EMIDS INSTRUCTION MANUAL

EMIDS Transmitter MMCT – 13D0210	EMIDS Receiver MMCR – 13D0209

EMIDS Manual

Table of Contents

Section 1: EMIDS Receiver Operational Mode

A receiver during normal operation will receive and decode any messages on a selectable channel. The message will be displayed as two-digit (MIDS message) or three-digit (EMIDS message).

Status indicators will also be displayed with any EMIDS message received. This information may also be sent through the RS232 serial port to a remote computer/terminal.

FEATURES:

Antenna RS232 Port Push Button

Ear Phone Jack

On/Off Switch
Volume Control
Menu Selection &
Programming Knob
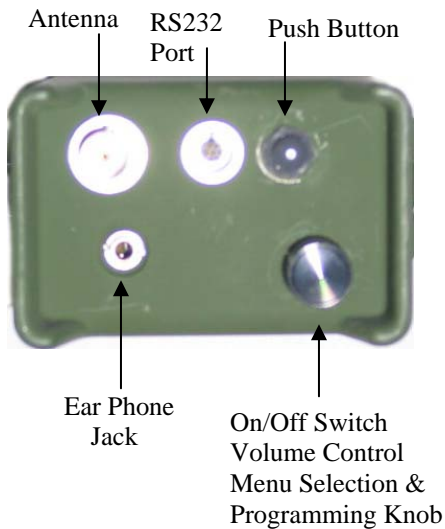
- Displays either MIDS or EMIDS messages.

- Stores the last 10 messages received in memory for later recall.

- Available in three frequency ranges Low, Mid, and High:
  Low Band: 138.025-153.000 MHz @ 25 kHz steps
  Mid Band: 154.005-162.000 MHz @ 5.0 kHz steps
  High Band: 162.00625-174.000 MHz @ 6.25 kHz steps

- May operate on one of up to 1920 channels depending on frequency range.
  Low Band: 600 channels (001-600)
  Mid Band: 1600 channels (001-1600)
  High Band: 1920 channels (001-1920)

- ID codes may be locked out as individual ID codes or as a group of sequential codes (duty gate during hours of operation), up to 9 groups can be locked out. (Either MIDS or EMIDS).
- Audio level can be adjustable during operation, set to a fixed level, or turned off.
- A short audio tone (EMIDS only) indicates a status only message, a long audio tone indicates active alarm message.
- Backlight level may be off or fixed to one of nine levels.
- Serial interface with selectable baud rates. Many of the features may be controlled by a computer/terminal.
- Potted and sealed electronic components.
- Injection molded lexan plastic housing.
- Metal battery cap clamps with heat welded screw inserts.
- Frequency matched antenna.
- Sealed battery compartment.
- RS232 data port for interfacing with a computer. (Setup receiver as a base station receiver. Receiver MIDSComm software and receiver cable required.)

Receiver Menu
The Menu is accessed from the Off state. Hold the push button down and rotate the On/Off Volume knob clockwise. The receiver will turn On, and be in the Menu mode.
CHn – sets the received channel number
 LO – sets the lockouts
AUd – sets the level of the audio
   bl – sets the backlight level
 SEr – sets the serial port parameters

ON/OFF Volume Control
During **Normal Operation** the volume knob is used to turn the receiver on and off, and to adjust the audio level of the piezo (if adjustable audio is selected).
During **Menu Mode** the volume knob is used to display the desired menu item.

Push Button
During **Normal Operation** the push button will light the backlight for 4 seconds on the first push (if the backlight is enabled), on the next push of the button (while backlight is on) the contents of memory [0] will be displayed, the next push of the button (while memory [0] is still displayed) will display memory [1] and so on through memory [9]. Memory [0] will always contain the last message received. To clear the current display, push the button and hold it in, while tilting the receiver slightly past horizontal.
During the **Menu Mode** the push button is used to select the desired menu item.

EMIDS Receiver (MMCR) Display

Display located on the front of the MMCR.
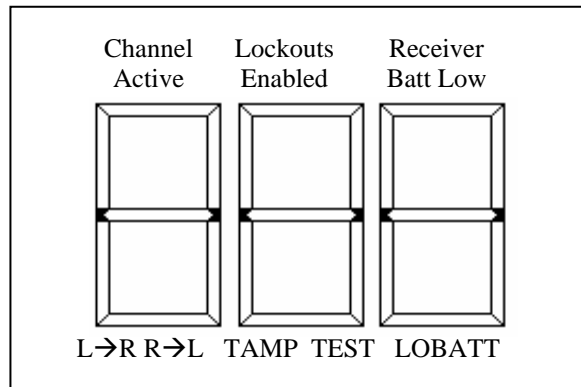
Top Indicators (Receiver Related)

Active Channel - Indicates there is either a signal or noise on the selected channel.

Lockouts Enabled - Indicates that the programmed lockouts are activated.

Receiver Batt Low - Indicates that the batteries in the receiver should be replaced.

Center Indicators

ID Codes – ID Codes received by the receiver from the transmitter.

Channel – Displays the current channel for two seconds when turned on, or when going to the operational mode from the programming mode.

Programming Mode – Displays options when in the programming mode.

Bottom Indicators (Transmitter Related)

L→R – Indicates target movement from left to right (when used with DAOR Switch).

R→L – Indicates target movement from right to left (when used with DAOR Switch).

L→R R→L – Indicates a sensor fault.

TAMP – Indicates the transmitter was tampered with.

TEST – Indicates the test button on the transmitter (MMCT) was pushed or a state of health message was received.

LOBATT – Indicates the batteries in the transmitter should be replaced.

EMIDS Receiver (MMCR) Programming
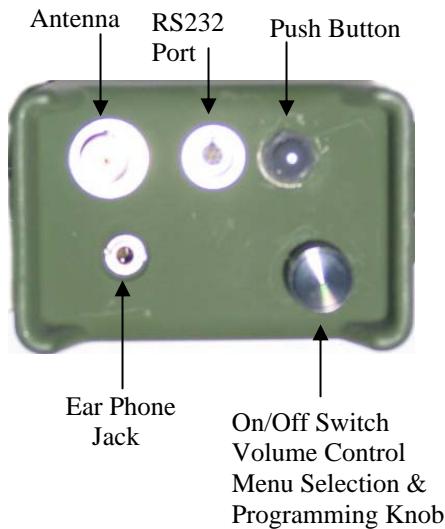## Changing the Channel

Low Freq Band	High Freq Band	Medium Freq Band	
Button Held in Power On			Press and hold the push button in. Turn the ON/OFF switch Clockwise to the On position.
Low Freq Band	High Freq Band	Medium Freq Band	
Chn	Chn	Chn	While in menu mode rotate knob until "Chn" appears. Press and release Button.
123	H1234	C1234	The channel the receiver is on will appear for 2 seconds. In this example the channel is "123" for a Low Freq. Band Receiver, "1234" for both the Medium and High Band Receivers. The Medium and High Band Receivers, scroll the display from right to left, in order to show all four digits of the Channel.
0--	H0-	C0-	After 2 seconds a "0--", "H0-" or "C0-" will appear.
1--	H1-	C1-	To select a new Channel rotate knob until the first number in the new channel appears.
11-	H11	C11	To select the second number - Press button (the number in the first position appears in the second position) - rotate the knob until the desired number is in the second position.
13-	H13	C13	In this example "3".
133	133	133	To select the third number - Press button (the number in the second position appears in the third position, if this is a Medium or High Band Receiver, the display will scroll left) - rotate the knob until the desired number is in the third position and press the button.
134	134	134	In this example "4".
skip this step for low band	344	344	To select the fourth number - Press button (the number in the third position appears in the fourth position, if this is a Medium or High Band Receiver, the display will scroll left) - rotate the knob until the desired number is in the fourth position and press the button.
skip this step for low band	345	345	In this example "5". The channel is now changed to "134" ("1345" if Medium or High Band Receiver) - the unit returns to the menu.
AUd	AUd	AUd	After the last number is entered the display will show "AUd" (this may vary depending upon the position of the knob) - rotate the knob until "End" is displayed.
End	End	End	Press button - the selected channel will appear briefly, the MMCR is in the operating mode.
134	H1345	C1345	The new channel number appears for a few seconds Medium and High Band Receivers scroll the display, so all four digits may be viewed.
---	---	---	Operating mode.

