# SIMOCO

# SDB680 BASE STATION

## INSTALLATION GUIDE

**TNM-I-E-0046, Issue 1.1 Draft**
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# PREFACE

**Before installation, commissioning or operation, this document should be read in full. In particular, the following parts MUST be read:**

- **Appendix A – Simoco Digital Management Terminal (SDMT) Getting Started Information.**

## DECLARATION

This Installation Guide covers the SDB680 50 W Base Station for installation in Wall Mount and Rack Mount variants.

Any performance figures quoted are subject to normal manufacturing and service tolerances. The right is reserved to alter the equipment described in this manual in the light of future technical development.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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## EQUIPMENT AND MANUAL UPDATES

In the interests of improving the performance, reliability or servicing of the equipment, Simoco reserves the right to update the equipment or this document or both without prior notice.

## ERRORS AND OMISSIONS

The usefulness of this publication depends upon the accuracy and completeness of the information contained within it. Whilst every endeavour has been made to eliminate any errors, some may still exist. It is requested that any errors or omissions noted should be reported to either of the following who are part of the Simoco group:

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## DOCUMENT HISTORY

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## RELATED DOCUMENTS

**1.      TNM-M-E-0047.  SDB680 Base Station – Service Manual.**

**2.      TNM-U-E-0112.  Simoco Digital Management Terminal – User Manual.**

**3.      TNM-U-E-0120.  Simoco IP Configuration Tool – User Manual.**

To order printed copies of this or any of the above publications, please contact Simoco.  See the Support page for contact information.

A comprehensive list of documentation is available for download on the Simoco website http://www.simocogroup.com via the Partner Portal.

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# PERSONAL SAFETY

## SAFETY PRECAUTIONS

These Safety Precautions, Warnings and Cautions advise personnel of specific hazards which may be encountered during the procedures contained in this document and that control measures are required to prevent injury to personnel, and damage to equipment and/or the environment.

Before commencing the installation or any maintenance of this equipment, personnel are to acquaint themselves with all risk assessments relevant to the work site and the task. They must then comply with the control measures detailed in those risk assessments.

References covering safety regulations, health hazards and hazardous substances are detailed under the **WARNINGS** section below. These are referred to in the tasks, when encountered.

Adequate precautions must be taken to ensure that other personnel do not activate any equipment that has been switched off for maintenance. Refer to the relevant Electrical Safety Regulations appropriate to the country of operation.

Where dangerous voltages are exposed during a task, safety personnel are to be provided as detailed in the relevant Electrical Safety Regulations. Where safety personnel are required for any other reason, management are to ensure that the personnel detailed are aware of the hazard and are fully briefed on the action to be taken in an emergency.

Where equipment contains heavy components or units that require lifting, lowering, pulling or pushing operations to be performed on them during maintenance tasks, all managers and tradesmen are to be conversant with the Manual Handling Operations Regulations.

## HAZARDOUS SUBSTANCES

Before using any hazardous substance or material, the user must be conversant with the safety precautions and first aid instructions:

- On the label of the container in which it was supplied.
- On the material Safety Data Sheet.
- In any local Safety Orders and Regulations.

# WARNINGS

## HEAVY EQUIPMENT

| | **WARNING** |
|---|---|
| ⚠️ | **HEAVY EQUIPMENT. THE WEIGHT OF A FULLY ASSEMBLED SDB680 BASE STATION IN THE WALL MOUNT IS APPROX 10 KG (2 MEN TO LIFT). REFER TO THE MANUAL HANDLING OPERATIONS REGULATIONS 1992.** |

## RADIO FREQUENCY RADIATION (EU)

| | **WARNING** |
|---|---|
| ☢️ | **RADIO FREQUENCY (RF) RADIATION. A RF RADIATION HAZARD EXISTS IN THIS EQUIPMENT. TO AVOID RF INJURY, DO NOT TOUCH THE ANTENNA WHEN THE TRANSMITTER IS IN USE. DO NOT OPERATE TRANSMITTER WITH ANTENNA DISCONNECTED. REFER TO EU DIRECTIVE 2004/40/EC DATED 29 APRIL 2004.** |

## HUMAN EXPOSURE TO RADIO FREQUENCY RADIATION (FCC)

| | **WARNING**<br>**TO COMPLY WITH THE MAXIMUM PERMISSIBLE EXPOSURE (MPE) LIMITS REFERENCED IN 47 CFR 1.1310 TABLE 1, THE FOLLOWING MINIMUM SAFE OPERATING DISTANCES MUST BE OBSERVED:**<br>**150 to 174 MHz: 1.8 m**<br>**406.1 to 480 MHz: 1.52 m**<br>**480 to 512 MHz: 1.49 m** |
|---|---|

## FCC PART 15 COMPLIANCE

| | **THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.** |
|---|---|

## DANGEROUS VOLTAGES

Dangerous voltages exist in this equipment, for the appropriate Safety precautions, refer to the relevant Electrical Safety Regulations appropriate to the country of operation.

# EQUIPMENT SAFETY

## INSTALLATION AND MAINTENANCE

**The SDB680 Series of base stations should only be installed and maintained by qualified personnel.**

## CAUTIONS

| | **CAUTION**<br>**Before drilling any walls, first check for any buried cables or pipes.** |
|---|---|

| | **CAUTION**<br>**EQUIPMENT DAMAGE.  When the SDB680 Base Station is installed into a rack, DO NOT use the front panel attachment points to support the full weight of the equipment or damage to the equipment may result.  Suitable shelves or supports MUST be provided to support the body of the base station along the length of each side.** |
|---|---|

| | **CAUTION**<br>**EQUIPMENT DAMAGE.  During installation operations, the Torque settings must be adhered to or damage to the equipment may result.** |
|---|---|

## MAINTENANCE PRECAUTIONS

| | **CAUTION**<br>**Electrostatic Discharge Sensitive Devices (ESDS Devices).  This equipment contains ESDS Devices, the handling procedures detailed in BS EN 61340-5-1:2007 or ANSI/ESD S20.20-1999 are to be observed.** |
|---|---|

# WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) NOTICE

The Waste Electrical and Electronic Equipment (WEEE) Directive became law in most EU countries during 2005.  The directive applies to the disposal of waste electrical and electronic equipment within the member states of the European Union.

As part of the legislation, electrical and electronic equipment will feature the crossed out wheeled bin symbol (see image at left) on the product or in the documentation to show that these products must be disposed of in accordance with the WEEE Directive.

In the European Union, this label indicates that this product should not be disposed of with domestic or "ordinary" waste.  It should be deposited at an appropriate facility to enable recovery and recycling.

# SIMOCO SUPPORT

## CONTACT INFORMATION

At Simoco we welcome your comments, feedback and suggestions. Departmental contacts have been provided for your quick reference below.

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## TECHNICAL SUPPORT

In order to streamline support requests and better serve our customers, at Simoco we utilize a support ticket system. Every support request is assigned a unique ticket number, which customers can use to track the progress and responses online. In order to use the support ticket system, a valid email address is required.

A link to the online Support Centre Ticket Tracking system is provided below:

http://simocoradiosupport.com

If you still require further technical assistance after raising a support ticket, please contact us via the email addresses or via the Technical Support Helpline numbers overleaf.

## Technical Support Email Addresses

**Simoco EMEA:**          techsupport@simocogroup.com

**Simoco Australasia:**   inquiry.aus@simocogroup.com

**Simoco Americas:**      techsupport@simocogroup.com

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## ABBREVIATIONS

The following abbreviations are used throughout this document.  Wherever practicable, whenever the abbreviation is first used, the full meaning is given with the abbreviation in parenthesis, after that only the abbreviation will be used.

| Abbreviation | Meaning |
|---|---|
| 2U | Two Units (U = vertical measurement of 44.45 mm for equipment racks) |
| AC | Alternating Current |
| BNC | Bayonet Neill-Concelman |
| COSHH | Control Of Substances Hazardous to Health |
| CTS | Clear To Send |
| DAC | Digital to Analogue Converter |
| DC | Direct Current |
| DMR | Digital Mobile Radio |
| ESDS Devices | Electrostatic Discharge Sensitive Devices |
| GPS | Global Positioning System |
| IEC | International Electrotechnical Commission |
| I/P | Input |
| IP | Ingress Protection |
| MAC | Media Access Control |
| NC | Not Connected |
| O/P | Output |
| PA | Power Amplifier |
| PC | Personal Computer |
| PSU | Power Supply Unit |
| RF | Radio Frequency |
| RSSI | Received Signal Strength Indicator |
| RTS | Ready To Send |
| Rx | Receiver |
| SDB | Simoco Digital Base |
| SDMT | Simoco Digital Management Terminal |
| Tx | Transmitter |
| USB | Universal Serial Bus |
| VAC | Voltage Alternating Current |
| VDC | Voltage Direct Current |
| VSWR | Voltage Standing Wave Ratio |
| WEEE | Waste Electrical and Electronic Equipment |
|  |  |
|  |  |

# RECOMMENDED TOOLS AND TEST EQUIPMENT

The following list of Tools, Electrical Engineering Test Equipment and Materials are required to carry out the Assembly procedures contained in this document.

## TOOLS

1.  Electric Drill (preferably with Hammer Action).

2.  7.5 mm Drill Bit.

3.  Spirit Level.

4.  Pozidriv Screwdriver.

## TEST EQUIPMENT

5.  Anritsu/Wiltron S331A Test Set.

6.  Earth Bonding Test Set.

7.  Dummy Load.

8.  Wattmeter (50 Ω Test Set).

## CABLES

9.  USB Cable.

10. Ethernet Switch Cable.

## MATERIALS

11. 4 x M4 x 12 Screws (supplied).

12. 4 x Rawlplugs (supplied).

13. 4 x No. 12 x 1½" Woodscrews (supplied).

14. M6 x 12 mm Pan Head Pozidriv Retaining Bolts.

15. M6 x 16 mm Pan Head Pozidriv Retaining Bolts.

16. M6 Nuts and Plain Washers.

17. Plastic Cup Washers.

18. M6 Cage Nuts.

## OTHER ITEMS

19. Personal Computer (PC) with the following Software Applications installed:

    (a).   Simoco Digital Management Terminal (SDMT).

