

EZ863H

Product description

Rev. 1 – August 24, 2015



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1. Overview

This document provides the description of features, functions and interfaces of the EZ863H unit.

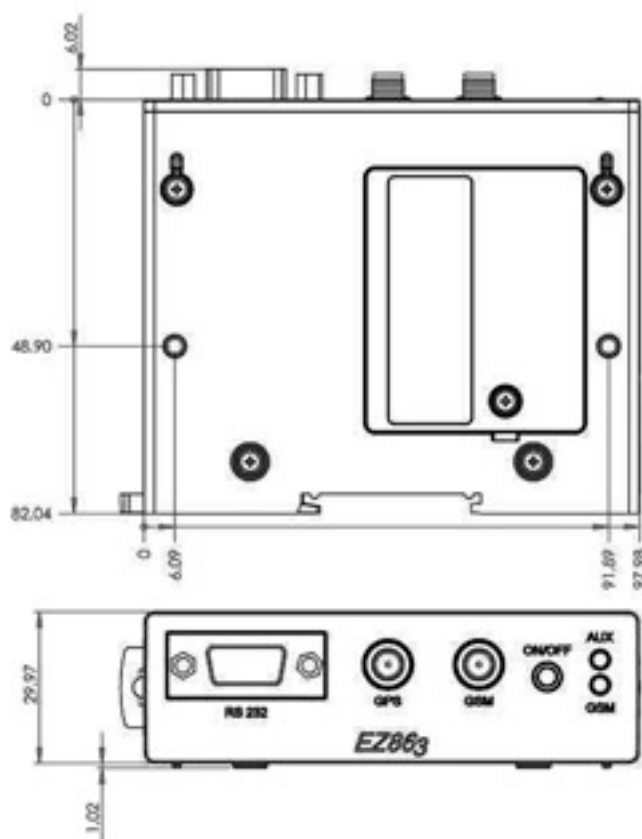
The EZ863H can be deployed as a complete system solution for various M2M metering applications like Automatic vehicle location system (AVL), Gate control, Cellular alert systems and more.

The unit includes Telit GE910/HE910 cellular GSM/UMTS- HSPA engine with Python and satellite navigation module that supports GPS, 3 Axis accelerometer sensors, microcontroller for peripheral assistance, and LiPo battery charger.

2. General Description

2.1 Dimensions

Dimensions: 98 mm x 82mm x 30mm

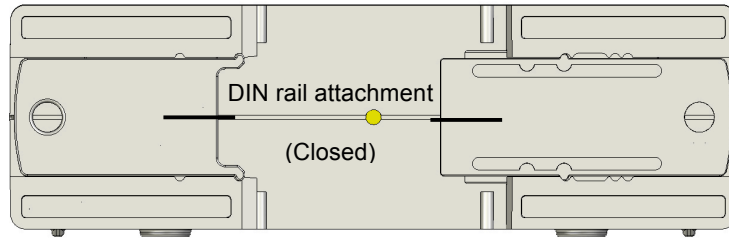


2.2 Weight

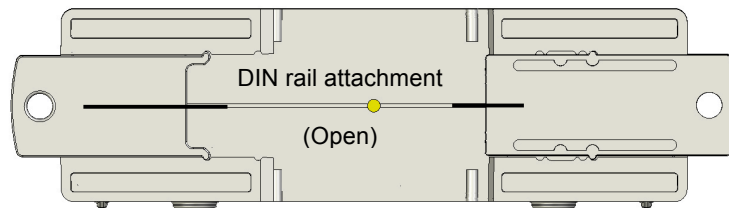
The weight of the EZ863H is 160 grams.

2.3 Installation

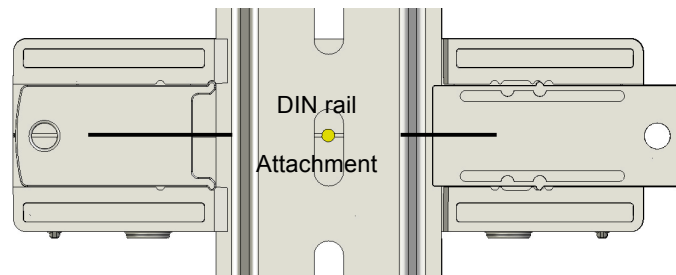
Different installation options of the EZ863H are outlined below:



