SmartBlock Power and Energy Monitor
HE-579ACM300

The SmartBlock ACM300 is a Power and Energy Monitor that is easy to setup, and provides a variety of advanced features, including:
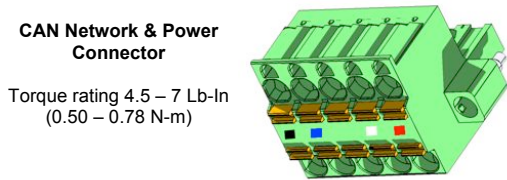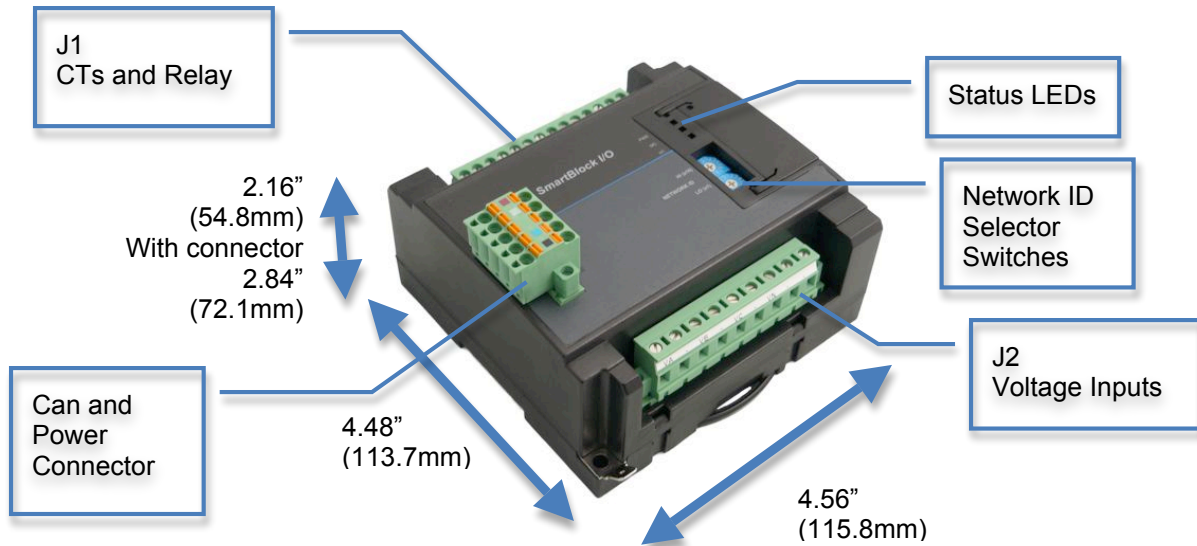
- 3-phase Power Monitoring with three current (0-5A CTs) and voltage inputs (480V, direct connect or PTs).

- CsCAN CAN network connection provides a fast flexible communication path.

- SmartBlock package allows convenient mounting close to the source to be monitored

- On board relay allows load shedding, alarming or other local switching.

1   SPECIFICATIONS

CURRENT INPUTS			VOLTAGE INPUTS	
Conversion	True RMS 78.1K samples/sec		**Conversion**	True RMS
CT Input	5A Secondary		**PT Input (or direct)**	480V Secondary
Burden	0.2VA		**Burden**	2.0Mohm
Range	1 to 150% of CT Primary		**Input Range**	40 to 600Vac
Full Scale	150% of CT Primary		**Full Scale**	600Vac
Accuracy	<1% of Full Scale		**Accuracy**	Better than 1% full scale
RELAY OUTPUT (Form C)				
Current	1A max at 30Vdc 0.5A max at 125Vac		**Contact Voltage**	30Vdc, Max 125Vac, Max
MEASURED DATA VALUES				
Phase A RMS voltage (Va)			Watts (W)	
Phase B RMS voltage (Vb)			Power Factor (PF)	
Phase C RMS voltage (Vc)			Volt-Amps (VA)	
Phase A RMS current (Ia)			Volt-Amps Reactive (VAR)	
Phase B RMS current (Ib)			Kilowatt Hour (KWhr)	
Phase C RMS current (Ic)			Voltage Peak (Vpeak)	
Frequency (Hz)			Current Peak (Ipeak)	

GENERAL SPECIFICATIONS	
Required Power (Steady State)	TBD
Required Power (Inrush)	TBD
Primary Power Range	10-30VDC
Operating Temperature	0 to +60 C
Relative Humidity	5 to 95%, Non-condensing
CONNECTIVITY	
CAN Port	Horner CsCAN Peer-to-Peer

Information is subject to change without notice.

