How to Read your Electricity Meter

This Factsheet gives advice on how to read your electricity meter. More information about saving energy in schools and how to read other types of meters can be found on the Energy in Education website at www.energyineducation.ie

Why Read the Meter?

If you want to save energy and money, you need to know how much energy you are using. Reading your electricity meter is the first step. The school probably spends more on electricity than other energy. Your electricity account is like a bank account: if you don't monitor it, how can you manage it?

Regardless of which company you purchase your electricity from, the meter is read by ESB Networks on behalf of your utility company. At present most school meters are read by ESB Networks approximately every four months. The school, however, probably receives an electricity bill every month. For months when the meter is not read, the bill is based on estimates of the consumption. To obtain a more accurate bill, it is a good idea to read your electricity meter monthly, and to let your utility company know what meter reading you took, either by phone or online. The details of how to do this will be on the electricity bill, perhaps on the back of the page. Most utilities now provide free smart-phone apps to help transfer meter readings to the company.

Although the utility companies only want monthly readings, the more often you read your meter, the more useful the readings will be in helping you control your electricity usage. Weekly readings, and readings before and after each holiday are recommended. It is best to read the meter at the same time of day and same day of the week. It is a good idea to put a reminder in the mobile phone of whoever is going to read the meter.

In order to get a good understanding of your electricity use, when you first start reading your meter, you may want to read it more often, such as:

- between each lesson for a day
- when the school opens and closes for a week.

By subtracting one meter reading from another, you can calculate how much electricity you used in that period. So you could find out how much electricity is used:

- through the day.
- each day of the week.
- over a typical weekend.
- during a week when the school is closed.
- during a holiday when the school is closed.

You might be surprised how much electricity is being wasted outside school hours by equipment being left on. You could use this information to launch a "switch it off" campaign and see how much money you can save. For ideas on energy awareness, how to manage your electrical and electronic appliances efficiently, and tips for switching off for holidays, see www.energyineducation.ie.

Example 1: Weekly readings:

Reading on Friday, week 2, 3 p.m.:	42,962 kWh
Reading on Friday, week 1, 3 p.m.:	42,517 kWh
Electricity used during 7 days:	445 kWh

Where is the Electricity Meter?

Electricity meters are in different places in each school. Some common locations are:

- in a dedicated electrical room
- in a cupboard off the corridor
- in a cabinet on the outside of the school

Often the meter is inside a steel cabinet with a glass window through which you can read the meter. The cabinet here is green, but it could be another colour. There may be several meters behind the glass.

Meter and ESB Enclosure

Some schools believe that they do not have access to their electricity meter, but every school does. If you are not sure where your meter is, ask the Principal or caretaker.

How many Meters are there?

Most schools have just one meter, which may have one or more meter readings which can be read off it. Other schools may have more than one meter because:

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- they have meters in different buildings
- they used to be on a tariff which required several meters

Meter Types

This is a typical traditional electricity meter. It has a disc that spins when electricity is being used. The faster it spins, the more electricity is being used.

This is an electronic meter with two orange buttons, a digital display, and two flashing lights. The faster the right hand light flashes the faster you are using electricity. There are different types of electronic meters.

You could look at the meter when the school is closing for the day. Time the flashes, then go around the school switching off as many electrical items as practical, then time how much slower the light flashes. If it takes twice as long for 10 flashes, you have halved the electricity use.

Electronic Meter

Traditional Meter

Tariff Types

You need to know what electricity tariff applies to the school. The name of the tariff is usually written on the school's electricity bill. Most schools are on a:

- General Purpose (GP or similar) tariff or
- General Purpose Night Saver or Night Storage Heating tariff (NSH, GPNS, GPNH or similar)

Some schools, especially larger schools, may be on a:

- Maximum Demand (MD or LVMD) tariff

Some utilities may not even name the tariff on the bill. You could phone them and ask.

Some schools have a "Multiplier" applied to one or more of their meter readings. If so, the multiplier will be shown on the electricity bill. This is related to how the electricity is metered, and rarely applies to smaller schools. Look at your electricity bill, and if there is a multiplier applied to one or more readings, you will need to apply the same multiplier to your readings of the same meters.

Example 2: Multiplier calculation:

Reading on Friday, week 2, 3 p.m.:	42,962 kWh
Reading on Friday, week 1, 3 p.m.:	42,517 kWh
Difference in readings	445 kWh
Multiplier	10
Electricity used during 7 days:	4,450 kWh

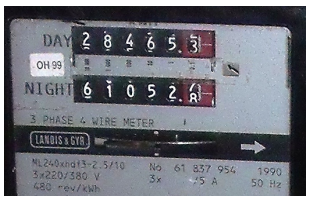
Multipliers vary from meter to meter.

