



# ACE Pilot

User Guide



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Itron S.A.S

ZI Chasseneuil - Avenue des Temps Modernes

86361 Chasseneuil du Poitou cedex

France

Tel: +33 5 49 62 70 00

Fax: +33 5 49 62 70 89

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## **1. About this guide**

### **1.1. Scope**

This guide provides all the information required to understand how to:

- create, edit and manage meter data
- program meters
- read data from meters
- administer the system
- update meter firmware



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## 2. Introduction

**ACE Pilot** is a Windows™-based support application designed for use with Itron DMLS electricity meters, such as the:

- ACE4000 - Smart residential meter range
- ACE6000 and SL7000 - Commercial and Industrial meter ranges

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**Note:** This user guide covers the C&I electricity meter ranges only.

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Ace Pilot communicates with each meter by either:

- an optical head connected to a communication port on the PC, and to the optical interface on the front of the meter
- a direct serial connection to a communication port on the meter
- a modem connection
- TCP/IP

The main functions performed through ACE Pilot are:

- system administration
- creating, editing and managing meter data
- programming meters
- reading data from meters (billing information and configuration)
- updating meter firmware

All functions are performed using standard Windows menus and dialogues, accessible from a single main window.

Security provision in the software and in the meters control the functions that can be performed by individual users.

Typically, there is no fixed order in which tasks must be performed, although some are pre-requisites for others. For example, before you can program meters, the relevant configuration must already have been created. Where pre-requisites *are* required, they will be detailed in the relevant procedures and topics.

## 2.1. Overview of functions

### Creating and managing meter data

Ittron commercial and industrial meters are highly configurable, allowing their operation to be defined to suit the specific requirements of each utility. Using ACE Pilot, you can create, save and manage the sets of configuration data that define meter operation. Configuration data sets (known as generic configurations) can also be created independently from the meters and these can then be used, as required, to program the supported meters.

### Programming meters

Programming consists primarily of transferring the configuration data created in ACE Pilot to individual meters. In addition, there are meter-specific functions for programming individual parameters such as passwords.

### Reading Meters

Using ACE Pilot, you can read current and historical billing data, load profile data, meter configuration, meter status and details of alarms/events logged by the meter. The retrieved data is automatically stored in the integral ACE Pilot file system and is immediately available for:

- viewing and analysis
- exporting in Microsoft Excel (.xls) or PDF format

### System administration

This includes a range of tasks such as setting up and managing system users, configuring the way some aspects of ACE Pilot operate and defining the meter-related functions that users are permitted to perform. All system administration tasks are restricted to users with the highest security level.

### Updating meter firmware

ACE Pilot includes all the functions necessary to allow you to download and transfer alternative (or later) versions of operating firmware to the range of supported meters.

## 2.2. Meter configuration data sets

### Configuration

A meter **Configuration** contains all the operational parameter values supported by a meter at its current firmware level.

A set of default generic meter configuration files are supplied with the ACE Pilot system (one per meter type). These can be used as templates for the generation of further customer-specific configurations using the various meter-configuration management and manipulation tools provided by the ACE Pilot system.

Once a configuration has been generated, it can be applied (programmed) into a meter of the relevant type. A configuration can be completely unique for a particular meter installation or common across a whole range of installed meters.

Meter configuration files are saved on the ACE Pilot system with (and always identified by) a unique name.

### Meter identity

The meter identity typically comprises data such as:

- the meter-access passwords and communication parameters
- the unique meter name
- the meter serial number
- the current firmware version
- group, client, and address information
- a suitable meter **Configuration**

Meter identity files are saved on the ACE Pilot system using the unique meter name. Therefore, each meter has its own file.

## 2.3. Supported meters

The ACE Pilot system can be used with variants within the following meter ranges:

- ACE6000
- SL7000

However, the specific meters supported by any individual installation of ACE Pilot are determined by the licence code, supplied with the software.

New licence codes can be supplied and entered into ACE Pilot to extend the support to additional meter-types, where required.

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**Note:** The ACE4000 meter range has separate user documentation, please contact your local Itron agent/representative for further details.

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## 2.4. Security

### Controlled user access

Every user of ACE Pilot requires a unique login **User ID** and **Password**.

When new users are added, they must be assigned to one of five access levels:

Level	Description
<b>Administrator</b>	An administrator level user has complete access to all ACE Pilot functions.

<b>User Groups</b> <b>1 to 4</b>	Each group is completely configurable and defines the program functions to which the users in that group have access.
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### **Controlled meter access**

Confidentiality and privacy of meter data is managed by COSEM logical devices in the meter and matching COSEM client connection profiles, each protected by a dedicated utility-set password. All connection attempts by COSEM clients are checked by the meter before establishing a connection.

## **2.5. System Requirements**

Before installing the software, ensure that the host PC meets the following minimum system requirements:

<b>Item</b>	<b>Specification</b>
<b>Operating system</b>	<ul style="list-style-type: none"><li>• Windows 7</li><li>• Windows Vista</li><li>• Windows XP (SP3 min)</li></ul>
<b>Processor</b>	2GHz
<b>Ram</b>	1Gb (2Gb recommended)
<b>HDU space</b>	1Gb
<b>Communications</b>	At least one RS232 serial or USB port

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## 3. Getting started

### 3.1. Installing the software

To install the software, you should log on as an Administrator level user on the host PC, then do the following:

1. If the software is supplied in a compressed (.zip) file format, extract the contents using WinZip™ or another suitable application.
2. Close all other applications.
3. Disable any anti-virus software that may interfere with the installation process.
4. Click on the **ACEPilot.exe** file to start the installation wizard.
5. Follow the on-screen instructions and select the default settings given during the installation process.
6. Once complete, the ACE Pilot icon will be added to your desktop:



7. Re-enable any anti-virus software previously disabled.

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**Note:** Also installed is **ACE Pilot License Manager**, a support tool used to add, activate or upgrade licenses.

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Following a successful installation on a Windows 7 or Vista based host PC system, the software should be started in Administrator mode (right-click on the icon and select the command: Execute in Administrator mode).

The application now needs to be licensed prior to use.

### 3.2. Licensing the software

An installation of ACE Pilot should include a license file having a **.LIC** extension.

License files are unique to every customer installation and grant controlled access to the various ACE Pilot options. Therefore, if you were not supplied with this important file, please contact your local Itron agent/representative.

To use the ACE Pilot software you must **Activate** the license using the **ACE Pilot License Manager** support tool. However, if the license is not activated, the application will run in its **Trial Mode**.

### 3.3. Activating a licence

To **Add** or **Activate** a new license:

1. Browse to and open the **ACE Pilot License Manager** that is installed (by default) in the same folder as the ACE Pilot software:

**Start > Programs > Itron > Ace Pilot**

2. Click on **Add a new license** and browse to the .LIC file provided.
3. Click on **Activate** to open the activate software window.
4. If you want to continue the full license activation process, do the following:
  - i. Click **Activate manually by entering a code**.  
The machine code and serial number appear.
  - ii. Click **Copy to Clipboard** or **Copy to Email** and send this information to your Itron customer support representative who will then supply the activation code.
  - iii. Upon receipt, enter the **Activation Code** in the field provided.
  - iv. Click **Activate** to complete the process.
5. If you want to run ACE Pilot using the time and functionality-limited trial mode, do the following:

- Click **Activate Later**.

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**Note:** The trial license can only be used to read data from a meter. Writing configurations and data to a meter is only possible with a permanent license.

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### 3.4. Logging on

The system stores a **User ID** and **Password** for every authorised user. Before you can use the system, you must identify yourself by typing these in exactly as they have been set up. This is referred to as **Logging On**, and unless it is done correctly you simply will not be able to gain access to any functions.

To log on, do the following:

1. Double-click the Windows Desktop **ACE Pilot** icon.  
Alternatively, it can be found via **Start > All Programs > Itron > Ace Pilot**.
2. Enter your **User ID** and **Password**.  
Both are mandatory and the password *is* case-sensitive.
3. Select the **Language** you require from the list box.  
If the language you require is not available, please contact your local Itron agent/representative to discuss your requirements.
4. Click **OK**.

#### System Administrators

If you are an **Administrator** initially logging on to ACE Pilot following a successful installation and license activation, use the following defaults:

- **User ID** (manager)
- **Password** (MANAGER)

For security, you should change the default password immediately after a successful initial log in. See **Maintaining user accounts** (page 24).

You will now need to configure the program to make it:

- usable with the types of meter supported by your license
- accessible to all other authorised users

### 3.5. Logging out

There is no need to log out of ACE Pilot, the application can simply be closed by clicking the **X** in the top right corner:



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## 4. ACE Pilot windows and controls

On start-up, ACE Pilot displays a single main window that can be resized, maximised and minimised using standard Windows™ controls and techniques.

The main window comprises distinct functional elements, such as:

1. a **Ribbon** menu at the top, providing user access to all program functions
2. a display region directly below the ribbon that shows:
  - multiple tabbed panes relevant to the selected functions
  - application dialogue boxes, as necessary
3. a quick access toolbar
4. a region along the bottom edge displaying parameter and settings conflict information

The following sections provide functional descriptions of each element.

### 4.1. Ribbon menu

The **Ribbon** menu provides an easy-to-use interface where the application icons are displayed on a large tabbed toolbar.

Typically, icons are grouped on the various ribbon tabs according to their functionality, each group being presented within a descriptively labelled box.

In accordance with standard Windows presentation techniques, clicking a ribbon tab will cause:

- the selected ribbon to become active and display its contents
- all other ribbons to become inactive with their content hidden

The ribbon itself is dynamic and displays only elements relevant to the:

- current operational context
- active functions
- meter-type
- user permissions

Therefore, while using ACE Pilot, further ribbon tabs may be presented and the active ribbon tab content may change. Also, be aware that some control elements may belong to more than one function grouping and appear on more than one ribbon tab at any one time.

When the main window is resized, the ribbon group boxes may collapse or expand as necessary. Therefore, some icons may appear smaller, lose their text labels or disappear completely. When a group box collapses to a point where some icons are no longer displayed, an expand control becomes available.

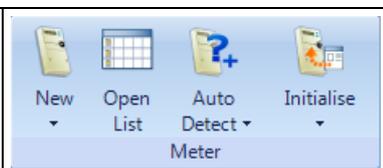
In accordance with normal Windows practice, in certain instances items that are not available for a particular operation are 'greyed out'. This indicates that you cannot perform these functions, either because they do not apply for some operational reason, or because you do not have the necessary user permissions.

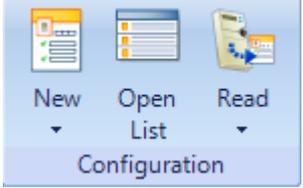
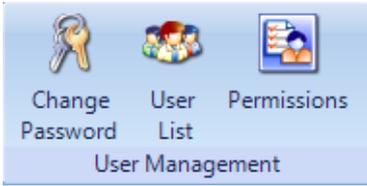
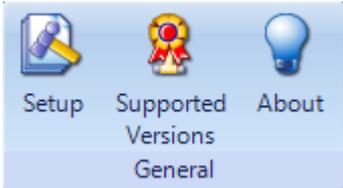
The following topics cover the ribbon tabs in greater detail.

#### 4.1.1. Main menu tab

The **Main Menu** ribbon tab is displayed at start-up and is generally available at all times.

Typically, it presents high-level function groups such as:

<p><b>Meter</b></p> <p>This provides a range of meter-specific functions to create new meter identity files, list existing meters, automatically detect meters and to initialise meters.</p>	
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<p><b>Configuration</b></p> <p>This provides a range of functions to create, list and read meter configurations.</p>	
<p><b>User Management</b></p> <p>This provides functions to list and change the passwords/permissions of authorised users in addition to creating new ones.</p>	
<p><b>General</b></p> <p>This provides a range of system setup functions and tools that give information about the ACE Pilot system and supported meters.</p>	

To activate a control simply click on the relevant icon. However, this action may cause a further list to be displayed from which you must make a choice before the desired function activation takes place.

The following topics describe in further detail the individual controls found in each group.

#### 4.1.1.1. Meter

The **Meter** group provides the following functions to manage the meter **Identities**:

<p><b>New</b></p>	
	<p>Displays a list of supported meter types.</p> <p>The system opens a <b>New Meter</b> tab below the ribbon based on your selected meter type.</p>
<p><b>Open List</b></p>	
	<p>Opens a <b>Meter List</b> tab below the ribbon displaying all the meter identities previously created and saved on the system.</p> <p>If further meters are created or auto-detected their details are dynamically added to this list.</p>
<p><b>Auto Detect</b></p>	
	<p>Displays a list of supported meter types.</p> <p>The system opens an optical connection dialogue box, then:</p> <ul style="list-style-type: none"> <li>• reads the meter <b>Identity</b> data</li> <li>• saves the meter details as a new entry in the meter list</li> <li>• opens a <b>New Meter</b> tab below the ribbon based on the details the system has just read</li> </ul> <p>This function will only work if the password of the connected meter matches the one defined in system <b>Setup &gt; Default Values</b>.</p>
<p><b>Initialise</b></p>	

	<p>The system opens an optical connection dialogue box, then:</p> <ul style="list-style-type: none"> <li>Initialises the meter passwords to the ones defined in system <b>Setup &gt; Default Values</b>.</li> <li>Carries out the meter initialisation procedure.</li> </ul>
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A further ribbon tab labelled **Meter** is presented when any of the above functions are activated.

#### 4.1.1.2. Configuration

The **Configuration** group provides the following functions to manage the generic meter **Configurations**:

<b>New</b>	
	<p>Displays a list of all supported meter-types.</p> <p>The system opens a <b>New Configuration</b> tab below the ribbon based on your selected meter-type.</p>
<b>Open List</b>	
	<p>Opens a <b>Configuration List</b> tab below the ribbon displaying all the meter configurations previously saved on, or imported into the system (including defaults).</p>
<b>Read</b>	
	<p>Displays a list of all supported meter-types.</p> <p>The system opens an optical connection dialogue box, then:</p> <ul style="list-style-type: none"> <li>saves the configuration as a new entry in the configuration list</li> <li>opens a <b>New Configuration</b> tab below the ribbon based on the configuration values the system has just read</li> </ul> <p>This function will only work if the password of the connected meter matches the one defined in the system setup.</p>

A further ribbon tab labelled **Configuration** is presented when any of the above functions are activated.

#### 4.1.1.3. User management

The **User Management** group functions open further dialogue boxes providing the following:

<b>Change Password</b>	
	<p>Text entry fields where you can enter a new personal <b>Password</b>.</p>
<b>User List</b>	
	<p>Functions to add, edit and delete <b>User Accounts</b>.</p>
<b>Permissions</b>	
	<p>Functions to set up group-based access rights for:</p> <ul style="list-style-type: none"> <li>application operation</li> <li>meter configuration parameters</li> <li>configuration parameter programming</li> </ul>

#### 4.1.1.4. General

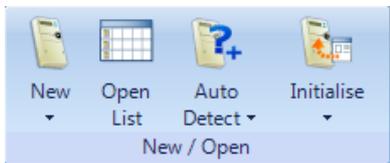
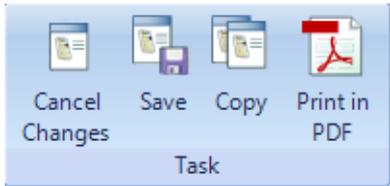
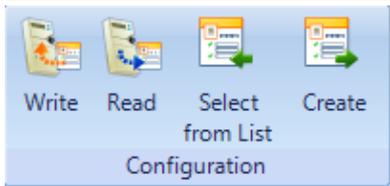
The **General** group functions open further dialogue boxes displaying the following:

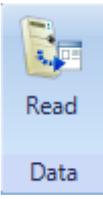
<b>Setup</b>	
	A range of individually selectable option categories, each one containing configurable parameters used to setup the system, for example: <ul style="list-style-type: none"> <li>• <b>Communication</b></li> <li>• <b>API Cossem</b></li> <li>• <b>File locations</b></li> <li>• <b>AIMS Import</b></li> <li>• <b>Default Values</b></li> </ul>
<b>Supported Versions</b>	
	The currently supported meter-types and the relevant firmware versions.
<b>About</b>	
	ACE Pilot current version, licence and application file information.

#### 4.1.2. Meter tab

The **Meter** ribbon tab is only displayed when any of the meter-specific functions on the **Main Menu** are activated.

Typically, it presents high-level function groups such as:

<p><b>New/Open</b></p> <p>This provides the same range of meter-specific functions as found in the <b>Meter</b> group on the <b>Main Menu</b> ribbon tab.</p>	
<p><b>Task</b></p> <p>This provides a range of functions to edit (and cancel any changes), save, copy and print an <i>active</i> meter identity.</p>	
<p><b>Meter Management</b></p> <p>This provides functions to open or delete, import or export meters from the meter listing</p>	
<p><b>Configuration</b></p> <p>This provides functions to:</p> <ul style="list-style-type: none"> <li>• write/read a configuration to/from a meter</li> <li>• select a configuration from a list or create a new one</li> </ul>	

<p><b>Data</b></p> <p>Provides a function to read metering data from a selected meter.</p>	
--	---

The following topics describe in detail the individual controls found in each group.

#### 4.1.2.1. Task

The **Task** group functions are related to meter identities and configurations (not metering data), as follows:

<b>Edit</b>	
	Enables the active meter parameters to be edited by unlocking text- and numeric-entry fields and providing selection list boxes where relevant.
<b>Save</b>	
	Saves any changes made to the meter parameters. The action is immediate and no save confirmation dialogue box appears. The active meter tab is then locked against further editing.
<b>Cancel changes</b>	
	Cancels <b>all</b> changes made to the meter parameters during an edit session. However, once a save action has occurred, you cannot then cancel any changes made.
<b>Copy</b>	
	Creates an exact copy of the active displayed meter. A further <b>Meter tab</b> is then displayed under the ribbon that can be edited, renamed and saved as required.
<b>Print in PDF</b>	
	<p>Opens a PDF dialogue box enabling you to print the parameters, as you require. All meter PDF files are automatically saved in the system <b>Export</b> folder. See File Locations (page 28).</p> <p>File naming convention is:</p> <ul style="list-style-type: none"> <li>• Meter serial number</li> <li>• Year</li> <li>• Month</li> <li>• Day</li> <li>• Hour (24h format)</li> <li>• Minute</li> <li>• Second</li> </ul> <p>Example: 12345678_2010_17_12_13_23_45</p>

#### 4.1.2.2. Meter management

The **Meter Management** group functions are as follows:

<b>Open Meter</b>
-------------------

	Opens a meter tab below the ribbon displaying the selected meter parameters.
<b>Delete Meters(s)</b>	
	Opens a confirm deletion dialogue box for the selected meter or meters.
<b>Import</b>	
	<p>Opens a dialogue box to import a previously-saved ACE Pilot compressed (.zip format) meter file.</p> <p>If a meter exists on the host system that contains the same serial number as the file to be imported the system will display a message dialogue box.</p> <p>This function is typically used to import meter parameters from another ACE Pilot installation.</p>
<b>Export</b>	
	<p>Opens a dialogue box to export the selected meter parameters as a compressed (.zip format) file.</p> <p>This function is typically used to transfer meter parameters to another ACE Pilot installation.</p>

For many of the functions above, by default, the system **Export** folder is used. However, you can navigate to any available folder, as necessary. See File Locations (page 28).

#### 4.1.2.3. Configuration

The **Configuration** group functions are as follows:

<b>Write</b>	
	<p>Opens a dialogue box that prompts you to confirm a connection to a meter. The system then:</p> <ul style="list-style-type: none"> <li>• opens a dialogue box that provides configuration-type selection functions and dynamic advice messages relevant to your selection</li> <li>• checks the meter connection security</li> <li>• writes the chosen configuration parameters to the connected meter, overwriting the existing parameters completely</li> </ul>
<b>Read</b>	
	<p>Opens an initial message box warning you that this action will overwrite the currently active configuration. The system then:</p> <ul style="list-style-type: none"> <li>• opens a dialogue box that prompts you to confirm a connection to a meter</li> <li>• reads and transfers the meter configuration parameters, overwriting the configuration contents of the active meter tab completely</li> </ul>
<b>Select from list</b>	
	<p>Opens a dialogue box that displays all the meter configurations previously saved on, or imported into the system (including defaults).</p> <p>The contents of this list are filtered depending on the type of meter displayed in the active meter tab.</p>
<b>Create</b>	

	<p>Opens a <b>New Configuration</b> tab under the ribbon.</p> <p>The newly created configuration is a copy of the selected meter. This function is typically used to create a generic configuration from a validated meter configuration (or template).</p>
---	---

**4.1.2.4. Data**

The **Read** group functions are as follows:

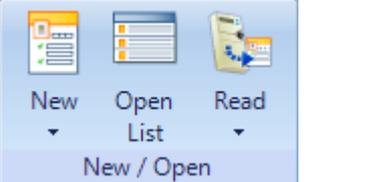
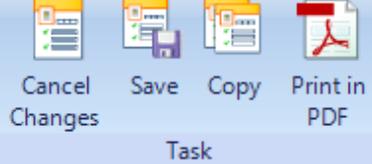
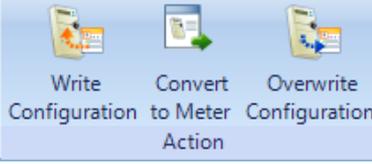
<p><b>Read</b></p>	
	<p>Opens an initial dialogue box that prompts you to confirm a connection to a meter. The system then:</p> <ul style="list-style-type: none"> <li>• opens a dialogue box that provides data type selection functions</li> <li>• reads the selected meter data</li> <li>• displays the collected data values in the active meter data tab.</li> </ul> <p>Errors and warnings will be displayed if the connected meter is of the incorrect type, or the firmware does not match.</p>

**4.1.3. Configuration tab**

The generic **Configuration** ribbon tab is only displayed when any of the configuration-specific functions on the **Main Menu** are activated.

