

USER MANUAL

EasyLogXL & -A

UNIVERSAL MODBUS DATALOGGER



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1. General Description

EasyLogXL is a data logger for all systems equipped with the ModBus RTU or ModBus TCP communication protocol.

It is configured via a **Webserver** from any PC, Computer or Mobile device. The configuration is very simple and intuitive and does not require knowledge of any programming language.

Configuration is done using your preferred web browser, i.e. without the installation of application software.

EasyLogXL has an extensive library of pre-coded tools and, once you have chosen the tool in use, the configuration of the variables is automatic. Libraries are available on the product website in the library section.

The user can easily decide which variables to store and which not, specifying their sampling time.

The stored data is saved in an **removable SD card** in a text file that can be easily imported by any software.

If connected to the network, EasyLogXL can automatically send data to a remote workstation/server via FTP protocol or directly to a WEB portal via **MQTT** and **HTTP REST protocols**.

Package contents

- EasyLogXL-A



- EasyLogXL



2. Specifications

EasyLogXL:

CPU	I/O
32b Arm® Cortex-M7®	Signal LED
2MBytes Flash ROM	N. 1 Ethernet port 10/100 Mb/s
1MByte RAM	N. 1 galvanically isolated RS485 serial port (on terminal)
Internal buffered RTC	
MECHANICAL	ENVIRONMENTAL
IP21 plastic enclosure for DIN rail	Operating Temperature: -20°C ÷ 60°C
Dimensions: 90 x 17 x 60 mm, 1 DIN module	Relative humidity: 0 to 80% non-condensing
Connector for inserting SD card	
POWER SUPPLY AND CONSUMPTION	
Power supply 10–32 V DC	
Average power consumption < 3 W	

EasyLogXL-A:

has all the features listed above with the difference

POWER SUPPLY AND CONSUMPTION
Power supply 10–40 V DC / 20–28 V AC
Pin terminals

SAFETY INFORMATION

- Do not install EasyLogXL near medical devices such as pacemakers or hearing aids.
- EasyLogXL should not be used on board aircraft.
- Do not install EasyLogXL near oil stations, fuel depots, chemical plants, or in potentially explosive areas.
- EasyLogXL may cause interference when used near television, radio, or personal computer equipment.

3. Quick Start

3.1 Wiring and connections

Wiring and installing EasyLogXL is very simple. This guide briefly explains how to make electrical connections and settings for initial access.

3.2 SD Card

EasyLogXL stores data on a standard "SD card". Insert the SD card with the slats facing the screen-printed part, as shown in Fig.1.

The connector is of the push-push type: to insert it, press until you hear a latching click. To take out the SD card, press lightly; When clicked, the card will lift up and can be extracted. We always recommend the use of industrial SD cards.



Fig. 1 SD Card Insertion
EasylogXL (Top)
EasyLogXL-A (Bottom)

3.3 Serial

If you use serial to read data from ModBus RTU devices, connect the RS485 wires as shown in the following figure (Fig. 2)



Fig. 2 RS485 connector
EasylogXL (Left)
EasyLogXL-A (Right)

3.4 Ethernet

If you are using an Ethernet connection to read data from ModBus TCP devices, Insert the ethernet cable jack into the appropriate RJ connector of the EasyLogXL, as shown in Fig.3



Fig. 3 Ethernet connector
EasylogXL (Left)
EasyLogXL-A (Right)

3.5 Power Supply

Connect EasyLogXL to a 10–32VDC power supply as in Fig.4.

N.B. Be careful to respect the power supply polarity correctly. EasyLogXL is protected against a possible reversal.

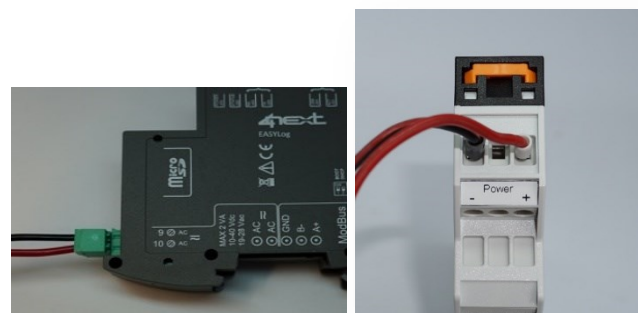


Fig. 4 Power connections
EasylogXL (Right)
EasyLogXL-A (Left)

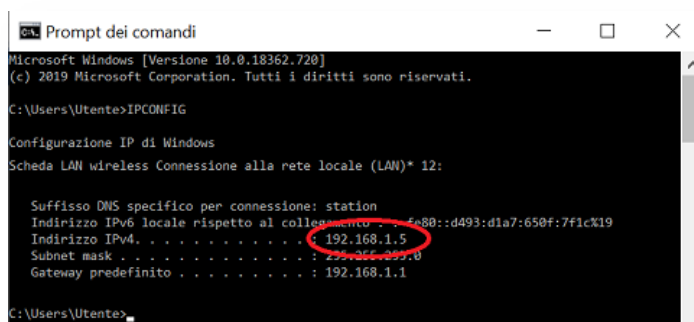
4. Access and configuration

EasyLogXL has a built-in WEB server, so it can be configured using a standard browser. To access the configuration pages, type the EasyLogXL IP address from the browser of your PC, tablet or smart phone.

The device from which you connect must be within the same network as EasyLogXL (Par 4.1)

4.1 Network IP address

The default IP address of EasyLogXL is **192.168.1.100**



```
cmd - Prompt dei comandi
Microsoft Windows [Versione 10.0.18362.720]
(c) 2019 Microsoft Corporation. Tutti i diritti sono riservati.

C:\Users\Utente>IPCONFIG

Configurazione IP di Windows

Scheda LAN wireless Connessione alla rete locale (LAN)* 12:

Suffisso DNS specifico per connessione: station
Indirizzo IPv6 locale rispetto al collegamento . . . . . : fe80::d493:d1a7:650f:7f1c%19
Indirizzo IPv4 . . . . . : 192.168.1.5
Subnet mask . . . . . : 255.255.255.0
Gateway predefinito . . . . . : 192.168.1.1

C:\Users\Utente>
```

Fig. 5 Checking the IP address of the PC

If your network is of the same IP class: 192.168.1..., skip to section 4.3, otherwise follow the instructions in section 4.2 to set the correct IP address. To identify the IP class of your network, run the IPCONFIG command from the command prompt.

In the above Fig.5, the IP address of the PC is 192.168.1.5. It belongs to the same class/network as EasyLogXL, as the first 3 numbers (192, 168 and 1) are the same. You can then reach EasyLogXL from your PC browser.

In the event that the network is NOT of class 192.168.1, you can proceed in 2 ways:

1. Set EasyLogXL to work in DHCP (see section 4.2);
2. Set a valid IP to EasyLogXL (see chapter 5).

4.2 DHCP Setup

To set up DHCP, set the DIP SWITCHES as follows:

1 =ON 2 =OFF

In EasyLogXL-A it is the opposite

1=OFF 2=ON

DIP-Switch configuration for addressing:

DIP-SWITCH 1	DIP-SWITCH 2	Meaning
OFF	OFF	Use the previously saved configuration. The factory configuration is 192.168.1.100
ON	OFF	Enable DHCP and ignore the saved configuration
OFF	ON	Use fixed IP 192.168.1.100 and ignore the saved configuration.

*EasyLogXL-A is reversed, dip-switch2 function is DHCP, and dip-switch1 is for factory configuration.

