



Celebrating
25 YEARS OF INNOVATION

NASPI Interoperability Panel (1)

Driving Applications Forward

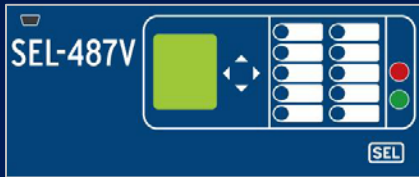
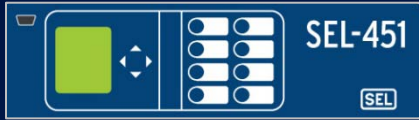
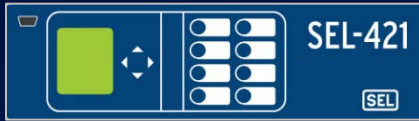
Greg Zweigle

October, 2010



“What Components Are You Offering?”

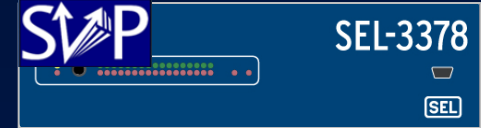
Integrated PMUs



Data Concentration



Distributed Control



Radios and Optical Networks



Visualization



Secure Communications



Satellite Clocks



“Do you have stand-alone PMUs?”



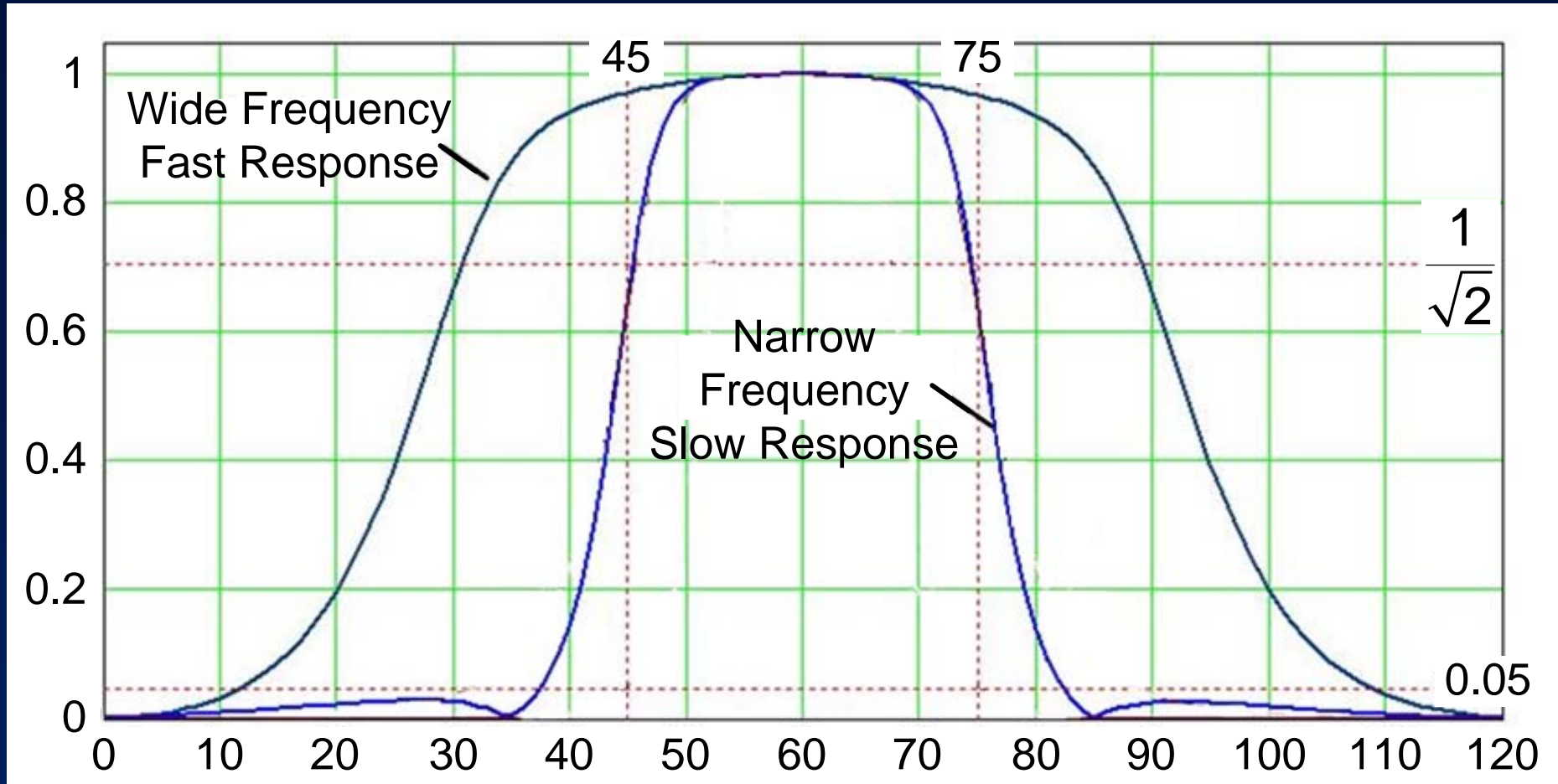
- 24 Channels of IEEE C37.118 Synchrophasors
- Includes Synchrophasor RTC
- SEL-351A Feeder PMU