This tab typically manages generic configurations created independently from the meters. Once prepared, a configuration can be applied to (programmed into) a supported meter.

The Configuration functions are as follows:

<p><b>New/Open</b></p> <p>This provides the same range of functions as found in the <b>Configuration</b> group on the <b>Main Menu</b> ribbon tab.</p>	
<p><b>Task</b></p> <p>This provides a range of functions to edit (and cancel any changes), save, copy and print an <i>active</i> configuration.</p>	
<p><b>Action</b></p> <p>This provides functions to:</p> <ul style="list-style-type: none"> <li>• write a configuration to a meter</li> <li>• convert the active configuration to a meter identity</li> <li>• overwrite the generic configuration with the parameters read from a connected meter</li> </ul>	

The following topics describe in detail the individual controls found in each group.

**4.1.3.1. Task**

The **Task** group functions are as follows:

<p><b>Edit</b></p>
--------------------

	Enables the active configuration parameters to be edited by unlocking text- and numeric-entry fields and providing selection list boxes where relevant.
<b>Save</b>	
	Saves any changes made to the configuration. The action is immediate and no save confirmation dialogue box appears. The active configuration tab is then locked against further editing
<b>Cancel changes</b>	
	Cancels <b>all</b> changes made to the configuration parameters during an edit session. However, once a save action has occurred, you cannot then cancel any changes made.
<b>Copy</b>	
	Creates an exact copy of the active displayed configuration. A further tab is then displayed under the ribbon that can be edited, renamed and saved as required.
<b>Print in PDF</b>	
	Opens a PDF dialogue box enabling you to print the configuration parameters, as you require. All configuration PDF files are automatically saved in the system <b>Export</b> folder. See File Locations (page 28). File naming convention is: <ul style="list-style-type: none"> <li>• CFG_GN</li> <li>• Configuration name</li> <li>• Year</li> <li>• Month</li> <li>• Day</li> <li>• Hour (24h format)</li> <li>• Minute</li> <li>• Second</li> </ul> Example: CFG_GN_ACE 6000 CT_2010_17_12_13_23_45

**4.1.3.2. Action**

The **Action** group functions are as follows:

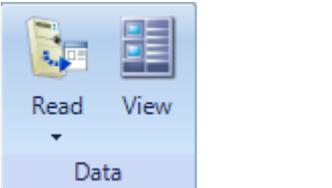
<b>Write Configuration</b>	
	Opens a dialogue box that prompts you to confirm a connection to a meter (typically using an optical head). The system then: <ul style="list-style-type: none"> <li>• opens a dialogue box that provides configuration type selection functions and dynamic advice messages relevant to your selection</li> <li>• checks the meter connection security</li> <li>• writes the chosen configuration parameters to the connected meter, overwriting the existing parameters completely</li> </ul>
<b>Convert to Meter</b>	

	<p>Converts the currently active configuration to a meter identity. The system then:</p> <ul style="list-style-type: none"> <li>• hides the ribbon <b>Configuration</b> tab</li> <li>• opens the <b>Meter</b> ribbon tab</li> <li>• opens a new meter <b>Definition</b> tab under the ribbon using the converted configuration values. This tab allows you to enter many parameter values that define the meter's unique identity.</li> </ul>
<p><b>Overwrite Configuration</b></p>	
	<p>Opens an initial message box warning you that this action will overwrite the current configuration. The system then:</p> <ul style="list-style-type: none"> <li>• opens a dialogue box that prompts you to confirm a connection to a meter (typically using an optical head)</li> <li>• reads and transfers the meter configuration parameters, overwriting the contents of the active meter configuration tab completely.</li> </ul>

**4.1.4. Tools tab**

The **Tools** ribbon tab is displayed at start-up and is generally available at all times.

Typically, it presents high-level function groups such as:

<p><b>Maintenance</b></p> <p>This provides meter maintenance and firmware download functions.</p>	
<p><b>Data</b></p> <p>This provides functions to select and read data from a connected meter and view the values collected.</p>	

The following topics describe in detail the individual controls found in each group.

**4.1.4.1. Maintenance**

The **Maintenance** group functions are as follows:

<p><b>Maintenance</b></p>	
	<p>Displays a list of all supported meter-types. The system then:</p> <ul style="list-style-type: none"> <li>• opens a dialogue box that prompts for a connection to a meter of the selected type (typically using an optical head).</li> <li>• opens a <b>Maintenance</b> tab below the ribbon providing functions relevant to the selected meter-type.</li> </ul>
<p><b>Firmware Download</b></p>	
	<p>Opens a <b>Download</b> tab below the ribbon providing all the functions necessary to select and download alternative versions of firmware to a connected meter.</p>

**4.1.4.2. Data**

The **Data** group functions are as follows:

<p><b>Read</b></p>
--------------------

	<p>Displays a list of all supported meter-types. The system then:</p> <ul style="list-style-type: none"> <li>• opens a dialogue box that prompts for a connection to a meter of the selected type (typically using an optical head)</li> <li>• opens a dialogue box that provides data type selection functions</li> <li>• reads the selected data from the connected meter</li> <li>• saves the collected data to the ACE Pilot file system</li> <li>• opens a <b>View Data</b> tab below the ribbon</li> </ul>
<p><b>View</b></p>	
	<p>Opens a <b>View Data</b> tab below the ribbon displaying <b>all</b> the data collected by the system.</p>

#### 4.2. Quick access toolbar

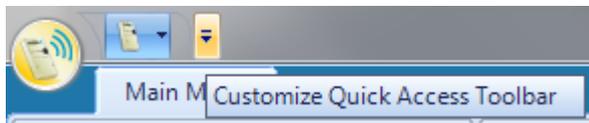
The **Quick Access Toolbar** function allows you to place any icons that you might want to use on a regular basis throughout your ACE Pilot session onto an easily accessible toolbar.

However, when ACE Pilot is closed, this toolbar is cleared.

To place a function on the quick access toolbar, right-click the relevant ribbon icon to display the following self-explanatory options:

- **Add to Quick Access Toolbar**
- **Remove from Quick Access Toolbar**
- **Show Quick Access Toolbar Below the Ribbon**
- **Minimise the Ribbon**

Alternatively, click the toolbar control to display the relevant options, as shown:



#### 4.3. Conflicts tab

Configuration conflicts typically occur when parameters have been incorrectly set, or are incomplete in some way. When required, message reports advising you of these situations are displayed in the **Conflicts** tab.

The conflicts tab label dynamically changes to a:

- green tick icon if no conflicts have been detected, or all existing conflicts have been cleared:



- red circle icon, if there are conflicts detected:



To display the tab contents simply hover over, or click the tab label. The resulting window can be resized if necessary and the **Auto Hide** function can also be disabled.

The conflict messages are displayed in a tabular format, simply click the **+** icons to expand any groupings. The table entries can be ordered (page 35), as required.

Double-click on a conflict description to open the relevant configuration parameter window, facilitating conflict resolution.

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## 5. Administering the system

The ACE Pilot system requires initial configuration prior to use and may require periodic administration during use. It is recommended that one person is nominated as the **System Administrator** to carry out these tasks. An administrator has full access to all ACE Pilot functions at all times.

Initial system configuration will involve:

- setting access permissions
- creating user accounts
- configuring the system

Periodic administration may involve:

- maintaining user accounts
- reconfiguring the system according to changing operational requirements

All of the functions related to these tasks are described in the following sections.

In addition, the System Administrator should take account of the information given concerning protecting and backing up data (page 101).

### 5.1. Setting access permissions

An ACE Pilot user must be assigned to one of five **Access** levels:

- **Administrator**

An administrator level user has complete access to all ACE Pilot functions at all times. More than one administrator level user can exist on the system, if required. However, it is recommended that only the person nominated as the **System Administrator** is granted this level of access. All other users should be assigned to an access group.

- **Access groups 1 to 4**

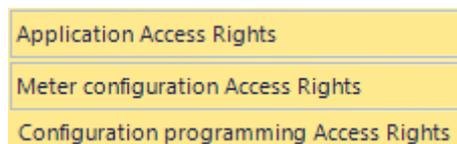
The groups are individually configurable and define the program functions to which the users in each group have access (granted permissions). Each group can be renamed with a more suitable or relevant title relating to the job description or task requirements of the group users. For example, **Engineers** or **Meter Readers**.

Typically, access group configuration is carried out prior to creating any user accounts.

Upon installation of ACE Pilot, by default, **No** access rights are granted to any Group 1 to 4.

#### Access group configuration

1. Click **Main Menu** ribbon > **Permissions**.
2. Click one of the control tabs provided to expand the relevant **Access Rights** display:

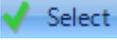
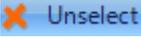


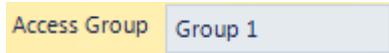
3. **Enable** or **Disable** the access right to each feature listed by clicking the tick box in the relevant group column.

You can use standard Windows techniques to select a combination of individual cells (Control + click) or select a block of cells (Shift + click).

To select all the cells in a column, simply click the column header cell.

Once a selection has been made use the:

-  icon to enable the access rights
  -  icon to disable the access rights
4. **Rename** the access groups by entering new text or modifying the existing contents of the title field, as required.



5. When all required access group configuration is completed, click **Close**.

## 5.2. Printing and saving access permissions

If a printout report of the access rights permissions is required, click **Print in PDF**. The standard PDF window allows you to print the displayed information.

The report is automatically saved as a PDF file in the system **Export** folder (see File Locations (page 28)).

The file naming convention is:

- **ACEPilot\_Permissions**
- **Year**
- **Month**
- **Day**
- **Hour (24h format)**
- **Minute**
- **Second**

Example: **ACEPilot\_Permissions\_2010\_17\_12\_13\_23\_45**

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**Note:** From ACE Pilot version 3.1.0 the access permissions can also be exported and imported as secured .xml files.

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## 5.3. Maintaining user accounts

Before delivery, ACE Pilot is programmed with a single default administrator log in User ID and Password. These should be used only by the person nominated as the System Administrator.

---

**For security, the System Administrator should change the default password immediately after installation of the software.**

---

When performing any user maintenance or other system configuration task, an administrator level user should use his or her own login details rather than the defaults.

### User account details

All user accounts comprise the following:

Field	Description
<b>User ID</b>	A required field where up to 8 alpha-numeric characters are allowed. It <i>cannot</i> include spaces, punctuation or any other characters and <i>is not</i> case-sensitive.
<b>Password</b>	A required field where up to 16 characters are allowed. It <i>can</i> include spaces, punctuation or any other characters and <i>is</i> case-sensitive.
<b>Employee Ref</b>	A non-mandatory field where any relevant employee reference can be entered to help identify the user.
<b>Full Name</b>	A non-mandatory field where the full name of the user can be entered.

<b>Access Group</b>	A required field where the access group level suitable to the user is selected using a list box. By default the first group (1) is selected.  Administrator level access can only be granted by another administrator level user.
---------------------	---

Maintaining **User Accounts** typically consists of:

- adding new users
- editing and/or deleting existing ones

The above actions can be performed only by an administrator or an authorised user with the necessary access permissions. However, all users can edit or change their own passwords at any time.

### 5.3.1. Adding a new user

1. Click **Main Menu** ribbon tab > **User List**.
2. Click the **Add** icon.
3. Make all the necessary entries into the fields provided, entering the **User ID** and **Password** exactly as you want them to be typed when the user logs on.
4. Complete the entries and click **OK** to save.

### 5.3.2. Editing an existing user

User details can be updated at any time, any changes made will take effect when the user next logs on.

To edit an existing user account details (including password), do the following:

1. Click **Main Menu** ribbon tab > **User List**.
2. Click on the user you wish to edit.
3. Click the **Edit** icon.
4. Make changes to the displayed details as necessary, then click **OK** to save.

---

**Note:** Details that you cannot edit due to user access permission restrictions are greyed out.

---

### 5.3.3. Deleting an existing user

1. Click **Main Menu** ribbon tab > **User List**.
2. Click on the user you wish to delete.
3. Click the **Delete** icon.
4. Click **Yes** to action the deletion.

### 5.3.4. Changing user passwords

1. Click **Main Menu** ribbon tab > **Change Password**.
2. Enter the old password in the field provided.
3. Enter the new password and confirm.
4. Click **OK** to save.

## 5.4. Supported versions information

To display the meter types and all associated firmware versions currently supported by the system, do the following:

1. Click **Main Menu** ribbon > **General** group > **Supported Versions**.  
The supported version table is displayed.
2. Click the **+** icons, as necessary, to expand the meter type groups to display the relevant firmware versions.

The table contents can be ordered (page 35), as required.

3. Click **OK** to close the window.

For meter firmware versions that do not appear in the supported versions table, please contact your local Itron agent/representative to discuss your requirements.

## 5.5. System information

To display important application, file and license information, do the following:

1. Click **Main Menu** ribbon > **General** group > **About**.

A **Library List** table is displayed, the contents can be ordered (page 35), as required.

2. Click **OK** to close the window.

You may be required to send a copy of the displayed information to the Itron support team during system update or troubleshooting procedures. The **Copy to Clipboard** function provides a convenient way to copy all the required data, ready for it to be pasted into an email or other document.

## 5.6. Configuring the ACE Pilot system

System configuration covers a range of options that must be set up for ACE Pilot to operate as required.

To access the system configuration options, do the following:

1. Click **Main Menu** ribbon tab > **Setup**.
2. Click on the required option icon to display the relevant page:

<b>Communication</b>	
	Setting the communications options is an essential task before any meters can be read or programmed.
<b>API Cosem</b>	
	The API Cosem options are concerned with meter-related connection parameters.
<b>File Locations</b>	
	Selecting the file locations is optional as ACE Pilot will use default locations if custom ones are not selected. However, this could be important for data security.
<b>AIMS Import</b>	
	The AIMS Import options are optional as they are only required if you need ACE Pilot to use existing <b>AIMS Pro</b> meter and configuration data files.
<b>Default Values</b>	
	The default values options are mainly concerned with the meter-related connection parameters and default connection passwords.
<b>Miscellaneous</b>	
	<b>Print orientation</b> and <b>Time setting format</b> controls are provided on this page.

### 5.6.1. Communication options

The ACE Pilot software installation process automatically identifies communication ports fitted to the host PC that are suitable for communicating with meters (typically COM 1 and COM 2). Before meters can be read or programmed, the ports to which they will be connected must be selected from those identified.

If you are using a USB Optical head it must be connected to a host PC USB port prior to setting up the communication options. When the optical head is plugged in to a USB port it will auto-configure and be assigned a com port number (typically COM 3 or 5).

#### Connection by Optical Head

Select the COM Port for the optical head using the list box, only valid COM port assignments will be shown.

#### Serial Connection

1. Select the COM Port for a direct serial connection using the list box, only valid COM port assignments will be shown

To change the speed on this port, go to **Default Values** and modify the:

*Default baudrate for direct link parameter*

2. Use the information below to set the port parameters as required:

<b>Modem TAPI connection</b>	
<b>Modem Name</b>	Use this list box to select the name of the modem using the Telephony Application Programming Interface (TAPI).
<b>Speed</b>	Use this list box to select the baudrate for the preconfigured TAPI modem.
<b>Modem Connection</b>	
<b>Modem Name</b>	Use this list box to select the name of the modem. The entries displayed in the list are managed using the controls provided (see below for details).
<b>COM Port</b>	Use this list box to select the COM Port for the modem connection. Only valid COM port assignments will be shown.
<b>Speed</b>	Use this list box to select the communication baudrate for the connected modem.
<b>Response Delay</b>	This parameter sets the time ACE Pilot waits for a response from the modem once it has issued a valid command during a communication session.  Use the spin controls or enter a suitable value for the selected modem. By default this value is 5 seconds.

#### Adding a modem to the list

1. Click the **Add** modem icon.
2. Enter a modem name in the field provided.
3. Select the dialling type using the list box:

- **ISDN**
  - **Pulse**
  - **Tone**
4. Enter any required modem initialisation strings (HAYES AT command set compatible).
  5. Click **OK** to save the details.

**Editing modem details**

1. Select the required modem from the list.
2. Click the **Edit** modem icon.
3. Amend the details, as required.
4. Click **OK** to save the changes.

**Deleting a modem from the list**

1. Select the required modem from the list.
2. Click the **Delete** modem icon.

**5.6.2. API Cosem options**

It is recommended that these values are left at their defaults. However, any modifications made will be taken into account the *next* time the application is started.

<b>API Settings</b>	
<b>Client Inactivity Timeout</b>	This parameter sets the duration of the period ACE Pilot waits before automatically disconnecting from a meter due to inactivity.  Use the spin control or enter a suitable value. By default this value is 300 seconds.
<b>Trace Level</b>	You may be required to send a copy of the trace information to the Itron support team during troubleshooting procedures.  Select the trace level required using this list box: <ul style="list-style-type: none"> <li>• <b>None</b> (default)</li> <li>• <b>Partial</b> - this option is rarely requested</li> <li>• <b>Full</b> - provides a trace down to the hexadecimal communication information</li> </ul>

**5.6.3. File locations**

During the installation of ACE Pilot, a series of default folders (directories) are created on the local PC hard drive to hold the various data files generated during use, as follows:

<b>Folder</b>	<b>File type</b>
<b>Meters</b>	Meter <b>Identities</b> as individual .xml files.
<b>Configurations</b>	<b>Configurations</b> as individual .xml files.
<b>Read Data</b>	Meter reading data as individual .xml files.
<b>Exports</b>	Import and export .zip files as well as PDF report and configuration/identity data files.  Excel format files (.xls) are also stored here.

However, the location of these folders can be modified, as required.

### Changing a folder location

1. Click the **Browse** control located at the end of the required file location entry, for example:

Meters  

2. Navigate the displayed folder tree, using the scroll bar if necessary.
3. Click on your chosen location.
4. If a new folder is required at the highlighted location, click **New Folder** and rename, as necessary.
5. Click **OK** to set.

---

**Note:** When navigating the browse window, standard Windows right-click menu options are available.

---

When the **Options** window is closed, the content of changed folders is automatically transferred to the new locations.

#### 5.6.4. AIMS Import

If you require access to existing meter **Identities** and **Configurations** created using the **AIMS Pro** application, do the following:

1. Export the meter identity or configuration from AIMS Pro either as a single or a multiple entry file (no metering data is exported).
2. To import a **Single** file, do the following:
  - i. Click the **Import File** button.
  - ii. Navigate to, and select the required **.cfg** or **.mtr** file.
  - iii. Click **Open** to import.
  - iv. The imported file is converted and saved in the system **Configurations** or **Meters** folder, as applicable (see File Locations (page 28)).
3. To import the contents of a folder containing **Multiple** configuration files, do the following:
  - i. Click the **Importing Folder** button.
  - ii. Navigate the displayed folder tree, using the scroll bar if necessary.
  - iii. Click on your chosen location.
  - iv. If a new folder is required at the highlighted location, click **New Folder** and rename, as necessary.
  - v. Click **OK** to import.
  - vi. The imported files are converted and saved in the system **Configurations** folder (see File Locations (page 28)).

---

**Note:** When navigating the browse window, standard Windows right-click menu options are available.

---

If you need to prevent multiple copies of the same file being imported, click the associated **Do Not Import Existing (Configurations or Meters)** tick box. Otherwise, the file will be imported and renamed with a # (number) filename, as shown by the example below:

- **ACE 661 Def**
- **ACE 661 Def #1**
- **ACE 661 Def #2**

### **Import reporting**

During an import, error messages may be displayed if the process cannot be completed successfully for some operational reason.

After an AIMS file import, a report is displayed that provides:

- details of the process
- controls to output a copy of the report in PDF or Excel (.xls)

### **5.6.5. Default Values**

The **Default Values** page displays a series of meter-type tabs, each containing specific meter-related parameters. The values entered on each tab are used when generic configuration is used to create a new meter of that type, for example:

- **SL7000 761**
- **ACE 6000 650**
- **ACE 6000 661**

### **Connection parameters**

Use the spin controls and list boxes provided to select suitable values for the relevant connection parameters and enter new values (or edit existing ones) in the text boxes, as necessary.

---

**Note:** The administrators/managers or providers of the external systems will need to supply many of the parameters required to complete this procedure.

---

### **Passwords**

Confidentiality and privacy of data are managed by COSEM logical devices in the meter and matching COSEM client connection profiles:

- **Electricity utility laboratory**
- **Electricity utility field**
- **Electricity reader**
- **End customer**
- **Engineer**

Each connection profile is protected by a dedicated password and all connection attempts by COSEM clients are checked by the meter before establishing a connection.

Enter new **Passwords** for each client type, as necessary. Exercise caution to ensure the passwords are entered correctly to ensure security-related issues do not arise when attempting to connect with meters.

When using the **Initialise** function the new passwords will be programmed into the meter.

### 5.6.6. Miscellaneous

#### Print orientation

By default, all PDF files are created in **Portrait** format.

To set to **Landscape** format click the tick box provided.

#### Time format

To change the time format used by the application, click the required radio button control:

- **Regional settings**  
Uses the host PC time setting (this could be 12h or 24h)
- **International (24h)**

Any change made to the time format setting will only come into effect the next time the application is started.



