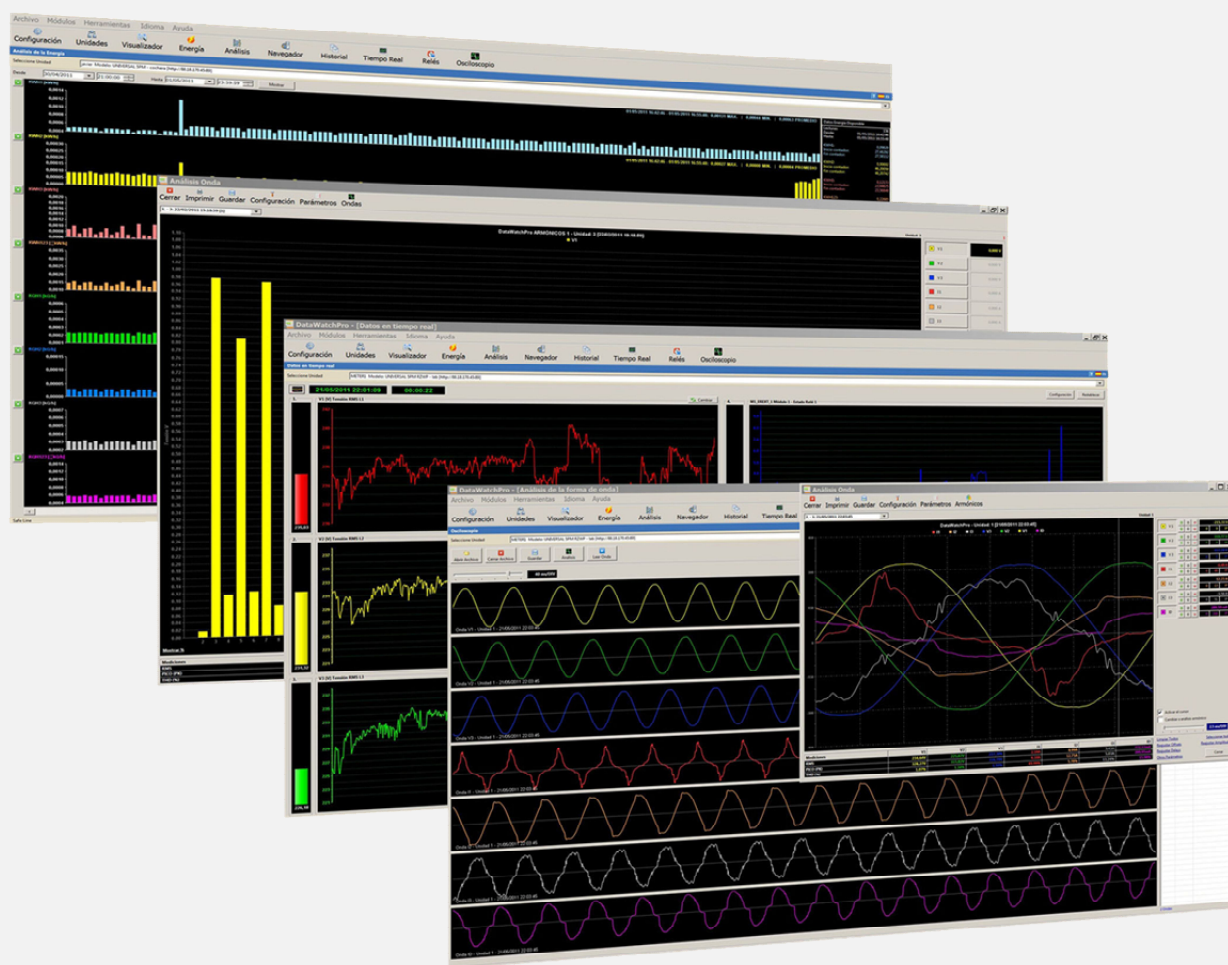


Software DatawatchPro for range of Universal protection, metering, analysis, recording and control units Programmable, reclosable and with WebServer

Instruction Manual – DataWatchPro Software Software version V1.0.0

Consult specific manuals of the universal range:
Model **5PM** with built-in reclosure motor-drive for MCB up to 63A 2-pole and 4-pole.
Accessories manual, relay I/O modules, temperature and humidity probe.



Index

1. Start	
1.1. Introduction	4
1.2. Supported Units	5
1.3. Parameter Listening	6
1.4. Installation	9
1.5. Uninstall	9
1.6. System Requirements	10
1.7. Core Modules	10
2. Support	
2.1. Product Support	10
3. Configuration Module	
3.1. General Tab	11
3.2. Alarms Tab	13
3.3. Email Setup Tab	14
3.4. Data Saving Tab	15
3.5. Data Analysis Tab	16
3.6. Parameters Tab	17
4. Units and Data Reader Module	
4.1. Adding Units	19
4.2. Functions	20
4.3. Editing and Deleting	21
4.4. Alarm Management	22
4.5. Data Reader	24
4.6. Viewer Module	27
4.7. Using the viewer	28
4.8. Energy Analysis Module	29
4.9. Using the Energy Module	30
5. Data Analysis Module	
5.1. Database Selection	32
5.2. Data Viewer	33
5.3. Plotter	35
5.4. Graphical Analysis Tool	36
5.5. By Day Tab	41
5.6. Period Selection Icon	42
6. Browser Module	
6.1. Viewing Web Pages	44
7. System Event Log Module	45
8. Live Data Monitor	
8.1. Setup	47
8.2. Multi Graph View	48
8.3. Combined Graph View	48
8.4. Data Viewer	49
9. Relay Manager Module	
9.1. Manual Control Tab	50
9.2. Hourly Programming Tab	51
9.3. Copy relay settings and alarms tab	53
10. Oscilloscope Module	
10.1. Reading Waves	54
10.2. Saving and opening waves	55
10.3. Wave Analysis	56
10.4. Wave analysis settings	58
11. File Menu	
11.1. Database Location	59
11.2. Backup Database	60
11.3. Restore Database	61
11.4. Create New Database	62
12. Tools Menu	
12.1. Compact and Verify Database	63
12.2. Database Details	64
12.3. Security Settings	65
12.4. Calculator	66
13. Language Menu	66
14. Graphics general interest	67

Start - Introduction

DatawatchPro is an advanced software tool, designed and developed to read, save and analyse data from the Universal range of electrical measurement and protection units.

The majority of electrical measurement devices on the market do not have a facility to store the parameter data output by the devices. This means that valuable historical data is lost, as measurements are only available in real time.

DatawatchPro provides a reliable and efficient way of storing the historical data for numerous electrical parameters, which would normally be lost forever. Once saved in the database or in memory, detailed analysis can be performed on the data using the graphical and visual tools available with the software.

DatawatchPro includes the following key features:

- Automatically reads data from one or more units via the internet or local area network (LAN).
- Stores the data readings efficiently in a relational database.
- Can be configured to automatically monitor individual units to trigger alarms and send email notifications.
- Advanced data analysis for historical data using various graphical and visual tools.
- Live data reading monitor, see the readings as they arrive.
- Power summary analysis.
- Integrated oscilloscope with wave and harmonic analysis tools.
- Remote control and direct access to individual units via the internet or local area network.
- Relay manager for ON/OFF programming including alarms based on parameter values.
- Automatic system event logging.
- Numerous configuration settings to adjust the software to meet your requirements.
- Multi lingual support for English and Spanish. Other languages will be added later.
- Administration tools for managing the database and accessing system information.
- Integrated help system.
- Password protection.

With the numerous features packed into DatawatchPro combined with the most advanced electrical measurement and protection units available on the market, this integrated package provides a total solution to your electrical protection and measurement requirements.

Start - Supported Units

DatawatchPro works with the Universal range of protection and monitoring units.

For further details on compatibility and unit functions contact your local distributor or refer to the instruction manual that comes with the actual unit.

A connected device is referred to as a "Unit" within DatawatchPro.

Universal 5PM



Start - Parameter Listing

A total of 201 parameters are available in DataWatchPro for reading and analysis from the Universal range of measuring and protection devices. Depending on the unit you have purchased certain parameters may not be available. For example to read temperature and relative humidity the unit must be equipped with the necessary measuring devices. To check the list of parameters available for your unit please refer to the instruction manual that came with the unit.

System Name	Description	Dimension
ReadingID	Reading reference code	
ReadingDateTime	Reading time	
MODEL	Unit model reference	
VER	Unit version details	
NOM	Unit internal name	
V1	Volts RMS L1	V
V2	Volts RMS L2	V
V3	Volts RMS L3	V
VPk1	Peak Volts L1	Vpk
VPk2	Peak Volts L2	Vpk
VPk3	Peak Volts L3	Vpk
ID	Differential Intensity	mA
IDPk	Peak Differential Intensity	mA
V12	Volts between phases	V
V23	Volts between phases	V
V31	Volts between phases	V
I1	Amps RMS L1	A
I2	Amps RMS L2	A
I3	Amps RMS L3	A
IPk1	Peak Amps L1	A pk
IPk2	Peak Amps L2	A pk
IPk3	Peak Amps L3	A pk
HZ1	Frequency L1	Hz
HZ2	Frequency L2	Hz
HZ3	Frequency L3	Hz
W1	Watts L1	W
W2	Watts L2	W
W3	Watts L3	W
W123	Watts	W
WP1	Positive Watts L1	W+
WP2	Positive Watts L2	W+
WP3	Positive Watts L3	W+
WP123	Positive Watts L123	$\Sigma W+$
WN1	Negative Watts L1	W-
WN2	Negative Watts L2	W-
WN3	Negative Watts L3	W-
WN123	Negative Watts L123	$\Sigma W-$
VA1	Volt Amps L1	W
VA2	Volt Amps L2	W
VA3	Volt Amps L3	W
VA123	Volt Amps	ΣVA
VARL1	VA Reactive Inductive L1	VARL
VARL2	VA Reactive Inductive L2	VARL
VARL3	VA Reactive Inductive L3	VARL
VARL123	VA Reactive Inductive L123	$\Sigma VARL$
VARC1	VA Reactive Capacitive L1	VARC
VARC2	VA Reactive Capacitive L2	VARC
VARC3	VA Reactive Capacitive L3	VARC
VARC123	VA Reactive Capacitive	$\Sigma VARC$
PF1	Power Factor L1	PF
PF2	Power Factor L2	PF
PF3	Power Factor L3	PF
DESV1	Imbalance V L1	% Des V1
DESV2	Imbalance V L2	% Des V2
DESV3	Imbalance V L3	% Des V3
DESI1	Imbalance I L1	% I1
DESI2	Imbalance I L2	% I2
DESI3	Imbalance I L3	% I3
INEUTRO	Amps Neutral	A
TEMP	Temperature	°C
HUME	Relative Humidity	% RH
THDV1	Total Harmonic Distortion L1	% THD V1
THDV2	Total Harmonic Distortion L2	% THD V2
THDV3	Total Harmonic Distortion L3	% THD V3
THDI1	Total Harmonic Distortion L1	% THD V1
THDI2	Total Harmonic Distortion L2	% THD V2
THDI3	Total Harmonic Distortion L3	% THD V3
CFV1	Crest Factor L1	

CFV2	Crest Factor L2	
CFV3	Crest Factor L3	
CFI1	Crest Factor L1	
CFI2	Crest Factor L2	
CFI3	Crest Factor L3	
Z1	Impedence L1	
Z2	Impedence L2	
Z3	Impedence L3	
CNST1	Counter - Over Volts L1	
CNST2	Counter - Over Volts L2	
CNST3	Counter - Over Volts L3	
CNIT1	Counter - Under Volts L1	
CNIT2	Counter - Under Volts L2	
CNIT3	Counter - Under Volts L3	
CNI1	Counter Amps L1	
CNI2	Counter Amps L2	
CNI3	Counter Amps L3	
CNID	Counter Amps	
CNDESV1	Counter Imbalance Volts L1	
CNDESV2	Counter Imbalance Volts L2	
CNDESV3	Counter Imbalance Volts L3	
CNDESI1	Counter Imbalance Amps L1	
CNDESI2	Counter Imbalance Amps L2	
CNDESI3	Counter Imbalance Amps L3	
CNIN	Counter - Amps Nuetral	
CNSTEMP	Counter - Over Temperature	
CNITEMP	Counter - Under Temperature	
CNSHUME	Counter - Over Relative Humidity	
CNIHUME	Counter - Under Relative Humidity	
CNTHDV1	Counter - THD Volts L1	
CNTHDV2	Counter - THD Volts L2	
CNTHDV3	Counter - THD Volts L3	
CNTHDI1	Counter - THD Amps L1	
CNTHDI2	Counter - THD Amps L2	
CNTHDI3	Counter - THD Amps L3	
CNSHZ1	Counter - Over Frequency L1	
CNSHZ2	Counter - Over Frequency L2	
CNSHZ3	Counter - Over Frequency L3	
CNIHZ1	Counter - Under Frequency L1	
CNIHZ2	Counter - Under Frequency L2	
CNIHZ3	Counter - Under Frequency L3	
CNFP1	Counter - Power Factor L1	
CNFP2	Counter - Power Factor L2	
CNFP3	Counter - Power Factor L3	
CNSF	Counter - Phase Sequence	
CNMCB	Counter - Mains Circuit Breaker	
CNPH	Counter - Schedule Programmer	
CNRIN1	Counter - Remote Input L1	
CNRIN2	Counter - Remote Input L2	
CNBLOCK	Counter - Blocks	
CNPOFF	Counter - Power Off	
CNTOTAL	Counter - Total	
CNACCUM	Counter - Accumulative	
MAXV1	Max. - Volts L1	V
MAXV2	Max. - Volts L2	V
MAXV3	Max. - Volts L3	V
MAXID	Max. - Differential Intensity	mA
MAXI1	Max. - Amps L1	A
MAXI2	Max. - Amps L2	A
MAXI3	Max. - Amps L3	A
MAXIN	Max. - Amps Nuetral	A
MAXHZ1	Max. - Frequency L1	Hz
MAXHZ2	Max. - Frequency L2	Hz
MAXHZ3	Max. - Frequency L3	Hz
MAXW1	Max. - Watts L1	W
MAXW2	Max. - Watts L2	W
MAXW3	Max. - Watts L3	W
MAXVA1	Max. - Volt Amps L1	VA
MAXVA2	Max. - Volt Amps L2	VA
MAXVA3	Max. - Volt Amps L3	VA
MAXVARC1	Max. - VA Reactive Capacitive L1	VARC
MAXVARC2	Max. - VA Reactive Capacitive L2	VARC
MAXVARC3	Max. - VA Reactive Capacitive L3	VARC
MAXVARL1	Max. - VA Reactive Inductive L1	VARL
MAXVARL2	Max. - VA Reactive Inductive L2	VARL
MAXVARL3	Max. - VA Reactive Inductive L3	VARL
MAXDESV1	Max. - Imbalance Volts L1	%Des V1
MAXDESV2	Max. - Imbalance Volts L2	%Des V2

MAXDES3	Max. - Imbalance Volts L3	%Des V3
MAXDES1	Max. - Imbalance Amps L1	%Des I1
MAXDES2	Max. - Imbalance Amps L2	%Des I2
MAXDES3	Max. - Imbalance Amps L3	%Des I3
MAXTEMP	Max. - Temperature	°C
MAXHUME	Max. - Relative Humidity	% RH
MAXTHDV1	Max. - THD Volts L1	% THD V1
MAXTHDV2	Max. - THD Volts L2	% THD V2
MAXTHDV3	Max. - THD Volts L3	% THD V3
MAXTHDI1	Max. - THD Amps L1	% THD I1
MAXTHDI2	Max. - THD Amps L2	% THD I2
MAXTHDI3	Max. - THD Amps L3	% THD I3
MINV1	Min. - Volts L1	V
MINV2	Min. - Volts L2	V
MINV3	Min. - Volts L3	V
MINHZ1	Min. - Frequency L1	Hz
MINHZ2	Min. - Frequency L2	Hz
MINHZ3	Min. - Frequency L3	Hz
MINTEMP	Min. - Temperature	°C
MINHUME	Min. - Relative Humidity	% RH
KWH1	Active Energy L1	kW/h
KWH2	Active Energy L2	kW/h
KWH3	Active Energy L3	kW/h
KWH123	Active Energy L123	ΣkW/h
KQH1	Reactive Energy L1	kQ/h
KQH2	Reactive Energy L2	kQ/h
KQH3	Reactive Energy L3	kQ/h
KQH123	Reactive Energy L123	ΣkQ/h
PMOTOR	Motor Position	
ELARMA	Alarm Status	
EACTUAL	Actual Status	
UDESCO	Last Disconnection	
FUDESCO	Last Disconnection Date	
VUDESCO	Disconnection Value	
UALARMA	Last Alarm	
FUALARMA	Last Alarm Date	
VUALARMA	Last Alarm Value	
ERINT_1	Status Relay A	
ERINT_2	Status Relay B	
M1_EREXT_1	Module 1 - External relay status 1	
M1_EREXT_2	Module 1 - External relay status 2	
M1_EREXT_3	Module 1 - External relay status 3	
M1_EREXT_4	Module 1 - External relay status 4	
M1_EINPUT_1	Module 1 - Input Status 1	
M1_EINPUT_2	Module 1 - Input Status 2	
M1_EINPUT_3	Module 1 - Input Status 3	
M1_EINPUT_4	Module 1 - Input Status 4	
M2_EREXT_1	Module 2 - External relay status 1	
M2_EREXT_2	Module 2 - External relay status 2	
M2_EREXT_3	Module 2 - External relay status 3	
M2_EREXT_4	Module 2 - External relay status 4	
M2_EINPUT_1	Module 2 - Input Status 1	
M2_EINPUT_2	Module 2 - Input Status 2	
M2_EINPUT_3	Module 2 - Input Status 3	
M2_EINPUT_4	Module 2 - Input Status 4	

Start - Installation

The latest version of DatawatchPro is available via download from the Internet.

Before starting the installation procedure, please check that you meet the System Requirements.

To install the software from a compact disk, insert the disk into your computer and wait for the Setup programme to start automatically. If the Setup screen does not appear after a few seconds, open Windows Explorer and locate the compact disk drive on your computer. Double click on the "DataWatchProSetup.exe" file to launch the Setup application.

If you wish to download Datawatch Pro from the Internet, follow the download instructions on the web page. After downloading the software, double click on the "DataWatchProSetup.exe" file to launch the Setup application.

The Setup application provides an easy way to install the software on your computer and create the necessary shortcuts. You will need to have administrator privileges to install the software on your computer.

After selecting the language from the list for the installation process, follow the on screen instructions to install DatawatchPro. The installation process does not require a registration or activation key as DataWatchPro can only work with the supported Universal range of protection and monitoring units.

The default location for the installation files on your computer is within the Windows "Program Files" folder under a new folder called "DatawatchPro".

The main data file "dwpdata.dwp" will be saved to a new folder in your My Documents folder called "DatawatchPro Data".

The actual default locations may vary depending on your version of Window.

The installation programme will install the following files on your computer.

- DatawatchPro.exe (the main executable application file)
- DatawatchPro support files
- Sample data file and wave forms
- dwpdata.dwp (empty database file used to store data readings, alarm settings and details of each unit)
- dwpconf.isf (file to store the user's preferences and configuration settings between settings. This file is installed in the users's Windows Application Folder and is usually hidden)
- uninstall.exe (software removal tool)
- dwphelp.ihf (help file to provide integrated multi-lingual help)

Once installation is complete, launch DatawatchPro by clicking on the new icon on your desktop or locate the DatawatchPro folder on your computer and double click on the "DatawatchPro.exe" file.

Should any of the installation files be deleted at any time, the software will not function correctly.

As with any commercial software, to use DatawatchPro on your computer you will be required to read and agree to the End User License Agreement before you can use the software for the first time. The license agreement is currently available in English and Spanish.

You are now ready to use DatawatchPro.

For initial software configuration refer to the section on Configuration.

Start – Uninstall

You can uninstall DatawatchPro by clicking the programme shortcut "Uninstall" or by using the standard uninstall tool provided by Windows.

The uninstall program is designed not to delete the database storage file or the user's preference file. If you need to completely remove all the files from your computer, you will need to remove the database file and preferences file manually.

Start - System Requirements

Excluding the installation files, DatawatchPro is completely standalone and has no other dependencies or system files to run the software on the supported Windows operating systems.

The following minimum system requirements apply:

- Windows® XP, Vista and Windows 7.
- Pentium processor or similar.
- Approximately 30 MB for installation.
- 1000 MB RAM minimum.
- Hard disk space depends on quantity of readings (approximately 400 Bytes per reading).
- Quality printer for printing graphs and reports.
- Broadband/ADSL internet connection or LAN to read units.
- A supported measurement/protection device for reading data from.
- Database files do not support multi-user connections.

Start - Core Modules

Datawatch Pro has the following core modules:

- Configuration module.
- Units and data reader module.
- Viewer module.
- Energy and power analysis module.
- Data analysis module.
- Browser module.
- System event log module.
- Live data monitor module.
- Relay manager module.
- Oscilloscope module.

After performing the initial system checks, the first screen to appear is the Units Module.

To change the selected module, click one of the main tool bar buttons at the top of the screen. Alternatively, you can use the top menu bar, click "Modules", and then select your chosen module from the list.

The interface is designed to ensure that all modules remain open behind the scenes. This ensures that when you return to a module the last view is still available. For example if a specific graph has been created with the Data and Analysis Module and you want to review the progress of one of the units in the Data Reader Module, you can switch between the modules without having to create your graph again.

In addition to the main modules, the system has numerous administrative tools and functions.

For further details about the various modules and administrative tools available, refer to the respective section.

The first time you use the software you will need to review the default configuration settings in the Configuration Module.

Product Support

For product support relating to the DataWatchPro you should contact your local distributor. [Configuration Module](#)

The Configuration Module allows the user to save user preferences and configuration settings between sessions.

Before using the software, you should review the default configuration settings and make any changes as required.

The system saves the settings to a special configuration file called "dwpconfig.isf". If the configuration has been moved or deleted, any changes you have made to the settings will be lost.

If the system cannot locate the configuration file, a new file will be created automatically the next time DatawatchPro is launched.

The configuration file is encrypted for security and can only be read by DatawatchPro.

The configuration module includes the following section tabs:

- General.
- Alarms.
- Email setup.
- Data saving.
- Data analysis.
- Parameters.

When you have finished changing the settings, click “Save” to update the configuration file.

Configuration Module - General Tab

Company Name (optional)

The name of your company or organisation. This will appear in the status bar at the bottom left of the main screen.

Database file location

DatawatchPro cannot run without a connection to a compatible database storage file. The database storage file contains all the information concerning the connected units, alarm settings and the historical data readings for each unit.

An empty data file is provided during the installation process and the path to the file is displayed within the database file location box. The name of the default file is “dwpdata.dwp”.

When DatawatchPro is first launched, it will look for this database file in the installation folder. The location of this file can be changed to any location on your computer. For example you could copy “dwpdata.dwp” from the original location to a new location on your computer, for example “MyDocuments/MyData/dwpdata_copy.dwp”. Once the file has been copied to the new location, change the location in the configuration settings using the Browse button. After the new file has been located, click “Save”. A message will be displayed requiring you to restart DatawatchPro, to connect to the new database. After the restart, the database location will show the new location.

The data file location must be within a folder that allows reading and writing to the file. We recommend that the user has administrative privileges to use DatawatchPro.

The database file is not designed for multi-user access over a network. To avoid network problems, we recommend that the data file is located on the same computer as the DatawatchPro software.

Select data folder (optional)

This setting is useful when using the Data Analysis Module where there is an option to load a compatible data file. When you select a data file to open, the system will open the user’s “My Documents” folder. If you want to open an alternative folder each time you use the Data Analysis Module to look for compatible database files, change this setting by using the “Browse” button.

Default Language

This setting changes the default language to the selected language. Just select a different language and click “Save”. After the change the interfaces will be updated and the next time DatawatchPro is run, the interface text will be loaded in the chosen language.

Activate multi-thread reader (optional)

The default way to read data from the connected units is sequential (e.g. Unit 1 then Unit 2 then Unit 3...). This is the simplest form of reading and requires that once Unit 1 has been read the system will then read Unit 2 and so on. This sequential reading is performed within a single computer thread. A thread is a computer term for a separate process running within a process. Running threads within an application enables the user to continue using the application while the thread is running. For most installations with a few units connected, we recommend the sequential reading option.

If the multi-thread reader option is selected, this activates an advanced reading process to read all the units at the same time using a thread for each connected unit. In theory, this option permits more units to be read at shorter intervals as compared to sequential reading. The multi-thread option depends on your computer operating system and the number of simultaneous connections permitted by your computer.

Although each reading is initiated at the same time for all units, the actual reading time will vary from unit to unit due to the difference in connection times between units.

For further information on sequential and multi thread reading refer to the Units and Data Reading Module.

The Units Module will display the type of reader process currently selected "Sequential" or "Multi-thread".

Maximize at startup (optional)

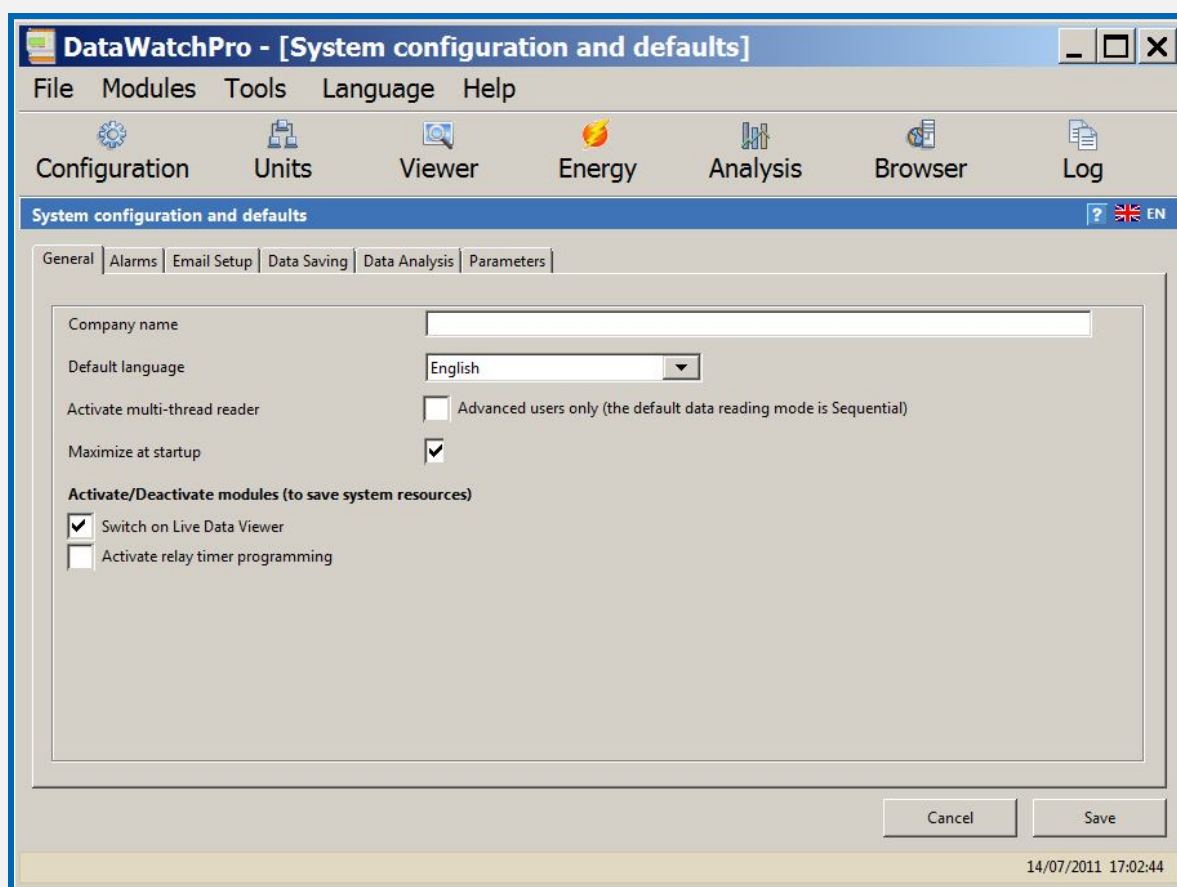
This setting will maximise the Datawatch Pro main screen automatically each time you run the application.

Switch on Live Data Viewer

This activates the live data viewer processing. If you do not use the live data viewer to reduce processing for each reading, we recommend this option is disabled. For further information refer to the Live Data Monitor.

Activate relay timer programming (optional)

This setting will turn on or off the global relay programming manager. If the option is off then the system will not access any of the programmed relay alarms and hourly ON/OFF settings for each unit. If you do not plan to use the relay timer programming feature we recommend that this option remains off.



Configuration Module - Alarms Tab

The alarm settings apply to the general operation of the internal alarm monitoring affecting all connected units. To change the alarm settings for individual units you should refer to the Units Module section.

When an alarm for a unit is activated during a reading, DatawatchPro has two methods for communicating the alarm to the user:

- Through the Automatic Logging Module.
- Via email.

DatawatchPro has a number of options to control how the alarms are received. These options can be used, for example, to limit the number of alarm notifications received. Limiting the number of alarms is important if there is a possibility of an alarm being triggered frequently. Potentially many hundreds of alarm notifications could be received during a short reading session.

The following alarm settings are available:

Switch on unit alarm monitoring

This setting switches alarm monitoring ON and OFF for all connected units. If alarm monitoring is set to OFF, no alarm notifications will be received. This option does not deactivate certain system alarm monitoring and only applies to parameter alarms set for individual units.

Switch on automatic email alerts

This setting switches ON and OFF the automatic email alerts. If this setting set to OFF and alarm monitoring is active then alarms will only be recorded in the Automatic Logging Module.

Failed Internet connection attempts to unit before alarm registered

On some occasions, it may not be possible for Datawatch Pro to connect to a unit to take a data reading. This setting tells DatawatchPro the number of failed attempts allowed before "No Connection" alarm is registered. If a successful connection is made after a failed connection, the counter for this alarm is reset to zero. For example, if the option is set to 5 attempts, this would require 5 failed connections to read the unit in a row to trigger the alarm.

This alarm remains active when alarm monitoring is set to OFF.

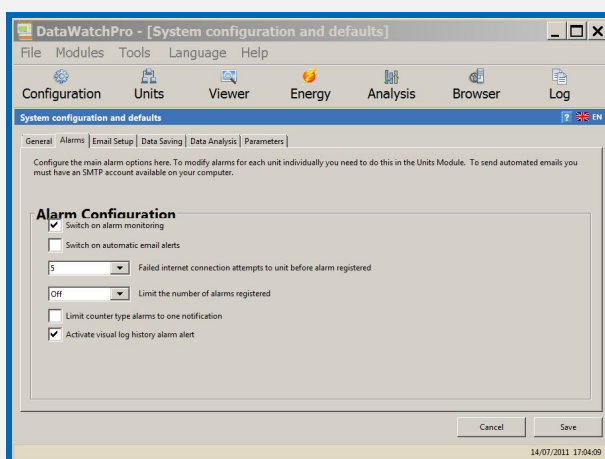
Limit the number of alarms registered

Depending on the alarm settings for each connected unit, a particular parameter could trigger an alarm every reading. Unless the alarm is adjusted in the Units Module, an alarm notification and email (if activated) will be logged. To limit the number of alarm notifications select a limit from the list. Once the limit has been reached for a specific alarm and unit, no further notifications would be sent. If the OFF option is selected all alarms will be logged however many. To avoid potentially unlimited notifications during a session, it is recommended that you limit the number of alarms using this option.

Limit counter type alarms to one notification

When DatawatchPro reads a unit, the software can identify if the parameter is a counter. Unlike parameter values that can go up and down such as voltage, counters only increase in value. If this option is not selected and a counter has reached a specific alarm limit, Datawatch Pro will register an alarm after each reading. This setting allows you to limit all counter type alarms to only one notification once the limit is reached.

You can switch off these alerts by unticking this option and saving the new setting.



Configuration Module - Email Setup Tab

To receive alarm notifications by email, the email setup configuration is required for your SMTP email server. A message will be displayed if you try to activate Automatic Email Alerts and the email setup has not been provided.

