A1700
CT Metering

The Power to Change...

Features
- CT & CT/VT operated
- Comprehensive tariff structure
- 2 line dot matrix multilingual display
- Instantaneous instrumentation values
- Communications via optical port or communications module
- 2 module slots for extended functionality
- 450 days of load profile data
- Internal clock and calendar with battery back-up
- Concealed utility/reset pushbutton
- 2 or 3 element availability
- Accuracy Class 0.2s, 0.5s, 1 or 2
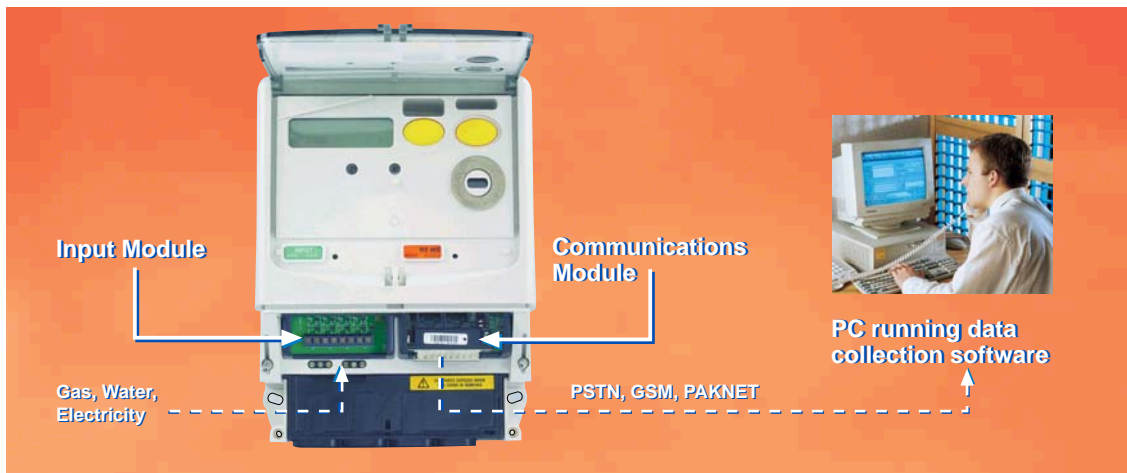- High security design

Options
- 4 relay outputs
- Range of interchangeable input/output and communications modules
- 900 days load profile data
- Data stream mode communications
- ANSI communications port
- Short terminal cover

The A1700 offers outstanding measurement and complex tariff capabilities for use in both industrial and commercial CT and CT/VT operated applications. The A1700 can operate as a stand alone unit or as part of a comprehensive metering system.

The meter features include a fully programmable customer defined display and an optical port for local communications. Two slots are provided for the addition of an input or output and a communications module. Load profile data can be stored for up to 900 days. Data stream mode communications allows up to 90 days of data to be collected in less than 30 seconds.

Communications modules can be RS232 or RS485. A range of PSTN, or a GSM modem plug into a module directly under the meter terminal cover. An input module provides the ideal solution for multi-utility metering. Alternatively an output module increases the number of relays from four to eight. Windows™ 'Power Master Unit' software programs or reads the meter data.

The CT meter can be supplied to meet accuracy Class 0.2s, 0.5s, Class 1 or Class 2 and is fully compliant to EMC regulations EN 50081-1 and EN 50082-1.

Input Module

Communications Module

Gas, Water, Electricity

PSTN, GSM, PAKNET

PC running data collection software

Measured Quantities
kWh total import/export
kvarh lagging import/export
kvarh leading import/export
kVAh (calculated)
3 customer defined registers -
    derived from measured quantities
4 inputs from external meters (if fitted)

Tariff Structure
32 Time of use registers
8   Maximum demand registers
12 Seasons
24 Season changeover dates
96 Switching times
64 Exclusion dates

Programmable deferred tariff

Data Storage
450 or 900 days of half hour data for one channel
Programmable integration period
Load profile storage for any measured quantity

12 sets of historical data

Display
2 line 16 character dot matrix liquid crystal display
Wide viewing angle
Fully customer defined, multilingual

