pacific data systems

Solutions. **Technology.** Simple.

TBOX

Semaphore T-BOX Lite

T-BOX Lite is a rugged, all-in-one RTU that brings programmable automation, Ethernet, wireless communications, integral Web server, push communications, and reporting via email and SMS text messaging to remote monitoring and control applications requiring up to 32 I/O points. Our compact, standard design and innovative technology enable real-time access, anywhere, with a mobile device or PC to create a highly cost-effective solution.

T-BOX Lite — A compact solution for monitoring and control

T-BOX Lite is an ideal solution for small applications requiring up to 32 I/O points. This self-contained system gives you everything needed to create high-performance yet economical monitoring and control installations.

Semaphore's innovative push and Web server technologies open up many new possibilities. Now, you can receive alarms and reports automatically on your cell phone, PDA, or computer. Automatic alarm escalation ensures that all key personnel are fully informed. T-BOX Lite not only stores live and historical information, it also maintains formatted reports and Web pages. Using push technology, it transmits them to multiple recipients as events dictate. No polling is necessary. This capability keeps network traffic to a minimum while reducing the infrastructure and network overhead costs associated with traditional SCADA networks.

For typical applications, a SCADA top-end computer system is not even necessary!

T-BOX Lite — Applying Internet and IP technology to monitoring and control

Semaphore's unique capabilities offer new advantages to today's monitoring and control systems. Only T-BOX products provide an integral Web server, push technology, email and IP communications, local alarm management, and internal datalogging.

The T-BOX Lite design includes

Onboard Web server technology eliminates complex, costly SCADA software and expensive HMI displays. Live data, alarms, events, historical reports, and diagnostics are all accessible via a standard Web browser. Multiple clients can connect without costly software licensing fees.

Advanced programming functions include ladder logic (IEC 61131-3 compliant), BASIC, Function Blocks, and Windows menus for configuration of push communications including IP/FTP, email, SMS pager messaging, alarm management, historical reports, trend graphs, and Web pages.

Connectivity — Four ports include the following:

- RS-232 for local configuration and programming
- RS-485 for field devices
- 10/100 Ethernet for IP networking

- Remote communications option: GSM ("GE" model), 3G ("3E-EU" and "3E-US" models), PSTN modem ("PE" model), 2.4 GHz SS Radio ("RE" model), 900 MHz SS Radio ("KE" model), Full RS-232 ("SE" model) or none ("E" model)

Compact, rugged package stands up to the harshest environments. Our specially developed alloy enclosure provides noise immunity, wide temperature range operation, and resistance to impact and vibration. It occupies a very small, DIN-rail footprint and mounts without the need for special tools.

Intelligent uninterruptible power supply conditions incoming power and includes an integral battery charger — another feature that eliminates the need and expense associated with an external component.

While T-BOX Lite features push technology, it also drops into traditional SCADA systems, which employ pull (polling) communication using a variety of protocols such as DNP 3.0, IEC 60870-5, Modbus, etc.

To serve a broad range of applications, T-BOX Lite is compatible with Semaphore's range of T-BOX products. Since applications programming and communications are fully compatible across the line, users and integrators can efficiently apply common efforts to all installations. T-BOX MS is a modular, scalable PLC/RTU that caters to applications requiring more communications ports (up to 16 ports) and I/O (up to 800 points). For installations lacking commercial power, T-BOX LP (low power) products operate with small, economical batteries or solar power systems.

Like all T-BOX products, T-BOX Lite includes Semaphore's unique Plug & Go technology, allowing the distribution of your full site configuration on a single MMC card. Maintenance personnel can deploy it without ever switching on a computer.

Receive alarms and control your site using a cellular phone or PDA. TBOX Lite provides worldwide connectivity for your monitoring and control system.

Enhanced capabilities

T-BOX Lite provides real-time centralization of site data plus powerful reporting and charting capabilities. T-BOX Lite can operate with thin clients and systems without additional software and networking support. In addition, Semaphore offers a suite of software products that provides the system with enhanced capabilities.

Optional T-VIEW software
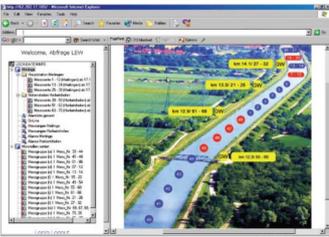
T-VIEW is an advanced communications front end that uses push and pull technology to automatically process archived information from T-BOX products. T-VIEW features a standard ODBC interface that seamlessly enables real-time data transfer with other software packages. This eliminates the need for costly data historian software and provides access to trending charts and site reports based on your specific criteria. With the optional Dream Report™ plug-in, you can generate statistical reports based on data stored in T-VIEW archives. Dream Report can also be sent to email addresses according to a schedule.

In addition, T-VIEW features automatic RTU detection. As soon as a new station comes into service on the telemetry network, T-VIEW self-configures and introduces definitions for tags, trends, and alarms. If the content of the station changes over time, T-VIEW will automatically adapt to its configuration.

T-BOX Lite configurations

To suit every application, T-BOX Lite is available in five different configurations — each with optimized process I/O. Each model includes RS-232 and RS-485 ports, 10/100 Ethernet, and a choice of GSM or PSTN modem, radio or supplementary RS-232.

LT-100 is the most basic, low-cost configuration and includes 2 DI/pulse inputs and 8 DI/DO points.

LT-200 meets a broad range of requirements from energy management to process control in water and wastewater treatment systems. I/O includes 6 AI, 2 Pt1000 temperature inputs, 2 DI/pulse inputs, 8 DI/DO, and 4 DO (relay).

LT-201 is designed for solar heating systems and temperature zone monitoring applications. I/O includes 2 AI, 6 Pt1000 temperature inputs, 2 DI/pulse inputs, 8 DI/DO, and 4 DO (relay).

