MetroCount®

The Traffic Data Specialists

MCSetLite User Guide

Covers MCSetLite v2.25

January 2002

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Freeway SOUTH 2
5 Riverside Dr
53 City Centre
P EXIT
LEFT LANE

Chapter 1

Introduction to MCSetLite

Overview

MCSetLite is a software component of MetroCount Traffic Executive, developed by MetroCount for the Pocket PC. MCSetLite contains all the functions of MetroCount Traffic Executive that are needed on the road, with the added convenience of the Pocket PC platform.

MCSetLite complements MCSurvey in the process of collecting your traffic data. MCSetLite adopts the intuitive interface of MCSurvey for the common Roadside Unit management tasks of setup, data unload, and axle hit monitoring.

As well as manual entry, MCSetLite also allows you to setup your Roadside Units from precompiled Site Lists created with MCSurvey. Last minute changes can be made using the Pocket PC's on-screen keyboard.

Sensor installation can be checked using MCSetLite's Rolling Axle Picture. This presents a variable length, scrolling time window, allowing verification of detected axle sequences, and approximate vehicle speed.

Unloaded data quality can be instantly checked using MCSetLite's Data Graphs. These graphs allow you to verify contiguous data flow and sensor balance.

Pocket PC Convenience

The Pocket PC's small size, light weight and ease-of-use make setup of your MetroCount Roadside Units a breeze. Long battery life and the availability of vehicle chargers takes out the trouble of flat batteries. The Pocket PC's relatively low cost also makes it an attractive alternative to laptop PCs.

Access to MCSetLite on your Pocket PC is instantaneous, with none of the start-up and shut-down delays associated with conventional PCs. MCSetLite is designed for use on Pocket PCs with either greyscale or full colour LCD screens. Some models include a screen that is perfectly visible in full sunlight.

CompactFlash Storage

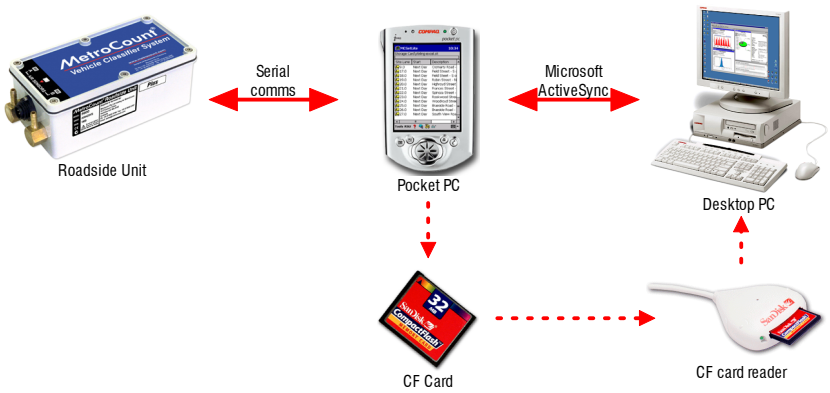
MCSetLite fully supports CompactFlash memory cards. These memory cards expand the storage capacity of your Pocket PC, with capacities capable of holding MetroCount data from over one hundred 2MB Roadside Units. CompactFlash memory cards are hot-swappable and interchangeable between Pocket PCs.

CompactFlash is a non-volatile storage media that does not require a battery to retain its data. With no moving parts they are an extremely robust method for storing your MetroCount data files in the field.

Connectivity

To get up-and-running with MCSetLite, there are two connectivity issues to consider:

- Connecting your Pocket PC to a MetroCount Roadside Unit.
- Transferring your data files from your Pocket PC to your desktop PC.



Transferring data from the Roadside Unit to a desktop PC

Roadside Unit Connection

The serial communications on all MetroCount Roadside Units and Pocket PCs are designed to be connected directly to a desktop PC. Consequently, an adapter, commonly known as a null-modem adapter, is required to connect a Pocket PC to a MetroCount Roadside Unit.

MCSetLite is supplied with a MetroCount PPC Adapter that allows you to connect the serial communications lead of your Pocket PC to the communications lead for your Roadside Units.

MetroCount PPC Adapter

Desktop PC Connection

There are several methods for transferring MetroCount data files from your Pocket PC to a desktop PC, for storage and analysis.

Docking Cradle

Pocket PCs are normally supplied with a docking cradle that provides a convenient means for connecting your Pocket PC to a desktop PC. Software supplied with Pocket PCs, called Microsoft ActiveSync, automatically connects to the device when it is inserted into the docking cradle. The Pocket PC's file system can then be accessed using MCFiler or Windows Explorer. Docking cradles commonly use a standard PC serial communications port, or USB (Universal Serial Bus).

Pocket PC inserted into its docking cradle

CompactFlash Card Reader

A CompactFlash card reader is an optional device that allows you to access CompactFlash memory cards as a removable drive in MCFiler or Windows Explorer. CompactFlash card readers are available with a number of interfaces, including USB, or your desktop PC's parallel (printer) port.

Example CompactFlash card reader

A CompactFlash card reader is an extremely convenient method for transferring your MetroCount data files to your desktop PC, especially if you have a number of CompactFlash memory cards that are interchanged amongst several Pocket PCs. Data can be transferred using conventional copy methods, just like any other drive on your desktop PC.

Purchasing a Pocket PC

Pocket PCs are supplied from a variety of manufacturers, each with their own set of strengths and weaknesses. The following is a discussion of the requirements, and some considerations, for selecting a Pocket PC for field use with MetroCount Roadside Units.

Minimum Requirements

Windows CE for Pocket PC

MCSetLite requires a *Pocket PC* running *Microsoft Windows CE 3.0* or later.

RS232 Serial Communications Interface

MCSetLite requires a standard RS232 communications port and cable to communicate with MetroCount Roadside Units.

Some manufacturers supply a suitable cable as a standard item. Others may only supply a docking cradle, with the serial communications cable as an optional accessory.

Pocket PC RS232 Cable

Memory Expansion

The standard storage capacity of most Pocket PCs is insufficient for the serious MetroCount user. Selecting a Pocket PC with some form of removable storage expansion, commonly CompactFlash, is highly recommended.

CompactFlash Card

CompactFlash memory cards are available in a variety of capacities. Consider the pattern of usage of your MetroCount Roadside Units, their respective memory capacities, the average size of the data files you unload, and how frequently you plan to transfer data to your desktop PC. Also consider that purchasing a number of smaller capacity CompactFlash memory cards may be more flexible and cost-effective than one large capacity card.

Suggested Features

Screen Visibility

The visibility of a Pocket PC's screen, especially in daylight, is an extremely important consideration. Ideally, you should trial a prospective unit outside, before purchasing.