Email addresses for notifications

You can provide up to 3 email addresses to receive the email notifications. If you want to add more than 3 recipients for the email notifications you can separate the emails with the delimiter ";". For example "email@address1.com; email@address2.com"

SMTP account details

Your SMTP account details can usually be found in the account details page of your default email software such as Microsoft Outlook. The details required are:

- SMTP Address (outgoing mail server).
- From Email (the email address you are sending the email from).
- Port (default is 25).
- Requires authentication.
- Username.
- Password.
- Send Test Email.

Once you have provided your SMTP account details, you can send a test email by clicking this link. Check your email inbox to confirm receipt of the test email. If you have not received the test email, you will need to adjust the SMTP account details. The test email will be sent to all addresses you have added to the Email Address section.

DataWatchPro - [System configuration and defaults]

File Modules Tools Language Help

Configuration Units Viewer Energy Analysis Browser Log

System configuration and defaults ? EN

General Alarms **Email Setup** Data Saving Data Analysis Parameters

To send automated emails you must have an SMTP account available on your computer.

Email addresses for notifications

Email Address 1 To:

Email Address 2 (Optional)

Email Address 3 (Optional)

SMTP account details

SMTP Address

From Email

Port

Requires authentication ☐

Username

Password [Send Test Email](#)

Cancel Save

14/07/2011 17:05:15

Configuration Module - Data Saving Tab

Several options are available for saving data to the connected database.

Data save modes

- Save unit readings in the database (default).
- Do not save unit readings in database.
- FIFO stack (First In First Out).

Database limits

- Do not limit records saved to database (Default).
- Limit number of records save in database for each unit.

FIFO stack data limit (First In First Out)

- Set FIFO Limit.

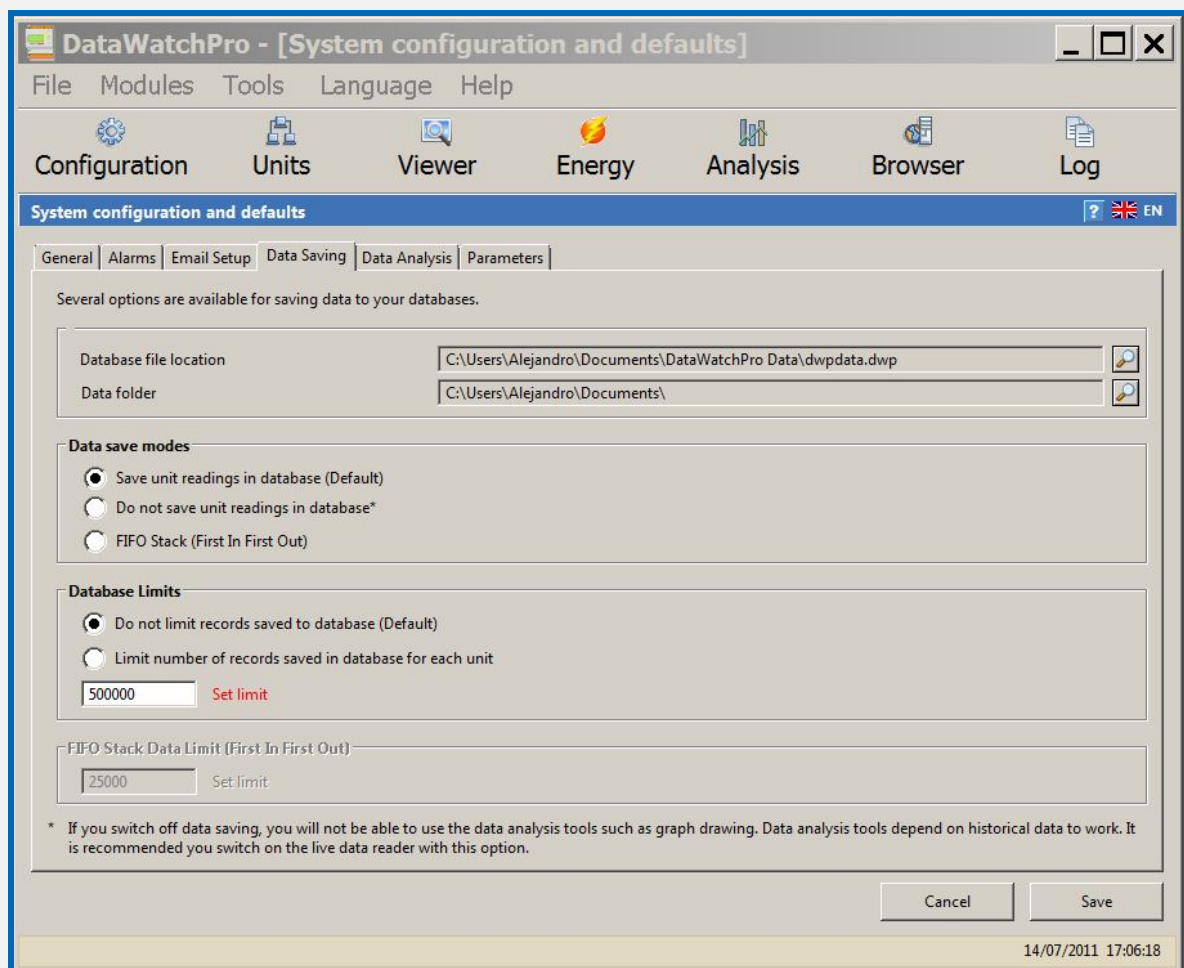
Generally, it is not recommended to specify database reading limits. This is because the system has to count the records during the reading process to check if the limit has been exceeded. This could cause the reading process to be interrupted for large record counts. It is more efficient just to keep saving the data to the database and periodically check the size of the database file using the Database Details Tool to ensure it is within the memory limits for the hard drive.

A notification message will be displayed when a data save limit has been reached.

The data save mode is displayed within the Units Module during the reading process.

The FIFO process will add one reading and remove the first reading to maintain a set number of readings in the database once the FIFO limit has been reached.

It is important to note that when using the FIFO limit and the current number of records in the connected database exceeds the chosen FIFO limit, the system will use the current record count to establish the FIFO limit. For example if there are 50000 records in the database for a unit and the FIFO limit is set to 25000, the system will operate the FIFO process using 50000. It is the responsibility of the user to delete the records to adjust the limit as required.



Configuration Module - Data Analysis Tab

DataWatchPro can store many thousands of readings. Although computer systems today are very powerful there are limits on the amount of visible data that can be displayed on the screen or indeed processed in one go. Some options have been included to fine tune your analysis settings and define limitations on the amount of data to display or process to reduce the risk of the application crashing.

Record/row limit for data analysis

This is the amount of records that can be displayed in one go in the data viewer tab. The default is 10000 but this number can be increased as required.

Limit number of nodes allowed for Data Analysis Graph (per graph line)

This is the number of nodes allowed for each graph line for the analysis graph. The default is 1000 readings or data points.

Percent font size for datagrid and date time controls

On some computers the users may have increased the operating system font text size. This option allows you to adjust the text size +/- % in the datagrid and date time controls. Usually this option is not required and the default setting is 0%.

Load temporary analysis data from connected database at startup

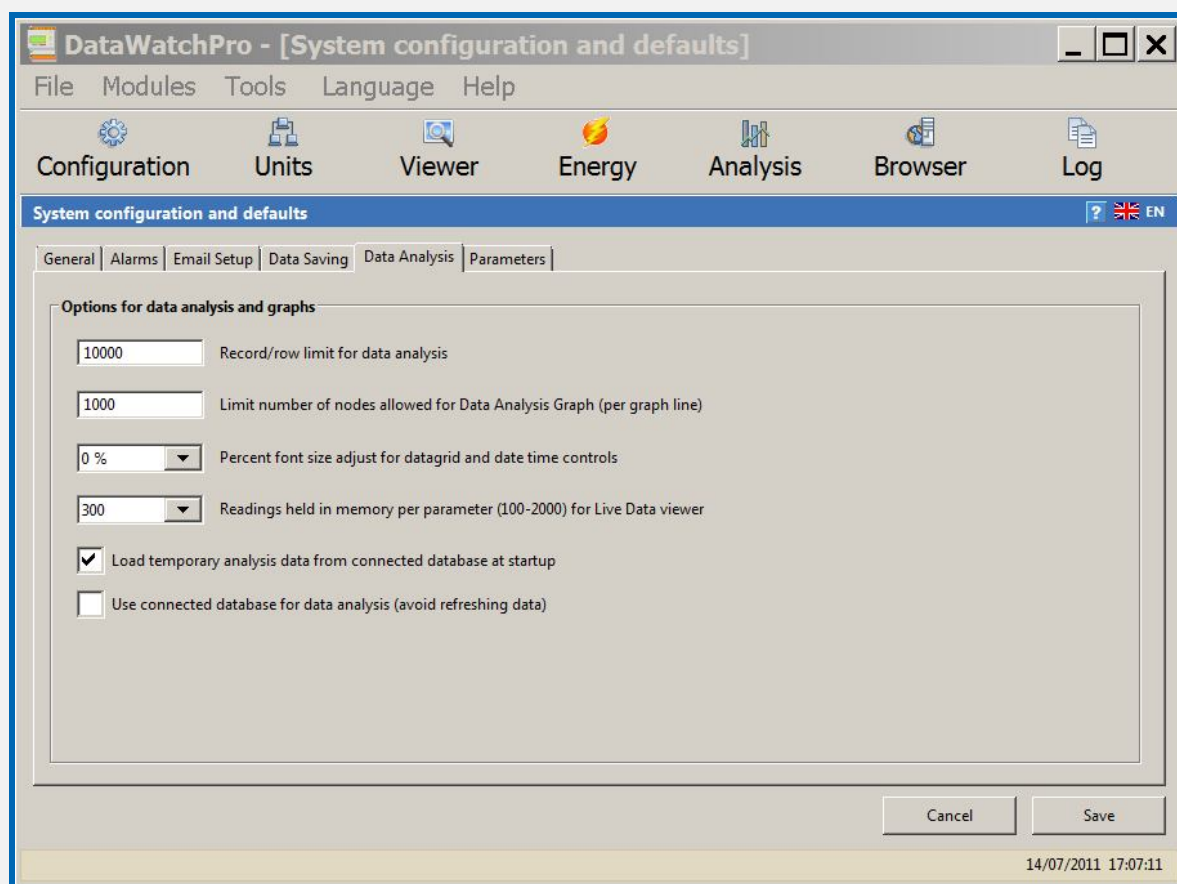
This option will update the temporary data file for analysis when the application is started. For more information read the configuration section on Data Saving.

Use connected database for data analysis (avoid refreshing data)

This option will use the actual connected data for analysis and remove the need to update or refresh the data periodically. For more information read the configuration section on Data Saving.

Readings held in memory for the Live Data Viewer

Live reading data is not stored in the database and stored temporarily in the computers memory (RAM). If you have a larger screen you could increase the amount of readings stored. Usually you only need to store the readings required to fill up on of the graphs in the live data viewer. Each pixel corresponds to 1 reading.



14/07/2011 17:07:11

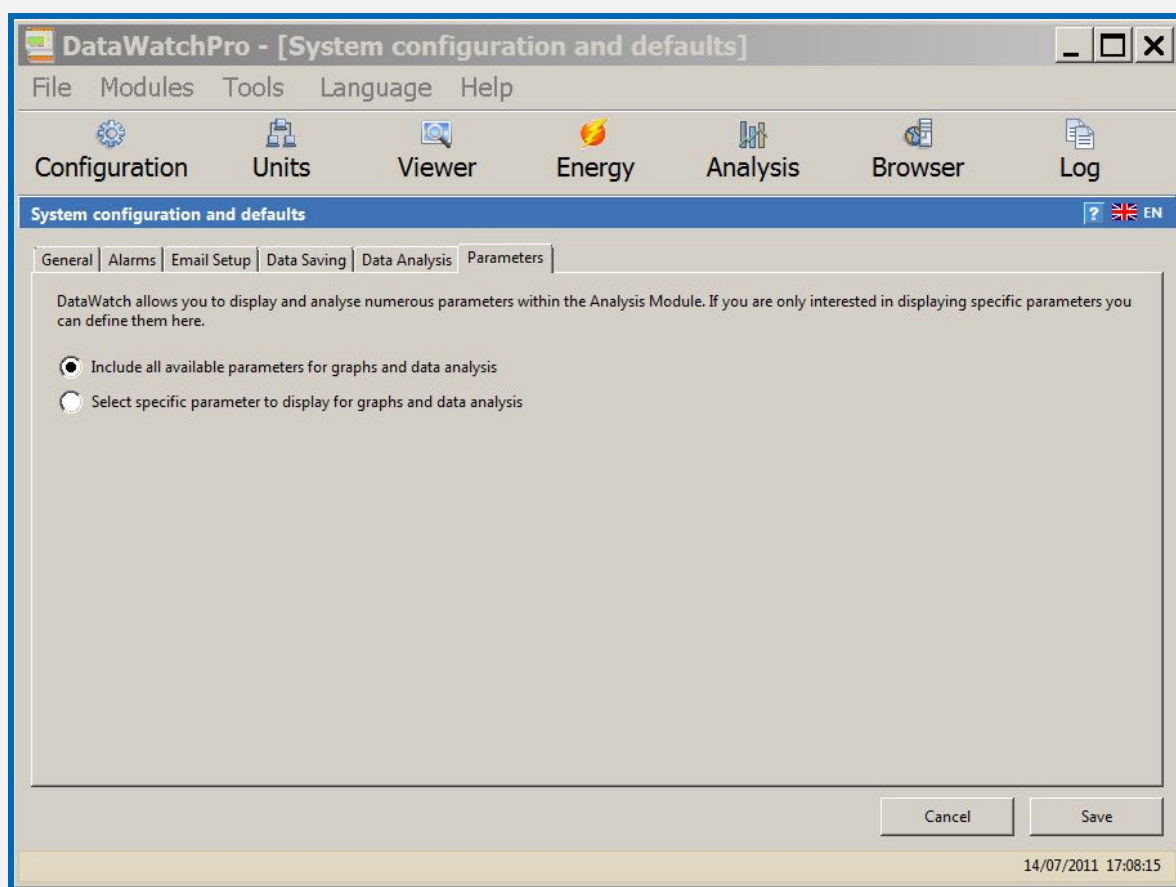
Configuration Module - Parameters Tab

DataWatchPro is designed to read and analyse an extensive list of parameters output from the connected units. To analyse these parameters, the parameter selection lists in various modules are populated with the full list of parameters available.

For most applications the full list of parameters may not be required. If you are only interested in displaying specific parameters of interest in the selection lists, you can define them here.

To activate the parameter selector choose the option "Select specific parameters to display for graphs and data analysis". Selecting this option will display a list of all available parameters. Select the parameters you are interested in and press "Save".

If you choose to switch on the include all parameters option, the system will store your existing selection list.



Units and Data Reader Module

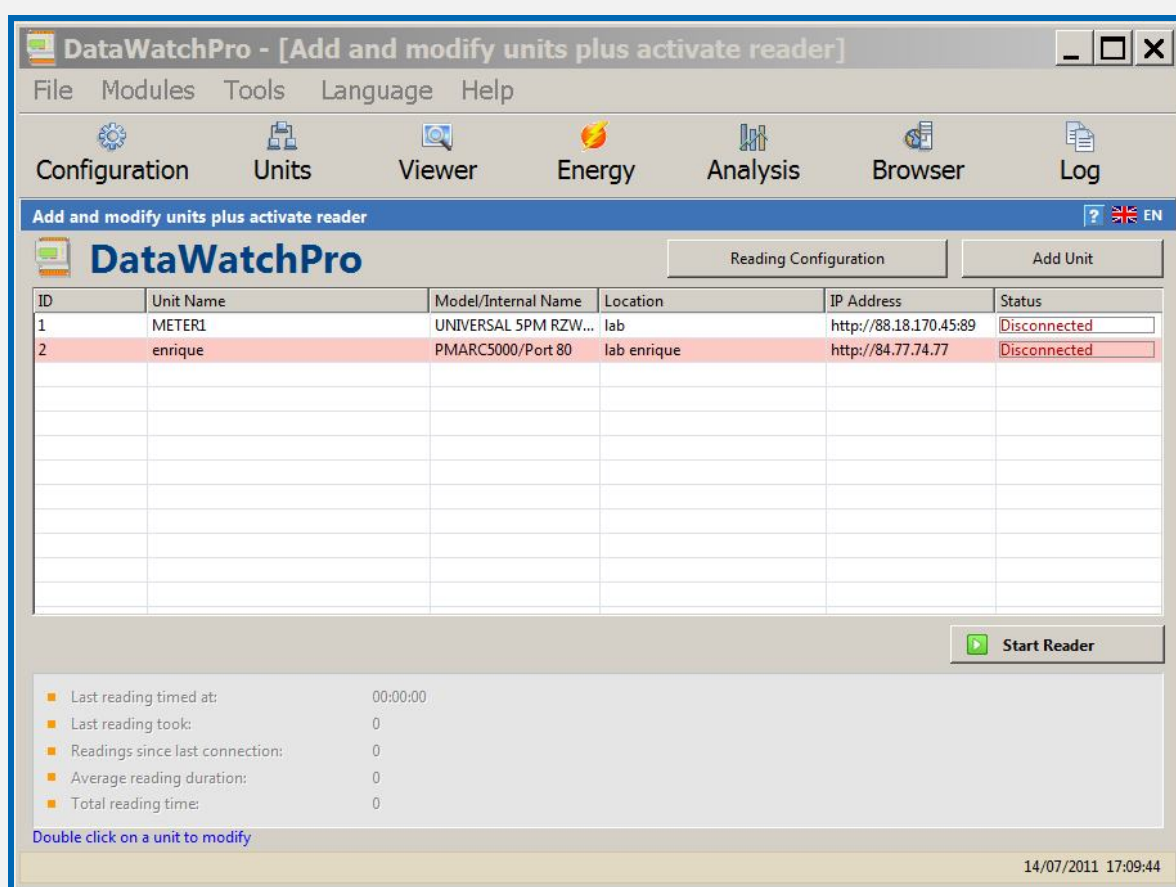
The Units Module and Data Reader screen is divided into two parts. The top area shows the summary list of all units currently in the system and the lower area contains the data reader panel.

The main function of the Units and Data Reader Module is to enter details about the connected units, set alarms for individual units and start/stop the data reader.

This section describes the following key functions:

- Adding the units you want to read data from and access remotely
- Edit and delete units
- Alarm management for individual units
- Data reader - Reading Configuration

To protect the reading process while updating individual units or performing specific tasks, the system may display a warning message if the reader is in the process of taking a reading.



Units and Data Reader - Adding Units

Before adding a new unit to DatawatchPro, the unit to measure needs to be connected to a network LAN or available via the Internet for reading. For instructions on connecting a unit to a network, consult the unit's user manual. If the unit device is not connected at the time you add the unit to DatawatchPro, you will not be able to perform a test communication to check if the data readings can be made.

To add a new unit to the Units Module, click the Add New button in the top right part of the screen to open the New Unit window. The unit window has three separate section tabs:

- Unit Details
- Alarm Setup
- Notes

Unit Details Tab

The unit details are required to identify the unit within the system. The following boxes should be completed:

Unit Name

The Unit Name is defined by the user and should be unique to that unit/device.

Internal Unit Name

This is supplied by the unit following a successful test connection. To change the internal name of the unit, you will need to manually adjust the unit. Refer to the unit's instruction manual for more information.

Model

The model is supplied by the unit following a successful test connection. The model name is a factory settings and cannot be changed.

Unit Location (Optional)

The unit location is optional and is useful when you have more than one connected unit or various zones within a factory or installation. Each time a new location is added, the list will be updated with the new location for use with other units.

IP Address

Each unit must have a unique IP Address and this should be correctly configured before data readings can be taken by Datawatch Pro. For further information on adding IP addresses and connecting units refer to unit's user manual.

The IP address should include the http:// part. If a port number is different from 80 then the port must be added to the IP address. For example, for an IP with port 89 the format would be http://192.168.2.10:89

PIN

Each unit has a four number PIN. The factory default PIN for a unit is "1234".

Disable

When reading commences, the system will refer to the summary unit list to establish which units should be read. The disable option informs the reader that the unit should not be read. All units that have been disabled in this way have a red background in the summary list. To enable the unit just double click the unit in the summary list and uncheck the disable box and then click save.

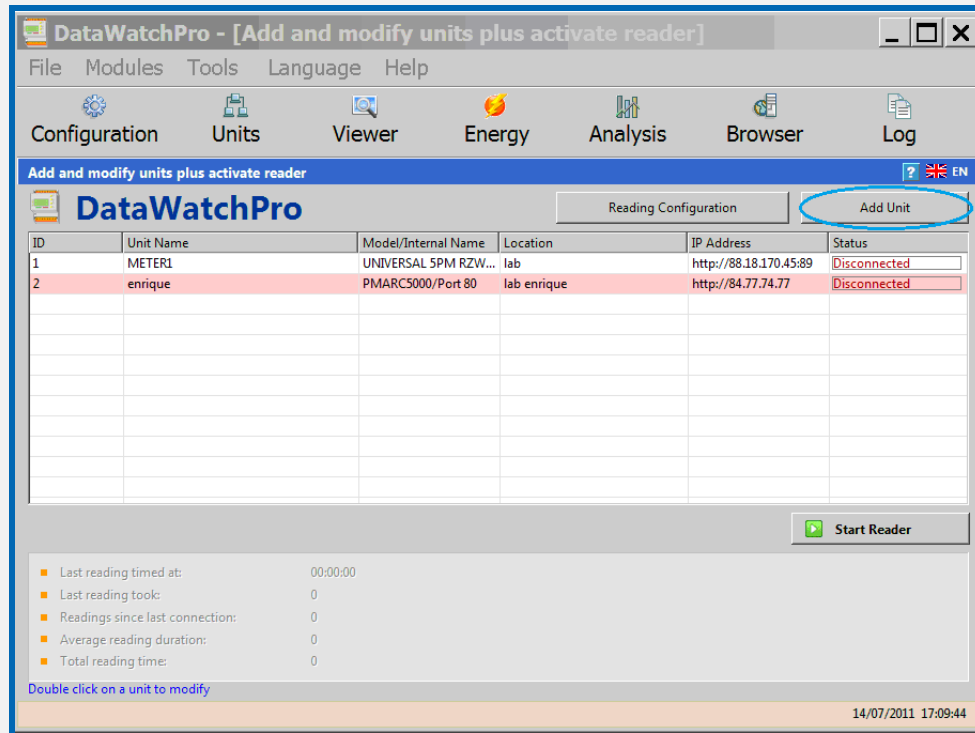
Test Connection

Before saving the unit, it is important to test the connection to verify DatawatchPro will be able to read data and to obtain the internal name, company and mode. Once you have completed the unit detail boxes, click the Test Connection link. A message will be displayed once the system has performed the test. You may have to adjust the configuration of your unit if the test is unsuccessful or check the Internet connection or LAN status.

Alarm Setup Tab

The alarm setup provides the capability to configure alarms for each unit individually. For example, Unit 1 could have an alarm for voltages over 240 V and Unit 2 alarms for voltages over 250 V.

For further information on alarm setup refer to the section on Alarm Management.



Add New Unit

Details Alarm Setup Commands Notes

Unit Name

Internal Unit Name

Company

Model

Unit Location

IP Address *

PIN

Disable Unit

* The IP address should include the http:// part. If a port number is different from 80 then the port must be added to the IP address. For example http://192.168.2.10:89

Close Save

Units and Data Reader - Functions

Unit clock reset

To reset the unit clock first ensure that the unit connection details have been added and you have tested the connection to the unit. The reset function will reset the unit's date and time to the same date and time of your computer clock. Depending on the time it takes to connect to the unit there may be a slight difference in the seconds value between the unit and your computer clock. Click the "Send reset clock command..." link. A message will be displayed to show the command was sent. To check that the unit has received the command you should test the connection again to display the current clock time for the unit.

Notes Tab

The notes section provides a box to provide general notes for a unit.

After adding the details, alarms and notes, click save to update the database and add the unit to the summary list.

DatawatchPro automatically allocates each new unit a unique ID reference number. This ID number can be seen in the first column of the unit list and is used to track the unit within DatawatchPro.

Units and Data Reader Module - Editing and Deleting

To edit an existing unit, double click on a unit in the main summary list to display the Unit window. Make the changes required and click Save.

To delete a unit from the main list, double click on a unit in the main summary list to display the Unit window and press the "Delete" button. A warning message will appear asking you to confirm the deletion. Deleting a unit is permanent and all records including historical data readings and alarm configuration will be deleted too.

The screenshot shows a software window titled "Unit Details - Enrique [2]". It has four tabs: "Details", "Alarm Setup", "Commands", and "Notes". The "Details" tab is active. The form contains the following fields:

- Unit Name: Enrique
- Internal Unit Name: Port 80
- Company: Safe Line
- Model: PMARC5000
- Unit Location: lab Enrique (dropdown menu)
- IP Address *: http://84.77.74.77
- PIN: ****
- Disable Unit: ☒ (with a red indicator)

Below the fields is a link: [Test connection and obtain internal unit name, model and company](#). At the bottom right, there are three buttons: "Delete" (circled in blue), "Close", and "Save". A red "Ref: 2" is visible in the top right corner of the form area.

* The IP address should include the http:// part. If a port number is different from 80 then the port must be added to the IP address. For example http://192.168.2.10:89

Units and Data Reader Module - Alarm Management

The alarm manager allows the user to configure alarms for each connected unit individually. For example, Unit 1 could have an alarm for voltages over 240 V and Unit 2 alarm an alarm for voltages over 250 V.

Alarms can be configured for a unit either when adding a new unit or editing unit details.

To update the alarms for a unit, open the Unit Details window by double clicking on a unit in the main summary list.

In the Unit window, click the "Alarm Setup" tab.

Warning messages will be displayed if incorrect values are entered in the value boxes.

The alarm list has the following columns:

- Alarm Name (the internal name for the alarm and usually it is the same as the parameter name).
- Activate (click this box to switch the alarm ON and OFF).
- Alarm Type.
- Value (the trigger value).
- Parameter dimension.
- Ignores (the number of times the alarm will be ignored).

To activate an alarm tick the activate alarm box. To deactivate an alarm remove the tick from the activate alarm box.

To update an alarm trigger value, click within the list cell to edit the value.

There are currently four alarm types available:

- MAX (alarm will be triggered when the value is greater or equal ">=" to the trigger value).
- MIN (alarm will be triggered when the value is less than or equal "<=" to the trigger value).
- Change of state (this alarm type does not require a trigger value, the value box will be disabled).
- I/O (for logic gates, only the values 0 or 1 are permitted).

MAX / MIN Alarms

For example, if the MAX alarm value is 250 Volts for RMS L1 and the reading for this parameter is 260 Volts, an alarm will be triggered. If the next reading is 249 Volts the alarm would NOT be triggered. The alarm would however be triggered if the value was the same value as the trigger value of 250 Volts. The MIN alarm works in the same way but the alarm is triggered with the reading value is less than or equal to the alarm value.

Change of state alarms

Change of state alarms or activation alarms do not have alarm values and will be triggered if there is a change when compared to the last reading.

IGNORE Setting

The majority of alarms have an option to indicate an "IGNORE" value. On occasions, a parameter reading may not reflect an accurate reading. For example, the reading may be the result of an external interference or random spike. To verify this type of reading as a genuine reading you can set the ignore value. The default ignore value is 2 but can be set up to a value of 99 depending on the alarm.

When the ignore value is set, DatawatchPro will activate a counter to record the number of instances a parameter reading triggers an alarm. For example if the alarm ignore value is 2 on the RMS L1 parameter with an alarm MAX value of 240 V an alarm would be triggered if 2 or more readings in a row are returned with values greater than or equal to 240 V. If a parameter reading is below the alarm trigger value before the ignore value has been reached, the ignore counter will be reset.

The following table explains further the ignore functionality:

Ignore Value: 2

Alarm Value: 240 V (RMS Voltage L1)

Alarm Type: MAX

Reading	1	2	3	4	5	6	7	8	9	10
Alarm Value	240	240	240	240	240	240	240	240	240	240
Reading Value	500	500	238	235	236	500	500	500	236	235
Ignore Counter	1	2	0	0	0	1	2	Reset	0	0
Alarm Trigger	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO

This example shows that reading 1 and 2 activated the alarm counter when the readings were above the 240 volt trigger value, but the readings were ignored when the counter was reset on the 3rd reading, which was below the trigger value. Again, the alarm counter was activated and the system correctly ignores the two readings above the 240 volt trigger, however the 8th reading is still above the trigger so an alarm is actually triggered.

Unit Details - METER1 [1]

Details Alarm Setup Commands Notes

Alarms for METER1
249 Alarms

Alarm Name	Activate	Type	Value	Dimension	Ignore
V1 Volts RMS L1 [MAX]	<input type="checkbox"/>	MAX	0.00	V	0
V1 Volts RMS L1 [MIN]	<input type="checkbox"/>	MIN	0.00	V	0
V2 Volts RMS L2 [MAX]	<input type="checkbox"/>	MAX	0.00	V	0
V2 Volts RMS L2 [MIN]	<input type="checkbox"/>	MIN	0.00	V	0
V3 Volts RMS L3 [MAX]	<input type="checkbox"/>	MAX	0.00	V	0
V3 Volts RMS L3 [MIN]	<input type="checkbox"/>	MIN	0.00	V	0
ID Differential Intensity RMS [MAX]	<input type="checkbox"/>	MAX	0.00	mA	0
ID Differential Intensity RMS [MIN]	<input type="checkbox"/>	MIN	0.00	mA	0
V12 Volts between phases L12 [MAX]	<input type="checkbox"/>	MAX	0.00	V	0
V12 Volts between phases L12 [MIN]	<input type="checkbox"/>	MIN	0.00	V	0
V23 Volts between phases L23 [MAX]	<input type="checkbox"/>	MAX	0.00	V	0
V23 Volts between phases L23 [MIN]	<input type="checkbox"/>	MIN	0.00	V	0
V31 Volts between phases L31 [MAX]	<input type="checkbox"/>	MAX	0.00	V	0
V31 Volts between phases L31 [MIN]	<input type="checkbox"/>	MIN	0.00	V	0
I1 Amps RMS L1 [MAX]	<input type="checkbox"/>	MAX	0.00	A	0
I1 Amps RMS L1 [MIN]	<input type="checkbox"/>	MIN	0.00	A	0
I2 Amps RMS L2 [MAX]	<input type="checkbox"/>	MAX	0.00	A	0
I2 Amps RMS L2 [MIN]	<input type="checkbox"/>	MIN	0.00	A	0
I3 Amps RMS L3 [MAX]	<input type="checkbox"/>	MAX	0.00	A	0
I3 Amps RMS L3 [MIN]	<input type="checkbox"/>	MIN	0.00	A	0
HZ1 Frequency L1 [MAX]	<input type="checkbox"/>	MAX	0.00	Hz	0
HZ1 Frequency L1 [MIN]	<input type="checkbox"/>	MIN	0.00	Hz	0
HZ2 Frequency L2 [MAX]	<input type="checkbox"/>	MAX	0.00	Hz	0
HZ2 Frequency L2 [MIN]	<input type="checkbox"/>	MIN	0.00	Hz	0
HZ3 Frequency L3 [MAX]	<input type="checkbox"/>	MAX	0.00	Hz	0
HZ3 Frequency L3 [MIN]	<input type="checkbox"/>	MIN	0.00	Hz	0
W1 Watts L1 [MAX]	<input type="checkbox"/>	MAX	0.00	W	0
W1 Watts L1 [MIN]	<input type="checkbox"/>	MIN	0.00	W	0
W2 Watts L2 [MAX]	<input type="checkbox"/>	MAX	0.00	W	0
W2 Watts L2 [MIN]	<input type="checkbox"/>	MIN	0.00	W	0
W3 Watts L3 [MAX]	<input type="checkbox"/>	MAX	0.00	W	0
W3 Watts L3 [MIN]	<input type="checkbox"/>	MIN	0.00	W	0
W123 Watts L123 [MAX]	<input type="checkbox"/>	MAX	0.00	W	0
W123 Watts L123 [MIN]	<input type="checkbox"/>	MIN	0.00	W	0
WP1 Positive Watts L1 [MAX]	<input type="checkbox"/>	MAX	0.00	W+	0
WP1 Positive Watts L1 [MIN]	<input type="checkbox"/>	MIN	0.00	W+	0
WP2 Positive Watts L2 [MAX]	<input type="checkbox"/>	MAX	0.00	W+	0
WP2 Positive Watts L2 [MIN]	<input type="checkbox"/>	MIN	0.00	W+	0
WP3 Positive Watts L3 [MAX]	<input type="checkbox"/>	MAX	0.00	W+	0
WP3 Positive Watts L3 [MIN]	<input type="checkbox"/>	MIN	0.00	W+	0
WP123 Positive Watts L123 [MAX]	<input type="checkbox"/>	MAX	0.00	ΣW+	0
WP123 Positive Watts L123 [MIN]	<input type="checkbox"/>	MIN	0.00	ΣW+	0
WN1 Negative Watts L1 [MAX]	<input type="checkbox"/>	MAX	0.00	W-	0
WN1 Negative Watts L1 [MIN]	<input type="checkbox"/>	MIN	0.00	W-	0
WN2 Negative Watts L2 [MAX]	<input type="checkbox"/>	MAX	0.00	W-	0
WN2 Negative Watts L2 [MIN]	<input type="checkbox"/>	MIN	0.00	W-	0
WN3 Negative Watts L3 [MAX]	<input type="checkbox"/>	MAX	0.00	W-	0
WN3 Negative Watts L3 [MIN]	<input type="checkbox"/>	MIN	0.00	W-	0
WN123 Negative Watts L123 [MAX]	<input type="checkbox"/>	MAX	0.00	ΣW-	0

99 Counter type alarms
Click on max and minimum values to edit

Delete Close Save

Units and Data Reader Module - Data Reader

Data Reader Panel

The data reader panel is located below the Unit Listing in the Units and Data Reader Module. The panel has the following features and functions:

- A Start button to initiate the data reader. When the reader is ON, the STOP button will appear.
- Last reading time e.g. 10:10:20.
- Last reading total duration e.g. 2.50 seconds (for sequential readings the number in brackets indicates how long the last unit in the sequence took to read).
- Readings since last connection e.g. 50 (this is the total readings since the reader was last started).
- Average reading duration e.g. 2.4 seconds.
- Total reading time (number of readings multiplied by the average reading duration).
- Time remaining until the next reading with a progress bar.
- Time remaining for the session will be displayed.
- Reading Mode - Sequential or Multi Threaded.
- Data Save Mode and limits – Save, No Save.

