





# Contents

	FCC Compliance statement (Part 15.19)	7
	FCC Compliance statement (Part 15.105)	7
	General information	7
	Warning (Part 15.21)	7
1	Introduction	8
	About this book	8
	Audience	8
	Conventions	8
	Automated meter reading	9
	Basic AMR components	9
	System overview	9
	How the system works	10
	EA_Mobile overview	11
	Features and functions	11
	Interrogator unit	12
	GPS receiver	12
	Antennas	12
	Display	12
	Vehicle Interactive Display (optional)	12
	How the EA_Mobile operates	12
	Endpoint selection	13
	Data accuracy verification	13
	Meter data acquisition and processing	13
	Route data collection made fast, easy and safe	13
	RF signals and conditions	14
	EA_Mobile range	14
	Obstructions	14
	Transaction capacity	14
	Interrogation window	14
	Adjusting interrogation window size	14
	Data Processing	15
	Maintenance	15
	Replacement Parts	15
2	Preparation and installation	16
	Vehicle requirements	16
	Unpacking and assembling EA_Mobile components	16
	Received equipment inventory	17
	Unpacking the EA_Mobile	17
	Antennas	17
	EnergyAxis transceiver (RX) antenna	17
	Transmit (TX) antenna	17
	Installing the EA_Mobile	17
	Installing the 7 inch LCD touch screen monitor	18

	Option 1 -to a dashboard .....	18
	Option 2 - to a windshield .....	19
	Connecting the monitor to the EA_Mobile .....	19
3	Quick Start Guide .....	24
	Installing the EA_Mobile .....	24
	Operating the EA_Mobile .....	25
	Loading a new route .....	27
	Reading endpoints .....	28
	Pausing or ending a reading session .....	34
	Resuming a route .....	34
4	Controls and indicators .....	36
	Controls and indicators .....	36
	Transmit and power manager controls and indicators .....	36
	Main POWER switch .....	37
	[Alarm] SILENCE button .....	38
	CHARGE .....	38
	TEMP .....	38
	BATT .....	38
	LINE .....	38
	POWER .....	39
	ENABLED .....	39
	EnergyAxis panel indicator .....	39
	ACTIVITY .....	40
	Fuses .....	40
	Removing a fuse .....	41
	Checking a fuse .....	41
	Replacing a fuse .....	41
	Specifications .....	41
5	Operating the EA_Mobile .....	42
	Accessing EA_Mobile functions .....	42
	EA_Mobile modes and menu options .....	43
	Command mode .....	43
	Reading mode .....	43
	Modes and menus .....	44
	Command mode .....	44
	Reading mode .....	46
6	Reading mode .....	47
	Discontinuing reading .....	49
	Change Reading mode options .....	49
	Audible signal .....	49
	Route Sequence .....	49
	Lat/Lon option .....	49
	Establishing Lat/Lon coordinates .....	50
	Using Lat/Long coordinates .....	50
	FIFO option .....	50
	Assigning endpoint coordinates .....	51
	GEO option .....	51
	Assigning coordinates .....	51

Reading meters	52
Loading the route	52
Set the Reading mode	53
Setting Date and Time	53
Entering Reading mode	54
Driving the route	54
Entering Command mode	55
Resuming reading	55
Saving a route	55
Powering down the EA_Mobile	55
Resuming a route after powering down	55
Reading displayed data	56
Header/Status line	57
Reading window	57
7 Command mode	59
Routes window	60
Load New Route button	61
Loading a route	61
Save Current Route button	62
Resume Route button	62
Resuming a route	62
Save Old Route button	63
Saving an old route	63
Help window	64
About button	65
Guide button	66
Settings window	67
System Setup button	68
Changing system settings	69
Set Perm button	70
Changing permanent settings	70
User Accounts button	72
Adding a new user	74
Changing an existing user	74
Deleting an existing user	74
Date & Time button	74
Changing the date or time	75
Summary window	75
All button	76
UnRead button	76
Un-int button	77
M. GEO button	77
In Wind button	77
Good button	77
Tamp. button	77
Viewing a summary	77
Endpoint status codes	78
Tools window	80
Tx On button	80
Sync VID button	80
Troubleshoot button	80
Route Scan button	83
Power Off button	83

A	Troubleshooting the EA_Mobile .....	84
B	GUI buttons.....	88
	Notes on GUI buttons .....	88

## FCC Compliance statement (Part 15.19)

The EA\_Mobile complies with Part 15 (Class A), Part 90 of the FCC.

The FCC ID is GAJEAMOBILE1

- Contains FCC ID: QZC-ILC2
- Contains IC: 4557A-ILC2

## FCC Compliance statement (Part 15.105)

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## General information

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

## Warning (Part 15.21)

Changes or modifications to the equipment not expressly approved by Elster could void the user's authority to operate this equipment.

# 1 INTRODUCTION

The EA\_Mobile is the most robust interrogator in Elster's portfolio of products for remote and automated meter reading (AMR). The EA\_Mobile has numerous features and functions not available with smaller, handheld devices and yet is versatile enough to be moved from vehicle to vehicle, wherever and whenever it is needed.

## About this book

This EA\_Mobile User Guide provides instructions for setup, installation, operation and troubleshooting the EA\_Mobile. It is structured for use as an adjunct to system training, as well as a standalone instruction guide and reference.

## Audience

This document is designed for utility industry meter readers and supervisory staff.

In order to establish appropriate levels of detail for the material, this document assumes the following:

- The user is experienced in reading meters of the type currently compatible with endpoints and possesses all the skills necessary to conduct meter reading by conventional means.
- The user has little or no prior expertise with AMR technology.
- The user is competent in the basic use of computer equipment and software.
- The user is familiar with geographic positioning concepts such as latitude and longitude.

## Conventions

In the interest of brevity and simplicity, this document uses the following conventions:

- Additional information relevant to a given instruction step may be shown in one of three ways:
  - a numbered or bulleted item covers **how-to** and verification information.
  - a **NOTE** contains relevant background information.
  - a blue **CAUTION** contains information important to the safety of either the user or the equipment.
  - a red **WARNING** contains information critical to the safety of people and/or equipment.
- Where reference to other parties is made, the generic masculine pronouns (he, his, and him) are used. This is no way reflects bias or gender discrimination in any manner related to the users, publishers or authors of this book.



## Automated meter reading

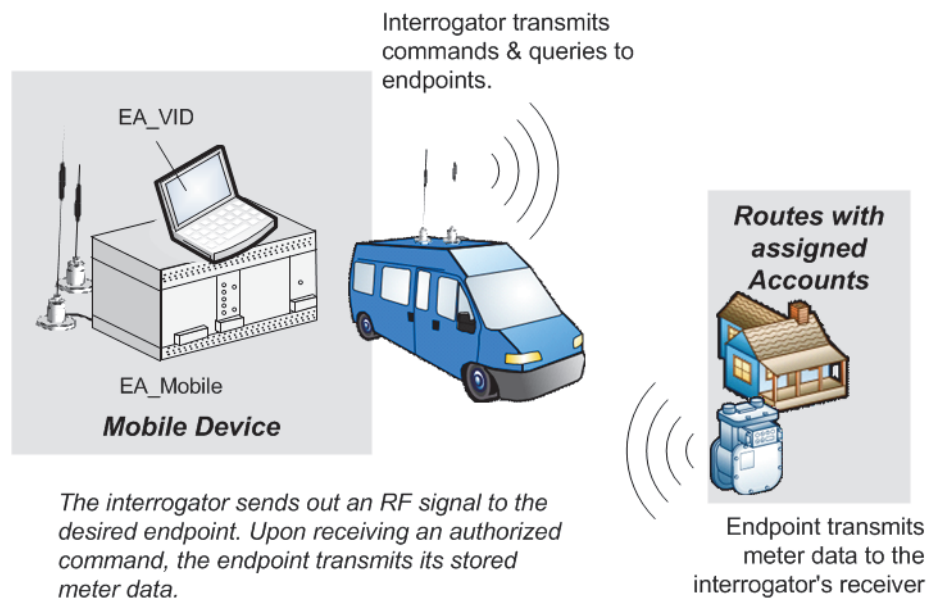
The system uses radio frequency (RF) signals to allow utility personnel to read meters from a distance while the reader is in motion. This technology is called automated meter reading (AMR). This technology greatly increases the speed at which routes can be covered with a high degree of accuracy.

### Basic AMR components

An automated meter reading system requires the following basic components:

- Endpoint - the endpoint interfaces with meter index mechanics, translates index reading into digital signals to capture data from meter, receives commands from an interrogator and transmits meter data.
- Interrogator - at its simplest, the interrogator remotely reads meter data transmitted by endpoints. At more sophisticated levels, an interrogator may also program endpoints, store route data, selectively wake up endpoints, verify endpoint conditions and data and set meter coordinates among other functions.
- Antennas - both the endpoint and the interrogator use antennas to broadcast and receive RF signals. The endpoint's antenna is typically located on the circuit board inside the endpoint case. Some interrogators use external antennas (as shown in the illustration below), one for transmitting and one for receiving. Many handheld interrogators use a single antenna for both transmitting and receiving (antenna may be internal or external).

Figure 1-1.



### System overview

In addition to standard automated meter reading functions, the system portfolio of products permits the remote recording of tamper conditions for gas and water meters and linking of meter latitude and longitude data using a global positioning satellite (GPS) system. With the optional EnergyAxis Vehicle Interactive Display (EA\_VID), the EA\_Mobile makes driver-to-meter orientation more intuitive and efficient.

EA\_Gas module and EA\_Water module endpoints that are normally in a sleep mode to conserve battery power wake up and periodically listen for an interrogation signal. These endpoints will transmit data back to the interrogation device only if it hears its unique ID and specified command and then it goes back to sleep. REX2 and A3 ALPHA electricity meters have AC power sources and do not require wake-up; they respond to the interrogation request without a wake-up.

### How the system works

Utility personnel no longer have to walk up to each meter, look at its index and record its reading. Once endpoints are installed on meters and programmed, meter readers simply drive a route allowing the interrogator to request and record meter data automatically.

Figure 1-2.



*The interrogator addresses each endpoint in the interrogation window individually. When the endpoint "hears" its unique ID and proper authorization, it transmits the current meter data. The system's frequency band allows remote reading of endpoints even through walls and fences.*

Acquisition of meter information begins with the endpoint where data is stored continuously for later retrieval and is received by the interrogator when requested. The acquired data from a given route can be transferred to a host computer via the supplied HP 4 GB USB flash drive for processing.

The information acquisition, storage and handling process includes several basic elements:

---

Meter interface	The gas and water endpoint, using a mechanical-to-digital interface, senses the output from the index of a utility meter and translates this into electronic form and stores it in the endpoint's memory. Electricity meters measure the kilowatts used and store this usage data in the endpoint's memory.
-----------------	---

---

Endpoint data acquisition	The endpoint is programmed with a unique serial number at the time of manufacture. Upon installation on a meter, the current (or baseline) meter index reading is also programmed into the endpoint's memory. As the meter reading advances it automatically updates the endpoint memory. For gas and water meters, the endpoint also records changes to the tamper detection sensor.
Compensation factor	For gas and water endpoints, a compensation factor can also be programmed into the endpoint memory ensuring the endpoint readings match the compensated mechanical index reading.
Route information loading	Route data includes the meter account number, address, latitude/longitude coordinates (when available), and endpoint serial number. This information, along with Guide and Start files, is downloaded to the interrogator prior to commencing automated meter reading. By tracking the vehicle or interrogator's coordinates, a GPS-equipped system determines which endpoints in the route are within range at any given time and transmits those serial numbers requesting meter data.
Interrogation	Once placed in an interrogation mode by the meter interrogator; the interrogator transmits serial numbers of the desired endpoints along with a command requesting the contents of each endpoint's memory. Endpoints are selected for reading on the basis of route and meter location information stored in the interrogator and presence of the endpoint within range of the interrogator.
Route data processing	Meter data from endpoints is stored in the interrogator's memory and can be transferred to the utility's host computer for processing.

## EA\_Mobile overview

The EA\_Mobile is a portable data retrieval and storage system designed to provide remote meter reading of mechanical indexes via meter endpoints.

The EA\_Mobile is designed for use in vehicles for fast, accurate automated meter reading at maximum range and at normal residential driving speeds.

**Caution:** Use only automatic EA\_Mobile operation while the vehicle is in motion. To change EA\_Mobile settings or view data, safely move the vehicle off the roadway and park in a secure location.

## Features and functions

The EA\_Mobile along with several primary components is transported in a wheeled case. Those components are:

- EA\_Mobile interrogator unit
- GPS receiver
- Transmitting antenna
- EnergyAxis transceiver antenna
- LCD touch screen display
- Power supply cable

Note: Optional EA\_VID is shipped separately.

### Interrogator unit

The interrogator unit is the heart of the EA\_Mobile, containing within its rugged case these core components:

- Wake-up transmitter
- EnergyAxis transceiver module
- Power supply (backup)
- Computer - CPU (microprocessor)
- Connection receptacles, controls and indicators

Figure 1-3.



### GPS receiver

The EA\_Mobile interfaces with a Global Positioning Satellite (GPS) system to provide data, including latitude and longitude information for the interrogator/ vehicle (the data can be used to determine the location of the vehicle and determine if meter endpoints are within the interrogation window).

### Antennas

The EA\_Mobile employs separate transmit wake-up and transceiver antennas for faster acquisition of endpoint data.

### Display

The user interface for the EA\_Mobile is accomplished via a 7 inch LCD Monitor with Touch Screen.

### Vehicle Interactive Display (optional)

The EnergyAxis Vehicle Interactive Display (EA\_VID) (installed on a ruggedized laptop computer) is an optional graphical user interface (GUI) terminal for the EA\_Mobile that provides a more visual and intuitive means to interact with the EA\_Mobile and view information.

## How the EA\_Mobile operates

1. On power up, the EA\_Mobile will turn off the transmitter.
2. The user plugs in the HP 4 GB USB flash drive, from which a route can be selected and loaded.

3. Once the route is loaded the reading mode can be entered. In reading mode the interrogator issues the necessary commands to interrogate the endpoints while the user drives along the route with the EA\_Mobile operating.
4. The EA\_Mobile sends out an interrogation signal searching for the endpoints that are determined to be within its current interrogation window.
5. When an endpoint receives a signal with its unique ID and specific command, the endpoint replies by transmitting the requested data (transmitted data depends on the type of meter).

### Endpoint selection

Endpoints can be queued for reading by the EA\_Mobile according to three types of criteria:

Proximity to EA_Mobile (Lat/Lon mode)	All endpoints with Lat/Lon coordinates within range of the EA_Mobile are polled until readings are obtained. This is the most efficient reading method because the EA_Mobile only attempts to read endpoints that are within its range. (Endpoints without Lat/Lon coordinates cannot be read in Lat/Lon mode.) The EA_Mobile limits route files to 50176 lines when in this mode.
Sequential (FIFO mode)	The FIFO, or first-in-first-out, method simply means the EA_Mobile will begin at the top of the route list, continuously searching for all unread endpoints on the list. As the route is covered and endpoints reply to the interrogation signal with valid data, the list becomes shorter. This is the least efficient reading method because the EA_Mobile may be polling endpoints that are out of range. The EA_Mobile limits routes to 300 endpoints when in this mode.
Combination (GEO mode)	GEO mode is a combination of Lat/Lon and FIFO. If an endpoint has Lat/Lon coordinates, the EA_Mobile will attempt to read this unit ONLY if it is currently within the interrogation window. All endpoints without Lat/Long coordinates are constantly polled until readings are obtained. The EA_Mobile limits the number of endpoints without Lat/Lon coordinates (GEO transponders) to 100.

### Data accuracy verification

The EA\_Mobile uses a module to perform RF communication using the EA\_LAN protocol. The EA\_Gas module and the EA\_Water module use various methods for error detection including a check sum algorithm.

### Meter data acquisition and processing

When the data stream from an endpoint meets the above criteria for accuracy, the EA\_Mobile records the meter index reading along with endpoint status, time and the vehicle position at the time of the read. If desired, this data can be stored in an output file on the supplied HP 4GB USB flash drive. At the end of a shift or upon terminating data collection for a particular route, the HP 4GB USB flash drive is removed for later use or for further processing by the utility.

### Route data collection made fast, easy and safe

Once the EA\_Mobile is initialized with the proper route data and the interrogation command is given by the user, the system will collect readings automatically, with little or no further intervention from the meter reader as the user drives the

specified route. The EA\_Mobile can be set to give an audible signal upon acquiring meter data so that the driver never has to take his eyes off the road while the vehicle is in motion.

## RF signals and conditions

### EA\_Mobile range

As a rule, residential gas endpoints within a line-of-sight distance of approximately 1200 feet of the EA\_Mobile should be able to receive interrogation signals and respond appropriately when the EA\_Mobile is in FIFO mode (Note: the line-of-sight distance for water endpoints may vary based on installation parameters). In GEO or L/L mode interrogations are limited to the size of the window. Certain fixed or transient conditions in the immediate environment surrounding the endpoint or EA\_Mobile may increase or reduce this range.

### Obstructions

Line-of-sight (no obstructions between the EA\_Mobile antennas and the endpoint) provides the optimum transaction range. Although the EA\_Mobile can typically read endpoints through walls and fences, any obstacles between the EA\_Mobile and the endpoint will reduce the range at which successful communications may be conducted. Metallic obstacles (vehicles, trash cans, metal sheds, etc.) in the path will severely limit interrogation range.

### Transaction capacity

The EA\_Mobile can interrogate one EA\_Gas module endpoint a second, retrieving 35 daily reads in addition to the current read in extremely dense populations under ideal conditions.

## Interrogation window

The interrogation window is a virtual space that simply defines which endpoints the EA\_Mobile will seek to read at any given time. Depending upon the selected reading mode, the interrogation window may include:

- Endpoints having Lat/Lon coordinates that are determined to be within the interrogation window of the EA\_Mobile at the moment (Lat/Lon mode).
- All endpoints, regardless of Lat/Lon coordinates or proximity to the EA\_Mobile (FIFO mode).
- A combination of the above, seeking those Lat/Lon endpoints determined to be within the interrogation window at the moment and in addition also seeking all endpoints without Lat/Lon coordinates regardless of proximity to the EA\_Mobile (GEO mode).

### Adjusting interrogation window size

The user can manually increase or decrease the interrogation window in order to change the scope of the EA\_Mobile's search for endpoints. A smaller interrogation window would be desirable, for example, in urban areas where the endpoint population is extremely dense. In rural areas where endpoints are few and far between, a larger Interrogation window may be used to detect endpoints at a greater distance.

## Data Processing

At the end of a route, data acquired automatically by the EA\_Mobile can be saved to a HP 4 GB USB flash drive disk for transfer to the utility company's host computer for administrative processing.

## Maintenance

The EA\_Mobile has no user-serviceable parts.

## Replacement Parts

Below is a list of the replacement parts that can be ordered from Elster.

Item	Part Name	Quantity	Part #
1	EA_Mobile Transmitter Antenna – 28 inches	1	40811 G001
2	EA_Mobile Transceiver Antenna – 12 inches	1	1B11917G01
3	EA_Mobile GPS Receiver	1	52860K001
4	EA_Mobile Power Cord (Optional)	1	52860K002
5	HP 4 GB USB flash drive	1	7S1969 H001
6	Direct Battery Cable Assembly (recommended option)	1	52860G050
7	Monitor, Xenarc 705 series 7 inch LCD Monitor with USB Touch Screen (Required when NOT using EA_VID)	1	7S1911 H001
8	Adhesive, dashboard mount for the touch screen. <i>Note: Required when NOT using the EA_VID.</i>	1	7S1941 H002
9	Suction, wind-shield mount for the touch screen. (Optional)	1	7S1941 H001
10	Cable, Xenarc 26 pin input <i>Note: Required when NOT using the EA_VID.</i>	1	7S1978 H001
11	Cigarette lighter Cable, Xenarc 12V DC <i>Note: Required when NOT using the EA_VID.</i>	1	7S1977 H001
14	Cable, CAT5e, Crossover,6' (Only required when using EA_VID)	1	7S1943 H001

**Caution:** Only use the USB drive provides by Elster.

## 2 PREPARATION AND INSTALLATION

This section details the procedures for unpacking the EA\_Mobile, assembling its components and installing them in and on your selected vehicle. This section also specifies EA\_Mobile requirements, conditions and cautions.

### Vehicle requirements

The EA\_Mobile typically uses 100 Watts of power (8 Amps current) and is powered by a vehicle's standard 13.8 Volt electrical systems using the direct battery connection cable (recommended configuration). If the optional outlet power cable is used, the vehicle accessory outlet should be rated for 20 Amps continuous.

