

Operating Manual

GTI Bi-Fuel®

IN-LINE ENGINE CONTROL SYSTEM

Form GPN1000 OM 11-12

altronic
HOERBIGER Engine Solutions



1.0 OVERVIEW

- 1.1 This manual applies to GPN1000 and GPN1000-12 panels used with Series 25-A, 50-A, 65-A, and 65-B (formerly Series A-A, I-A, II, and III-A) kits used on in-line or small V-engines. For help locating subjects in this document see page 17.
- 1.2 The control system panel GPN1000 consists of two main parts packaged in an industrial enclosure: Display Module DE-1510 and Power/Terminal Module 691142-2. Interconnecting cable 693115-1 connects Module DE-1510 to Module 691142-2. The GPN1000 is for 24V systems, and the GPN1000-12 is for 12V systems.
- 1.3 The Altronic DE-1510 controller system is a dedicated electronic microprocessor-based system designed to sense specific analog and digital input points to control and monitor the GTI Bi-Fuel® natural gas fumigation system for diesel engines. The system is configurable for various applications using a PC (personal computer) and the supplied DE-1510 terminal program and contains a non-volatile memory to store the setup. Serial communications provide an interface to PC's, PLC's, modems and satellite uplinks for remote communication if desired. A backlit 4x20 LCD character display shows system status, programmed controller parameters and channel labels. A front mounted keypad serves as the user interface. The DE-1510 provides for the natural gas fueling off/on control function and for an optional closed loop automatic control function to optimize the amount of natural gas substitution of diesel fuel under varying modes of operation. Additionally, the DE-1510 provides for remote data acquisition and supervisory control in a compact, low cost package dedicated to natural gas fuel substitution on industrial diesel engine 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 of the controller is necessary, this container will provide the optimum protection.

2.0 DE-1510 DISPLAY MODULE

- 2.1 The Display Module serves as the user interface for the DE-1510 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 and three pairs of serial port indicators.
- 2.2 The keypad is a sealed membrane unit containing the STOP and RESET keys and other keys used to navigate through channel status, description, view screens, and to edit the setpoints.
- 2.3 The LCD has a home screen that displays a status line, BI-FUEL OFF or ON, gas supply pressure (GSP), manifold air pressure (MAP1) and manifold air temperature (MAT1). Pressing the VIEW CHANNEL key displays the channel number, its timer status, analog value (if applicable) and the user label.
- 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's 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 at system power-down.
- 2.5 Three pairs of LED's 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.

3.0 POWER/TERMINAL MODULE

- 3.1 The Power/Terminal Module is rail mounted and is the interface to the DE-1510 Display Module and to other systems. It also is the point of interface between the field sensor wiring terminal strip and the DE-1510 control 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 10-13. The 8 analog inputs are numbered 20-27.
- 3.2 The Power/Terminal Module has six solid state output switches. The output switches provide a means of using the DE-1510 controller system status to operate relays and the fuel solenoid valve. The output switches will be in the open (de-energized) condition when the unit is unpowered. If 24 Vdc is lost to the DE-1510 system, the output switches will go to an open state. Output switches 3 and 4 function as normally-closed contacts to permit the Bi-Fuel solenoid valve to turn on. If supply voltage is lost, the LED's will be ON in the normal Bi-Fuel ON condition and OFF for a Bi-Fuel OFF or fault condition. Output 5 functions as a driver for the FAULT LED on the front of the panel and will normally be off.
- 3.3 The input power of the DE-1510 system is applied to the power supply terminals marked (+) and (-) PWR. A 6.3 amp, replaceable slow-blow fuse protects the system from over currents, and a power LED lights when power is applied to the system.

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.

5.0 WIRING (SEE WIRING DIAGRAMS: FIGS. 2, 3 & 4)

- 5.1 SYSTEM COMPONENT WIRING (FIG. 2)
Three individual wiring harnesses are provided in the system kits. Each wiring harness, or bundle, consists of functionally-grouped connections to sensors or actuators, which would normally be located in the same general area. Each bundle is marked as Engine Harness, Fuel Harness, or Power Harness. The wiring is protected by a flexible plastic tubing. Each wiring bundle is provided with a bulkhead fitting installed. Mount the bulkhead fittings into the holes provided in the bottom of the panel. When routing the wiring, it is essential that the following practices be adhered to:
- Never run sensor wires in the same conduit with high energy wiring such as the AC line power.
 - Keep high voltage wiring at least eight inches (200mm) away from sensor and sensor wiring.
 - If it becomes necessary to check sensor to panel wiring with an ohmmeter or other powered means, first DISCONNECT the plug-in terminal strips from the Terminal Module. Applying voltage to the DE-1510 system through the sensor leads may damage the device.
- 5.2 ENGINE (ORANGE) HARNESS WIRING (FIG. 3)
- A. Mount the pressure sensors provided in the accessory kit to the engine in a manifold or tube from the engine. Depending upon the specific application, there may be unused wires in the bundle. Plug in the mating connectors; VAC1 is the air cleaner vacuum and MAP1 is the MANIFOLD AIR PRESSURE.

NOTE: Avoid mounting the GPN1000 panel with the LCD display facing direct sunlight. The display operating temperature range is -31°F to $+176^{\circ}\text{F}$ (-35°C to $+80^{\circ}\text{C}$). The panel should be mounted within 10 ft. (GPA0005-10), 20 ft. (GPA0005-20), or 30 ft. (GPA0001-30) of the engine, the fuel solenoid valve and fuel pressure regulator.

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.

NOTE: Do not expose the pressure transducer to temperatures above 221°F . (105°C).

