Product Description

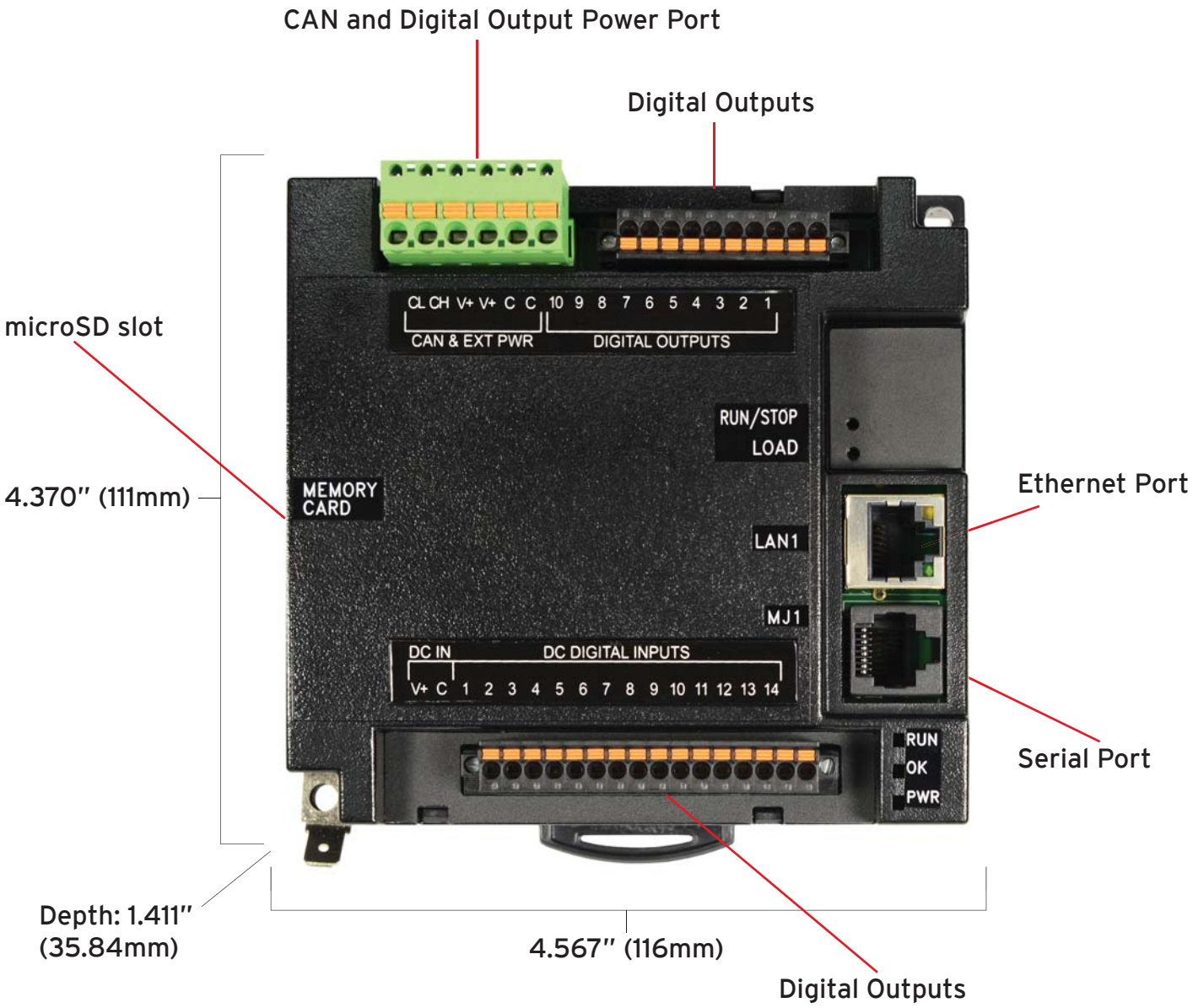
The RCC is a low cost RCX that relies on Horner's core XL4 infrastructure and does not have a display or keyboard. It has fixed I/O in the form of 14 digital inputs and 10 digital outputs. Expansion is by way of the Ethernet, RS-485 Serial port or CAN ports. It also has a battery to keep the core powered for long enough to store data fully upon input power loss, and it powers the RTC. The microSD will be used to load firmware/programs as well as for datalogging and webserving.

