

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06

Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
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Магнитогорск (3519)55-03-13

Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
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Омск (3812)21-46-40
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Орел (4862)44-53-42
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Пермь (342)205-81-47
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37

Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
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Уфа (347)229-48-12
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Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
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DMS Installation



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Publication Updates and Translations

The most current English versions of all Liquid Controls publications are available on our web site. It is the responsibility of the local distributor to provide the most current version of LC manuals, instructions, and specification sheets in the required language of the country, or the language of the end user to which the products are shipping. If there are questions about the language of any LC manuals, instructions, or specification sheets, please contact your local distributor.

Be Prepared

- WARNING

Before using this product, read and understand the instructions.

All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of equipment and/or systems in accordance with all applicable codes and ordinances.

When handling electronic components and boards, always use proper Electrostatic Discharge (ESD) equipment and follow the proper procedures

Make sure that all necessary safety precautions have been taken.

Provide for proper ventilation, temperature control, fire prevention, evacuation, and fire management.

Provide easy access to the appropriate fire extinguishers for your product.

Consult with your local fire department, state, and local codes to ensure adequate preparation.

Read this manual as well as all the literature provided in your owner's packet.

Save these instructions for future reference.

Failure to follow the instructions set forth in this publication could result in property damage, personal injury, or death from fire and/or explosion, or other hazards that may be associated with this type of equipment.

Safely Evacuate Piping System

! WARNING

Before disassembly of any meter or accessory component:

ALL INTERNAL PRESSURES MUST BE RELIEVED AND ALL LIQUID DRAINED FROM THE SYSTEM IN ACCORDANCE WITH ALL APPLICABLE PROCEDURES.

-Pressure must be 0 (zero) psi.

-Close all liquid and vapor lines between the meter and liquid source.

For **Safety Rules Regarding LPG**, refer to **NFPA Pamphlet 58** and local authorities.

Failure to follow this warning could result in property damage, personal injury, or death from fire and/or explosion, or other hazards that may be associated with this type of equipment.

Observe National and Local Codes

! WARNING

Power, input, and output (I/O) wiring must be in accordance with the area classification for which it is used (Class I, Div 2). For North America, installations must be per the U. S. National Electrical Code, NFPA 70, or the Canadian Electrical Code in order to maintain Class I, Division 2 ratings. This may require using connections or other adaptations in accordance with the requirements of the authority having jurisdiction.

WARNING: Explosion Hazard -

Substitution of components may impair suitability for Class I, Division 2 applications.

WARNING: Explosion Hazard -

When in hazardous locations, turn power OFF before replacing or wiring modules.

WARNING: Explosion Hazard -

Do NOT disconnect equipment unless power has been switched OFF or the area is known to be Non-Hazardous.

DMS SYSTEM COMPONENTS

General Information

The DMS is a data management system designed for fuel delivery vehicles. The DMS is a computer with a lap pad interface that mounts in the cab of a delivery vehicle. It interfaces with the LectroCount® LCR®, LCR-II®, and LCR 600® electronic registers on single, dual, or triple meter systems. The DMS gathers data from the electronic registers, combines it with your unique customer and transaction data, and transfers it to your office PC and your accounting system.

The in-cab DMS CPU is enclosed in a rugged, metal housing and features an internal, compact flash memory card with plenty of memory for any customer database. The DMS lap pad is a large, hand held, 30-key keypad. The display is 8 lines by 30 characters and backlit for easy viewing. The keypad case is sealed against moisture, operates in temperatures as low as -22°F, and is rubberized to resist petroleum products. Two spare serial ports are also available for accessories such as cell modems, RF transceivers, GPS tracking, and card readers.



DMS, Lap Pad, and Printer on Mounting Brackets

Software

DMS computers are preinstalled with two support software programs, LCR Host and LCP File Server, and one or more DMS application software programs. LCR Host is used to setup LCR networks and calibrate the metering system. LCP File Server is a file manager program where operators can maintain and manage files. DMS computers also include one or more DMS application software program. DMS application software programs combine the metrological data from the LCR-II with your company's operational data to produce a complete record of delivery activity. Each application software program is tailored to the intricacies of a specific fueling application such as fleet fueling, aviation, or fuel delivery. Each DMS application software program has a companion software program for the office PC. These office PC software programs make up the DMS Office Middleware suite.

DMS Office Middleware programs are data capture programs for office PCs that convert and manage operational data between the DMSs and third party accounting software. DMS Office Middleware's user-friendly, Windows® based interfaces make it easy to build and manage a database tailored to your operations. DMS Office Middleware controls a number of different DMS system features such as security and safety options, route reports, tax categories and calculations, discount calculations, and ticket storage for future reprints. DMS Office Middleware is compatible with Windows® 95, 98, 2000, NT, XP, and Vista operating systems.

DMS SYSTEM OVERVIEW



M-10 Meter with LectroCount LCR-II Electronic Register, Optical Air Eliminator, Hi Capacity Strainer, and E-7 Valve.



LectroCount LCR 600



LectroCount LCR-II



DMS and Lap Pad



Epson Printers



USB Memory Device

METERING SYSTEM

Typically mounted to the back or side of a delivery vehicle, the metering system accurately measures, stops and starts the flow, and preserves the purity of the product. A Liquid Controls metering system can include the meter, a LectroCount electronic register, a strainer, an ETV (temperature compensation) probe, an air eliminator, and a control valve.

LECTROCOUNT LCR-II & LCR 600

The LectroCount LCR-II and LCR 600 are weights & measures approved electronic registers typically mounted on top of the meter. They gather metrological data during custody transfers and relay it to the DMS.

DMS

The DMS is an in-cab computer with a heavy-duty lap pad interface. The DMS module runs application software designed by Liquid Controls for use with specific types of fuel delivery. These software applications combine the metrological data from a LectroCount register with your company's operational data to produce a complete record of fueling activity. From the DMS, the data can be transferred—via a USB device, RF communication, or cellular transmission—to an office PC.

Every DMS comes equipped with two support applications: LCP File Server and LCR Host software. LCP File Server is a file manager program where operators can maintain and manage files. LCR Host is used to setup LCR/DMS networks, configure most LectroCount registers and calibrate the metering system.

PRINTERS

Printers provide physical records of deliveries, shift totals and a selection of reports available in the suite of DMS Application Software. The most commonly used printers are the Epson slip printer and the Epson roll printer. Both print a multi-layer ticket so one copy may be left with the customer and the other can be retained for fueling records. A power cable is included with both printers. A data cable for connection to the DMS is available as an option.

