MID:COM E:Count

E:Count MCR-05 and E:Count LT MCR-09
User's Guide

Reference for Operating the
MID:COM E:Count MCR-XX Electronic Registers

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Section 1 – TECHNICAL SPECIFICATIONS

Electrical Requirements

Operating Voltage: 10–30 VDC unregulated
Operating Current: Standby 275 mA
Up to 3 solenoids activated: 1 A additional each

Operating Environment

Outdoors exposed to elements
Temperature Range: –40°C to +60°C (–40°F to 140°F)
Humidity: 100% Condensing

Enclosure

Aluminum permanent mold casting with epoxy powder coat
Rating: IP–66 and NEMA–4
Silicone gasket for keyboard and cover seals
Calibration and Program Screws seal with BUNA 'O' Ring

Environmental Testing

Temperature Range: –40°C to +60°C (–40°F to 140°F)
Vibration: 3 Gs, 30 Hz, 2 axes, 72 hours
Shock: 4 foot drop to concrete, 3 axes, 5 times each

Interconnect

Up to 5 multi–pin circular plastic connectors
Sealed to IP–66 standards
Compensator Probe uses a 1/4" NPT compression fitting with thread sealant
[MCR–09 LT: ½" NPT Conduit Hub – Internal Terminal Blocks]

Metrological Sealing

Drilled head screws for:
- Calibration Switch
- Program Switch ***[MCR–09 LT: Program Switch Not Available]***
- Enclosure Cover
- All Mounting Accessories

Mounting

Industry standard 'Veeder–Root' bolt circle with 1/4–20 threads
[MCR–09 LT: MID:COM Standard Bolt Circle – 1/4–20 threads]
Adapters available to mount all currently available meters

Inputs/Outputs

Pulse Input

Internal: 100 pulse-per-revolution (ppr) dual channel quadrature encoder for rotational input from positive displacement meters

External: Single or dual channel input from meters with electrical output, 3 to 30 V signal

Pulse Output

Calibrated pulse output for remote counting or monitoring devices.

Raw encoder pulse output for connection to small volume piston provers. ***[MCR-09 LT: Raw Encoder Pulse Output Not Available]***

Powered Control Outputs

Three (3) High-side 12 V drivers for use with solenoid valves and other ancillary devices.

[MCR-09 LT: One (1) High-side 12 V driver]

Analog Input

One (1) 4 to 20 mA current loop for applications including tank gauging. ***[MCR-09 LT: Analog Input Not Available]***

Communications

Four (4) RS-232 compliant serial ports for use with printers, external computing devices, etc.

[MCR-09 LT: Two (2) RS-232 compliant serial ports]

Calibration

Prescale Factor (MRATIO) Range: 1 to 99

Calibration Factor Range: 0.0001 to 1.9999

Compensation Accuracy: Four (4) decimal places from lookup table

Registration Capacity (Units)

Delivery: -99999.9

Totalizer: 9999999.9

Section 2 – LAYOUT

Figure 1. MCR-05 Layout

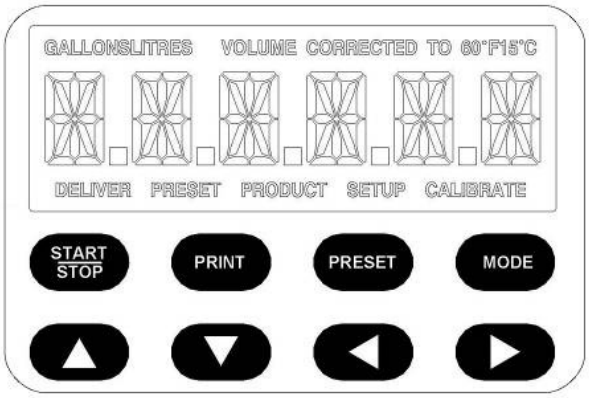
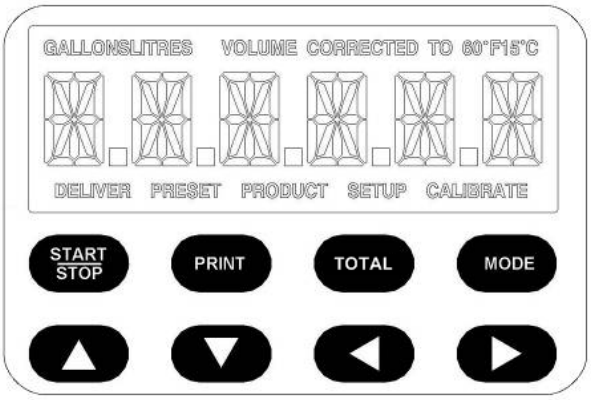


Figure 2. MCR-09 LT Layout



GALLONSLITRES	'GALLONS' or 'LITRES' indicates the current Volume Mode (US or Metric).
VOLUME CORRECTED TO 60F15C	Displayed whenever the Temperature Compensation is active. '60F' in Gallons Mode, 15C' in Liters mode.
DELIVER	Indicates Delivery Mode is active and will display until the Fuel Delivery Ticket prints.
PRESET	Indicates the Preset Volume is being changed. ***[MCR-09 LT: Preset is Optional – the <TOTAL> key may be used to display the Totalizer]***
PRODUCT	Indicates the Product Code is being changed.
SETUP	Displayed in the Delivery Menu and the Calibration Menu.
CALIBRATE	Indicates the Calibration Screw has been backed out – will display until the Calibration Screw is tightened.

Special Note on Keyboard Entry

The E:Count uses special technique called **PRESS & HOLD** for keyboard entry. This technique eases keyboard operation, especially when wearing gloves, in the absence of any audible or tactile feedback. Simply press a button and wait for the desired action.

Examples:

- For menus press & hold the mode key until the selection appears.
  - PRESS & HOLD **<START/STOP>** to enter that selection.
  - PRESS & HOLD **<START/STOP>** to exit the selection.
- To enter number PRESS & HOLD the **<RIGHT>** or **<LEFT>** arrow keys to select the digit to be changed. To change the number PRESS & HOLD the **<UP>** or **<DOWN>** arrow.
- To start a delivery PRESS & HOLD **<START/STOP>**.
- To enter a preset PRESS & HOLD **<PRESET>**.

Pressing and releasing a button may give results but it is only coincidental that the button was held long enough.

Section 3 – WIRING AND INSTALLATION

Figure 3. E:Count MCR-05 Wiring Diagram

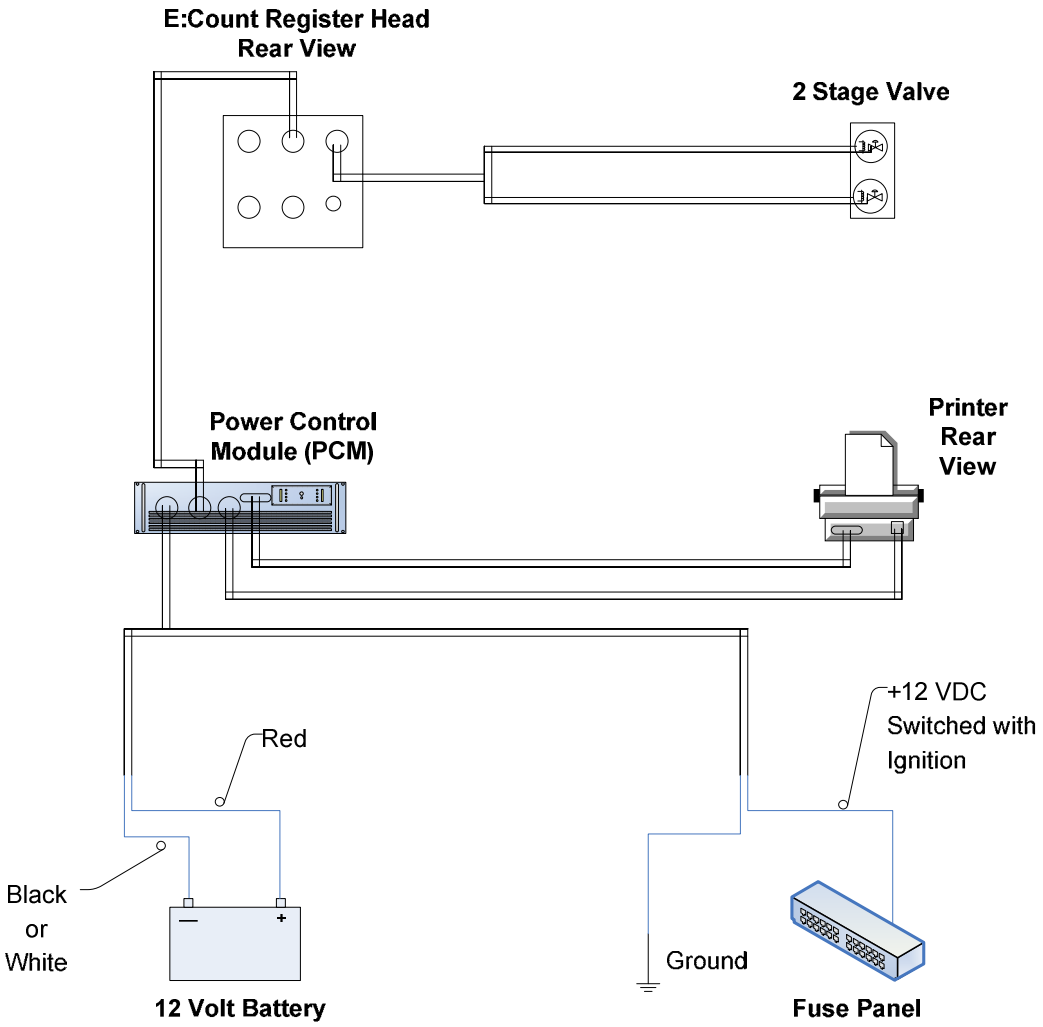
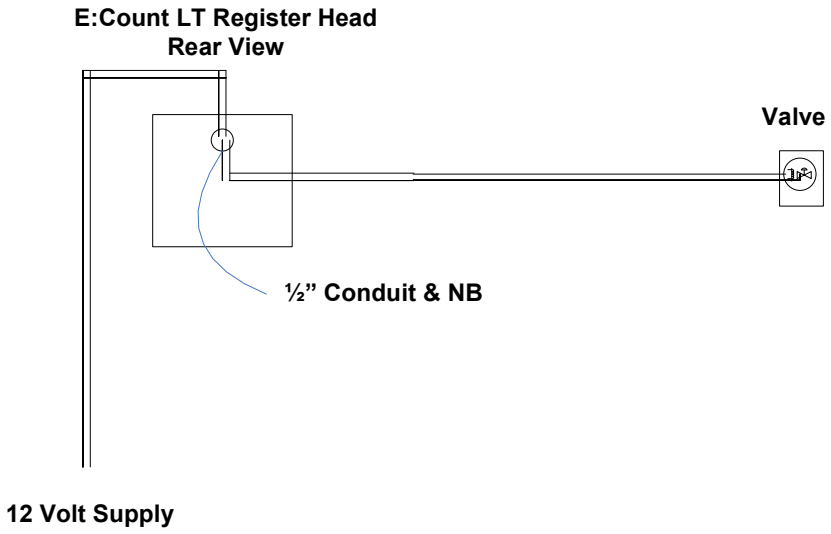


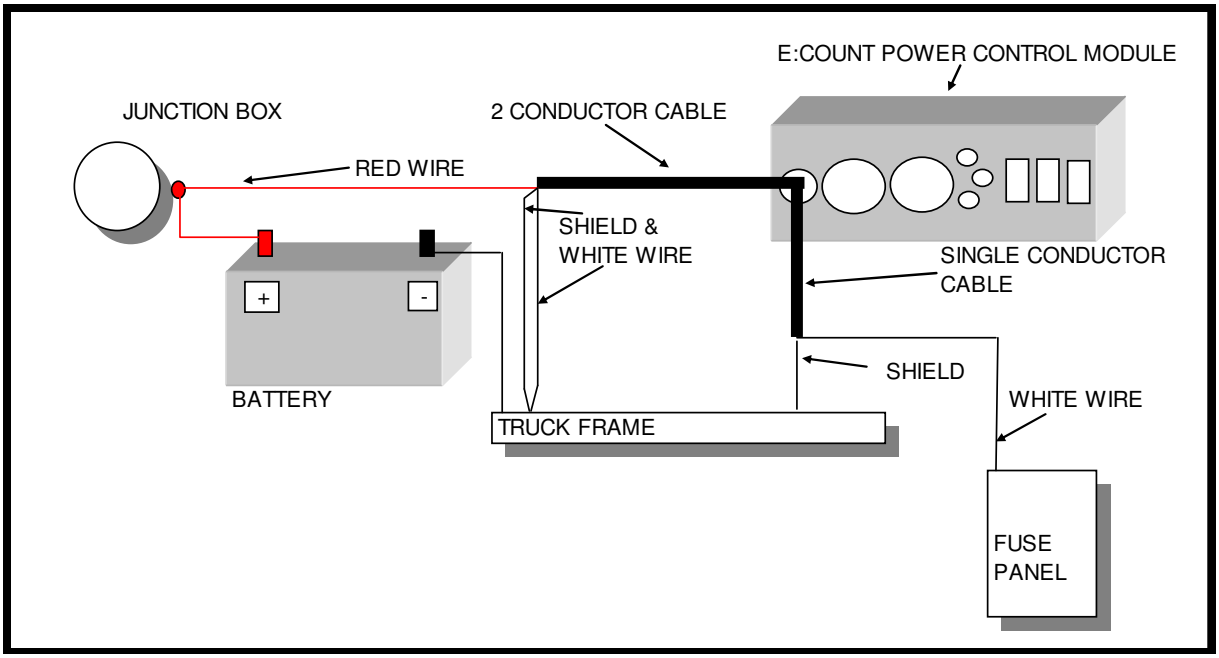
Figure 4. E:Count LT MCR-09 Wiring Diagram

[MCR-09 LT: The Power Control Module is not used by the E:Count LT MCR-09.]



E:Count Power Cable Connections

Figure 5. E:Count Power Cable Connections



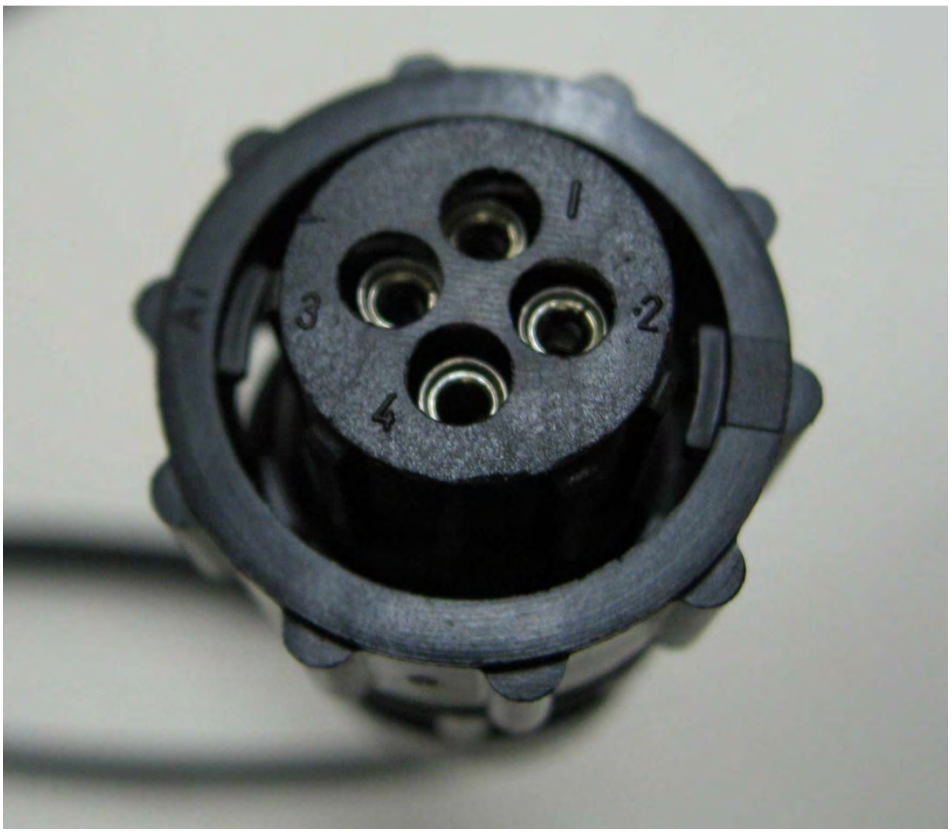
The power cable assembly consists of a **two conductor shielded cable for power** and a **single conductor shielded cable for ignition pick-up.** The two conductor cable should be routed to the vicinity of the truck battery and the single conductor cable to the vicinity of the fuse panel.

Make sure the negative terminal of the battery is connected to the truck frame. Locate the closest connection point to the positive terminal of the battery. Usually the heavy conductor attached to the battery post terminates to a junction post or solenoid nearby. This is where the 12-volt power will be picked up with the red wire. The white wire and shield of the two conductor cable should be twisted together and attached directly to the frame of the truck.

Using a 12 volt test light, find a circuit (at the fuse block) which is ON only when the ignition is in the RUN position, and OFF in both the START and OFF positions.

Attach the white wire from the single conductor cable to this point. Terminate the shield and connect it to a nearby screw that is grounded to the truck frame.

Figure 6. E:Count Power Cable Connector



After connecting the two conductor cable and the single conductor cable to power and ignition, the pins shown above in the E:Count Power Cable Connector are carrying the following signals:

Pin 1	+12VDC	+12 Volt Power (always on)
Pin 2	GROUND	Ground from Truck Frame
Pin 3	SHIELD	Shield from both Cables
Pin 4	IGNITION	Ignition Signal from Fuse Box

E:Count Serial Cable Connections

Device	Port	Cable	Part#
Handheld/Laptop Serial Port (DTE)	PCM-Serial1 (DCE)	Straight 9F/9M	114-0100
Handheld/Laptop Serial Port (DTE)	PCM-Printer (DCE)	Straight 9F/9F	114-0271
ComLink (DCE)	PCM-Serial2-AUX (DTE)	Straight 9F/9M	114-0100
GPS (DCE)	PCM-Serial2-AUX (DTE)	Custom	*
Blaster (Cognitive) (DTE)	PCM-Printer (DCE)	Custom Straight 3-Wire 9F/9M	**702-0091 ++**
Blaster (Cognitive) (DTE)	8000-Printer (DTE)	Custom NULL 3-Wire 9F/9M	**702-0089 +**
BlueSnap BlueTooth Adapter (DCE)	PCM-Printer (DCE)	NULL 9F/9M	114-0273
Citizen CT-S310 (DTE)	PCM-Printer (DCE)	Straight 9F/25M	114-0089
Citizen CT-S4000 (DTE)	PCM-Printer (DCE)	Straight 9F/25M	114-0089
Citizen CT-S601 (DTE)	PCM-Printer (DCE)	Straight 9F/25M	114-0089
Midcom/Citizen CT-S651 (DTE)	PCM-Printer (DCE)	Straight 9F/25M	114-0089
Datamax M4te Printer (DCE)	PCM-Printer (DCE)	NULL 9F/9M	**114-0273 ******
Epson TM-220 (DTE)	PCM-Printer (DCE)	Straight 9F/25M	**114-0089 ****
Epson TM-295 (DTE)	PCM-Printer (DCE)	Straight 9F/25M	114-0089
Epson TM-88 (DTE)	PCM-Printer (DCE)	Straight 9F/25M	114-0089
Fujitsu FP-460 (DTE)	PCM-Printer (DCE)	Straight 9F/25M	114-0089
MID:COM Impact Printer (DCE)	PCM-Printer (DCE)	NULL 9F/9M	114-0273
Midcom/Axiom/Telesto Thermal Printer (DTE)	PCM-Printer (DCE)	Straight 9F/9F	114-0271
Printek RT43 (BlueTooth)	None, Uses BlueTooth	---	---
Printek RT43 (Serial)	PCM-Printer (DCE)	NULL 9F/9M	**114-0273 ******
Zebra RW420 (DCE)	PCM-Printer (DCE)	Custom	**702-0116 *****

*Cable depends on GPS Reciever, contact Midcom.

