Macurco™ DVP-1200 Manual

Detection and Ventilation Control Panel with BACnet

Operation Instructions

IMPORTANT: Keep these user instructions for reference.

Table of Contents

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

1 General Safety Information

1.1 Warnings List

⚠ WARNING
Each person using this equipment must read and understand the information in this User manual before use. Use of this equipment by untrained or unqualified persons or use that is not in accordance with this user manual may adversely affect product performance.
This equipment helps monitor the presence and concentration level of certain specified airborne gases. Misuse may produce an inaccurate reading, which means that higher levels of the gas being monitored may be present and could result in overexposure. For proper use, see supervisor or User manual, or call Macurco Technical Service at 1-844-325-3050.
DVP-1200 may not function effectively below 32°F (0°C) or above 104°F (40°C). Using the equipment outside of this temperature range may adversely affect the product.
Immediately exit any environment that causes an alarm condition on the sensor.
Each time the unit is turned on it performs a self-test, which activates the audible and visual alarms. If the self-test fails, or all the alarms do not activate, do not use, and contact Technical Support at 1-844-325-3050.
Do not cover or obstruct audible alarm opening or visual alarm LED. Doing so may adversely affect product performance.
Do not disassemble the unit or attempt to repair or modify any component of this instrument. This instrument contains no user serviceable parts, and substitution of components may adversely affect product performance and void product warranty.
Use only for monitoring the gases which the sensors and equipment are designed to detect. Failure to do so may result in exposures to gases not detectable and result in serious injury or death. For proper use, see supervisor or User manual, or Contact Technical Support at 1-844-325-3050. Failure to follow instructions outlined in this user manual can result in sickness or death.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

2 Use Instructions and Limitations

2.1 DVP-1200 General Description

The DVP-1200 controller in conjunction with Macurco gas detectors provides automatic control to help maintain an acceptable environment in parking garages or other applications. The DVP-1200 offers an expandable system with up to 192 addressable detectors in the field. This panel also has an additional four relay board option in addition to the existing standard four relay boards. With three analog outputs, four 24 DVC drivers and another option for up to two remote relays, the DVP-1200 will fit into any gas detection application.

2.2 Remote Device (RD-24)

The DVP-1200 incorporates an optional remote device module (RD-24) that allows for up to four expansion boards to work in conjunction with DVP-1200. Expansion boards include a set of two relays, two analog outputs, or four analog inputs. The RD-24 can be populated with up to four of any combination of expansion boards. RD-24 communicates using standard Modbus protocol and can interface with Building Automation Systems, Control Panels or other Control Devices that accept Modbus communications.

NOTES: Macurco RD-24 is not a UL 2017 listed product and was not evaluated by Intertek in conjunction with the operation of DVP-1200.

Macurco RD-24 is not intended for use in hazardous locations.

Macurco RD-24 should be powered separately from the DVP-1200 using a dedicated Class 2 Power Supply ONLY.

Following are additional specifications and features of RD-24.

- Size: 10.26” x 11.06” x 3.16” (26.06 x 28.09 x 8.03 cm)
- Weight: 2.8 lbs. (1.3 kg)
- Voltage/Current: Power Input: 24VDC, 2A Overcurrent Projection
- Operating Temperature: 32 to 125°F (0 - 52°C)
- Ambient Humidity: 0% - 95% RH non-condensing
- Mounting: Mounting holes in each corner
- Expansion Slots: 4
- Expansion Relay Board: 2 SDPT, 250VAC, 10A Max (resistive)
- Expansion Analog Input Board: 4 Analog Inputs
- Expansion Analog Output Board: 2 Analog Outputs
- Settings: Dip Switch – 8 positions
- Status Indicators: (LED): Power, communication, Slots 1-4
- Baud Rate: 4800, 9600, 19200 (default), 98400, 57600, 115200 bps
- Enclosure: NEMA4X
- Warranty: Two-year limited warranty

2.3 MRS-485 Modbus Adapter

The Macurco MRS-485 adapter is an accessory used to convert the 4-20mA analog signal from Macurco 6-Series detectors to a digital Modbus signal for use with the DVP-1200 and other Macurco control panels.

The MRS-485 mounts to the back of a Macurco 6-Series detector installed on a 4”x 4” electrical box supplied by the contractor. An external power source supplies power to the MRS-485 and the detector.

Complete instructions for the MRS-485 Modbus Adapter can be found at https://www.macurco.com/product/mrs-485/

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

2.4 Features

- LCD display showing the status of each transducer and relay
- External keypad for user selection of the transducer/alarm display and setting the configuration (password protected)
- Three RS-485 digital input channels – 192 addressable sensors
- Up to 8 control zones can be defined
- Each zone can be controlled based on transducer signals and/or time of day
- Comes standard with four onboard 10A, 240 VAC SPDT Dry Contact relays
- Up to four optional onboard expansion relays available
- Up to 4 additional Remote Devices or Remote Relays
- Adjustable alarm and warning levels for sensors which are not assigned to a control zone
- On-board buzzer can be selected specifically for alarm, trouble, or warning
- Event logging of all fault conditions
- Each relay is configurable with a delay before activation and minimum on time
- Fail-safe operation can be implemented
- Lockable NEMA 4X type enclosure
- Modular input and output connectors
- Ethernet connection for BACnet output (BACnet IP) (Note: Model DVP-1200N does not have ethernet port)
- USB connection
- Compatible with Macurco Commercial 6-Series gas detectors, MRS-485 adapter, Horn & Strobe Combo
- Four 24 VDC Drivers for external Horn and Strobe
- Three 4-20mA output
- ETL Listed to UL 2017

2.5 Specifications

- Size: 13.0” x 10.0” x 2.75”
- Weight: 12.4 lb. (5.6 kg)
- Enclosure: NEMA 4X rated
- Operating Temperature: 32° to 104°F (0° to 40°C)
- Operating Humidity: 0% to 95% RH non-condensing
- Power Input: 100 – 240 VAC, 1 Amp, 50/60 Hz, single phase
- Relay Rating (4): SPDT, 120/240 VAC, 10 A Max (resistive)
- LCD Display: 320 x 240 Pixels Graphic LCD Display with backlight
- Status Indicators (LED): Power/Trouble, Hush, Warning/ALARM, and Relay
- Audible indicator: Internal buzzer, 90 dBA at 1 ft
- External Drivers (4): 24 VDC, maximum 250 mA
- Relay on Delay: 0 – 99 minutes in 1 second increments
- Relay Minimum Run Time: 0 – 99 minutes in 1 second increments

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

3 Installation Instructions

3.1 Location & Mounting

The DVP-1200 should be installed in a centralized location, easy to access and protected from environmental elements. A Mechanical room, Alarm Control Room, or other similar areas are recommended.

Mounting holes are provided in the DVP-1200 case at the four corners. See Figure 3-1. Choose an appropriate mounting location with space around the panel for access to conduit entry holes provided on the top, bottom, and right side of the panel.

Figure 3-1 – Mounting Holes Back View

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

3.2 Installation

3.2.1 General Wiring Information

⚠ WARNING

This equipment helps monitor the presence and concentration level of certain specified airborne gases. Misuse may produce an inaccurate reading, which means that higher levels of the gas being monitored may be present and could result in overexposure. For proper use, see supervisor or User manual, or call Macurco Technical Service at 1-844-325-3050.

Field wiring is completed via modular connectors (provided), except for the safety ground, AC power, and relays. After wiring, simply plug the modular connectors into the matching connectors on the printed circuit board (PCB).

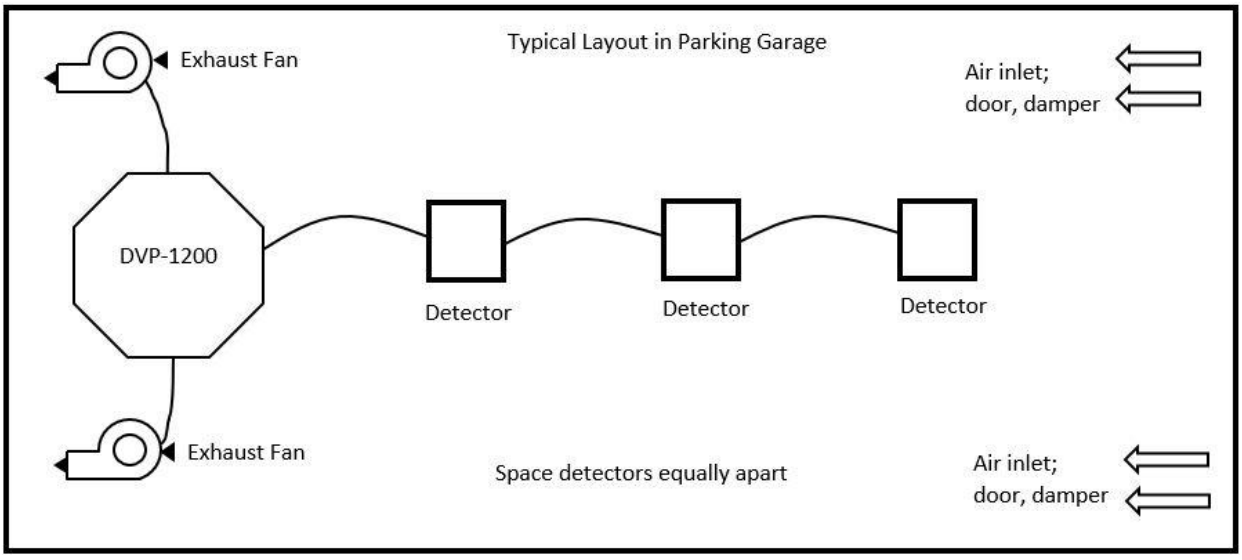


Figure 3-2 – Typical Layout diagram

Note: It is recommended to always install it with wires enclosed within the rigid metallic conduit.

The power to the remotely mounted sensors should be size AWG18 (minimum) for short runs. Refer to Table 3-1 for recommended wire gauges.

Wire Gauge	Maximum Run Length	
	(feet)	(meters)
18	263	80
16	418	127
14	665	203
12	1058	322

Table 3-1 – Wire Gauge for run Length

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Do not bundle sensor power or sensor signal connections with other AC power cables to prevent electrical interference. If other AC power connections must be bundled with the DVP-1200 sensor cables, the sensor connections should be made with two twisted pairs of the appropriate gauge, with an overall foil and braid shield. All shields should be terminated at the DVP-1200 end of the cable only.

The power connections to the MRS-485 and remote mounted sensors should be size 18 AWG (minimum) for short runs. Refer to Table 3 1 for recommended wire gauges. The power for the MRS-485 adapter is connected via a two-terminal screw type connector, 12 to 24 VAC or 12 to 24 VDC and no polarity.

The MRS-485 adapter output is wired in the standard 2W-Modbus circuit definition with selectable built-in terminating resistors at the ends of the RS-485 bus. It is recommended to always use twisted wires to reduce noise and allow for reliable data communication over greater distances. For best performance use shielded 3-conductor wire with one twisted pair providing a pair for signal (A & B), common (COM) and shield ground (SHD) connections. Use at least 3-conductor wire with one twisted pair providing a pair for signal (A & B) and common (COM) connections. The Macurco MRS-485 Modbus output is connected via a four-terminal screw type connector.

Running the Modbus cable adjacent to or in the same conduit with high voltage wires is not recommended as there may be interference from the high voltages near the bottom left corner of the panel.

3.2.2 Installation Diagram

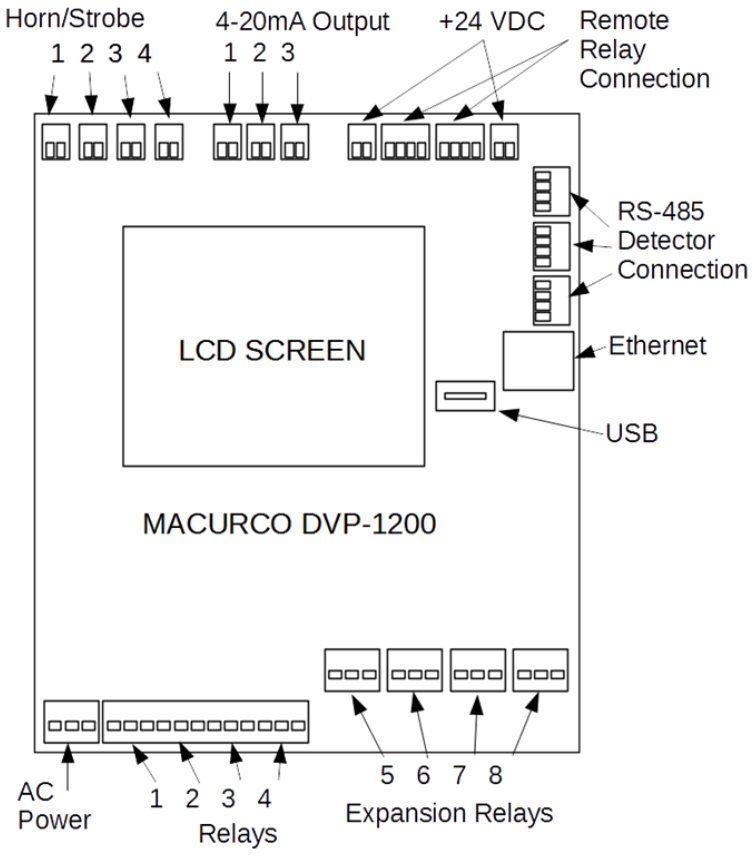


Figure 3-3 – DVP-1200 Board Diagram

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

3.2.3 Power Connection

The main power cable should be routed into the bottom left conduit entry.

Macurco recommends a minimum wire size of 18 AWG and the wire insulator must be rated for at least 140°F (60°C) service. The power connector will accept wire from 12-24 AWG.

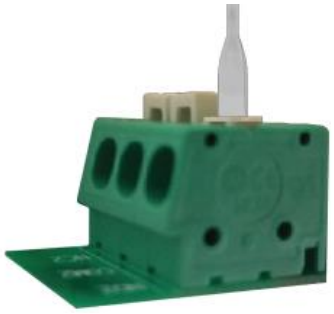
The safety ground wire should be connected to the terminal labeled as GND. Connect the wires to the following terminals:

Signal	Connector Label	Pin Label
Line (120/220/240/250 VAC)	AC~	L
Neutral	AC~	N
Ground	AC~	GND

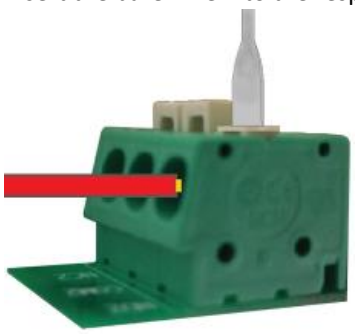
Table 3-2 – Input Power Connection

1. The line, neutral and ground wires should be stripped 1/4 in. (6.5 mm).

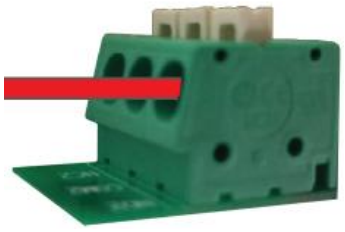
2. Press down the white button of the connector. You can use a flat-headed screwdriver for this.



3. Insert the bare wire into the respective wire cavity of the connector. Refer Table 3-2.



4. Release the white button.



5. Ensure that the wire cannot be easily pulled from the connector.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

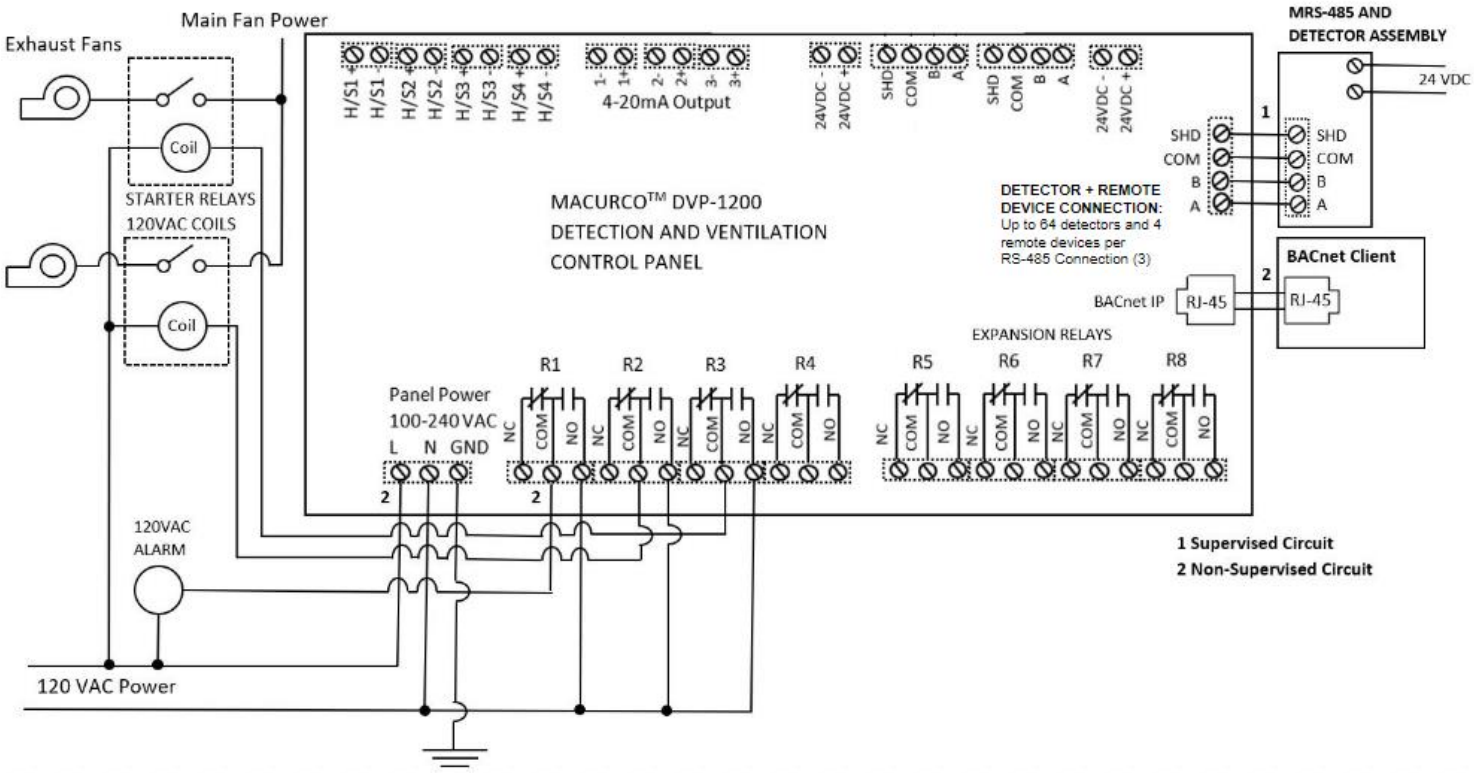


Figure 3-4 System Wiring Diagram

Note: For ethernet connection, use surge protector (Model: DTK-MRJPOE manufactured by DITEK) and connect one end of the surge protector to DVP-1200 ethernet connection.

Note: For the DVP-1200N Model, the ethernet port is not included and BACnet output is not an option

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

3.2.4 Remote Sensor Connection

Remote sensors must be connected to the DVP-1200 at one of the three RS-485 connectors labeled “MRS-485 DETECTOR CONNECTION”.

3.2.4.1 MRS-485 Connection and Operation

The Macurco MRS-485 Adapter converts the Macurco 6-Series 4-20mA analog output to a digital output for use with the DVP-1200 and other addressable network systems.

To install the MRS-485 on a Macurco 6-Series detector,

1. Remove the 4-20mA/Power plug from the Macurco 6-Series gas detector
2. Plug the MRS-485 adapter into the empty socket.
3. Install the provided MRS-485 screw.

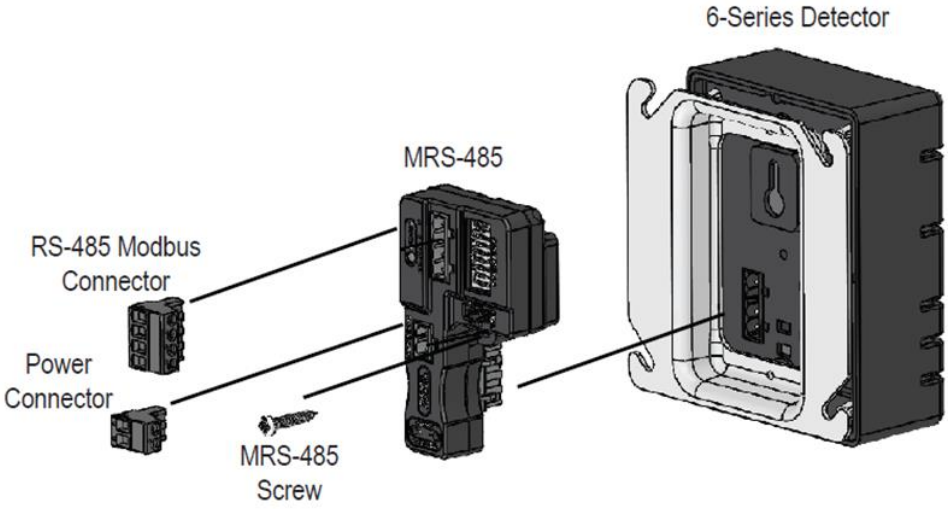


Figure 3-5 – MRS-485 Exploded View

Power connections to Macurco sensors used with the DVP-1200 are polarity-insensitive (no polarity) since a bridge rectifier is connected to the power input terminals. All sensors used with the DVP-1200 panel employ screw clamp terminal blocks for power and signal connections. The polarity of the current loop connections is marked on the printed circuit board of the sensor.

The MRS-485 will monitor the 4-20 mA current output of the detector. At power up and during its warm-up period, the 6-Series detector will communicate its sensor type over the 4-20 current output using a custom protocol. The MRS-485 will automatically register each 6-Series detector as it is programmed with information about all the detectors to which it can be connected. The MRS-485 will use this information to determine the gas level sensed by the 6-Series detector by measuring the 4-20 mA current-loop output during normal operation of the detector.

When the LED is solid GREEN, the operation is normal, the MRS-485 knows the detector type, no errors are detected, and no MODBUS data are being received or transmitted over the RS-485 line.

When the LED is GREEN with random bursts of AMBER, the operation is normal, and data are being received or transmitted over the RS-485 line. The AMBER LED will come on anytime that there is data traffic.

NOTE: After complete system installation, verify all sensors (verify sensor address and sensor type) connected to the panel are detected by the panel and there is not any trouble indication for any of the connected detector.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

3.2.4.2 Connection

The Macurco MRS-485 output is connected via a four-terminal screw type connector. The MRS-485 adapter is wired in the standard 2W-Modbus circuit definition with selectable built-in terminating resistors at the ends of the RS-485 bus. The power for the MRS-485 adapter is connected via a two-terminal screw type connector, 12 to 24 VAC or 12 to 24 VDC and no polarity.

NOTE: Running the Modbus cable adjacent to or in the same conduit with high voltage wires is not recommended as there may be interference from the high voltages.