EMIDS Receiver (MMCR) Programming
LOCKOUTS
First Time Setup for Group Lockouts

Button held in Power On	Press and hold the push button in. Turn the ON/OFF switch clockwise to the ON position.

Note: The push button prompt means to press the button and then release it.

Chn	Release Button – (If already in Menu Mode disregard). To select Lockouts (LO) rotate knob until the "LO" appears.
LO	Press button – "On" will be displayed.
On	To enable lockouts press button when "On" is displayed – "LO1" will be displayed.
LO1	Rotate knob until the desired lockout group is displayed. In this example it is LO2. Press button.
LO2	To enable lockouts in LO2 rotate the knob until "On" is displayed. Press button – display changes to ??
??	Press button.
– – –	Rotate knob until the first number of the Low ID of the group is displayed (if using standard MIDS it will be a blank, to set a blank rotate the knob clockwise slightly past the "9") – Press button.
0--	Set the second number by rotating the knob until the desired number appears – Press button
02-	Rotate knob until the last desired number appears – Press button.
024	ID 24 is now set as the low ID in LO2 group.
LO4	Rotate the knob back to LO2 and press the button.
LO2	Press button.
??	To confirm Low ID rotate knob counter clockwise – the ID programmed in the previous steps will appear – rotate knob clockwise until ?? appears – press button.
_ _ _	"_ _ _" appears in the display window.
1--	Rotate knob until the first number of the High ID appears – Press button.
15-	Rotate knob until the second number is displayed – press button.
150	Rotate knob until the third number is displayed – press button.
End	If "End" is not displayed rotate the knob until "End" appears. Press button – return to menu.
Chn	Rotate knob until "End" is displayed – press button.
Lockouts Enabled	Operating mode – "Lockouts Enabled" shown top center of display.

Antenna   RS232 Port   Push Button

Ear Phone Jack

On/Off Switch
Volume Control
Menu Selection &
Programming Knob

Individual ID Lockouts

Follow the same steps as group lockouts, except the desired lockout (ID Code) is inserted in both the low and high settings.

To confirm group lockout:
Rotate the knob to "LO" press button- "On" press button. Rotate knob to "LO2" (lockouts enabled). Press button. Rotating the knob will display the Low and High ID of the Group. The lockouts can be turned "On" or "OFF" at this time.

The MMCR must be returned to the operating mode to save the changes. The saved changes now become the default settings when the MMCR is powered up.
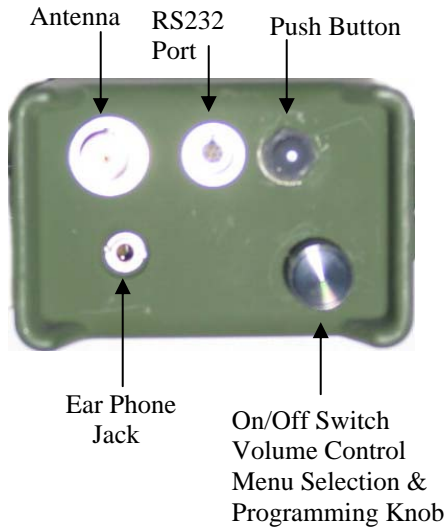
EMIDS Receiver (MMCR) Programming
LOCKOUTS
Changing Group Lockouts

Button held in Power On	Press and hold the push button in. Turn the ON/OFF switch clockwise to the ON position.
Chn	Release Button – (If already in Menu Mode disregard). To select Lockouts (LO) rotate knob until the "LO" appears.
LO	Press button – "On" will be displayed.
On	To enable lockouts press button when "On" is displayed – "LO1" will be displayed.
LO1	Rotate knob until the desired lockout group is displayed. In this example it is LO2.
LO2	To enable lockouts in LO2 rotate the knob until "On" is displayed. Press button – display changes to current setting.
024	Rotate knob to current Low ID – Press button.
0_ _	Rotate knob until the first number of the NEW Low ID of the group is displayed (if using standard MIDS it will be a blank, to set a black rotate the knob clockwise slightly past the "9")
0--	Press button – set the second number by rotating the knob until the desired number appears.
01-	Press button – rotate knob until the last desired number appears.
010	Press button – ID 24 is now set as the low ID in the LO2 group.
LO4	Rotate the knob back to LO2 and press the button.
LO2	Press button.
150	If the old high ID is not displayed, rotate the knob until it is. Press button.
1--	Rotate knob until the first number of the High ID appears. Press button.
10-	Rotate knob until the second number is displayed – press button.
100	Rotate knob until the third number is displayed – press button.
End	If "End" is not displayed rotate the knob until "End" appears. Press button – return to menu.
Chn	Rotate knob until "End" is displayed.
End	Press button.
Lockouts Enabled	Operating mode – "Lockouts Enabled" shown top center of display.

Example: Changing LO2 group from 024 (Lo) – 250(hi) to 010(Lo) – 100(hi)

Note: The push button prompt means to press the button and then release it.

Antenna   RS232 Port   Push Button

Ear Phone Jack

On/Off Switch Volume Control Menu Selection & Programming Knob

Individual ID Lockouts

Follow the same steps as group lockouts, except the desired lockout (ID Code) is inserted in both the low and high settings.

The MMCR must be returned to the operating mode to save the changes. The saved changes now become the default settings when the MMCR is powered up.

EMIDS Receiver (MMCR) Programming

Setting or Changing the Audio Level

| Button held in Power On | Press and hold the push button in. Turn the ON/OFF switch clockwise to the ON position. |

or (Menu Mode)

Note: The push button prompt means to press the button and then release it.

| Chn | Release Button – (If already in Menu Mode disregard). Rotate knob until "AUd" is displayed. |

| AUd | Press button – intermittent beeping starts. |

| 2 | Rotate knob until desired level of audio is reached or "ADJ" is displayed. |

Press Button. Volume level will be adjustable at all times in the operating mode.

| ADJ | or | 7 | Press button This level is fixed in operating mode. |

| AUd | Return to Menu. |

Setting the Backlight Level

| Button held in Power On | Press and hold the push button in. Turn the ON/OFF switch clockwise to the ON position. |

or (Menu Mode)

Antenna   RS232 Port   Push Button

| Chn | Release Button – (If already in Menu Mode disregard). Rotate knob until "bl" is displayed. |

| bl | Press the button – the backlight will come on. |

| 5 | Rotate knob for desired level (0 to 9) – press button. |

| bl | Return to menu. Backlight fixed at this level. |

Ear Phone Jack   On/Off Switch Volume Control Menu Selection & Programming Knob

Setting the Baud Rate

| Button held in Power On | Press and hold the push button in. Turn the ON/OFF switch clockwise to the ON position. |