USB FLASH MEMORY DEVICE

The USB Flash Memory Device is a data repository used to transfer data between the DMS and the office PC. It is included with the DMS.

SPECIFICATIONS

DMS Module

Enclosure

Dimensions

- 6.875" W x 2.625" H x 7.25"

L

Material

- Powder coated steel

Operating Voltage

- +9 to 30 VDC

Power Consumption

- 5A maximum
- 60 watts (maximum, intermittent)

Temperature Rating

- -22° to 158°F (-30° to 70°C)

Microprocessor

- 133 MHz, 486

Memory

- Internal compact flash memory
- USB flash memory (optional)



DMS Module

DMS Lap Pad

Housing

- Lightweight, high impact, molded plastic

Housing Rating

- NEMA 3, IP54

Display

- LCD, dot matrix, 240 x 64 pixels, backlit, 5.2" W, 1.55" H; 8 rows, 30 characters per row

Keyboard

- 6 row, 5 column membrane with tactile metal dome switch contacts and silicone rubber overlay

Supply Current

- 150 mA maximum

Temperature

- -22°F to 158°F (-30° to 70°C)

Vibration

- 2 g between 10-150 sinusoidal sweep cycle
- 20 sweep cycles per axis.

Electrostatic Discharge

- IEC801-2
- 8 kV for air discharges
- 6 kV for contact discharges

Electromagnetic Susceptibility

- IEC 801-3
- 3 V/m 26-500 MHz
- 1 V/m 500-1000 MHz

Chemical Protection

- Common petroleum products

Interface

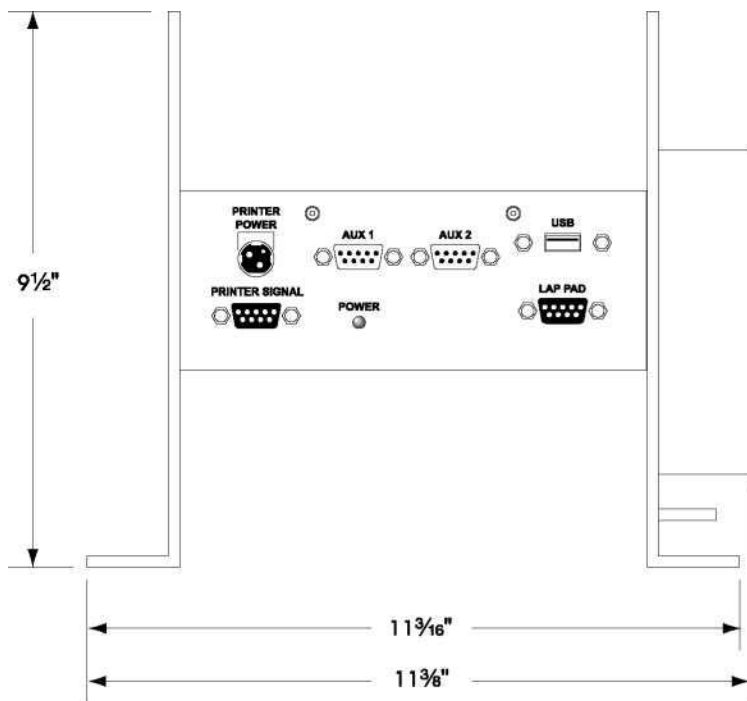
- RS-232 at 115,200 baud rate



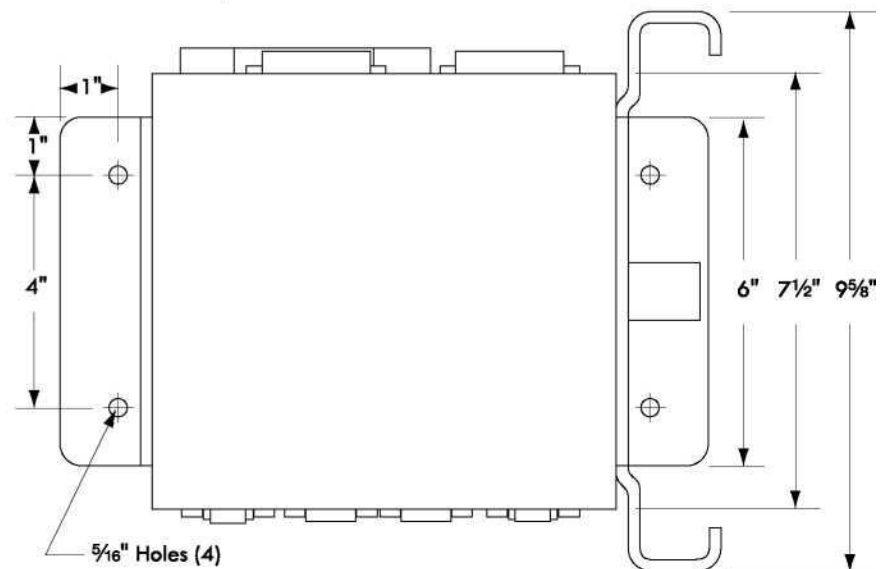
DMS Lap Pad

DIMENSIONS

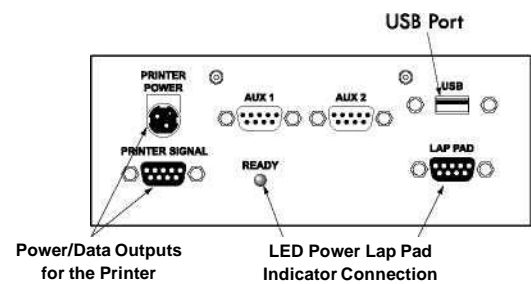
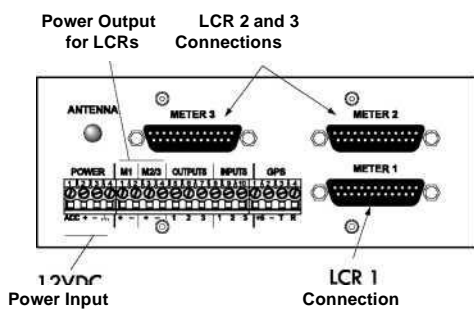
FRONT



TOP



TERMINALS, PORTS, AND CONNECTIONS



INSTALLATION

Installation Overview

This manual assumes a meter system and an LCR-II Lectrocount register is installed on the truck. Only the physical and electrical installation of the DMS will be covered. Specific installation requirements will vary with the model of vehicle and the configuration of the existing meter system.

