

CARDtimer User Manual



CARDtimer User Manual ver 00f 2012-08-30.docx

Author:	Steve Heaton
Checker:	Jason Paul
Printing date and time:	08/12/14, 18:56

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1 REVISION RECORD

Version no.	Revision Date	Reason for Change
00a	2011-05-15	First issue for firmware version ADXR100JADSC
00b	2011-06-07	First issue for firmware version ADXR100KADSC FAQ Section Added
00c	2011-06-13	First issue for firmware version ADXR100KADSC ADXR100LADSC ADXR100MADSC ADXR100NADSC FAQ Section Added
00d	2012-03-09	First issue for firmware version BCKR100RBCSC Added extra EQUIPTYP of BOOT HEATER, JET WASH, HOT TUB, MACHINE POWER, EQUIPMENT SUPPLY
00e	2012-04-19	Covers software versions: ADXR100KADSC ADXR100LADSC ADXR100MADSC ADXR100NADSC BCKR100RBCSC BCKR100SBDSC
00f	2012-08-30	Covers software versions: BCKR100VBDSC

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Indemnification

User agrees to defend, indemnify, and hold harmless, the author from and against all claims and expenses, including solicitors' fees, arising out of the use of the information contained herein.

This equipment shall only be installed by suitably qualified and experienced persons. The timer is microprocessor controlled, and as with all systems, may fail or operate in an unexpected manner in the event of a fault. Always isolate mains supplies before installing, working on or modifying any wiring. Do not rely on the timer to isolate the load, always isolate upstream.

2 INTRODUCTION

2.1 General

- 2.1.1 The CARDtimer is ideal for all situations where the duration of electricity usage needs to be controlled, and it is desirable to avoid coin timers with their inherent security, reliability and emptying issues.
- 2.1.2 The timer owner sells disposable cards to the customer, and sets the timer to provide an appropriate duration of electricity usage for the appliance.
- 2.1.3 For example, for a sun-bed, the owner may sell the cards to the customers at £3.50, and set the timer to provide 30 minutes of power to the sun-bed.
- 2.1.4 The cards can be sold in pounds, euros or any other currency.

2.2 Options

- 2.2.1 The standard cards are generally imprinted "ONE CREDIT". Other text is available from your supplier.
- 2.2.2 Timers with Option A have a second controlled output which stays closed for 5 minutes after the main contact has opened. This may be used for fans or auxiliary lighting.
- 2.2.3 Timers with Option L have a backlit LCD display, ideal for installations in areas with low lighting levels, or for controlling lighting where the timer will not be easily visible until the lights are switched on by the timer itself.
- 2.2.4 Custom software applications can often be developed on request.



2.3 Example Applications:

- Gym equipment, Sun-beds, Tanning Booths
- Snooker Table Lights
- Vehicle cleaning – Vacuums, Jet-wash, etc
- Squash Court and Sports Field Lighting
- Washing Machine (operating the water inlet solenoid)
- Gaming Machines (control power to the display)
- Showers (including electric showers up to 25kW)
- Heating (control live supply to gas or oil heating system)
- Hairdryers & Hair Straighteners
- Air-conditioning
- Rented Workshops, Garages, & Premises

2.4 Key Features

- Uses secure disposable magnetic cards
- When card is inserted, time credit is copied from the card to the timer
- Multiple cards may be entered in one session
- Card is erased and permanently marked
- Cardtimer display counts down in hours, minutes and seconds
- User settable duration of 0 to 999,999seconds (0 to 227hrs) per card
- Maximum accumulated time is unlimited
- User friendly 16 character LCD display
- Master Programming Card allows settings to be easily changed
- Switches up to 100A and can supply up to 25kW of load
- Red led clearly indicates the supply contactor is closed
- Optional warning beeper when credit running out
- No battery replacement required – design lifetime 20 years
- Independent of currency
- Landlord Mode (dispenses electricity without charge) for friends and family use

2.5 Business Benefits

- 2.5.1 Incidental sales resulting during the purchase of cards
- 2.5.2 Sales are not lost due to consumers not having the correct change
- 2.5.3 Ability to flexibly change the time and cost per session
- 2.5.4 No attraction for theft
- 2.5.5 Better control of cash (no need to periodically empty meters of coins)

3 DEFAULT REGISTER VALUES

3.1 Settings

- 3.1.1 The CARDtimer has various registers which can be adjusted by the user, depending on the application.
- 3.1.2 The default values are shown here, together with any adjustments made by your supplier or electrician.