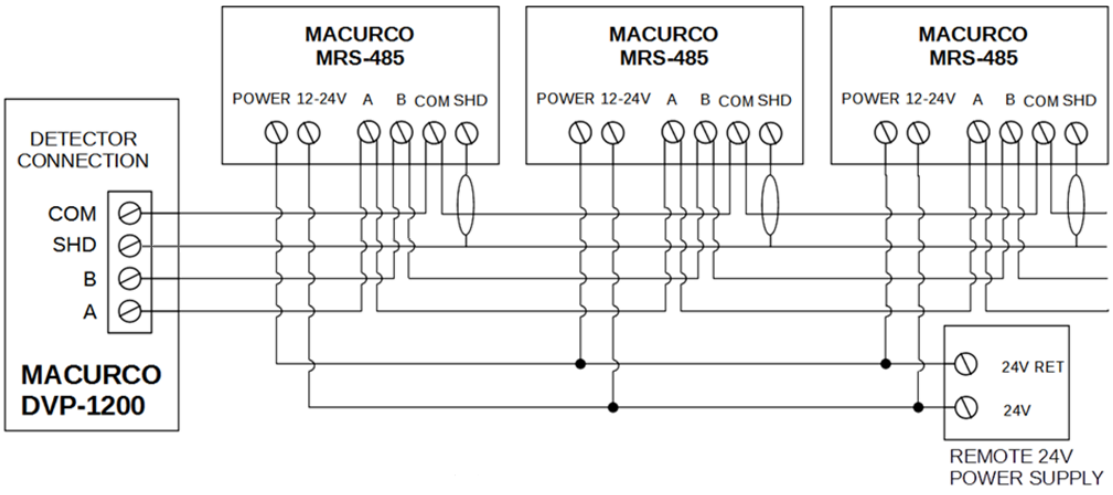


Figure 3-6 – MRS-485 Wiring Diagram

3.2.4.3 Dip Switches and Addressing

Each MRS-485 (and the detector it is connected to) must be configured to a unique address. If there are 10 detectors on the serial line, then 10 unique addresses must be used, one for each detector. To set the address, use the eight DIP switch positions. For each unit choose the value from 1 to 192 (see chart) and set the eight switches to match the address. UP means ON or 1 and DOWN means OFF or 0. For example, to configure a unit as address “50”, set switches “2, 5, 6” (see Table 3-3) to ON or in the up position (01001100).

NOTE: If CX-6 is assigned address X and connected to DVP-1200, then address X is assigned to NO2 Sensor (Type: 2) and address X+1 is assigned to CO Sensor (Type: 1) by the panel.

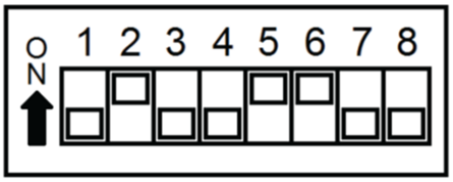


Figure 3-7 – Dip Switch

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Address #	"On" Switches	Address #	"On" Switches	Address #	"On" Switches	Address #	"On" Switches
1 =	1	**49 =**	1, 5, 6	**97 =**	1, 6, 7	**145 =**	1, 5, 8
2 =	2	**50 =**	2, 5, 6	**98 =**	2, 6, 7	**146 =**	2, 5, 8
3 =	1, 2	**51 =**	1, 2, 5, 6	**99 =**	1, 2, 6, 7	**147 =**	1, 2, 5, 8
4 =	3	**52 =**	3, 5, 6	**100 =**	3, 6, 7	**148 =**	3, 5, 8
5 =	1, 3	**53 =**	1, 3, 5, 6	**101 =**	1, 3, 6, 7	**149 =**	1, 3, 5, 8
6 =	2, 3	**54 =**	2, 3, 5, 6	**102 =**	2, 3, 6, 7	**150 =**	2, 3, 5, 8
7 =	1, 2, 3	**55 =**	1, 2, 3, 5, 6	**103 =**	1, 2, 3, 6, 7	**151 =**	1, 2, 3, 5, 8
8 =	4	**56 =**	4, 5, 6	**104 =**	4, 6, 7	**152 =**	4, 5, 8
9 =	1, 4	**57 =**	1, 4, 5, 6	**105 =**	1, 4, 6, 7	**153 =**	1, 4, 5, 8
10 =	2, 4	**58 =**	2, 4, 5, 6	**106 =**	2, 4, 6, 7	**154 =**	2, 4, 5, 8
11 =	1, 2, 4	**59 =**	1, 2, 4, 5, 6	**107 =**	1, 2, 4, 6, 7	**155 =**	1, 2, 4, 5, 8
12 =	3, 4	**60 =**	3, 4, 5, 6	**108 =**	3, 4, 6, 7	**156 =**	3, 4, 5, 8
13 =	1, 3, 4	**61 =**	1, 3, 4, 5, 6	**109 =**	1, 3, 4, 6, 7	**157 =**	1, 3, 4, 5, 8
14 =	2, 3, 4	**62 =**	2, 3, 4, 5, 6	**110 =**	2, 3, 4, 6, 7	**158 =**	2, 3, 4, 5, 8
15 =	1, 2, 3, 4	**63 =**	1, 2, 3, 4, 5, 6	**111 =**	1, 2, 3, 4, 6, 7	**159 =**	1, 2, 3, 4, 5, 8
16 =	5	**64 =**	7	**112 =**	5, 6, 7	**160 =**	6, 8
17 =	1, 5	**65 =**	1, 7	**113 =**	1, 5, 6, 7	**161 =**	1, 6, 8
18 =	2, 5	**66 =**	2, 7	**114 =**	2, 5, 6, 7	**162 =**	2, 6, 8
19 =	1, 2, 5	**67 =**	1, 2, 7	**115 =**	1, 2, 5, 6, 7	**163 =**	1, 2, 6, 8
20 =	3, 5	**68 =**	3, 7	**116 =**	3, 5, 6, 7	**164 =**	3, 6, 8
21 =	1, 3, 5	**69 =**	1, 3, 7	**117 =**	1, 3, 5, 6, 7	**165 =**	1, 3, 6, 8
22 =	2, 3, 5	**70 =**	2, 3, 7	**118 =**	2, 3, 5, 6, 7	**166 =**	2, 3, 6, 8
23 =	1, 2, 3, 5	**71 =**	1, 2, 3, 7	**119 =**	1, 2, 3, 5, 6, 7	**167 =**	1, 2, 3, 6, 8
24 =	4, 5	**72 =**	4, 7	**120 =**	4, 5, 6, 7	**168 =**	4, 6, 8
25 =	1, 4, 5	**73 =**	1, 4, 7	**121 =**	1, 4, 5, 6, 7	**169 =**	1, 4, 6, 8
26 =	2, 4, 5	**74 =**	2, 4, 7	**122 =**	2, 4, 5, 6, 7	**170 =**	2, 4, 6, 8
27 =	1, 2, 4, 5	**75 =**	1, 2, 4, 7	**123 =**	1, 2, 4, 5, 6, 7	**171 =**	1, 2, 4, 6, 8
28 =	3, 4, 5	**76 =**	3, 4, 7	**124 =**	3, 4, 5, 6, 7	**172 =**	3, 4, 6, 8
29 =	1, 3, 4, 5	**77 =**	1, 3, 4, 7	**125 =**	1, 3, 4, 5, 6, 7	**173 =**	1, 3, 4, 6, 8
30 =	2, 3, 4, 5	**78 =**	2, 3, 4, 7	**126 =**	2, 3, 4, 5, 6, 7	**174 =**	2, 3, 4, 6, 8
31 =	1, 2, 3, 4, 5	**79 =**	1, 2, 3, 4, 7	**127 =**	1,2,3,4, 5, 6, 7	**175 =**	1, 2, 3, 4, 6, 8
32 =	6	**80 =**	5, 7	**128 =**	8	**176 =**	5, 6, 8
33 =	1, 6	**81 =**	1, 5, 7	**129 =**	1, 8	**177 =**	1, 5, 6, 8
34 =	2, 6	**82 =**	2, 5, 7	**130 =**	2, 8	**178 =**	2, 5, 6, 8
35 =	1, 2, 6	**83 =**	1, 2, 5, 7	**131 =**	1, 2, 8	**179 =**	1, 2, 5, 6, 8
36 =	3, 6	**84 =**	3, 5, 7	**132 =**	3, 8	**180 =**	3, 5, 6, 8
37 =	1, 3, 6	**85 =**	1, 3, 5, 7	**133 =**	1, 3, 8	**181 =**	1, 3, 5, 6, 8
38 =	2, 3, 6	**86 =**	2, 3, 5, 7	**134 =**	2, 3, 8	**182 =**	2, 3, 5, 6, 8
39 =	1, 2, 3, 6	**87 =**	1, 2, 3, 5, 7	**135 =**	1, 2, 3, 8	**183 =**	1, 2, 3, 5, 6, 8
40 =	4, 6	**88 =**	4, 5, 7	**136 =**	4, 8	**184 =**	4, 5, 6, 8
41 =	1, 4, 6	**89 =**	1, 4, 5, 7	**137 =**	1, 4, 8	**185 =**	1, 4, 5, 6, 8
42 =	2, 4, 6	**90 =**	2, 4, 5, 7	**138 =**	2, 4, 8	**186 =**	2, 4, 5, 6, 8
43 =	1, 2, 4, 6	**91 =**	1, 2, 4, 5, 7	**139 =**	1, 2, 4, 8	**187 =**	1, 2, 4, 5, 6, 8
44 =	3, 4, 6	**92 =**	3, 4, 5, 7	**140 =**	3, 4, 8	**188 =**	3, 4, 5, 6, 8
45 =	1, 3, 4, 6	**93 =**	1, 3, 4, 5, 7	**141 =**	1, 3, 4, 8	**189 =**	1, 3, 4, 5, 6, 8
46 =	2, 3, 4, 6	**94 =**	2, 3, 4, 5, 7	**142 =**	2, 3, 4, 8	**190 =**	2, 3, 4, 5, 6, 8
47 =	1, 2, 3, 4, 6	**95 =**	1, 2, 3, 4, 5, 7	**143 =**	1, 2, 3, 4, 8	**191 =**	1,2,3,4, 5, 6, 8
48 =	5, 6	**96 =**	6, 7	**144 =**	5, 8	**192 =**	7, 8

Table 3-3 – Dip Switch Settings

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

3.2.4.4 Topology

An RS485-MODBUS configuration without repeater has one trunk cable, along which devices are connected, directly (daisy chaining) or by short derivation cables. The trunk cable, also named "Bus", can be long. Its two ends must be connected on "Line" Terminations. (See Section 3.2.4.5 Line Termination – End of Line Resistor). The use of repeaters between several RS485-MODBUS is also possible.

The DVP-1200 has three Modbus termination blocks that will accept two trunk cable connections allowing for two MODBUS communication lines. The Trunk cable must be wired in parallel from the panel to the end of line with no off shoots "T-tapping".

3.2.4.5 Line Termination – End of Line Resistor

The MRS-485 and DVP-1200 are wired in the standard 2W-Modbus circuit definition with selectable built-in terminating resistors at the ends of the RS-485 bus. The MRS-485 and DVP-1200 provide integral termination for the end of line resistors (EOL). The terminations use a 4-pin connector with a jumper to select termination: The user selects no termination or one of the two Modbus line termination options. The MRS-485 and DVP-1200 have two-line termination options (100 Ohm and 120 Ohm) available.

Place the EOL jumper on one of the following positions:

N = No termination (default)
2 = 120 ohm
1 = 100 ohm

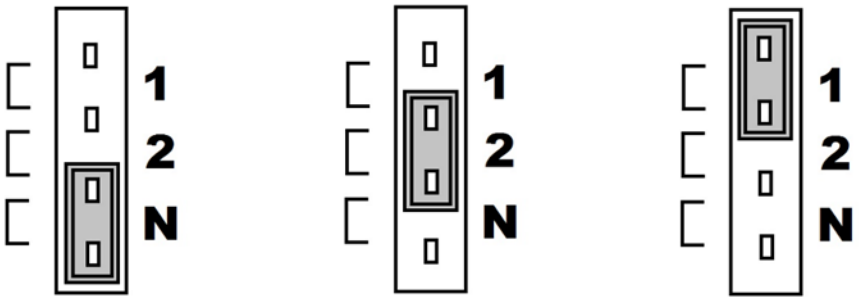


Figure 3-8 – EOL Jumper Settings

3.2.4.6 Baud Rate

At the baud rate of 19200 (default baud rate for Macurco MRS-485 and DVP-1200) and with cables less than 1,000 ft. in length, termination resistors are not recommended.

At the baud rate of 19200 and with cables longer than 1,000 ft., termination resistors are recommended.

It is recommended to use an RS-485 type of cable and 120 ohms for termination resistor.

An RS-485 network requires a 3-wire cable: a twisted pair and a third wire. It is difficult to tell whether shielding is required or not in a particular system until problems arise, so it is recommended to always use shielded cable.

When using termination resistors use only 2 resistors, one at each end of the RS-485 transmission line (i.e., 1 at the DVP-485B and 1 at the last/farthest MRS-485).

For any other baud rates calculate when (at what length) termination resistors are required. This is calculated by dividing the length L by the ratio between the new baud rate and 19200 or (x/19200) where x is the new baud rate.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

$$\frac{L}{(x/19200\ baud)}$$

For example, if the new baud rate is 9600

$$\frac{1000\ ft}{(9600\ baud/19200\ baud)} = \frac{1000\ ft}{0.5} = 2000\ ft$$

Use termination resistors when cables are longer than 2000 ft.

For example, if the new baud rate is 38400

$$\frac{1000\ ft}{(38400\ baud/19200\ baud)} = \frac{1000\ ft}{2} = 500\ ft$$

Use termination resistors when cables are longer than 500 ft.

NOTE: Other manufacturers may have different recommendations on wire length and EOL resistor usage.

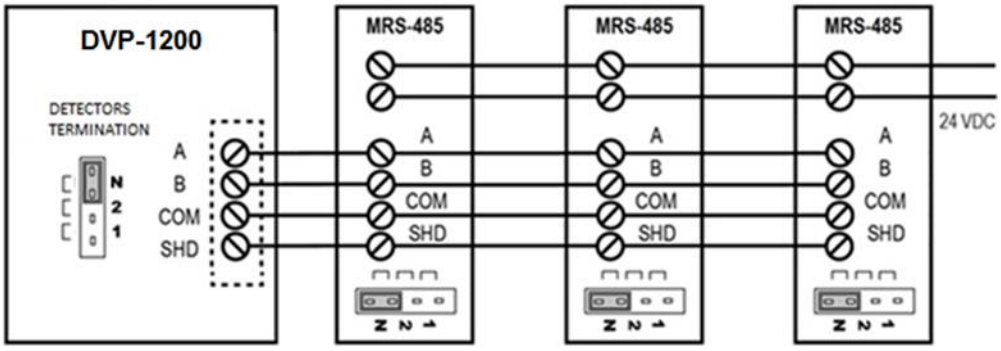


Figure 3-9 – End of Line Resistor Diagram, RS-484, 1000 feet or less

In Figure 3-9 above, the panel is depicted at a 19200 baud rate (default), 1000 ft or less, and using RS-485 or Cat-5 type cable

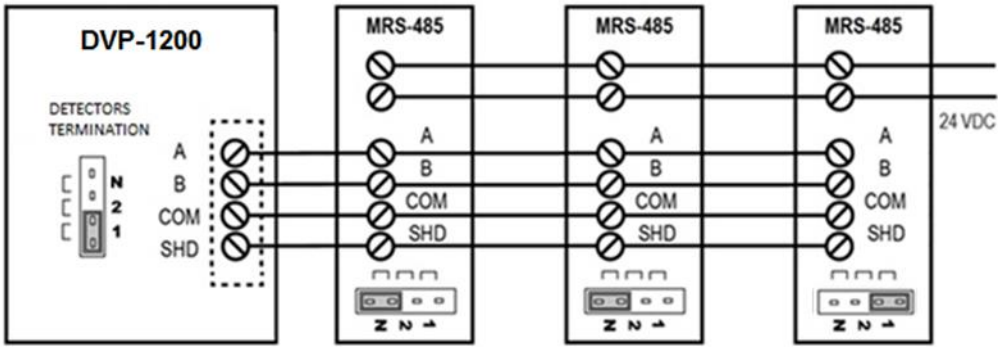


Figure 3-10 – End of Line Resistor Diagram, RS-484, 1000 feet or more

In Figure 3-10 above, the panel is depicted at a 19200 baud rate (default), more than 1000 ft, and using RS-485 type cable. The jumper is shown at 100 ohms resistor configuration, but the 120 ohms configuration can also be used, which is position 2.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

3.2.4.7 Wire Selection

For best performance, use shielded 3-conductor wire with one twisted pair providing a pair for signal (A & B), common (COM) and shield ground (SHD) connections.

For the balanced pairs used in an RS485 system, wire with a characteristic impedance of higher than 100 Ohms may be preferred, especially for 19200 and higher baud rates.

3.2.4.8 Wire Length

For the RS485-MODBUS, the wire gauge must be chosen sufficiently wide to permit the maximum length (1000 m or 3281ft). 24 AWG is always enough for the MODBUS Data. The modular RS-485 connector will accept wire from 16 to 28 AWG. The wire insulator must be rated for at least 140°F (60°C). Category 5 cables may operate for RS485-MODBUS, to a maximum length of 600 m 1968.5 ft.

The maximum length of the trunk cable depends on the

- baud rate
- cable (gauge, capacitance, or characteristic impedance)
- number of loads on the daisy chain
- network configuration (2-wire)

For a maximum 9600 Baud Rate and 26 AWG (or wider) gauge, the maximum length is 1000m (3281ft). The derivations must be short, never more than 20m (65.5ft). If a multi-port tap is used with n derivations, each one must respect a maximum length of 40m (131ft) divided by n.

3.2.4.9 Grounding

The Common Circuit (COM) must be connected directly to protective ground, preferably at one point only for the entire bus. The shield should be connected to each detector at the SHD terminal and connected to a ground terminal or chassis only at one end of the bus.

3.2.4.10 External Power Supply

Select a UL Listed NEC Class 2 power supply which can power the MRS-485 units connected to 6-Series detectors.

To determine the required minimum power supply,

- Each MRS-485 connected with a detector is rated at 3.25W.
- The minimum power which the power supply needs to deliver for 12 detectors is figured as: 12 detectors x 3.25 W per detector = 39W
- Therefore, a 24VDC, 60W power supply will work.

3.2.4.11 Power Wire

All field wiring is completed via modular connectors (provided). After wiring, simply plug the modular connectors into the matching connectors on the MRS-485. The power connections to the remotely mounted detectors should be size 18 AWG (minimum) for short runs. Since Macurco detectors are rated for operation between 12 and 24 VDC or VAC, the voltage drop between the power supply and the MRS-485 should not be an issue if the recommended power wire gauge guidelines are followed.

The terminals will accept wire from 16 to 28 AWG. To install a wire, strip back approximately 0.25 in. (6 mm) of insulation and insert the bare wire into the terminal. Tighten the screw clamp and ensure that the wire cannot be easily pulled from the connector.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

3.2.4.12 4-20mA Connection

There are three 4-20mA output modular connectors. The wire terminals for the three 4-20 mA connectors are available at the connector labeled “4-20mA O/P”. The connector accepts wires from 16 to 28 AWG. Refer to Figure 3-4 for details.

3.2.4.13 Relay Connection

The wire terminals for the four onboard relays are available at the connectors labeled “R1”, “R2”, “R3”, and “R4”. The wire terminals for the optional expansion relays are available at the connectors labeled “R5”, “R6”, “R7”, and “R8”.

Each relay will be wired to be either normally open (NO) or normally closed (NC). There is no polarity for these connections. Each terminal can accommodate a wire size from 12 to 24 AWG.

Connect one wire to the COM terminal. For normally open (NO) configuration, connect the other wire to the NO terminal. For normally closed (NC) configuration, connect the other wire to the NC terminal.

To connect wires to the relay terminals,

1. Strip each wire back 1/4 in. (6.5 mm).
2. Press down the white button of the connector.
3. Insert the bare wire into the wire cavity of the connector.
4. Release the white button.
5. Ensure that the wire cannot be easily pulled from the connector.

3.2.5 Remote Device Connection

In addition to the onboard relays (four standard and four optional), the DVP-1200 can be connected to four additional Remote Devices. Each remote device can be configured with 4 expansion boards that include a combination of Expansion Relay Board: 2 SDPT, Expansion Analog Input Board: 4 Analog Inputs and Expansion Analog Output Board: 2 Analog Outputs.

The Remote Devices can be wired directly into the trunk cable of a new or existing Modbus communication line.

3.2.5.1 Remote Device (RD-24) Mounting

Macurco RD-24 is shipped with mounting screws, and the enclosure provides pre-determined mounting locations, with one screw in each corner. RD-24 should be mounted with sufficient space around the enclosure to allow for ease of opening enclosure door, as well as wiring access.

3.2.5.2 Remote Device (RD-24) Wiring

All the connectors in RD-24 are spring tightening and will accept wire from 14 to 24 AWG. To connect the wires to terminals, press down the white button of the connector (use flat-headed screwdriver), insert bare wire into respective wire cavity of the connector and release the white button. Ensure that the wire cannot be easily pulled from the connector. Refer to Figure 3-2 - below for location of different connectors in RD-24. *The Analog Input board has 4 screw terminal connectors.

The power connections to the RD-24 should be size AWG18 (minimum) for short runs. For the longer run follow recommended power wire gauge guidelines. Match the polarity for power connection.

For RS-485 or communication connection it is recommended to always use a twisted wire to reduce noise and allow for reliable data communication over greater distances. For best performance use shielded 3-conductor wire with one twisted pair providing a pair for signal (A & B), common (COM) and shield ground (SHD) connection.

NOTE: Running the RS-485 cable adjacent to or in the same conduit with high voltage wires is not recommended as there may be interference from the high voltages.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

RD-24 provides integral termination for end of line resistors (EOL). The termination uses a 4-pin connector (labeled J8) to select termination. Place the EOL jumper on one of the following positions:

- NU = No termination (default)
- 120 = 120 Ohm
- 100 = 100 Ohm

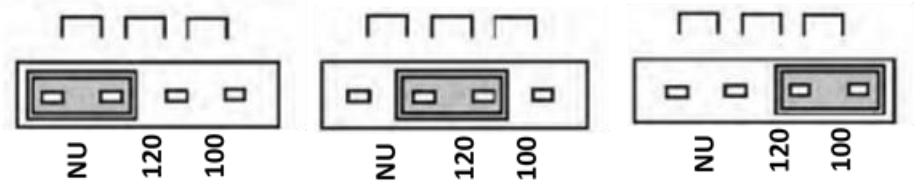
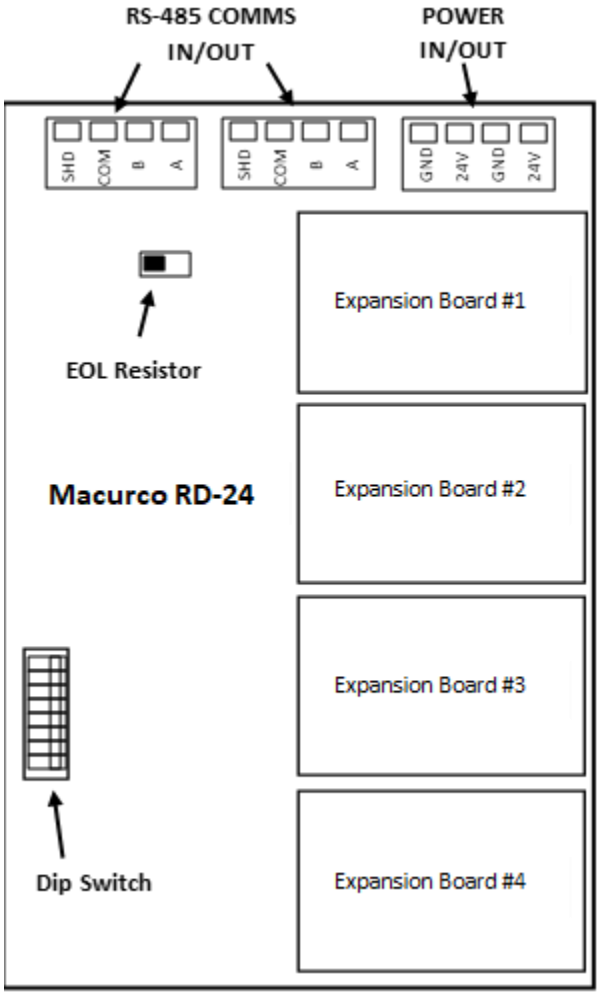


Figure 3-11 - EOL Placement



www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Figure 3-12 – RD-24 Board Diagram

3.2.6 Remote Device Operation

Power LED will light up green to indicate the unit is operational. TX LED will flash blue to indicate the unit is communicating with DVP-1200. Slot 1,2,3,4 LED will light up green when corresponding expansion board is in use. Refer to Figure above for location of Slots 1 through 4.

