Calixto-Telit xE910 MODEM User Manual

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Revision History

Date	Revision	Remarks
08/02/2014	0.1	First version created

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1. Introduction

This document talks about details of Calixto's Telit xE910 family based modems.

Telit offers its customers a form factor and family concept. Part of this concept is the xE910 family of wireless modules featuring a single, compact form factor that is interchangeable on any regional cellular network, delivering ubiquitous, cost-effective coverage for M2M applications and consumer electronics devices worldwide.

Based on a Land-Grid-Array (LGA) form factor with a footprint of just 795mm2 and a total size of 28.2 x 28.2 x 2.2mm, the Telit xE910 family's uniform design gives customers the ability to choose between global or regional cellular technologies depending upon the location and requirements of a specific application for optimum data rates and module costs.

Supporting GSM/GPRS, UMTS/HSPA+ and CDMA/EV-DO cellular technologies, the xE910 family also allows applications to be easily upgraded, such as when migrating from 2G to 3.5G, while maintaining the core design of an application or device throughout its lifecycle. This allows M2M developers and device manufacturers to easily customize their applications by enabling simple module integration and upgrades.

Calixto xE910 modems are optimum, ready to use solution for customers of Machine to Machine (M2M) applications. This module is based on Telit xE910 family of modules. Calixto provides optional battery charging feature and GPS support for selected modules.

These modems can also be used as ideal evaluation platform to evaluate xE910 modules from Telit.

Some key application areas include:
- Industrial M2M communications
- Remote Monitoring and Control
- Point of Sale Terminals
- Metering
- Warehousing
- Logistics and Freight Management

.Note: There is optional rugged, yet lightweight aluminum enclosure available for this modem.

2. CST-xE910-MODEM General Features:

- Based on Telit xE910 family of Modules
- Currently supported modules are
    - HE910: 3G UMTS, HSPA+ with GPRS/EDGE and optional GPS
    - UE910: 3G UMTS, HSPA modules
    - CE910_SC: Single Band CDMA 1xRTT module.

- o GE910: GSM/GPRS modem with USB 2.0 interface.
- Wide power input range from 9 to 24 Volt
  - o Ideal for automotive applications.
- USB Interface with miniUSB connector.
- RS232 interface with DB9 connector
- Optional battery charger feature
  - o Ideal for remote monitoring
- 14 pin Expansion connector with following interfaces
  - o 3 GPIOS
  - o SPI Interfaces
  - o Digital Voice Interfaces (DVI)
- Antenna connector options
  - o SMA and uFL options
- Dimension
  - o 50mm x 75 mm

3. Calixto CST-xE910-XX-MODEM ordering Info

3.1 Product Variants

There are many variants of the module available:
- Standard modem with xE910 modules varieties are:
  - o CST-HE910-XXX-MODEM (XXX is for different variation of HE910-EUD, EUG etc).
  - o CST-CE910-SC-MODEM
  - o CST-GE910-XX-MODEM
- CST-xE910 with battery charging interface: CST-xE910-XX-MODEM-BC

4. Product details

The figures below shows pictures of CST-GL868-MODEM-BC with important components marked. SIM card holder is in the other side of the board as in second picture.