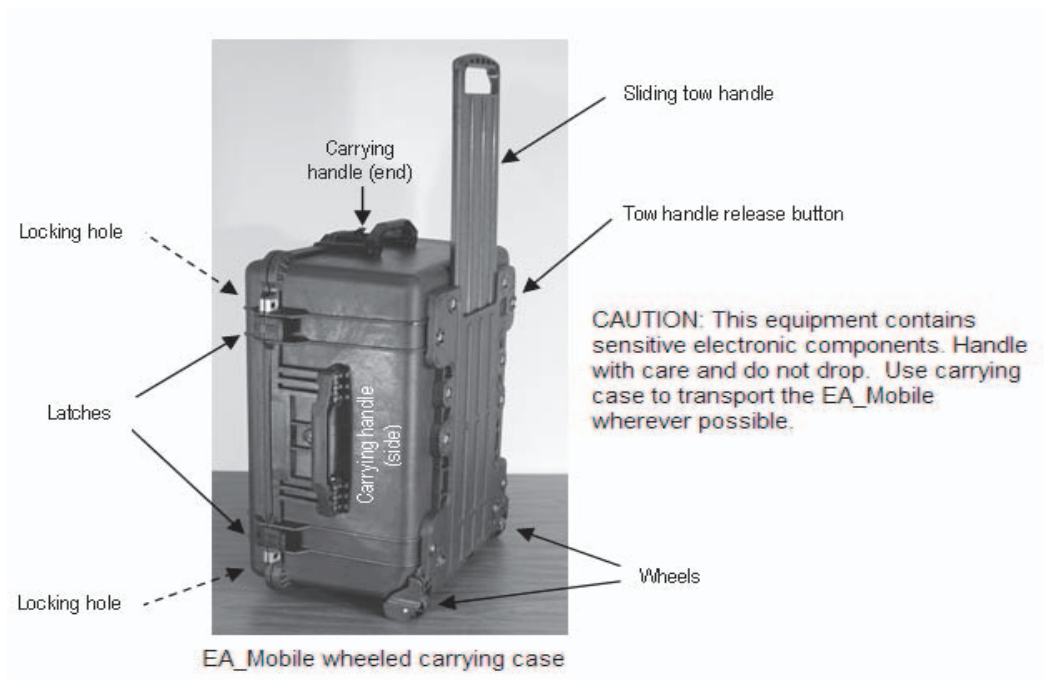
Operating the EA\_Mobile with the optional EA\_VID requires a separate accessory outlet for each device.

### Unpacking and assembling EA\_Mobile components

When you receive the EA\_Mobile, it will contain all components inside a single, hard-shelled case that has wheels on the bottom and a handle on top for easy transport.

**Note:** The optional EA\_VID is shipped separately.

Figure 2-1.





EA\_Mobile unpacking and set-up will take about five minutes using the procedure described below. No special tools are required.

## Received equipment inventory

The EA\_Mobile is shipped with the following components inside its case:

- Interrogator unit (transceiver, CPU, USB flash drive, etc.)
- EA\_Mobile-to-vehicle power cable and connector
- GPS receiver, cable and connector
- Transmit antenna, cable and connector
- EnergyAxis transceiver antenna, cable and connector
- 7 inch LCD touch screen and connector cables

**Note:** The optional EA\_VID is shipped separately.

## Unpacking the EA\_Mobile

The EA\_Mobile wheeled carrying case contains all the basic EA\_Mobile equipment and materials listed above.

1. Set the carrying case on a sturdy flat surface with the wheels and sliding tow handle on the bottom.
2. Remove any locks that may have been attached for security purposes.
3. Release both latches and open the case.
4. Remove the handheld touch screen from the top of the EA\_Mobile unit.
5. Remove the cables and antennas from beside the EA\_Mobile.
6. Lift the EA\_Mobile unit from the case and remove the packing wrap.
7. Leave packing materials in the case for future use and stow the case in a secure location.

## Antennas

Antennas are fully assembled and can not be disassembled

**Caution:** Attempting to disassemble antennas with black Mag from mount bases will cause damage to the antennas and possibly to the EA\_Mobile.

### EnergyAxis transceiver (RX) antenna

Screw-in BNC connector.

### Transmit (TX) antenna

Screw-in N connector.

## Installing the EA\_Mobile

This section describes the procedure for installing the EA\_Mobile and components in the selected vehicle.

**Caution:** The EA\_Mobile base unit contains sensitive electronic components. Handle with care and do not drop. Use carrying case to transport the EA\_Mobile wherever possible.

1. Verify the vehicle requirements (see "Vehicle requirements" on page 16) are met.
2. Place the EA\_Mobile unit in the vehicle:
  - Set the EA\_Mobile on a passenger seat or on any other firm and reasonably level surface where it will not interfere with the vehicle's operation yet is accessible to the user.
  - Situate the EA\_Mobile with its front toward the user/driver and its back and cooling fan away from any objects or surfaces that might impede air flow.

**Caution:** Failure to provide adequate cooling can cause EA\_Mobile to overheat, which can damage components.

- Position the front panel so that the operator can view the indicator lights and access the USB flash drive when the vehicle is parked.

**Caution:** The EA\_Mobile should only be used for automated functions when the vehicle is in motion. To interact with the EA\_Mobile, the user must first stop and park the vehicle safely off the roadway.

## Installing the 7 inch LCD touch screen monitor

You can select to install the 7-inch LCD monitor in either of the following positions:

- Option 1 -to a dashboard
- Option 2 - to a windshield

**Note:** The suction mount needed to install the LCD monitor is an optional component and, if required, must be ordered separately.

If you are using a suction windshield mount instead of the adhesive, dashboard mount, see "Option 2 - to a windshield" on page 19.

### Option 1 -to a dashboard

**Note:** Elster recommends mounting the 7 inch LCD touch screen monitor onto the dashboard.

To mount the monitor to the dashboard:

1. Mount the LCD monitor to its dashboard holder by sliding the monitor into the mounting stand and then secure the height position by adjusting the knob.
  - Choose an area near the driver's side dashboard for the mount.
  - Make sure the area does not block the driver's view of the road when the touch screen monitor is installed.
  - Position the holder in such a way so when the monitor is installed, the monitor can be easily reached by the operator when the vehicle is safely parked.

- Use an area below the driver’s line of sight
2. Clean the selected location.
  3. Remove the adhesive cover from the holder’s base and securely mount the holder and the monitor on the selected location of the dashboard.

### Option 2 - to a windshield

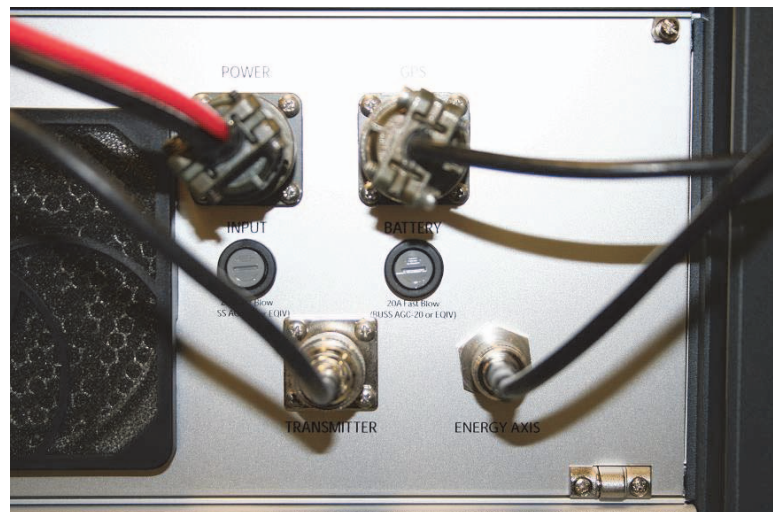
1. Mount the LCD monitor to its suction windshield holder by sliding monitor into the mounting stand, then, secure the height position by adjusting knob.
  - Choose an area near the driver’s side windshield for the mount.
  - Make sure the area does not block the driver’s view of the road when the touch screen monitor is installed.
  - Position the holder in such a way so when monitor installed, the monitor can be easily reached by the operator when the vehicle is safely parked.
  - Use an area below the driver’s line of sight, close to the dashboard.
2. Clean the selected location with the glass cleaner.
3. Remove the protecting film covering the suction cup.
4. Press the suction cup against the flat area of the selected location and use the release lever to secure the holder.

## Connecting the monitor to the EA\_Mobile

To connect the touch screen monitor with the EA\_Mobile after mounting the monitor on the dashboard or on the windshield:

1. Connect the power cable to the POWER receptacle on the back of the monitor (Figure 2-2).

Figure 2-2. EA\_Mobile back panel



2. Have a certified vehicle mechanic connect the other end of the direct connect power cable to the vehicle’s battery post.
3. Connect the LCD monitor to the EA\_Mobile by connecting the VGA, Line Out and USB 1 into the corresponding sockets on the EA\_Mobile front panel as shown in Figure 2-3.

Figure 2-3. EA\_Mobile front panel



Caution: The monitor must be connected before powering up the EA\_Mobile for the touch screen to function correctly.

4. Install the antennas, including GPS, on the roof of the vehicle (as shown in Figures 2-4 and 2-5).

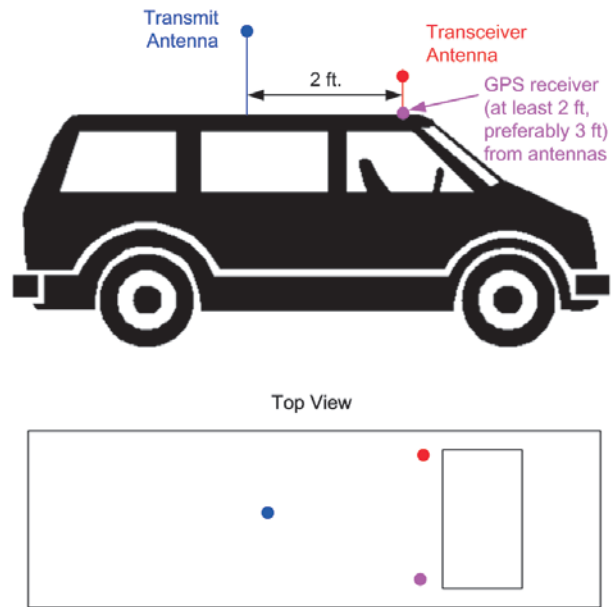
Caution: Use of antennas other than those supplied with the EA\_Mobile or improperly connected antennas may result in reduced performance and/or EA\_Mobile damage. Use of unauthorized antennas will void your warranty.

- Position the antennas so they are separated by a minimum of 2 feet.
- Antennas should also be placed a minimum of 2 feet from the edge of the vehicle or metal surface.

The transceiver antenna should be placed as close to the front edge of the vehicle as possible to get the antenna nearly vertical.

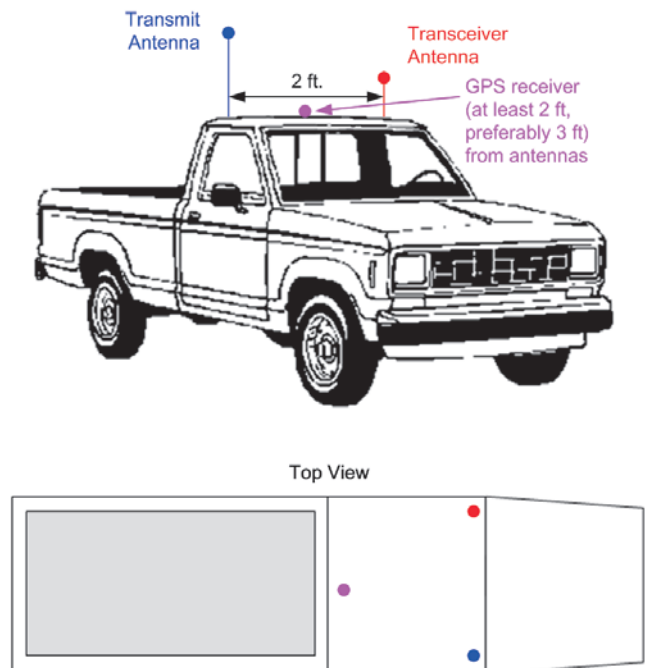
The figures below show the ideal placement of antennas mounted on roof of a mini van and pickup. Vehicles with larger roof area can provide greater antenna separation.

Figure 2-4. Placement of GPS receiver and RF antennas (van or SUV)



- a. Place the transceiver antenna on the roof of the vehicle near the front and secure its magnetic mount to the roof.
  - b. Place the transmit antenna on the roof of the vehicle near the back and secure its magnetic mount to the roof.
- See the figure below for recommended mounting configuration on a pickup truck.

Figure 2-5. Placement of GPS receiver and RF antennas (truck)



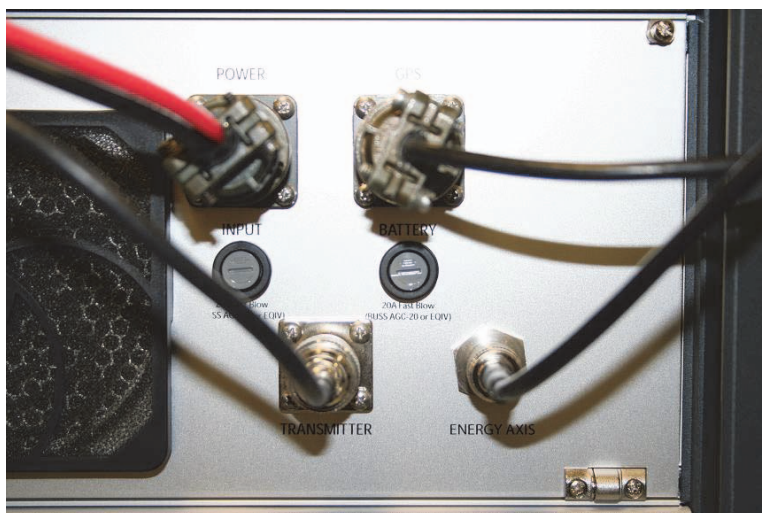
5. Route both antenna coaxial cables to the inside of the vehicle, preferably from the passenger side.

**Caution:** Ensure routing method secures cables without crimping or crushing and provides proper safety for occupants and equipment.

6. Mount the GPS receiver on the front right for a van or the back middle for a truck:
  - a. Attach the GPS receiver to the roof using the magnetic mount on the flat (bottom) side of the receiver.
  - b. For optimal satellite reception, mount the receiver with the flat side down and as nearly horizontal as possible.
  - c. To minimize interference to and from antennas, mount GPS at least 2 to 3 feet away from antennas.
7. Route the GPS receiver cable to the inside of the vehicle.

**Caution:** Ensure cable routing method secures cable without crimping or crushing and provides proper safety for occupants and equipment.

Figure 2-6.



8. Connect the antennas and GPS receiver cables to the EA\_Mobile (see Figure 2-6):
  - a. Connect transmitter antenna to the TRANSMITTER receptacle on the EA\_Mobile back panel by turning the screw-type connector until finger-tight.
  - b. Connect the Transceiver antenna to the EnergyAxis receptacle on the EA\_Mobile back panel by aligning the pin and pushing the coax connector on and twisting it 1/4 turn until locked in place.
  - c. Connect the GPS receiver by aligning the 4 connector holes, slotted side up, with the 4 GPS receptacle pins on the EA\_Mobile back panel and turn screw-type connector until finger tight.

**Warning:** Do not block air flow to the EA\_Mobile cooling fan located on the back panel to the left of the power connector.

9. Connect EA\_Mobile power:

- a. Align the 2 connector holes, slotted side up, with the 2 receptacle pins on the EA\_Mobile back panel (Figure 2-6) and turn screw-type connector until finger tight.
- b. Firmly insert the other end of the power cable into the vehicle's accessory/ cigarette lighter receptacle and push until snug.

**Warning:** If using the EA\_VID option, you must use a separate car accessory sockets to power the EA\_VID and utilize the EA\_Mobile direct battery connect cable (Part #:52860G050) to power the EA\_Mobile. Any other means of powering the EA\_VID and EA\_Mobile units may result in product and/or vehicle damage and may void product warranties.

10. Secure the EA\_Mobile in the vehicle so as to prevent accidental movement.

Standard seat-belts and custom-designed mounting harnesses or brackets may be part of a system used for properly restraining the EA\_Mobile in a given vehicle.

**Caution:** Failure to secure the EA\_Mobile in the vehicle may result in injury to occupants and/or damage to vehicle or EA\_Mobile in the event of an accident or abrupt vehicle movement. The user is responsible for providing a system appropriate to each vehicle used that ensures the safety and protection of persons and equipment in that vehicle.

The EA\_Mobile is now properly set up and ready to receive a route. See [Chapter 3, "Quick Start Guide"](#) and [Chapter 5, "Operating the EA\\_Mobile"](#) for operating instructions.

# 3 QUICK START GUIDE

This chapter provides a streamlined version of the installation and operating instructions for those who simply wish to set up and begin acquiring endpoint data quickly on fully automated routes.

**Note:** This chapter assumes all systems and operations perform properly and that all meters desired to be read automatically on the route are equipped with endpoints. For detailed instructions and troubleshooting tips regarding these and other types of route conditions, refer to the applicable chapter and section in the book.

## Installing the EA\_Mobile

1. Position EA\_Mobile with front accessible to operator, and its back and cooling fan free of obstacles.
2. Secure EA\_Mobile properly.

Figure 3-1.



EA\_Mobile front shown with LCD touch screen monitor



EA\_Mobile back

3. Mount transmit and transceiver antennas on top of vehicle at least 2-3 feet apart.
4. Mount GPS receiver on top of vehicle with flat side down and as horizontal as possible at least 2-3 feet from antennas.
5. Route antenna cables and GPS cable to inside of vehicle and connect to proper receptacles on EA\_Mobile back.
6. Connect the LCD touch screen monitor to the EA\_Mobile. (See ["Installing the EA\\_Mobile" on page 17](#) for more details on how to connect the LCD.)
7. Connect the power cable to the receptacle on the back of EA\_Mobile and plug the other end into the vehicle's accessory/cigarette lighter receptacle.
8. Turn on the LCD monitor.



## Operating the EA\_Mobile

**Note:** If using the EA\_VID, there is no longer a need to load the route on the EA\_VID. The EA\_Mobile will copy the data to the EA\_VID.

1. Obtain an HP 4 GB USB flash drive that has been properly loaded with routes created using Elster's Route Manager for use on the EA\_Mobile.

**Note:** All route directories must be the part of the parent directory named TraceVRT. To load the route successfully, each route directory must include the following three files: a Start file, a Guide file, and a Reading.rte file.

- The route disk must include the following directory structure if the USB flash drive will be used for multiple routes:

TraceVRT			
	0311		
		001rte	
			guide
			Reading.rte
			Start
		.	
		.	
		.	
		999rte	
			guide
			Reading.rte
			Start

- TraceVRT is the top level directory and must be included.
- The 0311 directory represents the top route directory for March 2011 (mmYY format).
- The 001rte directory will contain all the files necessary for EA\_Mobile to interrogate the 001 route.

When the route is complete and the Save Current Route button is selected, the 0010311.van file will be stored in the 001rte directory.

**Note:** Ensure that no directory name is longer than 8 characters and that the following characters: '+', ',', '=', '!', ']' and space are not used in the directory name. Additionally, the directory structure is limited to three levels deep.

2. Use the directions detailed in "Installing the EA\_Mobile" on page 17 to install the EA\_Mobile and the LCD touch screen monitor.
3. Insert the HP 4 GB USB flash drive in the socket labelled USB 2 on the EA\_Mobile.
4. Turn on the EA\_Mobile main power switch located on the front panel labeled POWER/AMP MGR.

If using an EA\_VID, wait a few minutes until the red XMIT status on the EA\_VID changes from a '?' to 'off', otherwise wait until the monitor displays the EA\_Mobile Login Screen.

Figure 3-2.



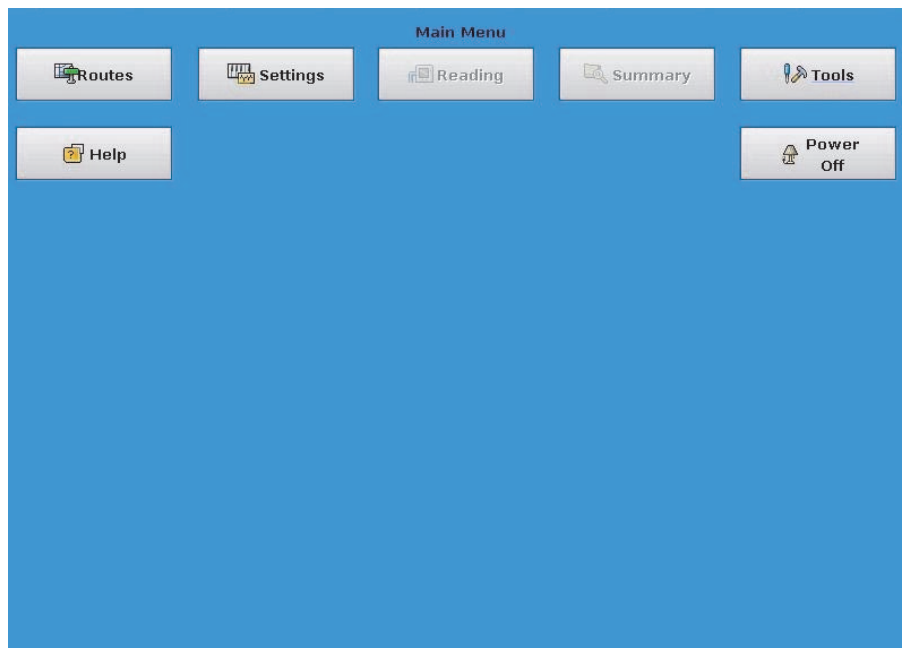
5. Enter the user name and the password and then press the OK button.

Note: The initial user name is 'ELSTER' and the initial password is '357837'. For security purposes, this user account may be removed after new user accounts are created and logged in.

Note: Make sure to enter the user name in all capital letters.

If the log in is successful, the system displays the Main Menu as shown below.

Figure 3-3.



**Note:** The Reading and Summary buttons will be disabled (that is, grayed out and unselectable) until a route is loaded.

## Loading a new route

To load a new route:

1. From the Main Menu, press the Routes button.

The Routes menu is displayed with the following buttons: Load New Route, Save Current Route, Resume Route, Save Old Route, and Close, as shown below.