**TM-220 must be in XON/XOFF, set DIP1 SW3 to ON.

***Zebra RW-420 requires DSR high to be awake, Pin4 on DE9 is DTR --> DSR on Pin7 of 10 pin connector.

****Requires Datamax Cable: DB9-FRTANGRJ127NONCOIL + M/F Null Modem Adapter

+ Blaster puts +5 VDC on Pin9, use Midcom cable with 8000 to isolate Pin9 or printer may be destroyed.

++ E:Count PCM uses only 3-Wire Comms so Pin9 is already isolated, but custom 3-wire cable recommended.

+++ Requires Printek Cable: Part # 91849 "RT43 RS232 Cable" + M/F Null Modem Adapter

Wired Cable - Printer to PCM	Part #	Opposite Gender for Wireless	Part #
Custom Straight 3-Wire 9F/9M	**702-0091**	Custom Straight 3-Wire 9M/9M	114-0384
Custom NULL 3-Wire 9F/9M	**702-0089**	Custom NULL 3-Wire 9M/9M	114-0385
NULL 9F/9M	114-0273	NULL 9M/9M	114-0386
Straight 9F/25M	114-0089	Straight 9M/25M	114-0387
Straight 9F/9F	114-0271	Straight 9M/9F	114-0100

PRINTER NOTES:

To connect a Printer to the E:Count PCM via Digi RF Radios:
1. Connect the RF Radio to the PCM-Printer port via a NULL 9F/(M cable (Part # 114-0273).
2. Connect the RF Radio to the Printer using the opposite gender of the appropriate cable for that printer.

Refer to the full Midcom ECount Printer Notes document available on the Midcom website for all makes and models of printers supported by the ECount MCR-05 and the ECount LT MCR-09.

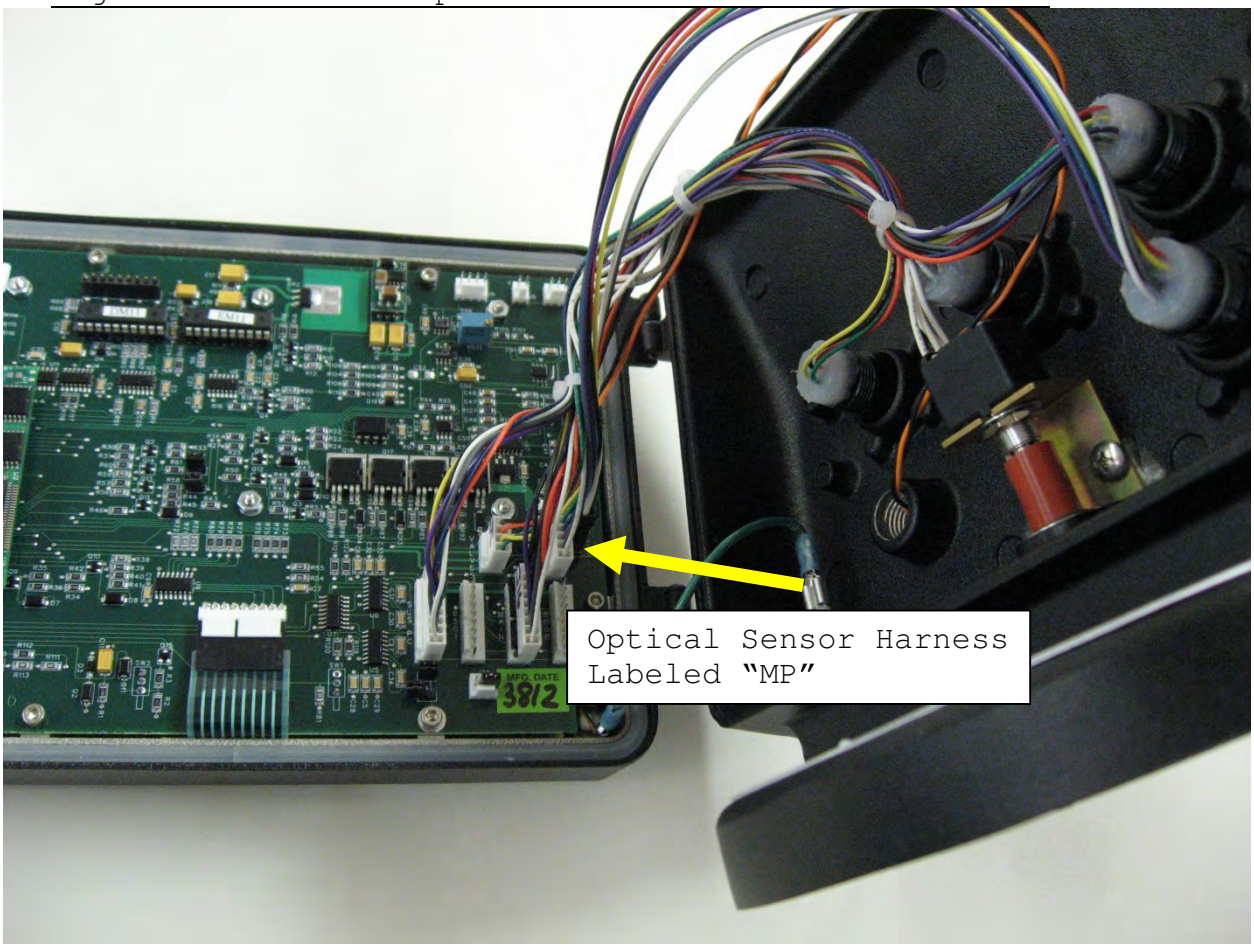
The E:Count PCM-PRINTER port is DCE, but the MID:COM 8000 Printer Port (the outside serial port on the 8000 computer when facing the back) is DTE - this means that different cables will be required to connect the 8000 computer to an external printer. Contact MID:COM for more information.

The 8000-Cognitive Blaster cable is NULL 9F/9M, the E:Count-Cognitive cable is STRAIGHT 9F/9M. The correct cable must be used for the application, however a null modem adapter with the 8000 cable we manufacture may safely be used with the E:Count (since the danger is the cable used with the 8000). The Cognitive printer puts out 5v on pin 9, and the 8000 puts out 12 V on pin 9. If a cable is used with the Cognitive printer and the 8000 that does *__not__* isolate pin 9 the printer internal power supply will be destroyed, therefore our 8000-Cognitive cable is 9M9F Null and only connects pins 2, 3, and 5. MID:COM Part Number 702-0089 is recommended with an 8000.

The E:Count-Cognitive Blaster cable is 9M9F straight-through, since the PCM only has pins 2,3,5 connected to the printer any 9M9F straight-through cable may safely be used as the power is output from the printer on pin 9 and is not connected in the PCM. MID:COM Part Number 114-0100 or 702-0091 (which connects only pins 2,3,5) are the recommended cables when used with the E:Count PCM.

Optical Sensor

Figure 7. E:Count Optical Sensor Harness Connection



The Optical Sensor connector for FUEL OIL (Part # 702-0083) has two cables:

VALVE - 1 black wire, 1 white wire
SENSOR - 1 black wire, 1 red wire, 1 clear wire

The Optical Sensor connector for PROPANE (Part #) has one cable:

SENSOR - 1 black wire, 1 red wire, 1 clear wire

Spike Suppressor Installation

All MID:COM systems are shipped complete with one spike suppressor per register head, these are included in the installation kit. The spike suppressor must be installed across each hose reel solenoid – refer to the Solenoid Spike Suppressor Wiring Diagram (refer to the Table of Figures for a page number). It also may be necessary to install more than the one on the hose reel solenoid or other spike producing components of the truck electrical or pumping system. If so, contact the factory to order additional spike suppressors.

Reel Motor Solenoid Spike Suppressor Installation

The spike suppressor is a heavy-duty diode used to kill the high-voltage inductive kickback that occurs when the reel motor switch is released and the solenoid contactor opens. The spikes that are produced can cause electrical noise interference with any type of electronic equipment.

Most solenoids are equipped with a single screw stud that is connected to one side of the coil, with the other side of the coil either grounded or connected to 12-volts. Before installing the suppressor, it's important to determine which configuration you have. A 12-volt test light works well for this.

Connect the light between the switch stud and ground. If the light does not glow at all, press the reel switch and it should light. This is a grounded coil configuration. Connect the red lead of the suppressor to the stud, and the black lead to ground.

If the light glows even dimly, press the reel switch and it should go out altogether. This is a hot coil configuration. Connect the black lead to the stud and the red lead to 12-volts (the hot side of solenoid).

If the solenoid has two studs, and both have a wire going to them, check both as described above and connect the suppressor to whichever stud reacts like the grounded coil configuration.

Figure 8. Ferrite Cylinder Clamp Installation

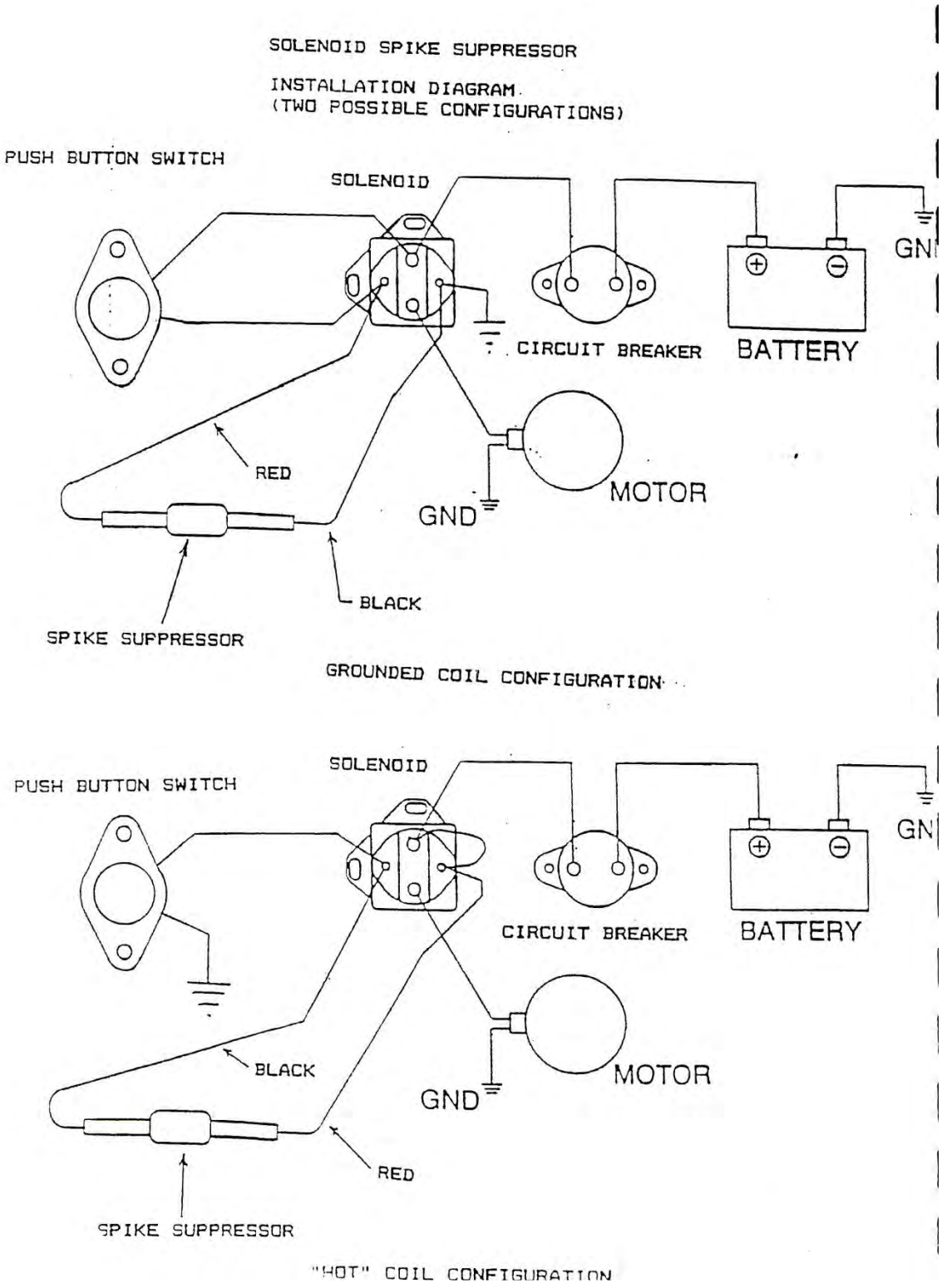
8000 COMPUTER OR EPCM

INSTALL ONE FERRITE CLAMP TO THE REGISTER CABLE AS CLOSE AS YOU CAN TO THE 9 PIN CPC CONNECTOR.

REGISTER 8000 OR ECOUNT

INSTALL ONE FERRITE CLAMP TO THE REGISTER CABLE AS CLOSE AS YOU CAN TO THE CPC CABLE ENTRY SEAL.

Figure 9. Solenoid Spike Suppressor Wiring Diagram



SV104 Valve Wiring Instructions

3 Conductor Valve Cable Connections:
Red = Connect to **Both** 1st and 2nd Stage
Black = 1st Stage Shut Down
White = 2nd Stage Shut Down

The voltage present on an individual wire is dependent on the device connected to the valve:

	E:Count Register	8000 Computer or SLS
Red Wire	Constant Ground	Constant +12 VDC
Black Wire	Switched +12 VDC	Switched Solenoid Ground
White Wire	Switched +12 VDC	Switched Solenoid Ground

Valve Connections: Red to one wire from each solenoid.

1st Stage Shut Down (Black) to solenoid
Identified on tag as #EF8016G1

2nd Stage Shut Down (White) to solenoid
Identified on tag as #EFHT8003G1

SV104 Valve Operation

Once solenoids are energized product can begin to flow. Upon reaching 1st Stage Shut Down the large valve will slowly shut down while pressure is equalized. This is a spring assisted closure. This then creates a slow flow of approximately 10 GPM. Once preset or 2nd Stage Shut Down is reached the valve will completely close.

NOTE: If Solenoids have a third wire that is green with yellow stripe, it can be cut off as it is not used.

NOTE: DO NOT USE DIODES WHEN HOOKING VALVES UP TO AN E:COUNT REGISTER.

Figure 10. SV104 2 Stage Solenoid Valve

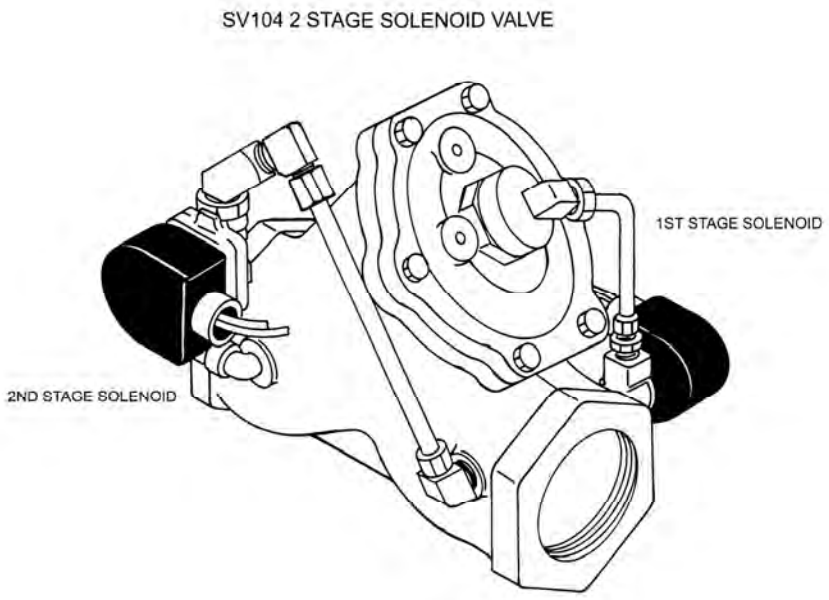
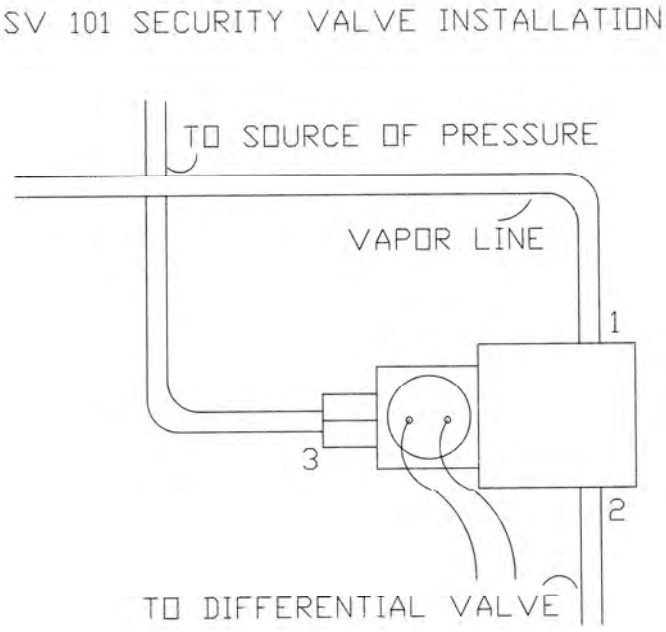


Figure 11. SV101 Security Valve Installation



SV101 Solenoid Security/Preset Valve

For E:Count

PART NUMBER	DESCRIPTION
Valve:	
706-0045	Security/Preset valve for use with the E:Count system, equipped with a short cable and 4 position circular plastic connector.
Wiring:	
706-0045	Route the valve cable from the valve to the back of the E:Count register and connect with mating receptacle.

PART NUMBER	DESCRIPTION

Plumbing:

MID:COM has supplied valves manufactured by two different companies: Asco and Parker-Skinner. Although they are functionally the same, they are constructed differently and their ports are numbered differently.

Valves No Longer Available:

ASCO P/N 832058	Green solenoid housing with three ports on main valve body. [1]
Parker-Skinner P/N X54LB2XXX	Gold solenoid housing with two ports on main valve body, and one port out the solenoid cover. [1]
Parker-Skinner P/N 714X50202A	Blue solenoid housing with three ports on the main valve body. [1 2]
Parker-Skinner P/N 7133TVN	Black solenoid housing with three ports on main valve body. [1 2]
Parker-Skinner P/N 71335SN	Black solenoid housing with two ports on the main valve body, and one out the solenoid top. [1 2]

Current Production Valve:

Parker-Skinner P/N 7139	Black solenoid housing with two ports on the main valve body, and one out the solenoid top. [2]

Notes:

1. This valve is no longer available.
2. A Repair Kit is available for this valve.

Security Valve Installation

1. Make sure the meter is blown down and safe to break pipe connections.
2. Remove the vapor line going to the differential valve.
3. Referring to the port designations below, connect the "common" port to the differential valve with a pipe nipple.
   NOTE: Fittings and hoses are user supplied.
4. Connect the vapor line to the "vapor" port.
5. Connect the "pressure" port to any source of liquid pressure upstream of the differential valve.

