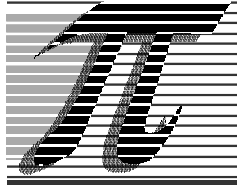


REMOTE LINE MONITOR INSTALLATION GUIDE



Progressive
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ELECTRONICS



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RLM Remote Line Monitor System

INSTALLATION GUIDE

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RLM

**HISTORY OF DOCUMENTATION
CHANGES & REVISIONS**

Version 1.0 — April 20, 1998

Version 1.1 — November 1998 (preliminary release)

RLM

PURPOSE OF THIS DOCUMENT

This manual contains instructions for installation of the Remote Line Monitor systems used to monitor transactions between dispensers and the consoles that control them.

Instructions for installing or servicing dispensers, consoles and tank monitors are not included. For more detail on any product not manufactured by PIE, always refer to that product's accompanying documentation.

NOTICE

Progressive International Electronics reserves the right to revise and improve this document as required. This publication details our Remote Line Monitors at this time, and may not accurately describe these products at all times in the future. Specifications are subject to change without notice.

PATENTS

Progressive International Products are manufactured or sold under one or more of the following U.S. patents.

5,790,410	5,663,887	5,361,216
5,831,861	5,557,529	5,270,943
5,694,326	5,394,336	5,108,742

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RLM

WARRANTY

Progressive International Electronics, Inc. (PIE) warrants to the Purchaser of the RLM equipment manufactured by PIE against defects in material or workmanship for 1 (one) year from date of shipment. Seller will replace or repair defective parts or replace and issue credits to the Purchaser's account in accordance with the following Conditions of Warranty.

Conditions of Warranty

- Credit will be applied only when the completed warranty request form and the defective parts are received and inspected.
- When parts shipments are made prior to receiving the required warranty request and defective parts, they will be billed to the Purchaser.
- In all cases, approved warranty requests will be expedited by issuing the appropriate credit to the Purchaser's account and shipping replacement parts.
- Credits will not be issued for parts and no cash refunds for warranty credits will be made.
- All components and parts must be returned to the factory prepaid and, in turn, replacement components and parts will be returned prepaid by the factory.

- PIE's warranty applies only if the equipment has been installed and used in accordance with PIE's instructions. The warranty is void if any unauthorized alteration or addition has been made to the equipment or if it has been subject to damage caused by abuse, misapplication, accident or improper operation.
- PIE's liability for any damages, including contribution and indemnification, arising out of or in any way connected with the supplying of the equipment or its use, shall not in any case exceed the cost of repair of the equipment as herein provided. Upon expiration of the warranty, all such liability, as well as any other liability, shall terminate.
- Nothing contained herein shall make the Purchaser, its agents or employees, an agent or representative of PIE, and PIE assumes no responsibility of any act, omission, representation or warranty by the Purchaser or anyone else except as expressly stated herein.
- The final decision as to the validity of any claims arising under the warranty shall be determined solely by PIE.

The foregoing warranty is in lieu of all other warranties, expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose which exceed the aforesaid obligations and are hereby disclaimed and excluded by Progressive International Electronics.

RLM

EXPLANATION OF DOCUMENT STANDARDS

The following documentation standards are applied throughout this document.

I Comments are noted in *italics*.

X Variable data formats are represented by X(s).



Electrical hazards and other warnings are indicated with this caution sign.

These abbreviations are used.

DBox Pump manufacturer's distribution box.

EGD Electronic Gas Dispenser

MPD Multiple product dispenser.

MOC Major Oil Company — A term used by Gilbarco in their G-SITE systems

SPD Single product dispenser

RLM Remote Line Monitor. Term used collectively to refer to the RLM electronic and/or mechanical systems manufactured by Progressive International Electronics.

PIE Progressive International Electronics, Inc.

POS Point of sale terminal.

PC Personal computer

System Installation

System Warnings



Safety hazards are inherent with all electrical equipment. Standard precautions must be taken at all times during installation and operation of the RLM systems. In addition to normal electrical precautions, the following points should be noted during installation.

- Installation must comply with the National Electrical Code, as well as Federal, State/Provincial, Local, and all applicable codes.
- High voltages are present in the RLM components, as well as the equipment to which it is attaching. To prevent personal injury or equipment damage, disconnect all power before proceeding with installation.
- RLM equipment must be installed in nonhazardous areas. The main box must be protected from severe vibration, extreme temperatures and excessive humidity.
- All equipment connected to the RLM must be UL-approved and mounted in a non-hazardous location. Standard RS232 or RS485 connections must be used.
- The RLM is intended for use with other devices, such as tank monitors, which determine whether leaks exist at a site. The RLM device cannot determine if product leaks are present.

For Use in USA

Installation of the RLM fuel control system must comply with the requirements of the National Electrical Code (NFPA 70), the Automotive and Marine Station Code (NFPA 30A), and all Federal, State, Local, and applicable safety codes.

For Use in Canada

Installation of the RLM fuel control system must comply with the requirements of the Canadian Electrical Code, the Flammable and Combustible Liquid Code, and all Federal, Provincial, State, Local, and applicable safety codes.

System Installation
System Evaluation

Important!

One of the most important steps in the installation of any RLM takes place prior to any equipment installation. To ensure that the correct RLM is being purchased for an application, a site survey should be completed, listing all the fuel dispensing related equipment.

The survey should include:

- Model numbers of both dispenser and DBox
- Manufacturer of equipment
- Number of dispensers
- A simple drawing describing the station layout

System Installation**System Installation Checklist**

The line monitoring system should be installed in the following order.

1. Install dispensers and controlling console according to manufacturer's specifications. Test dispensers with console for proper operation. *See System Installation Requirements on following page.*
2. Install Tank Monitor System according to manufacturer's specifications. *See System Installation Requirements on following page.*
3. Mount RLM. *Refer to RLM General Installation section of this manual.*
4. Connect system components to specific dispenser box (DBox). *See Pump Specific Installation section for the appropriate brand of dispenser.*
5. Test RLM with Tester Program. *Refer to Diagnostics section of this manual.*
6. Connect to Tank Monitoring System and test fully integrated system.

System Installation**System Installation Requirements**

In preparation for the RLM installation, ensure that the following requirements have been met.

1. Following the manufacturer's installation instructions, install the dispensing equipment (dispensers and data distribution boxes).
2. Test all dispensers in stand-alone (manual) mode.
3. Test all dispensers with same brand console to check basic dispenser functionality and confirm a working communications link between the DBox and the dispensers. On dispensers which have programmable identification numbers, ensure that the numbers are set correctly. If multiple dispensers contain the same i.d. number, communication conflicts will occur.

All dispensers and communications should be functioning properly before proceeding with RLM installation. If not, refer questions to the dispenser vendor/manufacturer.

System Installation**Description of RLM Components**

The RLM systems are made up of the components listed below. Using this checklist, identify and familiarize yourself with each of the components in your shipment. *(For further clarification, refer to the block diagrams at the end of each section in the Dispenser Specific Installation portion of this manual.)*

Component Checklist**RLM
(Electronic)**

- ✓ RLM Main Box
With communication cable to Tank Monitor, power transformer and connector for dispenser communication cable. Also contains the communications adapter board for the specific brand of dispenser.
- ✓ Pump Communication Cable
Cable which connects the RLM box to the fuel dispenser distribution box.
- ✓ Installation Manual
- ✓ System/Test Diskette

**RLM
(Mechanical)**

- ✓ RLM Main Box
With communication cable to Tank Monitor, power transformer and connector for dispenser communication cable.
- ✓ Installation Manual
- ✓ System/Test Diskette

System Installation**RLM General Installation**

Read entire installation manual before attempting to install the system.

Note warnings on previous page.

RLM (Electronic)

1. A junction box with a single receptacle outlet must be provided.
(See RLM Power Requirements listed below.)

RLM Power Requirements

The RLM must be powered from a dedicated 115 VAC single circuit breaker, with no other devices connected to wire or breaker. Do not use a switched neutral breaker. The neutral must come directly from the neutral bus in the electric supply panel. No other neutral circuits may be connected to this wire.

The electric supply system earth bond must connect to a driven ground rod or other earth bonding systems that comply with the National Electrical Code, Article 250.

**Failure to comply with these requirements
will void warranty.**

2. Securely mount the RLM main box in a nonhazardous location according to the suggested layout in the Tank Monitor Installation instructions.

3. Referring to Connector/Jumper Layout diagram on the next page, set all jumpers on the RLM main board according to the specific application requirements. These settings affect the Tank Monitor communications parameters such as baud rate, parity, data bits and device addressing. Also, these jumpers allow the RLM to be configured for daisy-chaining together using RS485 multi-drop circuitry. *Reference the three diagrams at the end of this section.*
4. Connect a PC to the installed RLM's communication cable.
5. Plug the wall transformer into the dedicated power outlet to apply power to the RLM system.
6. Run Tester Program supplied on the system diskette shipped with the RLM, and perform a preliminary test. *Refer to Tester Program, Preliminary Test in the Diagnostics section of this manual.*

