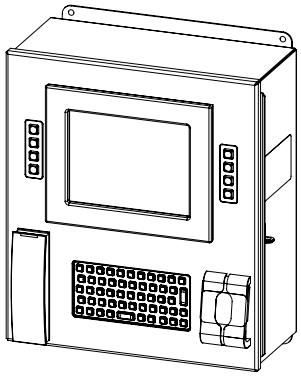
IOM097GVAE0709
Software Version 1.0

8620 Driver Entry Terminal

Field interface used for data entry and process management at facility control points



FM C US APPROVED
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Installation and Operations Manual

Automation Solutions for oil & gas, defense and aviation applications

Varec®

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Read this manual carefully and make sure you understand its contents before using this product. Follow all instructions and safety guidelines presented in this manual when using this product. If the user does not follow these instructions properly, Varec cannot guarantee the safety of the system.

Note Comply with all applicable regulations, codes, and standards. For safety precautions, the user shall refer to the appropriate industry or military standards.

Caution **Electrical Hazard!** Read and understand static and lightning electrical protection and grounding described in API 2003. Make certain that the 8620 Driver Entry Terminal (DET) installation, operation, and maintenance conforms with the practice set forth therein. Make sure the power is turned off at the main circuit breaker or switch. The power switch should be in the OFF position, locked, and labeled to prevent other personnel from turning the power on during installation.

Contents

1 Introduction

This manual provides the information needed to install, maintain, and troubleshoot the Varec 8620 Driver Entry Terminal (DET).

Overview

The 8620 DET is a field interface device designed for data entry and process management at facility control points, such as entry and exit gates, load racks, BOL request stations, weight scale stations, and preload stations. It features multiple interface components, such as a display, card reader, and fingerprint scanner that can be used to enter and record pertinent information about the operator or operation.

The 8620 DET interfaces to FuelsManager® Oil and Gas Terminal Automation Edition software. It captures data based on the desired configuration for the specific control point application, process or operation. For example, it may capture driver ID for access control, truck ID for equipment safety and loading or company ID for product allocations. Refer to the *FuelsManager Software User Guide(s)* and documentation for your specific implementation.

The 8620 DET is constructed with the following assemblies as shown in Figure 1-1:

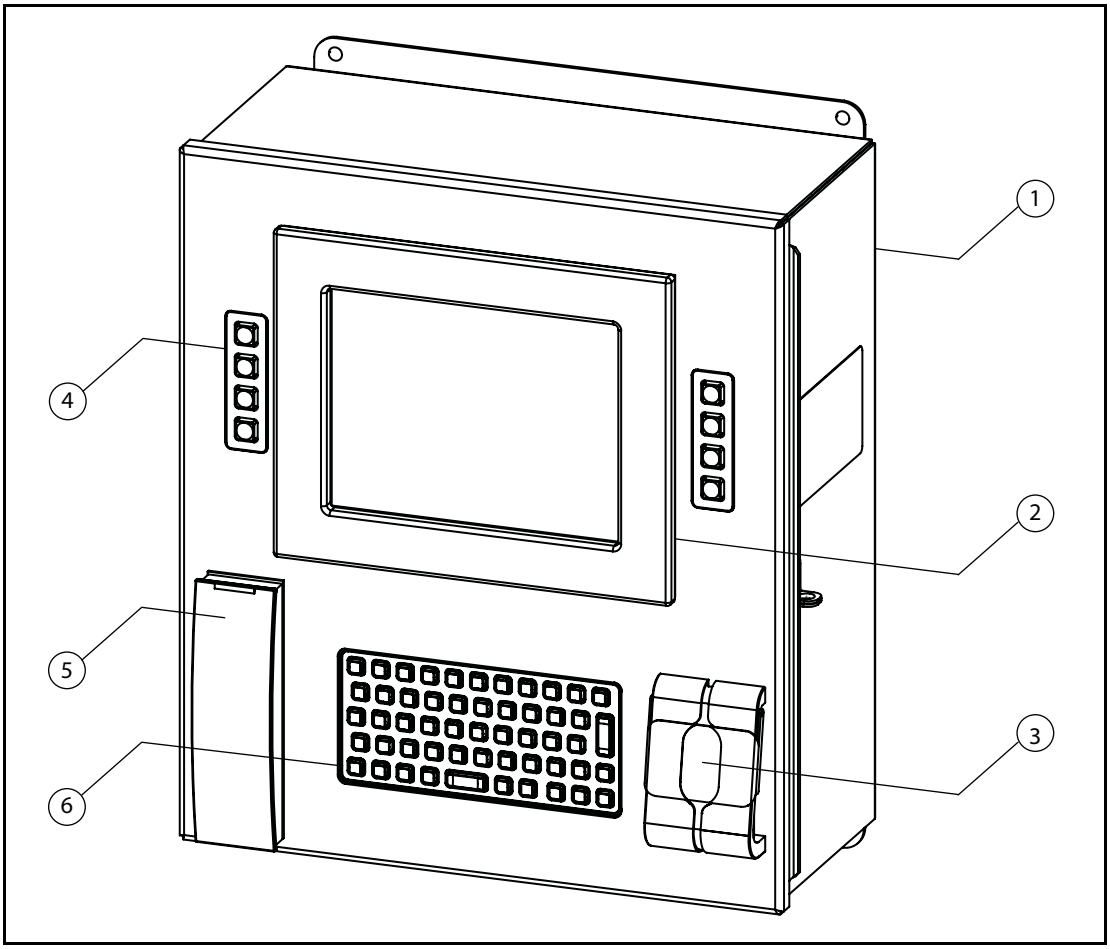

Figure 1-1: 8620 DET System Components

Item	Qty	Description
1	1	17.50" x 14.92" Enclosure with Window Kit
2	1	8.4" LCD
3	1	Fingerprint Scanner
4	2	4 Key Keypad
5	1	Smart Card Reader
6	1	Keyboard

