



**Haidar Technology, LLC.**

**Industrial Control Innovations Begin Here**

[www.haidartechnology.com](http://www.haidartechnology.com)

(614) 389-3022

Sales@haidartechnology.com

**ModBus Modules  
RMC-D100**

**Reference Manual  
REV 1.00**

Revision 1.00

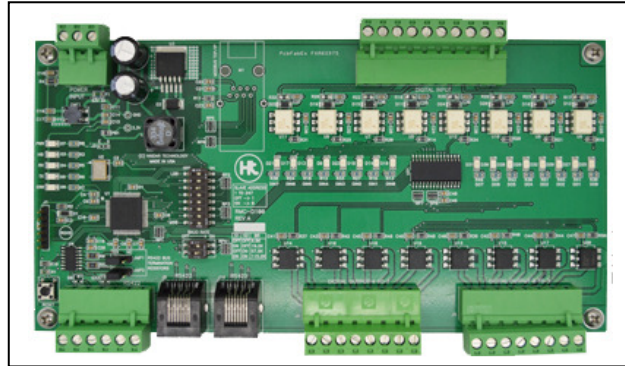
Issue Date: 7/9/2015

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## 1. Overview



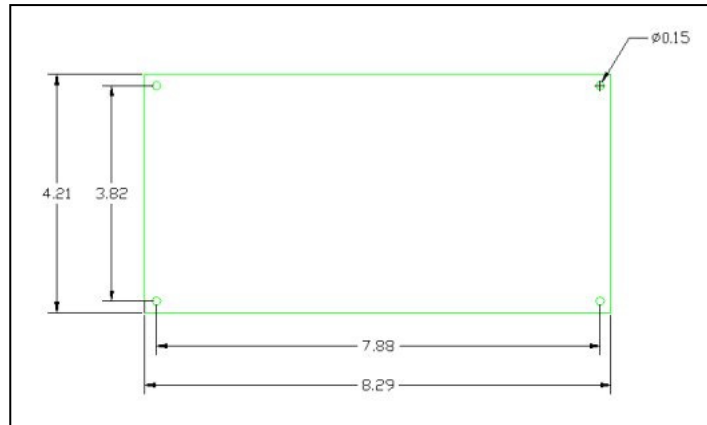
*\*For more information about RMC Modbus modules, please refer to RMC Series Reference Manual\**

Haidar's RMC-D100 is 8-ch digital inputs and 8-ch digital outputs ModBus module, built with 5000V optical isolation, suitable for wide range of industrial applications. Different from other modules, RMC-D100 accepts input voltage up to 24V and sinks/sources up to 60V at 2A per output channel. Full-Duplex RS485 ModBus RTU or ModBus TCP interface. Moreover, user can read the current status of the digital inputs or the digital outputs from the LED indicators on board.

## 2. Features

- Full-Duplex RS485 interface using ModBus slave RTU communication Protocol
- Optional ModBus TCP Protocol
- Powerful 32-bit @ 80MHZ microcontroller on board
- 8 optical-isolated digital input channels
- 8 optical-isolated digital output channels
- Up to 60VDC @ 2A (sink/source) output voltage
- Up to 24VDC input voltage
- LED indicators for digital inputs and outputs
- LED indicators for Power, RX, TX, HB and Error
- Plug-in terminal blocks
- Dual RJ45 connectors allowing a chain of multiple modules
- Data and Power (optional) over single RJ45 cable up to 1200 meters
- $\pm 80\text{V}$  fault and  $\pm 8\text{KV}$  ESD protection on the RS422 lines
- Communication speed and address are set via on board DIP switches
- Full industrial temperature from  $-40$  to  $85^{\circ}\text{C}$
- Optional DIN-RAIL mounting plate
- Watchdog system timer
- Communication speed from 9600 bps to 115.2 Kbps
- Free modbus test and simulation software

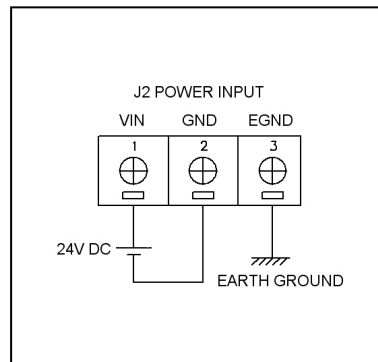
### 3. Board Dimensions



<b>Width</b>	4.21" (107mm)
<b>Length</b>	8.29" (210mm)
<b>Depth</b>	0.71" (18mm)

