

The National Emergency Number Association (NENA) defines a standard for Master Clock systems used in Public Safety Answering Point (PSAP) 911 call centers. For a copy of these standards see <http://www.nena.org>. Masterclock® can provide Master Clock systems that conform in all major respects to these standards.

The Masterclock® NENA-911 system is built from standard Masterclock® components used throughout the world. The NENA specified IRIG time codes and RS-232 data streams are generated by a TCI-500 time code interface unit with the part number TCI500-NENA.

Listed below are the major components of the NENA standards showing our compliance and exceptions.

Basic Requirements

Compliance

Time traceable to UTC and accurate to within 100ms	Exceeded [by GPS-200 component]
Free run time drift < 1000ms/day	Exceeded (worst-case 86ms/day) [by GPS-200 component]
IRIG time code output	Met [by TCI-500 component]
ASCII time string output	Met [by TCI-500 component]
Time zone and daylight savings time adjustment	Exceeded [by TCI-500 component]
Indicates locked/synchronized and unlocked/unsynchronized	Met [by GPS-200 component]
Alarm dry contact closure upon power or time synchronization loss	Met [by TCI-500 component]

1 & 2. Accuracy

Specification is met and exceeded by the product

3. IRIG Time Code Output

Specification which calls for the below-listed configurable time code outputs are met with several exceptions.

IRIG-B modulated IRIG-B pulse-width encoded IRIG-E modulated IRIG-E pulse-width encoded	Any one of the IRIG B or E time codes can be selected at a given time. If multiple simultaneous outputs of the two different time codes are required then a second TCI-500/NENA can be installed in the system.
Modulated mark-to space ratio specification.	Complies
Pulse-width encoded logic high and low specification.	Complies
Optionally supports "signature control"	Complies

Time zone offsets, -11 to +12 hours in 1/2 hour increments.	Complies
Supports automatic daylight savings time adjustment.	Complies
NENA-defined time source status and BCD year extended encoding.	Complies
Adjustable time code signal level outputs	not supported - outputs are fixed at 5 volts peak-to-peak
Output connector	Complies (DB9 to BNC adapter is supplied)

4. RS-232 ASCII Output String

The specification is met with the exception of the TZ=?? Section of the ASCII string and the bi-directional serial port.

Bi-directional (output on request) is not implemented on a separate serial port.

The single serial port can be switched between broadcast and bi-directional mode.

The published specification is incomplete in that it does not specify how the bi-directional serial port is to be interrogated.

In bi-directional mode the receipt of a <CR> (carriage return) character will instruct the system to immediately respond with the ASCII time string.

Baud Rate

Baud rates for the ASCII input/output are available at 9600, 4800, 2400, and 1200. The line configuration is 8 data bits, 1 start bit, 1 stop bit, and no parity.

5 & 6. Time zone and daylight savings time adjustment

The published specification is incomplete in that it does not specify how the time zone (TZ) offset is to be specified.

The 00-23 range specified by NENA is mapped as follows: -11 hour offset=0, +12 hour offset= 23, etc.

Specification is met by TCD-200 clock.

Adjustable time/date display

GPS-200 Master Clock generator should be placed in SMPTE time code generation mode to drive TCI-500 and TCD-200. TCD-200 will display time or date info from the SMPTE data stream.

Automatic daylight savings time - display

TCD-200 provides time zone and/or automatic daylight savings time on display. It should be driven by UTC-referenced SMPTE time code from GPS-200.

Automatic daylight savings time - IRIG B & E outputs

TCI-500 provides time zone and/or automatic daylight savings time adjustments on time code output (IRIG-B or IRIG-E). It should be driven by UTC-referenced SMPTE time code from GPS-200.

Implementation

Components: GPS-200, TCI-500 (w/ NENA firmware and relay modification), and TCD200 in RM-4 rack configuration. GPS-200 configured for SMPTE 30 frames/second UTC- referenced time code output.

TCI-500 and TCD-200 to be driven by GPS-200

TCI-500 configured for SMPTE time code input and IRIG-B modulated output with no time zone or daylight savings time offsets. To be configured at ship time per customer requirement or by customer.

TCD-200 configured for SMPTE time code with no time zone or daylight savings time offsets. To be configured at ship time per customer requirement or by customer.

Recommend that the customer does not change GPS-200 configuration or TCI-500 time code input configuration.