

AS230 Overview

Smart AMI

Single Phase Metering



Overview – AS230 Meter



Flexible Platform

- Based on **Proven** A1140 & A1700 used by Eskom
- Common meter features single phase & polyphase
- Integrated disconnect switch
- Wide Area Network (WAN) based on GSM/GPRS
- Local Area Network (LAN) Low Power Radio
- Short Range Comms (HAN)
 - Wireless Wavenis 868 MHz

Benefit

- Easy for Eskom to adopt and use !
- Communications easily changed !

Overview – AS230 Meter



The Solution for Residential AMI

- Proven, Flexible Platforms
 - Single Phase
 - Flexible tariff (8 TOU, 1Max Dem, and Deferred option)
 - Firmware remote download
 - Supply Capacity management
 - Appliance control management
 - Load Profiling (60 Day for 6 Channel 30 Min)
 - Instrumentation and Voltage Profiling
 - Comprehensive security data
 - Historic Billing information (12 Sets)
 - Daily Read (14 Sets)

Benefit

- Flexibility reduces risk of stranded assets !
- Acts like A1700 used today !

Overview – AS230 Meter



Measurement & Accuracy

- 1ph, 2w
- Voltage range 220 - 240V
- Whole current 10 - 100A
- 50hz
- LED for accuracy testing
- 1 kWh, 1 kvarh
- Registration of:
 - kWh Import/Export
 - Kvarh Import/Export
 - kVAh
- kWh cl 1 & 2
- kvarh cl 2 & 3
- Full Instrumentation
 - To aid installation

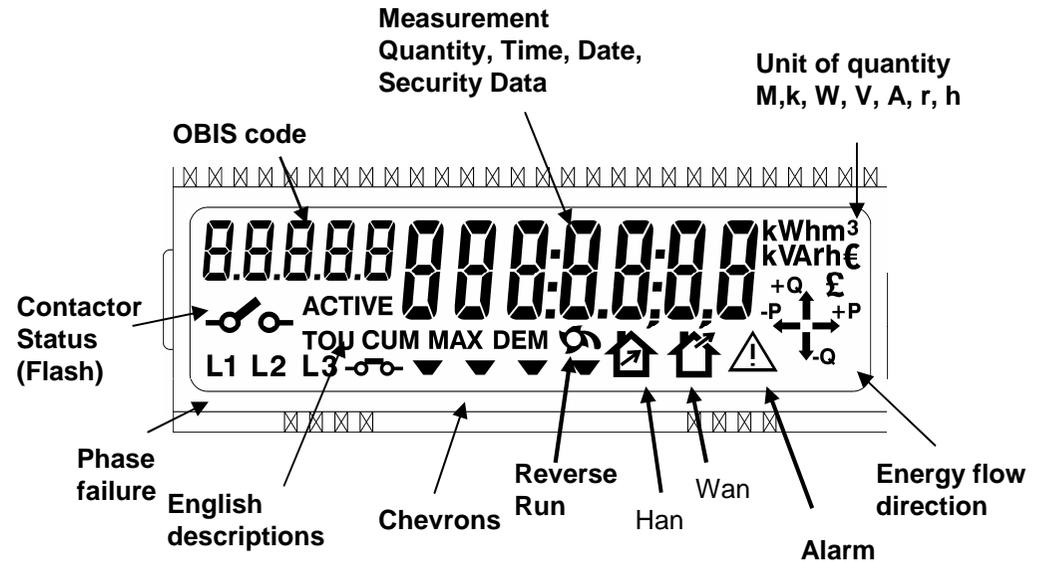


Overview – AS230 Meter



LCD

- 9.8mm digits
- Configurable
 - Number of digits
 - Position of decimal point
- Items to be displayed
 - Current time and date
 - Cumulative totals
 - Time of use registers
 - Billing information
 - Maximum demand registers
 - Security data
 - Segment test pattern



Benefit

- Easy to read and Programme !

