Infrared Gas Detection

Model D12-IR

Digital Gas Transmitter

ATI's Series D12 gas transmitter line now includes a versatile Infrared system that can be configured for LEL or select toxic gases. The D12-IR utilizes a compact IR sensor in a corrosion resistant housing with sintered flame arrestor to meet hazardous area classification requirements, and is suitable for most plant environments.

The D12-IR gas transmitter eliminates the poisoning problems inherent in catalytic bead sensors. While catalytic LEL sensors offer reliable service, the presence of silicon vapors, hydrogen sulfide, and halogenated hydrocarbons can quickly degrade sensor performance. Infrared sensing technology is not susceptible to these potential interferants, which means greater measurement stability and longer sensor life.

The D12-IR transmitter can also be configured with Infrared sensor for carbon dioxide (CO_2) or nitrous oxide (N_2O) detection. All sensor versions can operate in diffusion mode for ambient air or with a flow cell for pumped samples.

D12-IR Gas Transmitter

The D12-IR is available in four configurations:

Transmitter

For measurement and data transmission to remote display and alarm equipment, the D12-IR operates in 3-wire mode. Integral LCD indicates gas concentration as well as alarm conditions.

Transmitter with HART™

For plants operating with HART™ protocol communications systems, the D12-IR can be supplied with this option. Our HART™ output supports both 4-20 mA and constant current mode of operation.

Transmitter with Integral Relays

For systems requiring local alarm functions, or systems where discrete outputs are desired, the D12-IR can provide 3 relay outputs. Relays are assignable to any alarm setpoint or fault condition and are fully programmable for setpoint, hysteresis, and time delay.
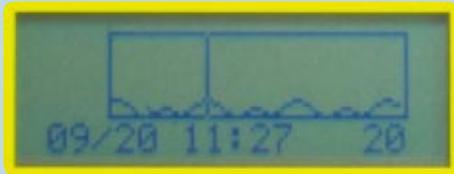
Transmitter with Modbus™

When RS-485 communication is desirable, D12-IR transmitters with alarm relays can be supplied with a Modbus™ interface. Software supports up to 247 unique addresses for large system use.

Features For Every Application

• **LCD Graphics Display:** Gas concentrations are displayed in large, easy to read numbers. The display also provides alarm indication and complete menus for setting up operating parameters. A backlight is standard for good visibility in low light.

• **Internal Data Logger:** Measured gas values are stored at user definable intervals and can be recalled when needed on the LCD display. Data can be downloaded using the MOD-BUS™ interface.

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• **Non-Intrusive Operation:** Operating functions such as calibration, alarm setup, alarm reset, data view, and setup options are all available using a magnetic tool. It is not necessary to open the enclosure when making adjustments.

• **Password Protection:** Program settings stored in the transmitter may be protected by a user selectable 4-digit password. Operators may still review all functions, but changes may only be made by authorized personnel.

• **Modular Electronics:** The D12 electronic assembly plugs easily into the power supply board in the base of the enclosure. Transmitters can be removed for wiring and quickly replaced in the event of a fault condition.

• **Explosion Proof Enclosure:** Transmitters are designed for operation in hazardous areas. The cast aluminum housing for the D12 transmitter is rated for Class 1, Division 1, Group B, C, D locations and is UL, FM, and CSA certified.

• **Scalable 4-20 mA:** The output range for a particular sensor is programmable within the range boundaries set in that sensor.

• **Explosion-proof Sensor Design:** Infrared sensing element is protected by stainless steel housing and flame arrestor

• **Fail-safe Sensor Operation:** Because the IR sensor is always in an active state, the transmitter continuously monitors critical sensor functions and indicates any sensor problems, both on the display and via the analog output.

• **High Range Methane Measurement:** D12-IR transmitters can be factory calibrated for volumetric methane measurements in special applications. Ranges from 0-10% to 0-100% by volume are available. A separate sensor is also available for high percent level measurements of heavier hydrocarbons such a butane and propane.

• **Sensor Calibration History:** Each time a sensor is zeroed or spanned, the data is stored in memory. Calibration history can be recalled and sensor condition reviewed by operating personnel when necessary.

• **Three Internal Alarm Relays:** Optional relay outputs can be used for local alarm functions. All relays are programmable for setpoint, hysteresis, on-delay, off-delay, and other variables. Even a remote reset feature is provided for in the transmitter design.

• **Analog Output Simulation:** Transmitter analog output can be set to user definable values. This provides for complete loop testing without the need to apply gas to the sensor.

• **Relay Output Simulation:** Alarm relays may be activated on command to allow testing of local alarm devices. Any combination of relays may be activated based on operator selection. Output and alarms may also be inhibited for maintenance and calibration.

• **Serial Communication Interface:** The transmitter is available with either HART™ or MODBUS™ protocol. The HART™ protocol supports the HART™ Universal and Common Practice Commands at 1200 baud using the Bell 202 FSK modem standard. The MODBUS™ protocol supports 9600 baud access to concentration and status information, and supports alarm setup and many other functions on either RS485 or RS232 (software selectable). Comes with a register/tag database on a 3-1/2" diskette

Specifications

Gas Type:	Combustible gas, carbon dioxide, volumetric methane, or nitrous oxide Combustible gas selectable for methane, ethane, propane, or butane
Sensor Type:	Single path Non-dispersive Infrared (NDIR)
Sensor Separation:	Maximum 25' cable from sensor to transmitter
Range:	Combustible Gas: 0-50% LEL min., 0-100% max., or 0-100% V/V methane High Hydrocarbon: 0-10% min., 0-100% max. V/V for heavier hydrocarbons Carbon Dioxide: 0-2000 PPM min., 0-50% max. Nitrous Oxide: 0-2000 PPM min., 0-1% max
Response Time:	90% in 10 seconds
Accuracy:	Generally ±5% of value, but limited by available calibration gas accuracy
Electronic Repeatability:	±1%
Electronic Linearity:	±0.5%

Zero Drift:	Less than 1% full scale per month, non-cumulative
Span Drift:	Dependent on operating environment but generally less than 1% per month
Analog Output:	4-20 mA, 675 ohms maximum at 24 VDC
Serial Interface:	HART™ (1200 baud modem interface) MODBUS™ (1200-9600; RS-232 or RS-485; s/w selectable)
Power:	12-30 VDC, 350 mA maximum, 3-wire connection
Optional Alarm Relays:	Three SPST, 5 A @ 230 VAC resistive
Relay Coil:	Programmable either normally energized or normally de-energized
Enclosure:	Explosion-proof, Class 1, Div. 1, Groups B, C, & D
Controls:	Four magnetic switches on front of transmitter
Operating Temperature:	-40º to +75ºC
Weight:	4 Lbs (1.8 Kg)

Ordering Information:
Model D12IR-E-F-G Gas Transmitter

Suffix E – Transmitter Type
   1 – Integral sensor, no relays
   2 – Integral sensor, with relays
   3 – Remote sensor, no relays
   4 – Remote sensor, with relays

Suffix F – Gas & Range
   1 – Combustible Gas, 50%/100% LEL
   2 – High Hydrocarbon, 100% V/V
   3 – CO_2, 1%/5% by volume
   4 – CO_2, 5%/50% by volume
   5 – N_2O, 1% by volume

Suffix G – Digital Output
   1 – None
   2 - MODBUS™ (requires alarm Suffix A)
   3 - HART™ Interface

Accessories
   00-0258 Calibration Adapter
   00-0261 Splash Guard/ Remote Calibration Adapter
   00-0298 Sensor Flow Cell

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