

PO Box 8067
The Woodlands, TX 77387
888-367-4286 (toll free)
281-367-4100
281-292-2860 (fax)
sales@detcon.com



Model Series 12

SINGLE SENSOR CONTROL CARD Gas Detection Alarm & Control Systems



Catalog #12-0105

www.detcon.com

ISO 9001:2000 • Certified

Model Series 12 Control Systems

Description

Detcon Model Series 12 gas detection and alarm systems consist of single sensor control cards that can be integrated into one system design to create multi-function monitoring and control of a wide range of field devices. Field devices include gas detection sensors, flame and fire detection devices and process sensors. Each control card is capable of supervising a single field device, displaying the current status of that device and providing alarm relay outputs once user-configured limits are detected. Gas detection control modules display the real time concentration of a wide range of toxic gases, combustible gas, and oxygen sensors that output a 4-20 milliamp signal. The flame detection module displays the real time status of any flame detector with a 4-20 milliamp output signal. The alarm annunciator module can be used to monitor smoke and thermal detectors, pull stations, and dry contact closure devices.

Model Series 12 single sensor control cards feature four alarm relays. Three relays are used as active alarm control outputs and the fourth relay is a fault condition relay. Each alarm relay is adjustable in single digit increments across the range of sensitivity. Alarm relays can be user-configured as latching, non-latching, normally energized or normally de-energized via simple onboard programming jumpers. Front panel indicators include alarm status LEDs and a 7-segment LED digital display of the real time concentration of a field device when applicable. Each module is addressable via RS-485 serial communication.

Detcon manufactures a variety of pre-engineered Model 12 Series mainframe hardware assemblies including NEMA 1 panel mount, standard 19" rack mount, NEMA 4X weather-proof and NEMA 7 explosion-proof. Engineering services for high density integrated fire, gas and process control systems are available from the factory.

Typical Applications

- ▶ Oil and Gas Drilling and Production
- ▶ Oil and Gas Treating Plants
- ▶ Refining Chemical and Petrochemical Plants
- ▶ Automotive Industry
- ▶ Food and Beverage Processing
- ▶ Power Generation Plants
- ▶ Pulp and Paper Mills
- ▶ Underground Mining
- ▶ Water and Wastewater Treatment

Monitoring and Control Options

Gas Detection Sensor Technology

- ▶ **Combustible Gas**
Catalytic & Infrared
- ▶ **Hydrogen Sulfide Gas**
Solid State MOS & Electrochemical
- ▶ **Toxic Gas**
Electrochemical & Photo Ionization
- ▶ **Oxygen Deficiency/Enrichment**
Air Battery Electrochemical

Process Controls

- ▶ Pressure
- ▶ Temperature
- ▶ Humidity
- ▶ Flow
- ▶ Level

Safety Controls

- ▶ Intrusion
- ▶ Thermal
- ▶ Smoke
- ▶ Flame

Anatomy of a Model 12 Series Single Sensor Control Card

Color Banding Label
Yellow-H2S, Orange-LEL, Blue-Toxic, Green-O2, Red-Flame →

LED Indicator
Flashes in Over-range →

Alarm & Fault LEDs →
Alarm Disable Switch →

Design Features

Single Sensor Control Cards

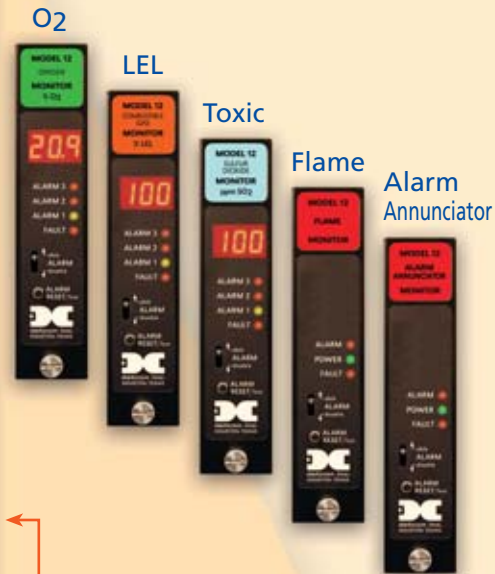
- ▶ Modular Front Panel Plug-in Design
- ▶ Standard Outputs: 4-20mA, RS-485 Modbus
- ▶ Programmable Relay Outputs: 3 Alarms plus Fault
- ▶ Control Module Status Accessible via RS-485
- ▶ Alarm Reset & Alarm Silence
- ▶ Alarm Disable for Calibration
- ▶ Full Diagnostics for Sensor Inputs & Field Wiring
- ▶ Test Function Simulation for Verifying Operation
- ▶ Five Year Fixed-Fee Service Policy