Components Supplied with the DMS

- DMS CPU Module
- DMS Lap Pad
- Mounting Brackets
- Ground Strap Kit
- Epson Printer (optional)
- Printer Power Cable (w/ printer)
- Printer Data Cable (optional)

Parts Supplied by Installer

- All conduit/cable glands
- All fittings
- Hardware for mounting brackets
- Non-standard cables or cable extensions



Ground Strap Kit
PN 82180



Mounting Brackets
PN 82170



Printer Power Cable
PN 81233



Printer Data Cable
(Optional)
PN 70986

DMS INSTALLATION

Before beginning the installation, review the **Vehicle System Check** list on this page and ensure the vehicle is in the correct condition to run the DMS.

1. Mount the DMS in the cab of the truck.
2. Ground the DMS.
3. Connect the data cables for the LCR-II, the printer, the DMS lap pad, and other components.
4. Connect power to the DMS.

Vehicle System Checklist

«■ Ensure the vehicle produces at least 12.6 VDC to reliably power the DMS, LectroCount register, and control valve solenoids. Consult the manuals of each component for power consumption requirements.

A Clean any corrosion from the battery terminals and battery cable to guarantee a solid connection.

A Charge the battery in accordance with manufacturer's specifications.

A Check the alternator capacity and ensure it can meet the demands of the DMS, LectroCount register, printer, control valve solenoids, and all other electrical components.

A Inspect the electrical equipment on the vehicle, and ensure it is properly installed and operating correctly.

A Determine whether the the vehicle is grounded positively or negatively. Consult Liquid Controls if the vehicle has a positive ground.

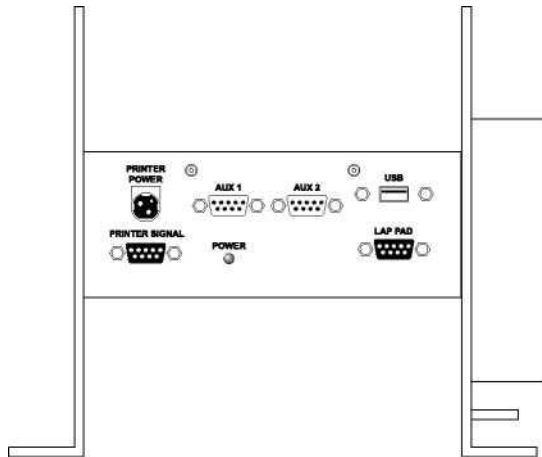
A Run the vehicle at a low idle with all accessories on (including the hose reel). Ensure that the voltage does not drop below +9 VDC. If the voltage falls under +9 VDC, the LectroCount register will power down.

Mounting the DMS

The DMS is shipped mounted to the support brackets. There are four $\frac{5}{16}$ " holes drilled into the base of the support brackets for mounting the DMS to the floor of the cab. Mounting bolts and washers must be provided by the installer.

Before mounting the DMS in the truck cab, find a suitable place in the cab that takes into account the following considerations:

- Leave space around front and rear panels for data/power connections and the USB flash memory device.
- Position the DMS where the lap pad will be convenient for driver operation.
- Position the DMS where slip tickets can be easily inserted and removed from the printer (if mounting the printer atop the DMS).
- Do not obstruct air bags or other cab components.



DMS as shipped

MOUNTING EPSON PRINTERS

The printer is typically mounted on the top of the DMS Module, but it can also be mounted on the dash, the passenger seat, or other locations in the cab.

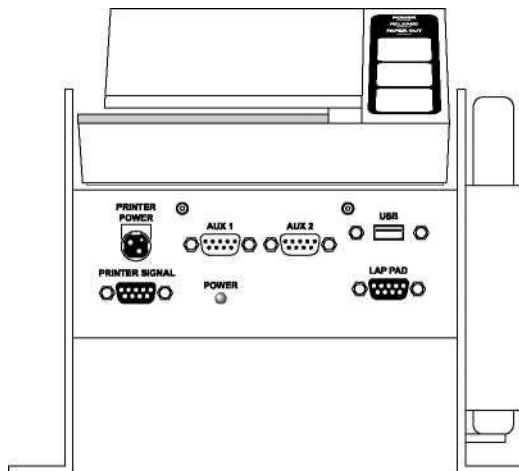
Before mounting the printer in the cab, ensure that it is:

- Positioned away from heavy traffic spots to avoid physical abuse.
- Within easy reach of the driver.
- Within the reach of printer data and power cables.

A rectangular section of industrial grade Velcro® is included with the printer.

Fasten the printer to the top of the DMS:

1. Remove the adhesive from one piece of the Velcro® and stick it to the bottom of the printer.
2. Remove the adhesive from the other piece of the Velcro®.
3. Align the printer over the top of the DMS, and lower it into position. Press down on the printer to secure the adhesive side of the Velcro® to the DMS.



DMS with Epson Slip Printer

GROUNDING

Grounding the DMS

After the DMS is mounted, you must ensure that the DMS is properly grounded. Without a proper ground, the DMS is susceptible to damage in the event of static discharges and voltage spikes.

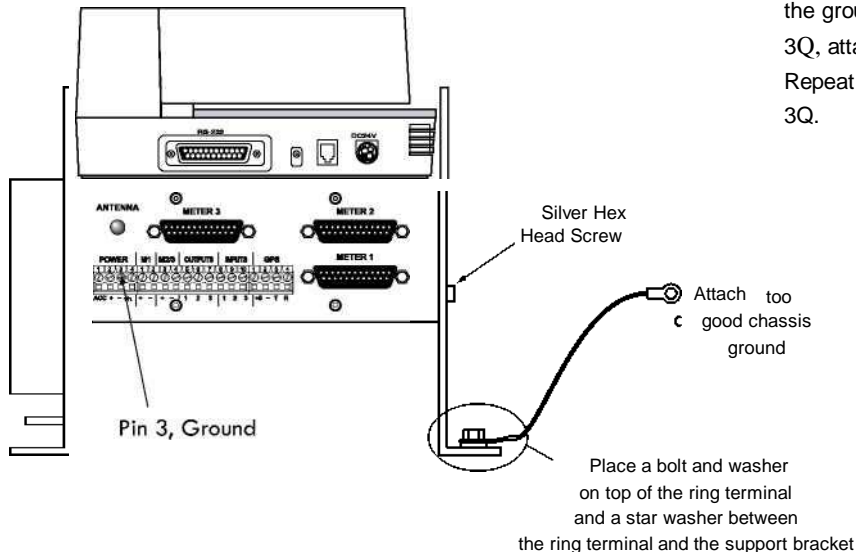
To protect the DMS, LC ships each unit with a ground strap kit (82180). Each kit contains two ground straps. One strap is for grounding the support brackets to the chassis. The other strap grounds the seat to the chassis. If the truck has two seats, both seats must be grounded. An additional ground strap kit can be ordered from Liquid Controls.

