Hybrid Controller

“Diesel – PV Off the shelve”

Manual

Version 2.5

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1. Introduction

Dear customer, thank you for purchasing this product. The HYBRID BASIC controller is the first series produced control system which enable you to control a PV system connected with a Diesel generator in an intelligent way. With the modern HYBRID BASIC series Diesel - PV controller you can control your PV system in a way that Diesel load is minimised, and fuel saving is maximized. The modern controllers offer the following functions:

- Multiple Generator set control
- Prime mover and generator protections
- Engine data measurement (optional trough external bus):
  - Operating hours
  - Running hours
  - Start attempts
  - Oil pressure
  - Coolant temperature
  - Battery voltage
  - Fuel level measurement
  - Engine speed
  - Service hours
  - Etc.
- Generator voltage, current and power measurement
- GRID control and GENERATOR control with one device
- Ethernet based web interface for remote control (optional)
- 2x MODBUS RS-485 for engine control and easy expanding

Specializing in products for generators and hybrid power solutions, the HYBRID BASIC offers the following features standard:

- Wide range power supply input from 85 - 265 V_{AC} (50 - 60 Hz)
- Small footprint.
- Intuitive software.
- Wide temperature range of -25° – +85°.
- Industrial PUR protection coating for extra rugged environment.
- IP-68 on request.

If you have any questions or if something is unclear, you can contact us in several ways:

Per E-Mail : support@elgrispower.com

By Phone : +49 (0) 2423 9086501

1.1 Version overview

The HYBRID BASIC series controller consists of 1 model now.

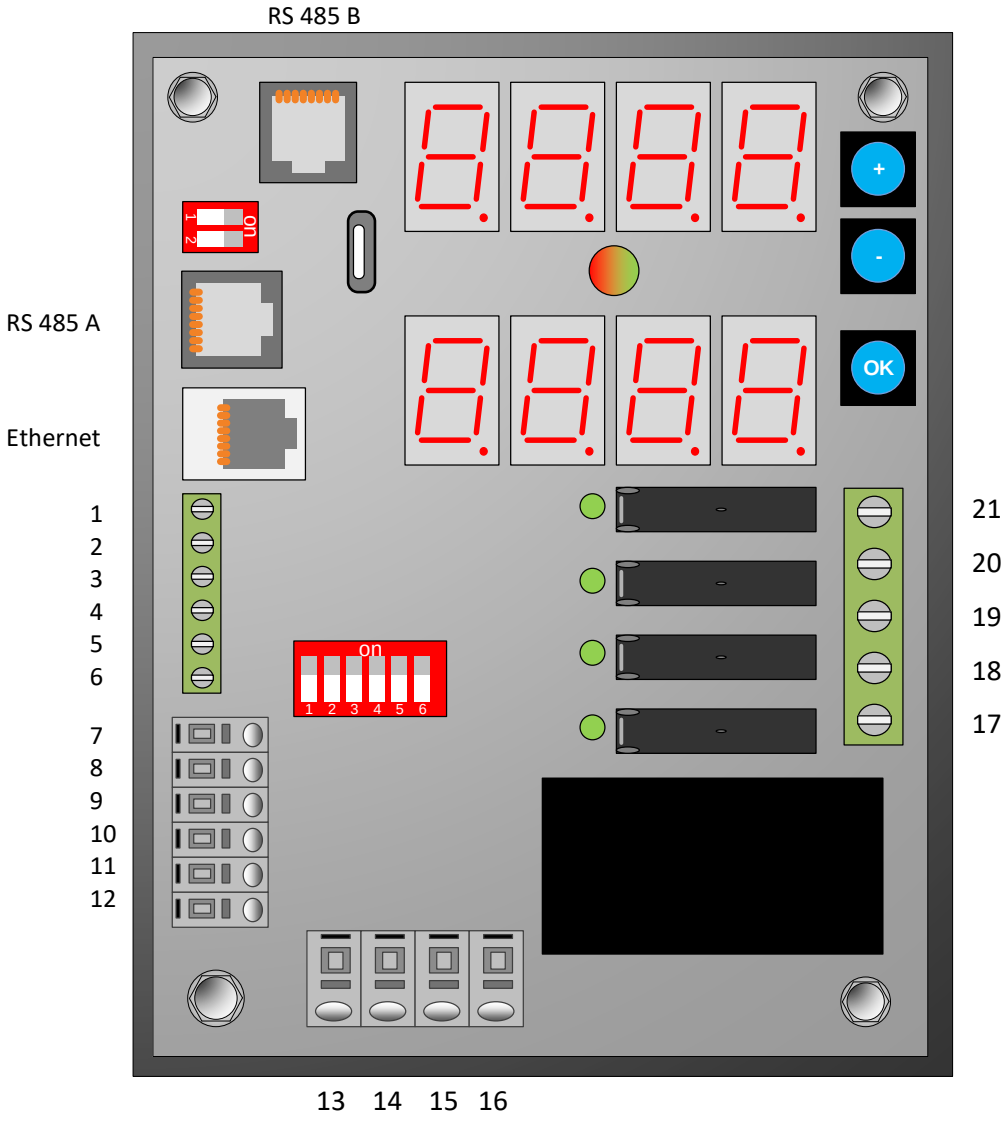
2. Installation

2.1 Safety instructions

Before installing the product in the end-installation, ensure that the device is not damages during transport and everything looks in a normal way.
All the connecting cables must not be bent or squeezed. This can result in malfunctions, short circuits and defects in the device and/or sensor connected.
Make sure that cables are not damaged when drilling or bolting in place.
The module may only be commissioned after it has been installed contact-free in a casing. This product generates high frequency. Never operate it in the vicinity of medical devices (e.g. pacemakers) and/or medical equipment (e.g. in hospitals). Look for a suitable installation site.