Table 1-1: 8620 DET System Components

Functionality and System Design

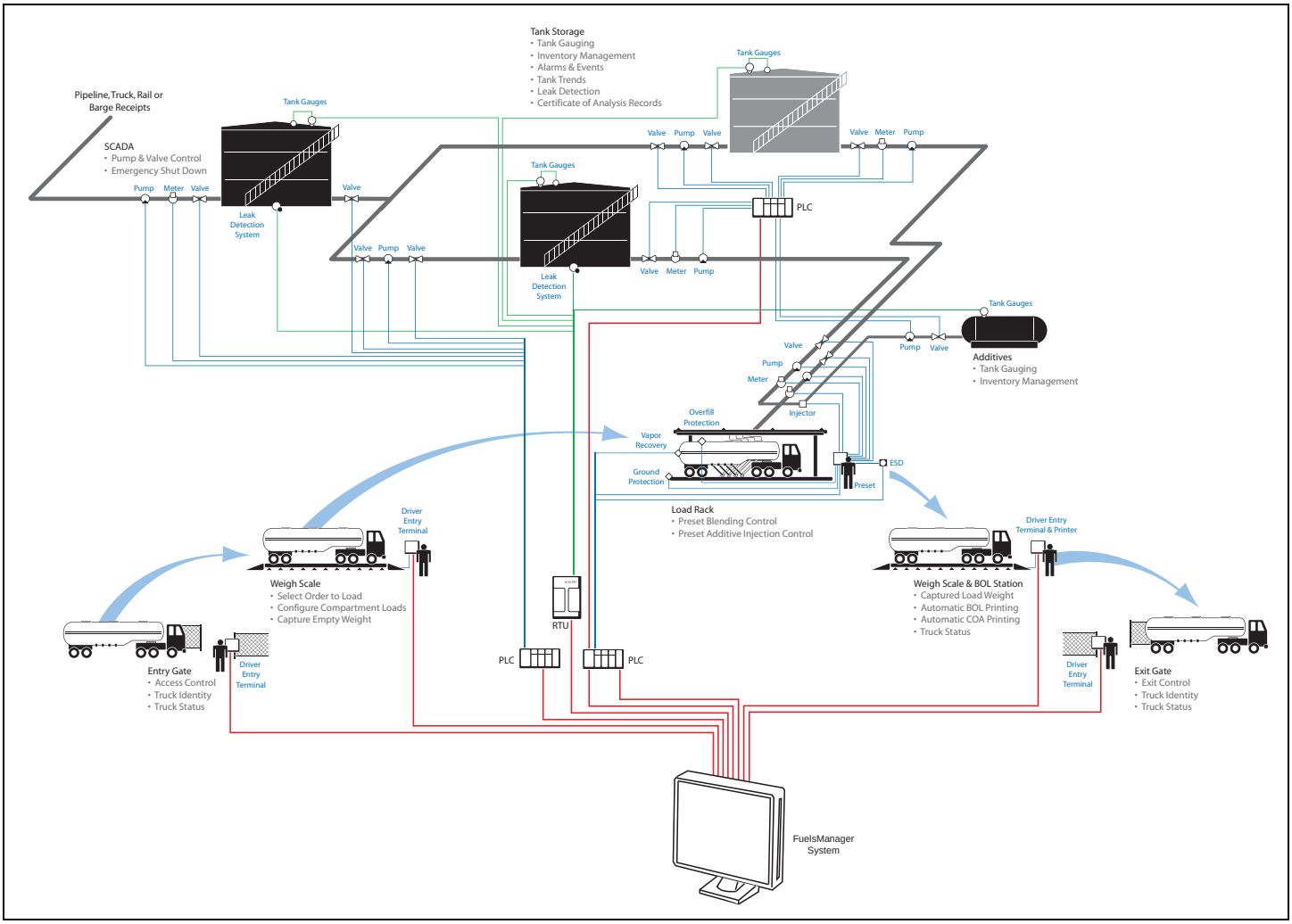

Figure 1-2: 8620 DET System Diagram

2 Preparing for Installation

This chapter provides a site preparation checklist, safety information, unpacking instructions, and installation instructions.

Site Preparation Checklist

Before installing the 8620 DET, ensure the following items:

- Adequate space for installation
- The appropriate communication lines back to the FuelsManager Oil & Gas Terminal Automation system
- Power (AC or DC)
- Grounding
- Enclosure protection, such as concrete barrier poles to prevent trucks from damaging the unit

General Safety Guidelines

The 8620 DET is certified to be used in Class I, Div 2, hazardous locations.

The user shall follow safety guidelines provided by the Occupational Safety and Health Administration (OSHA) for additional protection. Information may also be obtained from the following sources:

- National Electrical Code (NEC)
- National Fire Protection Association (NFPA)
- Instrument Society of America (ISA)
- FM Approvals (FM)
- Underwriters' Laboratories Incorporated (UL)

When in doubt about the safety of an area, check with the local safety authorities. Always observe equipment labels and warning signs posted in the area.

Installation Safety Guidelines

This equipment should be installed only by qualified personnel familiar with the installation of display and monitoring equipment.

Caution should be exercised when any area that is posted or otherwise assumed to contain hazardous gases. Always follow OSHA guidelines.