- B. Mount the thermocouples to the engine, routing the thermocouple wires as required. To accommodate the differences in location of the sensors, remove the individual wires from the plastic tubing, as required, and tape the tubing closed after proper length to reach the sensor location is known. MAT1 is the MANIFOLD AIR TEMPERATURE and EGT1 is the EXHAUST GAS TEMPERATURE.
- C. If the optional vibration sensor is used, mount as indicated and connect to the wires marked VIB+ and VIB1 (signal to panel).
- D. At the panel end, adjust the length of the bundle, if required, and mount the bulkhead fitting through the far left hole, viewing the panel from the front. Terminate the wires to the customer connection terminal strip. Each wire is marked with the same identifier as the terminal strip; connect these to match.

5.3 FUEL (BLUE) HARNESS WIRING (FIG. 3)

The FUEL HARNESS contains the wiring to the fuel supply and pressure regulator and is not to be routed to the engine.

- A. After mounting the FUEL GAS SOLENOID VALVE, connect the SOL+ and SOL- wires to the solenoid coil.
- B. Connect the ROP wires to the REGULATOR OUTPUT PRESSURE switch terminals. Do not connect the shield wire, as it is terminated at the panel end only.

Note: The GPN1000-12 panel does not utilize the ROP input.

- C. Mount the GAS SUPPLY pressure transducer GSP and plug in the connector.
- D. At the panel end, adjust the length of the bundle, if required, and mount the bulkhead fitting through the third from the left hole viewing the panel from the front. Terminate the wires to the customer connection terminal strip. Each wire is marked with the same identifier as the terminal strip; connect these to match.

5.4 POWER (RED) HARNESS WIRING (FIG. 3)

The POWER HARNESS contains the power wiring for the panel.

- A. GPN1000
Connect the supply power wires to the 24 Vdc input power terminals on the power supply, plus to terminal (+) and minus to terminal (–); power requirement is 24 Vdc, 120 watts max. The DC– terminal will be connected to the panel ground which must be the same as engine chassis ground.

GPN1000-12

Connect the supply power wires to the 12 Vdc input power terminals on the power supply, plus to terminal (+) and minus to terminal (–); power requirement is 12 Vdc, 180 watts max. The DC– terminal will be connected to the panel ground which must be the same as engine chassis ground.

- B. At the panel end adjust the length of the bundle, if required, and mount the bulkhead fitting through the far right hole viewing the panel from the front. Terminate the wires to the customer connection terminal strip. Each wire is marked with the same identifier as the terminal strip; connect these to match.

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-1510 controller Display Module contains a 16-key sealed membrane keypad which is used to adjust, stop and reset the system.
- 6.2 STOP
Used for a manual stop condition. By pressing the STOP key, the controller activates the configured outputs.
- 6.3 RESET
Clears all past faulted points and resets all input and output timers to their preset values. This can also be accomplished remotely by interrupting the DC power to the panel for 5 seconds.
- 6.4 CANCEL TIMERS
Cancels all timers.
- 6.5 VIEW CHAN
Allows the user to view the status of any input channel and its user defined label.
- 6.6 NEXT
Shows optional settings.
- 6.7 ENTER
Used to accept a selection and to save a new value in memory.
- 6.8 ESC
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
Allows the user to enter the edit menu. Control setpoints may be viewed and adjusted using the MENU key.
- 6.10 UNITS/TENS
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, timers and to move the pointer in the menu screen.
- 6.11 F1
From Home screen, function key F1 displays the hourmeter. From control screen F1 switches between auto and manual modes.
- 6.12 F2
Displays the time and date of the first fault.

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:

BI-FUEL ON
BI-FUEL OFF
BI-FUEL INHIB
TIMERS ACTIVE
CHECKING INPUTS
FAULT AL1
MANUAL STOP

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

- 7.2 To activate the Bi-Fuel system, turn on the power; the unit automatically resets. If no system faults are detected during the CHECKING INPUTS scan, the home screen will display the TIMERS ACTIVE message until the programmed fuel delay timer expires. After the time delay is completed, the home screen will display either the BI-FUEL ON or BI-FUEL OFF status according to the current conditions and the programmed control values. The RESETTING message will be displayed momentarily followed by TIMERS ACTIVE, and the home screen will then re-appear.

RESETTING

APPEARS IMMEDIATELY
AFTER POWER-UP OR A USER
RESET COMMAND FOR ABOUT
1 SECOND

CHECKING INPUTS
GSP1 9.0 PSIG
MAP1 12.0 PSIG
MAT1 62 °F

APPEARS AFTER **RESET** AS
UNIT SCANS INPUTS FOR
PRE-EXISTING FAULT
CONDITIONS

STATUS TIMERS ACTIVE
GSP1 9.0 PSIG
MAP1 12.0 PSIG
MAT1 62 °F

APPEARS AFTER **RESET** OR
BI-FUEL OFF CONDITION
WHEN NO FAULTS ARE
DETECTED AND THE
BI-FUEL DELAY TIMER IS
ACTIVE

STATUS BI-FUEL ON
GSP1 9.0 PSIG
MAP1 12.0 PSIG
MAT1 62 °F

APPEARS WHEN ALL TIMERS
ARE EXPIRED, ALL FAULTS ARE
CLEAR AND ALL CONTROL
SETTINGS ARE PERMITTING
THE **BI-FUEL** GAS VALVE TO
BE **ON**

```
STATUS  BI-FUEL OFF
GSP1    9.0 PSIG
MAP1    12.0 PSIG
MAT1    62 °F
```

APPEARS WHEN ALL TIMERS
ARE EXPIRED, ALL FAULTS ARE
CLEAR AND ONE OR MORE
CONTROL SETTINGS IS
KEEPING THE **BI-FUEL** GAS
GAS VALVE IN THE **OFF**
POSITION UNTIL CONDITIONS
CHANGE

