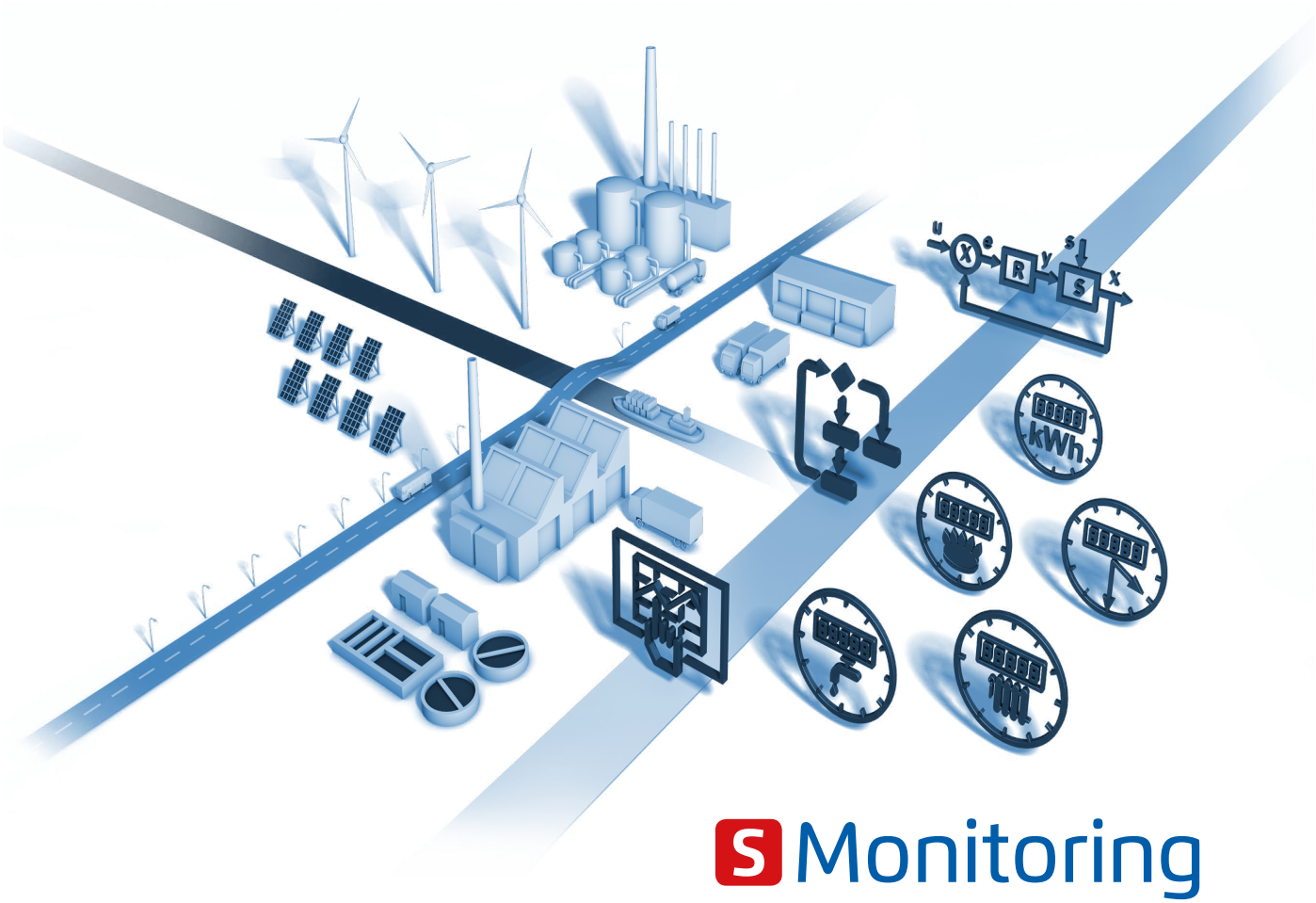
SAIA BURGESS CONTROLS



S Monitoring

Greater transparency for your resources
Take control of your consumption

S-Monitoring Application

Document 27-623 | Manual S-Monitoring Application | ENG02 | 2015-12-18

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0 Table of contents

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0.1 Document history

Version	Published	Changed	Comments
EN01	2014-08-25	Document published	New Document
ENG02	2015-12-18	Chapter 6.2 and A.2	E-Meter baudrates

0.2 Trademarks

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Technical changes are subject to the latest technical developments.

Published in Switzerland

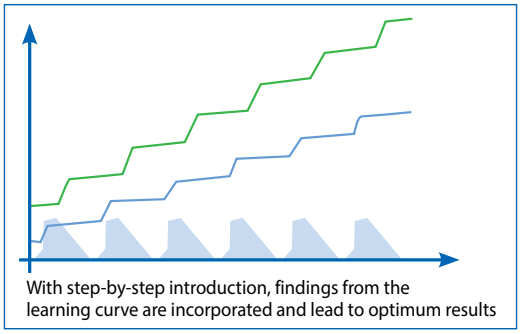
1 Quickstart

1.1 SBC Energymanagement

SBC S-Monitoring is a system made for the recording, visualisation, storage and transport. Through the transparency, consistency and simplicity of the web and IT technology of S-Monitoring, every user in a property becomes a manager for the consumption of water, electricity, gas, heat, etc.

Anyone can see all the data relevant to them and can influence it from anywhere and at any time. This means that substantial long-term improvements in efficiency are possible without any expensive and time-consuming investment projects. Increased awareness and responsibility eliminates energy wastage.

Continuous optimisation in calculable steps


With step-by-step introduction, findings from the learning curve are incorporated and lead to optimum results

Sustainable resource management means being able to continuously gain insight in a changing environment. The optimal solution is different for every business, and needs to be developed with careful consideration. S-Monitoring supports a cautious approach in small, controllable steps and begins at the very foundation. Using cost-efficient, easy to install components, the entry into resource management can be achieved without external help. First results can already be seen after just a few days and these lay the groundwork for the next stages of optimisation. The investment risk is negligible and is limited to each individual development stage.

Further information is available at http://www.saia-pcd.com/en/energy-management/

Getting your consumption under control – from energy meters to the Internet

S-Monitoring makes it easy to launch an energy and consumption management system. Ready for use right out of the box, the solution requires no complex configuration or programming. Yet it can still be individually tailored to special requirements, even retroactively – a system that grows as needed.

The system is comprised of devices and components to capture, record and display consumption. Analyses can be performed on the locally installed Web Panel, conveniently at the office PC or remotely via Internet using standard Web browsers.

1.2 System overview

1.2.1 Capture consumption

- A wide range of single- and three-phase electrical meters up to 6,000 A
- S0 interface for connecting market standard meters for gas, water, oil…

SBC energy meters are available in established industrial designs and fit on DIN rails of standard cabinets. The meters capture electrical work (electricity meters) as well as electrical values such as current, voltage, active and idle power and power factor cos phi. The values are integrated in a bus system with an extension of up to 1 km and transmitted to Web Panels and controllers for analysis and logging.
Standard commercial meters with an S0 output or PT 1000 temperature sensors can be connected to the bus system via pulse counters equipped with an interface

1.2.2 Record and visualise consumption

- Recording of historical consumption (day/week/month/year) and costs
- Logging in Excel compatiblefiles

Web Panels and controllers read consumption values of the connected me-ters and display them in the form of a web visualisation. The figures can be retrieved both directly on the Web Panel and via the controllers' Web server with a Web browser. Both consumption values and costs can be retrieved in meaningful diagrams using an intuitive user interface. The Web Panels and controllers also write the captured values to a CSV file that can be read in Excel and which can be conveniently transmitted to a PC via FTP. The function can be activated on any newer controller. The E-Controller and E-Monitor are factory installed and are ready for imme-diate use without additional programming.

1.2.3 Analyse consumption remotely

- Reading and operating via LAN/Internet using Web browsers
- Mobile access with mobile phone and iPad

If the Web Panel and controller are linked with a local area network, the meters can be read and operated via the regular office PC with standard browsers. No special software installation is necessary; apps are available for mobile devices. With an existing Internet connection, this can even be carried out across com-pany sites.
Databases, energy management software or control systems can be con-nected via standard interfaces (e.g. FTP, CGI, HTTP…).

1.3 Energymonitoring Products

1.3.1 Ready-to-use energy monitoring right out of the box

“Ready-to-use” devices already have the application pre-installed from the factory. They can be put into operation by an electrical technician with absolutely no programming. The project can be expanded at any time with SBC programming tools.

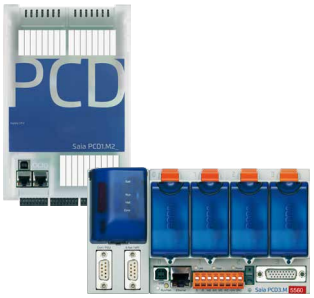
E-Monitor
The E-Monitor is an SBC Function PCD that is immediately ready for use without addi-tional programming right out of the box. It combines data capture, visualisation and logging in one compact device. Energy meters and pulse counters are automatically detected and read via the linked S-Bus interface. Historical data and Web visualisation can be accessed from anywhere via FTP and HTTP with the integrated Automation-Serv-er. They can also be accessed with mobile devices using SBC apps.

E-Controller
The E-Controller is an SBC Function PCD that is immediately ready for use without additional programming right out of the box. It combines data capture, decentralvisuali-sation and logging in one compact device. Energy meters and pulse counters are au-tomatically detected and read via the linked S-Bus interface. Historical data and Web visualisation can be accessed from anywhere via FTP and HTTP with the integrated AutomationServer. They can also be accessed with mobile devices using SBC apps.

1.3.2 Integration of the monitoring function in primary systems and Web Panels

The S-Monitoring application can be loaded to Saia PCD® controllers and Web Panels using the engi-neering software Saia PG5® Controls Suite. This substantially reduces the development effort needed. Functional extensions and modifications to the application can be made at any time. The optional com-munications interfaces allow other protocols and hence data (such as from a Modbus or M-Bus meter) to be integrated.

Programmable Web Panels
A programmable Logic Controller is integrated with the pWeb Panels. The S-Monitoring application can likewise be loaded on the pWeb Panels. This enables existing systems to be enhanced and modernised. In doing so, the system control itself remains unchanged.



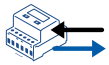
Powerful Function PCDs
The hardware platforms are extremely powerful and provide a large scope for function extensions. This is a mandatory precondition that will allow the platform to be kept up-to-date throughout a system’s entire lifecycle.

2 S-Monitoring Web-Application

2.1 Application Overview

SBC delivers a PG5 project which also includes a web visualisation. The project is based on the COSinus functions and enables saved data to be visualised on the PC immediately.

The application can be found on the homepage at www.sbc-support.com

Capturing of energy values			
	Automatic detection of connected energy meters		Display of the energy meter status
	Grouping of the energy meters		Comparison between meters and periods
	Connection of bidirectional meters		Connection of H104SE coupler modules (for S0 meters)
Presentation and evaluation of energy values			
	Current meter readings such as consumption, voltage, current, active and reactive output and cosφ		Evaluation and presentation of the costs
	Visualisation in bar charts and trend diagrams		Consumption and costs presentation per day/week/month/year[1]
	Data storage in Excel-readable CSV files		
Remote access via network and Internet			
	Operation at the PC with standard browser (IE, Chrome, Firefox)		Operation via smartphone and tablet
	Access to log data and web project with FTP		Integrated USB port for update and maintenance
User support			
	User administration with up to 2 user levels		User interface in several languages

[1] Daily view only available if memory extension is plugged in

2.2 S-Monitoring COSinus function

S-Monitoring is an integral part of the COSinus operating system and is integrated into all Saia PCD® controllers ending with xx60 and having the pWeb-Panel MB. It is activated in the PG5 Device Configurator.

The S-Monitoring function can read three different types of meters:

- Connected S-Bus energy meters and pulse counters (PCD7.H104SE)
- Groups of meters
- Other incremental meter values (M-Bus, Modbus, etc. are referred as “custom counters” and needed to program withSaia PG5®)

The S-Monitoring COSinus function comprises the following three parts:

1. Saving the meter values in CSV files

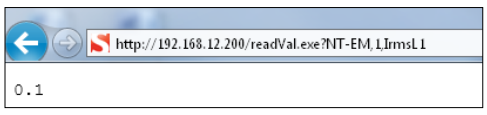
The values of the energy meters connected are saved once a day at midnight in a CSV file on the internal file system of the PCD. The daily, weekly and monthly consumption can be calculated from this data. If an additional memory card is inserted, the values can be saved at 5-60 minute intervals. This makes it possible to visualise consumption over a day.

	A	B	C	D	E	F	G	H	I
1	Date	Energy1	Energy2	Tariff1	Tariff2	Energy3	Energy4	Tariff3	Tariff4
2	10.6.2013	206.10	0.00	0.1600	0.1300	160.00	13.23	0.1500	0.0800
3	11.6.2013	208.70	0.00	0.1600	0.1300	164.10	13.76	0.1500	0.0800
4	12.6.2013	214.43	0.00	0.1600	0.1300	168.13	14.82	0.1500	0.0800

2. Provision of meter values via NT-EM tags (CGI interface)

All data and basic functions can be called via CGI tags. These functions can therefore be accessed via the web interface or by other programs (e.g. Excel). The controller does not need a Fupla or IL program (see document 27/623).

NT-EM tag (CGI command) in the web browser:



← Command

← Value

Excel Report Tool
When the COSinus function is activated, the data can simply be imported into Excel without programming.
Download: www.sbc-support.com

3. Autoscan of S-Bus energy meters and pulse counters

If the S-Bus Autoscan is activated, meters connected to the RS-485 interface are automatically detected and read.
By permanently requesting the meter data, remote diagnosis of the S-Bus meters and bus connection is possible.

2.2.1 Enable COSinus Function

• Enable the Monitoring and Logging functions in the Device Configurator

When „Yes“ S-Monitoring is enabled.

• Select an S-Bus interface for Auto Scan

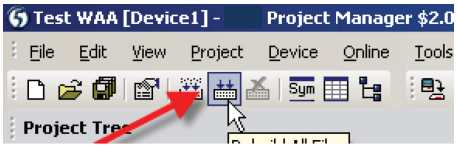
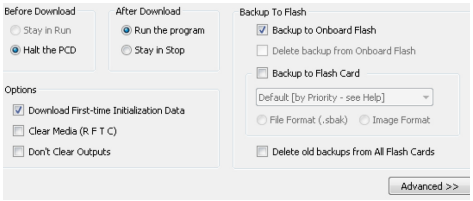
When „Yes“ (Monitoring function has to be also enabled), the COSinus is reading automatically the RS-485 Bus. In this case, the interface can not be used otherwise.

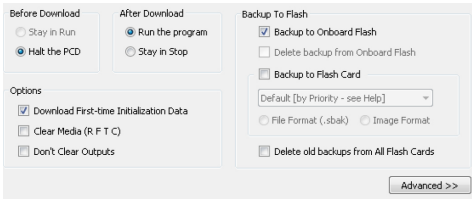
Additional parameters can be set if the bus is enabled:

• Baud Rate: The Saia energy meter support „autobaud“
• S-Bus-Timeout and S-Bus-Retries (depending on Baud Rate)
• Max. S-Bus address: Default 32 (recommended), 0 bis 127 selectable
• Log interval for logdata: 0 no log, default 15 min., 3 bis 60 min. selectable
• Data hold: Default 4 year, 1 to 5 year selectable

2.3 Downloading the program

The user program is downloaded in the same way as performing device configuration with the PG5 software.

1	**Create and compile the user program**	
	The file your_project.pcd contains the following information: User program (FUPLA, IL, etc.) Configuration files (in some cases) Data forfirstinitialisation	
2	**Program download**	
	Clicking on the Download button shows the following window.  The user program is downloaded as a file in a particular partition of the internal file system. The useris not able to see this partition.	
3	**Options after download**	
	Execute program (RUN)	Sets the PLC to RUN, once the download is successfully completed
	Remain STOPPED	After the download, PLC remains STOPPED



- It is not possible to only download those blocks which have been modified.
- The user program is downloaded into the on-board memory in a file and, after a restart of the system, the process is complete.
- If the download is not successfully completed, the FW deletes all files inside
- thesystemfolder.

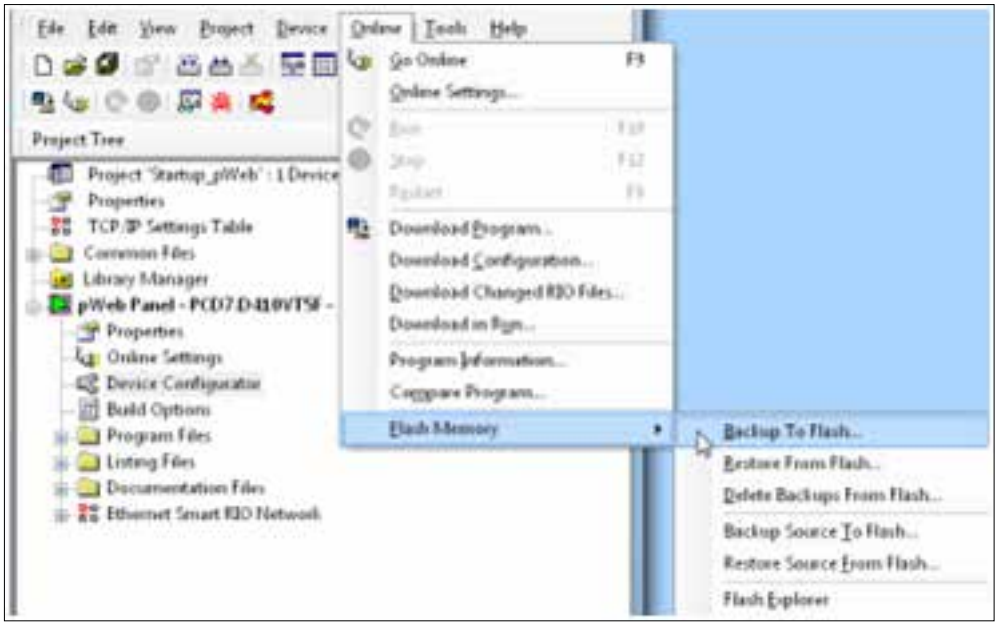
Once the download has been successfully completed, start the controller:

After the system restart, the user program and ROM DB/text are transferred into the execution memory. This is a write-protected memory, which does not need to be backed up; all data is stored in the Web panel file system.

The data for the user program is transferred to the execution memory after the Web panel device starts up.

2.4 Backing up and restoring the user program

Select a backup with “Backup To Flash”



Since the user program is already stored in the on-board flash memory, only the RAM DB/text for the on-board flash memory are stored to the folder PLC_SYS (not visible to the user)

Note: Registers, flags, timers and counters are not stored.