3.2.6.1 Changing RD-24 Settings

The DIP switches are used to set the Modbus address and are also used to change the communication settings. Valid Modbus addresses for RD-24 are from 193 to 200 where switch 1 is the least significant bit (LSB) and switch 8 is the most significant bit (MSB). Address 254 is used to place the RD-24 in programming mode. Address 255 is used to refresh the configuration of the RD-24.

3.2.6.2 Programming Mode

When the RD-24 is powered with address set to 254, it enters programming mode. The STATUS LED will be flashing RED and GREEN alternatively every 200 milliseconds to indicate that RD-24 is ready and waiting for the user to enter new communication settings using 8 dip switches. Using the 8 dip switches, use can change the communication settings like baud rate and parity.

When looking at the switches with “Address” marking on top, the switches are defined from left to right.

- Switch 8, switch 7 and switch 6 are used to modify baud rate
- Switch 5 and switch 4 are used to modify parity
- Switch 1 is used to request to save the new settings
- Switches 3 and 2 are unused and should be left in the ON position.

Switch 8	Switch 7	Switch 6	Description
OFF	OFF	OFF	Default baud rate (19200 Bd)
OFF	OFF	ON	4800 Bd
OFF	ON	OFF	9600Bd
OFF	ON	ON	19200 Bd (Default value)
ON	OFF	OFF	38400 Bd
ON	OFF	ON	57600 Bd
ON	ON	OFF	115200 Bd
ON	ON	ON	Do not change

Table 3-4 – Baud Rate configuration

Switch 5	Switch 4	Description
OFF	OFF	Default Parity EVEN (Default Value)
OFF	ON	Parity is ODD
ON	OFF	Parity is NONE
ON	ON	Do not change

Table 3-5 – Parity Configuration

Set the switches to the desired value and then set switch 1 to ON and then OFF, and the new settings will be saved in EEPROM.

The result of saving operation is displayed on STATUS LED. Alternating GREEN/OFF every 200 milliseconds indicates saving new settings passed and alternating RED/OFF every 200 milliseconds indicates that saving new settings failed. Once the new settings have passed, disconnect power from the unit, set the address for the device using the address switches and apply power back to unit.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

3.2.6.3 Configuration Refresh

Upon initial installation, or when the user would like to change the RD-24 configuration (move, swap, or change expansion board type or locations), the following process must be followed. Before making any changes, power off the RD-24. Next, make the preferred changes to the RD-24 configuration. After, set the dip switch address to 255 and power on the RD-24 for at least 3 seconds. The LED below the dip switch should blink green rapidly. After at least 3 seconds, power off the RD-24. Using the dip switch, change the address back to its original setting, or a number between 193 and 200. Power on the RD-24. Last, navigate in the DVP-1200 menu CONFIGURE SYSTEM →MANUAL CONFIGURE →CONFIG. RLYS,SIGNALS,SENSORS,REM. DEV. →REMOTE DEVICES. Select the Remote Device and delete it from the DVP-1200. If the RD-24 is still powered on, the DVP-1200 will automatically find it, and update the configuration. If the DVP-1200 does not find the device after 60 seconds, power cycle the panel and check again.

3.2.7 Horn & Strobe Connection

There are four connection terminals for horns and strobes. The modular connectors are located at the top left of the board and are labeled “Horn/Strobe”.

Refer to Table 3 4 for recommended wire gauge vs. run length for the horn & strobe functions (maximum 2.5-volt drop in the wire). The horn & strobe circuits are Class 2 control circuits, so Class 2 conductors should be used.

Wire gauge	Maximum run Length	
	(feet)	(meters)
24	200	61
22	340	103
20	480	147
18	850	215

Table 3-6 – Wire Gauge vs. Run Length

4 Operations

4.1 Power up

When power is applied to the panel, the DVP-1200 will start up. During the startup sequence, the LED status lights will flash. Once the POWER/TROUBLE light is steady green, the panel is ready to configure. If the panel is powered up for the first-time screen like Figure 4-1 will show up. This screen will allow the installation company information to be entered and saved in the control panel. This information can be accessed or changed via “TECHNICAL SUPPORT” in main menu. Select “MAIN MENU” and hit ENTER to go to DVP-1200 Main Menu.

⚠ WARNING

DVP-1200 may not function effectively below 32°F (0°C) or above 104°F (40°C). Using the equipment outside of this temperature range may adversely affect the product.

4.1.1 Initial Operating Mode

If the user has not entered any parameters, the system WILL NOT be controlling the ventilation system. The relays WILL NOT actuate, and the horn and strobe outputs WILL NOT be powered.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

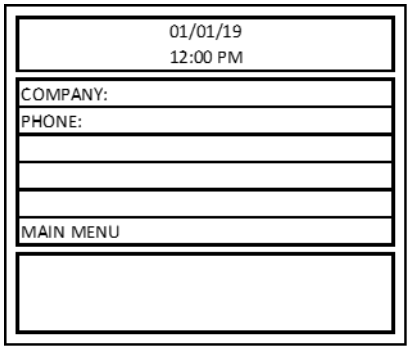


Figure 4-1 – Contact Information Screen

4.2 User Interface

4.2.1 LCD Display

The LCD display is used to show detailed information about the status of the control system and the configuration parameters.

4.2.2 Status Lights

The POWER/TROUBLE, HUSH, WARNING/ALARM, RELAY status lights indicate the system status and provide the following data:

- POWER/TROUBLE
  - Green – Power is good and there are no trouble indications.
  - Red– Trouble is indicated by a transducer or the panel itself.
- HUSH
  - Off –There are no silenced alarms or warnings or troubles.
  - Red –There are alarms, warnings and/or troubles that have been silenced (gas levels may or may not remain or continue to be at an alarm or warning levels).
- WARNING/ALARM
  - Off – All indicated gas levels are below the warning level
  - Red – One or more gas levels are at or above the alarm level
  - Amber – One or more gas levels are at or above the warning level
- RELAY
  - Off – Relay is not active
  - Green – Relay is active

The overall system status is visible via the status lights as described above. More detailed system information is displayed on the LCD, which can show information about sensor and panel configuration. A typical status display is shown in Figure 4-2.

4.2.3 Keypad

The keypad is used to select the menu displayed and to enter the configuration parameters, which are stored in the DVP-1200 memory. The keypad consists of ten number keys, four cursor keys, a MENU key, a HUSH key, an ENTER key, a DEL key, and a brightness key.

4.2.3.1 Digit Keys

The digit keys are used to input any alphanumeric information such as sensor numbers or a password.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.2.3.2 Cursor Keys

In normal mode, (no warnings or alarms indicated), the up and down cursor keys will scroll through the menu. The left and right cursor keys can be used to scroll through options on some menu items. Also, the left cursor key can be used to return to the previous higher-level menu.

4.2.3.3 MENU Key

When the system is in the normal display, press MENU to show the Configuration Menu. Press MENU again to return to the normal display.

If the MENU key is pressed from any submenu, the display will return to the configuration menu. Any changes made within the submenus will be lost if it is not saved by the user.

4.2.3.4 Hush Key

The HUSH key is only used to silence the audible indicators (internal buzzer and possible external Horn and Strobe devices). Pressing and releasing the key will silence the internal buzzer. The HUSH key must be held for 3 seconds to silence the Horn and Strobe devices.

The following table shows the silence period for different states of the panel.

State of the Panel	Silence Period
Alarm	5 minutes
Warning	15 minutes
Trouble	8 hours

Table 4-1 – Notification Silence Periods

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.2.3.5 Enter key

The enter key is used to select menu items and to confirm any user input.

4.2.3.6 DEL Key

The DEL key is used to delete characters if an incorrect character is entered or is used to delete the event log.

4.2.3.7 Brightness Key

The brightness key is used to turn the LCD display backlight on or off. It is located on the lower left corner of the keypad.

4.3 Normal Status Display

The normal display shows the date and the time, the status and basic configuration of each zone, and the sensor type and number of sensors connected for each sensor type.

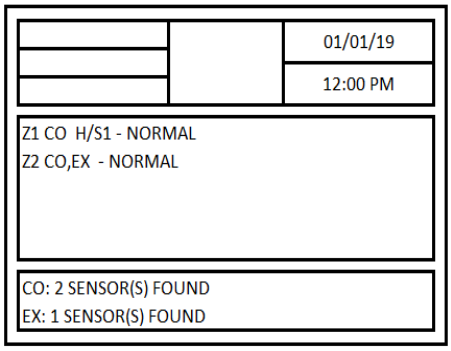


Figure 4-2 – Normal Status Display

In the middle box, each zone is indicated by “Z” followed by zone number.

All sensors assigned to the zone are listed by their sensor type. They are indicated by the two-letter abbreviation for the gas type of the sensor.

If a horn/strobe is assigned to the group, it will be indicated by H/Sx where “x” is the horn/strobe number. Similarly, if a relay is assigned to the group, it will be indicated by Rx where “x” is the relay number.

Lastly, the status of each zone is displayed. In normal operating conditions, it will show “NORMAL”. If a sensor in the zone is indicating a gas level that is greater than the alarm or warning levels, the zone status will show “ALARM” or “WARNING” as appropriate. If any of the sensors assigned to the zone goes into trouble, then the status of the zone in the main screen is updated with ‘TROUBLE’.

NOTE: If a sensor is part of final system installation and needs to be monitored, it must be assigned to a zone.

4.4 ALARM, WARNING, and TROUBLE Status Display

If an alarm, warning, or trouble event occurs, the display will automatically switch to the corresponding screen. If multiple events occur simultaneously, the display will only show the event with higher priority. The event priority is (from highest to lowest) ALARM, GAS WARNING, TROUBLE.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.4.1 ALARM Status Display

When any sensor indicates a gas level that is at or above the configured alarm level for the sensor, the panel will enter ALARM mode, during which the internal buzzer will sound, the WARNING/ALARM LED will be red, and the display will switch to the ALARM status display.

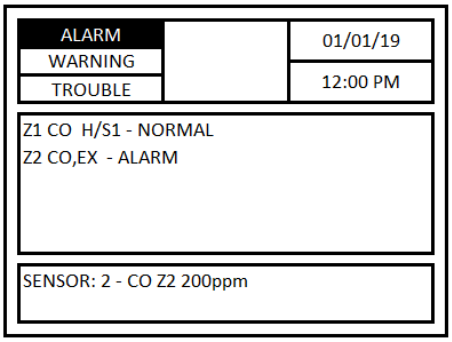


Figure 4-3 – Alarm Display Status

The top left box will have ALARM highlighted.

If the sensor in alarm is assigned to any of the zones, then status of the zone is updated to indicate ALARM in the middle box of the display.

The bottom box will cycle through all sensors that are in alarm, at five seconds per display. It will display sensor address, gas type, zone number (if assigned to a zone) and corresponding gas reading.

⚠ WARNING
Immediately exit any environment that causes an alarm condition on the sensor.

If an external horn and/or strobe are connected and configured to signal an alarm condition, they will also sound when an alarm condition occurs, after a delay if that configuration option is used.

When the HUSH key is pressed, the internal buzzer will be silenced for five (5) minutes. HUSH key must be held for three (3) seconds to silence the horn and strobe.

When all indicators have been silenced, the display will show that alarms have been silenced for five minutes. After any key is pressed (or five seconds), the display will return to normal mode and HUSH led will light up steady red.

If a relay is configured as an alarm relay, it will be turned on when an alarm condition is recognized.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.4.2 Warning Status Display

When any sensor indicates a gas level that is at or above the configured warning level for the sensor, the panel will enter WARNING mode during which the internal buzzer will sound, the WARNING/ALARM status LED will be amber, and the display will switch to the WARNING status display.

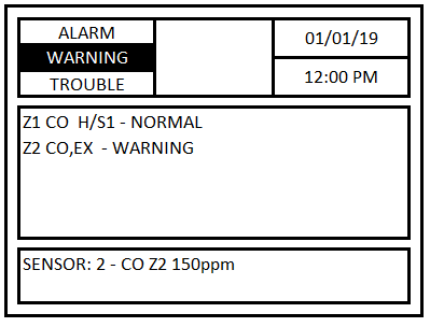


Figure 4-4 – Warning Display Status

The top left box will have WARNING highlighted.

If the sensor in the warning is assigned to any of the zones, then the status of the zone is updated to indicate WARNING in the middle box of the display.

The bottom box will cycle through all sensors that are in warning, at five seconds per display. It will display sensor address, gas type, zone number (if assigned to a zone) and corresponding gas reading.

If the buzzer and/or an external horn and/or external strobe are connected and configured to signal a warning condition, they will also sound when a warning condition occurs. There is a configurable delay before the horn or strobe will sound.

When the HUSH key is pressed, the internal buzzer will be silenced for fifteen (15) minutes. The HUSH key must be held for three (3) seconds to silence the horn and strobe.

When all indicators have been silenced, the display will show that warnings have been silenced for fifteen minutes. After any key is pressed (or five seconds) the display will return to normal mode and hush led will light up steady red.

4.4.3 Trouble Status Display

If a sensor fails, a connection is lost or the panel itself detects a failure of its own, the panel will enter TROUBLE mode during which the internal buzzer will sound, the POWER/TROUBLE LED will be red, and the display will switch to the trouble status display.

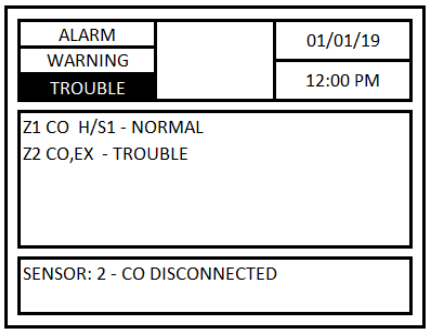


Figure 4-5 – Trouble Display Status

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

The top left box will have TROUBLE highlighted.

If the sensor in trouble is assigned to any of the zones, then the status of the zone is updated to indicate TROUBLE in the middle box of the display.

The bottom box will cycle through all sensors that are in trouble, at five seconds per display. It will display sensor address, gas type, zone number (if assigned to a zone) and corresponding trouble description.

Possible trouble conditions are:

- Any configured channel has less than 4 mA flowing in the current loop
- A sensor is reporting a trouble condition
- Any configured channel wiring is open or shorted.
- Internal controller board problems are detected.

If an external horn and/or strobe are connected and configured to signal a trouble condition, they will also sound when a trouble condition occurs, after a delay, if that configuration option is selected.

When the HUSH key is pressed, the internal buzzer will be silenced for eight (8) hours. HUSH key must be held for three (3) seconds to silence the horn and strobe.

When all indicators have been silenced, the display will show that trouble indications have been silenced for eight hours. After any key is pressed (or five seconds), the display will return to normal mode and the hush led will light up steady red.

4.4.4 Unoccupied Failure Display

When Title 24 is enabled, during unoccupied time, DVP-1200 compares the readings of all CO detectors connected (irrespective of assigned zones), and if any CO detector is more than 15 ppm above or below the average of all CO detectors for longer than 4 hours, the detector has failed. This failure is referred to as unoccupied failure in the rest of the manual. Refer to “Section 4.6.3.5 for process to define occupied time. Time outside the defined occupied time is unoccupied time.

If there is unoccupied sensor failure, the panel will enter ALARM mode during which the internal buzzer will sound, the ALARM/WARNING LED will be red, and the display will switch to the ALARM status display. Any outputs assigned to alarm condition will be triggered. Figure 4-6 shows an example of DVP-1200 display during unoccupied failure. “FAIL - UNOCC.” on the screen indicates unoccupied failure.

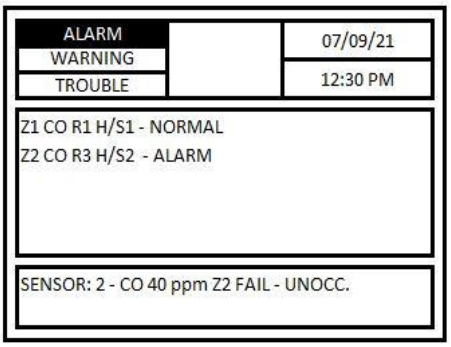


Figure 4-6 – Unoccupied Failure Display Status

DVP-1200 displays the address of the unoccupied failure detector. If there is more than one unoccupied failure detector, then display scrolls every 5 seconds to display all unoccupied failure detectors.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

If unoccupied failure sensor is part of a zone (Zone 2 in above figure), then the status of the zone will be updated to ALARM and all outputs assigned to that zone will get activated. If 4-20mA output is assigned to the zone with unoccupied failure sensor, then its output will be 20mA.

When the HUSH key is pressed and held for 5 seconds, the internal buzzer will be silenced for 4 hours. If the horn or strobe turn on delays have not finished, then they will also be silenced.

When all indicators have been silenced, the display will show that unoccupied failure indications have been silenced for four hours and the display will return to normal mode. In VIEW SENSOR screen, sensors with unoccupied failure silenced will display "FAILED UNOCCUPIED" alternating with current gas reading.

4.4.5 Occupied Failure Display

When Title 24 is enabled, during occupied time, DVP-1200 compares the readings of all CO detectors assigned to a zone, and if any CO detector is more than 15ppm above or below the 30-minute rolling average of all CO detectors assigned to the corresponding zone, then the detector has failed. This failure is referred to as occupied failure in the rest of the manual. Refer to "Section 4.6.3.5 for process to define occupied time.

If there is occupied sensor failure, the panel will enter ALARM mode during which the internal buzzer will sound, the ALARM/WARNING LED will be red, and the display will switch to the ALARM status display. Any outputs assigned to alarm condition will be triggered. Figure 4-7 shows an example of DVP-1200 display during unoccupied failure. "FAIL - OCC." on the screen indicates occupied failure.

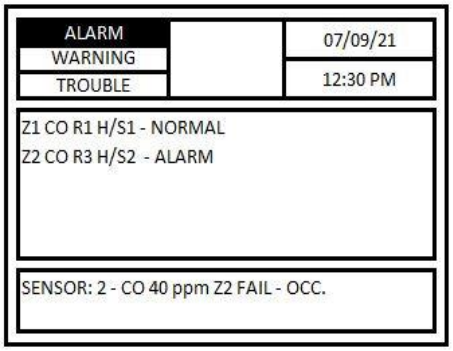


Figure 4-7 – Occupied Failure Display Status

DVP-1200 displays the address of the occupied failure detector. If there is more than one occupied failure detector, then display scrolls every 5 seconds to display all occupied failure detectors.

The status of the zone with occupied failure sensor will be updated to ALARM and all outputs assigned to that zone will be activated. If 4-20mA output is assigned to the zone with occupied failure sensor, then its output will be 20mA.

When the HUSH key is pressed and held for 5 seconds, the internal buzzer will be silenced for 5 minutes. If the horn or strobe turn on delays have not finished, then they will also be silenced.

When all indicators have been silenced, the display will show that occupied failure indications have been silenced for 5 minutes and the display will return to normal mode. In VIEW SENSOR screen, sensors with occupied failure silenced will display "FAILED OCCUPIED" alternating with current gas reading.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.4.6 Calibration Due Warning Display

When there are up to 30 days until calibration for any carbon monoxide sensors connected, panel will trigger Calibration Due Warning. Calibration Due Warning has lower priority than gas warning. This feature is applicable only for carbon monoxide detectors with calibration period feature with Title 24 feature enabled in DVP-1200.

DVP-1200 displays the address of the detector with calibration due warning. If there is more than one detector with calibration due warning, then display scrolls every 5 seconds to display all detectors with calibration due warning.

If there is a carbon monoxide sensor with calibration due warning, the panel will enter WARNING mode during which the internal buzzer will sound, the ALARM/WARNING LED will be amber, and the display will switch to the WARNING status display. Any outputs assigned to warning condition will be triggered.

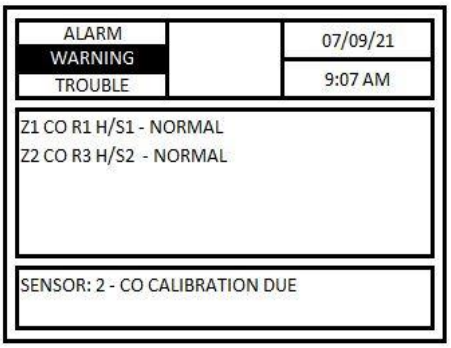


Figure 4-8 – Calibration Due Warning Display Status

When the HUSH key is pressed and held for 5 seconds, the internal buzzer and horn/strobe will be silenced. Silence period is dependent on time left to calibration. The following table shows silence period for different time to calibration.

Time till Calibration	Silence Period
>14 days, and <30 days	14 days
>7 days, and <14 days	7 days
< 7 days	1 day

Table 4-2 – Calibration Due Silence Period

When all indicators have been silenced, the display will show that calibration due warning indication have been silenced for corresponding silence period. After approximately 5 seconds the display will return to normal mode. Only a calibration due warning with lower silence interval (refer Table 4-2) or calibration due warning from new sensor will reset the HUSH and panel will go back to state indicating Calibration Due Warning.

When in normal display mode, for detectors with Calibration Due Warning silenced, panel will display current gas reading alternating with “CALIBRATION DUE” in VIEW SENSOR screen for the corresponding sensor.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.4.7 Calibration Overdue Trouble Display

When the panel detects a carbon monoxide sensor with Calibration Overdue condition it will go into trouble state. This trouble has higher priority than a regular trouble condition. This feature is applicable only for carbon monoxide detectors with calibration period feature with Title 24 featured enabled in DVP-1200.DVP-1200 displays the address of the detector with calibration overdue trouble. If there is more than one carbon monoxide sensor with calibration overdue condition or are sensors in trouble due to other conditions, then display scrolls every 5 seconds to display all detectors with the trouble condition.

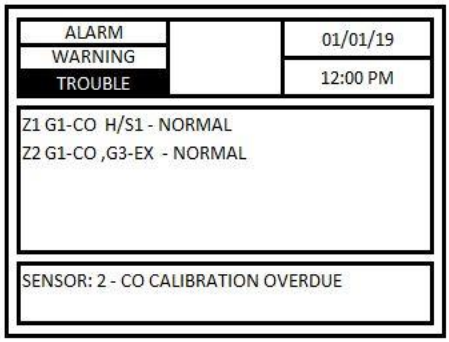


Figure 4-9 – Calibration Overdue Display Status

During Calibration Overdue trouble, the trouble LED will be ON (the POWER/TROUBLE LED will be red), and the display will switch to the TROUBLE status display. Any outputs assigned to trouble condition will be triggered. The status of the zone with calibration overdue carbon monoxide sensor will be updated to TROUBLE and all outputs assigned to that zone will get activated. If 4-20mA output is assigned to the zone with calibration overdue sensor, then its output will be 20mA.

