TB9400
SPECIFICATIONS

High performing, multi-mode base stations for mission critical networks.

The Tait TB9400 "High level" base station is a multi-mode platform for analog conventional, MPT, DMR and P25 systems.

It provides both digital frequency and time division multiple access for FDMA and TDMA operations.

The TB9400 offers a spectrally efficient solution, enabling migration path between modes, with greater capacity and thus future proof your investment. It delivers operational efficiency through features such as internal voter capability, Linear Simulcast Modulation (LSM) and remote network management.

KEY FEATURES

- Multi-mode platform supporting Analog Conventional, AS-IP (Analog Simulcast over IP), MPT, DMR Conventional and Trunking, P25 Conventional and P25 Trunking modes
- Simple change of mode through the web interface, or program complex operations with TaskBuilder
- Dual mode automatic switching between Analog and P25 conventional
- Dual mode automatic switching between Analog and DMR Tier 2 (single repeater)
- P25 and analog conventional simplex and DFSI support for ease of migration
- Adherence to P25 standards Phase1 and Phase2 (ultra-narrowband 6.25 kHz) for interoperability
- Tait DMR Access and Express solution compatible
- Simulcast and Voting in AS-IP, DMR and P25 networks
- DMR fallback into single site operation
- Linear Simulcast Modulation (LSM) to increase P25 coverage efficiency
- Migration capability from Tait AS-IP to P25 Conventional network, with dual mode, simplex and DFSI capabilities or to Tait DMR simulcast
- Analog line (supporting 4 wire E&M) in analog mode for RF linking connection and local console support
- Efficient system infrastructure scalability based on IP network connectivity
- Extensive range of remote management and monitoring capabilities with a security focus
- Built-in basic spectrum analyzer provides on-site diagnostics
- Modular structure offers variety of build options to satisfy serviceability or space constraints
- Designed to military standard MIL-STD-810G

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FEATURES AND BENEFITS

Delivering on operational needs

- Flexible network design through IP connectivity and linking
- TB9100 channel group compatibility mode
- Transfer data and voice across a packet-switched infrastructure using standard IP communications
- Robust design provides mission-critical voice communications
- P25/DMR Voice over IP (VoIP) support
- Cornerstone of a Tait P25 software-upgradable system
- Quality of Service (QoS) assignments for voice and signalling to allow optimal network packet routing
- Simulcast and Voting solutions for analog conventional, DMR Tier 2 and Tier 3, P25 conventional and trunking systems
- Built-in optional central voting facility selects the best quality signal for transmission
- LSM support means digital P25 simulcast networks require fewer sites
- C4FM simulcast operation
- Multi-DFSI support with full control or audio connectivity only in P25 and analog conventional modes
- Simplex support with antenna relay management in P25 and analog conventional modes
- Analog line support in analog conventional mode for console and system connectivity as well as relay and RF linking configurations
- Built-in Continuous Wave Identification (CWID) generation meets FCC call-sign requirements
- Remote software downloads with no impact to operations
- Built-in basic spectrum analyzer provides on-site diagnostics, by way of plotting signal level
- Control, customize, and enhance base station operations with TaskBuilder, by creating rules that extend the functionality of the base station. Rules can control channel changes, digital outputs, timers, and alarms, based on events and external signals

Resiliency to manage risk and enhance safety in challenging environments

- Dual software image support for fast rollback
- Dual diversity not required due to Simulcast and automatic macro diversity
- Integrated Web https secured application to remotely monitor, diagnose and configure
- Tait smart power supply with auto change from AC to DC for easy battery back-up
- Rated for continuous full output power at 60ºC ambient
- Rugged construction with efficient heatsinks and front-to-rear fan-forced cooling
- Meets relevant MIL-STD-810G test methods

Designed to support effective deployment

- Compact modular design to minimize rack space and improve serviceability
- Migration paths between analog/ P25 conventional/ P25 trunked networks with extensive re-use
- Migration paths from analog/ MPT networks to DMR with extensive re-use
- Front panel user interface to set device IP address, where required