Connect EasyLogXL/XL-A to the LAN via an Ethernet cable (Par. 3.3) and power it (Par. 3.4). When the Status LED flashes at regular intervals, EasyLogXL is ready for use. At this point you can proceed in 2 ways:

- a. By determining the IP address using network discovery software (e.g. Advanced IP Scanner or Free IP Scanner). Then type the address found on the browser.
- b. Type `http://easylog.local` on the browser. EasyLogXL thanks to the DNS protocol will respond to the request allowing the user to access the configuration pages without knowing the exact IP. This option is available if the Bonjour service or other DNS service (usually present) is available on the PC from which you are accessing.

NOTE: Use this option by connecting a maximum of one EasyLogXL to the same LAN.



Fig. 6 Example of the DIP position: OFF

4.3 Login and authentication

Once you have defined the IP address, type it into your browser. You will then be able to access the EasyLogXL configuration and consultation pages.

The first screen (Fig. 7) is the username and password authentication page. The default values are:

User name: Admin

Password: Admin

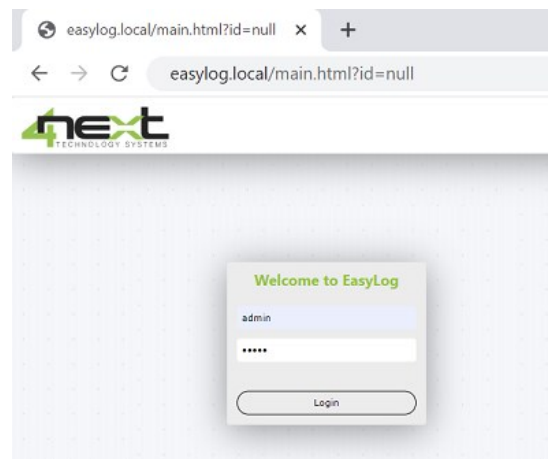


Fig. 7 Login

5. IP Setting

Associate a defined IP address with EasyLogXL/XL-A

1. Connect EasyLogXL to PC directly
2. From the Windows menu select Settings (Fig.8)
3. Choose Network and Internet (Fig.9)

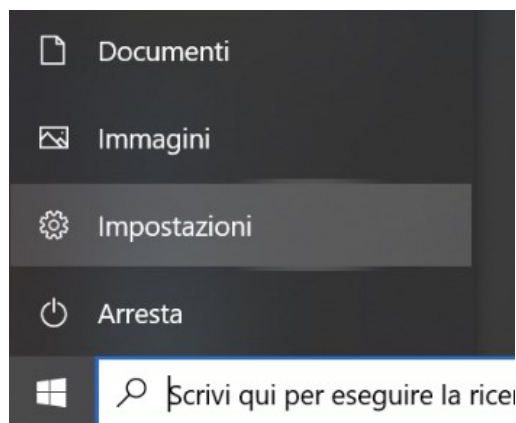


Fig. 8

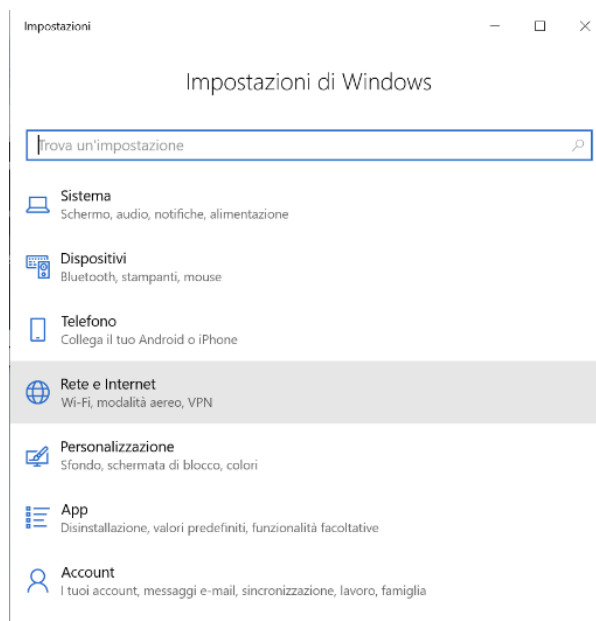


Fig. 9

4. Choose Ethernet again (Fig.10) and the menu will open as in Fig 11.

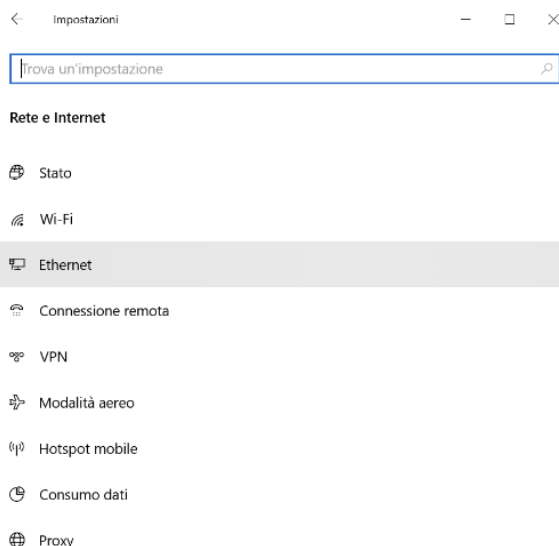


Fig. 10

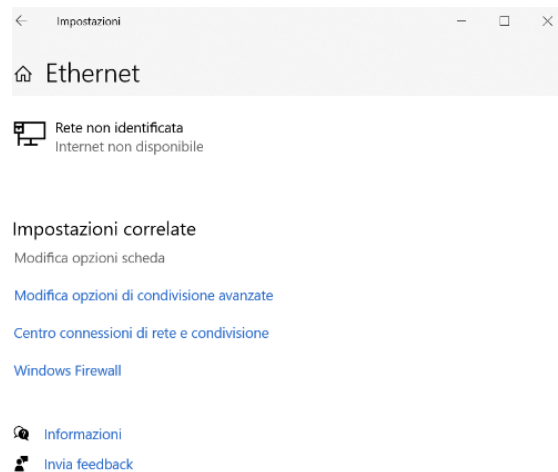


Fig. 11

5. Click on "Edit tab options". A tab with all the network resources will appear (Fig.12)

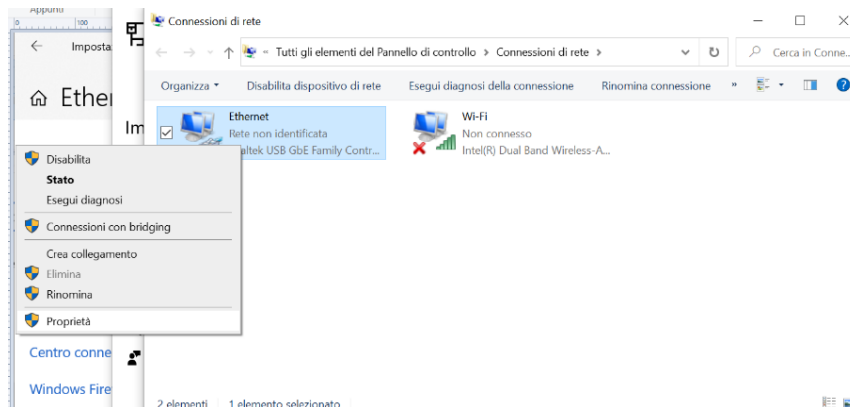


Fig. 12

6. Place the mouse over Ethernet, press the right button and choose "Properties"
7. From the Ethernet properties menu (Fig.13), select "Internet Protocol version 4 (TCP/IPv4)" and press the properties button that you will have enabled in the meantime. The following screen will open (Fig.14)