Security Valve Port Designations

SKINNER #X54LB	PORT 1	VAPOR	Vapor Line
	PORT 2	COMMON	Differential Valve
	PORT 3	PRESSURE	Source of Pressure
SKINNER #714X & 7133	PORT 1	VAPOR	Vapor Line
	PORT 2	COMMON	Differential Valve
	PORT 3	PRESSURE	Source of Pressure
ASCO #832058	PORT 1	COMMON	Differential Valve
	PORT 2	VAPOR	Vapor Line
	PORT 3	PRESSURE	Source of Pressure

Security Valve Operation

When the valve is de-energized, liquid pressure is ported to the differential valve holding it closed. When the valve is energized, the liquid is bled back through the vapor line and the pressure port is cut off. The meter and differential valve then operate as if the valve was not in the system.

LC & TCS METERS – METER RATIOS AND 1:1 PACKING GLANDS

Figure 12. LC & TCS Meter 1:1 Packing Gland Installation

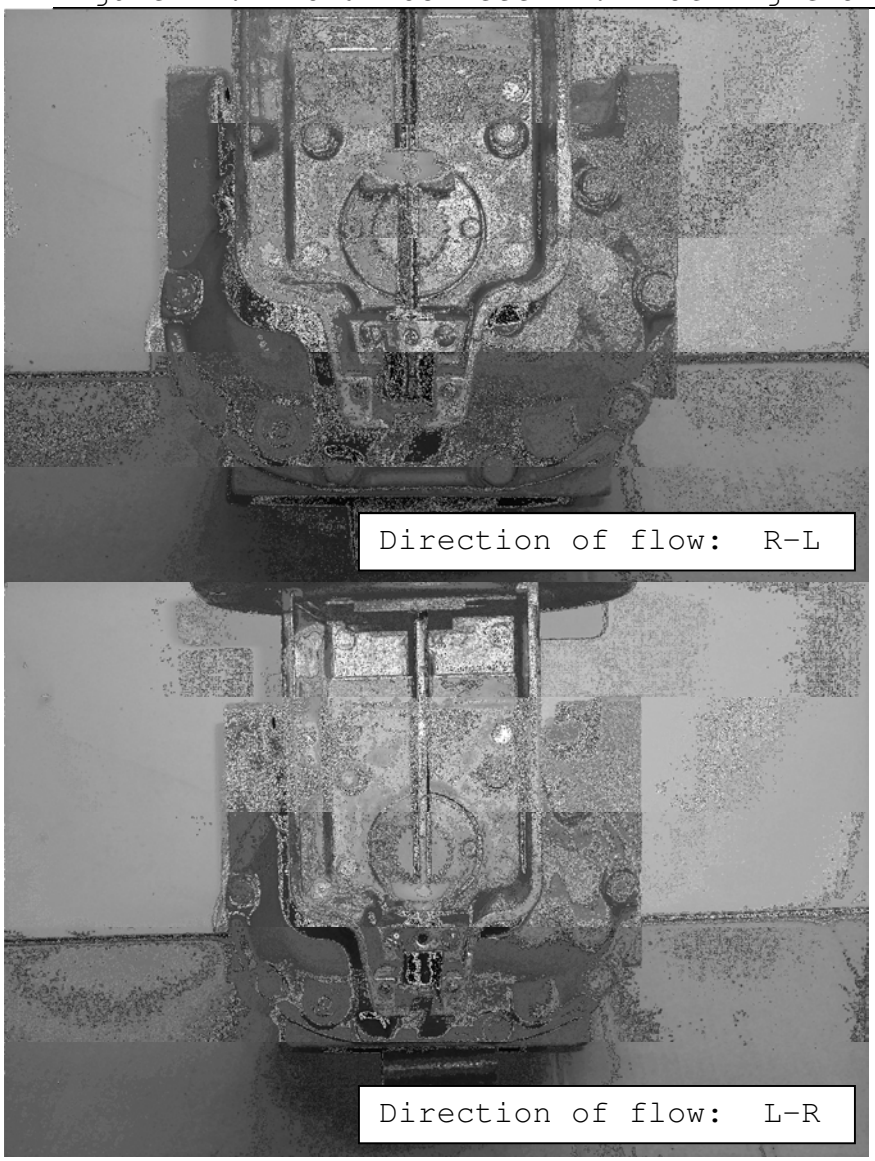


Figure 13. 1:1 Packing Gland Meter Ratios

MID:COM E:COUNT METER RATIOS					
1:1 Packing Gland					
LC METER TYPE	**TCS Meter Type**	**REV/GAL**	**REV/LITRE**	**1:1 GAL**	**1:1 LITRE**
M5	700–15	4.08	1.05	40	10
M7/M10	700–20	5.55	1.42	55	14
M15	700–30	2.06	0.53	21	5
M25	700–35	2.06	0.53	21	5
M30/M40	700–40	0.74	0.19	7	2
M60/M80	700–45	0.4	0.103	4	1

LC & TCS METERS – METER RATIOS AND 2:1 PACKING GLANDS

Figure 14. LC & TCS Meter 2:1 Packing Gland Installation

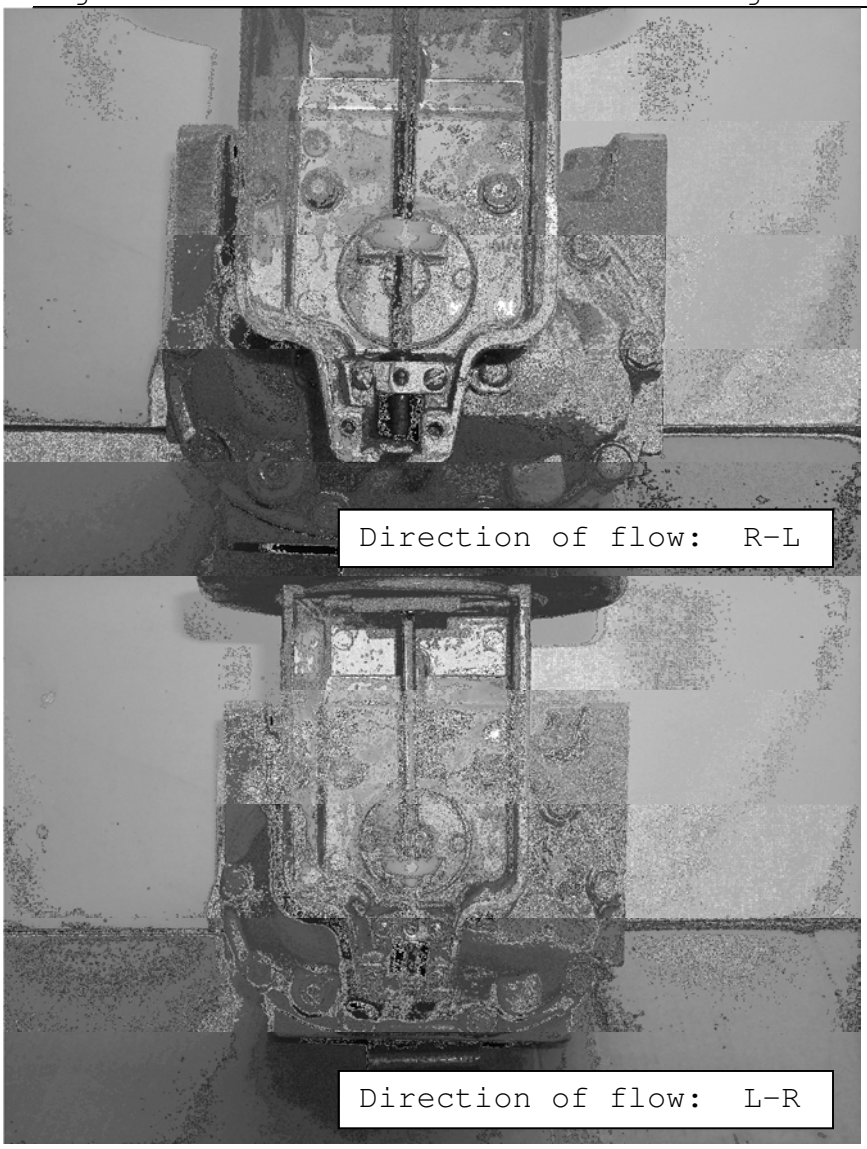
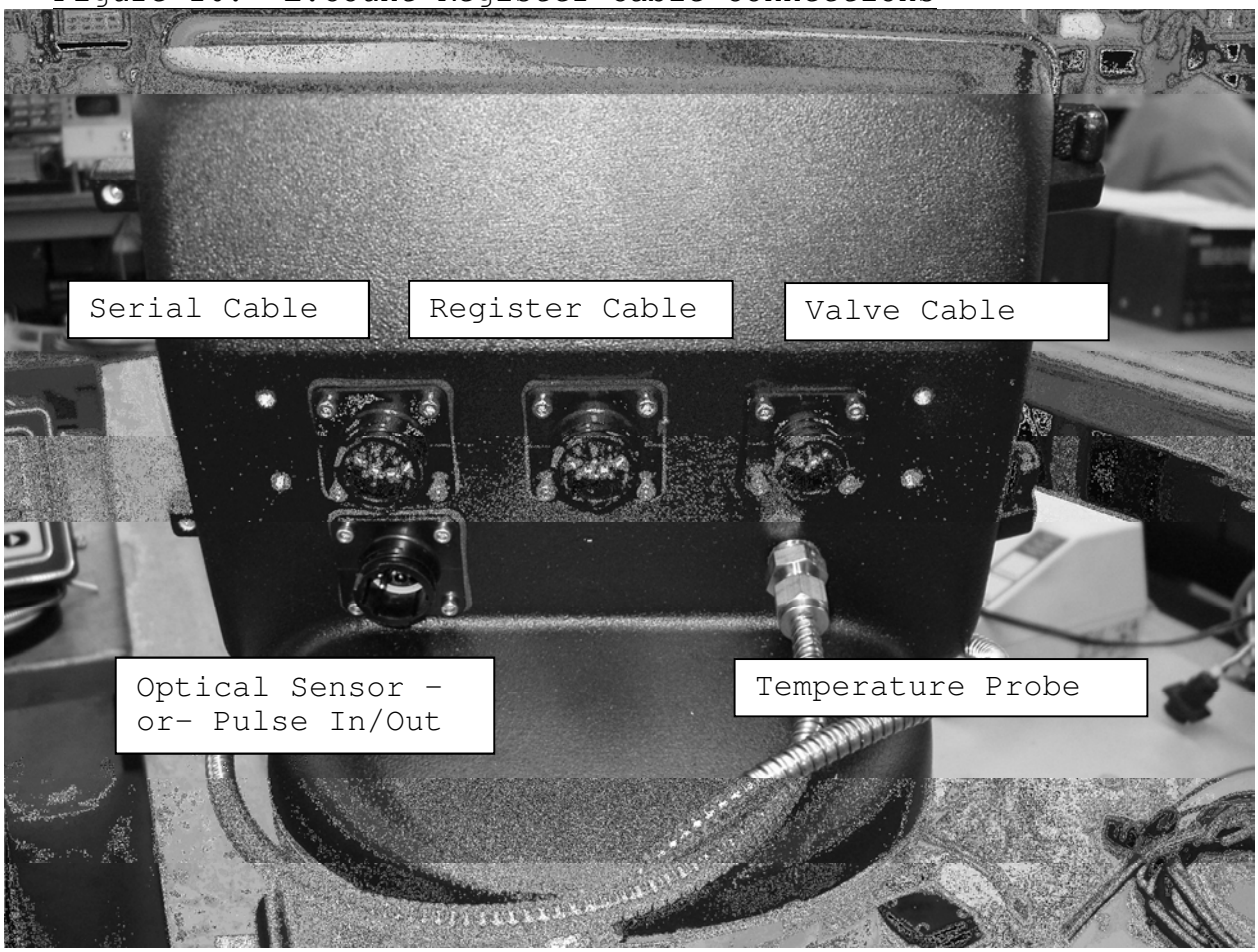


Figure 15. 2:1 Packing Gland Meter Ratios

MID:COM E:COUNT METER RATIOS					
2:1 Packing Gland					
LC METER TYPE	**TCS Meter Type**	**REV/GAL**	**REV/LITRE**	**2:1 GAL**	**2:1 LITRE**
M5	700–15	4.08	1.05	20	5
M7/M10	700–20	5.55	1.42	27	7
M15	700–30	2.06	0.53	10	2
M25	700–35	2.06	0.53	10	2
M30/M40	700–40	0.74	0.19	3	1
M60/M80	700–45	0.4	0.103	2	1

E:Count Register Back Panel Cable Connections

Figure 16. E:Count Register Cable Connections



Serial Cable – Used with:
- 8000 Computer for serial communications
- Laptop for updating the flash program in the E:Count

Register Cable – Used for communication and power via PCM/8000

Valve Cable – Used to control security valves or security/preset valves

Optical Sensor – Used for Optical Vapor Sensor (LP) or Optical Sensor/Coil (Fuel Oil)

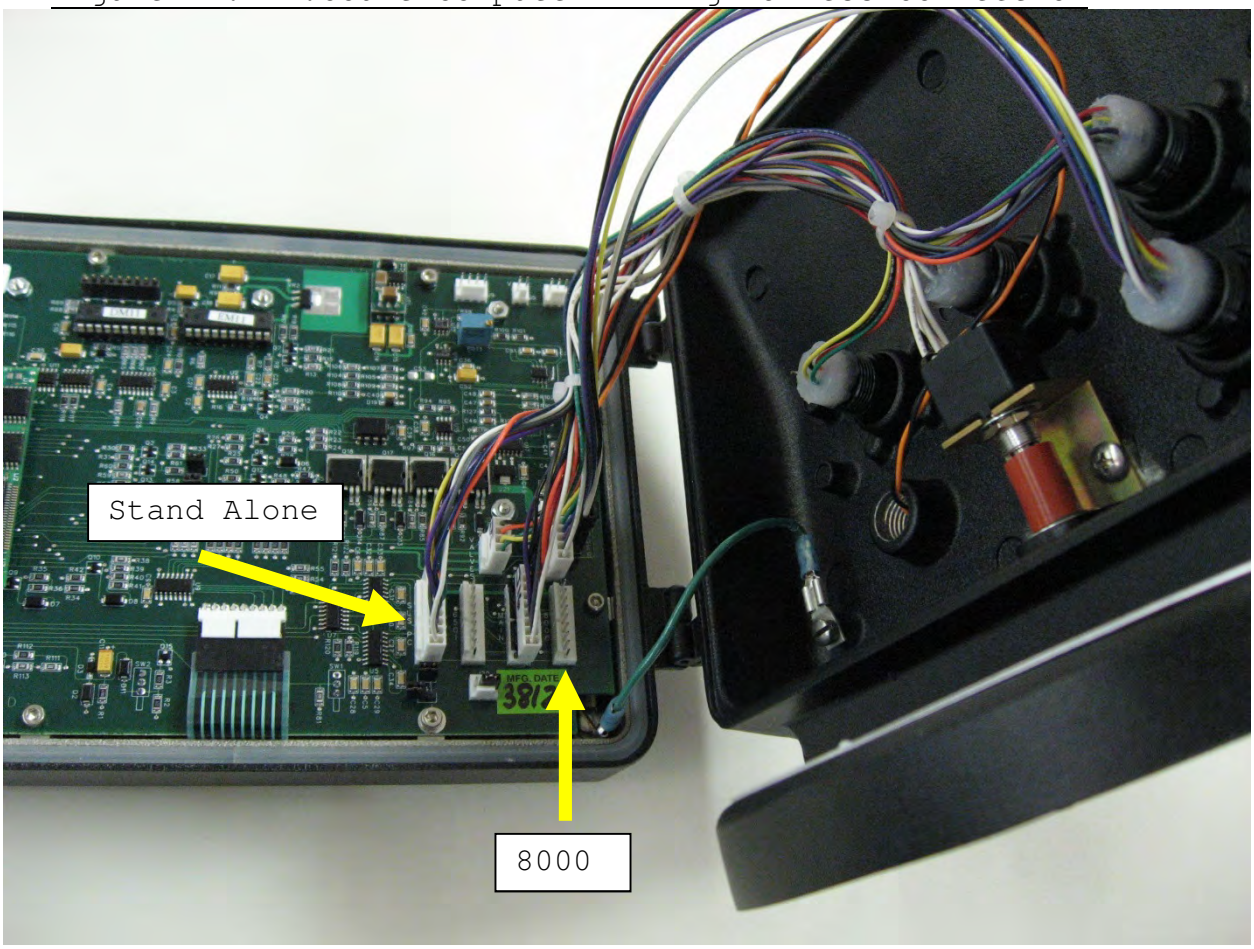
Pulse Inout/Pulse Output – Used with other equipmetn requiring pulse interface

Temperature Probe – Used for Temperature Compensation

E:Count 'Computer' Wiring Harness Connection

Depending on whether the E:Count is used as a Stand Alone register or if it is used with an 8000 Computer, the "Computer" wiring harness in the E:Count will be connected to a different location.

Figure 17. E:Count Computer Wiring Harness Connection



Notice that there is a label on the connectors:

- "8000" is used when connecting the 8000 Computer
- "SLS/PC" is used for Stand Alone operation

The above Register is configured for Stand Alone Operation.

Section 4 – FIRMWARE VERSIONS AND COMMAND REFERENCE

Firmware Versions

ECount: **E:Count Model # MCR-05**
LT: **E:Count LT Model # MCR-09**

New Version Numbers as of September 2013:

ECount: E179E0, E179F0, E179S0

LT: L412E1, L412F1, L412S1
L412E2, L412F2, L412S2

E	179	E	0
PRODUCT	**VERSION**	**LANGUAGE**	**COMPENSATION TABLE**
E = ECount	3-Digits	E=English	0 = All Tables 1-9
L = ECount LT		F=French	1 = Propane Only
		S=Spanish	2 = Fuel Oil/Diesel

Previous Version Numbers:

ECount English E178F
ECount French F178F
ECount Spanish S178F

LT English LT411C
LT French LF411C
LT Spanish LS411C

Figure 18. E:Count Quick Command Reference E179

PRESS PRESET BUTTON TO CHANGE PRESET BEFORE / DURING DELIVERY

Delivery Mode - In Delivery

PRSESET	MODE-->	PRSESET
AMOUNT		MONEY
▲▼◄►		▲▼◄►

Press MODE to set preset on Dollars

PRESS RIGHT-ARROW BUTTON TO CHANGE PRICE DURING DELIVERY

Delivery Mode - In Delivery

MONEY
PRICE
▲▼◄►

PRESS MODE BUTTON TO DISPLAY FLOW RATE DURING DELIVERY

Delivery Mode - In Delivery

MODE
FRXXXX

Rate = xxxx units/minute

PRESS MODE BUTTON TO ACCESS MENUS WHEN NOT IN DELIVERY

Delivery Menu

HOSEPK	OK	***
PRCODE	▲▼◄►	
QOB	▲▼◄►	
MONEY	currency menu	***
TIMOVR	▲▼	***
SHIFT	print shift report	
DRIVER	▲▼◄►	
TOTAL	◄►	
DISVOL	▲▼	
TEMP F		
TEMP C		
CALTKT	print cal report	
SETUP	setup menu	
EXIT	delivery mode	

Setup Menu

NEWCOD	▲▼◄►
STAGE1	▲▼◄►
STAGE2	▲▼◄►
TIME	▲▼◄►
DATE	▲▼◄►
SALE	▲▼◄►
TRUCK	▲▼◄►
CURNCY	▼
PS RQD	▲▼
PRINTR	▼
COPIES	▲▼◄►
HOSEPK	▲▼
SS RST	▼
6501PF	▲▼
HOSTFX	▼
KEYSON	▼
EXIT	delivery mode

Currency Menu

PRICE	▲▼◄►
TAX 1	▲▼◄►
TXTYP1	▲▼
TAX 2	▲▼◄►
TXTYP2	▲▼
TAXSUB	▲▼
DISCNT	▲▼◄►
DSCTYP	▲▼
DSCDAY	▲▼◄►
PRCADJ	▲▼◄►, ▲▼
EXIT	delivery mode

Calibration Menu

PRCODE	▲▼◄►
DISVOL	▲▼
ATOCAL	▲▼◄►
CALFAC	▲▼◄►
TEMP F	▲▼
TEMP C	▲▼
TABLE#	value at temp
MRATIO	▲▼◄►
CMPTBL	▲▼◄►
SERIAL	▲▼◄►
TIMER	▲▼
REGNUM	▲▼◄►
U TYPE	▲▼
UNITS	▲▼
PGROSS	▼
DECMAL	▲▼
AIRSEN	▲▼
PROBE	▲▼
BRKVLV	▲▼
DEMO	▲▼
EXIT	calibration mode

MID:COM E:Count
Menu Guide
Version: E179E0 English
January 16, 2014

Press & Hold keys until the desired item is shown or until the desired action is taken.

