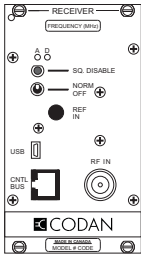


TN247 VR-4E VHF MT-4E Receiver


The VR-4E VHF receiver is an FM radio module capable of analog operation in 12.5 KHz (narrowband) or 25 KHz (wideband) channels. A firmware upgrade may be purchased to allow P25 digital operation. The VR-4E VHF receiver operates over the frequency band from 136 to 174 MHz. A modular design allows each of the receiver's internal modules to be individually assembled and tested. This facilitates construction, tuning and maintenance as well as troubleshooting procedures. The receiver can be programmed with up to 2 banks of 16 channels each.

Specifications

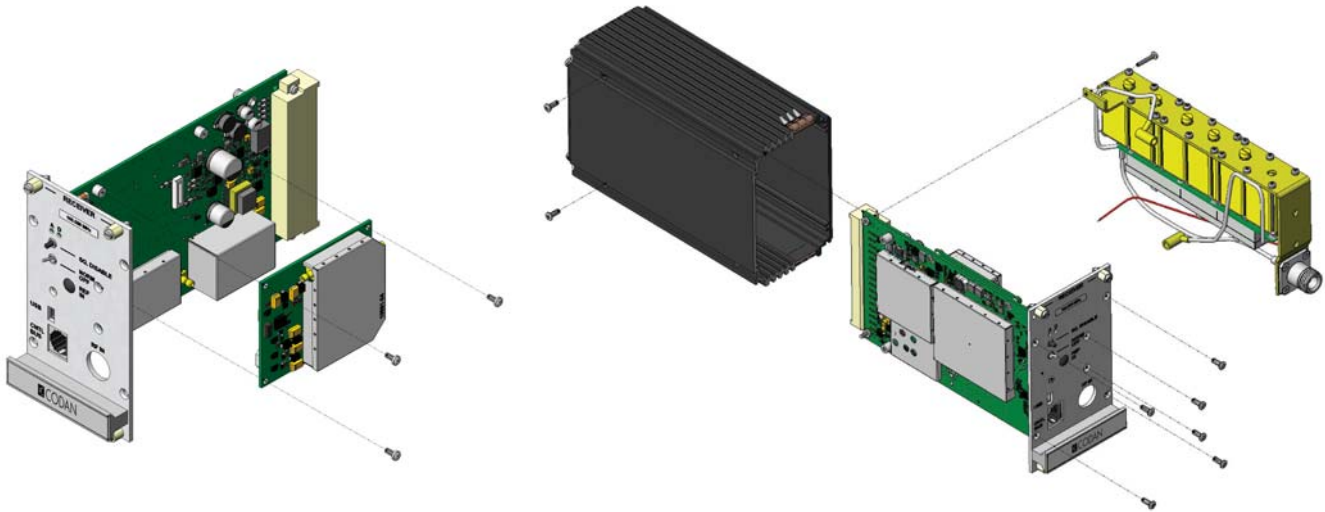
Frequency Band	136 - 174 MHz
Channel Spacing	12.5, 15, 25 and 30 KHz
Frequency Switching Range	± 2 MHz
Reference Sensitivity (12 dB SINAD and 5% BER)	≤ -118 dBm (.280 µV)
Adjacent Channel Rejection (Class A)	≥ 45 dB; NB Analog / ≥ 75 dB; WB Analog / ≥ 60 dB; Digital
Adjacent Channel Rejection (Class B)	≥ 40 dB; NB Analog / ≥ 70 dB; WB Analog / ≥ 60 dB; Digital
Conducted Spurious Output Power (Analog)	≤ -95 dBm (Class A) / ≤ -57 dBm (Class B)
Intermodulation Rejection	≥ 75 dB Analog / ≥ 80 dB Digital (Class A) ≥ 70 dB Analog / ≥ 70 dB Digital (Class B)
Hum & Noise Ratio	≥ 34 dB Narrowband / ≥ 40 dB Wideband
L.O. Frequency Stability	± 1.0 ppm (-30°C to +60°C)
Audio Distortion (Analog and Digital)	≤ 2.0 % (25°C); ≤ 3.0 % (-30°C to +60°C)
Audio Output Level (600 Ω Balanced)	≤ +3.0 dBm
Operating Temperature	-30°C to +60°C
Supply Current (Class A)	≤ 250 mA / ≤ 280 mA with encryption module
Supply Current (Class B)	≤ 115 mA / ≤ 145 mA with encryption module