GROUNDING THE SUPPORT BRACKETS

The DMS must be grounded to a good chassis ground. In many cases, a good ground is established when the support brackets are bolted to the chassis. Check for a good chassis ground. If the ground is inadequate, attach a ground strap to the support brackets.

Check for a good ground connection between the DMS and the chassis:

1. Turn **OFF** all accessories, including the dome light, to prevent other currents from distorting the reading.
2. Take a multimeter and measure the resistance between one of the silver, hex head screws on the support brackets and the ground terminal of the DMS, pin 3 on the power plug (see figure below).
 - a. If the resistance is less than 3Q, the system is grounded adequately.
 - b. If the resistance is greater than 3Q, install a ground strap between a support bracket and a clean ground point on the cab chassis.



Ground Strap Kit
PN 82180

Ground a DMS support bracket to the cab chassis:

1. Find a suitable ground point, and bolt one ring terminal of the ground strap to the chassis of the cab. An ideal grounding point is clean, out of the way, and easily drilled and bolted.
2. Remove a mounting bolt from the support bracket.
3. Rebolt the support bracket to the cab chassis with the ring terminal and a star washer. Place the star washer directly onto the support bracket, and turn it into the bracket until it penetrates the coat of paint.
4. Measure the resistance between the silver, hex head screw and Pin 3 again.
5. If the resistance is still greater than 3Q, check for proper metal to metal contact on both ends of the grounding strap. Clean any paint, dirt, or oxidation that may block the grounding point. If the resistance remains above 3Q, attach the ground strap to a different ground point. Repeat the process until the ground resistance is below 3Q.

Check the Ground

Check the ground connection periodically. Connections can become susceptible to electrostatic discharge over time due to corrosion and gunk.

GROUNDING THE DMS

GROUNDING THE TRUCK SEAT

Static electricity can build up on truck seats and the drivers themselves, especially during cold, dry weather. Adjustable, shock-absorbing seats are especially vulnerable because they isolate the seat cushion from an electrical ground. If electrostatic discharge (ESD) occurs on or near the DMS, the truck's electrical system, its components, and the DMS are all susceptible to damage.

To prevent the occurrence of electrostatic discharge, it is **mandatory** that installers properly ground the truck seat(s). Properly grounded seats allow static electricity to "bleed off" the driver and the seat before it can build up, discharge, and interfere with the operation of the DMS or other truck components.

Two Truck Seats

If the truck has two seats, ground both seats. To ground a second seat, another Ground Strap Kit (PN# 82180) must be ordered from LC.

Power and Data Cables

Preserve the integrity of cables and their connections to the components. Bind them together with electrical tape, zip ties, or another fastener, and loop the cables around the mount (or another secure support). This will prevent any tugging on the connections if the cables are stepped on or pulled inadvertently.

Ground the seat:

1. Locate a good ground point near the back of the seat frame. The bottom of the seat base is usually a good spot.
2. Drill a 9/32" hole in the seat frame near the back of the base.
3. Attach one end of the ground strap to the seat frame bracket using the lock washer, flat washer, and nut provided. The lock washer should penetrate any paint on the bracket to ensure a good electrical connection.
4. Attach the other end of the strap to a metal part of the seat frame at a point where it contacts the seat cushion. Make sure that there are no intervening pivot points, guides, adjustment mechanisms, etc., which could interfere with the ground path between the seat cushion and the ground strap.
5. If the seat cushion has a wooden base, use a wood screw and washer to attach the strap lug to the bottom of the seat at a point where the seat fabric is attached to the wood. There must be good contact between the seat fabric and ground strap lug.
6. Make sure the strap is positioned so that it doesn't interfere with the movement of the seat and it is clear of traffic areas in the cab.
7. Check the strap for a good ground connection.

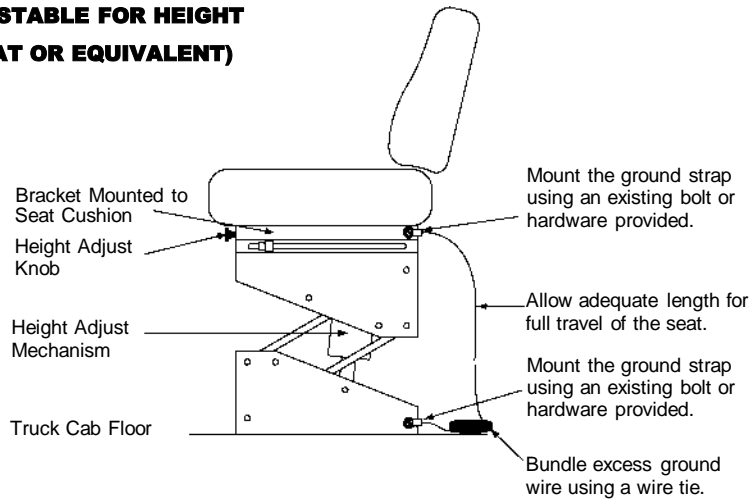
Check for a good ground connection along the ground strap:

1. Turn off all accessories, including the dome light, to prevent other currents from distorting the reading.
2. Take a multimeter and measure the resistance between the brackets the ground strap bolts are fastened to. Find a clean spot on the brackets without paint to use as contact points. Other bolts on the brackets are often suitable.
 - 2a. If the resistance is less than 3Q, the system is grounded adequately.
 - 2b. If the resistance is still greater than 3Q, check for proper metal to metal contact on both ends of the grounding strap. Clean any paint, dirt, or oxidation that may block the grounding point. If the resistance remains above 3Q, attach the ground strap to a different ground point. Repeat the process until the ground resistance is below 3Q.

