

New Solutions in Metering



Elster Metronica New Solutions in Metering

Elster Metering - the new global metering company created by Ruhrgas Industries and ABB Metering. The consolidation of ABB's electricity and water metering business and Ruhrgas' gas metering business has formed a company that is totally focused on the metering business.

The representative of Elster Metering in European Union is Elster Metronica, headquartered in Russia. At the factory in Moscow Elster Metronica produces solid-state electricity meters and sells them in Russia, Europe, Asia and Middle East. Elster Metronica has a wide international experience of large-scale AMR projects and produces all the necessary equipment for building metering systems.

Today Elster Metronica offers brand new Metering technology Alpha CENTER. Alpha CENTER is the metering system that completely meets stringent requirements of Metering Industry. The system is specially designed for energy and power metering and billing purposes including automated meter reading (AMR), data collection, processing, storing, and easy-to-analyze display of received data.

To create metering system Elster Metronica offers:

- High functional, fully programmable solid state electricity meters ALPHA.
- Controllers RTU-300 series (data acquisition, processing and communication units).
- Alpha CENTER program package.
- Communication and essential equipment.

Elster Metronica provides Customers with meters or the whole metering systems on a turnkey basis and creates it in close cooperation with you. Elster Metronica renders support on every stage of metering system implementation, including enterprise investigation, system's installation, adjustment, commissioning, training etc.

Alpha CENTER Brand New Metering System

Alpha CENTER metering systems are specially designed for energy and power metering and billing purposes including automated meter reading, data collection, processing, storing, and easy-to-analyze display of received data.



Alpha CENTER is the series of software products; it is based on the principles of client-server architecture (Oracle, Windows NT/2000). The program collects and analyzes data from meters, balances the accounts and integrates it into business administration systems. The system is designed for billing, managing networks or consumption, load management and measuring and analyzing of electricity quality parameters.

The system satisfies the requirements of all our customers from utility companies and large industrial with thousands of meters to small enterprises and divisions with several meters. Easy-to-use and intuitively understandable graphical interface facilitates the software access and usage even for novice PC users. The tips & hints system makes the program readily available for learning.

Multiuser version of software provides easy access to information from dozens of workplaces and combines several data collecting and processing caters into one information field. Version of Alpha CENTER for small enterprises (workstations) is very functional and it also emphasizes monitoring loads: currents, voltages, and outputs, network frequency.

Application

Alpha CENTER metering systems are used for commercial and technical energy billing at power plants, substations, industrial enterprises and power suppliers' and power consumers' organizations.

Alpha CENTER serves also to organize AMR systems for:

- Utilities (power plants, substations, distribution networks).
- Industrial enterprises and Railroads.
- Residential buildings and public utilities.

Description

Alpha CENTER metering systems are configured based on data collection and processing centers that can be integrated into hierarchical multilevel systems. Alpha CENTER can be supplied in the following configurations:

- Single-user, single-level metering system
- Multiuser, single-level metering system
- Multiuser, multilevel metering system

Hardware

Alpha CENTER metering system integrates modern equipment based on digital measurement technologies:

- High functional, fully programmable solid state electricity meters ALPHA (ALPHA Plus, A1600 ALPHA, A1400 ALPHA, A1300 ALPHA, A1000, A1200 ALPHA)
- Controllers RTU-300 series (data acquisition, processing and communication units)
- Alpha CENTER program package
- Communication and essential equipment (Workstations, servers, printers, adapters, cable etc.)

Software

There are three main versions of Alpha CENTER software:

- AC_PE – Personal Edition (Single-user version)
- AC_SE – Standard Edition (Multiuser version)
- AC_EE – Enterprise Edition (Multiuser version for multi-level distributed systems)

1. AC_PE – Personal Edition (Single-user version)

The software is installed on one workstation. The AC_PE version operates with from 1 up to 100 meters. In case of need AC_PE based extra workstation can be added. Thus AC_PE version can serve as Power Engineering Department as Chief of Engineer or Accounts Department.

The software is used to configure AMR system at your enterprise and provides simultaneous on-line monitoring of the network parameters and various demand profile intervals. Easy-to-use and intuitively understandable graphical interface facilitates the software access and usage even for novice PC users. The tips & hints system makes the program readily available for learning.

ORACLE Personal Edition is used as a database (DB). Access to software functions is differentiated depending on the user category. The user activities logging is provided.

