Operating Manual

CDM-2100

Differential Pressure Monitor

Form CDM-2100 OM 3-21

altronic

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1.0 OVERVIEW

1.1 The CDM-2100 control panel consists of the DSG-1611DUPS instrument, wiring terminals, and fuse installed in an industrial enclosure.

1.2 The CDM-2100 controller is a dedicated electronic microprocessor-based system designed to sense differential pressure across a single catalyst element. A front mounted keypad serves as the user interface for all required system configuration. A backlit 128 x 64 character graphic display shows system status, programmed controller parameters and channel labels. The controller provides complete supervisory and alarm annunciation capability dedicated to monitoring and protecting catalyst elements indicating when internal pressures have risen above manufacturers limits.

In conjunction with the CDM-2100 controller, a highly accurate, low pressure inches of water column differential pressure transmitter is used. When each port of the differential pressure transmitter is placed across the catalyst element, it sends an electronic signal back to the CDM-2100. This signal represents the amount of pressure drop across the catalyst element.

2.0 CDM-2100 PANEL

2.1 The panel contains all the necessary hardware and provides the wiring interface to an external sensor. Conduit openings at the bottom of the enclosure provide access for supply power, sensor and other necessary wiring.

3.0 CDM-2100 DISPLAY MODULE

3.1 The CDM-2100 display module provides for monitoring the catalyst differential pressure. The output of the CDM-2100 instrument provides a 4-20mA signal representing the incoming pressure, and alarm outputs as discrete contacts.

3.2 The keypad is a sealed membrane unit containing MENU/ESC, UP, DOWN and ENTER keys, used to navigate through channel status and description and to edit the setpoints.

3.3 The LCD has a Home Screen that displays a Status Line, along with the catalyst differential pressure in inH2O.

3.4 The keypad and display are used to navigate through channel status and descriptions, view screens, and to view or edit the system's configuration. Pressing the MENU/ESC key advances the display to the menus. All menu adjustments are saved in non-volatile EEPROM memory by pressing the ENTER key. The EEPROM memory retains the current configuration during normal operation, after engine shutdown and a system power-down.

3.5 The CDM-2100 has serial communications compliant to Modbus RTU standard and uses RS-485 for its hardware communication format.

4.0 MOUNTING THE PANEL (FIG. 1)

4.1 Mount the control panel(s) to a post or to a suitable flat surface so that the display is at a convenient viewing height.

NOTE: Avoid mounting the panel with the LCD display facing direct sunlight. The display operating temperature range is -31°F to +176°F (-35°C to +80°C). The panel(s) should be mounted within 10–20 feet of the engine, the fuel solenoid valve and sensors.

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5.0 WIRING (SEE WIRING DIAGRAM, FIG. 2)

5.1 Wire Cable Assembly 693158-XX, where XX may be -60, -120, -360 (which represents the cable length in inches) cabling, into the panel. This assembly contains the wiring for the connection to the differential pressure transmitter.

Feed the cable through the bottom of the panel and connect each wire to its appropriate position on the terminal strips. Separate power wiring must be routed to the panel, and must follow guidelines published by the NEC and local authority.

NOTE: All furnished drawings and instructions assume (–) ground DC system. In the case of a floating ground, or (+) ground DC system, please contact Altronic Factory for support.

6.0 KEYPAD DESCRIPTION

6.1 The CDM-2100 gauge features a four-key front keypad which is used to view or change the setpoint values, configure and calibrate the gauge. The front panel keys are MENU/ESC, ENTER, and ▲, ▼ (up and down arrow keys).

6.2 MENU/ESC
The MENU/ESC key is used to enter the main menu and to return to the home screen at any time. **If the MENU/ESC key is used to return to the home screen prior to pressing the ENTER key, changes are not stored in the memory and do not take effect.**

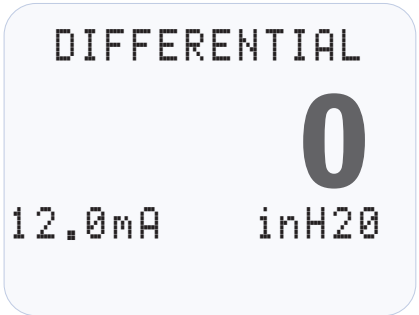
6.3 ENTER
The ENTER key is used throughout the menu to proceed through the configuration and to accept the data to be saved. Throughout configuration when a change has been made and is to be saved to memory, press ENTER and the display will read SAVED, and the new data or configuration will be stored in the nonvolatile memory.

6.4 ▲ AND ▼
The up and down arrow keys are used to scroll through the selections in the menu and to increase or decrease values during configuration and calibrations. Values can be changed incrementally using individual key presses or more rapidly by holding the key down.

7.0 UNDERSTANDING THE HOME SCREEN

7.1 The CDM-2100 is considered in the HOME SCREEN when measuring and displaying monitored data. The gauge displays up to a 5-digit numeric value in 0.5" numbers, units of measure, the monitored point label, and a graph if enabled. If a setpoint is configured and its value is exceeded, the output switch turns on and the display will indicate SW1 LO, SW1 HI, SW2 LO or SW2 HI (low, or high setpoint and switch 1 or 2 has tripped).

When the displayed reading exceeds the upper limit of the gauge (110% of range), the display will read INPUT SIGNAL IS HI OUT OF RANGE, and if configured, its high output switch will activate. If the displayed reading exceeds the lower limit of the gauge, the display will read INPUT SIGNAL IS LO OUT OF RANGE, and if configured, its low output switch will activate.



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8.0 INITIAL CONFIGURATION

8.1 The CDM-2100 is pre-configured for measuring the differential catalyst pressure using the Altronic differential pressure transmitter. All of the basic labels and configuration are already complete for the user to start monitoring. However, there are site specific parameters that should be updated. This section will guide the user through the minimum screens required to set-up the controller. A more detailed description of all user parameters is provided in section 10.

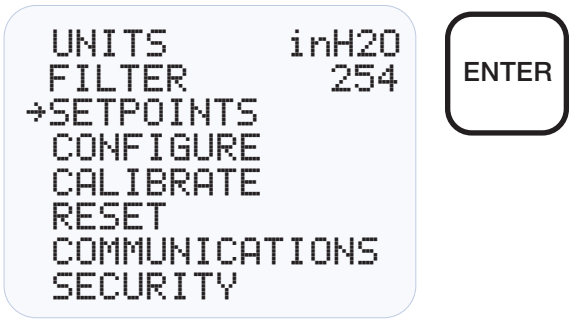
NOTE: The splash screen can be displayed at anytime from a home screen by pressing both the up and down arrow keys together.