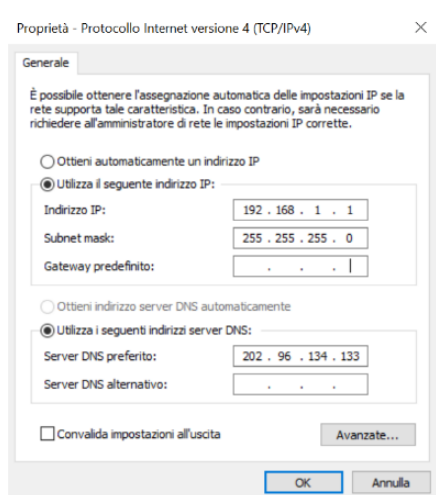


Fig. 13

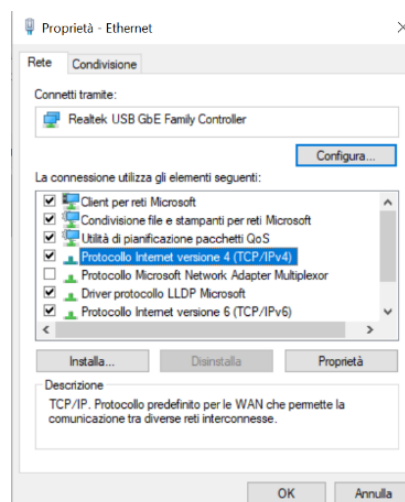


Fig. 14

8. Write down any settings present that will be needed later for the reset
9. Set the IP address to 192.168.1.1
10. Set Subnet mask to 255.255.255.0 and confirm with OK
11. At this point you can open the WEB browser and type 192.168.1.100 to configure EasyLogXL
12. Log in with username and password. The default values are:
Username: admin **Password:** admin (Fig. 7)
13. Select "Network" from the Configurations menu to set the EasyLogXL network parameters in accordance with those of your Ethernet network. For example, if in the original screenshot of Fig.7 the IP address was 192.168.10.1, set EasyLogXL to 192.168.10.100 (example in Fig. 15)
14. Save the new EasyLogXL configuration
15. Reset values on PC
16. EasyLogXL is ready to be used on the same network as your PC



Network.

DHCP
Disabled ▼

IP address
192.168.10.100

IP network mask
255.255.255.0

IP gateway
192.168.1.1

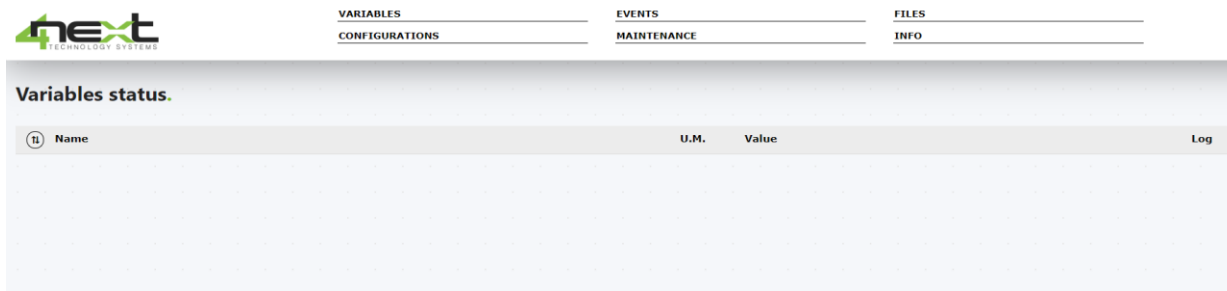
HTTP server port
80

Fig. 15

6. Programming

6.1 Main Menu

After login, EasyLogXL/XL-A publishes the variable display page that represents the default page or Home page. If EasyLogXL has never been configured, the page displayed will be as follows.



On all pages of the application, the menu bar will be visible at the top, which includes:

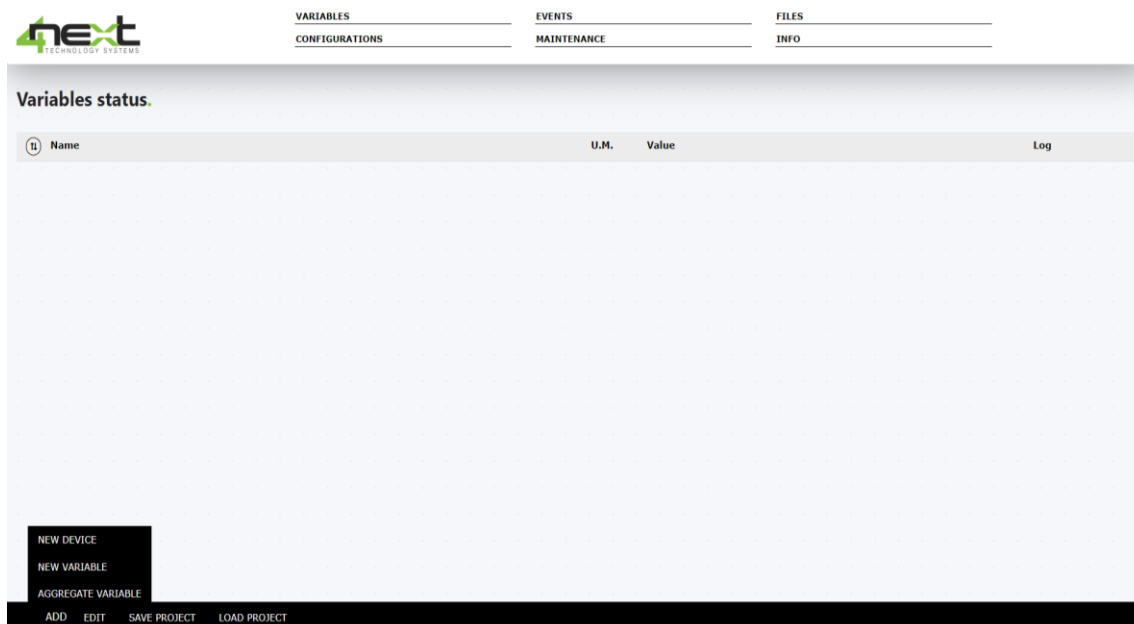
- **Variables:** For the display and configuration of the variables read by the ModBus devices.
- **Events:** Setting for monitoring user-set events.
- **Files:** The list of files created on SD containing the logged data.
- **Configurations:** For setting all system parameters.
- **Maintenance:** For maintenance operations such as Firmware update, factory reset...
- **Info:** Displays the version of Firmware, serial number, bootloader and MAC address.

At the bottom is a menu bar whose "buttons" have the following features. In order from left to right, the possible operations are:

- **Add:** Creating new devices and variables with choices:
 - **NEW DEVICE:** Creates a new device (ModBus Slave) ModBus RTU or ModBus TCP. If you already have the ModBus libraries for the Slave in use, you can import the variables with a few clicks and save a lot of time in configuration.
 - **NEW VARIABLE:** Allows you to add a new variable to a particular device.
 - **Aggregate variable:** Allows you to add a new type of aggregate variable to the main variable with mean, minimum, and maximum mathematical function.
- **Change device/variable ("EDIT"):** This function allows you to modify a variable or a device depending on whether the cursor is positioned over one of the two elements.
- **SAVE PROJECT:** This function saves the entire EasyLogXL configuration

(System Variables and Settings) to a JSON file.

- **LOAD PROJECT:** Allows you to program an EasyLogXL from a previously saved configuration file



6.2 Inserting a new device

By pressing the function key "**NEW DEVICE**" you can add a new device. The following screen is used to enter the information related to the new device

- **Device name**
- **Read variables period:** Reading range of all device variables

Communication:

- **Source:** for choosing ModBus RTU or ModBus TCP
- **Modbus Parameters:** the Modbus parameters at device level (slave).