2.1 Device overview

Before wiring the device, be sure that the voltage is switched off.

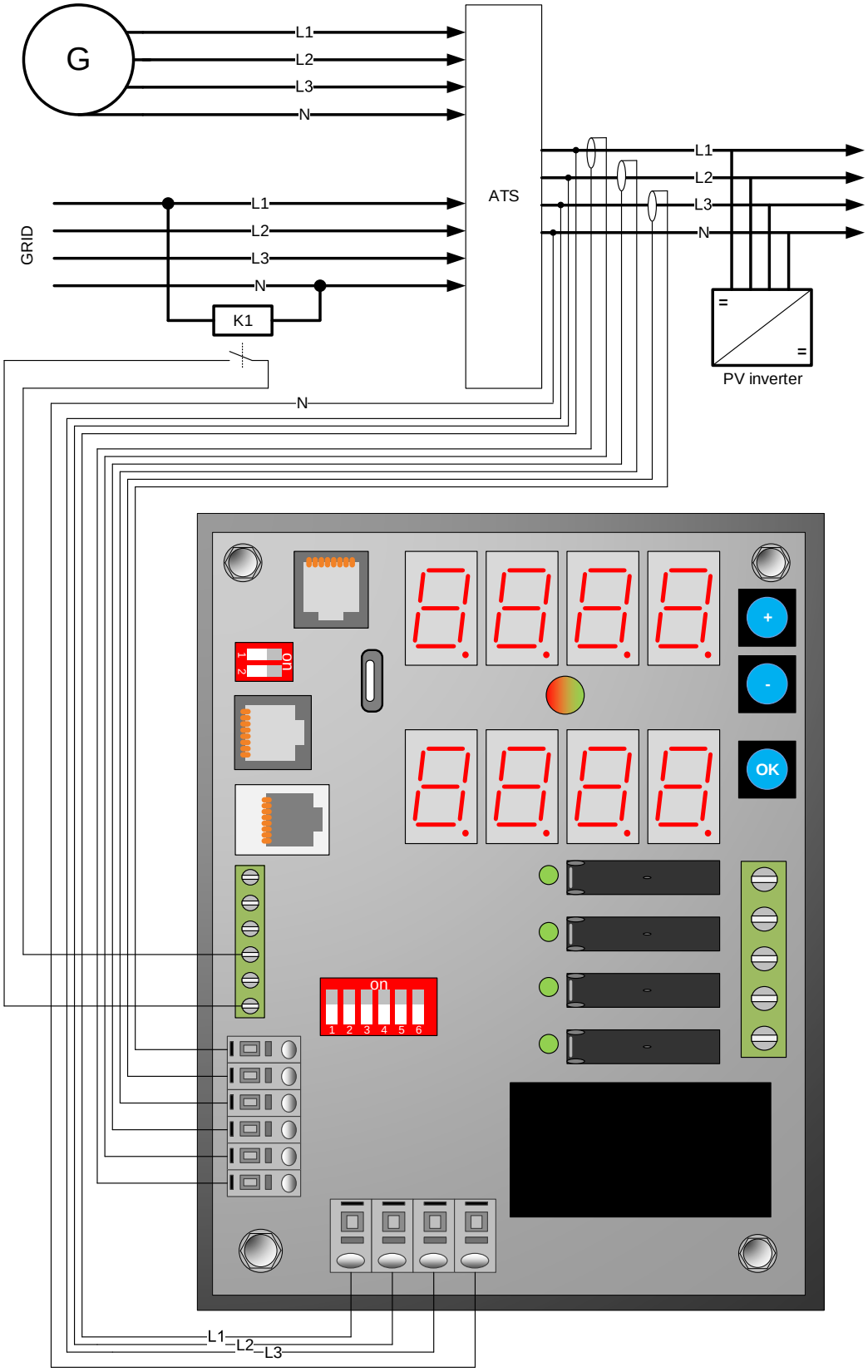


2.2 Pin description

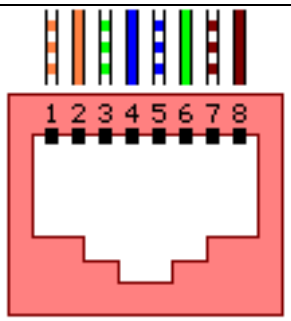
	Pin	Description	Minimum	Maximum
Signal connector	1	Analogue input 1 positive	0 V / 0 mA	10 V / 20 mA*
	2	Analogue input 2 positive	0 V / 0 mA	10 V / 20 mA*
	3	Input common level	0 V	0 V
	4	Digital input 1	Open	Closed
	5	Digital input 2	Open	Closed
	6	Input common level	0 V	0 V
Power input	7	K input current transformer L3	0 Aac	5 Aac
	8	L input current transformer L3	0 Aac	5 Aac
	9	K input current transformer L2	0 Aac	5 Aac
	10	L input current transformer L2	0 Aac	5 Aac
	11	K input current transformer L1	0 Aac	5 Aac
	12	L input current transformer L1	0 Aac	5 Aac
	13	Phase L1 voltage input	85 Vac	250 Vac
	14	Phase L2 voltage input	85 Vac	250 Vac
	15	Phase L3 voltage input	85 Vac	250 Vac
	16	Neutral input of voltage		
Control input	17	Level 1 (0 % limitation)	2 A @ 250 V_{AC} / 30 V_{DC}	
	18	Level 2 (30 % limitation)	2 A @ 250 V_{AC} / 30 V_{DC}	
	19	Level 3 (60 % limitation)	2 A @ 250 V_{AC} / 30 V_{DC}	
	20	Level 4 (100 % limitation)	2 A @ 250 V_{AC} / 30 V_{DC}	
	21	Relay signal common	Check inverter specifications	
Dipswitch 1	1	IP address selection	OFF = DHCP	ON = static
	2	System frequency	OFF = 50 Hz	ON = 60 Hz
	3	Single or Three phase	OFF = Three phase	ON = Single phase
	4	Not used	Must be OFF	
	5	Analog selection channel 1	ON = 0 – 20 mA	OFF = 0 – 10 V
	6	Analog selection channel 2	ON = 0 – 20 mA	OFF = 0 – 10 V
Dipswitch 2	1	120 Ohm termination RS-485 A	ON = 120 Ohm	OFF = Open
	2	120 Ohm termination RS-485 B	ON = 120 Ohm	OFF = Open

