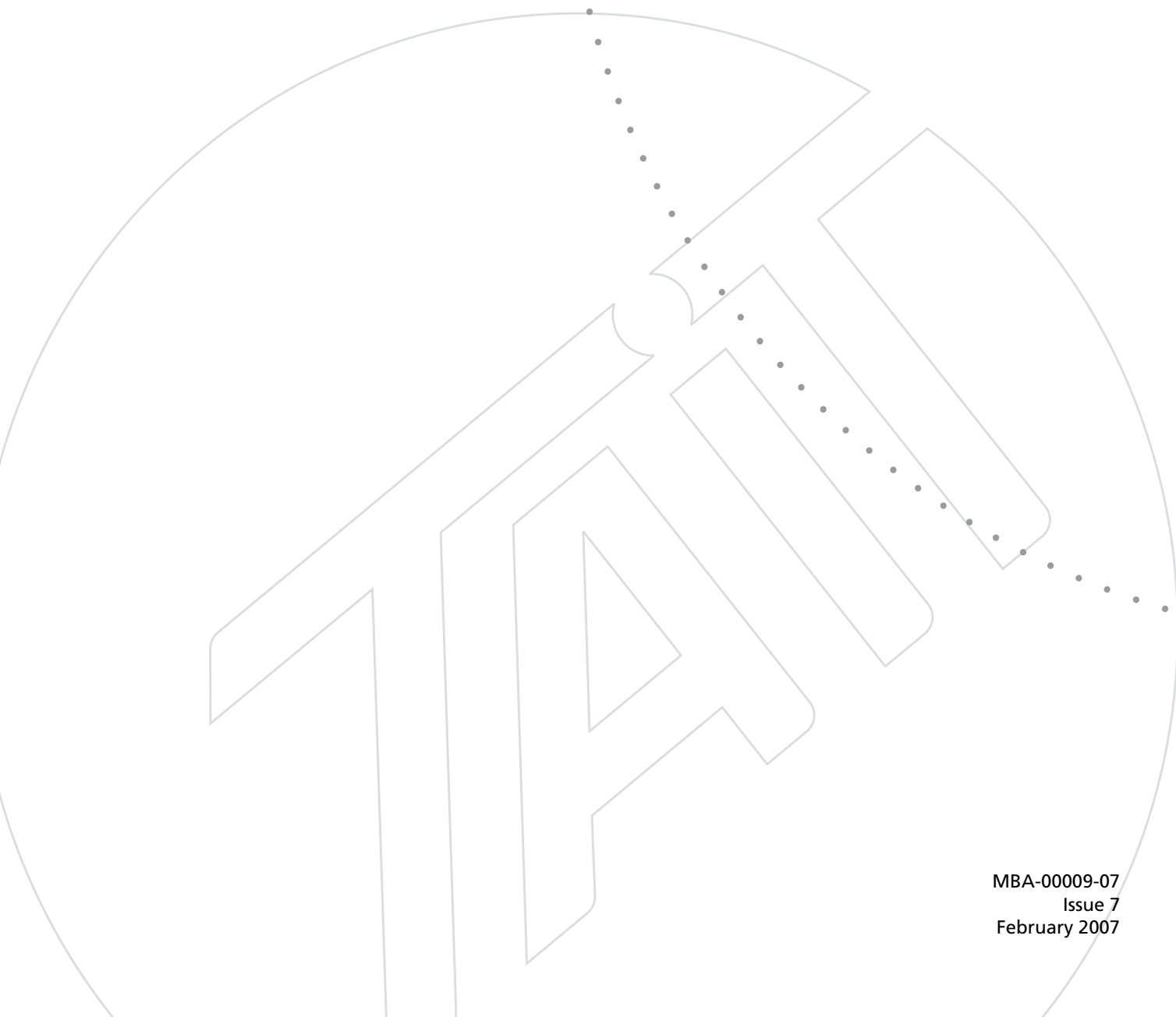


TB8100 base station

Installation Guide



Contact Information

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Website: <http://www.taitworld.com>

Technical Support

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Enquiries and Comments

If you have any enquiries regarding this manual, or any comments, suggestions and notifications of errors, please contact Technical Support.

Updates of Manual and Equipment

In the interests of improving the performance, reliability or servicing of the equipment, Tait Electronics Limited reserves the right to update the equipment or this manual or both without prior notice.

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To Our European Customers



Tait Electronics Limited is an environmentally responsible company which supports waste minimization and material recovery. The European Union's Waste Electrical and Electronic Equipment

Directive requires that this product be disposed of separately from the general waste stream when its service life is over. Please be environmentally responsible and dispose through the original supplier, your local municipal waste "separate collection" service, or contact Tait Electronics Limited.

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Associated Documentation

MBA-00001- xx	TB8100 Specifications Manual.
MBA-00005- xx	TB8100 Installation and Operation Manual.
MBA-00010- xx	TB8100 Service Kit User's Manual.
MBA-00011- xx	TB8100 Calibration Kit User's Manual.
MB8100-80-00-806	TB8100 Alarm Center User's Manual.
MBA-00013- xx	TBA0STU/TBA0STP Calibration and Test Unit Operation Manual
MBA-00016- xx	TB8100 Service Manual.

The characters **xx** represent the issue number of the documentation. All available TB8100 product documentation is provided on the Product CD supplied with the base station. Updates may also be published on the Tait Technical Support website (<http://support.taitworld.com>).

Tuning and Configuration

If your TB8100 base station has not been tuned to your requirements at the factory, you will need to tune the reciter modules before operating them in your radio system. To do this you will need to use the Calibration Kit software included on the Product CD, plus the Calibration and Test Unit. The TB8100 base station has been programmed with a default software configuration and default passwords at the factory. You will need to use the Service Kit software to configure your base station to suit the requirements of your radio system. Refer to the Calibration Kit and Service Kit documentation for full details on these procedures.

1 Installation

This chapter describes how to install the TB8100 base station in a standard 19 inch rack or cabinet. It also provides some general information on safety precautions and site requirements. We recommend that you read the entire chapter before beginning the installation.

1.1 Personal Safety

1.1.1 Lethal Voltages



Warning!! The PMU contains voltages that may be lethal. Refer to the ratings label on the rear of the module.

The TB8100 base station must be installed so that the rear of the PMU is located in a service access area. The PMU must be connected to the mains supply source by trained personnel in accordance with local and national regulations.

Disconnect the mains IEC connector and wait for five minutes for the internal voltages to self-discharge before dismantling. The AC power on/off switch does not isolate the PMU from the mains. It breaks only the phase circuit, not the neutral.

The PMU should be serviced only by qualified technicians. There are no user-replaceable parts inside. If the PMU is damaged and does not function properly, stop the module safely and contact your nearest Tait Dealer or Customer Service Organisation immediately.

All servicing should be carried out only when the PMU is powered through a mains isolating transformer of sufficient rating. We **strongly recommend** that the mains power to the whole of the repair and test area is supplied via an earth leakage circuit breaker.

1.1.2 Explosive Environments



Warning!! Do not operate TB8100 equipment near electrical blasting caps or in an explosive atmosphere. Operating the equipment in these environments is a definite safety hazard.

1.1.3 Proximity to RF Transmissions

Do not operate the transmitter when someone is standing within 90 cm (3 ft) of the antenna. Do not operate the transmitter unless you have checked that all RF connectors are secure.

1.1.4 High Temperatures

Take care when handling a PMU or PA which has been operating recently. Under extreme operating conditions (+60°C [+140°F] ambient air temperature) or high duty cycles the external surfaces of the PMU and PA can reach temperatures of up to +80°C (+176°F).

1.2 Equipment Safety

1.2.1 ESD Precautions



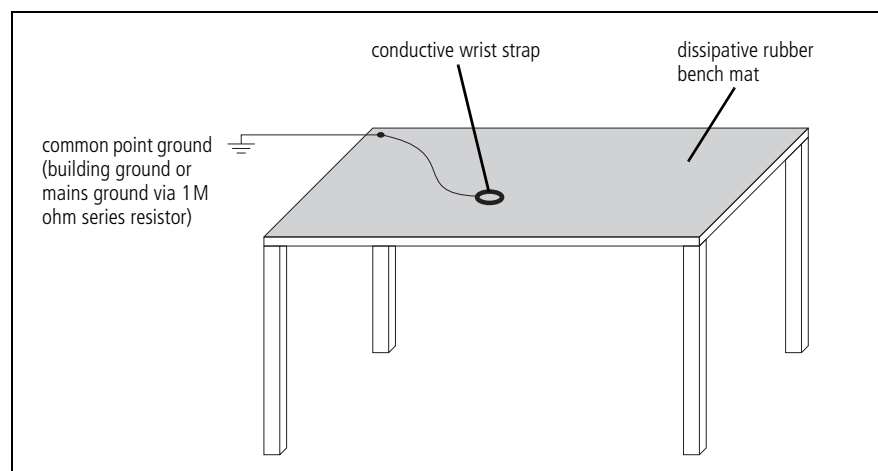
Important

This equipment contains devices which are susceptible to damage from static charges. You must handle these devices carefully and according to the procedures described in the manufacturers' data books.

