Programming Manual

MBR-400

UHF Transceiver

maxon®
COMMUNICATIONS MAXIMIZED

11535 W, 83rd Terrace Lenexa, KS 66214
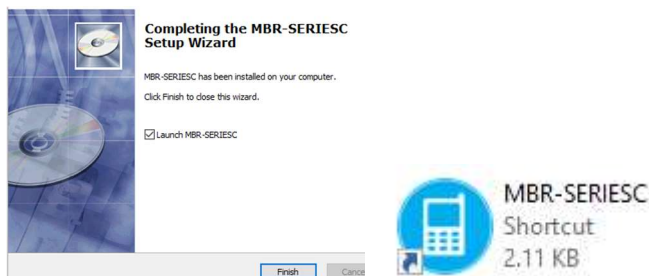
Contents

Your MBR-400 radio is programmed to communicate with other MBR-400 radios out of the box. However, in the event that you need to enable/disable certain basic settings or if your radio encounters unwanted interference with another radio, we provide basic programming software to change your radio's 16 channels to other available itinerant Jobsite frequencies & also enable some basic radio functions you can manipulate via your radio settings menu.
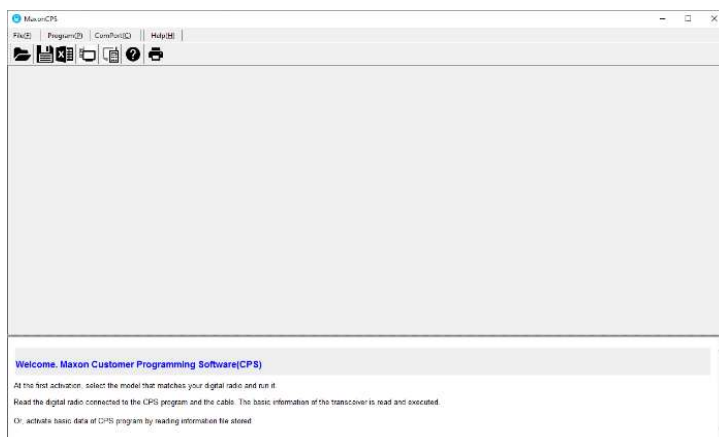
- This software can be purchased at (https://maxonamerica.com/product/mbr-400-business-radio).

- Please use the instructions below to help program your radio with the **MBR-400 CPS SW (Consumer Version)**.

- Advanced Radio features and additional Channel manipulation can be done through a Maxon dealer. *(www.maxonamerica.com/find-a-maxon-dealer/)*

1. Program Installation

Insert the CPS Programming SW CD into the computer and install the **ACC-MBRC** Programming Software. Click through any file warnings during install. Next step is to plug the ACC-3320E Programming Cable into your computer. The computer should recognize the cable as new hardware. If not, you may need to install the driver for the cable. It is located on the CD as **CP210x_VCP_Win_XPS2K3_VISTA_7**. Also, if the computer is hooked to the internet, it can automatically search for the correct driver.
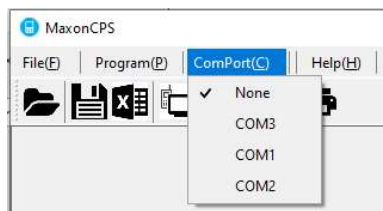

With the software installed, click on the icon to start the program. When it runs it starts with a blank screen. You can either open a saved file or read the radio. **We recommend READING the radio first if this is your first time using the CPS Software.**
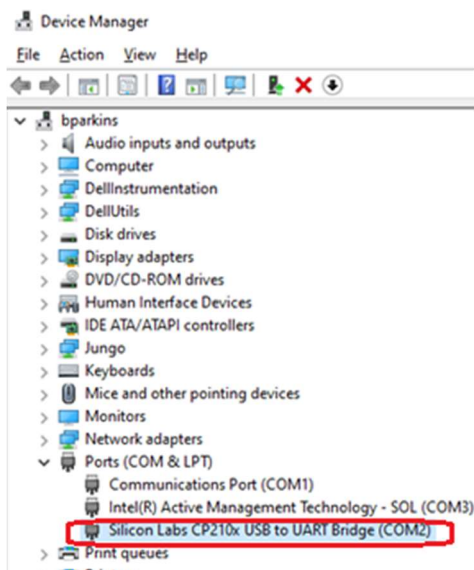
2. Reading the Radio

To read the radio, plug the dual pin plug into the side of the radio and power it on by pressing and holding the light gray side button. Release button when you see it power up.