* Depending on dipswitch 5 and 6

2.3 General connection overview GRID and FUEL SAVING



2.4 RS 485 pin out

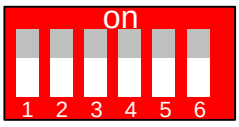


Pin	Description
1	Not connected
2	RS-232 TX (Only on A)
3	RS-232 RX (Only on A)
4	RS-485 B (D-)
5	RS-485 A (D+)
6	GND
7	Not connected
8	Not connected

2.5 Dipswitches

There are 2 dipswitches on the controller. The 2 switch is for the termination resistors of the RS 485 A and B and the 6 switches if for settings.

Dipswitch	Description	
	OFF	ON
1	No termination A	120 Ohm A
2	No termination B	120 Ohm B



Dipswitch	Description	
	OFF	ON
1	DHCP	Static IP
2	50 Hz	60 Hz
3	Three phase	Single phase
4	Not used must be OFF	
5	0 – 10 Vdc	0 – 20 mAdc
6	0 – 10 Vdc	0 – 20 mAdc

2.6 LED status

The LED on board informs the user about the internal status.

LED colour	Meaning	Action
Off	No power or internal error	Contact support
	Internal Error	Contact support
	Date and time not set, no USB data logging possible	Update date and time or check internet connection for SNTP
	Standby, no inverter online	Check inverter settings
	Controller is throttling the PV	Normal operation
	Power management active	Normal operation
	Controller is not throttling PV	Normal operation

3.0 Software

The software on the controller enables the user to change all relevant settings and adjust the system to local needs for example during commissioning.

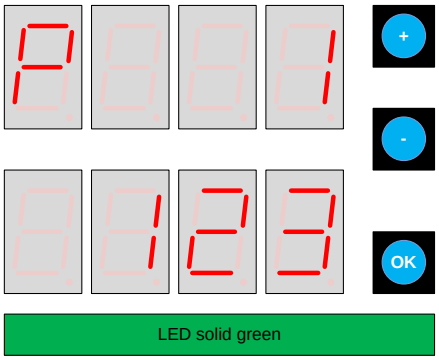
The HYBRID BASIC controller has an integrated menu which can be selected by pressing the OK button. When the menu is active, the outputs are disabled and no control is possible. After leaving the menu, the new settings will be stored in EEPROM and the controller automatically loads the new parameters and start working.

When the system is working, you can read the actual power on the top display. The bottom display shows error or other parameters, depending on the firmware version and type of HYBRID controller.

☞ Availability of the settings and display screen depends on the firmware version.

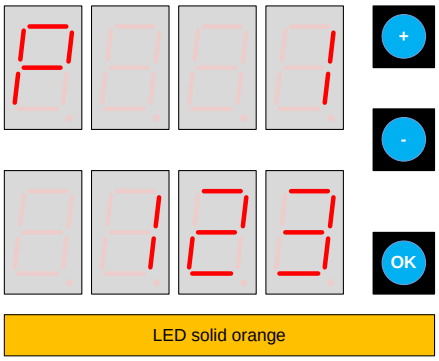
3.1 Settings reading

To read out the actual parameters of the HYBRID BASIC controller press the OK button. The led will start flashing green and by pressing UP and DOWN you can scroll through the parameters.
On the top screen you can read the parameter number and on the bottom screen you can read the actual parameter value.



3.2 Settings changing

You can change the settings by pressing the OK button when the parameter which needs to be changed is selected and displayed on the screen.



The led will lid orange to indicate that the parameter can be changed.

3.3 Parameter overview

The following parameters are available. Not all paramters can be changed. Parameters which can not be changed are marked with a * and are read only. Most parameters which can not be changed are for measurements only.

Parameter 4 and 9 are used for the power calculations. Parameter 4 holds the secundairy value of the CT and parameter 9 the primairy.

Number	Description	Default	Minimum value	Maximum value	Symbol
P1	Generator power*	0	0	999	kW
P2	CT current*	0	0	1 – 5	A
P3	CT current in % of maximum	0	0	100	%
P4	CT type (1A – 5A)	1	1	5	A
P5	Minimum setpoint generator	50	0	100	%
P6	Ramp up speed	30	0	60	Seconds
P7	Ramp down speed	5	0	60	Seconds
P8	Power correction	1	0.00	2.00	
P9	CT ratio (P4:P9)	100	1	1000	A
P10	Output type	1	1	5	See table

3.4 Output selection type

The 4 relays on the controller can be programmed with different functionality. There are 3 main output modes, the BAR mode, the DOT mode and the BINAIR mode each having the possibility to set a minimum value rather than having all the relays off.

When the time set with P7 is elapsed, the next output type is selected. When the value is below 0 % either no output will be selected (without minimum) or the lowest possible value is selected (with minimum).