Most Pocket PCs come with an LCD display, which is either *reflective* or *transmissive*.

Reflective displays, as the name suggests, use selectively reflected ambient light to create the image. As such, these displays are normally brightest in sunlight. A light source in front of the screen is normally included to boost brightness in dull conditions, however, the Pocket PC's battery lasts significantly longer when the light source is not in use.

Transmissive displays pass light from a light source behind the screen, called a back-light. These displays will only ever be as bright as this light source, and screen contrast suffers in bright ambient light. Battery life tends to be shorter as the back-light is normally on its highest setting for outside use.

USB Interface

Pocket PCs with a USB interface generally provide faster data transfer rates with your desktop PC, and also leave your serial communications ports free for use with MCSurvey. Check with your IT consultants, or supplier, as to whether your desktop PC has a functioning USB port.

Suggested Accessories

Manufacturers offer a variety of optional accessories. Some accessories to consider:

- Vehicle charger - keep your Pocket PC's battery topped up between sites.
- Spare stylus pens - the easiest part to misplace.
- CompactFlash card reader - as previously discussed.
- Screen protectors - prevent scratching.

Vehicle charger and spare stylus pens

Introduction to Windows CE

The Windows CE operating system introduces a number of new concepts and terminology used throughout this User Guide.

The User Interface

Using the Stylus

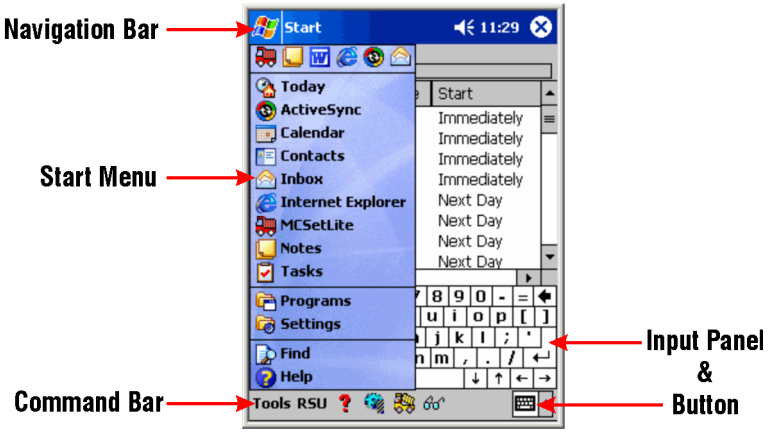
The Pocket PC utilises a touch-sensitive screen and a stylus as a pointing device. The common stylus actions are:

- **Single tap** - used to activate common items, such as menus and buttons, by tapping the screen once on the desired item.
- **Double tap** - used to execute an action. Requires tapping the screen twice on the desired item, analogous to double-clicking a mouse button.
- **Tap-and-hold** - used to activate tool-tips and menus, analogous to right-click menus. Requires tapping and holding the stylus on an item until the corresponding tool-tip or menu appears.
- **Tap-and-drag** - used to move and copy items, analogous to dragging with a mouse. Requires tapping and holding the stylus on an item, and dragging the stylus across the screen.

Screen Layout

The following is a list of the important components of the Windows CE screen:

- **Navigation bar** - located across the top of the screen, containing the **Start** menu, the name of the currently active application, and the current time.
- **Command bar** - located across the bottom of the screen, containing application menus and toolbars.
- **Input panel button** - located in the bottom right-hand corner, activates the Pocket PC's input panel.



Windows CE for Pocket PC screen layout

The Input Panel

Tapping the Input Panel button displays a keyboard across the bottom of the screen for data entry. MCSetLite is designed to minimise the amount of data entry required in the field.

Application Behaviour

Many Windows CE applications do not have an **Exit** menu item or a close button. You switch between applications by simply selecting them from the **Start** menu, even if they are already running. Windows CE will automatically close applications to free up system resources as required.

MCSetLite includes an **Exit** menu item in the **Tools** menu. Using this menu item when you have finished with MCSetLite ensures that your Pocket PC's serial communications port is available for synchronisation or other applications.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Chapter 2

Traffic Data Collection

Overview

The MetroCount Vehicle Classifier System data collection philosophy is simple – store every axle event. The MetroCount Roadside Unit is installed at an appropriate survey site and time-stamps each axle event detected on its sensors. This axle stream data is then unloaded to a proprietary format data file on your PC, ready for analysis.

This section covers the fundamentals of MCSetLite, including:

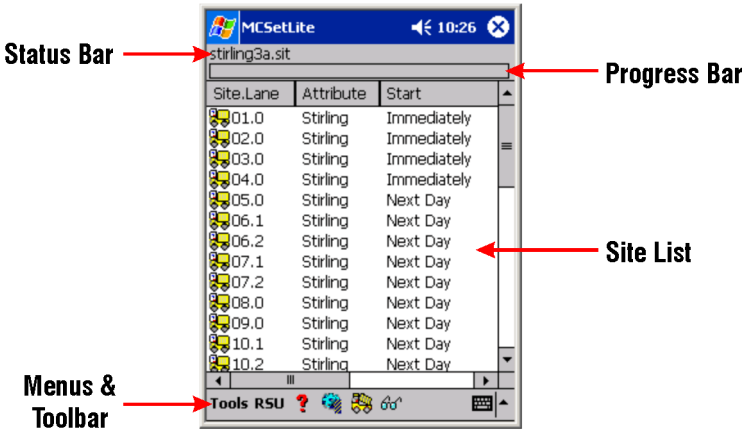
- configuring MCSetLite for your Pocket PC,
- connecting to the Roadside Unit,
- checking the status of the Roadside Unit,
- starting a survey,
- viewing traffic in real-time,
- unloading data from the Roadside Unit, and
- monitoring a survey.

If you are new to the MetroCount Vehicle Classifier System, it is highly recommended that you familiarise yourself with MCSurvey first. Your *MetroCount Traffic Executive User Manual* contains a comprehensive discussion of the MetroCount System philosophy, and introduces you to the behaviour of your MetroCount Roadside Units. Similarly, your *MetroCount Roadside Unit Operator Guide* provides an introduction to site selection, sensor installation and information specific to your MetroCount Roadside Unit series.

Getting Started

MCSetLite Layout

The fundamental components of MCSetLite are shown in the diagram below.



MCSetLite's main application window

The **Status Bar** displays MCSetLite's current activity, and relevant responses from the Roadside Unit. The **Progress Bar** indicates the progress of tasks as they are processed. The **Site List** window displays a single Site List, from which Roadside Units can be selectively setup. Site Lists are created using MCSurvey and copied to your Pocket PC.