How to Read a Mechanical Meter

Reading a mechanical or spinning disc meter is easy. There are usually one or two rows of numbers on the meter, with a label to the right hand side or elsewhere on the meter. If the label is "kWh" or "kilowatt hours", the unit of electricity consumption, read the numbers. Read the numbers from left to right. You need not read the numbers in red or surrounded by red.

This meter is reading 42,517 kWh.

This meter is reading 19,864 kWh.



Meter Readings

This meter has a reading of 28,465 for "Day" kWh and 61,052 for "Night" kWh, totalling 89,517 kWh. The bill will report both of the readings, because Night electricity costs less than Day electricity.

Don't forget, if your bill shows a Multiplier, you must apply it as shown in Example 2.

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How to Read an Electronic Meter

How to read an electronic meter depends upon the type of meter and the tariff the school is using. It also depends on whether you are reading the meter for your own information, or to pass readings to the electricity provider.

Electronic Meter

Each electronic meter is different. See the appendices, find a photograph which matches your meter, and follow those instructions.

Still don't Know How to Read your Meter?

If you are in doubt about how to read the meter after reading this Factsheet, or you have a different meter, contact your electricity provider or look on their website. Some utilities have videos explaining how to read the meter. This Factsheet , written in 2012, covers most meters. New meter types will come out in future.

Day and Night Rates

If your bill shows that some of your electricity is charged at a "night" rate, this is electricity metered between 11 p.m. and 8 a.m. Greenwich Mean Time (midnight to 9 a.m. Summer Time).

A "day" rate meter captures consumption of electricity between 8 a.m. and 11 p.m. GMT i.e. during the day.

Some schools have bills which show a "24 hour" meter. This meter captures consumption over all 24 hours and may be in addition to a separate night rate meter.

Total consumption can be calculated by adding the Night Rate kWh consumption to the Day or 24 hour consumption.

Example 3: Consumption calculation:

Night Rate kWh		445 kWh
Day Rate kWh		2,423 kWh
Total Electricity kWh	:	2,868 kWh

Example 4: Consumption calculation:

Night Rate kWh		283 kWh
24 Hr Rate kWh		1,952 kWh
Total Electricity kWh	:	2,235 kWh

36 Month Historical Data

If you want to obtain information of how much electricity the school has been using over the last 36 months, your electricity company must provide this information to you free of charge. They will usually email you a spreadsheet, after you email them a request. This is a new requirement since early 2012. They will send you details of consumption, not cost.

Summary

To save on electricity costs, you need to manage your electricity use. To do that, you need to read the meter at suitable intervals, say weekly, and work out how much electricity you are using each week. You need to know what tariff you are on, which you will find on your electricity bill. You need to know where the meter is in the school. You may have more than one meter. You need to know how to read the meter, and how to calculate energy used, or kWh used, from the readings.

This Factsheet explains the details. Other Factsheets in this series provide information about inexpensive ways of reducing the electricity use in your school, thus saving money, and how to read other meters. These Factsheets are on the Energy In Education website at www.energyineducation.ie

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APPENDIX A- A1700 Meter

These meters are called ABB Vision or Elster A1700 Meters, sometimes called an RM645 or RM647. On the following two pages are forms which can be filled out if you wish when reading the meter shown. One form is for meters which give readings for "Total 24 hr kWh", and have a total of 22 different items shown by the display, one by one in sequence. The second form has 20 different items shown by the display, and does not include any readings for "Total 24 hr kWh".

The first time you use these forms to read your meter, it is best to take copies of both forms. Before copying any of the numbers to the form, watch the display and see which form it matches. The display will usually scroll through from one reading to the next every 9 seconds. If you want to go through the readings more quickly, press the orange button briefly, and the LCD will move to the next reading. Press the button again to move on. Leave the meter alone for 60 seconds and it will resume auto scrolling.

Are there 20 readings or 22? Both types include the same 20 readings, but one type includes two extra readings:

- Crnt: Total 24 hr kWh
- H1: Total 24 hr kWh

After you have decided if your meter has 20 or 22 readings, fill in the appropriate form. It is easiest to write down all the numbers in the meter room, and decide later which ones are needed.

Taking Readings for the Electricity Company

The readings to take and transfer to the electricity company depend upon what tariff you are on. See the Tariff Types section in this Factsheet.