Delivers on Public Safety

- Benefit from the spectral efficiency, multi-vendor interoperability, security, migration and data capability demanded by P25 standards
- Designed and tested with the DMR Tier 2 Conventional and Tier 3 Trunking standards to provide customers with choice of vendor and equipment
- 6.25 kHz equivalent 2-slot TDMA for both voice and data offers spectral efficiency operation
- Ongoing communications during an outage with failsoft
- Tested using the CAP certification program, providing confidence of multi-vendor interoperability

Efficient management with a focus on security

- Remote network management utilizing built-in secure https web server and SNMP V3 support
- Detailed alarm monitoring and reporting of critical base station/repeater parameters
- 12 digital inputs to monitor external equipment
- Inbuilt diagnostics to allow technicians to remotely confirm optimal operation and identify network faults
- Enhanced security through password protection and access level control on web server
- Multiple user accounts
- System logs to provide audit records
- Ability to configure 4,000 channels to allow single configuration across sites

Future-proofed to protect your investment

- Software configurable, including mode and feature upgrades through software licenses as required
- Software upgradeable to add new features and functionality to ensure that your analog, DMR, or P25 solution is maintained and updated with the ever-changing needs of your market and environment

Wide range of configuration options available

- Configurable as a single channel 100W or 50W unit, or a dual channel 50W unit, with a range of DC and AC power supply options

This document refers to the TB9400 range, including the TB9415, TB9435, TB9444, TB9460, and TB9465.
For more details on these products, please see the TB9400 Catalog.

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FREQUENCY BANDS

Frequency	Range	Tait Band	Configuration
VHF	136-174MHz	B1	50W & 100W
UHF	378-420MHz	HH	50W & 100W
	400-440MHz	H1	50W & 100W
	440-480MHz	H2	50W & 100W
	470-520MHz	H3	50W & 100W
700/800MHz	Tx: 762-870MHz*, Rx: 794-824MHz	K4	50W & 100W

* The actual Tx frequency coverage in this band is 762-776MHz, and 850-870MHz

REGULATORY

	P25, Analog FM	DMR
USA (CFR 47)	B1, HH, H1, H2, H3, K4	B1, H1, H2, H3, K4
Canada (RSS-119)	B1, HH, H1, H2, K4	B1, H1, H2, K4
Europe (EN300-113, EN300-086, EN301-489)	B1[1, 2], H1, H2[1], H3	B1[1, 2], H1, H2[1], H3
Australia/New Zealand (AS/NZS4768)	B1[1, 2], H1, H2[1], H3	B1[1, 2], H1, H2[1], H3

[1] CE EN300086 Wideband Approved
[2] EN301929 Marine Wideband Approved on 100W B1 model

GENERAL

Radio specifications

Frequency stability	±0.5 ppm
Channels	4,000
Channel spacing	12.5 kHz and 25kHz** in analog Phase 1 - FDMA channel is 12.5KHz, and Phase 2 - 2 TDMA voice channels is 6.25 kHz equivalent in P25
Frequency increment/channel step	VHF 2.5kHz/3.125kHz, UHF 5kHz/6.25kHz, 700/800MHz 5kHz/6.25kHz
External frequency reference	10 MHz/12.8 MHz (auto detect)

Physical specifications

Dimensions (HxWxD)	7 x 19 x 15.8 in (177 x 483 x 400 mm) 4U rack space
Weight	Single 100 W: 46.5 lb (21.1 kg) Dual 50W : 54.7lb (24.8kg) Single 50W 43.2lb (19.6kg)
Operating temperature	-22°F to +140°F (-30°C to +60°C)

Power specifications

Power Supply	
DC	12V, 24V, 48V, PMU (+ve or -ve earth)
AC	88-264V (with Power Factor Correction)

Power consumption* (UHF)	120VAC	230VAC	12VDC	24VDC	48VDC
Standby (Single 50 and 100 W)	0.370A, 30W	0.510A, 31W	2A, 24W	0.975A, 23W	0.480A, 23W
Tx @ 50W Single	1.9A, 235W	1.1A, 220W	18A, 216W	9A, 216W	4.2A, 202W
Tx @ 100W	3.3A, 395W	1.7A, 375W	32A, 385W	15.5A, 370W	7.4A, 355W

* Note Transmitter: These figures are specific to UHF, for other bands consult the product specification manual.
** When P25/AS-IP capable firmware is loaded (not available with DMR/Analog firmware)

