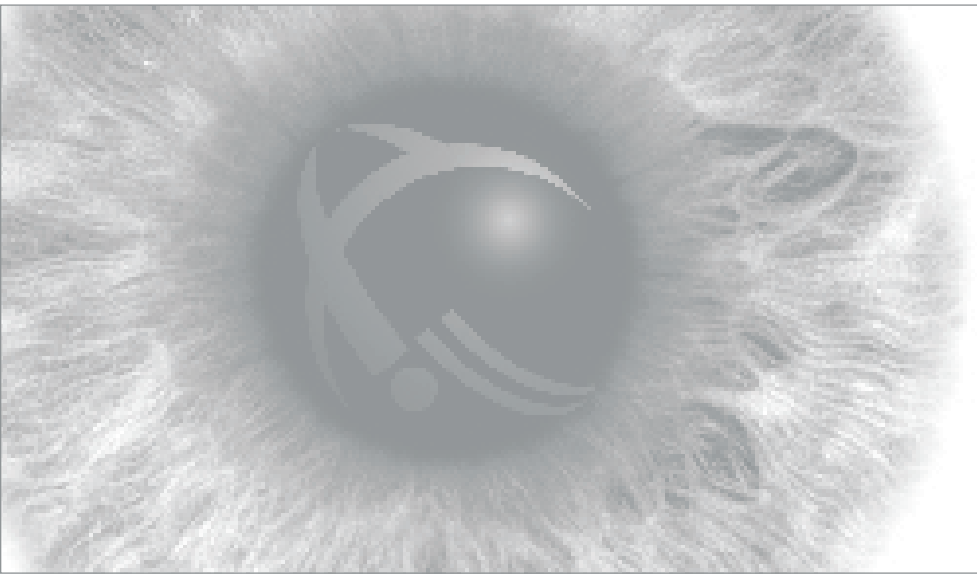

satamatics

# SAT-202

# SAT-202

The SAT-202 is a complete single unit satellite terminal. Compact in size, the unit provides global coverage and information specific to customer requirements:

- Locate, track and communicate with mobile assets
- Safeguard personnel, fleets and cargo
- Monitor fixed assets

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# SAT-202

## Attributes

The SAT-202 is Satamatics latest satellite terminal. Designed as a multi-purpose unit, the terminal includes modem and antenna with interface functionality. Power supply is normally provided by the asset, however power source/battery backup is possible via the GEM-100 expansion module.

The SAT-202 terminal has three fully configurable inputs and outputs for sensor monitoring, and one open drain output suitable for driving relays and indicators. The data-logging function includes GPS positions, transmissions and data for more than 6,500 entries which is accessible locally via the serial port. All transmissions are logged and a record is kept of the time the message is created and, if applicable, when it was transmitted.

There are two cable entry variations for the SAT-202 depending on how the terminal is to be installed - either bottom or side entry. Direct interface is possible with most application environments without extra circuitry, providing the opportunity to minimise system integration costs and timescales.

The SAT-202 terminal is ideal for all environments and is favoured in remote regions where terrestrial communication cannot be relied upon.

## Network & Process

Each asset is fitted with a SAT-202 terminal. When out in the field the unit will automatically select the most appropriate satellite depending on its GPS position. The message is then sent via secure systems before being delivered to the designated recipient.

Like all of Satamatics' terminals, the SAT-202 utilises Inmarsat's I2 and I3 satellites via the IsatM2M standard. This service delivers an affordable and reliable direct-to-desktop information service with fast message handling and high quality service.

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SAT-202

# functions such as messaging, navigation and internet based tracking

The SAT-202 is the ideal satellite terminal for applications requiring small data rate messages with GPS position details. It is perfect for many IMO (International Maritime Organisation) regulations such as Ship Security Alert Systems (SSAS) and Long Range Identification Tracking (LRIT) which are regulations all commercial maritime operators (operating vessels over 500 gross tonnes) have to comply with.

The leisure marine sector follows similar trends to the land-based market in that navigation, messaging and location-based services are becoming the norm. The SAT-202 terminal has NMEA output of GPS data to other on board systems, eliminating the need for additional GPS systems. This feature opens the applications up to other functions such as messaging, navigation and internet based-tracking for sailboat and yacht racing, as well as exception based reporting of onboard sensors that detect theft, unauthorised entry and other customer determined features.

The superior antenna performance with low look angle to the satellite is the ideal solution in a maritime environment providing excellent operation in ocean going applications.

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# SAT-202

## fully programmable, providing real-time position reporting and details of events

Asset Management enables fleet managers to maximise efficiency and strengthen their bottom line. The SAT-202 satellite terminal can help with this by addressing issues such as security, tracking and monitoring of vehicles, trailers and cargo. The SAT-202 terminal is fully programmable, providing real-time position reporting, details of events and exceptions such as the activation of panic buttons and sensor alerts, as well as geofencing and tempo-fencing capabilities.

