

## Product Description

The AL-3414 Ethernet interface allows the connection of Altus' PLCs to open networks that follow TCP/IP standard. It permits the communication between Altus' PLCs (AL Series) and other equipments that communicate through Ethernet TCP/IP protocol with ALNET II or MODBUS application levels.

Besides that, this interface offers support to redundant communication, conferring to the CPU a new characteristic: network or interface fault tolerance.

The module has a 10/100Base-TX electrical interface, through a RJ45 female shielded connector, UTP (unshielded twisted pair) standard, category 5, supporting also ScTP (screened twisted pair) shielded cables, with the advantage to improve its immunity to external noise.



Its main features are:

- Allows multi master communication between CLPs for control tasks simultaneously with MMI, supervision softwares and MasterTool programmer
- Communication with supervisory systems through pooling or through exception (unsolicited messages), using the ALNET II over TCP/IP protocol
- Communication through MODBUS TCP/IP or MODBUS RTU over TCP/IP protocol, simultaneously in client and server mode
- Supports redundant communication, attributing to the CP a characteristic of network fault tolerance
- Compatible with AL-2004 CPUs
- 10/100Base-TX Ethernet physical layer, UTP standard, supporting ScTP, and network speed auto detection
- TCP/IP transport and net protocols
- ALNET II over TCP/IP, MODBUS TCP/IP e MODBUS RTU over TCP/IP protocol applications levels (MODBUS TCP/IP and MODBUS RTU over TCP/IP protocols can't be used simultaneously, so it's needed to select one of them)
- Client mode of MODBUS TCP/IP protocol supports multi-request messages (limited to single-request when MODBUS RTU over TCP/IP protocol is selected)
- Server and client modes of ALNET II and MODBUS TCP/IP protocols with support to TCP/IP messages with multiples applications packages
- Configuration though MasterTool programmer
- Diagnostic available for the application in operands
- State indication through LEDs on panel and in RJ45 connector
- It substitutes the AL-3412 Ethernet interface, offering a significant increase of the availability of communication through the redundancy characteristic, when used to the pairs
- Humidity and water condensation tolerance, because of a special process of coating

## Ordering Information

### Included Items

The product packing contains the following parts:

- AL-3414 module
- Installation guide

### Product Code

The following part number must be used when ordering the product:

Part Number	Description
AL-3414	Redundant MODBUS TCP Ethernet Interface

## Related Items

To use the AL-3414 interface, the following products are needed for configure a typical minimum system:

- Rack
- Power supply
- CPU AL-2004
- MasterTool programmer

To implement redundant communication systems, the AL-3414 Ethernet interfaces must be used in pairs.

More complete systems may be configured with the following products:

- I/O digital modules
- I/O analog modules
- Bus expansion Interfaces
- PROFIBUS Interfaces
- Serial protocol interfaces
- Redundancy co-processors and remote I/O
- Multitask co-processors

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## Characteristics

The TCP/IP Ethernet channel of the AL-3414 interface turns possible to connect programmable controllers on communication networks to change data with other controllers, supervisory systems and with MasterTool programmer.

The protocols supported by the interface are:

- ALNET II over TCP/IP, compatible with the other Ethernet interfaces of Altus and with other supervisory systems;
- MODBUS TCP/IP or MODBUS RTU over TCP/IP, modes client e server, compatible with many supervisory systems, man-machines interfaces, gateways and programmable controllers of the world market.

The AL-2004 CPU supports up to 8 AL-3414 interfaces in it bus, being able the same ones to operate in independent form or redundant form when in pairs. Only one interface, or one redundant par, can be configured to use the ALNET II over TCP/IP protocol. If used with other Ethernet interface in the same bus (AL-3405 or AL-3412), its impossible to enable the ALNET II protocol in the AL-3414 interfaces.

Differently, the MODBUS protocol can be enabled in all AL-3414 interfaces or redundant AL-3414 par interfaces inserted in the bus, also in the same interface with ALNET II over TCP/IP enabled.

### ATTENTION:

The AL-3414 Ethernet interface has a 10/100Base-TX physical layer, UTP standard, being necessary the use of hubs, switches or transceivers to implement the network. The easy identification of defective links is one advantage of these type of architecture. A eventual disruption of one UTP cable doesn't affect the others connections.

Always that necessary a bigger availability of communication with the CLP, across the network, it's recommended the use of the AL-3414 interface in its redundant configuration.

## General Characteristics

	AL-3414
Network interface	Physical level Ethernet 10/100Base-TX, UTP standard, supporting also ScTP, and RJ45 shielded female connector
Memory	1 Mbytes of code (Flash) 1 Mbytes of data (RAM)
CLP interface	DMA for CPU memory accessing
Transfer data rate	2 Mbytes/s for CPU memory
State indication	4 LEDs on panel 2 LEDs on RJ45 connector
Diagnose indication	LEDs CPU operands
Configurable parameters	Through MasterTool Programming
Auto testing	Executed on module start up
Operation temperature	0 a 60 °C (exceeds IEC 1131 standard)
Storage temperature	-25 a 75 °C (according IEC 1131 standard)
Operation humidity	5 a 95% without condensation (according IEC 1131 standard RH2 level)
Weight	0,5 Kg
Physical dimensions	261,6 x 30,4 x 183,0 mm (H x W x D)

### Notes:

#### Network interface:

- The AL-2004 supports only one Ethernet interface in it bus with the ALNET II over TCP/IP protocol active.
- We can't activate, simultaneously, the MODBUS TCP/IP and MODBUS RTU over TCP/IP protocols. It's necessary to select one of them during the configuration.

