MDIM/LVDIM Interface Module Kits

Installation Guide

VR VEEDER-ROOT

Notice

Veeder-Root makes no warranty of any kind with regard to this publication, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Veeder-Root shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this publication.

Veeder-Root reserves the right to change system options or features, or the information contained in this publication.

This publication contains proprietary information which is protected by copyright. All rights reserved. No part of this publication may be photocopied, reproduced, or translated to another language without the prior written consent of Veeder-Root.

For complete warranty, technical support, and additional product information, refer to your console's Operator Manual.

DAMAGE CLAIMS

1. Thoroughly examine all components and units as soon as they are received. If damaged, write a complete and detailed description of the damage on the face of the freight bill. The carrier's agent *must* verify the inspection and sign the description.

2. Immediately notify the delivering carrier of damage or loss. This notification may be given either in person or by telephone. Written confirmation must be mailed within 48 hours. Railroads and motor carriers are reluctant to make adjustments for damaged merchandise unless inspected and reported promptly.

3. Risk of loss, or damage to merchandise remains with the buyer. It is the buyer's responsibility to file a claim with the carrier involved. Immediately advise your Veeder-Root representative, distributor, or the factory so that we may assist you.

RETURN SHIPPING

For the parts return procedure, please follow the instruction in the "Veeder-Root Warranty and Dispatch Program" pages in the "Policies, Literature, and Contact" Section of the Veeder-Root **Consoles - North America** Price List.

Contents

Figures

Tables

Introduction

General

This manual contains installation procedures for the installation of the Mechanical or Low Voltage Dispenser Interface Module (MDIM and LVDIM) in an existing TLS-350R with Business Inventory Reconciliation (BIR) and Inventory Management System.

Important☞ Failure to install this product in accordance with its instructions and warnings will result in voiding of all warranties connected with this product.

Mechanical Dispenser Interface Module (MDIM)

MDIMs provide an interface for the TLS-350R to mechanical dispenser heads using high voltage volume pulses. This manual describes the operation, installation, and set-up of the MDIM to mechanical dispenser heads.

The MDIM allows the console to gather relevant dispensing information, including how much product has been dispensed from each fueling station.

Low Voltage Dispenser Interface Module (LVDIM)

LVDIMs provide an interface for the TLS-350R to mechanical and electronic dispenser heads and pump controllers using low voltage volume pulses. This manual describes the operation, installation, and setup of the LVDIM.

The LVDIM allows the console to gather relevant dispensing information including how much product has been dispensed from each fueling station.

Related Manuals

For proper operation you may have to change variables in the TLS Setup mode. Refer to the TLS-350R System Setup Manual for specific information.

If this is a new installation or if site preparation is necessary, refer to the TLS-350R Site Prep and Installation Guide, or contact your Veeder-Root representative for assistance.

576013-879 TLS-300 & TLS-350 Series Consoles Site Prep and Installation Guide

576013-623 TLS-350/TLS-350R Consoles System Setup Manual

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

Level 1   Contractors holding valid Level 1 Certification are approved to perform wiring and conduit routing, equipment mounting, probe and sensor installation, tank and line preparation, and line leak detector installation.

Level 2/3   Contractors holding valid Level 2 or 3 Certifications are approved to perform installation checkout, startup, programming and operations training, troubleshooting and servicing for all Veeder-Root Tank Monitoring Systems, including Line Leak Detection and associated accessories.

Warranty Registrations may only be submitted by selected Distributors.

Safety Symbols

The following safety symbols may be used throughout this manual to alert you to important safety hazards and precautions

	Explosive Fuels and their vapors are extremely explosive if ignited.		**Flammable** Fuels and their vapors are extremely flammable.
	Electricity High voltage exists in, and is supplied to, the device. A potential shock hazard exists.		**Turn Power Off** Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.
	No Smoking Sparks and embers from burning cigarettes or pipes can ignite fuels and their vapors.		**No Open Flames** Open flames from matches, lighters, welding torches, etc. can ignite fuels and their vapors.
	No Power Tools Sparks from power tools (such as drills) can ignite fuels and their vapors.		**No Vehicles** Moving vehicles in the area during service can create a potential for personal injury to you or others. Sparks from starting vehicles can ignite fuels and their vapors.
	No People in the Area Unauthorized people in the area during service can create a potential for personal injury to you and them.		**Use Safety Barricades** Unauthorized people or vehicles in the work area are dangerous. Always use safety cones or barricades, safety tape, and your vehicle to block the work area.
	Wear Eye Protection Fuel spray from residual pressure in the lines can cause serious eye injuries. Always wear eye protection.		**Injury** Careless or improper handling of materials can result in bodily injury.

	Gloves Wear gloves to protect hands from irritation or injury.		**Read All Related Manuals** Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.

Warnings and Important Notes

⚠ WARNING

This product is to be installed in systems operating near locations where highly combustible fuels or vapors may be present. Fire or explosion resulting in serious injury or death could result if the equipment is improperly installed or modified. Serious contamination of the environment may also occur.

You are working with a device in which potentially lethal voltages may be present. Death or injury may result if safety precautions are not followed.