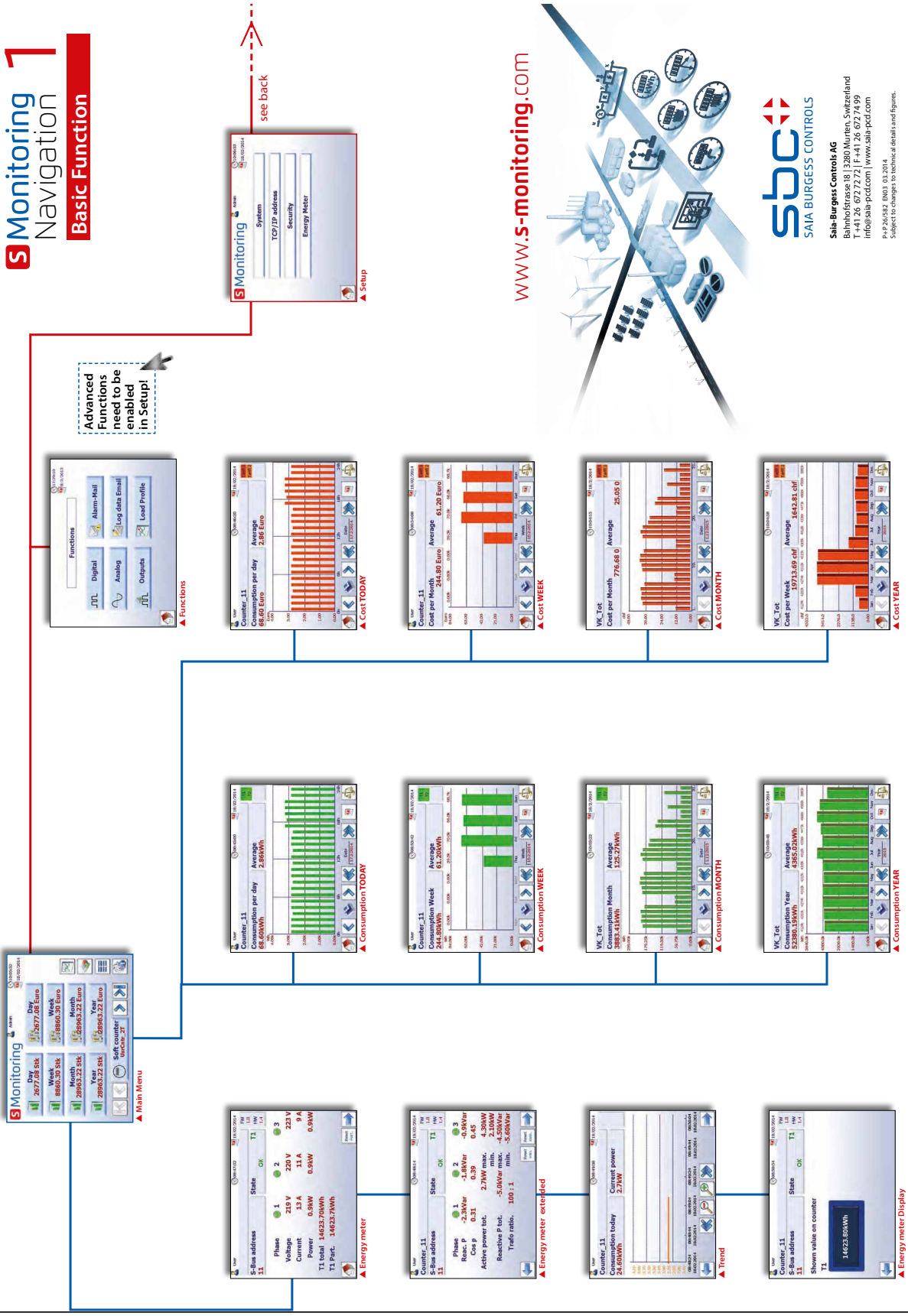
During a restore, the DB/text are copied back into the SRAM memory.

Backup to INTFLASH file system

The values RAM DB/text are stored in the internal PCD_Backup folder. This allows the backup files to be accessed via the FTP server and then uploaded to a PC.

2.5 Energymonitoring Web Application

The basic function of the web application only uses CGI tags and therefore does not require a PG5 program. It is used to create all bar charts and to make the settings in the setup menu. More information in document 26-582.

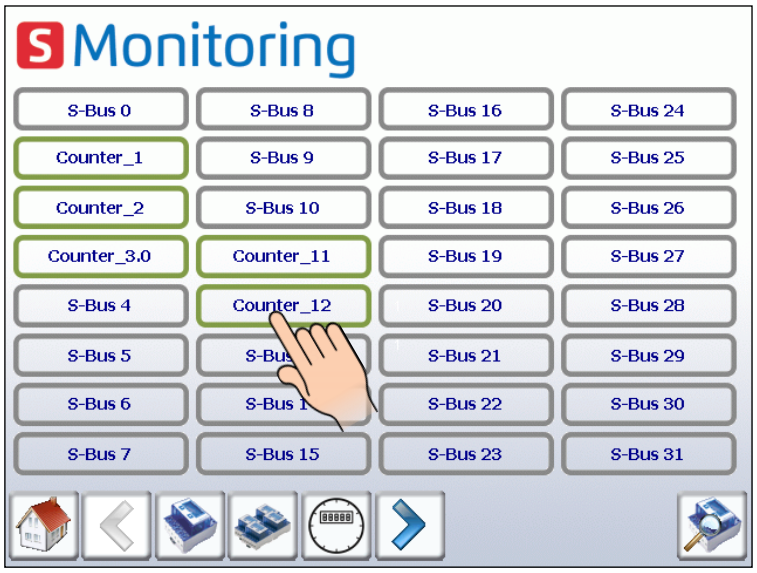


2.5.1 Easy navigate with counter summary list

The counter summary list provides an excellence overview and an easy navigation between connected meters. Access the summary list direct from home page by pressing button below.

Navigate
to counter list

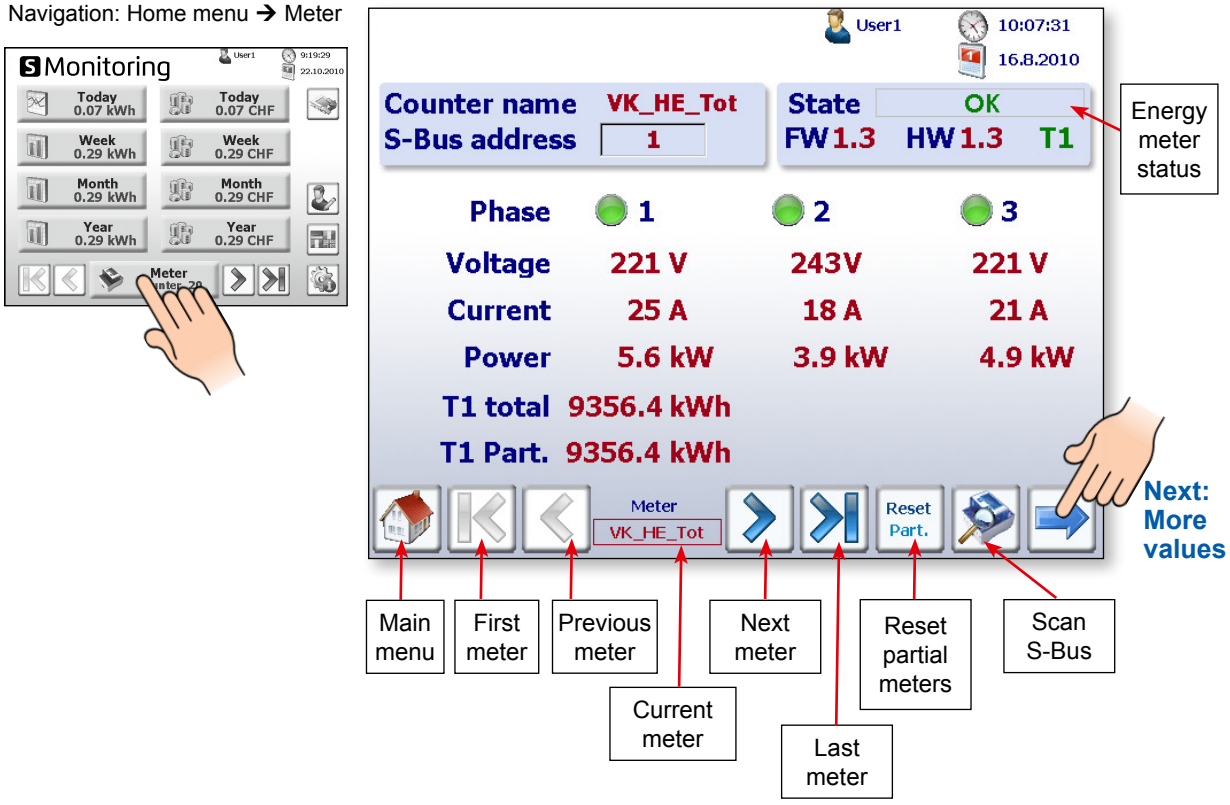
By clicking on a connected meter (green marked) a popup appears with major information of the respective counter. Red marked counter have a connection error or are no more available.



Pulse counter via H104 Module appear as one single counter.
Navigation between different inputs is disposable in popup.

2.5.2 Live values provided by the energy meter

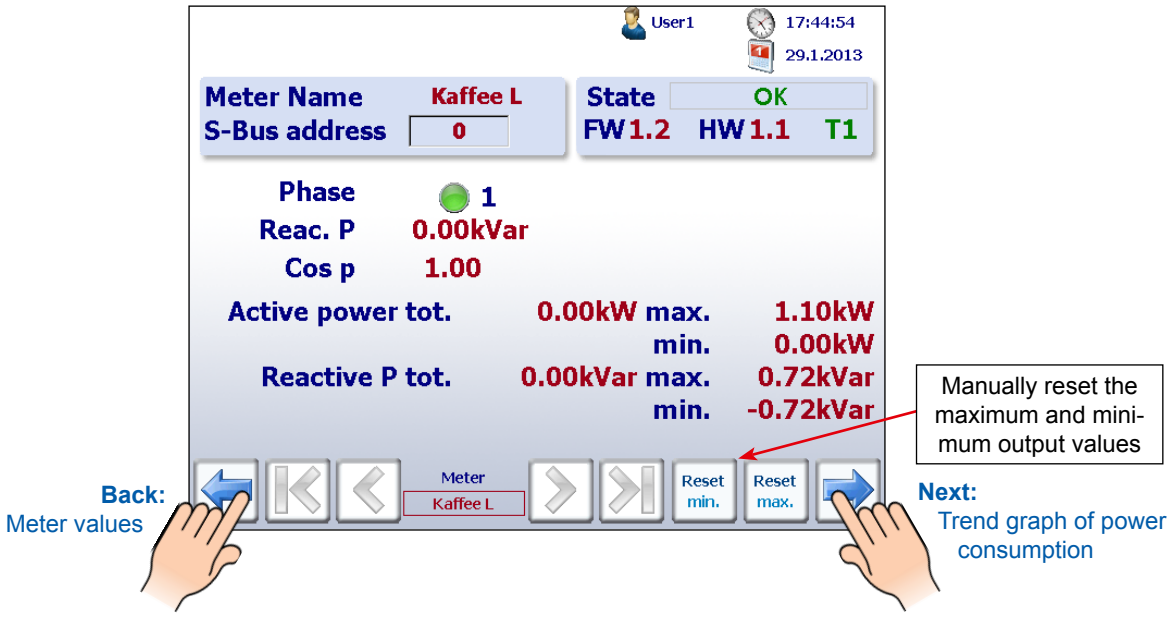
Navigation: Home menu → Meter



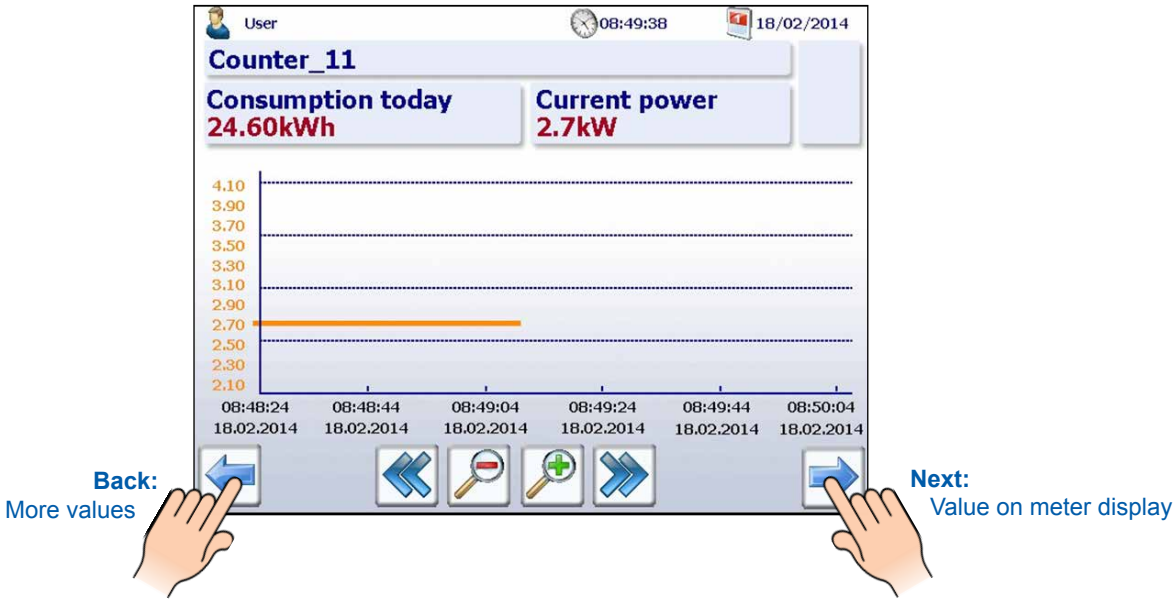
The status of the individual energy meters is checked continuously.
The following operating modes are displayed:

OK	Connection to energy meter OK
Connection Error	The meter is recognised, but there is a connection problem
Not Connected	No connection to the energy meter

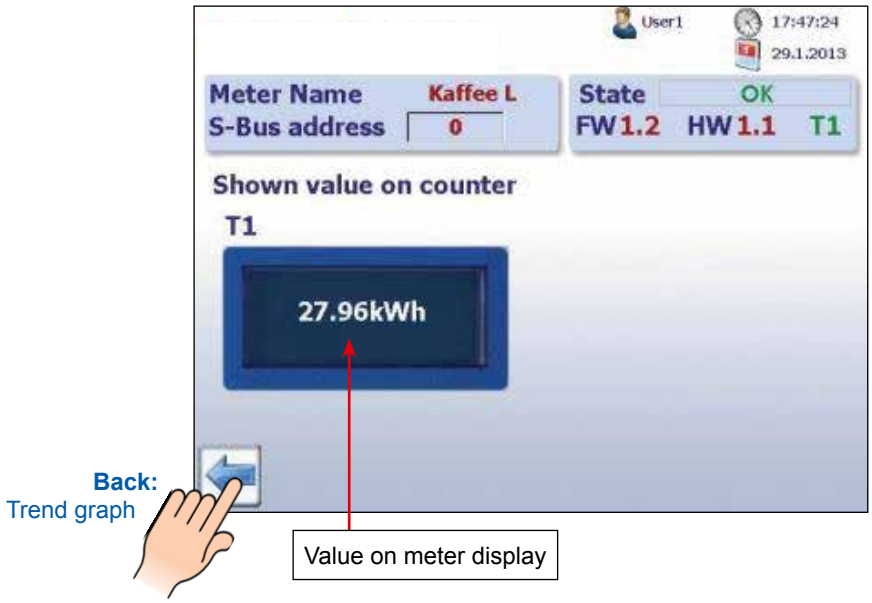
More values like reactive power, active power and cos p:



Trend graph of current power consumption in kW:



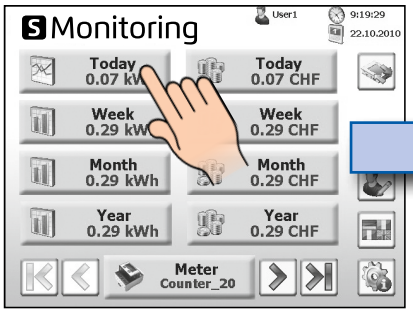
Real value shown on meter display of all SBC S-Bus energy meters:

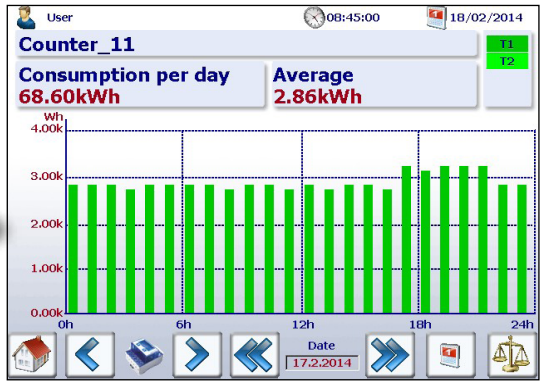


2.5.3 Visualisation of consumption in bar charts

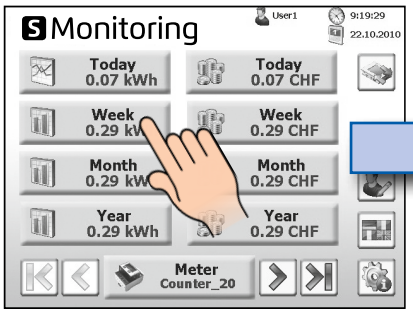
The web application provides historical visualization in bar graphs per day, week, month and year.

Navigation:
Home menu ➔ Day

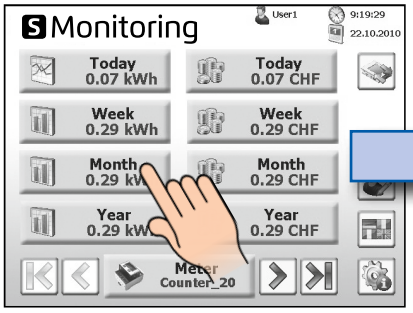


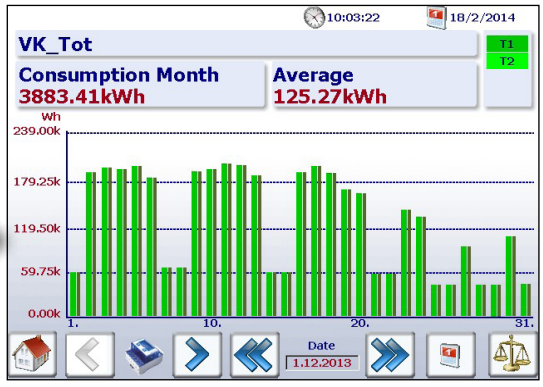


Navigation:
Home menu ➔ Week

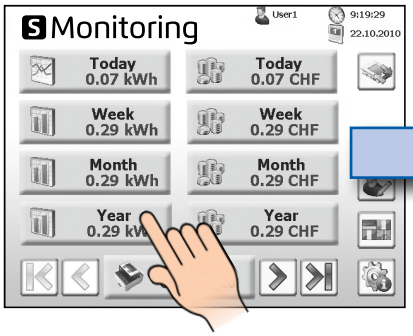


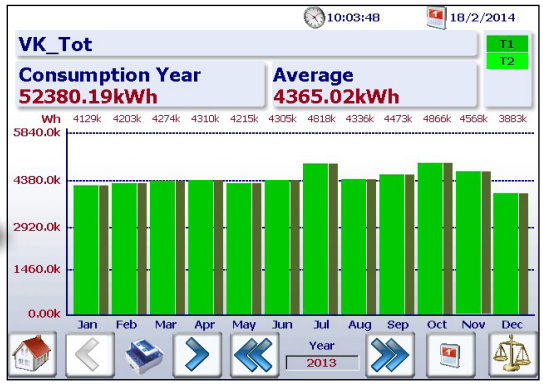
Navigation:
Home menu ➔ Month





Navigation:
Home menu ➔ Year





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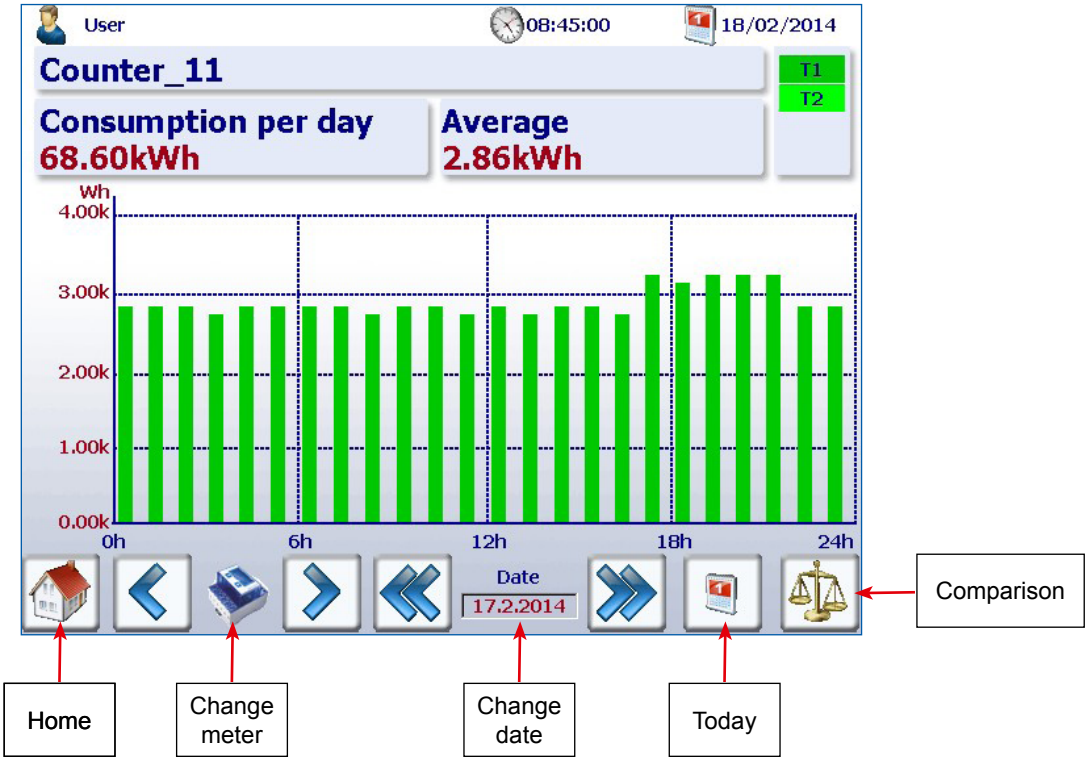
Flash card has to be plugged in for daily consumption.

