
TB9100 base station

Release Notes



Base station version 1.23
TN-1067-SR
1 September 2005

This technical note contains information to accompany the 1.23 release of the TB9100 base station. This release delivers the following:

- Improved receiver performance, increasing the TB9100's ability to capture digital signals (including supplementary services), especially when the transmitter has a frequency offset or when conditions are noisy.
- Receive-only base stations and base stations for use with an external DC supply
- Repeat disable
- Network improvements
- Fixes for many issues

1 What's New in This Release

The TB9100 Base Station version 1.23 incorporates the following improvements:

Repeat function can be disabled

Those who do not want an all-informed system can now disable the TB9100's repeat function. The setting is in the calling profile, making it possible for the dispatcher to turn the repeat function on and off by changing calling profile. When repeat is disabled, the TB9100 does not transmit the signal received on its RF interface.

New base station options

The TB9100 base station can be supplied with a 12 V PA, for use with an external DC supply.

A receive-only base station is also available; it has no PA.

Configurable jitter buffer

The transmitter's jitter buffer is now configurable so that you can minimize buffer underflows while adding no more initial delay than is necessary. The CSS can monitor buffer underflows to help you configure the buffer correctly.

Voter information

You can now monitor the information that the voter uses to make its decisions. This is useful when troubleshooting call problems.

Improved Supplementary Services Reliability

The reliability of receiving supplementary service messages (TSBKs), even when the sending subscriber unit has an offset frequency, has been improved. You can now expect supplementary services to perform under adverse signal conditions. TSBK re-tries and acknowledgements minimize the consequences of an occasional failure to achieve frame synchronization.

Channel scanning now supported

Task Manager can now instruct a standalone TB9100 base station to scan several different frequencies, stopping if it recognizes a signal. The channel can be changed up to once every 350 ms. The CSS manual and online Help provide an example set of Task Manager statements.

New configuration items

Version 1.23 adds the following items to the base station's configuration database. If you are upgrading to this version, check that the defaults are compatible with your system and if necessary change them.

Item	Default	Description of Default Setting
RF repeat	Enabled	Specifies that the TB9100 functions as a repeater.
Squelch	Normal	Switches all vote-winning voice streams onto the analog line
Jitter Buffer/Initial Delay	0 ^a ms	The transmitter does not wait for the buffer to store packets before beginning to transmit. (This default setting needs altering for networked base stations. Routed networks require a jitter buffer of 50-60 ms and switched networks 20-30 ms. See the online Help for details.)

- a. The default jitter buffer setting reduces the delay by 60 ms compared with previous TB9100 versions.

The CSS connection list now displays an entry for default base stations (these have the IP address 192.168.1.2). This makes it easier to connect with new base stations. However, those upgrading from earlier versions may want to add this entry manually; upgrading does not overwrite any existing connection list.

2 Compatibility

The following table specifies all compatible configurations of the TB9100 base station and the related software. A configuration is compatible if a base station, the CSS, and the calibration software have compatible versions. If changes are made to the hardware or firmware of a base station, you need to check whether the hardware and firmware versions of the individual modules are compatible.

- Each row in the table identifies a compatible base station 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	Module Hardware					Module Firmware			
				Digital Board	Network Board	PMU	PA	Control Panel	Digital Board	N/W board	PMU	PA
1.23	2.07	1.23	2.11	00.03	00.01 ^a 00.00	00.01	00.01	TBA2020	1.23	1.23	2.08	2.07
1.16	2.05	1.16	2.10	00.03	00.00	00.01	00.01	TBA2020	1.09	1.07	2.07	2.07
1.15	2.05	1.15	2.10	00.03	00.00	00.01	00.01	TBA2020	1.09	1.07	2.06	2.05
1.14	2.05	1.12	2.10	00.03	00.00	00.01	00.01	TBA2020	1.07	1.06	2.06	2.05
01.02	2.03	01.01	02.08	00.03	00.00	00.01	00.01	TBA2020	01.02 ^b	01.02 ^b	02.03	02.03

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

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

3 Upgrading to Version 1.23

If you are upgrading an existing system to version 1.23, follow these steps.

1. Install the version 1.23 CSS software from the product CD. You can install it alongside any existing versions of the CSS.
2. Upgrade each base station in turn as follows.
(For additional details, see [“Safe practices for firmware download” on page 5](#) and the CSS Help or manual.)
 - a. Connect to the base station.

Important Make sure that you have saved a copy of the current base station configuration before upgrading the firmware. If the

firmware download doesn't complete successfully and must be repeated, you will need to restore the configuration from the backup copy.

