Universal Remote Ethernet

XM-210 ETH

Introduction

Thank you for choosing our XM-210 ETH. To ensure its proper and efficient usage, it is important to read this user manual thoroughly to understand how to operate the XM-210 ETH, before operating it.

About this Manual

1 - This manual should be delivered to the end user of the XM-210 ETH;

2 - The contents of this manual are subject to change without notice;

3 -

4 - The specifications contained herein are limited to standard models and do not cover customized versions;

5 - All precautions were taken on preparing this manual, in order to guarantee the quality of its information.

CAUTION!

The instrument described in this technical user manual is a device suitable for application in a specialized technical area. DLG supplied products are submitted to a strict quality control process. However, electronic industrial control equipment may cause damage to machinery or processes in the event of any failure or improper operations and may even endanger human lives. The user is responsible for settling and selecting values of the parameters of the instrument. The manufacturer warns of the risk of incidents with injuries to both people and goods, resulting from the incorrect use of the equipment.

Contents

Presentation

The Universal Remote Ethernet XM-210 ETH is designed to promote versatility and robustness in industrial plants.

With is processing core based in the ARM® technology, the XM-210 ETH offers speed and accessibility to field variables through the Modbus TCP protocol over Ethernet and also through the Modbus RTU protocol over the RS-485 physical interface, thus enabling the acquisition of 16 inputs from several kind of signals such as thermocouples, RTD resistive sensors, current, tension, frequency and logical levels.

The available inputs and product features are described below:

- Thermocouples type J, K, T, R, S, E, N, B (ITS-90) with cold junction compensation
- RTD type Pt100 (two or three wires)
- Current 0-20 mA and 4-20 mA
- Voltage 0 – 75 mV, 0 – 5 V or 0 – 10 V
- Logic level maximum amplitude 12 Vdc
- Frequency up to 10 kHz with 4 simultaneous channels with 0.3 V to 50 V sensibility
- Two digital inputs isolated up to 30 Vdc for alarm acknowledgment
- Two alarm levels per channel, configurable (high, low, or differential) with hysteresis and delay of 1 to 10 seconds
- Two relay outputs for alarm status
- Fully detachable (plug-in type) connection to the terminal block
- Integrated Ethernet switch

The XM-210 ETH is configured by the universal DLG configuration tool DLG Tools.

Typical Applications

The Universal Remote Ethernet XM-210 ETH is designed to several types of industrial applications, enabling the concentration of distributed field data. The XM-210 ETH applications demonstrate high optimization in remote field data acquisition, which were previously delegated to controllers, increasing the process scalability and decreasing costs.

The 16 inputs of the XM-210 ETH acquire reliable data for SCADA systems.

Technical Specifications

Input characteristics

Type	Parameter	Min	Max	Comments	Unit
Input signal	Current	0	20	Burnout in 3.5	mA
	Voltage	0	10		Vdc
	Logic level	0	12		
	Thermocouple	-270	1820	B, E J, K, N, R, S, T	ºC
	Cold junction comp.	-10	+60	Operating range	
	Pt100	-200	850	Two or three wires Burnout in V, G or I	
	Frequency	0.0004	10	0.3 to 50 Vdc sensibility	kHz
Input impedance	Current	49			Ω
	Voltage	5			MΩ
	Thermocouple	5			
	Pt100	5			
	Frequency	150 @10Vp 10KHz			KΩ
A/D precision	Current	0-20	± 1		uA
		4-20	± 1		
	Voltage	0-75	± 0.003		mV
		0-5	± 0.25		
		0-10	± 0.5		
	Thermocouple	± 0.1			%
	Pt100	Pt	± 0.1		
	Cold junction comp.	± 0.5			ºC
Linearization	Thermocouple	0.1			ºC
	Pt100	0.2			
Frequency precision	0.02 @10000Hz				%

