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

1.0 OVERVIEW

1.1　The Altronic DE-2000 annunciator system is an electronic microprocessor-based system designed to monitor normally open or normally closed dry contact sensors used on industrial natural gas engines, compressors and equipment. The system is field-programmable using a PC (personal computer) and the DE-2000 terminal program and contains a non-volatile memory to store the setup. Serial communications provide an interface to Altronic DSM and DSG instruments with RS-485 communications and to PC's, PLC's and modems for remote communication. A backlit 4x20 LCD character display shows system status, programmed engine and compressor parameters and channel labels. A front mounted keypad serves as the user interface.

1.2　The system consists of three main parts: a panel mounted Display Module DE-2000, a Power Supply Module 691122-1, and a Terminal Module 691123-1. These components are interconnected by means of Cable assembly 693115-1.

1.3　This document provides instructions and descriptions for the operation of the annunciator system and does not cover the physical installation. Reference the installation instructions form DE II regarding installation and mounting instructions. Reference the programming instructions form DE PI for configuring the system through a PC or laptop computer using the terminal program.

> **WARNING: THE ANNUNCIATOR SYSTEM MUST BE CONFIGURED PRIOR TO USE ON AN ENGINE. REFERENCE FORM DE PI PROGRAMMING INSTRUCTIONS, FOR INSTRUCTIONS DESCRIBING HOW TO CONFIGURE THE ANNUNCIATOR SYSTEM FOR THE SPECIFIC APPLICATION. VERIFY THE PROGRAM IN NONVOLATILE MEMORY (THE EEPROM) PRIOR TO STARTING ENGINE. REFER TO SECTION 10.0 ON HOW TO VIEW THE CURRENT CONFIGURATION.**

2.0 THE DISPLAY MODULE

2.1　The Display Module serves as the user interface to the DE-2000 annunciator system. It consists of an alphanumeric 20-character x 4-line backlit LCD display, a 16-key front mounted keypad, a 25-pin and 9-pin connectors, and three pair of serial port LED indicators.

2.2　The LCD displays a "home screen" that displays a status line, the engine speed, the suction pressure and the discharge pressure. 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 Altronic DSM or DSG gauges. Pressing the VIEW CHANNEL key displays the channel number, its timer status, analog value (if configured) and the corresponding 20-character user defined label.

2.3   A sealed membrane keypad, along with the LCD display, is used to navigate through channel status and descriptions, view process 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 an engine shutdown and a system power-down. Reference section 4.0 and the drawings section for a description of the keypad.

2.4   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 SUPPLY OUTPUTS, LED INDICATORS AND SERIAL COMMUNICATIONS

3.1   Four plug-in digital Output Modules in the Power Supply Module provide a means of using the DE-2000 annunciator system status to interface with other systems on the engine and compressor. These modules have optically isolated outputs which are not referenced to engine or power ground. The normal state (run state) of these modules is software selectable as either normally open (N/O) or normally closed (N/C). The Output Module sockets and driver system are compatible with industry standard commercially available 0.6 inch plug-in output modules (OPTO 22). They will be in the open condition (de-energized) when the unit is unpowered. A typical application would be as a relay or solenoid coil driver.

In addition to accepting industry standard output modules, custom output module 691124 is available for interface to CD-ignition powered fuel valves or CD-ignition shutdown leads. This custom module is open in the normal run condition and closes upon a fault. The module is specially designed to place the output in the closed condition if power is lost to the annunciator system, thereby achieving "fail-safe" operation of a normally closed module. These modules must be used in position OUT 1 for fuel valve trip, and in OUT 2 for ignition shutdown. Use the "IGN" selection when programming the system for these custom output modules.

3.2   Five red LED indicators are provided on the Power Supply Module for troubleshooting purposes.
   -   The Power LED is ON to indicate that the unit has power and OFF for no power.
   -   The OUT 1 to OUT 4 LED's are ON to indicate that the associated output module is energized. The LED is ON in the normal run condition for N/C and IGN modules and turns OFF for a fault. The LED is OFF in the normal run mode for N/O modules and turns ON for a fault.

3.3   One RS-232 and two RS-485 serial communication ports are provided with the DE-2000 system. The RS-232 port is accessible through a male DB-9 connector on the back of the Display Module. It provides for connection via a standard male/female 9 pin computer cable to a PC or laptop computer to configure the annunciator system using the DE-2000 terminal software. This connection allows direct access to the annunciator configuration. The two RS-485 communication ports are accessible on the Power Supply Module terminal strip; they are labeled port 2 and port 3. RS-485 port 2 is normally used for communication to the optional DSM/DSG monitoring devices. RS-485 port 3 can be used to connect a PC (personal computer) or a PLC (programmable logic controller) to perform remote monitoring or control functions.

4.0 KEYPAD DESCRIPTION

4.1   The DE-2000 annunciator Display Module contains a sixteen-key membrane keypad which is used to stop, reset and test the system. The user can also view process information screens, view channel specifics, cancel timers, and view and edit pertinent operating parameters.

4.2   STOP - The STOP key is used for a manual stop condition. By pressing the STOP key, the annunciator activates the configured output modules in the power supply.

4.3   RESET - The RESET key clears all past faulted points and resets all input and output timers to their preset values.

4.4   TEST - The TEST key disables the output modules and allows the user to fault or test the input sensors. Every time the test button is pressed, the test timer resets to its preset value.

4.5   CANCEL TIMERS - The CANCEL TIMERS key cancels all timers.

4.6   VIEW CHAN - The VIEW CHANNELS key allows the user to view the status of any input channel and its user defined label.

4.7   NEXT - The NEXT key allows the user to view the next item in the sequence; either process information screens, the next fault captured or the next value to be edited.

4.8   VIEW - The VIEW key allows the user to view the process information screens.

4.9   ENTER - The ENTER key is used to accept a selection and to save a new value or configuration in nonvolatile memory.

4.10 ESC - The ESCAPE key enables the user to exit any view channels, information or menu screens at any time and return to the home screen.

4.11 MENU - The menu key allows the user to enter the edit menu. The global timers, input class output assignment, output configuration and the time and date may be viewed and adjusted using the MENU key.

4.12 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, timers and to move the pointer in the menu screen.

4.13 F1 - Function key F1 displays the current time and date entered into the system. It also displays the firmware part number and version date of the firmware.

4.14 F2 - Function key F2 displays the time and date of the first fault.

5.0 UNDERSTANDING THE HOME SCREENS

5.1   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 engine speed on the second line, the suction pressure on the third line and the discharge pressure on the fourth line.

The status line will read one of the following: "TIMERS ACTIVE", "RUNNING", "TEST XXX SEC", FAULT AL1234, MANUAL STOP.

The LCD display always reverts back to one of the home screens after a keypad operation is completed or the operation times out. NOTE: The speed, suction and discharge analog values come from either DSM and/or DSG instruments with RS-485 serial communications configured by the terminal program. The absence of this information will result in dashes for the values of those analog values.

5.2   To start the engine, press the RESET button. The "TIMERS ACTIVE" message will be displayed and remains until all Class B and Class C inputs have been armed.
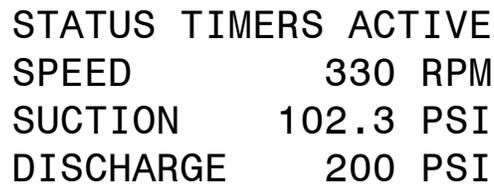
```
STATUS TIMERS ACTIVE
SPEED          330 RPM
SUCTION      102.3 PSI
DISCHARGE     200 PSI
```

5.3   After all Class B and Class C points have timed out and are being monitored, and if no faults are detected, the home screen will show the "RUNNING" message. This is the screen that will remain under normal operation.
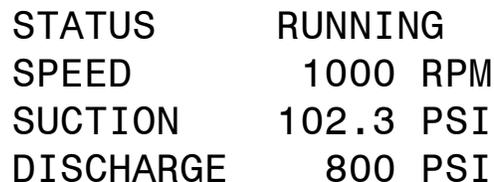
```
STATUS      RUNNING
SPEED        1000 RPM
SUCTION     102.3 PSI
DISCHARGE    800 PSI
```

5.4   The TEST home screen is entered by pressing the TEST key. The TEST mode disarms all outputs and may only be entered from the RUNNING mode. The test time remaining is shown on the top line. See section 9.0 TEST MODE SCREENS for more information.
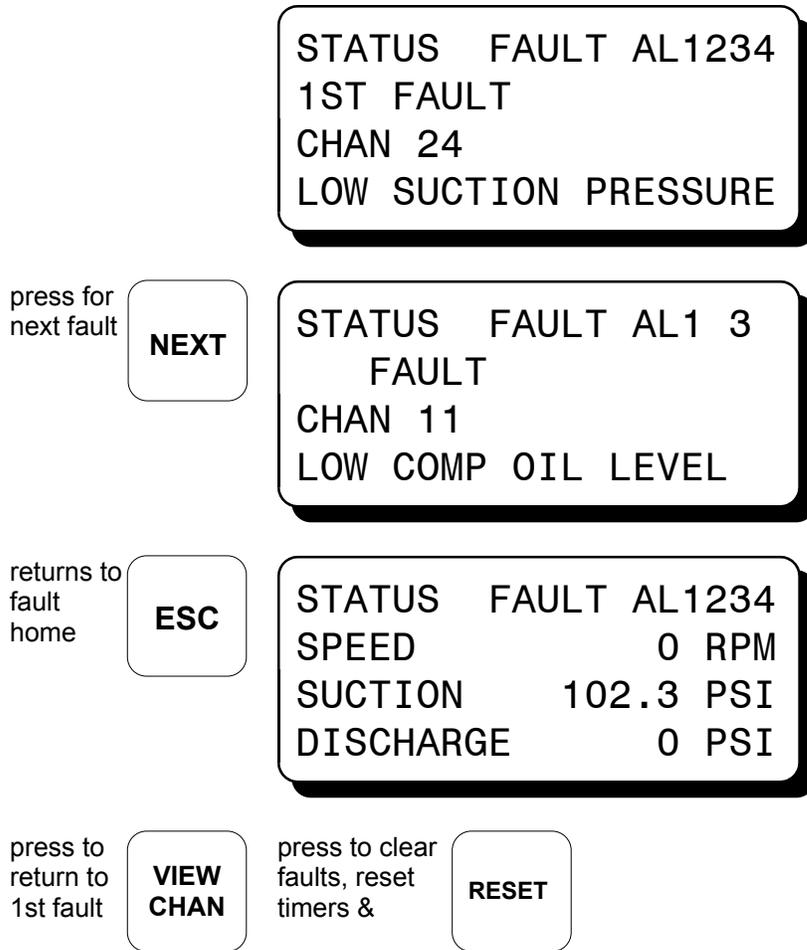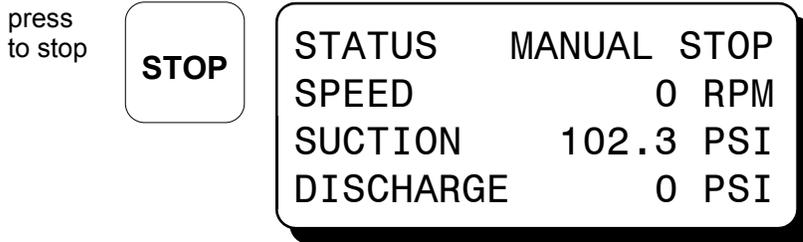
press
to test
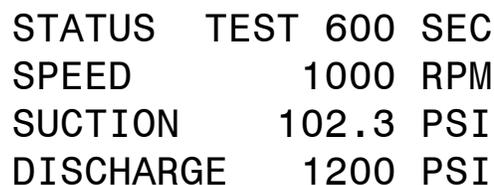
TEST

```
STATUS   TEST 600 SEC
SPEED        1000 RPM
SUCTION     102.3 PSI
DISCHARGE   1200 PSI
```

