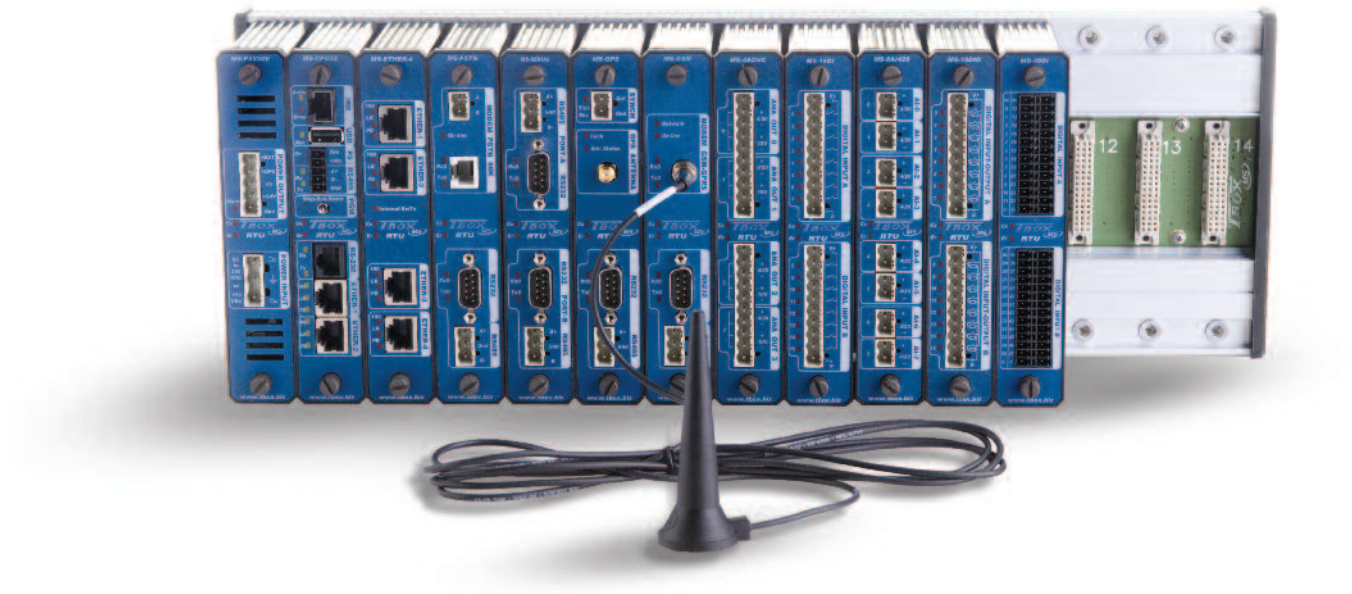
Semaphore TBox MS



TBox MS combines the power of the Internet with modular-based architecture to create a class-leading remote control and automation solution. Equipped with one of the market's most powerful processors, only TBox incorporates Web server technology with SMS reporting and remote control to give you real-time access anytime, anywhere, using a standard Web browser.

The result of 25 years of experience in the telemetry industry, TBox telemetry products give you everything needed to create high-performance yet economical SCADA and control applications. Semaphore combines IP capabilities with an unmatched software package to transform your measurement and control ideas into powerful solutions.

Now, you can receive alarms and control your site remotely using a cell phone. Automatic alarm escalation allows your key maintenance personnel to receive any unacknowledged alarms. With the optional T-VIEW data aggregator, you can generate reports and trending charts, eliminating the need for historian software. In addition, our innovative push technology allows you to receive alarms as they happen without ever having to poll a device. This capability keeps network traffic to a minimum while reducing infrastructure and network overhead costs associated with traditional RTU networks.

TBox — The Web generation of telemetry products

TBox MS features Plug & Go technology, allowing you to distribute your full site configuration on an SD/MMC card. Now you can program and configure a full TBox MS system on an SD/MMC card and your maintenance personnel can deploy it without switching on a computer.