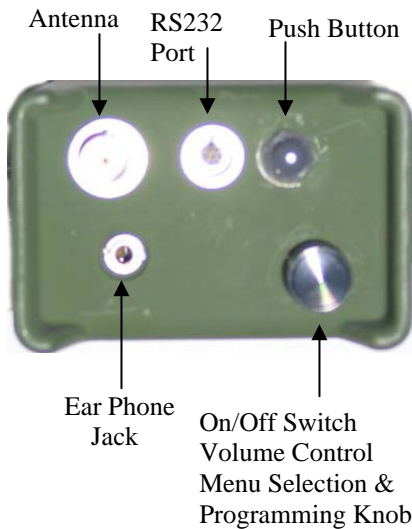or (Menu Mode)

| Chn | Release Button – (If already in Menu Mode disregard). Rotate knob until "SEr" is displayed. |

| SEr | Press button. Rotate knob for desired baud rate (12, 24, 48, 96, OFF) |

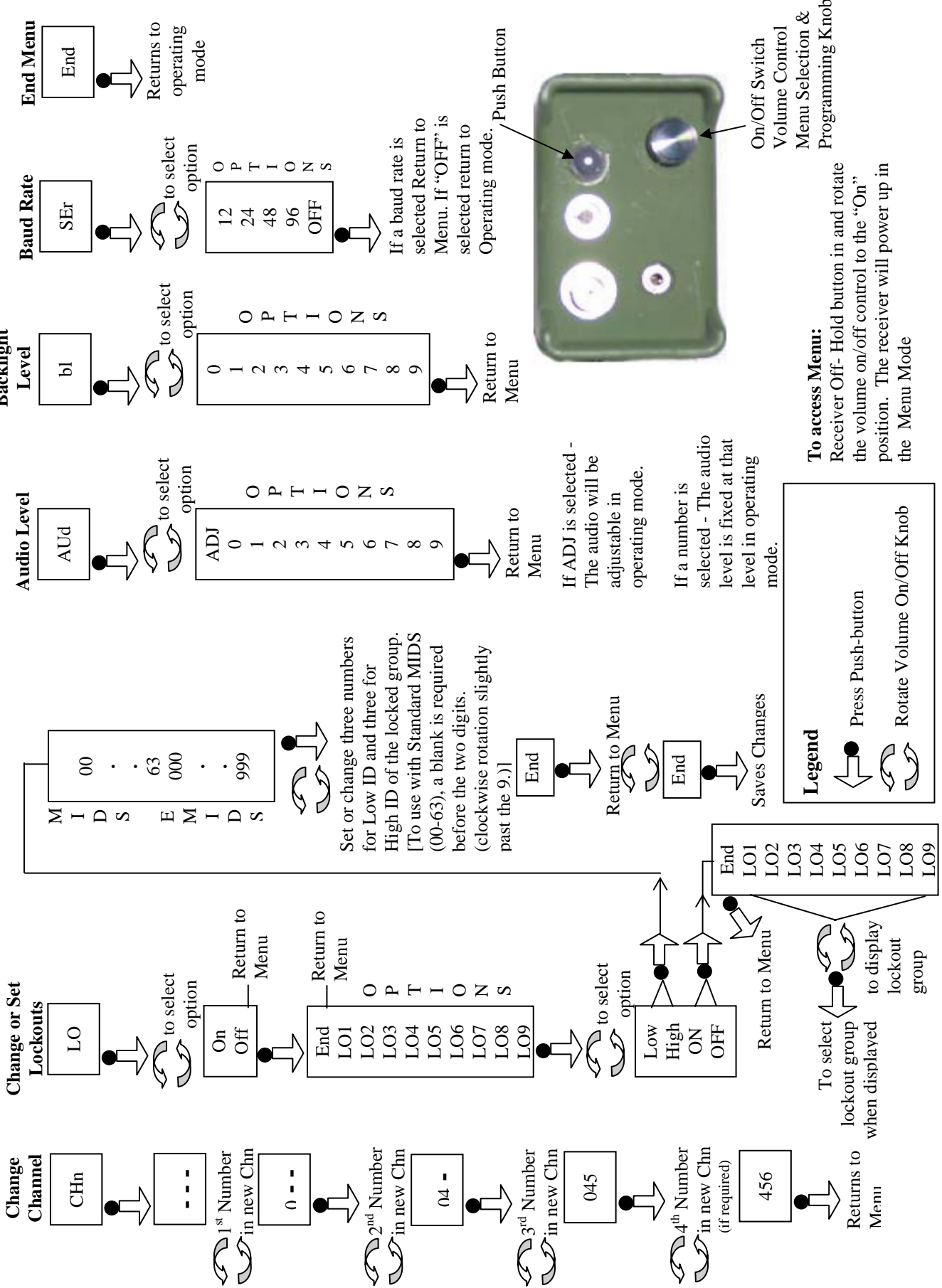| 96 | Press button. |

| SEr | Return to menu. Baud rate is set at 9600. |

Quick Reference Guide #1
Receiver Menu Options

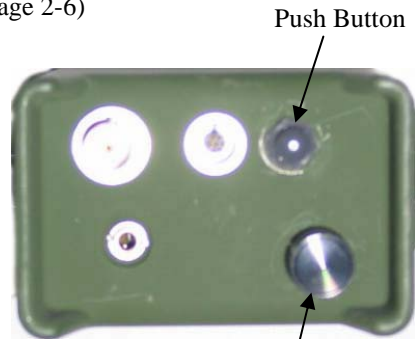Detailed instructions for each option on pages 2-6

End Menu
End → Returns to operating mode

Baud Rate
SEr → [rotate] to select option → OPTIONS: 12, 24, 48, 96, OFF → If a baud rate is selected Return to Menu. If "OFF" is selected return to Operating mode.

Backlight Level
bl → to select option → OPTIONS: 0 1 2 3 4 5 6 7 8 9 → Return to Menu

Audio Level
AUd → to select option → OPTIONS: ADJ 0 1 2 3 4 5 6 7 8 9 → Return to Menu

If ADJ is selected - The audio will be adjustable in operating mode.

If a number is selected - The audio level is fixed at that level in operating mode.

MIDS
MIDS 00 . . 63 / EMIDS 000 . . 999 → Set or change three numbers for Low ID and three for High ID of the locked group. [To use with Standard MIDS (00-63), a blank is required before the two digits. (clockwise rotation slightly past the 9.)] → End Return to Menu → End Saves Changes

Change or Set Lockouts
LO → to select option → On / Off — Return to Menu → End LO1 LO2 LO3 LO4 LO5 LO6 LO7 LO8 LO9 — Return to Menu → to select option → Low / High / ON / OFF → Return to Menu → End LO1 LO2 LO3 LO4 LO5 LO6 LO7 LO8 LO9 → to display lockout group → To select lockout group when displayed

Change Channel
CHn → 1st Number in new Chn → 0 - - → 2nd Number in new Chn → 04 - → 3rd Number in new Chn → 045 → 4th Number in new Chn (if required) → 456 → Returns to Menu

Device photo labels: Push Button; On/Off Switch, Volume Control, Menu Selection & Programming Knob

To access Menu:
Receiver Off- Hold button in and rotate the volume on/off control to the "On" position. The receiver will power up in the Menu Mode

Legend
- Press Push-button
- Rotate Volume On/Off Knob

Quick Reference Guide #2
EMIDS Receiver MENU System Flowchart
(Detailed instructions for each option page 2-6)

Start

Hold push-button in. Turn the On/Off control knob clockwise to the ON position.