5.5 If a fault condition occurs, the "FAULT" message for the first faulted channel will appear on the display and will remain there until it is acknowledged. The numbers one through four, after "AL" (alarm), shows the output switch that is faulted. Pressing the NEXT key will show another faulted point if one exists. If the display is showing a fault other than the first fault, continuously pressing the NEXT key will eventually return the display to the first fault screen. Pressing the ESC key will return the display to the fault home screen. To again view the first fault screen, press the VIEW CHAN key. If all of the faulted sensors have been cleared and the RESET key is pressed, the class B, C and output timers will reset and the display will return to the TIMERS ACTIVE home screen.

```
STATUS   FAULT AL1234
1ST FAULT
CHAN 24
LOW SUCTION PRESSURE
```

press for
next fault **NEXT**

```
STATUS   FAULT  AL1 3
    FAULT
CHAN 11
LOW COMP OIL LEVEL
```

returns to
fault
home **ESC**

```
STATUS   FAULT AL1234
SPEED          0 RPM
SUCTION    102.3 PSI
DISCHARGE      0 PSI
```

press to
return to   **VIEW**   press to clear
1st fault   **CHAN**   faults, reset   **RESET**
                         timers &

NOTE: The reset function can also be implemented by using the external RESET input available on the Terminal Module. The behavior of the Annunciator and display will be identical to that obtained by pressing the local RESET key on the Display Module.

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

press
to stop

```
┌────────┐        ┌─────────────────────────────┐
│        │        │ STATUS    MANUAL STOP       │
│  STOP  │        │ SPEED            0 RPM      │
│        │        │ SUCTION      102.3 PSI      │
└────────┘        │ DISCHARGE        0 PSI      │
                  └─────────────────────────────┘
```
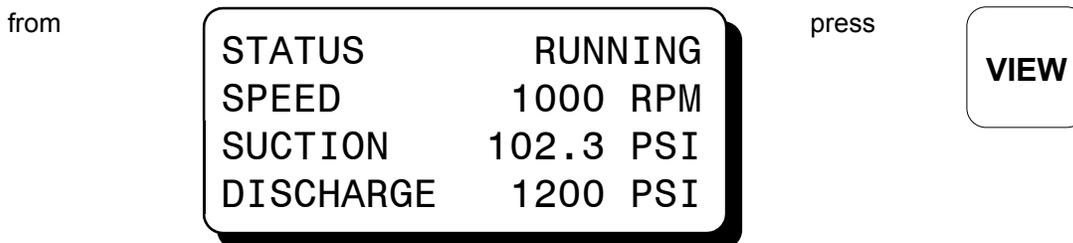
NOTE: The stop function can also be implemented remotely by using the external STOP input available on the Terminal Module. The behavior of the Annunciator and display will be identical to that obtained by pressing the local STOP key on the Display Module.

6.0 VIEW PROCESS INFORMATION SCREENS

6.1 The process information screens can be accessed from any of the home screens (except the test home screen) or from the view channel screen by pressing the VIEW key. There are four process screens: screens one and three each display up to four user programmed process variables; screens two and four display an analog bargraph associated with the previous process variable screen. Thus, up to eight process variables can be displayed both digitally and in bar graph format.

The analog values must come from Altronic DSM/DSG instruments through RS-485 serial communications and are configured by the terminal program. The bargraph end points are set by the low and high setpoints of the DSM/DSG instruments. Unused screens will not be displayed.

from

```
┌─────────────────────────────┐          press     ┌────────┐
│ STATUS        RUNNING       │                    │        │
│ SPEED        1000 RPM       │                    │  VIEW  │
│ SUCTION      102.3 PSI      │                    │        │
│ DISCHARGE    1200 PSI       │                    └────────┘
└─────────────────────────────┘
```

SEE NEXT PAGE FOR THE FOUR CUSTOM "VIEW PROCESS" SCREENS.

6.1   (continued)

NOTE: Screens one and two display in digital and bargraph form the first group of four selected analog inputs.

then at

```
SUCTION      102 PSI
INTSTG1      400 PSI
INTSTG2      800 PSI
DISCHRG     1200 PSI
```

press to view bargraph **VIEW**

then at bargraph screen

```
SUCTION  L▓           H
INTSTG1  L▓▓▓▓▓       H
INTSTG2  L▓▓▓▓▓▓▓     H
DISCHRG  L▓▓▓▓▓▓▓▓▓▓ H
```

press to view next **VIEW**

NOTE: Screens three and four display in digital and bargraph form the second group of four selected analog inputs.

then at

```
TEMP 1         180
EF
TEMP 2         250
EF
TEMP 3         300
EF
TEMP 4         320
EF
```

press to view bargraph **VIEW**

then at

```
TEMP 1  L▓▓▓▓▓      H
TEMP 2  L▓▓▓▓▓      H
TEMP 3  L▓▓▓▓▓▓     H
TEMP 4  L▓▓▓▓▓▓▓▓▓  H
```

press to view next process **VIEW**

press To escape **ESC**

7.0 VIEW CHANNEL STATUS SCREENS

7.1 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 first line will be the annunciator system status; "TIMERS ACTIVE", "RUNNING", "FAULT AL1234", or "MANUAL STOP".
- The second line shows whether the input point is "ARMED" or "NOT ARMED". Class A points will always be armed; class B and C points become armed only after their timers have timed out.
- The third line shows the channel number and an analog value of either a DSM or DSG unit; if configured for that channel.
- The fourth line shows the user entered 20 character channel description.

Upon pressing the view channel key, channel 10 will be shown. The UNITS and TENS keys allow the user to quickly navigate through the annunciator 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 five minutes with no keypad activity, the display will revert back to the current home screen.

from current
home screen

```
STATUS TIMERS ACTIVE
SPEED           330 RPM
SUCTION      102.3 PSI
DISCHARGE      200 PSI
```

press   **VIEW CHAN**

to see channel
20 from channel
10

```
STATUS TIMERS ACTIVE
  NOT ARMED
  CHAN 10
ENGINE OIL PRESSURE
```

press   **→ TENS**

to see channel
21 from channel
20

```
STATUS TIMERS ACTIVE
  ARMED
  CHAN 20       23 PSI
LB MANIFOLD PRESSURE
```
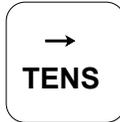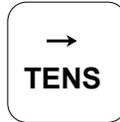
press   **↑ UNITS**

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7.1 (continued)

to see channel A from channel 21

```
STATUS TIMERS ACTIVE
  NOT ARMED
  CHAN 21      23 PSI
LB MANIFOLD PRESSURE
```
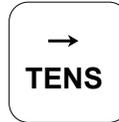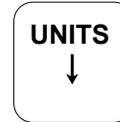
press [→ TENS] then press [→ TENS] then press [→ TENS] then press [UNITS ↓]
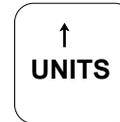
to see channel A1 from channel A

```
STATUS      RUNNING
  ARMED
  CHAN A
PRESSURES
```

press [↑ UNITS]

to exit view channels mode

```
STATUS      RUNNING
  ARMED
  CHAN A1     550 PSI
SUCTION PRESSURES
```

press [ESC]

8.0 SHUTDOWN OR FAULT STATUS SCREENS

8.1 With the engine running and the annunciator system monitoring points, if a fault occurs, the display will show the first fault detected. The phrase "1ST FAULT" and "AL1234" will be displayed; "AL1" is for the first output, "AL12" is for outputs one and two and so on. The output or outputs configured for that channel will trip. The first fault will stay displayed on the screen until it is acknowledged by one of the keypad keys NEXT, RESET or ESC. Pressing the NEXT key increments the display to another faulted channel, if one exists. With each press of the NEXT key, another currently faulted channel will be displayed. The word "FAULT" will be displayed for subsequent faults.

After all of the current faulted channels are displayed, the display will revert back to the first fault. If no class A sensors are faulted, pressing the RESET key will clear all displayed faults and return the display to the timers active home screen. All class B and C input timers and the output timers will be reset. Pressing the ESC key when the fault screen is displayed will return the display to the fault home screen. To again view the "first fault" from the fault home screen, press the VIEW CHAN key.

8.1   (continued)

Upon a fault,
the first fault is shown.

```
STATUS FAULT   AL1234
1st FAULT
  CHAN 24
LIQUID LEVEL STAGE 1
```

press
next for
another

NEXT

Next faulted channel
is shown. Current
analog value is shown
from DSG or DSM
gauge.

```
STATUS FAULT    AL1234
FAULT
  CHAN 26       50 PSI
LB MANIFOLD PRESSURE
```

press
next for
another

NEXT

press to
reset
timers &

RESET

```
STATUS TIMERS ACTIVE
SPEED         330 RPM
SUCTION    102.3 PSI
DISCHARGE    200 PSI
```

press
next for
the next

NEXT

or press
reset to
reset

RESET

or press
esc for
fault home

ESC

8.2   When a fault occurs on an Altronic DSM monitor, a "HIGH" or "LOW" indication will additionally
be displayed as to whether the point faulted on a high or low setpoint.

A high setpoint faulted
on a DSM monitor.
The analog value and
"HIGH" are displayed.

```
STATUS  FAULT   AL12
1st FAULT HIGH
  CHAN A3     500 PSI
HIGH  INTRSTAGE PRESS
```

press
reset to
clear

RESET

9.0 TEST MODE SCREENS

WARNING: TEST MODE DISARMS ALL OUTPUTS. ACTUAL FAULTS WILL DISPLAY BUT WILL NOT TRIP THE SYSTEM ALARM AND SHUTDOWN OUTPUTS.