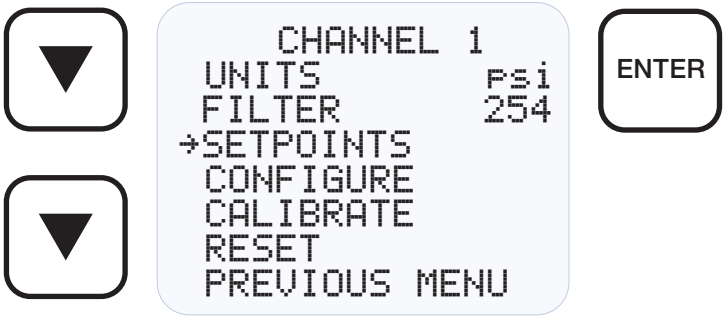
This system is shipped with factory default settings. Upon power-up a splash screen displays: DSG-1611DUPS, the firmware Rev. Level, and date.

Once the arrow cursor is adjacent to the line to be changed, pressing the ENTER key changes the icon to ⇳. Now the up and down arrow keys can be used to change the selection. Once the desired change is made, pressing the ENTER key saves the change and returns the arrow cursor.

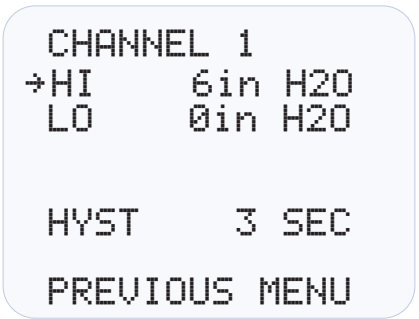
Press the MENU key to enter into the main system menu.

The up and down arrow keys can be used to move the cursor down to the PREVIOUS MENU. Pressing ENTER then returns the display to the main menu. Move the cursor adjacent to SETPOINTS and press ENTER.





An LED is tied to the output of Switch 2, such that when a fault occurs the LED will illuminate. According to the manufacturer of the catalyst there will be an end of life pressure. Switch output 2 should be set such that the LED indicator will alert someone visually before the end of life pressure of the catalyst. Optionally Switch 1 is wired to terminals, and can be configured to operate an external relay or digital input to notify a control system of the elevated catalyst pressure.



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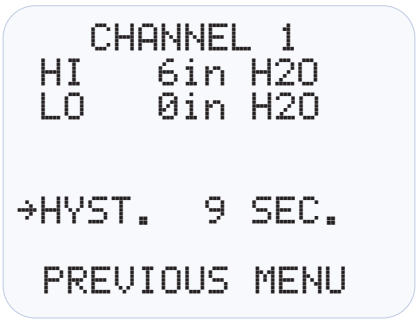
Press ENTER again to change the cursor to the ⇕ icon. Use the UP and DOWN arrow buttons to make the desired setpoint changes. The procedure is repeated to change the first setpoint value.

8.2 HYSTERESIS

Hysteresis can be used when the output switch is configured as non-latching to prevent the output switch from oscillating or turning on and off around the setpoint. The hysteresis is implemented as a time, in seconds, that begins when the sensor input value returns to within the setpoint value limits. When the input value returns to within the setpoint value limits, the hysteresis timer starts and the switch stays tripped for the configured hysteresis time. If during the hysteresis time the setpoint is violated again, the hysteresis timer starts over. The hysteresis value can be set from 0 to 99 seconds. To set the hysteresis value, point to HYST and press the ENTER key. Use ▲ or ▼ to increase or decrease the hysteresis time and press ENTER to save the new value.



8.3 SETPOINTS

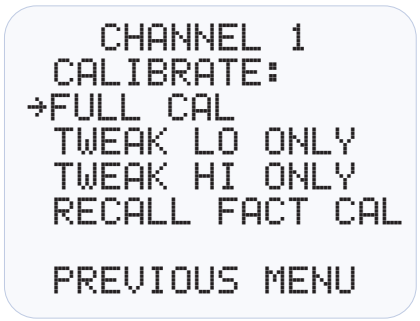
The SETPOINTS menu allows the user to set a setpoint value for Low and High, and set the hysteresis value for each channel.

REFER TO SECTION 8 FOR DETAILS ON SETPOINTS

NOTE: During calibration, the unit allows 2 minutes between keystrokes to change or save a new calibration. If 2 minutes lapse without a keystroke, the device will automatically return to the home screen with the previous values. The new calibration information is saved only if the ENTER key is pressed and the display reads SAVED.

8.4 CALIBRATE

The gauge is calibrated at the factory and should not require additional calibration. However, calibration can be performed in the field many times over the life of the gauge. Each channel is calibrated separately to the type of input transducer selected. The calibration mode is used to calibrate the zero and span values. Calibration can be performed from the front keypad without disassembling the gauge. A calibrator or simulator capable of outputting the correct signal for the type of transducer selected for that channel is required to provide a calibration reference.



8.4.1 CALIBRATION PROCEDURE

Connect the appropriate calibrator or simulator (for thermocouples use the proper type of thermocouple extension wire) to the gauge for channel 1 or 2, follow the hook-up drawing for that sensor type. Be sure that the sensor type and the engineering units of the calibrator match the type and engineering units of the instrument before performing a calibration.

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To calibrate the gauge, select CALIBRATE from the channel 1 or 2 menu and press the ENTER key. Select FULL CAL and press ENTER. The display will read SET LO POINT ON CALIBRATOR AND PRESS ENTER. Adjust the calibrator/simulator at or near zero or a very low reading and press ENTER; the display will show SAMPLING, then ADJUST LO POINT TO MATCH CALIBRATOR. Use the ▲ or ▼ arrow keys to increase or decrease the display reading to match the setting of the simulator and press ENTER. The display will show SET HI POINT ON CALIBRATOR AND PRESS ENTER. Adjust the simulator at or near the span value of the transducer or a very high reading and press ENTER; the display will show SAMPLING, then ADJUST HI POINT TO MATCH CALIBRATOR. Again use the ▲ or ▼ arrow keys to increase or decrease the display reading to match the simulator and press ENTER. The display will read CALIBRATION VALUES SAVED!. The gauge will return to the home screen with the new calibration values stored in memory.

8.4.2 The CDM-2100 gauge has a feature that allows a slight adjustment of either the zero or span values individually. This type of calibration can be used to "tweak" the readout to match that of a known value without actually performing a formal calibration procedure. This adjustment is independent for each channel and must be performed on that individual channel. Please note that this type of adjustment will invalidate calibration settings from the FULL CAL procedures.

TWEAK LO ONLY
To make a small adjustment on the zero calibration value of the gauge, enter the calibration mode by selecting CALIBRATE and press ENTER; select TWEAK LO ONLY from the menu and press ENTER. The display will show SET LO POINT ON CALIBRATOR AND PRESS ENTER. Adjust the calibrator/simulator at or near zero or a very low reading and press ENTER; the display will show SAMPLING, then ADJUST LO POINT TO MATCH CALIBRATOR. Use the ▲ or ▼ arrow keys to increase or decrease the display reading to match the calibrator and press ENTER. The display will read CALIBRATION VALUES SAVED!. The gauge will return to the home screen with the new zero calibration value stored in memory.