Use the volume knob to display the desired item. Press the push button to select that item.

Push Button

On/Off Switch
Volume Control
Menu Selection &
Programming Knob

CHn ···· Short Beep

Displays current Channel number for 1 second

```
000
.
.
600*
```

Select with volume knob and button

Short Beep

* LB 600, MB 1600, HB 1920

LO ➤ Short Beep

Select with volume knob and button

ON
OFF

Short Beep

Short Beep

End

```
LO1
LO2
LO3
LO4
LO5
LO6
LO7
LO8
LO9
```

(Low) = current low setting or ??
(High) = current high setting or ??

Short Beep

Select with volume knob and button

(Low)
(High)
ON
OFF

Short Beep

```
00
.
63
000
.
999
```

Select with volume knob and button

Short Beep

Short Beep

AUd ➤ Intermittent Beep

Volume will be adjustable at all times in the operating mode

ADJ ➤

```
0
.
9
```

Select with volume knob and button

Volume will be fixed at this level in operating mode

bl ➤ Short Beep   Backlight On

Short Beep
Backlight will be fixed at this level

```
0
.
9
```

Select with volume knob and button

SEr ➤ Short Beep

Short Beep

```
12
24
48
96
OFF
```

Select with volume knob and button

END ➤ ········ Go to operating mode

Section 2: **EMIDS Transmitter (MMCT) Operational Mode**

RS232

Sensor
Connector

Test
Button

Antenna
Connector

Battery Cap

Channel:	Low Band: 25 kHz spacing (600 channels) Mid Band: 5 kHz spacing (1600 channels) High Band: 6.25 kHz spacing (1920 channels)
ID Code:	0-999 per RF Channel
Antenna:	¼ wire whip
RF Output:	Nominal 1 Watt
Frequency Range:	Low Band: 138.025-153.000 MHz Mid Band: 154.005-162.000 MHz High Band: 162.00625-174.000 MHz
Power Supply:	4 commercial 9 volt (MN1604)
Battery Life:	4-6 months @ 25° C
Sensor:	Any MIDS sensor can be used with this transmitter. With special instructions additional sensors can also be used.
Pin Connection:	A: Ground B: +9 VDC C: Tx Trigger D: ID Code Control (Do not use)

Description

Normal operation for the transmitter is to receive, process and transmit via RF frequencies, data from various types of attached ground sensors. The transmitter frequency is selectable via synthesizer control circuits providing a selection of up to 1920 RF channels, depending on frequency range, to choose from:

Low Band	**Mid Band**	**High Band**
Channel 001 = 138.025 MHz	Channel 001 = 154.005 MHz	Channel 001 = 162.00625 MHz
Channel 600 = 153.000 MHz	Channel 1600 = 162.000 MHz	Channel 1920 = 174.000 MHz

Design Features:
- ID Code Selection 001-999
- Internal power ON – normal operation – antenna up
- Internal power OFF – non operating – battery cap up
- Internal power ON – align (sensor set) – battery cap down
- Transmit ID Code Alarms
- Transmit State-Of-Health-Messages
  - Directional information (L>R, R>L)
  - Sensor fault (when both are on at the same time)
  - Tamper
  - Test
  - Low Battery
- Three switches for programming operation functions
- A Tri colored LED used to confirm programming process functions
- A sealed battery compartment
- An RS-232 data port for interfacing with a computer
- Potted and sealed electronic components
- Injection molded plastic housing
- Metal battery cap clamps with heat welded screw inserts
- Frequency matched antenna

During normal operation the transmitter may be triggered by an external sensor through its sensor connection. A message will then be transmitted on a selected channel. A message may also be initiated with the push button on the top unit. The unit may be put in the align mode by placing it with the battery cap down. Power is turned off by placing the unit with the battery cap up. Power will remain on for five minutes after it is initially applied.

Section 2: EMIDS Transmitter (MMCT) Operational Mode

Sensor
Connector
RS232
Test
Button
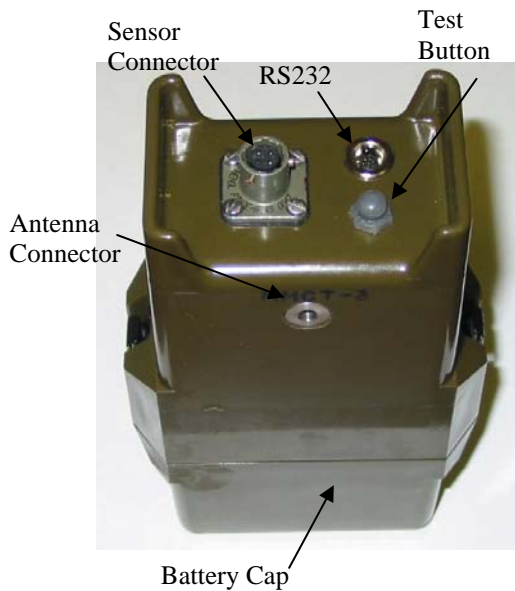
MMCT Battery Compartment
9 volt Battery connectors

Antenna
Connector

Battery Cap
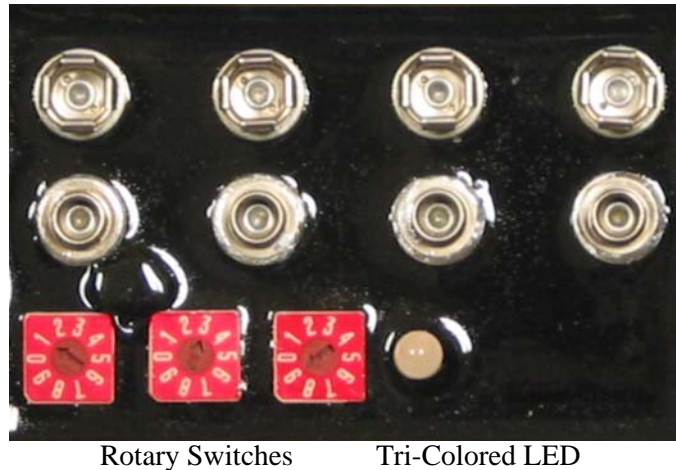
Rotary Switches   Tri-Colored LED

Initial Transmitter Set Up

Set up of the transmitter consists of selecting the desired channel number, the desired ID number and the desired modes of operation. This is accomplished with the three rotary switches in the battery compartment and the push button on the top of the transmitter. These rotary switches are used to set up the transmitter. After set up they are used to inform the transmitter the ID number or the channel number depending on the mode of operation selected. A tri-colored LED is provided to give the operator feed back during the set up of the transmitter.

- ▪ **LED Amber –** the unit is waiting for an entry
- ▪ **LED Green –** indicates that the set up was accepted
- ▪ **LED Red –** indicates an incorrect entry

Items required:

Power Source:	One (1) to four (4) 9-volt MN1604 *Duracell* "copper top" batteries.	
Tool:	One R3322 Small Xcelite or equivalent screwdriver.	
Receiver:	One MMCR – to confirm transmitter operations.	

