

# 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 in IIoT applications for 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 sensor data from on-board I/O or connected devices. RAM RTUs can optimize cellular data consumption by optionally reporting only on an exception or only transmitting relevant data points saving time and money. 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

### SUPPORTED IIOT PLATFORMS\*\*

- Amazon<sup>®</sup>—AWS<sup>™</sup> IoT
- AT&T<sup>®</sup>—M2X
- Autodesk<sup>®</sup>—Fusion Connect
- LEC—IQ Web SCADA
- Set-Point Control—IPwebcontrol
- Skynet<sup>®</sup>—SkkyHub<sup>™</sup>
- Telenor—Connexion Cloud Connect
- Telit<sup>®</sup>—deviceWISE<sup>®</sup>
- Distrix—SDN Technology<sup>\*\*\*</sup>

### 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 using MQTT messaging protocol
- > 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\*\*

- Amazon® - AWS™ IoT
- AT&T® - M2X
- Autodesk® - Fusion Connect
- LEC - IQ Web SCADA
- Set-Point Control - IPwebcontrol
- SkkyNet® - SkkyHub™
- Telenor - Connexion Cloud Connect
- Telit® - deviceWISE®
- District - SDN Technology\*\*\*

## 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

- VRRP

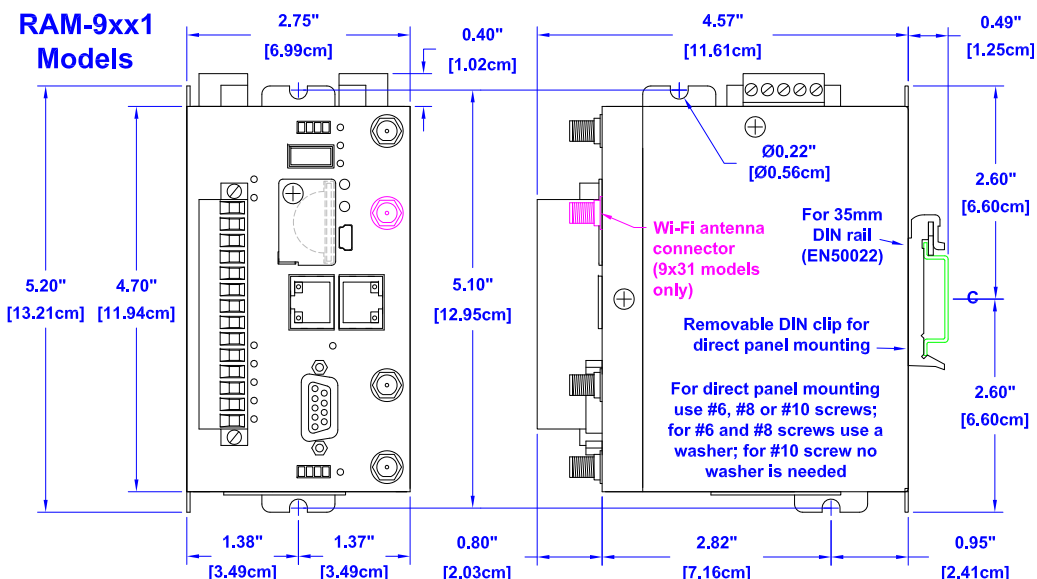
## GPS

- 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)

## DIMENSIONS



## 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 every platform client is preloaded.

\*\*\* District offers Software Defined Network security solutions.

# ▶▶▶ RAM 9000 LTE Multi-Carrier Specifications

## ORDERING GUIDE

MODEL NUMBER	SERIES	SERIAL		ETHERNET	WI-FI	CELLULAR	POWER CONNECTOR	CARRIER CODES
		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	

Notes: 1. See Band/Frequency table for compatibility.

2. Carrier Code indicates the carrier pre-configured on the device. Alternate carrier can be selected via software.

3. AM (Generic) model includes Bell Mobility, TELUS and Rogers carriers or other North American carriers. EU (Europe/Asia) model is not supported in North America. JP (Japan) model only supported in Japan.

## 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.



[www.redlion.net](http://www.redlion.net)

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As the global experts in communication, monitoring and control for industrial automation and networking, Red Lion has been delivering innovative solutions for over forty years. Our automation, Ethernet and cellular M2M technology enables companies worldwide to gain real-time data visibility that drives productivity. Product brands include Red Lion, N-Tron and Sixnet. With headquarters in York, Pennsylvania, the company has offices across the Americas, Asia-Pacific and Europe. Red Lion is part of Spectris plc, the productivity-enhancing instrumentation and controls company. For more information, please visit [www.redlion.net](http://www.redlion.net).

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