STYLITIS-POWER

OPERATOR'S GUIDE

SYMMETRON
ELECTRONIC APPLICATIONS

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SYMMETRON ELECTRONIC APPLICATIONS
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CONVENTIONS USED IN THIS MANUAL

Symbol	Meaning
	To avoid injury of personnel and/or damage to the instrument, the operator must refer to the user's manual.
CAUTION	Calls attention to a procedure or condition which, if not correctly performed could result in damage to the instrument.

SAFETY INSTRUCTIONS

Please review the following safety precautions carefully before putting the instrument into operation so as to avoid any personal injury or damage to the instrument and any product connected to it.

Use Proper Power Cord. Only the power cord designed for the instrument and authorized for use within the local country could be used.

Ground the Instrument. The instrument is grounded through the Protective Earth lead of the power cord. To avoid electric shock, it is essential to connect the earth terminal of the power cord to the Protective Earth terminal before connecting any inputs or outputs.

Connect the leads correctly. Do not connect the Current Transformer inputs to high voltage. The Current Transformer inputs must only be connected to specified probes only.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markers on the instrument and check your manual for more information about ratings before connecting the instrument.

Use Proper Overvoltage Protection. Make sure that no overvoltage (such as that caused by a thunderstorm) can reach the product, or else the operator might be exposed to the danger of electrical shock.

Do Not Operate Without Covers. Do not operate the instrument with covers or panels removed.

Use Proper Fuse. The specified fuse is 1A slow blow.

Avoid Circuit or Wire Exposure. Do not touch exposed junctions and components when the unit is powered.

Do Not Operate With Suspected Failures. If you suspect damage occurs to the instrument, have it inspected by SYMMETRON authorized personnel before further operations. Any maintenance, adjustment or replacement especially to circuits or accessories must be performed by SYMMETRON authorized personnel.

Keep Good Ventilation. Inadequate ventilation may cause an increase of instrument temperature which would cause damage to the instrument.

Do Not Operate in Wet Conditions while the Cover is Open. In order to avoid short circuiting to the interior of the device or electric shock, please do not operate the instrument in a humid environment.

Do Not Operate in Explosive Atmosphere. In order to avoid damage to the device or personal injuries, it is important to operate the device away from an explosive atmosphere.

Proper Use of Battery. The internal battery must not be exposed to high temperature or in contact with fire. Keep it out of the reach of children. Improper change of battery (note: lithium battery) may cause explosion. Use specified battery only.

Handling Safety. Please handle with care during transportation to avoid damage to connectors and other parts.

TABLE OF CONTENTS

SAFETY INSTRUCTIONS 3

1. Introduction 5
2. Physical Description 6
3. Data Storage 8
4. Communication methods 9
5. The Opton 4 software 10
6. Communication between computer and logger 11
7. Measurement Setup 13
8. Voltage and Current Transformer wiring 16

9 Monitoring 17

10 Data retrieval 19

11 Data View 22

APPENDIX A WIRING 24

APPENDIX B LCD SCREEN 31

APPENDIX C ETHERNET SETUP 33

REVISION HISTORY 34

1. Introduction

Stylitis-Power is an advanced portable data logger for recording and managing electrical energy consumptions. Some of its unique features are:

- It can be easily installed on your electric panel, without interrupting the installation's operation, by using *split-core* Current Transformers.
- It records voltage, current, frequency, power, energy and power factor in up to 10x 3-phase lines (+neutral) simultaneously.
- It records up to 2 temperature inputs using the accessory PT100 RTD sensors or other compatible PT100 RTD sensors.
- With sampling from 0.5 sec to 1 hour, it is capable of highlighting instantaneous phenomena and Transients.
- Communication via Ethernet, GPRS, microSD card and RS-232/USB.
- Remote communication with the logger, from your PC, from anywhere in the world.
- IP65 protection.
- Comprehensive operating software: Opton 4.

For additional information please refer to the **Stylitis-Power User's Manual**.

2. Physical Description

2.1 Front Panel

If the INTERNAL GSM/GPRS MODEM is selected (see APPENDIX B), this indicator shows the modem state:

1. Fast blinking: Attempting to register in the network
2. Slow blinking: Idle.
3. Steady light: Connected via a GSM call.

Removable µSD card. 2GB maximum.

Safety Residual-current device (RCD).

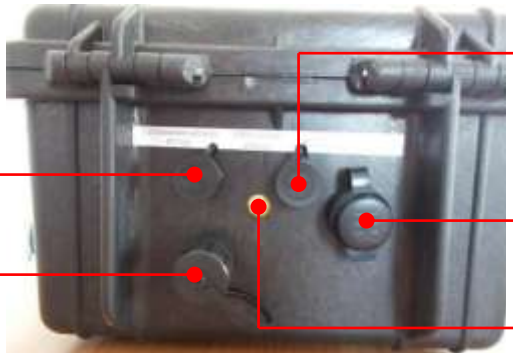
LCD touch screen. See APPENDIX B.

Mains fuse. Use a screwdriver to open.

Mains instrument power switch (CENTER OFF).

- INTERNAL: The operation power comes from the voltage measurement connection L1.
- EXTERNAL: The operation power comes from the back panel mains supply cable. **CAUTION** External must be used if the measured RMS voltage may be higher than 264V.

2.2 Back Panel



Temperature sensor input (RTD PT100)

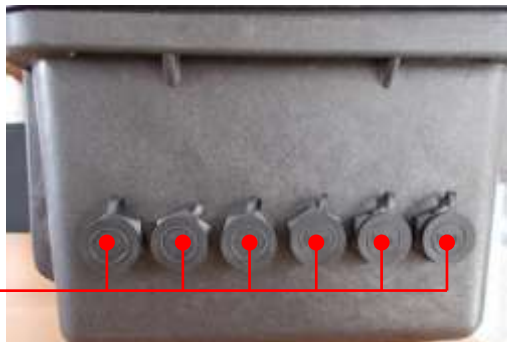
External mains connector. Use with supplied cable.

Local communication connection

Ethernet (LAN) connector

Modem antenna connector (SMA-F)

2.3 Left Side



Current Transformer input connectors.
Channels 1, 2, 3, 4, 5, 6.

CAUTION

Must be connected to voltage-output CTs only.

2.4 Right Side

Current Transformer input connectors.
Channels 7, 8, 9, 10.

CAUTION

Must be connected to voltage-output CTs only.

Voltage measurement connector. Use with supplied cable assembly.

2.5 SIM Card

To insert the modem SIM card, unscrew the 4 screws and lift the front panel. Open the SIM card cover by sliding it towards the arrow direction.

CAUTION *Always disable the modem before opening or closing the SIM cover.*

3. Data Storage

The data are stored in the internal Flash memory and in the uSD memory card (if inserted).

- The data logger stores data compressed in a binary format. Opton decompresses data to ASCII format.
- The maximum file size is 4 MBytes
- A new file is opened when the user starts the Acquisition.
- The current file is closed when the user stops the Acquisition.
- To change the Acquisition setting press **Change** in the main screen.

The internal Flash memory:

- Is not removable.
- Has a size of 4 MBytes
- Is cyclic, i.e. oldest data are overwritten by newer data.
- The maximum number of files is 4000.
- Does not hold a file directory

The removable uSD memory card:

- Has a size of up to 2 GBytes
- Is not cyclic, i.e. no new data are recorded if the card is full.
- The maximum number of files is 65000.
- It keeps a file directory with file numbers, sizes and dates.
- Always insert and remove the memory card when Acquisition is stopped.

NOTE: The data logger accepts memory cards sized up to 2GBytes. To erase the card use the Opton4 software (see 10.3). You may also erase the card via the LCD screen (see APENDIX B).

4. Communication methods

There are many communication options to choose from. To setup these it is recommended that, initially, the user communicates with the logger via the Local or Ethernet ports.

4.1. To connect via the LOCAL COMMUNICATION PORT

The Local port is enabled only when the internal Modem is disabled and vice versa.

From the main screen press **Setup** | **Modem**. Internal means that the Modem is enabled. External means that the Local port is enabled. Press the **Int/Ext** button to change.

4.1.1 USB Communication

- The accessory USB cable has one end terminated to a circular bayonet-type IP67 connector. It connects to the 6-pin circular LOCAL connector at the data logger back.
- The other end is terminated to a standard USB connector suitable for connecting to a USB Host, like a PC.
- Use the supplied CD to install the driver to your PC.

4.1.2 Serial Communication

- The accessory Serial cable has one end terminated to a circular bayonet-type IP67 connector. It connects to the 6-pin circular LOCAL connector at the data logger back.
- The other end is terminated to a DB9M Plug (Male): PIN 2 Receive, PIN 3 Transmit and PIN 5 Ground.
- Use a null modem adaptor or cable to connect to a PC.
- Communication speed is 115200 baud, 8 data bits, 1 stop bit and no parity bit.

4.2. To connect via the ETHERNET COMMUNICATION PORT

The Ethernet port is a standard 10/100 port and is always active.
Connect the data logger to your LAN using a standard Ethernet cable.

NOTE: See APPENDIX C for Ethernet module setup information.

4.3. To connect via the INTERNAL MODEM

The internal Modem is enabled only when the Local port is disabled and vice versa.

From the main screen press **Setup** | **Modem**. Internal means that the Modem is enabled and the Local port is disabled. External means that the Local port is enabled and the modem is disabled. Press the **Int/Ext** button to change.

