

TB8100 base station

Specifications Manual



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Preface

Scope of Manual

Welcome to the TB8100 base station system Specifications Manual. This manual provides general, performance and physical specifications for the TB8100 UHF 5W, 50W and 100W base station systems.

Enquiries and Comments

If you have any enquiries regarding this manual, or any comments, suggestions and notifications of errors, please contact Technical Support (refer to [“Tait Contact Information”](#) on page 2).

Updates of Manual and Equipment

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

Copyright

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Disclaimer

There are no warranties extended or granted by this manual. Tait Electronics Ltd accepts no responsibility for damage arising from use of the information contained in the manual or of the equipment and software it describes. It is the responsibility of the user to ensure that use of such information, equipment and software complies with the laws, rules and regulations of the applicable jurisdictions.

Associated Documentation

TB8100 Installation and Operation Manual.

TB8100 Installation Guide (a subset of the Installation and Operation Manual).

TB8100 Service Manual.

TB8100 Service Kit and Alarm Center User's Manuals and online Help.

TB8100 Calibration Kit User's Manual and online Help.

Technical notes are published from time to time to describe applications for Tait products, to provide technical details not included in manuals, and to offer solutions for any problems that arise.

All available TB8100 product documentation is provided on the CD supplied with the base station¹. Updates may also be published on the Tait support website.

Publication Record

Issue	Publication Date	Description
1	June 2003	first release
2	July 2003	minor errors corrected
3	March 2004	System Specifications chapter added
		Reciter Specifications updated as follows: <ul style="list-style-type: none">■ Maximum Usable Sensitivity specifications added■ receiver and exciter audio flat response specifications now split into Balanced and Unbalanced
		PMU Specifications updated in accordance with the increase in the PMU's DC input voltage range
		minor errors corrected

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1. Technical notes are only available in PDF format from the Tait support website. Consult your nearest Tait Dealer or Customer Service Organisation for more information.

1 System Specifications

This chapter provides specifications pertaining to the TB8100 base station system. You will find the specifications for individual modules in separate chapters in this manual.

The performance figures given in the power and current consumption specifications are typical figures based on using the equipment listed in the table below. The test frequency used was 475MHz.

Module	Description
reciter	mid-band UHF (H2 band) reciter with isolated system interface PCB
PA	5W, 50W or 100W PA, as stated in the appropriate specifications
PMU	AC and DC PMU fitted with a 10W standby power supply card and a 40W auxiliary power supply PCB
control panel	standard control panel, unless stated otherwise

AC measurements were made using a Voltech PM100 power analyser. High power DC measurements were made using an HP 6032A DC power supply. All measurements for power save modes were made using a Tektronix TM502A current probe.



Note For AC power measurements the voltage, current drawn, volt.amp product, and true power are given. True power is equal to the volt.amp product multiplied by the power factor.

Transmit Power and Current Consumption - 240VAC Input

	A	VA	W
5W BSS			
Minimum RF Output Power (1W)	480mA	115VA	30W
50% RF Output Power (2.5W)	490mA	118VA	37W
Maximum RF Output Power (5W)	490mA	118VA	41W
50W BSS			
Minimum RF Output Power (5W)	550mA	133VA	66W
50% RF Output Power (25W)	650mA	155VA	102W
Maximum RF Output Power (50W)	740mA	177VA	132W
100W BSS			
Minimum RF Output Power (10W)	640mA	154VA	100W
50% RF Output Power (50W)	870mA	209VA	171W
Maximum RF Output Power (100W)	1.1A	262VA	230W

Transmit Power and Current Consumption - 110VAC Input

	A	VA	W
5W BSS			
Minimum RF Output Power (1W)	350mA	39VA	30W
50% RF Output Power (2.5W)	400mA	44VA	36W
Maximum RF Output Power (5W)	430mA	47VA	39W
50W BSS			
Minimum RF Output Power (5W)	650mA	72VA	67W
50% RF Output Power (25W)	990mA	109VA	105W
Maximum RF Output Power (50W)	1.3A	138VA	136W
100W BSS			
Minimum RF Output Power (10W)	960mA	106VA	103W
50% RF Output Power (50W)	1.6A	178VA	176W
Maximum RF Output Power (100W)	2.2A	239VA	237W