We recommend you purchase an antistatic bench kit from a reputable manufacturer and install and test it according to the manufacturer's instructions. [Figure 1.1](#) shows a typical antistatic bench set-up.

You can obtain further information on antistatic precautions and the dangers of electrostatic discharge (ESD) from standards such as ANSI/ESD S20.20-1999 or BS EN 100015-4 1994. The Electrostatic Discharge Association website is <http://www.esda.org>.

Figure 1.1 Typical antistatic bench set-up



1.2.2 Antenna Load



Important The PA may be damaged if the load is removed or switched while the PA is transmitting.

Introduction

One of the inherent characteristics of 28V LDMOS technology is its lower breakdown voltage. Tait Electronics, and most other major base station manufacturers, have adopted this technology to benefit from its superb wide band performance and high efficiency.

The MRF9060 LDMOS FET is used as the final power device in the TB8100 50W and 100W PAs. In these PAs, the MRF9060 device is protected from high VSWR by the design of the circuitry. This circuitry makes it impossible to damage the device by keying the PA into a mismatched load, or if the load deteriorates over even a short period of time (milliseconds). Thus, no PA will fail if it is keyed while connected to a mismatched load.

However, it is possible to damage the device if **all** the following conditions happen **at the same time**:

- there is a step change in the PA load (i.e. the load is removed)
- the PA is transmitting
- the feed line loss between the PA and the mismatch is <1 dB.

The effect of such conditions is variable: some devices will not be destroyed, and some may fail after repeated load interruptions.



Note Ice on the antenna, or a broken antenna, is unlikely to cause damage to the PA. There should be enough coaxial cable between the antenna and PA to protect it from high VSWR.

5W PAs will not fail due to a highly mismatched load. They do not use the 60W board with the MRF9060 device.

Recommendations

The procedures recommended below should help to protect the PA from damage under all but the most extreme operating conditions.

1. **Do not remove the load from the PA while it is transmitting.**
2. Do not connect the PA directly to the antenna. To protect the PA output stage from load transients (i.e. switching or removing the load) or atmospheric disturbances (e.g. rain static, electrical storms, etc.), we recommend that you fit an isolator or cavity filter (e.g. duplexer) between the PA and the load.

Fit the isolator as close as possible to the RF output connector on the PA. Do not connect any switching equipment between the isolator and the PA, unless the switch **cannot** operate while there is RF present (i.e. the base station is transmitting).

3. Fit a surge suppressor to the antenna cabling where it enters the building.
4. Inspect all cables and equipment connected to the TB8100 base station for defects.

1.2.3 Equipment Grounding

To ensure safe operation the TB8100 base station equipment must be correctly grounded as described in these installation instructions.

1.2.4 Installation and Servicing Personnel

The TB8100 base station should be installed and serviced only by qualified personnel.

1.3 Regulatory Information

1.3.1 Distress Frequencies

The 406 to 406.1 MHz frequency range is reserved worldwide for use by Distress Beacons. Do **not** program transmitters to operate in this frequency range.

1.3.2 FCC Compliance¹

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

1.3.3 Unauthorised Modifications

Any modifications you make to this equipment which are not authorised by Tait Electronics Limited may invalidate your compliance authority's approval to operate the equipment.

1.3.4 Health, Safety and Electromagnetic Compatibility in Europe

In the European Community, radio and telecommunications equipment is regulated by Directive 1999/5/EC, also known as the Radio and Telecommunications Terminal Equipment (R&TTE) directive. The

1. Refer to the TB8100 Specifications Manual (MBA-00001-xx) for more information on the compliance standards to which the TB8100 base station equipment has been tested and approved.

requirements of this directive include protection of health and safety of users, as well as electromagnetic compatibility.

Intended Purpose of Product

This product is an FM radio transceiver. It is intended for radio-communication in the Private Mobile Radio (PMR) or Public Access Mobile Radio (PAMR) services, to be used in all member states of the European Union (EU) and states within the European Economic Area (EEA).

This product can be programmed to transmit on frequencies that are not harmonised throughout the EU/EEA, and will require a licence to operate in each member state. Limitations may apply to transmitter power, operating frequency, channel spacing, and emission.

Declaration of Conformity

Brief Declarations of Conformity appear on page 32. You can download the formal Declaration of Conformity from <http://eudocs.taitworld.com/>. You can also obtain a signed and dated paper copy of the Declaration of Conformity from Tait Europe Ltd.

1.4 Environmental Conditions

1.4.1 Operating Temperature Range

The operating temperature range of the TB8100 base station is -30°C to $+60^{\circ}\text{C}$ (-22°F to $+140^{\circ}\text{F}$) ambient temperature. Ambient temperature is defined as the temperature of the air at the intake to the cooling fans.

1.4.2 Humidity

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

1.4.3 Dust and Dirt

For uncontrolled environments, the level of airborne particulates must not exceed $100\mu\text{g}/\text{m}^3$.

1.5 Grounding and Lightning Protection

1.5.1 Electrical Ground

The TB8100 modules are grounded by physical contact between the module case and the subrack. To ensure a good ground connection you must tighten each module retaining clamp securely (refer to “Replacing Modules” in the Installation and Operation Manual for the correct torque).

A threaded grounding connector is provided on the rear of the subrack for connection to the site ground point (refer to “Connection” in the Installation and Operation Manual for more details).

1.5.2 Lightning Ground

It is extremely important for the security of the site and its equipment that you take adequate precautions against lightning strike. Because it is outside the scope of this manual to provide comprehensive information on this subject, we recommend that you conform to your country’s standards organisation or regulatory body.

1.6 Recommended Tools

It is beyond the scope of this manual to list every tool that an installation technician should carry. However, the following tools are specifically required for installing the TB8100 base station:

- Pozidriv PZ3 screwdriver for the M6 screws used in the DC input terminals on the PMU; M6 screws are also used to secure the subrack to the cabinet in Tait factory-assembled systems
- Pozidriv PZ2 screwdriver for the M4 screws used to secure the module retaining clamps
- 1/4in or 6mm flat blade screwdriver for the fasteners used to secure the front panel to the subrack
- 5/16in or 8mm AF spanner for the SMA connectors.

You can also obtain the TBA0ST2 tool kit from your nearest Tait Dealer or Customer Service Organisation. It contains the basic tools needed to install, tune and service the TB8100 base station.

1.7 Ventilation

Always ensure there is adequate ventilation around the TB8100 base station. **Do not** operate it in a sealed cabinet. You **must** keep the ambient temperature within the specified range, and we **strongly** recommended that you ensure that the cooling airflow is not restricted.

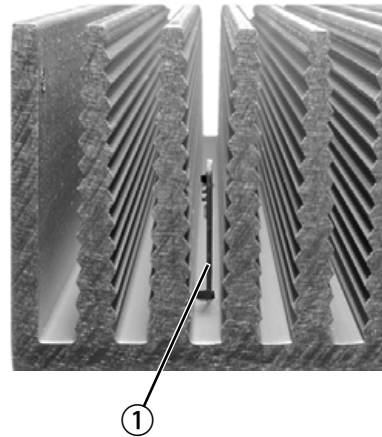


Important The cooling fans are mounted on the front panel and will only operate when the panel is fitted correctly to the front of the subrack. To ensure adequate airflow through the base station, do not operate it for more than a few minutes with the front panel removed (e.g. for servicing purposes).

1.7.1 Ambient Air Temperature Sensor

The ambient air temperature reading for the TB8100 base station is provided by the ambient air temperature sensor board ① fitted to the PA control board.

The sensor board is inserted through slots in the control board and heatsink to be positioned between the heatsink fins.



Important If the sensor board is to provide accurate ambient temperature readings, it must have forced airflow and must not come into contact with the metal of the heatsink fins. **Do not stack PAs with the fins together.** It is possible for the fins on one heatsink to slide between the fins on the other heatsink. This can damage the sensor board, and possibly result in the heatsink fins becoming locked together.

1.7.2 Cabinet and Rack Ventilation

Refer to [Figure 1.2 on page 12](#).