    (b).   Simoco IP Configuration Tool.

# ENVIRONMENTAL CONDITIONS

## OPERATING TEMPERATURE RANGE

For the 50 W SDB680 Base Stations, the operating temperature range is: −30 °C to +60 °C (−22 °F to +140 °F) ambient temperature.

The storage temperature range is −40 °C to +80 °C (−40 °F to +176 °F).

Ambient temperature is defined as the temperature of the air at the intake to the cooling fans.

## HUMIDITY

The humidity should not exceed 95% relative humidity non-condensing through the specified operating temperature range.

## DUST AND DIRT

The SDB680 Base Station has an Ingress Protection rating of IP30, i.e. it provides protection against access to hazardous parts and the ingress of solid foreign objects >12.5 mm in size.

## VENTILATION

The SDB680 Base Station uses forced air cooling to maintain internal temperatures and adequate cooling airflow is critical to the performance of the base station. Whether wall mounted or rack mounted, always ensure that there is adequate ventilation around the base station. The ambient temperature must be kept within the specified range and it is strongly recommended that the cooling airflow is not restricted.

For the SDB680 Base Station, the essential cooling airflow (recommended <40 °C) enters through one side of the unit and the hot exhaust air exits at the rear of the unit. For optimal thermal performance, heated air that has passed through the base station must not be allowed to re-enter the air intakes of the unit.

At least 72 cm$^2$ of ventilation MUST be provided for each base station at the inlet AND at the outlet.

In order to allow enough airflow through a rack mounted base station, it is recommended that:

- A minimum distance of 5 cm clearance to any obstruction at the front of the unit.
- A minimum distance of 10 cm clearance to any obstruction at the rear of the unit.
- An open area of at least 50 cm$^2$ per tray of ventilation slots or louvres in front of the air intakes for the fans of each unit; e.g. ten 6 x 85 mm slots will allow the recommended airflow.
- An open area of at least 50 cm$^2$ per tray of ventilation slots or louvres to the rear of each tray or in the top of the rack.
- A 2U gap at the top of the rack.

*Note.*

> *The ventilation openings must be unrestricted. If the openings are covered with a filter or grille, the open area must be increased in order to provide the same airflow as unrestricted openings.*

If the SDB680 Base Station is installed in a rack or cabinet with other equipment that has different ventilation requirements, it is recommended that the SDB680 be positioned below this equipment.

If multiple bases are fitted in a rack, auxiliary extractor fans may be required to ensure that adequate cooling is provided.

If any other configuration is employed, the performance of the system will depend on how closely you comply with the airflow requirements described above.

In a wall mount installation, it is recommended that at least 20 cm of clear space is allowed above and below the equipment for ventilation.

Equipment rooms as a whole should be checked for adequate ventilation so that they do not overheat.

Correct operation of internal fans should be checked prior to completion of the installation.

Any secondary ventilation equipment (rack fans, grills etc.) should be checked for correct operation and to ensure that they are free from blockage. Filters are not recommended on enclosures unless they can be regularly maintained.

# MOUNTING LOCATION

A clean and dry location that meets the above ventilation requirements should be chosen for mounting the equipment. The unit should not be sited where it will be exposed to long periods of direct sunlight.

Provision should be made for bringing the antenna feeder(s), IP cables, station earth and the AC and/or DC supply leads to the installation. These cables must be firmly anchored, in accordance with good installation practice and comply with all local mandatory wiring requirements.

## WALL MOUNT

When installing the wall mount unit, it is essential that the vertical surface chosen for the positioning of the equipment is of a solid construction as the weight of the SDB680 Base Station can be as much as 10 kg when fully equipped.

# POWER SUPPLIES

For type approval reasons, this product should not be operated with unapproved supplies.

The equipment must be installed so that the IEC connector for the Wall or Rack Mount can be easily removed and/or the power socket should be readily accessible.

Mains protective Earth should be checked for low impedance (<0.3 Ω).

All mains wiring must comply with local wiring regulations.

## POWER SUPPLY OPTIONS

The SDB680 Base Station is only available as a DC version, which uses an external DC power source. The PSU tray can be used to supply the DC voltage required.

The switch mode supplies used in the wall mount and rack mount ancillaries are able to accept mains AC voltage in the range of 85 V to 265 V @ 1.9 A, 47 Hz to 63 Hz. The output from the switched mode power supply to the SDB680 Base Station is +14.0 Voltage Direct Current (VDC).

## PSU TRAY

The PSU Tray can be either a 1U or 2U rack tray with a front panel and is designed for use with an SDB680 Base Station in an enclosed 19" rack. Together, an SDB680 Base Station and the PSU Tray occupy a total of either 3U or 4U of rack space.

The tray is supplied complete with a universal power supply, which can accept an IEC input of 100 V to 240 V AC (Voltage Alternating Current), at 50/60 Hz suitable for a single SDB680 Base Station. The voltage range appropriate to the area of use is selectable on the universal PSU.

## AC POWER CORD

A 2 m long cable is used to connect the AC Mains Supply to the PSU tray in the rack mount. An appropriate version of power cord, relevant to the area of use, is supplied with the PSU Tray. Relevant areas of use are as follows:

United Kingdom.

Rest of Europe.

United States.

# ELECTRICAL CONNECTIONS

This section gives an overview of the external connections that are made to the SDB680 Base Station.  It also provides details of the pin-outs for these connections.

## GENERAL

All cabling should be installed so that the equipment can be accessed for servicing purposes without straining the cables or connectors used.

Where equipment is rack mounted, cables must be run so that the unit can be fully withdrawn on its runners without straining, catching or pinching any of the cables.

Cables should be dressed into cable trays etc where available and run so as to reduce likelihood of damage from vermin or adverse environments.

Multi-strand wires must be used wherever the wire will be flexed by accessing the equipment.

## REAR PANEL CONNECTORS

The rear panel of the SDM680 DMR base station showing all the external connections is shown below in **Figure 1**.  The functions of each connector on the rear panel are detailed in **Table 1**.
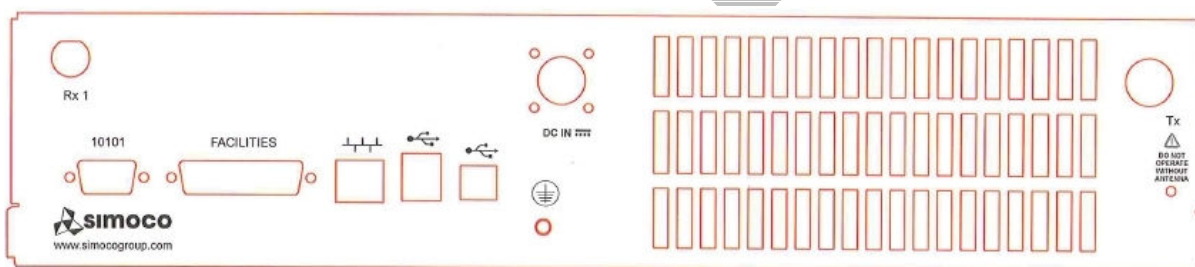


**Figure 1.  Layout of Rear Panel.**

Table 1.  Rear Panel Connections.

| Connector # | Conn Type | Function | Description |
|---|---|---|---|
| DC IN | | Power I/P | 14.0 V DC power input |
| S2 | RS232 | Serial Port | |
| S1 | D Type | Facilities | |
| P5 | RJ45 | Ethernet | 10/100 base-T RJ45 Ethernet connector |
| P4 | USB Type B | Peripheral | USB peripheral interface |
| P3 | USB Type A | Host | USB interface |
| Tx | N Type | Tx O/P | RF Power output from the Tx |
| Rx 1 | BNC | Rx I/P | Rx input for full duplex operation |

### Tx/Rx Connections

The Tx antenna connection on the SDB680 Base Station is provided with a 50 Ω female N-type socket, while for the Rx antenna connection a 50 Ω female Bayonet Neill-Concelman (BNC) socket is used.

The Tx antenna cable connections must be made with 50 Ω N-type on flexible tails.  The Voltage Standing Wave Ratio (VSWR) of the Tx and Rx connections should be tested prior to use by using of a suitable test set, e.g. an Anritsu/Wiltron S331A.  A VSWR of 1.5:1 or better at the relevant Tx and Rx frequencies should be ensured.

Mating connectors should be galvanically compatible with nickel outer and gold centre pin to minimise passive intermodulation.

A minimum of 85 dB transmit-receive isolation should be provided by the antenna system and associated filters.

It is recommended that a good quality flexible co-axial cable is used, e.g. with double-screening braid and multi-strand copper inner.

| | |
|---|---|
| ⚠ | **CAUTION**<br>**The Antenna System should be protected against lightning by means of an earthing system and surge protection device.**<br>**Do not connect Antenna Lightning conductors to the base station or Mains Earth.** |

## Power Connection

The DC power input is via a 2-pin IP67 DC plug connector.  The two pins are wired to suit the voltage range shown in **Table 2** below.

**Table 2.  DC Power Connector Pin-outs.**

| Pin | Description |
|-----|-------------|
| 1 | +14.0 V |
| 2 | Ground |



**Figure 2.  2-pin IP67 DC Power Connector.**

The equipment must be installed so that the power socket is readily accessible.

## Earth Point

The earth stud on the rear panel is provided for protective earthing of the equipment.  This should be connected using heavy duty earthing wire with as few bends as possible, typically 6 mm Green/Yellow with 5 mm eyelet tag.

## P3 USB A Dual

The USB Type A connector is used as the host connection.  The connector pin-outs are detailed below in **Table 3**.

**Table 3.  USB Type A Connector Pin-outs.**

| Pin | Function |
|-----|----------|
| 1 | Vcc (+5 V) |
| 2 | Data - |
| 3 | Data + |
| 4 | Ground |

### P4 USB B

The Universal Serial Bus (USB) Type B connector is used as the peripheral connection. The connector pin-outs are detailed below in **Table 4**.
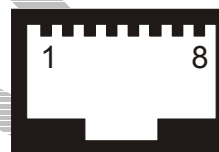
**Table 4.  USB Type B Connector Pin-outs.**

| Pin | Function |
|---|---|
| 1 | Vcc (+5 V) |
| 2 | Data - |
| 3 | Data + |
| 4 | Ground |

### P5 Ethernet

The P5 Ethernet connector uses standard network cable wiring for an RJ45, which is detailed below in **Table 5**.

