

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 5 W, 50 W and 100 W base station systems in PDF format. You can view it online, or print it if you want a paper copy.

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

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1. The service manual is only available in PDF format from the Tait support website. Consult your nearest Tait Dealer or Customer Service Organisation for more information.

1 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 20](#).

The performance figures given in these specifications are applicable only to equipment operating as an integral part of a TB8100 base station. Where appropriate, separate performance figures are given for modules operating in stand-alone mode or as part of a non-Tait system.

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 EIA 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
TBA50xx-xxxx	receiver only

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	12 kHz
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	12 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
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	4-way Micro-Fit 3.0 (Molex) male
System	depends on system interface PCB fitted*
*if fitted	*refer to Installation and Operation Manual
Dimensions	
Height	143.6mm (5.7in)
Width	54.6mm (2.1in)
Length	333.3mm (13.1in)
Weight	2.1 kg (4.6lb)

Receiver RF Section

Frequency Range	400 to 520MHz
Frequency Bands	400 to 440MHz 440 to 480MHz 470 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	-120dBm to -60dBm ($0.22\mu\text{V}$ to $223.6\mu\text{V}$), 0.5V to 6V, programmable slope
IF Stages	
Frequencies	
Analogue	70.1MHz with IF filtering at 20kHz bandwidth, -4dB
Digital	9.9MHz and 0Hz
Digital IF Bandwidths	
Narrow Bandwidth	8.8kHz, -3dB
Mid Bandwidth	12.0kHz, -3dB
Wide Bandwidth	14.0kHz, -3dB
Sensitivity*	
De-emphasised Response	
Centre of Switching Range	$<-119\text{dBm}$ ($0.25\mu\text{V}$) at 25°C **
Edge of Switching Range	$<-117\text{dBm}$ ($0.32\mu\text{V}$) at 25°C **
Flat Response	
Centre of Switching Range	$<-117.5\text{dBm}$ ($0.30\mu\text{V}$) at 25°C **
Edge of Switching Range	$<-115.5\text{dBm}$ ($0.38\mu\text{V}$) at 25°C **
*12dB SINAD	**up to 2dB degradation at extremes of temperature

Receiver RF Section (Continued)

Ultimate Signal-to-Noise Ratio*

Narrow Bandwidth	50dB typical (EIA)*
Mid Bandwidth	50dB typical (EIA)*
Wide Bandwidth	55dB typical (EIA)*
*at -47 dBm	*up to 5dB degradation at extremes of switching range and temperature

Selectivity

Narrow Bandwidth	85dB typical (ETSI)*
Mid Bandwidth	85dB typical (ETSI)*
Wide Bandwidth	90dB typical (EIA)*
	*up to 5dB degradation at extremes of switching range and temperature

Spurious Response Attenuation

≥100dB (EIA)*
 ≥90dB (ETSI)
 *AGC switched off

Intermodulation Response Attenuation

Narrow Bandwidth	80dB typical (ETSI)*
Mid Bandwidth	80dB typical (TBD)*
Wide Bandwidth	85dB typical (EIA)*
	*up to 5dB degradation at extremes of switching range and temperature

Blocking Rejection

1–10MHz	100dB (ETSI)
> 10MHz	110dB (ETSI)
±1, ±2, ±5 and ±10MHz	100dB (EIA)*
	*AGC switched off

Co-channel Rejection

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

Amplitude Characteristic*

≤3dB (ETSI)

*RF Input Level -107dBm to -13dBm

Spurious Emissions

Conducted	<-90dBm to 2GHz <-70dBm 2 to 4GHz
Radiated	<-57dBm EIRP to 1GHz <-47dBm EIRP 1 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 (750µs)
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. 1 kHz)
Flat Response	
Bandwidth	67Hz to 2.55kHz (NB) 67Hz to 3.4kHz (MB) 67Hz to 3.4kHz (WB)
Response	within +1, -3dB of output level at 1 kHz
Balanced Line Output (via System Interface PCB)	
Output Level Range	-20 to +10dBm
Output Impedance	600Ω
Distortion*	
De-emphasised	≤2%
Flat	≤4% (NB) ≤2% (WB)
*at -70dBm signal level	
Unbalanced Line Output (via System Interface PCB)	
Output Level Range	0.3 to 3Vpp into 10kΩ
Speaker Output (via Control Panel)	
Power	0.5W
Speaker Impedance	16Ω
Distortion*	≤3% at 1kHz, 0.35W, 16Ω
*at -70dBm signal level, de-emphasis selected	

Receiver Audio Section - CTCSS

High Pass (Subaudible) Filter

Bandwidth	300 to 2.55kHz (NB) 300 to 3.4kHz (MB) 300 to 3.4kHz (WB)
Response	within +1, –3dB of level at 1kHz
Hum and Noise*	30dB minimum at 250.3Hz 35dB typical (67 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	8 to 20dB SINAD
Accuracy	± 3 dB
RF Hysteresis*	1.5 to 6dB
Opening Time	≤ 20 ms
Closing Time	50 ± 10 ms

