Chipsmall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

red lion ®

Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No.   XCHSPA-B
Drawing No.   LP0966
Released   04/15

MODEL XCHSPA – HSPA+ CELLULAR MODEM OPTION CARD FOR DATA STATION PLUS, MODULAR CONTROLLER AND PTV

- SUPPORTS HSPA+ CELLULAR DATA CONNECTIVITY WITH FALL BACK TO 3G AND 2G
- UP TO 21 MBPS DOWNLINK/5.76 MBPS UPLINK SPEEDS
- CONFIGURED USING CRIMSON® 3.0 SOFTWARE
- FOR INSTALLATION WITH A DATA STATION PLUS, A MODULAR CONTROLLER MASTER OR A ProducTVity STATION (PTV)
- INSTALLATION AND CONNECTION HARDWARE ARE INCLUDED WITH CARD

GENERAL DESCRIPTION

The XCHSPA option card allows the user to add HSPA+ cellular modem capability to their Data Station Plus, Modular Controller Master or PTV. The cellular standard adopted in this option card is HSPA+ with fallback capability to 3G and 2G. It can get speeds up to 21 Mbps downlink and 5.76 Mbps uplink. It's built upon the GSM standard and widely available throughout the world. HSPA+ can be used for services such as Wireless Application Protocol (WAP) access, Short Message Service (SMS), and for Internet connectivity.

The XCHSPA option card is penta-band, allowing it to work in frequencies across the Americas, Europe and Asia. US and Canada work in the 850/1900 MHz bands, while Europe, Middle East, Africa and most of Asia work in the 900/1700/2100 MHz HSPA+ frequencies.

The XCHSPA requires the addition of a SIM (Subscriber Identity Module) card, which is inserted into the holder prior to installation of the XCHSPA card. The SIM card securely stores the service-subscriber key (IMSI) used to identify a subscriber, and is used to connect to the network to obtain an IP address from the provider.

The XCHSPA communication card is easily installed by removing the blank expansion port cover of your Data Station Plus, Modular Controller Master or PTV and plugging the XCHSPA card into the expansion port. Configuration is simple using Red Lion's free Crimson® 3.0 software.

CONTENTS OF PACKAGE
- XCHSPA option card
- This hardware bulletin

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
XCHSPA	GSM/HSPA+ Modem Option Card [1]	XCHSPA00
ANT	2G/3G 3" hinged antenna	ANT-TG090113
	2G/3G/4G LTE low profile direct permanent mount antenna, IP67 rated	ANT-G30B108111
	2G/3G 4.5" whip magnetic mount antenna, IP65 rated	ANT-GA107201111
	2G/3G low profile direct permanent mount antenna, IP65 rated	ANT-G21B301111

[1] Antenna is NOT included with the card. Must be purchased separately if needed.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

⚠ **CAUTION: Risk of Danger.**
Read complete instructions prior to installation and operation of the unit.

SPECIFICATIONS
1. **POWER REQUIREMENTS**:
   HSPA+ Mode: During continuous active webserver traffic
   Instantaneous maximum: 24 V @ 300 mA
   Average: 24 V @ 200 mA
   GPRS Mode:
   Instantaneous maximum: 24 V @ 650 mA (1.1 msec every 4.6 msec)
   Average: 24 V @ 275 mA
   Power is supplied to the option card from the main board of the Modular Controller Master, Data Station Plus or PTV.
2. **LINK STATUS LEDs**:
   Link Status - Link Status LED shows cellular link condition.
3. **COMMUNICATIONS**:
   Isolation from XCHSPA Antenna connector to Modular Controller Master, Data Station Plus or PTV: 500 VDC for 1 minute.
2. **ANTENNA CONNECTOR**:
   SMA Female connector requires:
   50 Ohm antenna with SMA male connector
   Penta-band HSPA+ antenna (850/900/1700/1900/2100 MHz) for global support.
   Dual-band (850/1900 MHz) antenna for US and Canada only
   Dual band (900/2100 MHz) for Europe only
   Voltage Standing Wave Ratio (VSWR) should not exceed 2.0:1
   The antenna cable should be 50Ω impedance, RG178/U or RG174/U type and be able to connect to the RSMA (Male) jack bulkhead. The antenna could be horizontal, vertical or right angled. Longer antenna cable would equate to signal loss. This device is intended for connection to an antenna mounted within the building or a UL certified enclosure suitably rated for application.