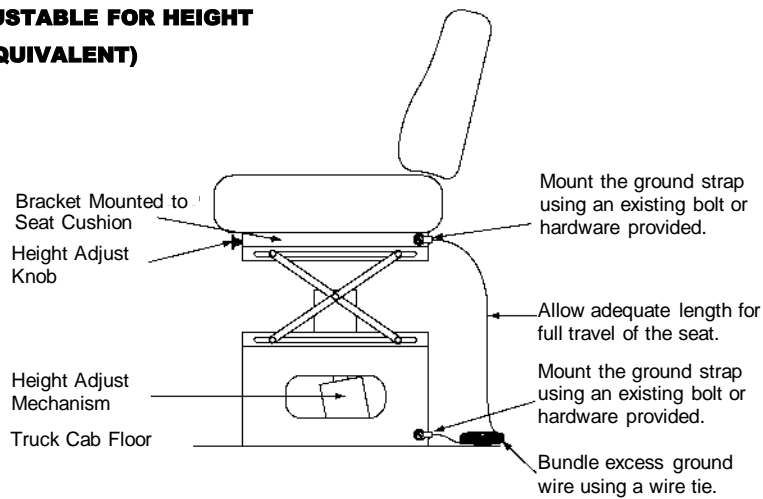
GROUNDING

Grounding the DMS

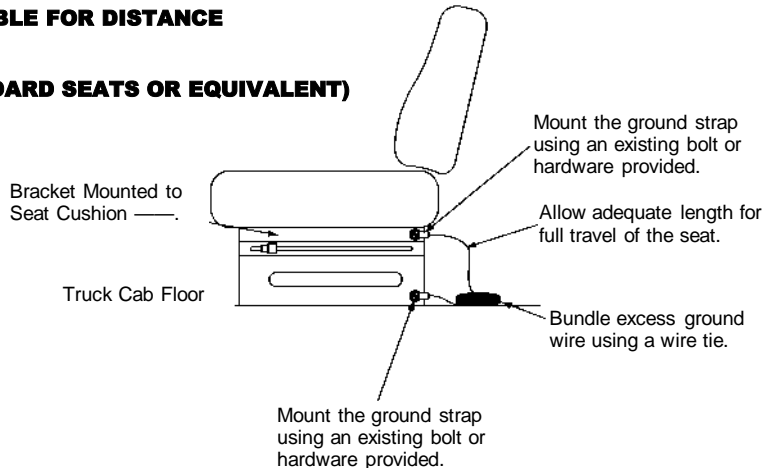
AIR CUSHION SEAT - ADJUSTABLE FOR HEIGHT (BOSTROM 914 SERIES SEAT OR EQUIVALENT)



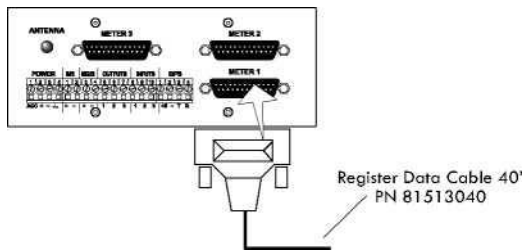
AIR CUSHION SEAT - ADJUSTABLE FOR HEIGHT (DURA-FORM SEATS OR EQUIVALENT)



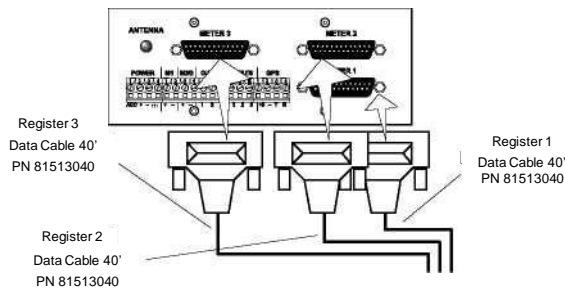
BENCH SEATS - ADJUSTABLE FOR DISTANCE TO THE STEERING WHEEL (MANUFACTURERS STANDARD SEATS OR EQUIVALENT)



DATA CONECTIONS



Electronic Register 1 Connection



Electronic Register 2 and 3 Connections

Before Powering Up the DMS

Do not apply power to the DMS Module until the LectroCount Register has been rewired for RS-485 communication.

See page 14 for diagrams.

DMS & LectroCount Registers

Connecting the DMS and a LectroCount register(s) together for data communication requires some minor rewiring on the LectroCount 81920 CPU board. Two wires from the 40' data cable (PN 81513040) must be moved to different terminals. The connector at the other end of the data cable must be plugged into the specified DMS port. The LectroCount 84040 CPU requires no modification to communicate with the DMS.

The DMS provides female communication ports for three LectroCount registers with 81513040 data cables.

DATA CONNECTION TO THE DMS

Single Meter Systems

To install data communication for a single meter system, plug the DB-25 connector of the LectroCount data cable into the DMS port labeled "METER 1".

Multiple Meter Systems

To install data communication for a multiple meter systems, plug the DB-25 connector of each LectroCount data cable into its respective DMS port: "METER 1", "METER 2", or "METER 3".

WIRING LECTROCOUNT REGISTERS FOR DMS COMMUNICATION

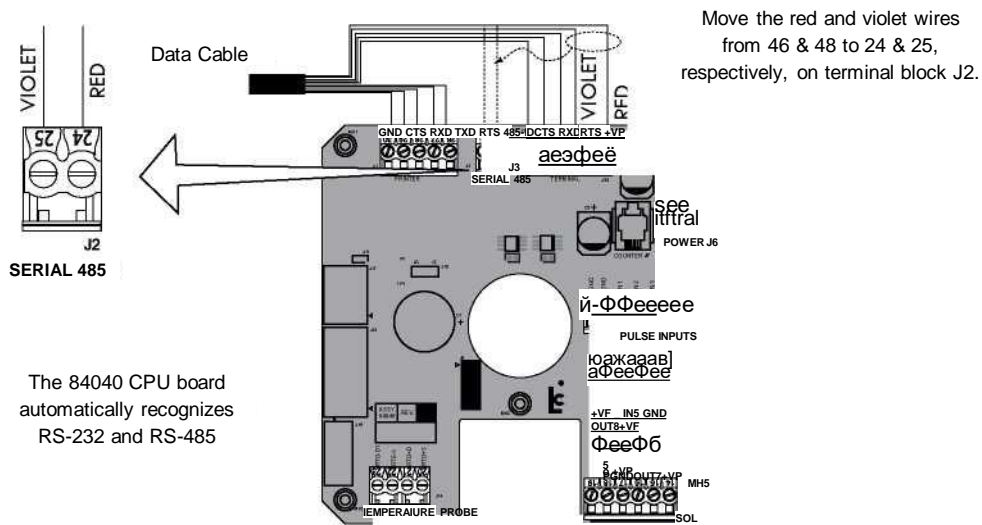
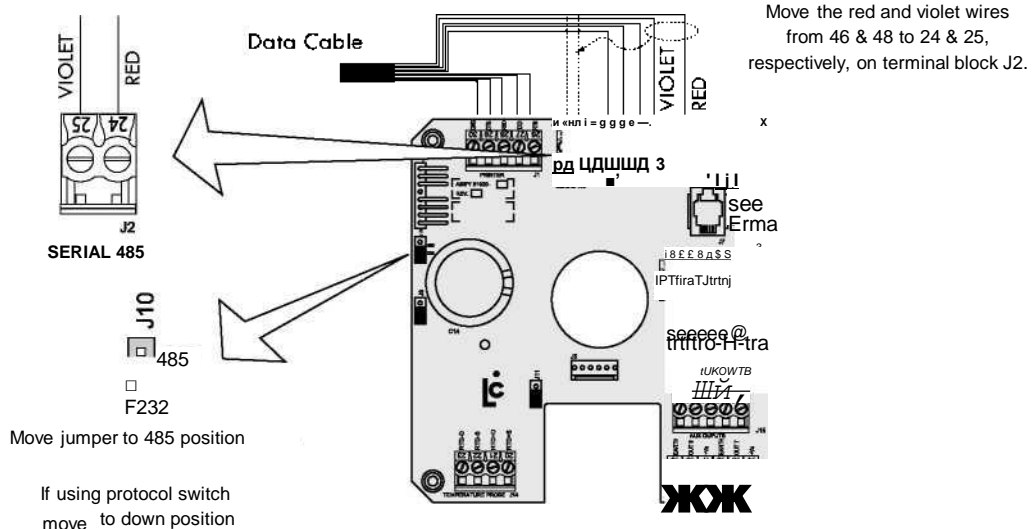
When connecting a DMS to a single or multiple meter system with LectroCount registers with 81920 CPU boards, they must be configured to communicate via RS-485. LectroCount registers with 84040 CPU boards do not require any configuration to communicate via RS-485.