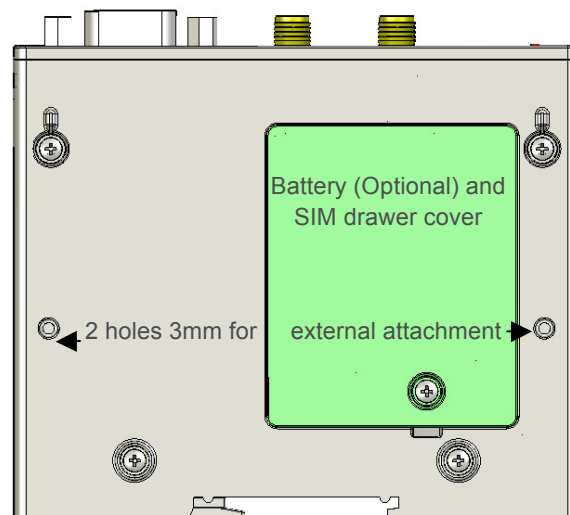
EZ863H Terminal rear view # 1- DIN rail attachment closed position



EZ863H Terminal rear view # 2 – DIN rail attachment open position



EZ863H Terminal rear view # 3 – DIN rail attachment locked on DIN rail



EZ863H Terminal bottom view (revealing threaded mounting holes)

2.4 Casing material

PC/ABS Cycloy / Polycarbonate 1200 HF

2.5 Class of flammability

UL94 HB

2.6 Protection class

IP40 Avoid exposing the EZ863H Terminal to liquid or moisture

2.7 Environmental requirements

2.7.1 Temperature range

2.7.1.1 without internal battery

	Ambient temperature	Note
Operating Temperature Range	-20°C to +55°C	The device is fully functional at this temperature range, and meets the ETSI specifications.
	-30°C to +85°C	The device is fully functional at this temperature range. Outside the range of -20°C to +55°C, it may slightly deviate from ETSI specifications.
Storage and Non Operating Temperature Range	-40°C to +85°C	

2.7.1.2 with internal battery (Optional)

	Ambient temperature	Note
Operating Temperature Range	-10°C to +55°C	The device is fully functional at this temperature range, and meets the ETSI specification
	-10°C to +75°C	The device is fully functional at this temperature range. At temperatures above +55°C, It may slightly deviate from ETSI specifications
Storage and Non Operating Temperature Range	-10°C to +75°C	