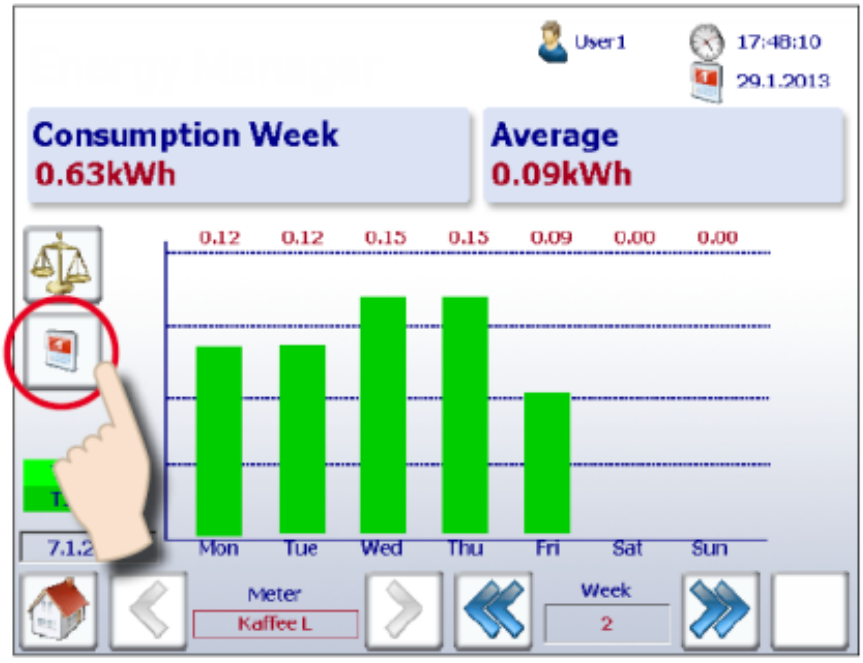
For more information refer to SBC System Catalogue 26-215

Description of navigation in bar graph websites:



2.5.4 Today button

An additional button has been added. Pressing the appropriate button on the websites for consump-tion per week, month and year and for costs per week, month and year, the screen immediately switches to the current date (week, month, year). This function is useful if you want to navigate through time periods and quickly go back to the current date.

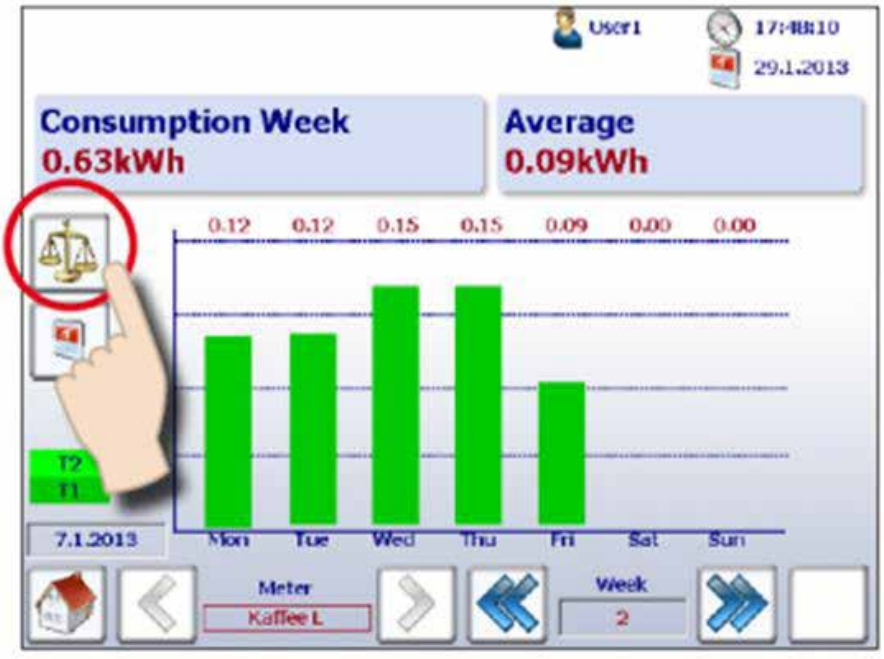


2.5.5 Comparison between meters and periods

Visual comparisons can be made between meters and periods.
A comparison is made as follows:

1. Navigate to select reference meters and periods.
In the following example, the meter “Coffee L” and week “2”.

2. Start the comparison by pressing the comparison button.



3. **The reference bars are shown along with the name of the reference meter and the period at the top ritht of the screen.**

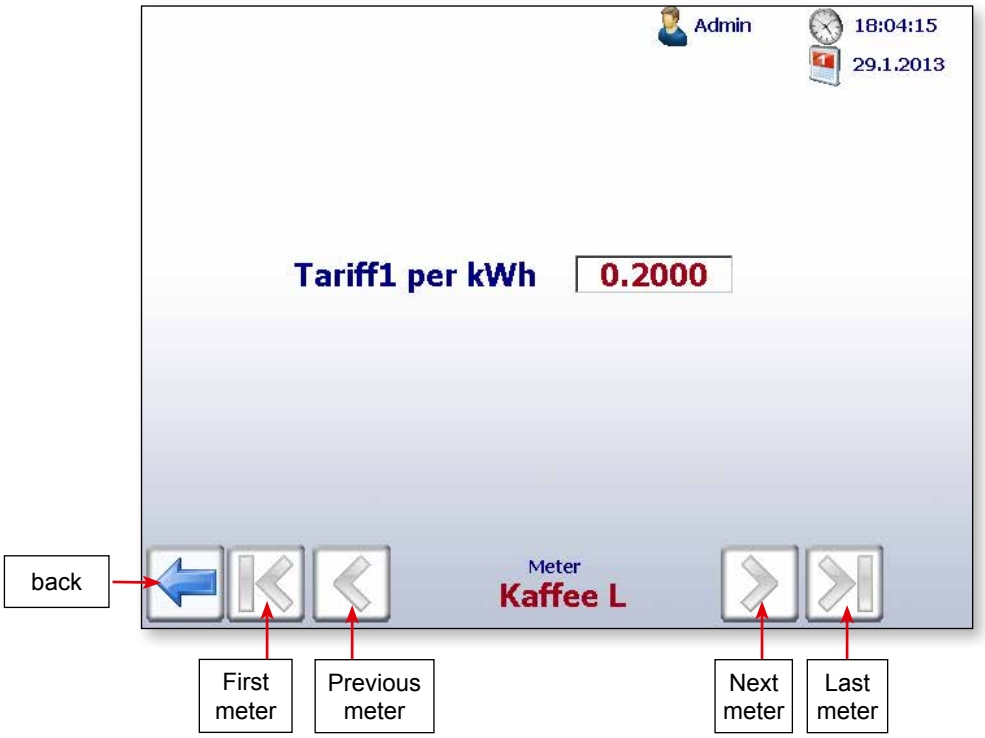
4. **You can now compare the reference and another meter or period by navigation as normal.**

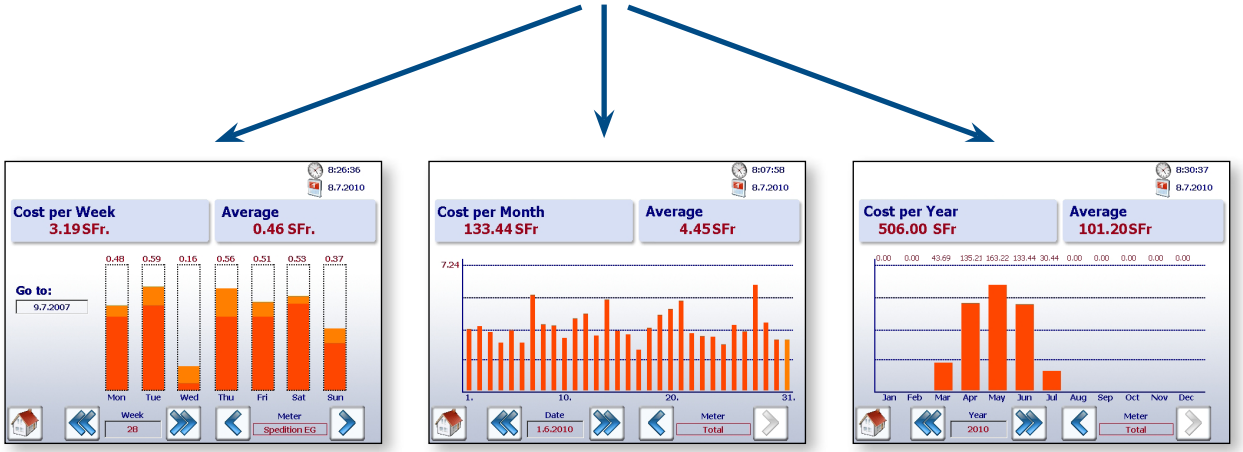
5. **To deactivate the comparison screen, simply press the deactivate button.**

2.5.6 Costs

The costs per day, per week, per month and per year shown in the graph correspond to the power consumption. Tariff 1 and Tariff 2 can be input for each energy meter. Global currency such as the euro, the Swiss franc or the US dollar can be input under Setup (only when logged in as admin). See chapter “Login as Admin”.

Setup ➞ Energy meter ➞ Tariff





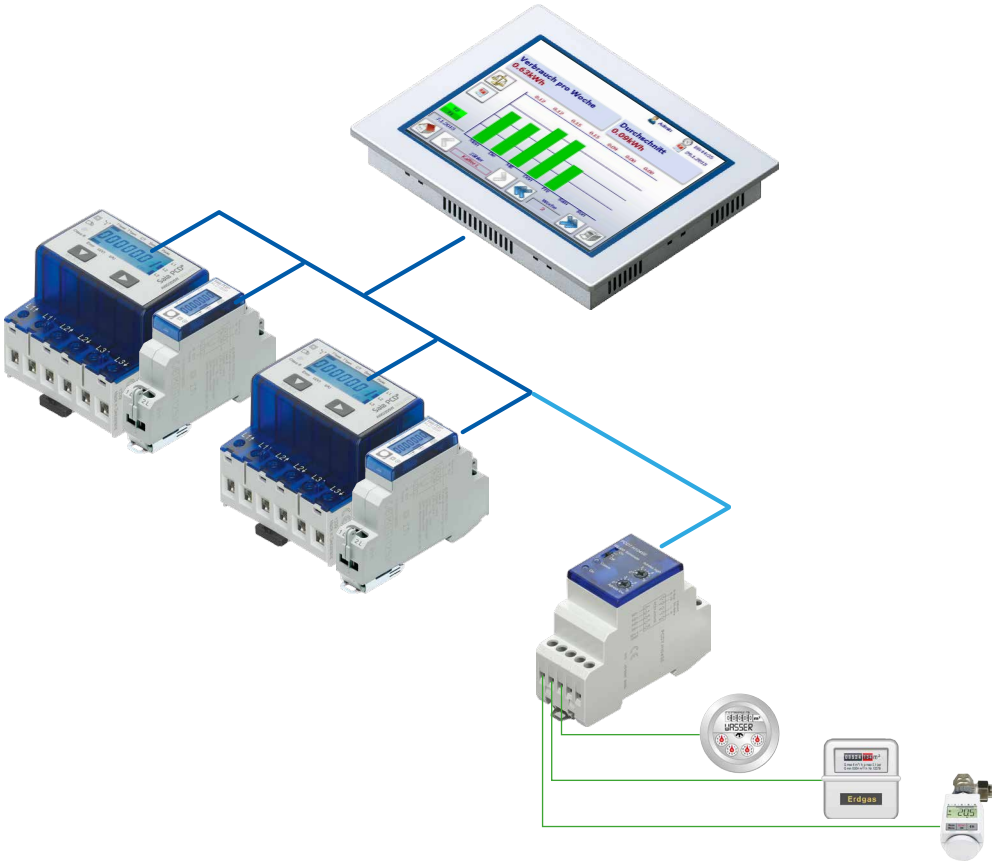
Costs per week | Costs per month | Costs per year

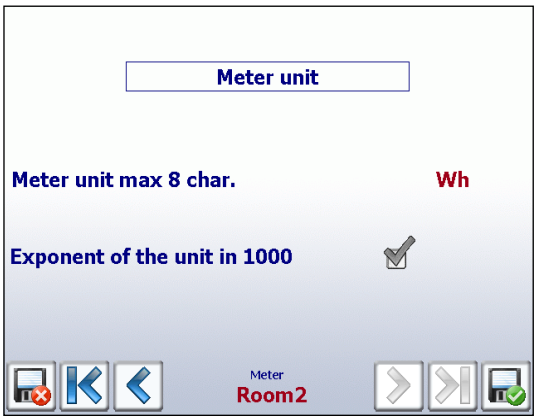
Ø: If this symbol appears, a midnight log was not prepared for the previous night. The energy consumption is averaged.

2.5.7 Visualisation of S0 pulse meter PCD7.H104SE

The S-Monitoring application automatically creates four virtual meters per PCD7.H104SE module. Each of these four meters is shown on the screen as an individual standard S-Bus meter. The meter values are logged in the CSV file. Every S0 meter is displayed with the standard navigation.

Example with S-Bus-address:
Meter 1.0 S01→ Meter 1.1 S02 → Meter 1.2 S03 → Meter 1.3 S04





The visualisation corresponds to the display of the standard S-Bus meter. The unit and factor can be adjusted under Setup → Energy meter → Meter unit (only when logged in as admin). See chapter “Login as Admin”.

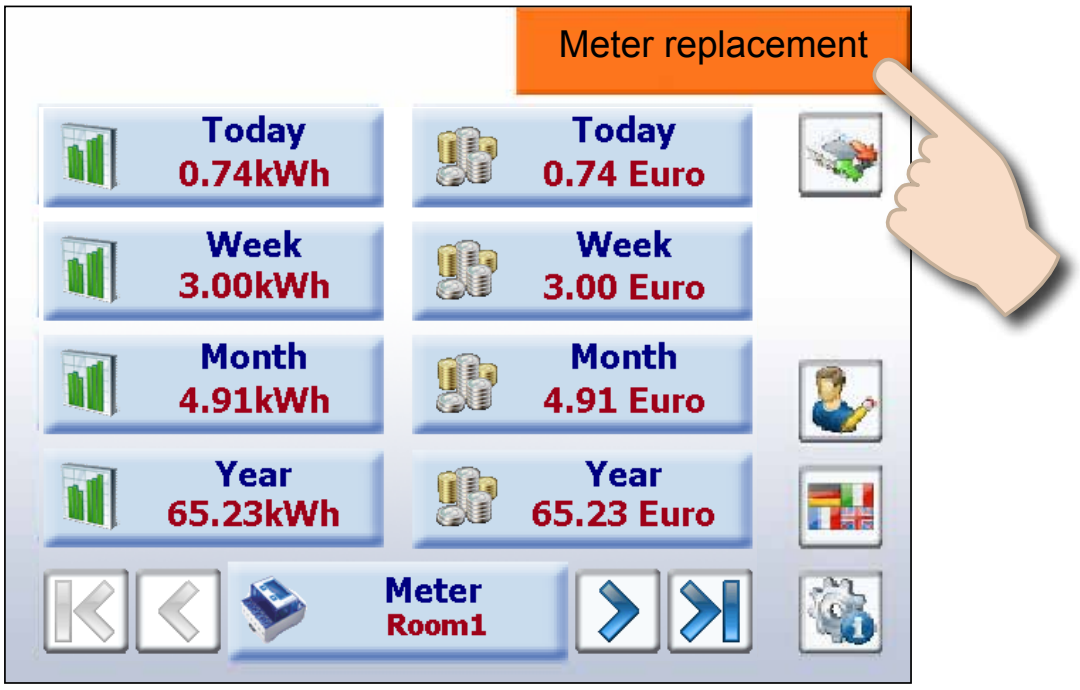
2.5.8 Replacing Saia PCD® energy meters

The E-Monitor Panel automatically detects that a meter has been replaced if one of the following conditions is met on the same S-Bus address:

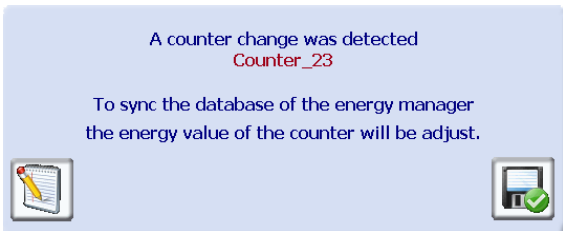
- ASN of the new energy meter is not the same as the old one (e.g. a different type of bidirec-tional meter or PCD7.H104SE module)
- Serial number is not the same
- Meter value is not plausible (new value is lower than the value of the exchanged meter)

Process for replacing a meter

1. The E-Monitor continually saves the last known value of an energy meter during operation.
2. An energy meter is replaced and the new meter is configured to the same S-Bus address.
3. The E-Monitor detects the meter has been replaced and reports this on the user interface with a warning.

