



# RCC8842 DATASHEET

## 8 Digital Inputs, 8 Digital Outputs 4 Analog Inputs, 2 Analog Outputs

### 1 TECHNICAL SPECIFICATIONS

#### 1.1 General

|                              |   |
|------------------------------|---|
| Required Pwr. (steady state) | 120mA at 24VDC  |
| Required Pwr. (inrush)       | 25A for 1mS at 24VDC switched   |
| Primary Pwr. Range           | 10-32 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 +60° C  |
| Battery                      | Li-Ion Polymer Battery<br>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: <a href="http://www.heapg.com/content/21-certifications">http://www.heapg.com/content/21-certifications</a><br>Europe: <a href="http://www.horner-apg.com/en/support/certifications.aspx">http://www.horner-apg.com/en/support/certifications.aspx</a> |

#### 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   |
| Digital 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                                      |

#### 1.3 Connectivity

|                       |                                    |
|-----------------------|------------------------------------|
| Serial                | 2(1xRS232, 1x2-wire RS485)         |
| CAN                   | 1 x 125kbps - 1Mbps                |
| Ethernet              | 1 x 10Mbps/100Mbps                 |
| microSD               | 1 x SD, SDHC, SDXC in FAT32 format |
| USB                   | No                                 |
| 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        | 14                                  |
| Commons per Module       | 1                                   |
| Addressing               | %I1 - %I14                          |
| Input Voltage Range      | 0VDC or 10-30VDC                    |
| Absolute Max. Voltage    | 35 VDC Max.                         |
| Input Impedance          | 10 kΩ                               |
| Input Current            | Pos. Logic    Neg. Logic            |
| Min. "On" Current        | 0.8 mA    -1.6 mA                   |
| Max. "Off" Current       | 0.3 mA    -2.1 mA                   |
| 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           | Pos. or Neg. Based on configuration |
| I/O Indication           | LED                                 |
| High Speed Counter (HSC) | None                                |
| Connector Type           | 3.5 mm Pluggable Cage Clamp         |

#### 1.5 Digital DC Outputs

|                                    |                               |
|------------------------------------|-------------------------------|
| Outputs per Module                 | 10                            |
| Commons per Module                 | 1                             |
| Addressing                         | %Q1 - %Q10                    |
| Output Type                        | Sourcing                      |
| 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                      |
| Min. Load                          | None                          |
| I/O Indication                     | LED                           |
| Galvanic Isolation                 | None                          |
| OFF to ON Response                 | 500 nS min*                   |
| ON to OFF Response                 | 500 nS min*                   |
| PWM Out                            | None                          |
| Output Characteristics             | Current Sourcing (Pos. Logic) |

#### 1.6 Analog Inputs

|  |   |
|--|---|
| Number of Channels                           | 4   |
| Input Ranges                                 | 0 - 10 VDC, 0 - 20 mA DC                                |
| Addressing                                   | %AI1 - %AI4   |
| %AI Full Scale Value                         | 32,000  |
| Max Input Voltage                            | -0.5 - 12VDC (+/- 30 VDC)                               |
| Galvanic Isolation                           | None  |
| Input Impedance (clamped @ -0.5 to 10.23VDC) | mA: 15 Ω +/- 1.5V<br>V: 1.1 MΩ                          |
| Nominal Resolution                           | 12 bits   |
| Conversion Rate                              | All channels once per OCS scan                          |
| Max Error at 25° C (excludes 0° C)           | 1.5% of full scale 0-10 V - 1.5% of full scale          |
| Filters                                      | 160 Hz hash (noise), 1-128 scan digital running average |