The TBox MS system includes

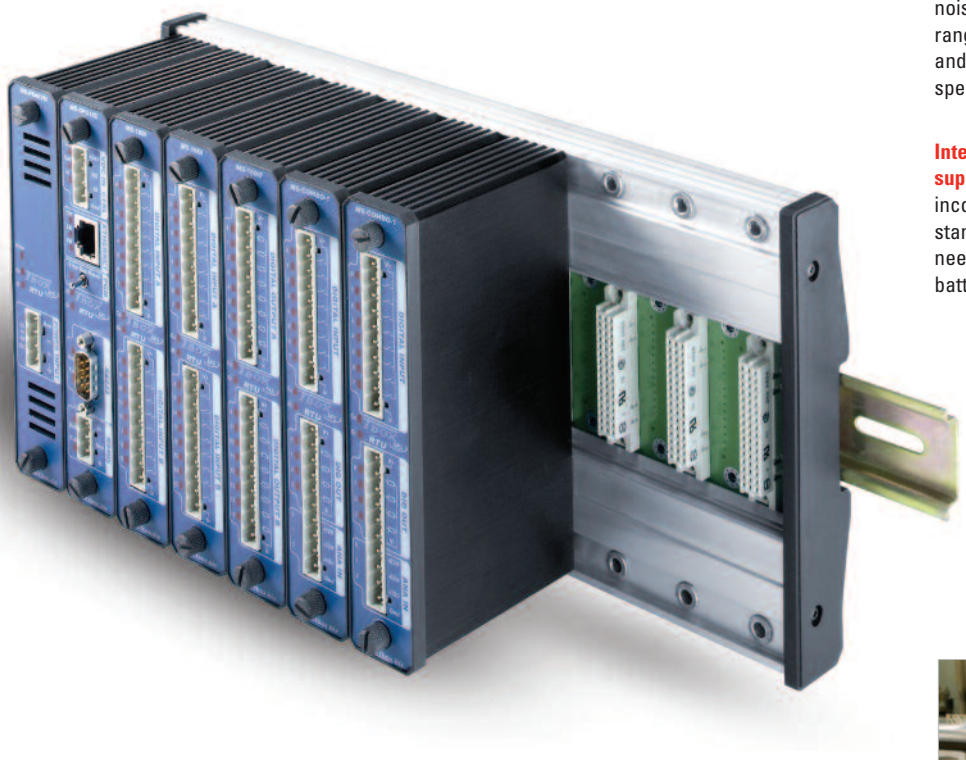
Integral Web Server 2.0 WebForm™ Studio 2.0 unlocks the power of Asynchronous JavaScript and XML (AJAX), the agnostic technology of reference for Web 2.0 applications. Without writing code, TBox MS-CPU32 users can build live HMI displays that work across all smart, web-enabled devices—and license-free!

Powerful alarm management sends alarms to multiple recipients, eliminating the need for 24-hour site monitoring. Whether it's Monday morning in the office or Sunday afternoon at home, the built-in scheduler enables advanced alarm reporting according to the set date and time. Integrated alarm escalation and autodialer mean you never miss an alarm.

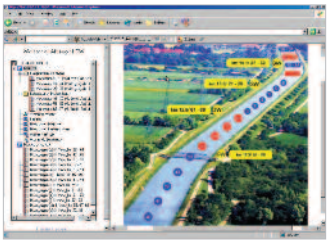
Onboard multimedia capabilities allow the addition of cost-effective industrial imaging to your application. This technology permits the remote verification of operations onsite, or the capture of event-driven images.

Robust, all-alloy construction stands up to the harshest environments. Our specially developed, proprietary alloy enclosure provides noise immunity, wide temperature range, impact/vibration resistance, and DIN-rail mounting without special tools.

Intelligent uninterruptible power supply filters and conditions incoming power and manages standby batteries. TBox removes the need for additional power supplies or battery chargers.



Combining the power of the Internet with modular-based architecture to create a class-leading remote control and automation solution.



Optional T-VIEW software

TBox systems are complemented by T-VIEW — an optional software package that provides real-time centralization of site data plus powerful reporting and charting options. T-VIEW eliminates the need for costly data historian software and provides access to trending charts and site reports based on your specific criteria. The T-VIEW aggregator features a standard ODBC interface that seamlessly enables real-time data transfer with other software packages. With the optional Dream Report™ plug-in, you can generate statistical reports based on the data stored in T-VIEW archives. Dream Report outputs can also be sent to email addresses according to a schedule.

