SKYWAVE™

AN ORBCOMM COMPANY

ST 9100 Series

Dual mode satellite-cellular terminal for diverse IoT applications.

A flexible, robust, and programmable dual mode satellite-cellular terminal. It is ideal for remotely monitoring and controlling fixed and portable assets. Versatile and environmentally sealed, the ST 9100 series is perfect operating in remote and rugged environments.

Easy integration

The ST 9100 series offers a flexible programming environment that supports the development of custom solutions, as well as support for SKYWAVE configurable terminal apps. In fact, you can combine terminal apps with your own code to create a custom solution to speed time to market.

Development kit

The ST 9100 series development kit includes all the hardware, software development tools, documentation, accessories and support to write and test your IoT solution for quicker time to market.

Feature-rich

Standard features include multiple I/Os, including analog/digital, 2 RS232, 1 RS-485/J1708, 1-Wire and 2 CANbus. 3-axis accelerometer, Bluetooth connectivity and multiple SIMs are also supported.

Remote reefer control

Advanced temperature management

Internal reefer cabinet install

No-drill install

Remote pre-trip inspections

Support for Copeland REFCON BLE monitoring system

Airtime savings

Use cellular or automatically switch between cellular and satellite for cost savings. Program the terminal to process data and send essential updates over the air.

Continuous operation

A backup battery enables reporting for more than 48 hours (1-minute cellular or 60-minute satellite reporting) when power is interrupted.

Specifications

Dimensions

- 148 x 113 x 47 mm
- 181 x 113 x 47 mm including mounting feet

Satellite communications

- Satellite service: Two-way, Global, OGx or IsatData Pro
- Maximum message size:
    - *OGx: From-mobile 1 MB, to-mobile 1 MB*
    - *IsatData Pro: From-mobile 6.4 kB, to-mobile 10 kB*
- Typical latency: <15 sec, 100 bytes
- Elevation angle: +20° to +90° (remote antenna); -15° to +90° (low elevation antenna)
- Frequencies:
    - *OGx: Rx 1525.0 to 1559.0 MHz; Tx 1626.5 to 1660.5 MHz*
    - *IsatData Pro: Rx 1525.0 to 1559.0 MHz; Tx 1626.5 to 1660.5 MHz*
- EIRP: <7.0 dBW

Cellular communication

- ST 9100 series Global: Cat 4 LTE (B1, B3, B5, B7, B8, B28), UMTS (850, 900, 1900, 2100), Quad-band GSM
- ST 9100 series Americas: Cat 1 LTE (B2, B4, B5, B12), UMTS (850, 900, 1900, 2100), Quad-band GSM
- ST 9100 series Saudi Arabia: Cat 1 LTE (B1, B3, B8, B20, B28), UMTS (2100)
- ST 9101 Global: Cat 1 LTE (B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B26, B28, B38, B39, B40, B41), UMTS (850, 900, 1900, 2100), Quad-band GSM
- SIM: 3.3V/1.8V SIM

Certification

- FCC/IC, FFA,PTCRB, Inmarsat type approval, RCM, ICASA, Anatel, IFT, IEC 60945, ENACOM

Battery

- Lithium ion 2,000 mAh
- Discharge temperature range: -20°C to +75°C
- Battery backup: >48 hours operation with 1-minute cellular reporting or 60-minute satellite reporting

Memory

- Lua Code: PSRAM 8MB, NVM: ST 9100 series , 16 MB; ST 9101, 32 MB

External interfaces

- 4 configurable inputs/outputs: Analog/digital/input/output
- 2 dedicated outputs (sink-ground)
- 4 Digital/analog inputs (2x 4-20mA)
- Serial: 2 RS-232; 1 RS-485/J1708; 2 CAN bus; 1-Wire

GPS/Glonass/Beidou/Galileo

- Acquisition time: *Hot: 1 second — Cold: 26/30/34/26 seconds*
- Accuracy: 2.0 m CEP-horizontal
- Sensitivity:
    - *Acquisition: -148 dBm*
    - *Tracking: -167 dBm*
- Security: signal jamming detection

Electrical

- Input voltage: 9 to 32V; load dump protection: +150V; SAE J1455 (Sec. 4.13)

Other interfaces

- Bluetooth v5.0 low energy module
- Two embedded SIMs plus additional user accessible SIM

Accelerometer

- 3-axis accelerometer

Environmental

- Operating temperature:
    - *Transceiver and antenna: -40°C to +85°C*
    - *Back-up battery: -20°C to +75°C*
- Dust and water ingress:
    - *Transceiver: IP67*
    - *Satellite/GPS* antenna: IP67
- Vibration: SAE J1455 (Sec 4.9.4.2 fig 6-8); MIL-STD-810G
- Shock: MIL-STD-810G (Sec 516.6)

Programming

- Lua scripting engine with core services. SDK with GUI development tools available. Lua software application and firmware upgradable over the air (SOTA, FOTA)
- Geofencing: 128 Polygons
- Data Logger: 50,000 position reports
- AES 256 encryption-capable

Specifications

- Optional, configurable terminal apps:
  - ▸ **AVL** *enables location tracking, status monitoring and driver behavior monitoring.*
  - ▸ **Heavy CAN Bus** *extracts engine data such as engine hours, fuel consumption from heavy-duty vehicles.*
  - ▸ **Garmin Dispatch** *enables text messaging, custom forms, stops, and HOS through a Garmin device.*
  - ▸ **Sensors** *extracts data from connected sensors or devices and generates reports, alarms and histograms.*
  - ▸ **Modbus** *interprets data from Modbus devices and allowdata processing and alarms.*
  - ▸ **Vessel Monitoring System** *provides location tracking, status monitoring and behavior monitoring.*

Order codes

- ST9101-F01
- ST101599-APA OGx antenna
- ST101600-APA OGx low elevation antenna
- ST101597-NSA OGx side no cable
- ST101597-NSB OGx bottom no cable
- ST101598-NSA OGx low elevation side no cable
- ST101598-NSB OGx low elevation bottom no cable
- ST101066-001 bar cellular antenna
- ST101561-001 puck cellular antenna
- ST101014-001 White shroud
- ST101062-002 Blunt cut cable, 5 meters
- ST101096 Mating connector kit
- ST101356-004 ST9101 Dev Kit
- ST901066-APA
- ST101600-APM

* Cellular antenna included

For more on our solutions or to book a demo, email us: **sales@skywave.com**

Visit our website **www.skywave.com**

SKYWAVE, an ORBCOMM company, is a global provider of IoT solution enablement technology. We empower solution providers, system integrators and OEMs to serve their customers through satellite and cellular managed IoT networks and a complete application enablement platform. We provide a fully integrated ecosystem of purpose-built devices, data automation and connectivity services for high-reliability, low-data solutions. SKYWAVE is where IoT powers mission-critical applications for the transportation, agriculture, oil and gas and maritime industries.