1. Read and follow all instructions in this manual, including all safety warnings.
2. Turn off power to the console before installing this kit.
3. Comply with all applicable codes including: the National Electrical Code; federal, state, and local codes; and other applicable safety codes.
4. Do not alter or modify any component or substitute components in this kit.
5. Do not use this component for other systems aside from the TLS-350R. Install only as described in this manual.
6. Field wiring to the MDIM or LVDIM module must not share conduit with any intrinsically safe probe or sensor.

MDIM/LVDIM Installation

Module / Connector Position

Important☞   If you are installing this module in a system that has already been programmed, you CANNOT CHANGE the positions of existing modules or connectors without re-programming the entire system.

If any connectors are removed during installation, BE SURE they are re-connected to their original modules.

Module Position

Record on the circuit directory (located on the inside front panel) the type of module you are installing in a slot.

Once a particular **type** of module has been installed in that slot, the system will always look for that **type** of module in that slot, unless you reprogram the system.

Connector Position

Identify all connectors according to their slot location. Use the self-adhesive numbering labels supplied with each module.

Once a device has been wired to certain terminals on the connector and the system has been programmed, terminal positions may not be changed without re-programming the system.

Modules Install in Power Bay

Th e MDIM and LVDIM modules are to be installed only in the Power Bay of the TLS-350R Console. If empty slots in the Power Bay have no connection point, you may need an expansion board kit.

		⚠ **WARNING**
		This equipment is installed where potentially lethal voltages exist.
		Electrical shock resulting in severe injury or death may occur.
		1. **Turn off power to the TLS-350R system.**
		2. **Turn off power to any affected pump or dispenser.**
		3. **Turn off power to any independent power source (Figure 1 on page 5).**

For additional information regarding the below steps, refer to the TLS-350R *Site Prep and Installation Guide*.

To install the module, proceed as follows:

1. Read and follow all instructions carefully.

2. To ensure that you will retain current system programming, remove the two Torx screws on the top and bottom corners of the left door of the TLS-350R Console, swing it open and check that the ECPU board battery switch is set to "ON" (see Figure 1 on page 5). To avoid electrical shock, or damage to components, don't touch any circuit components with your hand, any conductive tool, or metallic jewelry. With the battery switch set to the "ON" position, close the left door and replace the Torx screws.

3. Turn Off power to the console before installing this kit.

4. Remove the Torx screws from the top and bottom corners of the right door of the TLS-350R Console and swing it open.

    Take care to avoid shorting high voltage across any component or module in the Intrinsically Safe Bay of the console (see Figure 2 on page 6). Shorting high voltage across an intrinsically safe device could result in fire or an explosion near the device.

5. Orient the MDIM or LVDIM module as shown in Figure 2 on page 6 and carefully slide the module into the selected Power Bay slot. Press firmly to seat the module connector into the motherboard/extension board connector.

6. To secure the module, press down on the two snap-in fasteners on the module face plate until they snap in.

7. BE SURE ALL UNUSED SLOTS in the Power Bay are covered with a snap-in blank plate!

Front Panel Display Enabled
(DIP Switch 3 in the OPEN position)
HRM Features (Europe Only) - Enabled
(DIP Switch 3 in the CLOSED position)

RS-232 Security Code
Disabled (DIP Switch 2
in the OPEN position)

Front Panel Security Code
Disabled (DIP Switch 1
in the OPEN position)

DIP rocker switch 4 - Unused

Battery Backup Switch -
Shown in OFF position
(down)

DIP rocker switches:
OPEN position - open end down, number end up
CLOSED position - open end up, number end down

consoles\ecpubbsw.eps

Figure 1.   ECPU Board Battery Switch ON (SW1)
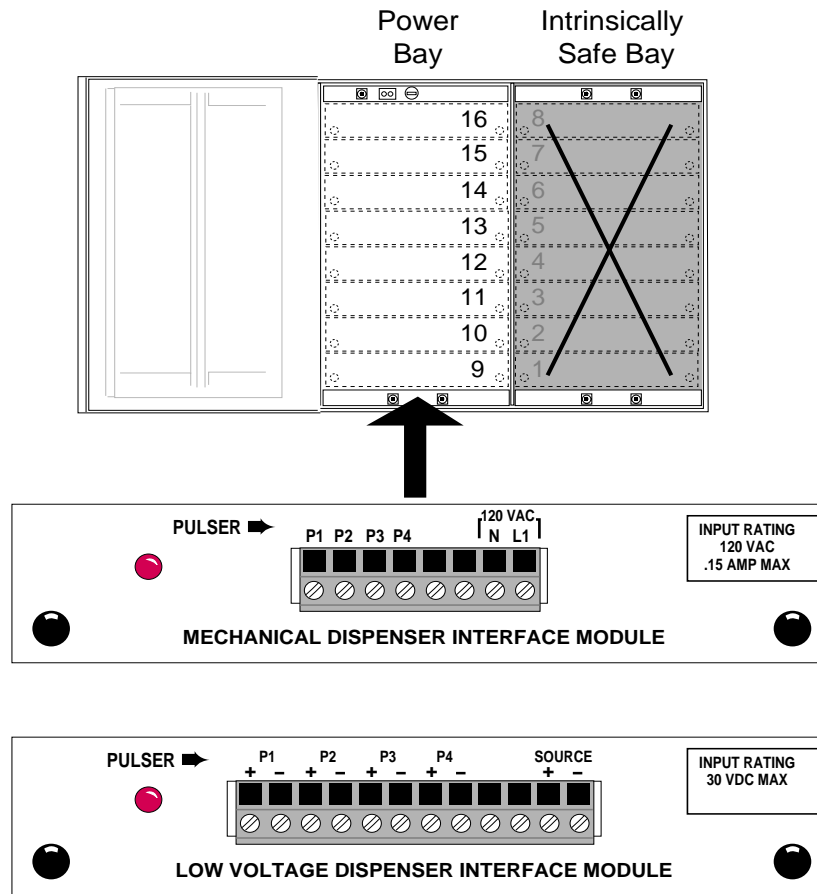
Figure 2.   MDIM or LVDIM Modules Install Only in the Console's Power Bay

