



RI10 Product Overview

The *RI10* IP-to-Sync Controllers are a pair of 19" rack-mountable hardware for transferring Synchronous Serial Data over Ethernet (TCP/IP). By utilizing the *RI10*, the transfer of encrypted bulk Data-over-IP over extended distances is possible whilst leveraging on the already installed base of high performance COMSEC devices.

The *RI10* DCE variant is positioned between the COMSEC device and the Wide Area Network (WAN). On the radio equipment side the *RI10* DTE variant operates as a Data Terminal Equipment (DTE) device. If the RapidM RM10 HF Wideband Modem is used, *RI10* DTE variant is not required as the RM10 provides an embedded DATA LAN/WAN Port.

The *RI10* DCE and DTE units can be installed as both land and ship-borne 19" rack equipment occupying only a single 1U slot. The units are typically used at NAVAL SHORE & STRATEGIC GROUND stations where the encrypted bulk data must be transferred over an IP network.

IP-to-Sync Operation

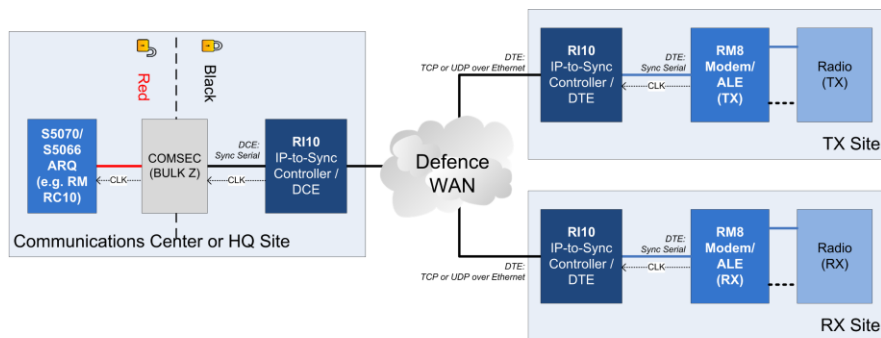
The *RI10* product breaks continuous serial data stream into fixed size packets, adds the IP framing and sends the data over a packet switched Ethernet network, e.g. Defence LAN/WAN to a remote Tx or Rx Site. In the reverse direction, the IP Data received via the LAN is de-encapsulated and synchronously clocked into the data encryption equipment, e.g. KIV-7.

The *RI10* provides for very low end-to-end latency. A synchronous balanced DTE port is built into the *RI10* DCE variant to interface with the crypto unit. The serial interface is EIA-530 & EIA-530A compatible. The maximum synchronous serial data rate is 128 kbps. The *RI10* can be used to supply the send-timing clock to the data encryption equipment. It can also be configured to accept an external send-timing clock.

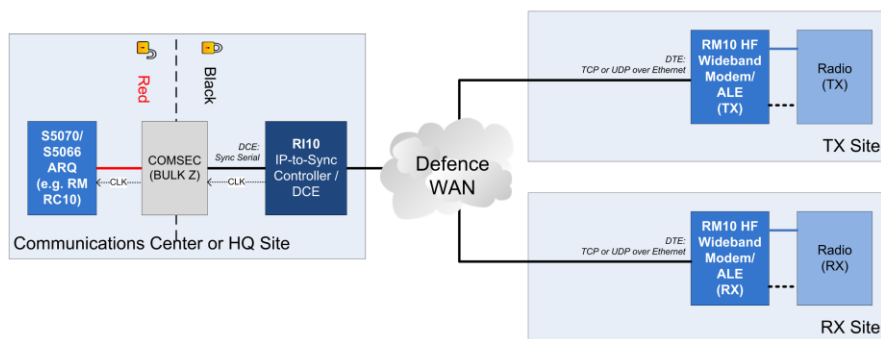
Front panel indications include serial port rate, packet generation rate, packet size, clocking status and Sync or Ethernet ports activity.