*programmable

RSSI Gating

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

*programmable

Exciter RF Section

Frequency Range	400 to 520MHz
Frequency Bands	400 to 440MHz 440 to 480MHz 470 to 520MHz
Modulation Type	FM
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
Output Load Impedance	50 Ω nominal (VSWR <2:1)
Frequency Stability	± 1 ppm -30°C to $+60^{\circ}\text{C}$ (-22°F to $+140^{\circ}\text{F}$)
Power Output	+10dBm ± 2 dB

Exciter Audio Section - Inputs

Inputs Available	microphone input via control panel balanced and unbalanced line inputs via system interface PCB
Microphone Input	
Input Level Range*	80 to 115dB SPL
Impedance	600 Ω
Compressor	
Attack Time	10ms
Decay Time	800ms
Dynamic Range	35dB
Distortion	$\leq 3\%$
*60% modulation at 1 kHz	
Balanced Line Input	
Input Level Range*	-20 to $+10$ dBm
Impedance	600 Ω balanced
*60% modulation at 1 kHz	
Unbalanced Line Input	
Input Level Range	0.3 to 3V _{pp}
Impedance	>10k Ω

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 Bandwidth	67Hz to 2.55kHz (NB) 67Hz to 3kHz (MB) 67Hz to 3kHz (WB)
Response	within +1, -3dB of output at 1kHz
Above Limiting Response	within +1, -2dB of a flat response (ref. 1kHz)
Distortion	<2%
Hum and Noise	
Narrow Bandwidth	-50dB typical (ETSI)*
Mid Bandwidth	-50dB typical (ETSI)*
Wide Bandwidth	-55dB typical, 300Hz to 3kHz (EIA)*
	*up to 5dB degradation at extremes of switching range and temperature

Exciter Audio Section - CTCSS

Standard Tones	all 37 EIA group A, B and C tones plus 13 commonly used tones
Frequency Error*	0.08% maximum
*from EIA tones	
Generated Tone Distortion	1.2% maximum
Generated Tone Flatness	flat across 67 to 250.3Hz to within 1dB
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	±50Hz
Input Level	300mVpp to 5Vpp
Input Impedance	≥1kΩ

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) EN 300 719-1:1997 AS4295-1995 CFR 47 Parts 15, 22 and 90 RSS-119 Iss 6 ICES 003 GB/T 15844.1 - 1995 GB/T 15938 - 1995 GB/T 16611 - 1996 Ga176-1998 HKTA 1002 Issue 3 Nov. 1996 iDA TS101 Iss1 rev4 iDA TS107 Iss1 rev3
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

2 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. Where appropriate, separate performance figures are given for modules operating in stand-alone mode or as part of a non-Tait system.

These performance figures are minimum figures, unless otherwise indicated, for equipment operating at standard room temperature ($+22^{\circ}\text{C}$ to $+28^{\circ}\text{C}$ [$+71.6^{\circ}\text{F}$ to $+82.4^{\circ}\text{F}$]) and standard test voltage (28VDC).

Where applicable, the test methods used to obtain these figures are those described in the EIA and ETSI 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	$\pm 2.5\text{kHz}$	7.5kHz
Mid Bandwidth	20kHz	$\pm 4\text{kHz}$	12kHz
Wide Bandwidth	25kHz	$\pm 5\text{kHz}$	15kHz

General

Supply Voltage

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

Supply Current

Standby	≤50mA
Transmit	
5W PA @ 5W	≤500mA
50W PA @ 50W	≤6A
100W PA @ 100W	≤12A

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)

*with optional internal isolator fitted

Power Amplifier RF Section

Frequency Range	400 to 520MHz
Input Power	
With TB8100 Reciter	+10dBm $\pm$ 2 dB
Stand-alone PA	900 to 1100mW
Output Power	
5W PA	
Rated Power	5W (4W*)
Range of Adjustment	1 to 5W (4W*) in 1W steps
50W PA	
Rated Power	50W (45W*)
Range of Adjustment	5 to 50W (45W*) in 5W steps
100W PA	
Rated Power	100W (90W*)
Range of Adjustment	10 to 100W (90W*) in 10W steps
	*with internal isolator
Output Power Accuracy	
Within Normal Operating Voltages and Temperatures	$\pm$ 1 dB into a 50 Ω load
Outside Normal Operating Voltages and Temperatures	+1, -2 dB into a 50 Ω load
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 two minutes*
Stability	5:1 load VSWR at all phase angles*
	*under power foldback

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
±10MHz	<−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 3 kHz [EIA])
Mid Bandwidth	−54dB (300Hz to 3 kHz [EIA])
Wide Bandwidth	−55dB (300Hz to 3 kHz [EIA])