DIM Setup Values

Each DIM can interface with up to four pumps. Table 1 lists the DIM setup values that the system will accept. Enter only one pulser type and one volume type for each meter.

The system will assign the values to the meters in the order in which you input them. For example, the first Pulser Type entered will be assigned to Meter 1, the second Pulser Type to Meter 2, and so on (see Table 2). In the same manner, the first Volume Unit you enter will be assigned to Meter 1, the second to Meter 2. You may enter all pulser types assigned to the DIM first and then all Volume Units; or you may enter both parameters for Meter 1, then parameters for Meter 2. If no data is entered, the system defaults to the values highlighted in bold.

Table 1. **Pulse/Unit Conversion**

PULSE CONVERSION		UNIT CONVERSION	
Parameter	**Pulses Per Unit Volume**	**Parameter**	**Unit Type**
P	100 (7697 pulser)	G	U.S. Gallons
F	10 (7697 on high volume pump)	M	Litres
T	25 (7874 Pulse/ Totalizer)	I	Imperial Gallons
Q	2,5 (7874 on high volume pump)		
A	1/2		
S	1		
W	250		
X	500		
Y	1000		

Table 2. **Pulse Conversion Example**

EXAMPLE: PPFFMMMM		
Parameter	**Meter**	**Pulses**
PP	Meter 1 & 2	7697 Pulser
FF	Meter 3 & 4	7697 High Volume
MMMM	Meter 1, 2, 3, 4	Litre Pulses Unit

MDIM Applications

Using 1871/7697 Series Pulse Transmitter or 7874 Series Pulser/Totalizer

System Requirements

Veeder-Root Hardware Requirements

The following equipment is required to connect to mechanical dispensers:

- TLS-350R with Business Inventory Reconciliation (BIR) Console
- One Mechanical Dispenser Interface Module (MDIM) for up to 4 dispensers:
  - Part No. 330250-001 when ordered with the console
  - Part No. 847490-206 when ordered as an upgrade or replacement
- Safe Barrier Part No. 7859. Order one per pulser; 4 per MDIM Module.
- Pulsers: 769780-008 pulse transmitter or 787491-03 pulser/totalizer

System Limitations

- Up to 4 single product fueling positions are supported per module, and a maximum of 8 modules (32 fueling positions) per system are supported.
- The dispenser must separately meter each product prior to blending. The TLS-350R cannot provide reconciliation on dispensers that blend fuel prior to the metering process.
- Only Mechanical Dispensers are supported.

Typical Wiring to Mechanical Dispensers

Make sure power is removed from TLS-350R systems and from all power breakers.

1. Be sure to record on the circuit directory the type of module and the name or location of each unit wired to the connector.

2. Turn OFF power before connecting any wires.

3. Connect the wires (#14 AWG) from each pump or dispenser junction box to the appropriate terminals on the MDIM (see Figure 3 on page 9).

4. Refer to Figure 3 on page 9 and Figure 4 on page 10. Connect barrier (part no. 7859) white wires to each other. These are the neutral wires and should be connected to the (N) terminal on the MDIM. The (N) terminal should be connected to the neutral point in the electrical system (usually done in the circuit breaker panel).

Important☞   The barrier should be installed as close to the fueling device as possible.

5. Connect the orange wires from each barrier to the pulser inputs (P1-P4) on the MDIM.

6. Connect the blue wire from the barrier to the orange/blue wire on the 769780-008 pulse transmitter or the 787491-003 pulser/totalizer.

7. Connect the black wire from the barrier to the orange wire on the 769780-008 pulse transmitter or the 787491-003 pulser/totalizer.

