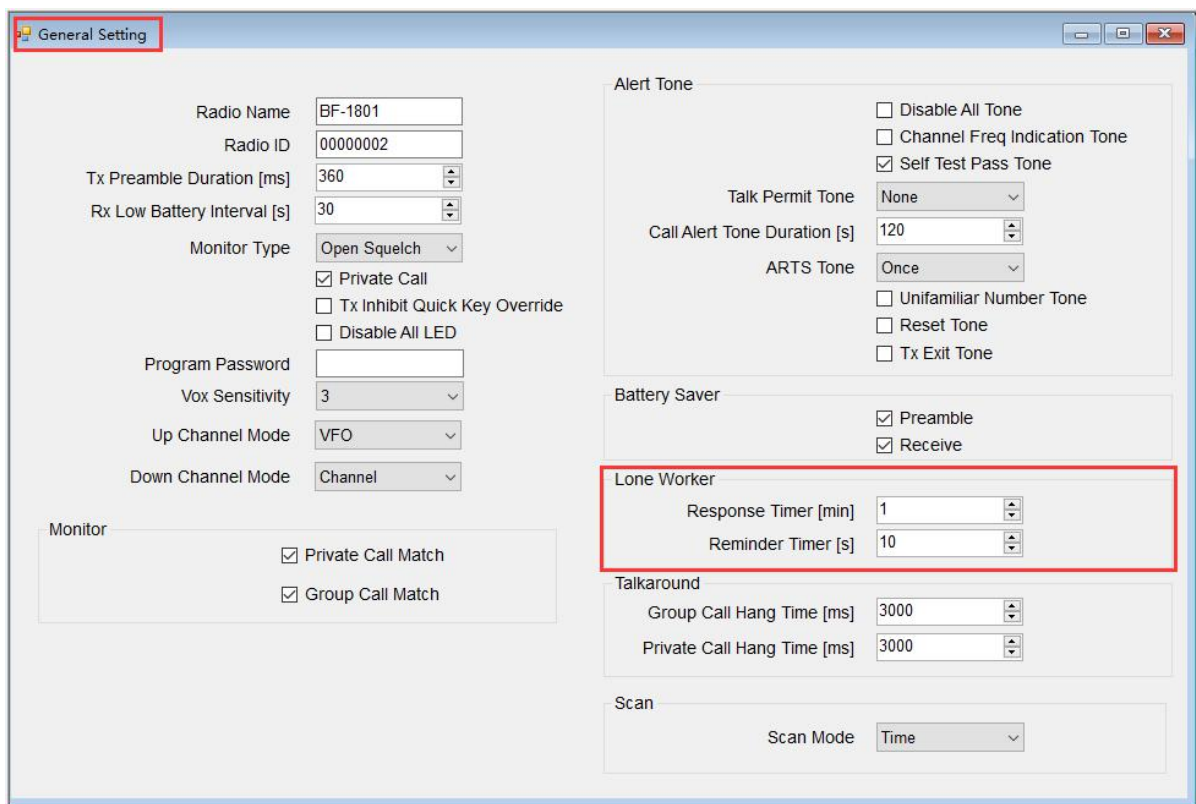If you check 'Disable All Tone', you will not hear any prompts, even if you check 'Channel

Free Indication Tone' or 'Talk Permit Tone'. Both options would no longer be supported.

Channel Free Indication Tone: Indicates if the current channel is not transmitting and receiving, indicating a free channel.

Talk Permit: This alert tone sounds after the Push-to-Talk (PTT) button is pressed and the radio is able to transmit on the channel. This is to prompt the user to begin speaking.

3.2 Lone Worker

Lone Worker: This functionality is for establishing a convenient rescue. 2 operators have both started their separate work. If one of them does not perform any action during the set time (including pressing the PTT button, turn the knob) or pressing the button light), the other one will receive an alarm tone within a certain time.
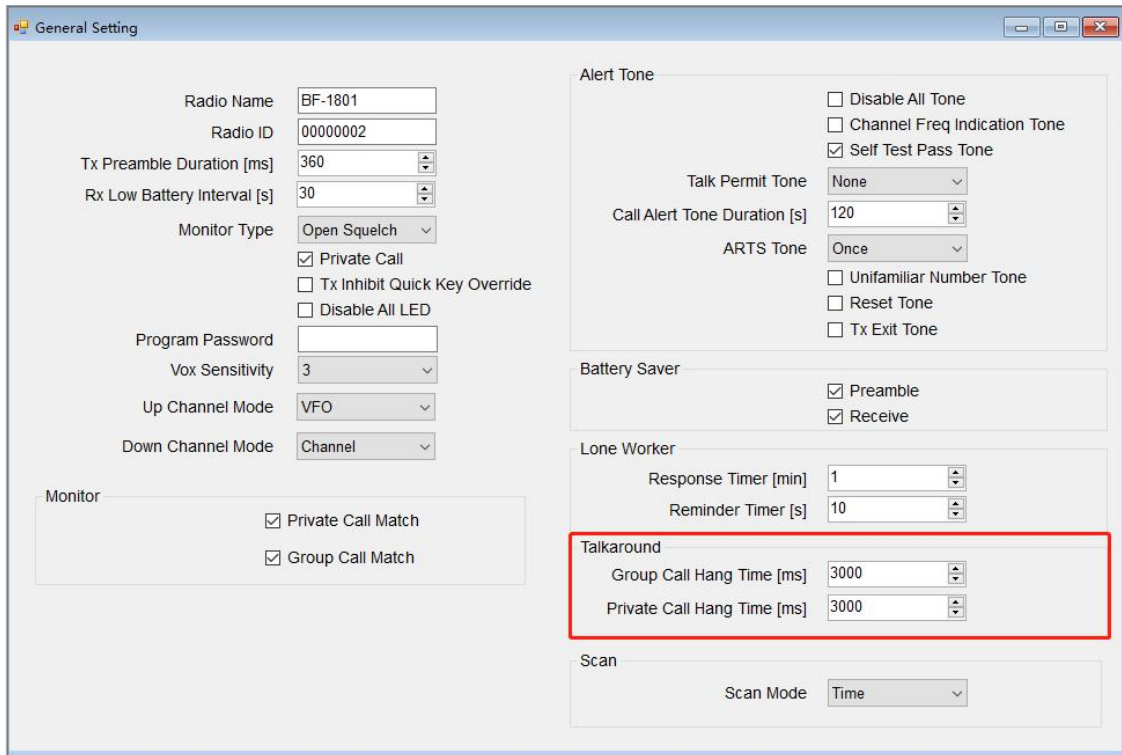

Picture 7: Lone Worker

With the corresponding settings, this function may be adjusted to the personal needs.

