SmartMod
DC Digital Input Module
HE359DIM610
12/24VDC Negative Logic

## 1   Specifications

|	DIM610			DIM610
Number of Channels	12		PLC Update Rate	Determined by Communicat-ions w/OCS
Input Ranges	12/24 VDC		Terminal Type	Screw Type, Removable
OFF Point	0-3VDC		Storage Temp.	-40° to 85° Celsius
ON Point	10-30VDC		Operating Temp.	-10° to 60° Celsius
			Relative Humidity	5 to 95% Non-condensing
Input Impedence	4.7Kohm		Dimensions WxHxD	17.5mm x 100mm x 120mm 0.69" x 3.94" x 4.72"
External Power Supply Voltage	10-30Vdc		Weight	150g (6 oz.)
Required Power (Steady State)	35mA @ 24Vdc, typical		Communications	Modbus/RTU (binary) RS-485 half duplex
Required Power (Inrush)	Negligible		Factory Default Communications Parameters	38400 baud, N, 8, 1, no h/s Default Modbus ID 1
Isolation	2000Vac for 60 seconds (Input/Power & Input/Comms)		Supported Modbus Commands	1,2,3,4,5,6,8,15,16
CE & UL Compliance	See Compliance Table at http://www.heapg.com/Pages/TechSupport/ProductCert.html			
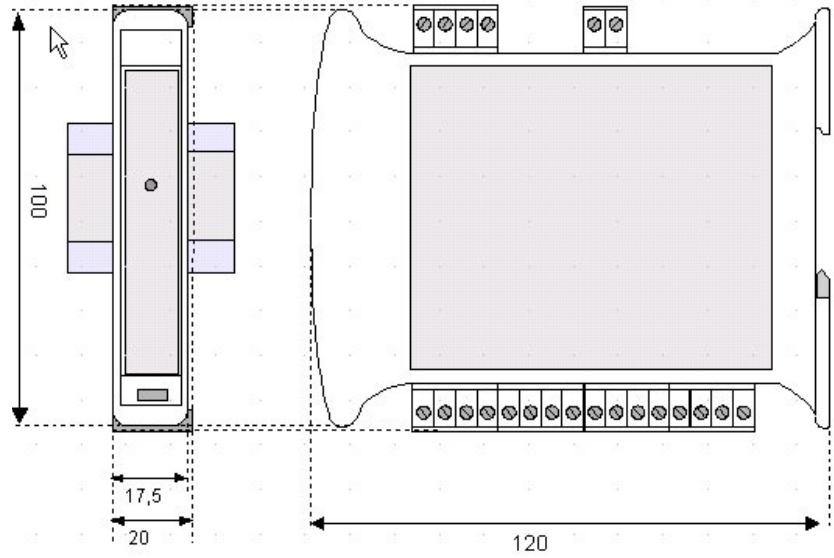
Dimensions in inches are 0.69"W x 3.95"H x 4.72"D
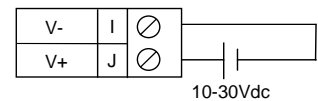Note: Number of I/O terminal connections vary from model to model

2   Wiring – I/O

12/24VDC

12/24VDC

I/O   RS-485   DC IN
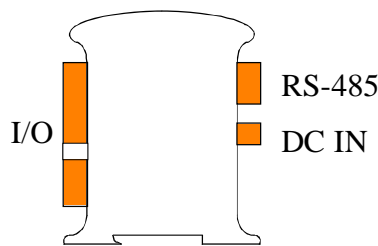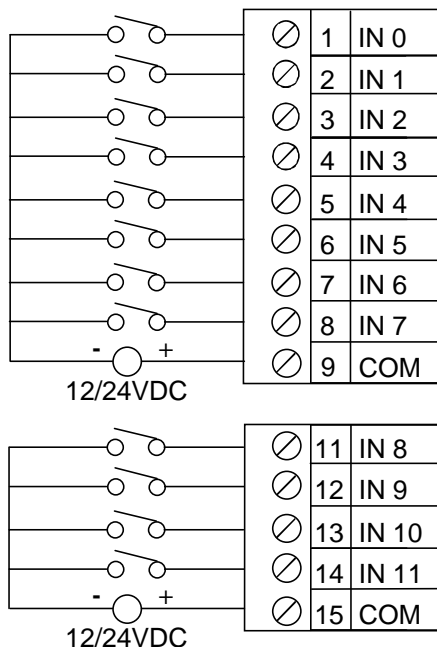
| Pin #	DIM610		Pin #	DIM610
1	INPUT 0		11	INPUT 8
2	INPUT 1		12	INPUT 9
3	INPUT 2		13	INPUT 10
4	INPUT 3		14	INPUT 11
5	INPUT 4		15	INPUT COMMON 2
6	INPUT 5			
7	INPUT 6			
8	INPUT 7			
9	INPUT COMMON 1			
INPUTS 0-7 & 8-11 are isolated from each other				
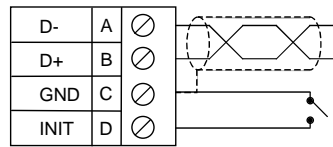
Wiring RS-485

Wiring DC IN

10-30Vdc

Notes:

Both ends of the RS-485 network should be terminated with a 100ohm, 1/4W, 1% resistor. Many OCS controllers feature dip switches or jumpers which enable appropriate termination if the OCS is located on a network end.

