TB9100 base station
P25 CG console gateway

Release Notes

Version 2.26
TN-1191-SR
13 September 2006

This technical note contains information to accompany the version 2.26 release of the TB9100 base station and P25 Console Gateway. Two product CDs are available, one for the base station only and the other for the base station and the Console Gateway.

TB9100 Base Station

1 What's New in This Release

The TB9100 base station version 2.26 incorporates the following improvements:

Dual Channel and Other Options

A new control panel design and subrack interconnect board means that a TB9100 subrack can contain the following:

- up to two PAs
- up to seven receive channels

The new control panel has a horizontal row of LEDs that let you monitor all reciters in the subrack simultaneously. You can configure them to display the status of alarms or of the Rx gate. The control panel displays additional status information for the selected reciter and connects it to the microphone and speaker.

When using the CSS with these new combinations, note the following:

- Only reciter 1 (the right-most reciter looking from the front) can communicate with the PMU. Other reciters should have their 'No PMU detected' alarm disabled. If you want to monitor, configure, or carry out diagnostic tests on the PMU, connect to reciter 1. Only program Task Manager tasks involving the PMU into reciter 1.
- Front panel fan operation is under the control of the PA and PMU. The line carrying fan rotation information passes through the control panel to the selected reciter. Consult the Installation and Operation manual to ensure correct fan failure monitoring.
- If you want to carry out a diagnostic test on the control panel, use the CH (channel) button to select the base station (channel) that you are connected to.

Encryption and the TB9100 Base Station

TB9100 base stations of version 2.26 and above no longer support encryption to a connected dispatch console. However, they can still transparently pass encrypted signals.

When earlier TB9100 base station versions have their firmware upgraded, their analog line loses any encryption capability.

Identifying Your Product

In version 2.26, the CSS can tell you what kind of channel module you are connected to. Select Monitor > Module Details > Reciter and view the Crypto module box.

Display	Description
Not fitted	You are connected to a base station reciter. A firmware crypto module is not present and cannot be loaded.
1.01	You are connected to a P25 Console Gateway. The display shows the version number of the firmware crypto module.

H-Band range extended

TB9100 reciters are now available for the H4 band (380–420 MHz). You need to make sure that H4 band reciters operating in the 380–400 MHz range are only used with H0 PAs that are rated for 380–520 MHz operation. The sticker on the back of the PA displays its operating range. Only H0 PAs of version 00.02 and above are rated for operation below 400 MHz. The use of older PAs is non-compliant and may result in the PA overheating.

2 Compatibility

The following tables specify all compatible configurations for the TB9100 base station. A configuration is compatible if module firmware, module hardware, the CSS, and the calibration software have compatible versions. If changes are made to hardware or firmware, you need to check whether the new versions are compatible.

- Each row in the table identifies a compatible configuration.
- Each cell within a row contains the hardware, firmware, or software version number that is compatible with the other versions in the row. If a cell contains more than one version number, more than one version is compatible.
- Table footnotes indicate any restrictions imposed on a particular combination by the hardware, firmware, or CSS version.

- Any other combination is **not** compatible and not supported.

Base Stn	Calib s/w	CSS	Data-base	Network Board			Digital Board		PMU		PA	
				F/w	Kernel	H/w	F/w	H/w	F/w	H/w	F/w	H/w
2.26	3.04	2.26	2.26	2.26	2.10	00.01[a]	2.26	00.06 00.05[b] 00.04 00.03	2.08	00.02 00.01	3.04	00.02[c] 00.01
2.15	3.00	2.15	2.24	2.15	2.10	00.01[a]	2.15	00.05[b] 00.04 00.03	2.08	00.02 00.01	2.09	00.02 00.01
2.04	2.09	2.04	2.18	2.04		00.01[a] 00.00	2.03	00.04 00.03	2.08	00.02 00.01	2.09	00.02 00.01
1.23	2.07	1.23	2.11	1.23		00.01[a] 00.00	1.23	00.04 00.03	2.08	00.02 00.01	2.07	00.02 00.01
1.16	2.05	1.16	2.10	1.07		00.00	1.09	00.03	2.07	00.01	2.07	00.01
1.15	2.05	1.15	2.10	1.07		00.00	1.09	00.03	2.06	00.01	2.05	00.01
1.14	2.05	1.12	2.10	1.06		00.00	1.07	00.03	2.06	00.01	2.05	00.01
01.02	2.03	01.01	02.08	01.02[d]		00.00	01.02[d]	00.03	02.03	00.01	02.03	00.01

a. This network board version has a larger (8 MB) flash memory.