3.3 Talkaround

When the Talkaround function is activated, the transmission and reception frequencies are exchanged with each other. You would only activate that function if you can no longer reach the repeater you had been working on, but knowing that the other station is in direct reach.
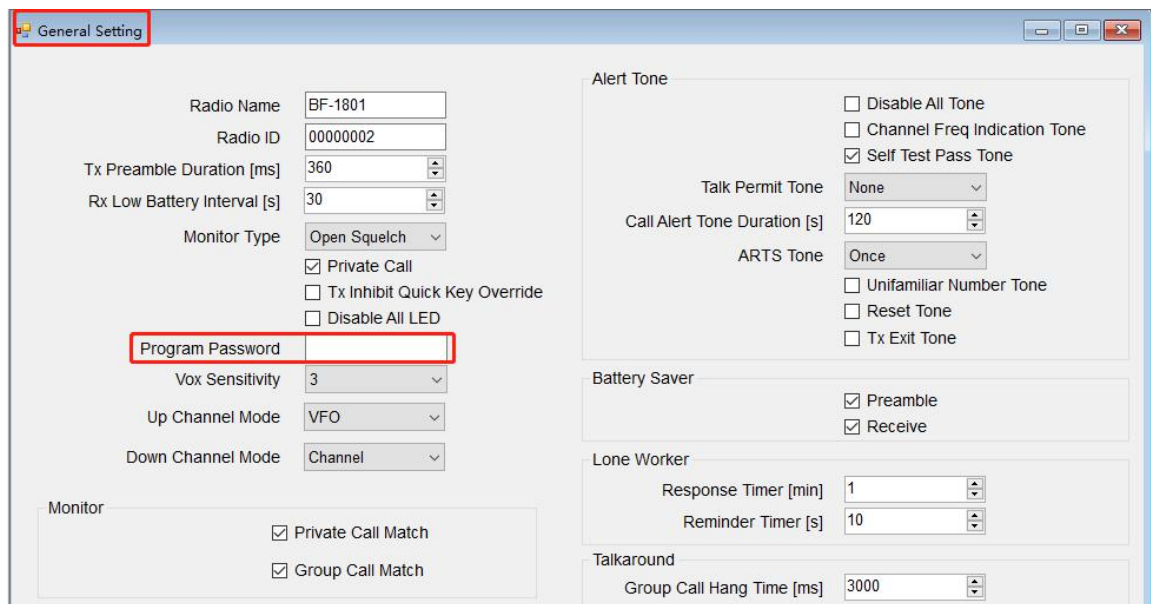
Picture 8: Assign Talkaround

4. Basic settings

There are a few settings that do require special attention.

- If you set PC programming password, you must remember this password. If you forget it, there will be no way to retrieve it.
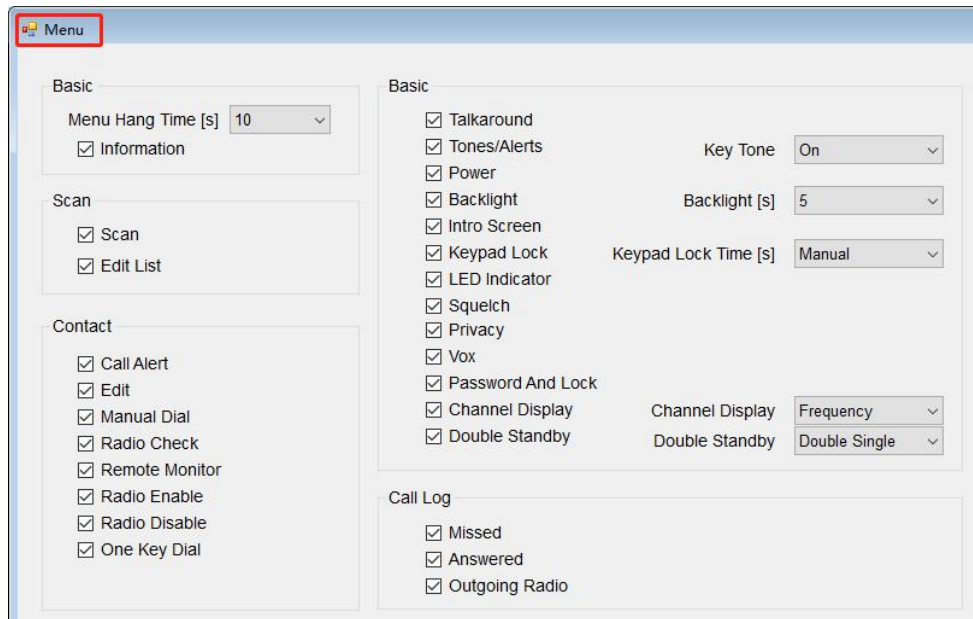

Pict

ure 9: Program Password

5. Menu Item

The menu classifies the functions of the radio and is the interface between the radio and the user. The menu settings make it easy for the end user to operate on certain functions.

Often not all those menus that are available are really required by the user. Thus in order to ease operation, you may disable certain menus to your personal requirements. Using 'Edit' -> 'Menu' you navigate to the corresponding configuration page within the CPS.