When the HUSH key is pressed and held for 5 seconds, the internal buzzer will be silenced for 15 minutes. If the horn or strobe turn on delays have not finished, then they will also be silenced for 15 minutes.

When all indicators have been silenced, the display will show that calibration overdue trouble indication have been silenced for 15 minutes. After approximately 5 seconds the display will return to normal mode.

When in normal display mode, for detectors with calibration overdue trouble silenced panel will display “CALIBRATION REQUIRED” in VIEW SENSOR screen for the corresponding sensor.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.5 Ventilation Control

The ventilation control function operates independently from the alarm function. It provides the ability to configure the DVP-1200 for control of up to 8 zones. Each zone can be configured to control relays and an external horn and strobe if desired.

When more than one zone is controlling a relay, it only takes one zone to activate the relay, but all controlling zones must release the relay before it turns off. Each of the relays, horn, and strobe has independent turn-on delays (to ignore short duration, transient gas signals) and turn off delays (to ensure minimum run times for fans that must run for internal cooling).

A VFD may be enabled and controlled by the DVP-1200 output relays or the DVP-1200 4-20mA output. This allows an operator to change fixed speeds for a VFD if it is used as a stand-alone control.

Here is an example of an application where VFD is controlling the speed of a fan: An operator can close relay 1, 2, or 3 to set the fan speed. If relay 1 is closed, the VFD will operate at 50%, If relay 2 is closed, the VFD will operate 75%, If relay 3 is closed, the VFD will operate at 100%.

Each zone can respond to gas levels indicated by one or more of the sensors, with configurable turn on and turn off concentrations (rising and falling) for each gas type.

For example, each zone can be configured to monitor a separate set of four sensors and control a single relay.

A single sensor may be assigned to multiple zones if desired. Here is an example of a control scheme which has single sensors assigned to multiple zones:

1. One zone monitors all sensors and turns one relay on at a low gas concentration.
2. A second zone monitors the same sensors and turns on a second relay if the gas concentration reaches a higher level.
3. A third zone also monitors the same sensors and turns on the last relay as a signaling device to a live monitor station, as well as turning on an external horn and strobe.

In addition to controlling the relays based on the gas concentration, each zone can have a timed function, e.g., turn on low volume ventilation fans at 7:00 AM and turn them off at 8:00 PM.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.6 Main Menu

The Main Menu can be entered from normal mode by pressing the MENU key. The display will show the main menu as shown below. All the DVP-1200 configuration menus are password protected. The default password for the panel is '1234'.

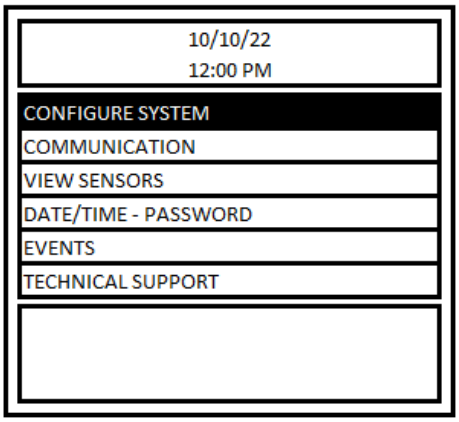


Figure 4-10 – Configure System Menu

4.6.1 CONFIGURE SYSTEM

Menu path: Main Menu/CONFIGURE SYSTEM /

The DVP-1200 configuration can be changed manually. To enter the configuration menu, a password is required. While the DVP-1200 is in configuration mode, alarm and ventilation control functions continue in the background with the previously set configuration values. If an alarm, warning, or trouble condition is detected, the corresponding LED, the buzzer, the horn and the strobe will operate as configured and the display will switch to the corresponding status display.

4.6.2 MANUAL CONFIGURE

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->

Choose "MANUAL CONFIGURE" to use the DVP-1200 interface to configure the system. Follow the menu as shown below to enter the "MANUAL CONFIGURE" menu.

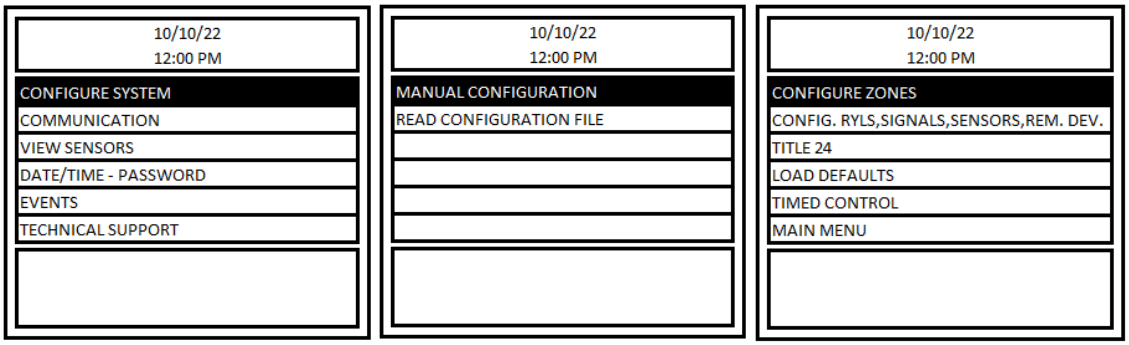


Figure 4-11 – Configure Zones Menu

CONFIGURE ZONES

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->CONFIGURE ZONES -->

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

The “CONFIGURE ZONES” menu is used to create a new zone, edit an existing zone, or delete an existing zone.

To select a zone for editing select CONFIGURE ZONES from the CONFIGURE SYSTEM menu and press ENTER. The display will show the ADD/EDIT ZONES screen. Press ENTER. Then, enter the zone number and press Enter. The user can enter any valid zone number from 1-8.

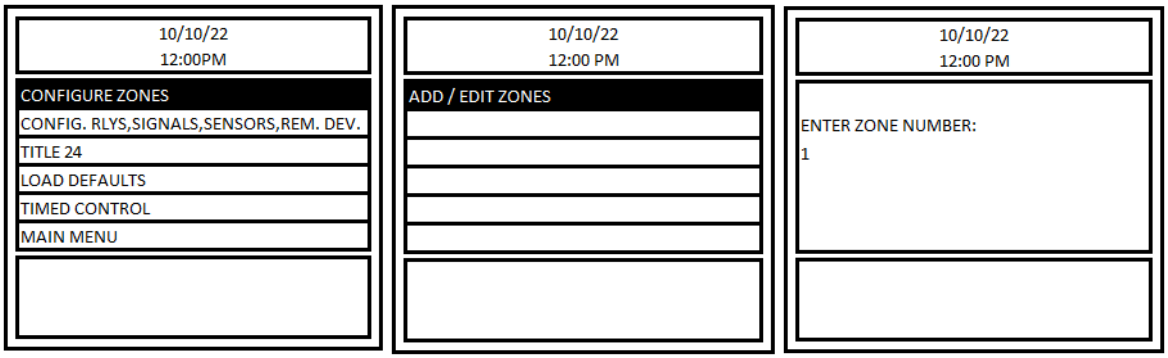


Figure 4-12 – Edit Zones Menu

If the zone has not been configured, the system will skip straight to the zone configuration menu shown below.

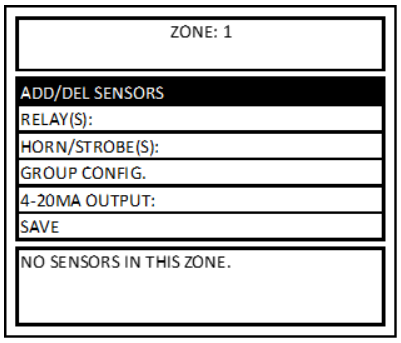


Figure 4-13 – Zone Menu Options

If the zone has already been configured, the display will briefly show the message “STATUS: ZONE EXIST” as shown below and then the user will have the option to CANCEL, RELOAD CONFIG, or DELETE.

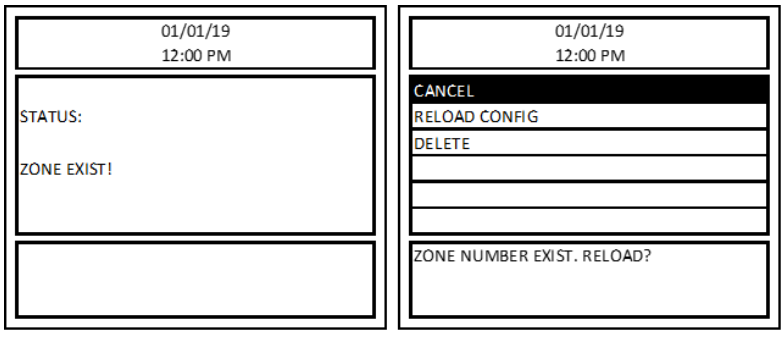


Figure 4-14 – Configured Zone Menu Options

Choose CANCEL to return to the previous screen.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Choose RELOAD CONFIG to load the previous configuration for edit.

Choose DELETE to delete the zone.

Refer to Figure 4–15 for an example of a zone configuration screen. The top box displays the current zone (ZONE:1) you are configuring during the zone configuration process. The middle box of Figure 4–15 shows that Relay 4, Horn/Strobe 1, Horn/Strobe 3, and 4-20mA Output 2 are assigned to Zone 1. Also, the bottom box of Figure 4–15 shows 2 CO Sensors, and 1 EX (Combustible) Sensor are assigned to Zone 1.

4.6.2.1 ADD/DEL SENSORS

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->CONFIGURE ZONES -->ADD/EDIT ZONES-->ADD/DEL SENSORS -->

To add, delete, and view sensors assigned to the zone, select the ADD/DEL SENSORS option from the zone configuration menu and press ENTER.

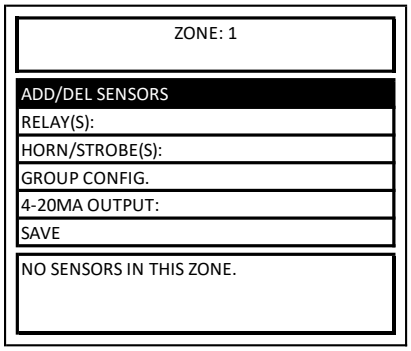


Figure 4-15 – ADD/DEL Sensor Menu

Refer to Figure 4-16 for sequence of display screen during sensor addition to a zone. To assign a sensor to the zone, select ADD SENSOR and press ENTER. Enter the Modbus address of sensor and press ENTER. The sensor will be added to the zone and the display will return to the ADD/DEL SENSORS menu. The bottom box of the display will be updated with the added sensor information. Repeat the process to add another sensor to the zone.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

The bottom box in “ADD SENSOR” and “DELETE SENSOR” screen will list the address of all the sensors currently assigned to the zone.

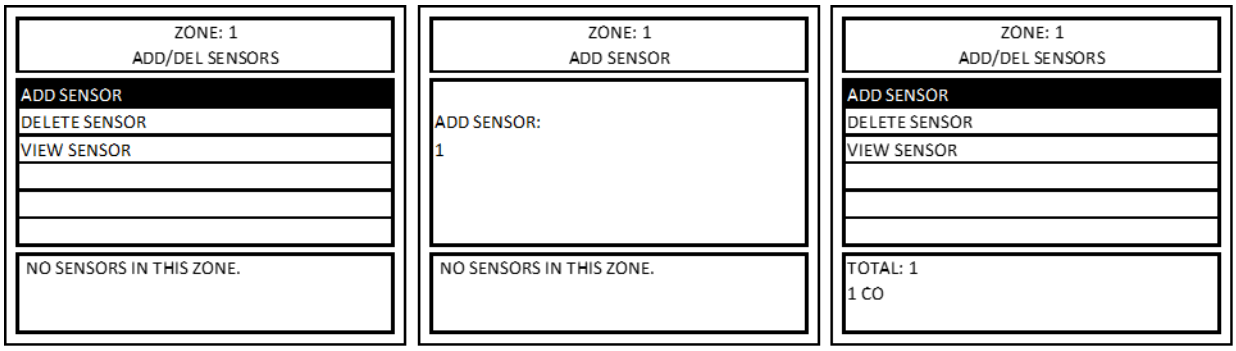


Figure 4-16 – Zone Add Sensor Menu

Refer to Figure 4-17 for sequence of display screen during deleting sensor from a zone. To remove a sensor from the zone, select DELETE SENSOR and press ENTER. Enter the Modbus address of the sensor to remove from the zone and press ENTER. The sensor will be deleted from the zone and the display will return to the ADD/DEL SENSORS menu. The bottom box of the display will be updated to reflect this change.

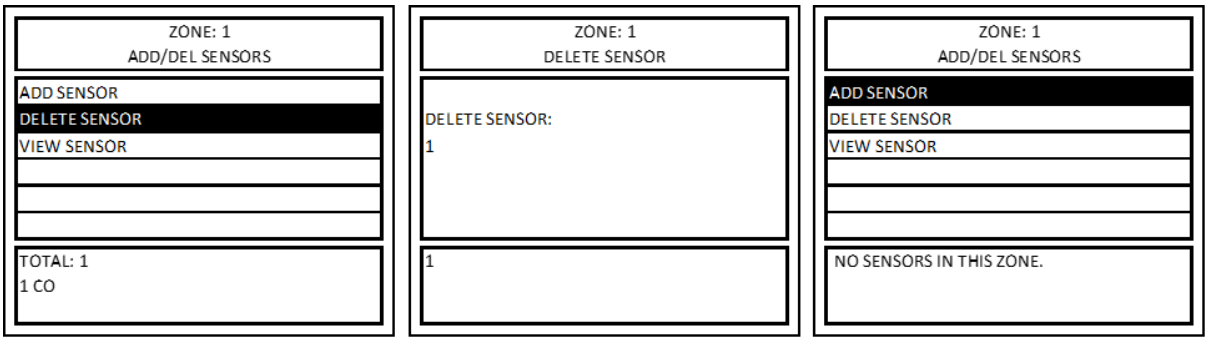


Figure 4-17 – Zone Delete Sensor Menu

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

To view the sensors assigned to the zone, select VIEW SENSOR and press ENTER. The middle box of the display will list the addresses of the sensors assigned to the zone (Figure 4-18). Press ENTER or the LEFT arrow to return to the ADD/DEL SENSORS menu.

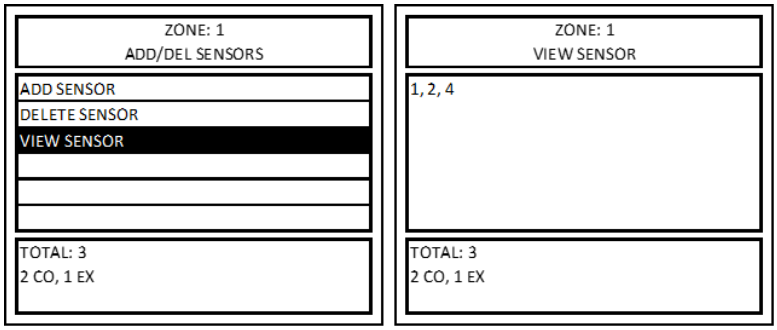


Figure 4-18 – Zone View Sensor Menu

4.6.2.2 RELAY(S)

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->CONFIGURE ZONES -->ADD/EDIT ZONES--> RELAY(S): -->

To add relays to a zone or delete relays assigned from a zone, select "RELAY(S):" from the zone configuration menu and press ENTER. Then, select ADD RELAY or DELETE RELAY as shown below. The bottom box of the display will show any relays assigned to the zone and will get updated as you make changes.

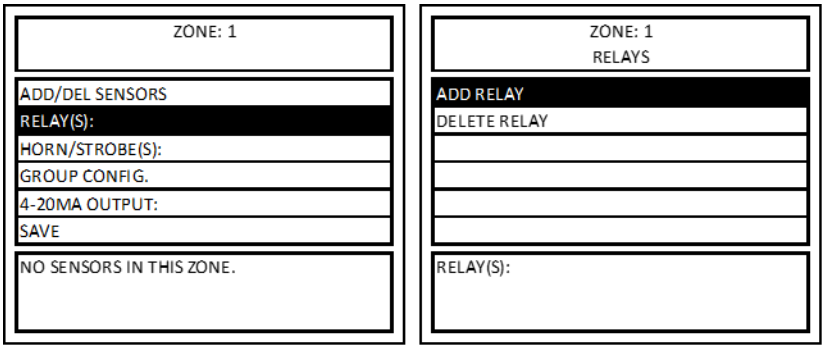


Figure 4-19 – Zone Relay Menu

To assign a relay to the zone, select ADD RELAY and press ENTER. Input the relay number and press ENTER. The relay will be added to the zone and the display will return to the RELAYS menu with the bottom box of the display updated to reflect the changes made.

To delete a relay, select DELETE RELAY from the RELAYS menu and press ENTER. Input the relay number to delete and press ENTER (to delete all relays assigned to the zone, input "0" and press ENTER). The relay(s) will be deleted from the zone and the display will return to the RELAY menu with the bottom box of the display updated to reflect the change made.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

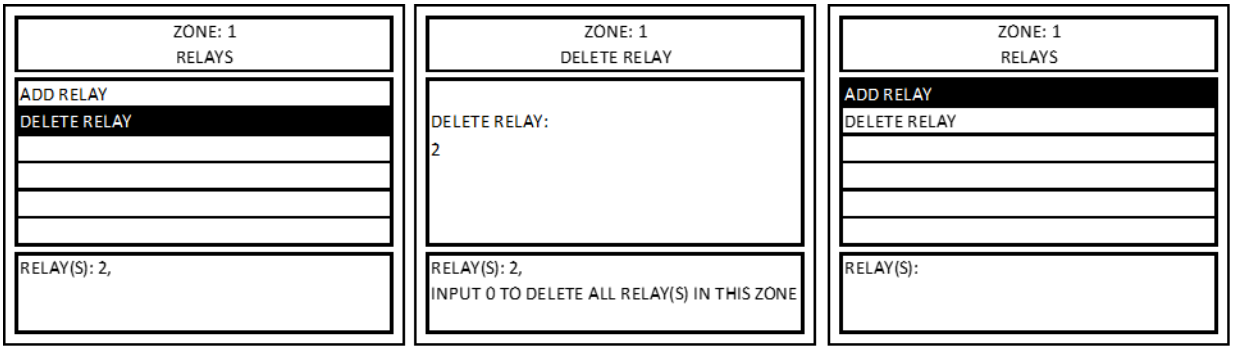


Figure 4-20 – Zone Delete Relay Menu

Relay assigned as Alarm Relay cannot be added to a zone. If an attempt to add an alarm relay to a zone is made, then it will display an error message “CANNOT ADD RELAY. DEDICATE FOR ALARM” as shown in Figure 4-21.

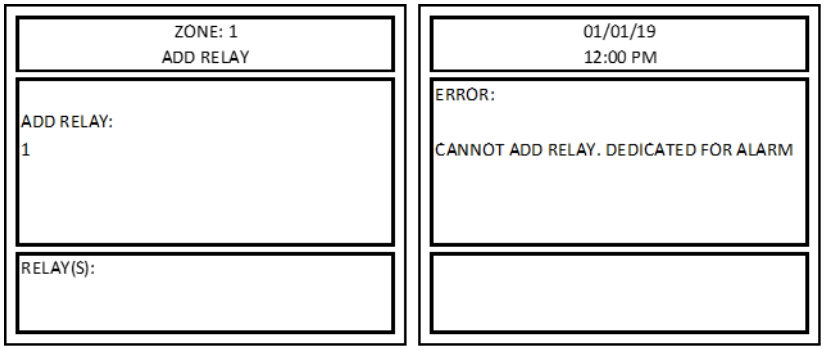


Figure 4-21 – Zone Add Relay Error

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.6.2.3 HORN/STROBE(S)

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->CONFIGURE ZONES -->ADD/EDIT ZONES-->HORN/STROBE(S): -->

To add Horn/Strobes to a zone or delete Horn/Strobes from a zone, select "HORN/STROBE(S)" from the zone configuration menu and press ENTER. Then, select ADD H/S or DELETE H/S. The bottom box of the display will display H/S assigned to the zone and will get updated as you make changes.

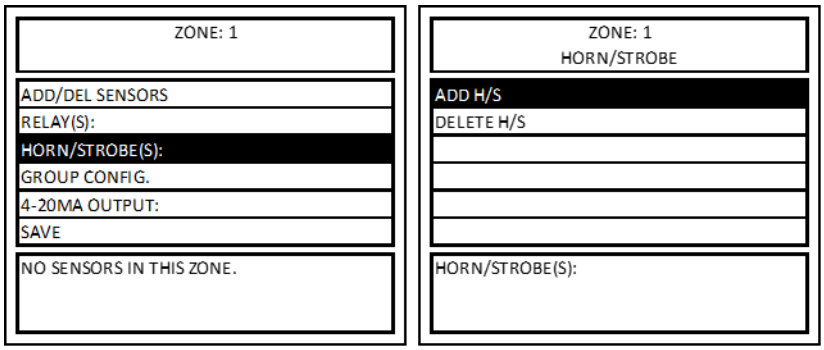


Figure 4-22 – Zone Horn/Strobe Menu

To assign a horn/strobe to the zone, select ADD H/S and press ENTER. Input the horn/strobe number (valid entries are 1 to 4) and press ENTER. The horn/strobe will be added to the zone and the display will return to the HORN/STROBE menu with the bottom box of the display updated to reflect the changes made (Refer Figure 4-23).

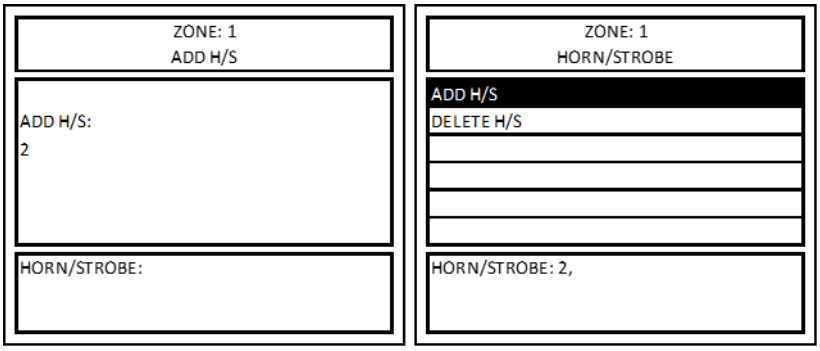


Figure 4-23 – Zone Add Horn/Strobe Menu

To delete a horn/strobe, select DELETE H/S from the HORN/STROBE menu and press ENTER. Input the horn/strobe number and press ENTER (to delete all horn/strobes assigned to the zone, input "0" and press ENTER). The horn/strobe(s) will be deleted from the zone and the display will return to the HORN/STROBE menu with the bottom box of the display updated to reflect the changes made.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

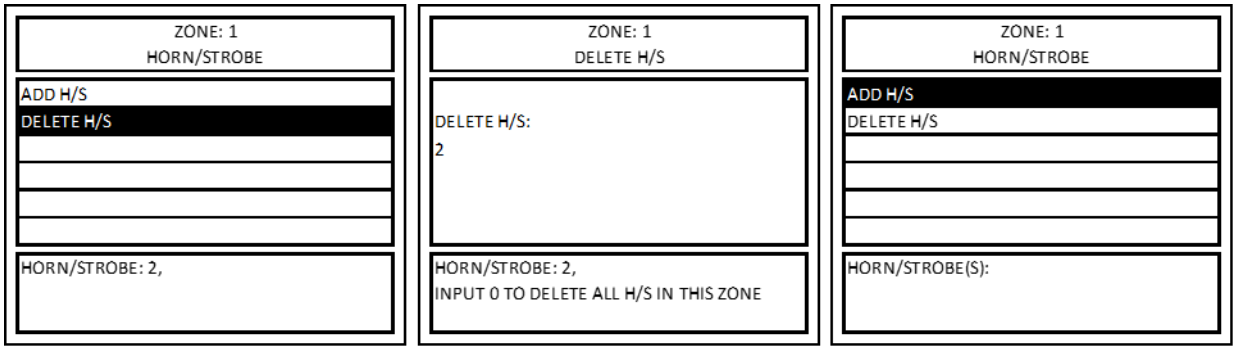


Figure 4-24 – Zone Delete Horn/Strobe Menu

If a horn/strobe is already assigned as a dedicated alarm, warning, or trouble (see Section 4.6.1.2.2.3 CONFIGURE H/S), it will not be able to be added to the zone configuration and vice-versa. In the example below, H/S 1 has already been assigned as a dedicated alarm. Attempting to add it to the Zone 1 configuration results in an error message. Similarly, if a Horn/Strobe is assigned to a zone then it cannot be assigned to alarm, warning, or trouble.