The cooling airflow for the TB8100 base station enters through the front panel and exits at the rear of the subrack. For optimum thermal performance, the heated air that has passed through a base station must not be allowed to re-enter the air intakes on the front panel. Any space at the front of the cabinet not occupied by equipment should be covered by a blanking panel.

To allow enough cooling airflow through a cabinet-mounted base station, we recommend the following:

- an area of at least 150cm² (23in²) of unrestricted ventilation slots or holes in front of the air intakes for the fans for each subrack; for example, thirty 6x85mm (0.25x3.3in) slots will allow the recommended airflow
- a vent in the top of the cabinet with an area of approximately 150cm² (23in²) per subrack, or a similar area of ventilation per subrack at the rear of the cabinet behind each subrack
- a 2U gap at the top of the cabinet.



Note The ventilation opening must be unrestricted. If the slots or holes are covered with a filter, mesh or grille, the open area must be increased to allow the same airflow as an unrestricted opening.

The maximum ambient temperature entering the cabinet must not exceed +60°C (+140°F).

If you are installing multiple subracks in a cabinet, ensure that there will be enough cooling airflow through the cabinet after the equipment has been installed. For example, the recommended maximum number of subracks in a 38U cabinet is five, as shown in [Figure 1.2 on page 12](#).

If the TB8100 base station is installed in a rack or cabinet with other equipment with different ventilation requirements, we recommend that the TB8100 be positioned below this equipment.

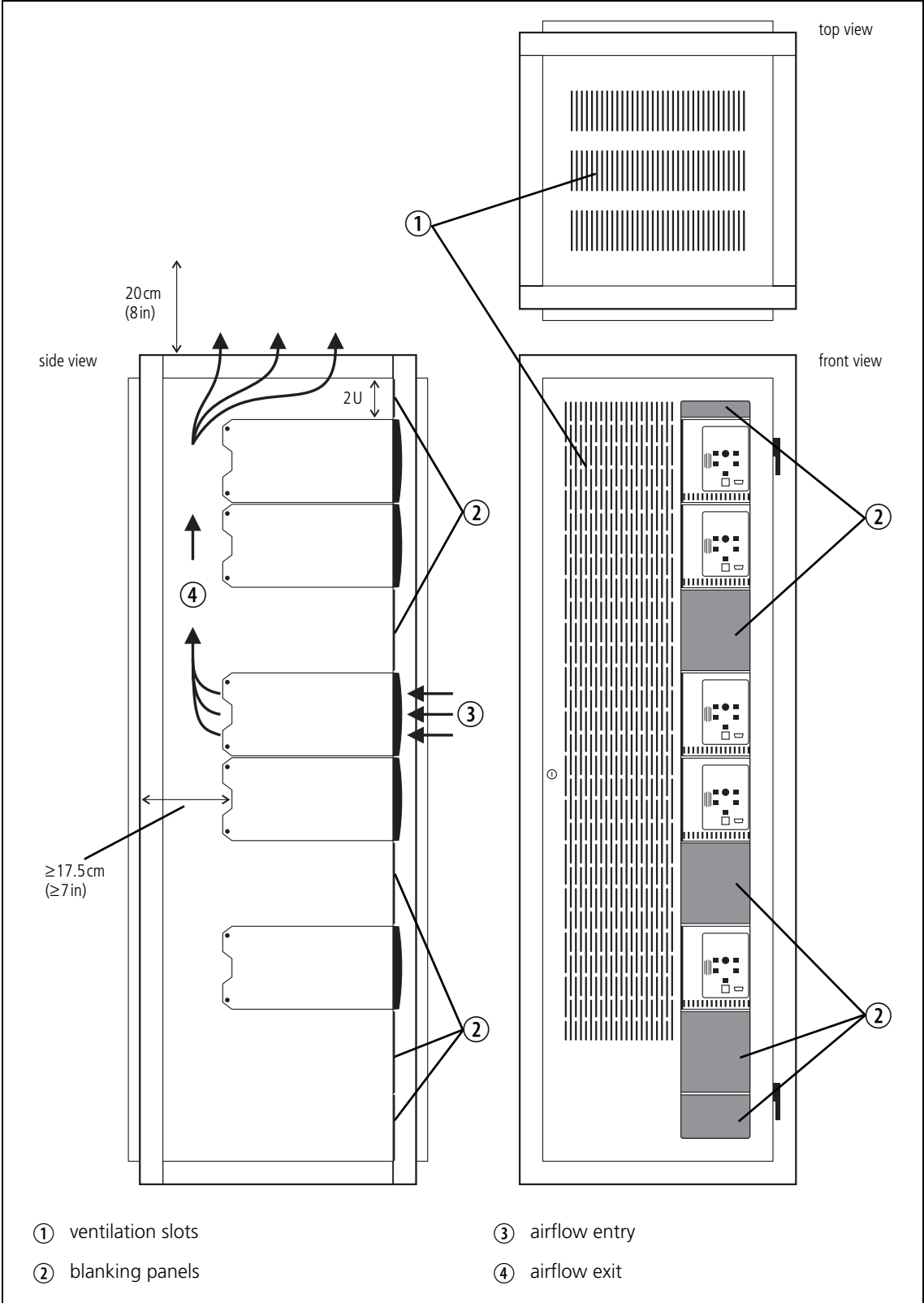
Auxiliary Extractor Fans

The TB8100 base station does not require auxiliary extractor fans mounted in the top of the cabinet. If your cabinet is already fitted with fans, the following procedures apply:

- if there are six or more 120mm (4.75in) fans, each capable of extracting 160m³ per hour (94.2CFM), they must run continuously
- if there are fewer than six fans, you must remove them and ensure the vent in the top of the cabinet has an area of approximately 150cm² (23in²) per subrack.

If you have any other configuration, the performance of your system will depend on how closely you comply with the base station airflow requirements described above.

Figure 1.2 Typical cabinet ventilation requirements



1.8 Installing the Base Station



Caution

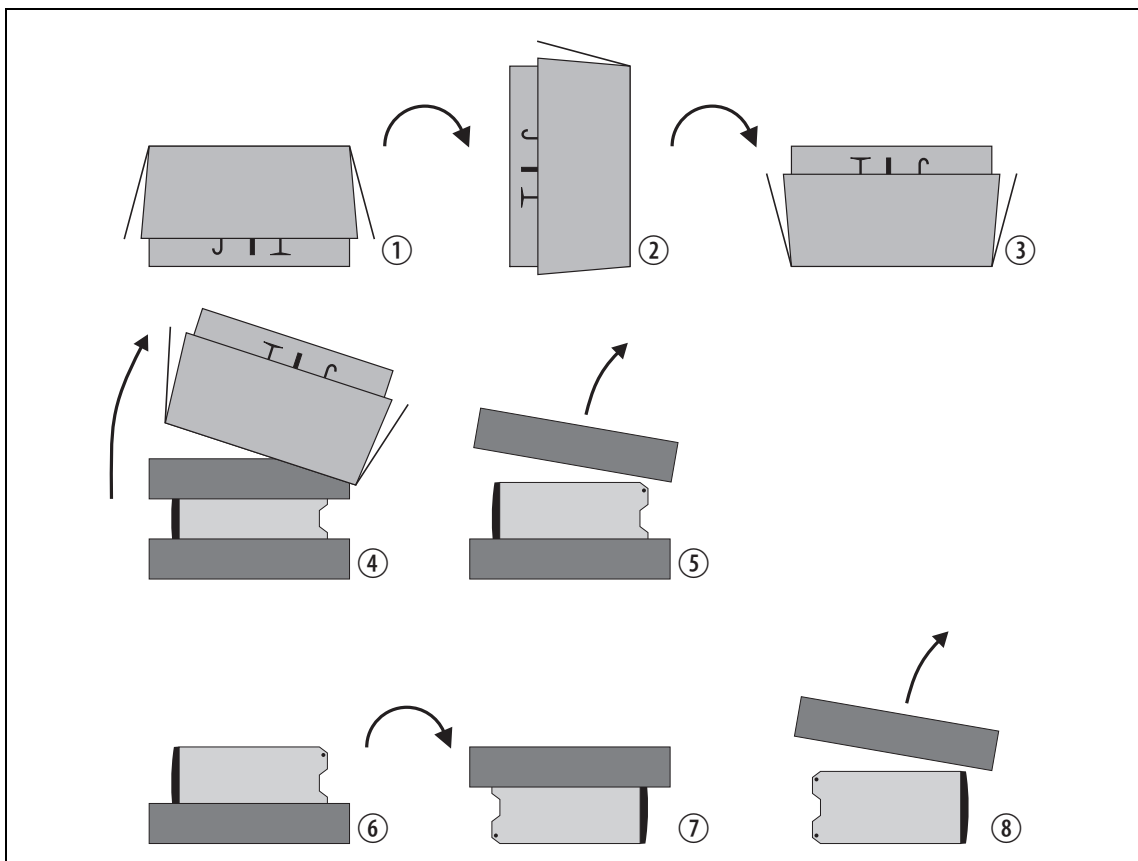
A TB8100 base station (subrack complete with modules) can weigh up to 28kg (62lb), or up to 30kg (66lb) complete with packaging. We recommend that you have another person help you unpack and move the base station. The TBAA03-16 carrying handles will make it easier to move the base station once it has been unpacked. If necessary, remove the modules from the subrack before moving it. In all cases follow safe lifting practices.