The following is a list of programming codes and their functions. **After the setup is complete, the rotary switches should not be left in the position 000.** The position 000 is reserved for programming mode only, this causes the unit to go into programming mode for one minute to allow entry of the set up codes. After the one-minute is up, the unit goes back to the normal operating mode. Entry of a set up code after the one minute will result in the transmission of a test message, no programming will occur.

<u>STEP ONE</u>:   Initial Channel Set-Up

NOTE: The channel number may be 001-600 for LB, 001-1600 for MB, or 001-1920 for HB. Channel number 000 should not be used.

1. Remove the battery cap and install 1-4 new 9-volt batteries (see battery compartment above) (When power is first applied, the unit will stay on for five minutes whatever its position.)

2. Hold the transmitter to view the switches – the transmitter should be in a level position with the antenna terminal up.

3. Set each switch to the "0" position. Press and release the test button (on top of the transmitter) once – the LED should be amber. The unit is now in the programming mode, **and the next selection must be made within one minute.**

Amber
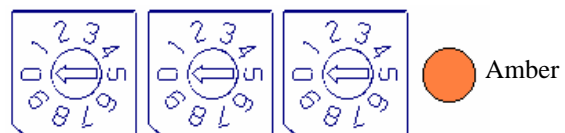
EMIDS Transmitter (MMCT) Programming

4. Set the switches to "901" for Low Band channels 001-600,
   Set the switches to "920" for High Band channels 001-999,
   Set the switches to "921" for High Band channels 1000-1920,
   Set the switches to "950" for Mid Band channels 001-999, or
   Set the switches to "951" for Mid Band channels 1000-1600.
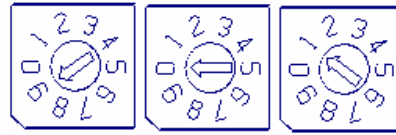
   Blinks
   Remains
   Amber

5. Press and release the test button.

6. Set the three switches to the desired channel number. (For MB and HB channels over 999, use only the last three digits).

7. Press and release the test button. (The LED will change to **Green** when correct or to **Red** for incorrect switch positions or if delays in meeting time limits to make changes).

8. If the LED is **Green**, press and release the test button to transmit a test message to the receiver and confirm operation of both units.

9. If the LED is **Red**, start the procedure over starting at step 3 and continue through step 8 until a Green LED is obtained, then test.

STEP TWO Initial ID Code Set-Up

NOTE: The ID Code may be 001-999 in the EMIDS mode, or 01-63 in the MIDS mode.

1. Set Switches to the three number ID code for each transmitter/sensor used for the specific application. (In this example, 123)
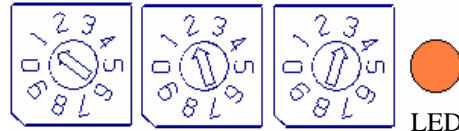
   LED

2. For ease of identifying transmitters, before deployment, apply a piece of tape to the transmitter (not the battery cap) and mark the ID code on the tape.

3. To test the tamper alarm, lay the transmitter flat with the antenna port up for five minutes, then pick up the transmitter, observe the tamper alarm on the receiver to verify it displayed a warning that the transmitter has been disturbed.

4. Important: While the battery cap is off, keep the transmitter free of dirt and water. Clean the gasket area before installing the battery cap.

5. Replace battery cap and snap clamps shut. Make sure black rubber plug is installed to protect the RS-232 data port.

6. The antenna and sensor may now be installed or they may be attached at the deployment site. The transmitter should lay as flat as possible to prevent it from being turned off or activating tamper switches.

EMIDS Transmitter (MMCT) Programming

Program 901: Fixed Channel Mode (Changing the channel after initial set-up)

Program 901 is used for Low Frequency Band transmitters, Channels 001-600.
For High Frequency Band transmitters, Channels 001-999, use Program 920.
For High Frequency Band transmitters, Channels 1000-1920, use Program 921.
For Medium Frequency Band transmitters, Channels 001-999, use Program 950.
For Medium Frequency Band transmitters, Channels 1000-1600, use Program 951.

1. Set the switches to "000" – Press and release the test button, the LED should turn to **Amber**. The unit is now in the programming mode.
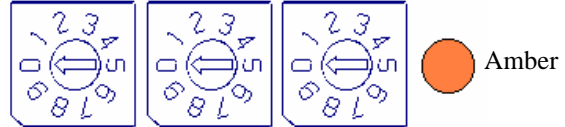
   Amber

2. Set the switches to "901" for LB channels 001-600 (or other corresponding program number as described above) – Press and release the test button, the LED should blink once and return to **Amber**. The unit is ready to accept the channel number.

   Blinks
   Remains
   Amber
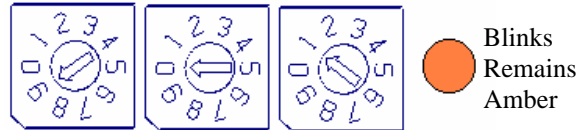
3. Set the switches to the desired channel number. (In this example "345"). Press and release the test button, the LED should turn **Green** for two seconds. Channel "345" is selected.

   Green - OK
   Red - Error
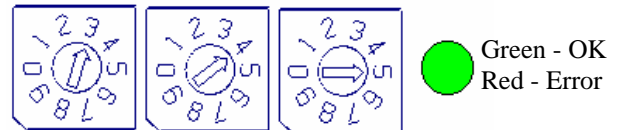
   NOTE 1: If the LED is **Red** at the end of step 3, an error has occurred. Repeat the procedure, otherwise no programming will occur.

   NOTE 2: The channel number may be 001- 600 for LB, 001-1600 for MB, or 001-1920 for HB. Channel number 000 should not be used.

Program 902: Fixed ID Mode (Changes and locks in transmitter identification code)

   NOTE: The ID number may be 001-999. In the EMIDS Mode, or 01-63 in the MIDS Mode.

1. Set the switches to "000" – Press and release the test button, the LED should turn to **Amber**. The unit is now in the programming mode.
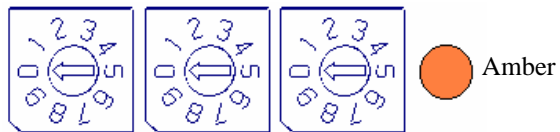
   Amber

2. Set the switches to "902" – Press and release the test button, the LED should blink once and return to **Amber**. The unit is ready to accept the ID number.

   Blinks
   Remains
   Amber
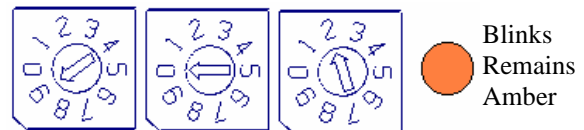
3. Set the switches to the desired ID number. (In this example "044"). Press and release the test button, the LED should turn **Green** for two seconds. ID Code "044" is set.
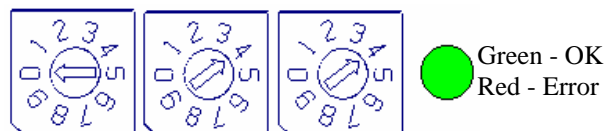
   Green - OK
   Red - Error

For ease of identifying transmitters, before deployment, apply a piece of tape to the transmitter (not the battery cap) and mark the ID code on the tape.

EMIDS Transmitter (MMCT) Programming

Program 903: EMIDS Format Enabled (Used when EMIDS (MMCT) transmitters are deployed)

The EMIDS format allows the use of all the added features of the EMIDS transmitter. (See page two for details).

