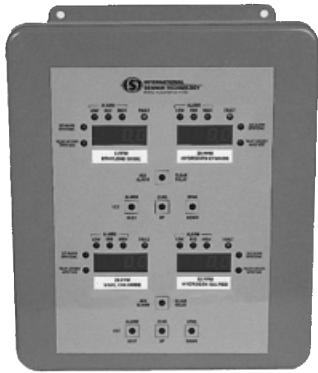


MP SERIES

# STATIONARY GAS MONITORING SYSTEMS

FOR THE DETECTION OF OVER 150  
TOXIC & COMBUSTIBLE GASES

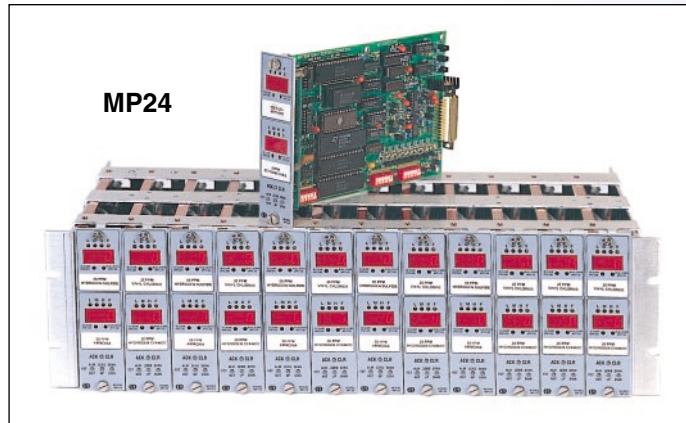
FOR AREA AIR QUALITY AND SAFETY APPLICATIONS








**MP 204**  
(4 CHANNEL)



**MP 202**  
(2 CHANNEL)



-  **MP202 & MP204:** Wall-mounted, weatherproof controllers with front door keypad. Available for 1 to 4 sensor channels.
-  **MP24:** 2-channel, rack-mounted version. Compact design allows up to 12 units (24 channels) to fit into a 19" rack or panel space.
-  **Automated One-Man Calibration.**  
Simply apply gas and the intelligent controller makes all necessary calibration adjustments!
-  **Three Sensor Types Available:** (*Solid State, Electrochemical, Catalytic Bead*)  
Detecting over 150 toxic and combustible gases.
-  **Additional Features Include:** Individual digital displays for each channel, 3 alarm set points for each channel, and individual or common alarm relays.



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*The Leader In Gas Detection Since 1972*



# MP SERIES COMPONENTS

IST's **MP Series** of instruments are stationary gas detection systems consisting of 3 major components: A microprocessor based control unit, sensor transmitters, and sensors. Different choices are available for each component, allowing you to configure the gas monitoring system which best meets your needs.

## CONTROL UNITS

Intelligent, microprocessor based MP Series control units are available in either wall-mounted or rack-mounted configurations.

### ■ MP202/MP204

The **MP202** and **MP204** are wall-mounted control units housed in weatherproof enclosures. The **MP202** is a two channel controller which can be used for 1 or 2 sensor channels, while the **MP204** is a four channel controller which can be used for up to 4 sensor channels. A front door keypad enables convenient operation of the controller without the need to open the enclosure.

### ■ MP24

The **MP24** is a rack/panel-mounted version of the **MP202**. It is a compact control unit which accepts 1 or 2 sensor channels. Up to 12 of these control units will fit into a 19" rack or panel space, for a total of 24 sensor channels.

### ■ MP220EX

The **MP220EX** is a two-channel, explosion proof, wall mounted, control unit rated for use in Class 1, Div. 1, Groups C, & D (B optional) hazardous areas. Operation via magnetic wand allows the unit to be operated without opening the cover, thereby ensuring that hazardous areas do not require declassification.

For all control units, a digital display of gas concentration is provided (for each sensor channel) and low, mid, and high alarm LED's indicate the presence of hazardous gas levels. 3 alarm relays and 1 fault relay common to all channels are also provided to trigger alarm devices (lights, horns, etc.). As an option, individual relays can be provided for each sensor channel. Relays can also be set up as failsafe and/or latching.