Parameter 10	Mode	Limitation	Relay output			
			1	2	3	4
1	BAR without minimum	0 %	X			
		30 %	X	X		
		60 %	X	X	X	
		100 %	X	X	X	X
2	BAR with minimum after delay of P7	0 %	X			
		0 %	X	X		
		30 %	X	X	X	
		60 %	X	X	X	X
		100 %	X	X	X	X

Parameter 10	Mode	Limitation	Relay output			
			1	2	3	4
3	DOT without minimum	0 %	X			
		30 %		X		
		60 %			X	
		100 %				X
4	DOT with minimum after delay of P7	0 %	X			
		0 %	X			
		30 %		X		
		60 %			X	
		100 %				X

Parameter 10	Mode	Limitation	Relay output			
			1	2	3	4
5	Binair output	0				
		1				X
		2			X	
		3			X	X
		4		X		
		5		X		X
		6		X	X	
		7		X	X	X
		8	X			
		9	X			X
		10	X		X	
		11	X		X	X
		12	X	X		
		13	X	X		X
		14	X	X	X	
		15	X	X	X	X

3.5 Grid feed in protection modus

The HYBRID BASIC controller can also be used to set a specific feed in limit, prevent the inverter from feeding into a (public) grid (zero export) or have a minimum consumption from the grid.

The controller accepts two different setpoints which can be selected with digital input 1 (pin 4). When the digital input 1 is open, the controller uses the grid setpoint.

3.6 Fuel Saving mode with generator

In the “Fuel Saving” mode the controller automatically determines the optimum production point of the solar system to archive maximum savings for the Diesel. Further the controller ensures that the generator will not be running under the minimum load specified by the engine manufacturer.
The controller accepts two different setpoints which can be selected with digital input 1 (pin 4).
When the digital input 1 is open, the controller uses the grid setpoint.

4 Commissioning

Before starting with the commissioning of the HYBRID controller all safety precautions must be taken which apply to the rules in your country and general safety rules. Never work on a system with a running generator and short the output of the generator before working on the power system.

Only a few settings are needed to commissioning the HYBRID system. Most important is the settings of the current transformer and the setpoints for grid mode and Fuel Saving mode.

4.1 First time power on

Follow the following steps when the system is first time being powered.

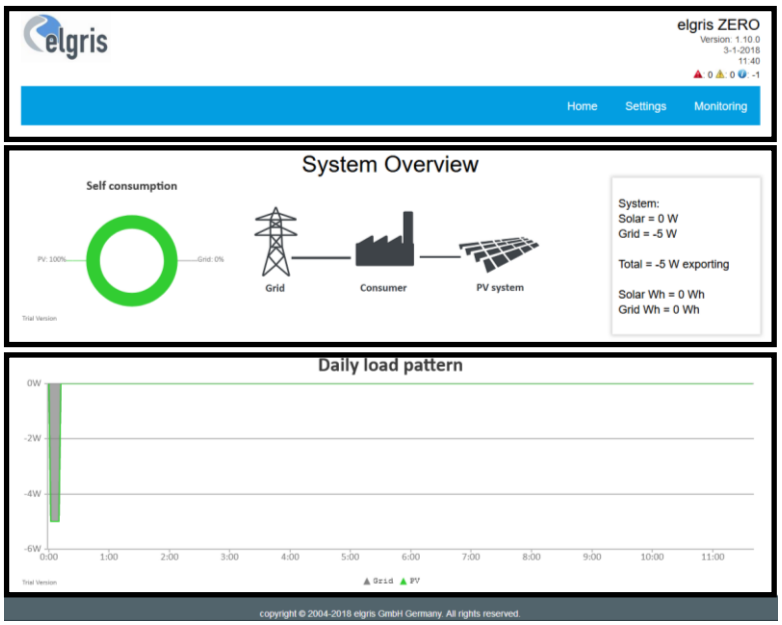
- ☞ When using TCP for communication, all components needs to have static IP settings.
- ☞ Switch off the PV inverter, disconnect the PV inverter from the system and start the controller by applying power to L1 and N in case you use a single-phase system or L1, L2 and L3 with N for three phase systems. When the HYBRID controller is working properly, the LED is blinking green.
- ☞ Connect to the embedded webserver by typing the default address 192.168.1.100 in a web browser.
- ☞ On the Menu select Settings to adjust the CT ratio. The CT ratio is defined as 1: value. For example, when you have a CT 5:200 the value is 40.
- ☞ When the CT ratio is changed the power readings on the overview page should match the actual power. More detailed information can be obtained with 192.168.1.100/Meter
  A positive value is consumption from the grid, a negative value means exporting to the grid.
  When this is not correct, check the wiring of K and L of the CT.
- ☞ Switch on the DC side of the PV system to commission the PV inverters. The steps to add an inverter to the system is explained on page 15.
- ☞ End

5 Graphical User Interface

The HYBRID BASIC controller includes a webserver to adjust the system parameters and see the status of the system.

By default, the webserver can be reached by typing the IP address 192.168.1.100 in a web browser. Supported web browsers are Microsoft Edge, Google Chrome and Mozilla Firefox.

