

RLM3

Remote Line Monitor

Installation Guide





1106 Great Falls Court, Suite G
Knightdale, NC 27545
Phone 919 266-4442 • Fax 919 266-4588
www.pie-corp.com



© Copyright 2013
Progressive International Electronics

RLM3 Installation Guide

CONTENTS

REMOTE LINE MONITOR.....	iii
Purpose of This Document.....	iii
Notice.....	iii
Patents.....	iii
Copyright.....	iii
History of Document Revisions.....	iii
Explanation of Document Standards.....	iv
Warranty.....	v
SYSTEM INSTALLATION.....	1
System Warnings.....	1
System Evaluation.....	2
System Installation Checklist.....	2
System Installation Requirements.....	3
Description of RLM Components.....	3
RLM3 General Specifications.....	3
GENERAL INSTALLATION.....	4
RLM3 Power Requirements.....	4
Diagram: Top View of RLM3 Main Board.....	5
Diagram: RLM3 Jumper Selections.....	5
Diagram: RLM3 Dip Switch Selections.....	6
PUMP SPECIFIC INSTALLATION.....	7
RLM3 for Bennett 310/515 Systems.....	7
Diagram: RLM3 to Bennett 310/515.....	7
RLM3 for Gilbarco Electronic Dispensers.....	8
Table: Gilbarco DBoxes.....	9
Diagram: RLM3 to Gilbarco DBox Universal/TS1000.....	10
Diagram: RLM3 to Gilbarco DBox PA01330000.....	10
Diagram: RLM3 to Gilbarco DBox PA03060000.....	11
RLM3 for Gilbarco MOC G-SITE Systems.....	12
Diagram: RLM3 to Gilbarco C2 G-SITE.....	13
Diagram: RLM3 to Gilbarco 486 G-SITE.....	13
RLM3 for Wayne/Dresser Electronic Dispensers.....	14
Diagram: RLM3 to Wayne/Dresser – Typical Installation.....	15

Diagram: Wayne/Dresser DBox RLM3 Connection Example.....	16
Special Start-Up Procedure for RLM3 with Wayne/Dresser Pumps.....	16
Procedure for Storing Line Factors from Diagnostics.....	17
RLM3 for Tokheim Electronic Dispenser.....	17
Diagram: RLM3 to Tokheim – Typical Installation.....	18
 FIELD UPGRADE.....	 19
Download Application.....	19
 DIAGNOSTICS.....	 20
Features and Operation of the RLM3 Diagnostic Port.....	20
Diagram: RLM3 Front Panel View.....	20

REMOTE LINE MONITOR

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 in this manual. 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

Copyright

Copyright © 2013 Progressive International Electronics, Inc. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Progressive International Electronics, Inc.

All brands or product names are trademarks or registered trademarks of their respective companies.




History of Document Revisions

Version 1.0 – January 2013
Initial Release

REMOTE LINE MONITOR

Explanation of Document Standards

The following documentation standards are applied throughout this document.

-  Comments are noted in italics.
-  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
MOC	Major Oil Company — A term used by Gilbarco in their G-SITE systems
PC	Personal computer
PIE	Progressive International Electronics, Inc
RLM	Term used collectively for remote line monitor systems manufactured by Progressive International Electronics (RLM3 is used with electronic systems)

REMOTE LINE MONITOR

RLM3 Manufacturer's Warranty

Progressive International Electronics, Inc. (SELLER) warrants to the Purchaser of fuel control equipment manufactured by Seller against defects in material or workmanship for one (1) 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

1. Credit will be applied only when the completed warranty request form and the defective parts are received and inspected.
Decisions to repair or replace defective equipment are solely at the discretion of PIE.
2. When parts shipments are made prior to receiving the required warranty request and defective parts, they will be billed to the Purchaser.
3. In all cases, approved warranty requests will be expedited by issuing the appropriate credit to the Purchaser's account and shipping replacement parts.
4. Credits will not be issued for parts and no cash refunds for warranty credits will be made.
5. 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.
6. Seller's warranty applies only if the equipment has been installed and used in accordance with Seller'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.
7. The Seller'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.
8. Nothing contained herein shall make the Purchaser, its agents or employees, an agent or representative of Seller and Seller assumes no responsibility of any act, omission, representation or warranty by the Purchaser or anyone else except as expressly stated herein.
9. The final Decision as to the validity of any claims arising under the warranty shall be determined solely by the Seller.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE AFORESAID OBLIGATIONS AND ARE HEREBY DISCLAIMED AND EXCLUDED BY SELLER.

WARNING

Installation must comply with the National Electrical Code, as well as Federal, State, Local and all applicable codes.

Do not install RLM3 in a volatile, combustible or explosive atmosphere. RLM3 must be protected from severe vibration, extreme temperatures, and excessive humidity.

Any peripheral equipment is to be installed in a non-hazardous location.

Any peripheral equipment connected to the RLM3 must be UL listed.

The RLM3 must be plugged into a dedicated 115 VAC wall socket.

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.

The installation of the systems covered by this manual in conjunction with equipment not UL Listed has not been evaluated by the Underwriters Laboratories and is outside the intended use of this equipment. Warning: All dispensing equipment discussed in this manual is not UL Listed and the combination has not been evaluated by Underwriters Laboratories.

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 equipment 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 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 below.*
2. Install Tank Monitor System according to manufacturer's specifications. *See System Installation Requirements below.*
3. Mount RLM3. *Refer to the 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 data through diagnostic port.
6. Connect to Tank Monitoring System and test fully integrated system.

