Cutler-Hammer

New Information

Power Management Systems
Analog Input Module (AIM)

Analog Input Module (AIM)

Applications

- Real-time usage measurement and verification by utility
- Energy conversion
- Cost allocation to individual departments
- Establish baseline load profiles for verification of actual results.

Monitors Real-time Usage of:

- Gas
- Steam
- Temperature
- Pressure
- Water
- Compressed air
- BTUs
- Run-time,
- Any other 0-20 or 4-20 mA transducer or digital signal.

Communications

- Communicates as a single device in a Cutler-Hammer PowerNet system network via an IPONI communications card, included as standard.

Certifications

- UL

Physical Characteristics

Suitable for panel mounting. Optional external terminal blocks and power supply require an additional enclosure.

General Description

The Analog Input Module (AIM) is a microprocessor-based analog input data acquisition device designed for use with Cutler-Hammer PowerNet networks. It is intended to record customer utility information by monitoring signals from primary measurement devices such as gas and water flow transducers, pulse output contacts, BTU and steam flow meters, temperature and pressure sensors, equipment run-time and other devices.

The Analog Input Module monitors 0-20 mA or 4-20 mA conventional transducers signals, counts pulses and tracks run-time hours. The device scales, identifies units, performs BTU calculations and tracks run-time hours within the unit.

In addition to its 32 input channels the Analog Input Module has one double pole output relay which can be controlled through the IMPACC Series III or Cutler-Hammer Power-Net software.

The Analog Input Module bridges information from devices without inherent communications capability into the facility-wide Cutler-Hammer PowerNet network. Analog Input

Modules can be daisy-chained together on a twisted shielded pair network with other Cutler-Hammer PowerNet devices to a NetLink, Ethernet Gateway, or central monitoring computer running Cutler-Hammer PowerNet software. An IPONI communications card is included as standard and allows AIM to communicate as a single device on a Cutler-Hammer PowerNet network.

Users can configure alarms on the first 24 sensors' present value and a 1-30 minute average value with Series III or an unlimited number using Net InTouch and Cutler-Hammer PowerNet and trend the data for historical analysis. The output relay can be configured to close contact on an alarm condition for use as a load alarm.

(Contact Cutler-Hammer for availability of Cutler-Hammer PowerNet support for the Analog Input Module.)

Analog inputs are scaled internal to the Analog Input Module in non-volatile RAM and returned to Cutler-Hammer PowerNet in engineering units. There are four types of configurable inputs described above.

F·T·N

General Purpose – configurable to 0-20 mA or 4-20 mA signals scaled in non-volatile RAM to engineering units. Instantaneous value is displayed along with average value over two user-definable time periods.

Pulse Input – the AIM counts form "A" pulses. The count is then multiplied by a scaling factor associated with the measured input. For example, one pulse may indicate 400 ft^3. The demand windows would then indicate the ft^3/min. The running total is stored in non-volatile RAM in engineering units. Two demand windows of user-configurable duration store the total pulses recorded in the last 1-30 minutes. The running total may be reset through software with password authorization. The time of reset of the running total and the time of a meter rollover are recorded in the Analog Input Module in non-volatile RAM.

Run-Time – run-time inputs report current on/off status of the monitored point, the total on-time, total off-to-on transitions, run-time in the last x minutes, and off-to-on transitions in the last x minutes. The running total may be reset through software with the correct password authorization. The time of reset of the running total, time of total run-time rollover, time of last off-to-on transition and time of last on-to-off transition are all recorded.

BTU Sensor – a BTU sensor requires three inputs from the Analog Input Module. One input monitors flow from an incompressible fluid, another from the high temperature side of the cycle, and the third from the low temperature side of the cycle. Running totals are reported for forward BTUs, reverse BTUs, and net BTUs. 1-30 minute averages are provided for forward, reverse, and net BTUs. Present flow, high temperature, and low temperature are provided as well as two user-definable averages.

Applications:

■ Monitor analog or digital signals as a drop on the IMPACC network, including real-time usage of gas, steam, temperature, pressure, water, sewer, compressed air, BTUs, run-time.

■ Monitor building pressures, temperature and humidity in real-time.

■ Record utility costs such as water and gas for allocating usage costs to individual departments.

■ Create current usage load profiles to verify cost reductions on energy-saving projects such as lighting, chiller and boiler retrofits; and steam and compressed air-line upgrades.

■ Establish baseline load profiles before enacting energy-saving retrofit projects, then verify actual savings by tracing new load profiles.

External Termination Box

Cutler-Hammer recommends using the AIM with a separate termination box wherever non-instrument grade digital contacts are monitored. The termination box allows for the mounting of required resistors when used as a digital input module and serves to house terminal blocks and a suggested 120/240 Ac/Dc to 24 Vdc power supply for powering both digital inputs and 4-20 or 0-20 mA transducers.

A list of components suggested for mounting in a custom termination box is shown below. Quantities of individual components will vary by application.