The Tools menu includes Site List control, data file inspection tools, and MCSetLite's preferences. The **RSU** menu contains the common Roadside Unit command functions. These can also be launched from MCSetLite's toolbar.

Button	Function
	Get Roadside Unit Status
	Setup Roadside Unit
	Unload data
	View sensor hits

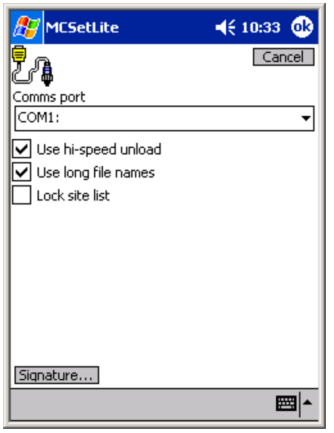
MCSetLite's Toolbar

Setting Preferences

There are a number of program options that can be found in MCSetLite's Preferences. These should be reviewed when you first use MCSetLite.

To set MCSetLite's Preferences

1. Select **Tools** » **Preferences**.
2. Adjust the options according to the table below.
3. Tap the **OK** button in the **Navigation Bar** to save the settings.



MCSetLite's Preferences

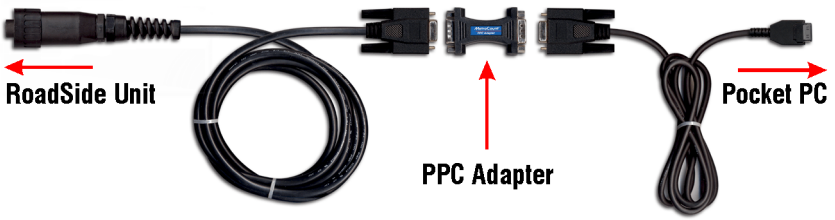
Parameter	Description
Comms port	This is the name of the serial port on your Pocket PC you intend to connect to the Roadside Unit. This will usually be **Com1:**. Refer to the section *Communicating with the Roadside Unit* on page 17 for further details.
Use hi-speed unload	Enabling MCSetLite's high speed unload transfers data from the Roadside Unit at 38kbps. If you experience errors unloading data at this speed, try disabling this option.
Use long file names	When unloading data from the Roadside Unit, MCSetLite will suggest a file name based on the site number and the date. With this option off, MCSetLite will restrict this suggestion to the 8.3 naming convention, with 5 characters for the site number, a hexadecimal digit for the month and two characters for the day.
Lock site list	This options prevents setup parameters from being changed when the Roadside Unit is setup from a Site List. Refer to the section *Using Site Lists* on page 37 for further details.

Communicating with the Roadside Unit

Before attempting to use MCSetLite in the field for the first time, you should establish a successful connection to the Roadside Unit by checking the unit's status, and ensure that you can successfully perform a setup.

Connecting the Roadside Unit to your Pocket PC requires the following:

- The serial communications cable supplied with your particular model of MetroCount Roadside Units.
- A MetroCount PPC adapter, supplied with MCSetLite.
- The serial communications cable for your particular model of Pocket PC. This may have been supplied standard with your Pocket PC, or an optional accessory. Refer to the section *Purchasing a Pocket PC* on page 9 for further details.



Required communications cables

To communicate with the Roadside Unit

1. If you haven't already done so, set the correct communications port in MCSetLite's Preferences.
2. Join your Pocket PC serial cable to your Roadside Unit serial cable with your PPC adapter.
3. Connect the respective ends to your Pocket PC and the Roadside Unit.
4. Tap the **Roadside Unit Status** button on MCSetLite's toolbar.
5. If the connection was successful, the Status sheet will appear.

Checking the Roadside Unit

The Status sheet in MCSetLite displays a snapshot of the Roadside Unit's current status. This status information is divided into four pages:

- **Data** - survey details of the data currently in memory.
- **RSU1** - the Roadside Unit's current activity, and health indicators.
- **RSU2** - the Roadside Unit's identity.
- **Hits** - the number of axles recorded by each sensor.

If a potential problem exists in any of the status pages, MCSetLite will display a warning message, and jump to the page containing the problem item. Refer to the section *Monitoring a Survey* on page 31 for further details.

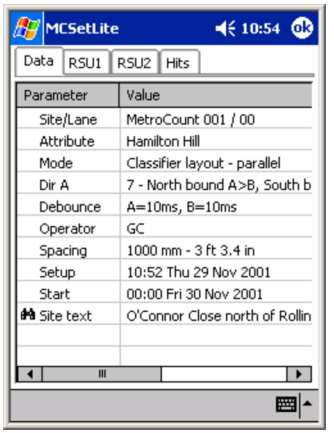
To get the Roadside Unit's current status

1. Tap the **Roadside Unit Status** button on MCSetLite's toolbar, or select **RSU » Get RSU Status**.
2. To select a different page in the Status sheet, tap the appropriate tab.

Tip: Complete information for any item in the Status sheet can be viewed by double-tapping that item. Items with an icon next to their name contain information of interest.

Data Page

The **Data** page contains information about the data currently stored in the Roadside Unit's memory.

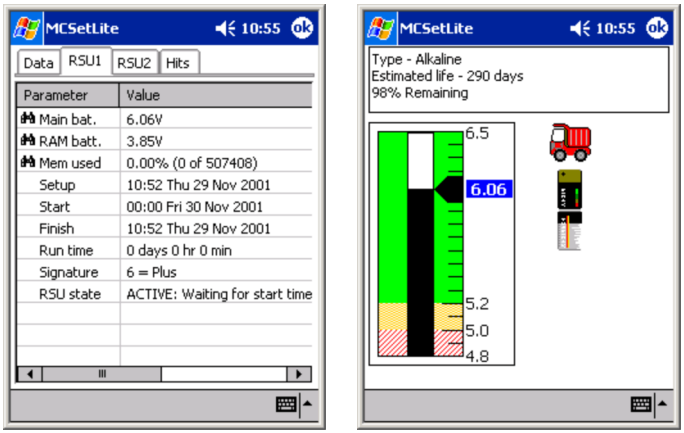


Data Status Page

Parameter	Description
Site, lane, attribute, mode, directions, debounce, operator, spacing, site text	Survey parameters of the data currently in memory, as specified when the Roadside Unit was setup, as described in the section *Survey Parameters* on page 23.
Setup	Time at which the Roadside Unit was setup.
Start	Time at which the Roadside Unit switched to its Active Logging state, and started logging data.

