X-SERIES GSM/GPRS MODEM COM MODULE DATASHEET

HE-XRC2Q / HE-XRC2Q-A

1   TECHNICAL SPECIFICATIONS

1.1 General	
Antenna Interface	Female SMA
Frequency Bands	850 / 900 / 1800 / 1900 MHz
GSM / GPRRS Features Supported	Provides for all GSM / GPRS authentication, encryption, and frequency hopping algorithms.
	GPRS Coding Schemes CS1 - CS4 supported
	Multi-Slot Class 10 (4RX/2TX, Max 5 slots)
Regulatory Agency Approvals	GCF Type Approval
	CE (Europe)
	PTCRB Type Approval
	FCC Certification (Part 24)
	IC (Industry Canada) Approval
GSM Functionality	Mobile-Originated and moble-terminated SMS messages: up to 140 bytes or up to 160 GSM 7-bit ASCII characters
	Reception of Cell Broadcast Message
	SMS receipt acknowledgement
GPRS Functionality	Quad ban BPRS Class 10
	Mobile Station Class B
	Coding Scheme 1 to 4
	PBCCH Support
	GERAN Feature Package 1 support (NACC, Extended TBF)
SIM	1V8 / 3 V Mini Subscriber Identity Module (SIM)
Size (L x W)	82.3 mm x 34.6 mm x 3.1 mm
Weight	Less than 80 grams
Operating & Storage Temperature	-40° C to 125° C (operating)
	-40° C to 125° C (Storage)
Relative Humidity	5 - 95%
Air Pressure (altitude)	70 kPa to 106 kPa (-400 m to 3000 m)

Transmit Power	FREQUENCY	POWER CLASS	TRANSMIT POWER
	850 MHz	GSM Class 4	(2W, 33dBm) @ GSM 850 / 900MHz
	900 MHz		
	1800 MHz	GSM Class 1	Class 1 (1W, 30dBm) @ GSM 1800 / 1900 MHz
	1900 MHz		

Receive Power	FREQUENCY	POWER CLASS	TRANSMIT POWER
	850 MHz	-107 dBm	107 dBm @ GSM 850 / 900MHz
	900 MHz		
	1800 MHz	-107 dBm	107 dBm @ DCS1800 / PCS1900MHz
	1900 MHz		

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2.1 - Introduction

For the XLE, XLT the HE-XRC2Q utilizes the same internal communications channel (UART) as the MJ1 serial port; thus, enabling the modem deactivates the MJ1 serial port. However, support is provided to select which device (or port) is currently active. XL4, EXL6, XL7 & EXL10 provide a COM port to support the modem thereby leaving MJ1 free for other use.

2.2 - Installation

1. Disconnect all power from the X-Series unit including I/O power.

2. Remove the four screws on the back of the unit and remove the back cover. The back cover will be replaced with the extended back cover that ships with the communication add-on. Screws are re-used (Figure 1, below).

REMOVE 4 SCREWS AS SHOWN AND REMOVE BACK COVER. DISCARD BACK COVER ONLY – DO NOT DISCARD SCREWS
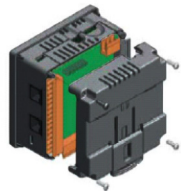
Figure 1

3. Plug the communication board onto the 24-pin connector. Ensure that all the pins are properly aligned (Figure 2, below).

INSTALL COM BOARD BY ALIGNING CONNECTOR AND SEATING BOARD FULLY ON STANDOFFS. INSTALL NEW BACK COVER RE-USING THE FOUR SCREWS.
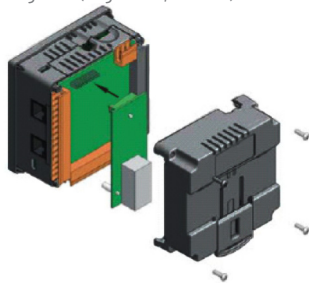
Figure 2

4. Place the extended back cover onto the unit. It can be helpful to tip it at an angle so the connector on the COM board passes through the opening on the back cover.

5. Place the screw back into the hole and turn the screw slowly counter clockwise until it clicks into the threads. This prevents the screw from being cross-threaded. Now, turn the screw clock-wise until the cover is firmly secured. Repeat this process for all four (4) screws.
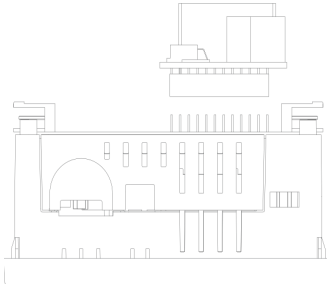
Warning: be careful when installing the module to align properly. Misalignment will damage the module.

