

# Installation & Operating Manual

*Altronic ECMD, Emissions Compliance Monitor Datalogger*

*Form DE-1520 IOM 7-11*



## 1.0 OVERVIEW

- 1.1 This instruction applies to the DE-1520 Emission Compliance Monitor Datalogger. For help locating subjects in this document, a section index is provided on page 25.
- 1.2 The ECMD-101 consists of a DE-1520 display module and a terminal module, P/N 691142-6. These modules are connected via a cable, P/N 693115-1, and are housed in a NEMA 4 enclosure. The ECMD-102 adds a Red Lion datalogger for extended monitoring requirements. The ECMD-101 may be upgraded to the ECMD-102 using P/N 615240KT.
- 1.3 The DE-1520 (ECMD) is specifically designed to monitor and record data according to RICE-NESHAP regulations. This continuous parameter monitoring system will maintain 4-hour rolling averages on channels 20 and 21 and can cause compliance fault condition on annunciator systems (like the Altronic DD or DE). The system is configurable for various applications using a PC (personal computer) and the supplied DE-1520 terminal program, and contains a non-volatile memory to store the setup. RS-485 serial communications, using a Modbus RTU protocol, provide an interface to PCs, PLCs, modems and satellite uplinks for remote communication. A backlit 4x20-character LCD display shows system status, programmed DE-1520 parameters, and user-assigned channel labels. A front-mounted keypad serves as the local user interface. The DE-1520 provides for remote data acquisition and supervisory control in a compact, low cost package specifically designed for industrial engine and compressor applications.

**WARNING: DEVIATION FROM THESE INSTRUCTIONS MAY LEAD TO IMPROPER ENGINE OPERATION WHICH COULD CAUSE PERSONAL INJURY TO OPERATORS OR OTHER NEARBY PERSONNEL.**

**NOTE: If possible, keep the original shipping container. If future transportation or storage is necessary, this container will provide the optimum protection.**

## 2.0 DE-1520 DISPLAY MODULE

- 2.1 The display module serves as the user interface for the DE-1520 system. Packaged in a 6.5" x 6.5" panel-mounted enclosure, it consists of an alphanumeric 20-character x 4-line backlit LCD display, a 16-key, front-mounted keypad, DB-25 D-sub and DB-9 D-sub connectors, USB connector, and five pairs of serial port indicators.
- 2.2 The keypad is a sealed membrane unit that contains the familiar STOP and RESET keys, as well as other keys used to navigate through channel status and description, view screens, and to edit the setpoints.
- 2.3 The LCD has a user-configured "home screen" that displays a status line, and three USER-selected analog channel values. Pressing the VIEW CHANNEL key displays the channel number, its timer status, analog value (if applicable), and the corresponding 20-character user label. A "view screen", which is available by pressing the VIEW key, displays up to eight user-configurable analog process labels, values, and bargraphs of the corresponding analog inputs.
- 2.4 The keypad, along with the LCD display, are used to navigate through channel status and descriptions, view screens, and to view or edit the system configuration. The ↑UNITS or ↓UNITS or the →TENS or ←TENS keys are used to access channels by increasing or decreasing the channel numbers by one, or by ten, with each key press. Pressing the NEXT key advances the display to the next screen or item. 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 after a system power-down.
- 2.5 Five pairs of LEDs are provided on the back of the display module for troubleshooting purposes – one Receive (RX) and one Transmit (TX) LED for each port. The TX LED will flash when the display module is transmitting serial communications on the labeled port. The RX LED will flash when the display module is receiving serial communications on the labeled port.

**WARNING: THE DE-1520 MUST BE CONFIGURED PRIOR TO USE. REFER TO SECTION 13.0 PROGRAMMING INSTRUCTIONS, FOR INSTRUCTIONS DESCRIBING HOW TO CONFIGURE THE DE-1520 FOR THE SPECIFIC APPLICATION. VERIFY THE PROGRAM IN NON-VOLATILE MEMORY (THE EEPROM) PRIOR TO USE.**

### 3.0 POWER TERMINAL MODULE

- 3.1 The power/terminal module is rail-mounted and is the interface to the DE-1520 display module, and to other systems. It also is the point of interface between the field sensor wiring terminal strip and the DE-1520 system. A removable dual terminal strip is used for the connection of the system. The equipment-mounted discrete sensors may consist of up to 4 normally-open or normally-closed switches, as well as 8 analog transducers. The 4 discrete sensor inputs are numbered in typical annunciator format as 10-13. The 8 analog inputs are numbered 20-27.
- 3.2 The power/terminal module has eight solid-state output switches. The output switches provide a means of using the DE-1520 to operate relays and solenoid valves. The output switches are in an open (de-energized) condition when the unit is unpowered. If 12-24Vdc is lost to the DE-1520 system, the output switches will go to an open state. The LEDs will be ON when the switches are ON, and OFF when the switches are OFF.
- 3.3 The 12-24 Vdc power for the DE-1520 system is applied to the power supply terminals marked (+) and (-) 12-24 VDC INPUT POWER. A 6 amp, replaceable, slow-blow fuse protects the system from over-currents.

### 4.0 MOUNTING

- 4.1 Mount the DE-1520 so that the display is at a convenient viewing height. NOTE: Avoid mounting the unit 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 should be mounted within 30 feet of the engine or process equipment being controlled.

### 5.0 SYSTEM WIRING (SEE WIRING DIAGRAMS)

- 5.1 The terminal module is rail-mounted and is the point of interface between the field sensor wiring and the DE-1520 system. A removable dual-terminal strip is used for connection of the system to the equipment-mounted discrete sensors which may consist of up to 4 normally-open or normally-closed switches, as well as 8 analog transducers. The 8 analog inputs are numbered 20-27 and accept industry-standard transducer signals in the range of 0-5Vdc. Connections from the terminal module to the display module are made using the 693115-1 series cable assembly.
- 5.2 The DE-1520 is designed to operate with industry-standard, voltage or current amplified, output transducers in the range of 0 to 5Vdc or 0 to 25mA. Four series of transducers are available from Altronic: pressure transducers, P/N 691201-x, P/N 691204-x, and temperature transducers, P/N 691202/203-300, P/N 691212/213-450.
- 5.3 PRESSURE TRANSDUCERS – The pressure transducers, P/N 691201-x and P/N 691204-x, are packaged in a rugged, sealed case with a NPT pressure port, a corrosion resistant media cavity, and a Packard “Metri-Pack” connector. The ranges available are 0-100, 300, 500, 1000, 2000, and 5000PSIG for the 691201-x and 0-50,100, 300, 500PSIA for the 691204-x – all of which have an overload rating of 1.5 times full scale without damage. The three wires from the transducer are: +5 volt excitation, +0.5 to 4.5 volt output, and minus return. These three wires connect directly to the back of the terminal module using cable assembly P/N 693008-x.
- 5.4 TEMPERATURE TRANSDUCER – The temperature transducers, P/N 691202-300, 691203-300, with a temperature measurement range of +5 to 300°F and P/N 691212-450, 691213-450, with a temperature range of -40 to +450°F, are packaged in a sealed, stainless steel housing with a 5/8"-18 UNF threaded body, and a Packard “Metri-Pack” connector. During configuration, the standard calibration for the 691202/203-300 sensor is selected as “dEG1” and the standard calibration for the 691212/213-450 is selected by choosing “dEG2”. The three wires from the transducer are: +5 volt excitation, temperature output voltage, and minus return. These wires connect directly to the terminal module using cable assembly, P/N 693008-x.

- 5.5 THERMOCOUPLE INPUTS – The terminal module also accepts industry-standard type J or K thermocouples on inputs 20-27. Automatic cold junction compensation is built-in. The units can be configured to °F or °C. Both a high and low setpoint are associated with each channel. The monitor can read type J thermocouples between –76°F and +1382°F (–60°C and +750°C) and type K thermocouples between –76°F and +1472°F (–60°C and +800°C).
- 5.6 GENERAL PRECAUTIONS FOR ALL SENSOR WIRING – In addition to the specific guidance given for each type of sensor, it is essential that the following practices be adhered to for all sensor wiring:
- A. Never run sensor wires in the same conduit with ignition wiring or other high-energy wiring such as the AC line power.
  - B. Keep secondary wires to spark plugs and other high voltage wiring at least eight inches (200mm) away from sensors and sensor wiring.
  - C. If it becomes necessary to check sensor switch-to-panel wiring with an ohmmeter or other checker, first DISCONNECT the plug-in terminal strips from the terminal module. Applying voltage through the DE-1520 sensor leads may damage the device. In addition, the area should be confirmed as non-hazardous before such testing commences.
- 5.7 ANALOG SENSOR WIRING – For each analog monitored point (inputs 20-27), select a transducer—either an Altronic pressure or temperature transducer listed above, or one that outputs a signal in the range of 0 to 5Vdc or 0 to 25mA. Mount as described above. Use cable assembly, P/N 693008-x, or similar, to wire the transducer to the terminal module. An internal 5-volt sensor supply is available to power the transducers (see wiring diagrams). Take care not to damage the insulation when installing and take precautions against later damage from vibration, abrasion, or liquids in conduits.
- 5.8 THERMOCOUPLES AND THERMOCOUPLE EXTENSION WIRE – Grounded or ungrounded type J or K thermocouples may be used. Use thermocouple extension wire of the same type as the thermocouple probe to connect the thermocouple to the temperature scanner. Use stranded thermocouple wire having a good moisture-resistant insulation such as PVC; for higher ambient temperatures, Teflon® or B-fibre insulated thermocouple wire is recommended. To ensure that an accurate signal is transmitted to the instrument, avoid any added junctions, splices and contact with other metals. All unused inputs must be shorted with a short jumper wire. Take care not to damage the insulation when installing and take precautions against later damage from vibration, abrasion, or liquids in conduits.
- 5.9 DISCRETE SENSOR WIRING – Any discrete sensor point can be wired for normally-open or normally-closed operation. Any unused sensor input must contain a short jumper wire across the input.

Normally-open (N/O) sensor switches are wired with one wire to the bottom terminal strip of the respective sensor number and the other to engine ground, which should be the same as power minus (–). A short jumper from the bottom terminal to the top terminal must be connected for normally-open sensors (see wiring diagrams).