Models Available

VR-4E150-A0-000	12.5 / 25 KHz Bandwidth, 136 - 174 MHz, Class A
VR-4E150-00-000	12.5 / 25 KHz Bandwidth, 136 - 174 MHz, Class B

Receiver Operating Frequency

The receiver is initially aligned at the factory for the frequency shown on the label on the front panel. For a small frequency change, no re-alignment of the receiver may be required. If the frequency change is greater than **±2 MHz** from the frequency at which the last complete receiver alignment was performed, the **RF Preselector** will need to be realigned. To align and / or adjust the receiver, the outer cover needs to be removed; the receiver needs to be plugged into the subrack via a cable and / or extender card; and power must be applied to the system.

TN247 VR-4E VHF MT-4E Receiver

The VR-4E VHF receiver is primarily software-controlled, allowing tuning, programming and maintenance to be done via software service with few hardware adjustments required.

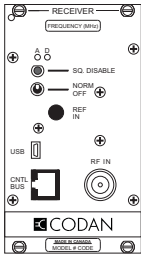
RF Preselector Alignment:

Alignment for the RF Preselector consists of tuning the five-section helical filter only. There are two methods of tuning the RF Preselector. The preferred method of tuning the RF Preselector is to use a Spectrum Analyzer with a Tracking Generator. Ensure that the +9.5 Vdc supply is connected to the RF Preselector (red wire). Connect the Tracking Generator output at a level of -20 dBm to the Receiver's RF input. Connect the Spectrum Analyzer input to the RF Preselector's IF output (SMB cable normally connected to the Receiver Mainboard). Adjust the helical filter trimmer capacitors for a flat response at a level typically -40 dBm to -65 dBm, centred at the desired RF frequency. The alternate method of tuning the RF Preselector is to monitor receiver SINAD. Inject the desired RF signal to the RF input connector at a level of -118 dBm and adjust the helical filter trimmer capacitors for best receiver SINAD (\leq -118 dBm).

RSS Service Mode:

The RSS has the ability to put a receiver into Service Mode, where the Reference Oscillator may be aligned, Audio Levels may be set, Jumper Settings may be selected, a BER test can be performed, and an RSSI meter can be monitored. To put the receiver into Service Mode, it must be connected to a PC running the Radio Service Software (RSS) using a type A to 5-pin mini-type B USB cable. From the RSS Receiver Configuration window, click on the Service button. Note that you must not remove power to the radio or swap radios during servicing. When any required Service functions have been completed, the radio can be taken out of Service Mode by clicking on the Quit button in the Service window.

Note: For complete alignment procedures, refer to the instruction manual. These notes are for reference only.

TN267 UR-4E UHF MT-4E Receiver


The UR-4E UHF receiver is an FM radio module capable of analog operation in 12.5 KHz (narrowband) or 25 KHz (wideband) channels. A firmware upgrade may be purchased to allow P25 digital operation. The UR-4E UHF receiver operates in one of five frequency bands: 380 to 406 MHz, 406 to 430 MHz, 430 to 450 MHz, 450 to 470 MHz or 470 to 520 MHz. A modular design allows each of the receiver's internal modules to be individually assembled and tested. This facilitates construction, tuning and maintenance as well as troubleshooting procedures. The receiver can be programmed with up to 2 banks of 16 channels each.

