ReaderMate RM201
Users Guide

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Introduction

CHAPTER 1

This chapter is an introduction to the ReaderMate 201 device and accessories

The ReaderMate 201

The ReaderMate 201 is a portable, ruggedised device for “in the field” collection and storage of logged data within it’s internal memory, for later transfer to one of the PC based ReaderMate programs. It may also be used to change some of the operating parameters within loggers and can display the values of the inputs currently being applied to the loggers.

The ReaderMate 201 is menu driven, with all information being displayed on it’s internal four line LCD display. The display incorporates a backlit facility, to enable the use of the device in poor lighting conditions, but this may be turned off using the keypad to save internal power. Commands and values are entered using the numeric keypad on the front of the RM201. The device operates from internal rechargeable batteries, which can be recharged via a mains adapter which connects to the charging/download lead.

The ReaderMate 201 Accessories

The ReaderMate 201 is provided with four accessories :-

The Infra-Red Probe

The infra-red probe is used for data communications with the logger. One end of the probe connects to the circular connector on the base of the RM201. The other end is placed over the infra-red window on the logger and is held in place by the internal magnet fitted around the infra-red window on the logger.

The probe incorporates a download button. Once a logger and the RM201 have been set up correctly, downloading of data may be performed simply by pressing the button. This will then turn on the RM201, read the specified number of days worth of information from the logger into the internal memory of the ReaderMate 201 (equivalent to option *1) Data Collection* from the main menu) and then switch the RM201 off again.

The Charging/Download Lead

The Charging/Download lead, as it’s name suggests, is used for two purposes - to charge the internal batteries of the RM201 and to transfer any logged data held in the internal memory to one of the larger PC based ReaderMate programs, for permanent storage on the hard disk of the PC.

The Charging/Download Lead connects to the circular connector on the base of the RM201, replacing the infra-red probe when it is required. The other end of the lead ends in a 9 pin serial port connector, which should be connected to the required serial port on the PC when transfer of data is required. If the PC to be used has the older 25 pin style of serial ports, then a 25 to 9 way serial adapter will be required to connect the lead.

The 9 pin serial connector also incorporates a small socket and a small red LED. To charge the RM201, the mains adapter is plugged this socket. The LED on this lead, and an LED just above the RM201 keypad, will illuminate when charging is taking place.

The Mains Adapter

The mains adapter plugs into a standard mains socket and is used to provide the ReaderMate 201 with the required 12V DC charging supply. The other plug on the mains adapter plugs into a small socket on the charge/download lead. When power is applied to the charge/download lead, a small LED on the lead glows. When the lead is connected to the ReaderMate 201 and the ReaderMate 201 is charging, an LED above the keypad also glows.

A full charge of a ReaderMate 201 will take 12-14 hours. Charging may occur whilst the ReaderMate is transferring information to a PC, and since trickle charging is used, the ReaderMate 201 may be left connected to the charger indefinitely without harm.

The Carrying Case

Each ReaderMate 201 is supplied with a case. The case incorporates a shoulder strap and a pocket to hold the infra-red probe. The case has a clear panel so that the ReaderMate 201 may be operated without removing it from the case.

Using the Keypad

CHAPTER 2

This chapter describes how to use the keypad to perform certain tasks.

The ReaderMate 201 is controlled using the keypad on the front of the device. The use of these keys for a number of tasks is as follows :-

Turning On the ReaderMate 201

Pressing any key on the ReaderMate 201 keypad when the device is switched off will switch the RM201 on (the first keypress has no effect apart from switching on the device).

Turning the backlit display On / Off

The key that is marked with a lightbulb symbol has one function - to turn the backlit display on or off. Normally this option is turned off and there must be sufficient ambient light to read the four line LCD display. However in poor light conditions this button may be pressed to switch the backlighting on. The LCD display will then be lit up from behind, making it much easier to read, but at a cost of an additional power drain.

Selecting a Menu Option

The menu options are numbered. Pressing the number next to the option will select that option.

If the menu takes up more than 3 lines of the display then only the first three options will be displayed and the word <*NEXT*> will appear at the bottom of the screen. Pressing the *ENTER* key (also marked *NEXT* in blue at the bottom of the key) will show the next screen of options (this will eventually cycle through to the first set of options again).

Entering a Numeric Value

When entering a number, simply type the number using the number keys (numeric values are chosen in units that do not require decimal points, as there is no decimal point on the keypad).