Key Features

- **Converts EIA-530 Serial to IP**
- **Interfaces**
 - DCE: Synchronous & Asynchronous Modes
 - EIA-530, EIA-530A
 - RS-232, RS-422
 - Internal/External Clocks
 - IP: TCP/IP via Ethernet
 - 10/100/1000 Electrical
 - IEEE 802.3
- **Deployment** – ship-borne & shore station/split-site
- **Companion Products** – RI10 DCE variant or RM10
- **Data Rate**
 - Sync: 50 bps to 128 kbps (Half Duplex)
 - Sync: 50 bps to 64 kbps (Full Duplex)
 - Async: 50 bps to 480k8 bps (Half/Full Duplex)
- **Menu-Driven control & configuration**
- **DTE port** – Synchronous / Asynchronous
- **Ethernet LAN interfaces** – for Control and IP-based Data services
- **Factory Presets** – lower integration effort



(a) RI10 DCE & DTE units used in combination with modems providing a EIA-530 based DTE port (e.g. RM8)



(b) RI10 DCE unit used in combination with modems providing an Ethernet LAN/WAN port (e.g. RM10)

Figure 1: RI10 Typical Use-Cases

IP-TO-SYNC CONTROLLER	
MODES	<ul style="list-style-type: none"> ○ TCP/IP to Async (Built-in congestion control) ○ TCP/IP to Sync (Built-in congestion control) ○ UDP/IP to Async ○ UDP/IP to Sync
TIME SYNCHRONISATION	<ul style="list-style-type: none"> ○ Support for NTP via CTRL LAN Ethernet Interface (≤ 10 ms accuracy) ○ External GPS via REM CTRL/GPS Interface (≤ 2 ms accuracy)
DTE PORT ACTIVITY DETECTION	<ul style="list-style-type: none"> ○ Disabled when flow control signalling lines (e.g. DTR/DSR, RTS/CTS and DCD) are available between the DTE/Crypto and the RI10. ○ Enabled when start and stop control of the data transferred between the DTE/Crypto and the RI10 are required in the absence of the flow control signalling lines.
Tx & Rx SITE OPERATION	<ul style="list-style-type: none"> ○ Normal Transceiver Site – User IP Data send and receive from modem at TRX site ○ Split Transit and Receive Sites – User IP Data send to modem at TX site, User IP Data received from modem at RX site

PHYSICAL CHARACTERISTICS		
SIZE, WEIGHT & COLOR	Width: 212.2 mm Depth: 225.6 mm Height: 41.1 mm (excl. front panel) Height: 44.1 mm (incl. front panel) Weight: 2.2 kg Color: Black Grey (RAL 7021), Saddlewood Powder (VX 7517)	
ENVIRONMENTAL SPECIFICATIONS	Climatic	<ul style="list-style-type: none"> ○ Storage/Operation: -30 °C to +70 °C (MIL-STD-810F) ○ Humidity: 90% non-condensing at 30 °C (MIL-STD-810F)
	Mechanical	<ul style="list-style-type: none"> ○ Vibration: Surface Ship, Marine Vehicles, Aircraft, Min. Integrity (MIL-STD-810F) ○ Shock: 40 G, 11 ms (MIL-STD-810F)
	EMC	<ul style="list-style-type: none"> ○ MIL-STD-461E (RE101, RE102, CE102, CS101, CS114, RS101, RS103)
	Safety/CE Marking	<ul style="list-style-type: none"> ○ CE Marking - Directives 2006/95/EC as amended ○ SANS 60950-1:2010 / IEC 60950-1:2012 ○ LVD - Low Voltage Directive 2014/35/UE ○ EMC - Electromagnetic Compatibility Directive 2014/30/UE ○ EDD – Eco-Design Directive 2009/125/EC
	MTBF	<ul style="list-style-type: none"> ○ > 40,000 hours
INSTALLATION	Compact design: The unit occupies a width less than ½ of an 1U 19" rack slot, <i>RapidM</i> 19" rack-mountable tray available.	
PRESETS	Factory and Custom Presets	

