

nstallation/Operation

Wayne Nucleus[©] Fusion Site Controller Upgrade P/N 940002 Rev 1(C)

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1 **PRODUCT**

,	
Product	Dresser Wayne Fusion Forecourt Controller
Application	Nucleus Base 19 or better
Production Version	Version x.xx
Current Build	Version x.xx
Hardware Platform	Wayne Proprietary Hardware

2 INTRODUCTION

The Fusion Forecourt Controller is an Ethernet-based device capable of supporting existing peripheral devices that are currently supported through the SCC card. This manual explains how to install Fusion and configure it for use with a Nucleus site controller.

3 HOW TO USE THIS DOCUMENT

By following the installation instructions and performing the steps in the sequence presented, you will be assured of a successful install.

- NOTE: This kit may require installation of several wiring and hardware assemblies. Any installation or modification must comply with the requirements of the National Electrical Code (NFPA 70), the Automotive and Marine Service Station Code (NFPA 30A) and any other applicable codes
- NOTE: You must wear a static wrist strap, part number 916962 or equivalent, securely attached to an earth ground, when handling any circuit board, electronic component or assembly, or when reaching into the site controller or dispenser computer enclosure. Do not use power tools.

4 UNPACKING AND INSPECTION

Complete the following steps:

- 1. Before opening any cartons, count the number of cartons and verify the carton count against the supplied packing list.
- 2. Inspect the cartons for damage made during transit.
- 3. File claim information with the carrier on the bill of lading.
- 4. Retain cartons suspected of damage for future claim purposes.
- NOTE: You must wear an anti-static wrist strap, part number 916962 when removing electronic components from static packages. Attach the wrist strap securely to an earth grounding point to prevent possible damage from static electricity.
 - 5. Remove all equipment from the shipping cartons and carefully inspect for visible damage.
- NOTE: Any damage should be brought to the attention of the carrier and claims made immediately. Return all equipment to the respective cartons for protection until actual installation is made. Save all cartons until it is certain that return shipments are not required.

5 RETURNING DAMAGED COMPONENTS

Parts or components returned to the factory under warranty or for repair are subject to damage if not packaged properly. Complete the following steps to return parts or components to the factory.

- 1. Place electronic components in an anti-static bag and in the original shipping cartons for return shipment to the factory.
- NOTE: If original shipping cartons are not available use a sturdy cardboard container and suitable packing materials such as anti-static polyethylene foam or bubble pack, to ensure the component is firmly packed.
 - 2. Include a Return Parts Tag with the defective component describing the particular problem with the part.
 - 3. Make sure adequate insurance is provided when returning parts to the factory.



WARNING

If the parts or components arrive at our factory in a damaged condition and it is determined that the damage is a direct result of inadequate or improper packaging, the damage will not be covered under the original warranty and the customer or distributor will be held responsible for the cost of repairs necessary to correct or replace the damaged parts.

6 SAFETY INFORMATION

Read NFPA 30A and NFPA 70 (U.S. Installations)

Before installing the equipment, the installer must read, understand and follow this manual, NFPA 30A, NFPA 70, and applicable federal, state and local codes and regulations. Failure to do so may adversely affect the safe use and operation of the equipment.

CSA C22.1 (Canadian Installations)

For installation in Canada the installer must read and understand this manual, CSA C22.1 (Canadian Electrical Code) and applicable federal, provincial and local codes and regulations.

Emergency Power Cutoff

NFPA30A require that an emergency power cutoff be installed. An emergency power cutoff is a single control that removes AC power from all site fueling equipment and submersible pumps. Make sure the control is accessible, labeled clearly, and installed away from dispensers. Make sure all station employees know where the Emergency Power Cutoff is located and how to operate it.

Electrical Circuits

Some of the procedures in this manual involve removal and connection of components during installation or service. Remove power from the distribution box before executing these procedures.

Low Voltage

Do not be misled by the term "Low Voltage". Voltage potentials as low as 50 volts may cause death under adverse conditions.

High Voltage

High voltage of 110 volts AC is used for operation of this equipment. Death on contact may result if safety procedures are not followed.

7 INSTALLATION LOCATION

Fusion equipment may be installed in a variety of locations, all the cabinets and required wireways must be located in a non-hazardous area of an enclosed weather protected building.