The **MP Series** units feature **automated calibration** which enables the sensor transmitters to be calibrated without removing any covers or adjusting potentiometers, resulting in a significant reduction in maintenance time and cost. During calibration, the **MP Series** controllers automatically compensate for any changes in the sensitivity of the sensor. Simply apply gas to the sensor and the control unit will make all necessary calibration adjustments! ***It couldn't be easier!***

## SENSOR TRANSMITTERS

Each **MP Series** unit also comes with sensor transmitters which are located in the field and send a linear 4-20 mA signal proportional to the gas concentration back to the control unit. **IST** offers two different types of sensor transmitters for use with the **MP Series** instruments, a standard transmitter and an intelligent transmitter.

### ■ STANDARD TRANSMITTER, MODEL SM95

The **Model SM95** is a sensor transmitter housed in an explosion-proof casing. It operates on 14-24 VDC which is supplied by the **MP Series** control unit and produces a linear 4-20 mA output proportional to the gas concentration. The 4-20 mA output is sent to the **MP Series** control unit, which displays the corresponding gas concentration.

Manual calibration is "*one man*" and is accomplished via potentiometers located inside the housing. However, when used in conjunction with the **MP Series** controllers, automated calibration is also available. With this feature, calibration can be accomplished by simply applying gas to the sensor and letting the controller make all the necessary adjustments.

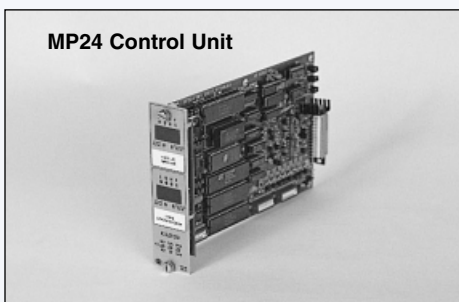
### ■ INTELLIGENT TRANSMITTER, MODEL 4-20 IQ

The **Model 4-20 IQ** is a microprocessor based intelligent sensor module. It comes equipped with a local digital display, thus providing a reading of the gas concentration at the sensor site itself. It operates on 14-24 VDC and, like the standard **SM95** transmitter, it is housed in an explosion-proof casing. Interfacing with the **4-20 IQ** is accomplished by applying a magnetic wand to magnetic switches located on the front panel. Thus, all functions can be performed without removing any covers, meaning there is no need to declassify areas being monitored.

The **4-20 IQ** is completely self-contained and can operate as a stand-alone unit. It does not require a control unit to operate. In addition to having a local digital display, it also has an automated calibration feature built into the unit and thus does not rely on the **MP Series** controller for automated calibration. However, when used in conjunction with the **MP Series** controllers, the controller provides alarm processing and alarm relays, and also a central monitoring location for multiple sensor channels. The **MP Series** controller will provide power to the **4-20 IQ**, and accepts the 4-20 mA linear output from the **4-20 IQ**.



MP204 with SM95 and 4-20 IQ transmitters



MP24 Control Unit



4-20 IQ

## SENSORS

**IST** offers 3 different types of sensors, each having certain advantages depending on the application. This gives you the flexibility to choose the best sensor(s) for your particular application. In all, sensors for over 150 different toxic and combustible gases are available to choose from, in concentration ranges from several ppm up to %LEL. The 3 sensor types are Solid State, Catalytic Bead, and Electrochemical. Generally, these sensors are intended for use in ambient air monitoring. If future needs require, **IST** sensor types can be easily retrofitted in the field. A brief description of each sensor type follows.

### SOLID STATE

Solid State sensors are made up of a heated metal oxide material which temporarily changes resistance in the presence of gas. Solid State sensors are available for the detection of over 150 different toxic and combustible gases, in ranges from low ppm to %LEL. A list of gases and ranges appears on the back of this brochure. Solid State sensors come with a 3 year warranty, and have a life expectancy in excess of 10 years.