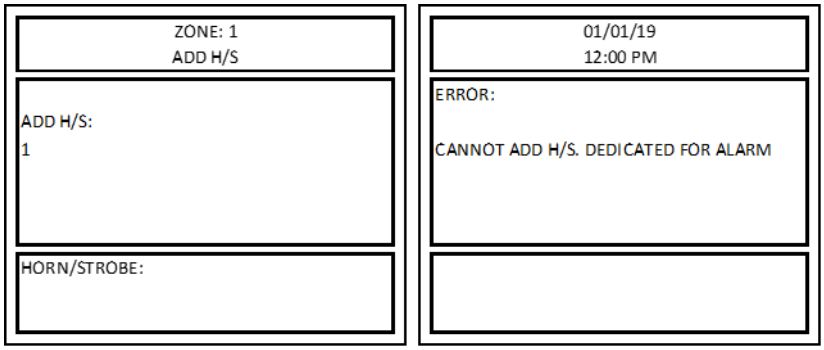


Figure 4-25 – Zone Add Horn/Strobe Error

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.6.2.4 GROUP CONFIG.

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->CONFIGURE ZONES -->ADD/EDIT ZONES-->GROUP CONFIG. -->

Each group of sensors can be configured with settings unique to each zone.

For example, Group 1 sensors (CO gas) ALARM could be set to 200 ppm in Zone 1 and 100 ppm in Zone 2.

To configure the sensor groups within each zone, select GROUP CONFIG. from the zone configuration menu and press ENTER. To view or change values for a sensor type, select SENSOR TYPE and press ENTER.

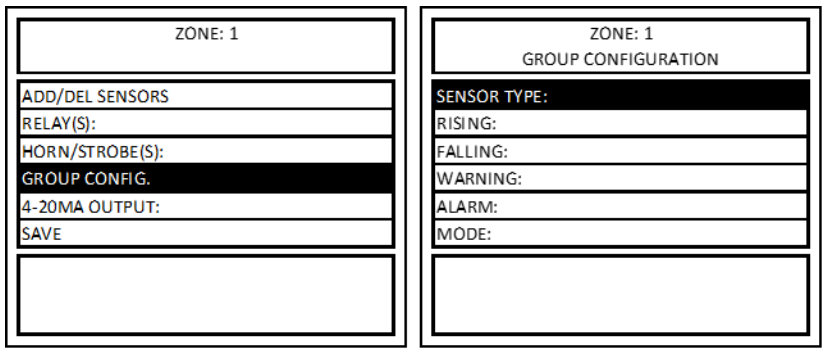


Figure 4-26 – Zone Group Config. Menu

Then, enter the valid sensor type (displayed in bottom box) of the group to view and press ENTER. Once a valid sensor type has been entered, the current values for that sensor type or group of sensors in that zone will be displayed as shown below. To change the values, select the menu item and press ENTER. Then, key in the new value and press ENTER. For NO2 and O2 sensor press RIGHT key to add a decimal point after a value. E.g., to enter value 3.2, enter 3 press RIGHT key and then enter 2. Panel will display a message if an invalid value is entered. Values entered cannot be larger than range of the detector, rising value must be equal or greater than Falling value, and Alarm value must be equal or greater than Warning. Refer to Table 4-2 for default values for each field or menu item.

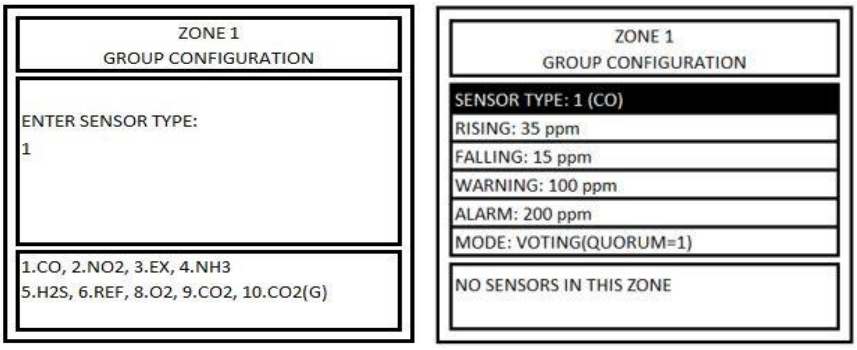


Figure 4-27 – Zone Group Config. Sensor Type

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

The following options are available for GROUP CONFIGURATION:

- RISING – If the gas concentration is greater than or equal to this level, the zone output(s) will be turned on.
- FALLING – If the gas concentration is less than or equal to this level, the zone output(s) will be turned off.
- WARNING - The gas concentration used to trigger a warning status for the group of sensors within the zone. Setting a warning level of 0 (zero) will disable warning detection for this sensor.
- ALARM – The gas concentration used to trigger an alarm status for the group of sensors within the zone. Setting an alarm level of 0 (zero) will disable alarm detection for this sensor.
- MODE – When multiple sensors are being monitored by a group, the output decision can be based on either voting, or the average of all sensors in the group. Valid modes are AVERAGE or VOTING (default). The bottom box in the LCD displays the current Mode used for the group (or sensor type).
    - AVERAGE: The gas concentrations from all sensors (of same type) in the group in a zone are averaged and
        - If the average is greater than or equal to the rising trip point, the zone outputs(s) are activated.
        - If the average is less than or equal to the falling trip point, the zone output(s) are de-activated.
        - If the average is between the two trip points, the outputs remain in their previous state.
    - VOTING: The number of sensors (of same type) in the group indicating a value greater than or equal to the rising trip point is counted.
        - If the count is greater than or equal to the QUORUM, then the zone output(s) are activated.
        - For zone outputs to be deactivated first the count of sensors (of same type) with value greater than or equal to the rising trip point should be less than quorum value and count of sensors (of same type) with value less than or equal to the falling trip point should be greater than or equal to the quorum. NOTE: Activating the output(s) is given priority if there is an equal number of sensors (of same type) with gas readings greater than or equal to the rising trip point and sensors (of same type) with readings less than or equal to the falling trip point.
        - QUORUM: It is up to the installer to ensure that the quorum entry is appropriate for the configuration. A value greater than the number of sensors being monitored by the group stops the group from controlling the outputs. The default quorum value is 1. Select Quorum and hit Enter after Selecting Voting to change the quorum to values other than default value of 1.

The default sensor types and settings are as follows:

Description	Carbon Monoxide	Nitrogen Dioxide	Combustible Gas	Ammonia	Hydrogen Sulfide	Refrigerants	Carbon Dioxide (Type: 9)	Oxygen Depletion*	Oxygen Enrichment*	Carbon Dioxide (Type 10)
Type	CO	NO_2	EX	NH_3	H_2S	REF	CO_2	O_2	O_2	CO_2 (G)
Range	200 ppm	20 ppm	50% LEL	100 ppm	50 ppm	1,000 ppm	5,000 ppm	25% v/v	25.0% v/v	5.00% v/v
Alarm Level	200 ppm	5 ppm	20% LEL	75 ppm	20 ppm	300 ppm	4,000 ppm	19.5% v/v	23.5% v/v	3.00% v/v
Warning Level	100 ppm	2.5 ppm	15% LEL	50 ppm	15 ppm	200 ppm	3,000 ppm	20.0% v/v	22.5% v/v	1.00% v/v
Rising Level	35 ppm	2.5 ppm	10% LEL	25 ppm	8 ppm	100 ppm	1,000 ppm	20.3% v/v	22.0% v/v	0.10% v/v
Falling Level	15 ppm	1.2 ppm	5% LEL	10 ppm	3 ppm	50 ppm	800 ppm	20.6% v/v	21.5% v/v	0..08% v/v

Table 4-2 – Sensor Default Settings

*The GROUP CONFIG. menu for Oxygen (SENSOR TYPE 8) has an additional option “O2 MODE” with available options: DEPLETION, ENHANCEMENT, BOTH. The Oxygen sensor can be configured to signal for:

1. High gas levels (ENHANCEMENT)
   Values equal to or greater than 20.9% v/v are only valid for Enhancement settings (Rising, Falling, Warning and Alarm).
2. Low gas levels (DEPLETION)
   Values equal to or less than 20.9% v/v are only valid for Depletion settings (Rising, Falling, Warning and Alarm).
3. High and low gas levels (BOTH)

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

If “BOTH” is selected for O2 mode, then the panel will signal alarm, warning or zone activation for both oxygen depletion and enhancement. E.g., with default settings as indicated in Table 4-2 panel will indicate alarm condition for oxygen sensor reading of less than or equal to 19.5% vol as well as reading greater than or equal to 23.5% vol if “BOTH” is selected for O2 Mode. Whereas if “DEPLETION” mode is selected then panel will indicate alarm condition for reading less than or equal to 19.5% vol only and similarly if “ENHANCEMENT” mode is selected then panel will indicate alarm condition for reading greater than or equal to 23.5% vol only.

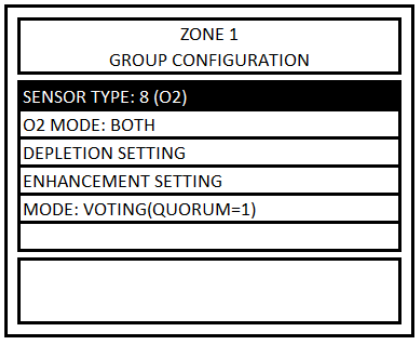


Figure 4-28 – Zone Group Config. Sensor Type

4.6.2.5 4-20mA OUTPUT or Analog Output

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->CONFIGURE ZONES -->ADD/EDIT ZONES-->4-20MA OUTPUT: -->

To assign 4-20mA output to a zone, select “4-20MA OUTPUT:” from the zone configuration menu and press ENTER. Then select “OUTPUT NUMBER:” and press ENTER.

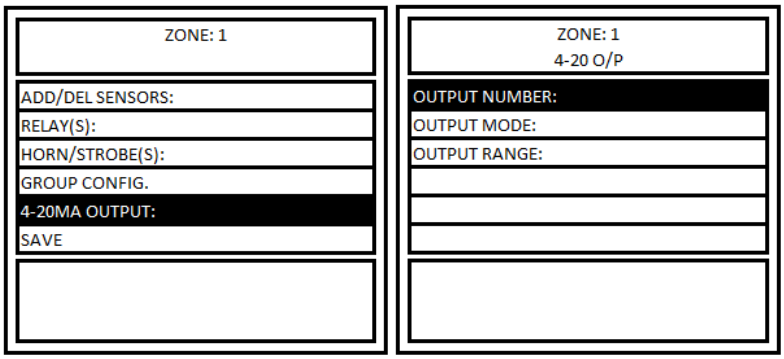


Figure 4-29 – Zone 4-20mA Output Menu

Input the 4-20mA output number to assign it to the zone. Valid entries are 1, 2 and 3 and press ENTER. The display will return to the 4-20 O/P menu screen and show the currently assigned 4-20 mA output in the OUTPUT NUMBER field.

NOTE: A zone can be assigned only one 4-20mA output, and a 4-20mA output can only be assigned to one zone. 4-20mA output once assigned to a zone can be deleted or reassigned to a different zone.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

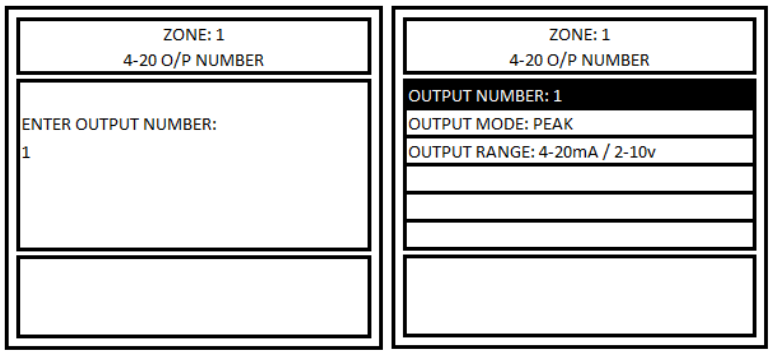


Figure 4-30 – Zone 4-20mA Output Number Menu

NOTE: Oxygen sensor readings are an exclusion for 4-20mA output i.e., its reading is not considered while computing output value for 4-20mA output.

Next, the output mode can be set to PEAK or SCALE.

PEAK – In this mode the gas reading active in the zone (except for the oxygen) corresponding to highest mA output is used to control the analog output assigned to the specific zone. In this case, any active gas reading, that is part of the zone will be taken in consideration, and the sensor reading corresponding to highest mA output will be used to control the analog output. E.g. If a CO and NO2 sensor is assigned to a zone and CO Sensor reading is 50ppm (which corresponds to 8mA) and NO2 sensor reading is 10.0ppm (which corresponds to 12mA) then 4-20mA or Analog output assigned to the zone will output 12mA.

SCALE – In this mode, the 4-20mA value for all detectors added to a zone are computed (for all sensor types except oxygen), and the output is the average of the 4-20mA value for all detectors assigned to the zone. E.g. If a CO and NO2 sensor is assigned to a zone and CO Sensor reading is 50ppm (which corresponds to 8mA) and NO2 sensor reading is 10.0ppm (which corresponds to 12mA) then 4-20mA or Analog output assigned to the zone will output 10mA.

To select the output mode for 4-20mA output, select OUTPUT MODE from the 4-20 O/P menu and press ENTER. Then, select PEAK or SCALE from the 4-20 O/P MODE menu and press ENTER. The display will return to the 4-20 O/P menu and the output mode selection will be updated as shown in Figure 4-31.

When the status of the zone is TROUBLE then 4-20mA output assigned to corresponding zone will switch the output to 20mA.

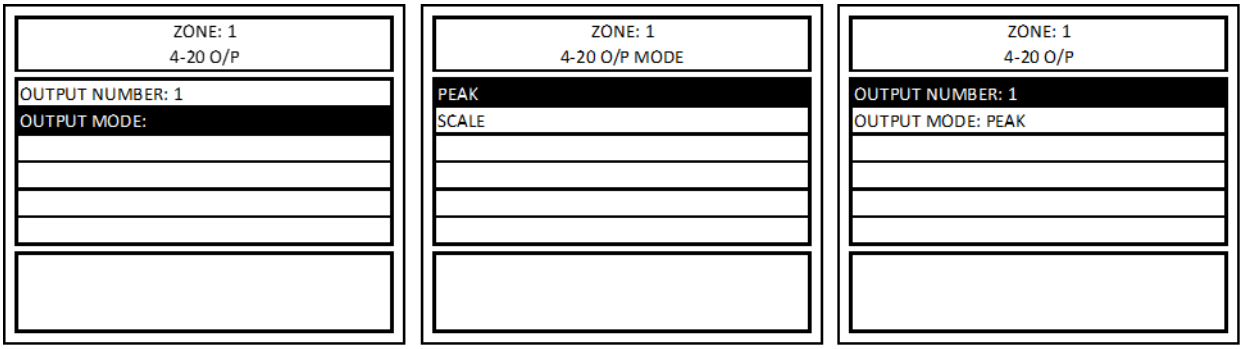


Figure 4-31 – Zone 4-20mA Output Mode Menu

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.6.3 CONFIGURE RELAYS, H/S, BUZZER

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->CONFIG. RLYS, SIGNALS, SENSORS, REM. DEV., BUZZER -->

The DVP-1200 includes 4 standard onboard relays with the option to add an additional 4 onboard relays. Additionally, remote relays can be added to the system. It also has an onboard buzzer and includes 4 outputs designed to operate standalone horn/strobe units. This section includes directions to configure those components.

From the CONFIGURE SYSTEM menu, select CONFIGURE RELAYS, H/S, BUZZER and press ENTER. The display will show the CONFIGURE RELAYS, H/S, BUZZER menu as shown in the images below.

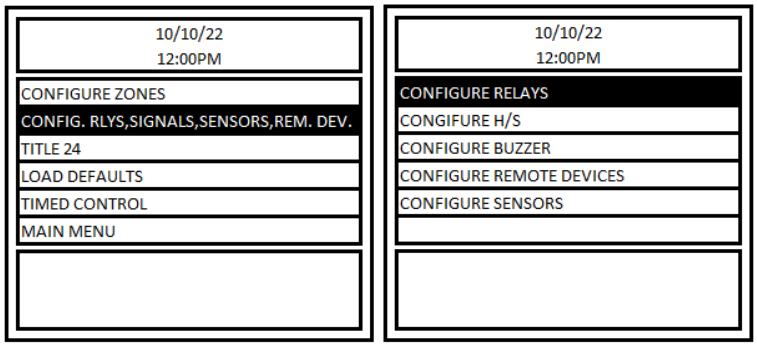


Figure 4-32 – Configure Relays, H/S, Buzzer Menu

4.6.3.1 CONFIGURE RELAY

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE --> CONFIG. RLYS, SIGNALS, SENSORS, REM. DEV. *-->CONFIGURE RELAY* -->

To configure an onboard relay, follow the menu sequence as shown in Figure 4–33. With "RELAY:" selected, press ENTER.

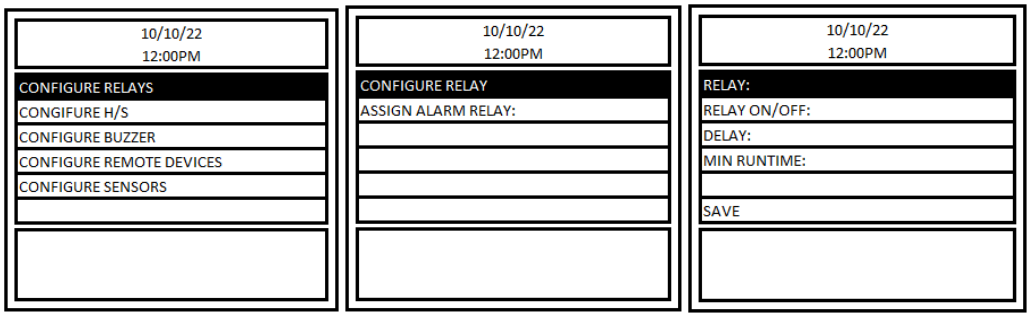


Figure 4-33 – Configure Relay Menu

Then, input the relay number to configure and press ENTER. The current relay configuration will be loaded and become editable as shown in Figure 4–34.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

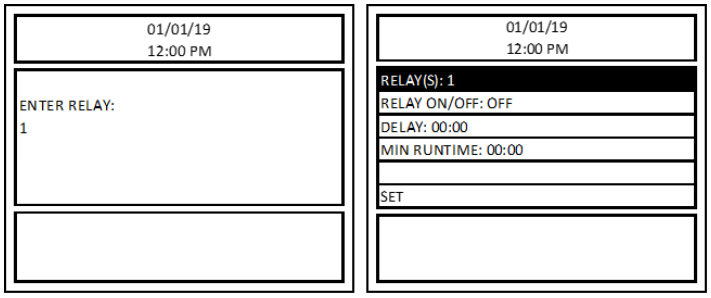


Figure 4-34 – Configure Relay Options Menu

The following options are available for relay configuration:

- RELAY – Select the relay number to view settings and make changes.
- RELAY ON/OFF – Sets the selected relay to normally closed (ON) or normally open (OFF). The default value for this setting is OFF. Highlight this sub-menu and press Enter to change this configuration. Fail Safe operation can be implemented by configuring a relay to operate Normally ON and wiring the circuit using the NC (normally closed) contact. In this way, if the control panel loses power the relay will activate the controlled device if it still has power.
- DELAY – Sets a delay between when conditions to activate the relay occur and when the relay activates. The time format is: [mm: ss]. The default delay time is 00:00. Highlight this sub-menu and press Enter to enter the delay for the selected relay.
- MIN RUNTIME – Sets the minimum runtime once a relay is activated. The time format is: [mm: ss]. Default value is 00:00. Highlight this sub-menu and press Enter to enter the minimum run time value for the selected relay.
- SET – The user must select SET to save the changes. The changes will become active as soon as the user selects SET.

ASSIGN ALARM RELAY

The user can assign a single relay to activate when an alarm condition occurs (regardless of zone). A relay assigned to ALARM will be dedicated to ALARM only and will not be shared with zones.

To assign a relay to ALARM, follow the menu as shown in Figure X. If any of the relay was assigned for Alarm, then it would be displayed in sub-menu “ASSIGN ALARM RELAY:”.

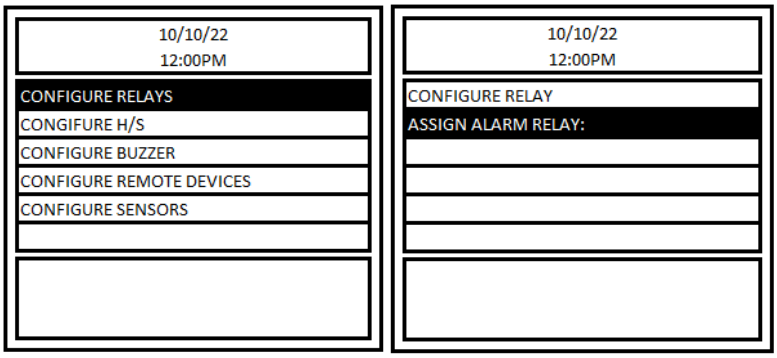


Figure 4-35 – Assign Alarm Relay Menu

In the example below, relay 1 is assigned for the ALARM relay. After pressing ENTER, the display shows confirmation of the relay status. Enter “0” to set no relay as the alarm relay.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

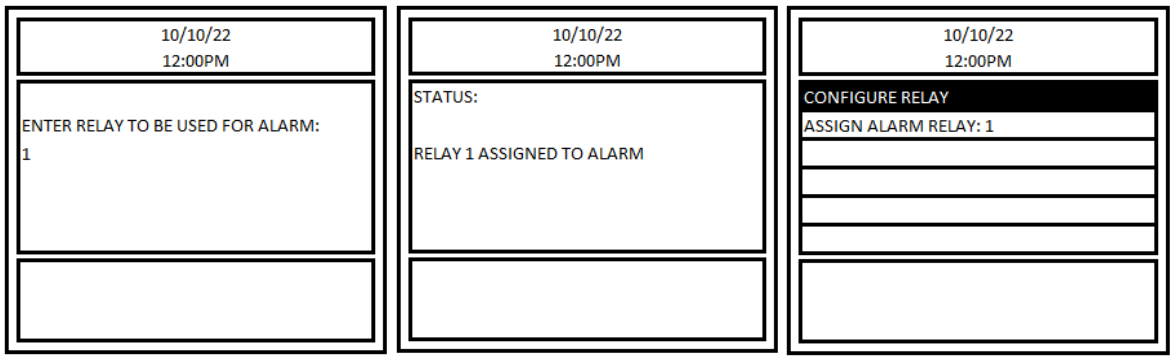


Figure 4-36 – Assign Alarm Relay, Configure Relay Menu

4.6.3.2 CONFIGURE REMOTE DEVICES

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE --> CONFIG. RLYS, SIGNALS, SENSORS, REM. DEV.--*>CONFIGURE REMOTE DEVICES*

To view or delete Remote Devices, follow the menu as shown in the images below. The user must first assign an appropriate address to the remote device and connect it to the DVP-1200 panel through an RS-485 connection.