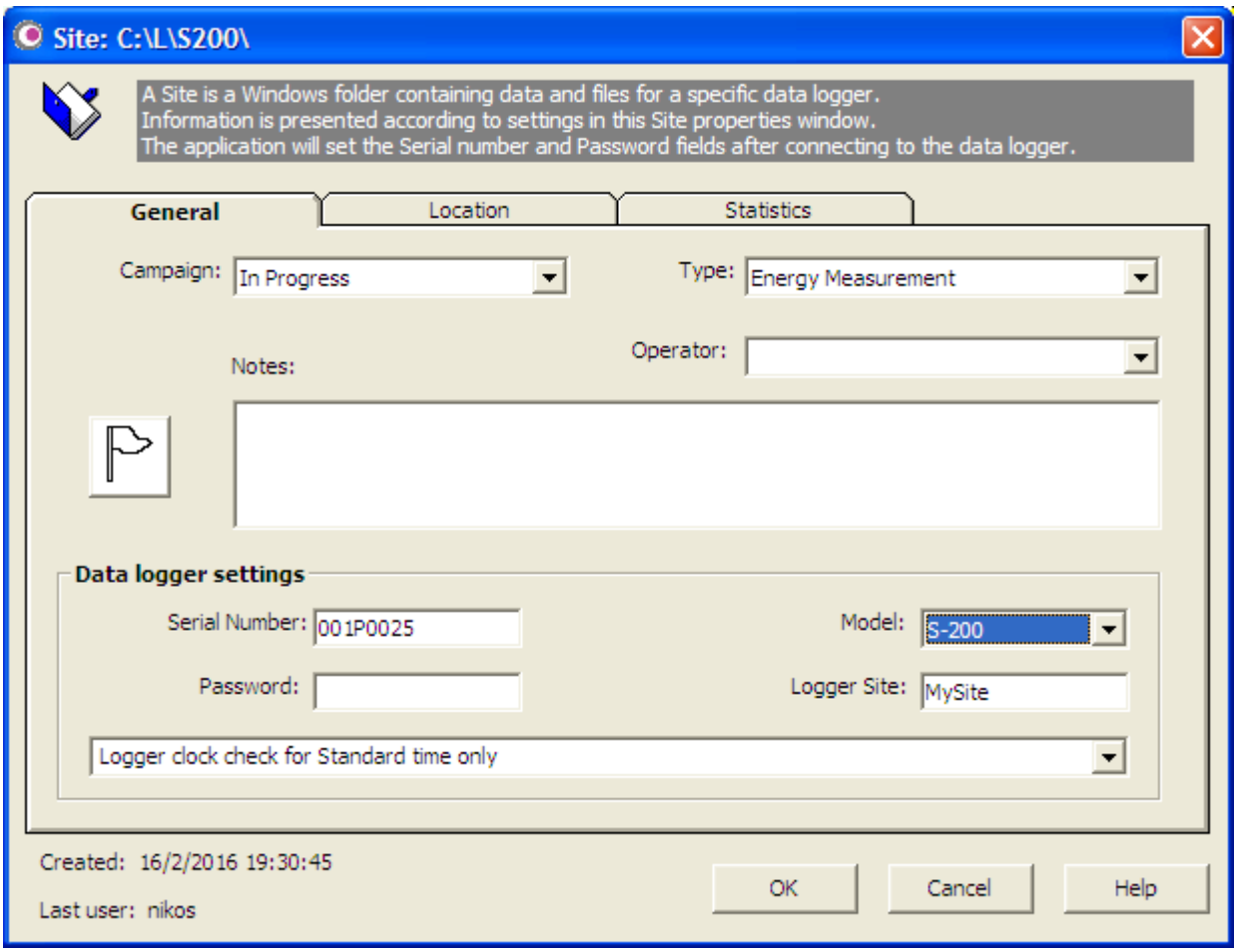
The Modem is useful for connecting remotely to the logger via a GPRS or GSM connection.
Use a SIM card suitable for its intended usage (Data calls and/or GPRS connections).

NOTE: For more information on other Communication methods, see the 'GPRS connection with Stylitis data loggers' chapter in Opton4 Help.

5. The Opton 4 software

Install (with Administrator rights) the Opton 4 software in your computer.

Run the software. The software will prompt to create a new Site folder. Accept the prompt and create the folder at a convenient location (My Documents is recommended). As logger model, select S-200.



In the **Sites** tab, double-click on the newly created folder to open.

The Site tab will open. It contains all information and data relevant to this data logger.

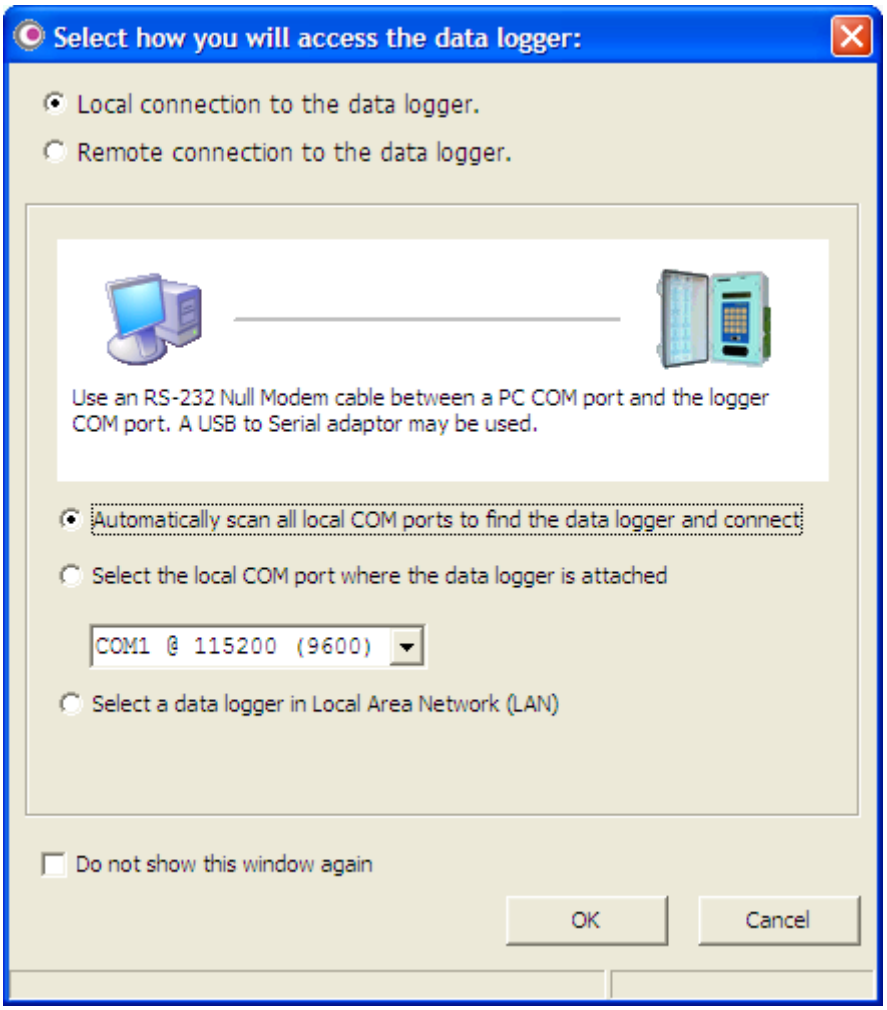
The top center part is the **Tasks** bar, from which you may initiate the basic jobs.

6. Communication between computer and logger

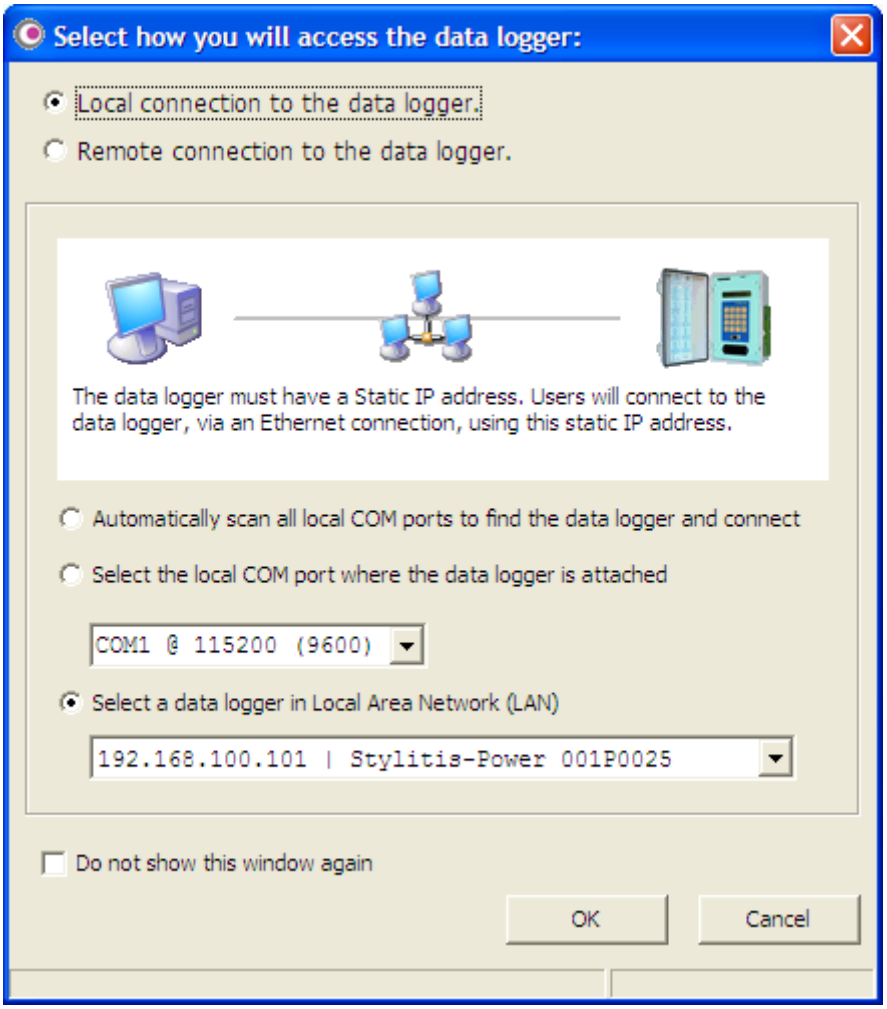
Setup a physical connection as described in 3.1 or 3.2 above.

On the **Tasks** bar, click **Begin logger session** (see 4.2).

- If communication is via the LOCAL COMMUNICATION PORT select as in the following picture and click OK.



- If the communication is via the ETHERNET PORT select as in the following picture and click OK. NOTE: Your logger should be visible in the LAN box.

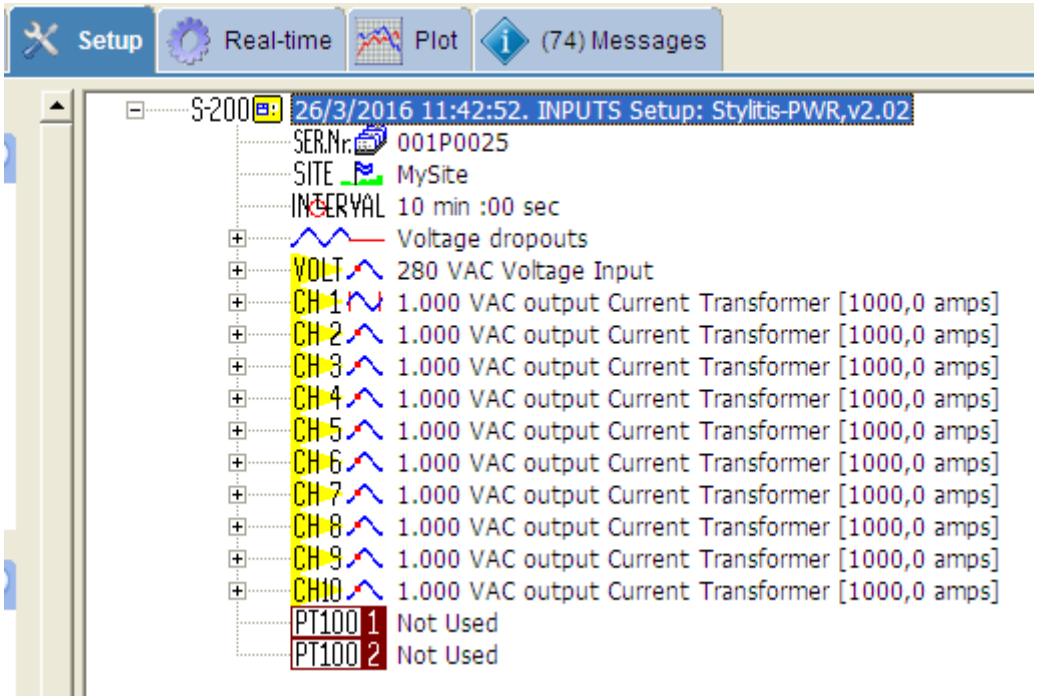


Opton will communicate with the logger and the Connection Assistant square button should change to green.