TWEAK HI ONLY
To make a small adjustment on the span calibration value of the gauge, enter the calibration mode by selecting CALIBRATE and press ENTER; select TWEAK HI ONLY from the menu and press ENTER. The display will show SET HI POINT ON CALIBRATOR AND PRESS ENTER. Adjust the calibrator/simulator at or near the desired span value and press ENTER; the display will show SAMPLING, then ADJUST HI POINT TO MATCH CALIBRATOR. Use the ▲ or ▼ arrow keys to increase or decrease the display reading to match the calibrator and press ENTER. The display will read CALIBRATION VALUES SAVED!. The gauge will return to the home screen with the new span calibration value stored in memory.

8.4.3 RECALL FACTORY CAL VALUES
The user can at any time during the life of the gauge reinstate the factory calibration values for channel 1 or 2 independently. Select CALIBRATE from the CHANNEL 1 or CHANNEL 2 menu and press ENTER; select RECALL FACTORY CAL and press ENTER. The next screen will display the type and range for which the selected channel's input is currently configured. Select APPLY to confirm or CANCEL to decline and press ENTER. If APPLY is selected, the display will show CALIBRATION VALUES SAVED!. The gauge will return to the home screen with the factory default calibration values stored in memory. If CANCEL is selected, the gauge will retain the current calibration values. Press the ESC key to return to the home screen.

The *calibration values only*, will return to the factory default; all other settings will remain unchanged. If the transducer type or range is incorrect, press the MENU/ESC key to abort saving incorrect factory cal values. Configure the gauge for the desired input sensor type and range and then recall the factory cal values.

8.5 RESET
The reset selection in the menu is used to reset the min/max reading for channel 1 or 2 independently. To perform a reset, select either channel 1 or 2

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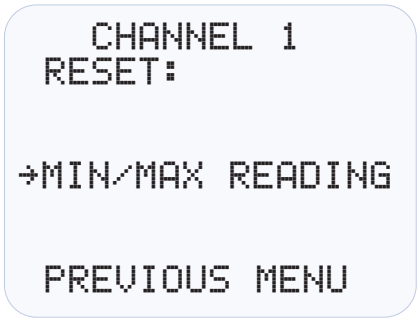
from the menu, use ▲ or ▼ to scroll to RESET and press ENTER. The display will show RESET!. A reset can also be performed by sending a reset command via the RS-485 Modbus RTU communications register.

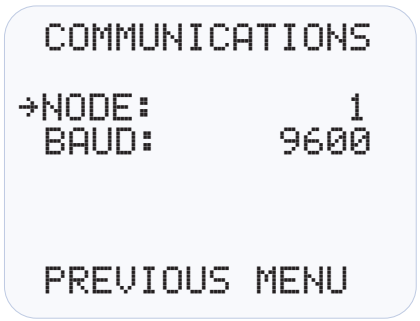
8.5.1 MIN/MAX READING
Use the ▲ or ▼ arrow key to point to MIN/MAX READING and press ENTER; The display will show RESET!. RESET resets both the min and max readings to the current reading.



8.6 COMMUNICATIONS

8.6.1 The CDM-2100 gauge is part of a system that has been carefully designed to easily interface to popular computers, terminals, programmable controllers and Altronic instruments. Modbus RTU is the protocol used in the CDM-2100. A Modbus register list with register numbers and descriptions of each register can be found in section 10.0. The serial communications are compliant to the Modicon Modbus RTU standard and uses RS-485 for its hardware communication format. To view or adjust the communication parameters, select COMMUNICATIONS from the main menu and press ENTER. Throughout the menu use the ▲ or ▼ arrow keys to make a selection and press ENTER to save the changes.

FOR DETAILED COMMUNICATIONS INFORMATION SEE SECTION 9.0.



8.6.2 NODE
The node number gives each gauge on the communications port an identity. Any node number from 1 to 99 can be used. Use the up and down arrow keys to select a node number and press ENTER to save.

8.6.3 BAUD — Select the required baud rate and press ENTER to save.

SEE SECTION 9.3 FOR AVAILABLE BAUD RATES.

8.7 SECURITY

8.7.1 The security feature allows for a user to lock the gauge to secure chosen areas of the menu from being changed. There are several individual areas in the menu system that can be protected as well as two layers of protection. The menus that can be protected are the CONFIGURATION menu settings, the SETPOINT values, the ability to make changes via modbus COMMUNICATIONS, and

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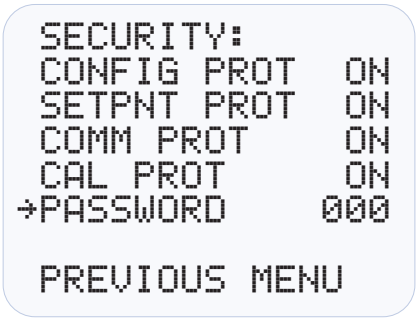
CALIBRATION protection. When protection is ON, the user is able to view the menu values but not able to change them. If an attempt is made to change the values and the ENTER key is pressed when protection is on, the display will read PASSWORD PROTECTED! ENTER PASSWORD. This prompts the user to enter the password. If the correct password is entered, the requested configuration values can be changed.

To set or change a password, select SECURITY from the main menu and press ENTER. If the password is set to 000, the security menu will be available without entering the password. If the password is any number but 000, the proper password must be entered to enter the security menu. Each of the security selections can be turned ON or OFF individually. Use the ▲ or ▼ arrow key to point to the item to be protected and press ENTER, the ⇕ arrow will change to é. Use the ▲ or ▼ key to select either ON or OFF and press ENTER. The display will show SAVED and the change will be saved to memory. When a menu item is protected, the display will read ON, not protected will show as OFF. To enter a password, point to PASSWORD and press ENTER. Use the ▲ or ▼ arrow key to increase or decrease each of the 3-digit password numbers and press ENTER. The display will show SAVED and the change will be saved to memory. Any number from 000 to 999 can be used. Please note that Autoscan, Units, Filter Values, and R eset cannot be locked out by security protection. Please note that SECURITY protects both channels.



8.7.2 CONFIGURATION PROTECTION:
When set to ON, prevents the user from changing items in the CONFIGURE menu. Items protected are TYPE (input sensor type), GAUGE LABEL, and BARGRAPH.

8.7.3 SETPOINT PROTECTION:
When set to ON, prevents the user from changing the items in the SETPOINTS menu. All setpoint values and configurations can be read but not changed.

8.7.4 COMMUNICATIONS PROTECTION:
When set to ON prevents the user from changing the Modbus registers via the serial communications. User can read, but not write data. If the user attempts to perform a write, the error message INVALID FUNCTION CODE will be sent.

