

# **Assessment and Overview of the World Market for Time Synchronization in Electric Power Substations**

A Utility and Industry Survey-Based  
Report on Precision Timing  
Requirements



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SAMPLE

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## Part One Contents

- Industry Participation
- Which Timing References (Inputs) Do Your Products Support?
- Do any Products Offered have the capability to take GPS signals directly (i.e. an embedded GPS capability)?
- If Answer to Question 3 was “Yes” or “Plans to offer GPS”, Will the manufacturer respondent consider using a third party developed product?
- Do You Offer products that support the Precision Time Protocol (PTP) (IEEE 1588, and IEC 61588 and Power Profile Standards (C37.238-2011)?
- If You do offer PTP products or have near term plans to do so, what is the schedule for product releases?
- Which of the Company Products support PTP?
- Which of the Company’s Distribution Products or Lines Support PTP?
- Do you have any interest in a third party developed PTP Client?
- How fast do you see PTP Adoption?
- If you see a strong demand for PTP, please indicate which area:
- If demand for PTP is project-related, which projects are responsible?
- If you see a strong demand for PTP, please indicate which geographic regions are responsible for this demand?
- What type of oscillator do you use in your products (check all that apply)?
- What Support Options do you offer with your Substation IEDs?
- Length of Standard Hardware Warranties for Substation electronic devices
- If you offer an extended warranty or rapid replacement, are these included in the price, or available for an additional cost?
- If your currently available IEDs are designed to hardening standards, please indicate which standards apply?
- What new developments or trends do you see on the horizon for time synchronization in substations?
- What new developments or trends do you see on the horizon for time synchronization in utility telecom networks?

## Part Two Contents

- Introduction to the Utility Study of Time Synchronization in Substations
- Listing of Acronyms used in this section of the report
- Which timing references are currently used in your substations?
- Is your utility implementing PTP Standard (IEEE 1588, IEC 61588 and Power Profile C37.238-2011 for time distribution within substations?
- If PTP implementation is done on a project basis, for which projects would you specify PTP?
- If you have established a program for upgrading your substations, are you designing to the IEC 61850 substation automation standard?
- Do you typically specify embedded GPS in IEDs/switches or a stand-alone clock?
- Have you experienced issues with GPS signals and/or GPS antennas in your substations?
- Does your utility specify holdover for your time reference source?
- How important is it that substation time references can be managed remotely?
- What type of telecommunications network (WAN) do you currently have to your connected substations (check all that apply)?
- How important is it that substation devices are electrically hardened?
- In what context is having electronically hardened substation devices important to you?
- Does the utility specify a particular hardening criteria or standard when you purchase substation devices? (Check all that apply).
- How important are product warranties on your buying decisions?
- Do you/would you pay for additional services such as rapid equipment replacement?

### **Part Three Contents**

- Current Market for Precision Time Clocks
- Some general market estimates for 2012 (prepared by Newton-Evans Research)
- Precision Clock Manufacturers – World Regional Presence (and Methodology)
- Estimates of Overall Revenue for the Precision Time Clock Manufacturing Location (and the parent company)
- Five Year Outlook
- Industry Focus of Precision Time Clock Manufacturers
- Web Site Information for Precision Time Clock Manufacturers
- Sampling of Related White Papers

**Introduction to the Report:**

During the second quarter of 2013, Newton-Evans Research Company undertook a two-pronged research program to determine the current usage patterns and mid-term plans among electric utilities for implementing time synchronization, the use of various time reference standards and the role of GPS. Concurrently, manufacturers of substation devices were queried about the extent to which their products and equipment supported precision timing protocol.

By August 1, Newton-Evans had received usable survey responses (or replies) from 17 manufacturing company participants, 57 utilities from nearly 30 countries, and substation engineering teams from six major transmission and distribution engineering consulting firms.

The report is organized in three sections. The first section summarizes the survey findings from 17 leading suppliers of substation automation-related intelligent devices. The second section is a summary of findings from a survey of utilities around the world regarding their approaches and plans for time synchronization in their electric power substations. The third section is our synopsis of the size, vertical industry focus and global sales regions for the identified suppliers of precision timing clocks (whether PTP IEEE 1588-compatible or not).

## **Part One: Substation Electronic Device Supplier Survey of Time Synchronization Topics**

### **Industry Participation**

A total of 17 usable replies were provided by manufacturers and a few systems integration specialists. The top five international leaders in the provision of substation equipment and intelligent devices all participated in this study. Respondents included representative firms based in Europe and Asia as well as in North America. Another company, a leader in the protective relay market, declined to participate in the study.

These participating companies represent an estimated 80% of all substation-based intelligent electronic devices used in conjunction with substation modernization programs. A number of these respondents also manufacture synchrophasor products including phasor measurement units and phasor data concentrators. Among the product classes represented are: metering products; communications switches; fault and event recorders; protective relays; automation processing platforms; equipment monitors, and a range of IEC 61850 and DNP 3 supported equipment and devices.