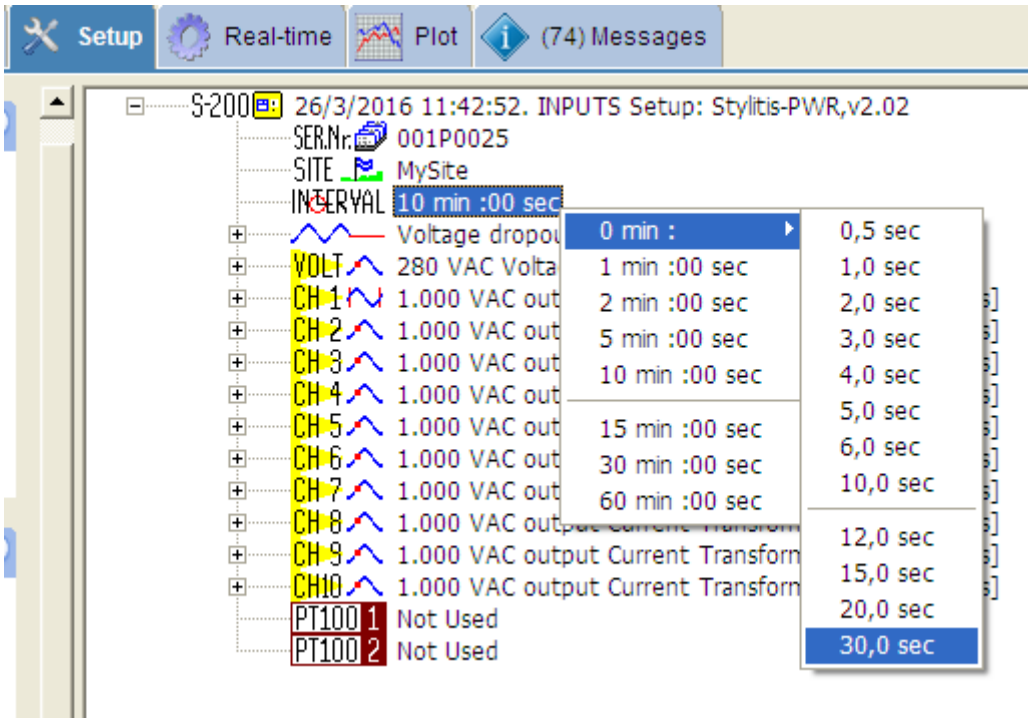
NOTE: You may also begin and end communication by clicking on the Connection Assistant square button.

7. Measurement Setup

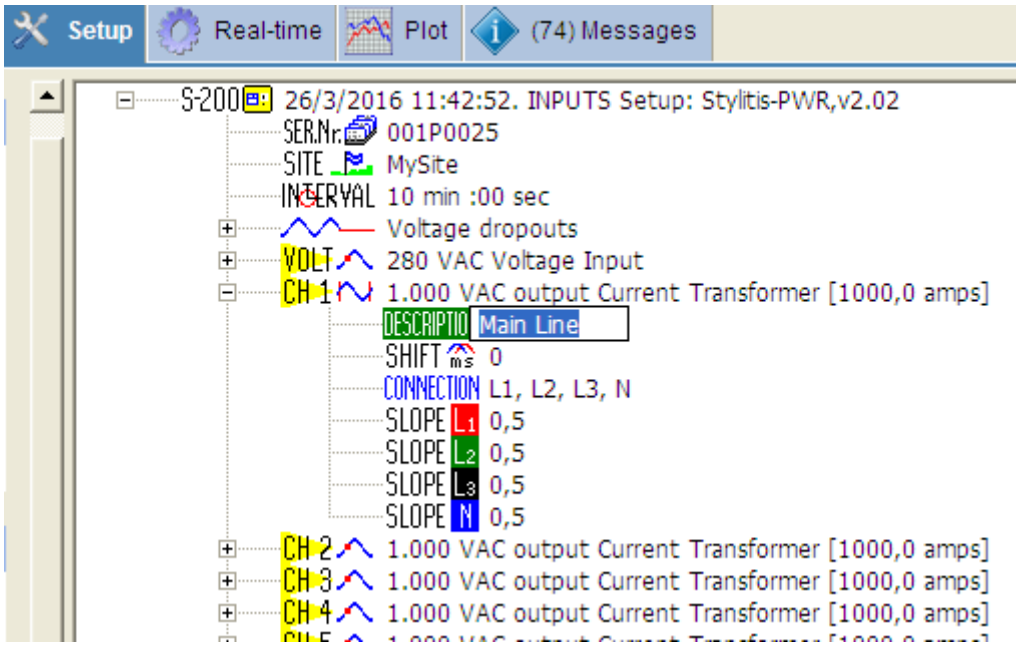
7.1. On the **Tasks** bar, click **View logger setup** (see 4.2).



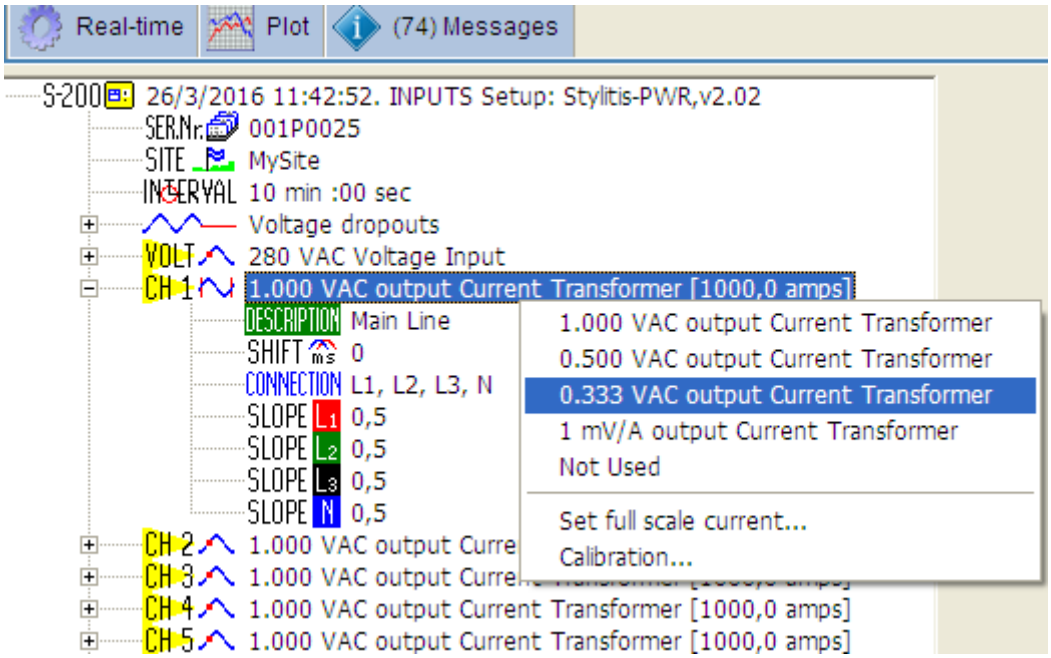
7.2. Set the data acquisition averaging interval.



7.3. For each input channel group, type a description (for example: Main line, 1st floor, etc.).



7.4. For each input channel group, setup the C.T. type and scale. Set channels with no C.T.s to ‘Not Used’.



7.5. For each input channel group, setup the C.T. connection method. You have these options:

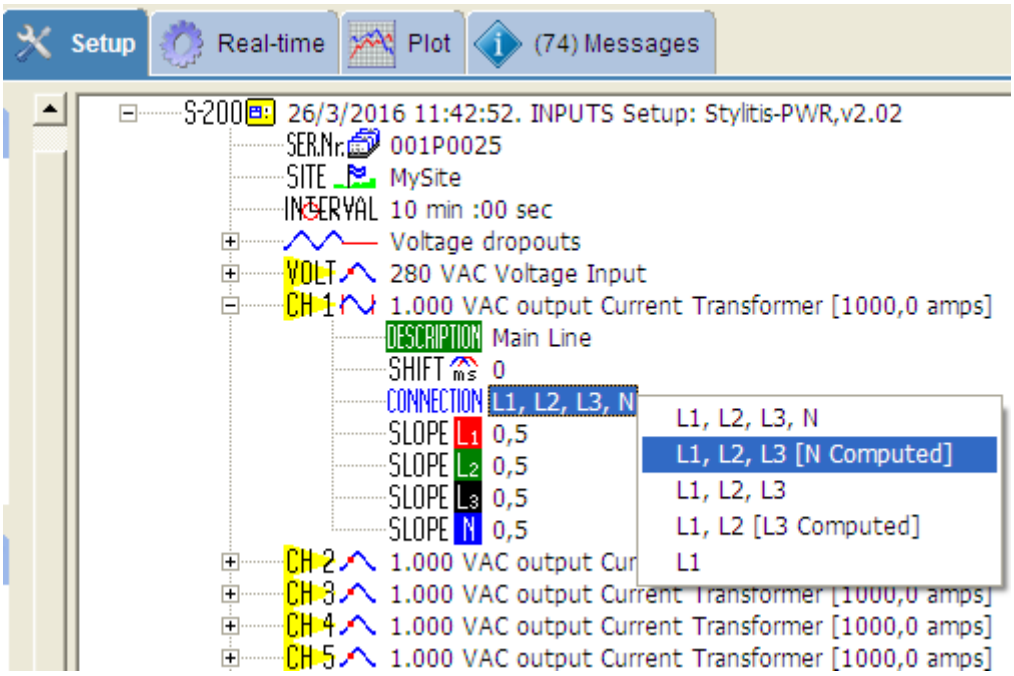
a. L1, L2, L3, N →3-phase connection using 4 C.T.s. Neutral current is recorded (STAR connection).

b. L1, L2, L3 [N Computed] →3-phase connection using 3 C.T.s. Neutral current is computed from the current of the 3 phases and recorded (STAR connection).

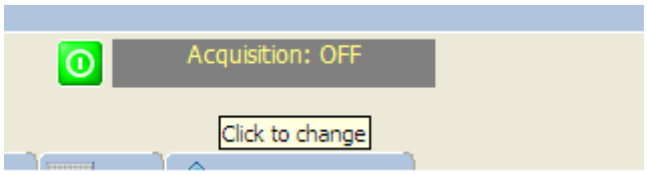
c. L1, L2, L3 →3-phase connection using 3 C.T.s. Neutral current is not recorded (DELTA connection).

d. L1, L2 [L3 Computed] →3-phase connection using 2 C.T.s. Neutral current is not recorded (DELTA connection).

e. L1 →1-phase connection using 1 C.T.



