MX1 Cradle Reference Guide

**Storage/Charging/Communication Options
for the LXE 2330, 2335 and MX1**

LXE

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Attention:

The LXE MX1 Intrinsically Safe device (MX1-IS) and battery pack are NOT compatible with the MX1 Docking Cradle, Multidock or AC / DC Singledocks. Damage may be caused to the MX1-IS and battery pack if placed in an unauthorized MX1-IS docking cradle/charger. The MX1-IS keypad is bright blue in color.

Initial Release, April 2004; Second Release, December 2005

Revision B Notice: Added 2335 and MX1 to obsolete list.
Added new LXE logo to cover page.
Updated "Obsolete Equipment" section.
Updated "Manuals" and "Accessories" sections.
Added WEEE statement to "Notices".

Archived December 2008

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Illustrations

Chapter 1 Introduction

Single Docking Cradle

The Single Docking Cradle is designed to provide power, battery charging and standard data communication for the LXE 2330, 2335 and MX1 devices while also providing ease of use, serviceability and installation, modularity for future growth, and operation in harsh environments.

Figure 1-1 Vehicle Mount Docking Cradle Charging/Communicating Device

The Docking Cradle Family of chargers charge the Main Battery in the 2330, 2335 and MX1 while it is in the cradle.

The vehicle, wall or table mounted charger must have a Power/Charging Communications module installed and be connected to an external power source before charging or communicating can commence.

This guide provides information on the features and functionality of each of the components and related accessories. Use this guide as you would any other source book: reading portions to learn about the module, and then referring to it when you need more information about a particular subject. This guide takes you through all aspects of the installation and configuration of the desktop, vehicle and wall mounted cradles.

Features

Once installed and configured, the docking cradle could function as a:

- Simple holding device when the hand-held computer is in use or stored at the end of the day.

- Quick charge (3½ hour) battery charger at the end of normal work periods.

- Constant power source for the computer while it is operating or stored in the cradle.

- Data transfer communications device using either the computer's IR port or the docking cradle RS232 port.

Document Conventions

ALL CAPS	All caps are used to represent disk directories, file names, and application names.
Menu|**Choice**	Rather than use the phrase "choose the **Save** command from the **File** menu", this manual uses the convention "choose **File**|**Save**".
"Quotes"	Indicates the title of a book, chapter or a section within a chapter (for example, "Document Conventions").
< >	Indicates a key on the keyboard (for example, <Enter>).
	Indicates a reference to other documentation.
ATTENTION	Keyword that indicates vital or pivotal information to follow.
	Attention symbol that indicates vital or pivotal information to follow. Also, when marked on product, means to refer to the manual or operator's guide.
	International fuse replacement symbol. When marked on the product, the label includes fuse ratings in volts (v) and amperes (a) for the product.
Note:	Keyword that indicates immediately relevant information.
Caution:	Keyword that indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.
WARNING	Keyword that indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.
DANGER	Keyword that indicates an imminent hazardous situation, which, if not avoided, will result in death or serious injury.

Quick Start

> *Note:*   *Always store unused mobile devices with a fully charged main battery pack installed. LXE recommends the mobile device be connected to an external power source periodically to retain optimum power levels in the main battery pack and the backup battery.*

This section's instructions are **abbreviated** and based on the assumption that your new docking cradle is pre-configured and requires only mounting and a power source.

How To

1. First, assemble all docking cradle components.

2. Attach the docking cradle to the mounting brackets.

3. Install the docking cradle on a stable surface using the mounting brackets.

4. Connect all cables.

5. Connect the docking cradle to a power supply.

6. Turn the docking cradle on.

7. Last, insert a 2330, 2335 or MX1 in the docking cradle.
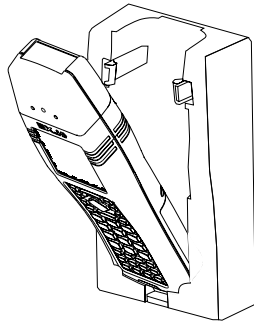
The mobile device (with or without the hand trigger-grip) pushes into the cradle tail first and can be removed or inserted with one hand. The device is inserted with the display facing out and is held in the cradle with flexible side clips.

The cradle supports the device with any endcap option and pistol grip and/or hand-strap installed.

Figure 1-2 Insert Device into Cradle

There are three primary components of the single docking cradle:

- Passive Storage Cradle
- Power/Charging and Communications Module
- Mounting Brackets (Wall, Table or Vehicle)
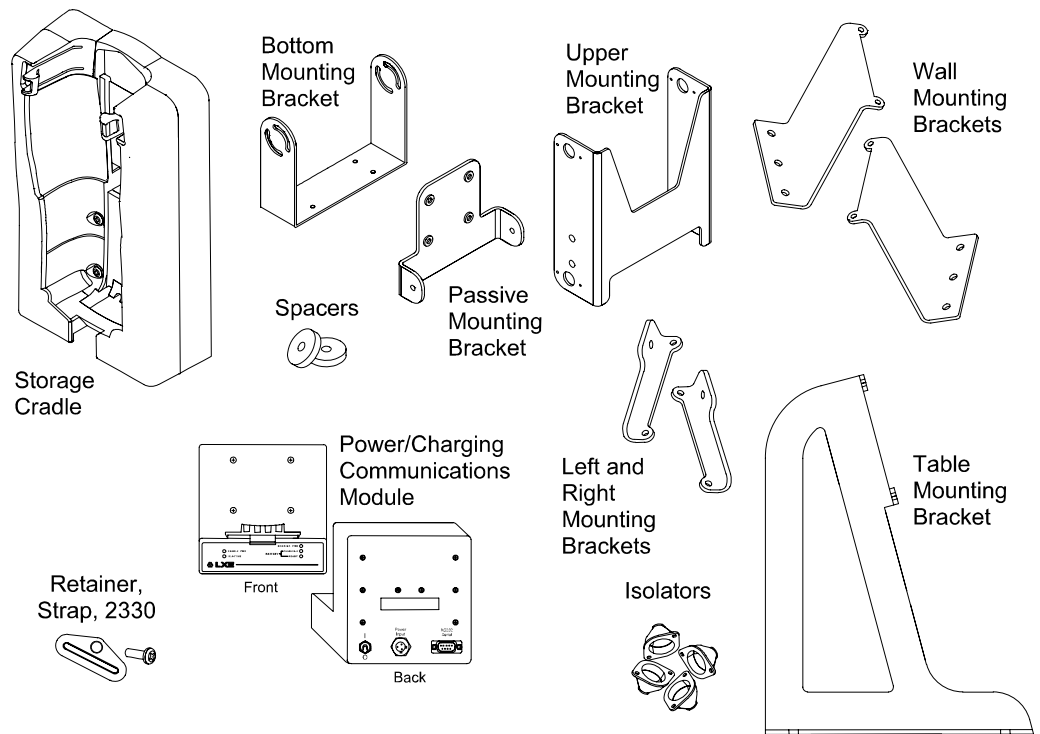
Figure 1-3 Wall, Vehicle and Desk Cradle Components

Compatible Devices

The docking cradles can be used in independent or combined configurations with these devices:

| 2330 | 2335 | MX1 |

Figure 1-4 Compatible Devices

Attention:

The MX1 Intrinsically Safe device and battery pack are NOT compatible with the MX1 Docking Cradle and may cause damage to the MX1-IS and battery pack if placed in an unauthorized MX1-IS docking cradle/charger. The MX1-IS keypad is bright blue in color.

MX1 I-Safe

Battery Charging Contacts

Battery Charging
Contacts   IR Port
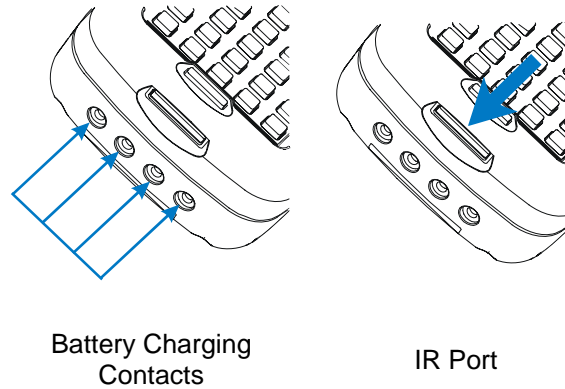
Figure 1-5 Cradle Connectors on the Hand Held Devices

There are a row of charging contacts located on the bottom of the 2330, 2335 and MX1.

Charging Cradle Connector

They are designed to provide charging voltage to the main battery pack when the unit is placed in a charging station connected to an external power supply.

IR Port

Just above the battery charging contacts is the IR port. Data from the computer is sent/received through the IR port to the cradle's IR Port to/from the cabled host connection on the cradle.

Obsolete Equipment

As equipment is placed on the obsolete list (quite often due to the rapidly changing nature of the RF environment and the improvements in computer hardware), LXE makes every effort to support, service and repair the equipment until it is no longer repairable/serviceable. The information contained in this document relating to obsolete devices has been made available as a courtesy to LXE's customers.

Please contact your LXE customer support representative for assistance with these units and for replacement equipment and software.

The 2335 and MX1 are obsolete as of December 2005. The 2330 is obsolete as of May 2000.

Software/Hardware Upgrades Required for the 2330 only

The following upgrades are available for 2330's that will be used with the docking cradle.

- A 2330 **without** an "M" in the product serial number must be returned to LXE for upgrade before using the 2330 in the Docking Cradle. The serial number is located on the LXE product identification tag on the back of the 2330.

- Rev. C CPU upgrade to the 2330 is performed at LXE.

- RetroFit Kit, LXE part number 154873-0001, upgrade to the 2330 is performed at LXE.

Please contact LXE Customer Support at 770-449-0154 to determine if your 2330 requires upgrading.

Retainer Clip for 2330 Required

Each 2330 that is to be placed in the cradle must have a Retainer installed.

Retainer, Strap 2330
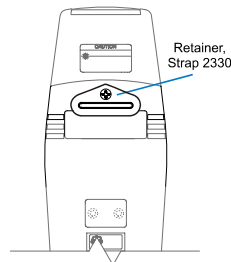
The Screw part number is: 711205-1716

The Retainer part number is: 153852-0001

Note: If the 2330 has a hand strap installed already, you do not need to perform this step.

Turn the mobile device off, if necessary, and place the mobile device face down on a flat surface.

Position the retaining strap bracket on the mobile device as shown below.

Insert the flat head screw and tighten securely.

Maintenance

Storage Cradle

Replace the storage cradle once a year.

The cradle is replaced at no charge during a Preventive Maintenance Inspection.

Check the cradle regularly for excessive wear at pressure points. If the cradle becomes cracked or broken at any time, it must be taken out of service and replaced. Contact LXE Customer Service for replacement cradle.

Vehicle Mount Assembly

Check the vehicle bottom bracket fasteners and re-tighten if necessary. If the vehicle bracket and cradle connections become broken, loose or cracked, it must be taken out of service and replaced..

Pay particular attention to the condition of the rubber vibration isolators. If the rubber isolators become damaged in any way, the vehicle bracket must be taken out of service and the isolators replaced.

Docking Cradle Configurations

The docking cradle components are designed to provide the following functions whether the docking cradle is mounted to a wall, table or vehicle:

- Secure the mobile computer while ensuring vibration/shock isolation.

- Provide operational and battery charging power to the mobile computer.

- Provide IR to RS232 communication and IR "pass-through" with the mobile computer.

The docking cradle has four basic configurations. Additional combinations are available depending on the power supply and cable accessory selected. See "Accessories" for part numbers.

Table/Wall Mount Passive Storage Cradle
Stand-alone unit to retain mobile device on table or wall.

Table/Wall Mount Power/Charging and Communications Module (PCM)
Passive storage cradle and PCM for power, recharge and communications capability.

Vehicle Mount with Passive Cradle
Passive storage cradle and vehicle mounting bracket for mobile use.

Vehicle Mount Power/Charging and Communications Module (PCM)
Passive storage cradle, PCM, and vehicle mount bracket for mobile power, recharge and communications capability.

Add on modules and accessories include:

Power/Charging and Communications Module (PCM)
Provides power and battery charging to the mobile device, IR pass-through and IR to RS232 conversion. A passive storage cradle is required.

Vehicle Mounting Bracket
Provides vibration isolation between vehicle and passive storage cradle. Attaches to passive storage cradle and mounts to vehicle.

Power Supplies (only one is required)
LXE 110-240VAC input, 12VDC output power supply.
LXE 24-60DC input, 12VDC output power supply.
Circular connector to bare wire cable (12VDC input only).

Cables
DB9 to DB25 for connecting PCM to printer or computer.
DB9 to DB9 for connecting PCM to printer or computer.
DB9 to circular DIN for connecting PCM to Renegade printer.

Strap Retainer for each mobile device that will be using the cradle.

Docking Cradle Components

Passive Storage Cradle

The passive storage cradle is designed to support and protect the mobile device. The device can be fully operational while in the cradle, including display, keyboard and RF operation.

Figure 1-6 Passive Storage Cradle

Power/Charging and Communications Module

Front   Back
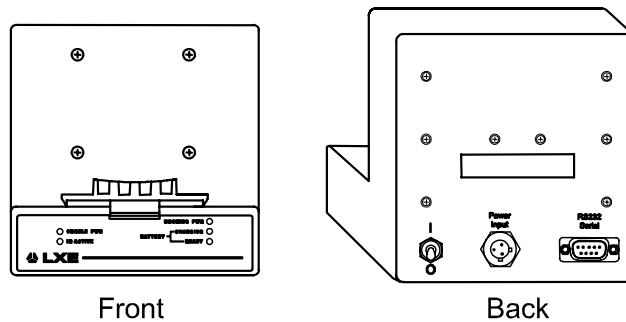
Figure 1-7 Power/Charging and Communications Module

The Power/Charging and Communications Module (PCM) attaches to the bottom and rear of the passive storage cradle. It provides several electrical functions required by the mobile device including:

- Power subsystem for operational and battery pack charging power, as well as power for PCM digital circuits.

- Battery charger for the battery pack.

- IR to RS232 interface to connect the mobile device's IR port to external cabled serial devices.

A contact block on the PCM passes operational and charging power to the mobile device.

Power Subsystem

The power subsystem is designed to accept input power from a vehicle's battery or add-on DC power supply and then provide power to the mobile device, including charge power to the built-in battery pack. In addition, standard wall AC power can be used with an AC-to-DC converter.

It has an input power filter to help limit voltage spikes and noise from the vehicle battery input voltage. A toggle switch disconnects the PCM from the external power source.

The power subsystem accepts power from the following external power sources:

- Universal input (120/240VAC) AC to DC power supply providing 12VDC output into the docking cradle.

- 24 to 60VDC input DC to DC power supply providing 12VDC output to the docking cradle.

- 8 to 18VDC input directly from truck or forklift battery power.

The power subsystem provides current limit protection for the PCM circuits and the mobile device. A 4.0 Amp, Fast-blo fuse protects the PCM circuits, while a 1.1 Amp, self-resetting fuse protects the mobile device. Fuses are not user replaceable.

Battery Charging Subsystem

The battery charging subsystem is used to charge the Nickel-Metal Hydride (NiMH) battery pack, while the battery pack is installed in the mobile device. Total charge time is 3.5 hours when fast charging. It delivers a constant current of 350mA to the battery pack at 8VDC maximum charging voltage.

The charger automatically switches from fast charge mode to trickle charge mode, upon completion of fast charging. Trickle charge provides 30mA current to the battery pack, to help sustain battery pack capacity and prevent self-discharge. The charger monitors the battery pack temperature to control fast charge termination.

Prior to and during fast charge, the battery charger monitors battery temperature and voltage as a safety feature. If battery temperature and voltage are not within acceptable ranges, the battery charger will remain in the trickle charge mode.

The charger also provides control signals for the battery charger indicator LEDs on the front of the PCM:

- Fast Charge in Progress,

- Fast Charge Pending,

- Fast Charge Complete/Trickle Charge Active and

- Battery Absent/Fault.

The charger also provides over-current protection to the mobile device's battery pack, via a 1.1 Amp self-resetting fuse. Fuse is not user replaceable.

IR to RS232 Interface

The IR-RS232 interface converts IR formatted input data transferred between the docking cradle and the mobile device, into RS232 formatted serial output data, for transfer with an external cabled serial device (such as a printer or laptop computer). This interface also provides a control signal for visual indication of IR and RS232 data transmission: the IR Active LED is green when IR - RS232 transmission is in progress.

The IR portion of the interface is IrDA-SIR 1.0 compatible with the exception of the range of allowable data rates. **The IR data transmission rate default value is 9600 bps, and is fixed at this rate**. The IR operating envelope has a distance range of 2 cm (.79 inches) to 1 meter (3.2 feet) with a viewing angle of 30 degrees. The IR interface is half-duplex, capable of data transfer in only one direction at a time.

The RS232 portion of the interface is serial, half-duplex through the 9-pin connector port. The RS232 port provides the following serial data and handshaking control signals: TD, RD, CTS, RTS, DTR, DSR and GND.

Mounting Brackets
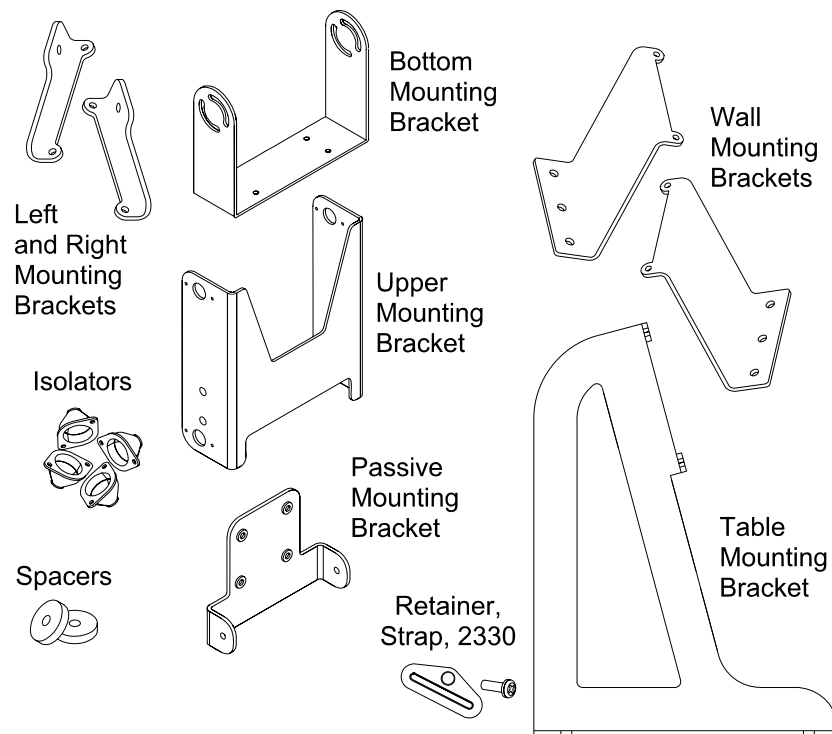
Figure 1-8 Mounting Bracket Assemblies

The brackets provide vibration isolation and mount adaptation for both the mobile device and the full docking cradle, including the passive cradle and PCM.