3. CERTIFICATIONS AND COMPLIANCES:

Refer to main unit manual or "Agency Approvals" section of Red Lion's website for agency certifications.

ELECTROMAGNETIC COMPATIBILITY

Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

Reference Data Station Plus, Modular Controller Master or PTV unit for EMC specifications

The XCHSPA option card has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules.

4. ENVIRONMENTAL CONDITIONS:

Refer to the specifications of the Data Station Plus, Modular Controller Master or PTV you are installing this card in. *** See Thermal Performance and Consideration section when installing in DSP extended temperature units.**

5. CONSTRUCTION: For indoor use only. Installation Category II, Pollution Degree 2.

6. INSTALLATION REQUIREMENTS: See "Installing the XCHSPA Option card" for more details.

7. WEIGHT: 3.0 oz (85.05 g)

EMC INSTALLATION GUIDELINES

Although Red Lion Controls Products are designed with a high degree of immunity to Electromagnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, source or coupling method into a unit may be different for various installations. Cable length, routing, and shield termination are very important and can mean the difference between a successful or troublesome installation. Listed are some EMI guidelines for a successful installation in an industrial environment.

1. A unit should be mounted in a metal enclosure, which is properly connected to protective earth.
2. Use shielded cables for all Signal and Control inputs. The shield connection should be made as short as possible. The connection point for the shield depends somewhat upon the application. Listed below are the recommended methods of connecting the shield, in order of their effectiveness.
   a. Connect the shield to earth ground (protective earth) at one end where the unit is mounted.
   b. Connect the shield to earth ground at both ends of the cable, usually when the noise source frequency is over 1 MHz.
3. Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors, feeding motors, solenoids, SCR controls, and heaters, etc. The cables should be run through metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter. Also, Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.
4. Long cable runs are more susceptible to EMI pickup than short cable runs.
5. In extremely high EMI environments, the use of external EMI suppression devices such as Ferrite Suppression Cores for signal and control cables is effective. The following EMI suppression devices (or equivalent) are recommended:
   Fair-Rite part number 0443167251 (RLC part number FCOR0000)
   Line Filters for input power cables:
   Schaffner # FN2010-1/07 (Red Lion Controls # LFIL0000)
6. To protect relay contacts that control inductive loads and to minimize radiated and conducted noise (EMI), some type of contact protection network is normally installed across the load, the contacts or both. The most effective location is across the load.
   a. Using a snubber, which is a resistor-capacitor (RC) network or metal oxide varistor (MOV) across an AC inductive load is very effective at reducing EMI and increasing relay contact life.
   b. If a DC inductive load (such as a DC relay coil) is controlled by a transistor switch, care must be taken not to exceed the breakdown voltage of the transistor when the load is switched. One of the most effective ways is to place a diode across the inductive load. Most RLC products with solid state outputs have internal zener diode protection. However external diode protection at the load is always a good design practice to limit EMI. Although the use of a snubber or varistor could be used.
   RLC part numbers: Snubber: SNUB0000
                      Varistor: ILS11500 or ILS23000
7. Care should be taken when connecting input and output devices to the instrument. When a separate input and output common is provided, they should not be mixed. Therefore a sensor common should NOT be connected to an output common. This would cause EMI on the sensitive input common, which could affect the instrument's operation.

Visit RLC's web site at http://www.redlion.net/emi for more information on EMI guidelines, Safety and CE issues as they relate to Red Lion Controls products.

THERMAL PERFORMANCE AND CONSIDERATIONS

This option card is rated for operation from -20°C to +70°C (See below for thermal de-ratings) when the proper thermal considerations are taken into account. Please refer to the following information to maximize the performance of this option card when it's operated under extreme temperatures.

High Temperature Operating Conditions:

This option card has many modes of operation which can cause the power consumption and corresponding heat dissipation to vary greatly. This factor, along with others, can affect the performance and longevity of the unit.