**Table 5.  Ethernet RJ45 Connector Pin-outs.**

| Pin | Description |
|---|---|
| 1 | Tx Data+, balanced I/P 1 |
| 2 | Tx Data-, balanced I/P 2 |
| 3 | Rx Data+, balanced O/P 1 |
| 4 | NC |
| 5 | NC |
| 6 | Rx Data-, balanced O/P 2 |
| 7 | NC |
| 8 | NC |

### S2 Serial Port

The connector pin-outs for the 9-way D Type S2 Serial Port are shown below in **Table 6**.

**Table 6.  S2 Serial Port Connector Pin-outs.**

| Pin | Function |
|---|---|
| 1 | Connected to pin 4 and 6 |
| 2 | Tx 1 |
| 3 | Rx 1 |
| 4 | Connected to pin 1 and 6 |
| 5 | 0 V |
| 6 | Connected to pin 1 and 4 |
| 7 | Rx 2 (opt CTS 1) |
| 8 | Tx 2 (opt RTS 1) |
| 9 | NC |

**S1 Facilities Connector**

The 25-way D Type facilities connector can be programmed for any combination of digital inputs and outputs.  The connector pin-outs for the Facilities Connector are shown below in **Table 7**.

**Table 7.   Facilities Connector Pin-outs.**

| Pin | Function | Pin | Function |
|-----|----------|-----|----------|
| 1 | Digital Input | 14 | Digital Output |
| 2 | Digital Input | 15 | Digital Output |
| 3 | Digital Input | 16 | Digital Output |
| 4 | Digital Input | 17 | Digital Output |
| 5 | Digital Input | 18 | Digital Output |
| 6 | Digital Input | 19 | Digital Output |
| 7 | Digital Input | 20 | Digital Output |
| 8 | Digital Input | 21 | Digital Output |
| 9 | GPS Rx + | 22 | GPS Rx - |
| 10 | GPS Tx + | 23 | GPS Tx - |
| 11 | 1PPS Rx + | 24 | 1PPS Rx - |
| 12 | Digital to Analogue Converter (DAC) Output | 25 | 0 V |
| 13 | Supply Voltage | | |

Maximum current provided by the supply voltage pin (pin 13) is 1 A protected by a self resetting fuse.

The Digital Outputs are open collector and able to sink 300 mA each; the total for all outputs must not exceed 600 mA.

Digital inputs are active low.  Digital high voltages should not exceed 20 V.

The GPS Rx and 1PPS Rx connections are Differential RS422.

The "Analogue Out" connection is between 0 V and 5 V and software controlled to indicate various functions e.g. Received Signal Strength Indication (RSSI) level.

# 1   WALL MOUNT INSTALLATION

**This Procedure should be followed when installing all new DMR Base Stations with a Wall Mount cabinet.**

## TOOLS, TEST EQUIPMENT AND MATERIALS REQUIRED

The following Tools, Test Equipment and Materials will be required to perform this procedure:

Electric Drill (preferably with Hammer Action)

7.5 mm Drill Bit

Spirit Level

Screwdriver

4 x M4 x 12 Screws (supplied)

4 x Rawlplugs (supplied)

4 x No. 12 x 1½" Woodscrews (supplied)

4 x M6 x 12 mm Pan Head Pozidriv Retaining Bolts

4 x Plastic CupWashers

Anritsu/Wiltron S331A Test Set

Earth Bonding Test Set

## 1.1   INSTALLATION OF THE WALL MOUNT UNIT

1.   Unpack all the equipment and retain the packaging.

2.   Establish the mounting position of the base station.

| ⚠ | **CAUTION** <br> **Before drilling any walls, first check for any buried cables or pipes.** |
|---|---|

3.   Ensure that there are no buried pipes or cables in the vicinity.

4.   Referring to **Figure 3** (overleaf), mark out the four holes required to secure the wall mount to the wall.

5.   Using the drill and 7.5 mm drill bit, drill the four holes to a depth of 50 mm.

6.   Place the four masonry rawlplugs into the four holes and ensure they are fully inserted.  If necessary, use a small hammer to drive them fully home.

7.   Attach the two wall mount brackets to the wall mount case using M6 nuts and washers (see **Figure 4** overleaf).

8.   Using the M5 nuts and washers, fit the wall mount inner chassis plate into the wall mount unit (see **Figure 4** overleaf).

9.   Using a screwdriver and the four No. 12 x 1.5" woodscrews, secure the wall mount unit to the wall surface.
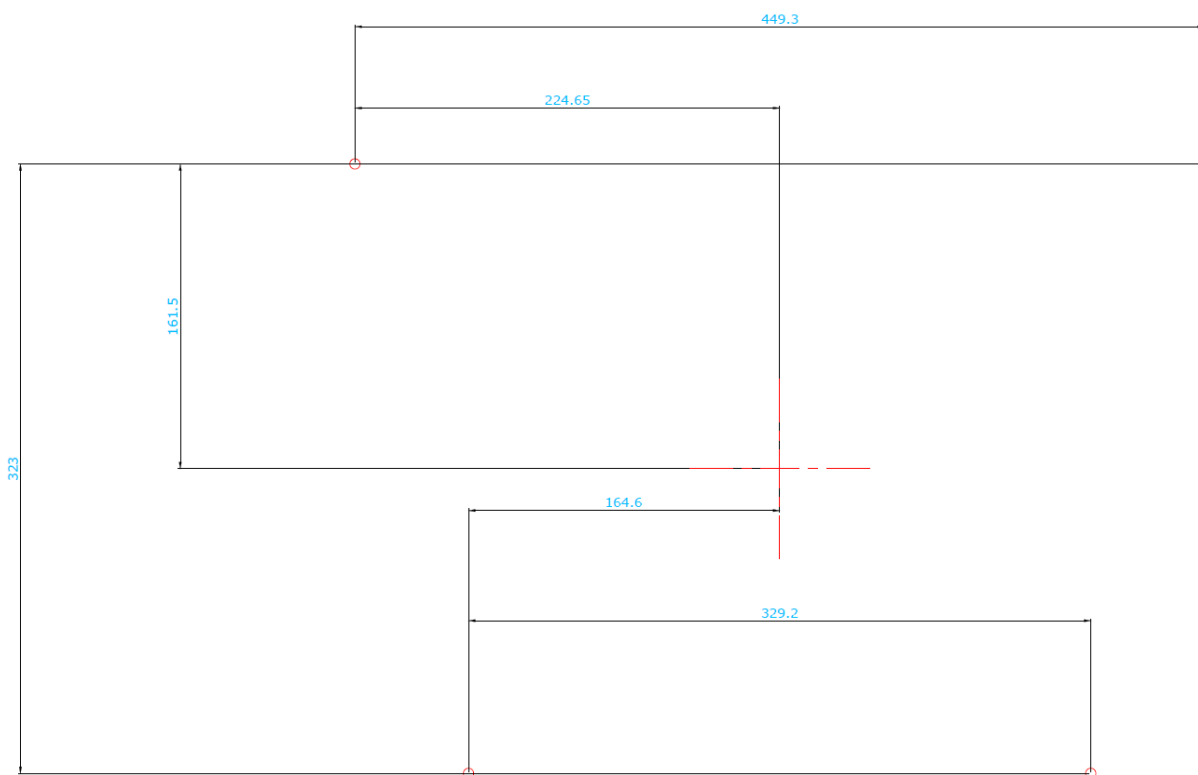
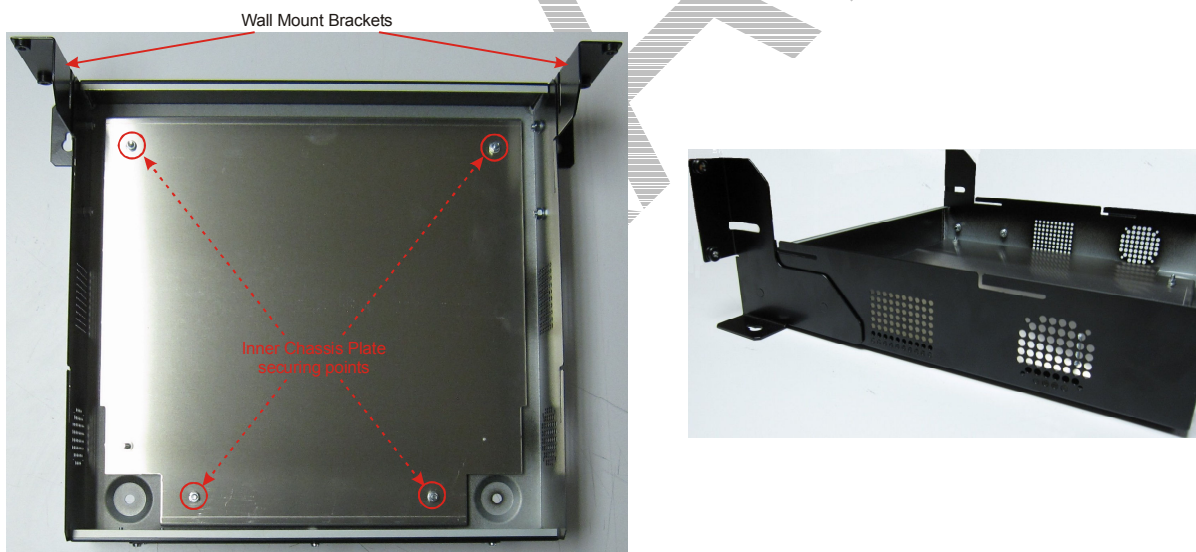**Figure 3.  Mounting holes drilling template (dimensions in mm).**



**Figure 4.  Wall Mount Assembly.**

## 1.2    FITTING THE SDB680 BASE STATION

10.    Ensuring that all cables are clear of the mounting position and cannot be trapped, offer the base station up to the wall mount unit and fit the four keyhole standoffs on the base station (two per side) into the mounting grooves on the wall mount case (see **Figure 5** overleaf for details).