8. Connect the black wire from the circuit breaker panel (LINE 115 VAC) to the terminal L1 on the MDIM.

9. Reconnect AC power from the circuit breaker to the MDIM.
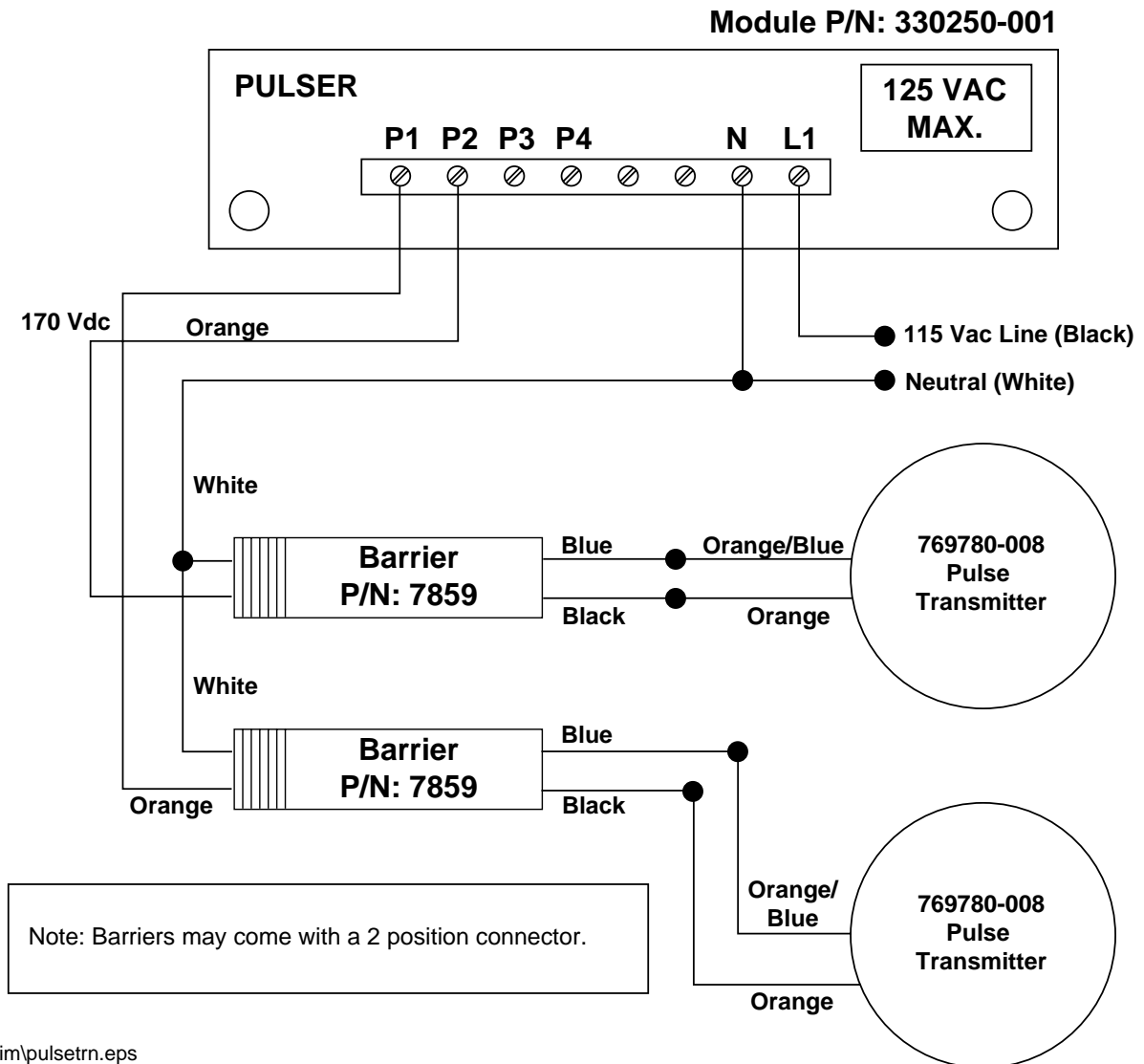
cab&dim\pulsetrn.eps

Figure 3. Wiring Diagram of Mechanical Dispenser Applications using two 1871/7697 Series Pulse Transmitters and required Barriers

Security Plugs

Wire
Retaining
Clip

Money Pulser/Totalizer
(Retrofit Kits 787491-001, -002, -005, -006,
-007, -008, -009 or
787401-001, -002, -005, -006, -007, -008, -009)

Pulser/Totalizer
Warning Label
Retaining

Quantity Pulser/Totalizer
(Retrofit Kits 787491-003, -004
or 787401-003, -004)

Wire
Retaining
Clip

Computer

WARNING

Barrier Warning Label

Intrinsically Safe
Protective Barrier
No. 7859

Typical Junction Box

Conduit Hub Enlarger 1/2" to 3/4"
(If Required)

cab&dim\pulsrtt.eps

Figure 4. Mechanical Dispenser Applications using 7874 Series Pulser/Totalizer

Typical Wiring for Meter Stand Applications

For 1871/7697 Series Pulse Transmitter with required Veeder-Root Safe Barrier (Part No. 7859)

