

PhaseLog plus

VOLTAGE MONITOR WITH PROTECTION FOR THREE-PHASE LOADS AND

INTERNAL DATALOGGER

Serial

programming

















1. DESCRIPTION

The PhaseLog plus is an instrument for monitoring and protection of electrical equipment for industrial, commercial and residential facilities.

Through the method of True RMS* voltage measurement, the PhaseLog plus also monitors power quality and protects mono / bi / three phase loads against: under and over voltage, angular asymmetry, modular asymmetry, phase loss and phase sequence inversionThe internal datalogger stores the voltages of each phase of the electrical grid during periods of time determined by the user. Time and date of each sample is stored as well (internal real-time clock). All functions of the PhaseLog plus can be changed through the software SITRAD®, which can be acessed through the internet (computer/iOS/Android). This software is also used to retrieve the data stored in its datalogger.

The PhaseLog plue allows you to configure the RS-485 communication port for the MODBUS-RTU protocol. For more information about the implemented commands and the registration table, contact Full Gauge Controls.

Frue RMS: Real voltage value (Root Mean Square), values evaluated taking into consideration the contribution of the high frequency noise on the network (harmonic distortion). That's the real voltage being perceived by the connected load (i.e. motors, compressors, etc). Using this method, it is possible to accurately measure the voltage at any waveform, whereas the traditional methods are only able to measure correctly pure sine waveforms.

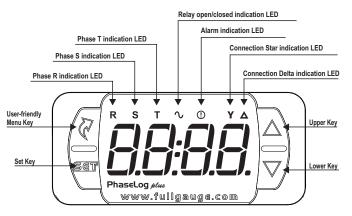
2. APPLICATION

- Energy quality monitoring
- Motors protection
- · Electrical panels protection
- · Other multiphase equipments protection

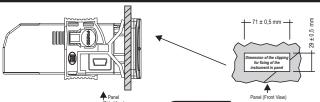
3. TECHNICAL SPECIFICATIONS

	Phaselog: 90~240Vac (50/60 Hz)
Power supply	Phaselog L: 12Vdc/350mA ± 10%
Monitoring voltage range	90 to 600 VRMS (phase voltages)
monitoring voltage range	90 to 600 VRMS (line voltages)
Monitoring frequency range	35 to 80 Hz
Frequency of sampling	7 Khz
Error (25°C)	< 1% of full scale range
Resolution	1 Vac in all range
Maximum Current	3A / 250Vac
Operational Temperature	0 to 50°C
Operational Humidity	10 to 90% UR (without condensation)
Minimum delay to open load output relay in case of failure	1 s
Dimensions	76 x 34 x 77 mm - 2,99" x 1,34" x 3,03" (WxHxD)
Dimensions of the clipping for fixing of the instrument	71 ± 0,5 x 29 ± 0,5 mm - 2,79"±0,02 x 1,14"±0,02

4. INDICATIONS AND KEYS







↑ ATTENTION

FOR INSTALLATIONS WHERE A SEALING IS REQUIRED TO AVOID LIQUID CONTACT, THE CUT FOR THE CONTROLLER MUST BE OF 70,5X29mm MAXIMUM. THE SIDE LOCKS MUST BE FIXED SO IT PRESSES THE RUBBER SEALING AVIOIDING INFILTRATION BETWEEN THE CUT AND THE CONTROLLER.

THE USE OF APPROPRIATE TOOLS IS ESSENTIAL TO AVOID DAMAGE IN THE CONNECTIONAT INSTRUMENT TERMINALS: → SCREWDRIVER SLOT 3/32"(2.4mm) FOR ADJUSTMENTS IN THE SIGNAL TERMINALS;

SCREWDRIVER PHILLIPS #1 FOR ADJUSTMENTS IN THE POWERTERMINALS;

6. OPERATIONS

6.1 Quick access menu map

By pressing &, it is possible to navigate through the function menus. For more details, see chapter 6.3. See the functions map below:



EXIT FUNCTION

CONTROL FUNCTIONS SHUTDOWN



FUNCTION SELECTION

(MANUAL MODE)





DISPLAY SELECTED

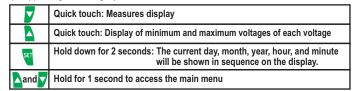






6.2 Quick access keys map

When the controller is displaying the voltages, it is possible to access the some controller functions by quickly pressing the following keys:



6.3 Basic operations

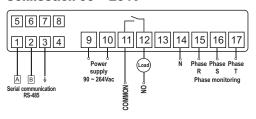
6.3.1Functions Lockdown

For safety reasons, this controller provides the ability to lock the function adjustment. With this feature For salety reasons, this common provides the ability to lock the includin adjustment. With this relative activated, the parameters are protected against tampering; however they can still be visualized. If a user tries to change a parameter value while the functions lockdown is active, the message $[\underline{L}, \underline{D}, \underline{T}]$ will appear on the display. To enable the functions lockdown, the function $[\underline{F}, \underline{C}, \underline{T}]$ - **Time for functions** lockdown" must be set to a value greater than 14 (if the user tries to decrease it to a value smaller than 15, the message $\boxed{n \ p}$ will be displayed, indicating that this feature will be disabled. Once the functions lockdown is enabled, to activate it the user must press the key \boxed{n} (short touch) and select $\boxed{p \ p}$, press \boxed{n} (short touch) to confirm, then hold the key \boxed{n} until the message $\boxed{p \ p}$ appears. When the key is released, the message [an] will be shown on the display. To unlock, turn off the controller and turn it back on while holding the key . Keep the key pressed until

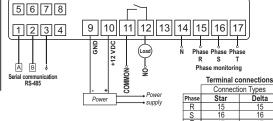
the message [_ [] F F] will be shown on the

