

Section 8 Accessories

8.1 Enclosures

Basic Enclosure

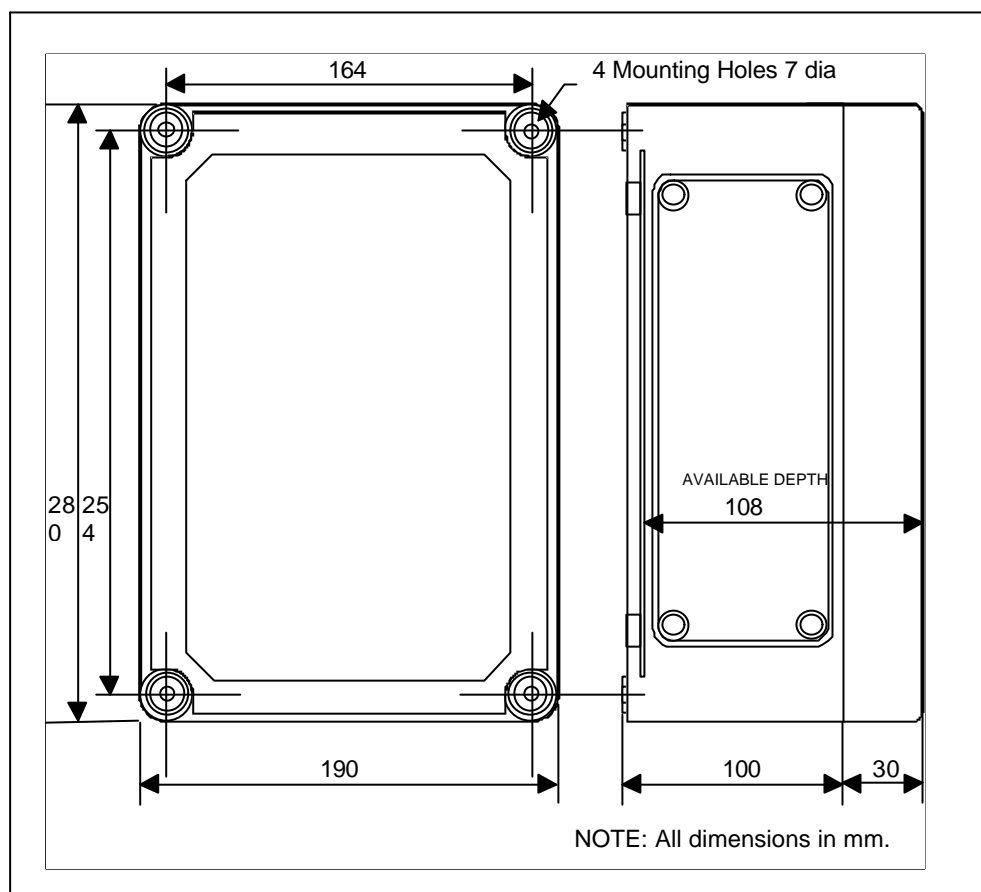


Figure 37 Mechanical Drawing of Basic Enclosure

The Basic Enclosure is an impact resistant, polycarbonate enclosure which offers protection from dust and moisture in accordance with IP67 (IEC529/DIN 40050/BS5490). It is moulded from homogeneous thermoplastic polycarbonate, is resistant to normal atmosphere corrosion and is resistant to most mineral and organic acids. Contact should be avoided, however, with organic solvents and strong alkalis. The material is self-extinguishing and does not release any toxic combustion products.

It is supplied complete with lid, gland plate, four cable glands and metal base plate, ready to take VersaNet modules. A depth of 108mm is available in an unexpanded enclosure. Enclosures may be bolted together or increased in depth using suitable accessories to accommodate larger numbers of modules.

The enclosure is supplied with a grey finish (RAL7035) and may be painted and machined with normal tools or ultrasonic welding apparatus. Cleaning should be performed with soap and water only.

Specifications

| | |
|---------------|--|
| Part Name | Basic Enclosure |
| Part Number | ENC0001 |
| Dimensions | 190 x 280 x 130 (Available Depth 108mm) |
| Weight | 1.5kg |
| No. in a node | No Limit |
| Cleaning | Soap & Water Only AVOID ORGANIC SOLVENTS or STRONG ALKALIES |

8.1.1 Depth Extension Kit

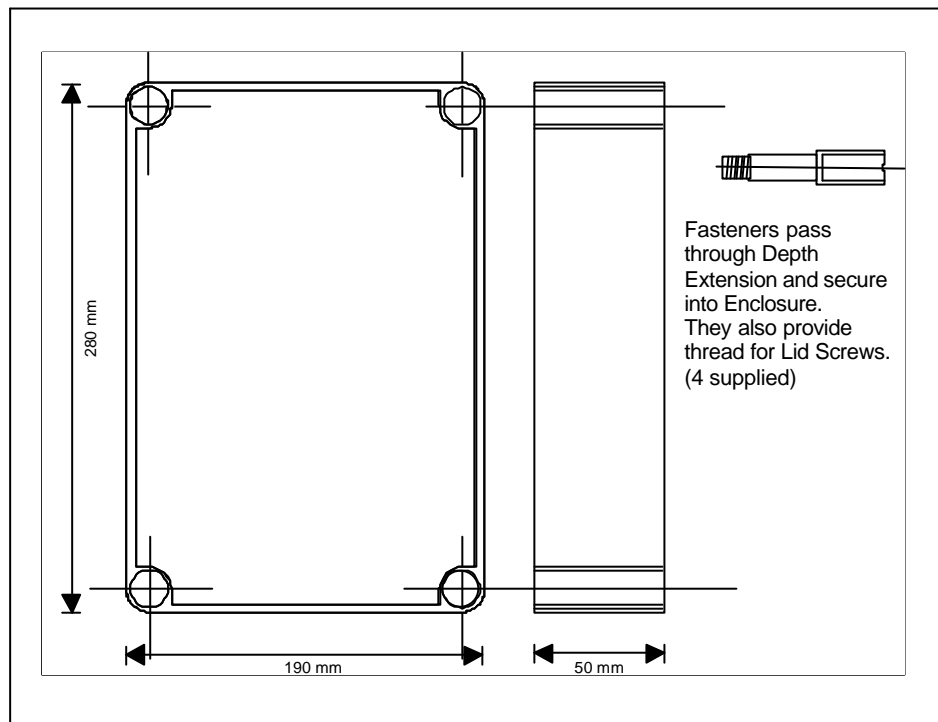


Figure 38 Mechanical Drawing of Depth Extension Kit

The Depth Extension Kit is used to increase the available depth of the Basic Enclosure. Each extension provides an additional 50mm, therefore when the suggested maximum of 2 extensions are fitted, a total depth of 208mm is available. When fitted in accordance with the instructions in Section C of this manual, the IP67 protection is maintained.