Connectors are supplied with each Mechanical Dispenser Interface Module (MDIM). They provide screw terminations for up to four pump or dispenser junction boxes. To establish wiring connections for the MDIM:
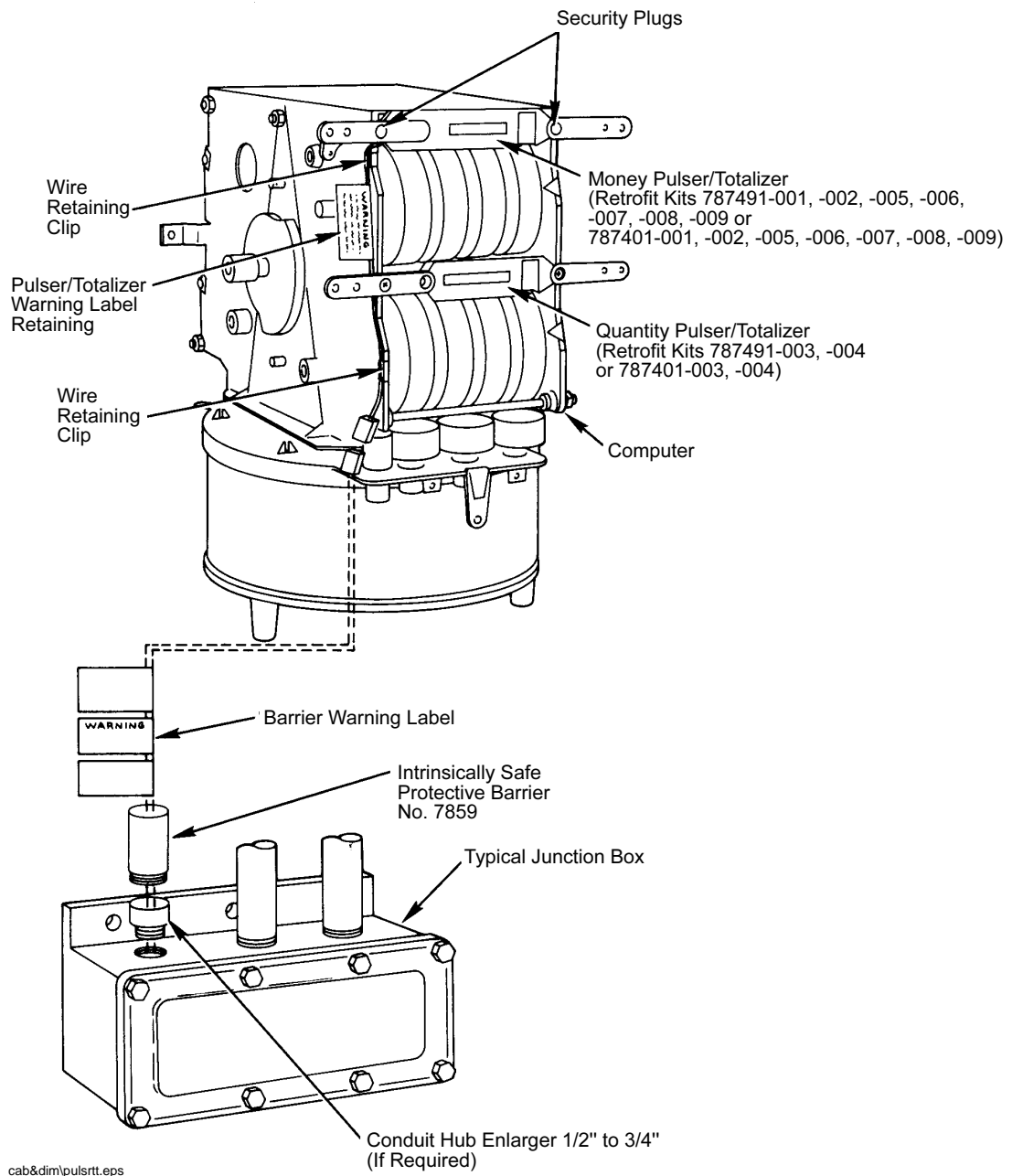
1. Be sure to record on the circuit directory the type of module and the name or location of each unit wired to the connector.

2. Turn OFF power before connecting any wires.

Important☞ Two conductors are required per each pulse transmitter or pulser/totalizer kit.

3. Connect the wires (#14 AWG) from each pump or dispenser junction box to the appropriate terminals on the MDIM (see Figure 5 on page 12).

4. Connect safe barrier (part no. 7859) to junction box (explosion proof type).

Important☞ To work within manufacturers' specifications for long field runs, install the barrier at the pulser end of the wire run.