1.8.1 Unpacking the Equipment

Unpacking the Base Station

The TB8100 base station is packed in a strong corrugated cardboard carton with top and bottom foam cushions. To prevent personal injury and damage to the equipment, we recommend that two people unpack the base station.

Figure 1.3 Unpacking the TB8100 base station



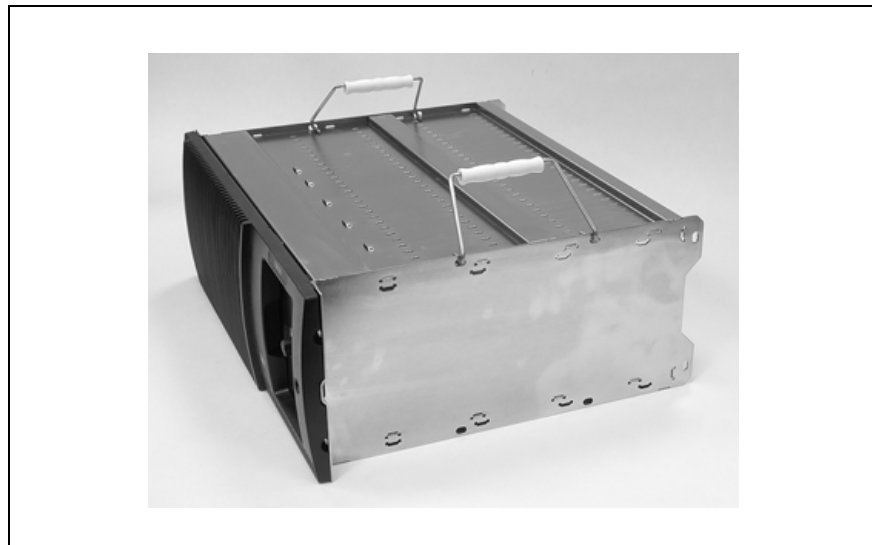
1. Cut the tape securing the flaps at the top of the carton and fold them flat against the sides ①.

2. Rotate the carton carefully onto its side ② and then onto its top ③, ensuring that none of the flaps is trapped underneath.
3. Slide the carton upwards over the foam cushions and lift it away ④. Remove the cushion from the bottom of the base station ⑤.
4. Rotate the base station and cushion carefully over the rear of the base station ⑥ so that the base station is the right way up with the cushion on top ⑦. Remove the cushion from the top of the base station ⑧.

Moving the Base Station

The TBAA03-16 carrying handles can be used to move the base station once it has been unpacked. The handles fit into the holes in the sides of the subrack, as shown below.

Figure 1.4 Base station carrying handles



Disposal of Packaging

If you do not need to keep the packaging, we recommend that you recycle it according to your local recycling methods. The foam cushions are CFC- and HCFC-free and may be burnt in a suitable waste-to-energy combustion facility, or compacted in landfill.

1.8.2 Mounting the Subrack



Caution

We recommend that you have another person help you lift the subrack. If necessary, remove the modules from the subrack before lifting it (refer to “Replacing Modules” in the Installation and Operation Manual).

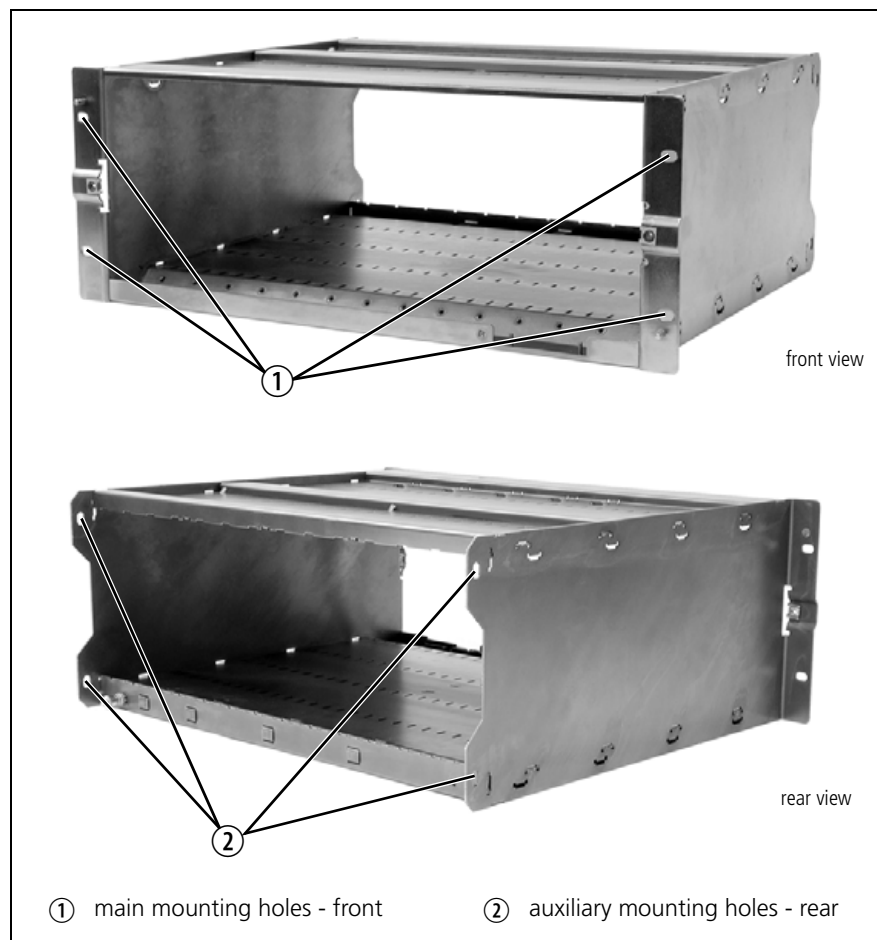
1. Remove the front panel by undoing the fasteners with a quarter turn anti-clockwise, as described in “Replacing Modules” in the Installation and Operation Manual.
2. Fit the subrack into the cabinet or rack and secure it firmly with an M6 (or 0.25 in if you are using imperial fittings) screw, flat and spring washer in each of the four main mounting holes ①, as shown in Figure 1.5.



Note

If you need extra mounting security, there are additional mounting holes ② provided at the rear of the subrack for auxiliary support brackets.

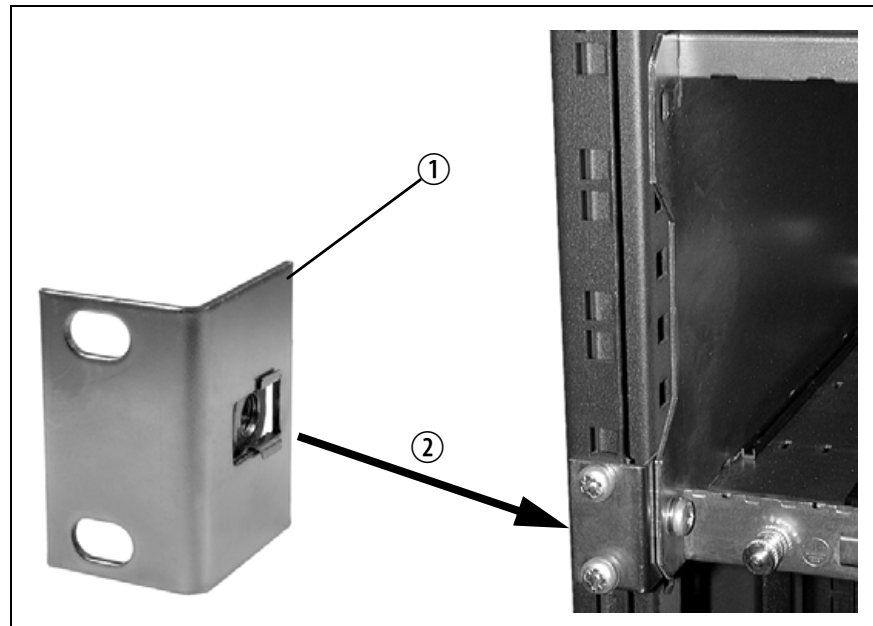
Figure 1.5 Subrack mounting points



1.8.3 Auxiliary Support Bracket

TBAA03-13 auxiliary support brackets can be fitted to the rear of the TB8100 subrack to provide additional mounting security. Figure 1.6 below shows a standard TBAA03-13 bracket ① fitted in a typical Tait Electronics cabinet ②. If you are not using a Tait cabinet, you may have to make your own brackets to suit your installation.