5.1 Overview



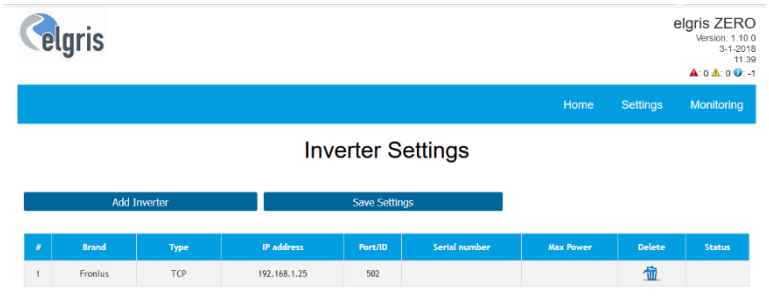
Header with status information and menu

Main area with system information

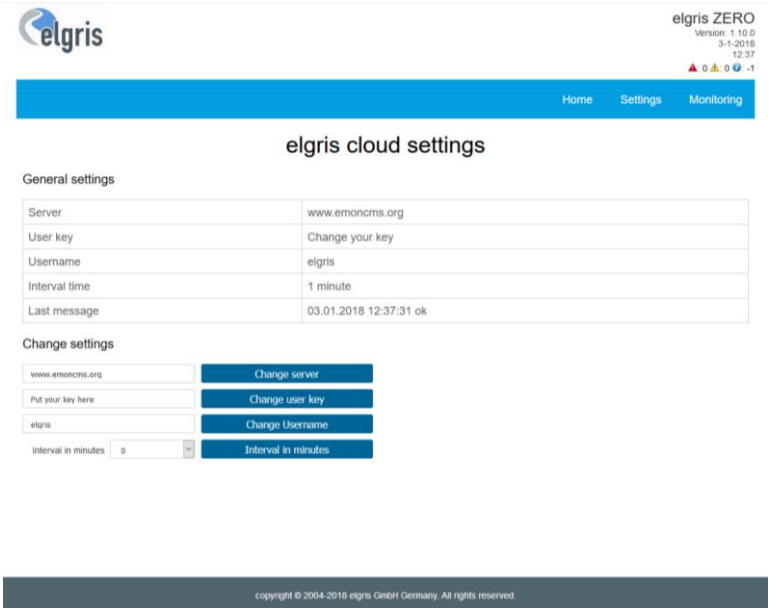
Daily chart with load and PV output

5.2 Inverter settings

After selecting the brand of the inverter which needs to be controlled, the type of communication needs to be selected. Not all communication options are available for all inverters. Please refer to the inverter support list on the website www.elgrispower.com
When selecting TCP as communication, the IP address and MODBUS TCP port (Default 502) must be adjusted. When selecting RS 485 for communication, the MODBUS slave ID must be set, and the serial port settings must match the inverter settings.
When all settings are correct they can be send to the inverter by pressing “Save settings”. Up to ten inverters can be programmed by pressing “Add Inverter”.



5.3 elgris cloud



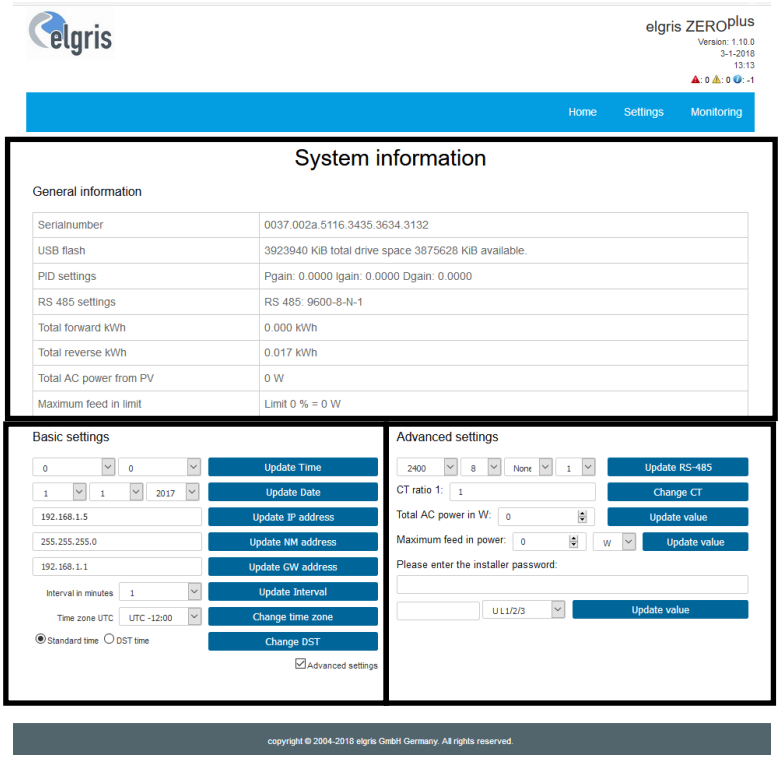
With the elgris cloud you can store data on the open source platform eCloud. This enables the user to have a cloud solution where all data can be visualised and transferred on other mediums.

The eCloud software can run on the open source server, a self-hosted server or local server like Raspberry PI.

To start logging, you must fill out the server address with its hostname, the user key for security and optional a user name when you want to log more data under the same account.
With the interval time you can set the time between each update interval. By setting the time to zero, the data logging to the remote sever stops.

The response of the communication is displayed as last messages. When everything is working fine, the message ”Ok” will be displayed here.

5.4 System settings



Status information and settings for information

Basic settings like IP address and date / time

Advanced settings for RS 485 bus and control parameters

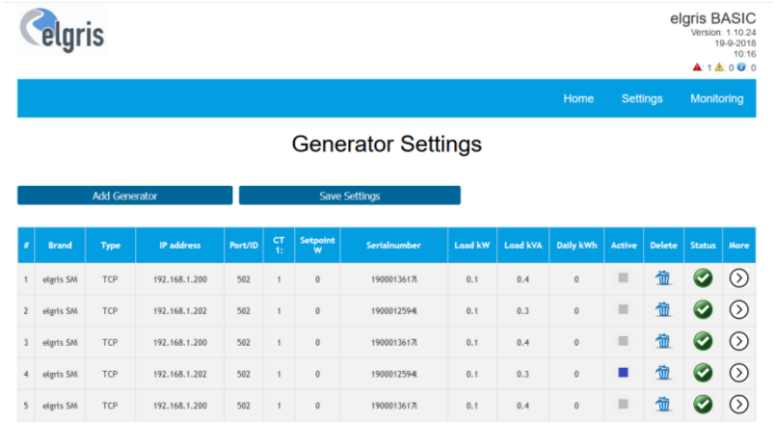
On the settings page the main settings and parameters can be changed. To enable the advanced settings, the checkbox must be selected.