11.    Secure the front panel of the base station to the wall mount brackets using four M6 x 12 mm pozidriv retaining bolts with plastic cup washers (two per side) (see **Figure 6** overleaf).
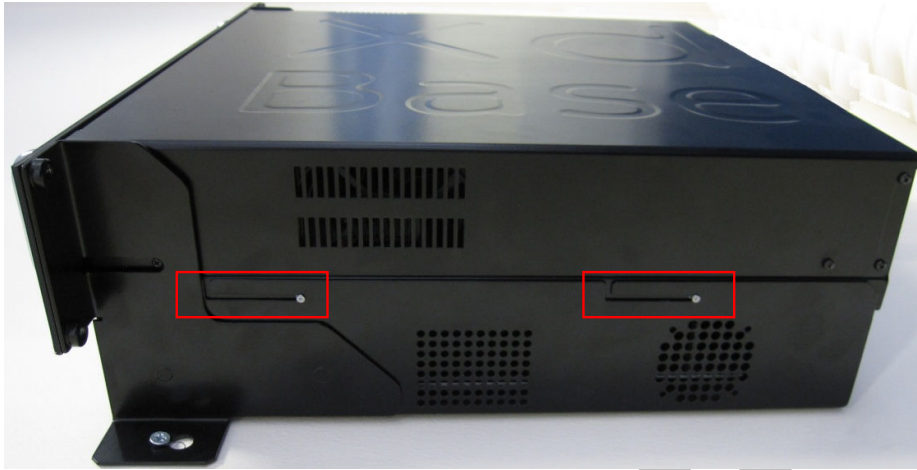
**Figure 5.  Keyhole Standoff mounting locations.**



**Figure 6.  Base Station secured to Wall Mount.**

## 1.3    ELECTRICAL CONNECTIONS

12.    Refer to the Electrical Connections section, for full details of all connections and the connector pin-outs.

13.    Using a suitable test set, e.g. an Anritsu/Wiltron S331A, check the Tx and Rx antenna connections for a VSWR of 1.5:1 or better at the relevant Tx and Rx Frequencies.

14.    On the SDB680 Base Station rear panel, carry out the following:

14.1.  Connect the Tx and Rx antenna cables to their respective connectors.

14.2.  Ensuring that the power source is switched off, connect the DC power cable from the 'DC IN' connector to the power source.

15.    Carry out the configuration of the SDB680 in accordance with **Section 3 – Configuration of New Tier II Base Station** or **Section 4 – Configuration of New Tier III Base Station** as appropriate.

## 2    RACK MOUNT INSTALLATION PROCEDURE

**The SDB680 Base Station is designed to be fitted in a standard 403 mm (19") rack.  This procedure should be followed when installing all new SDB680s into a 19" racking system.**

### TOOLS, TEST EQUIPMENT AND MATERIALS REQUIRED

The following Tools, Test Equipment and Materials will be required to perform this procedure:

Pozidriv Screwdriver

4 x M6 x 12 mm Pozidriv Retaining Bolts

4 x M6 x 16 mm Pozidriv Retaining Bolts

8 x M6 Nuts and Plain Washers

M6 Cage Nuts

Anritsu/Wiltron S331A Test Set

Earth Bonding Test Set

### 2.1    RACK PREPARATION

*Note.*

*Rack runner fittings differ between the various rack manufacturers.  If the procedure described below does not apply to the type of rack being used, the procedure should be modified to suit.*

1.    Ensure that the rack chosen for installation is firmly bolted together and is securely anchored to the floor or wall to prevent overbalancing.

2.    In the rack, plan out the locations of equipment before commencing installation.

*Notes:*

*(i).    Each SDB680 requires 2U height of rack space.*

*(ii).   Unused space should be blanked off to prevent uncontrolled circulation of air.*

*(iii).  If used, the associated PSU TRAY requires either 1U or 2U height of rack space and is designed to locate adjacent to the base station.*

*(iv).   When the SDB680 is installed into a rack, support shelves or side slide runners should be used. These are available from Simoco and supplied as a pair with all the necessary screws for securing them.*

| | |
|---|---|
| ⚠️ | **CAUTION**<br><br>**EQUIPMENT DAMAGE.  When the SDB680 Base Station is installed into a rack, DO NOT use the front panel attachment points to support the full weight of the equipment or damage to the equipment may result.  Suitable shelves or supports MUST be provided to support the body of the base station along the length of each side.** |

3.    Unpack all the equipment and retain the packaging.

**2.2    FITTING THE SDB680 BASE STATION**

4.    To fit the SDB680 into a rack on a support shelf, carry out the following:

4.1.   Hook the support shelves onto either side (internal) of the rack at equal heights.

4.2.   Fit the M6 cage nuts into the appropriate positions on the front rack mounting support rails.

4.3.   At the front of the rack, position the rear of the base station onto the support shelves and slide the base station into the rack, checking that it does not catch on anything.

4.4.   Secure the base station into the rack using the four M6 x 12 mm pozidriv retaining bolts with plastic cup washers (two per side).

5.    To fit the SDB680 into a rack using rack mount supports, carry out the following (see **Figure 7** below):

5.1.   Fit the slide rails to the pair of front rack mount support brackets using the four screws provided (two per slide rail).

5.2.   Ensuring that the left-hand and right-hand rack mount support brackets are paired up correctly, fit the front and rear rack mount support brackets together using four M6 nuts and plain washers (two each per side) do not fully tighten at this stage.
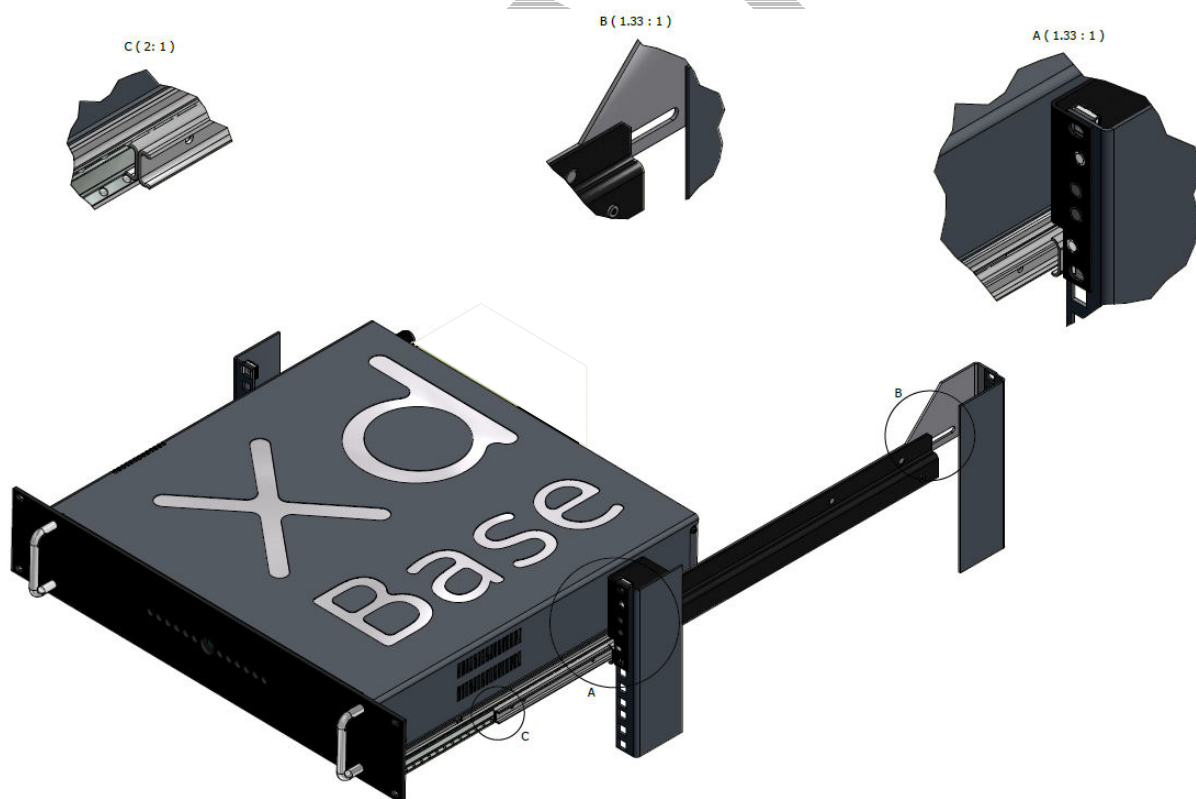


**Figure 7.  Inserting and securing the base station into the rack.**

5.3.   Fit the pair of rack mount support assemblies into the rack at suitable heights as follows:

5.3.1.    Secure the rack mount support assemblies to the front rack mounting support rails using four M6 nuts and plain washers (two each per side) provided.

5.3.2.  Adjust the rack mount support assemblies to the correct length and secure them to the rear rack mounting support rails using the four M6 x 16 mm pan head pozidriv retaining bolts and cage nuts (two each per side).

5.3.3.  Tighten the four M6 nuts that secure the front and rear rack mount support brackets together.

5.4.  Fit M6 cage nuts into the appropriate positions on the front rack mounting support rails so that the base station can be secured into the rack.

5.5.  Pull out the slide runners and fit the base station onto the runners. Ensure that the keyhole standoffs on the base station (two per side) are correctly located in the keyhole slots on the slide rails.

6.  Secure the base station into the rack using the four M6 x 12 mm pozidriv retaining screws (with plastic cup washers).

| ⚠ | **CAUTION**<br>**EQUIPMENT DAMAGE.  During installation operations, the Torque settings must be adhered to or damage to the equipment may result.** |
|---|---|

7.  Tighten all four of the M6 screws to a torque of 2 Nm to secure the base into the rack.

## 2.3  ELECTRICAL CONNECTIONS

8.  Refer to the Electrical Connections section, for full details of all connections and the connector pin-outs.

9.  Using a suitable test set, e.g. an Anritsu/Wiltron S331A, check the Tx and Rx antenna connections for a VSWR of 1.5:1 or better at the relevant Tx and Rx Frequencies.

10.  On the SDB680 rear panel, carry out the following:

10.1.  Connect the Tx and Rx antenna cables to their respective N-type connectors.

10.2.  Ensuring that the power source is switched off, connect the DC power cable from the 'DC IN' connector to the power source.