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

Amber
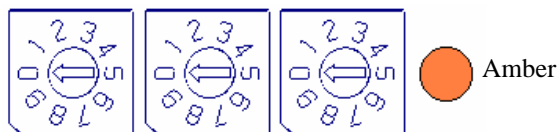
2. Set the switches to "903" – Press and release the test button, the LED should turn to **Green** for two seconds. This will enable the EMIDS format.

Turns Green for 2 Sec
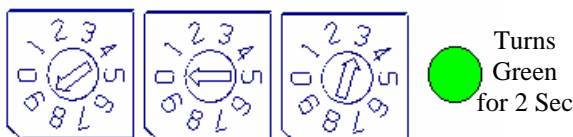
Program 904: MIDS Format Enabled (Used when standard MIDS transmitters (MXMT) are deployed)

The MIDS format allows the EMIDS transmitter to emulate a standard MIDS transmitter. This mode only transmits two digit ID codes and status messages are not transmitted. This is done to reduce false alarms when using MIDS transmitters (MXMT).

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

Amber
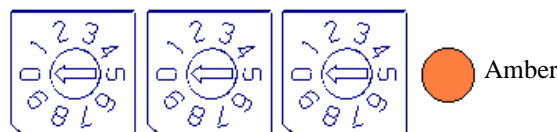
2. Set the switches to "904" – Press and release the test button, the LED should turn to **Green** for two seconds. This will enable the MIDS format.

Turns Green for 2 Sec
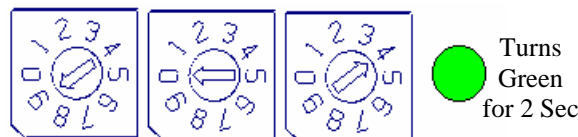
Program 905: Fixed Mode Enabled (Locks in the channel number and the ID code)

The fixed mode allows both the channel number and the ID number to be fixed. This prevents unauthorized tampering from changing the channel or ID number of the transmitter. The channel number will be the last channel number entered in the fixed channel mode. The ID number will be the last ID number entered in the fixed ID mode. **This information should be entered before entering the fixed mode of operation.**

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

Amber
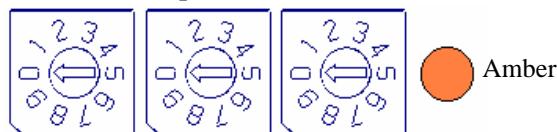
2. Set the switches to "905" – Press and release the test button, the LED should turn to **Green** for two seconds. This will enable the Fixed mode.

Turns Green for 2 Sec
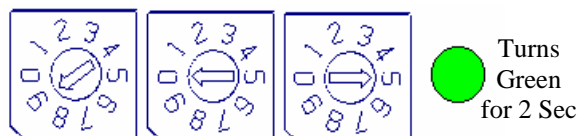
EMIDS Transmitter (MMCT) Programming

Program 906: Fixed Mode Disabled

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

   Amber
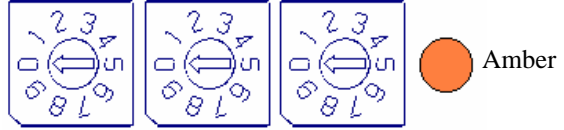
2. Set the switches to "906" – Press and release the test button, the LED should turn to **Green** for two seconds. The Fixed Mode is disabled.
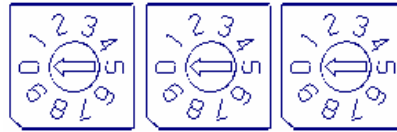
   Turns Green for 2 Sec
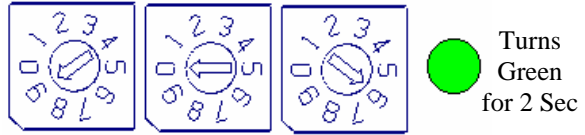
Program 907: Power Down Mode Enabled

Warning: If the serial port is being used, this mode should be **disabled** to prevent the loss of communications when the power down mode is activated.

The Power Down Mode puts the transmitter into a sleep mode five minutes after the transmitter is turned on. The transmitter will revert to normal mode when triggered by a sensor. This mode will extend battery life, and should be enabled when the unit is placed in the field.

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

   Amber
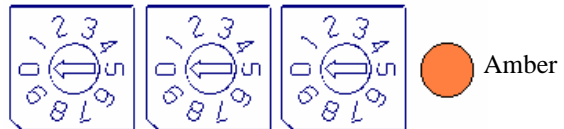
2. Set the switches to "907" – Press and release the test button, the LED should turn to **Green** for two seconds. The Power Down Mode is enabled.

   Turns Green for 2 Sec
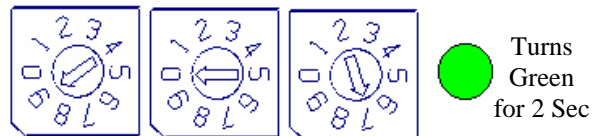
Program 908: Power Down Mode Disabled

Program 908 should be entered whenever the serial port is being used to program transmitters

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

   Amber
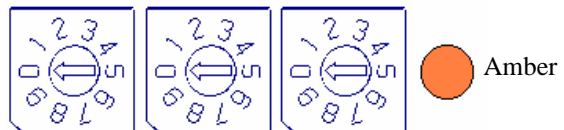
2. Set the switches to "908" – Press and release the test button, the LED should turn to **Green** for two seconds. The Power Down Mode is disabled.

   Turns Green for 2 Sec
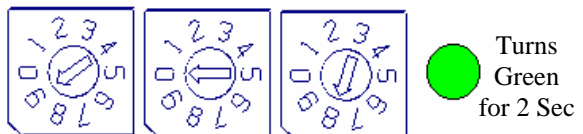
EMIDS Transmitter (MMCT) Programming

Program 910 to 915: State of Health Messages

A State-of-Health message, depending on the program, will be transmitted. This message confirms that the transmitter is working properly. "Test" will be displayed on the receiver display along with the ID code of the transmitter.
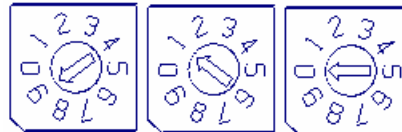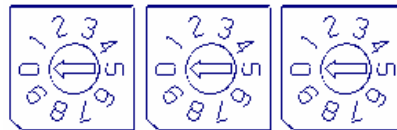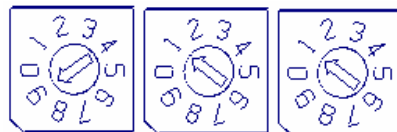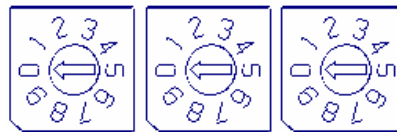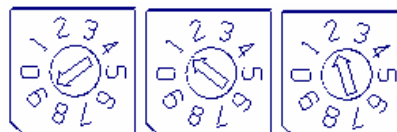
Every Hour (910)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.
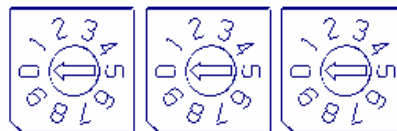
Amber

2. Set the switches to "910" – Press and release the test button, the LED should turn to **Green** for two seconds. A State of Health Message will be sent every hour.

