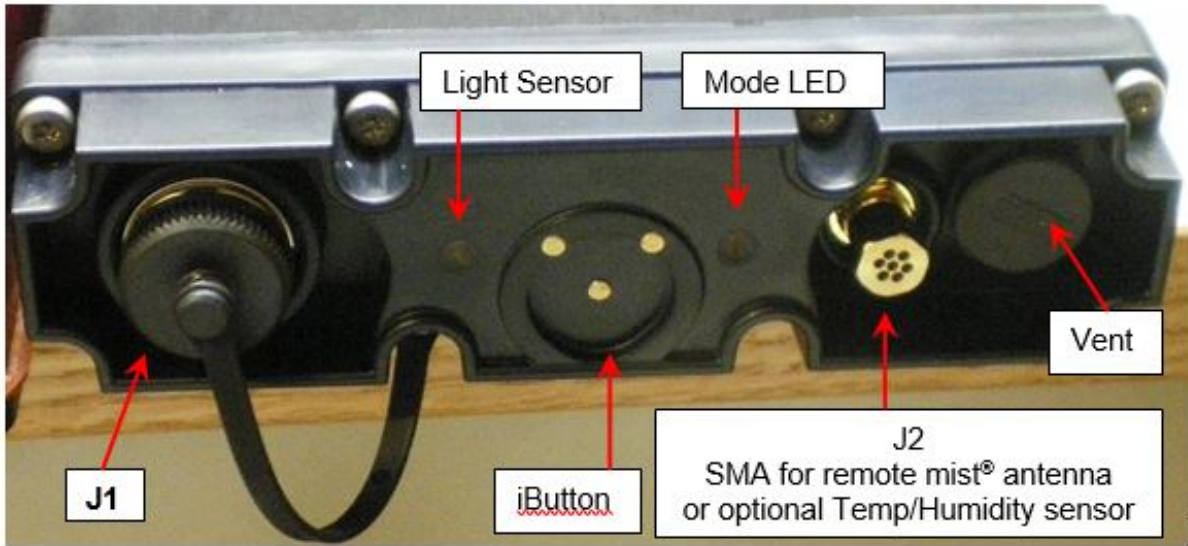


GS-5L External Interfaces

The GS-5 family of tracking and monitoring devices includes a very robust set of external power, M2M and tethered sensor interfaces.



J1: The J1 Connector allows the GS-5L to communicate and source power to external peripherals and sensors. It also allows the user to supply power to the GS-5L and to issue console commands to it. While the connector is sealed to IP-67 compliance when unmated, users should put the cover on J1 when not in use to keep its contacts free of dust, moisture and other contaminants.

Connector	Function	Nbr Pins	Type
J1	Power and Sensor Interface	14	F-Binder
	External Power Input AC/DC	J01-01	6-28 VAC or 6-40 VDC
	External Power Return	J01-02	Ground
	Sensor 1 -- Sensor Power	J01-03	Switched 3.3
	Sensor 1 -- Sensor	J01-04	Analog Input
	Ground	J01-05	Ground
	Serial 1 RXD	J01-06	Serial RS232 Input
	Serial 1 TXD	J01-07	Serial RS232 Output
	Ground	J01-08	Ground
	Serial 2 RXD	J01-09	Serial RS232 Input
	Serial 2 TXD	J01-10	Serial RS232 Output
	Ground	J01-11	Ground
	Serial 3 RXD	J01-12	Serial RS232 Input
	Serial 3 TXD	J01-13	Serial RS232 Output
Loopback Sensor	J01-14	Analog Input	
J2	WSS/WSN 2.4GHz External Antenna	2	RP-SMA
	2.4 GHz RF	J10-01	RF
	Ground	J10-02	Ground

1.1 Power Interface

The GS-5L power interface accepts voltages between 6 VDC and 40 VDC or 6 VAC and 28 VAC. The input current varies depending on operating state. The GS-5L can disconnect the external power input which reduces the input current to micro-amperes.

The GS-5L monitors the external power input and can change operating states based on the applied voltage. This includes going to sleep when the external voltage drops below configurable thresholds or waking up when external power is applied. The GS-5L can also reduce the input current based on the configurable thresholds. There are timers associated with all of the power state transitions so that minutes to days of operation can occur following voltage changes before changing operating modes.

1.2 Serial Interfaces

The GS-5L has 3 serial interfaces. Serial 1 is dedicated for configuring the GS-5L. The other two serial interfaces (Serial 2 and Serial 3) are available to control or monitor external devices. Serial 2 and Serial 3 are normally 3-wire interfaces (Tx, Rx, Ground) but they may be combined to form a single 5-wire serial interface. Baud rates up to 19,200 are supported.

The standard interface levels are fully compliant RS-232 levels. Ordering options also include RS-485, RS-422 and TTL/CMOS levels.

1.3 Discrete Signal Interfaces

The GS-5L has 2 discrete sensor inputs which support either analog or digital operating modes. Both sensor interfaces are high-impedance and incorporate a 100K pull-up resistor. The input range is limited to 0 to 3 V.

1.4 External Sensor Power

The GS-5L is capable of providing power to an external sensor. The power is limited to 300mA and the voltage is the unregulated GS-5L battery. This voltage ranges from 2.6V to 3.8V depending on battery state and external power. The sensor power signal is controlled by the GS-5L software and can turn on and off to manage the external sensor's duty cycle. Use of the external sensor power can have significant adverse impact on the GS-5L battery life.

1.5 Internal Dismount Sensor

The GS-5L is equipped with a ferrous metal sensor that allows the GS-5L to detect when the GS-5L is mounted on a ferrous metal surface. This sensor is internal to the GS-5L. The normal use of the demount sensor is to drive automated arming or trip start processes.

1.6 Internal Temperature Sensor

The GS-5L is equipped with a temperature sensor that is mounted inside the GS-5L. This temperature sensor is always available and can be used to report the internal temperature of the GS-5L.

1.7 Internal Accelerometer Sensor

The GS-5L is equipped with a 3-axis +/-16G accelerometer sensor. This sensor can be used to detect shock events, determine motion state and determine installation orientation. This sensor is not supported in the initial software release.

1.8 Internal Motion/Vibration Sensor

The GS-5L is equipped with an internal 3-axis, BB based motion/vibration sensor. This sensor is used to detect conveyance motion. The thresholds are configurable and can be configured to cause reports on motion to still or still to motion transitions.

1.9 Internally Mounted External Temperature/Humidity Sensor

The GS-5LH is equipped with a temperature and humidity sensor instead of the J2 connector. This sensor samples external air temperature and humidity.