To prevent shock hazards, the housing of all units should be properly grounded in accordance with the National Electrical Code. A grounding conductor should be wired to the grounding terminal provided on the 8620 DET.

! Warning Before attempting installation of the 8620 DET, review the "General Safety Guidelines" above. Installation and maintenance personnel should become familiar with any hazards present as well as any agency requirements before working with any equipment.

Obtain a hot permit before opening the 8620 DET cover with power applied.

Before installing/repairing any wiring to the 8620 DET, make sure that the power is turned off at the main circuit breaker or switch. The power switch should be locked in the OFF position and labeled to prevent other personnel from turning the power on during installation.

Do not apply power until the 8620 DET is properly grounded.

Do not apply power in a hazardous environment until the cover is closed.

Incorrect field wiring connections can damage the 8620 DET electronics and cause system malfunctions.

Unpacking

Varec's 8620 DET(s) are shipped fully assembled and ready for installation.

To unpack the 8620 DET, follow the steps below:

1. Place the shipping container on a secure bench.
2. Open the shipping container, taking care not to damage the contents.
3. Carefully remove the 8620 DET from the shipping container and place it on the bench.
4. Inspect the 8620 DET for shipping damage. Report any damage to the carrier and Varec.

Note If the 8620 DET must be stored prior to installation, it should be repacked in its shipping container and stored in a temperature-and-humidity-controlled environment.

Installation

To install the 8620 DET, follow the steps below:

1. Verify proper 8620 DET configuration for the RS-232, RS-422/485, or Ethernet protocol.
2. Ensure proper grounding of the 8620 DET. Refer to Figure 2-1 below for dimensions and mounting holes.
3. Verify that there is proper mounting height for your application (trucks, cars, and pedestrians).
4. Install proper mounting hardware (pole, stand, or wall).
5. Install the 8620 DET to the mounting hardware.
6. Run the conduit and wiring to the 8620 DET.
7. Power up and verify communications.

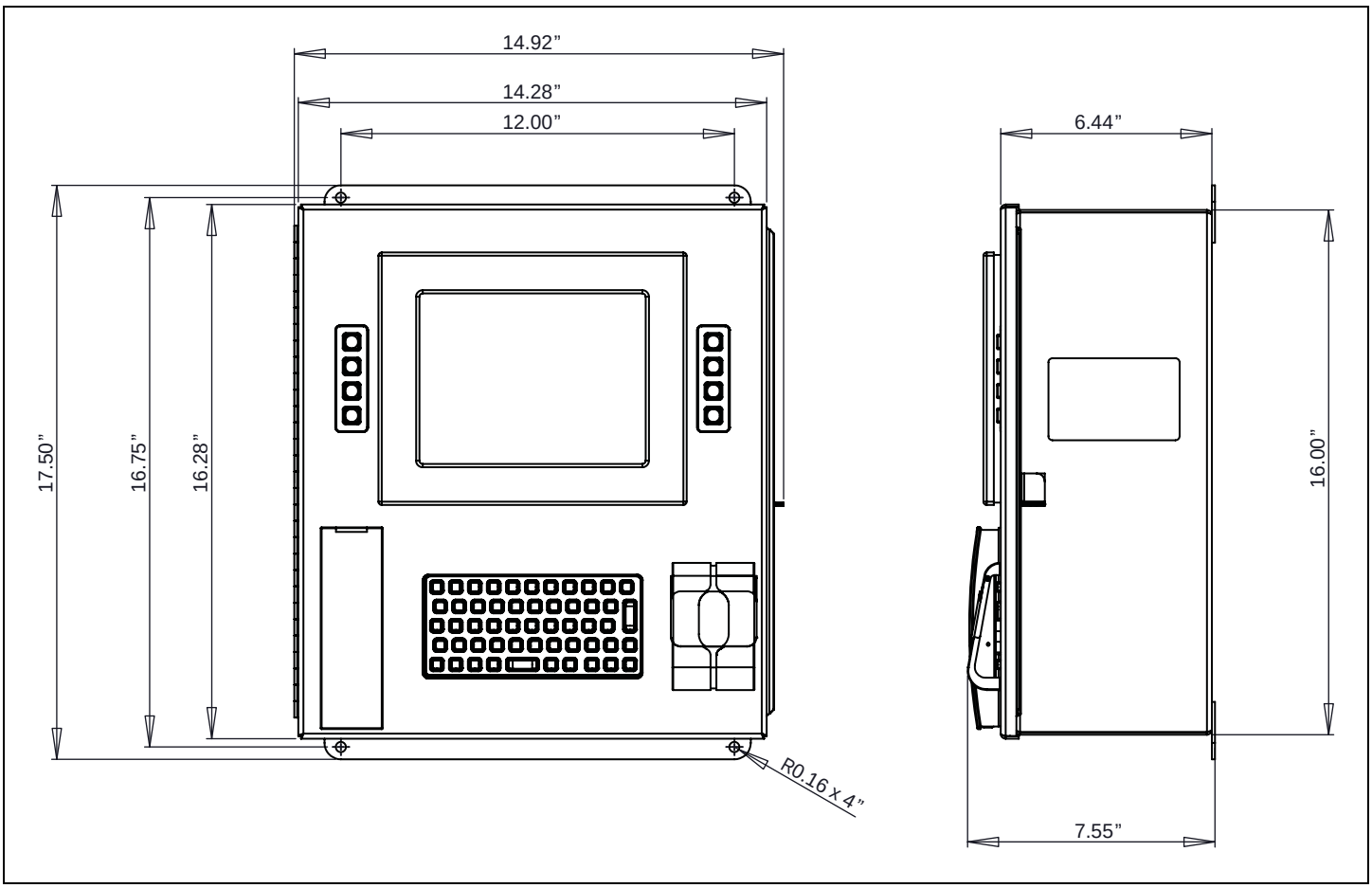

Figure 2-1: 8620 DET Dimensions

3 Wiring

This chapter describes wiring requirements for the 8620 DET. Wiring should be performed after the unit is installed.

