# EMR4

## Software Upgrade Guide

**VEEDER-ROOT**

# Notice

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Contact Technical Support for additional troubleshooting information at 800-323-1799.

**DAMAGE CLAIMS / LOST EQUIPMENT**

Thoroughly examine all components and units as soon as they are received. If any cartons are damaged or missing, write a complete and detailed description of the damage or shortage on the face of the freight bill. The carrier's agent must verify the inspection and sign the description. Refuse only the damaged product, not the entire shipment.

Veeder-Root must be notified of any damages and/or shortages within 30 days of receipt of the shipment, as stated in our Terms and Conditions.

**VEEDER-ROOT'S PREFERRED CARRIER**

1.  Contact Veeder-Root Customer Service at 800-873-3313 with the specific part numbers and quantities that were missing or received damaged.

2.   Fax signed Bill of Lading (BOL) to Veeder-Root Customer Service at 800-234-5350.

3.  Veeder-Root will file the claim with the carrier and replace the damaged/missing product at no charge to the customer. Customer Service will work with production facility to have the replacement product shipped as soon as possible.

**CUSTOMER'S PREFERRED CARRIER**

1.  It is the customer's responsibility to file a claim with their carrier.

2.  Customer may submit a replacement purchase order. Customer is responsible for all charges and freight associated with replacement order. Customer Service will work with production facility to have the replacement product shipped as soon as possible.

3.  If "lost" equipment is delivered at a later date and is not needed, Veeder-Root will allow a Return to Stock without a restocking fee.

4.  Veeder-Root will NOT be responsible for any compensation when a customer chooses their own carrier.

**RETURN SHIPPING**

For the parts return procedure, please follow the appropriate instructions in the EMR Products General Returned Goods Policy pages in the EMR4 Products price list. Veeder-Root will not accept any return product without a Return Goods Authorization (RGA) number clearly printed on the outside of the package.

# Figures

# Introduction

## General

This manual covers truck and terminal - fueling depot installation of the Veeder-Root Electronic Meter Register (EMR4) System. The EMR4 System consists of several major components:

- **Display Head (DH)** - The Display Head replaces the mechanical register on a truck or a terminal - fueling depot fuel flow meter. Using the Display Head front panel display and the keys on its face, the operator can choose to dispense either a preset or a variable quantity of product. An optional Temperature Probe is available for temperature compensated product deliveries.
  The Display Head must be configured and calibrated before it is placed in service. Once the initial Configuration and Calibration procedures are complete, the Display Head is sealed for weights and measures certification.

- **Interconnection Box (IB)** - The IB box contains the EMR4 System control circuitry. The IB is mounted in the truck cab or the terminal - fueling depot office. The IB provides an intrinsically-safe barrier for connections to one or two Display Heads located at dispensing points in the hazardous area. IB boxes can accept either 12 or 24 Vdc input power. Note: check label affixed to outside of IB box to verify input power ratings.

- **Printer** (optional) - A multi-part slip printer (truck cab) or roll printer (terminal - fueling depot office)

- **Remote Display** (Optional) - For use as a Secondary Display unit in the cab along with a meter mounted Display Head, or for use as a Display Head (w/ Remote Pulser) in dual meter configurations.

- **Remote Pulser** (Optional) - Mounts directly onto meter. This pulser is functionally identical to the internal encoder.

## EMR4 – Legal Disclaimer Notice

**PRODUCT SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.**

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**VEEDER-ROOT'S EMR4 PRODUCT IS NOT APPROVED FOR USE AS A COMPONENT THAT PROVIDES LIQUID ADDITIVES TO AN AIRCRAFT FUELING SYSTEM WHERE THE ABSENCE OF SUCH ADDITIVES CAN REASONABLY BE EXPECTED TO RESULT IN SIGNIFICANT INJURY TO PERSONS, PROPERTY AND THE ENVIRONMENT.  CUSTOMERS USING VEEDER-ROOT PRODUCTS NOT EXPRESSLY INDICATED FOR USE IN SUCH APPLICATIONS DO SO ENTIRELY AT THEIR OWN RISK AND AGREE TO FULLY INDEMNIFY VEEDER-ROOT FOR ANY DAMAGE ARISING OR RESULTING FROM SUCH USE.**