Diagram: RLM (Electronic) Connector/Jumper Layout

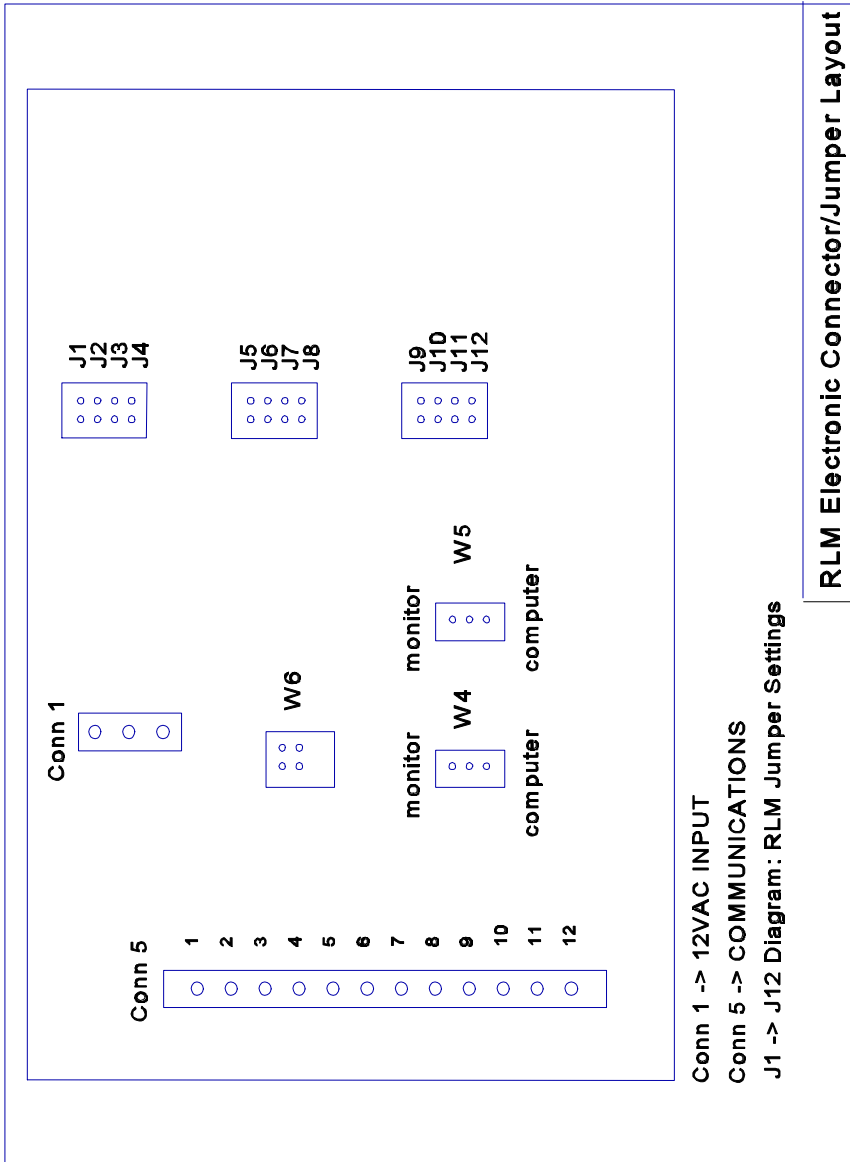


Diagram: RLM (Electronic) Multi Board 485 Link

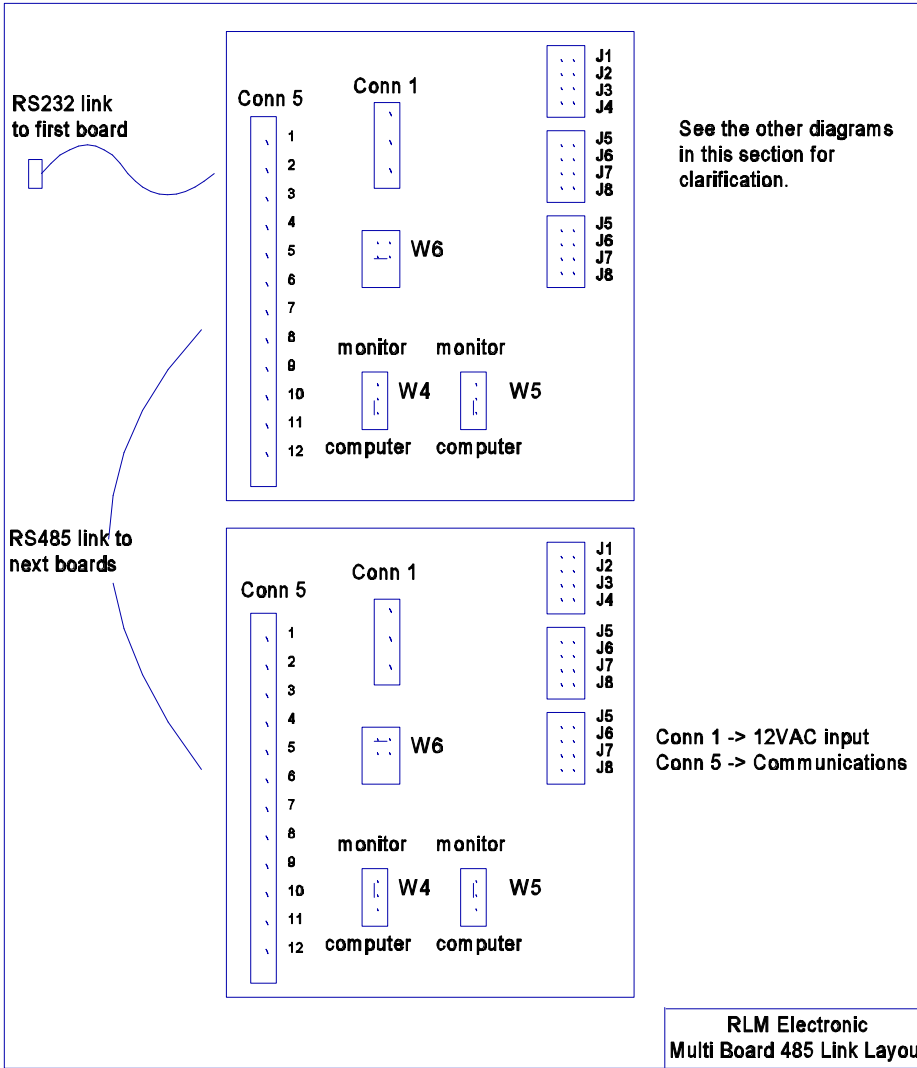


Diagram: RLM (Electronic) Board 1 in RS232/RS485 Link

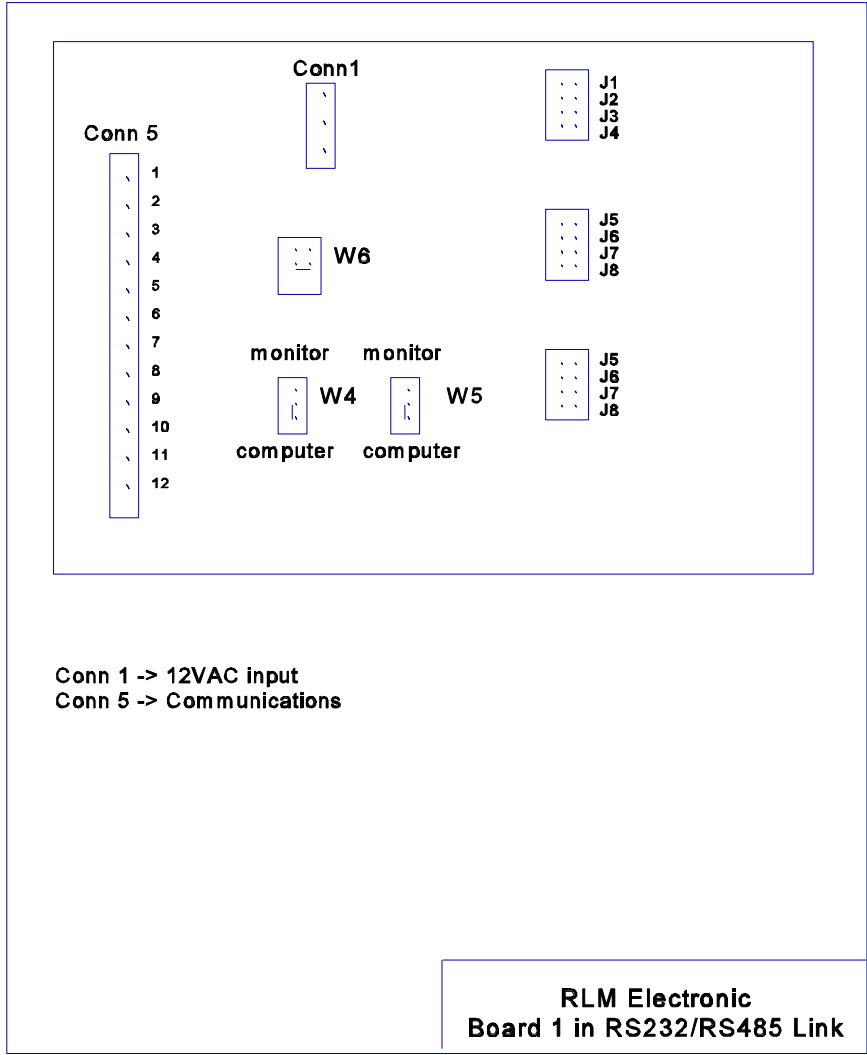


Diagram: RLM (Electronic) 485 Linked Boards

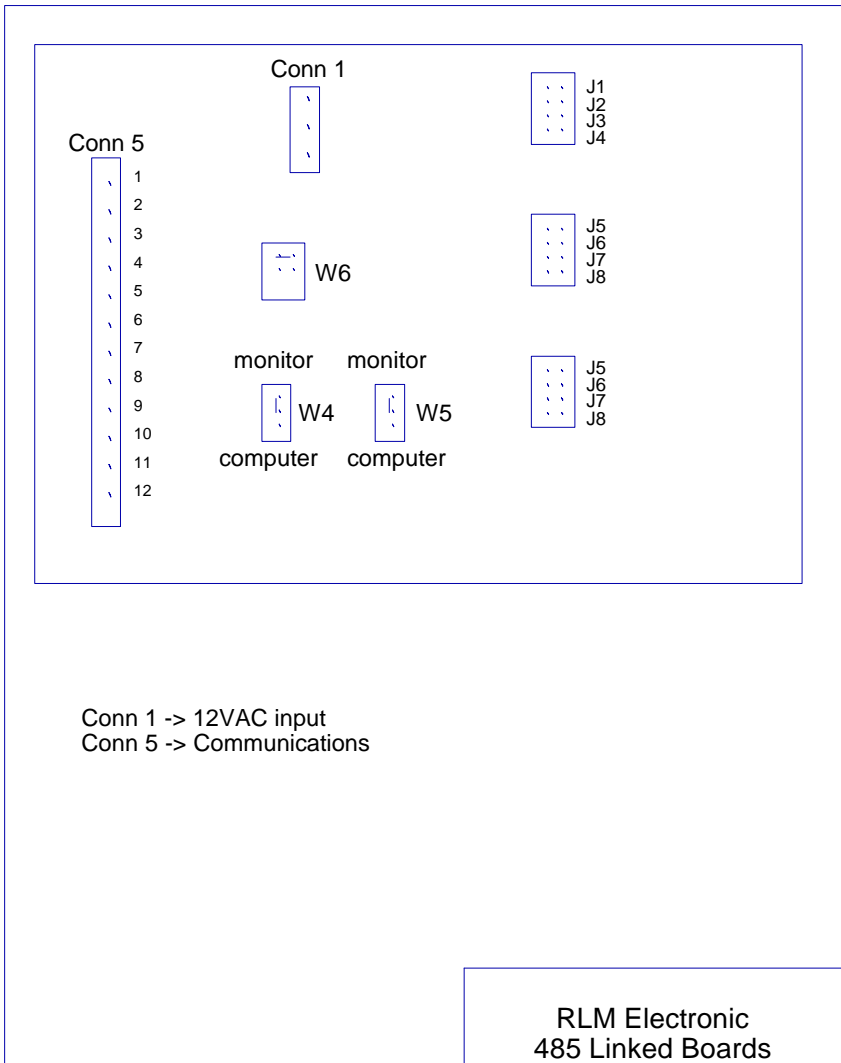


Table: RLM (Electronic) Jumper Settings

Jumper headers J1-J12 are used to configure the RLM.
Configuration is determined by the following settings.

Note: J1 - J12. 0 is no jumper. 1 is jumpered.

BAUD RATE			
J1	J2	BAUD	
0	0	9600	
1	0	4800	
0	1	2400	
1	1	1200	

DATA BITS		
J3	Data Bits	
0	7	
1	8	

STOP BITS		
J4	Stop Bits	
0	1	
1	2	

PARITY			
J5	Parity	J6	Parity
0	no	0	odd
1	yes	1	even

DEVICE ADDRESS	
J9 (LSB) through J12 (MSB)	

System Installation
RLM General Installation

Read entire installation manual before attempting to install the system.

Note warnings on previous page.

RLM (Mechanical)

1. A junction box with a single receptacle outlet must be provided.
See RLM Power Requirements listed below.

RLM Power Requirements

The RLM must be powered from a dedicated 115 VAC single circuit breaker, with no other devices connected to wire or breaker. Do not use a switched neutral breaker. The neutral must come directly from the neutral bus in the electric supply panel. No other neutral circuits may be connected to this wire.

The electric supply system earth bond must connect to a driven ground rod or other earth bonding systems that comply with the National Electrical Code, Article 250.

**Failure to comply with these requirements
will void warranty.**

2. Securely mount the RLM main box in a nonhazardous location according to the suggested layout in the Tank Monitor Installation instructions.

3. Referring to Connector/Jumper Layout diagram on the following page, set all jumpers on the RLM main board according to the specific application requirements. These settings affect the Tank Monitor communications parameters such as baud rate, parity, data bits and device addressing. Also, these jumpers allow the RLM to be configured for daisy-chaining together using, RS485 multi-drop circuitry. *Refer to Diagram: RLM (Mechanical) Connector/Jumper Layout which follows.*