Component	Preferred Location	Notes
Fusion Site Controller	Back room; on wall near the wiring conduits for pumps and CATs	AC Power input requiredEthernet input required

Table 1: Mounting Location

Component	Width	Height	Depth
Fusion Site Controller	16	14	2

Dispenser conduit and Wiring requirements

Conduits used must be ³/₄ in. and the length of each conduit can be up to 330 feet from Fusion to the dispenser. Verify that approved wireways and threaded metallic conduit with tight connections are used, that Data Link wiring is #18 AWG 600 Volt oil and gasoline resistant as a minimum.

Environmental Requirements

Ensure that all cabinets are located in an area that offers easy access for service, and free air space for cooling, 6" away from other cabinets.

Care should be taken to ensure that the temperature of the cabinets does not exceed the operational ranges of 0°C to 40°C (32°F to 104°F)

Preliminary Wiring

The site wiring must be completed before installation of a Fusion Forecourt Controller.

Data Link and CAT Wiring

Two pairs of data link wires must be installed from each dispenser to the location of the Fusion cabinet. One pair for pump communication and one pair for CAT communication.

8 CONFORMITY WITH STANDARDS

Ensure that all National, State, and local standards and codes are observed in site preparations, wiring, and installation.

Power Wiring

Confirm that all 120VAC to 240VAC wiring for outdoor equipment (line, neutral, relay select, etc.), is #14 AWG minimum (unless local codes call for 12 gauge), stranded, oil and gasoline resistant.

One conduit from the breaker panel to a dedicated outlet located near the Fusion Site Controller location is required. The conduit must contain three 14 AWG wires; 110 to 240 VAC, Phase, Neutral and Ground. Do not use electrical conduit to provide earth ground (earth ground does not exceed 5 ohms) The electrical wiring for the Fusion dedicated outlet must be run through the Emergency Stop circuit at the site so that all electrical power is cut to the dedicated outlet for Fusion whenever the Emergency Stop button is pressed. Do not connect the Fusion power supply cord to any UPS.

The circuit powering the distribution box must not power other devices. This circuit must not share a conduit with wiring for devices drawing high amperage (compressor, freezer, etc.) or devices that are sources of RFI (TV, microwave, intercom, etc.)

Data Wiring

Confirm that all data wiring for outdoor equipment (communication lines) is #18 AWG (minimum) stranded, oil and gasoline resistant. Pump and CAT data wiring that attaches from the wiring trough to Fusion need to be double insulated to satisfy **NEC** code for commercial use. Wayne recommends the use of the following cable or equivalent for use as the pump and CAT communication wire for running between the wiring trough and the Fusion box.

💎 Genera	al Cable
Product SKU: Product Description:	C2404.41.10 Communication & Control Cable, Multi-Conductor, Unshielded, UL 2464, NEC Type CM (UL) c(UL), CSA CMG, No. of Conductors: 4, Gauge Size (AWG): 18, Conductor/Strands: 16/30, Jacket: Gray PVC, Temperature Range: -20ŰC to +80ŰC - Gray - 1000 Ft. Reel
Product Category:	Electronics - Communication & Control Cable, Multi-Conductor - Unshielded-18 AWG & 20 AWG - Gray
Product Construction	1:
Conductor:	• 20 or 18 AWG fully-annealed, stranded tinned copper per ASTM B-33
Insulation:	Color Code: See charts below
	Premium grade color coded PVC per UL 1007
Jacket:	• PVC, gray
	• Temperature Range: -20°C to +80°C

Product Specification:

No. of Conductors:	•	4
Conductor Size (AWG):	•	18
Conductor/Strands:	•	16/30
Jacket Color:	•	Gray
Nominal Insulation Thickness (in):	•	0.016
Nominal Insulation Thickness (mm):	•	0.41
Nominal Jacket Thickness (in):	•	0.032
Nominal Jacket Thickness (mm):	•	0.81
Nominal Outside Diameter (in):	•	0.258
Nominal Outside Diameter (mm):	•	6.55
Color Code:	•	1
Nominal C-C Capacitance (pF/ft):	•	28.0
Standard Packaging:	•	1000' Non-returnable Wood Reels
Standard Package Quantity:	•	1
UPC #:	•	079407700875

NOTE: Existing wiring that runs from the wiring trough out to the dispensers do not need to be modified since those wires are protected within the wiring trough or conduit.

Codes

Confirm that all equipment is installed in accordance with the National Electrical Code (NFPA 70), the automotive and Marine Service Station Code (NFPA 30A), and any other applicable State and local codes.

9 REQUIRED TOOLS

Refer to Table 3 for a list of tools required to install Fusion.

