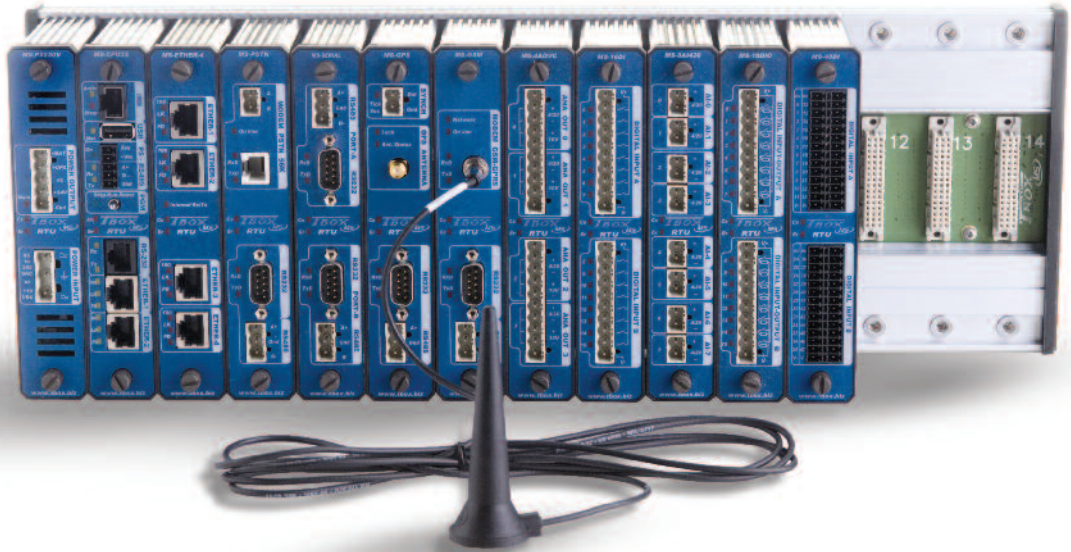




## Semaphore T-BOX MS



T-BOX 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 T-BOX 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 20 years of experience in the telemetry industry, T-BOX 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.

## T-BOX — The Web generation of telemetry products

T-BOX 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 T-BOX MS system on an SD/MMC card and your maintenance personnel can deploy it without switching on a computer.

The T-BOX MS system includes

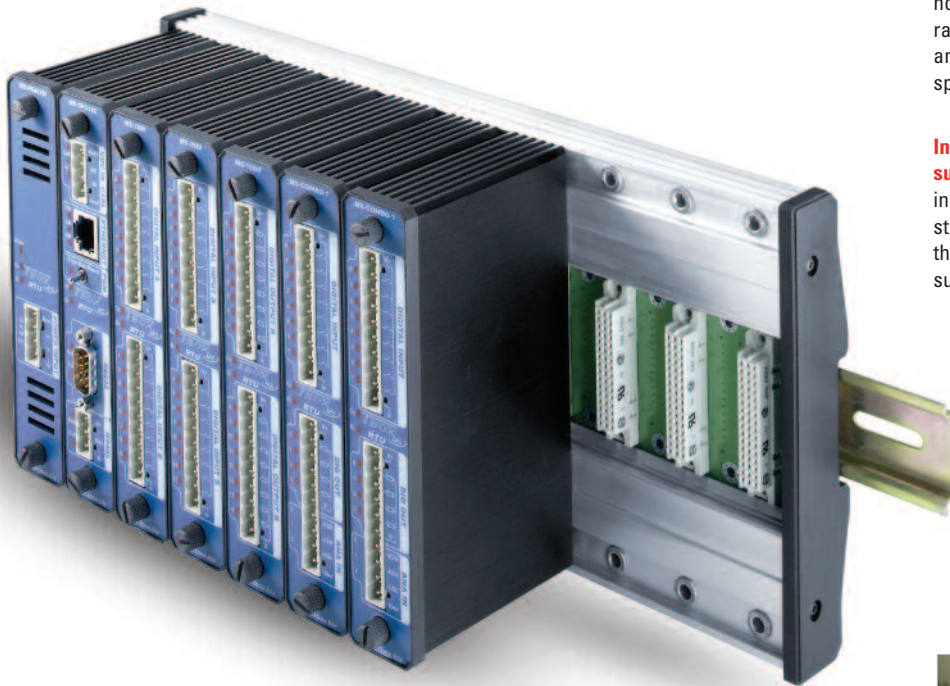
**Onboard Web server** technology that eliminates the need for complex, costly SCADA software and expensive HMI displays. T-BOX gives you real-time access to alarm management, event logs, I/O status, and control — all from a standard Web browser. Multiple clients can be simultaneously connected to the same device, all without costly software licensing fees.

**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.

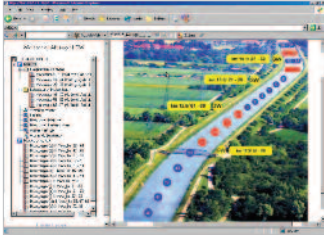
**Robust, all-alloy construction** stands up to the harshest environments. Our specially developed, proprietary alloy enclosure provides noise immunity, wide temperature range, impact/vibration resistance, and DIN-rail mounting without special tools.