## Electrical Characteristics

	AL-3414
Bus power consumption	600 mA @ 5 Vdc
Power dissipation	3 W
Electrical chock protection	According to IEC 536 (1976) standard, class I

## Connection Characteristics

	AL-3414
Connector type	RJ45 shielded female
Baud rate	10/100 Mbps
Cabling	UTP or ScTP, category 5
Distance	100 m
Diagnose	LEDs green and orange

## Software Characteristics

	AL-3414
Link level	LLC (logical link control)
Network level	IP (internet protocol)
Transport level	TCP (transmission control protocol)
Application level	ALNET II over TCP/IP (by Altus) MODBUS TCP/IP MODBUS RTU over TCP/IP
Connection mode	Client Server
Server port	405 for ALNET II over TCP/IP 502 for MODBUS TCP/IP e MODBUS RTU over TCP/IP
Maximum number of connections	128
Redundancy	Altus technology
Configuration	MasterTool Programming
Control	CPU operands
Diagnose	CPU operands

## Compatibility

The AL-3414 Ethernet Interface is compatible with these versions of CPU and programmer:

	Compatible Version
UCP AL-2004	2.30
MasterTool Programming	4.00

The next table describes the AL-3414 Ethernet Interface compatibility, considering the ALNET II over TCP/IP protocol, with the programmers and the principals communication drivers of supervisory systems.

Product	Description	Compatibility
MT4000 MT4100	MasterTool Programming	Yes
AL-2781	ALNET – Windows NT for FIX-DMACS Driver	Yes
AL-2784	OPC Ethernet ALNET II Communication Driver	<b>Not</b>
AL-2785	OPC Ethernet ALNET II Communication Driver	Yes
AL-2786	Driver for Supervisory VXL: <ul style="list-style-type: none"> <li>• Until the version 2.00</li> <li>• Version 2.00 or grater</li> </ul>	<b>Not</b> Yes
ElipseSCADA	Elipse SCADA Driver	Yes
ALTCP1	Scan Driver for InTouch	Yes

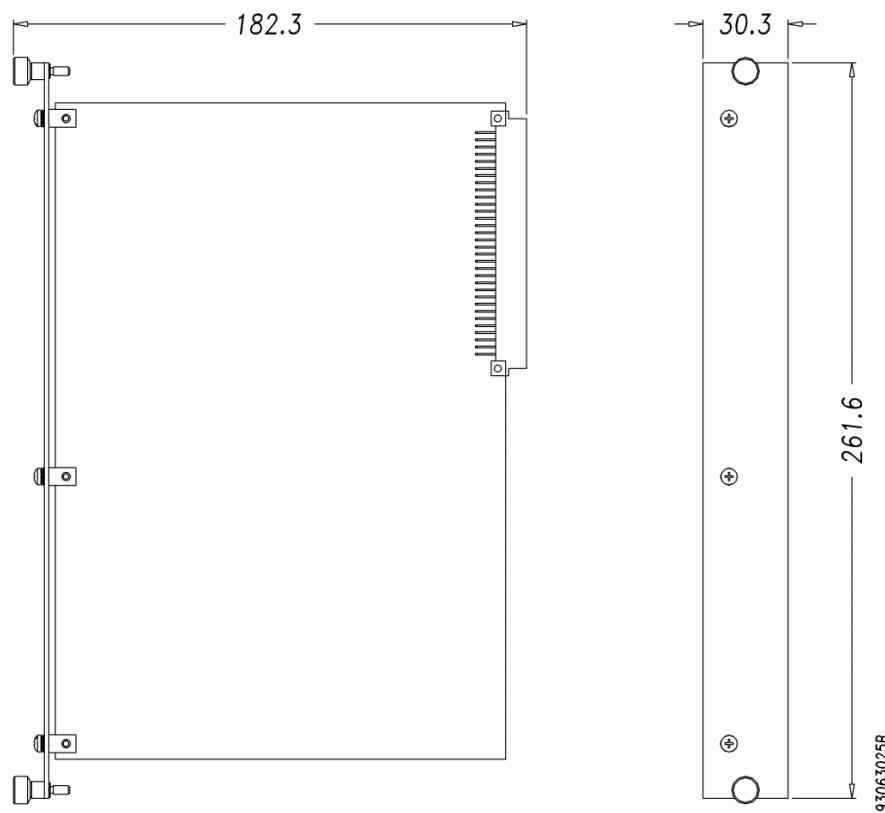
### Notes:

**Scan Driver for InTouch:** The compatibility depends of the driver configuration. The data message length, configurable on the driver through the parameter *Register ReadSize*, can't be grater than 220 bytes to be compatible.

The MODBUS TCP/IP protocol, implemented in the AL-3414 Ethernet Interface, follows the standard established by the responsible organization - Modbus-IDA - ([www.modbus.org](http://www.modbus.org)), being compatible with any another equipment that follows the same standard.

## Physicals Dimensions

Dimensions in millimeters.



## Manuals

For further technical details, configuration, installation and programming of AL-2000 Series products please consult following documents:

Document Code	Description
MU202002	AL-3414 Utilization Manual
MU207011	AL-2002/AL-2003/AL-2004 Utilization Manual
MU299025	MasterTool Programming - Utilization Manual
MP399100	MasterTool Programming - Program Manual
NAP103	Application Note - Ethernet Network Configuration