- b. Select Tools > Firmware Download. The CSS downloads the new firmware. When this is completed, the base station takes itself out of service and activates the new firmware. The configuration data is restored and new data items (with default settings) are added to it.
- c. In these Release Notes, check the information about the new data items (see [“New configuration items” on page 3](#)) to make sure that their default settings suit your system. If necessary, change them.
- d. Save the new configuration data to a file, so that you have a backup.

Safe practices for firmware download

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.

- Always make sure that you have saved a copy of the base station configuration data before beginning a firmware download.
- 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. Repeating the download generally results in the loss of configuration data, so that you will need to manually restore the configuration.

3 Issues Fixed

The following known issues and limitations, listed in the release notes for version 01.16, have been fixed in this release.

Headline	Tait Reference
Analog line: Multi-console re-voting is not supported	TIMS00041866
Base station: Frequency stability	TIMS00047212
Base station: Limited digital inputs and outputs	TIMS00034777, TIMS00038599, TIMS00040119, TIMS00042205
Base station: TB9100 is always a repeater	TIMS00045642
Calibration: Cannot open serial port	TIMS00046082
Calibration: Correct tuning hole is not obvious	TIMS00045304
Configuration: Receiver analog muting enhancements intended	TIMS00030377
CSS: Internet Explorer version 5.50 is required	TIMS00043255
CSS: Password request on first connection	TIMS00046232
Firmware download: Cancel doesn't stop the download	TIMS00046592
Firmware download: 'Fail' message on DC power supply	TIMS00033419, TIMS00042738
Network: Setting QoS	TIMS00033691, TIMS00036859
Receiver: Limited frequency offset in supplementary service messages	TIMS00041098
Receiver: Mute chatter can cause an overload	TIMS00049110
Receiver: Poor sensitivity after calibration	TIMS00044731
System: Recommended subscriber unit preamble	TIMS00047870
Task Manager: Problems implementing channel scanning	TIMS00045047, TIMS00045053
(Other issues)	TIMS00038985 TIMS00043594 TIMS00044142

4 Known Issues and Limitations

Analog line: MDC 1200 product-specific variations

Tait reference:
TIMS00043248

Contact Tait Electronics Ltd. for details of compatibility information with your MDC 1200 console.

Analog line: Dispatcher must re-start call after losing vote

Tait reference:
TIMS00050462

If the analog line loses the vote to the control panel microphone, the base station will not start handling the dispatcher's call once the control panel microphone PTT is released. The analog line call is only recognized at the start of the call (E-wire or function tone).

Work-around: If the maintainer interrupts a dispatcher call, the dispatcher must release PTT and then press it again before the dispatcher can speak again.

Analog line: Transient signals

Tait reference:
TIMS00050156

The TB9100 has dual analog and digital RF receiver paths. As a result, the base station receiver can detect brief analog FM transients at the start or end of a P25 call. These are visible on the analog line monitoring screen as Analog valid and M-wire indications.

Work-around: Tait recommends that systems with dual-mode base stations use analog selective squelch (PL / DPL - CTCSS / DCS).

Base Station: Blank IP Address and hostname

Tait reference:
TIMS00050617

This problem is normally seen after a firmware download and upgrade. The base station reports a blank IP address and hostname to the CSS. The base station still has a valid IP address and hostname, it simply reports blank if the CSS tries to read the configuration data.

Work-around: Reprogram a valid configuration: make sure that its IP and hostname are properly set, program the data, and then reset the base station.

Base station: CSS cannot connect (rare)

Tait reference:
TIMS00050412

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

Work-around: It is possible to use telnet to reset the state of the CSS communication process. Contact your Tait technical support representative for details.

Base station: CWID transmissions override calls

Tait reference:
TIMS00045562

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.

Work-around: A future release will allow automatic CWID transmissions to be held off until the Tx tail.

Base Station: External frequency reference problems

Tait reference:
TIMS00044470

A number of problems have been observed with the external frequency reference, for example when the external frequency reference is removed or lost.

Work-around: Use the base station's internal frequency reference. There is no need to connect an external frequency reference for conventional UHF and VHF operation on the currently supported frequency bands. The internal reference source is more than sufficiently accurate for these purposes.

Calibration Software: Receive-only reciter appears as standard

Tait reference:
TIMS00050365

The calibration software can display details about the currently selected module. It always reports the reciter type as standard, even when it is receive only.

The calibration functionality is shared with the TB8100 - but the TB8100 and TB9100 implement the receive-only function differently. The TB8100 receive-only reciter is a hardware variant, with no transmit capability. It does not make sense to calibrate the transmitter. The TB9100 receive-only functionality is determined by a SFE license (Transmit Enable). The transmitter circuitry is fully capable, and can be calibrated.