The maximum ambient temperature rating is further defined as follows:

- 60 °C maximum for continuous data usage and webserver operation with refresh rate set at 0 seconds in Crimson:
- 65 °C maximum for continuous webserver operation with refresh rate set to 10 seconds in Crimson
- 70 °C maximum for continuous web server operation with a refresh rate set to 30 seconds in Crimson
- 70 °C maximum for SMS mode of operation (sending and receiving text messages). These units may also be operated at 70 °C if data usage is brief and intermittent (e.g. downloading a 100 kB log file once an hour).
- For best performance and longevity, try to maintain an ambient air temperature less than 60 °C.
- The ambient temperature is defined as the temperature of the air immediately surrounding the unit.

- Reduced wireless performance may occur when operating above +60 °C in continuous webserver mode of operation with refresh rate set at 0 seconds.
- Running at temperatures above 60 °C for extended periods of time may reduce the performance and longevity of the unit.

If your wireless communications is atypically high or frequent, then the maximum ambient operating temperature may be reduced. The wireless circuit(s) in this option card may shutdown to protect from permanent damage when the internal circuitry temperature becomes extreme.

INSTALLING THE XCHSPA OPTION CARD

The first step is to buy a SIM Card from one of the GSM/HSPA+ providers and insert it into the SIM Card slot of the option card. The SIM Card slot is the rectangular slot on top of the GSM/HSPA+ Cellular Modem in the XCHSPA option card as shown in Figure 1. See SIM Card details in the Software/Unit Operation Section for more details.

1. Remove power from the unit.
2. Insert a flat-bladed screwdriver into the slot at the top of the expansion port cover. Gently apply pressure on the screwdriver in an upward direction until the expansion port cover disengages from the unit as shown in Figure 2.
3. Verify that the option card knobs are in the "unlocked" position as shown in Figure 3.
4. Carefully insert the option card into the expansion port opening while aligning the card-edge connector on the option card with the main board's header, as shown in Figure 4. Once aligned, gently press on the front of the card until it is flush with the front of the case.
5. Turn the option card knobs to the locked position as shown in Figure 5.

Caution: The expansion and main circuit boards contain static sensitive components. Before handling the cards, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the cards at a static controlled clean workstation. Also, handle the cards by the edges only. Dirt, oil, or other contaminants that may contact the cards can adversely affect circuit operation.

Warning: Risk of Danger: Be sure to remove all power before removing the expansion port cover.
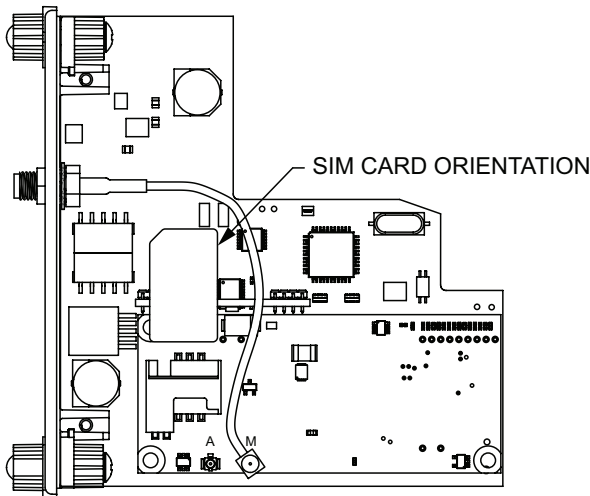
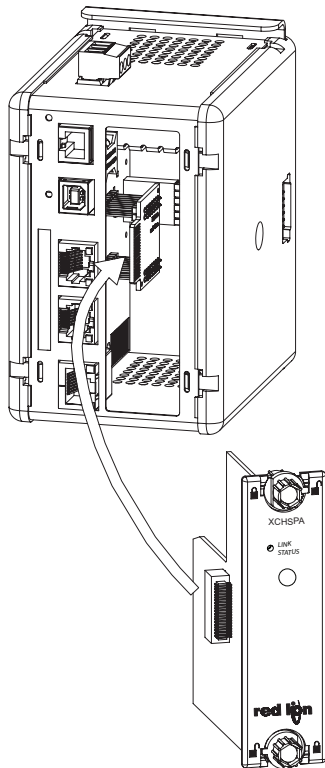**Figure 1**
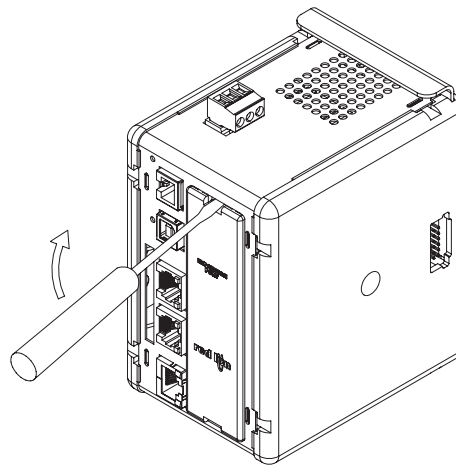
Figure 2
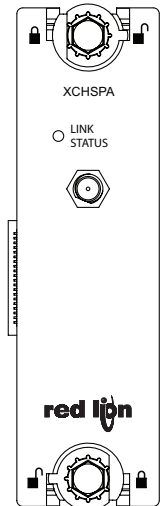
Figure 3