11.  Carry out the configuration of the SDB680 in accordance with **Section 3 – Configuration of New Tier II Base Station** or **Section 4 – Configuration of New Tier III Base Station** as appropriate.

# 3    CONFIGURATION OF NEW TIER II BASE STATION

**This Procedure should be followed when configuring all new <u>Tier II</u> SDB680 Base Stations after their initial installation in a new system.**

## TOOLS, TEST EQUIPMENT AND MATERIALS REQUIRED

The following Tools, Test Equipment and Materials will be required to perform this procedure:

Dummy Load

Personal Computer

Software Applications:

Simoco Digital Management Terminal (SDMT)

Simoco IP Configuration Tool

*Notes*

*(i).    The software applications listed above are available for download on the Simoco website http://www.simocogroup.com via the Partner Portal. To access the Partner Portal a Username and Password will be required.*

*(ii).   To request access to the partner portal please contact your local business development manager or alternatively contact the relevant Simoco Customer Services (see Support Page for details).*

## 3.1    SDB680 PREPARATION

> **WARNING**
>
> **RF RADIATION. A RF RADIATION HAZARD EXISTS IN THIS EQUIPMENT. TO AVOID RF INJURY, DO NOT TOUCH THE ANTENNA WHEN THE TRANSMITTER IS IN USE. DO NOT OPERATE TRANSMITTER WITH ANTENNA DISCONNECTED. REFER TO EU DIRECTIVE 2004/40/EC DATED 29 APRIL 2004.**

1.    Ensure that the SDB680 base stations are securely fitted into the rack and that the power and antenna cables are connected on the rear panel.

2.    On the SDB680 rear panel, connect the Tx antenna socket to a suitable dummy load (for the 50 W base a minimum 60 Watt load can be used provided that it is suitable for use).

3.    Connect an Ethernet switch cable to the Ethernet socket.

4.    Switch on the power for the system and, in turn, power up each SDB680 base station.

## 3.2    SDMT INSTALLATION AND PREPARATION

5.    Refer to the SDMT DMR Tier II User Manual **[2]** and carry out the following:

5.1.   Install the SDMT software in accordance with **Section 1.2 – Software Installation**.

5.2.   Prepare the SDMT software for use in accordance with **Section 2.2 – SDMT Preparation**.

5.3.   Create or establish a connection to a suitable Microsoft SQL Server database in accordance with **Section 2.3 – Database Connection**.

**3.3    INSTALLING THE SIMOCO IP CONFIGURATION SERVER**

6.    Refer to the Simoco IP Configuration Tool User Manual **[3]** and install the Simoco IP Configuration Server software in accordance with **Section 1.3 – Software Installation**.

7.    After installing the Simoco IP Configuration Tool software, ensure that the PC on which the software is installed is connected to the Ethernet switch via a CAT 5 Ethernet cable.

**3.4    IP ADDRESS CONFIGURATION**

8.    On the PC, start the Simoco IP Configuration Tool.

9.    If the PC has more than one IP address or Network Connection, when the IP Configuration Tool is started, the Interface Selection screen will be displayed (see **Figure 8** below).
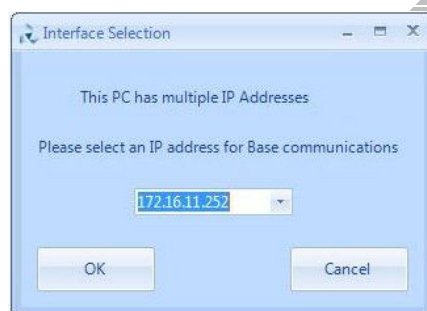


**Figure 8.  Interface Selection screen.**

10.    On the Interface Selection screen, select the relevant IP address that is to be used for communicating with the base station(s).

11.    Once the IP address has been selected the Simoco IP Configuration Tool main screen will be displayed (see **Figure 9** below).
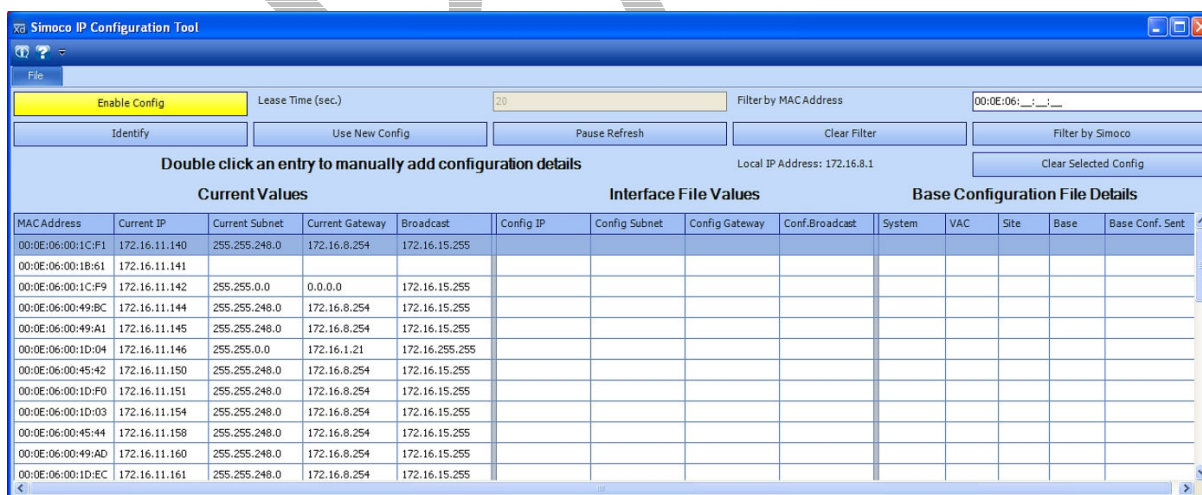


**Figure 9.  IP Configuration Tool main screen**
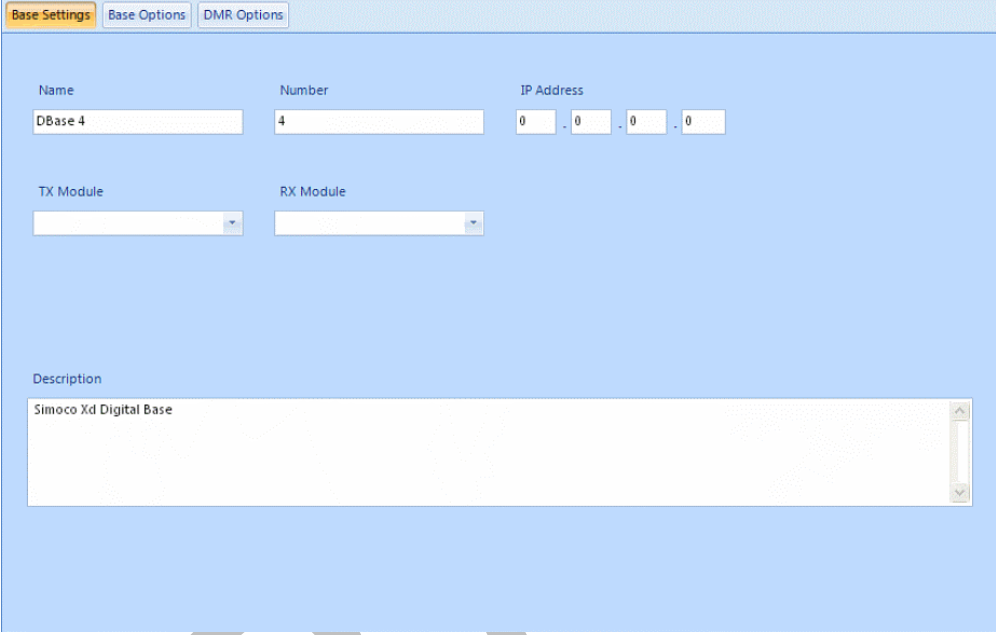
12.    Refer to the Simoco IP Configuration Tool User Manual **[3]** and configure the IP Address for the relevant MAC Address listed in the data grid of the main screen in accordance with **Section 2.2 – Configuring an IP Address**.

**3.5    CONFIGURING THE DMR BASE**

13.    On the SDMT main screen, carry out the following:

13.1. On the ribbon bar, select the 'DMR Tier II' tab.

13.2. On the Site View tab of the Navigation Pane, from the navigation tree, click on the 'System' branch to expand it. Click on the 'Site 1' node displayed.

13.3. On the Ribbon bar, select the 'Add Digital Base' button to add a digital base to Site 1 on the navigation tree.

13.4. On the Site View tab of the Navigation Pane, from the navigation tree, select the new DMR Base that has just been added to the navigation tree. The Base configuration page will be displayed in the configuration page area (see **Figure 10** below).



**Figure 10. Base configuration page – Base Settings tab.**

13.5. On the base Configuration page on the Base Settings tab, set the 'IP Address' to that sent to the base with the IP Configuration tool.

13.6. On the tab of the base configuration page, select the 🖫 icon that is displayed to save the changes that have been made to the configuration page.

13.7. Create a working configuration that includes the new DMR Base in accordance with the SDMT User Manual **[2]** and appropriate for the system in which it is installed.

13.8. On the DMR Tier II ribbon bar, select the 'Write' button. The 'Write Base(s)' page will be displayed (see **Figure 11** overleaf) and any open base configuration pages will be closed.

13.9. On the 'Write Base(s)' page, carry out the following:

13.9.1. Select the new DMR Base that is included in the working configuration.

13.9.2. Select the 'Write' button. A progress bar will briefly be displayed.

13.9.3. After a few seconds, check that a green dot appears in the Success column for the selected base (indicating that the Write operation has been successful) and a 'Reboot' button appears at the bottom of the page.