MILITARY STANDARDS 810G

Applicable MIL-STD	Method	Procedure
Low pressure (Altitude 15,000ft (4,572m))	500.5	2
Humidity	507.5	2
Vibration	514.6	1
Shock	516.6	1

ANALOG LINE

	Input	Output
Audio interfaces	600Ω Balanced	600Ω Balanced
Audio interface level	-30dBm to 0dBm nominal (300Hz to 2,550Hz)	-30dBm to 0dBm nominal (300Hz to 2,550Hz)
Frequency response	+0.5/-2.0dB rel. 1kHz (300Hz to 3,000Hz)	
Passband ripple	-3 ~ +1dB	-3 ~ +1dB
Audio distortion	<3% typical (line to RF)	<3% typical (RF to line)

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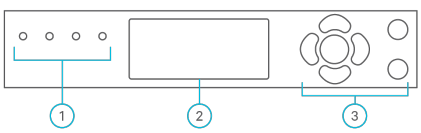
TRANSMITTER

Modulation types	FM, C4FM, LSM, H-DQPSK, FFSK, 4FSK
P25 Modulation fidelity (TIA-102)	<2%
Adjacent channel power	-60dBc (ETSI) and -67dBc (TIA-102)
Conducted spurious emissions	
VHF	<-36dBm 9kHz to 1GHz and <-30dBm 1GHz to 4GHz
UHF	<-36dBm 30MHz to 1GHz and <-30dBm 1GHz to 4GHz/12.75GHz
700/800/900MHz	<-20dBm to 9GHz
Output power	
50W	Programmable 5-50W
100W	Programmable 10-100W
Duty cycle	100%

RECEIVER

Modulation types	C4FM, H-CPM, Analog FM, FFSK, 4FSK
Radiated spurious emissions	<-57dBm EIRP to 1GHz
Conducted spurious emissions	<-90 dBm to 1GHz
P25 (TIA102)	
Sensitivity	0.22µV (-120 dBm) @ 5% BER
Intermodulation response attenuation	85dB
Adjacent channel rejection	60dB
Co-channel rejection	9dB
DMR	
Unfaded sensitivity ETS 300 113	
Typical	-119dBm (0.25µV) @ 1% BER
Selectivity ETS 300 113	
@ 1% BER	≥82dB (VHF), ≥79dB (UHF)
Intermodulation response attenuation	≥78dB @ 1% BER unfaded
Blocking rejection	
> 1MHz	100dB @ 1% BER
Analog	
Sensitivity	-120dBm @ 12dB SINAD (0.22µV)
Selectivity (EIA-603)	85dB (VHF & UHF), 79dB (700/800MHz)
Intermodulation	80dB
Spurious response attenuation	≥100dB (ANSI/TIA) and ≥90dB (ETSI)
FM hum and noise	
VHF/UHF	45dB (ANSI/TIA), 50dB (ETSI)
700/800/900MHz	43dB (ANSI/TIA)

FRONT PANEL



1. Status LEDs
2. 20-character 4-row LCD Display
3. Keypad
4. Flow through ventilation fans x 3 (not pictured)

TAIT NETWORK SOLUTIONS

Backed up by our proven radio network expertise, the TB9400 is part of our larger network offering. The Tait network solution consists of radio units, infrastructure, applications, services and integration with third party interfaces to ensure that your organization can reap all the benefits of the DMR or P25 standard in a mission critical environment.

Tait has taken every care in compiling this specification sheet, but we're always innovating and therefore changes to our models, designs, technical specification, visuals and other information included in this specification sheet could occur. For the most up-to-date information and for a copy of our terms and conditions please visit our website www.taitcommunications.com.

Tait International Limited offices and facilities are certified for ISO 9001:2015 (Quality Management System), ISO 14001:2015 (Environmental Management System) and ISO 45001:2018 (Occupational Health and Safety Management System) for aspects associated with the design, manufacture and distribution of radio communications and control equipment, systems and services. Tait Managed Services are certified for ISO 27001:2013 (Information Security Management System).

Authorized Partners

Quality Management ISO 9001

Environment Management ISO 14001:2015

Occupational Health & Safety Management ISO 45001:2018

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