

RTCX SX1 series

Advanced Control and Tracking Platform

The RTCX SX1 is a stand-alone tracking, monitoring and data collection device designed for applications, which require extremely long operating time without access to external power. Based on the X32 generation of RTCX products the SX1 series introduces zero-power saving mode reducing the power consumption in the deepest hibernation mode to virtually nothing. This state-of-the-art technology allows the unit to operate as long as 10 years with no external power!



The RTCX SX1 is a compact tracking, monitoring and data collection device especially designed for stand-alone as well as extremely long operating time in harsh environments. The product is fully integrated in an IP66 ingress-protected ruggedized plastic box that can withstand years of operation. The zero-power saving mode allows the unit to enter power saving mode - waking up on the on-board 3D accelerometer, digital input change or after a certain time period – and to stay in this mode virtually forever only limited by the battery technology used! The RTCX SX1 series is available in versions for standard GSM (*RTCX SX1 pro*) and railroad based GSM-R (*RTCX SX1 pro-r*) for advanced and reliable asset tracking in a wide range of application segments.

The RTCX SX1 series has support for medium range wireless communication using the ISM 868 MHz frequency band. This feature allows implementation of wireless sensors, RF-tracking and simple remote key fob applications. For usage in various application scenarios there is no less than four on-board battery configurations available ranging up to a massive 58 Ah non-rechargeable pack.

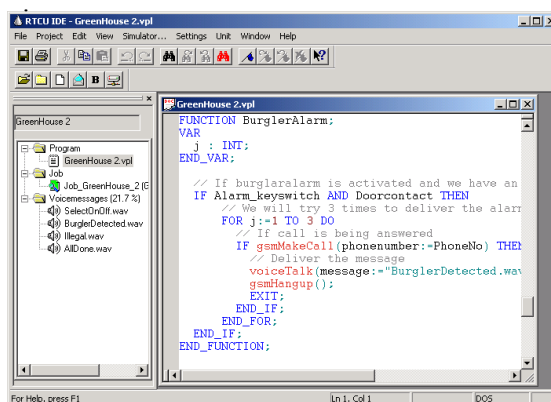
The RTCX SX1 series has on-board antennas for GSM, GPS and ISM RF with an optional feature to use external antennas for longer range or for specialized applications, where the unit is installed in metal enclosures etc. Switching back and forth from internal to external GSM/ISM antennas can even be controlled programmatically by the application.

In addition to the powerful features allowing long-term autonomous operation the RTCX SX1 series also offers the possibility of operating from external power and comes with digital and analog I/O as well as 1-wire and an RS232 port available for the most demanding applications. For flexible external interfacing, the three PG7 blinds can be substituted with PG7 glands for IP66 protected cable entries.

For RTCX SX1 series has many other sophisticated features such as: Micro SD-CARD with up to 32 GB capacity and a 512 Kbyte internal flash drive with a FAT32 compatible file-system for easy sharing of files locally and remotely with a PC/server.

Some of the application areas includes:

- ❖ Trailer/container asset management.
- ❖ Railway asset management.
- ❖ Alarm / Security systems
- ❖ Mobile tracking applications
- ❖ Remote monitoring / control.
- ❖ *Your applications...*



The RTCX-IDE Integrated Development Environment for the RTCX is an easy-to-use program for all aspects of the development of applications for the RTCX. The RTCX-IDE contains a broad range of features, such as project control, comprehensive online help, built-in syntax highlighting editor, code generating wizard, voice recorder etc. A built-in simulator enables complete simulation of all features on the RTCX: GSM, GPRS, SMS messaging, GPS, Analog / Digital I/O etc. A remote update feature allows the application developer to download new versions of a program, firmware or voice messages to a remote RTCX via a modem connection or over GPRS. Together, all of these features enable the user to cut development time to a minimum.

RTCU SX1 series

Advanced Control and Tracking Platform

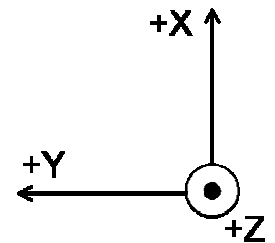
Powerful and Flexible Platform...