9.1 The test mode is used for testing sensors without tripping the outputs. The annunciator system stays in the test mode for a preset timed period. To enter the test mode, make sure the home screen status line says "RUNNING", and press the TEST key on the keypad. The status line will display "TEST xxx SEC"; xxx being the remaining test time. To test an input, momentarily fault a sensor. The display will show the faulted point, its description and "1st FAULT" for the first point tested. To test another point press the TEST key, this will clear the tested sensor from the display and will refresh the test timer to its full programmed test time.

press to enter test mode

TEST

```
STATUS   TEST 600 SEC
SPEED           1000 RPM
SUCTION       102.3 PSI
DISCHARGE     1200 PSI
```

Test screen is shown with no faulted points. Test key was pressed from the "RUNNING" home screen.

sensor point 24 is tested.

```
STATUS   TEST 525 SEC
1st FAULT
 CHAN 24
LIQUID LEVEL STAGE 1
```

press to test another

TEST

9.2 If desired, more than one sensor can be tested at a time. When several sensors are momentarily faulted, they can be acknowledged by pressing the NEXT key. The first faulted sensor will display "1st FAULT" the others will be shown as "FAULT" (note the absence of "1st"). The NEXT key does not refresh the test timer. After the last faulted sensor is acknowledged, the display will return to displaying the first faulted point.

sensor points 26 and 30 are tested

```
STATUS   TEST 413 SEC
1st FAULT
 CHAN 26
ENGINE OIL PRESSURE
```

press to view another

NEXT

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9.2   (continued)

Sensor points 26 and
30 are tested

```
STATUS   TEST 235 SEC
 FAULT
 CHAN 30
ENGINE VIBRATION
```

press
to clear
both

TEST

9.3   When an Altronic DSM monitor is tested, a "HIGH" or "LOW" indication will additionally be displayed indicating whether a high or low setpoint was tested. With either a DSM and DSG instrument, the display will show the current analog value for the channel displayed.

A high setpoint was
faulted on a DSM
monitor

```
STATUS   TEST 530 SEC
1st FAULT HIGH
 CHAN A3     500 PSI
HIGH INTRSTAGE PRESS
```

9.4   If no sensors are faulted and the TEST key is pressed, the display will return to the test home screen. The test timer will be reset and speed, suction and discharge values will be displayed.

press
test key

TEST

```
STATUS   TEST 600 SEC
SPEED        1000 RPM
SUCTION    102.3 PSI
DISCHARGE   1200 PSI
```

No sensors faulted. Test
home screen is displayed.

9.5   To exit the test screen, press either the ESC or RESET key. Pressing the ESC key takes the user to the "STATUS RUNNING" home screen and does not reset the class B, C and output timers. Pressing the RESET key takes the user to the "STATUS TIMERS ACTIVE" home screen with the class B, C and output timers reset.

press
esc key

ESC

```
STATUS      RUNNING
SPEED        1000 RPM
SUCTION    102.3 PSI
DISCHARGE   1200 PSI
```

No sensors faulted.
Running home screen is
displayed.

9.5   (continued)

press
reset key   **RESET**

```
┌─────────────────────────────┐
│  STATUS TIMERS ACTIVE       │
│  SPEED            1000 RPM   │
│  SUCTION         102.3 PSI   │
│  DISCHARGE       1200 PSI    │
└─────────────────────────────┘
```

No sensors faulted.
Timers active home
screen is displayed.

10.0 VIEWING OR EDITING THE CONFIGURATION USING THE MENU MODE

10.1   The menu screens can be accessed from any home screen (except test) by pressing the MENU key. The menu screens allow the user to view or edit the global values, the input class, the output assignment, the output configuration, and the time and date. The annunciator must be initially configured using the terminal program running on a PC connected to the RS-232 port on the back of the annunciator. Reference the programming instructions form DE PI for instructions on how to configure the annunciator 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. Listed below are the values that can be edited:

A: EDIT THE GLOBAL VALUES:
1.   CLASS C TIME - from 1 to 999 minutes.
2.   TEST TIME - from 1 to 999 seconds.

B: EDIT THE INPUT CLASS:
The input class options are:
- Class A - no time delay on start-up.
- Class B - 1 to 999 seconds time delay on start-up before input is active.
- Class C - safe-until-first-met with a global time delay; as edited in part A.

C: EDIT THE OUTPUT ASSIGNMENT:
Each input channel can be mapped to outputs 1, 2, 3, or 4 or any combination of them.

D: EDIT THE OUTPUT CONFIGURATION:
1.   CONFIGURATION
- N/O (Normally Open) - open in the normal run state and closes upon a fault
- N/C (Normally Closed) - closed in the normal run state and opens upon a fault or loss of 12-24 Vdc input power.
- IGN (Ignition Shorting and Fuel Valve Trip Module, Altronic P/N 691124) - open in the normal run state and closes upon a fault or loss of 12-24 Vdc input power.
2.   ACTIVATION DELAY TIME - from 0 to 99 seconds.

E: EDIT THE TIME AND DATE:
1.   TIME
2.   DATE

F: COMMUNICATIONS
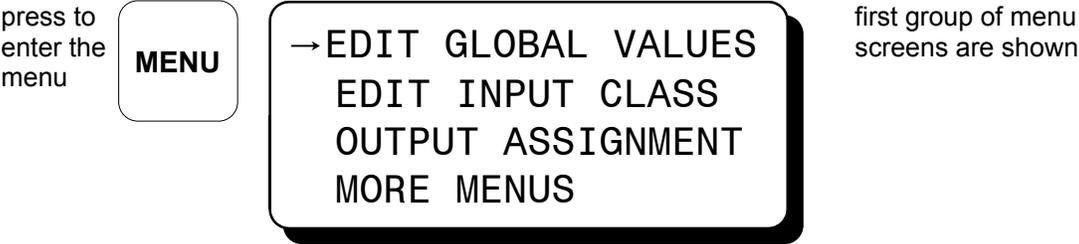1.   NODE (1-99)
2.   ASCII or Modbus RTU

10.2 To VIEW the annunciator 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 annunciator configuration, the annunciator system requires a password key sequence.

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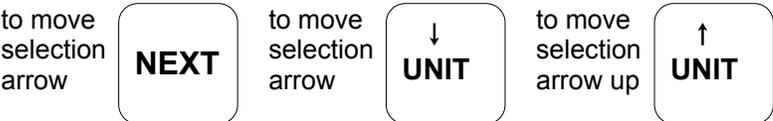Upon pressing this sequence changes can be made to the configuration.

10.3 The following keys have the same effect in all of the menu screens. If no key is pressed within one minute, the menu screen will time out and return to the current home screen.

NEXT: The NEXT key moves the selection arrow to the next selection or value without making a change to the previous value.

↑UNITS: The ↑UNITS key moves the selection arrow up one selection or increases the value by one.

↓UNITS: The ↓UNITS key moves the selection arrow down one selection or decreases the value by one.

→TENS: The →TENS key increases the value by ten.

←TENS: The ←TENS key decreases the value by ten.

ENTER: The ENTER key saves the new value and advances the selection arrow to the next value to be changed.

ESC: The ESC key returns the display back to the first level of menu screens and when pressed again back to the current home screen.

10.4 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. The second level is where the items can be viewed or changes can be made. 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: "EDIT GLOBAL VALUES". 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.

press to enter the menu | **MENU** | →EDIT GLOBAL VALUES
     EDIT INPUT CLASS
     OUTPUT ASSIGNMENT
     MORE MENUS   first group of menu screens are shown

Use the following keys to navigate the menu screen.

to move selection arrow | **NEXT** | to move selection arrow | **↓ UNIT** | to move selection arrow up | **↑ UNIT** |

10.5 To edit the global values, point to "EDIT GLOBAL VALUES" and press the ENTER key. The edit global values screen is shown. The arrow points to the value to be changed.

press to edit the global

ENTER

```
EDIT GLOBAL VALUES
CLASS C TIME→1O MIN
TEST TIME    1OO SEC
NODE NUMBER    1
```
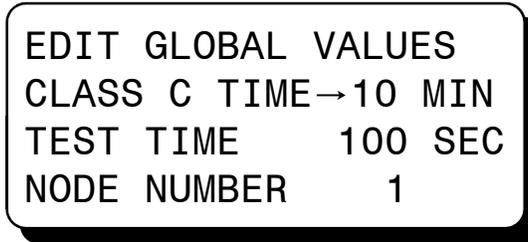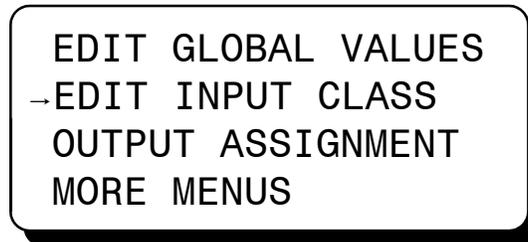
edit the class C global time

To change the global time for the class C sensor inputs use the ↑UNITS or ↓UNITS keys to increase or decrease the value by one. Use the →TENS or ←TENS keys to increase or decrease the value by ten. Press the ENTER key to save the new value and advance to the next value to be changed. Press the NEXT key without making a change to the class C time to reach the test time. Pressing the NEXT key when the arrow is pointing to the node number brings the edit pointer back up to the class C time.