Overview – AS230 Meter

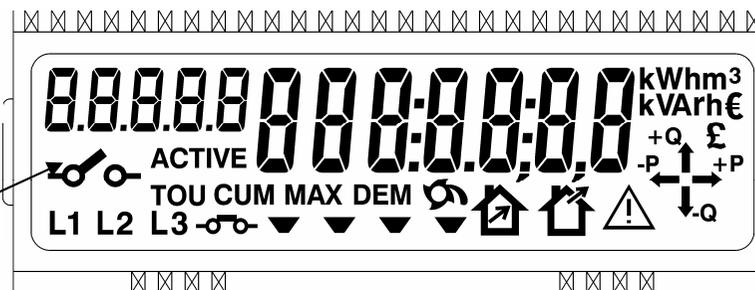


Pushbuttons

- One
 - Display control
 - Step
 - Utility
 - Enabling Contactor
 - once armed



Flash



Overview – AS230 Meter

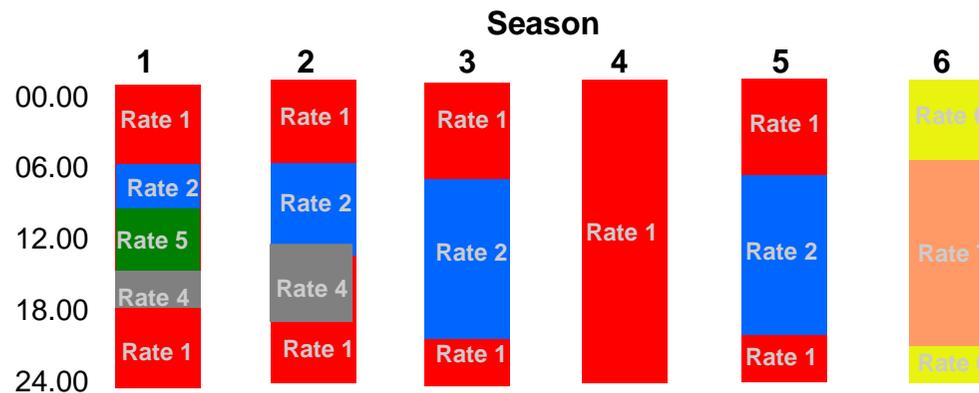


Tariff

- 8 Time of use
- 1 Time of use MD
- 12 Seasons
- 48 Switching points
- 32 Exclusion dates
 - Fixed every year
 - 'Last Sunday in the month'
 - Single date
- Independent day control
- Acts as A1700/A1140



Deferred tariff program



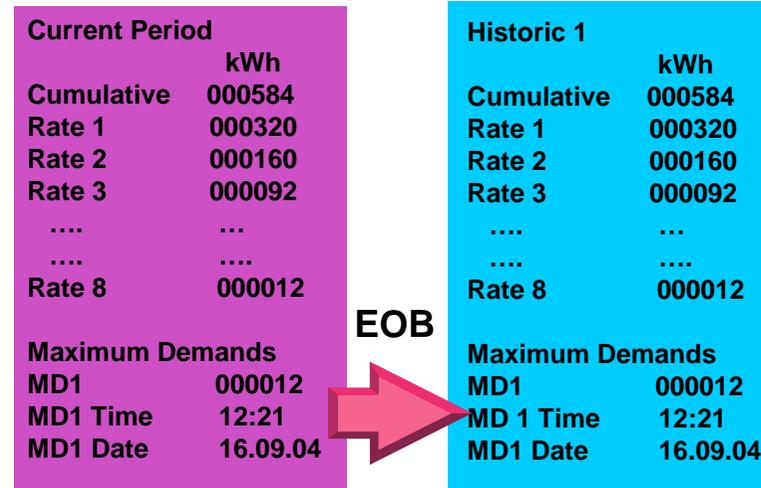
Overview – AS230 Meter



End of Billing

- Created by:
 - Automatically - 13 dates
 - Optical communications
 - Change of season date
 - Introduction of deferred tariff
 - Battery fail at power-up