High Performance 32-bit Processor with large memory capacity

- Powerful industry leading dedicated 32-bit ARM7 Processor.
- Very fast execution (48 MHz).
- 1088 KByte RAM.
- 2304 KByte Flash for application and database.
- 512 Kbyte Dataflash for datalogging / parameters.
 - Support for additional 8 MByte DataFlash.
- 512 Kbyte internal flash drive with FAT compatible file-system, for easy sharing of files with a PC.
- 8 KByte FRAM for fast access memory without any write endurance limitations.
- Micro-SD Card Reader with FAT32 file-system and up to 32 GB capacity.

Extensive Range of Standard Features

- 2 Digital inputs, 2 Digital output and 2 Analog inputs.
- Dedicated high-speed USB programming port providing improved communication speed.
- Standard RS232 serial port. Alternatively used as service port.
- 1-wire bus for connection to temperature sensors, ID-button readers, etc.
- Full support for the Navigation and Messaging Platform available from Logic IO.
- One user available bi-color LED-Indicators with 3 colors: Green, Red and Yellow.
- One bi-color and one yellow system LED indicating state of GSM, Power management and Battery charging etc.
- High performance +/-16g 3-axis accelerometer / movement sensor.
- On-board dipswitch for input configuration and general use.
- Temperature sensor.



State of The Art Communication Technology

- **RTCU SX1 pro:** Quad Band (850/900/1800/1900 Mhz) GSM.
- **RTCU SX1 pro-r:** Triple Band (900/1800/1900 Mhz) GSM-R for GSM-Rail system.
 - SMS (Text and PDU)
 - GPRS. Multislot class 10
 - CSD (Datacall)
 - On-board internal chip antenna. Prepared for external antenna connection.
- On-board high-sensitivity GPS-receiver with extremely fast acquisition and low-power consumption.
 - Full SBAS (EGNOS / WAAS / MSAS) support for enhanced GPS precision
 - Prepared for A-GPS.
 - On-board internal patch antenna. Prepared for external antenna connection.
- On-Board medium range RF transceiver (868 MHz)
 - On-board internal chip antenna prepared for external antenna connection.

Advanced Power Management

- Several power-saving modes: Zero Power, 'Wait for Event', zero-power and 5 processor execution steps.
- Wakeup from 'Wait for Event' using: Digital input, 3D movement sensor, Timeout, GSM- or UART activity.
- Advanced power saving mode while awaiting 2D/3D GPS fix.
- Zero Power saving mode reducing the power consumption to virtually none with wake-up from:
 - 3D movement sensor.
 - Digital inputs.
 - Timer.
- Integrated dynamic battery power consumption measurement circuit for management and statistical purposes.



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...ready to meet ALL your requirements...

Full Flexible Power

- Powered from internal battery pack and/or from external powers source.
- Several battery configurations supported:
 - 58 Ah (nominel) non-rechargeable battery. Height: 56 mm.
 - 24 Ah (nominel) non-rechargeable battery. Height: 43 mm.
 - 10 Ah (nominel) rechargeable battery. Height: 43 mm.
 - 2 Ah (nominel) rechargeable battery. Height: 43 mm.
- Automatic switch-over from external to internal power.
- Automatic charging and maintenance of rechargeable batteries.
- Integrated dynamic battery power consumption measurement circuit for management and statistical purposes.
- During service and development the unit is powered directly from USB.

Development Tools for Rapid Application Development

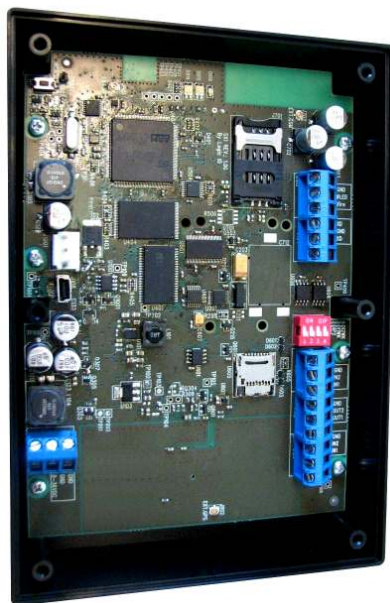
- Programmable using the FREE RTCU IDE full-feature development environment.
- Easy to learn VPL high-level programming language based on the EIC 1131-3 industrial standard.
- More than 800+ standard functions and 1000 pages of on-line documentation suits every application.
- Many example programs available to "kick-start" application development.
- Full feature Microsoft Windows Simulator allowing test of complete application without use of physical unit.
- VSMS technology seamlessly supports SMS, GPRS, CSD without application/server changes.
- Seamless upgrade to future technologies.
- 100% backward compatible with other and past generation RTCU products.