The table below summarises what readings to transfer to the utility provider:

Tariff:	**Maximum Demand**		**Other (not Maximum Demand)**	
Readings:	**20 Readings**	**22 Readings**	**20 Readings**	**22 Readings**
	(12) H1: Last Reset On	(13) H1: Last Reset On	(9) Crnt :Day kWh	(10) Crnt: Night kWh
	(14) H1: Cum Normal MD	(15) H1: Cum Normal MD	(10) Crnt: Night kWh	(11) Crnt; kVArh
	(18) H1: Day kWh	(20) H1 Night kWh	(11) Crnt; kVArh	(12) Crnt; Total kWh
	(19) H1 Night kWh	(21) H1: kVArh		
	(20) H1: kVArh	(22) H1: 24 hr kWh		

Taking Readings for the School Only

The readings to take to measure energy use in kWh an energy management programme are:

Readings:	**20 Readings**	**22 Readings**
	(9) Crnt :Day kWh	(10) Crnt: Night kWh
	(10) Crnt: Night kWh	(12) Crnt : 24 Hr kWh

To work out how much electricity has been used in any period, see Examples 1 and 2.

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ELSTER A1700 Display Sequence & Reading Sheet

Current Register Values

Sequence		Reading
1	Current Date dd/mm/yyyy	
2	Current Time hh:mm:ss GMT	
3	Crnt:MD1-Normal 000.000 kW	
4	MD1 occurred: dd:mm:yyyy hh:mm	
5	Crnt:MD2-Peak 000.000 kW	
6	MD2 occurred: dd:mm:yyyy hh:mm	
7	Current :15 Demand 000.000 kW	
8	@ Power Factor 00.0000	
9	Current: Day kWh 0000000.0 kWh	
10	Current: Night kWh 0000000.0 kWh	
11	Current: kvarh 0000000.0 kvarh	

Historical Register Values

		Reading
12	H1: LAST RESET dd/mm/yyyy hh:mm	
13	H1: RESET COUNT 00	
14	H1:CUM MD1-NORM 000.000 kW	
15	H1:MD1 - NORMAL 000.000 kW	
16	H1:CUM MD2 PEAK 000.000 kW	
17	H1:MD2 - PEAK 000.000 kW	
18	H1:DAY KWH 0000000.0 kWh	
19	H1:NIGHT KWH 0000000.0 kWh	
20	H1:KVARH 0000000.0 kvarh	
	Repeats Autoscroll	

MPRN			
Customer:			
Address:			
Meter Serial No.		Meter RM	Year/Month
Modem Serial No.		Modem RM	Baud Rate
Modem Data Phone No.			
Remarks:			

