

## ACU Specifications

### Railcar Tracking System



*Shown with optional bracket*

<b>GPS Capabilities</b>	
Location precision:	10m (Received signal > -130dBm; elevation angle 5 degrees or better; no interception environment, such as signal reflections)
<b>GPS Time to First Fix (TTFF)</b>	
TTFF Hot Start:	4 seconds
TTFF Warm Start:	33 seconds
TTFF Cold Start:	40 seconds
<b>Wireless Communication</b>	
Method:	GSM Quad Band (850/900/1800/1900MHz)
Transmission power level:	32 dBm
Transmission antenna gain:	1 dBi (GSM)
Power source:	2 Watt solar panel
Backup power supply:	Transmit up to 350 messages
<b>I/O</b>	
Connector functions:	(2) 3.6 VDC sensor power output (2) RS-485 Intelligent sensor busses with independent alarms External temperature sensor (-25°C to 100°C) (2) Contact circuit closure inputs
<b>Mechanical</b>	
Dimensions:	10.1" X 8.3" X 3.1"
Weight:	4.2 lbs (without mounting plate)
Connector type:	Keyed 15 pin MIL SPEC 26482 over-molded to cable
*Cable:	15', 15 conductor, shielded, with urethane jacket
*Mounting plate:	Powder coated mild steel, with 4 mounting holes
<b>Environmental</b>	
Operational temperature range:	-20°C to +60°C (-4°F to +140°F)
Operational relative humidity:	0% to 100% condensing
Storage relative humidity:	5% to 95% non-condensing recommended
Shock:	50G at 11 millisecond pulse
Vibration:	7.64 – 2000 Hz 1.5G Peak
Certification:	UL 913, Class 1, Division 1

\* Optional

## Accelerometer Option

Temperature Range:	-25°C to +75°C (-40° to +85°C Storage)
Power Consumption:	250µA Standby, 1.4mA Active (Typical)
Operating Voltage:	3.6 VDC
Accelerometer:	Micro Electromechanical (MEMS)
Measurement Range:	±10G
Measurement Accuracy:	±5%
Sample Rate:	50 samples per second
Temperature Measurement Range:	-25°C to +75°C
Temperature Measurement Accuracy:	±3°C (over the range 0° to +75°C, otherwise unspecified)
Serial Communications:	RS-485 Slave with hardware alarm line interrupt
Baud Rate:	19,200
Memory Capacity:	1MB (43 minute total recording maximum)
Trigger Thresholds:	Single, symmetrical ± thresholds for X and Y. Separate thresholds for Z. Peak to peak thresholds for all three axes
Z Axis Gravity Correction:	Selectable ability to show the Z axis at either 1G or 0G
Orientation:	Programmable axis assignment and direction
Auto Zero:	Recalibrates the sensor for offset variations due to environmental factors while the train is stationary
Digital Filtering:	Selectable 10Hz digital filtering of all three axes
Histogram Measurement Types:	Acceleration and Jerk (rate of acceleration)
Histogram Collection Range:	±5G (50 bins @ 0.2G per bin)
Programming:	71 separate commands, watchdog timer, downloadable firmware, dynamic RS485 address assignment

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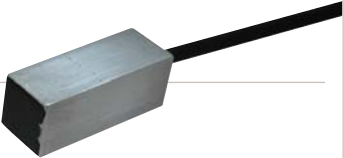
## ACU and Sensor Specifications