Figure 1.6 Auxiliary support bracket



Important You **must** fit the auxiliary support brackets if you intend to transport a cabinet fitted with a fully built-up TB8100 base station.

We also recommend that you fit the brackets under the following conditions:

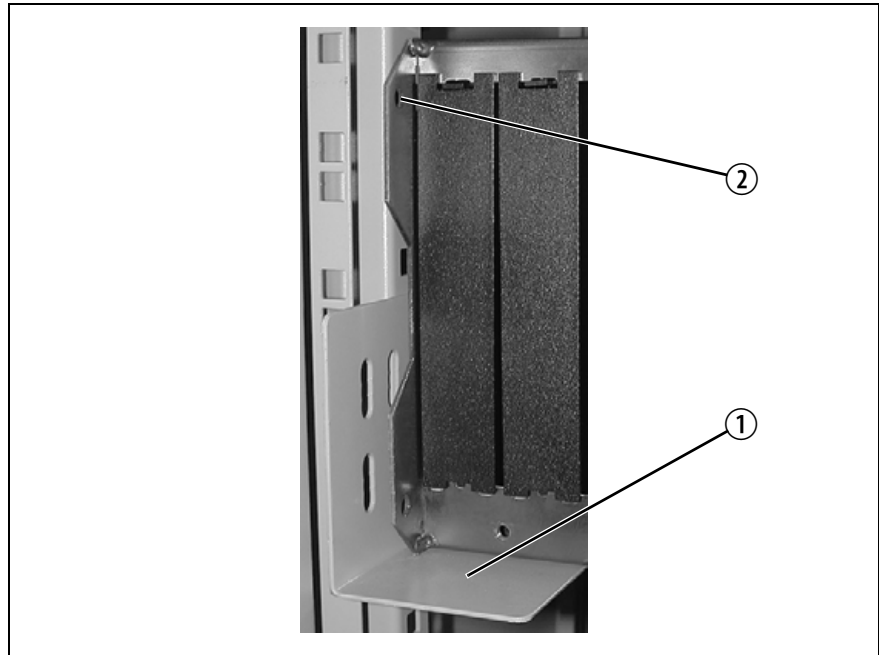
- when the installation is in an area prone to earthquakes
- when third party equipment is installed hard up underneath the TB8100 subrack.

1.8.4 Optional Slide Mounting Rails

You can also use TBAA03-14 slide mounting rails ① when mounting the TB8100 base station in a cabinet, as shown in Figure 1.7 below. These rails will support the base station while you slide it into the cabinet.

However, you must still secure the base station to the cabinet with four M6 (0.25in) screws through the main mounting holes on the front of the subrack, as shown in Figure 1.5 on page 15.

Figure 1.7 Optional slide mounting rail - rear view



Important

The slide mounting rails are not suitable for transporting a cabinet fitted with a fully built-up TB8100 base station. In this case, you must also fit the TBAA03-13 auxiliary support brackets to the upper set of rear mounting holes ②.

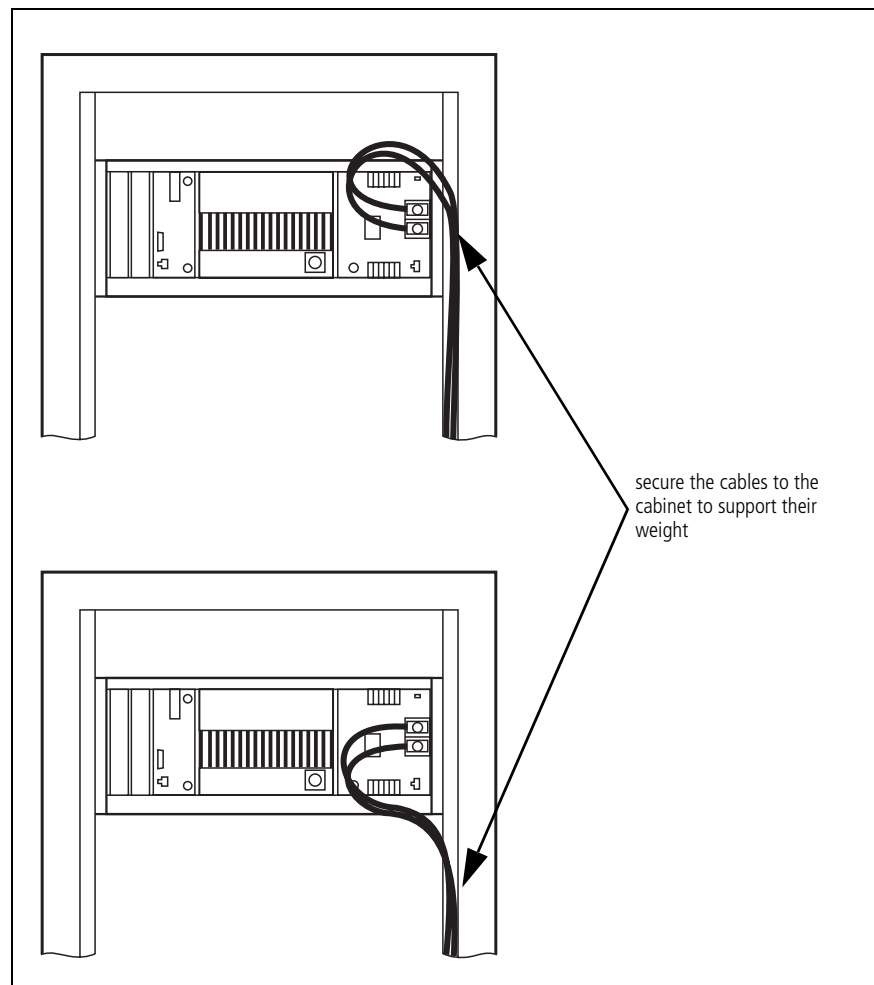
1.8.5 Cabling

General We recommend that you try to route all cables to and from the TB8100 base station along the side of the cabinet so the cooling airflow is not restricted.

DC Power Cabling DC power cables should be well supported so that the terminals on the PMU and on the ends of the cables do not have to support the full weight of the cables.

Figure 1.8 below shows two recommended methods of securing these cables to prevent straining either set of terminals.

Figure 1.8 DC power cabling



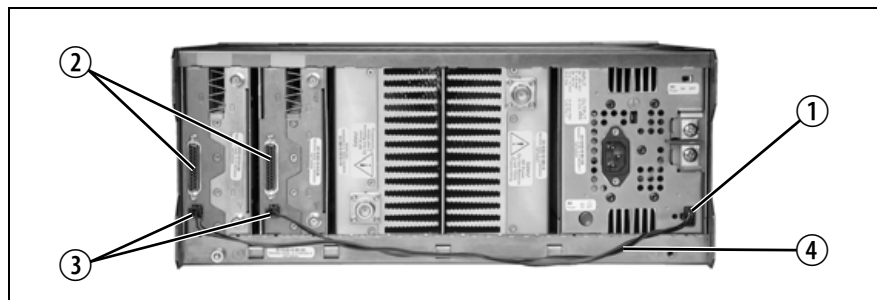
2 Connection

2.1 Auxiliary Power Supply Connections

PMU Auxiliary DC Output

The PMU can provide an auxiliary DC output when it is fitted with the optional auxiliary power supply board. This board is available with an output of 13.65VDC, 27.3VDC, or 54.6VDC (depending on the model), and is current limited to 3A, 1.5A or 750mA respectively. This optional power supply is available on the auxiliary DC output connector ① on the rear panel. DC from this output can be supplied to the +AUX_V pin on the system interface connector ② on the reciter via the auxiliary DC input connector ③ on the system interface board (see “[Reciter Auxiliary DC Input from PMU](#)” on page 20). The auxiliary DC power cables ④ are described in “Power Supply Connections” in the Installation and Operation Manual.

Figure 2.1 Auxiliary DC power supply connections



The auxiliary power supply is configured with the Service Kit (Configure > Base Station > Miscellaneous > Power configuration > Auxiliary power control). Its operation can be controlled by Task Manager statements, for example:

IF Digital input 01 active THEN Enable auxiliary supply.

Refer to the Service Kit documentation for more details.

