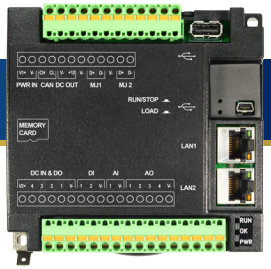
HORNER AUTOMATION GROUP

RCC2414 DATASHEET



2 Digital Inputs, 4 Digital Outputs
1 Analog Input, 4 Analog Outputs

1 TECHNICAL SPECIFICATIONS

1.1 General

Required Pwr. (steady state)	120mA at 24 VDC
Required Pwr. (inrush)	25A for 1mS at 24 VDC switched
Primary Pwr. Range	20-28 VDC
Real-Time Clock	Yes
Clock Accuracy	+/- 8 seconds/month at 25° C
Relative Humidity	5-95% non-condensing
Operating Temp.	-10° C to +60° C
Storage Temp.	-10° C to +70° C
Battery	Li-Ion Polymer Battery Charging Range 0-50° C
Weight	10 oz / 283.5 g
Mounting	35mm DIN Rail or Panel Surface
Housing Type	Plastic (UL 50 rated, flame retardant, UV resistant)
Certifications (CE)	USA: http://www.heapg.com/content/21-certifications Europe: http://www.horner-apg.com/en/support/certifications.aspx

1.2 Control & Logic

Control Lang. Support	Advanced Ladder Logic or Full IEC 61131-3 Languages
Logic Size & Scan Rate	128kb, 0.013 mS/K
Online Programming Changes	Supported in Advanced Ladder
PID Support	Up to 6
Digitial Inputs (%I)	2048
Digital Outputs (%Q)	2048
Analog Inputs (%AI)	512
Analog Outputs (%AQ)	512
Gen. Purpose 16-bit Registers (%R)	4096 Retentive
Gen. Purpose 1-bit Registers (%T)	2048 Non-Retentive
Gen. Purpose 1-bit Registers (%M)	2048 Retentive

* all values updated 1x per scan

1.3 Connectivity

Serial	2x2-wire RS485
CAN	1 x 125kbps - 1Mbps
Ethernet	1 x 10Mbps/100Mbps
microSD	1 x SD, SDHC, SDXC in FAT32 format
USB	1 x Mini Program 1 x USB Flash Drive
Communication Support	WebMI
	Web Portal
	Outgoing Email w/ Attachments
	TCP/IP and Modbus TCP/IP
	FTP
	Data Logging

1.4 Digital DC Inputs

Inputs per Module	2
Commons per Module	1
Addressing	%I1 - %I2
Input Voltage Range	10-30VDC
Absolute Max. Voltage	35 VDC Max.
Input Impedance	10 kΩ
Min. "On" Input	8 VDC
Max. "Off" Input	3 VDC
OFF to ON Response	100 µS min*
ON to OFF Response	100 µS min*
Galvanic Isolation	None
Logic Polarity	Positive
I/O Indication	None
High Speed Counter (HSC)	None
Connector Type	5.08 mm Pluggable Cage Clamp

1.5 Digital DC Outputs

Outputs per Module	4
Commons per Module	1
Addressing	%Q1 - %Q4
Output Type	Sourcing/10kΩ Pull-Down
Absolute Max. Voltage	30 VDC Max.
Output Protection	Short Circuit & Overvoltage
Max. Output Current/Point	0.5 A
Max. Total Current	2 A Total Current
Max. Output Supply	30 VDC
Min. Output Supply	10 VDC
Max. Voltage Drop at Rated Current	0.25 VDC
Max Inrush Current	650mA/Channel
Min. Load	None
I/O Indication	None
Galvanic Isolation	None
OFF to ON Response	100 mS min*
ON to OFF Response	15 mS min*
PWM Out	None

1.6 Analog Inputs

Number of Channels	1
Input Ranges	0 - 10 VDC
Addressing	%AI1
%AI Full Scale Value	32,000
Max Input Voltage	-0.5 to +12VDC
Galvanic Isolation	None
Input Impedance (clamped @ -0.5 to 10.23VDC)	mA: 15 Ω +/- 1.5V V: 1.1 MΩ
Nominal Resolution	12 bits
Converstion Rate	One update/ladder scan
Max Error at 25° C (excludes 0° C)	1.5% of full scale 0-10 V -1.5% of full scale
Filters	270 Hz hash (noise), 1-128 scan digital running average

technical specifications continued on next page...