Turns Green for 2 Sec

Every Two Hours (911)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

Amber

2. Set the switches to "911" – Press and release the test button, the LED should turn to **Green** for two seconds. A State of Health Message will be sent every two hours.
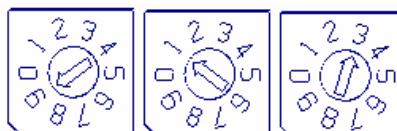
Turns Green for 2 Sec

Every Six Hours (912)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

Amber

2. Set the switches to "912" – Press and release the test button, the LED should turn to **Green** for two seconds. A State of Health Message will be sent every six hours.

Turns Green for 2 Sec

Every Twelve Hours (913)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

Amber

2. Set the switches to "913" – Press and release the test button, the LED should turn to **Green** for two seconds. A State of Health Message will be sent every twelve hours.
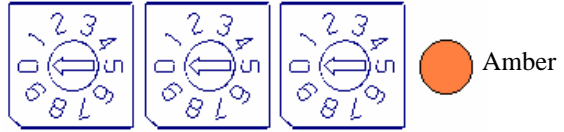
Turns Green for 2 Sec
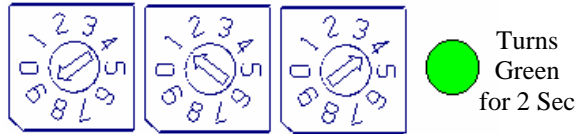
EMIDS Transmitter (MMCT) Programming

State of Health Messages (cont.)

Every Twenty-Four Hours (914)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.
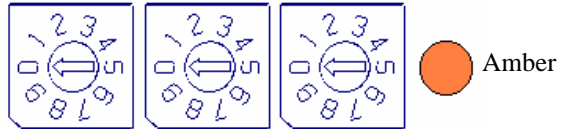
Amber

2. Set the switches to "914" – Press and release the test button, the LED should turn to **Green** for two seconds. A State of Health Message will be sent every twenty-four hours.
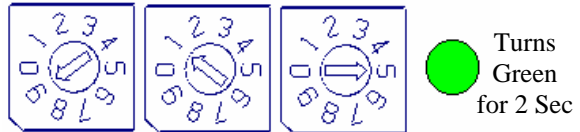
Turns Green for 2 Sec

State of Health Messages Disabled (915)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

Amber

2. Set the switches to "915" – Press and release the test button, the LED should turn to **Green** for two seconds. A State of Health Message are disabled.
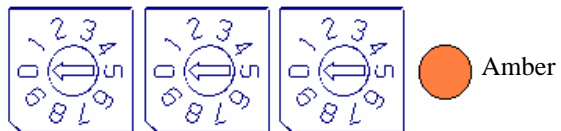
Turns Green for 2 Sec

Program 930 to 934: Serial Port Baud Rates

These programs are used to set the baud rate of the serial port.

Warning: If the serial port is activated, the power down option must be disabled. (See Program 908)

Baud Rate 9600 (930)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

Amber

2. Set the switches to "930" – Press and release the test button, the LED should turn to **Green** for two seconds. Baud rate is set at 9600.

Turns Green for 2 Sec
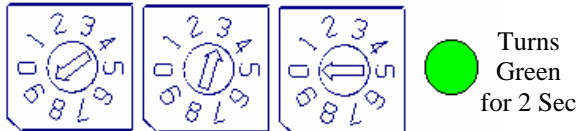
Baud Rate 4800 (931)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.
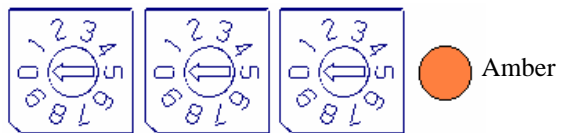
Amber

2. Set the switches to "931" – Press and release the test button, the LED should turn to **Green** for two seconds. Baud rate is set at 4800.

Turns Green for 2 Sec

EMIDS Transmitter (MMCT) Programming
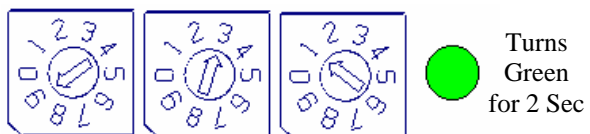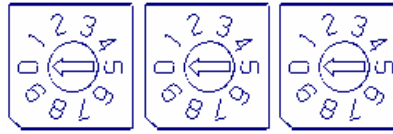
Serial Port Baud Rates (cont.)

Baud Rate 2400 (932)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

    Amber

2. Set the switches to "932" – Press and release the test button, the LED should turn to **Green** for two seconds. Baud rate is set at 2400.
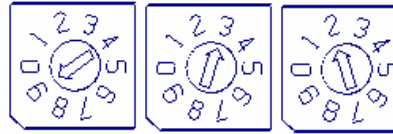
    Turns Green for 2 Sec

Baud Rate 1200 (933)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

    Amber

2. Set the switches to "933" – Press and release the test button, the LED should turn to **Green** for two seconds. Baud rate is set at 1200.

    Turns Green for 2 Sec

Serial Port Disabled (934)

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.

    Amber

2. Set the switches to "934" – Press and release the test button, the LED should turn to **Green** for two seconds. The serial port is turned off to conserve battery life.
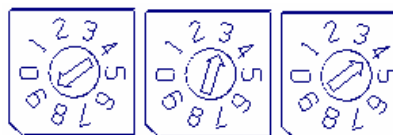
    Turns Green for 2 Sec

Program 999: Reset to Factory Defaults

1. Set the switches to "000" – Press and release the test button. The LED should turn to **Amber**. The unit is now in the programming mode.
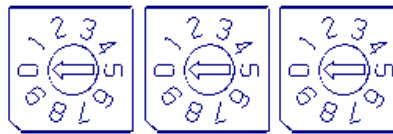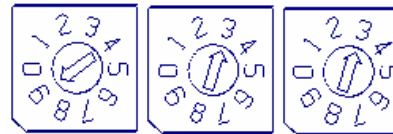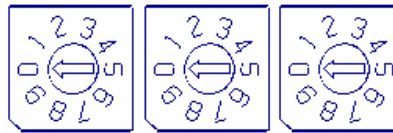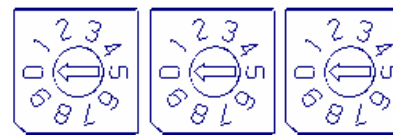
    Amber

2. Set the switches to "999" – Press and release the test button, the LED should turn to **Green** for two seconds. The transmitter is reset to the factory defaults.
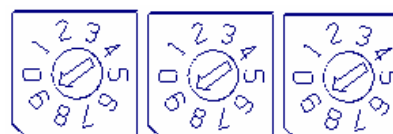
    Turns Green for 2 Sec

EMIDS Transmitter (MMCT) Programming

Reset to Factory Defaults

The factory Reset allows the transmitter to be programmed to a known condition.

Factory Defaults

Fixed Channel Mode	Enabled	Channel # 000
Fixed ID Mode	Disabled	
EMIDS Format	Enabled	
MIDS Format	Disabled	
Fixed Mode	Disabled	
Power Down Mode	Enabled	
Serial Port	Disabled	
State-of-Health	24 Hours	

Section 3: **Maintenance**

Recommended Battery: QTI recommends four (4) batteries based on past experience and the ability to peak rapidly.

        Duracell Coppertop Alkaline MN1604
        Duracell Procell Alkaline PC1604
        Kodak Alkaline 6LR61
        Ultralife Lithium U9VL-J (MMCR Only)

MAINTENANCE:

A. OPERATOR MAINTENANCE:

      The EMIDS equipment has been designed as low cost low maintenance equipment. All components are potted and sealed which reduces the amount of maintenance required. The only required operator maintenance is to inspect the equipment for damage and keep the equipment clean of dirt, grime, and caked on mud.