When mounted in the vehicle mounting bracket, the docking cradle can be rotated about the X axis which accommodates user keypad accessibility and line-of-site IR port positioning. All brackets have several pre-drilled mounting hole patterns to allow mounting to different vehicles/surfaces.

Powered Cradle Indicators
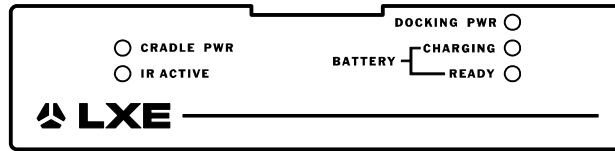
Figure 1-9 Status Indicators

Note: *The docking cradle must have a Power/Charging and Communications Module installed and connected to a power supply before these indicators are activated.*

Power On

Note: *The Power Switch must be ON and both indicators must be Green before the battery pack in the mobile device can be charged.*

◯ **CRADLE PWR**   *Green*

The CRADLE PWR indicator is green when receiving power from the +5VDC power supply.

DOCKING PWR ◯   *Green*

The DOCKING PWR indicator is green when receiving power from the +12VDC power supply.

Battery Charging Status

Battery charging status is indicated by the BATTERY CHARGING and the BATTERY READY indicators.
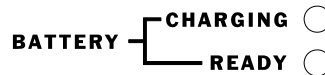
Figure 1-10 Battery Charging Status Indicators

READY indicator is ON	Fast Charge Complete / Trickle Charge Active
CHARGING indicator is ON	Fast Charge in Progress
CHARGING indicator is BLINKING	Fast Charge Pending
CHARGING is Off, READY is Off	Battery Absent / Fault

Note: *The battery pack in the mobile device begins charging as soon as it is placed in the docking cradle regardless of the mobile device's On/Off status.*

IR-RS232 Status

Both IR and RS232 receive/transmit status is indicated by the IR ACTIVE indicator.

◯ **IR ACTIVE**

Figure 1-11 IR-RS232 Status Indicator

The indicator is ON when actual data transmission is occurring and is OFF when no transmissions are in progress.

Note: The mobile device must be ON before IR-RS232 transmission can occur.

Cradle Connectors

Power Switch, Power Cable and RS232 Connector

The power switch, power cable and RS232 cable connectors are located at the back of the PCM on the Docking Cradle.
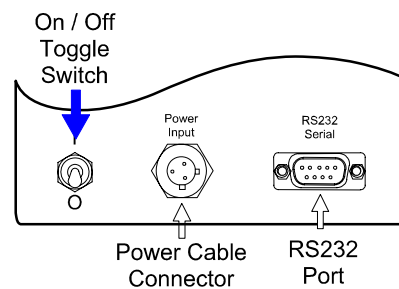
Figure 1-12 On/Off Switch and Cable Connectors

ON   Toggle switch is UP. (I)

OFF   Toggle switch is DOWN. (O)

Docking Cradle Label
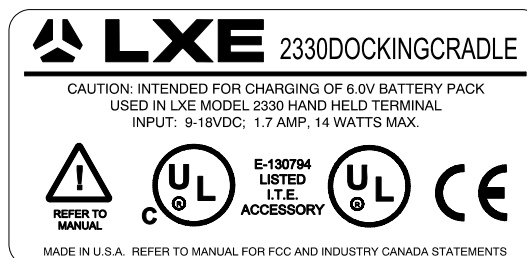
Figure 1-13 Nameplate Label on Docking Cradle

AC Adapters for Docking Stations (Optional)

US AC Wall Adapter

Figure 1-14 US AC/DC 12V Power Supply

Operating Temperature	32°F to 104°F (-0°C to 40°C)
Storage Temperature	-22°F to 140°F (-30°C to 60°C)
Operating Humidity	Up to 90% non-condensing at 104°F (40°C)

International AC Adapter

Figure 1-15 International AC/DC 12V Power Supply

Operating Temperature	32°F to 104°F (-0°C to 40°C)
Storage Temperature	-22°F to 140°F (-30°C to 60°C)
Operating Humidity	Up to 90% non-condensing at 104°F (40°C)

Getting Help

LXE user guides are now available on CD and they can also be viewed/downloaded from the LXE ServicePass website. Contact your LXE representative to obtain the LXE Manuals CD or access to the LXE ServicePass website. You can also check the LXE ServicePass website for the latest manual releases.

Note: Obsolete/archived manuals are not available on the LXE Manuals CD. They are available for download from the ServicePass website only.

You can get help from LXE by calling the telephone numbers listed on the LXE Manuals CD, in the file titled "Contacting LXE". This information is also available on the LXE website. Explanations of terms and acronyms used in this manual are located in the file titled "LXE Technical Glossary" on the LXE Manuals CD and on the LXE website.

User Guides

Note: The 2330, 2335 and MX1 are obsolete. The 900MHz radio used in these mobile devices is obsolete. Please contact your LXE representative for replacement devices.

2330 Installation and Operator's Guide *

2330 Reference Guide *

MX1 (2335) User's Guide *

MX1 (2335) Reference Guide

MX1 User's Guide *

MX1 Reference Guide *

2330 Multidock Reference Guide *

Getting the Most From Your Batteries

AC Singledock Desk Mounting Instruction *

DC Singledock Vehicle Wiring and Mounting Instruction *

2330 Table Mounting Bracket Installation *

2330 Vehicle Mounting Bracket Installation *

2330 Wall Mounting Bracket Installation *

* User guides that have been archived are available on the LXE ServicePass Website. All others are available on the LXE Manuals CD as well as on the LXE Website.

Accessories

Cradles	
Passive Table (mounted on table/wall) Cradle	2330A004STORCRADLE
Powered Table (mounted on table/wall) Cradle	2330A006PCCRADLE
Passive VMT (mounted in vehicle) Cradle	2330A007VMCRADLE
Powered VMT (mounted in vehicle) Cradle	2330A009PCVMCRADLE
Power Supply	
Power Module Upgrade	2330A003PCMODULE

Power Adapter, Bare Wire 12 VDC	1300A053CBL12ML3
Power Adapter, 24-60 VDC, 20 Watts	1300A301PS24WW
Power Adapter, 110-240 VAC	1300A303PSACWW
Battery, 1500mAh, NiMH	2330A381BATT1500

Multidocks

4 Bay Comm Power Multidock	2330A013MULTIDOCK
4 Line Communications Co-Processor	9000A063COMMPROC4

SingleDocks

Single Comm Power Dock (AC)	2330A010ACSINGDOCK
Single Comm Power Dock (DC)	2330A011DCSINGDOCK

Brackets

VMT Bracket Upgrade	2330A001BRKT
Vehicle Bracket Kit for DC Singledock	2330A012VMTBRKT
Bracket, Dock, Desk Mounting	2330A018DOCKDESKMTG
Bracket, Dock, Raised Wall Mounting	2330A020DOCKRAISED

Peripheral Device Cables

D9 to D25 Printer/PC Cable, 6ft	9000A053CBL6D9D25
D9 to D9 PC Cable, 6ft	9000A054CBL6D9D9
D9 to DIN Renegade Cable, 6ft	9000A055CBL6DIN8D9
Cable, Multidock, DA9F-DA9F, Multi-Multi	9000A058CBLD9D9MULTI
Cable, Null Modem, DA9F-DB25F, Single/Multi	6200L200
Cable, Straight Thru, DB25F-DB25M	6200L201
Cable, Null Modem, DB25F-DB25F, Single/Single	6200L202

Miscellaneous

RS232 to RS485 Converter	2330A015CONV232485
RS485 Terminator, 115K Baud	2330A016RS485FAST
RS485 Terminator, 9.6K Baud	2330A017RS485SLOW

Battery Chargers

6 Unit Charger/Analyzer	2330A378CHGR6WW
3 Unit Battery Analyzer	2330A379ANLZR3WW
Portable Charger, Clip-On (see Note)	2335A376PORTACHGR

Note: Must order one Power Supply (9000A303PSCIGLTADPT) with each Portable Charger.

Chapter 2 Installation

Introduction

The cradle is attached to the mounting assembly then installed on a flat, stable stationary or mobile surface. Four isolation supports on the mounting bracket provide vibration mounting for the mobile computer and PCM.

Power cables, and any required RS232 cable, are then connected to the Power Module.
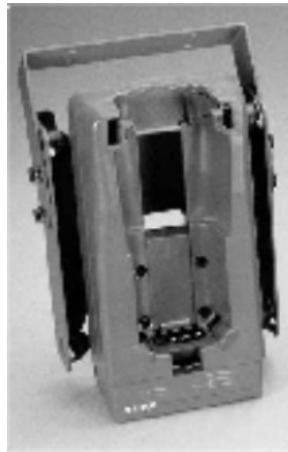
Vehicle Mount
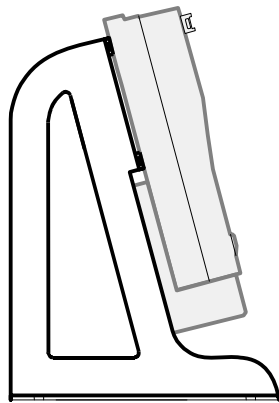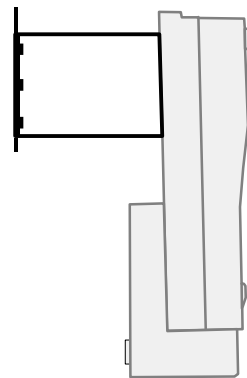
Table Mount   Wall Mount

Figure 2-1 Vehicle, Desktop and Wall Mounted Cradle Components

Foreign Language Translations

This chapter contains assembly instructions in English only. The assembly instructions have been translated into the following languages:

- French
- German
- Italian
- Portuguese
- Spanish
- Swedish

Please refer to the following documents, available on the LXE website in the Archived section, for the translated text:

Vehicle	"2330 Docking Cradle Vehicle Mounting Bracket" Installation Instruction Sheet (DocID 2330A142INSTVEH).
Table	"2330 Docking Cradle Table Mounting Bracket" Installation Instruction Sheet (DocID 2330A140INSTTBL).
Wall	"2330 Docking Cradle Wall Mounting Bracket" Installation Instruction Sheet (DocID 2330A141INSTWALL).

The Multidock and AC/DC docking stations arrive already assembled.

Before Assembly Begins

Unpack the shipping container and verify the components for the mounting bracket to be installed are present.

General Components

Verify you have the following general assembly components:

Passive Storage Cradle

Front   Back

Retainer, Nylon Hand Strap for mobile device (if needed)

1 each   6-32 x 3/8 Flat Head Screw
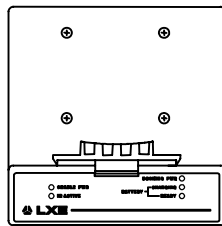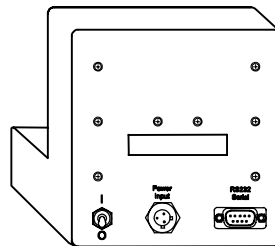
Power/Communications Module (if ordered)

For cradle power, mobile device recharge and communications capability.

4 each   #8 Flat Washer
4 each   #8 Lock Washer
4 each   8-32 x ½ Pan Head Screw

Torquing tool needed to attach PCM to cradle is not supplied by LXE. You will need a torquing tool capable of torquing to 8±1 in/lb (.90±.11 N/m) when attaching the **Power/Communications Module** to the **cradle**.

See the following sections for components that are unique to the docking cradle's use.

Note: Bolts, washers and wrench required to attach the mounting brackets to the surface are not supplied by LXE.

Vehicle Mount Components

Clearance:

There must be at least 8" clearance at the back of the bracket for the trigger handle. Position the bracket to allow access to the switches and ports on the back of the Power Module, if installed.
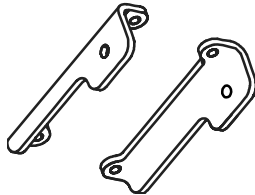
Left and Right Mounting Brackets

These brackets are attached to the *back* of the cradle.

4 each   #8 Flat Washer
4 each   #8 Lock Washer
4 each   8-32 x ½ Pan Head Screw
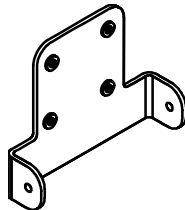
Passive Mounting Bracket

This bracket is attached to the *back* of the cradle when the cradle *does not* have a Power Communications Module (PCM) installed.

4 each   #8 Flat Washer
4 each   #8 Lock Washer
4 each   8-32 x ½ Pan Head Screw
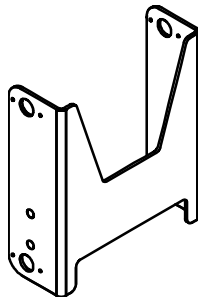
Upper Mounting Bracket

4 each   #8 Lock Washer
2 each   8-32 x ½ Pan Head Screw
2 each   8-32 x ¾ Pan Head Screw

2 each   **Aluminum spacer**

4 each   **Isolator**
8 each   Nut, Hex 4-40 Keps
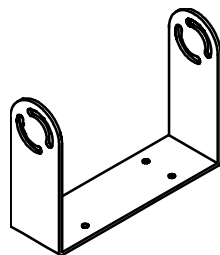
Bottom Mounting Bracket

This bracket is mounted to the vehicle.

4 each   1/4 Flat Washer
4 each   1/4 Lock Washer
4 each   ¼-20 Bolt

Table Mount Components

Clearance:

There must be at least 8" clearance at the back of the bracket for the trigger handle. Position the bracket to allow access to the switches and ports on the back of the Power Module, if installed.
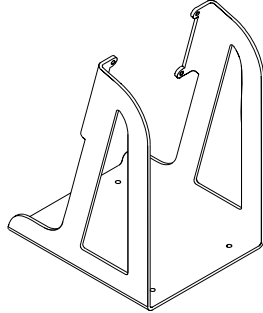
Table Mounting Bracket

4 each   #8 Flat Washer
4 each   #8 Lock Washer
4 each   8-32 x ½ Pan Head Screw
4 each   Rubber Feet

Wall Mount Components

Clearance:

There must be at least 8" clearance at the back of the bracket for the trigger handle. Position the bracket to allow access to the switches and ports on the back of the Power Module, if installed.
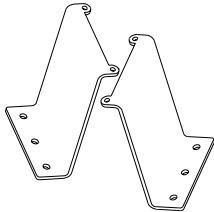
Wall Mounting Brackets, 2 each

Left side and right side

4 each   #8 Flat Washer
4 each   #8 Lock Washer
4 each   8-32 x ½ Pan Head Screw

Putting it all Together

Attach Power Communications Module to Cradle

Equipment Needed: Torque wrench capable of torquing to 8±1 in/lb (.90±.11 N/m) .

1. Holding the cradle securely in one hand and the power module in the other, slide the cradle bottom onto the power communications module.

2. Position the battery contacts into the opening in the cradle bottom and the red IR port into the front opening of the cradle.
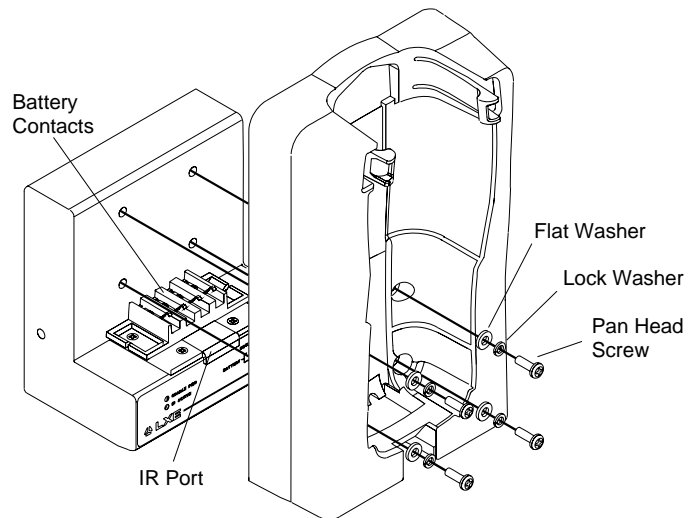
3. Insert a Flat Washer, Lock Washer and Pan Head Screw into each of four holes.

4. Torque the Pan Head Screws to 8±1 in/lb (.90±.11 N/m).

Continue to the section for the cradle's intended use; vehicle, desk or wall.

Table Mount Assembly

The table mounted cradle's lower end is tilted forward at a 15° angle.

Clearance:

There must be at least 5" clearance (10 cm) at the back of the table mount bracket for the trigger handle. Position the bracket to allow access to the switches and ports on the back of the Power Module, if installed.

Assemble Movable Table Bracket
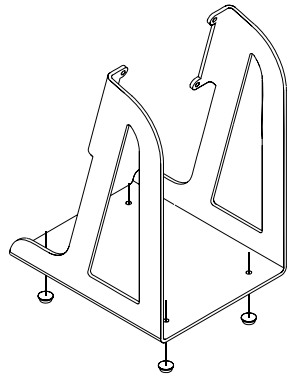
When the Table Bracket is to be placed on a flat surface without the need for securing the bracket to the surface, insert the Rubber Feet in the holes in the base of the Table Bracket.

You are now ready to attach the cradle to the Table Bracket.