Transmit Power and Current Consumption - AC Input Voltage Extremes

	A	VA	W
5W BSS*			
85VAC	530mA	45VA	42W
264VAC	540mA	142VA	40W
*at 5W RF output power			
50W BSS*			
85VAC	1.6A	139VA	138W
264VAC	730mA	194VA	131W
*at 50W RF output power			
100W BSS*			
85VAC	2.9A	243VA	242W
264VAC	1.0A	274VA	229W
*at 100W RF output power			

Transmit Power and Current Consumption - 12.5VDC Input

	A	W
5W BSS		
Minimum RF Output Power (1W)	1.8A	23W
50% RF Output Power (2.5W)	2.2A	28W
Maximum RF Output Power (5W)	2.6A	32W
50W BSS		
Minimum RF Output Power (5W)	4.6A	58W
50% RF Output Power (25W)	7.6A	95W
Maximum RF Output Power (50W)	10A	125W
100W BSS		
Minimum RF Output Power (10W)	8.0A	100W
50% RF Output Power (50W)	14.0A	175W
Maximum RF Output Power (100W)	19.2A	240W

Transmit Power and Current Consumption - DC Input Voltage Extremes

	A	W
5W BSS*		
10.5VDC	2.9A	30W
15.5VDC	2.1A	33W
*at 5W RF output power		
50W BSS*		
10.5VDC	11.7A	123W
15.5VDC	8.3A	128W
*at 50W RF output power		
100W BSS*		
10.5VDC	21.7A	228W
15.5VDC	15.0A	232W
*at 100W RF output power		

Receive Power and Current Consumption

The specifications in this section refer to a BSS operating in receive mode with an input voltage of 12.5VDC.

	A	W
Normal Mode, No Power Save*		
Full Speaker Audio	1.1A	13.9W
Gate Open, Speaker Off	1.0A	12.5W
*with standard control panel		
Normal Mode, 20ms Receiver Cycling, 20ms Transmit Key Time		
Gate Closed, Standard Control Panel	745mA	9.3W
Power Save Control Panel	720mA	9.0W
Sleep Mode, 200ms Receiver Cycling*		
	400mA	5.0W
*with power save control panel and standby power supply card		

Receive Power and Current Consumption (Continued)

	A	W
Deep Sleep Mode*		
200ms Receiver Cycling	160mA	2.0W
500ms Receiver Cycling	122mA	1.52W
1s Receiver Cycling	109mA	1.36W
5s Receiver Cycling	98mA	1.23W

*with power save control panel and standby power supply card

Dimensions and Weight

Dimensions

Height	176.8mm (7in)
Width	482.6mm (19in)
Length	
Subrack Only	385mm (15.2in)
Including Front Panel	410mm (16.1in)

Weight*

Single 5/50W Base Station System	20.6kg (45.4lb)
Dual 5/50W Base Station System	27.6kg (60.8lb)
Single 100W Base Station System	21.5kg (47.4lb)

*with AC and DC PMU

Isolation

Coaxial Changeover Relay Isolation	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
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2 Reciter Specifications

This chapter provides specifications pertaining to the receiver and exciter circuitry within the reciter module. However, the transmitter RF specifications which pertain to the combination of exciter and power amplifier are given in “[Transmitter RF Section](#)” on page 26.

The performance figures given in these specifications are applicable only to equipment operating as an integral part of a TB8100 base station. These performance figures are minimum figures, unless otherwise indicated (e.g. “typical”), for equipment tuned with the maximum switching range and operating at standard room temperature (+22°C to +28°C [+71.6°F to +82.4°F]) and standard test voltage (28VDC).

Where applicable, the test methods used to obtain these figures are those described in the ANSI/TIA-603-B-2002 and ETSI-EN specifications. You can obtain further details of test methods and the conditions which apply for compliance testing in all countries from Tait Electronics Ltd.

Product Identification

TB8100 reciters are identified by a product code printed on the label fixed to the rear of the cover. The product codes are explained in the following table.

Product Code	Configuration
TBA40xx-xxxx	receiver + exciter

Bandwidth

The terms “wide bandwidth”, “mid bandwidth” and “narrow bandwidth” used in this and following sections are defined in the following table.

	Channel Spacing	Modulation 100% Deviation	Receiver IF Bandwidth
Narrow Bandwidth (NB)	12.5kHz	±2.5kHz	7.5kHz
Mid Bandwidth (MB)	20kHz	±4kHz	12kHz
Wide Bandwidth (WB)	25kHz	±5.0kHz	15.0kHz

Sensitivity and distortion figures are stated for standard operating conditions which includes audio de-emphasis. Note that the sensitivity, distortion and signal-to-noise figures will be degraded when flat audio is selected.