4. Mount pulsers on volume shaft of mechanical dispenser computer. *Refer to diagram on following page.*
5. Identify unused switch in electric reset for use as a return switch on the RLM Mechanical. *Refer to diagram on following page.*
6. Wire the pulsers and motor return (MR) switches to the RLM Mechanical. *Refer to Diagram: RLM (Mechanical) Connector/Jumper Layout which follows.*
7. Connect a PC to the installed RLM's communication cable.
8. Plug the wall transformer into the dedicated power outlet to apply power to the RLM system.
9. Run Tester Program supplied on the system diskette shipped with the RLM, and perform a preliminary test. *Refer to Tester Program, Preliminary Test, in the Diagnostics section of this document.*

Diagram: RLM (Mechanical) Connector/Jumper Layout

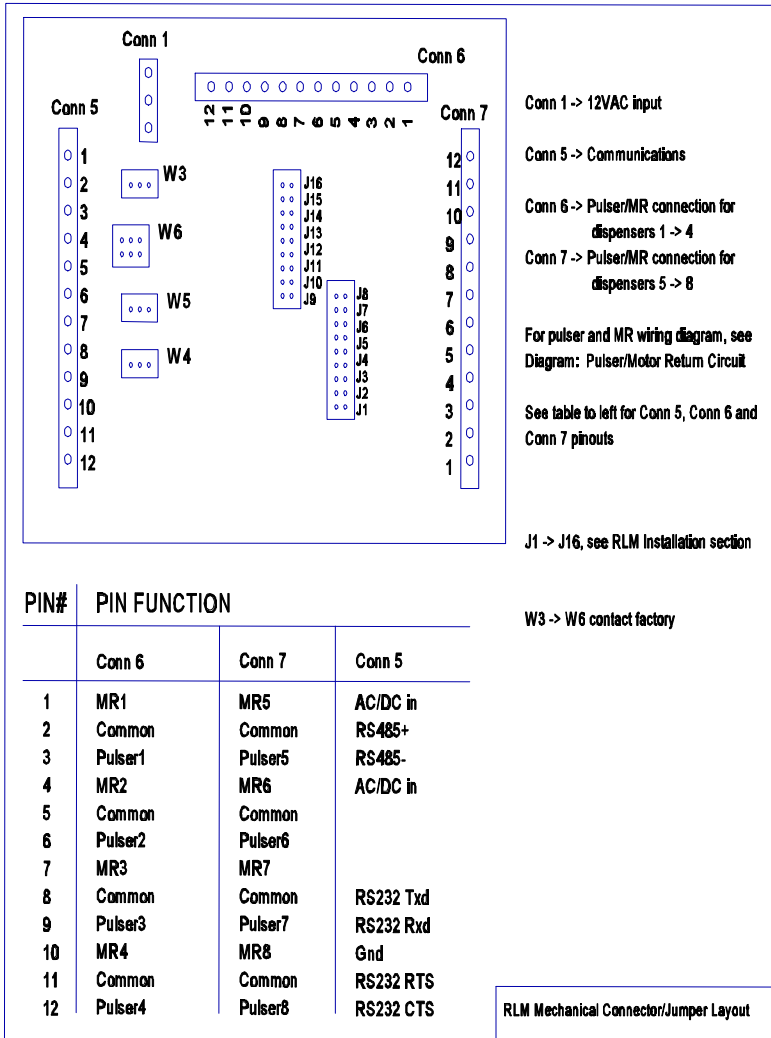
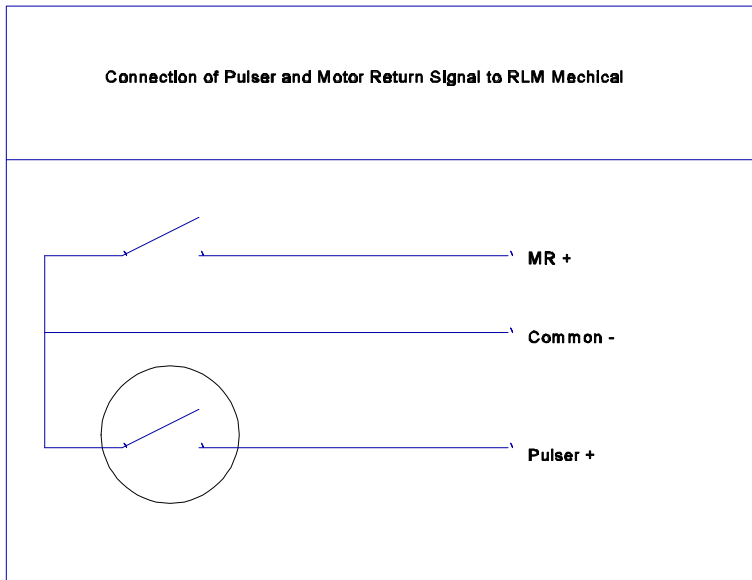


Diagram: Pulsar/MR Circuit

Connection of Pulsar and Motor Return Signal to RLM Mechanical



The RLM Mechanical has 8 pulse monitor inputs. The pulses are accumulated when a pulse input is monitored, going from a low to a high state. The pulse is ignored if the MR Input is not low. The pulses are recorded as they occur and can be read at any time.

The pulse and MR Inputs are optically isolated from the main logic. To activate the Input, the signal is shorted to common by the switches shown at right. These inputs are meant to be connected to a switch/relay type device such as a reed switch or relay contacts. The pulser must provide 1 pulse per 1/10 gallon. A few examples of this type of pulser are:

- Veeder Root Pulsar
- Veeder Root Pulsar — Totalizer (volume type)
- Wester Electric Pulsar
- PMP Pulsar

Contact the pulser manufacturer/dealer for pulser model recommendations for this application.

WARNING!

Serious damage will occur to the RLM Mechanical if any 110VAC is applied to the input pins.

Pulsar/MR Circuit

System Installation

Pump Specific Installation

RLM-G for Gilbarco Electronic Dispenser



Note all warnings at the beginning of installation section.

Gilbarco MOC (major oil company) G-SITE Systems are a special configuration. Refer to System Installation, RLM-GS for Gilbarco G-SITE Installation, which follows this section, for Gilbarco MOC instructions and installation requirements.