b. The digital board version 0.05 has a different exciter synthesizer circuit. Base station firmware v 2.1x can use the old or the new circuit.

c. Version 00.02 extends the PA frequency range from 400–520 MHz to 380–520 MHz. This version must be used with H4 band reciters that will operate in the 380–400 MHz range

d. Downgrading firmware to this version should not be done using the CSS. Contact Tait for more information.

3 Upgrading a Base Station

New base station firmware is available on both product CDs.

Important Upgrading a base station or old analog gateway will render it crypto-denied. If you have a reciter with encryption, contact Tait.

Upgrading base station firmware to version 2.26 cannot be done by the CSS alone. You will need to download firmware files using the TFTP protocol.

Follow these steps:

1. Install the version 2.26 CSS software from the product CD. You can install it alongside any existing versions of the CSS.

Important When upgrading firmware using TFTP, you must first save a copy of the current base station configuration.

2. Follow the instructions in TN-977b. See also "Safe practices for firmware download from the CSS" below.

3. Save the new configuration data to a file, so that you have a backup.

Safe practices for firmware download from the CSS

The process of loading firmware from the CSS to the base station is very reliable. The base station and CSS perform many checks during the process, and the likelihood of corrupt firmware on the base station is very low. Still, remote communications can occasionally go wrong, and checks sometimes fail. Here are some practical steps to take to ensure the best likelihood of success.

- Until you gain confidence in the overall process, upgrade firmware locally at the base station, rather than remotely via a communications link.
- All communication links have occasional transmission errors. If a download fails before the activation process begins, then resetting the base station will clear all loaded files, and allow you to try again. The activation process does not begin until the files have been successfully transferred to the base station.
- Even if the CSS reports that something failed, do not panic. Restart the base station (if necessary) and use the download screen to see what is on the base station. You can try the download again, and if necessary use the 'Force download' option to force the files to be transferred again.

4 Issues Fixed

The following known issues and limitations, listed in the release notes for version 2.15, have been fixed in this release.

Headline	Tait Reference
CSS: Cryptic warning when another maintainer is connected	TIMS00055765
CSS: Programming configuration may fail	TIMS00054619

P25 Console Gateway

The P25 Console Gateway is now available. It is used for connecting analog dispatch equipment and can serve as an encryption and decryption point for secure communications between dispatcher and radio user. Its encryption capabilities are similar to those of Tait P25 mobiles and portables. Up to 16 encryption keys can be stored. DES encryption is supported by default. AES encryption is optionally available.

P25 Console Gateways have a 4-wire E & M analog line to connect to the console equipment and an Ethernet connection to connect to the channel group and the TaitNet P25 network. They can convert between MDC1200 and P25 signaling. They have no RF capability.

The P25 Console Gateway is available in the following hardware configurations:

- DC version with up to seven gateway modules. An external DC power supply is required.
- AC version with power management unit (PMU) and up to five gateway modules. The PMU can be powered by AC or by 12 V DC.

For information on working with P25 Console Gateways that have multiple gateway modules, see "Dual Channel and Other Options" on page 2.

Identifying Your Product

In version 2.26, the CSS can tell you what kind of channel module you are connected to. Select Monitor > Module Details > Reciter and view the Crypto module box.

Display	Description
Not fitted	You are connected to a base station reciter. A firmware crypto module is not present and cannot be loaded.
1.01	You are connected to a P25 Console Gateway. The display shows the version number of the firmware crypto module.

5 Compatibility

The following tables specify all compatible configurations for the P25 Console Gateway. A configuration is compatible if module firmware, module hardware, the CSS, and the calibration software have compatible versions. If changes are made to hardware or firmware, you need to check whether the new versions are compatible.