Assemble Stationary Table Bracket

Step 1 - Mount Table Bracket to Flat Surface

Important: *Attach the table bracket to the table before attaching bracket to the cradle.*
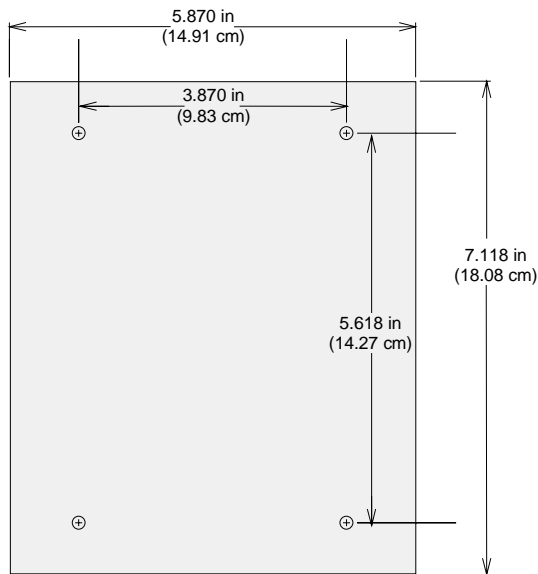
Using the *dimensions* on this diagram, place the table bracket on a flat surface.

Insert four ¼ bolts, or equivalent, and tighten the bolts securely.

Important: Mount to the most rigid surface available.

Test the bolts frequently during operation cycles and re-tighten if necessary.

5.870 in
(14.91 cm)

3.870 in
(9.83 cm)

7.118 in
(18.08 cm)

5.618 in
(14.27 cm)

MOUNTING DIMENSIONS,
DESK MOUNT
(NOT TO SCALE)

Step 2 - Connect the Cradle to the Table Bracket

1. If the mobile device is in the storage cradle, remove it from the cradle and place in a safe location.

2. Turn the Power Module, if installed in the cradle, off and remove all cables from the Power Module.
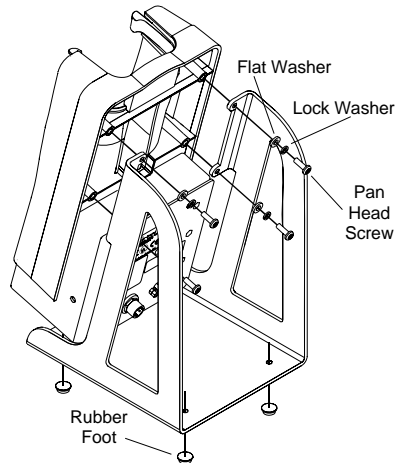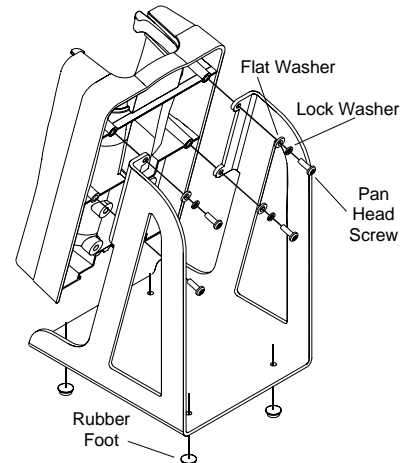
With Power Module   Without Power Module

3. Place the cradle in front of the table bracket, aligning the upper screw holes in the back of the cradle with the upper screw holes in the table bracket.

4. Insert the flat washer, lock washer and pan head screws in the cradle screw holes and torque the Pan Head Screws to 8±1 in/lb (.90±.11 N/m).

5. The cradle is now ready to use. If a Power Module is installed in the cradle, reattach all cables and turn the Power Module on.

Wall Mount Assembly

Step 1 - Attach Brackets to Cradle

Important: *Attach the brackets to the cradle before attaching brackets to the wall.*

Equipment Needed: Torque wrench capable of torquing to 7 in/lb (.79 N/m) .
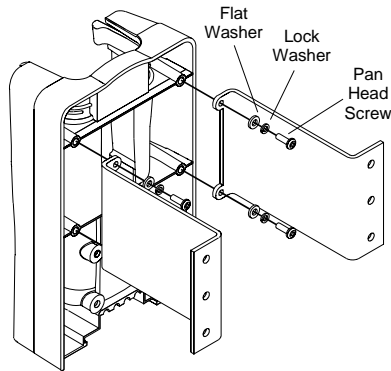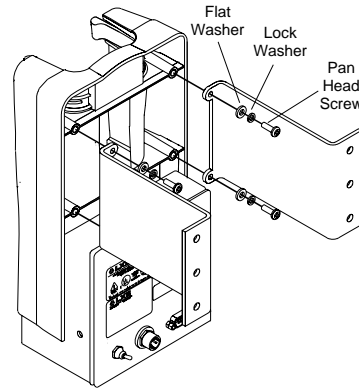
Without Power Module   With Power Module

1. If the mobile device is in the storage cradle, remove it from the cradle and place in a safe location.

2. Turn the Power Module, if installed in the cradle, off and remove all cables from the Power Module.

3. Place the cradle face down on a stable surface.

4. Place a wall bracket on the cradle with the cradle end down and the wall end up.

5. Align the cradle screw holes in the back of the cradle with the cradle end screw holes in the brackets.

6. Insert the flat washer, lock washer and pan head screws in the cradle screw holes and torque the Pan Head Screws to 7 in/lb (.79 N/m).

You are ready to mount the wall brackets to the wall.

Step 2 - Mount Wall Brackets to the Wall

7.682 in
(19.51 cm)

6.682 in
(16.97 cm)

3.566 in
(9.06 cm)

2.564 in
(6.51 cm)

1.282 in
(3.26 cm)

.50 in
(1.27 cm)

10.547 in
(26.79 cm)

5.669 in
(14.4 cm)

MOUNTING DIMENSIONS,
WALL MOUNT
(NOT TO SCALE)
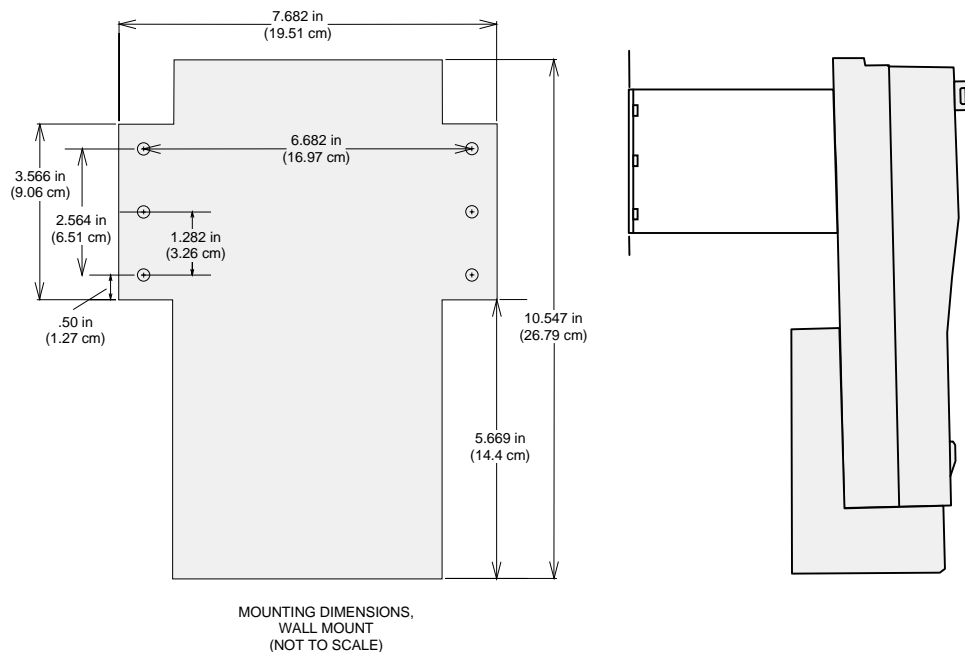
Important: **Mount to the most rigid surface available.**

1. Place the assembled cradle wall mounting on a vertical surface.

2. Insert four #10 bolts, or equivalent fasteners, in the wall end of the bracket and tighten securely.

3. The cradle is now ready to use. If a Power Module is installed in the cradle, reattach all cables and turn the Power Module on.

Vehicle Mount Assembly
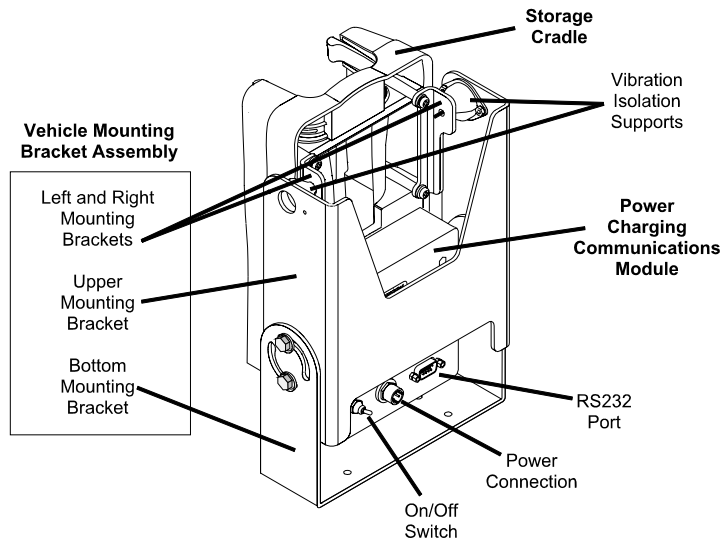
Step 1 - Prepare Cradle

Cradle Without Power/Communications Module

Equipment Needed: Torque wrench capable of torquing to 8±1 in/lb (.90±.11 N/m).
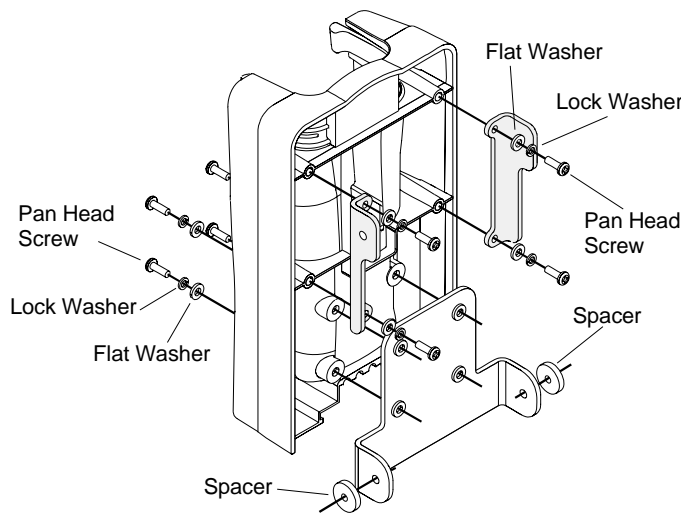
> *Note:*   *When there is no PCM in the cradle, the flat lower mounting bracket (passive bracket)*
>   *must be attached to the cradle.*

Attach the Passive Bracket

1. If the mobile device is in the storage cradle, remove it from the cradle and place in a safe location.

2. Place the passive cradle face up on a flat surface.

3. Insert a Flat Washer, Lock Washer and Pan Head Screw into each of four holes at the front of the cradle.

4. Attach the Passive Bracket to the cradle.

5. Torque the Pan Head Screws to 8±1 in/lb (.90±.11 N/m). Now you are ready to attach the Left and Right Brackets.

Attach the Left and Right Brackets

1. Place the passive cradle face down on a flat surface.

2. Put the Left and Right Brackets on the cradle, aligning the screw holes in the cradle with the screw holes in the brackets.

3. Insert a Flat Washer, Lock Washer and Pan Head Screw into each hole.

6. Torque the Pan Head Screws to 8±1 in/lb (.90±.11 N/m).

Cradle With Power/Communications Module

Equipment Needed: Torque wrench capable of torquing to 8±1 in/lb (.90±.11 N/m) .
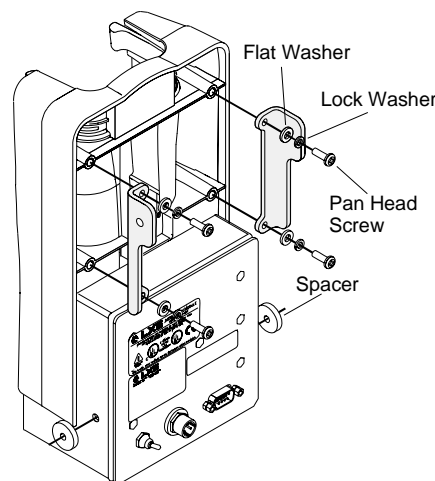
1. If the mobile device is in the storage cradle, remove it from the cradle and place in a safe location.

2. Turn the Power Module off and remove all cables from the Power Module.

3. Place the cradle face down on a flat surface.

4. Put the Left and Right Brackets on the cradle, aligning the screw holes in the cradle with the screw holes in the brackets.

5. Insert a Flat Washer, Lock Washer and Pan Head Screw into each hole.

6. Torque the Pan Head Screws to 8±1 in/lb (.90±.11 N/m).

Step 2 - Mount Bottom Mounting Bracket to Vehicle

The vehicle mounted cradle should be mounted in an area in the vehicle where it:

- Does not obstruct the vehicle operator's vision or safe vehicle operation.
- Will be protected from rain or inclement weather.
- Will be protected from extremely high concentrations of dust or wind-blown debris.
- Can be easily accessed by a driver seated in the driver's seat.

Note: Install the Bottom Mounting Bracket to the vehicle before attaching the cradle.
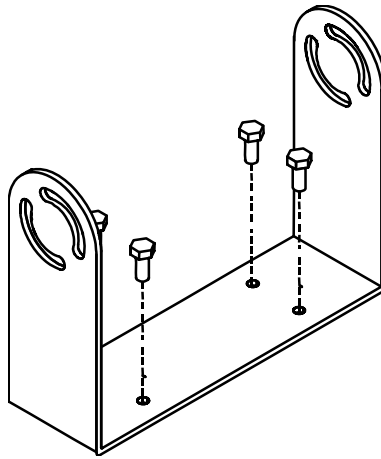
Attach Bracket to Vehicle

There must be at least 8" clearance at the back of the bracket for the mobile device's trigger handle. Position the bracket to allow access to the switches and ports on the back of the Power Module, if installed.

Using the mounting dimensions on the following diagram to mount the bottom mounting bracket *to the vehicle*, using ¼" bolts (not supplied by LXE).

1.190 in
(3.02 cm)

1.729 in
(4.39 cm)

.530 in
(1.35 cm)

4.00 in
(10.0 cm)

7.448 in
(18.92 cm)

2.250 in
(5.71 cm)
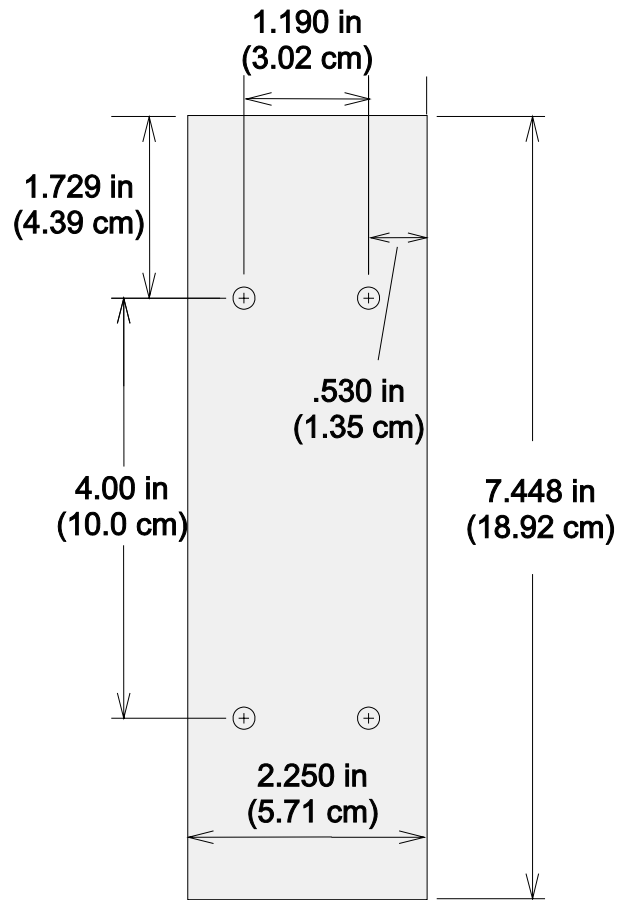
Mounting Dimensions, Vehicle Mount (Not to Scale)

Use the dimensions on this diagram to place the vehicle mount bracket.

Step 3 - Prepare the Cradle Mounting Assembly

Equipment Needed: Torque wrench capable of torquing to 5±1 in/lb (.56±.11 N/m) and 15±1 in/lb (1.69±.11 N/m).

Nut, Hex 4-40 Keps
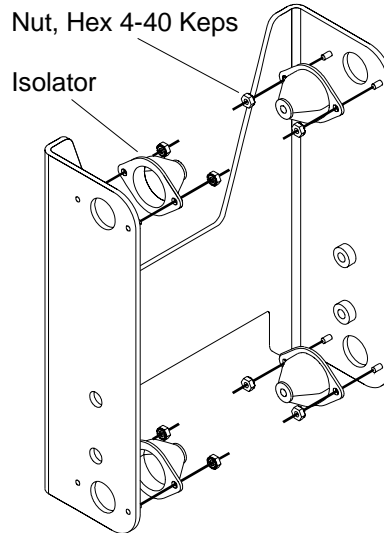
Isolator

Attach Isolators to Upper Mounting Bracket

1. Place an isolator over an upper mounting bracket opening. Align the pins on the side of the opening with the two small holes in the isolator.

2. Place a hex nut over each pin and tighten, torquing to 5±1 in/lb (.56±.11 N/m).

Now you are ready to attach the Upper Mounting Bracket to the cradle assembly.