Entering a Word

Entering a parameter that may consist of letters and/or numbers (such as the logger location) is slightly more involved than entering numbers alone, as there are no letters printed on the keypad. In this case the numbers now act as cursor keys :-

8 = ↑	Select Next Letter
2 = ↓	Select Previous Letter
4 = ←	Select Previous Character in word
6 = →	Select Next Character in word

Thus each character is entered by using the up or down cursor keys to cycle through the letters/numbers until the correct character is shown. Then the right cursor key is pressed to go on to choosing the next character. Each press of the up or down cursor key will select the next letter/number in the sequence. The up arrow will cycle from a space, then A to Z, then a to z, then finally 0 to 9. The down arrow will cycle through this sequence in reverse.

Some of the other keys on the keypad also have functions when entering a word :-

1 =	Select the current character as *a*
3 =	Select the current character as *A*
0 =	Select the current character as *0*
7 =	Go to the start of the word
9 =	Go to the end of the word

Cycling through a set of options

Sometimes a menu may have a set list of options that are available. When this happens the word <*MORE*> will appear next to the option. Pressing the *0* key (also marked in blue with the word *MORE*) will select the next available option.

Moving through a table of data

When viewing logged data stored in the internal memory then the data is displayed as a table. To move through the table, to view the logged data, use the following keys :-

8 = ↑	Select Next row of data
2 = ↓	Select Previous row of data
7 = Home	Select first row of data in table
1 = End	Select last row of data in table
9 = Page Up	Select previous screen for data
3 = Page Down	Select next screen of data

(This is the same layout as a PC numeric keypad)

The Probe Key

The key marked *PROBE* on the keypad duplicates the effects of the download button on the infra-red probe (see *Chapter 1*).

Returning to the previous menu

The *CANCEL* button may be used to return to the previous menu.

Turning Off The ReaderMate 201

Pressing the *CANCEL* button whilst on the main menu will turn off the ReaderMate 201. The ReaderMate 201 will also switch itself off if no key is pressed for a period of 2 minutes.

Using the Menus

CHAPTER 3

This chapter describes the menu options.

The functions of the ReaderMate 201 are controlled using the built in menu-driven software.

The Main menu has seven options :-

1) Data Collection

This option is used to read data from a logger using the infra-red probe. Before using this option ensure both logger and RM201 have be correctly set up (see options *4) ReaderMate Setup* and *6) Logger Setup* of the main menu) and the infra-red probe is connected and has been placed over the infra-red window on the logger.

The message *Reading Logger* will appear. Underneath this is an indication of the progress of the read, e.g. *Block 127 of 528*. The first number will start at *000* and when it becomes equal to the second number the download will be complete.

If communications are interrupted during a download (e.g. the probe is removed from the logger before all the data has been transferred), then the logger will display the following message (the error code may vary) :-

Comms Failure
Error Code 02
<enter> to retry

Press the *ENTER* key to retry the download from the first block, or the *CANCEL* key to return to the main menu. The data that had already been transferred during this download will be lost.

This technique can be used to abort an unwanted download.

If the logger to be read is a multichannel logger then the message

Multi-channel Logger
Reading Pair #1

will appear, and then the window will blank and start reading blocks for the channel pair as normal. This process will be repeated for all channel pairs that have an input that has logged data. Any channel that does not have data (no inputs, or both inputs switched off) will cause the message *No Logging* to briefly appear below the Reading Pair # message, before the program tests the next channel pair for data.

2) Spot Readings

This option is used to view the inputs that are currently being read by the logger.

When selected the following information will appear (for a dual logger) :-

Flow: 0.0000m^3
Rate: 0.00 l/s
Pressure: 10.1 m
<cancel> (0 Secs)

(For a flow logger the pressure line will be blank. For a pressure logger the flow and rate lines will be blank)

The rate line will be initially blank, until two flow pulses have been received, as a flow rate is a calculation based on the time interval between successive pulses. After receiving two flow pulses the flow rate will be calculated and displayed. The flow volume since spot readings were started will also be calculated and the current pressure will be displayed.

The Secs reading will start at 0 and count up, to give an indication of the time spent looking at spot readings. After 60 seconds, however, the spot reader will “time out” and return to the main menu (to conserve internal power of both the logger and RM201).