Value	Factory Setting	Adjusted Value
EQUIPTYP text to be displayed alternately with INSERT CARD, when the credit has reached zero	108 [BLANK]	
TIMECRED number of seconds credited for each card inserted	30sec	
MAXCRED number of seconds of credit which can be added by the user	60sec	
TIMEWARN start of warning sound that credit is running out	15sec	
SOUND sound confirmations when keys are pressed, cards are inserted, or the display shows a message	ON	
TICK tick sound each time a second elapses	ON	

4 SPECIFICATION

4.1 Electrical

Voltage Rating	220-250Vac 50Hz
Current rating	100A main contactor 5A auxiliary contactor (option A timers only)
Maximum cable diameter	8mm (main terminals) 3.2mm (auxiliary terminals)

4.2 Physical

Height	171mm
Width	124mm
Depth	92mm
Weight	950g

4.3 Timing

Duration per card (user settable)	1 to 999,999 sec (0 to 277hrs)
Maximum time credit (user settable)	unlimited
Timing accuracy	1%

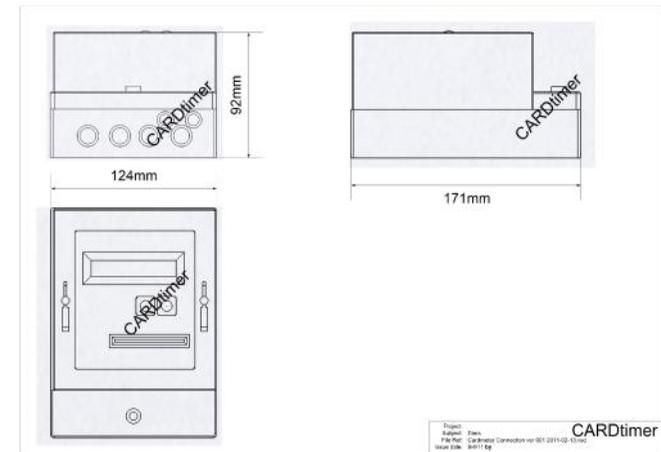
4.4 Misc

Design lifetime	20yrs
IP rating	IP20

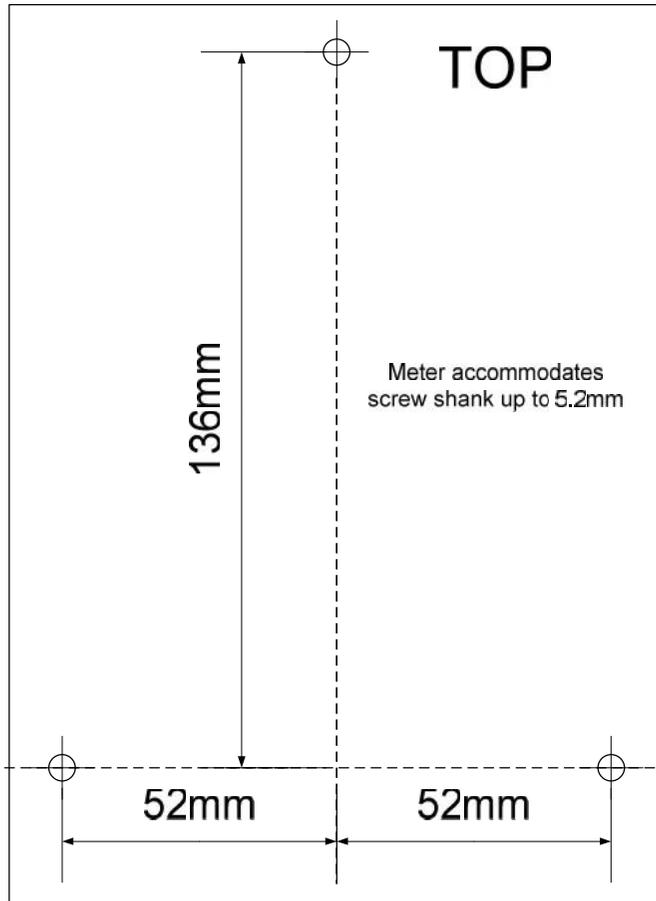
5 INSTALLATION INSTRUCTIONS

5.1 Dimensions

5.1.1 Allow 50mm clear below the timer for wiring connections.



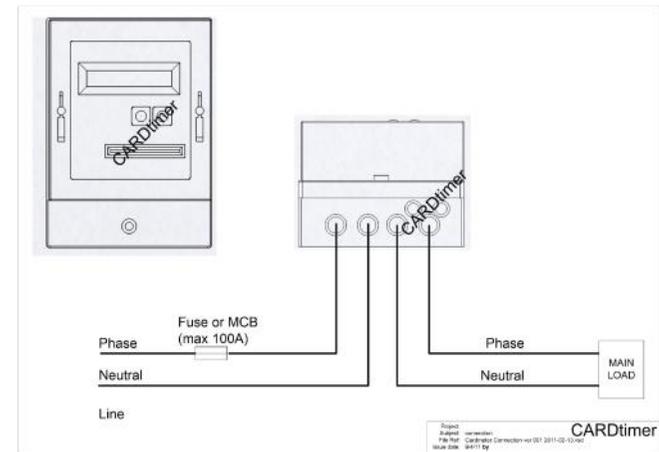