If the device is **ModBus RTU** the parameters are:

- **Slave ID** ("Slave Address"): address of the slave device (1 ÷ 255)
- **Answer timeout:** the timeout for waiting for the answer from the master (EasyLogXL)
- **Extra Delay between request:** the time to wait between one request and the next one.

In the case of **ModBus TCP**:

- In addition to Slave ID, Answer timeout and Extra delay between request, the IP address and port of the Slave device are also added.
- **Read optimization:** optimized reading mode of variables in a single request (up to a maximum of 64 variables)
 - **Consecutive addresses** (standard): consecutive reading does not

allow discontinuity.

- **Allow discontinuity of maximum 2 registers:** consecutive reading allowing jumps of maximum 2 registers.
Example: if there is a request for addresses 0,1,4,5, it will make two requests, because from 1 to 4 are differences of 3 addresses, this same logic applies to the next option.
- **Allow discontinuity of maximum 10 registers:** consecutive reading allowing jumps of up to 10 registers.
- **Disabled (read each variable at time)** [*Default*]: by default it is disabled when the device is created, it makes one request at a time for each existing variable.

The last parameter is **MQTT publish topic**: it is the identifier (digital signature) of the device for sending via the MQTT protocol. It is used to differentiate the MQTT topics of publication for each device. The "Separate publish for each device" parameter must be active. In this way, the topic on which the device will publish its log data will be given by the concatenation of the publish topic (configuration parameter) and the string defined here.

The screenshot displays the 'Device setup' configuration page. At the top, there are navigation tabs: VARIABLES, CONFIGURATIONS, EVENTS, MAINTENANCE, FILES, and INFO. The 'Device setup' section includes the following fields:

- Device name:** A text input field.
- Read variables period:** A dropdown menu set to '1s' and a checkbox for 'Disabled'.
- Communication:** A section with several sub-fields:
 - Source:** A dropdown menu set to 'Modbus RTU'.
 - Slave ID:** A text input field set to '1'.
 - Answer timeout:** A dropdown menu set to '500ms'.
 - Extra delay before requests:** A dropdown menu set to 'No delay'.
 - Read optimization:** A dropdown menu set to 'Disabled (read each variable at time)'.
- Others:** A text input field with the placeholder 'String to add to MQTT publish topic (leave empty if not used):'.

At the bottom of the page, there are buttons for 'CANCEL', 'SAVE', and '...', along with navigation arrows for '<Prev' and 'Next>'.

6.3 Configuring variables

From the "ADD" screen, press the "NEW VARIABLE" button at the bottom left. Your browser displays the following page:

This is the information to be entered for the correct configuration of a variable of a QI-Power485, each device has its own register mapping, you need to consult the manual/mapping of the device with which you are configuring:

GENERAL INFORMATION

- **Device:** The device referenced by the variable.
If you press the "NEW VARIABLE" button when selecting a device, this field is already set.
- **Variable name:** enter the name of the variable, a text of your choice that will also be used as a label on the display page.
- **Measure unit:** The unit of measurement of the variable.

MODBUS PARAMETERS

Section that is used to set the identification data to access the variable, and in particular:

- **Register address:** the address of the variable identifiable by the register mapping provided by the constructor
- **Register Type:** Coil, Digital Input, Holding Register and Input Register
- **MSW first:** literally Most Significant Word first, it is used for variables of type Int, Long or Float that can have Big-Endian or Little Endian format. The constructor specifies the format used
- **Little Endian:** For 4-byte variables, represent the Big-Endian or Little Endian order in each WORD

N.B. The manual of the ModBus slave device should indicate whether or not to select the latter parameters.

DATA TYPE ("VALUE TYPE")

- Variable Type ("**Type**"): The data type of the variable. A combo box allows you to easily select from all supported data types without the possibility of making a mistake
- **Decimal digits:** The number of decimal places that are displayed and stored on a file.
- **Access Mode:** indicates the mode of the variable at memory access if it is only read or write according to the parameters of the datasheet provided by the manufacturer
- The format of the print of the value on the screen ("**Print format**"): indicates the format of the number measured in decimal or hexadecimal value

Depending on the type of value, we have two types of conversion:

- o **Bit conversion:** Function that allows the choice of the reading on the position of the word of our choice
- o **Linear conversion:** Mathematical function with the insertion of two read measures; a high and a low and finally scales them
- Multiplication Factor ("**Multiplication(m)**"): the factor by which the raw data will be multiplied to obtain the correctly engineered variable. Many devices export information in a non-standard format, such as

temperature in tenths of a degree. To display it in degrees, you will have to set this value to 0.1.

- **Offset (q):** Allow you to add a fixed value to the value of the read variable

The screenshot shows a configuration window for a variable. It includes a 'Type' dropdown set to 'Float (32bit)', a 'Decimal digits' dropdown set to '.00', and a 'Writable' checkbox. Below these are three input fields: 'Linear conversion:' with a 'Calculate' button, 'Multiplication (m)' set to '1', and 'Offset (q)' set to '0'.

DATA STORAGE ("DATA LOG")

- **Enable log:** This checkbox enables writing to files or not.
N.B. It absolutely must be selected to store files on the SD card
- **Enabled only on timeslot:** If selected, it allows you to define the time interval within which the data is stored. It is used to limit the sending of unnecessary data. E.g. from 8:00 to 20:00
- **Periodic log time:** Sampling time of the variable, defines how often the ModBus network master (EasyLogXL) reads the variable from the Slave and saves it to file if the log option is enabled.
- **Log on event:** EasyLogXL allows you to store data when a specific event occurs, which can be:
 - **Any event:** Any event
 - **Value changed:** The value of the variable changes
 - **Value changed at least of:** The variable changes by a minimum value specified in the field next to it
 - **Value changed at least of %:** The variable changes by a minimum value in percentage specified in the field next to it
 - **Value lower of:** The variable is less than a value specified in the field next to it
 - **Value lower or equal of:** The variable is less than or equal to a value specified in the field next to it
 - **Value higher of:** The variable is greater than a value specified in the field next to it
 - **Value higher or equal of:** The variable is greater than or equal to a value specified in the field next to it
- **Operation on log value:** Performs an operation on the read data:
 - **Any operation:** The read data is stored in any condition
 - **Cut-off: ("Value cut-off to 0 if lower than"):** If the value read is less than the threshold set, it is not considered and will be considered as 0
 - **Filter: (Discard value that differs from last one more than %:)** does not store the data if it differs from the previous value by x% reported in the field

The menu at the bottom of the page allows you to do the following:

- **Cancel:** Cancels the operation of modifying or inserting the variable.
 - **Save:** Stores the variable you entered or the changes you made.
 - **Test:** Sends the test ModBus command by tracing the various packets.
 - **Delete:** Deletes the variable.
- N.B.** Once the variable deletion operation has been carried out, it will not be possible to annul the operation and the variable will be permanently deleted.

<Prev/Next>: Navigating Variables

The screenshot displays the configuration page for a variable in the EASYLOG software. At the top, there are navigation tabs for VARIABLES, EVENTS, and FILES, with sub-tabs for CONFIGURATIONS, MAINTENANCE, and INFO. The main configuration area is divided into several sections:

- Value type:** Includes dropdowns for Type (Float (32bit)), Decimal digits (0), Access mode (Read), and Print format (Decimal). Below this is a Linear conversion section with a Calculate button and input fields for Multiplication (m) and Offset (q).
- Data log:** Features a checked 'Enable log' checkbox, an 'Enabled on timeslot' checkbox, and 'Start at' and 'Stop at' time pickers. It also includes 'Log events' with a 'Periodic Log Time (sec.)' dropdown (set to 1 min) and two 'Event condition' rows, each with a dropdown and an input field.
- Operation on log value:** A dropdown menu set to 'Any operation' and an input field set to '0'.
- Modbus mirroring service:** A checkbox for 'Write mirrored (can be written with the Modbus mirroring service)'.