### ELECTROCHEMICAL

Electrochemical sensors operate by producing a chemical reaction with the gas of interest. Sensors are available for certain toxic gases in ppm ranges, including: **NH<sub>3</sub>, CO, Cl<sub>2</sub>, H<sub>2</sub>, HCl, HCN, H<sub>2</sub>S, NO, NO<sub>2</sub>, O<sub>2</sub>, and SO<sub>2</sub>**. For some of these gases, electrochemical sensors can offer a fairly high degree of selectivity. Electrochemical sensors have a life expectancy of 1 to 2 years and come with a 1 year warranty.

### CATALYTIC BEAD

Catalytic bead sensors operate by burning combustible gases, raising the temperature of the sensor. This temperature rise changes the resistance of the sensor and produces a signal proportional to the gas concentration. They detect combustible gases in higher concentrations (above 1000 ppm) only. They are not selective and will respond to a wide range of combustible gases. However, since they only detect higher gas concentrations, they are not prone to interference from many toxic gases. Catalytic Bead sensors have a life expectancy of 2 years and come with a 1 year warranty.

# DESCRIPTION

*To help you select the most appropriate sensor for your application, contact **IST** to receive additional assistance and a copy of **IST's Sensor Selection Guide**.*

#### GENERAL SPECIFICATIONS

<b>Sensors:</b>	Accepts solid state, electrochemical, and catalytic bead sensors. Sensors operate with <b>IST's</b> standard and intelligent transmitters.
<b>Controls:</b>	4 pushbuttons, 3 DIP switches.
<b>Display:</b>	3 digit LED's/channel on <b>MP24</b> . 3-4 digit LED's/channel on <b>MP202</b> and <b>MP204</b> (depending upon range).
<b>Alarms:</b>	Low, Mid, High Alarm and Fault LED per channel.
<b>Relays:</b>	Common or Individual relays for low, mid, high alarm, and fault. Can be made failsafe, latching, or reset on acknowledge.

#### ELECTRICAL SPECIFICATION

<b>Power:</b>	<b>MP202/204:</b> 110/220VAC, 50/60 Hz. <b>MP24:</b> 110/220VAC, 50/60 Hz or 24VDC.
<b>CPU:</b>	Zilog Z-80, 12-bit A/D.
<b>Memory:</b>	32K EPROM. 2K non-volatile RAM.
<b>External Output:</b>	Optional 4-20 mA output per channel (linearized).
<b>Relays:</b>	3A Resistive, 220VAC max.

#### ENVIRONMENTAL SPECIFICATIONS

<b>Temp:</b>	-20°C to +50°C operating.
<b>Humidity:</b>	0 to 99% RH, non-condensing.

#### MECHANICAL SPECIFICATIONS

<b>Case:</b>	<b>MP24</b> — Rackmount <b>MP202 &amp; MP204</b> — NEMA 4X Weatherproof
<b>Size:</b>	<b>MP202 &amp; MP204</b> 13.6"H x 11.5"W x 5.0"D (345 x 292 x 127 mm) <b>MP24</b> (2 channel controller) 5.25"H x 1.4"W x 9.0"D (133 x 36 x 229 mm)

REPRESENTED BY:

## SOLID STATE SENSOR GAS LIST

The following gases are available for detection using IST's *Solid State Sensors*. The full-scale ranges listed are standard ranges available. For toxic gas monitoring, ranges are typically chosen which are higher than the TIV so that hazardous levels will be detected (TIV is defined as a SAFE level). For combustible gases, the typical range is 0-100 % LEL. Other ranges can also be provided—please contact IST for information. The following information is valid as of 3/95.