5.5 Multiple generators with elgris SMART METER

The elgris HYBRID controller has only one metering input which is shared for both grid mode and generator “Fuel Saving” mode.

In case there are more than one generator in the system, or the physical location of the feeders do not allow the use of the shared metering input, elgris SMART METERS can be used to obtain the measurement data.

- ☞ Only generators can be connected to the system as an elgris SMART METER slave. By design, the grid is always the elgris HYBRID controller internal meter.
- ☞ The maximum of single generators than can be add is 5.
- ☞ Ensure that all SMART METERS are powered all the time, otherwise the communication is delayed all the time.

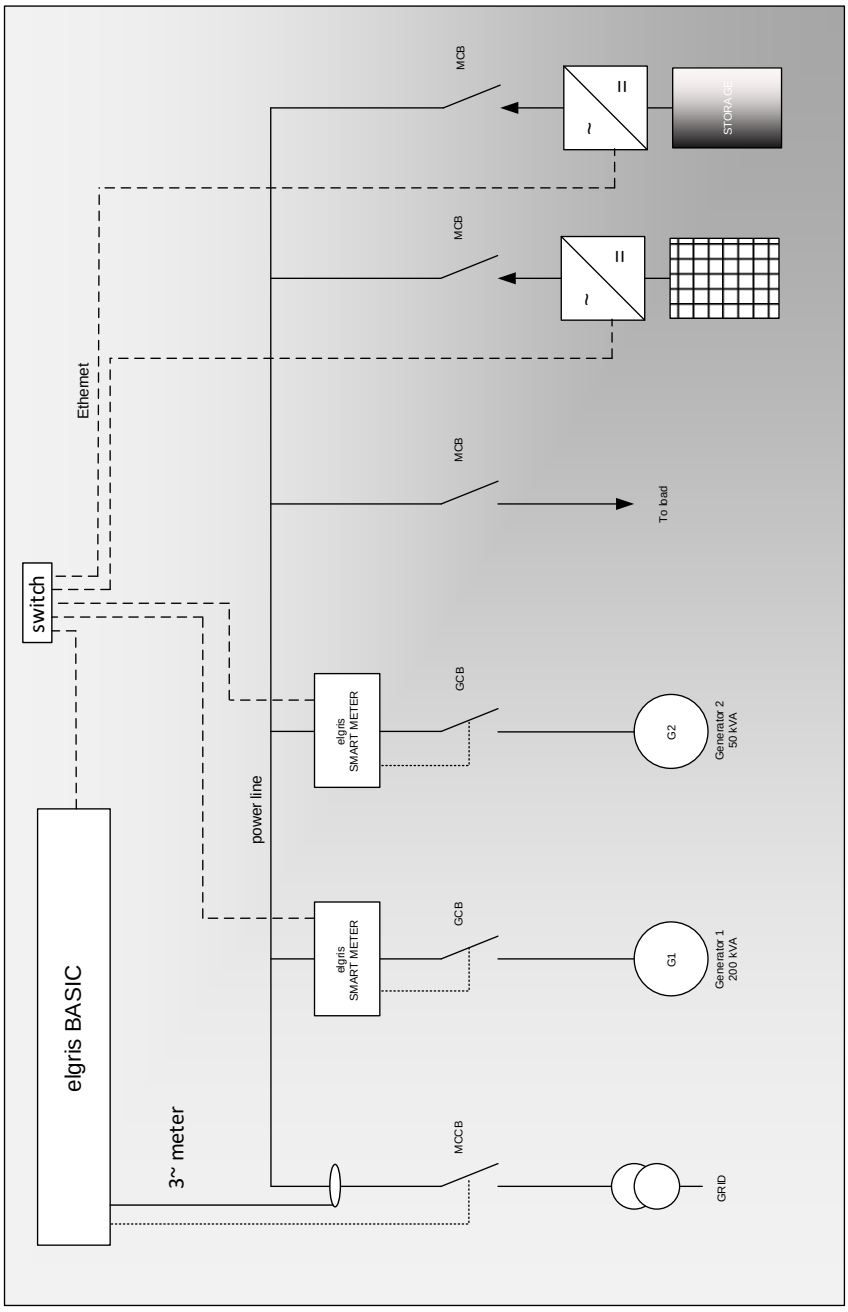


To select the elgris SMART METER first select “elgris SM” in the dropdown and fill out the IP address. MODBUS port is 502 by default.
Then press “Save Settings” to store the settings. After refreshing the page, the serial number and load will be shown on the table.

The current used generator for control is shown as “active”. This is even active when the controller is in grid mode but has no influence on the actual value taken for the controller as current value which is still the measurement from the internal meter.

With the more button, detailed information can be obtained.

5.5.1 Grid and dual generator application example with optional storage



In this example the elgris BASIC is used as the master controller. The BASIC communicates with each generator over Ethernet and collects the load of each generator. The BASIC controller automatically determines the optimum setpoint for each generator and sends a setpoint to the PV inverters.

When the grid is connected to the load, the grid setpoint is used.