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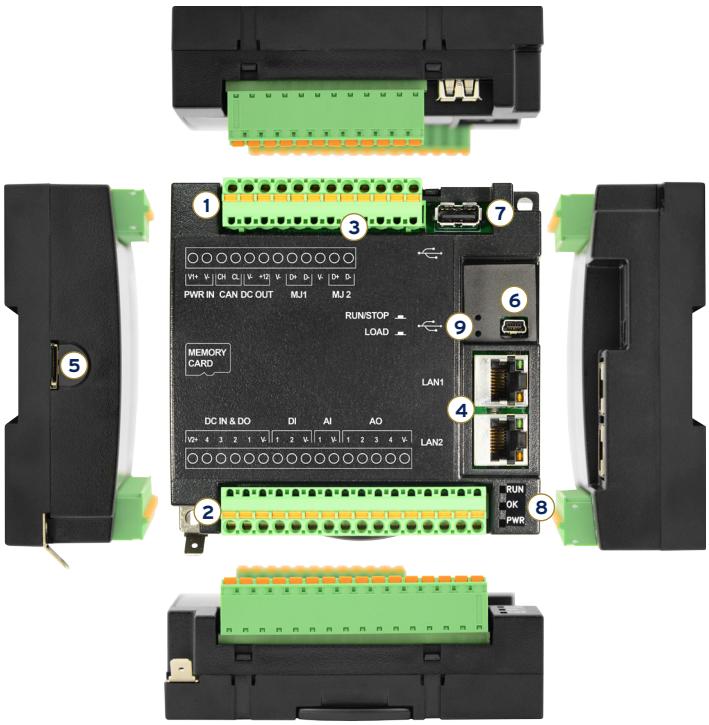
technical specifications continued...

1.7 Analog Outputs	
Number of Channels	4
Output Ranges	0 - 10 VDC
Addressing	%AQ1 - %AQ4
%AQ Full Scale Value	32,000
Galvanic Isolation	None
Nominal Resolution	12 Bits
Maximum Current Load	500 Ω
Conversion Rate	One update/ladder scan
Response Time	One update/ladder scan
Max Error at 25° C (excludes 0° C)	0.5% of full scale

2 WIRING & JUMPERS

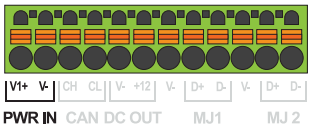
2.1 - Port Connectors



1. Power & Comms Connector
2. I/O Connector
3. Serial Ports
4. Ethernet Ports
5. microSD Slot
6. Mini USB Programing
7. USB Flash Memory
8. Status LEDs
9. Buttons

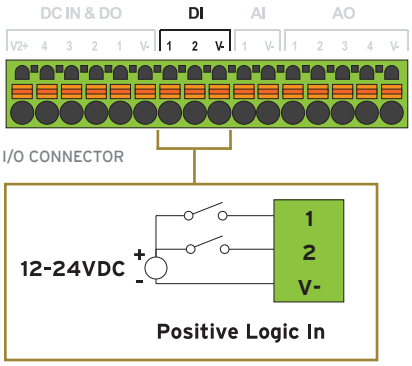
wiring & jumpers continued...

2.2 - Power Wiring



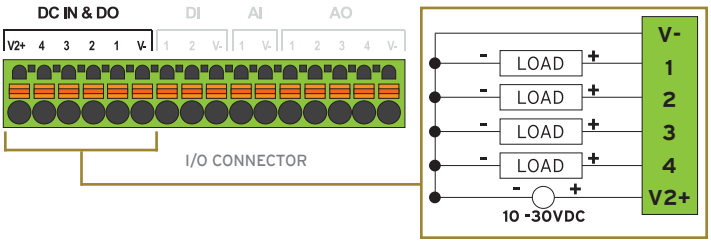
To power up the RCC2414, supply 20-28VDC to the V+ and C connections on the Power and Comms Connector. Additionally, a 12V source is provided at the +12 terminal that is capable of 1A maximum current.

2.3 - Digital Input Wiring



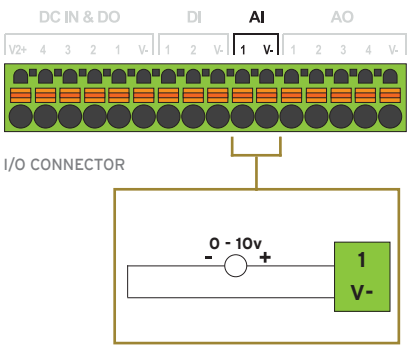
Digital inputs may be wired in A Positive Logic fashion as shown. The state of the inputs are reflected in registers %I1 and %I2.