Communications
Local: IEC 62056-21 (formerly IEC 61107)
Remote: Interchangeable modules (RS232,
              RS485 or customer specific)

Measurement
Accuracy class: Class 0.2s, 0.5s, 1 or 2

Ratings
Voltage range: 57.5 - 240V (3 ph 4 wire)
                               100 - 415V (3 ph 3 wire)
Max. current (Imax): 10A
Standard current (In): 1, 2, 5A

Other voltage and current values are available
Contact Elster Metering Systems

Frequency: 50Hz or 60HZ
Temperature:
Operating: -20°C to $+55^{o}$C
Storage: -25°C to $+70^{o}$C

Case & Dimensions
Sealed flip-up lid:
• Conceals utility/reset pushbutton
• Provides for customers own information to be
    securely added to the nameplate
• Allows visual identification of modules fitted

Ingress protection to IP 53, IEC 60529:89

279mm(high) x 170mm(wide) x 81mm(deep)
Weight: 1.5kg

Approvals
EN 61268-1996
Compliant to EMC regulations
EN 50081-1, EN 50082-1

A1700
Direct Connected Metering

The Power to Change...

Features
- Cost effective direct connected meter
- Comprehensive tariff structure
- 2 line dot matrix multilingual display
- Instantaneous instrumentation values
- Plug-in modules to extend functionality
- Communications via optical port or communications module
- 40 days of load profile data
- Internal clock and calendar with battery back-up
- Concealed utility/reset pushbutton
- 2 or 3 element availability
- Accuracy Class 1 or 2
- Upgradeable to Code of Practice 5
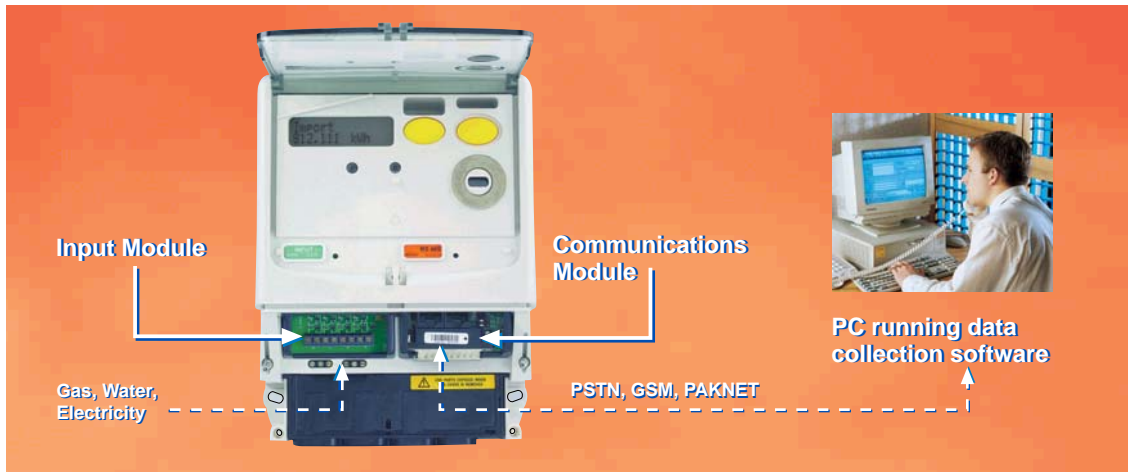- High security design

Options
- 4 relay outputs
- Range of interchangeable input/output and communications modules
- 450 days of load profile data
- Data stream mode communications
- ANSI communications port
- Short terminal cover

The A1700 meter offers a cost effective solution for direct connected metering applications. It provides a range of tariff functions suitable for all industrial and commercial applications.

The meter features include a fully programmable customer defined display and an optical port for local communications. Two slots are provided for the addition of an input or output and a communications module. Load profile data can be stored for up to 450 days. Data stream mode communications allows up to 90 days of data to be collected in less than 30 seconds.