Specifications

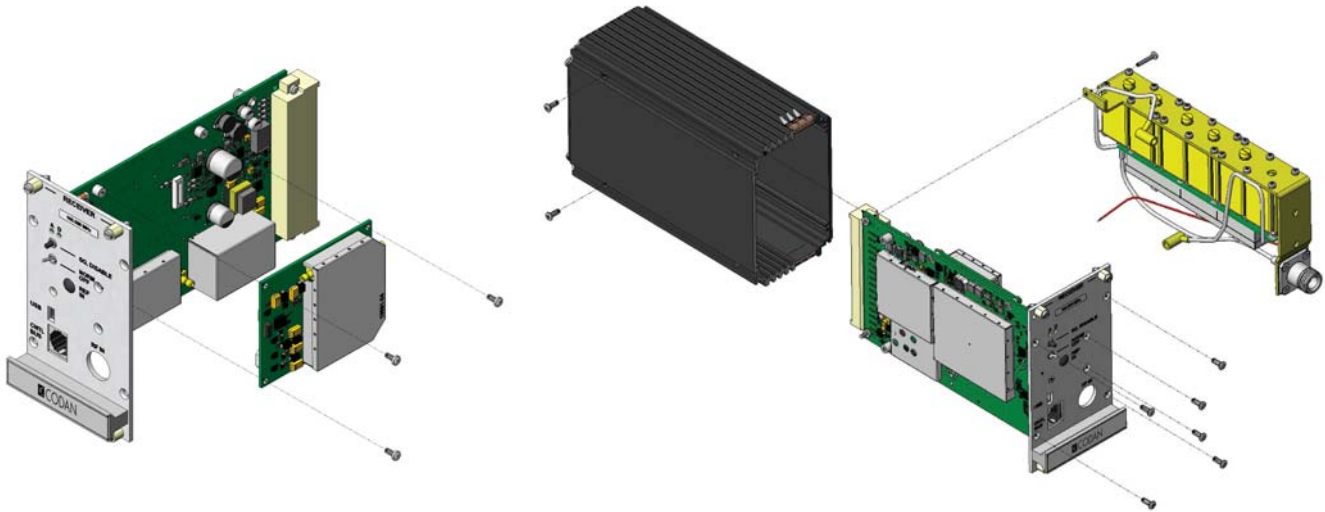
Frequency Bands	380 - 406 / 406 - 430 / 430 - 450 / 450 - 470 / 470 - 520 MHz
Channel Spacing	12.5 and 25 KHz
Frequency Switching Range	± 2 MHz
Reference Sensitivity (12 dB SINAD and 5% BER)	≤ -116 dBm (.350 μV) 380 & 440 & 500 ≤ -118 dBm (.280 μV) 420 & 460
Adjacent Channel Rejection (Class A)	≥ 45 dB; NB Analog / ≥ 75 dB; WB Analog / ≥ 60 dB; Digital
Adjacent Channel Rejection (Class B)	≥ 40 dB; NB Analog / ≥ 70 dB; WB Analog / ≥ 60 dB; Digital
Conducted Spurious Output Power (Analog)	≤ -95 dBm (Class A & 380 & 440) / ≤ -80 dBm (500) ≤ -57 dBm (Class B)
Intermodulation Rejection	≥ 75 dB Analog / ≥ 80 dB Digital (Class A & 380 & 440) ≥ 70 dB Analog / ≥ 70 dB Digital (Class B)
Hum & Noise Ratio	≥ 34 dB Narrowband / ≥ 40 dB Wideband
L.O. Frequency Stability	± 0.5 ppm (-30°C to +60°C)
Audio Distortion (Analog and Digital)	≤ 2.0 % (25°C); ≤ 3.0 % (-30°C to +60°C)
Audio Output Level (600 Ω Balanced)	≤ +3.0 dBm
Operating Temperature	-30°C to +60°C
Supply Current (Class A)	≤ 250 mA / ≤ 280 mA with encryption module
Supply Current (Class B)	≤ 115 mA / ≤ 145 mA with encryption module
Supply Current (380 & 440)	≤ 270 mA / ≤ 300 mA with encryption module

Models Available

UR-4E380-00-000	12.5 / 25 KHz Bandwidth, 380 - 406 MHz, Class B
UR-4E420-A0-000	12.5 / 25 KHz Bandwidth, 406 - 430 MHz, Class A
UR-4E420-00-000	12.5 / 25 KHz Bandwidth, 406 - 430 MHz, Class B
UR-4E440-00-000	12.5 / 25 KHz Bandwidth, 430 - 450 MHz, Class B
UR-4E460-A0-000	12.5 / 25 KHz Bandwidth, 450 - 470 MHz, Class A
UR-4E460-00-000	12.5 / 25 KHz Bandwidth, 450 - 470 MHz, Class B
UR-4E500-00-000	12.5 / 25 KHz Bandwidth, 470 - 520 MHz, Class B * Not available in Canada