5.2 Drilling Template



6 CONNECTION

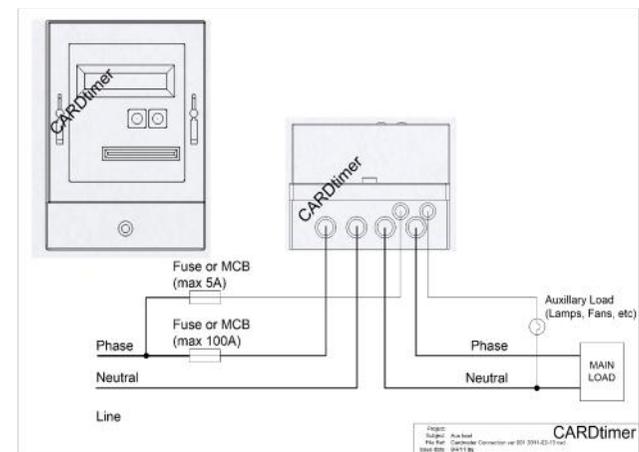
6.1 Connection – Single Load

6.1.1 The CARDtimer is able to support a load of up to 100A from the main terminals.



6.2 Connection – Auxiliary Load (Option A)

- 6.2.1 The CARDtimer is capable of switching an auxiliary load of up to 5A (timer with option A only).
- 6.2.2 The relay contact within the timer opens 5 minutes after the main contact opens, and is ideal to operate background lamps, fans and so on after the main contact has opened.



7 PROGRAMMING INSTRUCTIONS

7.1 Introduction

7.1.1 The CARDtimer can only be programmed using the **master programming card** originally supplied with the timer (replacements are available from your supplier).



7.1.2 The **master programming card** is inserted in the card slot on the front of the CARDtimer, magnetic strip upwards. This can be done whenever "INSERT CARD" is displayed, or when the timer is running (timer continues to count down in the background during programming).



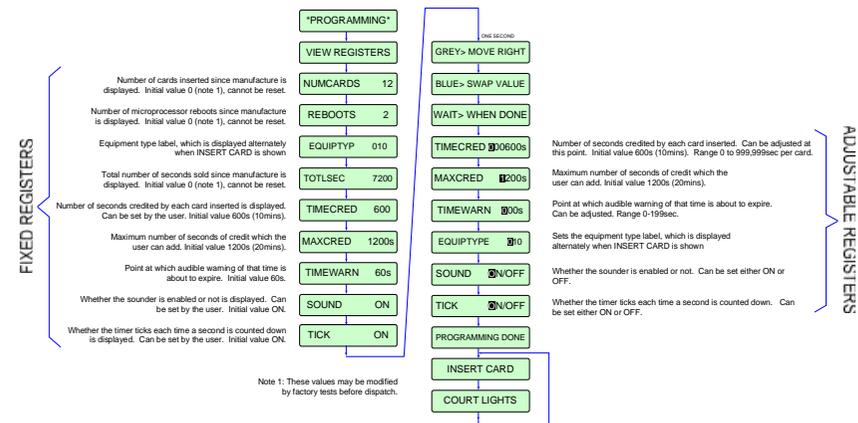
INSERT CARD

7.1.3 The card needs to be inserted in one smooth action. If the card is inserted too fast, or too slowly, then the timer will display "CARD ERROR".