INTERFACES	
DCE (DATA) PORT (DB25M)	RS-422 balanced, RS-423, RS-232 unbal., MIL-STD-188-114 (interoperable), EIA 530A compliant. Half & Full Duplex operation, Sync, Std. and High-speed Async modes. Connects to COMSEC. Provision of Fiber Optical supply: 5 VDC
ETHERNET DATA PORT (RJ45)	IP Packet Data: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack Protocol: RAW SIS IP packet data. Connects to application PCs / servers / laptops.
ETHERNET AUX LAN (RJ45)	IP Packet Data: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack Protocol: TCP/IP, connects to application Router (Enclave or Federating Router)
REMOTE CONTROL/ GPS PORT (DE9M)	Remote Control Pins: RS-485 Multi-drop, RS-422 balanced or RS-232 Protocol: Control Protocol (RAP1 + RIPC, ASCII S5066 Annex E). Connects to <i>RM8 SDM</i> External GPS Control Pins: RS-232 (nominally input). Data Rate: 300 to 19200 bps. PPS line: RS 232/422 (NMEA) or TTL. Time reference, [position function]. Connects to external GPS.
GPS ANTENNA (MCX)	Optional Built-in GPS receiver: Time reference for time-based functions, [position function].
SERIAL DATA (2) & AUDIO PORTS (2) (DB25M)	Asynchronous Data (2 ports): RS-232, up to 115200 bps, 1/2 stop bits, 5/6/7/8 bit data Support for: ITA-2, ITA-5 for ACP-127 support. Connects to ACP 127 terminal. Input Audio: 600 ohm balanced, -20 to +10 dBm without adjustment or MIC input Output Audio: Balanced, -40 to +10 dBm adjustable into 600 ohm load. Connects to intercom or hand / headset.
ETHERNET CTRL PORT (RJ45)	Remote Control: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack Protocol: Control Protocol (RAP1 + RIPC). Connects to external management / control system.
USER INTERFACE FOR UNIT CONTROL	Local control via 32x202 pixel graphical LCD display and 16-key keypad. 3 bi-colour LED indicators Alphanumeric and digit keypad for fast data entry, 4-way navigation button.
POWER SUPPLY	Wide-range supply input: 90-264 VAC, 40-440 Hz, 2A & 100-370 VAC. Makes the unit suitable for use on military base stations, vessels and aircraft.

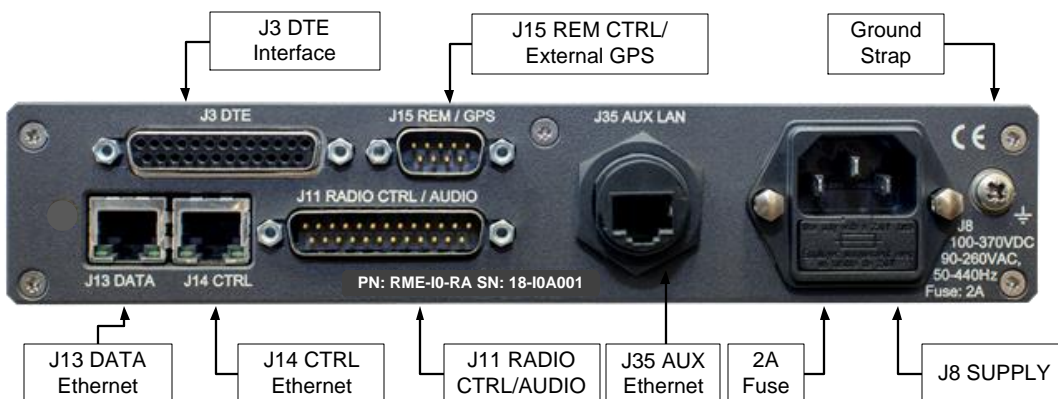


Figure 2: RI10 DCE Rear Panel Layout

RI10 ORDERING INFORMATION	STOCK NUMBER	DESCRIPTION
RI10 IP-to-Sync Controller / DCE	RME-I0-RA-CCV06	SDC: RI10 IP-to-Sync / DCE, 120 kbps V06
RI10 IP-to-Sync Controller / DTE	RME-I1-RA-CTV06	SDC: RI10 IP-to-Sync / DTE, 120 kbps V06

Distributed by:

Rapid Mobile Pty (Ltd)
 Tel: +27 12 349 0000
 Fax: +27 12 349 0010
 Email: info@rapidm.com
 Web: www.rapidm.com

Apex Corporate Park
 Quintin Brand Street
 Persequor Park
 Pretoria, South Africa
 0020



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