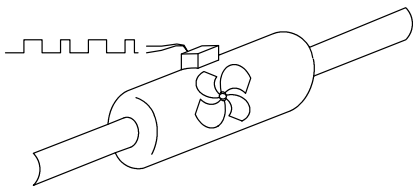
Magnetic Pulse Input Module

Overview

The F4-8MPI is an eight-channel Magnetic Pulse Input CoProcessor Module. It is designed to take input pulses from Hall effect type magnetic pick-ups, (typically found on turbine meters, tachometers and signal generators), and perform calculations. Up to eight differential inputs from magnetic pickups are wired directly to the terminal block on the front of the module.

The Magnetic Pulse module is based on the FACTS Engineering CoProcessor design. Therefore, it offers a built-in real-time battery-backed clock/calendar and a very fast floating point processor. Because of this powerful design, it can easily support Indicated Volume, Gross Volume, Volume Logging, Flow rate, and Tachometer modes. These operational modes are explained in the adjacent chart.



Specifications	
Module Type	CoProcessor, Intelligent
Number of Channels	Eight Differential per module
Modules per CPU	Eight Maximum, any slot in CPU base
Input Voltage Range	±10mV to ±10VDC peak
Input Frequency Range	DC to 5.0kHz (channels 1 to 4) DC to 2.5kHz (channel 5 to 8)
Maximum Continuous Overload	-150 to +150VDC, 220 Vrms
Input Impedance	100KΩ
Differential Low – Pass Filter	f_{-3db} = 20kHz, 6db per octave roll-off
Common Mode Voltage Range	±15VDC
Common Mode Rejection	Over common mode input voltage range
Update Time	3 PLC scans minimum
Isolation	750VDC, channels to PLC
LED Status Indicators	Power ON, Input Pulse (8 LEDs)
Field Termination	20 position removable terminal block 16 positions, ±CHn, Pulse inputs 2 positions, 24 VDC power supply
External Power Required	170mA maximum, +18 to +25VDC
Internal Power Consumption	225mA from 5VDC maximum
External Power Required	170mA maximum, +18 to +25VDC
Internal Power Consumption	225mA from 5VDC maximum
Operating Environment	0°C to 60°C (32°F to 140°F)/5% to 95% humidity (non-condensing)
Manufacturer	FACTS Engineering

Modes	
Indicated and Gross Volume	
Configuration	The module calculates Indicated Volume of flow given a K Factor. The K Factor is the nominal pulses per unit for the flow meter. This is the factory calibration number normally stamped on the flow meter housing. Indicated volume may be in pulses, gallons, dm^3 , or barrels depending on the K Factor. Gross Volume may also be calculated by substituting for the K Factor, the K Factor divided by the Meter Factor (Meter Factor is the calibration factor derived at the installation).
Output Data	Total volume of flow is output to the PLC in engineering units. The formulas used to calculate volume are: Indicated Volume = Total Pulses ÷ K Factor Gross Volume = Total Pulses ÷ (K Factor/Meter Factor)
Flow Rate	
Configuration	The flow rate calculation uses the same configuration information as the Volume calculation. The sample rate may range from .1 to 999.9 seconds, or minutes.
Output Data	Flow rate is output to the PLC in engineering units. The formula used to calculate flow rate is: (Volume last sample time – Current Volume) ÷ Sample Rate.
Volume Logging	
Configuration	Indicated or gross volume may be logged at either a particular time or at periodic intervals throughout the day. If desired, the counters may be automatically reset when the data is logged. The built-in real time battery-backed clock calendar must be set before volume logging is enabled.
Output Data	Indicated or gross volume is output to the PLC in engineering units. A one-shot flag is also set to indicate to the PLC that new data has been logged.
Tachometer	
Configuration	Tachometer applications are simply a variation of the flow rate calculation. To calculate revolutions per minute, set the K Factor equal to the number of pulses per revolution multiplied by 60. Set the Sample Rate equal to one second. To calculate pulses per second (PPS), set the K Factor equal to one and the Sample Rate equal to one second.
Output Data	RPM or PPS