General

Number of Channels 255

Supply Voltage

Operating Voltage	12VDC to 29.5VDC
Standard Test Voltage	28VDC
Polarity	negative earth
Polarity Protection	Zener diode and thermal resistor

Supply Current

Receiver and Exciter Operating	<330mA at 28VDC
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Operating Temperature Range –30°C to +60°C (–22°F to +140°F) ambient temperature*

*ambient temperature is defined as the temperature of the air immediately in front of the control panel

Cooling convection

Connectors

RF Input	BNC female
RF Output	SMA female
Control and Alarm	16-way IDC male
External Reference Frequency Input	BNC female
28VDC Input	4-way Micro-Fit 3.0 (Molex) male
Auxiliary DC Input System	4-way Micro-Fit 3.0 (Molex) male depends on system interface PCB fitted*

*refer to Installation and Operation Manual

Dimensions

Height	143.6mm (5.7in)
Width	54.6mm (2.1in)
Length	333.3mm (13.1in)

Weight 2.1kg (4.6lb)

Receiver RF Section

Frequency Range	400MHz to 520MHz
Frequency Bands	400MHz to 440MHz 440MHz to 480MHz 470MHz to 520MHz
Type	triple conversion superheterodyne; first conversion is analogue, second is hybrid, and third is digital
Frequency Increments	5kHz and 6.25kHz
Switching Range	>2% of the centre frequency* *i.e. ± 4 MHz from the centre frequency at 400MHz, and ± 5.2 MHz from the centre frequency at 520MHz
Input Load Impedance	50 Ω nominal (VSWR <2:1)
RF Input Protection	no degradation after 5 minutes exposure to on-channel signals at +20dBm (2.2V)
Frequency Stability	± 1 ppm -30°C to $+60^{\circ}\text{C}$ (-22°F to $+140^{\circ}\text{F}$)
RSSI	-120 dBm to -60 dBm (0.22 μV to 223.6 μV), 0.5V to 6V, programmable slope
IF Stages	
Frequencies	
Analogue	70.1 MHz with IF filtering at 20kHz bandwidth, -4 dB
Digital	9.9MHz and 0Hz
Digital IF Bandwidths	
Narrow Bandwidth	8.8kHz, -3 dB
Mid Bandwidth	12.0kHz, -3 dB
Wide Bandwidth	14.0kHz, -3 dB
Sensitivity*	
De-emphasised Response	
Centre of Switching Range	< -119 dBm (0.25 μV) at 25°C **
Edge of Switching Range	< -117 dBm (0.32 μV) at 25°C **
Flat Response	
Centre of Switching Range	< -117.5 dBm (0.30 μV) at 25°C **
Edge of Switching Range	< -115.5 dBm (0.38 μV) at 25°C **
*12dB SINAD	**up to 2dB degradation at extremes of temperature

Receiver RF Section (Continued)

Maximum Usable Sensitivity*

De-emphasised Response	
Centre of Switching Range	<-116dBm (0.35 μ V) at 25°C (NB)**
	<-118dBm (0.28 μ V) at 25°C (WB)**
Edge of Switching Range	<-114dBm (0.45 μ V) at 25°C (NB)**
	<-116dBm (0.35 μ V) at 25°C (WB)**
Flat Response	
Centre of Switching Range	<-112dBm (0.56 μ V) at 25°C (NB)**
	<-116dBm (0.35 μ V) at 25°C (WB)**
Edge of Switching Range	<-110dBm (0.71 μ V) at 25°C (NB)**
	<-114dBm (0.45 μ V) at 25°C (WB)**

*sensitivity for 20dB SINAD, psophometrically weighted, RF source modulated at 60% deviation with 1kHz

**up to 2dB degradation at extremes of temperature

Ultimate Signal-to-Noise Ratio*

Narrow Bandwidth	45dB (ANSI/TIA)**
	50dB (CEPT - psophometric)**
Mid Bandwidth	50dB (ANSI/TIA)**
Wide Bandwidth	55dB (ANSI/TIA)**

*at -47dBm

**up to 5dB degradation at extremes of switching range and temperature

Selectivity

Narrow Bandwidth	85dB (ETSI)*
Mid Bandwidth	85dB (ETSI)*
Wide Bandwidth	90dB (ANSI/TIA)*