Normally-closed (N/C) sensor switches are wired with one wire to the bottom terminal strip and the other to the top terminal strip of the respective sensor number. Note that the short jumper wire must be removed.

Use a wire size between 16 AWG (max.) to 24 AWG (min.) to connect the sensor switches to the terminal strip connector. Strip the insulation back 3/8" and twist the exposed wires tightly together. Insert the exposed wire completely into the terminal strip and securely tighten the clamping screw. Wires running to sensor switches must be in good condition or replaced with new wires. When running wires, take care not to damage the insulation and take precautions against later damage from vibration, abrasion, or liquids in conduits. An explosion-proof conduit is not required, however, wires should be protected from damage by running them in a protective conduit or in sheaths where appropriate.

- 5.10 POWER WIRING – Connect the supply power wires to the 12-24Vdc input power terminals on the terminal module—plus to terminal (+) and minus to terminal (–). Power requirement is 12 to 24Vdc (10 watts max.). The DC– terminal will be connected to the panel ground which must be the same as engine chassis ground. NOTE: This is the return path for normally-open sensors and must be connected to the engine block or chassis ground for proper operation.

## 6.0 KEYPAD DESCRIPTION

- 6.1 The DE-1520 Display Module contains a 16-key sealed membrane keypad which is used to adjust, stop, and reset the system.
- 6.2 STOP – The STOP key is used for a manual stop condition. By pressing the STOP key, the DE-1520 activates the fault output #2.
- 6.3 RESET – The RESET key clears all past faulted points and resets all input and output timers to their preset values.
- 6.4 CANCEL TIMERS – The CANCEL TIMERS key cancels all timers.
- 6.5 VIEW CHAN – The VIEW CHANNELS key allows the user to view the status of any input channel and its user defined label.
- 6.6 NEXT – The NEXT key allows the user to view the rolling average values for channels 20 and 21.
- 6.7 ENTER – The ENTER key is used to accept a selection and to save a new value in memory.
- 6.8 ESC – The ESCAPE key enables the user to exit any view channels, information or menu screens at any time and return to the previous screen without changing programmed values.
- 6.9 MENU – The menu key allows the user to enter the edit menu. Control setpoints may be viewed and adjusted using the MENU key.
- 6.10 UNITS/TENS – ↑UNITS/↓UNITS keys increase or decrease values by one. The →TENS/←TENS keys increase or decrease values by ten. These keys are used to increase or decrease channel numbers and timers, and to move the pointer in the menu screen.
- 6.11 F1 – Function key F1 displays the hourmeter. From the control screen, F1 switches between auto and manual modes.
- 6.12 F2 – Function key F2 displays the time and date of the first fault.
- 6.13 F1 and F2 keys can be used in conjunction with other keys to implement custom functions.

## 7.0 UNDERSTANDING THE HOME SCREENS

7.1 The “home screens” are described as a series of screens used to display several of the most critical operating parameters on one screen. All of the home screens provide a status word on the upper line.

The status line will read one of the following: RUNNING, TIMERS ACTIVE, FAULT, ALARM, MANUAL STOP, READY, and TEST.

The LCD display always reverts to one of the home screens after a keypad operation is completed or the operation times out.

7.2 MONITORING MODE – Monitoring mode begins when either CH10 is grounded (or open) or if SPEED is greater than zero. Either of these conditions signal that the device will begin monitoring critical points once the class B timer has expired. This is the message when the unit is not monitoring for any alarm or fault conditions. During this time, all the outputs are turned off.

```

STATUS      READY
SPEED       0 RPM
PRE-CAT.    70 °F
POST-CAT.   70 °F
  
```

If speed is greater than zero or CH10 is activated (by grounding this input), the DE-1520 then displays “STATUS TIMERS ACTIVE”. This indicates that the DE-1520 has begun the class B timer. All the channels are displayed as ‘NOT ARMED”.

This Class B timer is configurable from the PC terminal program and is used to ignore alarms and fault conditions during warm-up of the engine.

```

STATUS TIMERS ACTIVE
SPEED       1007 RPM
PRE-CAT.    522 °F
POST-CAT.   702 °F
  
```

After the class B timer has expired, the unit displays ‘STATUS RUNNING”. This indicates that channels 22-30 are within compliance and monitoring is active. All channels will display ‘ARMED”.

```

STATUS      RUNNING
SPEED       1007 RPM
PRE-CAT.    522 °F
POST-CAT.   702 °F
  
```

7.3 NON-LATCHING VIOLATIONS – When the DE-1520 is no longer in the “READY” state, any channel (20-27, 30) outside of its alarm setpoint range will turn on output #1 and display “STATUS ALARM”. This is typically used as a warning to indicate a setpoint is outside of the specified range. This does not necessarily mean the engine is out of compliance. More than one channel may be in the ALARM state. Use the VIEW CHAN key to examine which channel is ‘ALARMED’.

STATUS	ALARM
SPEED	1007 RPM
PRE-CAT.	522 °F
POST-CAT.	702 °F

PRESS TO VIEW ALARM CHANNEL

**VIEW CHAN**

7.4 LATCHING VIOLATIONS – After the Class B timer has expired, any violation in the setpoints will cause channels 22-27, 30 to cause a FAULT condition. Channel 20 and 21 must violate the rolling average before it shuts down on a latching violation as shown.

**NOTE: Channel 20 and 21 only cause a LATCHING violation (trip output #2) when the setpoint is greater than its ROLLING AVERAGE value. All the other channels cause a latching violation when TIMERS ACTIVE is over AND there is any violation.**

STATUS	FAULT
1st FAULT	LOW
CHAN 20	678 °F
PRE-CAT.	

This action would typically shut down the engine due to compliance violations.

When any of these setpoints are violated, even momentarily, the digital output #2 will activate and will NOT change until a USER initiated RESET is received. When one of the fault shutdown setpoints has been violated, the digital output #2 is closed, and the “FAULT” message for the first faulted channel will appear on the display and will remain until it is acknowledged by a RESET. If all of the faulted sensors have been cleared and the RESET key is pressed, the class B and output timers will reset, and the display will repeat the sequence of section 7.2. Channels 11, 12 and 13 are Class A channels and will fault immediately.

STATUS	FAULT
1ST FAULT	LOW
CHAN 11	
AFR CONTROLLER	

RETURNS TO HOME SCREEN

**ESC**

The “MANUAL STOP” message will supersede all of the above home screens if the STOP key is pressed.

STATUS	MANUAL STOP
CHAN 20	422 °F
CHAN 21	487 °F
SPEED	0 RPM

PRESS TO STOP

**STOP**

7.5 ROLLING AVERAGES – The DE-1520 provides for two channels (20 and 21) to provide a ‘rolling average’. This value is the culmination of the past four hours and is displayed on the ‘NEXT’ screen. Press the NEXT key to view the current value on channel 20, followed by the ‘rolling average’ on the second line. Press the ‘NEXT’ key again to view the rolling average for channel 21. These channels can only cause a fault 4 hours after the timer has expired.

```
CH 20      81 °F
AVERAGE   N/A °F
NOT ARMED
PRE-CAT.
```

The first line shows the current value of CH20. The second line shows ‘N/A’ indicating that there is no ‘rolling average’ to display.

```
CH 20      450 °F
AVERAGE   N/A °F
NOT ARMED  2/4 HRS
PRE-CAT.
```

The ‘2/4’ indicates that two hours has elapsed and no ‘rolling’ average is available.

```
CH 20      472 °F
AVERAGE   380 °F
ARMED
PRE-CAT.
```

After 4 hours, the second line shows the ‘rolling average’ of the previously accumulated averages. This line will only update the average every hour. The third line shows ‘ARMED’, which indicates that a fault shutdown can occur on channels 20 and 21.

7.6 The DE-1520 system “stamps” the time and date occurrence of the first fault. To view the time and date of the first fault, press the F2 key after a fault occurs but before reset is initiated. The time and date of the first fault will be displayed. If no key is pressed for 10 seconds, the display will revert to the first fault screen.

```
TIME AND DATE OF
THE FIRST FAULT.
TIME: 3:10 PM
DATE: 04-25-2011
```

**VIEW TIME  
AND DATE  
OF FIRST  
FAULT**

**F2**

7.7 Use the VIEW CHAN key to enter the view channels screens. Once in the VIEW CHAN mode, the user can view any channel’s details. Upon pressing the view channel key, channel 10 will be shown. The UNITS and TENS keys allow the user to quickly navigate through the DE-1520 channels. Use the ↑ UNITS or ↓ UNITS keys to increase or decrease the viewed channel by one. Use the → TENS or ← TENS keys to increase or decrease the viewed channel by ten. To exit the VIEW CHAN mode, press the ESC key. After one minute with no keypad activity, the display will revert back to the current home screen.



## 8.0 DIGITAL OUTPUTS

8.1 The digital outputs (discrete) cause the output to electrically go to ground and may be used to energize relays, trip an annunciator, or turn on a lamp. Each switch is rated for 500mA at 60V.

DISCRETE OUTPUTS – Each digital output has a specific function:

DISCRETE OUTPUT # 1 – This output ‘turns on’ when there is a non-latching setpoint violation and the Class B timer has expired. Once the setpoint violation no longer occurs, the output will turn off.

DISCRETE OUTPUT # 2 – This output ‘turns on’ when there is a latching setpoint violation and the Class B timers has expired. This output does not ‘turn off’ once the channel is no longer violated. A RESET or power down operation is required to re-start.

DISCRETE OUTPUT #3 – This output turns on when the TEST function has been activated.

DISCRETE OUTPUT #4 – This output turns on when the unit is in the ‘MONITORING’ mode. This occurs whenever CH10 is grounded (or open) or if speed is greater than zero. This allows the user to know the unit is in the process of MONITORING.

## 9.0 SETUP MENU OPTIONS

9.1 The menu screens can be accessed from any home screen by pressing the MENU key. The menu screens allow the user to view or edit values, the time, and date. The DE-1520 must be initially configured using the terminal program running on a PC connected to the RS-232 or USB port on the back of the display. Reference the programming instructions in section 13.0 for details on how to configure the DE-1520 system for a specific application. The menu screens are intended to view or edit the already programmed values in the field. Changes made in the menu are stored in permanent memory and remain fixed until changed again.