CARD ERROR

7.1.4 If this happens, wait for the timer to display "INSERT CARD" and then try again.

7.1.5 When you have successfully inserted the **master programming card**, the display will show "*PROGRAMMING*", and will cycle through the registers as shown below. The actual values may vary slightly depending on the software version.



8 FIXED REGISTERS

8.1 Introduction

8.1.1 Once in programming mode, the CARDtimer will provide information from its internal registers. These registers contain records of various values, some of which are set to zero at the time of timer manufacture. It is not possible to subsequently reset or change these registers, so they provide a true record of the usage of the timer.

8.2 NUMCARDS

8.2.1 This register records the number of cards successfully used by consumers since the manufacture of the timer and this value will increase by one each time a card is inserted.

8.2.2 This register is set to zero at the time of manufacture and cannot be reset. Note, this value may be modified by factory tests before dispatch.

NUMCARDS 155

8.3 REBOOTS

8.3.1 This register records the number of reboots of the microprocessor since the manufacture of the timer. A reboot occurs each time the mains fails. If there are an excessive number of reboots it may indicate that there have been attempts at tampering with the timer.

8.3.2 This register is set to zero at the time of manufacture and cannot be reset. Note, this value may be modified by factory tests before dispatch.

REBOOTS 3

8.3.3 This number should be noted down after installation, and any significant increase investigated.

8.4 EQUIPTYP

8.4.1 This register records the text to be displayed alternately with INSERT CARD, when the credit has reached zero.

8.4.2 This register is set to zero at the time of manufacture and can be altered by the user.

EQUIPTYPE 010

8.4.3 The acceptable values are as follows:

- 0 No equipment type (ie blank)
- 1 SUNBED
- 2 TANNING BOOTH
- 3 SNOOKER TABLE
- 4 LIGHTS
- 5 HEATING
- 6 HEATER
- 7 VAC
- 8 VACUUM
- 9 POOL LIGHTS
- 10 COURT LIGHTS
- 11 SQUASH COURT
- 12 GAMES MACHINE
- 13 PITCH LIGHTS
- 14 WASHING MACHINE
- 15 TUMBLE DRIER
- 16 SHOWER
- 17 HEATING SYSTEM
- 18 HAIR DRIER
- 19 HAIR STRAIGHTNERS
- 20 AIRCON
- 21 AIRCONDITIONING
- 22 SHOWER 1
- 23 SHOWER 2
- 24 POWER PLATE
- 25 JETWASH
- 26 HOT TUB
- 27 MACHINE POWER
- 28 EQUIPMENT SUPPLY

29-199 No equipment type (ie blank)

8.5 TOTLSEC

8.5.1 This register records the number of seconds purchased by consumers since the manufacture of the timer. This value will increase by the amount of time purchased by each card when it is inserted.

8.5.2 This register is set to zero at the time of manufacture and cannot be reset. Note, this value may be modified by factory tests before dispatch.

TOTLSEC 7200

8.6 TIMECRED

8.6.1 This register records the number of seconds credited for each card inserted.

TIMECRED 600

8.6.2 This register is set to 600sec at the time of manufacture.

8.6.3 The value can be changed (see next section).

8.6.4 If TIMECRED is set to less than MAXCRED, then MAXCRED will be updated automatically to match TIMECRED. If MAXCRED were not adjusted in this way, it would not be possible to add any credit to the timer, as any credit added by the insertion of a card would result in an amount of credit above MAXCRED, and so would not be accepted.

8.6.5 If TIMECRED is set to zero, the CARDtimer erases any remaining time, and enters LANDLORD MODE. In this mode the meter dispenses electricity without the user needing to enter cards. This mode is ideal for testing purposes, or friends and family.

LANDLORD MODE

8.6.6 To return to normal operation, program the TIMECRED register to a value other than zero.

8.7 MAXCRED

8.7.1 This register sets the number of seconds of credit which can be added by the user.

8.7.2 For instance, if MAXCRED is set to 1200 (seconds) and TIMECRED is set to 600 (seconds), then a maximum of two cards can be inserted at a time. Another card can only be inserted after the displayed credit falls below 600 seconds.

MAXCRED 1200s

8.7.3 MAXCRED can be set between zero and 999999seconds.

8.7.4 If accepting credit from a card will cause the credit to exceed MAXCRED, the display shows CREDIT FULL.

8.7.5 If TIMECRED is set to less than MAXCRED, then MAXCRED will updated automatically to match TIMECRED. If MAXCRED were not adjusted in this way, it would not be possible to add any credit to the timer, as any credit added by the insertion of a card would result in an amount of credit above MAXCRED, and so would not be accepted.