5. INSTALLATION - ELECTRICAL CONNECTIONS

Connection 90 ~ 264V

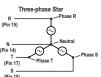


Connection 12Vdc











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(short touch), to visualize its current value. If the correct access code has been entered, the user can adjust the parameter value using the keys \$ and \$' is store the value and return to the previous menu, press and hold the key \$ until the message \$ is shown. In elither case, to exit this menu and return to mornal operation (voltage indication), press and hold with the message \$ is shown. In elither case, to exit this menu and return to mornal operation (voltage indication), press and hold with the case (access code has been inserted, the message \$ if it is shown. In elither case, to exit this menu and return to nornal operation (voltage indication), press and hold with the case (access code has been inserted, the message \$ if it is shown. In elither case, to exit this menu and return to nornal operation (voltage indication), press and hold with the value of any advanced parameter using the keys \$ or \$ 1. 6.4.4 Settling date and time user the six of a construction of the controller remers the date and time adjustment mode. To change a value, use the keys \$ or \$ or \$ in the case of an energy shortage half value (for extension of the case) and \$ in the case of an energy shortage half value (for extension of the case) is the date and time using the provided menu. In this case, it is not necessary to enter the access code. Example 1 (Correct access code has been inserted): **EXTENSION OF THE CENTRAL OF THE CONTROLL OF THE CONTRO						_			
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NOTICE: The controller is equipped with a an auxiliary internal power supply in order to keep its date and time in the case of an energy shortage. A fully charged battery can provide enough energy to keep the time and date running for some weeks. If the controller remains turned off for a prolonged period of time, it will display the message [E_T_Q]: in this case the controller's date and time has been lost due to low battery and the user must adjust it again. To completely recharge a dischaged battery, keep the controller turned on for at least 5 hours. 6.5 Parameters table Fun									
NOTICE: The controller is equipped with a an auxiliary internal power supply in order to keep its date and time in the case of an energy shortage. Afully charged battery can provide enough energy to keep the time and date running for some weeks. If the controller remains turned off for a prolonged period of time, it will display the message (E.C. ji); in this case the controller's date and time has been lost due to low battery and the user must adjust it again. To completely recharge a dischaged battery, keep the controller turned on for at least 5 hours. 6.5 Parameters table Fun	UUc								
NOTICE: The controller is equipped with a an auxiliary internal power supply in order to keep its date and time in the case of an energy shortage. A fully charged battery can provide enough energy to keep the time and date running for some weeks. If the controller remains turned off for a prolonged period of time, it will display the message [E_T_Z]; in this case the controller's date and time has been lost due to low battery and the user must adjust it again. To completely recharge a dischaged battery, keep the controller turned on for at least 5 hours. 6.5 Parameters table Fun		hour ↓ mir	nute				Time in seconds that the three-phase monitor waits to validate the out of range voltage ala		
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of an energy shortage A fully charged battery can provide enough energy to keep the time and date running for some weeks. If the controller remains turned off for a prolonged period of time, it will display the message [£ £ £ £]; in this case the controller's date and time has been lost due to low battery and the user must adjust it again. To completely recharge a dischaged battery, keep the controller turned on for at least 5 hours. 6.5 Parameters table Fun			alv in order to	keen its da	ate and time	in the case			
message [F_T]; in this case the controller's date and time has been lost due to low battery and the user must adjust it again. To completely recharge a dischaged battery, keep the controller turned on for at least 5 hours. 6.5 Parameters table Fun Description Min Max Unit. Standard FDI Number of phases in operation 1 4 - 4 FDI Number of phases in operation 0-no 1-yes - 1-yes FDI Time to validate angular asymmetry sensitivity 0 100 - 80 FDI Time to validate modular asymmetry 0 30 sec. 5 FDI Minimum operating voltage 90 600 Vac 90 FDI Maximum operating voltage 90 600 Vac 600 FDI Time for validation of out of range voltage 90 600 Vac 600 FDI Time for validation of out of range voltage 90 600 Vac 0 FDI Time for validation of out of range voltage 90 600 Vac 0 FDI Offset of R voltage indication 97.5 - 1.9	of an en	ergy shortage. A fully charged battery can provide enough	h energy to	keep the tin	ne and date	running for			
### Adjust it again. To completely recharge a dischaged battery, keep the controller turned on for at least 5 hours. ### Branches** Fun	some w	eeks. If the controller remains turned off for a pro	olonged pe	eriod of tim	ne, it will (display the			
Fun Description Min Max Unit. Standard							This parameter lets you adjust the K phase voltage indication onset.		
Fun Description Min Max Unit. Standard	6.5 P	arameters table					F / / - Offset of S voltage indication:		
Fig. Number of phases in operation 1	Fun	Description	Min	Max	Unit	Standard			
File Enables the detection of phase inversion O-no 1-yes - 1-yes			_		-		Officet of Typitage indications		
Ray Angular asymmetry sensitivity 0 100 - 80			.						
Fig. Time to validate angular asymmetry 0 30 sec. 5	_						, , , , , , , , , , , , , , , , , , , ,		
Time in seconds in wish the Phaselog will wait before triggering its o Fill Offset of T voltage indication -20 20 Vac 0 Fill Offset of T v				_	sec				
Fig. Time to validate modular asymmetry 0 30 sec. 5	_				-		Time in seconds in wish the Phaselog will wait before triggering its output.		
Fig. Minimum operating voltage 90 600 Vac 90		, , ,			sec		G U - Minimum time to reactivate lead output		
File Maximum operating voltage 90 600 Vac 600 File Time for validation of out of range voltage 0 30 sec. 5 File Offset of R voltage indication -20 20 Vac 0 File Offset of S voltage indication -20 20 Vac 0 File Offset of T							Time in seconds that the Phaselog plus will wait before reactivating its load output once it has before reactivating its load output once its load output once its load outp		
F 13 Time for validation of out of range voltage 0 30 sec. 5			1						
F II Offset of R voltage indication -20 20 Vac 0 F II Offset of S voltage indication -20 20 Vac 0 F II Offset of S voltage indication -20 20 Vac 0 F III Offset of T voltage indication -20 20 Vac 0 III Delay to energize the controller 0 999 sec. 0 III Minimum time to reactivate load output 0 999 sec. 180									
This parameter controls the datalogger operating mode: F 12 Offset of S voltage indication -20 20 Vac 0 F 12 Offset of T voltage indication -20 20 Vac 0 F 13 Delay to energize the controller 0 999 sec. 0 F 13 Minimum time to reactivate load output 0 999 sec. 180 F 13 Minimum time to reactivate load output 0 999 sec. 180 F 13 Minimum time to reactivate load output 0 999 sec. 180 F 13 Minimum time to reactivate load output 0 999 sec. 180 F 14 Minimum time to reactivate load output 0 999 sec. 180 F 15 Minimum time to reactivate load output 0 999 sec. 180 F 15 Minimum time to reactivate load output 0 999 sec. 180 F 15 Minimum time to reactivate load output 0 999 sec. 180 F 15 Minimum time to reactivate load output 0 999 sec. 180 F 15 Minimum time to reactivate load output 0 999 sec. 180 F 15 Minimum time to reactivate load output 0 999 sec. 180 F 15 Minimum time to reactivate load output 0 999 sec. 180 F 15 Minimum time to reactivate load output 0 999 sec. 180			_						
F 12 Offset of T voltage indication -20 20 Vac 0 1 -Always on F 13 Delay to energize the controller 0 999 sec. 0 2 -Manual operation F 19 Minimum time to reactivate load output 0 999 sec. 180		·							
F 13 Delay to energize the controller 0 999 sec. 0 F 19 Minimum time to reactivate load output 0 999 sec. 180		*				_			
F 1/4 Minimum time to reactivate load output 0 999 sec. 180		*							
E / E Time between each sample in memory			_						
	F 15	Datalogger operating mode	0	2	-	1	F 16 - Time between each sample in memory		

Legend: <u>YES</u> = yes

sec.