9.2 To view the DE-1520 configuration, press the MENU key from the home screen. Use the NEXT key to select the group to be viewed and press ENTER. To edit the DE-1520 configuration, the system requires a password key sequence.

The password procedure is: Press the MENU key. Then press the F2 key followed by the F1 key. Upon pressing this sequence, changes can be made to the configuration.

9.3 The menu screens have two levels. The first level lists the headings of the items to be viewed or edited. Upon selecting one of the headings, the second level is displayed. Press the MENU key to enter the first level of the menu screens. The arrow points to the first selection to be viewed or edited. Three keys can be used to navigate the first level of menu selections: NEXT or ↑UNITS or ↓UNITS keys. The NEXT key will move the arrow down one selection. The ↑UNITS or ↓UNITS keys will move the selector arrow up or down one selection. Once the arrow is pointing to the selection group to be edited, press the ENTER key. The display will advance to the second level to view or allow changes to the values.

9.4 To edit the alarm setpoint values, point to “EDIT ALARM SETPOINT” and press the ENTER key. The EDIT ALARM SETPOINT menu is shown. The example shows how to change the LO setpoint of CHAN 21. Use arrow keys as shown to select desired channels. Use ENTER key as shown to select either the LO or HI setpoint.

**NOTE: TO EDIT ANY VALUE, THE PASSWORD COMBINATION MUST BE ENTERED FROM FIRST LEVEL MENU. PRESS THE F2 KEY FOLLOWED BY THE F1 KEY. UPON PRESSING THIS SEQUENCE, CHANGES CAN BE MADE TO THE CONFIGURATION.**

FIRST GROUP OF MENU SCREENS

```

→EDIT ALARM SETPOINT
EDIT FAULT SETPOINT
VIEW FIRMWARE REV.
MORE MENUS
    
```

PRESS  
TO EDIT  
SETPOINTS

ENTER

```

CHAN →20      (ALARM)
LO SP          720 °F
HI SP          1300 °F
PRE-CAT.
    
```

PRESS TO  
SELECT  
CHANNEL  
21

↑  
UNITS

```

CHAN →21      (ALARM)
LO SP          730 °F
HI SP          1300 °F
POST-CAT.
    
```

PRESS TO  
EDIT LO  
SETPOINT

ENTER

```

CHAN  21      (ALARM)
LO SP →       731 °F
HI SP          1300 °F
POST-CAT.
    
```

PRESS  
TO  
CHANGE  
LO VALUE

ACCEPT  
AND GO  
TO HIGH  
VALUE

↑  
UNITS

ENTER

**NOTE: TO EDIT ANY VALUE, THE PASSWORD COMBINATION MUST BE ENTERED FROM FIRST LEVEL MENU. PRESS THE F2 KEY FOLLOWED BY THE F1 KEY. UPON PRESSING THIS SEQUENCE, CHANGES CAN BE MADE TO THE CONFIGURATION.**

9.5 To view or edit FAULT SETPOINT, choose "EDIT FAULT SETPOINT" from the main menu.

FIRST GROUP OF MENU SCREENS

```

EDIT ALARM SETPOINT
→EDIT FAULT SETPOINT
VIEW FIRMWARE REV.
MORE MENUS
    
```

PRESS  
TO GO  
TO NEXT  
MENU

ENTER

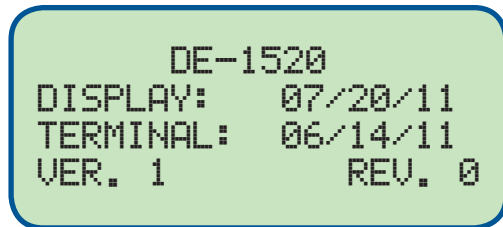
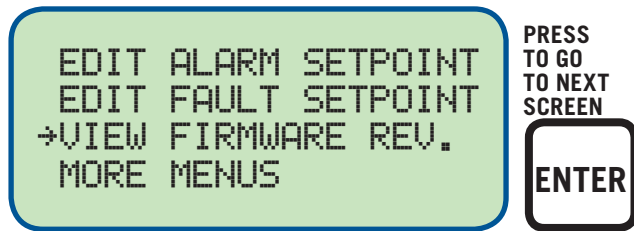
```

CHAN →20      (FAULT)
LO SP          720 °F
HI SP          1300 °F
PRE-CAT.
    
```

PRESS TO  
GO TO LO  
SETPOINT

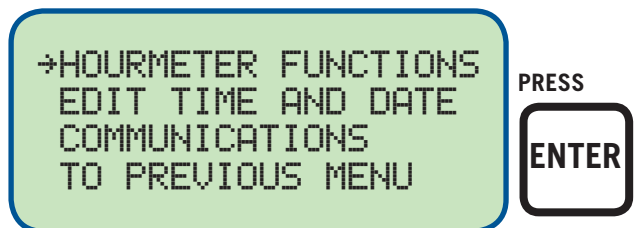
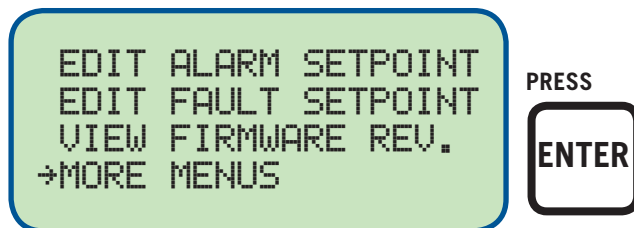
ENTER

9.6 To view FIRMWARE REVISION information, choose "VIEW FIRMWARE REV." from the main menu.

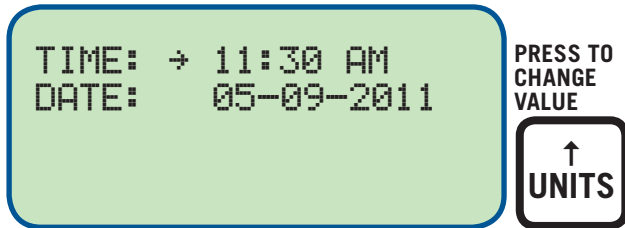


This screen displays the firmware date of the display and terminal board of the DE-1520. The last line displays the version and revision of the datalogger. The ECMD-101 displays " - NO DATA LOGGER -".

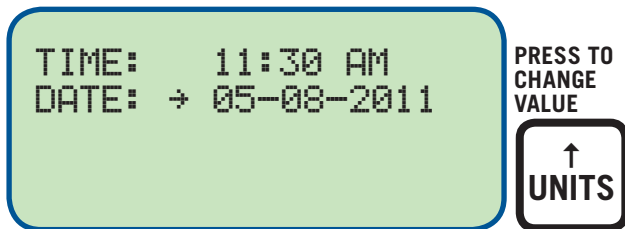
9.7 To view or edit the time and date, select "MORE MENUS" from the following menu. Finally, select "EDIT TIME AND DATE".



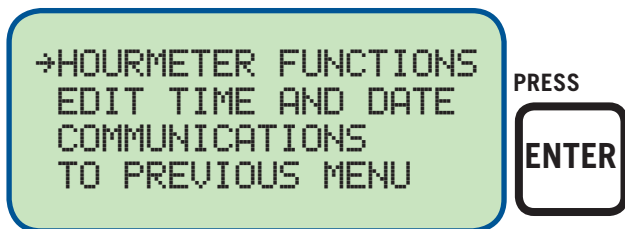
The time and date will be displayed with the selection arrow pointing to the time. The hours and minutes can be edited separately; AM and PM follow the hours. With the selection arrow pointing to the hours, use the ↑UNITS or ↓UNITS keys to increase or decrease the hours. Press ENTER to save the new hour setting; the selection arrow will point to the minutes. Use the same procedure to edit the minutes. Use the NEXT key to move through the time and date screen without making a permanent change in memory.



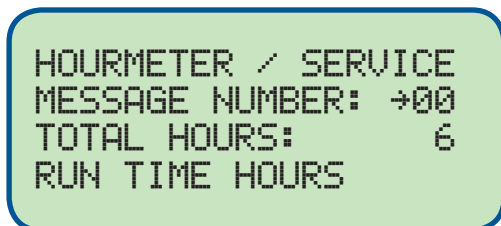
The date is shown as month-day-year. The month, day and year can be edited separately. With the selection arrow pointing to the month, use the ↑UNITS or ↓UNITS keys to increase or decrease the month. Press ENTER to save the new month setting; the selection arrow will point to the day. Use the same procedure to edit the day and the year.



9.8 To view the Hourmeter message, select “HOURMETER FUNCTIONS” from the main menu and press ENTER.



The screen displays the total number of hours that the unit has been in the monitoring mode.



## 10.0 CONTRAST RATIO ADJUSTMENT

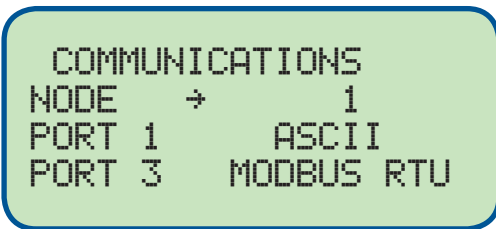
10.1 The LCD contrast ratio is adjusted for optimum contrast over a large temperature range at the factory. It may be necessary, however, to make slight adjustments to the LCD contrast ratio because of aging and/or extreme temperature changes. The contrast ratio potentiometer (TP1) is located on the back of the Display Module as shown in the drawings section. Use an adjusting tool and turn the potentiometer clockwise to lighten the contrast ratio or counterclockwise to darken the contrast ratio.

To set the potentiometer back to the factory setting: with the Display Module at an ambient temperature of approximately 65°F to 77°F (18°C to 25°C), turn the potentiometer clockwise until the display contrast ratio is almost too light to read. Turn the potentiometer counterclockwise 3 to 3-1/2 turns. The display should then be at a desirable contrast ratio.

## 11.0 DATALOGGING AND COMMUNICATIONS FOR THE ECMD-101/DE-1520

- 11.1 The DE-1520 contains a datalogging feature. Datalogging collects information from the system and keeps track of, or logs, that information over a period of time. That data is then available through a PC or PLC at port 1, the RS-232 port, or the RS-485 port (port 3).
- 11.2 **NODE NUMBER** - The node number is the address of the DE-1520 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.