If the current logger is a multichannel logger, then the message

Multi-Channel Logger
Select Channel Pair
Currently: 1
1,2 <enter>

will appear. You must select the channel pair by pressing the number of the channel to be viewed (e.g. the *1* key to view channel pair 1). The channel pairs available are displayed at the bottom of the screen (in this case 1,2 means channel pairs 1 and 2). After the channel pair has been selected, press the *ENTER* key.

3) View Config

This option may be used to look at the settings of the current logger without changing the values (this option is also useful if the PIN is not known as accessing the change setup option requires the current PIN number to be entered).

The program will then display a number of screens (pages) of information, with two lines of data per screen. At the top of each screen is the title *LoggerMate Data* and the bottom of the screen the message <*next*> appears, to remind you that pressing the *NEXT* key will go to the next screen of data.

The first two lines of the setup display the logger ID and the type (Dual, Flow, Pressure or None).

e.g. *LoggerMate Data*
I.D.: ZZ9999
Log Type: Dual
<*next*>

The next two lines are used to show the location information.

e.g. *LoggerMate Data*
Test Location

<*next*>

The next two lines are used to display the current time and date held in the logger (in GMT format).

e.g. *LoggerMate Data*
Time (GMT) : 14:23
Date: 14/04/97
<*next*>

The next two lines are used to show the *Grand Total* (value of the internal register) and the Flow pulse rate. This page is not shown if the logger does not have a flow channel.

e.g. *LoggerMate Data*
GT: 0000017.660 m^3
At: 10.000 l/Plse
<next>

The next two lines show the current sampling rate and pressure information (the pressure information is not shown if the logger has no pressure channel).

e.g. *LoggerMate Data*
Logging: 1 Minute
Presure: 0.0m
<next>

The final page of information shows the time and date that the setup of the logger was last changed.

e.g. *LoggerMate Data*
Setup Time: 16:20
Setup Data: 09/04/97
<next>

Pressing the *NEXT* key on this page returns the program to the main menu.

4) ReaderMate Setup

This option allows changes to be made to the setup of the ReaderMate 201 itself. Choosing this option presents a submenu of options :-

ReaderMate V1.00L
1) Days to Read
2) Set Time (GMT)
3) Logger Time

An important item to note is that the current version of the internal ReaderMate software is displayed at the top of this screen (in this case Version 1.00L). From here simply press the keys 1 to 3 to choose the desired option

1) Days to Read

When choosing this option, the screen will display the following information :-

Days to read :10
Enter number of days
****
<cancel> <enter>

This option controls the maximum number of days of logged data that the ReaderMate will retrieve from a logger. In this case the current value of 10 shows that the ReaderMate will read up to 10 days of logged information from the logger.

Simply use the keypad to enter the desired number of days, e.g. 5, and then press the *ENTER* key. Pressing *CANCEL* will return to the main menu without making any changes.

Do NOT press enter until a value has been entered, as the ReaderMate will set the *days to read* to 0, and will not read any logged data until this has been changed.

2) Set Time (GMT)

Choosing this option allows the current time and date, as held by the ReaderMate, to be changed. These should always be entered in GMT.

This option is important, as the next option may be used to set the Logger's time to the time held in the ReaderMate when a download takes place.

Choosing this option will display the current time and date, e.g.

Set RM201 Time/Date
Time (GMT): 15:02:56
Date: Mon 14/04/97
(1) Time (2) Date

Press *1* to change the time or *2* to change the date.

When changing the time, type in the number of hours (24 hour format), press *ENTER*, then the number of minutes followed by *ENTER* and finally the number of seconds, again followed by *ENTER*. The time has now been set and the menu returns to setting the time/date.

Setting the date is carried out in a similar way as the time. Type in the days, months and year of the current date, each followed by the *ENTER* key.

Pressing the *CANCEL* key before the last value of the time or date has been entered will return to the previous menu without changing the current value of time and date.

3) Logger Time

The option is used to affect whether the ReaderMate sets the current time of the logger by it's internal clock when downloading data. When chosen, the screen displays the current option, e.g.

Logger Time
Set on download
Set Option <more>
<cancel> <enter>

The *0* key (also marked with *MORE*) is used to toggle between the two available options - *Set on download* or *Leave Unchanged*. If the option is set to *Set on download* then the current ReaderMate time and date will be copied to the logger when the download occurs. If the *Leave Unchanged* option is chosen then this will not occur.

Select the desired option and then press *ENTER*.