Assemble Upper and Lower Connectors

Pan Head Screw (8-32 x 1/2)

Lock Washer

Pan Head Screw (8-32 x 3/4)

Spacers inside

Without Power Module
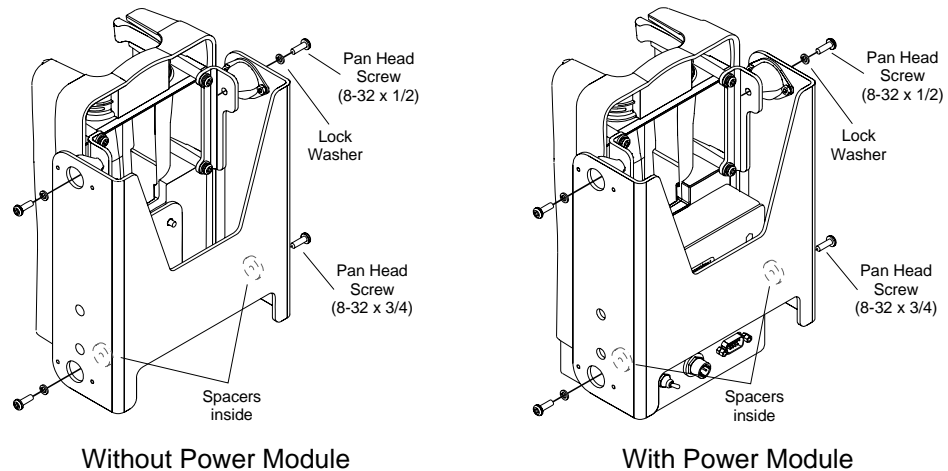
With Power Module

Connect Upper Bracket to Cradle Assembly

1. Put the aluminum spacers between the lower isolators and the Power Module (or Passive Bracket).

2. Insert lock washer and 8-32 x ¾ pan head screw in upper and lower openings, being sure to thread the screw through the lock washer, isolator and spacer (spacer in lower opening).

3. Loosely tighten each pan head screw as it is inserted. **Important: Do not torque screws until all screws are threaded in place.**

4. Torque all four pan head screws to 15±1 in/lb (1.69±.11 N/m).

Now you are ready to connect the assembled cradle to the vehicle.

Step 4 - Connect Cradle to Vehicle Bracket

Equipment Needed: Torque wrench capable of torquing to 50±5 in/lb (5.65±.56 N/m).
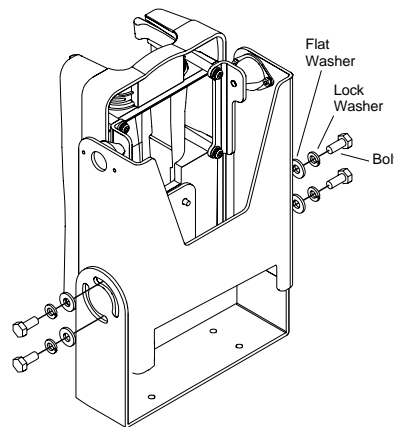
Cradle without Power Module   Cradle with Power Module
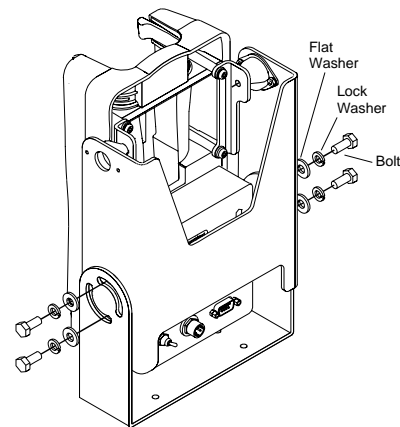
Connect Cradle to Vehicle Mounting Bracket

1. Insert mounting bolts (place washer first) through the curved apertures in the Bottom Bracket and into the screws holes in the Upper Bracket.

2. Securely fasten the hex bolts by torquing the bolts to 50±5 in/lb (5.65±.56 N/m).

3. Loosen the hex bolts on both sides to adjust the viewing angle of the mounted cradle then tighten the hex bolts.

4. **Test the torque on the bolts frequently during operation and re-tighten if necessary to 50±5 in/lb (5.65±.56 N/m).**

5. Connect all cables to the Power Module, if installed.

6. The vehicle mounted cradle is now ready for use.

Power Supplies and Cable Connections

LXE computers require a continuous source of relatively noise-free DC power. If this requirement is not satisfied, data in the LXE computer may be lost. The cradle can be powered by any one of the following three standard electrical supply configurations:

AC Power Supply
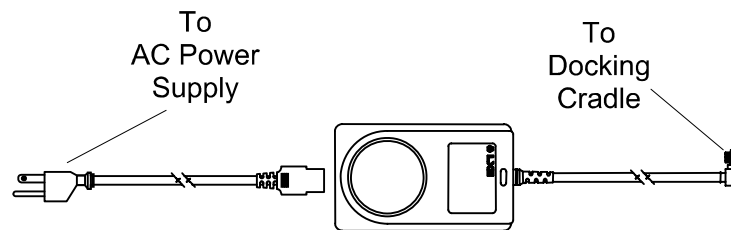
Figure 2-2 120/240VAC Input to DC Power Supply

The external AC supply may be connected to either a 120V, 60Hz supply or, outside North America, to a 230V, 50Hz supply, using the appropriate detachable cordset. In all cases, connect the external AC supply to a properly grounded source of supply provided with maximum 15 Amp overcurrent protection (10 Amp for 230V circuits).

The figure shown above must provide Inherently Limited 12VDC NEC Class 2 Output (or LPS Output as Defined By UL 1950), with Minimum Output Ratings of 1.7A and 14 Watts.

> **How To**

1. If the mobile device is in the storage cradle, it can be either On or Off during this process.
2. Turn the Docking Cradle off.
3. Connect the detachable cordset provided by LXE to the external AC supply (IEC 320 connector).
4. Plug cordset into appropriate, grounded, electrical supply receptacle.
5. Connect the Molex connector end to the cradle by aligning the connector pins to the power connector; push down on the Molex connector and twist it to fasten securely.
6. Turn the cradle on.
7. The Power LED and Cradle Power LED illuminate.
8. Battery Charging LED illuminates (steady or blinking).

Vehicle Power Connections

Caution: ⚠	*Electrical supply connections should only be performed by a qualified technician or electrician.*

Warning: ⚠	*Risk of ignition or explosion. Explosive gas mixture may be vented from battery. Work only in well ventilated area. Avoid creating arcs and sparks at battery terminals.*

Foreign Language Translations

The Vehicle Cable Connection sections of this chapter have been translated into the following languages:

- French
- German
- Italian
- Portuguese
- Spanish
- Swedish

Please refer to the following documents, available on the LXE website in the Archived section, for the translated text:

Vehicle	"2330 Docking Cradle Vehicle Mounting Bracket" Installation Instruction Sheet (DocID 2330A142INSTVEH).
Table	"2330 Docking Cradle Table Mounting Bracket" Installation Instruction Sheet (DocID 2330A140INSTTBL).
Wall	"2330 Docking Cradle Wall Mounting Bracket" Installation Instruction Sheet (DocID 2330A141INSTWALL).

Vehicle 24/60VDC Input Cable Connection

Caution ⚠	For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. This fused circuit requires a 5 Amp maximum time delay (slow blow) fuse. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery positive (+) terminal.

Figure 2-3 24/60 VDC Input to Power Supply Providing 12VDC Output (Shown Without Fuse)
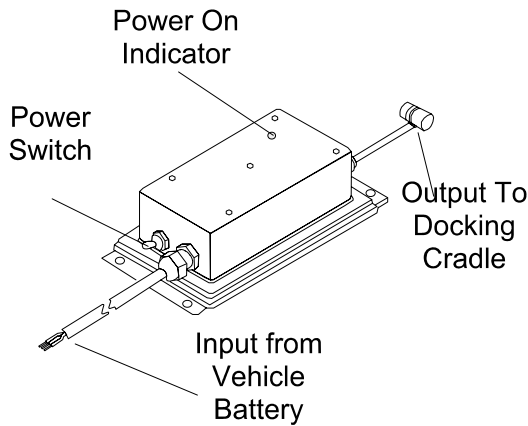
Figure 2-4 Vehicle Power Supply, 24 - 60VDC (Fuse Not Shown)

Figure 2-5 Connecting the Power Supply to the Vehicle

How To

---

1. If the mobile device is in the storage cradle, it can be either On or Off during this process.

2. Turn the Docking Cradle off. Turn the Power Supply toggle switch to the Off position.

3. While observing the fuse requirements specified above, connect the power cable as close as possible to the actual battery terminals of the vehicle. When available, always connect to unswitched terminals in vehicle fuse panel, after providing proper fusing.

    IMPORTANT:

    For uninterrupted power, electrical supply connections should not be made at any point after the ignition switch of the vehicle.

4. Route the cable the shortest way possible. The input cable from the connection to the battery is rated for a maximum temperature of 60°C (140°F). When routing this cable it should be protected from physical damage and from surfaces which might exceed this temperature. Additionally do not expose the cable to chemicals or oil that may cause the wiring insulation to deteriorate.

    Note: If the vehicle is equipped with a panel containing Silicon Controller Rectifiers (SCR's), avoid routing the power cable in close proximity to these devices.

    Always route the cable so that it does not interfere with the user's safe operation and maintenance of the vehicle. Use proper electrical and mechanical fastening means for terminating the cable. Properly sized "crimp" type electrical terminals are an accepted method of termination.

    Wiring color codes for LXE supplied DC input power cabling:

Vehicle Supply		Wire Color
+12VDC	(DC +)	Brown or White
Return	(DC -)	Blue or Black
Vehicle Chassis	(GND)	Green

    Figure 2-6 Vehicle Connection Wiring Color Codes

    Note: The input power cord for the DC-DC Power Supply uses white, black and green wires. Some LXE products have DC input power cords with brown, blue and green wires. The previous table shows the correct electrical connection for either type of cable.

5. Provide mechanical support for the cable by securing it to the vehicle structure at approximately one foot intervals, taking care not to overtighten and pinch conductors or penetrate outer cable jacket.

6. Connect the Power Supply to the cradle by aligning the Molex connector pins to the power connector; push down on the Molex connector and twist it to fasten securely.

7. Turn the Power Supply on. The ON LED on the Power Supply illuminates when it is receiving power from the vehicle.

8. Turn the Docking Cradle on. The Docking Power LED and Cradle Power LED illuminate.

9. The Battery Charging LED illuminates (steady or blinking) when the mobile device is in the cradle.

Vehicle 8-18VDC Direct Connection

Caution ⚠	For proper and safe installation, the input power cable must be connected to a fused circuit on the vehicle. This fused circuit requires a 5 Amp maximum time delay (slow blow) fuse. If the supply connection is made directly to the battery, the fuse should be installed in the positive lead within 5 inches of the battery positive (+) terminal.

Figure 2-7 8 - 18 VDC Direct Vehicle Connection (Shown Without Fuse)

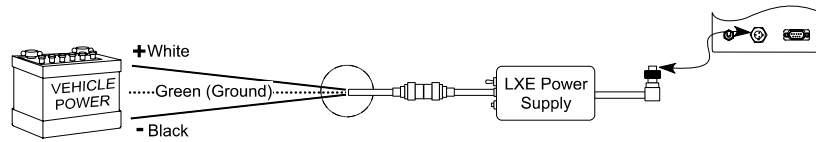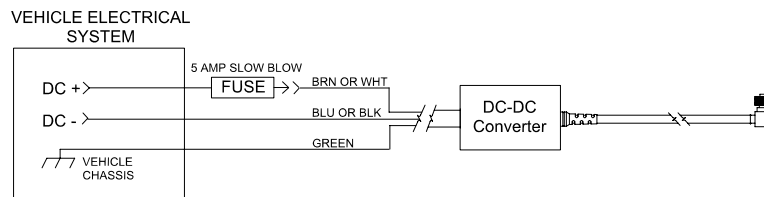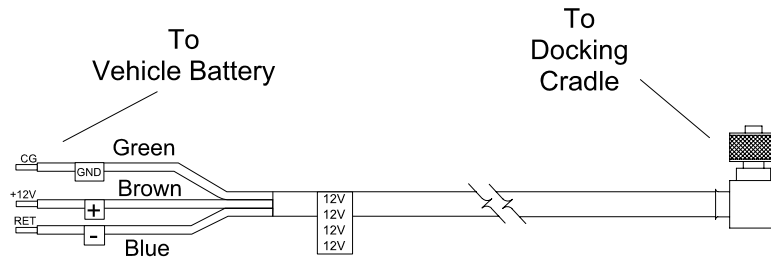**Figure 2-8 Direct Vehicle Power Connection (Fuse Not Shown)**
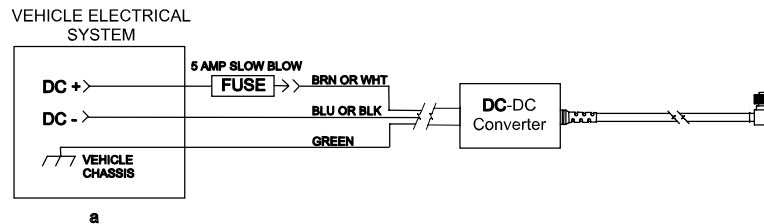
Figure 2-9 Connecting the Power Supply to the Vehicle

How To

---

1. If the mobile device is in the storage cradle, it can be either On or Off during this process.

2. While observing the fuse requirements specified above, connect the power cable as close as possible to the actual battery terminals of the vehicle. When available, always connect to unswitched terminals in vehicle fuse panel, after providing proper fusing.

    IMPORTANT:

    For uninterrupted power, electrical supply connections should not be made at any point after the ignition switch of the vehicle.

3. Route the cable the shortest way possible. The input cable from the connection to the battery is rated for a maximum temperature of 60°C (140°F). When routing this cable it should be protected from physical damage and from surfaces which might exceed this temperature. Additionally do not expose the cable to chemicals or oil that may cause the wiring insulation to deteriorate.

    Note: If the vehicle is equipped with a panel containing Silicon Controller Rectifiers (SCR's), avoid routing the power cable in close proximity to these devices.

    Always route the cable so that it does not interfere with the operator's safe operation and maintenance of the vehicle. Use proper electrical and mechanical fastening means for terminating the cable. Properly sized "crimp" type electrical terminals are an accepted method of termination.

    Wiring color codes for LXE supplied DC input power cabling:

Vehicle Supply		Wire Color
+12VDC	(DC +)	Brown or White
Return	(DC -)	Blue or Black
Vehicle Chassis	(GND)	Green

    Figure 2-10 Vehicle Connection Wiring Color Codes

    Note: The input power cord for the DC-DC Power Supply uses white, black and green wires. Some LXE products have DC input power cords with brown, blue and green wires. The previous table shows the correct electrical connection for either type of cable.

4. Provide mechanical support for the cable by securing it to the vehicle structure at approximately one foot intervals, taking care not to overtighten and pinch conductors or penetrate outer cable jacket.

5. Connect the cable to the Docking Cradle by aligning the Molex connector pins to the power connector; push down on the Molex connector and twist it to fasten securely.

6. Turn the cradle on.

7. The Docking Power LED and Cradle Power LED illuminate when the docking cradle is receiving power from the vehicle's power source (battery).

8. The Battery Charging LED illuminates (steady or blinking) when a mobile device is in the cradle.

Connect RS232 Cable

Connect the RS232 cable to the Power Module to download data from the mobile device to a printer or another computer. A data transfer program is required before data can be exchanged between the mobile device and a desktop computer.

Note: After the cables are installed, the mobile device (client) and, if applicable, the other computer (host) must be powered on and running the data transfer program before data can be transferred.

Connect Using 25-Pin or 9-Pin Printer/PC Cable

1. Turn the mobile device and the cradle Off.

2. Connect the 9-pin connector end to the RS-232 port on the back of the Docking Cradle and fasten securely.

3. Connect the other connector end to the receiving computer or printer's serial port and fasten securely.

4. Turn the Docking Cradle on then turn the mobile device on.

Note: A null modem and/or gender changer may be required to connect the 25-pin connector end to computer or printer.

Connect Using DIN Cable
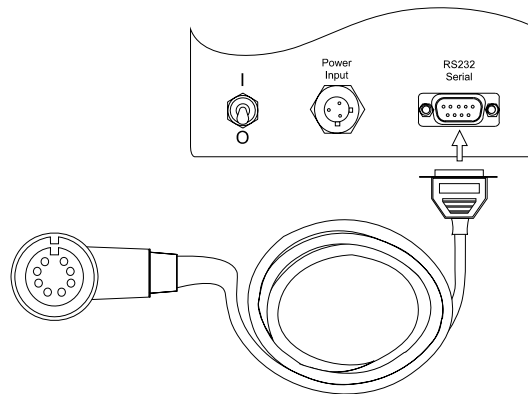
Figure 2-11 D9 to DIN Printer Cable

1. Turn the mobile device and the cradle Off.

2. Connect the 9-pin connector end to the Docking Cradle and fasten securely.

3. Connect the DIN connector end to the receiving printer's DIN port by fitting the pins over the connector. Push and twist the DIN connector head to fasten the connection.

4. Turn the Docking Cradle on then turn the mobile device on.

Docking Cradle End Molex Connector Location

After completing external power connection process (and RS232 cable connection, if any), connect the molex connector to the docking cradle.
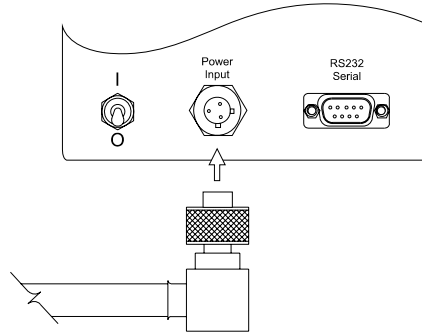
Figure 2-12 Docking Cradle End Molex Connector

The docking cradle is ready to be turned on.

ON   Toggle switch is UP (I).

OFF   Toggle switch is DOWN (O).

Chapter 3 Using The Docking Cradle

Introduction

The mobile device can be inserted in the cradle with or without:

- the hand trigger grip
- a handstrap
- a spare battery.

Note: The mobile device may be turned On or Off while inserting or removing it from the cradle.

The mobile device must have an installed battery pack before battery charging will proceed.

Before battery charging can begin, the Docking Cradle must have a Power/Charging and Communications Module. It must also be connected to an external power source.

The Docking Power LED and Cradle Power LED must be illuminated before:

- mobile device battery charging begins.
- IrDA port data transmission to printer begins.
- RS232 port data transmission begins.

Prepare Mobile Device For Docking Cradle

The main battery pack will begin charging as soon as the mobile device is placed in the docking cradle regardless of the mobile device's On/Off status.

Turn off the 2330
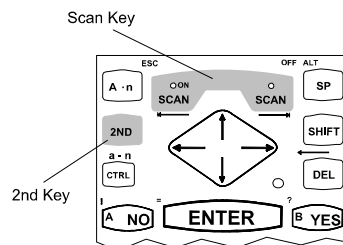
The 2330 is turned off by pressing the 2nd key then pressing the Scan key.