RS232-DB9 connector   Expansion Connector

SMA Connector & Antenna

xE910 Module

DC Jack (Power Adapter)
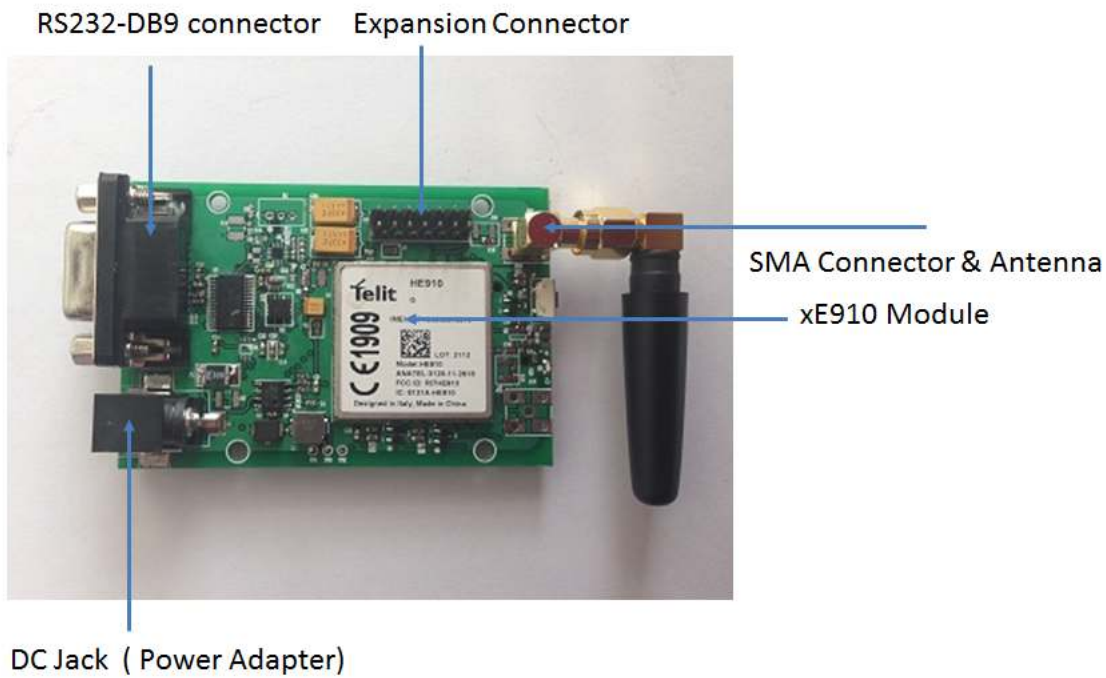
FIG1: xE910 MODEM: TOP VIEW

