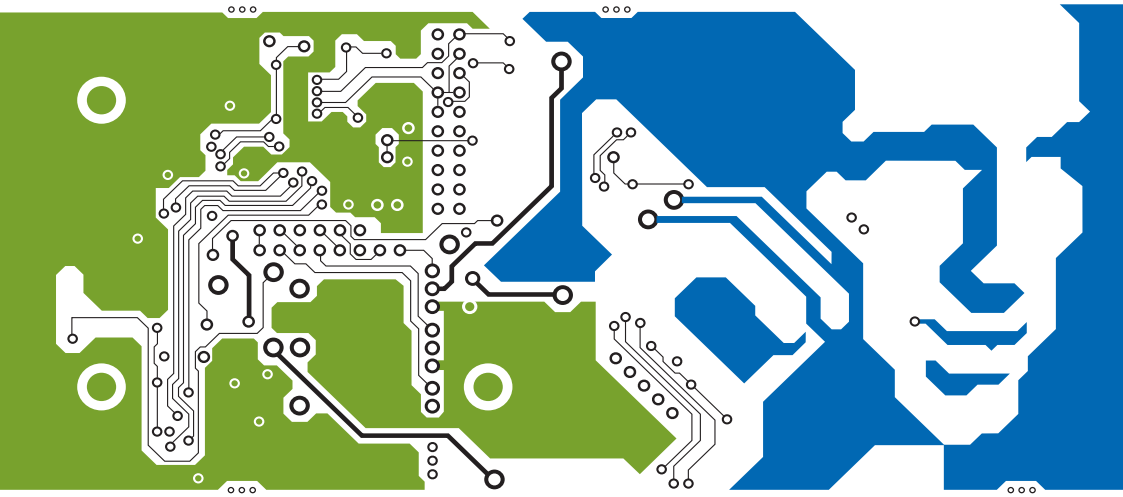
CODAN

Digital Microwave Radio

8800 series

MICROWAVE LINKS



INSTALLATION HANDBOOK

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The English version takes precedence over any translated versions.

Installation

This document provides step-by-step hardware installation and software configuration guidelines for the Codan 8800 series Digital Microwave Radio (DMR). For more detailed installation and configuration instructions, please see the *Digital Microwave Radio 8800 series Reference Manual*, the *Digital Microwave Radio 8800 series Redundancy Systems Reference Manual*, and the *MINet Management Software User Guide*.

To:

- install the hardware, see page 1, *Installing the hardware*
- configure the individual terminals from their respective front panels, see page 9, *Configuring the terminals*
- install and configure MINet, see page 13, *Installing and configuring MINet*

Installing the hardware

Hardware installation involves:

- installing the antenna
- installing the outdoor unit (ODU) to indoor unit (IDU) coaxial cable
- installing the ODU
- installing the IDU
- earthing the installation
- connecting the DC power supply
- connecting the communication, and monitor and control cables

Installing the antenna

Antenna installation requirements vary significantly depending upon the manufacturer. Please refer to the manufacturer's documentation.

Installing the ODU-to-IDU coaxial cable

To install the coaxial cable:

- ❑ Attach an N-type male connector to one end of the coaxial cable.

  NOTE

  Use a standard installation kit and follow the connector manufacturer's instructions.

  The maximum allowed cable length is 300 m (1000 ft) for a –48 V DC supply.

- ❑ Position the coaxial cable, connector end up, on the mounting pole, leaving a minimum of 45 cm (18 in) for a service loop at the point where the cable will connect to the ODU.
- ❑ Fasten the coaxial cable to the structure every 2 m (6 ft).

  CAUTION

  Avoid tight bending and over tightening the cable during fastening.

Installing the ODU

NOTE

If the antenna has a diameter greater than 1.8 m (6 ft), the ODU must be mounted indirectly (see the *Digital Microwave Radio 8800 series Reference Manual* or the *Digital Microwave Radio 8800 series Redundancy Systems Reference Manual*).

To install the ODU directly on the antenna:

- ❑ Mount the ODU onto the antenna, observing the **H** or **V** polarisation marks on the body of the ODU (see Figure 1 on page 4).

  The **H** label must point either straight up or straight down for horizontal polarisation.

  The **V** label must point either straight up or straight down for vertical polarisation.