Overview	
Housing type	Plastic, flame retardant
Mounting	DIN Rail / Panel mounting
Weight	10 oz. (325.0g)
Operating Voltage Range	10-32 VDC
Operating Temperature	-10 to 60°C
Storage Temperature	-10 to 70°C
Relative Humidity	5 to 95% Non-condensing
Terminal	Clamp Type, 5.08 mm, Removable
Switches	1-Run/Idle, 2-Load
LED's	1-Power, 2- OK, 3- Run
Real Time Clock	Yes
Program memory size	128 KB
Number of registers	4K
Number of PID loops	64

Connectivity		
CAN	1 Port, non-isolated using standard terminal; Baud rate up to 1MBd	
Ethernet	1 x 10/100	
Serial Port	1 x RS-485 & RS232	
MicroSD	Tested for up to 32GB, firmware & program load, data-logging, webserver	
Communication Support	- Webserver - Outoing email with attachments - BootP support to Smartrail	- TCP/IP and Modbus TCP/IP - FTP - Datalogging

HORNER AUTOMATION GROUP

Ports and Connectors Diagram



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Digital and Analog I/O

Digital DC Inputs		
Inputs per Module	14	
Commons per Module	1	
Input Voltage Range	0 VDC - 24 VDC	
Absolute Max. Voltage	35 VDC Max.	
Input Impedance	10 kilohm	
Input Current	Positive Logic	Negative Logic
Minimum 'On' current	0.8 mA	-1.6 mA
Maximum 'Off' current.	0.3 mA	-2.1 mA
Min 'On' Input	8 VDC	
Max 'Off' Input	3 VDC	
OFF to ON Response	1 ms	
ON to OFF Response	1 ms	
Galvanic Isolation	None	
Logic Polarity	Positive or Negative, selectable	
I/O Indication	LED	
High Speed Counter	None	

Digital DC Outputs	
Outputs per Module	10
Commons per Module	1
Output Type	Sourcing / 10 K Pull-Down
Absolute Max. Voltage	30 VDC Max.
Output Protection	Short Circuit & Overvoltage
Max. Output Current per point	0.5 A
Max. Total Current	2A Continuous
Max. Output Supply Voltage	30 VDC
Minimum Output Supply Voltage	10 VDC
Max. Voltage Drop at Rated Current	0.25 VDC
Min. Load	None
Galvanic Isolation	None
OFF to ON Response	1 ms
ON to OFF Response	1 ms
PWM Out	None
Output Characteristics	Current Sourcing (Pos logic)

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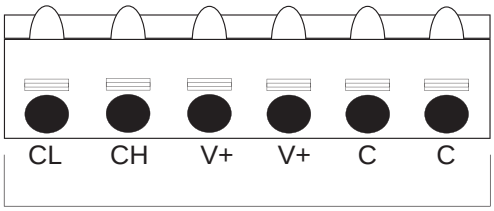
Top Connector

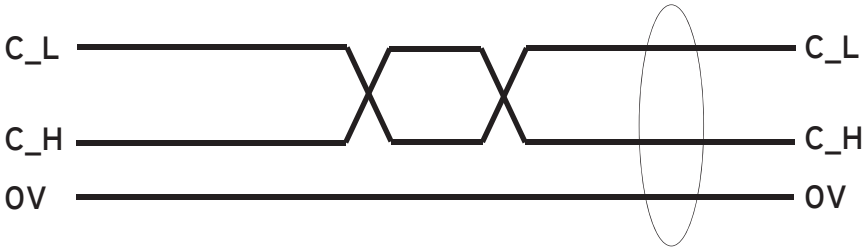


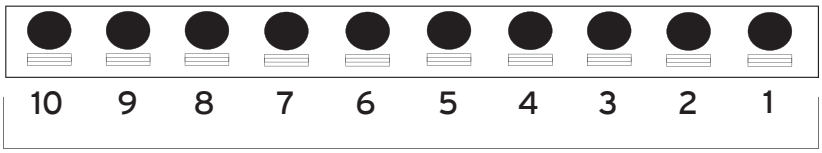
CAN & EXT PWR

CAN and External Power
Locking spring clamp,
two terminators per conductor
Torque rating: 4.5 lb-in
(0.50 N-m)

CAN & EXT PWR		
Signal	Signal Description	Direction
CN L	CAN Data Low, Blue	In/Out
CN H	Can Data High, White	In/Out
V+	DC Power	Out
V+	DC Power	Out
Common	0V	
Common	0V	

EXT PWR V+ is for digital output power only.
NOT input power or CAN network power.