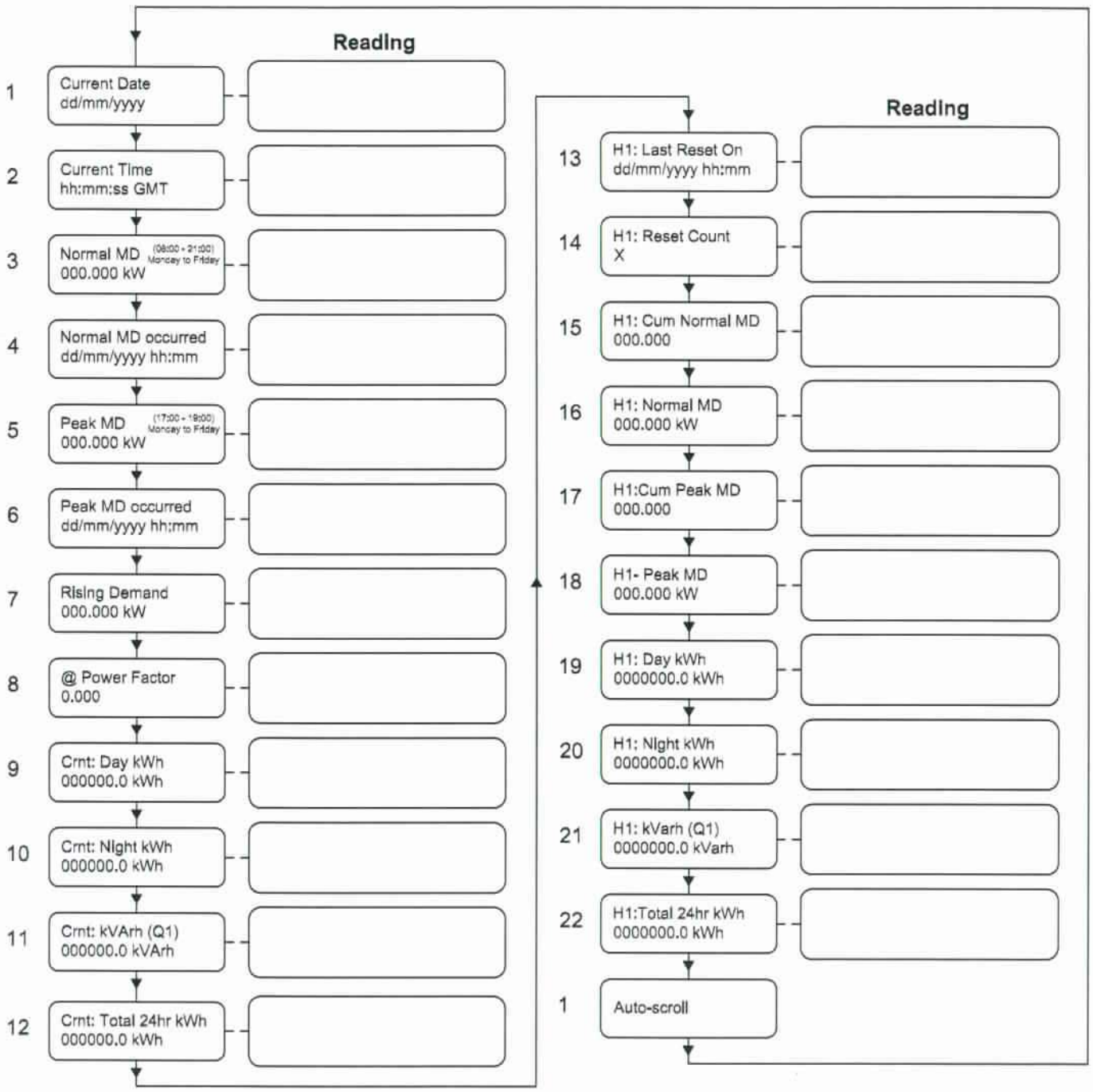
CT DETAILS

	Ratio	Serial No.	RM No.
R			
S			
T			

VT DETAILS

	Ratio	Serial No.	RM No.
R			
S			
T			

A1700 Register Scroll Sequence With 24hr Total kWh Register



APPENDIX B- A1120 and A1140 Meter

These meters are Elster A1120 or 1140 Meters, sometimes known as an RM651. On the following two pages are forms which can be filled out if you wish when reading the meter shown. One form is for meters which give readings for General Purpose (GP), General Purpose Night Saver (GPNS), General Purpose Night Heating (GPNH) or similar tariffs, and have a total of 6 different items shown by the display, one by one in sequence. The second form is for schools which have this type of meter and are on a Maximum Demand (LVMD or MD) tariff and has a total of 25 readings.

The first time you use these forms to read your meter, it is best to take copies of both forms. Before copying any of the numbers to the form, watch the display and see which form it matches. The display will usually scroll through from one reading to the next every few seconds. If you want to go through the readings more quickly, press the right hand orange button briefly, and the LCD will move to the next reading. Press the right hand button again to move on.

Are there 6 readings or 25? Choose the appropriate form to fill out. It is easiest to write down all the numbers in the meter room, and decide later which ones are needed.

Taking Readings for the Electricity Company

The readings to take and transfer to the electricity company depend upon what tariff you are on. See the Tariff Types section in this Factsheet.

The table below summarises what readings to transfer to the utility provider:

Readings:	6 Readings Non-Max Demand Tariff	25 Readings Max Demand Tariff
	(2) Date	(15) Last Reset Date
	(3) Time	(16) Last Reset Date
	(4) Cum kWh	(22) H1 TOU 2 kWh
	(5) TOU 2 Active kWh	(23) H1 TOU 1 kWh
	(6) TOU 1 kWh	(24) H1 L1 kVArh

TOU stands for Time of Use. TOU 2 are day kWh. TOU 1 are night kWh. Having taken the readings, compare with the electricity bill to see that all the readings are relevant. You may be able to omit one or two from the left hand column. The readings you have written down should be similar in magnitude to meter readings on the bill. Comparing with the bill, you may need any combination of:

- (2), (3) and (4)
- (2), (3), (4) and (6)
- (2), (3), (5) and (6)

Taking Readings for the School Only

The readings to take to measure energy use in kWh an energy management programme are:

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Readings:	6 Readings Non-Max Demand Tariff	25 Readings Max Demand Tariff
	(2) Date	(1) Date
	(3) Time	(2) Time
	(4) Cum kWh	(11) TOU Active 2 kWh
	(5) TOU 2 Active kWh	(12) TOU 1 kWh
	(6) TOU 1 kWh	

To work out how much electricity has been used in any period, see Examples 1 and 2. Comparing with the bill, you may need any combination of:

- (2), (3) and (4)
- (2), (3), (4) and (6)
- (2), (3), (5) and (6)

Only consider the combination above which matches the bill, otherwise you may count some or all of your electricity consumption twice.