SYSTEM INSTALLATION

System Installation Requirements

In preparation for RLM3 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 ID 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

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 Pump Specific Installation portion of this manual.)*

COMPONENT CHECKLIST

- | |
|--|
| <ul style="list-style-type: none">✓ RLM3 Main Box with power transformer and connector for dispenser cable✓ Pump Communication Cable to connect the RLM3 to the fuel dispenser DBox✓ Installation Manual |
|--|

RLM3 General Specifications

Physical Size	7.5" x 8.5" x 2"
Operating Temperature	59 to 104 degrees F
Storage Temperature	32 to 120 degrees F
Electrical Requirements	115VAC, 20 W Maximum (dedicated circuit)

GENERAL INSTALLATION

Read previous sections, as well as this entire section of installation manual before attempting to install the RLM3. Note System Warnings in the previous section.

1. A junction box must be provided which has only enough receptacle outlets to accommodate the transformers of the RLM3 system.

RLM3 Power Requirements

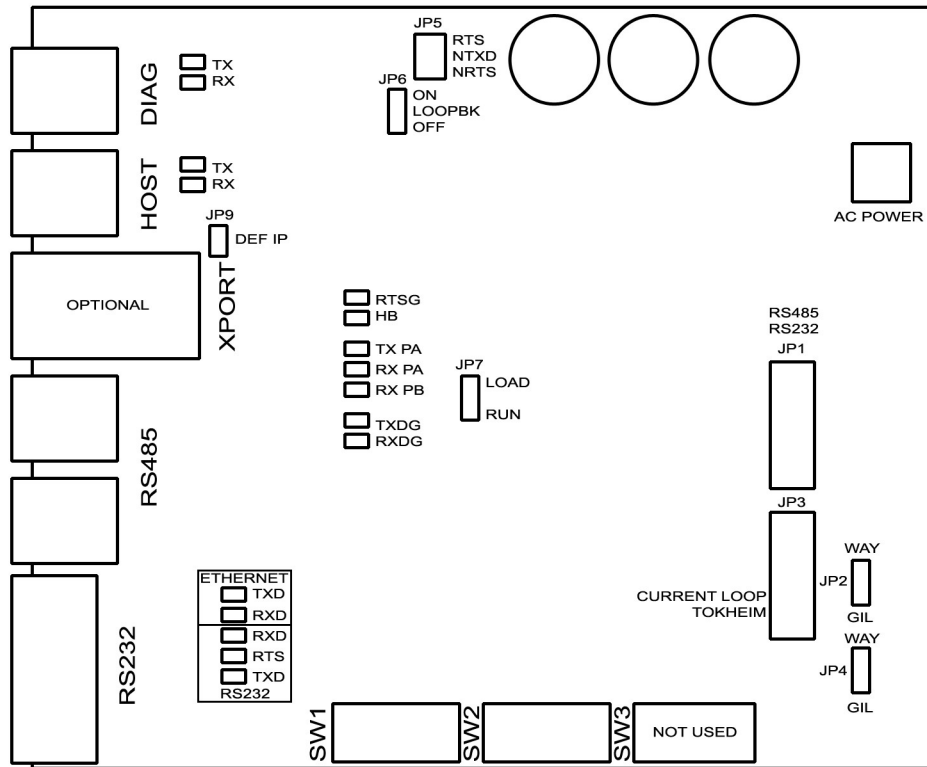
The RLM3 must be powered from a dedicated 115 VAC single circuit breaker, with no other devices connected to wire or breaker. Do not use a switched neutral breaker. The neutral must come directly from the neutral bus in the electric supply panel. No other neutral circuits may be connected to this wire.

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.

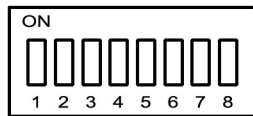
Failure to comply with these requirements will void warranty.

2. Securely mount the RLM3 main box in a nonhazardous location according to the suggested layout in the Tank Monitor Installation instructions.
3. Referring to **Diagram: RLM3 Dip Switch Selections**, set all dip switches on the RLM3 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 switches allow the RLM3 to be configured for daisy-chaining together using RS485 multi-drop circuitry.
4. Connect a PC to the installed RLM3 in one of the following ports: Ethernet (optional), USB, RS232, or RS485.
5. Plug the wall transformer into the dedicated power outlet to apply power to the RLM3 system.
6. Run VCWinTester program to perform a preliminary test. *This program is available on our website: www.pie-corp.com.*

Diagram: Top View of RLM3 Main Board



Layout for SW1, SW2, & SW3



Layout for JP2 & JP4

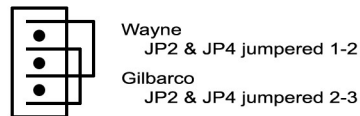
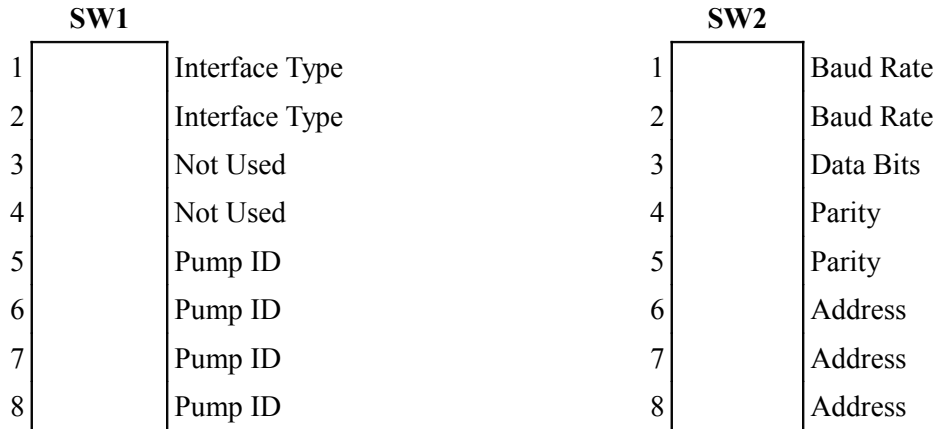