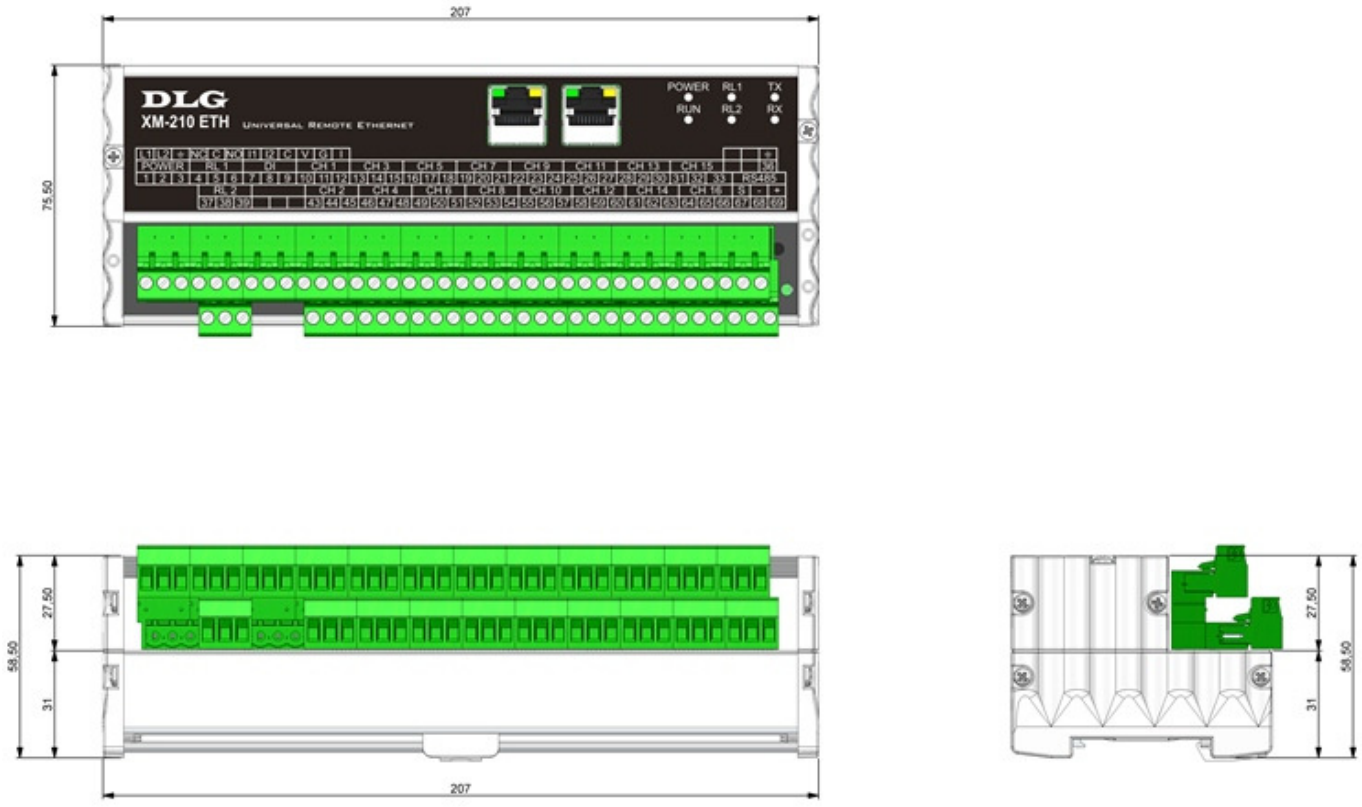
General characteristics

Type	Comments
CPU	ARM7TDMI, 32 bits
Alarms	Two relay outputs: RL1 and RL2 SPDT max. 3 A / 220 Vac
Communications	Ethernet 10/100 Mbps full duplex, two isolated RJ45 connectors, integrated Ethernet switch, up to 10 simultaneous Modbus TCP connections RS-485, isolated and with transient protection filter, Modbus RTU with even or odd parity, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200 bps
Operating temperature	–10 ºC to 60 ºC
Thermal stability	±0.005% / ºC span @ 25ºC
Relative humidity	Up to 90%
IP protection	IP-50 (DIN EN 60529 VDE 0470)
Input voltage	Universal 90 ~ 265 Vac
Current consumption	200 mA
Construction	Aluminum and side panels in PA 6.6-FR (flame resistant polyamide)
Placement	DIN35 rail (DIN EN 60715 TH35)
Electrical connection	Cable up to 2.5mm² with “plug-in” type removable connectors
Approx. Weight	0.5 kg
Dimensions	59 x 208 x 75 mm. (height x width x depth)

LEDs

LED	Behavior
RJ45 (green)	Ethernet link established
RJ45 (green)	Ethernet data transmission / reception
POWER (green)	Equipment energized
RUN (green)	Lit under normal operation, blinking when TCP/IP settings are being changed
RL1 (green)	Relay 1 activated
RL2 (green)	Relay 2 activated
TX (orange)	RS-485 data transmission
RX (green)	RS-485 data reception

Dimensions

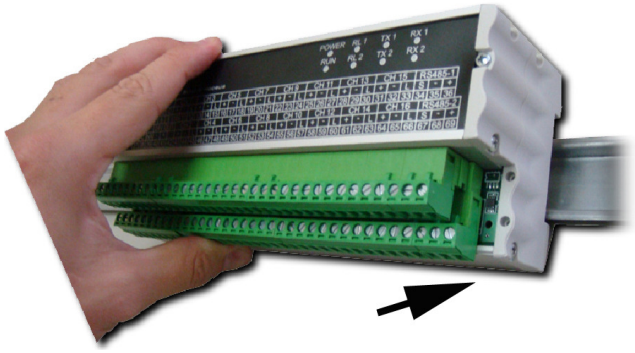


Dimensioning for assembling (millimeters)

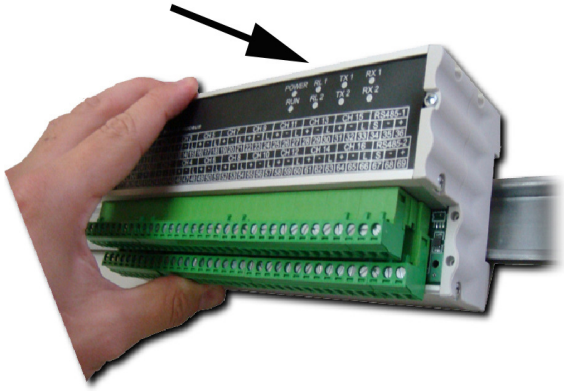
Mechanical installation

The installation of the Universal Remote Ethernet XM-210 ETH requires the use of an appropriate screwdriver so the mechanical parts are not damaged. A “terminal” type 1/8” screwdriver is recommended. The following steps details the installation.

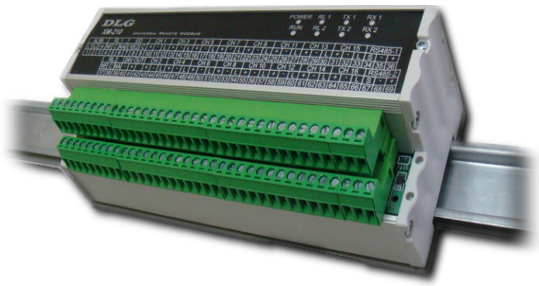
1. Place the bottom of the XM-210 ETH in the DIN 35mm rail.



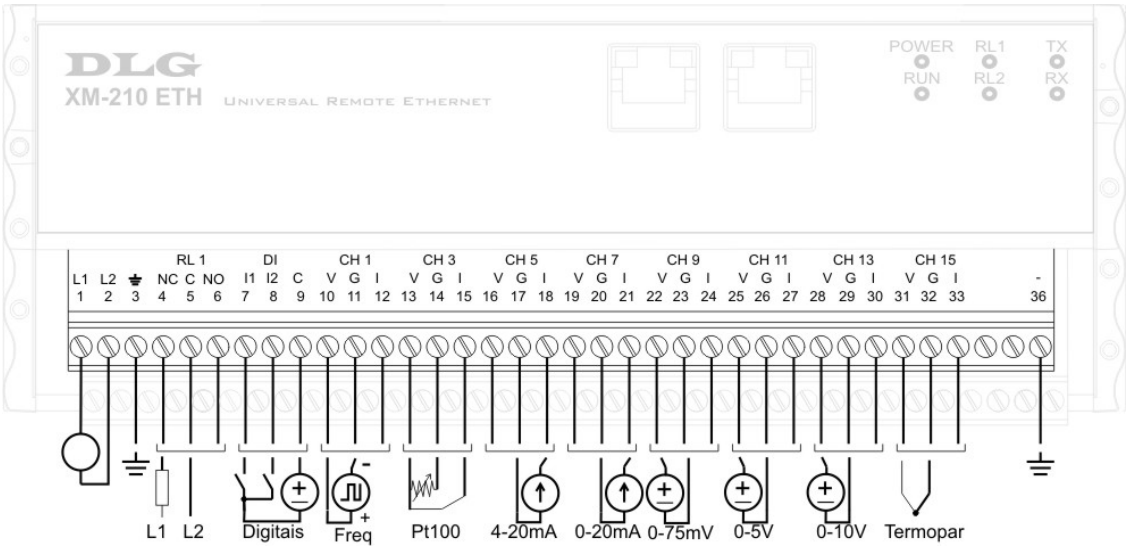
2. Press the top part of the XM-210 ETH until hearing a click. To remove the XM-210 ETH, just apply the opposite force, i.e., force the XM-210 ETH up and pull it out.