Relays/PMUs Send And Receive Synchronphasors



“Filtering requirements & usage”

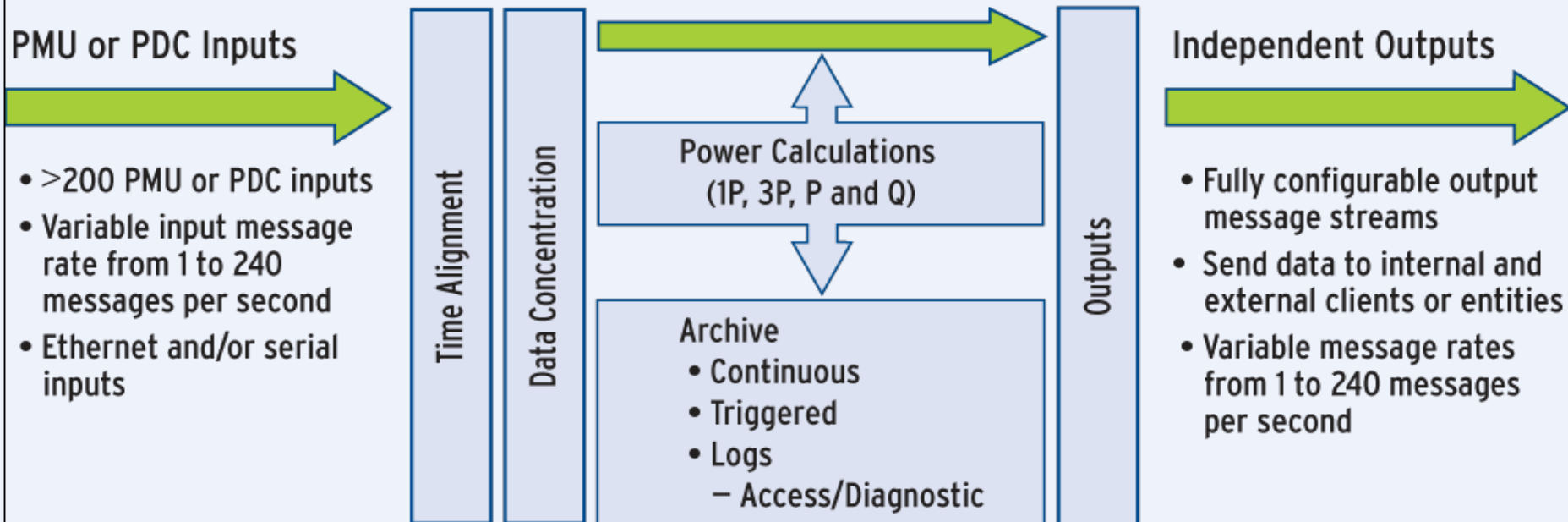


Planned compliance with new C37.118 standard

“PDC Functionality and Performance”



SEL-5073 SYNCHROWAVE PDC Functional Block Diagram



“PDC Functionality And Performance”