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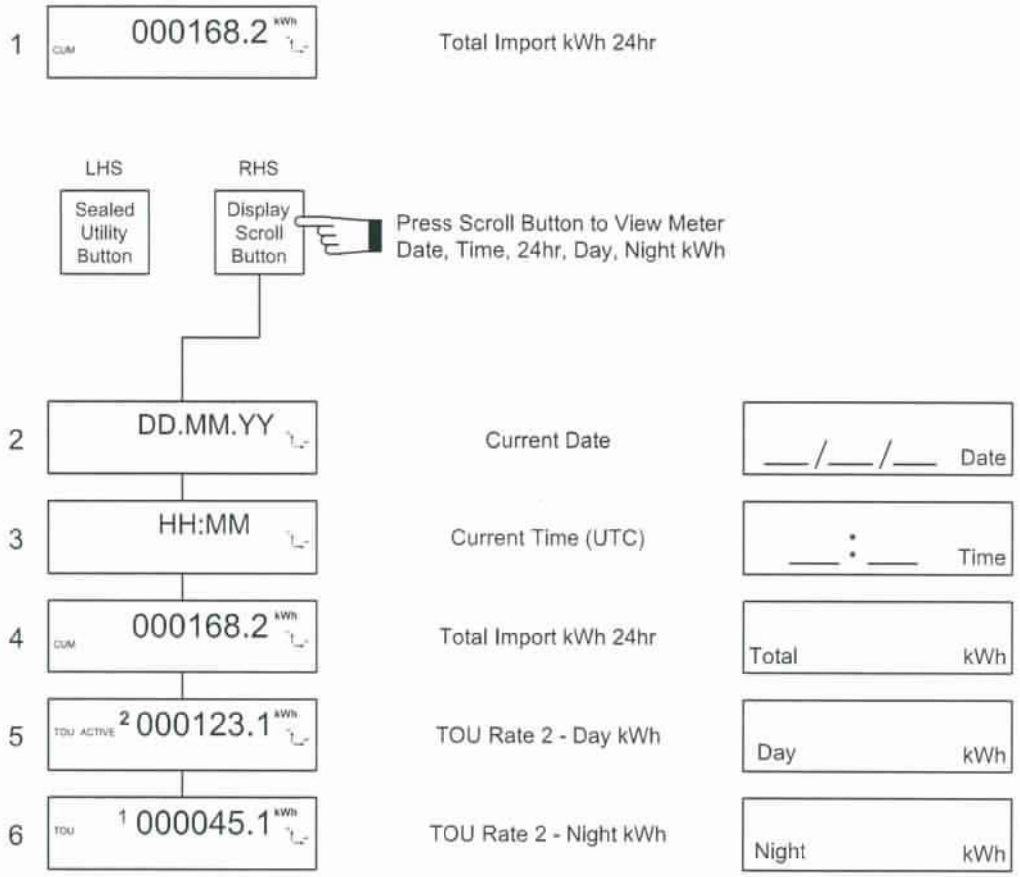
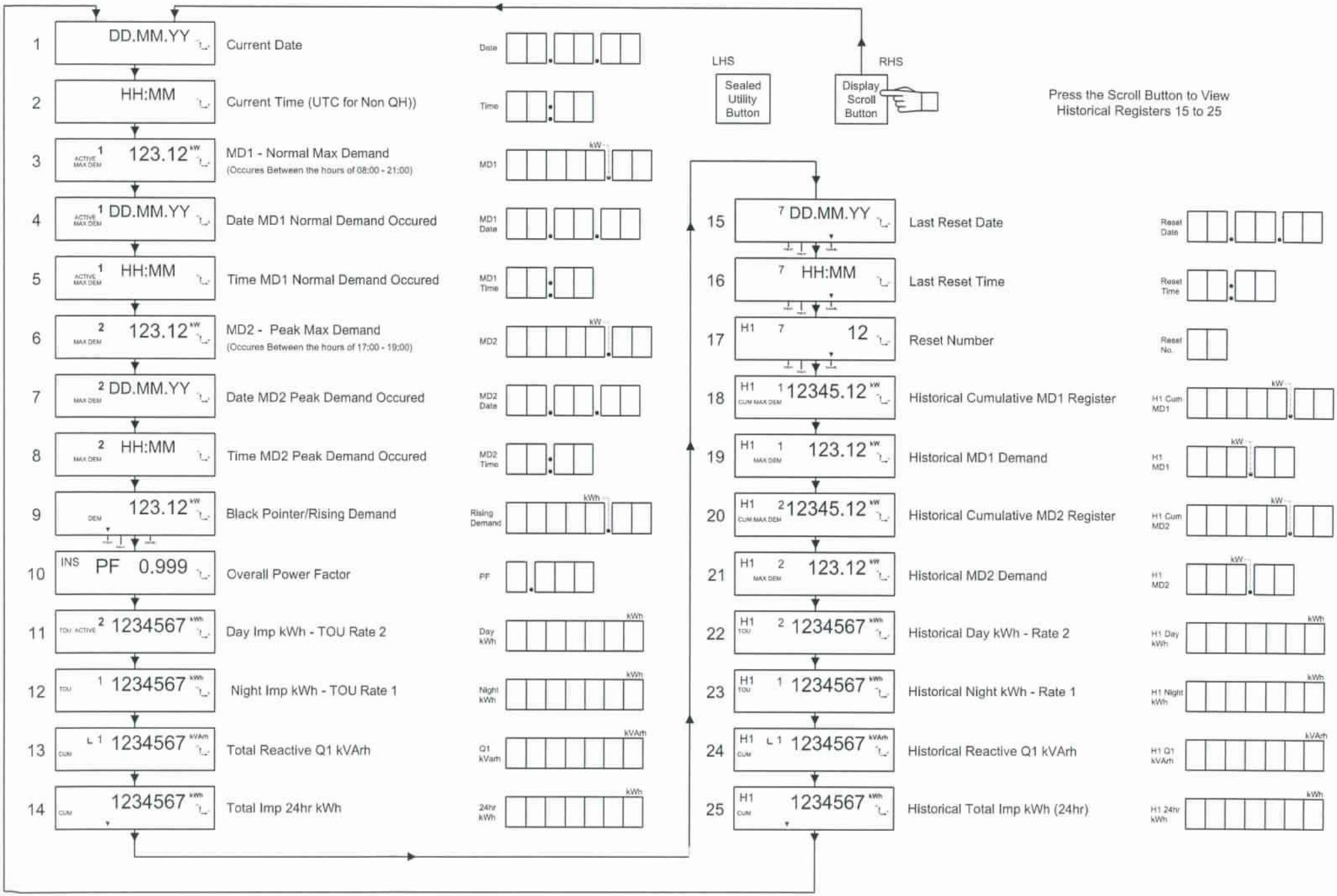
A1120 or A1140 24hr or Double Tariff