PIN No.1 in expansion connector

3 1
2

USB Connector
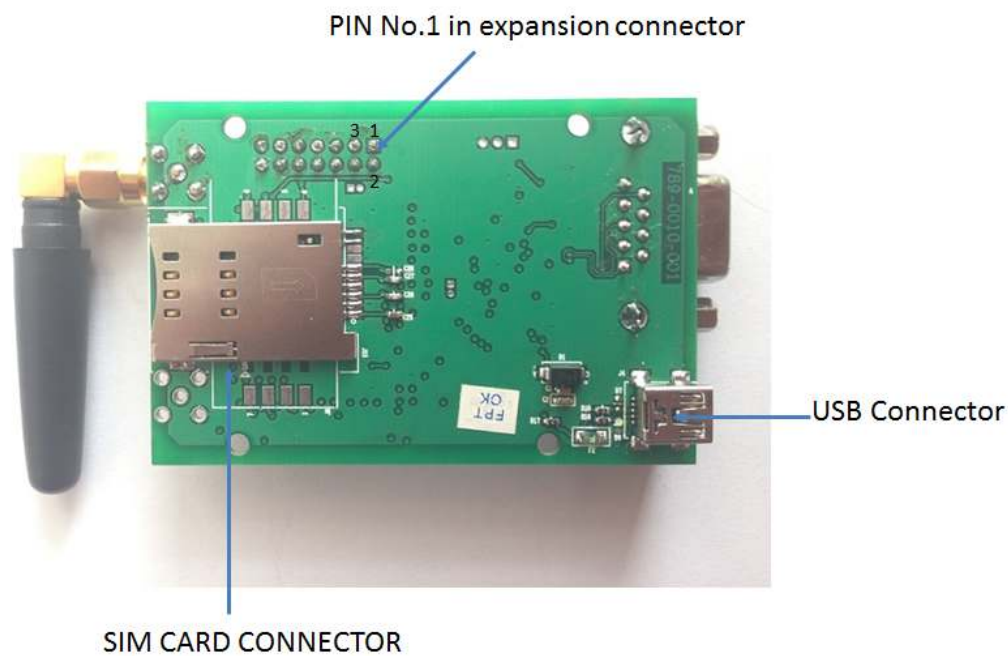
SIM CARD CONNECTOR

FIG2: xE910 MODEM: BOTTOM VIEW

FIG3: xE910 MODEM with Enclosure: Side View 1

FIG4: xE910 MODEM with Enclosure: Side View 2

5. Hardware Description

5.1 Antenna

Antenna connector allows transmission of radio frequency (RF) signals between the modem and an external customer-supplied antenna. Calixto provides option one of the two antenna connectors. One is uFL and other one is 50ΩFME male coaxial jack. As an option Calixto provides WIP Antenna with 50ΩFME male coaxial jack connector.

For modules with GPS functionality, there is a provision for uFL and SMA connector.

5.2 Power Jack

The power Jack supported is 2mm DC power jack with locking option. The figure below shows the power jack used in the modem.

5.3 LED Indications

There are two LEDs in the xE910 modem. The LED1 (at D3) is POWER indicator LED The LED1 (at D8) is MODULE status LED. For CST-xE910-xx- BC, there is an additional Charging Indicator LED (D4).

5.4 Battery connector

CST-xE910-MODEM-BC modem has additional battery connector. This is a 2 pin RELIMATE connector (location B1).

5.5 USB – Mini USB connector:

Calixto xE910 modems come with USB device connector (at J4). USB is directly connected to USB signals of modules. Please note that GE910-QUAD-V3 does not have USB interface.

5.6 RS232-DB9 (J3)

This DB9 connector has main UART of the xA910 module in RS232 level. There is also DCD, RING pins from the module in RS232 level. There is also GSM_RESET, ON_OFF input signals to GL86x module at 0-3.6 V level directly to this DB9 connector. These extra pins allow customers to utilize the xE910 module completely.

Pin No	PIN Name	Pin Type	Signal Type	Description
1	DCD	O	RS232	DCD PIN. Coming from xE910 module. This gives server connectivity status.
2	TXD	O	RS232	Transmit Data of RS232
3	RxD	I	RS232	Reception Data for UART
4	ON_OFF	I	0 to 3.6 (Typical 3.3)	ON/OFF PIN OF the module
5	GND	Gnd		Ground
6	MODULE_RESET	I	0-3.6 V (Typical 3.3)	Reset PIN of xE910 module. Active High. (20 ms High Pulse for reset)
7	CTS	O	RS232	Clear to Send
8	RTS	I	RS232	Request to Send
9	RING	O	RS232	RING PIN. Coming from xE910 module. Notification status for SMS and call.

5.7 Expansion Connector Slot (J14)

Pin No	PIN Name	Pin Type	Signal Type	Description
1	VCC_3V8D	Power		3.8V supply (to use outside)
2	DVI_WA0	I/O	CMOS1.8V	Digital Voice Interface (WA0). 16K Pull down when Input.
3	DVI_Rx	I	CMOS1.8V	Digital Voice Interface (RX). 16KPull down is needed.
4	DVI_Tx	I/O	CMOS1.8V	Digital Voice Interface (TX).
5	DVI_CLK	I/O	CMOS1.8V	Digital Voice Interface (CLK). 16K Pull down when Input.
6	SPI_MOSI/Tx_AUX	I	CMOS1.8V	SPI MOSI for HE910, Tx_AUX for GE910 QUAD
7	SPI_MISO/Rx_AUX	O	CMOS1.8V	SPI MISO for HE910, Rx_AUX for GE910 QUAD
8	SPI_CLK	I	CMOS1.8V	SPI CLK for HE910. Not used for other modules.
9	SPI_MRDY	I	CMOS1.8V	SPI MRDY for HE910. Not used for other modules.
10	SPI_SRDY	O	CMOS 1.8V	SPI SRDY for HE910. Not used for other modules.
11	GPIO_2	I/O	CMOS 1.8V	GPIO_2 from Module
12	GPIO_3	I/O	CMOS 1.8V	GPIO_3 from Module
13	GPIO_4	I/O	CMOS 1.8V	GPIO_4 from Module
14	GND	Gnd		Digital Ground

6. Telit Module Details:

Calixto xE910 module designed for all members of Telit's xE910 family of modules.