When using the ECMD-102, verify that the communications on port 3 is set for MODBUS RTU and that the unit is set for node 1.



- 11.3 **COMMUNICATIONS PARAMETERS** - The following must be set in the PC or PLC to communicate with the DE-1520:

**Baud Rate:** 9600  
**Data Bits:** 8  
**Stop Bits:** 1  
**Parity:** None

- 11.4 The datalogging memory can retain a total of 100 records before writing over the oldest information. The most current data is always record number one; the next most current is number two, etc. The oldest information, record 100, is lost when a new record is written. The logging period is the time between datalogs and can be set from 5 minutes to 999 minutes. The logging period must be set in the terminal program. For example, if the logging period is set for 60 minutes and there are 100 records, it would take 100 hours or 4.16 days before any logged data was overwritten.

A new record is also written when a first fault occurs. If the first fault occurs between the logging period, the first fault record will be record number one, and the next scheduled record will be number two.

- 11.5 The following describes the spacing for the fields of the DE-1520 datalogging command. This command is functional from the RS-232 and the RS-485 datalogging port. The communications settings are 9600, 8, N and 1. The node number must be correct for the DE-1520 to respond on the RS-485 port. The node number field is ignored on the RS-232 port and responds accordingly.

The command to access a particular record is as follows:

>(XX DL YYY)

COMMAND HEADER ">" (0) - ASCII value 3Eh.

BEGIN TEXT "(" (1) - ASCII value 28h.

DE-1520 NODE NUMBER (2-3) - This field consists of the node number associated with the particular DE-1520. The range is from 01 to 99.

SPACE (4), (7) - ASCII value 20h.

COMMAND (5, 6) - The letters "D" and "L", which stand for "datalog".

REQUESTED RECORD NUMBER (8-10) -

**Table 1:** This value will be between 001 and 100 and represents the requested record number. Record number 001 will always contain the most recent datalog event. Record number 002 contains the second most recent datalog event and so on. Requesting record number 999 gives a response which occurred due to a

first fault condition. If there are no faults and 999 is requested, the “NO DATA AVAILABLE” message occurs. Requesting record number 000 transmits current status information.

**Table II:** shows the structure of datalog command 998. This is for the Hourmeter.

END TEXT “)” (11) - ASCII value 29h.

## Table I

The following is the response:

FIELD DESCRIPTION	EXAMPLES OF LOGGED DATA	AMT OF CHARACTERS	CHARACTER LOCATION
SITE LOCATION	Cherokee engine #22	30.00	0-29
CR, LF		2	30, 31
REC NUM / HOURS	022 12345 HRS	14.00	32 - 45
CR, LF		2.00	46, 47
TIME AND DATE	06-16-2011 12:02 PM	20.00	48 - 67
CR, LF		2.00	68, 69
STATUS DISPLAY	STATUS RUNNING	20.00	70 - 89
CR, LF		2.00	90, 91
HOME LINE 2	ACT 57.7 PSIG	20.00	92 - 111
CR, LF		2.00	112, 113
HOME LINE 3	GSP 12.3 PSIG	20.00	114 - 133
CR, LF		2.00	134, 135
HOME LINE 4	MAP1 12.5 PSIG	20.00	136 - 155
CR, LF		2.00	156, 157
VIEW scn #1, L1	VAC1 67.9 PSIG	20.00	158 - 177
CR, LF		2.00	178, 179
VIEW scn #1, L2	MAT1 145 F	20.00	180 - 199
CR, LF		2.00	200, 201
VIEW scn #1, L3	EGT1 1022 F	20.00	202 - 221
CR, LF		2.00	222, 223
VIEW scn #1, L4	T1 1020 F	20.00	224 - 243
CR, LF		2.00	244, 245
VIEW scn #2, L1	T2 1221 F	20.00	246 - 265
CR, LF		2.00	266, 267
VIEW scn #2, L2		20.00	268 - 287
CR, LF		2.00	288, 289
VIEW scn #2, L3		20.00	290 - 309
CR, LF		2.00	310, 311
VIEW scn #2, L4		20.00	312 - 331
CR, LF		2.00	332, 333
L12		20.00	334 - 353
CR, LF		2.00	354, 355
L13		20.00	356 - 375
CR, LF		2.00	376, 377
L14		20.00	378 - 397

FIELD DESCRIPTION	EXAMPLES OF LOGGED DATA	AMT OF CHARACTERS	CHARACTER LOCATION
CR, LF		2.00	398, 399
L15		20.00	400 - 419
CR, LF		2.00	420, 421
POSS. 1ST FAULT	1ST FAULT	20.00	422 - 441
CR, LF		2.00	442, 443
POSS. FAULT CH	CHAN 23	20.00	444 - 463
CR, LF		2.00	464, 465
FAULT LABEL	MAP1 ENG MAN PRESS 1	20.00	466 - 485
CR, LF		2.00	486, 487
1ST FAULT TIME	06-06-2011 11:07AM	20	488, 507
CR, LF		2.00	508, 509
CR, LF		2.00	510, 511
TOTAL CHARACTERS		512.00	

The following will be displayed when there is no information in the datalog.

“NO DATA AVAILABLE  
 (CR, LF)  
 (CR, LF)”

Note that the spacing for the analog labels and values on the 20 character line is as follows:  
 Locations 1-? occupy the label associated with that channel. (? dependant upon label name)  
 Locations 12-16 occupy the analog value (100.4).  
 Location 17 contains a space.  
 Locations 18-20 contain the units of measure (PSI).

**Table II**

FIELD DESCRIPTION	EXAMPLES OF LOGGED DATA	AMT OF CHAR.	CHAR. LOCATION	HOUR LOCATION
SITE LOCATION	Cherokee engine #22	30.00	0-29	
CR, LF		2	30, 31	
REC NUM/HOURS	998 12345 HRS	14.00	32 - 45	
CR, LF		2.00	46, 47	
TIME AND DATE	06-16-2003 12:02 PM	20.00	48 - 67	
CR, LF		2.00	68, 69	
HOURLMETER	RUN-TIME HOURS 12345	26.00	70 - 95	91-95
CR, LF		2.00	96, 97	
CR, LF		2.00	98, 99	
LABEL MESSAGE	SERVICE HOURS LEFT:	19.00	100-118	
CR, LF		2.00	119, 120	
SERV. MSG. 1	NOT USED	26	121-146	142-146
CR, LF		2.00	147, 148	
SERV. MSG. 2	NOT USED	26.00	149-174	170-174
CR, LF		2.00	175, 176	
SERV. MSG. 3	NOT USED	26.00	177-202	198-202
CR, LF		2.00	203, 204	
SERV. MSG. 4	NOT USED	26.00	205-230	226-230
CR, LF		2.00	231, 232	
SERV. MSG. 5	NOT USED	26.00	233-258	254-258
CR, LF		2.00	259, 260	
SERV. MSG. 6	NOT USED	26.00	261-286	282-286
CR, LF		2.00	287, 288	
SERV. MSG. 7	NOT USED	26.00	289-314	310-314
CR, LF		2.00	315, 316	
SERV. MSG. 8	NOT USED	26.00	317-342	338-342
CR, LF		2.00	343, 344	
SERV. MSG. 9	NOT USED	26.00	345-370	366-370
CR, LF		2.00	371, 372	
SERV. MSG. 10	NOT USED	26.00	373-398	394-398
CR, LF		2.00	399, 400	
SERV. MSG. 11	NOT USED	26.00	401-426	422-426
CR, LF		2.00	427, 428	
RESERVED		26.00	429-454	
CR, LF		2.00	455, 456	
RESERVED		26.00	457-482	
CR, LF		2.00	483, 484	
RESERVED		25.00	485-509	
CR,LF		2.00	510, 511	



The CHARACTER LOCATION for the service messages consists of 20 characters which was previously programmed into the unit. The HOUR LOCATION describes the position of the hours associated with the service message or with the hourmeter function. If a service message is "NOT USED", then there will be "-----" in the HOUR LOCATION field. Values less than 10,000 hours are flush right with spaces in locations to the left. For example, the hour value of 12345 will be displayed as "12345" and an hour value of 477 will be shown as " 477".

**Overview:**

The DE-1520 includes a RS-232 / RS-485 feature that allows a remote user to "emulate" the keypad and receive the contents of the display.

**Remote Keypad Emulation:**

**Query:**

>(01 KP 0)

01 = node number, KP = keypress function, 0 is the single ASCII "Key Press" from the table below.

"Key Press" Table  
0 = NONE (no keypress, returns current display)  
C = CANCEL TIMERS  
T = TEST  
R = RESET  
S = STOP  
P = VIEW  
N = NEXT  
U = UP/UNITS  
V = VIEW CHAN  
1 = F1  
A = RIGHT/TENS  
X = ENTER  
L = LEFT/TENS  
2 = F2  
M = MENU  
D = DOWN/UNITS  
E = ESC

**Response:**

**CR LF (20 bytes 1st line of display) CR LF (20 bytes 2nd line) CR LF (20 bytes 3rd line) CR LF (20 bytes 4th line) CR LF**

CR = Carriage Return, LF = Linefeed, 4 20-byte ASCII blocks that is the display. The total number of returned characters is 90.

## MODBUS REGISTERS

The DE-1520 is compliant to the Modicon Modbus RTU standard. The DE-1520 supports DE-1520 Display Modbus Communications.

**Communications Parameters:** All communications are at 9600 baud, 8 Data bits, No Parity, 1 Stop bits. (9600 8N1)

**Overview:** Register reads and data is duplicated for the 30000's & 40000's address range. Maximum number of registers that can be read at one time has been limited to 32.

