

# DET+ / DET+(LV)

## DETONATION SENSING MONITOR FOR USE WITH PLC+ PANELS

- **Compatible with most Altronic digital ignition systems to offer automatic timing retard when a cylinder is experiencing detonation events**
- **Automatic load reduction and engine shutdown functionality**
- **Monitors up to 16 engine cylinders for misfire or detonation events**
- **User selectable communication protocols: EtherNet/IP™ or Modbus/TCP**
- **Uses low-cost automotive, piezoelectric vibration sensors as system inputs**
- **Specifically designed for incorporation in PLC+ panels**
- **Pluggable connectors with convenient push-in spring-cage connections**
- **On board diagnostic LEDs**
- **Din-Rail mounted**
- **Built-in bad sensor diagnostic**

The Altronic Detonation Sensing Monitor, DET+ or DET+(LV), is a 32-bit, microprocessor-based, electronic instrument designed for use as a component of a PLC+ Control Panel, or as a stand-alone product. PLC+ panels use one or more such devices for engine control and monitoring. All functions can be controlled by a single human-machine interface (HMI) which typically is an Altronic MIDAS display (or equivalent). The HMI can display detonation and misfire reference level numbers, engine cylinder labels, control and output switch status, the cause of shutdown log, and all diagnostic messages.

The DET+ or DET+(LV) protects industrial engines systems from damage caused by misfire and detonation. The monitor accepts industry standard, low cost, broad band, piezoelectric vibration sensors that are mounted directly on each cylinder and convert combustion vibrations into electrical signals which are then evaluated by the DET+ or DET+(LV) on a cycle-by-cycle basis. The resulting vibration levels are internally compared to user-defined misfire and detonation setpoint to determine if a misfire or detonation event occurred in one of the cylinders during the last cycle. If one of the setpoints is violated then the DET+ or DET+(LV) system can be configured to take a number of control actions to protect the monitored engine system.

Typically, upon recognition of a detonation event, the DET+ or DET+(LV) will utilize one of two solid-state output switches to activate an external unloader which can reduce the engine's load. If reducing the engine's load proves to be unsuccessful in eliminating the detonation issue then the DET+ or DET+(LV) can be configured (when used in conjunction with a digital ignition system) to automatically retard the ignition timing. In the event that reducing the engine's load and retarding the engine's timing both are ineffective in eliminating the detonation issue then the second output switch—typically tied to a digital annunciator or other monitoring device—acts as a final safety measure to shut down the engine to prevent consequential engine damage.

With each input channel operating independently of the other, the DET+ or DET+(LV) accepts up to 16 detonation sensors that are wired to pluggable connectors with convenient push-in spring-cage connections and the recommended configuration is one sensor per cylinder. Also, the DET+ or DET+(LV) offers user selectable communications protocols—EtherNet/IP™ or Modbus/TCP which are native to the device allowing the misfire or detonation data from each channel to be communicated to a control PC/PLC or remotely as a means of determining the overhaul health and well-being of the engine system.



## Specifications

Power Requirement.....	10-32VDC, 0.30 AMP max.
Ambient Temperature Range .....	-40°C to 85°C (-40°F to 185°F)
Sensors .....	Up to 16
Sensor Type	Piezoelectric Vibration Sensor, Altronic 615107, Bosch 0 261 231 148 or equivalent
Sensor Scan Rate .....	On Firing Event
Output Switch .....	2 programmable, solid-state, rated 200VDC, 0.2 AMP continuous, optically isolated from power supply, one for Alarm, one for Shutdown
Outputs .....	2
Current Loop Output .....	4-20mA
Switch Configurations.....	NC/NO, Failsafe/Shelf
Communications.....	Ethernet Port (RJ45)
Hazardous Area Classification .....	Class I, Div. 2, Groups C & D for direct hook-up, Temp Code T4, max ambient temp 85°C

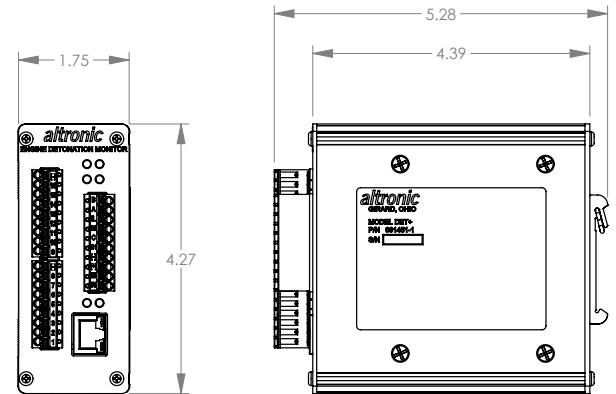
## Ordering Information

Detonation Sensing Monitor <sup>1</sup> .....	DET+
Detonation Sensing Monitor <sup>2</sup> .....	DET+(LV)
Vibration Sensor .....	615107
Sensor Cable, 10' .....	693134-1
Sensor Cable, 20' .....	693134-2
Sensor Cable, 30' .....	693134-3
Sensor Cable, 40' .....	693134-4
Sensor Cable, 50' .....	693134-5
Sensor Cable, 100' .....	693134-6

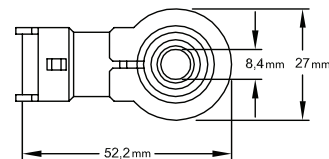
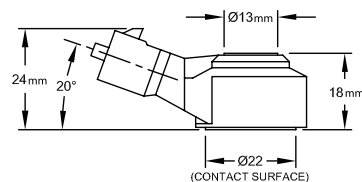
<sup>(1)</sup> For engines equipped with Altronic CD200, DISN, or CPU-95 ignition systems. For CPU-95 units with dual capacitors, please contact the factory.

<sup>(2)</sup> For engines equipped with Altronic CPU-2000 ignition system. Requires adapter 691015.

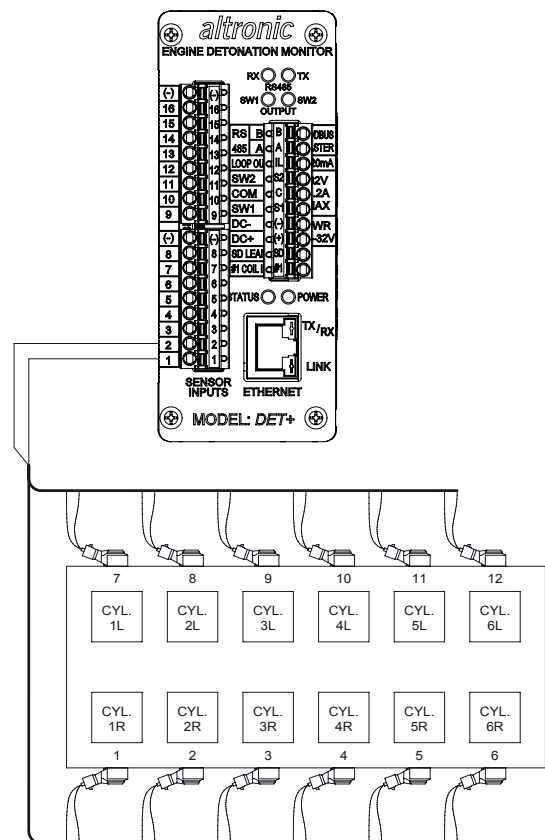
## Monitor Dimensions



## Sensor Dimensions



## System Diagram (Overview)



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