Contents

1   INTRODUCTION

1.1   General

1.1.1   The 5188A Cardmeter is designed to control the supply of electricity in rented accommodation, marinas, holiday lets, and other locations where it is desirable to only supply power when it has been paid for in advance.

1.1.2   Unlike coin meters, there is no money stored in the meter, and hence no temptation for theft. The credit is loaded on to the meter using disposable magnetic cards (called VALUE CARDS).
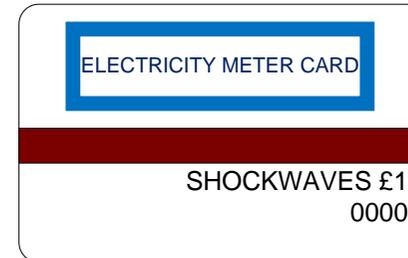
1.1.3   The landlord sells cards to the tenant at their face value, commonly £10 per card. The tenant then inserts the cards and the credit is transferred to the meter (at this point the credit on the card is erased and the card marked with an indentation to show it has been used). The meter will then allow a set amount of electricity to be consumed, depending on the unit rate and standing charge settings programmed in by the landlord. When the electricity bill arrives, the landlord pays this using the proceeds from the sale of cards to the tenants.

1.1.4   The meter can also be set to recover the standing charge. The landlord programmes in the standing charge as a weekly rate, and every 1/100th of a week (1.63hrs), the remaining credit is reduced by 1/100th of the weekly rate.

1.1.5   If set by the landlord, the meter can be allowed to run into debt. When all the credit is used up the electricity is disconnected. The tenant than then press the EMERGENCY CREDIT (grey button), this will then restore the supply and allow the meter to accumulate debt up to a set maximum. When this level is exceeded, the supply is again disconnected, and will only be restored when sufficient credit has been received by the meter by the insertion of cards to create at least a positive (credit) balance of £1.

1.1.6   Dual-rate (Economy7 tariff) meters are available. Separate rates for unit cost can be programmed on the dual rate meters, and are selected by the use of an internal or external timer. Dual-rate meters can also be used for single rate use by setting the pence per unit (ppu) to the same amount for Rate 1 and Rate 2.

1.2   Fraud Prevention

1.2.1   The meter is extensively protected against fraud using the following means:

1.2.2   Reverse energy flow detection – to prevent attempts to operate the meter in reverse.

1.2.3   EMC Fraud – the meter is protected against external electrical influences which may be used to attempt to reset the system controller. If detected the meter indicates LOCK OUT and will need to be reset using the meterman card.

1.2.4   Third Party Card Supply – The supply of cards is carefully controlled to ensure that programmed cards are difficult and uneconomical to obtain other than for legitimate users. The meter contains a card counter, which should be checked to ensure the meter is not receiving more credit than the landlord has supplied to the tenant.

1.2.5   Terminal Seals – all connections upstream of the meter should be appropriately sealed using wire seals and these should be regularly inspected for tampering.

1.3   Connection

1.3.1   The CARDmeter is able to support a load of up to 100A from the main terminals.
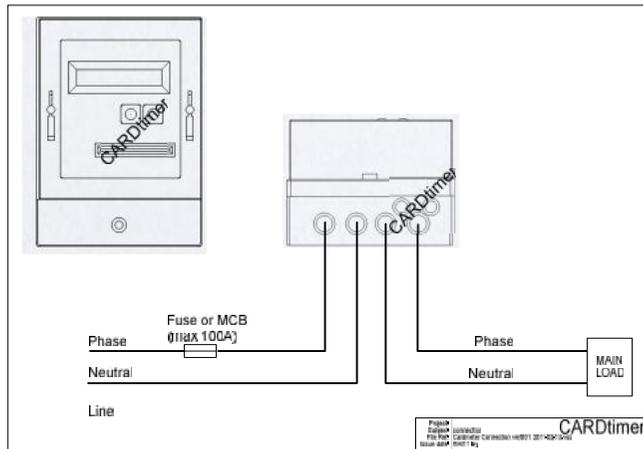
2   CONNECTION

2.1   Cable Connection

2.1.1   The meter is designed to be installed into the main supply meter tails, upstream of the distribution board. If installed on sub-circuits (for instance for air-conditioning units), then it is recommended that cable with a sufficient cross-section is used to ensure a secure connection.