Quantity	Description
1	Small Channel Lock pliers
1	Phillips Screwdriver Set (standard sizes)
1	Slotted Screwdriver Set (standard sizes)
1	Wire Cutters
1	Anti-static Wrist Strap
1	Needle Nose Pliers
1	Wire Strippers
16 to 32	Wire Nuts
1	Volt Meter
1	Diagonal Cutters
1	Standard Drill Bit Set
1	Drill
1	PC Feature Card Slot Blank

Table 3: Required Tools

10 INSTALLATION OVERVIEW



Figure 1 Backroom Installation

11 INSTALLATION PROCEDURE

When possible, mount the Fusion in the same location as the Data Distribution Cabinet for Wayne sites or the Gilbarco Distribution box for Gilbarco sites. The previous diagram shows a typical placement of the Fusion Unit.

- NOTE: If mounting the Fusion to a concrete wall, you will need concrete bits and appropriate mounting hardware.
- NOTE: The Fusion mounting location may be require different placement than shown. Whenever handling boards and components that are susceptible to damage from static electrical discharge, BE SURE to wear an anti-static wrist strap.
- IMPORTANT: The Fusion battery must be fully charged prior to site start-up otherwise Fusion will not boot. Charge the battery prior to going to the site to avoid waiting on-site for the battery to charge. If the battery is not fully charged, the system will beep three times every five seconds until the battery charge is complete. Charge time is 4 hours for a full charge on an exhausted battery but generally should only require a 2 hour charge.

11.1 Shutdown the Site

- 1. Stop all pumps one at a time, allowing current customers to complete their transactions.
- ____ 2. Shutdown the site and tape off the pumps and run EOD.

3. Go to **Programming > System > Site**. You will see the following screen.

Pump & CAT Manufacturer: Wayne	Volume Measurement Type Gallons CLiters	- Enable F
Allow Sales Until Battery Low Pumps were manufactured before 1989 Secure Payment Modules Installed	Forecourt Hardware C SCC Board (PCI Carel) Fusion IP Address or Name: 132.168.1.20 Port Number: 3012	IP Addree Port
WARNING: System mus	t be restarted for these changes to take effect.	

Figure 2 Nucleus Programming Screen - Site

- 4. In the Forecourt Hardware section, Enable **Fusion** and program the **IP Address** and **Port**.
- ____ 5. Click OK to save.
- ____ 6. Exit the Programming screen.
- _____ 7. Log off and shutdown all IPTs then log off and shutdown the Server.
- 8. Disconnect the 883635-xxx cable from the SCC card on the back of the server.

11.1.1 Sites with Wayne Dispensers and no Veeder-Root BIR

Perform the following steps if you are installing at a site with Wayne dispensers.

- Disconnect other end of the 883635-xxx cable from Primary Distribution box, then remove the cable.
- ____ 2. Open the server and remove the SCC board.
- 3. Install a feature card blank and re-install the server cover.
- 4. Run a CAT5 Ethernet cable from the Nucleus network switch to the data distribution box location.
- Disconnect and remove the 860514-xxx cable that runs from the Data Distribution box to the Primary Distribution box.
 - ____ 6. Remove the Primary Distribution box from its mounting location.
 - Open the Data Distribution box, remove the inside panel and verify the labeling of the pump and CAT data wires.
 - 8. Disconnect pump and CAT wires from DD box.
 - 9. Disconnect pump and CAT wire conduit from DD box and remove the box.
 - 10. Extend discrete CAT and pump wire pairs from the wiring trough to the Data Distribution box location for each dispenser if needed.

NOTE: CAT data wires may have been bundled together in parallel within the wiring trough. Un-bundle the wire pairs and splice extensions if needed so that each discrete CAT wire pair reaches the

location of the Fusion box. Use double insulated wire specified in Section 8 for all exposed wiring from the wiring trough to the Fusion box.

11.1.2 Sites with Gilbarco Dispensers and no Veeder-Root BIR

Perform the following steps if you are installing at a site with Gilbarco dispensers and no Veeder-Root BIR.