To configure LectroCount LCR-II registers to RS-485:

1. Shut off power to the registers before moving any wires or jumpers.
2. Open the register(s).
3. On terminal block J3, remove the red wire from pin 46 and the violet wire from pin 48.
4. On terminal block J2, attach the violet wire to pin 25 and the red wire to pin 24.
5. Move the J10 jumper position from 232 to 485. Newer registers may be labeled P, for RS-485, and T, for RS-232.

DATA CONECTIONS

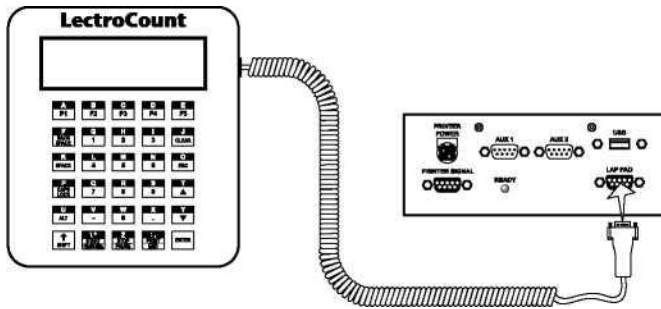
Wiring Lectrocount Registers to Communicate with the DMS



DATA CONNECTIONS

DMS Lap Pad

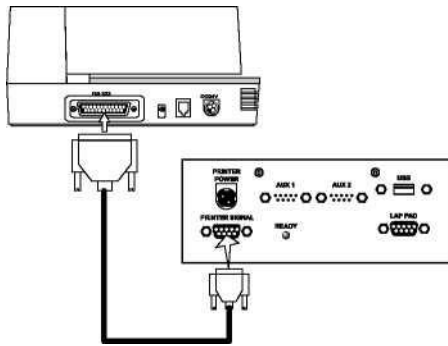
The DMS lap pad connects to the DMS via the attached, coiled cable. The DB-9 connector plugs into the port labeled “LAP PAD” on the front of the DMS. Tighten the two captive screws on the connector to secure it in place.



DMS Lap Pad Connection

Epson Printer

The printer data cable has a DB-25 connector that plugs into the back of the printer and a DB-9 connector which plugs into the “PRINTER SIGNAL” port on the front panel of the DMS. Install this cable, and secure with the thumb screws.



Epson Printer Data Connection

Power and Data

Preserve the integrity of cables and their connections to the components. Bind them together with electrical tape, zip ties, or another fastener, and loop the cables around the mount (or another secure support). This will prevent any tugging on the connections if the cables are stepped on or pulled inadvertently.

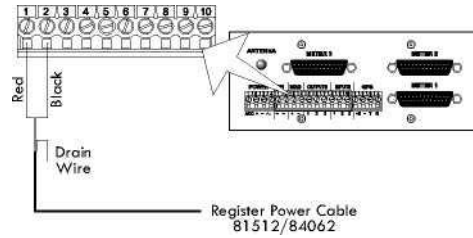
POWER CONNECTIONS

Electronic Registration Power DMS

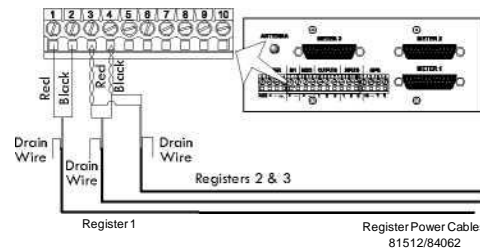
The DMS can supply power to one, two, or three LectroCount registers.

To supply power to LectroCount register(s) through the DMS:

1. Pull the 10 pin, center terminal block off the back of the DMS.
2. Connect the red wire from the register's power cable to pin 1 and the black wire from the register's power cable to pin 2.
- 3a. To supply power to a second register, connect the red wire from the second register's power cable to pin 3 and the black wire from the second register's power cable to pin 4.
- 3b. To supply power for three registers, connect the the two red wires from the second and third register's power cables to pin 3 and the black wires from the second and third register's power cables to pin 4.
4. Replace the 10 pin, center terminal block onto the back of the DMS.



LectroCount Register Power Connection



Multiple LectroCount Register Power Connection

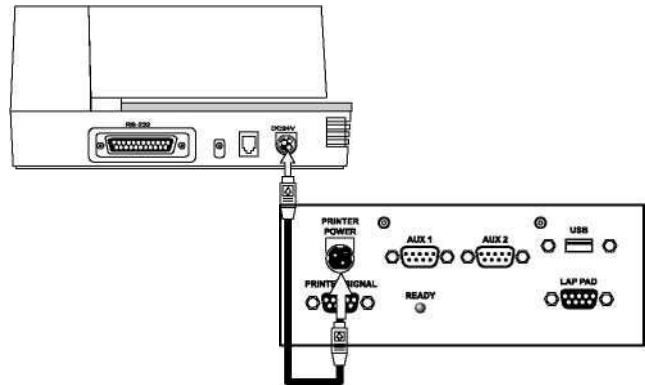
If installing the DMS into an existing system, the electronic register power supply may already be connected to the accessory panel. If so, this may remain in place.