---

## 6. Connecting to meters

The ACE Pilot system can communicate with a meter via:

- a separate optical head and a serial communications port (RS232 or USB) on the host PC
- a direct serial connection to a communication port on the meter
- a modem connection
- TCP/IP

---

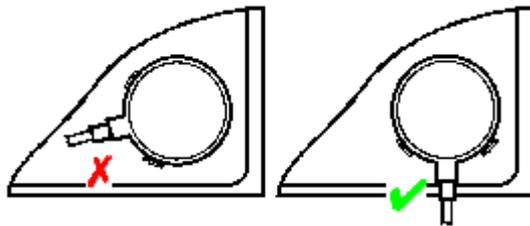
**Note:** The serial port(s) must already have been configured for use through the system setup **Communication** (page 27) options.

---

### Meter connection dialogue

Whenever you connect to a meter to read or write data, a meter **Connection** dialogue box is displayed.

1. Select the required function.
2. If displayed, select an appropriate entry from the **Choose Connection Method** list box.
3. Make the relevant connection to the meter:
  - **Optical head connection:**  
Connect the optical head to a pre-configured serial (or USB) port on the host computer, then attach the magnetic head to the optical port on the front of the meter, with the probe cable at the bottom, as shown:



- **Serial connection (RS232):**  
Use the specific direct connection cable available from Itron (RJ45 to DB9).
  - **Modem connection:**  
If modem is selected, the system will use the modem definition details entered in the system **Setup > Communication** options.
4. Click **Connect**.
- Once the process starts, an **Action in progress** dialogue box will display a progress bar. The process is typically finished once the progress bar reaches 100%, and all open dialogue boxes are closed.



## 7. Working with configuration data sets

When a meter **Identity** or **Configuration** is created or imported into the system, it is stored as an individually named XML file in either the system **Meter** or **Configuration** folder (see File Locations (page 28)).

Access to these files is provided via the **List** functions, as follows:

- For **Identities**, click **Main Menu** ribbon tab > **Meter** group > **Open List**.
- For **Configurations**, click **Main Menu** ribbon tab > **Configuration** group > **Open List**.  
By default, all details are shown. If further entries are created, they are dynamically added to the displayed list.

Depending on the list type, the Meter tab (page 16) or the Configuration tab (page 19) is displayed on the main menu ribbon.

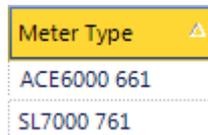
A list display tab is divided into two functional regions:

Left-hand display pane	
<b>Meters</b>	This tab contains icons representing all predefined system filters.
<b>Customised Filters</b>	This tab contains icons representing any user-configured search filters.
Right-hand display pane	
This pane contains meter details presented in a tabular format.	

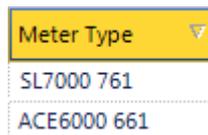
To close a list display, click the **X** icon on the relevant list tab label.

### Ordering list table contents

List table contents can be ordered depending on detail type. By simply clicking on the relevant detail column header, the table contents will be ordered and presented in an ascending alpha-numeric fashion, as shown by the example below:



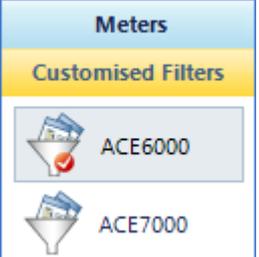
A subsequent click on the same header will reorder the contents in a descending fashion, as shown:



### Filtering list table contents

List table contents can be filtered to display only required details, as follows:

Meter type	
<p>A screenshot of a filtered list table. The 'Meters' tab is selected. Below it are two entries: 'All Meters' and 'SL7000 761'.</p>	<p>Click on the <b>Meters</b> tab, then click the required meter type icon.</p> <p>The table contents are dynamically updated to include only entries that match the selection made.</p>

<p><b>Customised Filters</b></p> 	<p>Click on the <b>Customised Filters</b> tab, then click the required filter icon.</p> <p>This option is only available if filters have already been setup (see below).</p> <p>The table contents are dynamically updated to include only list entries that match the filter criteria.</p>
<p><b>Any detail</b></p> 	<p>Enter searchable parameters (the search criteria) into the <b>Search</b> field, as required.</p> <p>The table contents are dynamically updated as characters are entered. All list entries containing a matching sequence of parameters (in any column) are displayed.</p> <p>The <b>Add Filter</b> function becomes active and search sequences can be saved as preset <b>Customised Filters</b> (see below)</p>

### Adding a search filter to the Customised Filter tab

1. Enter the required search parameters in the **Search** field.
2. Click the **Add Filter** button.
3. Enter a **Name** for the filter in the text field provided.
4. If you want to include the filter in both **Meter and Configuration** lists, click the relevant tick box.
5. If you want to set the filter as the **Default**, click the relevant tick box.

Alternatively, you can set any customised filter as the default by right-clicking on the relevant filter icon and selecting **Select filter as default**.

A red tick  on the icon denotes the default.

6. Click **Save**.

### Deleting a search filter

1. Right-click on the relevant filter icon.
2. Select **Delete filter**
3. Click **Yes** when prompted to action the deletion.

## 7.1. Common functions

Many ACE Pilot system functions and operations are common to both meter **Identity** and **Configuration** display list entries, such as:

- **Opening**
- **Saving and Deleting**
- **Importing and Exporting**
- **Creating and Copying**
- **Printing**

Prior to accessing and using any of the above functions, ensure the configuration and/or identity **Display Lists** (page 35) are open.

The following sections describe the common functions in greater detail.

### 7.1.1. Opening a list entry

To open a meter identity or configuration from a displayed list, do the following:

1. Double-click the required entry in the table.
2. Alternatively, click on the required entry in the table and select an appropriate action from the following:
  - For an **Identity**, click **Meter** ribbon tab > **Meter Management** group > **Open Meter**.
  - For a **Configuration**, click **Configuration** ribbon tab > **Configuration Manager** group > **Open**.

### 7.1.2. Deleting a list entry

To delete meter identities or configurations from a displayed list, do the following:

1. Click on the required entry in the table.

However, you can use standard Windows techniques to select a combination of individual entries (Control + click) or select a block of entries (Shift + click).
2. Press the **Delete** button on the PC keyboard.
3. Alternatively, select the required entry (or entries) in the table and select an appropriate action from the following:
  - For an **Identity**, click **Meter** ribbon tab > **Meter Management** group > **Delete Meter(s)**.
  - For a **Configuration**, click **Configuration** ribbon tab > **Configuration Manager** group > **Delete**.
4. Click **Yes** when prompted to action the deletion.

### 7.1.3. Importing

To import a meter identity or configuration created on another ACE Pilot installation, do the following:

1. Select, as appropriate:
  - for an **Identity**, click **Meter** ribbon tab > **Meter Management** group > **Import Meter**.
  - for a **Configuration**, click **Configuration** ribbon tab > **Configuration Manager** group > **Import**.

By default, the system use the **Export** folder for files (.zip format) to import. However, you can navigate to any available folder, as necessary.

2. Navigate to, and select the required file.

Each file can contain a number of individual meter definitions or configurations.
3. Click **Open** to import.

If a meter identity or configuration exists on the system that has the same name as the one being imported, the system will display a message dialogue box. Follow any on-screen instructions given, as appropriate.

### 7.1.4. Exporting

To export a meter identity or configuration for use on another ACE Pilot installation, do the following:

1. For a **Single** identity or configuration, click on the required entry in the table.
2. For **Multiple** identities or configurations in a single file.

Use standard Windows techniques to select individual entries (Control + click) or select a block of entries (Shift + click). The resulting file will contain all the selected entries.

  - For **Identities**, click **Meter** ribbon tab > **Meter Management** group > **Export Meter**.
  - For **Configurations**, click **Configuration** ribbon tab > **Configuration Manager** group > **Export**.

By default, the system places the file (.zip format) in the **Export** folder. However, you can navigate to any available folder, as necessary.

3. Enter a suitable name for the exported file in the **File name** field.
4. Click **Save** to export.

### 7.1.5. Creating

To create a completely new:

- **Identity:**
  - click **Meter** ribbon tab > **New/Open** group > **New**.
  - click **Main Menu** ribbon tab > **Meter** group > **New**.
- **Configuration**, click **Main Menu** ribbon tab > **Configuration** group > **New**.

1. Click on the required meter type.

A **New Meter** or **New Configuration** tab is displayed below the menu ribbon with its parameters set to the default values for the selected meter type.

2. On the **Definition** and **Configuration** tab pages enter new values and edit the parameters, as required.

The procedures for configuring the various parameters are described in dedicated task-related topics later in this guide.

3. **Save (page 39)** the identity or configuration when completed.

However, if a meter identity or configuration similar to the one you want already exists, it is generally quicker to create a **Copy (page 38)** and then edit it.

### 7.1.6. Copying

1. **Open (page 37)** the meter identity or configuration you wish to copy.

- For an **Identity**, click **Meter** ribbon tab > **Task** group > **Copy**.
- For a **Configuration**, click **Configuration** ribbon tab > **Task** group > **Copy**.

A **New Meter** or **New Configuration** tab is displayed below the menu ribbon with its parameters set to the values of the copied meter.

2. On the **Definition** and **Configuration** tab pages enter new values and edit the parameters, as required.

The procedures for configuring the various parameters are described in dedicated task-related topics later in this guide.

3. **Save (page 39)** the identity or configuration when completed.

### 7.1.7. Editing

1. **Open (page 37)** the meter identity or configuration you wish to edit.

- For an **Identity**, click **Meter** ribbon tab > **Task** group > **Edit**.
- For a **Configuration**, click **Configuration** ribbon tab > **Task** group > **Edit**.

Fields that can be modified are unlocked allowing you to edit their contents. These fields are highlighted and any relevant controls are displayed.

2. On the **Definition** and **Configuration** tab pages enter new values and edit the parameters, as required.

The procedures for configuring the various parameters are described in dedicated task-related topics later in this guide.

3. **Save (page 39)** the identity or configuration when completed.

However, if you do not want to save the changes made, click the **Cancel Changes** icon to restore the original values.

### 7.1.8. Saving

To save a completed:

- **Identity**, click **Meter** ribbon tab > **Task** group > **Save**.
- **Configuration**, click **Configuration** ribbon tab > **Task** group > **Save**.

Alternatively, click the **X** icon on the relevant tab label, this action also closes the tab.

If any changes have been made to the meter identity or configuration, a **Confirm Save** dialogue box is displayed, simply follow any on-screen instructions given.

### 7.1.9. Printing

To produce a **PDF** format printout of an identity or configuration, do the following:

1. **Open** (page 37) the identity or configuration you wish to print.
  - For an **Identity**, click **Meter** ribbon tab > **Task** group > **Print in PDF**.
  - For a **Configuration**, click **Configuration** ribbon tab > **Task** group > **Print in PDF**.

When the file is created, it is automatically opened if a PDF viewer application is available on the host PC.

By default, the PDF file is placed in the system **Export** folder (see File Locations (page 28)).

2. Use the standard PDF options provided to output to a suitable printer.

## 7.2. Specific configuration functions

The ACE Pilot system provides the following range of specific functions for managing and manipulating meter **Configurations**:

### 7.2.1. Reading configurations

To read a configuration directly from a meter, do the following:

1. Click **Main Menu** ribbon tab > **Configuration** group > **Read**.
2. Click on the required meter type from the choices presented.
3. Connect the ACE Pilot host PC system to the meter, using the connection method and the communication parameters defined in system **Setup > Communication**.
4. Click **Connect (page 33)**.

Once the read operation has completed, a **New Configuration** tab is displayed below the menu ribbon based on the values the system has just read.

5. On the **Configuration** tab pages enter new values and edit the parameters, as required.

The procedures for configuring the various parameters are described in dedicated task-related topics later in this guide.

6. **Save (page 39)** the configuration when completed.

### 7.2.2. Writing configurations

To write a configuration directly to a meter, do the following:

1. Connect the ACE Pilot host PC to the meter, using one of the supported connection methods.
2. **Open (page 37)** the configuration you wish to write to the meter.
3. Click **Configuration** ribbon tab > **Action** group > **Write Configuration**.
4. Select the required **Connection Method** from the list box.
5. If required, expand the **Connection Settings** field to check or modify the parameters.
6. Click **Connect**.

After a successful connection process, a **Meter Connection - Write Configuration** dialogue box is displayed.

7. If all the configuration parameters are to be programmed, click the **Programme All** tick box.  
Warning and information messages are displayed when certain options are selected. Always refer to these before proceeding.
8. If only certain selected configuration parameters are to be programmed, ensure the **Programme All** tick box is cleared.
9. Choose the required parameters using the tick boxes provided. Click the **+** icons to expand the options, if necessary. Take note of any warning or information messages that may be displayed.
10. If the non-fatal **Alarms** are to be cleared, click the **Erasing of Alarms** tick box.
11. If the meter clock is to be updated, click the **Write Time and Date** tick box and set the **Synchronising Time** radio button for either:
  - **PC Time**  
The system host PC current time value is used.
  - **User Defined Time**  
Click the **Current Date and Time** list box control and select the required date using the displayed calendar window.  
  
Alternatively, manually enter a new time value, or edit the existing time as necessary.
12. Click **OK** to update the meter with the new configuration.

---

**Note:** When programming a partial configuration, it may not be accepted by the meter if an inconsistency is generated by its use. In that case, investigate the possible causes and modify your choice of selected parameters to solve the inconsistency.

---

### 7.2.3. Overwriting configurations

To read the configuration of a meter and use those values to overwrite an existing configuration, do the following:

1. Connect the ACE Pilot host PC to the meter, using one of the supported connection methods.
2. **Open (page 37)** the configuration you wish to overwrite.
3. Click **Configuration** ribbon tab > **Action** group > **Overwrite Configuration**.
4. When prompted, click **OK** to proceed.
5. Select the required **Connection Method** from the list box.
6. If required, expand the **Connection Settings** field to check or modify the parameters.
7. Click **Connect**.

### 7.2.4. Convert to meter

To convert a configuration into a full meter identity, do the following:

1. **Open (page 37)** the configuration you wish to convert.
2. Click **Configuration** ribbon tab > **Action** group > **Convert to Meter**.  
A **New Meter** tab is displayed below the menu ribbon.
3. On the **Definition** and **Configuration** tab pages enter new values and edit the parameters, as required.  
The procedures for configuring the various parameters are described in dedicated task-related topics later in this guide.
4. **Save (page 39)** the meter identity when completed.

### 7.2.5. Creating generic configurations

To create a new generic configuration from an existing meter identity, do the following:

1. **Open (page 37)** the meter definition you wish use as the basis for the generic configuration.
2. Click **Meter** ribbon tab > **Configuration** group > **Create**.

A **New Configuration** tab is displayed below the menu ribbon.

3. On the **Configuration** tab pages enter new values and edit the parameters, as required.

The procedures for configuring the various parameters are described in dedicated task-related topics later in this guide.

4. **Save (page 39)** the configuration when completed.

### 7.3. Specific meter identity functions

The ACE Pilot system provides a range of specific functions for managing and manipulating meter **Identities**, as described in the following sections.

#### 7.3.1. Auto Detect

The **Auto Detect** function provides facilities to:

- optically connect to a meter using the password defined in the system **Setup > Default Values**.
- read the meter **Identity** and **Configuration** parameters
- save the meter details as a new entry in the meter display list
- open a **New Meter** tab based on the parameters the system has just read

To use Auto Detect, do the following:

1. Ensure the optical head is connected to the meter and the ACE Pilot host PC system.
2. Click **Main Menu** ribbon tab > **Meter** group > **Auto Detect**.
3. Click on the required meter type from the choices presented.
4. Click **Connect** when prompted.
5. An **Action in progress** dialogue box is displayed which includes a progress gauge bar and the following details read directly from the meter:
  - meter type
  - serial number
  - firmware version

If the *read* meter type is different from the *selected* meter type, a continue confirmation message box is displayed.

A **New Meter** tab below the menu ribbon is displayed with its parameters set to the values read from the connected meter.

### 7.3.2. Initialising a meter

The **Initialise** function provides facilities to:

- optically connect to a meter using factory-preset password and physical address values
- read the configuration of the connected meter
- program the connected meter with a chosen configuration
- set the connected meter identity (definitions) preferences (such as the passwords)

To initialise a meter, do the following:

1. Ensure the optical head is connected to the meter and the ACE Pilot PC system.
2. Click **Main Menu** ribbon tab > **Meter** group > **Initialise**.
3. Click on the required meter type from the choices presented.

A **Meter Connection** dialogue box is displayed.

4. If you want to read the current configuration of the meter, click the relevant radio button (this is set by default).
5. If you want to choose a default configuration, click the relevant radio button.

A **Configuration Selection** window is displayed containing details of available matching configurations presented in a tabular format.

The table contents can be ordered (page 35) as required.

To select an entry, either:

- Click on the required configuration row, then click **OK**.
- Double-click the required configuration row.

6. Click **Connect**.

### 7.3.3. Meter definition tabs

When a meter **Identity** is opened by the system, a tabbed window is displayed in the region below the ribbon menu. The tabs provided are:

- **Definition**
- **Configuration**
- **Data**
- **Maintenance**

To access the contents of each tab simply click the required tab label.

The tab contents are described in greater detail in the following topics:

#### 7.3.3.1. Definition tab

The **Definition** tab displays individual identification and parameter data for the selected meter in three regions:

Region	Description
<b>Characteristics</b>	These fields contain data relating to individual meter identification, such as: <ul style="list-style-type: none"> <li>• <b>Meter Name</b></li> <li>• <b>Serial Number</b></li> <li>• <b>Meter Type</b></li> </ul>

<b>Communication</b>	These fields contain connection-specific data, such as: <ul style="list-style-type: none"> <li>• <b>Preferred connection</b></li> <li>• <b>Physical address</b></li> </ul>
<b>Passwords</b>	These fields contain the various COSEM client passwords.

### 7.3.3.2. Configuration tab

The **Configuration** tab is divided into two functional regions:

<b>Left-hand display pane</b>
<p>This pane contains tabs representing the various meter-dependent configuration parameter groups, such as:</p> <ul style="list-style-type: none"> <li>• <b>Resources</b></li> <li>• <b>Metrology</b></li> <li>• <b>Monitoring</b></li> <li>• <b>Energy</b></li> <li>• <b>Clock</b></li> <li>• <b>Display</b></li> <li>• <b>Communications</b></li> </ul> <p>All tabs have sub-pages that are accessed by simply clicking the relevant group tab and selecting the required sub-page for display.</p>
<b>Right-hand display pane</b>
This pane displays all the relevant controls and fields for the selected parameter group sub-page.

### 7.3.3.3. Data tab

The **Data** tab displays all the data that has been previously read and stored in the ACE Pilot file system for the selected meter.

The tab is divided into two functional regions:

<b>Left-hand display pane</b>
This pane contains a list of data-type entries from the ACE Pilot file system.
<b>Right-hand display pane</b>
<p>This pane displays the selected meter data in a tabular format.</p> <p>The entries in these tables cannot be edited or ordered in any way.</p> <p>Where required, <b>side tabs</b> are provided to access and display further associated data.</p>

### Selecting and viewing meter data

By default, the data list contents are displayed with the latest entries at the top. However, the entries can be ordered (page 35) by **Date** and **Type of Data Collected**, as required.

- Select the data list entry you wish to display and either:
  - click the **Open** icon
  - double-click the entry

The right-hand display pane is updated with the relevant meter data values and if **Side Tabs** are displayed, simply click as required to view the associated data.

### Deleting a data list entry

Refer to **Deleting a data list entry** (page 99) for full details.

### Exporting the meter data

Refer to **Exporting the meter data** (page 99) for full details.

#### 7.3.3.4. Maintenance tab

The **Maintenance** tab is divided into two functional regions:

<b>Left-hand display pane</b>
This pane contains a series of meter-related task icons, such as: <ul style="list-style-type: none"><li>• <b>Set Time</b></li><li>• <b>Download</b></li><li>• <b>CT/VT Correction</b></li><li>• <b>Actions</b></li><li>• <b>Toolbox</b></li></ul> The tasks are accessed by simply clicking the relevant icon.
<b>Right-hand display pane</b>
This pane displays all the relevant controls and fields for the selected maintenance task.

---

## 8. Configuring the meter functions

Once a meter **Identity** or **Configuration** has been opened (page 37) for editing (page 38), all the meter's operational parameters can be modified as required.

The following task-related sections provide all the information and procedures required to carry out meter function configuration.

### 8.1. Configuring the meter hardware

During manufacture, many meter operating specifications, resources and options will be factory-defined according to meter series, firmware revision and customer requirement. These fundamental hardware-level characteristics *cannot* be changed using ACE Pilot.

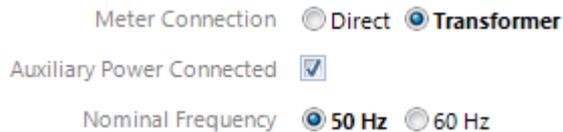
Typically, they include the following (however, this is *not* an exhaustive list):

- **Connection type**
- **Voltage, Frequency and Current Ratings**
- **I/O Board and Serial Port Type**
- **Resource Level**
- **Factory-fitted options**

It is important to understand that although factory-defined characteristics *cannot be changed* once the meter has been supplied, you do need to set the associated parameters within ACE Pilot to correctly match the meter specifications. If this is not done, any resulting meter definition or configuration will be incorrect and the meter may not operate as required. In addition, due to the dynamic nature of the ACE Pilot system, certain tabbed pages, panels, controls and fields may not be available to you if these parameters are incorrectly set.

Therefore, before attempting any configuration using ACE Pilot, ensure you are completely aware of the full specification of the meter you are (or will be) working on.