**Note:** The Save Current Route button will be disabled until a route is loaded.

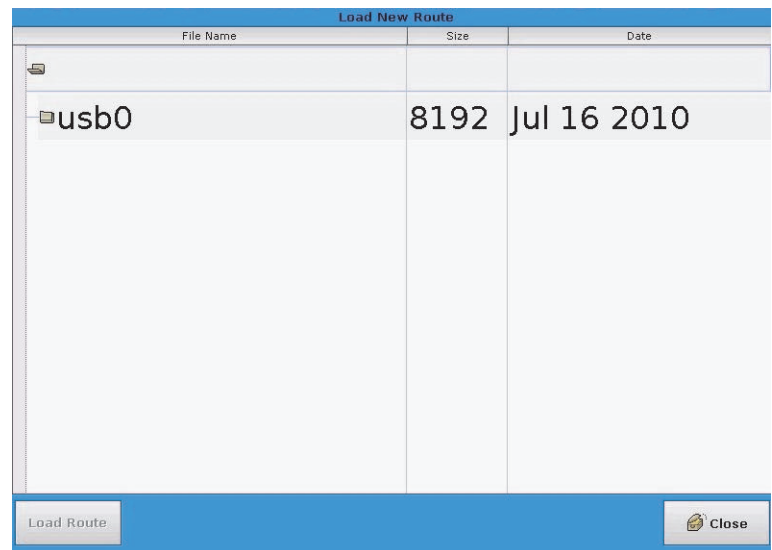
Figure 3-4.



2. Press the Load New Route button.

The File Manager window is displayed as shown below with a usb0 subfolder.

Figure 3-5.



3. Click on the `usb0` subfolder.  
The File Manager window displays the subfolders for folder `usb0` including the subfolder named `TraceVRT`.
4. Click on the `TraceVRT` subfolder.  
The subfolders for the different routes will be displayed in the File Manager window.
5. Select on the route that you wish to load.  
A file named `Reading.rte` is displayed as a part of the selected folder.
6. Click on the `Reading.rte` file and then click on the `Load Route` button located in the bottom left corner of the screen.  
A bar graph window should open and be updating to indicate the progress of the loading route.  
Once the route is completely loaded without errors the `Okay` button in bottom right corner of the bar graph window becomes enabled and the bar shows 100.
7. Press the `Okay` button.
8. Press the `Close` button in the bottom right corner and go back to the `Load New Route` menu.
9. Press the `Close` button in the bottom right corner again and go back to the `Main Menu`.

**Note:** Please verify the date and time before reading a route (see "Setting Date and Time" on page 53).

## Reading endpoints

**Caution:** Verify date and time before reading the route. The `EA_Mobile` will set the endpoint date and time as it reads the route.

To start reading endpoints:

1. From the Main Menu, press the Reading button.

The EA\_Mobile will open a new window and automatically start reading the route loaded. The EA\_Mobile starts in the mode specified in the guide file (unless the GPS is not present, then the mode is forced to FIFO, see Figure 3-7).

At this point the EA\_Mobile will begin to transmit, at minimum, keep-awake signals to endpoints within range. If there are endpoints remaining on the route to be interrogated, and they are in the window, the EA\_Mobile will automatically begin interrogation.

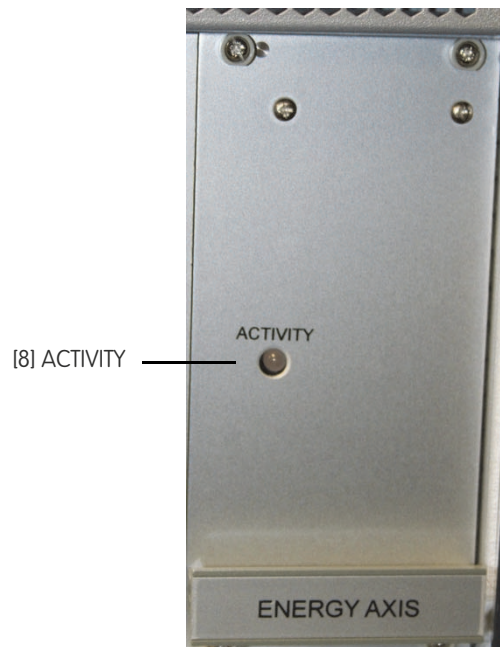
2. Verify that the EA\_Mobile indicator conditions are as shown in Figure 3-7.

Note: The EA\_Mobile includes a TX / POWER MGR panel. The TX / POWER MGR panel includes a Charge indicator.

Figure 3-6. TX / POWER MGR panel



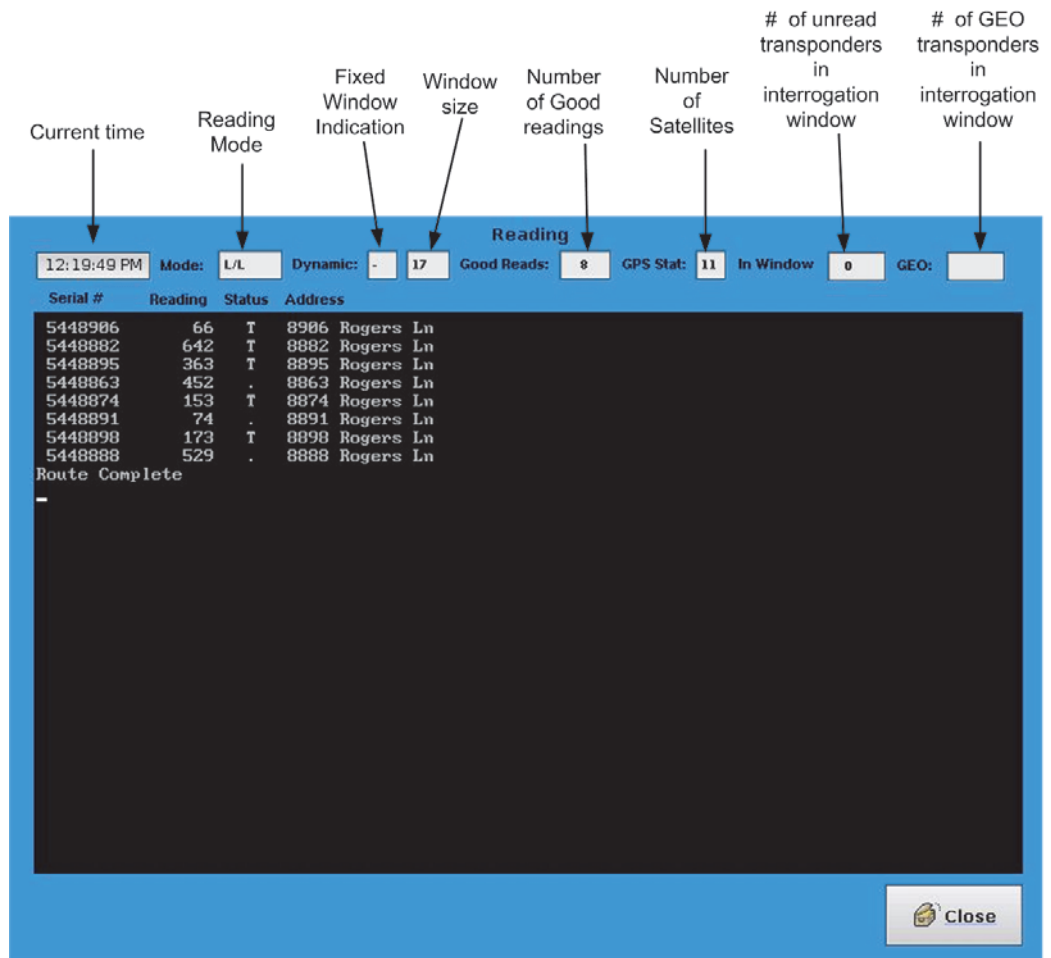
Figure 3-7. EnergyAxis panel



#	Indicator Label	Function	Start-up Condition
1	[Alarm] SILENCE button	[Not an indicator but a push button]	--
2	CHARGE	Battery Charging Status (Power AMP / Mgr.)	ON (green or red)
3	TEMP	Temperature status	ON (green)
4	BATT	Battery status	ON (green)
5	LINE	+12V line status	ON (green)
6	POWER	[Next to BATT light] Power status	ON (red)
7	ENABLED	TX enabled	ON (green)
8	ACTIVITY	Shows transceiver activity	OFF (green)

Figure 3-8 shows an example of a Reading mode header.

Figure 3-8.



The table below describes the information listed on the Reading mode display:

Item	Description
12:19:49 PM	Shows current time from the EA_Mobile internal clock.
Mode	Indicates the Reading mode currently selected. In this case it is L/L representing Lat/Lon mode. Other modes are FIFO and GEO.
Dynamic	<ul style="list-style-type: none"> <li>Fixed Window Size Flag - The '-' indicates the window is a fixed size.</li> <li>Window Size:                             <ul style="list-style-type: none"> <li>Indicates in the forward direction the interrogation window size if 17 × 100 feet or 1700 feet.</li> <li>To the side of the vehicle the distance is half or 850 feet.</li> </ul> </li> </ul> <p>Note: The interrogation window is approximately an oval.</p>
Good Reads	Indicates the total number of good reads. In this example, 8 endpoints have been successfully interrogated.
GPS Stat	Indicates the GPS status. In this example, GPS is active and is currently receiving data from 11 satellites.

Item	Description
In Window	Indicates the number of endpoints currently in the interrogation window. In this example, there are 0 endpoints.
GEO	Indicates the number of GEO endpoints in the interrogation window. In this example, there is no GEO indicated since the EA_Mobile is not in GEO mode.

The table below describes the GPS Status Codes and their meaning:

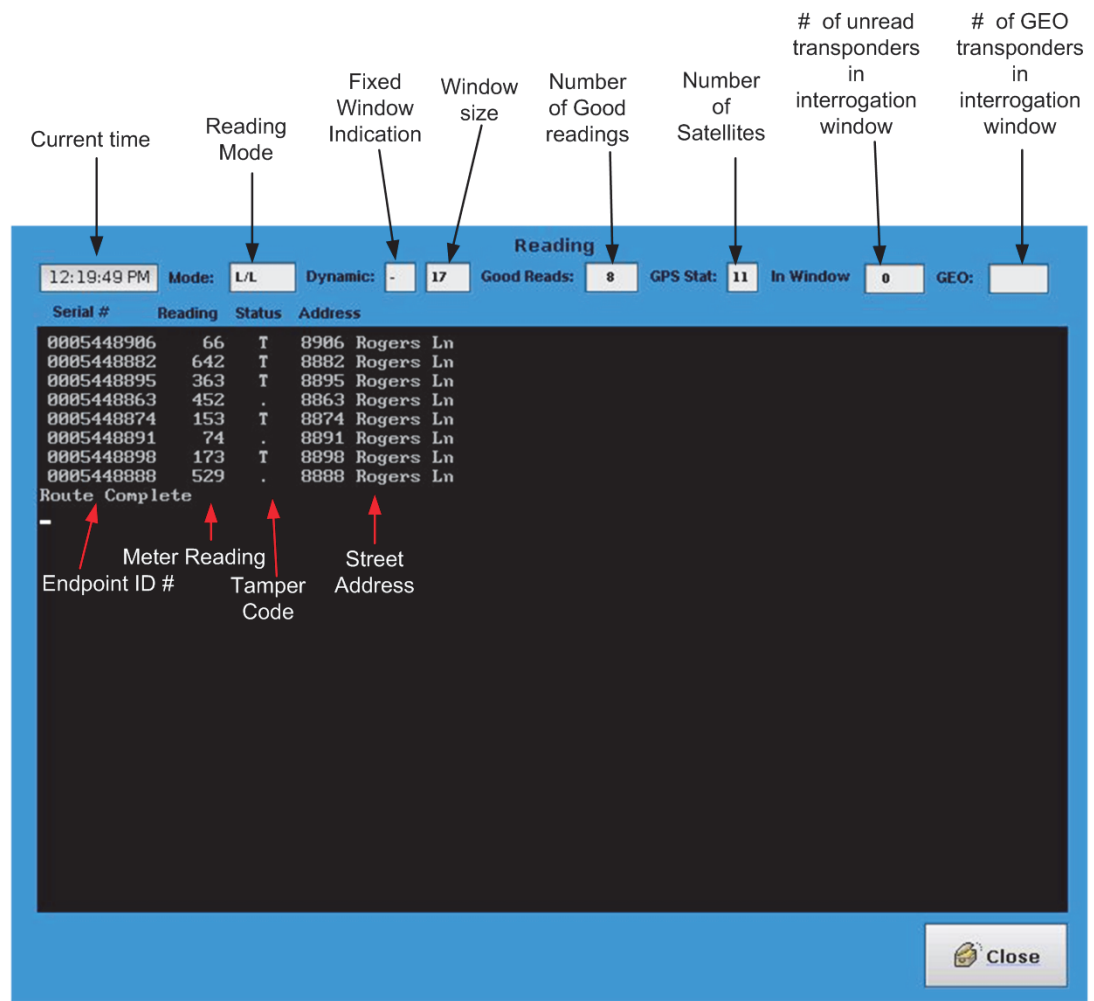
Value	Description
XX	(A numerical value will be displayed) The GPS receiver is communicating with the EA_Mobile and is producing valid position data. The value shows the number of satellites.
-	The GPS receiver is not properly communicating with the EA_Mobile or is not connected.
A	The GPS receiver is properly communicating with the EA_Mobile; however, the GPS is not getting good data from the satellites or the EA_Mobile is in FIFO mode.

3. You may now begin driving the route.

The EA\_Mobile will automatically scan for endpoints within its interrogation window. You will hear a beep each time the EA\_Mobile gets a good response from an endpoint (unless the "Beep on Good Read" option is turned off).



Figure 3-9.



Upon receiving endpoint data, the EA\_Mobile will display whatever data it has acquired regarding that particular interrogation attempt including:

- Endpoint serial number
- Meter reading
- Tamper status:

Status Code	Meaning
• [bullet]	Non-tampered
T	Tampered
R	Tamper reset successful
F	Tamper reset failed

- Street address

If a endpoint replies with tamper code T indicating potential evidence of tampering, the EA\_Mobile will automatically attempt to reset the tamper indicator. (You may turn off this option off on the Tools menu.)

## Pausing or ending a reading session

1. To pause or end a session or route, press the Close button on the bottom corner of the screen.

**Note:** The EA\_Mobile automatically saves the last 30 routes on the systems drive. (When 30 routes have been saved, the EA\_Mobile will overwrite the oldest route.)

— OR —

To save the current route, press the Close button on the bottom of the screen.

This takes you to the Main Menu.

2. Press the Routes button and then click the Save Current Route button.

This saves the results of the current route to the USB flash drive. (This is the button you would likely select when a route is completed and you are ready to load a new route or when you are done.)

— OR —

To exit the system, go to the Main Menu and press the Power Off button.

**Note:** Powering down the system will not result in data being lost, even if the route is not saved to the USB flash drive.

## Resuming a route

1. From the Main Menu, press the Routes button.

A new menu is displayed with the following buttons: Load New Route, Save Current Route, Resume Route, Save Old Route, and Close as shown in Figure 3-10.

**Note:** If a route has not been previously loaded, the Save Current Route button will be disabled.

Figure 3-10.



2. Press the Resume Route button once.

A window displays listing the last 30 routes read by the EA\_Mobile.

Figure 3-11.

Resume Route		
/zindex 22 Sep 2010 03:06 CMD=40	/rte1 20 Sep 2010 03:04 CMD=735	/rte1 22 Sep 2010 03:03 CMD=735
/rte2 23 Sep 2010 09:09 CMD=15	/rte1 20 Sep 2010 03:04 CMD=735	/rte2 22 Sep 2010 03:03 CMD=15
/zi_vr 23 Sep 2010 09:10 CMD=124	/rte1 20 Sep 2010 03:04 CMD=735	/rte1000 22 Sep 2010 03:03 CMD=1000
/123 23 Sep 2010 09:34 CMD=40	/rte1 20 Sep 2010 03:04 CMD=735	/rte1000 22 Sep 2010 03:04 CMD=1000 S
/rte1 23 Sep 2010 09:34 CMD=735	/rte1 20 Sep 2010 03:04 CMD=735	/rte2 22 Sep 2010 03:04 CMD=15
/rte1000 23 Sep 2010 09:35 CMD=1000	/rte1 20 Sep 2010 03:05 CMD=735	/rte1 22 Sep 2010 03:04 CMD=735
/rte1 23 Sep 2010 09:35 CMD=735	/123 22 Sep 2010 12:11 CMD=40 S	/rte1 22 Sep 2010 03:04 CMD=735 S
/rte2 20 Sep 2010 03:04 CMD=15	/rte1000 22 Sep 2010 03:02 CMD=1000 S	/rte2 22 Sep 2010 03:04 CMD=15 S
/rte2 20 Sep 2010 03:04 CMD=15	/rte1 22 Sep 2010 03:02 CMD=735	/rte1000 22 Sep 2010 03:04 CMD=1000 S
/rte2 20 Sep 2010 03:04 CMD=15	/rte2 22 Sep 2010 03:02 CMD=15	/rte2 22 Sep 2010 03:05 CMD=15 S

Close

3. Select the desired route by finding the route with the time stamp close to the time you loaded the route and with your route's directory name.

The last file loaded is the highlighted route with a route name of /rte1 loaded on 23 Sep 2010 9:35 with 735 commands.

**Note:** If an S follows the command data, the route has been saved.

# 4 CONTROLS AND INDICATORS

The EA\_Mobile hardware offers a variety of audible and visual indicators and interaction mechanisms to tell you how the EA\_Mobile is functioning internally and give you control over certain functions.

This chapter describes these controls and indicators along with their conditions and any actions you may need to take in response.

The LCD Touch screen display can also provide system indications and controls. These capabilities are discussed in [Chapter 5, "Operating the EA\\_Mobile."](#)

## Controls and indicators

Figure 4-1 and Figure 4-2 show the indicators and controls located on the EA\_Mobile's front panel. Some of the indicators will change color or appearance when the EA\_Mobile is actively acquiring endpoint data.

## Transmit and power manager controls and indicators

Transmit and power manager controls and indicators are located on the center front panel of the EA\_Mobile. The EA\_Mobile indicator lights (LEDs) and alarms convey information regarding the status of the power supply unit, internal temperature and transmitter/receiver operation. The controls allow you to turn on power and silence alarms.

**Note:** The EA\_Mobile includes a TX / POWER MGR panel. The TX / POWER MGR panel includes a Charge indicator. See [Table 4-1](#) for the configuration of your EA\_Mobile.

Figure 4-1. TX / POWER MGR panel



### Main POWER switch

The main Power switch turns on or turns off the 12 Volt power to the EA\_Mobile. It is a rocker switch labeled to show the ON and OFF positions.

**Note:** Key numbers shown in brackets [ ] in Figure 4-2 refer to the Key numbers in the table.

Table 4-1. TX / Power Mgr. Indicators

Key	Indicator	Condition			
		Optimal t EA_Mobile startup	During interrogation	Warning conditions	Error condition
1	[Alarm] SILENCE button				
2	CHARGE	Green	Green (when charging)	NA	Red (when discharging)
3	TEMP	Green	Green	Yellow	Red
4	BATT	Green	Green	Yellow	Red
5	LINE (+12V)	Green	Green	Yellow	Red
6	POWER	Red	Red	NA	Off
7	ENABLED	Off	Green	NA	Off when interrogating

Familiarize yourself with the normal conditions of these indicators at startup and during interrogation so that any improper conditions will quickly alert you to take action.

**Caution:** Failure to respond to certain improper indications in a timely manner may lead to poor EA\_Mobile performance and, in some cases, permanent equipment damage.

**Note:** As a rule of thumb, all indicator lights except the transmit ENABLED light - should be ON continuously while the EA\_Mobile is operating. If the remaining lights are off or flickering, you may need to troubleshoot an error condition. See [Appendix A, "Troubleshooting the EA\\_Mobile"](#) for details.

### [Alarm] SILENCE button

Any new alarm condition (also shown by indicator lights) will activate the audible alarm.

- If you choose to ignore the problem, you may press the Silence button to silence the alarm.

Even after you silence the alarm, however, the indicator light will continue to flash until the actual alarm condition ceases. If the alarm condition persists or recurs, the audible alarm will sound again.

### CHARGE

[Green] Indicates the battery is charging. [Red] Indicates the battery is discharging.

### TEMP

[Green] Indicates the internal temperature of the EA\_Mobile is below 130° F. It should be ON continuously whenever the EA\_Mobile is powered.

If this light is flashing or is Red, it indicates the internal temperature has exceeded the threshold:

- Check the cooling fan. Remove any clogs and reposition the EA\_Mobile if necessary to ensure adequate air circulation to the cooling fan.
- If the fan is operating properly, lower the ambient temperature in the vehicle either by opening windows or by adjusting the heater or air conditioning thermostat.
- If the fan is not operating, call Elster's Service Department.

**Warning:** If the EA\_Mobile overheating conditions cannot be corrected immediately, shut down the EA\_Mobile. Failure to do so may result in damage to EA\_Mobile components.

### BATT

[Green] Indicates the internal battery voltage is stable and adequate to power the EA\_Mobile. It should be ON continuously whenever the EA\_Mobile is powered.

- If this light is flashing, it indicates the EA\_Mobile is running on battery power. The internal battery is for temporary emergency use only.

**Warning:** If the BATT light is flashing or is Red, it may indicate the internal battery has dropped to an unusable voltage. Immediately shut down the EA\_Mobile!