- Disconnect other end of the 883635-xxx cable from Gilbarco Competitive Primary Distribution box, then remove the cable.
- 2. Disconnect and remove cable PN 886843-xxx and PN 886229-xxx.
- ____ 3. Remove the Wayne Competitive Primary Distribution Box.
- 4. Open the case of the Gilbarco Distribution Box and label the pump and CRIND wire pairs that are connected to P106 and P107 of the Pump and CRIND boards so that each pump and CRIND has a set of discrete wire pairs identified. See Figure 3.
- Disconnect the pump and CRIND wire pairs from P106 and P107 of the pump board and from the CRIND board.
- Extend discrete pump and CRIND wire pairs from the wiring trough to the Fusion Site Controller mounting location for each dispenser. Splice additional wire to the wire pairs if needed.

NOTE: Splice extensions if needed so that each discrete CRIND wire pair reaches the location of the Fusion box. Use double insulated wire specified in Section 8 for all exposed wiring from the wiring trough to the Fusion box.

- 7. Disconnect the transformer power supply from the Gilbarco Distribution Box and remove the box from its mounting location.
 - _____ 8. Open the server and remove the SCC board.
 - 9. Install a feature card blank and re-install the server cover.
 - 10. Run a CAT5 Ethernet cable from the Nucleus network switch to the Fusion Site Controller location.



Figure 3 Gilbarco Distribution Box

11.1.3 Sites with Gilbarco Dispensers and Veeder-Root BIR

Perform the following steps if you are installing at a site with Gilbarco dispensers and a Veeder-Root BIR is installed.

- Disconnect other end of the 883635-xxx cable from Gilbarco Competitive Primary Distribution box, then remove the cable.
- 2. Disconnect and remove cable PN 886843-xxx. Leave the cable PN 886229-xxx connected up to the UDB but disconnect the other end from the Competitive Primary Distribution Cabinet
- ____ 3. Remove the Wayne Competitive Primary Distribution Cabinet.
- 4. Open the case of the Gilbarco Distribution Box and label the CRIND wire pairs that are connected to P106 and P107 of the CRIND board so that each CRIND has a set of discrete wire pairs identified. See Figure 3.
- 5. Disconnect the CRIND wire pairs from P106 and P107 of the CRIND board.
 - Extend discrete CRIND wire pairs from the wiring trough to the Fusion Site Controller mounting location for each dispenser. Splice additional wire to the wire pairs if needed.
- NOTE: Splice extensions if needed so that each discrete CRIND wire pair reaches the location of the Fusion box. Use double insulated wire specified in Section 8 for all exposed wiring from the wiring trough to the Fusion box.
 - 7. Connect one end of the cable from the Gilbarco CAB into a GRIB plug at pin 1(+) and pin 4(-).
 After the Fusion is mounted the plug will get plugged into Electronic Interface Board A Channel
 1. See Figure 28.

- _____ 8. Open the server and remove the SCC board.
- 9. Install a feature card blank and re-install the server cover.
- 10. Run a CAT5 Ethernet cable from the Nucleus network switch to the Fusion Site Controller location.

11.2 Fusion Installation

1. Select a Fusion Site Controller mounting location on the wall near where the Wayne Data Distribution box was located or where the Gilbarco Distribution box was located. The Fusion Site Controller mounting bracket should be mounted on the wall first, then the Fusion Site Controller slides onto the mounting tabs or slots of the bracket. Orient the bracket/box so that the data wire connectors are located facing down. Fusion should be mounted in such a way that there is visual access to the XMIT and RCV LEDs which are next to the GRIB connectors. The opposite end of the box has the Status display LEDs and should also be visible.



Figure 4 Fusion Mounting Bracket

- After selecting a mounting location, attach the bracket to the wall by using two screws in the top two screw holes first.
- 3. For Wayne dispensers, route the pump data wires (2 pairs per connector) up to the pump GRIB plugs beginning with Dispenser #1. Pump data wires can be connected as 4 fueling points per plug. See Figure 29 and Figure 30.
- 4. Route the CAT or CRIND data wires up to the CAT GRIB plugs beginning with Dispenser #1. CAT data wires can be connected as 4 single CAT boards per plug or 2 dual CAT boards per plug. See Figure 31 and Figure 32.
- NOTE: The GRIB connectors for the Pumps (Current Loop) are located on the right-hand row of connectors while the GRIB connectors for the Wayne CATs (RS485/422) are located on the left-hand row of connectors. See Figure 25. If installing Gilbarco pumps then both the pumps and CRINDS will use current loop. The GRIB boards will have different colors at the connector to distinguish between the current loop and 485 versions.

