# Installing the IDR

This chapter describes the installation of the WipLL **Indoor Data Radio** (IDR), which is installed at the subscriber site.

**Warning:** When operating in the 900 MHz band, the IDR model with an external antenna must not be co-located or operating in conjunction, with any other antenna or transmitter.

**Warning:** To avoid electrical or fire hazard, ensure that all cable connections to the IDR are performed prior to connecting the power supply.

**Note:** The digital portion of the transceiver 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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to 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 on and off, the user is encouraged to try correct the interference by performing one or more of the following measures:
- Reorientate or relocate the receiving antenna
- Increase separation between the equipment and receiver
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

# 12.1. Physical Dimensions and Basic Design

The IDR is encased in a chassis providing access to the IDR's communication port at the front panel. The following figure displays the IDR's front panel (when the front chassis cover is removed).
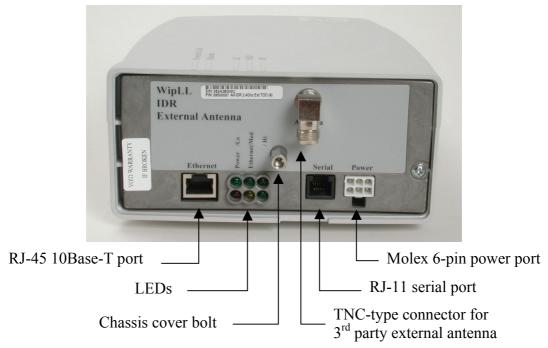


**Figure 12-1: IDR front panel (removed cover) exposing ports**

The IDR's physical dimensions are described in Table 12-1.

**Table 12-1:  IDR physical dimensions**

| Parameter | Value | Comment |
|---|---|---|
| Weight | 1,43 kg | |
| Dimensions (H x W x D)<br><br>• IDR with built-in antenna<br><br><br><br>• IDR with an external antenna | <br><br>• 155 mm (6.1 inches) x 233 mm (9.17 inches) x 74.5 mm (2.93 inches)<br><br>• 120.5 mm (4.74 inches) x 61mm (2.4 inches) x 35 mm (1.37 inches) | Note: Dimensions exclude the external power adapter. |

# 12.2. Mounting the IDR

The IDR is installed indoors. It is positioned so that the IDR (or a third-party external antenna) is in line-of-site with the WipLL Base Station (i.e., BSR).

The IDR may be mounted in the following ways:

■ Desktop

■ Pole

■ Wall

**Warning:**  The IDR must only be installed indoors. Airspan is not liable and responsible for any damages that may occur to the IDR if it is installed outdoors.

**Note:**  Before mounting or attaching any brackets to the IDR, ensure that all cables are securely attached and that the unit functions correctly in the proposed location.

## 12.2.1. Desktop Mounting

The IDR may be mounted on a desk in one of the following orientations:

■ Vertically

■ Horizontally

### 12.2.1.1. Vertical Desk Mounting

A base plate is provided to mount the IDR vertically on a desk so that it is in a standing position.

**To desk mount the IDR in a vertical position:**

■ Insert the IDR into the base plate, pressing firmly until the tabs click into place (see Figure 12-2).



**Figure 12-2:  IDR vertical desk mounting**

## 12.2.1.2. Horizontal-Desk Mounting

To position the IDR horizontally on a desk, four rubber pads, supplied with the unit, must be fitted to avoid damage to the mounting surface.

**To desk mount the IDR in a horizontal position:**

■ Secure the rubber pads to the posts provided on the rear of the IDR using four self-tapping screws. See Figure 12-3.
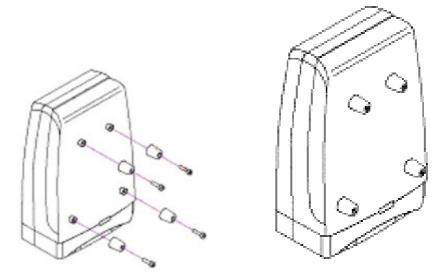




**Figure 12-3:  IDR horizontal desk mounting using supplied rubber pads and tapping screws**

# 12.2.2. Wall and Pole Mounting

The IDR may be mounted to a wall or to a 5-cm diameter pole. Wall and pole mounting both use the same mounting brackets and wall hanger plate.

## 12.2.2.1. Assembling the Bracket and Hanger Plate

The wall hanger plate secures the IDR to a wall or pole. The wall bracket and hanger plate allows positioning the IDR in the correct orientation. Holes are provided in the wall hanger plate for both pole and wall mounting options

**To assemble the bracket and hanger plate:**

1.  Insert a 4 mm hex nut into the slot on the tilt arm component

2.  Holding the nut in place, attach the tilt arm to the mounting bracket using a 4 mm socket head bolt. Hand-tighten the bolt only. See Figure 12-4.

