Atlas SOLAR1
Communication device and data logger

Atlas SOLAR1 is a low power consumption communication device and data logger with an optional battery supply, intended for outdoor installation (IP67) and industrial 24/7 unattended use with 99.90% uptime. The device can be powered by different power supplies:

- battery supply,
- external DC voltage supply 3.3-20 V,
- Power over Ethernet.

The device has two ARM core processors, for different purposes. The main, controlling processor is a low power microcontroller, which acquires data from sensors using serial ports, I2C bus and analog inputs, stores collected data in non-volatile memory and communicates over GSM/3G/4G LTE and LoRa networks. It has the capability of remote firmware upgrade via GSM communication. In the main operation mode, the device acquires and sends data to a remote server over GSM/3G/4G LTE network with configurable period. This processor has inbuilt watchdog which enables automatic reset in case of failure. Reset can be triggered remotely.

The second processor is a system on a chip (SoC) ARM computer, with frequency scaling in the range 240 MHz-1 GHz. It could be powered on on-demand. This computer is a miniature Atlas RTU system with PLC functionality, and it is physically connected to the main processor, serial ports, GSM module, Ethernet, and USB. It can be used as a multifunctional processing computer, data concentrator, and protocol converter, to connect different DCS (Distributed Control System) segments, as well as real-time data processing (arithmetic and Boolean operations) use by PLC algorithms created according to IEC 61131-3 standard.

Atlas SOLAR1 can monitor and control all peripheral devices and sensors and send status data to DCS or store data in non-volatile memory for later transmission. External communication modem (satellite, WiFi) can be connected to SOLAR1, to serve as secondary communication method if primary (GSM) is not available at the scheduled transmission time.

Stored data can be transmitted periodically with configurable period, on demand, or if any of the measured values changes between two measurements more than set amount.

Atlas SOLAR1 conserves power by entering sleep mode after measurement and data transmission operations.

Optional built-in li-Ion or Li-Po battery enables sending of alarms and diagnostic data even in case of failure of the main batteries.

General technical characteristics

- Input voltage 3.3-20V DC
- Two serial RS-232/RS-485 ports, galvanically isolated
- I²C bus communication with sensors
- GSM/2.5G/3G/4G LTE Cat1 and LoRa communication
- M2M, IoT and broadband Internet communication
- One galvanically isolated digital/counter input
- 4 analog 4-20mA inputs
- USB 2.0 host
- 10/100Mb Ethernet

- Power over Ethernet
- Main battery voltage and charging current monitoring
- Optional Li-Ion 18650, or Li-Po battery, 2000-2500 mAh
- Integrated Li-Ion and Li-Po battery charging controller
- Operating temperature range -40°C to 70°C
- Enclosure dimensions: 250x80x64 mm
- IP67 rating
- Power consumption:
    - 0.02 W in main operation mode
    - Up to 2 W with ARM SoC computer

ARM computer technical characteristics:

- CPU: Quad-core Cortex-A7, up to 1GHz
- RAM: 512MB
- FLASH: 8GB
- SD Memory card up to 128GB
- USB 2.0 host
- 10/100Mb Ethernet

Communication protocols supported by using ARM computer:

- IEC 60870-5-101 Master/Slave
- IEC 60870-5-102 Master
- IEC 60870-5-103 Master
- IEC 60870-5-104 Client/Server
- MODBUS RTU over serial and UDP Master/Slave
- MODBUS TCP Client/Server
- IEC 61850 Client/Server
- DNP3 Master
- DLMS