Press & Hold <MODE> to cycle through Menu Items.

Press & Hold <START/STOP> to select the Menu Item for display and update.

Press & Hold <START/STOP> again to return to the Menu Item selection.

Press & Hold <RIGHT ARROW> on Menu Items to skip to **EXIT**.

Press & Hold <LEFT ARROW> on Deliver Menu to skip to **SETUP**.

Press & Hold <LEFT ARROW> on Setup Menu to skip to **PRINTR**.

Press & Hold <LEFT ARROW> on Calibrate Menu to skip to **REGNUM**.

****** Displayed depending on configuration.***

Figure 19. E:Count Quick Command Reference E180

PRESS PRESET BUTTON TO CHANGE PRESET BEFORE / DURING DELIVERY

Delivery Mode - In Delivery
PRSESET
AMOUNT
▲▼◄►

PRESS MODE BUTTON TO DISPLAY FLOW RATE DURING DELIVERY

Delivery Mode - In Delivery
MODE
FRXXXX

Rate = xxxx units/minute

PRESS MODE BUTTON TO ACCESS MENUS WHEN NOT IN DELIVERY

Delivery Menu

HOSEPK	OK	***
PRCODE	▲▼◄►	
QOB	▲▼◄►	***
TIMOVR	▲▼	***
SHIFT	print shift report	
DRIVER	▲▼◄►	
TOTAL	◄►	
DISVOL	▲▼	
TEMP F		
TEMP C		
CALTKT	print cal report	
SETUP	setup menu	
EXIT	delivery mode	

Setup Menu

NEWCOD	▲▼◄►	
STAGE1	▲▼◄►	
STAGE2	▲▼◄►	
TIME	▲▼◄►	
DATE	▲▼◄►	
SALE	▲▼◄►	
TRUCK	▲▼◄►	
REGNUM	▲▼◄►	
PRINTR	▲▼	
COPIES	▲▼◄►	***
LOGOHT	▲▼◄►	***
SS KEY	▲▼	
EMULAT	▲▼	
QOB MD	▲▼	
SWAUTH	▲▼	
HOSTFX	▲▼	
PKEYS	▼	
HOSEPK	▲▼	
EXIT	delivery mode	

Calibration Menu

PRCODE	▲▼◄►
DISVOL	▲▼
ATOCAL	▲▼◄►
CALFAC	▲▼◄►
MPCAL	▲▼◄►
TEMP F	▲▼
TEMP C	▲▼
TABLE#	value at temp
MRATIO	▲▼◄►
PLSREV	▲▼
CHANNL	▲▼
FLODIR	▲▼
CMPTBL	▲▼◄►
SERIAL	▲▼◄►
TIMER	▲▼
REGNUM	▲▼◄►
U TYPE	▲▼
UNITS	▲▼
PGROSS	▼
DECMAL	▲▼
AIRSEN	▲▼
PROBE	▲▼
BRKVLV	▲▼
DEMO	▲▼
EXIT	calibration mode

MID:COM E:Count
Menu Guide
Version: E180E0 English
September 16, 2015

Press & Hold keys until the desired item is shown or until the desired action is taken.

Press & Hold <MODE> to cycle through Menu Items.

Press & Hold <START/STOP> to select the Menu Item for display and update.

Press & Hold <START/STOP> again to return to the Menu Item selection.

Press & Hold <RIGHT ARROW> on Menu Items to skip to **EXIT**.

Press & Hold <LEFT ARROW> on Deliver Menu to skip to **SETUP**.

Press & Hold <LEFT ARROW> on Setup Menu to skip to **PRINTR**.

Press & Hold <LEFT ARROW> on Calibrate Menu to skip to **REGNUM**.

****** Displayed depending on configuration.***

Section 5 – OPERATION

E:Count Overview and Theory of Operation

Meter Calibration and Temperature Compensation

The MID:COM E:Count model MCR-05 and E:Count LT model MCR-09 are a general purpose electronic meter register for use with mechanical positive displacement meter with rotational output as well as other types of meters with electronic pulse outputs. In the case of a rotational output, the E:Count has an internal 100 pulse per revolution (ppr) quadrature encoder which converts the meter rotation to a pulse train. Meter calibration and optional temperature compensation techniques are all-digital in nature and are explained below.

Meter Calibration (Un-compensated)

Meter calibration is a two-step process. First a prescale factor called MRATIO must be determined and entered. This number is an integer value from 1 to 99 and only needs to be entered when the E:Count is initially installed.

This factor serves three purposes:

1. It allows the resulting calibration factor to remain just above or below unity which preserves the "1 part in 10,000" calibration resolution. For example, if there were 10 times too many pulses per unit volume the calibration factor would be near 0.1. This would result in the least significant digit of the calibration factor representing 1 part in 1000.
2. It allows for the elimination of mechanical adjusters and gear reductions which can add torque to the meter as well as wear out and slip.
3. It allows for a convenient way to change units of measure such as: gallons, liters, kilograms, etc.

This factor can be determined by trial and error or by contacting MID:COM with the following information:

1. Meter manufacturer.
2. Meter size.
3. Units of measure.

The second step in calibration, and only step after initial installation, is to determine the calibration factor with a prover or master meter. For initial installation a factor of 1.0000 should be used as a point of reference. Subsequently use the present factor.

E:Count Overview (continued)

With a calibration factor near unity, the meter error as expressed by PROVER VOLUME/REGISTER VOLUME results in a percentage in which the error can be added or subtracted to the current calibration factor as needed.

Another way to view the factor is that the digits to the right of the decimal represent the following:

- First digit – tens of units/hundred units
- Second digit – units/hundred units
- Third digit – tenths of units/hundred units
- Fourth digit – hundredths of units/hundred units.

The calibration factor represents the value of each pulse as it is received by the E:Count. These are added to each other and the resultant sum is compared to the volume currently displayed. If the new rounded value is greater than the current displayed value the displayed value is adjusted accordingly.

Temperature Compensation

Temperature compensation is done by table lookup only. The E:Count is loaded with the appropriate API or ASTM table for the following products:

Comp Table #	Description
00	UNCOMPENSATED
01	PROPANE
02	DIESEL/HEATING OIL
03	GASOLINE
04	LUBE OIL
05	METHANOL
06	ANHYDROUS AMMONIA ***OR*** AVIATION GASOLINE
07	JET-A FUEL
08	JET-B FUEL
09	ETHANOL

The tables are interpolated and extrapolated as necessary to have 1024 entries ranging from -40 to +62.4 degrees Celsius in 0.1 degree steps. As each pulse is received the temperature is sampled and the corresponding table entry for that temperature is multiplied by the calibration factor. The result is added, rounded and displayed as described above, but as a separate value.

E:Count Overview (continued)

Thus, there is always a running count of uncompensated AND compensated volumes. After the delivery these values can be toggled on the display to facilitate computations without the need to run BOTH compensated and uncompensated tests.

Both the current temperature and its associated table value can be displayed. If adjustment is necessary for the net volume, the temperature is adjusted up or down to obtain the table value necessary for the next test to be accurate.

It can occur that when an accurate test is obtained, the displayed temperature is not the same as the test thermometer temperature. There can always be small discrepancies since the temperature can vary during the delivery and the displayed temperature is what the product is at after the delivery.

However, if the difference is large the following needs to be considered:

1. The displayed temperature will always correspond to the correct table value.
2. The resulting calculations using that value will also always be correct.
3. The table in the E:Count may not be the same as the one being used for the test.
4. The product being tested is not exactly the same as what the table is intended for.

The fourth item is the most common source of error especially in the case of propane. In the summer months it is quite common for refiners to blend in other products with higher or lower coefficients of expansion thus skewing the test.

There is no inherent problem with adjusting the temperature to make the test come out correctly, however if the product changes later on, the system may go out of tolerance. This situation has come up so often that it is necessary to emphasize that the compensator may be working as designed and consideration should be given to other factors affecting the test.

E:Count Overview (continued)

Product Codes

The E:Count MCR-05 is able to handle 99 different product codes. Each product code defines:

1. Product identifier (i.e. PROPANE) which is printed on the delivery ticket.
2. Calibration factor for the product.
3. Compensator status (on/off) for the product.
4. Assigned compensator table for the product.
5. Preset valve second stage dwell.

The product code must be selected in Delivery Mode before a delivery is started. All settings made in any mode are stored associated with the current product code.

[MCR-09 LT: The E:Count LT is preprogrammed at the factory with one (1) product code.]

Electronic Air Sensor

The AIRSEN Menu Item in the Calibration Menu is an ON/OFF toggle.

If an Electronic Air Eliminator is connected to the E:Count the AIRSEN feature needs to be turned on. If the AIRSEN feature is Enabled and the Sensor is not connected the outlet valves will never open.

During the delivery process, if the optical sensor sees air the E:Count will close the outlet solenoid valves and simultaneously open the air release solenoid. When the optical sensor sees liquid the reverse occurs unless the outlet valves were previously closed by either a Preset or by the START/STOP key, in which case only the air solenoid will close.

Outside of delivery mode the air solenoid is off or closed.

MCR-09 LT AIRSEN Reference - LT Air Sensor Functions

The AIRSEN menu item in the LT is not available in versions prior to L413.

LT (MCR-09) AIRSEN CONNECTIONS

Air Solenoid:

J9-3	RELAY1/AIRSOL
J9-5/6	GROUND

Optic Sensor:

J3-2	+5 VDC	(RED)
J1-5	SIGNAL	(WHITE)
J1-6	GROUND	(BLACK)

Mechanical Switch:

J1-5	SIGNAL	The Optic input is active LOW when liquid is present. The switch should be wired so that it is closed when liquid is present or the float is high.
J1-6	GROUND	

MCR-09 LT AIRSEN, HOSSEL, AUTHRX IMPORTANT NOTE

AIRSEN is implemented in all LT versions starting with L413. If **AIRSEN** is **ON** then neither **HOSSEL** (Hose Selection) *nor* **AUTHRX** (Host Authorization) can be enabled. Conversely, if either **HOSSEL** or **AUTHRX** is **ON** then **AIRSEN** cannot be enabled. **"NOGOOD"** will be displayed when an attempt is made to configure the LT as such in either case.

Flow Rate

While delivering product, the <MODE> key may be pressed during pumping to show flow rate.

The flow rate will display "FRxxxx" for one second and then normal counting will resume.

A minimum of 6 seconds of product flowing is required for the flow rate to display.

If fewer than 6 seconds have elapsed since the previous flow rate display, the display will simply hesitate for one second and resume normal counting.

Mass or Volume

The "U TYPE" setting in the Calibration Menu controls whether Mass in POUNDS/KILOS or Volume in GALLONS/LITRES are delivered.

All tickets will display the units based on the selected Unit Type and Units settings.

Compensation Table Reference

			Parameter		Temp			
Table #	**Product**	**VCF Source**	**COE**	**Range**	**Scale**	**Tbase**	**Tmin**	**Tmax**
0	Uncompensated							
1	Propane	ASTM 54	Density	510	°C	15.0	-40.0	62.4
2	Diesel/Heating Oil	API 54B	Density	840	°C	15.0	-40.0	62.4
3	Gasoline	API 54B	Density	730	°C	15.0	-40.0	62.4
4	Lube Oil	API 54D	Density	878	°C	15.0	-40.0	62.4
5	Methanol	API 54C	COE	0.001180	°C	15.0	-40.0	62.4
6	Anhydrous Ammonia	API 54C	COE	0.002293	°C	15.0	-40.0	62.4
7	Jet-A Fuel	API 54B	Density	800	°C	15.0	-40.0	62.4
8	Jet-B Fuel	API 54A	Density	760	°C	15.0	-40.0	62.4
9	Ethanol	API 54C	COE	0.001072	°C	15.0	-40.0	62.4
10	Aviation Gasoline	API 54B	Density	710	°C	15.0	-40.0	62.4

Power Latching

"Power Latching" refers to the ability of the E:Count to tell the PCM to not power off during a delivery.

Normally, a PCM is installed with both switched and unswitched +12VDC connected to it. When the key is turned on the PCM senses this and powers on all equipment connected to it.

Similarly, when the PCM detects that the ignition has been turned off, it will turn off the power to all equipment. During a delivery, the E:Count instructs the PCM to *__not__* power off, thereby preventing an ignition event (or some unknown condition) from prematurely ending a delivery. Once the delivery is over the E:Count resumes the PCM normal power monitoring.

Power Failure

In the Event that a Delivery is interrupted by a Power Failure (whether due to vehicle hardware failure, accidental causes, or malfeasance), upon rebooting the E:Count will detect and indicate that an error has occurred.

The Meter Block for the interrupted delivery must be printed before the register may be used again.

Upon rebooting after a Power Failure During a Delivery the E:Count register will display ERROR PRESS PRINT until any of the 8 keys on the E:Count are pressed.

In a configuration with multiple registers connected to a single printer this sequence allows the operator to control when each register prints, as well as preventing multiple printers from automatically printing at the same time.

The E:Count will next verify that the configured printer has paper, and should it be necessary the E:Count will indicate that paper must be loaded to continue.

The E:Count then finalizes and prints the delivery Meter Block for the interrupted delivery, and finishes initializing.

***** POWER FAILURE ***** will print on the Meter Block.

Power Failure During a Host Mode Delivery

In the Event that a Host Mode Delivery is interrupted by a Power Failure, the following **also** applies:

The E:Count will not respond to the Host until the interrupted Meter Block is printed.

The Host may interrogate the delivery data for the proceeding delivery at any time, and the E:Count will indicate in the Delivery Status data that Power was interrupted during the delivery.

The Host will not be allowed to print before or after the Meter Block is printed – the delivery will be ended just as if it was a Pump & Print delivery.

See the E:Count Host Interface Guide for more information.

Display Microprocessor – Errors and Detection

As of software version E164E, the E:Count will detect that the Display Microprocessor has the correct firmware.

If the Display Microprocessor contains an incompatible software version an error message will be displayed.

Depending on the error message, the software for either or both the **Display Micro** and the **Main Micro** in the E:Count must be updated.

To verify the error, cycle the power **twice** and make sure the same error message is repeated. **If the error goes away then it was a synchronization problem due to programming, and no changes are necessary.**

NEW DM CYCLE POWER	1. Displayed: After programming with FILL 0. To Fix: Cycle power as indicated. 2. Displayed: When DM contains DM11 (or newer) and the E:Count software is E163E (or older). To Fix: Load E:Count software E164E (or newer) – or – if using old version of E:Count software is required then an old DM version must be loaded (such as DM4). Contact the Factory for assistance.
DMICRO ERROR CYCLE POWER	1. Displayed: After programming with FILL 0. To Fix: Cycle power as indicated. 2. Displayed: When DM contains DM10 (or older) and the E:Count software is E164E (or newer). To Fix: Contact the factory for a DM11 (or newer) chip.

In order to use version E164E (or newer) of the E:Count software on an *existing* E:Count, the "Display Micro" chip inside the E:Count must be upgraded to version DM11. All previous versions of the Display Micro are incompatible with E:Count version E164E and higher. DM11 will not work in an E:Count with E163E (or older), *also* DM10 will not work in an E:Count with E164E (or newer).

HostFix

The HostFix E:Count setting (HOSTFX in the Setup Menu) requires Host commands send a prefix character intended to prevent stray serial characters from being interpreted as commands. Use the <DOWN> arrow to cycle through the available settings.

Added in E:Count version E175F.

Software Updates/Versions Required (If Enabled):

- MATRIX, ALL ...: Matrix version 2.0.0.523 (or newer).
- MATRIX, ALL ...: RoadWarrior version 3.0.35.447 (or newer).
- All .....: Updated Host software, contact vendor.

Settings:

- **OFF** HOSTFX OFF Prefix not required.- *DEFAULT*.
- **MATRIX** HOSTFX MATRIX Require only 'Matrix' commands to use a prefix character. This setting requires updated Matrix software.
- **ALL** HOSTFX ALL Requires all host software commands to use a prefix character. This setting requires updated Matrix software *and* updated Host software. Contact your Host software provider for more information.

Compatibility:

E:Count	**HostFix**	**Software Compatibility**
E174/older	N/A	All Host Versions Compatible.
E175(+)	"OFF"	All Host Versions Compatible.
E175(+)	**"MATRIX"**	**Requires Matrix 2.0.0.524**(+). All Host Versions Compatible.
E175(+)	**"ALL"**	**Requires Matrix 2.0.0.524**(+). **RoadWarrior 3.0.35.447**(+). ***Requires Updated Host Software!***

Section 6 – REQUIRED E:COUNT CONFIGURATION SETTINGS

Below are the Minimum Required Settings for the end-user to setup an E:Count "out of the box".

Calibration Menu:

PRCODE – Current Product Code
CALFAC – Calibration Factor (per product)
MPCAL – Muiltipoint Calibration setting
MRATIO – Meter Ratio
PSLREV – Encoder Pulses per Revolution
CHANNL – Single or Dual Channel Encoder
FLODIR – Clockwise or Counter-Clockwise Flow Direction
CMPTBL – Compensation Table Number (per product)
SERIAL – Register Serial Number
TIMER – No Flow Timeout setting
REGNUM – Register Port Number
U TYPE – Mass or Volume
UNITS – Units, either Gallons or Litres
PGROSS – Print Gross Volume setting
DECMAL – Decimal Settings
AIRSEN – Air Sensor Status
PROBE – RTD or Analog (RTD replaces Analog as of June 2007)
BRKVLV – Broken Valve to Detect Flow Outside of a Delivery

DELIVERY MENU

DRIVER – Driver Number

SETUP MENU

NEWCOD – Note the Existing Security Code
STAGE1 – Stage 1 Fast Flow Shutoff Value
STAGE2 – Stage 2 Slow Flow Dwell Value (per product)
SALE – Next Sale Number
TRUCK – System Truck Number
CURNCY – Currency Display setting
PRINTR – Printer Type
COPIES – Number of Thermal Printer Copies (if necessary)
HOSEPK – Enable Hose Packing (if necessary)
SS RST – Disable Pump & Print (if necessary)
6501PF – MID:COM 6501 Print Format (if necessary)
HOSTFX – Host Fix to require Prefix Characters (if necessary)
EMULAT – Host Emulation for other Firmware Versions
SWAUTH – Software Authorization for Host Control

Section 7 – MODES

Delivery Mode

To enter Calibration Mode back out the <**CALIBRATION SCREW**>. ***CALBRT MODE*** will be shown and the E:Count will enter Calibration Mode.