Specifications

| | |
|------------------|--|
| Part Name | Depth Extension Kit |
| Part Number | ENC0004 |
| Number in a Node | No Limit (maximum 2 per Basic Enclosure) |
| Weight | 0.4 kg |

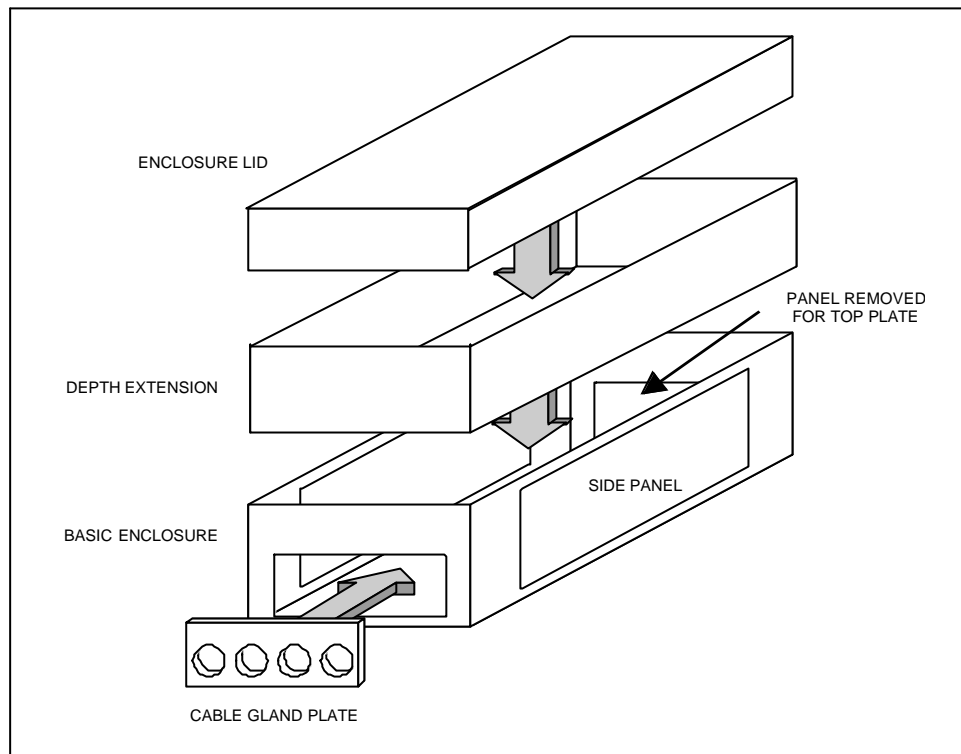


Figure 39 Example Enclosure Construction

8.1.2 Side Extension Kit

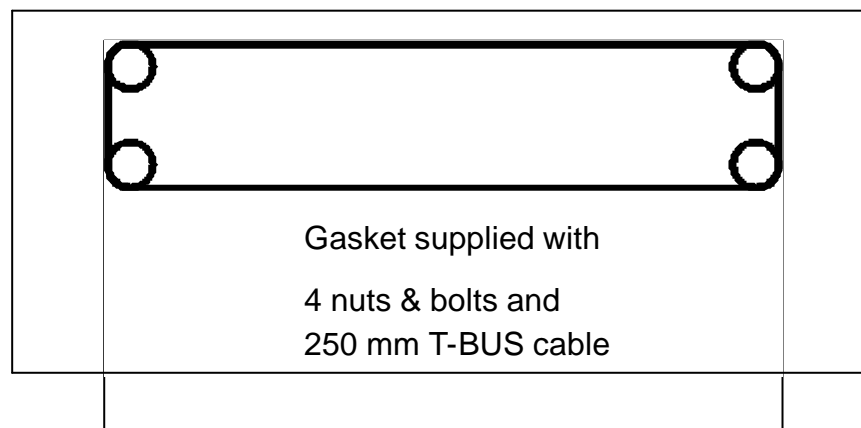


Figure 40 Side Extension Kit

The Side Extension Kit is used to connect two Basic Enclosures together to accommodate large numbers of modules.

It consists of a sealing gasket, four nuts and bolts and an extended T-BUS cable. When fitted in accordance with instructions in Section C of this manual, the IP67 protection is maintained.

Specifications

| | |
|------------------|--------------------|
| Part Name | Side Extension Kit |
| Part Number | ENC0002 |
| Number in a Node | No Limit |

| | |
|---------------------|------------|
| Dimensions - gasket | 215 x 80mm |
| T2-BUS cable | 250mm |
| Weight | 0.05kg |