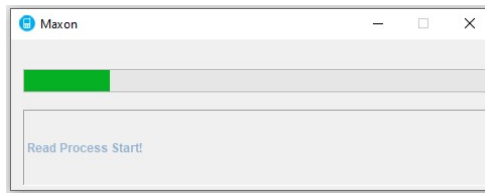Next select the correct port. Only the ports availble will be displayed.

If unsure of the correct port number, go to the Device Manager on your PC and look for the port with the Silicon Labs driver software. In this case it is COM2
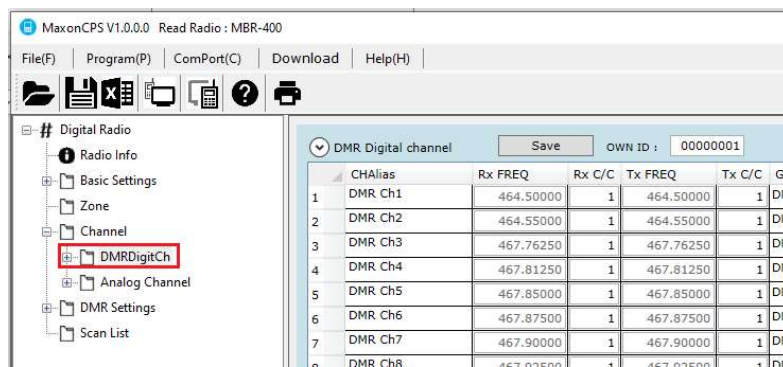
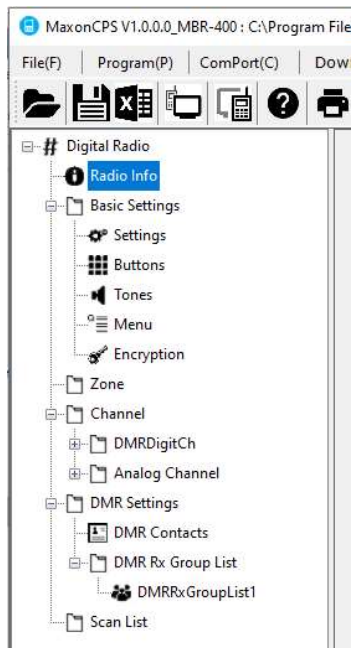On the CPS programmer you can either select the Read icon as shown or select it from the pull-down menu.

During the read process a green scroll bar will be displayed. Wait for it to complete and click OK.

All fields will populate on the screen and it will automatically display the DMR frequency screen. **This is your radio's "Codeplug".**

3. Various Screens and their Options

On the left-hand side of the programmer, a tree view is displayed showing the various options available in the radio.

Each is explained in a top to bottom order below.

a. Radio Info

Radio Information

Manufacture Information

Model Name : MBR-400

Frequency Range[MHz]: 440MHz - 470MHz

Made Date : 2308-0000

PCB Version : XB14-R3

Software Ver: V3.0.0.4

Baseband Chip Information

Baseband No . 0000430005446166

Base Band Ver: V3.01.01B7

Model Name: Model name of the current radio.

Frequency Range: Allowable frequencies to be entered into the radio.

Made Date: 2308 stands for 2023, August. 0000 currently unassigned.

PCB Version: Current PCB board number.

Software Ver.: Current embedded firmware version.

Baseband No.: Unique embedded baseband chip number.

Base Band Ver.: Current version of baseband chip.

b. Basic Settings

Basic Settings

Own ID : 00000001

Radio Alias: MBR-400

Language: English

Vox Level: 2

Screen Type : Screen 3

Background Color : Bright

Remote Alert Retries: 0

Remote Alert: ☑

Own ID: This is the ID for the radio. Each radio can have its own ID. This is useful in identifying the person calling. It can also be linked to a name when assinged in the Contact List.

Radio Alias: This is the name of the radio when powered on.

Language: Can be either English or Spanish

Vox Level: VOX stands for Voice Operated Transmission which means that speaking into the microphone will cause the radio to transmit. Pressing PTT is not necessary in this mode. The Level can be set from 1 ~ 5, with 1 being the most sensitive.