5) PC communication

This option is used to download data stored in the internal memory of the ReaderMate 201 to a PC. More information on this process is available in the manual for the PC ReaderMate software.

6) Logger Setup

This option is used to change the internal settings of a logger. When the option is first selected the following screen will appear :-

Enter Security PIN
****
<cancel> <enter>

Each ReaderMate 201 is encoded with a four digit security PIN to prevent unauthorised changes to logger setups. Type the four digits on the keypad and then press *ENTER* (or *CANCEL* if the PIN is not known). If the code is wrong then the message *Incorrect PIN* - will appear on the top line of the display and you may try to enter the code again.

After the correct PIN has been entered, the ReaderMate will check if the logger is a multichannel logger.

If the current logger is a multichannel logger, then the message

Multi-Channel Logger
Select Channel Pair
Currently: 1
1,2 <enter>

will appear. You must select the channel pair by pressing the number of the channel to be viewed (e.g. the *1* key to view channel pair 1). The channel pairs available are displayed at the bottom of the screen (in this case 1,2 means channel pairs 1 and 2). After the channel pair has been selected, press the *ENTER* key.

After selecting the desired channel pair, or if the logger only has a single channel pair, then the ReaderMate 201 will display another menu of options, to change the logger setup. The full list of options for a dual logger is as follows :-

1) New ID
2) Location
3) Logging Interval
4) Logger Type
5) Set Time
6) Flow Pulse Rate
7) Grand Total
8) Pressure Channel

If the logger is a flow logger then option 8) will not be shown, and if the logger is a pressure logger then options 6) and 7) will not be shown (and the pressure channel will now be option 6)).

The options are as follows :-

1) New ID

This option is used to change the logger ID. The display will be as follows :-

LoggerMate Setup
New ID: ZZ9999
<-4 6-> Change: 2^ 8v
<cancel> <enter>

The existing logger ID in this case is ZZ9999. To change the ID the number keys are used like cursor keys, as illustrated by the middle row. Thus the 4 and 6 keys move the cursor left or right, under each character in the ID. The character to be changed can be selected using the 2 and 8 keys and when the ID has been selected, press *ENTER* to keep the new ID or *CANCEL* to retain the previous ID.

The first two characters may be set to a number or letters, but the last four characters must be numbers (and the program will only cycle through numbers when selecting them).

2) Location

When the location option is chosen the display may look something like this :-

LoggerMate Setup
Location: HELLO THER
E
<cancel> <enter>

The middle two lines are used to enter a suitable location description, which may be up to 24 characters long.

The location string uses the number keys on the keypad as cursor keys to enter the description. See the section on *Entering a Word* in Chapter 2 for more information.

3) Logging Interval

This option is used to select one of the four available logging intervals. When first selected the display will look something like this :-

LoggerMate Setup
Logging Interval
Every 1 Minute
select (1-4) <enter>

Pressing the keys 1 to 4 will display the corresponding interval from the table below :-

1 = 1 Minute
2 = 5 Minutes
3 = 15 Minutes
4 = 60 Minutes

Press the *ENTER* key to when the desired logging interval is displayed to select that interval, or the *CANCEL* key to return to the setup menu keeping the previous interval.

4) Logger Type

This option is used to select the inputs on the current channel pair that you wish the logger to read information from. The available options are, Dual Channel Logger, Flow Logger, Pressure Logger and possibly No logging. The *0* key (*MORE*) is used to cycle through the available options (the option to turn logging off for both inputs of the current channel pair, *No Logging*, may not be available for every logger).

Press the *ENTER* key when the desired type is displayed.

5) Set Time

Choosing this option sets the current logger time to be equal to the current ReaderMate 201 time. A message will appear informing you that the logger time has been changed.

e.g. *LoggerMate Setup*
Time Set OK
08:43 15/04/97
Press any key

Press any of the keys on the keypad to return to the setup menu.

6) Flow Pulse Rate

This option is used to change the number of litres that each pulse from a flow transducer represents.

e.g. *Flow Pulse Rate:*
10.000 l/Plse
0 ml/Plse
Enter new Flow Rate

Type in the new desired rate using the numeric keys and press *ENTER* to confirm the new choice or *CANCEL* to keep the previous value.

Please note that the value is entered in terms of millilitres per pulse (ml/Plse) rather than litres per pulse, to avoid the use of the decimal point (1000 ml = 1 litre).