- 7.3 The DE-1510 controller continuously monitors the system for two different levels of setpoints. The first group are called control setpoints and, when violated, they cause the Bi-Fuel function to be temporarily suspended (engine reverts to 100% diesel operation) until conditions change. The violation of these setpoints may occur readily in normal operation of the engine and the system does not require any USER intervention to begin re-supplying natural gas when these clear, after the bi-fuel delay expires.

```
STATUS  BI-FUEL OFF
GSP1    9.0 PSIG
MAP1    12.0 PSIG
MAT1    62 °F
```

APPEARS WHEN ALL TIMERS
ARE EXPIRED, ALL FAULTS ARE
CLEAR AND ONE OR MORE
CONTROL SETTINGS IS
KEEPING THE **BI-FUEL** GAS
GAS VALVE IN THE **OFF**
POSITION UNTIL CONDITIONS
CHANGE

```
STATUS  BI-FUEL OFF
GSP1    9.0 PSIG
MAP1    12.0 PSIG
MAT1    62 °F
```

APPEARS WHEN CHANNEL 13
HAS BEEN ACTUATED

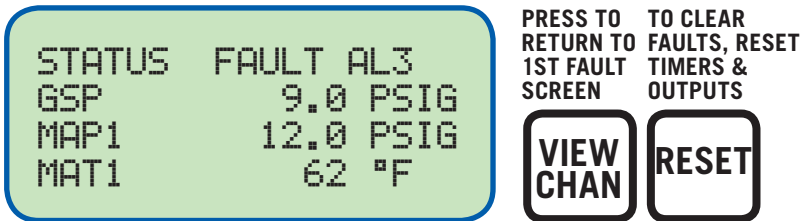
A temporary Bi-Fuel Inhibit can be implemented when desired, by opening the jumper connection between the terminals for input 13. This input prevents output #4 from turning on, which prevents Bi-Fuel operation. Bi-Fuel operation may begin after input 13 is no longer actuated.

- 7.4 The safety shutdowns are the second level of monitored setpoints. When any of these setpoints are violated even momentarily, the Bi-Fuel will stop supplying natural gas (engine reverts to 100% diesel operation) and will NOT begin re-supplying gas, until a USER initiated RESET is received. When one of the safety shutdown setpoints has been violated, the gas solenoid valve 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. The number 1, after AL (alarm), shows the output switch that is faulted. 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.

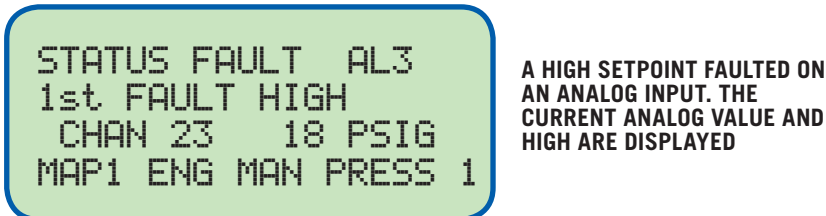
```
STATUS  FAULT AL3
1ST FAULT
CHAN 12
ROP REG. OUT. PRESS
```

RETURNS
TO FAULT
HOME
SCREEN

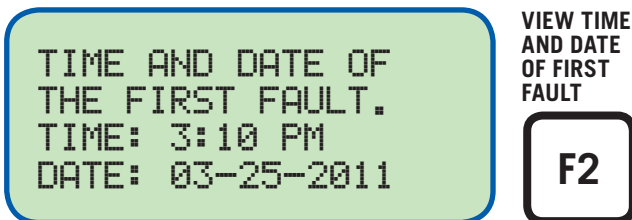
ESC



When a fault occurs on analog channel, 20-27, a HIGH or LOW indication will also be displayed as to whether the point faulted on a high or low setpoint.



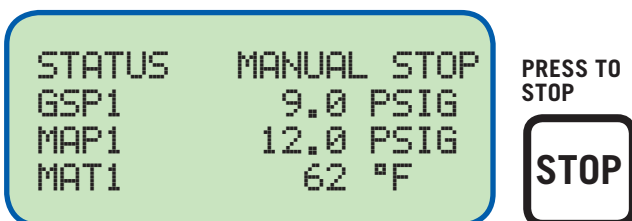
The DE-1510 controller system “stamps” the time and date of the first fault. To view the time and date of the first fault, press the F2 key after a fault occurs but before reset is initiated. If no key is pressed for 10 seconds, the display will revert to the first fault screen.



- 7.5 From the home screen, any control fault condition can be viewed by pressing the NEXT key once. The screen holds a host of information for optional equipment, but also has the ability to scroll through any outstanding channels with a CONTROL set point violated. As long as the first line is holding the Gas Valve in AUTO mode, the second line will contain the violated channels, scrolled one at a time. If the Gas Valve is in MANUAL mode, or there are no control set points violated, then the second line will contain the HOLD POSITION value.

To alternate between MANUAL and AUTO mode press the F1 key.

- 7.6 The MANUAL STOP message will supersede all of the above home screens if the STOP key is pressed. The fuel solenoid valve will close and remain closed until RESET.



8.0 VIEW CHANNEL STATUS SCREENS

- 8.1 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. The UNITS and TENS keys allow the user to quickly navigate through the controller 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 two minutes with no keypad activity, the display will revert to the current home screen.

9.0 VIEWING OR EDITING THE SETPOINT VALUES USING THE MENU MODE

- 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 and the time and date. The controller must be initially configured using the terminal program running on a PC connected to the RS-232 port on the back of the controller. Reference the programming instructions section 12.0 for details on how to configure the controller 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.

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.