### 4. Supply Voltage (Vin)

<b>Typical Supply Voltage (Vin)</b>	24V DC
<b>Supply Current</b>	TBD



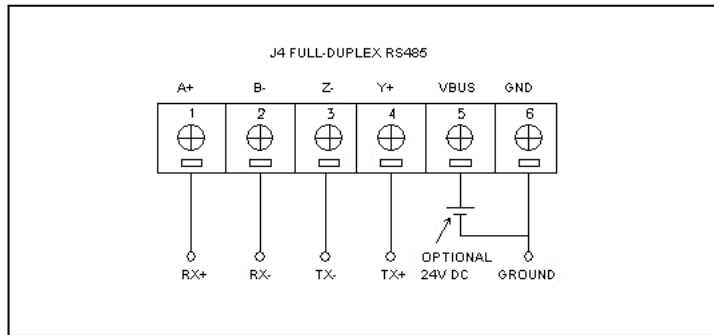
<b>J3 Pin Number</b>	<b>Description</b>
1	Supply Voltage Input (VIN)
2	Power Ground
3	Earth Ground

## 5. Full-Duplex RS485 (RS422) Connectors

- Specifications

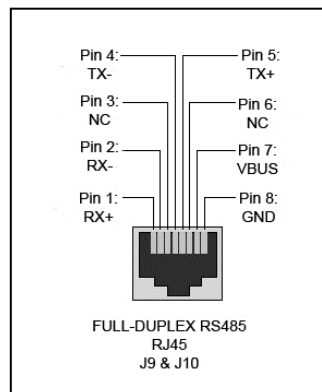
<b>Driver</b>	MAX13448E
<b>Isolation</b>	None
<b>Fault Protection</b>	±80V on the RS485 I/O Ports
<b>ESD Protection</b>	±8KV ESD Protection
<b>Common Mode</b>	-7V to +12V common-mode input voltage range
<b>Data Rate</b>	Max 250Kbps
<b>Hot Swap</b>	Yes
<b>Slew Rate Limiting</b>	Yes
<b>True Fail-Safe</b>	Yes
<b>Bus Transceivers</b>	Up to 256

- J4 (6-pole screw terminal block)



J4 Pin Number	Description
1	Receiver + (RX+ Or A+)
2	Receiver - (RX- Or B-)
3	Transmitter - (TX- Or Z-)
4	Transmitter + (TX+ Or Y+)
5	Optional Bus Voltage (Typical 24V DC). Not required for normal operation.
6	Common Ground

- J9 and J10 (RJ45)



J4 Pin Number	Description
1	Receiver + (RX+ Or A+)
2	Receiver - (RX- Or B-)
3	Not Connected
4	Transmitter - (TX- Or Z-)
5	Transmitter + (TX+ Or Y+)
6	Not Connected
7	Optional Bus Voltage (Typical 24V DC). Not required for normal operation.
8	Common Ground

## 6. Discrete (Digital) Inputs

- Specifications

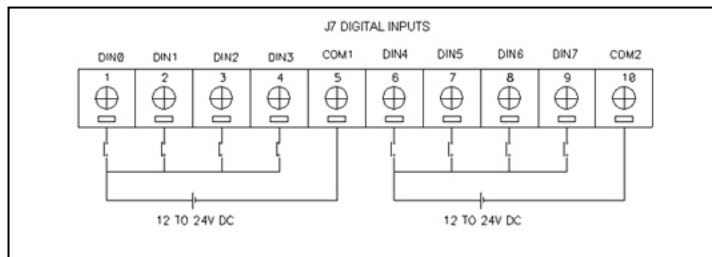
Channel	8 Schmitt Trigger Output Optocoupler (H11L1M)
Isolation	Optical Isolation up to 1500V
Input Voltage Range	Typical 12V to 24V
Input Current	10ma @ 24V
ON/OFF Response	5usec
Input Impedance	2.2K
Input Capacitor	0.01uF
ON Level	>3V
OFF Level	<3V
Common	2 independent
Status LEDs	8

- ModBus Addresses

Channel	0	1	2	3	4	5	6	7
Address	0	1	2	3	4	5	6	7

Input Register Address	0 (Read all channels LSB = Channel 0, 0 = OFF, 1 = ON)
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- J7 (10-pole screw terminal block)



J7 Pin Number	Description
1	Digital Input 0 (DIN0)
2	Digital Input 1 (DIN1)
3	Digital Input 2 (DIN2)
4	Digital Input 3 (DIN3)
5	Common Ground (COM1)
6	Digital Input 4 (DIN4)
7	Digital Input 5 (DIN5)