**THE COMBINATION OF THE EMR4 AND THE PRODUCT METER MUST BE CALIBRATED PRIOR TO PERFORMING CUSTOMER TRANSACTIONS.**

## Related Manuals

## System Specifications

- **System power:** 10 - 28 Vdc, fused @ 5 A

- **Pulser Capacity:** 0 - 1000 rpm (0-1667 Hz)

- **Temperature compensation range:** -40 to +158°F (-40 to +70°C)

- **Communication between Display Head and IB:** RS-485; 2-wire half duplex; custom protocol; 115,200 baud; 8 bit; no parity; 1 stop bit

- **Communication between Printer and IB:** RS-232; 9600 baud; 8 bit; no parity; 1 stop bit

- **Display Head Operating temperature range:** -40 to +140°F (-40 to +60°C)

- **IB Operating temperature range:** -13 to +104°F (-25 to +40°C)

- **Display Head and IB Storage temperature range:** -40 to +185°F (-40 to +85°C)

- **Printer power:** +24 Vdc, 2 A (supplied by the IB)

- **Printer Operating temperature range:** +32 to +122°F (0 to +50°C)

- **Printer Storage temperature range:** +32 to +122°F (0 to +50°C)

- **Weights and Measures:** Designed to meet NIST, OIML, Australian and Canadian W&M specifications.

- **Relay Ratings:** 5A at 120 Vac, 2.5A at 240Vac, 5A at 24 Vdc

- **Vibration:** MIL-STD-810G, Method 514.6; Table 514.6 C-VI Category 4

- **Shock:** MIL-STD-810G, Method 516.6; 20G, 11ms, 1/2-Sine

## Available Parts

All available EMR4 system parts, including options, are listed below.

- Display Head (P/N 84559X-XXX) - standard

- Keypad Group (P/N 845900-014) - optional

- Bracket with internal V-R Encoder Installation Kit (P/N 845900-015) - included with Display Head

- C&C Corner Switch Group, Normally Open (P/N 845900-018) - included with Display Head

- Slip Printer Kit (10 feet [3.04m] cable included) (P/N 845900-020) - optional

- Temp Probe Kit (P/N 845900-002) - replacement

- Thermowell group - UL/cUL Listed, 350 psi working pressure, Canadian W&M Approved (P/N 0331373-001)

- Interconnect Box (P/N 8457XX-XXX) - standard

- Display Head Hookup Cable: 4-conductor cable from 6 to 1000 feet (1.83 to 152.4 m) lengths (P/N 846000-1XX)

- Emergency Stop Switch (ESS) Kit (P/N 845900-021) - optional

- Remote Display Head (P/N 84559X-002) - optional

- Remote Display Bracket Install Kit (P/N 845900-024) - optional

- RS-232 Cable Kit (P/N 330020-432 [10 feet {3.04 m}]) - optional

- Top Mount Remote Pulser Kit (P/N 845900-504) - optional

- Front Mount Remote Pulser Kit (P/N 845900-505, 845900-506) - optional

- Epson TM-U220A Roll Printer Only (Cable in separate kit) (P/N 845900-067)

- Printer Cable Kit - 10 feet (3.04 m) (845900-013) - optional

- Printer Cable Kit - 35 feet (10.67m) (845900-071) - optional

If the EMR4 Display Head will be installed in an application other than replacing a V-R Mechanical Meter Register, you must also have the Veeder-Root approved installation kit for that meter.