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

The password procedure is: From the home screen, 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 setpoint values, point to EDIT CONTROL VALUES and press the ENTER key. The edit control values menu is shown. The arrow points to the EDIT SETPOINTS. The example shows how to change the LO setpoint of CHAN 23. Use arrow keys as shown to select desired channels. Use ENTER key as shown to select LO or HI setpoint.
- 9.5 To edit the setpoint values, point to EDIT CONTROL VALUES and press the ENTER key. The edit control values menu is shown. The arrow points to the EDIT SETPOINTS. The example shows how to change the LO setpoint of Chan 23a. Use arrow keys to select desired channels. Use ENTER key to select LO or HI setpoint.

```
→EDIT CONTROL VALUES
EDIT SAFETY SHUTDOWN
CALIBRATION
MORE MENUS
```

**FIRST GROUP OF
MENU SCREENS**

→EDIT SETPOINTS
EDIT DYNAMIC VALUES

PRESS TO
EDIT
SETPOINTS

ENTER

CHAN →20
LO SP 20.0%
HI SP 110.0%
DIESEL FUEL PERCENT

TO SELECT
CHAN 23
PRESS 3
TIMES

↑
UNITS

CHAN →23
LO SP 2.0 PSIG
HI SP 15.0 PSIG
MAP1 ENG MAN PRESS 1

PRESS TO
EDIT **LO**
SETPOINT

ENTER

CHAN 23
LO SP → 2.0 PSIG
HI SP 15.0 PSIG
MAP1 ENG MAN PRESS 1

PRESS TO
CHANGE
LO VALUE

↑
UNITS

ACCEPT
AND GO TO
HI VALUE

ENTER

9.6 To edit hysteresis values, select EDIT HYSTERESIS and press the ENTER key.

EDIT SETPOINTS
EDIT DYNAMIC VALUES
→EDIT HYSTERESIS

PRESS
TO EDIT
HYSTERESIS

ENTER

EDIT HYSTERESIS
MAP1 → 0.0
KW% 0.0

PRESS TO
CHANGE
VALUE

↑
UNITS

PRESS TO
ACCEPT
OR GO
TO NEXT
VALUE

UNITS
↓

ENTER

There is a programmable hysteresis value for both the MAP1 and the KW% sensor which prevents the gas from turning on and off as these channels dither around the high and low control setpoints.

- 9.7 To view or edit safety shutdown values, choose EDIT SAFETY SHUTDOWN from the main menu. To edit or view setpoints, choose EDIT SETPOINTS.

FIRST GROUP OF MENU SCREENS

EDIT CONTROL VALUES
 →EDIT SAFETY SHUTDOWN
 CALIBRATION
 MORE MENUS

PRESS TO
GO TO
NEXT
MENU

ENTER

SECOND GROUP OF MENU SCREENS

→EDIT SETPOINTS
 VIEW INPUT CLASS

PRESS TO
GO TO
NEXT
SCREEN

ENTER

CHAN →20
 LO SP 20.0 %
 HI SP 110.0 %
 DIESEL FUEL PERCENT

PRESS TO
GO TO **LO**
SETPOINT

ENTER

- 9.8 To view or edit the sensor calibration, select CALIBRATION from the main menu. Use the arrow keys to select the desired channel for calibration. Use the enter key to select either zero or span calibration for the selected channel. Watching the bottom line of the display use the arrow keys to display the desired value. For example, in order to calibrate the zero value of the transducer, apply the zero value to the input and follow the steps below. If the full scale value also requires calibration apply the full scale input to the channel and adjust the span to obtain the desired reading on the bottom line of the display as shown.

FIRST GROUP OF MENU SCREENS

EDIT CONTROL VALUES
 EDIT SAFETY SHUTDOWN
 →CALIBRATION
 MORE MENUS

PRESS TO
GO TO
NEXT
MENU

ENTER

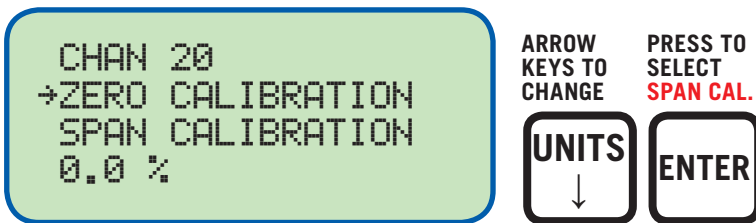
CHAN →20
 ZERO CALIBRATION
 SPAN CALIBRATION
 0.3 %

ARROW
KEYS TO
CHANGE
CHANNEL

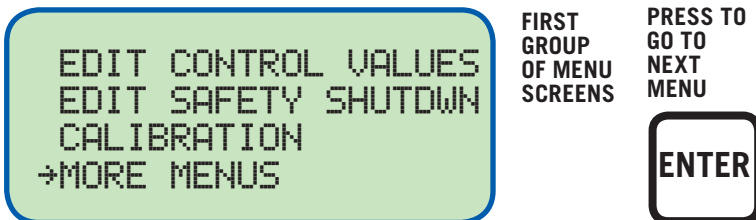
↑
UNITS

PRESS TO
SELECT
ZERO CAL.

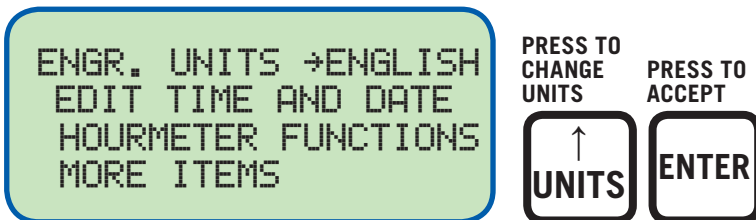
ENTER



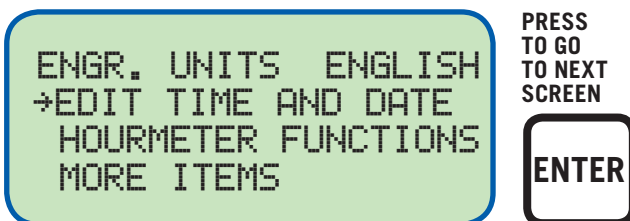
9.9 Select MORE MENUS from menu.



