

Factory Interface Module (FIM)

The Factory Interface Module is an optional component that provides digital and analog (4-20mA) input and output (I/O) to allow interfacing the EMS-10 to a factory data system and/or to acquire additional sensor signals. Analog inputs can be used to acquire data from an external sensor (flow, temp, etc.). Analog outputs can be used to transmit concentration data to a factory data system. Digital outputs can be used to indicate health, state or gas alarm status.

The 8/6/6 Module has 8 Digital relay outputs, 6 analog inputs and 6 analog outputs.

The 8/2/2 Module includes 8 digital relay outputs, 2 analog inputs and 2 analog outputs.

Modbus TCP/IP is included in the MAX-Acquisition control software, even if the FIM is not purchased.

Factory Interface Module Setup

Digital Outputs

Digital outputs from the FIM are relays with both normally open (N.O.) and normally closed (N.C.) terminals. The operator can wire to either the N.O. or N.C. terminals, depending on how they want the logic to work for their factory data system. A Failsafe setting in the software configuration defines how the relays will behave during normal operation. If Failsafe is False, then the relay will be turned on when the defined condition occurs. If Failsafe is True, then the relay will be turned off when the defined condition occurs and will be on otherwise.

Typically, the operator would wire to the N.C. terminal with Failsafe=True. The relay would then be closed when the alarm state is true and would be open when the alarm state is false. The relay would also be closed when the system is powered down.

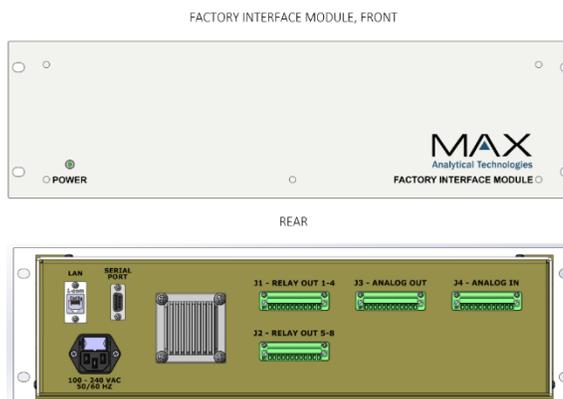
If Failsafe=False, then the operator would wire to the N.O. terminal. The relay would be closed when the alarm state is true and would be open when the alarm state is false. However, the relay would also be open when the system is powered down.

Analog Outputs

The FIM is equipped with isolated 4-20 mA current loop outputs that can be configured in the software to output gas concentrations or other data as desired. The native unit ranges for the 4-20 mA output ranges are defined in the software. The current loop outputs are passive, and the loop power should be provided externally. Typically, +24 VDC is connected to the (+) terminal, and the data system load and sensing are connected to the (-) terminal.

Analog Inputs

The FIM is equipped with isolated 4-20 mA current loop inputs that can be configured in the software to acquire analog signals from auxiliary sensors or equipment. The EMS-10 software can acquire and use these data together with the FTIR data. The native unit ranges for the 4-20 mA input ranges are defined in the software. The current loop inputs are passive, and the loop power should be provided externally. Typically, an active 4-20 mA signal would be connected to the (+) terminal, and the system ground would be connected to the (-) terminal.

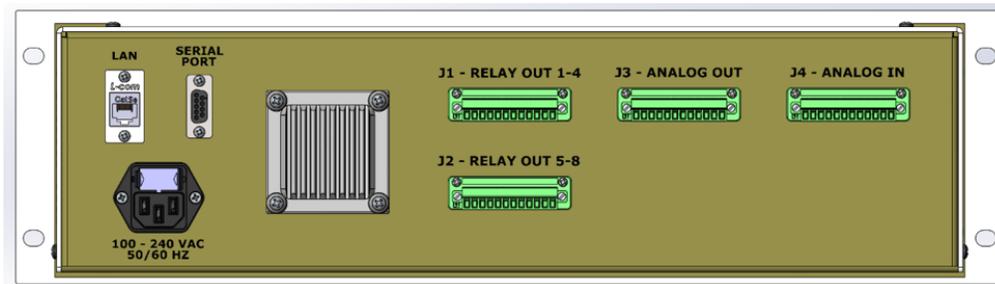


Alternatively, a passive (sinking) 4-20mA signal line would be connected to the (-) terminal with +24 VDC connected to the (+) terminal.

Hardware Connections

Connections to the Factory Interface Module should be made using 16-28 AWG wire with 0.5A maximum current. Before wiring the FIM, refer to the operating manual for a detailed map of pin positions.