\* all values updated 1x per scan

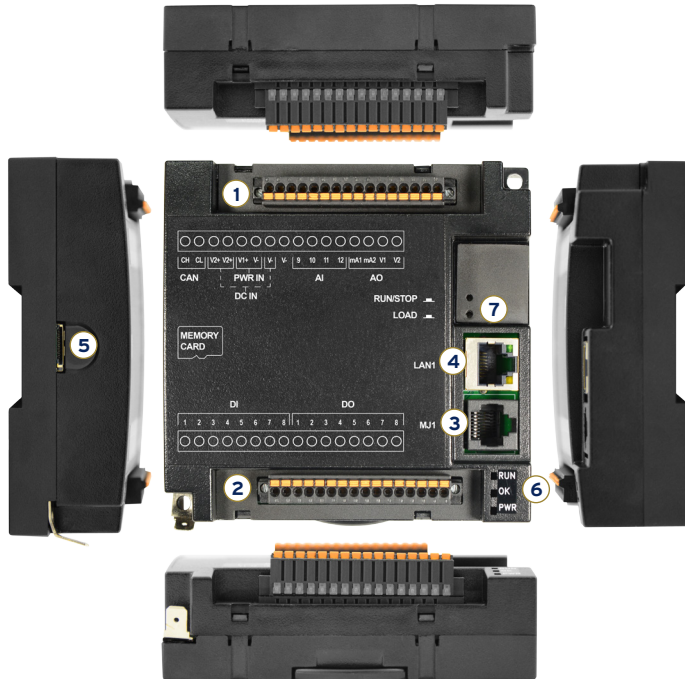
## technical specifications continued...

### 1.7 Analog Outputs

|                                    |   |
|------------------------------------|---|
| Number of Channels                 | 2   |
| Output Ranges                      | 0 - 10 VDC, 0 - 20 mA                       |
| Addressing                         | %AQ1 - %AQ2                                 |
| %AQ Full Scale Value               | 32,000                                      |
| Galvanic Isolation                 | None  |
| Nominal Resolution                 | 12 Bits                                     |
| Maximum Current Load               | 500 ohm                                     |
| Conversion Rate                    | One update/ladder scan                      |
| Response Time                      | One update/ladder scan                      |
| Max Error at 25° C (excludes 0° C) | 0 - 20 mA 0.25% of full scale<br>0 - 10 VDC |

## 2 WIRING & JUMPERS

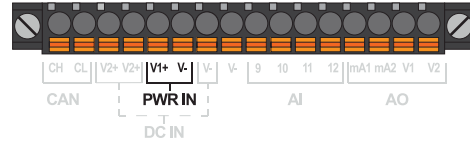
### 2.1 - Port Connectors



- |                                       |                  |                |
|---------------------------------------|------------------|----------------|
| 1. Power, CAN, & Analog I/O Connector | 3. Serial Port   | 6. Status LEDs |
| 2. Digital Connector                  | 4. Ethernet Port | 7. Buttons     |
|                                       | 5. microSD Slot  |                |

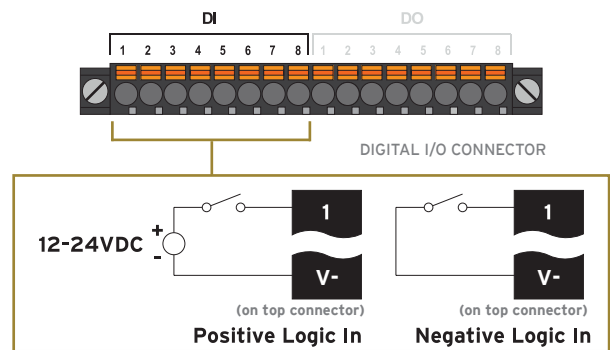
## wiring & jumpers continued...

### 2.2 - Power Wiring



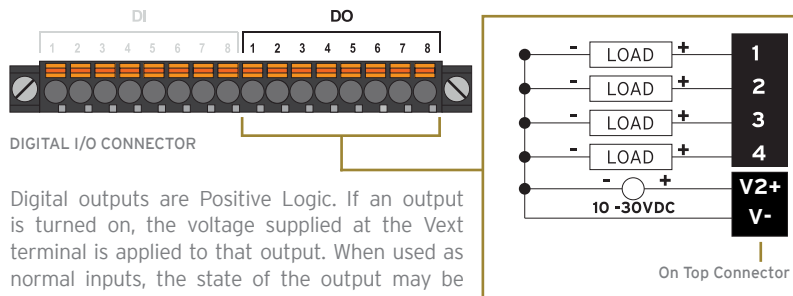
To power up the RCC8842, supply 10-32VDC to the V+ and C connections on the Power, CAN, and Analog Connector.