2   DIMENSIONS AND INSTALLATION

J1
CTs and Relay

Status LEDs

2.16"
(54.8mm)
With connector
2.84"
(72.1mm)

Network ID
Selector
Switches

Can and
Power
Connector

4.48"
(113.7mm)

J2
Voltage Inputs

4.56"
(115.8mm)

**CAN Network & Power
Connector**

Torque rating 4.5 – 7 Lb-In
(0.50 – 0.78 N-m)

Earth Ground
Location

| CAN Network & Power Port Pin Assignments			
Pin	**Signal**	**Signal Description**	**Direction**
1	V-	CAN and Device Ground - Black	–
2	CN_L	CAN Data Low - Blue	In/Out
3	SHLD	Shield Ground - None	–
4	CN_H	CAN Data High - White	In/Out
5	V+	Positive DC Voltage Input (10-30VDC) - Red	–
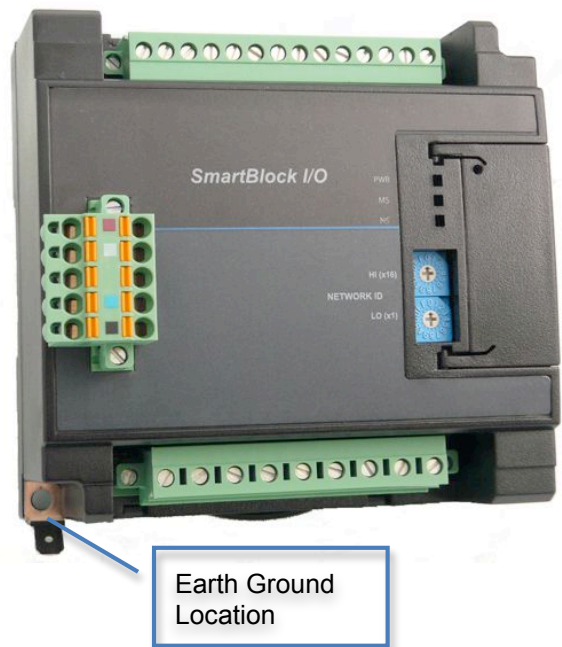
Network, Power and Grounding:
A single 5 pin connector is used to make both a network connection and power input. A quality class 2 power supply should be used for this product. If the power is run with the network cable, care must be taken such that the voltage does not drop below the lower supply limit on longer runs.
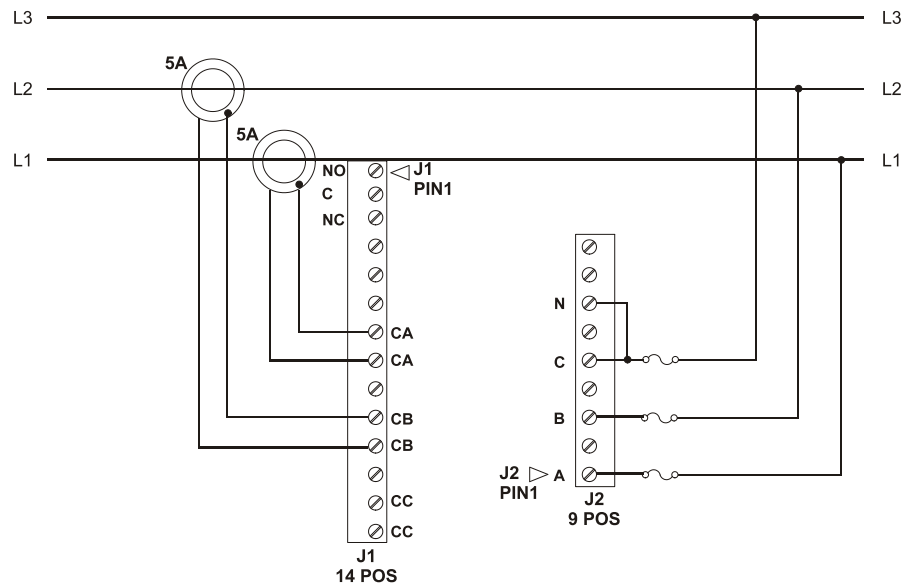
A quality earth ground is required for safe and proper operation. The best ground is achieved by screwing the lower left grounding location into a grounded back plate. Alternately a ground can be connected to the spade lug.