Figure 3-1 Turn 2330 Off

Turn off the 2335 and MX1
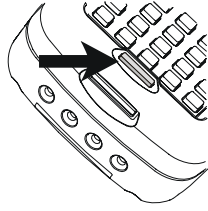
Hold the Power button down. The unit will emit three short beeps and one long beep. After the long beep the mobile device will power down. The Power button and the display will turn off.

Troubleshooting

The 2335 or MX1 will not turn off – force a Power Off by holding the Power key down for 15 seconds and the mobile device will power off. Locate and correct the problem before powering the mobile device back on – e.g. IRQ conflict, very low battery power, radio conflict, unexpected software application result, etc.

Figure 3-2 Location of the Power Button on the 2335 and MX1

Note: Quickly tapping or releasing the Power button prior to the one long beep signal will place the mobile device in Suspend mode (if Suspend is enabled).

Insert Main Battery Pack in Mobile Device

Note: Mobile devices must be turned OFF before the Main Battery Pack is inserted.

1.   Battery Contacts

2.   Battery Pack Tab
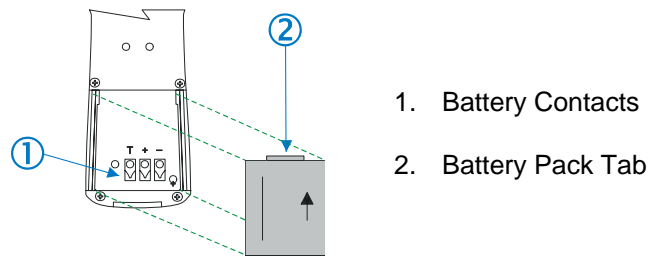
Figure 3-3 Insert Battery And Close Cover

1.   If the mobile device is powered on, save any work, and close running programs.

2.   Turn the unit off.

3.   Open the battery access panel or cover and remove the battery.

4.   Insert an appropriate fully charged battery, aligning the positive and negative contacts on the battery with the metal contacts in the unit.

5.   Close the battery access panel or cover.

6.   Turn the unit on.

Place the used battery in the appropriate battery charger/analyzer.

Insert Mobile Device in Powered Cradle

The device is held in the cradle with the display and keyboard facing outwards.

Spring
Clip

Power/Battery
Contacts
(when PCM
installed
In cradle)
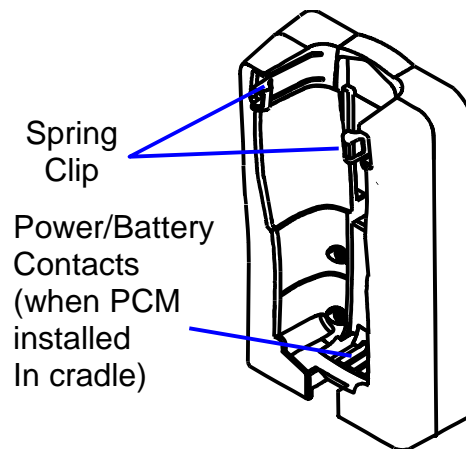
Figure 3-4 Spring Clips and Power/Battery Contacts   **Figure 3-5 Insert Device in Cradle**
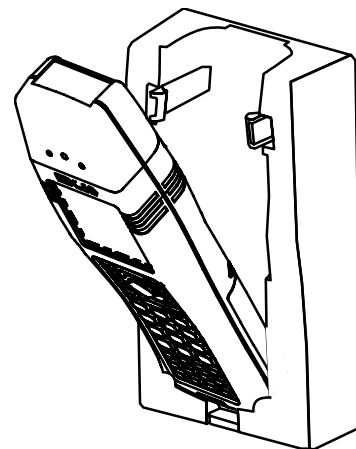
1. Push the mobile device (with or without the hand trigger-grip) into the cradle "tail first".

2. Gently push the mobile device down past the spring clips until both click into place over the top of the mobile device.

The mobile device can be removed or inserted with one hand. If the powered cradle is a desktop unit, hold the desktop unit with one hand while removing the mobile device with the other. The desktop unit may move unless it is held stationary while the mobile device is removed or inserted.

Data Transfer Methods

> *Note: The docking cradle **must** have a Power Charging and Communications Module installed before data transfer can begin.*

The InfraRed (IR) to RS232 interface provides conversion of infrared data from the IR port into RS232 serial data to be output to serial devices (printer or computer). This allows the mobile device to communicate with non-IR devices.

No software is present or required in the docking cradle.

Communication software is required for the client (mobile device) and the host (computer).

> See the "2330 Reference Guide" (DocID 2330A137REFGD) in the Archive section on the LXE Website for additional file transfer information.

Cables

A *null modem cable* may be required to connect the docking cradle and a desktop printer. Please refer to the printer manufacturer's instructions for further information.

LXE offers three printer and/or PC cables:

- D9 to D25 Printer/PC cable,
- D9 to D9 PC cable
- D9 to DIN Renegade printer cable

Make sure you have the appropriate cable for the equipment to be used for data transmission.

> *Note: IrDA data transfer to an IR printer does not require cabling.*

RS232 Serial Port on the Docking Cradle

Note: This port is located on the cradle, on the Power Charging and Communications Module.

Either hardware (RTS/CTS) or software (XON/XOFF) can be used to communicate over the serial port. The port is configured as a 9-pin DCE port with the following connector pinouts:

Figure 3-6 Male 9-Pin Connector on the PCM

Note: During hardware handshake, CTS and DSR will be in the same state as RTS and DTR, respectively.

Signal Name	Pin No.
TD	3
RD	2
CTS	8
RTS	7
DTR	4
DSR	6
GND	5

Figure 3-7 RS232 Serial Port Pinout on the PCM

A null modem cable may be required to connect the docking cradle and a desktop printer. Please refer to the printer manufacturer's instructions for further information.

Sending Data to an External Computer

The client (mobile device), host computer and docking cradle must be powered on during this process.

Note: The client and the external computer must be running the same communication software.

1.   If necessary, disable (REM out) the IrDA protocol driver (IRDACOM.SYS) in the CONFIG.SYS file.

2.   Connect the appropriate serial cable to the cradle's PCM serial port and the serial port on the external computer.

3.   Begin running the communications software on the external computer. Set up the software to *receive* data using the computer's RS232 port that is connected to the Docking Cradle.

4.   Begin running the communications software on the mobile device. Set up the software to *send* data using the mobile device's COM1 port.

5.   *Hint*:   Clear both screen displays to more easily view file transmission progress.

6.   Place the mobile device in the Docking Cradle, seating the IrDA window firmly over the IrDA window in the cradle. The IrDA port is now the COM1 port. During transmission the data signal will exit the mobile device's IrDA port, be captured by the IR port on the cradle and be transmitted through the RS232 port on the cradle to the external computer.

7.   Press the appropriate keys on the mobile device to transmit the file to the external computer.

During transmission, the IR Status LED will blink. When transmission is complete the IR Status LED will turn off.

Receiving Data from an External Computer

The mobile device, external computer and docking cradle must be powered on during this process.

Note: The mobile device and the external computer must be running the same communication software.

1. If necessary, disable (REM out) the IrDA protocol driver (IRDACOM.SYS) in the CONFIG.SYS file.

2. Connect the appropriate serial cable to the cradle's serial port and the serial port on the external computer.

3. Begin running the communications software on the external computer. Set up the software to *send* data using the computer's RS232 port that is connected to the Docking Cradle.

4. Begin running the communications software[1] on the mobile device. Set up the software to *receive* data using the mobile device's COM1 port.

5. *Hint*:   Clear both screen displays to more easily view file transmission progress.

6. Place the mobile device in the Docking Cradle, seating the IrDA window firmly over the IrDA window in the cradle. The IrDA port is now the COM1 port. During transmission the data signal arrives at the cradle's RS232 port, is transferred to the the IR port and transmitted to the mobile device through it's IrDA port.

7. Press the appropriate keys on the external computer to transmit the file to the mobile device.

During transmission, the IR Status LED will blink. When transmission is complete the IR Status LED will turn off.

---

[1] The mobile device hardware provides half duplex communications only, therefore zmodem transfer protocol cannot be utilized. LXE recommends using ASCII text or ymodem protocol.

Serial File Transfer Utility using ROM-DOS Commands

> *Note:*   *REMSERV and REMDISK are included in the Datalight ROM-DOS file load for serial file transfers.*

> *Note:*   *Devices with MS-DOS should use INTERLNK and INTERSVR for serial file transfer.*

A null modem cable must be used to connect the two computers. Both computers must have both REMSERV and REMDISK set to the same settings. REMSERV is run on the host (which is usually the mobile computer). REMDISK is run on the client (which is usually a desktop or laptop PC).

Using this utility you can move files from one computer to the other over the serial line using the DOS Copy or Xcopy commands.

REMSERV

```
REMSERV.EXE  d: [/T] [/H] [/Bxxxx][+|-] [/COMn] [/IRQn]
```

/Bxxxx	Set the baud rate. Choose from 300, 1200, 2400, 19200, 38400, 57600, 115. A '+' after the BAUD specifies 'packet' style transfers. By default, packet transfers will be used for all baud rates higher than 9600. Use '-' after the BAUD to force polling operation under Microsoft Windows 95. Both sides must agree on using either '+' or '-'.
/COMn	Set the communications port. Choose 1, 2, 3 or 4.
/IRQn	Set the IRQ for the communications port. choose 3-15.
/S	Silent (no output).
/Tnnn	Set the timeout in seconds. Choose 2-3640, 15 seconds is not unusual for FLASH drives.
/H	Use Hardware Handshaking for flow control.

Example:
```
REMSERV D: /B38400- /COM2 /T10
```
Default:
```
/B115+ /COM1 /T2
```

REMDISK

```
REMDISK  [/?] [/U] [/T] [/H] [/Bxxxx][+│-] [/COMn] [/IRQn]
```

/Bxxxx	Set the baud rate. Choose from 300, 1200, 2400, 19200, 38400, 57600, 115. A '+' after the BAUD specifies 'packet' style transfers. By default, packet transfers will be used for all baud rates higher than 9600. Use '-' after the BAUD if REMSERV is running under Microsoft Windows 95. Both sides must agree on using either '+' or '-'.
/COMn	Set the communications port. Choose 1, 2, 3 or 4.
/IRQn	Set the IRQ for the communications port. Choose 3-15.
/Tnnn	Set the timeout in seconds. Choose 3-3640, 15 seconds is not unusual for FLASH drives.
/H	Use Hardware Handshaking for flow control.
/U	Unload REMDISK from memory.

Examples:

```
(in CONFIG.SYS)    DEVICE=REMDISK.EXE /T15

(in AUTOEXEC.BAT)  REMDISK /B9600 /COM2 /T10
```

Default:

```
/B115K+ /COM1 /T3
```

Serial File Transfer using MS-DOS Commands

Note: *LXE replaced Microsoft MS-DOS 6.22 with Datalight ROM-DOS 6.22 in March, 2001 on LXE DOS devices manufactured after that date. This information is placed here for backward compatibility for the 2330 running MS-DOS.*

Refer to commercially available MS-DOS user guides for more information on the INTERLNK and INTERSVR commands.

Transferring Files Using MS-DOS INTERLNK / INTERSVR

Requirements

- An IBM compatible PC or laptop with:
    - MS-DOS version 3 or later
    - one serial port (minimum)
    - one floppy drive (minimum).
- The mobile device with one available serial port and the MS-DOS program INTERSVR loaded in the DOS directory.
- One 7-wire null modem serial cable for a serial connection.

Procedure

1. Using the 7 wire null modem cable, connect the PC/Laptop to the mobile device.

2. Using the PC/Laptop, make sure the INTERLNK.EXE file is located on the PC/Laptop's hard drive. (Typically located in the DOS directory.)

    IMPORTANT   *If the INTERLNK.EXE file is not installed on the PC/Laptop go to step 3, otherwise go to step 5.*

3. If you are using a port other than COM1 on the PC/Laptop, make sure that the SHARE program is not running on the PC/Laptop.

4. Using the mobile device, type the following at the MS-DOS prompt:

    INTERSVR /RCOPY

    INTERSVR must be running on the mobile device before it connects to the PC/Laptop. The remote installation screen should appear, follow the instructions that appear on the screen.

5. Using the PC/Laptop, type the following at the MS-DOS prompt:

    COPY C:\CONFIG.SYS C:\CONFIG.OLD

    This will create a backup of the CONFIG.SYS file.

6. Using the PC/Laptop, type the following at the MS-DOS prompt:

    EDIT C:\CONFIG.SYS

    This will allow you to edit the CONFIG.SYS file. If EDIT is not installed or you prefer not to use it, you may use any text editor to edit the CONFIG.SYS file.

7. Add a DEVICE command to the end of the CONFIG.SYS file that specifies the location of the INTERLNK.EXE file. The following example specifies an INTERLNK file that is located in the DOS directory on the C: drive.

    Example: DEVICE=C:\DOS\INTERLNK.EXE

8. Save the changes to your CONFIG.SYS file and exit the text editor. (Typically pressing <ALT> + <F>, then <X> will save and exit. If using a later version of MS-DOS EDIT, you will be asked to verify that the changes should be saved. Press <Y> to save changes or <N> to discard changes.)

9. Using the mobile device, type the following at the MS-DOS prompt:

    INTERSVR

    INTERLNK (now running on the PC/Laptop) should display information about the redirected drives and printer ports on the mobile device's screen. (See example below.)

```
This Computer                Other Computer
  (Server)                      (Client)


    A:               equals        E:
    B:               equals        F:
    C: (10Mb)        equals        G:
    Lpt1             equals        Lpt2
```

10. Restart the PC/Laptop by pressing <CTRL> + <ALT> + <DEL>.

    IMPORTANT   *INTERSVR must be running before starting INTERLNK.*

11. Locate the files to be transferred to the mobile device from the PC/Laptop. (Use the DOS DIR and CD commands to locate files.)

12. Copy the specified files from the PC/Laptop to the mobile device. (Use the DOS COPY or XCOPY commands to copy the specified files from the PC/Laptop.)

    Example:

    COPY C:\AUTOEXEC.BAT G:\AUTOEXEC.BAT

    This example copies a single file (AUTOEXEC.BAT) from the root directory (\C) on the PC/Laptop to the redirected C drive (\G) on the mobile device.

13. Break the server connection between the two computers by pressing <ALT> + <F4> on the server keyboard (the mobile device).

IR Port
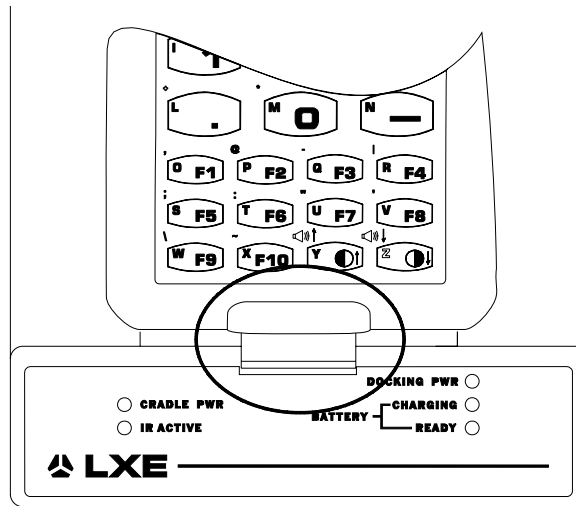
Figure 3-8 PCM and IR Ports Line Up

The InfraRed (IR) port is located at the top, and at the front of the PCM. It is designed to receive and transmit data with the IrDA port on the end of the mobile device. The two IR ports line up directly with each other when the mobile device is secured in the Docking Cradle.

Additionally, the cradle allows "pass through" of the device's infrared to an external IR device (i.e. IrDA printer). The cradle will need to be rotated slightly backward to provide line-of-sight IR.

The IR operating envelope has a distance range of 2 cm (.79 inches) to 1 meter (3.2 feet) with a viewing angle of 30 degrees.

Note to Programmers

IR Port Transmitting Data Through RS-232 Port

When the mobile device's IrDA port is initially opened to send (or when changing states), the cradle's RS-232 RXD (pin 2) and TXD (pin 3) pins are active. RXD should be ignored when TXD is activated or the data transmitted may be immediately returned through the IR port by the RXD pin. The data transfer direction is half-duplex only.

Sending Data to a Printer With an IR Port

The mobile device, printer and docking cradle must be powered on during this process.

1. If necessary, enable the IrDA protocol driver (IRDACOM.SYS) in the CONFIG.SYS file.

2. Set up the mobile device to send the file over the COM1 communication port (which is now the IrDA port).

3. Place the mobile device in the docking cradle.

4. Place the IR window on the IrDA compatible printer (e.g. O'Neil microFlash Printer) in front of the mobile device's IR window, with the device mounted in the docking cradle.

5. Locate the printer within 1 meter of the cradle and within a 30 degree operating angle of the mobile device's IR window. The docking cradle may need to be rotated backward to allow proper line-of-sight for both IR windows.

6. Transmit the file from the mobile device to the printer, (e.g. O'Neil microFlash Printer).

During transmission, the IR Status LED on the cradle will blink. When transmission is complete the IR Status LED will turn off.

Sending Data to a Printer Without an IR Port

A null modem cable may be required to connect the docking cradle and a desktop printer. Please refer to the printer manufacturer's instructions for further information.

The mobile device, printer and docking cradle must be powered on during this process.

1. If necessary, disable (REM out) the IrDA protocol driver (IRDACOM.SYS) in the CONFIG.SYS file.

2. Connect the appropriate serial cable to the cradle's serial port and the printer.

3. Begin running the printer communications software[2] on the mobile device. Set up the software to print using the mobile device's COM1 port.

4. *Hint*: Clear the screen to more easily view file print progress.

5. Place the mobile device in the Docking Cradle, seating the IrDA window firmly over the IrDA window in the cradle. The IrDA port is now the COM1 port. During transmission the data signal will exit the device's IrDA port, be captured by the IR port on the cradle and be transmitted through the RS232 port to the printer, (e.g. O'Neil microFlash Printer).

6. Press the appropriate keys on the mobile device to transmit the file to the printer.

During transmission, the IR Status LED will blink. When transmission is complete the IR Status LED will turn off.