Volts

300

OFF

0-no

1-yes

3

no

no

5

0-no

0

no

no

999

DF F

1-yes

1-yes

3

60

2

F 16 Time between each sample in memory

F 19 Overwrite the old data from the data logger

Time for functions lockdown

Address in RS-485 network

F22 Control functions shutdown

Preferential indication on the display

F 18

F 2 0

F23

Voltage variation (voltage peak) to force data recording

Variation in output state (relay activation) to force data logging

Period of time in seconds between each voltage sample stored in the controller's datalogger.

Voltage variation (voltage peak) to force data logging:

Voltage difference on any of the monitored phases so that **Phaselog** forces the data to be recorded in the datalogger, regardless of the sampling time set in Fib. This functions is evaluated once per second. This function can be set from 3 to 50 volts; to deactivate it, press the key until the

	rdless of the
[F19] - Overwrite old data on the Datalogger: This parameter controls whether the controller should overwrite the old data in the datalog memory is full. This function prevents that the latest data evaluated by the equipment be lost	
「 <u>F こ</u> - Display preferential indication: This parameter configures which voltage phase will be shown by default on the display: 「	

F 2 | - Key pressed time to activate the functions lockdown:

-Alternate the display of all phase voltages

-S Phase voltage T Phase voltage

This parameter controls how much time the user must press the key to activate the functions lockdown. Once activated, this functions protects the parameters against tampering, although the user still will be able to visualize its parameters. To obtain further informations on how to activate/deactivate the functions lockdown, see chapter 6.3.1-Functions Lockdown.

F 2 2 - Control functions shutdown:

This parameter enables/disables the load output switching off to perform maintenance. To obtain further informations on how to activate/deactivate the Control functions shutdown, see chapter 6.3.2 - Control functions shutdown

F23 - Address in RS-485 network:

Instrument address on the network to communicate with SITRAD® software.

Note: In the same network, there cannot be more than one instrument with the same address.

7. SIGNALLING E - -Error reading R phase voltage. Error reading S phase voltage. Obs. 1 E - E Error reading T phase voltage. R phase voltage out of range alarm. S phase voltage out of range alarm. Obs. 2 T phase voltage out of range alarm. A - 4 Angular asymmetry alarm. A - 5 Modular asymmetry alarm. A - 6 Incorrect phase sequence alarm. Date and/or time invalid. ECLO[] F F (flashing) Control functions shutdown active (controller on standby). RdFL Datalogger full alarm. Datalogger error. Obs. 3 EdtL ПЕП Initializing memory. Memory error. Obs. 4 ЕПЕП PPPP Reconfigure the values of the functions.

Obs.1: These errors are triggered if the respective measured voltage is outside the equipment's voltage control range.

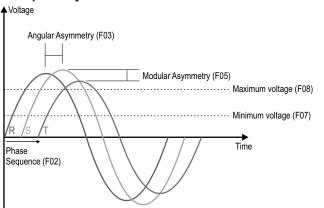
Obs.2: These alarms are triggered if the respective measured voltage is smaller than the value specified in Fig. or greater than the value specified in Fig.

Obs.3: Unable to find entry point in the datalogger to start to record data. In this case, it is recommended to download all data from the datalogger before erasing it. To ignore the error and clear all records from the datalogger, use the access code 6 12

Obs. 4: Controller's internal memory failed its self-test (send instrument for service).

8. PARAMETERS ANALYZED

8.1 Explanatory chart



8.2 Detection alarms angular/modular asymmetry

S = Sensibility (0 to 100%)

Modular asymmetry

Tolerance = (100 - S) x (Average Measured voltages)

100

Angular asymmetry:

Tolerance = (100 - S) x (Average Measured phase difference)

100

Alarm activation condition: (both cases)

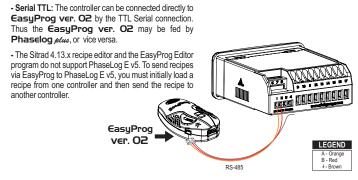
Measured value higher than average value + tolerance or Measured value lower than average value -