Add support standoffs from the kit.
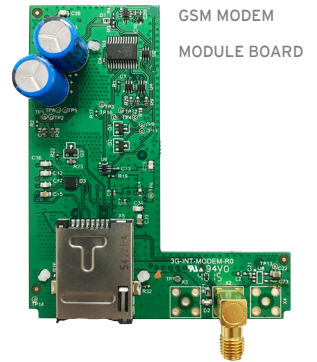
GSM MODEM MODULE BOARD

EXTENDED BACK COVER

3 COMMUNICATIONS

3.1 - General

The GSM modem module supports the following features :

- SMS
- GPRS Data
- Email
- 63-word Status block includes communication status, Initialization status, signal strength, invalid messages count and Retry count for Initialisation commands.

3.2 - SMS Functionality

- Up to 32 Send and 32 Receive messages with up to 20 Variables per message.
- Group Names allow multiple devices to be grouped together so that a particular message will be sent to a number of different devices.
- Phone number including country code and area code. The phone numbers may have special characters such as brackets, comma, plus and dash.
- Register numbers can be used instead of phone numbers. In this case, the phone number is stored in PLC registers as ASCII data with a maximum size of 20 chars (10 words).
- Bit, Byte, Word, Double Word and Real variable types supported.
- 160 character message buffer stores last sent or received message.

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3.3 - GPRS DATA

- Connection with Cscape & Envision
- Support for Protocols on Ethernet.

3.4 - EMAIL

- Support for email send
- Support for Email with attachment (CSV, Text, Images) send.

4 SAFETY

4.1 - WARNINGS

1. To avoid the risk of electric shock or burns, always connect the safety (or earth) ground before making any other connections.
2. To reduce the risk of fire, electrical shock, or phsycial injury, it is strongly recommended to fuse the voltage measurement inputs. Be sure to locate fuses as close to the source as possible.
3. Replace fuse with the same type and rating to provide protection against risk of fire and shock hazards.
4. In the event of repeated failure, do NOT replace the fuse again as repeated failure indicates a defective condition that will NOT clear by replacing the fuse.
5. Only qualifed electrical personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, or service this equipment. Read and understand this manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaustion could result in severe bodily injury or loss of life.
6. To comply with FCC RF exposure requirements, a separation distance of 20cm (7.87") or more must be maintained between this antenna and all persons.
7. Maximum antenna gain is limited to 3 dBi in mobile products and applications. Maximum antenna gain is limited to 7 dBi in fixed products and applications.

4.2 - FCC REGULATORY NOTICES

Horner has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20cm between the radiator and any person. Antenna gain must be below:

FREQUENCY BAND (MHZ)	ANTENNA GAIN
GSM850	6.43 dBi
PCS 1900	2.75 dBi

The transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

4.3 - FCC CLASS B DIGITAL DEVICE NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to the part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed ad used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

A. Reorient or relocate the antenna
B. Increase the distance between the equipment and the receiver
C. Connect the equipment to a power outlet on a different circuit to the one to which the receiver is connected
D. Consult the dealer or an experienced radio/TV technichian for help

4.4 - PRECAUTIONS

All applicable codes and standards need to be followed in the installation of this product. Adhere to the following safety precautions whenever any type of connection is made to the module:
1. Connect the safety (earth) ground on the power connector first before making any other connections.
2. When connecting to the electric circuits or pulse-initiating equipment, open their related breakers.
3. Do NOT make connection to live power lines.
4. Make connections to the module first; then connect to the circuit to be monitored.
5. Route power wires in a save manner in accordance with good practice and local codes.
6. Wear proper personal protective equipment including safety glasses and insulted gloves when making connections to power circuits.
7. Ensure hands, shoes, and floor are dry before making any connection to a power line.
8. Make sure the unit is turned OFF before making connection to terminals.
9. Make sure all circuits are de-energized before making connections.
10. Before each use, inspect all cables for breaks or cracks in the insulation. Replace immediately if defective.
11. Use copper conductors in Field Wiring only, 60/75° C.

4.5 - RECOMMENDATIONS

Be sure that the use of this product is allowed in the country and environment required. The use of this product may be dangerous and has to be avoided in the following areas:
1. Where it can interfere with other electronic devices in environments such as hospitals, airports, aircraft, etc. etc.
2. Where there is risk of explosion such as fuel stations, oil refineries, etc. etc.

6 TECHNICAL SUPPORT

For assistance and manual updates, contact Technical Support at the following locations:

North America
+1 (317) 916-4274
www.hornerautomation.com
techsppt@heapg.com

Europe
+353 (21) 4321-266
www.horner-apg.com
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