*Note.*

*To complete the software configuration update procedure for the selected DMR Base, the base must be re-booted.*

13.9.4. Select the Reboot button to enable the base to use the new configuration.

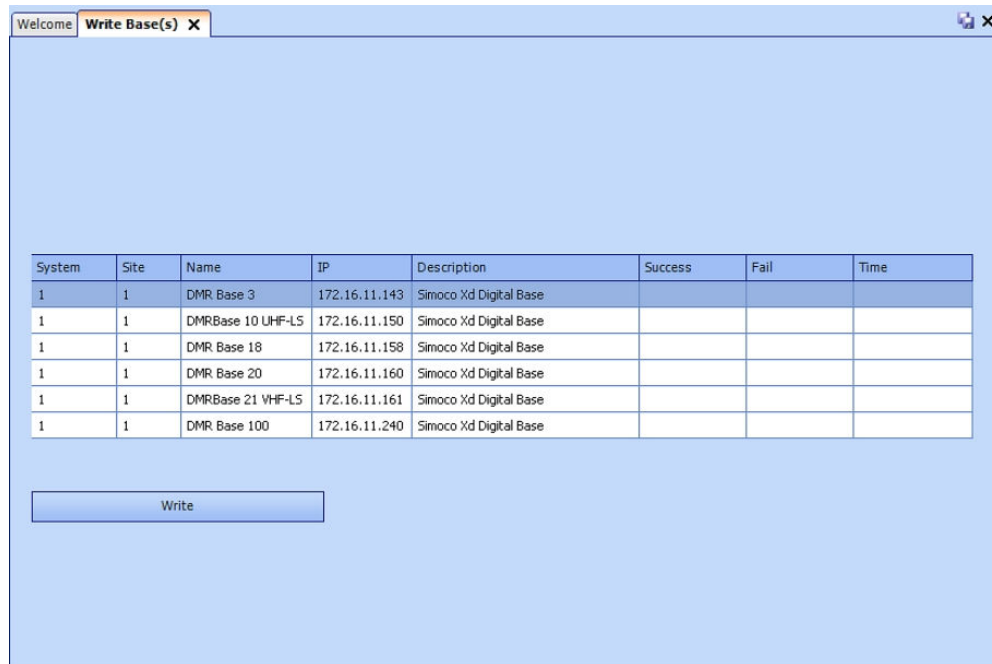| System | Site | Name | IP | Description | Success | Fail | Time |
|---|---|---|---|---|---|---|---|
| 1 | 1 | DMR Base 3 | 172.16.11.143 | Simoco Xd Digital Base | | | |
| 1 | 1 | DMRBase 10 UHF-LS | 172.16.11.150 | Simoco Xd Digital Base | | | |
| 1 | 1 | DMR Base 18 | 172.16.11.158 | Simoco Xd Digital Base | | | |
| 1 | 1 | DMR Base 20 | 172.16.11.160 | Simoco Xd Digital Base | | | |
| 1 | 1 | DMRBase 21 VHF-LS | 172.16.11.161 | Simoco Xd Digital Base | | | |
| 1 | 1 | DMR Base 100 | 172.16.11.240 | Simoco Xd Digital Base | | | |

**Figure 11.  Write Base(s) page.**

# 4  CONFIGURATION OF NEW TIER III BASE STATION

**This Procedure should be followed when configuring all new <u>Tier III</u> SDB680 Base Stations after their initial installation in a new system.**

## TOOLS, TEST EQUIPMENT AND MATERIALS REQUIRED

The following Tools, Test Equipment and Materials will be required to perform this procedure:

> Dummy Load
>
> Personal Computer
>
> Software Applications:
>
>> SDMT
>>
>> Simoco IP Configuration Tool

*Notes*

*(i).    The software applications listed above are available for download on the Simoco website http://www.simocogroup.com via the Partner Portal.  To access the Partner Portal a Username and Password will be required.*

*(ii).   To request access to the partner portal please contact your local business development manager or alternatively contact the relevant Simoco Customer Services (see Support Page for details).*

## 4.1  SOFTWARE LICENCES

All Tier III Base Stations require a Software Licence in order to operate; these licences can be obtained from Simoco.  If a Tier III Base Station is added to an existing Tier III system, the software licences for all the base stations on that system will have to be updated.

It is assumed that all the relevant software licences required have been obtained before commencing this procedure and that they have been uploaded onto a suitable PC.

## 4.2  SDB680 PREPARATION

> **WARNING**
>
> **RF RADIATION.  A RF RADIATION HAZARD EXISTS IN THIS EQUIPMENT.  TO AVOID RF INJURY, DO NOT TOUCH THE ANTENNA WHEN THE TRANSMITTER IS IN USE.  DO NOT OPERATE TRANSMITTER WITH ANTENNA DISCONNECTED.  REFER TO EU DIRECTIVE 2004/40/EC DATED 29 APRIL 2004.**

1.    Ensure that the SDB680 base stations are securely fitted into the rack and that the power and antenna cables are connected on the rear panel.

2.    On the SDB680 rear panel, connect the Tx antenna socket to a suitable dummy load (for the 50 W base a minimum 60 Watt load can be used provided that it is suitable for use).

3.    Connect an Ethernet switch cable to the Ethernet socket.

4.    Switch on the power for the system and, in turn, power up each SDB680 base station.

## 4.3  SDMT INSTALLATION AND PREPARATION

5.    Refer to the SDMT User Manual **[2]** and carry out the following:

5.1.    Install the SDMT software in accordance with **Section 1.2 – Software Installation**.

5.2.    Prepare the SDMT software for use in accordance with **Section 2.2 – SDMT Preparation**.

5.3.    Create or establish a connection to a suitable Microsoft SQL Server database in accordance with **Section 2.2.3 – Database Connection**.

## 4.4    INSTALLING THE SIMOCO IP CONFIGURATION SERVER

6.    Refer to the Simoco IP Configuration Tool User Manual **[3]** and install the Simoco IP Configuration Server software in accordance with **Section 1.3 – Software Installation**.

7.    After installing the Simoco IP Configuration Tool software, ensure that the PC on which the software is installed is connected to the Ethernet switch via a CAT 5 Ethernet cable.

## 4.5    IP ADDRESS CONFIGURATION

8.    On the PC, start the Simoco IP Configuration Tool.

9.    If the PC has more than one IP address or Network Connection, when the IP Configuration Tool is started, the Interface Selection screen will be displayed (see **Figure 12** below).
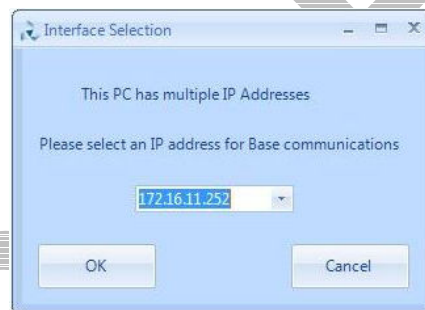


**Figure 12.  Interface Selection screen.**

10.    On the Interface Selection screen, select the relevant IP address that is to be used for communicating with the base station(s).

11.    Once the IP address has been selected the Simoco IP Configuration Tool main screen will be displayed (see **Figure 13** below).
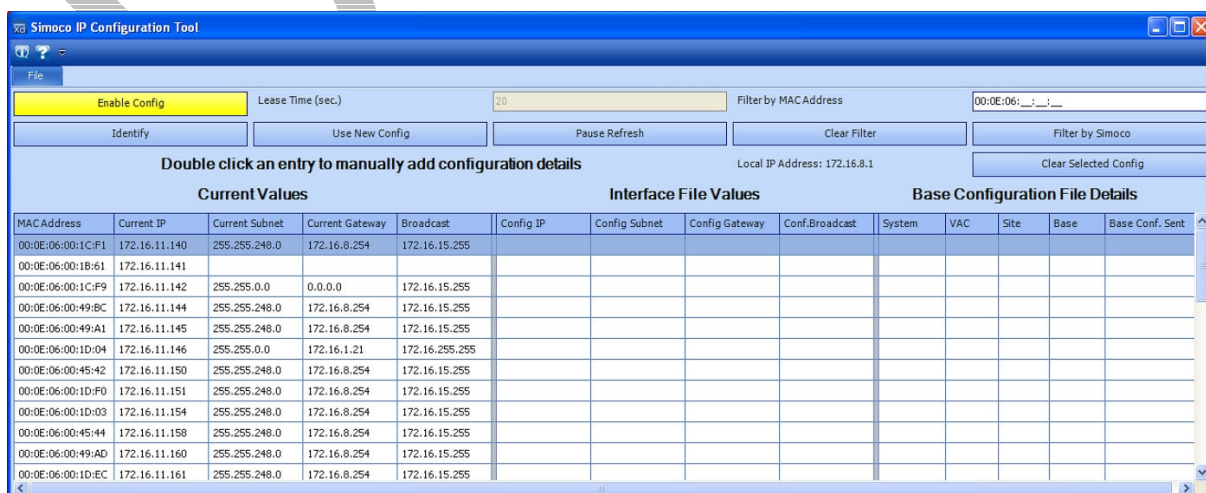


**Figure 13.  IP Configuration Tool main screen**

12.  Refer to the Simoco IP Configuration Tool User Manual **[3]** and configure the IP Address for the relevant MAC Address listed in the data grid of the main screen in accordance with **Section 2.2 – Configuring an IP Address**.

## 4.6    CONFIGURING THE DMR BASE

### 4.6.1    Platform and Application Software Update

13.  On the PC, open an internet browser and access the Simoco webpage.

14.  On the Simoco webpage, select 'Partner Login' and login to the Partner Portal area.

15.  When logged in to the Partner Portal, navigate to the 'Resource Library' > 'Software Downloads' > 'DMR' > 'Simoco Xd Infrastructure' page and ensure that you have the latest version of the 'DMR Tier III' > 'DMR Base' software.  If necessary, download the latest software to the PC.

*Note.*

*The versions of DMR Base software listed and available on the Partner Portal contain two software files.  These are the Cerebral Platform software and the Application software.  The files are in the form CerebralPlatform_R.X.X.X.tar.gz and DMRT3_RX.X.X.tar.gz, where RX.X.X refers to the version of software released in each case.*

16.  On the PC, start and login to the SDMT.  The System Selector screen will be displayed.

17.  On the 'System Selector' screen, carry out either of the following:

17.1.  If the base station is to be added to an existing Tier III system, select the system number from the displayed list and select the 'OK' button.

17.2.  If the base station is to be added to a new Tier III system, enter the system number for the new system and select the 'OK' button.

