



SmartSite GX Outdoor Payment Terminal (OPT)

Installation and Specification Guide

Version 1.0

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Customer Support

SmartSite Tech Support 800 Numbers



Pacific Pride: 800-282-0032

Comsite: 800-741-2777 option 6, option 1, option 5

SmartSite Technical Support: 800.282.0032

CFN: 866-662-3636

Revision Log

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V04	20180115	M Marroquin	Pictures, Addendum B
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Confidentiality Statement

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Section 1: Unpacking and Initial Testing

SmartSite Gx Assembly and Initial Test Instructions

Introduction

Assembly and initial testing of a standard SmartSite Gx product verifies basic system operation and functional performance. The following instructions apply to the assembly and initial tests for the standard product. A standard SmartSite Gx product ships as two sub-assemblies, requiring assembly at the site:

1. Pedestal for mounting
2. Enclosure for the customer interface components

Each enclosure assembly further separates into two pieces, the enclosure that mounts to the pedestal and the door with customer interface components.

The initial test will *only* verify system basic operation and functional performance; this initial test does *not* test specifics of the identification and authorization processes. Tests for the specific identification functions such as magnetic card data and authorization by a network service requires changes to the configuration details of the local system database. The initial test database does not support these specific tests.

Hardware Mechanical Setup

1. Unpack pedestal. Save box and packing material for return shipment.
2. Set pedestal firmly on ground.
3. Bolt base plate to four (4) wood 2" x 4", each 3 foot in length or use weights to stabilize the pedestal.
4. Unpack the enclosure (head). Save box and packing material for return shipment.
5. Locate bolts to assemble the two product components.
6. Locate keys to access pedestal and enclosure cavities.
7. Open the pedestal and enclosure cavities.
8. Set enclosure head on top of pedestal and fasten assembly in four places.

Hardware Electrical Setup

1. Locate the various connecting cables between the two product assemblies. Cables requiring connection are found in the enclosure and will terminate in the pedestal.
2. The connections in Table 1 should be made to the pedestal Power Distribution Board (PDB) and Mechanical Pump Control (MPC). Chassis ground connects to pedestal chassis near the Power Distribution Board.
3. The Data Interface and Communication Board in the enclosure for the SmartSite Gx system provides remote connections for system configuration, remote authorization networks and optional serial port devices. Connections at the Communication Board include the MPC serial communications and optional equipment such as tank monitors. The connections in the enclosure assembly should be made at the Data

Interface or Communication Board as shown in Table 1. The connections in Table 2 should be made as necessary.

- Inspect remaining cables for cables that may have come loose during shipment.

Table 1 – Pedestal Connections

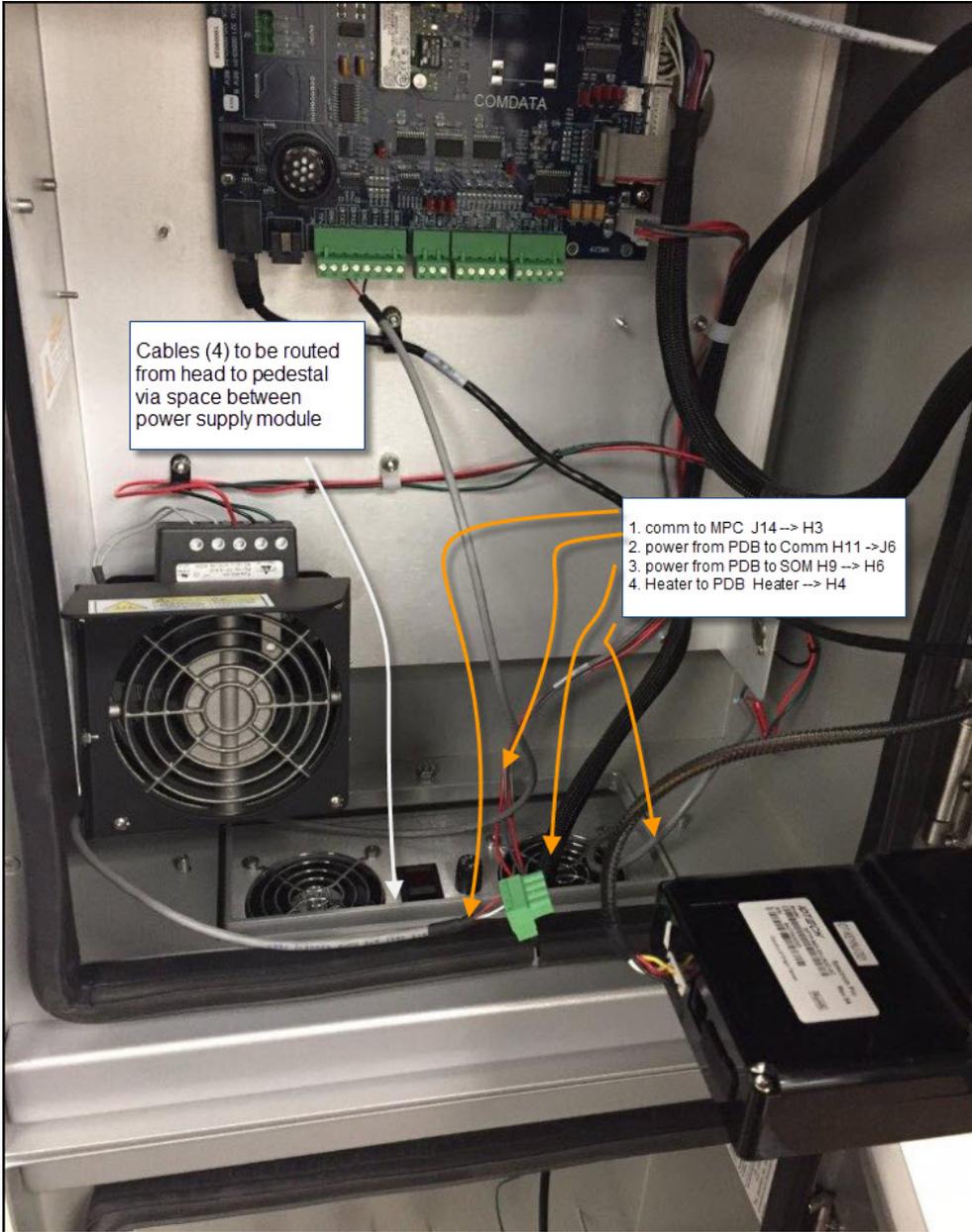
	Cable	Part No.	Connector Pins	Source	Destination
1	AC Heater Assembly	270-00242-01	2	Enclosure Heater Assembly	Pedestal PDB-H4
2	DC Power	270-00401-01	10	Enclosure Micro Interface	Pedestal PDB-H9
3	DC Power Comm Board	270-00190-01	10	Enclosure Data Interface	Pedestal PDB-H11
4	MPC serial port	270-00194-01	4	Enclosure Data Interface	Pedestal MPC-H3
5	Chassis Ground	270-00328-01 270-00329-01 270-00330-01	4 - in 10 - in 14 - in	Enclosure Chassis	Pedestal Chassis

Table 2 – Remote Data Connections – Comm Board

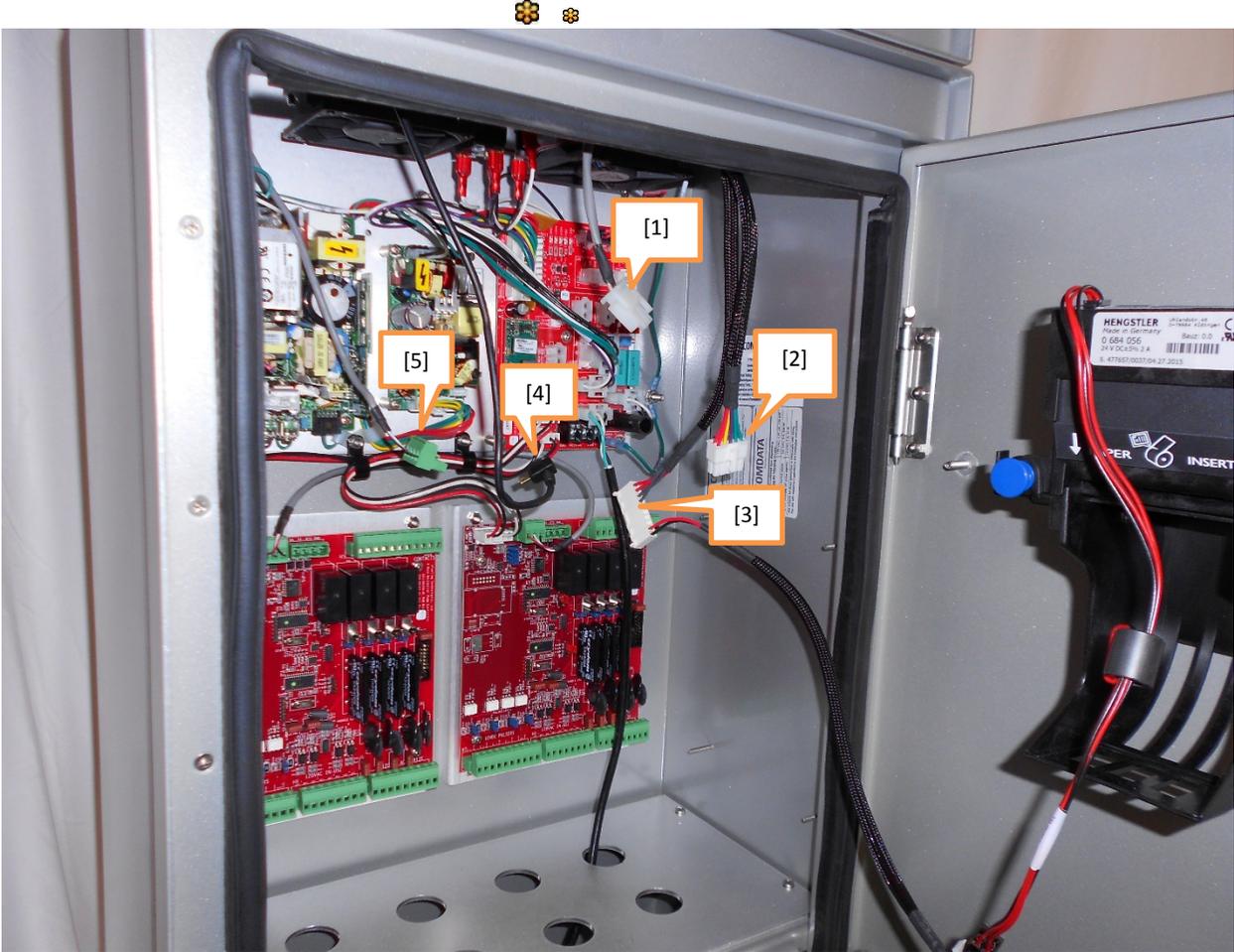
	Cable	Connector Pins	Source	Destination
1	Ethernet	8	J2-RJ45	Network RJ45
2	Phone line	6	15-RJ11	Modem
3	Spare (remote device)	5	J9 Comm 6	Optional RS 422
4	Spare (remote device)	5	J10 Comm 7	Optional RS422
5	Spare (remote device)	3	J13 Comm 3	Optional RS485
6	Serial Comms	8 3 - circuits	J14 Comm 2, Comm 4, Tip/Ring	RS232 and Telephone (printer[4])

Component Locations:

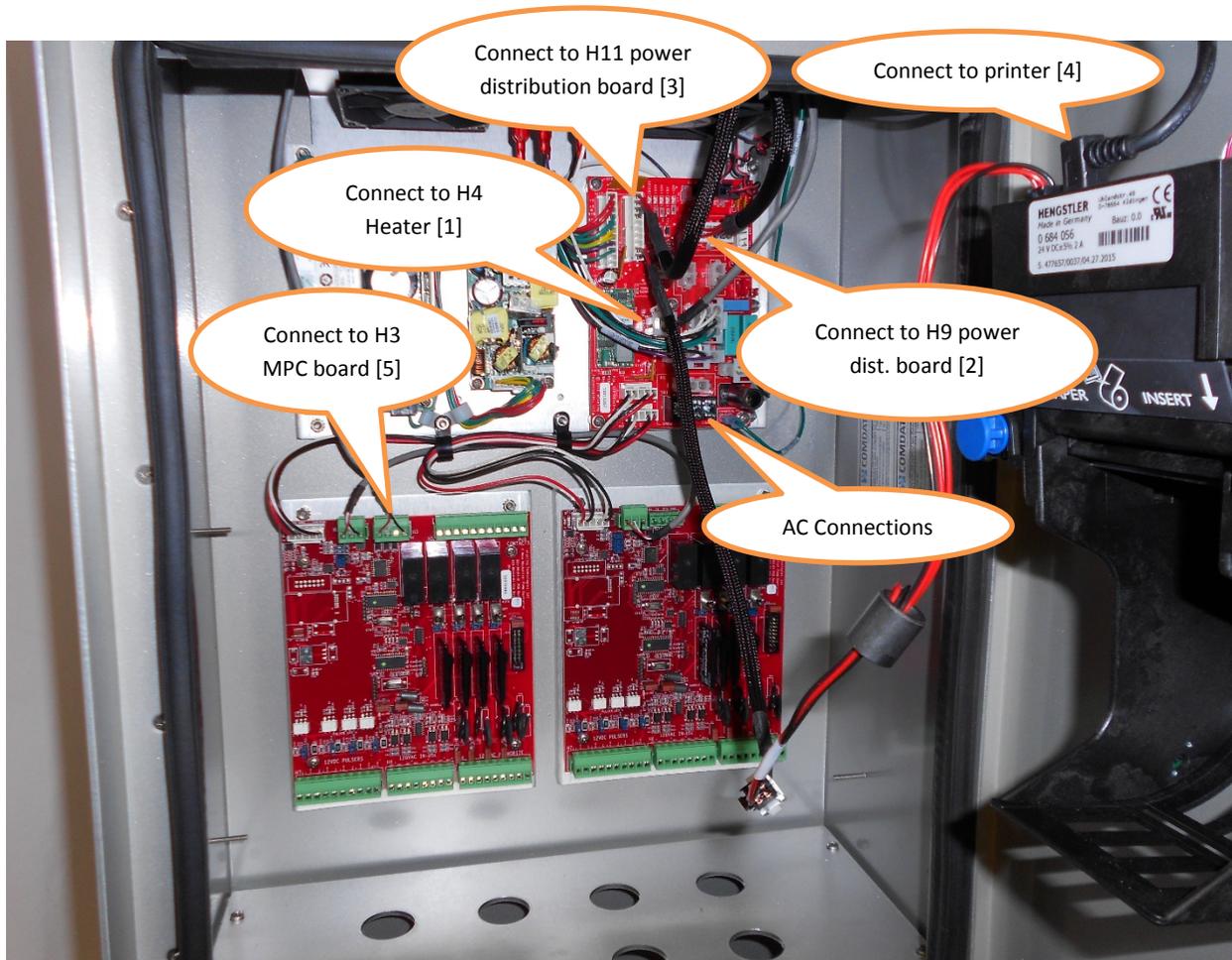
Cables in OPT head



Cables (5) between Power Supply and Pedestal



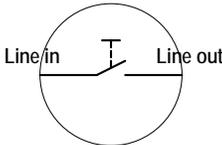
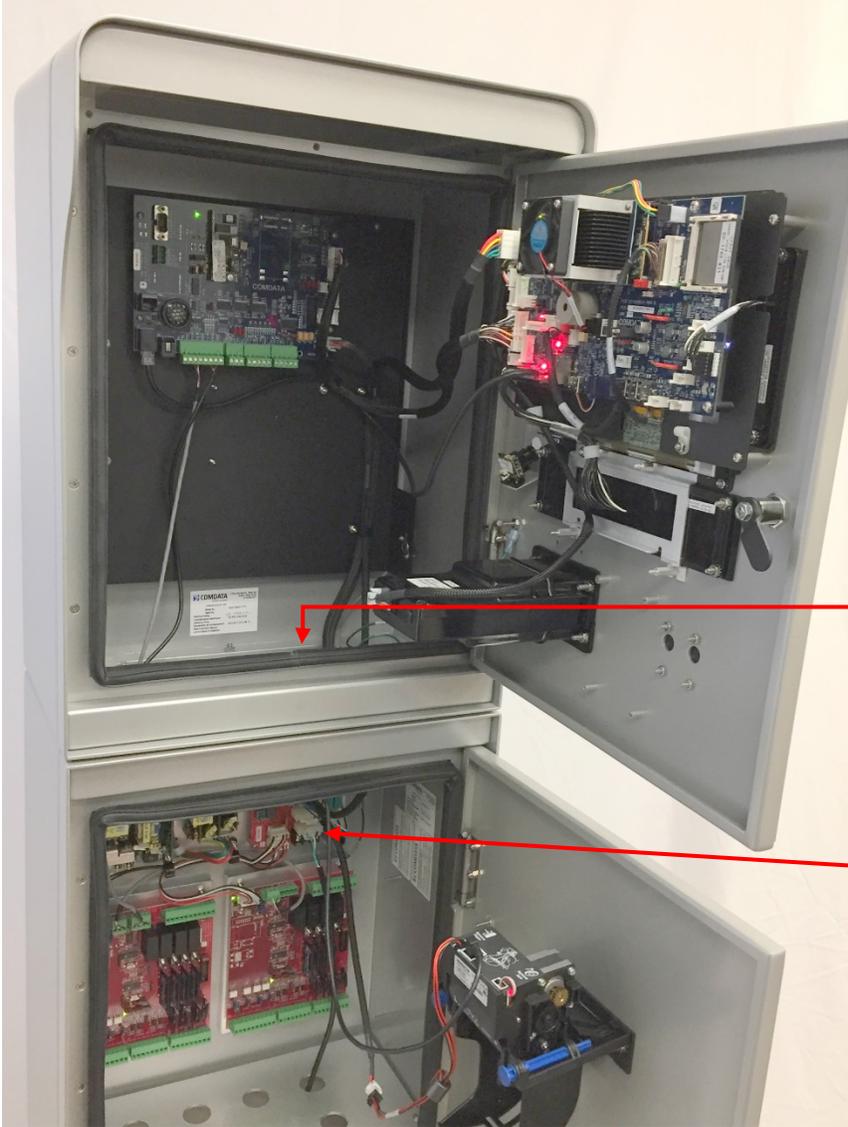
☼ Connections for SmartSite Gx OPT to Pedestal



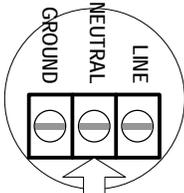
Applying Power to the System

1. Locate power switch at the top of the pedestal inside the enclosure.
2. Verify illuminating switch is Off (no illumination). Press down on switch edge nearest door.
3. Connect power cord at PDB-H1 or PDB-TB1 to a power source (typical 20A circuit).
4. Turn power SW1 **ON**. Switch illuminates.
5. Verify various circuits on system circuit boards energize.
6. SOM Micro - Startup sequence is 5 small green LEDs.
7. MPC Board - Power is 1 green LED, +5VDC; 1 green LED +12V; 2 red LEDs, serial data; and a startup transient sequence of 8 LEDs as board processors boot.
8. Graphic display will show a typical PC type boot process. The boot process in this code version may take several minutes. The process completion should present a red and black display with a customer prompt.

AC Power Component Location:

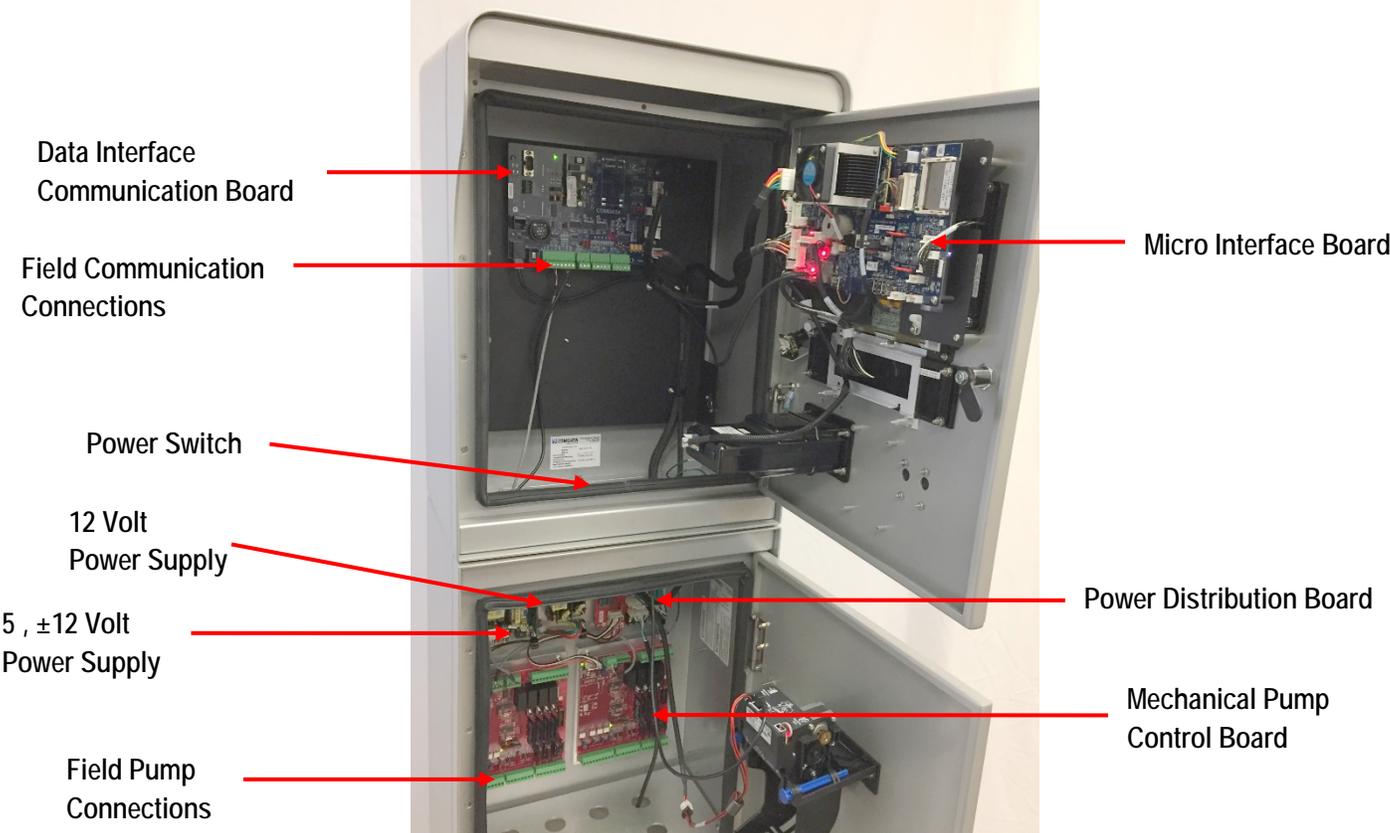


**AC Power Switch
Top of Pedestal
Access via Enclosure**



**AC Power Connection
PDB-TB1 or PDB-H1**

SmartSite Gx Component Location:



Section 2: Introduction to SmartSite Gx

Getting to Know the SmartSite Gx

The SmartSite Gx unattended Fuel Management System is the latest offering in Comdata's Point of Sale product line. SmartSite Gx OPT (Outdoor Payment Terminal) is a reliable fuel island-mounted Card Reader that can accept numerous ID devices (mag cards, RF tags, and future expansion) and authorizes up to 16 mechanical or up to 32 electronic dispenser positions. Captured fueling transactions are relayed to the Comdata HOST system for processing.

The SmartSite Gx is comprised of 6 main components:

1. SOM Microprocessor, mounted on interface Board
2. Communication (Comm.) Board
3. Mechanical Pump Controller (MPC)
4. Secure Insertion Card Reader (EMV)
5. Metallic piezo electric full alpha/numeric keypad
6. Power Supply

An optional receipt printer is also available. The SmartSite Gx OPT is housed in a rugged weatherproof enclosure (NEMA 3R). The user interface consists of an easily read back lite LCD display swipe type card reader or other ID Device reader and an extremely rugged metal keypad. All COMDATA NETWORK SmartSite Gx OPTs are equipped with thermostat-controlled heaters to allow reliable use in a wide range of environmental conditions.

General SmartSite Gx Requirements

Fuel Dispensers Minimal Requirements

Typical Mechanical Fuel Dispenser with an Electric Reset and/or an Electric Solenoid valve. Pulsers that will connect to the OPT 12VDC Pulser interface enabling a signal count for gallons dispensed.



- The above is required on each metered fuel position.
- Gas Boy 9800 series dispensers (pseudo electronic) require an optional Dispenser Interface Board that allows for Pulser output to the OPT's Pulser input circuit. Bennett GO Dispensers are also hybrid mechanical-electronic, these include the required mechanical interface.
- The standard SmartSite Gx does not support electronic dispensers. Electronic dispenser support is available for the SmartSite Gx with the addition of an optional Site Controller.

Terminal Location

The SmartSite Gx Outdoor Payment Terminal (OPT) is typically installed near the fuel dispensers on the existing concrete fuel island pad. Space required is approximately a 2-3 sq. ft. area that allows front panel access.

If not placed on the fuel island pad, the OPT pedestal must be securely anchored to a concrete pad or roadway surrounded by guarding posts for protection.

Power Configuration

The OPT must have a DEDICATED 120VAC power circuit to supply power. This circuit can have other electronic systems (i.e., CPU). Motor and lights circuits are **not** allowed.

Conduits and electrical wiring between the fuel dispensers and the OPT and between the OPT as well as the power and communications sources will need to be determined on a site-by-site basis.

Site Planning

When planning how many OPTs you will need at your site, here are some considerations:



- ✓ Number of fuel islands at each facility.
- ✓ Number of dispensers on each fuel island.
- ✓ Do you require a SmartSite Gx OPT on each island?

** A site survey should be done for every SmartSite Installation so that the Comdata Implementation team will have the necessary information to help if needed.

Section 3: Installation Overview

Specifications, Wiring Suggestions and Conduit Diagrams



- Electrical equipment connected to associated apparatus should not use or generate more than 250VAC.
- Installation shall be in accordance with the manufacturer’s instructions and the National Electrical Code (ANSI/NFPA 70).
- For guidance on installation see ANSI/ISA RF 12.6 *“Installation of Intrinsically Safe Instrument Systems in Class I Hazardous Locations.”*
- Tampering and replacement with non-factory components may adversely affect the safe use of the system.

SmartSite Gx OPT Environmental Specifications

The OPT was designed to mount securely on a pedestal exposed to the weather. Its environmental specifications are listed in Table 1 below.

The OPT power requirement listed in Table 1 is for operational power only. This power supply is **not** designed to provide power directly to the dispenser or pump. AC power to operate the dispenser must come from a separate circuit and is controlled by the OPT’s MPC.

Table 1 – OPT Specifications

Weight	35 lbs. (without pedestal and receipt printer)
Dimensions	21.5"(H) x 16.5"(W) x 10"(D)
Operating Temperature	-40°F - 167°F
Storage Temperature	-40°F - 185°F
Humidity	5% - 95% non-condensing
Power Requirements	95mA - 125mA, 60Hz 2A Max.

Conduit Layout - Building-based (preferred layout)

Building-based Power and Communication Wiring:

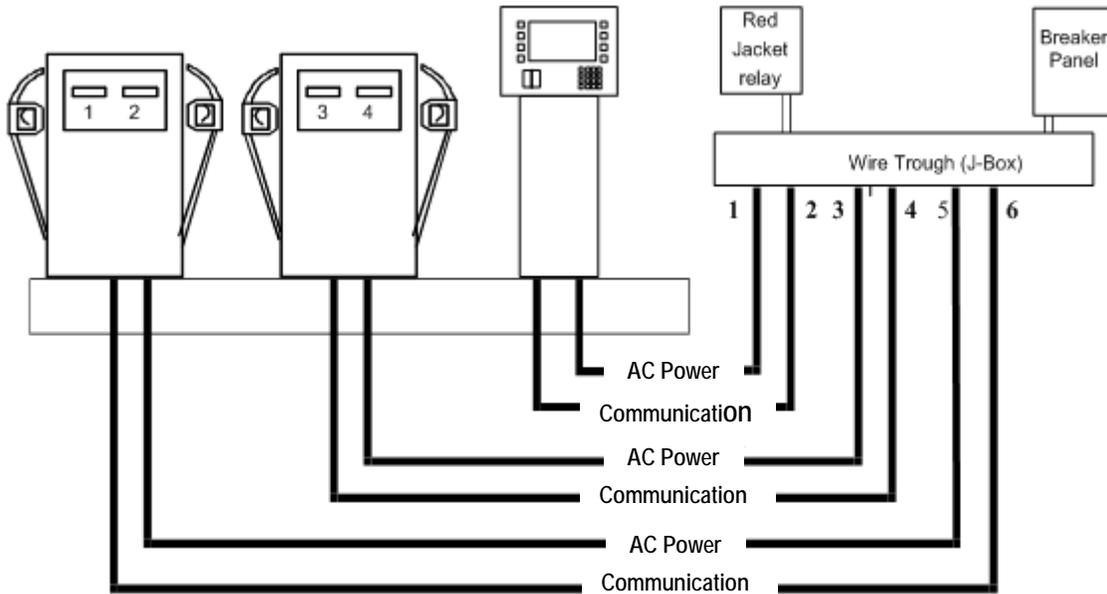


Table 2 – Conduit / Wiring

Conduit No.	Wire Signal Names	AWG	Wire Color Recommendation
1	120VAC Hot, Neutral, Ground (3 wires dedicated OPT power)	12	black, white, green
	120VAC Authorize, Hose Handle / In-use Return (EACH HOSE)	12	blue, yellow
	Dispenser Control/STP Control Power 120VAC Hot, Neutral (2 wires / circuit)	12	red, grey
2	OPT communications – CAT5 Preferred CAT6	cable	CAT5 or CAT6
	Optional dial backup (2 conductors)	cable	1 or 2 pair Belden
3	120VAC Authorize, Handle / In-Use return, (2 per hose position)	16-12	orange, yellow
	Disp/STP Control Power, STP ON Return, Disp. Neutral, Ground (4 per dispenser)	16-12	red, red2, grey, green
4	Pulser wiring, 2 wires per hose for reed-switch type Pulsers	22-18	-
	3 wires per hose for electronic-type Pulsers	22-18	Can use cable or wires
5	Same as 3 – AC above		-
6	Same as 4 – DC above		-



- These are *recommendations* for typical installation of a SmartSite Gx OPT connected to mechanical dispensers. Site needs may vary.
- Communication cabling requirements can be combined with electrical if needed.
- Use of shielded cable and separate AC and DC conduits provides maximum protection against noise and interference.