3.  Affix the complete mounting assembly to the rear of the IDR using the 4-off self-tapping screws supplied with the kit.
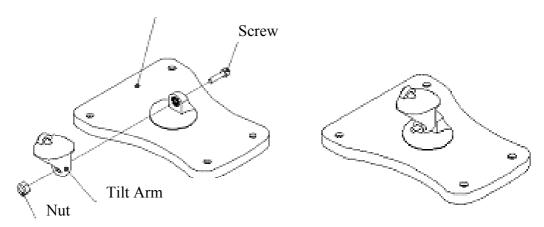


**Figure 12-4:  Mounting bracket assembly**

4. Attach the wall bracket assembly to wall hanger using an M4 socket-head bolt and nut as shown in Figure 12-5. The bolt is only to be hand tightened at this stage.
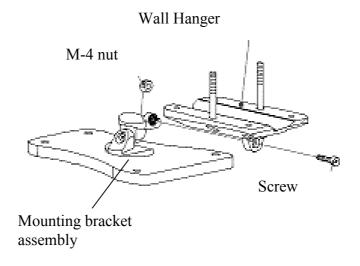


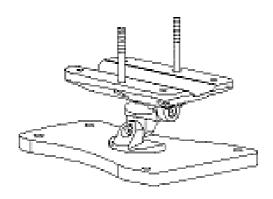**Figure 12-5:  Wall hanger fixing method**



**Figure 12-6:  Wall hanger & mounting bracket assembly**

5.  Once assembled, the IDR mounting bracket assembly may be secured to the rear of the IDR using the 4-off self-tapping screws supplied in the unit fixing kit. See Figure 12-7.
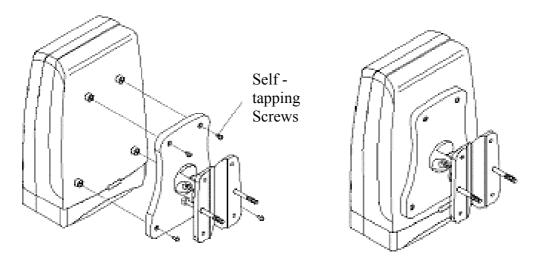
Self - tapping Screws

**Figure 12-7:  Mounting bracket assembly secured to IDR**

## 12.2.2.2. Pole Mounting

Prior to mounting the IDR to a pole the wall mounting bracket assembly must be fitted as described in the previous section.

**To pole mount the IDR:**

1.  Offer up the IDR assembly to the pole as shown in Figure 12-8.

2.  Insert 2-off M10 bolts through the holes in the wall hanger.

3.  Slide the clamp-holder into position and secure using washers, spring-washers and nuts as illustrated in Figure 12-9. Finger-tighten the fasteners.

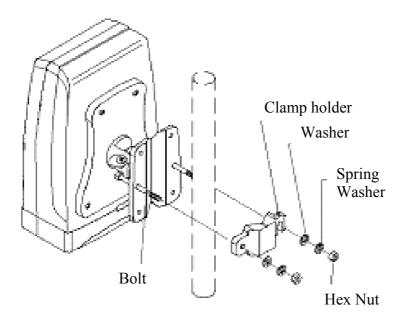4.  Slide the IDR to the required location on the pole and fully tighten the fasteners.

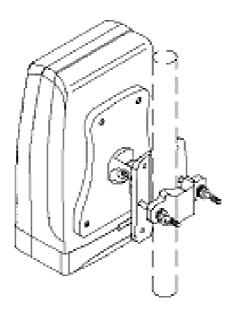

**Figure 12-8: IDR pole mounting components**

**Figure 12-9:  IDR secured to a pole**

**To set the correct IDR inclination:**

1.  Loosen the 2-off M4 socket head screws on the mounting bracket tilt-arm

2.  Position the IDR at the desired angle.

3.  Re-tighten the 2 off socket screws on the tilt arm.

## 12.2.2.3. Wall Mounting

⚠ **Warning:** Prior to drilling holes in a wall ensure that there are no hidden services such as electricity cables or water pipes. A stop must be used on the power drill to ensure that bored holes do not exceed 35 mm.