Screen Type: There are 3 screen types.
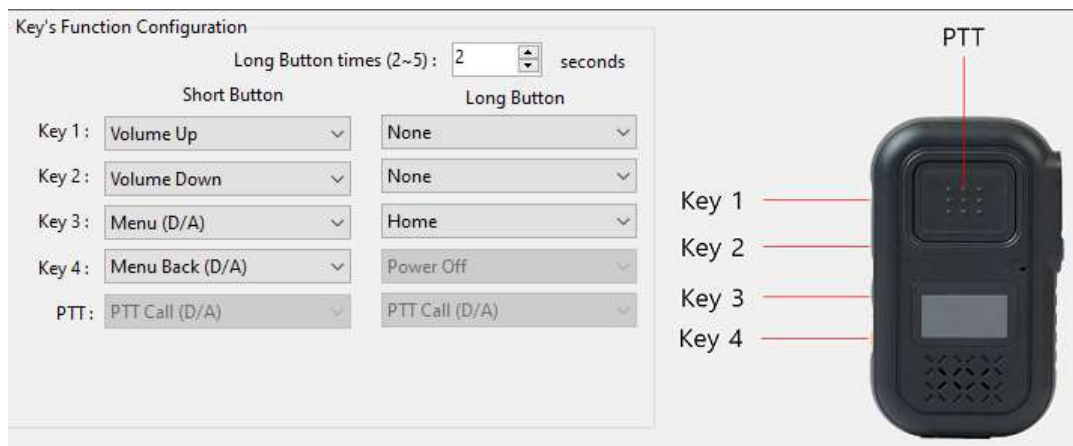
Screen 1 example: DIGITAl: 01.

Screen 2 example: CH: 01D.

Screen 3 example (Channel Alias): DMR Ch1.

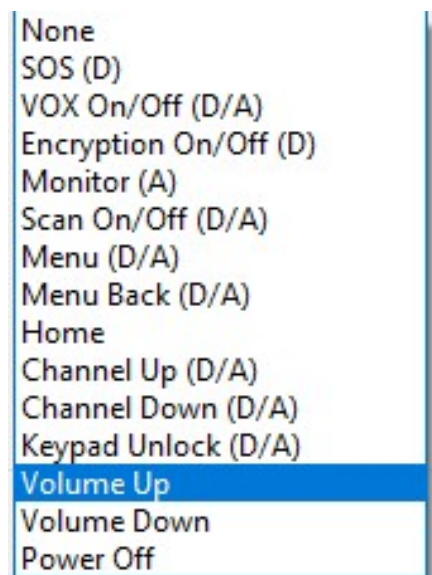**Background Color**: Bright or Dark background

Remote Alert / Retries: Allows radio to use SOS Emergency Alert button & Program # of Alert Re-transmissions after first alert (0-15).

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c. Buttons

- Button operation can either be a LONG or SHORT press.
  - Long Press duration can be set from 2 ~ 5 sec.

There are 11 available button functions that can be turned on via the CPS software. To change a button function, select the pull down menu next to the Button (Key) you want to reassign and highlight & click on the function you want to change the button to. Changes will save when you have written the codeplug back to the radio.

**** Care should be taken so that other options are available when buttons are assigned. *Ie: Remember to always have a "Keypad Unlock" & "Menu Back / Home function" assigned.*

d. Tones

Tones section of the programmer is used to turn beeps ON or OFF while using the radio. There is also LED and Backlight controls. Any tones or LED options that are checked will be turned ON when the codeplug is written back to your radio. Remote Alert Duration is the time in-between your Remote Alert (SOS) transmissions.

e. Menu

Menu Selection allows you to view and change menu items in the radio. Checking the box makes the selection visible to the user when going through the Settings, Functions, and Radio Info menus

on the radio. Unchecking the box hides the selection from those menus.

f. Encryption

Encryption blocks other users from hearing the individual transmitting unless their radio has encryption enabled and the correct encryption key. This feature is defaulted OFF in your function menu. It can be turned on / accessed using the CPS program, and can only used on a digital channel. Encryption is AES-CTR type and is compatible with most other Maxon DMR radios.

Store up to 10 different Encryption Keys. Add or Delete Keys using the "Add" or "Delete" Button.

Key length can be 128, 192 or 256 characters in length. Format used is hexidecimal so characters 0123456789ABCDE and F are allowed *(see above example)*.

g. Zone

Zone is the bank of channels displayed on the radio. **This section is where you can edit the available channels on your radio.** We will discuss how to change the channels at the end of the channels section.

Your radio has only 1 Zone available, with up to 16 channels in the Zone. Channels can be mixed of both analog and digital channels. The first channel in the zone is first channel in the radio.

h. **Channel** (178 predefined DMR Digital & Analog Channels available)

DMR Digital Channels

There are a total of 89 available digital DMR channels in the radio. Digital Channels allow you to have clearer audio and more features than Analog radio channels like Direct Call, Encryption, and SMS Texting. You can select different channels to use as your 16 DMR channels in your radio's Zone, however the frequencies in these channels are predefined and can't be changed. Only an authorized Maxon Dealer with CPS software can edit your radio's frequencies beyond what is in your available channel list. Options available are listed below.