- Time, Date & Method stored



Overview – AS230 Meter



Real time clock

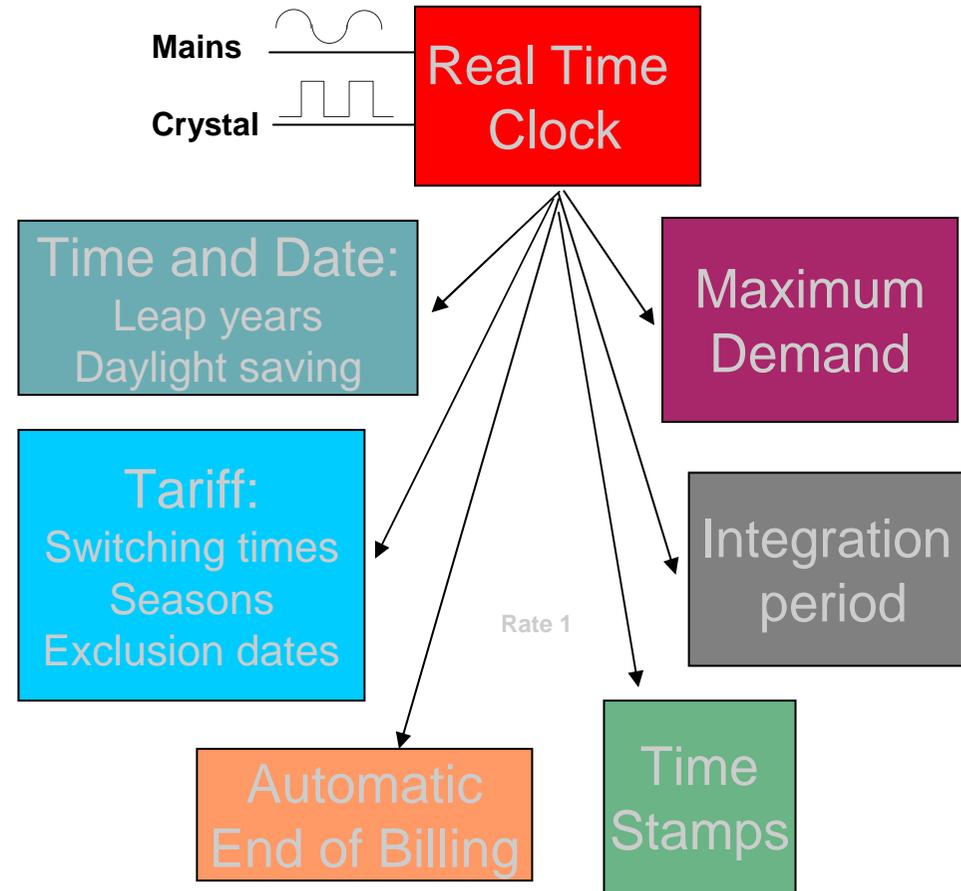
- Mains or crystal, 0.5s/day

Day light saving

- 1 or 2 hrs
- 'Last Sunday in March'

Synchronisation

- From Host system



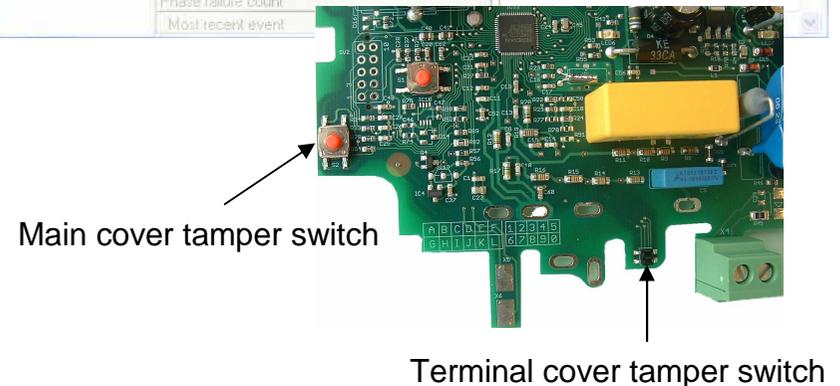
Overview – AS230 Meter



Security

- Event counter, last 10 time & date stamp
 - Reverse run
 - Power fail (duration)
 - Over & under voltage
 - End of billing (& method)
 - Modular comms
 - Optical comms
 - Password change
 - Meter error
 - Battery fail
 - Battery voltage monitoring
 - Contactor status monitoring
 - Appliance Load Control Device Monitoring
- Immediate alarming
- Reverse energy register
- Power on hour count
- Watchdog count
- CRC - Tariff and metrological code