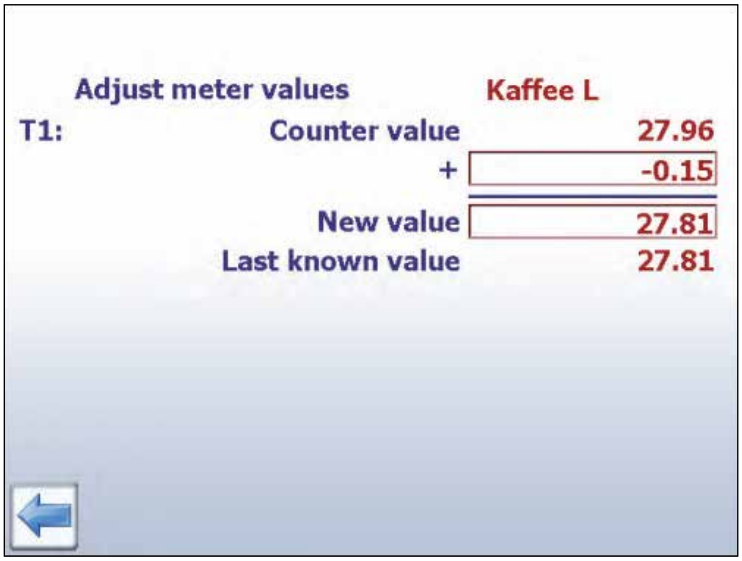


4. If the user presses the orange warning message, he is automatically taken to the Setup screen, where the E-Monitor automatically adjusts the new value or the user can change it manually.



5. The new meter value can be specified on the following website.

Navigation: Setup ➞ Energy meters ➞ Meter comparison



Replacing PCD7.H104SE with an energy meter:

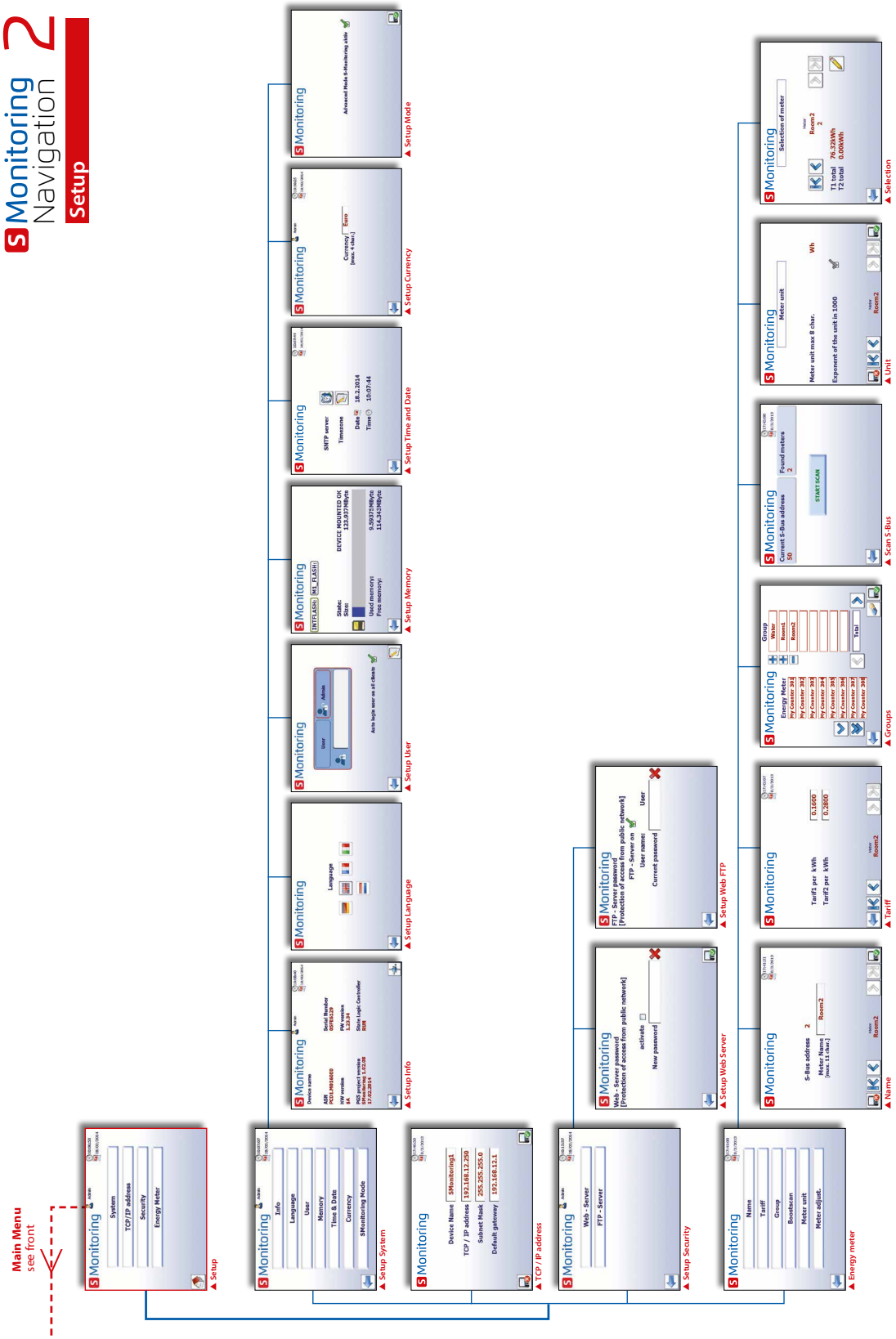
The E-Monitor automatically creates a new log file (CSV file) when a PCD7.H104SE is replaced with an energy meter. However, the old files are not deleted.

Replacing PCD7.H104SE with PCD7.H104SE:

The same as for standard energy meters, but up to 4 values can be set (one for each S0 meter). This also applies, logically, to bidirectional meters. These can be replaced with any bidirectional meters, but information will subsequently be lost.

2.6 Web Application Setup

To configure settings in the setup menu, you need to be logged in as administrator.
See chapter “Login as Admin”.

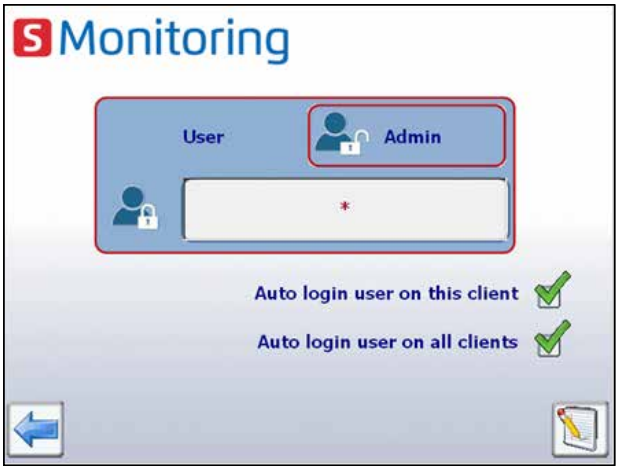


2.6.1 Login as Admin

S-Monitoring is based on 2 user levels. As a standard user, you only have read-only access with the exception of the ability to set the language and to change your own password and user name. When logged in as an administrator, your privileges are unrestricted, and you can configure and change all settings under Setup or directly by clicking on user icon at the upper edge of each site.

User level	Default name	Default password
1	Admin	12345678
2	User	- no password -

By activating checkbox auto login, a user authentication is not required when reboot the application.



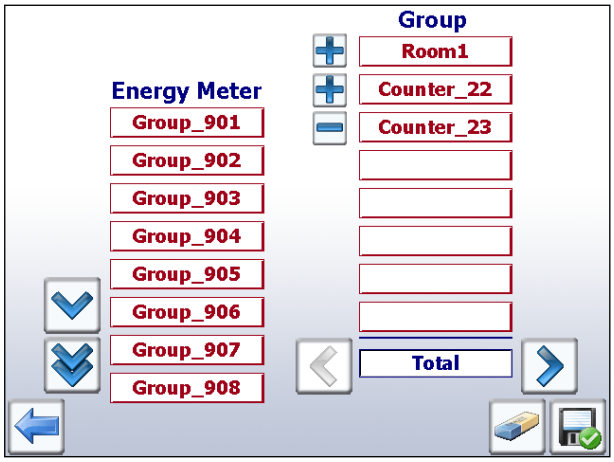
If user name or password is lost, the user configuration has to be downloaded from Saia PG5®!

2.6.2 Group of energy meters

Up to 32 independent groups of energy meters can be created. To add a meter, simply click on it in the configuration screen; this adds the selected energy meter to the group. To remove the meter from the group, simply click on it in the group. A group can also contain a group. This function is only accessible when logged in as administrator.

The function can be used mainly to calculate the energy supplied and consumed as well as to display “Net energy”.

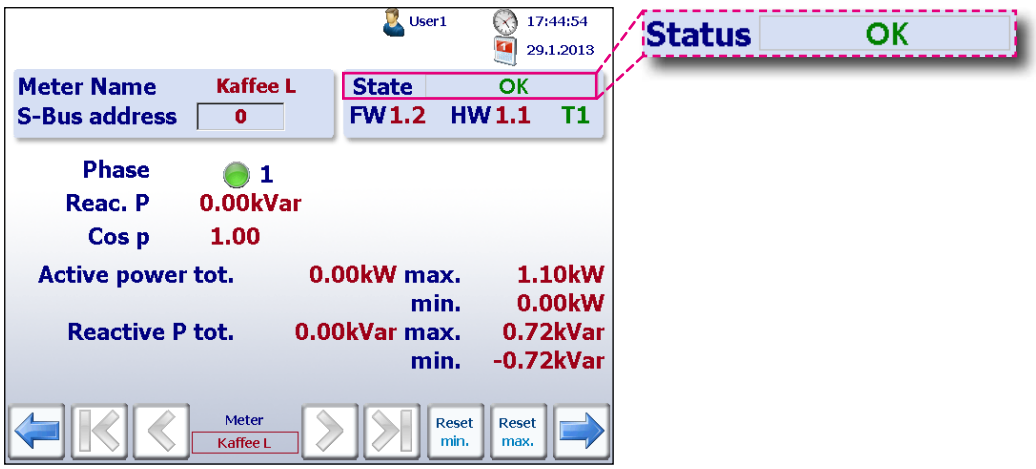
Navigation: Setup ➞ Energy meters ➞ Groups



In the example, the “Total” group corresponds to the energy from ALE3 – AWD3 + ALD1

A plausibility check for the unit is not carried out when grouping. The E-Monitor does therefore not provide notification of whether, for example, the user is billing electrical energy using heat energy.

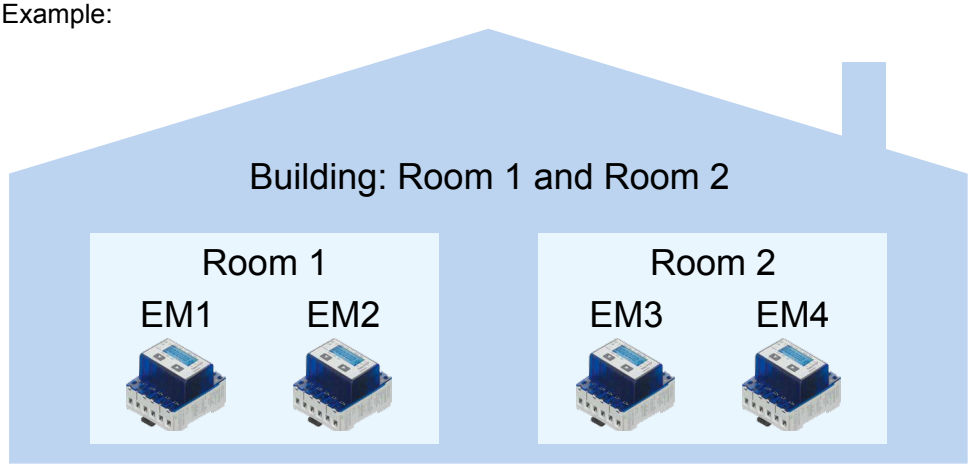
Note: A group is only displayed if each of the configured meters in it is configured (OK status).



Values displayed for each group:

- Current phases 1, 2 and 3 • PRMS total
- PMRS phases 1, 2 and 3 • QRMS total
- QRMS phases 1, 2 and 3 • T1/T2 total
- T1/T2 partial

Example:



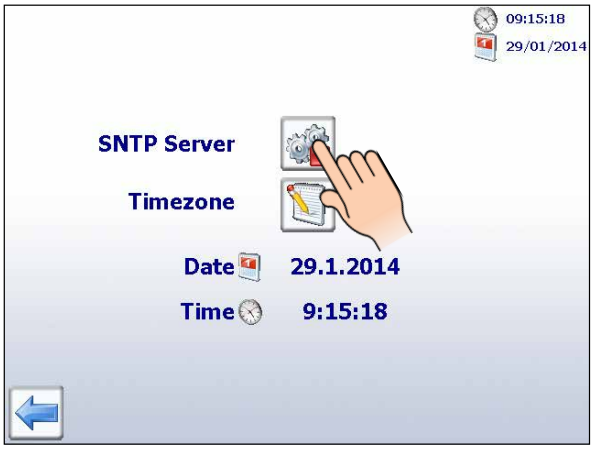
Room 1 group = Energy meter 1 + Energy meter 2
Room 2 group = Energy meter 3 + Energy meter 4
Group formation = Room 1 group + Room 2
Group Building = Room 1 group + Room 2 group = EM1 + EM2 + EM3 + EM4

2.6.3 Date and Time settings

SNTP technology is intended to synchronize the internal clock with the Coordinated Universal Time (UTC). SNTP can usually maintain time to within tens of milliseconds over the public internet, and can achieve better than one millisecond accuracy in local area networks under ideal conditions. Asymmetric routes and network congestion can cause errors of 100ms or more.

Configuration can be done only when logged in as admin. See chapter “Login as Admin”.

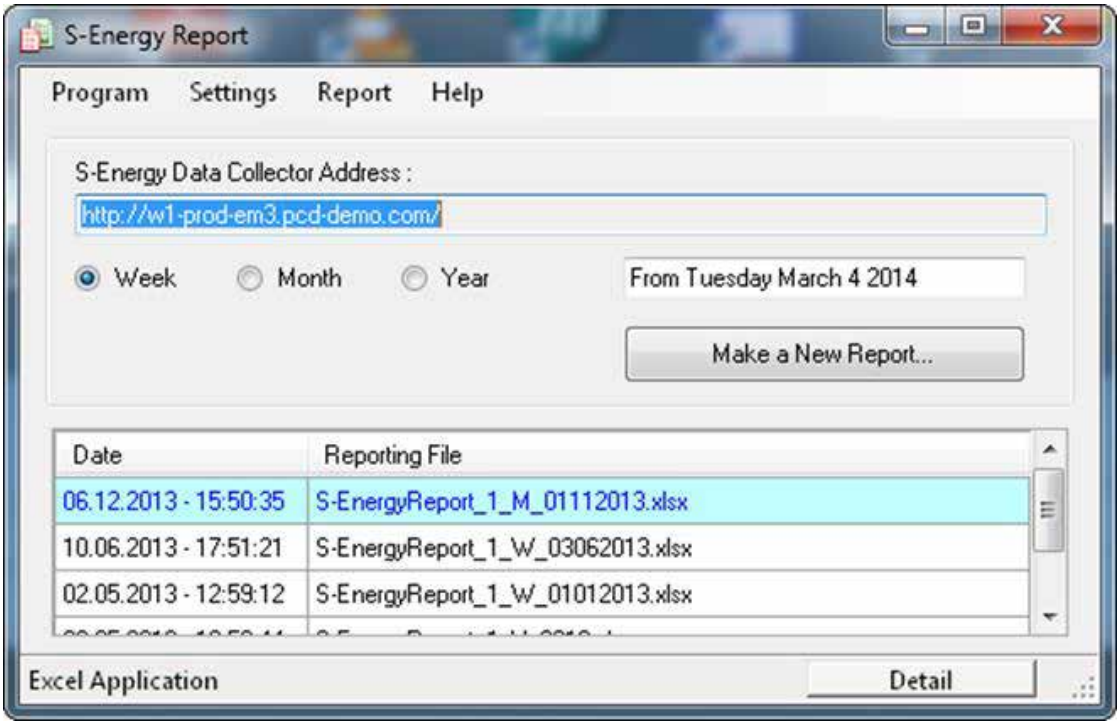
Navigation: Home ➞ Setup ➞ System ➞ Time & Date



When clock synchronisation via SNTP is enabled, specific timezone has to be chosen.

3 Historical data

3.1 Import data and create report in Excel



Supported operating systems:
Windows XP, Windows Vista and Windows 7.

Supported SBC S-Energy and S-Monitoring devices:

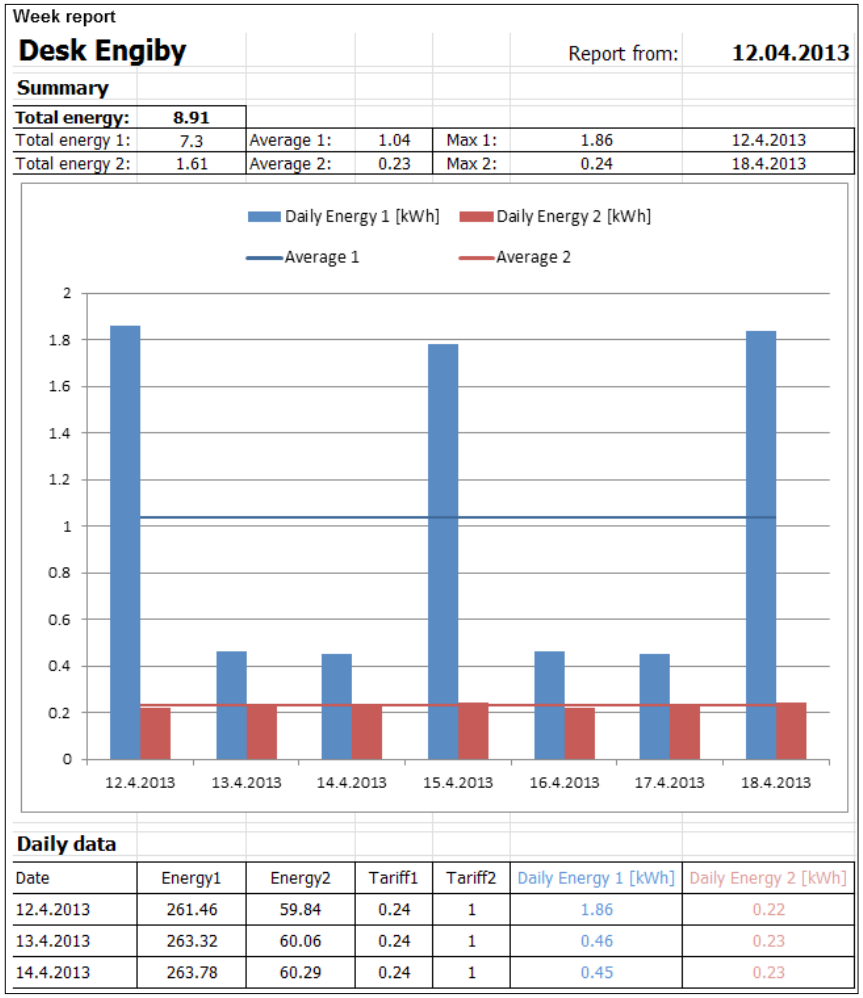
- PCD7.D457VT5E0
  E-Monitor Web Panel supporting S-Monitoring
- PCD1.M0160E0
  E-Controller supporting S-Monitoring
- PCD1.M2160
  CPU with Ethernet supporting S-Monitoring
- PCD3.Mxx60
  CPU with Ethernet supporting S-Monitoring
- PCD7.D4xxVT5F
  Programmable Web Panel 5.7”, 10.4”
  VGA TFT or 12.1” SVGA TFT supporting S-Monitoring
- PCD7.D4xxET7F
  Energy Manager Web Panel

Excel requirements:
S-Energy Report requires Excel 2003 or above to be installed on the PC.