*Note.*

*The Tier III system number selected or entered above must match that entered when configuring the IP address for the Tier III base station.  Refer to Para 12 above and Para 2.3 of Section 2.2 – Configuring an IP Address in the Simoco IP Configuration Tool User Manual [3] for clarification.*

18.  On the SDMT main screen, carry out the following:

18.1.  On the ribbon bar, select the DMR Tier III tab.

18.2.  On the DMR Tier III ribbon bar, select the System Commands button.  The System I/O page will be displayed.

18.3.  On the System I/O page, select the 'Browse' button for relevant software you wish to upload (i.e. Cerebral Platform or Application Software).  An open file dialogue window will be displayed.

19.  On the 'Open' file window, navigate to and select the latest version of DMR Tier III software (i.e. Cerebral Platform or Application Software) downloaded at **Para 15**.  Select the Open button to load the file into the SDMT.

20.  Repeat **Para 18.3** and **Para 19** for the other type of software (i.e. Cerebral Platform or Application Software) as required.

21.  On the SDMT, on the System I/O Page, carry out the following:

21.1.    In the System Monitor area, on the navigation tree, right click on the Base that you wish to upload the software to.  Menu options will be displayed.

21.2.    From the menu options, select 'Update' > 'Update Software'.

21.3.    In the Comms History area, confirm that a 'Starting Update Software' message is displayed.

21.4.    The progress of the software update operation will be displayed in the 'Current Message Progress' area.

21.5.    In the Comms History area, after a short delay, confirm that a 'Completed Update Software' message is displayed.

### 4.6.2     Software Licence Update

22.    On the SDMT, on the System I/O Page, select the 'Browse' button for the Licence file.  An Open file dialogue window will be displayed.

23.    On the 'Open' file window, navigate to and select the relevant software licence file.  Select the Open button to load the file into the SDMT.

24.    On the SDMT main screen, on the System I/O page, carry out the following:

24.1.    In the System Monitor area, on the navigation tree, right click on the VAC for the system. Menu options will be displayed.

24.2.    From the VAC menu options, select 'Update' > 'Update Software'.

24.3.    In the Comms History area, confirm that a 'Starting Update Software' message is displayed.

24.4.    The progress of the update operation will be displayed in the 'Current Message Progress' area.

24.5.    In the Comms History area, after a short delay, confirm that a 'Completed Update Software' message is displayed.

### 4.6.3     Configuration Creation and Upload

25.    Refer to Part 3 of the SDMT User Manual **[2]** and create a working configuration that includes the new DMR Base and appropriate for the system in which it is installed.

26.    When creating a working configuration, ensure that any changes to the configuration are saved by selecting the ⊟ icon that will be displayed on the page tab of the relevant configuration pages.  This will save the changes to the local SQL Server ® database stored on the PC.

27.    On the SDMT main screen, on the ribbon bar, select the System Commands button.  The System I/O configuration page will be displayed.

28.    On the System I/O page, carry out the following:

28.1.    In the 'Select Read/Write System Areas' box, depending on the configuration you wish to write, select either the 'Configuration', the 'Subscribers' or both.  Select the 'Write to System' button.

28.2.    In the Comms History area, confirm that a 'Starting Write All Config' message is displayed.

28.3.    The progress of the write operation will be displayed in the 'Current Message Progress' area.

28.4.    In the Comms History area, after a short delay, confirm that a 'Completed Write All Config' message is displayed.

28.5.    When the write operation is completed, the success or failure of the operation for each VAC, Site or Base will be indicated in the Comms History area.

### 4.6.4    Enable Bases

29.    On the system I/O page, in the System Monitor area, on the navigation tree, carry out the following:

29.1.    To enable all the bases on a system, carry out the following:

29.1.1.    Right click on the VAC that you wish to enable.  Menu options will be displayed.

29.1.2.    From the menu options, select 'Site Options' > 'Enable Site(s)'.  The sites enable warning message will be displayed.

29.2.    To enable an individual base, carry out the following:

29.2.1.    Right click on the Base that you wish to enable.  Menu options will be displayed.

29.2.2.    From the menu options, select 'Base Operations' > 'Enable Base(s)'.  The base enable warning message will be displayed.

29.3.    On the relevant warning message, select 'Yes' to continue.

29.4.    In the System Monitor area, on the navigation tree, confirm that the status notification that was alongside the relevant VAC, Site or individual base has now disappeared.

29.5.    In the Comms History area, after a short delay, confirm that the relevant 'Completed Enabling Base' message(s) is displayed.

## 5   BASE CONFIGURATION TIER II TO TIER III

**This Procedure should be followed when configuring a Tier II SDB680 Base Station into a Tier III SDB680 Base Station.**

### TOOLS, TEST EQUIPMENT AND MATERIALS REQUIRED

The following Tools, Test Equipment and Materials will be required to perform this procedure:

PC with the following Software Applications installed:

SDMT

Simoco IP Configuration Tool

*Notes*

*(i).    The software applications listed above are available for download on the Simoco website http://www.simocogroup.com via the Partner Portal. To access the Partner Portal a Username and Password will be required.*

*(ii).   To request access to the partner portal please contact your local business development manager or alternatively contact the relevant Simoco Customer Services (see Support Page for details).*

### 5.1   TIER III BASE PREREQUISITES

Before commencing this procedure to configure a Tier II Base Station into a Tier III Base Station, it is assumed that the base station has already been fitted into a rack and is connected to the network as a Tier II Base.

It as also assumed that the SDMT and Simoco IP Configuration Tool software applications have been installed on a PC and have previously been used.

### 5.2   SOFTWARE LICENCES

All Tier III Base Stations require a Software Licence in order to operate; these licences can be obtained from Simoco. If a Tier III Base Station is added to an existing Tier III system, the software licences for all the base stations on that system will have to be updated.

It is assumed that all the relevant software licences required have been obtained before commencing this procedure and that they have been uploaded onto a suitable PC.

### 5.3   IP ADDRESS CONFIGURATION

1.    If the relevant base station has already been allocated an IP address, note the IP address.

2.    Ensure that the PC is connected to the Ethernet switch via a CAT 5 Ethernet cable and the PC has a fixed IP address in the same subnet as the bases.

3.    On the PC, start the Simoco IP Configuration Tool.

4.    If the PC has more than one IP address or Network Connection, when the IP Configuration Tool is started, the Interface Selection screen will be displayed.

5.    On the Interface Selection screen, select the relevant IP address that is to be used for communicating with the base station(s).

6.    Once the IP address has been selected the Simoco IP Configuration Tool main screen will be displayed.

7.    Refer to the Simoco IP Configuration Tool User Manual **[3]** and configure a **Tier II** IP Address for the relevant MAC Address listed in the data grid of the main screen in accordance with **Section 2.2 – Configuring an IP Address**.

## 5.4    CONFIGURING THE DMR BASE

### 5.4.1    Platform and Application Software Update

8.    On the PC, open an internet browser and access the Simoco webpage.

9.    On the Simoco webpage, select 'Partner Login' and login to the Partner Portal area.

10.   When logged in to the Partner Portal, navigate to the 'Resource Library' > 'Software Downloads' > 'DMR' > 'Simoco Xd Infrastructure' page and ensure that you have the latest version of the 'DMR Tier III' > 'DMR Base' software.  If necessary, download the latest software to the PC.

*Note.*

*The versions of DMR Base software listed and available on the Partner Portal contain two software files.  These are the Cerebral Platform software and the Application software.  The files are in the form CerebralPlatform_R.X.X.X.tar.gz and DMRT3_RX.X.X.tar.gz, where RX.X.X refers to the version of software released in each case.*

11.   On the PC, start and login to the SDMT.  The System Selector screen will be displayed.

12.   On the 'System Selector' screen, carry out either of the following:

12.1.   If the base station is to be added to an existing Tier III system, select the system number from the displayed and select the 'OK' button.

12.2.   If the base station is to be added to a new Tier III system, enter the system number for the new system and select the 'OK' button.

13.   On the SDMT main screen, carry out the following:

13.1.   On the ribbon bar, select the DMR Tier II tab.

13.2.   On the Site View tab of the Navigation Pane, from the navigation tree, click on the 'System' branch to expand it.  Click on the 'Site 1' node displayed.

13.3.   On the DMR Tier II ribbon bar, select the 'Add Digital Base' button to add a digital base to Site 1 on the navigation tree.

13.4.   On the Site View tab of the Navigation Pane, from the navigation tree, select the new DMR Base that has just been added to the navigation tree.  The Base configuration page will be displayed in the configuration page area.

13.5.   On the base Configuration page on the Base Settings tab, set the 'IP Address' to that of the new Tier III base station noted in **Para 1** or that sent to the base with the IP Configuration tool as appropriate.

13.6.   On the tab of the base configuration page, select the ⊟ icon that is displayed to save the changes that have been made to the configuration page.

13.7.   On the DMR Tier II ribbon bar, select the 'Software Upload' button.  The 'Upload to Base(s)' page will be displayed.

13.7.1.   On the Upload to Base(s) page, select the 'Browse' button for the Application Software File.  An Open file dialogue window will be displayed.

14.     On the 'Open' file window, navigate to and select the latest version of the DMR Tier III Application Software downloaded at **Para 10**. Select the Open button to load the file into the SDMT.

15.     On the SDMT main screen, on the Upload to Base(s) page, select the 'Browse' button for the Cerebral Platform File. An Open file dialogue window will be displayed.

16.     On the 'Open' file window, navigate to and select the latest version of the DMR Tier III Cerebral Platform software downloaded at **Para 10**. Select the Open button to load the file into the SDMT.

17.     On the SDMT main screen, carry out the following:

    17.1.     On the Upload to Base(s) page, carry out the following:

        17.1.1.     Select the base(s) you wish to upload the software to.

        17.1.2.     Select the 'Upload' button to programme the base with the Application Software and the Cerebral Platform.

    17.2.     On the DMR Tier II ribbon bar, select the Re-boot button. The Re-boot Base(s) page will be displayed.

    17.3.     On the Re-boot Base(s) page, select the base station(s) that the software was uploaded to and select the 'Re-boot' button. The base station(s) will re-boot and load the new versions of software.

### 5.4.2     Tier III IP Address Configuration

18.     On the IP Configuration Tool, in the data grid of the main screen, select the relevant MAC Address for the Tier II Base.