Picture 10: Menu Item

Those menu functions checked will later be displayed in the various menus of the DM-1801 radio. Those not checked will not be displayed and not become accessible on the radio.
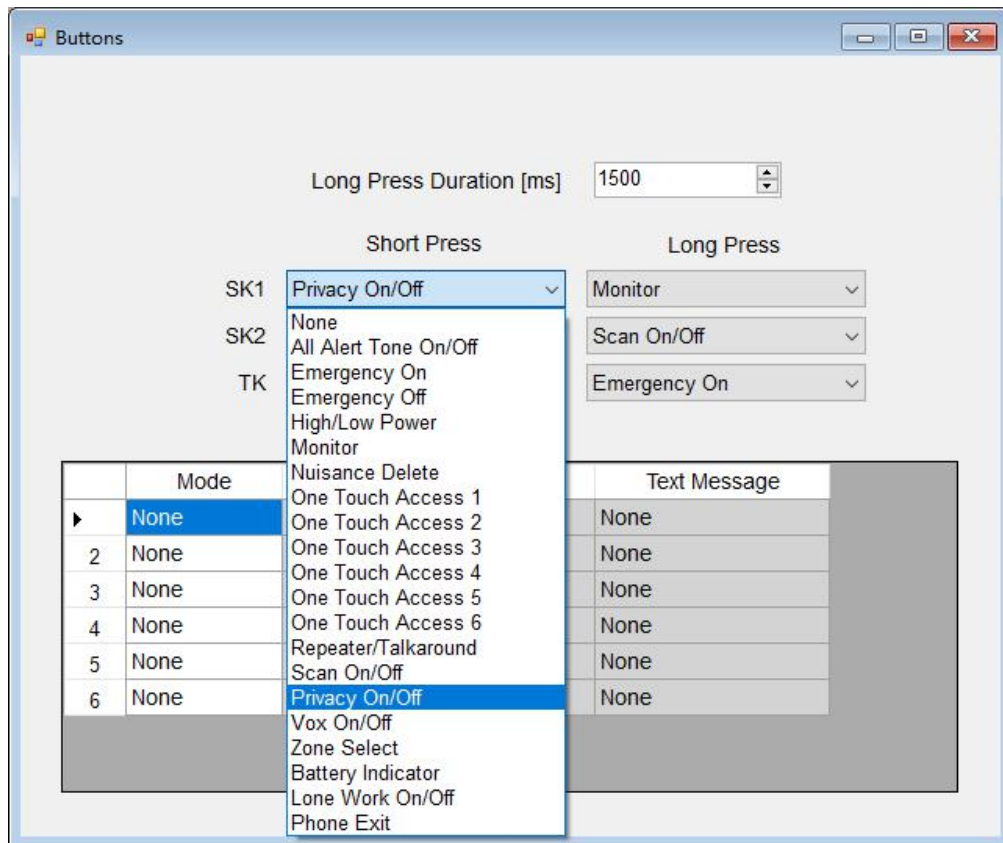
6. Button Definitions

There are various buttons definitions possible:
- Radio Buttons
- One Touch Access
- Number Key Quick Contact Access

6.1 Radio Buttons

The radio buttons may even have two different functions assigned. One of the functions is been activated on a 'Short Press' of the corresponding keys whereas the other one requires a 'Long Press'. The 'Long Press Duration(ms)' defines the time period required to keep the key pressed in order to activate this 'Long Press' function.

Picture 11: Radio Buttons

Each of the keys has a function activated on 'Short Press' and another one activated on 'Long Press', resulting in a total of 10 different functions being directly accessible.
Those are your options:

• None	• One Touch Access 6
• All Alert Tones On/Off	• Repeater/ Talkaround
• Emergency On	• Scan On/Off
• Emergency Off	• Privacy On/Off
• High/Low Power	• Vox On/Off
• Monitor	• Zone Select
• Nuisance Delete	• Battery Indicator
• One Touch Access 1	• Lone Work On/Off
• One Touch Access 2	• Phone Exit

Remark:
Those functions related to recording of transmissions are currently not available.

6.2 One touch access

There is a total of six 'One Touch Access' options. Each of them with its own 'Mode', 'Call',

'Call Type' and 'Message/Encode'

Picture 12: One Touch Access

- **Mode**: select either 'Digital' or 'Analog'
- **Call**: If you select analog mode, this option is ignored. If you select digital mode, it will define the 'Digital Contact' to be used.
- **Call type**: In "Analog' mode, there will be four types of DTMF for you to choose from: 'DTMF Call'. In 'Digital' mode, you can choose between 'Call' and 'Text Message'.
- **Message/Encode**: If 'DTMF Call' has been selected as 'Call Type', this option defaults to encode '1'. If 'Text Message' has been selected as 'Call Type', you will be able to choose one of the preset SMS within the menu 'Text Message' you have defined already.
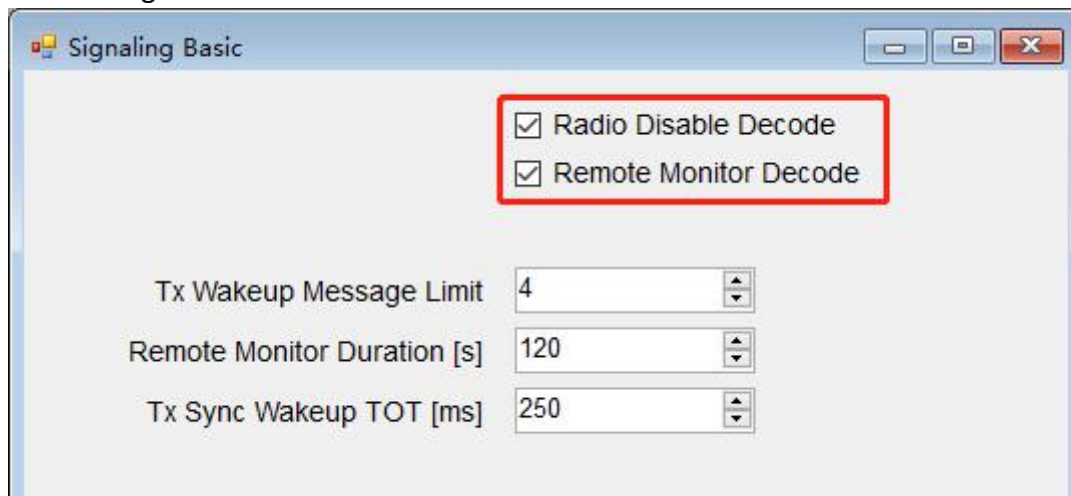
6.3 Number key quick contact access

The numerical keypad of your DM-1801 has 10 numerical keys, numbered 0..9. Each of those keys can be connected to one of the defined digital contacts. In order to access one of those assigned digital contacts, press and hold the corresponding numerical key.

