Technical Information

Honeywell

RC500 Specification

RC500-010-100
Release 100
November 2009, Version 1.1

Revision History

Revision	Date	Description
1.0	October 2009	Preliminary version
1.1	November 2009	Modifications

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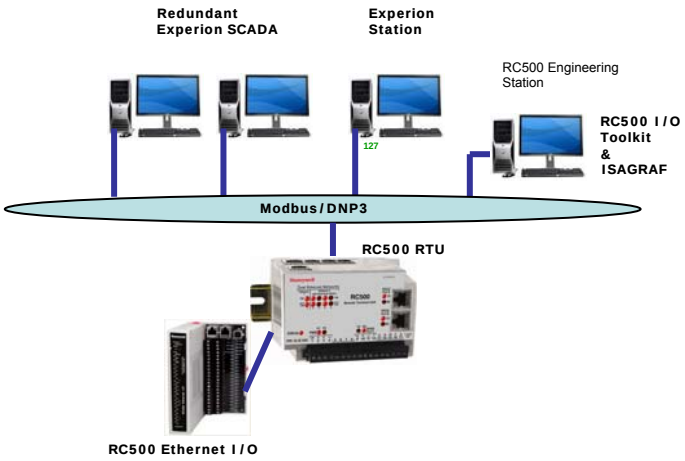
1. Product Introduction

1.1. RC500 Remote Terminal Units

Honeywell's RC500 RTU is a modular and scalable controller capable of all remote automation and control applications. RC500 RTU combined with Honeywell's powerful and feature-rich SCADA products provides an integrated solution solving complex remote automation requirements.

1.2. RC500 Overview

RC500 offers the flexibility to choose appropriate RTU model to suit specific application needs. RTU variants are available based on number of communication ports needed, memory requirements, system topology needs, protocol needs and type of Input/Output modules needed. RC500 RTUs have the power of embedded Linux platform and are capable of all remote automation and control applications. RC500 RTUs integrates into Experion using industry standard protocols such as Modbus and DNP3. This seamless RTU integration with Experion answers the most critical and complex automation needs and at the same time brings in all the latest technology that Experion platform offers.



RC500 RTU provides flexibility in I/O expansion. RC500 provides Ethernet I/O options to suit specific application needs. These I/O modules are DIN Rail mountable and allow hot swapping of modules in a live system for easy replacement, configuring, and self-calibration. There is a full range of different I/O module types available.

The RTU Engineering station consists mainly of RC500 I/O Toolkit and ISAGRAF software. The RC500 I/O Toolkit is an easy-to-use software package for designing, configuring and maintaining RC500 RTU & I/O modules. ISAGRAF programming for RC500 gives all IEC 61131 standard programming languages Sequential Function Chart, Ladder Diagram, Structured Text, Instruction List and Function Block Diagram and Flow Charting.

2. RC500 Specifications

2.1. RC500 RTU Models

RC500 RTU Models	Ports			On-board I/O				Memory		
	Ethernet	RS232	RD485	DI	DO	AI	AO	Datalogging	Program Flash	DRAM
RC-SCONTRL	5	2	1	-	-	-	-	2M	128M	64M
RC-VCONTRL	1	3	1	-	-	-	-	512K	16M	16M
RC-MVACONTRL	1	2	2	12	4	8	2	512K	64M	32M
RC-MVBCONTRL	1	2	1	12	8	6	-	512K	64M	32M

2.2. RC-SCONTRL & RC-VCONTRL RTU Specifications

Feature	Description
Operating system	Embedded LINUX
Unique station addresses (unit Ids)	247 (Modbus)
Dynamic memory (RAM) (for program execution, dynamic variables, dynamic file system)	32 bit, 0 wait states SCONTRL : 64 Megabytes VCONTRL : 16 Megabytes
Program memory (Flash) (for Linux OS, program storage, and file system)	SCONTRL : 128 Megabytes VCONTRL : 16 Megabytes
Datalogging memory (RAM) (for datalogging and retained variables)	Battery-backed – Rechargeable Lithium SCONTRL : 2 Megabytes VCONTRL : 512 K
Battery backup time / life	1 year / 10+ years
Real-time clock resolution	10 mS
Real-time clock accuracy	+/-15 seconds per month
I/O expansion	RC500 Ethernet I/O-1, Ethernet I/O-2
Datalogging support	Yes – Honeywell RC500 Datalog
Datalogging modes	Trending, alarm logging, sequence of events, event initiated, client transfers, and others
IEC 61131 programming	Yes –ISaGRAF
Languages supported	Ladder logic, function chart, function block, instruction list, structured text, and flow chart.
Number of programs allowed to be run in RTU at same time	2 for VCONTRL 4 for SCONTRL
Cycle time	10 mS minimum (user settable)
Communication capabilities	Master, slave, peer to peer, report on exception
Communication media supported	Ethernet, telemetry, telephone (dialup and leased line), radio (dumb and smart), other wireless, fiber optic, short haul.
Backup RS485 communications	Yes – especially with RC500 Ethernet I/O modules
Watchdogs and Monitors for run-time diagnostics	CPU automatically resets if error is detected; status LED flashes error code and Settable timeout and output action (force off or freeze)
Redundant RTU	Automatic switch-over is supported with user application programming