10.6 To edit the input class, use the NEXT or ↓UNITS key to point to the edit input class and press the ENTER key.

from

```
 EDIT GLOBAL VALUES
→EDIT INPUT CLASS
 OUTPUT ASSIGNMENT
 MORE MENUS
```

press

ENTER

Channel 10's input class configuration will be displayed. Each input channel 10-47 can be either class A, B, or C. The class for input channels A, B, C and D is set in the DSM monitor. A diamond next to the input class letter selects that class for the displayed channel. First select the channel to be edited by using the ↑UNITS or ↓UNITS keys to increase or decrease the value by one or use the →TENS or ←TENS keys to increase or decrease the value by ten. Once the desired channel is displayed, press the ENTER key. An arrow replaces the diamond pointing to the current class. Use the →TENS or ←TENS keys to change the selected channel's class. The description for the class will be described below it.

```
CHAN →1O
INPUT CLASS ,A  B  C
NO TIME DELAY ON
START-UP
```
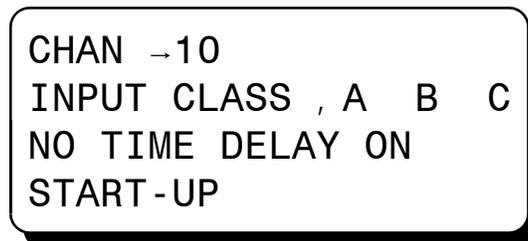
10.6   (continued)

To view channel 20's input class.

press

```
  →
 TENS
```

```
CHAN →20
INPUT CLASS  A , B   C
   92 SECONDS TIME
DELAY ON START-UP
```
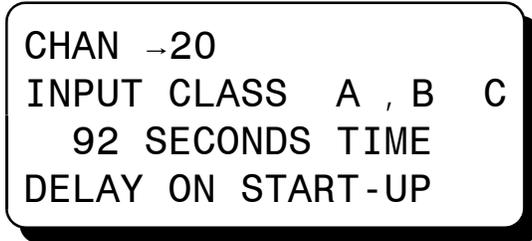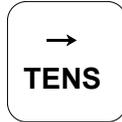
To edit channel 20's input class.

press

```
ENTER
```

```
CHAN  20
INPUT CLASS A →B   C
   92 SECONDS TIME
DELAY ON START-UP
```
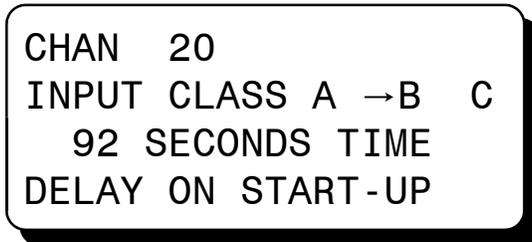
The selection arrow will point to the current class B time. To adjust it, use the ↑UNITS or ↓UNITS keys to increase or decrease the value by one or use the →TENS or ←TENS keys to increase or decrease the value by ten.   Once the desired time is displayed, press the ENTER key to save the new value.

press

```
ENTER
```

```
CHAN   20
INPUT CLASS   A , B   C
  →92 SECONDS TIME
DELAY ON START-UP
```

```
CHAN   20
INPUT CLASS   A , B   C
→160 SECONDS TIME
DELAY ON START-UP
```
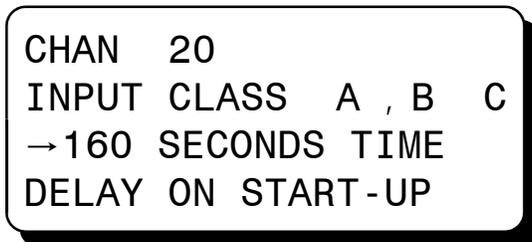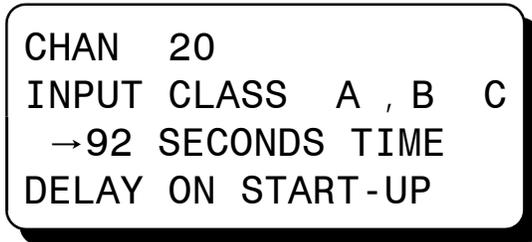
press to
save the
new time

```
ENTER
```

10.6 (continued)

Any channel can be changed to a class C input in the EDIT INPUT CLASS menu, but the input delay time is a global time (the same timeout for all class C inputs) and is edited in the "EDIT GLOBAL VALUES" screen as described in section 10.5. Inputs that are class C will display a diamond in front of "C" on the input class line as shown below.

```
CHAN →37
INPUT CLASS  A  B , C
CLASS C GLOBAL TIME
10 MINUTES
```

To view or edit the next channel number, press the NEXT key until the arrow points to the channel number. Select another channel number by using the ↑UNITS or ↓UNITS keys to increase or decrease the value by one or use the →TENS or ←TENS key to increase or decrease the value by ten and press ENTER.

10.7 To edit the output assignment, use the NEXT or ↓UNITS keys to point to the "OUTPUT ASSIGNMENT" menu and press the ENTER key.

from

```
 EDIT GLOBAL VALUES
 EDIT INPUT CLASS
→OUTPUT ASSIGNMENT
 MORE MENUS
```

press

```
ENTER
```

Channel 10's output assignment will be displayed. Each input channel can be mapped to outputs 1, 2, 3, or 4 or any combination of them. All four outputs are shown with the word "ON" or "OFF" below the output number. The outputs selected ON will change state upon a fault of that channel number; the outputs selected OFF will not be affected by that channel. If no output action is desired for a given input, select OFF for all outputs.

First select the channel to be edited by using the appropriate UNITS or TENS keys. Once the desired channel is displayed press the ENTER key. An arrow will precede output 1. Use the ↑UNITS or ↓UNITS keys to toggle the selected output ON or OFF. The ENTER key accepts the change and advances the pointer to output 2. Use the NEXT or →TENS or ←TENS keys to select the other output numbers and follow the same procedure to make changes. To view or edit the next channel number, press the NEXT or →TENS keys until the arrow points to the channel number. Select another channel number by using the appropriate UNITS or TENS keys.

```
CHAN 10'S INPUT
ACTIVATES OUTPUT
→1   2   3   4
ON  ON  OFF OFF
```

10.8 To edit the output configuration, use the NEXT or ↓UNITS keys to point to the "OUTPUT CONFIG." menu and press the ENTER key.

from

```
→OUTPUT CONFIG.
 EDIT TIME AND DATE
 COMMUNICATIONS
 TO PREVIOUS MENU
```

press

ENTER

A selection arrow pointing to output 1 along with output 1's delay time and a diamond showing whether it is configured for N/O (normally open), N/C (normally closed), or IGN (ignition output module 691124) will be shown. To view an output's configuration, use the NEXT or →TENS or ←TENS keys to place the selection arrow in front of the output to be viewed.   The output's time delay and output state will be shown for each output.

```
OUTPUT→1   2   3    4
DELAY TIME      0 SEC
 N/O      N/C    , IGN
```

To edit an output's configuration, use the NEXT or →TENS or ←TENS keys to place the selection arrow in front of the desired output and press the ENTER key. The selection arrow will point to the delay time. Each output switch can have its own activation delay time from 0 to 999 seconds. An output switch with a delay time of 0 seconds will trip immediately upon a fault. If a delay time is set for an output switch, the output will trip following a fault plus the delay time selected. This allows, for example, a delay time between when the fuel valve trips on output 1 and when the ignition shorts on output 2.

press

NEXT

```
OUTPUT 1  →2   3    4
DELAY TIME      3 SEC
 N/O      N/C     , IGN
```

then
press

ENTER

10.8   (continued)

A diamond will replace the arrow in front of the selected output switch. An arrow will proceed the delay time indicating a change can be made to the selected output's delay time. Use the ↑UNITS or ↓UNITS keys to increase or decrease the value by one or use the →TENS or ←TENS key to increase or decrease the value by ten. The ENTER key accepts the change and advances the pointer to select either N/O, N/C or IGN.

```
OUTPUT  1 , 2   3    4
DELAY  TIME    →6 SEC
 N/O        N/C     , IGN
```

press to accept the   **ENTER**
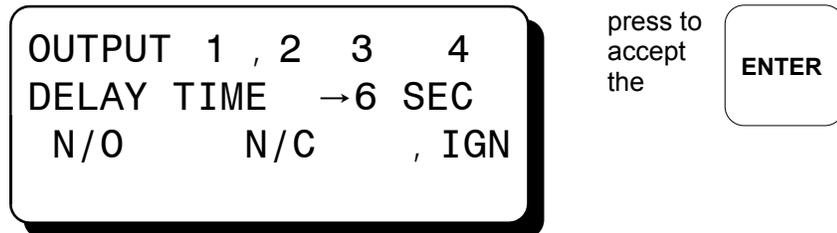
The selection arrow replaces the diamond indicating a change can be made. The selected output switch can be configured for N/O (normally open), N/C (normally closed), or IGN (ignition module 691124).

NOTE: The IGN selection is intended for the Altronic output module 691124 only. The IGN selection can be made for output switch numbers 1 and 2 only.

An output switch configured for normally open will be open in the normal run state and close upon a fault.

An output switch configured for normally closed will be closed in the normal run state and will open upon a fault or loss of 12-24 Vdc input power.

An output switch configured for the ignition module will be open during normal run and will close upon a fault or loss of 12-24 Vdc input power.   Use the NEXT key to make a selection and press ENTER to save.

press to select   **NEXT**

```
OUTPUT  1 , 2   3    4
DELAY  TIME     , 6 SEC
 N/O        N/C    →IGN
```

press to accept the   **ENTER**
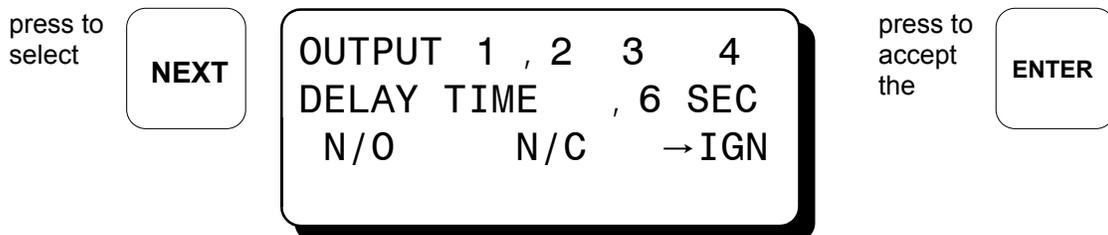
Upon pressing the ENTER key, a diamond will replace the selection arrow. To view or edit the next output number, press the NEXT or →TENS or ←TENS keys until the arrow points to the desired output number and repeat the process.

10.9 To view or edit the time and date, use the NEXT or ↓UNITS keys to point to the "EDIT TIME AND DATE" menu and press the ENTER key.

from

```
┌─────────────────────────────┐
│  OUTPUT CONFIG.             │
│ →EDIT TIME AND DATE         │
│  COMMUNICATIONS             │
│  TO PREVIOUS MENU           │
└─────────────────────────────┘
```

press

```
┌─────────┐
│  ENTER  │
└─────────┘
```

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.

```
┌─────────────────────────────┐
│  TIME:  →11:30 AM           │
│  DATE:    09-03-1998        │
│                             │
│                             │
└─────────────────────────────┘
```

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.

```
┌─────────────────────────────┐
│  TIME:   11:30 AM           │
│  DATE:  →09-03-1998         │
│                             │
│                             │
└─────────────────────────────┘
```

10.10 To view or edit the communications setup, select "COMMUNICATIONS" from the menu and press ENTER.

```
COMMUNICATIONS
NODE  → 1
PORT 1   ASCII
PORT 3   MODBUS
```
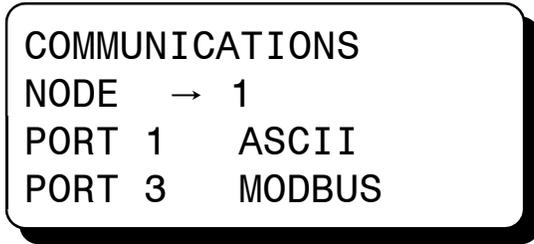
Use the NEXT key to select node, port1 or port 3; then use the UP or DOWN arrow keys to change the node number from 1 to 99 and port 1 and port 3 from ASCII to MODBUS. Press ENTER to save selection.