Typically, factory-definition related parameters are displayed in ACE Pilot with **grey** text labels (all other parameters have black text labels), as illustrated below:



During meter configuration you simply use the controls provided to select parameter values and options that match the actual meter specifications.

However, some meter characteristics have a range of pre-defined operating values and these parameters should be selected depending on the metering context and the installation requirements. These values may have black labels, even though they are based on the factory definition of the meter.

To set the various hardware-related parameters (options are displayed depending on meter-type), do the following:

1. Click **Resources > General Resources**.
2. Use the radio buttons to set the following meter-related parameters:
  - **Meter Connection**
  - **Nominal Frequency**
3. Use the tick-boxes to activate the following options (if fitted):
  - **Voltage Quality Logging**
  - **MID Directive Conformity**

If MID conformity is selected, the TER energy scalar *cannot* be set to Wh.

See Total Energy Registers (page 70) for further information.

- **Auxiliary Power connected**
4. Click **Resources > Resource Level**.
  5. Choose an option that matches the meter hardware from the **Resource Level** list box.  
 Full information on the selection made is dynamically displayed under the list box, use this to verify your choice.  
  
 Making the correct choice here ensures the system dynamically provides all the necessary controls and fields for configuring the associated energy channels and rates.
  6. Click **Metrology > Network**.
  7. Use the spin controls, or enter a value to set the following meter-related parameters:
    - **Current Rating**
    - **Maximum Current**
    - **Nominal and Maximum Current**
    - **Maximum Usual Current**
  8. Use the controls provided to set the following:

Parameter	Comments
<b>Connection Type</b>	Select either 3 wire or 4 wire.
<b>Nominal Voltage</b>	Use the spin control, or enter an appropriate value. <i>When setting or modifying this value, all associated threshold values based on a percentage of nominal voltage will be updated automatically.</i>
<b>Auto-ranging</b>	If an auto-ranging power supply is fitted, tick this box.

9. Click **Resources > I/O Board**.
10. Use the controls provided to set the following:

Parameter	Comments
<b>Back-light</b>	Select either Standard or Blue.
<b>With Magnet Sensor</b>	If the Magnetic Attack monitoring option is fitted, tick this box to activate it.
<b>RTP Port</b>	If the Real Time Port option is fitted, tick this box to activate it.
<b>Data Push</b>	If the Data Push option is fitted, tick this box to activate it.

## 8.2. Configuring meter monitoring

The meter monitors various parameters and if any exceed or fall below their pre-programmed threshold value, an alarm can be triggered.

Depending on meter-type and firmware version, a meter typically monitors the following parameters and conditions:

- **Zero U** - (Neutral voltage)
- **Zero I** - (Neutral current)
- **Zero sequence I Duration**
- **Number of days without consumption** - Internal and External (where applicable)

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**Note:** The above are all grouped collectively as **Network Analysis** parameters.

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- **Excess current**
- **Battery expiry date**
- **Network quality** - Voltage Cuts, Swells and Sags
- **Power failures**
- **Total Harmonic Distortion (THD)**

Use the information and procedures given in the following sections to configure the threshold values associated with monitoring these conditions.

### 8.2.1. Network Analysis Thresholds

1. Click **Monitoring > Network Analysis**.
2. Use the spin controls or enter values in the boxes to set the:

- **Zero U** threshold

The meter calculates a neutral voltage displacement value once every second using a standard residual voltage technique (rms value of the vector sum of the phase-to-neutral voltages). When the calculated value exceeds this threshold, an alarm can be triggered.

- **Zero I** threshold

The meter calculates a neutral current value once every second using a standard homopolar current technique (rms value of the vector sum of the phase currents). When the calculated value exceeds this threshold, an alarm can be triggered.

The values chosen **must** represent an actual and realistic value. If left at 0.00 (or too low) the meter will constantly trigger unnecessary alarms.

#### **Zero sequence I Duration**

1. Click the **Activation** tick box to activate the monitoring of this parameter.
2. Use the spin control or enter a value (minutes) in the box to set the **Zero sequence I Duration** threshold.

#### **Number of days without consumption**

The meter records the number of days where *none* of the energy registers have incremented due to a lack of metrological activity (no internal or external consumption).

- Use the spin control or enter a value (number of days) in the box to set the **No Consumption** threshold.

### 8.2.2. Battery

An optional field-replaceable device, the meter's rechargeable lithium **Battery** is specified to provide a minimum capacity of 3 years *continuous* operation at 25°C and a minimum shelf-life of 10 years.

1. Click **Monitoring > Battery**.
2. If the meter is fitted with the (optional) backup battery, click the **With Battery** tick box.
3. Use the spin control or enter a value in the box to set the **Battery Capacity** threshold.

This value is compared against the cumulative duration of power failures recorded over the meter's life and can only be set between the limits of 1 to 3 years (default).

4. Set the **Expiry Date** using the calendar drop-down list.

This value represents the battery's minimum shelf-life and should be set to 10 years from its initial installation date.

### 8.2.3. Excess Current

The meter calculates the instantaneous current value once every second for each phase. Depending on meter type, an **Excess Current** condition can be reported if the threshold value is exceeded.

1. Click **Monitoring > Excess Current**.
2. Click the **Activate Current Monitoring** tick box to activate excess current monitoring.
3. Use the spin controls or enter values in the boxes to set the:

Parameter	Comments
<b>Detection Delay</b>	This value represents the period of time (in minutes) the meter will wait once an excess current event has occurred, before reporting that event.  To avoid spurious excess current reporting, set this parameter to a realistic value with respect to the metering context.
The following two controls work in association with each other and the meter's <b>Maximum Current</b> parameter.  Use either control to set the threshold value, as one is adjusted, the other will dynamically change interactively.	
<b>Current Threshold</b>	This value represents the threshold as a percentage (%) of the maximum current parameter.
<b>Max Current</b>	This value represents an absolute max current threshold value in Amps.

### 8.2.4. Voltage quality

Depending on meter type, firmware version, wiring system type *and* if the voltage quality option is fitted at the time of manufacture, a meter can monitor the following network-distribution voltage defects:

- **Sags**
- **Swells**

All meters can detect voltage **Cuts**.

The meter detects voltage quality defect events by continually sampling and analysing the per phase RMS voltages (Urms) and comparing these voltages against associated threshold values.

For each defect there is a high and a low threshold value, crossing one threshold starts the event, crossing the other finishes it.

Before attempting to configure any voltage quality parameters, ensure you know the following for the meter you are (or will be) working on:

- Is the voltage-quality option fitted?
- Is the meter a 3 wire or 4 wire system?

Then do the following:

1. Click **Resources > General Resources**.
2. If the voltage quality option is fitted, click the **Voltage Quality Logging** tick box.
3. Click **Metrology > Network**.
4. Set the **Connection type** radio button for either:
  - **3 wires**
  - **4 wires**

Voltage quality monitoring is only available on 4 wire system meters.

5. Use the spin controls or enter values in the boxes to set the various **Voltage Thresholds**.

The Voltage and Percentage (%) threshold controls work in association with each other and the **Nominal Voltage** parameter applied to the meter.

Use either threshold control to set the required value, as one is adjusted, the other will dynamically change interactively.

- **Cut**

On all meters, a voltage cut is detected if the input voltage drops below the cut start (low) threshold value and continues until the voltage rises above the cut end (high) threshold value.

- **Sag**

On 4 wire system meters equipped with the voltage quality option, a voltage sag is detected if the input voltage drops below the sag start (low) threshold value and continues until the voltage rises above the sag end (high) threshold value.

However, if the input voltage drops below the sag start threshold and then subsequently drops below the cut start threshold, the sag defect is ignored as a cut start always erases a sag start.

- **Swell**

On 4 wire system meters equipped with the voltage quality option a voltage swell is detected if the input voltage rises above the swell start (high) threshold value and continues until the voltage falls below the swell end (low) threshold value.

All values chosen **must** represent actual and realistic values.

Use the **Default Values** button as appropriate to set or reset the thresholds to firmware-dependent default values.

### 8.2.5. Power failure

The meter detects a **Power Failure** when all three input phase voltages are lost.

1. Click **Resources > General Resources**.
2. Use the spin control or enter a value in the box (between 0 and 255 seconds) to set the **Duration of Long Power Failure**.

Once set, any power failure durations:

- below this value are recorded as **Short** power failure occurrences
- at, or above this value are recorded as **Long** power failure occurrences

### 8.2.6. Total Harmonic Distortion

Depending on meter type, the meter can be configured to calculate the per phase **Total Harmonic Distortion (THD)** value for both voltage and current. However, the THD feature is only available if the meter is a 4 wire system and the voltage quality option is fitted at the time of manufacture.

1. Click **Metrology > Total Harmonic Distortion (THD)**.
2. Click the **THD Computing** tick box to activate THD monitoring.

THD calculations occur once-a-second placing a high load on the meter's processing resources. Therefore, to reduce the possibility of increased communication time (especially when transferring large quantities of meter data) THD calculations are automatically suspended when the transfer of load profile or EOB data is requested.

If THD is not activated the meter processing load is reduced.

3. Click the **THD Threshold Enabled** tick box to activate the user-selectable thresholds, if this is not selected the greyed default values (%) displayed in the fields will be used.
4. Use the spin controls or enter values in the boxes to set the various **THD Relative Thresholds**.

THD defect events occur when the threshold values are exceeded, the meter then records the following defect-event parameters:

- number of defects (incremental)
  - duration
  - magnitude
5. Use the **THD Calculation Algorithm** radio buttons to choose the required calculation method for voltage and current:
    - **ANSI** (relative to RMS value)
    - **IEC61000-4-7** (relative to fundamental value)
  6. Click **Metrology > Network**
  7. Use the spin control or enter a value in the box to set the **THD Nominal Current** value.

### 8.3. Configuring events

The meter is factory programmed with a list of pre-defined metering **Events** (the list contents are dependent on meter-type and firmware version).

Events from the list can be selected so that if they occur, a time-stamped record is made in the meter **Logbook**.

The logbook has a maximum capacity of 500 recorded events. Therefore, to ensure the logbook doesn't become full too quickly, it is recommended that only events related to the installation requirements and the metering context are selected, for example:

- specific action events
- communication events
- fatal and non-fatal alarm events (appearance and disappearance)
- asynchronous events

The selection of all other events to be logged should be carefully considered with regard to logbook capacity, for example:

If the event **Periodical EOI** is selected with a period equal to 15 minutes, then 96 Periodical EOI events will be recorded each day, filling the logbook in about 5 days.

However, as meter **Alarms** are reported *only* when the corresponding event is logged into the logbook, it is important that the following events are *always* selected for event logging:

- **Non-fatal alarm appearance**
- **Non-fatal alarm disappearance**
- **Fatal alarm appearance**

To select events for inclusion in the logbook, do the following:

1. Click **Monitoring > Log Book**.
2. Click tick boxes in the **Event Logging** column for the required **Event** entries.  
Controls are provided to **Select All** or **Unselect All** entries, if required.

### 8.4. Configuring alarms

When an **Alarm** condition is detected by the meter it can be reported in several ways:

- an alarm symbol on the meter **LCD**
- a triggered **Control Output**
- an **SMS** alarm notification message is sent via GSM to either the customer and the utility
- an **email** alarm notification message is sent to the customer via TCP

#### Alarm types

The meter manages two types of alarm:

- **Fatal**

These cause the meter to enter the non-operational mode (STOP displayed on the LCD) where only instantaneous values are processed and no further registration of energy or demand/load profile calculation is performed.

The meter should be removed from the installation site and tested. However, it will still contain all the metered data collected up to the point the fatal alarm occurred.

Typically, this alarm type is reported directly to the utility so remedial maintenance action can be taken.

- **Non-fatal**

The meter is still able to operate during this type of alarm and some of these alarms are purely informative.

Typically, selections of this alarm type are reported to either the customer or utility (in some cases to both).

Alarms are further classified according to the way they clear, as follows:

- **Self-healing**

These alarms automatically clear when the alarm state disappears.

- **Trapped**

These alarms will only clear when a reset command is performed (via communication or pushbutton) even if the alarm state has disappeared.

Fatal alarm types can only be cleared by a reset command, therefore, they are always trapped.

- **Fugitive**

For some alarms (e.g. a communication error) there is only an alarm appearance event. These can only be cleared by a reset command as there is no alarm disappearance event.

Therefore, fugitive alarm types are always trapped.

### Alarm notification messages

Prior to configuring any SMS or email alarm notifications, ensure the meter is equipped with the necessary hardware (TCP or GSM modem) and all the associated serial communication configuration has been carried out. If using TCP, refer to Email Parameters (page 61) for further configurational details.

The meter constructs and formats the required SMS or email alarm notification messages when a selected alarms occur, so no further user configuration is required. In the event of multiple alarm occurrences, each alarm will have its own individual message sent by SMS. However, when using email only one notification message reporting *all* current alarm occurrences will be sent.

A message comprises the:

- Meter name and physical address
- Event ID
- Alarm ID
- Logbook entry ID
- Date and time of alarm event

To configure the alarm notifications, do the following:

1. Click **Monitoring > Alarms**

The displayed table contains a list of all the available alarm conditions that can be reported. The list contents are dependent on meter-type and firmware version and cannot be edited in any way.

The list entries are generally ordered by severity, with Fatal Alarms appearing at the top.

2. As required, use the list boxes provided to select the **Alarms Notification Type** for both the **Customer** and **Utility**.

If **SMS** or **Email** is selected, three further fields are provided, **Destination 1, 2** and **3**.

- i. Enter valid telephone numbers (max 15 characters) or email addresses (max 63 characters) in the destination text boxes, as required. Ensure the format of the numbers or the characters used are compatible with the connected communication systems.
  - ii. Select a suitable **Repetition Delay** (between 1 and 18 Hours). This is the period between successive message send retry attempts in the event of a message send failure.
3. Select notification method(s) for the required **Alarm** entries by clicking tick boxes in the relevant columns, as necessary.

Notification choices should always be made with careful regard to:

- **Alarm type** - Fatal or Non-fatal
- **Clearing method** - Self-healing, Trapped or Fugitive

Notification	Comments
<b>LCD Symbol</b>	The selected alarm activates the symbol on the liquid crystal display.
<b>Control Output</b>	The selected alarm activates a control output. Ensure a control output is configured to handle alarms.
<b>1, 2 or 3 informed</b>	Choose <i>one</i> <b>Destination</b> for the selected alarm. Ensure a valid entry has been made in the associated destination field.

Controls are provided to **Select All** or **Unselect All** entries, if required.

### 8.5. Setting CT/VT ratios

When using either **Current** or **Voltage** (CT/VT) transformers, the meter must be programmed with ratio values that match the specifications of the actual transformers in use.

Prior to setting these ratios, ensure **Transformer** connection is selected on the **General Resources (page 45)** tab, then do the following:

1. Select **Metrology > Connection**.
2. Use the spin controls or enter values to set the individual transformer ratios (default values 1:1).

The first value is the **Numerator** and this must *always* be a higher value than the second value (the **Denominator**).

### 8.6. Configuring I/O functions

During manufacture, auxiliary **Inputs** and **Outputs** (I/O) may be fitted, allowing external equipment to be connected to the meter. For each meter series, pre-defined hardware I/O options are available and once factory-fitted, these *cannot* be changed using ACE Pilot.

However, before attempting to configure any I/O functions, ensure you correctly identify the hardware option that is actually fitted to the meter you are (or will be) working on, then do the following:

1. Click **Resources > I/O Board**.
2. Choose an option that matches the meter hardware from the **I/O Board** list box.

Full information on the selection made is dynamically displayed under the list box, use this to verify your choice.

Making the correct choice here ensures the system dynamically provides all the necessary controls and fields for configuring the auxiliaries.

#### 8.6.1. Inputs

Inputs are only available on SL7000 series meters.

To configure the **Inputs**, do the following:

- Click **Auxiliary I/O > Inputs**.

Depending on the hardware option fitted to the meter, two types of input may be available:

- **Pulse**

Pulse inputs are optically-isolated and are typically connected to further DIN S0 meters or other low-level pulse outputting devices. The received pulses can represent metered energy types such as electricity, water or gas as either import or export energy values.

- **Control**

Control inputs are optically-isolated and are typically connected to further meters or other external high-level switching devices (such as timers) and are individually assigned to trigger various meter actions.

### Pulse inputs

Use the information given in the table below to configure each numbered pulse input:

Parameter	Comments
<b>Quantity</b>	<p>Click the + icon to expand each energy-type group:</p> <ul style="list-style-type: none"> <li>• <b>Active</b></li> <li>• <b>Reactive</b></li> <li>• <b>Apparent</b></li> <li>• <b>Other</b></li> </ul> <p>Select the required energy quantity type for the input from the choices given.</p>
<b>Direction</b>	<p>Received pulses can represent either <b>Import</b> (forward) or <b>Export</b> (reverse) energy values. If the energy direction for the input is fixed, choose as appropriate.</p> <p>However, if the energy direction for the input periodically changes between import and export, the meter can respond to an associated control input state change and register the energy accordingly.</p> <p>Select <b>Direction of a control input</b> to enable this type of operation. See Control Input Functionality (below) for further details.</p>
<p>The following <b>Pulse weight</b> parameters modify the way the metrology responds to the pulses received. If the values are set to 1, each raw pulse is treated as a single unit of energy and the corresponding register is incremented accordingly.</p> <p>Always refer to the external device settings to ensure these parameters are set correctly otherwise incorrect billing could result.</p> <p>Use the spin controls or enter a value (max 65535) to modify the number of units/pulse, as required:</p> <ul style="list-style-type: none"> <li>• <b>Multiplier</b></li> <li>• <b>Divider</b></li> </ul> <p>Entered values can be either integer or decimal point.</p>	

### Control inputs

Use the information given in the table below to assign the **Functionality** of each numbered control input. Please note that the choices provided in the Functionality list box are dependent on the meter type and firmware revision:

Parameter	Comments
<b>Not attributed</b>	No function is assigned to the input.
<b>Rates set</b>	Allows an external device to force an energy and/or demand rate switch to a pre-selected rate (tariff). This control will always override any programmed rate-change events.
<b>Daily profile</b>	Allows an external device to force a switch to a pre-selected day profile. This control will always override any programmed daily profile change events.
<b>Season</b>	Allows an external device to force a season change. This control will always override any programmed season change events.

<b>Direction of pulse input (N)</b>	Allows an external device to change the registered direction (import or export) of the relevant (N) pulse input.
<b>Alarm</b>	Allows the meter to register the occurrence of an alarm from an external device.
<b>End of integration interval</b>	Allows an external device to force an End Of Integration (EOI) event. When this control is applied: <ul style="list-style-type: none"> <li>the current integration interval is overridden and closed</li> <li>the maximum demand values are calculated and stored</li> <li>a new integration period is started</li> </ul>
<b>Clock synchronisation</b>	Allows the internal clock to be synchronised by an external device. See Configuring the meter clock (page 64) for further information.
<b>Display button</b>	Allows the control input to duplicate the operation of the display pushbutton. This function is useful when the meter's front panel pushbutton is not readily accessible.
<b>EOB (1 and 2)</b>	Allows an external device to force an End Of Billing (EOB) event. Normally, the meter handles EOB events automatically, however, when this control is applied: <ul style="list-style-type: none"> <li>the current billing period is immediately closed</li> <li>a new billing period is started</li> </ul>

To ensure more secure EOB control, two Control Inputs (CI) can be used in a changeover (or alternate) switching configuration by assigning (for example) EOB1 to CI1 and EOB2 to CI2:

- if CI1 is activated an EOB event takes place. Any subsequent EOB activations on this input are then ignored as control is passed to CI2.
- if CI2 is now activated an EOB event takes place. Any subsequent EOB activations on this input are then ignored and control is passed back to CI1.
- the above sequence is then repeated

Tick the **Positive active level** box if the input uses a low to high voltage transition to represent an **ON** state (this is set as a default).

**Note:** Many of the events in the table above can be recorded in the meter logbook. See Configuring alarms and events (page 51) for further information.

## 8.6.2. Outputs

To configure the **Outputs**, do the following:

- Click **Auxiliary I/O > Output**.

Depending on the hardware option fitted to the meter, two types of output may be available:

- Pulse**

Pulse outputs provide optically-isolated, low-level signals typically connected to further DIN S0 meters or other pulse receiving devices.

- Control**

Control outputs provide optically-isolated, high-level switching and are typically connected to further meters or other external devices (such as relays or alarm management systems). In addition, Pulse Output signals can be re-directed to a Control Output, if necessary.