7.6. On the **Tasks** bar, click **Apply setup and start Acquisition** (see 4.2). This will instruct the logger to start recording measurements. The Acquisition button should indicate Acquisition: ON.



NOTE: You can switch Acquisition ON and OFF by clicking on the Acquisition button.

8. Voltage and Current Transformer wiring

8.1 The instrument is supplied with a voltage measurement assembly similar to the one below.

The banana plugs may be attached the electrical board via the supplied alligator clips.

By default the color coding is compatible to the European standard:

- L1 is Brown
- L2 is Black
- L3 is Grey
- Neutral is Blue
- Earth is Green-Yellow

8.2 The current transformers are attached 3 or 4 per 1 connector.

Current Transformer inputs must be connected to voltage-output CTs only.

For wiring information please refer to APPENDIX A.

9 Monitoring

You may view measurements and instrument status in real-time.

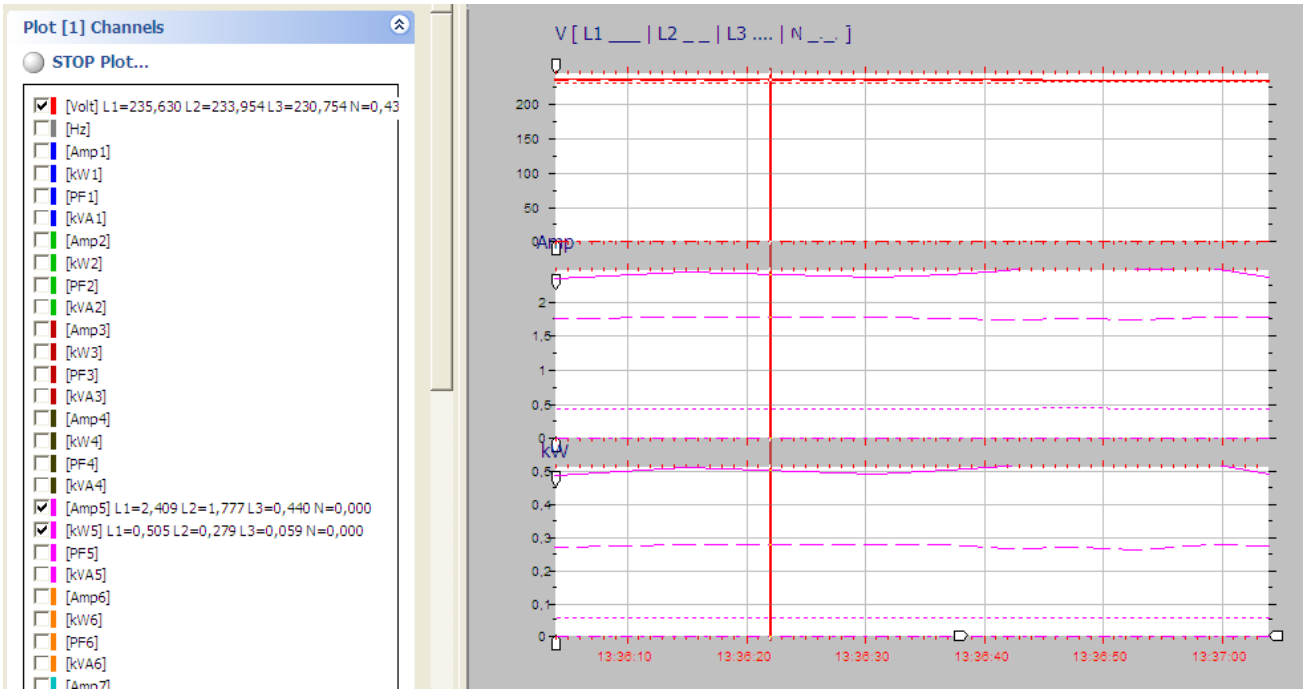
9.1. To check your instantaneous measurements:

Click on the **Real-time** tab. Expand the **Data** bar and click **Read Input data.**

```
Stylitis-200 Logger Data.
On: 3/1/2016 13:31:30
-----------------------------------------------------
      |     L1    |     L2    |     L3    |     N     |
-----------------------------------------------------
Volt  |    235.870|    234.371|    229.598|      0.430|
-----------------------------------------------------
Hz    |     49.967|           |           |           |
-----------------------------------------------------
Amp  3|      5.391|      0.000|      0.000|      0.000|
kW   3|     -0.001|      0.000|      0.000|      0.000|
P.F. 3|     -0.001|      0.000|      0.000|      0.000|
-----------------------------------------------------
Amp  5|      2.458|      1.795|      0.440|      0.000|
kW   5|      0.516|      0.288|      0.058|      0.000|
P.F. 5|      0.891|      0.685|      0.576|      0.000|
-----------------------------------------------------
Amp  6|      2.458|      1.804|      0.431|      0.000|
kW   6|      0.527|      0.290|      0.058|      0.000|
P.F. 6|      0.910|      0.687|      0.584|      0.000|
-----------------------------------------------------
Amp  7|      2.454|      1.817|      0.431|      0.000|
kW   7|      0.529|     -0.289|      0.057|      0.000|
P.F. 7|      0.914|     -0.680|      0.578|      0.000|
-----------------------------------------------------
Amp  8|      2.400|      1.787|      0.430|      0.000|
kW   8|      0.509|      0.273|      0.053|      0.000|
P.F. 8|      0.899|      0.652|      0.537|      0.000|
-----------------------------------------------------
Temperature 1 (PT100) = 10.966 deg C
Temperature 2 (PT100) = 22.412 deg C
```

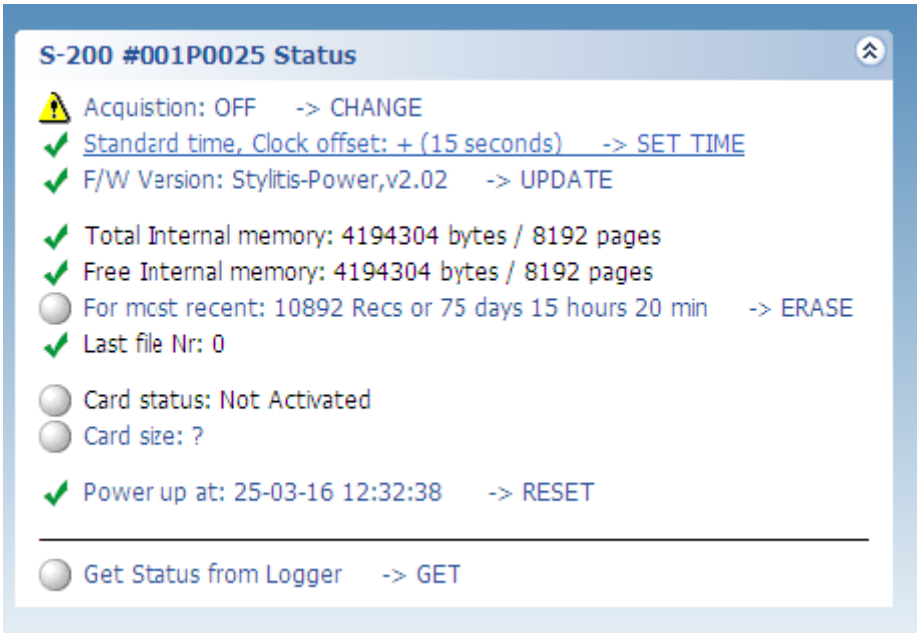
9.2. To display an on-line trend of your measurements:

Click on the **Plot** tab and expand the **Plot** bar. Select the channels you want to plot and click **Start** on-line plot.



9.3. It is recommended that you regularly check the data logger Status.

Click on the **Home** tab. Expand the **Status** bar and click **Get Status from Logger.**



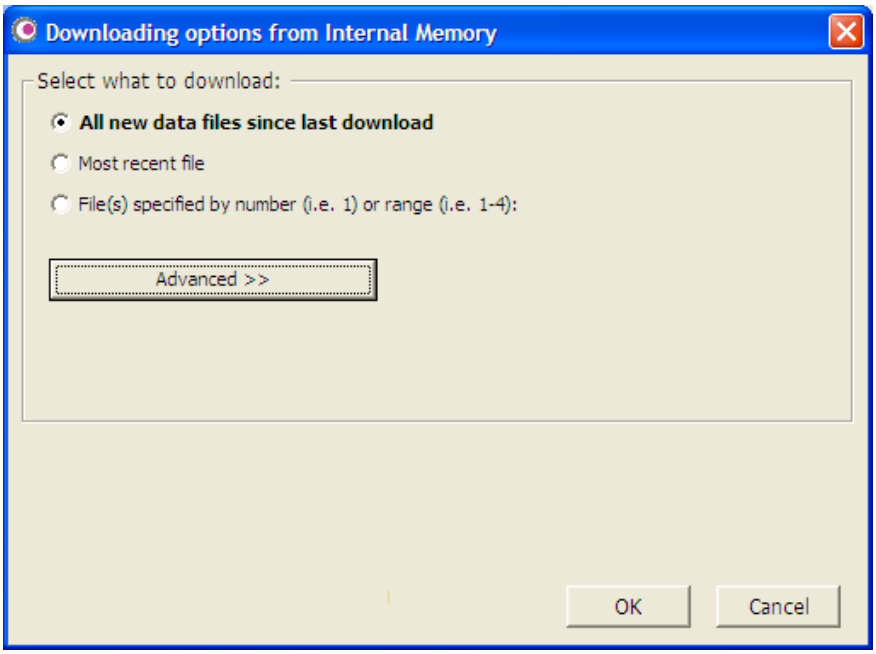
10 Data retrieval

There are several ways to retrieve measurements from the logger. Remember that the logger records measurements only when Acquisition is ON.
The Data retrieval (or download) procedure copies the compressed binary file to the Site folder and automatically decompresses it to an ASCII text data file.

10.1. Download measurements from the internal memory.

Click on the **Home** tab. Expand the **Tasks** bar and click **Download logger memory data.**

From the next window select your option.

