



RAM-6021 Wired Router

Quick Start Guide & Hardware Guide

November 2013

Quick Start Guide

UNPACKING INSTRUCTIONS

- 1 Unpack the Red Lion unit and verify the following components are enclosed for the RAM-6021 Router:
RAM-6021 & CD



- 2 There are 2 methods to provide power to the router:

- 4-pin screw terminal
- Side mounted 2.5mm barrel connector

The modem requires a power source between 8 and 30 VDC to operate:

Label	Color	Description
GND	Black	Ground
PWR+	Red	Power 8 to 30 VDC (500mA@12VDC)
IN	White	Future feature – not supported
OUT	Green	Future feature – not supported

- 3 Connect to the Ethernet RJ45 port for network connectivity.

ACCESSING THE WEB USER INTERFACE

- 1 Connect PC to the RAM-6021 Router

Connect a CAT-5 Ethernet cable between the local PC and the unit's Ethernet port. Verify that the green LED is lit.

- 2 Setup PC IP Address

For assistance with configuring your PC, see the appropriate Microsoft Windows support webpage listed at: <http://support.microsoft.com>.

PC to Ethernet Interfaces

Select "Use the following IP address" and fill in the blank fields with the information below:

	Ethernet 0
IP address	192.168.0.2
Subnet mask	255.255.255.0
Default gateway	192.168.0.1
Preferred DNS	192.168.0.1

- 3 Access Web User Interface

Open a web browser & enter the following in the address bar: <http://192.168.0.1:10000/newgau.html>

LOGIN INSTRUCTIONS

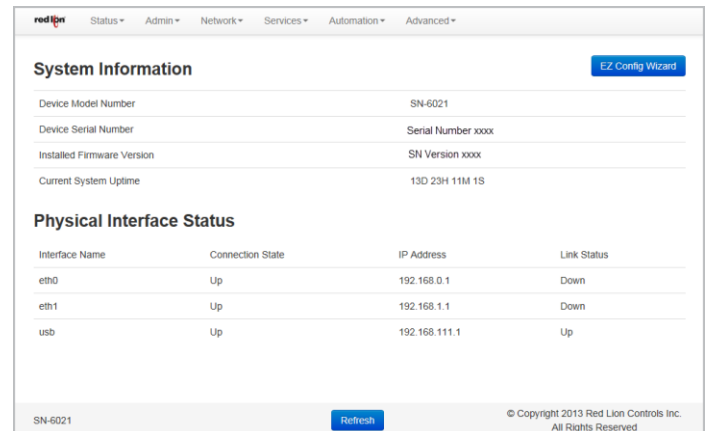
- User Name:
admin (lowercase letters)
- For Password:
last six digits of the unit serial number

Upon successfully logging in, the Web UI will launch.

Note: For security purposes, it is recommended that the admin password be changed according to your internal policies.

To change your password, please go to: **Admin->Access Settings**.

Figure B - Web UI:



You are now connected to the Web interface. If you should see anything other than the screen shown above, please refer to the RAM-6021 User Manual located at: www.redlion.net.

For more information to set up Modbus features, please refer to the RAM-6021 User Guide available at www.redlion.net.

RED LION CONTROLS TECHNICAL SUPPORT

If you have followed all of the instructions up to this point, have satisfied yourself that you are not having an authentication problem, are convinced that you have sufficient reception, and your unit is still not communicating, then it is time to contact Red Lion Technical Support at support@redlion.net or +1-877-432-9908 and we will be happy to assist you in getting your unit operational.

HARDWARE STATUS LEDS

LED	State	Description
Power	ON	Power is applied to the router
WAN	ON	Link established, but no data activity
	FLASH	Data transmitted/received on network
RS232	ON	Link established with serial device but no data activity
	FLASH	Data transmitted/received with attached serial device
Ethernet	ON	Link established with Ethernet device

SOFTWARE LICENSING TERMS & CONDITIONS

Software supplied with each Red Lion product remains the exclusive property of Red Lion Controls. Red Lion grants with each unit a perpetual license to use this software with the express limitation that the software may not be copied or used in any other product for any purpose. It may not be reverse engineered, or used for any other purpose other than in and with the computer hardware sold by Red Lion.