DC Low Voltage Conduits

TCP/IP Network communications, OPT to Building/Main J-Box through to equipment

- Cat5 cable (Cat6 cable is preferred).
- Optional two-wire telephone line for dial backup.

DC Pulsar Wiring from OPT MPC Pulsar Connector to each fueling dispenser

- REED-SWITCH Type or equivalent 2 WIRE type, Standard Volume Pulsar 10:1 or 100:1
- 2-conductor shielded cable or 2 individual THHN wires are adequate when located in separate conduit from AC wires, per Pulsar location
- ELECTRONIC – 3 WIRE Type requiring +12VDC, DC GRD/common, and pulse output
- 3-conductor minimum shielded cable or 3 individual THHN wires

AC High Voltage Conduits

OPT's Power Wiring

OPT's Terminal Block 1(TB-1) to building circuit breaker panel, on a dedicated 20A Breaker

- #12 AWG stranded THHN wires for 120VAC Hot, Neutral, and GRD, 20A circuit
- #16 - 12 AWG stranded for Dispenser Control Power Circuit and Neutral (2 per STP)

OPT's Hose Control Wiring

OPT to Island Dispenser (using Submersible Turbine Pump, STP system)

- #16 - 12 AWG wires for EACH HOSE position (1 for 120VAC Auth and 1 for Handle Return, Neutral should be run to each dispenser as well)
- 120VAC Authorize Signal, OPT MPC Authorize Connector H4 to Dispenser Electric Reset
- 120VAC Handle Signal Return (In-Use, Switch Detect), from dispenser electric reset to OPT MPC Handle Relay connector H8 (This circuit requires a Neutral connection.)

Dispenser Power Wiring

- #16 - 12 AWG wires for EACH HOSE position (1 for 120VAC Auth and 1 for Handle Return) *Note: The above dispenser wiring is typical of a Gas Boy 9100 series, sites may vary.*

Suction Pump Dispenser Wiring

OPT to Island Pump Dispenser

- 5 wires / hose for control wires *Note: Assumption - dispenser's 120VAC supply, Neutral, and GRD wiring are already present*

120VAC Authorize Signal

Optional OPT Heavy Duty Relay to Pump Reset and Motor

- #12-14 AWG Stranded THHN wires (supply from pump circuit, Auth, & spare)

120VAC Handle Signal Return ('Switch Detect')

OPT Handle Relay to Dispenser

- #16-18 AWG Stranded THHN wire (120VAC after reset complete to OPT handle relay Neutral)

Conduit Layout - Island-based

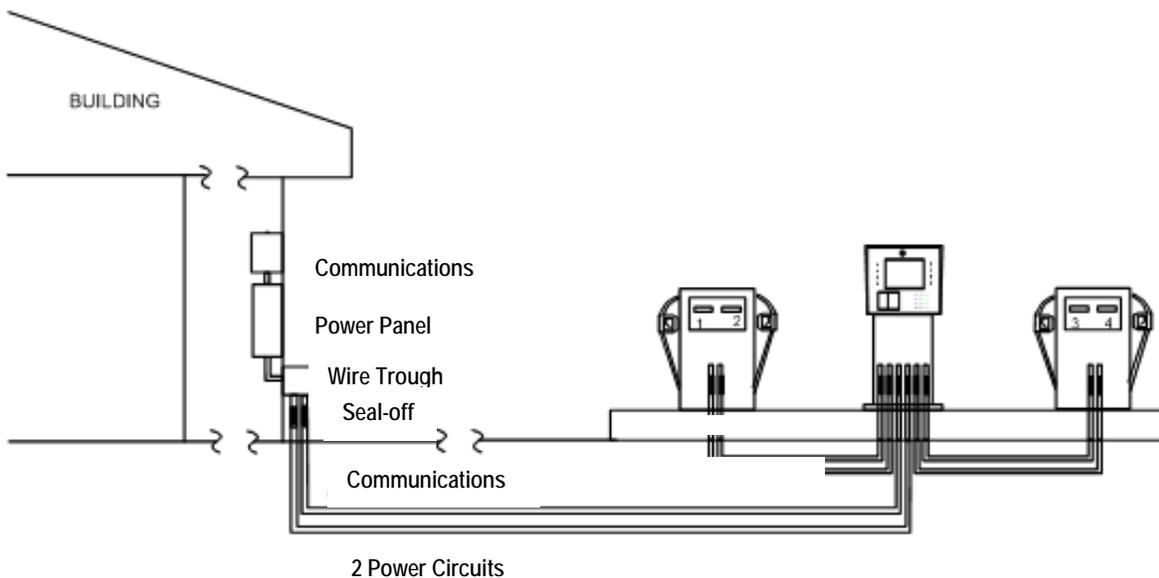
The OPT requires a minimum of two conduits from the facility:

1. Communications data lines (Internet and optional phone) cables (2)
2. Cable for power requirements (1)

Ensure the conduit for electrical power has the capability for both dispenser and the dedicated power source for the OPT.

These conduits are duplicated from the OPT to each dispenser, for both communication and power.

Island-based Power and Communication Wiring:

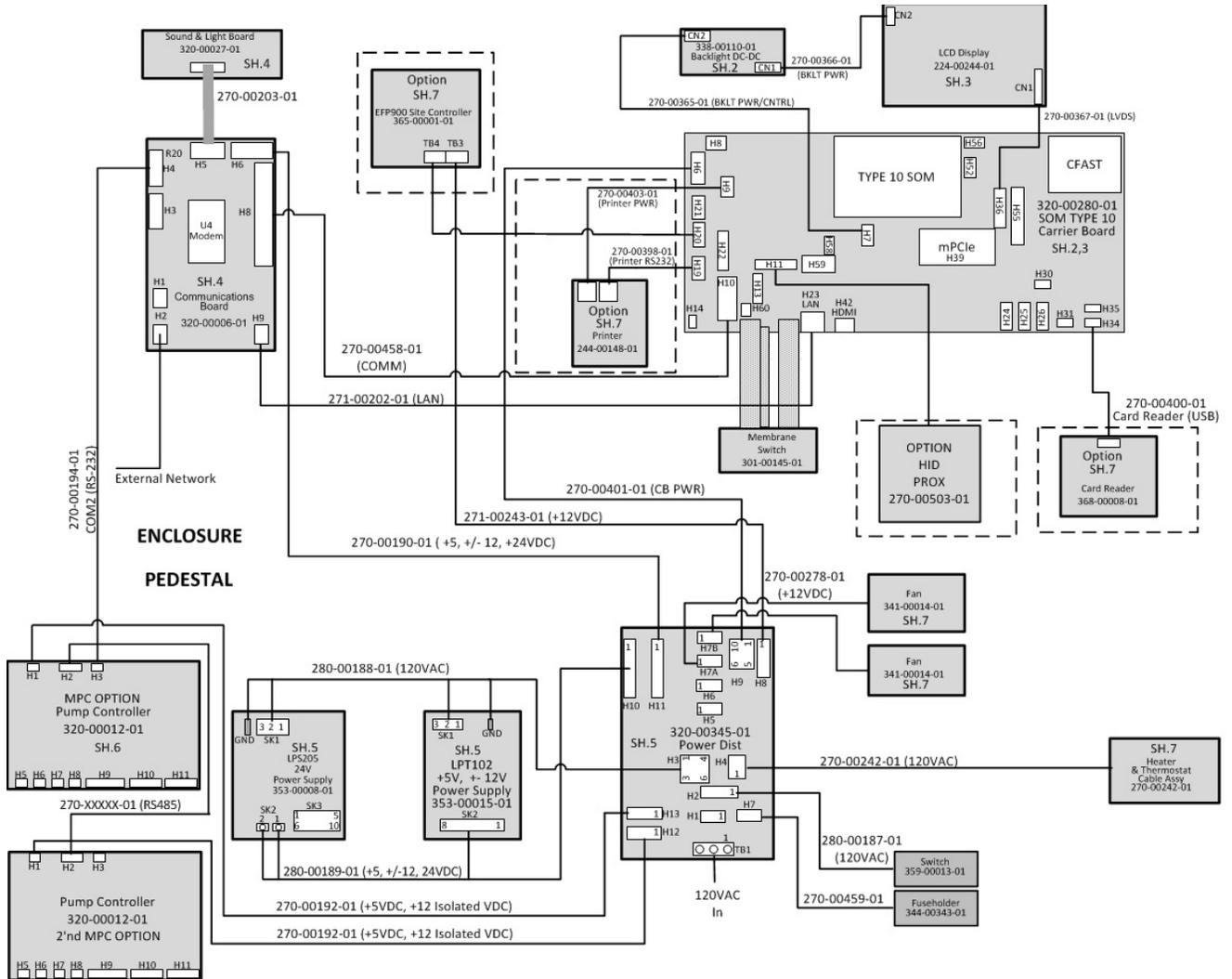


- Arrange the conduits under OPT pedestal to fit within the inside pedestal dimensions of 6" x 6" or 7" x 13" depending on which pedestal option selected.
- This is a recommendation *only*. Site needs may vary. Communication cabling requirements can be combined if needed. Use of shielded cable and separate AC and DC metal conduits provides maximum insurance against noise and interference.

Section 4: Hardware Components

SmartSite Gx System Overview

SmartSite Gx OPT Electrical Component Layout:

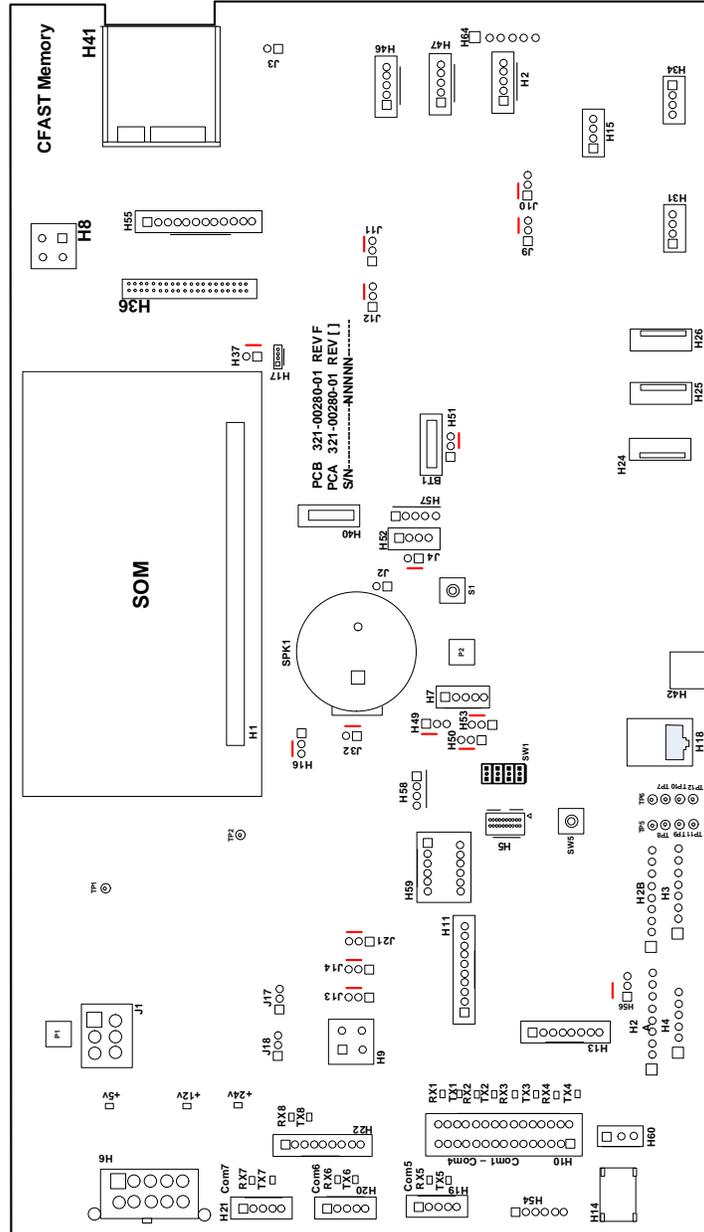


SOM Microprocessor Board

This door-mounted circuit board is the central processor of the SmartSite Gx - it connects to and controls all peripherals.

SOM Microprocessor Board Component Layout:

SOM BLUE PCB



SOM Carrier Board Jumpers (Blue)	Description and Setting	
J1	JTag Programming port for PSOC	
J2	SATA Selection	1-2 external drive
J3	Microphone	1-2 mute
J4	CPU Fan select	1-2 On PWM control
J5 – J8	N/A	
J9	Audio amplifier	1-2 mute off; 2-3 on
J10	Speakers	1-2 3W; 2-3 11W
J11	Audio R	1-2 no PA; 2-3 with PA
J12	AudioL	1-2 no PA; 2-3 with PA
J13	Com7 TX echo	1-2 echo on
J14	Com7 RS mode	1-2 RS-232; 2-3 RS485 (2-3)
J15 – J16	N/A	
J17	Com7 Term TX	1-2 on; 2-3 off (1-2)
J18	Com7 Term TX	1-2 on; 2-3 off (1-2)
J19 – J20	N/A	
J21	Com7 RS mode	1-2 Full duplex; 2-3 Half duplex (1-2)

Header	Header settings	Description
H1	Com10 Module	SOM 7565 or 7567
H2		
H2A/B	Keypads	NxN
H3	4 x 4 keypad	FX keypad device
H4	1 x 4 keypads (2)	Also H54 and H64
H5	PSOC JTag	PSOC Programming
H6		Power Input
H7	Backlight	LVDS display backlight
H8	+5V / +12V	Power input
H9		Printer power if present
H10		Com1 – Com4
H11 – H13	N/A	
H14		Microtip backlight
H15	USB Mini – Lock	USB_HUB_4
H16	Buzzer (2-3) on;	P1=+12V, P2=Gnd, P3=NC
H17		LVDS backlight
H18		Ethernet
H19		Com5
H20		Com6
H21		Com7
H22		Com8
H23	N/A	

