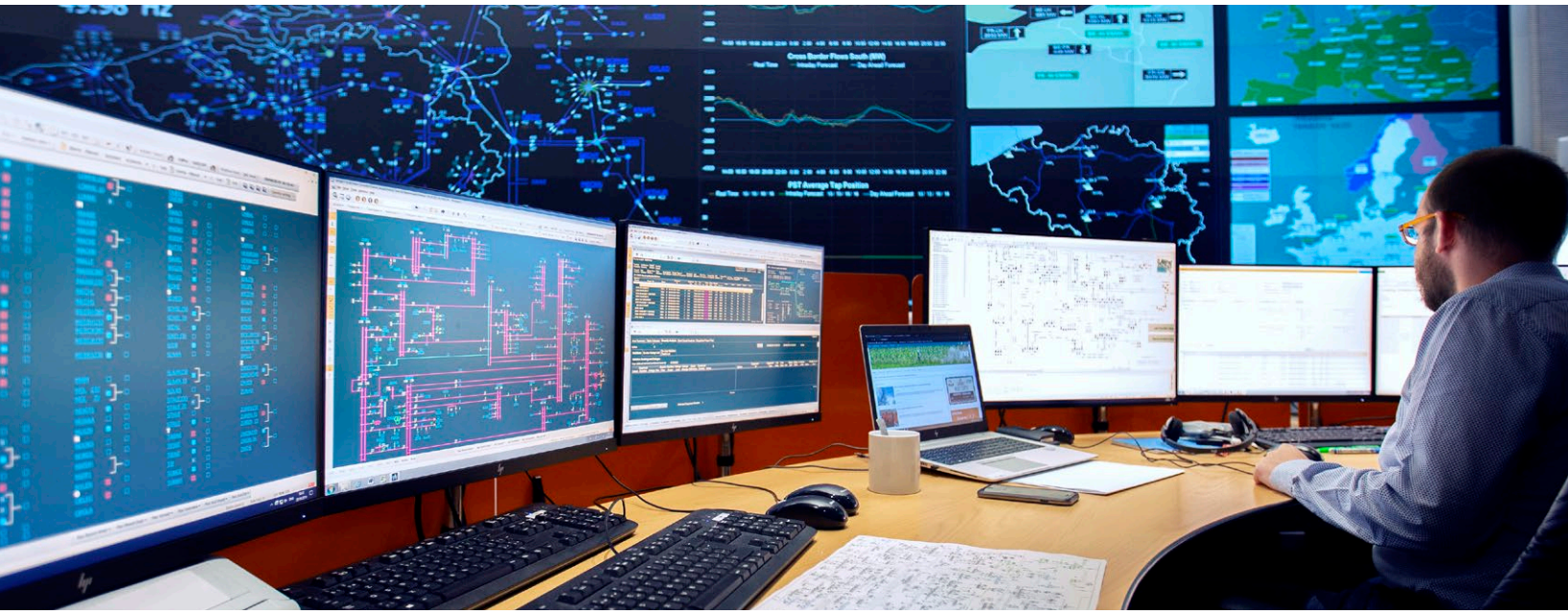
ICON®

Network-Distributed Time Synchronization



Transition to network-distributed time synchronization to reduce the impact of localized GPS outages

- Synchronize time over a packet-based WAN with the ICON using the Precision Time Protocol (PTP) Telecom Profile.
- Time-synchronize substation IEDs to submicrosecond accuracy with IRIG-B and the PTP Power Profile.
- Manage the timing system centrally with SEL-5051/5052 Client/Server Network Management System (NMS) Software.
- Ensure high-quality time synchronization, even in the event of a GPS outage or spoofing attack.