RSU Pages

The **RSU1** and **RSU2** pages contain information about the Roadside Unit's physical status.



Roadside Unit Status Page (with graphical representations)

RSU1

Parameter	Description
Main bat.	Roadside Unit's main battery voltage. Double-tap for a graphical representation.
RAM bat.	Roadside Unit's backup battery voltage. Double-tap for a graphical representation.
Mem used	Percentage of memory used and memory capacity in bytes. Double-tap for a graphical representation.
Setup	Time the Roadside Unit was setup.
Start	Time the Roadside Unit switched to its Active Logging state, and started logging data.
Finish	Time the Roadside Unit stopped logging data. If the Roadside Unit is still active, this will be the current time.
Run time	Duration for which the Roadside Unit has been active.
Signature	Signature type of the Roadside Unit.
RSU State	See following table.

RSU State

The **RSU state** shows the Roadside Unit's current activity. It also lists recent events that may impact the data currently in memory, or the Roadside Unit's condition.

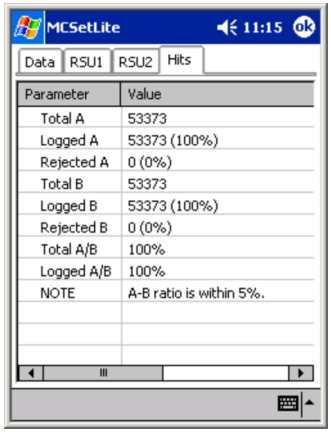
String	Description
Roadside Unit not ACTIVE	The Roadside Unit is in its idle state.
Roadside Unit is ACTIVE - waiting for start time	The Roadside Unit has been setup with a deferred start time. When the start time is reached the Roadside Unit will switch to its active state.
Roadside Unit is ACTIVE - Running normally	The Roadside Unit is in its active state, logging axle events.
Roadside Unit has DATA to unload	The Roadside Unit contains data that has not been unloaded using the Unload then Stop mode.
Memory FULL	The Roadside Unit has filled to capacity.
Main battery ran down	The Roadside Unit will switch to its idle state if the main battery drops below a certain level. This ensures that there is always sufficient power to communicate with the Roadside Unit. This message indicates the Roadside Unit may have stopped logging sooner than expected.
Roadside Unit POWER was interrupted	Power was interrupted while the Roadside Unit was active. If power is interrupted the Roadside Unit will stop logging data.
Internal hardware FAIL	A potential hardware fault has been detected. Consult your local MetroCount agent to diagnose the problem.

RSU2

Parameter	Description
RSU Ident.	Roadside Unit's ID and firmware revision.
RSU Type	Roadside Unit series.
Bat at setup	Battery voltages measured when the Roadside Unit was last setup.
Address / Status Byte	Technical data.

Hits Page

The Hits page shows statistical information about the axle hits that have occurred since the last setup.



Hits Status Page

Parameter	Description
Sensor A and B counts	The sensor **Total** counts are the total number of hits detected by each sensor. The **Rejected** counts are the number of close following hits that have fallen within the digital debounce window, and were subsequently ignored. **Logged** counts represent the actual number of hits stored in memory.
A/B Ratios	Ratios between the number of hits on each sensor. When using a Classifier Sensor Layout, the sensors should be matched within 5%. Refer to the section *Monitoring a Survey* on page 31 for further details.
Note	Conclusions and warnings related to the sensor totals and ratios. Warnings will only be issued if there is at least 200 axle hits on both sensors.

Starting a Survey

This section introduces the fundamental concepts associated with setting up the Roadside Unit. For simple, infrequent surveys the Roadside Unit can be easily configured on site. For large and on-going surveys you can take advantage of MCSetLite's Site Lists. Refer to the section *Survey Management* on page 36 for further details.

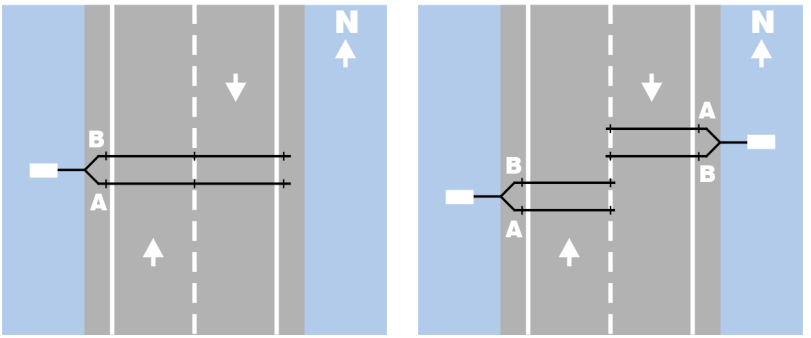
Sensor Configuration

The Roadside Unit can be installed using a variety of Sensor Configurations, to obtain either classification data, or short-term event count data. Irrespective of the Sensor Configuration selected, the Roadside Unit philosophy is the same - logging time-stamped axle events.

Note: For a detailed discussion about Sensor Configuration, recommendations and limitations, refer to your MetroCount Roadside Unit Operator Guide.

Classifier Sensor Layout

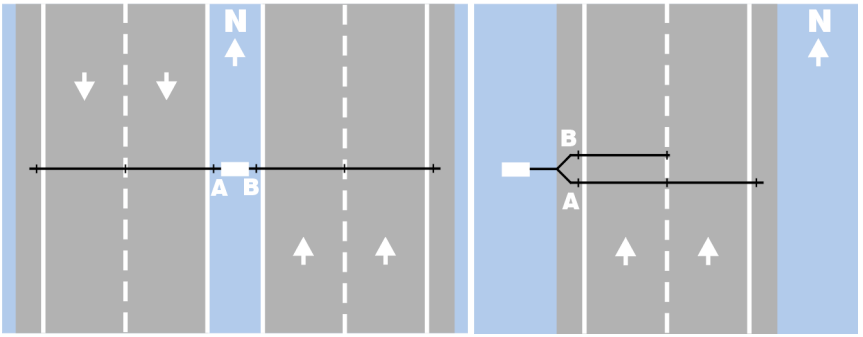
Data collected using a Classifier Sensor Layout provides the best value-for-effort in terms of the wealth of information that can be obtained. This includes the common parameters of volume, class, speed, direction, headway and so on.



Examples of Classifier Sensor Layouts (Left-hand driving)

Count Sensor Layout

Using a Count Sensor Layout allows you to obtain short-term volumetric data for sites where a Classifier Sensor Layout is inappropriate, such as multiple lanes with traffic flows in the same direction. Data in this form can also be used for gap analysis.