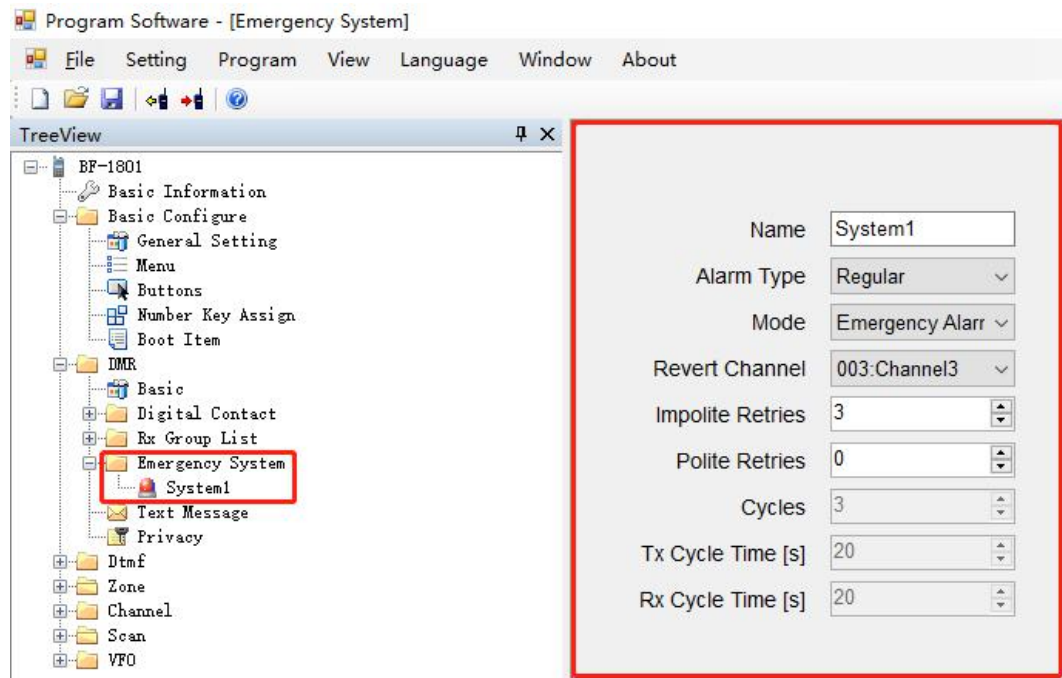**Picture 13: Number Key Quick Contact Access**

7. Signaling Basic

Set whether the intercom enters the remote state or is activated when receiving the remote/activate command. After the radio is remotely tuned, it can be remotely monitored, but other functions cannot be used. At this time, the radio can only be activated by writing or receiving an activation command.

Picture 14: Signaling Basic Setting

8. Emergency System

The availability of a digital emergency system depends on the digital network used. Select 'Edit' -> 'Emergency System' and selected the system to edit.
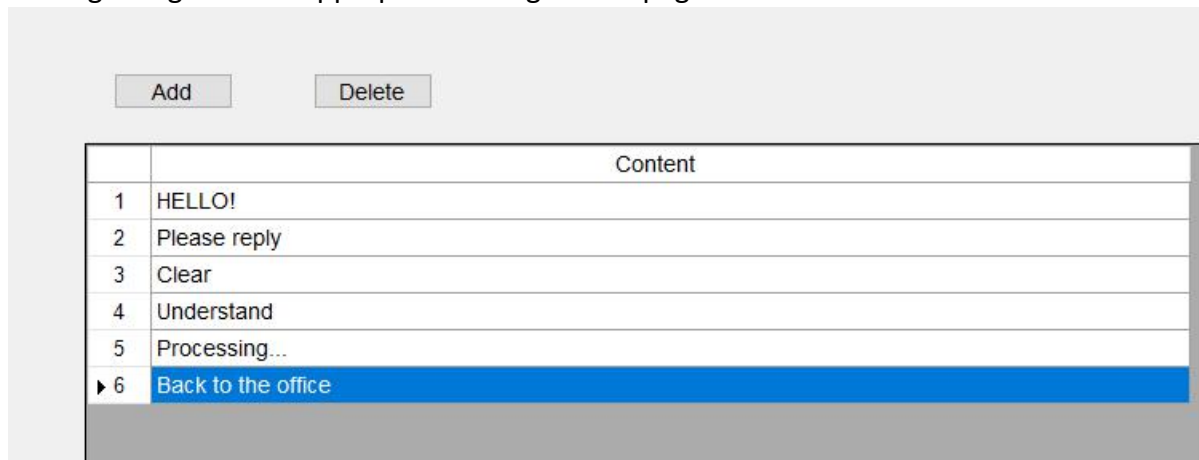
Picture 15: Emergency System

Name	This entry displays the name of the system. The user can enter up to 8 characters. Valid characters include letters, numbers, spaces, and special characters.
Alarm Type	An alarm is a non-voice signal that triggers an alert indication on another radio. This feature specifies the behavior of the initiating radio's alarm when the emergency button is pressed.
Mode	Defines the radio's behavior when the radio's emergency button is pressed.
Impolite Retries	An impolite transmission is a transmission that occurs even when there is activity on the current channel. The radio tries a number of impolite transmissions to get an acknowledgement and then goes on to try a number of polite transmissions. This feature sets the number of attempts to transmit an emergency alarm impolitely.
Polite Retries	A polite transmission is a transmission that occurs only when there is no activity on the current channel. The radio tries a number of impolite transmissions to get an acknowledgement before trying a number of polite transmissions. This feature sets the number of attempts to transmit an emergency alarm politely.