2. AC_SE – Standard Edition (Multiuser version)

Multiuser software version AC_SE is intended for large enterprise where many departments need metering information. The AC_SE version works with Database, Communication Servers and Workstations in LAN networks.

Standard option supplied for 5 users. Plus ORACLE DBMS for 5 users, Windows 2000 Serv, Windows 2000 Pro for 5 clients.

AC_SE software includes:

- Communication server
- Billing server
- Administrator modules
- Database installation basis
- System control modules
- Client-requested software

3. AC_EE – Enterprise Edition (Multiuser version for multi-level distributed systems)

The AC_EE version is intended for large geographically distributed companies or utilities with a lot of substations and numerous consumers. Several communication servers, many data collection and processing units can operate within the system. Dedicated, dialup channels, direct communication lines and LAN can be used.

Complete package consist of all Alpha CENTEE versions (L, PE, SE, EE) plus DBMS ORACLE, Windows2000 serv, Windows2000 pro. Data synchronization between DB servers or between the DB server and self-contained remote workstations provide by using various communication channels (via TCP/IP protocol) or a Laptop.

Additional versions and modules of Alpha CENTER software

AC_WWW – Multiuser WEB version

For working via Internet. Plus DBMS ORACLE, Windows2000 serv, Windows2000 pro.

AC_L – Laptop version

Alpha CENTER Laptop version can be only supplied complete with other versions. AC-L provides manual meter interrogation via the meter optical port or the multiplexer (RS232) with further data export into the DB.

AC_M – Monitoring module

AC_M is supplied as an option for AC_PE or AC_SE. It provides:

- Circuit diagram editor
- Feeder data display (including grid parameters – phase currents, voltages, demand, shifts) in cycles from 10 s to 1 min, 3 min, 5 min
- Computing and displaying group substation characteristics (balance, total demand, etc.) in 1 min, 3 min, 5 min, 10 min, 15 min cycles

AC_N – Navigator module

AC_N is extended diagnostics module. It is an option for AC_PE or AC_SE. It is supplied for systems with a lot of interrogation devices, or developed communications system. Provides fast viewing of status data on a lot of substations and relevant diagnostics.

AC_T – Time module

AC_T is satellite clock time synchronization module based on GPS. It is an option for AC_PE or AC_SE.

AC_R – Reserve module

AC_R is archiving and restoring module. It is an option for AC_PE or AC_SE.

Controller RTU-300

A part of Alpha CENTER metering system



Controller RTU-300 is a family of data acquisition, processing, and communication units. There are three main variations RTU-300, RTU-310 and RTU-320. Each variation is based on an Remote Communications Server OS-9 platform and Windows NT operating system. The configuration software is simple and easy to use. The database and reporting tools are included as separate blocks and configurable on customer request.

The RTU differ in the controller types, capacity and the environment. Functional capabilities and capacity can be upgraded both, by means of replacing one RTU series with another, and by integrating of add-on modules into controllers. RTUs are designed for application at power utilities, industrial plants and other organizations which make independent mutual settlements with energy suppliers or consumers.

- RTU-300 is the most powerful VME standard unit. RTU-300 maintains multi-level operating performance, along with providing reliability and flexibility in communication. RTU-300 was designed for the special series of AMR single purpose devices.
- RTU-310 provides more functionality than the RTU-320. The standard RTU-310 uses an IUC32 controller (PEP Co. Germany). The communication possibilities include Profibus and a local Ethernet network.
- RTU-320 uses a Motorola 68302 microprocessor and operates in a Profibus network as a slave. It can also be used with RS-485 to connect ALPHA meters and Splitter with galvanically isolated current loop interfaces (MPR16).

Basic RTU application – high-accuracy time-of-use commercial energy consumption (delivery) metering (in multiple-rate conditions), real-time preset load technical billing and monitoring. Data is collected from meters type ALPHA and EuroALPHA (IRPS “current loop”, RS232, RS422/485) via digital channels.

The RTU has a box-type design, protection class IP 65, and a cabinet-type design, protection class IP 55, which allows to install these units either directly at the objects or in data collection centers.

Application of a liquid-crystal display (LCD) with 128 per 128 points resolution allows to easily take readings from meters (connected to RTU) and obtain data calculated based on such readings. Special-purpose software is used for selection of data displayed on LCD as well as for RTU configuring.