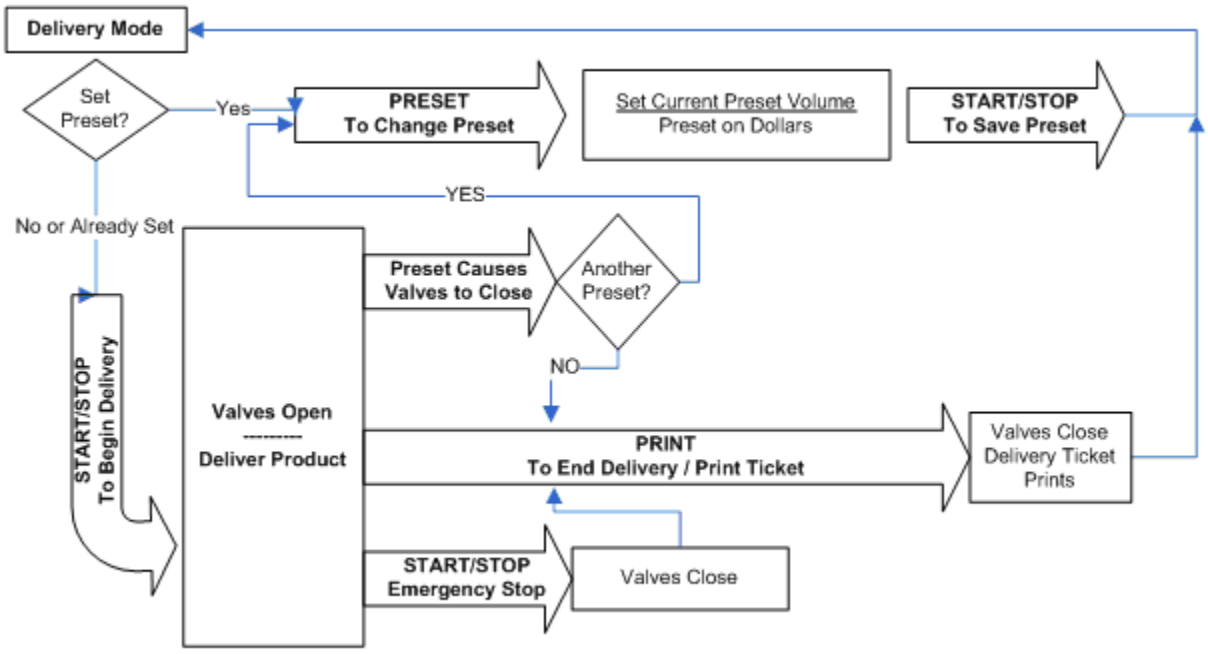
To enter Program Mode back out the <**PROGRAM SCREW**> and the E:Count will automatically enter Program Mode.
[MCR-09 LT: Program Mode Not Available.]

To Set the **Preset Volume** press <**PRESET**>. ***PRESET*** will be shown and allow the Preset Volume to be modified.

To **Begin a Delivery** insert a ticket into the printer and press **<START/STOP>**; ***DELIVR*** will be shown, the E:Count will reset to **00000.0**, and the Security Valve will open allowing product to be dispensed.

To enter the Delivery Menu press **<MODE>** and ***PRCODE*** will be shown.

Figure 20. E:Count Delivery Process



Delivery Mode (continued)

1. Press **<PRESET>** to enable the **Preset** and set the **Preset Volume.**
   a. Press the **<ARROW>** keys to modify the current **Preset Volume.**
   b. Press **<MODE>** to enter the Preset on Dollars.
      - Press **<START/STOP>** to save the **Preset on Dollars**
   c. Press the **<START/STOP>** key to save the **Preset Volume** and enable the **Preset** for the next delivery. ***[MCR-09 LT: Preset is Optional]***

2. Press **<START/STOP>** to **Begin a Delivery** and **Open the Security Valve.**
   a. If a ticket is in the printer ***DELIVR*** will be displayed and ***VALVES OPEN*** will be displayed.
   b. The **Security Valve** will open and the display elements will reset (all on followed by all off).
   c. If no ticket is in the printer ***INSERT TICKET*** will be displayed – **the E:Count will not begin a delivery until a ticket is inserted into the printer.**

3. **Deliver Product.**

4. Press **<PRESET>** to enable another **Preset** and set a **Preset Volume for the next Delivery Segment.**
   a. Press the **<ARROW>** keys to modify the **Preset Volume for the next Delivery Segment.**
   b. Press **<MODE>** to enter the Preset on Dollars.
      - Press **<START/STOP>** to save the **Preset on Dollars**
   c. Press the **<START/STOP>** key to save the **Preset Volume** and enable the next **Preset Volume for the next Delivery Segment.**

5. Press **<MODE>** to edit the current Product Price (added in version E138E.

6. Press **<PRINT>** to finalize and end the delivery.
   a. ***VALVES CLOSED*** will be shown and the **Fuel Delivery Ticket** will print.
   b. The **Delivered Volume** will remain on the display.

Note: <START/STOP> functions as an **<EMERGENCY STOP>** button while product is flowing. After an **<EMERGENCY STOP>** the **Security Valve** will be closed. The **Fuel Delivery Report** will not print until **<PRINT>** is pressed.

Hose Packing

To Enable the Hose Packing feature of the E:Count, turn the Hose Pack item (**HOSEPK)** in the Setup Menu to **ON.**

Hose Packing is intended to allow the operator to pressurize the hose as needed.

Per Weights and Measures specifications up to 1.0 Gallon or 0.3 Litres may be pumped into the hose to Pack the Hose before or after the delivery.

Selecting HOSEPK on the Delivery Menu will cause the E:Count to open the Stage 2 (slow flow) valve.

If less than 1.0 Gallon or 0.3 Litres are pumped during a Hose Pack operation the E:Count will automatically discard that volume; it will not be added to either a delivery volume or a shift volume.

If more than 1.0 Gallon or 0.3 Litres are pumped during a Hose Pack operation the E:Count will automatically reset and begin a delivery at the accumulated volume, 1.1 Gallons or 0.4 Litres respectively.

Broken Valve Detection

The E:Count will automatically reset and begin a delivery if either of the valves fail (or if either of them are incorrectly installed) and product is allowed to flow outside of a delivery.

Preset Operation

[MCR-09 LT: Preset Is Optional]

The preset function works differently depending on whether the preset amount is entered before the delivery, and/or during the delivery.

"Before the Delivery" is defined as any time a delivery is not active, and continues until the register is reset to begin a delivery. "During the Delivery" is defined as the time between pushing the <START/STOP> button to start a delivery and the meter ticket being printed.

Preset Before the Delivery:

- The preset amount may be entered any number of times.
- The last entry is saved as the "TARGET" preset amount.
- A volume of zero (00000.0) means no preset for the delivery, any amount may be delivered.

Each time the <PRESET> button is pressed to enter an amount the last amount entered before the start of the delivery will be displayed. This is true for entries made during deliveries and also on subsequent deliveries. This feature facilitates batching situations. The one exception to this is if the "PRESET REQUIRED" option has been turned on in SETUP. If so the default amount displayed is always zero.

Preset During the Delivery:

- Multiple presets are allowed during the delivery.
- Preset entries made during a delivery are additive in nature. The amount entered is added to the original TARGET amount to create a new Preset TARGET amount.
    - Example:
    - Original preset amount of 80 gallons is delivered and the valves will shut.
    - The user wants to deliver 20 more gallons and therefore 20 is entered for the next preset.
    - The E:Count does the math to correctly set the new Target at 100 gallons.
    - Each time a new entry is made the TARGET increases by that amount.
- **Note:** A new preset amount cannot be entered until the last preset is reached. If an attempt to do so is made the E:Count will display "PRESET ACTIVE" and return back to the delivery.

No Preset Entered Before the Delivery

A preset amount may be entered during a delivery even if no preset amount was entered before the delivery. The amount entered should be the total amount to be delivered since the E:Count is using zero as the "original preset", for the "no preset" delivery. Note: If the amount entered is less than what has already been delivered the E:Count will shut the preset valve immediately on resuming the delivery.

Note: If a situation occurs that the delivery has started and the preset amount is incorrect, the procedure would be to print the ticket at the current amount and start over with the correct preset amount.

Preset on Dollars

When **<PRESET>** is pressed the volume displayed will be the current Preset Volume.

The **<MODE>** button may be pressed to switch to **MONEY**.

Use the Arrow keys to modify the Preset on Dollars Amount.

Press **<START/STOP>** to save the target Preset on Dollars Amount. The equivalent Preset Volume required based on the current pricing will be calculated and shown, allowing the new Preset Volume to be modified if necessary.

The Preset Volume is 'saved' when the **<START/STOP>** button is pressed.

Batch Mode Preset (E179 Rev3 and earlier)

When **Batch Mode** is ***ON*** the **Preset Volume** is saved both between deliveries and when the E:Count is powered off. Every delivery performed during **Batch Mode** use the existing **Preset Volume**, which may only be modified before the delivery.

During a **Batch Mode** delivery both pressing <START/STOP> *and* reaching the **Preset Volume** will end the delivery and print the Meter Ticket.

The **Host Mode Preset** and **Host Mode Reset** functions are *not valid* when **Batch Mode** is **ON**.

Multiple Presets in a Single Delivery

The MID:COM E:Count is capable of **Multiple Presets**. The following is an example of a blending delivery:

1. Press **<PRESET>** to enter the Preset Screen
   a. Use the **<ARROW>** keys to set the **initial** Preset Volume
   b. Press **<START/STOP>** on the Preset Screen to save the **initial** Preset Volume
2. Press **<START/STOP>** to open the security valves and **begin** the delivery
   a. When the Preset Volume is reached the valves will close
3. Press **<PRESET>** to enter the Preset Screen
   a. Use the **<ARROW>** keys to set the **next** Preset Volume
   b. Press **<START/STOP>** on the Preset Screen to save the **next** Preset Volume
4. Press **<START/STOP>** to open the security valves and **continue** the delivery
   a. When the Preset Volume is reached the valves will close.

At the beginning of each delivery the Preset Volume is 0 unless a Preset is entered using the **<PRESET>** key. When **<PRESET>** is pressed during the delivery the previous Preset Volume value will be displayed. The Preset Volume is 'saved' when the **<START/STOP>** button is pressed.

During the delivery the Preset Volume is an additive field, not an absolute value. That is, each time the **<START/STOP>** button is pressed (to save the Preset Volume) the New Preset Target is the total of the Preset Volumes that have been entered during the delivery.

Example: A delivery of 100 units of 80%/20% diesel/kerosene

Blending is used primarily for preventing diesel from freezing during cold weather. The initial Preset Volume would be 80 (for 80 units of diesel). After delivering 80 units the valves close automatically. The operator would next set the Preset Volume to 20 (which indicates that the E:Count should add 20 additional units to the Preset Target). After delivering the 20 units of kerosene (yielding a 20% blend) the valves will again close automatically.

The additive method of multiple presets is intended to prevent the operator from having to do math. He simply sets the next Preset Volume to be the volume of the product to be delivered.

Editing Product Price During (or After) Delivery

With Currency enabled, pressing the **<RIGHT ARROW>** button during the delivery while product is not flowing will display the price for the Current Product and allow it to be changed.

If Currency is disabled, pressing the **<RIGHT ARROW>** during the delivery will *not* display the price.

The price may be changed up until the actual delivery Meter Block is printed.

Multiple Product Price Adjustment

The price of all valid products may be adjusted by a specific amount using the PRCADJ command on the MONEY Menu.

The price(s) will be increased (ADD) or decreased (SUB) depending on the selection.

When **<START/STOP>** is selected on PRCADJ, a price adjustment amount may be entered.

After entering the price adjustment amount, pressing **<START/STOP>** will display ADD. Press **<UP>** to select ADD or <DOWN> to select SUB (or subtract).

After selecting ADD or SUB, press **<START/STOP>** to force the adjustment on all prices.

Delivery Menu

Delivery Menu Categories

- ***HOSEPK*** – Enable Hose Pack – Open Stage 2 Valve
- ***PRCODE*** – Display or Change the Active Product Code
- ***QOB*** – Display or Change the Quantity On Board
- ***MONEY*** – Enter Currency Mode (179 and older)
- ***TIMOVR*** – Display or Change the Flow Timer Override
- ***SHIFT*** – End the Shift and Print the Shift Report
- ***DRIVER*** – Display or Change the Driver Number
- ***TOTAL*** – Display the Totalizer
- ***DISVOL*** – Display the Gross and Net Delivery Volumes
- ***TEMP F*** – Display the current Product Temp in Degrees F
- ***TEMP C*** – Display the current Product Temp in Degrees C
- ***CALTKT*** – Print a Calibration Ticket
- ***SETUP*** – Enter the Setup Menu
- ***EXIT*** – Return to Delivery Mode

When entering the Delivery Menu the E:Count will display the current Delivery Menu Category.

To display the next Delivery Menu Category press **<MODE>.**

To view or modify the Delivery Menu Category press **<START/STOP>.**

To exit the Delivery Menu and return to Delivery Mode press and hold **<MODE>,** or press and hold **<RIGHT ARROW>** to display ***EXIT,*** and then press **<START/STOP>.**

To enter Setup Mode:

1. Press and hold **<MODE>** until ***SETUP*** is displayed in the Delivery Menu
2. Press **<START/STOP>**
   a. The E:Count will display ***ENTER CODE.***
3. Enter the **Security Code** and press **<START/STOP>.**
   a. If the **Security Code** is correct ***OK*** will be displayed and the E:Count will enter Setup Mode.
   b. If the **Security Code** entered is NOT correct ***NOGOOD*** will be displayed and the E:Count will return to Delivery Mode.

Note: The factory default **Security Code** is 000000.

Delivery Menu (continued)

Delivery Menu Categories

HOSEPK – Open Valve to Pack the Hose
Press **<START/STOP>** to Open Stage 2 (Slow Flow) Valve to Pressurize Hose.

PRCODE – Product Code
Press **<START/STOP>** to set the current **Product Code.**
The **Product Code** is a 2-digit number from 00 to 99.
Use the **<ARROW>** keys to change the **Product Code.**
Press **<START/STOP>** to save the **Product Code** and return to Delivery Mode.

Note on Product Code:
Changing the **Product Code** affects all calibration data. The **Calibration Factor**, **Temperature Compensation Setting** (enabled or disabled), and the **Stage 2 Dwell** are all stored separately for each **Product Code.** Changing the **Product Code** will load the saved value for each of these variables.

QOB – Quantity on Board
Press **<START/STOP>** to display or set the **Quantity on Board** for the current **Product Code.**
The **Quantity on Board** is a 6-digit number from 00000.0 to 99999.9.
Use the **<ARROW>** keys to change the **Quantity on Board.**
Press **<START/STOP>** to save the **Quantity on Board** and return to Delivery Mode.

MONEY – Currency Mode
Press **<START/STOP>** to enter Currency Mode.
The E:Count will display the Currency Menu.

Delivery Menu (continued)

TIMOVR – No Flow Timer Override
Press **<START/STOP>** to display the current **Timer Override** setting.
Press **<UP>** to disable the No Flow Timer for the Next Delivery (**Timer Override is ON**). The message "MULTIPLE TANK DELIVERY AT ONE SITE ONLY" will print on the delivery ticket. The Timer will automatically be enabled at the start of the next delivery.
Press **<DOWN>** to enable the No Flow Timer for the Next Delivery (**Timer Override is Off**).
The **TIMOVR** default value at the beginning of each delivery is **OFF**.
Press **<START/STOP>** to save the **Timer Override** and return to Delivery Mode.

Note on Timer Override:
If the **TIMER** setting in the **Calibration Menu** is **OFF**, the **TIMOVR** menu item will not be shown.

SHIFT – Shift Report
Press **<START/STOP>** to print the current **Shift Report**.
The E:Count will return to Delivery Mode automatically when **Shift Report** printing is complete.

DRIVER – Driver Code
Press **<START/STOP>** to set the current **Driver** code.
The **Driver** code is a 4-digit number from 0000 to 9999.
Use the **<ARROW>** keys to change the **Driver** code.
Press **<START/STOP>** to save the **Driver** code and return to Delivery Mode.

TOTAL – Totalizer
Press **<START/STOP>** to display the Current Totalizer.
The **Net Totalizer** will be displayed if Temperature Compensation is enabled – OR – the **Gross Totalizer** will be displayed if temperature compensation is disabled.
The **Totalizer** display requires two screens to show all of the **Totalizer** data; initially only the right-most 5 digits and the tenths will be displayed.

To view the left **Totalizer** digits press the **<LEFT ARROW>**.
To view the right **Totalizer** digits press the **<RIGHT ARROW>**.
Press **<START/STOP>** to exit the **Totalizer** and return to Delivery Mode.

Delivery Menu (continued)

DISVOL – Volumes
Press **<START/STOP>** to display the **Gross Volume** or the **Net Volume** of the previous delivery.
Press **<UP>** to display the **Net Volume.**
Press **<DOWN>** to display the **Gross Volume.**
Press **<START/STOP>** to return to Delivery Mode.

TEMP F – Current Product Temperature in Degrees F
Press **<START/STOP>** to display the **Current Temperature.**
The current Temperature in **Degrees Fahrenheit** will be displayed (if the temperature probe is installed).
Press **<START/STOP>** to return to Delivery Mode.

TEMP C – Current Product Temperature in Degrees C
Press **<START/STOP>** to display the **Current Temperature.**
The current Temperature in **Degrees Celsius** will be displayed (if the temperature probe is installed).
Press **<START/STOP>** to return to Delivery Mode.

CALTKT – Calibration Report
Press **<START/STOP>** to print the current **Calibration Report.**
The E:Count will return to Delivery Mode automatically when **Calibration Report** printing is complete.

SETUP – Enter Setup Mode
Press **<START/STOP>** to enter Setup Mode.
ENTER CODE and then ***000000*** will be displayed and the **Security Code** must be entered to continue.
Use the ***<ARROW>*** buttons to enter the current **Security Code.**
Press **<START/STOP>** to enter the **Security Code** and continue in Setup Mode.
If the **Security Code** entered is correct the E:Count will display ***OK*** and begin Setup Mode.
If the Security Code entered is incorrect the E:Count will display ***NOGOOD*** and return to Delivery Mode.

Note: The factory default **Security Code** is 000000.

EXIT – Exit Delivery Menu
Press **<START/STOP>** to exit the Delivery Menu and return to Delivery Mode.

Currency Mode

Currency Mode Categories:

- ***PRICE*** – Display or Change the Price for the Current Product
- ***TAX 1*** – Display or Change the Tax 1 Rate
- ***TXTYP1*** – Display or Change the Tax 1 Type
- ***TAX 2*** – Display or Change the Tax 2 Rate
- ***TXTYP2*** – Display or Change the Tax 2 Type
- ***TAXSUB*** – Display or Change 'Tax 1 Subject to Tax 2'
- ***DISCNT*** – Display or Change the Discount Rate
- ***DSCTYP*** – Display or Change the Discount Type
- ***DSCDAY*** – Display or Change the Discount Days
- ***PRCADJ*** – Price Adjustment for all Valid Products
- ***EXIT*** – Return to Delivery Mode

To display the next Currency Category press **<MODE>.**

To view or modify the Currency Category press **<START/STOP>.**

To exit Money Mode and return to Delivery Mode press and hold **<MODE>** or press and hold **<RIGHT ARROW>** until the E:Count displays ***EXIT*** and then press **<START/STOP>.**

Currency Mode (continued)

Currency Mode Categories

PRICE – Set the Price for the Current Product
Press **<START/STOP>** to set the **Price.**
The **Price** is a number from 0.0000 to $9.9999.
Use the **<ARROW>** keys to change the **Price.**
Press **<START/STOP>** to save the **Price** and return to Money Mode.