2.1.2   The cables to and from the meter must be protected by a suitable protective device upstream.

2.1.3   Dual-rate meters have a separate terminal (Terminal 1), which when connected to neutral using a time-switch will select the alternative charging rate.

2.1.4   The meter has ingress protection to level IP20, that is Protection against fingers or other object not greater than 80mm in length or less than 12.5mm in diameter.

3   USER SETTINGS

3.1   Getting Started

3.1.1   When the supply is first connected, the meter powers up and displays the software version (currently CPM-SM V1.6C-4F) and then remaining credit.

3.1.2   As supplied the meters have £1 of credit, so the display will read R1 CRED £1.00. This means that the currently operating tariff is R1, that the account is in credit, and that credit is £1.00. The supply is also connected (you can hear the relay clunk) and the led on the front panel lights).

3.1.3   The led will remain lit if less than 12.5W is drawn and no current will be recorded. When an average of more than 12.5W is drawn in a five minute period, the meter will record all consumption.

3.1.4   Pressing the SETTINGS DISPLAY (blue button) allows the settings of the meter to be reviewed (these are the settings that both the landlord and tenant can view):

**DISPLAY*TEST*	
TIME 22:04	The current time as used to apply the 1/100th of the weekly standing charge every 1.63hrs.
T.CREDIT £1	The total amount of credit inserted into the meter.
T.CARDS 00001	The total number of cards used to insert credit into the meter.
STCH/WK £0.00	The standing charge rate applied per week.
KWH 08713.42 R1	The total number of kWh consumed at Rate 1.
KWH 01150.23 R2	The total number of kWh consumed at Rate 2.*
RATE 1 010.00ppu	The set cost per kWh on Rate 1 (pence per unit).
RATE 2 010.00ppu	The set cost per kWh on Rate 2 (pence per unit).*
KWH 09863.65 TOT	The total energy passed through the meter.
DISPLAY END	
R1 CRED £1.00	Returns to the original display on pressing SETTINGS DISPLAY.

3.1.5   The meter reverts to displaying the current credit if no key is pressed for 30 seconds.

3.1.6   *Single rate meters may not display the rate 2 information.

3.2   Setting Rates

3.2.1   The METERMAN CARD is required to setup the meter for your chosen tariff.
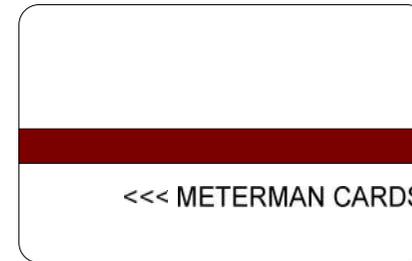
<<< METERMAN CARDS

3.2.2   The meterman card is similar to a card used to apply credit to the meter, although it carries no credit and is not erased and so can be used many times.

3.2.3   Keep the meterman card safe, storing away from magnetic fields which may inadvertently affect the magnetic information stored on the card. We recommend ordering an additional meterman card and storing this separately for emergencies.

3.2.4   Insert the card in to the meter as indicated by the arrows on the card. The meter will display REMOVE CARD if the data has been read correctly. When the card is removed #PROGRAMMING# will be displayed. If this is not seen, insert and withdraw the card again, ensuring that when REMOVE CARD is seen, the card is immediately removed.

3.2.5   Pressing the SETTINGS DISPLAY (blue button) allows the settings of the meter to be reviewed and later changed if required (these contain some settings that only the landlord can view):

3.3   Typical Menu for Single Rate Meters

RATE 1 010.00ppu	The set cost per kWh on Rate 1 (pence per unit).
DEBT/WK £000.00	The Debt Collection rate per week.
T.DEBT £0000.00	The total outstanding debt.
STCH/WK £000.00	The standing charge rate applied per week.
TIME 22:27	Time now.
E.CRED £000.00	The Emergency Credit Value allowed.
E.AVAIL £000.00	The Emergency Credit allowed only if credit below this value.
PROGRAMMING END	