---

[2] The mobile device hardware provides half duplex communications only, therefore zmodem transfer protocol cannot be utilized. LXE recommends using ASCII text or ymodem protocol.

Chapter 4 Multidock and AC/DC Singledocks

Introduction

The MX1 Docking Cradle family includes an AC Singledock, a DC Singledock and a Multidock. The AC Singledock and Multidock are designed for protected, indoor use while the DC Singledock is mounted in a vehicle. All docks use a modular cradle designed to support and protect a mobile device, specifically the LXE 2330, 2335 and MX1. The mobile devices can be fully operational while in the cradle, including display, keypad, RF and IR operation.
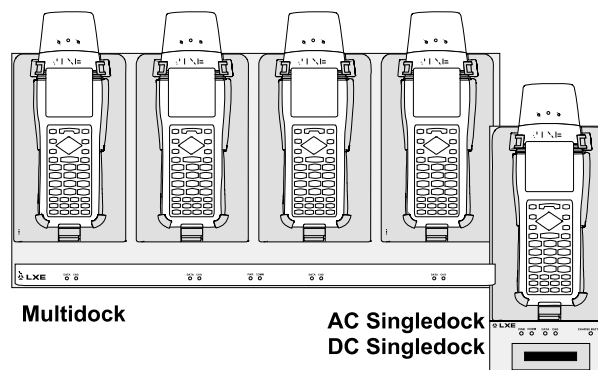
Multidock

**AC Singledock
DC Singledock**

Figure 4-1 Multidock and Singledocks

Attention:

The MX1 Intrinsically Safe device and battery pack are NOT compatible with the Multidock and AC/DC Singledocks and may cause damage to the MX1-IS and battery pack if placed in an unauthorized MX1-IS docking cradle/charger. The MX1-IS keypad is bright blue in color.

MX1 I-Safe

Three different powered docking stations are available for the MX1, the 2335 and the 2330. These docking stations charge the computer's main battery in under seven hours. In addition, the dock provides power to operate the computer while it is in the dock. The dock also maintains a charged main battery with a trickle charge. Since both single docking stations are similar in operation and only differ by the power source (AC or DC current), they are described together in this chapter.

The LXE publication "2330 Multidock Reference Guide" is available on the LXE Manuals CD and on the LXE website.

Multidock

Note: *An Upper Strap Bracket installation is a requirement prior to using any of the mobile devices in a cradle. The bracket, as well as the spring clips on the cradle, helps to secure the unit in the cradle. The handstrap is not a requirement.*

Figure 4-2 Multidock

This dock holds four mobile devices. The status of the charging process is indicated by two lights on the front of the multidock.

Installation

Guidelines

Follow these guidelines when setting up the Multidock system.

- Each Multidock and AC Singledock is always plugged into an AC outlet. If a modem is included in the configuration, it too is plugged into an AC outlet.

- The host computer is always cabled to the first item in the configuration (a modem, an RS232-RS485 converter or an AC Singledock).

- Multidocks that are chained together are cabled to each other with a 9-pin Multidock cable (included with Multidock).

- Multidocks have an RS485 terminator installed at the end of the communications line. 9600 baud Singledocks have no terminator. 115k baud Singledocks require a Fast terminator.

- For a direct PC connection to the host, the host PC is first cabled to a null modem cable, then to a converter or an AC Singledock then to the Multidock.

Note: *Only use the cables that came with each piece of equipment. Do not switch cables or power supplies.*

This section's instructions are based on the assumption that your new equipment is pre-configured and requires only peripheral installation (e.g. modem or printer) at least one mobile device and a power source.

Procedure

1. Install Multidock(s) on a wall. If placed on a table, the Multidock may tip over when the mobile device is inserted or removed from the cradle.

2. Cable each Multidock to the next making sure the last Multidock in the line contains the bus terminator.

3. Cable the first Multidock in the line to the Singledock or Converter.

4. Cable the Singledock or converter to the host.

5. Insert mobile devices and spare batteries in Multidocks.

6. Connect AC power source to each Multidock.

7. Dock Power LEDs illuminate. Batteries begin to charge.

8. Turn the mobile devices on.

9. You are ready to begin host communication.

Features

The Multidock supports storage and charging of up to four hand held computers simultaneously. There is no limit to the number of Multidocks and Singledocks that can be connected when their only task is to secure and charge mobile devices and spare batteries.

Multidocks and Singledocks can be daisy-chained together. A single PC communications port can support up to 64 hand held computers. Up to 16 Multidocks can be daisy-chained to a single host port. A four port digi-board installed in the host computer allows communications to both direct-connect and remote handhelds via high speed modem.

The docks accommodate a high speed data communications link (up to 115 kb/second) to a host computer. Remote handhelds in Singledocks communicate with the host via modem at 9600 baud using a Hayes compatible modem and the RS-232 port.

Batch Operation

The Multidock and associated accessories are intended for use where a number of mobile devices are used in batch operation. In these applications, the mobile devices are typically used for one long shift and then left overnight to recharge. During the night the mobile devices can be stored, batteries recharged and the data stored in the device from the current day's work is downloaded to the host. Data for the next day's work is then uploaded into the targeted device. AC power is constantly available to the devices in the Multidocks so communication can take place at any time during the overnight hours.

Components

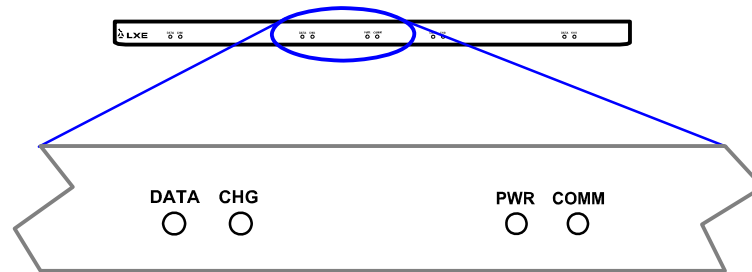|	
Multidock and 9x9 Cable	2330A013MULTIDOCK
9600 Baud Terminator	2330A017RS485SLOW
115K Baud Terminator	2330A016RS485FAST
Converter	2330A015CONV232485
Null Modem Cable for Direct PC Connection	6200L200
AC Power Supply	1300A303PSACWW

Front Panel Indicators

Figure 4-3 Multidock Indicators

DATA   When solid green or flashing green, the adjacent mobile device is sending data to
          the host.

CHG   When solid green, the battery in the mobile device is being charged. When dark, the
          battery in the mobile device is fully charged and is receiving a trickle charge to
          maintain the full charge.

PWR   When green, the Multidock is receiving AC power.

COMM   When solid green or flashing green, the host is sending data to all mobile device's
          in the Multidock chain.

Specifications

Communication Interface	Two RS485 communication ports (9 pin D connector). Two ports allow chaining of up to 16 Multidocks (64 terminals) to single host port.
Baud Rate	9600 baud or 115k baud, Half Duplex selectable by terminator.
Indicators	DATA and CHG per dock, PWR and COMM per Multidock, either green or unlit.
Battery Charging	Multidock charges each battery within 7 hours and fully powers device in addition to charging battery. Trickle charge maintains full charge.
Dimensions	23.0" wide x 12.5" high x 3.25" deep
Temperature	0°C to 50°C, 5% to 95% humidity
Power Input	110-250 VAC, 50/60 Hz

RS485 Converter

Host to client device and client device to host communications using the Multidock are through a RS485 communications bus. The RS232 to RS485 converter facilitates connection to an RS232 host connector. The converter is powered by the Multidock and converts the signals of the two RS485 buses to RS232 signal levels.

The converter has a 9 pin male connector that connects to the cable from the Multidock and a 25 pin male connector that connects to the cable from the host.

Pinout - RS485 Connector

Pin	
1	Terminal Data Y
2	Baud Rate Control Input
3	
4	
5	Ground
6	Terminal Data Z
7	Host Comm B
8	Host Comm A
9	+5V Supplied

Terminator

Multidocks and Singledocks have a RS485 terminator installed at the end of the communications line. 9600 baud Singledocks need no terminator. The terminators are available in two speeds: 115K baud and 9.6K baud.

The 115K baud terminator is used with host direct connections and the 9.6K baud terminator is used with modem connection to the host.

Pinout - RS485 Terminator, 9.6K and 115K Baud

9.6K Baud		
Pin	**Resistor**	**Pin**
7	120 Ohm 1/4W	8
1	120 Ohm 1/4W	6

115K Baud		
Pin	**Resistor**	**Pin**
2	0 Ohm Jumper	9
7	120 Ohm 1/4W	8
1	120 Ohm 1/4W	6

RS485 Comm Port

Two RS485 (9 pin D style) connectors are located at each end of the Multidock. Each Multidock can be daisychained to each other using a 9-pin to 9 pin cable from LXE.

Pinout - Null Modem Cable

Null 9 x 25

LXE Part No. 6200L200

DTE 9 Pin Female	DTE 25 Pin Female
3 (TX)	3 (RX)
2 (RX)	2 (TX)
7 (RTS)	8 (DCD)
1 (DCD)	4 (RTS)
6, 8 (DSR, CTS)	20 (DTR)
4 (DTR)	5, 6 (CTS, DSR)
5 (GND)	7 (GND)

Null 25 x 25

LXE Part No. 6200L202

DTE 25 Pin Female	DTE 25 Pin Female
1 (PROT GND)	1 (PROT GND)
2 (TX)	3 (RX)
3 (RX)	2 (TX)
4 (RTS)	8 (DCD)
8 (DCD)	4 (RTS)
5, 6 (CTS, DSR)	20 (DTR)
20 (DTR)	5, 6 (CTS, DSR)
7 (SIG GND)	7 (SIG GND)

Pinout - Straight Through Cable

Straight Through 9 x 25

LXE Part No. 9000A052CBL6D9D25

DTE 9 Pin Female	DCE 25 Pin Male
3 (TX)	2
2 (RX)	3
7 (RTS)	4
1 (DCD)	8
6, 8 (DSR, CTS)	6
4 (DTR)	20
5 (GND)	7
9 (RI)	22

Straight Through 25 x 25

LXE Part No. 6200L201

DTE 25 Pin Female	DCE 25 Pin Male
1 (PROT GND)	1
2 (TX)	2
3 (RX)	3
4 (RTS)	4
5 (CTS)	5
6 (DSR)	6
7 (SIG GND)	7
8 (DCD)	8
15	15
17	17
18	18
20 (DTR)	20
21	21
22 (RI)	22
25	25

AC or DC Single Dock

This dock holds one mobile device plus it has a cup to charge a spare battery.

Both the battery in the mobile device and the spare battery charge in less than seven hours.

A full charge in both batteries is maintained by a trickle charge. Three lights on the front of the dock indicate the charging process.

Figure 4-4 AC or DC Singledock

AC Singledock

The AC Singledock is intended for use where a mobile device is used in batch operation, and must be stored, charged, and communicated with just as with the Multidock. However, the AC Singledock is typically used when the mobile device user does not return to a central depot. In this case each user must independently communicate from the client device to the host. This is typically done via a dialup modem to the host.

Components

AC Singledock	2330A010ACSINGDOCK
9600 Baud Terminator	2330A017RS485SLOW
115K Baud Terminator	2330A016RS485FAST
Straight Through Cable for Connection to Modem	6200L201
Null Modem Cable for Direct PC Connection	6200L200
AC Power Adapter	1300A303PSACWW

Specifications

Communication Interface	One RS232 communication port (25 pin DTE) for host connection. One RS485 communications port (9 pin D connector). This port allows AC Singledock to be used as RS232 to RS485 converter at beginning of Multidock chain.
Baud Rate	9600 baud or 115K baud, half duplex, selectable with Terminator

Indicators	DATA, CHG, PWR, COMM, and CHARGE BATTERY for spare battery, either green or unlit.
Battery Charging	Fully charges spare battery within 7 hours and fully powers terminal in addition to charging battery. Trickle charge maintains full charge.
Dimensions	5.77" wide x 12.5" high x 3.25" deep
Temperature	0°C to 50°C, 5% to 95% humidity, non-condensing
Power Input	110-250 VAC, 50/60 Hz

AC Singledock Installation

1. Install AC Singledock on a wall.

2. Insert a mobile device and spare battery in the AC Singledock.

3. Connect power source to the Singledock.

4. Dock Power LED illuminates. The spare battery begins to recharge.

5. Turn the mobile device on.

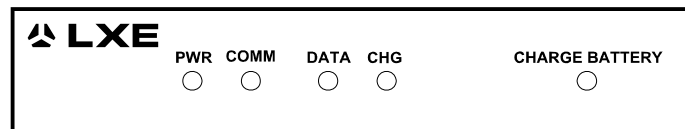6. You are ready to begin host communication.

Indicators
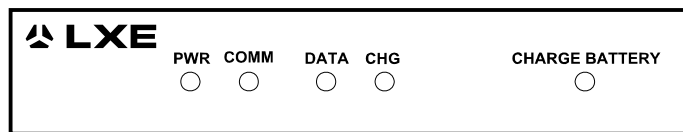
Figure 4-5 AC Singledock Indicators

PWR   When green, the Singledock is receiving AC power.

COMM   When solid green or flashing green, the host is sending data to the mobile
                device.

DATA   When solid green or flashing green, the Singledock is sending data to the
                host.

CHG   When solid green, the battery in the mobile device is being charged. When
                dark, the battery in the mobile device is fully charged and is receiving a
                trickle charge to maintain the full charge.

CHARGE   When solid green, the battery in the battery charger is being charged. When
BATTERY   dark, the battery in the charger is fully charged and is receiving a trickle
                charge to maintain the full charge.

DC Singledock

The DC Singledock is intended for use where a mobile device needs to be cradled in a vehicle during the day's operation. The DC Singledock charges the main battery while docked, powers the mobile device and provides a means for the client device to communicate to on-board devices such as printers or Wide Area Network communications devices. The DC Singledock is powered directly from the motor vehicle's power system, and designed to operate in the temperature and vibration conditions typically found in over-the-road vehicles.

If extreme vibration or outdoor environments are anticipated, contact your LXE representative for information about the LXE Fork Lift Cradle.

DC Singledock Installation

1. Assemble mounting bracket.

2. Install Mounting Bracket on a stable, flat surface. Use the LXE Vehicle Mounting Bracket or an equivalent mounting assembly.

3. Insert a mobile device and spare battery in Docking Bracket Assembly.

4. Connect power source to the Singledock.

5. Dock Power LED illuminates. The spare battery begins to recharge.

6. Turn the mobile device on.

7. You are ready to begin standalone operation.

Indicators

Figure 4-6 DC Singledock Indicators

PWR	When green, the Singledock is receiving DC power.
COMM	When solid green or flashing green, the in-vehicle computing equipment is sending data to the mobile device.
DATA	When solid green or flashing green, the Singledock is sending data to the in-vehicle communications equipment.
CHG	When solid green, the battery in the mobile device is being charged. When dark, the battery in the mobile device is fully charged and is receiving a trickle charge to maintain the full charge.
CHARGE BATTERY	When solid green, the battery in the battery charger is being charged. When dark, the battery in the charger is fully charged and is receiving a trickle charge to maintain the full charge.

Components

DC Singledock and DC Power Cable Assembly	2330A011DCSINGDOCK
Vehicle Bracket	2330A012VMTBRKT

Specifications

Communication Interface	One RS232 communications port (25 pin DTE) for in vehicle connection.
Indicators	DATA, CHG, PWR, COMM, and CHARGE BATTERY for spare battery, either green or unlit.
Battery Charging	Fully charges spare battery within 7 hours and fully powers terminal in addition to charging battery. Trickle charge maintains full charge.
Dimensions	5.77" wide x 12.5" high x 3.25" deep
Temperature	-20C to 55C, 5% to 95% humidity, non-condensing
Power Input	11 - 16.5 VDC, 0.75 ams max

Modem

> *Note: Without exception, use only the modem-specific cables and power supply that came with the modem. Connect to an analog telephone line. The modem will be damaged if a digital telephone line is used.*

The 33.3K Baud Modem allows offsite multidock or singledock systems to communicate with the host PC. The host PC is connected to a local modem that receives signals from the remote modem over telephone lines.

There are only a few requirements when using a modem:

- Use an analog telephone line for modem connection. Digital telephone lines will damage the modem.

- Use only the modem specific power adapter and LXE RS232 serial cables that were delivered with the modem.

- Modem connection to a Multidock series requires an LXE RS232 to RS485 converter and a Multidock cable.

- Modem connection to a PC host requires an LXE 25 pin RS232 cable. Do not use a null modem cable.

> *Note: Multidock and Singledock RS232 ports do **not** support hardware handshaking.*

Installation

TELCO   **PHONE**   **Dip**   **25 Pin**   **Power**
Jack   **Jack**   **Switches** **RS-232**   **Supply**
(Analog-only)   **Port**   **Jack**
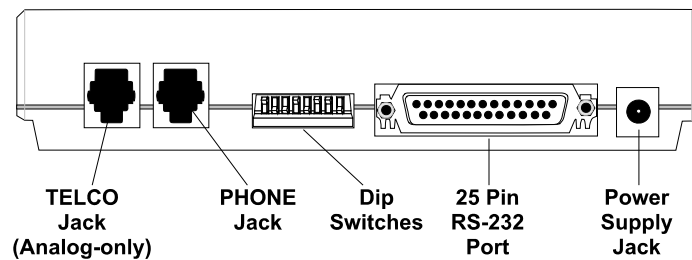
Figure 4-7 Modem Connectors and Dip Switches

1. Place modem on a stable, flat surface.

2. Cable the modem to the Singledock or Multidock or host.

3. Connect the modem to an analog phone line.

4. Connect the modem's power supply.

5. You are ready to begin host communication.

Components

33.3K Baud Modem	9000A064MODEM
Null Modem Cable for Direct PC Connection	6200L200
AC Power Adapter	1300A303PSACWW
Straight Through Cable for Connection to AC Singledock or Converter	6200L201

Indicators

Figure 4-8 Modem Indicators

Symbol	Meaning	Status
AA	Auto Answer/Answer	Answer mode: ON when set to Auto Answer, and when answering a call; OFF when modem originates a call. Light flashes when there is an incoming call.
CD	Carrier Detect	ON if modem receives a valid data signal (carrier_) from a remote modem, indicating that data transmission is possible. Always ON if CD override is ON.
RD	Received Data	Flashes when modem sends result codes or passes received data bits.
SD	Send Data	Flashes when computer sends a data bit.
TR	Data Terminal Ready	ON if modem receives a DTR signal from computer. Always ON (modem ignores DTR) if the DTR override is ON.
CS	Clear to Send	ON until modem lowers CTS when transmit Data hardware flow control is enabled.
ARQ/ FAX	Error Control / Fax Operations	Data Mode: Automatic Repeat Request. ON if modem is set to Normal ARQ or ARQ Mode and successfully establishes an error control connection. Flashes when modem retransmits data to remote modem. Fax Mode: Flashes to indicate fax mode.
OH	Off Hook	ON when modem accesses the phone line. OFF when modem is On Hook.

