



Product Data (Provisional)

TAM 200 Series

GLOBAL SOLUTIONS FOR TRACKING & MONITORING WITH INTEGRAL POWER SOURCE

The second generation TAM-200 Series provides global tracking and sensor monitoring for fixed and mobile assets – such as trailers, containers, tanks and railcars – without the need for an external power source in an extremely compact package. The internal 19Ah battery will provide up to 5 years of maintenance free operation.

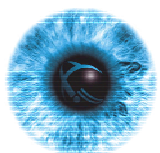
The TAM-200 series incorporates magnetic feet thus providing greater flexibility for the user to monitor transitory or fixed assets.

Satamatics offer a one-stop solution to manage your fleet:

- ❑ Remote terminals with a choice of sensor monitoring options.
- ❑ A satellite airtime package to suit your needs
- ❑ Secure web based data access
- ❑ Standard and bespoke user Application Software



(Provisional. Product may vary from that shown)



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TRACKING & COMMON FEATURES

Based on Satamatics own SAT-201 satellite modem, all TAM Series products incorporate the following capability:

- ❑ GPS position reports
- ❑ Secure logging of positions for interrogation later
- ❑ Reliable satellite communications using the Inmarsat ISATM2M service.
- ❑ Configurable reporting intervals and remote polling.
- ❑ Integral 19Ah battery pack with low capacity alarm
- ❑ 3-year battery life with 2 transmissions per day.
- ❑ Robust enclosure with IP66 ingress protection.
- ❑ Serial communication via local port
- ❑ Mounting by either built-in magnetic feet or screw fixings

MONITORING CAPABILITY

TAM-210

The TAM-210 is most cost effective solution for tracking only applications. It also provides direct connections to the data interface within the SAT-201 based modem:

- ❑ Two input channels, configurable as:
 - Digital inputs
 - Switch inputs (with internal pull-up resistor)
 - Analogue inputs with 0V to 2.5V ranges and 12 bit resolution
- ❑ Two digital output channels (open drain type)
- ❑ Temperature measurement (local ambient)

TAM-220

The TAM-120 is designed to operate with Rosemount™ or similar low power transducers. It is ideal for tank monitoring applications and provides:

- ❑ Two analogue inputs with link programmable ranges:
 - 0V to 5V DC
 - 0V to 3.2V DC
 - 0mA to 20mA
- ❑ A 10V DC supply output for transducer excitation
- ❑ One digital/switch input (with internal pull-up resistor)
- ❑ Temperature measurement (local ambient)

TAM-230

The TAM-230 is fitted with accelerometers to monitor shock. It is therefore ideal for containers or railroad cars carrying delicate or high value goods. It features:

- ❑ Two axis (x,y) shock measurement up to 5g
- ❑ Alarm threshold - programmable over-the-air.
- ❑ One digital/switch input (with internal pull-up resistor)
- ❑ Temperature measurement (local ambient)

PERFORMANCE SPECIFICATIONS

TAM-210

Signal Input Channels 1 & 2

Individually configurable as either:

Digital Inputs

High Range: 15V to 32V maximum levels
Low Range: 3.3 to 15V maximum levels
Both ranges with falling edge interrupt capability

Switch Inputs: Internal pull up (used with external switch to ground)

Analogue Inputs: 0V to 2.5V, 12 bit resolution

Output Channels 1 & 2

Digital Outputs: Open drain output (250mA max sink current)

Ambient Temperature

Measurement Range: -35°C to +55°C
Resolution: 4°C (limited by output message, 1°C available)
Measurement Accuracy: +/- 2°C

TAM-220

Analogue Channels 1 & 2

Measurement Range: +5V, +3.2V & +20mA (selectable by internal links)

Resolution: 11-bit (limited by output message, 12 bits available)

Measurement Accuracy: +/-5% Reading +/- 0.5% Range (5 years, -35°C to +55°C)
Add any lead resistance error, as defined below.

Effective Accuracy

1V to 5V Span: +/-4% Reading +/- 1.5% Range (5 years, -35°C to +55°C)
4mA to 20mA Span: +/-4% Reading +/- 1.5% Range (5 years, -35°C to +55°C)
0.8V to 3.2V Span: +/-3.8% Reading +/- 1.8% Range (5 years, -35°C to +55°C)
Applies when transducer output span is over the range specified

Transducer Connection: 3- wire (Signal, Supply & Common)

Lead Resistance Error

5V Range: 0.025% of Range/mA/ohm
3.2V Range: 0.031% of Range/mA/ohm
Error is a result of the voltage drop caused by the transducer current in the common lead. Ignore errors <0.06%.

Input Resistance

5V Range:	156Kohms
3.2V Range:	100Kohms
20mA Range:	80 ohms

Transducer Supply

Voltage:	10V +3%, -0%
Current:	20mA maximum per channel

Protection: Input must not exceed above Transducer Supply voltage.

Switch Input

Input Low:	<500 ohms (at 1.5mA sink)
Input High:	>100 Kohms (at 5V open circuit)

Ambient Temperature

Measurement Range:	-35°C to +55°C
Resolution:	4°C (limited by output message, 1°C available)
Measurement Accuracy:	+/- 2°C

TAM-130

Shock and Vibration

Measurement Range:	0g to 5g (magnitude only, negative values are rectified)
Measurement Resolution:	6-bit (12 bits internal)
Measurement Axis:	X and Y (measures sum of both accelerometer outputs)
Measurement Accuracy:	+/- 8% Reading +/- 4% Range (5 years, -20°C to +55°C)

Switch Input

Input Low:	<500 ohms (at 1.5mA sink)
Input High:	>100 Kohms (at 5V open circuit)

Ambient Temperature

Measurement Range:	-35°C to +55°C
Resolution:	4°C output message (1°C internal)
Measurement Accuracy:	+/- 2°C

GENERAL

Physical

Dimensions:	250mm x 170mm x 45mm [provisional]
Weight	
With Battery Pack:	1.3 kg [provisional]
Shipping weight:	1.5 kg [provisional]

Environmental

Temperature:	-35°C to +55°C
Humidity:	≤ 95% @ +40°C, non-condensing
Ingress Protection Rating:	IP66
Altitude:	< 2,000 metres (affects safety approvals)

Approvals (pending)

EMC	FCC Part 15 Class A
Safety	IEC/EN61010-1:2001, UL61010A, CSA 22.2 61010-1
Ingress	IP66

Local Serial Communication

Interface:	Asynchronous serial RS232
Baud rate:	9600 bps
Parity/data bits/stop bits:	N,8,1

SATELLITE TRANSCEIVER

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°
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Transmitter

EIRP:	0 - 9dBW
Modulation:	2 level FSK, 256Hz tone spacing
Tx burst duration:	8s (Global Beam)
User data rate:	~10 bits per second (Global beam)
Message length:	Up to 84 bits per burst

Receiver

G/T:	≥ -25dB/K at EL = 30°
Modulation:	32-ary FSK, 20Hz tone spacing
User data rate:	~9 bits per second
Message length:	Up to 1000 bits

GPS

Channels:	12
Time To First Fix (Typ.)	
Cold start:	45s
Hot start:	<8s (GPS was off for less than 2 hours)
Accuracy (SA Off)	
Position (CEP, 2D):	4m (Typical)
Altitude:	maximum 18,000m
Dynamic capability	
Velocity:	maximum 515m/s
Acceleration:	≤4g
Maximum update rate:	1s

Certification

Inmarsat Type Approved
FCC Compliant
EN60945
CE