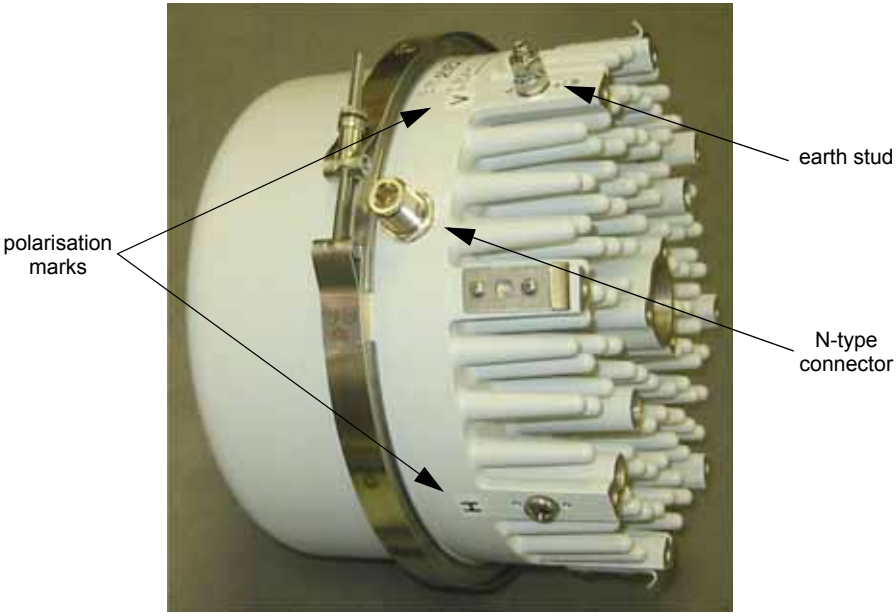
  CAUTION

  Both ends of the link *must* be identically polarised.

  NOTE

  To discourage birds from perching on the ODU-to-IDU coaxial cable, orient the N-type connector on the ODU downwards.

Figure 1: ODU identification



- ❑ Secure the ODU in place using the four clips on the antenna.
- ❑ Connect surge protection to the ODU-to-IDU coaxial cable, if required.

NOTE In-line surge protection is recommended to minimise damage from lightning strikes.

- ❑ Connect the ODU-to-IDU coaxial cable to the N-type connector on the ODU.
- ❑ Seal the connection, and the surge protection if used, with self-amalgamating tape (PIB (Rotunda 2501) or EPR (3M Scotch™ 23)).
- ❑ Cover the self-amalgamating tape with an overlay of high-quality electrical tape (3M Scotch™ 33+, or similar) to minimise aging of the self-amalgamating tape.

- ❑ Connect the earth stud of the ODU directly to the tower using the earth cable supplied.

NOTE The position of the earth stud on the body of the ODU may be altered to suit installation requirements.

NOTE The earth cable should follow the most direct route, and be as short as possible, to minimise damage from lightning strikes.

Installing the IDU

To mount the IDU:

- ❑ Mount the IDU in the rack in its pre-determined position using the supplied mounting screws.

  The IDU requires one standard 19" rack space (EIA 4.5 cm (1.75 in)).

- ❑ Pull the coaxial cable (see page 2, *Installing the ODU-to-IDU coaxial cable*) into the rack, then cut to length leaving a 45 cm (18 in) service loop.

- ❑ Attach an N-type male connector to the end of the coaxial cable.

NOTE Use a standard installation kit and follow the connector manufacturer's instructions.

- ❑ Connect the N-type elbow connector to the **ODU** connector on the IDU (see Figure 2 on page 6 and Table 1 on page 6).

NOTE In-line surge protection is recommended to minimise damage from lightning strikes.

- ❑ Connect the coaxial cable to the female portion of the N-type elbow.

Figure 2: IDU connection points

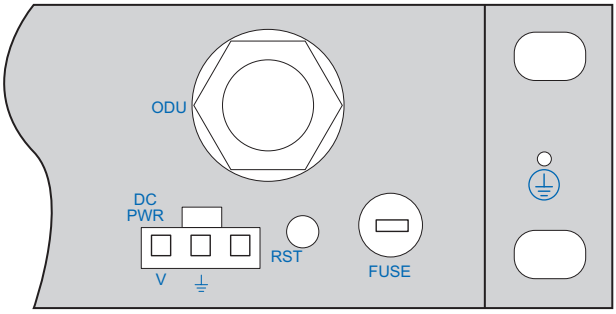


Table 1: IDU connections

Connector	Type	Function
ODU	N-type female coaxial connector	Connects to ODU
DC PWR	3-pin receptacle	Provides DC power in ±(22 to 60) V DC, –48 V typical
RST	Push button	Resets the terminal (cold reset)
FUSE	Fuse	Provides DC protection: 3 A for 22 to 36 V DC 1.6 A for 36 to 60 V DC
Protective earth symbol (⏚)	Earthing lug	Provides earth

Earthing the installation

To earth the installation:

- ❑ Connect the ring terminal of the supplied earth cable to the earth stud on the IDU.
- ❑ Cut the earth cable to an appropriate length to allow for connection to the rack earth.