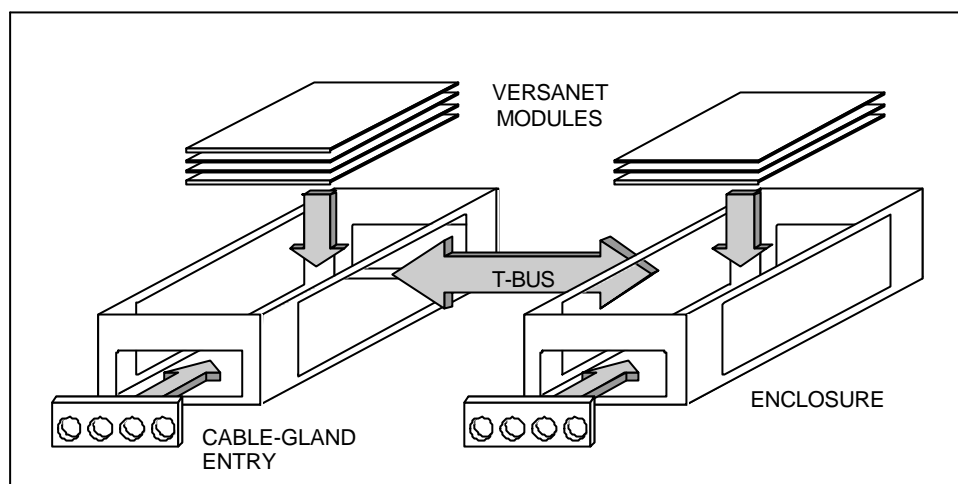


Figure 41 Example Enclosure Construction

8.1.3 Battery Mounting Kit

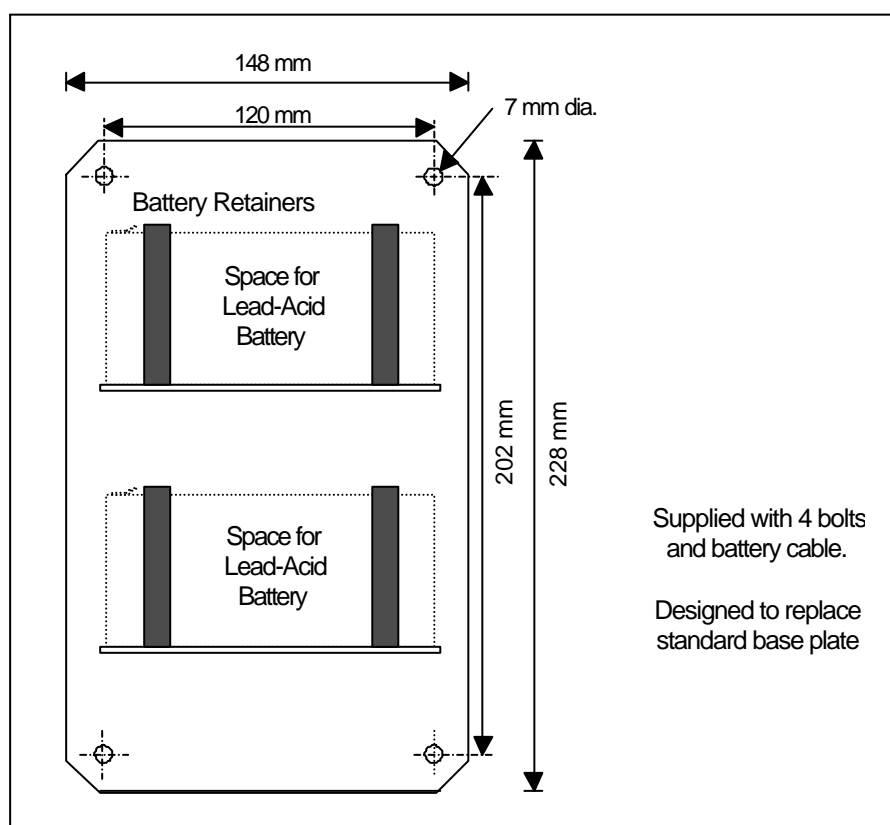


Figure 42 Mechanical Drawing of Battery Mounting Kit

The Battery Mounting Kit is used in place of the standard metal base plate to provide means of retaining two 12V batteries in a Basic Enclosure. It consists of a

formed metal base plate, battery retention straps, fasteners and a battery cable to connect to the relevant VersaNet Module (Low Power Input or DC Adaptor)

Specifications

| | |
|-------------------------|----------------------|
| Part Name | Battery Mounting Kit |
| Part Number | ENC0005 |
| Number in a Node | 1 max |
| Dimensions - base plate | 148 x 228 mm |
| - battery cable | 250mm |
| Weight | 0.5kg |
| Battery space | 2 off 150 x 100 mm |