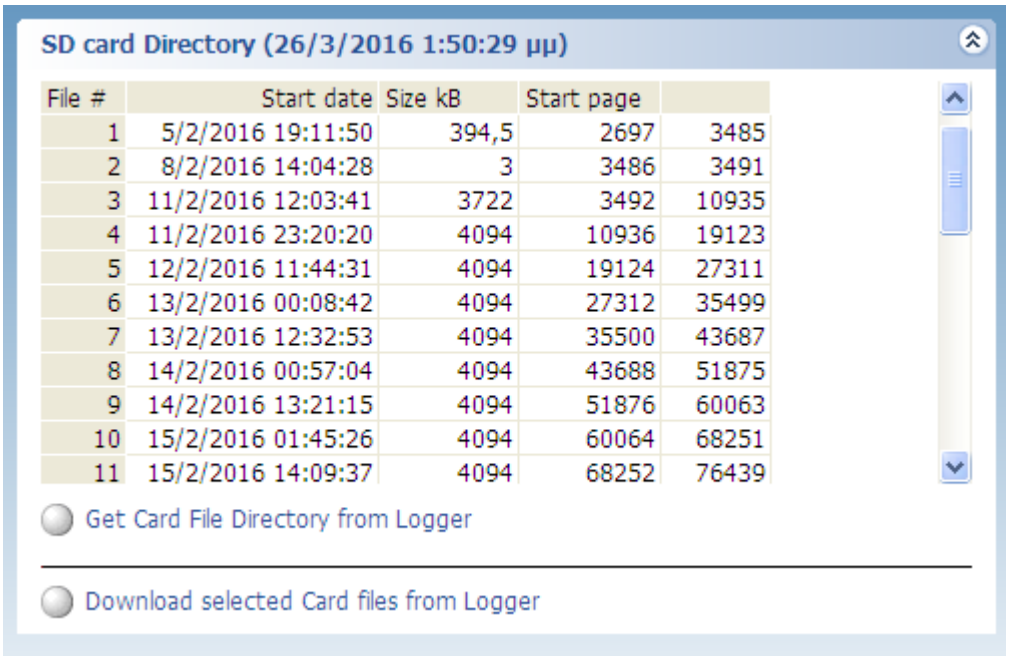


NOTE: The Status screen displays the recent (or current) file number (see 8.3). When you download the most recent file while Acquisition is ON, the file is closed and a new file is opened which becomes the recent file.

10.2. Download measurements from the SD card (if used).

Remember to insert and remove the memory card when Acquisition is stopped.

To view the SD card file directory click on the **Home** tab. Expand the **SD card Directory** bar and click **Get Card File Directory from Logger.** Wait until the directory appears.



Select the files to download by clicking on them. To select more than one file you may use CTRL-click and SHIFT-click.

Click **Download selected Card files from Logger** to start download.

NOTE: downloading the card data from the logger is a slow process. It is recommended that you use method 3 below.

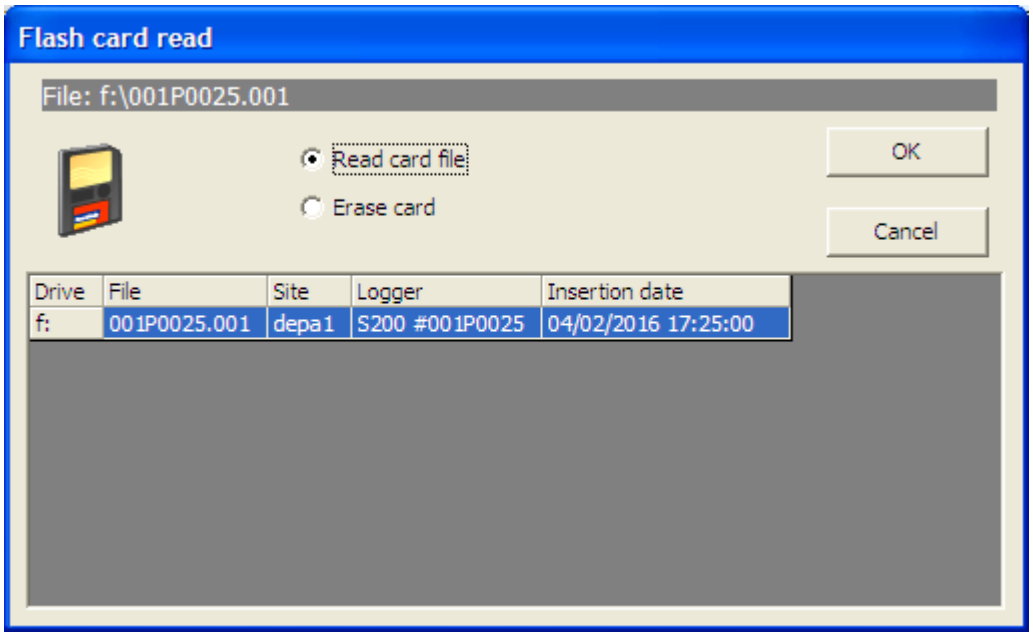
10.3. **Read the SD card in your computer.**

This is the recommended reading method for large files.

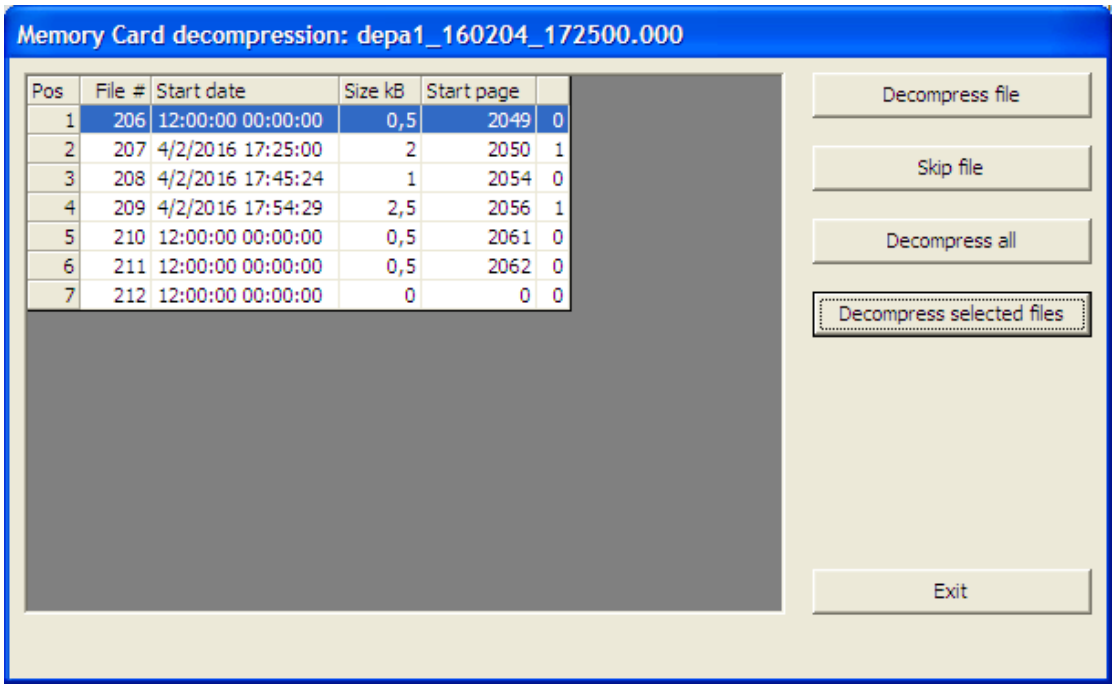
Remember to insert and remove the memory card only when Acquisition is stopped.

Remove the SD memory card from the logger and insert it in a suitable card reader connected to your computer. Opton allows you to directly access the card.

To view the SD card file directory click on the **Files** tab. Expand the **Memory card** bar and click **SD Flash.** To Erase the card select **Erase card** and click OK.



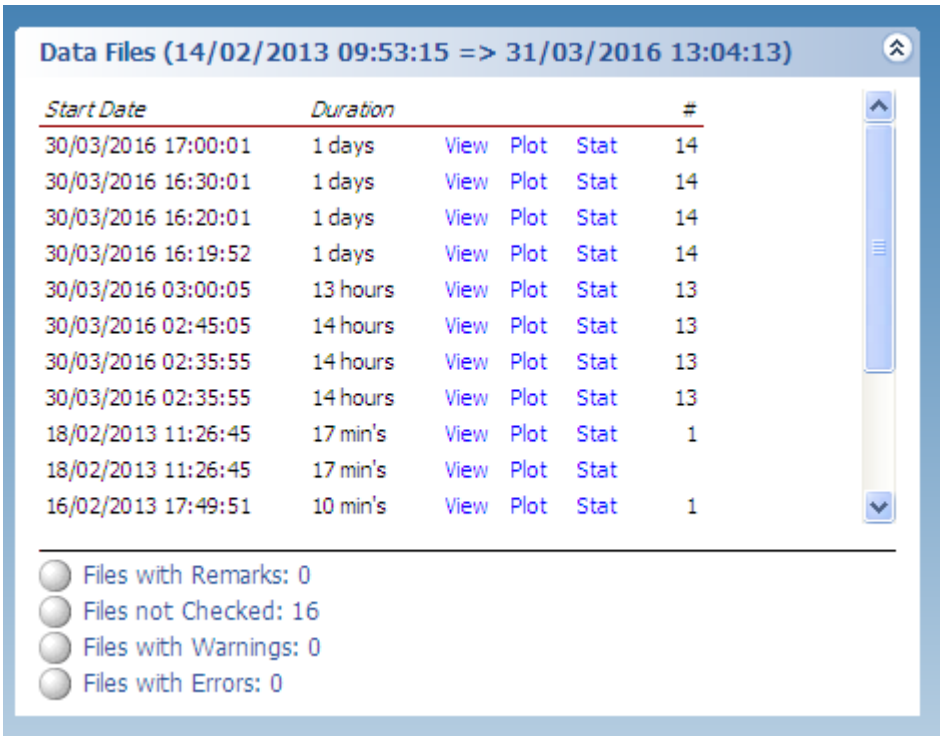
Select the card file from the list and click OK. From the Directory list select the files you want to decompress.



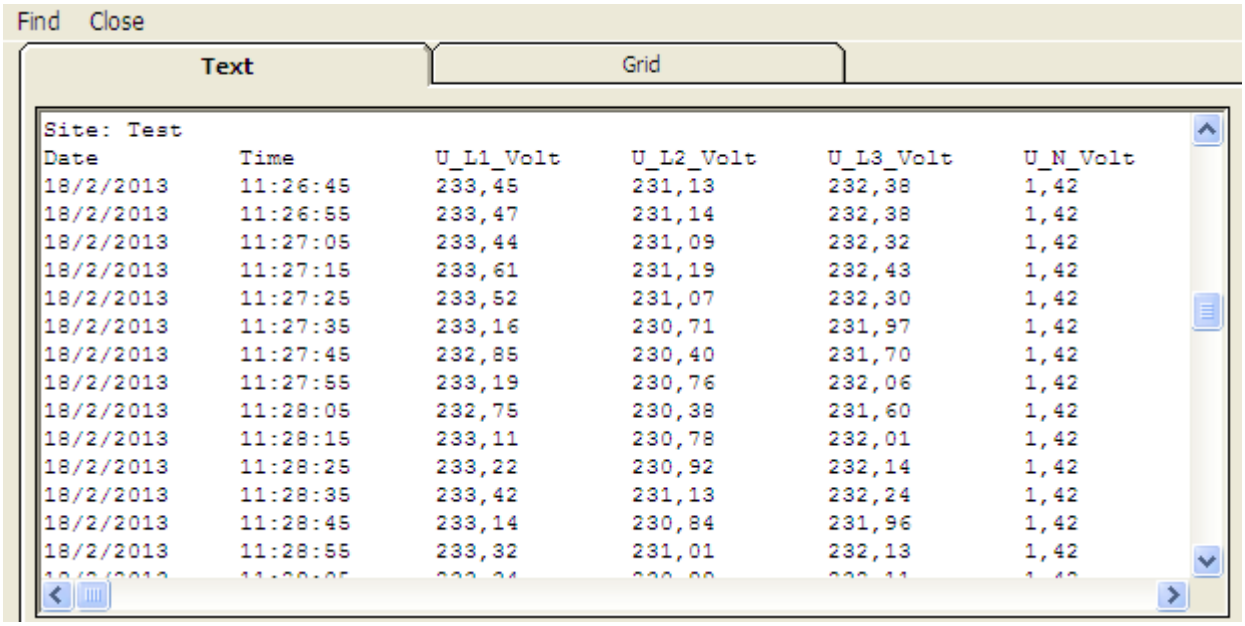
11 Data View

To view the Site data files Click on the **Home** tab and expand the **Data files** bar on top of the right column.