Please see Horner manual MAN0799 for details on CAN wiring.

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3 WIRING
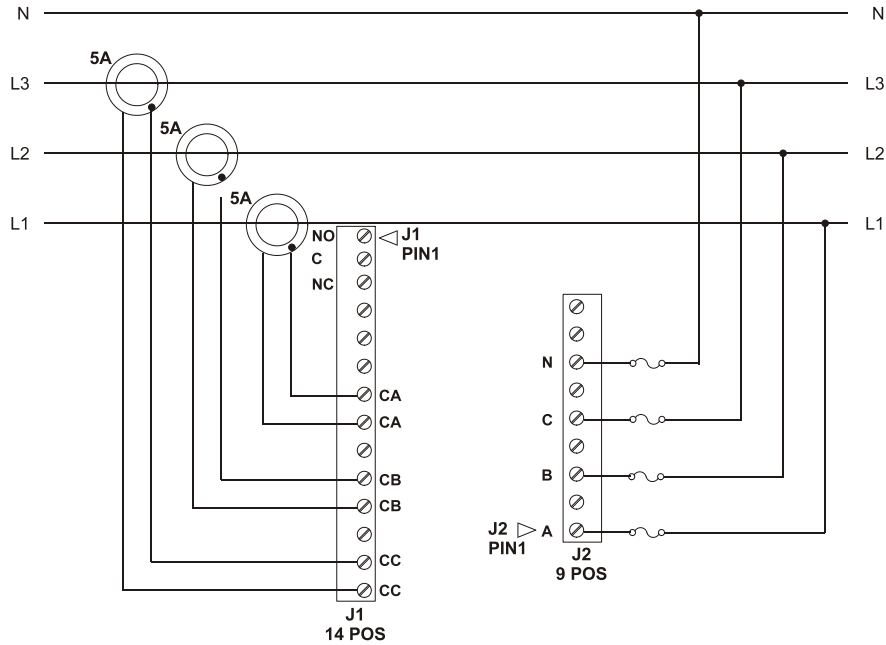
4-wire Wye or 4-wire Delta

3-wire Delta

4   NETWORK DATA

Consumed Digital Data – This data is sent from the controller to the SmartBlock. *For typical applications the I/O configuration setup in Cscape will automatically populate this data.* For more advanced applications you may use NetPut functions to write this data. Please see the advanced programming guide MAN0880 for more details.

Bit	Description	
1	Q1 default	
2	Q1 override	
	Upon module stop / timeout, if Q1 override is true, Q1 is set to Q1 default, otherwise the Q1 value is held. This override / hold polarity is consistent with OCS / Cscape usage but the reverse of the legacy analog hold / override polarity in word 5.	
3	Frequency Source, Set for phase B, Clear for phase A or C	
4	Frequency Source, Set for phase C, Clear for phase A or B	
5	If Clear	Always accumulate Watt-Hours
	If Set	Do not accumulate Watt-Hours if load is under 0.005% of full scale to avoid meter creep due to slight zero errors
6	Set to report period instead of frequency in AI13 / AI14	
17	Relay output, set to ON to close N.O. and open N.C contacts.	
23	Set to ON to clear KWhr, set to OFF to re-enable KWhr accumulator	
24	Set to ON to clear Status flags, set to OFF to re-enable Status flags	

Produced Digital Data – This data is sent from the SmartBlock to the controller. *Normally this data is mapped into specific registers in the I/O configuration in Cscape.* For advanced applications NetGet functions can be used to obtain this data. Since this data is broadcast to all controllers on the network additional controllers can use NetGet functions to obtain this data as well.

