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# T-BOX LP Ultra-Low-Power Wireless RTU

## Compact, battery or solar-powered solution for remote automation and monitoring.



*The T-BOX LP ultra-low-power wireless RTU cost effectively extends advanced IP, Web, and telemetry technologies to practically any remote location. To meet all installation needs, it is available in a very compact, self powered DIN rail-mounting module or IP68 package, shown here.*
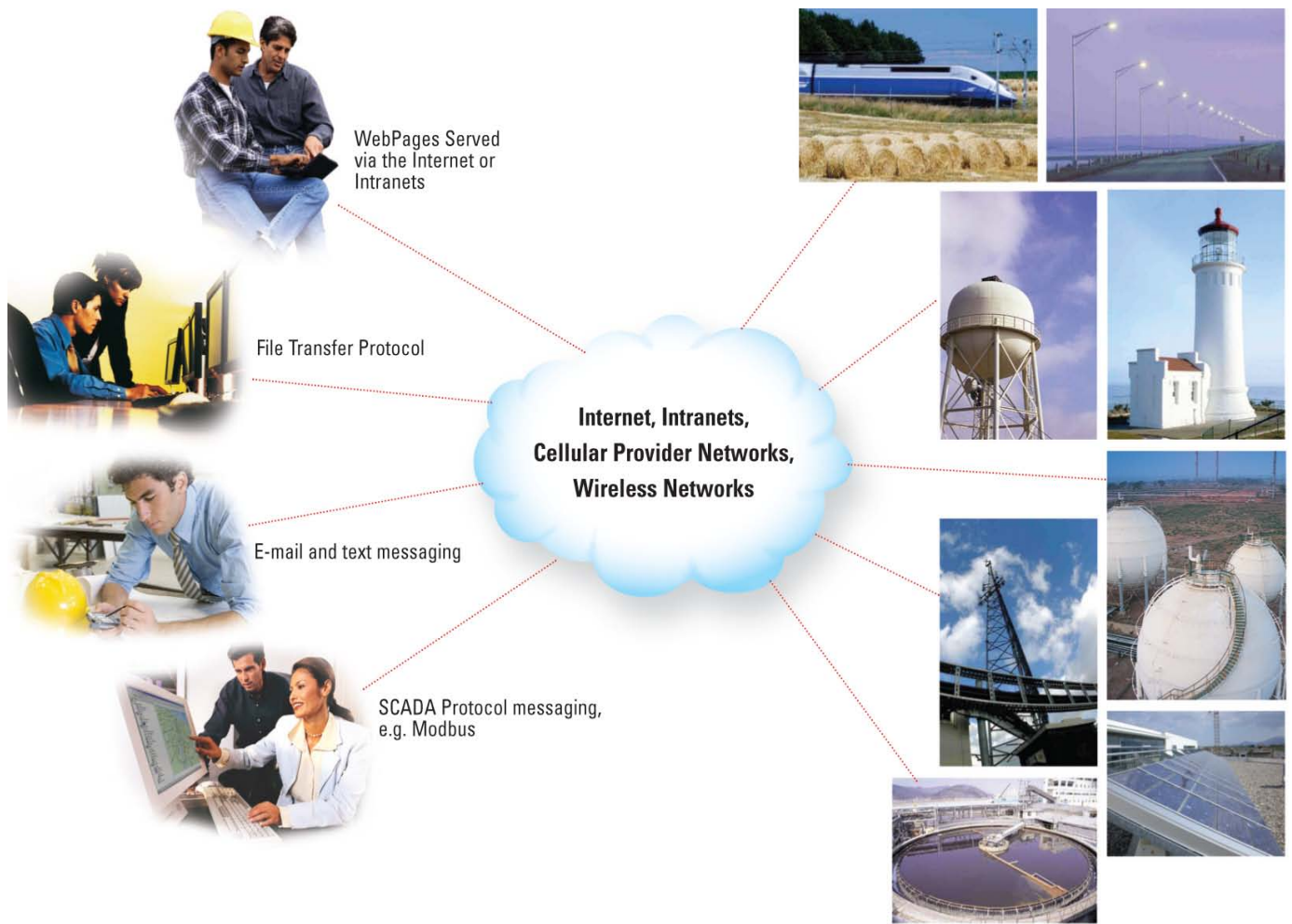
The T-BOX LP ultra-low-power wireless RTU is a complete solution for remote automation and monitoring. It is available in an IP68 package and has been approved for operation in Zone 2 hazardous areas. Ultra-low current draw allows long life using lithium ion batteries or solar power systems.