Reader configuration

Click the Reading Configuration button located top right of the unit listing to access the reader configuration screen. The configuration settings allow you to fine tune when and for how long you would like to take readings. The following reading settings are available:

- Period between readings (1 – 60 seconds and 1 - 180 minutes).
- Maximum period to take each reading.
- Duration of the reading session (1 minute up to a possible 31 days).
- Activate multi-thread reading mode.
- Button to reset default values.

Period between readings

The default reading frequency is every 5 minute. For certain requirements you may wish to reduce the period between readings to under 1 minute. Reading periods of under 1 minute are considered to be high speed. If the reading period is high speed a number of additional limitations come into affect. For example the browser module will prevent connections to the units while the high speed reading session is active.

For sequential reading, the system will check to ensure the number of units does not exceed the number of permitted units. The system also checks the average period for reading a unit (if available). If the average reading time is greater than the period between readings selected, a warning message will be displayed.

Maximum period to take each reading

The maximum period to take each reading will depend on the connection speed of the internet or the network and be fine tuned based on the average period for each reading. DatawatchPro performs numerous internal tasks each time it takes a data reading such as, connecting to the unit, processing the data received, checking for alarms, updating counters and saving the reading in the database. An important reading task performed, is to make a connection to each unit via the Internet or local area network (LAN). This connection time can vary considerably between readings and it is important to have this setting to ensure that the next reading does not start before the previous reading has finished.

If you have the global relay programming option active. For any relay changes to take effect you must allow an additional reading period so both the reading can be taken and if necessary new relay settings sent to the unit. The required period depends on your specific circumstances and internet connection.

When working with multiple units, the system will check whether the number of units connected is within the periods defined. For example if you have 2 minutes between readings and a maximum period to take a reading of 10 seconds, this would mean you could have up to 12 units connected in sequence $((2 \times 60) / 10)$.

Session duration

To protect the computer hard disk and system it is recommended that the duration for the readings is always set when using the high speed features to ensure that the number of records saved is manageable. When a session duration has been set, a duration timer will appear in the main reading panel.

Activate multi-thread reading mode

Multi threaded reading is only really required when there are a large number of units to read or more than one unit needs to be read at the same time. The default setting for Data Watch Pro is sequential. For further information, about Sequential and Multi Threaded reading refer to the [Configuration Module](#). The two types of reading supported by DataWatchPro are:

- Sequential - reads unit 1 then unit 2 then unit 3... (default setting).
- Multi Threaded - reads unit 1, 2 and 3 at the same time.

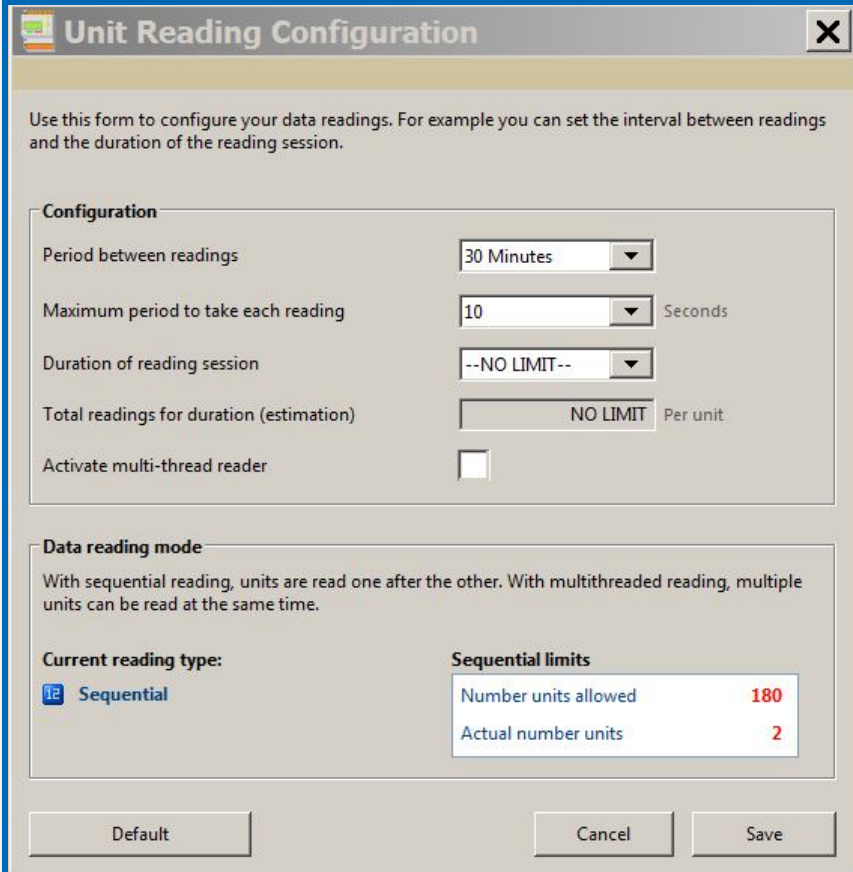
General configuration information

The configuration screen also show some additional information on:

- Total readings per unit for the duration of the session (estimation).
- Data reading mode currently selected (sequential or multi threaded).
- Number of units allowed for sequential reading.
- Actual number of units.

Default settings

To return the reader configuration to the factory default setting presee the Default Settings button.



Unit Reading Configuration

Use this form to configure your data readings. For example you can set the interval between readings and the duration of the reading session.

Configuration

Period between readings: 30 Minutes

Maximum period to take each reading: 10 Seconds

Duration of reading session: --NO LIMIT--

Total readings for duration (estimation): NO LIMIT Per unit

Activate multi-thread reader: ☐

Data reading mode

With sequential reading, units are read one after the other. With multithreaded reading, multiple units can be read at the same time.

Current reading type: Sequential

Sequential limits

Number units allowed	180
Actual number units	2

Default Cancel Save

Starting and stopping the data reader

Before starting the Data Reader, ensure that the units you want to read are enabled in the unit summary list. To select a unit for reading, make sure the disable unit check box in the Unit Details form has been unchecked. In addition, you need to make sure that each unit you want to read data from has been correctly connected to the Internet or LAN. When the reader is not running all units in the summary list will show the status "Disconnected" in red.

Start the reader by clicking the Start Reader button. The counter clocks will become visible and show the time remaining before the next reading.

The units marked for reading will show the status "Connected" in blue.

The start time for the reading session will be added to the Automatic Event Log.

If the live data option has been selected in the Configuration Module, you will be able to review the data as it is read in the Live Data Module.

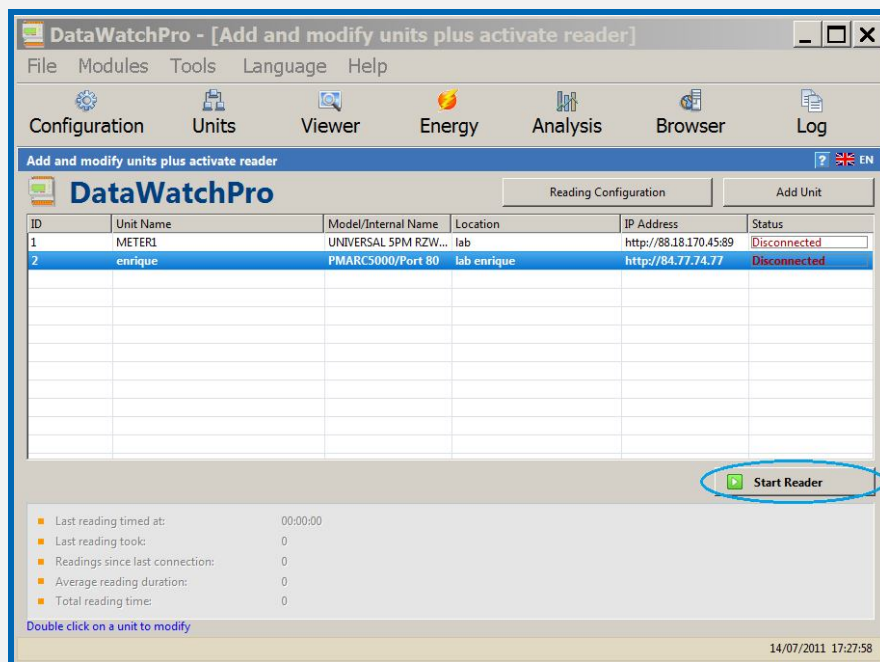
When a unit is receiving data, the unit will be marked in blue for the duration of the reading.

If the sequential reading option is selected, you will see the units being read one at a time from the top to the bottom of the unit list. If multithreaded reading is selected the status of the multi reading will be displayed in the list.

While the data reader is active, you can commence the data analysis within the Data Analysis Module.

Many of the functions within DatawatchPro can influence the data reading process. To prevent the internal reading process from being interrupted at critical points during the process, the system will display a warning message prior to an action taking place.

To stop the data reader, click the Stop Reader button. If the system is currently in the middle of a read, a message will be displayed requesting confirmation to interrupt the process immediately or cancel the stop command until the reading has terminated.



Data reading process and functions

The following list provides a summary of the main internal processes and functions performed while reading data from a unit.

- Reader is started by the user.
- Event log updated with the session start time.
- Reader attempts to connect to the unit's web server within the allowed connection period.
- If connection is unsuccessful the reader will move on to next unit or if there is only one unit the reader will wait for the next reading.
- If connection is successful proceeds to read the data.
- Obtains the web source page generated by the unit's web server containing the parameter values.
- System extracts the data from the source page using various functions to filter the parameter values.
- Once the values are available, they are loaded into the internal alarm manager to compare with the previous reading values for the unit being read. Depending on the alarm settings, the alarm manager will determine whether an alarm needs to be triggered. Once the alarm manager has completed the checks.
- Process relay configuration (if selected).
- System saves values to the database.
- Counters are adjusted or reset and the reading process for the unit terminates.
- Reader starts the process again for the next unit or if there is only one unit the reader will wait for the next reading time.
- User stops the reader and event log updated with session end time.

Limitations for multi unit reading

The system is designed to read a number of units at the same time. The limit on the number of units you can read at the same time depends on each particular case including for example the speed of your internet connection, speed of computer (processing power), graphics card and available computer memory.

As an example for illustration purposes only, the software has been tested with 112 units connected via a LAN (intranet) and configured in sequential read and multithreading modes using a DELL laptop (DELL Dell Precision M6300 Intel Core 2 Duo T7250 2.00GHz CPU, 2 GB of system RAM Microsoft Windows XP Professional Version 2002 Service Pack 2).

The following results were obtained:

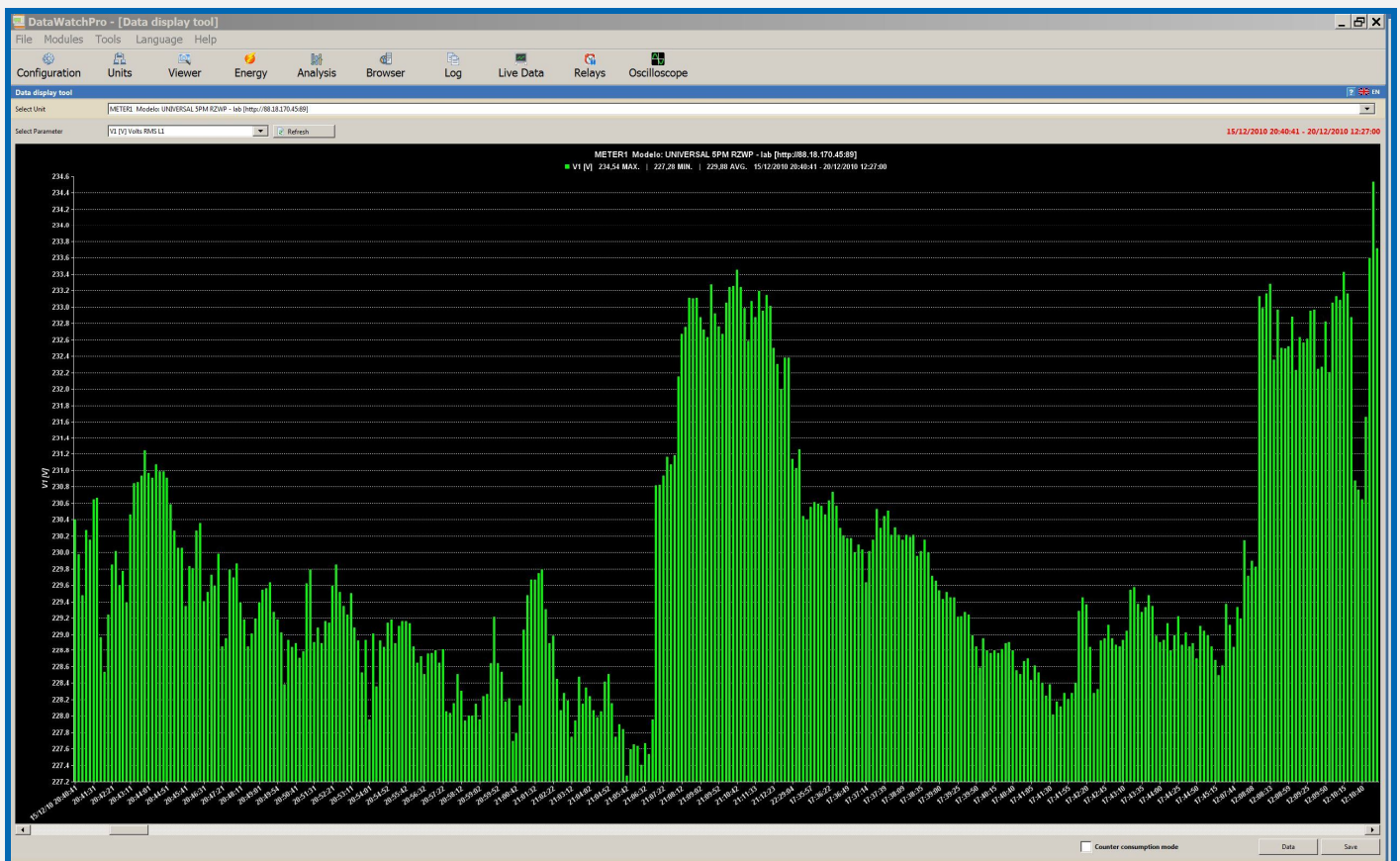
Reading 57 units in multithreaded mode, every 15 seconds (within 15 sec).

Reading 112 units sequentially, every 120 seconds (within 1 sec).

When taking multiple readings from a number of units it should be noted that the computer will be working intensively and resources for other functions may become limited. In the case of the multithreaded mode and depending on the number of units connected and type of computer, the occasional reading may not be recorded.

Units and Data Reader Module - Viewer Module

The viewer module generates basic graphs for quick viewing and analysing of data. With two clicks the graphical data for selected parameters can be viewed. The viewer connects directly to the reading database.



Units and Data Reader Module - Using the viewer

Using the viewer is very easy. First select a connected unit from the select list and then select a parameter. The resulting bar graph will be drawn for you. Use the refresh button to redraw the graph.

Each bar represents one reading. Clicking on any bar will highlight the bar in red and display the selected value in the heading.

DataWatchPro only displays in the screen a portion of the readings available. The number of bars displayed depends on the size of screen you have and the resolution. If you have more readings in the datafile for the selected unit a scroll bar will appear at the base of the graph. You can navigate left and right to display other periods. The heading displays the Max, Min and average readings for each period selected.

There is an option to switch the output graph to "counter consumption mode". This option can be used to calculate a consumption between readings. For example if the you had selected KWH1 as the parameter and reading 1 was 100kWh, reading 2 was 105kWh and reading 3 was 110kWh, with the counter consumption mode selected the consumption between readings would show 0, 5kWh, 10kWh. If the consumption mode was not selected the actual values would be shown 100, 105 and 110kWh.

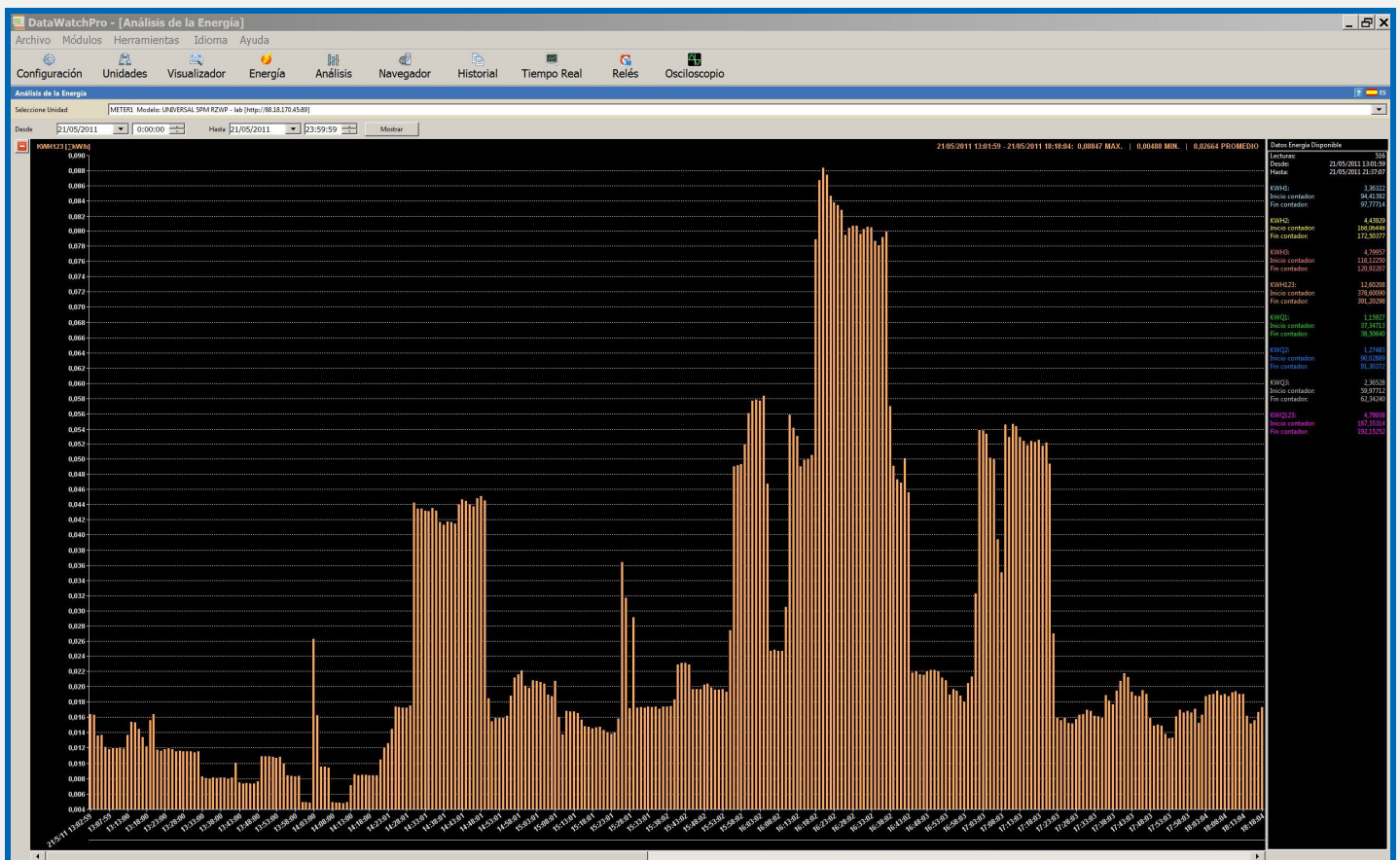
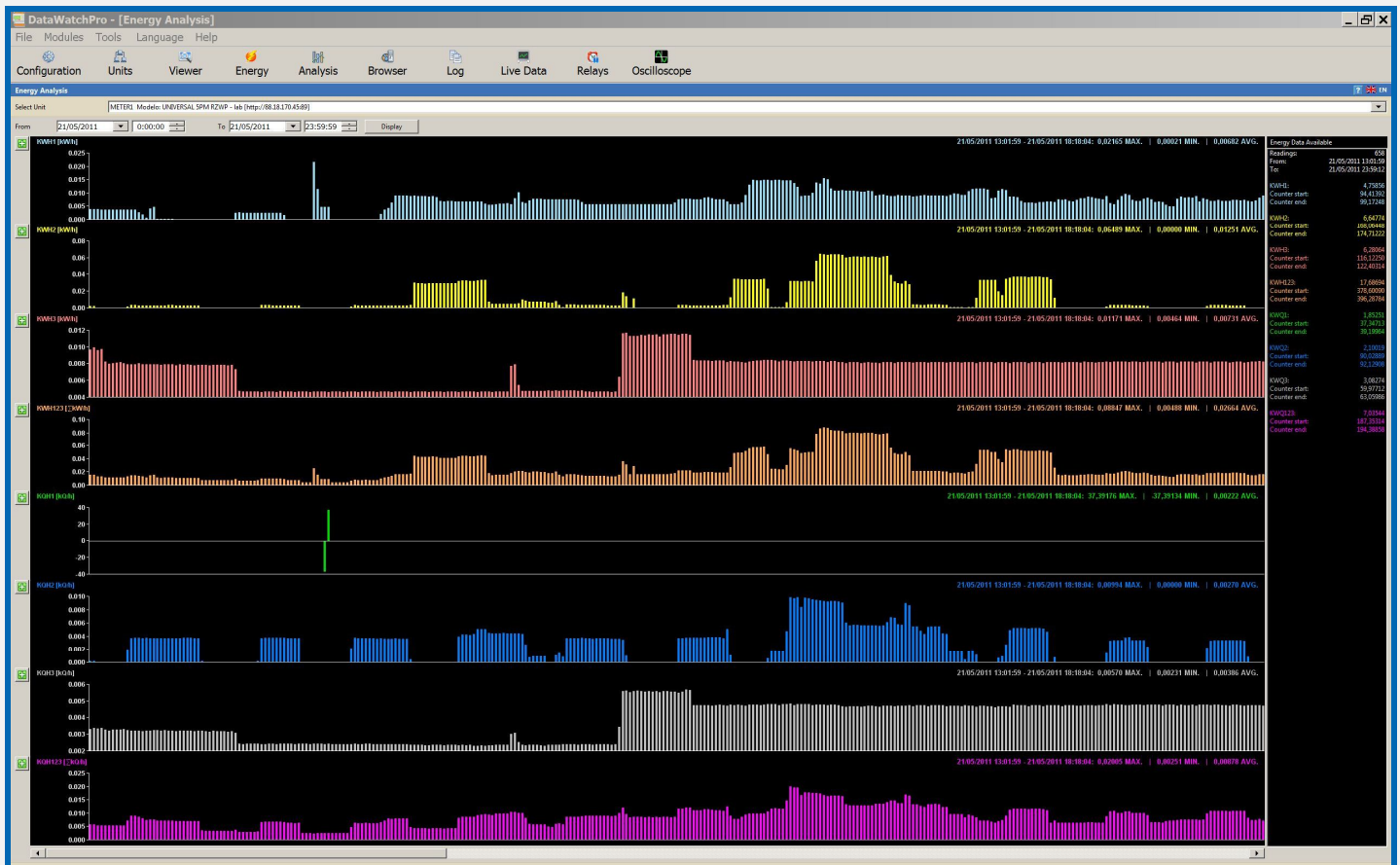
To view the data for the period in list form, double click on the graph or press the "Data" button. For each item in the list you can apply the date and time to be used in the Data Analysis Module. Right click with your mouse on an entry and select the from date/time and then select the to date/time. After selection the dates will appear in the corresponding analysis tool.

A picture of the image can be saved by pressing the "Save" button. A number of image formats are available to save your graph picture.

Because the viewer accesses data from the live reading database a message will be displayed when a unit is being read and the viewer is unavailable.

Units and Data Reader Module - Energy Analysis Module

The Energy Module displays energy data for selected unit and periods. The tool connects directly to the reading database.



Units and Data Reader Module - Using the Energy Module

The Energy Module displays data for the following parameters:

- kWh1
- kWh2
- kWh3
- kWh123
- kWh1
- kWh2
- kWh3
- kWh123

To use the Energy Module, select a unit from the list and then define the period you want to view and press the "Display" button.

In the right column DataWatchPro will display a summary for the full period selected together with a total consumption for each energy parameter.

In the main drawing block, DataWatchPro will draw consumption bar graphs for the energy parameters. Each graph also shows the Max, Min and Average for the periods. DataWatchPro only displays in the screen a portion of the readings available for selected period. The number of bars displayed depends on the size of screen you have and the resolution. If you have more readings in the datafile for the selected unit and period, a scroll bar will appear at the base of the graph. You can navigate left and right to display other periods.

To view the data for the period in list form, double click on the graphs. For each item in the list you can apply the date and time to be used in the Data Analysis Module. Right click with your mouse on an entry and select the from date/time and then select the to date/time. After selection the dates will appear in the corresponding analysis tool.

You can click on the "+" buttons in green to amplify the selected energy parameter graph. This will create a much more detailed graph for the selected parameter. To close the detailed graph and return to the multiple graph view click on the "-" button in red.

Data Analysis Module

The Data Analysis Module allows the user to view and analyse historical data for selected units.

The main tabs within the module provide access to four analysis tools.

- Data Viewer.
- Graphs.
- Analysis.
- By day.

The analysis tools require a database and unit to be selected.

Data, analysis and graphs

Select Unit: [dwpdata.dwp] [METER: Modelo UNIVERSAL SPM RZWP - lab (http://88.18.170.45/88)]

Data: [Plotter] [Analysis] [By Day] [Display]

From: [21/05/2011] [13:02:00] To: [25/05/2011] [23:59:59]

ReadingID	UnitID	ReadingDate/Time	MODC	VER	NDM	V1	V2
8053	1	21/05/2011 13:02:59	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.96	235
8054	1	21/05/2011 13:03:59	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.98	235.55
8055	1	21/05/2011 13:04:59	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.18	235.31
8056	1	21/05/2011 13:05:59	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237	234.97
8057	1	21/05/2011 13:06:59	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.44	235.35
8058	1	21/05/2011 13:07:59	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.73	234.79
8059	1	21/05/2011 13:08:59	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.53	235.02
8060	1	21/05/2011 13:10:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.18	235.2
8061	1	21/05/2011 13:11:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.18	235.57
8062	1	21/05/2011 13:12:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.65	235.87
8063	1	21/05/2011 13:13:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	232.24	231.51
8064	1	21/05/2011 13:14:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	232.76	231.38
8065	1	21/05/2011 13:15:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	233.69	232.86
8066	1	21/05/2011 13:16:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	233.35	232.89
8067	1	21/05/2011 13:17:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	233.67	232.02
8068	1	21/05/2011 13:18:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	233.18	232.31
8069	1	21/05/2011 13:19:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	233.22	232.04
8070	1	21/05/2011 13:20:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	233.26	231.8
8071	1	21/05/2011 13:21:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	233.78	231.37
8072	1	21/05/2011 13:22:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.52	231.73
8073	1	21/05/2011 13:23:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.72	231.87
8074	1	21/05/2011 13:24:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.31	230.8
8075	1	21/05/2011 13:25:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.26	231.35
8076	1	21/05/2011 13:26:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.15	231.89
8077	1	21/05/2011 13:27:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.75	231.95
8078	1	21/05/2011 13:28:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	234.83	232.21
8079	1	21/05/2011 13:29:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.22	232.44
8080	1	21/05/2011 13:30:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.86	232.53
8081	1	21/05/2011 13:31:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.37	231.89
8082	1	21/05/2011 13:32:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.9	232.59
8083	1	21/05/2011 13:33:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.84	232.91
8084	1	21/05/2011 13:34:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.12	232.35
8085	1	21/05/2011 13:35:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.51	232.04
8086	1	21/05/2011 13:36:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.47	233.4
8087	1	21/05/2011 13:37:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.15	232.77
8088	1	21/05/2011 13:38:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.5	233.15
8089	1	21/05/2011 13:39:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.47	232.97
8090	1	21/05/2011 13:40:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.15	232.48
8091	1	21/05/2011 13:41:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.83	232.68
8092	1	21/05/2011 13:42:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.9	232.53
8093	1	21/05/2011 13:43:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.09	232.5
8094	1	21/05/2011 13:44:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.3	232.33
8095	1	21/05/2011 13:45:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.56	232.67
8096	1	21/05/2011 13:46:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.87	232.59
8097	1	21/05/2011 13:47:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.91	233.26
8098	1	21/05/2011 13:48:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.47	232.41
8099	1	21/05/2011 13:49:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.71	232.89
8100	1	21/05/2011 13:50:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.38	232.97
8101	1	21/05/2011 13:51:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	236.85	232.5
8102	1	21/05/2011 13:52:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.17	233.66
8103	1	21/05/2011 13:53:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.22	233.9
8104	1	21/05/2011 13:54:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.02	233.23
8105	1	21/05/2011 13:55:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.41	233.31
8106	1	21/05/2011 13:56:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.86	230.94
8107	1	21/05/2011 13:57:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.52	231.54
8108	1	21/05/2011 13:58:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.78	230.88
8109	1	21/05/2011 13:59:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.46	231.25
8110	1	21/05/2011 14:00:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.6	231.61
8111	1	21/05/2011 14:01:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.87	231.98
8112	1	21/05/2011 14:02:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.75	231.48
8113	1	21/05/2011 14:03:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	235.29	231.02
8114	1	21/05/2011 14:04:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.75	231.63
8115	1	21/05/2011 14:05:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	238.01	232.45
8116	1	21/05/2011 14:06:00	UNIVERSAL SPM RZWP	V1.0 May 9 2011	PRU22	237.43	233.81

Unit: 1 [dwpdata.dwp]

Data Analysis - dwpdata.dwp

Previous Next

Unit: METER: Modelo UNIVERSAL SPM RZWP - lab (http://88.18.170.45/88)

Reference: 1

Reference: 21/05/2011 13:02:59

Parameter	Field	Reading	Dimension
CNLOCK	Counter - Blocks	0	
CNPOFF	Counter - Power Off	1	
CNTOTAL	Counter - Total	1	
CNACCUM	Counter - Accumulative	1	
MAXV1	Max - Volts L1	238.92	V
MAXV2	Max - Volts L2	235.76	V
MAXV3	Max - Volts L3	233.69	V
MAXID	Max - Differential Intensity RMS	277.7	mA
MAXI1	Max - Amps L1	6.85	A
MAXI2	Max - Amps L2	0.69	A
MAXI3	Max - Amps L3	3.93	A
MAXIN	Max - Amps Neutral	7.3	A
MAXHZ1	Max - Frequency L1	49.9	Hz
MAXHZ2	Max - Frequency L2	49.8	Hz
MAXHZ3	Max - Frequency L3	49.9	Hz
MAXW1	Max - Watts L1	1413.8	W
MAXW2	Max - Watts L2	163.5	W
MAXW3	Max - Watts L3	890	W
MAXVA1	Max - Volt Amps L1	1625.4	VA
MAXVA2	Max - Volt Amps L2	164.3	VA
MAXVA3	Max - Volt Amps L3	916.4	VA
MAXVARC1	Max - VA Reactive Capacitive L1	801.7	VARC
MAXVARC2	Max - VA Reactive Capacitive L2	16.3	VARC
MAXVARC3	Max - VA Reactive Capacitive L3	275	VARC
MAXVARL1	Max - VA Reactive Inductive L1	0	VARL
MAXVARL2	Max - VA Reactive Inductive L2	0	VARL
MAXVARL3	Max - VA Reactive Inductive L3	0	VARL
MAXDES1	Max - Imbalance Volts L1	1.4	%Des V1
MAXDES2	Max - Imbalance Volts L2	0.4	%Des V2
MAXDES3	Max - Imbalance Volts L3	1.2	%Des V3
MAXDES1	Max - Imbalance Amps L1	108.8	%Des I1
MAXDES2	Max - Imbalance Amps L2	78.9	%Des I2
MAXDES3	Max - Imbalance Amps L3	124.7	%Des I3
MAXTEMP	Max - Temperature	0	°C
MAXHUME	Max - Relative Humidity	0	% RH
MAXTHDV1	Max - THD Volts L1	1.2	% THD V1
MAXTHDV2	Max - THD Volts L2	1.5	% THD V2
MAXTHDV3	Max - THD Volts L3	1.7	% THD V3
MAXTHDI1	Max - THD Amps L1	19.3	% THD I1
MAXTHDI2	Max - THD Amps L2	5.8	% THD I2
MAXTHDI3	Max - THD Amps L3	16.3	% THD I3
MINV1	Min - Volts L1	237.06	V
MINV2	Min - Volts L2	234.44	V
MINV3	Min - Volts L3	232.39	V
MINHZ1	Min - Frequency L1	49.9	Hz
MINHZ2	Min - Frequency L2	49.9	Hz
MINHZ3	Min - Frequency L3	49.9	Hz
MINTEMP	Min - Temperature	0	°C
MINHUME	Min - Relative Humidity	0	% RH
KWH1	Active Energy L1	94.41794	kWh
KWH2	Active Energy L2	168.0672	kWh
KWH3	Active Energy L3	1161.322	kWh
KWH123	Active Energy L123	378.6173	kWh

OK

Data Analysis Module - Database Selection

Historical data is available from three sources:

- Access the connected database via a temporary data file.
- Access the currently connected database directly.
- A compatible database file created with Datawatch Pro.