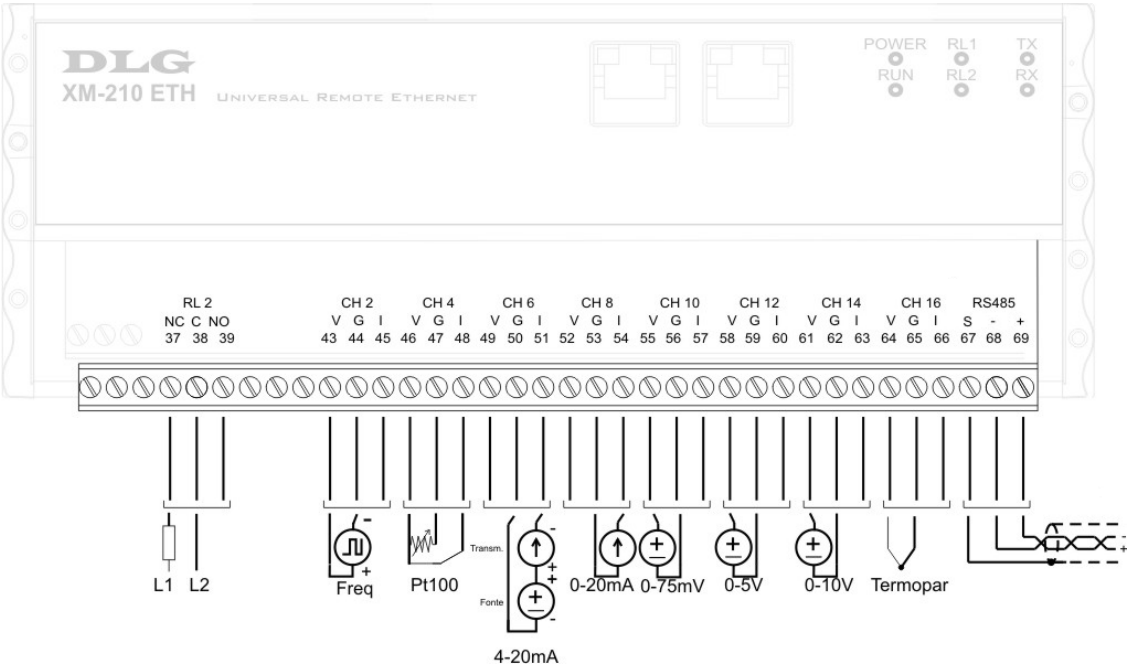
3. The XM-210 ETH is designed to be installed in regular DIN 35 mm rails and after the installation the equipment must remain securely fastened and must not present any slack within the trail. If there is any slack, the trail is possibly not standard.



Electrical installation



Top terminal

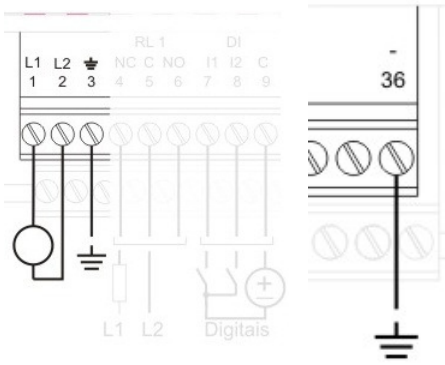


Bottom terminal

Attention: all cables must be “crimped” with eyelet type terminals for cables up to 1.5 mm² unless otherwise stated. The XM-210 ETH input type selection is done entirely through the DLG Tools software and there are no configuration jumpers. It is recommended to use woven shielded cables and the woven grounding should be mostly done around the field instruments at just one point.

Power supply

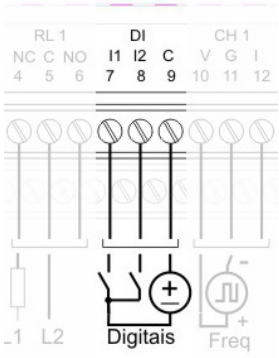
The XM-210 ETH must be powered through terminals 1 and 2 with voltage ranging from 90 to 260 Vac. Terminals 3 and 36 are used to ground the “mass” to the panel and it is recommended to use 1,5 mm² cables for the phases and 2,5 mm² for grounding. The electric scheme is described in the picture.



Digital inputs

The digital inputs are used for alarm status and recognition. Input I1 and I2 are photo-coupled, with sensibility from 10 to 30 Vdc, common for both inputs, NPN driven. Digital input I1 is used to reset or recognize RL1 an RL2 alarm conditions and digital input I2 is used as a status flag for general use. The electric scheme is described in the picture where terminals 7 and 8 are the NPN inputs and terminal 9 is the positive source common.

Digital inputs can be read through Modbus register 40020.

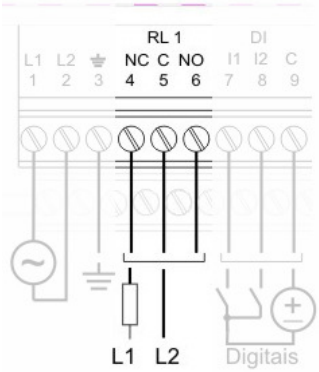


Relay outputs and alarms

The relay outputs are used to physically indicate alarmed conditions preset for each input. The outputs can only be reseted through the digital inputs or Modbus registers.

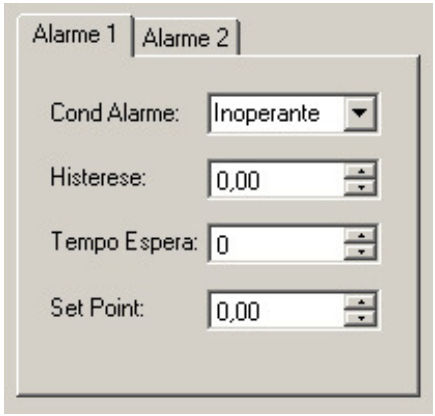
The electric scheme is described in the picture, where the common contact is connected to terminals 5 and 38, the normally open contacts are connected to terminals 6 and 39 and the normally closed contacts are connected to terminals 4 and 37.

The relay outputs can be read and written through Modbus register 40022.



The XM-210 ETH has two independent alarms for each channel.

Each alarm can operate under four conditions: inoperative, low value, high value and differential.



Inoperative: no alarm condition.

Low value: the alarm is active when the input value is lower than the setpoint.

High value: the alarm is active when the input value is greater than the setpoint.