## Pulse outputs

Use the information given in the table below to configure each numbered pulse output:

Parameter	Comments
<b>Duration T ON (*10ms)</b>	Use the spin controls or enter a value to modify the <b>Time On</b> duration of the pulse. Values are in 10ms increments: <ul style="list-style-type: none"> <li>• Minimum 3 = 30ms (0.3 second)</li> <li>• Maximum 255 = 2550ms (2.55 seconds)</li> </ul>
<b>Duration T Off (*10ms)</b>	Use the spin controls or enter a value to modify the <b>Time Off</b> duration of the pulse. Values are in 10ms increments: <ul style="list-style-type: none"> <li>• Minimum value 3 = 30ms (0.3 second)</li> <li>• Maximum value 255 = 2550ms (2.55 seconds)</li> </ul> <p>This parameter sets the <i>minimum</i> period between consecutive pulses.</p>
<b>Max. Frequency</b>	This parameter represents the maximum frequency the pulse output can handle at 100% duty cycle (constant). <ul style="list-style-type: none"> <li>• Minimum value = 0.2Hz</li> <li>• Maximum value = 16.67Hz</li> </ul> <p>See <b>Frequency</b> below for further details.</p> <p>The system dynamically calculates this parameter depending on the pulse duration <b>T On</b> and <b>T Off</b> settings. Rounding is applied to the displayed value.</p>
<b>Quantity</b>	Click the + icon to expand each energy-type group: <ul style="list-style-type: none"> <li>• <b>Active</b></li> <li>• <b>Reactive</b></li> <li>• <b>Apparent</b></li> <li>• <b>Other</b></li> </ul> <p>Select the required energy quantity type for the output from the choices given.</p>
<b>Active Level Positive</b>	Tick this box if the output uses a low to high voltage transition to represent an <b>ON</b> state. This is set as a default.
<b>Control Output</b>	Pulses can be re-directed to a parallel control output, select the required Control Output (CO) from the list box. <p>Use this function if the meter has no pulse outputs available (as none fitted), or a higher-level output is required to drive the external device.</p> <p>Setting this parameter only makes the pulse available to the selected control output, you still have to assign the function at the control output (see below).</p>
The following two parameters define the weight of each output pulse (in 0.1Wh, VAh or varh, per pulse) when the pulses transmit primary values:	
<b>Weight Multiplier</b>	This defines the numerator value for the pulse weight variable, use in conjunction with Weight Divider.
<b>Weight Divider</b>	This defines the denominator value for the pulse weight variable, use in conjunction with Weight Multiplier.

<b>Frequency</b>	The system dynamically calculates and displays this value depending on the pulse weight multiplier and divider settings.  If the frequency field is highlighted in yellow, this means it contains a value higher than <b>Max. Frequency</b> (see above). Modify the <b>Weight Multiplier</b> and/or <b>Weight Divider</b> values to change this to an acceptable value.
The following <b>Active</b> and <b>Reactive Pulse</b> parameter is only available if the meter supports the <b>Secondary Energy</b> mode (used for metrological tests):	
<b>Frequency</b>	The system dynamically calculates and displays these values depending on the associated threshold settings.

### Control Outputs

Use the information given in the table below to assign the **Output Mapping** of each numbered control output:

Parameter	Comments
<b>Not attributed</b>	No function is assigned to the output.
<b>Managed by the Calendar</b>	Allows the meter's internal calendar to control the output like a timeswitch. To use this function, an output assignment must be made prior to setting up the associated <b>Daily Profile</b> and <b>Groups</b> .  See Defining groups (page 79) and Defining day profiles (page 80) for further information.
<b>Pulse Output (N)</b>	If any pulse outputs (see above) have been configured for re-direction, select an entry to assign it to the control output.
<b>Alarm</b>	Allows the meter to report alarm conditions to an external device.  Typically, only one control output is assigned this function and the alarms to be reported are pre-selected from the meter's alarm list. The first occurrence of any selected alarm will activate the output. The behaviour of the output depends on the type of alarm (or alarms) that activated it. <ul style="list-style-type: none"> <li>• All fatal alarms and <i>certain</i> non-fatal alarms are non-healing, the output will remain active until the meter is investigated and/or reset.</li> <li>• Most non-fatal alarms are self-healing, the output will remain active only while the alarm condition persists.</li> </ul> See Configuring Alarms and events (page 51) for further information.
<b>Clock Synchronisation</b>	Allows the internal clock to synchronise other meters or external devices either every hour or once a day.  See Configuring the meter clock (page 64) for further information.
<b>Phase Cut</b>	Allows the meter to report to an external device that a phase voltage has fallen below the lower threshold limit.  See Configuring meter monitoring (page 47) for further information.
<b>EOB (1 and 2)</b>	Allows the meter to report to an external device or devices that the current billing period has ended.

To ensure more secure EOB reporting, two Control Outputs (CO) can be used in an inverted (alternate) switching configuration by assigning (for example) EOB1 to CO1 and EOB2 to CO2:

- an EOB event takes place and CO1 is activated. No further EOB activations can occur on this output as control is passed to CO2.
- an EOB event takes place and CO2 is activated. No further EOB activations can occur on this output and control is passed back to CO1.
- the above sequence is then repeated

The information message box **EOB via Control Output** is dynamically updated to report the CO operating mode:

- Simple Contact - one EOB CO used
- Inverted Contact - two EOB COs used (alternate)

The demand channels must be setup prior to assigning the following two functions.

See Configuring demand settings (page 71) for further information.

<b>Excess Demand</b>	Allows the meter to report to an external device that the internal calculation for excess demand has exceeded the preset limit.
<b>End of Integration Period</b>	Allows the meter to report to an external device that the internal integration period has ended.

Tick the **Positive active level** box if the output uses a low to high voltage transition to represent an **ON** state. This is set as a default.

## 8.7. Configuring meter communications

Meters are generally supplied with two types of communication interface:

- an infrared **Optical** port  
This provides a local connection to a Hand Held Unit (HHU) or a PC running ACE Pilot.
- RS232 or RS485 **Serial** communication ports  
These provide either a directly wired connection, or remote access via an appropriate modem.

**Note:** The number of serial ports and their type is solely dependent on the meter's factory-defined hardware configuration and this *cannot* be changed or re-configured using ACE Pilot.

Use the information and procedures provided in the following sections to configure meter communication facilities, such as the:

Facility	Typical parameters
<b>Interfaces</b>	Optical, Serial, Hand Held Unit
<b>Protocols</b>	HDLC, TCP, UDP and Real time
<b>Modem</b>	Speed, Type and Initialisation
<b>Email</b>	User, Password and addresses

### 8.7.1. Meter readout (HHU)

Meter data can be read by a suitable **Hand Held Unit** (HHU).

Prior to configuring this feature ensure the HHU Readout display list (page 89) has been defined, then do the following:

1. Click **Communication > HHU Readout**.
2. Select the required **Identification Code Separator** using the list box.  
This parameter represents the delimiter character used between adjacent code fields:

Choice	Description
<b>EDIS Separation</b>	The separators used are as defined by IEC 62056-61 Annex 1.
<b>Point</b>	A decimal point is used. For example: 8.88.88.8.
<b>No separation</b>	No separation character is used.

- Use the spin control to select the **Number of Historical Sets to Read**.

If the value is zero, no historical data is read. The upper limit is determined by meter-type and firmware version, typically **36** or **18**.

### 8.7.2. Optical port settings

- Click **Communication > Optical settings**.
- Use the information given in the table below to set the port parameters:

Parameter	Comments
<b>Proposed Speed</b>	Use this list box to select the baudrate for the optical port, by default the value is 9600.
<b>Response Time</b>	This is the time between the reception of a message and the transmission of an answer (acknowledgement).  By default the value is 200 milliseconds. Typically, this value is never changed.

### 8.7.3. Serial port settings

During manufacture, a meter can have either a single **Serial** port or a pair of serial ports fitted, each is factory-configured to an industry-standard protocol (RS232 or RS485).

If two ports are fitted, their functions are usually defined as:

- **Utility port**  
Typically used exclusively by the utility company and therefore unavailable to the end user or customer.
- **Customer port**  
Typically available for use by the end user or customer.

To configure the serial ports, do the following:

- Click **Resources > I/O Board**.
- Choose a protocol (RS232 or RS485) option that matches the meter hardware from the appropriate list box:
  - **Serial Port**
  - **Utility Port**
  - **Customer Port**

Making the correct choice here ensures the system dynamically provides all the controls and fields necessary for configuring the meter communications.

- Click **Communication > Communication type**.
- Click the **Serial** or **Utility** and **Customer** port list box and use the information given in the table below to set the communication type:

Type	Comments
<b>HDLC</b>	High-level Data Link Control protocol.  Supports Cosem over HDLC (also known as tunnelling). In this case any modem is transparent to the data transmission. This protocol can be used in a variety of communication configurations.
<b>TCP</b>	Transmission Control Protocol.  Select this option if the port is used for: <ul style="list-style-type: none"> <li>• Ethernet connection via a Sparklet modem</li> <li>• GPRS connection via a Sparklet modem (only valid for SL7000)</li> </ul>
<b>Real Time Port</b>	Select this option if the port is used for real time applications such as a SCADA (Supervisory Control And Data Acquisition) system.  Refer to Real time port (page 62) for configuration parameters.

As you select a communication type, the system dynamically updates the communication tab contents and provides grouped links to these related configuration options.

The following sections provide the information, details and procedures necessary to configure these type-specific options.

### 8.7.3.1. HDLC settings

1. Click, as appropriate:
  - **Communication > Serial Port HDLC Settings**
  - **Communication > Utility Port HDLC Settings**
  - **Communication > Customer Port HDLC Settings**
2. Use the information given in the table below to configure the HDLC port parameters:

Parameter	Comments
<b>Communication Speed</b>	Use this list box to select the baudrate for the port, by default the value is 9600.
Use the spin controls or enter values in the boxes to set the:	
<b>Transmit Window Size</b>	By default the value is 7.  This defines the maximum number of frames that a device or system can receive before it needs to transmit an acknowledgement to the corresponding station. During logon, other values can be negotiated.
<b>Transmission Characters Timeout</b>	By default the value is 40 milliseconds.  This defines the time (in milliseconds) over which, when any character is received from the primary station, the device will treat the already received data as a complete frame.  In the case of bad communication conditions, this value should be increased.
<b>Inactivity Timeout</b>	By default the value is 30 seconds.  This defines the time (in seconds) over which, when any frame is received from the primary station, the device will process a disconnection.  When this value is set to 0, the timeout is not operational.

### 8.7.3.2. TCP configuration

The procedures in the following sections assume that any relevant IT or Telephony infrastructure such as **Registration** and **Mediation** servers are already in place and fully configured for use.

**Note:** The administrators/managers or providers of these external systems will need to supply many of the parameters required to complete the various configuration procedures.

Parameters must be entered exactly as supplied to prevent unnecessary communication errors or failures.

#### TCP settings

1. Click **Communication > TCP Settings**.
2. Select the appropriate **Medium Type**:
  - **Ethernet** - Choose this option if configuring an Ethernet Sparklet modem
  - **GPRS** - Choose this option if configuring a GPRS Sparklet modem
3. Use the information given in the table below to configure the port settings:

Parameter	Comments
<b>Device Type</b>	Displays the selected modem type.
<b>Registration Method</b>	Use this list box to choose: <ul style="list-style-type: none"> <li>• <b>No Method</b></li> <li>• <b>COSEM Method</b></li> <li>• <b>Registration String</b></li> </ul>
<b>Registration Server Address</b>	Enter the network address for the registration server.
<b>Save String</b>	Enter the required registration string.
<b>Mediation Method</b>	Use this list box to choose: <ul style="list-style-type: none"> <li>• <b>No Method</b></li> <li>• <b>COSEM Method</b></li> </ul>
<b>Mediation Server Address</b>	Enter the network address for the mediation server (telephony gateway device or application).

Use the spin controls or enter values in the boxes to set the:

- **Registration Server Port**
- **Mediation Server Port**
- **Delay before Reinitialisation of the IPCM** (Inter-Processor Communication Module)

#### Email Parameters

These parameters are only available if alarms notification via **Email** is selected.

1. Click **Communication > Email Parameters**.
2. Use the information given in the table below to configure the email settings:

Parameter	Comments
<b>User</b>	The name required to access the email account used for sending all meter-generated emails.

<b>Password</b>	The password required for the above email account.
<b>Destination Address</b>	The full address of the server hosting the email account. For example: smtp.emailposting.com
<b>Source Address</b>	The full email address of the sender.

### IP Addresses

1. Click **Communication > IP Addresses**.
2. Click the **Inactive Address** tick box to display the various IP parameter boxes.  
Configure these typical TCP parameters in accordance with the external IT infrastructure.
3. Use the spin controls or enter values in the boxes to set the:

- **IP Address**
- **Subnet**
- **IP Gateway Address**
- **Primary DNS Address**
- **Secondary DNS Address**

By default, all the values are initially set to zero.

### TCP-UDP Parameters

1. Click **Communication > TCP-UDP Parameters**.
2. Use the spin controls or enter values in the boxes to set the:

- **Port**
- **Inactivity Delay**

This defines the time (in seconds), over which, if no frame is received from the COSEM client, the inactive TCP connection shall be aborted.

When this value is set to 0, the timeout is not operational. Therefore, in normal conditions a TCP connection, once established (no power failures or similar issues) will never be aborted by the COSEM server.

### GPRS Settings

1. Click **Communication > GPRS Settings**.
2. Enter the **Access Point Name (APN)**.
3. Use the spin control or enter the **Personal Identification Number (PIN)** value in the box.
4. Select the **Point to Point Protocol (PPP) Authentication Mode** from the list box:

- **No Authentication**
- **PPP Password**

When PPP Password is selected, two further user-entry boxes are provided for **User Name** and **Password**.

#### 8.7.3.3. Real time port

1. Click **Communication > Real Time port**.
2. Use the information given in the table below to configure the port settings:

Parameter	Comments
<b>Communication Speed</b>	Use this list box to select the baudrate for the port, by default the value is 9600.
Use the spin controls or enter values in the boxes to set the:	
<b>Character Transmission Delay</b>	By default the value is 40 milliseconds. Defines the time (in milliseconds), over which, when any character is received from the primary station, the device will treat the already received data as a complete frame In the case of bad communication conditions, this value should be increased.
<b>Response Time</b>	This is the time between the reception of a message and the transmission of an answer (acknowledgement). By default the value is 200 milliseconds. Typically, this value is never changed.

#### 8.7.4. Modem settings

To provide remote access across the range of supported media types, a suitable **Modem** can be connected to any available meter serial port.

The attached modem can, if necessary, be managed and/or powered by the meter.

To configure the modem, do the following:

- Click, as appropriate:
  - Communication > Modem Settings.**
  - Communication > Utility Port Modem Settings.**
  - Communication > Customer Port Modem Settings.**
- Click the **Type of Line** drop-down list box and use the information given in the table below to select the appropriate operating mode:

Mode	Comments
<b>Modem powered by Serial Port</b>	A modem connected to the port is fully managed and powered by the meter. See below for further information.
<b>Direct Line. No modem control on serial port</b>	A modem connected to the port <i>will</i> be powered but not managed by the meter. Select this mode when meters are connected together using serial port daisy-chain wiring.
The following modes are not available on some meter types:	
<b>Power supply On</b>	The modem power supply signal (VMDM) is permanently enabled. A modem connected to the port <i>will</i> be powered but not managed by the meter.
<b>Power supply Off</b>	The modem power supply signal (VMDM) is permanently disabled. A modem connected to the port <i>will not</i> be powered or managed by the meter.

### Modem powered by Serial Port

If you select the **Modem powered by Serial Port** option, the system dynamically updates the displayed tab with further parameter options.

Use the information given in the table below to configure the port parameters:

Parameter	Comments
<b>Communication Speed</b>	Use this list box to select the baudrate for the modem, by default the value is 2400.
<b>Initialisation Strings</b>	<p>During an initialisation, these HAYES™ AT command-set strings are transmitted to the modem and processed in sequence.</p> <p>Enter up to five separate initialisation strings. However, if the attached modem does not require any, leave all the entries blank.</p> <p>Example string: - ATX3&amp;D0S0=2</p>
<p>Be aware that changing certain <b>Profile Strings</b> in the <b>Modem Profile</b> can prevent further communication between the meter and Itron meter support tools such as ACE Pilot.</p> <p>Please contact your local Itron agent/representative or the Itron support team for further information and advice.</p>	
<b>Modem Profile</b>	Enter information as required, if the modem in use is different from the standard (recommended) ones.

### 8.8. Configuring the meter clock

The meter incorporates a **Real Time Clock (RTC)** that facilitates time- and date-based energy rate switching, interval measurement and event time stamping.

To operate, the RTC requires a reference frequency derived from one of two **Clock Base** sources:

1. Click **Clock > Clock Settings**.
2. Click the **Clock Base** list box and use the information given in the table below to select the appropriate operating mode:

Mode	Comments
<b>Quartz Crystal</b>	An integral quartz crystal oscillator provides the reference frequency.
<b>Mains Network</b>	<p>The incoming mains network supply provides the reference frequency.</p> <p>However, if the mains supply fails, the RTC is automatically maintained by the quartz crystal powered from the meters backup power supplies.</p>

### Threshold settings

The **Threshold** settings allow you to progressively adjust the RTC time value following a time synchronisation from an external source. This function is of particular interest when several meters are connected together in a network and a single synchronisation source is used. Setting an appropriate threshold value provides a way to overcome any timing discrepancies that may otherwise occur between the meters.

If the meter is fully stand-alone, or clock synchronisation is not required, the **Threshold** values should be set to zero (inactive). Use the spin controls or enter values in the boxes to set the:

<b>Threshold per Minute</b>	0 to 29 Seconds.
<b>Threshold per Billing Period</b>	0 to 60 Minutes.

### Threshold per Minute example

With a **Threshold per Minute** value of 15 seconds and a current meter time of 09:45.35, if a new clock synchronise time of 10:00.00 is received, the time difference is equal to 14 minutes and 25 seconds (or 865

seconds total). With this function, the new time is progressively reached by incrementing the RTC by 15 seconds each time it reaches a half-minute marker such as 09:46.30, effectively making each meter-minute equal to 75 seconds.

This progressive correction is continued until the total difference between the current time and the time is reduced to zero (865 seconds / 75 = approx 12 minutes).

---

**Note:** If the clock synchronise value requested is *back* compared to the current time, the threshold value is subtracted at each half-minute, so one meter-minute is shorter, during the correction process.

---

### Threshold per Billing Period example

This threshold value is added to the current time and used as a 'window' for accepting a meter time synchronisation. With a **Threshold per Billing Period** value of 15 minutes and a current meter time of 09:45.35, only synchronisation values up to 10:00.35 would be accepted. Values in excess of this are *rejected* and *no* synchronisation is carried out.

## 8.9. Configuring Daylight Saving Time

The meter can be programmed to follow seasonally-based changes (transitions) in local time, generally referred to as **Daylight Saving Time** (DST) or Summer Time.

Where the facility is enabled, the meter clock times will be advanced and retarded automatically by up to 2 hours each year.

The DST configuration can be defined in a number of ways to accommodate the different rules that apply in different countries.

To configure DST, do the following:

1. Click **Clock > Time Change**.
2. Select the appropriate **Operating Mode** from the list box, using the information given in the table below. As you select the operating mode, the system dynamically updates the time change tab contents and provides further configuration options.

Option	Comments
<b>No DST</b>	No DST transitions will be applied.
<b>Generic</b>	All the date parameters for the two DST transitions are individually programmable.
<b>Generic with season</b>	The individually programmable DST transition dates are linked to a pre-defined season value.
<b>Programmed</b>	Specific <b>dates of change</b> for the DST transitions can be chosen for each year. Up to ten future values can be programmed in advance.
<b>Programmed with season</b>	The specific <b>dates of change</b> for the DST transitions are linked to a pre-defined season value.

3. Use the spin controls or enter a value in the **Deviation** field to set the time deviation for the DST transition. By convention it is set to 60, but can range from 0 to 120 in one minute increments.

### Generic options

Use the function button provided to set the **European** rules for DST (reduces meter configuration time), otherwise use the information given in the table below to set the DST transition options:

Option	Comments
<b>Day of the Week</b>	Select a specific week day, or choose <b>Undefined</b> from the list box.

<b>Day of the Month</b>	<p>Select an appropriate entry from the list box:</p> <ul style="list-style-type: none"> <li>• <b>Day of the month</b> 1 to 31</li> <li>• <b>Last of the Month</b> If the week day is undefined, this represents the very last day of the month. If a week day has been selected this represents the last occurrence of that day prior to the end of the month.</li> <li>• <b>Before the Last of the Month</b> If the week day is undefined, this represents the day before the last day of the month.</li> <li>• <b>3rd/15th Last of the month</b> A fixed period of days from the end of the month.</li> </ul>
<b>Month</b>	Select the month for the transition.
<b>Hour</b>	Select the time the DST transition occurs - 0 to 23 (24 hour format).
<b>Direction</b>	<p>Select the appropriate DST transition direction:</p> <ul style="list-style-type: none"> <li>• <b>Summer to Standard</b></li> <li>• <b>Standard to Summer</b></li> </ul>
<b>Season</b>	<p>Select one of the meter's twelve pre-defined seasons.</p> <p>See Defining tariff seasons (page 82) for further information.</p>
<b>Deviation</b>	This sets the time-shift value. By default it is 60 minutes, but it can be set between 1 and 120 minutes.

### Programmed options

To set the programmed options, do the following:

1. Click **Add** to insert an entry in the **Programmed Time Change** table.  
Up to ten individual transitions can be entered in the table (5 years).
2. Click the **Date** list box control in the entry and select an appropriate DST transition date using the displayed calendar window.
3. The following parameters are the same as the generic options shown above, set them as required:
  - **Hour**
  - **Direction**
  - **Season**

### Deleting table entries

When more than two entries have been entered in the table, the **Delete** button becomes active:

1. Select an unwanted entry.
2. Click **Delete**.
3. Click **Yes** when prompted to confirm the deletion.

The delete button will become inactive if only two entries remain in the table.

## 8.10. Configuring energy settings

A meter records the consumption of all tariff-based metered energy in up to thirty-two individual energy registers and it can be configured with up to ten independent **Energy Channels**, each channel being allocated an energy quantity.

If required, a specific energy quantity can be allocated to more than one channel and three channels are available for **Excess** energy accumulation.

Each configured energy channel can have a *maximum* allocation of eight energy registers from within the thirty-two limit.

Typically, only energy channels configured with active and reactive energy types are used for billing purposes. However, it is possible to configure any remaining channels with alternative energy quantities for analysis purposes.