The RTU provides the following functions:

- Collection, processing, logging, storage and display of energy meter data on required and delivered active and reactive energy and power
- Combining of measurements taken from meters into common group measurements corresponding to specific objects
- Time-of-use energy metering taking account of time zones within a preset time interval
- Demand interval measurement (one of the two intervals: 1, 3, 5 minutes and 15, 30 minutes)
- Searching for power maximum within preset time intervals
- Archiving according to preset structure
- Supporting the universal time system to provide synchronous measurements

- Keeping track of 2 preset excess power limits
- Measured energy display by meter indicator readings
- Parallel data transmission from RTU via physical line or dialup or dedicated telephone channels (or other communications environment) to several data collection centers
- Protection of measured data and IVK metrological characteristics against tampering and unauthorized modifications
- Internal operability monitoring

For direct connection to individual RTU and for RTU group data readout (for instance, in the event of communication line breakdown) it is possible to take RTU readings directly at the object using portable computer type NoteBook with the following data transmission to the higher-level computer. The RTU will automatically restore data lost as the result of a line breakdown between the meter and RTU. On the basis of RTU-300 it is possible to design the distributed, hierarchical metering systems. A wide range of communication interfaces allows to create flexible metering systems based on RTU-300 with their customization depending on the infrastructure of a specific enterprise.

Examples of complete metering units with RTU, meters and server



Unit with RTU-314, modems, adaptors RS485/RS232, UPS, conditioner



Unit with ALPHA Meters and modem



Unit with AMR server, modems in box, UPS

Technical characteristics

Description	RTU-300	RTU-310	RTU-320
Processor	M68040 and TI M68060 and TI	M68302 and TI M68360 and TI	M68302 and TI
DRAM	2-32 MB	1-4 MB	512 kB -1,5 MB
SRAM	1-4 MB	256 kB – 1 MB	64-256 kB
FLASH	2-4 MB	2 MB	2 MB
Ethernet support	Yes	Yes	No
Profibus support	Yes	Yes	No/Yes
RS-485	32	8 (max)	No/Yes (Profibus)
RS-232 modem	32	8 (max)	1
RS-232 true	2	2	1
CL	16-32	16	16
DIN pulse inputs	256	64	16
Total processing channels (digital + pulse)	256 and more	128	32 (48)
Meter reading period (min)	1 min	1 min	1 min
Other meter reading periods possibility	Yes	Yes	Yes
Operating Temperature: standard extended	0 – +70 °C -40 – +85 °C	0 – +70 °C -40 – +85 °C	0 – +70 °C -40 – +85 °C
AC power supply	90-300 V	90-300 V	90-300 V
Non-volatile memory	Yes	Yes	Yes
Seasons	4	4	4
Tariffs	up to 48	up to 48	up to 48
Weight	less than 12 kg	less than 8 kg	less than 5 kg
Dimensions of terminal unit	260 x 230 x 330	260 x 230 x 330	260 x 230 x 330 260 x 230 x 140

A1400, A1410 ALPHA Meters

ALPHA meters are a comprehensive family of meters from Class 0,2S to Class 1 according to the IEC 61036 and 60687. The meters are intended for advanced use from industrial to high voltage transmission applications.

The ALPHA meters can measure and register active, reactive and apparent power one by one or in combinations thereof. Combining these values for a bi-directional meter is easy. Maximum demand and instrumentation values are also available within the ALPHA range. Their unique flexibility and modularity allows you to include most of the external equipment under the same housing as the meter. For instance, you can include functions for time switch and load profile registration as well as different communication interfaces.



ALPHA meters are unique in their modularity and new options will be developed to meet the current demands on metering equipment. The software modularity also offer unique possibilities to remote upgrading of the meter via modem or on site via the optical port which is a standard feature of the meter. Communication options are the most extensive area of metering. ALPHA meters featuring a RS232 (or other digital port) output will be able to fulfill the needs for future communication media, such as LON, telephone lines, cellular phone systems and others. The adaptation to the communication media is done outside the actual meter and without disconnecting it. When you have an ALPHA Meter on site you can always choose the most economic communication media at the time. Changing the communication module is an easy operation that can be done in minutes.

A1400 ALPHA Meter

An advanced Class 0,5S A1400 ALPHA meter measures both active, reactive and apparent power

A1410 ALPHA Meter

An advanced Class 0,2S A1410 ALPHA meter measures both active, reactive and apparent power

Measured values may be registered in both directions or in combinations of the four quadrants. Maximum demand with programmable intervals is standard. The A1400 can be programmed for load profile, which may be recorded in up to eight channels. Extra load profile capacity may be added. The meter has an optical communication port in accordance with IEC 61107. One of the following types of optional ports can be added: RS232, RS485 or 20mA Current loop. One pulse output is standard on the meter and five more can be added.