2.4 - Digital Output Wiring



Digital outputs are Positive Logic. If an output is turned on, the voltage supplied at the V+ terminal is applied to that output. The state of the output may be controlled using the registers %Q1, %Q2, %Q3, and %Q4

2.5 - Analog Input Wiring



The Analog Input has a range of 0-10VDC. The Analog Input register %AI1 will contain values between 0 - 32000 to match measurements in the 0-10VDC range. Using this raw value, the Scaling function in Cscape, and

wiring & jumpers continued on next page...

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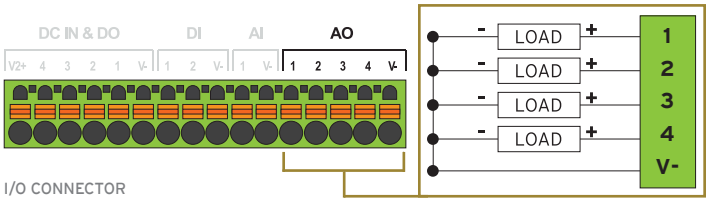
wiring & jumpers continued...

the connected sensor's given range, it is easy to get a measurement for display, alarming, datalogging, or any other purpose required. Alternately, the raw value may be used directly for PID loops.

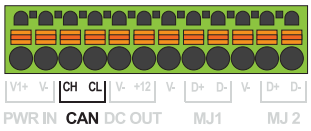
2.6 - Analog Output Wiring



Each Analog Output has a range of 0-10VDC. The Analog Output registers %AQ1 - %AQ4 may be used to control the output by placing a value between 0 – 32000 into the register. This may be directly from a PID loop output or a conversion from a desired output from the touchscreen, for example.

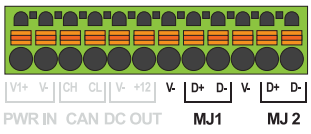
3 COMMUNICATIONS

3.1 - CAN Communications



The CAN port is provided via three connections on the CAN, Power, and Analog connector: CAN_LOW (CL), CAN_HIGH (CH), and V- (C). It may be used to communicate with other OCS products using Horner's CsCAN protocol. Additionally, remote expansion I/O such as SmartRail, SmartBlock, and SmartStix may be implemented using the CsCAN protocol. If CsCAN expansion I/O is to be used, a 24VDC power source will be required on the CsCAN bus in order to power the expansion I/O modules.

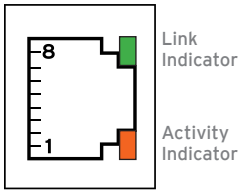
3.2 - Serial Communications



Two serial ports are provided via cage clamp terminals. Both are 2-wire RS-485 only. The most common use is for Modbus communications, either as a Modbus Master or Modbus Slave, though other options are also available.

communications continued...

3.3 - Ethernet Communications



Two 10/100 Ethernet ports with automatic MDI-X (crossover detection) are provided via the 8-position modular jacks labeled "LAN1" and "LAN2". Several features are available for use over Ethernet, such as WebMI, Modbus TCP/IP, Ethernet/IP, SMTP (E-mail), expansion I/O to SmartRail, and more.

Ethernet configuration is done via the Cscape Hardware Configuration. For more information on Ethernet, available features and protocols, refer to the Ethernet Supplement document (SUP0740).

3.4 - microSD Slot

A MicroSD card may be used for data and alarm logging, historic trending, program loading, firmware updates, and many other features. Supported types of MicroSD cards are SD, SDHC, and SDXC as long as the format of the card file system is FAT32.

3.5 - Status LEDs

Three LEDs provide general status of the RCC:

LED - Normal Functionality			
LED TYPE	WHEN OFF	WHEN ON	WHEN FLASHING (1Hz)
PWR	No power applied	10-30VDC applied	N/A
OK	Self-test fail	Self-test pass	I/O forcing enabled
RUN	Stop mode	Run mode	Do I/O Mode

LED – DIAGNOSTIC FUNCTIONALITY

When the OK and RUN are flashing alternately, a download is in progress. When the flashing stops, the download is complete and the unit reboots (allow 30 seconds). When flashing together, the download has failed, and the number of flashes indicates the error. There will be a two second gap and the pattern will be repeated. The number of flashes and the associated error are as follows:

communications continued on next page...

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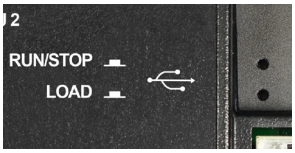
communications continued...

- 2 Flashes - The MAC ID is empty.
- 3 Flashes - The internal MAC file is corrupt. 4 Flashes - The MAC ID TXT file is invalid.
- 5 Flashes - The MAC ID file is not found or the microSD card is empty or missing system files.

3.6 - Buttons



Two recessed buttons provide control of several RCC modes. A paperclip may be used as the buttons are far enough recessed that a pen or pencil is not able to activate them.