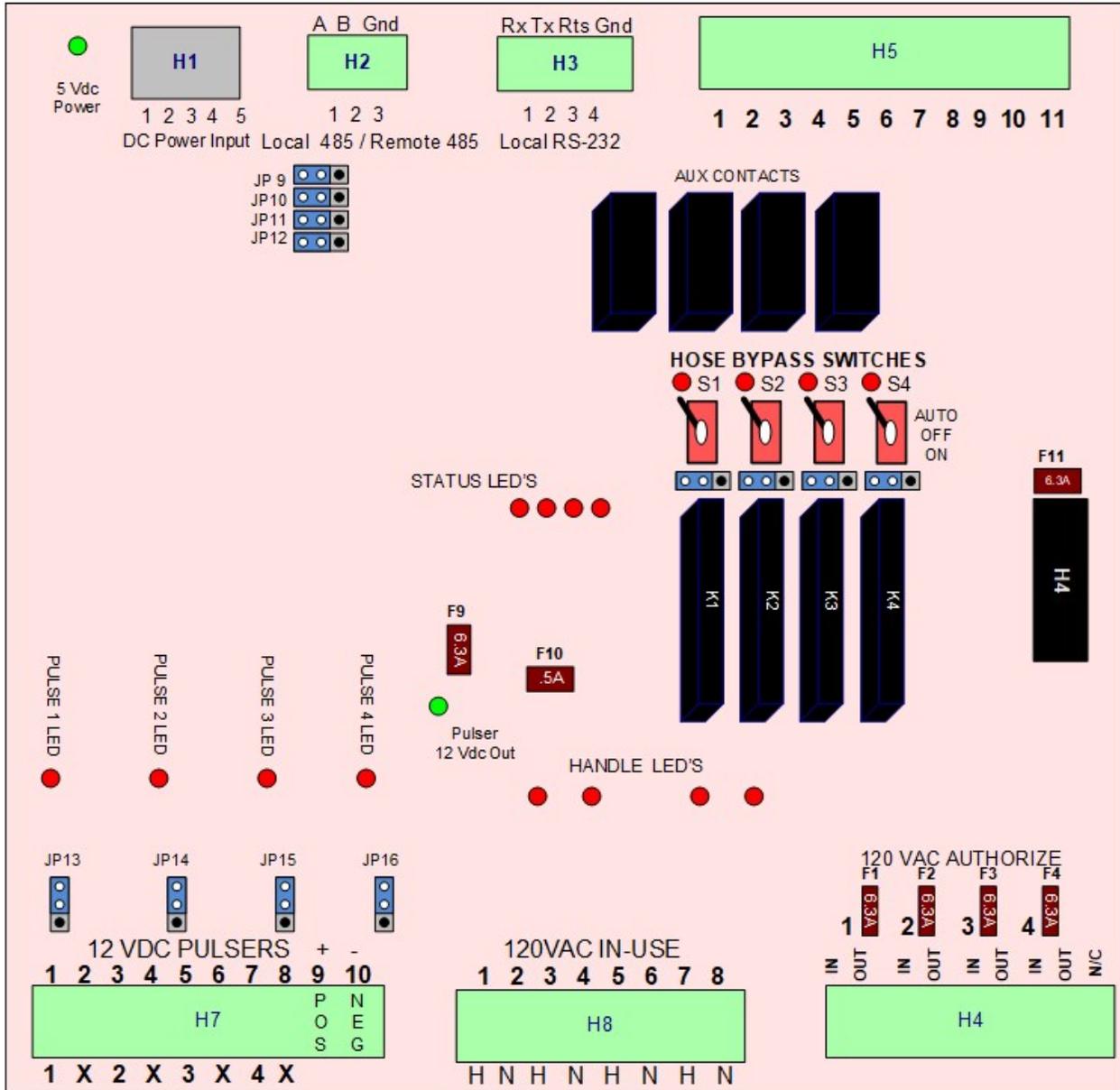
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H24	USB Type A USB3.0	USB_0
H25	USB Type A USB1	USB_1
H26	USB Type A	USB_HBU_1
H27 – H30	N/A	
H31	USB Mini-Lock	USB_HUB_2
H32 – H33	N/A	
H34	USB Mini-Lock	USB_HUB_3
H35	N/A	
H36	LVDS	
H37	DDIO_DDC_AUX_SEL	HDMI Enable (1-2)
H38 – H39	N/A	
H40	mSATA	
H41	CFAST card	
H42	HDMI	
H43 – H45	N/A	
H46	Microphone	
H47	Line In	
H48	N/A	
H49	Backlight	1=vcc_12v 3=vcc 5v (1-2)
H50	Backlight	1 = LVDS_BKLT_CTRL 3 = Pot_P2 (2-3)
H51	RTC Power	
H52	CPU Fan Power	
H53	Backlight	1 = LVDS_BKLT_ENABLE 3 = V3.3 (2-3)
H54	1 x 4 keypads RT	4pos keypad 1
H55	GPIO	
H56	COM to PSOC	
H57	Power	
H58	Power 12V	
H59	LCD Character Display	
H60	I2C	
H61 – H63	N/A	
H64	1 x 4 keypads LFT	4pos keypad 2

Mechanical Dispenser Controller

The MPC allows the OPT to control up to 4 hose positions, 16 when the optional 2nd, 3rd and 4th MPC are installed. The OPT can connect to the MPC via RS-485, RS-232, or through the 10baseT Ethernet connection using a typical Lantronix Ethernet to Serial converter.

Mechanical Dispenser Controller – 4 - Hose:



Each hose position is fuse protected, surge protected, and in-rush current limited. The MPC supports ONLY DC voltage pulser connections including those that require pull up resistors.

Dispenser Authorization

A DEDICATED Dispenser Power circuit (20A) is used by the MPC to control a dispenser's Electric Reset or Electric Solenoid Valve. When connected to pumps with integrated pump motors or other large current draw device, an OPTIONAL heavy duty relay must be installed.

Bypass switches (S1-4) allow maintenance personnel to override the computer control of the hose in order to disable the hose position or turn it ON in a software override mode. In the AUTO position the OPT controls each hose position's solid-state relay.

Dispenser Handle Detection

The MPC monitors dispenser's handle or switch detect signal by connecting a 120VAC wire to its IN-USE connections on H8. The 120VAC IN-USE connections require the DEDICATED Dispenser Power circuit's Neutral to be connected to position 2,4,6,8 of H8.

4-Hose MPC, Jumpers, Switches, Fuses, Connectors and Indicators

Connectors				
H1	+5, +12VDC Input			
H2	RS485 Local Interface			
H3	RS232 Interface			
H4	Authorization hoses 1 - 4			
H5	Auxiliary Contacts			
H7	Pulser in for hoses 1 – 4, pin 9 = 12VDC Pulser power, pin 10 = Gnd			
H8	120VAC In-Use hoses 1 - 4			
H11	Programming port for U1 PIC			
H13	Programming port for U3 PIC			
Jumpers, Switches				
JP111	Hose 1 Authorize Select, Internal/External, Default = 1-2 Internal			
JP112	Hose 2 Authorize Select, Internal/External, Default = 1-2 Internal			
JP113	Hose 3 Authorize Select, Internal/External, Default = 1-2 Internal			
JP114	Hose 4 Authorize Select, Internal/External, Default = 1-2 Internal			
4 – Hose MPC Channel Number Jumpers J6 – J9				
	J6	J7	J8	J9
1, 2, 3, 4	OPEN	OPEN	OPEN	OPEN
5, 6, 7, 8	OPEN	CLOSED	OPEN	CLOSED
9, 10, 11, 12	CLOSED	OPEN	CLOSED	OPEN
13,14,15,16	CLOSED	CLOSED	CLOSED	CLOSED
JP9	232 Select - Default 1-2, 2-3 used with optional rabbit			

JP10	232 Select - Default 1-2, 2-3 used with optional rabbit
JP11	485 Select - Default 1-2, 2-3 used with optional rabbit
JP12	485 Select - Default 1-2, 2-3 used with optional rabbit
JP13	Pulser 1 Pull up resistor, Default = 2-3
JP14	Pulser 2 Pull up resistor, Default = 2-3
JP15	Pulser 3 Pull up resistor, Default = 2-3
JP16	Pulser Pull up resistor, Default = 2-3
S1	Hose 1 Authorize, Auto/Off/Manual
S2	Hose 2 Authorize, Auto/Off/Manual
S3	Hose 3 Authorize, Auto/Off/Manual
S4	Hose 4 Authorize, Auto/Off/Manual

Indicators

D1	+5VDC Power
D2	RS232 TX
D3	RS232 RX

Hose LED Indicators

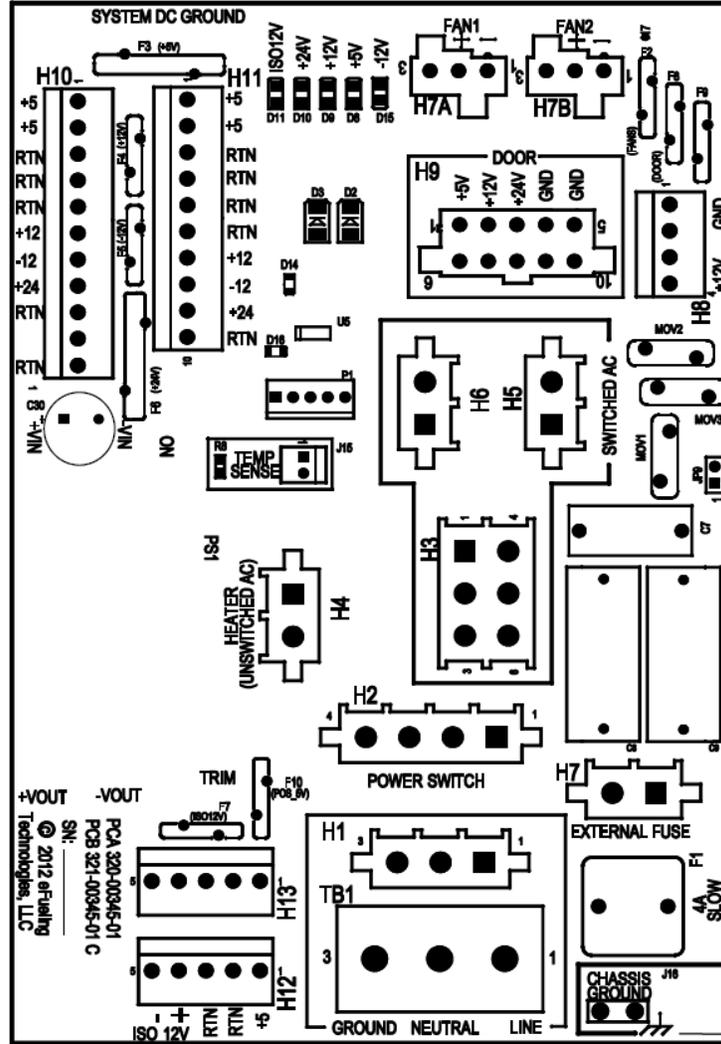
	STATUS	AUTH	HANDLE	PULSER
Hose 1	D21	D61	D41	D81
Hose 2	D22	D62	D42	D82
Hose 3	D23	D63	D43	D83
Hose 4	D24	D64	D44	D84

Fuses

F1	Hose 1 Authorize, 6.3A (Littelfuse 39616300440)
F2	Hose 2 Authorize, 6.3A (Littelfuse 39616300440)
F3	Hose 3 Authorize, 6.3A (Littelfuse 39616300440)
F4	Hose 4 Authorize, 6.3A (Littelfuse 39616300440)
F9	+12V Pulser Output Secondary Fuse, 6.3A (Littelfuse 39616300440)
F10	+12V Pulser Output, .5A (Littelfuse 39605000440)
F11	External Authorize +5V (Littelfuse 39605000440)

Power Distribution Board

Power Distribution Board Component Layout:



PDB Connectors, Indicators and Fuses

Power Supply Connectors	
TB1	AC Input
H1	AC Input (Alternate)
H2	Power Switch
H3	AC out to DC power supplies
H4	Un-switched AC (Heater)
H5	AC AUX out (switched)
H6	AC AUX out (switched)
H7	External Fuse
H7A	FAN #1, 12VDC
H7B	FAN #2, 12VDC
H8	+12VDC out (Auxiliary)
H9	+5V, +12V, +24V output (SOM-Micro)
H10	DC Inputs from power supplies (+5VDC, +12VDC, -12VDC, +24VDC)
H11	+5V, +12V, -12V, +24V output (Comm Board)
H12	+5V, +12V Isolated
H13	+5V, +12V Isolated
P1	PSoC programming header
J15	External thermistor
J16	Earth Ground
JP9	Enable MOV's to earth GND

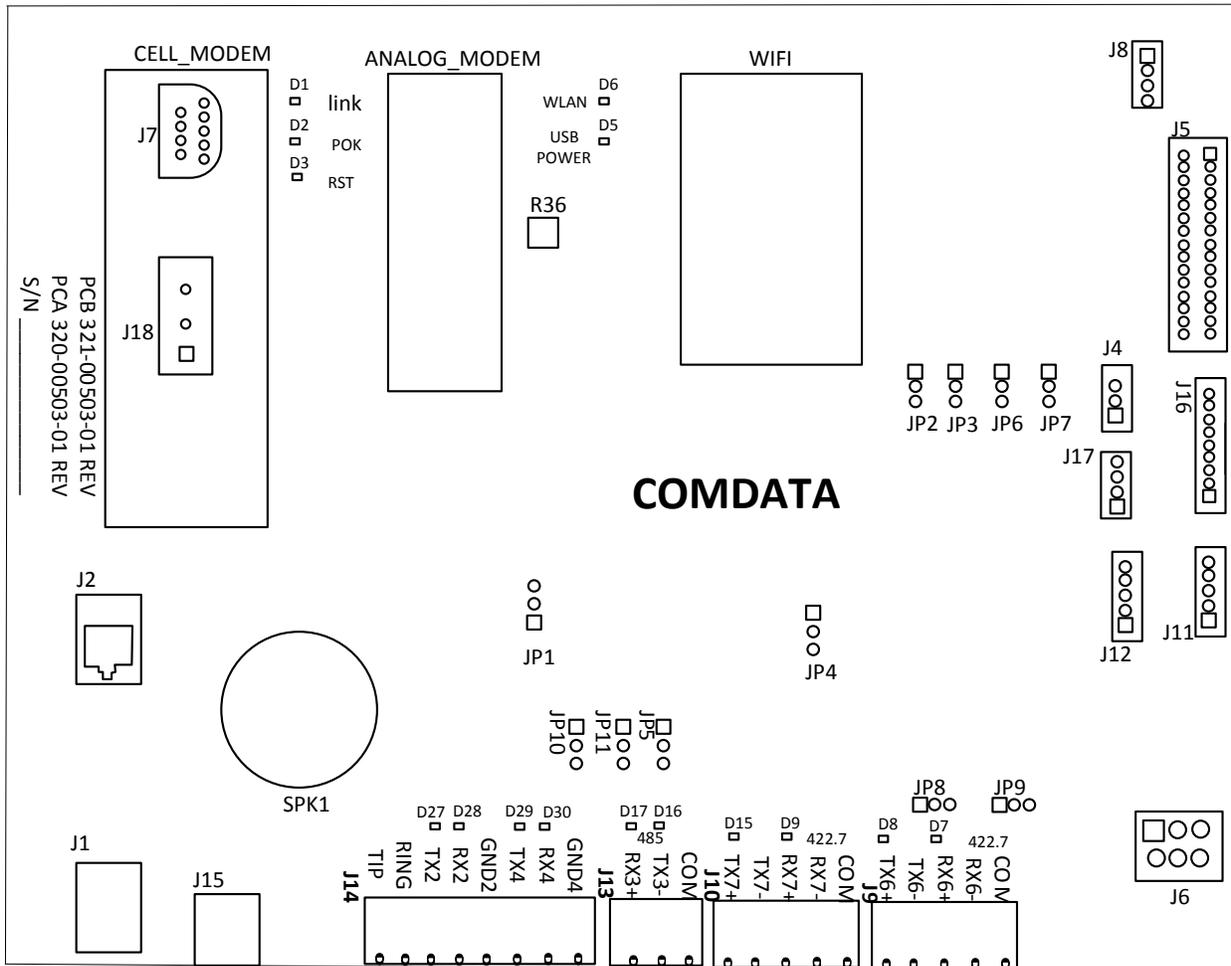
Power Supply Connectors	
D8	+5VDC
D9	+12VDC
D10	+24VDC
D11	+12VDC Isolated
D15	-12VDC

Fuse	
FI	SLOW, 4A, 250V, GLASS, Littelfuse 0313004

Communication Board

The OPT's Communication Board (Comm Board) is the connection center for all communication wiring to the outside world as well as DC power distribution from the Power Supply to the SOM components via a 60-pin cable.