Features

- Modular design in both hardware and software
- Possible to upgrade both hardware and software
- Demand metering
- Total active energy
- Total energy hours for additional energy input (kVAh or kvarh)
- Fixed or rolling maximum demand
- Cumulative demand
- Programmable demand threshold
- Programmable outage times to trigger demand forgiveness
- Separate demand thresholds for each tariff

- Previous billing period information (total kWh, maximum demand, and cumulative demand at the time of the last demand reset)
- Programmable manual demand reset lockout
- Programmable demand forgiveness after power outage
- Internal real time clock automatically adjusting for leap year, seasons, daylight savings time, holidays, month, day of month, and day of week
- Up to four seasons in a year
- Up to four day types per week per season
- Up to four tariffs
- Optical interface according to IEC 61107 (FLAG) as standard
- Optical communications up to 9600 BPS
- Communication modems outside the meter sealing for easy access
- Communication interface for RS232, 20mA Current Loop and RS485
- Up to 255 meters possible in one multidrop configuration
- One pulse output as standard
- Power up for reading during power absence
- External power supply
- Super capacitor for maintaining time during power failure
- Non volatile memory for billing data and security related quantities
- Event log: Power fail, Time change and Demand resets
- System warning and error displays
- Programmable display for quantities, in any order, with identifiers for billing quantities and any 3 digit display identifier
- Alternate display sequence
- Programmable number of digits (5 to 8) and number of decimal places (0 to 3) for energy quantities
- Programmable number of digits (3 to 6) and number of decimal places (0 to 3) for demand quantities
- Programmable leading zero suppression of billing quantities
- Exchangeable LCD in field
- Real time clock automatically adjusting for leap year, seasons, daylight savings time, holidays, month, day of month, and day of week
- Cumulative energy for each tariff period
- Maximum demand with its time and date for each tariff
- Cumulative demand for each tariff
- Storage of tariff and total energy data at the last season change
- Storage of tariff and total energy data at the last demand reset
- Additional security features: cumulative power outage time, start and stop times of the last power outage, date of the last demand reset, date of last optical port data modification, date of last reprogramming, and test of the battery

Intended Uses/Users

Intended for use by:

- Power producers
- Net companies
- Utilities
- Industries

Intended for use in:

- Power stations
- Distribution line applications
- Net stations
- Sub stations
- Commercial applications
- Domestic houses

Designed for:

- Collect energy use and demand data
- Process energy use and demand data
- Store energy use and demand data
- Collect up to four tariff values

Option Boards

- Tariff control inputs
- Ripple control
- Extra pulse outputs
- Relay outputs
- External power supply
- Communication boards
- Extended loadprofile

Communications Media

- GSM
- Optical port communications
- Remote port communications
- Telephone modem capabilities when the RS232 board is used

Technical data

Accuracy (IEC 687)	Class 0,5 (Alpha A1400) Class 0,2 (Alpha A1410)
Voltages (U_n) Voltage variations	3x230/400, 3x230, 3x57/100, 3x63/110, 3x100, 3x100 V +/- 20 % of U_n
Other voltages in the range Voltage variations	3 x 46-300/80-520 V 3 x 80-520 V Both are specified as min and max voltage
Frequency	50 Hz (+/-5%)
Ext. power supply at terminals Ext. power supply at connector	48 VDC or 35 VAC +/- 20 %. U_{max} 60 VDC or 42,4 VAC peak value 12 VDC
Current base/nominal current I_b / I_n max. current I_{max} starting current	1 A 10 A 1 mA
Power consumption Voltage circuit Current circuit	max 2 W/phase, typically 1 W/phase. Depends on the type and number of installed optional boards 0,52 VA at 230 V < 0,02 VA
Internal metering constant	50.000 imp/kWh
LED frequency	Variable, set in production Default value 5.000 imp/kWh
Pulse output frequency	Default value 1000 imp/kWh
Degree of protection Meter Terminal	IP 51 IP 20
Wire size Current Voltage	1.5 to 10 mm ² 0.5 to 2.5 mm ²
Number of value digits	Programmable up to 8 value digits possible for energy and 6 for power measurements, with a maximum of 3 decimals
Temperature range	-40 °C to + 70 °C
Max. impulse voltage	10 kV on meter terminals 6 kV on other terminals
Optoport	IEC 1107 mode C and D
Internal clock Accuracy Frequency	1 ppm (1 ppm = 0,0001 %) 32,7 kHz
Pulse outputs	Acc. to IEC62053-31