> | NOTICE | **The 300 series installation kits, include the necessary meter connection parts as well as 35 feet of communications cable for a typical truck application. A printer cable kit - 10', 845900-313, and temperature probe kit, 845900-302, will need to be selected if required.** |

- Kit - installation for Tokheim, Daniels, Energy Flow Systems (Donovan) - Temp Comp (P/N 845900-304)

- Kit - installation for Smith - Temp Comp (P/N 845900-305) Satam, Avery Hardoll, Alfons Haar, Petrol Instruments

- Kit - installation for Liquid Controls, SAMPI, Total Controls Systems - Temp Comp (P/N 845900-306) Tuthill

- Kit - installation for 1-1/2" - 4" Neptune/Liquatech with existing mechanical Temp Comp - Temp Comp (P/N 845900-308)

- Kit - installation for 1-1/2" - 4" Neptune/Liquatech with no existing mechanical Temp Comp - Temp Comp (P/N 845900-309)

- Kit - installation for Brodie Brooks - Temp Comp (P/N 845900-327)

- Kit - Installation for 3/4" and 1" Neptune/Liquatech with existing mechanical Temp Comp (P/N 845900-010)

- Kit - Installation to retrofit 3/4" and 1" Neptune/Liquatech with electronic Temp Comp (P/N 845900-310)
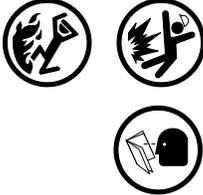
## Safety Symbols

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

| | | | |
|---|---|---|---|
|  | **EXPLOSIVE**<br>Fuels and their vapors are extremely explosive if ignited. |  | **FLAMMABLE**<br>Fuels and their vapors are extremely flammable. |
|  | **TURN POWER OFF**<br>Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit. | NOTICE | **NOTICE**<br>Alerts the user to practices not related to physical injury. |
|  | **INJURY**<br>Careless or improper handling of materials can result in bodily injury. |  | **GLOVES**<br>Wear gloves to protect hands from irritation or injury. |

| | **WEAR EYE PROTECTION**<br>Fuel spray from residual pressure in the lines can cause serious eye injuries. Epoxy sealant can cause eye injury. Always wear eye protection when working with pressurized lines and epoxy mixtures. | | **READ ALL RELATED MANUALS**<br>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. |
| --- | --- | --- | --- |
| ⚠WARNING | **WARNING**<br>Indicates a hazardous situation which, if not avoided, could result in death or serious injury. | | |

## Safety Warnings

| **⚠ WARNING** |
| --- |
| This system operates near highly combustible fuel storage tanks.<br><br>**FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.**<br><br>**VEEDER-ROOT'S EMR4 PRODUCT IS NOT APPROVED FOR USE AS A COMPONENT THAT PROVIDES LIQUID ADDITIVES TO AN AIRCRAFT FUELING SYSTEM.**<br><br>**To ensure proper installation, operation, and continued safe use of this product:**<br><br>1. **Read and follow all instructions in this manual, including all safety warnings.**<br><br>2. **Have equipment installed by a contractor trained in its proper installation and in compliance with all applicable codes including: the National Electrical Code; federal, state, and local codes; and other applicable safety codes.**<br><br>3. **To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.**<br><br>4. **Operate this equipment in accordance with the instructions in this manual.**<br><br>5. **Do not modify or use service parts other than those provided by Veeder-Root. Substitution of components may impair intrinsic safety.** |

**NOTICE** **This system operates on low dc voltage/current inputs. To avoid equipment damage:**

**• Disconnect the EMR power wire prior to using vehicle battery charging equipment.**

**• Disconnect the EMR power wire prior to jump starting the vehicle.**

**• Disconnect the EMR power wire prior to replacing the vehicle's battery.**

**• Always disconnect the IB box from truck power before welding on the truck.**

If the storage tank to be fitted with an EMR4 system either contains or at any time has contained petroleum products then the tank inspection chamber must be considered a hazardous environment as defined in IEC EN 60079-10 Classification of Hazardous Areas. Suitable working practices for this environment must be observed.

# Software Upgrade

C&C Mode must be entered to perform a software upgrade. To access C&C mode the weights and measures seal must be removed.