**To mount the IDR on a wall:**

1. Loosen the 2-off M4 socket head screws on the mounting bracket tilt-arm and remove the wall hanger.

2. Offer up the wall hanger to the wall and scribe through the mounting-hole locations.

3. Drill holes to suit the type of wall fixing.

4. If required insert anchor plugs suited to the wall material.

5. Affix the wall hanger using 4-off screws suited to the anchor plugs and wall material.

6. Re-attach the IDR mounting bracket to the wall hanger. Finger-tighten the screws.

7. Position the IDR at the desired inclination.

8. Re-tighten the screws to lock the IDR in position.

## 12.3. Connecting a Third-Party External Antenna

The IDR provides a TNC-type connector for connecting a third-party antenna. This antenna can be placed on the subscriber's windowsill to provide better RF signal reception with the BSR.

■ **Connector:** TNC-type male

**Warning:** Before connecting the external antenna, ensure that the IDR is NOT connected to the power source.
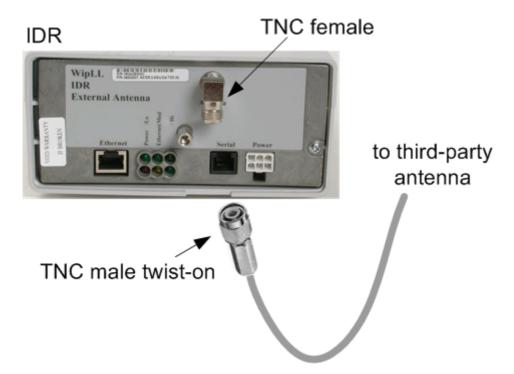


**Figure 12-10: Connecting a third-party antenna**

**Warning:** It is the responsibility of the person installing the WipLL system to ensure that when using the outdoor antenna kits in the United States (or where FCC rules apply), that only those antennas certified with the product are used. The use of any antenna other than those certified with the product is expressly forbidden in accordance with FCC rules CFR47 part 15.204. The installer should configure the output power level of antennas according to country regulations and per antenna type.

**Warning:** Indoor units and antennas should be installed ONLY by experienced installation professionals who are familiar with the local building and safety codes and are licensed by the appropriate government authorities

**Warning:** In accordance with FCC regulations, ensure that when operating in unlicensed bands, the external antennas provide a maximum EIRP of 36 dBm to prevent interference with other radios operating in the unlicensed band. The EIRP is defined as:

**Max. Power Output + Antenna Gain + Cable Loss $\leq$ 36 dBm (EIRP)**

**Warning:** When using external antennas, the external antennas must not be co-located or operating in conjunction with any other antenna or transmitter.
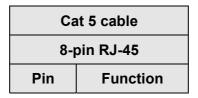
# 12.4. Connecting to an Ethernet Network

The IDR provides one Ethernet interface for the subscriber's Ethernet network. This port is located on the front panel, and labeled **Ethernet**.

The IDR-to-Ethernet network cable set up is as follows:

- **Cable:** CAT-5

- **Connector:** 8-pin RJ-45

- **Connector pinouts:**

| Cat 5 cable | |
|:---:|:---:|
| 8-pin RJ-45 | |
| Pin | Function |

| | |
|---|---|
| 1 | Rx+ |
| 2 | Rx- |
| 3 | Tx+ |
| 6 | Tx- |

**Note:** pins not mentioned in the table are not connected.

**To connect IDR to the subscriber's Ethernet network:**

1. Attach the 8-pin RJ-45 connector, at one end of the cable, to the IDR's Ethernet port, labeled **Ethernet** (see Figure 12-11).

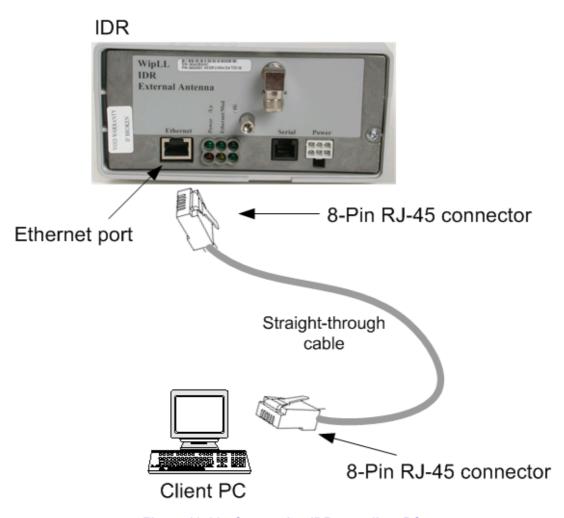2. Attach the 8-pin RJ-45 connector, at the other end of the cable, to the PC's LAN port (see Figure 12-11).

