

TECHNICAL NOTE

Multiple Satellite Time Reference (STR) Units Can Share a Single GPS Antenna

Summary

When applying two or more STR-100 Satellite Time Reference modules, it is often desirable for them to share a single time reference signal from one GPS antenna. This not only eliminates the cost of the additional antenna hardware itself; it also avoids cutting additional holes in the building's roof to gain cable access.

This technical note describes the required connections to take advantage of a single antenna without compromising system performance.

It is possible to connect multiple STR-100 Satellite Time Reference modules to a single Trimble Acutime Gold smart antenna.

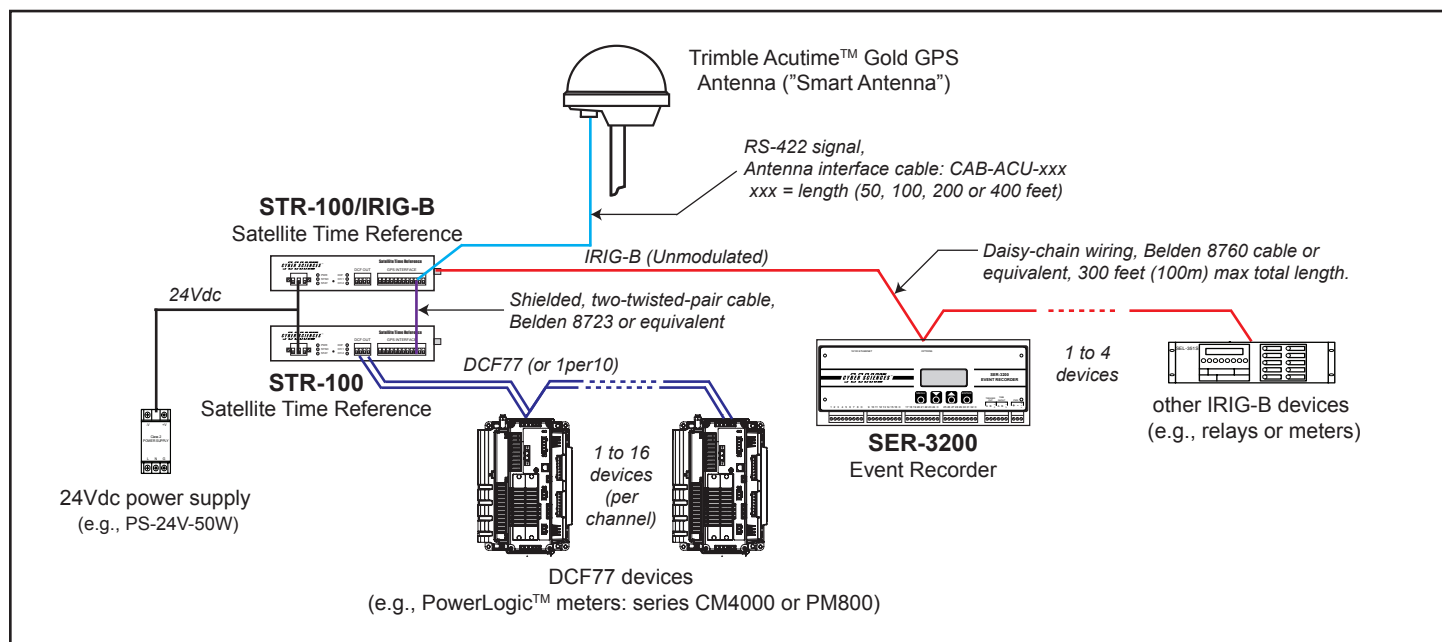
Introduction

Connecting multiple STR modules to a single GPS antenna can be useful to simplify wiring and reduce costs. A typical scenario is when two different STR models are used to provide different types of time reference signals required by the application. An example of this would be the use of a base model STR-100 to provide DCF77 outputs and an STR-100/IRIG-B to provide IRIG-B outputs. See the system architecture drawing below.