Control Enclosures

- ▶ 4 to 12 Channel Packaging
- ▶ Motherboard has External Common Reset Switch
- ▶ Relays Programmable for Discrete, Common or Zoned



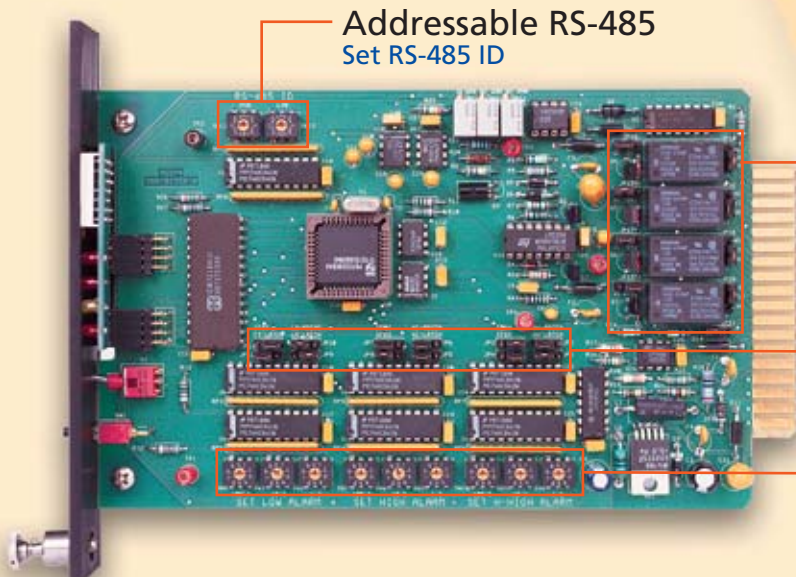
← Actual Size



← Alarm Reset Switch

← Test Switch
Displays Alarm Set Points,
RS-485 ID, Activates Test Function

← Locking Hardware
Secures modular Model 12 to
control enclosure card cage



Alarm Relays
Provide discrete, jumper programmable, normally open or normally closed contacts. Jumper programmable for normally energized or normally de-energized.

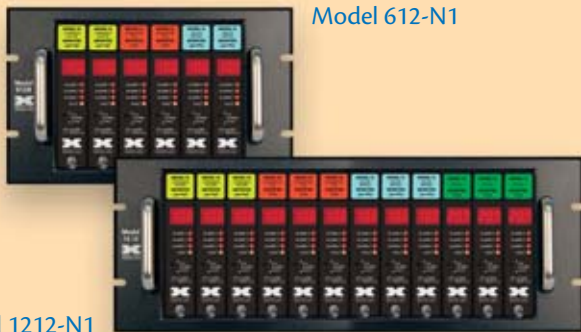
Alarms 1, 2, & 3
Jumper programmable to operate as ascending or descending alarms. All alarms are jumper programmable for latching or non-latching.

Alarm Set Points
Alarms 1, 2, and 3 are rotary switch programmable in single digit increments.

Pre-Engineered System Packaging

Detcon Model 12 single sensor control cards can be used with a number of pre-engineered system packages consisting of mainframe hardware assemblies that accommodate from 4 up to 12 control cards. Each mainframe hardware assembly consists of a ruggedly constructed card cage, and motherboard with all I/O terminal strips and alarm zoning jumpers.