Overview

Field wiring of the 8620 DET consists of the following:

- Power (AC/DC)
- Communications (RS-232, RS-485/422, or Ethernet)
- Digital I/O (Optional)

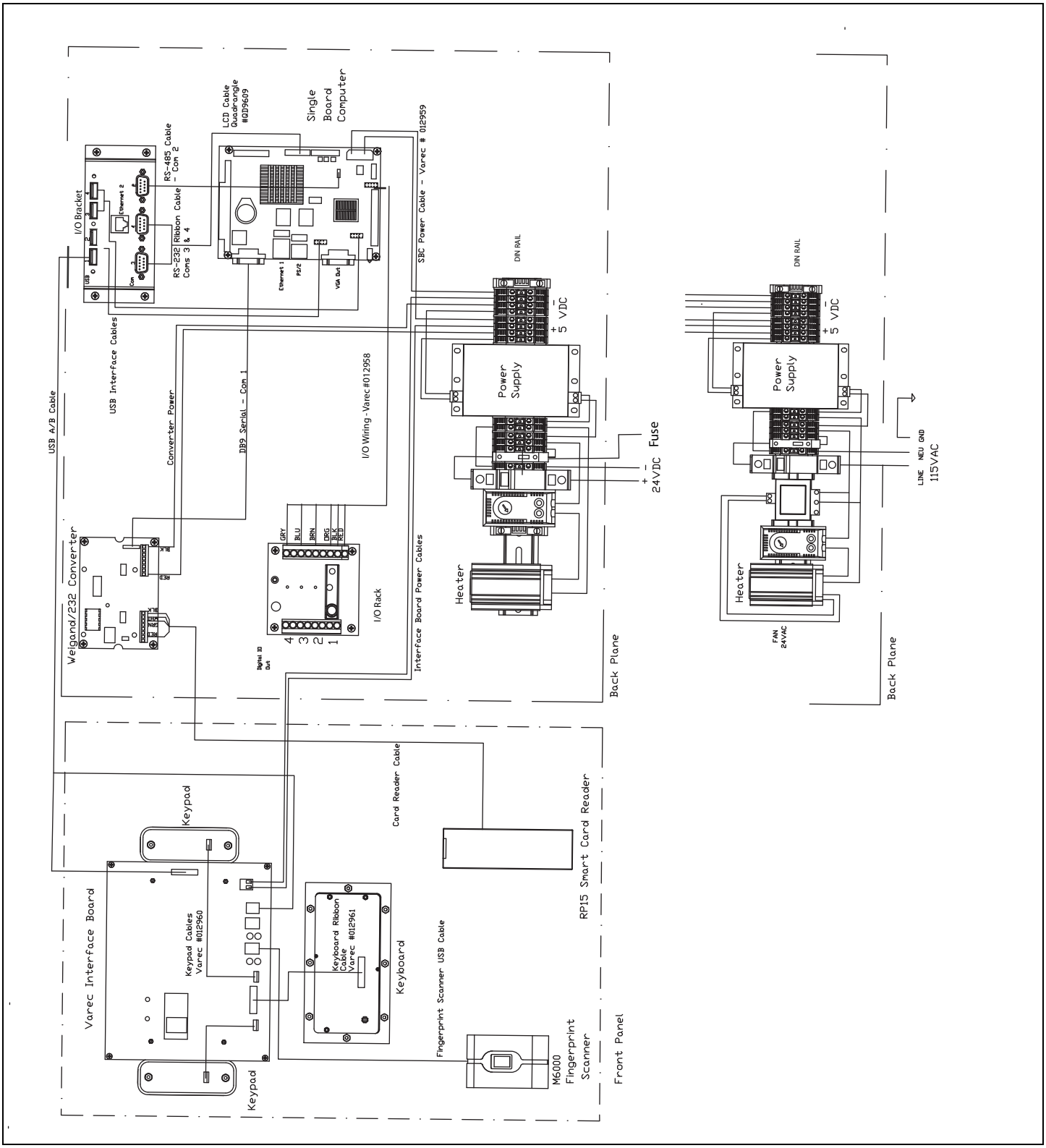

Figure 3-1: 8620 DET Internal Wiring

Power

To connect DC or AC power to the 8620, connect the power wires to the appropriate terminals supplied with the 8620 DET.

Note Before connecting power wires to the 8620 DET, ensure that power is switched off and that the 8620 DET is correctly grounded.

DC Wiring

1. Connect the 20 – 72 VDC positive wire to the bottom of the terminal switch as shown in Figure 3-1.
2. Connect the negative wire to Terminal Block Black.

AC Wiring

1. Connect the hot wire to Terminal Switch as shown in Figure 3-1.
2. Connect the neutral wire to Terminal as shown in Figure 3-1.
3. Connect the ground wire to the ground.

Communications

RS-485 is the default setting used for Com 2 as shown in Figure 3-1.