### Address List:

40002	Hourmeter; range from 0-65535
40003	Null, will always read 0
40004	STATUS (11-13, 20-27, 30) FOR A FAULT on that channel. 00 = TIMERS ACTIVE (CH10 IS GND OR RPM > 0) 01 = RUNNING 32 = STATUS READY (CH10 IS NOT GND OR RPM = 0) 60 = MANUAL STOP. 120 = ALARM (OUTPUT 1 IS ON)
40005	Reserved
40006	Reserved
40007	Alarm Status MSB:LSB (0 0 0 CH30:CH27-20). 0 = No Alarm, 1 = Alarm
40008	Armed Status MSB:LSB (0 0 0 CH30:CH27-20) 0 = Not Armed, 1 = Armed
40009	Bit 0 = Low fault shutdown. Bit 1 = High fault shutdown. Only applicable when fault exists.
40012	4 HOURS MARK 0 = Not Yet 4 Hours, 1 = 4 Hours has passed
40013	1 Hour Flag (~5-8 SECOND) Occur every time Ch20 Average and Ch21 Average are calculated.
40100	Analog Channel 20; range from -9999 to 9999
40101	Analog Channel 21; range from -9999 to 9999
40102	Analog Channel 22; range from -9999 to 9999
40103	Analog Channel 23; range from -9999 to 9999
40104	Analog Channel 24; range from -9999 to 9999
40105	Analog Channel 25; range from -9999 to 9999
40106	Analog Channel 26; range from -9999 to 9999
40107	Analog Channel 27; range from -9999 to 9999
40108	RPM Channel 30; range from 0 to 9999
40109	4-Hours-Average Value of Channel 20
40110	4-Hours-Average Value of Channel 21
40115	Decimal point location for Analog Channel 20; range from 0-3. 0 = no decimal place, 1 = 1 decimal place etc.
40116	Decimal point location for Analog Channel 21; range from 0-3
40117	Decimal point location for Analog Channel 22; range from 0-3
40118	Decimal point location for Analog Channel 23; range from 0-3
40119	Decimal point location for Analog Channel 24; range from 0-3
40120	Decimal point location for Analog Channel 25; range from 0-3
40121	Decimal point location for Analog Channel 26; range from 0-3

40122	Decimal point location for Analog Channel 27; range from 0-3
40123	Decimal point location for Analog Channel 30; range from 0-3
40124	Decimal point location for 4 Hours-Average Channel 20; range from 0-3
40125	Decimal point location for 4 Hours-Average Channel 21; range from 0-3

**Identification:**

In addition to the above, the DE-1520 will respond to function code 17 with an identification string as follows:

**Query:**

**NN 17 CRC CRC**

NN = node number, 17 = ID function code, CRC CRC = two byte Modbus RTU CRC.

**Response:**

**NN 17 07 D E - 1 5 2 0 CRC CRC**

NN = node number, 17 = ID function code, 07 = number of bytes to follow, DE-1520 ( seven byte ASCII ID string ), CRC CRC = two byte Modbus RTU CRC

**Stop/Reset:**

Register 40999 can be written to remotely trigger the STOP & RESET functions. It will only respond to a single write (function code 06). The stop Command is 0x53AC. The reset command is 0x41BE.

**Remote Keypad Emulation:**

The DE has a feature called the “Remote Keypad Emulation” that can be accessed through function code 20 as follows

**Query:**

**NN 20 KP CRC CRC**

NN = node number, 20 = KP function code, KP is the single byte “Key Press” from the table below, CRC CRC = two byte Modbus RTU CRC.

- “Key Press” Table
- 00 = NONE ( no keypress, returns current display )
  - 01 = CANCEL TIMERS
  - 02 = TEST
  - 03 = RESET
  - 04 = STOP
  - 05 = VIEW
  - 06 = NEXT
  - 07 = UP/UNITS
  - 08 = VIEW CHAN
  - 09 = F1
  - 10 = RIGHT/TENS
  - 11 = ENTER
  - 12 = LEFT/TENS
  - 13 = F2
  - 14 = MENU
  - 15 = DOWN/UNITS
  - 16 = ESC

**Response:**

**NN 20 88 (20 bytes 1st line of display) CR LF (20 bytes 2nd line) CR LF (20 bytes 3rd line) CR LF (20 bytes 4th line) CR LF CRC CRC**

NN = node number, 20 = KP function code, 88 = number of bytes to follow, CR = Carriage Return, LF = Linefeed, 4 20 byte ASCII blocks that is the display, CRC CRC = two byte Modbus RTU CRC

## 12.0 DATALOGGING AND COMMUNICATIONS FOR THE ECMD-102 ONLY

12.1 The ECMD-102 contains an enhanced datalogger module capable of storing additional data beyond that of the base ECMD-101 system. This is ideal for remote applications when frequent retrieval of the information is not desired. The ECMD-102 comes with a 2-gigabyte Compact Flash memory card for storing the data. This must be present and installed to store the information. All datalog files are stored as industry-standard .CSV (computer files) that can be stored and read using common tools such as Microsoft Excel. The unit must be powered to log the data for required regulations. The information may be retrieved using a Compact Flash reader, USB or Ethernet.

12.2 DATALOGS – The following directories are in the “LOGS” directory. All system datalogs are named with a date code to allow for easy storage and review, the date code follows the following format: **YYMMDD00**.CSV. Each day, a new file will be created. The information in each directory is listed below:

“RAWDATA” – this log contains up to 120 days of files, each which contain every channel on the system sampled at 1 minute intervals.

“COMPDATA” – this log contains up to 120 days of files, each which contain the compliance average values, unit number, engine speed, and engine hours sampled at 5 second intervals. This log also contains the parameter “bit.NewAVG” which is turned on for a single sample when new data is present – this allows for easy sorting of relevant compliance data with common tools such as the “filter” command in Microsoft Excel.

“ALRMEVNT” – this log contains up to 10 files, each up to 4 hours long, that are generated when an Alarm condition is present, Data is sampled at 1 minute intervals.

“SHDNEVNT” – this log contains up to 10 files, each up to 4 hours long, that are generated when a fault condition is present. Data is sampled at 1 minute intervals.

12.3 RETRIEVAL OF DATA – There are several different methods for retrieving the data from the datalogger. The information may be retrieved using a Compact Flash reader, USB or Ethernet.

- A. COMPACT FLASH CARD – The stored datalogs in the datalogger module can be accessed by removing the installed Compact Flash card and reading the data with a commonly available Compact Flash memory reader. Ensure that the unit is not powered when removing or installing the Compact Flash cards, otherwise, data could be lost.
- B. USB – The data may be transferred via the USB port. Once the connection between the PC and datalogger is made, the laptop recognizes the datalogger as a ‘Removable disk’ and the information may be retrieved using Windows Explorer.

In order for this to occur, the PC must be setup to recognize the datalogger. This process must be performed for each datalogger to which the PC will be connected. In order to “mount” the CF card to the PC, first download and install the Crimson software from Red Lion Controls.

MOUNTING THE DATALOGGER – To “mount” the datalogger via USB follow these steps:

- a. connect a standard type A-to-type B USB cable between your PC and the datalogging module. This connects into the port on the datalogger called “USB/PG”.
- b. proceed with automated driver installation as required by your PC.
- c. open the Crimson software package.

**NOTE: To ensure proper operation of enhanced datalog module, a compatible Compact Flash card must be used. The unit is supplied with a 2GB Sandisk card that is compatible. For information regarding compatibility of CF cards, please refer to Red Lion's documentation.**

- d. select LINK>>OPTIONS and verify “USB” is selected.



- e. then select LINK>>CompactFlash>>Mount Flash...



- f. Once complete, your PC should react as if you just connected a USB flash drive, and the contents of the Compact Flash card should be visible on your PC.

\* please refer to the Red Lion Controls website for applicable software and additional documentation.

- C. Ethernet Network via HTTP/FTP – The datalogs can be accessed via the Ethernet port using the HTTP and/or FTP protocols. The default configuration of the Ethernet adapter is via DHCP. All Ethernet parameters are configurable via the Crimson software package. Network configuration is a site-specific task and is beyond the scope of this document. Please refer to the documentation available from Red Lion Controls to configure the adapter as required for your network.

- 12.4 MODBUS COMMUNICATIONS – Along with the logged data, the datalogger can also read the ‘live’ data coming from the ECMD-102. These registers may be accessed via Modbus RTU through the RS-232 port or the Ethernet.

Use the RS-232 port on the datalogger when communicating through Modbus RTU. The default port settings are 9600, 8, N and 1 stop bit at node 1. These values can be viewed or edited with the Crimson software available from Red Lion Controls. Use the Modbus registers in section 12.5.

When communicating with the enhanced datalogger via Modbus TCP the default configuration of the Ethernet adapter is via DHCP. The Ethernet parameters are configurable via the Crimson software package. Network configuration is a site-specific task and is beyond the scope of this document. Please refer to the documentation available from Red Lion Controls to configure the adapter as required for your network.

**WARNING: USB is a consumer-oriented interface that is not as robust as most industrial standards. Exercise care when using a USB port in proximity to sources of high electrical noise. Use of the USB port while the engine is running is not recommended.**