	and configuration
Redundant Ethernet links	Yes – 2 unique MAC & IP addresses allow for 2 unique network connections
Redundant I/O modules	Multiple modules can interface to the same I/O; an internal discrete bit reports on-line status of each module
Redundant power inputs (RC-SCONTRL and RC-VCONRTL only)	Yes – automatic switch-over on failure
Ethernet Ports	**10/100BaseTx (auto-detecting)**
Connection	RJ45 (auto-crossover)
Isolation	1500 Volts RMS 1 minute (60 Hz.)
Message response time (typical)	5mS
Diagnostic LEDs on each port	Indicates speed, link and activity
Protocols supported	TCP/IP, ARP, UDP, ICMP, DHCP, Modbus/TCP,
Independent networks	1 w/ unique MAC & IP address or 2 w/ unique MAC & IP addresses
Network port 1	1 shielded RJ45 connector
Serial Ports	**300 to 115,200 baud**
RS232 Port A	RJ45 (TD, RD, CTS, RTS, CD, DTR, DSR/RI , GND)
RS232 Port B	RJ45 (TD, RD, CTS, RTS, CD, DTR, DSR/RI , GND)
RS485 Port C	Screws (GND, 485+, 485-, termination) (2-wire half-duplex) (GND common with port D)
RS485 network	Up to 32 (full-load)
RS485 distance	Up to 0.5 miles (1 km)
RS232 Port D (RC-VCONTRL only)	Screws (TD, RD, RTS, CTS, GND)
Protocols	Modbus and DNP3
Diagnostic LEDs on each port	Transmit Data (TD) & Receive Data (RD)
Flow Control	Hardware, software, RTS-party (for radios and RS485)
I/O Toolkit Windows Software	**Level 1 (RC-TOOLS-1) provided free with all systems**
Operating systems	Windows NT, 2000, and XP
Minimum system requirements	Pentium or equivalent, 32 Mb RAM, 100 Mb hard disk space
I/O Toolkit Basic	Configuration, calibration, diagnostics, and limited exporting of I/O definitions.
Option Choice 1	Full importing and exporting of I/O definitions, peer to peer I/O transfers, and the IOmap shared database.
Option Choice 2	Datalogging capability
Environmental	**Mount**
Input voltage	10-30 VDC (integrated switching supply)
Input power (@ 24 VDC unless otherwise noted) (+/-10%) (NOTE: The power consumption variations mostly depend on the number of Ethernet and/or serial connections.)	**RC-VCONTRL:** 2.4 W (110 mA) – typical (no communications) 2.7 W (112 mA) – typical (serial communications only) 3.1 W (128 mA) – typical (all ports communicating) (rated current at max. voltage 30 VDC is 125 mA) **RC-SCONTRL:** 3.8 W (159 mA) – typical (no communications)

	4.6 W (190 mA) – typical (some serial and Ethernet coms.) 5.3 W (220 mA) – typical (all ports communicating) (rated current at max. voltage 30 VDC is 175 mA)
Redundant power inputs	Yes, with automatic switch over, diode protection, and internal voltage monitoring
Temperature	-40 to 70°C (-40 to 85°C storage)
Humidity	5% to 95% RH (non-condensing)
Packaging	Alum. Cover (iridite finish) on Lexan base
Mounting	DIN rail (EN50022) or direct to panel
Size	**RC-VCONTRL:** 4.75”L x 3.25”W x 2.65”H (121mm x 83mm x 67mm) **RC-SCONTRL:** 4.75”L x 3.25”W x 3.15”H (121mm x 83mm x 80mm)
Weight	**RC-VCONTRL:** 0.730 Lbs. **RC-SCONTRL:** 0.840 Lbs.

2.3. RC-MVACONTRL and RC-MVBCONTRL RTU Specifications

Feature	Description
Local I/O (on board)	26
Operating system	Embedded LINUX
Unique station addresses (unit Ids)	247 (Modbus)
Dynamic memory (RAM) (for program execution, dynamic variables, dynamic file system, etc.)	32bit, 0 wait states 32 Megabytes
Program memory (Flash) (for Linux OS, program storage, and file system)	64 Megabytes
Datalogging memory (RAM) (for datalogging and retained variables)	Battery-backed – Rechargeable Lithium 512K bytes
Battery-backup time / life	1 year / 10+ years
Real-time clock resolution	10 mS
Real-time clock accuracy	+/-15 seconds per month
I/O expansion	RC500 Ethernet I/O
Datalogging support	Yes – Honeywell RC500 DataLog
Datalogging modes	Trending, alarm logging, sequence of events, event initiated, client transfers, and others
Capabilities	**Description**
Number of applications allowed	Depending on memory
IEC 61131 programming	Yes – ISaGRAF
Languages supported	Ladder logic, function chart, function block, instruction list, structured text, and flow chart
Cycle time	10 mS minimum (user settable)
Communication capabilities	Master, slave, peer to peer, report on exception
Communication media supported	Ethernet, telemetry, telephone (dialup and leased line), radio (dumb and