The box at the top of the Data Analysis screen displays the currently selected database file name.

Each time a database file is loaded into the Data Analysis Module, the unit selection list will display the units available within the database file.

Database files can be accessed when the data reader is running.

Access the connected database via a temporary data file

If the configuration setting for pre-load temporary analysis data has been selected, the name of the connected database will be displayed in the database name box e.g. "dwpdata.dwp". If the box is empty you will need to load the connected database.

To ensure the reading process is not interrupted when using the analysis tools, a temporary copy of the database is created automatically by DatawatchPro. All viewing and analysis will then be performed on the temporary database file rather than the actual connected file.

To open the database file click on the "Browse" icon next to the database name box to open the database select form. Select the first option "Access the connected database via a temporary data file" and click Open.

The connected database name will appear in the database name box. For larger database files a progress bar will appear while DatawatchPro creates the temporary database file.

When the currently connected database is selected there is also a refresh button provided next to the search button plus an additional refresh button will appear in the main module menu bar.

Clicking the refresh button will recreate the temporary database file with the latest readings available in the connected database.

Access the currently connected database directly

With this option you are not required to press the refresh data button each time you want to update the analysis tools with the most recent readings. This option creates a connection directly with the connected database, which is performing the readings. We do not recommend this option when you have more than one unit or require readings to take place at high speed because complex analysis could interfere with the reading process.

The data refresh button remains hidden while this option is selected.

Open a compatible database file created with DatawatchPro

The Data Analysis Module allows the user to open a compatible database file. Each database file is "standalone" and will contain unit details and data readings.

Saving data in separate data files ensures that database files do not grow too large and remain manageable. For example, you could have historical records for 2009 and 2010 in two separate files. When you need to review the historical data, you can open them in the Data Analysis Module.

To open a compatible data file click on the "Browse" icon next to the database name box to open the database select form. Select the second option "Open another compatible database..." and click Open.

The database name will appear in the database name box. The connection to the database file will generally be faster than connecting to the temporary reading database as the system does not have to create a temporary file copy.

The data refresh button is not available when opening compatible database files.

Data Analysis Module - Data Viewer

Clicking the “Data” tab in the Data Analysis Module displays the Data Viewer Tool.

Populating the data viewer

The Data Viewer tool includes an advanced Data-On-Demand grid to navigate easily through thousands of data readings.

Data on demand is a technology that only loads the records necessary to populate the viewable area of the data grid. This means that scrolling through numerous reading can be performed very efficiently without having to load the entire list of records into the grid in one go.

Once the database has been selected, you need to select a unit from the list.

Next, select a data period using the data and time selection controls. The default time is the current 24 hour period 0:00:00 hours to 23:59:59. Once the time period has been set, click Display to populate the data grid with the data for the selected unit. You can also do this manually or use the icon "Reading sessions in the database".

The time it takes to access the records and the number of records returned will be displayed in red in the top right corner of the screen. The access time will depend on the number of records in the selected period, the computer RAM and the speed of the processor you are running.

If the number of records has exceeded the data query limit set in the Configuration Module, a warning message will be displayed.

If readings are found for the for the sample period, the raw reading data will be displayed in the grid. The first two columns always display the Reading ID and the recoded Reading Date Time. All other columns contain the parameter values.

Click Display again to refresh the records.

Remember, if you are accessing the connected temporary data file, you need to refresh the data if you want to see the most recent data readings.

Automatic time period selection

To save time when selecting date periods for the analysis tools, click the right mouse button on a reading entry to display the period selector menu. The date and time for the reading entry can be used to automatically set the time period for one or more of the analysis tools. The following menu options are available:

- From Date – All.
- From Date – Data.
- From Date – Data Graph.
- From Date – Analysis.
- To Date – All.
- To Date – Data.
- To Date – Data Graph.
- To Date – Analysis.

The “From” menu items uses the selected reading time for, example 01/01/2008 10:10:00, and sets the “From” time for the selected tool. If the “All” option is selected all analysis “From” periods will be updated with the new time period. Likewise, if the one of the “To” menu items is selected, the “To” time period will be updated for the selected tool.

One way of using this feature is to select a wide sample period in the data viewer to review and locate a smaller sample period for further analysis. Once the new sample period has been found, the time period for the other analysis tools can be easily set.

Data Viewer Form

Double click on a reading entry to open the Data Viewer Form. The form displays the parameter readings in rows rather than columns for easy viewing. Parameters are colour code. Use the Previous and Next buttons to navigate to different reading entries.

Export Data

The Export button becomes available after the records are displayed. To export data click the Export button to display the Export form. The following export formats are supported.

- XML.
- CSV (Comma Separate Values).
- SQL Insert statement (Data + Table Structure).
- SQL Insert statement (Data only).

Other export formats may be added in future versions.

In the Export form, select the format type and then choose whether to display the data on the screen or export to a new file on your computer.

The CSV delimiter is required for the CSV option. Data values will be separated according to this delimiter value.

All data is stored in the database as Unicode UTF-8 encoding. If you would like the data to be exported in a different encoding such as ASCII, use the encoding select box.

Click Export to export the data using the selected options or cancel to close the form.

Exporting large amounts of data to a file or to view on screen may cause problems for your computer depending on the available RAM and processor speed. Also, third party applications such as Excel will not be able to work with very large data sets.

Statistics

The Statistics button becomes available when the data grid has been populated. The statistics form displays a list of statistics applicable to the unit, parameter and time period selected. If a parameter column has been selected in the main data viewer, the unit parameter will be automatically selected from the parameter list box in the statistics form.

Select parameters to view the statistics. A price factor option is available when viewing counter type parameters such as KW usage to calculate estimated costs for the period selected.

Delete Data

Records can be deleted from any historical data file by using the Delete record button. If you are connected directly with the reading database or using a historical data file the delete button will be visible.

If necessary you should change the database selection option so the delete button becomes available. Before deleting records you should stop the reading process if active.

To delete a group of records select a time period using the manual period selectors or reduce the selected records to the required period using the automatic date selector menu.

When the Delete button is clicked all records shown for the selected period will be deleted. After deletion you will be given the option to compact the data file.

Data Analysis Module - Plotter

The plotter tool provides a quick way to graphically display raw data for a specific unit and parameter.

Using the Plotter Tool

Only one parameter can be displayed at a time.

The Plotter is similar in design to the Data Viewer in that only the records required for the viewable area are displayed. This means that longer duration periods can be selected without having to load all the records into the graph in one go.

The Plotter is useful for scrolling through periods and view trends in parameter values or identify spikes.

On the X axis, a period of 1 minute represents 1 pixel in width. If data readings have intervals of less than 1 minute, readings will appear more concentrated on the Plotter

The Y axis scale is calculated automatically depending on the range of values returned from the database.

To use the data graph tool make sure a database and unit has been selected.

Select the date period you require and then a parameter from the parameter list. The parameter list will change depending on the unit model selected. If no parameter is selected a warning message will be displayed.

Click Display to draw the graph

If the number of records has exceeded the data query limit set in the Configuration Module, a warning message will be displayed.

Use the horizontal scroll bar to scroll through the data sample. Two vertical blue lines will mark the actual start and end for the selected period.

Using the green vertical pointer (data guide line), you can move from left to right to display the reading values in the value box located in the top right of the graph area. The value box has up/down buttons to also move through the values. The green pointer position is updated automatically when the up/down value buttons are pressed. If no readings are available the value box will display "No Data".

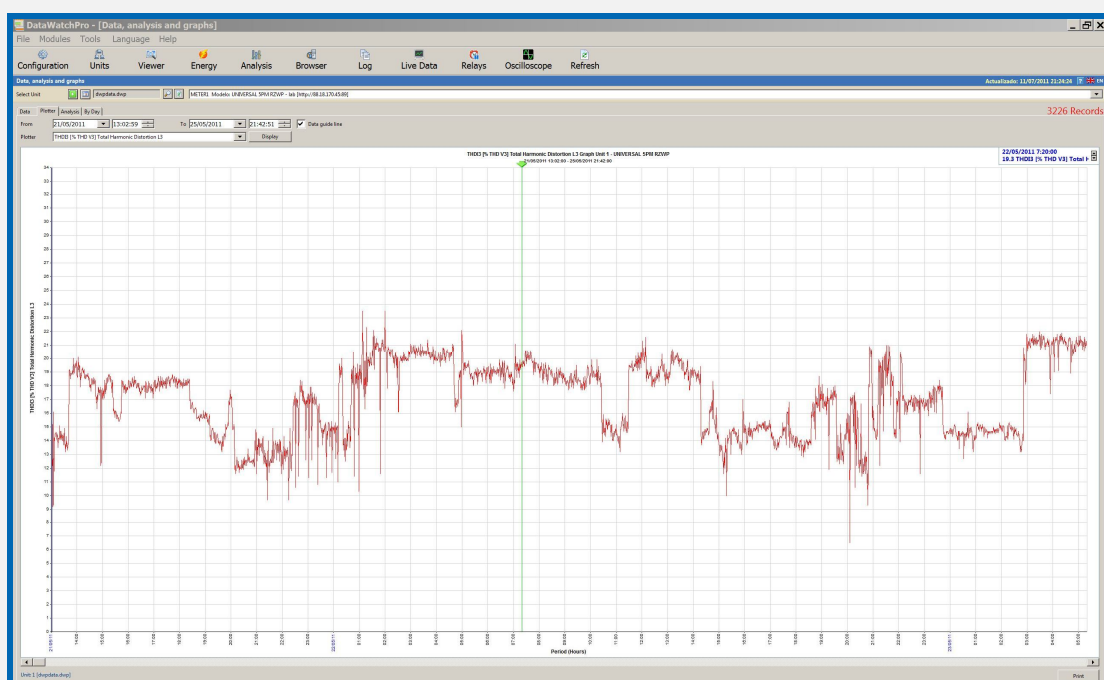
You can hide the data guide line by removing the tick from the data guide check box.

Automatic time period selection

The Data Graph has access to the automatic period selector menu (right mouse click), so time periods can be selected using the period selector for use in the other analysis tools. Refer to the Data Viewer section for instructions on how to use the period selector menu.

Printing

When the graph has been displayed, the Print button becomes available. Click the Print button to print the current graph view. The print function only prints the viewable graph area and not the full period selected.



Data Analysis Module - Graphical Analysis Tool

The Graphical Analysis Tool uses advanced computer programming techniques to provide the user with a range of functions for graphical data analysis.

To use the Graphical Analysis Tool, first select a database and unit.

This section describes the following features:

- Graph drawing area.
- Graph setup form.
- Options Panel.
- Creating graphs.
- Automatic Period Selection.
- Averaging data.
- Using Filters.
- Scaling.
- Offsets.
- Mathematical Operations.
- Statistics.
- Graph Data Viewer.
- Saving Graphs.
- Printing Graphs.

Graph Drawing Area

The graph drawing area consists of an outer border and an inner drawing area. Both left and right Y-axes are available (Y and Y2) for displaying the parameter reading values.

A maximum of six parameters can be displayed within the graph drawing area, up to 3 on the Y-axis and 3 on the Y2-axis.

Different parameters will be available depending on the unit model selected.

The X-axis always displays the date time value for a reading.

The title and legend boxes can be repositioned manually by dragging them to another location. This is useful when the legend or title are positioned over graph nodes and you want to change the location for printing or saving.

Most aspects of the graph drawing area can be tailored using the options available in the graph setup form.

Graph Setup Form

Click the Setup button below the graph drawing area to display the Setup form. The graph styles will initially be set to the default settings.

The following setup options are available for the main graph drawing area.

- Show legend (hides or displays the graph legend).
- Show title (hides or displays the graph title).
- Background effect (this activates a colour gradient effect for the inner area background).
- Y Number format (applies different formats to the Y values, default is one decimal place).
- Y2 Number format (applies different formats to the Y2 values).
- Vertical Grid (hides or displays a vertical dotted grid line).
- Horizontal Grid (hides or displays a horizontal dotted grid line).
- Print background (if there is a coloured background you can decide to print the background or not).
- Colour outer rim (this is the colour of the graph outer area).
- Colour inner area (this is the colour of the inner graph area).
- Grid line and axis colour (this sets the colour of the axis lines and grid lines if applicable).
- Background effect (if the background effect is selected you can control the level of colour gradient to be applied using the slider control).
- General node size (set the size of the individual nodes to between 0 and 100 pixels).

- The following options are available for the individual parameter graph lines and nodes. The select box lists the Y axis lines available (Y1, Y2, Y3, Y21, Y22, Y23). To change the format of a line or node click on one of the Y axes to view the current format settings.
- Line colour.
- Node colour.
- Line style.
- Node style.

Save the setting changes using the Save button. If a graph is currently displayed, the graph will be updated automatically with the new styles. If no graph is available, the settings will apply next time a graph is created.

When changing the background colour of the inner graph area to black, it is important to note that the marker rectangle, which is used to select date ranges, is black and the colour cannot be changed. We recommend that a dark grey colour is used rather than black for the background so the black marker rectangle remains visible.

To reset the styles to the default settings click Default.

Options Panel

The Options Panel, to the left of the graph drawing area, contains various functions and settings to manipulate and interpret the graphs you create. Some settings are required before you can create the graph such as the selection of the Y-axis parameters and the period for the graph; other settings are applied directly to the graph dynamically without having to refresh the graph data.

The Option Panel can be hidden by clicking the green arrow in the top right corner. To open the panel again, click the green arrow button again. The graph drawing area will be automatically resized to accommodate the new dimensions.

The following settings are available from the Options Panel:

- Period From.
- Period To.
- Average.
- Y – Axis Selection Y1, Y2, Y3 (select the parameters for the right Y axis).
- Y2 – Axis Selection Y21, Y22, Y23 (select the parameters for the Y2 axis).
- Filters with select and value box.
- Scaling options for both Y axes.
- Offset for the Y1, Y2, Y3 axes with reset button.
- Mathematical operations between two axes.
- Hide selected lines.
- Fill area under curve option for a selected line.
- Show line best fit trend for a selected line.
- Convert line graph to bar graph option for a selected line.

Creating Graphs

To create a graph, first ensure the database and unit are selected. When the unit model is selected from the list the Options Panel is automatically activated.

Select a From and To date and time manually or use the automatic period selector in the other analysis tools.

Select at least one Y-axis parameter to create your graph. A warning message will appear if you try to display a graph with no parameters.

Click the Display button to draw your graph.

If the number of nodes has exceeded the data analysis graph limit set in the Configuration Module, a warning message will be displayed.

The number of readings found will be displayed in the top right corner of the screen.

To refresh the graph click the display button again.

If you hover over any of the nodes, the node value and date and time of the reading will be displayed. You can also click on a node to open the Node Details Form to display information about the selected node. The form also includes an option to change the colour of individual nodes. The node colours will reset to the default node colour when the graph is refreshed.

Automatic Period Selecting (zoom mode within graph)

If the graph has too many nodes, it may be difficult to interpret the data. To help define different time periods quickly, you can use the mouse to select a period within the graph area. First position the mouse cursor where you want the new period to start and then drag the mouse to the left in the form of a rectangle selecting an area within the rectangle. When the mouse button is released a message is displayed requesting confirmation to change the sample period to the new dates and times. Select OK and the graph will be updated.

Averaging Data

The analysis tool includes options to average the data within a period.

- Month (31 days).
- Week (7 days).
- 24 hours.
- 12 hours.
- Hour.
- Minute.

The “From” and “To” period will determine which averaging options are displayed in the list. For longer sample periods, for example, the hours and minute average options are not available due to the large number of calculations required.

When averaging, the system will look at the global period between the “From” and “To” date and divide the period into the averaging “periods”. For example if the global period equates to 5 days and the 24 hour averaging option is selected, the period would be split into 5 x 24 hour periods. The system would then make 5 separation calculations and work out the average reading values for each parameter selected during each of the 5 periods. So, if there are 1000 readings in the first 24 hour period and the total sum for the voltage parameter is 238000, the average value for this first period would be $238000/1000=238$ V. The first node would be drawn with a value of 238 V.

The averaging option must be selected before the graph is created.

Using Filters

There are several filters included in the Options Panel. The filters require a filter value to work correctly.

- Values greater than (finds values greater than the filter value).
- Values less than (finds values less than the filter value).
- Average readings over period (simple average calculation using the filter value e.g. if the filter value is 10 then the system will find the average for each set of 10 readings).
- Every Nth reading (e.g. if the filter value is 10 then the system will extract every 10 reading during the period selected).
- Multiply values by (multiply the parameter reading value by the filter value).
- Divide values by (divide the parameter reading value by the filter value).
- Add to each value (add the filter value to the parameter reading value).

The filter option must be selected before the graph is created.

Filters cannot work at the same time as the period averaging. When the averaging feature is activated the filter options will be automatically cancelled and vice versa.

Scaling

Automatic scaling for both the Y-axes is the default action when creating graphs. To turn the automatic scaling off for one or both of the Y axes you need to uncheck the “autosize” option in the scaling section.

Once the autosize option has been deactivated, the Max and Min scale values are enabled for manual scaling. The current scale values are automatically added to the Max and Min value boxes. Use the up and down arrows to modify the values to change the scaling.

Manual scaling can only be performed on a graph, which has been created already. Each time the scaling is adjusted, the graph will be dynamically adjusted.

When the graph is refreshed, the scaling will default back to automatic scaling.

Offsets

The offset tool allows the user to move the Y1, Y2 or Y3 graph lines up and down with the offset slider controls. Initially each offset slider is positioned in the centre position (zero offset). Only the axes included on the graph will have their offset sliders enabled.

To change the offset for a graph, move the associated axis slider up or down to reposition the graph curve.

Changing the offset positions can only be performed on a graph, which has been created already. Each time the offsets are adjusted, the graph will be dynamically adjusted.

When the graph is refreshed, the offsets will be automatically reset to zero.

Mathematical Operations

The mathematical operations tool is activated when there are two or more graph lines available. The mathematical functions require two sets of parameter values to perform the calculation. If the calculation is to be performed on one set of values the Filter Tool should be used.

The following settings are available:

- Axis 1 (the first parameter reading values for the calculation).
- Mathematical Operator (Supported operators: Multiply, Divide, Add and Subtract).
- Axis 2 (the second parameter reading values for the calculation).
- Additional Mathematical Operator (Optional).
- Value input box (Optional).

To use the mathematical operator tool, select Axis 1 and Axis 2 from the available list. The system will initially select the first and second parameter axis for convenience.

Next, select one of the mathematical operators. For example you may have a graph with VL1 and VL2 and you would like to see the result if you multiply the two parameter values ($VL1 \times VL2 = \text{Result}$).

Click the Calculate Graph link to draw the results.

For this example, the system will take the two parameter values for each reading and multiply them together to create a new graph line with the results. For example if the first reading value for VL1 is 200V and the reading value for VL2 is 300V, the first node for the calculated graph would be 60000 Volts. The two original graph lines will be removed from the graph to accommodate the new calculated line and ensure the automatic scaling can accommodate the graph.

Calculations can only be performed once. To perform another calculation the graph should be refreshed by pressing the Display button. A warning message will appear to remind you to refresh the graph. Once refreshed, the graph will return to the original values prior to the calculation. If the Calculate Graph link is used again after a calculation has been performed, a warning message will appear to remind you to refresh the graph.

The mathematical operations tool has two further optional settings to refine the calculation, a second mathematical operator and a value box. This allows you to perform a further calculation on the first result. If we take the example $VL1 \times VL2$ values and select the Divide for the second operator and 10 for the value box the calculation would become $(VL1 \times VL2) / 10$. Using the above example the first node value would be $(200 \times 300) / 10 = 6000$.

Using the second mathematical operator is useful for manipulating the results to ensure the scaling is within the ranges for other parameters, which may be displayed on the graph but not included in the calculation. For example, you could create a graph for VL1, VL2 and VL3, then create a calculated combining VL1, VL2 and see the results as compared with VL3.

The calculation operations can only be performed on a graph, which has been created already.

Statistics Button

The statistics button, located below the graph drawing area, becomes available after the graph has been created.

The statistics form displays a list of statistics applicable to the unit, parameter and time period selected. The parameter select list will match the parameters included in the graph.

A price factor option is available when viewing counter type parameters such as KW usage to calculate estimated costs for the period selected.

Various graphical statistics have been included such as slope, correlation, intercept, regression coefficient and T-Test

Graph Data Viewer Button

The Data button, located below the graph drawing area, becomes available after the graph has been created.

The graph data viewer displays the values for the graph nodes used to create the current graph.

Saving Graph Button

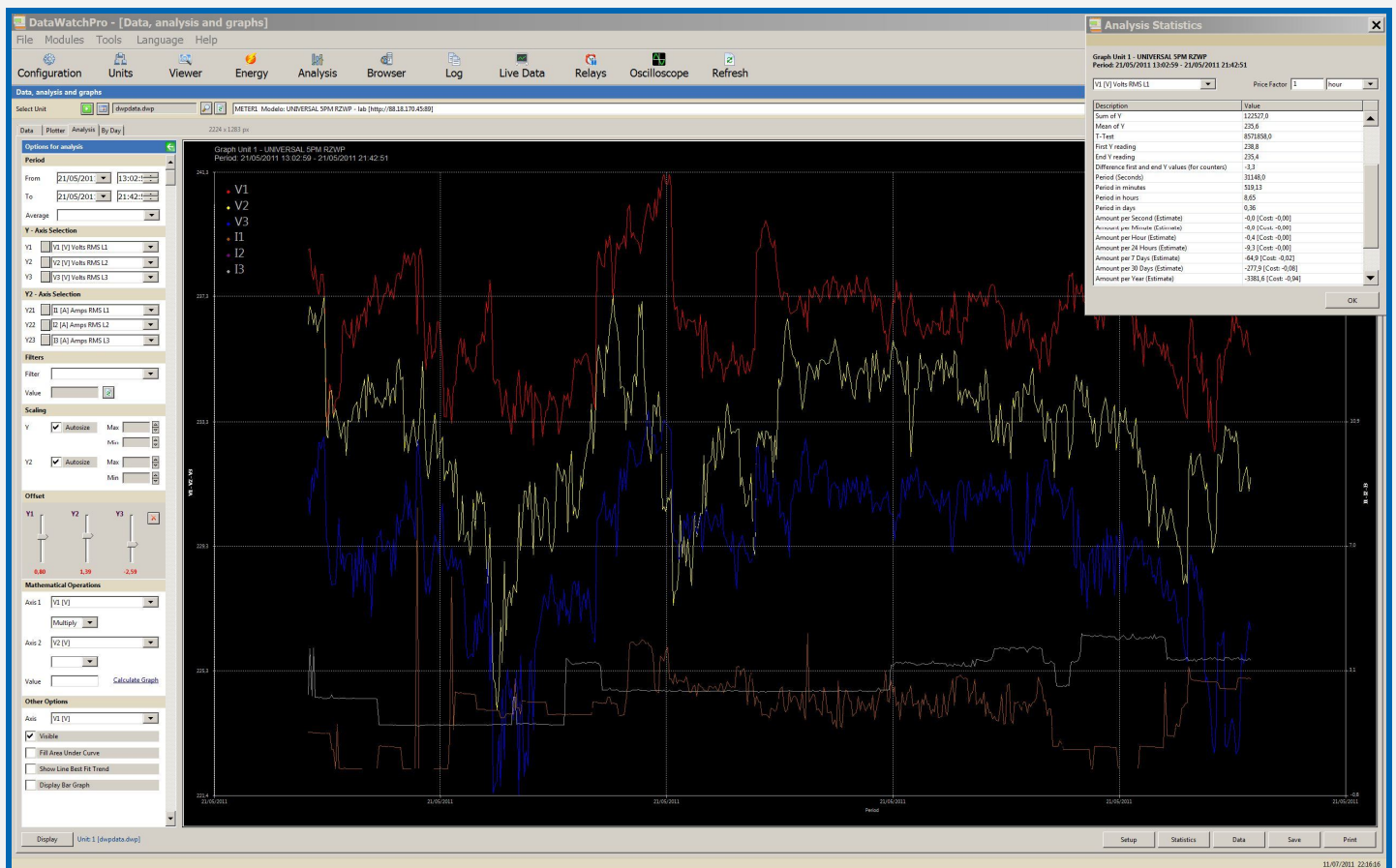
The Save button, located below the graph drawing area, becomes available after the graph has been created.

Click the Save button to create an image file of the current graph on your computer. Supported image formats are BMP, JPG, GIF and PNG. The availability of these formats will depend on your version of Windows operating system.

The save process will create an image with dimensions according to the actual screen pixel size. If you want to make the graph image smaller or larger you can resize the Datawatch Pro screen. The dimensions for the graph will appear at the top of the graph drawing area in pixels.

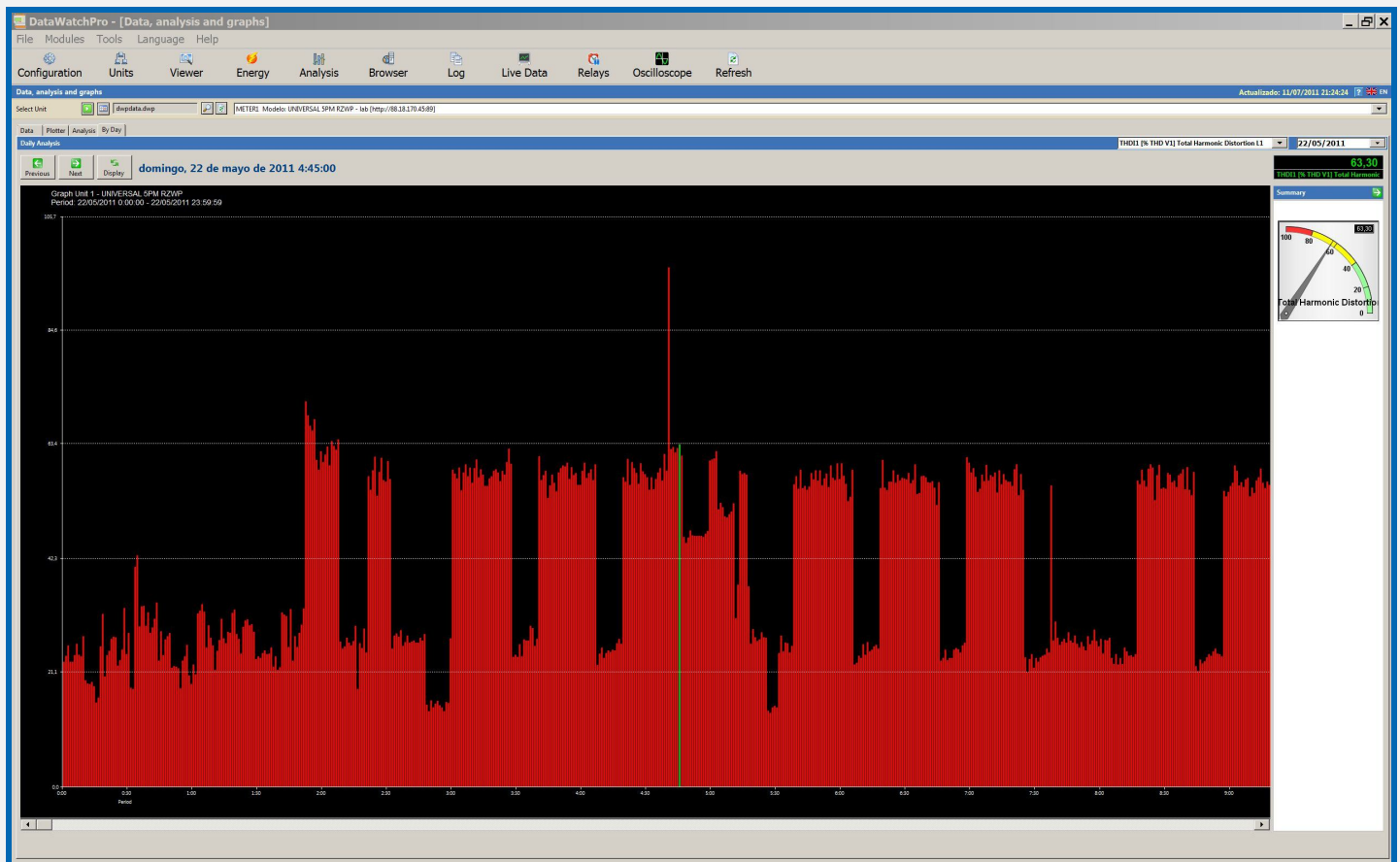
Printing Graph Button

The Print button, located below the graph drawing area, becomes available after the graph has been created. Click the Print button to print the current graph view.



Data Analysis Module - By Day Tab

The By Day analysis tool allows you to navigate data in blocks of 24 hour. Each day displays a bar graph corresponding to the readings available. Each bar corresponds to the reading at the selected time. If there were no readings for a time period no bars will be shown. To use the By Day tool, first select the unit from the unit list, and then the parameter you would like to display. To move between days you can either select the date selector or use the Previous and Next navigation buttons. After selecting the day you may need to select the Display button. The day and time selected is displayed in the module heading. Use the horizontal scroll bar to navigate to the desired time in the 24 hour period. Select a reading on the graph with the mouse to display the selected reading value. Selected bars will be highlighted in green.