Following the instructions in RLM General Installation, perform general installation procedure and the preliminary test procedure using Tester/WinTester program. Then, follow specific instructions for connecting the RLM system to the appropriate Gilbarco distribution box (DBox). *See Table: Gilbarco DBoxes at the end of this section.*

Match the RLM-G with the Gilbarco system by using the appropriate adapter board selection in the RLM-G. *Reference Diagram: RLM Gilbarco Adapter Board later in this section.*

1. If the Gilbarco system employs a current loop style Universal DBox or a TS1000 DBox, disconnect the Gilbarco console/controller from the distribution box and connect the Gilbarco style RLM adapter cable (PIE 9000 15 0027) to the Gilbarco DBox. Plug the long end of the adapter cable into the RLM DB9P connector on the end of the RLM. *Reference Diagram: RLM-G to Gilbarco later in this section.*
2. If the Gilbarco system employs a PA01330000 DBox, cut off the 'T' end of the RLM adapter cable (PIE 9000 15 0027). *Refer to Diagram: RLM-G to Gilbarco DBox PA01330000.*

Locate an unused position in the Gilbarco DBox and ensure that the switch is in the 'Isolate' position. Connect the cut end into the Gilbarco DBox at this position. At this point, move the switch to the 'Normal' position. In the event that the DBox positions are full, wire the RLM adapter cable in series with an existing pump. *Reference Diagram: RLM-G to Gilbarco DBox PA01330000..*

3. If the Gilbarco system employs a PA03060020 DBox, disconnect the Gilbarco console/controller from the distribution box and connect the Gilbarco style RLM adapter cable (PIE 9000 15 0027) to the Gilbarco DBox the DB9 to RJ45 adapters. Plug the long end of the adapter cable into the RLM DB9P connector. *Reference Diagram: RLM-G to Gilbarco DBox PA03060000 following this section.*
4. If the Gilbarco system employs an RS422 style Universal DBox, disconnect the Gilbarco console/controller from the DBox and connect the Gilbarco style RLM adapter cable (PIE 9000 15 0028) to the Gilbarco DBox. Plug the long end of the adapter cable into the RLM DB9P connector on the end of the RLM. *Reference Diagram: RLM-G to Gilbarco RS422 following this section.*
5. On all RLM-Gs that attach to current loop style DBoxes, check green LED D4 for reverse loop condition. If this LED is on, rotate the harness on J4 180 degrees and replug. D4 should go out and the red LED D3 should start flashing. *See Diagnostics, Pump Specific Troubleshooting, Gilbarco, for assistance.*
6. Return to the RLM General Installation for remaining system installation procedures.

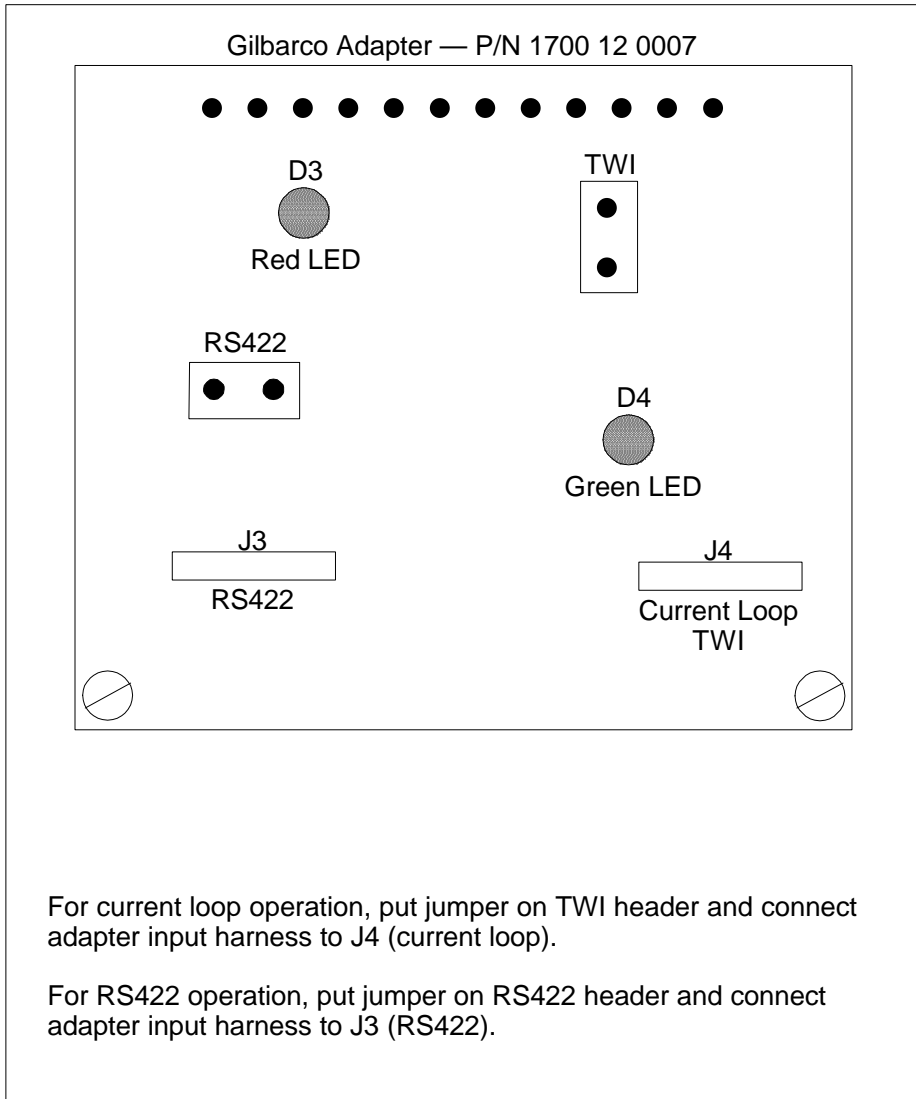
Table: Gilbarco DBoxes

Gilbarco dispensing systems use several types of distribution boxes. This table of DBox part numbers with descriptions will assist you in determining which connection method to the RLM meets your requirements. Gilbarco uses two different electrical means of transmitting data — current loop and RS422. It is very important to determine this prior to installing the RLM.

DBox Part #	Description
PA01330000	Old style DBox with circular DINN connector (current loop)
PA0261x000010	Universal DBox ₁ with DB9P male (current loop) — one board
PA0261x000020	Universal DBox ₁ with DB9P male (current loop) — two boards
PA0261x000011	Universal DBox ₁ with DB9S female (RS422) — one board
PA0261x000021	Universal DBox ₁ with DB9S female (RS422) — two boards
PA03060020	G-SITE DBox with RJ45 connector (current loop)
PA0242	TS1000 DBox ₂ with DB9P connector (current loop)

- 1 The Gilbarco Universal DBox may be configured as a one or two board unit, depending on the fuel site dispensing equipment layout. If two boards and two inputs are used, multiple RLMs are required. Please refer to Gilbarco document number MDE-2713 for detailed information on this product.
- 2 Please refer to Gilbarco document number MDE-2381A or MDE-2382A for detailed information on this product.

Diagram: RLM Gilbarco Adapter Board



For current loop operation, put jumper on TWI header and connect adapter input harness to J4 (current loop).

For RS422 operation, put jumper on RS422 header and connect adapter input harness to J3 (RS422).