  NOTE The earth cable should follow the most direct route possible.

- ❑ Attach the supplied ring terminal to the other end of the IDU earth cable.
- ❑ Connect the ring terminal to the rack earth.

Connecting the DC power

NOTE The IDU supports 22 to 60 V DC. The 1.6 A fuse (installed in the factory) supports 36 to 60 V DC.

WARNING If your IDU is required to operate on 22 to 36 V DC, replace the 1.6 A fuse with the 3 A fuse provided.

To connect the DC power:

- ❑ Measure the DC voltage to confirm its magnitude and polarity.

  WARNING Use of an improper voltage or a faulty earthing connection may cause serious injury or equipment damage.

- ❑ Use the DC connection kit provided to connect the switched DC power supply to the 3-pin receptacle on the IDU (see Figure 2).

WARNING The rack earth of the DC power supply must be connected to the centre pin (⏚) of the **DC PWR** connector.

The voltage may be either positive or negative earth reference.

Connecting the communication, and monitor and control cables to the IDU

NOTE For information on pinouts see the *Digital Microwave Radio 8800 series Reference Manual* or the *Digital Microwave Radio 8800 series Redundancy Systems Reference Manual*.

To connect the cables:

- ❑ Connect the tributary cables as required.
- ❑ Connect the alarm I/O cables as required.
- ❑ Connect the data cables as required.

NOTE Do not connect the **NMS-IN**/**NMS-OUT** and **ETH** ports at this time. These ports should be connected only after performing configuration as described on page 9, *Configuring the terminals*.

Configuring the terminals

The 8800 series DMRs are now ready for configuration. Configuration must be carried out before antenna alignment is attempted.

In order to configure an entire link, this process must be carried out on the front panel of the terminal at each end of the link.

NOTE Press **ESC** at any time in the following process to return to a known starting point.

To configure the DMR:

- ❑ Switch on the power supply to the DMR.

  The following tests are noted on the display:

  `RAM TEST`

  `LOADING BANK 1`

  `INITIALISING`

  `SELF TEST` (all LEDs should flash)

  `HARDWARE INIT OK`

  `STARTING UP`

  `SELF TEST PASSED SUCCESSFULLY`

  On completion of all the startup tests, `LINK DOWN` is displayed unless the antenna is coincidentally aligned to allow system lockup with a low receiver power.

- ❑ Check that the **PWR** LED on the front panel is on.
- ❑ Check that the **LOC** LED on the front panel is on.

  If the **REM** LED is on, press **LOC**/**REM**.

  The DMR is now ready to configure for use.

  NOTE All changes made are stored in volatile RAM and are not implemented until they are saved into the working configuration.

- ❑ Press **SEL/SAVE** to enter the menu options.

```
Please Wait . . . .
. . . . . . . . . .
```

- ❑ Scroll through the menu options using ◀ or ▶ until `QUICK CONFIG` is displayed.

```
QUICK CONFIG
```

- ❑ Press **SEL/SAVE** to enter the **QUICK CONFIG** menu.

  A password prompt is displayed.

```
ENTER PASSWORD
```

- ❑ Enter the default supervisor password:

  ESC ESC ▶▶▶.

```
ENTER PASSWORD
*****
```

- ❑ Use ◀ or ▶ to move through the **QUICK CONFIG** menu until `Link Capacity` is displayed.

```
Link Capacity
Sixteen E1        *
```

- ❑ Press **SEL/SAVE** to enter the **Link Capacity** menu, then use ◀ or ▶ to scroll to the required capacity.

NOTE

A # mark appears on the lower right of the display to indicate that any changes made have not been saved into the working configuration of the DMR (see page 12, *Saving the changes to the working configuration*).

- ❑ Press **SEL/SAVE** to select the capacity.
- ❑ Press **ESC** to exit the **Link Capacity** menu.

- ❑ Use ◀ or ▶ to move through the **QUICK CONFIG** menu until `Frequency` is displayed.

```
Frequency(Ch #)
38854.25 (1017)*
```

- ❑ Press **SEL/SAVE** to enter the **Frequency** menu.
- ❑ Press **SEL/SAVE** to move across the frequency digits and ◀ or ▶ to increase or decrease each digit until the correct transmit frequency is displayed.

NOTE

The frequency selected is the transmit frequency.