RS-422 and RS-485 Wiring — Com 2

DB-9 Connector on I/O Bracket		
Pin	**Pin Name**	**Signal Type**
1	422-RXD-	IN
2	422-RXD+	IN
3	485-422-TXD+	OUT
4	485-422-TXD-	OUT

Table 3-1: 4-Pin Connectors for RS-422 and RS-485 Communication Protocols

Note Com 1, Com 3, and Com 4 are all standard RS-232 Ports. All Com ports are standard DB-9 male connectors. Com 2 also supports RS-232 as properly configured.

Digital I/O Wiring

Four digital I/O modules can be installed in the 8620 DET. Field wiring should be installed directly onto the Digital I/O Rack as shown in Table 3-2 and Table 3-3.

Pin	Pin Name
2	I/O 1+
3	I/O 1-
4	I/O 2+
5	I/O 2-
6	I/O 3+
7	I/O 3-
8	I/O 4+
9	I/O 4-

Table 3-2: Field Terminal

Pin	Wire Color	Terminal
1	Red	Standard Voltage
2	Black	GND
7	Orange	I/O 1
4	Empty	N/A
5	Brown	I/O 2
6	Empty	N/A
7	Blue	I/O 3
8	Empty	N/A
9	Gray	I/O 4

Table 3-3: Control Terminal — to Single Board Computer

Ethernet Wiring

The 8620 DET has two 100-Base-T Ethernet jacks. One is located on the side of the single board computer. The second one is located on the communications terminal as shown in Figure 3-1. These standard 8-pin RJ-45 connectors are used for ethernet wiring.

Communications Wiring

Table 3-4 describes the wiring considerations for each communications protocol.

Communication Protocol	Description
Ethernet	Maximum length of 250 feet of twisted pair CAT5 cable.
RS-232	Maximum length of 50 feet of cable.
RS-485/422	Maximum length of 4000 feet of cable.

Table 3-4: Communications Wiring Information

4 Configuration

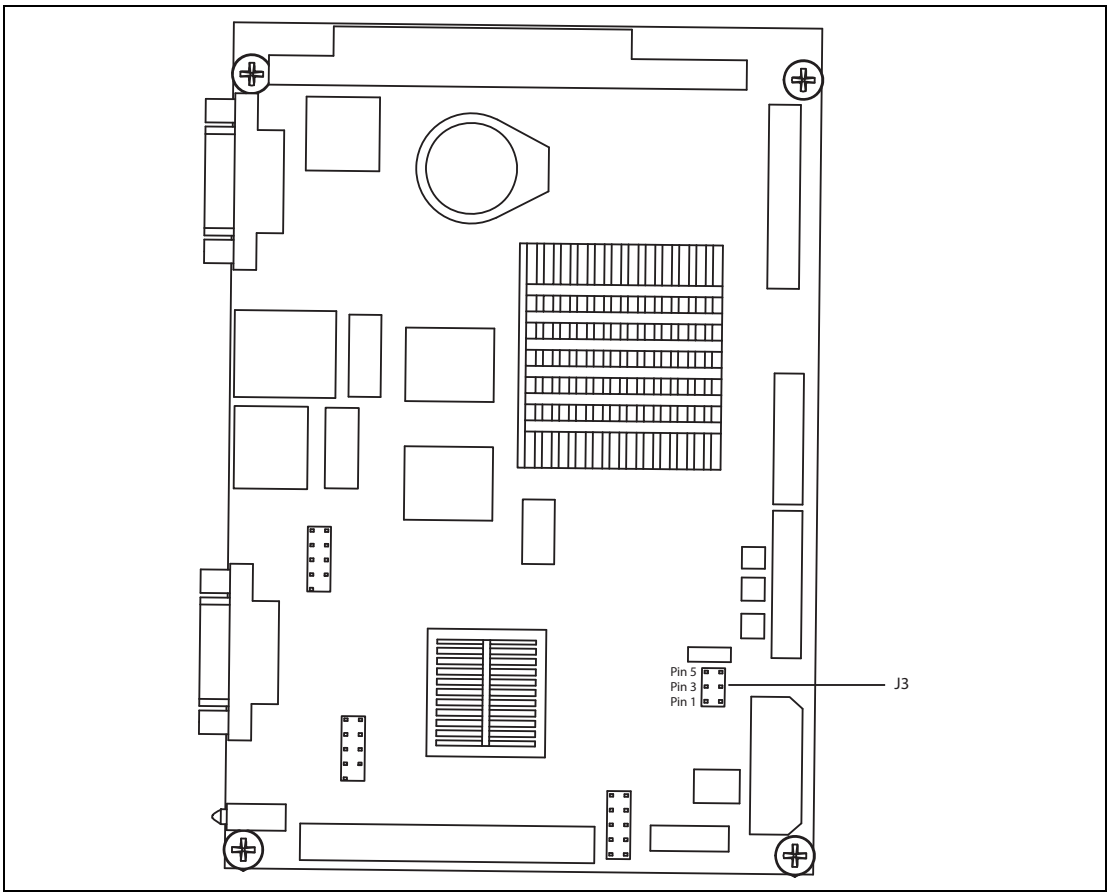

Figure 4-1: J3 on the Single Board Computer

Configuring the 8620 DET consists of the following:

- Configuring the RS-232 Com port (Com 1, 2, 3, and 4)
- Configuring the RS-485/422 or RS-232 Com port (Com 2)
- Configuring the DET.Config File

Note Com 2 is a dual protocol port that can be an RS-232 or an RS-485/422 communications protocol set by jumper J3 on the single board computer (see Figure 4-1 above) as shown in Table 4-1.