*up to 5dB degradation at extremes of switching range and temperature

Spurious Response Attenuation

\geq 100dB (ANSI/TIA)*
 \geq 90dB (ETSI)
 *AGC switched off

Intermodulation Response Attenuation

Narrow Bandwidth	80dB (ETSI)*
Mid Bandwidth	80dB (ETSI)*
Wide Bandwidth	85dB (ANSI/TIA)*

*up to 5dB degradation at extremes of switching range and temperature

Blocking Rejection

1-10MHz	100dB (ETSI)
>10MHz	110dB (ETSI)
\pm 1, \pm 2, \pm 5 and \pm 10MHz	100dB (ANSI/TIA)*

*AGC switched off

Receiver RF Section (Continued)

Co-channel Rejection

Narrow Bandwidth	-8dB
Mid Bandwidth	-8dB
Wide Bandwidth	-5dB

Amplitude Characteristic* ≤ 3 dB (ETSI)

*RF Input Level -107dBm to -13dBm

Spurious Emissions

Conducted	<-90dBm to 2GHz <-70dBm 2GHz to 4GHz
Radiated	<-57dBm EIRP to 1GHz <-47dBm EIRP 1GHz to 4GHz

Receiver Audio Section - General

Outputs Available speaker output via control panel
balanced and unbalanced line outputs via system interface PCB

Frequency Response flat or de-emphasised (750 μ s)

De-emphasised Response

Bandwidth	300Hz to 2.55kHz (NB) 300Hz to 3.4kHz (MB) 300Hz to 3.4kHz (WB)
Response	within +1, -3dB of a -6dB/octave de-emphasis curve (ref. 1kHz)

Flat Response	Balanced Audio	Unbalanced Audio
Bandwidth	67Hz to 2.55kHz (NB) 67Hz to 3.4kHz (MB) 67Hz to 3.4kHz (WB)	10Hz to 2.55kHz (NB) 10Hz to 3.4kHz (MB) 10Hz to 3.4kHz (WB)
Response	within +1, -3dB of output level at 1kHz	within +1, -1dB of output level at 1kHz

Balanced Line Output (via System Interface PCB)

Output Level Range	-20dBm to +10dBm
Output Impedance	600 Ω
Distortion*	
De-emphasised	$\leq 2\%$
Flat	$\leq 4\%$ (NB) $\leq 2\%$ (WB)

*at -70dBm signal level

Receiver Audio Section - General (Continued)

Unbalanced Line Output
(via System Interface PCB)

Output Level Range	0.3Vpp to 3Vpp into 10k Ω
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Speaker Output
(via Control Panel)

Power	0.5W maximum
Speaker Impedance	16 Ω nominal
Distortion*	$\leq 3\%$ at 1kHz, 0.35W, 16 Ω

*at -70dBm signal level, de-emphasis selected

Receiver Audio Section - CTCSS

High Pass (Subaudible) Filter

Bandwidth	300Hz to 2.55kHz (NB) 300Hz to 3.4kHz (MB) 300Hz to 3.4kHz (WB)
Response	within +1, -3dB of level at 1kHz
Hum and Noise*	30dB minimum at 250.3Hz 35dB typical (67Hz to 240Hz)

*1 kHz at 60% system deviation, CTCSS at 10% system deviation

Tone Detect

Tone Squelch Opening	better than 6dB SINAD 3dB SINAD at 250.3Hz (typical) 4dB SINAD at 100Hz (typical)
Tone Detect Bandwidth	± 2 Hz accept (typical) ± 3 Hz reject (typical)
Response Time	150ms open and close (typical)

Receiver Audio Section - Gating Operation

Systems Available	SINAD gating (noise mute) RSSI gating (carrier mute)
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SINAD Gating

Opening Level	8dB to 20dB SINAD
Accuracy	±3dB
RF Hysteresis*	1.5dB to 6dB
Opening Time	≤20ms
Closing Time	50 ± 10ms

*programmable

RSSI Gating

Opening Level	-117dBm to -70dBm
Accuracy	±3dB
Hysteresis*	2dB to 10dB
Opening Time	≤5ms
Closing Time	50 ± 10ms

