



**THE DATASHEET OF
RAM-9931-AT**



RAM[®] 9000 Industrial Cellular RTUs

Sixnet[®] Networking Series



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

Red Lion's Sixnet[®] series RAM[®] 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[®]—AWS[™] IoT
- AT&T[®]—M2X
- Autodesk[®]—Fusion Connect
- Cumulocity
- Inductive Automation's Ignition SCADA
- LEC—IQ Web SCADA
- Microsoft—Azure[®]
- Nokia—IMPACT
- Set-Point Control—IPwebcontrol
- Skkynet[®]—SkkynetHub[™]
- Telenor—Connexion Cloud Connect
- Telit[®]—deviceWISE[®]

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 70°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

SELECTABLE IIOT CLOUD PLATFORMS**

Amazon® - AWS™ IoT
 AT&T® - M2X
 Autodesk® - Fusion Connect
 Cumulocity
 Inductive Automation's Ignition SCADA
 LEC - IQ Web SCADA
 Microsoft - Azure®
 Nokia - IMPACT
 Set-Point Control - IPwebcontrol
 Skkynet® - SkkyHub™
 Telenor - Connexion Cloud Connect
 Telit® - deviceWISE®

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

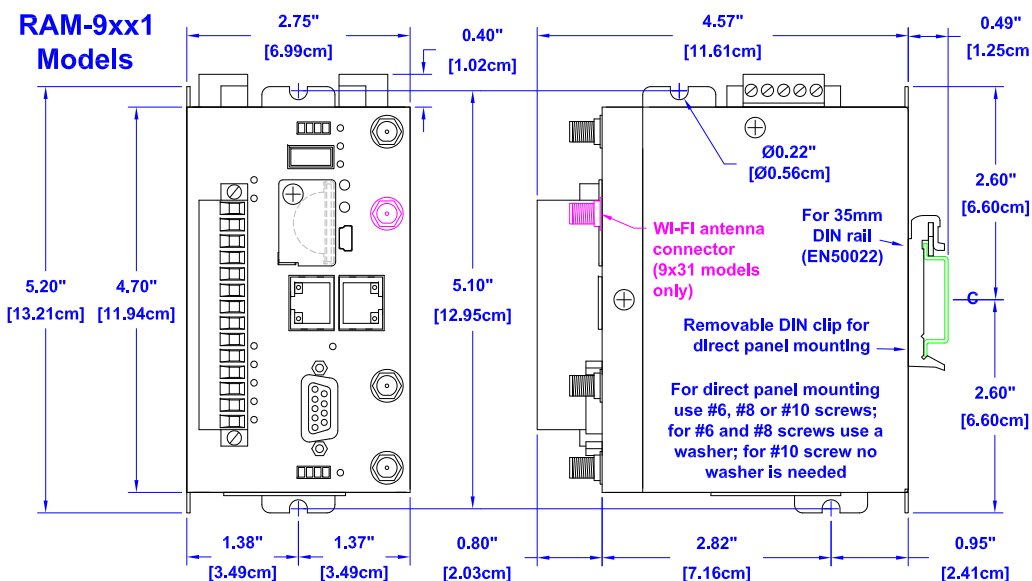
GPS

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 +70°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 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.

▶▶▶ 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.



Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

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-  [Red Lion Controls Information](#)

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-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management