Communication Board (Comm) Component Layout:



JP1:485 1-2: On 2-3: Off	JP4:RS422.6 1-2: On 2-3: Off	JP5:RS422.7 1-2: Off 2-3: On	JP6,JP7:Audio 1-2: J5 2-1: J4
JP2:TX Enable 1-2: RTS 2-3: Auto	JP8,JP9:Mode 1-2: RS485 2-3: RS422	JP10,JP11:Mode 1-2: RS485 2-3: RS422	
JP3:TX Echo 1-2: Off 2-3: On	<u>Silkscreened on back of board.</u>		

Telephone Line Connections

The telephone line is connected to the Comm Board using a standard RJ11 plug using a standard RJ11 line cord may be used to connect the TELCO jack to the Comm Board's RJ11 jack labeled J15.

10/100BaseT Network Connections

If available, an RJ45 patch cable may be connected to the Comm Board's RJ45 jack labeled J2.

Comm Board Jumpers, Switches, Indicators and Connectors

Jumper	Description / Default
JP1	COM3 Term Enable (1 – 2), Disable 2 – 3
JP2	COM3 RS485 TX ENABLE RTS (1 – 2), Auto 2 – 3
JP3	COM3 TX Echo Disable (1 - 2); Enable 2 - 3
JP4	COM6 RS422 Term Enable (1 – 2); Disable 2 – 3
JP5	COM7 Term Enable (1 – 2); Disable 2 – 3
JP6	AudioL From SOM (1 – 2); From Ext 2 - 3
JP7	AudioR From SOM (1 – 2); From Ext 2 – 3
JP8	COM6 MODE RS485 (1 – 2); RS422 2 – 3
JP9	COM6 MODE RS485 (1 – 2); RS422 2 – 3
JP10	COM7 MODE RS485 (1 – 2); RS422 2 – 3
JP11	COM7 MODE RS485 (1 – 2); RS422 2 - 3

Connector	Description
J1	RJ45 Vertical Network Connector
J2	RJ45 Horizontal Network Connector
J3	Sound and Light Connector IDC 16 pin
J4	Audio Molex 3 pin
J5	SOM Molex 30 pin
J6	5VDC Connector Molex 6 pin
J7	DB9 Male Com8
J8	PCIE USB Molex 4 pin (not populated)
J9	COM6 Out Phoenix 5 pin
J10	COM7 Out Phoenix 5 pin
J11	COM6 In from SOM Molex 5 pin
J12	COM7 In from SOM Molex 5 pin
J13	COM3 Out Phoenix 3 pin
J14	COM2 and COM4 Out Phoenix 8 pin
J15	Phone Line Connector RJ11
J16	COM8 In from SOM Molex 9 pin
J17	USB1 Connector Molex 4 pin Cell Modem (not populated)
J18	COM1 Out Phoenix 3 pin

Section 5: Mechanical Dispenser Interfaces

Mechanical Dispenser Interface - LOW VOLTAGE for Pulser Input

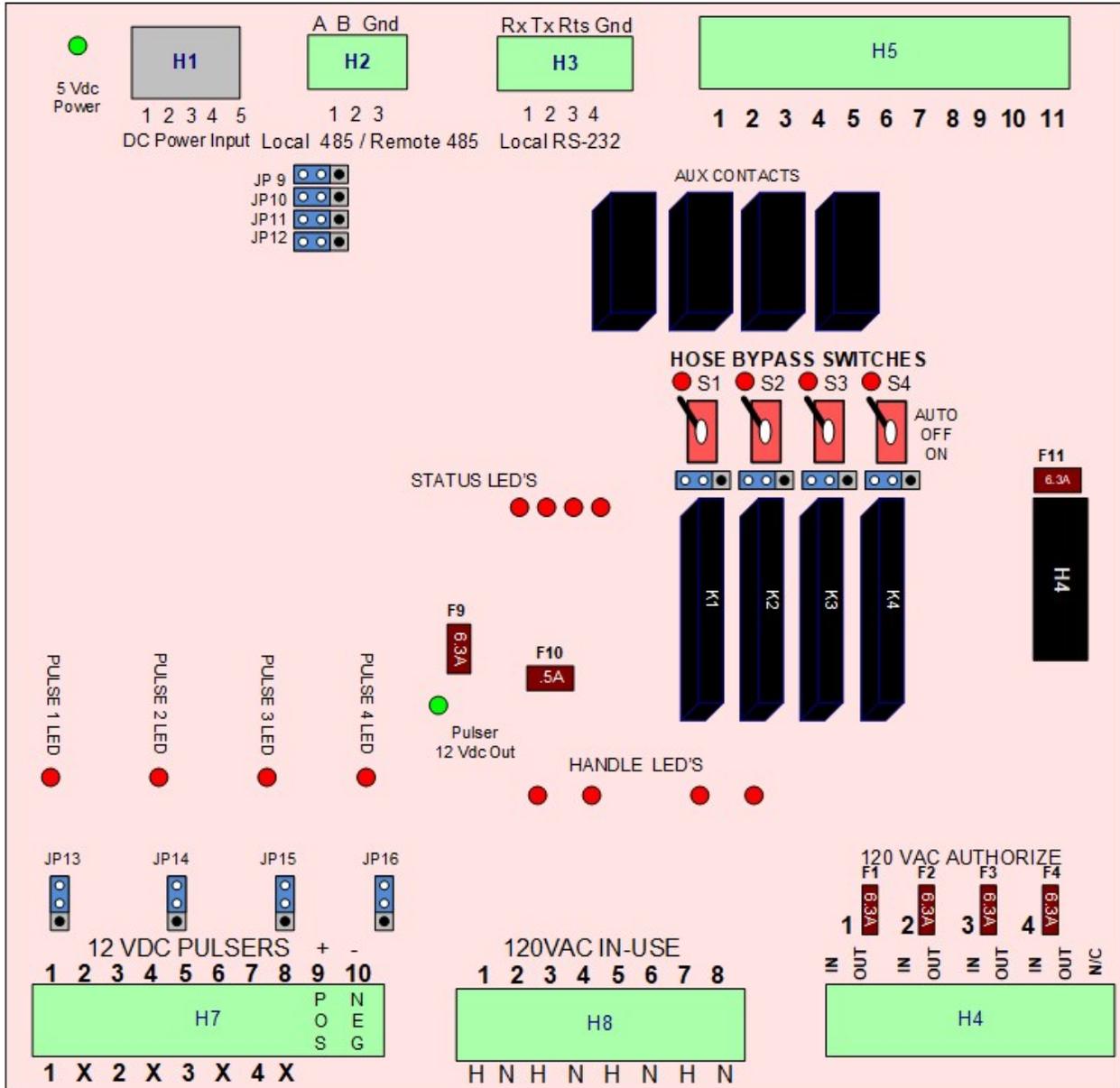
PULSER Types and MPC Configurations

All pulser connections to the SmartSite GX OPT are made on the MPC connector H7 and mating plug P7. The pulser input section of the MPC can support three types of pulsers. Each type of pulser type will require specific jumper settings as follows. The main types of pulser configurations are:

- 2 wire standard (open close switch type)
- 2 wire with pull up resistor (typically Ground and Pulse Input with pull up to +12VDC)
- 3 wire (wires for +12VDC Ground, and Pulser Output)

These are also sometimes referred to as reed-switches, open-collectors or electronic types:

Mechanical Dispenser Controller - 4-Hose:



Pulsers Options for Mechanical Dispensers

All pulse circuit connections to the SmartSite device are made on the Mechanical Pump Controllers (MPC4)10-position header H7.

An isolated 12V power supply MPC pulse circuit inputs can support three main types of pulsers. Pulsers types include: reed-switches or Western types, open-collectors or electronic types.

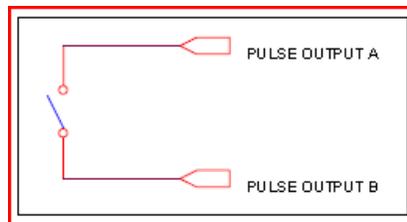
Each pulser-type has unique jumper settings:

2-Wire Pulser Configuration (Standard)

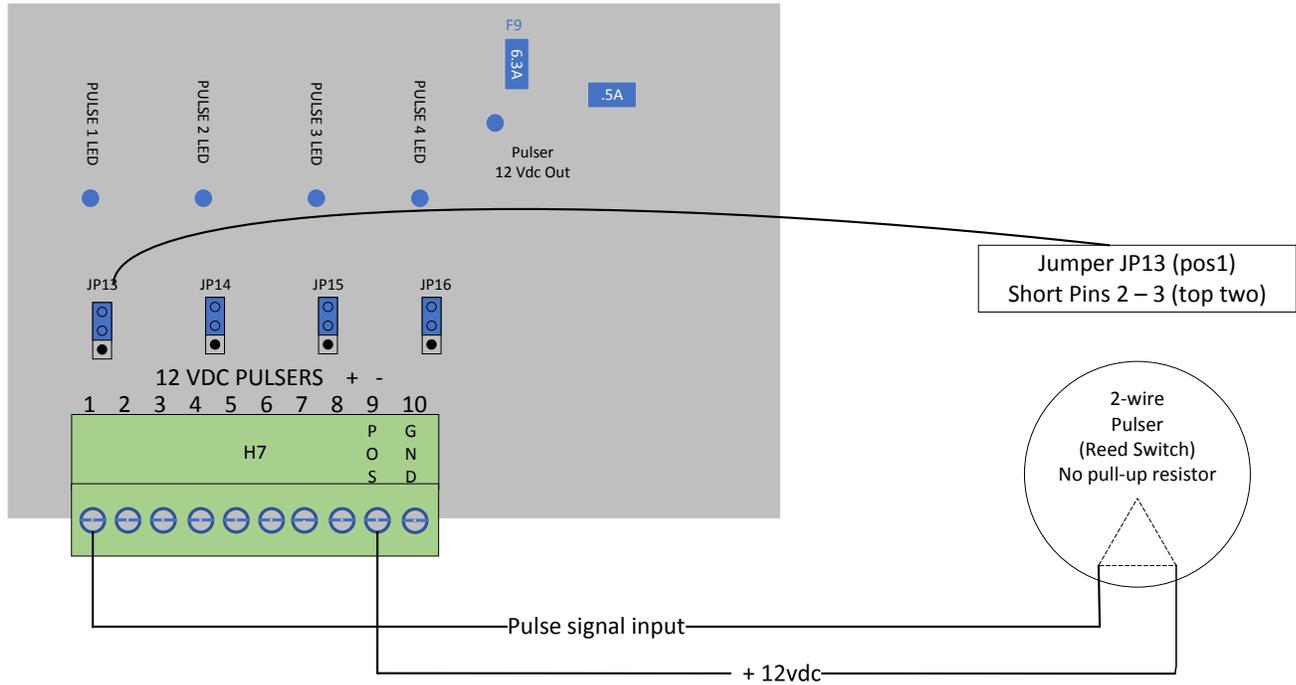
- The standard 2-wire type of pulser is usually a simple reed-switch or solid state equivalent designed to 'switch' back the +12VDC isolated supply to the pulser input position on MPC H7 (1,3,5,7).
- Wire A is +12VDC out to the pulser from MPC H7 positions 9.
- Wire B is the pulse signal from the dispenser pulser to MPC H7 pins 1, 3, 5, 7.

Jumper Settings: JP1 - 4 must be installed on the top most two pins to ensure that the pull-up resistors are not in the pulser circuit.

Pulser Switch Contacts



2-Wire Switch Pulser

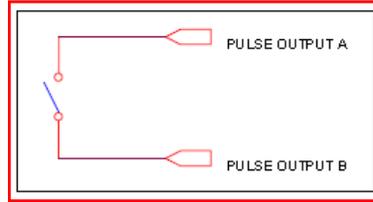


2-Wire Pull-Up Pulser Configuration (ex: Gas Boy 9800 with pulser interface board)

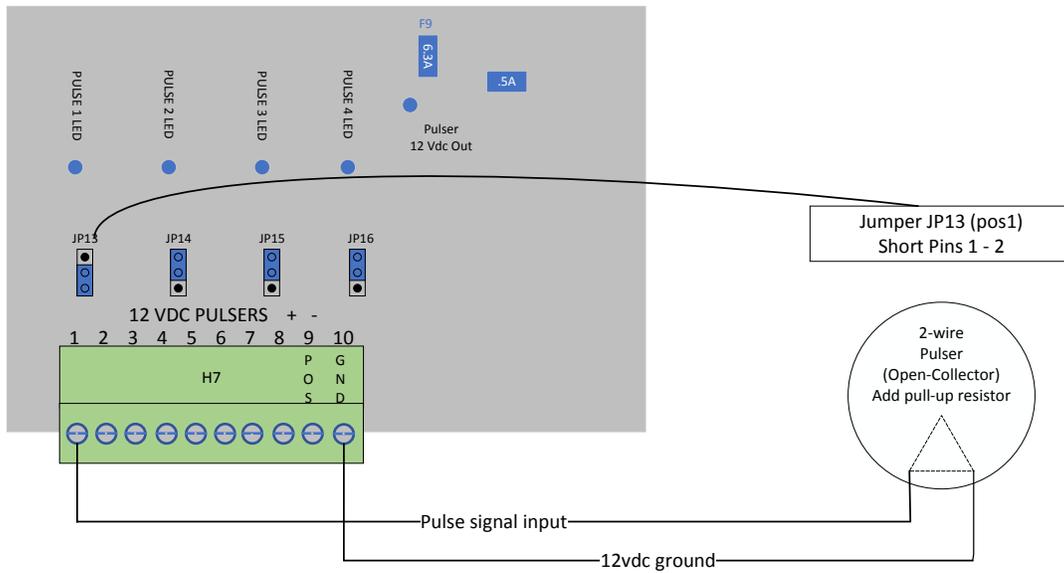
- Wire A is the MPC's isolated DC Ground signal on H7 label '-' (the minus sign) which connects to the dispenser's pulser interface DC Ground.
- Wire B connects to the dispenser's pulser output and ran back to the MPC Header H4 positions 1, 2, 3, 4 where it is pulled up to +12VDC.

Jumper Settings: JP1-JP4 must be installed on the bottom most two pins to ensure that the pull-up resistors are IN the pulser circuit.

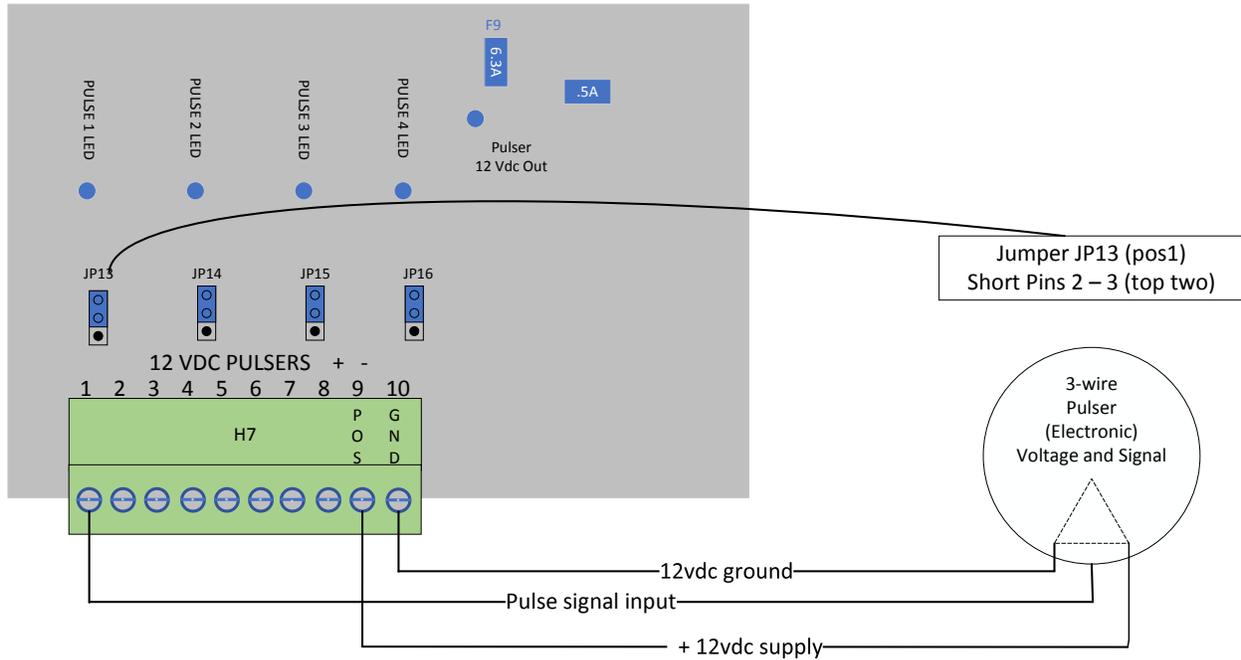
2-Wire Open Collector Gate



2-Wire Open Collector Pulser



3-Wire Pulser Configuration (MPC supplies +12VDC, DC GRD and receives pulse)



Mechanical Dispenser Controller – High Voltage Interface (Auth and In-Use)



CAUTION

This section of the MPC is designed to switch 120VAC (HIGH VOLTAGE) to the dispenser/pump electric reset or solenoid valve.