11.0 VIEWING THE TIME AND DATE

11.1 The time and date can be viewed by pressing the F1 key. The time displayed will be the time when the F1 key was pressed and will not update in this screen. The firmware part number (of the microcontroller chip) and the version date of the firmware are also displayed on this screen. Press the ESC key to return to the current home screen. If no key is pressed for 10 seconds, the display will revert back to the current home screen.

Press to view time and date

F1

```
 Time: 11:30 AM
 Date: 11-15-1998
Firmware P/N 601883
Version  10/15/98
```
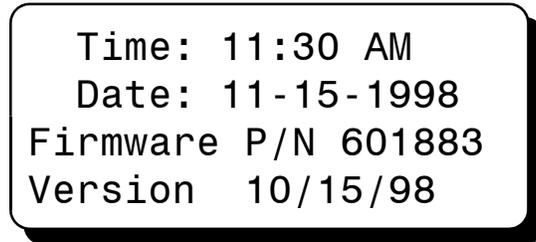

12.0 VIEWING THE TIME AND DATE OF THE FIRST FAULT

12.1 The DE-2000 annunciator 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 back to the first fault screen. Press the ESC key to return to the current home screen.

Press to view time & date of

F2

```
TIME AND DATE OF
THE FIRST FAULT.
TIME: 3:10 PM
DATE: 03-25-1999
```
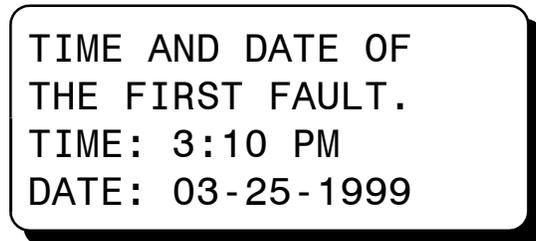
13.0 CONTRAST RATIO ADJUSTMENT

13.1 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 65EF to 77EF (18EC to 25EC), 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.

14.0 DATA LOGGING AND COMMUNICATION OPTIONS

14.1 The DE-2000 annunciator 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.

14.2 NODE NUMBER - The node number is the address of the annunciator being contacted. This number is programmed by the terminal program and can be viewed or edited in the menu screen, refer to section 10.5. A two digit number from 01 to 99 can be used.

14.3 COMMUNICATIONS PARAMETERS - The following must be set in the PC or PLC to communicate with the annunciator system:
      Baud Rate: 9600
      Data Bits: 8
      Stop Bits: 1
      Parity: None

14.4 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 the time between data logs and can be set from 5 minutes to 999 minutes. The logging period must be set in the terminal program. Reference the programming instructions form DE PI to set the logging period. So 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.

14.5   The DE-2000 system uses a simple ASCII command to read the data collected. The ASCII command must be transmitted to the annunciator by the PC or PLC before it can respond. The command is shown below. The hexadecimal values for the characters are shown only for those using low level (assembly language) decoding and will not appear on the communications terminal screen.

ASCII   >(01 DL 001)
HEX   3Eh 28h 30h 32h 20h 44h 4Ch 20h 30h 30h 32h 29h

COMMAND HEADER ">" (3Eh) - The command must begin with the command header.

START OF TEXT "(" (28h) - The start of text character must be next.

NODE NUMBER 01 - 99 - The node number or address of the annunciator being contacted is next. 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.

SPACE (20h) - Following the node number is an ASCII space character (not printable, value 20h) to act as a delimiter between the node number and the two character command word.

COMMAND WORD "DL" (44h, 4Ch) - The command word is an upper case DL that stands for data log.

SPACE (20h) - A space again is used as a delimiter.

RECORD NUMBER 001 - 100 - The record number is the requested record. This number can be any number from 001 to 100. Record number 001 always contains the most recent record, 002 the second most recent and so on. The annunciator holds a maximum of 100 records in its memory before overwriting the oldest record.

14.6   One record contains the following information:

COMP. STATION #01 GIRARD, OHIO	User entered data log header describing location
001 OUT OF 100	Record number
10-19-1998 9:46 AM	Date/time the record information was collected
STATUS RUNNING	Normal home screen status line
SPEED 925 RPM	Normal home screen, line two
SUCTION 102.3 PSI	Normal home screen, line three
DISCHARGE 800 PSI	Normal home screen, line four
SUCTION 102.3 PSI	* First view process screen, line one
INTSTG1 355 PSI	* First view process screen, line two
INTSTG2 550 PSI	* First view process screen, line three
DISCHRG 800 PSI	* First view process screen, line four
TEMP 1 55 EF	* Second view process screen, line one
TEMP 2 170 EF	* Second view process screen, line two
TEMP 3 180 EF	* Second view process screen, line three
TEMP 4 190 EF	* Second view process screen, line four
1ST FAULT HIGH	** First fault indication when fault occurs
CHAN A3 500 PSI	** Channel number and value of first fault
HIGH INTRSTAGE PRESS	** 20 character label associated with the first fault
10-19-1998 9:46 AM	** Date and time of the first fault

*   If a view process screen line is not programmed in the annunciator, the line will be blank.
**   These lines will be blank when there are no faults.

14.7 If it is desired to read more than one record, the read command can be sent in succession with a different record number. The time between read commands should be five seconds or longer.

14.8 The first fault data log record can be read remotely if a current fault exists in the annunciator. Send the following ASCII command for the first fault data log:

>(01 DL 999)

01 is the node number and should match the annunciator. 999 is where the current first fault is located. If this command is sent with no faults on the annunciator, it will respond with NO DATA AVAILABLE.

14.9 The most current data can be read remotely by sending the following ASCII command:

>(01 DL 000)

14.10 The DE-2000 is also compliant to the Modicon **Modbus RTU** standard. The DE-2000 only supports register reads; 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. See Modbus register address list pages 28 to 32. Note the first 7 Modbus registers duplicate the registers of the Altronic DD-40NTS to simplify user software requirements, if both types of systems are in use.

14.11 IDENTIFICATION - In addition to the above, the DE-2000 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 - 2 0 0 0 CRC CRC

NN = node number, 17 = ID function code, 07 = number of bytes to follow, DE-2000 (seven byte ASCII ID string), CRC CRC = two byte Modbus RTU CRC

14.12 STOP / RESET - Register 40999 can be written to remotely trigger the stop and reset functions. It will respond to a single write only (function code 06). The stop command is 0xAC53. The reset command is 0xBE41.

15.0 AUTOMATIC CALL OUT USING AN EXTERNAL MODEM

15.1 The DE-2000 annunciator system can perform an automatic call out upon a fault condition. When a fault occurs, the DE-2000 annunciator system will dial up to four preprogrammed phone numbers stored in an external modem, negotiate communications and send the first fault data log report message (the 999 command) to the Altronic monitor program on a PC or to a customer supplied device.

15.2 An external modem of 9600 baud or greater along with a null modem cable or adapter connected to the RS-232 port on the annunciator is used for remote modem communications. Please see the Altronic drawing WIRING DIAGRAM - EXTERNAL MODEM in the programming instructions form DE PI and the modems user's guide for more information on installing the modem.

15.3   The modem must first be configured using the monitor program to the following configuration:
Note: The related modem configuration commands are shown in parenthesis. The commands not listed are set to factory defaults. Modem profile 0 (zero) is used by the annunciator system. Up to four phone numbers can be programmed in the modem.

9600 baud only (S37=9)
8 data bits
1 stop bit
no parity
DTR is always on (&D0)
Local Echo off (E0)
Display verbal result codes (V1)
Auto answer on the first ring (S00=1)
Set inactivity timer to one minute (S19=1)
Store the current configuration as profile 0 in nonvolatile memory (&W0)
Use modem profile 0 (&Y0)
store up to four telephone numbers in nonvolatile memory (&Zn=x)
        n is the memory location, x is the phone number to be stored

For more information on configuring the modem please see the programming instructions DE PI. Also please refer to the modems user's guide and reference manual.

15.4   Upon a fault, the annunciator sends the dial string to dial the first stored phone number in the modem (ATDTS0). If communications are established, the first fault data log report message is sent. After the first fault message is sent, a pause of about ten seconds occurs allowing for time to request other data logs. After ten seconds of no activity the annunciator causes the modem to go offline. The first fault data log is then available on the remote PC for customer use. If more than one phone number is programmed in the modem, the annunciator will attempt to dial each number until all numbers have been successfully negotiated. If the first stored phone number in the modem is not available, the annunciator will immediately dial the second stored phone number. After attempting to dial all of the programmed phone numbers and If any of them were not answered, a pause of 10 minutes will occur. After the 10 minute wait period for the line to clear, the annunciator will send the dial string for the unanswered stored phone numbers. This sequence will occur twenty times or until it gets a connect signal for each programmed phone number. If all faults are cleared by initiating a reset, the annunciator will cease dialing out.

16.0 TROUBLESHOOTING THE DE-2000 ANNUNCIATOR SYSTEM

16.1   The power LED's on the Power Supply and Terminal Module are blank as well as the LCD on the display module:
   A.   Check the power supply voltage at the 12-24 Vdc input terminals; should be between 12 and 24 Vdc.
   B.   Check the power supply power fuse and replace if blown. NOTE: A spare fuse (part number 601653 - 6.3 amp) is provided on the power supply board.
   C.   If the Terminal Module power LED or the Display Module LCD is not on, make sure the 25 pin connectors and cable assembly are connected and are secured.

16.2   The normally open sensors do not cause a fault:
A.   Make sure the power supply minus terminal is grounded to the panel and the panel is grounded to the engine block. They must all be at the same potential for normally open sensors that use the engine block as a return path. Use an ohmmeter and measure between the power supply minus terminal and the panel and engine block - this reading should be less than 2 ohms.

16.3   The output LED's are changing state but the relays or solenoid valves connected to the outputs are not tripping:
A.   Check that the wiring is correct and check the output module fuse. NOTE: A spare fuse (part number 601653 - 6.3 amp) is provided on the power supply board.