### 2.3 - Digital Input Wiring



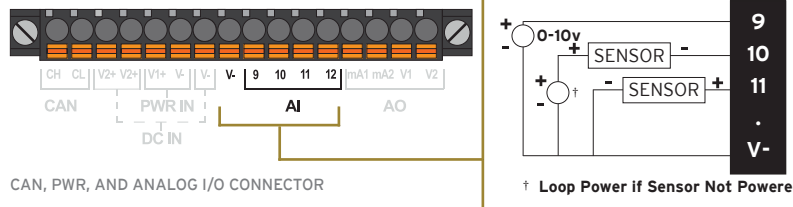
Digital inputs may be wired in either a Positive Logic or Negative Logic fashion as shown. The setting in the Cscape Hardware Configuration for the Digital Inputs must match the wiring used in order for the correct input states to be registered. The state of the inputs are reflected in registers %I1 - %I8. The Common connections are found on the top connector.

### 2.4 - Digital Output Wiring



Digital outputs are Positive Logic. If an output is turned on, the voltage supplied at the Vext terminal is applied to that output. When used as normal inputs, the state of the output may be controlled using the registers %Q1 - %Q8.

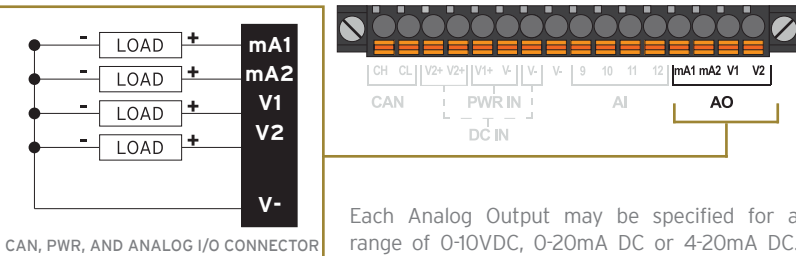
### 2.5 - Analog Input Wiring



## wiring & jumpers continued...

Each Analog Input may be specified separately in the Cscape configuration as having a range of 0-10VDC, 0-20mA DC, or 4-20mA DC. For whichever range is configured, the Analog Input registers %AI9 - %AI12 will contain values between 0 - 32000 to match measurements in that range. Using this raw value, the Scaling function in Cscape, and 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



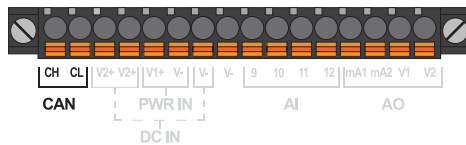
Each Analog Output may be specified for a range of 0-10VDC, 0-20mA DC or 4-20mA DC. For whichever range is configured, the Analog

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.

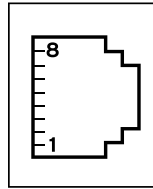


### 3.2 - Serial Communications

Two serial ports are provided via the single 8-position modular jack labeled "MJ1/2". MJ1 defaults to one of several methods available to program the controller. It may instead be specified for RS-232 communications, such as for Modbus Master/Slave, or to communicate to devices such as bar code scanners.

MJ2 may only be used as half-duplex (2-wire) RS-485. The most common use is for Modbus communications, either as a Modbus Master or Modbus Slave, though other options are also available.