T-BOX LP incorporates programmable automation, calculations, and logic operations with support for IEC 61131-3 Ladder Diagram, Basic, and Microsoft Windows Automation. Four analog inputs, eight discrete inputs (including two with counting capabilities), eight discrete outputs, and a serial RS-485 interface meet the I/O requirements of a broad array of applications.

With T-BOX LP, remote locations also benefit from the advanced IP, Web, and telemetry technologies provided by Semaphore's T-BOX architecture. T-BOX technology provides users real-time access to alarms, live information, and historical data, anytime, anywhere, through a standard Web browser. T-BOX LP best manages inexpensive, public networks by transmitting information via e-mail, IP, and SMS text messaging, only when necessary, and allows personnel to be kept fully up-to-date using a mobile phone or PDA.

Integrating the T-BOX IP/Web technology platform in a rugged, compact package, T-BOX LP provides the highest automation and monitoring capabilities in an ultra-low-power platform.

# T-BOX LP Ultra-Low-Power Wireless RTU

WebPages Served
via the Internet or
Intranets

File Transfer Protocol

E-mail and text messaging

**Internet, Intranets,
Cellular Provider Networks,
Wireless Networks**

SCADA Protocol messaging,
e.g. Modbus

*T-BOX LP can be installed in practically any remote location and cost-effectively stays in touch with operations staff using push communications.*

*T-BOX LP also drops-in to existing SCADA networks using common protocols such as Modbus.*

## Applications

T-BOX LP is ideal for remote automation and monitoring applications in a broad variety of industries, including agriculture, energy management, mobile asset management, oil & gas, smart grid, soil remediation, telecommunications, transportation, utilities, vendor-managed inventory, and water/wastewater.

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# T-BOX LP Ultra-Low-Power Wireless RTU

*Bringing T-BOX technology to remote site automation and monitoring:*



*The DIN rail-mounting package, shown here, presents a very compact footprint for installation in third-party enclosures.*

### Communications Management

Timely updates on consumables, inventory and process status substantially reduce site visits.

Intelligent management of communications and push technology minimize networking costs while providing the comprehensive information that is needed to optimize maintenance and operations. T-BOX LP transmits alarms, live updates and historical reports via e-mail, SMS text, or IP when required without continual polling on the network.

### Integral Web Server

T-BOX LP serves very informative Web pages, which comprise an inexpensive HMI for operations and local maintenance. Semaphore's WebForm Studio greatly simplifies configuration of web pages using dynamic objects.

### Alarm Management

Using multi-media messaging, T-BOX LP notifies multiple recipients upon an alarm and escalates unacknowledged alarms. Users can acknowledge alarms via phone, PDA, or PC.

### Data Logging

T-BOX LP supports sophisticated archiving that maintains values in the form of averages, maxima, minima or instantaneous samples to provide reports for auditing, maintenance, and optimization purposes.

### SCADA Compatibility

T-BOX LP is also compatible with traditional SCADA systems, which use a variety of common protocols such as Modbus.

### Programmable Automation

Automation tasks, custom calculations and logic operations are programmable using IEC 61131-3 ladder diagram or BASIC. Microsoft Automation support allows compilation of source from Microsoft Excel, Visual Basic, etc.
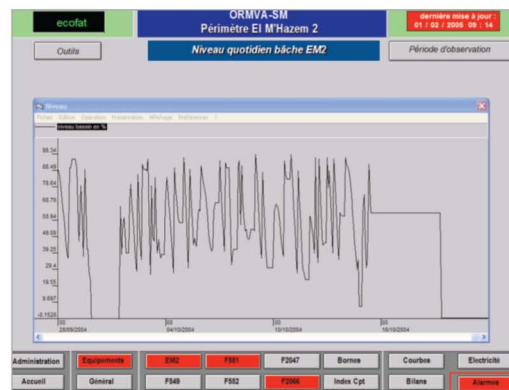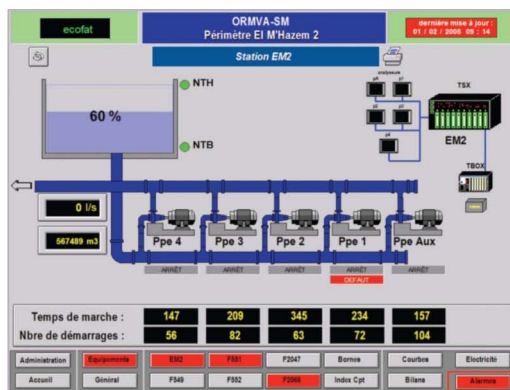
### Integrated Packaging

The compact, easy-to-install, IP68 package completely integrates the T-BOX platform, communications devices, and batteries. For installations in third-party enclosures, a DIN rail-mounting package is also available.