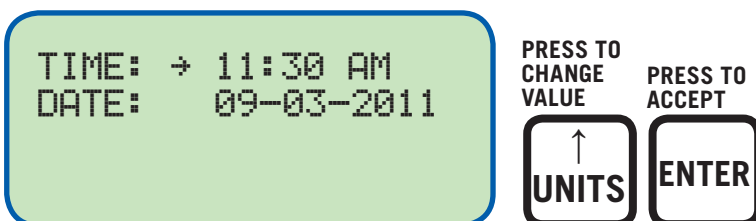
9.10 The display shows the current Engineering units selection English or Metric. Use the up arrow key to change and then press Enter to accept the new selection and move to Edit Time and Date.



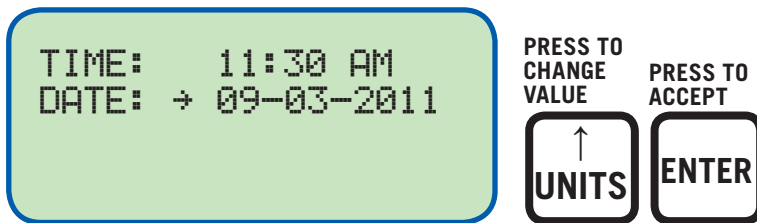
Selection arrow now points to time and date.



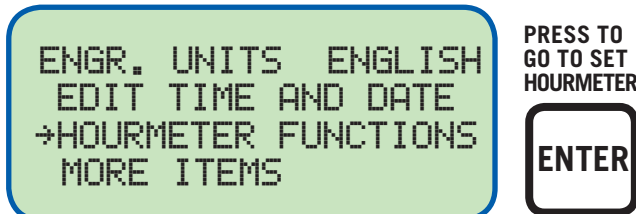
The time and date will be displayed with the selection arrow pointing to the time. The hours and minutes can be edited separately; AM and PM follow the hours. With the selection arrow pointing to the hours, use the ↑ UNITS or ↓ UNITS keys to increase or decrease the hours. Press ENTER to save the new 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.



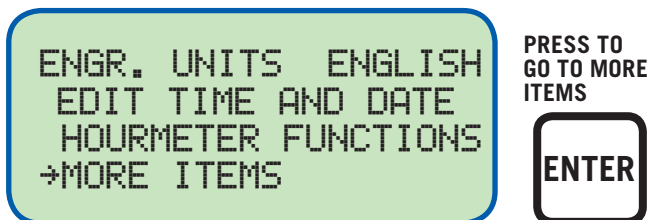
The date is shown as month-day-year. The month, day and year can be edited separately. With the selection arrow pointing to the month, use the ↑ UNITS or ↓ UNITS keys to increase or decrease the month. Press ENTER to save the new month setting; the selection arrow will point to the day. Use the same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

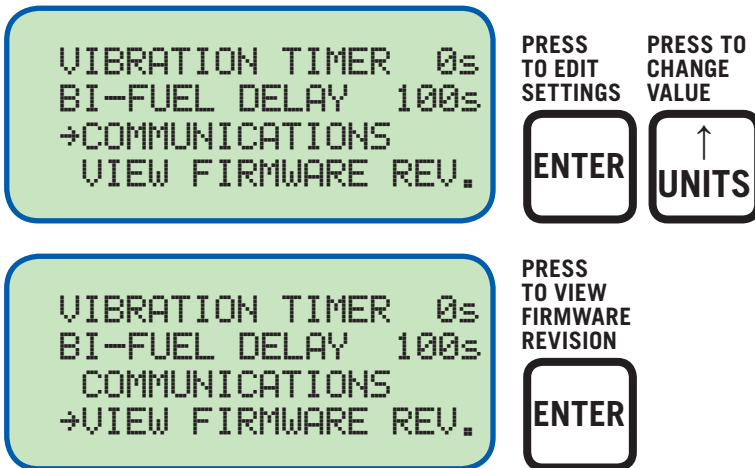


- 9.11 To view the Hourmeter message, select HOURMETER FUNCTIONS from the main menu and press ENTER.



- 9.12 To view or edit the values for VIBRATION TIMER, BI-FUEL DELAY TIMER, COMMUNICATION SETTINGS and to view the FIRMWARE REVISION level, select MORE ITEMS. The Vibration Timer is the length of time in seconds that a vibration level must be detected for to cause a fault. The Bi-Fuel Delay Timer is the amount of time in seconds before Bi-fuel will be allowed to turn on after a power loss, reset, or controlled off condition, if no faults exist.





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 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. 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 3-½ turns. The display should then be at a desirable contrast ratio.

11.0 DATA LOGGING AND COMMUNICATION OPTIONS

- 11.1 The DE-1510 controller system contains a data logging feature. Data logging 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 port 3 (the RS-485 port).
- 11.2 NODE NUMBER
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.
- 11.3 COMMUNICATIONS PARAMETERS
The following must be set in the PC or PLC to communicate with the controller system:
- | | |
|------------|------|
| Baud Rate: | 9600 |
| Data Bits: | 8 |
| Stop Bits: | 1 |
| Parity: | None |
- 11.4 The data logging 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 set for 1 minute.

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 Refer to files on the DE-1510 CD-ROM for more information on serial communication specifications. This document contains in depth information on MODBUS, ASCII, ROI (Remote Operator Interface), data logging, and dial in/out features.

12.0 PROGRAMMING THE DE-1510

- 12.1 The DE-1510 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, Windows 95/98/ME/XP, hard drive (10 MB of free disk space required), CD-ROM drive, SVGA graphics (800X600 or greater preferred) with color monitor.

Serial Port: RS-232 port for programming.

Modem: 9600 baud (or greater) modem required.

- 12.2 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 data log 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. After the install completes, you can run the program from the Windows Start button, Programs Menu, Altronic DE-1510 system. Select the DE-1510 menu selection.

