Time Sync

1588-PTP Grandmasters - P2P and E2E on the same network

Technical Application Note

A-TSM

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1. PREFACE

1.1. PURPOSE OF THIS DOCUMENT

This document will assist the user to setup 1588 PTP End-to-End and Peer-to-Peer Grandmasters on the same network using Aparian's Time Sync Module.

1.2. ADDITIONAL INFORMATION

The following resources contain additional information that can assist the user with the module installation and operation.

Resource	Link
Slate Installation	http://www.aparian.com/software/slate
Time Sync User Manual Time Sync Datasheet Example Code & UDTs	http://www.aparian.com/products/timesync
Ethernet wiring standard	www.cisco.com/c/en/us/td/docs/video/cds/cde/cde205_220_420/installation/guide/cde205_220_420_hig/Connectors.html
GPS information	https://www.u-blox.com/images/stories/the_gps_dictionary.pdf
1588 Precision Time Protocol (PTP)	http://www.ieee1588.com/
Network Time Protocol (NTP)	http://www.ntp.org/documentation.html
CIPSync	https://www.odva.org/Home/ODVATECHNOLOGIES/CIP/CIPTechnologyOverview/CIPSync.aspx

1.3. SUPPORT

Technical support will be provided via the Web (in the form of user manuals, FAQ, datasheets etc.) to assist with installation, operation, and diagnostics.

For additional support the user can use either of the following:

Contact Us web link	https://www.prosoft-technology.com/Services-Support/Customer-Support
Support email	support@prosoft-technology.com

2. APPLICATION DESCRIPTION

The Aparian Time Sync Module can be configured to become a 1588 PTP Grandmaster if sufficient GPS satellites are locked. The Time Sync Module can also be configured to use either Peer-to-Peer (P2P) or End-to-End (E2E) delay mechanism on the 1588 PTP network. Certain devices on the PTP network may support E2E delay mechanism while other on the same network may support P2P delay mechanism. To allow both delay mechanisms to coexist with GPS Grandmasters, at least two Time Sync Modules need to be used each supporting the respective delay mechanism and setup with different PTP domain numbers.

Below is an example of how two separate Time Sync modules can be configured to support both P2P and E2E delay mechanisms on the same 1588 PTP network.