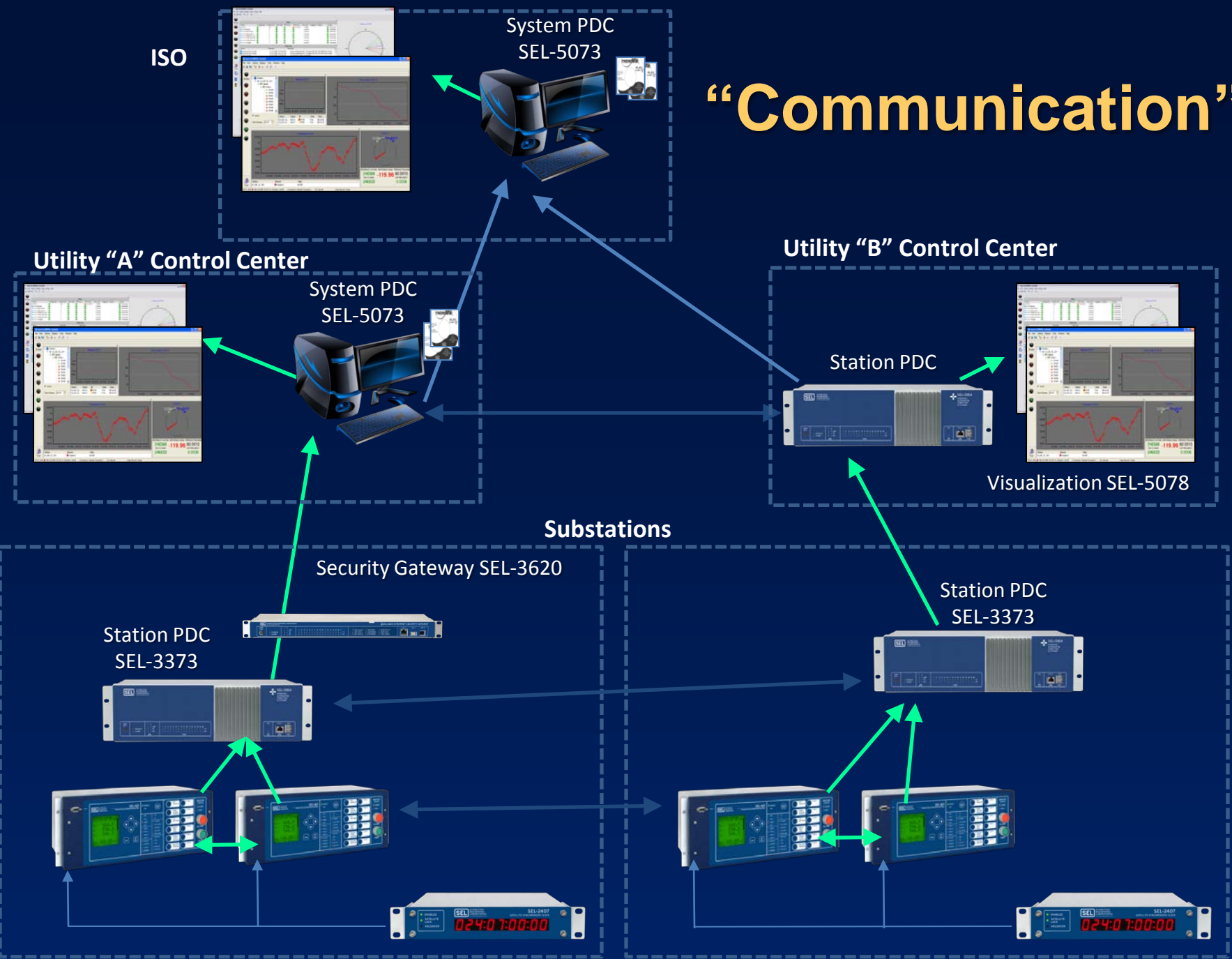
Phasor Data Concentration

Integrated Protection and Control

Built-in Functions like Modal Analysis, etc



“Communication”