5. Connect (white) barrier wire to the (N) screw terminal (Neutral) on MDIM.

6. Connect (orange) barrier wire to P1 screw terminal on MDIM.

7. Connect (blue) barrier wire to 7697 (orange) pulser wire.

8. Connect (black) barrier wire to 7697 (orange) pulser wire.

9. Other pulsers can be installed as described in steps 3-8.

Refer to Figure 5 below for Meter Stand Applications (and see Figure 3 on page 9 for a close-up of a Pulse Transmitter wiring diagram):
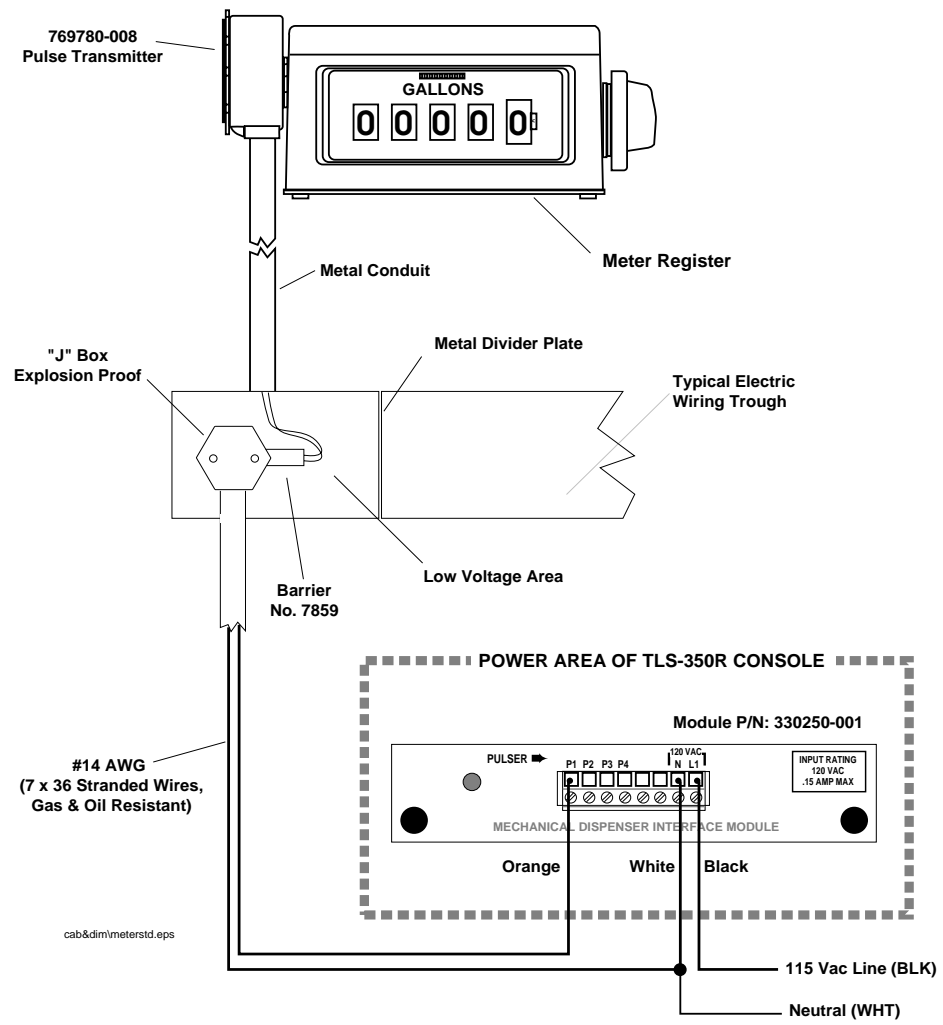
Figure 5. Meter Stand Application Using 1871/7697 Series Pulse Transmitter

LVDIM Installation to Pump Controllers

System Requirements

Veeder-Root System Requirements

The following equipment is required to operate with a PetroVend System2 Controller:

• TLS-350Rwith Business Inventory Reconciliation (BIR) Console

• One Low Voltage Dispenser Interface Module (LVDIM) for up to 4 dispensers per card (and up to 8 cards):

  - Part No. 331214-001 when ordered with the console

  - Part No. 847490-210 when ordered as an upgrade or replacement

PetroVend Dispensing System Requirements

• PetroVend System2 Controller.

• PetroVend Four-conductor Shielded Cable, Part No. 12-1026 (or else be sure to run pulser wires in metal conduit, separate from high-voltage wiring).

System Limitations

• Up to 4 dispensers per module, and a maximum of 8 modules (32 fueling positions) per system are supported.

• The dispenser must separately meter each product prior to blending. The TLS-350R cannot provide reconciliation on dispensers that blend fuel prior to the metering process.

Wiring to the PetroVend System2 Controller

1. Locate the PetroVend System2 PV270 Pump Relay Board. See Figure 7 on page 14.

Important☞ The PetroVend System2 PV270 Pump Relay Board is in a controller rather than on each dispenser.

2. Locate Switch 1 (SW1) on LVDIM module. Be sure switch is in the "EXTERNAL" position. See Figure 6 on page 14.

3. Refer to Figure 7 on page 14. Connect **SOURCE (+)** on LVDIM to **+12** screw terminal on the PV270 relay board in the PetroVend Controller.

4. Connect **SOURCE (-)** on LVDIM to **COMMON** screw terminal on the PV270 relay board.

5. Connect **P1 (+)** to pulser on PV270 relay board. Any other pulser connections should be installed to the PV270 relay boards as described in Figure 7 on page 14.

6. Pulser wires should be kept as short as possible. Use PetroVend cable part no. 12-1026. If metal conduit is used, use a #18 AWG gas, oil, and flame-resistant wire, and keep away from high-voltage wiring and conduit.

