

# RAM<sup>®</sup> 9000 Industrial Cellular RTUs

Sixnet<sup>®</sup> Networking Series



## ▶▶▶ High-Density I/O RTUs with GPS and Local Control

Red Lion's Sixnet<sup>®</sup> series RAM<sup>®</sup> 9000 high-density I/O cellular RTUs with multi-carrier 4G LTE support provide advanced control and communication for monitoring and controlling remote assets and processes in extreme conditions.

RAM 9000 industrial cellular RTUs seamlessly connect Modbus and DNP3 enabled SCADA equipment via software selectable multi-carrier 4G LTE to remote networks or select Industrial Internet of Things (IIoT) Cloud platforms. Featuring a web-based event engine that can trigger built-in I/O or send SMS text messages based on real-time operational data, RAM cellular RTUs can perform advanced control at the edge and alert personnel of critical events. A built-in I/O concentrator allows the RAM to collect local sensor data from on-board I/O or external equipment and can optimize cellular bandwidth by optionally reporting only on an exception. With built-in Ethernet, serial, digital and analog I/O and GPS, RAM RTUs easily integrate with existing equipment enabling remote monitoring and control for M2M applications in industries including oil and gas, water/wastewater, utility, transportation and mining.



### APPLICATIONS

- > Mining
- > Oil & Gas
- > Transportation
- > Utility
- > Water/Wastewater

### PRODUCT HIGHLIGHTS

- > High-Performance Multi-Carrier 4G LTE Connectivity
- > Built-in I/O Lowers Total System Cost
- > Multiple Communication Ports
- > Powerful data logging for process analysis
- > Cloud Connectivity to IIoT Cloud Platforms
- > Event Engine that can Send SMS Messages or Control I/O Based on Operational Data

### FEATURES & BENEFITS

- > On-Board High-Density I/O with concentrator
  - 2 digital inputs, 2 digital outputs, 3 analog inputs and 1 form c relay reduce the need for external I/O devices
- > Multiple Communication Ports
  - RS-232 and RS-485 provides seamless connectivity to remote devices
  - Native Modbus and DNP3 Support
- > Rugged, Industrial Design
  - -40° to 75°C operating temperature\*
- > Cloud Connectivity to IIoT Cloud Platforms
  - Allows for seamless communication with leading IIoT cloud platforms
  - Integrates with deviceWISE, Fusion Connect, IPwebcontrol, IQ Web SCADA and Skkyne platforms
- > IEEE802.11b/g/n Wi-Fi Compliant - Access Point
  - Supports local access to communicate with network assets
  - Configure and update firmware without physically connecting to RAM
- > Secure Ethernet Connectivity
  - Routing capabilities for reliable communication
  - Stateful firewall, SSL, GRE and VPN services and deep packet inspection reduce the risk of unwanted access
- > Advanced RTU Functionality
  - Configurable control engine with drop-down menus
  - Powerful data logging of I/O registers to SD Card or internal storage

industrial  
networking



# RAM 9000 LTE Multi-Carrier Specifications

## WIRELESS INTERFACE

AT&T LTE with fallback to HSPA+  
Generic LTE with fallback to HSPA+  
Verizon LTE with fallback to EVDO  
Verizon DMNR/NEMO compliance

## SELECTABLE IIOT CLOUD PLATFORMS\*\*

deviceWISE  
Fusion Connect  
IPwebcontrol  
IQ Web SCADA  
Skkynet

## PROGRAMMABLE PLATFORM

Configurable Events: Up to 99 events can be triggered by I/O,  
Modbus registers, or over 200 system variable which in turn  
can send text messages or control I/O  
Software Development Kit (SDK)  
C/C++/Perl

## PROTOCOL GATEWAY

I/O controller  
Modbus RTU/TCP/ASCII  
DNP3 Slave

## SYSTEM PERFORMANCE

32-bit ARM9 400 MHz CPU  
512 MB NAND Memory  
128 MB RAM

## TUNNELING

IPsec, GRE, OpenVPN

## IP

NAT, port forwarding, dynamic DNS, DHCP  
Stateful inspection firewall, IP transparency

## ROUTING PROTOCOLS

OSPF, BGP, RIP

## CLUSTERING

VRP

## GPS

GNSS Supported: GPS L1, GLONASS L1, Galileo E1  
high RF sensitivity plus jamming detection/removal

## CONNECTORS

Ethernet: Two (2) 10/100Base-T RJ-45 ports  
WAN capability on ETH0  
Serial: One (1) RS-232 (DB9) 115200bps  
One (1) RS-485 (screw block) 115200bps  
USB: One (1) USB 2.0 (mini)  
Antennas: Three (3) SMA connectors (antenna, diversity, GPS)  
One (1) RP-SMA connector (Wi-Fi optional)

## INPUTS & OUTPUTS\*

2 Digital Inputs  
2 Digital Outputs  
3 Analog Inputs  
1 Form C Relay

## WI-FI INTERFACE (OPTIONAL)

Complies with IEEE802.11b/g/n  
Wireless Operation: Access Point  
Maximum output power up to 25dBm  
Supports up to 150Mbps with 40MHz channel

## POWER INPUT

Range: 8-30 VDC (12 or 24 VDC nominal)  
Power Consumption: (less DO power)  
Standby: 4W (all models)  
Transmitting:  
-9X11: 5.0W – 9.4W (cellular only)  
-9X31: 5.0W – 13.6W (cellular and Wi-Fi)  
Power Consumption of DO: (max. each)  
30 W (1A at 30 VDC)  
Heat Dissipation: 46 BTU/hour max

## MECHANICAL

Dimensions: 132H x 127D x 70W mm (5.2" x 5.00" x 2.75")  
Material: Steel with black zinc coating  
Weight: 906 g (2 lbs)