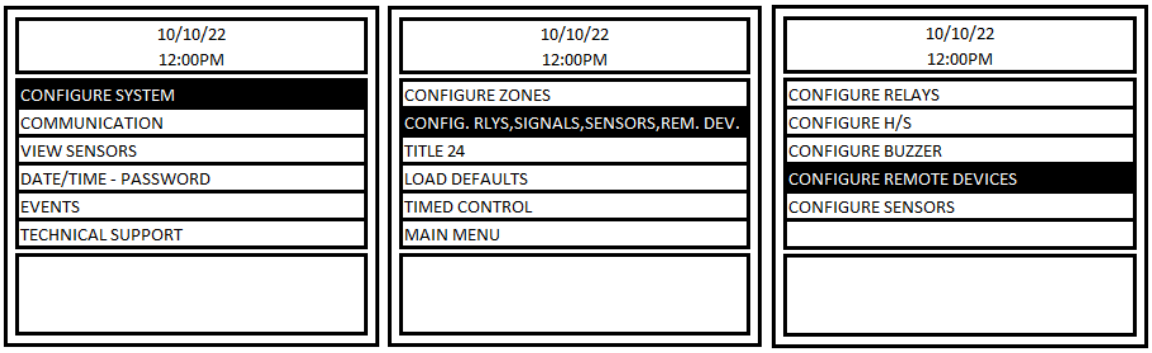


Figure 4-37 Configure Remote Devices Menu

Once the system has found one or more remote devices, the screen shown in Figure 4-38 displays the remote device type and address. If the DVP-1200 does not find any remote device, it will display NO REMOTE DEVICE FOUND. In this case it is recommended to verify DVP-1200 and remote device communication settings and ensure wiring into RS-485 communications is correct.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

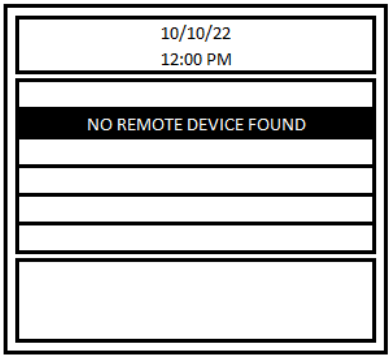


Figure 4-38 Remote Device Configuration Screen

After successful remote device discovery, the user can enter the configuration menu for a specific remote device. Within the configuration menu, the user can edit fail/safe settings or delete the remote device from the DVP-1200. Fail/Safe settings can be used to provide a specific output on the remote device when it is disconnected from the DVP-1200 for a predetermined amount of time. Also, it is important to note that when a remote device has been deleted from the panel, it will be rediscovered by the panel in a short time, unless it has been disconnected via the RS-485 wiring or powered off. Further, in the bottom pane of the display window, for RD-24 only, the slot configuration is displayed. From there, the user can verify that the DVP-1200 is recognizing the correct RD-24 configuration. If the correct configuration is not displayed, delete the RD-24 from the DVP-1200 and allow the DVP-1200 to discover it again. Refer to the figure below for a representation of an RD-24 configuration menu.

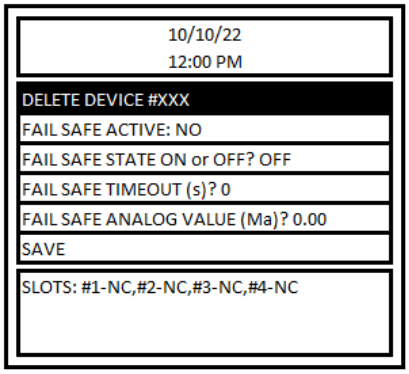


Figure 4-39 Remote Device Settings

Following additional fail-safe settings are available for Remote Relay Configuration.

- FAIL SAFE ACTIVE/NOT ACTIVE
  With this setting one can either enable (FAIL SAFE ACTIVE) or disable (FAIL SAFE NOT ACTIVE) fail safe operation for corresponding remote relay.
- FAIL SAFE STATE ON or OFF
  This setting defines the state of the relay during fail safe condition if fail-safe settings are active or enabled.
- FAIL SAFE TIMEOUT (s)
  This is the time (in seconds) that the remote relay must wait for communication from the DVP-1200 before going into fail-safe mode if fail-safe setting is active (ON). Valid entries are 10 to 3600 seconds.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

To change the corresponding setting, highlight the line and hit Enter. Select the desired settings and hit Enter again. Once the desired configuration is selected for all fail-safe settings hit SAVE to save the settings and transfer the settings to remote relay. Repeat the assignment procedure for second remote relay.

To configure Relays 9 to 12 for regular settings (delay, minimum run time etc.) use CONFIGURE RELAY menu. Once remote relay is discovered and assigned then only corresponding relay number (9,10,11 and 12) will be valid entries for CONFIGURE RELAY menu.

4.6.3.3 CONFIGURE H/S

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE --> CONFIG. RLYS, SIGNALS, SENSORS, REM. DEV.-->CONFIGURE H/S

To configure a horn/strobe, follow the menu as shown in the images below. With "HORN/STROBE(S):" selected, press ENTER. Then input the horn/strobe number to configure (H/S 1 is shown in the example below) and press ENTER.

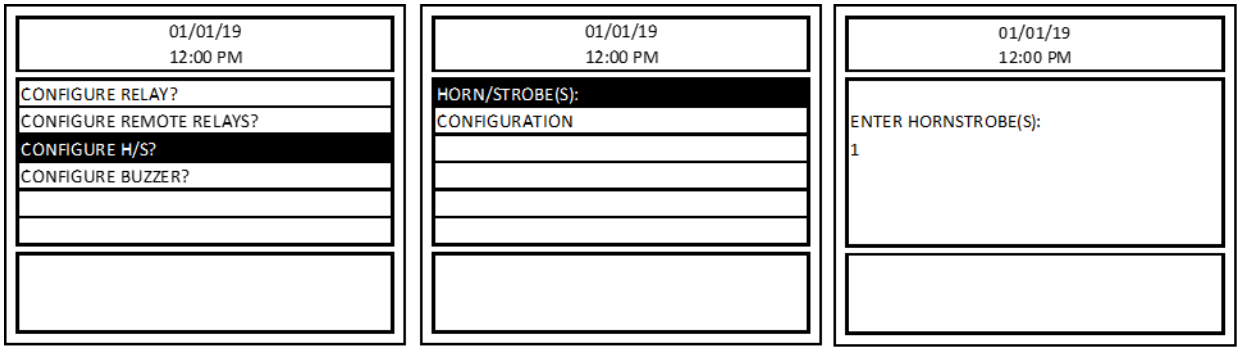


Figure 4-40 – Configure Horn/Strobe Menu

Select CONFIGURATION and press ENTER. The current configuration for the selected horn/strobe will load and become editable as shown in the images below.

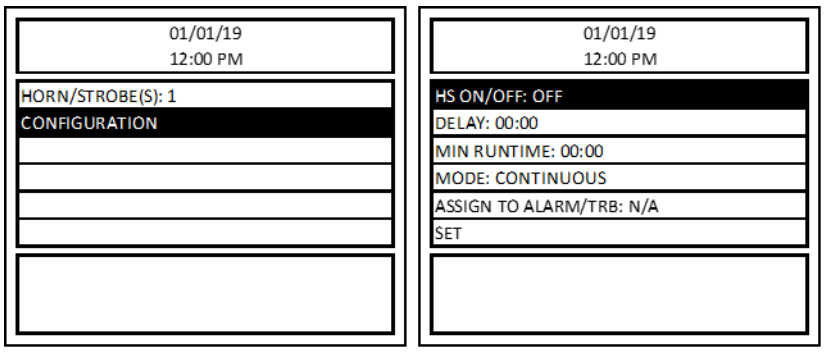


Figure 4-41 – Configure Horn/Strobe Menu Options

The following options are available for horn/strobe configuration:

- HS ON/OFF – Sets the selected Horn/Strobe to normally closed (ON) or normally open (OFF). The default value for this setting is OFF.
- DELAY – Sets a delay between when conditions to trigger the horn/strobe occur and when the horn/strobe turns on. The time format is: [mm: ss]. The default delay time is 00:00. To set the delay for the selected horn/strobe, highlight this sub-menu and press Enter.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

- MIN RUNTIME – Sets the minimum runtime once a horn/strobe is activated. The time format is: [mm: ss]. The default minimum runtime is 00:00. To set the minimum runtime for the selected horn/strobe, highlight this sub-menu and press Enter. A horn would not normally require a minimum on time, but this parameter allows a more versatile configuration.
- MODE – The horn/strobe MODE can be set to CONTINUOUS(DEFAULT) or INTERMITTENT.
- ASSIGN TO ALARM/TRB – The horn/strobe can be assigned to activate during an ALARM, WARNING, or TROUBLE condition (regardless of zone). The default setting is NOT ASSIGNED(DEFAULT).
  NOTE: A horn/strobe assigned to ALARM/WARNING/TROUBLE will be dedicated to that function and will not be able to be assigned to a zone.
- SET – The user must select SET to save the changes. The changes will become active as soon as the user selects SET.

4.6.3.4 CONFIGURE BUZZER

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE --> CONFIG. RLYS, SIGNALS, SENSORS, REM. DEV.--*>CONFIGURE BUZZER*

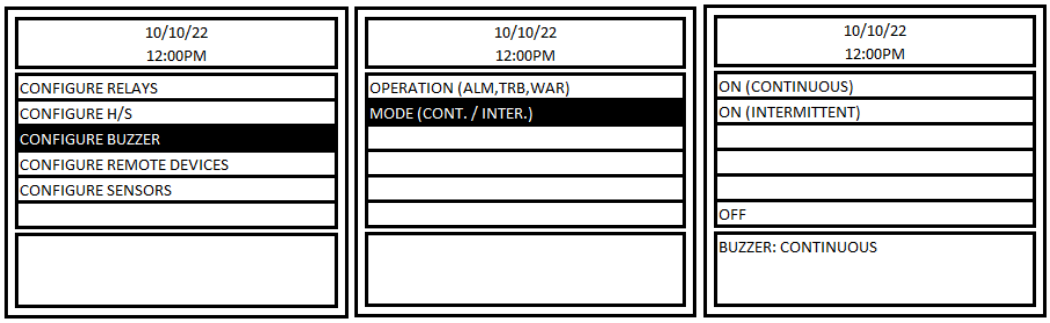


Figure 4-42 – Configure Buzzer Menu

The DVP-1200 includes an onboard buzzer. The buzzer will activate during an ALARM, WARNING or TROUBLE condition. If the buzzer is activated, the user can press the HUSH button to silence it.

To configure the onboard buzzer, follow the menu as shown in Figure 4-42. Select CONFIGURE BUZZER and press ENTER. The display will show the buzzer configuration options. It will also show the current buzzer configuration in the bottom box of the display.

The following options are available for the buzzer configuration:

- ON (CONTINUOUS) –During an ALARM, WARNING or TROUBLE condition, the buzzer will activate continuously. This is the default setting.
- ON (INTERMITTENT) – During an ALARM, WARNING or TROUBLE condition, the buzzer will activate intermittently (1 second on, 1 second off).
- OFF – This configuration will disable the functionality of the buzzer and the buzzer will not activate during any ALARM, WARNING or TROUBLE conditions.
- OPERATION – (ALM, TRB, WAR) – If preferred, the buzzer can be selected to activate only for alarm, trouble, or warning faults.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.6.3.5 TITLE 24

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->TITLE 24 -->

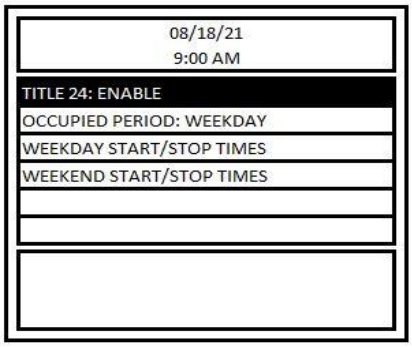


Figure 4-43 – Configure Title 24 Menu

The figure above shows the Title 24 menu screen in DVP-1200. DVP-1200 features like occupied failure, unoccupied failure, calibration due and calibration overdue are enabled only when Title 24 is enabled in DVP-1200. By default, the Title 24 feature for the DVP-1200 is disabled. To enable Title 24, select line with TITLE 24 and press Enter, then select “Enable” and hit Enter.

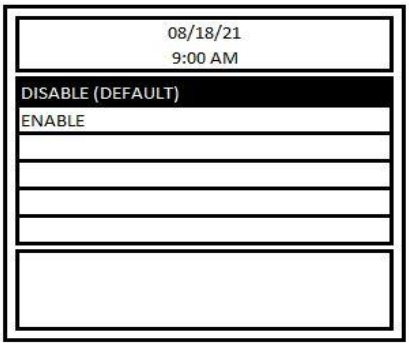


Figure 4-44 – Configure Title 24 Disable/Enable

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

By default, weekdays (Monday to Friday) 8 AM to 5 PM is configured as occupied time. Use “WEEKDAY START/STOP TIMES” and “WEEKEND START/STOP TIMES” to modify occupied period during weekday and weekend respectively. Up to two occupied periods can be defined for weekday and weekend. DVP-1200 validates that Start Time is earlier than the End Time i.e., 9:15 AM as Start Time and 1:00 PM as End Time is a valid entry, but 10:00 PM as Start Time and 3:00 AM as End Time is invalid entry because 3:00 AM is earlier event in a day in comparison to 10:00 PM.

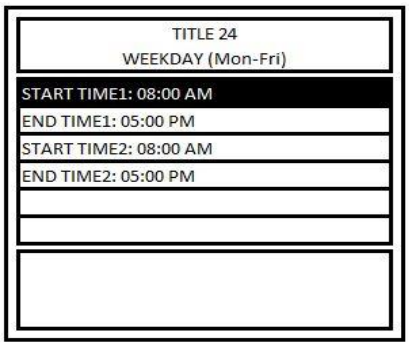


Figure 4-45 - Configure Title 24 Day Options

Time period outside of defined occupied period is considered as unoccupied time. Using “OCCUPIED PERIOD” menu selection you can selectively enable occupied period for WEEKDAY, WEEKEND or ALL WEEK. In Figure 4-43, “OCCUPIED PERIOD” has “WEEKDAY” selected which means only the time defined in “WEEKDAY START/STOP TIMES” will be considered as occupied time during a weekday. Even if there is time defined in “WEEKEND START/STOP TIMES” entire weekend time will be regarded as unoccupied time.

4.6.3.6 LOAD DEFAULTS

Menu path: Main Menu-->CONFIGURE SYSTEM --->MANUAL CONFIGURE --->LOAD DEFAULTS -->

WARNING: This option will reset the DVP-1200 to its default factory settings. All zones and configuration will be lost.

To reset the DVP-1200 to its default factory settings, select LOAD DEFAULTS from the CONFIGURE SYSTEM menu and press ENTER. Then press ENTER again. The configuration will be reset to factory settings and the DVP-1200 will restart.

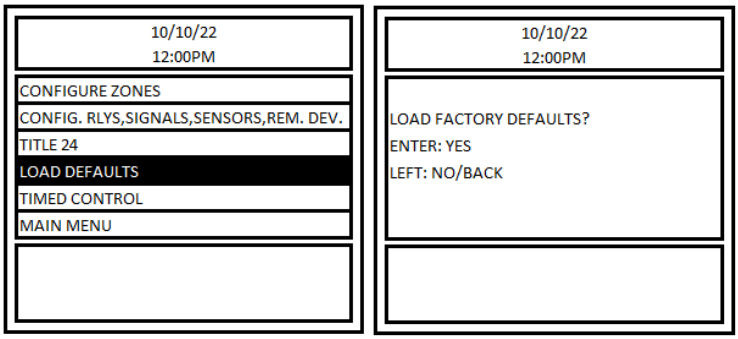


Figure 4-46 – Load Defaults Menu

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.6.3.7 TIMED CONTROL

Menu path: Main Menu-->CONFIGURE SYSTEM -->MANUAL CONFIGURE -->TIMED CONTROL -->

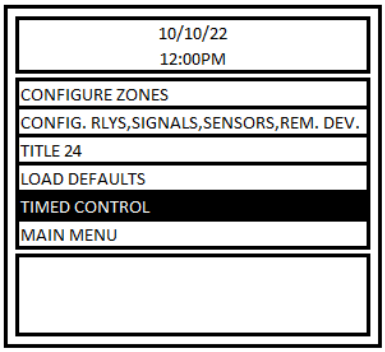


Figure 4-47 – Timed Control Menu

TIMED CONTROL can be used to turn the zone's output ON at the START TIME and OFF at the next occurrence of STOP TIME irrespective of readings of sensors assigned to the zone. Timing control can be configured with separate time periods for weekdays, weekends, or all weeks. A zone must be created first (via Zone Configuration menu) before using TIMED MODE for the zone.

To setup timed control, select TIMED CONTROL from the configuration menu and press ENTER. Then select ZONE: and press ENTER. Enter the zone number to configure and press ENTER. Select CONFIGURE and press ENTER to enter the TIMED CONTROL menu.

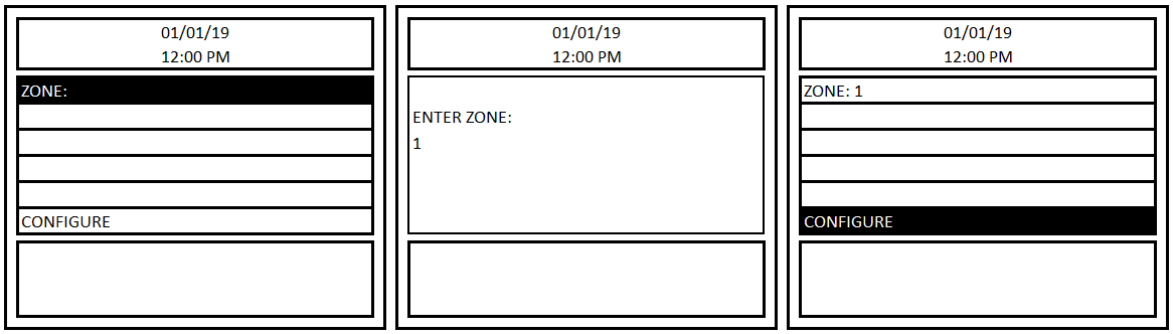


Figure 4-48 – Timed Control Zone Options

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

The display will show the following TIMED CONTROL menu:

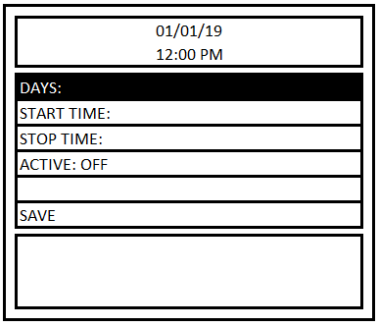


Figure 4-49 – Timed Control Days Options

DAYS – Choose whether to configure weekdays, weekends, or all week. Select DAYS and press ENTER. Then, to set a schedule for WEEKDAY, press 1, then ENTER. To set a schedule for the WEEKEND, press 2, then ENTER. To set a schedule for ALL WEEK, press 3, then ENTER.

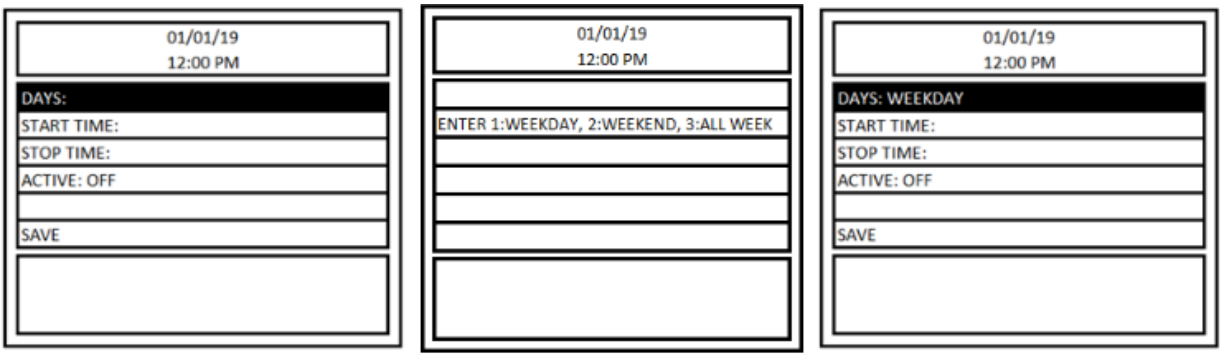


Figure 4-50 – Timed Control Days Options

START TIME – start of the period for this zone. To enter the START TIME, use the left and right arrows to select the digit and the number pad to enter the value. To toggle between AM and PM, use the up and down arrows.

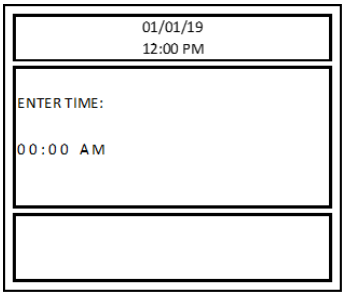


Figure 4-51 – Timed Control Times Options

END TIME – End of the period for this zone. To enter the END TIME, use the left and right arrows to select the digit and the number pad to enter the value. To toggle between AM and PM, use the up and down arrows.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

ACTIVE – Timed Mode Control will work only when this field is set to ON. The default setting is OFF. The user can disable the TIMED MODE for the chosen zone by setting ACTIVE: OFF.

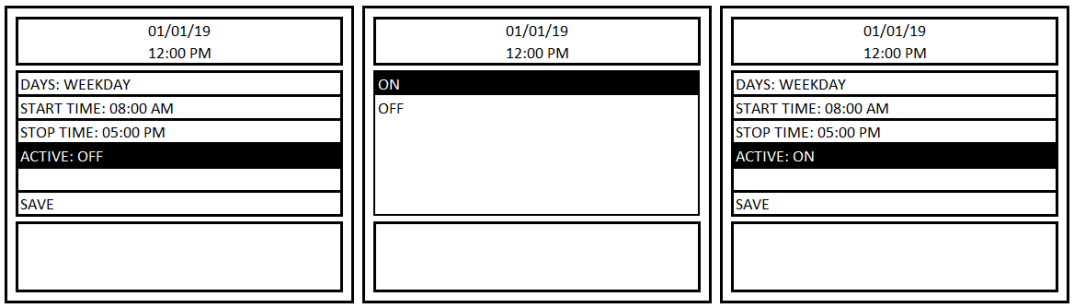


Figure 4-52 – Timed Control On/Off Options

SAVE – Select SAVE and press ENTER to save any changes.