This 120VAC supply should be on a dedicated breaker separate from the OPT power supply breaker. Turning off the OPT power supply switch will not turn off power to this section of the MPC board.



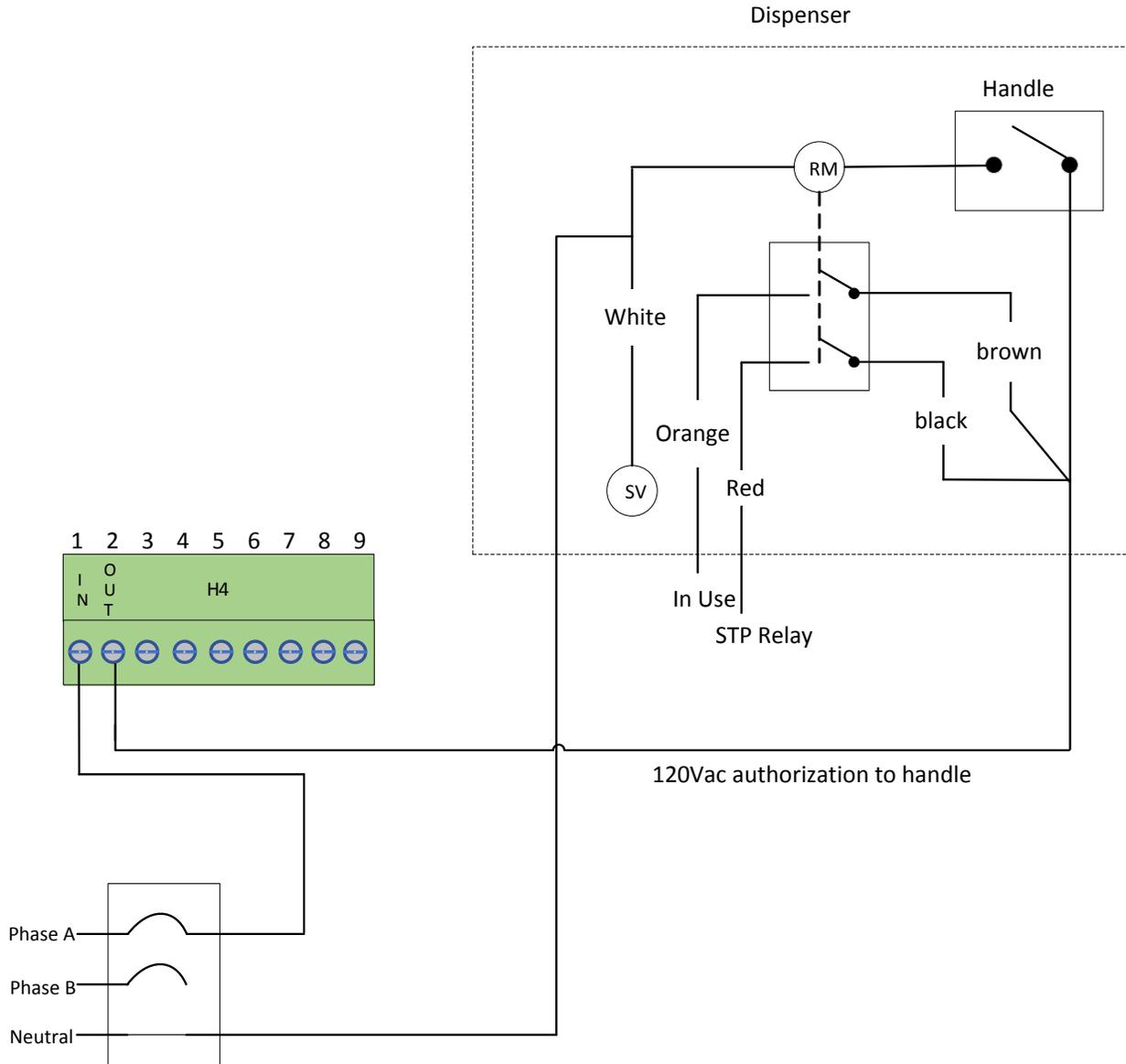
WARNING

The Solid State relays on the MPC board are not designed to handle the current requirements for any motor. An external heavy-duty motor control relay needs to be installed and controlled by the MPC solid state relay. The relay can be mounted in the OPT housing if space allows or in a small box next to the electrical distribution panel or wire trough.

The MPC connector H4 and mating plugs P4 have two positions for each hose. The 1st or odd numbered position is typically connected to the 120 VAC input power directly from the circuit breaker while the 2nd or even numbered position is the switch power out or Authorize signal to the dispenser.

Basic Authorization Connections

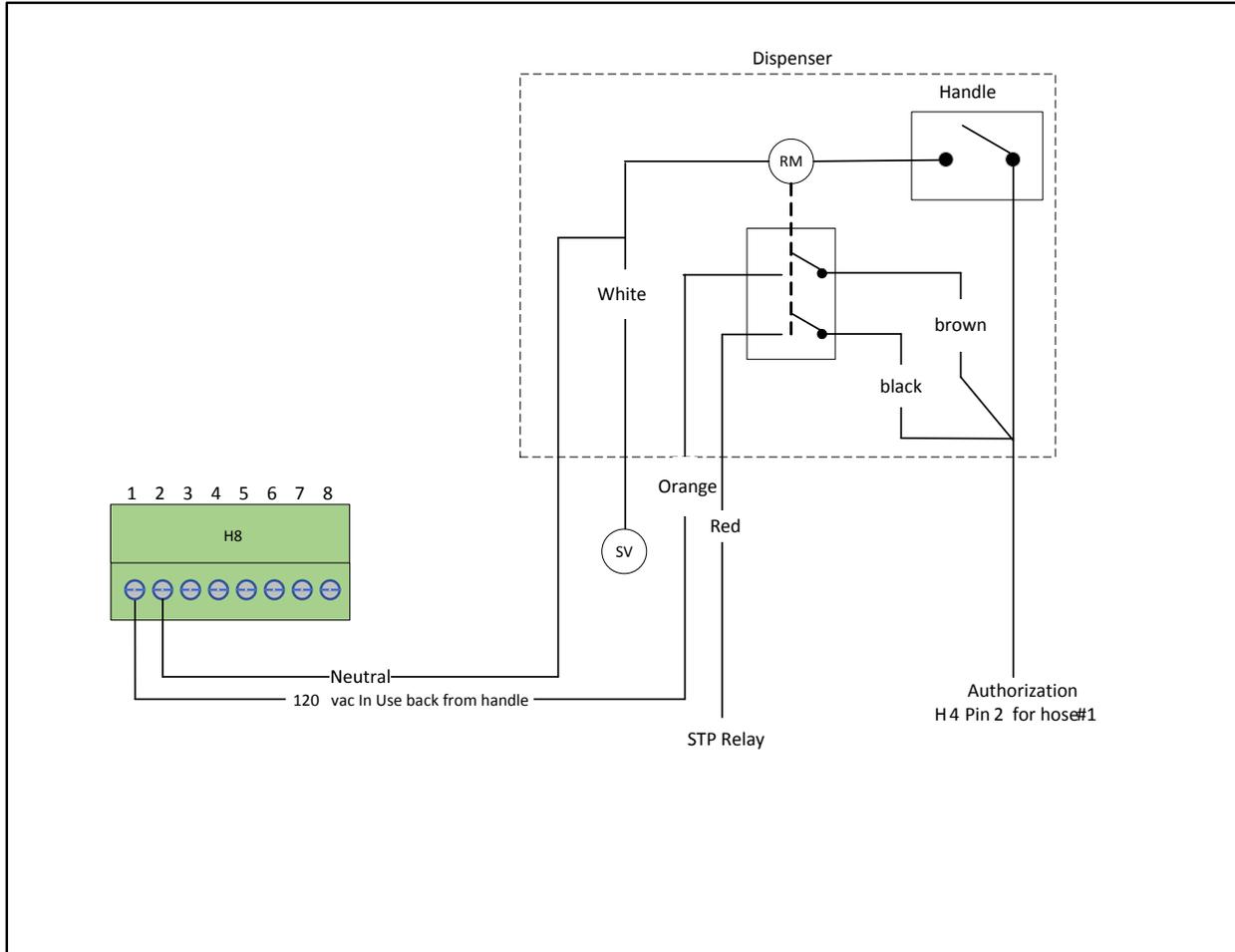
Auth Connections Component Layout:



In-Use / Handle Wiring to MPC 4

The In-Use / Handle signal of the MPC requires both a 120VAC and Neutral from the Dispenser/Pump AC circuit. Use of the dedicated OPT power circuit's neutral could result in noise induced erratic behavior of OPT electronics and result in decreased reliability.

In-Use / Handle Wiring Component Layout:



Section 6: Electronic Dispenser Interfaces

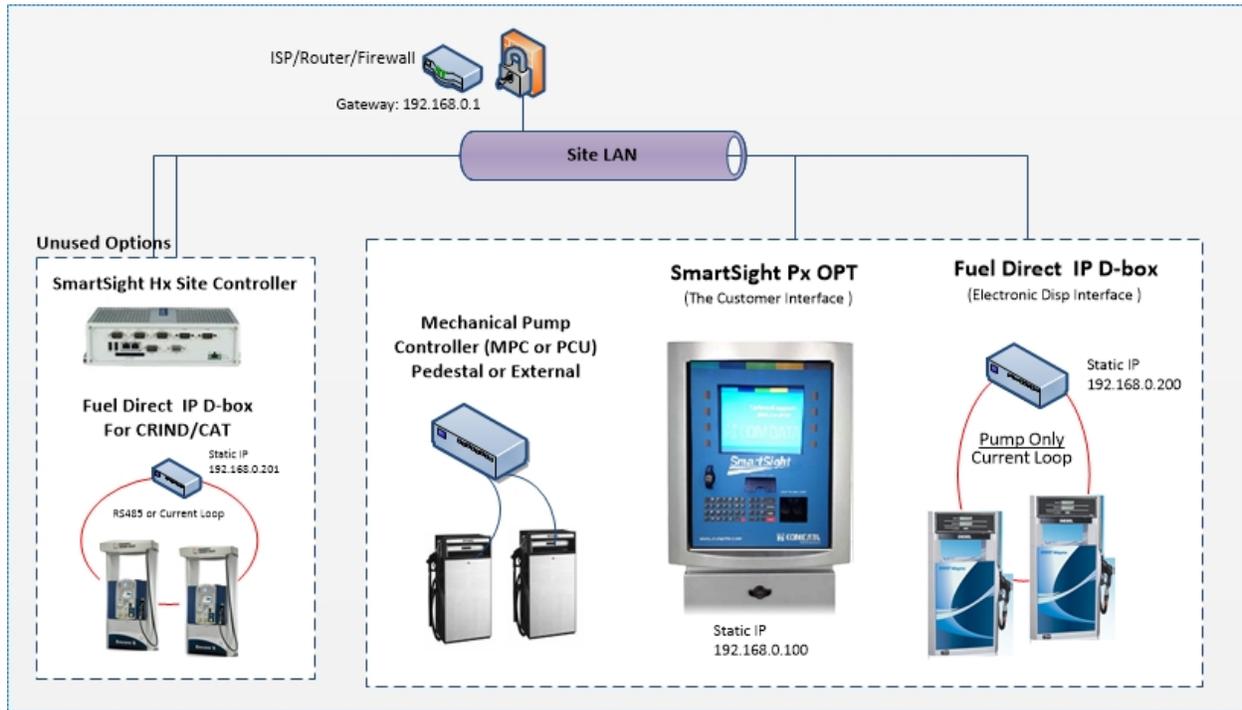
Overview of SmartSite Electronic Dispenser Interface Options

The SmartSite Gx product line utilizes the new family of Electronic Dispenser Interface called **Fuel Direct**. This interface is used with an IP Distribution Box (IP DBox) to control the major brands of electronic dispensers including Gilbarco, Wayne, Bennett, Tokheim, and Tatsuno.

All versions of the Fuel Direct IP DBoxes communicate via Serial or by Ethernet on the sites Local Area Network. Typically the existing site's legacy system Distribution box is removed and the IP DBox is installed with all dispenser current loop or RS485 wires terminating in the new IP DBox.

Typically a SmartSite Gx OPT is used with a single Pump Loop version of the Fuel Direct IP DBox. In this case the SmartSite Gx is the customer interface. For systems requiring the use of CRIND/CAT (integrated card readers and keypads in the dispenser) the system will require an additional IP DBox. A total of two are required: one for the pump loop and a second for the CRIND/CAT Loop.

Dispenser Interface Options:



Configurations of Fuel Direct IP DBox Supported by SmartSite

To ensure compatibility with major model electronic dispensers, Fuel Direct IP DBox is available in several versions. Each of these versions is specifically configured for its intended dispenser type.

Current Loop and Tokheim style IP DBox models come with isolation capability for each physical connection to the dispenser. LED indicators allow simple in-field troubleshooting and diagnostics.