This option is only available if the current channel pair has a flow input and that it has been switched on using option 4) of the setup menu (Flow Logger or Dual Channel Logger selected).

7) Grand Total

This option is used to set the internal register for the flow input of the current input pair. It can be used reset the value to zero or to any other desired value (possibly to match the value of an existing register within a physical meter). When first selected the display will look something like this :-

Current Grand Total
0000017.660 m^3
0 Ltrs
Press digit key

Type in the new desired value for the grand total using the numeric keys and press *ENTER* to confirm the new value or *CANCEL* to keep the previous value.

Please note that the value is entered in terms of litres rather than cubic metres, to avoid the use of a decimal point (1000 Litres = 1 cubic metre). Another item to note is that the value will not set any digits less than the *Flow Pulse Rate* entered in option 6) from the main menu (e.g. if the Flow Pulse Rate is set to 10 litres per pulse then the register will not allow any digit less than 10 litres to be used).

This option is only available if the current channel pair has a flow input and that it has been switched on using option 4) of the setup menu (Flow Logger or Dual Channel Logger selected).

8) Pressure channel

This option used to allow field calibration of pressure transducers. The calibration system used, however, has been superseded by calibration routines available from the ReaderMate PC software, so **this option should not be used.**

7) View Data

This option is used to look at logger data that has been downloaded into the internal memory of the ReaderMate 201. If this option is chosen when the there is no logged data in the internal memory of the RM201 then the following message will appear on the display :-

No Data Files

Press any key

Pressing any key on the keypad will return to the main menu.

If the internal memory does contain some data read from loggers, then the display will show a table of the available data files

e.g. *> OW0001-1 D 15/04/97*
NW0002-2 P 15/04/97
DM0094 P 15/04/97
NT4009 P 15/04/97

Use the 2 and 8 keys to move the cursor (the > mark) next to the data file to be viewed, and the press *ENTER*. If there are more than four data files in the RM201 memory then pressing the 8 (down) key at the bottom of the screen will select the next data file in the list, scrolling the list up to make room for the file on the display. This may be repeated until the last file in the list is reached.

If the name of a data file ends in a dash and a number (e.g. -1) then that data file represents data read from one channel pair of a multichannel logger (thus -1 represents channel pair 1). The letter after the name is the type of data stored (D = dual (flow and pressure), P = pressure and F = Flow). The data shown is the date that the information was read into the RM201.

If a data file is displayed that contains both flow and pressure information (type D in the list), then the RM201 will ask which information you wish to view,

e.g. *OW0001-1 Dual*
1) Flow Data
2) Pressure Data
Select Data Type

Simply press the 1 key to view the flow data or the 2 key to view the pressure data.

When data is first displayed then the screen will be in max/min mode, i.e. the display will show the maximum and minimum readings that were taken during the first day logged.

e.g. *OW0001-1 05/04/97*
Min 11:45 1.8m
Max 03:45 2.0m
<more> maxmin/data

The 2 and 8 keys may be used to look through the max/min values for each day of information in the data file (in the example the max/min readings for the date 05/04/97 are being shown).

To view the logged readings themselves, press the *0* (*MORE*) button (this button can be used between logged readings and max/min data at any time whilst viewing a data file). The screen will change to show the actual data values as a table of information,

e.g. *OW0001-1 05/04/97*
00:00 1.9m
00:30 1.9m 1.9m
01:00 1.9m 1.9m

In the example above the readings were taken at 15 minute intervals (2 data readings are shown per line, so each line represent 30 minutes of data), and the time and value of the readings are shown (the date at the top of the screen is the date of the first row of the table shown on the screen).

The keypad is used as cursors to move through the data. More on the roles of each key in this mode is given in the section on *Moving through a table of data* in Chapter 2.

CHAPTER
4

The Security PIN

This chapter describes the use and initial value of the Security PIN.

When using the ReaderMate 201, a four digit PIN number must be entered when the option 6) Logger Setup is chosen from the main menu. This is to prevent unauthorised tampering with the settings of a logger.

By default the PIN number used for a ReaderMate 201 is **1234**.

If you wish to change this PIN number for a particular ReaderMate 201 then please contact Palmer Environmental (each ReaderMate 201 may have it's own unique PIN number).

If the PIN is changed then the new pin may be recorded in the boxes below :-

If desired this page may be removed from the manual and kept in a more secure area.