Diagram: RLM3 Jumper Selections

Jumper #	Jumper Label	Description
JP2	WAY GIL	Refer to Pump Specific section for Wayne Electronic Dispensers Refer to Pump Specific section for Gilbarco Electronic Dispensers
JP4	WAY GIL	Refer to Pump Specific section for Wayne Electronic Dispensers Refer to Pump Specific section for Gilbarco Electronic Dispensers
JP5	RTS NTXD NRTS	Use with systems that must control the transmit/receive direction Use for USB (Default) Use with systems that must control the transmit/receive direction
JP6	ON OFF	Loopback set to ON. Allows transmit data to be looped back to the Host Loopback set to OFF
JP7	LOAD RUN	Temporary setting to download new code to RLM3 Normal Operation
JP9	DEF IP	Default IP (192.168.0.199) Optional with the XPort

Diagram: RLM3 Dip Switch Selections



SW1

Interface Type	1	2
RS485	ON	ON
TOK Standard	OFF	ON
RS232 Full Duplex	ON	OFF
Current Loop	OFF	OFF

Pump ID	5	6	7	8
Non-Selected	ON	ON	ON	ON
Gilbarco	OFF	ON	ON	ON
Wayne	ON	OFF	ON	ON
Tokheim	OFF	OFF	ON	ON
Gilbarco G-SITE	ON	ON	OFF	ON
Bennett 510	OFF	ON	OFF	ON
Not Used	ON	OFF	OFF	ON
Not Used	OFF	OFF	ON	ON

SW2

Baud Rate	1	2
1200	ON	ON
4800	OFF	ON
2400	ON	OFF
9600	OFF	OFF

Data Bits	3
7	ON
8	OFF

Parity	4	5
None	ON	ON
Even	OFF	ON
Odd	ON	OFF
None	OFF	OFF

Address	6	7	8
OFF	ON	ON	ON
1	OFF	ON	ON
2	ON	OFF	ON
3	OFF	OFF	ON
4	ON	ON	OFF
5	OFF	ON	OFF
6	ON	OFF	OFF
7	OFF	OFF	OFF

PUMP SPECIFIC INSTALLATION

RLM3 for Bennett 310/515 Systems

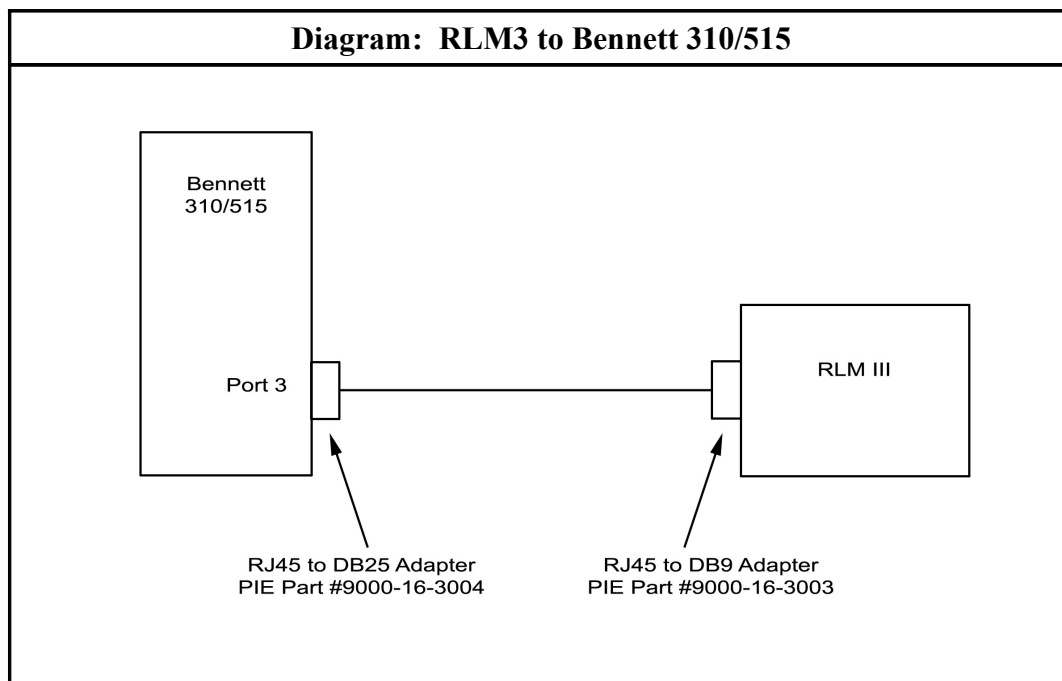


Note System Warnings in the Systems Installation section.

Following the instructions in RLM3 General Installation, perform general installation procedure and the preliminary test procedure using the VCWinTester program.

Proceed with RLM3 installation, referencing **Diagram: RLM3 Dip Switch Selections** in the General Installation section.

1. Set the Pump ID of SW1 for Bennett 310/515.
2. Set the Interface Type of SW1 for RS232 Full Duplex.
3. Plug the adapter harness into position JP1.
4. Referencing the Bennett 310/515 Installation manual, locate port 3 on the Bennett 310/515. Connect the RLM3 to the Bennett 310/515 using the adapter cable (PIE Part # 9000-15-0040) and RJ45 adapters (PIE Part # 9000-16-3004 & PIE Part # 9000-16-3003).
5. Return to the RLM3 General Installation for remaining system installation procedures.