### 1. Click **Energy > Energy Settings**.

The displayed table contains a row entry for each of the ten energy channels. The table format cannot be edited, or the contents ordered in any way.

### 2. Set the **Energy Calculation Mode** radio button for either:

- **Cumulative**

The energy registers are *never* reset and the energy will continue to accumulate during the next billing periods.

- **Reset at EOB** (incremental operation)

The energy registers are reset to zero at the end of a billing period (EOB).

### 3. Set the **Apparent Power Calculation Mode** radio button for either:

- **Vectorial**

Multiplication of the RMS voltage and current values.

$S = U_{rms} \cdot I_{rms}$  (true apparent power - this method gives good results above 1b/10)

- **Arithmetic**

$S = P^2 + Q^2$  (this method is more precise at low currents)

The arithmetical method is not available on **3 wire** meters, therefore, the calculation will be done using the vectorial method.

### 4. Select the required **Aggregate Energy Calculation Mode** (page 103) from the list box:

- **Algo 1 One direction, net value calculation**
- **Algo 2 One direction, sum of positive phases**
- **Algo 3 Simultaneous calculation in two directions**
- **Algo 4 Absolute sum of import and export energy**

This mode is also called **Anti-Fraud** and the export aggregate energy corresponds to the sum of export energies per phase.

### 5. Use the list boxes and spin controls to configure the following parameters for each required energy channel:

Parameter	Comments
<b>Quantity</b>	<p>Click the + icon to expand each energy-type group:</p> <ul style="list-style-type: none"> <li>• <b>Active</b></li> <li>• <b>Reactive</b></li> <li>• <b>Apparent</b></li> <li>• <b>External</b> (if the pulse inputs are configured)</li> <li>• <b>Summation</b> (if summation is defined in the meter)</li> </ul> <p>Select the energy quantity type from the choices given.</p>
<b>Scalar</b>	<p>Select the scalar value for the energy channel. Choose from:</p> <ul style="list-style-type: none"> <li>• <b>Unit</b></li> <li>• <b>Kilo</b></li> <li>• <b>Mega</b></li> </ul>
<b>Number of Rates</b>	<p>The meter records energy in up to thirty-two individual registers. Each energy channel can have a <i>maximum</i> allocation of eight energy registers from within this limit.</p> <p>Select an appropriate value for each energy channel. Your choice may depend on the number of individual tariff rates the selected energy quantity has been configured for.</p>

The following values are automatically set by the system depending on the settings of other associated parameters:

- **Unit**
- **Fluid**

#### **Adding new energy channel entries**

1. Click **Add**.  
New entries are always added at the bottom of the energy table.
2. For each new entry made, repeat step 5 in the procedure above.

#### **Deleting existing energy channel entries**

1. Click on the required energy channel row to select it.
2. Click **Delete**.

### 8.10.1. Summation energy

The meter can support up to four **Summation** energy registers that algebraically sum the contents of up to five (internal and if applicable, external) energy rate registers recording the same type of energy.

Summation process results are *only* stored if they are a positive value. Negative or null results are equal to zero and not stored.

#### External energies

The summation of external energy can *only* occur on SL7000 meters fitted with **Pulse Inputs** (page 53).

Therefore, ensure these inputs are correctly configured to receive the external energy pulses prior to configuring the summation registers, otherwise the required external energies will *not* be available for selection.

---

**Note:** The summation calculation takes place once-a-second, so any pulse input signal used for summation *must* have a frequency higher than 1Hz to ensure accuracy.

---

To configure the summation registers, do the following:

1. Click **Energy > Summation**.

The four individual summation control panels all operate in the same way.

2. Choose a summation register and select the required **Unit** from its list box.
  - **No unit** - this selection disables the **Add** control
  - **Wh, VAh, varh** - these selections all enable the **Add** control and dynamically configure the energy choices available in its list box.
3. Click the **Add** button.
4. Click the **+** or **-** button controls to set the energy direction. These controls operate in a toggle fashion, ensure the one (and only one) button you require is highlighted.
5. Click the **+** icon displayed in the list to expand each energy-type group, as required.
6. Click the energy type you require from the group list(s) to select it.
7. Click the **Select** button to add your chosen energy type to the summation register table.
8. Repeat the above procedure from step 4 to configure up to four more summation energies per register.

To delete a summation table entry, simply click the required entry and click **Delete**.

### 8.10.2. Total energy registers

The meter measures energy quantities every second and records the values in a series of **Total Energy Registers (TER)** that are:

- dedicated to storing the total accumulation of an energy quantity
- independent of any tariff switching or calendar definition
- not reset at the end of a billing period
- not programmable

The TERs accumulate their respective energy values in an incremental fashion until they reach their limit. At that point they are automatically reset to zero in the same way as roll-over electromechanical meter types.

The TERs can be configured to accumulate energy in three discrete multiplier steps and it is very important that the multiplier is chosen correctly and with regard to the following requirements:

- metering context
- installation
- energy summation

The multiplier is applied to all TERs of the same energy type.

The example below shows watt hour (Wh), however varh and VAh follow the same pattern.

Unit	Value	Name
Wh		Watt hour
kWh	10 <sup>3</sup>	Kilowatt hour
MWh	10 <sup>6</sup>	Megawatt hour

TER contents can be displayed at any time as instantaneous values on the meter LCD with a maximum resolution of either **8** or **9** digits (depending on meter-type), the following table illustrates the full range available for each unit multiplier:

Unit	TER unit 8 digits	TER max value 8 digits	TER unit 9 digits	TER max value 9 digits
Wh	99 999 999 Wh	99 999.999 kWh	999 999 999 Wh	999 999.999 kWh
kWh	99 999 999 kWh	99 999.999 MWh	999 999 999 kWh	999 999.999 MWh
MWh	99 999 999 MWh	99 999.999 GWh	999 999 999 MWh	999 999.999 GWh

The maximum register values are just under:

- **100TWh** for 8 digit meters
- **1000TWh** for 9 digit meters

To set the TER multiplier values, do the following:

1. Click **Energy > Total Energy**.
2. Select the required **Internal** and if applicable, **External Energy** multipliers from the energy-type list boxes provided:
  - **Active Wh**
  - **Reactive varh**
  - **Apparent VAh**

### 8.10.3. Resetting external TER

When several meters are linked by pulse outputs and inputs and the energy summation feature is used, a meter can be initialised (reset) using the last values related to the external input and summation registers.

This function is typically used when a new meter replaces an existing but defective one.

Values used when resetting the registers cannot be read from the meter, they can only be programmed. Therefore, prior to attempting this procedure always obtain the necessary last values from the meter you are replacing.

To reset the external and/or summation registers, do the following:

1. Click **Energy > Reset TER**.

The displayed tables contain row entries for any external energy quantities and if applicable, any summation registers. The table format cannot be edited, or the contents ordered in any way.

The **Coefficient** and **Unit** fields are updated automatically depending on the register configuration and cannot be edited.

2. Use the **Initialise** tick boxes to select the required registers.
3. Enter the appropriate **Reset Value** in the adjacent numeric-entry field.

### 8.11. Configuring demand registering

Meter-based **Demand** registering is a convenient way for both the customer and the utility to monitor energy consumption.

The meter can support up to ten independent demand channels, each channel being allocated an energy quantity.

Tariffs are applied to these demand channels, with the exception of the aggregate power factor channel.

At any time, several tariff rates can be active for a particular demand channel and it is possible to have different tariff rate configurations in each demand channel.

Prior to defining demand registering, ensure the **Energy settings (page 67)** are fully configured.

#### 8.11.1. Demand settings

1. Click **Demand > Demand Settings**.
2. Select the a **Power Up Mode** from the list box to configure the behaviour of the meter after a power failure:

- **Restart**

A new integration period starts after a power-up.

- **Resume**

The integration period interrupted by a power failure is continued after a power-up.

- **Synchronise**

The integration period is always synchronised with the next whole hour.

3. Select the required **Excess Demand Control Mode** from the list box:

- **No Management**

Excess demand registering is not managed.

- **End of Integration Period**

If the threshold value is exceeded during the integration period, the meter indicates an excess at the end of the integration period and during subsequent integration periods. At the end of each integration period the excess demand indicators are reset only if the rising value has remained lower than the excess threshold.

- **Rising Value**

Every second, the meter calculates and compares the rising demand value with the demand threshold. If the demand threshold value is exceeded, the meter immediately indicates an excess. At the end of the current integration period all excess demand indicators are reset.
  - **Projection**

Every second, the meter calculates and extrapolates the demand to the end of the current integration period. If the demand threshold value is exceeded by the extrapolated value, the meter immediately indicates an excess. This calculation is always inhibited during the first 30% of the integration period.
4. Select the required **Maximum Registering Mode** from the list box:
    - **Maximum Mode**

This mode registers the maximum demand peaks only, any preconfigured thresholds *will* be ignored.
    - **Maximum Excess Mode**

This mode activates the pre-configured thresholds. If a threshold is defined for a channel, only the maximum demand peak value *above* the threshold is recorded. If no threshold is defined the operation is identical to Maximum mode
  5. Select the required **Incomplete Period Mode** from the list box:
    - **Neglected**

The value will not be taken into account for maximum demand calculation and excess demand control. The previous demand is not updated and in case of a sliding period, the entry in the sliding array is null.
    - **Used**

The value will be considered as coming from a complete period and taken into account for maximum demand calculation and excess demand control. The previous demand is updated.
  6. Tick the box provided if the **Clock Modification Threshold** uses the **End of Systematic Integration Period (EOI)**, otherwise use the spin control (0 to 5%).
  7. Select the required **Demand Calculation Algorithm** from the list box:
    - **Standard**
    - **Green Tariff**

This is a French specific algorithm for MV/HV meters.
  8. If a **Fixed Integration** period is required, do the following:
    - i. Leave the **Number of Sub-Intervals** tick box blank.
    - ii. Choose an appropriate **Sub-Interval Period** from the list box.

The **Total Integration Period** value is dynamically updated.
  9. If a **Sliding Integration** period is required, do the following:
    - i. Tick the **Number of Sub-Intervals** box to activate the function.
    - ii. Use the spin-control to select the number of **Sub-Intervals** (from 2 to 16).
    - iii. Choose an appropriate **Sub-Interval Period** from the list box.

The **Total Integration Period** value is dynamically updated.
  10. Use the spin-control to select the **Power Factor Calculation Limit** value.

This parameter defines the minimum value of the active demand, allowing power factor calculation. The scalar and unit are the same as for the associated register.

### 8.11.2. Demand channels

1. Click **Demand > Demand Channels**.

The displayed table contains a row for each of the ten demand channels. The table format cannot be edited, or the contents ordered in any way.

2. Click the **Coincident Values** tick box if this mode of operation is required.

When a maximum demand is recorded on channel 1, the demand on the last channel is also recorded (even if a maximum demand is not detected on that channel).

3. Use the list boxes and spin controls to configure the following parameters for each required demand channel:

Parameter	Comments
<b>Quantity</b>	<p>Click the + icon to expand each energy-type group:</p> <ul style="list-style-type: none"> <li>• <b>Active</b></li> <li>• <b>Reactive</b></li> <li>• <b>Apparent</b></li> <li>• <b>Other</b></li> <li>• <b>Summations</b></li> <li>• <b>External energies</b> (this is meter-type dependent)</li> </ul> <p>Select the energy quantity type for demand registering from the choices given. Choosing <b>Other &gt; No energy - No allocation</b> deactivates the channel.</p>
<b>Scalar</b>	<p>Select the scalar value for the demand channel. Choose from:</p> <ul style="list-style-type: none"> <li>• <b>Unit</b></li> <li>• <b>Kilo</b></li> <li>• <b>Mega</b></li> </ul>
<b>Decimals</b>	<p>Use the spin controls to set the number of decimal places the demand channel uses. The range is typically 0 to 3. However, the values available are dependent on the scalar selected.</p>
<b>Number of Rates</b>	<p>The meter records energy demand in up to twenty-four individual demand registers. Each demand channel can have a <i>maximum</i> allocation of eight demand registers from within this limit.</p> <p>Select an appropriate value for each demand channel. Your choice may depend on the number of individual tariff rates the selected energy quantity has been configured for.</p>

The following self-explanatory values are automatically set by the system depending on the settings of other associated parameters:

- **Unit**
- **Fluid**

The **Memory Use** parameter gives a percentage value for the usage of memory of the channel on every register.

---

**Note:** If the **Memory Use** value exceeds 100%, the data will not be stored correctly.

---

### 8.11.3. Excess demand

The meter detects an **Excess** demand when the calculated demand value rises above predefined thresholds for the current rates. Up to ten excess demand thresholds can be defined.

Prior to configuring the excess demand registering, ensure the required **Excess Demand Control Mode** has been selected in the **Demand Settings** tab, then do the following:

1. Click **Demand > Excess Demand**.

The displayed table contains a row for each of the ten excess demand channels. The table format cannot be edited. However, the contents can be ordered according to **Unit**.

2. Use the list boxes and spin controls to configure the following parameters for each required excess demand channels:

Parameter	Comments
<b>Quantity</b>	Select the energy quantity type for excess demand registering from the choices given. The list content is dependent on the meter's pre-configured demand quantities.
<b>Rate</b>	Select the tariff rate required. The values available are dependent on the energy quantity selected.
<b>Threshold</b>	Set the excess demand detection threshold value for the selected rate. The threshold unit is dependent on the energy quantity selected.

The following values are automatically set by the system depending on the settings of other associated parameters:

- **Scalar**
- **Unit**

### 8.12. Configuring billing events

A billing period is defined as the time between two successive **End Of Billing** (EOB) events. At the end of a billing period all the energy registers are read and their values recorded as meter data. The utility company then reads this data and uses it for billing purposes.

#### 8.12.1. EOB event triggers

Depending on meter type, a meter can be configured so that up to five different (internal and external) sources can trigger an EOB event:

- specific and generic calendar dates and times
- periodical times (within 24 Hours = Daily EOB)
- an active signal on a control input
- a command from a communication channel or protocol
- the front-panel pushbutton reset switch

When triggered, the meter will *always* process an EOB event immediately.

To configure the calendar time and date related EOB events, do the following:

1. Click **End of Billing > EOB Control**.
2. Set the **Type of EOB** radio button for either:
  - **Specific and Generic**
  - **Periodical**

#### Generic

1. Click the **Add** tick icon in the **Generic EOB** panel.

Only **one** generic event can be added to the table.

- Use the information given in the table below to set the generic options:

Parameter	Comments
Day of the Week	Select a specific week day, or choose <b>Undefined</b> from the list box.
Day	Select an entry, or choose <b>Undefined</b> from the list box: <ul style="list-style-type: none"> <li><b>Day of the month</b> 1 to 31</li> <li><b>Last of the Month</b> If the week day is undefined, this represents the very last day of the month. If a week day has been selected this represents the last occurrence of that day prior to the end of the month.</li> <li><b>Before the Last of the Month</b> If the week day is undefined, this represents the day before the last day of the month.</li> <li><b>3rd/15th Last of the month</b> A fixed period of days from the end of the month.</li> </ul>
Month	Select an entry, or choose <b>Undefined</b> from the list box.
Time	Use the spin control to set the time the EOB event occurs.

### Specific (programmed)

- Click the **Add** tick icon in the **Programmed EOB** panel.  
Up to **twenty-four** programmed events can be added to the table.
- Click the **Date** list box control in the entry and select an appropriate EOB date using the displayed calendar window.
- Use the spin-control to set the **Time** the EOB event occurs.

To delete a generic or programmed table entry, simply click the required entry and click **Delete**.

---

**Note:** The time format for the **Time** parameters used in this function is defined in the system **Setup > Miscellaneous**.

---

### Periodical

Use the spin control or enter a value in the **EOB Period** field to set the time the daily EOB occurs - 0 to 23 (24 hour format - whole hours only).

---

**Note:** Periodical EOB operation is *exclusive* and if selected, all generic and specific programmed EOB events are cleared.

---

### 8.13. Configuring tariffs

A **Tariff** specifies a set of energy and demand rates for one energy quantity. For billing purposes, each individual tariff is associated to an energy cost.

The contract between the customer and the utility will usually specify how many tariffs are available and at what times of the day these rates can be applied.

Typically, tariff use is controlled by:

- The **Calendar (page 76)** - This facility enables the meter to perform tariff switching according to a pre-defined time- and date-based regime.
- An external **Control Input (page 53)** - This facility allows the utility company, or an external device to override the tariff currently in use and switch to a pre-defined alternative.
- A **Clock Loss (page 83)** event - In the event the meter loses its internal clock settings, it automatically switches to a default tariff rate.

#### 8.13.1. Calendar

The meter's **Calendar** facility uses:

- **Day Profiles** - to handle up to sixteen energy rate switches (tariff changes) per day.
- **Seasons** - to apply different energy rate regimes during different seasons of the year.
- **Special days** - to apply different energy rate regimes on designated special days such as religious or public holidays.

Two separate calendars can be programmed into the meter to accommodate contractually agreed energy rate changes and automatically apply them when they are due to come into force.

- **Current** - The tariff regime currently in use by the meter.
- **Future (latent)** - The alternative tariff regime used by the meter once the due date is reached.

To configure a calendar, do the following:

1. Ensure the meter's RTC time and date are set correctly.
2. Click **Calendar > General Settings**.
3. Enter a unique **Calendar Name** (up to eight characters).

This purely informative data has no influence on the meter's behaviour and is simply shown on the LCD if included in a display list.

4. Set an appropriate **Activation Date**.

For a **Current** calendar use the actual meter configuration date (i.e. today), or alternatively a date such as the first day of the current year.

If the activation date is set to a date in the past, the calendar will be taken into account immediately, otherwise, it will be taken into account on the pre-set due date.

5. Select the **Index Activation Mode**:
  - **Immediate** - The change is applied immediately.
  - **Delayed** - The change is delayed until the end of any running demand calculation integration period.

### 8.13.2. External tariff structure

Meters equipped with **Control Inputs** can accept externally generated signals that *override* current meter settings. Once a control input is activated, the meter operates using a pre-defined alternative setting. Normal meter operation then resumes when the control input signal becomes inactive.

Prior to defining the external tariff structure, ensure the **Energy settings (page 67)**, **Daily Profiles (page 80)** and **Seasons (page 82)** are fully configured.

To configure the external tariffs, do the following:

1. Ensure one or more **Control Inputs (page 53)** is assigned to:
  - **Rates Set**
  - **Daily profile**
  - **Season**
2. Click **Calendar > External tariff structure**.

Depending on the control input assignments, up to three separate control regions may be displayed in the window.

#### 8.13.2.1. Set list

If any control input is assigned to **Rates Set**, the **Set List** control region is displayed which can contain up to 4 individual side-tabbed pages, at least one (Set 1) will be shown.

Use the list and tick boxes provided to select the group energy and demand rates that will be activated from an external source.

If any group of assigned control outputs needs to be forced to a closed state from an external source, click the relevant tick box.

#### Selecting and viewing a set

- Click the relevant labelled **side-tab control**.

#### Adding a set

- Click **Add**.

New side-tabbed pages are always created at the end of the existing set sequence.

- Up to two sets can be added if one control input is assigned.
- Up to four sets can be added if two control inputs are assigned.

#### Deleting a set

1. Select the required set side-tab (for example: Set 2.)
2. Click **Delete**.
3. Select **Yes** to confirm the deletion, when prompted.

### 8.13.2.2. Daily profiles authorized on control inputs

If any control input is assigned to **Daily profile**, the **Daily profiles authorized on control inputs** control region is displayed. The table entries are dependent on the number of control inputs assigned, as follows:

- **One** control input assigned - Day profiles 1, 2, 3, 5, 9 and 17 are valid.
- **Two** control inputs assigned - Day profiles 4, 6, 7, 10, 11, 13, 18, 19, and 21 are added to the above list of valid entries.

To activate a particular day profile from an external source:

- Click the tick box in the **is used** column for the required entry.

As you choose profiles, the table grid is dynamically refreshed and valid or available choices are highlighted **grey**, invalid or unavailable choices are **white**.

- Day profile 1 must *always* be selected.
- Up to two profiles can be chosen if one control input is assigned.
- Up to four profiles can be chosen if two control inputs are assigned.
- The table contents can be ordered (page 35), if required.

### 8.13.2.3. Seasons authorized on control inputs

If any control input is assigned to **Season**, the **Seasons authorized on control inputs** control region is displayed. The table entries are dependent on the number of control inputs assigned, as follows:

- **One** control input assigned - Seasons 1, 2, 3, 5, and 9 are valid.
- **Two** control inputs assigned - Seasons 4, 6, 7, 10, and 11 are added to the above list of valid entries.

To activate a particular season from an external source:

- Click the tick box in the **is used** column for the required entry.

As you choose seasons, the table grid is dynamically refreshed and valid or available choices are highlighted **grey**, invalid or unavailable choices are **white**.

- Up to two seasons can be chosen if one control input is assigned.
- Up to four seasons can be chosen if two control inputs are assigned.
- The table contents can be ordered (page 35), if required.

### 8.13.3. Defining groups

A **Group** describes a combination of energy and demand rates that are activated simultaneously.

A group is created automatically every time:

- an **Energy** or **Demand** channel is configured.
- a **Control Output** is assigned to **Managed by the Calendar**.

Therefore, if required, every pre-defined channel or control output could be assigned individually to its own unique group.

However, where channels or control outputs need to have common rate-change timings applied, it is normal practise to assign those channels to the same group, wherever possible.

Only channels with the same number of rates can be assigned together in the same group, and all rate change and switch timings are assigned to the groups using **Day Profiles** (page 80).