Channel Alias: The channel name displayed on the radio when Screen 3 is selected in the Menu.

Slot: Can be set to Slot 1 or Slot 2, but we recommend keeping your radios on the same slot.

VOX: Checking this box enables VOX for the channel.

TX Frequency: The transmit frequency in MHz for that particular channel.

TX CC: The transmit color code assigned to the channel. Any number 0 ~ 15 is available. ***Your channel must have the same Color Code as the channel on the receiving radio you are trying to transmit to or they will not hear you.

TX Contacts: These are the contacts assigned in the DMR Contact List.

TX Power Level: TX power assigned to the channel. High = 2W, Low = 0.5W.

RX Frequency: The receive frequency in MHz for that particular channel.

RX CC: The receive color code assigned to the channel. Any number 0 ~ 15 is available. ***Your channel must have the same Color Code as the channel on the transmitting radio you are trying to receive from or you will not hear them.

RX Group List: These are the groups assigned in the DMR RX Group List.

Encryption: Checking the box enables encryption for the channel.

Encryption Key Index: Assigns one of the available Encryption keys.

Analog Channels

There are a total of 89 available Analog channels in the radio. You can select different channels to use as your 16 channels in your radio's Zone, however the frequencies in these channels are predefined and can't be changed. Only an authorized Maxon Dealer with CPS software can edit your radio's frequencies beyond what is in your available channel list. Options available are listed below.

Channel Alias: The channel name displayed on the radio when Screen 3 is selected in the Menu.

Analog Bandwidth: This is fixed to 12.5kHz, Narrow Band.

Tail Degree: Used to eliminate squelch tails. No Tail, 120 degrees, 180 degrees

VOX: Checking this box enables VOX for the channel.

TX Frequency: The transmit frequency in MHz for that particular channel.

TX Squelch Type: Carrier Only, CTCSS, DCS and Reverse DCS ***All your radios must have the same Squelch Type settings to communicate together on that channel.

TX CTCSS: Frequencies available are from 63Hz to 254.1Hz

TX DCS: Selectable from 017 to 754

Reverse DCS: Selectable from 017 to 754

TX Power Level: TX power assigned to the channel. High = 2W, Low = 0.5W.

RX Frequency: The receive frequency in MHz for that particular channel.

RX Squelch Type: Carrier Only, CTCSS, DCS and Reverse DCS ***All your radios must have the same Squelch Type settings to communicate together on that channel.

RX CTCSS: Frequencies available are from 63Hz to 254.1Hz

RX DCS: Selectable from 017 to 754

Reverse DCS: Selectable from 017 to 754

RX Squelch Level: Selectable from 0 ~ 5. 0 = Open, 5 = Tight

4. Changing Channels

- To **ADD** channels in your radio, simply go back to the **Zone** section of the programmer, highlight the Alias you want from the Available Channel list on the left and ADD that channel to the right (Channel Member).

- To **REMOVE** a channel, highlight the Alias you want to remove on the right hand side (Channel Member) and select Remove.

- To **REORDER** Channels in your radio, go to the Channel Member list, highlight the Alias you want to move and select either Up or Down.

i. DMR Settings

DMR Contacts

Contacts are only used on Digital Channels. There are 3 types of Contacts: Individual Call, Group Call and All Call. During radio operation, the user can select if they want to talk to a particular user (Individual Call), make a call to a specific set of users (Group Call), or call everyone on the channel (All Call).

Each radio can be setup for a specific ID which means that each radio can be called specifically for a private conversation. The ID can also be made a person's name or department. This is the **Call Alias**.

The radio supports a maximum of 54 DMR contacts. Contacts can be added by clicking on the Add button. Contacts can also be inserted into the table or deleted. You can also adjust the Call Type when you create or insert a contact.

j. DMR RX Group List

There is a maximum of 10 Group Lists. Each channel can be assigned to receive any of these lists.