Dip Switch Settings

Note: Dip switch is ON when switch is DOWN and OFF when switch is UP.

Switch	LXE Setting	Function	
1	**Off**	Data Terminal Ready (DTR Override	
		Off	Normal DTR operations: computer must provide DTR signal for modem to accept commands; dropping DTR terminates a call.
		On	Modem ignores DTR (Override).
2	**On**	Verbal/Numeric Result Codes	
		Off	Verbal (word) results.
		On	Numeric results.
3	**On**	Result Code Display	
		Off	Suppresses result codes.
		On	Enables result codes.
4	**Off**	Command Mode Local Echo Suppression	
		Off	Displays keyboard commands.
		On	Suppresses echo.
5	**Off**	Auto answer Suppression	
		Off	Modem answers on first ring, or higher if specified in nonvolatile memory (NVRAM).
		On	Disables auto answer.
6	**Off**	Carrier Detect (CD) Override	
		Off	Modem sends CD signal when it connects with another modem, drops CD on disconnect.
		On	CD always ON (Override).
7	**On**	Power on and ATZ Reset Software Defaults	
		Off	Loads profile 0 or profile 1 configuration from user-defined nonvolatile memory (NVRAM).
		On	Loads generic template from read only memory (ROM).
8	**On**	AT Command Set Recognition	
		Off	Disables command recognition (Dumb mode).
		On	Enables recognition (Smart mode).

Modem / PC Setup
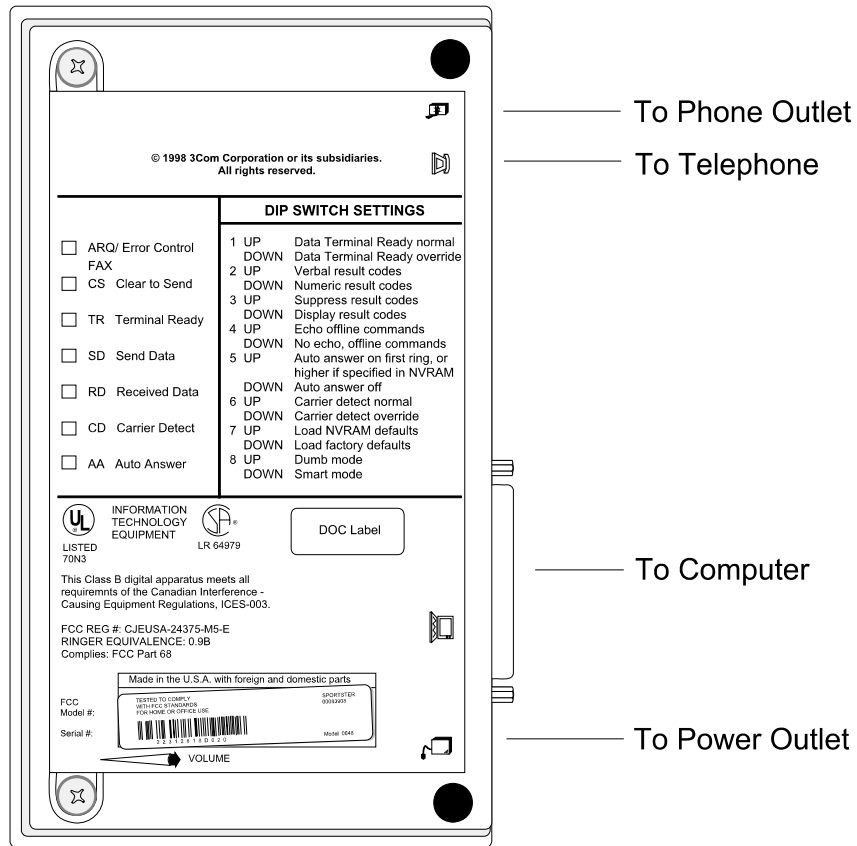
Figure 4-9 Modem Connections

Communications software allows you to change settings and issue commands to the modem connected to the PC.

The communications software is preconfigured for optimal performance with the modem. Refer to the software manual for any additional information.

Mounting Brackets for Multidocks, AC and DC Singledocks

Note: Hardware (bolts, washers and wrench) required to attach the docks to a surface are not supplied by LXE.

Wall Mount

- You will need eight each ¼" hardware, or equivalent fasteners, for mounting the Multidock.
- You will need two each ¼" hardware, or equivalent fasteners, for mounting the Singledock.

Vehicle Mount

- You will need four each ¼" hardware, or equivalent fasteners, to attach vehicle mount to the surface.

Use the dimensions on the mounting diagrams to place the brackets.

Mounting Multidock to Wall

Note: LXE recommends the Multidock be mounted to a wall or other vertical, sturdy surface. If placed on a table, the Multidock may tip over when the 2330 is inserted or removed from the cradle.

The mounting holes are two inches apart, vertically, and 5.75 inches apart horizontally.

1. Place ¼" hardware in the mounting locations on the wall, allowing enough room between the wall and the fastener head to hold the Multidock.
2. Guide the larger area of the keyhole openings over the fastener heads until the Multidock is flush with the wall.
3. Pull down gently until all fastener heads are in the smaller area of the keyhole opening. Tighten hardware.

Mounting AC Singledock to Wall

Note: LXE recommends the Singledock be mounted to a wall or other vertical, sturdy surface. If placed on a table, the Singledock may tip over when the 2330 is inserted or removed from the cradle.

The mounting holes are two inches apart, vertically.

1. Place ¼" hardware in the mounting locations on the wall, allowing enough room between the wall and the fastener head to hold the Singledock.
2. Guide the larger area of the keyhole openings over the fastener heads until the Singledock is flush with the wall.
3. Pull down gently until all fastener heads are in the smaller area of the keyhole opening. Tighten hardware.

When mounting more than one Singledock, or a sequence of modems and Singledocks, allow enough room between each unit for the power supply and modem cables.

5.75 in.
14.6cm

2.88 in.
7.31cm

9.37 in.
23.8cm

23 in.
58cm

NOT TO SCALE

2 in. / 5.08cm

9.37 in.
23.8cm

NOT TO
SCALE

2.00 in.
5.08cm

3.12 in.
7.92cm

5.75 in.
14.6cm

2.88 in.
7.31cm

3.12 in.
7.92cm

Multidock   Singledock
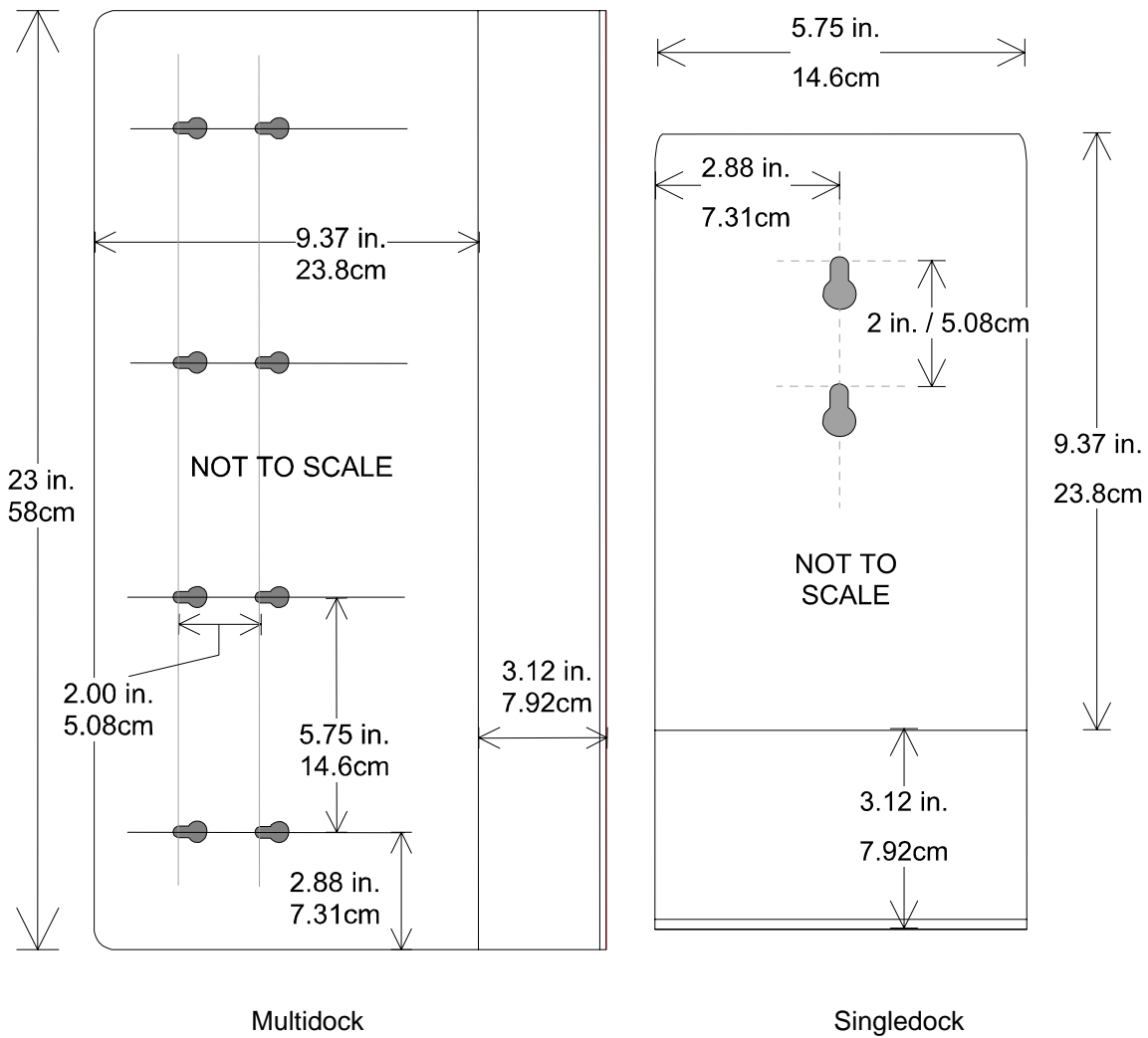
Figure 4-10 Mounting Diagrams

Mounting in Sequence

Multidocks and Singledocks are designed to be touching each other when mounted in sequence. When mounting more than one Multidock, or a sequence of Multidocks and AC Singledocks, connect all cables and power supplies before final mounting. The cables are placed in the storage areas in the back that are created when the units are mounted flush to each other.

Vehicle Mounting and the DC Singledock

The DC Singledock is intended for mounting in typical over the road vehicles such as step vans or semi trailer tractors. Because of the variety of vehicle configurations and personal driver preferences, no one mounting configuration can suit all applications. LXE does offer a vehicle mounting bracket that provides vibration isolation, but in many cases the user may want to provide their own mounting hardware. Off the shelf cell phone mounting equipment or custom mounting brackets could be used.

The mounting instructions that follow show the use of the LXE bracket and the mounting hole pattern to be used if a custom mount is to be used.

LXE Vehicle Bracket

Install the Bottom Mounting Bracket portion of the mounting assembly to the vehicle using ¼" (6.35mm) maximum diameter fasteners (not supplied by LXE).
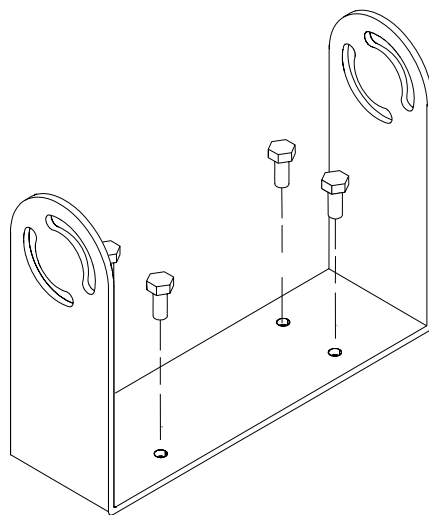
Bottom Mounting Bracket
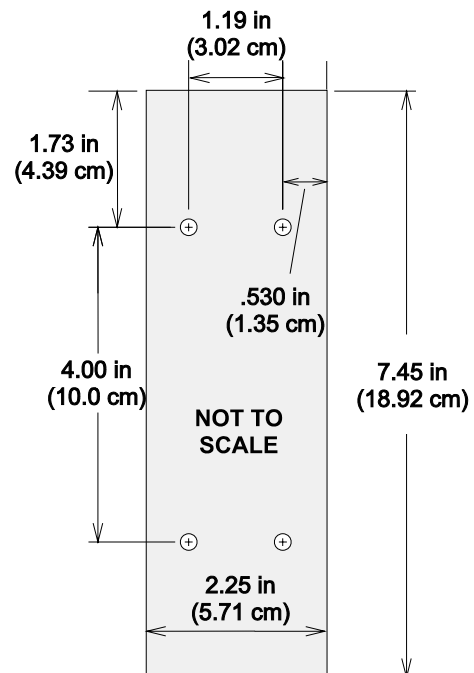
Mounting Footprint – Not to Scale

Fasten the backplate assembly to the DC Singledock using the thru holes in the backplate and the threaded holes in the back of the Singledock. Four #8-32 fasteners are provided with the mounting kit.
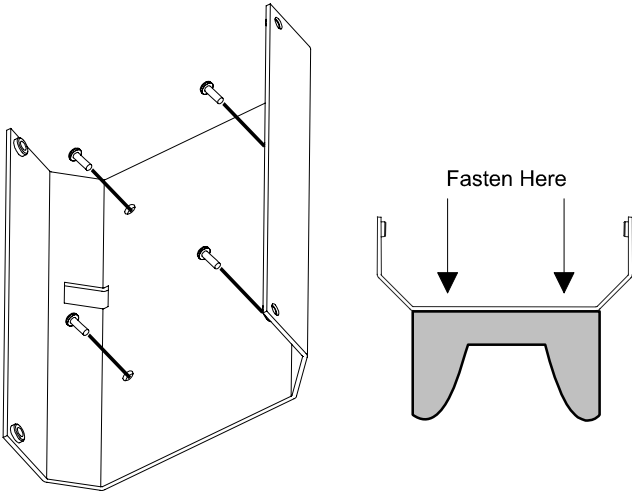
Figure 4-11 Fasten Backplate Assembly to DC Singledock

The DC Singledock is ready for cabling.

Cable Port Connections

Complete all cabling before connecting the equipment to a power source.

Multidock Cabling
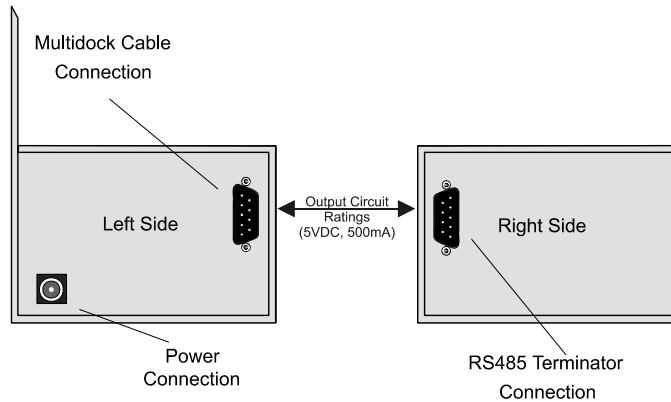
Figure 4-12 Multidock Cable Ports

Use the Multidock 9 pin cable to connect the Multidock to one of the following:

- An RS232 to RS485 converter.
- Another Multidock.
- An AC Singledock.
- An RS485 terminator.

AC Singledock Cabling
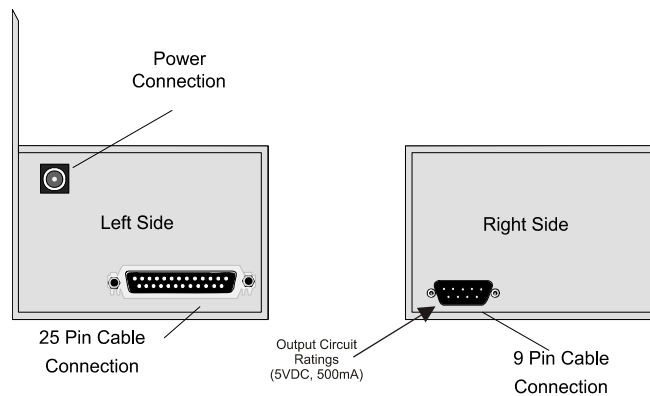
Figure 4-13 AC Singledock Cable Ports

Use the 9 pin port to connect to a Multidock.

Use the 25 pin port to connect to one of the following:

- A 25 pin port on a modem.
- A 25 pin serial port on the host PC.

DC Singledock Cabling
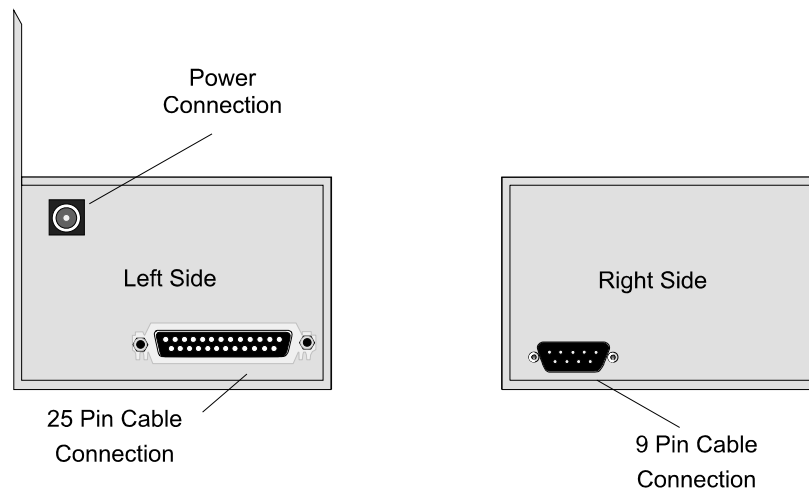
Figure 4-14 DC Singledock Cable Ports (Port on Right Side is not Connected)

Use the 25 pin port to connect to one of the following:

- In-vehicle computing equipment.
- In-vehicle communications equipment.