2.7.2 Air humidity range

5% - 85%

2.7.3 RoHS compliance

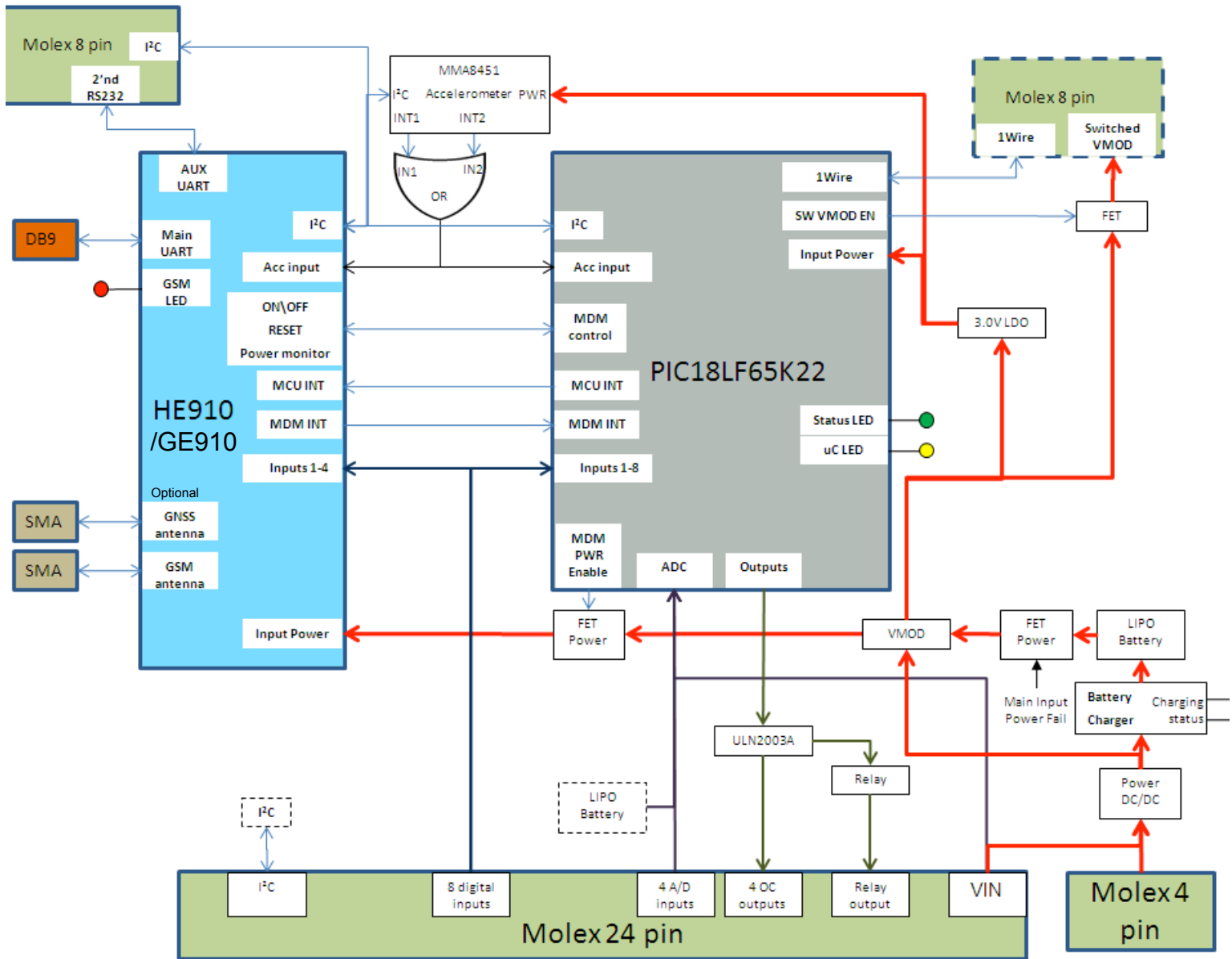
All hardware components are fully compliant with the EU RoHS and WEEE Directives

3. Hardware Interface Description

3.1 Main features of the EZ863H

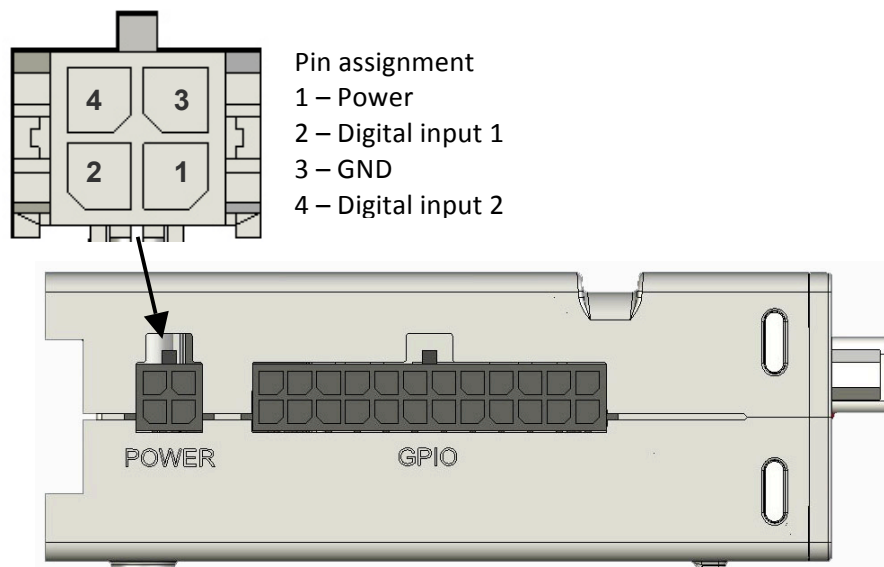
Feature	Implementation
Incorporates Telit GE910\HE910 module	The Telit module handles all GSM\UMTS-HSPA processing. It includes PYTHON script interpreter as well as satellite navigation module that supports GPS
PIC18LF65K22 Microcontroller	Low power microcontroller that provides watchdog and peripheral support.
Frequency bands	Based on HE910-EUD/G: GSM Quad band 850, 900, 1800, 1900 UMTS-HSPA: 800/850, 900, 2100 Based on HE910-NAD/G: GSM Quad band 850, 900, 1800, 1900 UMTS-HSPA: 800/850, AWS1700, 1900 Based on GE910-Quad/GNSS: GSM Quad band 850, 900, 1800, 1900
Power supply	With GPS/GNSS: Single supply voltage 8V to 40V 15W Without GPS/GNSS: Single supply voltage 7V to 55V 15W
ADC and GPIO inputs	<ul style="list-style-type: none"> • 1 Relay output 30V 1A • 2 12bit ADC inputs 0-15V • 2 12bit ADC 4-20mA • 8 digital inputs 0-50V • 4 open collector outputs 500mA
Energy modes	<ul style="list-style-type: none"> • Full operation – GSM and GPS on – 50mA • GSM on GPS off – 25mA • GSM and GPS off (uC and accelerometer on) - <3mA
Communication	<ul style="list-style-type: none"> • Full RS232 • RS232 Tx / Rx - modem trace • I²C • 1 wire • USB
Battery Backup (optional)	500mAh LIPO battery with integrated charger
Accelerometer	Freescale MMA8451 - 3 Axis digital accelerometer, up to 14 bit with 2 programmable interrupts (motion detection, freefall detection, ...)
Antennas	Cellular GPS\GNSS (optional) external antennas with SMA connectors