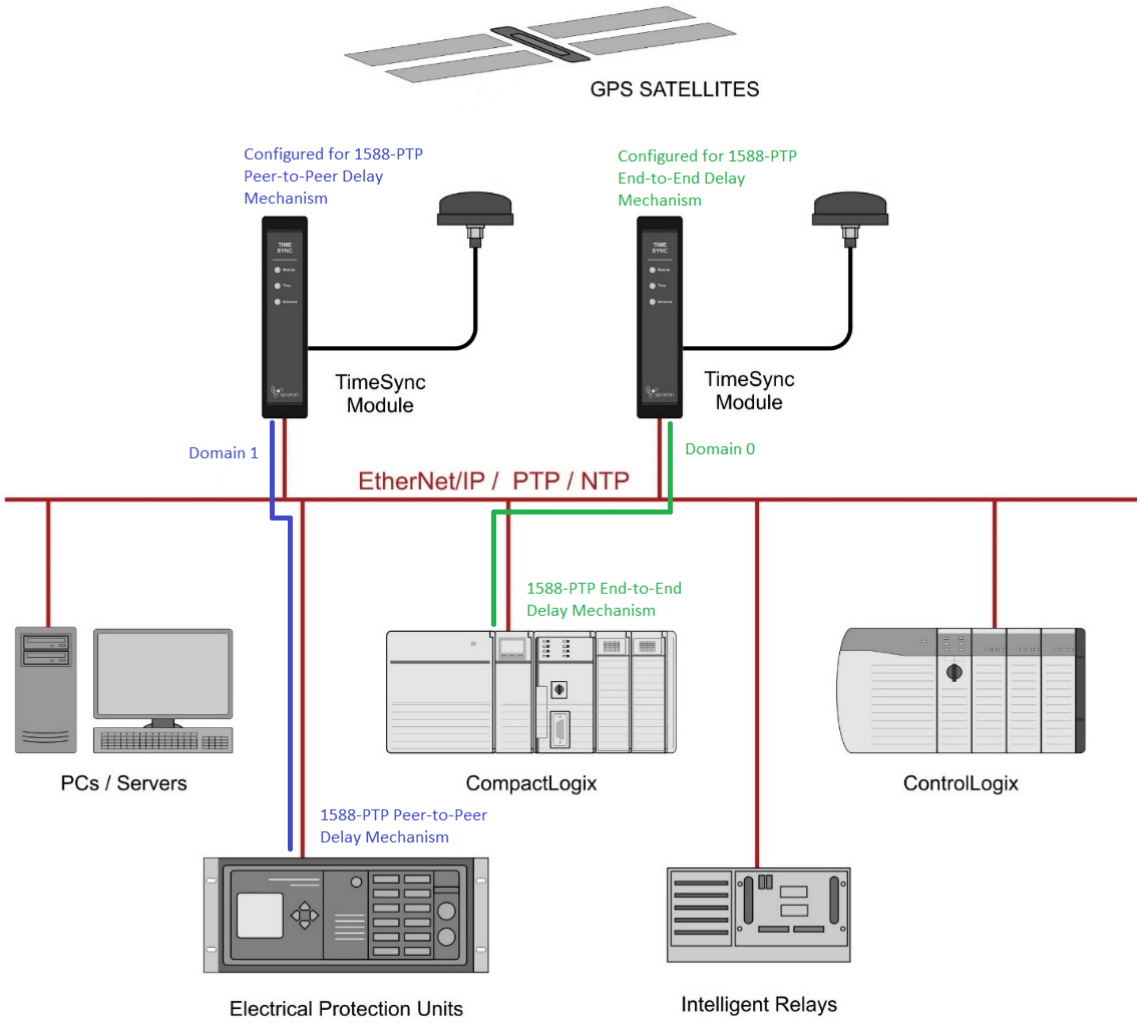

Figure 1 – Time Sync Modules setup for E2E and P2P on the same network

When setup correctly the Time Sync module can provide both P2P and E2E delay mechanisms on the same Ethernet network.

3. SETUP

The following sections will describe the configuration required to allow E2E and P2P Grandmasters on the same network. For this setup to work two Time Sync Modules must be used as shown in Figure 1.

3.1. TIME SYNC MODULE SETUP

3.1.1. ADVANCED CONFIGURATION

For each of the Time Sync Modules the user will need to select the Master Delay Mechanism (one must be E2E while the other is P2P) as shown below.