Modem Cabling

1. Connect a 25 pin cable to the 25 pin port on the modem and to one of the following:

   - A 25 pin port on a Singledock.
   - A 25 pin serial port on a PC.
   - An RS232 to RS485 converter.

   Note: When connecting a modem to a PC, note which PC serial port is selected. The PC port selected may be labeled COM, MODEM, RS-232 or SERIAL.

2. Plug the power adapter into the power supply jack and into a standard wall outlet.

3. Plug one end of the (supplied) telephone cord into the TELCO jack and the other end into an *analog* telephone wall jack.

Note: To use the modem and telephone through the same phone wall jack, plug the telephone's cord into the modem's PHONE jack.

Power Adapter, 110-240 VAC

Used for Multidocks and AC Singledocks.

The external power supply may be connected to a 110V, 60Hz supply using the appropriate detachable cordset. In all cases, connect to a properly grounded source of supply provided with maximum 15 Amp overcurrent protection (10 Amp for 240V circuits).

1. Connect the detachable cordset provided by LXE to the external power supply (IEC 320 connector).

2. Plug cordset into appropriate, grounded, electrical supply receptacle (AC mains).

3. Connect the pin end to theMultidock or Singledock power connector by aligning the connector pin to the power connector; and push down firmly.

Power Connection

Left Side

Multidock Cable Connection

Multidock Connector

Power Connection

Left Side

25 Pin Cable Connection
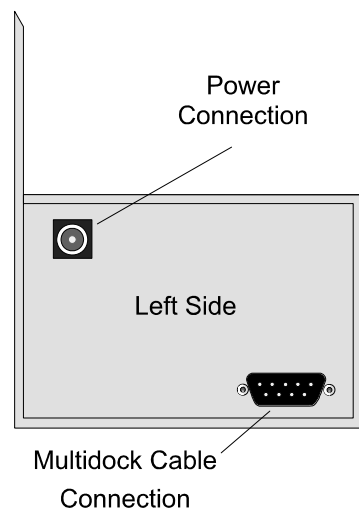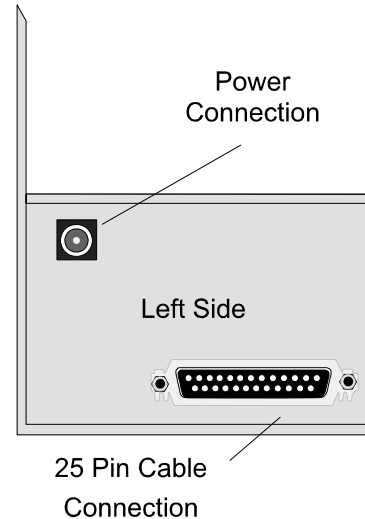
Singledock Connector

4. The Power LED on the Multidock or Singledock illuminates when it is receiving power.

Vehicle 12VDC Connection

Important	***Equipment is designed to use 11 to 16.5 volt power source only.***

The DC Singledock is designed for use with any DC power source within the range of 11 V to 16.5 V.

It is recommended that the vehicle cable be connected to an unswitched outlet on the vehicle's fuse box. This connection method reduces the chance of interference from the vehicle's charging system.
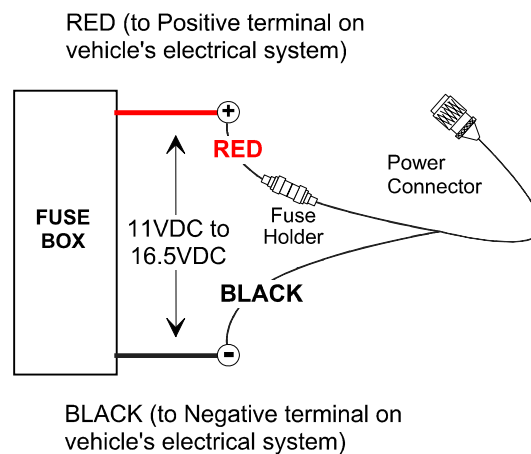
Figure 4-15 Proper Connection of the Vehicle Cable

Caution: ⚠️	*Correct electrical polarity and grounding is required for safe and proper installation.* *Only connect to a negative ground DC supply circuit.* *Not for installation to positive ground circuits.*

When the Singledock is connected to an unswitched outlet on the fuse box the mobile device battery will always receive a charge from the vehicle battery. If the unit is left turned on for extended periods of time, the mobile device could drain the vehicle battery.

If the Singledock is connected to a switched outlet on the fuse box the mobile device and battery will only charge when the vehicle is on. This will eliminate the problem of draining the vehicle battery.

Fuse Replacement

The unit uses a 250V, 1.5A (fast blow), high current interrupting rating fuse that is externally accessible and user replaceable. Should it need replacement, replace with same size, rating and type of fuse (such as Bussman AGC-1 1/2).

Chapter 5 Battery Pack Chargers

Introduction

The LXE publication "Getting the Most from Your Batteries" is available on the LXE Manuals CD and is a single-source guide to battery management. The document contains information about battery recharging, conditioning, and other pertinent issues, portions of which are duplicated in this chapter.

Attention:

The MX1 Intrinsically Safe device battery pack is NOT compatible with these battery pack chargers. The battery pack may be damaged if placed in an unauthorized MX1-IS battery charger/analyzer. The MX1-IS keypad is bright blue in color.

MX1 I-Safe

Handling Batteries Safely

Never dispose of a battery in a fire. This may cause an explosion.

Do not replace individual cells in a battery.

Be careful when handling NiMH batteries. If a battery is broken or shows signs of leakage do not attempt to charge it. Dispose of it using proper procedures.

Caution: Nickel-based cells contain a chemical solution which burns skin, eyes, etc. Leakage from cells is the only possible way for such exposure to occur. In this event, rinse the affected area thoroughly with water. If the solution contacts the eyes, get immediate medical attention.

Caution: NiMH batteries are capable of delivering high currents when accidentally shorted. Accidental shorting can occur when contact is made with jewelry, metal surfaces, conductive tools, etc., making the objects very hot. Never place a battery in a pocket or case with keys, coins, or other metal objects.

Battery Warning Messages on Computers

Many LXE battery operated units have been programmed to either display a warning message and/or emit distinctive beeps when battery capacity has fallen to a pre-determined level.

The warning messages displayed on the screen may be similar to the following:

```
Low Battery Warning
Replace Battery Now
Critically Low
System Will Power Off In n Seconds
```

Do not ignore the warnings. The messages are displayed to warn you that the battery must be replaced or data will be lost.

Follow the instructions displayed on the screen or listed in the respective equipment's reference guide. The instructions are directed toward proper unit shutdown and battery replacement.

Optional Clip-on Portable Charger for the 2335 and MX1

The 2335 and MX1 Battery Pack can be fully charged using the Clip-on Portable Charger. A complete recharge of a dead main battery with the mobile device in an Off state will take 8 hours.

Charge only at ambient temperature above 32°F / 0°C.
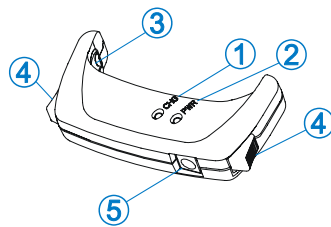
1. Charging LED
2. Power LED
3. Catch pins
4. Spring loaded arms
5. Power Jack connector

Figure 5-1 Clip-on Portable Charger

Note: The unit will not operate correctly on charger power without a battery installed in the mobile device.

The Clip-on Portable Charger must be powered by one of the following:

- Cigarette Lighter Adapter

- Power Supply, External, AC, US

- Power Supply, External AC, International

How To

Snap the Clip-on Portable Charger to the base of the mobile device by aligning the catch pins with the notches in the Battery Door.

Plug the Wall Mount or the Cigarette Lighter adapter into a power source before connecting the Power Jack to the Clip-on Portable Charger.

Remove the Clip-on Portable Charger from the mobile device by depressing the spring loaded arm at the base of the module.

Then remove the AC adapter from its power source.

Clip-on Portable Charger LEDs

The green Power LED on the Clip-on Portable Charger indicates voltage is present in the charger. The yellow Charging LED indicates the battery is being charged. When a battery is present in the mobile device, the Charging LED is always lit.

The intensity of the Charging LED indicates the following states:

Bright   The Portable Charger is using its high charge rate. The charger detected a battery low state and is charging the battery until a full battery condition is detected.

Dim The Portable Charger is using its low charge rate. The charger detected a full battery or that the battery only requires "topping off."

Unlit There is no battery in the mobile device. No charge rate is being applied. The indicator does NOT turn off when charging is complete.

Main Battery Pack Charger for the Mobile Device

Figure 5-2 Main Battery Pack Chargers / Analyzers

		Charges NiMH Battery Pack
6 Unit Charger/Analyzer	2330A378CHGR6WW	2330A381BATT1500 and
3 Unit Battery Analyzer	2330A379ANLZR3WW	2330A380BATT1500
Power Supply, AC, US	2335A301PSACUS	
Power Supply, AC, International	2335A302PSACWW	

The charger/analyzer used with the NiMH batteries for the 2330, 2335 and MX1 have from three to six battery cups.

There is one Test or Maintenance station, which is the last slot on the far right. This station will ultimately charge a battery. Mounted below the Analyzing Station is the LED Information Center and three dome switches, labeled Condition, Discharge and Analyze.
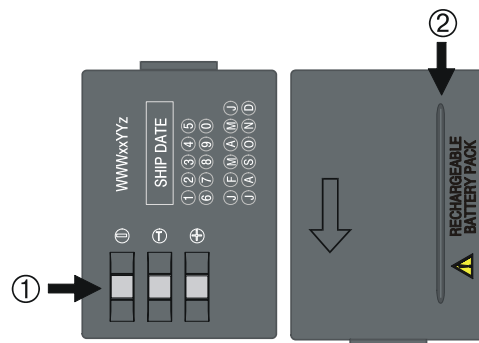
Figure 5-3 1500 mAh (NiMH) Main Battery

  1. Battery Contacts

  2. Positioning Key

Named for the Nickel-Metal hydride construction – Main Battery packs power the 2330, 2335 and the MX1 (except MX1-IS).

The minimum battery life before replacement is 300 – 500 charge/discharge cycles.
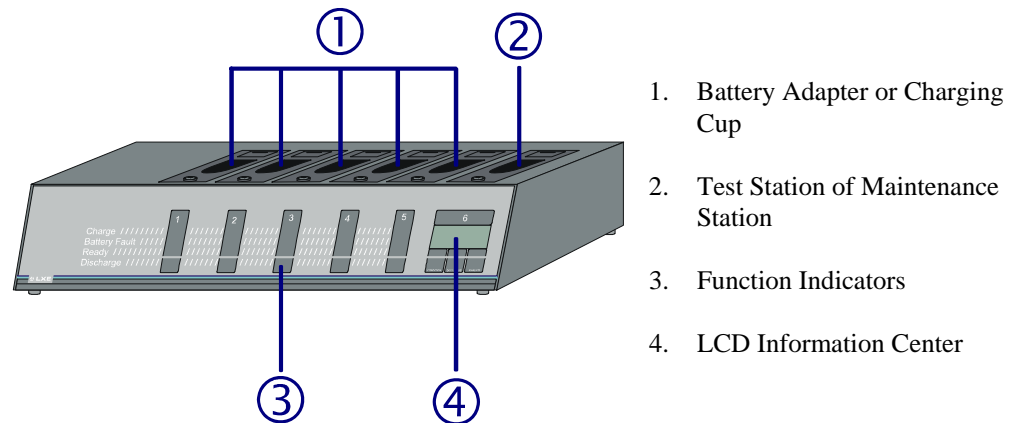
Figure 5-4 Six Cup Charger/Analyzer

1. Battery Adapter or Charging Cup

2. Test Station of Maintenance Station

3. Function Indicators

4. LCD Information Center
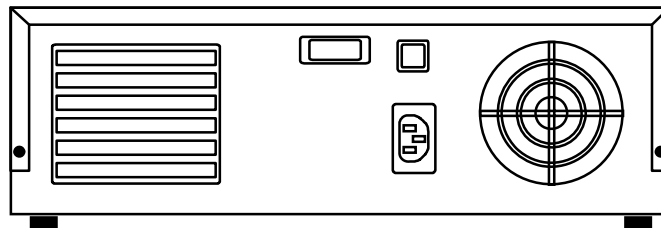
Figure 5-5 Back View of a Charger/Analyzer

Note: The power supply cord is the main disconnect device.

The rear panel contains some or all of these features:

- A/C cable receptacle.

- Protection provided by either a 2 amp SLO BLO fuse or a 1 or 2 amp circuit breaker.

- Power or On/Off switch.

- Fan for temperature control.

LXE multi-unit charger/analyzers perform the same four functions: Charge, Discharge, Analyze and Condition.

The function results are displayed on the LCD Information Center or the indicator strip under each battery adapter or cup.

Display	Description
DISCHARGE	The analyzer is discharging the battery.
CHARGE	The analyzer is charging the battery.
CONDITION	The analyzer fully charges, discharges, and recharges the battery three times and displays the capacity of the battery. At the end of the three-step process, the analyzer charges the battery.

Display	Description
1.2.3	Cycle numbers indicating which cycle the analyzer is currently performing in the Conditioning of the battery.
ANALYZE	The analyzer fully charges, discharges, and recharges the battery once and displays the capacity of the battery.
BAT.FAULT	The battery is shorted (contains 2 volts or less) or the battery has not reached 6 volts for a 6 cell battery (or 5 volts for a 5 cell battery) after fifteen minutes of the Charge cycle.
READY	The battery is ready for use.
mAh	The capacity reading of the battery.
V	The voltage of the battery.

Note: Do not remove the battery, or power the analyzer on and off, in the middle of a process. The process will start at the beginning when power, or the battery, is restored.

Using a 3 or 6 Bay Charger/Analyzer

Place the charger/analyzer on a flat surface, near an AC power supply and in a location that is protected from passing vehicles or falling objects.

Check all batteries for cracks, chips or leaks before placing in the charger/analyzer. If the battery is damaged it cannot be used in the charger/analyzer and must be discarded properly. Verify that the battery type is the correct type for the selected charger/analyzer – NiCad batteries in NiCad chargers, NiMH batteries in NiMH chargers, Li-Ion batteries in Li-Ion chargers..

Note: When the battery does not fit snugly in the battery charging cup, the battery is the incorrect type for that particular analyzer and must be removed.

Getting Started

If the unit is unplugged, confirm that the charger/analyzer power switch is in the Off position. The power switch is on the rear panel. The "I" indicates the On position and the "O" indicates the Off position. If the unit has a rear panel voltage selector switch, set the switch to match the line voltage it will be receiving.

Connect the AC plug from the rear of the analyzer to a convenient and appropriate (check the user guide or the voltage label on the analyzer) 115VAC or 220/240VAC outlet. Some analyzers require 220/240VAC only.

Power On

Note: Remove all batteries from the charger/analyzer before turning the unit on.

Press the rear panel Power Switch to the On position (On "I", Off "O").

When powered on, the LCD Information Center illuminates and, within the first 5 seconds, displays diagnostic information gathered from the charger/analyzer.
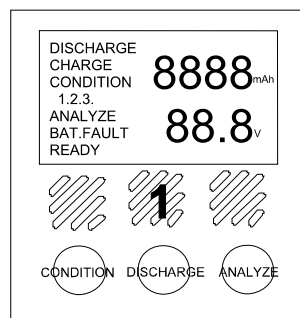
Figure 5-6 Sample Diagnostic Display

When the diagnostic cycle is complete, the LCD screen is blank and the charger/analyzer battery stations are in "Standby" mode, ready to begin charging batteries.

The "V" or volts message should increase during the charging cycles and decrease during the discharge cycles. During mode operations, the mAh display continuously tracks the depleted energy or capacity of the battery. The message displays the capacity in increasing 11 mAh increments, during the discharge cycles.

Note: When screens are blank, analyzer is ready for batteries.

Insert Battery
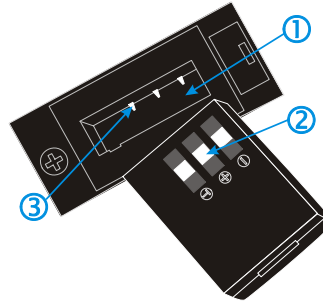
Figure 5-7 Battery Pack and Charging Cup

1   Battery Adapter or Charging Cup

2   Battery Contacts on Battery

3   Battery Contacts in Adapter or Charging Cup

Place the battery into a charging cup. Be certain the polarity is correct and the battery contacts align with the adapter contacts.

When using a charger/analyzer for NiMH batteries, and the battery is installed in the Test or Maintenance station, the letter "H" is displayed during the Charge mode only.

Select A Function

Do not remove the battery, or power the analyzer on and off, in the middle of a process. The process will start at the beginning when power, or the battery, is restored. When the first part of a process is Discharge, the available capacity in the battery will be discharged again.

Use This Mode	When You …
Condition	Prepare a new battery for use or restore a deficient battery to maximum available power.
Charge	Want to fast charge a battery and maintain it's full charge capacity via trickle charge until needed.
Analyze	Need to measure battery capacity. This process first discharges then charges the battery. The measured result can be compared against the battery specs.
Discharge	Want to verify the performance of another battery charger or check for excessive "stand-loss."

Note: Batteries are Conditioned and/or Analyzed in the Test or Maintenance station only.

AC Adapters for 3 and 6 Bay Battery Chargers

US AC Wall Adapter

Figure 5-8 US AC/DC 12V Power Supply

Operating Temperature	32°F to 104°F (-0°C to 40°C)
Storage Temperature	-22°F to 140°F (-30°C to 60°C)
Operating Humidity	Up to 90% non-condensing at 104°F (40°C)

International AC Adapter

Figure 5-9 International AC/DC 12V Power Supply

Operating Temperature	32°F to 104°F (-0°C to 40°C)
Storage Temperature	-22°F to 140°F (-30°C to 60°C)
Operating Humidity	Up to 90% non-condensing at 104°F (40°C)

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