LOAD SWITCH

- Pressing the LOAD switch during power-up boots from the microSD card. This starts a Firmware Load if the microSD is bootable and valid firmware files are found on it.
- After boot-up, pressing the LOAD switch for 3 seconds either starts a Firmware Load or an Application Load depending upon what files are found on the microSD card. If firmware files are found, a Firmware Load is performed. If firmware files are not found and the DEFAULT. PGM file is found, an Application Load is performed.

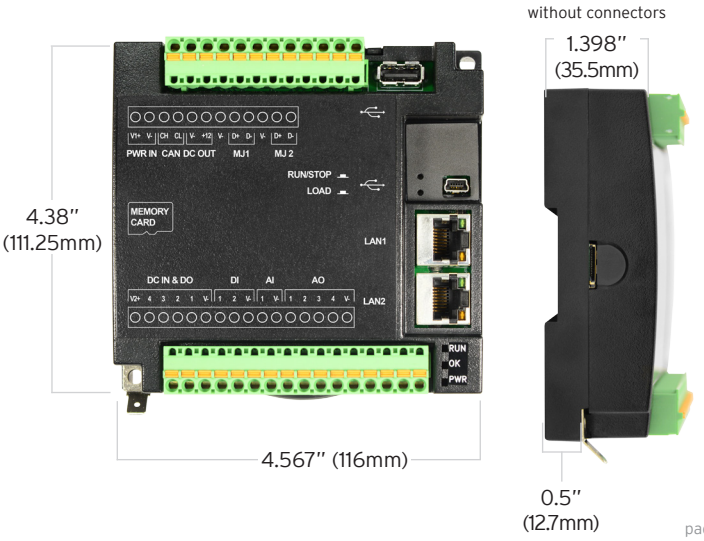
RUN/STOP SWITCH

- After boot-up, pressing the RUN/STOP switch for 3 seconds toggles the RCC between RUN and STOP modes.

ERASE PROGRAM FUNCTION

- After boot-up, pressing both Load and RUN/Stop switches for 3 seconds performs an "Erase All" function, which deletes all application programs.

4 INSTALLATION DIMENSIONS



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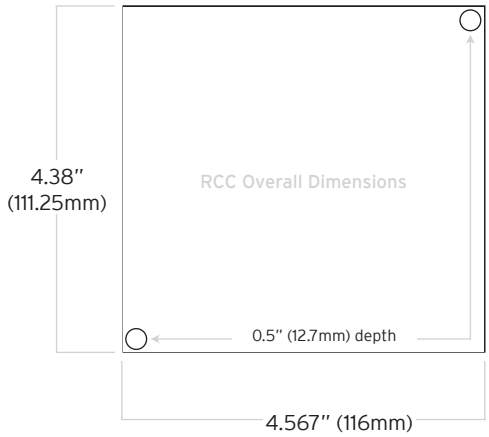

5 SAFETY

5.1 - WARNINGS

1. To avoid the risk of electric shock or burns, always connect the safety (or earth) ground before making any other connections.
2. To reduce the risk of fire, electrical shock, or phsycial injury, it is strongly recommended to fuse the voltage measurement inputs. Be sure to locate fuses as close to the source as possible.
3. Replace fuse with the same type and rating to provide protection against risk of fire and shock hazards.
4. In the event of repeated failure, do NOT replace the fuse again as repeated failure indicates a defective condition that will NOT clear by replacing the fuse.
5. Only qualifed electrical personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, or service this equipment. Read and understand this manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaustion could result in severe bodily injury or loss of life.

5.2 - FCC COMPLIANCE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation

5.3 - PRECAUTIONS

All applicable codes and standards need to be followed in the installation of this product. Adhere to the following safety precautions whenever any type of connection is made to the module:

1. Connect the safety (earth) ground on the power connector first before making any other connections.
2. When connecting to the electric circuits or pulse-initiating equipment, open their related breakers.
3. Do NOT make connection to live power lines.
4. Make connections to the module first; then connect to the circuit to be monitored.
5. Route power wires in a save manner in accordance with good practice and local codes.
6. Wear proper personal protective equipment including safety glasses and insulted gloves when making connections to power circuits.
7. Ensure hands, shoes, and floor are dry before making any connection to a power line.
8. Make sure the unit is turned OFF before making connection to terminals.
9. Make sure all circuits are de-energized before making connections.
10. Before each use, inspect all cables for breaks or cracks in the insulation. Replace immediately if defective.
11. Use copper conductors in Field Wiring only, 60/75° C.

6 TECHNICAL SUPPORT

For assistance and manual updates, contact Technical Support at the following locations:

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