Diagram: RLM-G to Gilbarco DBox PA01330000

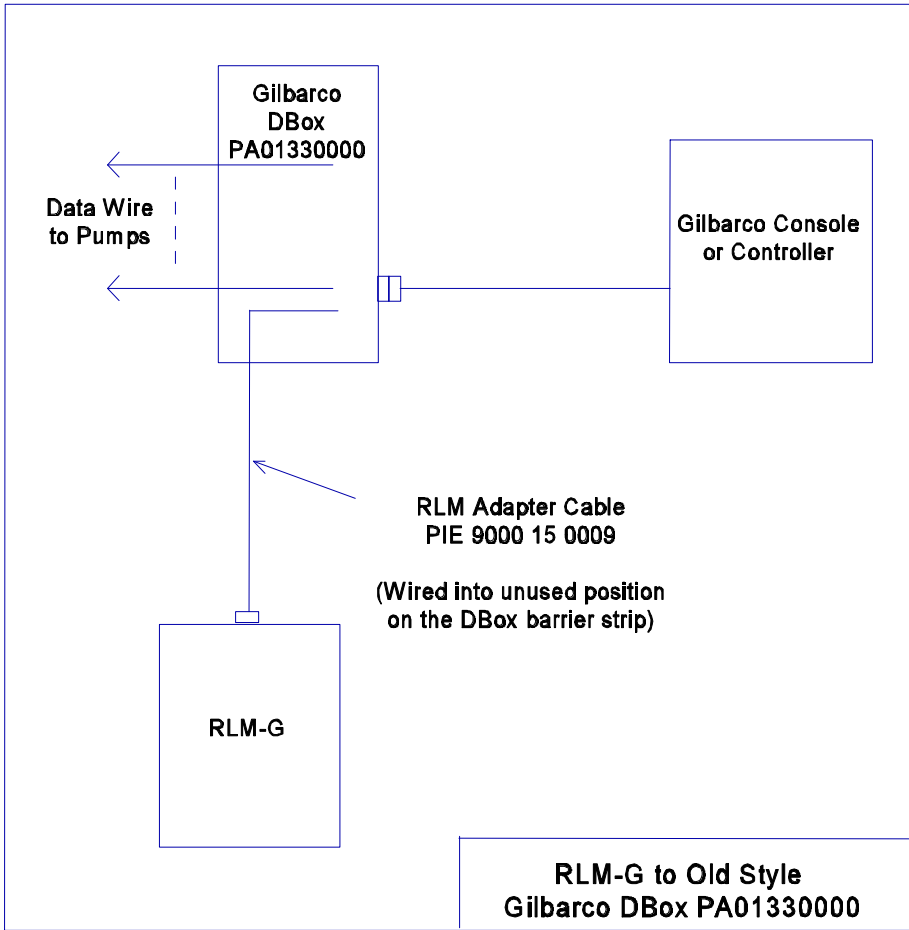


Diagram: RLM-G to Gilbarco DBox Universal/TS1000

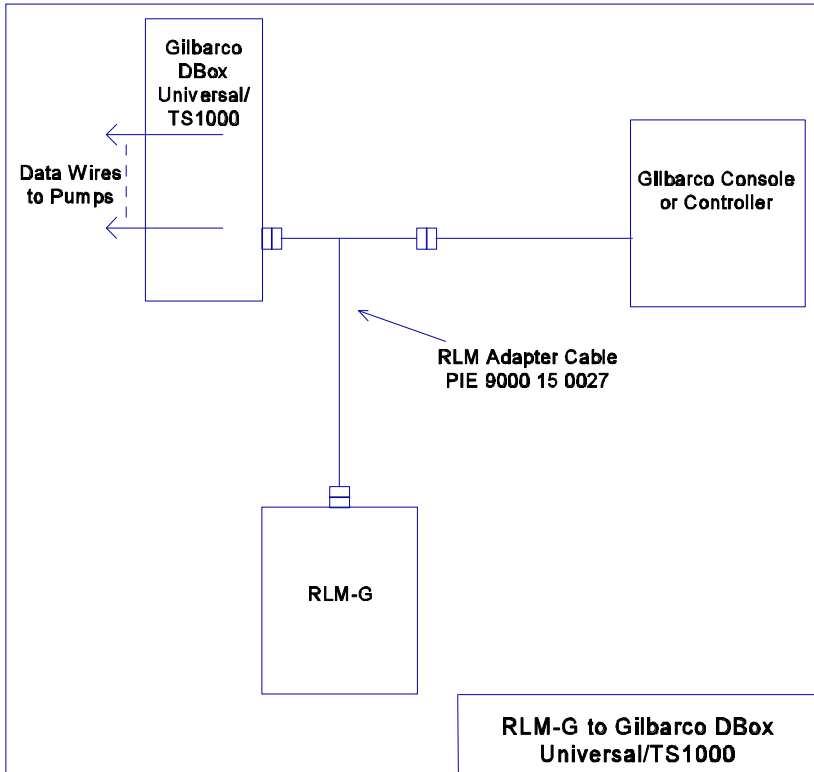
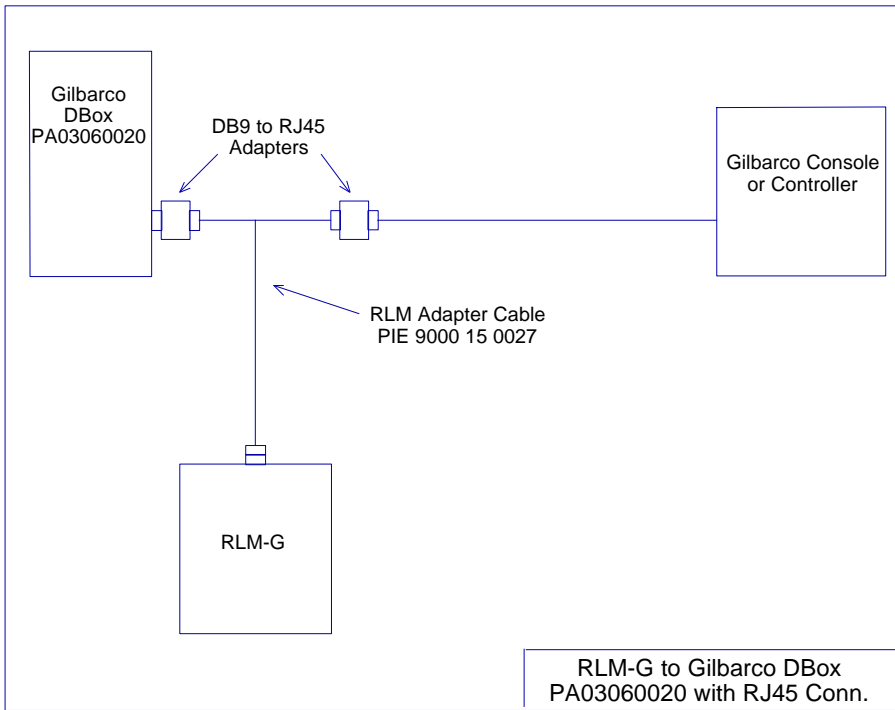


Diagram: RLM-G to Gilbarco DBox PA03060000



System Installation

Pump Specific Installation

RLM-GS for Gilbarco MOC G-SITE Systems



Note all warnings at the beginning of installation section.

If the Gilbarco system employs a MOC G-SITE point of sale system, special procedures must be followed to ensure a successful installation of the RLM. First of all, it is important to know from the site survey which type of controller (C2, 486, Pentium, etc.) the G-SITE is using. Secondly, the revision number of the software running on the G-SITE is very important to know.

Confirm that the G-SITE will support the EMC tank monitoring option which is a component of the BIR (Business Inventory Reconciliation) interface. The software revision number, along with the MOC type, indicate the ability of the G-SITE to support this function. If it is determined that the G-SITE does not have the correct revision software loaded, a software update is required from an authorized Gilbarco distributor.

If you have determined that the G-SITE is EMC ready, proceed with the RLM-GS installation. Otherwise, contact dealer for further assistance.

1. Locate the G-SITE controller EMC tank monitor port using the G-SITE installation manual. Connect the RLM-GS to the Gsite using the 9000 15 0045 cable and the RJ45 adapters (9000 16 0002 and 9000 16 0003) provided by PIE.

If the G-SITE is using the C2 style controller, both adapters will be required. If the G-SITE is a 486-style controller, adapter 9000 16 0002 will not be needed.

Reference the two diagrams at the end of this section.

2. Return to the RLM Installation Section for remaining system installation procedures.

The RLM G-SITE reports all totals by meter number for each fueling position. Blender dispensers will report meter 1 to hose 1 and meter 2 to hose 2 position on the RLM. A blended product will report an increase for both meters.

Diagram: RLM-GS to Gilbarco C2 G-SITE

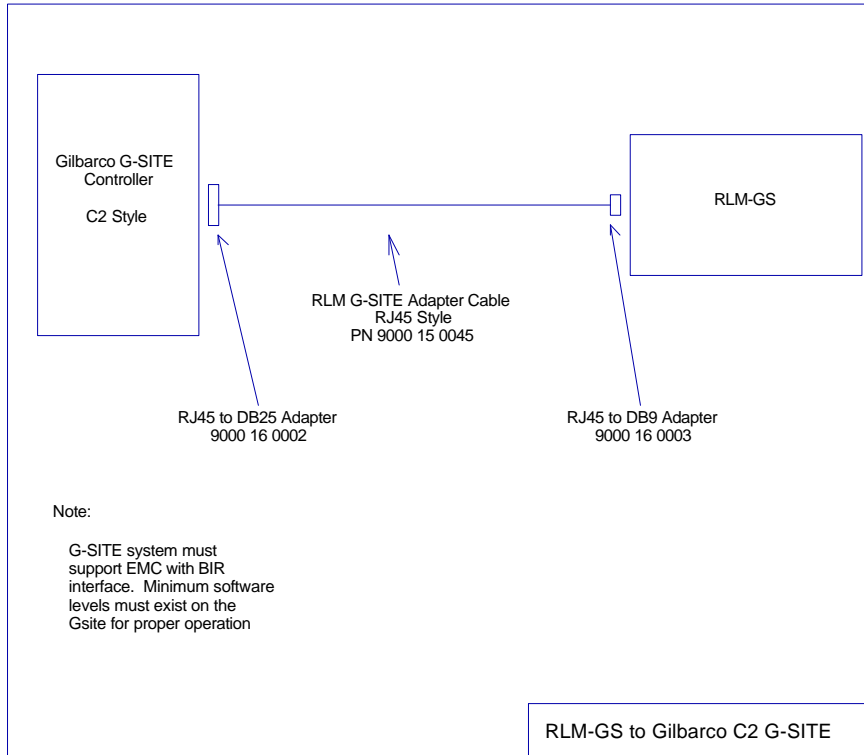
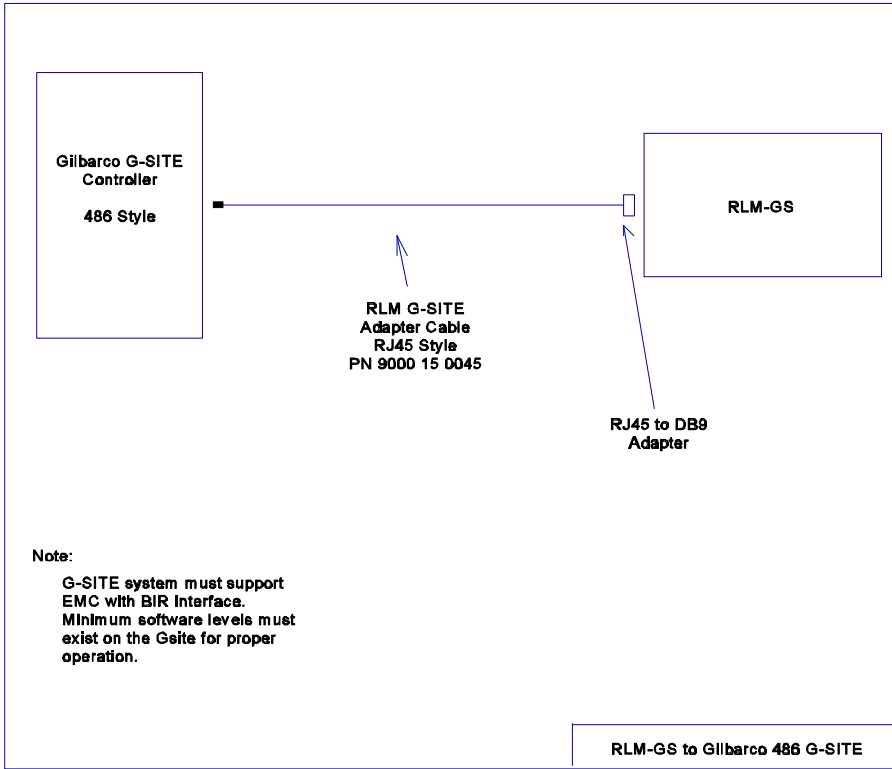


Diagram: RLM-GS to Gilbarco 486 G-SITE



System Installation

Pump Specific Installation**RLM-W for Wayne/Dresser Electronic Dispenser**

Note all warnings at the beginning of installation section.