Differential: differential mode is defined by the setpoint and hysteresis. The setpoint defines the center reference point and the hysteresis increases the reference range. If the input signal lies outside the reference range, the alarm becomes active. For instance, to define a reference range from 400 to 600, define the setpoint as 500 and the hysteresis as 100. When the input signal is lower than 400 or greater than 600 the alarm triggers.

The hysteresis is relative to the delay between the activation or deactivation of a condition. In the XM-210 ETH the operation mode can change based on the selected alarm condition.

With the low value alarm condition selected, the alarm activates when the input value is lower that the setpoint and deactivates when the input value is greater than the setpoint plus the hysteresis.

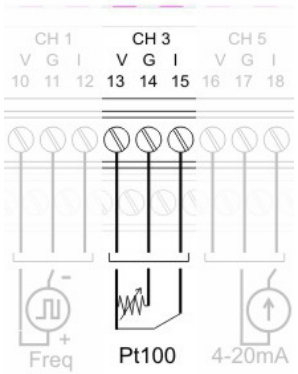
With the high value alarm condition selected, the alarm activates when the input value is greater than the setpoint and deactivates when the input value is lower than the setpoint minus the hysteresis.

The waiting time defines how many seconds the output waits to be activated.

Note:

For improved security when using output relays in burn-out conditions, when there is disruption of the Pt100 cable (see Pt100 input), it is recommended to configure the relay output wait time to more than five seconds. This condition is important to avoid operational failures, for instance, turbine “trips” or any other system that relies on error free states, taking into consideration that the burn-out is an error condition in the process.

Pt100 input

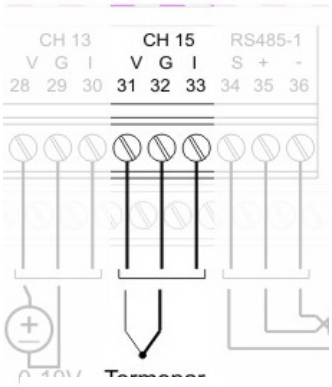


The Pt100 inputs are linearized according to ITS-90. With a current source circuit and cable compensation the XM-210 ETH eliminates the line charging effect, and with resistive sensors measurement it stands as a precise temperature measurement system. The sensor measurement terminals are positive (V) and negative (G) for channels CH1 up to CH16 and the cable compensation measurement is done in the (I) terminals referenced to the negative (G).

If the Pt100 cables are not connected or are open, a burn-out signal will be represented by an indication of -200°C in the respective channel.

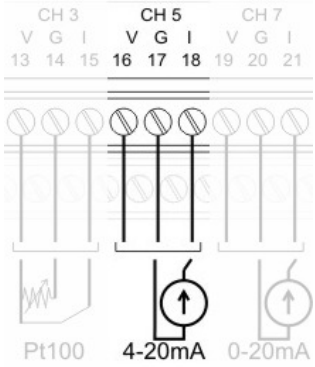
The XM-210 ETH detects the missing sensor and disables the alarm conditions associated with the open channel.

Thermocouple input



The thermocouple inputs are linearized according to ITS-90. With a cold junction compensation circuit, the XM-210 ETH takes into account the Seebeck effect in cable connections, standing as a precise system for high temperature or high differentials measurements. The sensor measurement terminals are positive (V) and negative (G) for channels CH1 up to CH16. Terminal (I) is not used in this configuration.

Current input

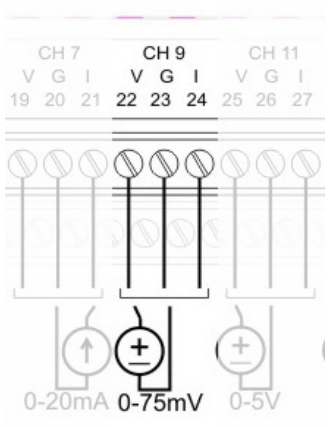


The XM-210 ETH has two current input configurations: 0 – 20 mA and 4 – 20 mA. The scheme for both configurations is described in the Picture, where the positive of the current loop is connected to the line terminal (I) and the negative to the (G) terminal for channels CH1 up to CH16. The positive terminal (V) is not used in this configuration.

Note: the burn-out is represented when the 4-20 mA signal is lower than 3.5 mA.

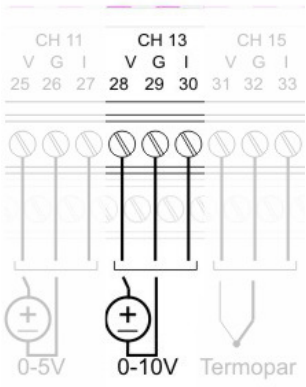
Voltage input

The XM-210 ETH has three voltage input configurations: 0 – 75 mV, 0 – 5 V and 0 – 10 V. The scheme for the configurations is described in the Picture, where the positive is connected to the (V) terminal and the negative to the (G) terminal for channels CH1 up to CH16. The line terminal (I) is not used in this configuration.



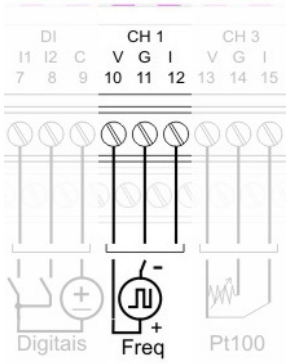
Logic level input

The XM-210 ETH has logic level inputs with 0 to 12 Vdc sensibility. The 0 to 3 Vdc range corresponds to logic level 0 while the 5 to 12 Vdc range corresponds to logic level 1. The scheme is described in the Picture, where the positive is connected to the (V) terminal and the negative to the (G) terminal for channels CH1 up to CH16. The line terminal (I) is not used in this configuration.



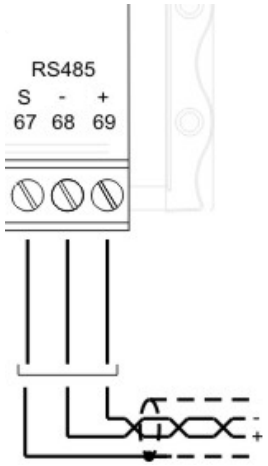
Frequency input

The XM-210 ETH has frequency inputs with 0.3 to 50 Vdc sensibility and 0.3 Hz to 10 kHz reading. The scheme is described in the Picture, where the positive is connected to the (V) terminal and the negative to the (G) terminal for channels CH1 up to CH4. The line terminal (I) is not used in this configuration.



Modbus RTU communications

The picture describes the connection scheme for the RS-485 channel, where the positive (+) is connected to terminal 69 and the negative (-) to terminal 68. Terminal 67 must be connected to the cable shield.