9. Text Message

You can edit the quick text messages that you use frequently. After you save them to your

DM-1801 radio, they all will be available in your 'Quick Text'-folder. You can easily send them to the people you need to send without additional editing. Select 'Edit' -> 'Text Message' to get to the appropriate configuration page.
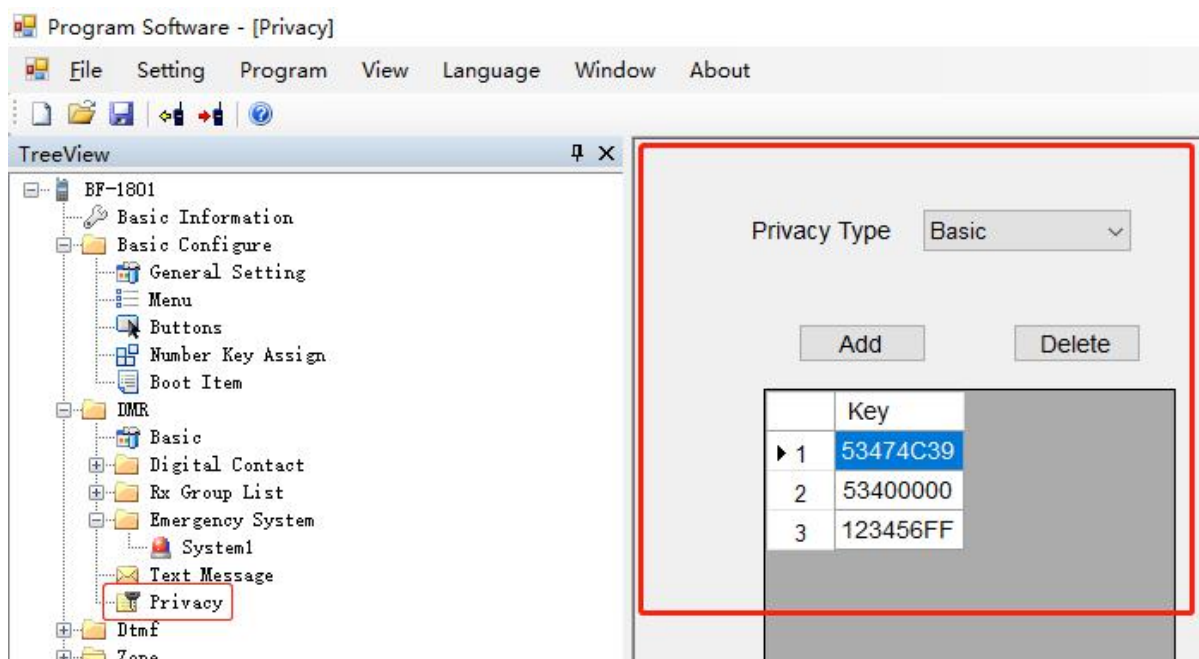

Picture 16: Text Message

10. Privacy Setting

Digital encryption is also supported by your DM-1801 radio. You can set the corresponding digital encryption password. The person you are talking to can only hear your voice by setting the same encryption password as you, avoiding other people hearing your call. Select 'Edit' -> 'Privacy Setting' to get to the appropriate configuration page.

Note: Configure the encryption key for the machine. The key is 32 or 64 bit characters, including 0-9, A-F.

Picture 17: Privacy Setting

> *Hint*:
> Encryption might not be allowed in your network.

11. DTMF

DTMF (Dual Tone Multi-Frequency) is a coding technique that uses two specific single-audio combined signals (high and low frequency groups) to represent digital symbols to achieve a certain function.
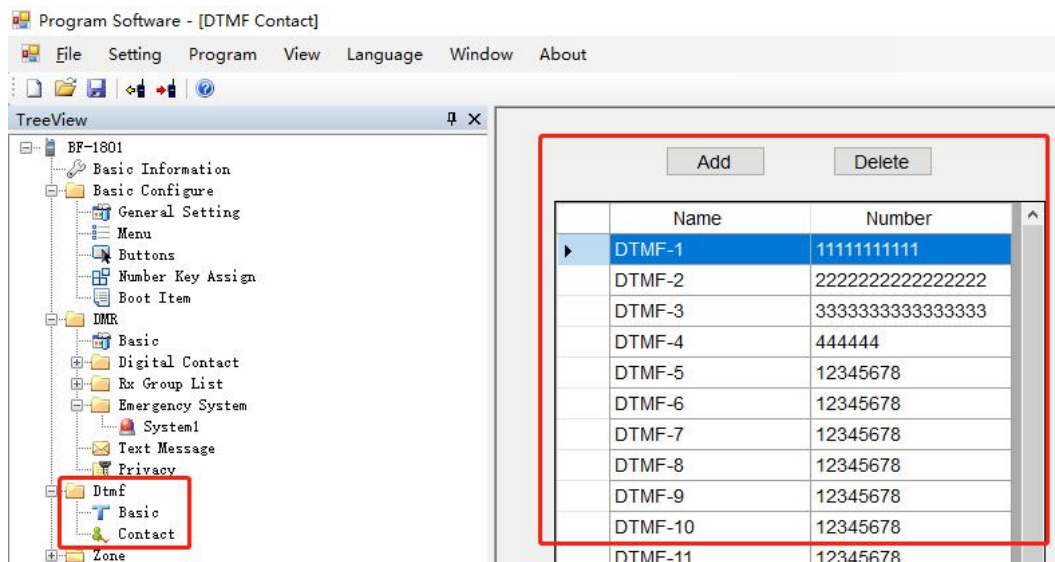
After the walkie-talkie enters the telephone system, it can initiate or receive a telephone call. This call is based on DTMF signaling.

11.1 Basic settings

Picture 18: DTMF Basic Setting

11.2DTMF Contact

Picture 19: DTMF Contact Setting

12. VFO Mode

The VFO mode is the similar to the normal channel mode in terms of the various parameters. Select 'Edit' -> 'VFO' to get to the appropriate configuration page.