**Figure 12-11:  Connecting IDR to a client PC**

## 12.4.1. Ethernet LED Indicator

The IDR provides a LED that indicates an Ethernet connection. This LED is labeled **Ethernet** and is located on the IDR's top panel.

**Table 12-2:  Description of Ethernet LEDs**

| LED | Color | Status | Indicates |
|---|---|---|---|
| **Ethernet** | **Orange** | On | Physical link between IDR and Ethernet network |
| | | Off | No physical link between IDR and Ethernet network |
| | | Blinking | Ethernet data packets are flowing through the Ethernet port |

# 12.5. Positioning IDR for Optimum RF Reception

Once mounted to a wall, pole, or desk the IDR unit may be positioned to ensure the best RF signal communication with the BSR. The RF signal strength is indicated by three LEDs on the IDR chassis. The following table describes the RF signaling strength indicator LEDs.

**Table 12-3:  Description of RF signal strength LEDs**

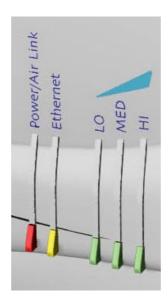| LED | Color | Function | Status | Description | |
|---|---|---|---|---|---|
| | | | | **Previous Releases** | **Release 4.2B** |
| RSSI LEDs: **LO**, **MED**, and **HI** | **Green** | RSSI level | All LEDs On | RSSI ≥ -60 dBm | RSSI ≥ -60 dBm |
| | | | Two LEDs On | -65 dBm ≤ RSSI ≤ -61 dBm | -70 dBm ≤ RSSI < -60 dBm |
| | | | One LED On | -70 dBm ≤ RSSI ≤ -66 dBm | -80 dBm ≤ RSSI < -70 dBm |
| | | | One LED Blinking | RSSI ≤ -77 dBm | -90 dBm ≤ RSSI < -80 dBm |
| | | | All LEDs Off | -76 dBm ≤ RSSI ≤ -71 dBm | RSSI < -90 dBm |

**Figure 12-12: IDR LED indicators**

**To position the IDR for optimum RF signal:**

■ Position the IDR until all three RF signaling strength indicator LEDs are lit.

Refer to Section 12.2.2, "Wall and Pole Mounting" page 12-6 for details on adjusting IDR wall and pole mounting position.

For desktop mounting, the IDR can be simply relocated to obtain the strongest signal.

# 12.6.  Connecting to PC for Serial Configuration

To perform IDR initial configuration, you need to connect the IDR's RJ-11 port to the serial port of a PC running the WipLL network management application (i.e., WipConfig).

The IDR's RJ-11 port labeled **Serial**, located on the front panel, connects to the serial port of a PC. This is performed using two cables (straight through and crossover) and an **RJ-11-to-9 pin D-type female adapter** on the crossover cable.

■ **Connectors:**

    ■ 6 pin RJ-11 male (to **IDR**)

    ■ 6 pin RJ-11 male (to **adapter**)

    ■ 6 pin RJ-11-to-9 pin D-type female adapter

    ■ 9 pin D-type male (to **adapter**)

    ■ 9 pin D-type female (to **PC**)

■ **Cable:**

    ■ **Straight-through cable** with 6-pin RJ-11 connectors on both sides: one for IDR and one for the **RJ-11-to-9 pin D-type adapter** (connects straight-through to crossover cable)

    ■ **Crossover cable** with **RJ-11-to-9 pin D-type adapter** on one end and 9-pin D-type female on the other that connects to the PC

■ **Connector pinouts:**

| IDR side | | | PC side | |
|---|---|---|---|---|
| Straight-through cable | | | Crossover cable | |
| 6-pin RJ-11 | | 9-pin D-type female | 9-pin D-type male | 9-pin D-type female |
| Pin | Function | Pin | Pin | Pin |
| 1 | Rx | 2 | 2 | 3 |
| 5 | GND | 5 | 5 | 5 |
| 6 | Tx | 3 | 3 | 2 |

**To connect the IDR to the WipLL management station (PC):**

1. Connect the **6 pin RJ-11** connector, at one end of the straight-through cable, to the IDR's RJ-11 port labeled **Serial**.

2. Connect the **RJ-11** connector, at the other end of the straight-through cable, to the **RJ-11-to-9 pin D-type adapter**.

3. Connect the **9 pin D-type male** connector, at one end of the crossover cable, to the **RJ-11-to-9 pin D-type adapter**.