Epson Printer Power - DMS

The printer operates on +24 VDC. The printer can be powered through the DMS with a DMS Printer Power Cable (PN81233) or through the truck accessory panel.

To power an Epson Slip Printer through the DMS:

1. Plug the power cable into the port labeled "DC24V" on the back of the printer.
2. Plug the power cable into the port labeled "PRINTER POWER" on the front panel of the DMS.



Epson Printer Power Connection

If installing the DMS into an existing system, then the printer may already have a separate power cable with a +24 VDC converter installed. This may remain in place.

POWER INSTALLATION

Before Powering Up the DMS

Do not apply power to the DMS Module until the LectroCount Register has been rewired for RS-485 communication. Refer to page 13 for instructions on rewiring the LectroCount Register for RS-485 communication. Failure to rewire the LectroCount register prior to applying power may result in damage to the DMS Module.

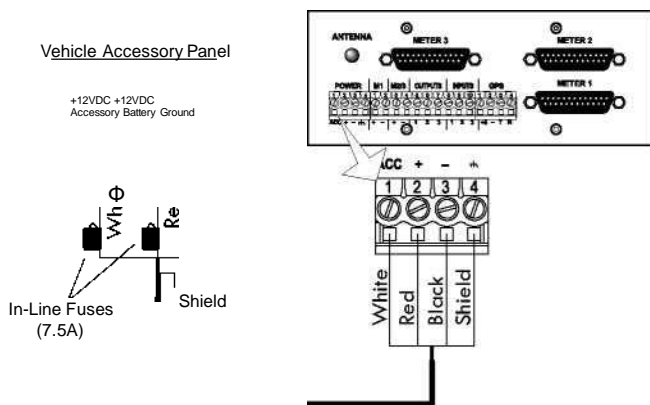
Connecting Power to the DMS

Typically, the voltage source of the DMS is the accessory panel. Powered by the accessory panel, the DMS has power only when the ignition switch is in the ON or ACCESSORY position. The DMS receives no power when the ignition is OFF eliminating any drain the DMS might have on the battery. The DMS is also powered down when the engine is cranking in order to prevent damage caused by voltage spikes or electrical noise that can occur when the starter is engaged.

The DMS power cable (Part No. 81973) is a three wire with shield cable with two in-line fuses installed on the red and white wires. The end with the two in-line fuses is wired to the truck's power source. The other end is connected to the left-most terminal connector on the rear panel of the DMS Module.

To connect the DMS to the truck's power:

1. Locate a +12 VDC switched accessory source, and connect the white wire to the panel.
2. Locate a +12 VDC battery source, and connect the red wire.
3. Connect the black wire to a good ground.
4. Route the cable to the rear of the DMS Module. Ensure that the cable is protected.
5. Remove the left-most terminal connector from the rear of the DMS.
6. Connect the white wire to pin 1.
7. Connect the red wire to pin 2.
8. Connect the black wire to pin 3.
9. Connect the shield wire to pin 4.
10. Reattach the terminal connector to the DMS



DMS Power Connection

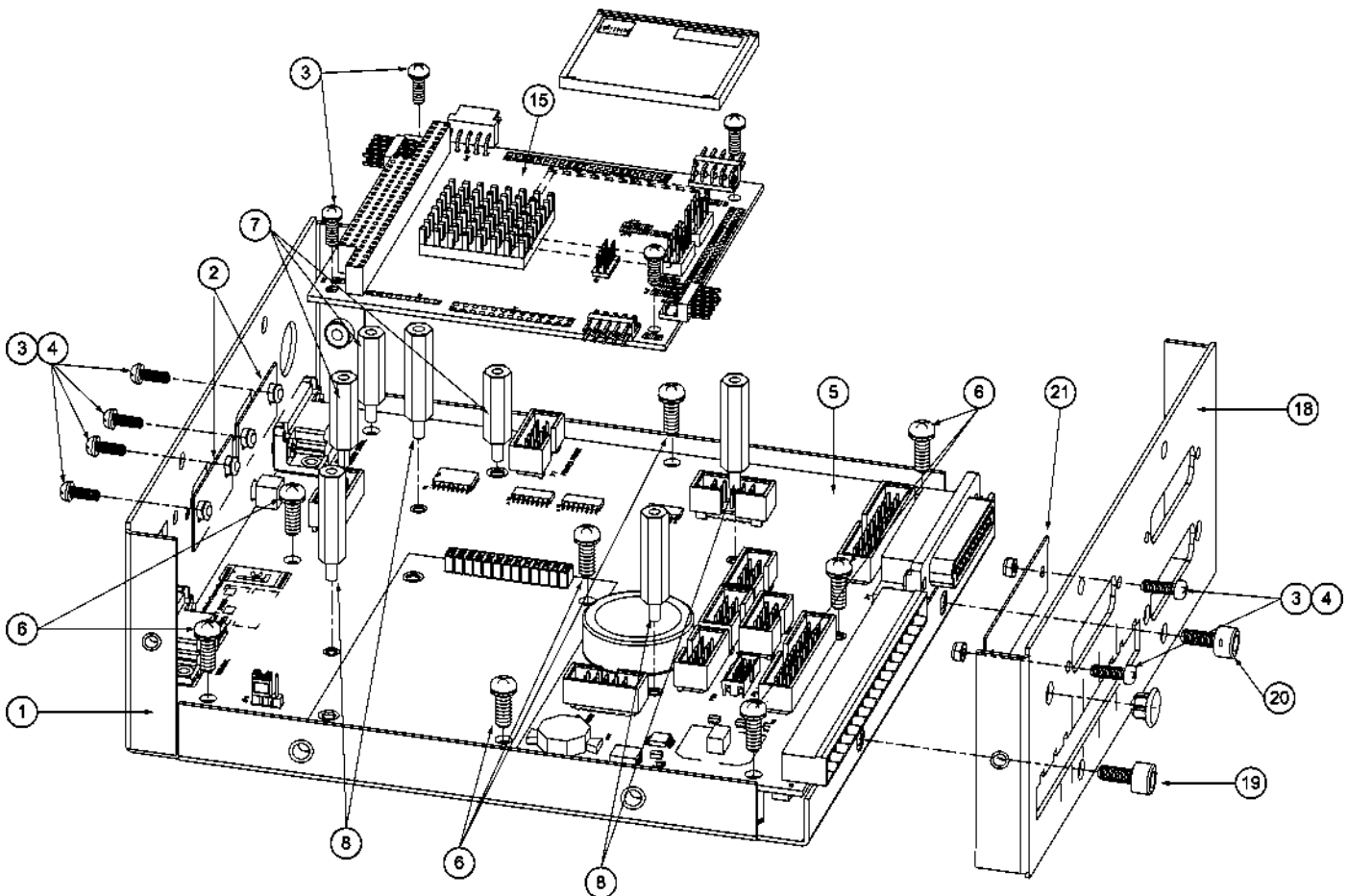
DMS Terminal Pins	
White	Pin 1
Red	Pin 2
Black	Pin 3
Shield	Pin 4