### LINE

[Green] Indicates the 12 Volt supply from the vehicle's accessory/cigarette lighter receptacle is delivering adequate voltage to power the EA\_Mobile. The LED should be ON continuously whenever the EA\_Mobile is powered.

If this light is flashing or is Red, it indicates the 12 Volt supply has dropped to an unusable voltage:

- Verify the power cable is connected.
- Check for vehicle accessories (radio, tape player, CD, etc.) that can be turned off to minimize the power drain.
- If the LINE light continues to blink, verify the accessory/cigarette lighter fuse is intact.
- If the fuse for the accessory/cigarette lighter has blown, shut down the EA\_Mobile and replace the fuse.
- If the LINE light continues to blink, the vehicle's alternator may be unable to produce adequate operating current and should be serviced.

### POWER

[Red] Indicates the +12 Volt power supply to the amplifier is on. It should be ON whenever the EA\_Mobile is powered.

- If it is not ON, check the fuse and replace if necessary. See "Checking a fuse" on page 41 for details.
- If the fuse is OK, contact Elster's Service Department.

### ENABLED

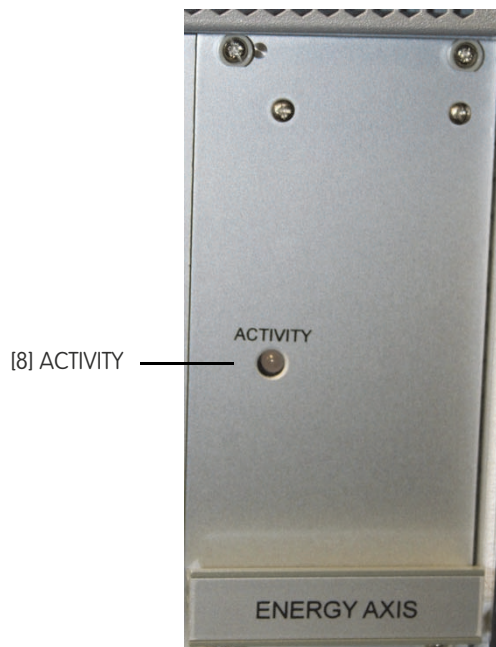
[Green] Indicates the EA\_Mobile transmitter is actively transmitting. The LED should be ON during interrogation or once turned on using the Tools window.

- If this light is not ON during interrogation or when transmitter is turned on from the Tools window, contact Elster's Service Department.

## EnergyAxis panel indicator

The EnergyAxis panel is located on the right side of the EA\_Mobile front panel (Figure 4-2). The sole indicator is **ACTIVITY**. This light indicates if serial communications are occurring. This light generally appears as a blinking red or orange. This indicates activity is occurring over the serial communications port.

Figure 4-2. EnergyAxis panel



Note: Key numbers shown in brackets [ ] in Figure 4-2 refer to the Key numbers in Table 4-2.

Table 4-2. Receiver (REC) and Transmitter (XMIT) Indicators

Key	Indicator	Color	Condition			
			At EA_Mobile startup	When EA_Mobile is powered	During interrogation	Error condition
8	ACTIVITY	Red	OFF	OFF	Blinking (Red or Green)	OFF

### ACTIVITY

The activity light indicates if there is activity on the EnergyAxis transceiver antenna.

- It will blink Red whenever RS-232 data is received.
- It will flicker Green whenever RS-232 data is read from the transceiver.
- If the transceiver is both receiving and reading, the Activity indicator will appear as Amber.

This includes communication with the transponder and the CPU.

This indicator should flicker whenever the EA\_Mobile is in reading mode. It's flickering becomes more solid when transmitting and receiving data from transponders.

### Fuses

The EA\_Mobile contains two internal fuses accessed from the back panel (Figure 4-3) Fuses. These are standard automotive-type fuses:

Input	20 Amp	AGC 32V
Battery	20 Amp	AGC 32V

Figure 4-3. Fuses





### Removing a fuse

To check a fuse you must remove it:

1. To remove the selected fuse, insert a flat-head screwdriver (or a dime) into the slotted center of the fuse holder.
2. Turn counterclockwise until the fuse holder springs out.
3. Pull the fuse holder and fuse out of the EA\_Mobile back panel.

### Checking a fuse

To check the fuse:

1. If the fuse has a window in it, check the metal filament inside.
  - If it is clearly broken, the fuse is blown.
  - If the filament appears to be intact, it could still be broken at one end where the break is less apparent. You may want to try replacing the fuse with a known good fuse, just to be sure.
  - If the fuse has no window, replace with a known good fuse to see if this solves the problem.

### Replacing a fuse

1. To replace the fuse, remove the old one from the fuse holder and insert a new one.
  - Verify the fuse has the proper amperage and voltage characteristics.
2. Replace the fuse holder (with new fuse) in the socket on the EA\_Mobile back panel.
3. Insert the screwdriver/coin into the center slot on the fuse holder cap, push in and turn clockwise until tight.

## Specifications

The following table shows the EA\_Mobile specifications:

Power Source	Standard 13.8 VDC vehicle power, sealed internal gel-cell battery
Power Consumption	100 Watts (8 Amps maximum current) fully loaded
RF Transmitter	Power is 12.5 Watts nominal. Frequency is software tunable to licensed frequency
Transceiver	ISM Band, Frequency Hopping 900 MHz transmit and receive
GPS Receiver	Accuracy, approximately 3 meters
FCC Compliance	Part 90, including Parts 90.210(d) FCC ID: G8JEAMOBILE1
Operating Temperature (Ambient)	-10C to 50C (14F to 122F)
Storage Temperature	-10 °C to +40 °C (+14 °F to +104 °F)
Size	17"W x 7"H x 12"D
Weight (approximate)	33 lbs (15 kg) in operational configuration 62 lbs (28 kg) in carrying case
Fuses	Input 20 Amp AGC 32V Battery 20 Amp AGC 32V

# 5 OPERATING THE EA\_MOBILE

This chapter describes the functions and operations of the EA\_Mobile and provides certain background information regarding technologies involved, where appropriate.

## Accessing EA\_Mobile functions

After the components have been assembled and connected and the EA\_Mobile has been properly installed in the vehicle (see [Chapter 2, "Preparation and installation"](#)), you are ready to begin the process of automated meter reading.

**Note:** If you are using the EA\_VID, there is no need to load the route on the EA\_VID. The EA\_Mobile will copy the data to the EA\_VID over the Ethernet cable. If the Ethernet cable becomes loose or is removed, it takes the EA\_Mobile and EA\_VID several seconds to re-establish communications. These communications are used to copy a route to the EA\_VID, to display the EA\_Mobile window on the EA\_VID and to send data bi-directionally between the EA\_Mobile and the EA\_VID.

Use the following steps to access EA\_Mobile functions:

1. Obtain a USB flash drive that has been loaded with a route by Route Manager software for use in the EA\_Mobile.

The routes on the USB flash drive must include the following three files for all route directories:

- start
- guide
- Reading.rte

2. Insert the USB flash drive into the slot labeled USB 2 on the EA\_Mobile front panel.
3. Turn on the EA\_Mobile's [Main POWER switch](#) located on the front panel to the right of the USB drive (Figure 5-1) and allow a couple of minutes for the system to boot up.

Once the system is ready, the touch screen monitor will display the log in screen.

Figure 5-1.



4. Log in to the EA\_Mobile by entering your Login ID and Password.  
The Main Menu displays.
5. To start reading, from the Main Menu, press the Reading button.  
The EA\_Mobile will start reading endpoints within range. The default reading mode is determined by the guide file.
6. To return to Command mode, close the Reading window by pressing the Close button.  
All other buttons are Command mode options. See [Chapter 7, "Command mode"](#) for details.

## EA\_Mobile modes and menu options

The EA\_Mobile has two primary operational modes: [Reading mode](#) and [Command mode](#).

### Command mode

Command mode allows you to view and analyze system data and parameters, alter operational parameters, load, save and resume a route, and perform various tasks. Command mode consists of six main menu buttons: Routes, Settings, Summary, Tools, Help, and Power Off. See [Chapter 7, "Command mode"](#) for details on using Command mode.

### Reading mode

Reading mode allows you to read/interrogate endpoints. See [Chapter 6, "Reading mode"](#) for details on using Reading mode.

## Modes and menus

The following table lists the EA\_Mobile modes and the menu options that may be selected from within those modes. The balance of this chapter details the use of each mode and selection.

### Command mode

See Chapter 7, "Command mode" for details on each command.

Menu	Submenu	2nd level	3rd level	Function
Routes window	Load New Route button	--	--	This button opens a file manager window and allows the user to find and load a route from the USB flash drive.
	Save Current Route button	--	--	This button is used to save the current route to the USB flash drive.
	Resume Route button	--	--	This button is used to resume one of the last thirty routes loaded.
	Save Old Route button	--	--	This button is used to save one of the last thirty routes loaded.
Settings window	System Setup button	Read Method	Lat/Lon	Latitude/Longitude mode selects for interrogation only those endpoints having Lat/Lon coordinates that are within the interrogation window.
			FIFO	FIFO mode (first-in-first-out) considers all endpoints on the route to be within the interrogation window and will repeatedly search through the route list looking for any unread endpoints that are within range at that given moment.
			GEO	GEO mode selects any endpoints with valid Lat/Lon coordinates that are within the interrogation window AND all endpoints without Lat/Lon coordinates, regardless of proximity.
	Display Good Reads	Yes	Yes	Enables system to display good reads.
		No	No	Enables system to not display good reads.
	Sound on Good Reads	Yes	Yes	Enables system to play sound on receiving good reads.
		No	No	Enables system to not play sound on receiving good reads.
	Reset Tamperers	Yes	Yes	Enables system so it can reset tamperers.
		No	No	Disables system from resetting tamperers.
	Window Size		0-17	Sets interrogation window size.
Sort Unread Display	Yes	Yes	Enables system to sort unread endpoints displayed.	
	No	No	Disables system from sorting unread endpoints displayed.	

Menu	Submenu	2nd level	3rd level	Function
Settings window	System Setup button	Monitor Unread Display	Yes	Enables system to monitor unread display.
			No	Disables system from monitoring unread display.
	Set Perm button	Unit Serial #	--	Displays Unit's serial number.
		Last Updated:	--	Displays the date of last update.
		Encryption Key	--	Encryption key used in determining the password needed.
	User Accounts button	First Name	--	First name of displayed User Account.
		Last Name	--	Last name of displayed User Account.
		Login ID	--	Login ID for displayed User Account.
		Password	--	Hidden password for displayed User Account
		Record	--	Shows which user account of total User Accounts is displayed.
		First	--	Goes to the first User Account is the list
		Previous	--	Goes to the previous User Account
		Next	--	Goes to the next User Account.
		Last	--	Goes to the Last User Account.
		New	--	Creates a new user at the next available User Account, there is a maxium of 25 Users. After selecting new a new user account can be entered using the touch screen and the keypad on this window.
		Delete	--	Deletes the present User Account.
	Date and Time	System Time	--	Displays and allows modification of system's current time.
		System Date	--	Displays and allows modification of system's current date.
	Summary window	All button	--	--
UnRead button		--	--	Shows endpoints who have not yet completed reading or who failed to read.
Un-int button		--	--	Show only endpoints that have not been interrogated.
Good button		--	--	Show all endpoints that have responded successfully to interrogation, including tampered units.
Tamp. button		--	--	Show all endpoints that have returned a tamper status including those in reset or reset failed condition.
M. Geo		--	--	Not yet implemented.
In Wind		--	--	Shows all endpoints within the interrogation window, that is, reading is not yet completed.

Menu	Submenu	2nd level	3rd level	Function
Tools window	Troubleshoot	--	--	Opens a window which allows the user to troubleshoot issues with endpoints.
	Route Scan	--	--	Not yet implemented.
	Sync EA_VID	--	--	This button is used to re-synchronize with the EA_VID.
Help window	About button	--	--	Display results including software version information.
	Guide button	--	--	Brief online command summary.
Power Off button	--	--	--	Powers the system down. The user will be prompted to confirm power down and if a route is loaded, but not saved, a message will warn the user the route was not saved.

### Reading mode

See [Chapter 6, "Reading mode"](#) for details on using Reading mode.

## 6 READING MODE

**Note:** Please verify the date and time before reading a route (see “Setting Date and Time” on page 53).

“EA\_Mobile modes and menu options” on page 43 listed the various Reading mode and Command mode buttons. Reading mode has three interrogation control options:

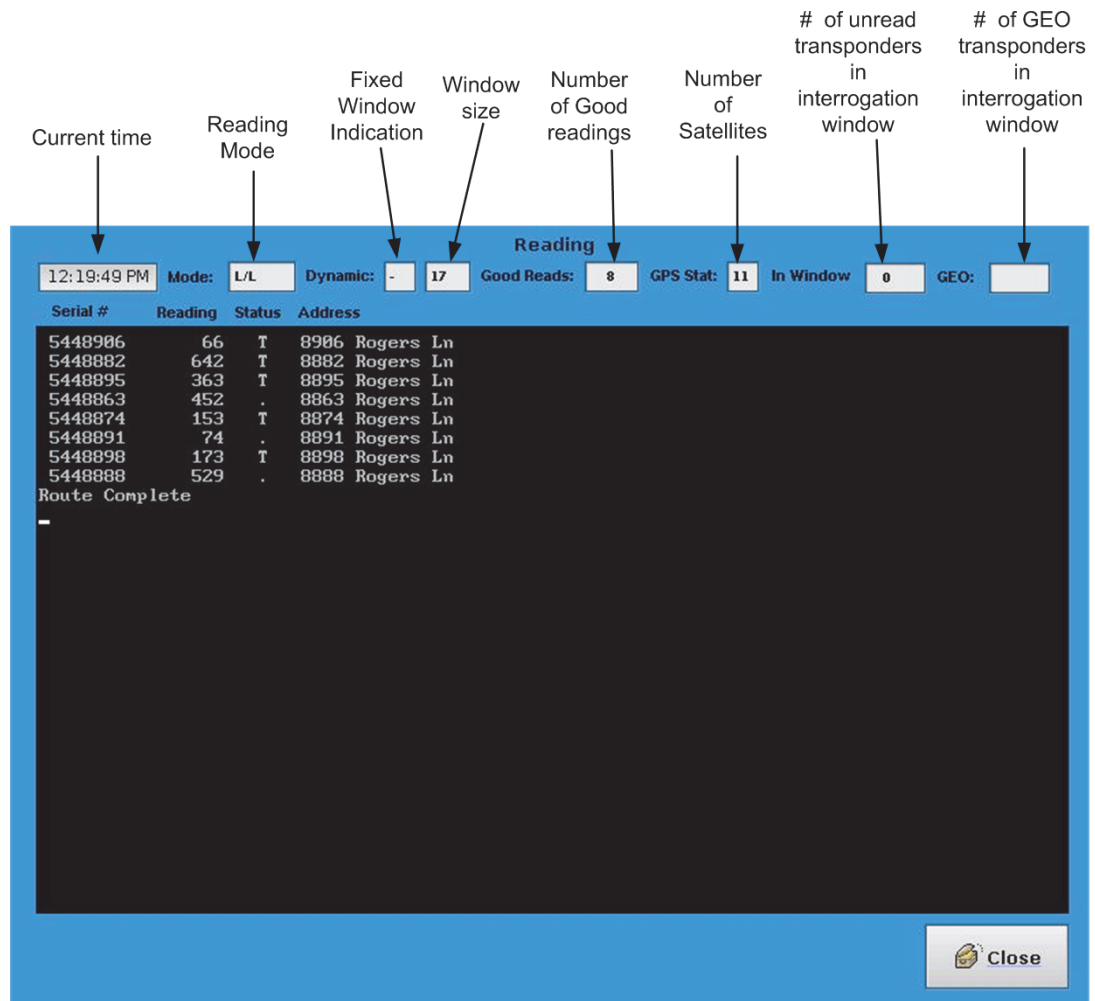
- Lat/Lon option
- FIFO option
- GEO option

Reading mode can be entered from the Main Menu by pressing the Reading button after a route is loaded. See “Loading a new route” on page 27 for details on loading a route.

**Caution:** Verify date and time before reading the route. The EA\_Mobile will set the endpoint date and time as it reads the route.

The following figure shows the Reading window.

Figure 6-1.



The three Reading mode options allow you to determine the method by which endpoints will be selected for interrogation:

- **Lat/Lon option** uses latitude and longitude coordinates of the meter's endpoint (along with current coordinates of the EA\_Mobile/vehicle) to determine which endpoints in the route should be within the interrogation window at any given time. It then scans only those endpoints.

**Note:** If no satellites are detected, the EA\_Mobile will automatically switch to FIFO mode.

- **GEO option** selects any endpoints with valid Lat/Lon coordinates that are within the interrogation window AND all endpoints without Lat/Lon coordinates, regardless of proximity to the EA\_Mobile.

**Note:** If no satellites are detected, the EA\_Mobile will automatically switch to FIFO mode.

- **FIFO option** (first-in-first-out) considers all endpoints on the route to be within the interrogation window and will repeatedly search through the route list looking for any unread endpoints.



## Discontinuing reading

To discontinue reading when in the Reading window, press the Close button.

## Change Reading mode options

To select/change Reading mode options, see "System Setup button" on page 68

## Audible signal

The EA\_Mobile default is to emit an audible beep upon each good read. See "System Setup button" on page 68 for details on changing this setting.

## Route Sequence

You may drive the route in any order since the EA\_Mobile is constantly computing which endpoints are available for interrogation.

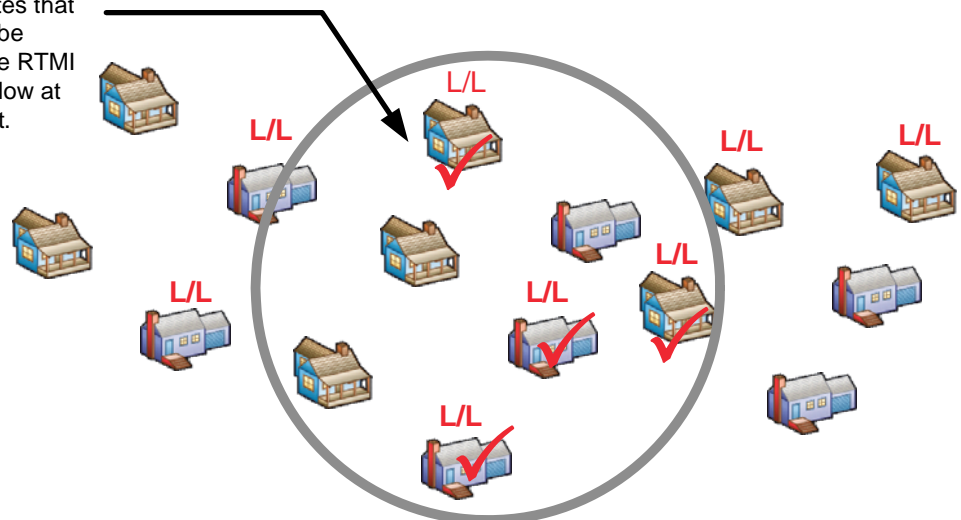
## Lat/Lon option

Lat/Lon (Latitude/Longitude) is the default Reading mode (unless changed in the Guide file via Route Manager software). It allows you to automatically select for interrogation only those endpoints determined to be in the interrogation window of the EA\_Mobile at any given time. This means that only a portion of the route list must be scanned at a location allowing for maximum speed in capturing route data.

- Lat/Lon is recommended for routes of 300 endpoints or more.
- Endpoints with zero or default coordinates will not appear for interrogation in this mode.
- Use the Lat/Long option when all or most endpoints on your route have valid Lat/Lon coordinates and your GPS system is functioning normally.

Figure 6-2.

**Lat/Lon** option selects only those transponders with L/L coordinates that are calculated to be within range of the RTMI interrogation window at the given moment.



## Establishing Lat/Lon coordinates

For new routes whose endpoints have not yet been assigned coordinates, the FIFO Mode is recommended. Once an endpoint is located and responds, the GPS can then provide latitude and longitude information to be stored along with other account information. For routes having many endpoints both with and without coordinates, the GEO mode is recommended, as it streamlines the search for endpoints that have coordinates while allowing for unassigned endpoints to be interrogated and their coordinates assigned. Interpolated Lat/Lon (captured by the EA\_Mobile) are the coordinates of the EA\_Mobile when the interrogation is validated, however, these coordinates may be up to 1500 ft away from the actual endpoint position. Therefore, for optimal performance hard coded Lat/Lon coordinates taken at the endpoint are recommended.

## Using Lat/Long coordinates

The GPS receiver provides latitude and longitude coordinates for the EA\_Mobile-equipped vehicle. Based on this position, the EA\_Mobile can calculate which endpoints should be in the interrogation window of the system. It then sends out interrogation signals looking for only those endpoints. When all endpoints in the interrogation window (IW) have been read, you can continue on the route.