Intermodulation

Without Internal Isolator	−40dBc with interfering signal at −30dBc at PA output
With Internal Isolator	−70dBi 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 4GHz
Standby	−57dBm to 1 GHz
	−47dBm 1 GHz to 4GHz

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

Transmit Key Time*

Key Up	
5W PA	≤1.5ms
50 and 100W PAs	≤1ms
Key Up Debounce Timer	20ms
Key Down	
5W PA	≤1.5ms
50 and 100W PAs	≤1ms
Key Down Debounce Timer	20ms

*with VCO in lock

Continuous Repetitive Key Rate	24Hz maximum
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Lock Time	≤20ms
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Control and Monitoring

Control Inputs and Outputs	I ² C data, clock and ground PA key line input fan control output
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Monitor Outputs*

Permanently Assigned	forward power reverse power
Selectable**	ambient temperature RF power control voltage

*analogue

**select one

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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Compliance Standards (Continued)

RF	EN 300 086-2:V1.2.1 EN 300 113-2 (03/2001) EN 300 719-1:1997 AS4295-1995 CFR 47 Parts 15, 22 and 90 RSS-119 Iss 6 ICES 003 GB/T 15844.1 - 1995 GB/T 15938 - 1995 GB/T 16611 - 1996 Ga176-1998 HKTA 1002 Issue 3 Nov. 1996 iDA TS101 Iss1 rev4 iDA TS107 Iss1 rev3
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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

3 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. Where appropriate, separate performance figures are given for modules operating in stand-alone mode or as part of a non-Tait system.

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 - 230 VAC
- DC module - 12VDC.

Where applicable, the test methods used to obtain these figures are those described in the EIA and ETSI 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 - 88 to 264VAC input
TBA3001-xxxx	DC PMU - 12VDC input
TBA30A1-xxxx	AC and DC PMU - 88 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						
Cooling	forced air over heatsink via fan mounted in subrack						
Front Panel LED Indicators	<table><tr><td>Green - Steady</td><td>PMU operating correctly</td></tr><tr><td>Green - Flashing</td><td>PMU not operating, bootloader in progress</td></tr><tr><td>Red - Flashing</td><td>one or more alarm conditions present</td></tr></table>	Green - Steady	PMU operating correctly	Green - Flashing	PMU not operating, bootloader in progress	Red - Flashing	one or more alarm conditions present
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						
Stand-alone Alarm Outputs*	summary alarm battery low alarm						
*open collector							
Dimensions							
Height	143.5mm (5.6in)						
Width	121.4mm (4.8in)						
Length							
AC PMU	324mm (12.8in)						
DC PMU	337mm (13.3in)						
AC and DC PMU	337mm (13.3in)						
Weight							
AC PMU	4.60kg (10.1lb)						
DC PMU	4.86kg (10.7lb)						
AC and DC PMU	6.40kg (14.1lb)						

Input - AC Module

Input	
Voltage	88 to 264VAC
Frequency	45 to 65Hz
Power Factor	>0.95
Total Harmonic Distortion (THD)	<6%
Inrush Current	<30A
Leakage Current	<3.5mA/240VAC

Input - AC Module (Continued)

Protection

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

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	11.8V $\pm$ 0.3V
Maximum Run Voltage	15.7V $\pm$ 0.3V
Maximum Turn-on Voltage	14.7V $\pm$ 0.3V
User-programmable Limits*+	
Low Battery Shutdown Voltage	10.0 to 11.5V
Low Battery Restart Voltage (after shutdown)	11.5 to 13.0V
User-programmable Alarms*	
Low Battery Voltage	10 to 12V
High Battery Voltage	14 to 16V

*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*	100mV pp
Ripple and Noise rms	15mV rms

*100MHz bandwidth

Low Current Output for Reciter

Voltage	28V
Current	1.2A maximum
Regulation	±2.5%
Ripple and Noise*	50mV pp
Ripple and Noise rms	15mV 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)
Transient Response on 28V Loadstep*	2% overshoot and recover within 0.6ms

*10% to 100% loadstep

Optional 10W Standby Output - DC Module

Low Current Output for Reciter

Voltage	28V
Current	0.3A maximum
Regulation	±2.5%
Ripple and Noise*	50mV pp
Ripple and Noise rms	15mV rms

*100MHz bandwidth

Protection

Overload/Short Circuit	electronic current limit
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General

Efficiency at Rated Output	85%
Input-to-output Isolation	1000VAC, 50Hz, 1 minute
Control	shutdown signal (isolated)

Optional 40W Auxiliary Power Supply

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

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

Voltage	13.8V
Current	3A maximum
Regulation	$\pm$ 1%
Ripple and Noise**	50mV pp
Ripple and Noise rms	20mV rms

*also for 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

DC Input*

Connector Type	M6 screw into threaded fitting on bus bar
Flexible Wire Size	2AWG for a length of 1.5 to 2m (5 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

Connections (Continued)

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
