PPS+ CO and NO2 Detector Quick Installation Guide

Prosense developed a complete solution for closed area car parks like underground parking areas and road tunnels. Vehicles release CO and NO2 during initial start-up. These gases tend to accumulate a lot in parking area and in enclosed spaces. CO and NO2 gases must be constantly monitored in these areas for health and safety reasons. If the ventilation in these areas not adequate, CO and NO2 gases can reach high concentration levels and cause a Number of damages including nausea and vomiting due to the high concentrations and can cause to death.

Nowadays high number of vehicles is using LPG instead of gasoline. LPG is a mixture of flammable gases like propane and butane. If there is any leakage on vehicles LPG can easily accumulate in enclosed areas and reach to the explosion level.

Prosense provides special detectors to monitor CO, NO2 and LPG gas concentration in enclosed car parking areas. Detectors equipped with high quality electrochemical sensors for the toxic gas detection that can show excellent output in PPM range for Carbon Monoxide, Nitric Oxide and Nitrogen Dioxide gases.
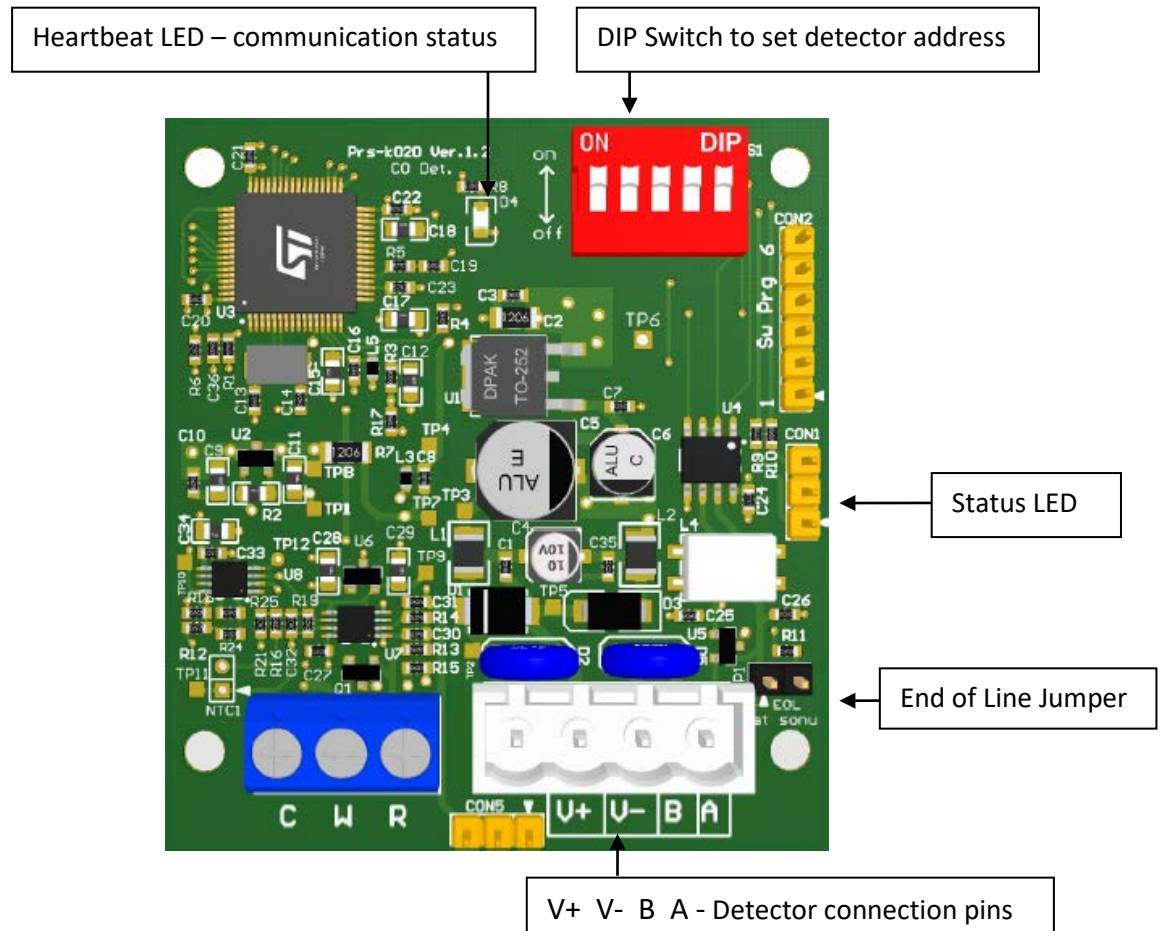
PPS+ series detectors have on board RS 485 (Modbus) communication protocol that provides a great advantage for cabling and installation. Prosense PPS+ series gas detectors can connect to Prosense PPS Manager gas control panel which has been developed specifically for car parks. PPS Manager Series gas control panels have flexible structure capacity and expandable even after installation.

PPS Manager Gas control panel can have up to 4 zone modules and each zone can monitor up to 32 detectors. A fully populated PPS Manager gas control support up to 128 different detectors. Toxic and flammable gas detectors should be installed separate zone modules. PPS Manager automatically recognizes the detectors. There is no need to make any special settings for each detector.

Prosense PPS+ series comprises a gas detector body and sensors head for detecting flammable and toxic gases.

PPS+ Series CO and NO2 Detectors Connections

Prosense PPS+ series detectors has onboard RS485 Modbus serial communication module. The board has 4 ports thus the detector connection should be made by 4 wire that 2 for power and 2 for RS485. The total length of the connection line should not exceed 1000 meters.