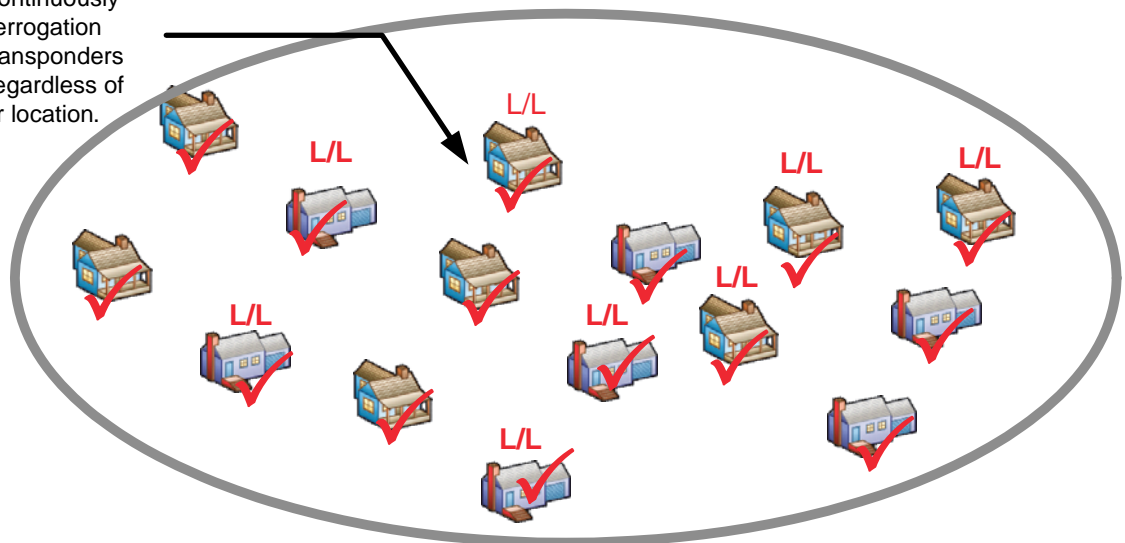
## FIFO option

In the FIFO option, the system considers all endpoints to be within the interrogation window at all times. The FIFO method does not require Lat/Lon coordinates for either the endpoints or the EA\_Mobile/vehicle. Instead it simply reads through the route list over and over as you drive the route, scanning for all unread endpoints on the list.

- This is the slowest Reading option, especially at the beginning of a session. As endpoints report their data, the list becomes shorter and thus the search for unread endpoints proceeds more and more quickly.

Figure 6-3.

**FIFO** option continuously selects for interrogation ALL unread transponders in the route, regardless of coordinates or location.



Use the FIFO option for the following situations:

- none of the endpoints in the route have been assigned coordinates
- when the GPS system is not delivering usable location data
- when you have a very small route list (the FIFO option requires less than 300 endpoints) and the EA\_Mobile/vehicle is moving slowly or stopped.

## Assigning endpoint coordinates

For a route whose endpoints have not yet been assigned formal latitude and longitude coordinates, the system can find and interrogate each endpoint using the sequential FIFO method. It then automatically assigns temporary GPS coordinates (according to EA\_Mobile/vehicle position) as the endpoint is read. Each time the endpoint is read thereafter, its coordinates will be rewritten in the same manner until formal coordinates are entered in the route for that endpoint via host software.

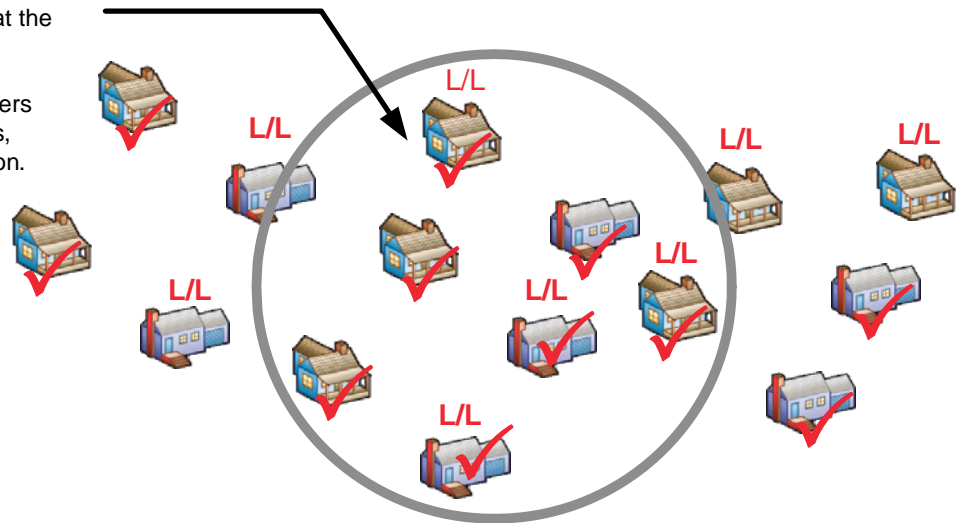
## GEO option

For endpoints with Lat/Lon coordinates, the GEO option seeks only those that are determined to be within the interrogation window (as in the Lat/Lon option). It also seeks ALL endpoints without coordinates at all times during the route until they are successfully read, regardless of the EA\_Mobile's present location. Routes with more than 100 endpoints without Lat/Lon coordinates are not allowed in the GEO option.

Figure 6-4.

**GEO** option selects those transponders with L/L coordinated that are calculated to be within range of the RTMI at the given moment –

plus ALL transponders with L/L coordinates, regardless of location.



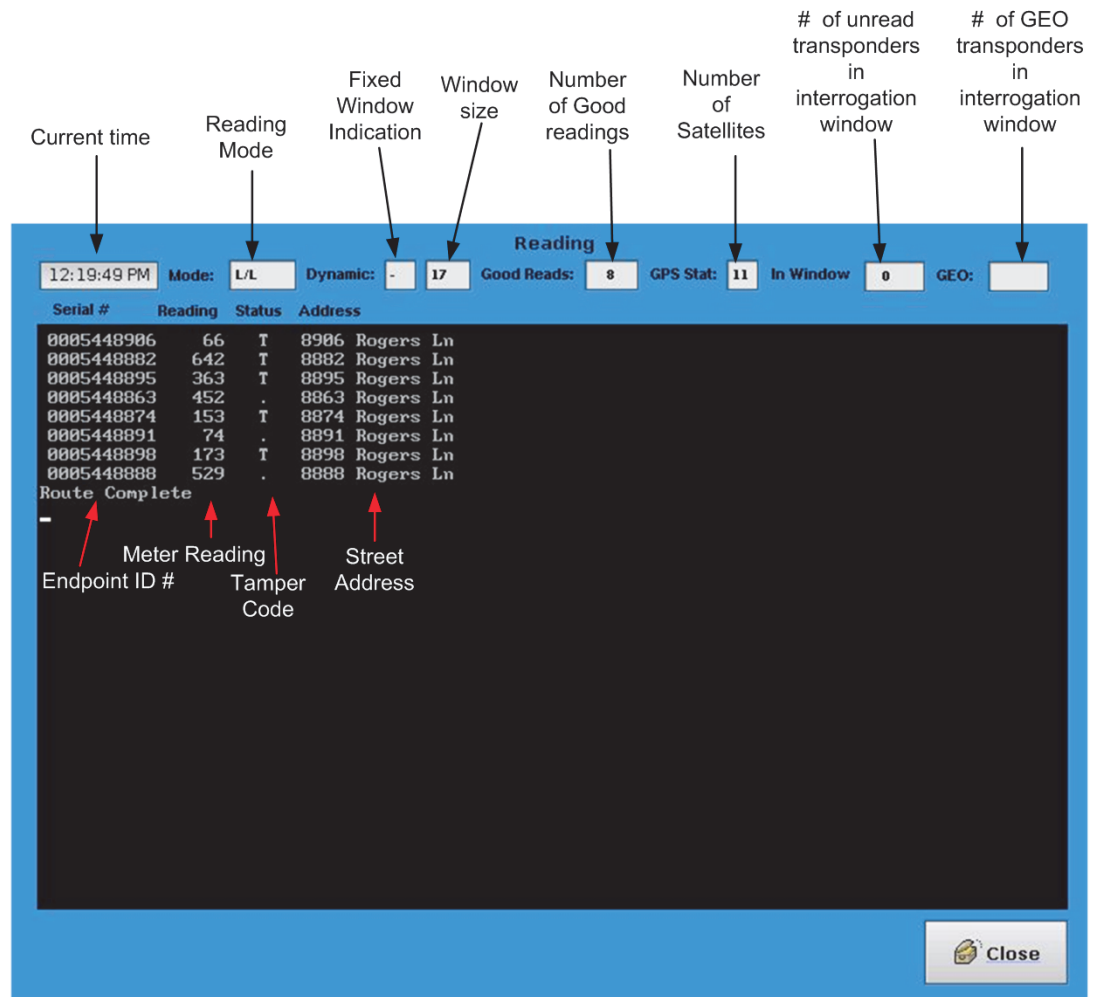
## Assigning coordinates

When an endpoint is located and read, the EA\_Mobile assigns temporary coordinates based on the current EA\_Mobile/vehicle position.

- Use the GEO option when you want to streamline coverage and optimize data acquisition speed for a route that contains a mix of endpoints with and without Lat/Lon coordinates.

In the GEO option, the status line is the same as in Lat/Lon or FIFO mode, except the GEO mode status shows the total GEO mode endpoints in the route.

Figure 6-5.



For the route above, there are 12 GEO endpoints and 53 In window" L/L endpoints.

## Reading meters

The following describes the steps involved in reading endpoint-equipped meters automatically using the EA\_Mobile.

### Loading the route

To load the route:

1. From the Main Menu, select the Route button.
2. From the Route window, select the Load New Route button.
3. Using the File Manager window find and select the Reading.rte file to be loaded.
4. Press the Load Route button and wait for the load to complete.
5. Press the Okay button.

## Set the Reading mode

The Reading mode (L/L, FIFO or GEO) can be changed if required:

1. Return to the Main Menu by pressing the Close button on the File Manager window and then the Route window.
2. From the Main Menu, select the Settings button.
3. From the Settings window, select the System Setup button.
4. In the System Setup menu, press the button of the mode you want.

You can also set other system settings if desired at this time, such as turning on/off audible beep. See [Chapter 7, "Command mode."](#)

5. Press the Close button to return to the Settings window.
6. Press the Close button to return to the Main Menu.

## Setting Date and Time

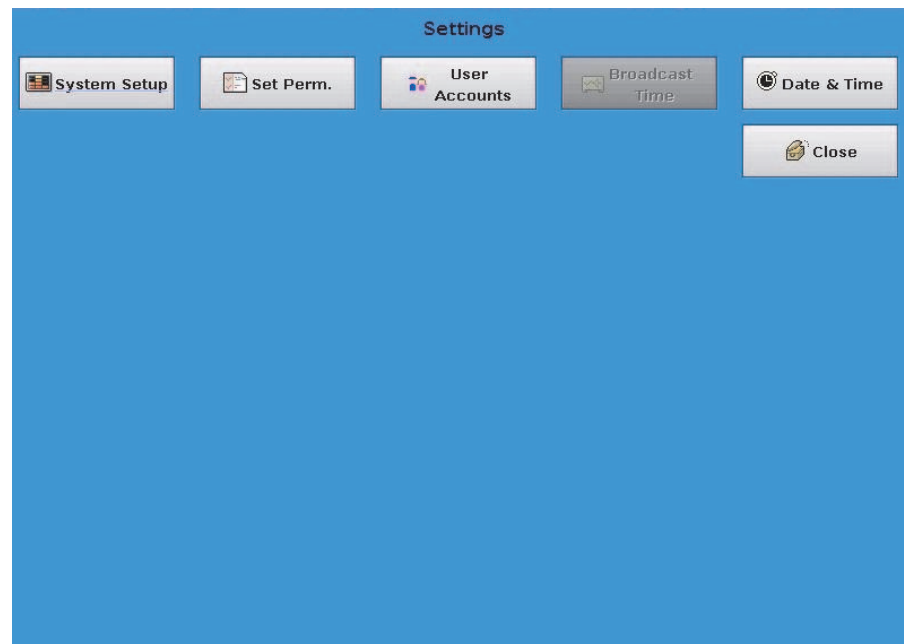
**Caution:** Failure to perform this procedure prior to reading a route may result in the endpoints having the incorrect date or time.

Before reading any endpoints, please verify that the date and time are set correctly in the system using the following steps:

1. From the Main Menu, press the Settings button.

The Settings window displays.

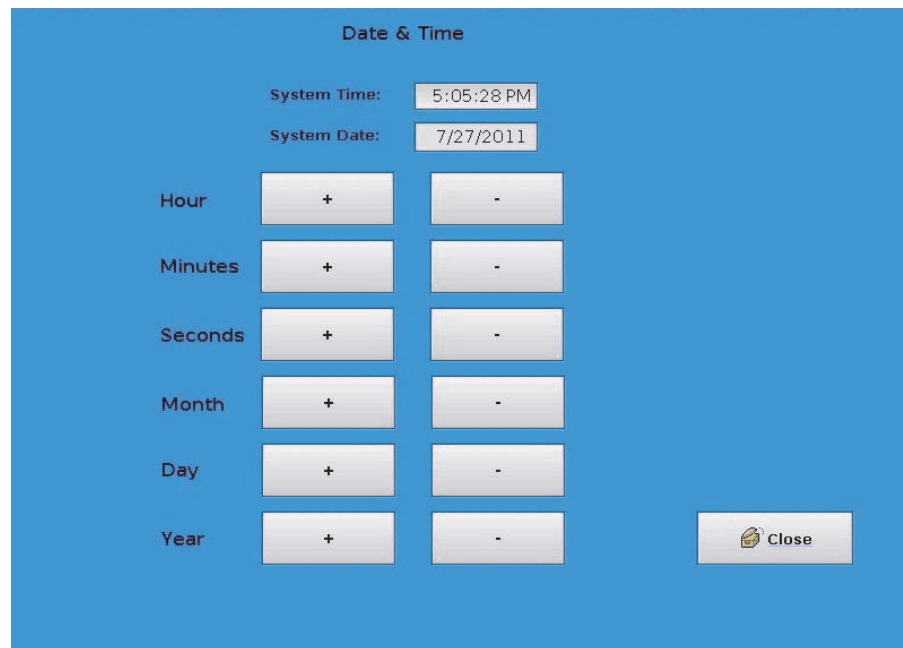
Figure 6-6.



2. From the Settings menu, press the Date & Time button.

The Date & Time window displays.

Figure 6-7.



3. If you need to adjust the date or time, use the + and - buttons next to the Hour, Minutes, Seconds, Month, Day and Year to set the date and time.
4. Press the Close button to return to the Settings window.
5. Press the Close button to return to the Main Menu.

## Entering Reading mode

**Caution:** Prior to reading a route, verify the date and time (see "Setting Date and Time" on page 53).

To enter reading mode:

- Press the Reading button on the Main Menu.  
The EA\_Mobile will now start reading endpoints within range.

## Driving the route

You may now drive the route in any order:

- The EA\_Mobile will continuously determine which endpoints are available for interrogation and will automatically interrogate.
- As the EA\_Mobile receives a valid endpoint response it will add a new line to the data display.
- The LCD touch screen monitor displays the results of the current interrogations in text form and provides an audible beep upon each good read (unless default audible signal settings have been changed) or the volume is turned off on the LCD touch screen display.

## Entering Command mode

To access the Command mode at any time during a reading session:

- Press the Close button on the Reading Current Route window to suspend reads until you return.

## Resuming reading

**Caution:** Prior to resuming reading a route, verify the date and time (see "Setting Date and Time" on page 53).

To resume reading where you left off:

- Navigate to the Reading window.  
The EA\_Mobile will now start reading endpoints within range.

## Saving a route

To save a route:

1. Navigate back to the Main Menu and select the Route button.
2. Select the Save Current Route button on the Route window and wait while the route is saved.

**Note:** If the Route was resumed, the route will be saved at the top level directory of the USB. If the route to be saved was loaded, and not resumed, the route will be saved in the directory on the USB flash drive from where the route was loaded.

## Powering down the EA\_Mobile

To power down the unit:

1. Navigate back to the Main Menu and select the Power Off button.  
This will ask you to confirm the Power Off and, if the route was not saved, it will display a message indicating route not saved.
2. Press the Okay button to power down.  
— OR —
3. Press the Cancel button to continue.

**Note:** The EA\_Mobile automatically saves route data for the last 30 routes.

## Resuming a route after powering down

**Caution:** Prior to resuming reading a route, verify the date and time (see "Setting Date and Time" on page 53).

To resume a route after powering down or loading a different route:

1. Navigate to the Main Menu.
2. Press the Route button.
3. Press the Resume Route button.

4. Select the Route you wish to resume by route directory, path name and time route was loaded and press that route's button.

The route will load and you can continue reading this route.

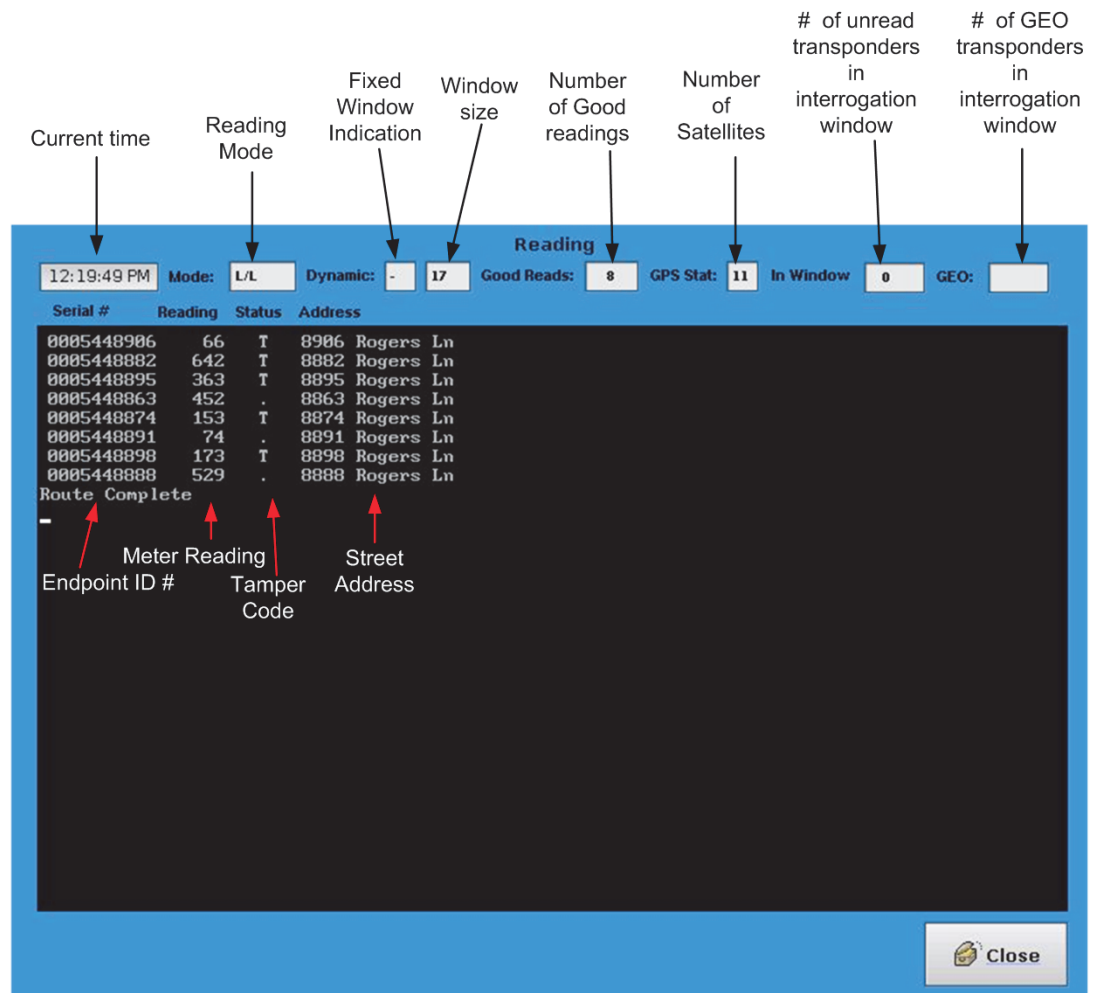
**Note:** Your route could be any one of the possible thirty route buttons.

## Reading displayed data

Any time the EA\_Mobile is in Reading mode, the LCD touch screen will display a header/status line showing the current status of eight parameters:

- Current time
- Reading mode
- Fixed Window size flag and window size indicator
- Number of good readings
- GPS status
- Number of endpoints in the interrogation window
- GEO mode - number of GEO endpoints

Figure 6-8.





If the Display Good Reads feedback option is turned on (the default setting unless changed using the System Setup window described in [Chapter 7, "Command mode"](#)) in the System Setup command, the LCD touch screen will also display a number of details regarding endpoints that have returned valid data. The information displayed includes:

- Endpoint serial number
- Meter reading
- Tamper code
- Meter/endpoint street address

## Header/Status line

12:19:49 PM	Current Time – This shows current time from the EA_Mobile internal real-time clock.
Mode:	Reading Mode – This displays the currently selected Reading mode. In this example the mode is L/L or Latitude/Longitude. Allowed modes are: <ul style="list-style-type: none"> <li>• L/L or Latitude/Longitude</li> <li>• FIFO (first-in-first-out)</li> <li>• GEO</li> </ul>
Dynamic:	<ul style="list-style-type: none"> <li>• Fixed Window Size Flag - The ‘-’ indicates the window is a fixed size.</li> <li>• Window Size:                 <ul style="list-style-type: none"> <li>• Indicates in the forward direction the interrogation window size if 17 x 100 feet or 1700 feet.</li> <li>• To the side of the vehicle the distance is half or 850 feet.</li> </ul> </li> </ul> <p>Note: The interrogation window is approximately an oval.</p>
Good Reads:	Number of Good Readings - Indicates total number of good reads, regardless of tamper condition. In this example, 8 endpoints have been successfully interrogated.
GPS Stats:	GPS status – Shows the level at which the GPS system is communicating and delivering valid position data to the EA_Mobile. In this example, GPS is active and is currently receiving data from 11 satellites.
In Window	Number of endpoints in interrogation window – Shows the total number of endpoints considered to be in the interrogation window according to the parameters of the selected Reading mode.
GEO:	GEO Endpoints – In Geo mode, shows the total number of GEO endpoints considered to be in the interrogation window, otherwise blank. In this example, the mode is L/L and thus the field is blank.