1. Plug the adapter cable (supplied by PIE) into the adapter port on the RLM-W.
2. Locate the Wayne/Dresser distribution box and wire the other end of the adapter cable for W/D into the unused pump positions in the DBox. In the event that the DBox is full, wire in “series” with existing pump. The following chart shows wire color to function.

Wire Color	Function
Black	Loop 1 -
Red	Loop 1 +
Green	Loop 2 -
White	Loop 2 +

On Wayne/Dresser DBoxes with pumps wired into one side of the DBox board, only one loop needs to be connected. For units with both sides of the DBox board wired, Loop 1 and Loop 2 must both be connected. *Refer to next page for typical installation drawing where 2 loops are needed.*

Diagram: RLM-W for Wayne/Dresser — Typical Installation

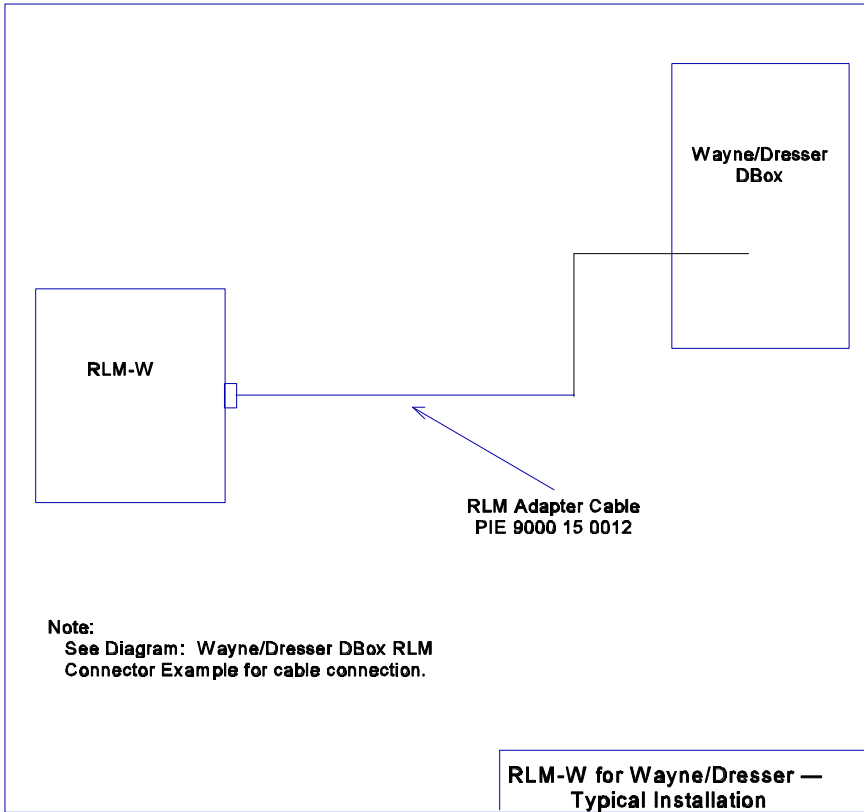
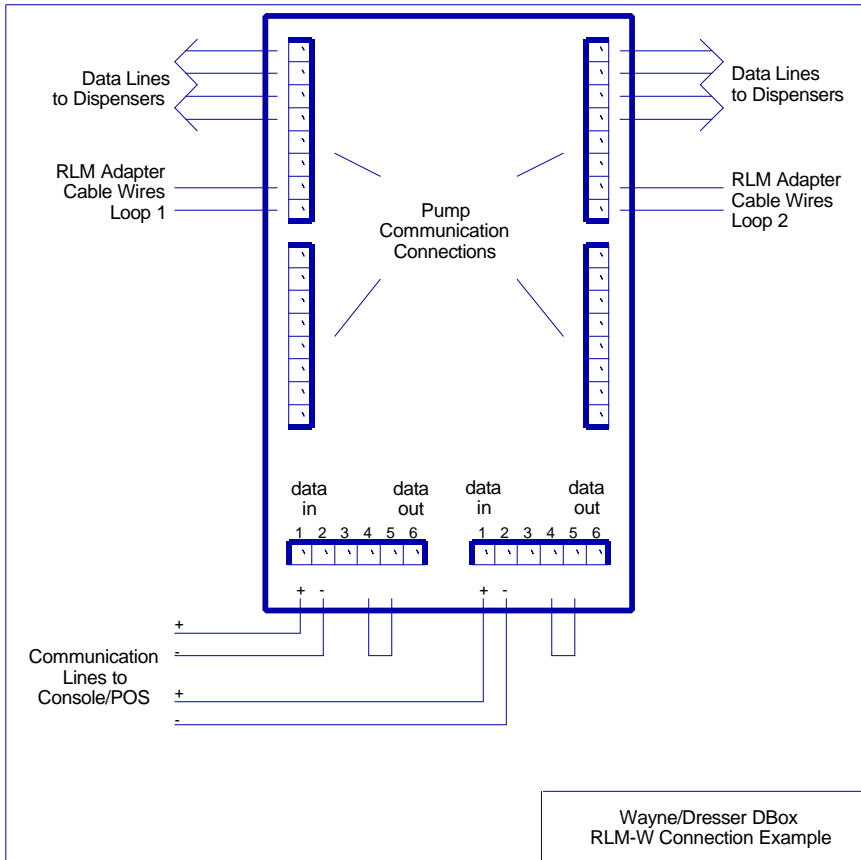


Diagram: Wayne/Dresser DBox RLM-W Connection Example



System Installation
Pump Specific Installation
RLM-T for Tokheim Electronic Dispenser



Note all warnings at the beginning of installation section.

1. Plug the adapter cable (supplied by PIE) for Tokheim dispensers into the adapter port on the RLM-T.
2. Determine the type of electrical communications used by the Tokheim system. Match the RLM-T with the Tokheim system by using the appropriate adapter board selection in the RLM-T.
Reference Diagram: RLM Tokheim Adapter Board later in this section.

Two types of electrical communications techniques are used by Tokheim — standard and RS422. The M98 and M94 Power Centers all use Tokheim standard. The 67 DBox uses standard, but may be modified in the field to run RS422. The 67B uses RS422, but may be modified in the field to run standard. Because of the ability to modify in the field, the model number on the 67 and 67B may not accurately reflect the communications method of the DBox settings. Contact the Tokheim service company responsible for site service to confirm DBox settings.

3. Locate the round black connectors on the existing console to DBox cable. Disconnect the existing console/controller cable from the Tokheim M98/M94 Power Center, the 67 DBox, or the 67B DBox. Attach the RLM adapter cable to the cable ends from the console/controller and from the DBox/power center. *Refer to the next page for a diagram of a typical installation.*