3

Report samples:

Below you can find some screenshots of sample reports. The reports are generated based on templates which can be adapted in order to fit your requirements.



Week report

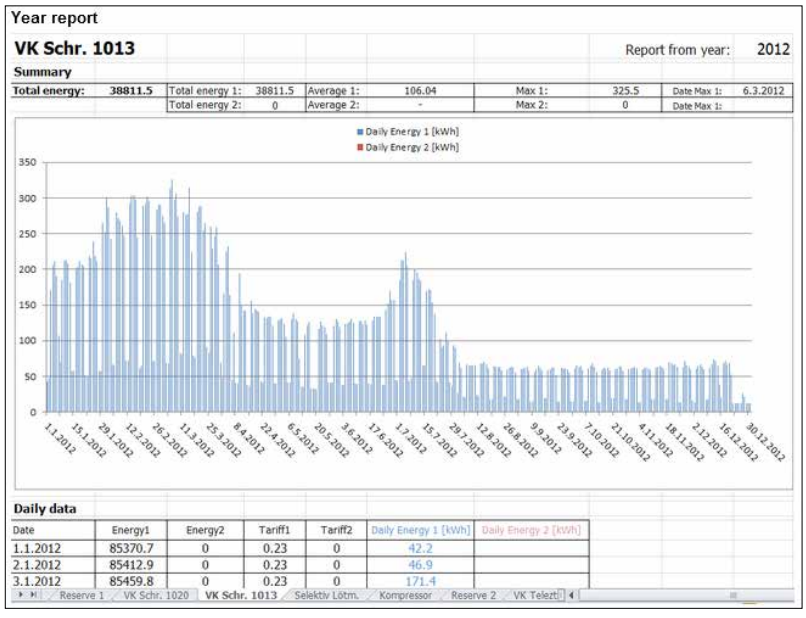
Desk Engiby Report from: **12.04.2013**

Summary

Total energy:	**8.91**					
Total energy 1:	7.3	Average 1:	1.04	Max 1:	1.86	12.4.2013
Total energy 2:	1.61	Average 2:	0.23	Max 2:	0.24	18.4.2013

Daily data

Date	Energy1	Energy2	Tariff1	Tariff2	Daily Energy 1 [kWh]	Daily Energy 2 [kWh]
12.4.2013	261.46	59.84	0.24	1	1.86	0.22
13.4.2013	263.32	60.06	0.24	1	0.46	0.23
14.4.2013	263.78	60.29	0.24	1	0.45	0.23



Year report

VK Schr. 1013 Report from year: 2012

Summary

Total energy:	**38811.5**	Total energy 1:	38811.5	Average 1:	106.04	Max 1:	325.5	Date Max 1:	6.3.2012
		Total energy 2:	0	Average 2:	-	Max 2:	0	Date Max 1:	

Daily data

Date	Energy1	Energy2	Tariff1	Tariff2	Daily Energy 1 [kWh]	Daily Energy 2 [kWh]
1.1.2012	85370.7	0	0.23	0	42.2	
2.1.2012	85412.9	0	0.23	0	46.9	
3.1.2012	85459.8	0	0.23	0	171.4	

Reserve 1 | VK Schr. 1020 | VK Schr. 1013 | Selektiv Lötm. | Kompressor | Reserve 2 | VK Telezt

Contact:
Engiby sàrl, Route des Noyers 25, 1782 Formangueires, Switzerland, www.engiby.ch

3.2 Day logfile

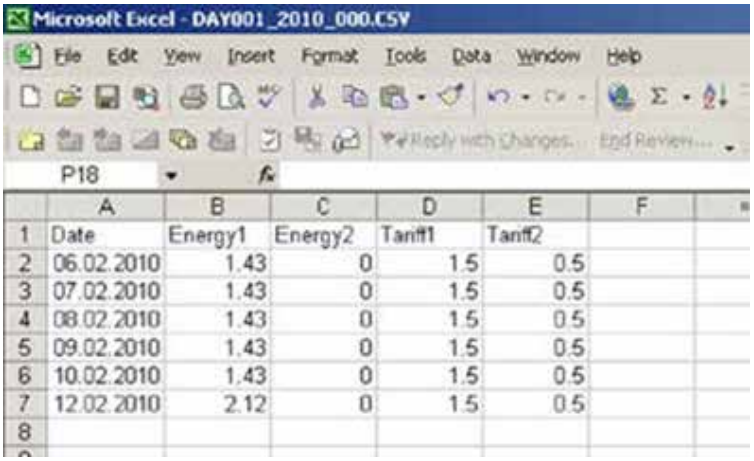
The midnight record day logfile is used primarily for the visualisation of energy consumption and costs (including tariffs) on the S-Monitoring application.

Storage

Day logfile is stored on internal flash

Logfile

- 1 logfile per year for every meter with information of 4 count values, tariffs and timestamp.
- Values are saved once a day (during midnight)
- Per default 4 years are stored



	A	B	C	D	E	F
1	Date	Energy1	Energy2	Tariff1	Tariff2	
2	06.02.2010	1.43	0	1.5	0.5	
3	07.02.2010	1.43	0	1.5	0.5	
4	08.02.2010	1.43	0	1.5	0.5	
5	09.02.2010	1.43	0	1.5	0.5	
6	10.02.2010	1.43	0	1.5	0.5	
7	12.02.2010	2.12	0	1.5	0.5	
8						

3.3 5 minute logfile

Storage

When the flash card (1GB) is plugged in, a logfile is automatically created for each meter.

PCD7.R610
Holder module
for microSD card

PCD7.R-MSD1024
MicroSD memory card 1 GB,
PCD formatted

For more information please refer to SBC system catalogue 26-215

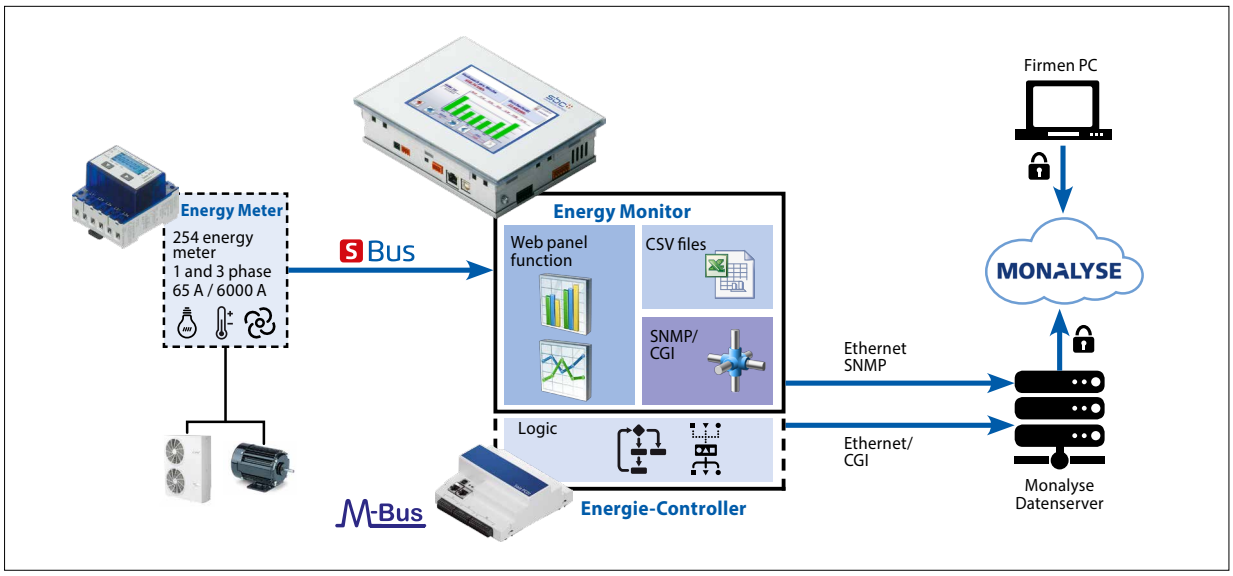
Logfile

- 1 logfile for every meter with information of 4 count values, tariffs, 9 auxiliary values and timestamp.
- Per default the month preceding and the current month are stored
- Values are saved at interval of 5min
- The function can be deactivated in the Saia PG5® Device Configurator

	A	B	C	D	E	F	
1	DateTime	Energy1	Tariff1	Energy2	Tariff2	Energy3	Tari
2	10.01.2014 08:50	254.25	0.23	0	1	0	
3	10.01.2014 08:55	254.87	0.23	0	1	0	
4	10.01.2014 09:00	256.48	0.23	0	1	0	
5	10.01.2014 09:05	257.43	0.23	0	1	0	
6	10.01.2014 09:10	258.545	0.23	0	1	0	

3.4 Different value types

The SBC S-Monitoring devices automatically convert the data of connected S-Bus meters and save the data on the internal file system. In addition the actual values of all meters are provided in a standard CGI interface.



Each meter gives different values. The values are divided in two types:

1. Count values

Each meter can have up to 4 count values.
The SBC energy meters usually have one or two (two tariffs or bidirectional).

The count values are

– stored in csv files one time per day
– have a specific unit which can be called with the CGI command

2. Auxiliary values

The auxiliary values are not logged in csv files, so there's no historical data.
These are for example voltage, current, cosPhi etc.

The auxiliary values are

– not stored in csv files
– have no unit which can be called with the CGI command

3.5 Get data with CGI calls

The CGI interface makes it very easy to read the meter data out of the devices. Therefore different commands can be used.

Attention: All CGI commands are case sensitive!

3.5.1 getValues.exe command

This CGI command allows reading multiple Web Tags from the PLC. The request is **limited to a total length of 1400 bytes**; including the HTTP headers and query. The response content-type is plain text.

We do not recommend getting more than 20 values with one call!

Request

http://<Controller IP>/cgi-bin/getValues.exe?CGI_tag0&CGI_tag1&CGI_tag2…

Response

Value0&Value1&Value2&Value3….

3.5.2 CGI_tags to get instantaneous values

The S-Monitoring tags you can use with the getValues.exe command have always the same syntax. They begin with NT-EM (Energy Monitoring Tags) followed by the address of the meter and the value you want to get from the meter.

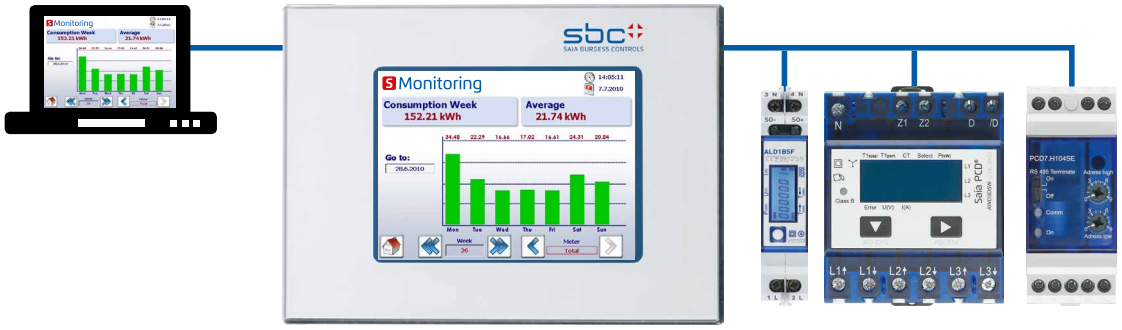
NT-EM,<Addr>,<valueTag>:unit:8

- Energy meter tags
- Address of meter
- Value you want to get
- Unit of meter and maximum of characters (only for count values)

To get the instantaneous values of the different SBC S-Bus meter you can refer to tags in chapter 5. Energy Monitoring Tags.

3.5.3 Example

We have the following configuration of devices and want to read instantaneous values of the connected meters. Therefore we connect the device with a computer. Both devices have to be in the same subnet. By writing the command in the address window of your web browser you'll get the data.



The values we want to read are:

Address 1 (ALD1B):

- Total counter value (used) with unit
- Total counter value (produced) with unit

Address 2 (ALE3):

- Voltage phase 1
- Voltage phase 2
- Voltage phase 3
- Total counter value of Tarif 1 with unit

Address 3 (PCD7.H104SE):
The PCD7.H104 has 4 meters in one device.
Therefore it has sub addresses. In this case they are 3.0 3.1 3.2 3.3

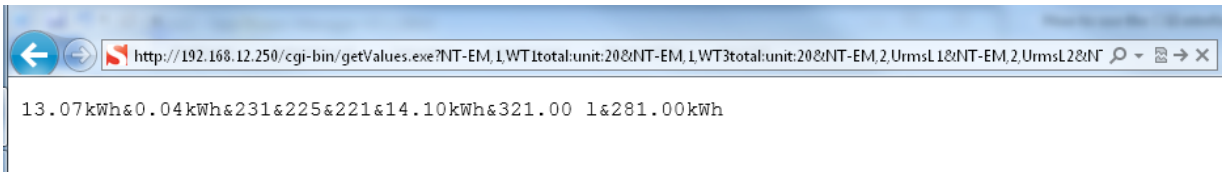
- Total counter value (counter0) with unit
- Total counter value (counter2) with unit

CGI command (all values at a glance)
With the following CGI command you get all values we want to read

```
http://192.168.12.250/cgi-bin/getValues.exe?NT-EM,1,WT1total:unit:20&NT-EM,1,WT3total:unit:20&NT-EM,2,UrmsL1&NT-EM,2,UrmsL2&NT-EM,2,UrmsL3&NT-EM,2,WT1total:unit:20&NT-EM,3.0,WT1total:unit:20&NT-EM,3.2,WT1total:unit:20
```

Output in web browser:

If you write the command in your browser address field, it will give all data separated by an &.



3.6 Get historical data files with http protocol

The historical data saved in the internal file system can be downloaded with the http protocol.

3.6.1 General description

All meter data is saved one timer per day at midnight in a csv file on the internal file system (intflash). The files are stored in the the following folder structure:

Folders:

INTFLASH:/

ENERGYLOG/

COUNTER/

<YEAR> Logs of virtual custom counters (only available if you have placed FBoxes in user program)

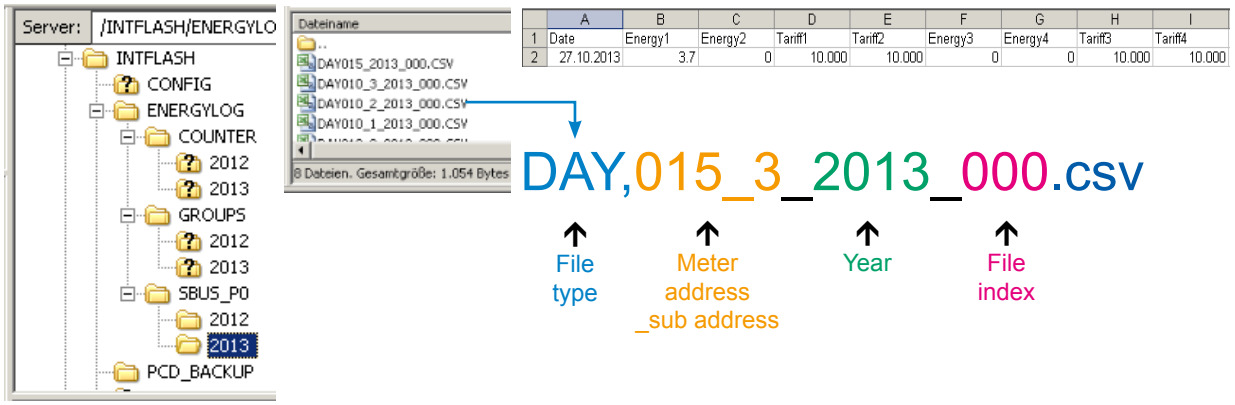
GROUPS/

<YEAR> Log files of groups

SBUS_P0/

<YEAR> Log files of Saia PCD® S-Bus meters

In each folder is for every meter address one file. The files have the following structure:



The filename has always the same syntax. The following described DAY files have always data from one meter for an entire year. For every day exists one log entry at midnight.

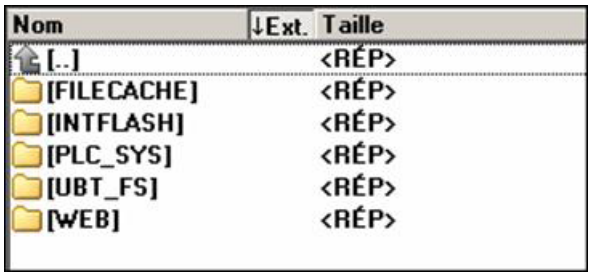
File syntax

DAY <address>_<year>_<index>.csv

DAY	File type (one log per day). Is always the same type in this folder
<address>	Address of meter has three characters + sub address. For example 003 without sub address or 003_1 if meter has a sub address.
<year>	Year where data was saved. For example 2013.
<index>	If an error occurs (date has changed, meter has changed) the firmware creates a new file and counts the index up. This mechanism prevents that existing data can be overwritten.

3.6.2 File system structure

The internal structure can only be accessed via FTP: SBC file system.



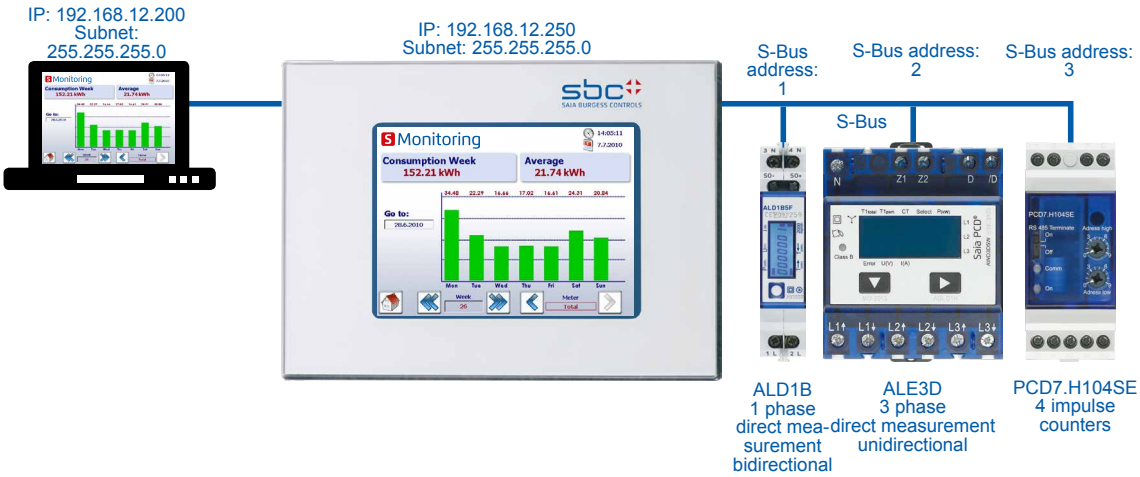
FILE CACHE : Contains the cache memory

INTFLASH : Contains:

- **INTFLASH/CONFIG/**
  KEYMAP.DAT ➞ Configure keyboard - only MB with buttons (F-keys).
  Does not apply to this MB panel.
  PASSWD.DAT ➞ Only displayed if a password has been creased
  (Forgot your password? ➞ Delete this file.)
  TSPOINTS.DAT ➞ For internal use
- **INTFLASH/WEBPAGES** ➞ Directory for all project files which you want to save “LOCAL-LY” (teq, gif files, etc.)
- **INFLASH/FONT** ➞ FONT directory must be created by the user.
  It contains all the special or additional .bft files containing typefaces.
- **INFLASH/TRENDLOGS** ➞ TRENDLOGS directory is created automatically when logs are stored. The .CSV files with the logs are saved to this location automatically (this uses Web Editor MB Macro S2F).
- **PLC_SYS** ➞ Internal use, no access (configuration sett., uBT_containers, etc.)
- **UBT_FS** ➞ UBT_FS/LOG.TXT List of the startup process + Error info (read only)
- **WEB** ➞ For internal use
- **SL0FLASH** ➞ Created automatically when an SD memory card is use with the SD card interface.