Communications modules can be RS232 or RS485. A range of PSTN, or a GSM modem plug into a module directly under the meter terminal cover. An input module provides the ideal solution for multi-utility metering. Alternatively an output module increases the number of relays from four to eight. Windows™ 'Power Master Unit' software programs or reads the meter data.

The direct connected meter can be supplied to meet accuracy Class 1 or 2 and is fully compliant to EMC regulations EN 50081-1 and EN 50082-1.

Input Module — Gas, Water, Electricity

Communications Module — PSTN, GSM, PAKNET

PC running data collection software

Measured Quantities

kWh total import/export
kvarh lagging import/export
kvarh leading import/export
kVAh (calculated)
3 customer defined registers -
   derived from measure quantities
4 inputs from external meters (if required)

Tariff Structure

32 Time of use registers
8   Maximum demand registers
12 Seasons
24 Season changeover dates
96 Switching times
64 Exclusion dates

Programmable deferred tariff

Data Storage

40 days of half hour data for one channel
Option of increased storage to 450 days
Load profile storage for any measured quantity
Programmable integration period

12 sets of historical data

Display

2 line 16 character dot matrix liquid crystal display
Wide viewing angle
Fully customer defined, multilingual

Communications

Local: IEC 62056-21 (formerly IEC 61107)
Remote: Interchangeable modules (RS232,
         RS485 or customer specific)

Measurement

Accuracy class: Class 1 or 2

Ratings

Voltage range: 57.5 - 240V (3 ph 4 wire)
                       100 - 415V (3ph 3 wire)
Standard voltages: 120, 230, 277, 400V
Max. current (Imax)   100A
Standard current (lb): 10, 15, 20, 30, 40A

Other voltage and current values are available.
Contact Elster Metering Systems

Frequency: 50Hz or 60Hz
Temperature:
Operating: -20°C to +55°C
Storage: -25°C to +70°C

Case & Dimensions

Sealed flip-up lid:
• Conceals utility/reset pushbutton
• Provides for customers own information to
  be securely added to the nameplate
• Allows visual identification of modules fitted
Ingress protection to IP53, IEC 60529:1989

279mm(high) x 170mm(wide) x 81mm(deep)
Weight: 1.5kg

Approvals

EN 61268-1996
Compliant to EMC standards
EN 50081-1, EN 50082-1

A1700
Communications

The Power to Change...

Module Types

RS232
- 25-way D-type connector
- Multi-drop terminals
- 10 Volt modem supply
- Connection for up to 10 meters
- 12 metres transmission distance
- Standard RS232 pin connections
- Class II isolation from meter

RS485
- 2 RJ45 sockets for RS485 multi-drop
- 25-way connector for standard RS232 communications
- 10V modem supply via RS232 connector
- Connection for up to 32 meters
- 1.2km transmission distance
- Class II isolation from meter

Applications
- Direct connection
- PSTN modem
- GSM modem
- Ethernet converters
- PAKNET™

The A1700 meter supports a range of modules that plug into the module slot. The slot is accessed by simply removing the meter terminal cover. The modules can be inserted into the meter without removing the power or affecting the meter certification.

Modules can be supplied for RS232 or RS485 applications. To reduce communications costs, both types of module have connectors for multi-drop installations, allowing several meters to be accessed from a single modem. For multi-drop connection a module must be fitted to each meter in the chain.

The RS232 and RS485 modules provide a 10V power supply that allows a modem to be powered directly from the module. The modem plugs directly into the module under the meter terminal cover. If the meter is multi-dropped and power to the host meter is removed, the modem will continue to operate by utilising the supply from any other meter in the chain.

Communications media that can be utilised include a range of V22/23/32 PSTN and GSM modems, Ethernet converters and PAKNET™. The communications speed can be up to 9600 baud.

GSM   Multi-drop

RS232 Module

The RS232 module allows direct connection to any RS232 communications device through a standard 25-way D-type connector.

The module has a 10V 80mA supply to power a modem. The power is provided via the 25-way connector allowing the modem to plug directly into the module beneath the terminal cover.
A row of terminals allows up to 10 meters to be connected in multi-drop mode, therefore reducing communications costs. The multi-drop connection can be over a distance of up to 12 metres.