**NOTE: For ModBus RTU communications, connections must be made to the RS232 port, not the RS232/PG port.**

## 12.5 MODBUS REGISTERS: ECMD WITH ENHANCED DATALOGGER

REGISTER	DESCRIPTION	TYPE / VALUE
10001	SYSTEM ARMED	1-YES / 0-NO
10002	START-UP TIMER ACTIVE	1-YES / 0-NO
10003	RUNNING	1-YES / 0-NO
10004	MANUAL STOP	1-YES / 0-NO
10005	-RESERVED-	
10006	-RESERVED-	
10007	-RESERVED-	
10008	-RESERVED-	
10009	ALARM - INPUT 20	1-YES / 0-NO
10010	ALARM - INPUT 21	1-YES / 0-NO
10011	ALARM - INPUT 22	1-YES / 0-NO
10012	ALARM - INPUT 23	1-YES / 0-NO
10013	ALARM - INPUT 24	1-YES / 0-NO
10014	ALARM - INPUT 25	1-YES / 0-NO
10015	ALARM - INPUT 26	1-YES / 0-NO
10016	ALARM - INPUT 27	1-YES / 0-NO
10017	-RESERVED-	
10018	FIRST FAULT - INPUT 11	1-YES / 0-NO
10019	FIRST FAULT - INPUT 12	1-YES / 0-NO
10020	FIRST FAULT - INPUT 13	1-YES / 0-NO
10021	FIRST FAULT - INPUT 20	1-YES / 0-NO
10022	FIRST FAULT - INPUT 21	1-YES / 0-NO
10023	FIRST FAULT - INPUT 22	1-YES / 0-NO
10024	FIRST FAULT - INPUT 23	1-YES / 0-NO
10025	FIRST FAULT - INPUT 24	1-YES / 0-NO
10026	FIRST FAULT - INPUT 25	1-YES / 0-NO
10027	FIRST FAULT - INPUT 26	1-YES / 0-NO
10028	FIRST FAULT - INPUT 27	1-YES / 0-NO
10029	NEW AVERAGE CALCULATED	1-YES / 0-NO (ON FOR ≈5S)
30001	HOURLY METER	SIGNED INTEGER (16-BIT)
30002	DATALOGGER VERSION NUMBER	SIGNED INTEGER (16-BIT)
30003	CHANNEL 20	SIGNED INTEGER (16-BIT)
30004	CHANNEL 21	SIGNED INTEGER (16-BIT)
30005	CHANNEL 22	SIGNED INTEGER (16-BIT)
30006	CHANNEL 23	SIGNED INTEGER (16-BIT)
30007	CHANNEL 24	SIGNED INTEGER (16-BIT)
30008	CHANNEL 25	SIGNED INTEGER (16-BIT)
30009	CHANNEL 26	SIGNED INTEGER (16-BIT)
30010	CHANNEL 27	SIGNED INTEGER (16-BIT)
30011	ENGINE SPEED	SIGNED INTEGER (16-BIT)
30012	CHANNEL 20 - COMPLIANCE AVERAGE	SIGNED INTEGER (16-BIT)

REGISTER	DESCRIPTION	TYPE / VALUE
30013	CHANNEL 21 - COMPLIANCE AVERAGE	SIGNED INTEGER (16-BIT)
30100	CHANNEL 20	FLOATING-POINT (32-bit)
30102	CHANNEL 21	FLOATING-POINT (32-bit)
30104	CHANNEL 22	FLOATING-POINT (32-bit)
30106	CHANNEL 23	FLOATING-POINT (32-bit)
30108	CHANNEL 24	FLOATING-POINT (32-bit)
30110	CHANNEL 25	FLOATING-POINT (32-bit)
30112	CHANNEL 26	FLOATING-POINT (32-bit)
30114	CHANNEL 27	FLOATING-POINT (32-bit)
30116	CHANNEL 20 - COMPLIANCE AVERAGE	FLOATING-POINT (32-bit)
30118	CHANNEL 21 - COMPLIANCE AVERAGE	FLOATING-POINT (32-bit)
40001	REMOTE RESET	RESET = 0x41BE
40002	UNIT NUMBER (NOT REQUIRED)*	SIGNED INTEGER (16-BIT)

\* The “Unit Number” Modbus register is an optional register that allows for a unique ID number to be stored in the unit’s datalogs – this can be assigned using either communication port on the datalogger module.

## 13.0 PROGRAMMING THE DE-1520

- 13.1 The DE-1520 Terminal Program operates from a standard PC and permits the operator to configure the system. There is a monitor mode that the operator can use to monitor an existing installation and access system data. This data can be accessed locally or remotely via a modem.

The following user-supplied hardware is required:

Computer: IBM-compatible PC.

PORT - Either RS-232 or USB. Port 1 must be set for ASCII mode in order to program the unit.

Modem - 9600 baud (or greater) modem required for monitor function.

- 13.2 The Terminal Program installs from a CD-ROM drive. A minimum of 10MB of free disk space is required. Additional disk space will be required if the remote datalog database function is used. The space required will be dependent on the size of the working database.

Insert the CD-ROM disk into the CD-ROM drive and run the setup.exe file. If you have the autorun selection enabled on your CD-ROM drive, the install program will run automatically. The install program will prompt you for a destination folder where the program will be installed. The default folder is **C:\Program Files\Altronic DE-1520\Terminal Program\**. After the install completes, you can run the program from the Windows Start button, Programs Menu, Altronic DE-1520 system, and select the DE-1520 menu selection.

- 13.3 CONFIGURE KEY - The DE-1520 needs to be initially programmed using the DE-1520 Terminal Program. Select the given file for download which best fits the intended application.
- 13.4 MONITOR KEY - This feature allows the user to retrieve datalogged messages and is typically used for PC monitoring or SCADA/PLC systems. The connection can be via a modem or direct connection to the RS232 port. Datalogs may be retrieved into a standard EXCEL file format.

The following keys are applicable during the monitor function:

CONNECT KEY - This feature selects how the PC is going to connect to the DE-1520. Select either a comm port or a telephone number for a modem.

HANGUP KEY - This disconnects the PC from the port or the modem.

DATALOGS KEY - This feature allows for retrieval of datalogged messages in the PC. Datalogs may be retrieved into a standard EXCEL file format.

VIEW DATABASE / CHART DATABASE KEY - These powerful tools allow users to display and chart the datalogged information.

- 13.5 CALIBRATE KEY - This allows the user to calibrate analog sensor channels.
- 13.6 EXIT KEY - Exits the DE-1520 PC Terminal Program.



## **INDEX BY SECTION:**

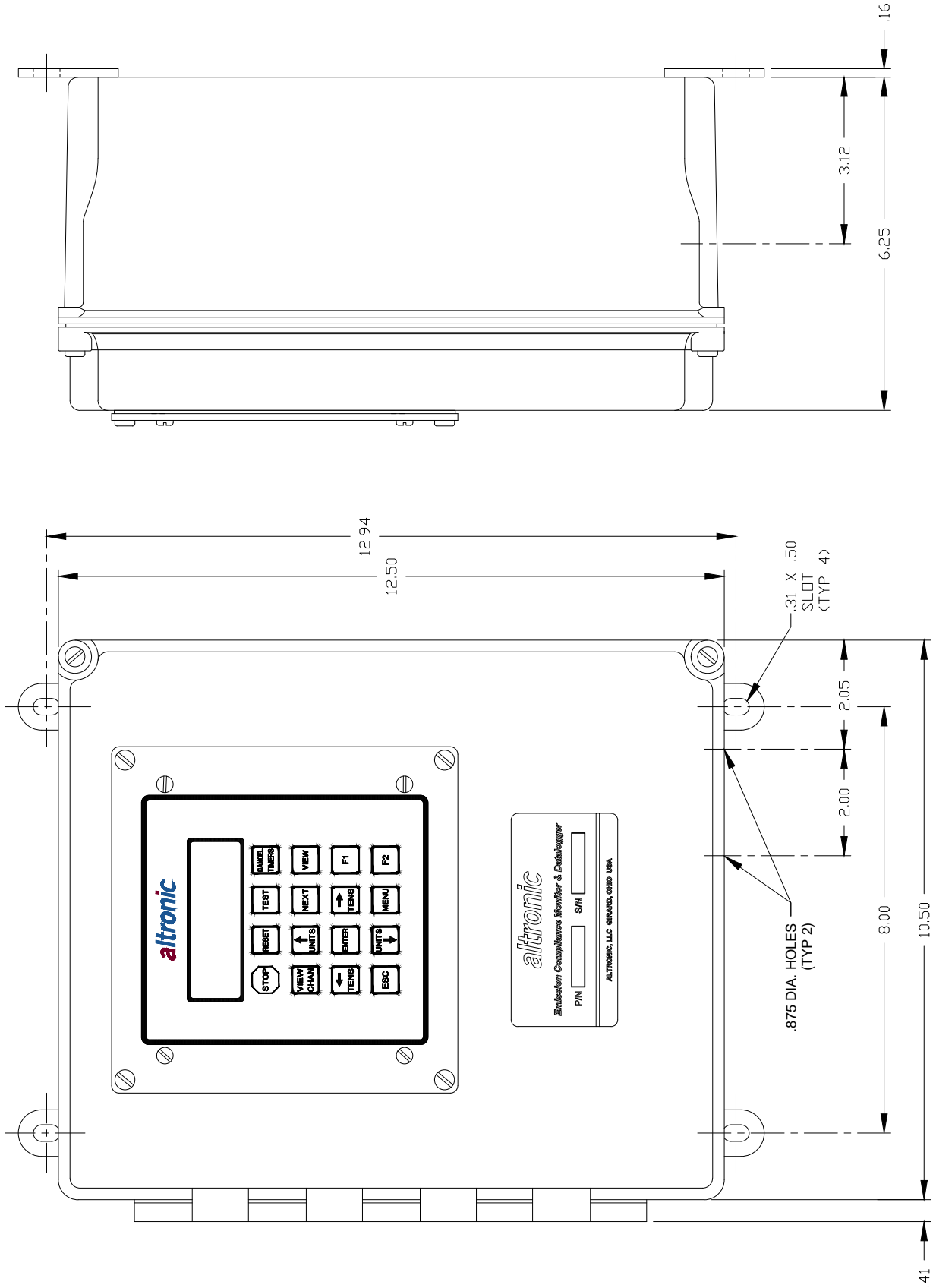
- 1.0 OVERVIEW
- 2.0 DISPLAY MODULE
- 3.0 POWER/TERMINAL MODULE
- 4.0 MOUNTING
- 5.0 WIRING
- 6.0 KEYPAD DESCRIPTION
- 7.0 UNDERSTANDING THE HOME SCREENS
- 8.0 DIGITAL OUTPUTS
- 9.0 SETUP MENU OPTIONS
- 10.0 CONTRAST RATIO ADJUSTMENT
- 11.0 DATALOGGING AND COMMUNICATIONS FOR THE ECMD-101/DE-1520
- 12.0 DATALOGGING AND COMMUNICATIONS FOR THE ECMD-102 ONLY
- 13.0 PROGRAMMING THE DE-1520