The most flexible communications options

With a wide range of available modules and communication options, flexibility is now second nature. Available modules include modems, cellular radios, RS-232/485 serial ports, and Ethernet.

The built-in GSM option provides rich SMS reporting and remote control directly via a mobile phone. Standard serial and Ethernet ports are also available for connection to a broad variety of SCADA networks and intelligent devices.

MS-PSTN	PSTN modem + extra RS-232/485 port
MS-GSM	CSD/GPRS/EDGE/UMTS/HSDPA + RS-232/485
MS-GSM-3G-EU	GSM 3G + RS-232/485 EU version
MS-GSM-3G-US	GSM 3G + RS-232/485 US version
MSR-GSM-R	GSM for Railway Networks
MS-SERIAL	2 RS-232/485 serial ports
MS-ETHER-4	4 10/100 Ethernet ports

CPU16 or CPU32 processor modules

Processor modules provide computing power, communications control, and advanced alarm functionality, including a Web server.

MS-CPU16E — 16-bit processor

MS-CPU32 — 32-bit processor

MS-CPU32X—32-bit processor with dual SHDSL modem

Power supplies

Power supplies provide intelligent filtering and conditioning, plus battery charging capabilities.

MS-PS-AC230W — 85 to 265 V ac/90 to 375 V dc

MS-PS-DCN — -60 to -24 V dc/+8 to +30 V dc

MS-CHARGER — 2 AH charger module for 12 V lead acid cell batteries

Input/output cards

Input/output cards provide an interface to other systems/devices and support standard industrial signals.

MS-8DI	8 digital inputs
MS-16DI	16 digital inputs
MS-16DO	16 digital outputs
MS-16DIO	8 digital inputs, 8 digital outputs
MS-48 DI	48 digital inputs
MS-10DI-HS	10 digital/50 KHz HS count inputs
MS-COMBO	8 digital inputs, 4 digital outputs, 3 analog inputs

MS-8AIVC	8 analog inputs
MS-6RTD	6 temperature inputs
MS-4AOVC	4 isolated analog outputs
MS-Relay	8 isolated relay outputs
MS-4AI420	4 isolated analog inputs
MS-8AI420	8 isolated analog inputs