Important ☞　　　Be sure to run wires in separate low voltage metal conduit away from high voltage wiring and conduit. All wiring must be in accordance with the National Electrical Code (NFPA No. 70), the Automotive and Marine Service Station Code (NFPA No. 30A), and the Compressed Natural Gas Code (NPFA No. 52). Installers are responsible for following any applicable local codes.
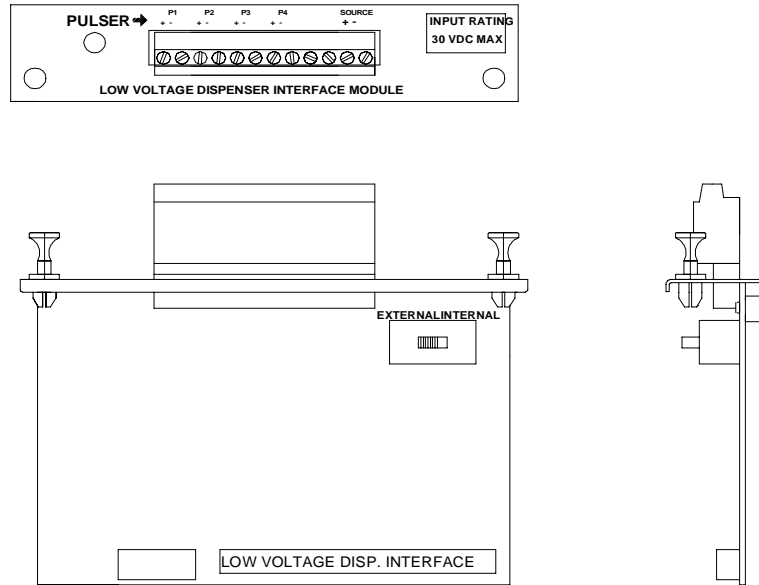
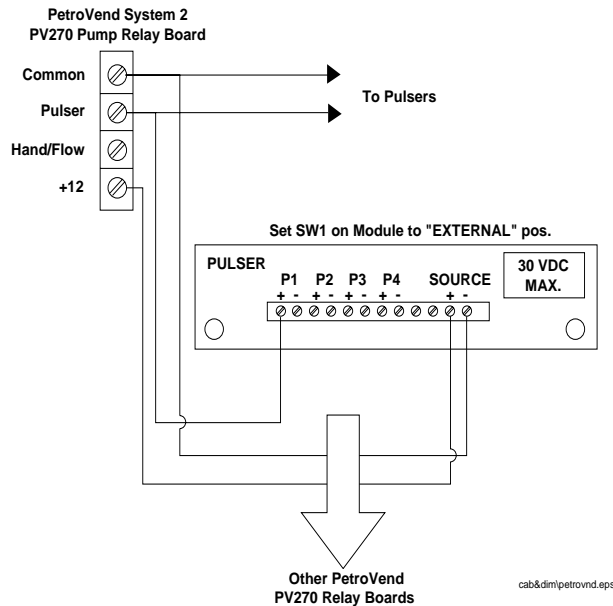**Figure 6. Illustration of LVDIM with SW1 in the EXTERNAL(left) Position**

Figure 7. Installation with PetroVend System 2 Site Controller

LVDIM Installation to Electronic Dispensers

System Requirements

Veeder-Root System Requirements

The following equipment is required to operate with Kraus Micon 200 Electronic Dispensers:

• TLS-350R console with Business Inventory Reconciliation (BIR)

• One Low Voltage Dispenser Interface Module (LVDIM) for up to 4 pulsers; maximum of 8 modules (32 fueling positions) per system.

  - Part No. 331214-001 when ordered with the console

  - Part No. 847490-210 when ordered as an upgrade or replacement

System Limitations for Kraus Micon 200 Dispensers*

• Each dispenser must provide "VOLUME" pulser output to LVDIM.

• Pulser wires must be shielded or separate metal conduit must be used.

Wiring to Kraus Micon 200 Electronic Dispenser*

1. Locate Switch 1 (SW1) on the LVDIM module. Be sure switch is in the "INTERNAL" position.

2. Refer to Figure 8 on page 16. Locate the yellow wire (#18 AWG) on the dispenser. This wire is the pulser common line. Connect this wire to the P1 (+) terminal on the LVDIM.

3. Locate the blue wire (volume pulser output) on the dispenser. Connect this wire to the P1 (-) terminal on the LVDIM. Other Kraus Micon 200 dispensers should be connected as described in steps 2-4.