## ENVIRONMENTAL

Operating Temperature: -40° to +75°C\*  
Shock: IEC60068-2-27  
Vibration: IEC60068-2-6  
Humidity: 5 to 95% non-condensing  
Ingress: IP30 protection

## CERTIFICATION

EMI/EMC:  
Emissions: FCC, Part 15 and Industry Canada, ICES-003; Class A;  
EN55022, IEC61000-6-4  
Immunity: IEC61000-6-2 (EN61000-4-2,3,4,5,6,8)  
Hazardous Locations: Class I, Div. 2, Groups A, B, C, D, ISA 12.12.01  
ATEX – EN60079-0, -15 (Zone 2, Category 3) CE  
Electrical Safety: UL508/CSA22.2/14 (CUL); IEC61010-1  
Carrier Specific Approvals (Contact Red Lion for latest)  
RoHS compliant

## WARRANTY

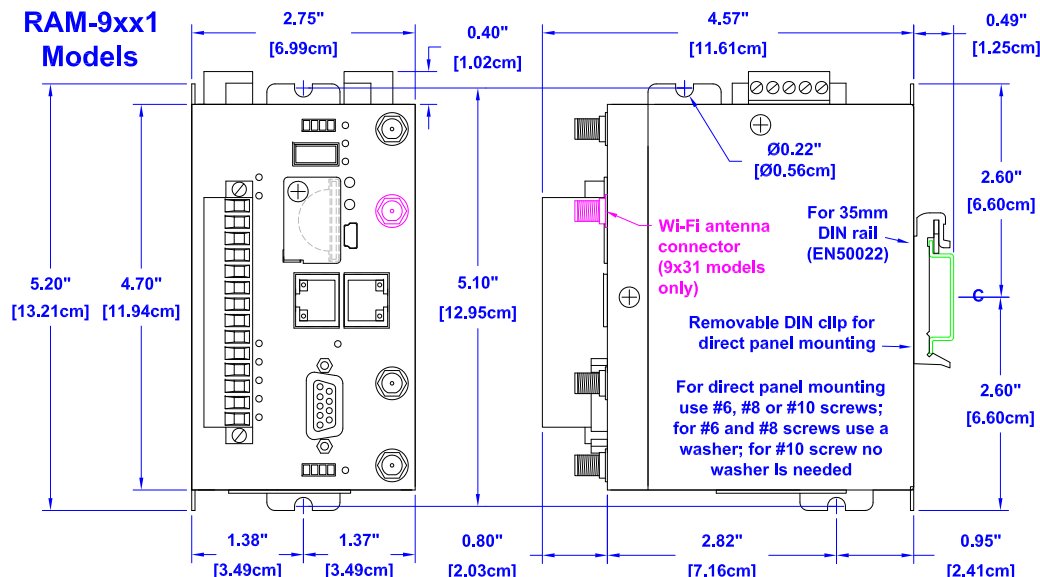
3 years on design and manufacturing defects

Specifications are subject to change. Visit [www.redlion.net](http://www.redlion.net) for more information.

\* See Hardware Manual for thermal considerations.

\*\* Monthly service fees may be required for cloud platform access,  
not all platforms client are preloaded.

## DIMENSIONS



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## ORDERING GUIDE

MODEL NUMBER	SERIES	SERIAL		ETHERNET	WI-FI	CELLULAR	POWER CONNECTOR	DEFAULT CARRIERS**
		RS-232	RS-485	10/100				
RAM-9911-(Carrier Code)	RAM	1	1	2 (WAN/LAN)	N	4G LTE	DC powered	(AT) AT&T; (VZ) Verizon; (AM) Generic; (EU)Europe/Asia; (JP) Japan
RAM-9931-(Carrier Code)	RAM	1	1	2 (WAN/LAN)	Y	4G LTE	DC powered	

\* AM (Generic) model includes Bell Mobility, TELUS and Rogers carriers. EU (Europe and Asia) model is not supported in North America. JP (Japan) model only supported in Japan.

\*\* Carrier that is pre-configured on device. Carrier can be selected via software.

## FREQUENCY SPECIFICATIONS

North America Models (AT/VZ/AM)

TECHNOLOGY	BANDS	FREQUENCIES	ANTENNA CONFIGURATION
LTE	2, 4, 5, 13, 17, 25	700/850/1900 & 1700(AWS)/2100(AWS) MHz	MIMO Required
Fallback CDMA/EVDO	BC0, BC1, BC10	800/1900 MHz	Diversity Support
Fallback HSPA+	1, 2, 4, 5, 8	850/900/1900/2100 & 1700(AWS)/2100(AWS) MHz	Diversity Support
Fallback GSM/GPRS/EDGE	-	850/900/1800/1900 MHz	-

Rest of World Model (EU)

TECHNOLOGY	BANDS	FREQUENCIES	ANTENNA CONFIGURATION
LTE	1, 3, 7, 8, 20	800/900/1800/2100/2600 MHz	MIMO Required
Fallback HSPA+	1, 2, 5, 8	850/900/1900/2100 MHz	Diversity Support
Fallback GSM/GPRS/EDGE	-	850/900/1800/1900 MHz	-

Japanese Model (JP)

TECHNOLOGY	BANDS	FREQUENCIES	ANTENNA CONFIGURATION
LTE	1, 19, 21	850/1500/1900/2100 MHz	MIMO Required
Fallback HSPA+	1, 5, 6, 19	800/850/2100 MHz	Diversity Support
Fallback GSM/GPRS/EDGE	-	850/900/1800/1900 MHz	-

All specifications are subject to change. Consult the company website for more information.