WARRANTY

Red Lion Controls provides a limited hardware warranty for the Industrial Pro Router, which consists of the following: This warranty is effective for three years from the delivery date of the IndustrialPro™ Router to the purchaser. The purchaser is responsible for returning the defective unit to our factory, freight prepaid. If the IndustrialPro™ Router is under warranty, Red Lion will repair it and return it, freight prepaid, via standard shipping. If the IndustrialPro™ Router is not covered by the warranty, we will notify you of the repair charges and not repair the IndustrialPro™ Router without your permission. Repairs are guaranteed for 90 days or the remainder of the warranty, whichever is longer. Buyer's remedies for breach of warranty shall be limited to repair or replacement subject to adjustment as stated herein, or full or partial adjustment to purchase price. The Red Lion Industrial Pro Router is provided with the following warranty: Hardware maintenance and repair is available on a return to factory basis. After this initial period, configuration assistance will continue to be available on a chargeable basis. Software support does not provide for custom code. Custom changes are available as a chargeable option. The warranty only covers items with a serial number. Cables and adapters are not covered.

For complete and most up-to-date warranty information go to www.redlion.net

Notice: UL Listed as BT-6xxx model

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1 Product Overview

1.1 Specifications

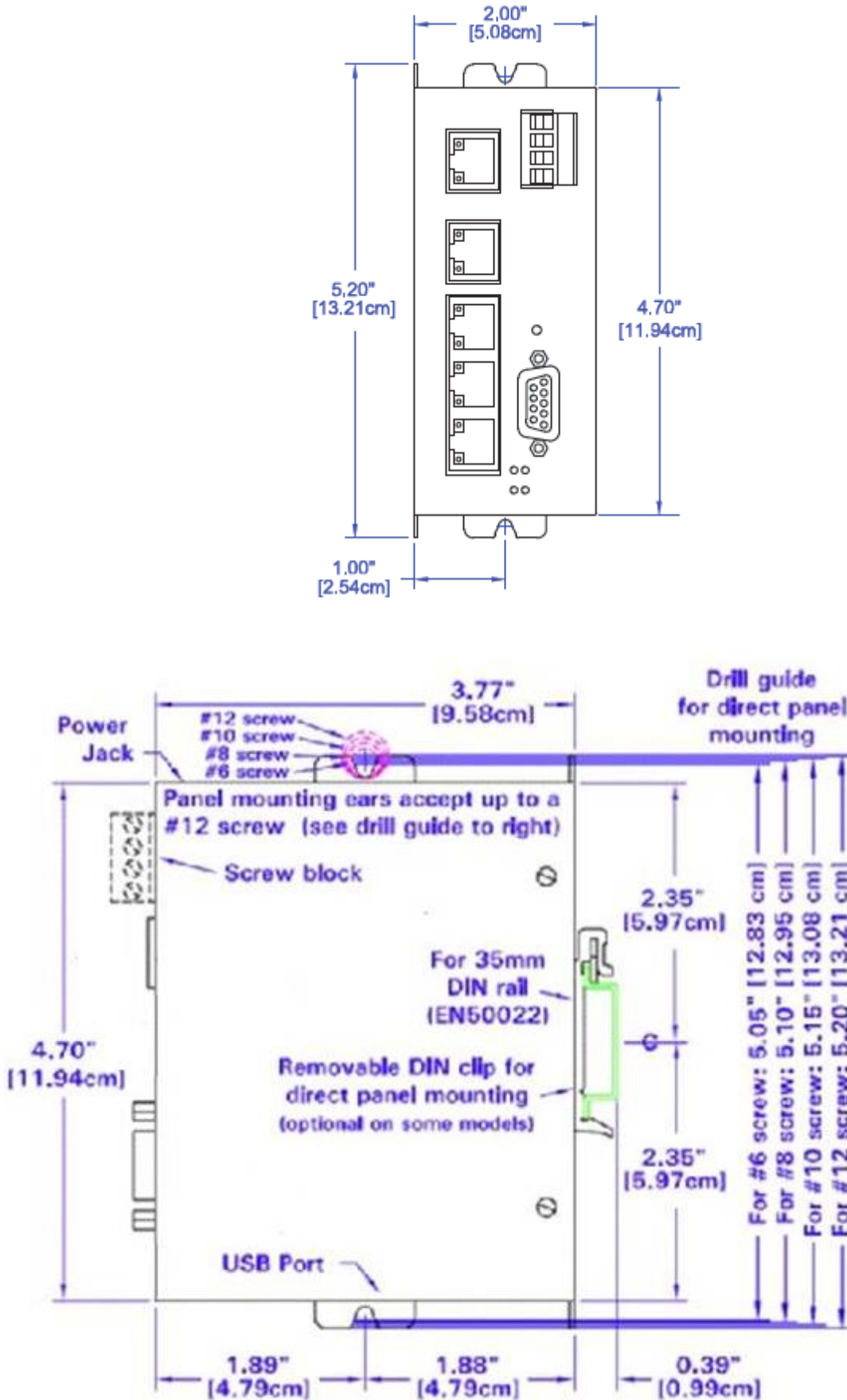
1.1.1 General specifications

Table 1 – General specifications

Serial interface	1x RS-232 Serial DB9 115200bps
USB interface	1x USB 2.0 mini configuration port
LED indicators	Power, WAN, RS232, Ethernet Link & Activity
Dimensions	Steel 120 x 96 x 51 mm (4.7" x 3.77" x 2.0")
Weight	544 g (1.2 lbs)
Power Input	4-pin screw terminal Side mounted 2.5 mm barrel connector 8-30 Vdc (nominal) Input current (max): 150mA