PUMP SPECIFIC INSTALLATION

RLM3 for Gilbarco Electronic Dispensers



Note System Warnings in the Systems Installation section.

Gilbarco Major Oil Company (MOC) G-SITE Systems are a special configuration. For Gilbarco MOC instructions and installation requirements, refer to RLM3 for Gilbarco MOC G-SITE Installation.

Following the instructions in RLM3 General Installation, perform general installation procedure and the preliminary test procedure using the VCWinTester program. Then, follow specific instructions for connecting the RLM3 system to the appropriate Gilbarco distribution box (DBox). *See Table: Gilbarco DBoxes at the end of this section.*

Proceed with RLM3 installation, referencing **Diagram: RLM3 Dip Switch Selections** in the General Installation section.

1. Set the Pump ID of SW1 for Gilbarco.
2. Set JP2 and JP4 for Gilbarco.
3. **If the Gilbarco system employs a current loop style Universal DBox or a TS1000 DBox**, set the Interface Type of SW1 for Current Loop. Plug the adapter harness into position JP3. Disconnect the Gilbarco console/controller from the distribution box and connect the Gilbarco style RLM3 adapter cable (PIE Part # 9000-15-3027) to the Gilbarco DBox. Plug the long end of the adapter cable into the RLM3 DB9P connector on the end of the RLM3. *Reference Diagram: RLM3 to Gilbarco DBox Universal/TS1000 later in this section.*

If the Gilbarco system employs an RS422 style Universal DBox, set the Interface Type of SW1 for RS422/RS485. Plug the adapter harness into position JP1. Disconnect the Gilbarco console/controller from the DBox and connect the Gilbarco style RLM3 adapter cable (PIE Part # 9000-15-3036) to the Gilbarco DBox. Plug the long end of the adapter cable into the RLM3 DB9P connector on the end of the RLM3. *Reference Diagram: RLM3 to Gilbarco DBox Universal/TS1000 later in this section.*

If the Gilbarco system employs a PA01330000 DBox, set the Interface Type of SW1 for Current Loop. Plug the adapter harness into position JP3. Cut off the 'T' end of the RLM3 adapter cable (PIE Part # 9000-15-3027). Locate an unused position in the Gilbarco DBox and ensure that the switch is in the 'Isolate' position. Connect the cut end to the Gilbarco DBox at this position. At this point, move the switch to the 'Normal' position. In the event that the DBox positions are all in use, wire the RLM3 adapter cable in series with an existing pump. *Reference Diagram: RLM3 to Gilbarco DBox PA01330000 later in this section.*

If the Gilbarco system employs a PA03060020 DBox, set the Interface Type of SW1 for Current Loop. Using connectors (PIE Part # 9000-16-0004 & PIE Part # 9000-16-0005) supplied by PIE, plug the adapter harness into position JP3. Disconnect the Gilbarco console/controller from the distribution box. Attach the DB9 to RJ45 adapters (supplied by PIE) to the ends of the RLM3 adapter cable (PIE Part # 9000-15-3097). Connect the RJ45 cable from the Gilbarco console/controller to one of the RJ45 adapters. Using PIE supplied RJ45 cable (#9000-15-0040), connect one end to the Gilbarco DBox and the other end to the other RJ45 adapter. *Reference Diagram: RLM3 to Gilbarco DBox PA03060000 later in this section.*

4. Return to the RLM3 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 RLM3 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 RLM3	
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)
<ol style="list-style-type: none"> 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 RLM3s are required for pump control. Refer to Gilbarco document number MDE-2713 for detailed information on this product. 2. Refer to Gilbarco document number MDE-2381A or MDE-2382A for detailed information on this product. 	