	smart), other wireless, fiber optic, short haul and more
Watchdogs and Monitors	**Description**
CPU watchdog	CPU automatically resets if error is detected; status LED flashes error code
Communications watchdog	Settable timeout and output action (force off or freeze)
Heartbeat watchdog	Settable timeout & output action (force off or freeze)
Ethernet Port	**Description**
Connection	RJ45 (auto-crossover)
Isolation	1500 Volts RMS 1 minute (60 Hz.)
Message response time (typical)	5 mS
Diagnostic LEDs	Indicates speed and activity
Protocols supported	TCP/IP, ARP, UDP, ICMP, DHCP, Modbus/TCP
Network port	1 shielded RJ45 connector
Serial Port	**Description**
RS232 Port B	RJ45 (TD, RD, CTS, RTS, CD, DTR, DSR/RI , GND)
RS232 Port D	RJ45 (TD, RD, RTS, GND)
RS485 Port A, C	Screws (GND, 485+, 485-, termination) (2-wire half-duplex) (Port C GND common with port D)
RS485 network	Up to 32 (full-load) stations
RS485 distance	Up to 0.5 miles (1 km)
Protocols	Modbus & DNP3
Diagnostic LEDs on each port	Transmit Data (TD) & Receive Data (RD)
Flow Control	Hardware, software, RTS-party (for radios and RS485)
Discrete Inputs	**12 Channels**
Guaranteed ON Voltage	9 VDC
Maximum Voltage	30 VDC
Guaranteed OFF	5.0 VDC & 1.5mA DC
Input Resistance	10K Ohms
Input Current @ 24V	3 mA
Filtered ON/OFF delay	25ms (20Hz max. counting)
Fast ON/OFF delay	4 ms (100Hz max counting)
Count Rate	(10khz on channel 1, see above for other rates)
Discrete Outputs	**4 or 8 channels (10-30 VDC)**
Maximum Output per channel	1 amp
Maximum Output per module	8 amps
Max. OFF state leakage	0.05 mA
Minimum Load	1 mA
Inrush current	5 Amps (100 ms surge)
Typical ON resistance	0.3 ohms
Typical ON voltage (@1A)	0.3 VDC
Analog Inputs	**6 or 8 channels (4-20 mA)**
A/D resolution	16 bits (0.003%)

Full scale accuracy	+/- 0.1% (@20□C)
Span and offset temp. coef.	+/- 50 ppm per degree C
Input impedance	100 Ohm
Current protection	Self-resetting fuses
DMRR (differential mode rejection)	66 dB at 50/60 Hz
Analog Outputs	**Upto 2 channels (4-20 mA)**
D/A resolution	16 bits (less than 1A)
Full Scale accuracy	+/- 0.02%
Span and offset temp. coef.	+/- 50 ppm per □C typical
Max. output settling time	5 ms (to .05%)
Load resistance range (@ +24 VDC supply	0-750 Ohms
Short circuit protection	Current limiting
Feature	**Description**
Input voltage	10-30 VDC (integrated switching supply)
Input power (@ 24 VDC unless otherwise noted) (+/-10%) (NOTE: The power consumption variations mostly depend on the number of Ethernet and/or serial connections.)	2.4 W (100mA) – typical (no communications)
Temperature	-40 to 70°C (-40 to 85°C storage)
Humidity	5% to 95% RH (non-condensing) (optional conformal coating)
Packaging	Lexan Packaging
Mounting	DIN rail (EN50022) or direct to panel
Size	4.75”L x 3.83”W x 4.13”H (12.07cm L x 9.73cm W x 10.48cm H)

2.4. RC500 Ethernet I/O-1 Specifications

Feature	Description
I/O Modules	Full range of discrete and analog I/O modules
Required Power	10-30 VDC for I/O modules
Ethernet port	10BaseT (10 Mbps); RJ45
Ethernet Isolation	1200 Volts RMS (for 1 minute)
Operating Temperature	-30 to 70 □C (storage: -40 to 85 □C)
Humidity	5 to 95% (non-condensing)
Protocols	Modbus/TCP, Modbus/UDP, & RC500 Universal

2.5. RC500 Ethernet I/O-2 Specifications

Feature	Description
I/O Modules	Full range of discrete and analog I/O modules
Required Power	10-30 VDC (I/O modules)
Input current requirement	100 mA @ 24 VDC typical
Two Ethernet ports	10/100BaseTx (auto-detecting); RJ45 (auto-crossover)
Ethernet Isolation	1500 Volts RMS (for 1 minute)
I/O polling response time	Less than 1 ms (except certain filtered or integrating I/O channels)
RS485 Ports	Master or connect up to 32 I/O modules or Modbus slave devices
Baud rates	From 300 to 57,600 baud
Operating Temp.	-40 to 75 °C (storage: -40 to 85 °C)
Humidity	5 to 95% (non-condensing)
Ethernet Protocols	TCP/IP, ARP, UDP, ICMP, DHCP, Modbus/TCP, Modbus/UDP, and RTU Universal Driver
RS485 Protocols	Modbus ASCII or RTU, RTU Universal; Master or Slave
I/O Transfers limit	16

For More Information
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