**Intelligent uninterruptible power supply** filters and conditions incoming power and manages standby batteries. T-BOX 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

T-BOX 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.

T-BOX MS allows you to configure the system the way you want via a modular-based backplane architecture — available in different sizes (5, 10, 15, or 20).

## The most flexible communications options

With a wide range of available modules and communication options, flexibility is now second nature. Available modules include power supplies, CPU, input/output, modems (PSTN, GSM, ISDN, etc.), RS-232/485 serial ports, Ethernet, and GPS.

The built-in GSM option provides rich SMS reporting and remote control directly to a cell phone. Standard serial and Ethernet ports are also available for connection to other devices such as packet radio, satellite, and PSTN modems.

Communication modules provide remote reporting and communications capabilities to the system and are available in a variety of configurations.

|            |                                       |
|------------|---------------------------------------|
| MS-PSTN    | PSTN modem + extra RS-232/485 port    |
| MS-GSM     | CSD/GPRS/EDGE/UMTS/HSDPA + RS-232/485 |
| MS-GPS     | GPS receiver + extra RS-232/485 port  |
| 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.

CPU16 — 16-bit processor

CPU32 — 32-bit processor

## Power supplies

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

MS-PS230V — 85 to 265 V ac/90 to 375 V dc

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

## Input/output cards

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

|          |  |           |                           |
|----------|--|-----------|---------------------------|
| MS-16DI  | 16 digital inputs  | MS-6RTD   | 6 temperature inputs      |
| MS-16DO  | 16 digital outputs                                       | MS-4AOVC  | 4 isolated analog outputs |
| MS-16DIO | 8 digital inputs, 8 digital outputs                      | MS-Relay  | 8 isolated relay outputs  |
| MS-COMBO | 8 digital inputs, 4 digital outputs,<br>3 analog outputs | MS-4AI420 | 4 isolated analog inputs  |
| MS-8AIVC | 8 analog inputs  | MS-8AI420 | 8 isolated analog inputs  |
|          |  | MS-48DI   | 48 digital inputs         |

## T-BOX MS SPECIFICATIONS

|                        |   |  |  |  |
|------------------------|---|--|--|--|
| Designation            | Industrial-grade remote terminal unit (RTU)   |  |  |  |
| 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  | 16 MB  |  |
|                        |   | SDRAM  | 16 MB  |  |
|                        |   | SRAM   | 1 MB   |  |
|                        | CPU 16-bit  | SD/MMC card  | up to 16 GB  |  |
|                        |   | Flash  | 768 KB   |  |
|                        |   | RAM  | 320 KB   |  |
|                        | SD/MMC card   | up to 1 GB   |  |  |
| Backplane rack         | Passive backplane. Available for 1, 5, 10, 15, and 20 slots.  |  |  |  |
| Communication          | Ethernet (10/100Base-T), PSTN, GSM (read/write support), serial (RS-232/RS-485), satellite, radio, ISDN, xDSL |  |  |  |
| 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-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 (incl. 3G support) + 1 RS-232/485        |  |
|                        |   | 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   |  |  |  |
| Programming            | Via TWinSoft Suite (automation, Web editor, report editors)   |  |  |  |
| Automation languages   | Ladder logic (IEC 61131-3), Basic, Function Blocks, Microsoft Windows® Automation                             |  |  |  |
| Alarm handling         | Smart alarm management with embedded calendar   |  |  |  |
| Datalogging            | Smart logging: sampling tables (instantaneous, min, max, average), digital and analog chronologies, SoE       |  |  |  |
| Datalogging resolution | CPU16 (16-bit module): 1 second   |  |  |  |
|                        | CPU32 (32-bit module): 1 ms   |  |  |  |
| SCADA compatibility    | T-VIEW, InTouch, iFix, WIZCON, CITECT, Topkapi, Cube, Labview, Panorama ...                                   |  |  |  |
| Remote upload          | Up to firmware level  |  |  |  |
| IT features            | HTTP, FTP, SMTP (email), POP3, SFTP, SNMP, IP forwarding, DynDNS, NTP, Industrial Defender ready              |  |  |  |
| Protocol support       | Support for over 40 drivers, including Modbus (master/slave, RTU, TCP, ASCII), DNP 3.0, IEC 60870-5           |  |  |  |
|                        | Library of more than 40 drivers available   |  |  |  |
| Protection             | 4 levels of authority, SSL, encryption, HTTPS, IEEE 802.1X, Open VPN  |  |  |  |
| PCB                    | 6, 8, and 10 layers PCB   |  |  |  |
| 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  |  |  |  |
|                        | All power supplies feature onboard intelligent battery charging   |  |  |  |
| Temperature            | Storage: -40° to +80°C  |  |  |  |
|                        | Working: -40° to +70°C (GSM, PSTN options: -20° to +65° C)  |  |  |  |
| Humidity               | 5-95% noncondensing   |  |  |  |
| Material               | Proprietary aluminum enclosure, anodized and Alodined for corrosion and noise interference resistance         |  |  |  |
| Approvals              | CE, UL/CSA  |  |  |  |
| EMC                    | EN61326-1, EN61000-4-2,3,4,6  |  |  |  |
| EMI emissions          | EN55022, EN61326-1  |  |  |  |
| MTBF                   | >400,000 hours, statement available upon request  |  |  |  |

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