LT-300 is designed for railroad monitoring and other applications that require more analog and digital points but no temperature inputs. I/O includes 8 AI, 2 DI/pulse inputs, 4 DI, 16 DI/DO, and 2 AO.

T-BOX Lite is ideal for small monitoring and control applications in a variety of industries, including energy management, railways, smart grid, traffic control, and water/ wastewater.

T-Box Lite Specifications

Designation	Industrial-grade, all-in-one remote terminal unit (RTU)
Processor	16-bit Mitsubishi 7.37 MIPS
Clock	Real-time clock with lithium battery backup
Memory	Flash 768 KB
	RAM 128 KB + 256 KB (sampling tables)
	SD/MMC card up to 1 GB
Communication	Ethernet (10/100BaseT)
	GSM, PSTN, Spread Spectrum Radio (900 MHz or 2.4 GHz), or RS-232 with full modem control
	RS-232 Modbus slave or master — 2 wires (RxD/TxD)
	RS-485 Modbus slave or master — 2 wires
PSTN modem	300 bps…56 kbps — RJ12 connector
	ITU-T: V21, V23, V22, V22bis, V32, V32bis, V34, V90, Bell 103, and Bell 212A
GSM modem	Frequencies: MTS 900/1900/2100 & GSM850, EGSM900, DCS1800, PCS1900
	Modes: CSD — GPRS — EDGE — UMTS — HSDPA
3G modem — "3E-EU" model	GSM Quadband (GSM850, GSM900, DCS1800, PCS1900) and UMTS Tripleband (Band I - 2100 MHz, Band II - 1900 MHz, Band VIII - 900 MHz)
3G modem — "3E-US" model	GSM Quadband (GSM850, GSM900, DCS1800, PCS1900) and UMTS Tripleband (Band I - 2100 MHz, Band II - 1900 MHz, Band V - 850 MHz)
Antenna	FME male connector

Inputs/outputs

LT-100:	2 counter inputs 0–10 kHz	LT-300:	2 counter inputs 0–10KHz
	8 digital inputs or outputs		4 digital inputs
LT-200:	2 counter inputs 0–10 kHz		16 digital inputs or outputs
	8 digital inputs or outputs		8 analog inputs 4-20 mA, 13 bits
	6 analog inputs 4/20 mA, 13 bits		2 analog outputs 4-20 mA, 8 bits resolution
	2 temperature inputs (Pt1000)		4 relays outputs (230 V ac 3A)
LT-201:	2 counter inputs 0–10 kHz		8 digital inputs or outputs
	1 analog input 0-2 mA, 1 analog input 4-20 mA, 13 bits		
	6 temperature inputs (Pt1000)		
	4 relays outputs (230 V ac 3A)		

Push button	RUN-STOP-RESET
Programming	Via TWinSoft Suite (automation, Web editor, report editor)
Automation languages	Ladder logic (IEC 61131-3), Basic, Function Blocks, Microsoft Windows® Automation
Alarm handling	Smart alarm management with embedded calendar
Datalogging	Intelligent logging: sampling tables (instantaneous, min, max, average, incremental), digital and analog chronologies, SoE
Timestamp resolution	1 second
SCADA compatibility	T-VIEW, WIZCON, CITECT, Wonderware (InTouch), iFix, Topkapi, Cube, Labview, Panorama …
Remote upload	Up to firmware level
IT features	HTTP, FTP, SMTP (email), POP3, IP forwarding, DynDNS, NTP Industrial Defender ready
Protocol support	In addition to default Modbus protocols (RTU, ASCII, TCP), more than 40 drivers including DNP.3, IEC-60870, DF1 . . .
Protection	4 levels of authority
Power supply	20-30 V dc or 12 V dc

Consumption	**- Vin 24 V dc**	**LT100/200/201**	**LT300**
	- E	35 mA	55 mA
	- PE	45 mA	65 mA
	- GE	100 mA	120 mA
	- 3E	120 mA	140 mA
Consumption	**- Vin 12 V dc**	**LT100/200/201**	**LT300**
	- E	50 mA	70 mA
	- PE	60 mA	80 mA
	- GE	200 mA	220 mA
	- 3E	240 mA	260 mA

Voltage V out	12 V dc backed up by external battery
Current V out	Max 100 mA
Battery charger	Embedded. Constant current/limited voltage. Max 13.8 V dc
Connectors	Spring-cage terminal blocks
Temperature	Storage: -40° to +80°C/-40° to + 176°F
	Working: -40° to +65°C/-40° to +149°F (Spread Spectrum, PSTN options: -20° to +65º C)
	Industrial grade SIM card is required for GSM and 3G operation down to -40°C
Humidity	5-95% noncondensing
Material	Proprietary aluminum enclosure, anodized and Alodined for corrosion and noise interference resistance
Safety certifications	CE LVD 2006/95/EC; CEBEC IEC 60950-1:2005 (2nd edition) and IEC 60950-1:2006; CAN/CSA C22.2 No. 60950-1-07; ANSI/UL 60950-1, 2nd Edition EMC certifications CE EMC 2004/108/EC, EN61000-4-2, 3, 4, 5, 6, 11, EN61326-1; C-Tick EN61326-1:2006; FCC CFR47: 2008 (Part 15 Sub Part B), EN55011: 1998+A1+A2
Telecom certifications	Industry Canada RSS-132 Issue 2, RSS-133 Issue 5; A-Tick AS/ACIF S002:2005; Telepermit PTC 211/09/043-044
Other certifications	GOST-R
MTBF	MTBF > 400,000 hours, statement available on request
Size Height x depth x width	150 mm x 83 mm x 29 mm/5.91" x 3.27" x 1.14"
Weight	300 gr/9.65 oz