TAX 1 – Set Tax 1 Rate
Press **<START/STOP>** to set the **Tax 1 Rate.**
The **Tax 1 Rate** is a number from 00.0000 to $9.9999 or 99.9999%.
Use the **<ARROW>** keys to change the **Tax 1 Rate.**
Press **<START/STOP>** to save the **Tax 1 Rate** and return to Money Mode.

TXTYP1 – Set Tax 1 Type
Press **<START/STOP>** to set the **Tax 1 Type.**
The **Tax 1 Type** is either **PERCNT** or **DOLLAR.**
PERCNT will calculate the tax at the tax rate as a percentage of the extension price.
DOLLAR will calculate the tax using the tax rate per unit volume.
Use the **<UP/DOWN ARROW>** keys to change the **Tax 1 Type.**
Press **<START/STOP>** to save the **Tax 1 Type** and return to Money Mode.

TAX 2 – Set Tax 2 Rate
Press **<START/STOP>** to set the **Tax 2 Rate.**
The **Tax 2 Rate** is a number from 00.0000 to $9.9999 or 99.9999%.
Use the **<ARROW>** keys to change the **Tax 2 Rate.**
Press **<START/STOP>** to save the **Tax 2 Rate** and return to Money Mode.

Currency Mode (continued)

TXTYP2 – Set Tax 2 Type
Press **<START/STOP>** to set the **Tax 2 Type.**
The **Tax 2 Type** is either **PERCNT** or **DOLLAR.**
PERCNT will calculate the tax at the tax rate as a percentage of the extension price.
DOLLAR will calculate the tax using the tax rate per unit volume.
Use the **<UP/DOWN ARROW>** keys to change the **Tax 2 Type.**
Press **<START/STOP>** to save the **Tax 2 Type** and return to Money Mode.

TAXSUB – Setup Subtotal Tax
Press **<START/STOP>** to set the **Subtotal Tax**, that is whether Tax 1 is Subject to Tax 2.
The **Subtotal Tax** is either **ON** or **OFF.**
ON will calculate Tax 2 including Tax 1.
OFF will calculate Tax 2 excluding Tax 1.
Use the **<UP/DOWN ARROW>** keys to change the **Subtotal Tax.**
Press **<START/STOP>** to save the **Subtotal Tax** and return to Money Mode.

DISCNT – Set the Discount Rate
Press **<START/STOP>** to set the **Discount Rate.**
The **Discount Rate** is a number from 00.0000 to $9.9999 or 99.9999%.
Use the **<ARROW>** keys to change the **Discount Rate.**
Press **<START/STOP>** to save the **Discount Rate** and return to Money Mode.

DSCTYP – Set the Discount Type
Press **<START/STOP>** to set the **Discount Type.**
The **Discount Type** is either **PERCNT** or **DOLLAR.**
PERCNT Discount = (Discount Rate * Total Amount Due)
DOLLAR Discount = (Discount Rate * Volume Delivered)
Use the **<UP/DOWN ARROW>** keys to change the **Discount Type.**
Press **<START/STOP>** to save the **Discount Type** and return to Money Mode.
Note: The Percent Discount is a "Bottom-Line" discount, all charges are discounted. The Dollar Discount is a "Rebate" discount, only the cost of the product is discounted.

Currency Mode (continued)

***DSCDAY* –** Set the Discount Days
Press **<START/STOP>** to set the **Discount Days.**
The **Discount Days** is a number from 00 to 99.
The **Discount Days** will print on the Delivery Ticket and inform the customer when they need to pay in order to deduct the discount amount.
Use the **<ARROW>** keys to set the **Discount Days.**
Press **<START/STOP>** to save the **Discount Days** and return to Money Mode.

PRCADJ – Adjust the price for all valid products
Press <START/STOP> to enter the amount of the Price Adjustment.
The **Price Adjustment i**s an amount from 0.0001 to 9.9999.
The **Price Adjustment will be applied to all valid products.**
Use the **<ARROW>** keys to set the **Discount Days.**
Press **<START/STOP>** to save the **Price Adjustment,** then press **<UP>** to select **ADD** or press **<DOWN>** to select **SUB** (or subtract).
Press **<START/STOP>** to apply the **Price Adjustment** and return to Money Mode.

EXIT – Exit Money Mode
Press **<START/STOP>** to exit Money Mode and return to Delivery Mode.

Setup Mode

Setup Categories:

- ***NEWCOD*** – Display or Change the Security Code
- ***STAGE1*** – Display or Change the Stage 1 Shutoff Value
- ***STAGE2*** – Display or Change the Stage 2 Dwell Value
- ***TIME*** – Display or Change the E:Count System Time
- ***DATE*** – Display or Change the E:Count System Date
- ***SALE*** – Display or Change the Next Sale Number
- ***TRUCK*** – Display or Change the System Truck Number
- ***REGNUM*** – Display or Change the Active Register Number (180)
- ***CURNCY*** – Display or Change the Currency Setting (179)
- ***PS RQD*** – Display or Change the Preset Requirement (179)
- ***PRINTR*** – Display or Change the Printer Type
- ***COPIES*** – Display or Change the Number of Thermal Copies
- ***HOSEPK*** – Display or Change the Hose Pack Setup
- ***SS RST*** – Enable/Disable the Start/Stop Reset Function
- ***6501PF*** – Enable/Disable the Midcom 6501 Print Format (179)
- ***HOSTFX*** – Set the Host Command Prefix Requirement
- ***BATCH*** – Display or Change the Batch Mode Setting (179)
- ***EXIT*** – Return to Delivery Mode

When entering Setup Mode the E:Count will require the operator to enter the **Security Code** to continue. After a valid Security Code is entered the E:Count will display the first Setup Category.

To display the next Setup Category press **<MODE>.**

To view or modify the Setup Category press **<START/STOP>.**

To exit Setup Mode and return to Delivery Mode press and hold **<MODE>** or press and hold **<RIGHT ARROW>** until the E:Count displays ***EXIT*** and then press **<START/STOP>.**

Note: The factory default **Security Code** is 000000.

Setup Mode (continued)

Setup Categories

NEWCOD – Set Security Code
Press **<START/STOP>** to set the **Security Code.**
The **Security Code** is 6 digits from 000000 to 999999.
Use the **<ARROW>** keys to change the **Security Code.**
Press **<START/STOP>** to save the **Security Code** and return to Setup Mode.

STAGE1 – Stage 1 (Fast Flow) Shutoff Volume
[MCR-09 LT: Stage1 Not Available]
Press **<START/STOP>** to set the **Stage 1 Shutoff** Volume.
The **Stage 1 Shutoff** Volume is a whole number from 00 to 99.
Use the **<ARROW>** keys to change the **Stage 1 Shutoff.**
Press **<START/STOP>** to save the **Stage 1 Shutoff** and return to Setup Mode.

STAGE2 – Stage 2 (Slow Flow) Dwell Volume
[MCR-09 LT: Stage2 Not Available]
Press **<START/STOP>** to set the **Stage 2 Dwell** Volume.
The **Stage 2 Dwell** Volume is tenths of units from 000.0 to 999.9.
Use the **<ARROW>** keys to change the **Stage 2 Dwell.**
Press **<START/STOP>** to save the **Stage 2 Dwell** and return to Setup Mode.

TIME – System Time
Press **<START/STOP>** to set the current **System Time.**
The **Time** will be displayed in 24 hour format HH.MM.
Use the **<ARROW>** keys to set the **System Time.**
Press **<START/STOP>** to save the **System Time** and return to Setup Mode.

DATE – System Date
Press **<START/STOP>** to set the current **System Date.**
The **Date** will be displayed in the format MM.DD.YY.
Use the **<ARROW>** keys to set the **System Date.**
Press **<START/STOP>** to save the **System Date** and return to Setup Mode.

Setup Mode (continued)

SALE **-** Next Sequential Sale Number
Press **<START/STOP>** to set the **Next Sequential Sale Number.**
The **Next Sequential Sale Number** will be displayed.
Use the **<ARROW>** keys to set the **Next Sequential Sale Number.**
Press **<START/STOP>** to save the **Next Sequential Sale Number** and return to Setup Mode.

TRUCK **-** Truck Number
Press **<START/STOP>** to set the **Truck Number.**
The **Truck Number** will be displayed.
Use the **<ARROW>** keys to set the **Truck Number.**
Press **<START/STOP>** to save the **Truck Number** and return to Setup Mode.

CURNCY - Currency Setting
[MCR-09 LT: Currency Not Available]
Press **<START/STOP>** to display the **Currency Setting.**
Press the **<DOWN ARROW>** to cycle through the available CURRENCY settings:

```
ALL    = Pricing will always be printed (175 + newer)
CHK PR = Pricing will only be printed if Price > 0
         (was ON in 174 and older)
OFF    = Pricing disabled
```

Press **<START/STOP>** to save the **Currency Setting** and return to the Setup Mode.

NOTE: If the Decimal Setting on the Calibration Menu is off the Currency Menu will also be disabled.

PS RQD - Preset Required
[MCR-09 LT: Preset Required Not Available]
Press **<START/STOP>** to display the **Preset Required Setting.**
Press the **<UP ARROW>** to turn **ON** the **Preset Required Setting.**
Press the **<DOWN ARROW>** to turn **OFF** the **Preset Required Setting.**
Press **<START/STOP>** to save the **Preset Required Setting** and return to the Setup Mode.

PRINTR - Printer Setup
Press **<START/STOP>** to display the **Printer Type.**
Press the **<DOWN ARROW>** to cycle through the **Printer Types.**
Press **<START/STOP>** to save the **Printer Type** and return to the Setup Mode.

Setup Mode (continued)

COPIES – Thermal Printer Ticket Copies
Press **<START/STOP>** to display the **Number of Thermal Copies.**
Press the **<UP ARROW>** to increase the number **Copies.**
Press the **<DOWN ARROW>** to decrease the number of **Copies.**
Press **<START/STOP>** to save the **Number of Thermal Copies** and return to the Setup Mode.

Printer Copies Note: Only the **THERMAL** printers allow the selection of the number of copies, all other printer types print only 1 copy per delivery.

HOSEPK – Hose Packing Setting
Press **<START/STOP>** to display the **Hose Pack Setting.**
Press the **<UP ARROW>** to turn **ON** Hose Packing in the Delivery Menu.
Press the **<DOWN ARROW>** to turn **OFF** Hose Packing in the Delivery Menu.
Press **<START/STOP>** to save the **Hose Pack Setting** and return to the Setup Mode.

SS RST – Enable or Disable START/STOP Reset
Press **<START/STOP>** to display the START/STOP Reset.
Press the **<DOWN ARROW>** to cycle through the available settings for 'START/STOP Reset':
ON – this will allow the operator to use the START/STOP button to begin a delivery. The operator may begin a delivery at the E:Count, or a Host computer application may begin a delivery.
NSSOHM – this will prevent the operator from using the START/STOP button to re-open the valves after they have been closed in a Host-mode delivery; only the Host software application may re-open the valves.
OFF – this will prevent the operator from using the START/STOP button to begin a delivery. A Host computer application is ***required*** to initiate every delivery, there is no means for the Operator to begin a delivery at the E:Count.
Press **<START/STOP>** to save the START/STOP Reset and return to the Setup Mode.

Setup Mode (continued)

6501PF – 6501 Print Format

Press **<START/STOP>** to display the **6501 Print Format Setting.**

Press the **<UP ARROW>** to turn **ON** the 6501 Print Format for all Meter Tickets.

Press the **<DOWN ARROW>** to turn **OFF** the 6501 Print Format for all Meter Tickets.

Press **<START/STOP>** to save the **6501 Print Format Setting** and return to the Setup Mode.

NOTE: Setting the **6501 Print Format Setting** to **ON** will do the following:

1. Set CURRENCY to ON and prevent it from being disabled.
2. Set TAX2RATE to 0.00 and prevent it from being changed.
3. Set PRINTER to MIDCOM and prevent it from being changed.
4. Restrict the lines that print on the Meter Ticket to those required to be compatible with the MID:COM 6501b Computer Register.

HOSTFX – Require Prefix Character for Host Commands

[MCR-09 LT: HOSTFX Not Available]

Press **<START/STOP>** to display the **HostFix Setting.**

Press the **<DOWN ARROW>** to cycle through the available HOSTFIX settings:

- ALL = All Host Commands are required to have the prefix character, requires new Matrix (2.0.0.524 or newer) as well as updated Host Software written to comply with these requirements (175 + newer)
- MATRIX = Require the Matrix-Only commands to have the prefix character, requires new Matrix (2.0.0.524 or newer), does not require updated Host Software.
- OFF = Host Command Prefix Requirement disabled

Press **<START/STOP>** to save the **HostFix Setting** and return to the Setup Mode.

Setup Mode (continued)

KEYSON – Print + Preset Key Setting

Press **<START/STOP>** to display the **Print + Preset Key Setting.**

Press the **<DOWN ARROW>** to cycle through the settings for the **Print + Preset Key** Setting:

BOTHON: Default, Both Enabled
NOPRNT: Print Key Disabled, Preset Key Enabled
NOPRST: Preset Key Disabled, Print Key Enabled
BOTHOF: Both Print + Preset Keys Disabled

Press **<START/STOP>** to save the **Print + Preset Key Setting** and return to the Setup Mode.

EXIT – Exit Setup Mode

Press **<START/STOP>** to exit Setup Mode and return to Delivery Mode.

Printing Options

Black Mark Sensor

Sensing a Black Mark on the paper allows a "Duty to Warn" message to be pre-printed on the back of the thermal paper roll and will automatically advance the ticket as necessary to ensure that the entire "Duty to Warn" message is visible.

To utilize the Black Mark Sensor in the printer:

1. Purchase the "Duty to Warn" preprinted paper rolls from MID:COM. If a local vendor is to be used, have them contact MID:COM for the specifications for the paper.
2. Configure the printer with Black Mark Sensor functions enabled, contact MID:COM for more information if the setting is to be changed in the field.
3. Set the E:Count to use the appropriate Setup Printer setting.

For programming other printer models supporting Black Mark Sensors contact MID:COM or your distributor.

Logo Printing

As of release E178F there are several thermal printers with a built-in Logo Printing function that the E:Count supports. The logo must be sent by the end-user to the MID:COM factory prior to shipping the printers in order for the logo to be converted and loaded. The logo will be printed at the top of every Meter Ticket and Duplicate Ticket.

To utilize the Logo Printing in the E:COunt:

1. Send the desired logo file to MID:COM.
2. MID:COM will convert and load the logo into the printer(s).
3. Set the E:Count to use the Setup Printer setting.

For programming other printer models supporting Logo Printing contact MID:COM or your distributor.

Calibration Mode

To enter Calibration Mode back out the <**CALIBRATION SCREW>** – the E:Count will display ***CALBRT MODE*** and enter Calibration Mode.

If the **Compensator** is turned **ON,** the VOLUME CORRECTED TO legend will display and the **Net Volume** will be displayed. If the **Compensator** is turned **OFF,** the VOLUME CORRECTED TO legend will **NOT** display and the **Gross Volume** will be displayed.

Security Valve Note: The security valve will be open while the E:Count is in Calibration Mode allowing the operator to directly control product flow.

Delivery Ticket Note: No delivery tickets will print while the E:Count is in Calibration Mode.

At the completion of Calibration Mode (after the tightening of the **<CALIBRATION SCREW>**) the E:Count will return to Delivery Mode.

Note on Calibration Data:

Set the **Product Code** before changing any calibration data. The **Calibration Factor, Compensation Setting** (enabled or disabled), and the **Stage 2 Dwell** are all stored separately for each **Product Code.** Changing the **Product Code** will load the saved value for each of these variables.

Auto-Calibration

Auto-Calibration is a process where the E:Count will calculate a Calibration Factor based on Raw Pulses and the Prover Volume during a Calibration Delivery. Auto-Calibration will calculate the Gross Meter Calibration Factor and may be used whether a product has been assigned a Compensation Table Number or not.

Prior to the Auto-Calibration process the E:Count must be fully configured. Refer to "Section 6 Required E:Count Configuration Settings" for more information. It is important to note that the MRATIO must be set prior to calibration, and that after changing the MRATIO the E:Count must be power-cycled for the new MRATIO to be used.

Auto-Calibration Procedure:

1. Select the PRCODE for the product to be calibrated.
2. If the Calibration Factor (CALFAC) for the selected product is 0.0000 set it to 1.0000. The CALFAC from a previous calibration should be used for an existing installation.
3. Perform the Auto-Calibration Delivery:
    a. Press <START/STOP> to begin the Calibration Delivery.
    b. Fill the Prover to the desired volume.
    c. Press <START/STOP> to end Calibration Delivery.
    d. Press and hold <MODE> until ATOCAL is displayed.
    e. Press <START/STOP> on ATOCAL.
    f. Use the <ARROW> keys to enter the Prover Delivered Volume indicated on the Prover.
    g. Press <START/STOP> to save the Prover Volume.
        i. The E:Count will display WAIT while calculating; when calculation is complete the E:Count will display DONE and then return to ATOCAL.
        ii. Calculations take several seconds.
        iii. To view the new Calibration Factor press <MODE> until CALFAC is displayed.
    h. Press and hold <MODE> until EXIT is displayed.
    i. Press <START/STOP> on EXIT to exit the Calibration Menu and return to Calibration Mode.
4. Repeat the Auto Calibration Procedure for each product to be calibrated.

Note: Auto-calibration will only calculate a Calibration Factor in the range of 0.7000 to 1.9999.

Calibration Mode (continued)

Calibration Menu Categories:

- ***PRCODE*** – Display or Change the Current Product Code
- ***DISVOL*** – Display Gross and Net Volumes
- ***ATOCAL*** – Enter the Prover Volume for Auto-Calibration
- ***CALFAC*** – Display or Change the Calibration Factor
- ***TEMP F*** – Display the current Product Temp in Degrees F
- ***TEMP C*** – Display the current Product Temp in Degrees C
- ***TABLE*** – Display the current Compensation Table Value
- ***MRATIO*** – Display or Change the Meter Ratio
- ***CMPTBL*** – Display or Change the Compensation Table Number
- ***SERIAL*** – Display or Change the Register Serial Number
- ***TIMER*** – Display or Change the No Flow Timeout
- ***REGNUM*** – Display or Change the Active Register Number
- ***U TYPE*** – Display or Change Unit Type as Mass or Volume
- ***UNITS*** – Display or Change Units as either Gallons or Litres
- ***PGROSS*** – Display or Change the Print Gross Volume setting
- ***DECMAL*** – Display or Change the Decimal Point setting
- ***AIRSEN*** – Display or Change the Air Sensor setting
- ***PROBE*** – Display or Change the Type of Temperature Probe
- ***BRKVLV*** – Display or Change the Broken Valve Setting
- ***DEMO*** – Display or Change the Demo Setting
- ***EXIT*** – Return to Calibration Mode

When entering the Calibration Menu the E:Count will display the current Calibration Menu Category.