Examples of Count Sensor Layouts (Right-hand driving)

Survey Parameters

All sites require a number of parameters to uniquely identify each site, specify the physical parameters of the Roadside Unit and assist data analysis.

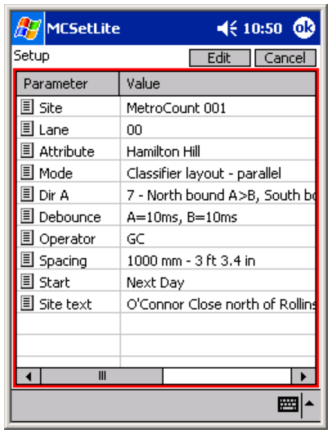
Survey Parameter	Description
Site	Site is user-defined and may be up to 20 characters long. This is commonly used to represent the site name or ID, such as a serial number.
Attribute	Attribute is user-defined and may be up to 20 characters long. This is commonly used for sub-grouping sites
Lane	The lane number is used to distinguish data collected from multiple Roadside Units at one site. By convention, a lane number of zero (0) is used for sites where only one Roadside Unit is used. This includes both unidirectional traffic flows and low volume bidirectional traffic flows. For multi-lane sites where multiple Roadside Units are required, each should be setup with a unique lane number starting at 1, through to a maximum of 15. When data is unloaded from the Roadside Unit the file name suggested by MCSetLite contains the lane number in the file extension. For example, the files for a multi-lane site with two Roadside Units can easily be recognised as having the same file name with **.ec1** and **.ec2** file extensions respectively.

Survey Parameter	Description
Operator	Initials (up to three characters) of the Roadside Unit operator's name. This is useful for identifying field operators if they need to be asked about a particular survey.
Direction(s)	Traffic flow directions are recorded during setup to be used later by the data analysis components of MTE. *Note that flow directions specified at setup are purely descriptive fields*. They do not perform any filtering function on the actual logging of axle events. Directions are specified as north, south, east or west. When specifying a direction, it is simply a matter of selecting one of these compass points that best approximates the actual direction. For a detailed discussion on the use of the direction codes, refer to your *MetroCount Roadside Unit Operator Guide*.
Debounce	The digital debounce in the Roadside Unit is used to eliminate the effects of sensor slap or bounce registering as multiple axle hits. For example, with a debounce time of 30 milliseconds (ms), all detected hits for a period of 30ms after the first detected hit are dropped. The recommended debounce settings for each sensor are: • 10ms if the sensor spans multiple lanes, and • 30ms if the sensor only spans a single lane.
Spacing	The sensor spacing setting only appears when using a Classification Sensor Layout. For optimal vehicle classification, it is recommended that a sensor spacing of 1000mm be used. MCSetLite will allow values between 200mm and 3050mm.
Start time	You may specify a time at which logging will commence. Usually the start time will be immediate, however this parameter allows you to defer the start time for up to 10 days. This feature is useful for conserving memory by only logging during the specific period of interest. It is also useful when the Roadside Unit is to be setup in the office and placed in the field some time later. Note that you do not specify a survey end time. The finish time of the data is set at the point of performing an **Unload then Stop** operation. Note that MCReport allows you to choose the exact survey start and end times from the available data.
Site text	The site text parameter is used to describe a site, and may be up to 70 characters long. It is useful to settle on a convention, such as the road name and nearby intersecting roads.

Roadside Unit Setup

Before attempting to setup a Roadside Unit, ensure that you have successfully established communications with a Roadside Unit. Refer to the section *Getting Started* on page 15 for further details.

Note: MCSetLite will not allow you to setup a Roadside Unit if it contains data that has not been unloaded using the "Unload then stop" mode. If you do not need this data, perform a Factory Setup, then start the normal setup process again.



Roadside Unit Setup

To setup a Roadside Unit

1. Connect a Roadside Unit to your Pocket PC and tap the **Setup** button on MCSetLite's toolbar.
2. Edit each of the survey parameters as required. To edit, double-tap a parameter, or select it and tap the **Edit** button.
3. Tap the **OK** button to send the setup information to the Roadside Unit. The Roadside Unit will switch to its Active Logging state once the specified start time is reached.

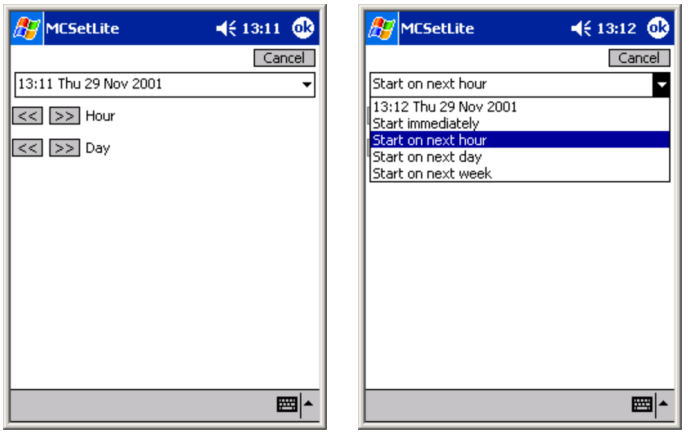
Setup Tips

Extra Direction Code

Selecting a Count Sensor Layout will remove the **Spacing** parameter and provide two direction codes. This allows an independent direction code to be assigned to both the A and B sensors.

Automatic Defer Time

Edit the **Start** parameter to defer the Roadside Unit start time. MCSetLite can automatically calculate the next convenient boundary for you, or you can manually specify a time up to 10 days in advance. For example, **Start on next day** will automatically defer the Roadside Unit until 00:00 of the next day. To manually set the start time, select the current time from the drop-down list and use the **Hour** and **Day** step buttons.



Setting a defer time

Automatic Range Checking

MCSetLite will automatically warn you if any fields have been set outside their allowable range, before sending the setup information to the Roadside Unit. The warning message will tell you setup field that contains the problem. Note that for text fields that have a length limit, they will be automatically truncated.

Initial Survey Parameters

MCSetLite automatically copies a Roadside Unit's current survey parameters into the **Setup** sheet, except for the start time.

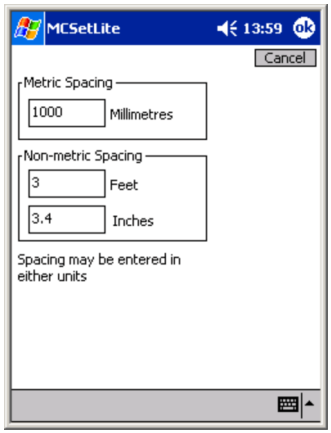
This feature is useful when a Roadside Unit is close to, or has reached, full capacity, and you need to collect further data at the same site. Data is first unloaded from the Roadside Unit using the **Unload then stop** mode. Starting the Roadside Unit logging again is a trivial matter of tapping the **Setup** button, and **OK** - no survey parameter entry is required. Data file segments can be easily combined during data analysis in MCReport.