A1200 ALPHA Meter

The A1000 ALPHA meter bridges the gap between electromechanical and existing electronic meters by making advanced metering functionality a cost-effective choice for 3-phase residential, commercial and small industrial applications. The A1000 ALPHA meter offers direct power line connection up to 100 amperes and meets or exceeds IEC standards, including IEC 1107 and IEC 1036 class 1 and 2.

The A1200 ALPHA meter builds on the A1000 ALPHA platform by offering an integrated real-time clock, current transformer connection, and RS-232 or RS-485 communications. All of these features make the A1200 ALPHA meter a cost-effective choice for 3-phase commercial and light industrial applications.



Features

- Records up to 4 energy tariffs with 3 day types and 8 seasons
- Economically measures active (kWh) and reactive (kVARh) or apparent (kVAh) energy in as many as four tariffs
- Records kWh over a certain kW threshold in a separate register with the A1200 ALPHA meter's optional overload energy registration feature
- Measures kW, kVAR, or kVA demand, depending on the meter's configuration
- Measures maximum demand for kW, kVAR, or kVA (arithmetic or vectorial)

Security Features

- Total operation time register
- Phase absent elapsed timer
- Reverse energy flow detection
- Service error registers
- Optional hardware lock which protects the meter from unauthorized configuration changes
- Meter can be ordered with theft-resistant measurement of kWh or kVARh which measures reverse energy flow on any phase as positive flow
- Optional daily verification of proper meter connections provides ongoing tamper detection

Installation and Instrumentation

- Installation tools help to ensure proper connections that reduce installation and maintenance labor
- Instrumentation tools display instantaneous per phase values of voltage, current, system kW, kVAR, and kVA (delivered and received)

Interfaces

- One pulse output for kWh
- Option for second pulse output on any configured meter quantity, including bidirectional kWh
- Optical port complies with IEC 61107
- Optional RS-232 port complies with IEC 61107
- Optional RS-485 port complies with IEC 61107

Wide Current and Voltage Range

Like the A1000 ALPHA, the A1200 ALPHA meter can be used for various current and voltage ratings, significantly reducing your inventory cost. The A1200 ALPHA meter will accurately meter at system voltages from 100 V line-to-neutral through 415V line-to-line. Direct connected (to 100 A) and CT-connected (to 10 A) system connections are supported.

Technical data

Accuracy (IEC 61036)	Class 1.0 or 2.0	
Maximum current	DC ¹ : 100 A continuous	CT ¹ : 10 A continuous
Current ranges (IEC 61036)	DC ¹ : I _n 5 A or 10 A. I _{max} to 100 A	CT ¹ : I _b 1 A or 5 A. I _{max} 6 A
Starting current	DC ¹ : < 20mA	CT ¹ : <2mA
Maximum continuous voltage	3-element: 500 VAC (line-to-line); 288 VAC (line-to-neutral), 2-element: 288 VAC	
Operating voltage range 3-phase, 3-wire 3-phase, 4-wire	3 x 100 to 240 VAC ±20% L1-to-L2 or L3-to-L2, delta or network 3 x 120/208 VAC to 3 x 240/415 VAC ±20% wye	
Frequency	50 Hz or 60 Hz ±2%	
I/O Relay output Tariff inputs Optical port RS-232/RS-485	DC ¹ : 1,000 pulses/kWh(kVAh)(kVARh) DC ¹ : 500 pulses/kWh(kVAh)(kVARh) T _i = 40 ms; V < 27 VDC, EC 62053-31 Nominal line voltage 4800 bps (nominal) IEC 61107 compliant Configurable 300 to 9600 bps. IEC 61107 compliant, optionally suppressing the baud rate negotiation	CT ¹ : 5,000 pulses/kWh(kVAh)(kVARh) CT ¹ : 5,000 pulses/kWh(kVAh)(kVARh) T _i = 40 ms; V < 27 VDC, IEC 62053-31
Accuracy (internal clock)	Typically < 5 ppm (while the meter is powered)	
Battery	LiSOC ₁₂ battery rated 800 mAh, 3.6V and shelf life of 20+ years. 5 years continuous duty at 25° C	
Temperature range	-40° to +55° C (ambient)	-40° to +85° C (at electronics)
Power supply burden (multiphase)	< 2 W and 10 VA across voltage range	
Surge voltage withstand	Test performed Disturbance voltage test (EFT fast transient)	Test levels 2 kV with current 4 kV with no current
	Impulse dielectric test 1.2 x 50 μs waveform	12 kV, R _{source} ≥ 40 ohms ² ; 6 kV, R _{source} ≥ 2 ohms
	AC voltage dielectric test (1 minute)	4000 V at 50 Hz
Start up delay	< 5 seconds from power application to pulse accumulation	