Prior to defining the groups, ensure the following are fully configured:

- **Energy settings** (page 67)
- **Demand settings** (page 71)
- **Control outputs** (page 55)

To manage the channel to group assignments, do the following:

1. Click **Calendar > Groups**.

A fixed-format table displays all the available pre-defined **Energy** and **Demand** entries on the left and the **Groups** on the right in numbered tick box columns.

You cannot add to, delete from, or order the contents of this table. If further entries are required (up to a maximum of 20 channels) they must be created using the appropriate Energy settings or Demand settings tab.

Valid or available group assignments are highlighted **grey**, invalid or unavailable group assignments are **white**.

2. As required, assign channels to the groups by clicking the relevant tick boxes in the numbered Groups columns. However, ensure only same-rate channels are assigned together.

As you assign channels, the table grid is dynamically refreshed. If you attempt to create an invalid group, the associated column entries will turn white to alert you to this situation.

3. If you wish to *automatically* assign channels with the same number of rates, or control outputs into groups, click the **Reset Groups** button.

### 8.13.4. Defining day profiles

A **Day Profile** defines the order and timing of up to sixteen energy/demand rate changes and control output switches over a 24 hour period.

Up to 24 individual day profiles can be defined with a total usage limit of 100 switching operations.

Prior to defining any day profiles, ensure the **Groups** (page 79) are fully configured, then do the following:

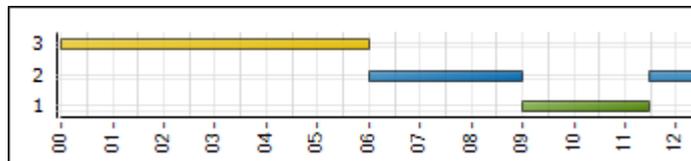
- Click **Calendar > Day Profile**.

The displayed window contains up to 24 individual side-tabbed pages, at least one (D.P.1) will be shown.

Each page contains one or more individually-labelled energy, demand or control output time-line displays for every active **Group**.

A time-line always starts at 00:00 and increments in 15 minute intervals through 24 hours, back to 00:00. However, only 30 minute grid lines are shown on the time-line display.

Depending on the number of rates configured for the energy in the group, energy time-line displays may have more than one row (with each row representing an energy rate). Time allocated to a rate is shown as a coloured time-bar section and an energy rate change is shown as a transition between two rates, as illustrated:



In the example above the timings are:

- Rate 3 starts at 00:00 then switches to Rate 2 at 06:00
- Rate 2 starts at 06:00 then switches to Rate 1 at 09:00
- Rate 1 starts at 09:00 then switches to Rate 2 at 11:30

Control output time-lines operate in a similar fashion. However, they only have two rows representing the physical relay contact states:

- **Closed**
- **Open**

#### Selecting and viewing a day profile

- Click the relevant labelled **side-tab control**.

A vertical scroll bar will be provided when necessary.

#### Adding a day profile

- Click **Add**.

New side-tabbed pages are always created at the end of the existing day profile sequence.

#### Deleting a day profile

1. Select the required day profile side-tab (for example: D.P.3)
2. Click **Delete**.
3. Select **Yes** to confirm the deletion, when prompted.

### Allocating time to a day profile time-line display

The allocation of time and energy rate changes to the various time-lines depends on the contract between the customer and the utility. Therefore, always refer to that document prior to configuring the time-line displays.

When applying time to any type of time-line, the entire period (00:00 to 00:00) *must* be allocated an appropriate rate or switch state, otherwise an error will be displayed in the conflict window.

1. Position the cursor over the required start time.
2. Left click the mouse and drag the cursor to the required finish time. A coloured time-bar section is drawn.
3. Release the mouse button.
4. Confirm the time various allocations by hovering the cursor over each time-bar section to display its associated start and finish times in a pop-up.
5. If necessary, repeat these steps to apply further timings.

In multi-rate energy and control output time-lines, the time-bar sections interact at the rate change or switching point:

- Dragging the rightmost edge of a time-bar section to the right increases its time allocation and dynamically adjusts the time-bar of the other rate involved in the switch. This operation moves the switch point forward in time.
- However, you cannot simply drag the section edge back to the left if you have misjudged the timing. To correct this situation, drag the leftmost edge of the *other* rate involved in the switch to the left. This operation dynamically adjusts the time-bars involved and moves the switch point back in time.

### 8.13.5. Defining special days

By applying a specific day profile, the **Special Days** facility allows the energy consumption charge for locally-significant days, to be different from the pre-configured weekday value.

The meter can accommodate up to a total of 100 entries (max) in the two internal special days lists:

- **Recurrent**  
This list allows different day profiles to be applied on *specific* days during the current and all subsequent years.
- **Fixed Date**  
This list allows different day profiles to be applied on *fixed* dates during the year. Each entry is completely independent and when the last entry is reached it will be necessary to reprogram the meter with new values.

Prior to defining any special days ensure the **Day Profiles** (page 80) (**D.P**) are all fully configured, then do the following:

1. Click **Calendar > Special Days**.
2. If *no* entries exist in the required list, click the relevant **Add** button.  
The date of the first special day is *always* set to the current host PC date.
3. Use the information provided below to configure the special day list entries:

Parameter	Comments
<b>Date (Recurrent)</b>	Use the spin controls (or manually enter a value) to set the recurrent special day date. This date <i>must always</i> occur after the date of any previous special day(s). All dates entered are verified by the system and invalid entries will result in an error message box being displayed.

<b>Date (Fixed)</b>	Use the calendar facility provided by the list box (or manually enter a value) to set the fixed special day date. You cannot set a date earlier than the previous entry.  All dates entered are verified by the system and invalid entries will result in an error message box being displayed.
<b>Day Profile</b>	Use the list boxes to select the day profile for the special day.

**Adding new special day list entries**

1. Click the relevant **Add** button.  
  
New entries are always added at the bottom of the relevant list and will have a default date of one day on from the last list entry.
2. For each new entry made, repeat step 3 in the procedure above.

**Deleting existing special day entries**

1. Click in the **leftmost column** of the required individual entry row to select it.  
  
or
2. Use standard Windows techniques to select a combination of individual rows (Control + click) or select a block of rows (Shift + click).
3. Click **Delete**, or press the **Delete** button on the PC keyboard.
4. Select **Yes** to confirm the deletion(s) when prompted.

**Applying a day profile across selected list entries**

1. Use standard Windows techniques to select a combination of individual rows (Control + click in the leftmost column) or select a block of rows (Shift + click in the leftmost column).
2. Use the **D.P.** list box to choose the required day profile.  
  
The selected list entries are dynamically updated.

**8.13.6. Defining seasons**

A **Season** is a pre-defined set of Day Profiles covering a specific period of the year. The meter supports up to twelve seasons per year each defined by a start date (set individually or derived from the programmed DST transitions).

Once a specific day profile has been selected for each weekday during the season, the meter will continuously use that setting unless overridden by a **Special Day**.

Prior to defining the seasons ensure the **Day Profiles** (page 80) (D.P.) are all fully configured, then do the following:

1. Click **Calendar > Seasons**.
2. If *no* season entries exist in the table, click **Add**.  
  
The start date of the first season is *always* set to 1st of January.
3. Use the information provided below to configure existing season table entries:

<b>Parameter</b>	<b>Comments</b>
<b>Start Day</b>	Use the spin controls (or manually enter a value) to set the season start date.  This date <i>must always</i> occur after the start day of any previous season(s).  All dates entered are verified by the system and invalid entries will result in an error message box being displayed.
<b>Day of the week</b>	Use the individual list boxes to select a day profile for each day of the week within the season.

**Adding new season table entries**

1. Click **Add**.

New entries are always added at the bottom of the season table and will have a default start date of the 1st of the month that follows the last season.

2. For each new entry made, repeat step 3 in the procedure above.

**Deleting existing season table entries**

1. Click on the required season row to select it.
2. Click **Delete**, or press the **Delete** button on the PC keyboard.
3. Select **Yes** to confirm the deletion when prompted.

**Applying a day profile across the season**

1. Click on the required season row to select it.
2. Use the **Select D.P.** list box to choose the required day profile.

The season entry is dynamically updated.

**8.13.7. Clock Loss**

The meter is equipped with backup power supply sources that ensure the internal real-time clock (RTC) is maintained during periods of mains power failure.

However, a **Clock Loss** event may result from an extended period of power failure, where the backup sources become exhausted and the RTC settings are subsequently lost.

When a clock loss occurs, the meter automatically switches to pre-selected default tariff rates.

Prior to setting the clock loss defaults, ensure the following are fully configured:

- **Energy settings** (page 67)
- **Groups** (page 79)

To select the default tariff rate for each group, do the following:

1. Click **Calendar > Clock Loss**.
2. Using the list boxes provided, select an appropriate **Rate** for each energy and demand group displayed.

It is important that the tariff chosen as the default should always be the *lowest* rate in the group to ensure the end user is not financially penalised during a clock loss event.

**8.14. Configuring the load profiles**

A **Load Profile** is a continuous record of average or cumulative energy values taken over a pre-set period of time (the recording interval). Up to eight individual load profile channels can be configured in each of the meter's two internal memory arrays (**LP1 & LP2**).

Load profiles are of interest to both the utility and the end customer as they can help determine which electricity contract and tariff rates may be the most appropriate. As well as analysis, load profile data can be used for billing purposes.

Up to three channels in each load profile array can be configured as excess energy channels. These are triggered to record energy quantities once the specified quantity has exceeded a configurable threshold.

Prior to defining either load profile, ensure the **Energy settings (page 67)** are fully configured, then do the following:

1. Click **Load Profile > Load Profile (1 or 2)**.

The displayed table contains a row for each of the eight load profile channels. The table format cannot be edited, or the contents ordered in any way.

2. Use the list boxes to configure the following common load profile parameters:

Parameter	Comments
<b>Recording Interval</b>	<p>Select from the list an appropriate value for the duration of the recording interval. The values range from <b>1</b> to <b>60</b> minutes in pre-defined discrete steps or <b>1440</b> minutes (1 day).</p> <p>You can choose a value different from the <b>Demand Integration Period</b> value except when a load profile channel has <b>Excess</b> enabled.</p>
<b>Clock Modification Threshold</b>	<p>This parameter is used when determining whether an End Of Interval (EOI) should be triggered when the meter's internal clock is synchronised.</p> <p>The list box values range from <b>0</b> to <b>5%</b> or <b>100%</b> of the recording interval.</p> <p>For example, if the recording interval is 15 minutes and the CM threshold is 4%, this parameter represents 36 seconds. When the clock is synchronised and the difference in time is <i>less</i> than 36 seconds, an EOI is not triggered. If the difference is <i>greater</i> than 36 seconds, an EOL is triggered.</p> <p>If set to zero an EOI is triggered when the clock is synchronised.</p>
<b>Energy Recording Format</b>	<p>This parameter is used to apply the recording resolution.</p> <ul style="list-style-type: none"> <li>• selecting <b>Base 10</b> provides energy to a resolution to 100MWh</li> <li>• selecting <b>Base 2</b> provides a resolution to 10MWh</li> </ul> <p>Itron recommend using Base 10 with the correct scalar selected to avoid memory overrun. However, in the event of a memory overrun please contact Itron for advice.</p>

3. Use the list and tick boxes to configure the following load profile parameters for the required channels:

Parameter	Comments
<b>Quantity</b>	<p>Click the + icon to expand each energy-type group:</p> <ul style="list-style-type: none"> <li>• <b>Active</b></li> <li>• <b>Reactive</b></li> <li>• <b>Apparent</b></li> <li>• <b>External</b> (meter-dependent)</li> <li>• <b>Summation</b></li> <li>• <b>RMS Current / Voltage</b></li> <li>• <b>Other</b></li> </ul> <p>Select the energy quantity type to be recorded in the load profile from the choices given.</p> <p>Choosing <b>Other &gt; No energy - No allocation</b> deactivates the channel.</p>
<b>Scalar</b>	<p>Choose a suitable scalar value for the selected energy quantity with regard to the <b>Energy Recording Format</b> resolution (Base 2 or Base 10) chosen.</p> <p>If an incorrect scalar value is chosen the field is highlighted in yellow until the situation is rectified.</p> <p>The values provided in the list are dependent on the quantity type selected.</p>
<b>Excess</b>	<p>Click tick boxes, as required to select up to three Excess channels per load profile.</p> <p>Refer to <b>Configuring demand settings</b> (page 71) for further information.</p>

4. Select the required **Calculation Mode** from the list box:

- **Cumulative**

The energy quantity allocated to the load profile is cumulated over the recording interval and then stored in the load profile array (cumulated unit-hours).

As this mode records energy consumption over the recording interval, only energy type quantities can be allocated.

- **Average**

The energy quantity allocated to the load profile is cumulated over the recording interval and then corresponding average power stored in the load profile array (cumulated unit-hours divided by the integration period).

This mode can be used with all energy quantity types but must be used if Excess is enabled on this channel.

The following self-explanatory values are automatically set by the system depending on the settings of other associated parameters:

- **Unit**
- **Fluid**
- **Memory Usage**

## 8.15. Configuring the UFER Settings

When the **UFER/DCMR** facility is enabled, it allows specific excess energy registers to be used if the meter measures a **Power Factor (PF)** below a programmed threshold level.

Prior to activating the UFER/DCMR facility ensure the following parameters are set:

- Demand (page 71) settings: **Power Up Mode** = Synchronise.
- Demand settings: **Clock Modification Threshold** = End of Systematic Integration Period.
- Calendar (page 76) settings: **Index Activation Mode** = Delayed.
- The first energy channel must measure import active energy aggregate.

Also ensure the **Seasons** (page 82) have been fully configured, then do the following:

1. Click **UFER > UFER Settings**.
2. Tick the **UFER/DCMR Active** box to activate the function.

The tab is dynamically updated with the necessary controls and fields.

The current UFER/DCMR rates are displayed in a table.

3. Use the spin controls or enter a value to set the following parameters:

- **Power Factor Threshold**

Set a threshold value from 0.8 up to 0.99 (by default 0.92), when the measured PF drops below this value the UFER registers are used.

- **EOI Limit**

This value should always be set with respect to the **Demand (page 71)** sub-interval period. The total UFER Interval should always be equal to 60 minutes. Therefore, if the demand sub-interval period equals 15 minutes, the EOI limit should be set to 4 (15x4=60).

If these value are incorrectly set a conflict message will be displayed.

The following parameters are automatically calculated and set by the system:

- **UFER Interval** (60 minutes, see EOI Limit above)
- **Memory Usage %**

## 8.16. Configuring meter displays

The meter front-panel LCD can display up to three individual **Lists** which define the information available to be viewed on the meters. Each list can contain up to 100 parameters (max) of billing and configuration information:

### 1. Normal

The default display mode where pre-selected parameter values automatically scroll, in sequence, on to the LCD.

### 2. Alternate short

An alternate list of pre-selected parameters typically accessible to the end-user.

### 3. Alternate long

A further list of pre-selected parameters typically accessible to the utility company.

Meter display configuration typically includes:

- defining aspects of meter display behaviour
- defining the number and order of displays shown on the meter for each of the three list modes
- setting the resolution of displayed energy consumption figures

Use the information and procedures given in the following sections to configure the meter display.

### 8.16.1. Display settings

To configure the behaviour and certain generic aspects of display appearance, do the following:

#### 1. Click **Display > Display Settings**.

Several of the following parameters are meter-type specific and ACE Pilot will only display them when relevant.

#### 2. Refer to the information given in the tables below and set the options as required.

#### General Settings

Parameter	Comments
<b>Leading zeros</b>	Click the tick box as required, to show or suppress leading zeros in the energy displays, for example: <b>0000793.6</b> <b>793.6</b>
<b>Display Separators</b>	OBIS codes are displayed as a number of individual field groups separated by dots. Click the tick box as required, to show or suppress these field separators, for example: <b>8.88.88.88.8.88</b> <b>8 88 88 88 8 88</b>
<b>Programming Reference</b>	This is a purely informative message that can be included in a display list to identify the meter programming. Enter up to eight alpha-numeric characters (including spaces and -, /) to define.
<b>Initialisation Reference</b>	This is a purely informative message that can be included in a display list to identify the meter initialisation. Enter up to eight alpha-numeric characters (including spaces and -, /) to define.
<b>Display Load Profile Menu</b>	Click the tick box as required, to show or suppress the load profile menu display.

End of billing (EOB)

Parameter	Comment
<b>Authorised EOB</b>	<p>This parameter is only relevant if EOB activation by reset pushbutton has been enabled. See End of billing (page 74) for further information.</p> <p>Normally, an EOB can only be triggered when in the normal display mode. Click the tick box as required, to activate the manual triggering of an EOB event when in either alternate display mode.</p>
<b>EOB Confirmation</b>	<p>Click the tick box as required, to activate the EOB confirmation feature.</p> <p>It is recommended that this feature is used to prevent unwanted manual EOB triggering.</p>
<b>EOB Confirmation String</b>	<p>Enter a string of up to eight alpha-numeric characters (including spaces and -, /) to define the displayed EOB confirmation message.</p> <p>When active, the EOB confirmation feature will display this message when the meter's reset button is pushed once, then while the message is displayed the reset button must be pushed once more to trigger an EOB event.</p>

End of List (EOL)

Parameter	Comments
<b>Activate End of List</b>	<p>Each display list can contain up to 100 entries making it difficult to identify when the end of the list has been reached.</p> <p>The EOL feature provides a message on the LCD when the last parameter has been displayed.</p> <p>Click the tick box as required, to activate the EOL feature.</p>
<b>End of List</b>	<p>Enter a string of up to eight alpha-numeric characters (including spaces and -, /) to define the displayed EOL message.</p>

Date / Time Format

Parameter	Comments
<b>Date Format</b>	<p>Select an appropriate format for the meter's date display according to regional requirements:</p> <ul style="list-style-type: none"> <li>• <b>DD_MM_YY</b></li> <li>• <b>MM_DD_YY</b></li> <li>• <b>YY_MM_DD</b></li> </ul>
<b>Time Format</b>	<p>Click the relevant radio button to set the time format as either:</p> <ul style="list-style-type: none"> <li>• <b>12 hour</b> (am and pm annunciators are displayed)</li> <li>• <b>24 hour</b></li> </ul>
<b>Days of the Week Displayed</b>	<p>Click the tick box as required, to show or suppress the display of week days on the meter's LCD.</p>

## Display Duration (Time Out)

Parameter	Comments
<b>Alt Mode</b>	This parameter sets the time (in minutes) the meter remains in either of the alternate display modes, before returning to the normal mode once all pushbutton activity has ceased. The value limits are 1 to 60 minutes.
<b>Set Mode</b>	This parameter sets the time (in seconds) the meter remains in the programmable set mode, before returning to the normal mode once all pushbutton activity has ceased. The value limits are 2 to 10 seconds.
<b>Load Profile Mode</b>	This parameter sets the time (in minutes) the meter remains in the load profile display mode, before returning to the normal mode once all pushbutton activity has ceased. The value limits are 1 to 60 minutes.
<b>Display Test</b>	This parameter sets the time (in seconds) the meter lights all the LCD segments before returning to the normal mode. The value limits are 1 to 60 seconds.
<b>Display On</b>	By default the Normal display mode is active with all selected parameters auto-scrolling in sequence. This parameter sets the time (in seconds) that an individual parameter is visible on the LCD. The value limits are 1 to 60 seconds, however earlier versions of meter firmware are set to 10 seconds (max).
<b>Display Off</b>	This parameter sets the time (in seconds) that the LCD remains blank between consecutive parameters. The value limits are 0 to 60 seconds, however earlier versions of meter firmware are set to 10 seconds (max).

**Historical data**

The meter records data values in a series of historical buffer registers after an EOB event. The following parameters determine how many of these historical values are shown, in sequence, after the associated current value has been displayed on the LCD.

Use the spin controls or enter values in the boxes to set the number of historical values shown for each display list mode:

- **Normal Mode**
- **Alt. Short Mode**
- **Alt. Long Mode**

If the value is zero, no historical data is displayed. The upper limit is determined by meter-type and firmware version, typically **36** or **18**.

**8.16.2. Identifications**

Purely informative client data (comments, labels) can also be included in a display list. This data has no influence on the meter's behaviour and is simply shown on the LCD as an entry in the parameter sequence of the relevant display list.

1. Click **Display > Identifications**.
2. As required, enter a string of up to eight alpha-numeric characters (including spaces and -, /) in any of the nine **Client Identification** fields.

Any unused fields can be left at the default value 00000000.

To include any of the configured fields in a display list, do the following:

1. When adding a new entry to the display list expand the **Various** options entry.
2. Select a matching numbered **Distribution Identification** field.
3. Click **Add selected items**.
4. Complete the configuration of the new list entry as required.

See Display list (page 89) for further information on the above procedure.

### 8.16.3. Display list

To configure the contents of the three display lists, do the following:

- Click **Display > Display List**.

The display formats and list box choices of several of the following parameters are meter-type specific.