Diagram: RLM3 to Gilbarco DBox Universal/TS1000

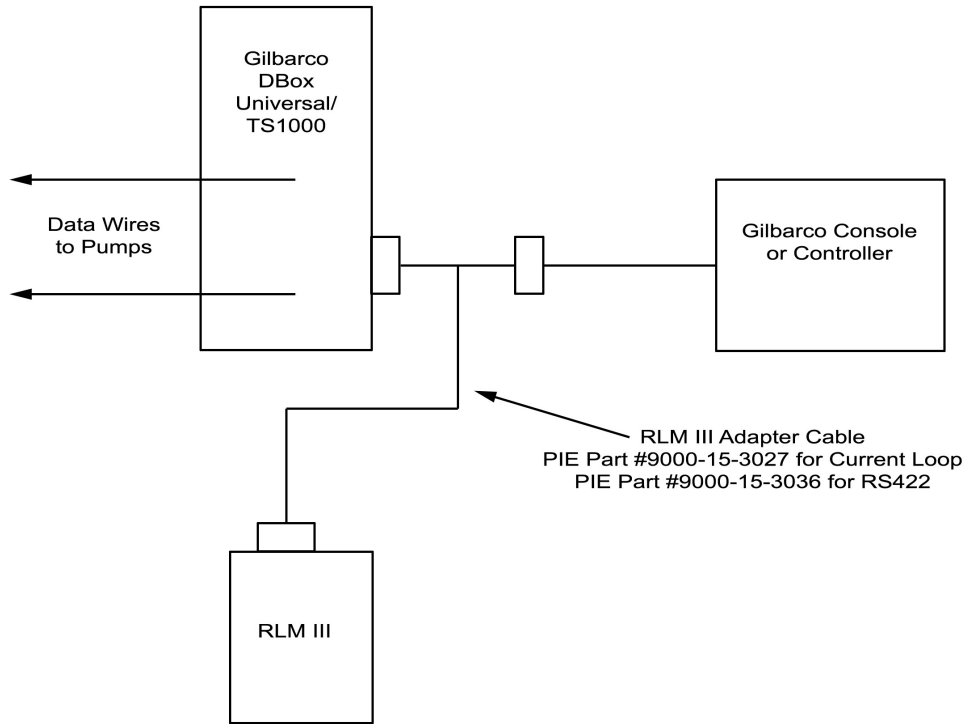


Diagram: RLM3 to Gilbarco DBox PA01330000

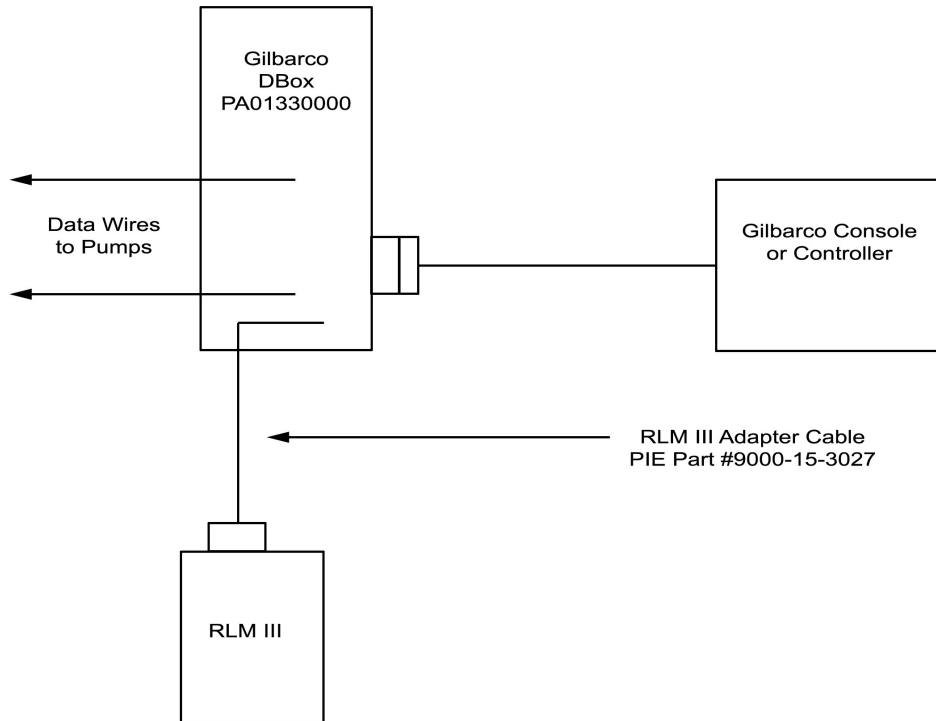
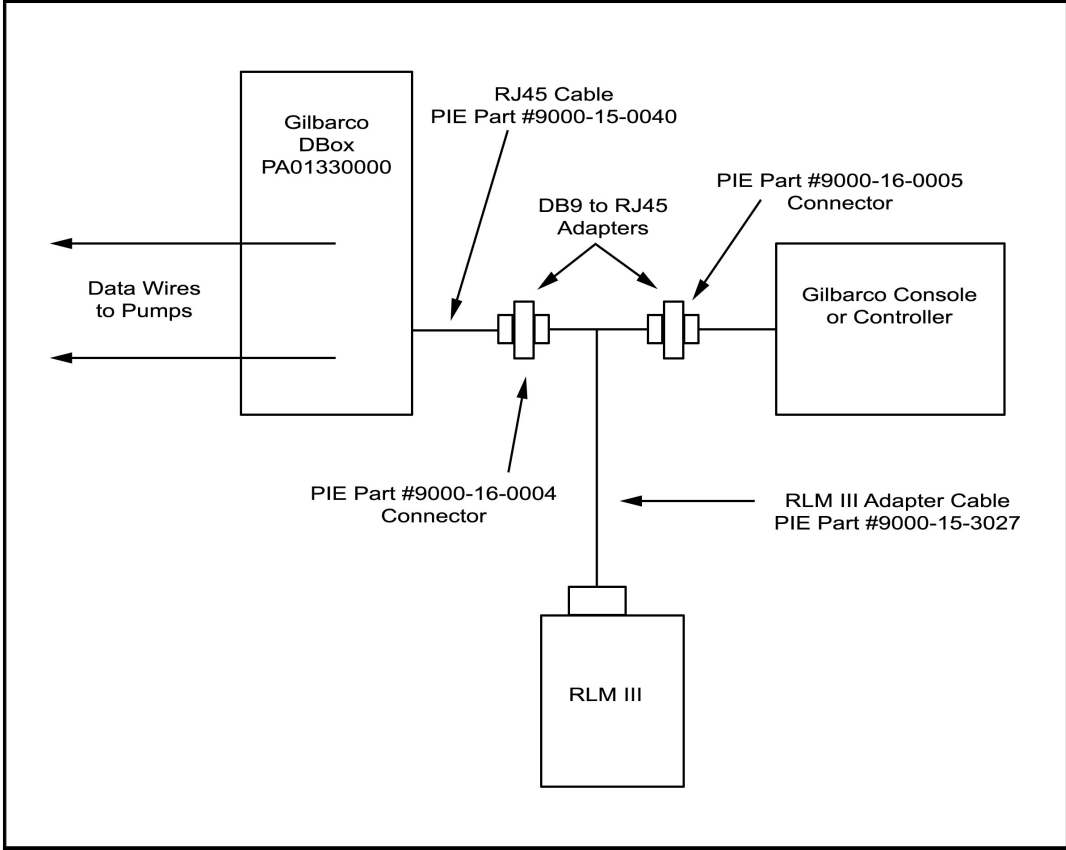


Diagram: RLM3 to Gilbarco DBox PA03060000



PUMP SPECIFIC INSTALLATION

RLM3 for Gilbarco MOC G-SITE Systems



Note System Warnings in the Systems 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 RLM3. First, it is important to know from the site survey which type of controller (C2, 486, Pentium, etc.) the G-SITE is using. Second, 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 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 it is determined that the G-SITE is EMC ready, proceed with RLM3 installation. Otherwise, contact dealer for further assistance.