8	Digital Input 6 (DIN6)
9	Digital Input 7 (DIN7)
10	Common Ground (COM2)

## 7. Discrete (Digital) Outputs

- Specifications

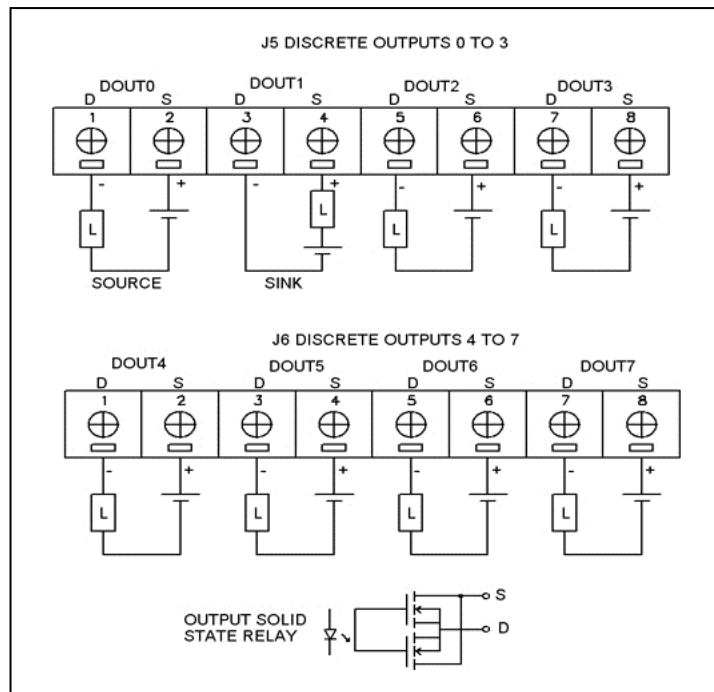
<b>Channel</b>	8 Solid State Relays (VO14642AABTR)
<b>Isolation</b>	Optical Isolation up to 5300V
<b>Load Voltage</b>	Up to 60V DC (Typical 24V DC)
<b>Load Current</b>	Up to 2A per channel
<b>Load Connection</b>	Sink or Source
<b>ON/OFF Response</b>	1msec
<b>Status LEDs</b>	8

- ModBus Addresses

<b>Channel</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Address</b>	0	1	2	3	4	5	6	7

<b>Output Register Address</b>	0 (Write to all channels LSB = Channel 0, 0 = OFF, 1 = ON)
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- J5 & J6 (8-pole screw terminal block)



J5 Pin Number	Description
1	Discrete Output D0
2	Discrete Output S0
3	Discrete Output D1
4	Discrete Output S1

5	Discrete Output D2
6	Discrete Output S2
7	Discrete Output D3
8	Discrete Output S3

<b>J6 Pin Number</b>	<b>Description</b>
1	Discrete Output D4
2	Discrete Output S4
3	Discrete Output D5
4	Discrete Output S5
5	Discrete Output D6
6	Discrete Output S6
7	Discrete Output D7
8	Discrete Output S7

## 8. Manual Change History

Date	Revision	Change
7/9/2015	REV1.00	Initial version of this manual

## 9. Hardware Limited Warrnty

Haidar Technology, LLC. Warrants its hardware products to be free from manufacturing defects in materials and workmanship under normal use for a period of one (1) year from the date of purchase from Haidar. This warranty extends to products purchased directly from Haidar or an authorized Haidar distributor. Purchasers should inquire of the distributor regarding the nature and extent of the distributor's warranty, if any. Haidar shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended, or if it has been subjected to misuse, accidental damage, modification, or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced, or removed. This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall Haidar be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. Haidar is not liable for any claim made by a third party or made by the purchaser for a third party. Haidar shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty. Except as expressly set forth in this warranty, Haidar makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supercedes all previous warranties, and covers only the Haidar hardware.

## 10. Returns and Repair Policy

No merchandise may be returned for credit, exchange, or service without prior authorization from. To obtain warranty service, contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number, and return address. Authorized returns must be shipped freight prepaid to Haidar Technology with the RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. Haidar reserves the right in its sole and absolute discretion to charge a 15% restocking fee, plus shipping costs, on any products returned with an RMA.

Return freight charges following repair of items under warranty shall be paid by Haidar, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.