



1 Introduction

The GE MDS TD220X base radio can operate with either of two timing input methods:

1. From a Global Positioning System (GPS) receiver or
2. Via Precision Time Protocol (IEEE 1588 v2) from a remote PTP Grandmaster.

For the first method there is motivation to use consumer-grade GPS receivers to supply timing to the TD220X radio system due to lower cost vs. industrial-grade options. This can be problematic, however, because some of these devices either do not hold accurate timing during temporary GPS reception dips, or even worse, supply corrupted timing during or after dips.

There are better GPS-disciplined timing options that can be used that include an ovenized oscillator (OCXO) to operate through outages. This application note describes how to use the GPS-disciplined Spectracom SecureSync with 1 PPS and ASCII output option to supply timing to the TD220X radio via the GPS method.

2 Setup

The basic block diagram of the timing setup is shown below.

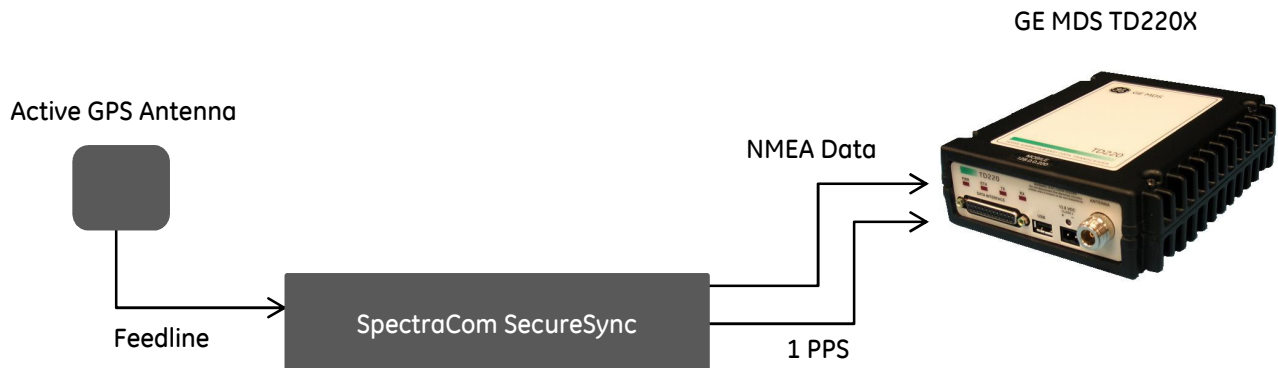


Figure 1. Block Diagram

To configure the Spectracom SecureSync, follow the manufacturer's documentation and include the ASCII RS-232 Timecode output setup as shown below.