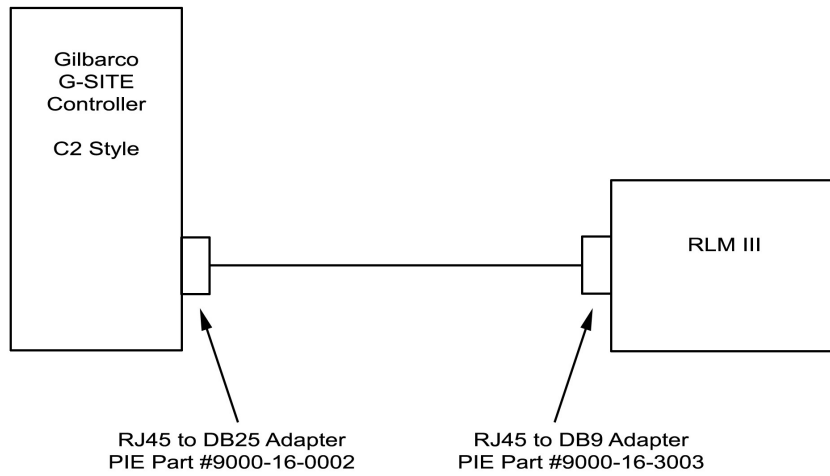
Following the instructions in RLM3 General Installation, perform general installation procedure and the preliminary test procedure using the VCWinTester program.

Proceed with RLM3 installation, referencing **Diagram: RLM3 Dip Switch Selections** in the General Installation section.

1. Set the Pump ID of SW1 for Gilbarco G-SITE.
2. Set the Interface Type of SW1 for RS232 Full Duplex.
3. Plug adapter harness onto position JP1.
4. Referencing the G-SITE installation manual, locate the G-SITE controller EMC tank monitor port. Connect the RLM3 to the G-SITE using the PIE cable (#9000-15-0040) and the RJ45 adapters (PIE Part # 9000-16-0002 & PIE Part # 9000-16-3003) supplied by PIE.
 - If the G-SITE is using the C2-style controller, both adapters will be required. *Reference Diagram: RLM3 to Gilbarco C2 G-SITE later in this section.*
 - If the G-SITE is a 486-style controller, adapter 9000-16-0002 will not be needed. *Reference Diagram: RLM3 to Gilbarco 486 G-SITE later in this section.*
5. Return to the RLM3 General Installation for remaining system installation procedures.

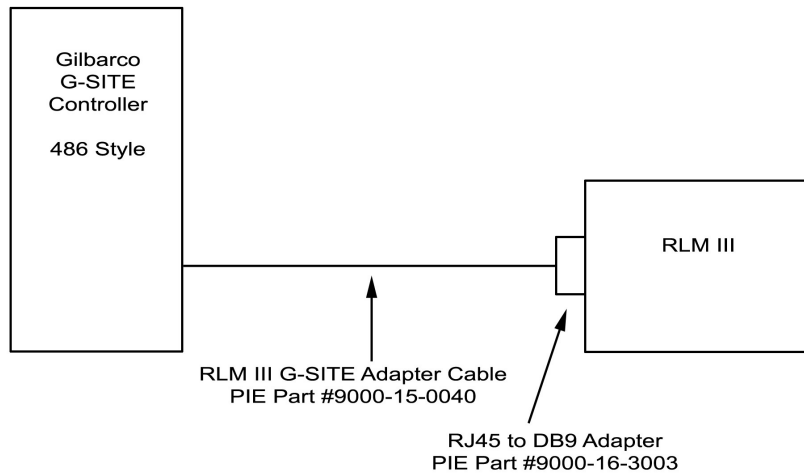
The RLM3 G-SITE reports all totals by meter number for each fueling position. Blender dispensers will report meter 1 to hose 1 and meter 2 to hose 2 position on the RLM3. A blended product will report an increase for both meters.

Diagram: RLM3 to Gilbarco C2 G-SITE



Note:
G-SITE System must support
EMC with BIR interface.
Minimum software levels
must exist on the G-SITE
for proper operation.

Diagram: RLM3 to Gilbarco 486 G-SITE



Note:
G-SITE System must support
EMC with BIR interface.
Minimum software levels
must exist on the G-SITE
for proper operation.

PUMP SPECIFIC INSTALLATION

RLM3 for Wayne/Dresser Electronic Dispensers



Note System Warnings in the Systems Installation section.

Following the instructions in RLM3 General Installation, perform general installation procedure and the preliminary test procedure using the VCWinTester program.

Proceed with RLM3 installation, referencing **Diagram: RLM3 Dip Switch Selections** in the General Installation section.