- Each row in the table identifies a compatible configuration.
- Each cell within a row contains the hardware, firmware, or software version number that is compatible with the other versions in the row. If a cell contains more than one version number, more than one version is compatible.
- Table footnotes indicate any restrictions imposed on a particular combination by the hardware, firmware, or CSS version.
- Any other combination is **not** compatible and not supported.

P25 Console Gateway	Calib s/w	CSS	Data-base	Network Board				Digital Board		PMU	
				F/w	Kernel	Crypto	H/w	F/w	H/w	F/w	H/w
2.26	3.04	2.26	2.26	2.26	2.10	1.01	00.01	2.26	00.06[a]	2.08	00.02 00.01

a. The P25 Console Gateway requires version 00.06. Hardware versions prior to 00.06 are crypto-denied.

Known Issues and Limitations

The following are known issues and limitations of version 2.26 of the TB9100 base station and the P25 Console Gateway.

Alarms: Some channel module alarms do nothing

The CSS displays a number of channel module (reciter or P25 Console Gateway) and system alarms. Some of these do not operate when they might be expected to. The alarms are:

- BER high
- Network board configuration invalid
- Network user traffic
- Network board comms failure (this alarm is not displayed, but is an input into Task Manager)

These faults are either meaningless, or occur seldom in practice.

Analog line: Cannot stop tone remote from keying the transmitter

Tait reference: TIMS00053125

The CSS Analog Line General screen allows the system designer to specify whether the channel group should transmit (channel seize) on an 'E' wire input from the line interface, or tone remote (low level guard tone), or both.

If the analog line receives low level guard tone, it seizes the channel, even if tone remote operation has not been enabled on the Analog Line General screen.

Work-around. If the dispatcher does not press PTT, the transmitter(s) will not be keyed.

Analog Line: Emergency Alert is only sent to dispatcher if line is a member of the destination talk group

Tait reference: TIMS00054116

The calling profile defines (among other things) how the analog line will unmute on P25 transmissions. If you set the calling profile to "selective squelch", the analog line will only unmute if the address in the received P25 matches the group or individual addresses specified in the calling profile. The emergency TSBK (normally sent to a group address) will behave the same way.

If you set the calling profile to "normal squelch," the analog line will ignore the P25 addressing (for a voice call) and unmute on any signal. However the emergency TSBK is still processed as if selective squelch was in effect - possibly leading to the analog line unmuting on speech, but not passing on the emergency TSBK.

Work-around: Set up calling profiles as if the analog line was using selective squelch. In other words, include all the groups the dispatcher wants to listen to in the group membership assigned to the calling profile.

Analog Line: M-wire output can miss line signaling

Tait reference: TIMS00055108

The analog line sends MDC1200 signaling, and audible warning tones to the line interface. The timing of the M-wire output may not be synchronized with the tones on the interface. If the dispatch system relies on the M-wire to indicate the presence of the tones, they may not be successfully received. The functions most likely affected are PTT ID information, and encryption warning tones (clear and mismatch tones).

Work-around: Many consoles can use a voice-operated switch (vox). If you experience this problem, turn the vox function on in your dispatcher.

Base station: CWID problems

Tait reference: TIMS00045562 TIMS00055710

Two problems with CWID have been identified.

1. If the base station is configured for automatic CWID and a call is in progress when a CWID is due for transmission, the call will be interrupted. If it is a dispatcher call, the dispatcher will not know that an interruption has occurred.

2. The Task Manager action ***Transmit CWID now*** is only effective if automatic mode is enabled in configuration (Configure > RF Interface > CWID).

Work-around: Enable automatic mode in the configuration and then use Task Manager to disable sending the CWID when needed (for example, when the base station is in a call), by using the ***Lock automatic CWID*** action. Set up Task Manager tasks that ***Unlock automatic CWID*** or ***Send CWID now*** under the right conditions.

Base station: External reference spurious alarms

Tait reference: TIMS00055739

The TB9100 allows the selection of 10 MHz or 12.8 MHz external reference. Using the CSS, you must configure the correct reference to be used. If you select the wrong reference, the base station gives spurious alarm indications including Reciter Power up failure and Synthesiser out of lock - as well as the correct alarm: External reference Invalid. The base station can also become unresponsive to the CSS, making it difficult to set the correct reference frequency.