This feature can also be used to copy survey parameters between Roadside Units, for example, when using multiple Roadside Units at one site. Setup one unit as per normal, and then immediately tap the **Setup** button again. Make the minor alterations as necessary, such as the lane number, connect the communications cable to another Roadside Unit, and hit the **OK** button.

Spacing Unit Conversion

When entering the sensor spacing during Roadside Unit setup, you can optionally specify a non-metric spacing in feet and inches, which will be automatically converted to millimetres. Simply double-tap the **Spacing** parameter, and enter the desired spacing. The alternate units will automatically update.

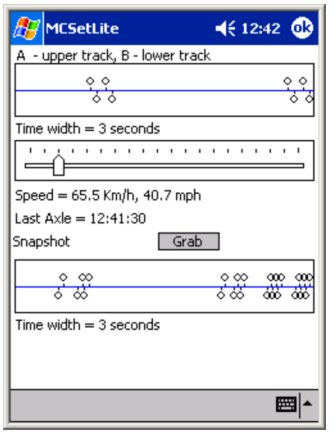
The Roadside Unit, and subsequent data files, store the sensor spacing in millimetres, however, the value is always reported in both units. All reports can be generated in either units.



Setting the sensor spacing

Viewing Traffic

MCSetLite provides a Rolling Axle Picture that allows you to verify correct sensor installation and Roadside Unit setup.



Viewing sensor hits using the Rolling Axle Picture

The Rolling Axle Picture displays a variable-width window of recently logged sensor hits. As vehicles pass over the sensors, the logged hits are displayed on the time-line at the top. A-sensor hits appear above the centre line, with B-sensor hits below.

If sensor hits are being logged correctly, you should see matching A/B pairs of hits for each axle. When surveying across two lanes of bidirectional traffic, the Rolling Axle Picture highlights the difficulty in classifying the series of hits created by two vehicles crossing the tubes simultaneously.

The Rolling Axle Picture will also display an approximate speed for passing vehicles determined from matching A/B pairs of sensor hits.

To view real-time traffic

1. Connect a Roadside Unit that is active (either deferred or logging) to your Pocket PC and tap the **View sensor hits** button on MCSetLite's toolbar.
2. Adjust the **Time width** slider bar to give the best view of the passing traffic. The time width can vary between 1 and 20 seconds. A longer time width will display more vehicles, but will give low intra-vehicle resolution.
3. To capture the current time window, click the **Grab** button. This will copy the displayed axles to the snapshot window.

Unloading Data

The Unload process transfers data from the Roadside Unit's memory to a proprietary format data file on your Pocket PC. There are two Unload modes:

- **Unload and continue logging** - unloads data, leaving the Roadside Unit active, logging axle hits.
- **Unload then stop** - unloads data, and upon successful completion places the Roadside Unit in its idle state.

Data File Location

The usual storage location will be your Pocket PC's CompactFlash memory card. These cards map to a folder in the root of your Pocket PC's file system, normally called **Storage Card**. MCSetLite will remember the most recently used folder.

Naming Conventions

When unloading data from a Roadside Unit, MCSetLite will automatically suggest a data file name. The suggested file name is formed as a combination of the 20 character site name, and the current date. There is no need to create a descriptive file name for a data file. When browsing for files with any component of MTE, files will always be listed by their key survey parameters.

The three character file extension is extremely important. Data files are created with a file extension of **.ec?**, where **?** is the lane number. Components of MTE use this extension to recognise MetroCount data files. Do not change this file extension.

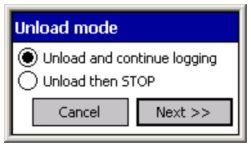
The Unload Process

During the transfer of data, MCSetLite will display a number of informative parameters and statistics, including:

- the data file name,
- the site description,
- the unload communications speed,
- the number of bytes written,
- the transfer rate, and
- a list of events.

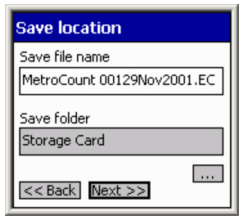
To unload data from a Roadside Unit

1. Connect a Roadside Unit to your Pocket PC that contains data to be unloaded, and click the **Unload data** button on MCSetLite's toolbar. If successful communication is established, the Unload mode dialog box will appear.



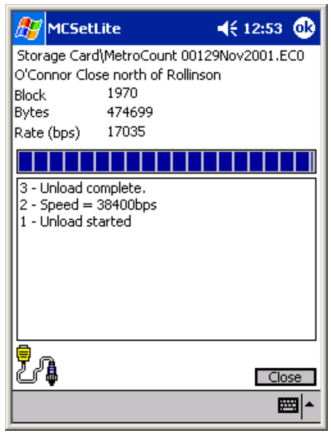
Selecting the Unload Mode

2. If this is the end of your survey, tap the **Unload then STOP** radio button. If this is a mid-survey unload, tap the **Unload and continue logging** radio button.
3. Tap the **Next** button to continue.



Selecting a data file name and folder

4. The suggested **Save file name** will be as described previously. In the unlikely event that you need to change this, use the Input Panel.
5. The **Save folder** will be the folder last used for unloaded data. To change this, click the **...** button, and browse for the desired folder. Any available CompactFlash memory cards will have a different folder icon. Remember that the default folder name for these cards is **Storage Card**.
6. To start the unload, click the **Next** button.



Unloading data

7. During the actual unloading process, the statistics of bytes written, transfer rate and the progress bar will be updated. Any transfer errors will appear in the list of events.
8. When the unload is complete, click the **Close** button. When a survey has been completed and the data unloaded, you should ensure that the Roadside Unit has a status of **Roadside Unit not ACTIVE**. This will prevent unneccessary battery drain.

Note: Unloading data from the Roadside Unit does not remove the data from memory. All data remains until the next setup of the Roadside Unit is performed. Thus, data can be unloaded repeatedly if necessary, until the next setup.

Monitoring a Survey

During a survey, it is advisable to regularly check your site to ensure that any loss in data quality is detected before a survey is completed. If problems are detected early, it allows you the option of leaving the Roadside Unit at a site longer, to get the required amount of data, rather than having to repeat the whole survey.

There are a number of parameters that should be monitored during a survey.