Browser Module

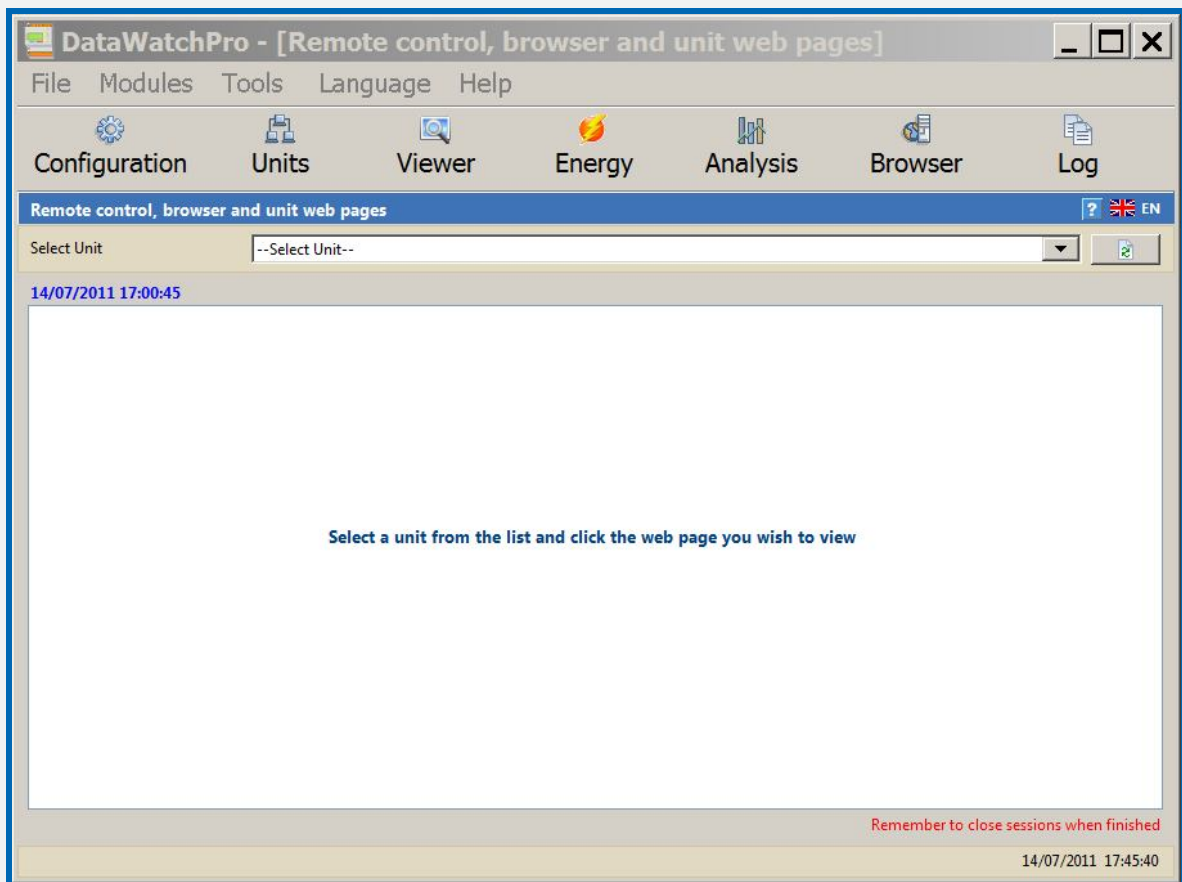
This module includes an integrated internet browser to communicate with selected units directly and perform remote control operations.

The integrated internet browser includes some of the base components of the default Windows Internet Explorer including the right contextual menu for performing various operations such as printing.

To use the browser module you need to make sure the unit is connected to the LAN or the Internet. Select a unit from the unit list and the unit's home page will appear.

If high speed reading is in progress the browser will be disabled to reduce the possibility of a conflict between the remote control system communicating with the unit's web server at the same time as the data reader is accessing the web server to read data.

When connecting to the unit directly, the system automatically opens a session for the unit device using the login details and password provided in the Units Module.



Browser Module - Viewing Web Pages

When the unit is initially selected, the Home page for the unit will appear in the viewer.

To navigate the device's web pages use the links that appear on each page.

The date and time a page is accessed will be displayed in the top right corner of the screen.

For information about using the device browser screen to change the unit settings such as IP Address, password and port, refer to the User Manual for the unit model.

When you have finished using the browser, we recommend using the Close Session link.

Measures & records	Input/output status	Relays manual control
Relay configuration	Relay timers	Time programmer
Unit configuration	Access configuration	Close session

[Consult manual](#)

Unit information (V1.1 Apr 24 2013)

Date - Hour:	Tuesday 21/01/14 20:16h
Motor position:	ON
Alarm status:	No Alarm
Current status:	OK. Power ON Wednesday 15/01/14 13:05h
Latest alarm:	Failure, energy Vac Wednesday 15/01/14 12:54h
Latest cut-off:	Pk Differential Intensity 198.2mA Tuesday 31/12/13 14:02h

PIN

Measurements

RMS voltage	Pk voltage	Voltage between phases	Frequency
V L1 = 235.14	VPk L1 = 328.54	V L12 = 409.17	Hz L1 = 50.0
V L2 = 238.67	VPk L2 = 334.05	V L23 = 404.99	Hz L2 = 50.0
V L3 = 230.93	VPk L3 = 323.19	V L31 = 406.30	Hz L3 = 50.0
RMS intensity	Pk intensity	Neutral intensity	RMS and Pk differential intensity
A L1 = 3.10	APk L1 = 5.82	A LN = 2.32	mA = 146.9
A L2 = 0.91	APk L2 = 1.55		mAPk = 218.2
A L3 = 2.16	APk L3 = 3.24		
Voltage off balance	THD voltage	Intensity off balance	THD intensity
% L1 = +0.0	% L1 = 1.1	% L1 = +51.2	% L1 = 31.0
% L2 = +1.6	% L2 = 1.1	% L2 = +55.6	% L2 = 16.5
% L3 = +1.6	% L3 = 1.2	% L3 = +5.3	% L3 = 14.8
Voltage crest factor	Intensity crest factor	Impedance	Temperature and Humidity
L1 = 1.397	L1 = 1.876	Z L1 = 75.85	%C = -.-
L2 = 1.399	L2 = 1.705	Z L2 = 262.27	%RH = -.-
L3 = 1.399	L3 = 1.496	Z L3 = 106.91	
Apparent Power	Active power	Requested Power	Returned Power
VA L1 = 730.3	W L1 = +692.4	W+ L1 = 692.4	W- L1 = 0.0
VA L2 = 218.0	W L2 = +214.1	W+ L2 = 214.1	W- L2 = 0.0
VA L3 = 500.1	W L3 = +487.0	W+ L3 = 487.1	W- L3 = 0.0
Σ L123 = 1448.4	Σ L123 = 1393.5	Σ L123 = 1393.6	Σ L123 = 0.0
Inductive reactive power	Capacitive reactive power	Power factor	
VARL L1 = 195.7	VARC L1 = 36.3	PF L1 = 0.947	
VARL L2 = 41.3	VARC L2 = 0.0	PF L2 = 0.981	
VARL L3 = 39.0	VARC L3 = 74.2	PF L3 = 0.973	
Σ L123 = 276.0	Σ L123 = 110.5		

System Event Log Module

The System Log, records important system events as they happen.

Because the data reader is likely to run continually for long periods of time and probably left unattended, error messages and other notifications such as alarms are managed internally by the system event manager. For data reading, it would not be feasible to flag errors in the traditional way by displaying a popup user message, as these messages usually require a response from the user such as clicking the OK button. This type of popup error message also can interrupt the software application until the user has clicked the OK button.

If an error or controlled event occurs, the error details will be entered automatically into the system log without the reading process being interrupted. The user can consult the System Log as required to see if any errors have occurred while DatawatchPro has been taking readings while unattended.

DatawatchPro has been designed to ensure that the data reading process can operate autonomously unattended. However, it is possible that other factors such as actions by the computer's operating system, internal error or other computer programmes running on the computer could interrupt the reading process and stop DatawatchPro from running. We recommend that DatawatchPro is checked regularly to ensure the programme is operating correctly.

System Event Log - Event Listing

The System Log displays the following information:

- Log ID (unique reference number for the event).
- Type (type of event to give an indication of where the event was registered within DatawatchPro).
- Event Description.
- Unit (unit ID number).
- Unit Name.
- Date.
- Time.

Historial de Eventos del Sistema - Tipos de Eventos

The event types are:

- System (a system wide error has occurred).
- Reader (starting and stopping the data reader for example).
- Database (errors relating to the database such as an error when saving a reading).
- Alarm (an alarm notification is logged).
- Relay (an alarm notification is logged for a relay or relays).
- Internet (errors relating to the internet including problems when connecting to a unit).

System Event Log - Save Log

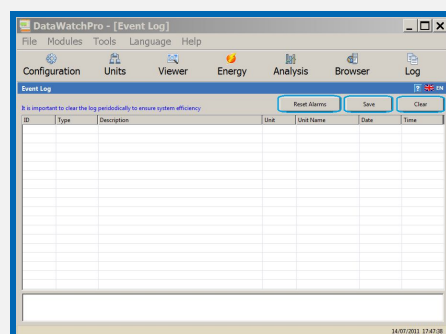
At any time the event listing can be saved to file by clicking the Save button. The event listing is saved as a standard text file (.txt).

System Event Log - Delete Log

Click the Clear button to delete the items in the list. A warning message will appear before deletion to request confirmation and give you the option to save the list to file.

System Event Log - Reset Alarms Button

The reset alarms button resets the reading alarm counters for all units. The alarm counters are part of the reading process such as how many alerts have been added to the event log and the amount of times a specific alarm has been triggered if the ignore alarms option is used. For more information refer to the Configuration Module and Alarm Management.



Live Data Monitor

The Live Data Monitor allows the user to view selected unit data readings as the data comes in. The following features are included:

- Up to six different parameters can be configured and monitored.
- Automatic scaling of values.
- Each parameter value is shown in a different colour.
- Switch between single combined and multi graph view.
- Offset and other tools included in the multi graph view.
- Setup form to configure and change the look of the monitor screens.
- Reset button.
- Last reading date and time.
- Next reading count down clock.

The Live Data Module will operate only when the data reader is switched on. If the data reader is not reading, the module is automatically disabled.

To view live data for a unit, you must first select the unit from the list at the top of the screen. If the unit is not currently reading a warning message will be displayed. If the unit is connected and is being read, the graph viewer will be activated and display the live data.

It is not possible to view all the data readings for all units at the same time so the system stores unit data readings for the parameters in memory. This means that when you switch between units to view the live data a certain number of readings are still available. The minimum number of readings held in memory per unit can be set between 100 and 2000 and depends to some degree on the resolution of your screen and the availability of system RAM. The width of each reading is one pixel. The number of readings per unit can be adjusted in the Configuration Module (data analysis tab). The default limit is set at 300 readings.

To save system resources while DatawatchPro is left unattended for long periods, you can switch off the Live Data Module in the Configuration Module (General tab).

The Live Data Module has two viewing modes:



Multi graph view (displays the six parameters in separate graphs).



Single combined graph (displays all six parameters on one graph).

The view mode button (see images above), to switch between the views, is located in the top left of the data monitor screen.

Click the reset button to delete all live data entries and clear the graphs. The reset function does not affect the historical data saved in the database.

Live Data Monitor - Setup

Before using the monitor, the configuration settings need to be adjusted depending on your requirements. To open the setup form, click the Settings button located in the top right corner of the screen.

There are two setting tabs available

- Parameters
- Other

Changes can only be made to the live data settings when the Data Reader is not running.

Parameters

Six parameters can be selected. Certain parameters such as Max Min Alarms and counters have been excluded from the parameter list.

The initial default parameters need to be reviewed depending on your specific requirements.

The parameter selection can be changed at any time.

Other Settings

The other settings are not model type specific and include:

- Display multi graph view at startup (default)
- Display combined graph at startup
- Graph grid colour (default colour green)
- Curve tension

Default Settings

If the Default button is used ALL settings for the live data monitor are set to their initial default values. Resetting the default values will cause the existing parameter values stored in memory to be reset. This operation is only available when the system is not taking a reading.

Save Settings

Use the Save button to save any changes you have made to the settings. Saving will cause the existing parameter values stored in memory to be reset. The save operation is only available when the system is not taking a reading.

The image displays two side-by-side screenshots of the 'Live Data Settings' dialog box. Both windows have a title bar with a close button (X) and a description: 'The Live Data Viewer allows you to view data as it is read for six different parameters per model. Use this form to change the parameters.'

The left screenshot shows the 'Parameters' tab selected. It contains a section titled 'Define Parameters' with six dropdown menus labeled Parameter 1 through Parameter 6. The selected values are: V1 [V] Volts RMS L1, V2 [V] Volts RMS L2, V3 [V] Volts RMS L3, I1 [A] Amps RMS L1, I2 [A] Amps RMS L2, and I3 [A] Amps RMS L3. At the bottom are buttons for 'Default', 'Cancel', and 'Save'.

The right screenshot shows the 'Other' tab selected. It contains a section titled 'Other Settings'. The first option is 'Display multi graph view at startup (default)' with a radio button that is selected. Below it is a color selection for 'Graph grid colour', showing a green square. At the bottom are buttons for 'Default', 'Cancel', and 'Save'.

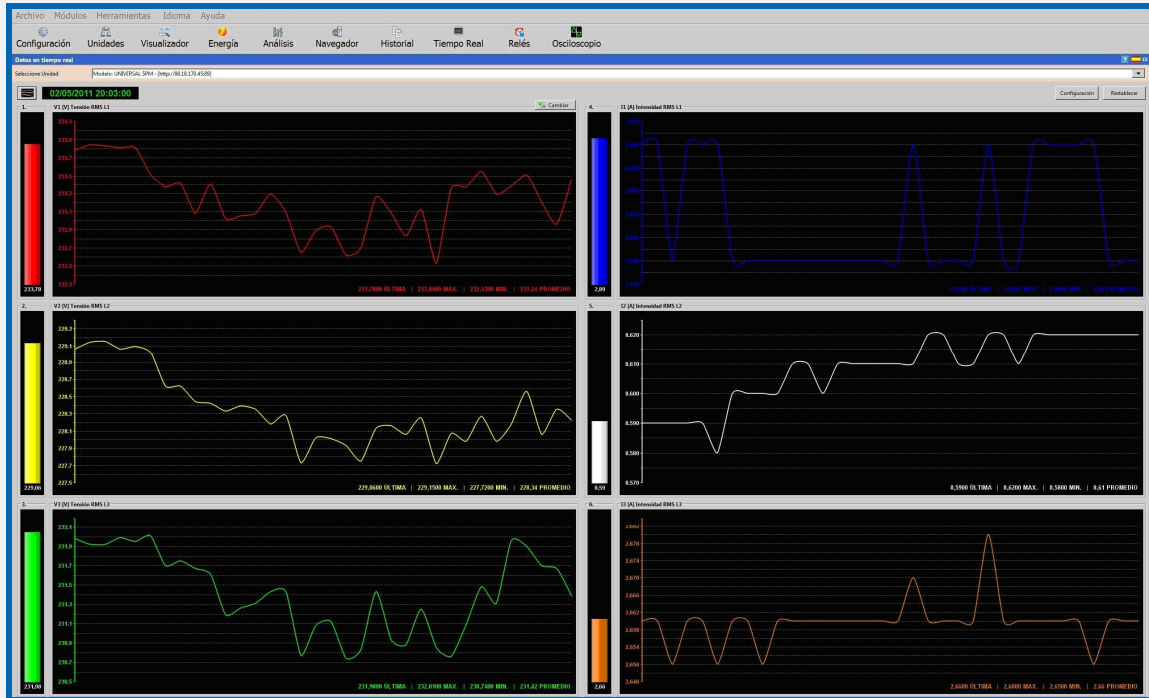
Live Data Monitor - Multi Graph View

This is the default view and displays the six chosen parameter values in separate graphs.

Each parameter graph includes a simple bar chart to the left with the last reading value.

Click on any of the graphs to view the Parameter Data Viewer form with the parameter reading values.

The screen shot below shows a typical live data view using the multi graph option.



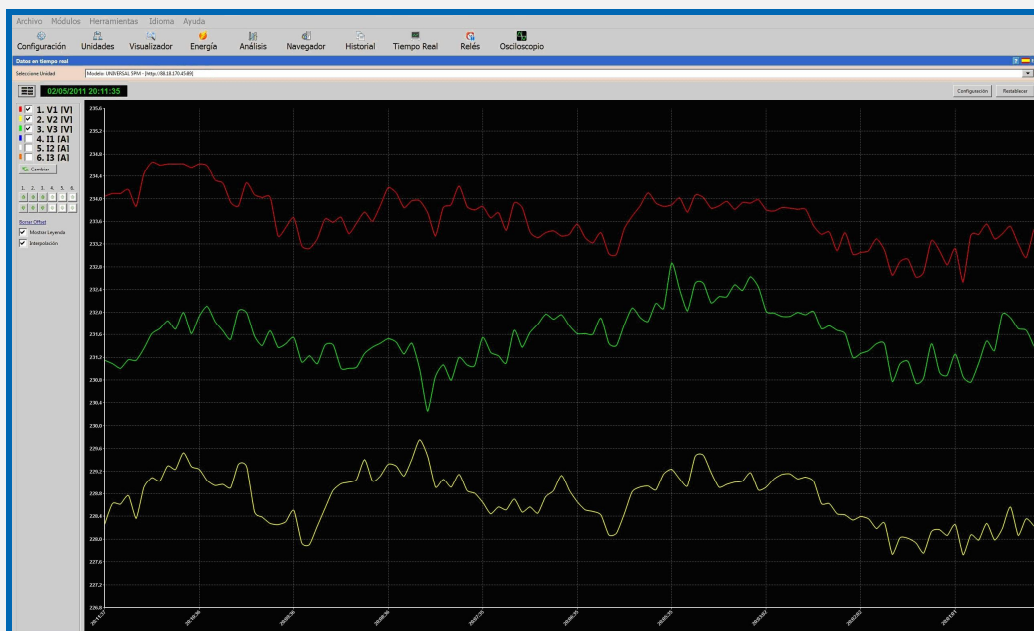
Live Data Monitor - Combined Graph View

The combined graph option displays all six parameters for a unit on one graph. The initial maximum and minimum scale values are defined in the setup form.

There are six offset slider bars to move the parameter value graphs up or down as required. To reset the offset values to zero click the Clear Offsets link.

Click on any of the graphs to view the Parameter Data Viewer form with the parameter reading values.

The screen shot below shows a typical live data view using the combined graph. Offsets have been used to separate out the parameter readings.



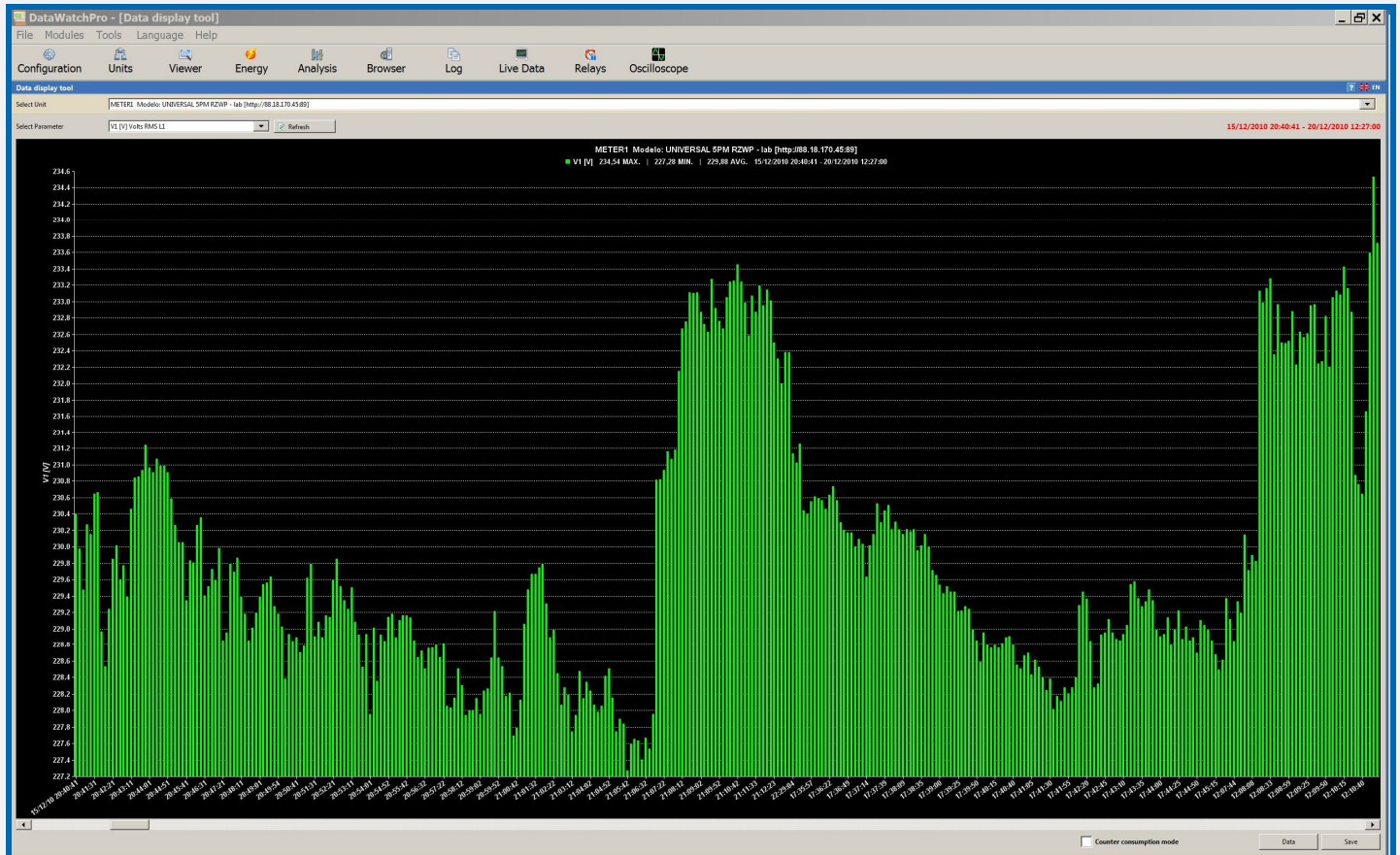
Live Data Monitor - Data Viewer

The Parameter Data Viewer can be accessed by clicking on a live data graph. The form displays the list of live data readings.

Select parameters to view the readings values in memory.

If a graph is clicked in the multi graph view the form will open with the parameter already selected.

The parameter value list has the Automatic Period Selector menu to select date periods for the Analysis Tools. See the Data Analysis Module for more information on the Automatic Period Selector.



Relay Manager Module

The relay manager provides a number of tools to switch ON and OFF relays for the unit devices either manually or automatically using the hourly programming tools alarms while taking data readings. Before using the relay tools please read the contents of these sections and ensure you understood the data reading process. Please note that the relay tools should only be used with device units, which are equipped with the optional Relay Module. Please contact your local distributor for more details about the Relay Module.

- Relay manual control
- Hourly programming (basic and advance relay programming)
- Copy relay alarm settings from one unit to another

Relay Manager Module - Manual Control Tab

The relay manual control tool allows you to manually receive the relay status for a unit and switch ON and OFF relays as required. To use the manual control you need to add a connected unit to DataWatchPro and select the unit in the relay manager. Care should be taken when using the manual control tool to ensure manual changes are not made at the same time a data reading is taking place. When attempting to connect to the unit a message will be displayed if a reading is taking place.

Receiving the relay status

After selecting the unit to read from the drop down menu, press the Receive Button to read the relay status for the unit. DataWatchPro will attempt to connect to the unit to read the relay status. The status bar will be updated to show the progress of the reading and whether the reading was a success. Each relay for the unit will be updated to show the current status ON or OFF. The time of the last status check will be displayed in the top right of the screen.

Manually switching relays ON/OFF

To set one or more of the relays for a selected unit ON or OFF, you must first ensure all the relay ON/OFF select boxes are enabled. To enable the boxes first receive the actual relay status by pressing the Receive button. After the relay status has been established, set one or more of the relay ON/OFF boxes to the required setting. ON equals a value of 1 and OFF equals a value of 0. After setting the ON/OFF boxes press the "Send" button. DataWatchPro will then attempt to connect to the unit to make the required changes to the relay settings. The status bar will be updated to show the progress of the changes and whether changes were successful. The time of the last relay changes will be displayed in the top right of the screen.

Cancel

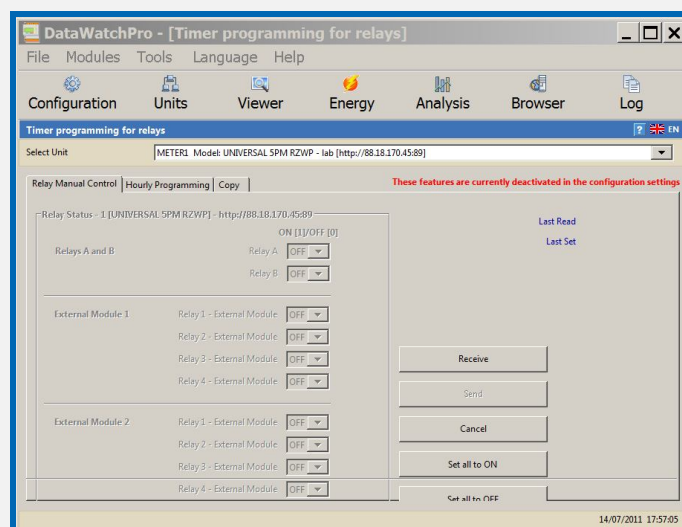
Use the cancel button to stop a relay status reading or relay setting change. The cancel instruction may not be immediate and you may have to wait a few seconds before the operation can be terminated.

Switch all to ON button

Use this button to set all the relays to the ON (1) position. You need to use the Send button to make the actual setting changes.

Switch all to OFF button

Use this button to set all the relays to the OFF(0) position. You need to use the Send button to make the actual setting changes.



Relay Manager Module - Hourly Programming Tab

The hourly programmer is used to switch selected relays ON and OFF automatically while performing data readings.

It is important to note that when using the relay hourly programmer, the time to take each reading must include sufficient time to allow the data reading plus the time need to make possible changes to the relay ON/OFF settings for the unit. For example if the time taken to process a normal reading is 3 seconds then a 6 second total reading period may need to be used if the unit needs to be contacted again during the allowed reading period to change one or more relay settings. Before setting the reading period, a certain amount of testing is required to determine your particular circumstances such as speed of connection, time required to actually switch a relay ON or OFF and general reading time.

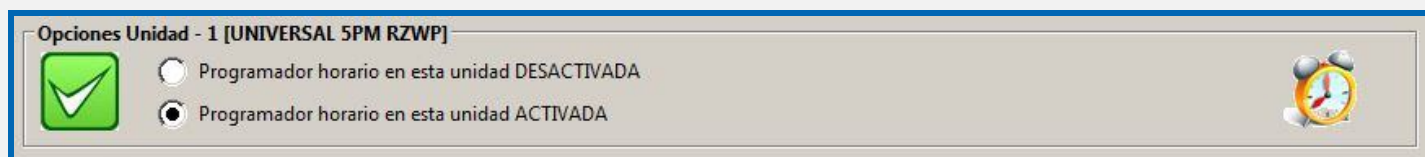
Getting Started (Hourly programming general activation/deactivation - applies to all units)

Before using the hourly programmer to change settings, we recommend you switch off the data readings in the Units Module. To activate the hourly programmer you need to first select the global Hourly Programming option in the Configuration Module (General Tab). This tells DataWatchPro to check the the hourly programming settings for each device during a data reading. If this option is not selected then all hourly programming settings for all units and relays will be ignored. When the global setting has not been selected a large red alert message will appear in the top right of the relay manager screen.

WARNING: The relay programming functions included in DataWatchPro should not be used for critical applications. When relay commands are sent to a unit this does not necessarily mean that the relay command has been accepted by the unit and actioned. The command may not actually arrive at the unit for a number of reasons including a problem with the internet connection, the reading process was not reading at the time, external factors outside the control of DataWatchPro, the internal computer clock is not correctly set, the configuration settings have not been set correctly in DataWatchPro, the reading period does not allow for sufficient time to change the relay before moving onto the next reading, intervals between readings are too large, unit currently unavailable, etc.... It should also be noted that the commands sent to a device will attempt to override current relay settings. For example if someone has manually set a relay to OFF then this may conflict with a relay programming command in DataWatchPro sending an ON command.

Activating/deactivating hourly programming for selected units

In the hourly programmer tab select the unit you want to programme from the main connected unit list. You can tell DataWatchPro to activate programming for this unit to ON or OFF. If programming is set to OFF then DataWatchPro will ignore all ON/OFF commands for all relays on this unit. If programming for the selected unit is set to ON, DataWatchPro will check to see if there are any commands set for the relays for the unit. The example shows that for the selected unit DataWatchPro will check for any programmed commands. As required you can turn the unit level option OFF at any time without having to change individual relay commands. When the unit level option is set to ON again the system will remember the commands for each relay. Press the Save button on the bottom right of the screen to save the setting.



Activating hourly programming for individual relays

For DataWatchPro to actually switch relays ON and OFF you must have the global and unit level hourly programming options both set to ON. If one or both of these levels is set to OFF, DataWatchPro will ignore any programmed commands you have set for the unit.

To programme ON/OFF commands first select a relay on the selected unit and then choose the desired programming option. There are three programming modes for each of the relays:

- Relay without programming.
- Basic relay programming ON/OFF (hourly).
- Advanced relay programming with alarms and parameters.

Relay without programming

This option tells DataWatchPro to ignore this particular unit relay. After selecting this option press the Save button on the bottom right of the screen to update the setting.

Basic relay programming ON/OFF (hourly)

This option tells DataWatchPro to turn the selected unit relay ON or OFF according to the hourly ON/OFF commands you have programmed. After selecting this option the list of hourly commands you have set is displayed. The list will be empty if you have not added any commands yet.

To add a new command press the Add New button to display the command form. You need to select the day of the week, start time and end time and whether the command is to set the relay ON or OFF. Press the Save button to add the new command to the list. The start and end time can cover a number of hours. For example if you have a command to set a relay to ON for the period 09:00 hrs to 11:59 hrs on Monday, each time DataWatchPro takes a reading during this time period a command will be sent to the unit to set the relay to ON (only if it is currently set to OFF).

To edit a command for the relay, double click on the command entry and edit the form. You can also delete a command by opening the command in edit mode and pressing the Delete button.

Each time a data reading is taken and a set command coincides with a programmed time period, DataWatchPro will check to see if the current relay setting matches with the programmed command. If it does not, a command will be sent to the unit.

Advanced relay programming with alarms and parameters

This option tells DataWatchPro to turn the selected unit relay ON or OFF according to the hourly ON/OFF commands and to specific parameter values you have set. After selecting this option the list of hourly commands you have set for this option is displayed. The list will be empty if you have not added any commands yet.

To add a new command press the Add New button to display the command form. For the advanced relay programming the following information is required:

- Day of week.
- Start time.
- End time.
- Parameter you wish to monitor.
- Alarm value for the selected parameter.
- Whether the command is to set the relay to ON or OFF.
- Alarm type (Maximum or Minimum).

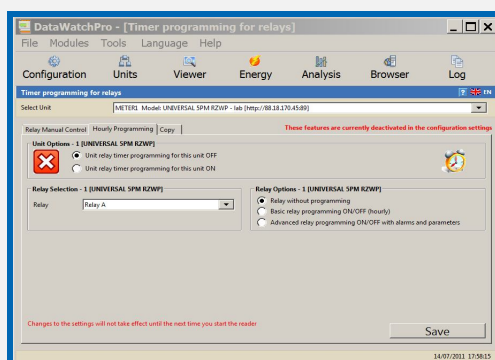
As an example you could set a command for Monday between 09:00 and 09:59 for DataWatchPro to switch the selected relay to ON if the voltage on V1 is equal to or goes above 235 Volts. Because the command will be detecting if the voltage goes above a value this would require the MAX option to be selected and 235 to be entered in the Alarm Value box. You will also need to select the V1 parameter from the parameter list. The MIN option would be used if you want to activate a command for values less than or equal to a chosen value.

Press the Save button to add the new command to the list.

For the advanced option, the default setting for detecting an trigger parameter value is one reading. To ignore the first trigger value for a command you can select the "Require two verification readings before alarm activation". Care should taken when ignoring trigger values because if the readings are taken at long intervals it maybe the case that only one reading is taken in a command period and the second verification reading takes place outside the required period and no relay command is sent.

To edit a command for the relay, double click on the command entry and edit the form. You can also delete a command by opening the command in edit mode and pressing the Delete button.