Diagram: RLM-T for Tokheim — Typical Installation

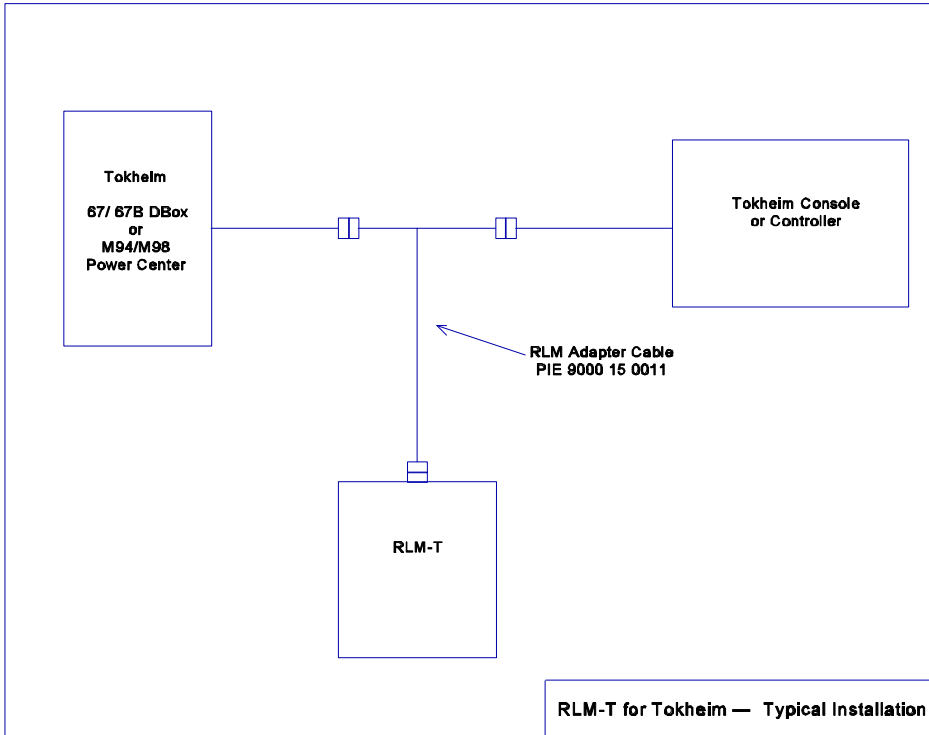
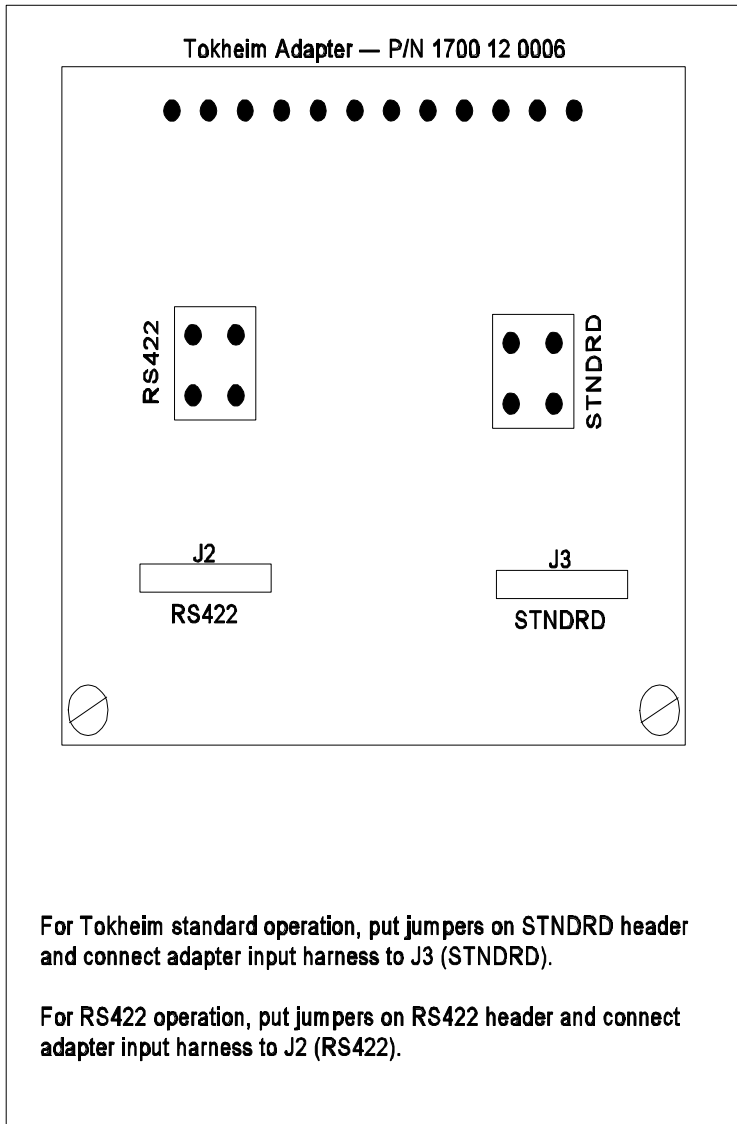


Diagram: RLM Tokheim Adapter Board



System Installation

Pump Specific Installation**RLM-S for Schlumberger SAM Electronic Dispenser**

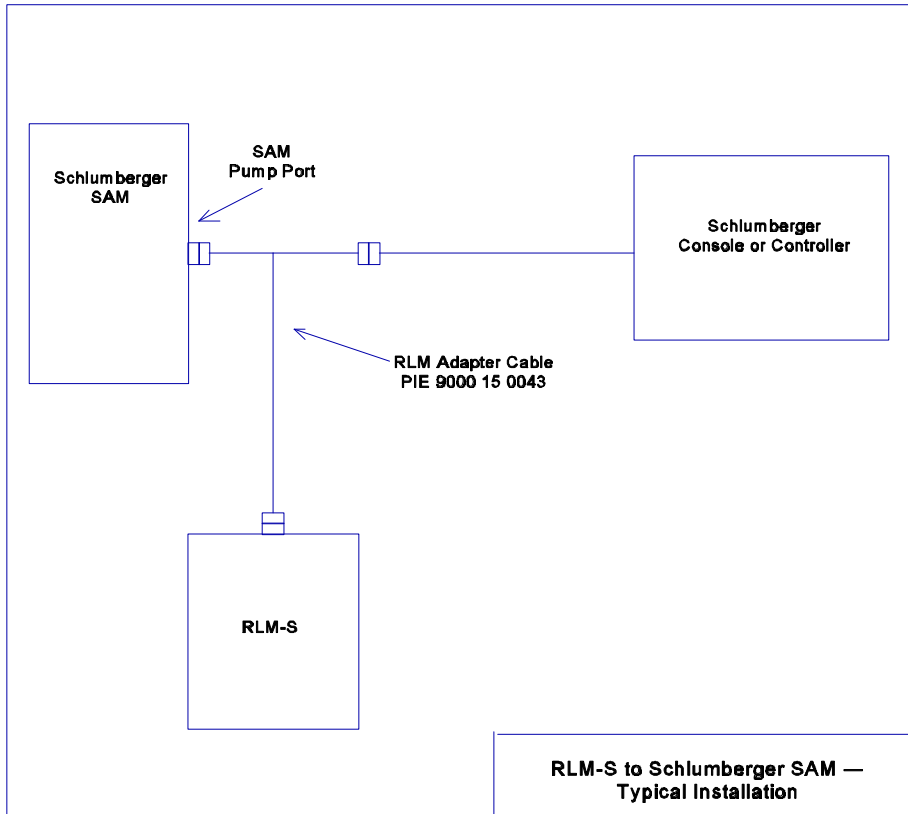
Note all warnings at the beginning of installation section.

The only Schlumberger dispensers supported by RLM-S are those utilizing the SAM interface.

1. Plug the adapter cable (supplied by PIE) for the Schlumberger SAM into the adapter port on the RLM-S.
2. Locate the SAM dispenser port and disconnect the existing console/controller cable. Connect the RLM adapter cable to the SAM dispenser port and the console/controller cable. *Refer to diagram on following page.*
3. Locate the dip switch in the SAM that determines the communications baud rate for the dispenser port. *Refer to the Schlumberger SAM installation documentation and look up the baud rate selected for this application.* Set the baud rate jumper on the RLM-S to match the baud rate of the SAM.

The pump/hose positions reported by the RLM do not reflect the product totals for physical pump/hose positions on the Schlumberger pumps. The RLM stores all Schlumberger transactions by product code. For additional details, see Table: Product Codes, later in this section. Refer to the next page for the diagram of a typical RLM-S installation.

Diagram: RLM-S to Schlumberger SAM — Typical Installation



Diagnostics

Testing the RLM Using Tester/WinTester

Shipped with each RLM, PIE provides two software diagnostic tools on diskette, "Tester" and "WinTester." Tester is a DOS-based utility, while WinTester is a Windows-based program designed to run on Win3.11, Win95 and Win98.

Either Tester or WinTester:

- Allows the user to retrieve data from the RLM.
- Has a reset feature which clears all totals in the RLM and a test load to determine the RLM's storage ability.
- Has the ability to run the comm port on the PC to coordinate the jumper settings of the RLM and the PC.

Testing the RLM with "Tester" Utility

1. Check to ensure that your computer has the ANSI.SYS driver loaded on the root directory on C drive. Your CONFIG.SYS file should have a statement such as **device=c:[path]\ansi.sys** . If not, locate the ANSI.SYS file on your computer and edit your CONFIG.SYS file to include the **device=c:[path]\ansi.sys** statement. *If this driver is not loaded properly, the screen will not be readable when Tester is loaded.*

2. Go to A:\ drive. Insert the Tester diskette and type **T**ester. This loads the Tester program.
3. Determine the communication settings in the RLM from the jumper settings (i.e., baud rate=9600, data bits=8, stop bits=1, parity=N, RTS=+, device address=00).
4. Follow the prompts on the screen, setting Tester's parameters to match those of the RLM.
5. The screen will fill with eight fueling positions with pump totals information. *If data appears scrambled on the screen, press E to exit and recheck to make sure ANSISYS is loaded.* These totals represent the transactions the RLM has captured since it was last reset.

Press **T** to view the next 8 positions, 9 through 16.

Press ? at any time to view a menu of the Tester commands.

To test the RLM serial comm port with Tester, follow 1-5 above and #6 below.

6. RLMs shipped from PIE will have all totals cleared. To test load an RLM and to ensure the communications link between the Tester program and the RLM, press **L** and look at "pump2 hose2" position on the screen. It should read "1234567890". To reset the RLM and clear all data, press **R**. All totals cells will show zeroes. Check to make sure that the status message at the top of each pump display reads "OK". *See note at end of this section.*

Testing the RLM with the "WinTester" Utility

1. Go to **A:**. Insert the WinTester diskette and, from the Start menu, run WinTester.exe. The WinTester utility is now loaded.
2. Determine the communication settings in the RLM from the jumper settings (i.e., baud rate=9600, data bits=8, stop bits=1, parity=N, RTS=+, device address=00).
3. Using the Setup and Select pulldown menus on the screen, set WinTester's parameters to match the RLM.
4. The screen will fill with eight fueling positions with pump totals information. These totals represent the transactions the RLM has captured since it was last reset.

An on-screen display of stats for each fueling position is a component of the testing procedure when using either the Tester or WinTester utility. The status of each fueling position will be indicated as one of the following:

OK
TO *time out*
CS *"check sum" error*

*Status for all fueling positions should read **OK** before proceeding with test program.*

Diagnostics

Troubleshooting Electronic Versions

RLM/E Diagnostics

PROBLEM	RECOMMENDATION
RLM does not talk to tank monitor.	Run Tester or WinTester utility.
RLM does not talk to Tester or WinTester. See "Testing the RLM" section.	<ul style="list-style-type: none"> ● Check jumper settings on RLM. <i>Refer to Diagram: RLM (Electronic) Connector/Jumper Layout</i> Baud correct? Parity correct? Stop bits correct? Data bits correct? Device address correct? ● Check power indicator on RLM main board. ● Check PC. Comm port on PC OK? RS232 cable plugged into PC? ● Port parameters set correctly on Tester/WinTester?