3.6.3 Example

We have the following configuration of devices and want to read the historical data of the connected meters. Therefore we connect the device with a computer. Both devices have to be in the same subnet. By writing the command in the address window of your web browser you'll get the data.



The files we want to get are:

S-Bus address 1 (ALD1B):
- Year 2013

S-Bus address 3.2 (PCD7.H104SE):
- Year 2013

The current file index of all files is 000!

Command

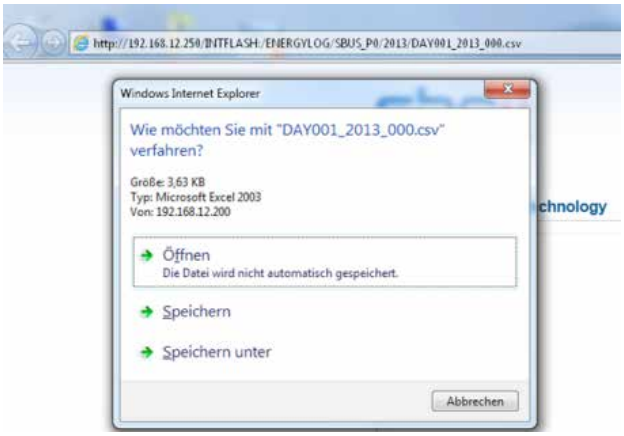
With the following command you can read the file from the file system

http://192.168.12.250/INTFLASH:/ENERGYLOG/SBUS_P0/2013/DAY001_2013_000.csv
http://192.168.12.250/INTFLASH:/ENERGYLOG/SBUS_P0/2013/DAY003_2_2013_000.csv

Output in web browser:

The command will download the specified file from the file system. Save the file on your computer.

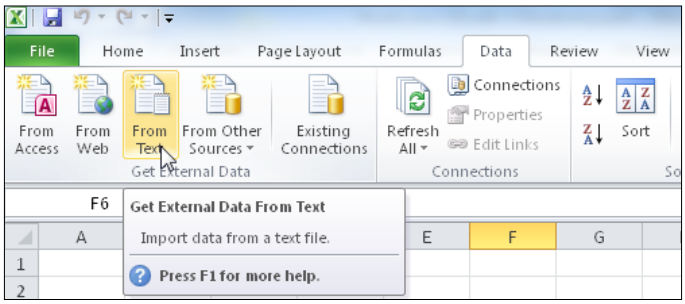
Do not open the files directly with MS Excel! Excel will interpret some energy values as date!



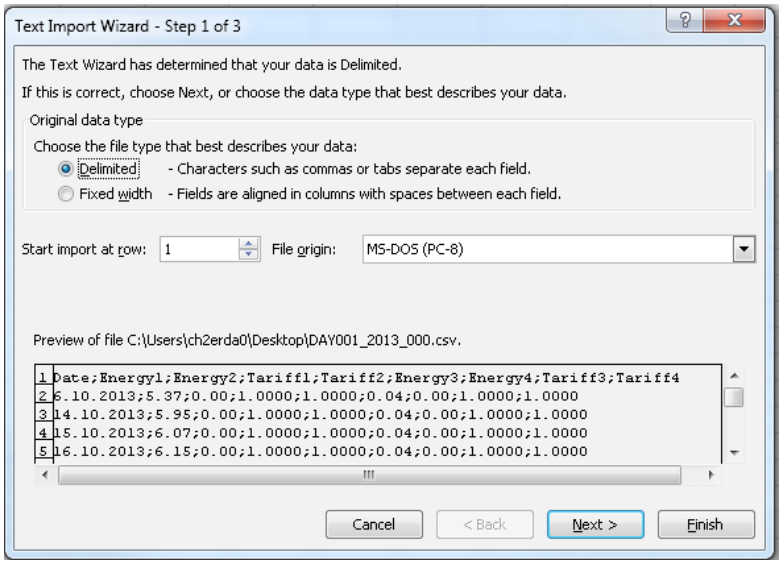
3.7 Import csv files in MS Excel

Open a new document in Excel and select

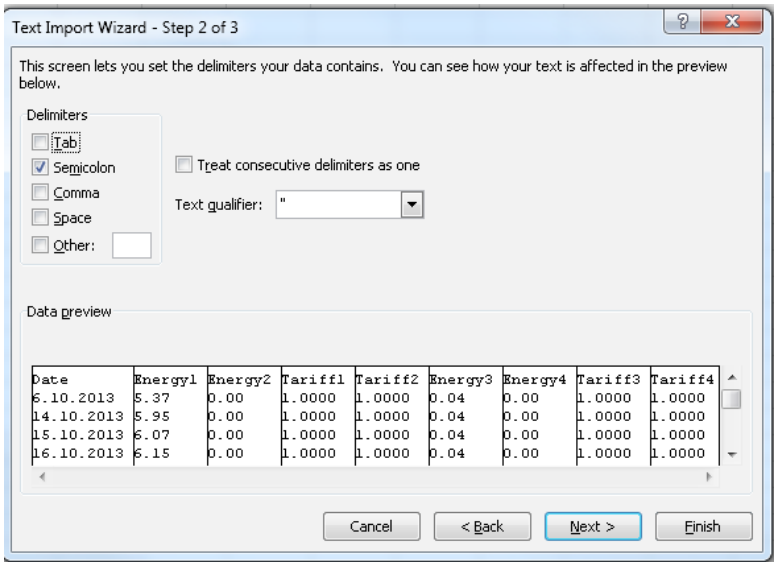
Data / Get External Data / From Text



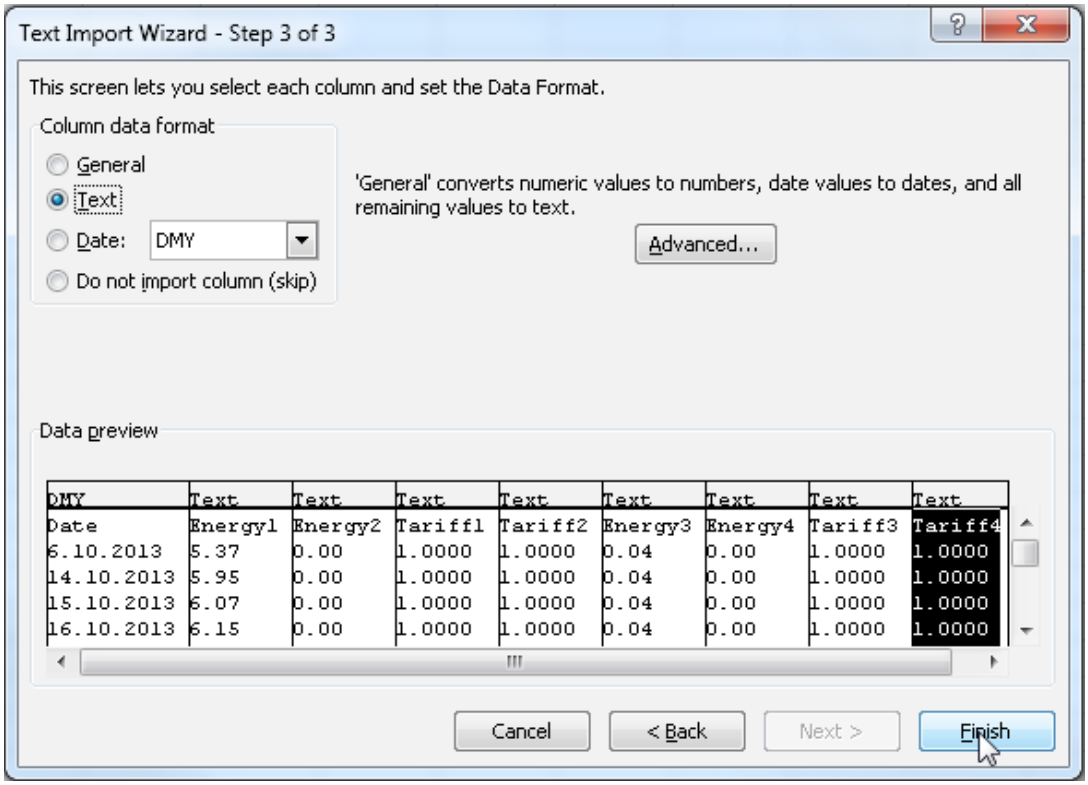
Coose Delimited as option and press next.



The csv file has a semicolon as delimiters. Select semicolon and press next.



To prevent that the data is interpreted as date select text for all data columns.
Select date DMY for the first column. Finish the import



Now you have all data for the meter in your Excel spreadsheet.
The data has always the same structure.

	A	B	C	D	E	F	G	H	I	J
1	Date	Energy1	Energy2	Tariff1	Tariff2	Energy3	Energy4	Tariff3	Tariff4	
2	06.10.2013	5.37	0.00	1.0000	1.0000	0.04	0.00	1.0000	1.0000	
3	14.10.2013	5.95	0.00	1.0000	1.0000	0.04	0.00	1.0000	1.0000	
4	15.10.2013	6.07	0.00	1.0000	1.0000	0.04	0.00	1.0000	1.0000	
5	16.10.2013	6.15	0.00	1.0000	1.0000	0.04	0.00	1.0000	1.0000	
6	17.10.2013	6.24	0.00	1.0000	1.0000	0.04	0.00	1.0000	1.0000	
7	18.10.2013	6.32	0.00	1.0000	1.0000	0.04	0.00	1.0000	1.0000	
8	19.10.2013	6.40	0.00	1.0000	1.0000	0.04	0.00	1.0000	1.0000	

4 Adjust and expand

4.1 Energy Monitoring for Custom Counters

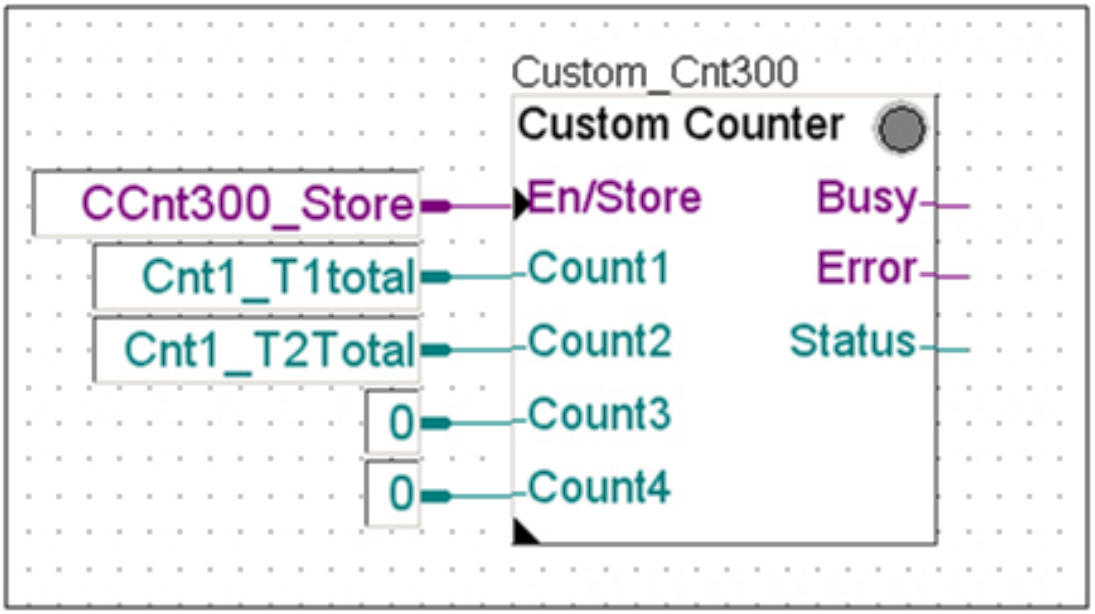
Energy monitoring is not restricted to S-Bus counters and user can feed his/her own custom counters to Energy monitoring function. These custom counters can be Modbus, M-Bus, or Pulse counters. Here is the example of using Modbus counters with energy monitoring func-tions. The device ‘Device3_Modbus_Cntr’ is used for this example.

4.1.1 Reading data from counters

Fbox library Energy Meters Modbus is used to read the data from Saia Modbus counters. The Modbus client is initialized on port 1 (Module PCD7.F150S) using Modbus Init channel Fbox. Now the Fboxes from ‘Energy Meter – Modbus’ library can be used to read the data from Modbus meters. 1 fbox for 2-tariff meter and 1 Fbox for 1-Tariff meter are demonstrated. The main configuration parameter for this Fbox is remote Modbus address. The address 1 and address 11 are configured in this project.

4.1.2 Feeding the consumption data to Custom counters

The Consumption data received from Modbus counters can now feed to the custom counter Fboxes from Energy.Plus Library. Here two custom counter Fboxes are used to feed the data to Energy Monitoring. First Fbox feeds the 2-Tariff counter data that are Count1 and Count2. The second Custom counter feeds 1-Tariff counter that is Count1 value. The counter data is feed either with edge trigger on ‘En/Store’ input or by defining the non-zero value for ‘Auto store cycle[s]’ in adjust parameters. The En/Store input should be 1 for periodically storing the data using ‘Auto store cycle[s]’ parameter’. If En/Store input is 0 then Fbox is disabled and no data is stored.

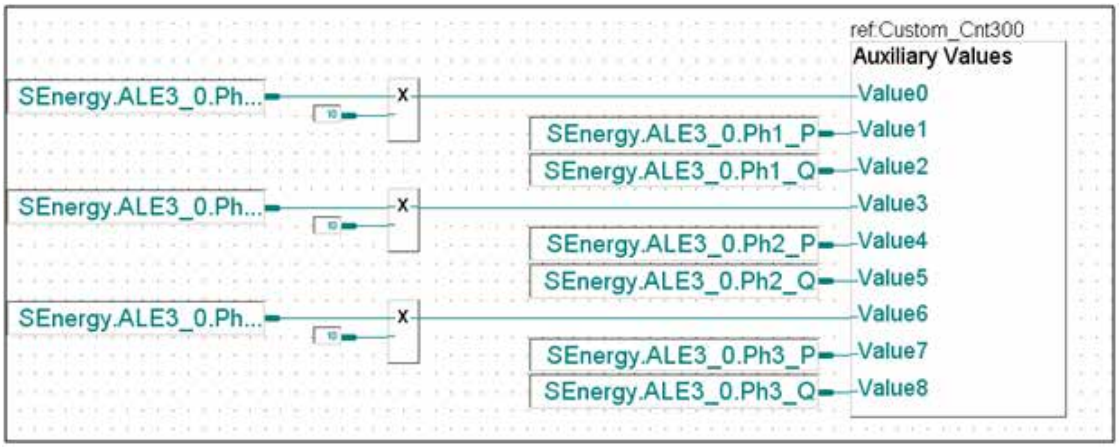


In the adjust parameters of Fbox the custom counter address is provided. Here the first custom counter has address 300 and second custom counter has address 301. The supported range of custom counters is 300 to 331. The address must be unique for each custom counter Fbox. There are other parameters like Name, Unit, Counter type and cost factor. These are feed to energy monitoring based on the selection of 'Counter initialization'. The counter name and unit will appear on default Energy web project GUI. The counter type is user defined string which is then used in GUI to determine and jump to the appropriate .teq page. In this example the string used for first counter is 'UsrCntr_2T' and the string used for second counter is 'UsrCntr_1T' where 1T, 2T stands for 1-Tariff and 2-Tariff respectively. It is explained in next section how these strings are used in web project.

Adjust Parameters	
Address	300
Counter initialization	After download
Auto store cycle [s]...	10
Counter Texts	
Name...	Modbus_Cnt1
Unit...	kWh
Counter type...	UsrCntr_2T
Cost Factors	
Count1 Cost Factor	1.0000
Count2 Cost Factor	1.0000
Count3 Cost Factor	1.0000
Count4 Cost Factor	1.0000
Static Symbols	

4.1.3 Feeding Auxilary values to 'Custom counters'

It is possible to feed upto 9 auxiliary values to 'Custom Counters' using 'Auxiliary Value Fbox' All values are fixed point with 2 decimal places.

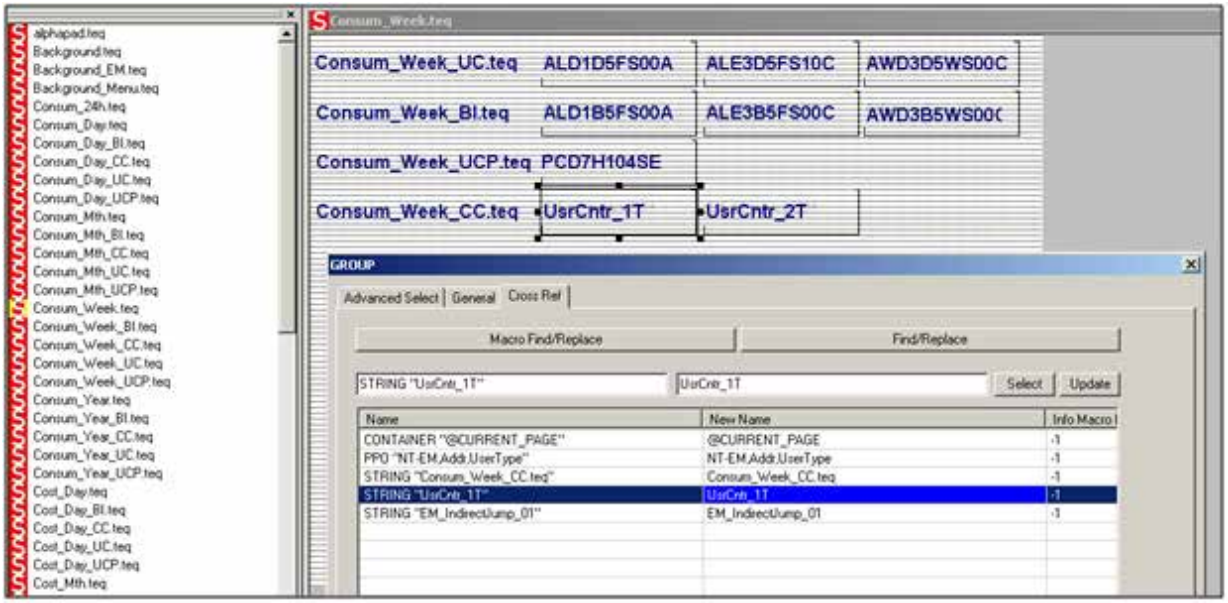


4.1.4 Visualization in Standard S-Energy Web project

The counter type string provided by ‘custom counter’ Fbox is used in web-project macro to jump to an appropriate .teq page. The configuration of .teq jump is defined in macro on following pages. If ‘Custom Counter’ Fbox supplies different string for counter type than default string then macros on all below pages needs to be adjusted.

Consum_day.teq
Consum_mth.teq
Consum_week.teq
Consum_year.teq
Cost_Day.teq
Cost_Mth.teq
Cost_Week.teq
Cost_Year.teq
Counter.teq
Home.teq

Following snap is shown for ‘Consum_week.teq’ page where macro checks for supplied ‘counter type’ from ‘Custom Counter’ Fbox. In this example the string is ‘UsrCntr_1T’, if this string matches then macro jumps to the .teq page ‘Cosum_Week_CC.teq’



Also if user wants to have his/her own pages then jump can be configured to their pages. The jumps are configured by default to following pages for custom counters.