NEMA-1 Panel and Rack Mount Assemblies



Model 612-N1

Model 1212-N1

NEMA 4X Weatherproof Enclosures



Model 412-N4X

Model 812-N4X

Model 1212-N4X

Model 612SS-N4X

NEMA 7X Weatherproof Explosion Proof Enclosures

Model 412-N7



Project Specific Engineered Systems

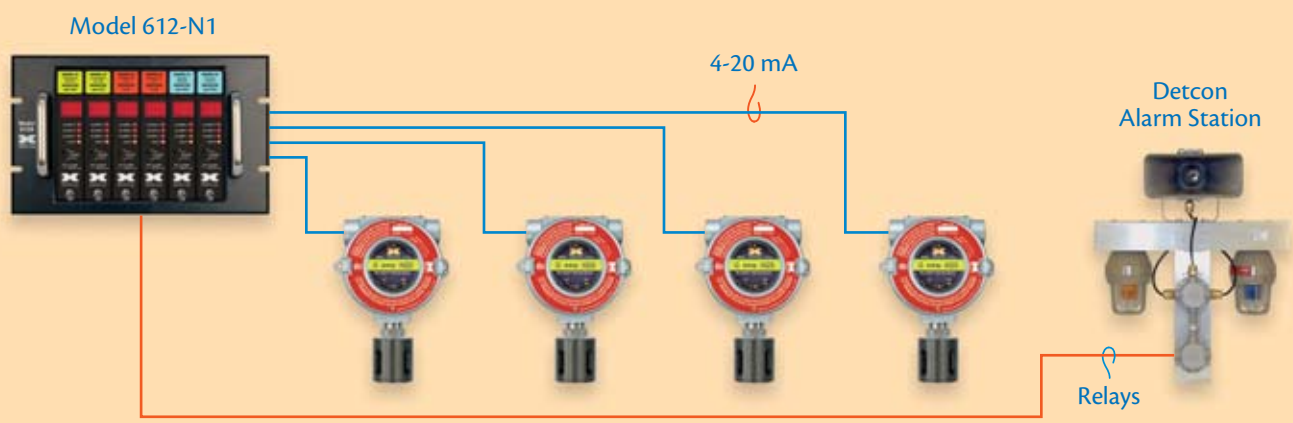
- ▶ Hardwire & PLC based Systems
- ▶ Addressable & PC MMI Systems
- ▶ Field device selection and location
- ▶ Installation drawings and details
- ▶ Cabinet design and manufacture
- ▶ System start-up, training & after sale support



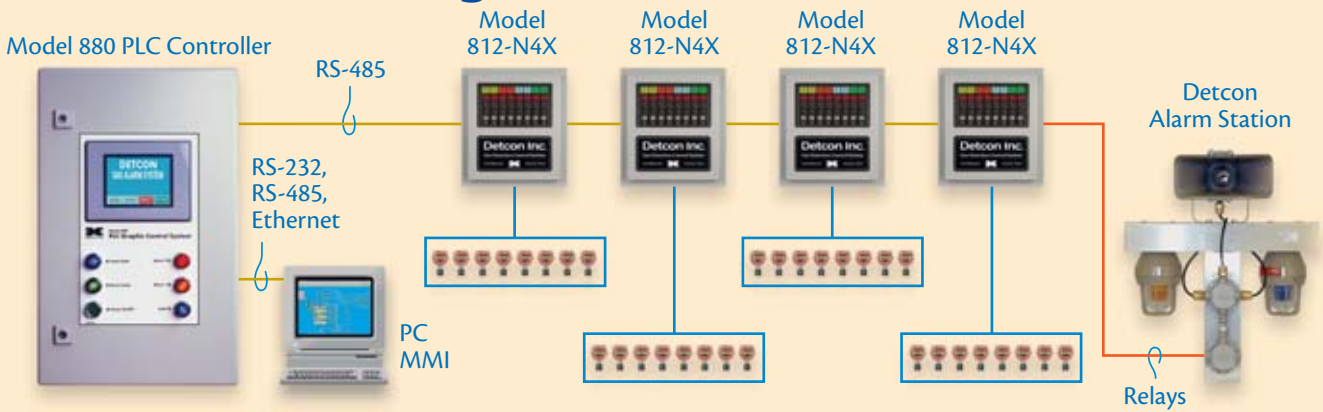
Installation & Integration Options

Model 12 Series control systems integrate directly with hardwire 4-20 mA inputs from field devices. All models offer discrete relay outputs for each sensor and provide the ability for relays to be set up as zoned or common. The RS-485 serial output can be connected to any DCS, PLC or SCADA host control device. The RS-485 serial output is also used to drive optional remote Read-Only Displays. Typical integration configurations are shown below.