8.8 TIMEWARN

8.8.1 This register shows when consumers will be warned that their credit is running out. For example, if the TIMEWARN is set to provide 60s then a warning sound will be produced by the timer one minute before the credit runs out. This gives consumers a chance to purchase additional credit.

8.8.2 This register is set to 60sec at the time of manufacture. It can be changed by the user (see elsewhere in this section). Range is 0-199 seconds.

TIMEWARN 120s

8.9 SOUND

8.9.1 This register records whether the timer will sound confirmations when keys are pressed, cards are inserted, or the display shows a message.

SOUND ON

8.9.2 Setting SOUND to OFF automatically sets TICK to OFF.

8.9.3 This register is set to ON at the time of manufacture. It can be changed to OFF by the user (see following section).

8.10 TICK

8.10.1 This register records whether the timer will produce a tick sound each time a second elapses. This can be useful to alert users that the timer has started, and their credit has begun to be used up.

TICK ON

8.10.2 Setting SOUND to off automatically sets TICK to OFF.

8.10.3 This register is set to ON at the time of manufacture. It can be changed to OFF by the user (see following section).

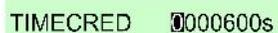
9 VARIABLES

9.1 Introduction

- 9.1.1 The variables in this section are settable by the user. You will need to have entered the programming mode using the **master programming card**, see the previous section.
- 9.1.2 Registers which may be adjusted are displayed with a black flashing cursor, at the digit or value position which can be changed.
- 9.1.3 If a key is not pressed, the CARDtimer will move on to the next settable value after 5 seconds.
- 9.1.4 If you change a value, wait for 5 seconds after your last key press. The time will accept your value and move to the next settable value.
- 9.1.5 If you make a mistake, just let the timer step through all the settable values, and then start again, by inserting the **master programming card** again.

9.2 Example of Changing a Register

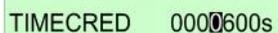
- 9.2.1 The TIMECRED register shows the number of seconds that will purchased by consumers for each insertion of a card. For example, if you want to provide 25 minutes for each insertion of a card (1500 seconds), then set this value to TIMECRED 1500s.
- 9.2.2 The display will show the present value, with a flashing cursor.



TIMECRED 0000600s



- 9.2.3 Use the grey button to move the cursor under the digit you wish to change.



TIMECRED 0000600s



- 9.2.4 Press the blue button to change the digit value.



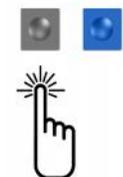
TIMECRED 0001600s



- 9.2.5 Press the grey button to move on to the next digit.



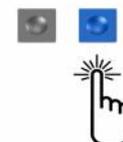
TIMECRED 0001600s



- 9.2.6 To change the digit to a 5, press the blue button repeatedly until 9 shows, and then continue pressing and the value step through 0, and count up to 5.



TIMECRED 0001500s



- 9.2.7 The value is now changed to 1500s, wait 5 seconds and the timer will move on to the next settable value.
- 9.2.8 If you have made a mistake, then wait until the PROGRAMMING DONE message has displayed, and then start again inserting the master programming card.

9.3 Completing Programming

- 9.3.1 Finally, after the opportunity to change any of the variables, the timer will display PROGRAMMING DONE and then revert to the timer function.

PROGRAMMING DONE

10 USER INSTRUCTIONS

10.1 Introduction

- 10.1.1 The CARDtimer provides electricity for a set amount of time whenever a card is inserted.



- 10.1.2 A card can be inserted whenever "INSERT CARD" is displayed, or when the timer is counting down.

INSERT CARD

- 10.1.3 Each card needs to be inserted in one smooth action. If the card is inserted too fast, or too slowly, then the timer will display "CARD ERROR".

CARD ERROR

- 10.1.4 If this happens, wait for the timer to display "INSERT CARD" and then try again.
 10.1.5 If you insert a card which has previously been used, the card will be ignored.
 10.1.6 When you have successfully inserted the card, credit will be added to the timer, and the countdown will begin. The red light on the front of the timer will light.