Build Timing Resiliency

ICON Makes It Easy to Migrate to Network-Distributed Time Synchronization

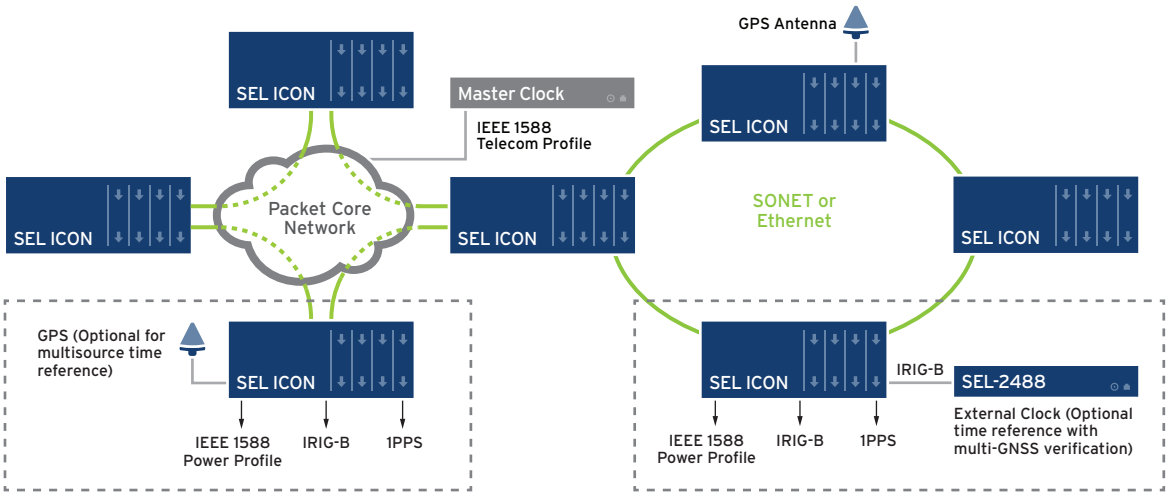
Using the SEL ICON with the new Enhanced Protected Line Module (EPLM), utilities can utilize WAN timing as the primary or alternate time source to provide substation IEDs with the submicrosecond timing accuracy required for critical applications. The new EPLM supports IEEE 1588 PTP Telecom input for WAN-based time synchronization over packet-based networks.

Generate Local-Time Reference for IEDs

The ICON is able to generate a local-time output for substation devices. The ICON can provide IRIG-B and 1PPS as standard, and IEEE 1588 Power Profile is supported with the PTP version of the Ethernet Bridging Access Module (EBAM).

Increased Resilience With Multiple Time Sources

GPS or IRIG-B from a local clock (e.g., SEL-2488 Satellite-Synchronized Network Clock) can be used as a backup timing source in each site. By comparing each time reference to a weighted average, the ICON determines if a source has been compromised, and the SEL-5051/5052 alerts the user. A compromised source is rejected, ensuring the ICON always uses the time reference with the highest quality. This guarantees dependable time is delivered to each substation device.



Manage Timing Centrally

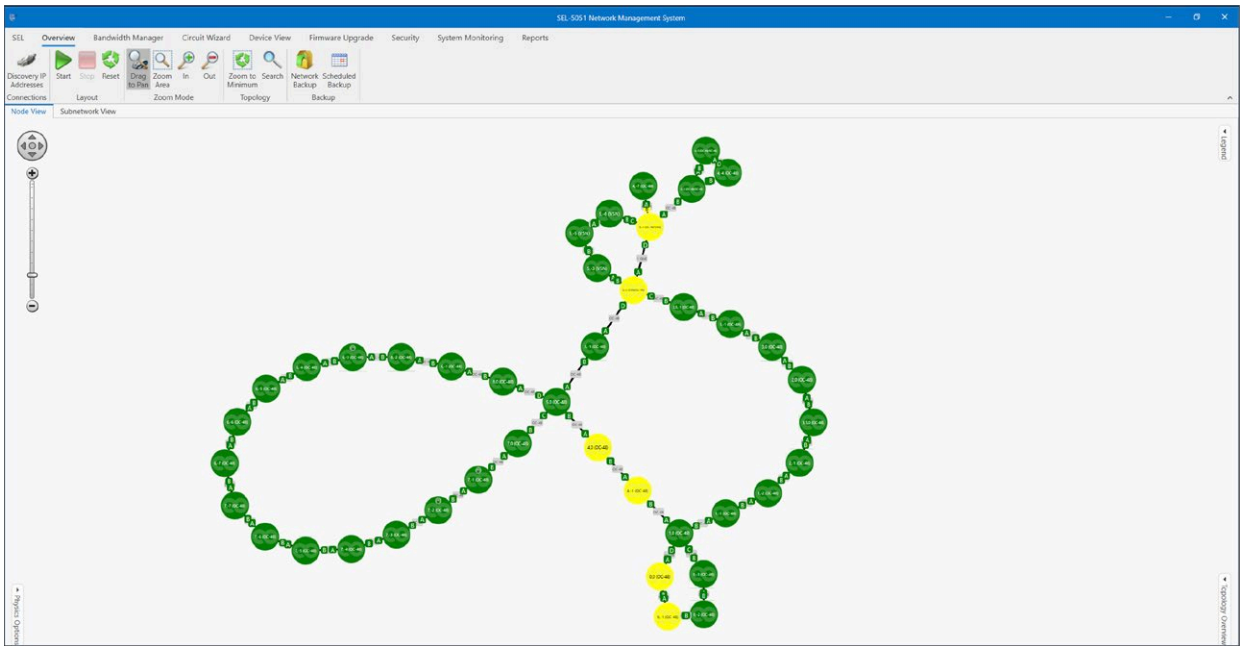
The ICON WAN timing system can be managed centrally and efficiently with SEL-5051/5052 software.