Setting	Function
1-2	RS-232
3-4	RS-485 **(Default)**
5-6	RS-422

Table 4-1: Com 2 Setting (J3)

Configuring the DET.Config File

This file is found on the “Local Drive” directory in the Single Board Computer. The values are edited to configure the DET.

Note Be aware that making direct edits to the DET.Config file can result in improper system behavior if not done in accordance with proper XML syntax.

In NotePad, modify the DET.Config file replacing the necessary variables as shown in the following example (see Table 4-2 below for more information about the variables used in the config file):

Example:

```
<configuration Title="VarecDET" HostInterfaceType="Network"
TouchScreen="False" Watchdog="False">

 <HostSerialInterface Name="COM2:" BaudRate="9600" Parity="none" DataBits="8"
StopBits="one" Address="1" />

  <HostNetworkInterface Port="4096" />
```

Variables	Description	Values	Value Notes
HostInterfaceType	Sets the Host Interface to Either Serial or Network	Network Serial	
TouchScreen	Configures DET Software for Touchscreen Interface, (Currently Touchscreen Not Supported)	TRUE FALSE	Default
Watchdog	Enables Watchdog Feature. (Currently Not Supported DO NOT Enable)	TRUE FALSE	Default
HostInterface Name	If HostInterfaceType is Set to Serial, this parameter sets the Com Port.	Com 1 Com 2 Com 3 Com 4	RS232 RS485/RS232 RS232 RS232
BaudRate	Sets the Serial Baud Rate.	4800 9600 19200	
Parity	Sets the Serial Parity.	None Even Odd	Default
DataBits	Sets the Serial Data Bits.	8	Default
StopBits	Sets the Serial Stop Bits	one	Default
Address	Sets the Serial Address. If using more than1DET on a 485 Loop, then each must have a unique Address.	1	
HostNetworkInterface Port	If HostinterfaceType is set to Network, this parameter sets the Network Port.	4096	
CardReaderSerial InterfaceEnabled	If the DET has a card Reader, this parameter enables or disables the card Read.	TRUE FALSE	
Name	If CardReadSerialInterface is Enabled, this parameter sets the ComPort.	Com 1 Com 3 Com 4	
BaudRate	Sets the Card Reader Baud Rate.	4800 9600 19200	Default
Parity	Sets the Card Reader Parity.	None Odd Even	Default
DataBits	Sets the Card Reader Data Bits	8	Default
StopBits	Sets the Card Reader Stop Bits	1	Default

Table 4-2: Variables Used in the DET.Config File

5 Maintenance and Troubleshooting

Maintenance

Maintenance should be performed only by authorized personnel.