3.4   Typical Menu for Dual Rate Meters

TIME 22:27	Time now.
DATE 24/01/2010	Today's date.
T.CREDIT £00001	The total amount of credit inserted into the meter.
T.CARDS 00001	The total number of cards used to insert credit into the meter.
STCH/WK £000.00	The standing charge rate applied per week.
KWH 08713.42 R1	The total number of kWh consumed at Rate 1.
KWH 01150.23 R2	The total number of kWh consumed at Rate 2.*
RATE 1 010.00ppu	The set cost per kWh on Rate 1 (pence per unit).
RATE 2 010.00ppu	The set cost per kWh on Rate 2 (pence per unit).*
KWH 09863.65 TOT	The total energy passed through the meter.
E.CRED £000.00	The Emergency Credit Value allowed.
DEBT/WK £000.00	The Debt Collection rate per week.
T.DEBT £0000.00	The total outstanding debt.
PROGRAM NO 24	Our standard default program for the change of rates.
07:30 R1 AW AY M	The start time of the Morning R1 rate.
00:30 R2 AW AY A	The start time of the Afternoon R2 rate.
00:00 R? ? ? M	Next tariff change point (if desired). Up to 15 possible.
AREA CODE 103	The original card type for the meter (modified by us for use with SHOCKWAVES cards).
PROGRAMMING END	

3.4.1   To change a setting, press the EMERGENCY CREDIT (grey button) and a cursor will appear.

3.4.2   This can be tabbed across under the text by using the SETTINGS DISPLAY (blue button). To change a value, do not release the EMERGENCY CREDIT button, but press the SETTINGS DISPLAY button simultaneously to change the value. If you miss the value you want, continue and the required value will come around again.

3.4.3   Press the SETTINGS DISPLAY button on its own to store the new setting.

3.5 Example 1 – Single Tarrif

3.5.1   Make a note of your standing charge and cost per kWh. For example:

Scottish Power
14.8p per kWh.
Standing charge £24.80 per quarter (divide by 13 to give the weekly standing charge of £1.91).

3.6 Inputting the settings

3.6.1   Insert and remove the meterman card.

3.6.2   Cycle through the settings using the SETTINGS DISPLAY button until you reach STCH/WK £000.00

3.6.3   Press and HOLD the EMERGENCY CREDIT button.

3.6.4   Press and Release the SETTINGS DISPLAY whilst still holding the EMERGENCY CREDIT BUTTON until the correct value is shown.

3.6.5   Release the EMERGENCY CREDIT BUTTON and repeat the process until all the digits are set correctly. Note you need to set the WEEKLY standing charge, found by dividing the quarterly standing charge by 13, in this case £001.91. The resulting display should read **STCH/WK £001.91**.

3.6.6   Press the SETTINGS DISPLAY button to store the new setting and display the next parameter.

3.6.7   Repeat setting **RATE 1 014.80ppu** and if your meter has a setting for two rates, then set **RATE 2 014.80ppu**. On single rate meters, you will only need to set RATE 1.

3.7 Example 2 – Dual Tarrif

3.7.1   Make a note of your standing charge and cost per kWh. For example:

Scottish Power
14.8p per kWh Normal (day) rate.
3.8 per kWh Low (night) rate.
Standing charge £24.80 per quarter (divide by 13 to give the weekly standing charge of £1.91).

3.8 Inputting the settings

3.8.1   Insert and remove the meterman card.

3.8.2   Cycle through the settings using the SETTINGS DISPLAY button until you reach STCH/WK £000.00

3.8.3   Press and HOLD the EMERGENCY CREDIT button.

3.8.4   Press and Release the SETTINGS DISPLAY whilst still holding the EMERGENCY CREDIT BUTTON until the correct value is shown.

3.8.5   Release the EMERGENCY CREDIT BUTTON and repeat the process until all the digits are set correctly. Note you need to set the WEEKLY standing charge, found by dividing the quarterly standing charge by 13, in this case £001.91. The resulting display should read **STCH/WK £001.91**.

3.8.6   Press the SETTINGS DISPLAY button to store the new setting and display the next parameter.

3.8.7   Repeat setting **RATE 1 014.80ppu** and **RATE 2 003.80ppu**.

4 ADDING CREDIT

4.1 Value Cards

4.1.1 When inserting a value card, the meter will display TOKEN VALUE £10 (or other value as appropriate). This will remain on the display for 5 seconds.