- 5. For Wayne dispensers, insert the GRIB plugs into the appropriate GRIB sockets on the rear panel of the Fusion Site Controller beginning with the plug for Pump #1, #2, #3 and #4. See Figure 28.
 - 6. Insert this plug into the Electronic Interface Board (EIB) A, Channel 1 socket. Insert the remaining plugs into the appropriate sockets at Electronic Interface Board (EIB) A Channel 2 and so on for the remaining pumps.
- NOTE: If the site uses a Veeder-Root BIR then the last port on the GRIB board will be used for CAB communications. GRIB Port 1 is the first available GRIB port to use for pump communications. See Figure 7. If
 - 7. Insert the GRIB plugs into the appropriate GRIB sockets on the rear panel of the Fusion Site Controller beginning with the plug for CAT #1, #2, #3 and #4. See Figure 26. Insert this plug into the Electronic Interface Board (EIB) A, Channel 3 socket. Insert the remaining plugs into the appropriate sockets at Electronic Interface Board (EIB) A Channel 4 and so on for the remaining CATs.

NOTE: Make a note of where all of the pumps and CATs are connected.

- 8. Connect the CAT 5 ethernet cable that was run in step 4 to the Ethernet port on the Fusion Site Controller. See Figure 25. Connect the other end of the cable to any available port on the Nucleus Ethernet switch.
- 9. Complete the wiring, secure the conduit, etc.
 - 10. Plug Fusion power brick into the dedicated120VAC power outlet which has been wired into the Emergency Stop button, then plug the other end into the transformer input of the Fusion Site Controller.

11.3 Fusion Installation using Veeder Root CDIM Configuration

If you are installing Fusion in a site which utilizes a Veeder-Root BIR (Business Inventory Reconciliation) system, the following instructions will guide you through configuring the system to work with the Fusion site controller. The CDIM (Current Loop Dispenser Interface Module) has three communications ports but the only ones that are used are Port 1 and Port 2.





Each CDIM port is attached to one (1) CAB (Cable Adapter Box) which can handle up to 16 Fueling Positions. If a site has more than 16 Fueling Positions then a second CAB is required.

When a CAB is connected to a Current Loop GRIB, it will plug into Port 4 at pins 1(+) and 4(-). Pins 2 and 3 are not used. This leaves Port 1, Port 2 and Port 3 as connection points for the current loop wires coming from the dispensers.

If a site has 16 Fueling Points they can be connected using one CAB and two Current Loop GRIBs. One GRIB connects the 16 Fueling Points and the 2nd GRIB connects the CAB at port 9.

11.3.1 Connect the CABs

- 1. Disconnect the CAB communications cable(s) which are connected to the Wayne Nucleus Data Distribution box. (Make a note of the polarity of the wires when disconnecting.
- 2. Attach the CAB communications wire(s) to a GRIB plug. See the example below.



Figure 6 GRIB Plug

- ____ 3. Insert the GRIB plug into Port 4 of Current Loop GRIB #1.
 - 4. If there are two CABs then the CAB GRIB plugs get plugged into the Current Loop GRIB #2 at ports 8 and 9. See Figure 9.

See the following examples for configuration options when connecting up the CABs.



Figure 7 One CAB - 12 Fueling Points



Figure 8 One CAB - 16 Fueling Points



Figure 9 Two CABs - 24 Fueling Points

11.3.2 Connect the Dispensers

- Connect the dispenser with the lowest Fueling Point number to the Current Loop GRIB #1 beginning with Port #2. See Section 13.2. Continue plugging dispensers into GRIB ports 3 and 4.
- If there are 2 CABs at the site then continue plugging any additional dispensers into the next set of GRIB plugs on Current Loop GRIB #2.

11.3.3 Programming the Fusion for Sites with Veeder-Root BIR

To access the Fusion Site Controller programming you can either log on using a laptop connected to the Nucleus switch or you can get a OneShot password and log onto Nucleus as Level 6.

- Go to Programming (if using the Nucleus), and then click the Windows Start button > All Programs > Internet Explorer.
- In the Explorer Address bar, type in **192.168.1.20** and press <enter>. The following Screen will then be displayed.



Figure 10 Fusion Login Screen

3. Enter the Admin in the Login field and enter the default Login and Password. Press <enter> to continue. The following window will be displayed.