## **DEFINITIONS**

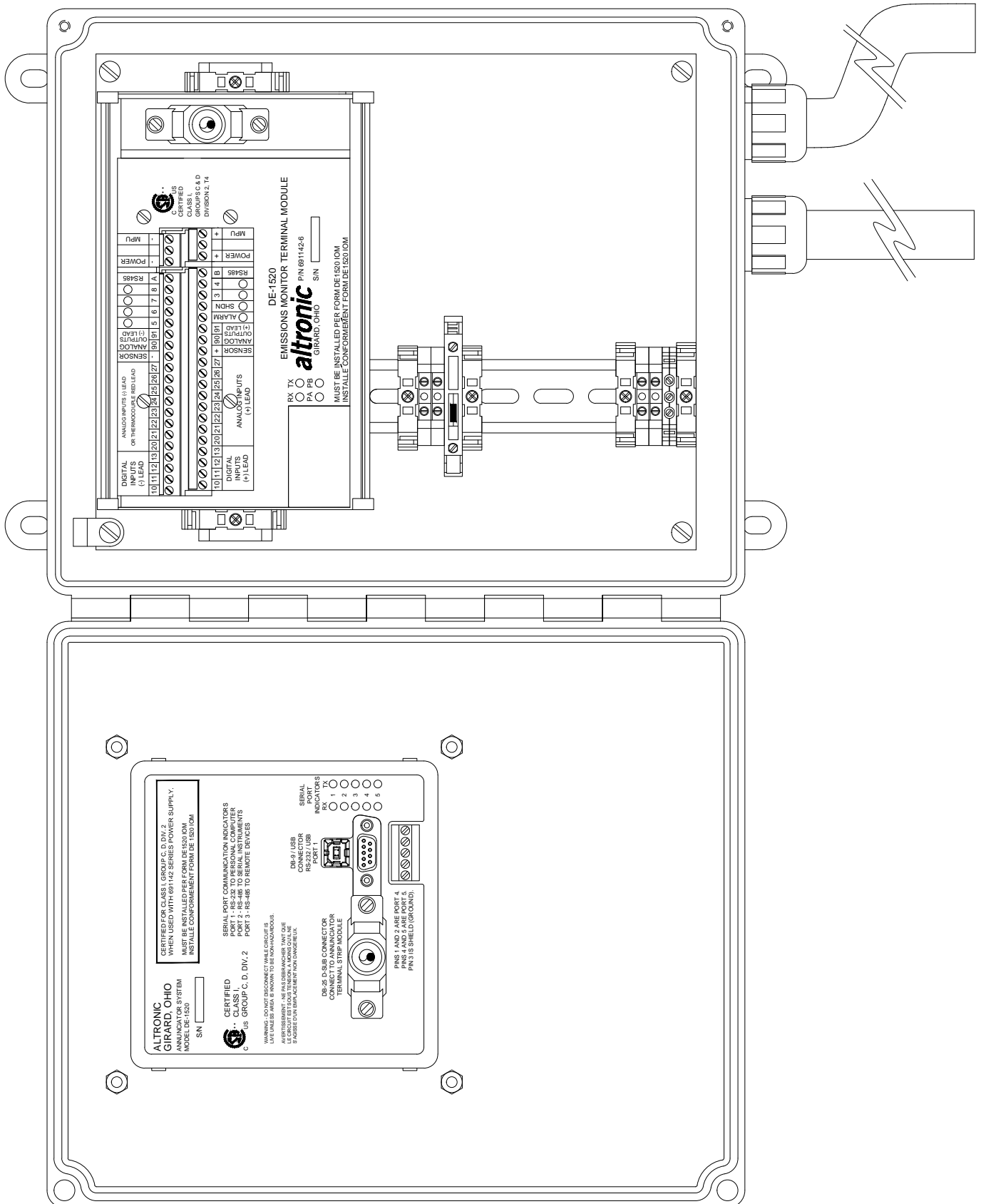
ECMD – Emissions Compliance Monitor Datalogger.

RICE-NESHAP – Reciprocating Internal Combustion Engine – National Emission Standard for Hazardous Air Pollutants.