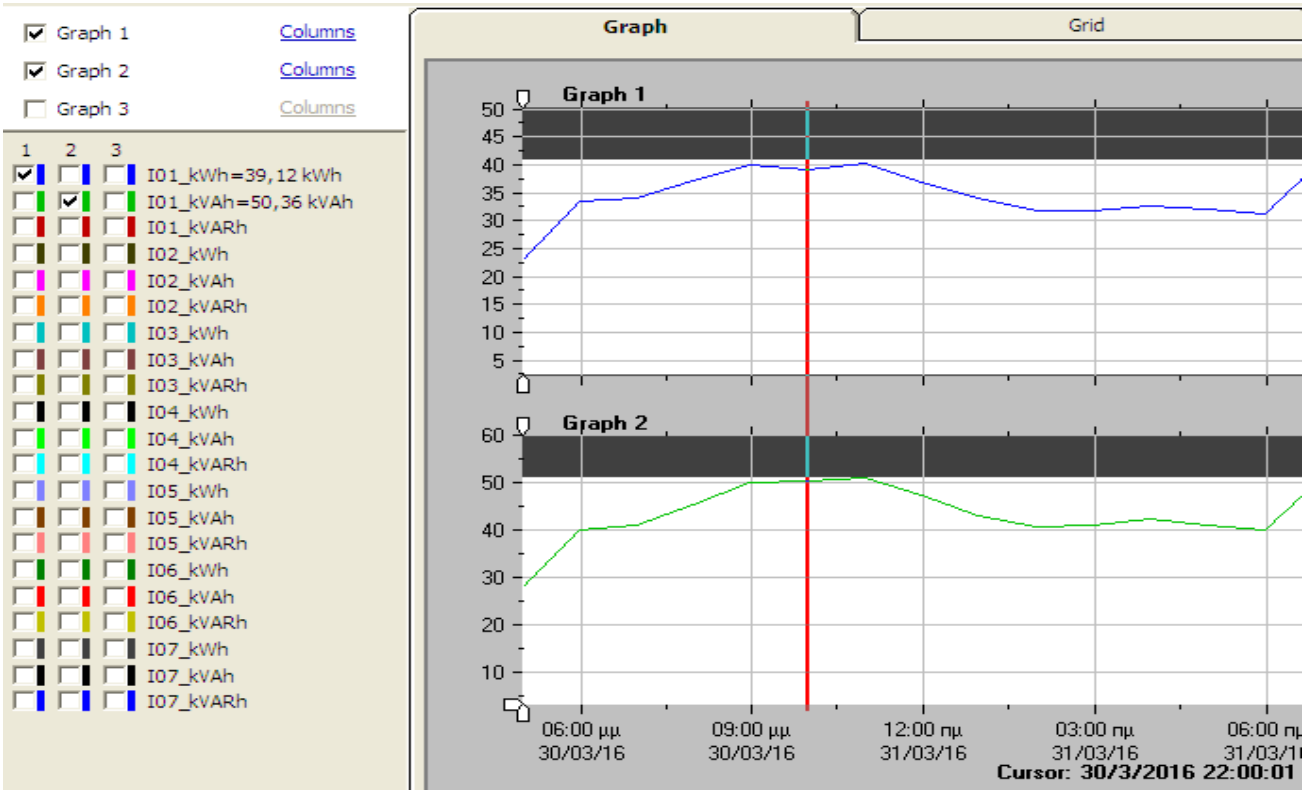
*NOTE: For more options when working with files click on the **Files** tab.*



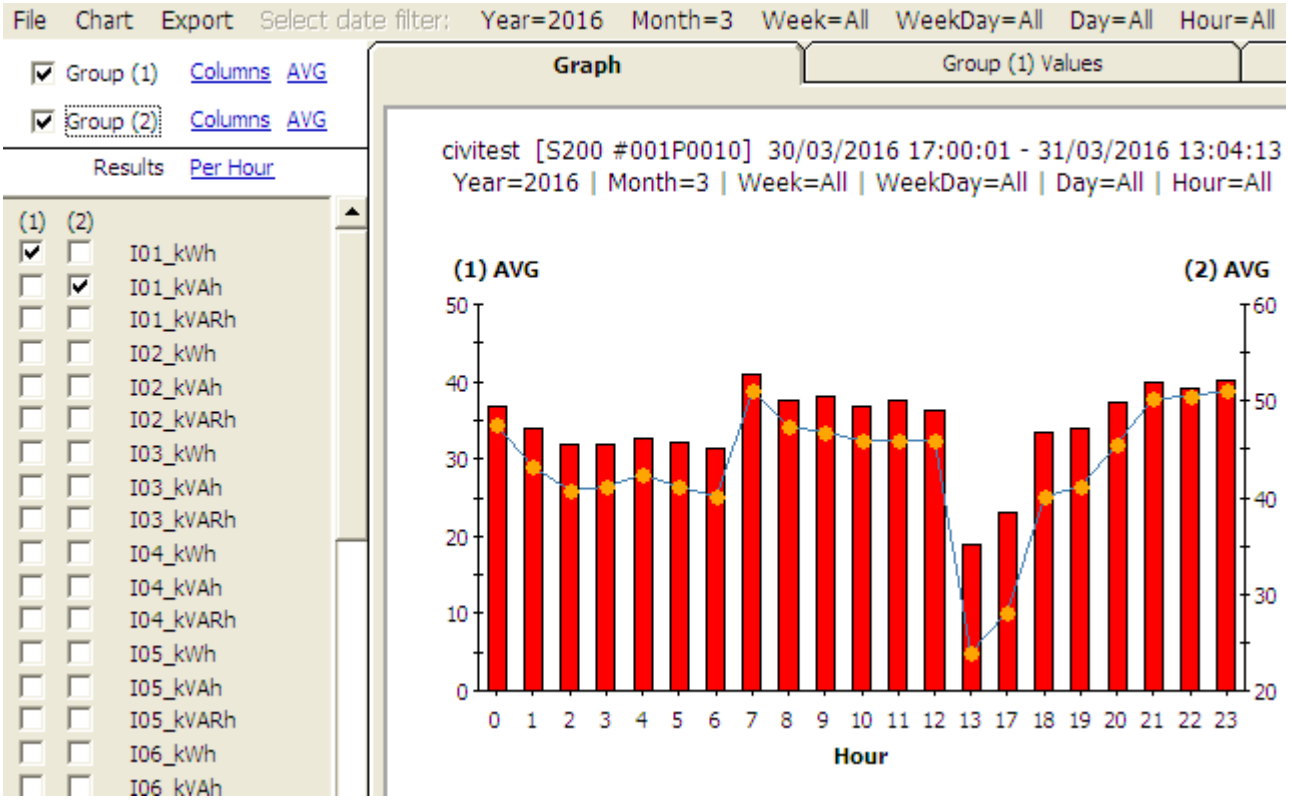
11.1 For Text view click the View link adjacent to the file:



11.2. To Plot data click the Plot link adjacent to the file:



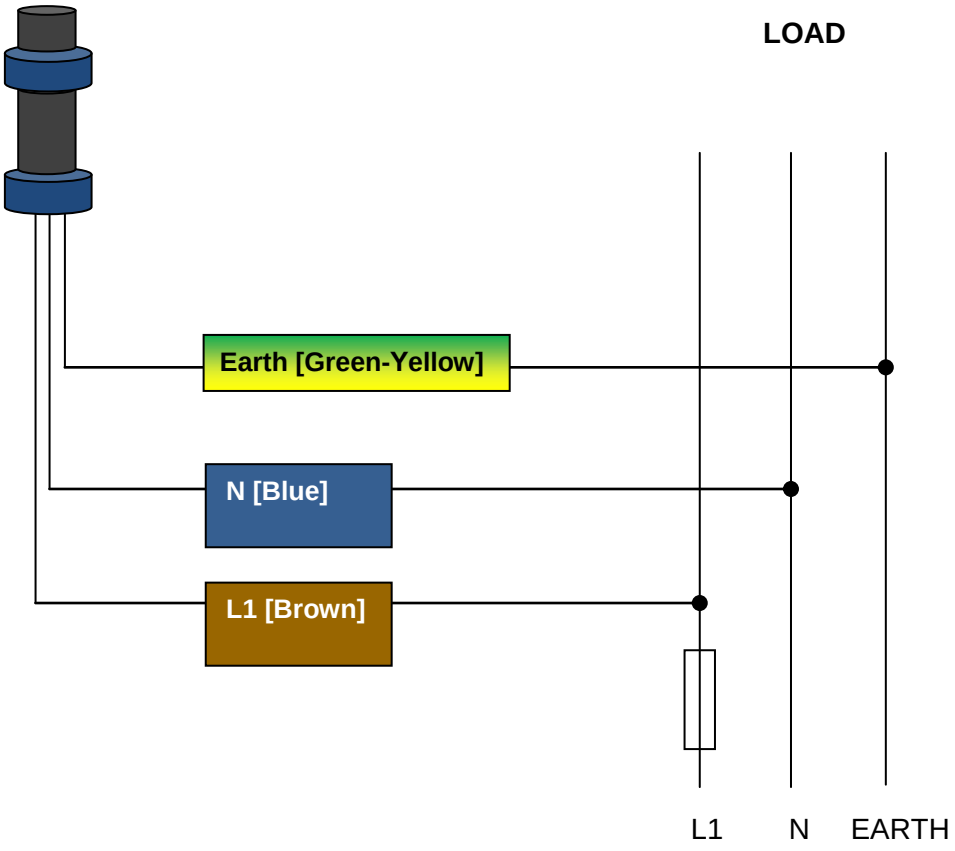
11.3. To view Statistics data click the Stat link adjacent to the file:



A1. Voltage: single-phase connection

This connection is suitable for:

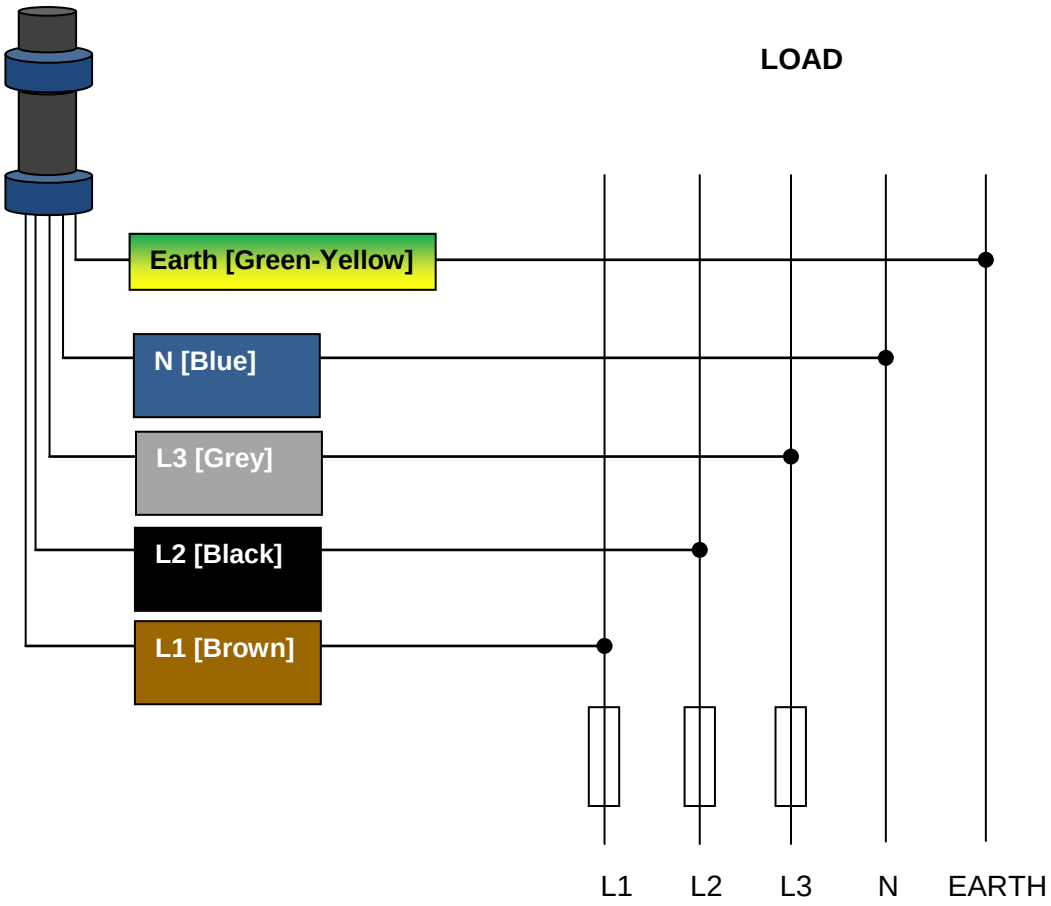
- **STAR** connection. Opton CONNECTION setting: L1



A2. Voltage: 3-phase connection

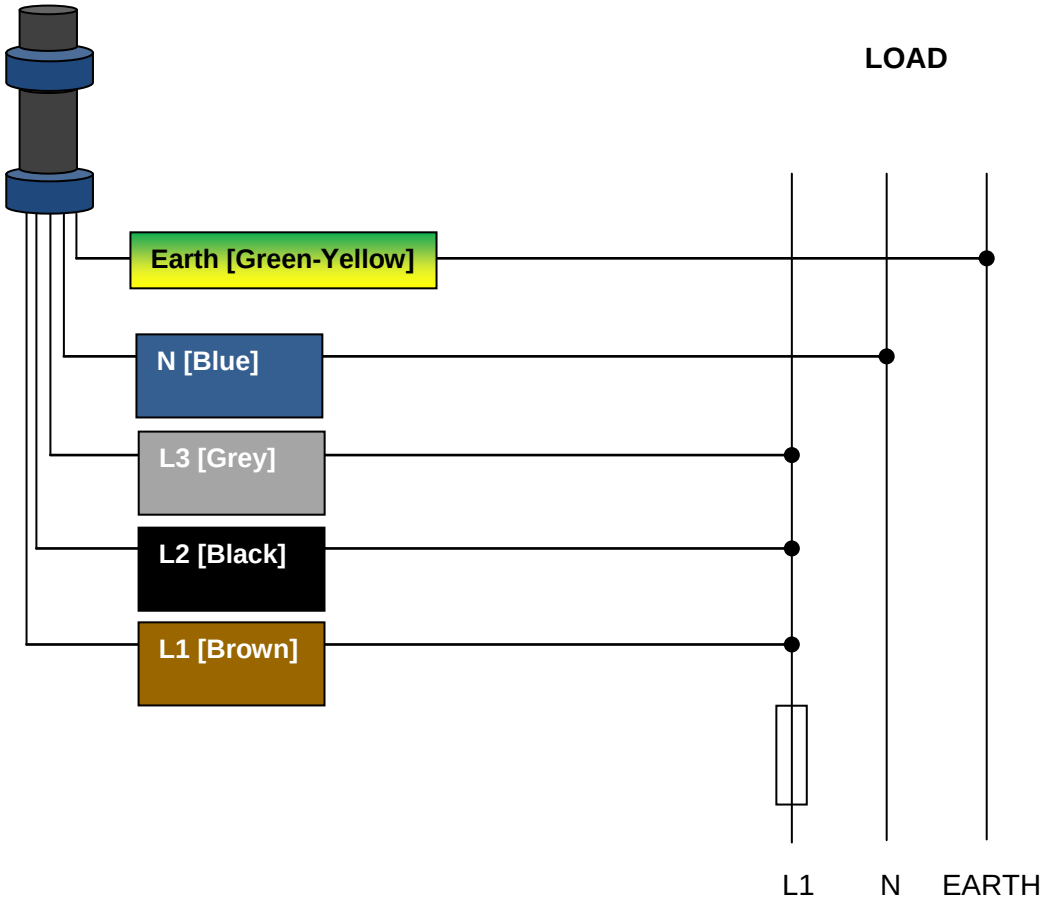
This connection is suitable for:

- **DELTA** connection.
- **STAR** connection.



A3. Voltage: single-phase connection

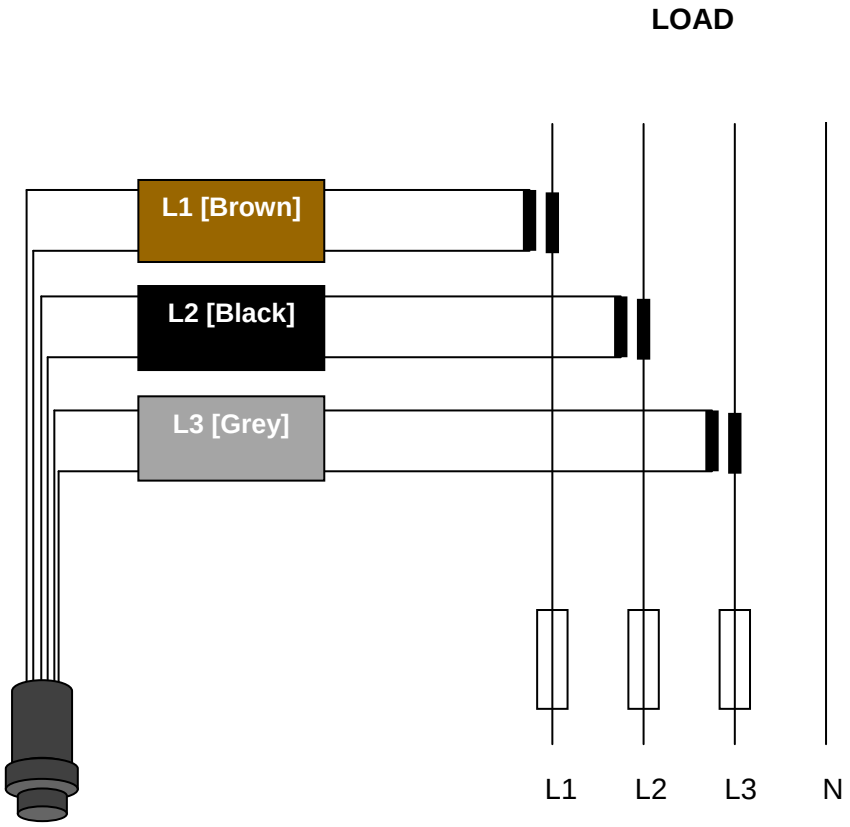
This connection is suitable for using all current inputs for single-phase measurements.
The reference voltage is L1.
It is possible to measure up to 40 single-phase currents.



A4. Current Transformer inputs: Basic 3-phase, 3 C.T. connections

This connection is suitable for:

- **DELTA** connection. Opton CONNECTION setting: L1, L2, L3
- **STAR** connection. Opton CONNECTION setting: L1, L2, L3 [N Computed]

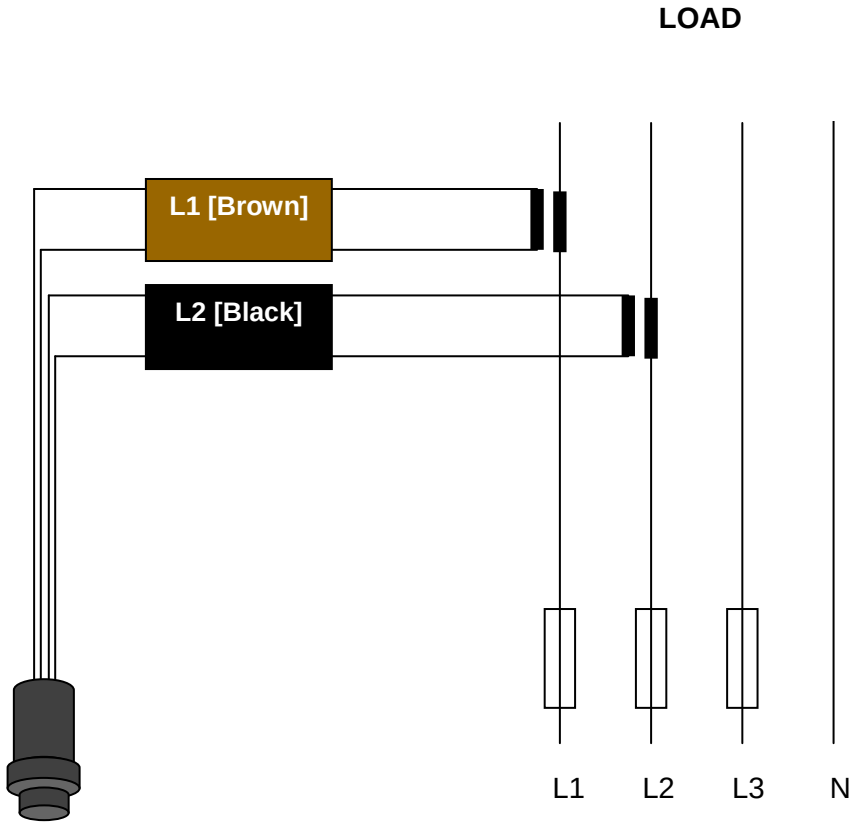


Current Transformer Inputs 1~10

A5. Current Transformer inputs: 3-phase, 2 C.T. connections

This connection is suitable for:

- **DELTA** connection. Opton CONNECTION setting: L1, L2, [L3 Computed].