Figure 11 Fusion Programming Screen 1

4. Click **Configuration**, and then select Generic. The following window will be displayed.



Figure 12 Fusion Programming Screen 2

 Select **BIR Port** from the module pull-down, then click **Search**. Scroll the display down to show the list of BIR Port Parameters. The following window will be displayed where you verify that the BIR port is set to **Enabled**.

module	BIRP	ort		
descriptio	n			
				Search
				1 Select "Port"
Send new	Configura	tion to Fusion		I. Select Fort
			/	
			/	
List o	fGene	ric Param	eters	
List o	f Gene	ric Paramo	eters	Th
List o module	f Gene sub-grou	ric Paramo	eters value	Тір
List o module BIR Port	f Gene sub-grou general	rîc Parame up description Enabled	eters value 0-DISABLE	Tip D Enable / disable this add in
List o module BIR Port BIR Port	f Gene sub-grou general general	ric Parame up description Enabled	eters value 0-DISABLE	Tip D Enable / disable this add in GRIB port to send data to BIR ATG (i.e. /dev/gribport3)
List o module BIR Port BIR Port BIR Port	f Gene sub-grou general general general	ric Parame up description Enabled Port	eters value 0-DISABLE	Tip D Enable / disable this add in GRIB port to send data to BIR ATG (i.e. /dev/gribport3) Second GRIB port to send data to BIR ATG, if more than one needed (i.e. more than 16 Fi

Figure 13 Fusion Programming Screen 3

 Click Port to open the following window where you enter the BIR CAB port address as /dev/ gribport4 when the CAB is plugged into port 4. See the following window,

module	sub-group	description	value	Tip
BIR Port	general	Enabled	1-ENABLED	Enable / disable this add in
BIR Port	general	Port	/dev/gribport1	GRIB port to send data to BIR ATG (i.e. /dev/gribport3)
BIR Port	general	Second Port	dev/gribport6	Second GRIB port to send data to BIR ATG, if more than one needed (i.e. more than 16 FP)
BIR	general	Second Port	0	If a second port is enabled, what is the first pump on this one?
		Lung		
Add/	Edit Gen	eric param	eters value	1. Enter "/dev/grib) 2. Click "Submit"
		Tank		1. Enter "/dev/grib)



7. If you are installing a site that has 2 CABs, then you will need to program the communication for the second CAB. Click **Second Port** and the following window will be displayed.

module s	sub-group	description	value	Tip
BIR Port	jeneral	Enabled	0-DISABLED	Enable / disable this add in
BIR Port	jeneral	Port		GRIB port to send data to BIR ATG (i.e. /dev/gribport3)
BIR Port	jeneral	Second Port		Second GRIB port to send data to BIR ATG, if more than one needed (i.e. more than 16 FP
BIR Port g	jeneral	Second Port Pump	0	If a second port is enabled, what is the first pump on this one?
Add/E	dit Gene	<u>Second Port Pump</u> eric paramete	o ers value	If a second port is enabled, what is the first pump on this one?
Add/Ed Module	dit General BIR Port	<u>second Port Pump</u> eric paramete	o ers value	If a second port is enabled, what is the first pump on this one?
Add/Ed Module Parameter	dit Gen BIR Port Second	Second Port Pump eric paramete Port Pump	o ers value	If a second port is enabled, what is the first pump on this one?

Figure 15 Fusion Programming Screen 5

	List of Gene	ric Parameters		
	module sub-grou	up description	value	Tip
	BIR Port general	Enabled	0-DISABLED	Enable / disable this add in
	BIR Port general	Port		GRIB port to send data to BIR ATG (i.e. /dev/gribport3)
	BIR Port general	Second Port	0	Second GRIB port to send data to BIR ATG, if more than one needed (i.e. more than 16 FP)
	BIR PORt general	Second Port Pump	U	In a second port is enabled, what is the first pump on this one?
Ento	Add/Edit Ge Module BIR P Parameter Secor Param Value //dev	neric parameto art d Port /gribport6 Figu	submi	S tt Cancel Fusion Programming Screen 6 ross as (dov/gribport0 than click Submit
Ente	er the second	ык сав р		ress as /dev/gribport9 then click Submit.
Whe	en using a se	cond BIR C	AB, clic	k on Second Port Pump to program the fueling point
addr	ess of the pu	imp that is p	lugged	into Current Loop GRIB #2 - Port 6 then click Submit.
Γ	List of Generi	c Parameters		
	module sub-group	description	value	Tin
	BIR Port general	Enabled		inp Enable / disable this add in
	BIR Port general	Port	O DIOMOLLD	(CPIB nort to send data to BID ATC (i.e. /dev/aribnort2)
	BIR Port general	Second Port		Second CPIB nort to send data to BIR ATG (i.e. ydev)gillopol (b)
	BIR Port general	Second Port Dump	0	The exceed part is evaluated what is the first runner on this are?
	Add/Edit Gent Module BIR Port Parameter Second Param Value 5	eric paramete t Port Pump	ers value	S It Cancel
-	Send new (Figu Configurati	i re 17 F on to F dows w	Fusion Programming Screen 7 Fusion to download the new configuration to the Fusion
). Click Cont	troller. The fo			
). Click Cont http:/	troller. The fc) - Fusion Mes	55 _	then