Figure 4

Figure 5

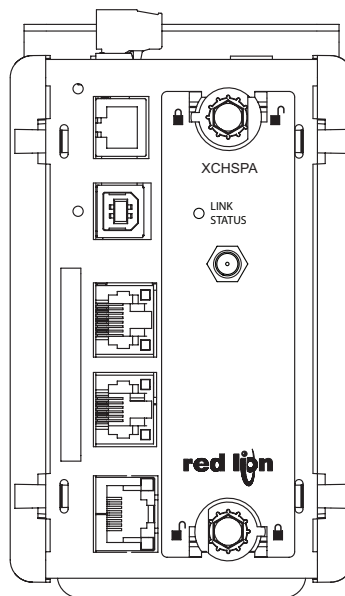## THE OPTION CARD LABEL

Place the option card label on your outer plastic cover of the Data Station Plus, Modular Controller Master or PTV. The label displays the FCC ID of the particular modem being used in the XCHSPA option card.

POWER SUPPLY REQUIREMENTS

NEW AND EXISTING INSTALLATIONS

The XCHSPA option card draws all of its power from the main board of the Data Station Plus, Modular Controller Master or PTV. The specifications of the Modular Controller Master, Data Station Plus or PTV account for the power needs of an option card.

SOFTWARE/UNIT OPERATION

CRIMSON SOFTWARE

Crimson® 3.0 software is available as a free download from www.redlion.net or it can be purchased on a CD, see "Ordering Information" for part number. The latest version of the software is always available from the web site, and updating your copy is free.

LED

LINK STATUS – MODEM STATUS LED

The Link Status LED is a green LED that provides information regarding the state of the modem module's cellular connection. The status is described below.

OFF	No power to the unit
ON	Powered and not registered on the cellular network.
BLINKING	Powered and registered on the cellular network.

CONFIGURING A XCHSPA OPTION CARD

The XCHSPA option card is configured using Crimson (3.0 or later) software. After choosing the appropriate Cellular modem option card, it is set up as a PPP Modem client (choosing HSPA+ modem in the drop down box selection), PPP Modem Server or SMS via HSPA+ Modem.

Additional information can be found in your Data Station Plus, Modular Controller Master or PTV hardware bulletin and the Crimson User Manual.

SIM CARD INSTALLATION & DETAILS

A SIM Card with data plan enabled has to be installed on the XCHSPA option card before installing the option card in the Data Station Plus, Modular Controller Master or PTV. Please contact your GSM/HSPA+ cellular network provider on setting up an account and data plan. The carrier should provide you with a SIM card to insert into the module, along with the APN, username, and password for data connectivity.

TROUBLESHOOTING YOUR XCHSPA OPTION CARD

If for any reason you have trouble operating, connecting, or simply have questions concerning your new XCHSPA option card, contact Red Lion's technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net