GAS	FULL-SCALE RANGES	GAS	FULL-SCALE RANGES
Acetic Acid	100, 200 ppm	Hexane	50, 100, 200, 2000, 2500, 3000 ppm, % LEL
Acetone	100, 200, 500, 1000, 5000 ppm, % LEL	Hexene	% LEL
Acetonitrile	100 ppm	Hydrazine	5, 10, 20, 100, 1000 ppm, 1% by Volume
Acetylene	50 ppm, % LEL, 3% by Volume	Hydrogen	50, 100, 200, 500, 1000, 2000, 5000 ppm, 3%, 5% by Vol., 2% to 100% LEL
Acrolein (Acrylaldehyde)	50 ppm	Hydrogen Bromide	50 ppm
Acrylic Acid	100 ppm	Hydrogen Chloride	50, 100, 200, 400, 500, 1000 ppm
Acrylonitrile	50, 60, 80, 100, 200, 500 ppm, % LEL	Hydrogen Cyanide	20, 30, 50, 100, 200, 1000, 10000 ppm
Allyl Alcohol	% LEL	Hydrogen Fluoride	20, 50, 100, 200 ppm
Allyl Chloride	200 ppm	Hydrogen Sulfide	5, 10, 20, 30, 50, 100, 300, 1000 ppm, % LEL
Ammonia	50, 70, 75, 100, 150, 200, 300, 400, 500, 1000, 2000, 2500, 4000, 5000 ppm, 1%, 2%, 10% by Vol., 10%, 25%, 100% LEL	Isobutane	1000, 3000 ppm, % LEL
Anisole	100 ppm	Isobutylene	% LEL
Arsenic Pentafluoride	5 ppm	Isopentane	1000 ppm
Arsine	1, 10 ppm	Isoprene	% LEL
Benzene	50, 75, 100, 1000 ppm, % LEL	Isopropanol	200, 400, 500, 1000 ppm, % LEL
Biphenyl	50%, 100% LEL	JP4	1000 ppm, % LEL
Boron Trichloride	500 ppm	JP5	1000, 5000 ppm, % LEL
Boron Trifluoride	500 ppm	Methane	100, 200, 1000, 1500, 2000, 5000 ppm, 1%, 2% by Volume, 100%, 200% LEL
Bromine	20 ppm	Methanol	200, 300, 400, 500, 1000, 2000, 5000 ppm, 15%, 30%, 100% LEL
Butadiene	50, 100, 3000 ppm, % LEL	Methyl Acetate	30 ppm
Butane	400, 1000 ppm, 100%, 200% LEL	Methyl Acrylate	60 ppm
Butanol	1000 ppm, 100% LEL	Methyl Bromide	20, 50, 60, 100, 500, 1000, 10000, 40,000 ppm
Butene	100% LEL	Methyl Butanol	% LEL
Butyl Acetate	100 ppm, % LEL	Methyl Cellosolve	% LEL
Carbon Disulfide	50, 60, 100 ppm, 5% by Volume	Methyl Chloride	100, 200, 300, 2000, 10000 ppm, % LEL
Carbon Monoxide	50, 100, 150, 200, 250, 300, 500, 1000, 3000, 5000 ppm, 3%, 5% by Volume, % LEL	Methyl Ethyl Ketone	100, 500, 1000, 4000 ppm, 100% LEL
Carbon Tetrachloride	50, 100, 10000 ppm	Methyl Hydrazine	5 ppm
Cellosolve Acetate	100 ppm	Methyl Isobutyl Ketone	200, 500, 2000 ppm, 50%, 100% LEL
Chlorine	10, 20, 50, 100, 200 ppm	Methyl Mercaptan	30 ppm
Chlorine Dioxide	10, 20 ppm	Methyl Methacrylate	100 ppm, % LEL
Chlorobutadiene	100% LEL	Methyl-Tert Butyl Ether	100% LEL
Chloroethanol	200 ppm	Methylene Chloride	20, 100, 200, 300, 400, 500, 600, 1000, 2000, 3000, 5000 ppm, % LEL
Chloroform	50, 100, 200 ppm	Mineral Spirits	200, 3000 ppm, % LEL
Chlorotrifluoroethylene	100% LEL	Monochlorobenzene	100% LEL
Cumene	100% LEL	Monoethylamine	30, 100, 1000 ppm