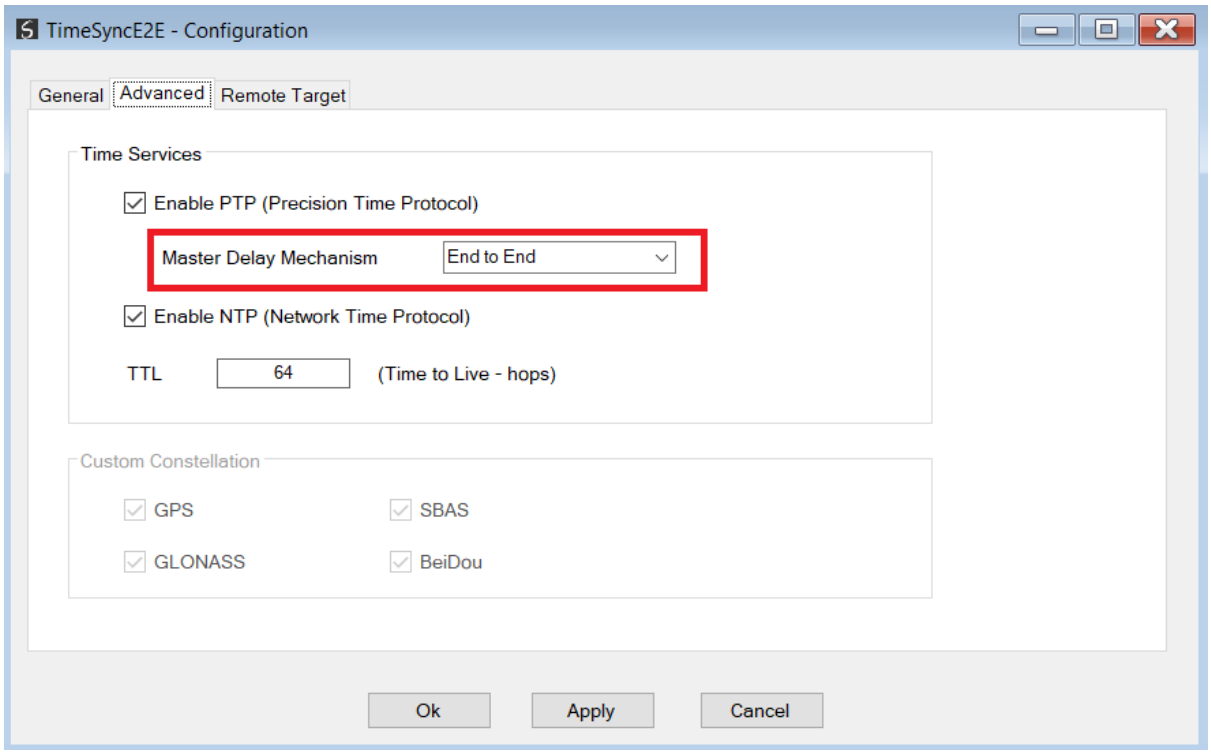

Figure 2 – Configure E2E delay mechanism

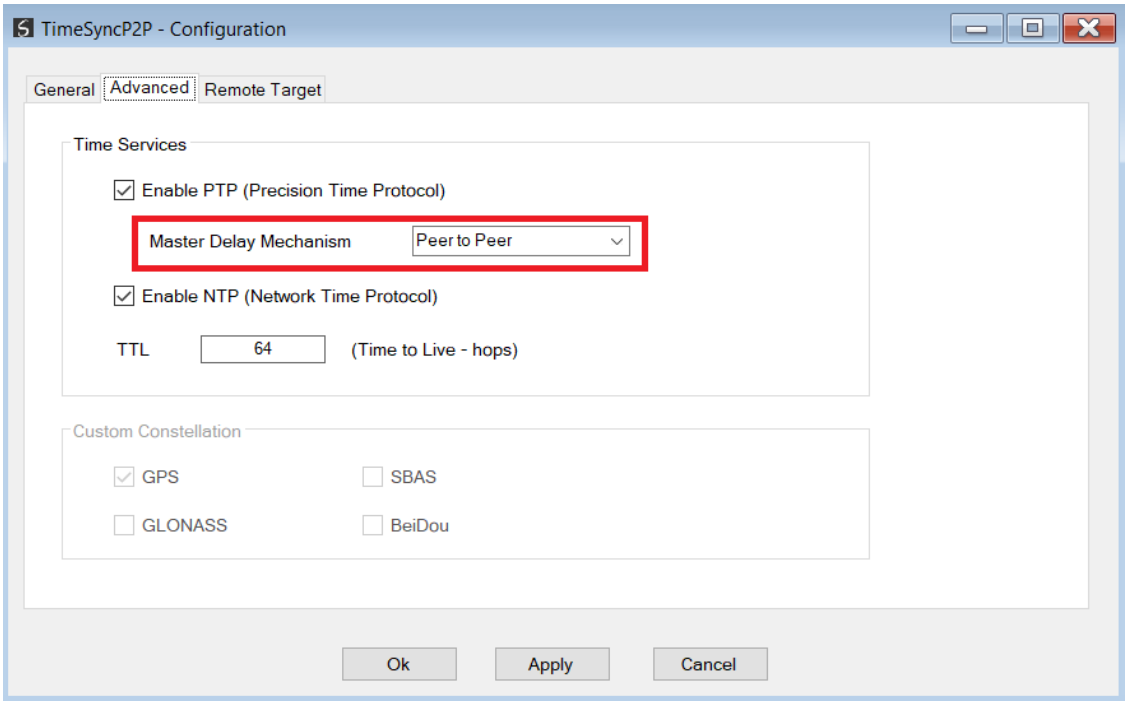

Figure 3 – Configure P2P delay mechanism

3.1.2. CIP Sync Parameters

For each of the Time Sync Masters a domain (different from the other) must be assigned to allow the two delay mechanisms to co-exist. In the example below the Time Sync Module (which uses the E2E delay mechanism) is configured to Domain Number 0.