Operation

Starting the XM-210 ETH

The Universal Remote Ethernet XM-210 ETH is designed to apply the advantages in the distribution and collection of field variables with Modbus protocol compatibility. The XM-210 ETH parameterization comprises the following steps:

Communications:

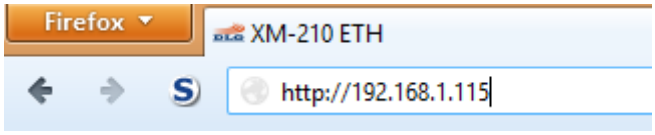
- IP, network mask and default gateway settings for the Ethernet interface.
- Address, baud rate and parity settings for the RS-485 interface.

Configuration:

- Sensor type selection.
- Offset setting for each sensor.
- Maximum and minimum engineering unit scales and decimal point.
- Alarm condition: low, high or differential.
- Alarm hysteresis setting.
- Alarm setpoint setting.
- Alarm activation wait time.

HTTP server (webserver)

The XM-210 ETH is equipped with a webserver that allows channel monitoring and changing communications settings. The webserver is accessed using a web browser (Firefox, Chrome, IE, Safari) via the URL *http://<equipment IP address>*



The *Monitoring* page displays the input values in the 16 channels, alarm status, relay status, digital inputs and internal temperature.

Configurações

Monitoração

Endereço Modbus	Valor	Descrição
40001	30	Canal 1
40002	0	Canal 2
40003	0	Canal 3
40004	0	Canal 4
40005	-200.0	Canal 5
40006	-200.0	Canal 6
40007	-200.0	Canal 7
40008	-200.0	Canal 8
40009	-200.0	Canal 9
40010	-200.0	Canal 10
40011	-200.0	Canal 11
40012	-200.0	Canal 12
40013	0	Canal 13
40014	-200.0	Canal 14
40015	-200.0	Canal 15
40016	-200.0	Canal 16
40017	1	Status do alarme 1 (canal 1 ao 16)
40018	1	Status do alarme 2 (canal 1 ao 16)
40019	3	Status dos relés 1 e 2
40020	0	Status das entradas digitais 1 e 2
40021	30.5	Temperatura ambiente

Recarregue a página para atualizar os valores.

Communication settings

The XM-210 ETH communication interfaces settings have the following factory defaults:

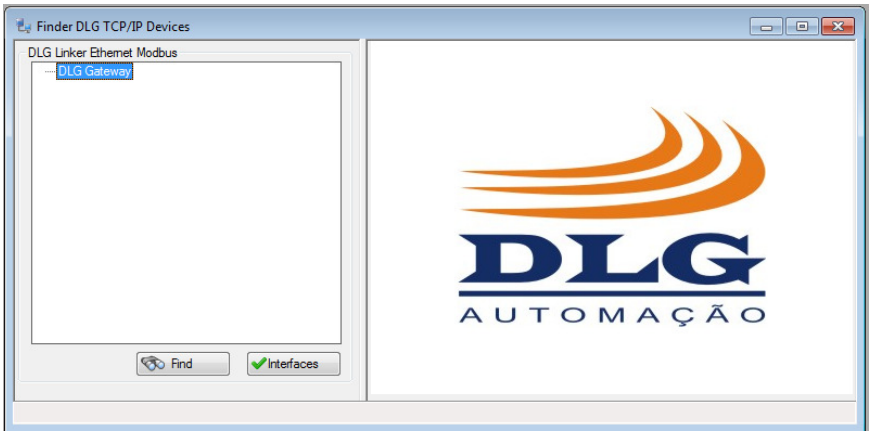
Ethernet interface

- IP: 192.168.1.100
- Network mask: 255.255.255.0
- Default gateway: 192.168.1.1

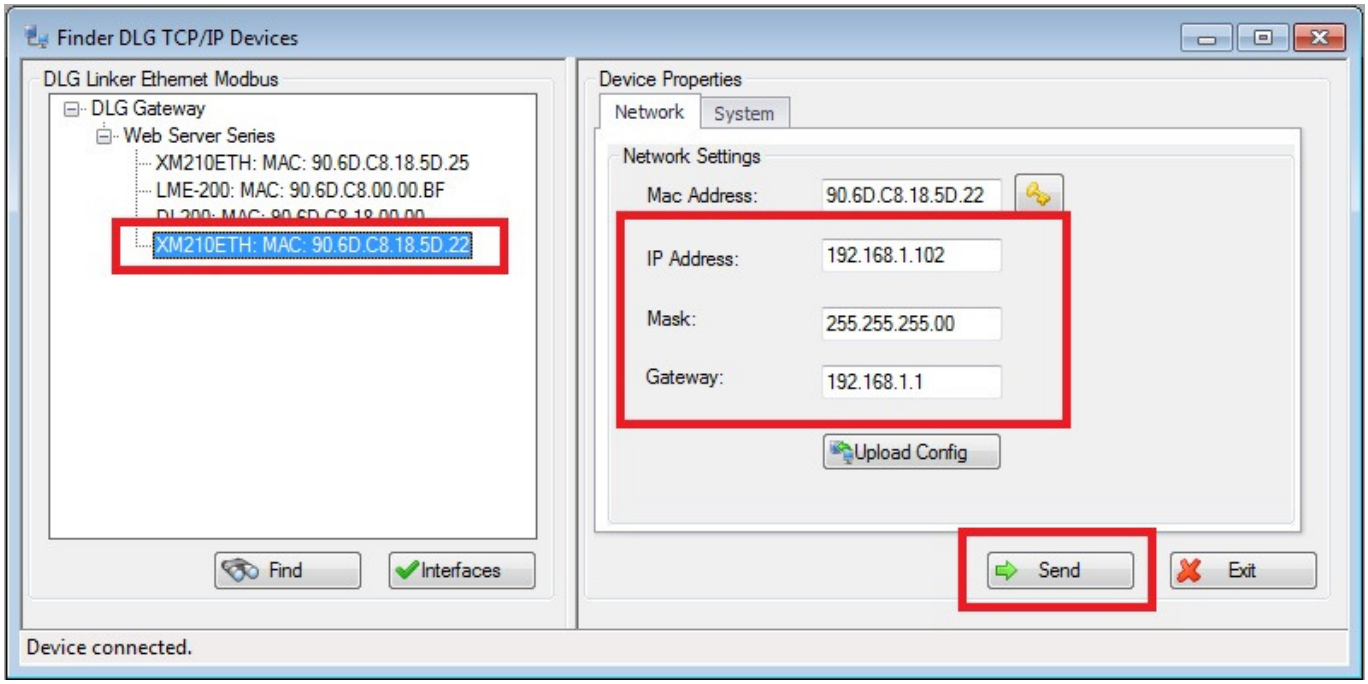
RS-485 interface

- Address: 1
- Baud rate: 19200 bps
- Parity: no parity

The Ethernet interface settings can be changed via the DLG Tools software, by selecting the option Ferramentas -> Gateway or the Gateway icon  in the toolbar.