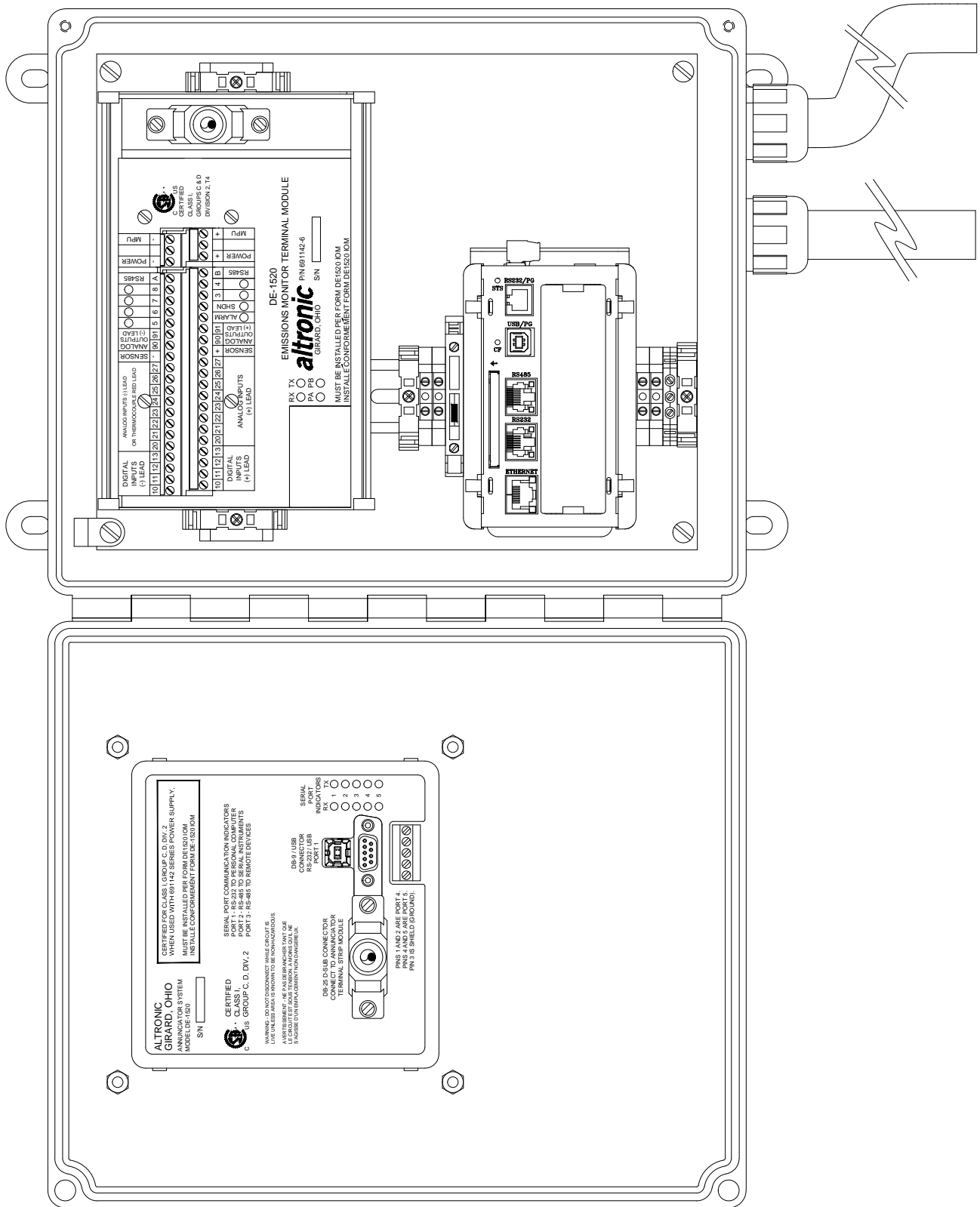
**FIG. 1 – MOUNTING DIMENSIONS, ECMD**



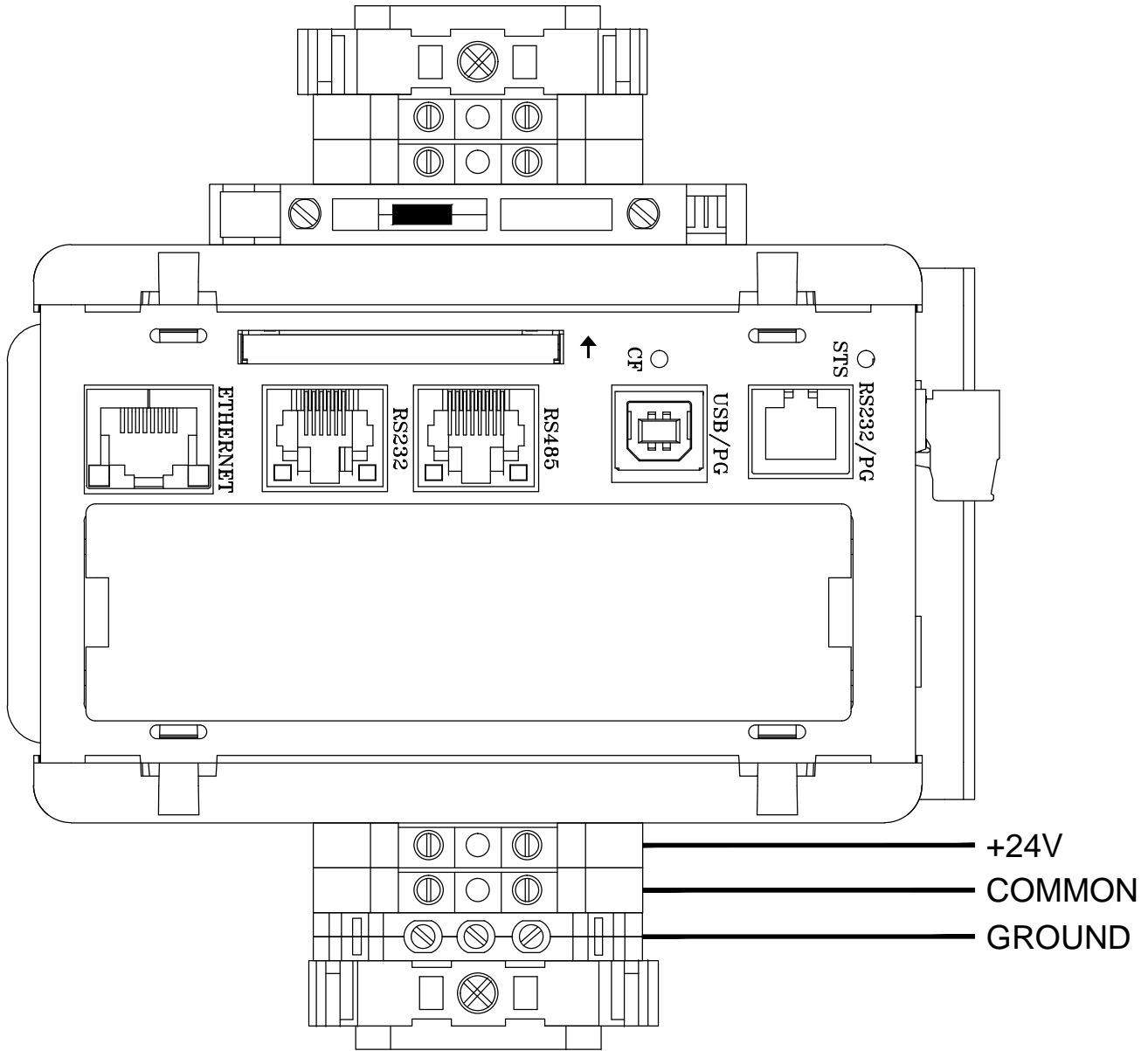
**FIG. 2 – INSIDE VIEW, EMCD-101**



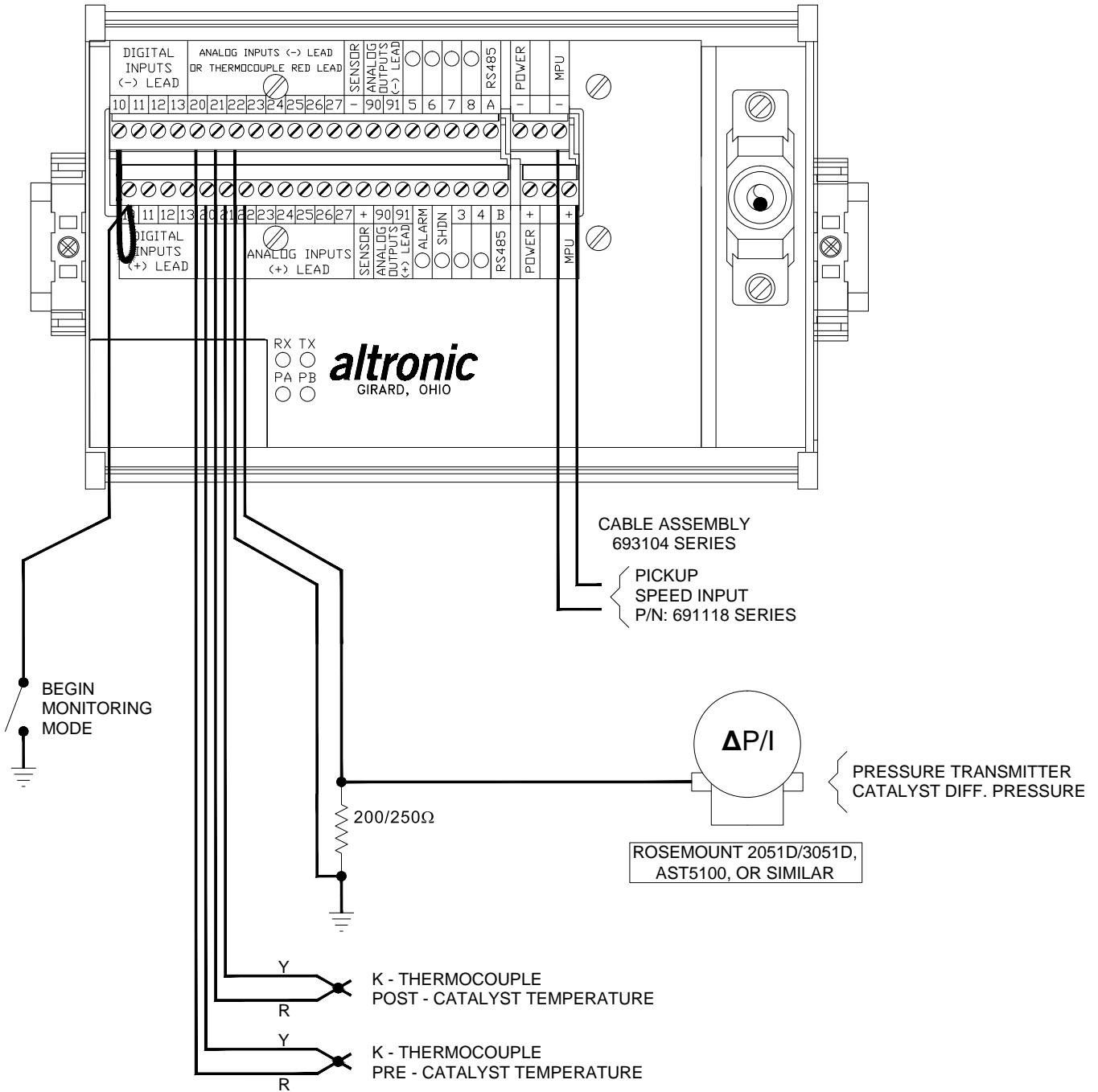
**FIG. 3 – INSIDE VIEW, EMCD-102**



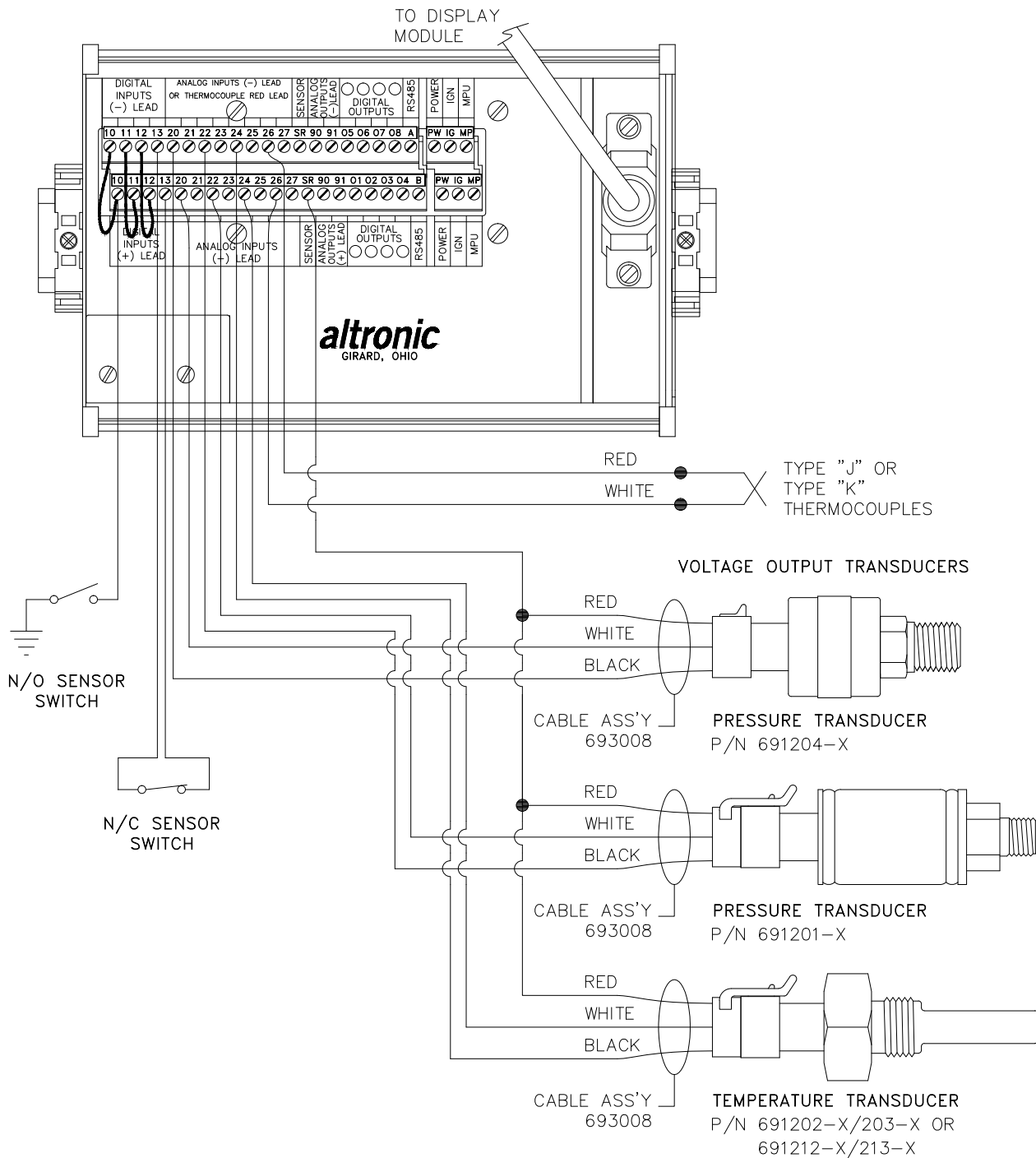
**FIG. 4 – POWER HOOK-UP**



**FIG. 5 – TYPICAL CUSTOMER SENSOR HOOK-UP**



**FIG. 6 – WIRING DIAGRAM, SENSOR AND TRANSDUCER INPUTS**



- NOTE: 1. N/O SENSOR SWITCH MUST HAVE JUMPER IN PLACE BETWEEN TOP ROW AND BOTTOM ROW OF TERMINAL BLOCK. POWER SUPPLY MINUS AND SENSOR GROUND MUST BOTH BE AT GROUND.
2. N/C SENSOR SWITCH, REMOVE JUMPER AND PLACE SWITCH WIRES, ONE IN TOP ROW OTHER IN BOTTOM ROW.
3. ALL UNUSED INPUTS MUST HAVE JUMPER WIRE IN PLACE.
4. THE +5VDC INTERNAL SUPPLY OUTPUT IS LIMITED TO 500 mA MAXIMUM. IF THIS SUPPLY EXISTS IN THE PANEL, IT MUST BE FUSED WITH A 0.5 AMPERE FUSE. BOTH +5VDC TERMINALS ARE ELECTRICALLY CONNECTED TOGETHER. TWO TERMINALS ARE PROVIDED FOR WIRING CONVENIENCE ONLY.

**FIG. 7 – DIGITAL OUTPUT SWITCHES**