Power consumption	See Table 6
Environmental	Operating Temp: -40 to +85°C (-40 to 185°F) Shock: IEC 60068-2-27 Vibration: IEC60068-2-6 Humidity: 5 to 95% non-condensing MTBF RAM-6021 1,832K Hours GB @ 40°C per MIL-HNDBK-217F2
Certification	Hazardous Locations - Class I, Div. 2, Groups A,B,C,D, ANSI / ISA12.12.01 Electrical Safety - UL508/CSA22.2/14 (CUL) EMC- FCC, part 15 and Industry Canada, ICES-003 CE, RoHS

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1.1.2 Mechanical specifications RAM-6021



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1.1.3 Power specifications and consumption

Power is supplied to the router via:

- 4-pin screw terminal
- Side mounted DC 2.5mm barrel connector router

4-pin Screw Terminal

Power is supplied to the router via the 4-pin Screw Terminal on the front panel for the RAM-6021 router. The pins are described as follows:



Power connector
(facing front)

Table 4 - 4-pin screw terminal

Pin	Name	Description
1	GND	Ground
2	PWR+	Power supply input (8 to 30 VDC) (500mA@12VDC)
3	OUT	Digital output
4	IN	Digital and analog input

DC 2.5mm Barrel Connector

Power is supplied to the router via the barrel connector on the left side of the RAM-6021 router. The contacts are described as follows:



Power connector
(facing left side)

Table 5 – DC 2.5mm Barrel adapter

Pin	Name	Description
Sleeve	GND	Ground
Tip	PWR+	Power supply input (8 to 30 VDC)

WARNING:

DC 2.5mm Barrel Connector shall not be used in hazardous locations.

Power specification

Power input to the router is protected against reverse polarity and over-voltage.

The router's power consumption is as follows:

Table 6 – Power consumption

Model	Draw in mA (at 12 VDC)		
	Standby	Transmitting	Peaks
RAM-6021	115	360	531

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Wiring instructions are provided in the [Hardware Installation](#) section.

All routers are equipped with protection for reversed polarity and power surges over 33 volts. The routers are equipped with an internal 3 Amp fuse.