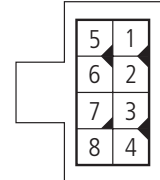


Note The auxiliary power supply is not available in Sleep or Deep Sleep modes.

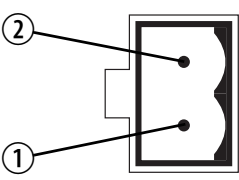
You can connect multiple auxiliary power supply boards in parallel for redundancy purposes, or to provide an output greater than 40 W. Although no active current sharing is used, auxiliary boards connected in parallel will current-share before reaching their power limit. For redundancy purposes the failure (or switching off) of one auxiliary board will not load any other paralleled auxiliary boards in the circuit.

Two different types of auxiliary DC output connector have been fitted to the PMU. The pin allocations for the 8-way connector fitted to PMUs

manufactured before August 2004 are given in the following table. Note that pins 1 to 4 and pins 5 to 8 on this connector are linked.

	Pin	Description	Links
 <p>8-way connector - external view</p>	1	+V output	●
	2	+V output	●
	3	+V output	●
	4	+V output	●
	5	ground	●
	6	ground	●
	7	ground	●
	8	ground	●

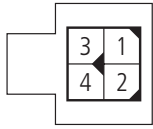
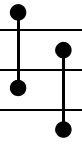
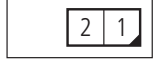
The pin allocations for the 2-way connector fitted to PMUs manufactured from August 2004 onwards are given in the following table.

	Pin	Description
 <p>2-way connector - external view</p>	1	+V output
	2	ground

Reciter Auxiliary DC Input from PMU

The system interface board in the reciter has an auxiliary DC input connector. DC from the auxiliary DC output on the PMU can be supplied to the +AUX_V pin on the system interface connector via this input (see [“PMU Auxiliary DC Output”](#) on page 19).

The pin allocations for the auxiliary DC input on the system interface board are given in the following table. Older boards use the 4-way connector, while the TaitNet RS-232 board and all other boards manufactured after March 2005 use the 2-way connector. Note that pins 1 & 3 and pins 2 & 4 on the 4-way connector are linked. Refer to [“System Connections”](#) on page 22 for the pin allocations for +AUX_V on each system interface board.

	Pin	Description	Links
 <p>4-way connector - external view</p>	1	+V input	
	2	ground	
	3	+V input	
	4	ground	
 <p>2-way connector - external view</p>			

The DC output from the PMU is 13.65VDC, 27.3VDC, or 54.6VDC (depending on the model). Although this power output is isolated, the negative side of the supply is grounded on the system interface board to give a +V output.

2.2 RF Connections



Important The PA may be damaged if the load is removed or switched while the PA is transmitting. Refer to “[Antenna Load](#)” on [page 6](#) of the Installation and Operation Manual for more details.

We recommend that you use dual-screened coaxial cable such as RG223 for the BNC/TNC connections, and RG214 for the N-type connections.

When the base station is used in simplex mode using a single antenna with a coaxial changeover relay, the isolation of this relay must be ≥ 40 dB.

2.3 System Control Bus



Important In base stations which use a PMU, the PMU must be connected to the system control bus at all times. The I²C current source is located in the PMU, and if the PMU is disconnected, the state of much of the bus will be undefined. This may cause corrupted data to be present on the bus when the reciter reads the states of the switches on the control panel. This in turn may result in random actuations of microphone PTT, carrier, or speaker key, causing the base station to transmit or the speaker to be actuated incorrectly.

2.4 System Connections


Isolated

This system interface board is fitted to reciters bearing the product code TBA4xxx-0B0x or TBA5xxx-0B0x. If purchased separately, it has the spares code TBA-SP-S0B0. The balanced audio interfaces are galvanically (transformer) isolated. It provides the following:

■ transformer isolated 600Ω balanced audio I/O	■ Tx key	■ RSSI
■ high impedance unbalanced audio I/O	■ Tx relay	
■ digital I/O (2 outputs, 6 inputs, 4 bi-directional)	■ Rx gate	

It is fitted with a 25-way female D-range connector and a 4-way auxiliary DC input connector. The pin allocations for the D-range are listed in the table below, and the pin allocations for the DC input connector are provided in “[Reciter Auxiliary DC Input from PMU](#)” on page 20.

Pin	Signal Name	Signal Type	Notes
1	Rx line out +	audio output	transformer isolated line
2	Rx line out –		
3	Rx audio out	audio output	AC coupled
4	ground	ground	
5	Tx audio in	audio input	AC coupled
6	Tx line in +	audio input	transformer isolated line
7	Tx line in –		
8	RSSI	DC signal	
9	Rx gate	output	open collector
10	Tx key	input	active low
11	digital out 1 ^a	output	open collector
12	digital out 2		
13	+AUX_V	power output	from auxiliary DC input
14	digital in 1	input	5V TTL logic active low
15	digital in 2		
16	digital in/out 3 ^b		
17	digital in/out 4 ^b		
18	digital in/out 5 ^b		
19	digital in/out 6 ^b		
20	digital in 7		
21	digital in 8		
22	digital in 9		
23	digital in 10		
24	Tx relay	output	open collector
25	ground	ground	



external view

- a. If a base station with a 12V PA is configured for Deep Sleep, digital out 1 is dedicated to Power Saving control and cannot be used for any other Task Manager function.
- b. On version 1 and later system interface boards, digital inputs 3, 4, 5, and 6 may also be configured as outputs using a Task Manager statement. For more details refer to “[Digital Interface](#)” on page 124 of the Installation and Operation Manual, and to the Service Kit documentation.

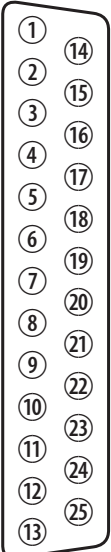
Isolated E&M

This system interface board is fitted to reciters bearing the product code TBA4xxx-0C0x or TBA5xxx-0C0x. If purchased separately, it has the spares code TBA-SP-S0C0. It provides the following:

■ transformer isolated 600Ω balanced audio I/O	■ Tx key
■ opto-isolated keying	■ Tx relay
■ opto-isolated gate output	■ Rx gate
■ digital I/O (2 outputs, 2 inputs, 4 bi-directional)	■ RSSI

It is fitted with a 25-way female D-range connector and a 4-way auxiliary DC input connector. The pin allocations for the D-range are listed in the table below, and the pin allocations for the DC input connector are provided in “[Reciter Auxiliary DC Input from PMU](#)” on page 20.

Pin	Signal Name	Signal Type	Notes
1	Rx line out +	audio output	transformer isolated line
2	Rx line out –		
3	Rx audio out	audio output	
4	audio ground	ground	
5	Tx audio in	audio input	
6	Tx line in +	audio input	transformer isolated line
7	Tx line in –		
8	RSSI	DC signal	
9	Rx gate	output	open collector
10	Tx key	input	active low
11	digital out 1 ^a	output	open collector
12	digital out 2		
13	+AUX_V	power output	from auxiliary DC input
14	digital in 1	input	5V TTL logic active low
15	digital in 2		
16	digital in/out 3 ^b		
17	digital in/out 4 ^b		
18	digital in/out 5 ^b		
19	digital in/out 6 ^b		
20	opto +/-	isolated keying input	input voltage range ±10VDC to ±60VDC; current rating 10mA
21	opto -/+		
22	relay +/-	isolated gate output	
23	relay -/+		
24	Tx relay	output	open collector
25	ground	ground	



external view

- a. If a base station with a 12V PA is configured for Deep Sleep, digital out 1 is dedicated to Power Saving control and cannot be used for any other Task Manager function.
- b. On version 1 and later system interface boards, digital inputs 3, 4, 5, and 6 may also be configured as outputs using a Task Manager statement. For more details refer to “[Digital Interface](#)” on page 124 of the Installation and Operation Manual, and to the Service Kit documentation.

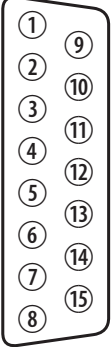
TaitNet

This system interface board is fitted to reciters bearing the product code TBA4xxx-0T1x. If purchased separately, it has the spares code TBA-SP-S0T1. It is designed for use with MPT trunking systems. It provides the following:

<ul style="list-style-type: none"> ■ transformer isolated 600Ω balanced audio I/O ■ high impedance unbalanced audio I/O ■ digital I/O (3 outputs, 1 input) 	<ul style="list-style-type: none"> ■ Tx key ■ Rx gate
---	---

It is fitted with a 15-way female D-range connector and a 4-way auxiliary DC input connector. The pin allocations for the D-range are listed in the table below, and the pin allocations for the DC input connector are provided in [“Reciter Auxiliary DC Input from PMU” on page 20](#).