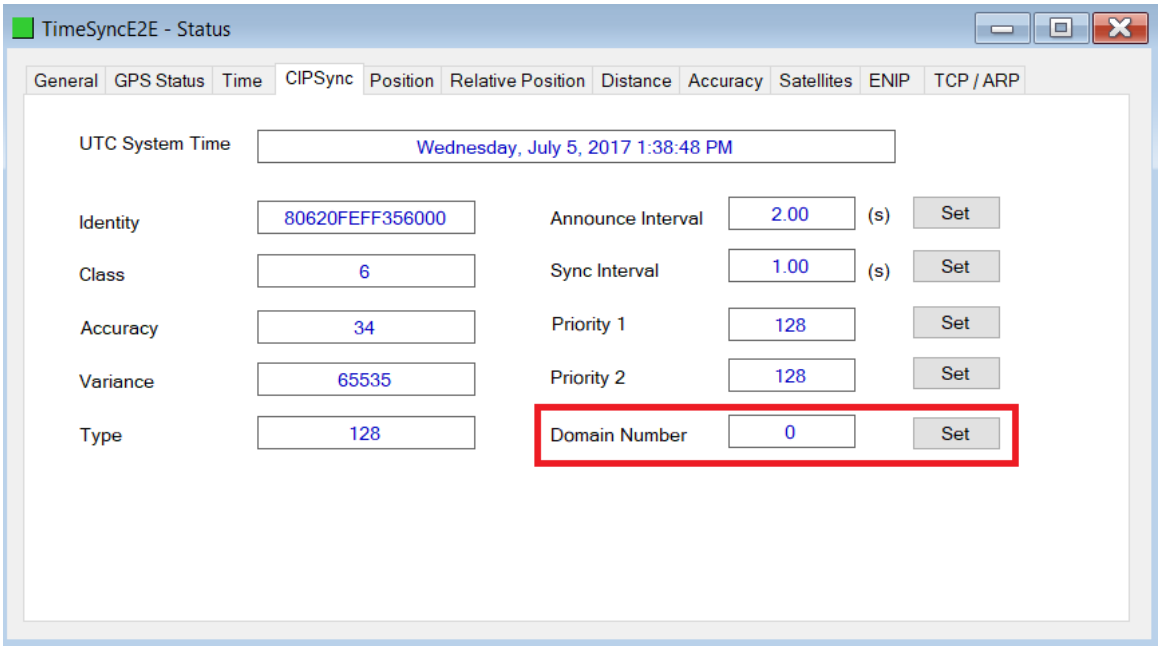

Figure 4 – Configure Domain number for Time Sync Module (E2E)

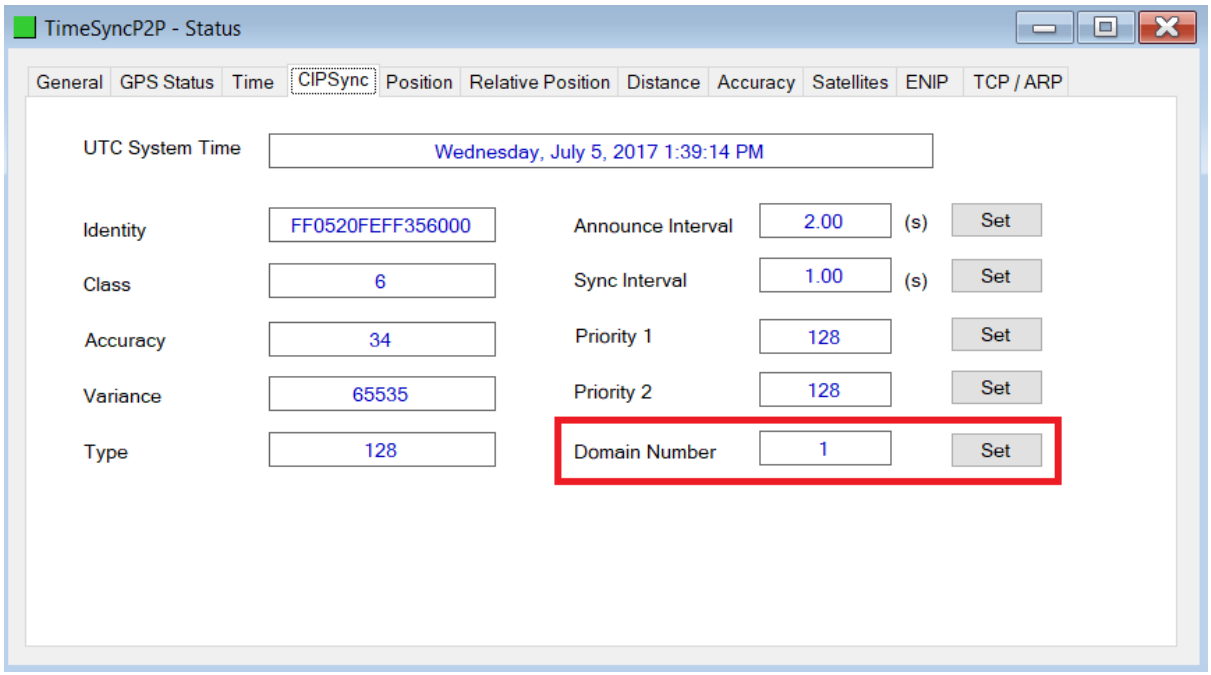

Figure 5 – Configure Domain number for Time Sync Module (P2P)

NOTE: Each device on the network supporting a specific delay mechanism must use the same Domain number as that of the Time Sync Grandmaster module with the same delay mechanism. In the example above, all P2P devices must be configured to have a domain number of 1, while all E2E devices must have their domain number set to 0.