16.4   The power LED's are lit as well as the LCD backlighting but the LCD is blank or shows "WARNING: THE DE-2000 ANNUNCIATOR MUST BE CONFIGURED PRIOR TO USE ON AN ENGINE":
A.   The annunciator system needs to be configured. See the programming instruction form DE-2000 PI to configure the system.

16.5   The DSG and/or the DSM instruments do not communicate to the DE-2000 annunciator (the (RX) and (TX) lights on the back of the DSM/DSG do not flash):
A.   Make sure the DSG or DSM device has serial communication capabilities (a "DUS" suffix in the part number) and is connected per the installation instructions.
B.   Make sure that the node number of the DSG or DSM is correct.
C.   Make sure the serial communication is connected correctly. See section 5.0 and the drawing section of the installation instructions form DE-2000 II for further information.

16.6   The receive (RX) LED on the DSG or DSM instrument flashes but the transmit (TX) light does not flash:
A.   Make sure that the node number of the DSG or DSM is correct. See section 5.0 of the installation instructions for further information.

16.7   The home screen displays NO COMM. message for either the speed, suction or discharge:
A.   Communications from the DSG or DSM instrument to the DE-2000 annunciator have been broken. See 15.5 and 15.6 above.

16.8   The home screen displays dashes for the speed, suction or discharge:
A.   A DSG or DSM instrument was not configured in the initial configuration for that parameter. See the programming instructions form DE-2000 PI to reprogram the annunciator system.

16.9   The output module and the related LED do not change state:
A.   The tripped sensor may not be mapped to the output. Use the menu and check the OUTPUT ASSIGNMENT to see if the input is mapped to the output in question.

16.10 The fault screen shows that outputs one and two should be tripping the fuel valve and shorting the ignition but the fuel valve and ignition do not trip:
A.   Make sure the fuel valve and ignition shutdown lead are wired to power supply terminals FV1 and FV2 for the fuel valve and IGN+ and IGN- for the ignition shutdown lead.
B.   Make sure that Altronic output module 691124 is in power supply output slots OUT 1 and OUT 2.

16.11 The time and date, after being set (refer to section 10.9 to set the time and date), are not correct after removing and reapplying the input power:
A.   The real time clock/RAM module (U10) needs replaced.

16.12 LCD contrast ratio on the DE-2000 Display Module is either too light or too dark:
A.   The contrast ratio needs to be adjusted. See section 12.0 CONTRAST RATIO ADJUSTMENT in these instructions.

16.13 The external modem does not commence dialing:
A.   A null modem cable or adapter is not used and is required from the RS-232 port to the modem.
B.   The modem was not configured properly. Make sure that DTR is always on and that configuration 0 (zero) is being used and the phone numbers are programmed into the modem.

MODBUS ADDRESS LIST

ADDRESS	DESCRIPTION OF FUNCTION	RANGE
40001	RPM	0 to 9999
40002	Hours	0 to 65535
40003	Reserved	0 at all times
40004	Status, 00=start up, 01=running, 255=stop, xxx=fault no.	00 to 255
40005	Output status 1-4=bits 0-3 in order, 0=fault, 1=inactive	0 to 16
40006	Inputs 10-17=bits 0-7, 20-27= bits 8-15, 0=faulted	0 to 65535
40007	Inputs 30-37=bits 0-7, 40-47=bits 8-15, 0=faulted	0 to 65535
40008	DSM's by node, 5x=bit 0, 6x=bit 1, 7x=bit 2, 8x=bit 3; 0=fault	65528 to 65535
40009	CHAN. 30-46 faults, bit 0=1 Lo setpoint bit 1=1 Hi setpoint	0 to 2
40010	From this register to 40049 reserved for future use	0 to 65535
40050	Optional DSG CHAN. 10 analog value	-9999 to 9999
40051	Optional DSG CHAN. 11 analog value	-9999 to 9999
40052	Optional DSG CHAN. 12 analog value	-9999 to 9999
40053	Optional DSG CHAN. 13 analog value	-9999 to 9999
40054	Optional DSG CHAN. 14 analog value	-9999 to 9999
40055	Optional DSG CHAN. 15 analog value	-9999 to 9999
40056	Optional DSG CHAN. 16 analog value	-9999 to 9999
40057	Optional DSG CHAN. 17 analog value	-9999 to 9999
40058	Optional DSG CHAN. 20 analog value	-9999 to 9999
40059	Optional DSG CHAN. 21 analog value	-9999 to 9999
40060	Optional DSG CHAN. 22 analog value	-9999 to 9999
40061	Optional DSG CHAN. 23 analog value	-9999 to 9999
40062	Optional DSG CHAN. 24 analog value	-9999 to 9999
40063	Optional DSG CHAN. 25 analog value	-9999 to 9999
40064	Optional DSG CHAN. 26 analog value	-9999 to 9999
40065	Optional DSG CHAN. 27 analog value	-9999 to 9999
40066	Optional DSG CHAN. 30 analog value	-9999 to 9999
40067	Optional DSG CHAN. 31 analog value	-9999 to 9999
40068	Optional DSG CHAN. 32 analog value	-9999 to 9999
40069	Optional DSG CHAN. 33 analog value	-9999 to 9999
40070	Optional DSG CHAN. 34 analog value	-9999 to 9999
40071	Optional DSG CHAN. 35 analog value	-9999 to 9999
40072	Optional DSG CHAN. 36 analog value	-9999 to 9999
40073	Optional DSG CHAN. 37 analog value	-9999 to 9999
40074	Optional DSG CHAN. 40 analog value	-9999 to 9999
40075	Optional DSG CHAN. 41 analog value	-9999 to 9999
40076	Optional DSG CHAN. 42 analog value	-9999 to 9999
40077	Optional DSG CHAN. 43 analog value	-9999 to 9999
40078	Optional DSG CHAN. 44 analog value	-9999 to 9999
40079	Optional DSG CHAN. 45 analog value	-9999 to 9999
40080	Optional DSG CHAN. 46 analog value	-9999 to 9999
40081	Optional DSG CHAN. 47 analog value	-9999 to 9999

MODBUS ADDRESS LIST (continued)

ADDRESS	DESCRIPTION OF FUNCTION	RANGE
40082	Optional DSM CHAN. A1 analog value (Node 50 chan.1)	-9999 to 9999
40083	Optional DSM CHAN. A2 analog value	-9999 to 9999
40084	Optional DSM CHAN. A3 analog value	-9999 to 9999
40085	Optional DSM CHAN. A4 analog value	-9999 to 9999
40086	Optional DSM CHAN. A5 analog value	-9999 to 9999
40087	Optional DSM CHAN. A6 analog value	-9999 to 9999
40088	Optional DSM CHAN. A7 analog value	-9999 to 9999
40089	Optional DSM CHAN. A8 analog value	-9999 to 9999
40090	Optional DSM CHAN. A9 analog value	-9999 to 9999
40091	Reserved	0 to 65535
40092	Optional DSM CHAN. B1 analog value (Node 60 chan.1)	-9999 to 9999
40093	Optional DSM CHAN. B2 analog value	-9999 to 9999
40094	Optional DSM CHAN. B3 analog value	-9999 to 9999
40095	Optional DSM CHAN. B4 analog value	-9999 to 9999
40096	Optional DSM CHAN. B5 analog value	-9999 to 9999
40097	Optional DSM CHAN. B6 analog value	-9999 to 9999
40098	Optional DSM CHAN. B7 analog value	-9999 to 9999
40099	Optional DSM CHAN. B8 analog value	-9999 to 9999
40100	Optional DSM CHAN. B9 analog value	-9999 to 9999
40101	Reserved	0 to 65535
40102	Optional DSM CHAN. C1 analog value (Node 70 chan.1)	-9999 to 9999
40103	Optional DSM CHAN. C2 analog value	-9999 to 9999
40104	Optional DSM CHAN. C3 analog value	-9999 to 9999
40105	Optional DSM CHAN. C4 analog value	-9999 to 9999
40106	Optional DSM CHAN. C5 analog value	-9999 to 9999
40107	Optional DSM CHAN. C6 analog value	-9999 to 9999
40108	Optional DSM CHAN. C7 analog value	-9999 to 9999
40109	Optional DSM CHAN. C8 analog value	-9999 to 9999
40110	Optional DSM CHAN. C9 analog value	-9999 to 9999
40111	Reserved	0 to 65535
40112	Optional DSM CHAN. D1 analog value (Node 80 chan.1)	-9999 to 9999
40113	Optional DSM CHAN. D2 analog value	-9999 to 9999
40114	Optional DSM CHAN. D3 analog value	-9999 to 9999
40115	Optional DSM CHAN. D4 analog value	-9999 to 9999
40116	Optional DSM CHAN. D5 analog value	-9999 to 9999
40117	Optional DSM CHAN. D6 analog value	-9999 to 9999
40118	Optional DSM CHAN. D7 analog value	-9999 to 9999
40119	Optional DSM CHAN. D8 analog value	-9999 to 9999
40120	Optional DSM CHAN. D9 analog value	-9999 to 9999
40121	Optional DSM CHAN. D10 analog value	-9999 to 9999

MODBUS ADDRESS LIST (continued)

ADDRESS	DESCRIPTION OF FUNCTION	RANGE
40122	Optional DSM CHAN. D11 analog value	-9999 to 9999
40123	Optional DSM CHAN. D12 analog value	-9999 to 9999
40124	Optional DSM CHAN. D13 analog value	-9999 to 9999
40125	Optional DSM CHAN. D14 analog value	-9999 to 9999
40126	Optional DSM CHAN. D15 analog value	-9999 to 9999
40127	Optional DSM CHAN. D16 analog value	-9999 to 9999
40128	Optional DSM CHAN. D17 analog value	-9999 to 9999
40129	Optional DSM CHAN. D18 analog value	-9999 to 9999
40130	Optional DSM CHAN. D19 analog value	-9999 to 9999
40131	Optional DSM CHAN. D20 analog value	-9999 to 9999
40132	Optional DSM CHAN. D21 analog value	-9999 to 9999
40133	Optional DSM CHAN. D22 analog value	-9999 to 9999
40134	Optional DSM CHAN. D23 analog value	-9999 to 9999
40135	Reserved	0 to 65535
40136	CHAN. 10 decimal point position from right	0 to 3
40137	CHAN. 11 decimal point position from right	0 to 3
40138	CHAN. 12 decimal point position from right	0 to 3
40139	CHAN. 13 decimal point position from right	0 to 3
40140	CHAN. 14 decimal point position from right	0 to 3
40141	CHAN. 15 decimal point position from right	0 to 3
40142	CHAN. 16 decimal point position from right	0 to 3
40143	CHAN. 17 decimal point position from right	0 to 3
40144	CHAN. 20 decimal point position from right	0 to 3
40145	CHAN. 21 decimal point position from right	0 to 3
40146	CHAN. 22 decimal point position from right	0 to 3
40147	CHAN. 23 decimal point position from right	0 to 3
40148	CHAN. 24 decimal point position from right	0 to 3
40149	CHAN. 25 decimal point position from right	0 to 3
40150	CHAN. 26 decimal point position from right	0 to 3
40151	CHAN. 27 decimal point position from right	0 to 3
40152	CHAN. 30 decimal point position from right	0 to 3
40153	CHAN. 31 decimal point position from right	0 to 3
40154	CHAN. 32 decimal point position from right	0 to 3
40155	CHAN. 33 decimal point position from right	0 to 3
40156	CHAN. 34 decimal point position from right	0 to 3
40157	CHAN. 35 decimal point position from right	0 to 3
40158	CHAN. 36 decimal point position from right	0 to 3
40159	CHAN. 37 decimal point position from right	0 to 3
40160	CHAN. 40 decimal point position from right	0 to 3
40161	CHAN. 41 decimal point position from right	0 to 3