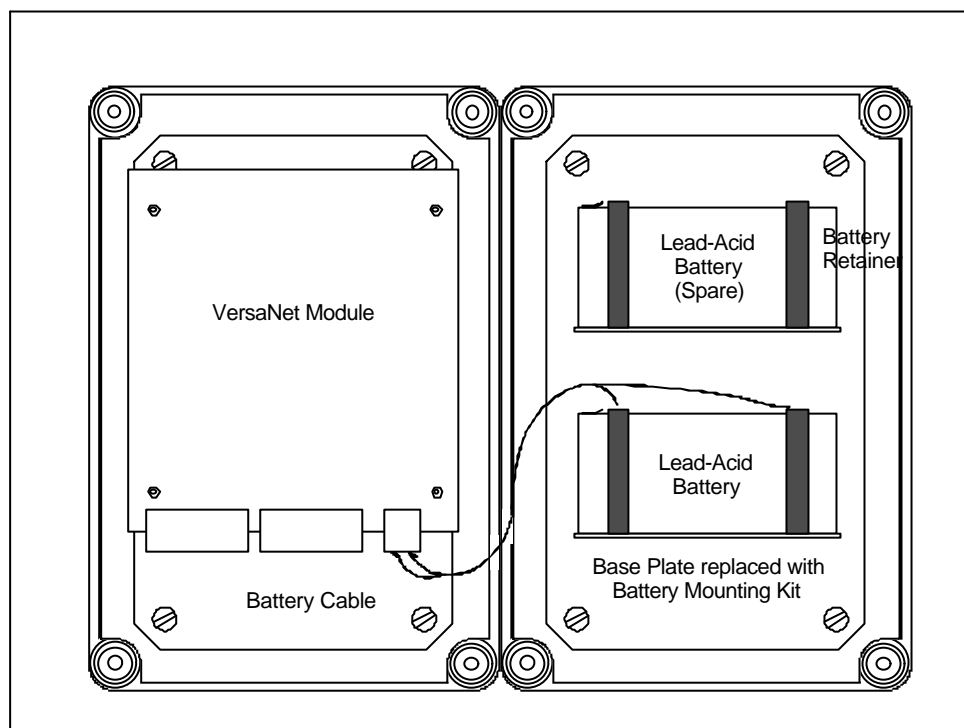


Figure 43 Battery Kit Construction

8.1.3 Antenna Top Plate Mounting Kit

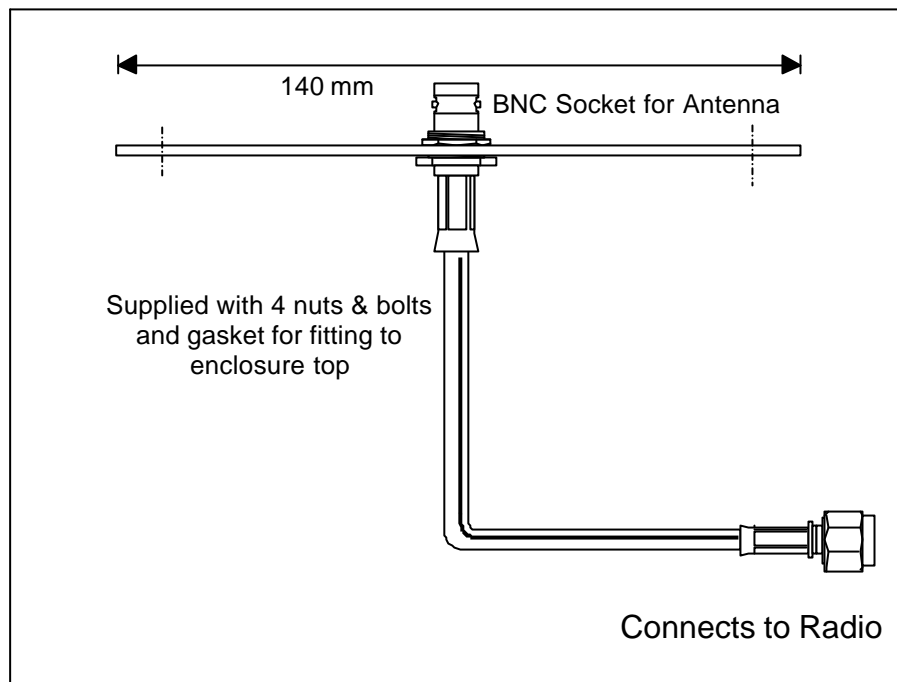


Figure 44 Mechanical Drawing of Antenna Top Plate Mounting Kit

The Antenna Mounting Kit is used to provide a means of connecting an enclosure-top antenna directly to a VersaNet enclosure. It consists of a metal plate fitted with a short RF cable, sealing gasket and four nuts and bolts. When fitted in accordance with the instructions in Section C of this manual, the IP67 protection is maintained.

Specifications

| | |
|------------------------|--------------------------------|
| Part Name | Antenna Top Plate Mounting Kit |
| Part Number | ENC0003 |
| External RF Connection | BNC female, bulkhead mounted |
| Number in Node | 1 max |
| Dimensions - plate | 140mm x 50mm x 2mm |
| - cable | 300mm |

8.1.5 Antenna Bulkhead Cable Kit

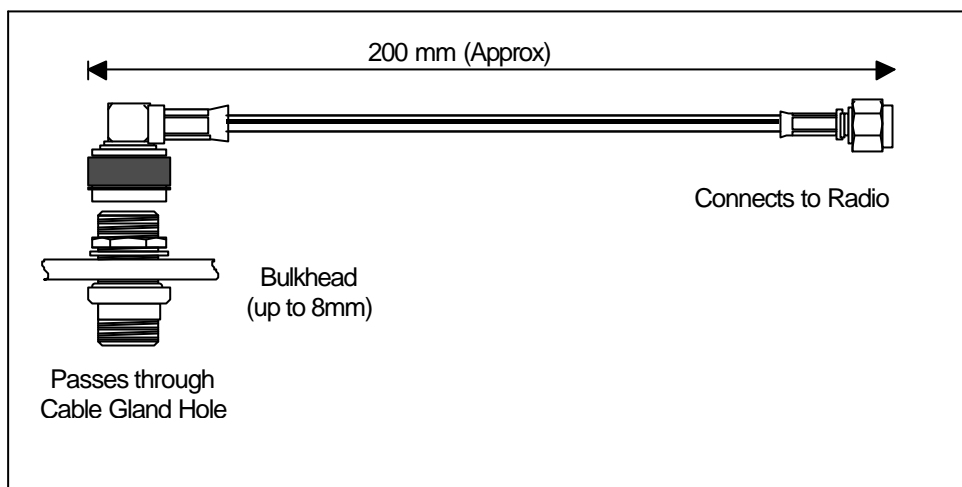


Figure 45 Antenna Bulkhead Cable Kit

The Antenna Bulkhead Cable Kit is used to provide an Ntype female bulkhead socket in the gland plate of the Basic Enclosure. It is fitted in place of a standard cable gland and allows direct connection of external antennas or feeders.

Specifications

| | |
|------------------|------------------------------|
| Part Name | Antenna Bulkhead Cable Kit |
| Part Number | ENC0007 |
| Number in a Node | 1 max |
| Dimensions | 300 mm x 10 mm dia. (approx) |
| Weight | 0.1kg |

8.2 Antennas

8.2.1 1/2 Wave Whip Antenna

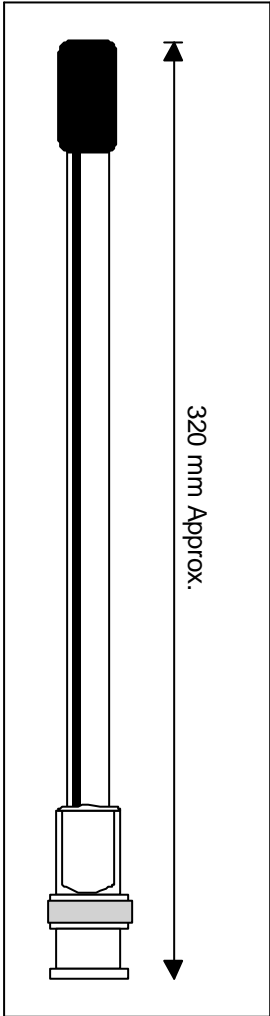


Figure 46

The 1/2-Wave Whip Antenna is used in conjunction with the Antenna Mounting Kit for those applications requiring a relatively short transmission range. The antenna is nominally rated at a loss of 3 dB and is suitable for ranges up to about 1km, dependent upon topography.

The construction is a corrosion-proof metal shaft with a resistive black plastic cover. The connector is black chromium plated brass.

NOTE: The BNC connection should be sealed with self amalgamating tape after installation.

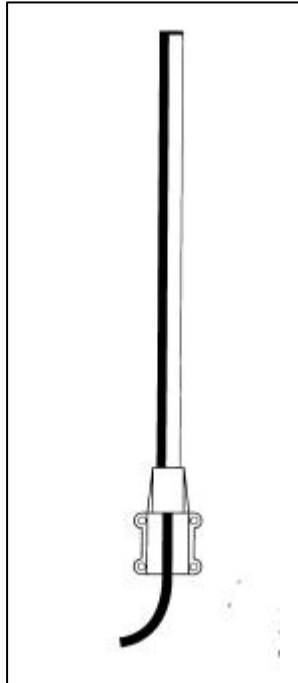
Specifications

| | |
|------------------|-----------------------------|
| Part Name | 1/2-Wave Whip Antenna |
| Part Number | ANT0006 |
| Number in a Node | 1 max |
| Frequency Range | 406-470 MHz |
| VSWR | <2 when mounted on top plat |
| Impedance | 50 Ohms |
| Connector | BNC |

| | | |
|----------|---------------|------------|
| ANT0006A | 440 – 470 MHz | 300mm Long |
| ANT0006C | 406 – 440 MHz | 330mm Long |

8.2.2 End Fed Dipole / Colinear

The end fed dipole and collinear antennas are a professional range of products designed for outside installations requiring mid to long range transmissions.