Figure 18 Fusion Programming Screen 8

- ____ 11. Click **Close Windows** to complete the process.
- 12. Close the Internet Explorer window by clicking the **X** in the upper right corner.

11.4 Programming the Nucleus System

If you are installing the Fusion Site Controller in an existing site where an SCC board was installed in the Nucleus server then additional programming is needed to enable the Fusion Site Controller.

- ____ 1. Power up the Nucleus server and wait until you are at the logon screen.
- ____ 2. Log onto Nucleus with a level 4 access or higher.
- ____ 3. Log onto Nucleus with a Level 4 or higher.
 - 4. Go to Programming > System > Pump > Each. Select Pump # 1 and press the Modify button.
 Press the Comm button to open the communications window. See below.

Communications	
Electronic Interface Board	
Channel • 1 • 2	Address 1
<u></u> K	Cancel

Figure 19 Pump Communications Window

- 5. Program Pump # 1 according to which EIB and Channel that Pump # 1 was plugged into in Section 11.2. Continue pump programming with the remaining pumps.
- Go to Programming > System > CAT > Each. Select CAT # 1 and press the Modify button.
 Press the Communications button to open the communications window. See below.

Communications							
Electronic Interface Board							
Channel © 3 © 4	Address 1						
<u>D</u> K	<u>C</u> ancel						

Figure 20 CAT Communications Window

- Program CAT # 1 according to which EIB and Channel that CAT # 1 was plugged into in Section 11.2. Continue CAT programming with the remaining CATs.
- 8. Shutdown and restart Nucleus when all the pumps and CATs have been programmed.

11.5 Gilbarco Blend Ratio Programming

Gilbarco pumps use a different way of designating blend ratios than Wayne pumps. Gilbarco defines the blend ratios as a percentage of low feedstock while Wayne defines blend ratios as a percentage of high feedstock.

Another programming difference is how Gilbarco blenders handle pump operations when the POS and the dispenser have different blend ratios set. Gilbarco blenders will communicate with the POS and dispense fuel even if the blend ratios at the dispenser and POS do not match. In this case the blend ratios programmed at the pump are valid.

Fusion programming contains a flag that controls whether Fusion checks for matching blend ratios. The default is set to **NO** so no blend ratio checking will take place. If the site is experiencing communications problems with the Gilbarco blenders and blend ratio programming is suspected, go to the Fusion programming page located under **Configuration > Devices > Pump**. Access each pump and verify that the value is set to **NO**.

Preset Amount in Fill Up Fuel Tank	999.000	It determines the Preset Amount in case of sending "FILL UP" in Preset command
Totalizer Update Time	0	Time to wait (in secs) for the electronic totalizer to update in case it didn't when the sale finished
Slot ID	0	Slot ID where the pump is conected to the GPBox
Check Blend Ratios	0-N0	If the blend ratios from the pump and Fusion don't match, should the pump come online?
Maximum transaction	0	Maximum volume in transaction (zero means no limit)
Slow down	0	Set the slow down value to prevent a transaction stop correctly with a preset. Set zero if you don't know the correct value
Price Level Switched	0-N0 V	Price level 2 of Fusion goes to 1 of Pump and viceversa
Apply Changes Du	plicate Delete Cancel	

Check Blend Ratios

Figure 21 Check Blend Ratio Flag

NOTE: This programming option only applies to Gilbarco blender programming. Wayne blenders are not affected by this programming option.

11.6 Veeder-Root BIR Installations with EDIM

If the site has a Veeder-Root Business Inventory Reconciliation (BIR) system installed then the installation of Fusion is different depending on the hardware at the site.

11.6.1 Gilbarco Site with EDIM Installed in the Veeder Root

Use the existing UDB with the new Wayne EDIM cable.

11.6.2 Wayne Site with EDIM Installed in the Veeder Root

This configuration is currently under development. Eventually will support more than 12 fueling points using EDIM.