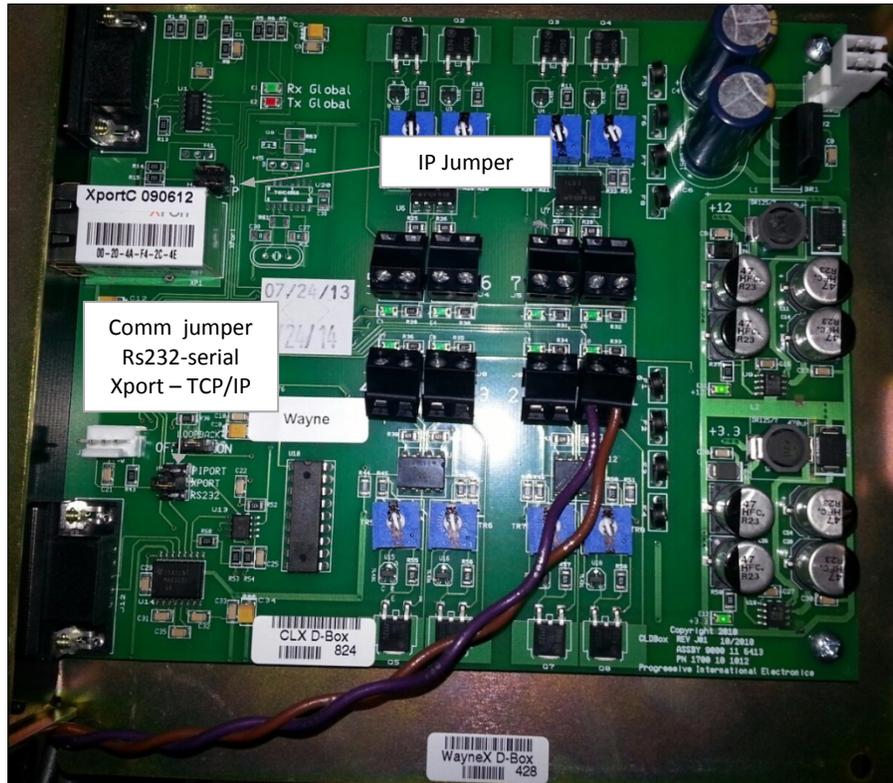
Gilbarco CRIND dispensers must be configured for 'Generic Mode' and so that the Pump and CRIND Card Reader loops are on separate wires. If your site has been configured for a Major Oil Configuration (MOC) which uses a single pair of wires for both CRIND and Pump loops, you will need to purchase some additional devices to allow the required two pairs of wires to travel over a single pair. This can be done with a pair of EZwire boxes or by using an EZwire DBox which allows for control a Gilbarco dispenser and reader over a single pair of communication wires. This eliminates the need to run a second pair of data wires when converting a major oil dispenser/reader to the generic version.

Table 1 – Overview of DBox Types

	Utilization:
CL-DBox	These both use 2-wire current loop for their pump loops. The voltages of the two brand varies slightly so be sure and specify the brand of dispenser at the time of order.
TOK-DBox	Tokheim dispenser
RS485-DBox	Wayne CAT and Tokheim DPT dispensers with integrated card reader
KB-DBox	Kraus electronic dispensers, Bennett dispensers

Fuel Direct IP DBox Circuit Boards and Connections

Wayne Current Loop Fuel Direct IP DBox Circuit Board:



Wayne Current Loop Fuel Direct IP DBox Port Connections:



Overview of SmartSite Electronic Dispenser Interface Options

Current Loop Style — CL-DBox for Wayne or Gilbarco

Current Loop Style DBoxes are used with Gilbarco and Wayne dispensers. Note dispenser-specific instructions for use with each dispenser. For overview, see the RS485 Style IP on following page.

Follow instructions in the installation section of the accompanying product manual before connecting IP DBox:

1. Connect IP DBox to dispenser. Dispensers using current loop communication have two connector wires, a negative (-) and a positive (+). Locate the pair from each dispenser to be connected and bring the pair into the IP DBox. The wires must be connected + to + and - to - on unused wiring position(s) in the DBox. Ensure that positive and negative wires are not criss-crossed at the IP DBox, as this will prevent communication with the controlling device.



A recent DBox board redesign has eliminated the need to set Isolate Jumpers. For Current Loop Style DBoxes with an Assembly Number of 900-11-6413, proceed to Step 3 in this section. If installing a IP DBox with an Assembly Number of 900-11-6313, follow instructions in Step 2.

2. Note that isolation jumpers are present above wiring positions in the IP DBox. These jumpers, marked JP1-JP8, should be left in isolate position until the controlling devices are connected to the DBox. After connecting all dispensers to be used, move jumpers to normal for each position connected.
3. Proceed with programming of system.

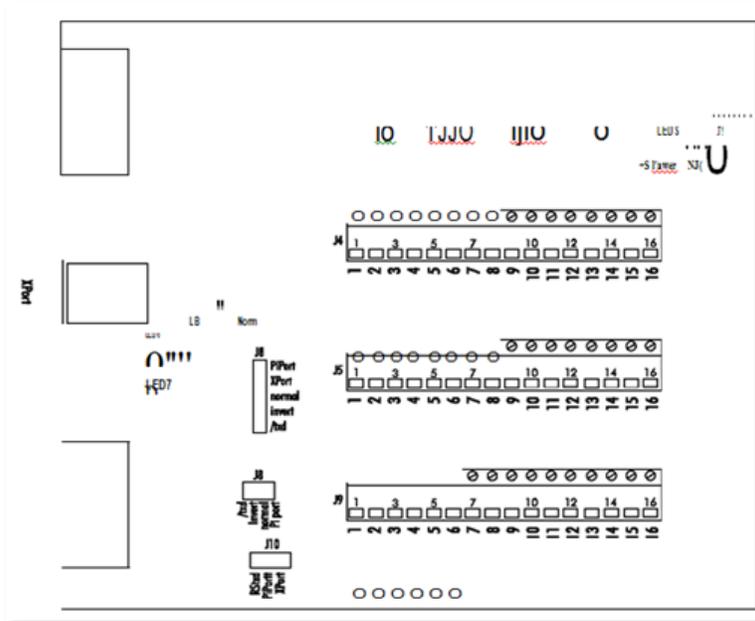
RS485 Style IP DBox for Wayne CAT and Tokheim DPT Configurations

RS485 Style DBox is used with the Wayne CAT card reader, Tokheim DPT, Tatsuno dispenser, and Nuovo Pignone dispenser. Note dispenser-specific instructions for each dispenser. For an overview, refer to the RS485 Component Layout below.

Follow instructions in the installation section of the accompanying product manual before connecting IP DBox:

1. Connect IP DBox to dispenser. Dispensers using RS485 communication have three wires for connectivity: +, -, and Ground. For each RS485 dispenser being connected, bring dispenser wires into the IP DBox and connect to +, -, and GRD on an unused wiring position. Ensure that wires are not criss-crossed at the DBox, as this will prevent communication with the controlling device. Connect no more than four physical devices in each of the four groups of connections (1-4, 5-8, 9-12 and 13-16). Two device addresses are equivalent to two connections.
2. To connect to a PIE console over the IP DBox's PiPort proprietary link, use PIE's 9000 15 0034 cable. Jumper J6 must be set for LB. Jumpers J8 and J10 must both be jumpered for PiPort. Jumper J3 should be set to GND. If connecting to PIE's FuelDirect Fuel Control Solution using the RS232 port, set J8 to /txd and J10 to RSTxd. If connecting to FuelDirect using ethernet, set J8 and J10 to XPort. (Refer to *IP Addressing of Fuel Direct IP DBox*, (p. 40) for further instructions on ethernet connectivity.)

RS485 Style IP DBox Component Layout



3. Proceed with programming of system.

Tokheim Style — Tok-DBox



- Electrical equipment connected to associated apparatus should not use or generate more than 250VAC.
- Installation shall be in accordance with the manufacturer's instructions and the National Electrical Code (ANSI/NFPA 70).
- For guidance on installation refer to ANSI/ISA RF 12.6 "Installation of Intrinsically Safe Instrument Systems in Class I Hazardous Locations."
- Tampering and replacement with non-factory components may adversely affect the safe use of the system.

Tokheim Style IP DBox are used with Tokheim dispensers. Note dispenser-specific instructions for use with each dispenser.

Follow instructions in the installation section of the accompanying product manual before connecting IP DBox:

1. Connect IP DBox to dispenser. Tokheim dispensers have three wires for connectivity: TTD, TTC, and DCC. For each Tokheim dispenser being connected, bring dispenser wires into the IP DBox and connect to TTD, TTC and DCC on an unused wiring position.

Ensure that wires are not criss-crossed at the DBox, as this will prevent communication with the controlling device.



A recent DBox board redesign has eliminated the need to set Isolate Jumpers. For Current Loop Style DBoxes with an Assembly Number of 900-11-6413, proceed to Step 3 in this section. If installing a IP DBox with an Assembly Number of 900-11-6313, follow instructions in Step 2.

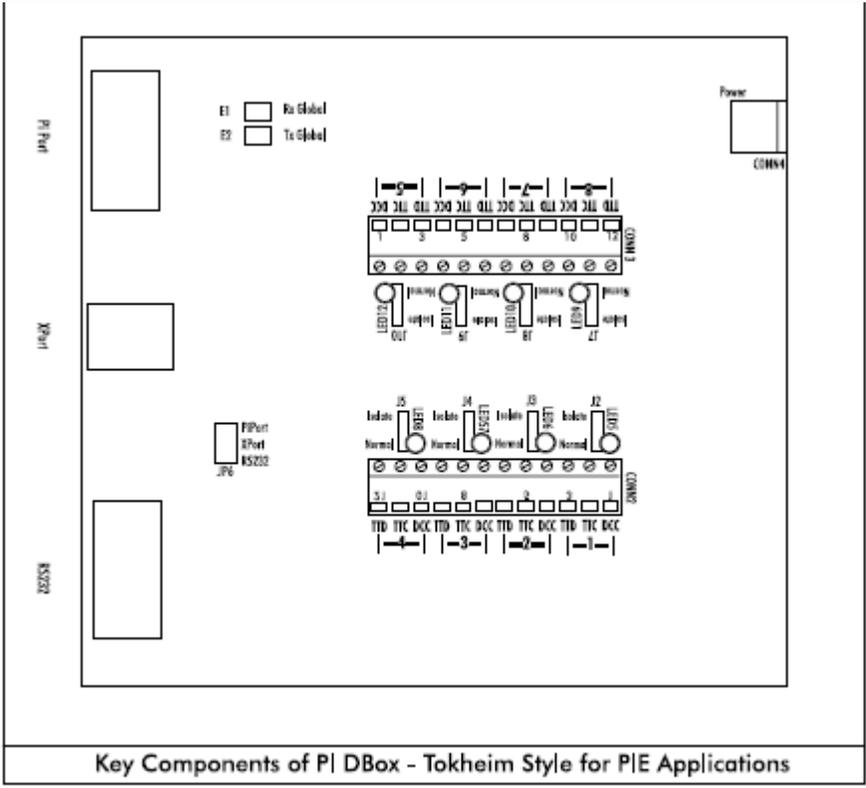
2. Note that above each wiring position in the IP DBox, there is an isolation jumper present (positions J2-J5 and J7-J10). Leave these jumpers in isolate position until the controlling devices are connected to the DBox. After connecting all needed dispensers to be used, move jumpers to normal for each position connected. Refer to Tokheim Style IP DBox Component Layout on the following page.



Steps 3-5 in the Tokheim -Style installation procedure are dependent upon the type of application — PIE application or stand-alone application. Steps are specific to applications. Refer to the appropriate drawings for jumper settings, interface connections and dispenser wiring.

3. Set the jumper on JP2 to the interface type to be used. The PiPort interface is used by the Plcon Console. The RS232 and Xport are used by the FuelDirect Fuel Control Solution.
4. Connect the PIE controller or console to the connector shown on the following diagram. If using ethernet connectivity, refer to *IP Addressing* (p. 40).
5. Proceed with programming of system.

Tokheim Style IP DBox Component Layout:



Troubleshooting and Diagnostics

LED Indicators

When installing the IP DBox, refer to on-board LED indicators for troubleshooting assistance. LED layout is illustrated for Current Loop Style, Tokheim Style and RS485 Style IP DBoxes.

General Troubleshooting Techniques:

IP	Communication Issues	<ol style="list-style-type: none"> 1. Run one dispenser only by isolating all the rest at the site. 2. Recheck wires at dispenser junction box, as well as in the IP DBox. 3. On IP DBox models with power supply, make sure power is applied. 4. Make sure console or controller is plugged into the correct connector on the front of the IP DBox. 5. Ensure that all configuration jumpers or switches are set correctly for the application.
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Addressing of Fuel Direct IP DBox

The default IP address for the IP DBox is 192.168.0.200 (typical for PUMP Loop IP DBoxes). When the IP jumper is installed, the default address changes to 192.168.0.199. Since each device at the site must have a unique IP address, it may be necessary to reconfigure all DBoxes to avoid conflicting addresses on the network.

The IP address for each IP DBox may be changed by following one of two procedures.

Changing IP Address	
When using either of these methods to change the IP address of a IP DBox, the default IP jumper must be installed and must remain installed throughout the entire procedure. Once the procedure is completed, remove the jumper and reset the DBox.	
<i>Preferred Method</i> Run Device Installer	<ol style="list-style-type: none"> 1. Install the IP jumper. 2. Power cycle the DBox. 3. Run Lantronix Device Installer. Note: Lantronix Device Installer is on the install disk supplied by Progressive International or may be found at the Lantronix website at http://www.lantronix.com. 4. Once the update is complete, remove the jumper and reset the DBox.

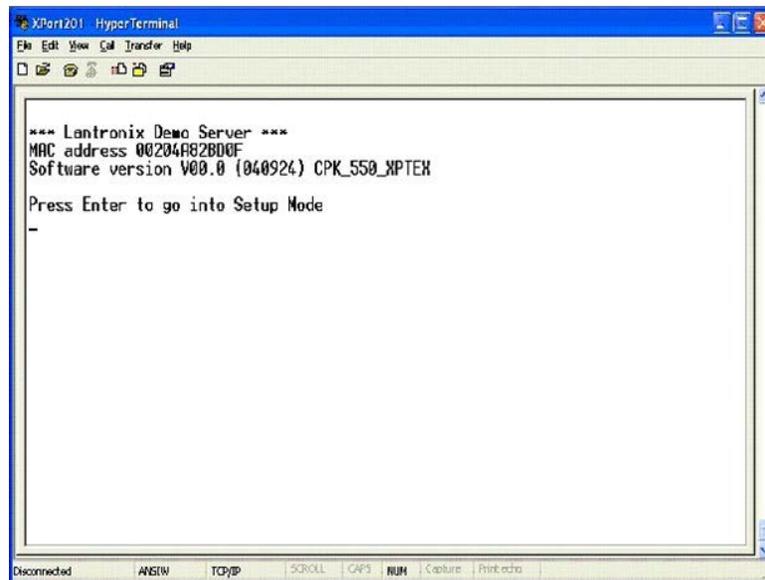
Alternate Method
Run HyperTerm

Configure and set up a new connection using Winsock with TCP protocol.

1. Install the IP jumper and Power cycle the DBox.
2. Run HyperTerm configure and set up a new connection using Winsock with TCP protocol.
3. Under Name, select a name for the session. Icon to appear onscreen may be changed under the Icon selection. Click **OK**. (See Connection Description dialog box below.)
4. Set the Host Address to the DBox default of 192.168.0.200. Set the Port Number to **9999**. Under Connect Using, select **TCP/IP (Winsock)**. Click on **OK**. See Connect To dialog box below.



5. On the HyperTerm screen, ensure the DBox is connected to the network and apply power to the DBox. The following message will appear on the HyperTerm session. Note that your DBox mac address will be different for each unit. Press **Enter**.



Alternate
Method
(con't.)

6. Select option **0** for Server Configuration and the following screen will appear.

```
*** Security
SNMP is          enabled
SNMP Community Name: public
Telnet Setup is  enabled
TFTP Download is enabled
Port 77FEh is   enabled
Web Server is   enabled
Web Setup is    enabled
ECHO is         disabled
Enhanced Password is disabled

***** Channel 1 *****
Baudrate 9600, I/F Mode 4C, Flow 00
CPU performance : Standard

Change Setup:
 0 Server configuration
 1 Channel 1 configuration
 6 Security
 7 factory defaults
 8 exit without save
 9 save and exit

Your choice ?
```

7. Assign new numbers for the first field of the IP address and press **Enter** or leave unchanged and press **Enter**.

You will be prompted to assign new numbers for the second field or to accept the default numbers by pressing **Enter**.