At the bottom, a dark navigation bar contains buttons for CANCEL, SAVE, TEST, and DELETED (highlighted in red), along with '<Prev' and 'Next>' navigation arrows.

Aggregate variable setup

By selecting a variable and clicking on the "**ADD**" item at the bottom left "**AGGREGATE VARIABLE**" you can add an aggregate variable and this screen will appear. Aggregate variables are variables that collect data from the variable, process them according to the function we set, which are available that of average, maximum and minimum.

The difference between variable and aggregate variable is the addition of two new sections.

FUNCTION SOURCE VARIABLE

- In this box you can select the available variables to aggregate to add averaging functions, if previously if you have selected a variable after clicking "**AGGREGATE VARIABLE**" this box automatically shows the selected variable.

FUNCTION SETTINGS

- Functions: in this box you can select three items:
 - **Average:** Returns the average of the values over the variable's execution period
 - **Minimum:** Returns the minimum measured in the variable's execution period
 - **Maximum:** Returns the maximum measured over the execution period of the variable
- **Run period:** This box indicates the regularity of execution of the function with the choices of: 1 min, 2 min, 3 min, 4 min, 5 min, 10 min, 15 min, 20 min,

30 min, 1 hour, 2 hours, 4 hours, 6 hours, 12 hours, a day, a week and a month.

N.B. The aggregate variable does not support the Modbus mirroring service.

6.4 File System

EasyLogXL stores files on the internal SD Card. You can view the list of files via the Files menu. This page allows you to see the files that have been stored and possibly sent and download them locally from the connected PC. The files are stored in the `elog_AAAAMMGG_ORA` format with the prefix "elog" that can be changed to "CONFIGURATIONS" and are contained in archives defined by a date with the format YYYYMMDD, with the order from the most recent to the oldest, from top to bottom so the first file is the most recent.

Log files.

Time	Name	Size	Status	Operations
Operations in progress				
	20221108/elog98_20230328_1743.csv		LOGGING	
	20221108/elog98_20230328_1600.csv	130	SENDING	
Stored files				
Invalid Date	/elog98_csv	26	TO SEND	↓ ⊞
27/2/2023, 11:07:00	[mdb-cw]		ARCHIVE	
8/11/2022, 16:27:52	[20221108]		ARCHIVE	
21/10/2022, 11:14:34	[20221021]		ARCHIVE	
22/9/2022, 11:50:22	[20220922]		ARCHIVE	
29/8/2022, 16:31:34	[20220829]		ARCHIVE	
26/7/2022, 10:42:34	[20220726]		ARCHIVE	
17/6/2022, 12:58:00	[20220617]		ARCHIVE	
28/4/2022, 16:24:22	[20220428]		ARCHIVE	
19/11/2021, 20:59:58	[20211119]		ARCHIVE	

RELOAD Log send period countdown: 21 sec

To download them, click on the underlined text and a list of .csv files saved with the prefix, date and time of the data logging will appear, finally click on

Log files.

Time	Name	Size	Status	Operations
Operations in progress				
	20240521/elog20240809_112300.csv		LOGGING	
Stored files				
07/08/2024, 11:07:00	20240521/elog20240807_110600.csv	222	TO SEND	↓ ⊞
07/08/2024, 11:06:00	20240521/elog20240807_110500.csv	222	TO SEND	↓ ⊞
07/08/2024, 11:04:58	20240521/elog20240807_110400.csv	222	TO SEND	↓ ⊞
07/08/2024, 11:04:00	20240521/elog20240807_110300.csv	222	TO SEND	↓ ⊞
07/08/2024, 11:03:00	20240521/elog20240807_110200.csv	222	TO SEND	↓ ⊞
07/08/2024, 11:02:02	20240521/elog20240807_110100.csv	222	TO SEND	↓ ⊞
07/08/2024, 11:01:02	20240521/elog20240807_110000.csv	172	TO SEND	↓ ⊞
07/08/2024, 11:00:00	20240521/elog20240807_1105900.csv	280	TO SEND	↓ ⊞
07/08/2024, 10:59:02	20240521/elog20240807_105800.csv	222	TO SEND	↓ ⊞
07/08/2024, 10:57:58	20240521/elog20240807_105700.csv	222	TO SEND	↓ ⊞
07/08/2024, 10:56:56	20240521/elog20240807_105600.csv	222	TO SEND	↓ ⊞
07/08/2024, 10:56:00	20240521/elog20240807_105500.csv	222	TO SEND	↓ ⊞
07/08/2024, 10:54:58	20240521/elog20240807_105400.csv	222	TO SEND	↓ ⊞

RELOAD Log send period countdown: 12 sec

the download symbol "↓" on the right and it will save the selected logging period in csv format (by default).

6.5 System Configuration

File Logger

The File logger menu allows you to choose how files will be saved on the SD, in particular:

- **Log File Mode:**
 - File type: None, CSV file, JSON file
 - How often to create a new file: every hour, every day, or write to the same file repeatedly
 - Decimal separator: (comma) or. (period)
 - Separator between fields: (semicolon), | (Pipe), # (sharp or sharp)
 - **Log file name prefix:** the prefix of the file name in the SD card
 - **Delete files after the following days:** represents the maximum time of days that the file remains on the SD card. Setting 0 never deletes files. Otherwise, they are deleted after n. days from their creation (by default it is 30). Ex. 8 keeps files from the last 8 days
 - **Use file encryption:** check box for enabling file encryption and using a different encryption key to be entered in the field next to max 32 hexadecimal characters or leave it blank so as not to change the encryption
- **Log Dispatch:** Used to define how often and how to send the file remotely
 - **Log Send Mode:** the sending mode that can be:
 - Disabled
 - FTP
 - HTTP
 - E-Mail (Options under development)
 - http REST (Options in development)
 - **Log Send Period:** Indicates how often to send the file
 - **Delete file after sent:** If selected the file will be deleted after sending

The screenshot displays the 'Logger' configuration page in the EASYLOG interface. The top navigation bar includes 'VARIABLES', 'EVENTS', and 'FILES' tabs, with 'CONFIGURATIONS', 'MAINTENANCE', and 'INFO' sub-tabs. The left sidebar lists menu items: File logger, Network, Modbus, IoT service, Modbus mirroring, Email, Password, and Clock. The main content area is titled 'Logger' and contains the following sections:

- Log backup:**
 - Log file mode: Csv file (dropdown)
 - New file every log send period (if log send mode is not disabled) (dropdown)
 - Use ; as decimal digit separator (dropdown)
 - Use ; as column separator (dropdown)
 - When the variable was not read for timeout or error: Fill with a space (dropdown)
 - Log file name prefix: elog (text input)
 - Delete files after the following days: 30 (checkbox and text input)
 - Use file encryption (checkbox)
 - Change encryption key (leave empty to not change) must be 32 hexadecimal characters (text input)
- Log dispatch:**
 - Log file send mode: Send log file to FTP server (dropdown)
 - Log send period: (text input)

At the bottom of the interface, the status bar shows the date and time '09/08/2024, 12:05:00', the test type 'TEST FTP/HTTP', and a green 'SAVE' button.