Picture 20: VFO Mode

- The displayed mode can be set in the overall general settings.
- Frequency mode is the basic mode of manual input frequency.
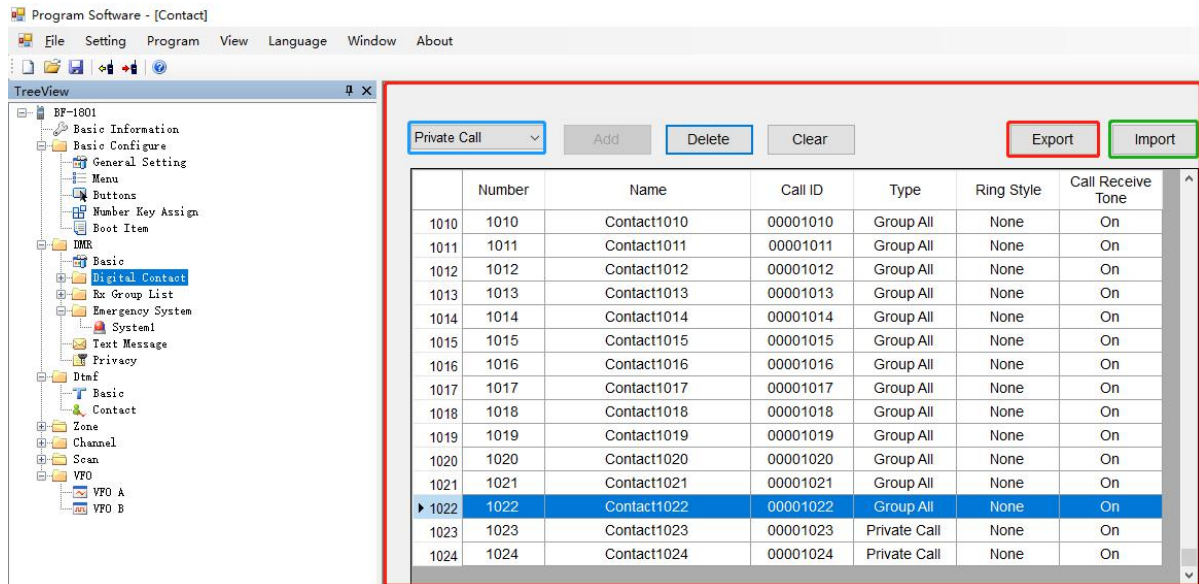

Picture 21: General Setting - VFO

13. DMR Parameter Configuration

13.1 Configuring Digital Contacts

Store up to 1024 Contacts.

Select 'Edit' -> 'Digital Contact' in order to work on those digital contacts.
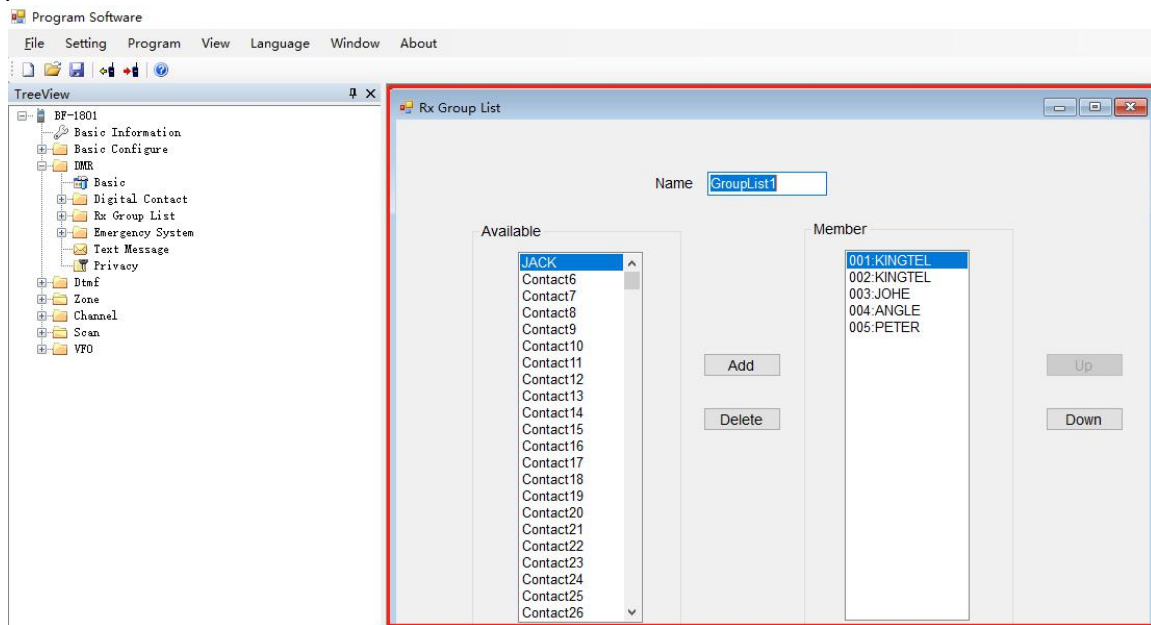

Picture 22: Digital Contacts

No	Entry within the list of digital contacts
Contact Name	Name to be displayed for this digital contact
Call Type	You may select between: • Group Call • Private Call
Call ID	ID for a digital call member or talk group. This ID is used to identify and communicate with a target radio (DMR ID) or group of radios (TG) depending on the call type
Call Receive Tone	An alert tone sounds on the receiving radio prior to unmooring during a 'Group Call', 'Private Call'. This feature is set on a per-call basis.

13.2 Configuring RX Group List

You will require a so called 'RX Group List' for your Channel settings. Creating such a group allows you to put your configured 'Contacts' into logical groups so they can be contacted.