Each time a data reading is taken and a set command coincides with a programmed time period, DataWatchPro will check to see if the current relay setting matches with the programmed command. If it does not, a command will be sent to the unit. For example if the programming command determines that the relay should be set to ON and current reading shows the relay is currently set to ON, no command will be sent.



Oscilloscope Module

The oscilloscope provides a range of different tools to analyse wave forms from the connected units. Key features include:

- Wave manager to read and open previously saved wave forms
- Separate analysis screen
- 7 available channels
- Harmonic analysis
- Amplitude control
- Offset control
- Delay control
- Time/Division (ms/DIV) control
- Comprehensive configuration module
- Key measurements RMS, Peaks, THD%
- Access to full parameter data for the reading
- Save waves in different image formats
- Print waves in different sizes
- User friendly interface

Oscilloscope - Reading Waves

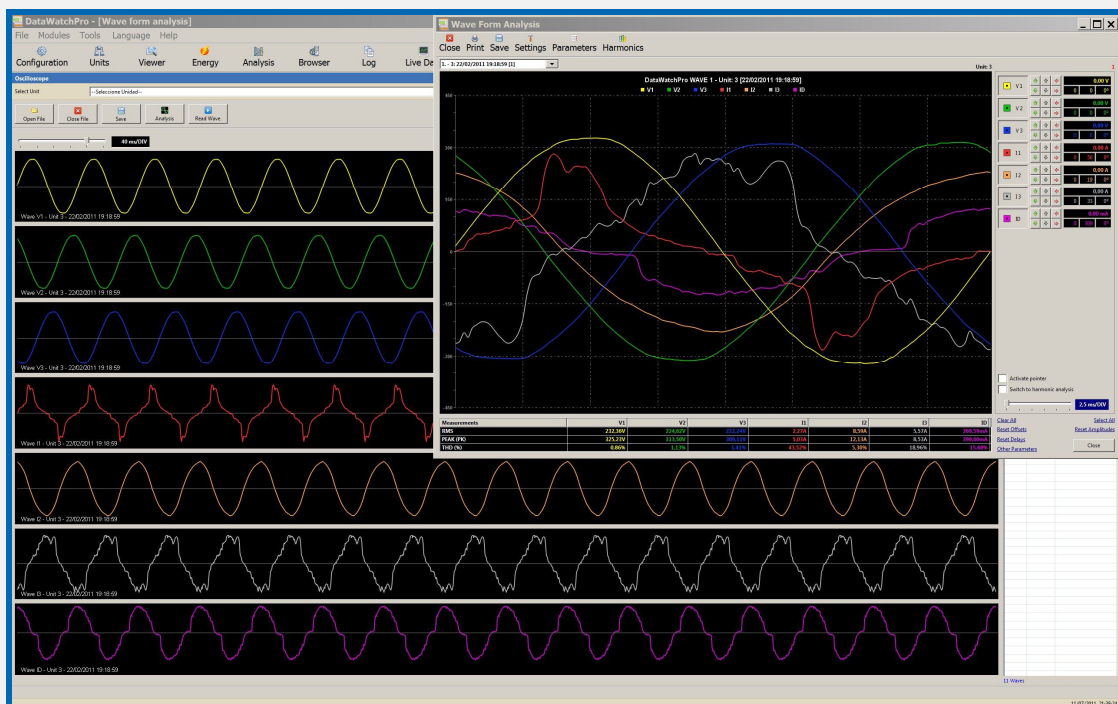
The first screen in the Oscilloscope Module is the wave reading manager. Here the user can read the waves as required and save them in DatawatchPro wave files to disc on the computer. These files have the file type ".dww" and can only be opened by DataWatchPro.

To read a wave first select a connected unit from the main list and then select the "Read Wave" from the Oscilloscope menu. There will be a shortly delay while the unit is contacted and if the reading is successful the seven wave channels will be displayed graphically in the wave manager. If the wave cannot be read then a message will be displayed.

The reading process for the oscilloscope is separate to the normal data reading process. For example you can have the data reading process active and still take a wave reading at any time provided the actual data reading is not taking place at the same time. The oscilloscope reading process will display a message if a data reading is actually taking place.

Each time a wave is read, the wave will be added to the wave list box. Each wave entry shows the ID (if the wave has been saved), the unit reference number and the date/time. Select a previously read wave to display by clicking once the waves in the list. Each wave reading shows the date and time the reading was taken. To control the frequency of the wave use the Time/Division (ms/DIV) slider bar to adjust the rate.

The example shows a typical reading displaying the seven wave channels in the reading manager.



Oscilloscope Module - Saving and opening waves

Saving waves to disc

The wave manager allows you to save and open DataWatchPro wave files on your computer (.dww). Each time a wave is read the wave is added to the wave list. To save the waves you need to click the save button and choose a name and location on your computer to save the file. The save process will give each wave in your list a unique ID number and a saved icon will appear at the side of the wave entry. After saving the name of the saved file is displayed in the top right corner of the module.

Opening wave files

To open a wave file, click on Open File button on the wave manager menu bar and select the DataWatchPro wave file on your computer. When the file is opened the previously saved waves will be displayed in the list. You can add to a previously saved wave list by reading more waves. Remember you need to click the Save button to add the wave entries to update the file. Waves without the ID and the saved icon have not been saved and will be lost if DataWatchPro is shutdown. After opening the name of the file is displayed in the top right corner of the module.

Closing wave files

To close a wave file click the Close File button on the wave manager menu bar. This will clear the wave list and any wave currently displayed in the manager screen.

Deleting waves

To delete individual wave listings, right click on a row in the wave list and select the delete option. To update the wave file, press the save button.

DataWatchPro - [Análisis de la forma de onda]

Archivo Módulos Herramientas Idioma Ayuda

Configuración Unidades Visualizador Energía Análisis Navegador Historia

Osciloscopio [?] ES

Seleccione Unidad: METER1 Modelo: UNIVERSAL 5PM RZWP - lab [http://88.18.170.45:89]

Abrir Archivo Cerrar Archivo Guardar Análisis Leer Onda **FormaOndas_4.dww**

40 ms/DIV

Onda V1 - Unidad 3 - 22/02/2011 19:18:59

Onda V2 - Unidad 3 - 22/02/2011 19:18:59

Onda V3 - Unidad 3 - 22/02/2011 19:18:59

Onda I1 - Unidad 3 - 22/02/2011 19:18:59

Onda I2 - Unidad 3 - 22/02/2011 19:18:59

Onda I3 - Unidad 3 - 22/02/2011 19:18:59

Onda I0 - Unidad 3 - 22/02/2011 19:18:59

3/1 22/02/2011 19:18:59

ID	Unidad	Fecha
1	3	22/02/2011 19:18:59
2	2	28/04/2011 18:20:49
3	2	28/04/2011 18:21:20
4	2	28/04/2011 18:21:45
5	2	28/04/2011 18:22:30
6	2	28/04/2011 18:23:57
7	2	28/04/2011 18:25:45
8	2	28/04/2011 18:27:30
9	2	28/04/2011 18:28:06
10	2	28/04/2011 18:28:40
11	2	28/04/2011 18:31:12

11 Ondas

14/06/2011 17:23:54

Oscilloscope Module - Wave Analysis

There are three ways you can select a wave form to analyse, pressing the Analysis button on the wave manager menu bar, double click on an item in the wave list or by double clicking on one of the seven channels displayed in the wave manager. The wave form analysis window will open.

If you select a wave form from the wave manager list or using the analysis button the default channel wave displayed will be the V1. Double clicking on one of the seven channels will display the selected channel. Use the channel buttons to add and remove channels as required.

The wave analysis form has two modes of operation: wave analysis (oscilloscope) and harmonic analysis. The window will open in the wave analysis mode (oscilloscope) . To switch to harmonic toggle the Harmonic button on the top menu bar or tick the Switch to harmonic analysis option below the channel selector controls.

Channel selection

Each channel button is equipped with an offset, amplitude and delay control. Use the up and down arrows to control these options. Holding down the buttons will cause the selected control to move up or down continually. To move one step at a time press the button once and remove the mouse button. For harmonic analysis the offset, amplitude and delay controls are hidden. The screen shot shows the channel selection controls.

Summary measurements table

The measurements table at the base of the wave viewer shows a summary of the RMS, Peak values and THD (%) for each of the channels.

Using the pointer to select values

To obtain specific readings at different points on the wave forms or harmonics graph click on the display area. Clicking on the display area will activate the pointer. To hide the pointer untick the Activate Pointer option. The values select are shown in the channel selector value boxes.

Time/Div

To change the Time/Div rate use the slider bar below the channel selector. The slider is disabled when operating in harmonics mode.

Resetting the channels

The wave analysis mode has a number of options to reset the channels:

- Clear all waves and controls
- Reset all offsets only
- Reset all delays only
- Reset all amplitudes
- Select all channels in one go
- View other parameter values

Additional parameter reading values

When wave form samples are read from the unit, DataWatchPro records numerous parameter readings at the same time. The full list of parameters values can be viewed by selecting the Other Parameters link or pressing the Parameters button on the top menu bar.

Harmonic analysis

The harmonic analysis option allows the users to analyse one or more of the channels at the same time. A number of options are available on the Settings Form to tailor the harmonic analysis graph.

The harmonic graph using a percentage display as default. If the channels are of the same parameter type for example V1 and V2 have been selected, the user can use the Display Dimension link at the bottom of the x-axis to switch to dimension mode. The display dimension will be hidden if parameters types are mixed.

Use the pointer to select harmonic distortion values for the different channels.

Save Analysis

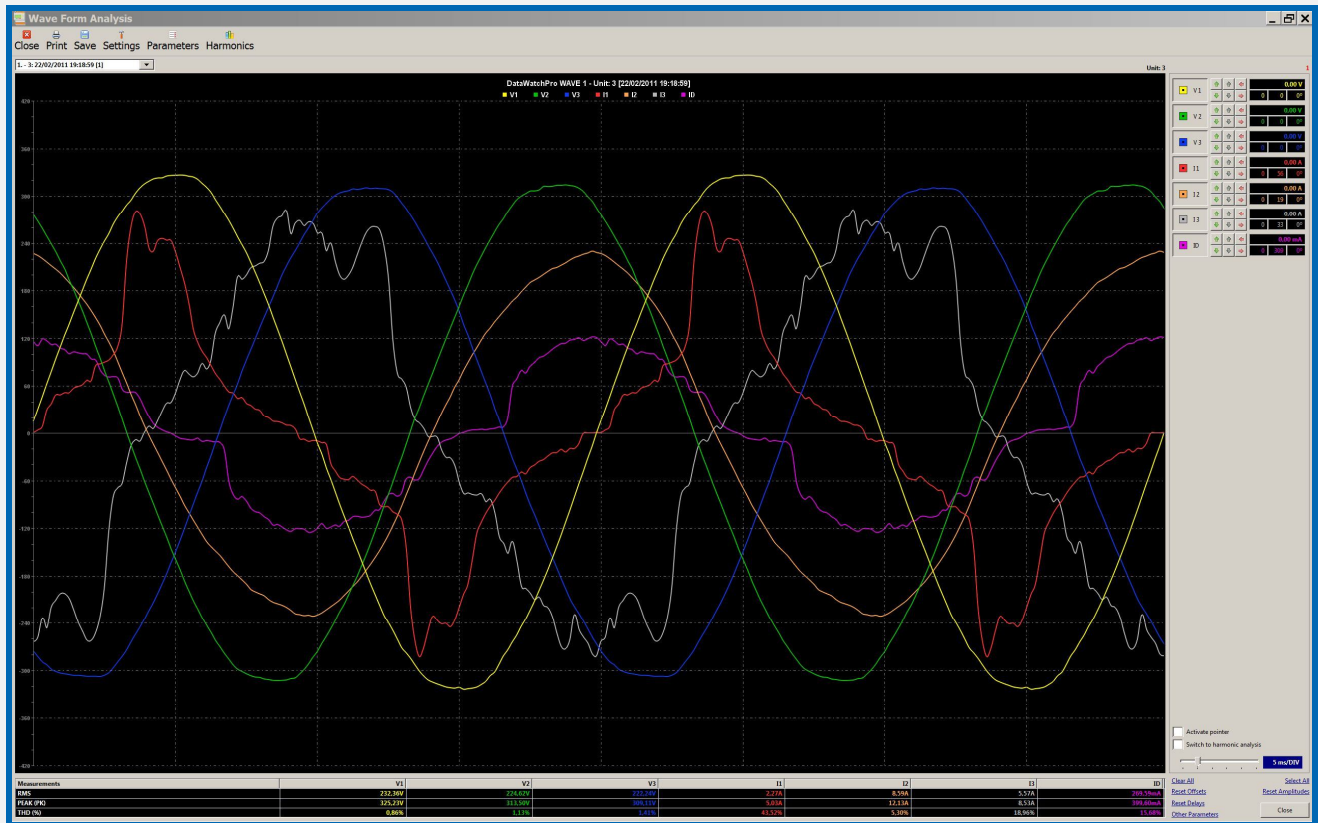
Use the save analysis button to save the displayed waves or harmonic graph in the image format you require. To change the size of the image saved increase or decrease the size of the display area by stretching the window.

Printing

Use the print button to output the displayed wave or harmonic graph. To change the size of the output printed increase or decrease the size of the display area by stretching the window. Refer to the Print Settings Form for more information.

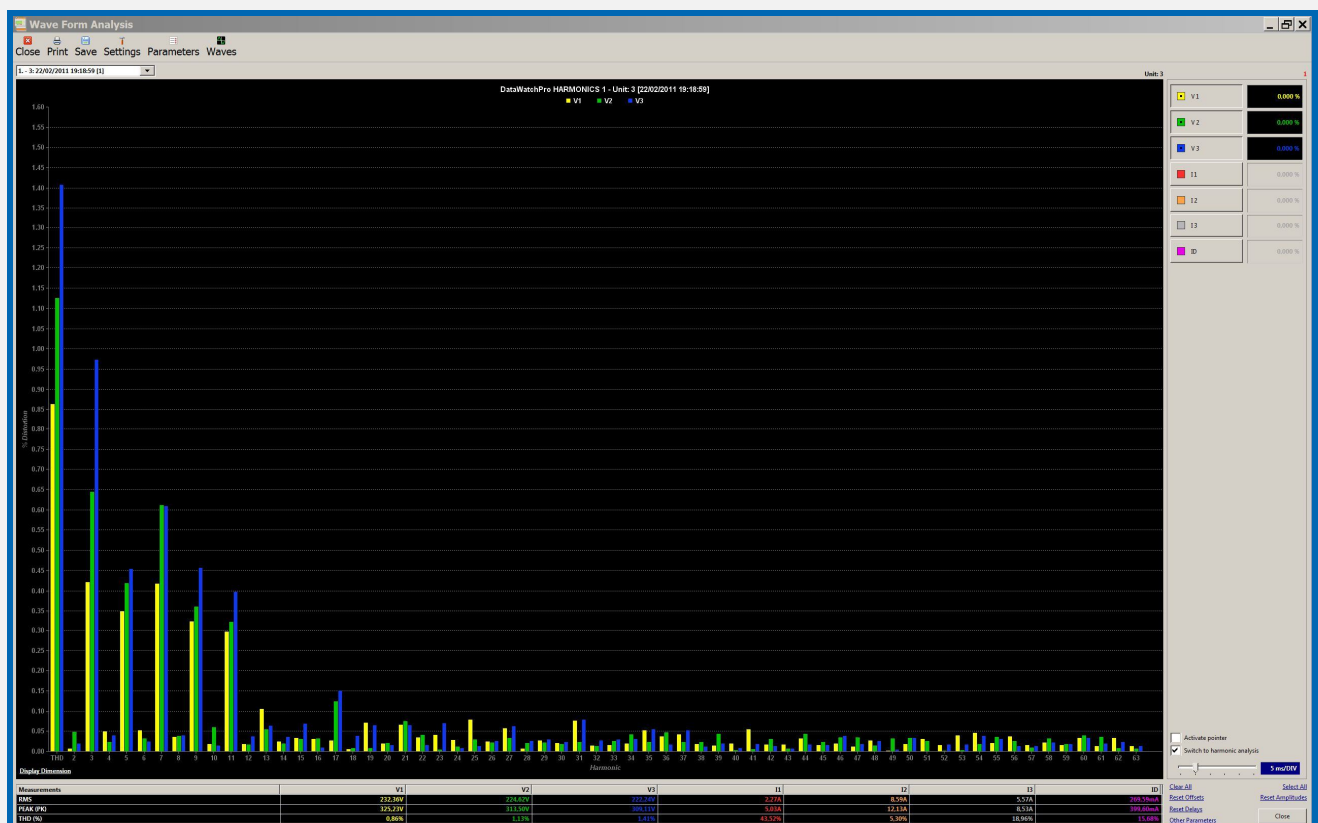
Wave analysis sample

Sample wave analysis showing all 7 channels selected



Harmonic analysis sample

Sample harmonic analysis graph comparing harmonics for V1 and V2



Oscilloscope Module - Wave analysis settings

Print Settings

The print settings allow you to adjust the colours of the title, legend, background and grid lines for printing. The default background colour for printing is white primarily to use less printing ink compared to printing with a darker background.

Wave offset jump

This controls the amount the offset will move each time you press the channel +/- offset buttons. For example if the wave offset jump was 2 then each time the + offset button was pressed the values would be increase by 2.

Wave amplitude jump

This controls the amount the amplitude will move each time you press the channel +/- amplitude buttons.

Default image format for saving waves

Select the preferred image format for saving wave images. The default is PNG. If you prefer, you can select a different format each time you save an image.

Graph curve line size (pixels)

The default line thicknes for all channel waves is 2. If you would like a thicker line you can select values from 1 - 10 pixels.

Grid lines and axis colours

This changes the color of grid lines and axis colours.

Include fundamental harmonic

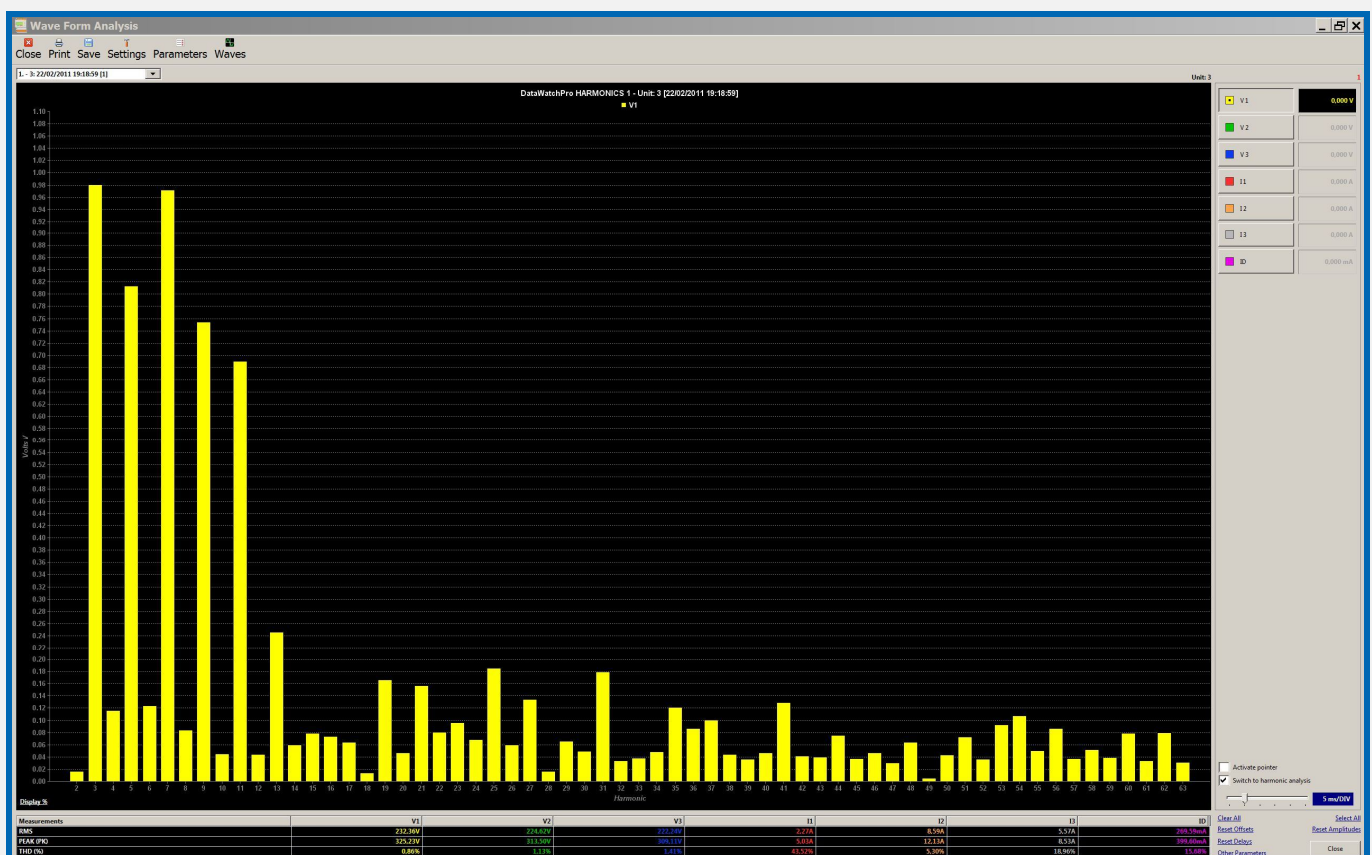
This option applies only to the harmonic analysis tools. Including the fundamental harmonic in the analysis often means that the other distortion harmonics are too small to see. If you remove the fundamental harmonic option the automatic scaling will magnify the harmonic distortions.

Include THD in harmonic analysis

This option applies only to the harmonic analysis tools. THD is the Total Harmonic Distortion.

Maximize oscilloscope wndow on opening

To save having to maximize your oscilloscope window each time you analyse a wave select this option.



File Menu

The file menu includes the following options:

- Change database file location
- Backup database
- Restore database
- Create new database file
- Salir

File Menu - Database Location

Menu – File – Data Location

The data file contains different tables and columns to store unit information including alarm settings and unit details. DatawatchPro will not function without access to a compatible data file.

DatawatchPro must know where this data file is to work properly. At installation, the file is installed in the same folder as the DatawatchPro executable. The default path to the data file is displayed in the Configuration Module and in the Data Location form.

If required, the data file can be moved manually to a different location on the computer. For example, it could be placed in the My Documents folder.

You need to update the data file location if the file has been moved. If DatawatchPro cannot find the data file at startup, a message will be displayed and the Data Location screen will appear.

The first box displays the current path (where the system expects the file to be). The box below this is the new data location, which will be empty. Click the Browse button to navigate your computer files to find the new location for the file.

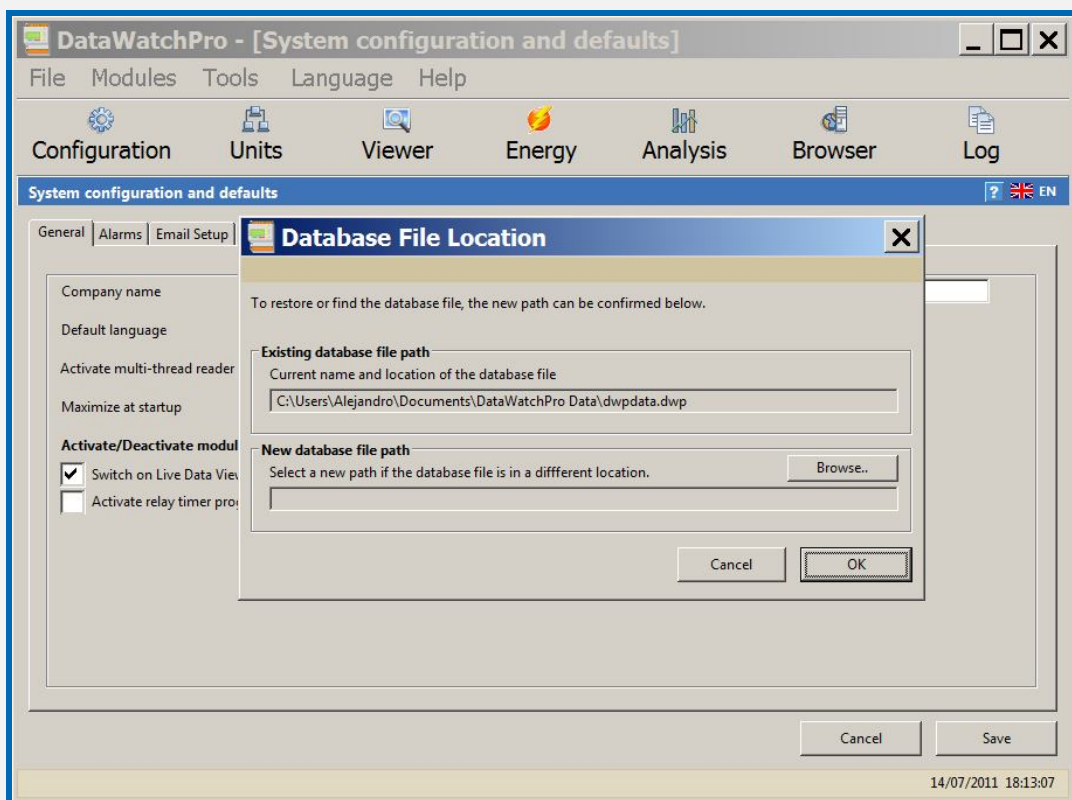
Press Open and the new data path will be displayed in the box. Press OK to confirm the data location.

You will need to restart DatawatchPro to reset the system.

Provided the system knows where the file location is the system will be able to access the file and run correctly.

The database file must be placed in a location where you have read/write permission.

You can also change the data file location using the Configuration Module.



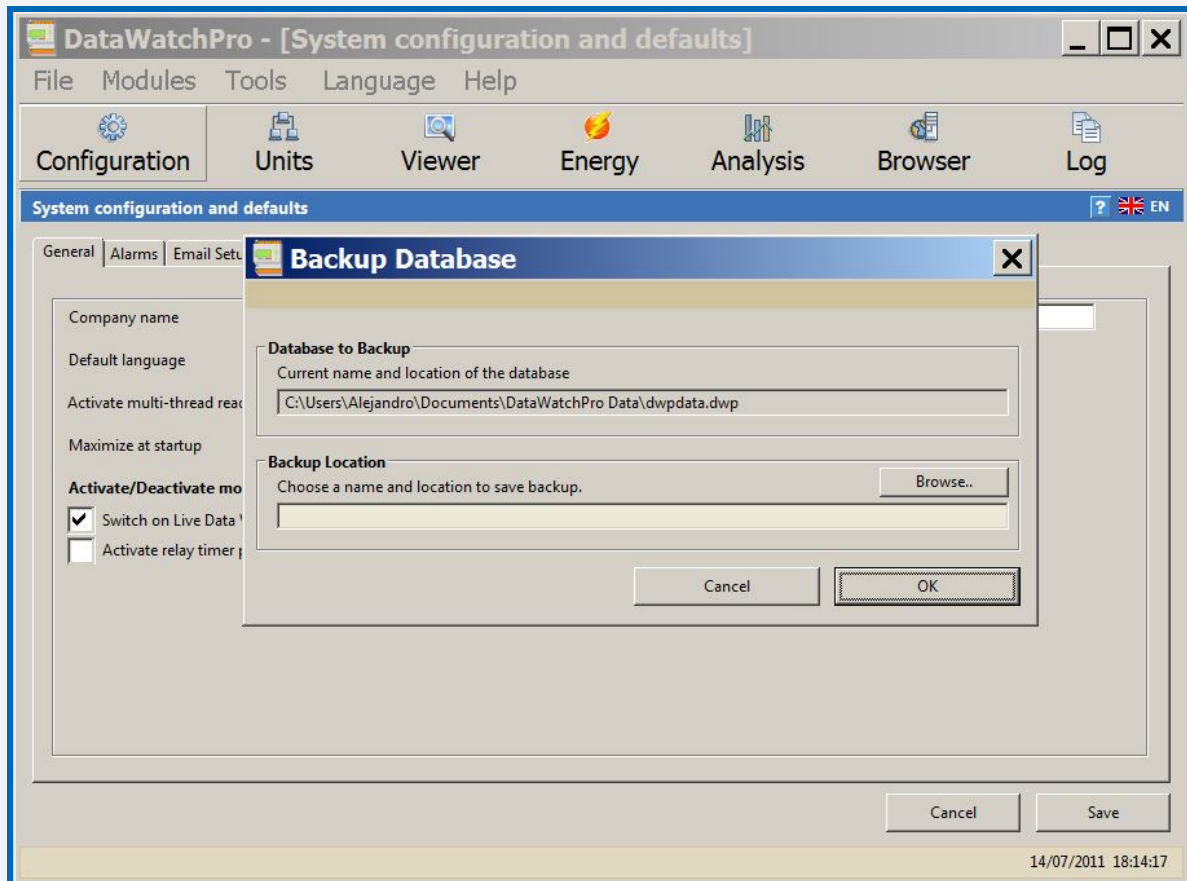
File Menu - Backup Database

Menu – File – Backup Database File

The backup process creates an identical copy of the current data file. The new file name is chosen by the user. You can alternatively just copy the data file using Windows Explorer without using the backup process.

There are two boxes in the backup screen, the first indicates the location and name of the current data file (the file to be backed up). The second box below indicates the path and name of the backup file. If no previous backups have been made this box will be empty. Click on the Browse button to locate where you wish to place the copy and type a new name such as 'data_copy1.dwp'. Then click Open, the backup path and file name will appear in the backup path box.

Press OK and then confirm. If you have selected the same name as the previous backup, the system will prompt you to overwrite this file. The backup screen also shows the date the last backup copy was made.



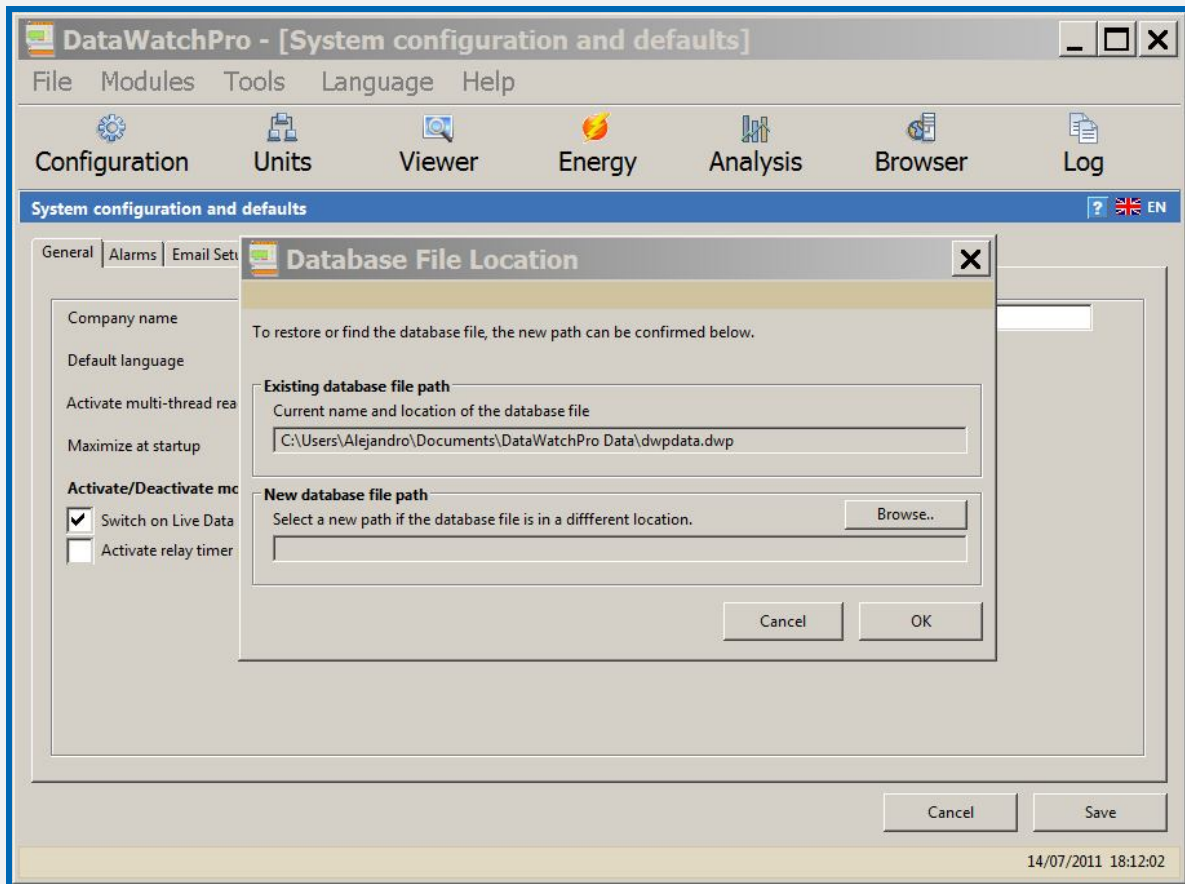
File Menu - Restore Database

Menu – File – Restore Backup

The restore screen is identical to the Data Location screen.