The construction is a parallel glass fibre tube with an integral die cast aluminium alloy mounting bracket.

The Colinear antennas offer 3 or 6 dB gain, which can be useful to recover losses in feeder cable.

NOTE: Check with local regulations to ensure the allowed ERP is not exceeded.

The antenna is supplied with 2 x 'U' bolts for mounting to a standard 50mm diameter pole and is complete with a 3 metre tail of RG213 cable terminated with an 'N' type male connector.

Specification

| | |
|-----------------|--------------|
| Part number | ANT0008 |
| Frequency range | 400 – 470MHz |
| Impedance | 50 Ω |
| VSWR | <1.5 : 1 |
| Polarization | Vertical |

Figure 47

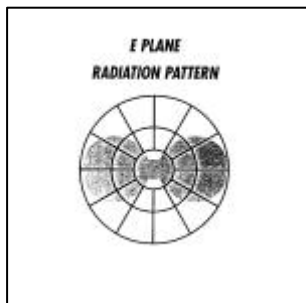


Figure 48

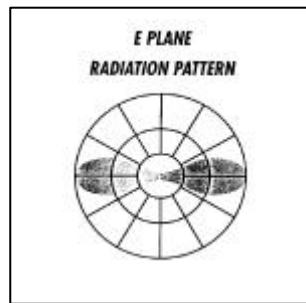


Figure 49

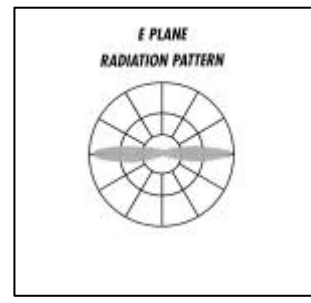


Figure 50

Endfed Dipole

| | |
|--------------|---------|
| Part no | ANT0008 |
| Gain | 0 dBd |
| Length | 0.6mtrs |
| Weight | 0.6Kg |
| Wind loading | 37 N |

3dB Colinear

| | |
|--------------|-----------|
| Part no | ANT0008-3 |
| Gain | 3dBd |
| Length | 1.6mtrs |
| Weight | 1.0 Kg |
| Wind loading | 70 N |

6 dB Colinear

| | |
|--------------|-----------|
| Part no | ANT0008-6 |
| Gain | 6dBd |
| Length | 3.1mtrs |
| Weight | 2.0 Kg |
| Wind loading | 156 N |

8.2.3 Yagi Antenna

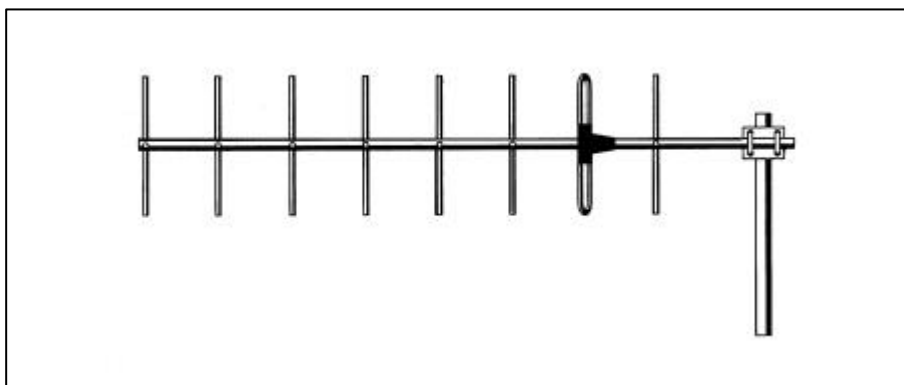


Figure 51

The 2 element and 8 element Yagi antennas are a professional range of products designed for long distance applications or where a directional signal is required i.e. to avoid receiving other nearby transmissions.

The 2-element Yagi offers a gain of 3 dBd and the 8-element, 10dBd.

NOTE: Check with local regulations to ensure the allowed ERP is not exceeded.

The construction is from aluminium alloy tubing with a zinc alloy diecast saddle clamp for mounting to a standard 50mm pole. The antenna is supplied complete with a 3 mtr tail of RG213 cable terminated with a 'N' type male connector.

Specification

| | |
|--------------|------------------------|
| Freq range | 400 – 470MHz |
| Impedance | 50 |
| VSWR | <1.5 : 1 |
| Polarisation | Horizontal or Vertical |

| | | |
|---------------|-----------------|-----------------|
| | 2 Element | 8 Element |
| Part Number | ANT0009-2 | ANT0009-8 |
| Gain | 3 dBd | 10 dBd |
| Length | 0.6 mtrs | 1.6 mtrs |
| Weight | 1.8 Kg | 3.5 Kg |
| Wind loading | 54 N | 128 N |
| Beamwidth (H) | 84 ⁰ | 50 ⁰ |
| Beamwidth (E) | 62 ⁰ | 43 ⁰ |

Fig 52 – 2 Element

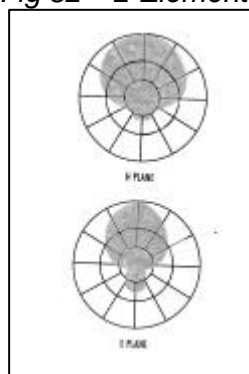
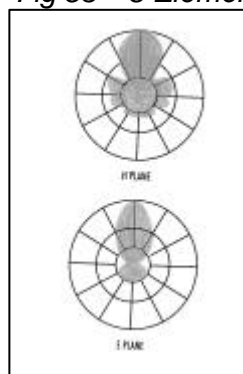


Fig 53 – 8 Element



8.2.4 Low Profile Vandal Resistant

This antenna is a small, lightweight, low profile unit suitable for any application where there is a height restriction. Because of its shape and mounting position, it also offers a degree of protection against vandalism. It is mountable on most surfaces as the ground plane is integral.