TBOX MS SPECIFICATIONS

Designation	Industrial-grade Remote Terminal Unit (RTU) Automation Controller		
Processor	16-bit Mitsubishi 7.37 MIPS; 32-bit PowerPC 266 Mhz — 505 MIPS — LINUX core		
Redundancy	Power supply, communications, processor (32-bit) level		
Clock	Real-time clock with battery backup — GPS synchronization (optional)		
Memory	CPU 32-bit	Flash memory	16 MB (Boot loader, Linux, OS, application, sources, web and report)
		SDRAM	64 MB (Linux execution, OS, application)
		SRAM	1 MB (datalogging, copy of tags value)
		SD/MMC card	up to 32 GB
	CPU 16-bit	Flash	768 KB
		RAM	320 KB
	SD/MMC card	up to 1 GB	
Backplane rack	Passive backplane. Available for 1, 3, 5, 10, 15, and 20 slots.		
I/O cards	MS-16DI	16 digital inputs, 24/48 V dc, isolated 8/8	
	MS-8DI-240VAC	8 digital inputs, 190-265 V ac 47/63 Hz, isolated 1/1 — IEC 61131 Type 1 approved	
	MS-8DI-120V	8 digital inputs, 90-132 V ac 47/63 Hz or 90-132 V dc, isolated 1/1 — IEC 61131 Type 1 approved	
	MS-8DI-48V	8 digital inputs, 20-60 V ac 47/63 Hz or 20-60 V dc, isolated 1/1 — IEC 61131 Type 1 approved	
	MS-48DI	48 digital inputs, 24/48 V dc, isolated 24/24 — no LED	
	MS-10DI-HS	10 digital inputs with high speed counting up to 50 KHz	
	MS-16DO	16 digital outputs, 24/48 V 350 mA open collector protected, isolated 8/8	
	MS-16DIO	16 digital inputs + outputs, 24 V 350 mA open collector protected, isolated 8/8	
	MS-RELAY	8 digital outputs relay, 230 V ac 3A, isolated 1/1	
	MS-4AI420	4 analog inputs 4/20 mA, 14-bit, isolated 1/1	
	MS-8AI420	8 analog inputs 4/20 mA, 14-bit, isolated 1/1	
	MS-8AIVC	8 analog inputs voltage: -10/+10 V, -20 mA/+20 mA, 0-20 mA, 4-20 mA, 14-bit, isolated 8/8 — 2 inputs out of the 8 can be configured with Pt100 or Pt1000 (2 wires)	
	MS-6RTD	6 temperature inputs (Pt100, Pt1000, Ni100, Ni1000) 2 and 3 wires, isolated 1/1	
	MS-4AOVC	4 analog outputs, 12-bit, 4/20 mA, -10 V/+10 V, active, isolated 1/1	
	MS-COMBO-1	8 DI (isolated 8/8) + 4 DO (isolated 4/4) + 3 AI (not isolated)	
Communication cards	MS-PSTN	PSTN 56K modem + 1 RS-232/485	
	MS-GSM	GSM modem + 1 RS-232/485	
	MS-GSM-3G-EU	GSM Quadband (GSM850, GSM900, DCS1800, PCS1900) and UMTS Tripleband (Band I - 2100 MHz, Band II - 1900 MHz, Band VIII - 900 MHz)	
	MS-GSM-3G-US	GSM Quadband (GSM850, GSM900, DCS1800, PCS1900) and UMTS Tripleband (Band I - 2100 MHz, Band II - 1900 MHz, Band V - 850 MHz)	
	MS-GSM-R	GSM for Railway Networks (876 MHz .. 880 MHz GSM-R uplink, 921 MHz .. 925 MHz GSM-R downlink)	
	MS-ETHER-4	4 Ethernet 10/100Base-T ports with embedded switch	
	MS-SERIAL	2 RS-232/RS-485 ports	
Special cards	MS-GPS	GPS timing and positioning module	
	MS-IO-SIMUL	Simulation + Test: 8 DI (switches), 8 DO (LEDs), 4 AI (potentiometers), 4 AO (LEDs)	
Hot swapping	All cards		
Power supplies	ac: 85 to 265 V ac (47 to 440 Hz) — dc: 90 to 375 V dc		
	dc: +8 to +30 V dc and -60 to -24 V dc		
Programming	Via TWinSoft Suite (TWinSoft, Web editor, report editor)		
Advanced Programming	TWinSoft supports Microsoft Windows® Automation; add-ons using ADK (advanced users)		
Automation languages	Ladder logic (IEC 61131-3 LD), Basic		
Alarm handling	Smart alarm management with embedded calendar		
Datalogging	Smart Data Logging: sampling tables (instantaneous, min, max, average), digital and analog chronologies		
Datalogging resolution	MS-CPU16 (16-bit module): 1 second		
	MS-CPU32 (32-bit module): 1 ms		
IT features	HTTP, FTP, SMTP (email), POP3, SFTP, SNMP, IP forwarding, DynDNS, NTP		
Security features	MS-CPU32 processor only: firewall, HTTP log-in, HTTPS, IEEE802.1x authentication, VPN, SFTP, SSL, Industrial Defender Ready		
Protocols	Support for over 40 protocols, including Modbus (master/slave, RTU, TCP, ASCII), DNP 3.0, IEC 60870-5		
DIN rail module housings	Proprietary aluminum enclosure, anodized and Alodined for corrosion and noise interference resistance		
Temperature	Storage: -40° to +80°C		
	Working: -40° to +70°C (GSM, PSTN options: -20° to +65° C)		
Humidity	5-95% noncondensing		
MTBF	>400,000 hours		
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, 8, 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		

www.servelec-semaphore.com

U.S.A.
Semaphore Americas Inc.
280 Wekiva Springs Road
Suite 3030
Longwood, FL 32779
U.S.A.

P +1 (844) 475 8020

Australia
Semaphore
Unit 8, 3-5 Gilda Crt
Mulgrave, Victoria 3170
Australia

P +61 (03) 8544 8544
F +61 (03) 8544 8555

Europe
Semaphore Belgium
Waterloo Office Park — Building "M"
Dreve Richelle, 161
B-1410 Waterloo
Belgium

P +32 (2) 387 42 59
F +32 (2) 387 42 75

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