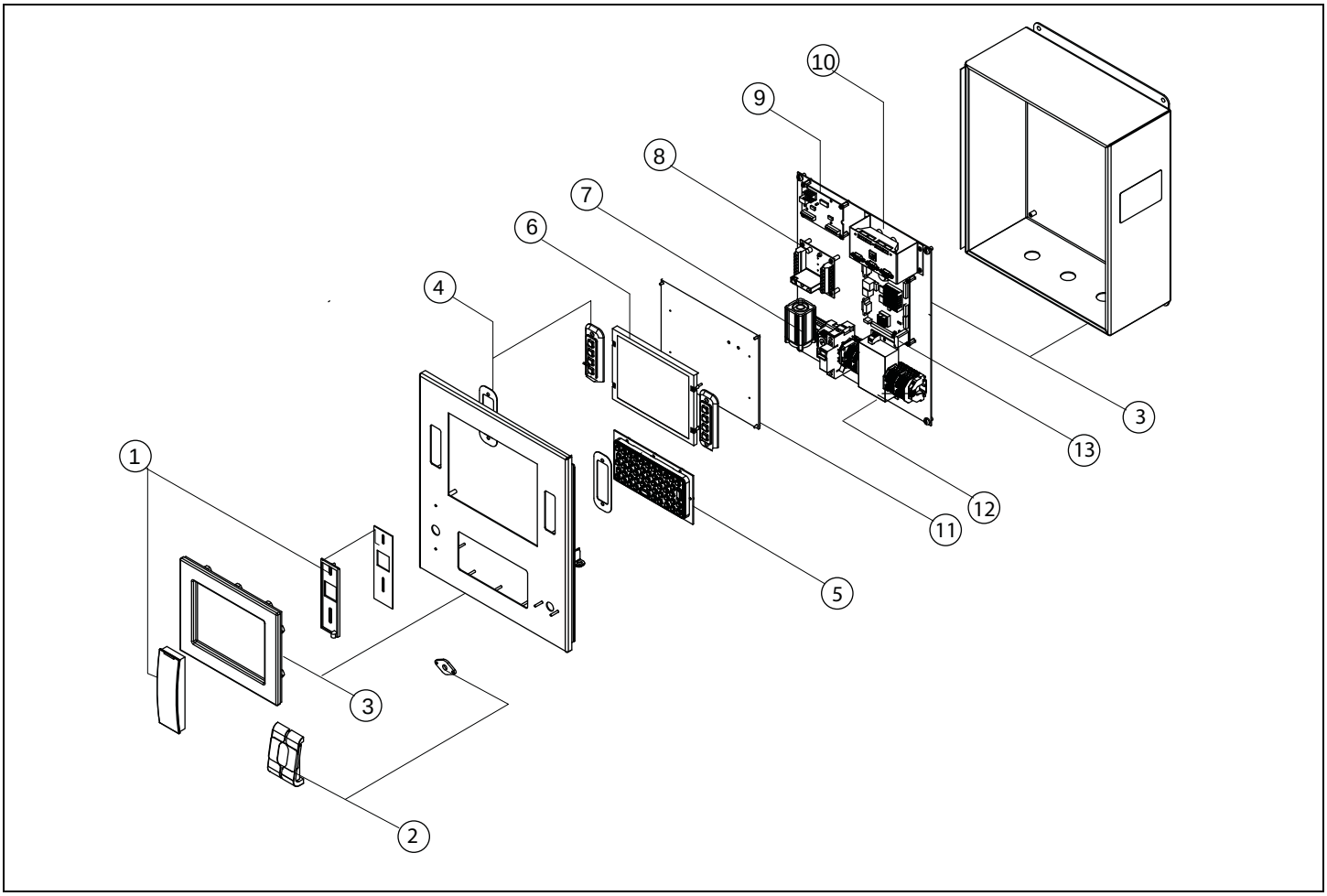

Figure 5-1: Assembly Diagram

Item	Part No.	Description
1	8620SCR	Smart Carder Reader
	P14-08620	Card Reader Gasket
2	8620FPR	Biometric Fingerprint Scanner
	8620FPR	Fingerprint Scanner Gasket
3	14001586	DET Enclosure including Window Kit
4	200008624	Two Screen Select Function Keypads
5	200008620	Alphanumeric Keyboard
6	280061862	8.4" TFT (640x480, 64,000 Colors) VGA LCD Display
7	862024DCHF	Optional Integrated Heater DC
	862024ACHF	Optional Integrated Heater AC
8	08-08622	I/O Rack
9	08-08632	Weigand/232 Converter
10	02-9860	I/O Bracket
11	012944	8620 Interface Board
12	40061635 40061637	DC Power Supply AC Power Supply
13	08-08625	32-Bit Single Board Computer

Table 5-1: 8620 DET Spare Parts List

Troubleshooting

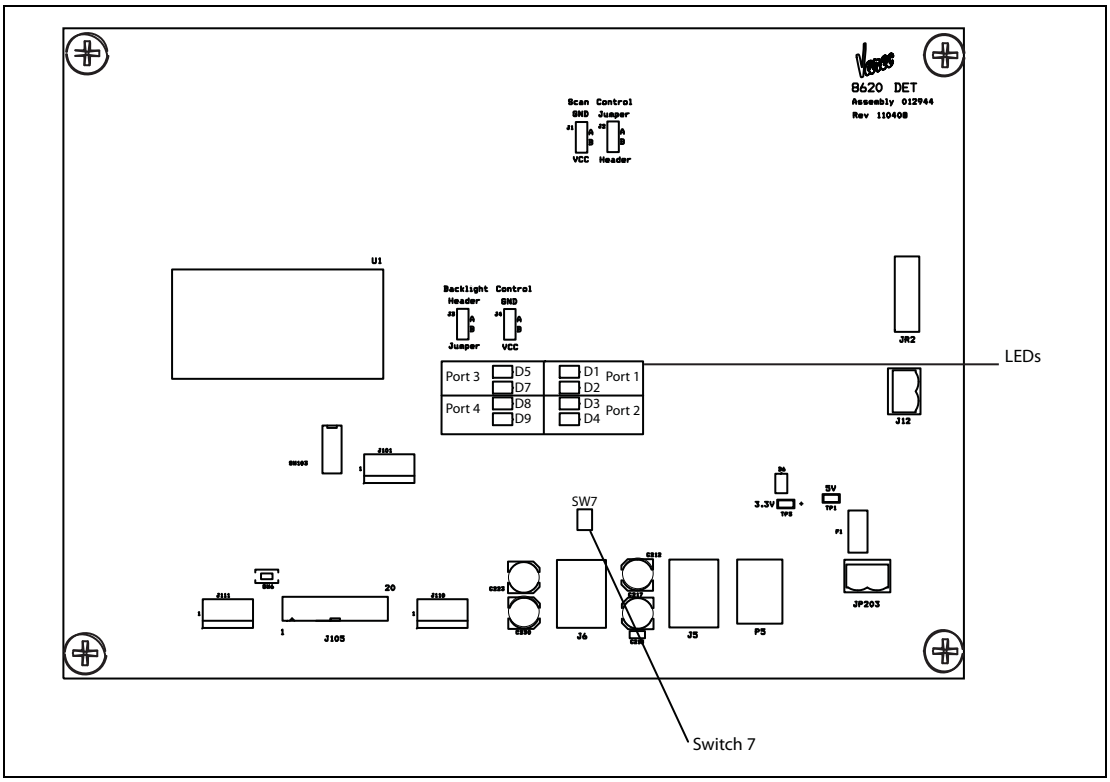

Figure 5-2: LEDs and Switch 7 on the Varec Interface Board

Using Local Diagnostics (LED Indicators)

Refer to Figure 5-2 to locate the 8620 DET Switch 7 (SW7) and LED indicators.

1. If SW7 is Up, Port 4 is available as a USB port.
2. If SW7 is Down, Port 4 is used for a Varec Keyboard.
3. LED D6 is the power indicator switch.
4. Monitor the LED indications as described below:

LED	Purpose	Description
D1 D2	Port 1	Green: Good USB Status Amber: USB Malfunction
D3 D4	Port 2	Green:Good USB Status Amber: USB Malfunction
D5 D7	Port 3	Green: Good USB Status Amber: USB Malfunction
D8 D9 ------ D8 D9	Port 4 = USB Port ---------- Port 4 = Varec Keyboard	Green: Good USB Status Amber: USB Malfunction ---------- Green: Good Varec Keyboard Status Amber: Varec Keyboard Malfunction

Table 5-2: 8620 LEDs and Switches for Troubleshooting

Replacing a Fuse

! Warning Explosion Hazard. To prevent an electrical shock or ignition of a flammable atmosphere, do not remove or replace Fuse 1 while the circuit is live.