Heartbeat LED – communication status

DIP Switch to set detector address

Status LED

End of Line Jumper

V+ V- B A - Detector connection pins

CO and NO2 detector main board

Cabling and Connections

Caution: All electrical connections should be made in accordance with any relevant local or national legislation, standards or codes of practice.

Prosense detectors can operate between 12 - 24 VDC. The connection socket is located on main board. Socket shape and locations are different for CO, NO2 and LPG detectors. User should consider the cable length when performing installation in the field. Please consider the cable lenght when performing installation in the field. The Prosense detector requires a power supply between 12VDC and 24VDC. Make sure that a minimum 12 VDC supply available at the detector entrance and consider the voltage drop due to cable resistance in case of long distance applications.

The use of industrial grade, suitably shielded field cable is recommended. The best practices shown that, screened 4 cores (plus screen 90% coverage), suitably mechanically protected copper cable with a suitable gland gives good results depending on the distance between signal received or control panel and detector. It is recommended to use 1.5 mm2 (16 AWG) cable to provide power to detectors. The total distance from PPS+ Manager Panel zone module to last detector should not exceed 800m. Ensure the cable gland is installed correctly and fully tightened. Detectors and PPS+ Manager Control panel communicates via RS485

communication protocol. Each PPS+ panel zone module can manage up to 32 PPS+ series CO and NO2 detectors via RS485 serial connection.

V+, V-(GND), A and B ports must be connected via using four-wire cable. Detector connections supply 16VDC power to detector and read the output signal of detector from A and B ports. Thus connections should be made correctly with extra care to do not mix ports and not cause any damage on the detectors. Detector power connection should be done with 1.5mm2 cross section cable. The total distance between control panel and detectors should not exceed 1km. Detector connections should be made with 4 core cable wire that 2 for power and 2 for RS485 and pin definitions are as follows:

Port	Usage	Details
V+	output	+16VDC (Only for panel and detectors, do not use for any other device)
V-	output	-VDC (GND)
A	input	RS485 port A
B	input	RS485 port B

Connection pins and definitions

The wiring for detectors utilized with RS485 board should be done by using connection cable EIA RS485 2 core wires with section 0.22 / 0.35 mm2 and shielded. Nominal capacity between the wires should be < 50pF/m and nominal impedance 120 Ohms.

Detectors will be wired in daisy chain (bus) mode. We recommend not using star mode connection due to negative impact of interference. Each detector should have unique address number in the chain. The detectors would not be recognised by control panel if same address given to them. The address of detector can be adjusted via using DIP-Switch set on the board:
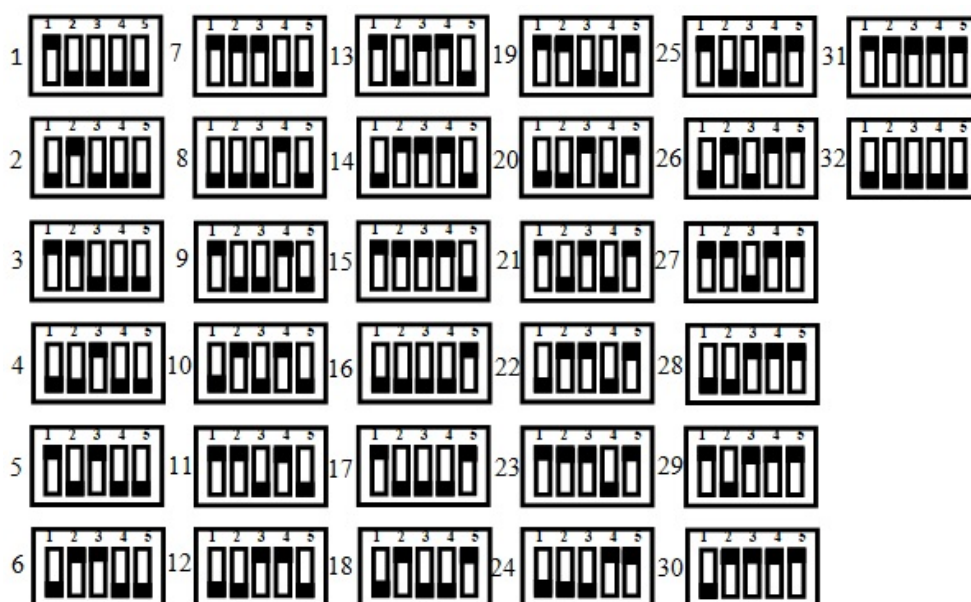
RS485 Modbus serial communication address and switch position

The last detector in the chain should have 120 Ohms RS485 termination resistor. The resistor is already implemented on the board by default but not activated. User should activate the termination resistor via using the termination pin once the installation completed.

Important: Only the last detector on the serial bus should have end of line pin.

General specification

PPS+ Series CO and NO2 Detector Electrical Specifications:

Input Voltage Range	12 to 24VDC (16VDC nominal)
Max Power Consumption	0.25 Watts
Terminals	4 x screw terminals suitable for wire diameter 1.5mm2 to 2.5mm2
Communication	RS485, Modbus RTU
Sensor	Electrochemical

Detector Body Specifications:

Material	Plastic (CO and NO2 grey, LPG black)
Weight	Plastic junction box: 230g (with Sensor Header)
Mounting	Wall mounting
Entries	PG11

Environmental:

IP Rating	IP54 (plastic junction box)
Operating Temperature	-10ºC to +50ºC / 14ºF to +120ºF
Operating Humidity	Continuous 20-90%RH (non condensing)
Operating Pressure	90-110kPa
Storage Conditions	-10°C to +50°C (14°F to +120°F)