8.7.5 CALIBRATION PROTECTION:
When set to ON, prevents user from changing calibration values.

8.7.6 PASSWORD:
The password is the second level of protection. When PASSWORD is selected, the user will be prompted to enter a 3-digit password. To enter a password, point to PASSWORD and press ENTER, the first digit will be underlined. Use the ▲ or ▼ arrow key to increase or decrease that digit from 0 to 9 and press ENTER. The next digit will be highlighted, use the same procedure to continue to enter a 3-digit password and press ENTER to save. Any number from 000 to 999 can be used. The default password is 330.

With a password in memory, and the security screen is accessed, the message PASSWORD PROTECTED! ENTER PASSWORD will appear. If the proper password is entered, the security screen will be displayed and changes will be allowed. To gain access to the protected menus without having to enter a password, turn protection OFF. If the incorrect password is entered, the display will return to the menu denying access to the protected menu.

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9.0 RS-485 COMMUNICATIONS

The CDM-2100 gauge is part of a system that has been carefully designed to easily interface to popular computers, terminals, programmable controllers and Altronic instruments. The gauge communicates in the Modbus RTU protocol.

9.1 MASTER/SLAVE OPERATION:
The gauge's RS-485 communication system is designed as a master/slave system; that is, each unit responds to its own unique address (node number) only after it is interrogated by the master (computer). One master and up to 32 slaves can communicate in the system. The units communicate with the master via a polling system. The master sends a command and only the polled slave responds. The slave modules can never initiate a communications sequence. A simple command/response protocol must be strictly observed.

9.2 NODE NUMBER:
The node number is used in the system to identify the desired slave unit being polled. The node number can be any numeric value from 1 to 99 although only 32 devices can be served on a single communications port. This number range (1 to 99) is allowed so that if device grouping by function or application is desired, it can be implemented using the first digit as the group or engine number and the second as the unit number. For example, 53 could be used to identify the number 3 slave unit mounted on engine number 5.

9.3 BAUD RATE:
Baud rates available are 9600, 19200, 38400, 57600, 115200.

9.4 HALF-DUPLEX OPERATION:
The RS-485 system employed uses two wires for communication and cannot send and receive data at the same time over the same two wires making it a half-duplex system. When the master is in the transmit mode, the slave is in the receive mode and vice-versa.

9.5 ELECTRICAL OPERATING RANGE:
RS-485 is a communications standard to satisfy the need for multi-dropped systems that can operate at high speeds over long distances. RS-485 uses a balanced differential pair of wires switching from 0 to 5 volts to communicate data. RS-485 drivers can handle common mode voltages from -7 to +12 volts without loss of data, making them an excellent choice for industrial environments.

9.6 COMMUNICATIONS PARAMETERS:
The following must be set by the master to communicate with the slaves:

- Baud Rate: 9600 (DEFAULT) others available, see section 10.3
- Data Bits: 8
- Stop Bits: 1
- Parity: None

9.7 COMMUNICATIONS WIRING:
The RS-485 wiring diagram illustrates the wiring required for multiple slave unit hookup. Note that every slave unit has a direct connection to the master. This allows any one slave unit to be removed from service without affecting the operation of the other units. Every unit must be programmed with a unique address or node number, but the addition of new units or nodes can be in any order. To minimize unwanted reflections on the transmission line, the bus should be arranged as a trunk line going from one module to the next. Random structures of the transmission line should be avoided. Special care must be taken with long busses (500 feet or more) to ensure error-free operation. Long busses must be terminated with a 120 ohm resistor between the terminals marked RS-485 A and RS-485 B at the master only. The use of twisted pair shielded cable will enhance signal fidelity and is recommended. To prevent ground loops, the shield should be connected to the shield terminal at the master only.

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9.8 RX, TX INDICATORS:
RX and TX (receive and transmit) LEDs on the back of the gauge indicate when the unit is receiving or transmitting data.

9.9 CONNECTING TO A PC:
When connecting the gauge to the RS-232 port on a PC, an RS-232 to RS-485 converter must be used for the communication interface.

9.10 LOADING:
RS-485 uses a balanced differential pair of wires switching from 0 to 5 volts to communicate data. In situations where many units (32 max.) are connected together on a long run, voltage drop on the communications leads becomes a major problem. Voltage drops on the RS-485 minus lead appear as a common mode voltage to the receivers. While the receivers are rated to a maximum voltage difference of ±7 volts, -7 V to +12 V, a practical system should not have a voltage difference exceeding ±3 volts under normal conditions. The wire gauge used for the connections, therefore, limits the maximum number of units or the maximum length of wire between units in each application. The following formula can be used as a guideline to select the appropriate wire gauge.

NOTE: The maximum number of units connected in a system is 32.

- For 18 AWG wire No. of units = (4000)/(ft. of wire used)
- For 20 AWG wire No. of units = (2500)/(ft. of wire used)
- For 22 AWG wire No. of units = (1600)/(ft. of wire used)

10.0 MODBUS REGISTER LISTS

The maximum number of registers that can be read at one time is limited to 32.
The maximum number of booleans that can be read at one time is limited to 256.
All communications are at 9600 baud (default), see section 9.3 for other speeds
8 Data bits, No Parity, 1 Stop bit (9600 8N1).

NOTE: All temperatures are stated in 0.1 DEG. Kelvin (for universal compatibility). Therefore a register value of 2730 is 273.0° K, which is 0° C, or 32° F.

10.1 00000 SERIES REGISTERS

ADDRESS	DESCRIPTION OF FUNCTION		
00001	PROTECT CONFIGURATION Protect configuration from being changed by keypad	0=OFF	1=ON
00002	PROTECT SETPOINT Protect setpoints from being changed by keypad	0=OFF	1=ON
00003	PROTECT COMMUNICATIONS Protect against ModBus writes	0=OFF	1=ON
00004	PROTECT CALIBRATION Protect against changing calibration values	0=OFF	1=ON
00005	DISPLAY LOOP Display loop value on home screen	0=OFF	1=ON
00006	RESET MIN/MAx Reset MIN/MAx readings		1=RESET
00008 ↓↓ 00016	RESERVED		
00017	SWITCH 1 RESET		1=RESET
00018	SWITCH 1 STATE	0=SHELF	1=FAILSAFE
00019	SWITCH 1 TYPE	0=NON-LATCH	1=LATCHING
00020 ↓↓ 00024	RESERVED		
00025	SWITCH 2 RESET		1=RESET
00026	SWITCH 2 STATE	0=SHELF	1=FAILSAFE
00027	SWITCH 2 TYPE	0=NON-LATCH	1=LATCHING

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ADDRESS	DESCRIPTION OF FUNCTION
00028 ↓↓ 00047	RESERVED
00048	Config Override – Allow ModBus to override Channel Configuration

10.2 10000 SERIES REGISTERS

The node number is the address of the controller being contacted. This number is programmed by the terminal program and can be viewed or edited in the menu screen. A two digit number from 01 to 99 can be used.