4.1.2 On removal, the card will be erased and marked ("clipped").

ELECTRICITY METER CARD

SHOCKWAVES £10
03000

Erasure marks ("clippings")
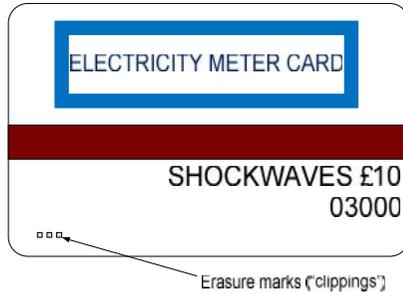
4.1.3 If the display shows CARD ERROR, the most likely reason is that the card has been inserted too quickly or too slowly (the card is not erased in this instance). Insert the card with one smooth action.

4.2 Card Reading Errors

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

4.2.2 The card may not have been supplied by SHOCKWAVES. Only SHOCKWAVES cards will add credit to the SHOCKWAVES cardmeter.

4.2.3 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 tenant to be in contact. It is recommended to check the total number of cards the tenant has bought from you, the total inserted (T.CARDS) and the number of cards the tenant has not used yet to make sure these agree.

4.3 Emergency Credit

4.3.1 Emergency Credit is a way that tenants can obtain additional electricity, even if they don't have any value cards available with which to add credit to the meter.

4.3.2 The setting **E.AVAIL** sets the point at which the Emergency Credit button becomes active. For instance if the following is set:

E.AVAIL £000.50

The tenant cannot obtain emergency credit until less than 50p credit is remaining on the meter. When the meter indicates a credit value below 50p, pressing the emergency credit button will add credit based on the setting of E.CRED, ie:

E.CRED £005.00

will add £5 of emergency credit when the emergency credit button is pressed.

4.3.3 Once all the emergency credit has been used up, the meter must have value cards inserted to bring the credit back to at least £1before the electricity supply is restored.

4.3.4 So if the emergency credit (E.CRED) was set to £5, and the tenant used all this up, the supply would be disconnected. The tenant must then insert at least £6 to reconnect the power. It is suggested that emergency credit is used, it is set to £1 less that the value card denomination that the tenant normally uses, meaning that one value card can restore power.

4.3.5 Recommended settings:

Smallest Value Card used by tennant	E.AVAIL	E.CRED
£5	£000.50	£004.00
£10	£000.50	£009.00
£20	£000.50	£019.00*
£50	£000.50	£049.00*

*You may wish to limit the level of emergency credit in these instances to a lower value.

5 RESET FUNCTION

5.1 Details

5.1.1 You will need to reset the meter if the meter has disconnected the supply and locked out.

5.1.2 This will occur if a possible attempted fraud has been detected (the meter will display LOCKED OUT), or of reverse running has been detected (the display will flash RED meaning Reverse Running Detected).

5.1.3 The meter is reset by setting Rate 1 to 000.00ppu (see Setting Rates example above), and then pressing the SETTINGS DISPLAY (blue button) repeatedly until EC&DIS TO CLEAR is displayed. At this point, both EMERGENCY CREDIT and SETTINGS DISPLAY buttons are pressed simultaneously.

5.2 Other Parameters Reset

5.2.1 Emergency Credit Value

5.2.2 Emergency Credit Availability Point

5.2.3 Pence per kWh for all rates

5.2.4 Outstanding debt

5.2.5 Debt collection per week

5.2.6 Standing charge per week

5.2.7 Total cards

5.2.8 Total credit

5.2.9 Credit (debt)

5.2.10 Reverse running flag

5.2.11 After following this procedure, you will need to reset these registers to your chosen values.

6 SPECIFICATION

6.1 Electrical Specification

Contactor rating	100A
Main Terminal diameter	8mm nominal
Auxillary terminal diameter	3mm nominal

Operating voltage	240V (+/-10%)
Frequency	50Hz
Current range	20A to 100A

Anticreep threshold (power)	12.5W (+/-20%) averaged during time
Anticreep threshold (time)	Existing below power threshold for 288 seconds
Indication	Pulse led permanently lit during anti-creep active
Deactivation	Exceeding average 12.5W for more than 288 seconds

7 FREQUENTLY ASKED QUESTIONS

7.1 Section 1

7.1.1 The tenant has moved out. Can I delete all the remaining credit from the meter?

7.1.2 To delete any remaining credit in the meter, set Rate1 to 000.00ppu, then perform a reset of the meter. See the section on resetting the meter.