¹DC: direct connected meter; CT: current transformer connected meter

²For the main terminals, tested per IEC 61036

A100, A120, A140 Electronic Single Phase Meters



A100 – a cost effective electronic domestic meter for one or two-rate tariff applications

A new range of electronic single-phase meters provides a cost-effective solution for one or two rate domestic tariff applications. These meters offer the advantages of leading edge electronic metering technology, enabling standard Class 1 or 2 accuracy, anti-tamper features and security data.

Features

- Meters are designed to comply with requirements of EN 61036:1996. They are for indoor use, and satisfy Class 1 or Class 2 accuracy requirements.
- The meter's temperature coefficient is such that the error variation over the whole operating range is well within the class accuracy at nominal current.
- The design of the meter ensures life-long stability. No adjustments are required in the field.
- The meter's low starting current ensures maximization of customer revenue.
- The A100 will operate for 20 years without maintenance.

Unidirectional Operation

For normal operation, import energy is added to the import register and export energy is added to the export register. A manufacturing option allows the import register (and the two rate registers) to increment for both import and export consumption. The pulsing LED indicates identically for both import and export consumption when in unidirectional operation.

The reverse energy register, reverse energy event flag and reverse energy event counts operate the same for both modes of operation.

The meter can be configured during manufacture to register one or two tariff rates, two-rate registration being controlled by an external device.

Liquid Crystal Display

The Liquid Crystal Display offers high contrast characters that can be viewed from a wide viewing angle. The display is programmable during manufacturing to meet each customer's requirements.

LED Indicator

A red test output LED is provided. For loads above the starting current, this gives 100ms pulses modulated at approximately 8kHz.

Typical decimal point displays, programmable during manufacturing.

IrDA output

The IrDA (Infrared Data Association) communications port provides one way communications, transmitting a continuous data stream from the meter to an external device. The data stream includes a start and end mechanism, ensuring only a complete stream of data is recorded. An error-checking algorithm protects the integrity of the data stream. IrDA communications offer low cost operation, low power consumption and high noise immunity.

The port provides two important features:

- Automatic meter reading, eliminating clerical errors that may result from manually recorded meter data.
- Access to security register's, status and identification data.
- The port can be set during manufacture to transmit at one the following baud rates: 2400, 4800 or 9600.
- The default baud rate is 2400.

Optional pulsing output

An opto-isolated pulse output provides the basis for an energy management system. Alternatively, pulses can be used as the basic element of AMR. The pulse output can be specified as standard terminals or RJ11 socket.

Technical Data

RATINGS Voltage	210V, 220V, 230V, 240V, 250V
Current I _{basic}	5 or 10A (DIN) 10 or 20A (BS)
Current I _{max}	Up to 60A (DIN) 100A (BS)
Frequency	50 or 60 Hz
System Connection	1phase 2 wire
Burden	0.66W, 8.5VA (capacitive burden)
Insulation	4kV RMS 50Hz
Impulse withstand	12kV 1.2/50µS 500 ohm source
Display	LCD (6mm characters, high contrast, wide angle)
Communications IrDA Port	Baud rate 2400, 4800, 9600
Pulsing Output	DIN/SO/BS EN 62053-31 100ms pulse 200p/kWh (= 5Wh/pulse) (DIN) 100ms pulse 100 p/kWh (= 10Wh/pulse) (BS)
Certified Product Life	20 years (OFGEM model)
Temperature	-10°C to +55°C (operational range)
Humidity	-25°C to +85°C (storage range) Annual mean 75% (For 30 days spread over one year, 95%)
Dimensions	185mm (H) x 130mm (W) x 50mm (D) (DIN)
Weight	125mm (H) x 130mm (W) x 50mm (D) (BS) 340 grams (DIN) 390 grams (BS)

A120/A140 Electronic Single Phase Meter Multi-tariff Single Phase Metering

The A120 range of advanced electronic meters offer all of the benefits associated with the very latest in design of solid state electricity metering. Highly secure, reliable and extremely accurate, the A120 provides a comprehensive tariff structure suitable for the most complex domestic metering applications. To further enhance the functionality, the A140 offers up to 300 days of load profile recording.