BILL OF MATERIALS

Item	Description	Part Number
1	Base Enclosure	81953
2	DB9 Cover Plate (2)	81956
3	Screw, #4-40 x .375 (12)	08114
4	Self Locking Nut (8)	07753
5	Interface Board Assembly	81960
6	Screw, #6-32 x .375 (8)	08117
7	Standoff, .75" (3)	08213
8	Standoff, 1.0" (4)	08214
15	PC/104 Computer Board (81955) with CF Card (81970)	81958
18	Rear Panel Enclosure	81954
19	Screw, #10-32 x .38 (2)	08119
20	Screw, #10-32 x .38 (4)	08120
21	DB25 Cover Plate (2)	81957
29	Screw, #6-32 x .25 (8)	08211

Optional Items (not shown)

Description	Part Number
DMS Power Cable	81973
DMS Printer Power Cable	81233
DMS Lap Pad	E4040
USB Memory Device	81975
Mounting Bracket Kit	82170

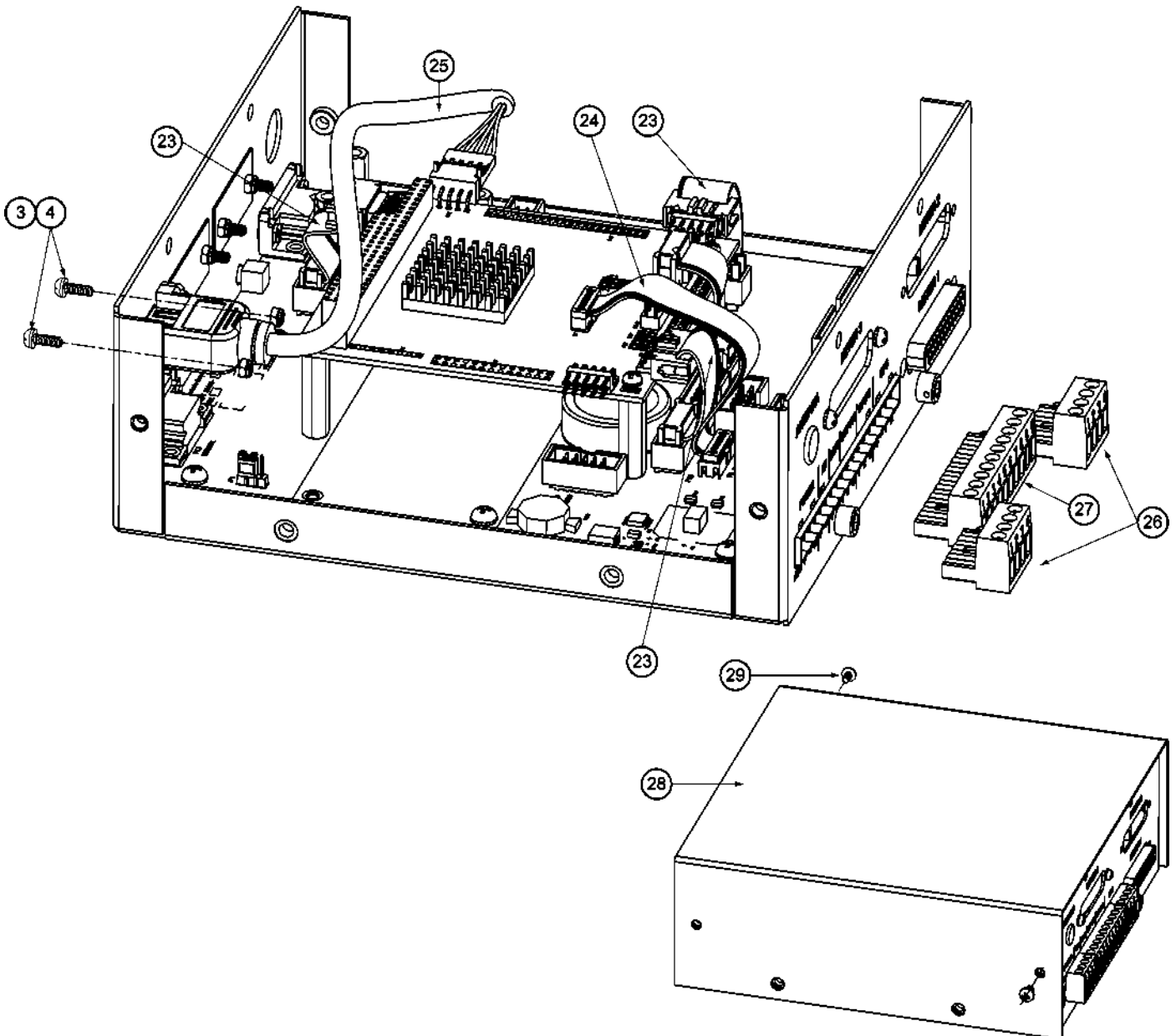


BILL OF MATERIALS

Item	Description	Part Number
3	Screw, #4-40 x .375 (12)	08114
4	Self Locking Nut (8)	07753
23	Cable, 10 Pin Ribbon (4)	81964
24	Cable, 10 Pin Ribbon	81965
25	USB Port Cable Assembly	81968
26	Terminal Block, 4 Pin (2)	70979
27	Terminal Block, 10 Pin	70954
28	Enclosure Cover	81281
29	Screw, #6-32 x .25 (8)	08211

Optional Items (not shown)

Description	Part Number
Internal Printer Power Supply	81962
Auxiliary 1 Cable	81966
Auxiliary 2 Cable	81966
Meter 2 Cable	81967
Meter 3 Cable	81967
GPS Module for Odometer	81976
USB Docking Station	71630





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