The C&C Mode is entered by a trained technician following instructions in the EMR4 Application Guide (V-R P/N 577014-339). When the Display Head is powered up after the C&C Mode is enabled, the C&C related parameters of the Setup Mode are displayed. C&C Mode is used to set up various calibration and configuration parameters, which when made, are sealed for metrological conformity. All C&C Mode parameters can be viewed by the user in the Setup Mode when C&C Mode is disabled, but no changes are allowed. The operator can not exit the C&C Mode until the C&C switch is returned to its normal operating state.
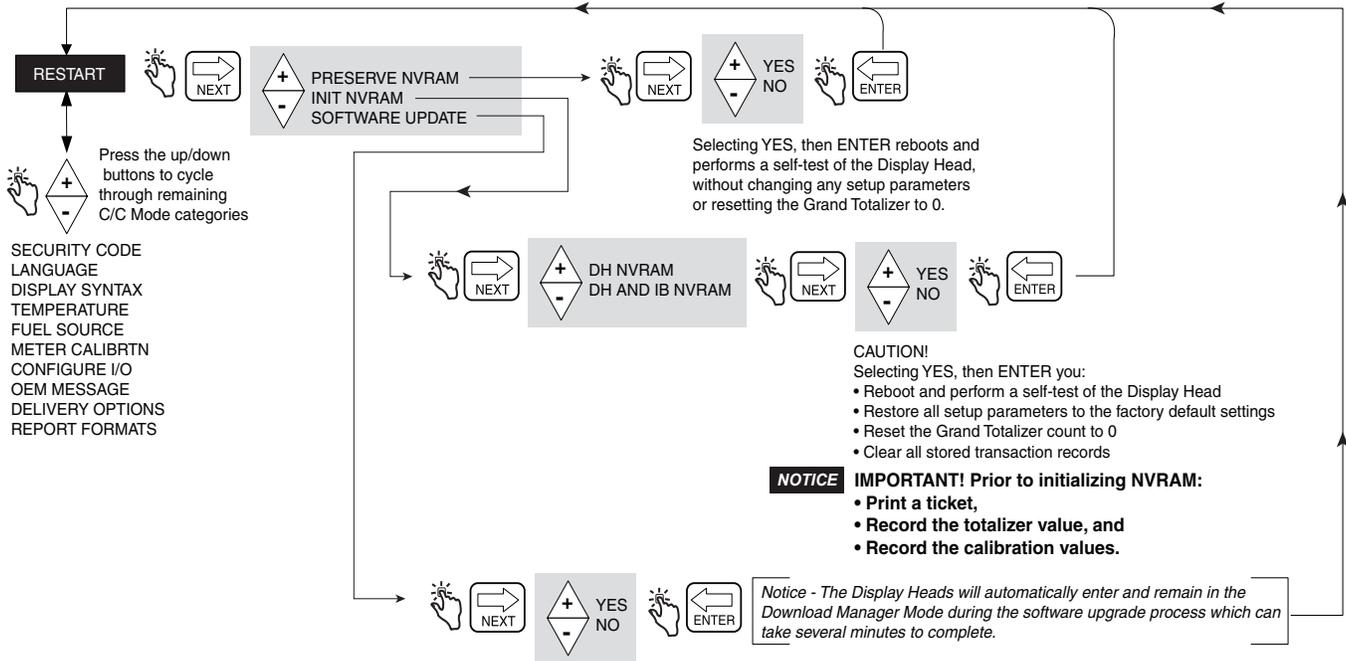
**NOTICE** **To access C&C Mode you must first configure the Display Head as instructed in the EMR4 Application Guide (V-R P/N 577014-339).**

**Only one Display Head can be upgraded at a time. If you have a dual head setup then disconnect one Display Head.**

**NOTICE** **IMPORTANT! Prior to performing a software upgrade:**

- **Print a ticket**
- **Record the totalizer value,**
- **Record the calibration values,**
- **It is recommended to backup the EMR4 configuration using the PC Setup Program (see EMR4 PC Setup Quick Help Guide, V-R P/N 577014-356),**
- **Disconnect the IB network if multiple IB's are connected,**
- **Prepare a USB device with the latest version of EMR4 software**
  - **Ensure the USB device is FAT32 formatted. Reformat if necessary.**
  - **Download the latest version of EMR4 software from the web:**
    **https://www.veeder.com/us/content/emr-software**
  - **Unzip the 349871-001 folder, and copy all (6) files (DH.bin, DH.crc, DH.ver, IB.bin, IB.crc, IB.ver) within the folder to the root directory of the USB device (e.g. F:\DH.bin). Do not copy the 349871-001 folder to the USB device.**
    - **Note that IB.ver is a text file that denotes the IB software P/N and version (e.g. 349869-001-C05 for version C05).**
    - **Note that DH.ver is a text file that denotes the Display Head software P/N and version (e.g. 349870-001-C05 for version C05).**