Frequency bands below 10 GHz will begin with a 0 as the first digit.

Error messages will be displayed if invalid frequencies are entered.

- ❑ Press **SEL/SAVE** to save the frequency.
- ❑ Press **ESC** to exit the **Frequency** menu.
- ❑ Use ◀ or ▶ to move through the **QUICK CONFIG** menu until `Channel Spacing` is displayed.

```
Channel Spacing
28 MHz           *
```

NOTE

`Channel Spacing` will only appear if an Eth 10/100 DIU is installed. If `Channel Spacing` is not available continue with setting the Tx Power.

- ❑ Press **SEL/SAVE** to enter the **Channel Spacing** menu, then use ◀ or ▶ to scroll to the desired channel spacing.
- ❑ Press **SEL/SAVE** to select the channel spacing.
- ❑ Press **ESC** to exit the **Channel Spacing** menu.

- ❑ Use ◀ or ▶ to move through the **QUICK CONFIG** menu until `Tx Power` is displayed.

```
Tx Power(-10,24)
+24                #
```

- ❑ Press **SEL/SAVE** to enter the **Tx Power** menu.
- ❑ Use **SEL/SAVE** to move across the power digits and ◀ or ▶ to increase or decrease the individual digits.

  Adjust the power level for the required transmit power.
- ❑ Press **SEL/SAVE** to save the transmit power level.
- ❑ Press **ESC** to exit the **Tx Power** menu.

Saving the changes to the working configuration

To save the changes to the working configuration:

- ❑ Press **ESC** twice to exit the **QUICK CONFIG** menu.
- ❑ Press **SEL/SAVE** to move the changes to the current working configuration of the DMR, then press **ESC** *twice* to update the working configuration.

Installing and configuring MINet

Installing MINet

To install MINet:

- ❑ Insert the MINet CD into the CD drive of your PC.

  The install programme will launch automatically.

Configuring the PC and DMRs to communicate with each other

In order to manage the 8800 series DMR using MINet software, the IP address of the computer running MINet and the connected DMR must belong to the same network.

Obtaining the IP address of the local terminal

The IP address of the local terminal is obtained using the front panel.

To obtain the IP address of the terminal:

- ❑ Press **SEL/SAVE** to enter the menu options.

```
Please Wait . . . .
. . . . . .
```

- ❑ Scroll through the menu options using ◀ or ▶ until `CONFIGURATION` is displayed.

```
CONFIGURATION
```

- ❑ Press **SEL/SAVE** to enter the **CONFIGURATION** menu.

  A password prompt is displayed.

```
ENTER PASSWORD
```

- ❑ Enter the supervisor password:

  ESC ESC ▶▶▶.

```
ENTER PASSWORD
*****
```

- ❑ Use ◀ or ▶ to move through the **CONFIGURATION** menu until `IP MANAGEMENT` is displayed.

```
IP MANAGEMENT
```

- ❑ Press **SEL/SAVE** to enter the **IP MANAGEMENT** menu.
- ❑ Use ◀ or ▶ to move through the **IP MANAGEMENT** menu until `ETH IP` is displayed.

NOTE Be careful not to select the IP ETH Mask IP address.

```
ETH IP
192 . 168 . 3 . 1  *
```

The IP address should be:

192.168.<network address>.<host address>

- ❑ Record the IP address.

NOTE You will need to enter the IP address when you ping the local and remote terminals, and when setting up MINet.

- ❑ Use ◀ or ▶ to move through the **IP MANAGEMENT** menu until `ETH IP MASK` is displayed.

- ❑ Record the address in the **ETH IP MASK** option as the subnet mask.

NOTE The subnet mask must be the same for the local and remote terminals. You must enter the same subnet mask for the PC running MINet.

- ❑ Repeat the above steps on the front panel of the other terminal to obtain its IP address and subnet mask.

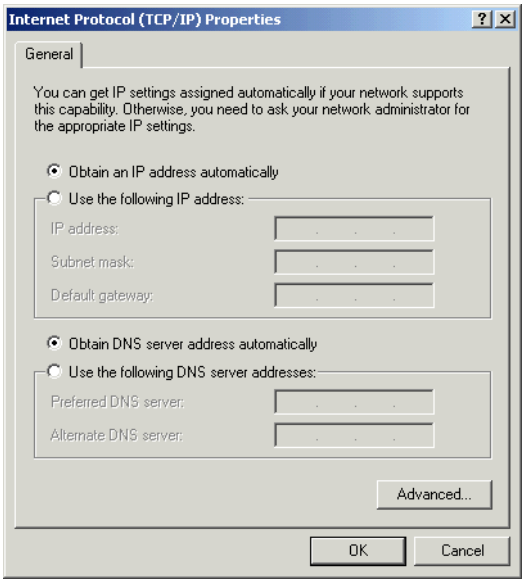
Setting the IP address of the local PC

The local PC running MINet *must* belong to the same IP network as the connected DMR. The IP address is set using Windows.