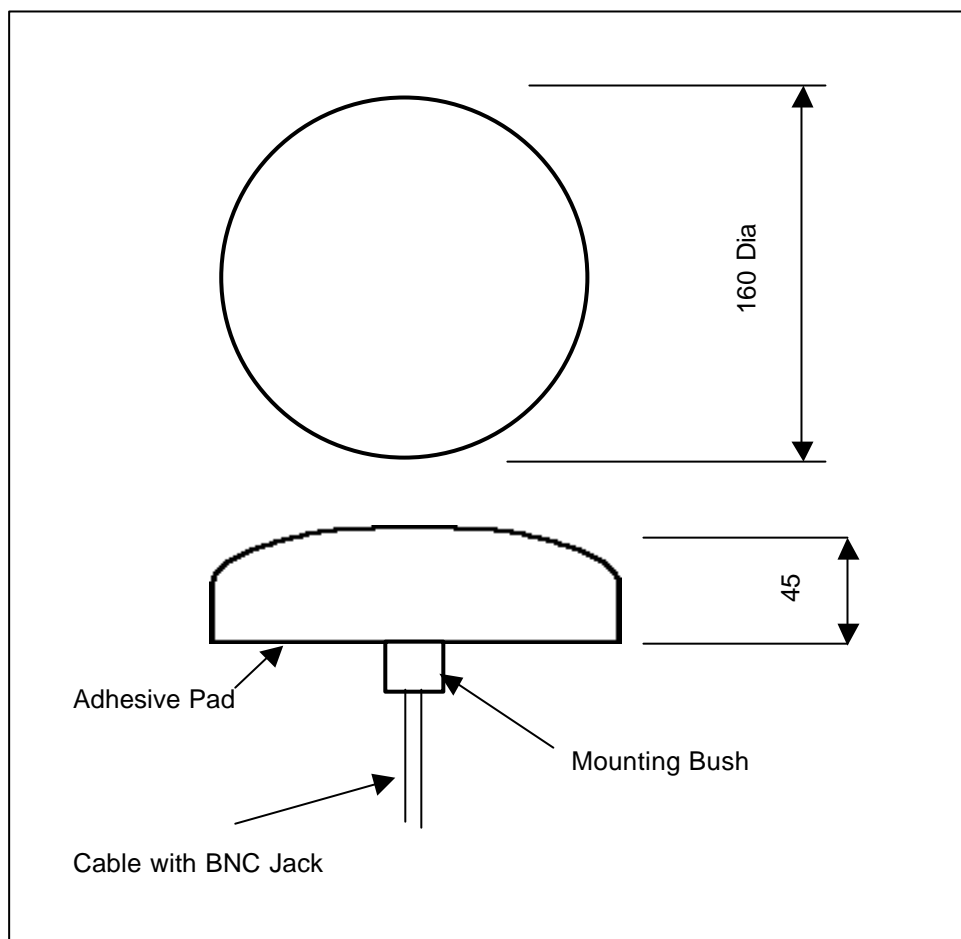


Figure 54 Low Profile Antenna

Specification

| | |
|-----------------|------------------------|
| Part Number | ANT0014 |
| Frequency range | 400-470 MHz |
| VSWR | <1.5 :1 |
| Impedance | 50 Ohm |
| Polarisation | Vertical |
| Connector | BNC + 0.5 mtr of cable |

8.2.5 Antenna Mounting Hardware

RDT can supply the following mounting hardware to assist with the installation of antennas.

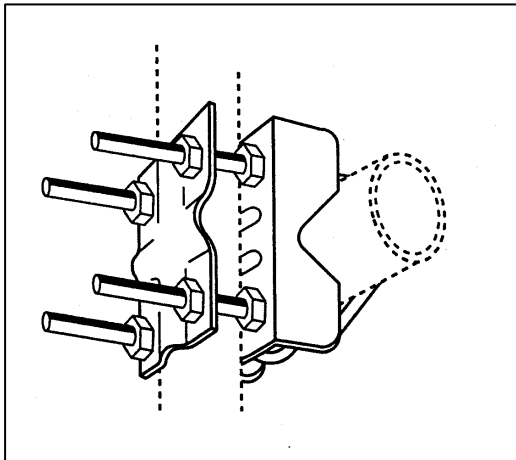


Figure 55
Standard Yagi Clamp

Designed to fit standard 50mm Poles and supplied with 2 x U bolts and nuts.

Part Number 1329

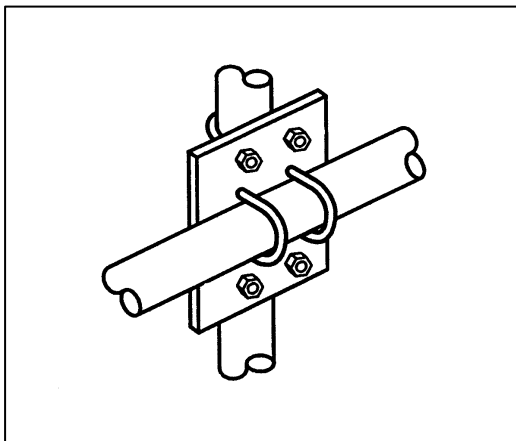


Figure 56
Crossover Clamp 50mm x 32mm (2" x 1 1/4")

Supplied with 4 x U bolts and nuts

Part number 1330

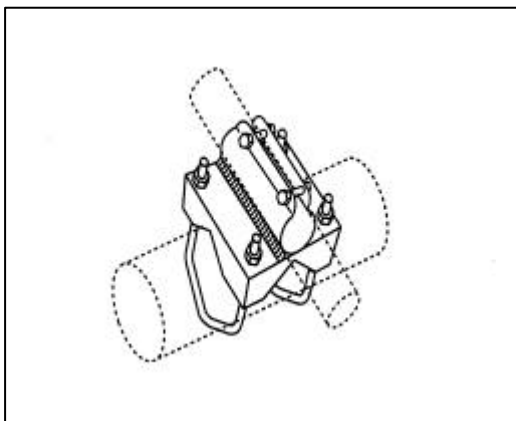


Figure 57
Standard Colinear Clamp

Designed to fit standard 50mm poles and supplied with 2 x U bolts and nuts.

Part number 1331

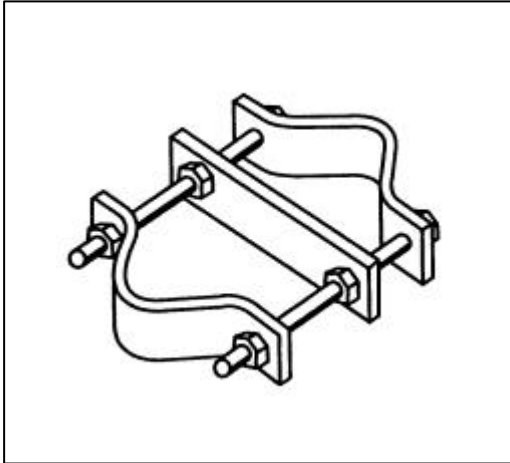


Figure 58
Colinear Parallel Clamp

Designed to fit standard 50mm poles and supplied with 2 x fixing bolts and nuts.