Consum_Day_CC.teq

Consum_Mth_CC.teq

Consum_Week_CC.teq

Consum_Year_CC.teq

Cost_Day_CC.teq

Cost_Mth_CC.teq

Cost_Week_CC.teq

Cost_Year_CC.teq

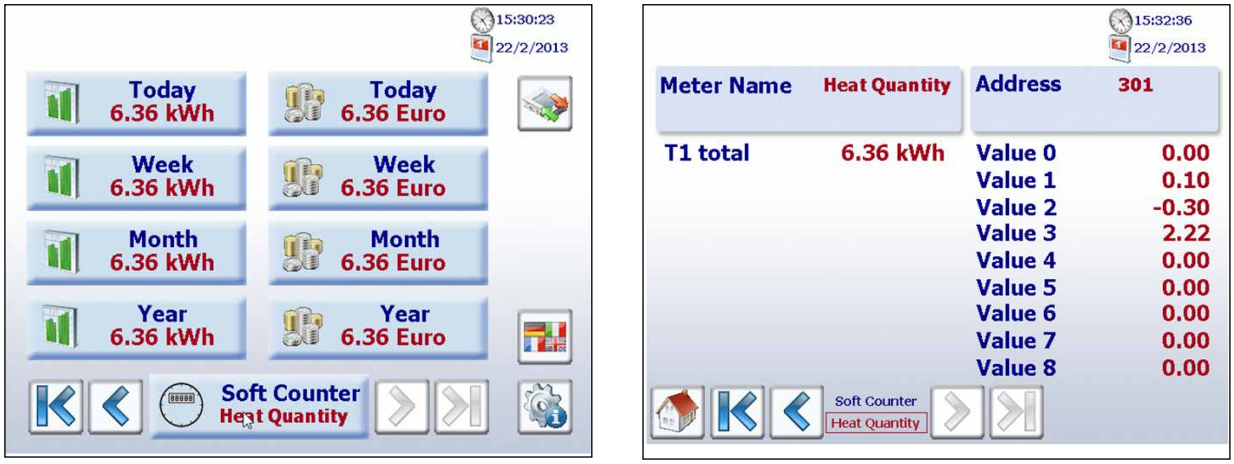
Counter_CC_1T.teq (1-Tariff Counter)

Counter_CC_2T.teq (2-Tariff Counter)

Home_CC_1T.teq (1-Tariff Counter)

Home_CC_2T.teq (2-Tariff Counter)

Following are the snap for default web project showing custom counter.



Values on Home and counter page for Custom Counter 300

5 Logic controller

5.1 Configuration of the hardware settings in PG5

Configuration of the programmable panel is usually performed via PG5, which is also used to generate the project.

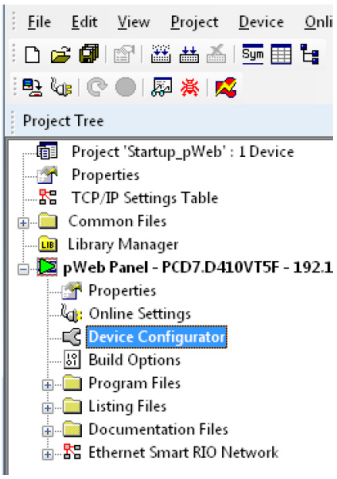
5.1.1 General information

The following description assumes that the user is familiar with the PG5 software. If this is not the case, we recommend reading the manual 26/733 „PG5, software requirements, PG5 V 2.0“ The device configurator defines direct access to programming instructions, for reading values from the peripheral input module and writing values to the peripheral output module.

5.1.2 Running the device configurator

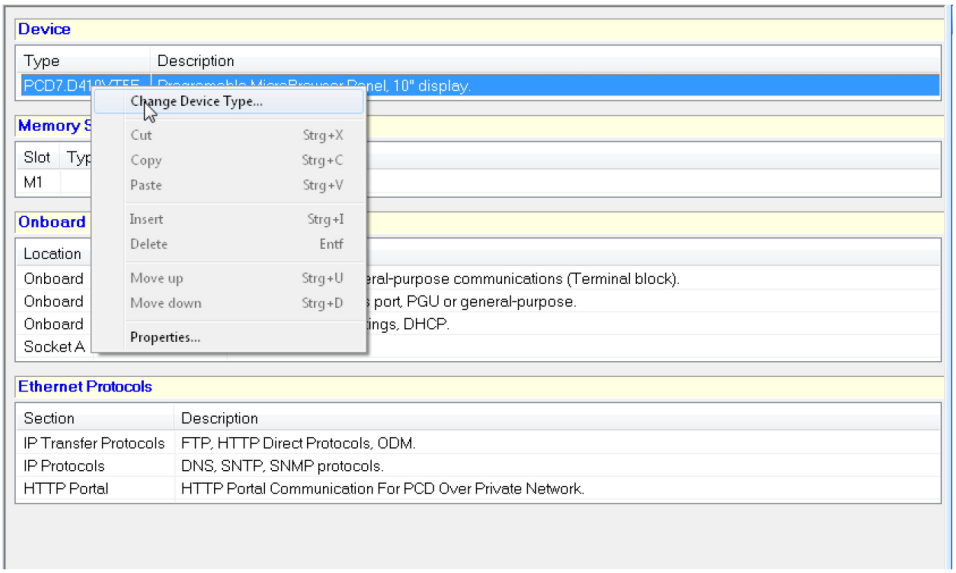
The device configurator is used for hardware configuration, setting up logs, and I/O handling

Double click on the project tree icon to start the device configurator



Use a right click to select the Device and use Change Device Type to set the panel which is to be configured.

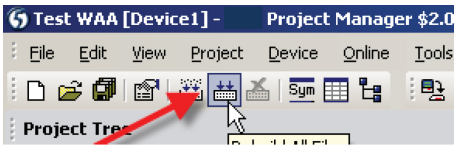
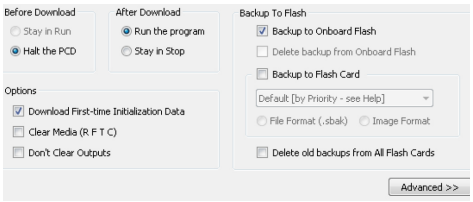
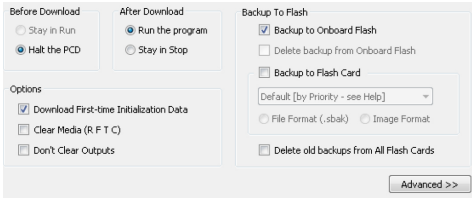
The Download button  can be used to download the configuration onto the Web Panel.



5.2 Downloading the program and backup

The user program is downloaded in the same way as performing device configuration with the PG5 software. This process is described below.

5.2.1 Downloading the user program with PG5

1	**Create and compile the user program**		
	The file your_project.pcd contains the following information: User program (FUPLA, IL, etc.) Configuration files (in some cases) Data forfirstinitialisation		
2	**Program download**		
	Clicking on the Download button shows the following window.  The user program is downloaded as a file in a particular partition of the internal file system. The useris not able to see this partition.		
3	**Options after download**		
	Execute program (RUN)	Sets the PLC to RUN, once the download is successfully completed	
	Remain STOPPED	After the download, PLC remains STOPPED	

- It is not possible to only download those blocks which have been modified.
- The user program is downloaded into the on-board memory in a file and, after a restart of the system, the process is complete.
- If the download is not successfully completed, the FW deletes all files inside
- the system folder.

Once the download has been successfully completed, start the controller:

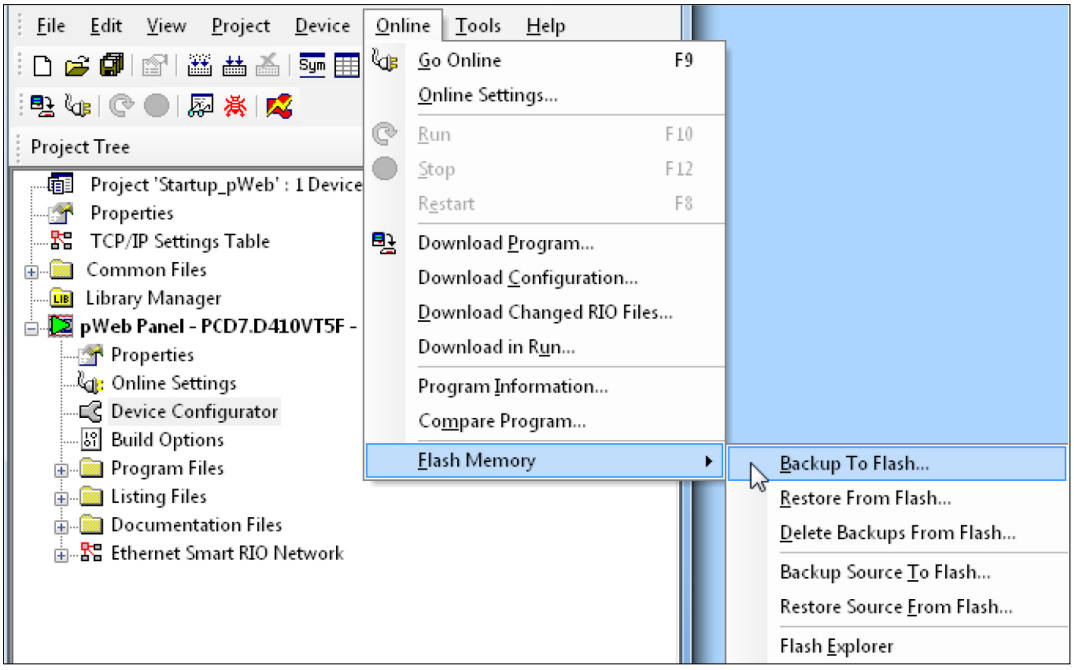
After the system restart, the user program and ROM DB/text are transferred into the execution memory. This is a write-protected memory, which does not need to be backed up; all data is stored in the Web panel file system.

The data for the user program is transferred to the execution memory after the Web panel device starts up.

5.2.2 Backing up and restoring the user program

Backup with PG5

Select a backup with “Backup To Flash”



Since the user program is already stored in the on-board flash memory, only the RAM DB/ text for the on-board flash memory are stored to the folder PLC_SYS (not visible to the user)

Note: Registers, flags, timers and counters are not stored.

During a restore, the DB/text are copied back into the SRAM memory.

Backup to INTFLASH file system

The values RAM DB/text are stored in the internal PCD_Backup folder. This allows the backup files to be accessed via the FTP server and then uploaded to a PC.

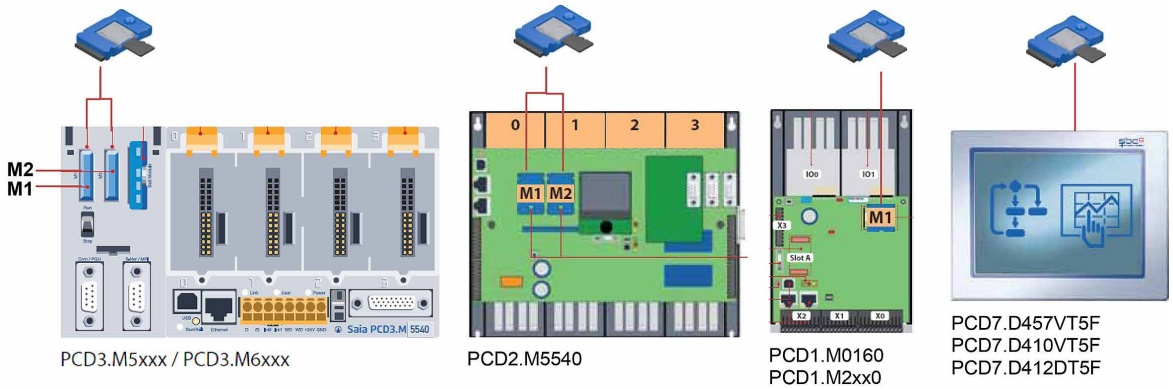
5.3 External Flash Module PCD7.R610

The module PCD7.R610 has a card holder for receiving the PCD7.R-MSD1024 Micro SD flash memory cards. The module PCD7.R610 is supplied without the Micro SD flash card. The flash card PCD7.R-MSD1024 must be ordered separately.

Technical data	
COMPATIBILITY	Usable on slot M1 and/or M2 supported with PCD1.M0160, PCD1.M2xx0, PCD2.M5540, PCD3.M5/6xxx, PCD7.D457VT5F, PCD7.D410VT5F und PCD7.D412DT5F
PG5	From version 2.1.300
COSinus version PLC controller	From version 1.23.32
COSinus version MB panel	From version 1.23.32
POWER	
Module power supply voltage	
Current consumption	
Hot pluggable	Yes, write/read access must be disabled first
LED display	
● Red LED	Function as with a hard disk drive, flashes during data processing
● Green LED	Do not remove the module while this LED is on. LED is turned off when the module can be removed safely. If the module is removed while the LED is on, data may be lost.

Ordering information:		
Order Type	**Description**	**Weight**
PCD7.R610	Basic module for uSD flash memory card, plug-in onto slot M1 or M2 (uSD card not included)	20 g

The module can be used in the systems PCD1.M2/M0, PCD2.M5, PCD3.M and on the programmable MB panel PCD7.D457VT5F, PCD7.D410VT5F and PCD7.D412DT5F.



5.4 Micro SD Flash Memory Card PCD7.R-MSD1024

The Micro SD flash cards are specially selected industrial flash cards which meet with the high requirements. “Consumer” flash cards may not be used. The industrial Micro SD flash cards PCD7.R-MSD1024 are available separately and can be easily plugged-in and replaced respectively in the basic module PCD7.R610.

Technical data	
Industrial, high reliable	Designed for embedded industrial market. Voltage detector and power-loss management to prevent data corruption after power-down.
Wear Leveling	Write accesses are uniformly distributed to all cells so that they are used uniformly. Thus the life of the card is increased.
Single layer Flash memory technology (SLC)	for up to 100 000 write cycles
Data retention	10 years
MTBF	> 3’000’000 hours
Number of insertions	>10’000
Extended Temperature range	–25…85 °C

Ordering information:		
Order Type	**Description**	**Weight**
PCD7.R-MSD1024	Micro SD flash memory card 1024 MByte (incl. SD flash adapter)	2 g

6 Energy Monitoring Tags

This document describes the tag interface provided by the Energymonitoring part in the PLC. It is accessible via its Web interface. All tags are accessed via NT-EM,<tag> syntax.

6.1 General

Syntax: NT-EM,<tag>

Tag	Access	Save	Remark
Date	RW	Y (RTC)	syntax → dd.mm.yyyy
Time	RW	Y (RTC)	syntax → hh:mm:ss
Year	R	N	Returns current year
UserTrimm	RW	Y (RTC)	[sec per 24h] The RTC can be adjusted in a range from –5.53…9.504 sec per day. Note: The default RTC factory trimming is set to +7.43 sec per day, therefore the user can adjust it from –12.96…2.074 sec per day. The value is limited to this range.
DeviceName	RW	Y	max size of device name is 32 chars, default is “EnergyManager”
Language	RW	Y	max size for language definition file name is 16, default is “german.csv”
Currency	RW	Y	max size for currency is 16, default is “Euro”
PeriodicLogTime	RW	Y	defines the time interval in minutes, in which the periodic log file is written (min = 3, default = 15, max = 60 minutes)
KeepTimeIndex	RW	Y	defines after how many years the log files are automatically deleted (min = 0 → never deleted, default = 4, max = 5)
User<n>	RW	Y	user name 1…4
Password<n>	RW	Y	password 1…4 → corresponds to user 1…4
HasDuplicatedUser	R	N	if tag “User<n>” is written with a name that already exists for an other user, it is ignored and this tag returns “1” for 5 seconds
Lock.<n>	RW	N	Lock PPO, <n>: 1…4. This can be used to realize a pseudo single access in the WebApp. The App has to trigger the tag. If the timeout elapses, the PPO is unlocked read: –1 → invalid <n> 0 → not locked, 1 → locked write: 0 → unlock, 1…59 sec timeout
LogFileMerge	R	N	0 → automatic log file merge inactive 1 → active
Save	RW	N	read: 0 → not changed, 1 → changed write: 0 → cancel (do not save), 1 → save

6.2 S-Bus

Syntax: NT-EM,<tag>

Tag	Access	Save	Remark
SBus0MaxAddr	RW	Y	defines highest address, that is scanned. min = 0, default = 32, max = 127
SBus0Baudrate	RW	Y	Baudrate on S-Bus*. Valid baudrates are: 4800, 9600, 19200, 38400, 57600 and 115200. Default baudrate is 57600
SBus0Baudrate Index	RW	(Y)	→ baudrate* can also be set via its index (→ drop down list) 2 → 4800, 3 → 9600, etc
SBus0Retries	RW	Y	(re)tries on S-Bus. min = 1 (→ no reties), default = 2, max = 5
SBus0Timeout	RW	Y	the minimal timeout [ms] depends on config- ured baudrate and is automatically set to minimal value if baudrate is changed min = default = f (baudrate), max = 1000
SBus0Tolerance	RW	Y	defines the time in minutes, where the counter has to be unreachable, till it is marked as lost. 0 → immediately (→ like now), default 1min, max 15min (NOTE: changeable in config file only!)
BoostScan	RW	N	read: 0 → boost scan not active, 1 → boost scan active write: 1 → start boost scan. S-Bus is initialized with its configured parameters but 1 retry (to get a faster scan), after scanning the bus it reinitialized with configured retries
CurrentCounter	R	N	return current used S-Bus address
FoundCounter	R	N	return count of found counters on bus
SBus0Save	RW	N	read: 0 → not changed, 1 → changed write: 0 → cancel (do not save), 1 → save

*See chapter A2

6.3 Counter

Syntax: NT-EM,<Addr>,<tag>

<Addr> → direct addressing e.g. “5” counter with address 5
→ direct addressing sub counter “6.1” sub counter “1” at address “6”
→ “Addr” → current session address is used
→ “Ref” → reference counter (→ compare)
→ “Chg” → first counter in counter change list (see counter change)

Session

Tag	Access	Save	Remark
HasSession	R	N	read: 0 → no free session for this client 1 → session for client available
SessionTimeout	RW	N	read: returns current session timeout [sec] write: set clients session timeout in a range of 1…600 sec (written value is limited to this bounds)

Navigation

Tag	Access	Save	Remark
Addr	RW	N	read: returns current session address write: set current session address
First	RW	N	read: 0 → no previos counter, 1 → has previous counter write: 1 → set addr to first counter
Next	RW	N	read: 0 → no next counter, 1 → has next counter write: 1 → set addr to next counter
Prev	RW	N	read: 0 → no previos counter, 1 → has previous counter write: 1 → set addr to previous counter
Last	RW	N	read: 0 → no next counter, 1 → has next counter write: 1 → set addr to last counter

Navigation List

It is possible to choose current counter from a scroll list instead of up / down move (→ “First”, “Next”, “Prev”, “Last”)

Tag	Access	Remark
NaviFirst	RW	read: 0 → can't move list up, 1 → can't move list up write: scroll list to top
NaviUp	RW	read: 0 → can't move list up, 1 → can't move list up write: scroll list up
NaviDown	RW	read: 0 → can't move list down, 1 → can't move list down write: scroll list down
NaviBottom	RW	read: 0 → can't move list down, 1 → can't move list down write: scroll list to bottom
NaviElement_<n>	RW	0 <= n <= 7 read: returns name of counter at list position <n> write: set counter at list position <n> as current counter