NOTE The options that you see depend upon the version of Microsoft Windows that you have installed (Windows XP is shown below). For more information on this topic refer to the on-line help provided for Windows.

To set the IP address of the local PC:

- ❑ From the **Start** menu select **Settings**—**Control Panel**—**Network and Dial-up Connections**.
- ❑ Double click on **Local Area Connection**.
- ❑ Select **Properties**.
- ❑ Scroll through the listed components used by this connection, select **Internet Protocol (TCP/IP)**, then click on **Properties**.



- ❑ Select **Use the following IP address**.
- ❑ Enter a suitable IP address for the PC that contains the same network address but a different host address as the connected DMR. For example:

Connected device	IP address
DMR	192.168.3.1
PC	192.168.3.10

- ❑ Ensure that the subnet mask for the PC is the same as that for the DMR, that is 255.255.255.0.
- ❑ Open a Windows Command Prompt session on the MINet PC.
- ❑ Connect the Ethernet port of the PC to the **ETH** port on the local IDU.
- ❑ To ping the local terminal of the DMR, type:

  ping <**IP address of local terminal**> (recorded earlier)

For example:

ping 192.168.3.1

A reply should be received from the DMR.

NOTE If there is no reply, you may need to change the type of IP cable connecting your PC to the network. The type of cable required (straight or crossover) depends on the Ethernet card installed in the PC.

MINet can now be used to communicate with the local radio.

Setting up out-of-band management of the remote (far) DMR

In order to manage the remote (far) end DMR, further configuration is required. In-band and out-of-band management are available. The setup for out-of-band management is described below. For more information on in-band and out-of-band management see the *Digital Microwave Radio 8800 series Reference Manual* or the *Digital Microwave Radio 8800 series Redundancy Systems Reference Manual*.

To configure out-of-band management:

- ❑ Set up a static route on the PC for the remote (far) end terminal using a Command Prompt session. Type:

  route add <IP address of remote terminal> <IP address of local terminal>

  For example:

  route add 192.168.1.1 192.168.3.1

- ❑ To ping the remote terminal of the DMR, type:

  ping <IP address of remote terminal> (recorded earlier)

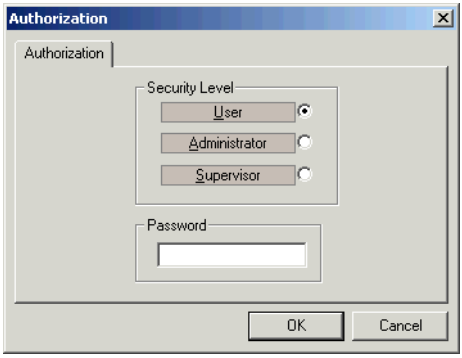
For example:

ping 192.168.1.1

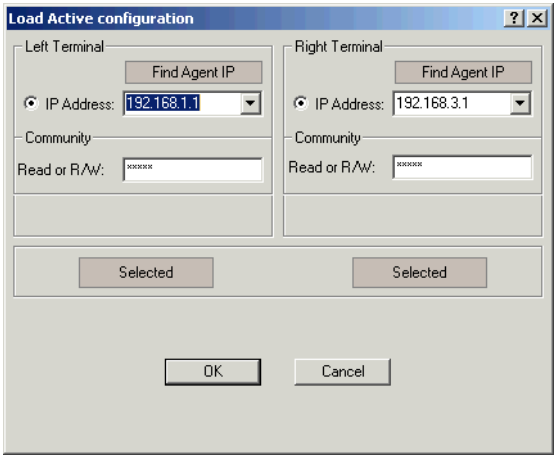
A reply should be received from the DMR.

The computer is now configured to communicate to both ends of the link.

- ❑ Close the Command Prompt session.
- ❑ Double click on the MINet icon on the desktop.
- ❑ The following screen is displayed.



- ❑ Click on **Supervisor**, enter the default supervisor password **super**, then click OK.



- ❑ Enter the IP addresses of the local and remote terminals, recorded earlier, in the left and right address locations respectively.
- ❑ Click OK to launch MINet.

NOTE For more information on using MINet see the *MINet Management Software User Guide*.

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