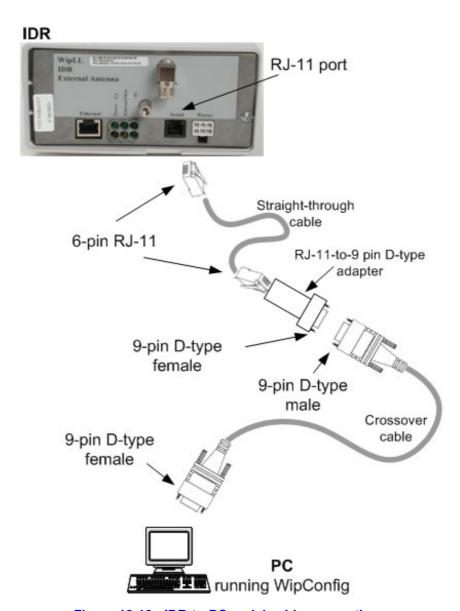4. Connect the **9 pin D-type female** connector, at the other end of the crossover cable, to the PC's serial port.

**Figure 12-13: IDR-to-PC serial cable connections**

# 12.7. Connecting Power

The IDR is powered by an external power supply (*Triple Output External Adapter*). The IDR connects to the power adapter via the IDR's power port located on the IDR's front panel.

The following table lists the external power supply specifications:

**Table 12-4: IDR power supply requirements**

| Power parameter | Units |
|---|---|
| Voltages | 110-240 VAC |
| Frequency | 50 to 60Hz |
| Maximum power consumption | Less than 15W |

**Warning:** If you are using an external antenna, ensure that you connect the antenna before connecting the BSR to the power source.

**Warning:** Ensure that plugs fitted to mains power leads for subscriber premises equipment are compatible with AC mains sockets. Do not replace plugs on power leads to suit local requirements without first verifying earthing practice for the country and equipment in question.

Careful consideration must be given to issues including local wiring requirements, cable color-coding, and safety earthing and circuit protection requirements.

**Warning:** To avoid electrical or fire hazard, ensure that the data connections to the IDR are made prior to connecting the power supply. The AC mains must be capable of supplying at least 230 VAC

Prior to connecting to the power outlet, the following pre-connection inspection should be performed on power sockets:

■ Ensure no other equipment is connected to the power outlet.

■ Ensure no physical sign of damage to the power outlet.

■ Ensure no water or dampness on or around the power outlet.

■ Ensure plug and socket assemblies are firmly secured.

■ Check the power outlet to verify the earth loop impedance value and the presence of phase, neutral and earth connections using a proprietary plug tester such as a 'Martindale Ze' type.

The IDR-to-power cable set up is as follows:

■ **Cable:** 3-core 0.7mm² type

■ **Connector:** 6-Pin power connector

■ **Connector pinouts:**

| Pin | Function |
|-----|----------|
| 1 | +6.5V |
| 2 | +5V |
| 3 | 3.3V |
| 4 | GND |
| 5 | Not connected |
| 6 | Not connected |

**To connect the power:**

1. Plug the AC power adapter's **6-pin Molex** connector into the IDR's power port labeled **Power** (see Figure 12-14).

2. Plug the **AC power plug female**, at the one end of the AC power cable, into the AC power adapter's socket (see Figure 12-14).

3. Plug the **AC power plug male**, at the other end of the AC power cable, into the electrical outlet (see Figure 12-14).
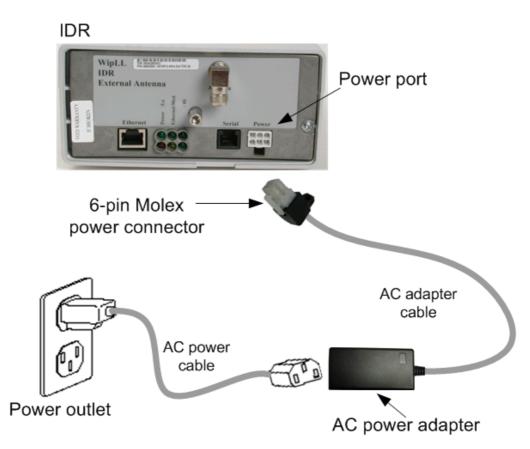
**Figure 12-14:  Connecting power to the IDR**

## 12.7.1. Power LED

The IDR provides a power LED indicator (labeled **Power)** indicating whether a power supply exists. The **Power** LED is located on the IDR's front panel.

**Table 12-5:  Description of Power LEDs**

| LED | Color | Status | Meaning |
|---|---|---|---|
| **Power** | **Red** | On | The SDA receives power supply |
|  |  | Off | No power received |