Readings viewer - 30/07/2005 12:26:53		
Readings Help		
Meter Identifiers	Programming count	118
Tariff/Display	Most recent event	30/07/2005 12:06
Deferred Tariff/Displ	Most recent programming source	Local comms
Deferred Setup	Most recent programming user	Administrato
Billing Dates	Second most recent event	30/07/2005 11:53
Meter Constants	Second most recent programming source	Local comms
Load Profiling	Second most recent programming user	Administrato
Meter Options	Third most recent event	30/07/2005 11:51
Meter UI Options	Third most recent programming source	Local comms
Time and Date	Third most recent programming user	Administrato
Current Values		
Historical Data		
Hardware Config.	Terminal cover count	0
Security	Most recent event	None
Load Profile Data	Second most recent event	None
	Third most recent event	None
	Main cover count	0
	Most recent event	None
	Second most recent event	None
	Third most recent event	None
	Phase failure count	1
	Most recent event	



Overview – AS230 Meter

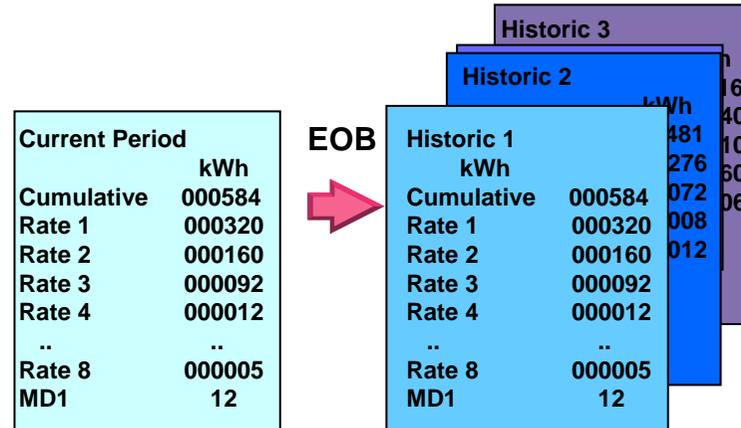


Historic data

- 12 sets data
 - Cumulative data
 - Time of use registers
 - Max demand

Daily Read

- 14 sets
 - Cumulative data
 - Time of use registers
 - Max demand



Overview – AS230 Meter



- **Contactor**

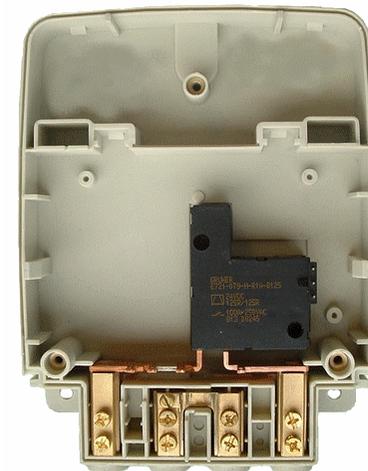
- Internal
 - Optional
- Contactor
 - 100A
 - In-line with live terminal
- Operational modes
 - From Communications network
 - Open, Arm, Close
 - Direct Close from communications
 - Detect current flow
 - Above threshold open contactor
 - Load Limiting (Supply Capacity) functionality - now
 - 2 Limits - kWh limits (0 to 75kWh)
 - Individual times to exceed the limits
 - Individual times to rearm the contactor
 - Supply Capacity Control - On demand



Overview – AS230 Meter



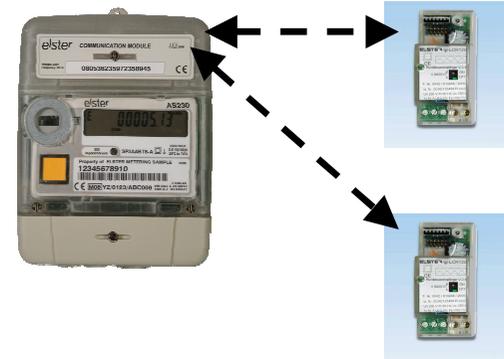
- 'On-Demand' Supply Capacity Control (Load Limiting)
 - Takes precedence over normal Supply Capacity Limits
 - Feature can be enabled or disabled
 - Function will only operate during:
 - 5 individual 'on demand' periods during any weekday
 - 5 individual 'on demand' periods during any weekend
 - Contactor open if average kW demand exceeds limit for D minutes (1 to 60)
 - kWh limit 1 to 75kWh
 - Remain open for F minutes (1 to 60)
 - Auto reclose