A1120 and A1140 Whole Current Type Meters with Max Demand

Auto-scroll display sequence 1 to 14 Historical display sequence viewed by pressing Display Scroll Button



APPENDIX C- PRI Meter

These meters are called PRI Meters, sometimes called an RM546. On the following page is a form which can be filled out if you wish when reading the meter shown. The form is for meters which give readings for any tariff, and have a total of 20 different items shown by the display, one by one in sequence.

The meter display will usually scroll through from one reading to the next every few seconds.

Taking Readings for the Electricity Company

The readings to take and transfer to the electricity company depend upon what tariff you are on. See the Tariff Types section in this Factsheet.

Tariff:	Maximum Demand	Other (not Maximum Demand)
	(13) BMD	(9): Day 02 kWh
	(14) CUMN kW	(10): N 01 kWh
	(18) BDay kWh	(11): kVArh
	(19) BNGT kWh	
	(20) BLNG kVArh	

Taking Readings for the School Only

The readings to take to measure energy use in kWh an energy management programme are:

Tariff:	All tariffs
	(9): Day 02 kWh
	(10): N 01 kWh

To work out how much electricity has been used in any period, see Examples 1 and 2.

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PRI Sprint Display Sequence & Reading Sheet

Current Register Values

Sequence		Reading
1	88:88:888 8888 88 MkWArh	All Segment Test Pattern
2	R - S - T	Phase Rotation
3	DD:MM:YY DATE	Current Date
4	HH:MM:SS TIME	Current Time (GMT)
5	0000.00 MD N 01 kW	MD1 Normal MD (Red Pointer)
6	0000.00 MD N 02 kW	MD2 Peak MD (Red Pointer)
7	0000.00 15m kW	Black Pointer (Rising Demand)
8	0000.00 PFAC	Power Factor
9	000000 DAY 02 kWh	Day kWh
10	000000 MD N 01 kW	Night kWh
11	000000 kVarh	Reactive Q1 kVarh

Historical Register Values

		Reading
12	000005 RSET	Number of Resets
13	DD:MM:YY B MD	Date of Last Reset
14	0000.00 CUMN 01 kW	H1 Cumulative MD1 (08:00 - 21:00 M-F)
15	0000.00 BMDN 01 kW	H1 MD1 kW (Normal MD)
16	0000.00 CUMP 02 kW	H1 Cumulative MD2 (17:00 - 19:00 M-F)
17	0000.00 BMDP 02 kW	H1 MD2 (Peak MD)
18	000000 BDAY 02 kWh	H1 Day kWh
19	000000 BNGT 01 kWh	H1 Night kWh
20	000000 BLNG kVArh	H1 kVArh Reactive Q1
		Blank Display End of Display Sequence Repeats