In the menu at the bottom we find from left to right:

- The date and time
- **FTP/HTTP test:** allows you to perform a connection test with the credentials entered
- **SAVE:** Saving Settings

**If the FTP/HTTP Test does not work and returns the message "Unable to resolve IP address", activate DHCP (Dynamic Host Configuration Protocol) to resolve the error, later you can disable it if you want to set a fixed IP address. If the problem persists, contact the company for further technical assistance.*

Network

In the "Configurations" menu we have a list of items, **Network** allows you to enter the parameters of the Ethernet network to which EasyLogXL is connected in order to make it communicate with the servers for sending data. These are the parameters to be configured in detail:

- **DHCP:** Allows you to determine whether you should use the network DHCP server to assign the IP address or not;
- **IP address:** The static IP address assigned to EasyLogXL. If DHCP is enabled or Dip-Switch 2 is set to ON, the IP is not the one displayed, but the current IP of the datalogger will be displayed in info;
- **IP network mask:** The subnet mask or netmask allows you to establish the range of IP addresses within a subnet;
- **Gateway IP:** IP address of the referring gateway;
- **DNS IP 1:** the DNS of the IP address, by default is 8.8.8.8;
- **DNS IP 2:** the DNS of the IP address alternatively, by default is 0.0.0.0;
- **HTTP server port:** Port of the http server when different from the standard 80 or 8080.

The screenshot shows the configuration interface for the Network settings. On the left is a navigation menu with the following items: File logger, Network, Modbus, IoT service, Modbus mirroring, Email, Password, and Clock. The main content area is titled "Network" and contains the following configuration fields:

- DHCP:** A dropdown menu set to "Enabled".
- IP address:** A text input field containing "192.168.1.105".
- IP network mask:** A text input field containing "255.255.255.0".
- IP gateway:** A text input field containing "192.168.1.1".
- IP DNS 1:** A text input field containing "8.8.8.8".
- IP DNS 2:** A text input field containing "0.0.0.0".
- HTTP server:** A section containing:
 - A text input field for "HTTP server port (empty=default)".
 - An unchecked checkbox for "Enable HTTPS".
 - A link: "CA certificate (to add to the trusted Root Certification Authority list)".

At the top of the interface, there are navigation tabs: VARIABLES, CONFIGURATIONS, EVENTS, MAINTENANCE, and FILES. INFO. At the bottom left, the timestamp "09/08/2024, 12:08:41" is displayed. At the bottom right, there is a green "SAVE" button.

ModBus

Defines the configuration parameters of the RS485 serial channel for ModBus communication with the Slaves:

ModBus RTU (Remote Terminal Unit):

With this configuration, the datalogger is connected directly to the slave via an electrical cable and the following settings define:

- **ModBus RTU speed:** Communication speed;
- **ModBus RTU mode:** Number of bits, stop bits, and parity of serial communication.

The screenshot displays the ModBus configuration page. At the top, there are navigation tabs: VARIABLES, CONFIGURATIONS, EVENTS, MAINTENANCE, FILES, and INFO. The left sidebar lists various system settings. The main content area is titled 'Modbus.' and is divided into three sections:

- Modbus RTU:** Includes a dropdown for 'Modbus RTU bus speed' (57600 bps), and three dropdowns for 'Modbus RTU bus mode' (Data bit: 8 data bit, Stop bit: 1 stop bit, Parity: no parity).
- Modbus TCP:** Features a checkbox for 'Modbus TCP server enabled' and a text input for 'Server TCP port' (502).
- Local device:** Features a checkbox for 'Local system device enabled' and a text input for 'System device modbus address' (247).

ModBus TCP (Transmission Control Protocol):

Alternatively, if the datalogger is connected to the router with the LAN/Ethernet cable and also the slave (having ModBus TCP) can transmit the data via TCP protocol and the items to activate it are:

- **ModBus TCP server enabled:** check box for enabling the modbus TCP connected to the server;
- **TCP server port:** The serial port of the TCP server is used to identify a connection endpoint or direct data to a service (by default it is 502 for the application of ModBus devices).

Local device:

This feature turns the datalogger into a Modbus server, allowing it to directly host and serve the collected data without the need for an external server. And the following items are:

- **Local system device enabled:** check box for enabling for local system;
- **System device modbus address:** the serial port of the local system (by default it is 247).

**This function creates a new device called Local in Variables containing its parameters and device information, if it is equipped with I/O modules it is consequently detected.*

IoT Service – MQTT

This configuration menu is used to set the parameters for sending data via the MQTT protocol.

- **Service type:** Enable or disable sending in MQTT
- **MQTT Provider:** This is the type of MQTT broker available by default. At the moment EasyLogXL provides connection to a generic MQTT broker and Databoom
- **MQTT server URL:** The address (URL) of the server
- **Authentication user:** Username for accessing the server
- **Authentication password:** Server access password
- **Client ID:** This is the identifier of the EasyLogXL client that connects to the MQTT broker. It is a unique ID for a particular broker. The broker uses this to identify the client and the current status of the client.
- **Enable SSL/TLS (server port 8883):** Enable if the remote broker uses SSL/TLS encryption for data transfer
- **Publish topic:** The topic of the MQTT broker on which to send the log data publications. It is a string that represents a path in the broker, for example, "EasyLogXL/location1"
- **Separate publish for each device:** Indicates whether you want to use a different topic in the broker for each device configured in EasyLogXL. In this case, the topic on which a device will publish its log data will be given by the concatenation of the publish topic (previous parameter) and the topic defined on the configuration of each individual device.
- **Publish QoS:**
Defined by the MQTT standard, it indicates the level of assurance that a message is actually received by the broker:
 - o 0 = the guarantee is delegated to the TCP/IP protocol
 - o 1 = the guarantee is managed by an acknowledgment by the broker. The risk is duplication of a publication
 - o 2 = the guarantee is managed by a double acknowledge between device and broker.
- There is no risk of duplication but there are 2 more posts per post. The choice should be made based on how much traffic is allowed for publications.

- **Retain:** Activate if a possible subscriber to the topic used by EasyLogXL for publication wants to receive the last published data immediately upon connection.

In the section **MQTT subscribe config (for admin access)** we can enable it for changing the topic messages and read it also for that we have:

- **Enable:** Enable the subscribe service. It can be used to manage configurations read and write messages.
- **Subscribe topic:** The topic where to subscribe. After subscribe, the device can receive each message published by other clients to that topic.
- **Qos:** MQTT quality of service. QoS is an agreement between the message sender and receiver that defines the level of delivery guarantee for a specific message. MQTT provides three levels of QoS:
 - o At most once (QoS 0)
 - o At least once (QoS 1)
 - o Exactly once (QoS 2)

At the bottom left we have the button:

- **MQTT test:** used to verify the connection to the server you want to connect which will send a test message
**If the MQTT Test does not work and returns the message "Unable to resolve IP address", activate DHCP (Dynamic Host Configuration Protocol) to resolve the error, later you can disable it if you want to set a fixed IP address. If the problem persists, contact the company for further technical assistance.*

Modbus Mirroring

This function allows you to bridge the slave devices on the RS485 and a Modbus TCP Master (Client). The variables read and logged by RS485 are written to the respective Modbus TCP addresses.