*programmable

Exciter RF Section

Frequency Range	400MHz to 520MHz
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Frequency Bands	400MHz to 440MHz 440MHz to 480MHz 470MHz to 520MHz
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Modulation Type	FM
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Frequency Increments	5kHz and 6.25kHz
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Switching Range	>2% of the centre frequency* *i.e. ±4MHz from the centre frequency at 400MHz, and ±5.2MHz from the centre frequency at 520MHz
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Output Load Impedance	50Ω nominal (VSWR <2:1)
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Frequency Stability	±1 ppm -30°C to +60°C (-22°F to +140°F)
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Power Output	+11dBm ±2dB
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Exciter Audio Section - Inputs

Inputs Available	microphone input via control panel balanced and unbalanced line inputs via system interface PCB
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Microphone Input

Input Level Range*	80dB SPL to 115dB SPL
Impedance	600Ω
Compressor	
Attack Time	10ms
Decay Time	800ms
Dynamic Range	35dB
Distortion	≤3%

*60% modulation at 1kHz

Balanced Line Input

Input Level Range*	-20dBm to +10dBm
Impedance	600Ω balanced

*60% modulation at 1kHz

Unbalanced Line Input

Input Level Range	0.3V _{pp} to 3V _{pp}
Impedance	>10kΩ

Exciter Audio Section - Modulation Characteristics

Frequency Response*	flat or pre-emphasised**
---------------------	--------------------------

*below limiting

**microphone input via control panel, balanced and unbalanced line inputs via system interface PCB

Line and Microphone Inputs

Pre-emphasised Response	Bandwidth	300Hz to 2.55kHz (NB) 300Hz to 3kHz (MB) 300Hz to 3kHz (WB)	
	Below Limiting	within +1, -3dB of a 6dB/octave pre-emphasis curve (ref. 1kHz)	
	Flat Response	Balanced Audio	Unbalanced Audio
Bandwidth		67Hz to 2.55kHz (NB)	10Hz to 2.55kHz (NB)
		67Hz to 3kHz (MB)	10Hz to 3kHz (MB)
Response		67Hz to 3kHz (WB)	10Hz to 3kHz (WB)
		within +1, -3dB of output level at 1kHz	within +1, -1dB of output level at 1kHz

Above Limiting Response	within +1, -2dB of a flat response (ref. 1kHz)
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Exciter Audio Section - Modulation Characteristics (Continued)

Distortion	<2%
Hum and Noise	
Narrow Bandwidth	-50dB typical (ETSI)*
Mid Bandwidth	-50dB typical (ETSI)*
Wide Bandwidth	-55dB typical, 300Hz to 3kHz (ANSI/TIA)*
	*up to 5dB degradation at extremes of switching range and temperature

Exciter Audio Section - CTCSS

Standard Tones	all 37 ANSI/TIA group A, B and C tones plus 13 commonly used tones
Frequency Error*	0.08% maximum
*from ANSI/TIA tones	
Generated Tone Distortion	1.2% maximum
Generated Tone Flatness	flat across 67Hz to 250.3Hz to within 1 dB
Modulation Level	adjustable
Modulated Distortion	<5%

External Reference Input

Frequencies*	10MHz or 12.8MHz
*One frequency must be specified by the Service Kit.	
Lock Range	± 50 Hz
Input Level	300mVpp to 5Vpp
Input Impedance	≥ 1 k Ω

Compliance Standards

Where applicable, this equipment has been tested and approved to the following standards.

RF	EN 300 086-2:V1.2.1 EN 300 113-2 (03/2001) AS4295-1995 CFR 47 Parts 15, 22 and 90 RSS-119 Iss 6
EMC	ETSI EN 301 489 V1.4.1 (2002-08) CFR 47 Part 15 Level B1
Safety	BS EN 60950-1:2002 ANSI/UL Std. 60950 3rd edition CAN/CSA-C22.2 No. 60950-00 3rd edition AS/NZS 60950 and ACATS001
Environmental	
Low Pressure (Altitude)	MIL-STD-810F 500.4 Proc 2
Humidity	IEC60068-2-30
Vibration	MIL-STD-810F 514.5 Proc 1
Shock	MIL-STD-810F 516.5 Proc 1

3 Power Amplifier and Transmitter Specifications

This chapter provides specifications pertaining to the power amplifier as a separate module. It also includes a number of transmitter RF specifications which pertain to the combination of power amplifier and exciter.

The performance figures given in these specifications are applicable only to equipment operating as an integral part of a TB8100 base station. These performance figures are minimum figures, unless otherwise indicated, for equipment operating at standard room temperature (+22°C to +28°C [+71.6°F to +82.4°F]) and standard test voltage (28VDC).