Receiver Operating Frequency

The receiver is initially aligned at the factory for the frequency shown on the label on the front panel. For a small frequency change, no re-alignment of the receiver may be required. If the frequency change is greater than **±2 MHz** from the frequency at which the last complete receiver alignment was performed, the **RF Preselector** will need to be realigned. To align and / or adjust the receiver, the outer cover needs to be removed; the receiver needs to be plugged into the subrack via a cable and / or extender card; and power must be applied to the system.

TN267 UR-4E UHF MT-4E Receiver

The UR-4E UHF receiver is primarily software-controlled, allowing tuning, programming and maintenance to be done via software service with few hardware adjustments required.

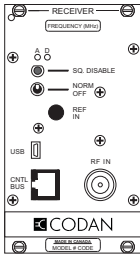
RF Preselector Alignment:

Alignment for the RF Preselector consists of tuning the five-section helical filter only. There are two methods of tuning the RF Preselector. The preferred method of tuning the RF Preselector is to use a Spectrum Analyzer with a Tracking Generator. Ensure that the +9.5 Vdc supply is connected to the RF Preselector (red wire). Connect the Tracking Generator output at a level of -20 dBm to the Receiver's RF input. Connect the Spectrum Analyzer input to the RF Preselector's IF output (SMB cable normally connected to the Receiver Mainboard). Adjust the helical filter trimmer capacitors for a flat response at a level typically -40 dBm to -65 dBm (-20 dBm to -40 dBm for Class B), centred at the desired RF frequency. The alternate method of tuning the RF Preselector is to monitor receiver SINAD. Inject the desired RF signal to the RF input connector at a level of -118 dBm and adjust the helical filter trimmer capacitors for best receiver SINAD (\leq -118 dBm).

RSS Service Mode:

The RSS has the ability to put a receiver into Service Mode, where the Reference Oscillator may be aligned, Audio Levels may be set, Jumper Settings may be selected, a BER test can be performed, and an RSSI meter can be monitored. To put the receiver into Service Mode, it must be connected to a PC running the Radio Service Software (RSS) using a type A to 5-pin mini-type B USB cable. From the RSS Receiver Configuration window, click on the Service button. Note that you must not remove power to the radio or swap radios during servicing. When any required Service functions have been completed, the radio can be taken out of Service Mode by clicking on the Quit button in the Service window.

Note: For complete alignment procedures, refer to the instruction manual. These notes are for reference only.

TN287 UR-4E UHF 700 / 800 / 900 MHz MT-4E Receiver


The UR-4E UHF 700 / 800 / 900 MHz receiver is an FM radio module capable of analog operation in 12.5 KHz (narrowband) or 25 KHz (wideband) channels. A firmware upgrade may be purchased to allow P25 digital operation. The UR-4E UHF 700 / 800 / 900 MHz receiver operates in one of five frequency bands: 768 to 776 MHz, 798 to 824 MHz, 851 to 869 MHz, 896 to 902 MHz or 930 to 960 MHz. A modular design allows each of the receiver's internal modules to be individually assembled and tested. This facilitates construction, tuning and maintenance as well as troubleshooting procedures. The receiver can be programmed with up to 2 banks of 16 channels each.