This process continues for each of the four fields. Only one number in one field must be changed to make the IP address unique — or each of the fields may be changed if it provides a more systematic setup for the programmer.

(Use caution that numbers do not fall outside the range of the SUBNET MASK.)

```
TFTP Download is  enabled
Port 77FEh is    enabled
Web Server is    enabled
Web Setup is     enabled
ECHO is         disabled
Enhanced Password is disabled

***** Channel 1 *****
Baudrate 9600, I/F Mode 4C, Flow 00
CPU performance : Standard

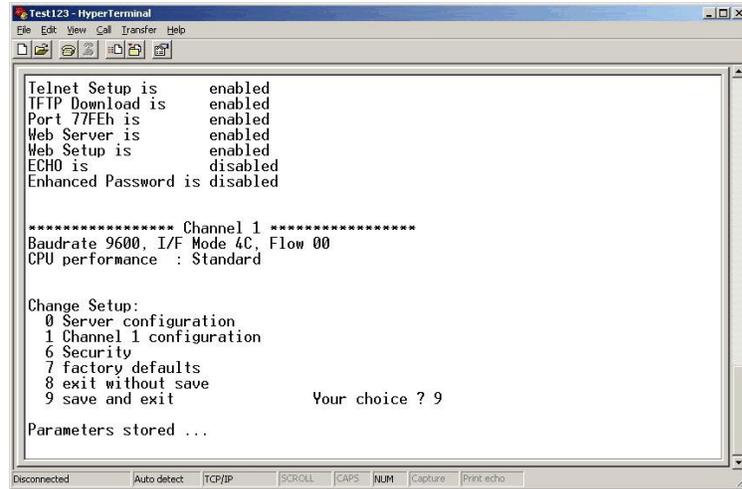
Change Setup:
 0 Server configuration
 1 Channel 1 configuration
 6 Security
 7 factory defaults
 8 exit without save
 9 save and exit

Your choice ? 0

IP Address : (192) .(168) .(000) .(200)
Set Gateway IP Address (N) ?
Netmask: Number of Bits for Host Part (0=default) (8)
```

8. Double-check under the basic parameters listing to make sure your new IP address is correct.

If correct, select option **9** to save and exit. If changes need to be made, select option **0** to reenter the server configuration mode.



9. Remove the IP jumper and reset the DBox.

At this point the PI DBox is reconfigured and ready to connect to the system network for site installation and testing.

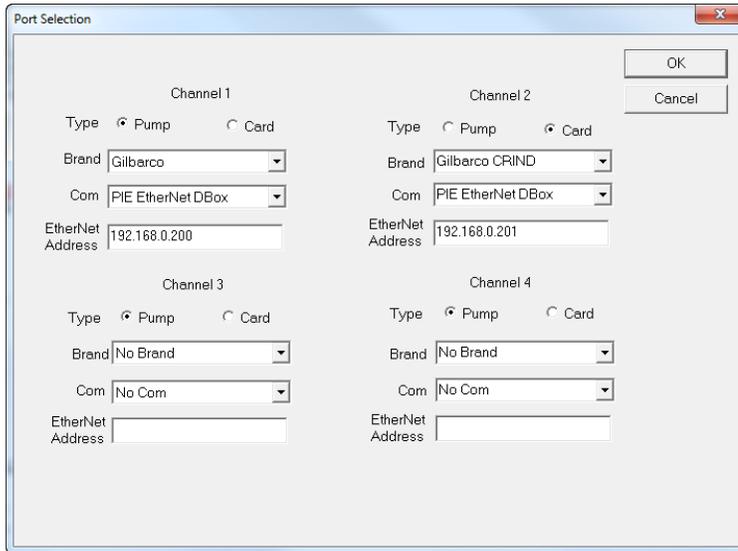
General Testing Procedures - *Check it out!*

<p><i>Are dispenser's IDs set properly?</i></p>	<p>Most brand dispensers and their card readers must have unique numbers — the dispenser/reader ID — set to identify each individual dispenser/reader. A common problem occurs when the ID for a dispenser/reader is set the same as for another dispenser/reader.</p> <p>Also, on new dispensers/readers, the manufacturer usually sets IDs to a default value. If they are not changed, then all dispensers/readers will try to answer at the same time, causing communications errors.</p>
<p><i>Are cable connections secure?</i></p>	<p>Check all cables from POS to dispensers/readers to ensure that the connections are secure before applying power to any equipment. Crossed wiring for both power and communications can cause erroneous operation as well as possible damage to system components.</p>
<p><i>Is the dispenser in manual override mode?</i></p>	<p>Dispensers may be put in a manual override mode to allow the dispenser to operate as if no control system is connected to it. The dispenser in manual is capable of pumping any time the handle is lifted off-hook.</p> <p>A dispenser in manual mode will not operate correctly with the SmartSite systems. For operation with SmartSite, be sure dispenser is in console control mode.</p>
<p><i>Have you run FuelDirect Test diagnostics?</i></p>	<p>Often when a dispenser/reader site is being upgraded with a POS using our Fuel Direct IP DBox, the dispensers and readers may have existing problems keeping them from performing 100%.</p> <p>Don't assume all problems during a POS start-up installation are POS-related. For use of Fuel Direct Test please contact support.</p>
<p><i>Have dispensers/readers been initialized correctly?</i></p>	<p>Dispensers/readers can operate erratically when power-cycled during an installation or upgrade. Power down the dispensers/readers, wait 30 seconds, then power up the dispensers/readers to initialize them correctly.</p>
<p><i>Have counter-balances been implemented to identify erroneous hose totals?</i></p>	<p>Dispensers may return erroneous hose totals or even no totals at all. It is recommended that the POS application software generate its own running totals in addition to the dispenser polled totals in case there are problems of this nature.</p>
<p><i>Have new dispenser/reader batteries been installed?</i></p>	<p>Dispensers/readers have a battery backup system to allow them to retain setup information in case of a power failure. Unfortunately the batteries in the dispenser are rarely replaced and therefore setup information, such as dispenser/reader IDs, are lost during a power glitch. Many problems can result from dead batteries, including the two immediately preceding this one.</p> <p>Is there fuel in all tanks? Are leak detectors falsely tripping? Make sure</p>

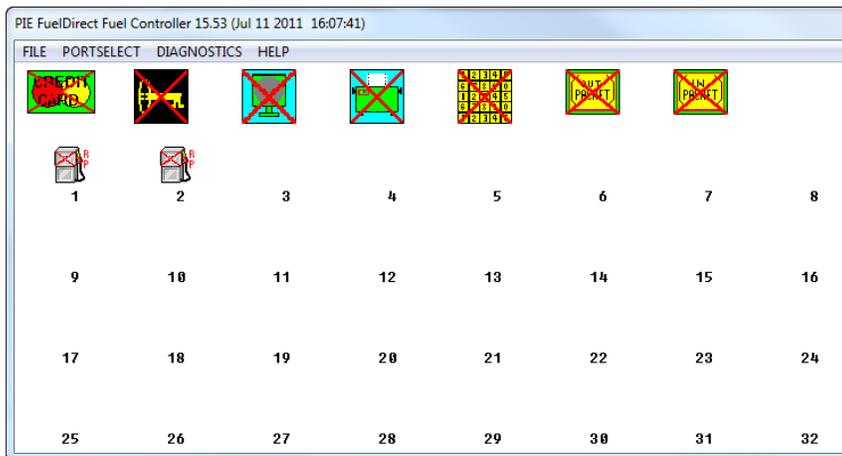
	<p>that there is fuel in the tanks at the site for all products.</p> <p>Leak detectors on the submersible pump can falsely trip, causing the dispenser to pump slowly or not at all. Remember to check hydraulic-related components.</p>
<p><i>Have circuit breakers been tripped or turned off?</i></p>	<p>There are many circuit breakers at a fueling site that control power to all the components of the dispensing system — POS, controllers, DBoxes, dispensers/readers, submersible dispenser, etc.</p> <p>If any of these breakers are tripped or turned off, the performance of the entire dispensing system is affected. Breakers may be located in different places throughout the facility.</p>
<p><i>Have you tested, using a step-by-step approach?</i></p>	<p>The startup of a new installation can present all kinds of problems that exhibit seemingly illogical situations. Multiple, layered problems may exist, complicating the diagnosis.</p> <p>At this point it is wise to try to work with a small portion of the site equipment, get that running correctly, then add additional equipment to the overall system, step-by-step.</p> <p>As an example of this approach, try running only one dispenser (such as dispenser ID 1) with the IP DBox controller and the Fuel Direct Test program.</p> <p>Once this step has been completed successfully, continue to put additional dispensers in the system. After all dispensers are responding correctly using this setup, exit the test program and bring the POS application online. This approach will provide a way to determine which problems exist and where they are located.</p>

FuelDirect Software Configuration

1. Browse to the D:\Program Files\FuelDirect folder and click on **FUELDIRECTTEST.EXE** and 'run as admin'. This opens up a window for the test interface.
2. Click on the button for **Window Control** and select **YES** to make Fuel Direct visible.

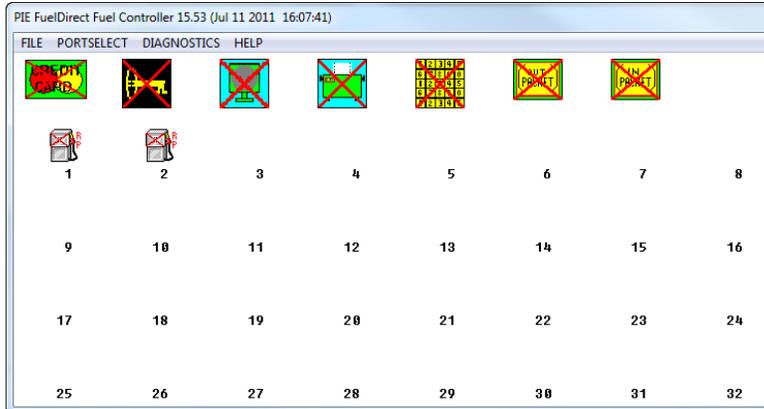


The Port Select window can also be opened by selecting **Dispensers Readers** from the **PORTSELECT** menu.

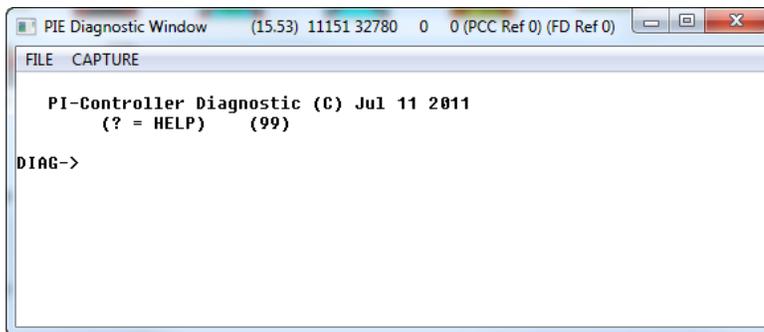


Trouble shooting Fuel Direct IP DBoxes After Installation

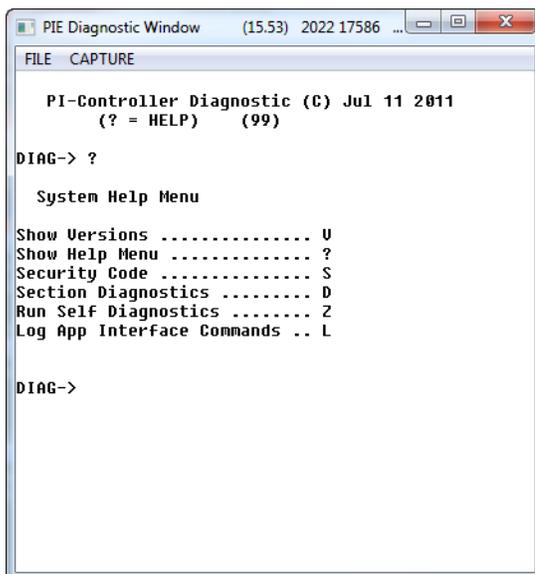
1. If your Dispenser will not fuel after authorized, launch the application **FuelDirect.exe**.



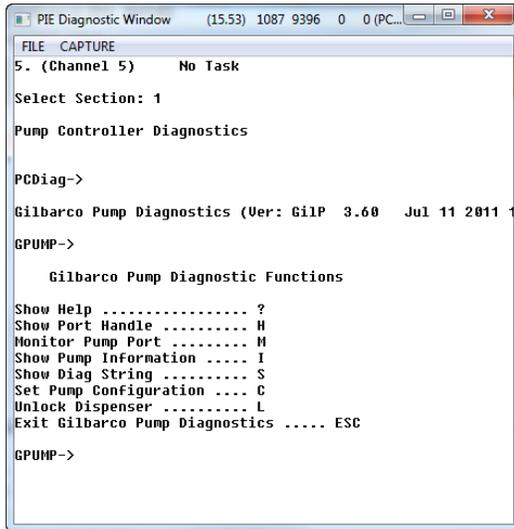
2. Click on **Diagnostics**.



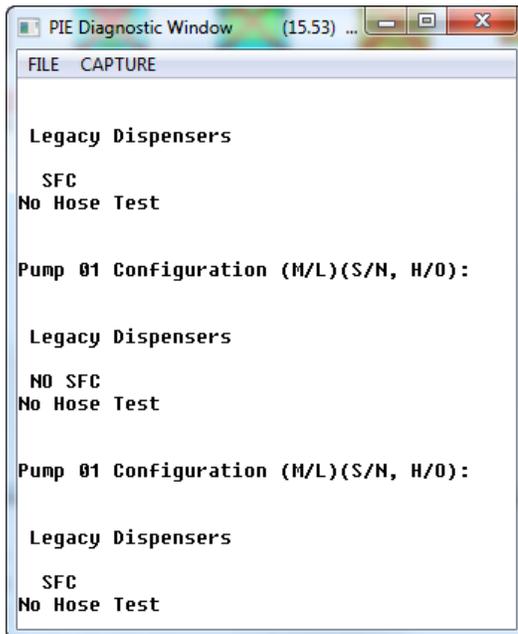
3. Press **? key** to see the **DIAG** help menu. Press **D** to select **Diagnostics**.



4. Drill down to **Gilbarco Pump Diagnostic Functions** by pressing the following keys:
 - a. **1** - (Dispenser / Read Channel Sections)
 - b. **1** - (select pump controller Channel)
 - c. **P** - (Pump Diagnostics?)
 - d. **?** - (Help)



5. Press **C** to set pump configuration. For each Pump that indicates **No SFC**, press **S** to toggle. Use the **+** and **-** keys to navigate through the pumps.



6. Continue pressing **Escape** until you see **DIAG** to save your changes.

PetroLeader.com Setup Requirements - FuelDirect Dyn Settings

The Pegasus Configuration (Dynamic Settings) must be configured:

➔ Dynamic Settings:

Enable the PIE Fuel Direct Support:

PIEFUELDIRECT = FD |1,2 (uses dispenser numbers)

➔ Define the CRIND/CAT Keypad type

KeypadPanelType = Custom

➔ Setup the details for the 'Custom' keypad type

CustomKeypadLayout

123@@456@@789@@L0E@@@15C26@37@48e

Addendum A

TATSUNO



RS232



RS232C → RS 485
 Converter

TATSUNO



RS485

Dynamic Setting / PetroLeader

Description	Value
Tatsuno	P 192.168.0.67:10002 P,101,102,103,201,202,203

Addendum B

GX SmartFuel Configuration