Bit	Name	Description
I1	AEHF	Watt-Hour accumulator half full.
I2	REHF	VAR-Hour accumulator half full
I3	VAEHF	VA-Hour accumulator half
I4	SAGA	Voltage sag on Phase A
I5	SAGB	Voltage sag on Phase B
I6	SAGC	Voltage sag on Phase C
I7	ZXTOA	Zero Cross timeout on Phase A
I8	ZXTOB	Zero Cross timeout on Phase B
I9	ZXTOC	Zero Cross timeout on Phase C
I10	ZXA	Zero Cross detected on Phase A
I11	ZXB	Zero Cross detected on Phase B
I12	ZXC	Zero Cross detected on Phase C
I13	LENERGY	Reserved
I14	RESET	5V supply rail under 4 volts
I15	PKV	Peak voltage level exceeded
I16	PKI	Peak current level exceeded
I17	WFSM	Reserved
I18	REVPAP	Sign changed occurred in Watt calculation
I19	REVPRP	Sign changed occurred in VAR calculation
I20	SEQERR	A-B-C Rotation

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Consumed Analog Data – This data is sent from the controller to the SmartBlock. *For typical applications the I/O configuration setup in Cscape will automatically populate this data.* For more advanced applications you may use NetPut functions to write this data. Please see the advanced programming guide MAN0880 for more details.

Word	Description		Details
Word 1 / 2	REAL	PT A Ratio	Voltage Input Ratio
Word 3 / 4	REAL	PT B Ratio	For example 120 to 480 step up enter 0.25
Word 5 / 6	REAL	PT C Ratio	for 7200 to 480 step down enter 15
Word 7 / 8	REAL	CT A Ratio	Current Input Ratio
Word 9 / 10	REAL	CT B Ratio	For example for 5A:100A CT enter 20
Word 11 / 12	REAL	CT C Ratio	
Word 13 / 14	REAL	CT A Phase Shift	Phase correction for CTs Enter in degrees
Word 15 / 16	REAL	CT B Phase Shift	Min of -1.63° Lag, Max of +3.32 Lead
Word 17 / 18	REAL	CT C Phase Shift	
Word 19 / 20	REAL	Zero Cross Timeout	Seconds for zero cross alarm – max 2.5
Word 21 / 22	REAL	RMS Sag Voltage Level	Voltage Sag level in volts
Word 23	UINT	Sag Half Cycles	Number of half cycles before alarm
Word 24	UINT	Peak Level Half Cycles	Number of half cycles before alarm
Word 25 / 26	REAL	Voltage Peak Level	Voltage level for peak alarm
Word 27 / 28	REAL	Current Peak Level	Current level for peak alarm

Produced Analog Data – This data is sent from the SmartBlock to the controller. *Normally this data is mapped into specific registers in the I/O configuration in Cscape.* For advanced applications NetGet functions can be used to obtain this data. Since this data is broadcast to all controllers on the network additional controllers can use NetGet functions to obtain this data as well.

Word	Function	
Word 1 / 2	REAL	Phase A RMS Voltage
Word 3 / 4	REAL	Phase B RMS Voltage
Word 5 / 6	REAL	Phase C RMS Voltage
Word 7 / 8	REAL	Phase A RMS Current
Word 9 / 10	REAL	Phase B RMS Current
Word 11 / 12	REAL	Phase C RMS Current
Word 13 / 14	REAL	Frequency
Word 15 / 16	REAL	Watts
Word 17 / 18	REAL	PF Power Factor
Word 19 / 20	REAL	VA Volt-Amps
Word 21 / 22	REAL	VAR Volt-Amps Reactive
Word 23 / 24	REAL	KWhr
Word 25 / 26	REAL	Voltage Peak
Word 27 / 28	REAL	Current Peak

5   INSTALLATION / SAFETY

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

Use the following wire type or equivalent:

- Belden 8917

- 16 AWG or larger

When found on the product, the following symbols specify:

⚠	**Warning:** Consult user documentation.

⚡	**Warning:** Electrical Shock Hazard.

> **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.

6   TECHNICAL SUPPORT

For assistance and manual up-dates, contact Technical Support at the following locations:

North America:

(317) 916-4274

www.heapg.com

Europe:

(+) 353-21-4321-266

www.horner-apg.com