Industry Leading Deployment Features

- Full Logic IO GPRS Gateway Professional / Upgrade & Deployment server compatible.
- Upgrade of application, firmware and parameters over CSD, GPRS and USB.
- Upgrade can occur during full unit operation minimizing down time of the application.
- Unattended and fully automatic upgrade and deployment.
- Automatic "bootstrap" of un-programmed unit on first time installation.

Innovative Design

- Encapsulated in a robust and compact plastic housing.
- IP-66 ingress protected for outside installation.
- Power and I/O externally accessible for easy and safe installation.
- Designed and developed in Denmark, produced in the EU.



Proven Technology from Logic IO

- All hardware and software developed by Logic IO.
- In the GSM/GPRS/GPS business since 1999.
- Practical experience from more than 50+ GSM networks.
- Network of partners around the globe.
- More than 75.000 units in operation worldwide.
- Logic IO has D&B highest credit rating **AAA**.
- Rewarded the Gazelle Award 2007 / 2008 for strong growth.




...and beyond!

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Technical Data

	Min	Typ	Max		
Operating Voltage	8	-	36	VDC	Protected against wrong polarity.
On-board Battery Pack		2/10 24/58		Ah Ah	Rechargeable Li-ion battery. Non-rechargeable battery.
Unit Active		35		mA	<i>Typical measurements @ 12 VDC Supply.</i> GSM idle @ -63 dBm. GSM idle @ -63 dBm. * Only with Li-ion battery backup option. Restart on: Ignition and RTC. Resume on: DI, 3D accelerometer., RTC. Resume on: RS232. Resume on: GSM. On internal battery, Vibration and RTC active.
Unit Active with GSM On		45		mA	
Unit Active with GPS On		50		mA	
Unit Active with GSM/GPS On		55		mA	
Unit Active while Charging		500		mA	
Unit in Power-down		0,5		mA	
Unit in "Wait for Event"		0,5		mA	
Unit in "Wait for Event"		5		mA	
Unit in "Wait for Event", GSM On		15		mA	
Unit in "zero-power" mode		50		µA	
I/O:					
Digital input logic "high"	0	-	0,3	VDC	
Digital input logic "low"	0,5	-	30	VDC	
Digital output voltage	-	-	36	VDC	
Digital output sink current	-	-	100	mA	
Analog input	0	-	10	VDC	
3D Movement Sensor:	12 bit @ +/- 16g				3-axis digital accelerometer with hardware buffer.
GPS:	66 Channels SuperGPS				Supports SBAS (WAAS, EGNOS, MSAS).
• Channels					
• Tracking Sensitivity	-165 dBm				
On-board ISM RF:	868 MHz				GFSK modulation. Automatic frequency compensation. Compliant with EN 300 220. Operating range depends on the environment. Outdoor range is at line-of-sight.
• Frequency	250 kHz				
• Channel Spacing	+10 dBm				
• Maximum Transmit power	-112 dBm				
• Receiver sensitivity	Indoor:up to 15m / Outdoor:up to 50m				
• Operating Range					
Storage temperature:	-30	-	+65	°C	External connections and LED: <ul style="list-style-type: none"> Power. Digital and analog I/O. RS232 and 1-wire. Two Bi-color LED and one yellow status LED. Internal interfaces: <ul style="list-style-type: none"> Mini USB programming connector. 2 user defined, 2 configuration DIP-switches. Standard 3 Volt SIM Card Reader . Micro-SD card reader.
Operating temperature (According to GSM 11.10 specification)	-40	-	+70	°C	
Battery Charging Temperature	-10	-	+45	°C	
Humidity (RH non condensing)	5	-	90	%	
Weight (Low profile with 10 Ah bat.) Weight (High profile with 58 Ah bat.)	0,530 0,820			Kg. Kg.	
External dimensions	W 175 x H 42 x D 126 mm W 175 x H 54 x D 126 mm				Low profile enclosure. Excluding mounting flanges. High profile enclosure. Excluding mounting flanges.
Ingress Protection (IP)	IP-66				Black UL94 plastic enclosure with sealing membrane
Approvals	EN 61000-6-2 / EN 61000-6-3				 EU EMC Directive 2004/108/EU

Technical data subject to change.

For more information:

Web: www.logicio.com

Email: info@logicio.com