Where applicable, the test methods used to obtain these figures are those described in the ANSI/TIA-603-B-2002 and ETSI-EN specifications. You can obtain further details of test methods and the conditions which apply for compliance testing in all countries from Tait Electronics Ltd.

Product Identification

TB8100 power amplifiers are identified by a product code printed on the label fixed to the rear of the cover. The product codes are explained in the following table.

Product Code	Rated Output Power
TBA70xx-xxxx	5W
TBA80xx-xxxx	50W
TBA90xx-xxxx	100W

Bandwidth

The terms “narrow bandwidth”, “mid bandwidth” and “wide bandwidth” used in this chapter are defined in the following table.

	Channel Spacing	Modulation 100% Deviation	Receiver IF Bandwidth
Narrow Bandwidth	12.5kHz	±2.5kHz	7.5kHz
Mid Bandwidth	20kHz	±4kHz	12kHz
Wide Bandwidth	25kHz	±5kHz	15kHz

General

Supply Voltage

Operating Voltage	26.5VDC to 29.5VDC
Standard Test Voltage	28VDC
Polarity	negative earth only
Polarity Protection	reverse polarity diode

Supply Current	Maximum	Typical
Standby	50mA	42mA
Transmit		
5W PA @ 5W	600mA	530mA
50W PA @ 50W	5A	4.2A
100W PA @ 100W	10A	8.3A

Operating Temperature Range	-30°C to +60°C (-22°F to +140°F) ambient temperature*
	*ambient temperature is defined as the temperature of the air at the intake to the cooling fan

Cooling	forced air over heatsink via fan mounted in subrack
---------	---

Connectors

28VDC Input	Phoenix Combicon MVSTBR2.5HC
RF Input	SMA female
RF Output	N-type female
Control and Alarm	16-way IDC male

Dimensions

Height	86mm (3.4in)
Length	350mm (13.8in)
Width	
5W and 50W PAs	144mm (5.7in)
100W PA	177mm (7in)

Weight

5 and 50W PAs	4.9kg (10.8lb)
100W PA	5.8kg (12.8lb)

Power Amplifier RF Section

Frequency Range	400MHz to 520MHz
Input Power	+11dBm \pm 2 dB
Output Power	
5W PA	
Rated Power	5W
Range of Adjustment	1W to 5W in 1W steps
50W PA	
Rated Power	50W
Range of Adjustment	5W to 50W in 1W steps
100W PA	
Rated Power	100W
Range of Adjustment	10W to 100W in 1W steps
Output Power Accuracy*	\pm 0.5dB into a 50 Ω load
*400MHz to 520MHz, within normal operating voltages and temperatures	
Duty Cycle	100% at maximum rated output power* at +60°C (+140°F) ambient temperature *measured directly on PA output
Input Load Impedance	50 Ω nominal (VSWR \leq 1.8:1)
Output Load Impedance	50 Ω nominal
Mismatch Capability	
Ruggedness	open and short circuit load at any phase angle for one hour*
Stability	5:1 load VSWR at all phase angles* *under power foldback
Protection	
Temperature	power foldback to 10% if RF power devices exceed safe operating conditions
Current	power foldback and shutdown if RF power devices exceed safe operating currents
Supply Voltage	power foldback to 10% when supply voltage is 24V to 26V and 30V to 32V; shutdown when supply voltage is <24V and >32V
VSWR	power foldback to 10% at VSWR extremes; continuous analogue power foldback to maintain 100% duty cycle into mismatched loads

Transmitter RF Section

The specifications in this section pertain only to the combination of a 5W, 50W or 100W power amplifier with a TB8100 reciter.

Adjacent Channel Power

Steady State (Full Deviation)	
Narrow Bandwidth	<-60dBc
Mid and Wide Bandwidth	<-70dBc
Transient (Unmodulated)	
Narrow Bandwidth	<-50dBc
Mid and Wide Bandwidth	<-60dBc

Sideband Noise*

±25 kHz	<-137dBc/Hz
±1 MHz	<-147dBc/Hz
±10 MHz	<-147dBc/Hz at 5W
	<-157dBc/Hz at 50W
	<-160dBc/Hz at 100W

*no modulation, measured from centre frequency

Hum and Noise

Narrow Bandwidth	-50dB (300Hz to 3kHz [ANSI/TIA])
Mid Bandwidth	-54dB (300Hz to 3kHz [ANSI/TIA])
Wide Bandwidth	-55dB (300Hz to 3kHz [ANSI/TIA])