- 12.3 Connect the computer cable from the computer to the DB9 connector Port #1 on the back of the DE-1510 display.

12.4 CONFIGURE KEY

The DE-1510 needs to be initially programmed using the DE-1510 Terminal program. Select the items for download which best fit the intended application.

12.5 EDIT SETPOINTS KEY

The setpoints of the DE-1510 may be changed from the computer by selecting this key.

12.6 MONITOR KEY

This feature allows the user to retrieve data logged messages which are typically used for PC monitoring or SCADA/PLC systems. The connections can use either a modem or connected directly into the comm. Port. Data logs 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-1510. 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 data logged messages in the PC. Data logs may be retrieved into a standard EXCEL file format.

AUTO START KEY

This feature allows for serial communications to STOP Bi-Fuel operation or RESET Bi-Fuel operation.

VIEW DATABASE / CHART DATABASE KEY

These powerful tools allow users to display and chart the data logged information.

12.7 CALIBRATE KEY

This allows the user to calibrate analog sensor channels. Press this button and select the channel to be calibrated. The sensor selection box will show the default values or the last values calibrated. The CURRENT DATA box shows the value being displayed by the DE-1510. On the terminals of the channel being calibrated, connect a voltmeter between the input (+ and –) to measure the output voltage of the transducer. Apply the desired minimum pressure, temperature, vibration, position or KW input to the transducer being calibrated. Now measure the voltage using the voltmeter on the terminal strip. Enter this voltage into the LOW SENSOR VOLTAGE box on the PC screen. Click the ACCEPT button to make this the new calibration value. The CURRENT DATA box will now read the desired minimum value. If the span is to be adjusted, increase the input to the transducer to the desired high value. Measure the voltage at the terminal strip using the voltmeter and enter the measured voltage in the HIGH SENSOR VOLTAGE box and hit the ACCEPT button. The calibration of the channel is now complete.

12.8 EXIT KEY

Exits the DE-1510 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 VIEW CHANNEL STATUS SCREENS**
- 9.0 VIEWING OR EDITING THE PROGRAMMED VALUES USING THE MENU MODE**
- 10.0 CONTRAST RATIO ADJUSTMENT**
- 11.0 COMMUNICATIONS**
- 12.0 PROGRAMMING**

DE-1510 CHANNEL DESCRIPTION CHART:

CHANNEL	DESCRIPTION	DISPLAYED UNITS (Default: English)	DISPLAYED UNITS (Metric)	DEFAULT CONTROL SETPOINTS		DEFAULT SAFETY SETPOINTS	
				LOW	HIGH	LOW	HIGH
11	GAS DETECTION (optional)	—	—	—	—	—	—
12*	ROP REG. OUT. PRESS.	—	—	—	—	—	—
13	BI-FUEL INHIB.	—	—	—	—	—	—
20	DIESEL FUEL PERCENT	%	%	– 25	125	– 25	125
21	GSP GAS SUPPLY PRESS	PSIG	Kpa	– 12.5	62.5	– 12.5	62.5
22	VAC1 AIR FILTER 1	PSIG	Kpa	– 12.5	62.5	– 12.5	62.5
23	MAP1 ENG MAN PRESS 1	PSIG	Kpa	20	62.5	20	62.5
24	MAT1 ENG MAN TEMP1	°F	°C	0	1472	0	1472
25	EGT1 ENG EXH TEMP 1	°F	°C	0	1472	0	1472
26	VIB1 ENG VIBRATION 1	IPS	MPS	– 0.5	2.50	– 0.5	2.50
27	KW PERCENT	%	%	– 25	125	– 25	125

* ROP not used with GPN1000-12

DE Terminal Program Configuration Defaults
Device/Units: DE-1510 Controller (English)
No. of Vibration Sensors: 1
With Dynamic Control System: Yes

PANEL APPLICATION CHART: SERIES 25-A, 50-A, 65-A, 65-B:

SERIES	25-A	50-A, 65-A	65-B
Panel	GPN1000-12	GPN1000	GPN1000
Panel Accessory Kit	GPA0005-10	GPA0005-20	GPA0001-30

PANEL ACCESSORY KIT: SERIES 25-A, 50-A, 65-A, 65-B:

PANEL ACCESSORY KIT		GPA0005-10	GPA0005-20	GPA0001-30
Engine Harness	PART NO.	693128-1	693140-1	693119-1
	FUNCTIONS	MAP1 VAC1 EGT1 MAT1 VIB+, VIB1 KW	MAP1 VAC1 EGT1 MAT1 VIB+, VIB1 KW	MAP1 VAC1 EGT1 MAT1 VIB+, VIB1 KW
Fuel Harness Assembly	PART NO.	693126-1	693139-1	693124-1
	FUNCTIONS	GSP ROP* SOL+, SOL-	GSP ROP* SOL+, SOL-	GSP ROP* SOL+, SOL-
Power Harness Assembly	PART NO.	693127-1	693138-1	693125-1
	FUNCTIONS	+, -, GND	+, -, GND	+, -, GND
691201-15 Transducer		1 - GSP	1 - GSP	1 - GSP
691201-50 Transducer		1 - MAP1	1 - MAP1	1 - MAP1
691206-50 Transducer		1 - VAC1	1 - VAC1	1 - VAC1
Vibration Monitoring Kit		—	—	GPA0006-1
Filter Transducer Adapter		610879	610879	610879
1/4" Gasket		610880	610880	610880
Bushing, Strain Relief		610756	610756	610756