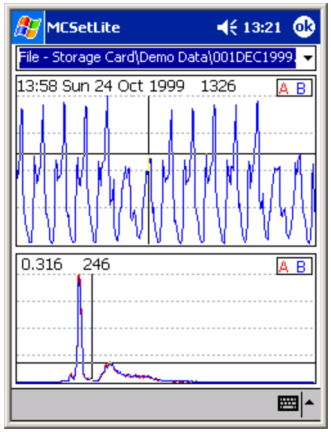
Data Quality

The easiest method of performing a data quality assessment mid-survey is to perform an unload using the **Unload and continue logging** mode, and use MCSetLite's Data Graphs to view the unloaded data file.

Axle Hits Graph

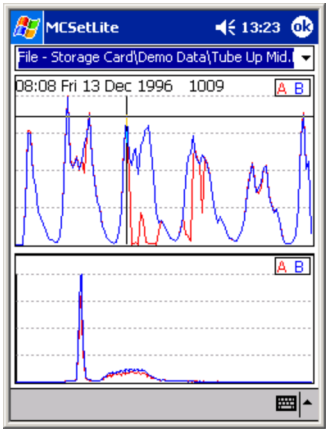
The Axle Hits graph is used for identifying periods of sensor failure during the course of a survey. This plot presents an overlaid graph of the raw A and B sensor hits per hour.

Ideal data for a Classification Sensor Layout is identified by the A and B sensor plots perfectly overlaying each other. The shape of the plots should also reflect the daily traffic behaviour you are expecting for the survey site. The example below shows ideal data - the A and B sensor plots overlay perfectly and there is a characteristic weekday afternoon peak. Lower weekend flow is also obvious.



Sensor hits plot for ideal data using a Classification Sensor Layout

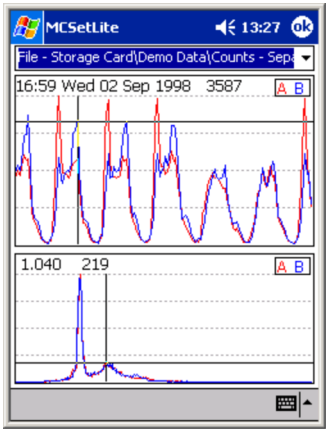
Data problems for a Classification Sensor Layout can be instantly recognised by a divergence in the two sensor plots, usually signifying breakage or vandalism of one or both of the sensors. The example below shows a mid-survey failure of the A sensor that was subsequently rectified. Detecting problems such as sensor failure as soon as possible allows you the option of gathering further data while the site is still setup.



Sensor hits plot showing sensor failure mid-survey

Similarly, when using a Count Sensor Layout, although there may be no relationship between the A and B sensor plots, you should still be able to instantly recognise any periods where no data was logged. There should also be a direct correlation with the expected daily flow patterns.

The data in the example plot below was collected using a separate Count Sensor Layout across both directions of a four lane highway. Note the AM peak in one direction and a corresponding PM peak in the other direction.



Sensor hits plot showing data collected using a separate Count Sensor Layout

Hit Spectrum Graph

The Hit Spectrum is a powerful tool for checking data quality and behaviour. Particularly, it highlights excessive hits caused by poor sensor installation.

The Hit Spectrum is essentially a histogram of the time between successive sensor hits, plotted on a logarithmic time axis. By default, the Hit Spectrum will display an A-to-A plot and a B-to-B plot. As with the Axle Hit Balance plot, these two plots should overlay perfectly when a Classification Sensor Layout was used.

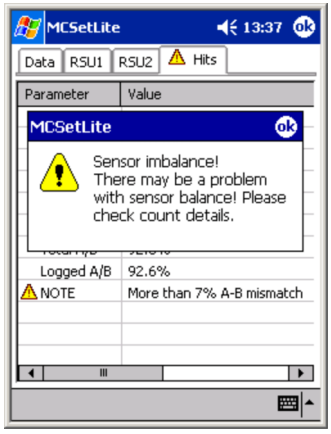
The Hit Spectrum used here is a smaller version of the Spectrum of Axle Hits report used in MCReport. Refer to your *MetroCount Traffic Executive User Manual* for further details.

To view data quality graphs

1. Select **Tools** » **Data graphs**.
2. Browse the **MetroCount PalmTree** for the data file you wish to view, select the file and tap the **OK** button.
3. There will be a short delay while MCSetLite processes the data file. Speed will vary depending on your Pocket PC and the size of the data file.
4. Two data graphs will be displayed - Axle Hits and the Hit Spectrum. To display coordinates on either graph, tap and drag across the graph. To toggle the A and B plots, tap the **A B** buttons in the respective graphs.
5. Data file details can be viewed by tapping the drop-down combo box at the top.

Sensor Balance

Another measure of data quality is to review the **Hits** page in the **Status** sheet. When operating using a Classifier Sensor Layout, a sensor balance variation of 5% is acceptable. That is, a **Logged A/B** ratio of between 95 - 105%.



Reviewing the Hits Status page

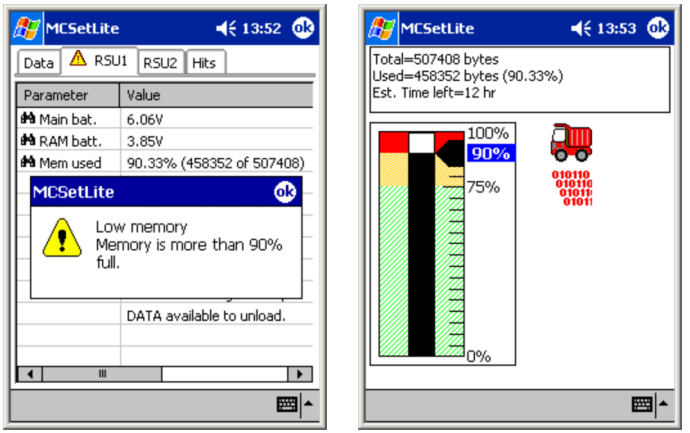
However, a sensor mismatch of more than 5% tends to indicate that one of the sensors has failed at some point during the survey. For instance, tubes may fail due to vandalism, water ingress, abrasion, or splitting.

MCSetLite will issue a warning when you click the **Roadside Unit Status** button if there is a problem with the sensor balance and you are using a Classifier Sensor Layout.

Memory Usage

When the Roadside Unit's memory fills up, it will stop logging vehicles. Therefore it is important to monitor the memory used throughout a survey. The **Mem used** item in the **RSU** page of the **Status** sheet contains the percentage of the Roadside Unit's memory capacity that has been used.