- Outside Case Maintenance: Remove large clumps of mud with a brush or by hand. Use a dry soft cloth to remove any remaining residue or dirt. NOTE: Do not submerge the equipment in water. This could result in damage.
- Display Maintenance: Remove excess dirt with soft brush and blow material away. Then clean the display surface with a damp cloth.
- Connector Inspection: Check connector cavities for dirt and obstructions. If present, remove obstructions.
- Battery Cap Inspection: Remove the battery cap and inspect the gasket and sealing surface. Replace the gasket if cracked or damaged. Remove any dirt or grime from both mating surfaces with a damp cloth. Lubricate the gasket with a silicon based lubricant to keep it soft and prevent cracking.
- Battery Terminals: Inspect battery terminals for bent terminals. If bent, straighten with needle nose pliers. Note: Do not work the terminal back and forth as this might cause the terminal to break.

B. DEPOT MAINTENANCE: Upper echelon maintenance will be performed by the supplier of the equipment. If the equipment is beyond the user capability to repair, it can be returned to the supplier for test and evaluation. Upon completion of the inspection, the supplier will notify the user if the unit can be repaired. If the equipment is not covered by the warranty, an estimate will be provided for repair costs. If the equipment is not repairable, the supplier will specify replacement costs. (Note: See warranty below for return procedures.)

C. EQUIPMENT STORAGE: Upon return to the facility, clean equipment as noted in operator maintenance above. Remove batteries from all equipment to prevent possible damage. If batteries are left in the equipment, transmitters will continue to send fault alarms every 10 minutes causing a continuous drain on the batteries and possibly resulting in damaged or ruptured batteries. After cleaning, return the equipment to the storage cases. Store in a dry, room temperature environment.

D. WARRANTY:

Qual-Tron, Inc. guarantees all products to be free from defects in materials and workmanship for 12 months from the date of purchase. Damage due to misuse, accidents, lightning strikes, unauthorized service, environmental conditions beyond the equipment specifications, acts of war or damage other than fair, wear and tear is excluded from this warranty.

E. RETURN PROCEDURES:

For support and service, please contact the following. To return any material, contact Qual-Tron, Inc. to receive a Return Material Authorization (RMA) number. Once an RMA number has been assigned, ship the material to the address below and reference the RMA number on the packing slip. Qual-Tron will return the equipment as quickly as possible to the user.

        QUAL-TRON, INC.
        Attn: Sales   Ph: 918-622-7052
        9409 E. 55th Place   Fax: 918-664-8557
        Tulsa, OK 74145   email: sales@qual-tron.com

F. TROUBLESHOOTING GUIDE:

MMCR Receiver

Defect	Possible Cause	Corrective Action	Stage Area	Empl Site
Will not turn on	Battery low voltage	Check and replace batteries	X	
Does not receive alarms	Battery low voltage	Check and replace batteries	X	
	Transmitter & receiver too close to each other	Experiment with antenna combinations (with & without)	X	X
	Program error	Program in correct channel number	X	
Will not communicate with computer	Bad cable connection	Check receiver cable and connection	X	
	Incorrect baud rates	Verify baud rates on computer and MMCR are the same	X	

MMCT Transmitter

Defect	Possible Cause	Corrective Action	Stage Area	Empl Site
No LED lights when programming	Battery low voltage	Check and replace batteries	X	
	Switch in wrong position	Verify arrow centered on number	X	
	Mercury switch stuck in off position	With battery cap on, tap transmitter in palm of hand to clear	X	X
Constant back to back alarms	Sensor Fault	Check sensor setup		X
		Adjust gain switch on sensor		X
		Test sensor with 2nd transmitter		X
		Test transmitter with 2nd sensor		X
No alarms	Battery low voltage	Check and replace batteries	X	
	Sensor Fault	Check sensor setup		X
		Adjust gain switch on sensor		X
		Test sensor with 2nd transmitter		X
		Test transmitter with 2nd sensor		X
	Mercury switch stuck in off position	With battery cap on, tap transmitter in palm of hand to clear	X	X
	Transmitter & receiver too close to each other	Experiment with antenna combinations (with & without)	X	X
	Program Error	Reset to factory defaults, program channel and ID	X	
Sensor Fault Alarm when connected	Sensor connector not fully seated on transmitter connector	Check connector and fully seat, twist and lock connector	X	X
	Broken sensor cable	Check sensor cable for damage	X	X
		Test sensor with 2nd transmitter	X	X
		Test transmitter with 2nd sensor	X	X
	Sensor Fault	Check sensor setup		X
		Adjust gain switch on sensor		X
		Test sensor with 2nd transmitter		X
		Test transmitter with 2nd sensor		X

G. SPARE PARTS: The following items are suggested stockage for operator level repairs or replacement:

Model	Description	P/N
EARPHN	Earphone Assembly, Receiver	77Z0011
TOOL	Frequency Tuning Tool	57M0003
ANT-WIRE	Antenna, Wire (Transmitter LB)	10D0769-1
ANT-SUB	Antenna, Stub (Receiver LB)	56Z0003
GASKET	Gasket, Battery Cap (EMIDS)	23B0124
COVER	Cover, Rubber Boot	68Z0020
CAP-EMIDS	Battery Cap, EMIDS	10D0827
CLAMP	Battery Cap Clamp	66Z0059

Section 4:   **Frequency/Channel Calculations**

Frequency Ranges				
Frequency Range	Frequency		Channel Steps	Max Channels
	Min	Max		
Low	138 MHz	153 MHz	25 kHz	600
Mid	154 MHz	162 MHz	5 kHz	1600
High	162 MHz	174 MHz	6.25 kHz	1920

Channel to Frequency Calculation

Channel * Channel Step + Min Frequency = Frequency for Channel
Examples:
-   Low Band Channel 20
-   20 * 0.025 +138 =138.5 MHz
-   Mid Band Channel 300
-   300 * 0.005 + 154 = 155.5 MHz

Frequency to Channel Calculation

(Frequency – Min Frequency) / Channel Step = Channel for Frequency
Examples:
-   Low Band 151.5 MHz
-   (151.5 – 138) / 0.025 = Channel 540
-   High Band 172.5 MHz
-   (172.5 – 162) / 0.00625 = Channel 1680

Section 5: **FCC Notice / RF Exposure**

FCC Notices (U.S. Only)

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separations between the equipment and receiver
- Connect the equipment into an outlet on a circu8it different from that to which the receiver is connected
- Consult the dealer or experience radio/TV technician for help.

FCC Compliance Information

The following information is provided on the device or devices covered in this document in compliance with FCC regulations:
- Model Number: QTIEMIDSMMCT, QTIEMIDSMMCR
- Company Name:
  Qual-Tron, Inc.
  9409 E. 55th Pl. S.
  Tulsa, OK 74145-8157 USA
  918-622-7052

RF Exposure – MPE / SAR

"For body worn operation", the MMCR has been tested and meets the FCC RF exposure guidelines when used with the Qual-Tron, Inc. accessories (to include batteries) supplied or designated for this product, and provided at least 10 cm separation between device including its antenna and the user's body is maintained. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

In order to comply with FCC RF Exposure requirements, the MMCT device must be installed and operated in such a way that a minimum separation distance of 20cm is always maintained between the antenna and all persons during normal operations.