MPRN	
Customer:	
Address:	

Meter Serial No.	Meter RM	Year/Month
Modem Serial No.	Modem RM	Baud Rate
Modem Data Phone No.		
Remarks:		

CT DETAILS

	Ratio	Serial No.	RM No.
R			
S			
T			

VT DETAILS

	Ratio	Serial No.	RM No.
R			
S			
T			

APPENDIX D- PPM Meter

These meters are called PPM Meters, or Programmable Polyphase Meter. This particular one is a model RM667. On the following page is a form which can be filled out if you wish when reading the meter shown. The form is for meters which give readings for General Purpose (GP), General Purpose Night Saver (GPNS), General Purpose Night Heating (GPNH) or similar tariffs, and have a total of 13 different items shown by the display, one by one in sequence. If you are on a Maximum Demand tariff, the readings used for preparing the electricity bill are not accessible to you. You can still take readings for your own use.

The meter display will usually scroll through from one reading to the next every few seconds.

Taking Readings for the Electricity Company

The readings to take and transfer to the electricity company depend upon what tariff you are on. See the Tariff Types section in this Factsheet.

Tariff:	Other (not Maximum Demand)
	(11):Rate 1 kWh
	(12): Rate 2 kWh
	(13): CUM kVArh

Taking Readings for the School Only

The readings to take to measure energy use in kWh an energy management programme are:

Tariff:	Any tariff	Comment
	(11):Rate 1 kWh	Night Rate
	(12): Rate 2 kWh	Day Rate

To work out how much electricity has been used in any period, see Examples 1 and 2.

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PPM Display Sequence when Auto Scrolling + Reading Sheet

Register Values

Sequence		Reading
1	DATE MM - YY RATE ACTIVE 2	Current Date Active Rate
2	TIME HH . MM RATE ACTIVE 2	Current Time Active Rate
3	MAX DEM RATE ACTIVE	Active Rates Max Demand
4	TEST 0044 4	Billing Reset Counter
5	TEST DATE MM - YY 4	Last Reset Date
6	CUM MAX DEM 060 .379 kW 1	H1 Cumulative MD1 Normal MD (08:00 -2100 M > F)
7	MAX DEM 000.000 kW 1	H1 MD1 Normal MD (Red pointer)
8	CUM MAX DEM 039.539 kW 2	H1 Cumulative MD2 Peak MD (17:00 > 19:00 M > F)
9	MAX DEM 000.000 kW 2	H1 MD2 Peak MD (Red pointer)
10	DEM 000.123 kW 2	Rising Demand (Black Pointer)
11	02791.0 kWh RATE 1	Night kWh Current Register **CHECK RATE NO.**

Register Values Cont.

		Reading
12	14656.0 kWh RATE 2	Day kWh Current Register CHECK RATE NO.
13	CUM MAX DEM 07554.7 kVarh 3	Reactive Energy kVArh Q1 Current Value
1	DATE MM - YY RATE ACTIVE 2	Display Auto-scrolls Back to Screen1 & Repeats

MPRN			
Customer:			
Address:			
Meter Serial No.		Meter RM	Year/Month
Modem Serial No.		Modem RM	Baud Rate
Modem Data Phone No.			
Remarks:			

CT DETAILS

	Ratio	Serial No.	RM No.
R			
S			
T			

VT DETAILS

	Ratio	Serial No.	RM No.
R			
S			
T			

APPENDIX E- ISKRA Meters

These meters are called ISKRA Meters, or RM534 meters. On the following page is a form which can be filled out if you wish when reading the meter shown.

These meters have codes written on the meter front called OBIS codes, an international standard for codes for energy meters. Common OBIS codes are:

0.9.2 Date
0.9.1 Time
1.8.0 Total 24 hour kWh
1.8.2 Day kWh
1.8.1 Night kWh

If your meter has more codes than this, or if you are on a Maximum Demand tariff, you should consult your electricity supplier for guidance on how to read the meter.

The LCD defaults to show the reading for code 1.8.0. To see other readings:

- Momentarily press the blue button. “LCD TEST” is shown.
- Momentarily press the blue button again. “STD DATA” is shown.
- Press the blue button for at least 2 seconds. An OBIS code and the reading value will be shown.
- Press the blue button for subsequent 2 second periods, and additional readings will be shown.

The form is for any tariff, and have a total of 5 different items shown by the display, one by one in sequence.

Taking Readings for the Electricity Company

The readings to take and transfer to the electricity company depend upon what tariff you are on. See the Tariff Types section in this Factsheet.