Part number 1332

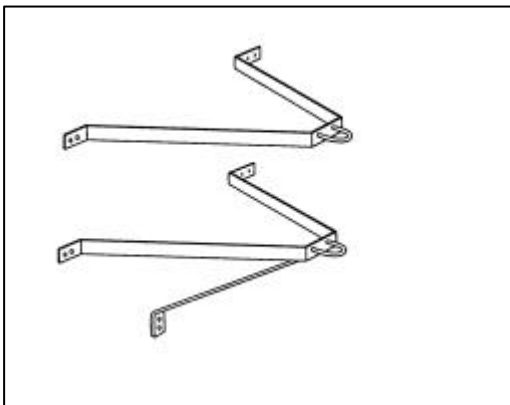


Figure 59
Wall Mounting 'A' Brackets

Supplied as a pair with 2 x U bolts and nuts

Part number 300mm stand-off 1333
450mm stand-off 1334
600mm stand-off 1335

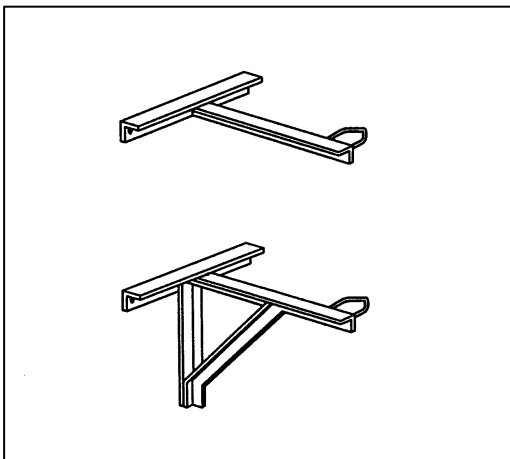


Figure 60
Wall Mounting 'T' and 'K' Brackets

Supplied as a pair with 2 x U bolts and nuts

Part number 300mm stand-off 0074
450mm stand-off 0076
600mm stand-off 1336

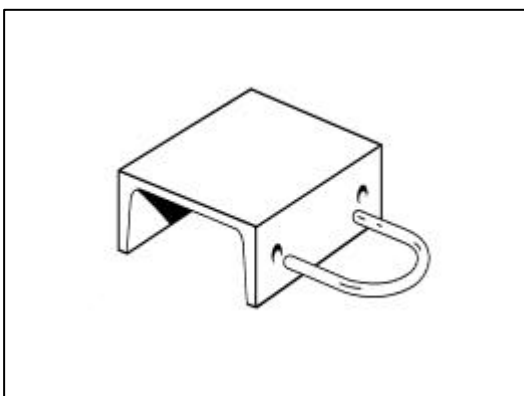


Figure 61
Channel Bracket

Supplied with 2 x U bolts and nuts.

Part number 1337

8.3 Cables

The following cables are available from RDT stock:

| RDT Part No | Length | Description | Application |
|-------------|---------|--------------------------------------|--------------------------|
| CAB0019 | 1.5mtrs | 9 Way 'D' Skt to 9 Way 'D' Skt | RS232 Data Highway Port |
| CAB0019 | 1.5mtrs | 9 Way 'D' Skt to 9 Way 'D' Skt | RS232 Configuration Port |
| CAB1338 | 450mm | 9 Way 'D' Skt to 15 Way 'min D' Plg | VN2 to GSM Modem |
| CAB1339 | 1.5mtrs | 9 Way 'D' Skt to 25 Way 'D' Plg | VN2 to Wire Line Modem |
| CAB1622 | 110mm | 10 Way IDC Skt to 10 Way IDC Skt | T2-BUS |
| CAB1623 | 400mm | 10 Way IDC Skt to 10 Way IDC Skt | T2-BUS |
| CAB1610 | 400mm | URM43 BNC bulkhead to SMA male | Radio to Top Plate |
| CAB1611 | 400mm | URM43 'N' type male to SMA male | Radio to Bulkhead |
| CAB001-1 | 1mtr | RG213 'N' type male to 'N' type male | VN2 to Antenna |
| CAB001-3 | 3mtr | RG213 'N' type male to 'N' type male | VN2 to Antenna |
| CAB-001-5 | 5mtr | RG213 'N' type male to 'N' type male | VN2 to Antenna |
| CAB001-10 | 10mtr | RG213 'N' type male to 'N' type male | VN2 to Antenna |
| CAB001-15 | 15mtr | RG213 'N' type male to 'N' type male | VN2 to Antenna |
| CAB001-20 | 20mtr | RG213 'N' type male to 'N' type male | VN2 to Antenna |
| CAB001-25 | 25mtr | RG213 'N' type male to 'N' type male | VN2 to Antenna |
| CAB001-30 | 30mtr | RG213 'N' type male to 'N' type male | VN2 to Antenna |

8.3.1 Connectors

| RDT Part No | Description | Application |
|-------------|--------------------------------------|-----------------------|
| 0022 | 2 Way free socket | DC input |
| 0029 | 3 Way free socket | Data I/O |
| 0013 | 4 Way free socket | Data I/O |
| 1063 | 5 Way free socket | Data I/O |
| 0042 | 8 Way free socket | Data I/O |
| 0048 | 12 Way free socket | Data I/O |
| 0049 | 16 Way free socket | Data I/O |
| 0879 | 9 Way 'D' socket | RS232 |
| 0880 | 9 Way 'D' cover and retaining screws | RS232 |
| 0511 | SMA male for URM43 | Connection to Radio |
| 0510 | R/A 'N' type male for URM43 | Connection to Antenna |
| 0525 | 'N' type male straight, for RG213 | Antenna cable |

8.4 Power Supplies

8.4.1 1 Amp Switch Mode

Specification

| | |
|----------------|-----------------------|
| Part number | PSU 1531 |
| Input Voltage | 90 to 264 V AC @ 50Hz |
| Output Voltage | 12 V DC at 1 Amp |
| Size | 90 x 50 x 30 |

8.4.2 3 Amp Switch Mode (with Battery Charger)

Specification

| | |
|----------------|------------------------|
| Part number | PSU 2092 |
| Input Voltage | 90 to 264 V AC @ 50 Hz |
| Output Voltage | 12 V DC at 3 Amps |
| Size | 156 x 95 x 40 |

8.5 GSM Modem

The VersaNet2 software, has been specifically designed to interface with the Wavecom WMOD2B dual-band GSM Modem. Other GSM Modems may work perfectly well with VersaNet2, but their operation cannot be guaranteed. For example, most modems use a similar command set in normal point to point mode, but they seem to use different protocols for SMS messaging.