4.6.4 COMMUNICATION

Menu path: Main Menu-->COMMUNICATION-->

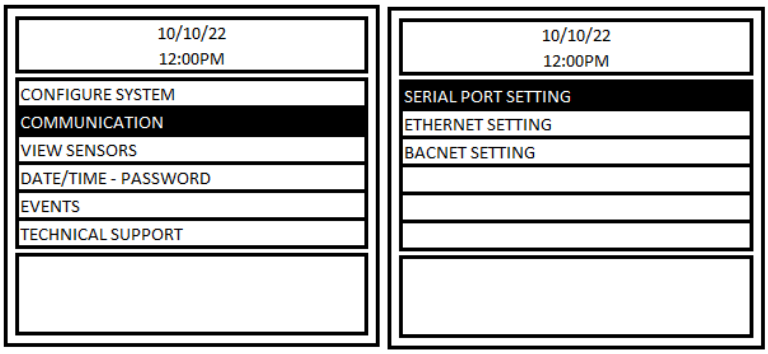
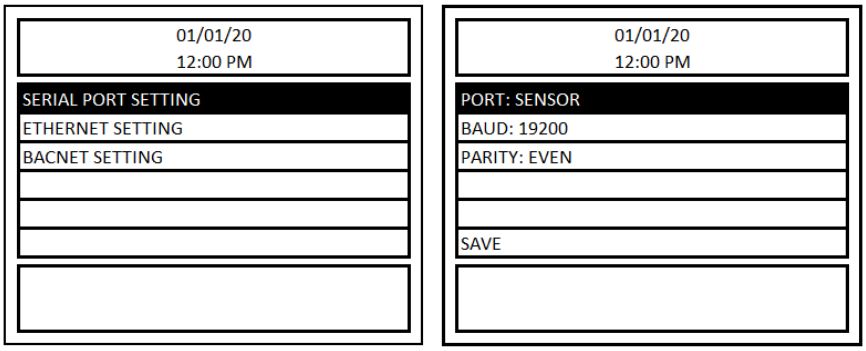


Figure 4-53 – Communication Menu

4.6.4.1 SERIAL PORT SETTING

Menu path: Main Menu-->COMMUNICATION -->SERIAL PORT SETTING-->



www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Figure 4-54 – Serial Port Settings Menu

Communication settings of the panel for communicating with sensors and remote relay connected can be configured via this setting.

PORT – Select the port to configure. Available options are SENSOR or REMOTE RELAY.

BAUD – The user can change the baud rate for communication with the detector using this menu. Available rates are: 4800, 9600, 19200 (default), 38400, 57600, 115200.

PARITY: – Available options are EVEN, ODD, OFF.

SAVE– To save changes select SAVE and press ENTER.

4.6.4.2 ETHERNET SETTING

Menu path: Main Menu-->COMMUNICATION -->ETHERNET SETTING-->

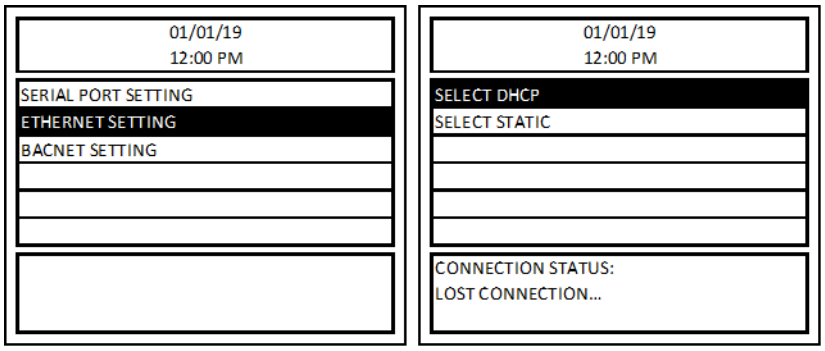


Figure 4-55 – Ethernet Setting Menu

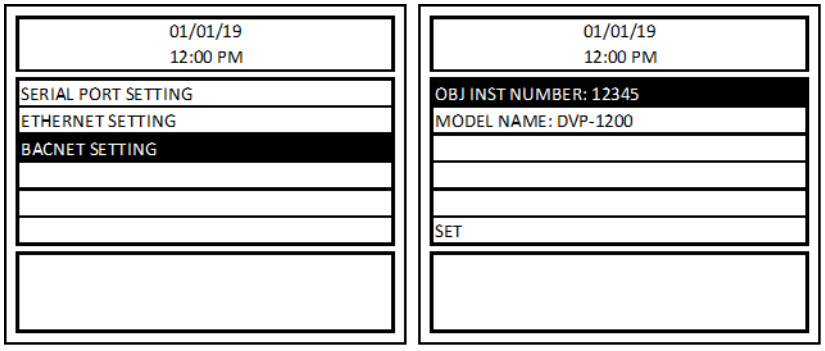
SELECT DHCP – The DHCP setting will allow a connected router to automatically configure the ethernet connection to the DVP-1200.

SELECT STATIC – The static setting allows the user to configure the ethernet connection manually.

- IP ADDRESS: 0.0.0.0
- SUBNET MASK: 0.0.0.0
- GATEWAY: 0.0.0.0

4.6.4.3 BACNET SETTING

Menu path: Main Menu-->COMMUNICATION -->BACNET SETTING-->



www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Figure 4-56 – BACnet Setting Menu

- OBJ INST NUMBER: Number in range 0 to 65535 are valid entries for Panel BACnet Object Instant Number.
- MODEL NAME: Model name entered in this field will appear as device name for the panel in BACnet network.

4.6.5 VIEW SENSORS

Menu path: Main Menu-->VIEW SENSORS-->

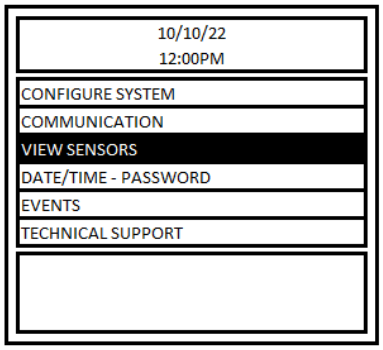


Figure 4-57 – View Sensors Menu

The VIEW SENSORS menu allows the user to view information about the sensors connected to the DVP-1200. Press the left/right cursor to scroll through the sensors. To select a specific sensor without scrolling, select “Sensor: x” and press ENTER. Then, enter the sensor address and press ENTER.

Sensor Description: Each sensor can be given a user-defined description. The description is often used to describe the sensor’s location. To add or change a sensor’s description, select Sensor Description and press ENTER. A screen with sensor address, DESCRIPTION and SAVE will appear. Select ‘DESCRIPTION’ and hit ENTER. Then, use the alphanumeric keys to enter the description and press ENTER. Sensor description is limited to 20 characters. Use RIGHT arrow key to move to next character or to add a space and use DEL to delete last character entered. Once desired description is entered, SAVE the sensor description. Sensor Description entered for each sensor will be displayed in ALARM, WARNING and TROUBLE screen if corresponding sensor is one of the sources for the ALARM, WARNING or TROUBLE signal.

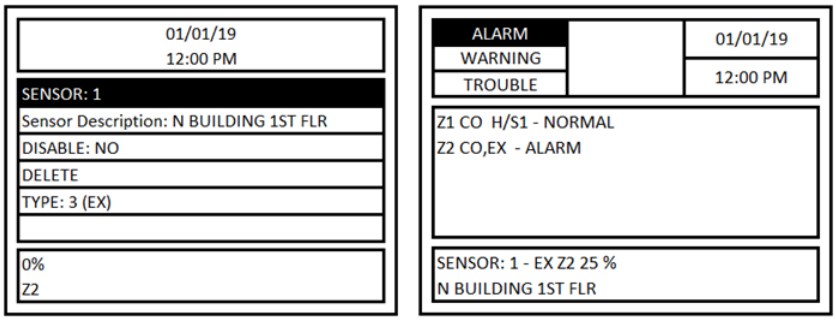


Figure 4-58 – View Sensors Information

Disable: No - If any sensor is disabled, the panel will not take the sensor readings into consideration for Zone Outputs activation, panel fault conditions, etc. This is like a virtual delete.

When a sensor previously disabled is enabled back, then all the functionality related to the sensor is resumed back, i.e., sensor readings will be taken into consideration for Zone Outputs activation, panel fault conditions, etc.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

This option allows the user to disconnect a sensor for repair or replacement without any trouble or error on the panel. For example, to replace a sensor, first disable that specific sensor in the panel. Then, disconnect it from the system and replace it with the new unit (of same type). Lastly, return to the VIEW SENSORS menu and enable the sensor. Using this method, all previous sensor configurations will be retained so it will not be necessary to reconfigure the sensor.

Delete – This will delete the sensor from the panel and from all the zone to which the sensor is added.

If the sensor is connected to the panel even after deleting it, then the panel must discover the sensor again. However, it will be like a new sensor discovery. Therefore, the sensor will not be added to any zones.

Note: When replacing a sensor (already registered with DVP-1200) with a sensor of different type but same address (e.g. CO sensor with address 17 replaced with NO2 sensor with address 17) then it is recommended to perform a Delete operation for corresponding sensor address, after sensor replacement is complete, and verify correct sensor type is displayed for corresponding sensor address.

Type: - Displays the sensor type. See Table 4-2 for a definition of each type.

The bottom box of the display shows the current gas reading of the detector. It also lists any zones the detector is part of. E.g. In the following example, Sensor 1 is CO Sensor (Type: 1) reading 0ppm and is currently assigned to Zone 1.

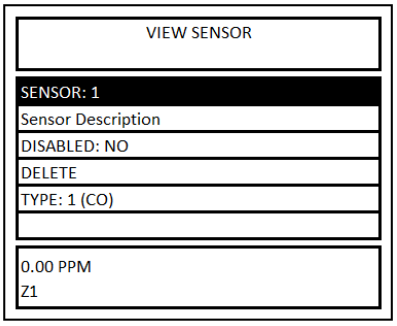
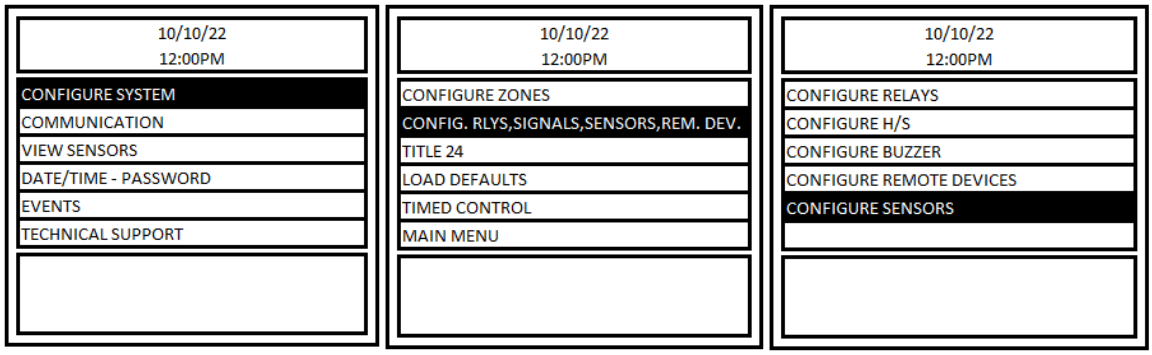


Figure 4-59 – Display Sensor Type

4.6.6 EDIT ALARM AND WARNING SETTINGS FOR SENSORS NOT IN ZONE

Menu path: Main Menu → CONFIGURE SYSTEM → CONFIG. RLYS, SIGNALS, SENSORS, REM. DEV. → CONFIGURE SENSORS



www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Figure 4-60 Configure Sensors Menu

The Configure Sensors menu allows the user to change the alarm and warning level of sensors by sensor type, for all connected sensors which are not assigned to a Zone. When a fault condition is reached, the DVP-1200 will go into alarm or warning, but any existing zones will remain normal, assuming they are not also in a fault condition. Fault events of these sensors are also recorded in the Events Log. See the figure below for an example of the Configure Sensors screen.

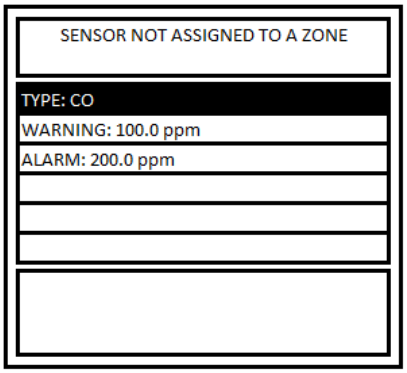


Figure 4-61 Configure Sensors Menu

4.6.7 DATE/TIME – PASSWORD

Menu path: Main Menu-->DATE/TIME – PASSWORD -->

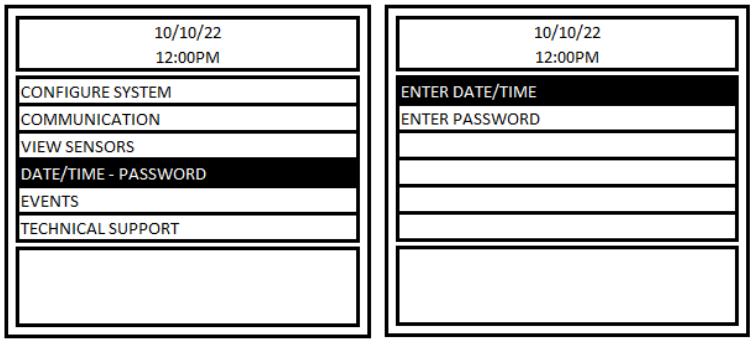


Figure 4-62 – Date/Time Menu

ENTER DATE/TIME – For the date and time, use the left/right keys to select the digit and the number keys to input a value. For the day of the week, select the field and use the up/down keys to scroll through days of the week. Time is entered in 12-hour format. To edit AM or PM, select the field and use up/down keys to toggle between AM and PM.

ENTER PASSWORD – This menu is used to enter a new password for the panel. Enter up to a 4-digit new password and hit ENTER to save the new password.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4.6.8 EVENTS

Menu path: Main Menu-->EVENTS -->

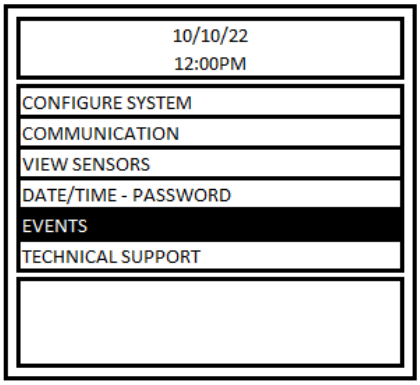


Figure 4-63 – Events Menu

The DVP-1200 keeps a log of events in its memory. To view the events, select EVENTS and press ENTER. The display will load the latest logged events if this menu is entered first time after power up otherwise it will load event screen last visited. It can store up to 122,880 events and once this limit is reached it will start overwriting older events.

Power Up, Alarm, Warning, Trouble and Relay activation are types of events that are logged in the panel. All the logged events will have date and time of the event occurrence. For Trouble, Alarm and Warning the event log will also have the sensor address that caused the corresponding event. Alarm and Warning events for a sensor are logged only if they are assigned to a zone. Figure 4-64 shows an example of Event Log screen and Table X lists the abbreviations used in Event Log for corresponding events.

EVENT	ABBREVIATION
Alarm	ALM
Warning	WARN
Relay Activation	RLY OP
Sensor Reading Out of Range Trouble	SNSR BRK
Sensor Disconnected	DISC.
Occupied Failure	OCC. FAIL
Unoccupied Failure	UNOCC. FAIL
Calibration Overdue	CAL OVER
Calibration Due	CAL DUE

Table 4-3 – Event Log Abbreviations

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

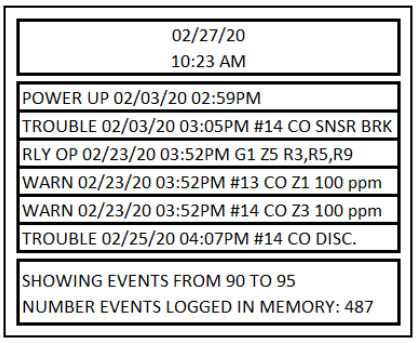


Figure 4-64 – Event Log Screen

Event Log screen also shows current displayed event number starting from top (events are logged in chronological order i.e., last event is the last entry in event log) and total number of events logged so far. Use the up and down arrow keys to scroll through past events. Press the LEFT arrow key to exit Event Log screen. To delete all events from memory, from the event log screen press DEL. Then, press "0" followed by ENTER.

4.6.9 TECHNICAL SUPPORT

Menu path: Main Menu-->TECHNICAL SUPPORT -->

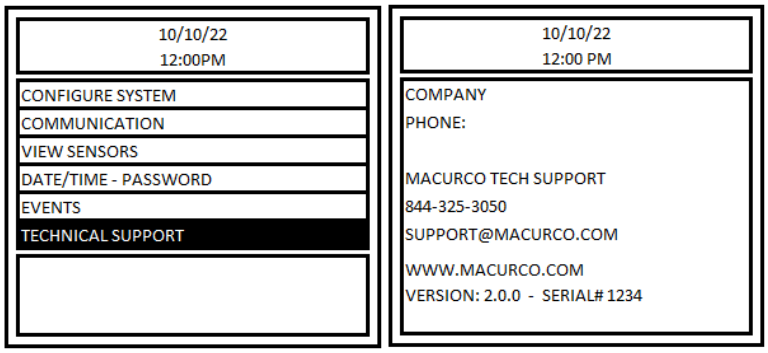


Figure 4-65 – Technical Support Menu

The TECHNICAL SUPPORT menu item shows the contact information for Macurco technical support. It also displays the currently installed firmware version and the serial number of the DVP-1200. If the Company Information and Phone Number of the installation company was entered during initial power up, then it will be displayed on this screen. This information (COMPANY and PHONE) can be entered or edited by pressing ENTER on the TECHNICAL SUPPORT screen.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

5 BACnet

5.1 General Information

When DVP-1200 boots, it is set by default to acquire the IP address using the DHCP client. For the BACnet the following information is important and will be necessary to configure the BACnet/IP client.

Note: For the DVP-1200N Model, the ethernet port is not included and BACnet output is not an option

Note:

- Device Instance: 12345 (default)
- Port Number: 47808
- IP Address: Use the IP address being leased by the DHCP server (router). This information can be retrieved by checking ETHERNET SETTING in COMMUNICATION setting of the DVP-1200 connected to the network on the DHCP server. If static IP address is being used, use the one that was assigned to the DVP-1200.
- DVP-1200 BACnet/IP interface server, only allows the client to read values from DVP-1200. Writing is not allowed by the interface.

The following information about DVP-1200 is accessible via BACnet.

1. Group Settings (Range, Alarm, Warning, Rising, Falling) for Each Sensor and Each Zone
2. Readings and Type for All Detectors
3. Zone Configurations (Types of detectors assigned, Horn/Strobe Assigned, Relay Assigned, Analog Output Assigned, Quorum for Voting Mode)
4. Output Status and Values of DVP-1200 Outputs
5. Title 24 Configuration and Sensor Status
6. Remote Devices Status and Configuration
7. System Status and Fault Events
8. Warning and Alarm Settings for Sensors Not in a Zone

Note: BACnet Objects with value 65535 indicate the value received is not reliable. Some of the possible reasons for such a high value received are sensor not connected to panel, sensor is in trouble, or invalid/not supported BACnet object. Operators must figure out the root cause of such readings.

For details on BACnet implementation or BACnet capabilities of DVP-1200, refer to DVP-1200 PICS available on the product page on the company website (www.macurco.com).

5.1.1 Group Settings for Each Sensor and Each Zone

Information about Group Settings for each gas type can be accessed via BACnet output in DVP-1200. Table 5-3 shows the BACnet Object Type and Object Instance for each object. N in Table 5-3 refers to zone number. E.g., if I want to access the Alarm settings for CO sensor in Zone 3, then Object Instance for the corresponding object is 3+ (3-1) * 68= 139.

Group settings are local to zone and hence each zone can have different settings for same type of sensor. Table 5-1 shows the possible values for ‘code’ object and corresponding detector type. Similarly, Table 5-2 shows the possible values for ‘Eng. Unit’ object and corresponding engineering unit.

Code (Type)	Detector Type
1	CO (Carbon Monoxide)
2	NO_2 (Nitrogen Dioxide)
3	EX (Combustible)
4	NH_3 (Ammonia)
5	H_2S (Hydrogen Sulfide)

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

6	REF (Refrigerant)
8	O_2 (Oxygen)
9	CO_2 (Carbon Dioxide) Range: 0-5000ppm
10	CO_2 (Carbon Dioxide) Range: 0-5% vol

Table 5-1 – Types of Detectors

Eng. Unit Value	Engineering Units
1	ppm
2	%LEL
3	%Vol.

Table 5-2 – Engineering Unit

Description			BACnet Object Type	BACnet Object Instance
Zone[N] N is from 1 to 8	Gas sensor [CO]	type	Analog value	0+(N-1)*75
		Eng. unit	Analog value	1+(N-1)*75
		range	Analog value	2+(N-1)*75
		Alarm	Analog value	3+(N-1)*75
		Warning	Analog value	4+(N-1)*75
		Rising	Analog value	5+(N-1)*75
		Falling	Analog value	6+(N-1)*75
	Gas sensor [NO_2]	type	Analog value	7+(N-1)*75
		Eng. unit	Analog value	8+(N-1)*75
		range	Analog value	9+(N-1)*75
		Alarm	Analog value	10+(N-1)*75
		Warning	Analog value	11+(N-1)*75
		Rising	Analog value	12+(N-1)*75
		Falling	Analog value	13+(N-1)*75
	Gas sensor [EX]	type	Analog value	14+(N-1)*75
		Eng. unit	Analog value	15+(N-1)*75
		range	Analog value	16+(N-1)*75
		Alarm	Analog value	17+(N-1)*75
		Warning	Analog value	18+(N-1)*75
		Rising	Analog value	19+(N-1)*75
		Falling	Analog value	20+(N-1)*75
	Gas sensor [NH_3]	type	Analog value	21+(N-1)*75
		Eng. unit	Analog value	22+(N-1)*75
		range	Analog value	23+(N-1)*75
		Alarm	Analog value	24+(N-1)*75
		Warning	Analog value	25+(N-1)*75
		Rising	Analog value	26+(N-1)*75
		Falling	Analog value	27+(N-1)*75
	Gas sensor [H_2S]	type	Analog value	28+(N-1)*75
		Eng. unit	Analog value	29+(N-1)*75
		range	Analog value	30+(N-1)*75
		Alarm	Analog value	31+(N-1)*75

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Description			BACnet Object Type	BACnet Object Instance
		Warning	Analog value	32+(N-1)*75
		Rising	Analog value	33+(N-1)*75
		Falling	Analog value	34+(N-1)*75
	Gas sensor [REF]	type	Analog value	35+(N-1)*75
		Eng. unit	Analog value	36+(N-1)*75
		range	Analog value	37+(N-1)*75
		Alarm	Analog value	38+(N-1)*75
		Warning	Analog value	39+(N-1)*75
		Rising	Analog value	40+(N-1)*75
		Falling	Analog value	41+(N-1)*75
	Gas sensor [O_2]	type	Analog value	49+(N-1)*75
		Eng. unit	Analog value	50+(N-1)*75
		range	Analog value	51+(N-1)*75
		Alarm	Analog value	52+(N-1)*75
		Warning	Analog value	53+(N-1)*75
		Rising	Analog value	54+(N-1)*75
		Falling	Analog value	55+(N-1)*75
		Alarm2	Analog value	56+(N-1)*75
		Warning2	Analog value	57+(N-1)*75
		Rising2	Analog value	58+(N-1)*75
		Falling 2	Analog value	59+(N-1)*75
		mode	Analog value	60+(N-1)*75
	Gas sensor [CO_2]	type	Analog value	61+(N-1)*75
		Eng. unit	Analog value	62+(N-1)*75
		range	Analog value	63+(N-1)*75
		Alarm	Analog value	64+(N-1)*75
		Warning	Analog value	65+(N-1)*75
		Rising	Analog value	66+(N-1)*75
		Falling	Analog value	67+(N-1)*75
	Gas sensor [CO_2]	type	Analog value	68+(N-1)*75
		Eng. unit	Analog value	69+(N-1)*75
		range	Analog value	70+(N-1)*75
		Alarm	Analog value	71+(N-1)*75
		Warning	Analog value	72+(N-1)*75
		Rising	Analog value	73+(N-1)*75
		Falling	Analog value	74+(N-1)*75

Table 5-3 – BACnet Objects for Group Settings of all Zone

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

5.1.2 Readings and Type for All Dectectors

Each sensor addresses from 1 to 192 has two BACnet Objects (one for sensor reading and one for sensor type referred as group). Table 5-4 shows the BACnet objects and corresponding object instance. N in Table 4 refers to the sensor address. E.g., to retrieve sensor reading for address 16, corresponding object instance is 553 + (16-1)*2 = 583.