The **Display List** table contains the following column headings:

Parameter	Comments
<b>Label</b>	This is the parameter name. It cannot be edited.
<b>Text Label</b>	This is the identifying OBIS code. Enter allowed characters only (case sensitive) into each field as appropriate:  0-9, A, b, C, d, E, F, H, I, J, L, n, o, P, q, r, S, t, u, y, - and space.  For example: <b>C 52 4</b>
<b>Scalar</b>	This field represents the scalar label displayed with the energy quantity parameter and will only have an entry if it is relevant . Choose from: <ul style="list-style-type: none"> <li>• <b>Unit</b></li> <li>• <b>Kilo</b></li> <li>• <b>Mega</b></li> <li>• <b>Giga</b></li> </ul>
<b>Decimals</b>	Use the spin controls to set the number of decimal places the display uses. The range is 0 to 4.
<b>Number of Digits</b>	Use the spin controls to set the number of digits the display shows. The range is 3 to either 8 or 9 (depending on meter-type).
<b>Historical Sets Display</b>	Select from the list box, the required number of historical values that will be displayed in sequence, after the associated current value.
The following are all tick box selections, select as appropriate to include the parameter in the:	
<b>Normal</b>	<b>Normal</b> display list.
<b>Alt. long</b>	<b>Alternate Long</b> display list.
<b>Alt. short</b>	<b>Alternate Short</b> display list.
<b>HHU Readout</b>	<b>Hand Held Unit (HHU)</b> reading list.
<b>Configurable</b>	<b>Set mode</b> display list.  This field will only have an entry if the parameter can be manually edited using the pushbuttons in set mode.

The order in which the parameters appear in the display table represents the meter's display sequence.

#### Ordering parameter entries

1. Click on the required entry in the table.

However, you can use standard Windows techniques to select a combination of individual entries (Control + click) or select a block of entries (Shift + click).

2. Click **Up** or **Down** as required, to move parameters within the display list. Alternatively, simply drag and drop the selected parameters to their new location using the mouse.

### Deleting parameter entries

1. Click on the required entry in the table.

However, you can use standard Windows techniques to select a combination of individual entries (Control + click) or select a block of entries (Shift + click).

2. Click **Delete**, or press the **Delete** button on the PC keyboard.
3. Select **Yes** to confirm the deletion(s).

### Adding parameter entries

1. Click **Select a New Display**.
2. Click the + icon to expand each high-level display-type group
3. Select and/or unselect parameters, as follows:
  - Click each parameter tick box individually  
or
  - Click a high-level group tick box to select/unselect all the parameters underneath it.
  - To select/unselect all the listed parameters, click **Select All** or **Unselect All**.
4. To add the selected parameters to the display list table (up to 100 max), click **Add selected items**.

---

## 9. Meter maintenance tasks

A range of **Maintenance Tasks** and **Actions** are available, they can be accessed in two ways:

- If you are working on an opened meter **Definition**, simply click the **Maintenance** tab.
- If you do not have a definition open, do the following:
  - i. Click **Tools** tab > **Maintenance**.
  - ii. Click on the required meter type from the choices presented.
  - iii. Select the required **Connection Method** from the list box.
  - iv. If required, expand the **Connection Settings** field to check or modify the parameters.
  - v. Connect the ACE Pilot host PC to the meter, using the chosen connection method.
  - vi. Click **Connect**, when successful, the **Maintenance tab** (page 44) is displayed.

---

**Note:** If you do not have a current connection to a meter, a meter connection dialogue box may appear at certain stages in the following procedures. To avoid unnecessary repetition, the meter connection process is described in detail as a separate topic. Refer to Connecting to meters (page 33) for further information whenever required.

---

Many of the maintenance tasks will require the meter to be in the **STOP** mode or automatically place the meter in this mode during the re-configuration or programming process. In addition, if activated or fitted, the status of the **Laboratory Switch** may be checked. If a programming failure occurs always check these conditions.

### 9.1. Setting the meter time

To read the meter's **Date and Time**:

1. Click the **Set Time** icon.
2. Click **Read**.
3. If required, **Connect (page 33)** to the meter.

The value displayed in the **Current Time** field is updated.

To write new **Date and Time** values to the meter:

1. Click the **Set Time** icon.
2. Set the **Clock Synchronisation** radio button for either:
  - **PC Time**

The system host PC current time value is used.
  - **User Defined Time**

Click the **New Date and Time** list box control and select the required date using the displayed calendar window.

Alternatively, manually enter a new time value, or edit the existing time as necessary.
3. Click **Configure** to update the meter with the new values.
4. If required, **Connect (page 33)** to the meter.

### 9.2. Updating the meter firmware

Access to this function is controlled via the ACE Pilot license. If necessary, please contact your local Itron agent/representative for further details and to discuss your requirements.

The operating firmware for Itron C&I meters is supplied in a compressed (.zip) file format.

**Note:** Due to the nature of the process it is recommended that you contact your local Itron agent/representative or the Itron global support team for further information or instruction prior to downloading firmware to the meter.

---

To select an alternative version of firmware and download it to a meter, do the following.

1. Click the **Download** icon.
2. Click **Select Zip File**.
3. Navigate to, and select the required firmware .zip file.
4. Choose the required entry from the **Physical Connection Type** list box.
5. Check that (by default) the **Secure Download** tick box is set, as it is *not* advisable to perform a download in the non-secure mode.
6. Click **Start Download** to load the firmware into ACE Pilot.

The selected file is extensively checked by the system to ensure data and format integrity prior to loading. If any inconsistencies are detected, error messages will be displayed.

### 9.3. Configuring CT/VT correction values

Access to this function is controlled via the ACE Pilot license. If necessary, please contact your local Itron agent/representative for further details and to discuss your requirements.

As current and voltage (CT/VT) transformers are not perfect components and not purely resistive, a meter can be configured to take into account any measurement errors they may introduce.

The CT/VT correction facility increases the global accuracy by applying compensating corrections to the applicable measured and/or calculated values within the meter.

Two types of correction can be applied:

- voltage and current amplitude correction to compensate for any transformer ratio errors
- voltage and current phase angle correction to compensate for any transformer angle errors

CT/VT correction must be carried out with regard to the accuracy of the transformers in use.

To configure the CT/VT correction facility, do the following:

1. Click the **CT/VT Correction** icon.
2. If required, **Connect (page 33)** to the meter.

The current CT/VT correction values are read from the connected meter and displayed in the **Read** table.

If no correction has been applied, all the values displayed will be zero.

3. Use the **Unit of Angles** radio buttons to choose the required unit for the display tables and calculations:

- **Minutes**
- **Centiradians**

The display tables are updated dynamically.

4. Use the **Report Mode** radio buttons to choose the required mode for the display tables and calculations:

- **IEC % Error**
- **ANSI RCF**

The display tables are updated dynamically.

5. As required, enter values related to the transformers in use (for each phase) into the **Configuring CT/VT Correction** table.

Prior to entering any configuration parameter values, always refer to the information provided underneath the table.

CT and VT error report in % values are limited to +/- 5%.

CT and VT phase error in minutes values are limited to +/- 18°

6. If you need to clear the table entries, click **Reset** to zero all values.
7. Once the CT/VT parameters have been set, click **Configure**.
8. If required, **Connect (page 33)** to the meter.
9. Once the connection and update process has completed, click **Read** to confirm the values have been updated successfully in the meter.

#### 9.4. Actions

To access and execute the range of **Maintenance Actions** available, do the following:

1. Click the **Actions** icon.
2. Click the **+** icon to expand each action-type group, for example:
  - **End of Billing**
  - **Erase Errors**
  - **Management Actions**
  - **Change Mode**
  - **Total Energy Register**
  - **Tests**
3. Click the **action** (page 104) required from the self-explanatory choices given.
  - the action is dynamically entered into the **Selected Action** field
  - the execute action **OK** button is activated
  - any associated warning or informative messages are displayed
4. Click **OK** to execute the action.
5. If required, **Connect (page 33)** to the meter.

#### 9.5. Toolbox

Access to this function is controlled via the ACE Pilot license. If necessary, please contact your local Itron agent/representative for further details and to discuss your requirements.

The ACE Pilot **Toolbox** facility provides useful information displays based on current meter status and measured parameters.

To access and use the toolbox, do the following:

1. Click the **Toolbox** icon.
2. If required, **Connect (page 33)** to the meter.

The right-hand display pane is updated with current meter data.
3. The following side-tabs are available, click to select:
  - **Graph**

Provides a graphical representation of the incoming phases, plus error messages, alarm indication, voltage and current information.
  - **Details**

Provides a series of meter information-only display panes. Each pane can be collapsed or expanded, as required.
4. If required, use the tick-box controls provided to customise the **Graph** display.

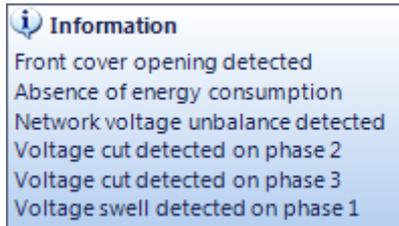
Each control will suppress or display the associated parameter:

- **Phases A, B, C**
- **Voltage**
- **Current**

5. If the alarm indicator icon is displayed:



hover the cursor over it to display the **Alarm Information** list window:



### Refreshing the display

1. Use the spin controls or enter a value in the **Inter-Communication Time** field to set the time between successive automatic display updates.
2. Click **Start**, the system will read the meter values at the pre-defined intervals and update the display accordingly.
3. To stop the automatic refresh operation, click **Stop**. Please be aware that the meter will automatically disconnect from the Toolbox after a period of inactivity.

### Transformation reports

If applicable, use the radio button to select either a **Primary** or **Secondary** energy transformation report display.

### Printing toolbox results

When enabled, use the **Save in PDF Format** button to save and print Toolbox results.

## 9.6. Changing passwords

Security access levels of the DLMS/COSEM protocol are applied to meter communication and interfacing.

Confidentiality and privacy of data are managed by COSEM logical devices in the meter (which can be addressed individually) and different COSEM **Client** identifications (connection profiles).

Each connection profile is protected by a dedicated **Password** and all connection attempts by COSEM clients are checked by the meter before establishing a connection.

The meter has three logical devices:

- **Electricity**
- **Management**
- **End customer**

Several **Client** identifications are predetermined, with different authorisations to access data:

- **Electricity Utility Laboratory**
- **Electricity Utility Field**
- **Electricity Reader**
- **End Customer**
- **Engineer**

To change the passwords associated with each **Client**, do the following:

1. Click the **Change Password** icon.
2. Select the required **Client** type from the list box.
3. If required, enter the current password in the **Current Password** field.
4. Enter a new password in the **New Password** field.
5. Enter the new password in the **Confirm Password** field.
6. Click **Configure**.
7. If required, **Connect (page 33)** to the meter.

A warning is displayed if the new and confirm password fields do not match.

## 9.7. Changing the physical address

If the meter is stand-alone and not connected to other meters in a daisy-chaining network it is recommended that the physical address is *not* changed from the default.

However, as each meter in a daisy-chaining network needs a *unique* address, where necessary, do the following:

1. Click the **Change Physical Address** icon.  
The current address value is displayed (by default **17**).
2. Use the spin controls or manually enter a value (between 16 and 16382) in the **New Physical Address** field.
3. Click **Configure**.
4. If required, **Connect (page 33)** to the meter.

## 9.8. Protection by laboratory switch

---

**Note:** This hardware-dependent facility is only available on certain meter types (such as the **SL7000**).

---

Located inside its metrological enclosure the **Laboratory Switch** can be used to protect a meter against unauthorised programming attempts. To enable this facility, do the following:

1. Click the **Protection by laboratory switch** icon.
2. If required, **Connect (page 33)** to the meter.

The system reads the current status of the laboratory switch and sets the Activation tick box accordingly.

3. To enable the switch, click the **Activation** tick box.
4. Click **Configure**.

---

## 10. Reading meter data

The **Read** function reads and stores data from a connected meter and makes it available for immediate viewing.

- Click **Tools** ribbon tab > **Data** group > **Read**.
- Alternatively, click **Meter** ribbon tab > **Data** group > **Read**.

Click on the required meter type from the choices presented.

1. Click **Connect** (page 33).
2. Use the tick boxes to select the meter data types to be read, such as:

- **Date, Time and Meter ID**
- **Meter Status**
- **Log Book**
- **Network History**
- **Fraud Data**
- **Meter History**
- **Voltage Quality Data**
- **Instantaneous Data**
- **Total Energy Registers**
- **Demand Registers**
- **Maximum Demand Registers**
- **Partial Read of Load Profile 1**

If **Partial Read of Load Profile 1** is selected, a further dialogue is displayed. Use the controls provided to select the **From** and **Until** dates, and use the **Select** tick boxes to choose the energy **Quantity** (or quantities) to be read.

- **Partial Read of Load Profile 2**
- **THD Defect**
- **THD Data**
- **Energy Rate Registers**
- **Historical Data (EOB)**

If **Historical Data (EOB)** is selected, further reading date selection controls are provided.

- **UFER Data**

**Select All** and **Unselect All** functions are provided, use as required.

3. Click **OK** to initiate the read function.

When the reading and storing of the selected data is complete, the **View Data** tab is automatically displayed.



---

## 11. Viewing meter data

The **View** function allows you to display meter data that has been previously read and stored in the ACE Pilot file system.

- If the **View Data** tab is not already displayed, click **Tools** ribbon tab > **Data** group > **View**.

The view display tab is divided into two functional regions:

<b>Left-hand display pane</b>
The cascaded tabs in this pane each contain an expandable list of entries from the file system: <ul style="list-style-type: none"><li>• <b>Meter Type</b></li><li>• <b>Serial Number</b></li></ul>
<b>Right-hand display pane</b>
This pane displays the selected meter data in a tabular format. The entries in these tables cannot be edited or ordered in any way. Where required, <b>side tabs</b> are provided to access and display further associated data.

### Selecting and viewing meter data

1. If necessary, click the **+** icon on the **Meter Type** tab to expand the list.
2. Click the required entry.
3. If necessary, click the **+** icon on the **Serial Number** tab to expand the list.  
By default, the data list contents are displayed with the latest entries for the selected meter at the top. However, the entries can be ordered (page 35) by **Date** and **Type of Data Collected**, as required.
4. Select the data list entry you wish to display and either:
  - click the **Open** icon
  - double-click the entry
5. The right-hand display pane is updated with the relevant meter data values.  
If **Side Tabs** are displayed, simply click as required to view the associated data.

### 11.1. Deleting a data list entry

1. Select the required entry, then either:
  - Click **Delete**.
  - Press the **Delete** button on the PC keyboard.
2. Select **Yes** to confirm the deletion, when prompted.  
This action removes the data from the system, it *cannot* be restored once deleted.

### 11.2. Exporting the meter data

To export the displayed meter data (including data on any associated side tabs), do the following:

1. Click the **Export** data drop down.
2. Select the required export output format from the choices displayed:
  - **Excel**
  - **PDF**

The generated files are automatically saved in the system **Export** folder. See File Locations (page 28).

File naming convention is:

- **Meter serial number**
- **Report name**
- **Year**
- **Month**
- **Day**
- **Hour (24h format)**
- **Minute**
- **Second**

Example: 12345678\_MHI\_2010\_17\_12\_13\_23\_45

---

## 12. Protecting and backing up data

ACE Pilot stores data files, such as:

- meter **Definitions**
- **Configurations**
- meter readings
- reports

as files in dedicated folders (see File Locations (page 28)).

For security, these folders should be protected by restricted access, and backed up regularly.



### 13. Technical appendix

#### 13.1. Aggregate energy algorithms

Table of phase summation calculations for all energy types:

	Phase 1	Phase 2	Phase 3	Total
<b>Active Import</b>	$P_{ph1+}$	$P_{ph2+}$	$P_{ph3+}$	$\Sigma P_{n+} = (P_{ph1+})+( P_{ph2+})+( P_{ph3+})$
<b>Active Export</b>	$P_{ph1-}$	$P_{ph2-}$	$P_{ph3-}$	$\Sigma P_{n-} = (P_{ph1-})+( P_{ph2-})+( P_{ph3-})$
<b>Reactive Import</b>	$Q_{ph1+}$	$Q_{ph2+}$	$Q_{ph3+}$	$\Sigma Q_{n+} = (Q_{ph1+})+( Q_{ph2+})+( Q_{ph3+})$
<b>Reactive Export</b>	$Q_{ph1-}$	$Q_{ph2-}$	$Q_{ph3-}$	$\Sigma Q_{n-} = (Q_{ph1-})+( Q_{ph2-})+( Q_{ph3-})$
<b>Reactive Q1</b>	$Q1_{ph1}$	$Q1_{ph2}$	$Q1_{ph3}$	$\Sigma Q1 = (Q1_{ph1})+( Q1_{ph2})+( Q1_{ph3})$
<b>Reactive Q2</b>	$Q2_{ph1}$	$Q2_{ph2}$	$Q2_{ph3}$	$\Sigma Q2 = (Q2_{ph1})+( Q2_{ph2})+( Q2_{ph3})$
<b>Reactive Q3</b>	$Q3_{ph1}$	$Q3_{ph2}$	$Q3_{ph3}$	$\Sigma Q3 = (Q3_{ph1})+( Q3_{ph2})+( Q3_{ph3})$
<b>Reactive Q4</b>	$Q4_{ph1}$	$Q4_{ph2}$	$Q4_{ph3}$	$\Sigma Q4 = (Q4_{ph1})+( Q4_{ph2})+( Q4_{ph3})$
<b>Apparent Import</b>	$S_{ph1+}$	$S_{ph2+}$	$S_{ph3+}$	$\Sigma S_{n+} = (S_{ph1+})+( S_{ph2+})+( S_{ph3+})$
<b>Apparent Export</b>	$S_{ph1-}$	$S_{ph2-}$	$S_{ph3-}$	$\Sigma S_{n-} = (S_{ph1-})+( S_{ph2-})+( S_{ph3-})$

Summary of Aggregate Energy Algorithms:

	Algo 1 (Net result)	Algo 2 (Positive aggregate)	Algo 3 (Both sum)	Algo 4 (Anti-fraud)
<b>Active import</b>	$If (\Sigma P_{n+}) >  \Sigma P_{n-}  :$ $= (\Sigma P_{n+})- \Sigma P_{n-} ,$ <i>Else :</i> $= 0.$	$If (\Sigma P_{n+}) >  \Sigma P_{n-}  :$ $= \Sigma P_{n+},$ <i>Else :</i> $= 0.$	$= \Sigma P_{n+}$	$= (\Sigma P_{n+}) +  \Sigma P_{n-} $
<b>Active export</b>	$If (\Sigma P_{n+}) <  \Sigma P_{n-}  :$ $=  \Sigma P_{n-} -(\Sigma P_{n+}),$ <i>Else :</i> $= 0.$	$If (\Sigma P_{n+}) <  \Sigma P_{n-}  :$ $=  \Sigma P_{n-} ,$ <i>Else :</i> $= 0.$	$=  \Sigma P_{n-} $	$=  \Sigma P_{n-} $
<b>Reactive import</b>	$If (\Sigma Q_{n+}) >  \Sigma Q_{n-}  :$ $= (\Sigma Q_{n+})- \Sigma Q_{n-} ,$ <i>Else :</i> $= 0.$	$If (\Sigma Q_{n+}) >  \Sigma Q_{n-}  :$ $= \Sigma Q_{n+},$ <i>Else :</i> $= 0.$	$= \Sigma Q_{n+}$	$= (\Sigma Q_{n+}) +  \Sigma Q_{n-} $
<b>Reactive export</b>	$If (\Sigma Q_{n+}) <  \Sigma Q_{n-}  :$ $=  \Sigma Q_{n-} -(\Sigma Q_{n+}),$ <i>Else :</i> $= 0.$	$If (\Sigma Q_{n+}) <  \Sigma Q_{n-}  :$ $=  \Sigma Q_{n-} ,$ <i>Else :</i> $= 0.$	$=  \Sigma Q_{n-} $	$=  \Sigma Q_{n-} $
<b>Apparent import</b>	$If (\Sigma S_{n+}) >  \Sigma S_{n-}  :$ $= (\Sigma S_{n+})- \Sigma S_{n-} ,$ <i>Else :</i> $= 0.$	$If (\Sigma S_{n+}) >  \Sigma S_{n-}  :$ $= \Sigma S_{n+},$ <i>Else :</i> $= 0.$	$= \Sigma S_{n+}$	$= (\Sigma S_{n+}) +  \Sigma S_{n-} $
<b>Apparent export</b>	$If (\Sigma S_{n+}) <  \Sigma S_{n-}  :$ $=  \Sigma S_{n-} -(\Sigma S_{n+}),$ <i>Else :</i> $= 0.$	$If (\Sigma S_{n+}) <  \Sigma S_{n-}  :$ $=  \Sigma S_{n-} ,$ <i>Else :</i> $= 0.$	$=  \Sigma S_{n-} $	$=  \Sigma S_{n-} $
<b>Reactive Q1</b>	$= \Sigma Q1$	$= \Sigma Q1$	$= \Sigma Q1$	$= \Sigma Q1$
<b>Reactive Q2</b>	$= \Sigma Q2$	$= \Sigma Q2$	$= \Sigma Q2$	$= \Sigma Q2$
<b>Reactive Q3</b>	$= \Sigma Q3$	$= \Sigma Q3$	$= \Sigma Q3$	$= \Sigma Q3$
<b>Reactive Q4</b>	$= \Sigma Q4$	$= \Sigma Q4$	$= \Sigma Q4$	$= \Sigma Q4$

**13.2. Maintenance actions**

The contents of the list below represent the commonly available maintenance actions. However, as entries are meter-type and firmware dependent, this list is *not* exhaustive:

<b>End of Billing</b>	
Reset EOB	
<b>Erase Errors</b>	
Clear Non Fatal Alarms	
<b>Management Actions</b>	
Reset Register	
Restore Default Passwords and Physical Address	
Reset Load Profile	
Clear Fatal Alarms	
Backup of manufacturer's parameters	
<b>Change Mode</b>	
Start Measurement	
Stop Measurement	
<b>Total Energy Register</b>	
Reset Total Energy Register	
<b>Tests</b>	
Start I/O Test	
Stop I/O Test	

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