The graphical representation of the percentage of memory used includes a run-time remaining estimate that you can use as a guide. This is based on the amount of data logged up to the current point in time, and requires the Roadside Unit to be at least 5% full.



Checking memory usage

If the Roadside Unit is approaching its capacity and you wish to continue surveying, the current data should be unloaded using the **Unload then STOP** mode, and the setup procedure repeated. This is an extremely simple procedure as the Setup process always retrieves the initial survey parameters from the Roadside Unit.

MCSetLite will issue a warning when you view the Roadside Unit's status if it is approaching capacity or is full and has stopped logging prematurely.

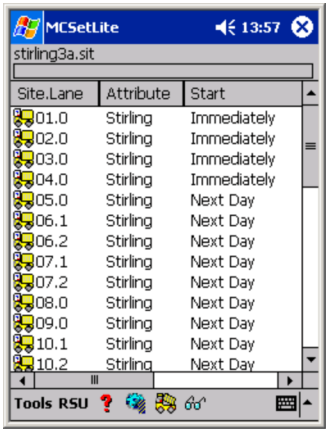

Freeway SOUTH 2
5 Riverside Dr
53 City Centre
P EXIT
LEFT LANE

Chapter 3

Survey Management

Overview

MCSetLite provides support for Site Lists created using MCSurvey. Field setup then only requires connection to a Roadside Unit and selection of a site from a loaded Site List. This removes the need for any manual entry in the field, greatly improving efficiency and accuracy of setup.



MCSetLite with a Site List loaded

Site Lists are displayed in MCSetLite's main window, with sites listed by their key site parameters. MCSetLite does not support the map interface provided by MCSurvey. Map information contained in Site Lists loaded into MCSetLite will be ignored.

For a discussion on the creation of Site Lists using MCSurvey, refer to your *MetroCount Traffic Executive User Manual.*

Using Site Lists

Opening Site Lists

The first step in using your Site Lists with MCSetLite is to copy the Site List files to your Pocket PC. This can be achieved in a similar fashion to copying your unloaded data files from your Pocket PC - either via your Pocket PC's docking cradle, or via a CompactFlash card reader.

Site List files created by MCSurvey have a default file extension of **.sit**, and are normally located in the **User\Sites** folder under your MetroCount Traffic Executive installation folder.

To open a Site List

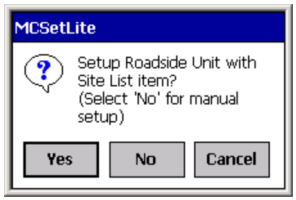
1. Copy your Site List file(s) to your Pocket PC.
2. Select **Tools** » **Open site list**.
3. Browse the **MetroCount PalmTree** for the location where you copied your Site List files, select a file and tap the **OK** button.
4. To clear the Site List window at any time, select **Tools** » **Clear site list**.

Roadside Unit Setup using Site Lists

The setup of a Roadside Unit using a Site List is the same process as a normal setup, except that the setup information is derived from the Site List, rather than manually entering the information. Remember that the same Roadside Unit connectivity and behavioural issues apply, as described in the section *Starting a Survey* on page 22.

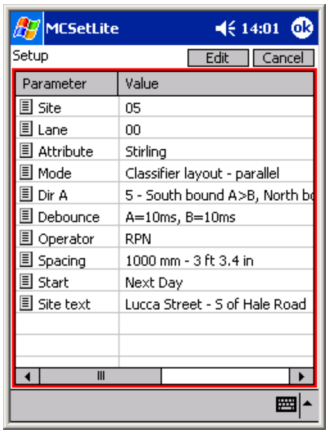
To setup a Roadside Unit from a Site List

1. Connect a Roadside Unit to your Pocket PC.
2. Open a Site List and select the site you wish to setup.
3. Tap the **Setup** button on MCSetLite's toolbar.
4. Tap the **Yes** button to confirm you wish to setup the selected site.



Confirming Site List use

5. The normal **Setup** sheet will appear, giving you the opportunity to review and change any of the survey parameters. Confirm the details and tap the **OK** button.

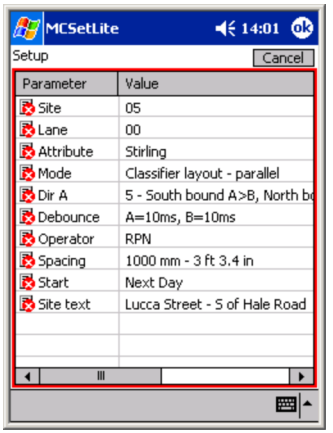


Confirming setup details

6. The setup information will be transferred to the Roadside Unit. Tap the **Roadside Unit Status** button to confirm a successful setup.

To prevent Site List changes

1. If you wish to prevent survey parameter changes when setting up from a Site List, select **Tools » Preferences**.
2. Check the **Lock site list** check box.
3. Tap the **OK** button. Now when you setup a site from a Site List, the survey parameters will be read-only.



Locked Site List prevents changes at setup


Freeway SOUTH 2
5 Riverside Dr
53 City Centre
P EXIT
LEFT LANE

Appendix A

License and Warranty

MetroCount End User Software License

(Version 2002-01-01 - English Language Only)

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MetroCount Traffic Survey Equipment Warranty

(Applicable for the MetroCount Roadside Unit)

(Version 2002-01-01 - English Language Only)

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Our Roadside Unit equipment contains embedded firmware, and other MetroCount products may contain embedded firmware. You may not transfer, rent, lease, lend, assign, copy, modify, translate, sublicense or electronically transmit or receive any MetroCount firmware contained in any of our products. You acknowledge that the firmware in source code form remains a confidential trade secret of Microcom Pty Ltd and therefore you agree not to modify the firmware or attempt to reverse engineer, decompile, or disassemble the firmware, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation.

GENERAL

This limited warranty constitutes the entire undertaking from us to you and any prior representations, statements or undertakings how so ever made are expressly cancelled. This limited warranty shall be governed by and construed in accordance with the laws of the State of Western Australia, and subject to the jurisdiction of the Supreme Court of Western Australia. This limited warranty can only be modified in writing signed by you and an authorised officer of Microcom Pty Ltd. If any provision of this warranty is declared by a Court of competent jurisdiction to be invalid, illegal, or unenforceable, such provision shall be severed from the warranty and the other provisions shall remain in full force and effect. This product is intended for use in the country in which Microcom Pty Ltd sold it (or the EC if first sold in the EC). You have specific legal rights under this document, and may have other rights that vary from state to state and country to country.

INTELLECTUAL PROPERTY

For any further information on this warranty please contact Microcom Pty Ltd, P.O. Box 1182, Fremantle Western Australia 6959. ACN 09 273 410