- Up to 76 individual RX Groups can be created and named to identify each group.
- Each group can contain as few or as many contacts as convenient.
- Groups should be named according to their group members (Digital Contacts).
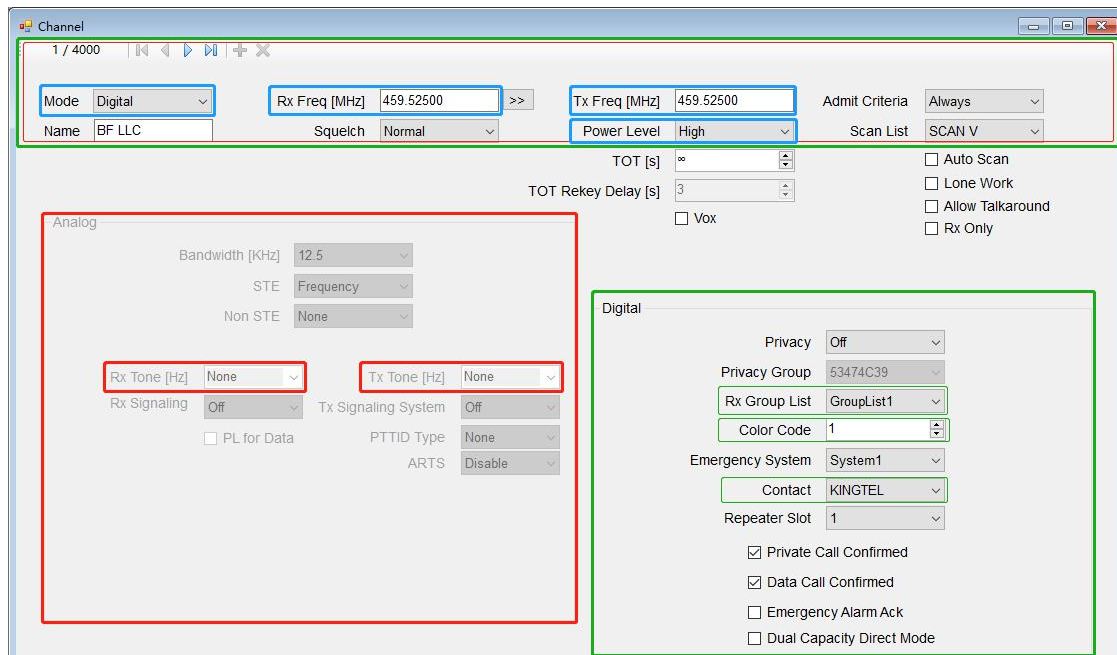- Only contacts set as group calls can be added to a group

To work on such groups use 'Edit' -> 'RX Group List'. A typical group may look like shown in the next picture.

Picture 23: Typical Digital RX group

13.3. Configuring Channels

The DM-1801 offers up to 1024 channels for UHF and VHF. To start double click on the first line No.1 to open the Channel Information window for that channel:

Picture 24: Channel Information

Let's have a very short explanation of all those fields:

Name	The name of the channel (should be unique)
Mode	Select 'Analog' and 'Digital'
Rx Freq[MHz]	the VHF or UHF frequency
Tx Freq[MHz]	the VHF or UHF frequency
Scan List	Select which Scan List(s) will be scanned
Squelch	Tight/Normal squelch selection, only for analog mode
Admit criteria	Selects PTT transmit criteria – typically same Color Code
Lone work	Check if the 'alone" emergency function should be allowed
TOT	the radio can continuously transmit before a transmission is automatically terminated
VOX	Voice Operated Transmit)
Power	Select one of four levels 1W/5W
Digital	
Privacy	Select 'off', 'basic' or 'enhanced' to use for encryption.
Rx Group List	If programmed, select the RX Group List
Color code	Select which Color Code (CC) is related to this channel
Emergency	Select emergency system
Contact	Talk Group (TG) to be assigned to this channel
Repeater Slot	Select which slot (1 or 2) applies to this 'Channel'
Analog	
Band Width	Select the bandwidth for transmission
Rx Tone	Select Off or CTCSS or DCS and tone frequency
Tx Tone	Select Off or CTCSS or DCS and tone frequency
RX signaling System	Select off, DTMF
TX signaling system	Select off, DTMF

> **Note:**
> *Repeater Slot is only available in DMR digital trunk mode, or dual capacity direct mode.*
> *Once completely filled in, click OK to save this Channel.*

13.3.1 Spread Sheet Option

For large amounts of channel data, this may be a desired method as it allows cut and paste of large amounts of data. This is especially desired when adding multiple repeaters with similar configurations.

The current channel configuration can be exported to a csv file, enhanced and finally imported back to the CPS.

Picture 25: Channel List Import

> *Hint:*
> *Always save data files for recovery purposes.*

13.4. Zones to bundle channels

Creating a 'Zone' allows you to put your previously configured 'channels' into logical groups so they can be accessed.

- Up to 150 individual zones can be created and named to identify each channel group.
- Each zone can contain as few or as many channels as convenient.
- Zones can be named to identify repeaters, functions, etc.
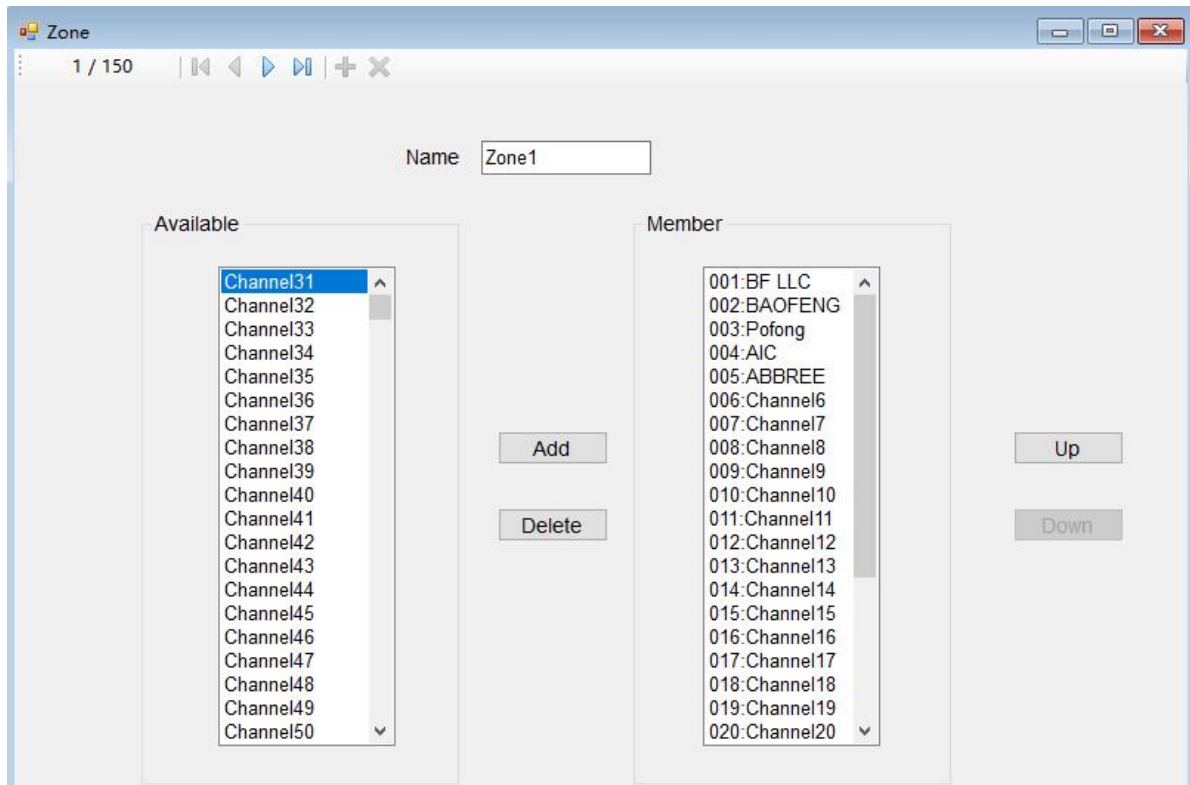- The channels in each zone can be sorted or rearranged in any order.