Electrical Specifications and Pinout

1x Digital Output (DOUT)

Configuration: Open Collector, reference to ground
Absolute Maximum IDC: 500mADC ($V_{ce} = 750\text{mVDC}$)
Absolute Maximum VDC: 30VDC (open circuit)
Absolute Minimum VDC: -0.4VDC (open circuit)

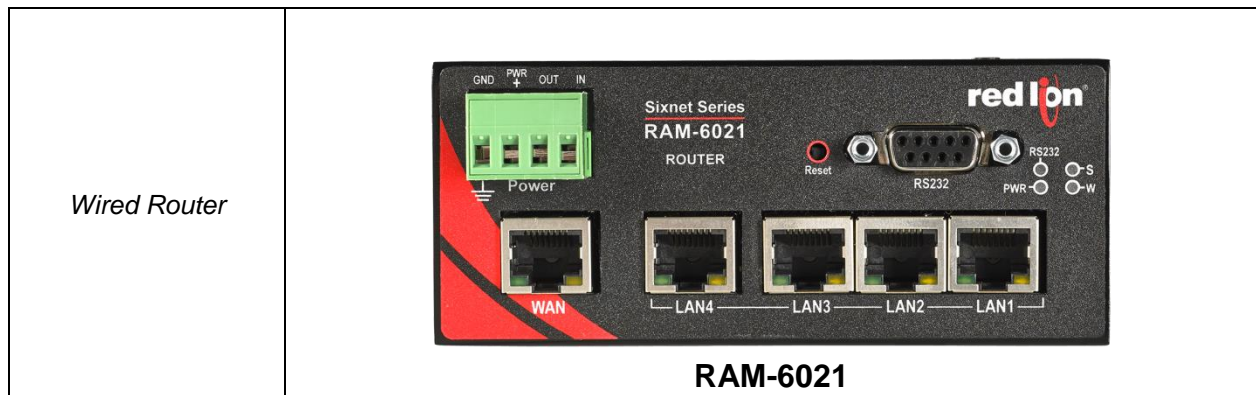
1x Digital Input (DIN)

Configuration: un-isolated level detection, reference to ground
Active level: 1.6VDC to 30VDC
Inactive level: 0VDC to 1.3VDC
Absolute Minimum VDC: -0.3VDC
Absolute Maximum VDC: 33VDC
Leakage IDC at 5VDC: 150uADC

1x Analog Input (Shared with Digital Input) (DIN/AI1)

Configuration: un-isolated input, reference to ground
Resolution: 1024 (ADC 10-bit)
VDC per step: 4.8875855mVDC
Full scale level: 5VDC
Zero level: 0VDC
Absolute Minimum VDC: -0.3VDC
Absolute Maximum VDC: 8.3VDC
Leakage IDC at 5VDC: 265.96uADC TYPE

Router view



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1.1.4 Indicators Lights (LED)

Table 7 – LEDs

LED	Status	Corresponding State
Power	OFF	Router is powered off
	ON	Router is powered on
	FLASH	Firmware error
WAN	OFF	Connection is not established
	ON	Link Established, but no data activity
	FLASH	Data transmitted/received on network
RS232	OFF	Connection is not established
	ON	Link established with serial device but no data activity
	*FLASH	Data transmitted/received
Ethernet	OFF	Connection is not established
	ON	Link established with Ethernet device
	FLASH	Data transmitted/received

*Depending on Serial Application

1.1.5 Data Interface Specifications: Serial, Ethernet & USB

1.1.5.1 Ethernet Port

The router's 10/100Mbps Ethernet port is compliant with the EIA-568 standard. The router's ports are autosensing so they can be used with either a straight or crossover RJ45 cable to connect to host ports.

The RAM-6021 Router features a 5-port Ethernet switch allowing connectivity to multiple local devices.

1.1.5.2 USB Device Port

This is a USB 2.0 Device interface on a Mini B connector. It offers Ethernet-over-USB functionality using the RNDIS driver for Windows XP and Windows Vista Operating systems only. The BlueTree RNDIS driver must be installed before the USB interface can be used. The driver and instructions can be obtained at www.redlion.net.

1.1.5.3 Serial Port (DB9)

The router's serial port is an RS232 DCE, compliant with EIA-232 standard. The connector used is DB9 female and is shown in the illustration below.