19.     Refer to the Simoco IP Configuration Tool User Manual **[3]** and configure a **Tier III** IP Address for the relevant MAC Address listed in the data grid of the main screen in accordance with **Section 2.2 – Configuring an IP Address**. Ensure that the 'System', 'VAC', 'Site' and 'Base' details entered are relevant to the Tier III system.

*Note.*

***When configuring the IP address for the Tier III base station, the Tier III 'System' number entered above must match the system number that the Tier III base station is to be added to. Refer to Para 12 above and Para 2.3 of Section 2.2 – Configuring an IP Address in the Simoco IP Configuration Tool User Manual [3] for clarification.***

### 5.4.3     Software Licence Update

20.     On the SDMT main screen, on the ribbon bar, select the DMR Tier III tab.

    20.1.     On the DMR Tier III ribbon bar, select the System Commands button. The System I/O configuration page will be displayed.

    20.2.     On the System I/O page, in the System Monitor area, expand the navigation tree and check that the new Tier III base has been added to the system.

    20.3.     On the System I/O page, select the 'Browse' button for the Licence file. An Open file dialogue window will be displayed.

21.     On the 'Open' file window, navigate to and select the relevant software licence file. Select the Open button to load the file into the SDMT.

22.     On the SDMT main screen, on the System I/O page, carry out the following:

22.1.   In the System Monitor area, on the navigation tree, right click on the VAC for the system. Menu options will be displayed.

22.2.   From the VAC menu options, select 'Update' > 'Update Software'.

22.3.   In the Comms History area, confirm that a 'Starting Update Software' message is displayed.

22.4.   The progress of the update operation will be displayed in the 'Current Message Progress' area.

22.5.   In the Comms History area, after a short delay, confirm that a 'Completed Update Software' message is displayed.

22.6.   In the System Monitor area, on the navigation tree, right click on the VAC for the system. Menu options will be displayed.

22.7.   From the VAC menu options, select 'Base Operations' > 'Reboot Base(s)'.  The Reboot Base(s) warning message will be displayed.

22.8.   On the Reboot Base(s) warning message, select 'Yes' to continue.

22.9.   In the Comms History area, after a short delay, confirm that a 'Resetting VAC' message is displayed.

22.10.  In the Comms History area, various messages for the reboot operation will be displayed. Eventually, as the reboot of each base station in the Tier III system is completed, an appropriate 'Discovered Base' message will be displayed.

### 5.4.4    Configuration Creation and Upload

23.   On the SDMT main screen, carry out the following:

23.1.   Refer to Part 3 of the SDMT User Manual **[2]** and create a working configuration that includes the new DMR Base and appropriate for the system in which it is installed.

23.2.   When creating a working configuration, ensure that any changes to the configuration are saved by selecting the ⊟ icon that will be displayed on the page tab of the relevant configuration pages.  This will save the changes to the local SQL Server ® database stored on the PC.

23.3.   On the ribbon bar, select the System Commands button.  The System I/O configuration page will be displayed.

23.4.   On the System I/O page, carry out the following:

23.4.1.   In the 'Select Read/Write System Areas' box, depending on the configuration you wish to write, select either the 'Configuration', the 'Subscribers' or both.  Select the 'Write to System' button.

23.4.2.   In the Comms History area, confirm that a 'Starting Write All Config' message is displayed.

23.4.3.   The progress of the write operation will be displayed in the 'Current Message Progress' area.

23.4.4.   In the Comms History area, after a short delay, confirm that a 'Completed Write All Config' message is displayed.

23.4.5.   When the write operation is completed, the success or failure of the operation for each VAC, Site or Base will be indicated in the Comms History area.

### 5.4.5    Enable New Tier III Base

24.    On system I/O page, in the System Monitor area, carry out the following:

   24.1.    On the navigation tree, right click on the new Tier III Base that you wish to enable.  Menu options will be displayed.

   24.2.    From the menu options, select 'Base Operations' > 'Enable Base(s)'.  The base enable warning message will be displayed.

25.    On the base enable warning message, select 'Yes' to continue.

26.    On system I/O page, carry out the following:

   26.1.    In the System Monitor area, on the navigation tree, confirm that the status notification that was alongside the relevant base has now disappeared.

   26.2.    In the Comms History area, after a short delay, confirm that the 'Completed Enabling Base' message is displayed.

# 6    BASE CONFIGURATION TIER III TO TIER II

**This Procedure should be followed when configuring a Tier III Base Station into a Tier II SDB680 Base Station.**

## TOOLS, TEST EQUIPMENT AND MATERIALS REQUIRED

The following Tools, Test Equipment and Materials will be required to perform this procedure:

PC with the following Software Applications installed:

SDMT

Simoco IP Configuration Tool

*Notes*

*(i).*    *The software applications listed above are available for download on the Simoco website http://www.simocogroup.com via the Partner Portal.  To access the Partner Portal a Username and Password will be required.*

*(ii).*    *To request access to the partner portal please contact your local business development manager or alternatively contact the relevant Simoco Customer Services (see Support Page for details).*

## 6.1    TIER II BASE PREREQUISITES

Before commencing this procedure to configure a Tier III Base Station into a Tier II Base Station, it is assumed that the base station has already been fitted into a rack and is connected to the relevant system.

It as also assumed that the SDMT and Simoco IP Configuration Tool software applications have been installed on a PC and have previously been used.

## 6.2    IP ADDRESS CONFIGURATION

1.    If the relevant base station has already been allocated an IP address, note the IP address.

2.    If the relevant base station has not been allocated an IP address, carry out the IP address configuration as described below.

3.    Ensure that the PC is connected to the Ethernet switch via a CAT 5 Ethernet cable and the PC has a fixed IP address in the same subnet as the bases.

4.    On the PC, start the Simoco IP Configuration Tool.

5.    If the PC has more than one IP address or Network Connection, when the IP Configuration Tool is started, the Interface Selection screen will be displayed.

6.    On the Interface Selection screen, select the relevant IP address that is to be used for communicating with the base station(s).

7.    Once the IP address has been selected the Simoco IP Configuration Tool main screen will be displayed.

8.    Refer to the Simoco IP Configuration Tool User Manual **[3]** and configure the IP Address for the relevant MAC Address listed in the data grid of the main screen in accordance with **Section 2.2 – Configuring an IP Address**.

**6.3**    CONFIGURING THE DMR BASE

**6.3.1    Changing the Platform and Application Software**

9.      On the PC, open an internet browser and access the Simoco webpage.

10.     On the Simoco webpage, select 'Partner Login' and login to the Partner Portal area.

11.     When logged in to the Partner Portal, navigate to the 'Resource Library' > 'Software Downloads' > 'DMR' > 'Simoco Xd Infrastructure' page and ensure that you have the latest version of the 'DMR Tier II' > 'DMR Base' software.  If necessary, download the latest software to the PC.

*Note.*

*The versions of DMR Base software listed and available on the Partner Portal contain two software files.  These are the Cerebral Platform software and the Application software.  The files are in the form CerebralPlatform_R.X.X.X.tar.gz and DMRT2_RX.X.X.tar.gz, where RX.X.X refers to the version of software released in each case.*

12.     On the PC, start and login to the SDMT.

13.     On the SDMT main screen, carry out the following:

13.1.   On the ribbon bar, select the 'DMR Tier II' tab.

13.2.   On the Site View tab of the Navigation Pane, from the navigation tree, click on the 'System' branch to expand it.  Click on the 'Site 1' node displayed.

13.3.   On the Ribbon bar, select the 'Add Digital Base' button to add a digital base to Site 1 on the navigation tree.

13.4.   On the Site View tab of the Navigation Pane, from the navigation tree, select the new DMR Base that has just been added to the navigation tree.  The Base configuration page will be displayed in the configuration page area.

13.5.   On the base Configuration page on the Base Settings tab, set the 'IP Address' to that of the new Tier II base station noted in **Para 1** or that sent to the base with the IP Configuration tool as appropriate.

13.6.   On the tab of the base configuration page, select the 🖫 icon that is displayed to save the changes that have been made to the configuration page.

13.7.   On the DMR Tier II ribbon bar, select the 'Software Upload' button.  The 'Upload to Base(s)' page will be displayed.

13.7.1.  On the Upload to Base(s) page, select the 'Browse' button for the Application Software File.  An Open file dialogue window will be displayed.

14.     On the 'Open' file window, navigate to and select the latest version of the DMR Tier II Application Software downloaded at **Para 11**.  Select the Open button to load the file into the SDMT.

15.     On the SDMT main screen, on the Upload to Base(s) page, select the 'Browse' button for the Cerebral Platform File.  An Open file dialogue window will be displayed.

16.     On the 'Open' file window, navigate to and select the latest version of the DMR Tier II Cerebral Platform software downloaded at **Para 11**.  Select the Open button to load the file into the SDMT.

17.     On the SDMT main screen, carry out the following:

17.1.   On the Upload to Base(s) page, carry out the following:

    17.1.1.   Select the base you wish to upload the software to.

    17.1.2.   Select the 'Upload' button to programme the base with the Application Software and the Cerebral Platform.

17.2.   On the DMR Tier II ribbon bar, select the Re-boot button.  The Re-boot Base(s) page will be displayed.

17.3.   On the Re-boot Base(s) page, select the base station that the software was uploaded to and select the 'Re-boot' button.  The base station will re-boot and load the new versions of software.

17.4.   Create a working configuration that includes the new DMR Base in accordance with the SDMT User Manual **[2]** and appropriate for the system in which it is installed.

17.5.   On the DMR Tier II ribbon bar, select the 'Write' button.  The 'Write Base(s)' page will be displayed and any open base configuration pages will be closed.

17.6.   On the 'Write Base(s)' page, carry out the following:

    17.6.1.   Select the new DMR Base that is included in the working configuration.

    17.6.2.   Select the 'Write' button.  A progress bar will briefly be displayed.

    17.6.3.   After a few seconds, check that a green dot appears in the Success column for the selected base (indicating that the Write operation has been successful) and a 'Reboot' button appears at the bottom of the page.

*Note.*

***To complete the software configuration update procedure for the selected DMR Base, the base must be re-booted.***

    17.6.4.   Select the Reboot button to enable the base to use the new configuration.