Specifications

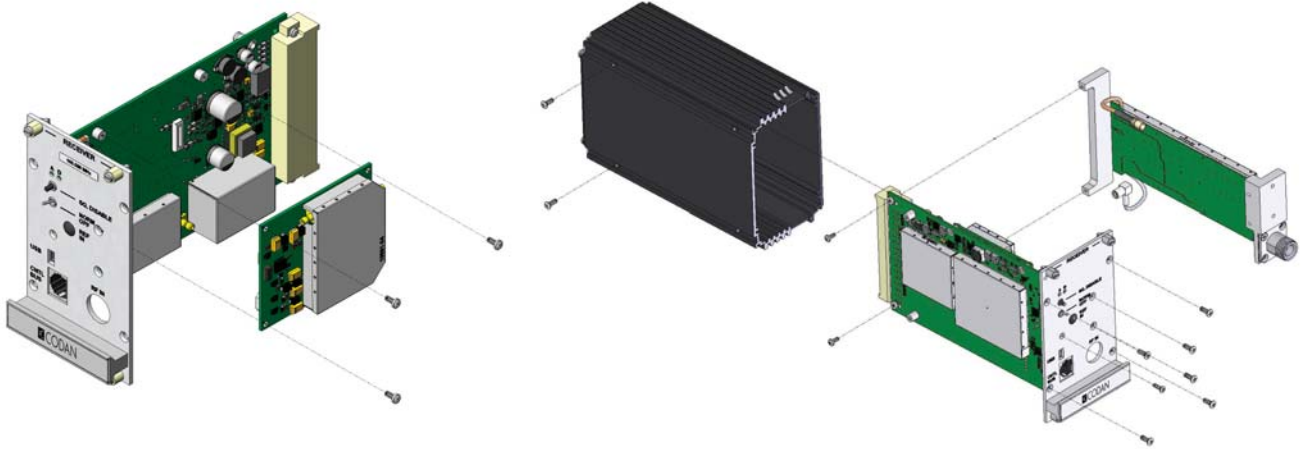
Frequency Bands	768 - 776 / 798 - 824 / 851 - 869 / 896 - 902 / 930 - 960 MHz
Channel Spacing	12.5 and 25 KHz
Frequency Switching Range	Full Band
Reference Sensitivity (12 dB SINAD and 5% BER)	≤ -116 dBm (.350 μV)
Adjacent Channel Rejection	≥ 45 dB; NB Analog / ≥ 70 dB; WB Analog / ≥ 60 dB; Digital
Conducted Spurious Output Power (Analog)	≤ -80 dBm
Intermodulation Rejection	≥ 70 dB
Hum & Noise Ratio	≥ 31 dB Narrowband / ≥ 37 dB Wideband
L.O. Frequency Stability	± 0.1 ppm (-30°C to +60°C)
Audio Distortion (Analog and Digital)	≤ 3.0 % (25°C); ≤ 5.0 % (-30°C to +60°C)
Audio Output Level (600 Ω Balanced)	≤ +3.0 dBm
Operating Temperature	-30°C to +60°C
Supply Current	≤ 200 mA / ≤ 230 mA with encryption module

Models Available

UR-4E768-00-000	12.5 / 25 KHz Bandwidth, 768 - 776 MHz, Class B
UR-4E800-00-000	12.5 / 25 KHz Bandwidth, 798 - 824 MHz, Class B
UR-4E850-00-000	12.5 / 25 KHz Bandwidth, 851 - 869 MHz, Class B
UR-4E900-00-000	12.5 / 25 KHz Bandwidth, 896 - 902 MHz, Class B
UR-4E950-00-000	12.5 / 25 KHz Bandwidth, 930 - 960 MHz, Class B

Receiver Operating Frequency

The receiver is initially aligned at the factory for the center of the frequency range and is programmed for the frequency shown on the label on the front panel. No re-alignment of the receiver is required to change frequencies.

TN287 UR-4E UHF 700 / 800 / 900 MHz MT-4E Receiver

The UR-4E UHF 700 / 800 / 900 MHz receiver is primarily software-controlled, allowing tuning, programming and maintenance to be done via software service with few hardware adjustments required.

RSS Service Mode:

The RSS has the ability to put a receiver into Service Mode, where the Reference Oscillator may be aligned, Audio Levels may be set, Jumper Settings may be selected, a BER test can be performed, and an RSSI meter can be monitored. To put the receiver into Service Mode, it must be connected to a PC running the Radio Service Software (RSS) using a type A to 5-pin mini-type B USB cable. From the RSS Receiver Configuration window, click on the Service button. Note that you must not remove power to the radio or swap radios during servicing. When any required Service functions have been completed, the radio can be taken out of Service Mode by clicking on the Quit button in the Service window.

Note: For complete alignment procedures, refer to the instruction manual. These notes are for reference only.