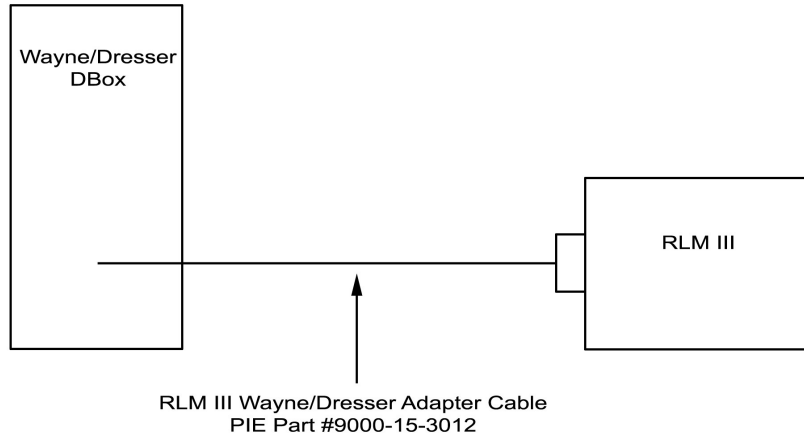
1. Set the Pump ID of SW1 for Wayne.
2. Set the Interface Type of SW1 for Current Loop.
3. Set JP2 and JP4 for Wayne.
4. Plug adapter harness onto position JP3.
5. Plug the adapter cable (PIE Part # 9000-15-3012) into the adapter port on the RLM3.
6. Locate the Wayne/Dresser distribution box and wire the other end of the adapter cable 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 +

7. For Wayne/Dresser DBoxes with pumps wired into one side of the DBox board, only one loop needs to be connected. *Refer to Diagram: Wayne/Dresser DBox RLM3 Connection Example later in this section.*

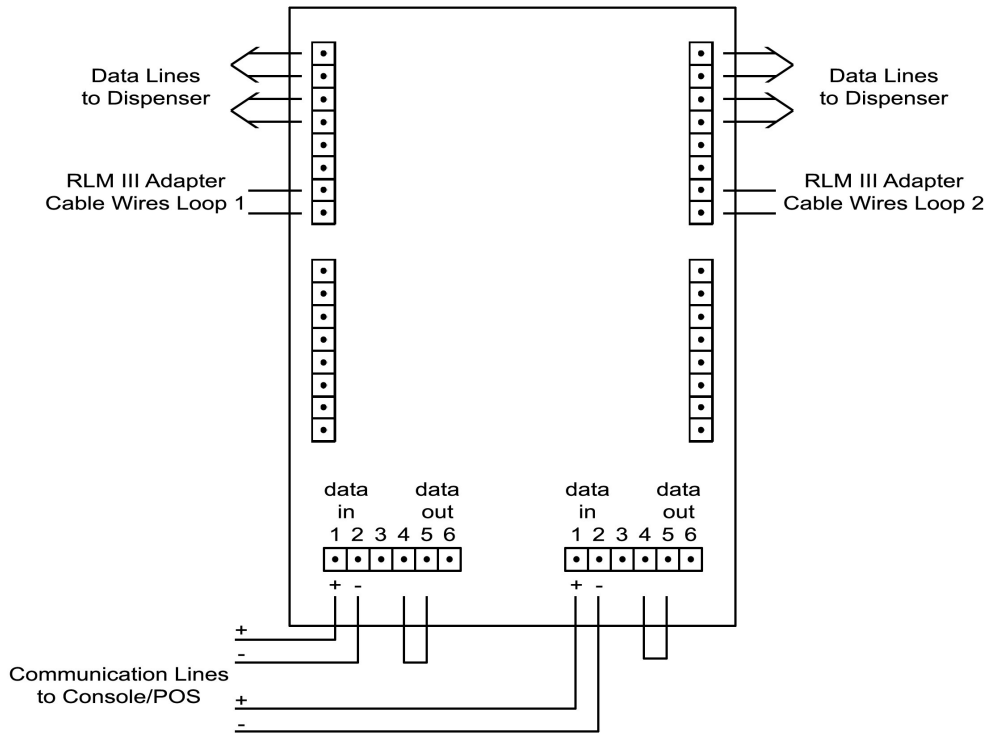
For units with both sides of the DBox board wired, Loop 1 and Loop 2 must both be connected. *Refer to Diagram: RLM3 to Wayne/Dresser — Typical Installation later in this section.*

Diagram: RLM3 to Wayne/Dresser – Typical Installation



Note:
See **Diagram: Wayne/Dresser DBox RLM III Connection Example** for cable connection.

Diagram: Wayne/Dresser DBox RLM3 Connection Example



Special Start-Up Procedure for RLM3 with Wayne/Dresser Pumps

Line factors are necessary for calculating the final volumes for each transaction. The RLM3 gathers line factors from the data communications line. If no line factors are detected by the RLM, all sales for that fueling position will be zero.

Line factors are sent from the dispenser to the controlling console only when requested. Some consoles only request the line factor upon console power start-up. In this case, the request for line factor may be forced by breaking the data loop to the pumps, waiting 15 seconds, and then restoring the loop.

The RLM3 software reports a BUSY status for a fueling position if the RLM3 has not detected and stored the line factor. (This is easily demonstrated with our diagnostic utility VCWintester, or the RLM3's built-in diagnostics.) As discussed above, if a fueling position status is reported as BUSY, with no sale in progress, the console can be forced to request the line factor by breaking the loop and restoring it. Repeat procedure until all BUSY statuses are gone. Once the RLM3 has detected the line factor for a fueling position, it is stored in nonvolatile memory. The following should be noted:

- The console should only be forced to report line factors when no sales are in progress.
- Wayne/Dresser DBoxes have two data loops — be sure to force the retry on the correct data loop.
- Another indicator of a missing line factor is a situation in which all sales for a fueling position register zero

Procedure for Storing Line Factors from Diagnostics

The Line Factors can be stored via Diagnostics using the following steps:

1. Break the Wayne current loop
2. Go to the Wayne pump-side in Diagnostics
3. Select Renew Calibration Factors (N)
4. Put the current loop back together
5. Wait until all the line factors are received
 - Verify all the line factors using the Show Local Block (B)
 - Check the Calibration Factors are correct
 - The plus sign (+) goes to the next pump, & the minus sign (-) goes to the previous pump
6. Save the Calibration Factors (F)
7. Verify the factors (A)

PUMP SPECIFIC INSTALLATION

RLM3 for Tokheim Electronic Dispensers



Note System Warnings in the Systems Installation section.