Before using the modem, it will be necessary to purchase a SIM Card and set up a service agreement with a network provider. Make sure that the network provider selected has good coverage in the proposed area. In general it is better to select a 900MHz system because the coverage is more widespread and the modem operates at a higher power level.

Specification

| | |
|--------------------|---|
| Part number | WMOD2B |
| Dual Band | 900 / 1800 MHz |
| Size | 98L x 54W x 25H |
| Supply | 12VDC @ 130mA typ. (900) 12VDC @ 95mA typ (1800) |
| Current Idle Mode | 4mA |
| Antenna connection | SMA |
| RS232 connection | 15 pin sub 'D' |
| Power in | 4 pin Micro-Fit |

LED Indicator Functions

| | |
|-------------------------|----------------------------------|
| LED off | Modem switched off |
| LED on | Modem on, connecting to Network |
| LED on flashing slowly | Modem connected, Idle mode |
| LED on flashing rapidly | Modem communicating with Network |

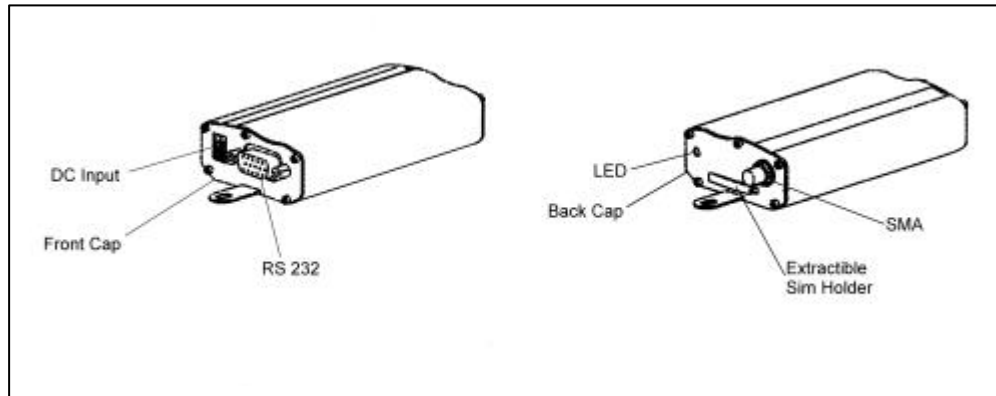


Figure 65 Mechanical details of WMOD2B GSM Modem

8.6 Wire Line Modem

VersaNet2 will work with many of the commonly available wire-line modems, however, because of the vast number of variations in specification and settings, RDT have standardised on the Westermo TD-32. This modem is a rugged industrial design offering all the facilities required for either dial-up or leased line operation.

Specification

The TD-32 is available in two standard versions for power supply by either 230V AC or 12 – 36V DC.

A watchdog facility continually monitors the power supply and internal hardware as well as the operational software. In the event of a problem the modem automatically resets. This feature has been included to make the unit more suitable for use in unmanned locations.

Leased line connections can be made on 2 or 4 wires. The modem can also be used on ordinary twisted pair cables to provide long distance asynchronous communications.

Westermo have implemented commands often left out of standard modems. Two examples of these Westermo specific AT-commands are '&D' and '&A' (see AT-command information in modem handbook)

The TD-32 has been designed with the engineer in mind, hence the extensive information on the command set, S registers, DIP switches and error codes.

DIP Switch Settings for Dial-Up Operation

| SWITCH BLOCK | SWITCH | COMMENT |
|--------------|----------------------|---|
| One | All OFF | Standard dial-up mode |
| Two | 1 & 4 ON | DTR/DSR disconnected |
| Three | 1 ON 2 ON | 2 Wire line connection Flow control OFF |
| Four | 2 & 3 ON 5 & 6 ON | Serial speed 9600 bit/sec 8 bits no parity |
| Five | 1,2,3 & 4 ON | Auto detect |

DIP Switch Settings for Leased Line Operation

Transmitter

| SWITCH BLOCK | SWITCH | COMMENT |
|--------------|------------------------------|--|
| One | 1,2 & 4 ON | Leased line originating |
| Two | All OFF | |
| Three | 1 ON 2 ON 7 ON 8 ON | 2 Wire line connection Flow control OFF DCD follows state of the line carrier Line monitor disabled |
| Four | 2 & 3 ON 5 & 6 ON | Serial speed 9600 bit/sec 8 bits no parity |
| Five | 1,2,3 & 4 ON | Auto detect |

Receiver

| SWITCH BLOCK | SWITCH | COMMENT |
|--------------|------------------------------|--|
| One | 2 & 4 ON | Leased line answering |
| Two | All OFF | |
| Three | 1 ON 2 ON 7 ON 8 ON | 2 Wire line connection Flow control OFF DCD follows state of the line carrier Line monitor disabled |
| Four | 2 & 3 ON 5 & 6 ON | Serial speed 9600 bit/sec 8 bits no parity |
| Five | 1,2,3 & 4 ON | Auto detect |

RS232 Connections VersaNet2 to TD-32

| 9 pin 'D' female (VersaNet2) | 25 pin 'D' male (TD-32) |
|------------------------------|-------------------------|
| | |
| 1 | Not used |
| 2 | 3 RXD |
| 3 | 2 TXD |
| 4 | 20 DTR |
| 5 | 7 GND |
| 6 | Not used |
| 7 | 4 RTS |
| 8 | 5 CTS |
| 9 | Not used |
| | |

Mechanical and Environmental

| | |
|-------------------|------------------------------------|
| Size | 100H x 55W x 128D |
| Weight | 0.6 Kg |
| Power consumption | 25 mA @ 230V AC 200 mA @ 12V DC |
| Isolation | 500V line, RS-232, power |
| Temperature | 5 – 50 ⁰ C |
| Humidity | 0 – 95%RH without condensation |

For further information and AT-commands summary, see manufacturers handbook.