Click the “Find” button and wait while DLG Tools find the equipments accessible in the network.

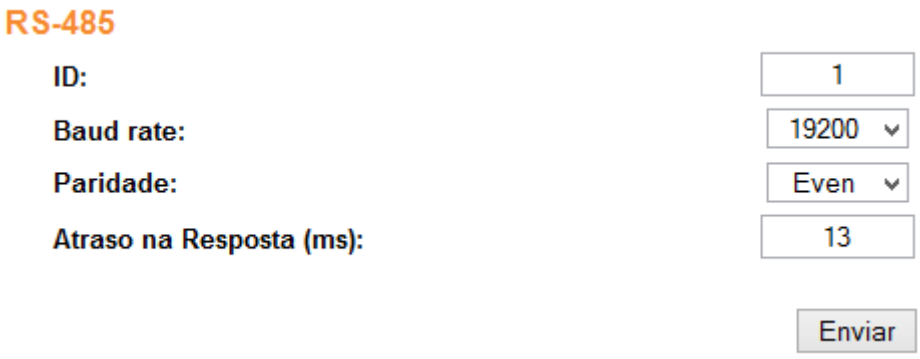


Select the XM-210 ETH which is to have its communication parameters changed. After changing the parameters, click the “Send” button. The RUN LED of the XM-210 ETH immediately starts to blink, until the parameters are effectively changed, when the RUN LED stops blinking.

It is also possible to change the Ethernet settings via the webserver, through the *Configuration* page.

The “Send” button sends the new settings to the equipment. The RUN LED of the XM-210 ETH blinks until the parameter changing is finished.

The RS-485 settings can also be changed via the webserver.



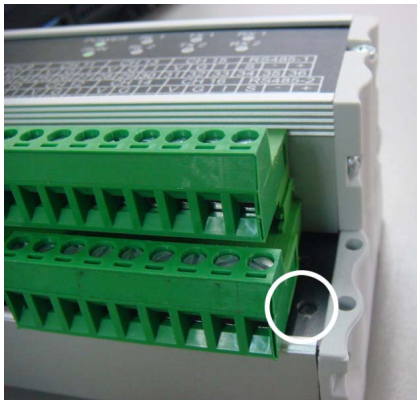
The RS-485 port settings are immediately changed when the “Send” button is clicked.

Ethernet switch

The two Ethernet interfaces comprise a switch. It is possible to connect several XM-210 ETH in a topology known as “daisy chain”, where the equipments are directly interconnected, in a different way as the “star” topology, where the equipments are connected to a central switch.

It is by no means mandatory to use both interfaces, as the equipment operates normally when just one interface is used. The interfaces are functionally identical, giving the user freedom to choose which one will be used.

Reset



The reset mode is useful to restore the TCP/IP settings to its factory default values. The equipment can be reset by pressing the “RST ID” button, located in the lower right section, as shown in the picture.

After pressing the reset button, the RUN LED starts blinking, indicating that the TCP/IP settings are being restored. When the LED stops blinking, the equipment is restored to the factory defaults:

- IP: 192.168.1.100
- Mask: 255.255.255.0
- Gateway: 192.168.1.1

Note: *neither the RS-485 interface settings nor the channel input type settings are changed by the reset mode.*

SNMP

The XM-210 ETH supplies management and diagnostic data through SNMP (Simple Network Management Protocol). The table below details important features regarding the protocol support.

Version	V1
Community	public
Available services	GetRequest, SetRequest, GetNextRequest
Maximum number of variables per request	1

The available management and diagnostic data supplied by the XM-210 ETH are standardized according to RFC 1213 [1].

Modbus table

Address	Mnemonic	Description
40001	EAI1	Channel 1 – analog input
40002	EAI2	Channel 2 – analog input
40003	EAI3	Channel 3 – analog input
40004	EAI4	Channel 4 – analog input
40005	EAI5	Channel 5 – analog input
40006	EAI6	Channel 6 – analog input
40007	EAI7	Channel 7 – analog input
40008	EAI8	Channel 8 – analog input
40009	EAI9	Channel 9 – analog input
40010	EAI10	Channel 10 – analog input
40011	EAI11	Channel 11 – analog input
40012	EAI12	Channel 12 – analog input
40013	EAI13	Channel 13 – analog input
40014	EAI14	Channel 14 – analog input
40015	EAI15	Channel 15 – analog input
40016	EAI16	Channel 16 – analog input
40017	MSA1	Alarm 1 status, channels 1-16
40018	MSA2	Alarm 2 status, channels 1-16
40019	SR01	Relay 1 and 2 status
40020	STDIV	Digital input 1 and 2 status and memory error
40021	TAMB	Room temperature
40022	R101	Relay deactivation 1=relay 1, 2=relay 2 Relay activation 4=relay 1, 8=relay 2
40023	ID	Equipment Modbus RTU address
40024	RES	Reserved
40025	RES	Reserved
40026	RES	Reserved
40027	BR1	RS-485 port baud rate
40028	PAR1	RS-485 port parity
40029	DR1	RS-485 port response delay
40030	TS01	Sensor type channel 1
40031	TS02	Sensor type channel 2
40032	TS03	Sensor type channel 3
40033	TS04	Sensor type channel 4
40034	TS05	Sensor type channel 5
40035	TS06	Sensor type channel 6
40036	TS07	Sensor type channel 7