11.7 Changing the Fusion Site Controller IP Address

The Fusion is pre-configured with an IP address of 192.168.1.20. If you need to change the IP address you must use the following procedure.

- 1. Connect a display and a keyboard to the Fusion Site Controller and cycle power.
- 2. After the Fusion boots up, log in with the user ID of "**ipchange**" then use the password "**ipchange**". See Figure 22.



Figure 22 Fusion Login and Password Prompt

3. The prompt on the screen will be "**ip address**:" Using the keyboard, enter the new IP Address and press <enter>. See Figure 23.



Figure 23 Fusion IP Address Entry Screen

- 4. Press <enter> again to confirm.
- 5. Press <enter> to accept the default Broadcast value.
- 6. Press <enter> to accept the default Gateway value.
- 7. Press <enter> to accept the default Name Server value.
- 8. Press <enter> to accept the default Netmask value.
- 9. Press <y> then <enter> to reboot.
- NOTE:

12 TROUBLESHOOTING

After Fusion has been mounted and the system wiring has been completed, all of the pumps and CATs should be online as shown in the Nucleus Sales screen. If pumps or CATs remain offline then double-check for the correct polarity of the pump current loop. The CAT communication wiring should also be double checked.

12.0.1 Powering Fusion On and Off

Note that after pressing the Fusion power button in order to power down, the Fusion power down sequence actually can take up to a minute to complete. This is due to the internal battery backup of Fusion which is shutting down in a controlled manner so that no file corruption occurs.

12.0.2 Fusion Box Components



Figure 24 Fusion Box Components

13 APPENDIX

13.1 Fusion Site Controller Rear Panel

The following diagrams show the Fusion Site Controller connections.



Figure 25 Fusion Rear Panel (Wayne Dispenser Configuration)

13.2 GRIB Connectors





Figure 26 GRIB Connectors - Nucleus CAT Configuration



NOTE: Each GRIB Connector can connect with two dispensers (4 CRINDS)

Figure 27 GRIB Connectors - Nucleus CRIND Configuration







OR



Figure 28 GRIB Connectors - Nucleus Pump Configuration



Figure 29 GRIB Plug - Single Pump (Dispenser) Per Plug Configuration



Figure 30 GRIB Plug - Two Pumps (Dispensers) Per Plug Configuration







Figure 32 GRIB Plug - Two CAT or CRIND Cables Per Plug Configuration



Figure 33 GRIB Plug - One CRIND Cable Per Plug Configuration

13.3 GRIB Jumper Configurations for Current Loop Board

	CH1	CH2	СНЗ	CH4
Dispenser	JP1	JP2	JP3	JP4
Wayne	2 & 3	2&3	2&3	2 & 3
Gilbarco	1 & 2	1 & 2	1 & 2	1 & 2

 Table 4: GRIB Jumper Configurations for Current Loop GRIB PCB Assy

13.4 GRIB Jumper Configurations for 485 Board

Table 5: Channel 1

	JP1	JP2	JP3	JP4	JP6	JP13	JP17	JP18	JP19
RS485	2&3	2&3	2&3	2&3	2&3	2&3	Off	Off	Off
RS422	1 & 2	1 & 2	1 & 2	1 & 2	1 & 2	1 & 2	Off	Off	Off
RS116	Off	Off	Off	Off	Off	Off	On	On	On

Channel 1 RS485/RS422 Echo Off (recommended)

ECHO	JP5
On	2&3
Off	1 & 2

Table 6: Channel 2

	JP7	JP8	JP9	JP10	JP12	JP14	JP20	JP21	JP22
RS485	2&3	2&3	2&3	2&3	2&3	2&3	Off	Off	Off
RS422	1 & 2	1 & 2	1 & 2	1 & 2	1 & 2	1 & 2	Off	Off	Off
RS116	Off	Off	Off	Off	Off	Off	On	On	On

Channel 2 RS485/RS422 Echo Off (recommended)

ECHO	JP11
On	2&3
Off	1 & 2

Channel 3 RS485 Only Echo Off (recommended)

ECHO	JP15
On	2&3
Off	1 & 2

Channel 4 RS485 Only Echo Off (recommended)

ECHO	JP16
On	2&3
Off	1 & 2

Power Source

	JP23
Power from USB	1 & 2
Power from Ext. Source	2 & 3



Figure 34 GFC (Fusion) Wiring Diagram

INSTALLATION/OPERATION	
Wayne Fusion	
Site Controller	
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NOTE: "This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."

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