7. Electrical and Environmental Specification

Parameter	Min	Max
Input Power Supply -DC	9-24V	9-24V
Operating Temperature	-25^0 C	$+85^0$ C
Relative humidity - Operational	10%	90%

8. Communicating with Modem

8.1 Serial Interface mechanism

Customers can interface the modem through main (DB9 Connector). Following are the serial interface format used in Calixto GL86x modem in below figure:
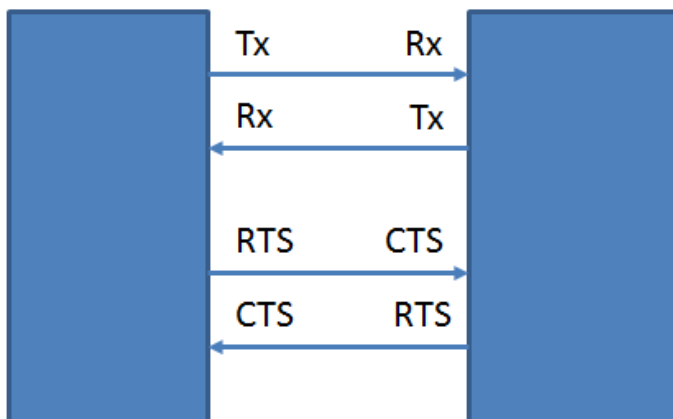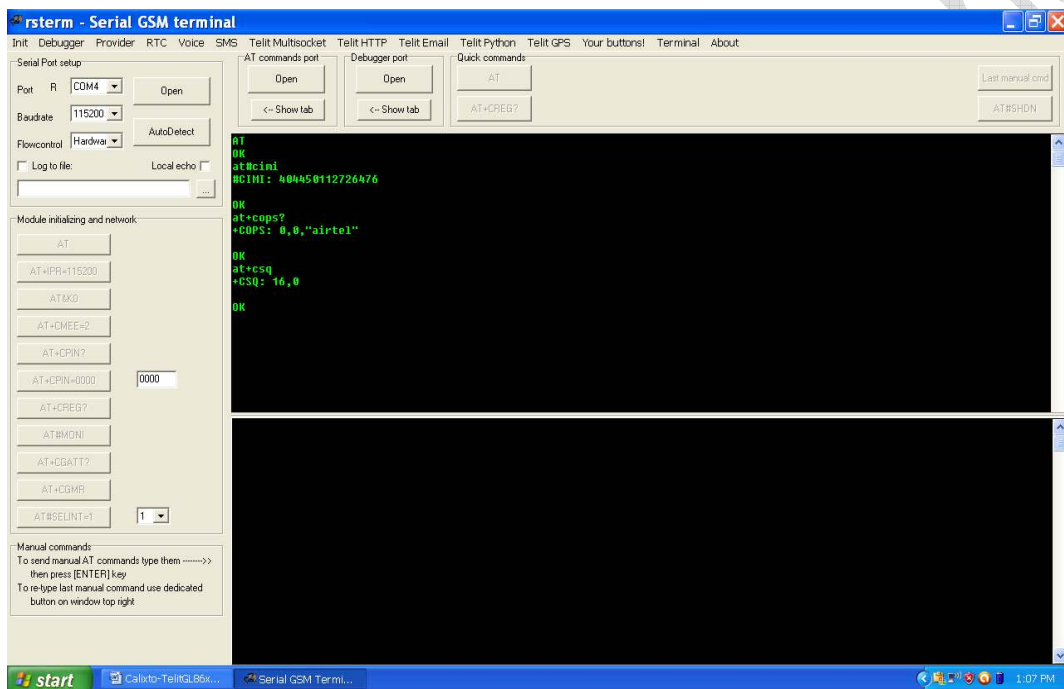
The CST-GL868-MODEM is built around Telit GL86x module. Customers can follow all the programing mechanism suggested by Telit.