Tariff:	Other (not Maximum Demand)
	1.8.0 Total 24 hr kWh
	1.8.1 Night kWh
	1.8.2 Day kWh

Having taken the readings, compare with the electricity bill to see that all the readings are relevant. You may be able to omit one or two. The readings you have written down should be similar in magnitude to meter readings on the bill. Comparing with the bill, you may need any combination of:

- 1.8.0
- 1.8.1
- 1.8.1 and 1.8.2

Taking Readings for the School Only

The readings to take to measure energy use in kWh an energy management programme are the same readings you need for the electricity company.

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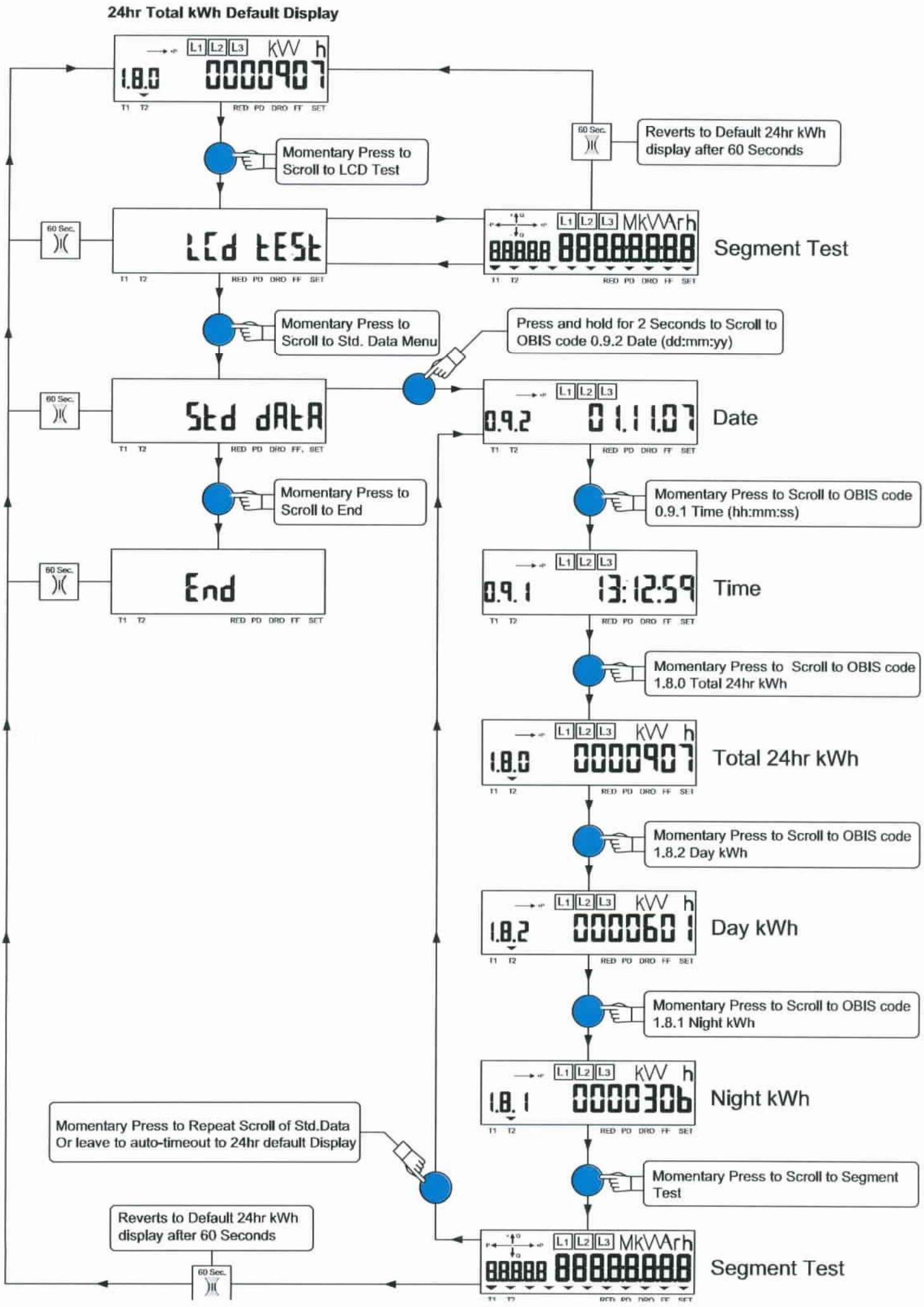
DISPLAY SEQUENCE MAP FOR RM534

3 Phase Whole Current Meter Configured for Single & Double Tarriff Operation