“PDC Functionality” – Easy to Use

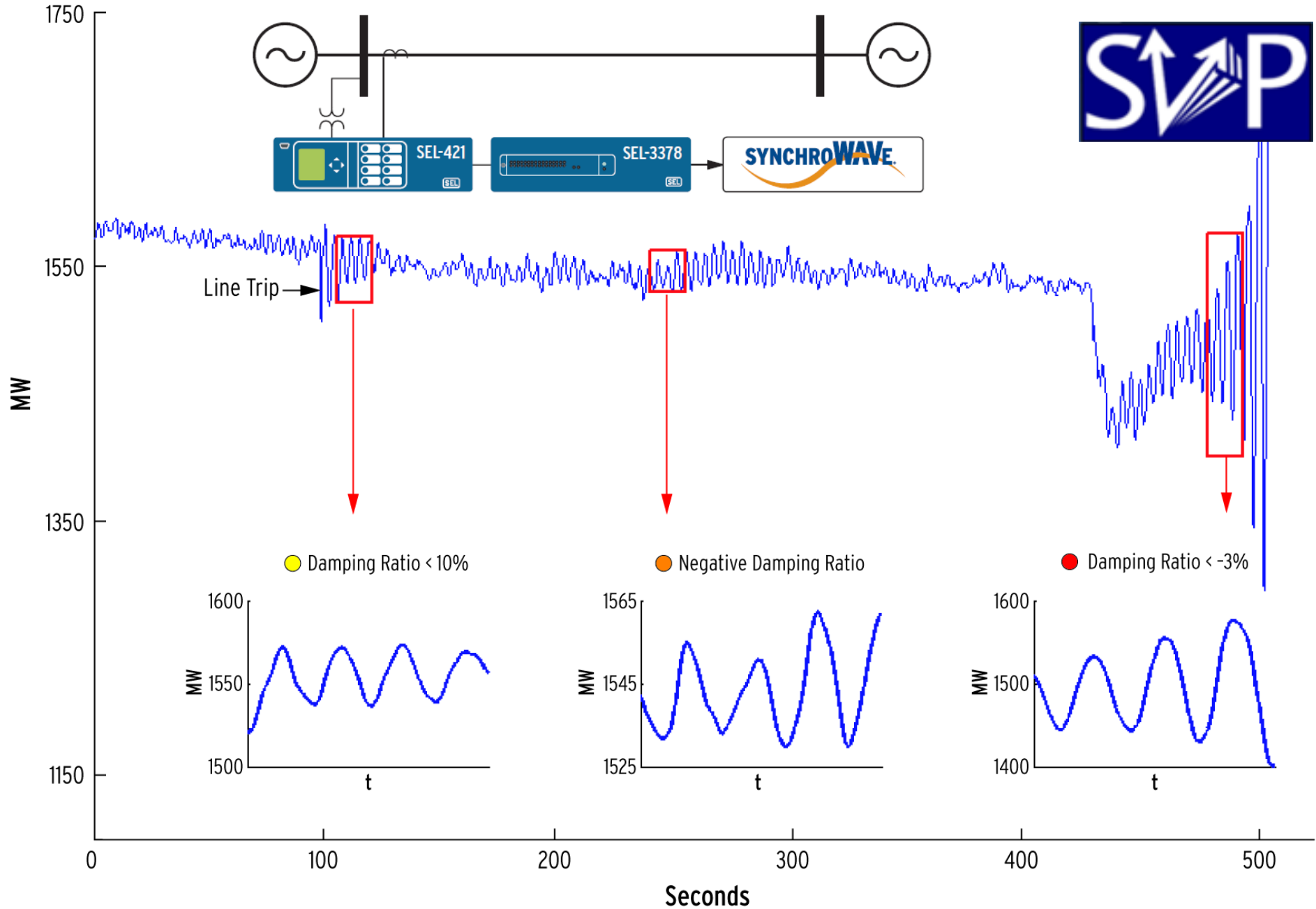
- Simple configuration
- Flexible data access
- Real-time status
- Event logs
- Upgradeable

The screenshot displays the PDC Assistant software interface. The window title is "PDC Assistant.cfgx - PDC Assistant - 1.0.0.3 (3779.17424)". The interface includes a menu bar with options: New, Open, Save, Save As, Close, Send Settings, Connect, and Disconnect. A left-hand navigation pane contains sections: Home, Settings (with sub-items: Inputs, Outputs, Calculations, Archives, Loggers, Globals), Status (with sub-items: Real-time, Diagnostic Logs), Data (with sub-item: Retrieve Archives), and Administration (with sub-items: User Accounts, Device). The main area is titled "Inputs" and shows a list of PMUs: Sullivan Road, Terrace, West Plains, and Southside. The "Sullivan Road" PMU is selected, and its configuration is displayed on the right. The configuration includes: Enabled (checked), Station Name (Sullivan Road), PMU ID (10), Data Rate (60 Msg per sec), Ethernet Configuration (IP Address: 10.203.12.7, Port: 49201), and a section for Tags. The Tags section contains a table with the following data:

Tag	Description	Type
V1LPM	Positive Sequence Voltage	Phasor
VALPM	A Phase Voltage	Phasor
VB LPM	B Phase Voltage	Phasor
VCLPM	C Phase Voltage	Phasor
I1WPM	Positive Sequence Current, W Terminals	Phasor
IAWPM	A Phase Current, W Terminals	Phasor
IBWPM	B Phase Current, W Terminals	Phasor
ICWPM	C Phase Current, W Terminals	Phasor

At the bottom of the interface, there are three status indicators: Project Status (green checkmark), PDC Sync (yellow warning triangle), and PDC Connection (blue question mark).