Current Transformer Inputs 1~10

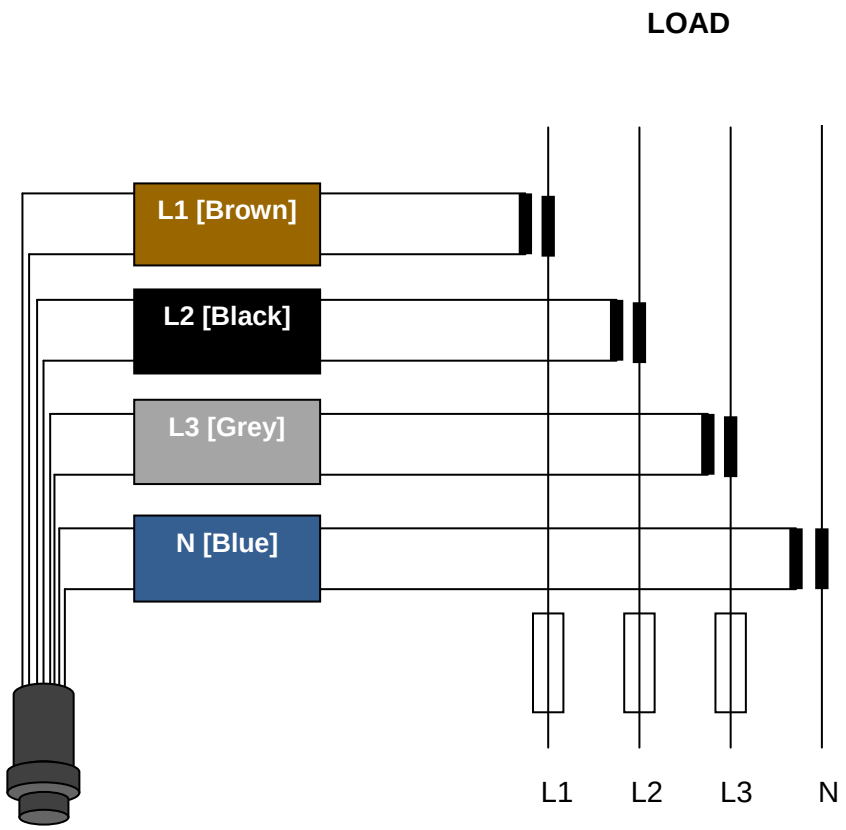
A6. Current Transformer inputs: 3-phase, 4 C.T. connections

This connection is suitable for:

- **STAR** connection. Opton CONNECTION setting: L1, L2, L3, N

A7. Current Transformer inputs: 1-phase, 4 C.T. connections

This connection is suitable for using all current inputs for single-phase measurements.

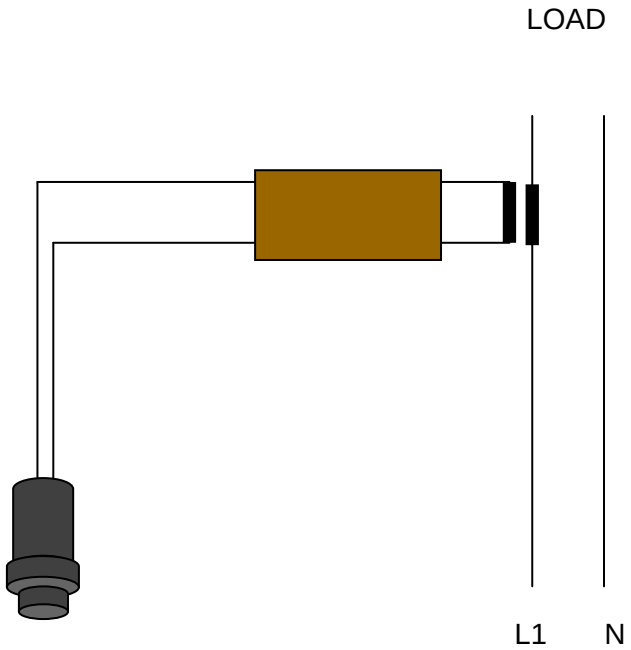


Current Transformer Inputs 1~10

A8. Current Transformer inputs: 1-phase, 1 C.T. connection

This connection is suitable for:

- **STAR** connection. Opton CONNECTION setting: L1



Current Transformer Inputs 1~10

APPENDIX B LCD SCREEN

NOTE: To save power, the LCD screen backlight is switched off after 1 minute of inactivity. Press on the screen bottom to switch on.

The main **STATUS** (power-up) screen shows the current instrument Status.

The **Display** button allows viewing of current values.
The **Setup** button enables and disables the internal Modem and other functions.
The **Card** button checks the µSD memory card.
The **Help** button displays online help.
The **Change** button switches Acquisition On and Off.

The **Display** screen shows the instantaneous measured values for all channels in vertical **Bar** form.

Use **L1**, **L2**, **L3**, **N** buttons to display the values for all phases.
Press the **Val** button to display the values in Table form.

The **Values** screen shows the instantaneous measured values for all channels in Table form.

Use **L1**, **L2**, **L3**, **N** buttons to display the values for all phases.
Press the **Bar** button to display the values in Bar form.
Press the **Temp** button to display the measured temperature values.

The **SETUP** screen allows modem and Ethernet connection checking and other functions.

Use the **Set** buttons to enter site information.
Press the **Modem** button to check and set the modem.
Press the **Ethernet** button to check the Ethernet connection.

Use the **MODEM** screen to enable or disable the modem and display information.

Press **Int/Ext** to enable or disable the modem.
Internal means that the modem in enabled and the Local port is disabled.
External means that the modem in disabled and the Local port is enabled.
Press **Check** to display modem connection information (If idle, displays Provider name and signal strength).

Use the **ETHERNET** screen to display information.

If idle it shows the instrument's IP address.
IP addresses starting with 169 indicate network problem. This may be caused by:

- A bad cable or connection.
- There is no DHCP server in the LAN to assign addresses. In this case you may need to assign a static address to the instrument (see APPENDIX C).

NOTE: The Ethernet module may take up to one minute after power up to initialize.

Use the **CARD** screen to erase the memory card and display card status.

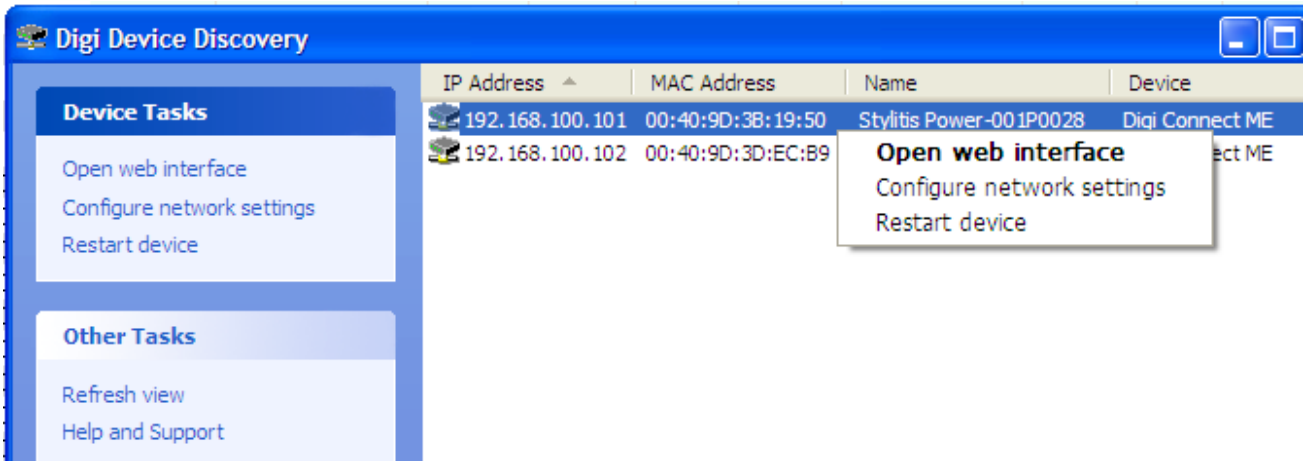
Use the **Erase** button to erase the memory card.
You can also erase the card using Opton (see 10.3).

APPENDIX C ETHERNET SETUP

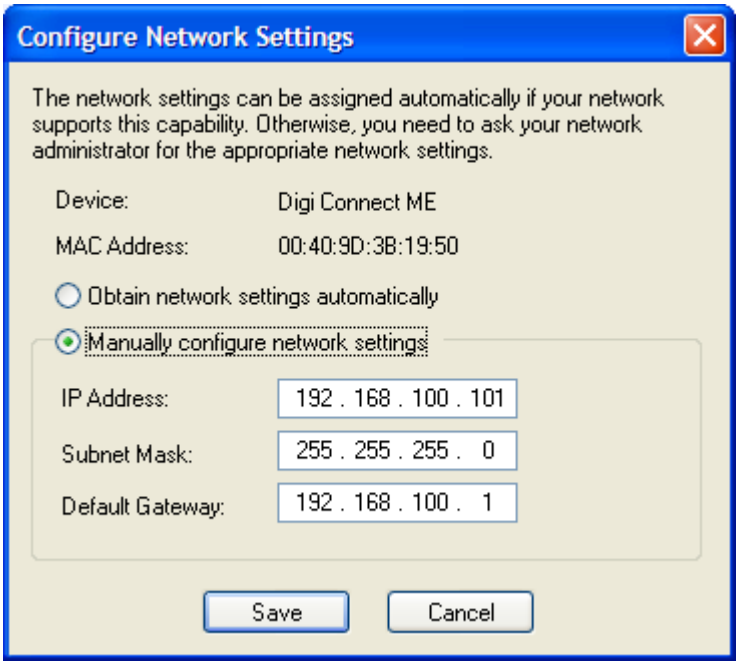
In some cases, for example when there is DHCP server in the LAN, you may want to assign a static IP address to the instrument. You can do this via the **Discovery** utility which also finds your logger in your LAN.

NOTE: While setting static IPs, if you make a mistake, the data logger may become 'invisible', i.e. stops appearing in the Discovery window. In this case contact Symmetron support.

In Opton, while not connected, click on the **Connections** tab. Expand the **Communication** bar and click **Find logger in LAN.** In the Discovery window, right-click on the data logger and select **Configure network settings**.



Select to **Manually configure network settings** and enter the static IP settings suitable for your LAN.



Click **Save** and allow Ethernet module reboot.

REVISION HISTORY

REVISION	DATE	DESCRIPTION
1	4/2/2106	Initial release
2	30/4/2016	Corrected APPENDIX B