## Reading window

The data displayed in the Reading window includes the following:

- Serial # - This is the LAN ID of the meter’s endpoint. It will be displayed when the endpoint is read and again, if necessary, when a Tamper indication is cleared.
- Reading - This shows the current usage, as computed by the meter’s endpoint (including, in some cases, a correction factor).
- Status - Shows the current tamper condition of the endpoint:

- • (bullet) indicates non-tampered
- T indicates Tampered; If Reset Tamper is on, the endpoint will be instructed to clear the tamper indication. The T or R result should appear within a few seconds.
- R indicates the Tamper reset successful; meter reading is not displayed since it was displayed when the endpoint was initially read.
- F indicates the Tamper reset failed; possible cause is a tilted meter that will not allow the liquid tamper switch inside the endpoint to level for a reset. Endpoint damage may also cause reset failure.
- L indicates Leak Detection (for water endpoints only) - The L character is displayed when a leak condition is detected using the leak detection route sequence commands.
- Address - Shows the street address for a given gas or water endpoint/meter.

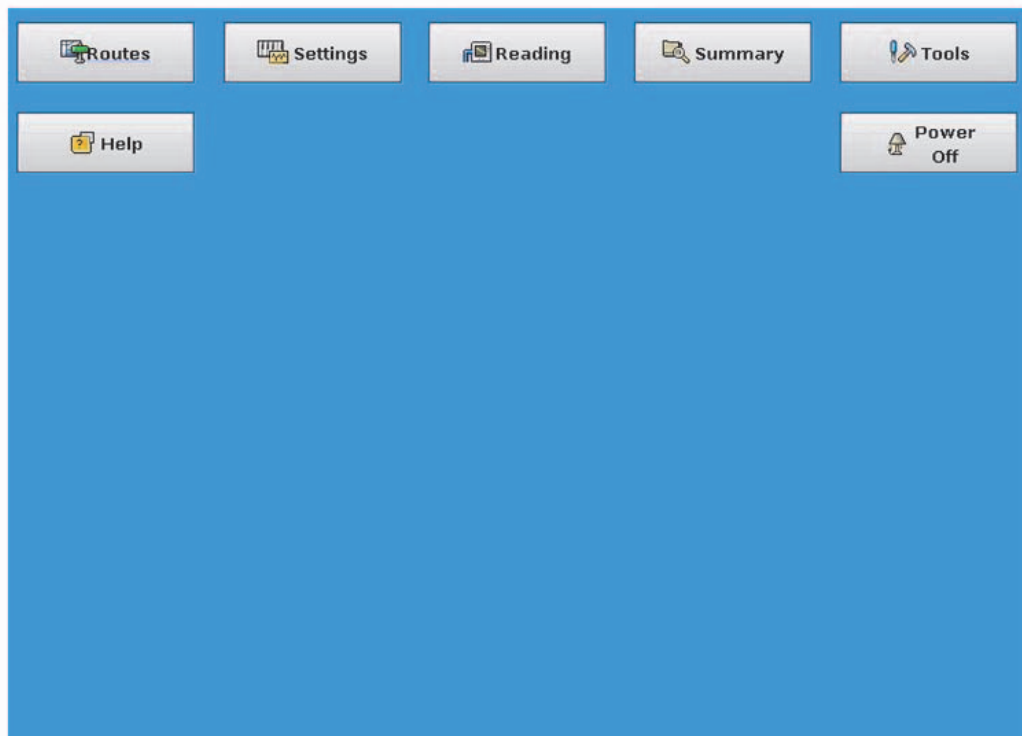
# 7 COMMAND MODE

"EA\_Mobile modes and menu options" on page 43 listed the various Reading mode and Command mode buttons. Command mode gives you access to EA\_Mobile data and user functions. Command mode provides access to the following windows:

- Routes window
- Settings window
- Tools window
- Summary window
- Help window
- Power Off button

These are represented by the buttons on the Main Menu as shown below. Reading mode button was discussed in Chapter 6, "Reading mode."

Figure 7-1.



The corresponding submenu selections for each main menu item are listed below:

Main Menu	Submenu	Main Menu	Submenu
Routes	Load New Route button Save Current Route button Resume Route button Save Old Route button	Summary	All button UnRead button Un-int button Good button Tamp. button M. GEO button In Wind button
Help	About button Guide button	Tools	Tx On button Sync VID button Troubleshoot button Route Scan button
Settings	System Setup button Set Perm button User Accounts button Date & Time button	Power Off	Power Off button

When a button is pressed on the Main Menu its window will be displayed on the LCD touch screen.

## Routes window

The Routes window buttons are related to USB access: loading, saving, and resuming a route. The Routes window offers four buttons and a Close button shown in the figure below:

Figure 7-2.



Item	Description
Load New Route button	Provides functionality to load a route from the USB flash drive.
Save Current Route button	Saves the route currently loaded to the USB flash drive, only available after a route is loaded or resumed.
Resume Route button	Resumes one of the thirty possible routes saved on the system drive.
Save Old Route button	Saves the route to the USB flash drive, one of thirty possible routes that can be saved on the system drive.

### Load New Route button

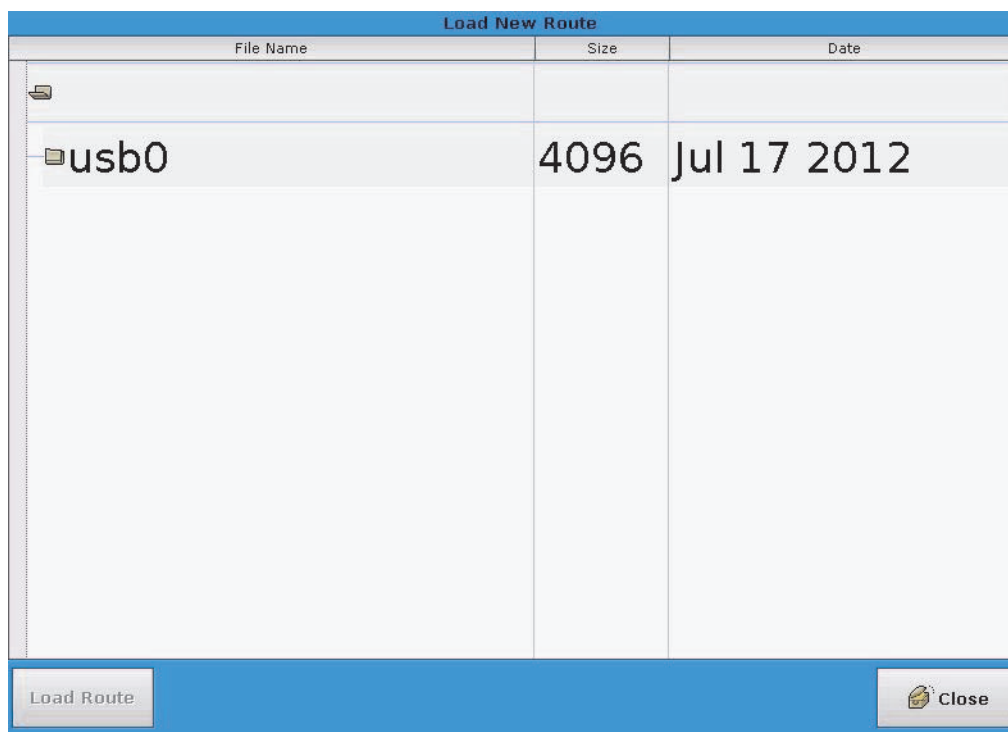
The Load New Route button opens a file manager window (Figure 7-3) which allows the user to navigate to the USB flash drive and to load a route from this drive. The USB flash drive top level directory will be listed as usb0 in the file manager window.

### Loading a route

To load a route:

1. From the Main Menu, press the Route button.  
This will open the Route window.
2. From the Route window, press the Load New Route button.  
The Load New Route window will open.

Figure 7-3.



3. Select the usb0 folder and it will expand.

4. Repeat for the TraceVRT folder.
5. Select the folder containing your route and navigate to the Reading.rte file.
6. Select the Reading.rte file.

The Load Route button should be enabled.

7. Press the Load Route button.

A bar graph will open indicating the progress of the load.

**Note:** The only files displayed other than directories are the Reading.rte files. The Guide and start files are not visible.

8. If your system is running with a EA\_VID, press the Okay button.

A new bar graph will open indicating that the EA\_Mobile is waiting for data from the EA\_VID.

- Once the EA\_VID is loaded press the OK button.

9. Press the Close button to return to the Routes window.

10. Press the Close button to return to the Main Menu.

You can now start reading a route, access and set System Settings, etc.

#### Save Current Route button

The Save Current Route button saves the current route to the USB flash drive of the route that was last loaded or resumed. If the last route was loaded, the save current route will write the van file to the directory the route was loaded from. If the last route loaded was resumed or saved as old, the van file will be saved at the /USB0/TraceVRT/ folder.

For example, if the route was loaded from /USB0/TraceVRT/031611/rt1/Reading.rte, the van file will be written to the following directory /USB0/TraceVRT/031611/rt1.

## Resume Route button

The Resume Route button opens the Resume Route window (Figure 7-4) and will display a button for each of the last thirty routes loaded and a Close button which closes this window.

**Note:** The last route loaded can be any one of the thirty possible buttons.

## Resuming a route

To resume a route:































1. From the Main Menu press the Routes button.


This will open the Routes window.

2. From the Routes window press the Resume Route button.

This will open the Resume Route window.

Figure 7-4.

Resume Route		
 /ea_35 20 Jun 2011 12:02 CMD=196 S	 /zi_j 16 Jun 2011 04:32 CMD=10 S	 /ea_bob35 17 Jun 2011 03:35 CMD=490 S
 /zi_ea_35 15 Jun 2011 04:58 CMD=245 S	 /zi_j 16 Jun 2011 04:32 CMD=10	 /ea_bob35 17 Jun 2011 03:38 CMD=490
 /zi_ea_10 15 Jun 2011 05:00 CMD=490	 /zi_j 16 Jun 2011 04:36 CMD=10	 /ea_m_35 17 Jun 2011 03:43 CMD=50
 /zi_ea_10 15 Jun 2011 05:04 CMD=490	 /zi_j 17 Jun 2011 07:43 CMD=10	 /ea_35 17 Jun 2011 03:45 CMD=196 S
 /3_index 16 Jun 2011 07:44 CMD=46	 /zi_35_pd 17 Jun 2011 11:31 CMD=510	 /ea_bob35 17 Jun 2011 03:56 CMD=490
 /ea_ci 16 Jun 2011 03:45 CMD=147 S	 /zi_j 17 Jun 2011 01:13 CMD=10 S	 /ea_bob35 17 Jun 2011 04:18 CMD=490
 /zi_ea_35 16 Jun 2011 03:48 CMD=245 S	 /zi_j 17 Jun 2011 01:19 CMD=10	 /ea_bob35 17 Jun 2011 04:19 CMD=490 S
 /zi_ea_35 16 Jun 2011 04:00 CMD=245 S	 /zi_j 17 Jun 2011 01:30 CMD=10 S	 /ea_bob35 17 Jun 2011 04:23 CMD=490
 /zi_ea_35 16 Jun 2011 04:19 CMD=245 S	 /zi_j 17 Jun 2011 01:41 CMD=10 S	 /ea_bob35 17 Jun 2011 04:32 CMD=490 S
 /zi_ea_10 16 Jun 2011 04:25 CMD=490 S	 /zi_j 17 Jun 2011 02:44 CMD=10 S	 /ea_bob35 17 Jun 2011 04:33 CMD=490



3. Select the route of interest and press that button.
4. If you want to resume the last route executed in this example, it is the first button, but it could be any button.  
The route will load.
5. Press Okay on the once the route is loaded.

**Note:** If you are operating the system with the EA\_VID, an additional bar graph window will open indicating that the EA\_Mobile is awaiting data from the EA\_VID. Once the EA\_VID has loaded the route, the Okay button will become enabled and pressing this button will allow you to continue.

**Note:** If an error message is displayed follow the message directions.

6. Press Close to return the EA\_Mobile to the Route window.

## Save Old Route button

The Save Old Route button opens the Save Old Route window (Figure 7-5) which will display a button for each of the last thirty routes loaded and a Close button which closes this window.

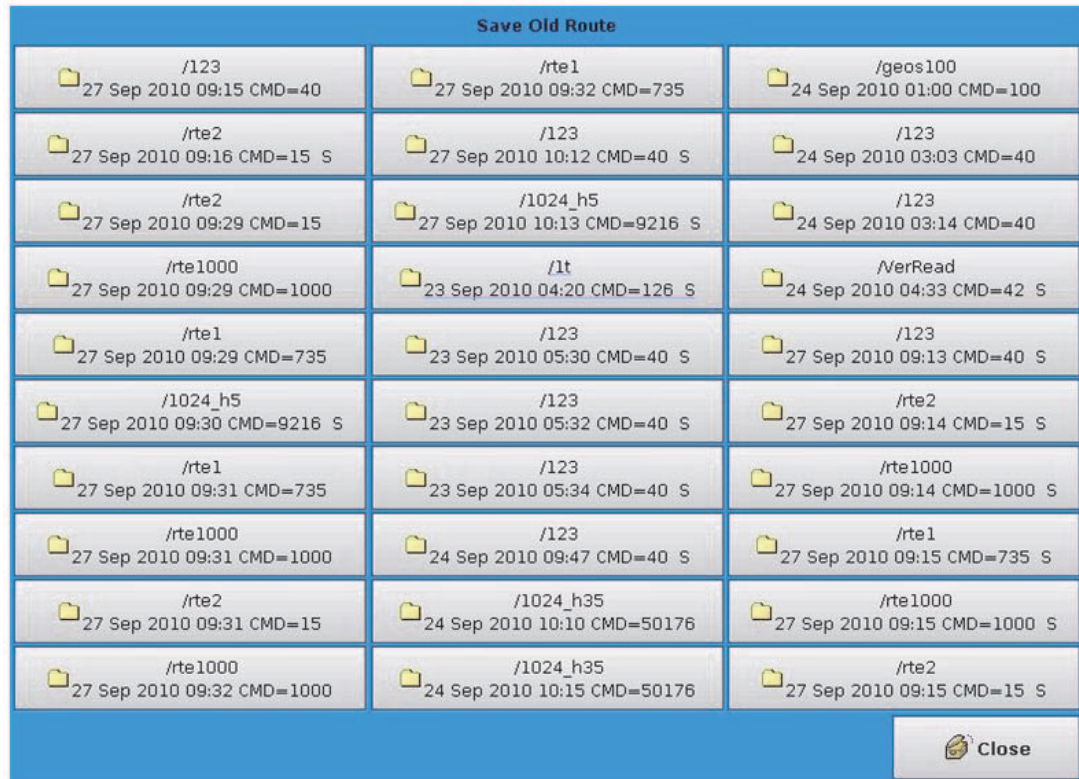
## Saving an old route

To save an old route:

1. From the Main Menu, press the Routes button.  
This will open the Routes window.
2. From the Routes window, press the Save Old Route button.

This will open the Save Old Route window.

Figure 7-5.



3. Select the route of interest and press that button.

For example, if you want to save the last route executed. In this example, it would be the 3rd button in the second column. Always inspect each button as the last executed can appear in any location.

The route will load and then be saved.

4. Press Okay on the bar graph once the route is saved.

**Note:** If you are operating the system with the EA\_VID, an additional bar graph window will open indicating the EA\_Mobile is awaiting data from the EA\_VID. Once the EA\_VID has loaded the route the Okay button will become enabled and pressing this button will allow you to continue.

**Note:** If an error message is displayed follow the message directions.

5. Press Close to return the EA\_Mobile to the Route window.

## Help window

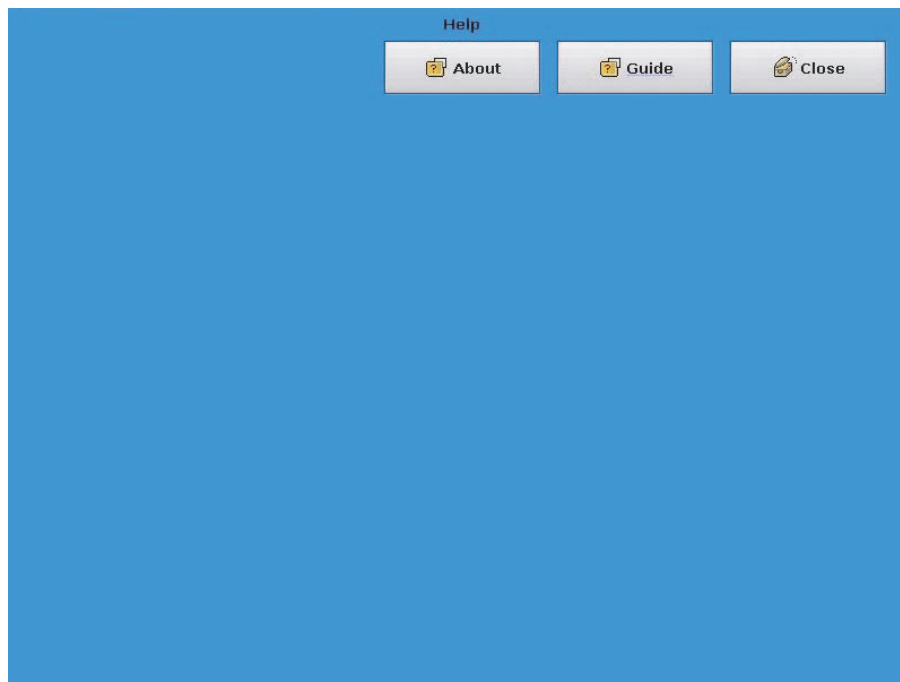
The Help window is accessed by pressing the Help button on the Main Menu and provides online assistance via three buttons:

- About - Displays information about the EA\_Mobile including version data and build date.
- Guide - Offers brief operating instructions.



- Close - Closes the Help Window.

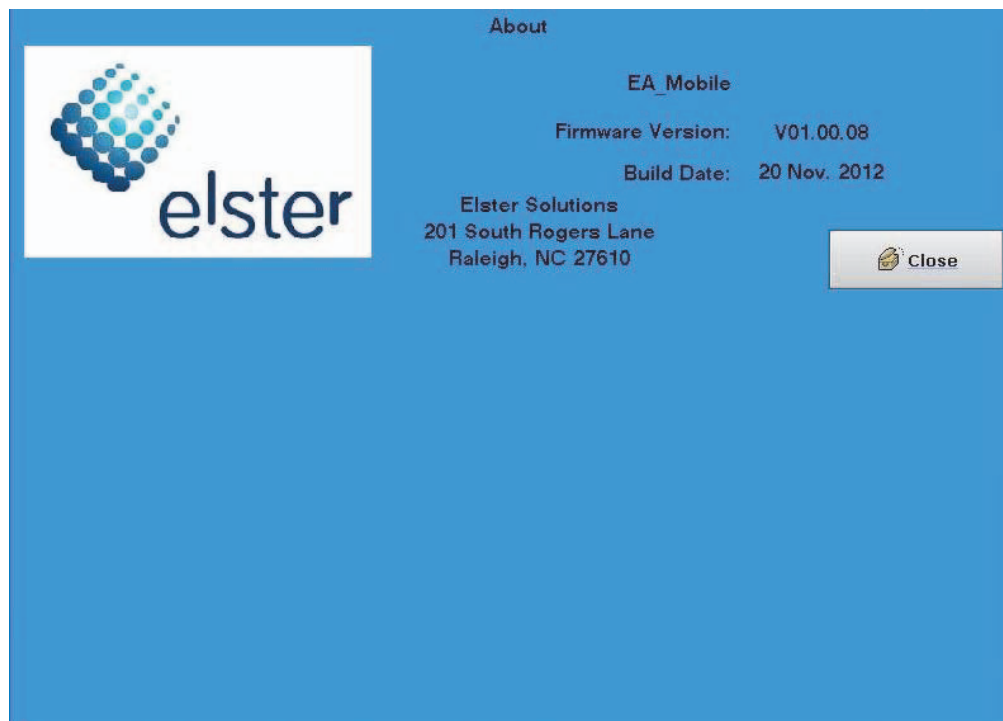
Figure 7-6.



### About button

Pressing the About buttons displays the About window (Figure 7-7) that shows the EA\_Mobile version number, build date of the installed firmware, Elster logo and address. See the below figure for an example of this window.

Figure 7-7.