The Groups are created in the Contact List and then arranged In the RX Group List. Groups can be add, removed and moved up or down in the Group Member list. Moving a group from Available Contacts to Group Members places the group in the RX Group List.
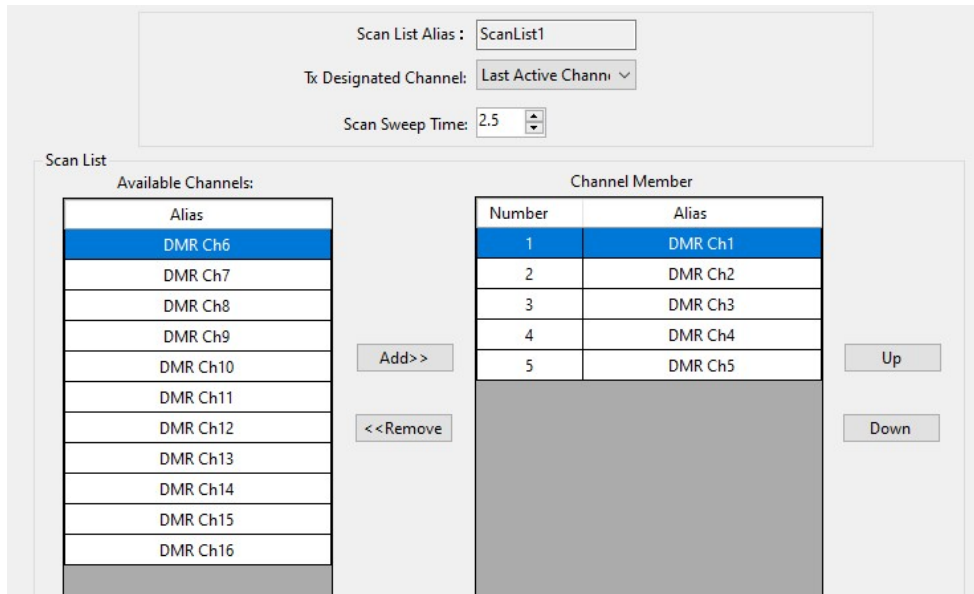

k. Scan List

There is one scan list in the radio. A button can be programmed to take the radio in or out of scan mode. This can also be done through the menu on the radio once the function is activated.

Below, **Scan List** shows the availble channels that can be moved into the **Channel Member** list. Channel Members are the channels that will be scanned when scan is started.

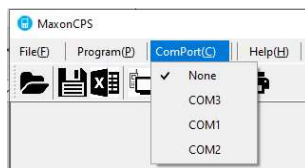There are 2 types of **TX Designated Channel**, they are:

1. **Last Active Channel**: The radio will transmit on the last channel it received.

2. **Current Channel**: This is the channel from which scan was started. If a call comes in on a channel that is not the Current Channel, TX is possible on the received channel as long as it is within the Scan Sweep Time. When scan resumes, transmit is on the Current Channel.

Scan Sweep Time: Sets the duration that a radio takes to scan a list of channels during idle period. This timer starts when a call is over and resumes scan when this timer expires. Adjustable from 0 seconds to 10 seconds.
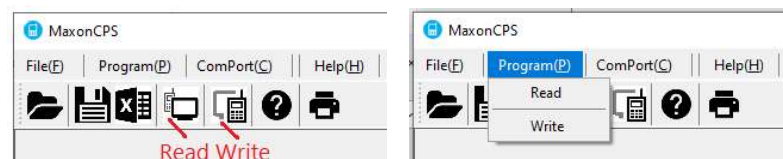
5. Programming/Writing to the Radio

Once all changes have been made in the programmer it is time to **WRITE** to the radio.
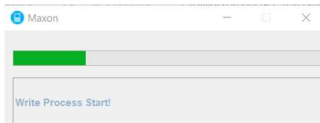
1. Click on the ComPort(C) tab and select the correct port number.

2. Next click on the **WRITE** icon or select **WRITE** from the Program(P) tab.
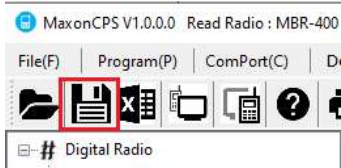

3. Wait for the scroll bar to finish and the radio will reboot.

4. Unplug the cable. You are done! You can plug up additional radios (radios need to be turned on) and write your changes to the next radio using the same process from #2 above or re-start the process of reading the radio to edit the codeplug over again before writing.

6. Saving a File

Once done, it is probably best to save your changes to a file. You can either select the floppy disk icon to Save or select Save from the File(F) tab to save the codeplug you just edited on your PC.

The programmer will automatically assign a file name, but this can be overwritten. The format is the Model #; Date (year, month, day); Time (hour, minutes, seconds).

Click Save to save the file and close the Save As screen.