Manufacturer	Description	Non-Cutler-Hammer Catalog Number
Phoenix Contact	Insulated Power Rail	**EB80-DIK WH**
Phoenix Contact	DIN-Rail Mountable Terminal Block, 300 Vac, 15A	**DOK 1,5-TG**
Phoenix Contact	Resistor Adapter. Plugs into DOK 1,5-TG Terminal Block	**ST-BE**
Yaego	1K, 1W 5% Metal Film Resistor	**RSF-1 1W**
Phoenix Contact	Power Supply 100-240 Vac, 47-63 Hz Input (0.7-1.2A), 24 Vdc Output at 2.5A	**CM50-PS-120-230 Ac/ 24 Vdc/2.5A**

Specifications

32 input channels, non-isolated,
±10 volts maximum
499 ohm input impedance
Capacitor backed-up RAM

Current Input

0-20 mA Dc accuracy ±0.02 mA from 0.2 to 20 mA (excludes sensor error) resolution 0.01 mA

Pulse Input

Form "A" contact closure
10 Hz maximum, 50% duty cycle
10 ms de-bounce

Run-Time Input

Form "A" contact closure

Power Supply

120 Vac/24 Vac UL listed transformer
24 VA

Power Consumption

8 VA including IPONI
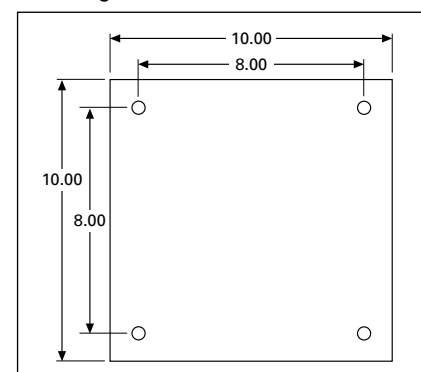
Auxiliary Power

8 Vdc and 24 Vdc
16 VA total, maximum

Operating Environment
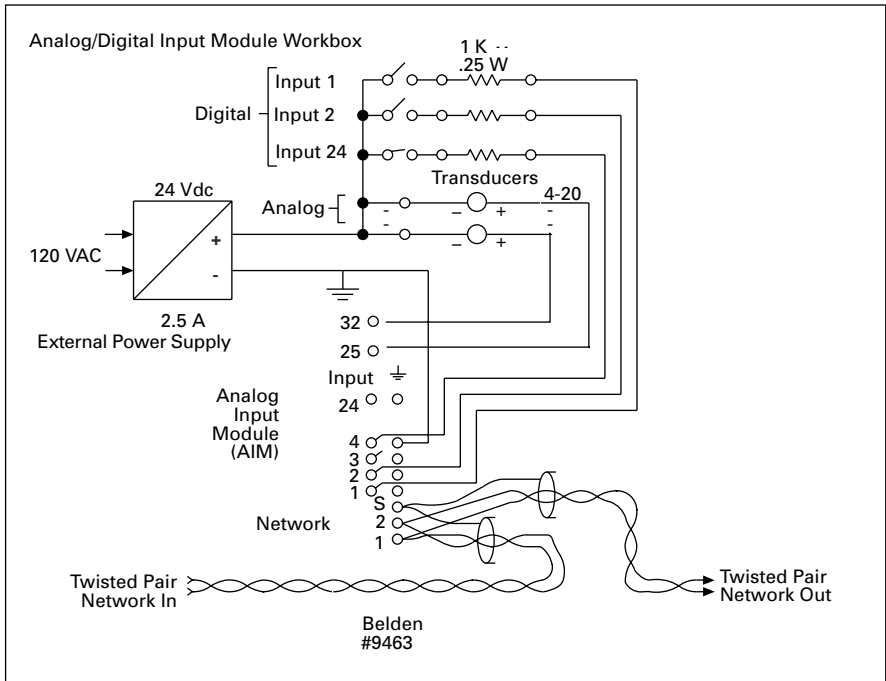
32-125°F (0-50°C)
20-80% RH non-condensing

Enclosure

NEMA 1
12-inch H x 10-inch W x 6-inch D

Mounting Holes

Cutler-Hammer

**Power Management Systems
Analog Input Module (AIM)**

Technical Data

Effective: May 1999

Page **3**

AIM Wiring With External Termination Box and Digital Input Use

The above illustrates the application of the Analog Input Module with external power supply, terminal blocks, and resistors. Resistors are used to enable the AIM for digital input module when used with non-instrument grade contacts. The standard wetting voltage supplied by the AIM (8 Vdc) is sufficient for instrument grade (gold) contacts, but non-instrument grade (silver) requires a higher wetting voltage of 24 Vdc. The same 24 Vdc power supply can also power two-wire analog transducers as shown above.

Ordering Information

Analog Input Module

Description	Catalog Number
Analog Input Module	**AIM**

Copyright Cutler-Hammer Inc., 1999.
All Rights Reserved.

F·T·N