Cyanogen Chloride	20 ppm	Morpholine	500 ppm
Cyclohexane	100 ppm, 100% LEL	Naptha	1000 ppm, 100% LEL
Cyclopentane	50 ppm	Natural Gas	1000, 2000 ppm, 2%, 4% by Volume, % LEL
Deuterium	50%, 100% LEL	Nitric Oxide	20, 50 ppm
Diborane	10, 50 ppm	Nitrogen Dioxide	20, 50, 100 ppm
Dibromoethane	50 ppm	Nitrogen Trifluoride	50, 500, 1000 ppm
Dibutylamine	100% LEL	Nonane	2000 ppm
Dichlorobutene	1% by Volume	Oxygen	25% by Volume
Dichloroethane (EDC)	50, 100 ppm, % LEL	Pentane	200, 1000 ppm, % LEL
Dichlorofluoroethane	100, 1000 ppm	Perchloroethylene	200, 1000, 2000, 20000 ppm
Dichloropentadiene	50 ppm	Phenol	100 ppm
Dichlorosilane	50, 100 ppm	Phosgene	50 ppm
Diesel Fuel	50 ppm, 100% LEL	Phosphine	3, 5, 10, 20, 30, 50 ppm
Diethyl Benzene	100% LEL	Phosphorus Oxychloride	200 ppm
Diethyl Sulfide	10 ppm	Picoline	% LEL
Difluorochloroethane	100% LEL	Propane	100, 1000 ppm, 100% LEL
Difluoroethane (152A)	100% LEL	Propylene	100, 200, 1000, 5000 ppm, %LEL
Dimethyl Ether	100% LEL	Propylene Oxide	100 ppm, % LEL
Dimethylamine (DMA)	30, 50 ppm	Silane	10, 20, 50 ppm
Epichlorohydrin	50, 100, 500, 1000 ppm	Silicon Tetrachloride	1000 ppm
Ethane	1000 ppm	Silicon Tetrafluoride	1000 ppm
Ethanol	200, 1000, 2000 ppm, % LEL	Styrene	200, 300 ppm, % LEL
Ethyl Acetate	200, 1000 ppm, % LEL	Sulfur Dioxide	50, 100 ppm
Ethyl Benzene	200 ppm, % LEL	Tetrahydrofuran	200, 300, 1000 ppm, % LEL
Ethyl Chloride	100 ppm, % LEL	Tetraline	100 ppm
Ethyl Chlorocarbonate	1% by Volume	Toluene	50, 100, 200, 500, 2000, 5000 ppm, % LEL
Ethyl Ether	100, 800, 1000 ppm, % LEL	Toluene Diisocyanate	15 ppm
Ethylene	100, 1000, 1200 ppm, % LEL	Trichloroethane	50, 100, 500, 1000 ppm, 1% by Volume
Ethylene Oxide	5, 10, 20, 30, 50, 75, 100, 150, 200, 300, 1000, 1500, 2000, 3000 ppm, % LEL	Trichloroethylene	50, 100, 200, 300, 500, 1000, 2000 ppm, %LEL
Fluorine	20, 100 ppm	Triethylamine (TEA)	100 ppm
Formaldehyde	15, 50, 100, 500, 1000 ppm	Trifluoroethanol	25, 100 ppm
Freon-11	1000, 2000, 5000 ppm	Trimethylamine (TMA)	50 ppm
Freon-12	1000, 2000, 3000 ppm	Tungsten Hexafluoride	50 ppm
Freon-22	100, 200, 500, 1000, 2000 ppm	Turpentine	% LEL
Freon-113	100, 200, 500, 1000, 2000 ppm, 1% by Vol.	Vinyl Acetate	1000 ppm, % LEL
Freon-114	1000, 2000, 20000 ppm	Vinyl Chloride	20, 50, 100, 200, 400, 500, 1000, 4000, 10000 ppm, 10%, 100% LEL
Freon-123	1000 ppm	Vinylidene Chloride	50 ppm
Fuel Oil or Kerosene	100% LEL	Xylene	100, 200, 300, 1000 ppm, 1% by Volume
Gasoline	100, 1000, 2000, 20000 ppm., % LEL		
Germene	10, 50 ppm		
Heptane	1000 ppm, % LEL		



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