7.1.3 My tenant owes me £50 for electricity. Can I install a cardmeter and use it to collect the debt?

7.1.4 Some versions of the meter allow a fixed debt to be collected at a weekly rate. This works in a similar way to the standing charge. The landlord programs in the debt charge as a weekly rate, and every 1/100th of a week (1.63hrs), the remaining credit is reduced by 1/100th of the weekly rate. So the £50 could be recovered at £5 per week for instance.

7.1.5 The meter is reading zero credit and the power is cut off. What can I do?

7.1.6 Inserting a value card will restore power or press the EMERGENCY CREDIT button. This will only add emergency credit to the meter if the landlord has set the value of E.CRED to a value other than zero.

7.1.7 How do I switch to emergency credit?

7.1.8 Only some meters have Emergency Credit available (look for E.CRED in the programming menu). You may receive one of the meters by chance, but if you definitely require this option, thius needs to be specified at the time of order. Emergency credit can only be selected provided the landlord has set the value of E.CRED to a value other than zero. It can be selected before all remaining credit has expired, or after the electricity supply is disconnected..

7.1.9 I have used up all the emergency credit, how do I get the power on?

7.1.10 Once all the emergency credit has been used up, the meter must have value cards inserted to bring the credit back to at least £1. So if the emergency credit (E.CRED) was set to £10, and the tenant used all this up, the supply would be disconnected. The tenant must then insert at least £11 to reconnect the power. It is suggested that emergency credit is used, it is set to £1 less that the value card denomination that the tenant normally uses, meaning that one value card can restore power.

7.1.11 I have lost the meterman card?

7.1.12 Additional meterman cards are available from us for a nominal charge of £5.

7.1.13 I need some more cards, what do I do?

7.1.14 Additional value cards are available from us. You will need to describe the printed text on the card clearly to make sure that the correctly coded cards are supplied for your meter.

7.1.15 What options does the meter have?

7.1.16 The following factory options are available:

7.1.17 Option A: Rate switching with up to 4 tariffs.
Option B: Reverse energy detection.
Option C: Electrical impulse fraud detection.
Option D: Disconnection overridden in economy mode
Option E: Audible warning
Option F: Debt collection

7.1.18 What should I see when inserting a value card?

7.1.19 When inserting a value card, the meter will display TOKEN VALUE £10 (or other value as appropriate). This will remain on the display for 5 seconds. On removal, the card will be erased and marked ("clipped").

7.1.20 The meter displays CARD ERROR.

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

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

7.1.23 The card may not have been supplied by SHOCKWAVES. Only SHOCKWAVES cards will add credit to the SHOCKWAVES cardmeter.

7.1.24 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 tenant to be in contact. It is recommended to check the total number of cards the tenant has bought from you, the total inserted (T.CARDS) and the number of cards the tenant has not used yet.

7.1.25 The meter displays LOCKED OUT.

7.1.26 This will occur if a possible attempted fraud has been detected. The meter is reset by setting Rate 1 to 000.00ppu, and then both EMERGENCY CREDIT and SETTINGS DISPLAY buttons are pressed simultaneously.

7.1.27 The meter flashes the word RED on the display.

7.1.28 Reverse running has been detected. The meter is reset by setting Rate 1 to 000.00ppu, and then both EMERGENCY CREDIT and SETTINGS DISPLAY buttons are pressed simultaneously.

7.1.29 The meter is showing DEBT £2.01

7.1.30 All the credit has been used, and the tenant has run up a debt of £2.01.

7.1.31 My meter only shows RATE1 and not RATE1 and RATE2.

7.1.32 Dual rate meters (for Economy 7) have separate settings for day (RATE 1) and night (RATE 2). If you are only selling the electricity at one rate, then you can set these to be the same.

7.1.33 The display shows LOW VOLTAGE.

7.1.34 It is normal when power is first applied that the display will briefly indicate LOW VOLTAGE. If this remains showing, then this indicates either a low supply voltage, or a fault with the meter.