MODBUS ADDRESS LIST (continued)

ADDRESS	DESCRIPTION OF FUNCTION	RANGE
40162	CHAN. 42 decimal point position from right	0 to 3
40163	CHAN. 43 decimal point position from right	0 to 3
40164	CHAN. 44 decimal point position from right	0 to 3
40165	CHAN. 45 decimal point position from right	0 to 3
40166	CHAN. 46 decimal point position from right	0 to 3
40167	CHAN. 47 decimal point position from right	0 to 3
40168	CHAN. A1 decimal point position from right	0 to 3
40169	CHAN. A2 decimal point position from right	0 to 3
40170	CHAN. A3 decimal point position from right	0 to 3
40171	CHAN. A4 decimal point position from right	0 to 3
40172	CHAN. A5 decimal point position from right	0 to 3
40173	CHAN. A6 decimal point position from right	0 to 3
40174	CHAN. A7 decimal point position from right	0 to 3
40175	CHAN. A8 decimal point position from right	0 to 3
40176	CHAN. A9 decimal point position from right	0 to 3
40177	Reserved	0 to 65535
40178	CHAN. B1 decimal point position from right	0 to 3
40179	CHAN. B2 decimal point position from right	0 to 3
40180	CHAN. B3 decimal point position from right	0 to 3
40181	CHAN. B4 decimal point position from right	0 to 3
40182	CHAN. B5 decimal point position from right	0 to 3
40183	CHAN. B6 decimal point position from right	0 to 3
40184	CHAN. B7 decimal point position from right	0 to 3
40185	CHAN. B8 decimal point position from right	0 to 3
40186	CHAN. B9 decimal point position from right	0 to 3
40187	Reserved	0 to 65535
40188	CHAN. C1 decimal point position from right	0 to 3
40189	CHAN. C2 decimal point position from right	0 to 3
40190	CHAN. C3 decimal point position from right	0 to 3
40191	CHAN. C4 decimal point position from right	0 to 3
40192	CHAN. C5 decimal point position from right	0 to 3
40193	CHAN. C6 decimal point position from right	0 to 3
40194	CHAN. C7 decimal point position from right	0 to 3
40195	CHAN. C8 decimal point position from right	0 to 3
40196	CHAN. C9 decimal point position from right	0 to 3
40197	Reserved	0 to 65535
40198	CHAN. D1 decimal point position from right	0 to 3
40199	CHAN. D2 decimal point position from right	0 to 3
40200	CHAN. D3 decimal point position from right	0 to 3
40201	CHAN. D4 decimal point position from right	0 to 3

MODBUS ADDRESS LIST (continued)

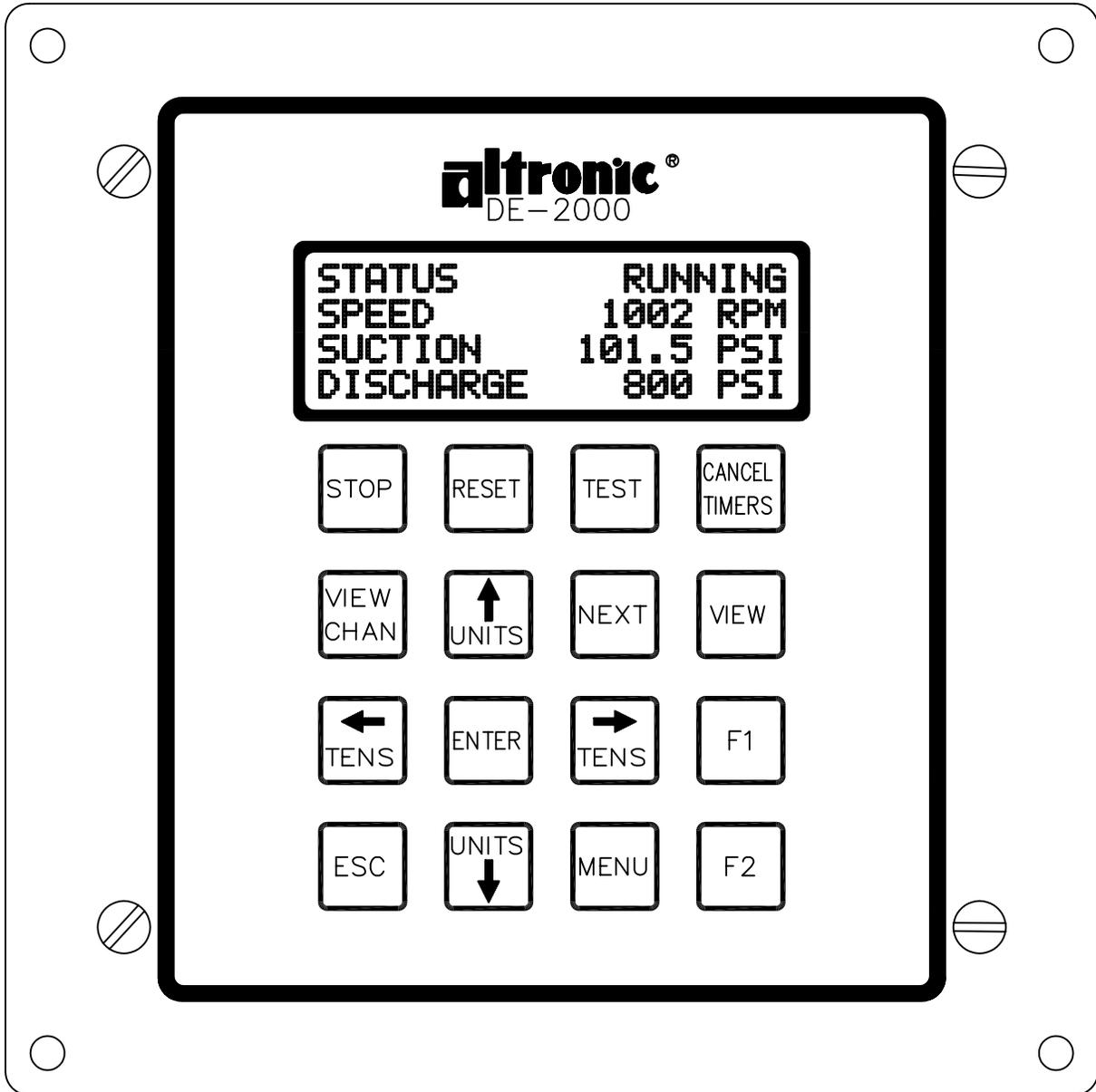| ADDRESS	DESCRIPTION OF FUNCTION	RANGE
40202	CHAN. D5 decimal point position from right	0 to 3
40203	CHAN. D6 decimal point position from right	0 to 3
40204	CHAN. D7 decimal point position from right	0 to 3
40205	CHAN. D8 decimal point position from right	0 to 3
40206	CHAN. D9 decimal point position from right	0 to 3
40207	CHAN. D10 decimal point position from right	0 to 3
40208	CHAN. D11 decimal point position from right	0 to 3
40209	CHAN. D12 decimal point position from right	0 to 3
40210	CHAN. D13 decimal point position from right	0 to 3
40211	CHAN. D14 decimal point position from right	0 to 3
40212	CHAN. D15 decimal point position from right	0 to 3
40213	CHAN. D16 decimal point position from right	0 to 3
40214	CHAN. D17 decimal point position from right	0 to 3
40215	CHAN. D18 decimal point position from right	0 to 3
40216	CHAN. D19 decimal point position from right	0 to 3
40217	CHAN. D20 decimal point position from right	0 to 3
40218	CHAN. D21 decimal point position from right	0 to 3
40219	CHAN. D22 decimal point position from right	0 to 3
40220	CHAN. D23 decimal point position from right	0 to 3

DRAWINGS SECTION:

DISPLAY MODULE, FRONT VIEW

DISPLAY MODULE, REAR VIEW

POWER SUPPLY LED AND OUTPUT MODULE LOCATIONS

CONTRAST ADJUSTMENT AND MEMORY LOCATION

altronic®
DE-2000

STATUS	RUNNING
SPEED	1002 RPM
SUCTION	101.5 PSI
DISCHARGE	800 PSI

STOP RESET TEST CANCEL TIMERS

VIEW CHAN | ↑ UNITS | NEXT | VIEW

← TENS | ENTER | → TENS | F1

ESC | UNITS ↓ | MENU | F2

DISPLAY MODULE — REAR VIEW

mitronic inc
GIRARD, OHIO

ANNUNCIATOR SYSTEM
MODEL DE-2000

S/N

CERTIFIED FOR CLASS I, GROUP C, D, DIV. 2
WHEN USED WITH 691122 SERIES POWER SUPPLY.