3.2 EZ863H Hardware block diagram



4. Interface Description

4.1 Molex 4 pin connector – Power connector



4.1.1 Power Supply

The power supply of the EZ863H Terminal has to be a single voltage source of power 8V-40V (with GPS/GNSS) or 7V-55V (without GPS/GNSS) capable of providing a peak during an active transmission. The EZ863H Terminal is protected from supply reversal voltage. An internal fuse ensures an electrical safety according to EN60950. This fuse is not removable. A fast acting fuse 0.8A with melting is necessary to use with the EZ863H Terminal at a 24V power supply system for vehicles. The power supply must be compliant with the EN60950 guidelines.

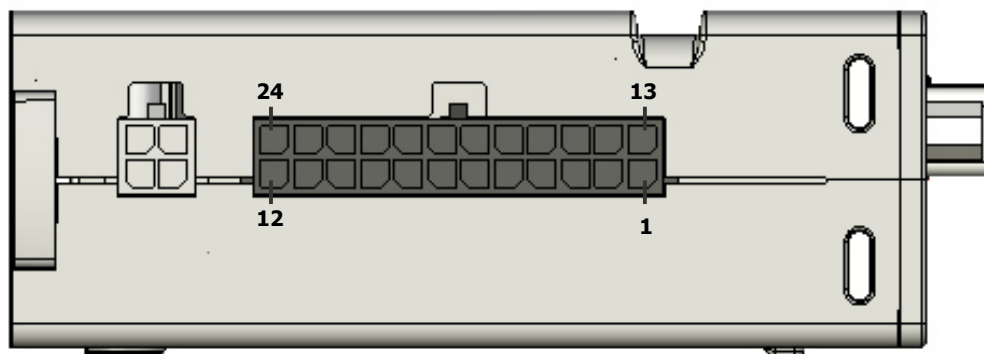
4.1.2 Supply voltage requirements

A DC power supply must be connected to the POWER input:

- Input voltage range 8 - 40V DC/ 7-55V DC
- Nominal Voltage 12V DC
- Power Supply current rating: min. 1.2A @12V
- Power Supply ripple: max. 120mV
- Input current in idle mode: 40mA @ 12V
- Input average current in communication mode: 100mA @ 12V

4.2 Molex 24 pin connector – I/O interface

The following interfaces and functions are provided via the I/O interface connector:



GPIO interface connector 24 pin

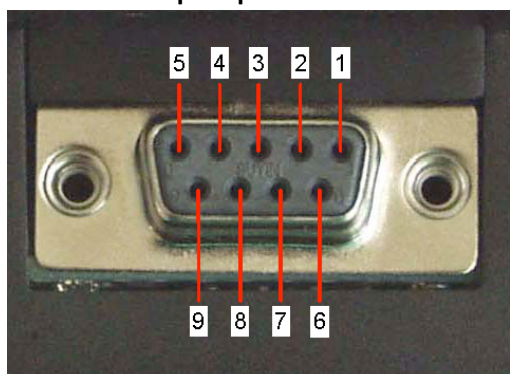
Pin	Signal name	I/O	Description
1	Digital input 1	I	0-50V digital input – pulled down
2	Digital input 2	I	0-50V digital input – pulled down
3	Digital input 3	I	0-50V digital input – pulled up
4	Digital input 4	I	0-50V digital input – pulled up
5	OC1	O	Open collector 500mA output
6	OC2	O	Open collector 500mA output
7	OC3	O	Open collector 500mA output
8	OC4	O	Open collector 500mA output
9	ADC1	I	0-15V 12bit analog input
10	ADC2	I	0-15V 12bit analog input
11	VMOD	O	VMOD voltage output for external accessory activation
12	DGND	PWR	Digital ground
13	Relay A	O	Relay output A
14	Relay B	O	Relay output B
15	Digital input 5	I	0-50V digital input – pulled down
16	Digital input 6	I	0-50V digital input – pulled down
17	Digital input 7	I	0-50V digital input – pulled up
18	Digital input 8	I	0-50V digital input – pulled up
19	ADC3	I	4-20mA 12bit analog input
20	ADC4	I	4-20mA 12bit analog input
21	I2C SCL		I2C bus clock
22	I2C SDA		I2C bus data
23	PLG GND	PWR	Plug ground
24	Vin	PWR	Input voltage

4.3 RS-232 Interface

The serial interface of the EZ863H Terminal is intended for the communication between the GSM module and the host application. This RS-232 interface is a data and control interface for transmitting data, AT commands and providing multiplexed channels. EMC immunity complies with the vehicular environment requirements according to EN301489-7.

The user interface of the EZ863H Terminal is accessible from a Data Terminal Equipment DTE connected to the RS232 interface. It is managed by AT commands according to the GSM 07.07 and 07.05 specifications. The supported commands are listed in the AT Commands Reference Guide.

4.3.1 D-Sub 9-pole pinout



Pin assignment RS-232
(D-Sub 9-pole female)

Pin no.	Signal name	I/O	Function of application
1	DCD	O	Data Carrier Detected
2	RXD	O	Receive Data
3	TXD	I	Transmit Data
4	DTR	I	Data Terminal Ready
5	GND	-	Ground
6	DSR	O	Data Set Ready
7	RTS	I	Request To Send
8	CTS	O	Clear To Send
9	RING	O	Ring Indication

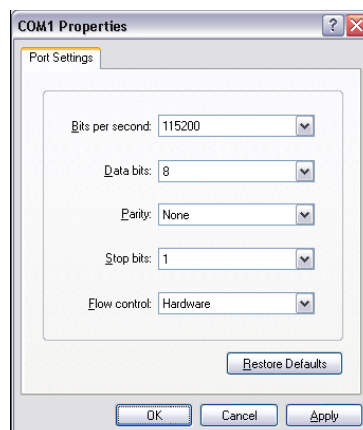
Connector type on the terminal is:

- RS-232 through D9-pin female
- Baud rate from 300 to 115.200 bit/s
- Short circuit (to Ground) protection on all outputs.
- Input voltage range: -12V to +12V

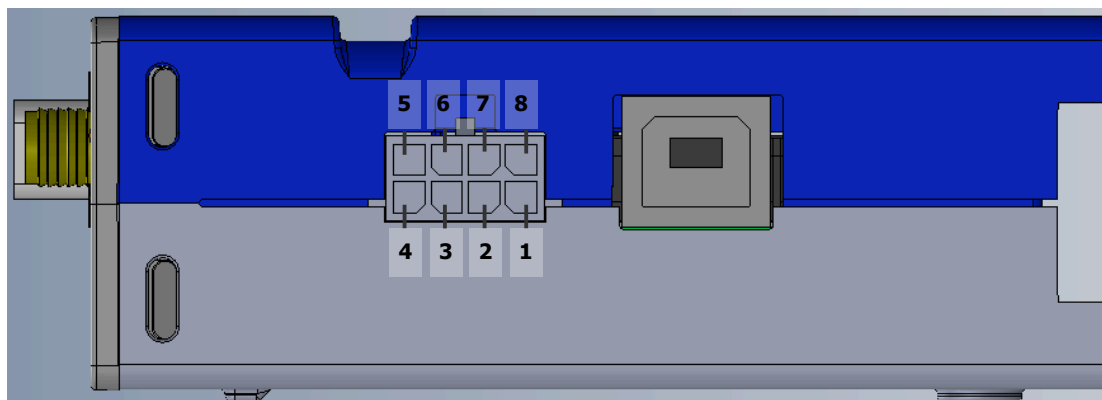
4.3.2 The PC as Data Terminal Equipment (DTE)

The software application for using the PC RS232 standard serial interface (COM-port) as Data Terminal Equipment (DTE) like Hyper Terminal, Putty, etc...