Work - around: Ignore the reciter module type setting. You may calibrate the transmitter of a receive-only reciter if you wish.

Diagnostics: Caution needed with transmission test

Tait reference:
TIMS00038765

The transmission test does not default to the currently configured frequency and power. If you start a transmission test without setting these parameters, you might transmit at full power on someone else's frequency.

Work-around: Always check the transmitted frequency and power before running the test.

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.

Firmware Upgrade: Spurious errors

Tait reference:
TIMS00050581

The TB9100 has a firmware supervision process whose purpose is to detect any other processes which have failed. At the end of a firmware upgrade, when the firmware is being activated, the supervision process determines that the base station isn't processing speech signals, (incorrectly) concluding that the speech transport process is faulty and must be restarted. As a result, the base station system log contains messages of the form:

```
2005-08-30T03:06:46Z 172.16.16.4 ASF_4_MCNTL: 1125371206.430, Process 1260 died abruptly!
```

Work-around: These messages are spurious, and can be safely ignored.

Logging: Call attempts are logged as calls when in Standby mode

Tait reference:
TIMS00045125

If the base station is in Standby mode, any calls arriving at the RF or line interfaces are recorded as actual calls, even though the calls are not actually transmitted.

Work-around: Minimize the time that the base station is in Standby mode.

Logging: Trace log display hard to understand

Tait reference:
TIMS00044108

The Trace log contains Tait-internal messages that are intended for use by designers. Maintainers may find that reading the log is slow, and the results hard to interpret.

Work-around: View the System log instead of the Trace log. If a problem is particularly difficult to diagnose, Tait staff may ask you to look at the Trace log or save it to file and send it to Tait.

Monitoring: Display misleading when transmitter not enabled

Tait reference: TIMS00050151
A receive-only base station PA may falsely display indications that the base station is transmitting, even though it cannot transmit. The CSS does not disable the transmitter monitoring display.

Network: VoIP availability

Tait reference: TIMS00043594
Multi-site Voice-over IP (VoIP) is functional in this release, but is not generally available. Please contact Tait to find out whether the VoIP facility can be used in your network.

Network: Gateway address may need configuring

Tait reference: TIMS00044306
At present, the base station uses Proxy ARP (RFC 1027) to find out which host on the LAN will forward packets destined for the network. The routers recommended by Tait support this protocol. Some networks may use different routers, or not use a local router at all. In these circumstances, it is necessary to set a gateway address in the base station. Tait's intention is to make the gateway address configurable in the CSS in a future release.

Work-around: If the network does not support the use of the Proxy ARP protocol, contact Tait for advice or assistance in setting up the gateway address.

Network: QoS alarms don't trigger actions

Tait reference: TIMS00044142
Although it is possible to program Task Manager with actions that respond to the QoS jitter and QoS lost packets alarms, Task Manager does not currently respond to those inputs.

Work-around: You can find out that the alarms are occurring by looking in the system log. At present, it is not possible to program the base station to respond in real time to these events.

PMU: Fan is not checked at start-up

Tait reference: TIMS00044738
While the PA and reciter fans are checked at start-up, the PMU fan is not. These checks turn the fan on briefly so that the control firmware can determine whether the fan is rotating. In the absence of such a check, the control firmware can only determine that the fan has failed once the PMU is hot enough to turn the fan on. This gives no warning before the PMU detects over-temperature and reduces its power output, which effectively disables the transmitter.

Work-around: Tait recommends that base station maintainers perform a PMU fan test from time to time.

Receiver: DPL decoder delay can lose speech

Tait reference:
TIMS00045587

In analog mode, Digital Private Line signaling (also known as DCS) allows the base station to reject channel noise — and to only repeat signals with the correct embedded code. In combination with a slow subscriber unit decoder, the delay can cause the first half-second of speech in a transmission to be lost.

Work-around: Use Private Line/CTCSS instead. This currently has a faster decode time.

Task Manager: No response to digital input 4

Tait reference:
TIMS00050273

Task Manager does not respond to changes in the status of digital input 4.

Work-around: If possible, use one of the other four digital inputs to trigger Task Manager actions.

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.

Transmitter - Analog FM: Over-deviation limiter may constrain deviation

Tait reference:
TIMS00031363

An overload test input will cause a transmitter deviation of only 80 percent of full system deviation.

Work-around: Normal FM signals are not affected.

5 Issuing Authority

This TN was issued by: Kurt Ebrecht
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