



Spectra Engineering® MX800

Rev: 1.3

Date: 10 January 2007

RADIO:

Spectra Engineering® MX800 Repeater / Transceiver

WIRING REQUIREMENTS:

Nexion universal radio cable (supplied) and three D style male connectors (not supplied), wired as follows (also refer to Attachment 1)...

Nexion NX2540 Cable End				MX800 Cable End			
HDDB9	Description	I/O	Cable Colour	Connector	Description	I/O	Cable Colour
Pin 1	Receive Audio	In	Black	DB15, Pin 4	Discriminator Audio	Out	Black
Pin 2	Transmit Audio	Out	Brown	DB15, Pin 13	Transmit Audio	In	Brown
Pin 5	Mic Mute	Out	Yellow	DB25, Pin 11	TX CTCSS Disable (if CTCSS is used)	In	Yellow
Pin 6	Ground	-	Dark Green	DB15, Pin 10	Ground	-	Dark Green
Pin 8	RX Busy / Mute	In	Violet	DB15, Pin 14	RX Mute / Squelch	Out	Violet
Pin 9	PTT	Out	White	DB15, Pin 12	PTT	In	White
Pin 12	Power	In	Light Green	DB9, Pin 5	Power (Switched)	Out	Light Green
Pin 13	Local PTT Detect	In	Black with White stripe	DB9, Pin 3	External PTT Input or Monitor Point	Out	Black with White stripe

MX800 REPEATER/TRANSCEIVER

Step 1 Confirm the MX800 is fully functional, i.e. test the Transmit (TX) and Receive (RX) functions, CTCSS (Continuous Tone Coded Squelch System) feature (if applicable), Wideband (WB) or Narrowband (NB) operation, TOT (Time Out Timer), etc

Step 2 Program the MX800 as required, i.e. TX/RX frequencies, CTCSS (if applicable), TOT, etc

Modify the MX800 internal jumper settings as per the following table...

Jumper	Description	Default Setting	New Setting
JMP 8	TX Limiter Bypass/Wideband Input	1-2	2-3
JMP27	CTCSS Input / WB DC-FM Input	2-3	1-2

Adjust the MX800 TX deviation as per the following table...

Channel Bandwidth	CTCSS	Voice Deviation	CTCSS Deviation	Total Deviation
25 KHz (Wideband)	Yes	4.5 KHz	500 Hz	5.0 KHz
25 KHz (Wideband)	No	5.0 KHz	0 Hz	5.0 KHz
12.5 KHz (Narrowband)	Yes	2.25 KHz	250 Hz	2.5 KHz
12.5 KHz (Narrowband)	No	2.5 KHz	0 Hz	2.5 KHz

Step 5 After making the above adjustments, re-confirm the MX800 is fully functional



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NX2540 MODEM

- Step 6** Connect the MX800 to the NX2540 using the universal radio cable (wired as per Attachment 1)
Connect the NX2540 to a suitable PC. This serial cable can be purchased from Nexion or assembled using the instructions in the Nexion Modem Installation Guide. Using any PC compatible terminal program (such as Hyperterm® or TeraTerm®), set the appropriate Com Port to 57,600bps, 8 Data, 1 Stop, No Parity and enable Hardware hand shaking (if connected properly, the modems version and serial number will be displayed after power-up)
- Step 7**
- Step 8** Connect the MX800 to a suitable 12V DC power source and power up. The NX2540 will display its power-up message containing its modem number, firmware version number and serial number
- Step 9** Change S register S300=17 (W.B. Transmit Deviation Level) <ENTER> and save these settings by using the AT&W <ENTER> command. Also make any other user specific changes to the S registers (i.e. Com 1 Baud Rate, set Local PTT Priority, etc) and save these settings.
- Step 10** Change S register S309=2 (Mic Mute Output Sense) and save setting (AT&W). In this case the Mic Mute is used to disable CTCSS when the MX800 transmits (also prevents the user hearing data if CTCSS decode is enabled on the mobile).
- Step 11** Change S register S521=9 (Invert Local PTT Detect Input Sense) and save setting (AT&W).
- Step 12** Connect the MX800 transmit antenna port to a suitable 50 ohm dummy load and the MX800 receive port to a suitable communications test set
- Step 13** Set the communication test set to output a test tone at 3.5Khz deviation / -80dBm RF level on the MX800's receive frequency (no CTCSS). Confirm the MX800 discriminators output level to the NX2540 (HD-DB9, Pin 1) is approximately 1.6V p-p (W.B. Level)
- Step 14** Using the attached PC and software, key the transmitter by using the AT&T3 <ENTER> command (NX2540 will transmit a 1.6Khz test tone with no CTCSS)
- Step 15** Using a suitable communications test set, adjust the NX2540 test tone deviation to 3.5Khz (WB) by varying Transmit Level register S300
- Step 16** Also monitor the transmitted 1.6Khz tone for signal purity (i.e. distortion). If there is any audio signal distortion (i.e. >3%), vary the value of register S300 until the transmitted signal is 'clean' and minimal audio distortion is observed (on a 25Khz WB radio system, the NX2540 should transmit it's data between 3.3 to 3.6Khz TX deviation)
- Step 17** De-key the transmitter by using the AT&T <ENTER> command on the PC terminal program
- Step 18** Make any other necessary S register changes to suit your application (PC terminal speed, handshaking, etc) and save these settings by using the AT&W <ENTER> command

The MX800 repeater/transceiver and NX2540 data modem is ready for use

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Attachment 1