RS485 Module

The RS485 module is supplied with two RJ45 multi-drop sockets. A modem, powered by a 10V 80mA supply, can be connected via the 25-way, RS232 D-Type connector. The module converts RS232 to RS485. For RS485 connection, external equipment is connected directly via the RJ45 sockets.

Up to 32 meters can be multi-dropped over a distance of 1.2km. Transmit/receive LED's provide an indication that communications are operating correctly. The module allows ease of installation using standard plug-in RJ45 connectors to link from one meter to the next. There are no other connections to make.

Isolation Levels

Isolation to protective Class II (all modules).

Applications

Dir ect Connection

The module is used as a standard RS232/RS485 port that interfaces directly to a PC or Hand Held Unit.

PSTN Modem

A standard V22/V23/V32 modem can be connected to the module for use on a telephone line, or via a terminal adaptor for use on an ISDN line.

PAKNET^{TM}

The module can be used with the PAKNET^{TM} Radio System. This allows radio communications to take place with a meter in remote areas.

GSM Modem

The A1700 can be used with a range of GSM modems, allowing full utilisation of the mobile telephone network.

The Elster GSM modem is simple to install and connects directly to an RS232/485 module D-type connector under the meter terminal cover.
This gives the benefit of higher security from fraud or tampering.

The modem draws its power from the module.

The communications speed can be set to 1200, 2400 or 9600 baud. The modem parameters are programmed prior to installation using Windows Terminal or Hyper-terminal.
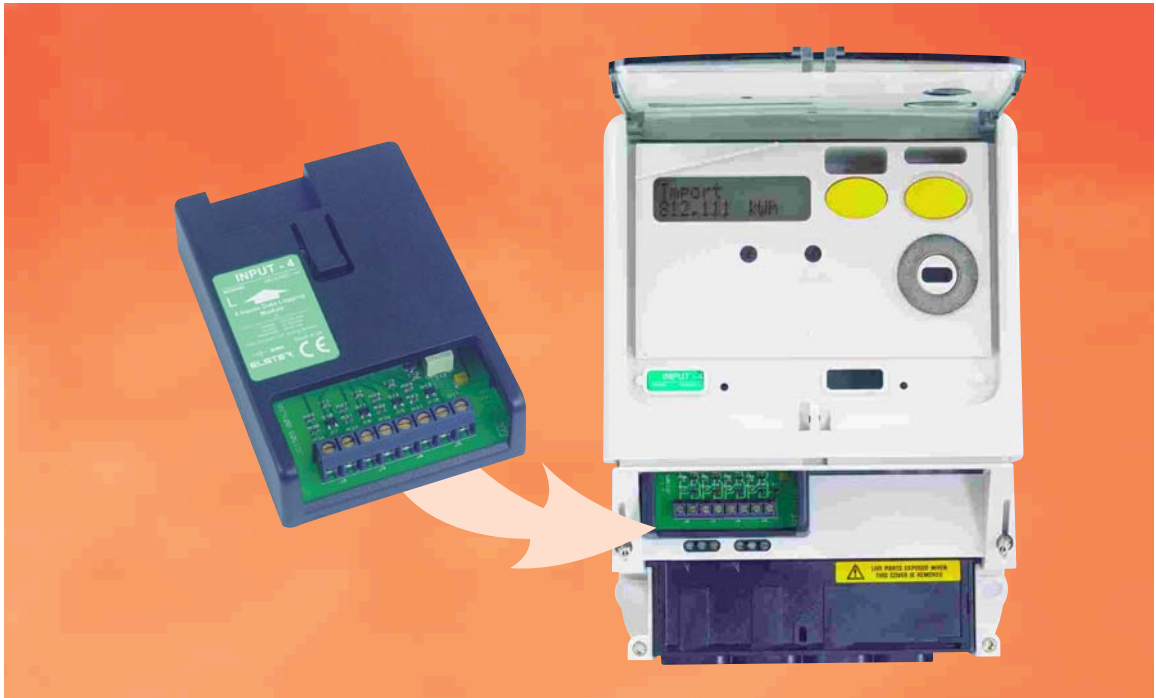
The modem supports a range of antennas that can be chosen to best suit the installation.
The modem can be used with the service provider of your choice.