Pin	Signal Name	Signal Type	Notes
1	Rx line out +	audio output	transformer isolated line
2	Rx line out –		
3	Rx audio out	audio output	
4	Rx gate	output	open collector
5	Tx key	input	
6	Tx audio in	audio input	
7	Tx line in +	audio input	transformer isolated line
8	Tx line in –		
9	+AUX_V	power output	from auxiliary DC input
10	digital out 3	output	open collector
11	no connection		
12	digital out 1 ^a	output	open collector
13	digital out 2		
14	digital in 1	input	5V logic
15	ground	ground	



external view

- a. If a base station with a 12V PA is configured for Deep Sleep, digital out 1 is dedicated to Power Saving control and cannot be used for any other Task Manager function.

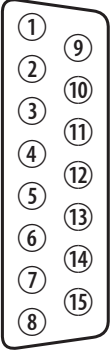
TaitNet RS-232

This system interface board is fitted to reciters bearing the product code TBA4xxx-0L0x or TBA5xxx-0L0x. If purchased separately, it has the spares code TBA-SP-S0L0. It is designed for use with MPT trunking systems, and also for use with multiple base stations. It provides the following:

<ul style="list-style-type: none"> ■ transformer isolated 600Ω balanced audio I/O ■ high impedance unbalanced audio I/O ■ digital I/O (3 outputs, 1 input) 	<ul style="list-style-type: none"> ■ Tx key ■ Rx gate
---	---

It is fitted with a 15-way female D-range connector (TaitNet), a 9-way female D-range connector (RS-232), and a 2-way auxiliary DC input connector. The pin allocations for the D-ranges are listed in the following tables, and the pin allocations for the DC input connector are provided in “Reciter Auxiliary DC Input from PMU” on page 20.

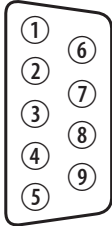
Pin	Signal Name	Signal Type	Notes
1	Rx line out +	audio output	transformer isolated line
2	Rx line out –		
3	Rx audio out	audio output	
4	Rx gate	output	open collector
5	Tx key	input	
6	Tx audio in	audio input	
7	Tx line in +	audio input	transformer isolated line
8	Tx line in –		
9	+AUX_V	power output	from auxiliary DC input
10	digital out 3	output	open collector
11	no connection		
12	digital out 1 ^a	output	open collector
13	digital out 2		
14	digital in 1	input	5V logic
15	ground	ground	



external view

a. If a base station with a 12V PA is configured for Deep Sleep, digital out 1 is dedicated to Power Saving control and cannot be used for any other Task Manager function.

Pin	Description	Links
1	not connected	●
2	receive data	●
3	transmit data	●
4	not connected	●
5	ground	●
6	not connected	●
7	not connected	●
8	not connected	●
9	not connected	●



external view

The rear-mounted RS-232 serial port facilitates the connection of multiple base stations to a Service Kit or Alarm Center using an APS (asynchronous

port switch) and modem or radio modem. Refer to TN-906 for more details on using an APS with TB8100 base stations.

TaitNet Ethernet

This system interface board is fitted to reciters bearing the product code TBA4xxx-0K0x or TBA5xxx-0K0x (receive-only). If purchased separately, it has the spares code TBA-SP-S0K0. It provides the TB8100 base station with an Ethernet interface.

It is fitted with a 15-way D-range connector (modified TaitNet), an RJ45 connector (Ethernet), and a 2-way auxiliary DC input connector. These connectors are described in more detail below. The pin allocations for the DC input connector are provided in [“Reciter Auxiliary DC Input from PMU” on page 20](#).

Some pins on the 15-way D-range connector can be configured to provide different signals. These pins are as follows:

- pins 3, 4, 5 and 6 can be configured for Rx gate, Tx key and unbalanced audio, **or** E&M signalling
- pin 11 can be configured for RSSI **or** Tx relay.

You can select which signal is connected to each pin by setting switches S1 and S2 on the system interface board.



Important

You must set both switches correctly for each D-range pin. Setting the switches incorrectly may result in both signals being connected to the pin at the same time, or no signal at all being connected.

The pin allocations and switch settings for the factory default and optional signals are listed in [Table 2.1 on page 27](#). [Figure 2.2 on page 28](#) shows the location of switches S1 and S2 on the board, and also provides a pictorial guide to their settings.

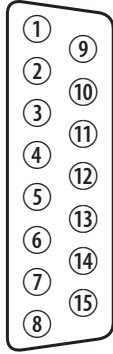


Note

The pin allocations for the 15-way D-range connector on the TaitNet Ethernet system interface board are different from those on other TaitNet boards. These differences are described in [Table 2.2 on page 28](#).

Table 2.1 Pin allocations for the TaitNet Ethernet D-range connector

Pin	Signal Name	Switch S1 & S2 Settings		Signal Type	Notes
		On	Off		
1	Rx line out +			audio output	transformer isolated line
2	Rx line out –				
3	Rx audio out ^a or opto +/-	S1:5 S1:6	S1:6 S1:5	audio output isolated keying input	input voltage range ±10VDC to ±60VDC
4	Rx gate ^a or relay +/-	S1:3 S1:4	S1:4 S1:3	output isolated gate output	open collector
5	Tx key ^a or relay -/+	S1:7 S1:8	S1:8 S1:7	input isolated gate output	
6	Tx audio in ^a or opto -/+	S1:1 S1:2	S1:2 S1:1	audio input isolated keying input	input voltage range ±10VDC to ±60VDC
7	Tx line in +			audio input	transformer isolated line
8	Tx line in –				
9	+AUX_V			power output	from auxiliary DC input
10	digital in/out 1 ^{bc}			input	5V TTL logic, active low
11	RSSI ^a or Tx relay	S2:8 S2:7	S2:7 S2:8	DC signal output	open collector
12	digital in/out 2 ^b			input	5V TTL logic, active low
13	digital in/out 3 ^b				
14	digital in/out 4 ^b				
15	ground			ground	



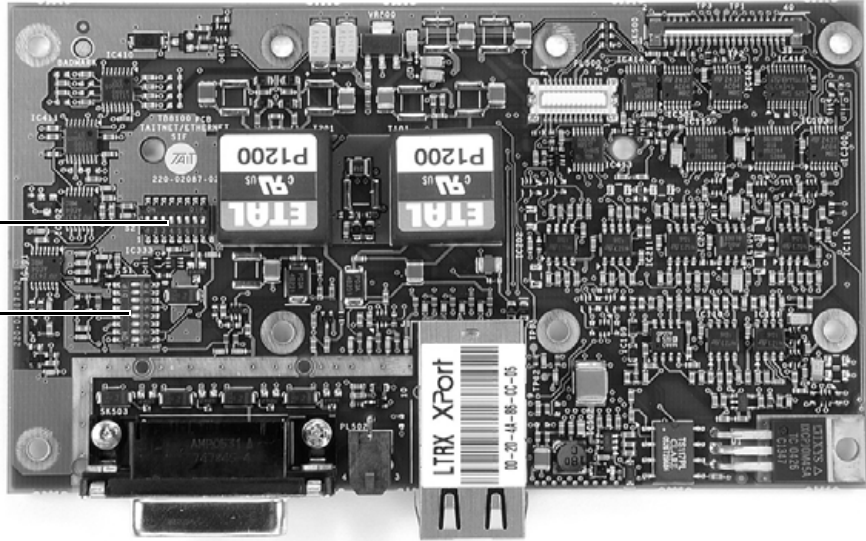
external view

- a. Factory default settings.
- b. Digital inputs 1, 2, 3, and 4 may also be configured as outputs using a Task Manager statement. For more details refer to “Digital Interface” in the “Connection” chapter of the Installation and Operation Manual, and to the Service Kit documentation.
- c. If a base station with a 12V PA is configured for Deep Sleep, digital out 1 is dedicated to Power Saving control and cannot be used for any other Task Manager function.

Table 2.2 Differences between the TaitNet Ethernet D-range connector and other TaitNet connectors

Pin	TaitNet Ethernet Signal Name	TaitNet and TaitNet RS-232 Signal Name
10	digital in/out 1	digital out 3
11	RSSI	no connection
12	digital in/out 2	digital out 1
13	digital in/out 3	digital out 2
14	digital in/out 4	digital in 1

Figure 2.2 Setting switches S1 and S2 on the TaitNet Ethernet system interface board



The photograph shows the TaitNet Ethernet system interface board. Two switches, S1 and S2, are indicated by arrows on the left side of the board. The board features two ETAL P1200 modules and an LTRX XPort connector.