In case that the PV energy available is higher than the possible load for the whole system, an optional storage can be charged and discharged later.

6 Adjusting the PID settings

The elgris HYBRID controller has a real time PID controller to adjust the amount of PV power within the system. By setting one value to zero, P, PI or PID controllers can be set. For standard applications, the PI controller is a good starting point.

The PID controller takes the current power value (single or three phase) as current value and the setpoint (grid or generator setpoint) as desired value.

The settings for P, I and D can be changed according to the application. Please note the following:

- ☞ The P value is the proportional gain of the error between setpoint and current value. The higher the P value, the more the controller will react to a change of load.
  When the solar system over reacts on load changes, the P factor is too high. The other way around, when the response is not high enough, the P factor is too small.
- ☞ The I value is the integrated value of the past error over time. The longer and error exist, the more the I part will affect the output.
  When the reaction time on a load change is too slow, the I factor is too low. Opposite, when the system is unstable (oscillating around a value) the I factor is too high.
- ☞ The D value is for future trends. When there are big load changes in a very small time interval this can be compensated by adding some D factor. The D factor only has influence on load changes and not in a steady system.
- ☞ The values entered on the settings page are divided by 1000.

6.1 Manual tuning

If the system must remain online, one tuning method is to first set I and D values to zero. Increase the P until the output of the loop oscillates, then the P should be set to approximately half of that value for a "quarter amplitude decay" type response. Then increase I until any offset is corrected in enough time for the process. However, too much I will cause instability.
Finally, increase D, if required, until the loop is acceptably quick to reach its reference after a load disturbance. However, too much D will cause excessive response and overshoot. A fast PID loop tuning usually overshoots slightly to reach the setpoint more quickly; however, some systems cannot accept overshoot, in which case an overdamped closed-loop system is required, which will require a P setting significantly less than half that of the P setting that was causing oscillation.

Parameter	Rise time	Overshoot	Settling time	Steady-state error	Stability
P	Decrease	Increase	Small change	Decrease	Degrade
I	Decrease	Increase	Increase	Eliminate	Degrade
D	Minor change	Decrease	Decrease	No effect in theory	Improve if small

6.2 Ziegler–Nichols method

As in the method above, the I and D gains are first set to zero. The proportional gain is increased until it reaches the ultimate gain, Ku, at which the output of the loop starts to oscillate. Ku and the oscillation period Tu are used to set the gains as follows:

Control type	P value	I value	D value
P	0,50 * Ku	-	-
PI	0,45 * Ku	0,54 * Ku / Tu	-
PID	0,60 * Ku	1,20 * Ku / Tu	3 * Ku * Tu / 40

7 MODBUS gateway function

The elgris controller can also act as a MODBUS gateway from TCP to RS-485 on port B only. Use the IP address of the elgris HYBRID controller and port 502 to connect.

When using a MODBUS TCP client, the following rules apply:

- The MODBUS Unit Identifier is used to address the slave. Unit Identifier 1 is reserved for the controller. All other Unit Identifiers are redirected to the serial port RS 485 B.
- The serial port settings must match the serial port settings of the slave.
- On serial activity, all other processes are put on hold and resumed after receiving data from the RS-485 slave client. It is advised not to poll data faster than 5 seconds.
- When sensors are connected to the same RS 485 port B the communication is stopped and resumed after 60 seconds of inactivity of the MODBUS gateway. During this time no values are updated. Stored values are not valid.
- Occasionally during the first attempt on connecting to the MODBUS slave trough the gateway the controller can return an error. This error can be ignored.

8 MODBUS SERVER

The elgris BASIC includes a MODBUS TCP server with parameter mapping according to SunSpec parameter list 203. By offering an open protocol the implementation can be easily adopted to the user needs.

The MODBUS uses port 502 by default.

8.1 Register mapping Common Model

The first register address is 40000 and the registers can be read with function 0x03.

Address	Size	Name	Label	Value	Type	R/W	Description
40000	2	ID	Common	1	uint32	R	Value = "SunS" (0x53756e53). Uniquely identifies this as a SunSpec MODBUS Map
40002	1	DID	SunSpec_DID	1	uint16	R	Value = 0x0001. Uniquely identifies this as a SunSpec Common Model Block
40003	1	L	SunSpec_Length	65	uint16	R	65 = Length of block in 16-bit register
40004	16	Mn	Manufacturer		string	R	"elgris"
40020	16	Md	Model		string	R	"SMART METER"
40036	8	Opt	Options		String	R	Not used, for future compatibility
40044	8	Vr	Version		string	R	"1.10.15"
40052	16	SN	Serial Number		string	R	19000XXXX (SMA serial compliant)