A1700
Input/Output

The Power to Change...

Module Types

Four Input Module

Features
- Inputs for creation of end of billing and/or end of integration period
- Inputs from external meters
- Programmable scaling factor
- Records input pulse or engineering units
- Three customer defined registers
- Input circuit detection without use of external power
- Battery backed
- Pulse collection continues when power to meter is removed
- Class II isolation from meter

Four Output Relay Module

Features
- Re-transmit pulses from energy registers, customer defined registers or any time of use register
- Programmable output pulse value
- Provide indication of billing reset, rising demand alarm, end of integration period, time of use register active and alarms
- Class II isolation from meter

Options
- Three solid-state relays and one 5A relay
- Four solid-state relays

The modular design of the A1700 meter allows the systems performance to be enhanced by the introduction of an input module or an output module. These modules plug into the I/O module slot which is accessed by simply removing the meter terminal cover. Modules can be retrofitted without breaking the meter certification seal or removing power from the meter.

By installing an input module, existing A1700 installations can be upgraded to provide load profile data for external meters such as gas, water or electricity. Up to four inputs provide a cost-effective solution for multi-utility metering. The customer defined registers combine module inputs with the A1700 internal registers. This allows kWh total import, kWh total export or any of the four quadrant registers to be summated with any similar input.

The output module can be fitted in addition to the A1700 meters internal relays, providing a total of eight outputs. Two versions of the output module are available. MODVAB provides three solid state relays and one 5A relay for controlling an external load or contactor. MODVAC has four solid state relays. The solid state relays allow the A1700 to be integrated into an existing energy management system by providing the energy manager with any measured data from the meter. The re-transmission of the end of billing and end of integration period from the meter ensures the systems are synchronised. A demand alarm can be used to indicate that a programmed threshold has been exceeded.
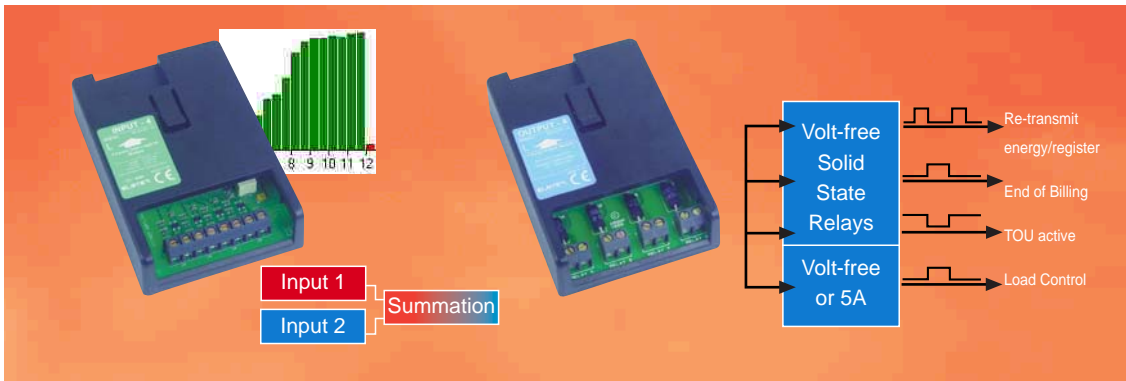
Input Module

Four inputs
Input Types:
- Volt free contact
- Transistor switch

Registration Input

Each input has a cumulative register which can have an initial offset and scaling value to ensure it matches the external meter. The register can be viewed on the meter display.

An input can be used to source the cumulative, demand, load profile, tariff, customer defined register or to be retransmitted via a relay. The scaling factor is programmable. To record the pulse count, set the scaling factor to one.

Customer Defined Registers

Customer defined registers can be used in tariff structures or load profiling.