ADDRESS	DESCRIPTION OF FUNCTION	
10001	CHANNEL 1 signal OK	1=OK
10002	LOOOR – Channel signal low out of range	1=LOOR
10003	HIOOR – Channel signal hi out of range	1=HOOR
10004	TCOPEN – Channel thermocouple open	1=TCOPEN
10005 ↓↓ 10016	RESERVED	
10017	SWITCH 1 FAULT HI	
10018	CHANNEL 2 signal hi out of range	1=HOOR
10020 ↓↓ 10024	RESERVED	
10025	SWITCH 2 FAULT HI	
10026	SWITCH 2 FAULT LO	

10.3 30000 SERIES REGISTERS

ADDRESS	DESCRIPTION OF FUNCTION
30001	CHANNEL STATUS – same as 10001–10016
30002	SWITCH STATUS – same as 10017–10032
30004	Analog Value (float msw)
30005	Analog Value (float lsw)
30010	Ambient Temp. DEGK (float msw)
30011	Ambient Temp. DEGK (float lsw)
30012	Current Loop (4-20ma,400=4mA, 2000=20mA)
30013	SWITCH 1 Hi Hysteresis Timer (0.1 increments)
30014	SWITCH 1 Lo Hysteresis Timer (0.1 increments)
30016	SWITCH 2 Hi Hysteresis Timer (0.1 increments)
30017	SWITCH 2 Lo Hysteresis Timer (0.1 increments)
30019	CHANNEL 1 MAX (float) (msw)
30020	CHANNEL 1 MAX (float) (lsw)
30021	CHANNEL 1 MIN (float) (msw)
30022	CHANNEL 1 MIN (float) (lsw)

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10.4 40000 SERIES REGISTERS

ADDRESS	DESCRIPTION OF FUNCTION
40001	Coils 001-016
40002	Coils 017-032
40003	Coils 033-048
40005	Node Number 1-99
40006	Baud rate Index 0=9.6k 1=19.2k 2=38.4k 3=57.6k 4=115.2k
40007	Security Password 000-999
40009	RESERVED
40010	RESERVED
40011	Lag Filter Gain (1-255)
40012	SENSOR TYPE CUSTOM 0=Custom PRESSURE SENSORS 256=15psi 257=25psi 258=50psi 259=100psi 260=300psi 261=500psi 262=1000psi 263=2000psi 264=5000psI 265=10000psi 266=Custom Pressure TEMPERATURE SENSORS 512=JTC 513=KTC 514=DEG1 515=DEG2 516=Custom Temperature VIBRATION SENSORS Velocity 768=1ips 769=2ips 770=Custom Velocity Acceleration 1024=10g 1025=20g 1026=50g 1027=Custom Acceleration PERCENT 1280=0–100% (0-55Vdc) 1281=Custom Percent VOLTAGE 1536=0-5Vdc 1537=±160mVdc 1538=±80mVdc 1539=Custom Voltage
40013	Units Index (class specific) PRESSURE SENSORS 0=psi 1=psig 2=psia 3=Kpa 4=bar 5=mbar 6=inH2O@20C 7=inHg 8=mmH2O 9=mmHg 10=kg/cm2 11=torr TEMPERATURE SENSORS 0=Kelvin 1=Celsius 2=Fahrenheit VIBRATION SENSORS Velocity 0=in/s 1=mm/s 2=cm/s Acceleration 0=G 1=ft/s/s 2=m/s/s
40014	A/D Voltage Range 0=5V 1=±160mV 2=±80mV
40015	SENSOR MAX (float) (msw)
40016	SENSOR MAX (float) (lsw)
40017	SENSOR MIN (float) (msw)
40018	SENSOR MIN (float) (lsw)
40019	Range HI (float) (msw)
40020	Range HI (float) (lsw)
40021	Volt HI (float) (msw)
40022	Volt HI (float) (lsw)
40023	Range LO (float) (msw)
40024	Range LO (float) (lsw)

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ADDRESS	DESCRIPTION OF FUNCTION
40025	Volt LO (float) (msw)
40026	Volt LO (float) (lsw)
40027	Zero Band (float) (msw)
40028	Zero Band (float) (lsw)
40029	Custom Decimal Place (0-4)
40030	Label Index 0=NONE 1=CUSTOM
40031	Custom Label (char. 1:2)
40032	Custom Label (char. 3:4)
40033	Custom Label (char. 5:6)
40034	Custom Label (char. 7:8)
40035	Custom Label(char. 9:10)
40036	Custom Label (char. 11:12)
40037	Custom Label (char. 13:14)
40038	Custom Label (char. 15:16)
40039	Custom Unit Label Index 0=NONE 1=CUSTOM
40040	Custom Unit Label (char. 1:2)
40041	Custom Unit Label (char. 3:4)
40042	Custom Unit Label (char. 5:–)
40043	CHANNEL 1 Bargraph type 0=Off 1=Single bar between low and high 2=Increasing bars between low and high 3=Single bar between setpoints for switch 1 4=Increasing bars between setpoints for switch 1 5=Single bar between setpoints for switch 2 6=Increasing bars between setpoints for switch 2
40044	Bargraph Hi (float) (msw)
40045	Bargraph Hi (float) (lsw)
40046	Bargraph Lo (float) (msw)
40047	Bargraph Lo (float) (lsw)
40048 ↓↓ 40054	RESERVED
40092 ↓↓ 40098	
40099	SWITCH 1 Setpoint Type 0=Off 1=High On 2=Low On 3=High and Low On
40100	SWITCH 1 Hysteresis Time 1-99s
40101	SWITCH 1 Setpoint Hi (float) (msw)
40102	SWITCH 1 Setpoint Hi (float) (lsw)
40103	SWITCH 1 Setpoint Lo (float) (msw)
40104	SWITCH 1 Setpoint Lo (float) (lsw)
40105	SWITCH 1 Setpoint Differential (float) (msw)
40106	SWITCH 1 Setpoint Differential (float) (lsw)

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ADDRESS	DESCRIPTION OF FUNCTION
40099	SWITCH 2 Setpoint Type 0=Off 1=High On 2=Low On 3=High and Low On
40108	SWITCH 2 Hysteresis Time 1-99s
40109	SWITCH 2 Setpoint Hi (float) (msw)
40110	SWITCH 2 Setpoint Hi (float) (lsw)
40111	SWITCH 2 Setpoint Lo (float) (msw)
40112	SWITCH 2 Setpoint Lo (float) (lsw)
40113	SWITCH 2 Setpoint Differential (float) (msw)
40114	SWITCH 2 Setpoint Differential (float) (lsw)