* ROP not used with GPN1000-12

FIG. 2 WIRE HARNESS LAYOUT – GPN1000/GPN1000-12

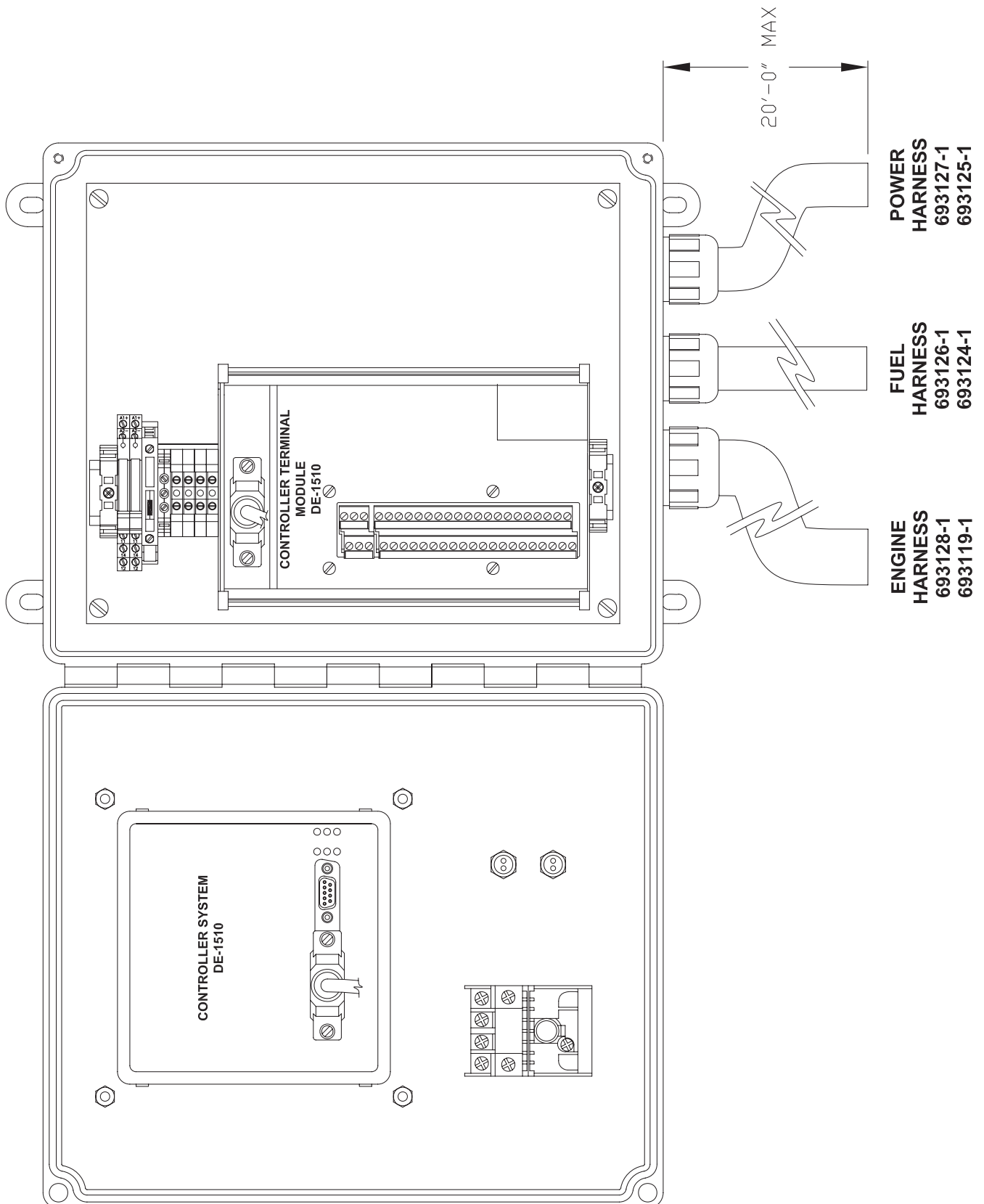


FIG. 3 WIRING DIAGRAM – CUSTOMER CONNECTIONS – GPN1000/GPN1000-12