8.2   Communication Software

Customer can use any serial terminal program in PC to communicate with modem. We have used "rsterm" for our development and test. Below figure shows typical screen shot of "rsterm".

Customer can use either AT commands or program the GL86x module with Python script defined by Telit.

Some of the documents to be referred are:

1. Telit Modules Software User Guide_r13 (1vv0300784 Rev.13 2013-02-14)

2. Telit AT Command Reference guide_r16 (80000ST10025a Rev.16 -2013-02-07)

3. Telit Easy Script Python_r15 (80000ST10020a Rev 15 -2012-10-09)

4. Telit CMUX Implementation User Guide_r3 (1VV0300994 Rv0.3 – 2013-02-15)

5. Telit SIM Access Profile User Guide_r3 (80000ST10029a Rev.3-2011-03-01)

6. Telit IP Easy User Guide_r15 (80000ST10028A rev 15-2013-02-19)

9. Legal Notice

9.1 Customer Support:

Calixto Systems are excited to offer our customers an easy "out of box" experience by providing board support package, software demos, user manuals and other electro mechanical documentation to get our evaluation modules up and running. We also provide further electronic (email, wiki and discussion forum) support for evaluation of our modules using corresponding Calixto boards.

Customer product development support is not part of standard support offer from Calixto systems. If customers are interested, Calixto can offer product development services around Calixto modules.

9.2 Usage Restriction:

Calixto products are excellent starting point for customer's applications development. But, selection and usage of Calixto systems products for a particular application is responsibility of customers. In order to minimize risks associated with customer applications, the customer must use adequate design and operating safeguards to minimize inherent or procedural hazards.

Calixto systems products are not intended for use in life support systems and appliances, nuclear systems or systems where malfunction can reasonably be expected to result in personal injury, death or severe property or environmental damage. Any use of products by the customer for such purposes are at the customer's own risk.

Off the shelf products from Calixto systems are commercial temperature grade. If customers are looking for Industrial or Extended temperature products, please order them specifically.

10. Warranty and Return Policy

10.1 Warranty Period:

Calixto Systems guarantees hardware products against defects in workmanship and material for a period of twelve (12) months from the date of shipment.

10.2 Warranty Coverage:

Calixto systems at its sole discretion, to either repair or replace the defective hardware product at no charge. Shipment costs in both directions are the responsibility of the customer. The warranty is void if the hardware product has been altered or damaged by accident, misuse or abuse. The warranty is void if the damage is due to the shipping of the Products and other external causes like problems with electrical power, usage not in

accordance with product instruction, and problems caused by use of parts and components not supplied by Calixto systems.

This warranty does not cover any items that are in one or more of the following categories:

  a. Software and/or device drivers,
  b. External devices,
  c. Accessories or parts added to products after the products shipped from Calixto Systems.
  d. All Warranty terms are subject to change without prior notice.

10.3 Product Repair:

- Calixto systems shall repair the defective products covered under this warranty that are returned to Calixto systems.
- Calixto systems shall own all parts removed from repaired products.
- Calixto systems will use parts made by various manufacturers in performing the repair. This can be different from the components used in the original products.
- The repaired products shall be warranted subjected to the original warranty only (If the original warranty period left was three months, the repaired product warranty will be only for three months)
- Customers shall agree that an independent third party assigned by Calixto Systems may repair the products covered under this limited warranty.

10.4 RMA (Return Merchandise Authorization)

- Customer shall enclose the completed "Calixto Systems RMA Service Form" with the returned packages.
- Customers shall provide all the relevant information of the defect in the "Calixto Systems RMA Service Form". This will reduce delay in defect identification and repair.
- Customers shall take responsibility to ensure that the packages of defective Products are durable enough to be resistant against further damage and deterioration during shipment. In case of damages occurred during the transportation, the repair is treated as "Out of Warranty".