### Ultra Low Power Management

Ultra low-power consumption keeps power source costs at a minimum and provides long life using a single lithium battery or solar power system.

Unlike most "low power" devices, T-BOX LP can source loop current for 4–20 mA instruments.



*Web pages can be dynamic, "mimic" displays, which incorporate multiple process objects, tabular displays or trend displays.*

# T-BOX LP – Specifications

| | Models | | |
|---|---|---|---|
| | *LP-400* | *LP-401* | *LP-450* |
| **Analog/Discrete Inputs/Outputs** | | | |
| Digital inputs, dry contact, 0-12 V dc* | | 8 | |
| *2 Digital input points are also 1KHz counters. Optional front panel pushbuttons use 2 points. | | | |
| Digital outputs, open drain | | 8 | |
| Analog inputs, 0–5 V dc only | | 4 | |
| Analog inputs, 0–5 V dc and 0/4–20 mA | 4 | | 4 |
| Source low power voltage transmitters via 12 V dc | | 8 | |
| Source 4–20 mA transmitters via 12 and 24 V dc | Yes | | Yes |
| **Integral Communications** | | | |
| RS-232 local "programming" port w/RTS and CTS | | Yes | |
| RS-485 2-wire port | | Yes | |
| RS-232 network port with full modem control option | | Yes | |
| GSM quad band option | | Yes | |
| CDMA option | | Contact Semaphore for availability | |
| Spread spectrum 900 MHz, 2.4 GHz, 9600 baud option | | Contact Semaphore for availability | |
| **Power** | | **Battery** | **External Nominal 12 V dc** |
| Internal battery | | Lithium D Cell, Saft LSH20-BA | - |
| Number of batteries | | 1 or 2 | - |
| Operating voltage | | 3.6 V dc | 8.0 to 16.1 V dc |
| Battery life calculation and low alarm | | Yes | |
| Average current draw at nominal input voltage | | 0.1 to 2.6 mA | 0.03 to 0.8 mA |
| Battery life using 2 batteries* | | 1 to 10 years | N/A |
| *Please refer to the T-BOX LP Battery Life Calculator spreadsheet to determine life time based on specific operating conditions. | | | |
| **Processor/Memory** | | | |
| Processor | | Low power Mitsubishi 16-bit microprocessor | |
| Real time clock | | Yes | |
| Flash | | 768K | |
| RAM | | 128K + 256K (chronologies + sample tables: 72k; additional tables: 256k) | |
| **Environment** | | | |
| Operating temperature | | -40 to 70° C (GSM option requires industrial-grade SIM) | |
| Storage temperature | | -40 to 80° C | |
| Humidity | | 5 to 95% RH | |
| 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 | |
| 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 | |
| **DIN Rail-mounting package** | **T-BOX LP** | | **Battery compartment** |
| Size, inches | 5.91 H x 4.53 D x 1.58 W | | 4.4 H x 4.33 D x 1.97 W |
| Size, mm | 150 H x 115 D x 40 W | | 112 H x 110 D x 50 W |
| Weight | 300 g (9.65 oz) | | 140 g (4.83 oz) |
| **IP68 housing — available in two materials** | Aluminum | | Manganese bronze |
| Approvals | IP68 and Nema 6 | | IP68, Nema 4x, Nema 6 |
| Size, inches | | 8.15 H x 3.0 D x 8.15 W | |
| Size, mm | | Size, mm 207 H x 77 D x 207 W | |
| Weight with GSM, LCD, one battery | 2.35 kg (5.2 lb) | | 6.3 kg (13.86 lb) |
| Installation | | Wall-mount and pipe-mount accessories optional | |
| LCD and pushbutton option | | Yes | |
| **Hazardous Area Approvals** | | | |
| Class I, Division 2, Groups C, D | | Pending | Pending |
| ATEX Zone 2 | | Approved | Approved |