Overview – AS230 Meter



- Appliance Load control
 - 2 Independent controls
 - 'On' driven by one rate schedule
 - Function will only operate during:
 - 5 individual 'on demand' periods during any weekday
 - 5 individual 'on demand' periods during any weekend
 - Require a configurable fixed time delay after 'on time'
 - Meter must receive 'on demand' request
 - Over-ride normal control for a configurable period (1 to 24hrs) then revert
 - When 'on' the meter must send signal through HAN to the application control device
 - Event monitoring of occurrence
 - Show status on display

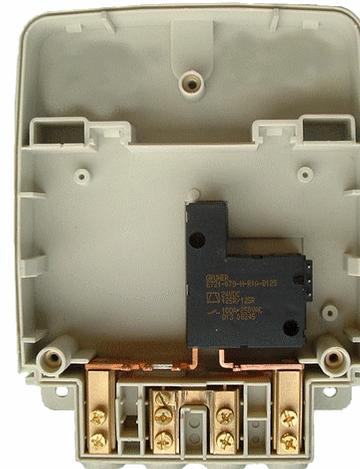


Overview – AS230 Meter



Outputs

- Control for Night Storage heater
 - 100mA, 230V solid state contactor
 - External load control
 - Controlled by TOU register
- Pulsed output 27V, 27mA
 - Pulse values programmed

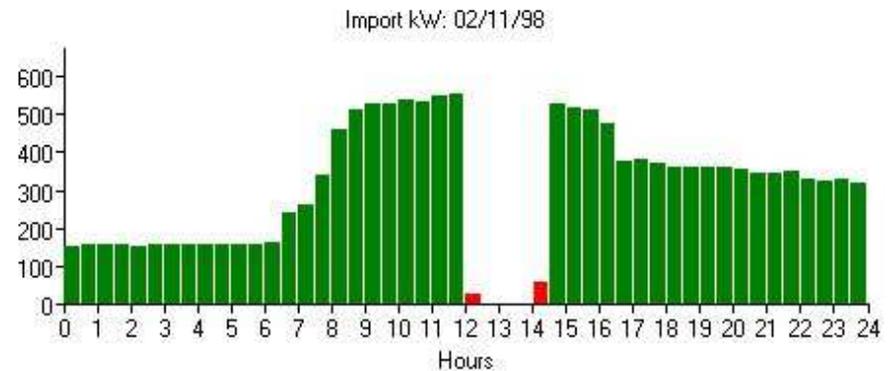


Overview – AS230 Meter



Load profiling

- 120 day index
 - 60 days, 6 channels, 30mins
- Up to 4 channels from:
 - Import, Export kW
 - Import, Export kvar
 - kVA
- 1, 2, 3, 5, 6, 10, 15, 20, 30, 60 min integration periods
- Status flag with each period
 - Programming
 - Reverse run
 - Change time & date
 - Battery fail
 - Meter error
 - Phase failure
- Profile format as the A1700/A1140



