

TCG 01, TCG 01-E and TCG 02-E Rev D Hardware

Firmware Release Notes

VERSION D:10.13 (E:1.13) - 15/03/13

- Same version as D: 10.12. Created a duplicate to be able to test upgrade functionality.

VERSION D:10.12 (E:1.12) - 23/08/12

- **Improvement:** Added sanity checks on incoming time from GPS to combat occasional repeat of same time. These messages caused the IRIG-B outputs to repeat time.
- **Bug Fix:** Corrected the operation of sync relay when "suppress out of sync indications" is selected. The sync relay now continues to reflect actual sync condition and while other indications (LED's and outputs) all report as if in sync.

VERSION D:10.11 (E:1.11) - 08/11/11

- **Bug Fix:** Changed algorithm which caused a second to be added to the time when the antenna was disconnected.

VERSION D:10.10 (E:1.10) - 12/08/11

- **Improvement:** Shifted response to event recording output requests to an async hi-speed response instead of only at the 400ms point in the second.
- **Bug Fix:** Corrected "IRIG-B input monitoring" function which could not be turned off after being switched on.

VERSION D:10.09 (E:1.09) - 27/04/11

- **Improvement:** Configuration changes using either the Ethernet or serial software now result in a localised "Warm Start", rather than a full clock reset.
- **Improvement:** Supports full reset via either RCM or serial tool.

VERSION D:10.08 (E:1.08) - Not released

- **Improvement:** Added GPS status into data reported in C9 message to Mother from RCM. This was to ensure that rogue timing from GPS receiver does not prevent info getting to Mother during startup phase (out of sync).
- **Improvement:** Defined flags for signalling alarms from Mother to RCM.
- **Improvement:** Changed hold-over to use GPS pulses for timing if GPS has previously been in full position hold.

VERSION D:10.07 (E:1.07) - 8/06/10

- **Bug Fix:** Created when "improving" the epoch checks in interrupt routines for all timing inputs. New checks implemented on full count between epochs. Bug caused glitches in IRIG-B sync detection.

VERSION D:10.02 (E:1.02) to D:10.06 (E:1.06) - Not released

- **Improvement:** Added Serial Time String G.
- **Improvement:** Rearranged Display control to allow for different OEM brand indications on display and in the configuration software.

VERSION D:10.01 (E:1.01) - Not released

- **Improvement:** PTP slave function now operative. This state is signalled by both front panel LED's flashing long on, short off.
- **Improvement:** Removed day-of-week from base IRIG-B code - now only appears if AFNOR S87-500 extensions are selected.
- **Bug Fix:** 8 min periodic "bump in secs value around the minute rollover caused by leap status poll (introduced in D9 Build 11).

VERSION D:9.011 (E:9.011) - Not released

- **Improvement:** This version supports "E" series operation for TCG 01-E, TCG 02-E Rev D hardware.
- **Improvement:** Automatic support for three IRIG-B inputs.
- **Improvement:** SYN led function is replaced by "IRG" LED function and action of LED's is changed.
- **Improvement:** Improved IRIG-B input syncing function provides sync within 3 secs.
- **Improvement:** Revamped interrupt code on PPS and TC7 interrupts to match algorithm developed for TTM01E (PTP).

VERSION D:9.010 - 14/05/09

- **Improvement:** Added support for new backlit LCD display.

VERSION D:9.009 - 14/01/09

- **Improvement:** Changed Leap second update routine to do the update even if unit started after the leap second event.
- **Improvement:** Introduced automatic output suppression at start-up until sync first obtained (4 satellites required).

VERSION D:9.008 - 20/09/08

- **Improvement:** Added initial code for PTP.
- **Improvement:** Strengthened firmware boot loader.

VERSION D:9.007 - 18/06/08

- **Improvement:** Added preliminary support for Ethernet configuration (via S1 serial port from NTS module).

VERSION D:9.006 - 21/04/08

- **Improvement:** Changed IEEE1344/ C37.118 quality indicators to reflect performance improvements (0<T=<10)-->0, (10<T=<45) -->3, (45<T=<600) -->4, (600<T=<1800) -->5, (>1800) -->6.