Following the instructions in RLM3 General Installation, perform general installation procedure and the preliminary test procedure using the VCWinTester program.

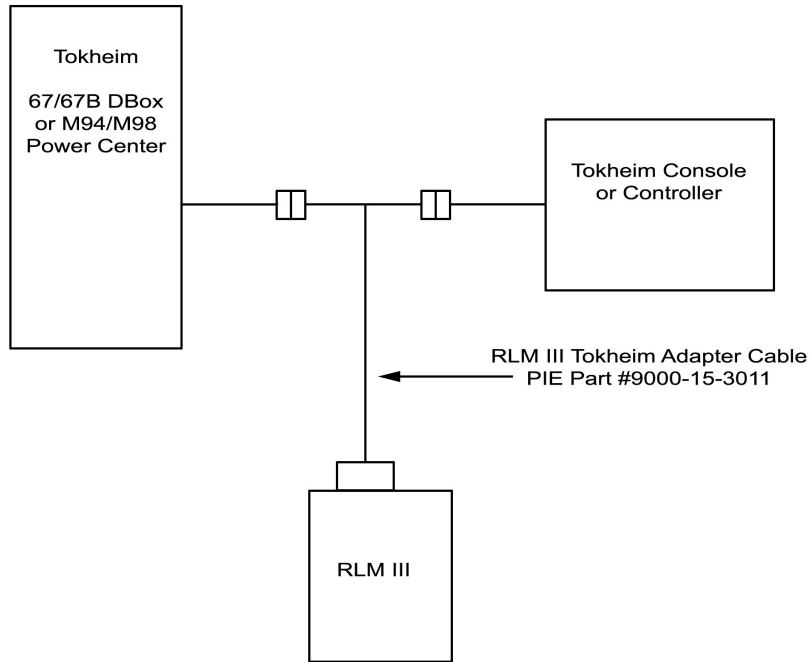
Proceed with RLM3 installation, referencing **Diagram: RLM3 Dip Switch Selections** in the General Installation section.

1. Set the Pump ID of SW1 for Tokheim.
2. Determine the type of electrical communications used by the Tokheim system. Match the Interface Type of SW1 with the appropriate Tokheim system:
 - For Tokheim M98 and M94 Power Centers or 67 DBoxes, set for Tokheim Standard.
 - For the 67B DBox, set for RS422/RS485.

Note that communication for the 67 and 67B DBoxes can be modified in the field, so that model number may not accurately reflect the communication method. Contact the Tokheim service company responsible for site service to confirm DBox settings.

3. Connect adapter cable:
 - Tokheim Standard — Plug adapter cable (PIE Part # 9000-15-3011) into position JP3.
 - RS422/RS485 — Plug adapter cable (PIE Part # 9000-15-3011) into position JP1.
4. 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 RLM3 adapter cable to the cable ends from the console/controller and from the DBox/power center. *Refer to Diagram: RLM3 for Tokheim — Typical Installation later in this section.*

Diagram: RLM3 to Tokheim – Typical Installation



FIELD UPGRADE

Download Application

Contact PIE for upgrade files that can be loaded via STM32 Update Loader. *This utility is available on our website: www.pie-corp.com.*

1. Power down the RLM3 and change the Boot Jumper (JP7) to LOAD. *Refer to Diagram: Top View of RLM3 Main Board to locate this jumper.*
2. Power up the RLM3.
3. Open STM32 Update Loader and use these settings:
 - Port Name: Com port # for Diagnostics
 - Baud Rate: 256000
 - Parity: Even
 - Echo: Disabled
 - Timeout(s): 10Select Next
4. The screen will read: "Target is readable. Please click "Next" to proceed." If it does not have this message (or a similar message), go back and verify that the jumper is set correctly and that all of the settings on the previous page are correct. Also check that no other device is trying to use the Diagnostics Com Port (HyperTerm, for example.)
Select Next.
5. Change Target to STM32_XL-density_768K
Select Next.
6. Make sure that "Download to device" is selected. Select the file in "Download from file"
Leave all other options on this page as they are.
Select Next
7. Close STM32 Update Loader when complete.
8. Power down the RLM3 and change the Boot Jumper (JP7) back to RUN.

DIAGNOSTICS

Features and Operation of the RLM3 Diagnostic Port

Extensive testing and data collection is available to the user through the RLM3's built-in diagnostic port, which is physically located on the front panel of the RLM3. *See Diagram: RLM3 Front Panel View below.* Accessing the diagnostic port requires a computer running a terminal emulation program such as HyperTerm. Physical connection is made using a USB cable. Once the connection is established, power up the RLM3 and a prompt will appear. To view a help menu, type a ? at the prompt. If you have more questions regarding the Diagnostics, please call your distributor.

The terminal emulation program (HyperTerm) must be set to the following parameters to work properly.

Baud rate	57600
Data bits	8
Parity	None
Stop bits	1
Flow control	None
Terminal emulation setting	ANSI

Note: HyperTerm no longer comes pre-loaded with Windows operating systems newer than XP.