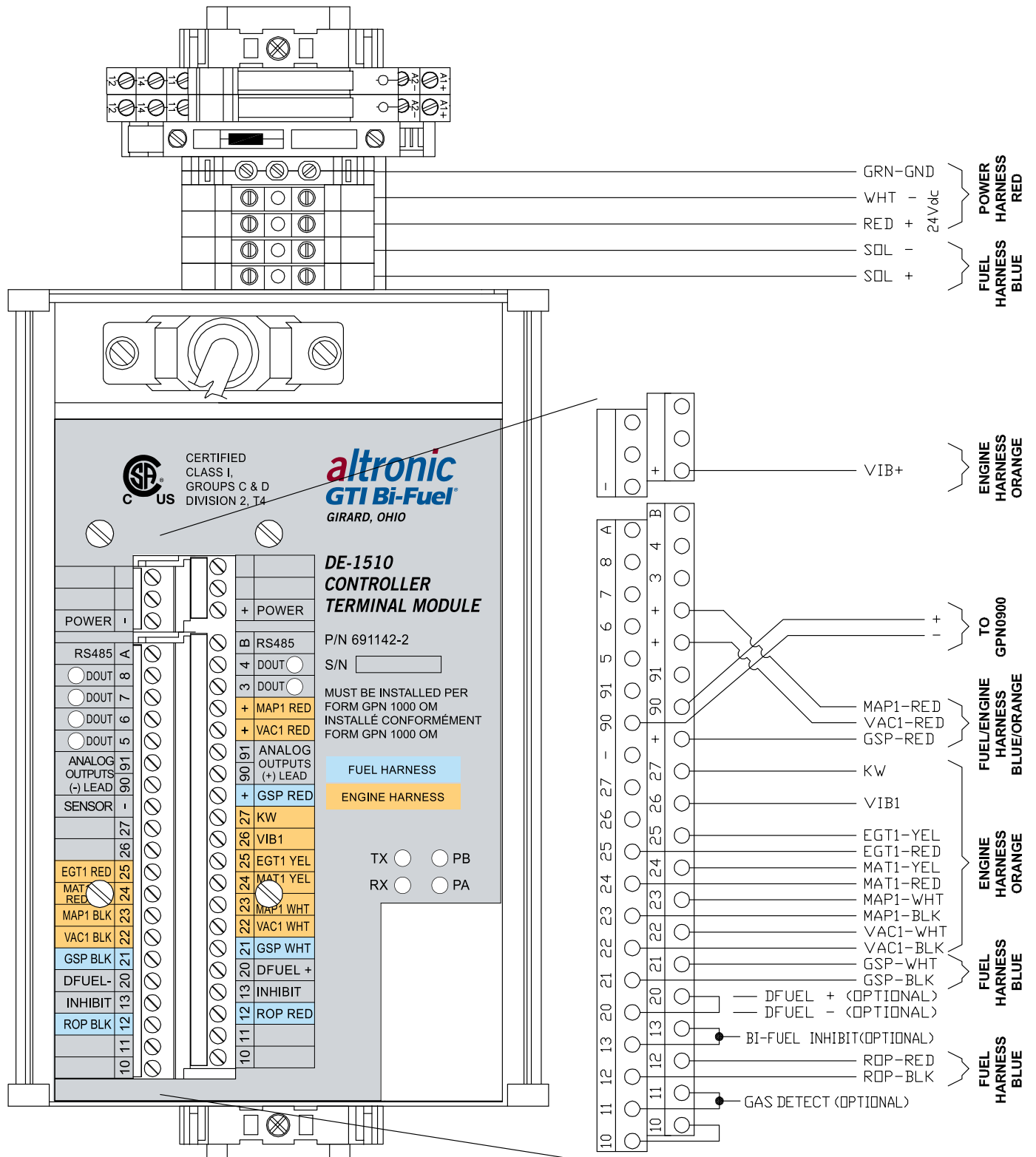
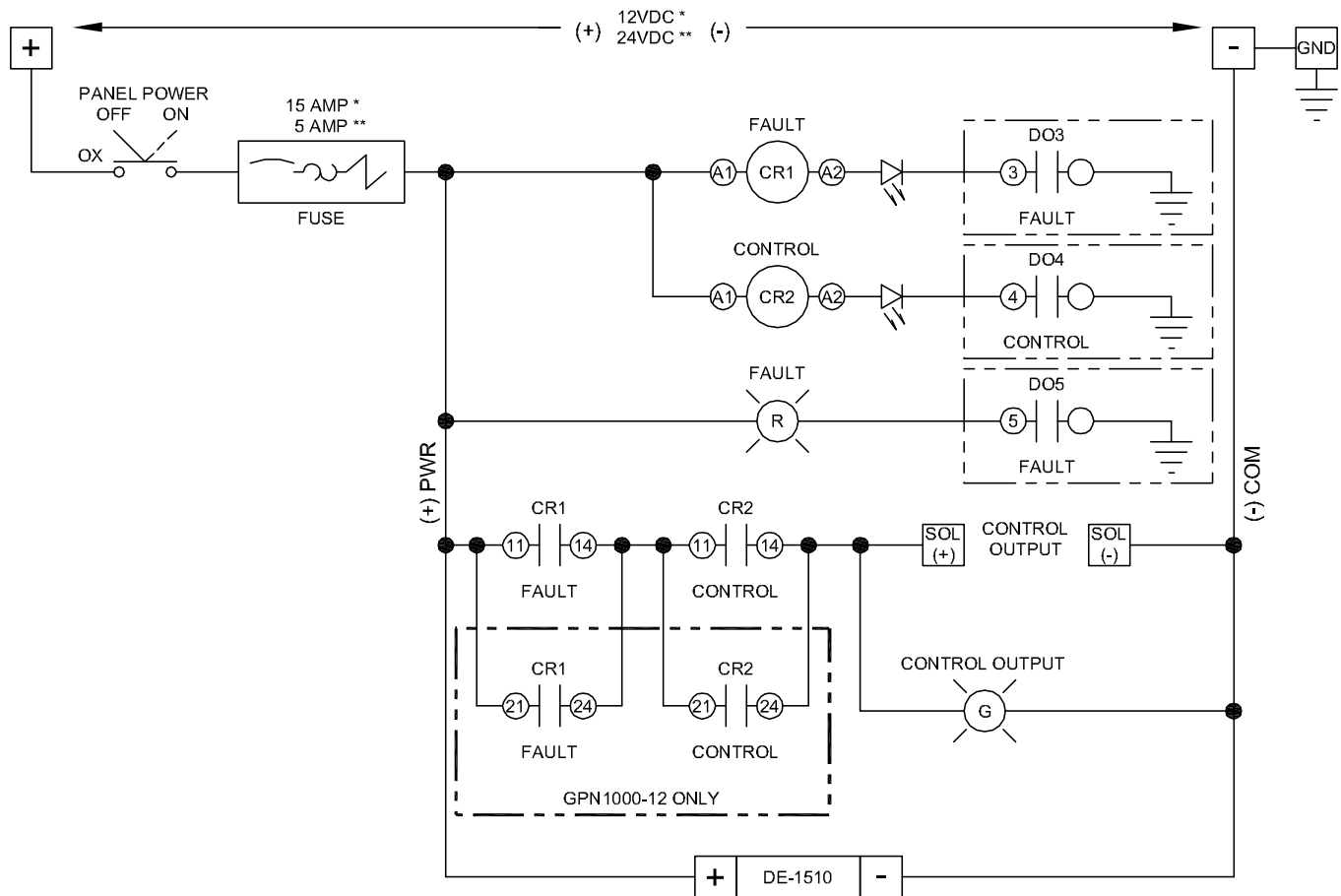


FIG. 4 WIRING DIAGRAM – LADDER LOGIC – GPN1000/GPN1000-12



* GPN1000-12

** GPN1000