Examples of the A1700 customer defined register configurations are shown below.

- Summate two module inputs (Input 1 + Input 3)
- Summate a module input with a A1700 meter register (Input 2 [kWh] + A1700 import kWh register)

Load Profile

At the end of an integration period, the contents of each rising demand, can be transferred to create a load profile record.

In the event of a power outage the module stores 30 minute data for a period of 48 hours. Data is transferred to the meter when power is restored.

Technical

Voltage rating	27V d.c. max
Current rating	10mA max (input active)
Pulse width	20ms min, 200ms max
Pulse rate	4Hz max

Output Module Types

MODVAB
- Three solid state relays
- One 5A relay

MODVAC
- Four solid state relays

Relay Functions

Re-transmit pulses from:
- kWh total import/export
- kvarh lagging/leading, import/export
- Three customer defined registers
- kVAh
- Input register
- Any time of use register

The re-transmission rate and pulse width are programmable.

Indication of:
- End of billing
- End of Integration period
- Time of use active indication
- Rising demand alarm
- Meter powered
- Alarm monitoring, any combination of:

Option board error	Battery fail
Battery elapsed warning	Meter-fault
Reverse run warning	Over-current
Phase failure	Partial demand
Meter comms event	Time/date changed

Technical

Solid state relays:

Voltage rating	240V a.c.
Current rating	100mA

High rating relay:

Voltage rating	240V a.c.
Current rating	5A

Isolation Levels

Isolation to protective Class II (all modules).

A1700
Meter Applications

3 phase 4 wire

A
B
C
N

3 phase 3 wire

A
B
C

Connections

The A1700 meter can be connected to the following network applications:

3 Element
3 phase 4 wire
2 phase 3 wire
2 phases of a 3 phase 4 wire
1 phase 3 wire
1 phase 2 wire

3 Element
3 phase 4 wire
3 phase 3 wire

2 Element
3 phase 3 wire

Connections can be made directly or through CT's and/or VT's

GMT | Mondays to Fridays | Saturdays & Sundays

00.00
01.00
02.00
03.00
04.00 — 2.41p — 2.41p
05.00
06.00
07.00
08.00
09.00
10.00
11.00
12.00
13.00 — 7.47p
14.00
15.00
16.00
17.00 — 28.22p
18.00 — 4.24p
19.00 — 15.79p
20.00
21.00
22.00 — 4.24p
23.00
24.00

A M J J A S O N D J F M

From April to March
(all prices exclusive of VAT)

All Months

Tariff Structure

The A1700 meter offers maximum tariff flexibility from a simple MD tariff which operates throughout the year, to a complex STOD (Seasonal Time Of Day) tariff.

The meter offers 32 TOU registers, 8 maximum demands, 12 seasons, 24 season change over dates, 96 switching times and 64 exclusion dates.

Load Profile Recording

The A1700 meter can record 900 days of 30 minute load profile data for one channel. The data can be displayed in the Power Master Unit, Meridian or in data analysis software.

Import kW 02/11/99

The Power to Change...

Gas, Water, Electricity

Multi-Utility Metering
The addition of a module with four pulsed inputs allows the A1700 meter to be enhanced for use as a multi-utility meter. External inputs such as gas, water or electricity meters can be connected and stored as load profile data, cumulatives, demands, time of use registers or in customer defined registers.

Local Connection

Remote Multi-Drop Connection

PAKNET

Meter Reading
The A1700 meter can be read via the optical port, or via an RS232 or RS485 module. Both modules can be used for the following applications:

Local connection
Multi-drop
PAKNET
Remote modem

The RS232 module can be used to multi-drop up to 10 meters over a transmission distance of up to 12 metres.

The RS485 module allows up to 32 meters to be multi-dropped over a distance of 1.2km.

Fast Data Collection

Data Stream Mode
Data stream mode communication allows for fast reading of energy registers and load profile data via the optical or serial port.

Data stream mode allows up to 90 days of data to be collected in less than 30 seconds.

## GSM Modem

Elster GSM Modem
The A1700 meter can utilise the GSM network, with the service being provided by the service provider of your choice.