The liquid crystal display is fully programmable and provides large, high contrast characters that can be viewed from a wide angle. Chevrons identify the values being displayed. The register displays can be programmed for the number of digits and the position of the decimal point.

Communications is via an IEC 61107 optical port. An additional RS232 port is available as an option. Both ports allow access to metered quantities, security and status data within the meter. A user friendly Windows™ 'Power Master Unit' software package programs or reads all metering data and configuration data.

The meter stores a comprehensive range of security data with respective flags, counts or time stamps. This includes reverse run count, reverse run energy total, reverse run indication on LCD, elapsed hours counter, power fail counter, cumulative hours spent in anti-creep, programming counter, end of billing count, watchdog and reset counter. Power insensitive mode, a manufacturing option, adds additional security by allowing the cumulative import register and TOU registers to increment for both import and export consumption.

Meters can be supplied to meet accuracy Class 1 or Class 2. They are fully approved to EN 61036: 1996 and comply with EMC standard EN50081-1: 1992.

Features

- Class 1 or Class 2 accuracy
- Comprehensive tariff structure
- Large digit display with chevron identification
- 300 days 30 minute load profile recording (A140 only)
- IEC 61107 optical communications port
- Internal clock and calendar with battery back-up
- 15 years product life
- Extensive security features
- DIN or BS double insulated, glass filled polycarbonate case
- Concealed or exposed top fixing and two outer lower fixing points (DIN)
- One top and two outer lower fixing points (BS)
- Compact design
- 12kV impulse protection

Options

- RS232 communications port with multi-drop capability
- Pulse output
- Extended terminal cover (BS only)

Liquid Crystal Display

The A120/140 is fitted with a high contrast, wide viewing angle liquid crystal display with seven large digits. The smaller digit (reference id) identifies the parameters being displayed. Seven chevrons point to the legend on the nameplate.

The nameplate may be printed with chosen items from the list, in the appropriate language, to suit local requirements. The liquid crystal display is programmable via the 'Power Master Unit'.

Communications

The meter is fitted with an IEC 61107 port that allows the meter to be fully configured and provides access to all metered quantities, load profile (if available), security and status data. An RS232 port, allowing configuration and access to the same data, is available as an option.

Pulse Output

An optional opto-isolated pulse output provides the basis for an energy management system or AMR. These pulses may be output via the auxiliary terminals.

The output can be configured to provide:

- Import pulses only
- Import or reverse pulses (Power flow insensitive mode)

The pulsed output pulse value can be programmed independently of the test indicator pulse value.

When the meter is in anti-creep mode the output is not active.

The pulse/kWh and pulse width is programmable as indicated below.

The Pulse output meets the requirements of EN 62053-31:1998 (DIN S.O.).

Test Indicator

A red test output LED is provided. For loads above starting current, this gives 100ms pulses modulated at approximately 8kHz.

Load Profile Data

The A140 stores up to 300 days of 30 minute load profile data, each period is tagged with status flags.

The data can be displayed in the Power Master Unit as a chart or report. The number of day's data to be read back is selectable. The chart gives mouse over viewing details of demand recording and flags.

Technical Data

Ratings	230V, 5-60A (DIN) 10-100A (BS)
Frequency	50 or 60Hz
System Connection	1phase, 2 wire
Burden	0.4W, 1.4VA (capacitive burden)
Insulation	4kV RMS 50Hz
Impulse withstand	12kV 1.2/50µS 500µ source
Display	7.5mm Characters High contrast, wide angle
Product Life	15 years
Temperature	-20° to + 60° C (Operational range) -20° to + 85° C (Storage)
Humidity	Annual Mean 75% (For 30 days spread over one year, 95%)
Pulse width	100ms or equal mark/space
Wh/pulse (Programmable)	100, 50, 40, 20, 10, 5, 4, 2, 1
Weight	400 grams (DIN) 450 grams (BS)
Specifications	Class 1 or 2 EN 61036 : 1996
Case	IP 53 to EN 60529 : 1991

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