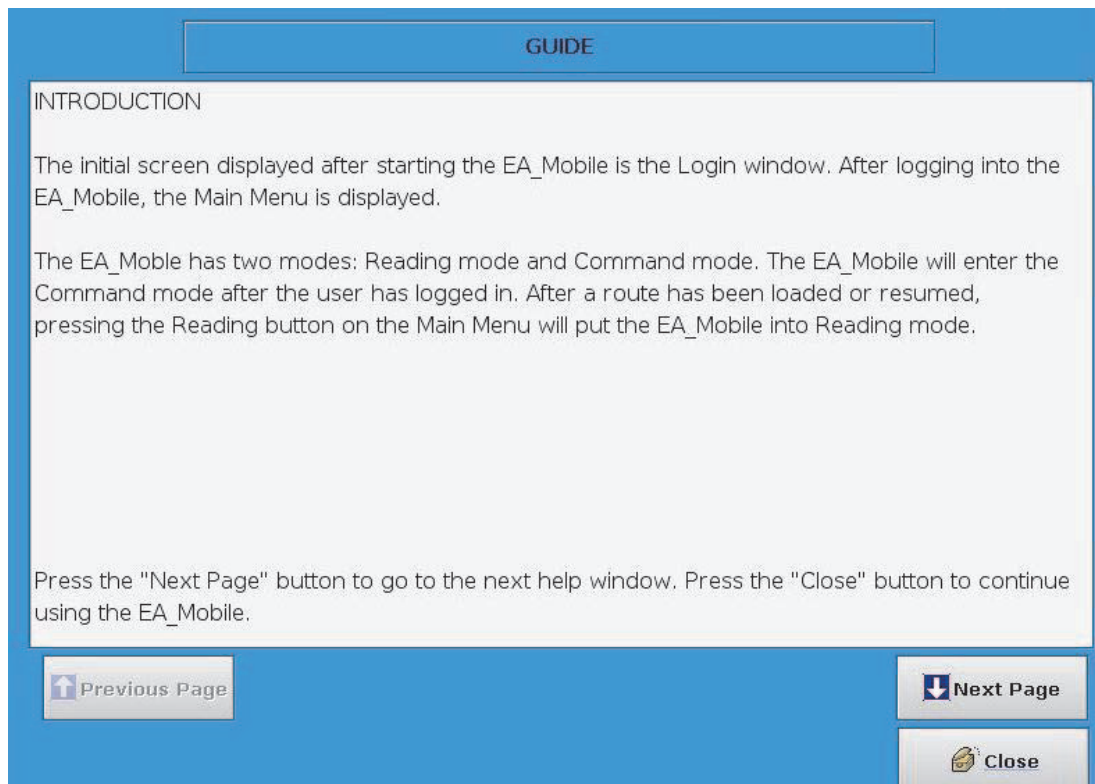


- Press Close to return the EA\_Mobile to the previous window.

### Guide button

The Guide button opens a Quick Help Manual, which supplies some useful information on how to use the EA\_Mobile.

Figure 7-8.



To move through the listing, use the following keys:

- Previous Page - pages back to the previous page.
- Next page - advances to the next page.
- Close - closes this window.

## Settings window

The Settings window offers five buttons and a Close button as seen in Figure 7-9.

Figure 7-9.



The [System Setup](#) button allows for configuration of route related parameters including Reading Mode, Display of Good Reads, Sound on Good Read, Reset Tamper, Window Size, Sort Unread Display, and Monitor Unread Display.

The [Set Perm](#) button displays system usage, unit serial #, date last updated, date of last service.

The [User Accounts](#) button allows the user to add, delete and modify users for this EA\_Mobile unit.

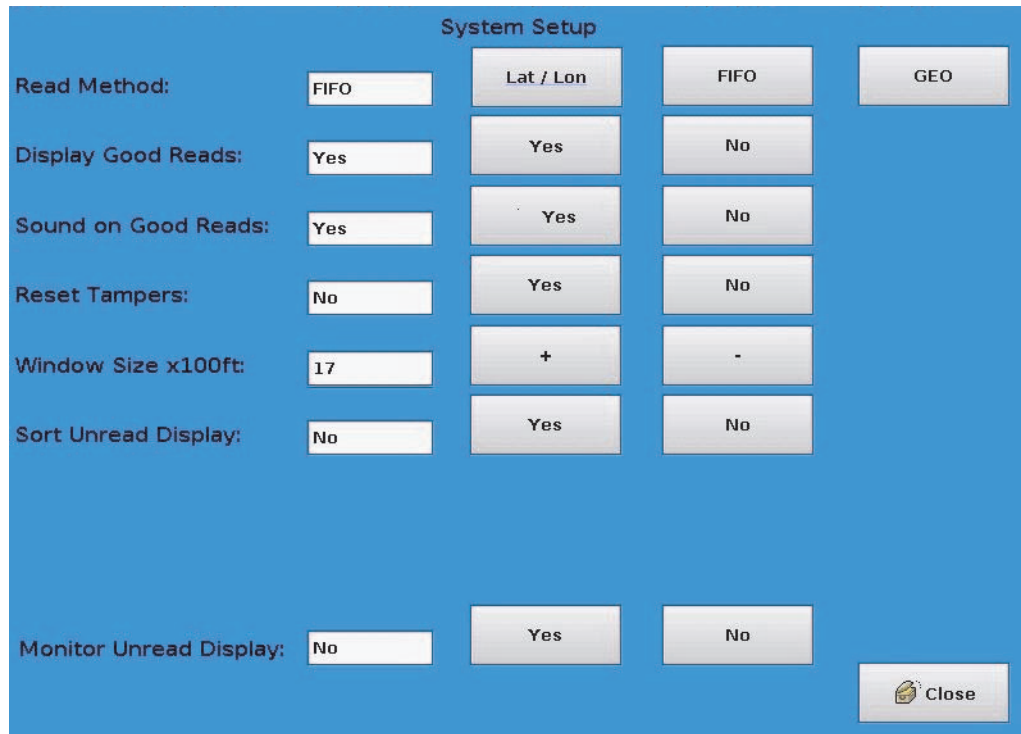
The [Date & Time](#) button allows user to configure the system data and time.

The Broadcast Time button is currently not implemented.

### System Setup button

Pressing the System Setup button displays the System Setup window (Figure 7-10).

Figure 7-10.



To exit this screen and save the new settings, press the Close button.

### Changing system settings

The table below describes each setting and tells you how to change the current setting:

Item	Description
Reading Method	<p>This option allows you to change the default Reading mode:</p> <ul style="list-style-type: none"> <li>• L/L (Lat/Lon)</li> <li>• GEO</li> <li>• FIFO</li> </ul> <p>Press the relevant button to select the desired mode. The new mode will be displayed in the white text area following the Read Method.</p>
Display Good Reads	<p>This option allows you to set up the EA_Mobile to display endpoint data details (endpoint LAN ID, meter reading and street address) after receiving a good reply.</p> <ul style="list-style-type: none"> <li>• Press the Yes or No button after this option to set to desired value.</li> </ul>
Sound on Good Reads	<p>This option tells the EA_Mobile whether or not to beep after each good read.</p> <ul style="list-style-type: none"> <li>• Press the Yes or No button after this option to set to desired value.</li> </ul>
Reset Tamperers	<p>This option determines whether or not the EA_Mobile will automatically attempt to reset a tamper indication after it receives a reply.</p> <ul style="list-style-type: none"> <li>• Press the Yes or No button after this option to set to desired value.</li> </ul>

Item	Description
Window Size x 100 feet	<p>This option allows you to set the interrogation window size for the Lat/Lon or GEO mode:</p> <ul style="list-style-type: none"> <li>• Press the + or - buttons following this option to increase/decrease the window size.</li> <li>• The interrogation window is approximately an oval. The size display is the radius in the forward direction multiplied by 100 and by 50 to the side of the vehicle. For example, if the window size is 12, meters up to 1200 feet in front or behind and up to 600 feet to either side the vehicle will be read.</li> <li>• Valid ranges are between 1 and 18.</li> </ul> <p>Note: Elster recommends a distance of 1200 feet.</p>
Sort Unread Display	<p>This option tells the EA_Mobile to sort unread endpoints by distance from the EA_Mobile. With this turned on, unread endpoints closest to the EA_Mobile will be listed first and the farthest will be listed last.</p> <ul style="list-style-type: none"> <li>• Press the Yes or No button after this option to set to desired value.</li> </ul>
Monitor Unread Display	<p>This allows you to set the EA_Mobile to alert you with an audible alarm if an endpoint comes in and then exits the interrogation window without being read.</p> <p>Note: Applies only when in Lat/Lon or GEO mode.</p> <ul style="list-style-type: none"> <li>• Press the Yes or No button after this option to set to desired value.</li> </ul>

## Set Perm button

The Set Perm button displays the Permanent Settings window (Figure 7-11) that allows you to view permanent settings in the EA\_Mobile's non-volatile (saved even when powered off) memory. These settings are not loaded from the USB flash drive and, typically, never need to be changed.

Note: Only authorized personnel can change permanent settings by entering the factory unlock password.

Do not use the Clear button unless you wish to reset all parameters to default value!

## Changing permanent settings

If you are authorized to change the settings in this option, use the following procedure:

1. Obtain the factory unlock password from Elster Customer Support.  
Customer Support will need the EA\_Mobile's serial number and the encrypt key found on the Permanent Settings window of the EA\_Mobile.
2. From the Main Menu, press the Settings button.
3. From the Settings window press the Set Perm. button.

The Permanent Settings window displays the current settings.

Figure 7-11.



The table below describes the permanent settings;

Item	Description
EA_Mobile Permanent Settings	(Locked/Unlocked) The heading line on this screen indicates whether this function is Locked (as it will be under all normal conditions) or Unlocked (by special factory password authorization only).
Usage	The total number of minutes (also shown in hours) that the EA_Mobile has been in the reading mode.
Unit Serial #	Serial number of the EA_Mobile.
Last Updated	Date the EA_Mobile firmware was last updated.
Last Service	Date of latest factory service to EA_Mobile.
Encrypt Key	This field is for factory use only.
Unlock Password	Password for unlocking Permanent Settings window. <i>Note: Please contact Elster Customer Support if this password is needed.</i>
Close	Press to exit the Set Perm. window and return to the Settings window.

4. Press the UNLCK (Unlock) button to access the Unlock sequence.
5. Enter the Password supplied by Elster in the Password field on the screen and then press Enter button.  
The top line of the screen will now display the message EA\_Mobile Permanent Settings \*UNLOCKED\*.
6. Press the Enter button on the LCD touch screen display and scroll to the parameter you wish to change.

7. Change the desired setting by selecting alphabetic characters on the LCD touch screen display.

**Caution:** The CLEAR button on the LCD touch screen will clear/reset all parameters to default values. Do NOT press CLEAR to correct individual entries.

8. To correct an entry, use the Back Space button on the LCD touch screen display.

**Caution:** The FW UPDATE button on the LCD touch screen display will try to update the firmware, do not press this button unless instructed to do so by Customer Support.

9. When you are satisfied with the entered changes and settings, press the APPLY button on the LCD touch screen display to apply the new settings and permanently reset the default values in EA\_Mobile memory.

10. Press the Close button to exit this function and return to the Settings window.

**Note:** Closing the window with out hitting the APPLY button will result in the settings returning to their original value and all changes will be lost.

## User Accounts button

The User Accounts button displays the User Account window (Figure 7-12) that allows the operator to add, modify and delete user accounts.

There are a maximum of 25 user accounts.

**Note:** The initial user name is 'ELSTER' and the initial password is '357837'. For security purposes, this user account may be removed after new user accounts are created and logged in.

**Note:** Make sure to enter the user name in all capital letters.

**Note:** This User Account can be deleted.

**Note:** The account for a user that is currently logged in cannot be deleted.



Figure 7-12.



The table below describes the permanent settings;

Item	Description
First Name	Indicates the first name for the selected user account.
Last Name	Indicates the last name for the selected user account.
Login ID	Indicates the Login ID for the user.
Password	Indicates the Password for the user. <i>Note: The password is hidden.</i>
Record	Identifies the list number for the selected user account and indicates the total number of user accounts defined in the EA_Mobile unit.
First	Displays the first user account in the list.
Previous	Displays the previous user account from the selected user account.
Next	Displays the next user account from the selected user account.
Last	Displays the last user account in the list.
New	Allows you to add a new user account to the list.
Delete	Allows you to delete the selected user account.
Save	Saves changes to user accounts.
Close	Closes the User Account window.

## Adding a new user

To add a new user account:

1. Press the New button.
2. Use the keyboard to enter new user data:
  - a. The First Name can be 6 characters.
  - b. The Last Name can be up to 10 characters.
  - c. The Login ID can be up to 6 characters.
  - d. Passwords must be between 6 and 10 characters.
3. Press Save to save the changes.

## Changing an existing user

To modify an existing account:

1. Locate the record for the user account to be modified using the First, Last, Next and Previous buttons.

**Note:** You cannot change a logged in user account.

2. Click in the text box you want to change.
3. Use the keyboard to make the desired changes:
  - a. Use the Back Space button to delete the last character in the field

**Note:** Using the Back Space button in the Password text box will delete the password.

- b. Use the keyboard to enter new data:
    - 1) The First Name can be 6 characters.
    - 2) The Last Name can be up to 10 characters.
    - 3) The Login ID can be up to 6 characters.
    - 4) Passwords must be between 6 and 10 characters.
4. Press Save to save the changes.

## Deleting an existing user

To delete an existing user:

1. Locate the record for the user account to be deleted using the First, Last, Next and Previous buttons.

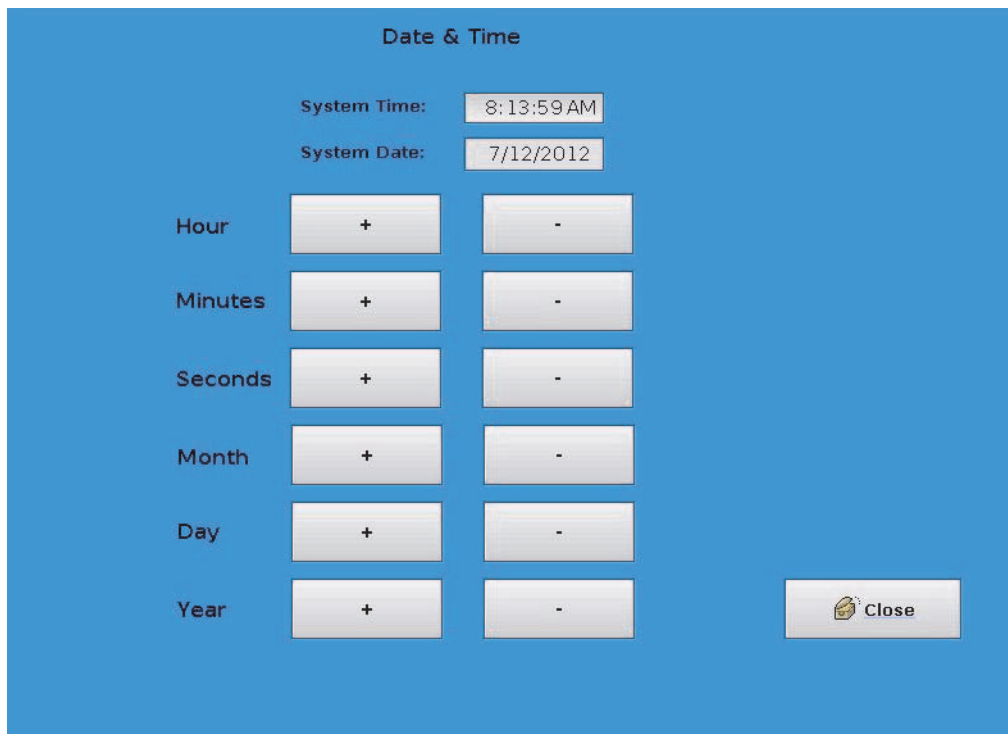
**Note:** You cannot delete a logged in user account.

2. Press Delete.
3. Press Save to save the changes.

## Date & Time button

Pressing the Date & Time button displays the Set System Time and Date window (Figure 7-13). Using the + and - buttons you can change the time (Hours, Minutes, and Seconds) and the date (Month, Day, and Year) as maintained by the EA\_Mobile's CPU.

Figure 7-13.



### Changing the date or time

To change the date or time:

1. Press the + or - buttons to increase or decrease, respectively, the value you wish to change.  
For example, to increase the hour from 5 to 6 simply press the + button next to the Hour label.
2. When you are satisfied with the system time and date settings, press the Close button to exit this screen and return to the Settings window.

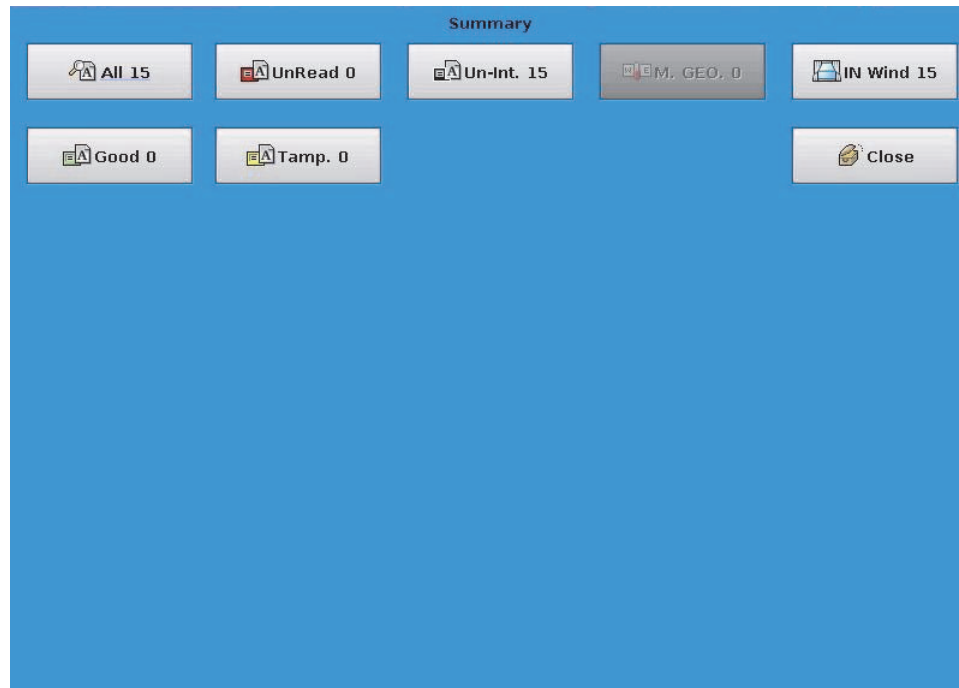
**Note:** Since the system clock continues to run while setting the time, when setting the seconds decreasing 1 second may result in no change, because the system time increased 1 second during the time it took you to decrease it by 1 second.

### Summary window

The Summary window supplies buttons to view the current route data according to various different categories. This can help you assess your progress and analyze route details and characteristics.

The Summary window (Figure 7-14) can be opened by clicking on the Summary button in the Main Menu.

Figure 7-14.



The Summary window offers five views of the current route's accumulated data represented by the following buttons:

• All button	• UnRead button	• Un-int button
• M. GEO button	• In Wind button	• Good button
• Tamp. button		• Close button

**Note:** The M. GEO button and IN Wind button are functional on the EA\_VID and not available on the EA\_Mobile.

## All button

The All button indicates the total number of endpoints in the route. When this button is selected, the screen displays the data for all endpoints in the route, regardless of read condition or proximity.

## UnRead button

The UnRead button indicates the number of unread endpoints in the route. This button displays all unread endpoints in the route regardless of proximity. For this option, the Reading column changes to a Distance column, showing the endpoint's distance from the EA\_Mobile. The Status column displays NO\_RD. Endpoints are listed in order from the closest to the farthest away. Distance is measured in feet up to 5280 then begins with miles up to 99.9. Any UNRD without a Lat/Lon will be indicated at a distance of 99.9 miles.

## Un-int button

The Un-int button indicates the number of uninterrogated endpoints in the route. This button displays all endpoints that have never been interrogated in the current session. This refers to any endpoints the EA\_Mobile has not yet broadcast an interrogation signal. (This means that in FIFO mode, there should be no interrogated endpoints after the first pass down the route list.)

## M. GEO button

The M. GEO button displays the number of unread GEO accounts. This button disable and ghosted out.

## In Wind button

The In Wind button indicates the number of unread transponder in the window. This button display all transponder that are with in the interrogation window and have not completed or are bad reads.

## Good button

The Good button indicates the number of endpoints successfully responding to the interrogation signal. This button displays all endpoints that have replied successfully to an interrogation, including tampered units.

## Tamp. button

The Tamp. button indicates the number of endpoints returning a tamper status. This button displays all endpoints that have returned a tamper status, regardless of whether or not the tamper has been reset.

**Note:** The Tamp. button does not apply to electricity meters.

## Viewing a summary

When you select one of the five summary buttons the LCD touch screen will display a screen like the one shown below (in this example, the [All button](#) has been selected).

Figure 7-15.

Top portion of screen

- Summary Type
- Entry line number
- Meter street address (12 character Max.)
- Endpoint LAN ID
- Endpoint status
- Meter reading (distance in Uninterrogated)
- Number of endpoints in this category

Bottom portion of screen

- UP button – scrolls up to the start of the list
- Down button- scrolls down to the end of the list
- Close button – closes this window

All					
Entry #	Address	Serial Number	Status	Reading	All 4500
0	Test rte 00000	129-0007200000	UNINT	00000000	
1	Test rte 00001	129-0007200001	UNINT	00000000	
2	Test rte 00002	129-0007200002	UNINT	00000000	
3	Test rte 00003	129-0007200003	UNINT	00000000	
4	Test rte 00004	129-0007200004	UNINT	00000000	
5	Test rte 00005	129-0007200005	UNINT	00000000	
6	Test rte 00006	129-0007200006	UNINT	00000000	
7	Test rte 00007	129-0007200007	UNINT	00000000	
8	Test rte 00008	129-0007200008	UNINT	00000000	
9	Test rte 00009	129-0007200009	UNINT	00000000	
10	Test rte 00010	129-0007200010	UNINT	00000000	
11	Test rte 00011	129-0007200011	UNINT	00000000	
12	Test rte 00012	129-0007200012	UNINT	00000000	
13	Test rte 00013	129-0007200013	UNINT	00000000	
14	Test rte 00014	129-0007200014	UNINT	00000000	
15	Test rte 00015	129-0007200015	UNINT	00000000	
16	Test rte 00016	129-0007200016	UNINT	00000000	
17	Test rte 00017	129-0007200017	UNINT	00000000	
18	Test rte 00018	129-0007200018	UNINT	00000000	
19	Test rte 00019	129-0007200019	UNINT	00000000	
20	Test rte 00020	129-0007200020	UNINT	00000000	
21	Test rte 00021	129-0007200021	UNINT	00000000	
22	Test rte 00022	129-0007200022	UNINT	00000000	
23	Test rte 00023	129-0007200023	UNINT	00000000	
24	Test rte 00024	129-0007200024	UNINT	00000000	
25	Test rte 00025	129-0007200025	UNINT	00000000	
26	Test rte 00026	129-0007200026	UNINT	00000000	
27	Test rte 00027	129-0007200027	UNINT	00000000	

UP

DOWN

Close

The top portion of the screen displays the sequential summary Entry number, endpoint/meter street Address, endpoint Serial Number, endpoint Status and meter Reading.