3   Init Default Setup

Communication parameters will be set to INIT default after performing the procedure:

1. Install jumper between INIT and GND terminals of the RS-485 port.
2. Apply power to Smartmod unit.
3. Read parameter words to see current parameters.
4. Write changes if necessary.
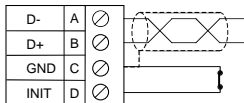
The INIT Default RS485 Settings Are:

Modbus ID = 1
Baud rate = 9600
Parity = None
Stop Bits = 1
Data Bits = 8
No handshake

> **Note**: There are 2 types of default settings possible:
> 1. Factory default as described in section 1 (Specifications)
> 2. Default after INIT as described in section 3 (INIT Default Setup)

4   Configuration DATA

SmartMod Configuration settings are mapped into Modbus Register space. This configuration data may be modified with any Modbus/RTU Master device. For convenience, Horner APG has developed a variety of Cscape application files which allow an OCS (Xle, NX, LX, QX) to act as a SmartMod configurator. Initial configuration of SmartMod module should be done on an individual basis, since all modules come from the factory with a default Modbus ID of 1. Once each module on the network has its own unique Modbus ID, further configuration adjustments can be made with the entire network powered.

All configuration parameters listed below (except 40012 Channel Enable) are stored in EPROM. That means they should not be constantly rewritten.

Configuration Parameters – Registers 40001 through 40014				
Modbus Register	**Description**	**Min**	**Max**	**Default**
40001-40005	Reserved			
40006	Communications Parameters	See Table		38.4kbaud, N, 8, 1, RTU Mode
40007	Modbus ID	1	255	1
40008	Rx/Tx Delay (in 2mS steps)	0	255	0mS
40009	Watchdog Timer (in 0.5s steps)	0	255	10 (5s)
40010	Watchdog Data	I/O Watchdog Data – See Table Below		
40011	Input Type	I/O Data – See Table Below		
40012-40014	Reserved			

Register 40006 (Communications Parameters) Bit Definition							
Bits 7-15	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
Unused	Mode	Parity		Data Bits	Baud Rate		
	0 = ASCII Mode	Value	Meaning	0 = 7 Data Bits	Value	Meaning	
		0	Mark		0	1200 baud	
		1	Even		1	2400 baud	
	1 = RTU Mode	2	Odd	1 = 8 Data Bits	2	4800 baud	
		3	Space		3	9600 baud	
					4	19200 baud	
					5-7	38400 baud	

Register 40010 (Watchdog Coils Mirror) Bit Definition				
Bit 11-15	**Bit 10**	**Bit 9**	**Bit 8**	**Bit 0-7**
Unused	**Power-up Event**	**Watchdog Event**	**Watchdog Enable**	Unused
	0 = No Event	0 = No Event	0 = No Event	
	1 = Event Occurred	1 = Event Occurred	1 = Event Occurred	

Register 40011 (Input Coil Mirror) Bit Definition												
Bit 15	**Bit 14**	**Bit 13**	**Bit 12**	**Bit 11**	**Bit 10**	**Bit 9**	**Bit 8**	**Bit 4-7**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
IN 7	IN 6	IN 5	IN 4	IN 3	IN 2	IN 1	IN 0	reserved	IN 11	IN 10	IN 9	IN 8

5   Input/Output DATA

SmartMod Analog I/O utilizes both Modbus Registers (40001-40030) and Coils (1-11). It is possible to access all data using Registers only, because the Coils can be accessed through Register 40010.

The following tables lists all Modbus I/O data available.

I/O Register Data (Registers 40014-40022)			
Modbus Register	**Description**	**Access**	**Notes**
40010	Mirror of Watchdog Coils	Read/Write	See Chart in Section 3 (Register 40010)
40011	Mirror of Digital Input Coils	Read-only	See Chart in Section 3 (Register 40011)
40012-40014	Reserved		

Modbus Coil	**Description**	**Access**	**Watchdog Event & Power-up Event Operation**
00001	Watchdog Enabled	Read/Write	If Coil 1 (Watchdog Enabled) is set, Coil 2 (Watchdog Event) will set if the Watchdog Timeout value is exceeded. The Watchdog Timeout value is set in Register 40009. When set, Coil 2 can be reset by the controller when normal communications resumes. The Power-up Event (Coil 3) is set every time the power is applied. It can be cleared by the controller if desired.
00002	Watchdog Event	Read/Write	
00003	Power-up Event	Read/Write	
00017	Digital Input 0	Read-only	
00018	Digital Input 1	Read-only	
00019	Digital Input 2	Read-only	
00020	Digital Input 3	Read-only	
00021	Digital Input 4	Read-only	
00022	Digital Input 5	Read-only	
00023	Digital Input 6	Read-only	
00024	Digital Input 7	Read-only	
00025	Digital Input 8	Read-only	
00026	Digital Input 9	Read-only	
00027	Digital Input 10	Read-only	
00028	Digital Input 11	Read-only	

6   Installation / safety

> **Warning:** Remove power from the OCS controller, CAN port, and any peripheral equipment connected to this local system before adding or replacing this or any module.

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields may be terminated at the module terminal strip.
d. In severe applications, shields should be tied directly to the ground block within the panel.
e. Use the following wire type or equivalent: Belden 8441.

For detailed installation and a handy checklist that covers panel box layout requirements and minimum clearances, refer to the hardware manual of the controller you are using.

When found on the product, the following symbols specify:

Warning: Electrical Shock Hazard.

Warning: Consult user documentation.

7   Technical Support

Technical Support at the following locations:

North America:
Tel: 317 916-4274
Fax: 317 639-4279
Web: http://www.heapg.com
Email: techsppt@heapg.com

Europe:
Tel: +353-21-4321266
Fax: +353-21-4321826
Web: http://www.horner-apg.com
Email: tech.support@horner-apg.com