“PDC Functionality” – Wide Area Control



“PDC Functionality” - Reliability

- Conforms to
 - ◆ IEEE 1613
 - ◆ IEEE C37.90
 - ◆ IEC 60255
- Built-in diagnostics
- No moving parts – all solid state
- Same design, testing, and manufacturing practices as SEL’s proven protective relays

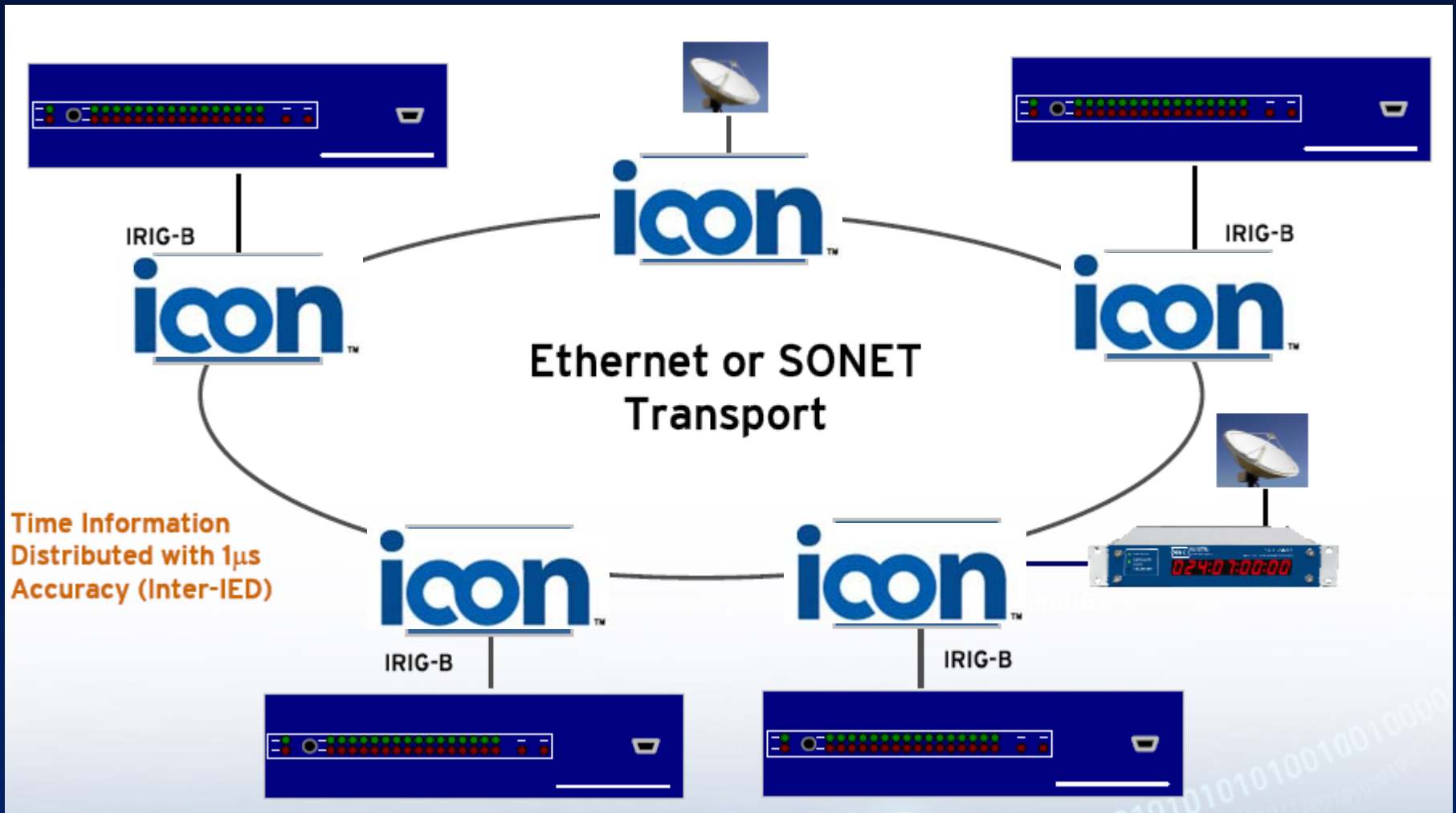


“PMU / PDC Testing Approach”