At some point, it may be necessary to revert to a backup copy of the data file. There are two options for restoring a backup copy. Firstly you can change the name of the backup copy to the current data file name in Windows Explorer and place it in the same directory as the original data file (making sure that original file has been moved first).

Alternatively, use the restore tool to select the backup file using the Browse button and change the data location path to the backup path and location.



File Menu - Create New Database

Menu – File – Create New Database File

You can create an empty database file using the Create New Database tool.

In the Create Database Form, use the Browse button to select the location for the new database file and provide a name when requested.

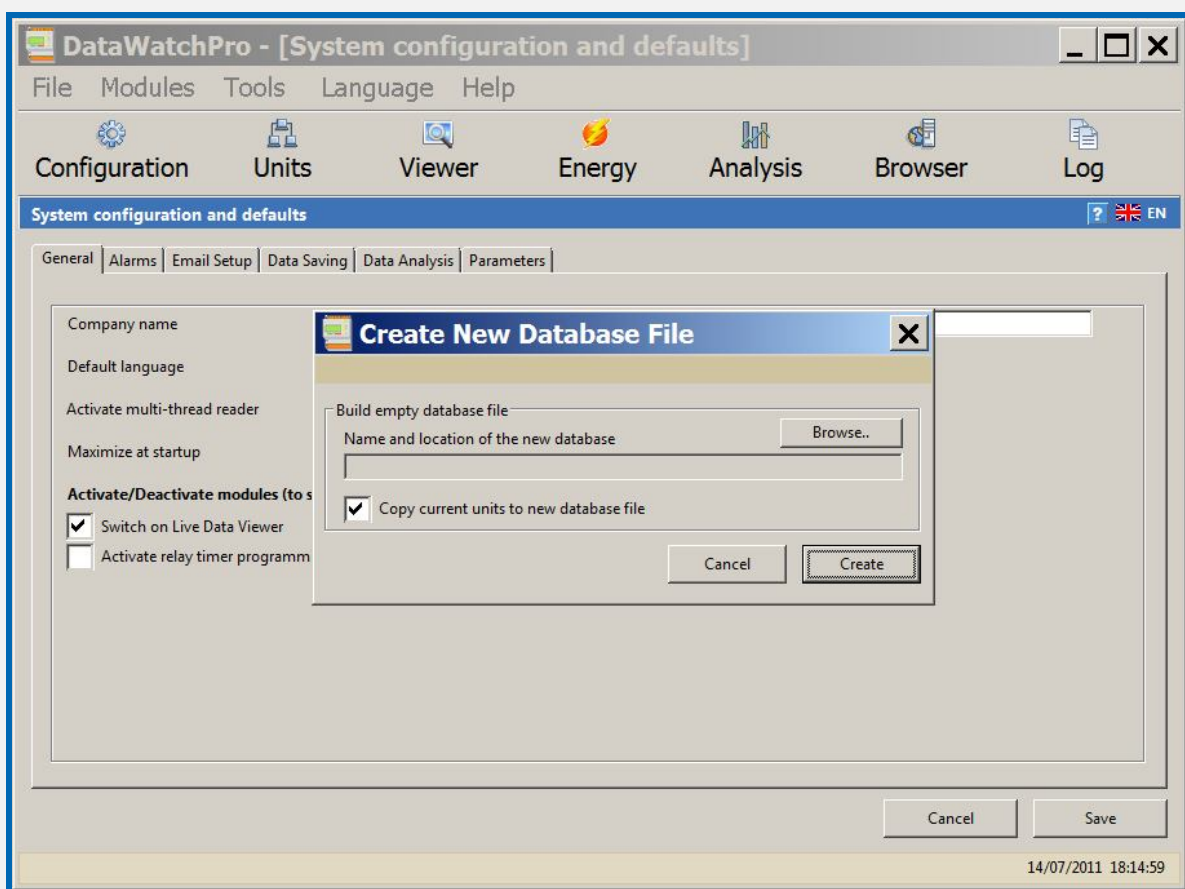
The name and path will appear in the location box.

You can either create an empty data file or choose to copy the existing units and settings to the new file by clicking the copy current units option. The data readings will not be copied from the active database.

If the units are not copied over to the new file, the unit details will have to be added manually.

Press the Create button.

To use the new file as the active reading database refer to the Configurations Module or use the Data Location form to change the data file location.



Close

This menu option closes the application.

Tools Menu

The tools menu includes the following options:

- Compact and verify database.
- Database details.
- Security.
- Calculator.

Tools - Compact and Verify Database

Menu – Tools – Compact and Check Database

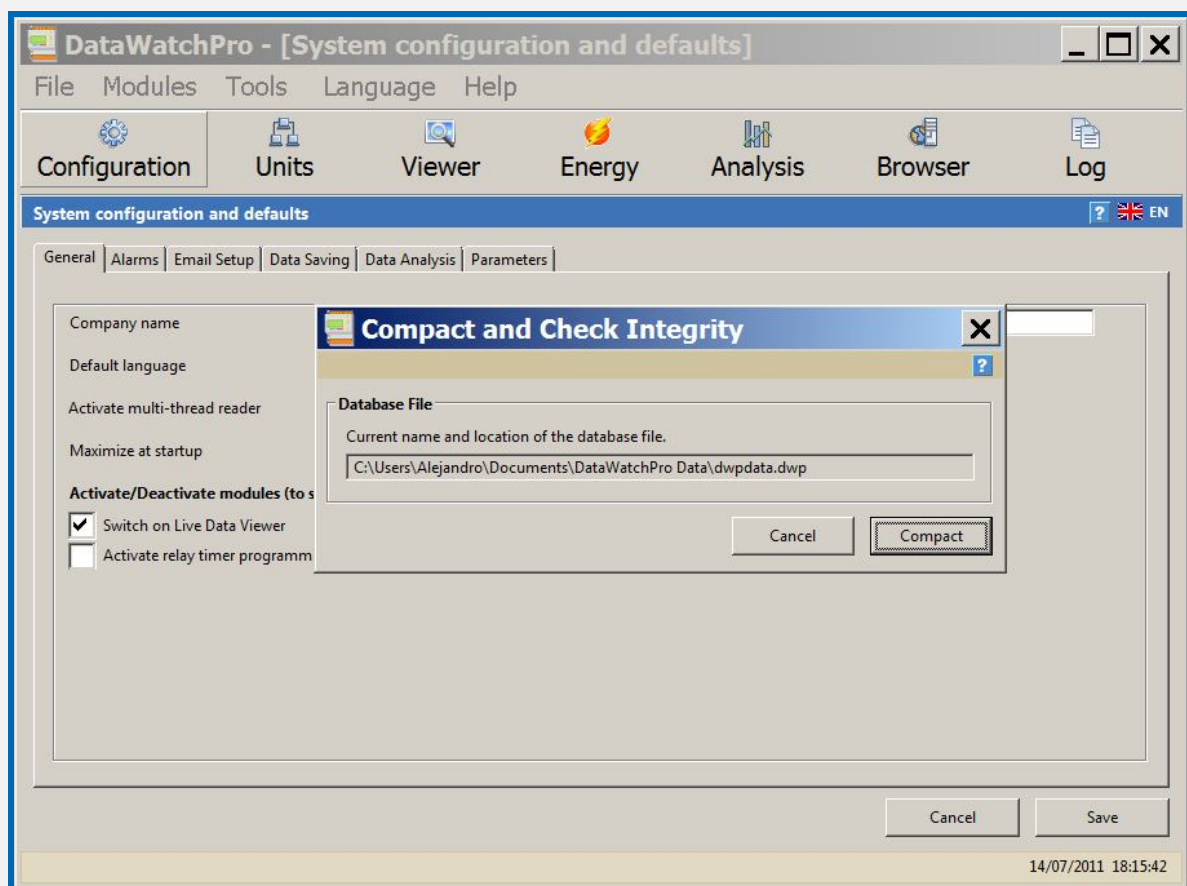
In time, inserts and deletes can leave the database file structure fragmented, which slows down disk access to the database contents. The Compact/Vacuum command cleans the main database by copying its contents to a temporary database file and reloading the original database file from the copy. This eliminates free pages, aligns table data to be contiguous, and otherwise cleans up the database file structure.

We recommended that you first backup the data file using the backup tool (menu File, Backup) before proceeding with compaction.

Activate the Compact tool (Menu Tools, Compact and Check Database).

The text box displays the current data file path (the file to be compacted).

Press OK to compact the file and check for errors.



Tools - Database Details

Menu – Tools – Database Details

The Database Details Form displays important information about the active reading database:

- Unit ID.
- Unit Name.
- Database Table.
- First Reading (date/time).
- Last Reading (date/time).
- Number records/readings in table.

Press the OK button to close the form.

If the database has numerous readings, the form may take several seconds to open while it counts records and obtains the database details.

DataWatchPro - [System configuration and defaults]

File Modules Tools Language Help

Configuration Units Viewer Energy Analysis Browser Log

System configuration

General Alarms

Company name: Database Name: dwpdata.dwp

Default language: Location: C:\Users\Alejandro\Documents\DataWatchPro Data\dwpdata.dwp

Activate multi- Size: 15370 KB

Maximize at start Total Records: 12727

Activate/Deactivate

☒ Switch on

☐ Activate re

Unit	Unit Name	Table	First Reading	Last Reading	Records
1	METER1	UnitReadings1	14/12/2010 12:01:49	26/05/2011 21:23:15	11913
2	enrique	UnitReadings2	14/12/2010 12:42:44	09/03/2011 16:23:24	814

OK

Cancel Save

14/07/2011 18:16:29

Tools - Security Settings

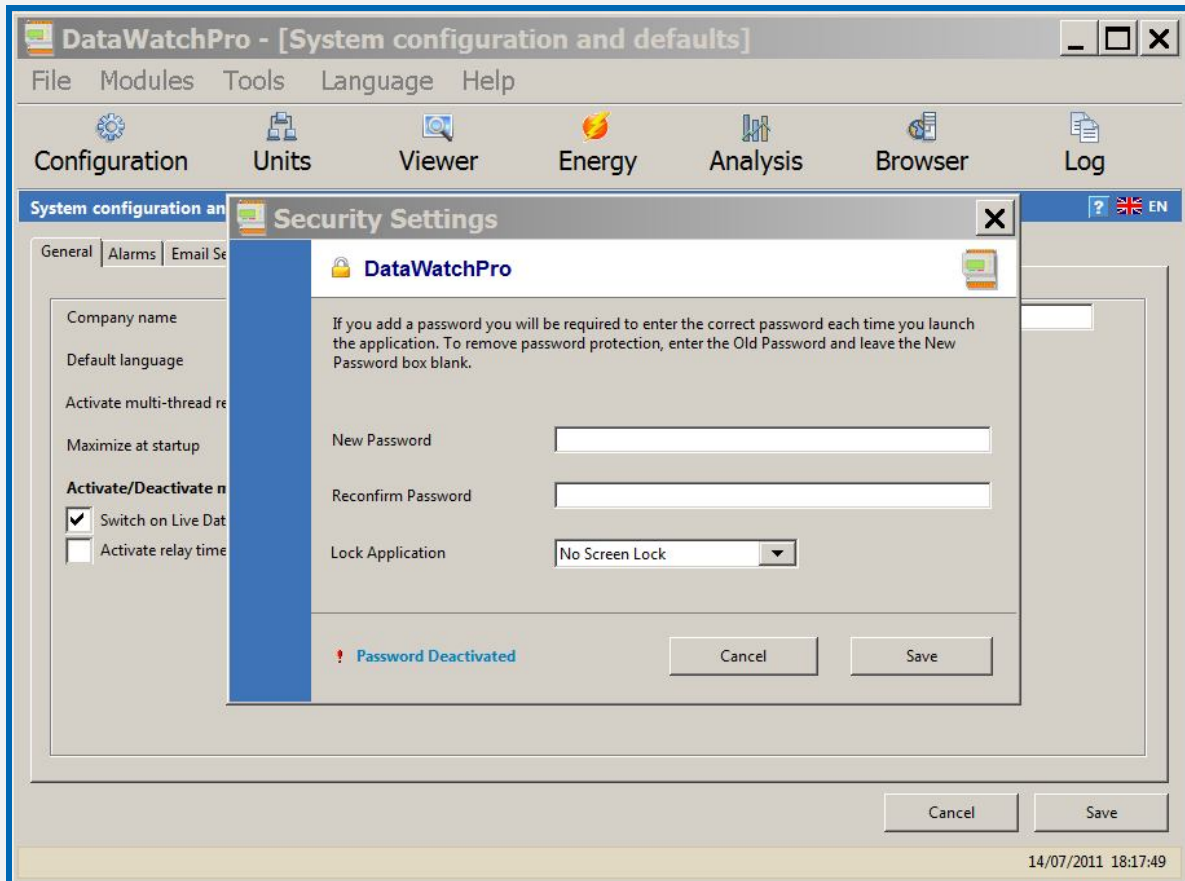
Menu – Tools – Security

Use the security tool to activate the password at login. If you add a password, you will be required to enter the correct password each time you launch the application.

To remove password protection, enter the Old Password and leave the New Password box blank.

You can also enable the application lock feature for DatawatchPro. The application will automatically be locked after a set period of time. The lock feature can be used to protect the running application while left unattended. Once the application is locked, you will have to enter the correct password to unlock the application.

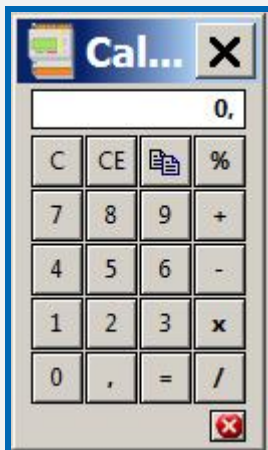
The lock feature only works when the login password is activated.



Tools - Calculator

Menu – Tools – Calculator

A basic calculator tool is provided for convenience when using DatawatchPro.



Language Menu

The language menu includes the following options:

- English
- Spanish

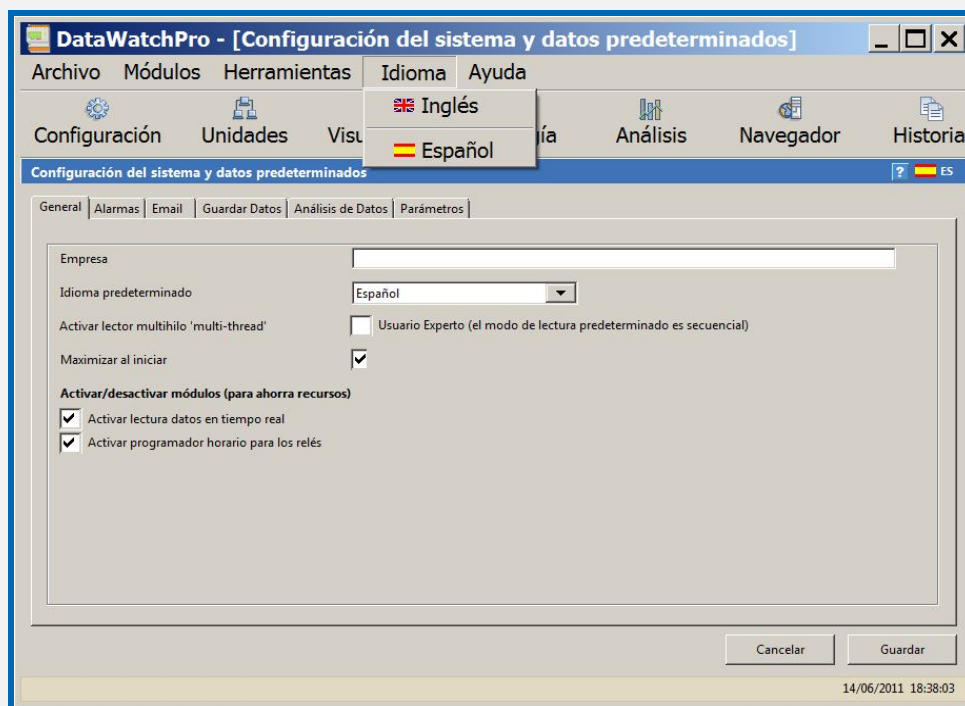
Language Menu – Languages

Menu – Languages – Language Selection

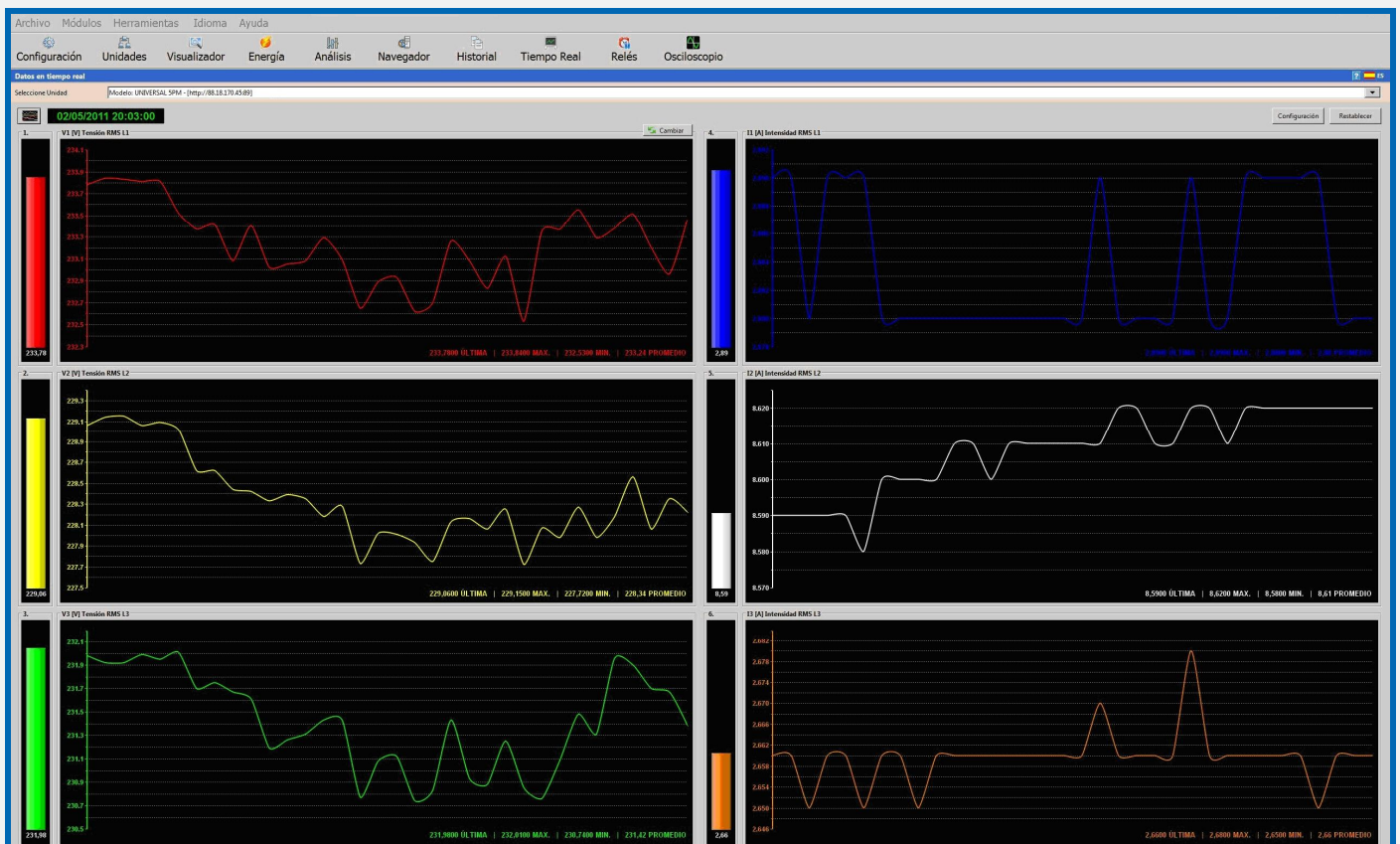
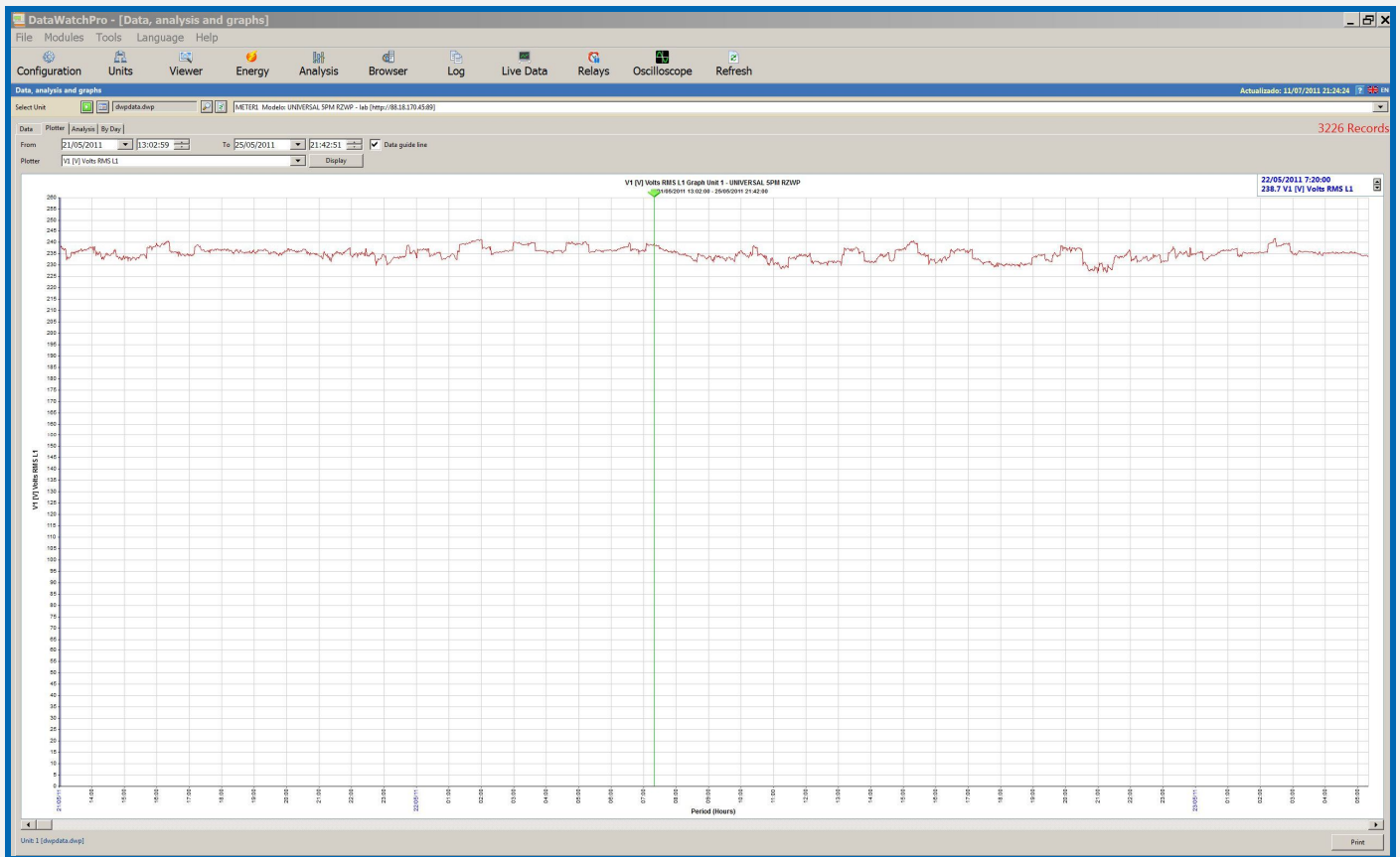
To change the language select a language from the menu and the interfaces will be dynamically updated with the new language. Alternatively, you can change the language in the Configuration Module.

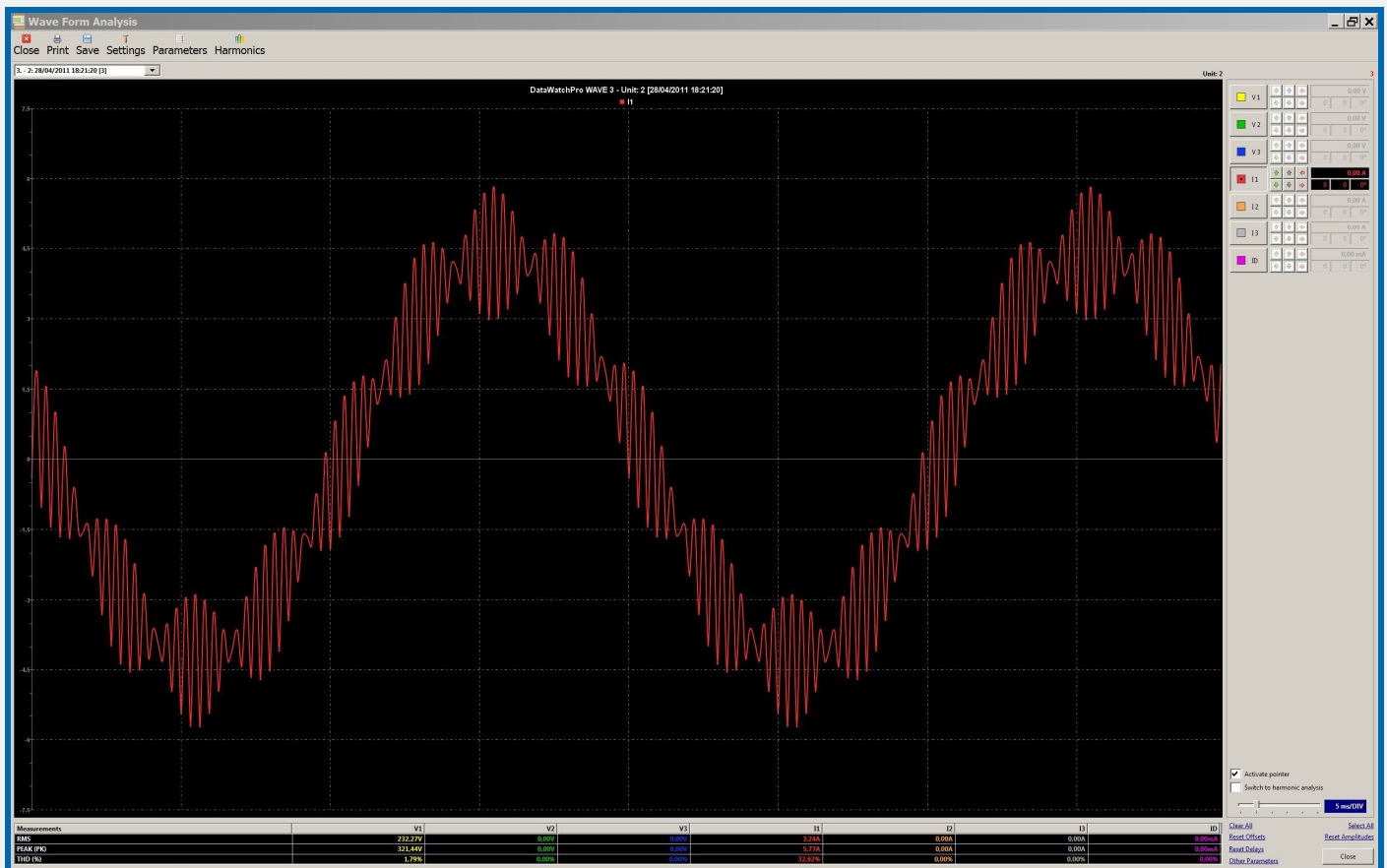
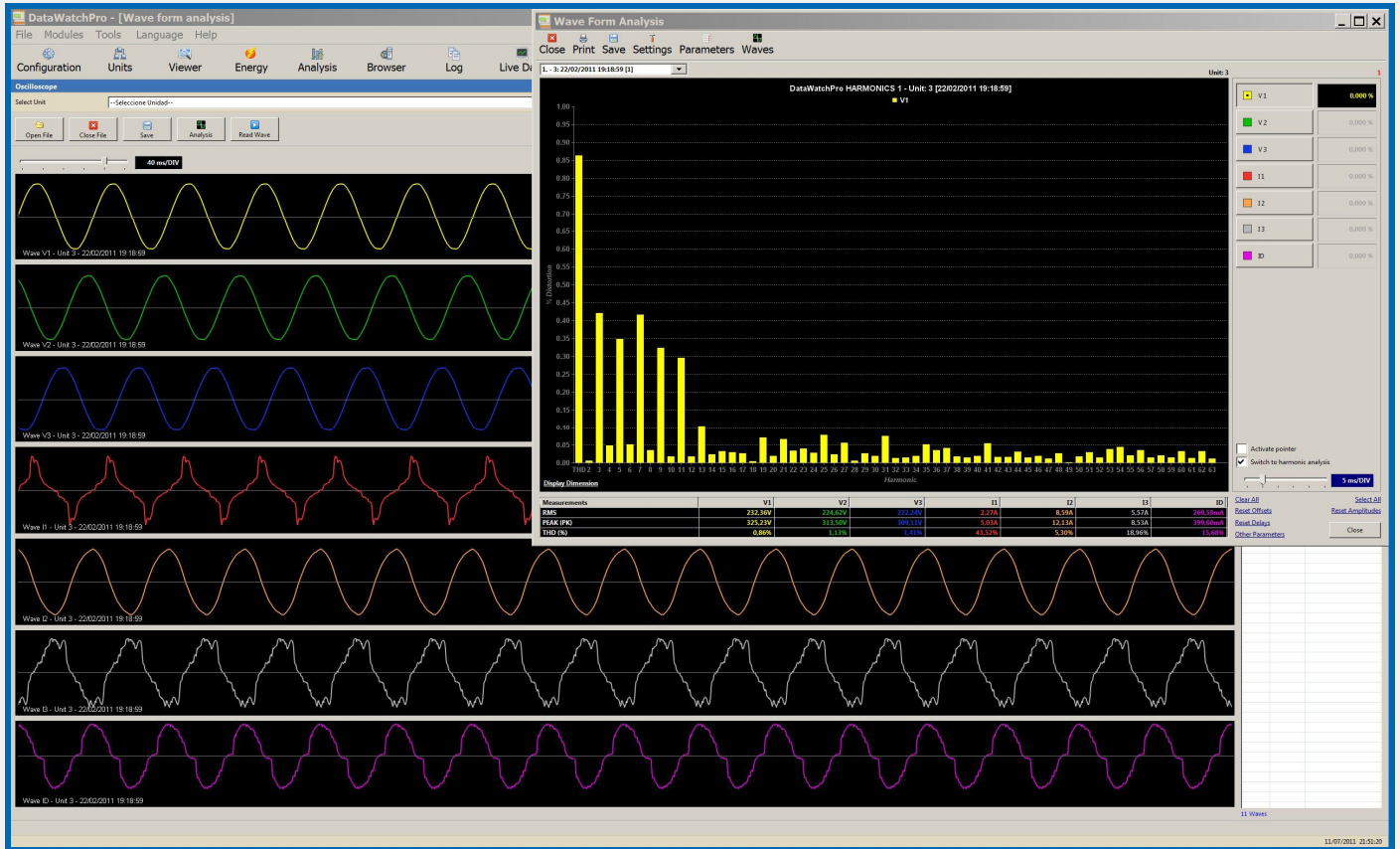
The following languages are currently installed:

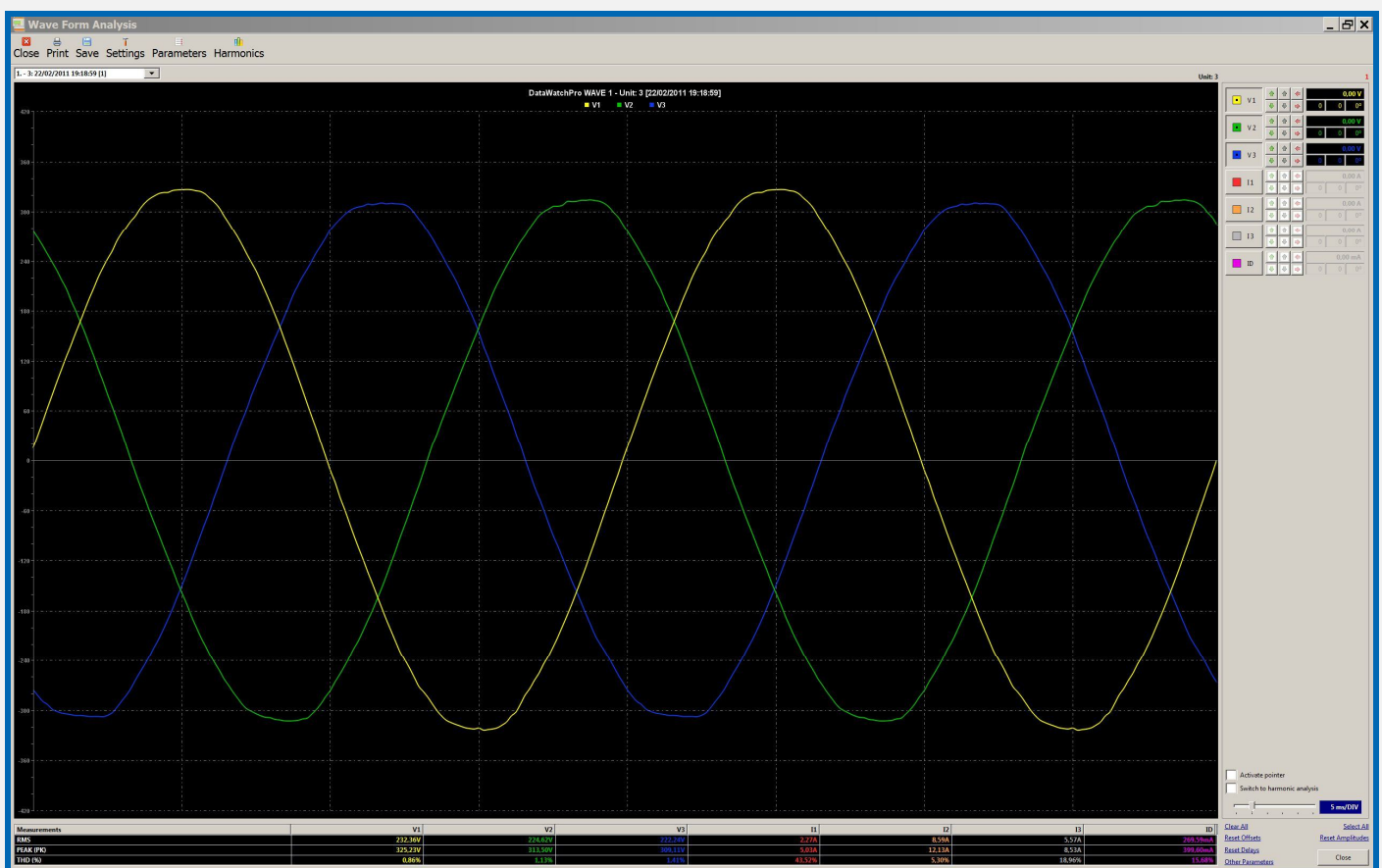
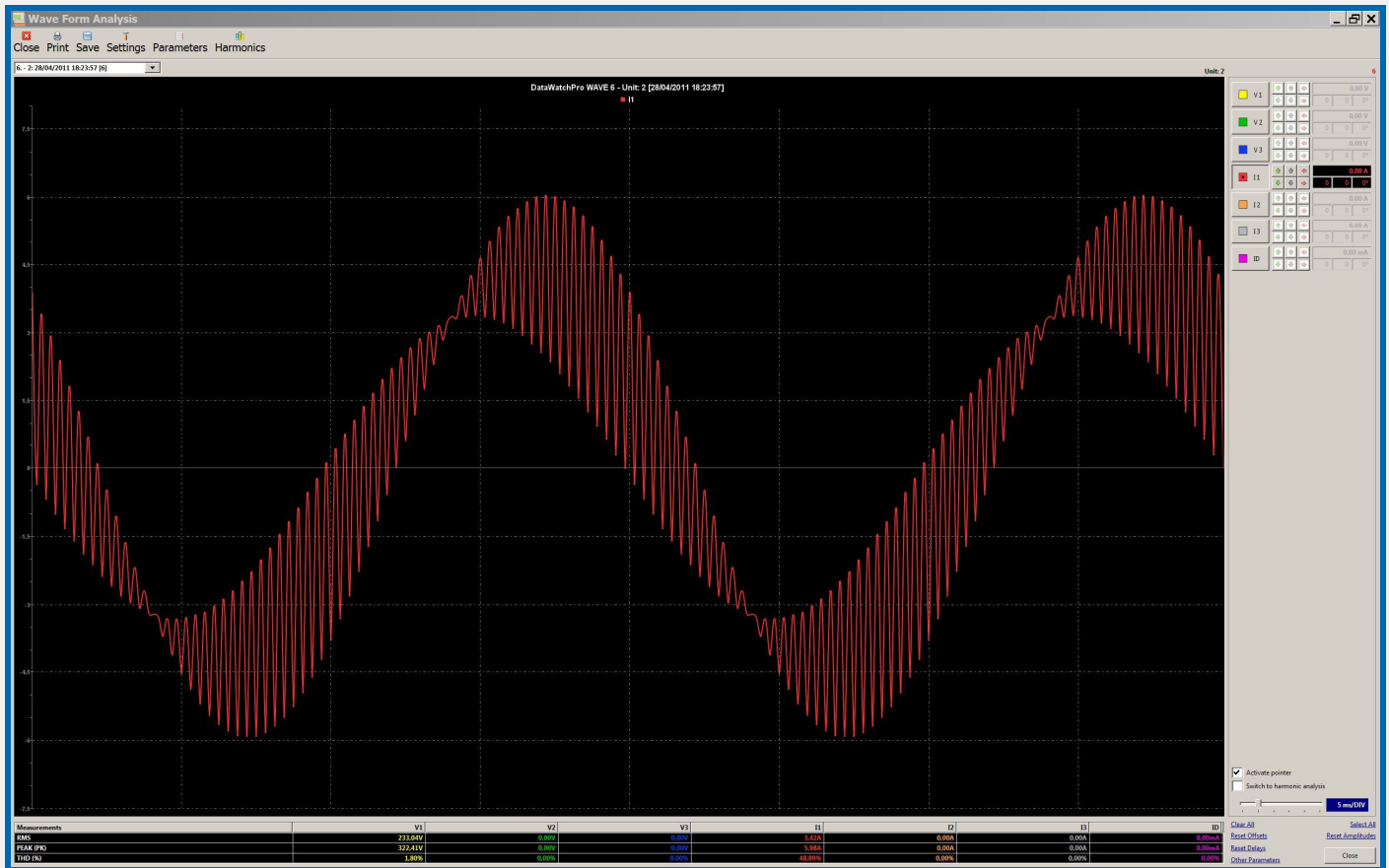
- English
- Spanish

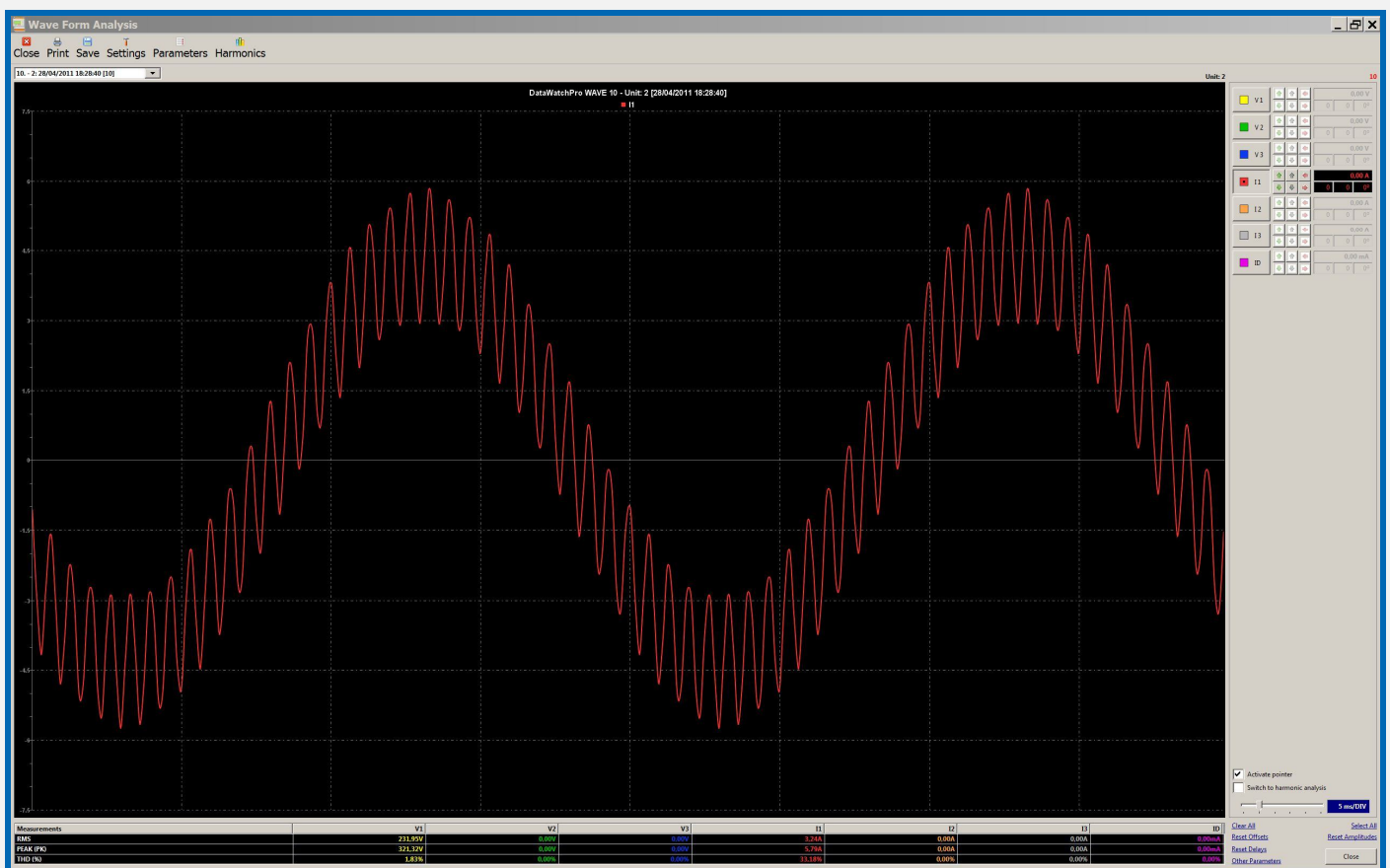
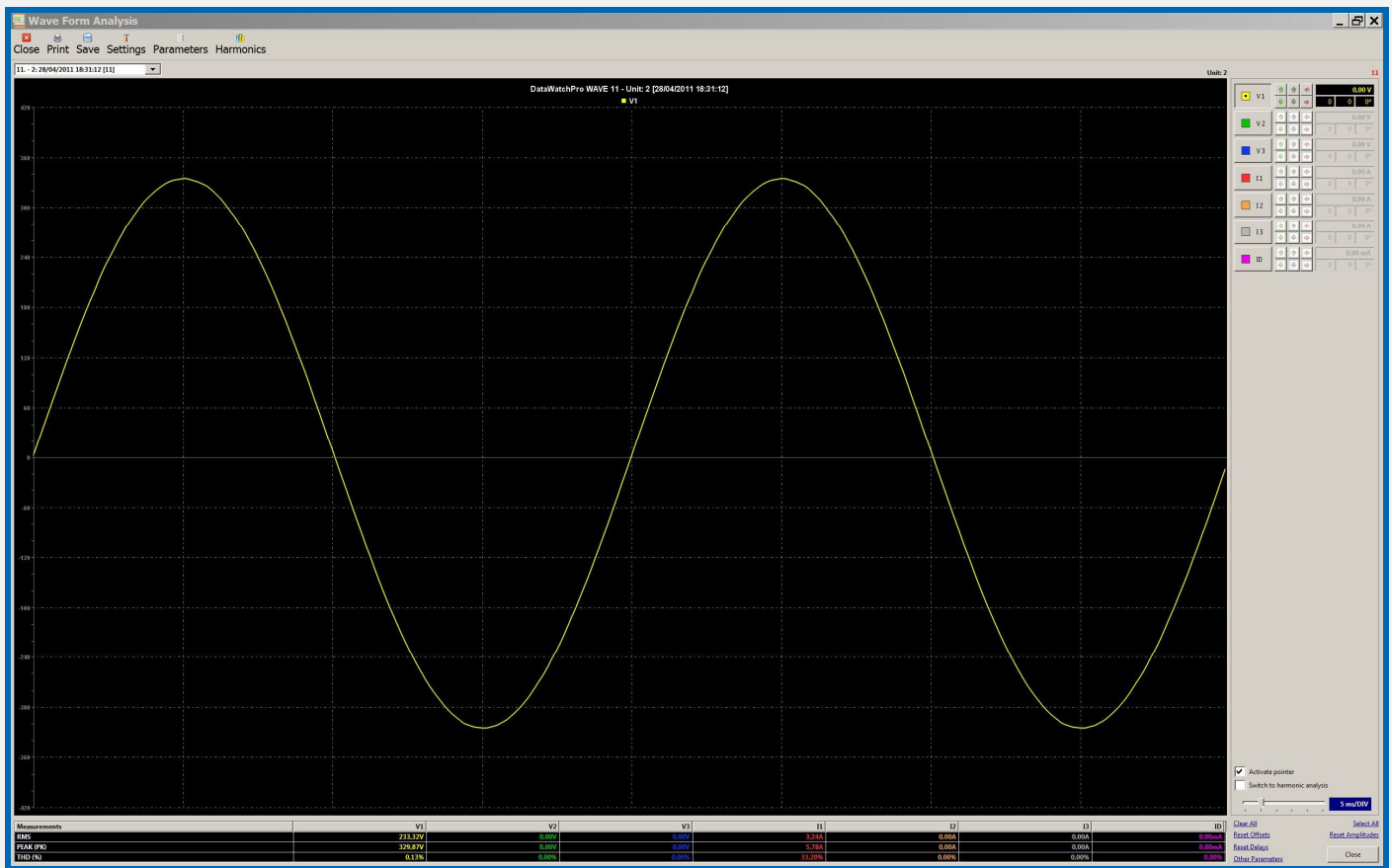


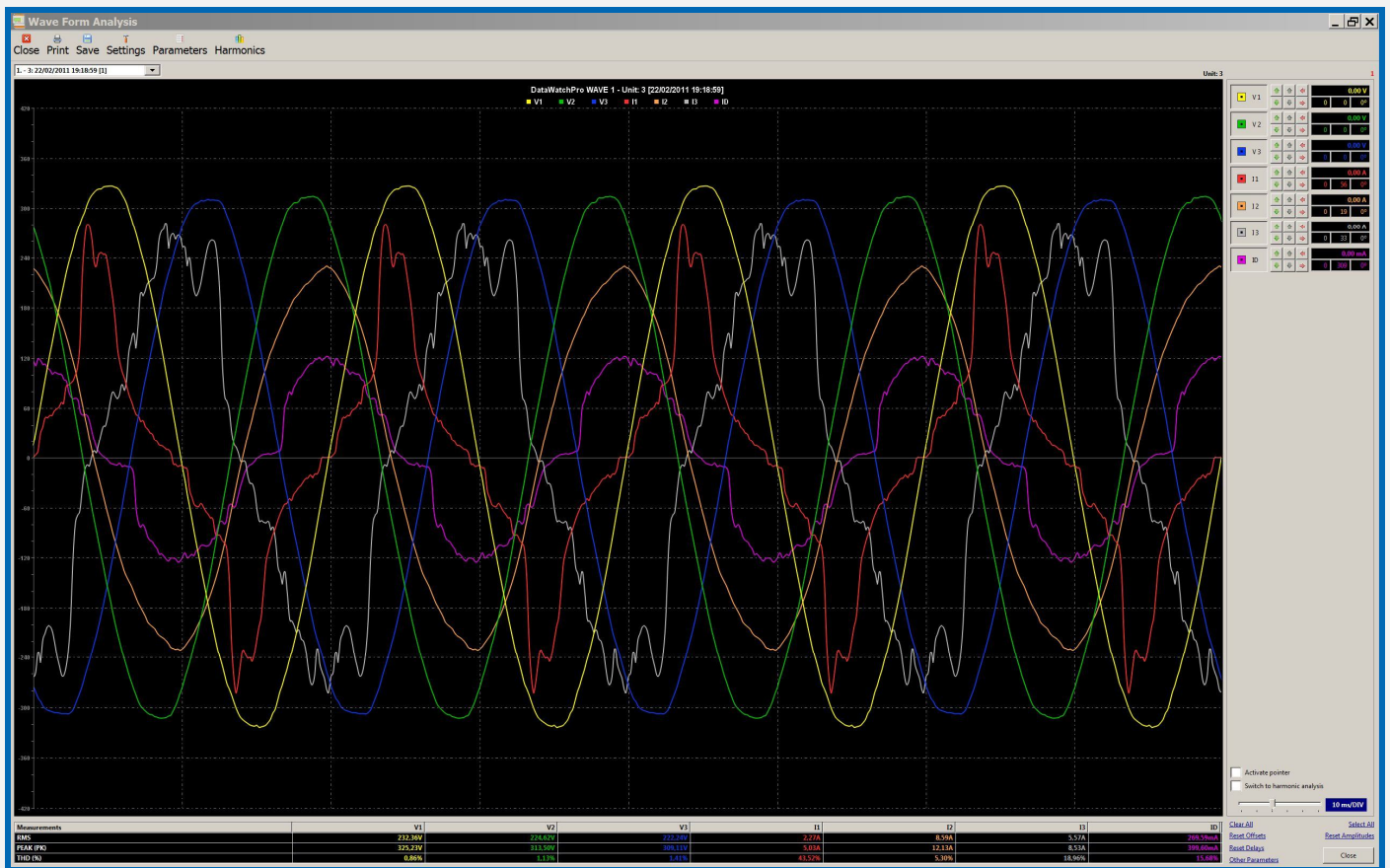
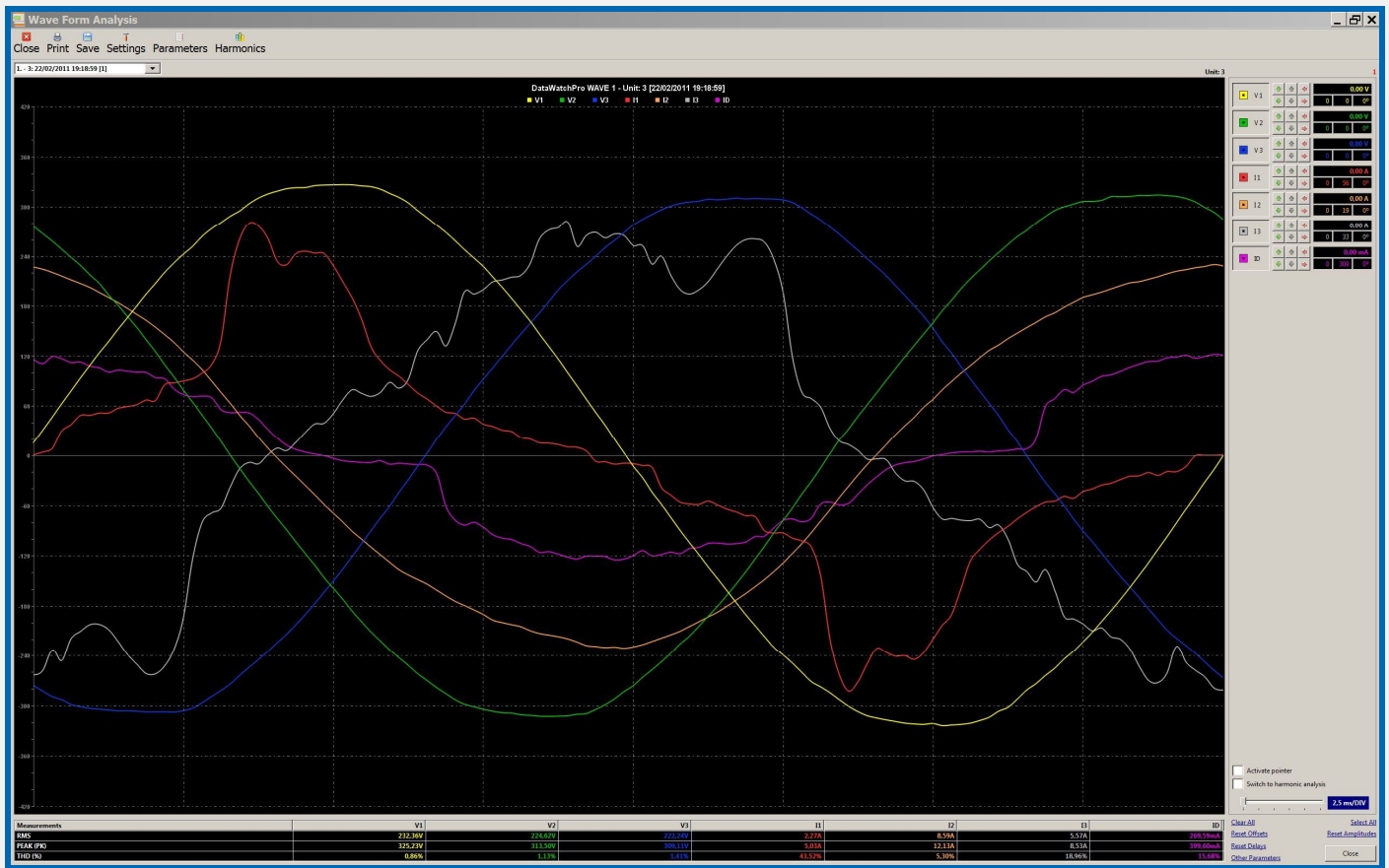
Graphics general interest

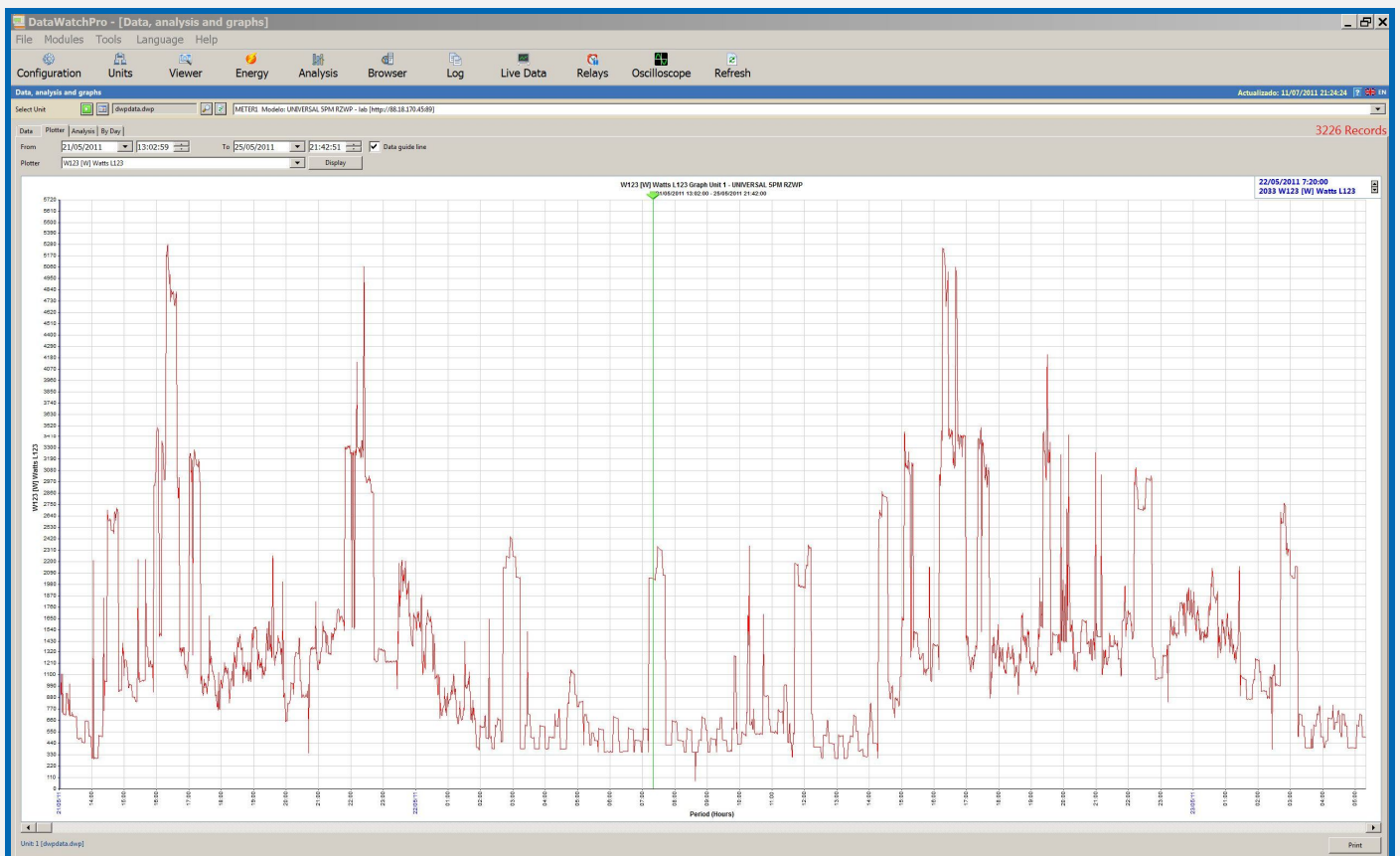
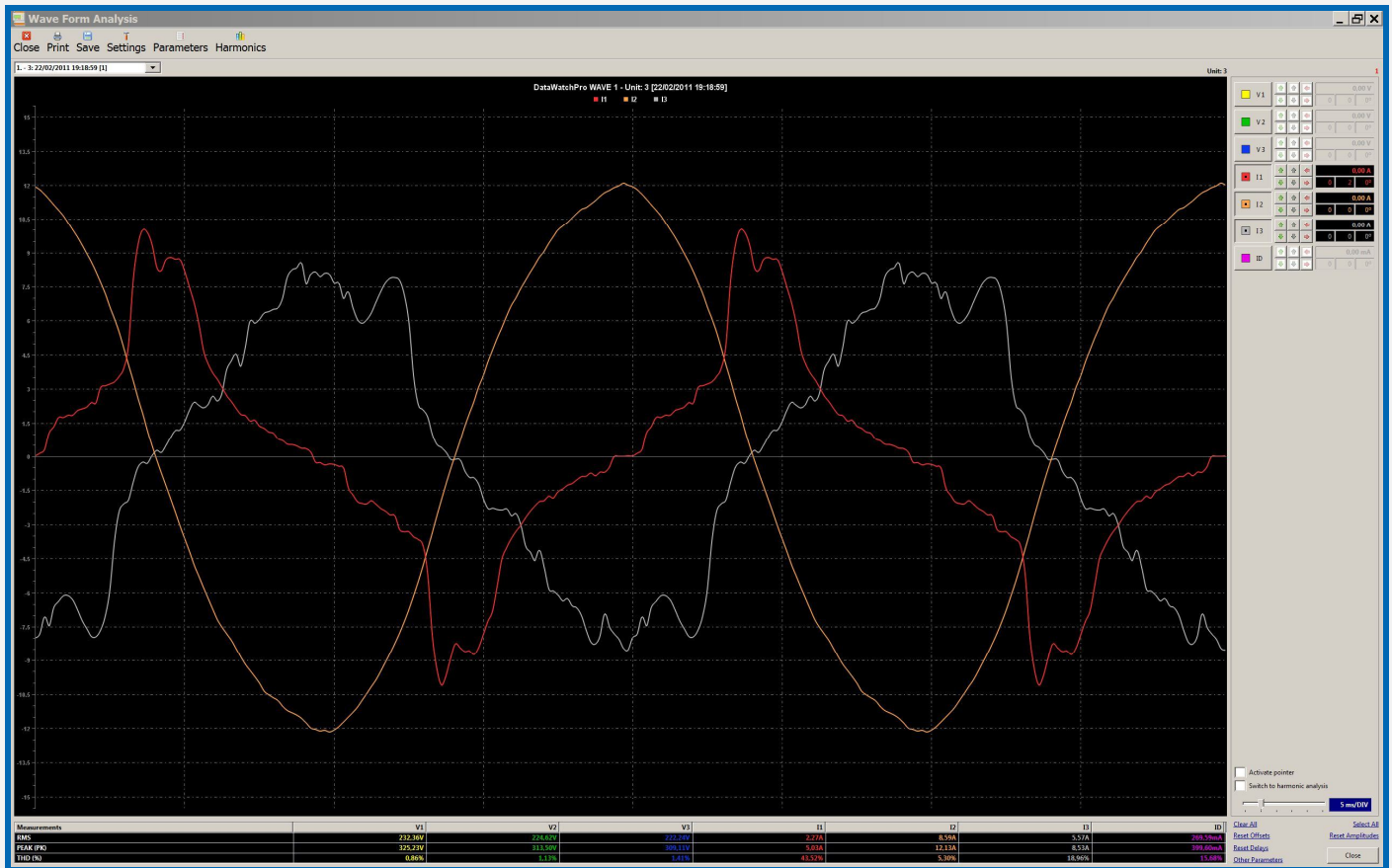


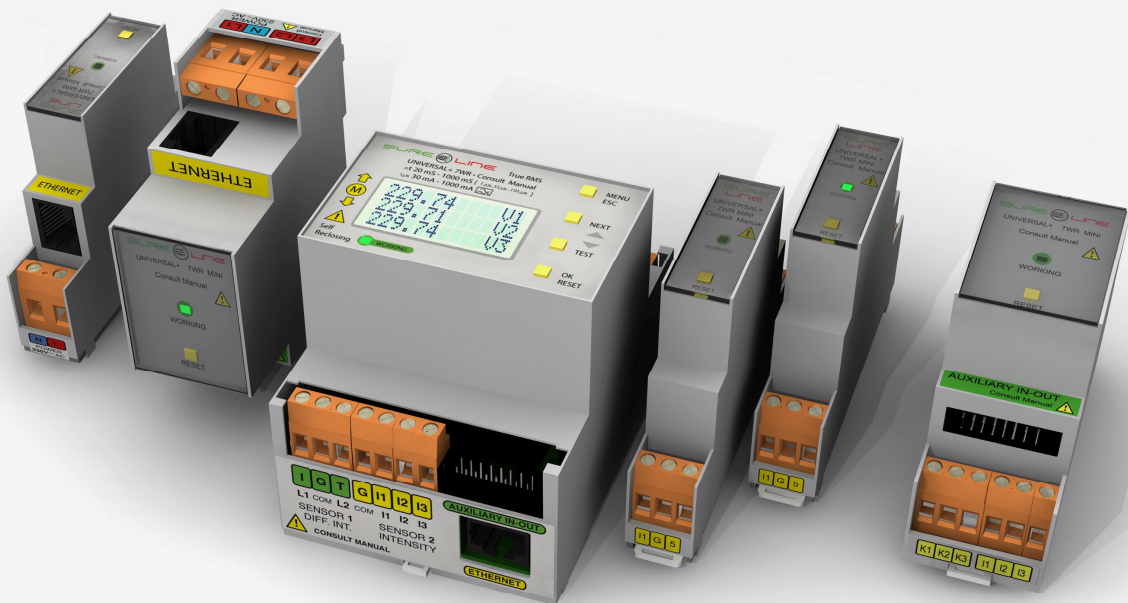












SAFELINE, S.L.

Edificio Safeline

Cooperativa, 24

E 08302 MATARO
(Barcelona) SPAIN

www.safeline.es
safeline@safeline.es

Commercial

T. +34 938841820

T. +34 937630801

comercial@safeline.es

Factory, R + D

T. +34 937630801

T. +34 607409841

inves@safeline.es

Administration

T. +34 937630801

T. +34 607409841

admin@safeline.es

Made in EU