The Service Mode combo allows you to:

- **Disabled:** Disable the service
- **Mirroring of logged variables on log event:** Copying logged variables to event
- **Mirroring of all variables with periodic refresh:** Copy all variables at defined intervals

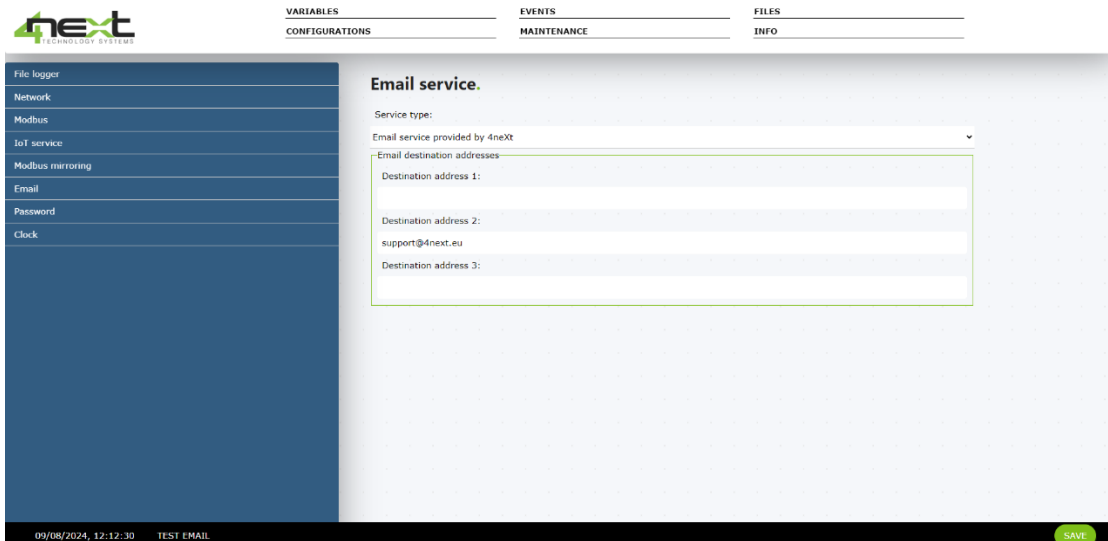
The Modbus Server IP address and Modbus server IP port parameters are used to address the Modbus TCP client. Refresh period is the refresh time of variables on the Modbus TCP client.

E-mail Service

This function allows you to receive e-mails in case of set events and there are three items that can be entered for this service:

- **Disabled:** disabled (by default)
- **E-mail service provided by 4next:** the e-mail service offered by our company
- **SMTP server:** option if you have a server with SMTP protocol.

After running the **Test Email** you will receive the test email

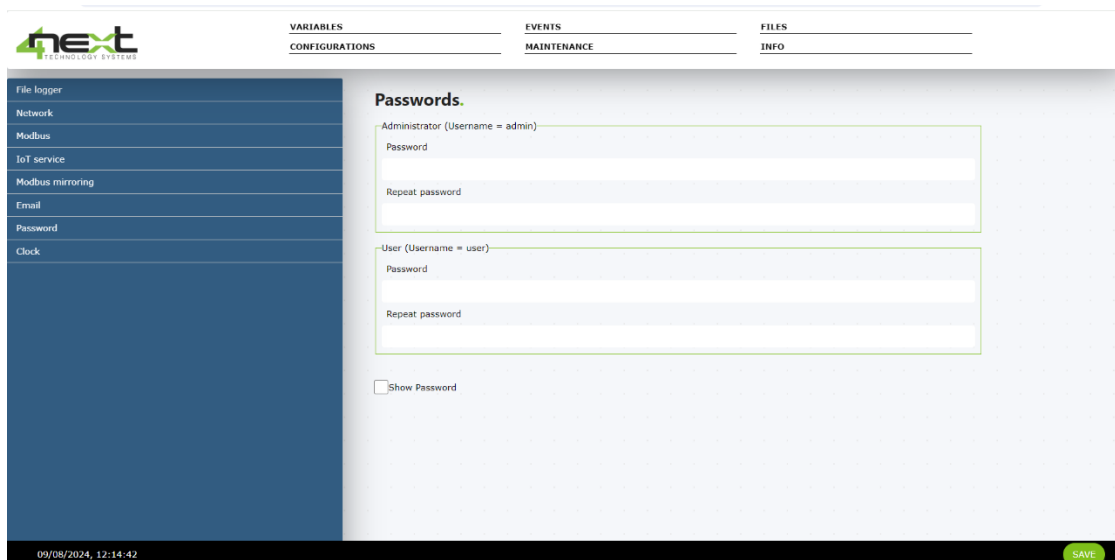


and this will be the default message that you will receive by email after you have set up the destination email using our email service (sent by "Test Email").



Password

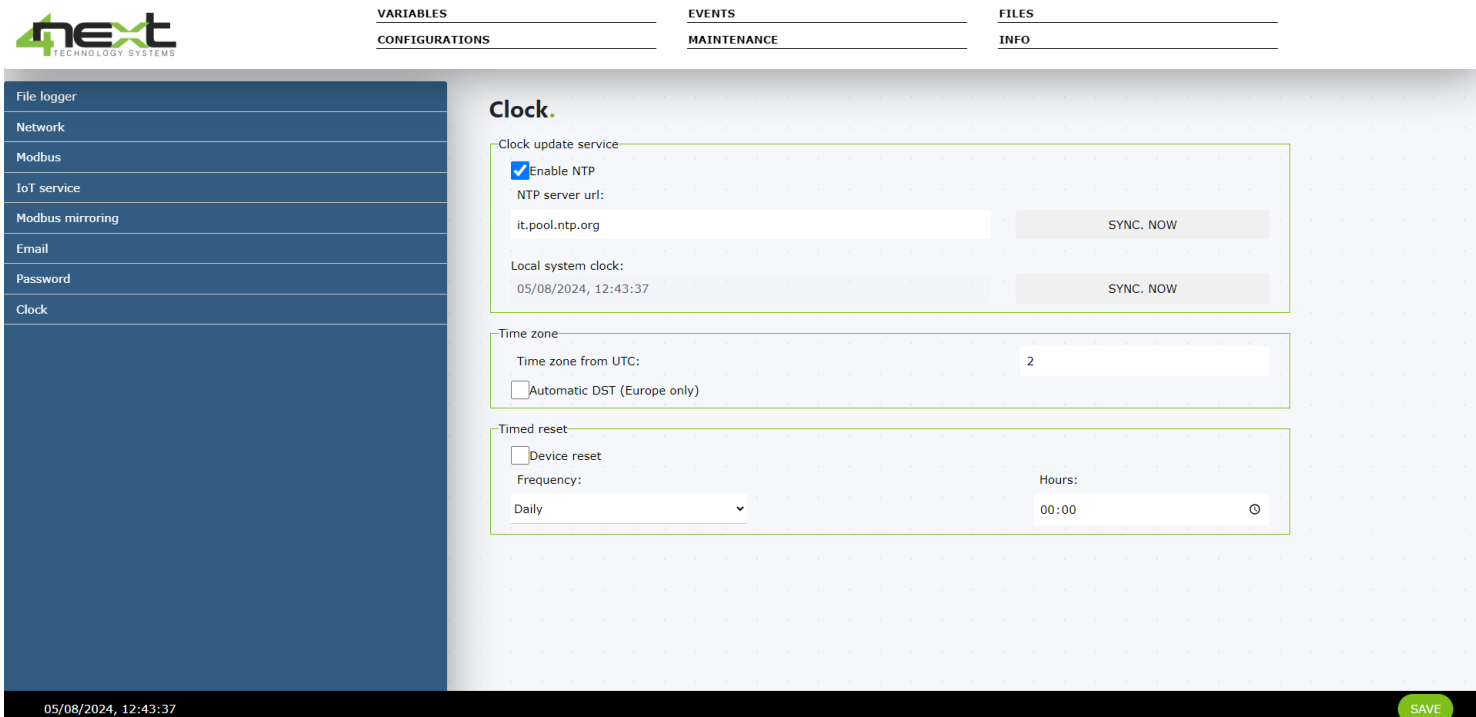
Set passwords for logging in to the EasyLogXL configuration page.