Intermodulation -40dBc with interfering signal at -30dBc at PA output

Radiated Spurious Emissions

Transmit	-36dBm to 1 GHz
	-30dBm 1 GHz to 4GHz
Standby	-57dBm to 1 GHz
	-47dBm 1 GHz to 4GHz

Conducted Spurious Emissions

Transmit	-36dBm to 1 GHz
	-30dBm 1 GHz to 12.75 GHz
Standby	-57dBm to 1 GHz
	-47dBm 1 GHz to 12.75 GHz

Transmitter Switching complies with EN 300 113-1 v1.4.1 and EN 300 113-2 (03/2001)

Compliance Standards (Continued)

Environmental

Low Pressure (Altitude)	MIL-STD-810F 500.4 Proc 2
Humidity	IEC60068-2-30
Vibration	MIL-STD-810F 514.5 Proc 1
Shock	MIL-STD-810F 516.5 Proc 1

4 Power Management Unit Specifications

This chapter provides specifications pertaining to the power management unit (PMU) as a separate module.

The performance figures given in these specifications are applicable only to equipment operating as an integral part of a TB8100 base station. These performance figures are minimum figures, unless otherwise indicated, for equipment operating at standard room temperature (+22°C to +28°C [+71.6°F to +82.4°F]) and standard test voltages as follows:

- AC module - 230VAC
- DC module - 12VDC.

Where applicable, the test methods used to obtain these figures are those described in the ETSI-EN specifications. You can obtain further details of test methods and the conditions which apply for compliance testing in all countries from Tait Electronics Ltd.

Product Identification

TB8100 PMUs are identified by a product code printed on the label fixed to the rear panel. The product codes are explained in the following table.

Product Code	Model
TBA30A0-xxxx	AC PMU - 88VAC to 264VAC input
TBA3001-xxxx	DC PMU - 12VDC input
TBA30A1-xxxx	AC and DC PMU - 88VAC to 264VAC input 12VDC input

General

Operating Temperature Range	-30°C to +60°C (-22°F to +140°F) ambient temperature* *ambient temperature is defined as the temperature of the air at the intake to the cooling fan
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Cooling	forced air over heatsink via fan mounted in subrack
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Front Panel LED Indicators

Green - Steady	PMU operating correctly
Green - Flashing	PMU not operating, bootloader in progress
Red - Flashing	one or more alarm conditions present

Parameters Monitored by PMU Microprocessor	mains input good signal DC input voltage PA output current and voltage heatsink temperatures of AC and DC modules
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Dimensions

Height	143.5 mm (5.6 in)
Width	121.4 mm (4.8 in)
Length	
AC PMU	324 mm (12.8 in)
DC PMU	337 mm (13.3 in)
AC and DC PMU	337 mm (13.3 in)

Weight

AC PMU	4.60 kg (10.1 lb)
DC PMU	4.86 kg (10.7 lb)
AC and DC PMU	6.40 kg (14.1 lb)

Input - AC Module

Input

Voltage	88VAC to 264VAC
Frequency	45Hz to 65Hz
Power Factor	>0.95
Total Harmonic Distortion (THD)	<8%
Inrush Current	<30A
Leakage Current	<3.5mA/240VAC

Protection

Fault Current (Input)	10A fuse
Transient Suppression	275V MOV (line-to-line)
Overvoltage Inhibit (Self Recovering)	275VAC ±10V
Undervoltage Signal	83VAC ±5V

Input - AC Module (Continued)

General

Efficiency at Rated Output*	86%
Input-to-chassis Isolation	1500VAC, 50Hz, 1 minute
Input-to-output Isolation	3000VAC, 50Hz, 1 minute
Output-to-chassis Isolation	500VAC, 50Hz, 1 minute

*at 220VAC

Input - DC Module

Input - 12V System

Factory-set Limits	
Minimum Run Voltage	9.5V \pm 0.3V
Minimum Turn-on Voltage	11.7V \pm 0.3V
Maximum Run Voltage	18.1V \pm 0.3V
Maximum Turn-on Voltage	17.1V \pm 0.3V
User-programmable Limits*+	
Low Battery Shutdown Voltage	10.0V to 13.5V
Low Battery Restart Voltage (after shutdown)	12.0V to 15.0V
User-programmable Alarms*	
Low Battery Voltage	10V to 14V
High Battery Voltage	14V to 17.5V