Important☞   *Kraus Micon applications are not UL approved. The installer will have to pull special shielded pairs in metal conduit. Use twisted pair, 18 AWG (or less) RS-422/485 style cable. Terminate the shield at the dispenser end. Be sure to run wires in separate low voltage metal conduit away from high voltage wiring and conduit. All pulser wiring should be UL/CSA type #18 AWG (or less) RS-422/485 style, and be gas, oil, and fire resistant
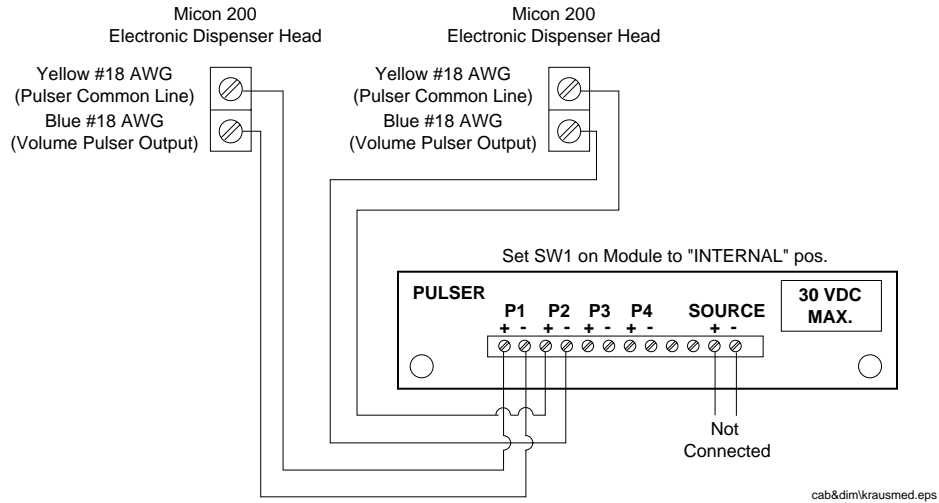
Figure 8.   Installation with Kraus Micon 200 Series Electronic Dispensers (Kraus Micon applications are not UL approved)

Wiring to Gasboy or Tokheim Electronic Dispensers

1. Locate Switch 1 (SW1) on the Low Voltage Dispenser Interface Module (LVDIM). Be sure switch is in the "INTERNAL" position (see Figure 6 on page 14).

2. Refer to Figure 9 below. Locate the DC Junction Box inside the Gasboy 9800 Series or Tokheim 2600 Series electronic dispensers.

3. Connect pulser (red) screw terminal to the P1 (-) terminal on LVDIM.

4. Connect DC ground (white) to the P1 (-) terminal. Other Gasboy and Tokheim dispensers should be connected as described in steps 2-4.

Important☞   Be sure to run wires in separate low voltage metal conduit away from high voltage wiring and conduit. All pulser wiring should be shielded UL/CSA type #18 AWG (or less) RS-422/485 style, and be gas, oil, and fire resistant.
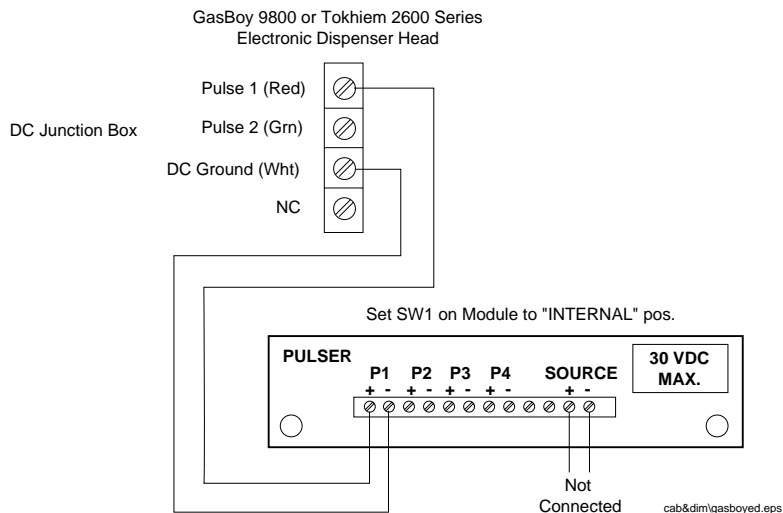

Figure 9. Installation with GasBoy 9800 Series Electronic Dispensers

Sales Offices

Veeder-Root has offices around the world to serve you.

Headquarters

Veeder-Root Company
125 Powder Forest Drive
Simsbury, CT 06070-7684   U.S.A.
(860) 651-2700   FAX: (860) 651-2719

England

Veeder-Root Environmental Systems Limited
Hydrex House, Garden Road
Richmond, Surrey TW9 4NR   ENGLAND
+44 20 8392 1355

Brazil

Veeder-Root do BRASIL
Rua ado Benatti, 92
Caixa Postal 8343
01051 Sao Paulo   BRAZIL
55-11-861-2155

Germany

Veeder-Root GmbH
Uhlandstrasse 49
D-78554 Aldingen   GERMANY
49 (0)7424 1400

France

Veeder-Root SARL
ZI des Mardelles
94-106 rue Blaise Pascal
93600 Aulnay-sous-Bois   FRANCE
33 (0)1 4879 5599

Canada

Veeder-Root Canada
151 Superior Boulevard, Suite 24
Mississauga, Ontario, L5T 2L1   CANADA
905-670-2755

Singapore

Veeder-Root Singapore
246 MacPherson Road
#08-01 Betime Building
348578 Singapore
65 745 9265

Mexico

Veeder-Root Mexico
Prado de las Camelias
No. 4483-4
Praddos Tepeyac C.P. 45500
Zapopan, Jal., MEXICO
(52) 36-47-3750

VR VEEDER-ROOT