To display the next Calibration Menu Category press **<MODE>.**

To view or modify the visible Calibration Menu Category press **<START/STOP>.**

To exit the Calibration Menu and return to Calibration Mode press and hold **<MODE>** or press and hold **<RIGHT ARROW>** until the E:Count displays ***EXIT*** and then press **<START/STOP>.**

Calibration Menu (continued)

Calibration Menu Categories

PRCODE – Product Code
Press **<START/STOP>** to set the current **Product Code.**
The **Product Code** is a 2-digit number from 00 to 99.
Use the **<ARROW>** keys to change the **Product Code.**
Press **<START/STOP>** to save the **Product Code** and return to the Calibration Menu.

Note:
Changing the **Product Code** affects all calibration data. The **Calibration Factor, Temperature Compensation Setting** (enabled or disabled), and the **Stage 2 Dwell** are all stored separately for each **Product Code.** Changing the **Product Code** will load the saved value for each of these variables.

DISVOL – Volumes
Press **<START/STOP>** to display the **Gross Volume** or the **Net Volume** of the previous delivery.
Press **<UP>** to display the **Net Volume.**
Press **<DOWN>** to display the **Gross Volume.**
Press **<START/STOP>** to return to the Calibration Menu.

ATOCAL – Enter Prover Volume for Auto-Calibration
Press **<START/STOP>** to display the Prover Volume that was entered for the previous Calibration Delivery.
Use the arrow keys to set the Prover Volume for the current Auto-Calibration delivery.
Press **<START/STOP>** to save the current Prover Volume, automatically calculate a new Calibration Factor, and return to the Calibration Menu.

CALFAC – Calibration Factor
Press **<START/STOP>** to set the **Calibration Factor.**
The **Calibration Factor** is a number from 0.0000 to 1.9999.
Use the **<ARROW>** keys to change the **Calibration Factor.**
Press **<START/STOP>** to save the **Calibration Factor** and return to the Calibration Menu.

Note:

$$\text{New Factor} = \frac{\text{Prover Volume}}{\text{Gross Register Volume}} * \text{Old Factor}$$

Calibration Menu (continued)

TEMP F – Temperature in Degrees Fahrenheit
Press **<START/STOP>** to display the **Current Temperature**. The current **Temperature in Degrees Fahrenheit** will be displayed (if the temperature probe is installed). Press **<START/STOP>** to return to the Calibration Menu.

TEMP C – Temperature in Degrees Celsius
Press **<START/STOP>** to display the **Current Temperature**. The current **Temperature in Degrees Celsius** will be displayed (if the temperature probe is installed). Press **<START/STOP>** to return to the Calibration Menu.

TABLE – Table Value at Current Temperature
Press **<START/STOP>** to display the current value in the compensation table based on the current temperature. Press **<START/STOP>** to return to the Calibration Menu.

PLSREV – Pulses per Revolution in L415/E180+ and EM13+
Press **<START/STOP>** to display the **Pulses per Revolution**. The Pulses per Revolution Setting is only valid in EM13/ELT13 and newer when used with E180/L415 and newer. Older Encoder/Main versions will use the fixed EM pulses. PLSREV settings are 100 or 256, 256 is the default. Contact the factory for more information. Press **<START/STOP>** to return to the Calibration Menu.

CHANNL – Dual or Single Channel Encoder Input in L415/E180+
Press **<START/STOP>** to display the **Encoder Channels**. The **Encoder Channels** Setting is only valid in EM13/ELT13 and newer when used with E180/L415 and newer. Older Encoder/Main versions will use the fixed EM channels. CHANNL settings are Single or Dual, Dual is the default. Contact the factory for more information. Press **<START/STOP>** to return to the Calibration Menu.

FLODIR – Product Flow Direction through the Meter/Encoder
Press **<START/STOP>** to display the **Current Flow Direction**. The **Encoder Flow Direction** Setting is only valid in EM13/ELT13 and newer when used with E180/L415 and newer. Older Encoder/Main versions will use the fixed EM Flow Direction. FLODIR settings are ClockWise (CW) or Counter-ClockWise (CCW), CW is the default. Contact the factory for more information.
Press **<START/STOP>** to return to the Calibration Menu.

Calibration Menu (continued)

MRATIO – Meter Ratio
Press **<START/STOP>** to enter the **Meter Ratio.**
Use the ***<ARROW>*** buttons to set the **Meter Ratio.**
Press **<START/STOP>** to save the **Meter Ratio** and return to the Calibration Menu.
Note: Contact the MID:COM factory or your distributor for more information about meter ratios and suggested values.

Figure 21. E:Count MRATIO Values

LC METER TYPE	TCS METER TYPE	REV/GAL	REV/LITRE	1:1 GAL	2:1 GAL	1:1 LITRE	2:1 LITRE
M5	700-15	4.08	1.05	40	20	10	5
M7	700-20	5.55	1.42	55	27	14	7
M15	700-30	2.06	0.53	21	10	5	2
M25	700-35	2.06	0.53	21	10	5	2
M30	700-40	0.74	0.19	7	3	2	1
M60	700-45	0.40	0.103	4	2	1	1
2" NEPTUNE				10		2	
2" SMITH				10		2	

VERY IMPORTANT NOTE:
Starting with Version E134E, if the MRATIO is changed the E:Count must be powered down and the restarted in order for the new **MRATIO** to take effect.

Calibration Menu (continued)

CMPTBL – Temperature Compensation Table Value
Press **<START/STOP>** to display the **Temperature Comp. Table.**
Use the ***<ARROW>*** buttons to set the desired **Temperature Compensation Table.**
Press **<START/STOP>** to save the **Temperature Compensation Table** and return to the Calibration Menu.

Figure 22. E:Count Compensation Table Numbers

Comp Table #	Description
00	UNCOMPENSATED
01	PROPANE
02	DIESEL/HEATING OIL
03	GASOLINE
04	LUBE OIL
05	METHANOL
06	ANHYDROUS AMMONIA ***OR*** AVIATION GASOLINE
07	JET-A FUEL
08	JET-B FUEL
09	ETHANOL

NOTE: To disable Temperature Compensation enter a Temperature Compensation Table Value of 00.

SERIAL – E:Count Serial Number
Press **<START/STOP>** to set the **E:Count Serial Number.**
The current **E:Count Serial Number** will be displayed.
This is intended to allow a circuit board in the E:Count to be replaced and set the **E:Count Serial Number** to match the Faceplate of the E:Count.
Use the ***<ARROW>*** buttons to set the **E:Count Serial Number.**
Press **<START/STOP>** to save the **E:Count Serial Number** and return to the Calibration Menu.

TIMER – Timer Setup
Press **<START/STOP>** to display the **Timer Status.**
Press the **<UP ARROW>** to set the **Timer ON.**
Press the **<DOWN ARROW>** to set **Timer OFF.**
Press **<START/STOP>** to save the **Timer Status** and return to the Calibration Menu.

NOTE: If the **TIMER** setting in the **Calibration Menu** is **OFF,** the **TIMOVR** item in the Delivery Menu will not be shown.

Calibration Menu (continued)

REGNUM – Set the Active Register Number to Configure
Press **<START/STOP>** to display the **current Register Number.**
Use the ***<ARROW>*** buttons to set the **current Register Number.**
Press **<START/STOP>** to save the **Register Number** and return to the Calibration Menu.

NOTE: When using the E:Count in standalone mode enter '01' for the Register Number. When using the E:Count in a dual-head configuration with two registers enter '01' or '02' depending on which head is being configured. Both heads must be configured separately.

U TYPE – Select Unit Type
Press **<START/STOP>** to display the **Unit Type.**
Press the **<UP ARROW>** to select **MASS.**
Press the **<DOWN ARROW>** to select **VOLUME.**
Press **<START/STOP>** to save the **Unit Type** and return to the Calibration Menu.

NOTE: For Unit Type VOLUME the UNITS selection will be GALLONS/LITRES, and for Unit Type MASS the UNITS selection will be POUNDS/KILOS.
In MASS mode the compensator is turned off and all references to NET/GROSS are eliminated; CMPTBL, DISVOL, and PGROSS will show NOCOMP when selected.

UNITS – Select Units
Press **<START/STOP>** to display the **Units.**
Press the **<UP ARROW>** to select **LITRES.**
Press the **<DOWN ARROW>** to select **GALLONS.**
Press **<START/STOP>** to save the **Units** and return to the Calibration Menu.

PGROSS – Print the Gross Volume on Delivery Tickets
Press **<START/STOP>** to display the **Print Gross** setting.
Press the **<DOWN ARROW>** to change the **Print Gross** value.
Press **<START/STOP>** to save the **Print Gross** setting and return to the Calibration Menu.

NOTE: When ***PGROSS*** is **ON** the delivery temperature will print on the meter ticket in both °F and °C; if ***PGROSS*** is **OFF** or **NOTEMP** the delivery temperature will not print.

Calibration Menu (continued)

DECMAL – Use Tenths of Units or Whole Units
Press **<START/STOP>** to display the **Decimal** setting.
Press the **<UP ARROW>** to **ON** to **enable the Decimal and use tenths of units for calculations.**
Press the **<DOWN ARROW>** to **OFF** to **disable the Decimal and use whole units for calculations. To be used only for high-rate installations.**
Press **<START/STOP>** to save the **Decimal** setting and return to the Calibration Menu.

NOTE: If the Decimal Setting is off the Currency Menu will also be disabled.

AIRSEN – Optical Air Sensor
Press **<START/STOP>** to display the **Air Sensor** setting.
Press the **<UP ARROW>** to **ON** to **enable the Air Sensor.**
Press the **<DOWN ARROW>** to **OFF** to **disable the Air Sensor.**
Press **<START/STOP>** to save the **Air Sensor** setting and return to the Calibration Menu.

NOTE: The ***AIRSEN*** requires an Electronic Air Sensor (or Electronic Air Eliminator) hardware to be installed. Contact your distributor for more information.

NOTE: The ***AIRSEN*** Menu Item in the *Calibration Menu* is an ON/OFF toggle.

NOTE: If an LC Electronic Air Eliminator is connected to the E:Count the ***AIRSEN*** feature needs to be turned on for the hardware features to be activated.

NOTE: If the ***AIRSEN*** feature is ***ON*** and a Sensor is not connected the valves will never open.

MCR-09 LT AIRSEN, HOSSEL, AUTHRX IMPORTANT NOTE:

AIRSEN is implemented in all LT versions starting with L413. If **AIRSEN** is **ON** then neither **HOSSEL** (Hose Selection) *nor* **AUTHRX** (Host Authorization) can be enabled. Conversely, if either **HOSSEL** or **AUTHRX** is **ON** then **AIRSEN** cannot be enabled. **"NOGOOD"** will be displayed when an attempt is made to configure the LT as such in either case.

Refer to the ***Electronic Air Sensor*** section for additional notes.

Calibration Menu (continued)

PROBE – Type of Temperature Probe Installed
Press **<START/STOP>** to display the **Temperature Probe Type** setting.
Press the **<UP ARROW>** to **RTD** to **enable the RTD Digital Temperature Probe** introduced in June 2007.
Press the **<DOWN ARROW>** to **ANALOG** to enable the **Analog Temperature Probe** used prior to June 2007.
Press **<START/STOP>** to save the **Temperature Probe Type** setting and return to the Calibration Menu.

NOTE: The ***PROBE*** setting will default to RTD as all probes shipped after June 2007 will include the RTD Digital probe. If you are unsure which type of Temperature Probe is installed refer to the following pictures or contact your distributor for more information.

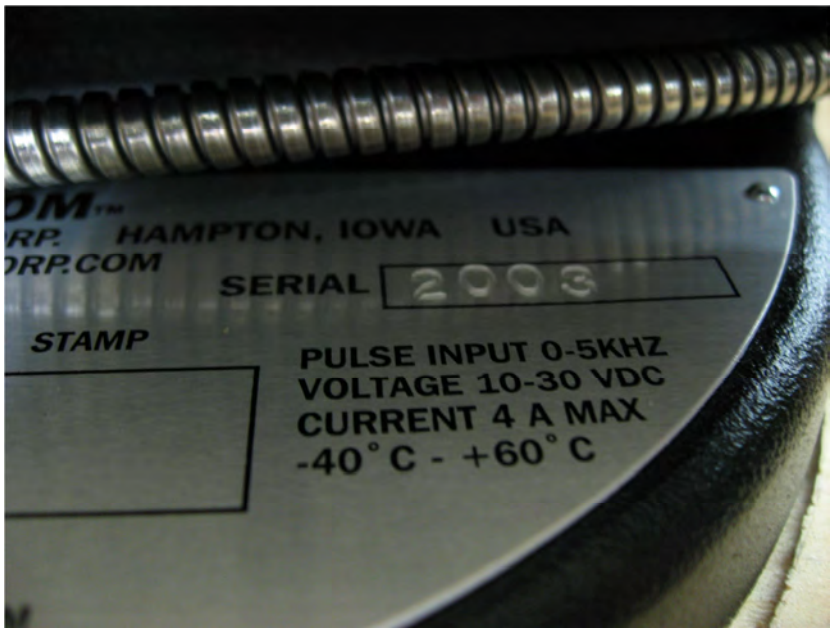
BRKVLV – Enable or Disable the Broken Valve setting.
Press the **<UP ARROW>** to **ON** to **enable** the **Broken Valve Detection** function which allows the E:Count to auto-reset on product flow detection when a delivery is not active.
Press the **<DOWN ARROW>** to **OFF** to disable the **Broken Valve Detection** function.
Press **<START/STOP>** to save the **Broken Valve Detection** setting and return to the Calibration Menu.

DEMO – Enable or Disable the Demo Mode setting.
Press the **<UP ARROW>** to **ON** to **enable** the **Demo Mode.**
Press the **<DOWN ARROW>** to **OFF** to disable the **Demo Mode.**
Press **<START/STOP>** to save the **Demo Mode** setting and return to the Calibration Menu.
Demo Mode Notes:

- Added in **E177F** and **LT309C** as of 2012/10/31.
- Will simulate pulses at a steady rate while valves open and delivery active.
- Will simulate pulses at a slower rate after Stage 1 Dwell reached if Preset active.
- Will stop simulating pulses after Stage 2 reached if Preset active.

EXIT – Exit Calibration Menu
Press **<START/STOP>** to exit the Calibration Menu and return to Calibration Mode.

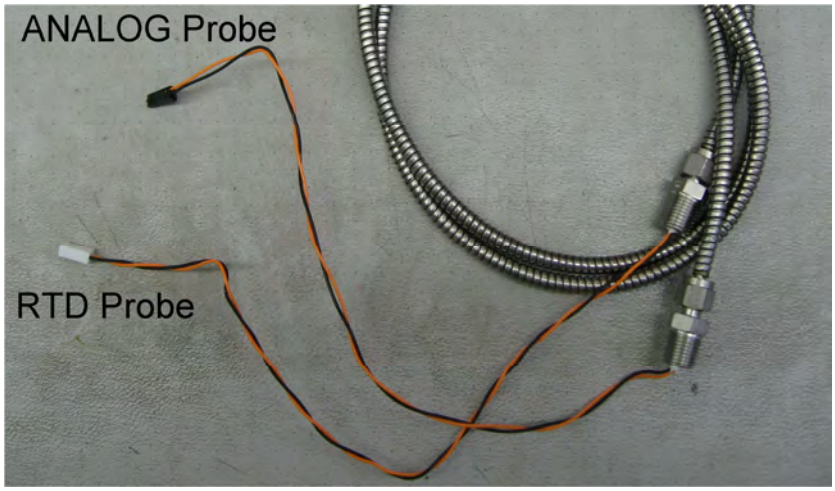
Figure 23. E:Count Temperature Probes and Serial Numbers



If the E:Count MCR-05 Serial Number stamped on the MID:COM Nameplate is greater than 2000 the RTD Digital Temperature Probe is installed.

[MCR-09 LT: All E:Count LT MCR-09 Registers are equipped with an RTD Digital Temperature Probe.]

Figure 24. E:Count Temperature Probes



The Black Connector was used for the Analog Probe and the White Connector is used for the RTD Digital Probe.

Program Mode

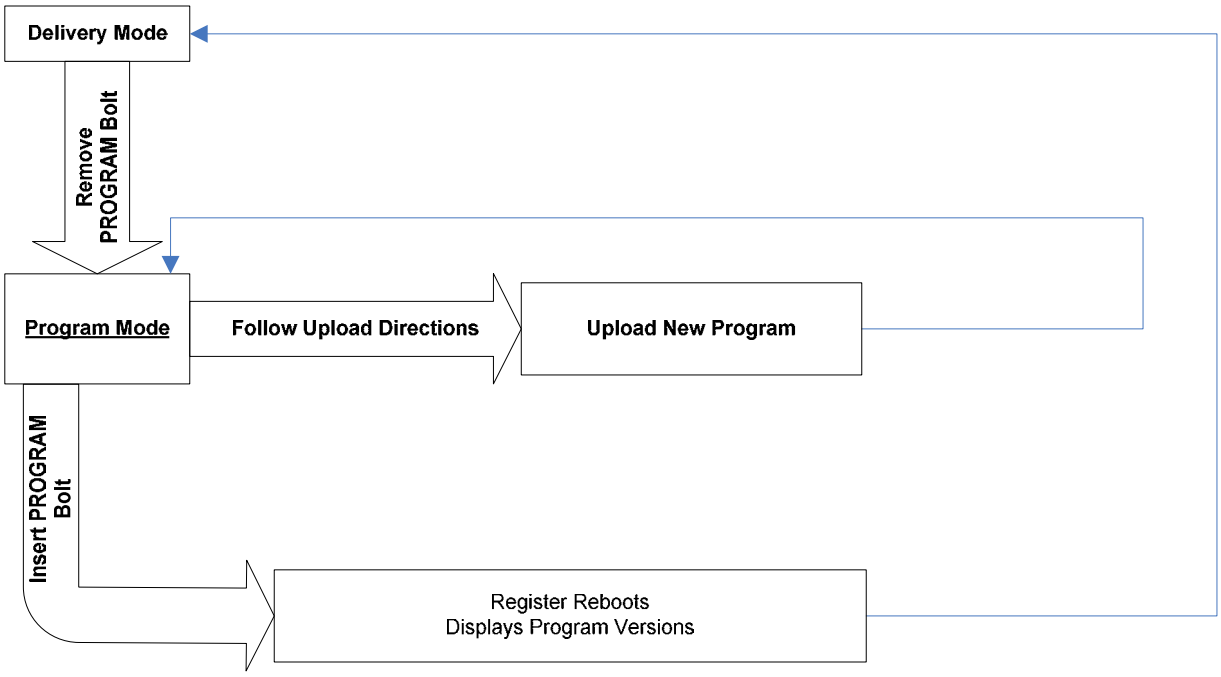
[MCR-09 LT: E:Count LT MCR-09 Registers are *NOT* field programmable, Program Mode is not available in the E:Count LT.]

To enter Program Mode in Delivery Mode back out the <**PROGRAM SCREW**> – the E:Count display will not change however the E:Count will be in Program Mode.

Proceed as directed by MID:COM personnel to complete E:Count programming.

To exit Program Mode (after programming is complete) tighten the **<PROGRAM SCREW>** – the E:Count will reset and will be in Delivery Mode.

Figure 25. E:Count Program Mode



Power-Up

On Power-up the E:Count will:

1. Reset all display elements
2. Perform a set of diagnostic tests
3. Display the Metrological Software Version: M ##
4. Display the User Software Version: U ##
5. Enter Delivery Mode.