The Elster GSM modem is simple to install and is sealed directly beneath the A1700 meter terminal cover.
This gives the added benefit from fraud or tampering.
The modem connects to the meter via a RS232 or RS485 module. This configuration allows several meters to be multi-dropped from a single modem.

The modem is powered directly from the meter.

# Power Master Unit Software
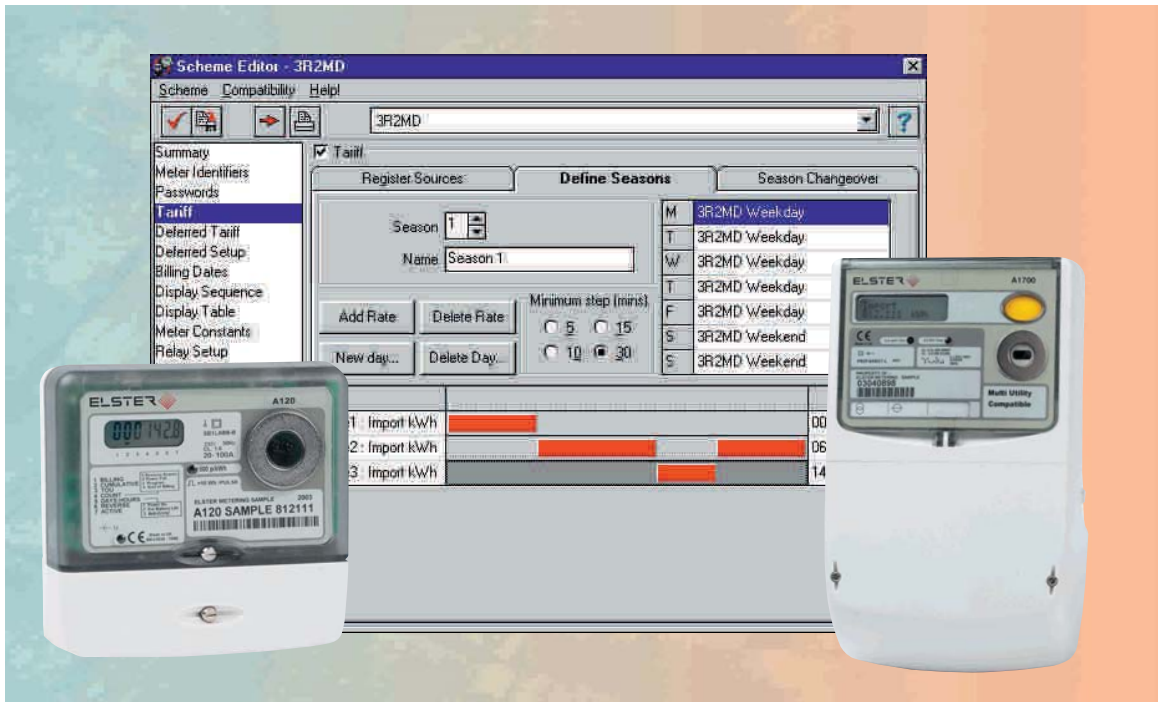
Features

- Enables local and remote reading and programming of meters
- Easy to use
- Graphical tariff scheme creation
- Compatible with all A1700 and A120/140 programmable polyphase and single phase meters
- Load profile display facility
- Menu and toolbar driven
- Quick send option
- A1700 Data stream mode communications
- CHIRPS files are fully supported
- Local communications via IEC 62056-21 (formerly IEC 61107), CHIRPS, RS232 or RS485
- Remote communications via modem, PSTN, GSM or PAKNET
- Enables remote diagnostics
- User password protection
- Retrieves instantaneous meter values
- On-line help
- Optional scheduler for automatic reading and programming
- Read only version
- User definable privileges
- Converts old Master Unit files

Power Master Unit Software supports Elster Metering Systems' range of programmable single and polyphase meters, providing a user-friendly, Windows™ graphical interface for programming meters and reading meter data.