If a sensor address is not detected by the panel, then corresponding BACnet object reading and group value will be 65535 and 0, respectively.

Note: If the value of sensor reading BACnet object is outside the range of detection of the sensor then the reading is not reliable and cause for unreliable reading must be investigated. Refer to Table 4-2 or sensor manual for information on range of detection.

Description		**BACnet Object Type**	**BACnet Object Instance**	**Notes**
Sensors[N] where N is from 1 to 192	reading	Analog value	600+(N-1)*2	e.g., To retrieve sensor # 16 reading, use 600+(16-1)*2 = 630
	type	Analog value	600+(N-1)*2+1	

Table 5-4 – BACnet Object for Detector Reading

5.1.3 Zone Configurations

(Types of detectors assigned, Horn/Strobe Assigned, Relay Assigned, Analog Output Assigned, Quorum for Voting Mode) for all Zones

Table 5-6 shows the BACnet Objects representing zone configuration for each zone. N in Table 5-6 refers to Zone number.

When binary output is set to 1 (or active), it means that the corresponding DVP-1200 output (Horn/Strobe, Relay) is configured or assigned to that zone, or in case of the group[X] means that the sensor of type X (Table 5-1 lists the valid values of type i.e., value of X) is added to that zone.

If any of the three analog outputs are assigned to the zone, then object “analog output” for corresponding zone will have the analog output number (valid values are 1,2 and 3). If the zone does not have any analog (or 4-20mA) output assigned, then “analog output” will have value 0.

“mode” BACnet object retrieves information about the mode for each sensor type in the zone. Value for mode is a 12-bit number. Bit 11, bit 10, and bit 6 are always set to 1. So, this field will have values from 3136 to 4095. If a sensor type has mode set to ‘VOTING’ in Group Configuration of the Zone, then its corresponding bit will be set to 1. And, if the sensor type has mode set to ‘AVERAGE’ then its corresponding bit will be set to 0. E.g., If Zone [1]. mode present value is 4095 then it means that all sensor types in Zone 1 are set to VOTING. Similarly, if Zone [2]. mode present value is 4094 then it indicates that all sensor types in Zone 2 are set to VOTING mode except Type 1 (CO) which is set to AVERAGE mode.

	Type 10 (Bit 9)	Type 9 (Bit 8)	Type 8 (Bit 7)	Bit 6	Type 6 (Bit 5)	Type 5 (Bit 4)	Type 4 (Bit 3)	Type 3 (Bit 2)	Type 2 (Bit 1)	Type 1 (Bit 0)
Zone mode	x	x	x	1	x	x	x	x	x	x

Table 5-5 – Bit Assignment for Zone[N]. mode value

“Quorum[X]” is another analog type of object for Zone Configuration. If voting mode of operation for a sensor type X (Table 5-1 lists the valid values of type i.e., value of X) is selected, then value of this BACnet object represents quorum value for that sensor type.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Description		BACnet Object Type	BACnet Object Instance
Zone[N] Where N is from 1 to 8	Horn/strobe1	Binary value	[(N-1)*4]
	Horn/strobe2	Binary value	[(N-1)*4] + 1
	Horn/strobe3	Binary value	[(N-1)*4] + 2
	Horn/strobe4	Binary value	[(N-1)*4] + 3
	group [1] … group [10]	Analog value	984+[(N-1)*18]
	On Board Relays #1-8	Analog value	984+[(N-1)*18]+1
	External Relays #9-24	Analog value	984+[(N-1)*18]+2
	External Relays #25-40	Analog value	984+[(N-1)*18]+3
	analog output	Analog value	984+[(N-1)*18]+4
	mode	Analog value	984+[(N-1)*18]+5
	quorum [1]	Analog value	984+[(N-1)*18]+6
	…	Analog value	…
	quorum [12]	Analog value	984+[(N-1)*18]+17

Table 5-6 – BACnet Objects for Zone Configuration

5.1.4 Output Status and Values of DVP-1200 Outputs

When the output (buzzer, Horn/Strobe, Relay) is active the binary output value for corresponding output is set to 1 (active) and when the output is not active then the corresponding output is set to 0 (inactive).

For three analog outputs, the values of corresponding BACnet object represents the current output (in mA) from the analog or 4-20mA output in DVP-1200.

Table 5-7 shows the BACnet objects and corresponding Object Instance for DVP-1200 panel outputs.

Description		BACnet Object Type	BACnet Object Instance
Output Status	Buzzer	Binary output	0
	Horn/Strobe 1	Binary output	1
	Horn/Strobe 2	Binary output	2
	Horn/Strobe 3	Binary output	3
	Horn/Strobe 4	Binary output	4
	Relay 1	Binary output	5
	…	Binary output	…
	Relay 40	Binary output	44
	Analog output 1	Analog output	0
	…	Analog output	…
	Analog output 35	Analog output	34

Table 5-7 – BACnet Objects for DVP-1200 Outputs

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

5.1.5 Title 24 Configuration

Description		BACnet Object Type	BACnet Object Instance	Note
Title 24 Configuration	Enabled	Analog value	1128	0-disabled, 1-enabled
	Occupied days of the week	Analog value	1129	0-weekday, 1-weekend
	Occupied/Unoccupied	Analog value	1130	0-unoccupied, 1-occupied
	Start time 1 hour	Analog value	1131	1-12 hour
	Start time 1 minute	Analog value	1132	0-59 minutes
	Start time 1 (AM/PM)	Analog value	1133	0-AM, 1-PM
	Stop time 1 hour	Analog value	1134	1-12 hour
	Stop time 1 minute	Analog value	1135	0-59 minutes
	Stop time 1 (AM/PM)	Analog value	1136	0-AM, 1-PM
	Start time 2 hour	Analog value	1137	1-12 hour
	Start time 2 minute	Analog value	1138	0-59 minutes
	Start time 2 (AM/PM)	Analog value	1139	0-AM, 1-PM
	Stop time 2 hour	Analog value	1140	1-12 hour
	Stop time 2 minute	Analog value	1141	0-59 minutes
	Stop time 2 (AM/PM)	Analog value	1142	0-AM, 1-PM
CO sensor[N] where N is from 1 to 192	Trouble	Analog value	1143+[(N-1)*3]	
	Fault	Analog value	1143+[(N-1)*3]+1	
	UntilCalDue	Analog value	1143+[(N-1)*3]+2	

Table 5-8 – BACnet Objects related to Title 24 configuration and sensor status

Table 5-8 shows the BACnet objects with information relevant to Title 24 configuration and sensor status. Table 5-8 also shows the expected values for Title 24 Configuration BACnet objects.

Each CO sensor addresses from 1 to 192 has three BACnet Objects (Trouble, Fault and UntilCalDue) to communicate the status of the CO sensor status related to Title 24 feature. Table 5-8 shows the BACnet objects and corresponding object instance. N in the table refers to the sensor address. The following are the expected values for each of the three BACnet objects.

- Trouble
  0 – No Trouble
  5 – Trouble
  Reasons for trouble indicated by value of 5 are calibration overdue, calibration due feature disabled, and calibration period feature not supported by the detector.
- Fault
  0 – No Fault
  1 – Unoccupied Fault
  2 – Occupied Fault
  4 – Calibration Overdue
  8 – Calibration Due Warning
  16 – Calibration due feature disabled
- UntilCalDue
  255 – Calibration due feature disabled
  254 – Unknown calibration due value or value not transmitted by detector yet
  253 – Calibration due feature not supported
  241 – There are more than 30 days until calibration is due
  1 to 240 – There are 30 or less days until calibration due
  0 – Calibration overdue

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

5.1.6 Remote Devices

Description		BACnet Object Type	BACnet Object Instance
Remote Devices [N] Where N is from 1 to 4	Type	Analog value	1719+[(N-1)*3]
	Address	Analog value	1719+[(N-1)*3]+1
	Configuration	Analog value	1719+[(N-1)*3]+2

Table 5-9 – Objects Related to Remote Device Information

Table 5-9 shows the remote device (RD-24 or RR-24) objects with information relevant to their setup and configuration. Each Remote Device has three BACnet Objects (Type, Address, Configuration) to communicate information about the remote device. Each remote device will have its own address, N. Following are the expected values for each of the three BACnet objects:

- Type
  0 = RR-24
  1 = RD-24
  255 = Unknown or not connected
- Address
  Modbus address range: 193 – 200
- Configuration
  Slots:

# 4	# 3	# 2	# 1

  0 = Relay
  1 = Analog Output
  2 = Analog Input
  15 = No Module
  65535 = RD-24 with no modules

5.1.7 System Status and Fault Events

Description		BACnet Object Type	BACnet Object Instance
System Status	Status	Analog value	1731

Table 5-10 – Object for Panel System Status

Table 5-10 shows the BACnet object for system status of the DVP-1200 panel. The following are the expected values for the BACnet object:

bit 2	bit 1	bit 0

Bit 0 set = Alarm
Bit 1 set = Trouble
Bit 3 set = Warning
0 = No fault – In the case of one or more faults, bits (0,2) will be set

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Description		BACnet Object Type	BACnet Object Instance
Last Fault Event	New event flag	Analog value	1732
	Date	Analog value	1733
	Time	Analog value	1734
	Type	Analog value	1735
	Device address	Analog value	1736
	Sub Type Info	Analog value	1737
	Gas reading	Analog Value	1738

Table 5-11 Objects Providing Event Fault Information

Table 5-11 shows the BACnet objects which can give information about the most recent fault event on the DVP-1200. A fault event qualifies as the panel leaving the normal state and entering trouble, warning, or alarm. A fault event can occur for many reasons, but the available BACnet objects can provide information to the user about the fault. See below for object outputs.

- New event flag – Indicates a new fault has been logged. Resets after client has read.
- Date – [mm][dd][yy]
  Value contains date per format above
  mm – 1 to 12
  dd – 1 to 31
  yy – 00 to 99
- Time – [HH]: [mm]
  Value contains 24h time format seen above
  HH – 0 to 23
  mm – 0 to 59
- Type
  1 = Trouble
  2 = Warning
  3 = Alarm
- Device Address – Output is the address of the device causing the fault
- Sub Type Info – Fault Type Details
  IF Trouble –
    2 = Disconnected
    3 = Sensor Break
    4 = Same Address
    5 = Title 24
    6 = Remote Device
  IF Warning –
    1-10 = detector type
    67 = Calibration
  IF Alarm –
    1-10 = detector type
    79 = Title 24 Occupied

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

85 = Title 24 Unoccupied

- Gas reading – Reading with units based on gas type:

1 - 'ppm'
2 - 'ppm'
3 – '% LEL'
4 – 'ppm'
5 – 'ppm'
6 – 'ppm'
7 – 'ppm'
8 – '% v/v'
9 – 'ppm'
10 – 'ppm'

5.1.8 Warning and Alarm Settings for Sensors Not in a Zone

Description		BACnet Object Type	BACnet Object Instance	Output Units
CO	Warning	Analog Value	1739	ppm
	Alarm	Analog Value	1740	
NO2	Warning	Analog Value	1741	ppm
	Alarm	Analog Value	1742	
EX	Warning	Analog Value	1743	% LEL
	Alarm	Analog Value	1744	
NH3	Warning	Analog Value	1745	ppm
	Alarm	Analog Value	1746	
H2S	Warning	Analog Value	1747	ppm
	Alarm	Analog Value	1748	
REF	Warning	Analog Value	1749	ppm
	Alarm	Analog Value	1750	
	Alarm	Analog Value	1752	
O2	Warning	Analog Value	1753	% v/v
	Alarm	Analog Value	1754	
	Enhancement Warning	Analog Value	1755	
	Enhancement Alarm	Analog Value	1756	
CO2	Warning	Analog Value	1757	ppm
	Alarm	Analog Value	1758	
CO2	Warning	Analog Value	1759	% v/v

Table 5-12 Objects for Fault Levels of Sensors Not in Zone

Table 5-12 shows the BACnet Objects related to alarm and warning levels for sensors which have not been assigned to a zone. For each sensor type, the user can set alarm and warning levels to trigger fault events, even when a sensor is not assigned to a zone.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

6 Testing & Maintenance

6.1 Testing

6.1.1 Relay Functionality Test

a. Access the Relay Configuration Menu (Refer to Section 4.6.3.1) and select the configuration for relay to be tested.
b. Change the "RELAY ON/OFF" to ON and save the configuration. This will activate the corresponding relay and normally open connections will be closed.

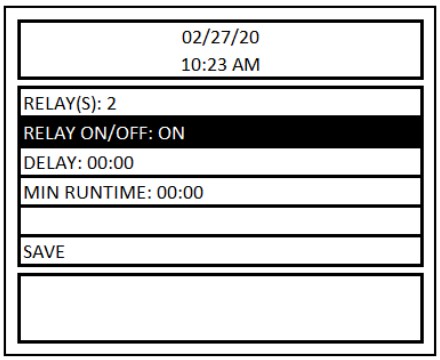


Figure 6-1 – Relay Functionality Test Menu

c. Once the test is complete, change the configuration back to desired settings and save it.

6.1.2 Horn and Strobe Functionality Test

a. Access the Horn/Strobe Configuration Menu (Refer to Section 4.6.3.3) and select the configuration for Horn/Strobe to be tested.
b. Change the "HS ON/OFF" to ON and save the configuration. This will activate the device connected to corresponding Horn/Strobe.

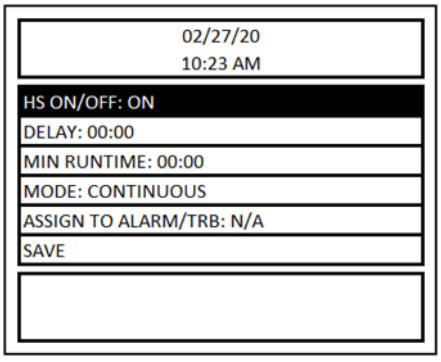


Figure 6-2 – Horn and Strobe Functionality Test Menu

c. Once the test is complete, change the configuration back to desired settings and save it.

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

6.2 Maintenance

DVP-1200 does not have parts that require regular maintenance.

For fuse replacement, use a 5x20 mm slow-blow glass body cartridge fuse with a rating of 1 Amp 250V, e.g., Littelfuse P/N 218001. Be sure to DISCONNECT POWER before removing the safety cover and REPLACE THE SAFETY COVER on F2 before re-applying power to theDVP-1200.

In the event of trouble or any kind of help and support contact Technical Support at +1-844-325-3050

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

7 Appendix A – Tables & Figures

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

8 Appendix C – Replacement Parts

The table below lists replaceable parts for the DVP Control Panels, parts not listed such as the keypad can only be replaced at the factory.

CAUTION: Certification on all DVP Panels is based on testing of the complete assembly. Replacing any part in the DVP Assembly voids the certification and user must remove the ETL label applied on the panel.

Product Model	Replacement Part	Part Number
DVP-120 All Models	DVP-120 Replacement Power Supply Assembly	70-2900-0017-0
DVP-120 All Models	DVP-120 Replacement Buzzer	70-2900-0017-1
DVP-120 All Models	DVP-120 Replacement Lock/Keys	70-2900-0017-6
DVP-120	DVP-120 Replacement Board	70-2900-0017-2
DVP-120M	DVP-120M Replacement Board	70-2900-0017-5
DVP-120B	DVP-120B Replacement Board	70-2900-0017-3
DVP-120C	DVP-120C Replacement Board	70-2900-0017-4
DVP-1200	DVP-1200 Replacement Board	70-2900-0017-7

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

9 Appendix D – Setup Record

Record network parameters and keep in a safe place to assist with installation and future troubleshooting will be simplified.

Date of Install: _____ Serial Number: _____

Location of Install: _____ Installed by: _____

Detectors / Sensors

Under Detector type record gas type (e.g. CM-6, TX-6-ND, OX-6)

Note that CX-6 uses two addresses, one for each gas type.

Modbus Address	Detector Type	Location	Modbus Address	Detector Type	Location	Modbus Address	Detector Type	Location
1			34			67		
2			35			68		
3			36			69		
4			37			70		
5			38			71		
6			39			72		
7			40			73		
8			41			74		
9			42			75		
10			43			76		
11			44			77		
12			45			78		
13			46			79		
14			47			80		
15			48			81		
16			49			82		
17			50			83		
18			51			84		
19			52			85		
20			53			86		
21			54			87		
22			55			88		
23			56			89		
24			57			90		
25			58			91		
26			59			92		
27			60			93		
28			61			94		
29			62			95		
30			63			96		
31			64			97		
32			65			98		
33			66			99		

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Modbus Address	Detector Type	Location	Modbus Address	Detector Type	Location	Modbus Address	Detector Type	Location
100			134			168		
101			135			169		
102			136			170		
103			137			171		
104			138			172		
105			139			173		
106			140			174		
107			141			175		
108			142			176		
109			143			177		
110			144			178		
111			145			179		
112			146			180		
113			147			181		
114			148			182		
115			149			183		
116			150			184		
117			151			185		
118			152			186		
119			153			187		
120			154			188		
121			155			189		
122			156			190		
123			157			191		
124			158			192		
125			159			Modbus Address	Rem. Dev. Type	**Location**
126			160			193		
127			161			194		
128			162			195		
129			163			196		
130			164			197		
131			165			198		
132			166			199		
133			167			200		

Relays and outputs

Relay connection	Connected device	Zone Configured	Delay	Runtime
Relay 1				
Relay 2				
Relay 3				
Relay 4				
Relay 5				
Relay 6				

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Relay 7				
Relay 8				
Horn/Strobe 1				
Horn/Strobe 2				
Horn/Strobe 3				
Horn/Strobe 4				
4-20mA output 1				
4-20mA output 2				
4-20mA output 3				
Remote Device Relays and Outputs				
Relay connection	Connected device	Zone Configured	Delay	Runtime
Relay 9				
Relay 10				
Relay 11				
Relay 12				
Relay 13				
Relay 14				
Relay 15				
Relay 16				
Relay 17				
Relay 18				
Relay 19				
Relay 20				
Relay 21				
Relay 22				
Relay 23				
Relay 24				
Relay 25				
Relay 26				
Relay 27				
Relay 28				
Relay 29				
Relay 30				
Relay 31				
Relay 32				
Relay 33				
Relay 34				
Relay 35				
Relay 36				
Relay 37				
Relay 38				

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

Relay 39				
Relay 40				
4-20mA output 4				
4-20mA output 5				
4-20mA output 6				
4-20mA output 7				
4-20mA output 8				
4-20mA output 9				
4-20mA output 10				
4-20mA output 11				
4-20mA output 12				
4-20mA output 13				
4-20mA output 14				
4-20mA output 15				
4-20mA output 16				
4-20mA output 17				
4-20mA output 18				
4-20mA output 19				
4-20mA output 20				
4-20mA output 21				
4-20mA output 22				
4-20mA output 23				
4-20mA output 24				
4-20mA output 25				
4-20mA output 26				
4-20mA output 27				
4-20mA output 28				
4-20mA output 29				
4-20mA output 30				
4-20mA output 31				
4-20mA output 32				
4-20mA output 33				
4-20mA output 34				
4-20mA output 35				
	Remote Device	Sensor Type	Sensor Location	Modbus Address
4-20mA input 1	1			192
4-20mA input 2	1			191
4-20mA input 3	1			190
4-20mA input 4	1			189
4-20mA input 5	1			188
4-20mA input 6	1			187
4-20mA input 7	1			186
4-20mA input 8	1			185
4-20mA input 9	1			184

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4-20mA input 10	1			183
4-20mA input 11	1			182
4-20mA input 12	1			181
4-20mA input 13	1			180
4-20mA input 14	1			179
4-20mA input 15	1			178
4-20mA input 16	1			177
4-20mA input 17	2			176
4-20mA input 18	2			175
4-20mA input 19	2			174
4-20mA input 20	2			173
4-20mA input 21	2			172
4-20mA input 22	2			171
4-20mA input 23	2			170
4-20mA input 24	2			169
4-20mA input 25	2			168
4-20mA input 26	2			167
4-20mA input 27	2			166
4-20mA input 28	2			165
4-20mA input 29	2			164
4-20mA input 30	2			163
4-20mA input 31	2			162
4-20mA input 32	2			161
4-20mA input 33	3			159
4-20mA input 34	3			158
4-20mA input 35	3			157
4-20mA input 36	3			156
4-20mA input 37	3			155
4-20mA input 38	3			154
4-20mA input 39	3			153
4-20mA input 40	3			152
4-20mA input 41	3			151
4-20mA input 42	3			150
4-20mA input 43	3			149
4-20mA input 44	3			148
4-20mA input 45	3			147
4-20mA input 46	3			146
4-20mA input 47	3			145
4-20mA input 48	3			144
				143
4-20mA input 49	4			
4-20mA input 50	4			142
4-20mA input 51	4			141
4-20mA input 52	4			140
4-20mA input 53	4			139
4-20mA input 54	4			138

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

4-20mA input 55	4			137
4-20mA input 56	4			136
4-20mA input 57	4			135
4-20mA input 58	4			134
4-20mA input 59	4			133
4-20mA input 60	4			132
4-20mA input 61	4			131
4-20mA input 62	4			130
4-20mA input 63	4			129
4-20mA input 64	4			128

Notes:

www.macurco.com 1-877-367-7891 info@macurco.com 1504 W 51st St. Sioux Falls, SD 57105

10 Macurco Inc. Product limited warranty

Macurco warrants the DVP-1200 control ventilation panel will be free from defective materials and workmanship for a period of two (2) years from the date of manufacture (indicated on inside cover of the DVP-1200), provided it is maintained and used in accordance with Macurco instructions and/or recommendations. If any component becomes defective during the warranty period, it will be replaced or repaired free of charge, if the unit is returned in accordance with the instructions below. This warranty does not apply to units that have been altered or had repair attempted, or that have been subjected to abuse, accidental or otherwise. The above warranty is in lieu of all other express warranties, obligations, or liabilities. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE ARE LIMITED TO A PERIOD OF TWO (2) YEARS FROM THE PURCHASE DATE. Macurco shall not be liable for any incidental or consequential damages for breach of this or any other warranty, express or implied, arising out of or related to the use of said gas detector. The manufacturer or its agent's liability shall be limited to replacement or repair as set forth above. Buyer's sole and exclusive remedies are the return of the goods and repayment of the price, or repair and replacement of non-conforming goods or parts.

*Modbus is a trademark or registered trademark of Schneider Automation Inc.
*BACnet is a registered trademark of ASHRAE.

Macurco Inc.

1504 W 51st St
Sioux Falls, SD 57105

Technical Support Contact Information

Phone: 1-844-325-3050
Fax: 1-605-951-9616
Email: support@macurco.com
Website: www.macurco.com/support/

General Contact Information

Phone : 1-877-367-7891
Fax : 1-605-951-9616
Email: info@macurco.com
Website: www.macurco.com

REV – 2.0.1
Issue Date: June 9, 2023
Document No: 34-8708-4770-9
© Macurco Inc. 2023. All rights reserved.
Macurco is a trademark of Macurco Inc.