RLM/E Diagnostics

PROBLEM	RECOMMENDATION
RLM does not capture any data.	<ul style="list-style-type: none"> ● Make sure LED on adapter board is flashing. ● Refer to pump specific diagnostics section to make sure connections are correct. ● Check software version in RLM to make sure it is latest rev. ● Check to ensure there are no console to dispenser connection errors. ● Contact dealer for assistance.
RLM data does not match dispenser totals exactly.	<ul style="list-style-type: none"> ● Make sure all dispensers are idle at beginning and end of totals test. ● Make sure there are no console (POS) to dispenser connection errors. ● Make sure RLM software version is current. Refer to page insert. ● Contact dealer for assistance.

Diagnostics

Troubleshooting Mechanical Versions

RLM/M Diagnostics

PROBLEM	RECOMMENDATION
RLM does not talk to tank monitor.	Run Tester or WinTester utility.
RLM does not talk to Tester or WinTester. See "Testing the RLM" section.	<ul style="list-style-type: none"> ● Check jumper settings on RLM. Refer to Diagram: RLM (Electronic) Connector/ Jumper Layout Baud correct? Parity correct? Stop bits correct? Data bits correct? Device address correct? ● Check power indicator on RLM main board. ● Check PC. Comm port on PC OK? RS232 cable plugged into PC? ● Port parameters set correctly on Tester/ WinTester?
RLM does not capture any data.	<ul style="list-style-type: none"> ● Make sure return switch is wired (operating) correctly. ● Make sure wiring for pulser and return switches is correct.

RLM/M Diagnostics

PROBLEM	RECOMMENDATION
RLM/M data does not match dispenser totals exactly.	<ul style="list-style-type: none"><li data-bbox="456 285 932 359">● Make sure all dispensers are idle at beginning and end of totals test (snapshot).<li data-bbox="456 407 716 438">● Check for defective pulser<li data-bbox="456 487 889 518">● Make sure return switch is operating correctly.

Diagnostics

Pump-Specific Troubleshooting

Gilbarco

PROBLEM	RECOMMENDATION
Reverse LED (D4) is on.	Rotate connector J4 on adapter board 180 degrees.
LED (D3) is off and never flashes.	Console/POS not communicating with pumps.
LED (D4) is on solid.	<ul style="list-style-type: none"> ● Adapter cable connected incorrectly. ● Wrong type adapter communications input used — RS422/current loop. <i>For current loop operation, connect adapter harness to J4 and place jumper on J5. For RS422 operation, connect adapter harness to J3 and place jumper on J2.</i> ● Defective cable.
All communications down on console/POS to pumps.	<ul style="list-style-type: none"> ● Make sure the correct adapter cable is connected. ● Adapter cable connected incorrectly. ● Wrong type adapter communications input used — RS422/current loop. <i>For current loop operation, connect adapter harness to J4 and place jumper on J5. For RS422 operation, connect adapter harness to J3 and place jumper on J2.</i> ● Defective cable.

Diagnostics

Pump-Specific Troubleshooting**Gilbarco MOC G-SITE**

PROBLEM	RECOMMENDATION
No data capture.	<ul style="list-style-type: none">● Is EMC port on G-SITE enabled?● Is correct software version being used on G-SITE?● Is adapter cable plugged into correct port on G-SITE?
RLM-GS not answering G-SITE.	Check baud rate on RLM adapter board. <i>Standard is 1200 baud.</i>

Diagnostics

Pump-Specific Troubleshooting**Tokheim**

PROBLEM	RECOMMENDATION
Console to dispenser communication shuts down when adapter cable is connected.	May have wrong version adapter board in RLM-T (RS422 or standard)
LEDs are off and never flash.	<ul style="list-style-type: none"> ● Test twist-lock connectors for tightness. ● Adapter cable connected incorrectly. ● Wrong type adapter communications input used — RS422/current loop. <i>For standard operation, connect adapter harness to J3 and place jumpers on JP1. For RS422 operation, connect adapter harness to J2 and place jumpers on JP2.</i> ● Defective cable.
Only one LED is flashing (D2 or D3).	Check all cable connections.

Diagnostics

Pump-Specific Troubleshooting**Wayne/Dresser**

PROBLEM	RECOMMENDATION
Data is not captured correctly for one or more of the dispensers .	<ul style="list-style-type: none"> ● Make sure both loops on adapter cable are wired correctly. ● Check normal/bypass switch. Is it in Normal? <i>See Diagram: Wayne/Dresser DBox RLM-W Connection Example.</i>
Console to dispenser communication shuts down when adapter cable is connected.	Loop wires in DBox may be wired incorrectly. <i>See Diagram: Wayne/Dresser DBox RLM-W Connection Example.</i>
LEDs not flashing.	<ul style="list-style-type: none"> ● Make sure both loops on adapter cable are wired correctly. ● Check normal/bypass switch. Is it in Normal? <i>See Diagram: Wayne/Dresser DBox RLM-W Connection Example.</i>

Diagnostics
Pump-Specific Troubleshooting
Schlumberger

PROBLEM	RECOMMENDATION
No data capture.	<ul style="list-style-type: none">● Wrong baud rate may be set on adapter board.● RLM adapter cable may be plugged into wrong port on SAM.
No LEDs flashing	<ul style="list-style-type: none">● Check adapter cable connections. <i>See Diagram: RLM-S to Schlumberger SAM — Typical Installation.</i>● Console/POS not talking to pumps.● Defective cable.

Diagnostics

Pump-Specific Troubleshooting**Mechanical Dispenser**

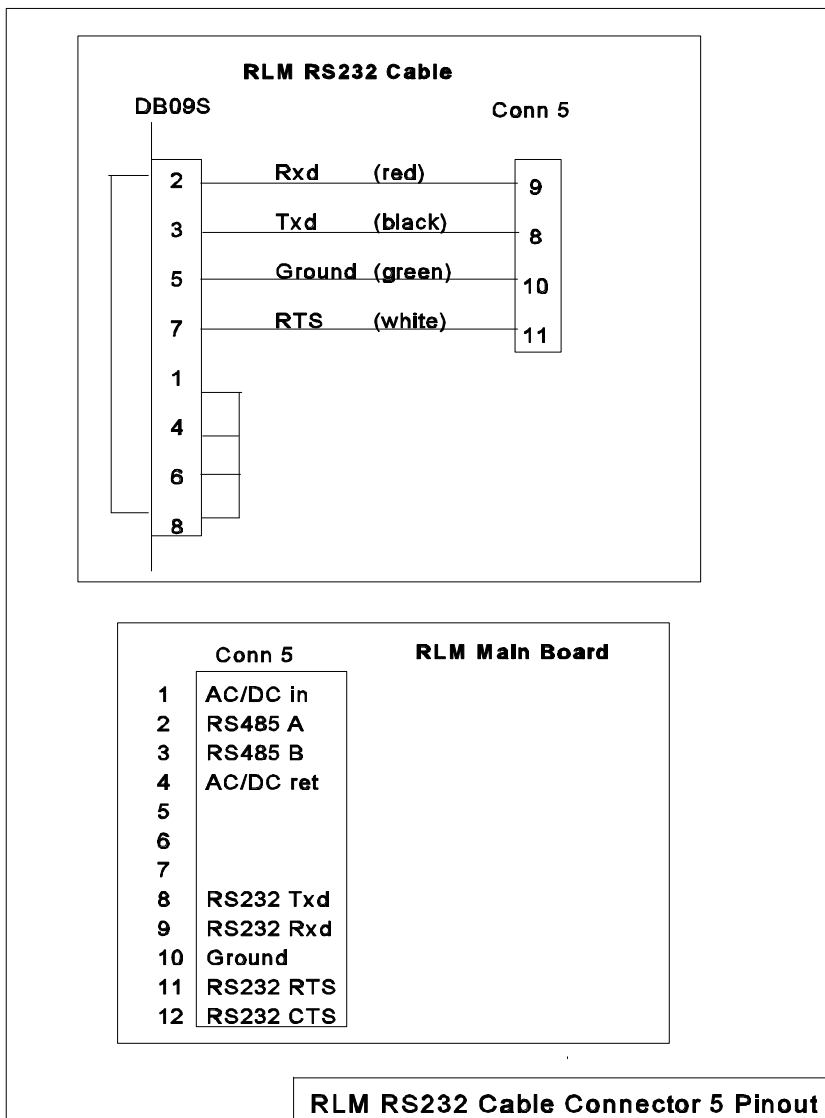
PROBLEM	RECOMMENDATION
Does not count on one or more pumps.	<ul style="list-style-type: none">● Check pulser operation.● Check MR going active after pump reset cycle. *
One or more pumps miscount.	<ul style="list-style-type: none">● Loose wire connection to pulser.● Defective pulser.● Defective mechanical computer.● Check MR signal operation. *

* *With volt meter set on a 10vdc scale, place probes on MR line and common. With MR switch inactive (pump off), your meter should read approximately 8vdc. With MR switch active (pump running), your meter should read approximately 0vdc.*

General Technical Information

This section contains miscellaneous information which may be useful in installing and troubleshooting the RLM. *Refer to the appropriate sections and diagrams in this manual for more specific information.*

Diagram: RLM RS232 Cable Connector 5 Pinout



RLM General Specs

Table: RLM General Specifications	
Physical Size	7.5" x 8.5" X 2"
Operating Temperature	32 to 120 degrees F
Storage Temperature	32 to 120 degrees F
Electrical Requirements	115VAC, 20 W Maximum (dedicated circuit with earth bond)