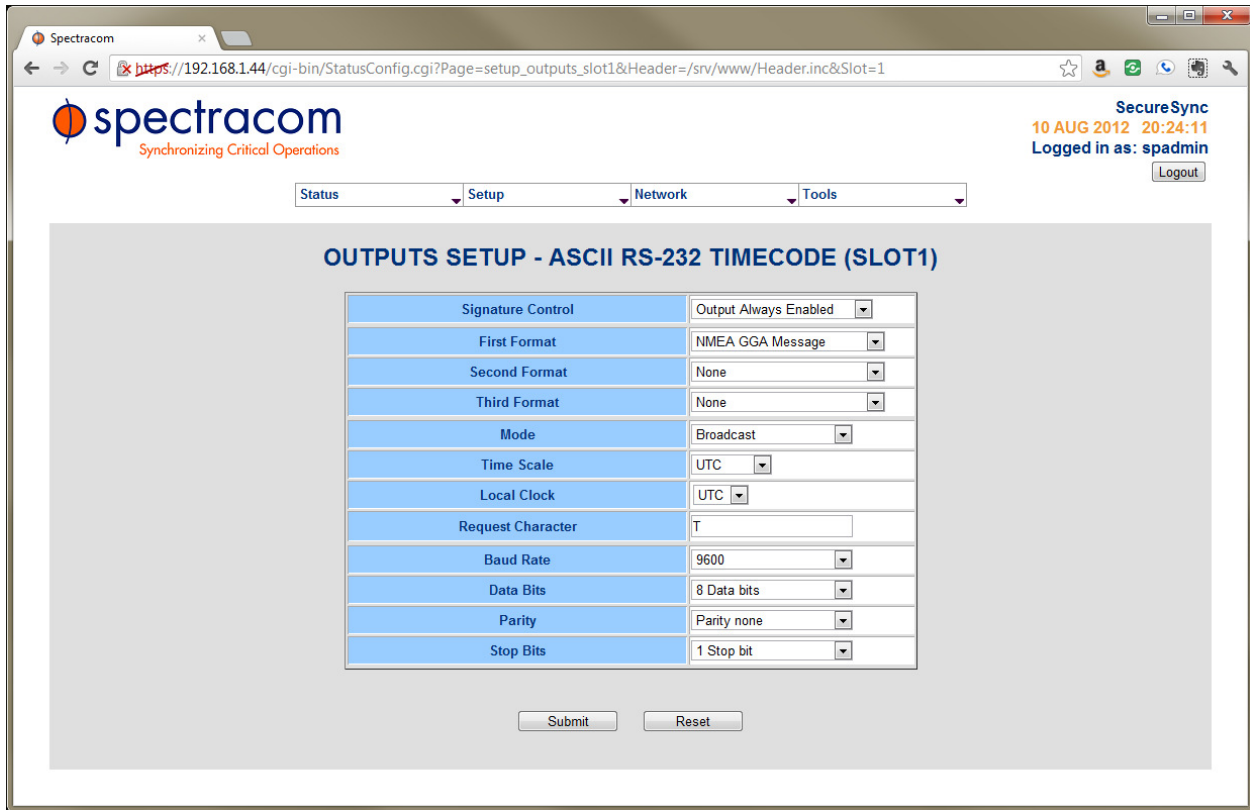


Figure 2. SecureSync ASCII Setup

Upon completing this configuration, a terminal program can be used to verify that the NMEA data is output from the ASCII output J1 connector as shown below.

```
$GPGGA,203633.00,4307.085,N,07736.679,W,1,03,,173.0,M,,,*02
$GPGGA,203634.00,4307.085,N,07736.679,W,1,03,,173.0,M,,,*05
$GPGGA,203635.00,4307.085,N,07736.679,W,1,03,,173.0,M,,,*04
$GPGGA,203636.00,4307.085,N,07736.679,W,1,03,,173.0,M,,,*07
$GPGGA,203637.00,4307.085,N,07736.679,W,1,03,,173.0,M,,,*06
$GPGGA,203638.00,4307.085,N,07736.679,W,1,03,,173.0,M,,,*09
```

Figure 3. ASCII NMEA Output

Once this is verified, proceed to connect this output to the COM2 port of the GE MDS TD220X. Both the SecureSync and the TD220X act as DCE, so the RXD line (J1-Pin 3) from the SecureSync should be input to TXD (DB-25-Pin 2) of the TD220X. A ground return must also be connected between the two units (SecureSync J1-Pin 5 to TD220X DB-25-Pin 7).

To supply 1 PPS from the SecureSync to the TD220X, connect the center of the 1 PPS out jack on the rear of the SecureSync to pin 23 of the DB-25 connector of the TD220X. Care must be taken to avoid a ground loop which could pick up RF energy and couple it into the devices, so consider using only the serial port return or the 1 PPS return on the SecureSync but not both. The return bus within the TD220X is connected for both the Serial input and the 1 PPS input.

Once both NMEA data and 1 PPS are supplied to the TD220X, the alarms will clear, the power LED on the radio will extinguish, and the unit will begin sending automatic beacons if configured.

3 Conclusion

This application note describes how to use the Spectracom SecureSync with the ASCII RS-232 Timecode option to supply timing to the GE MDS TD220X radio. With a configuration like this, where the GPS timing is backed up by an ovenized oscillator, radio network timing is stable