9. OPTIONAL ITEMS - Sold Separately

9.1 EasuProg ver. 02

It is an accessory that has as its main function to store the parameters of the controllers. At any time, you can load new parameters of a controller and unload them on a production line (of the same controller), for example. It has three types of connections to load or unload the parameters:

- Serial RS-485: It connects via RS-485 network to the controller (only for controllers that have RS-485).
- USB: it can be connected to the computer via the USB port, using Sitrad's Recipe Editor. The parameters can be copied, edited and saved in EasyProg ver. O2. The USB port can also have the function of electrically feeding the EasyProg ver. O2 and the controller (when the USB and Serial TTL are used



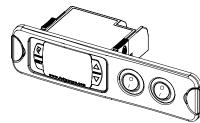
9.2 Ecase

Protective cover for controllers (Evolution line), which prevents the entrance of water and inner moisture. It protects the product when washing is carried out in the location where the controller is installed



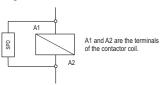
9.3 Extension Frame

The Full Gauge Controls extension frame allows the installation of Evolution / Ri line with measures 76x34x77 mm (dimensions of the clipping for fixing in the extension frame is 71x29mm) in varied situations, since it eliminates precision cut to embed the instrument. Allows customization via a sticker with the brand and the company contact, and accompany two 10A (250 Vac) switches that can trigger internal light, air curtain, on / off system or fan.



9.4 Surge Protective Device (SPD)

Wiring diagram for instalation of SPD in magnectic contactor





Wiring diagram for instalation of SPD in line with loads



10 - INTEGRATING CONTROLLERS, RS-485 SERIAL INTERFACE AND COMPUTER



*INTERFACE SERIAL RS-485

Device used to establish the connection of Full Gauge Controls instruments with Sitrad®.

Full Gauge offers different interface options, including technologies such as USB, Ethernet, Wifi, among others.

For more information, consult Full Gauge Controls. Sold separately.

MODBUS PROTOCOL
The controller allows you to configure the RS-485 communication port for the MODBUS-RTU protocol. For more information about the implemented commands and the registration table, contact Full Gauge Controls.



CONNECTION BLOCK
It is used to connect more than one controller to the Interface. The wire connections must be made as follows: Terminal A of the controller connect to terminal A of the connection block, which in turn, must be connected to terminal A of the Interface. Repeat the procedure for terminals B and $\frac{1}{7}$,

The Phaselog police allows you to configure the RS-485 communication port for the MODBUS-RTU protocol. For more information about the implemented commands and the registration table, contact Full Gauge Controls.



ENVIRONMENTAL INFORMATION

Packaging:

The materials used in the packaging of Full Gauge products are 100% recyclable. Try to perform disposal through specialized recyclers.

Product:

The components used in Full Gauge controllers can be recycled and reused if disassembled by specialized companies.

Do not incinerate or dispose the controllers that have reached the end of their service as household garbage. Observe the laws in your area regarding disposal of electronic waste. If in doubt, please contact Full Gauge Controls.

Products manufactured by Full Gauge Controls, as of May 2005, have a two (02) year warranty, as of the date of the consigned sale, as stated on the invoice. They are guaranteed against manufacturing defects that make them unsuitable or inadequate for their intended use.

EXCEPTIONS TO WARRANTY

The Warranty does not cover expenses incurred for freight and/or insurance when sending products with signs of defect or faulty functioning to an authorized provider of technical support services. The following events are not covered either: natural wear and tear of parts; external damage caused by falls or inadequate packaging of products.

LOSS OF WARRANTY

Products will automatically lose its warranty in the following cases:

- The instructions for assembly and use found in the technical description and installation procedures in Standard IEC60364 are not obeyed;
 The product is submitted to conditions beyond the limits specified in its technical
- description;
- The product is violated or repaired by any person not a member of the technical team of Full Gauge Controls;
- Damage has been caused by a fall, blow and/or impact, infiltration of water, overload and/or atmospheric discharge.

USE OF WARRANTY

To make use of the warranty, customers must send the properly packaged product to Full Gauge Controls together with the invoice or receipt for the corresponding purchase. As much information as possible in relation to the issue detected must be sent to facilitate analysis, testing and execution of the service.

These procedures and any maintenance of the product may only be provided by Full Gauge Controls Technical Support services in the company's headquarters at Rua Júlio de Castilhos, 250 - CEP 92120-030 - Canoas - Rio Grande do Sul – Brasil Rev. 03

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