**Note:** For the UnRead button, the Reading column is replaced with a Distance column.

The All number indicates the number of endpoint/entries in the selected category. In the case of the display example shown above, there are a total of 4500 entries, only 28 of which can be seen at this time.

The bottom of the screen displays the following three buttons:

- UP - scrolls to the previous window
- DOWN - scrolls to the next window
- Close - exits the screen and returns to the Summary window.

### Endpoint status codes

The following table lists the endpoint status codes and their definitions for gas and water endpoint. For electricity endpoints, a HEX value will be displayed indicating status. These status Output Codes are used in the VAN file only. Various screens on the LCD touch screen monitor use text mnemonics for some of the same indications.

In the table below:

- Status Code reflects various combinations of conditions including: interrogated/uninterrogated, good/bad/no read, tamper evidence, tamper reset succeeded/failed/pending and bad checksum (data integrity checks) on meter reading, serial number or both.
- Simple description describes the abbreviations used in the Status Code column.

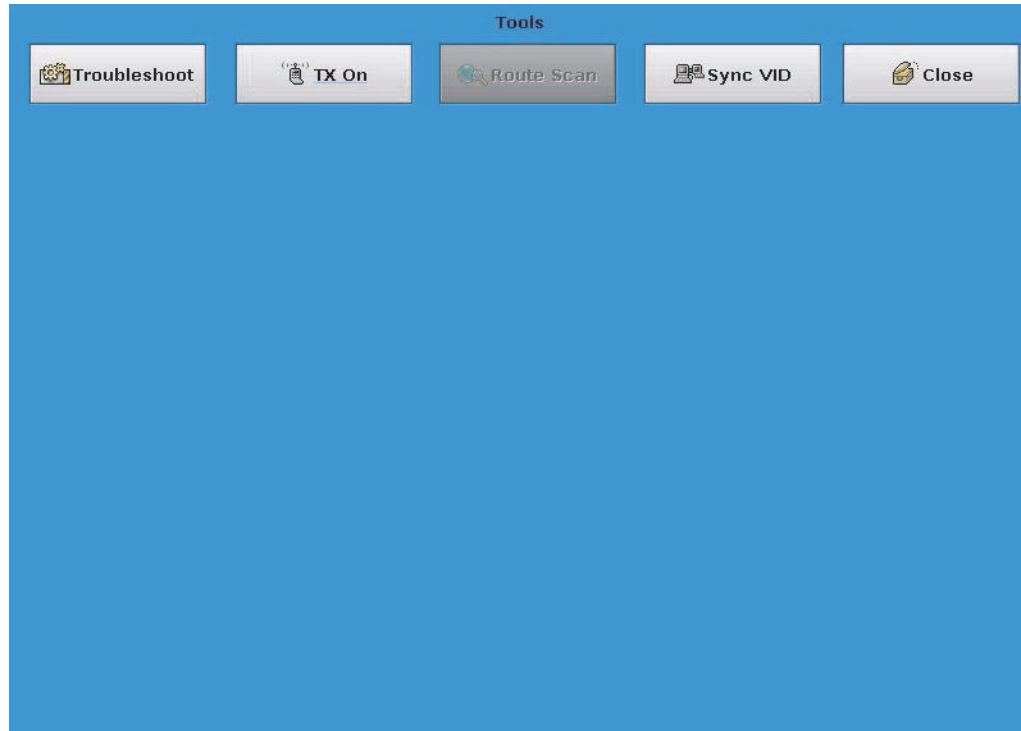
- Output Code is a code used by the EA\_Mobile's processor to classify read conditions in the output file written to the USB flash drive when a route is completed and saved.
- Detailed description describes the conditions identified by each status type, and in some cases, possible causes and solutions.

Status Code	Simple description	Output Code	Detailed description
UNINT	Uninterrogated	10	The endpoint has never been interrogated because it does not appear within the interrogation window.
G_NT	Good, not tampered	01	Endpoint has replied with a good read, no temper condition reported.
G_NR	Good, tampered, not reset	03	Endpoint has answered with a good reply and is showing a tamper status
G_TR	Good, tamper reset	07	Endpoint has answered with a good replay and was showing a tamper status. EA_Mobile has successfully reset tamper condition.
G_TRF	Good, tamper reset failed	0B	Endpoint has answered with a good reply and is showing a tamper status but the EA_Mobile cannot reset the tamper condition (possibly because the endpoint is still in the condition that triggered the tamper message).
G_TRP	Good, tamper reset pending	0F	Endpoint has answered with a good reply and is showing a tamper status but the EA_Mobile was not able to verify the tamper condition was reset. This may occur if the EA_Mobile goes out of range while interrogating and before verifying the tamper reset.
NO_RD	EA_Mobile received no reply from endpoint	20	Endpoints which have not processed all outstanding command or the endpoint failed to read for some reason.
BAD_RD	Bad read	40	Endpoint has been interrogated and the receiver was able to lock on to the incoming data but the BCH error detection test has failed. This may occur if the EA_Mobile is in an area of strong interference and is usually corrected when the EA_Mobile gets closer to the endpoint.
BAD_MR	Bad meter reading checksum	41	Endpoint has answered with an indication that the meter reading checksum has failed. This may be the result of a temporary power fluctuation. The endpoint should be checked and reprogrammed. Manually verify and enter meter reading.
BAD_ID	Bad serial number checksum	42	Endpoint has answered with an indication that the serial number checksum has failed. This may be the result of a temporary power fluctuation. The endpoint should be checked and reprogrammed. Manually verify and enter meter reading.
BAD_B2	Both checksums bad	43	Endpoint has answered with an indication that both the meter reading and serial number checksums have failed. This may be the result of a temporary power fluctuation. The endpoint should be checked and reprogrammed. Manually verify and enter meter reading.
N_TRP	No read, tamper reset pending	2F	Endpoint has answered with a good reply and is showing a tamper status but during the tamper reset verification, the endpoint reply resulted in a NO_RD status. The tamper condition may or may not still exist. (See NO_RD description.)
B_TRP	Bad read, tramper reset pending	4F	Endpoint has answered with a good reply and is showing a tamper status but during the tamper reset verification, the endpoint reply resulted in a BAD_RD status. The tamper condition may or may not still exist. (See BAD_RD description)

## Tools window

The Tools button on the Main Menu displays the Tools window. The Tools window contains buttons that allow you to troubleshoot system components, modify certain parameters, and view additional data detail stored in the EA\_Mobile's memory.

Figure 7-16.



The buttons available under the Tools window are described below.

### Tx On button

Turns the transmitter ON and OFF.

### Sync VID button

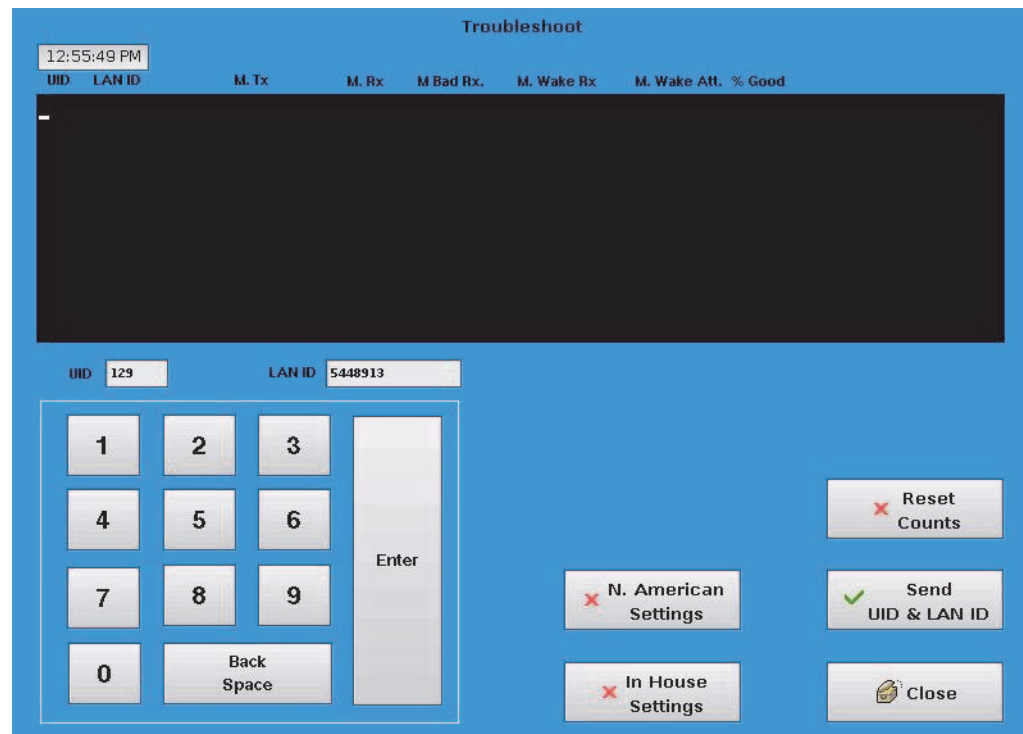
Sends currently read endpoints to the EA\_VID to allow the EA\_VID screen to update (when EA\_VID is connected).

### Troubleshoot button

Pressing the Troubleshoot button opens a new window (Figure 7-17) which allows the user to troubleshoot endpoints which are not reading.



Figure 7-17.



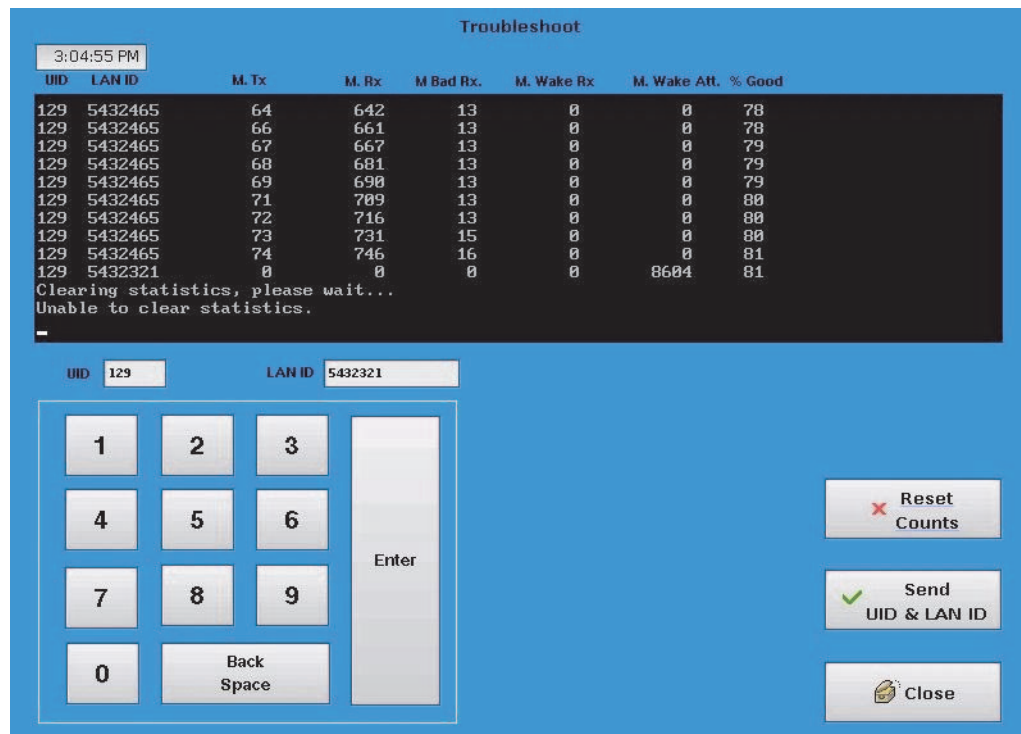
- Use the keypad to enter a new UID and LAN ID.
- Press the Send UID & LAN ID button to have the transceiver request the specified endpoint to start sending message count data.

The message count data includes: transmitted messages, good messages received, bad messages received, wake-up tones received, wake-up tones tried, and percent good.

- Press the Reset Counts button to reset the counts to zero.

The figure below (Figure 7-18) is an example of the Reset Counts command processing.

Figure 7-18.



The figure below is an example of the Reset Counts failing.

Figure 7-19.



**Note:** If no data is received from the selected endpoint, the endpoint is either out of range or it is bad.

## Route Scan button

Not currently implemented.

## Power Off button

The Power Off button can be used to power off the system. This button opens a message window informing the user that the system is about to power off and giving the user a choice between continuing and canceling the power off. If a route is loaded and not saved, this message will also inform the user of this.

- Pressing the Okay button will result in the system powering off.
- Pressing the Cancel button will cancel the power off and allow the user to continue using the EA\_Mobile.

**Note:** The EA\_Mobile stores the last 30 routes loaded so that powering off without saving does not result in lost data. These routes can be saved using the [Save Old Route button](#) or to continue reading the route can be resumed using the [Resume Route button](#).

# A TROUBLESHOOTING THE EA\_MOBILE

The following table offers troubleshooting assistance for many problems you may encounter. For those symptoms or solutions not covered by this table, contact:

Elster

Customer Service

Phone 800-786-2215 FAX 919-250-5439

Business Hours: Monday-Friday 8am-5pm [Eastern Time]

**Warning:** The EA\_Mobile contains NO user serviceable parts or adjustment. Tampering with such or breaking tamper seals may prove harmful to personnel or equipment and voids the warranty.

Table A-1. Global Positioning System (GPS)

Symptom	Possible Cause	Solutions
GPS not active	Insufficient time elapsed since being moved from its last known position and reactivated. GPS requires up to 5 minutes (30 minutes for first time initialization) to achieve maximum satellite communications.	Wait 30 minutes or until a minimum of 4 satellites in use, are displayed on handheld terminal or EA_VID.
GPS active but not providing good L/L coordinates in FIFO mode	Inadequate number of satellites for FIFO mode (minimum of 6 required).	Wait 30 minutes or until a minimum of 6 satellites in use, are displayed on handheld terminal or EA_VID.
GPS active but providing poor L/L readings	Interference is caused by tall buildings, overhanging trees or other obstacles.	Continue reading. When coverage resumes, the unit will continue operating in that mode.
	Receiver is too close to the other antennas	Reposition GPS receiver and/or antennas to allow for at least 2 feet separation from the GPS receiver.
Loss of GPS signal	GPS cable disconnected or improperly connected.	Properly connect cable to GPS receptacle on EA_Mobile back.
	GPS cable crimped or crushed.	Reroute cable. If damaged, contact American Meter for replacement unit.
	Interference is caused by tall buildings, overhanging trees or other obstacles.	Continue reading. When coverage resumes, the unit will continue operating in FIFO mode.
	GPS offline	Go to //FIFO or GEO?// mode and continue operating.

Table A-1. Global Positioning System (GPS)

Symptom	Possible Cause	Solutions
GPS status -" on status line	GPS has become unable to compute its position.	The EA_Mobile automatically switches to FIFO Mode. Continue in FIFO until the GPS resumes function. The EA_Mobile will switch back to the mode in effect prior to the outage.

Table A-2. Indicator Warnings

Symptom	Possible Cause	Solutions
No EA_Mobile indicator lights are solid Green	EA_Mobile is not receiving power.	See EA_Mobile is not receiving power" troubleshooting tips below.
LINE light is flashing Green or is Red	Line voltage insufficient because too many accessories are turned on, draining vehicle power.	Turn off non-essential accessories (radio, tape player, CD, etc.)
	Line voltage insufficient because power cable has become disconnected.	Check the EA_Mobile power cable and make sure both ends are properly attached at EA_Mobile and at the accessory/cigarette lighter receptacle.
	Line voltage insufficient because vehicle's accessory/cigarette lighter fuse has blown.	Turn off EA_Mobile and replace fuse.
	Line voltage insufficient because vehicle's alternator is unable to produce adequate operating current.	Turn off EA_Mobile and have vehicle serviced.
BATT light is flashing Green or is solid Red	EA_Mobile internal battery has dropped to an unusable voltage.	Allow unit to charge between uses.
TEMP light is flashing Green or is Solid Red	The EA_Mobile internal temperature has exceeded the threshold because the cooling fan is blocked or obstructed.	Remove any clogs from the fan intake and/or reposition the EA_Mobile to allow proper air circulation to the cooling fan.
	The EA_Mobile internal temperature has exceeded the threshold because the cooling fan has quit working.	Contact Elster Solutions.
	The EA_Mobile internal temperature has exceeded the threshold because the ambient temperature in the vehicle is too high.	Cool off the vehicle by opening windows, moving vehicle out of direct sun, and/or by adjusting the heater or air conditioning thermostat.
ACTIVITY light is flashing	Normal operating condition, indicating this transceiver channels is actively receiving endpoint data.	n/a

Table A-3. Displayed Status Reports & Messages

Symptom	Possible Cause	Solutions
NO_RD status returned	Endpoint is still too far from EA_Mobile for robust read.	Move EA_Mobile closer to endpoint and continue interrogation.
	RF-opaque (metallic) objects are blocking signal path.	Move EA_Mobile or objects and continue interrogation.
	Endpoint is faulty	Replace endpoint.
BAD_RD status returned	EA_Mobile is in area of strong interference from an outside source.	Move the EA_Mobile closer to the endpoint and continue interrogation.
	Endpoint is in area of interference from an outside source.	Determine source of interference and correct.
N_T_RP status returned	Condition causing tamper condition still exists.	Check meter and endpoint. Correct condition causing tamper status.
	During attempt to verify tamper reset, EA_Mobile moved out of range before reset was verified.	Move EA_Mobile closer and continue interrogation.
B_T_RP status returned	Condition causing tamper condition still exists.	Check meter and endpoint. Correct condition causing tamper status.
	During attempt to verify tamper reset, EA_Mobile moved into an area of strong interference from outside source.	Move the EA_Mobile closer to the endpoint and continue interrogation.
	Endpoint is in area of interference from an outside source.	Determine source of interference and correct.

Table A-4. Operational & Miscellaneous

Symptom	Possible Cause	Solutions
Cannot access the Settings/System Setup window	User is not authorized to access this function and does not have the password.	Contact your supervisor or Elster Solutions.
	Four previous failed password attempts have locked out further access to this function.	Restart the EA_Mobile and enter the correct password at the prompt for this screen.
Cannot change system date and time via Settings/Date & Time window	User is not authorized to access this function and does not have the password.	Contact your supervisor or Elster Solutions.
Tamper reset not working (for gas and water endpoints only)	Condition causing tamper condition still exists.	Check meter and endpoint. Correct condition causing tamper status.
	EA_Mobile went out of range before tamper reset verified.	Move close to endpoint and continue interrogation.
	Endpoint is faulty.	If no tamper condition exists, replace endpoint.
	Reset tamper function not enabled on EA_Mobile.	Contact your supervisor or Elster Solutions.

Table A-4. Operational & Miscellaneous

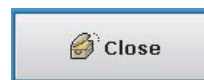
Symptom	Possible Cause	Solutions
Endpoints can be read in FIFO but not in Lat/Lon	GPS is not providing adequate GPS data.	Verify the GPS is in Active status and has satellite acquisition. If not, move EA_Mobile and try again.
	Endpoint Lat/Lon coordinates are incorrect or not valid.	Check Summary Command/INWIN button for list of endpoints in Lat/Lon Mode are considered to be in the interrogation window. If the desired endpoints are not in the list, interrogate the endpoints using FIFO Mode and correct the coordinates. See <a href="#">Chapter 6, "Reading mode."</a>

# B GUI BUTTONS

## Notes on GUI buttons

In the EA\_Mobile there are three types of buttons: normal, disabled and blocked.

Normal buttons can be pressed and their functionality will be implemented. For example the Close button will close the current window.



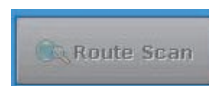
Disabled buttons (as shown below) indicate the functionality is not available at this time. The Sync EA\_VID button is only available after a route is loaded and running with a EA\_VID.



The following buttons are disabled until a route is loaded:

- On the Main Menu:
  - Reading
  - Summary
- On the Route Menu
  - Save Current Route
- On the Tools Menu
  - Sync EA\_VID - EA\_VID must also be present

Blocked buttons were added for future development and their functionality is not currently available in this release. For example, the Route Scan button is available on the EA\_VID, but has not yet been implemented in the EA\_Mobile.



The following buttons have been added for future functionality:

- On the Settings Menu
  - Broadcast Time
- On the Summary Button
  - M. Geo - available on the EA\_VID
- On the Tools Menu
  - Route Scan - available on the EA\_VID