Connect using the COM-port to which the EZ863H Terminal is connected with the following settings:



4.4 Molex 8 pin connector – AUX interface



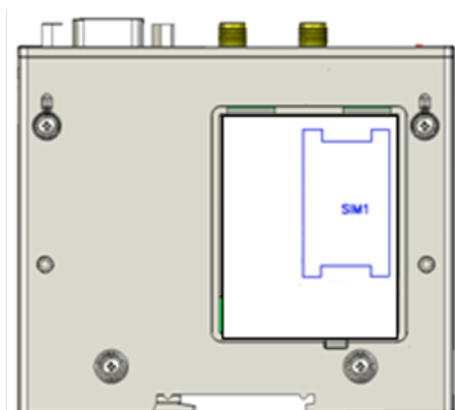
Pin	Signal name	Description	Cable Color
1	AUX RX	Modem AUX port RX – RS232 level	Black
2	AUX TX	Modem AUX port TX – RS232 level	Red
3	I2C SCL	I2C bus clock	Brown
4	I2C SDA	I2C bus data	Orange
5	SW VMOD	Switched VMOD	White
6	uC RX	uC RX port – RS232 level	Blue
7	1Wire	1Wire bus	Green
8	GND	Ground	Yellow

4.5 USB B connector - USB 2.0

The HE910 modem includes one integrated universal serial bus (USB) transceiver

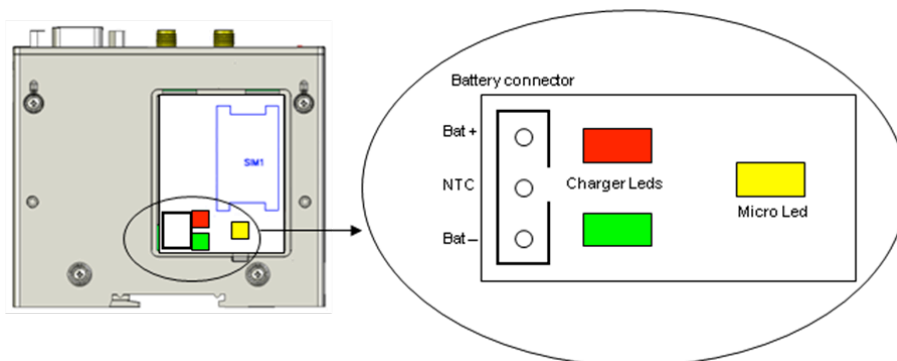
4.6 SIM Interface

The SIM interface is intended for 3V SIM cards. The cardholder is a five-wire interface according to GSM 11.11. A sixth pin has been added to detect whether or not the SIM card drawer is inserted. Removing and inserting the SIM card during operation may require the software to be reinitialized. Therefore, after reinserting the SIM card, the modem will detect it automatically, but it may be necessary to restart EZ863H Terminal.



5. Backup battery (optional)

The EZ863H-3G-GPS includes LiPo battery charger and housing for 960mAh LiPo battery. If the backup battery is present, when the input voltage drops below 6V, the DC\DC will stop working and the backup battery will take its place.



Charge condition	Description	Green	Red
Charge in progress	The battery is charging	ON	OFF
Charge done	Charging is done	OFF	ON
Stand By mode	Not charging because there is no input voltage or the charging is in sleep mode	OFF	OFF
Unacceptable battery temperature	Higher or lower temperature than the battery charging temperature limits, in accordance with the NTC	ON	ON
Battery absent	When the battery pack is removed	ON	ON
Over time	The battery has been charged for too long	ON	ON

6. Ordering part numbers

The part number is preset in the following table

Modem type	EZ863H part number	Description
HE910-EUG	EZ863H-EUG	3G, Europe bands, GPS, battery
HE910-EUD	EZ863H-EUD	3G, Europe bands
GE910-QUAD	EZ863H-QUAD	2G, Quad band
GE910-GNSS	EZ863-GNS	2G, Quad band, GNSS, battery
HE910-NAG	EZ863H-NAG	3G, North America bands, GPS, battery
HE910-NAD	EZ863H-NAD	3G, North America bands