1. Insert thumb drive into the USB port.
2. Press MODE button until the indicator at the bottom of the display points to SETUP.
3. The first C&C Mode category, LANGUAGE, displays in the Descriptor Field.
4. Press the Up/Down buttons to step through the C&C Mode Setup categories. Press NEXT when the menu displays RESTART.
5. Figure 1 illustrates the RESTART options. Navigate to Software Update > YES and press ENTER. See the EMR4 Setup and Operation manual (P/N 577014-350) for more detail.

RESTART

NEXT

+ / − PRESERVE NVRAM
INIT NVRAM
SOFTWARE UPDATE

NEXT

+ / − YES
NO

ENTER

Press the up/down buttons to cycle through remaining C/C Mode categories

SECURITY CODE
LANGUAGE
DISPLAY SYNTAX
TEMPERATURE
FUEL SOURCE
METER CALIBRTN
CONFIGURE I/O
OEM MESSAGE
DELIVERY OPTIONS
REPORT FORMATS

Selecting YES, then ENTER reboots and performs a self-test of the Display Head, without changing any setup parameters or resetting the Grand Totalizer to 0.

NEXT

+ / − DH NVRAM
DH AND IB NVRAM

NEXT

+ / − YES
NO

ENTER

CAUTION!
Selecting YES, then ENTER you:
• Reboot and perform a self-test of the Display Head
• Restore all setup parameters to the factory default settings
• Reset the Grand Totalizer count to 0
• Clear all stored transaction records

NOTICE **IMPORTANT! Prior to initializing NVRAM:**
**• Print a ticket,**
**• Record the totalizer value, and**
**• Record the calibration values.**

NEXT

+ / − YES
NO

ENTER

*Notice - The Display Heads will automatically enter and remain in the Download Manager Mode during the software upgrade process which can take several minutes to complete.*

NOTICE **IMPORTANT! Prior to performing a software upgrade:**
• Print a ticket,
• Record the totalizer value,
• Record the calibration values,
• It is recommended to backup the EMR4 configuration using the PC Setup Program
  (see EMR4 PC Setup Quick Help Guide, V-R P/N 577014-356),
• Disconnect the IB network if multiple IB's are connected,
• Prepare a USB device with the latest version of EMR4 software
  - Ensure the USB device is FAT32 formatted. Reformat if necessary.
  - Download the latest version of software from the web:
    https://www.veeder.com/us/content/emr-software
  - Unzip the 349871-001 folder, and copy all (6) files (DH.bin, DH.crc, DH.ver, IB.bin,
    IB.crc, IB.ver) within the folder to the root directory of the USB device (e.g. F:\DH.bin).
    Do not copy the 349871-001 folder to the USB device.
    ~ Note that IB.ver is a text file that denotes the IB software P/N and version
      (e.g. 349869-001-C05 for version C05)
    ~ Note that DH.ver is a text file that denotes the Display Head software P/N
      and version (e.g. 349870-001-C05 for version C05)

**Figure 1.   Restart Options**

6.  Display will show the following sequence:

    •Restart

    •Self Tests

    •Checksum

    •Software Upgrade

    •Insert USB

7.  If not already done in Step 1, insert thumb drive into the USB port. (It is recommended to insert the thumb drive into the USB port in Step 1 to ensure that the USB connection is stable prior to starting the upgrade.)

8. The display will automatically start the upgrade. As the software upgrades, the display will show the sequence below:

    •Verify Files

    •Erase IB Flash

    •Download MGR

    •Program IB

    •Program Flash

    •Download MGR

    •Xfer DH Data

    •Erase Sectors

    •Program Data

    •Download MGR

    •Xfer DH Data

9. The Display automatically restarts and then goes back to the Language Menu screen.

10. Exit C&C Mode

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