40037	TS08	Sensor type channel 8
40038	TS09	Sensor type channel 9
40039	TS10	Sensor type channel 10
40040	TS11	Sensor type channel 11
40041	TS12	Sensor type channel 12
40042	TS13	Sensor type channel 13
40043	TS14	Sensor type channel 14
40044	TS15	Sensor type channel 15
40045	TS16	Sensor type channel 16
40046	OF01	Channel 1 offset
40047	OF02	Channel 2 offset
40048	OF03	Channel 3 offset
40049	OF04	Channel 4 offset
40050	OF05	Channel 5 offset
40051	OF06	Channel 6 offset
40052	OF07	Channel 7 offset
40053	OF08	Channel 8 offset
40054	OF09	Channel 9 offset
40055	OF10	Channel 10 offset
40056	OF11	Channel 11 offset
40057	OF12	Channel 12 offset
40058	OF13	Channel 13 offset
40059	OF14	Channel 14 offset
40060	OF15	Channel 15 offset
40061	OF16	Channel 16 offset
40062	IH01	Max engineering unit channel 1
40063	IH02	Max engineering unit channel 2
40064	IH03	Max engineering unit channel 3
40065	IH04	Max engineering unit channel 4
40066	IH05	Max engineering unit channel 5
40067	IH06	Max engineering unit channel 6
40068	IH07	Max engineering unit channel 7
40069	IH08	Max engineering unit channel 8
40070	IH09	Max engineering unit channel 9
40071	IH10	Max engineering unit channel 10
40072	IH11	Max engineering unit channel 11
40073	IH12	Max engineering unit channel 12
40074	IH13	Max engineering unit channel 13
40075	IH14	Max engineering unit channel 14
40076	IH15	Max engineering unit channel 15
40077	IH16	Max engineering unit channel 16
40078	IL01	Min engineering unit channel 1
40079	IL02	Min engineering unit channel 2
40080	IL03	Min engineering unit channel 3

40081	IL04	Min engineering unit channel 4
40082	IL05	Min engineering unit channel 5
40083	IL06	Min engineering unit channel 6
40084	IL07	Min engineering unit channel 7
40085	IL08	Min engineering unit channel 8
40086	IL09	Min engineering unit channel 9
40087	IL10	Min engineering unit channel 10
40088	IL11	Min engineering unit channel 11
40089	IL12	Min engineering unit channel 12
40090	IL13	Min engineering unit channel 13
40091	IL14	Min engineering unit channel 14
40092	IL15	Min engineering unit channel 15
40093	IL16	Min engineering unit channel 16
40094	PD01	Decimal point channel 1
40095	PD02	Decimal point channel 2
40096	PD03	Decimal point channel 3
40097	PD04	Decimal point channel 4
40098	PD05	Decimal point channel 5
40099	PD06	Decimal point channel 6
40100	PD07	Decimal point channel 7
40101	PD08	Decimal point channel 8
40102	PD09	Decimal point channel 9
40103	PD10	Decimal point channel 10
40104	PD11	Decimal point channel 11
40105	PD12	Decimal point channel 12
40106	PD13	Decimal point channel 13
40107	PD14	Decimal point channel 14
40108	PD15	Decimal point channel 15
40109	PD16	Decimal point channel 16
40110	H101	Alarm 1 hysteresis channel 1
40111	H102	Alarm 1 hysteresis channel 2
40112	H103	Alarm 1 hysteresis channel 3
40113	H104	Alarm 1 hysteresis channel 4
40114	H105	Alarm 1 hysteresis channel 5
40115	H106	Alarm 1 hysteresis channel 6
40116	H107	Alarm 1 hysteresis channel 7
40117	H108	Alarm 1 hysteresis channel 8
40118	H109	Alarm 1 hysteresis channel 9
40119	H110	Alarm 1 hysteresis channel 10
40120	H111	Alarm 1 hysteresis channel 11
40121	H112	Alarm 1 hysteresis channel 12
40122	H113	Alarm 1 hysteresis channel 13
40123	H114	Alarm 1 hysteresis channel 14
40124	H115	Alarm 1 hysteresis channel 15

40125	H116	Alarm 1 hysteresis channel 16
40126	H201	Alarm 2 hysteresis channel 1
40127	H202	Alarm 2 hysteresis channel 2
40128	H203	Alarm 2 hysteresis channel 3
40129	H204	Alarm 2 hysteresis channel 4
40130	H205	Alarm 2 hysteresis channel 5
40131	H206	Alarm 2 hysteresis channel 6
40132	H207	Alarm 2 hysteresis channel 7
40133	H208	Alarm 2 hysteresis channel 8
40134	H209	Alarm 2 hysteresis channel 9
40135	H210	Alarm 2 hysteresis channel 10
40136	H211	Alarm 2 hysteresis channel 11
40137	H212	Alarm 2 hysteresis channel 12
40138	H213	Alarm 2 hysteresis channel 13
40139	H214	Alarm 2 hysteresis channel 14
40140	H215	Alarm 2 hysteresis channel 15
40141	H216	Alarm 2 hysteresis channel 16
40142	C101	Alarm 1 conditions channel 1
40143	C102	Alarm 1 conditions channel 2
40144	C103	Alarm 1 conditions channel 3
40145	C104	Alarm 1 conditions channel 4
40146	C105	Alarm 1 conditions channel 5
40147	C106	Alarm 1 conditions channel 6
40148	C107	Alarm 1 conditions channel 7
40149	C108	Alarm 1 conditions channel 8
40150	C109	Alarm 1 conditions channel 9
40151	C110	Alarm 1 conditions channel 10
40152	C111	Alarm 1 conditions channel 11
40153	C112	Alarm 1 conditions channel 12
40154	C113	Alarm 1 conditions channel 13
40155	C114	Alarm 1 conditions channel 14
40156	C115	Alarm 1 conditions channel 15
40157	C116	Alarm 1 conditions channel 16
40158	C201	Alarm 2 conditions channel 1
40159	C202	Alarm 2 conditions channel 2
40160	C203	Alarm 2 conditions channel 3
40161	C204	Alarm 2 conditions channel 4
40162	C205	Alarm 2 conditions channel 5
40163	C206	Alarm 2 conditions channel 6
40164	C207	Alarm 2 conditions channel 7
40165	C208	Alarm 2 conditions channel 8
40166	C209	Alarm 2 conditions channel 9
40167	C210	Alarm 2 conditions channel 10
40168	C211	Alarm 2 conditions channel 11