Work-around: You should be able to read the configuration, correct it, and program it to the base station. If you are local to the base station, it may be easiest to disconnect the reference - the error handling is more stable when the external reference is absent.

Calibration: Balanced line calibration appears to fail

Tait reference: TIMS00057966

Sometimes when calibrating the analog line, the process displays a message such as:

> Calibration failed. The calibrated reading of the 1 Vpp input signal is currently 0.98 Vpp.

The message is spurious, unless the reading is outside the 0.95–1.05 Vpp range. It appears because the limits are set too narrowly in the calibration software. Since the warning only appears occasionally, you should simply try again. The calibration should succeed the next time you do it. If the calibrated voltage reading is consistently outside the 0.95–1.05 range, the module is faulty; send it to your Tait Service Center.

Control panel: Speaker only gives receiver audio

Tait reference: TIMS00054032

The control panel speaker has three modes of operation:

- Monitor the voter output
- Monitor the receiver
- Off

Under particular receiver settings, the speaker only monitors the receiver audio, and not the voter output. This does not allow the maintainer to have a conversation with people at other base stations in the channel group.

Work-around. Use an SU, or choose another mode of operation (such as P25).

CSS: Cannot set the location for configuration files

Tait reference: TIMS00054953

The CSS has a File Folders dialog which defines some of the file locations that the CSS will use. The file location for configuration files is currently ignored. If you ask to save or open a configuration file, the CSS presents you with the folder in which you most recently saved or opened a file.

Work-around: None. You should find that the 'most recently used' location works well most of the time.

CSS: CSS cannot connect (rare)

Tait reference: TIMS00050412

On very rare occasions, the network element does not allow the CSS to connect to it. If you ping the network element IP address, the element responds - it just does not accept a connection request from the CSS. The problem is that the CSS communication process on the network element gets into a state that will not accept CSS requests.

Work-around: It is possible to use SSH to remotely reset the state of the network element's CSS communication process. Contact your Tait technical support representative for details.

CSS: Limited operating system support

Tait reference: TIMS00051024

The current CSS will work correctly with the English version of the Windows XP Professional or Windows 2000 (SP4 or later) operating systems. However, there is a known problem with the German Windows XP. Problems could also be encountered if the CSS is installed on Windows versions for other languages.

Work-around: Install the CSS on PCs with the English version of Windows XP Professional or Windows 2000.

Diagnostics: 800 MHz base stations may display the wrong lock range

Tait reference: TIMS00054591

The Synthesizers form (Diagnose > RF Interface > Synthesizers) displays the lock ranges of the receiver and exciter. The 800 MHz base station has two exciter synthesisers, each covering a different band. The form shows the range of the synthesizer that was most recently calibrated. This may not be the synthesizer used by the current channel.

Diagnostics: Auxiliary supply test always 'good'

Tait reference: TIMS00050649

The auxiliary supply diagnostics test is always reported as good. The Toggle Output button has no effect on the actual auxiliary supply output or on the display of its state in the PMU Control Tests form.

Diagnostics: Problems with Log C4FM test

Tait reference: TIMS00046453 TIMS00049209

The Log C4FM test allows you to record raw C4FM data from the RF. You can compare it with the original data that was sent and verify the performance of the RF channel and base station receiver. This facility is currently not reliable. The base station may lock up, or may produce garbled output.

Work-around: You may still use the diagnostic. It is usually obvious whether it is working properly. Only run the test when you are local to the base station, so that you can reset it if needed.

Logging: Call information in channel group duplex mode

Tait reference: TIMS00055276

In duplex channel group operation, the CSS call statistics screen (Monitor > Data Logging > Call Statistics) only records statistics for inbound (SU to dispatcher) voice calls. Also, a call from an SU results in a double entry in the call log, if RF repeat is enabled.

Task Manager: Problem with the input 'NAC received'

Tait reference: TIMS00043683, TIMS00043680

There is a problem with the Task Manager processing of detected NACs. Following a transition to Run mode (e.g. on restart), Task Manager may not respond when the base station receives the NAC code.

Work-around: After going to Run mode, use a subscriber unit to transmit a NAC code other than the one which Task Manager is expecting. Task Manager will then recognize the expected NAC code.

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