Clock

Allows you to set whether the update between wintertime and daylight-saving time is done automatically. When the **Automatic DST** Check box is checked, the update is done automatically. Clock alignment is always possible from the configuration page by clicking on the **SET CLOCK** button located at the bottom left of the page.

By selecting the Check box **NTP** clock update service EasyLogXL, if connected to the Internet, performs the alignment of the clock with the NTP server.



**To configure automatic time in Italy, you need to synchronize with the NTP service and set the Time zone from UTC to 2, from spring to summer and to 1 from autumn to winter depending on daylight saving time.*

6.6 Events

In this section you can set up events in which we can manage and intervene independently, for example the sending of the email from the datalogger to our email mail at the start or the variation of a variable configured according to the conditions that we set for example less than 10 Vdc in measured voltage, another possible configuration is the writing of a variable such as a sudden increase in temperature or voltage.

The screenshot shows the 'Events' configuration page in the EASYLOG web interface. The page has a navigation menu with 'EVENTS' selected. The 'Event setup' form includes the following fields:

- Event name:** A text input field.
- Minimum time:** A dropdown menu set to '1 sec'.
- Event condition:** A dropdown menu set to 'Any'.
- Action:** A dropdown menu set to 'Any'.

At the bottom of the page, there are buttons for 'SAVE', 'CANCEL', 'NEW EVENT', and 'DELETE'.

The items are:

- **Event name** : name of the event
- **Minimum time**: the minimum time for which the operation is performed
- **Event condition**: Event condition and has the following settings
 - **Any** : Any;
 - **Check variable value** : Check a value of the selected variable;
 - **Device**: Reference device
 - **Variable**: variable on which you want to apply the condition
 - **Condition**: Applicable conditions are equal to, not equal to, less than, less than equal to, greater than, and greater than
 - **Value**: The value for which the condition is based

- **Time(s):** Time to perform the set action.

- **Startup (after power-on or reboot)** : condition of boot or restart of the device;
- **Action** : Operation that is performed when the previously set conditions are met
 - **Any** : Any;
 - **Write variable**: Write on the variable;
 - **Device**: Device belonging to the variable
 - **Variable**: variable to write to
 - **Value to write**: the value to subscribe to the variable

- **Send email**: sending recipient email (maximum of 3 emails, has 3 checkboxes on which to select the recipient email);

At the bottom left there are features and they are:

- **Save**: Rescue
- **Cancel**: cancel

- **New event:** creating a new event
- **Delete:** Delete event

Events.

Name	Status
avvio	○

Event setup

Event name: avvio Minimum time: 1 sec.

Event condition: Startup (after power-on or reboot)

Action: Write variable

Device: [RTU:1] Qe-power

Variable: Machine ID

Value to write: 7

SAVE CANCEL NEW EVENT DELETE

This is the screenshot of a successful save of an event saved with its status.

**To use the Email feature, you need to enable it in Configurations -> Email service. (For Notice or Notification purposes only).*

6.7 Maintenance

The maintenance menu is used to update the device's firmware and enable debugging for technical support. Clicking on "**Update firmware**" will update you and you will have to load the latest version of the firmware and it is of the .bin file type.

To activate the debugging function by choosing the mode from:

- **Disabled:** Disabled by default
- **Basic messages[Lv1]:** Logs basic clock renewal request and network operations
- **Application debug[Lv2]:** Records all operations that the device performs at the application layer
- **Application and network debug[Lv3]:** Records all the operations listed above and also records network operations in detail allowing accurate error analysis.

You can store data on the SD card. You can then decide whether to download the data or delete it with "**Download/Delete**".

With the "**Fabric reset**" button you will reset each configuration to the default values and remove all devices and variables from the device's memory.

After that the "**Format SD**" button will format and erase all the contents of the SD card.

In addition, a "Diagnostics" diagnostic section that allows you to monitor the current connection of the device to the network from the items:

- **Network status**
- **MQTT status**
- **Mobile network**

(exclusive function of EasyNet for its GSM equipment)

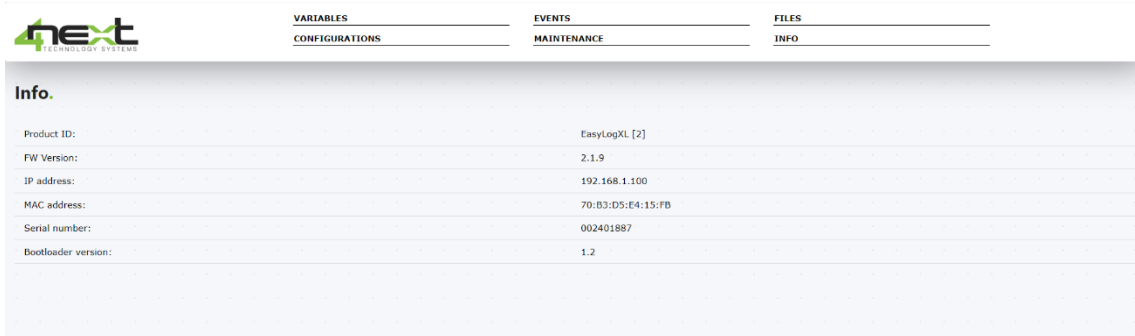
And finally a Ping feature to check the connection of a device, which requires the current entry of an IP address and then click the "**PING**" button and a log window will appear where it will verify the connection.

The screenshot displays the EasyLog web interface with the following sections:

- Navigation:** VARIABLES, CONFIGURATIONS, EVENTS, MAINTENANCE, FILES, INFO.
- Device Update:** Firmware update: select a firmware file to download. Includes an "Update firmware" button and a "Send progress:" indicator.
- Debug:** Enable the debug trace to file. A file debug.txt will be created in SD. Includes a "Debug trace to file mode:" dropdown (set to "Disabled") and "Download" and "Delete" buttons.
- Factory reset:** Reset all configurations to default values and remove all device and variables from the device memory. Includes a "Factory reset" button. Also includes "Format the SD card - all SD card content will be erased" with "Format SD" and "OK" buttons.
- Diagnostics:** Network status: LAN up; MQTT status: Not connected; Mobile network: (blank). Includes a "Ping test address:" input field and a "PING" button.
- Footer:** REMOVE SD, REBOOT.

6.8 Info

The info menu displays the Hardware and Software information for the device. Always check on the 4next.eu/easylog site if the firmware is updated to the latest version.



The screenshot shows the 4next Technology Systems web interface. At the top left is the 4next logo. To the right are three main menu categories: VARIABLES, EVENTS, and FILES. Under VARIABLES is CONFIGURATIONS; under EVENTS is MAINTENANCE; and under FILES is INFO. The 'INFO' menu is selected and highlighted in blue. Below the menu is a table displaying device information.

Info.	
Product ID:	EasyLogXL [2]
FW Version:	2.1.9
IP address:	192.168.1.100
MAC address:	70:B3:D5:E4:15:FB
Serial number:	002401887
Bootloader version:	1.2

7. Return and repair

The return for repair or replacement must be authorized in advance by requesting the RMA number.

Then email 4neXt to your support@4next.eu address or your dealer/reseller with a card with the following information:

- Company name and customer details (address, phone, fax, email)
- Referent
- Point of purchase
- P/N and S/N product details located on the back of each product or on the original box
- Detailed description of the fault or anomaly detected

4neXt will send the RMA number with which the customer can send the material for repair. The products must be shipped carriage paid.

If the material arrives without the factory seals, it will automatically be considered "out of warranty".

Technology systems **FOR YOUR BUSINESS**

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