1. Turn off the main circuit breaker switch to remove power from the unit.
2. Open the front panel of the 8620 DET.
3. Using needle-nosed pliers, remove fuse (F1) on the 8620 DET DIN Rail from the terminal block fuse holder and replace it with a new fuse. To locate the fuse holder, refer to Figure 3-1.
4. Close the front panel of the 8620 DET.
5. Turn on the main circuit breaker to connect power to the unit.

6 Specifications

General

Manufacturer	Varec, Inc. Atlanta, GA USA
Designation	8620 Driver Entry Terminal (DET)
Function	Field interface device used to control access to different control points

System Components

Single Board Computer	• Expansion Interface: PC/104 • Battery backup: Lithium 3V/196 mAHc • Four serial ports for host communications • Four USB 2.0 compliant universal serial bus ports for internal devices, configuration or optional components. One USB port is always reserved to facilitate communications between the Varec Interface Board and the Single Board Computer. • Solid State Disk (SSD): Supports one 50-pin socket for CFC type (type II optional) • Supports up to four GPIO - uses standard I/O modules • 9 LEDs indicate power and status
Interface	Four USB 2.0 compliant universal serial bus ports for optional interface components. e.g Use of the Varec Keyboard requires reservation of a USB port.
Display	24-bit TFT LCD
Keyboard	• Vandal resistant (20J BS EN 60068-2-75: 1997) • Weather resistant (IP65) • 53-Key alphanumeric • Engraved metal keys • RFI/EMI Protection in accordance with European and U.S. directives • Resistant to most commonly used cleaning agents

Smart Card Reader	• Dual reader technology:
	  • iCLASS
	  • Proximity
	• 64-bit authentication keys
	• Programmable LED/Beeper operation
	• Read Range is dependant upon which card is used:
	  • Min. 1.0" (2.5 cm) To Max. 4.0" (10.0 cm)
	• Ambient Operating Temperature: -40 to 60 °C (-40 To 140 °F)
	• Card Compatibility:
	  125 kHz Proximity:
	  • HID or Indala proximity cards, keyfobs, and tags
	  • AWID Credentials
	  13.56 MHZ contactless smart cards:
	  • ISO 15693 — read only; 2k bit (256 byte), 16k bit (2k byte), and 32k bit (4k byte); serial number
	  • ISO 14443A — read only; MIFARE and DESFire® (serial number)
	  • ISO 14443B — read only; 2k bit (256 byte), and 16k bit (2k byte)
	  • US Government PIV
	  • FeliCa IDm
	• Certifications:
	  • FCC Certification
	  • CE Mark
	• Housing Material: UL94 Polycarbonate

Fingerprint Scanner	• Supports TWIC applications • Waterproof • 12.8 mm X 12.0 mm active sensing area • Aluminum construction with commercial grade power coat finishing • Performs solid 1:1 verification and 1:N identification • Temperature Range: -35 To 70 °C (-31 To 158 °F)

Host Communication

Serial Ports	4
Communications type	Com 1, Com 3, and Com 4: RS-232 Com 2: RS-485/422 or RS-232
Ethernet	2

Environmental

Operating Temperature	From -20 °C To 70 °C Ambient (From -4 °F To 158 °F Ambient) **Note** The Smart Card Reader operates From -40 To 65 °C (-35 To 150 °F)
Storage Temperature	From -40 °C To 70 °C (From -40 °F To 158 °F)
Humidity	5 - 95% non-Condensing at 0 °C To 55 °C (32 °F To 131 °F)

Electrical

Operating Voltage	AC or DC • 20 - 72 VDC • 100 - 240 VAC 50/60 Hz • Supports 5 VDC throughout the 8620 DET • Units feature EMI/RFI Filtering, Load Regulation, and Over-current Protection
Power Consumption DC	• 800 mA @ 24 VDC without Heater • 3.4 A @ 24 VDC with Heater
Power Consumption AC	• 0.3 A @ 110 VAC without Heater • 0.8 A @ 110 VAC with Heater

Mechanical Construction

Enclosure Type	Rated NEMA 4X
Material	1/16" Thick Stainless Steel (1.5875 mm)
Dimensions	17.50" x 14.92" x 7.55" (445 x 380 x 192 mm)

Certifications and Approvals

FM Approvals (FM-c and FM-us) — Pending Class I, Division 2 Groups C and D AEx nA Class I, Zone 2, IIB

7 Ordering Information

Order Codes

	Approvals						
	4X	Weather Proof, NEMA 4X					
	FM	Factory Mutual Approvals (FM-c, FM-us) — Pending Class I, Division 2 Groups C & D AEx nA Class I, Zone 2, IIB					
		Power Supply – Input					
		1	20 - 72 VDC to 5 VDC				
		2	110 - 240 VAC to - 5 VDC				
			Enclosure Heater				
			A	Additional Options Not Used			
			B	DC Enclosure Heater			
			C	AC Enclosure Heater			
				Digital I/O			
				0	Additional Options Not Used		
				1	Single Dry Contact Output		
				2	Single DC Output		
				9	Custom Configuration		
					Card Reader		
					A	Additional Options Not Used	
					B	FIPS Compliant Smart Card Reader	
						Fingerprint Scanner	
						0	Additional Options Not Used
						1	FIPS Compliant USB Fingerprint Scanner
8620							Complete Product Designation

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