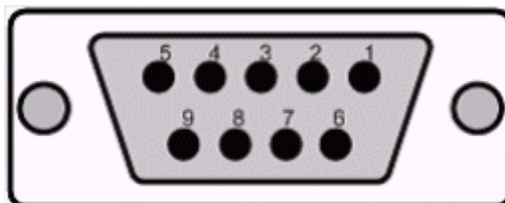


Figure 1 – Serial connector (looking at front of router)

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For further serial wiring information, refer to the [Hardware Installation](#) section.

1.1.6 **RESET button functions**

Table 8 – Reset button functions

Mode	Pattern	Description
Hard reset	Press and hold for less than 3 seconds	Standard reboot
Factory restore	Press and hold between 3 and 10 seconds RS232 LED flashes quickly	To restore default settings for older versions, rerun the SN Reflashing procedure found at www.redlion.net
FW upgrade	Press and hold between 10 and 15 seconds WAN LED flashes quickly	Puts the router in advanced firmware upgrade mode by restarting the router and running the boot loader only. Do not use this mode unless instructed to by Red Lion Technical Support.
USB pass-through	Press and hold for longer than 15 seconds Signal LED flashes quickly	Puts the router in main pass-through mode to the RF module, allowing CCT provisioning and PST support. Do not use this mode unless instructed to by Red Lion Technical Support.

2 Hardware Installation

2.1 Mounting the RAM-6021 wired router

There are 3 different ways to mount a RAM-6021 wired router:

- Horizontally using two #6 screws pan or fillister head onto its horizontal mounting feet
- Vertically using two #6 screws pan or fillister head onto its vertical mounting feet
- Vertically using a DIN rail clip

2.2 Ethernet cable

If you are connecting to the router via the Ethernet port, you will need a straight or crossover category 5 cable with two 8-pin RJ45 connectors on each end.

To visually confirm that Ethernet cabling was done properly, check the LED indication on the Ethernet port located at the rear panel of the router. The Link LED should be on when the right cable is used.

2.3 USB cable

This is an Ethernet-over-USB connection which behaves like an Ethernet connection. It can only be connected to a PC with Windows XP or Windows Vista installed. If you are connecting to the router via the USB port, you will need a Type A plug to Type B plug USB cable for the mini Type B plug to Type A plug for the RAM-6021 wired router. In order for the USB connection to work, you need to install the Sixnet USB driver which is available at www.redlion.net.

2.4 Serial cable

The router has all its serial port pins enabled. If all the pins are enabled on the attached serial device, it is important to know whether the device is using DTE or DCE as a communication mode.

The router is a DCE device, so use a straight-through serial cable between the router and a DTE device such as a terminal. Use a NULL router cable adapter between the router and a DCE device such as another router.

If using custom wiring or if some pins are disabled, follow the guidelines below. The wiring will vary depending on whether the attached serial device is a DTE or DCE.

Modem		DTE	Modem		DCE
CTS	↔	CTS	CTS	↔	RTS
RTS	↔	RTS	RTS	↔	CTS
DTR	↔	DTR	DTR	↔	DSR
DSR	↔	DSR	DSR	↔	DTR
TX	↔	TX	TX	↔	RX
RX	↔	RX	RX	↔	TX
DCD	↔	DCD	DCD	↔	DCD
GND	↔	GND	GND	↔	GND
RI	↔	RI	RI	↔	RI

2.5 Power source

IMPORTANT

Any installations involving electrical wiring and connections should be done by someone who is experienced in this field.

As described in the [Power specifications and consumption](#) section, the router can be powered using:

- 4-pin screw terminal
- Side mounted 2.5mm barrel connector

WARNING

DC 2.5mm Barrel Connector shall not be used in hazardous locations.

Powering up the router

The router will power up as soon as an 8 to 30 VDC voltage is applied to one of its power inputs and shuts off when this input voltage is below 4 VDC.

Testing the power connection

Check the PWR light on the router: if it is turned on then the router is powered. If it's off, then review the installation procedures, or contact Red Lion Technical Support for further assistance.