Picture 26: Zone Basic Information

Picture 27: Zone Information

13.5 Scan List

A 'Scan List' is a group of channels to be monitored when the 'Scan'-function is been activated using one of the programmable function keys. The DM-1801 has the capability of storing multiple scan lists per channel.

1. Select Scan List from the left column
2. Double click on the first open line
3. Enter a name for the new Scan List
4. Highlight the channel name you want to appear in the list and press 'Add>>'.

Up to 32 channels can be loaded into an individual list. You also have the ability to sort or rearrange the channels in this list. The scan list will later be assigned to a channel of your choice during the setup of a channel (see section on channels).

Picture 28: Scan List

Name	Name given to group of scanned channels
Available	Will list the channels available to scan
Member	List of channels to be scanned
Talkback	Determine if the user can transmit on the channel on which it sounds during the scan.
Channel Mark	During the priority listening process, the radio will sample the members with higher priority and the members with lower priority.
TX designated channel	This feature defines the conventional channel/trunking personality on which the radio will transmit if the user presses the Push-to-Talk (PTT) button while the radio is scanning.
Priority Channel select	Select the priority channel or 'off'
Signaling Hold time	Sets the amount of time that the radio waits on an analog scan list channel when a carrier signal of sufficient amplitude is detected on the channel. This pause allows the radio to decode the analog system signaling data. If the decoded information is incorrect, the radio reverts to scan.
Priority Sample time	Sets the duration that the radio waits, when in a call, before scanning the priority channels. If the call is taking place on a Priority 1 Channel, no scanning will take place. When scanning priority channels, the radio briefly mutes the current transmission. Increasing this interval improves the audio quality of the current transmission as fewer checks are done, but this also increases the chance of the radio missing out priority channel activity.

Priority Channel 1	Sets which channel is priority 1
Priority Channel 2	Sets which channel is priority 2

> **Note**:
> You can add the same channel to multiple scan lists.

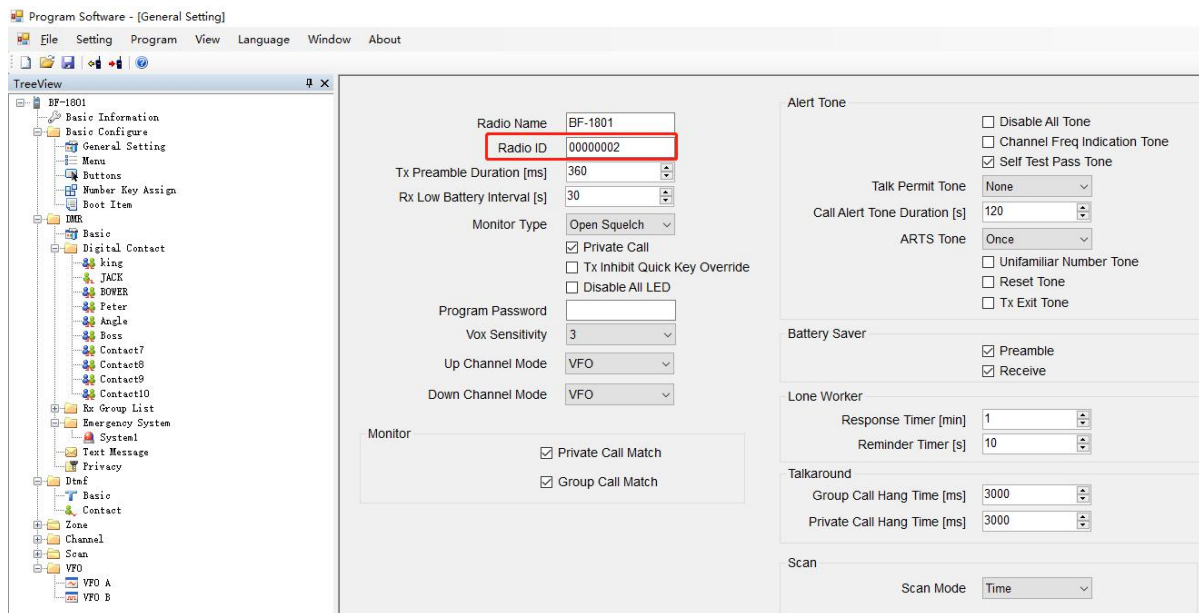## 13.6 Request a valid DMR RADIO ID

To operate on the DMR network, you must register for a DMR identification number. This can be done at https://www.radioid.net/or https://register.ham-digital.org/, depending on where you live.

Normally new DMR IDs are issued within 24 hours.

Your DMR ID can now be entered into the CPS.

- Click on 'Edit" ->'General settings"

Picture 29: store your call sign and your DMR Radio ID

> **Note:**
> Never ever operate the radio using an ID that is not issued to yourself. Within amateur radio networks this may result in losing your license.
> The radio ID of each handheld terminal must be unique and cannot be duplicated with the ID of other terminal.

14. Write data to radio

After you have completed all the above steps, you can write the data to the DM-1801 radio.

Note:

Whenever you have made your changes and additions to the settings of your DM-1801 radio use this option to write your settings to the radio.