Section 7 – SAMPLE TICKETS

Figure 26. E:Count Delivery Tickets

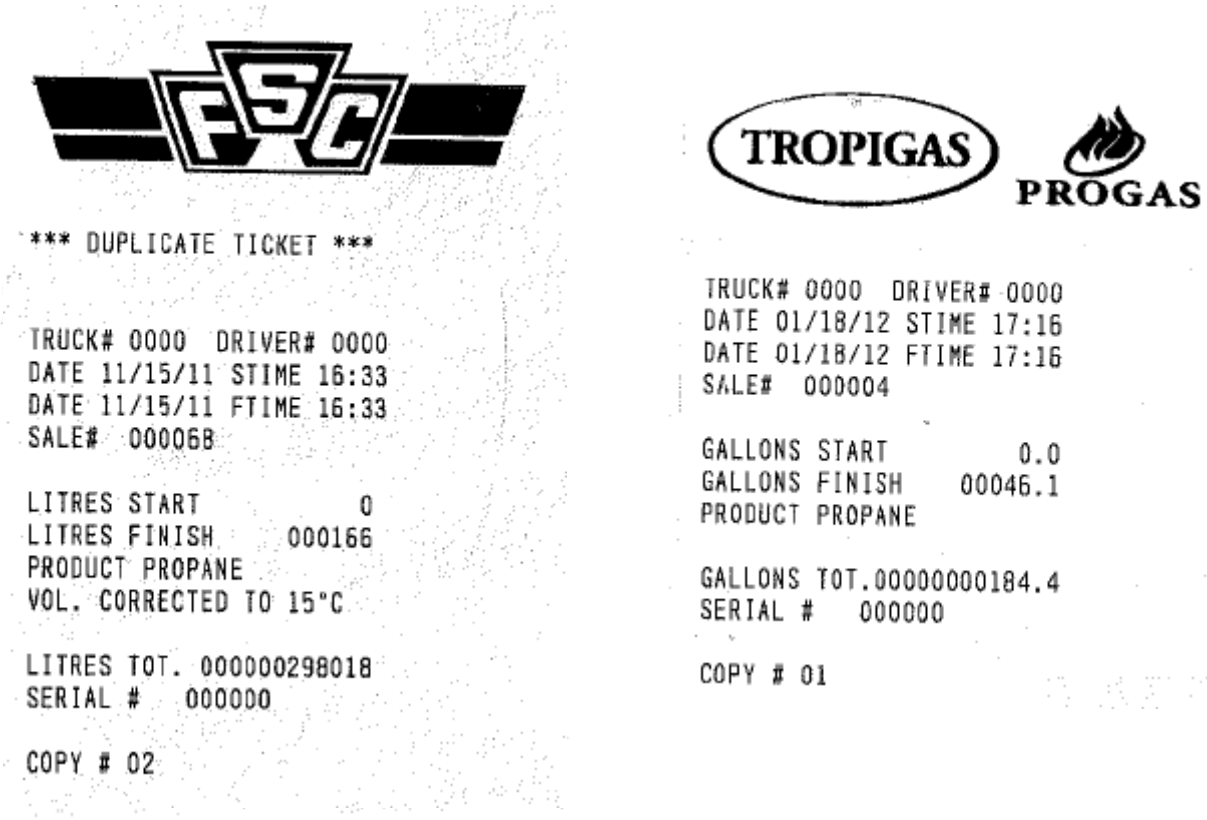
```
    HEADER LINE 1/10
    HEADER LINE 2/10
    HEADER LINE 3/10
    HEADER LINE 4/10
    HEADER LINE 5/10
    HEADER LINE 6/10
    HEADER LINE 7/10
    HEADER LINE 8/10
    HEADER LINE 9/10
    HEADER LINE 10/10

TRUCK# 2222  DRIVER# 1111
DATE 02/16/12 STIME 09:52
DATE 02/16/12 FTIME 09:53
SALE#  000029

GALLONS START          0.0
GALLONS NET        00412.5
GALLONS GROSS      00413.8


PRICE/GALLON   $   2.7999
EXTENDED PRICE $  1154.96

SPECIAL CHG 1/9$     4.75
SPECIAL CHG 2/9$    50.00
                  --------
SUBTOTAL       $    1209.71

TAX #1               66.53
@  5.5000%
TAX #2             2578.13
@ $ 6.2500
                  --------
AMOUNT DUE     $    3854.37

IF PAID IN 10 DAYS
YOU MAY DEDUCT $    80.90
@  2.0990%

PRODUCT PROPANE
ADD'L DESC. LINE 1/100
ADD'L DESC. LINE 2/100
VOL. CORRECTED TO 60°F
PROPANE  ASTM 54 @ 510
KILOGRAMS PER CUBIC METER

GALLONS TOTAL   1128629.1
SERIAL #   123456
FNL TEMP  60.9°F  16.1°C

      FOOTER LINE 1
      FOOTER LINE 2
      FOOTER LINE 3
      FOOTER LINE 4
COPY # 01
```

←-- This delivery ticket shows all options enabled.

The delivery ticket below shows all options disabled.

```
DATE 02/16/12 STIME 09:55
SALE#  000030
GALLONS START          0.0
GALLONS FINISH     00524.6
PRODUCT PROPANE
VOL. CORRECTED TO 60°F
COPY # 01
```

Figure 27. Thermal Printer Ticket with Logos



*** DUPLICATE TICKET ***

TRUCK# 0000 DRIVER# 0000
DATE 11/15/11 STIME 16:33
DATE 11/15/11 FTIME 16:33
SALE# 000068

LITRES START 0
LITRES FINISH 000166
PRODUCT PROPANE
VOL. CORRECTED TO 15°C

LITRES TOT. 000000298018
SERIAL # 000000

COPY # 02

TROPIGAS

PROGAS

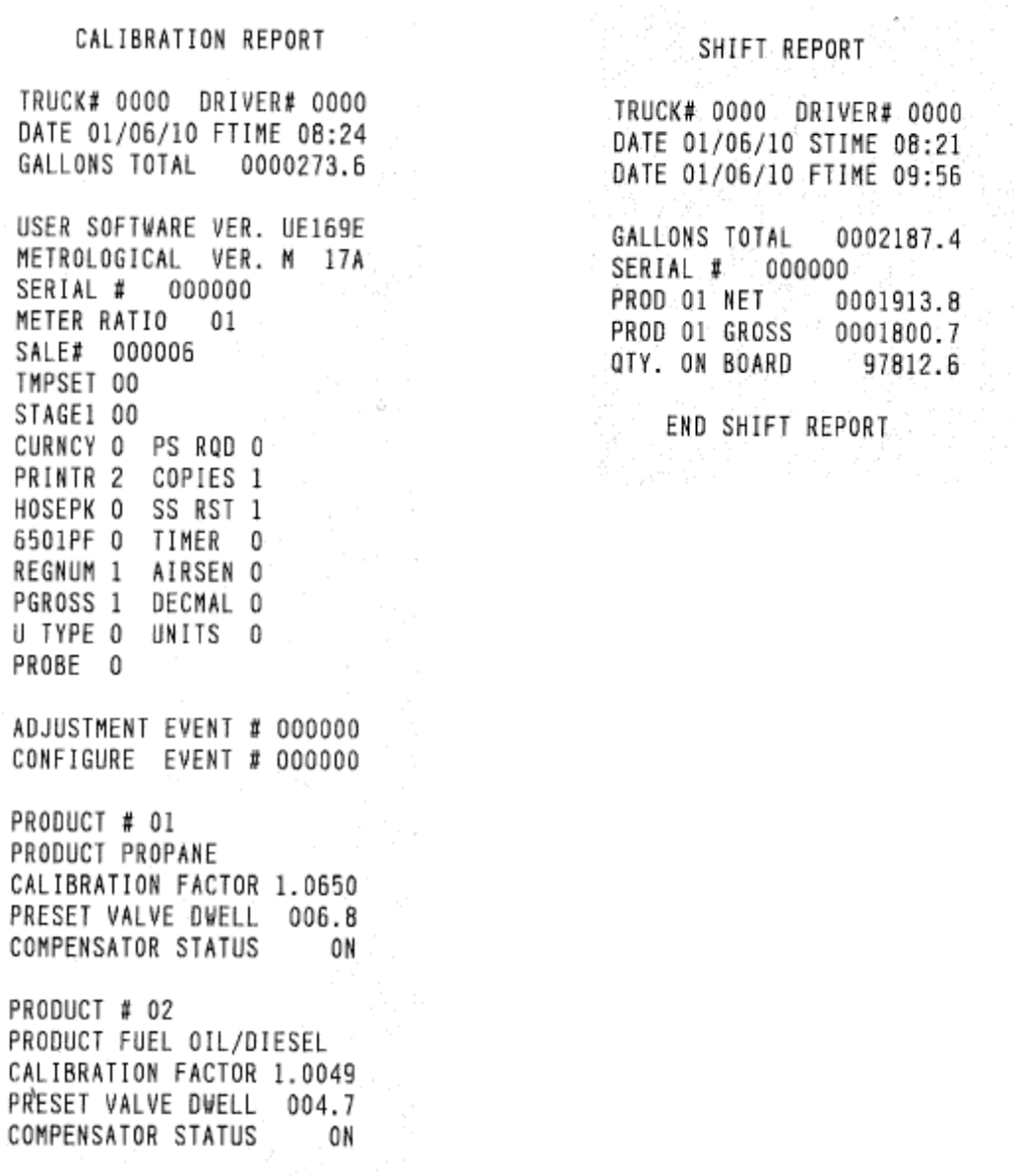
TRUCK# 0000 DRIVER# 0000
DATE 01/18/12 STIME 17:16
DATE 01/18/12 FTIME 17:16
SALE# 000004

GALLONS START 0.0
GALLONS FINISH 00046.1
PRODUCT PROPANE

GALLONS TOT.00000000184.4
SERIAL # 000000

COPY # 01

Figure 28. E:Count Calibration and Shift Tickets



CALIBRATION REPORT

TRUCK# 0000 DRIVER# 0000
DATE 01/06/10 FTIME 08:24
GALLONS TOTAL 0000273.6

USER SOFTWARE VER. UE169E
METROLOGICAL VER. M 17A
SERIAL # 000000
METER RATIO 01
SALE# 000006
TMPSET 00
STAGE1 00
CURNCY 0 PS RQD 0
PRINTR 2 COPIES 1
HOSEPK 0 SS RST 1
6501PF 0 TIMER 0
REGNUM 1 AIRSEN 0
PGROSS 1 DECMAL 0
U TYPE 0 UNITS 0
PROBE 0

ADJUSTMENT EVENT # 000000
CONFIGURE EVENT # 000000

PRODUCT # 01
PRODUCT PROPANE
CALIBRATION FACTOR 1.0650
PRESET VALVE DWELL 006.8
COMPENSATOR STATUS ON

PRODUCT # 02
PRODUCT FUEL OIL/DIESEL
CALIBRATION FACTOR 1.0049
PRESET VALVE DWELL 004.7
COMPENSATOR STATUS ON

SHIFT REPORT

TRUCK# 0000 DRIVER# 0000
DATE 01/06/10 STIME 08:21
DATE 01/06/10 FTIME 09:56

GALLONS TOTAL 0002187.4
SERIAL # 000000
PROD 01 NET 0001913.8
PROD 01 GROSS 0001800.7
QTY. ON BOARD 97812.6

END SHIFT REPORT

Section 8 – APPENDICES

Appendix A – E:Count MCR-05 to 8000 Interface

[MCR-09 LT: The E:Count LT MCR-09 does *NOT* interface with the MID:COM 8000 Computer.]

Theory of Operation

The MID:COM 8000 is the ultimate, rugged, easy to use cab mounted computer, printer, and data transfer system. Using the SD Data Card the driver has access to 50,000 complete customer records. An easy-to-follow menu guides the driver through the delivery process. The most popular software providers offer a MID:COM SD Card interface that provides automatic posting from the SD Card to your accounts receivable accounting package.

The MID:COM 8000 Cab-Mounted Computer has a seamless interface with the MID:COM E:Count Electronic Register. The combination of these systems allows fuel distributors to utilize the most cost-effective, flexible, efficient, secure, and reliable vehicle-based electronic registration system on the market today.

Return on Investment

Electronic Temperature Compensation:

- Reduces shrinkage by 1%
- Increases driver efficiency by 10% to 15%
- Reduces meter maintenance by 50%
- Eliminates handwritten tickets and ticket notation errors
- Reduces ticket posting time and eliminates posting errors
- Eliminates postage costs

Valve Options

When the MID:COM E:Count Electronic Register is connected to a MID:COM 8000 Electronic Computer either the E:Count or the 8000 can control the security valves.

The Calibration must be performed on the MID:COM E:Count regardless of the Valve Control Setting.

Appendix A – E:Count MCR-05 to 8000 Interface (continued)

There is a separate document that has detailed instructions for Calibrating the E:Count with a MID:COM 8000 Electronic Register.

Contact MID:COM or visit the MID:COM website at www.MidComCorp.com for more information.

Appendix B – E:Count LT MCR-09 Model-Specific Features

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Appendix C – E:Count LT MCR-09 Installation Reference

Mounting

The E:Count LT uses a four bolt (1/4-20) mounting pattern on the foot of the unit. If the unit is to be mounted directly to the flowmeter and uses the internal pulser the appropriate mounting flange adapter and drive shaft must be ordered for the particular model and size of meter. The adapter kits are provided with cross drilled seal bolts so that the unit can be Weight & Measures sealed after mounting.

If the unit is to be remotely mounted from the meter and an external pulser used, no additional hardware is required besides the 4 bolts.

Wiring

All wiring must be accordance with the National Electrical Code NFPA 70. In particular, if the unit is to be used in a Class 1, Division 2 hazardous location the installation and wiring must be in accordance with Article 500 of this publication.

Wire size: (refer to Field Wiring Connector Designations)

Power, Ground, Solenoid connections (J1-1,2,3,4)	18-16 AWG
All other connections	22-16 AWG

Terminal Blocks

The unit uses spring loaded terminal blocks that offer a good connection with vibration and temperature cycling. Prepare the wire by stripping off about 0.3 inches of insulation. Twist the strands tightly together. Raise the terminal lever, insert the wire and press the lever back down. Check for loose strands and pull on the wire to make ensure a good connection.

Field Wiring Connector Designations

Power:

J1-1 Power in 12 VDC nom. 250 mA Max no valve
2.0 A Max with valve
J1-2 Power ground in
J1-3 Solenoid valve power
J1-4 Solenoid valve ground
J1-5 Auxiliary input 0-20 VDC
J1-6 Auxiliary input Ground
Safety ground - Green screw adjacent to hub

RS-232 communication

J2-1 TX Printer
J2-2 RX Printer
J2-3 Signal ground Printer
J2-4 TX Host
J2-5 RX host
J2-6 Signal ground Host

External Encoder (pulser)

J3-1 Channel B
J3-2 +5 VDC Power
J3-3 Channel A
J3-4 Signal ground

RTD Probe

J2 - Compensator board

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VERSION HISTORY

Version	Date	Author	Description
1.01	09-27-05	BJS	Document created
1.02	02-28-06	BJS	Updated menus
1.03	03-06-06	BJS	Updated menus
1.04	03-15-06	BJS	Updated descriptions, added images
1.05	03-16-06	BJS	Added E:Count to 8000 Interface
1.06	03-20-06	BJS	Updated Images
1.07	07-17-06	BJS	Added E109D menu changes
1.08	08-02-06	BJS	Added E110E changes and QCRs
1.09	08-15-06	BJS	Added Currency changes
1.10	08-21-06	BJS	Added Timer and Print Gross Changes
1.11	08-22-06	BJS	Updated images
1.12	12-14-06	BJS	Updated menus
1.13	12-14-06	BJS	Added Calibration Instructions
1.14	12-15-06	BJS	Updated Copyright
1.15	12-15-06	BJS	Corrections
1.16	12-15-06	BJS	Corrections
1.17	12-17-06	BJS	Updated Discount Type Notes
1.18	12-18-06	BJS	Updated Sample Tickets
1.19	03-21-07	BJS	Updated Preset Info
1.20	03-22-07	BJS	Updates and Corrections
1.21	03-23-07	BJS	Update JET-B and Ethanol
1.22	05-16-07	BJS	Update AIRSEN and TIMOVR
1.23	06-12-07	BJS	Update PROBE
1.24	06-20-07	BJS	Add Editing Price During Delivery
1.25	07-18-07	BJS	Add HOSEPK, QOB, and Valve notes
1.26	07-24-07	BJS	Add Power Failure notes
1.27	07-25-07	BJS	Updated Printer Types
1.28	08-02-07	BJS	Updated Command Reference
1.29	08-06-07	BJS	Added Auto-Calibration
1.30	08-09-07	BJS	Updated Multiple Presets
1.31	08-09-07	BJS	Updated Power Cable Connection
1.32	08-24-07	BJS	Update Command Reference
1.33	10-23-07	BJS	Update PGROSS for temperature print
1.34	10-24-07	BJS	Update Command Reference
1.35	10-25-07	BJS	Update Command Reference
1.36	10-26-07	BJS	Update images
1.37	10-30-07	BJS	Update Indexes, TOC

Version	Date	Author	Description
1.38	12-10-07	BJS	Update Indexes, TOC, and QCR
1.39	12-11-07	BJS	Update QCR
1.40	03-14-08	BJS	Update QCR
1.41	04-03-08	BJS	Update Flow Rate, Mass, Preset $
1.42	04-08-08	BJS	Update Hose Pack, QCR, Preset $
1.43	04-14-08	BJS	Tax1 Subject to Tax 2, QCR
1.44	05-07-08	BJS	TIMOVR Update, QCR
1.45	07-16-08	BJS	Add Serial Cables, PRCADJ, SS RST
1.46	09-23-08	BJS	Update QCR
1.47	10-28-08	BJS	Update QCR
1.48	11-19-08	BJS	QCR, Cables, E164E and DM11
1.49	12-29-08	BJS	Update QCR E165E
1.50	01-16-09	BJS	Preset, QCR
1.51	03-05-09	BJS	Update QCR
1.52	03-18-09	BJS	Update QCR
1.53	07-22-09	BJS	Update 8000 Printer port type
1.54	08-03-09	BJS	Citizen CTS-310 Thermal Printer
1.54	10-09-09	BJS	6501 Print Format, QCR
1.55	11-19-09	BJS	Valve Wiring, MRATIOS
1.55	01-06-10	BJS	Sample Tickets, QCR
1.56	01-25-10	BJS	E:Count LT MCR-09 Model Notes
1.57	05-11-10	BJS	Cal Mode Notes
1.58	05-11-10	BJS	Hardware Notes from 8000 Guide
1.59	06-02-10	BJS	Update Delivery Mode Flowchart
E170E-1.00	10-26-10	BJS	Update QCR, Printers
E170E-1.01	11-23-10	BJS	Add Power Latching
E172E-1.00	04-08-11	BJS	Update for E172E Release
E173F-1.00	06-21-11	BJS	Update for Black Mark, Logo, 173F
E173F-1.01	06-28-11	BJS	Update Logs and Black Mark Sensors
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E177F-1.00	10-11-12	BJS	QCR, Batch Mode, E177F
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E177f-1.02	10-31-12	BJS	QCR, Demo Mode
E178F-1.00	05-20-13	BJS	Printers, QCR
E179E0-v100	09-30-13	BJS	179 Release
E179E0-v101	01-16-14	BJS	QCR, Remove Batch in E179_4, AIRSEN

Version	Date	Author	Description
E179E0-v102	02-10-14	BJS	Jumper on AIRSEN for LT