VERSION D:9.005 - 01/04/08

- **Improvement:** 09.004 caused loss of pulse polarity detection at start up. Fixed by changing detection to take place only when good pulse count is valid.

VERSION D:9.004 - Not released

- **Improvement:** Introduced GPS receiver PPS sanity check.
- **Bug Fix:** Corrected rare loss of frame - due to receiver misplacing pulse occasionally.

VERSION D:9.003 - 17/03/08

- **Bug Fix:** Corrected very occasional loss of start bit of IRIG-B frame due to new error compensation algorithm implementation failing to correct -ve errors properly. The error was introduced in D08.004.

VERSION D:9.002 - 29/02/08

- **Bug Fix:** Corrected time jump lasting 14 seconds every modulo 65536 seconds commencing 00:00:00 Sunday each week.

VERSION D:9.001 - 08/01/08

- **Improvement:** Changed the time offset sign (Indicates offset from UTC) in IEEE1344/ C37.118 Extensions in accordance with specification amendment.

VERSION D:9.000 - 03/01/2008

- **Improvement:** Introduced field upgradeable firmware.
- **Bug Fix:** Revisited 31 December issue - now tested over all transitions 1980 - 2040.

VERSION D:8.004 – Not Released

- **Improvement:** New error compensation algorithm for more even distribution of error correction through second on IRIG-B code.

VERSION D:8.003 - 26/11/07

- **Improvement:** Introduced safeguard to avoid GPS receiver commands from being confused.
- **Bug Fix:** Corrected 31 December issue - bad date / DoY when using specific GPS receiver versions.
- **Bug Fix:** String outputs are now inhibited when option to suppress outputs when out of sync is activated.

VERSION D:8.002 - 10/05/07

- **Improvement:** Opening Display change to show build number.
- **Improvement:** Added check for presence of PPS - inhibit sync if not present.
- **Bug Fix:** Floating point bugs caused time discontinuity 00:01:57 am Sunday UTC and issue with EOY rollover – in clocks with type B receivers.

VERSION D:8.000 - 10/01/07

- **Improvement:** Serial Strings GPZDA and GPRMC.
- **Improvement:** Option for NTS to output local time *** Feature is factory configurable only***.
- **Improvement:** Strengthened sanity checking on incoming GPS messages.
- **Improvement:** Increased immunity to interference on TTL serial lines from GPS receiver.
- **Bug Fix:** Serial traffic into MPU from GPS could be disrupted momentarily on type B receivers units during the 1PPS pulse to NTS.

VERSION D:7.000 - 07/09/06

- **Improvement:** Introduced auto-sensing of PPS polarity from GPS to allow for latest type B receiver interface board.
- **Improvement:** Introduces a new sync initialisation process which requires leap second info to be present before new Type A receiver will indicate sync.

VERSION D:6.000 - 08/05/06

VERSION D:5.000 - 21/03/06

- **Improvement:** Improved IRIG-B slave operation to remove distortion caused by momentary IRIG-B source discontinuity.
- **Improvement:** Modified configuration protocol to handle all-messages instead of breaks. (Breaks still work).
- **Bug Fix:** Corrected lock up issue which occurred upon receipt of unknown Type B receiver super packets

VERSION D:4.000 - 13/12/05

- **Improvement:** Changed start-up UTC secs offset parameter to 14 secs on 16 Jan 2006.
- **Improvement:** Master/Slave functionality.
- **Improvement:** Added support for new GPS messages from Type B GPS receivers (Includes single precision floating point support).
- **Bug Fix:** 11:59pm time discontinuity bug: 23:58:59 00:00:00 23:59:01 anomaly caused by un-flagged assembler syntax change.
- **Bug Fix:** Leap second handling modified due to the change from Type A to Type B receiver and the change in messaging.

VERSION D:3.000 - 21/04/05

- **Improvement:** Changed input 1PPS operation to be permanently on, and use GPS status messages to determine whether or not to ignore pulses.
- **Improvement:** Changes to tuning functionality to cater for non-tuneable XO.

VERSION D:2.000 - 01/04/05

- **Improvement:** Improved algorithm for 1 KHz sine wave generation.
- **Improvement:** Added ability to adjust LCD display angle.

VERSION D:1.000 - 30/11/04

- **Improvement:** Added event recording functionality.