The software provides three main windows comprising of a Scheme Manager, Meter Manager and Meter List. The Scheme and Meter Manager, allow schemes and information about meters to be organised hierarchically like files in Windows™ Explorer. Schemes and meter information are brought together as a Meter List before transfer to the meter.

Quick send mode allows changes to a meter without the requirement of identifying the particular meter or setting up a Meter List. Data stream mode allows for fast reading of energy registers, historical registers and load profile data via the optical or serial port.

A variety of communications media are supported including PSTN or GSM modem, PAKNET, IEC 62056-21 and RS232/RS485. The software also programs hand held units using CHIRPS for programming meter schemes and reading meter data at remote locations in the field.

Load profile data
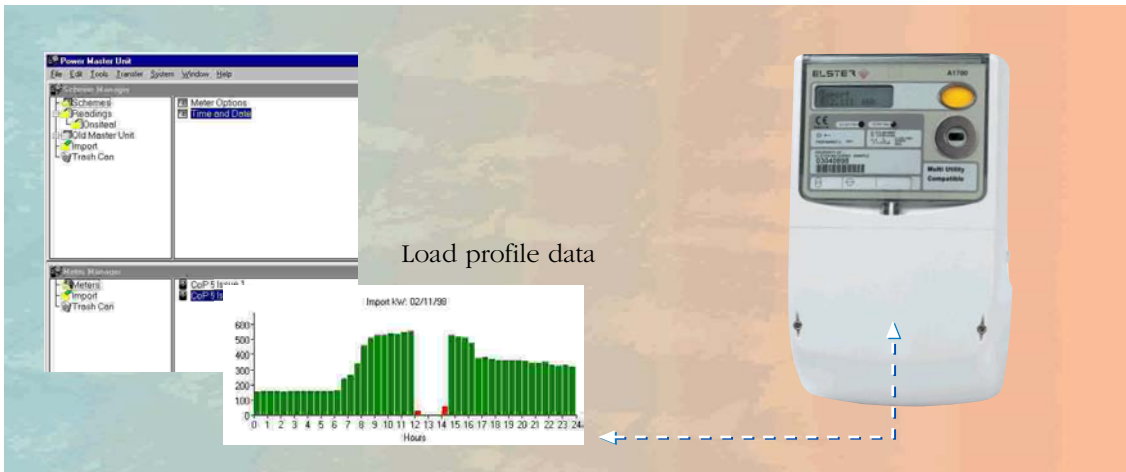
About the Master Unit

Scheme Manager

The scheme manager allows a variety of different schemes to be entered, each scheme consisting of a particular combination of items to be programmed to or read from the meter.

A scheme can consist of an individual entry, such as a display sequence. This gives the added advantage of changing only one parameter of a group of meters with all other parameters remaining unchanged.

A scheme can be set up to read a meter's configuration, registers and data. These readings can be read in the readings viewer.

Meter Manager

The meter manager stores information about a user's meters. As a new meter is added to the system, connection, identifiers, security, hardware and communications information about the meter can be entered.

Meter List

A meter list consists of a list of meters and their associated schemes. Once defined, the meter list can be executed via any of the communications methods available. The communications server gives a clear indication of files as they are transferred.

Load Profiling

Load profile data read back from a meter can be displayed as a bar chart or report. The number of days to be read back is selectable.

If a diagnostic flag has been set during an integration period then the bar will change to red. Simply placing the mouse pointer over the bar identifies the demand recording and flags set.

Systems Administrators

Systems administration allows the administrator to create new users with their appropriate access levels. It also provides facilities for locating files for importing into the master unit and provides the ability to change the communications server setup.

Communications

Communications are set up within the meter manager using the meter information editor. The communications applicable to a specific meter type are selectable from modem, PSTN or GSM modem, PAKNET, FLAG, RS232/485, CHIRPS or hand held unit. RS232/485 applications can be multi-dropped if required at speeds of up to 9600 baud.

Scheduler

The scheduler is a tool that is used within the Power Master Unit. It allows automatic reading and programming of meters to be activated at a time scheduled by the software out of office hours.