*using the Service Kit software

+only available if the 10W standby power supply card is fitted

Protection

Fault Current (Input)	circuit breaker or fuse in external wiring*
Wrong Input Voltage	electronic lock-out
Wrong Input Voltage Polarity	shunt diode
	*provided by user

General

Efficiency at Rated Output*	82%
Input-to-output Isolation	1000VAC, 50Hz, 1 minute

*at 13VDC

Output - AC and DC Modules

High Current Output for PA

Voltage	28V
Current	14A maximum
Regulation	±0.5%
Ripple and Noise*	50mV pp
Ripple and Noise rms	10mV rms
Transient Response on 28V Loadstep**	2% overshoot and recover within 0.6ms

*100MHz bandwidth

**10% to 100% loadstep

Low Current Output for Reciter

Voltage	28.6V 26.5V in hysteresis mode
Current	1.2A maximum
Regulation	±3.5%
Ripple and Noise*	50mV pp
Ripple and Noise rms	10mV rms

*100MHz bandwidth

Protection - PA Output

Overload	electronic current limit above 16A
Short Circuit	hiccup mode, self-resetting
Overvoltage	
AC Module	electronic shutdown latch (33.5V)
DC Module	electronic hysteric control (33.5V)

Protection - Reciter Output

Short Circuit	2.5A self-resetting fuse
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Optional 10W Standby Output - DC Module

Low Current Output for Reciter

Voltage	28.9V
Current	0.3A maximum
Regulation	±2.5%
Ripple and Noise*	50mV pp
Ripple and Noise rms	10mV rms

*100MHz bandwidth

Protection

Overload/Short Circuit	electronic current limit
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Optional 10W Standby Output - DC Module (Continued)

General

Efficiency at Rated Output	86%
Input-to-output Isolation Control	1000VAC, 50Hz, 1 minute shutdown signal (isolated)

Optional 40W Auxiliary Power Supply

The output from this optional power supply PCB may also be used to trickle-charge a 12V battery.

DC Input Voltage	28V \pm 15%
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DC Output*

Voltage	13.65V
Current	3A maximum
Regulation	\pm 2%
Ripple and Noise**	50mV pp
Ripple and Noise rms	10mV rms
Zero Load Ripple	100mVpp

*also for trickle-charging 12V battery

**100MHz bandwidth

Protection

Overload/Short Circuit	electronic current limit
Overvoltage*	16V Zener diode

*for 12V

General

Efficiency at Rated Output	88%
Input-to-output Isolation	1000VAC, 50Hz, 1 minute
Output-to-chassis Isolation	500VAC, 50Hz, 1 minute

Connections

The following specifications refer to the external wiring and connectors which are connected to the PMU. They do not refer to the wiring and connectors built into the PMU itself.

AC Input

Connector Type	IEC female
Current Rating	8A

Connections (Continued)

DC Input*

Connector Type	M6 screw into threaded fitting on bus bar
Flexible Wire Size	2AWG for a length of 1.5m to 2m (5ft to 6.5ft) (typical)**
Current Rating	50A

*battery

**the DC input leads should be of a suitable gauge to ensure less than 0.2V drop at maximum load over the required length of lead

DC Output - 28V High Current

Connector Type	Phoenix MVSTBR2.5HC/2-ST/5.08 female
Flexible Wire Size	11AWG
Current Rating	16A

DC Output - 28V Low Current

Connector Type	2x4-way Molex 43025-0800/crimp socket 43030-0001 female
Flexible Wire Size	20AWG
Current Rating	3A

DC Output - 12V Low Current/Battery Charger

Connector Type	2x4-way Molex 43025-0800/crimp socket 43030-0001 female
Flexible Wire Size	20AWG
Current Rating	2 x 3A (2 conductors in parallel)

Compliance Standards

Where applicable, this equipment has been tested and approved to the following standards.

Safety	BS EN 60950-1:2002 ANSI/UL Std. 60950 3rd edition CAN/CSA-C22.2 No. 60950-00 3rd edition AS/NZS 60950 and ACATS001
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EMC	ETSI EN 301 489 V1.4.1 (2002-08) CFR 47 Part 15 Level B1
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Environmental

Low Pressure (Altitude)	MIL-STD-810F 500.4 Proc 2
Humidity	IEC60068-2-30
Vibration	MIL-STD-810F 514.5 Proc 1
Shock	MIL-STD-810F 516.5 Proc 1