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FIG. 1 MOUNTING DIMENSIONS

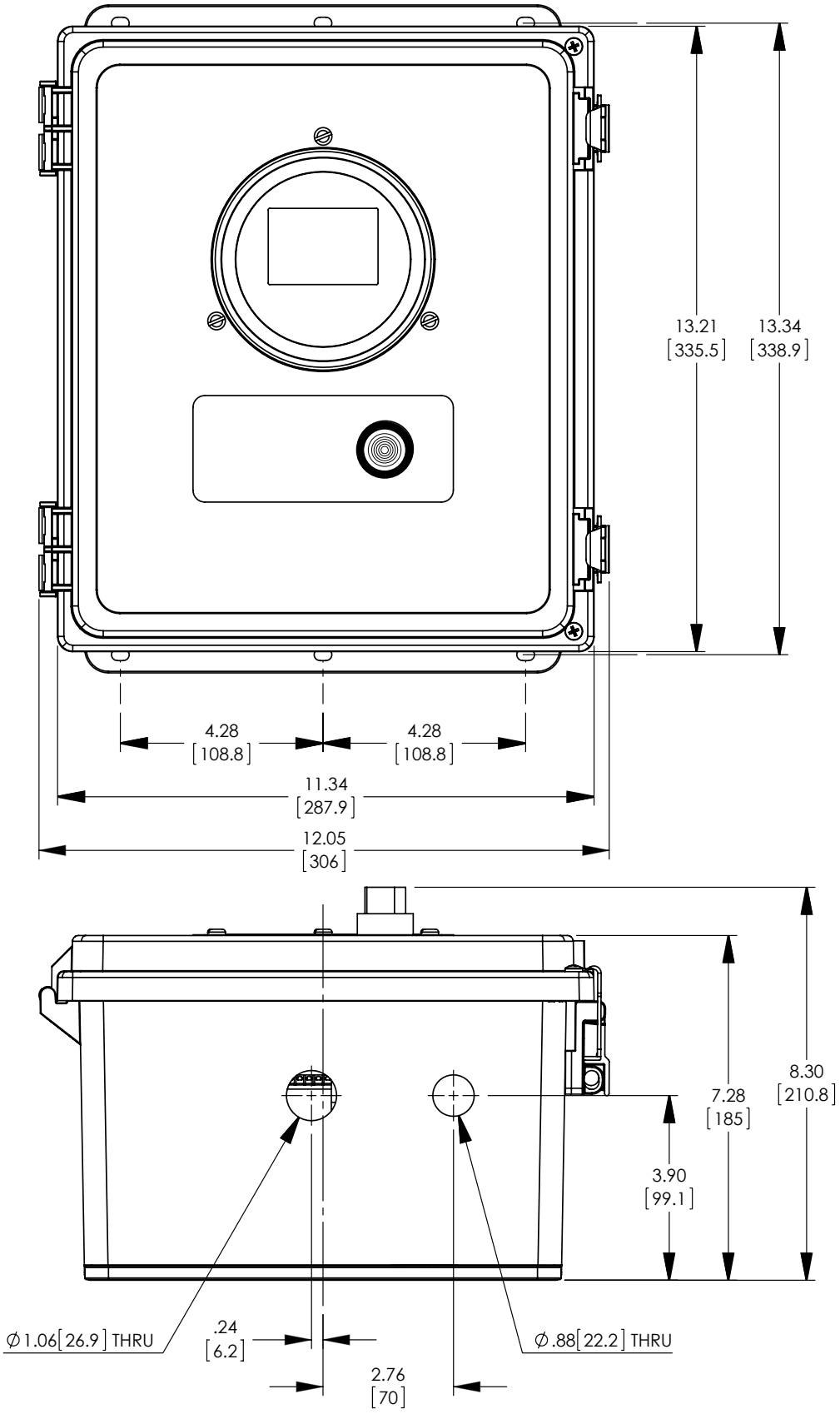

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FIG. 2 WIRING DIAGRAM, CUSTOMER CONNECTIONS