TIME: 00:05:00

- 10.1.7 When the time is nearly elapsed, the timer may make a warning sound, and then the electricity will be cut off. The red light on the front of the timer will go out.
 10.1.8 You can insert another card at any time to extend the amount of time purchased.
 10.1.9 If you have card problems, the meter owner can interrogate internal registers of the meter to determine what cards have been inserted and if any issues have been encountered in processing your cards.

11 FREQUENTLY ASKED QUESTIONS

11.1 Display

Q. The display shows **CARD ERROR**. What does this mean?

A. Each time a card is inserted, the magnetic data is read off the card. If the data read does not match that which the timer is expecting for a valid card, the display will show **CARD ERROR**.

The most common reason is that the card has been inserted too quickly or too slowly (the card will not be erased in this instance). Always ensure that the card is inserted with one smooth action.

The card may have already been used (look for an indentation in the card showing it has already been “clipped”).

The card may not have been supplied by your original supplier. Only cards from the original supplier of the **CARDtimer** will add credit to the **CARDtimer**.

The card may have been erased by having been stored in a magnetic field (ie on a loudspeaker, on top of the television, or next to credit cards). If this happens, you can expect your customer to be in contact. It is recommended to check the total number of cards the customer has bought from you, the total inserted and the number of cards the customer has not used yet.

Q. The display shows **CREDIT FULL**. What does this mean?

A. Each time a card inserted, the magnetic data is read off the card. If the data read matches that which the timer is expecting for a valid card, and there is zero credit on the timer, then the credit will be erased from the card and transferred to the timer.

If there is already some remaining credit on the **CARDtimer**, and another card is inserted, the timer will check the maximum amount of credit which allowed to accumulate. This is set with the register named **MAXCRED**.

If cards are inserted, that if accepted by the timer, would result in a credit in the timer of greater than **MAXCRED**, then they are not erased and the display shows **CREDIT FULL**.

For instance, if **TIMECRED** is set to 60 seconds (so that each card gives 60 seconds of credit), and **MAXCRED** is set to 180 seconds, then up to three cards can be inserted. Additional cards will not be accepted until the amount of remaining credit falls to 120sec or less.

Whenever the value of **TIMECRED** is changed by the user to a value above the current setting of **MAXCRED**, the timer automatically updates the value of **MAXCRED** to match **TIMECRED**. In this instance only once card can be credited to the timer. Any additional valid cards inserted will not be erased, and **CREDIT FULL** will be show on the display.

Q. The display shows **MAINS FAILED**. What does this mean?

A. If the mains supply fails, such that the microcontroller within the timer stops functioning, then when the supply is restored, the microcontroller performs a self-test. During this initialisation, the settings in place prior to the mains failure are reinstated and the display shows **MAINS FAILED** during this process.

Q. The display shows **LANDLORD MODE**. What does this mean?

A. If **TIMECRED** is set to zero, the **CARDtimer** erases any remaining time, and enters **LANDLORD MODE**. In this mode the meter dispenses electricity without the user needing to enter cards. This mode is ideal for testing purposes, or friends and family. To leave landlord mode, set **TIMECRED** to a value other than zero.

11.2 Card Entry

Q. What should I see when inserting a value card?

When inserting a value card, the meter will display ***THANK YOU***. This will remain on the display for two seconds. On removal, the card will be erased and marked (“clipped”).

Q. The display shows **CARD ERROR**.

A. The fact that **CARD ERROR** is shown, means that there is data on the card, but it is not recognised as valid. The data on the card may be corrupt, or the card may have been inserted too fast or too slow. It is important to insert the card in one smooth action. Only value cards provided by your original supplier will work with the **CARDtimer**.

Q. The timer ignores the fact I have inserted a card.

A. Each time a card is inserted, the magnetic data is read off the card. If the card is blank or corrupted, or the card has been inserted too fast or too slow, the card will not be recognised. Check to see if the card has previously been used (look for three small indentations). It is important to insert the card in one smooth action.

Q. The card is difficult to pull out.

A. When the credit from a valid card is accepted by the meter, and the card is removed, it is marked with three small indentations. The process of producing these indentations results in slight resistance when the card is being withdrawn.

Q. I have lost the meterman card?

A. Additional meterman cards are available from your supplier for a nominal charge.

Q. I need some more cards, what do I do?

A. Additional timer cards are available from your supplier. You will need to identify yourself for security reasons and describe the printed text on the card clearly to make sure that the correctly coded cards are supplied for your meter.

Q. What options does the meter have?

A. The following factory options are available:

Option A: Auxiliary relay output

Option L: Backlit display