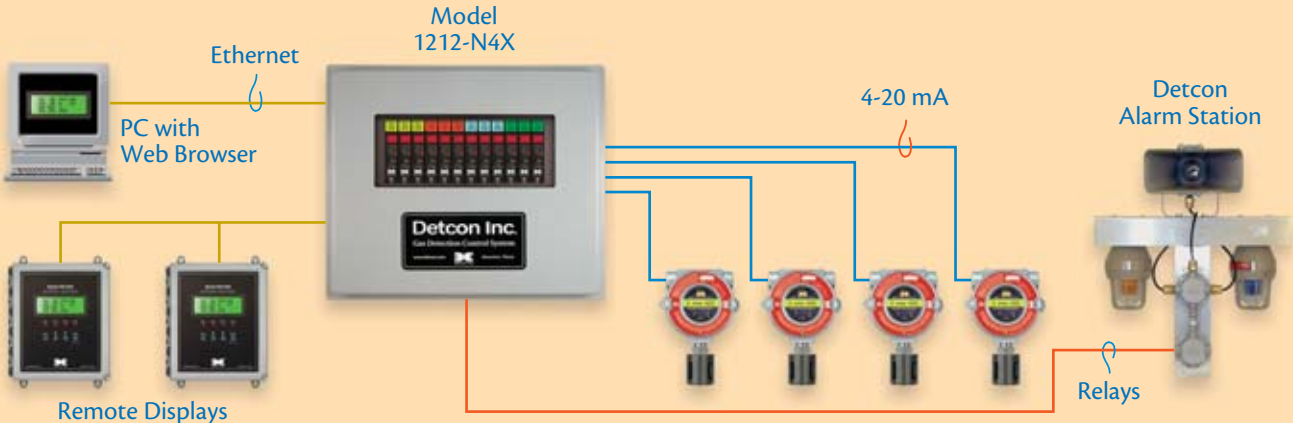
4-20 mA and Alarms



Serial Networking



Remote Display Capabilities



Ordering Information

Model 12 - Single Sensor Control Cards

Gas Type	Model Number	Standard Range*
Acetyldehyde	C2H3O-12	0-100 ppm
Acetylene	C2H2-12	0-100 ppm
Acrylonitrile	C3H3N-12	0-100 ppm
Ammonia	NH3-12	0-100 ppm
Arsine	AsH3-12	0-1 ppm
Bromine	Br2-12	0-5 ppm
Butadiene	C4H6-12	0-100 ppm
Carbon Dioxide	CO2-12	0-1 %
Carbon Monoxide	CO-12	0-100 ppm
Chlorine	Cl2-12	0-10 ppm
Chlorine Dioxide	ClO2-12	0-1 ppm
Combustible Gas	CG-12	0-100 % LEL
Diborane	B2H6-12	0-5 ppm
Ethanol	C2H5OH-12	0-100 ppm
Ethyl Mercaptan	C2H5SH-12	0-100 ppm
Ethylene	C2H4-12	0-100 ppm
Ethylene Oxide	C2H4O-12	0-100 ppm
Fluorine	F2-12	0-1 ppm
Formaldehyde	CH2O-12	0-100 ppm
Germane	GeH4-12	0-2 ppm
Hydrazine	N2H4-12	0-1 ppm
Hydrogen	H2-12	0-100 ppm
Hydrogen Bromide	HBr-12	0-30 ppm
Hydrogen Chloride	HCl-12	0-30 ppm
Hydrogen Cyanide	HCN-12	0-30 ppm
Hydrogen Fluoride	HF-12	0-10 ppm
Hydrogen Sulfide	H2S-12	0-100 ppm
Methanol	CH3OH-12	0-100 ppm
Methyl Mercaptan	CH3SH-12	0-100 ppm
Nitric Oxide	NO-12	0-100 ppm
Nitrogen Dioxide	NO2-12	0-10 ppm
Ozone	O3-12	0-1 ppm
Oxygen	O2-12-12	0-25%
Phosgene	COCl2-12	0-1 ppm
Phosphine	PH3-12	0-5 ppm
Silane	SiH4-12	0-50 ppm
Sulfur Dioxide	SO2-12	0-20 ppm
Vinyl Acetate	C4H6O2-12	0-100 ppm
Vinyl Chloride	C2H3Cl-12	0-100 ppm
*For measurement ranges other than standard, contact the factory.		
Alarm Annunciator	A-12	
Flame	FL-12	