MUST BE INSTALLED PER FORM DE II
INSTALLE CONFORMEMENT FORM DE II

CERTIFIED
CLASS I,
GROUP C, D, DIV. 2

SERIAL PORT COMMUNICATION INDICATORS
PORT 1 - RS-232 TO PERSONAL COMPUTER
PORT 2 - RS-485 TO SERIAL INSTRUMENTS
PORT 3 - RS-485 TO REMOTE DEVICES

DB-25 D-SUB CONNECTOR
CONNECT TO ANNUNCIATOR
TERMINAL STRIP MODULE

DB-9 D-SUB
CONNECTOR
RS-232 PORT 1

SERIAL
PORT
INDICATORS
RX   TX
○ 1 ○
○ 2 ○
○ 3 ○

SERIAL PORT INDICATORS

PORT 1 — RS-232 PORT

PORT 2 — RS-485 PORT
          TO DSM/DSG
          INSTRUMENTS

PORT 3 — RS-485 TO
          PC'S, PLC'S

P/N 693115
CABLE ASSEMBLY TO
TERMINAL MODULE

P/N 693116
CABLE ASSEMBLY TO
RS-232 PORT ON PC

POWER SUPPLY LED AND OUTPUT MODULE LOCATIONS
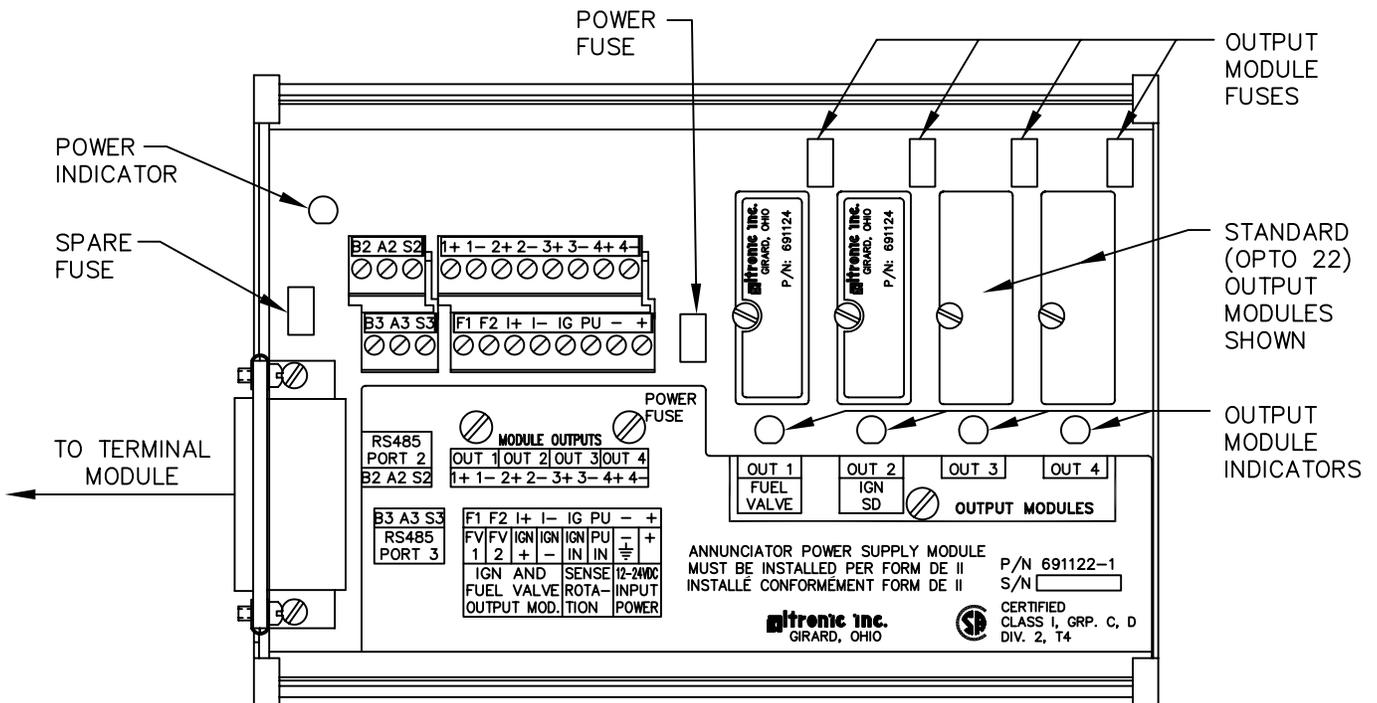
FUSES: FUSES ARE REPLACEABLE 6.3 AMP, P/N 601653.

OUTPUT MODULES: 691124 – THIS CUSTOM MODULE HAS TWO USES: CONNECTION TO A MURPHY FUEL VALVE AND DIRECTLY GROUNDING A C.D. IGNITION SYSTEM.
  – USE IN POSITION OUT 1 TO CONNECT TO A C.D. IGNITION TYPE MURPHY FUEL VALVE.
  – USE IN POSITION OUT 2 TO DIRECTLY GROUND–OUT (STOP) A C.D. IGNITION SYSTEM.

691125 – THIS STANDARD MODULE IS RATED FOR 5–48 Vdc, 5.0 A. AND MAY BE USED IN ANY OF THE FOUR OUTPUT SLOTS OUT 1 THROUGH OUT 4.

691056 – THIS STANDARD MODULE IS RATED FOR 5–60 Vdc, 2.0 A. AND MAY BE USED IN ANY OF THE FOUR OUTPUT SLOTS OUT 1 THROUGH OUT 4.

691066 – THIS STANDARD MODULE IS RATED FOR 5–200 Vdc, 0.67 A. AND MAY BE USED IN ANY OF THE FOUR OUTPUT SLOTS OUT 1 THROUGH OUT 4.
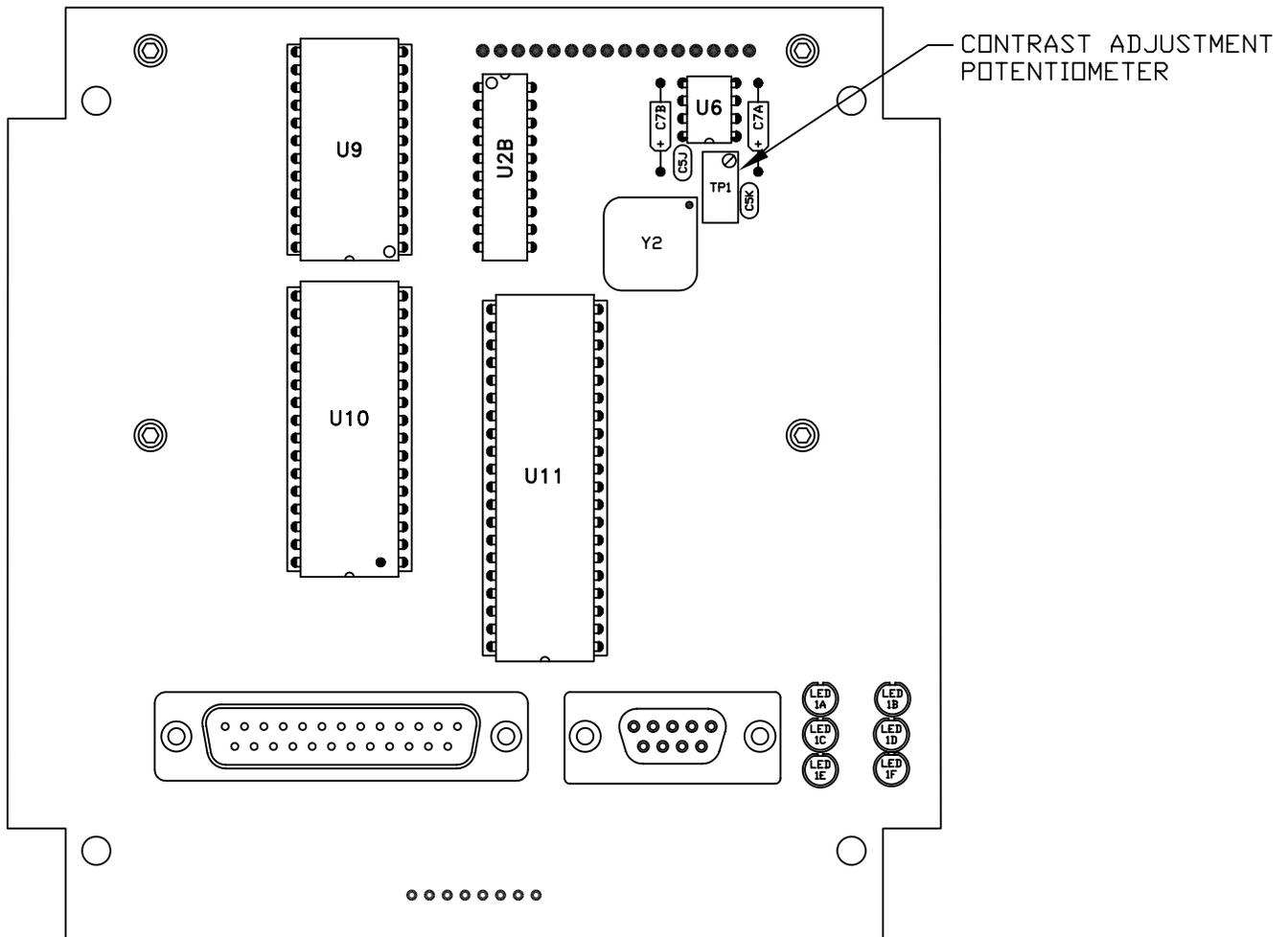
691065 – THIS STANDARD MODULE IS RATED FOR 24–280 Vac, 2.0 A. AND MAY BE USED IN ANY OF THE FOUR OUTPUT SLOTS OUT 1 THROUGH OUT 4.

NOTE: OTHER INDUSTRY STANDARD 0.6 INCH MODULES MAY BE USED AS REQUIRED.

LED OPERATION: – THE POWER LED INDICATOR LIGHTS WHEN POWER IS APPLIED TO THE SYSTEM.

– FOR THE NORMALLY CLOSED CONFIGURED OUTPUT MODULES (ENERGIZED FOR RUN), THE LED WILL BE ON IN THE NORMAL RUN STATE AND OFF FOR A FAULT CONDITION.

– FOR THE NORMALLY OPEN CONFIGURED OUTPUT MODULES, THE LED WILL BE OFF IN THE NORMAL RUN STATE AND TURN ON FOR A FAULT CONDITION.

– FOR THE ALTRONIC OUTPUT MODULES P/N 691124, THE LED WILL BE ON IN THE NORMAL RUN STATE AND OFF FOR A FAULT CONDITION.

CONTRAST ADJUSTMENT AND MEMORY LOCATION

CONTRAST ADJUSTMENT
POTENTIOMETER

U9

U2B

C7B

U6

C7A

C5J

TP1

C5K

Y2

U10

U11

LED 1A

LED 1B

LED 1C

LED 1D

LED 1E

LED 1F

1. TO ADJUST LCD DISPLAY CONTRAST RATIO: 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 COUNTERCLOCKWISE THREE TO THREE AND ONE HALF
   TURNS. THE DISPLAY SHOULD THEN BE AT A DESIRABLE CONTRAST RATIO.

2. U9 IS AN EEPROM. THIS IS WHERE THE USER CONFIGURED PROGRAM RESIDES.
   U10 IS A BATTERY BACKED RAM MODULE.
   U11 IS A MICRO CONTROLLER CHIP. THIS IS WHERE THE FIRMWARE RESIDES.