## communications continued...



### MJ1/2 SERIAL PORTS

**MJ1:** RS-232 w/full handshaking

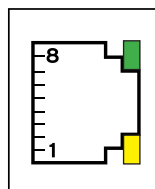
**MJ2:** RS-485 half-duplex

| MJ1 PINS |             |           | MJ2 PINS    |           |
|----------|-------------|-----------|-------------|-----------|
| PIN      | SIGNAL      | DIRECTION | SIGNAL      | DIRECTION |
| 8        | TXD         | OUT       | -           | -         |
| 7        | RXD         | IN        | -           | -         |
| 6        | 0V          | GROUND    | 0V          | GROUND    |
| 5        | +5V at 60mA | OUT       | +5V at 60mA | OUT       |
| 4        | -           | -         | -           | -         |
| 3        | -           | -         | -           | -         |
| 2        | -           | -         | RX-/TX-     | IN/OUT    |
| 1        | -           | -         | RX+/TX+     | IN/OUT    |

**note:** refer to connector pinout

Both serial ports are in one modular jack. To break pins out to terminals, use HE200MJ2TRM accessory

### 3.3 - Ethernet Communications



Link Indicator  
Activity Indicator

A 10/100 Ethernet port with automatic MDI-X (crossover detection) is provided via the single 8-position modular jack labeled "LAN". 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         |

communications continued on next page...

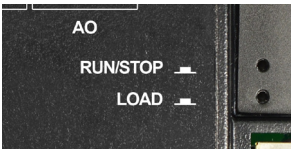
## communications continued...

### 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:

- 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.

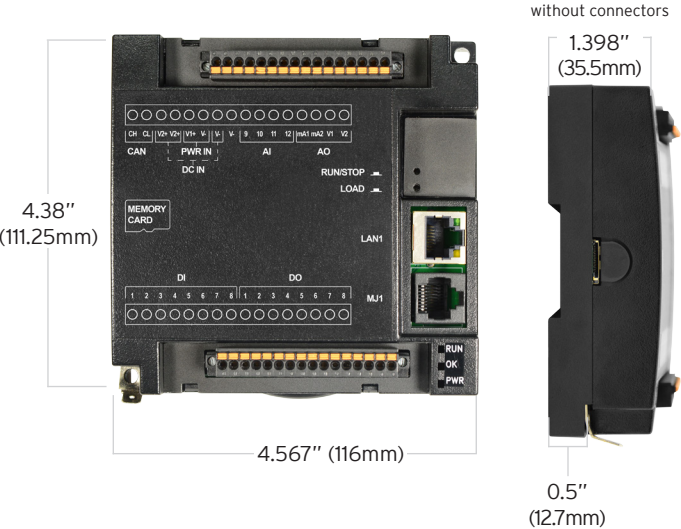
#### RUN/STOP SWITCH

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

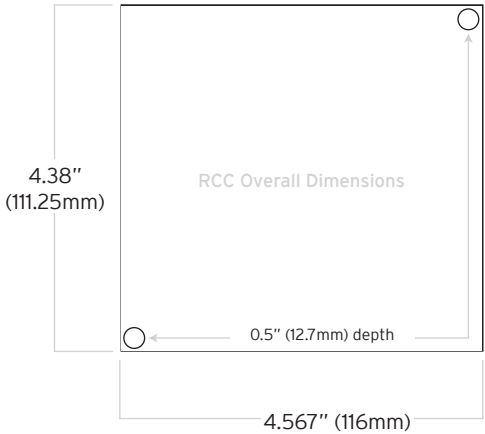
#### ERASE PROGRAM FUNCTION

- 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



## installation dimensions continued...



## 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 physical 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 qualified 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 precaution 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 safe manner in accordance with good practice and local codes.
6. Wear proper personal protective equipment including safety glasses and insulated 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.

## 6 TECHNICAL SUPPORT

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

**North America**  
 +1 (317) 916-4274  
[www.hornerautomation.com](http://www.hornerautomation.com)  
[techsppt@heapg.com](mailto:techsppt@heapg.com)

**Europe**  
 +353 (21) 4321-266  
[www.horner-apg.com](http://www.horner-apg.com)  
[technical.support@horner-apg.com](mailto:technical.support@horner-apg.com)