FACTORY INTERFACE MODULE, REAR

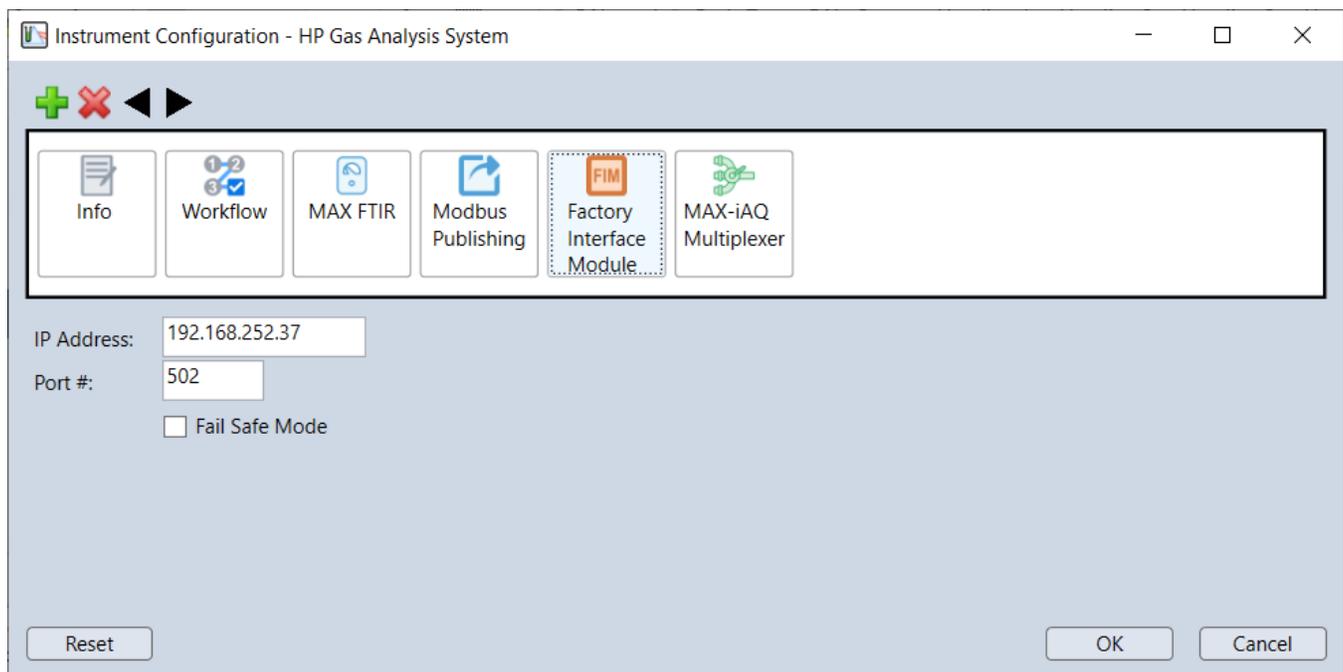


MAX-Acquisition Software Setup

FIM Connection Configuration

IP Address 192.168.252.37
TCP Port 502

The MAX-Acquisition software controls data acquisition and communication between all Max Analytical hardware modules. The Instrument Configuration below shows an example of the FIM within an integrated gas analysis system.



Example FIM Map

Note that variable data are assigned to digital and analog outputs based on the customer’s application, and that this is configurable in the MAX-Acquisition software as part of the Instrument Method. Refer to the MAX-Acquisition software setup instructions in the Operating Manual or contact Max Analytical Technologies applications team for a custom FIM Map. The table below provides an example FIM map.

Analog Inputs				
Holding Register	Data	Min Data Value	Max Data Value	Data Type
1	O ₂ Concentration (%)	0	30	Float (Single)
2				
3				
4				
5				
6				
Analog Outputs				
Holding Register	Data	Min Data Value	Max Data Value	Data Type
1	O ₂ Concentration (%)	0	30	Float (Single)
2	Total Hydrocarbon (ppm)	0	1	Float (Single)
3	Benzene (ppm)	0	1	Float (Single)
4				
5				
6				
Digital Outputs				
Coil	Alarm			Data Type
1*	FIM Instrument Error			Boolean
2*	Valid Data			Boolean
3	Propane Calibration Check Failure			Boolean
4	Benzene Calibration Check Failure			Boolean
5	FTIR Maintenance Alert			Boolean
6	Laser Maintenance Alert			Boolean
7				
8				

*Digital Output coils 1 and 2 are fixed in the software, whereas coils 3-8 are configurable.