Overview – AS230 Meter

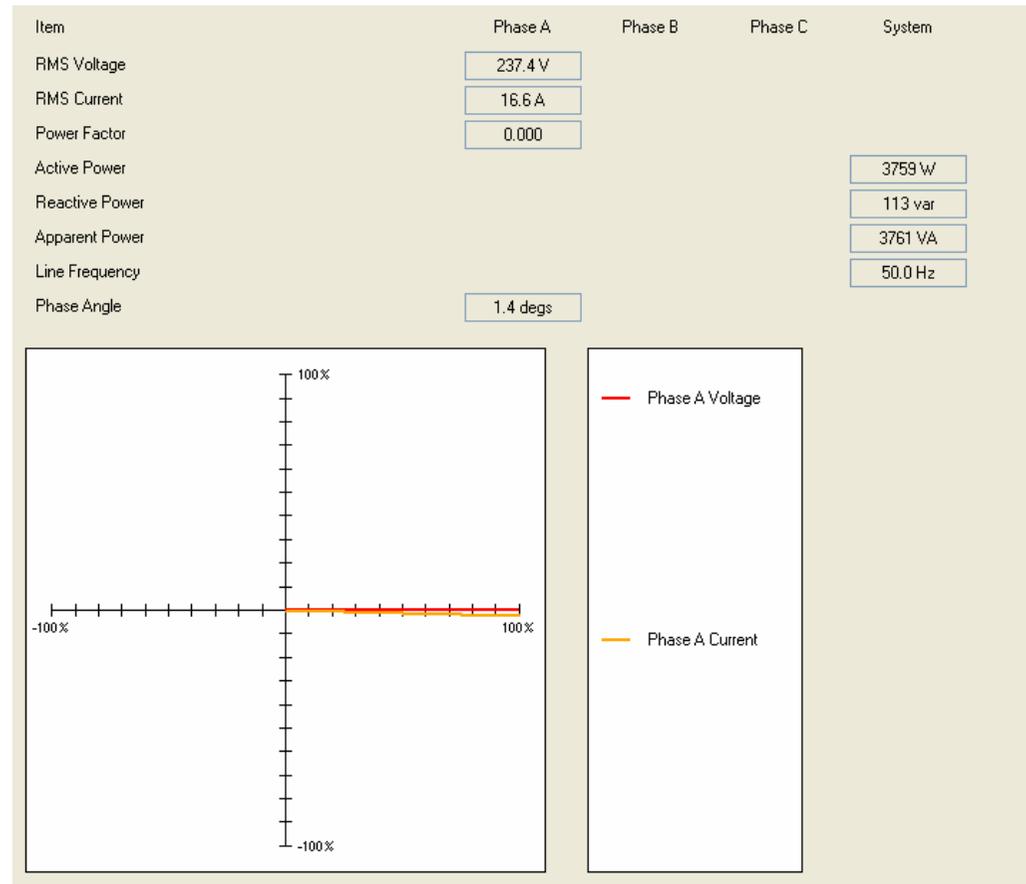


Instrumentation

- Volts
- Current
- Watts
- System power factor
- Phase angle
- Frequency
- Phase rotation

Instrumentation Profiling

- 8 Channels
- Separate integration period
- Store min, max, av. value



Overview – AS230 Meter



Communications

- Local communications
 - IEC 62056-21 (formerly IEC 61107)
 - Optical Port
- Remote communication
 - Provides any combination of:
 - HAN, LAN, WAN
- Modular
 - Future proof choice of Comms
 - HAN modular



Power for module
230V

Serial connection
to module



Overview – AS230 Meter



- Longer term deliverables:
 - Open protocol
 - HAN
 - WAN
 - Disconnect in a CT operated meter
 - Prepayment functionality
 - STS Compliance
 - Frequency control of appliance control
 - New proven communication solutions such as mesh RF and PLC

Overview – Power Master Unit Software



Benefit

- **Programming tool for A1700, A1140, A140, AS230**
- **New platform .NET2 ***
 - Support AS230
 - Same look and feel
- **Configuration & reads meters**
- **Local, remote & HHU communications supported**
- **Easy to use, Windows format**
- **Graphical tariff entry**
- **Quick & simple communications**
- **Database of meters**

- Used by Eskom today !

The screenshot displays the Power Master Unit software interface. On the left is the 'Scheme Editor - New scheme' window, which includes sections for 'Summary', 'Meter Identifiers', 'Passwords', and 'Tariff'. The 'Tariff' section shows a table for defining rates and seasons. In the center is a 'Graph' window titled 'Import kW', showing a bar chart of power consumption over time from 10/05/2001 to 16/05/2001. On the right is a 'Report' window showing a table of meter data.

DATE	STARTTIME	ENDTIME	VALUE	UNIT	FLAGS
11/05/2001	14:00:00	14:30:00	13.856	Import kW	
11/05/2001	14:30:00	15:00:00	13.84	Import kW	
11/05/2001	15:00:00	15:30:00	13.856	Import kW	
11/05/2001	15:30:00	15:47:00	8.128	Import kW	Partial demand
11/05/2001	16:20:00	16:22:00	1.088	Import kW	
11/05/2001	17:01:00	17:30:00	12.768	Import kW	Partial demand
11/05/2001	17:30:00	18:00:00	13.576	Import kW	Partial demand
11/05/2001	18:00:00	18:30:00	13.752	Import kW	
11/05/2001	18:30:00	19:00:00	13.8	Import kW	
11/05/2001	19:00:00	19:30:00	13.92	Import kW	
11/05/2001	19:30:00	20:00:00	13.88	Import kW	

Thank you



elster

Leading the World
in Metering Technology