Common			
Tag	**Access**	**Save**	**Remark**
CounterState	R	N	0 → never detected 1 → detected, but not updated 2 → updated
Type	R	N	0 → counter on S-Bus 1 → group 2 → Soft counter
UserType	RW	Y	Allowes the user to set a free type for a counter (e.g. to handle it differently in the GUI). UserType is default preseted with: - ASN number → S-BusCounter - “Group” → groups - “UserCounter” → SoftCounter
Direction	R	N	“UC“ → unidirectional consumption “BI” → bidirectional a “P” is added if it is a pulse counter (H104)
Name	RW	Y	Name of the counter (max 23 chars)
Unit	RW	Y	Unit of the counter (max 8 char) Default for counters on S-Bus is „Wh“, for all others „“
UnitExp	RW	Y	Exponent of „Unit“ 0 → base Unit, 3 → Kilo (k) Default for counters on S-Bus is 3 (→ kWh), for all others 0
LiveSign	R	N	incremented on every update
DeleteLogData	W	N	–1 → delete all log files 0 → delete log files of this counter
PresetTariff	W	N	S-Bus counter only: Set all WT<x>Tariff like in this counter
ChangeOffset	RW	N	read: 0 → counter can not be added to change offset list, 1 → counter can be added write: 1 → add counter to counter change list
CounterWT<n>IsUsed	R	N	0 → WT<n> not used, 1 → WT<n> used
CounterWT<n>Divisor	RW	Y	With this divisor the native value is devided to get a physical unit from impulse count. (NOTE: use it for pulse counter only)
SaveCounter			read: 0 → not changed, 1 → changed write: 0 → cancel (do not save), 1 → save

Tag	Access	MinMax	ALD1D	ALD1B	ALE3D	ALE3B	AWD3D	AWD3B	H 104SE	SoftCounter	Group	Remark
FW	R	N	●	●	●	●	●	●	●			Firmware version
Asn1	R	N	●	●	●	●	●	●	●			ASN reg 1
Asn2	R	N	●	●	●	●	●	●	●			ASN reg 2
Asn3	R	N	●	●	●	●	●	●	●			ASN reg 3
HW	R	N	●	●	●	●	●	●	●			Hardware version
SerNum	R	N	●	●	●	●	●	●	●			Serial number
Error	R	N	●	●	●	●	●	●	●		●	0 → no error, 1 → at least an error on one phase
Error.1	R	N	●	●	●	●	●	●	●		●	0 → no error, 1 → error on phase 1
Error.2	R	N			●	●	●	●			●	0 → no error, 1 → error on phase 2
Error.3	R	N			●	●	●	●			●	0 → no error, 1 → error on phase 3
TransRatio	R	N	●	●	●	●	●	●				
Tariff	R	N			●							
WT1total	R	N	●	●	●	●	●	●	●	●	●	Counter 1 (used 1)
WT2total	R	N			●					●	●	Counter 2 (used 2)
WT3total	R	N		●		●		●			●	Counter 3 (produced 1)
WT4total	R	N									●	Counter 4 (produced 2)
WT1part	RW	N	●		●	●	●					Partial counter 1 (write → 0 only)
WT2part	RW	N			●							Partial counter 2 (write → 0 only)
WT3part	RW	N				●						Partial counter 3 (write → 0 only)
WT4part	RW	N										Partial counter 4 (write → 0 only)
UrmsL1	R	Y	●	●	●	●	●	●		●	●	
IrmsL1	R	Y	●	●	●	●	●	●		●	●	
PrmsL1	R	Y	●	●	●	●	●	●		●	●	
QrmsL1	R	Y	●	●	●	●	●	●		●	●	
CosPL1	R	Y	●	●	●	●	●	●		●	●	
UrmsL2	R	Y			●	●	●	●		●	●	
IrmsL2	R	Y			●	●	●	●		●	●	
PrmsL2	R	Y			●	●	●	●		●	●	
QrmsL2	R	Y			●	●	●	●		●	●	
CosPL2	R	Y			●	●	●	●		●	●	
UrmsL3	R	Y			●	●	●	●		●	●	
IrmsL3	R	Y			●	●	●	●		●	●	
PrmsL3	R	Y			●	●	●	●		●	●	
QrmsL3	R	Y			●	●	●	●		●	●	
CosPL3	R	Y			●	●	●	●		●	●	
Prmstotal	R	Y			●	●	●	●		●	●	
Qrmstotal	R	Y			●	●	●	●		●	●	

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WT[<x>]total.<subTag>

Tag	Access	Remark
WT<x>total.Native	R	counter value divided by divisor (but without offset added)
WT<x>total.Day	R	energy per day
WT<x>total.Week	R	energy per week
WT<x>total.Month	R	energy per month
WT<x>total.Year	R	energy per year
WT<x>total.Day10	R	energy in current 10 min interval
WT<x>total.Day15	R	energy in current 15 min interval
WT<x>total.Day60	R	energy in current 60 min interval
WT<x>total.Day10Last	R	energy in last 10 min interval
WT<x>total.Day15Last	R	energy in last 15 min interval
WT<x>total.Day60Last	R	energy in last 60 min interval
WT<x>total.TariffWriteEnabled	R	‹1› → tariff can be written ‹0› → tariff can't be written
WT<x>total.Tariff	RW	factor to calculate cost from energy
WT<x>total.CostDay	R	cost per day
WT<x>total.CostWeek	R	cost per week
WT<x>total.CostMonth	R	cost per month
WT<x>total.CostYear	R	cost per year
WT<x>total.CostDay10	R	cost in current 10 min interval
WT<x>total.CostDay15	R	cost in current 15 min interval
WT<x>total.CostDay60	R	cost in current 60 min interval
WT<x>total.CostDay10Last	R	cost in last 10 min interval
WT<x>total.CostDay15Last	R	cost in last 15 min interval
WT<x>total.CostDay60Last	R	cost in last 60 min interval
WTtotal.Day	R	sum WT1total and WT2total
WTtotal.Week	R	sum WT1total and WT2total
WTtotal.Month	R	sum WT1total and WT2total
WTtotal.Year	R	sum WT1total and WT2total
WTtotal.Day[10 | 15 | 60]	R	sum WT1 and WT2 energy in current 10 | 15 | 60 min interval
WTtotal.Day[10 | 15 | 60]Last	R	sum WT1 and WT2 energy in current 10 | 15 | 60 min interval
WTtotal.CostDay	R	sum WT1total and WT2total
WTtotal.CostWeek	R	sum WT1total and WT2total
WTtotal.CostMonth	R	sum WT1total and WT2total
WTtotal.CostYear	R	sum WT1total and WT2total
WTtotal.CostDay[10 | 15 | 60]	R	sum WT1 and WT2 cost in current 10 | 15 | 60 min interval
WTtotal.CostDay[10 | 15 | 60] Last	R	sum WT1 and WT2 cost in last 10 | 15 | 60 min interval

Min/Max tracker → <REG>.<MinMaxTag>

Tag	Access	Remark
ScaleVal	RW	scale factor [%]
ScaledMin	R	scaled min, rounded (scale factor less than min, recalculated if min gets less than it)
ScaledMax	R	scaled max, rounded (scale factor more than max, recalculated if max reaches it)
Max	RW	read: max value write: max value reset
Min	RW	read: min value write: min value reset

CalcWTx.<cmd>

<cmd> → <select> <period> <calc> [<unit>] [<width>]

	Description
select	selects WTx data: “W” → WTtotal.<tag> “C” → WTtotal.Cost<tag>
period	period selects WTx time «D» → day «W» → week «M» → month «Y» → year NOTE: do not define <period> field for Bar.CalcWTx!
calc	calculates sums and differences of addressed values. «add<X>» → plus <X> «sub<X>» → minus <X> <X>: 1…4
unit	optional, prints unit. The unit is taken from the addressed counter. [] → not present. The native value is printed (e.g: if the calculated value is 3.62 kWh, the returned value is “3.62” “U” → value is printed with unit (e.g: if the calculated value is 3.62 kWh, the returned value is “3.62 kWh”
width	max. chars to use in string (without unit) “W<x>” → <x> chars

Example (energy meter):

CalcWTx.WDadd1add2sub3sub4U	returns todays energy WT1 + WT2 – WT3 – WT4 with its unit
CalcWTx.CWadd1	returns (+)WT1.Cost of week. It is the same, as tag “WT1total.CostWeek” would return
CalcWTx.CWadd1sub3W5	returns string that fits in 5 chars WT1 – WT3 with modifier “k” (kilo), “M” (mega) or “G” giga. e.g: “345.2 k”
CalcWTx.CWadd1sub3UW5	same as above but with unit. e.g: “345.2 kWh”

6.4 Group configuration

Navigation

Tag	Access	Save	Remark
GCActiveGroupIndex	RW	N	read: active group index write: valid group index (0 >= index < max) → active group set, –1 → clear group configuration
GCGroupSelect	RW	N	read: –1 no previous group, 0 previous and next group, 1 no next group write: if group configuration is unchanged –1 move to previous, 1 to next group if possible
GCGroupSelectDown	R	N	read: 0 → no previous group, 1 → has previous group
GCGroupSelectUp	R	N	read: 0 → no next group, 1 → has next group
GCActiveGroupName	RW	Y	read / write: name of active group
GCGroupSave	RW	N	read: 0 → not changed, 1 → changed write: 0 → cancel (do not save), 1 → save

Configuration

Tag	Access	Save	Remark
GCPoolFirst	RW	N	read: 0 → no previous counter, 1 → has previous counter write: 1 → move to top of list
GCPoolUp	RW	N	read: 0 → no previous counter, 1 → has previous counter write: 1 → move up
GCPoolDown	RW	N	read: 0 → no next counter, 1 → has next counter write: 1 → move down
GCPoolLast	RW	N	read: 0 → no next counter, 1 → has next counter write: 1 → move to bottom of list
GCGroupFirst	RW	N	→ GCPoolFirst, but for group list
GCGroupUp	RW	N	→ GCPoolUp, but for group list
GCGroupDown	RW	N	→ GCPoolDown, but for group list
GCGroupLast	RW	N	→ GCPoolLast, but for group list
GCPoolElm_<n>	RW	N	<n> = 0 … 7 read: name of list element <n> → counter name write: 1 move element <n> into group list
GCGroupElm_<n>	RW	Y	→ GCPoolElm_<n>, but for group list write: 1 move element <n> into pool list save: → GCGroupSave
GCGroupElmSign_<n>	RW	Y	<n> = 0 … 7 read: –1 member <n> counts negative, 1 member <n> counts positive write: change sign save: → GCGroupSave

6.5 Counter change

A S-Bus counter can be added to counter change list:

- The System detects a change ASN or SN is changed
  or a stored counter state is not plausible

- The counter is added via tag “ChangeOffset” to the list

  If a counter is added to the change list,
  its offset is preset in a way to get the last known value.

Tag	Access	Remark
CounterChgCount	RW	read: count of counters in change list write: –1 rotate list backward, 1 → rotate list forward
CounterChgAddr	R	return actual counter address
CounterChgCmd	W	0 → everything is ok, continue with current log files if possible 1 → reset offset and start with new logfiles
CounterChgCurrVal<n>	R	return current counter value
CounterChgOffset<n>	RW	read: current offset write: new offset → recalculate new val
CounterChgLastKnownVal<n>	R	return last known value
CounterChgNewVal<n>	RW	read: new value write: new value → recalculation offset

6.6 Bardata

The device can hold bar data for one counter for one year in its memory. Therefore the data has to be reloaded if year or counter changes. Bardata are calculated for tree periods (Week, Month and Year). There is the possibility to navigate through the periods, get statistical data over it and bar data for each bar in period.

Week

Tag			Access	Remark
Bar.Week.	GoToday		W	go to today date
	Num		RW	week number in actual displayed year
	Date		RW	read: monday date of displyed week write: date
	NumInc		W	increment week number
	NumDec		W	decrement week number
	Energy.	→ StatFields	R	see StatFields
	Cost.			
	Mon.	→ BarFields	R	see BarFields
	Tue.			
	Wed.			
	Thu.			
	Fri.			
	Sat.			
	Sun.			

Month

Tag			Access	Remark
	GoToday		W	go to today date
	Num		RW	read: month number write: navigate to month
	Date		RW	read: 1st of displayed month write: date
	MonthInc		W	increment month
	MonthDec		W	decrement month
	Days		R	count of days in this month
	Energy.	→ StatFields	R	see StatFields
	Cost.			
	Day.<DayNum>	→ BarFields	R	see BarFields

Year

Tag			Access	Remark
Bar.Week.	GoToday		W	go to today date
	Year		RW	displayed year
	Energy.	→ StatFields	R	see StatFields
	Jan.			
	Feb.	→ BarFields	R	see BarFields
	Mar.			
	Apr.			
	May.			
	June.			
	July.			
	Aug.			
	Sept.			
	Oct.			
	Nov.			
	Dec.			

DayXX → XX = [10 | 15 | 60]

Tag			Access	Remark
Bar.DayXX	GoToday		W	go to today date
	Date		RW	read: date of loaded day write: date
	DayInc		W	increment day
	DayDec		W	decrement day
	Energy.	→ StatFields	R	see StatFields
	Cost.			
	Day10			
	Hour.<Hour>.<Min>	→ BarFields	R	see BarFields <Hour> → 0…23 <Min> → 0, 10, 20, 30, 40, 50
	Day15			
	Hour.<Hour>.<Min>		R	see BarFields <Hour> → 0…23 <Min> → 0, 15, 30, 45
	Day60			
	Hour.<Hour>		R	see BarFields <Hour> → 0…23

6.7 StatFields

Get statistical information

Tag	Access	Remark
ScaledMin	R	0
ScaledMinPart.<Part>	R	returns (ScaledMin / 20.0) * <Part> (→ 0 <= Part <= 20)
Min[.0|1]	R	0
Max[.0|1]	R	Max value
ScaledMax	R	120% max value
ScaledMaxPart.<Part>	R	returns (ScaledMax / 20.0) * <Part> (→ 0 <= Part <= 20)
Sum[.0|1]	R	Sum over values
Average[.0|1]	R	Average of values

For bidirectional counters there is the need to have the statistical information for consumed and produced direction. The statistical tag can be expanded with .1 to get produced information.
<Tag> or <Tag>.0 → consumed direction
<Tag>.1 → produced direction

6.8 BarFields

Get bar data information

Tag	Access	Remark
CalcWTx.<cmd>	R	see “CalcWTx.<cmd>” for counters. **NOTE: because the period information is already defined in the tag, it is not valid for Bar.CalcWTx!**
IsValid	R	0 → not valid, 1 valid
IsAverage	R	0 → no average, 1 → average
Energy1	R	energy counter 1
Energy2	R	energy counter 2
Energy	R	sum of energy 1 and 2
Cost1	R	cost counter 1
Cost2	R	cost counter 2
Cost	R	sum of cost 1 and cost 2

6.9 Counter compare

The displayed bar data can be stored and accessed through “NT-EM,Ref,Bar.<….>”. It is possible to compare then 2 periods of two counters. NOTE: the reference is fixed and can not be modified or changed. The variable part is accessed via “NT-EM,Addr,Bar.<….>”

Tag	Access	Save	Remark
SetRefYear	RW	N	read: 0 → ref data are not valid, 1 → ref data is valid write: 0 → discharge ref data, 1 → set current data as ref
SetRefDay	RW	N	read: 0 → ref data are not valid, 1 → ref data is valid write: 0 → discharge ref data, 1 → set current data as ref

A Appendix

A.1 Symbols

	In operating manuals, this symbol refers the reader to other information in the manual or to information in other manuals or technical documentation. Direct links to other documentation are not provided.
	Instructions with this symbol must always be observed.

A

A.2 Baud rates of the energy meters

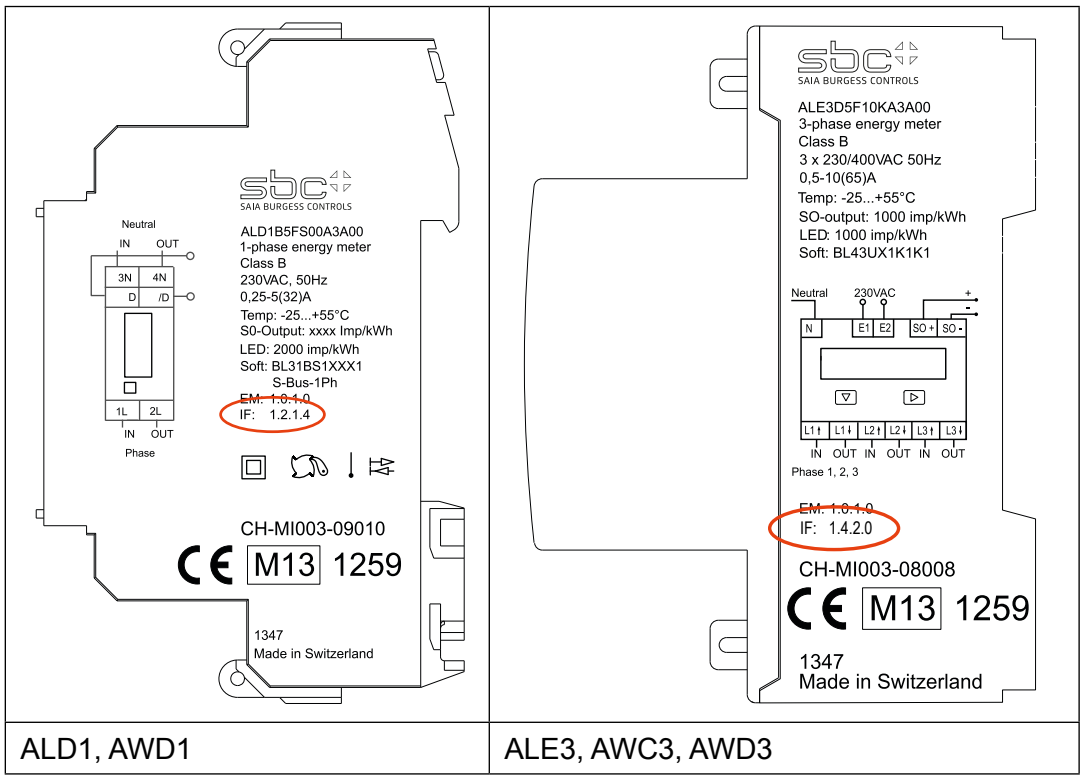
Single-phase energy meters up and including to the HW-version **1.2** and three-phase energy metersup to the and including HW-version **1.4** support the following baud rates:

1200, 2400, 4800, 9600, 19 200, 38 400, 57 600 and 115 200

Single-phase energy meter from the HW-version **1.3** and three-phase energy meter the HW version **1.5** support only the following baud rates:

4800, 9600, 19 200, 38 400, 57 600 and 115 200

The hardware version is lasered on the energy meter:



ALD1, AWD1	ALE3, AWC3, AWD3

Printing keys:

IF HW.HW.FW.FW

Example ALE3 with old hardware: IF 1.4.2.9

Example ALE3 with new hardware: IF 1.5.2.3

A.2.1 Drop-down lists for the baud rates of energy meters

List entry	Baud rate with old HW	Baud rate with new HW
0	1200	---
1	2400	---
2	4800	4800
3	9600	9600
4	19200	19200
5	38400	38400
6 (default)	57600	57600
7	115200	115200

A.5 Mailing address for Saia-Burgess Controls AG

Saia-Burgess Controls AG

Bahnhofstrasse 18
3280 Murten, Switzerland

Phone +41 26 580 30 00
Fax +41 26 580 34 99

E-Mail: info@saia-pcd.com
Homepage: www.saia-pcd.com
Support: www.sbc-support.com

Mailing address for return shipments from customers of the Swiss office:

Only for products with a Saia-Burgess Controls AG order number.

Saia-Burgess Controls AG

Service Après-Vente
Bahnhofstrasse 18
3280 Murten, Switzerland

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