### Locomotive Tracking System



<b>GPS Capabilities</b> Location precision:	2m (Received signal > -130dBm; elevation angle 5 degrees or better; no interception environment, such as signal reflections)
<b>GPS Time to First Fix (TTFF)</b> TTFF Hot Start: TTFF Warm Start: TTFF Cold Start:	4 seconds 33 seconds 40 seconds
<b>Wireless Communication</b> Method: Transmission power level: Transmission antenna gain: Power source: Backup power supply:	GSM Quad Band (850/900/1800/1900MHz) 32 dBm 1 dBi (GSM) 74 VDC (30 to 90 VDC) @ 2 Amps peak Transmit up to 350 messages
<b>I/O</b> Connector functions:	74 VDC power 74 VDC fuel level pulse input (2) 74 VDC logic inputs External temperature sensor, -25°C to +100°C (-13°F to +212°F) (2) Low voltage circuit closure inputs RS-485 Intelligent sensor bus
<b>Mechanical</b> Dimensions: Weight: Connector type: Cable: Mounting plate:	10.1" X 8.3" X 3.1" 4.2 lbs (without mounting plate) Keyed 15 pin MIL SPEC 26482 over-molded to cable 14', 15 conductor, shielded, with urethane jacket Powder coated mild steel, with 4 mounting holes
<b>Environmental</b> Operational temperature range: Operational relative humidity: Storage relative humidity: Shock: Vibration:	-25°C to +60°C (-13°F to +140°F) 0% to 100% condensing 5% to 95% non-condensing recommended 50G at 11 millisecond pulse 7.64 – 2000 Hz 1.5G Peak

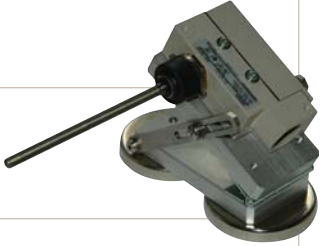
## Temperature Sensor

<p><b>Performance</b></p> <p>Operational temperature range: -25°C to +100°C (-13°F to +212°F)</p> <p>Accuracy: ±4°C</p>	
<p><b>Mechanical</b></p> <p>Sensor dimensions: 0.75" X 0.75" X 3.0"</p> <p>Housing: Aluminum, thermal epoxy filled</p> <p>Cable: 20' length, two (2), 20 AWG stranded conductors, shielded, with 20 AWG drain wire</p> <p>Jacket and wire insulation: 300V, -40°C to 125°C, thermoplastic elastomer</p>	
<p><b>Environmental</b></p> <p>Operational relative humidity: 0% to 100% condensing</p> <p>Storage relative humidity: 5% to 95% non-condensing recommended</p> <p>Certification: UL 913, Class 1, Division 1 in conjunction with ACU</p>	

## Magnetic Switch

<p><b>Electrical</b></p> <p>Contact form and rating: SPNO, 100 VAC/VDC, 0.5A, 10W</p> <p>Contact resistance: 0.15 ohm, maximum initial</p> <p>Gap design dimension: 75mm (2.95")</p>	
<p><b>Mechanical</b></p> <p>Switch dimensions: 104.5mm X 44.5mm X 11.5mm (4.1" X 1.75" X 0.45")</p> <p>Magnet dimensions: 78.5mm X 54.5mm X 29mm (3.1" X 2.15" X 1.14")</p> <p>Housings: Aluminum, switch and potted</p> <p>Cable: 15.25±0.25', two (2), 22 AWG stranded conductors</p> <p>Jacket and wire insulation: 300V, -55°C to +105°C, PVC</p>	
<p><b>Environmental</b></p> <p>Operational temperature range: -40°C to +80°C (-40°F to +176°F)</p> <p>Operational relative humidity: 0% to 100% condensing</p> <p>Storage relative humidity: 5% to 95% non-condensing recommended</p> <p>Certification: UL 913, Class 1, Division 1 in conjunction with ACU</p>	

## Loaded/Empty Switch Assembly

<p><b>Electrical</b></p> <p>Contact form and rating: SPDT, 250 VAC, 15A</p> <p>Contact resistance: 0.05 ohm, maximum initial</p>	
<p><b>Mechanical</b></p> <p>Magnetic mount area: approximately 2.75" X 5.75"</p> <p>Conduit fitting: 1/2" NPTF</p> <p>Weight: 2.1 pounds</p>	
<p><b>Environmental</b></p> <p>Operational temperature range: -25°C to +80°C (-13°F to +176°F)</p> <p>Operational relative humidity: 0% to 100% condensing</p> <p>Storage relative humidity: 5% to 95% non-condensing recommended</p> <p>Certification: UL 913, Class 1, Division 1 in conjunction with ACU</p>	

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