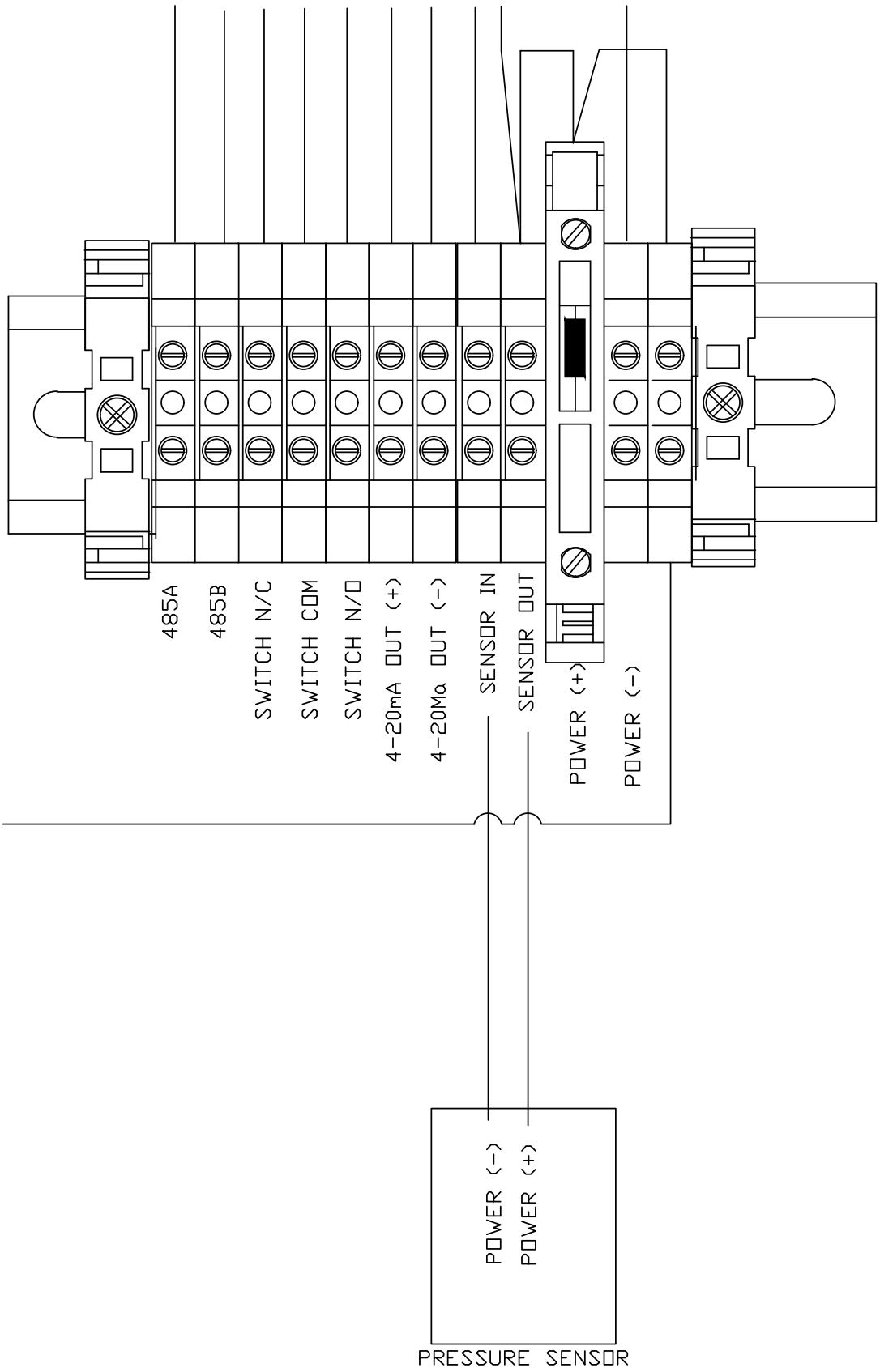

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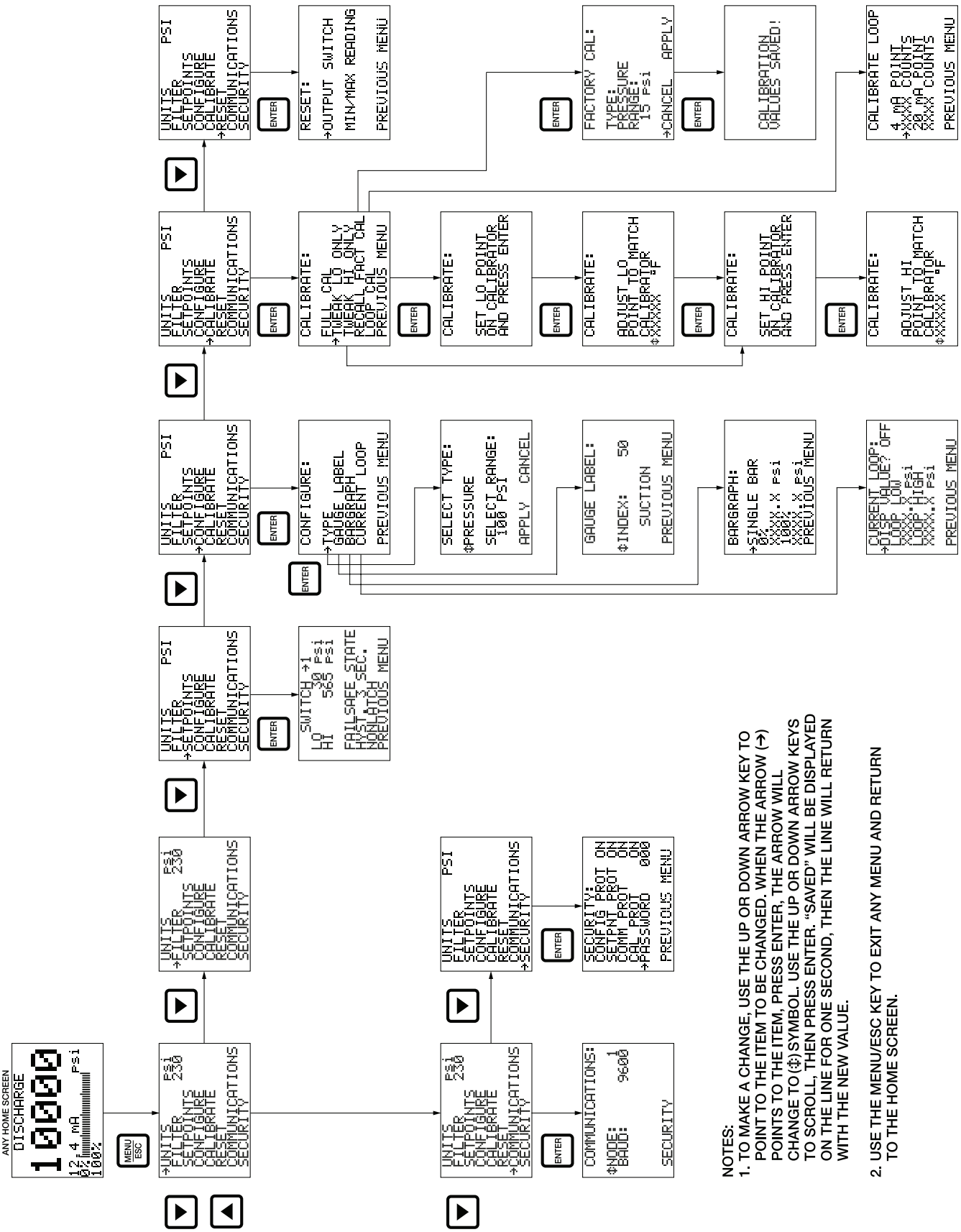
FIG. 3 FLOW CHART



NOTES:
1. TO MAKE A CHANGE, USE THE UP OR DOWN ARROW KEY TO POINT TO THE ITEM TO BE CHANGED. WHEN THE ARROW (→) POINTS TO THE ITEM, PRESS ENTER, THE ARROW WILL CHANGE TO (⇕) SYMBOL. USE THE UP OR DOWN ARROW KEYS TO SCROLL, THEN PRESS ENTER. "SAVED" WILL BE DISPLAYED ON THE LINE FOR ONE SECOND, THEN THE LINE WILL RETURN WITH THE NEW VALUE.
2. USE THE MENU/ESC KEY TO EXIT ANY MENU AND RETURN TO THE HOME SCREEN.

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FIG. 4 CDM–2100 SYSTEM DIAGRAM