- PMU / PDC testing
 - SEL
 - other vendors
- Thorough testing
 - IEEE C37.118
 - Other industry stds
 - SEL standards

“Timing source approach”



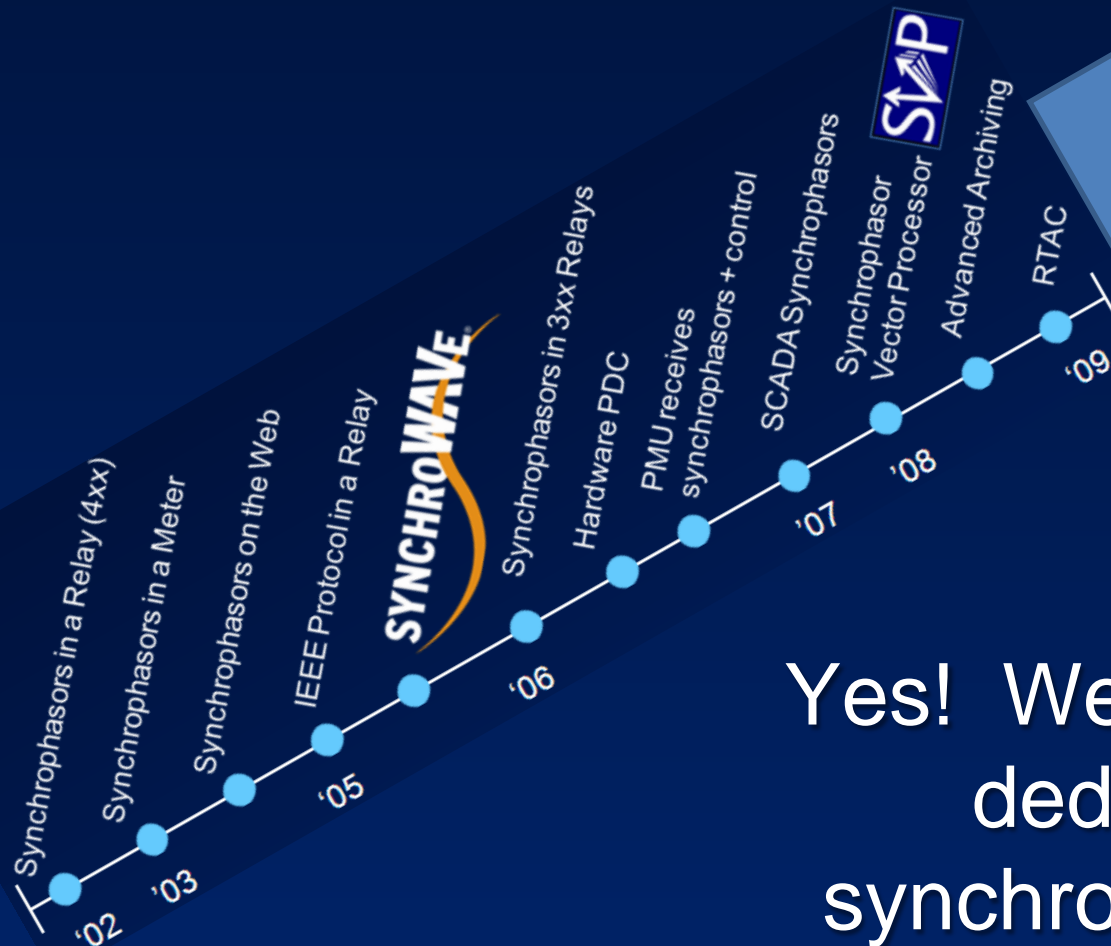
“How consistent are user requirements?”

- Conform to standards where applicable.
- Working on many distributed control solutions.
- Protection / control algorithms have system specific features.

“How do you comply to overall user’s requirements?”

1. Conform to standards.
2. Discuss end-users needs.
3. Inputs from SEL’s large team of field-application engineers.
4. Track all customer requests and commitment dates.
5. R&D team in Pullman, WA implementing new enhancements.

“Are you willing to participate in accelerated implementations to help end users?”



Yes! We have a team dedicated to synchrophasor R&D