NEMA 1 Rack/Panel Mount Enclosures

Model Number	Description
612-N1-24VDC	6 Channel (requires external 24 VDC power supply)
1212-N1-24VDC	12 Channel (requires external 24 VDC power supply)

NEMA 4 Weatherproof Enclosures

412-N4X	4 Channel with Line Power Supply (in fiberglass enclosure)
812-N4X	8 Channel with Line Power Supply (in fiberglass enclosure)
1212-N4X	12 Channel with Line Power Supply (in fiberglass enclosure)
612SS-N4X	6 Channel with Line Power Supply (in stainless steel enclosure)
1212SS-N4X	12 Channel with Line Power Supply (in stainless steel enclosure)

NEMA 7 Hazardous Environment Enclosures

Contact the factory for NEMA 7 enclosure specifications and availability.

Accessories

Description	Part No.
Model 12 Blank Plate	912-000008-005
PS-172 Rack Mount Power Supply (24 VDC, 172 Watt)	975-124172-110
PS-288 Rack Mount Power Supply (24 VDC, 288 Watt)	975-124288-110

Specifications

Single Sensor Control Cards

Range

Ranges can be set from 1 ppm/% up to 1000 ppm/% (in increments of 1 ppm/%)

Accuracy/Repeatability

± 2% F.S.

Operating Temperature Range

-40°F to +167°F; -40°C to +75°C

Input Voltage

24 VDC standard, 12 VDC optional

Power Consumption (per channel)

<3 watt (normal), 5 watts (full alarm)

Outputs

Analog 4-20 mA DC

Serial RS-485 Modbus™

Relays

Alarm 1, Alarm 2, Alarm 3, Fault

Jumper selectable Form "A" or Form "B"

Contacts rated for 5 amps @ 30 VDC, 250 VAC

Control Enclosures

Electrical Classification

NEMA 1 (612-N1-24VDC, 1212-N1-24VDC)

NEMA 4X (412, 812, 1212-N4X)

NEMA 4X (612SS-N4X, 1212SS-N4X)

NEMA 7 (see order guide)

Dimensions

11.5"W x 7"H x 8.75"D (612-N1-24VDC)

19"W x 7"H x 8.75"D (1212-N1-24VDC)

16"W x 18"H x 10 1/2"D (412, 812-N4X)

25 1/2"W x 23"H x 10 1/2"D (1212-N4X)

NEMA 7 & SS NEMA 4X (consult factory)

Power Input

24VDC (612-N1-24VDC, 1212-N1-24VDC)

220VAC/110VAC/24VDC (all others)

Power Consumption

5 watts per channel (maximum load)

Includes gas sensor & control module

Outputs

Discrete analog 4-20 mA DC

Serial RS-485 Modbus™

Discrete or zoned alarm relays

Operating Temperature

-40° F to +167° F; -40° to +75° C

Warranty

Detcon Inc. warrants each new Model 12 Control Card and Control Enclosure to be free from defects in material and workmanship under intended normal use for a period of two years from the date of shipment to the original purchaser. All warranties are FOB the Detcon factory located in The Woodlands, Texas, USA.