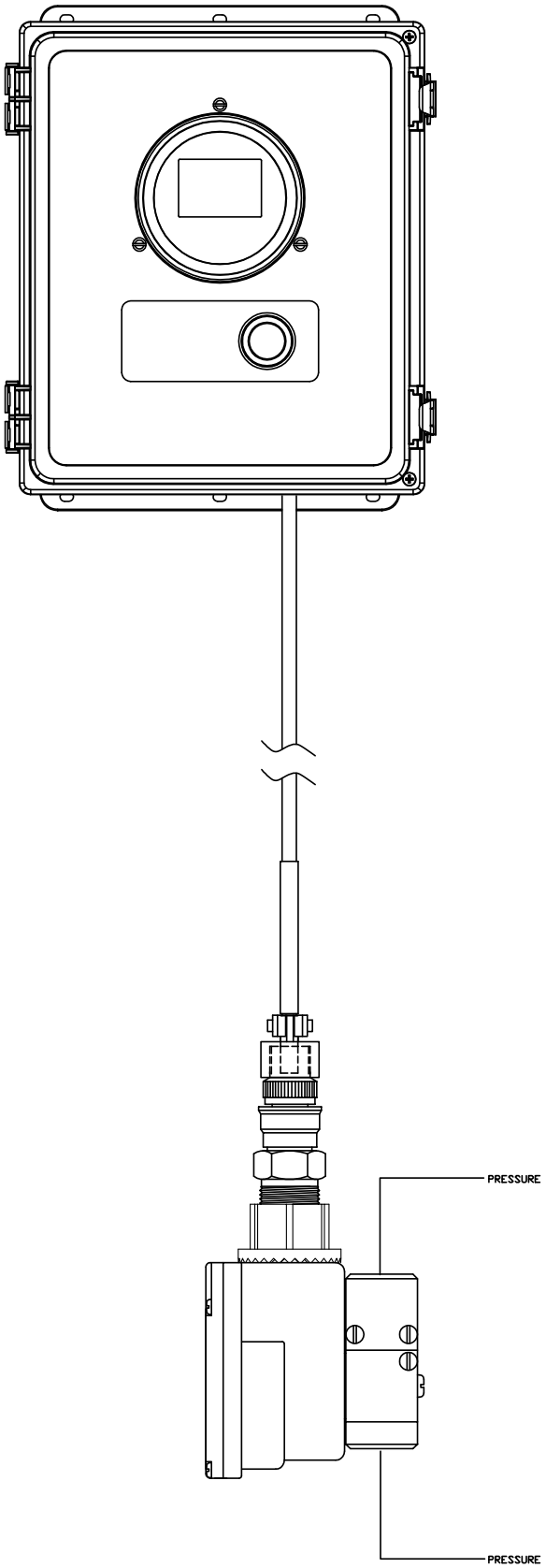

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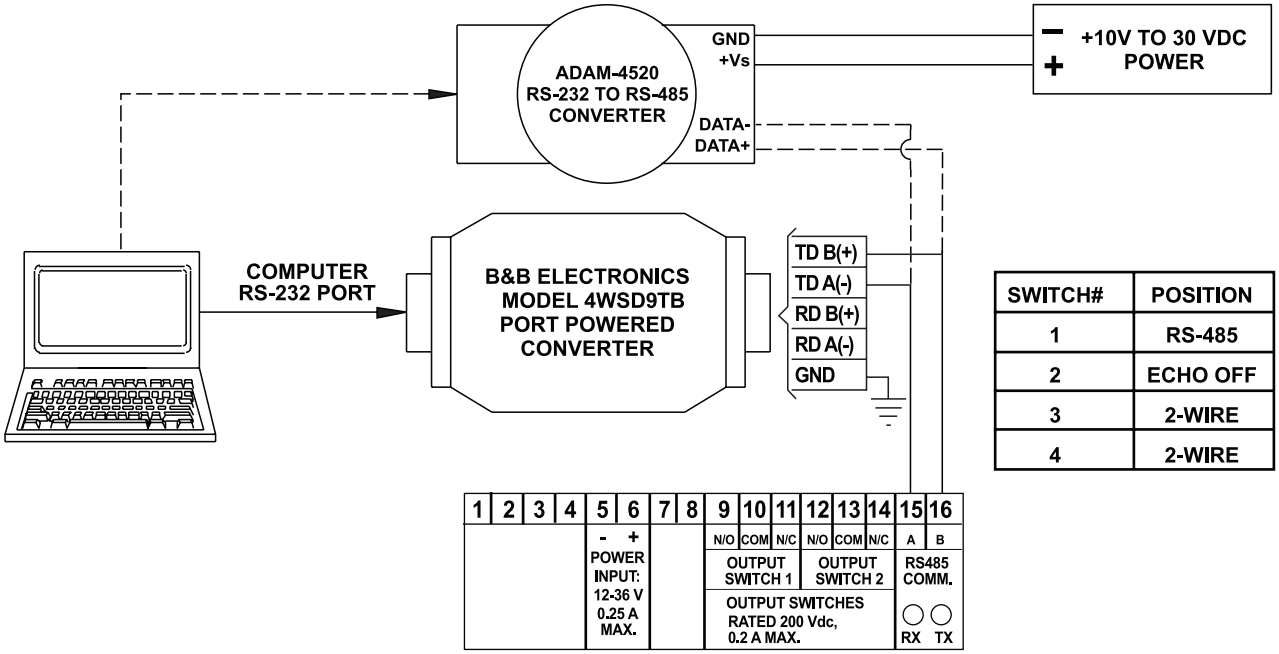
FIG. 5 RS–485 COMMUNICATIONS: PC HOOK–UP

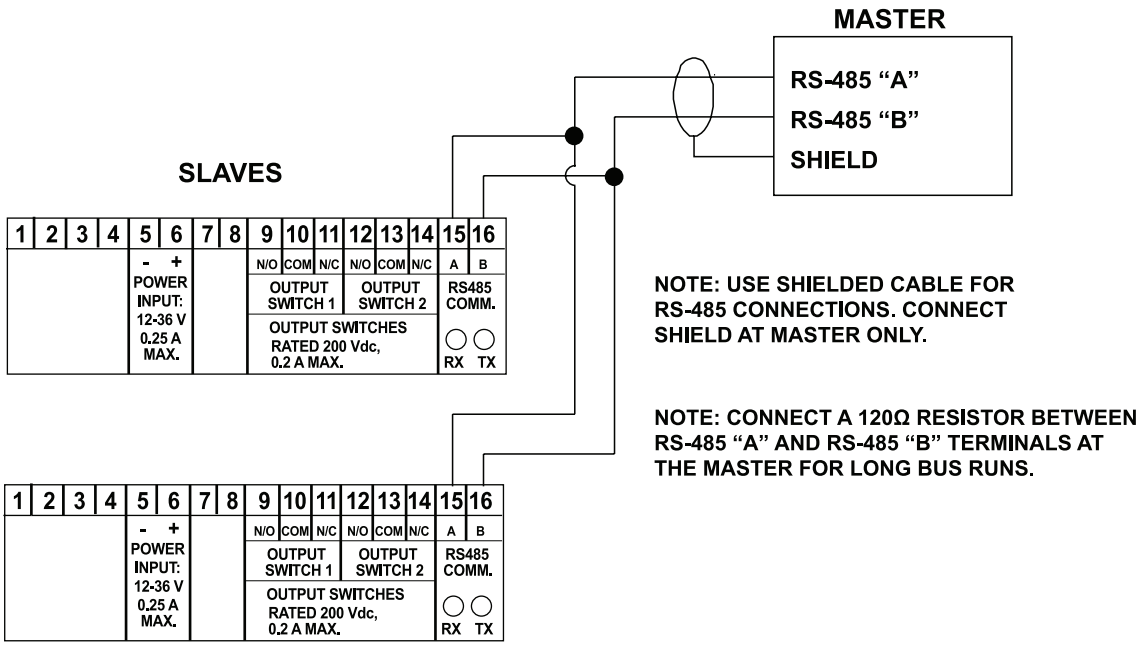


SWITCH#	POSITION
1	RS-485
2	ECHO OFF
3	2-WIRE
4	2-WIRE

RECOMMENDED RS-232 TO RS-485 CONVERTERS:

PORT POWERED B&B ELECTRONICS MODEL: 4WSD9TB
EXTERNAL DC POWERED OPTICALLY ISOLATED ADVANTECH AMERICA P/N: ADAM-4520

FIG. 6 RS–485 COMMUNICATIONS: MULTIPLE SLAVE UNITS



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