40169	C212	Alarm 2 conditions channel 12
40170	C213	Alarm 2 conditions channel 13
40171	C214	Alarm 2 conditions channel 14
40172	C215	Alarm 2 conditions channel 15
40173	C216	Alarm 2 conditions channel 16
40174	T101	Alarm 1 wait time channel 1
40175	T102	Alarm 1 wait time channel 2
40176	T103	Alarm 1 wait time channel 3
40177	T104	Alarm 1 wait time channel 4
40178	T105	Alarm 1 wait time channel 5
40179	T106	Alarm 1 wait time channel 6
40180	T107	Alarm 1 wait time channel 7
40181	T108	Alarm 1 wait time channel 8
40182	T109	Alarm 1 wait time channel 9
40183	T110	Alarm 1 wait time channel 10
40184	T111	Alarm 1 wait time channel 11
40185	T112	Alarm 1 wait time channel 12
40186	T113	Alarm 1 wait time channel 13
40187	T114	Alarm 1 wait time channel 14
40188	T115	Alarm 1 wait time channel 15
40189	T116	Alarm 1 wait time channel 16
40190	T201	Alarm 2 wait time channel 1
40191	T202	Alarm 2 wait time channel 2
40192	T203	Alarm 2 wait time channel 3
40193	T204	Alarm 2 wait time channel 4
40194	T205	Alarm 2 wait time channel 5
40195	T206	Alarm 2 wait time channel 6
40196	T207	Alarm 2 wait time channel 7
40197	T208	Alarm 2 wait time channel 8
40198	T209	Alarm 2 wait time channel 9
40199	T210	Alarm 2 wait time channel 10
40200	T211	Alarm 2 wait time channel 11
40201	T212	Alarm 2 wait time channel 12
40202	T213	Alarm 2 wait time channel 13
40203	T214	Alarm 2 wait time channel 14
40204	T215	Alarm 2 wait time channel 15
40205	T216	Alarm 2 wait time channel 16
40206	S101	Alarm 1 setpoint channel 1
40207	S102	Alarm 1 setpoint channel 2
40208	S103	Alarm 1 setpoint channel 3
40209	S104	Alarm 1 setpoint channel 4
40210	S105	Alarm 1 setpoint channel 5
40211	S106	Alarm 1 setpoint channel 6
40212	S107	Alarm 1 setpoint channel 7

40213	S108	Alarm 1 setpoint channel 8
40214	S109	Alarm 1 setpoint channel 9
40215	S110	Alarm 1 setpoint channel 10
40216	S111	Alarm 1 setpoint channel 11
40217	S112	Alarm 1 setpoint channel 12
40218	S113	Alarm 1 setpoint channel 13
40219	S114	Alarm 1 setpoint channel 14
40220	S115	Alarm 1 setpoint channel 15
40221	S116	Alarm 1 setpoint channel 16
40222	S201	Alarm 2 setpoint channel 1
40223	S202	Alarm 2 setpoint channel 2
40224	S203	Alarm 2 setpoint channel 3
40225	S204	Alarm 2 setpoint channel 4
40226	S205	Alarm 2 setpoint channel 5
40227	S206	Alarm 2 setpoint channel 6
40228	S207	Alarm 2 setpoint channel 7
40229	S208	Alarm 2 setpoint channel 8
40230	S209	Alarm 2 setpoint channel 9
40231	S210	Alarm 2 setpoint channel 10
40232	S211	Alarm 2 setpoint channel 11
40233	S212	Alarm 2 setpoint channel 12
40234	S213	Alarm 2 setpoint channel 13
40235	S214	Alarm 2 setpoint channel 14
40236	S215	Alarm 2 setpoint channel 15
40237	S216	Alarm 2 setpoint channel 16
40238	MA11	Alarm 1 relay 1 mask
40239	MA12	Alarm 1 relay 2 mask
40240	MA21	Alarm 2 relay 1 mask
40241	MA22	Alarm 2 relay 2 mask
40242	FREQ1	Max frequency for eng. unit channel 1
40243	FREQ2	Max frequency for eng. unit channel 2
40244	FREQ3	Max frequency for eng. unit channel 3
40245	FREQ4	Max frequency for eng. unit channel 4

Modbus register details

Status – 40020	
Bit	**Function**
0	Digital input 1
1	Digital input 2
2	Error reading calibration memory (0 = OK; 1= Failure)

Baud Rate – 40027	
Value	**Rate**
0	1200
1	2400
2	4800
3	9600
4	19200
5	38400
6	57600
7	115200

Parity – 40028	
Value	**Parity**
0	EVEN
1	ODD
2	NONE

Response delay – 40029		
Max value	**Min value**	**Step**
100	0	1 ms
Minimum delays for each baud rate:		
1200: 6 2400: 4 4800: 3 9600: 2		19200:2 38400:2 57600:2 115200: 2

Alarm conditions 40142 ~ 40158	
Index	**Condition**
0	Low
1	High
2	Differential
3	Inoperative

Relay reset ~ 40022		
Value	**Index**	**Action**
1	0000 0001	Deactivate relay 1
2	0000 0010	Deactivate relay 2
3	0000 0100	Activate relay 1
4	0000 1000	Activate relay 2

Sensor type 40030 ~ 40045	
Type	**Value**
J	0
K	1
T	2
R	3
S	4
E	5
N	6
B	7
Pt100	8
0 – 20 mA	9
4 – 20 mA	10
0 – 75 mV	11
0 – 5 V	12
0 – 10 V	13
Logic	14
No input	15
Frequency	16

Recommendations

It is recommended to only use appropriate tools for the XM-210 ETH installation and maintenance.

<table>
<tr><td>It is necessary to use a “terminal” type screwdriver for terminal connection or 1/8 with 3 mm maximum diameter, as it is the ideal format and will not damage the connection aperture.</td><td> 
Inappropriate screwdriver</td><td> 
Recommended screwdriver</td></tr>
<tr><td>It is recommended to crimp all the wires that will be connected to the XM-210 ETH with a pre-isolated “needle” type or “eyelet” terminal for cables of 0.5 ~ 1.5 mm^2.</td><td colspan="2">Needle terminal  Eyelet terminal  </td></tr>
</table>

Ethernet cable and connectors specification

In order to minimize electromagnetic interference effects, it is recommended to use Ethernet cables and connectors with the following specifications:

Cable	Twisted pair, four pairs, 24 AWG, 5e category, shielded (F/UTP), maximum length of meters
RJ45 connector	Male, shielded

Warranty

The manufacturer assures to equipment owners, identified by the purchase invoice, 1 (one) year warranty as follows:

1. The warranty period begins with the invoice issuing.

2. Within the warranty period, the labor and parts for repairing normal use damage are free.

3. For repairs, send the equipment along with the shipping invoices to our factory in Sertãozinho. DLG's address is available at the of this user manual.

4. The owner is responsible for transportation costs and risks.

5. Warranty will be automatically voided if changes are made to the equipment by non-authorized personnel, defects caused by mechanical shock, exposure to conditions unfit for use or tampering with the product.

6. DLG disclaims any charge related to unauthorized repairing or replacements due to failures caused by agents external to the equipment, the improper use of them and as a result of unforeseeable circumstances or major forces.

7. DLG ensures full operation of the equipment described herein.

Copyright note

This product makes use of the open source software components:

FreeRTOS	www.freertos.org
lwIP	Copyright (c) 2001-2004 Swedish Institute of Computer Science. All rights reserved.

References

[1] RFC 1213 – Management Information Base for Network Management of TCP/IP-based internets: MIB-II (http://www.ietf.org/rfc/rfc1213.txt)

Notes

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UNIVERSAL REMOTE ETHERNET
XM-210 ETH