Factory default settings

Rx gate, Tx Key, unbalanced audio

S1

ON	↓	↑	↓	↑	↓	↑	↑	↓
	1	2	3	4	5	6	7	8

S2

ON	↑	↑	↑	↑	↑	↑	↑	↓
	1	2	3	4	5	6	7	8

switches 1 to 6 not used

Optional settings

E&M signalling

S1

ON	↑	↓	↑	↓	↑	↓	↓	↑
	1	2	3	4	5	6	7	8

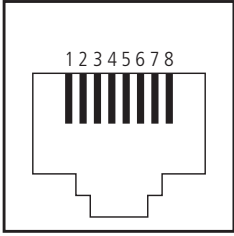
S2

ON	↑	↑	↑	↑	↑	↑	↓	↑
	1	2	3	4	5	6	7	8

switches 1 to 6 not used

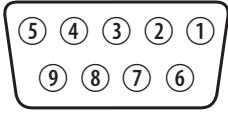
The pin allocations for the RJ45 Ethernet connector are given in the following table.

Table 2.3 Pin allocations for the RJ-45 Ethernet connector

	Pin	Signal	Description
 <p>external view</p>	1	Tx +	transmit data +
	2	Tx -	transmit data -
	3	Rx +	Ethernet receive data +
	4		terminated
	5		terminated
	6	Rx -	Ethernet receive data -
	7		terminated
	8		terminated

2.5 Service Kit Connections

The TB8100 Service Kit is connected to the base station via the RS-232 serial port on the control panel. This port is a 9-way female D-range connector. Use a straight through cable, as supplied with the Service Kit, to connect your programming computer to the base station. The pin allocations for the serial port are given in the following table. Note that pins 1, 4 & 6 and pins 7 & 8 are linked. This port is also used for remote connection to the Service Kit or Alarm Center software via a modem or radio modem.

	Pin	Description	Links
 <p>external view</p>	1	not connected	●
	2	receive data	●
	3	transmit data	●
	4	not connected	●
	5	ground	●
	6	not connected	●
	7	not connected	●
	8	not connected	●
	9	not connected	



Note If high-power HF equipment is located close to the TB8100 base station, it can sometimes cause interference to RS-232 serial port communications. If this interference does occur, we recommend fitting ferrites on the serial cable close to the control panel. This recommendation only applies to communication equipment permanently connected to the base station.



Note When a reciter fitted with a TaitNet RS-232 system interface board is used in a TB8100 base station, the RS-232 port on the control panel is disabled. In this situation you must connect to the RS-232 port at the rear of the reciter. Refer to “[TaitNet RS-232](#)” on page 25 for more details. When a reciter fitted with a TaitNet Ethernet system interface board is used, the RS-232 port on the control panel is available only when the base station first powers up. Refer to “Connection” in the Installation and Operation Manual for more details.

2.6 12V PA Power Saving Control Connection

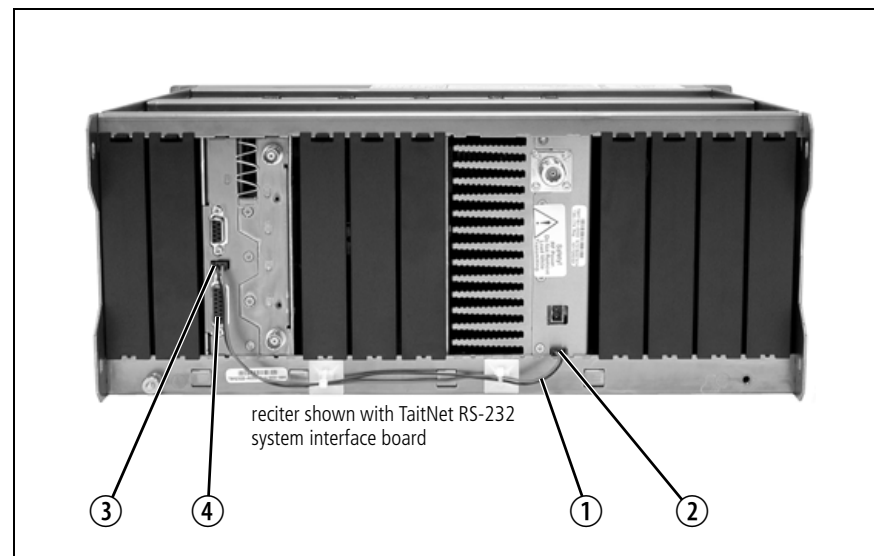
To enable Power Saving in the 12V PA, you must connect digital out 1 on the reciter’s system interface connector to pin 1 of the Power Saving control connector on the rear panel of the PA. Once this connection is made, the PA will shut down whenever the reciter goes into Deep Sleep mode. For more information on the operation and configuration of Power Saving, refer to “Power Saving” in the Installation and Operation Manual.



Note When a base station with a 12V PA is configured for Deep Sleep, digital out 1 is dedicated to Power Saving control and should not be used for any other Task Manager function.

Two ways of making the Power Saving control connection between the 12V PA and reciter are described below. The circled numbers in the following instructions refer to [Figure 2.3](#).

Figure 2.3 Fitting the Power Saving control cable to a 12V PA



Method 1

1. Connect one end of the Power Saving control cable ① (Tait part number 219-02971-00) to the Power Saving control connector ② at

the rear of the PA. Connect the other end to the auxiliary DC input connector ③ at the rear of the reciter.



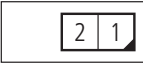
Note If you are using an older reciter with a 4-way connector, you will need to use Method 2.

2. On the D-range plug that is fitted to the system interface connector ④ on the reciter, link digital out 1 to +AUX_V.

Method 2

1. Connect one end of the Power Saving control cable ① to the Power Saving control connector ② at the rear of the PA.
2. Cut the socket off the other end of the cable. Connect the wires directly to the D-range plug fitted to the system interface connector ④ as follows:
 - red - digital out 1
 - black - ground.

The pin allocations for the Power Saving control connector on the PA are given in the following table.

	Pin	Signal Name	Signal Type	Notes
 external view	1	PA shutdown	input	active low
	2	ground	ground	

If you wish to make up your own cable, use the following connector for both the PA and reciter connections:

- 2x1-way Molex 43025-0200/crimp socket 43030-0001 female.

Directive 1999/5/EC Declaration of Conformity

da Dansk

Undertegnede Tait Electronics Limited erklærer herved, at følgende udstyr TBAB1, TBAC0 & TBAH0 overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

Se endvidere: <http://eudocs.taitworld.com/>

fr Français

Par la présente, Tait Electronics Limited déclare que l'appareil TBAB1, TBAC0 & TBAH0 est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Voir aussi: <http://eudocs.taitworld.com/>

de Deutsch

Hiermit erklärt Tait Electronics Limited die Übereinstimmung des Gerätes TBAB1, TBAC0 & TBAH0 mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG.

Siehe auch: <http://eudocs.taitworld.com/>

it Italiano

Con la presente Tait Electronics Limited dichiara che questo TBAB1, TBAC0 & TBAH0 è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Vedi anche: <http://eudocs.taitworld.com/>

el Ελληνικός

Με την παρουσία Tait Electronics Limited δηλώνει ότι TBAB1, TBAC0 & TBAH0 συμμορφώνεται προς τις ουσιαστικές απαιτήσεις και τις λοιπές σχετικές διατάξεις της οδηγίας 1999/5/ΕΚ.

βλέπε και: <http://eudocs.taitworld.com/>

nl Nederlands

Hierbij verklaart Tait Electronics Limited dat het toestel TBAB1, TBAC0 & TBAH0 in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

Zie ook: <http://eudocs.taitworld.com/>

en English

Tait Electronics Limited declares that this TBAB1, TBAC0 & TBAH0 complies with the essential requirements and other relevant provisions of Directive 1999/5/EC.

See also: <http://eudocs.taitworld.com/>

pt Português

Tait Electronics Limited declara que este TBAB1, TBAC0 & TBAH0 está conforme com os requisitos essenciais e outras provisões da Directiva 1999/5/CE.

Veja também: <http://eudocs.taitworld.com/>

es Español

Por medio de la presente Tait Electronics Limited declara que el TBAB1, TBAC0 & TBAH0 cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

Vea también: <http://eudocs.taitworld.com/>

sv Svensk

Härmed intygar Tait Electronics Limited att denna TBAB1, TBAC0 & TBAH0 står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Se även: <http://eudocs.taitworld.com/>

fi Suomi

Tait Electronics Limited vakuuttaa täten että TBAB1, TBAC0 & TBAH0 tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Katso: <http://eudocs.taitworld.com/>