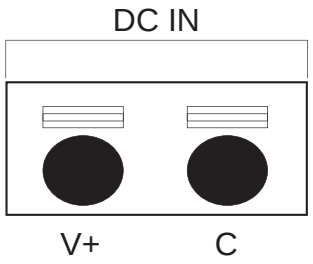


DIGITAL OUTPUTS

Digital Outputs
Locking spring clamp,
two terminators per conductor
Torque rating: 4.5 lb-in
(0.50 N-m)

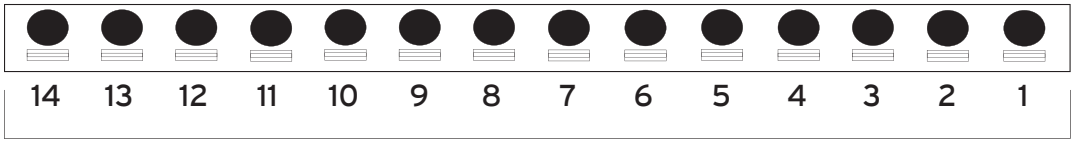
Digital Outputs	
Signal Description	Direction
10	Digital Out
9	Digital Out
8	Digital Out
7	Digital Out
6	Digital Out
5	Digital Out
4	Digital Out
3	Digital Out
2	Digital Out
1	Digital Out

Bottom Connector



DC Input - Pins 1 and 2
Locking spring clamp,
two terminators per conductor
Torque rating: 4.5 lb-in
(0.50 N-m)
DC is internally connected to I/O V.
A Class 2 power supply must be used.

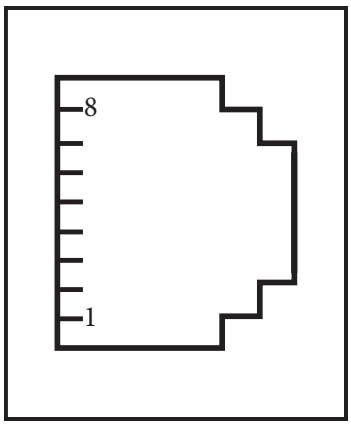
Primary Power Port Pins		
Pin	Signal	Description
1	DC+	Input Power Supply Voltage
2	DC-	Input Power Supply Ground



DIGITAL OUTPUTS

Digital Outputs
Locking spring clamp,
two terminators per conductor
Torque rating: 4.5 lb-in
(0.50 N-m)

Digital Outputs	
Signal Description	Direction
14	Digital Out
13	Digital Out
12	Digital Out
11	Digital Out
10	Digital Out
9	Digital Out
8	Digital Out
7	Digital Out
6	Digital Out
5	Digital Out
4	Digital Out
3	Digital Out
2	Digital Out
1	Digital Out



Serial Ports
1 x RS-485 & RS232
Locking spring clamps,
two terminators per conductor
Torque rating: 4.5 lb-in
(0.50 N-m)

MJ1 Pins		
8	TXD	OUT
7	RXD	IN
6	0V	Ground
5	+5V (60mA Max)	OUT
4	RTS	OUT
3	CTS	IN
2	RX/TX	IN/OUT
1	RX/TX	IN/OUT

Wiring

Wire according to the type of inputs / outputs used. Use Copper Conductors in Field Wiring Only, 60/75°C.

For I/O wiring (discrete), use the following wire type or equivalent: Belden 9918, 18 AWG (0.8 mm2) or larger for CAN & EXT POWER. For all others, use 28 (.0810 mm2) to 16 AWG (1.31 mm2).

Power Up: Connect to Earth Ground. Apply 10 – 30 VDC. Torque rating 4.5 - 7 Lb-In /(0.50 – 0.78 N-m)

For CAN wiring, use the following wire type or equivalent: Belden 3084, 24 AWG (0.2 mm2) or larger.

Registers

Register Map	
%I1 to %I4	Digital Inputs
%I15	Reserved
%I16	%Q Fault Status
%Q1 to %Q8	Digital Outputs

Register types	
Type	No. of Registers
%R	4096
%T, %M	2048
%S	13
%SR	1-192, 200-205
%I, %Q	2048
%AI, %AQ	512
Network DI/DO	64 per ID
Network AI/AO	32 per ID

Technical Support

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+1 (317) 916-4274
www.heapg.com
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Europe:
+353-21-4321-266
www.horner-apg.com
E: techsupport@hornerirl.ie

Certifications

North America: http://www.heapg.com/content/21-certifications

Europe: http://www.horner-apg.com/en/support/certification.aspx

Diagnostics

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

Switch - Normal Functionality

Load Switch

1. 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.
2. 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.

Switch – Erase Program Function

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

LED – Diagnostic Functionality

The leds are also used to indicate some fault conditions in the unit. The two leds OK and RUN will flash a number of times depending upon the fault. 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.

Safety

Warning: Electrical Shock Hazard.

Warning: Consult user documentation.

WARNING: To avoid the risk of electric shock or burns, always connect the safety (or earth) ground before making any other connections.

WARNING: 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.

WARNING: Replace fuse with the same type and rating to provide protection against risk of fire and shock hazards.

WARNING: In the event of repeated failure, do not replace the fuse again as a repeated failure indicates a defective condition that will not clear by replacing the fuse.

WARNING: 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.

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.

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:

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