Normal STR-to-Antenna Wiring

The STR module communicates with the Trimble Acutime™ Gold smart antenna through a 12-conductor cable containing two bidirectional RS-422-compatible channels and a single RS-422 one pulse-per-second (1 PPS) signal. The STR also provides power to the antenna through another pair of conductors. In order to connect multiple STR modules to a single antenna, one STR is designated as the master and is con-

SYSTEM ARCHITECTURE



System architecture: multiple STR modules share a single antenna.

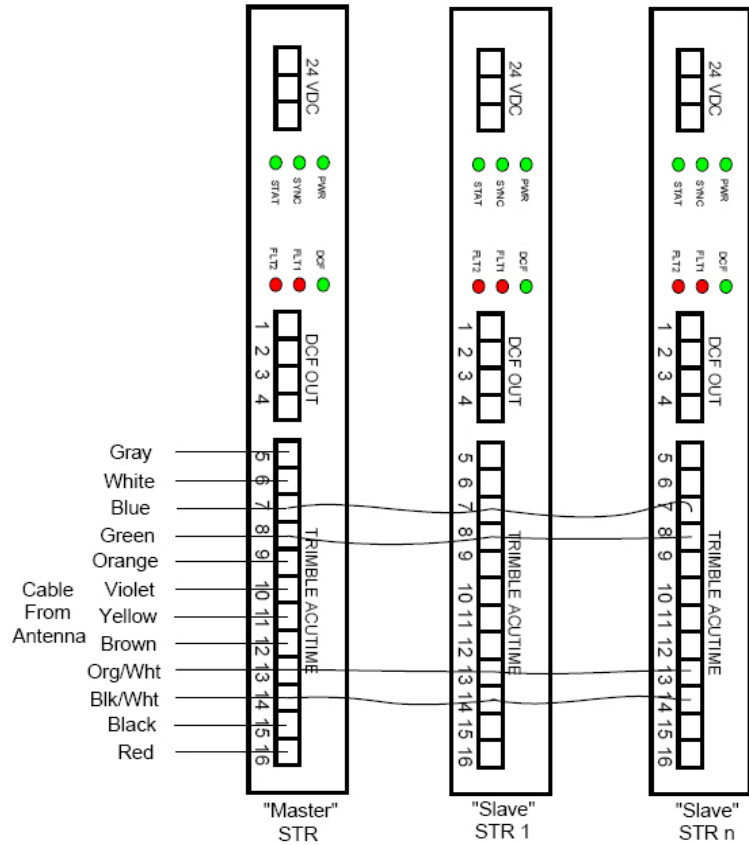
connected normally (as shown in the STR instruction bulletin), and additional STR units may be connected by “daisy-chaining” four of the 12 conductors from the master unit to each of the slaves. The master unit is the only unit capable of configuring the antenna, and also provides power to the antenna. Cyber Sciences recommends up to four units (one master and three slaves) be connected in this fashion. Each STR can be independently configured for non-antenna related parameters, but only the master unit will be able to configure the antenna.

WIRING

Wiring Connections

The figure below shows the connections necessary to connect one STR as a master and one or more STR modules as slaves. Note that it is not necessary to use the same 12-conductor antenna interface cable between units. Use of shielded, two-twisted pair cable (Belden 8723, or equivalent) is recommended. In addition, it is recommended that the distance between modules be kept as short as practical.

Note: In fact, up to 16 STRs can be connected to a single Acutime antenna output; however, as a practical consideration, best design practice is to limit the number to 4 or less per antenna. This makes system testing easier, facilitates troubleshooting, and increases overall system reliability.



Connections for multiple STR modules to a single antenna.

For More Information
 STR Instruction Bulletin (IB-STR-01)
 Trimble Acutime Gold Antenna User Manual

Special Considerations

All menu and configuration screens on the slave units will work normally, but only the STR designated as the master is able to communicate with and configure the antenna (the slaves only “listen”). Therefore, any attempt to check the antenna status via a slave unit’s serial port will result in an error message.

Doc. no: TN-105R2
 Jan-2011

Cyber Sciences, Inc. USA