8.2 Register mapping WYE connect Meter Model

Address	Size	Name	Label	Value	Type	R/W	Description
40069	1	ID	WYE-connect three phase (abcn) meter	1	uint16	R	Value = 203 Uniquely identifies this as a SunSpec 203 MODBUS Map
40070	1	L	SunSpec_Length	105	uint16	R	105 = Length of block in 16-bit register
40071	1	A	Amps		int16	R	Total AC current
40072	1	AphA	Amps Phase A		int16	R	Phase A current
40073	1	AphB	Amps Phase B		int16	R	Phase B current
40074	1	AphC	Amps Phase C		int16	R	Phase C current
40075	1	A_SF			sunssf	R	Current scale factor
40076	1	PhV	Voltage LN		int16	R	Line to neutral AC voltage
40077	1	PhVphA	Voltage AN		int16	R	Phase voltage AN
40078	1	PhVphB	Voltage BN		int16	R	Phase voltage BN
40079	1	PhVphC	Voltage CN		int16	R	Phase voltage CN
40080	1	PPV	Voltage LL		int16	R	Line to Line AC voltage
40081	1	PhVphAB			int16	R	Line voltage AB
40082	1	PhVphBC			int16	R	Line voltage BC
40083	1	PhVphCA			int16	R	Line voltage CA
40084	1	V_SF			sunssf	R	Voltage scale factor
40085	1	Hz	Hz		int16	R	Frequency
40086	1	Hz_SF			sunssf	R	Frequency scale factor
40087	1	W	Watts		int16	R	Total real power
40088	1	WphA	Watts phase A		int16	R	Real power phase A
40089	1	WphB	Watts phase B		int16	R	Real power phase B
40090	1	WpbC	Watts phase C		int16	R	Real power phase C
40091	1	W_SF			sunssf	R	Real power scale factor
40092	1	VA			int16		AC apparent power
40093	1	VAphA	VA phase A		int16	R	Apparent power phase A
40094	1	VAphB	VA phase B		int16	R	Apparent power phase B
40095	1	VAphC	VA phase C		int16	R	Apparent power phase C
40096	1	VA_SF			sunssf	R	Apparent power scale factor
40097	1	VAR			int16		AC apparent power
40098	1	VARphA	VA phase A		int16	R	Reactive power phase A
40099	1	VARphB	VA phase B		int16	R	Reactive power phase B
40100	1	VARphC	VA phase C		int16	R	Reactive power phase C
40101	1	VAR_SF			sunssf	R	Reactive power scale factor

Address	Size	Name	Label	Value	Type	R/W	Description
40102	1	PF	PF		int16	R	Power factor
40103	1	PFphA	PF phase A		int16	R	
40104	1	PFphB	PF phase B		int16	R	
40105	1	PFphC	PF phase C		int16	R	
40106	1	PF_SF			sunssf	R	Power factor scale factor
40107	2	TotWhExp			acc32	R	Total Wh exported
40109	2	TotWhExpPhA			acc32	R	Total Wh exported phase A
40111	2	TotWhExpPhB			acc32	R	Total Wh exported phase B
40113	2	TotWhExpPhC			acc32	R	Total Wh exported phase C
40115	2	TotWhImp			acc32	R	Total Wh imported
40117	2	TotWhImpPhA			acc32	R	Total Wh imported phase A
40119	2	TotWhImpPhB			acc32	R	Total Wh imported phase B
40121	2	TotWhImpPhC			acc32	R	Total Wh imported phase C
40123	1	TotWhSF			sunssf	R	Real energy scale factor
40125	2	TotVARhExp			acc32	R	Total VAR exported
40127	2	TotVARhExpPhA			acc32	R	Total VAR exported phase A
40129	2	TotVARhExpPhB			acc32	R	Total VAR exported phase B
40131	2	TotVARhExpPhC			acc32	R	Total VAR exported phase C
40133	2	TotVARhImp			acc32	R	Total VAR imported
40135	2	TotVARhImpPhA			acc32	R	Total VAR imported phase A
40137	2	TotVARhImpPhB			acc32	R	Total VAR imported phase B
40139	2	TotVARhImpPhC			acc32	R	Total VAR imported phase C
40140	1	TotVARh_SF			sunssf	R	Reactive energy scale factor
40141	1	Evt	Events		bitf32	R	Not supported yet

8.3 Custom mapping

The following table shows a custom mapping with a start address of 41000. This mapping can be read with function 0x03.

Address	Size	Name	Value	Type	R/W	Description
41000	1	Temperature	Degree	S16	R	CPU temperature
41001	1	Frequency	Hz	U16	R	Grid frequency * 100
41002	1	V L1	V	U16	R	Voltage L1 * 100
41003	1	V L2	V	U16	R	Voltage L2 * 100
41004	1	V L3	V	U16	R	Voltage L3 * 100
41005	1	I L1	A	U16	R	Current L1 in mA
41006	1	I L2	A	U16	R	Current L2 in mA
41007	1	I L3	A	U16	R	Current L3 in mA
41008	1	Power factor L1		S16	R	PF L1 * 1000
41009	1	Power factor L2		S16	R	PF L2 * 1000
41010	1	Power factor L3		S16	R	PF L3 * 1000
41011	1	P L1	W	S16	R	P L1 Watt / 10
41012	1	P L2	W	S16	R	P L2 Watt / 10
41013	1	P L3	W	S16	R	P L3 Watt / 10
41014	1	Q L1	VAr	S16	R	Q L1 Watt / 10
41015	1	Q L2	VAr	S16	R	Q L2 Watt / 10
41016	1	Q L3	VAr	S16	R	Q L3 Watt / 10
41017	1	S L1	VA	U16	R	S L1 Watt / 10
41018	1	S L2	VA	U16	R	S L2 Watt / 10
41019	1	S L3	VA	U16	R	S L3 Watt / 10
41020	4	Total kWh import	Wh	U64	R	Total forward kWh
41024	4	Total kWh export	Wh	U64	R	Total export kWh
41028	4	Total Forward Genset	Wh	U64	R	Total forward kWh Genset
41032	1	CT value 1:		U16	R	CT Ratio value
41033	1	VT value 1:		U16	R	VT Ratio value
41034	1	Digital input 1		B	R	0 = closed / 1 = open
41035	1	Digital input 2		B	R	0 = closed / 1 = open
41036	1	Analog input 1		U16	R	Voltage on input 1 in mV
41037	1	Analog input 2		U16	R	Voltage on input 2 in mV
41038		Inverter status		U16	R	High byte: Total inverters Low byte: Online inverters
41039		Generator status		U16	R	High byte: Total generators Low byte: Online generators
41040	1	0xFFFF		U16	R	End byte