Many organisations have seen a reduction in their insurance premiums due to operating solutions that provide these services.

The SAT-202 has been designed as an easy-to-use terminal, allowing the user to easily change scripts and firmware via the serial connection, which interfaces with computers, Window Mobile devices and “black box” controllers.

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SAT-202

# can help maximise time and resources in the field

Many organisations within the oil and gas sector operate over vast geographical areas and are therefore always looking for ways to maximise their time and resources in the field. The SAT-202 terminal can be the backbone to applications that help towards achieving this.

The SAT-202 is ideal where a small number of inputs and outputs are required and where power can be provided from other sources. When combined with the GEM-100 it can provide additional Inputs and Outputs and battery backup. Also, when coupled with other technology, it can provide remote monitoring of unmanned compressors, generators, tanks and pipelines.

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# SAT-202

TECHNICAL SPECIFICATION

## physical

| | |
|---|---|
| **Dimensions** | 112mm(diam) x 45.75mm(height)<br>(Does not include mounting threads/extensions/cable) |
| **Weight** | 350g (excluding cable on SAT-202C and SAT-202E variants) |
| **Colour** | UN0332 (Coconut) |
| **Connector** | 12 way plug |

## environmental

| | |
|---|---|
| **Temperature** | -40°C to +70°C |
| **Humidity** | ≤95% @ +40°C |
| **Vibration** | 5-20Hz: 1.92$m^2s^{-3}$ random noise<br>20-500Hz: -3dB octave random noise |
| **Shock (survival)** | Half sine 6ms, 300$ms^{-2}$ |
| **Ingress Protection Rating** | IP66 (when interface connector is correctly mated) |

## frequency range

| | |
|---|---|
| **Transmit** | 1626.5 MHz to 1660.5 MHz |
| **Receive** | 1525.0 MHz to 1559.0 MHz |
| **GPS** | 1575.42 ± 1.0 MHz |

## elevation angle range

0˚ to 90˚

## transmitter

| | |
|---|---|
| **EIRP** | 0 - 9 dBW |
| **Modulation** | 2 level FSK, 256Hz tone spacing |
| **Tx burst duration** | 2s or 8s |
| **Message length (standard burst)** | Up to 84 bits |
| **Message length (double burst)** | Up to 170 bits |

## receiver

| | |
|---|---|
| **G/T** | ≥ -25dB/K at EL = 30° |
| **Modulation** | 32-ary FSK, 32Hz tone spacing |
| **User data rate** | ~36 bits per second |
| **Message length** | Up to 800 bits |
| **Message latency** | <60s |

## GPS

| | |
|---|---|
| **Channels** | 50 |
| **Time To First Fix (Typical)** | |
| Cold start | <29s |
| Hot start | <1s (GPS was off for less than 2 hours) |
| **Accuracy (SA Off)** | |
| Position (CEP, 2D) | <2.5m (Typical) |
| **Altitude** | maximum 12000m |
| **Dynamic capability** | |
| Velocity | maximum 310m/s (default portable mode) |
| Acceleration | ≤ 4g |
| **Maximum update rate** | 1s |

## control & monitoring

| | |
|---|---|
| **Interface** | Asynchronous serial RS232 |
| **Baud rate** | 4800 or 9600 bps |
| **Parity/data bits/stop bits** | N,8,1 |

# TECHNICAL SPECIFICATION

SAT-202

## data interfaces

**3 x Inputs/Outputs**

Individually configurable as:

- High voltage digital input (15-32V maximum) with falling edge interrupt capability
- Switch input (internal pull up used with external switch to ground)
- Digital input (0-15V maximum) with falling edge interrupt capability
- Analog input (12 bit ADC, 0 to 2.5V)
- Digital output (3.3V, 330uA typical)

**1 x Open drain output** 250mA max sink current

## power consumption (typical@12V)

| | |
|---|---|
| **Sleep** | 0.75mW |
| **Receive (incl. GPS)** | 1W |
| **Slotted receive** | 50mW (Effective continuous receive power) |
| **Transmit** | 6W |

## power supply voltage

9.6V to 32V 'smoothed' DC

## functional

**Enhanced scripting** 64 operations
32 timers
32 alarms

**Geofencing** Complex
Point - radius

**Configurable return burst data scrambling**

**Selectable NMEA interface protocol for connection to third party GPS devices/applications**

## IsatM2M specific

**Message latencies (typical)** Poll/response - 1 minute
Time to first transmission - 45 seconds
Forward message delivery - 45 seconds
Return message delivery - 20 seconds

**Auto adjustment of return burst data rate to match quality of satellite link**

**Double burst messaging (IsatM2M)**

Return message of up to 170 user bits (satellite link quality same as normal burst)

## certification

Inmarsat-D Type Approved (IsatM2M mode)
FCC Compliant
EN60945
CE

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- Seamless worldwide coverage
- High quality terminal and service
- Secure and reliable data processing
- Value-added information delivered to servers and desktop