SEL-5051/5052 NMS Software

Whether your network is large or small, keeping it running smoothly can be a challenge. The ICON simplifies this task with SEL-5051 Client and SEL-5052 Server NMS Software—indispensable tools for maintaining a secure, reliable, and efficient communications and time distribution infrastructure.

The SEL-5052 Server Software offers centralized user authentication (with Lightweight Directory Access Protocol [LDAP] or Single Sign-On [SSO] integration), security, settings, alarms, and event management.

All nodes with an enabled timing input are clearly identified, along with health and status of each time source. The time settings for the entire network can be centrally managed. Comprehensive alarm management and notification tools include visual and audible alert, email notification, SNMP traps, and event reports.



ICON Specifications

General		
Line Modules	**8022-01 Enhanced Protected Line Module**	SFP Ports A/B/C/D: 155 Mbps, 622 Mbps, 1 Gbps, or 2.4 Gbps IRIG-B out: 2 BNC
Server Module	**8030-01 Server Module**	NMS ports: USB, RJ-45 GPS antenna: TNC IRIG-B in: BNC
Chassis and Power Modules	**19-Inch Rack Mount Chassis**	
	8001-01 Full 19-Inch Chassis	10 available slots
	8011-01 HV AC 120—240 V, IEC C6 Line Cord	Supply voltage: 102—264 Vac, 50/60 Hz
	8011-02 HV AC/DC 120—240 V, Terminal Block	Supply voltage: 102—264 Vac, 50/60 Hz; or 88—300 Vdc
	8011-03 MV DC 24—48 V, Terminal Block	Supply voltage: 19—58 Vdc
	Half-Width Cube Chassis	
	8002-01 Half-Width Chassis	
	8010-01 HV AC 120—240 V, IEC C6 Line Cord	Supply voltage: 102—264 Vac, 50/60 Hz
	8010-02 HV AC/DC 120—240 V, Terminal Block	Supply voltage: 102—264 Vac, 50/60 Hz; or 88—300 Vdc
	8010-13 MV DC 24—48 V, Terminal Block	Supply voltage: 19—60 Vdc
Access Modules	**8036-01 Ethernet Bridging Access Module**	100/1000 Ethernet ports: 4 SFP 10/100/1000 Ethernet ports: 4 RJ-45
	8036-02 Ethernet Bridging Access Module With PTP	100/1000 Ethernet ports: 4 SFP 10/100/1000 Ethernet ports: 4 RJ-45
	8051-11 Nx64F Multimode Submodule	ST ports: 1 Rx, 1 Tx Standard: IEEE C37.94 multimode
	8051-12 Nx64F Single-Mode Submodule	ST ports: 1 Rx, 1 Tx Standard: IEEE C37.94 single-mode
	8053-11 Data Async Submodule	Ports: 2 RJ-45 Standards: EIA-232, EIA-422, EIA-485
	8053-12 Async-CB Submodule	Ports: 2 RJ-45 Standards: EIA-232, EIA-422, EIA-485
	8055-01 422 Sync Submodule	Port: 1 RJ-45
	8056-01 G.703 Submodule	Port: 1 RJ-48C
	8065-11 4-Wire VF Submodule	Ports: 2 RJ-45
	8065-12 4-Wire VF Bridging Submodule	Ports: 2 RJ-45
	8066-01 2-Wire FXS Submodule	Port: 1 RJ-11
	8067-01 2-Wire FXO Submodule	Ports: 2 RJ-11
	8041-01, -04 Transfer Trip Module	Commands: 4
	8057-11 DS1 Async Submodule	Ports: 4 RJ-48C
	8057-12 DS1 Sync Submodule	Ports: 4 RJ-48C
	8057-03 DS1 Psync Submodule	Ports: 4 RJ-48C
	8057-14 E1 Async Submodule	Ports: 4 RJ-48C
	8057-15 E1 Sync Submodule	Ports: 4 RJ-48C
System Specifications	**Network Topologies**	Linear and multiple rings with single or dual interconnected nodes, plus linear spur and subtended ring topologies
	Path Switching Time	<5 ms
	Convection-Cooled	No fans
	Operating Temperature	−20° to +65°C (−4° to +149°F)
	Mounting	8", 19", or 23" rack or panel mount

SEL SCHWEITZER ENGINEERING LABORATORIES

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