Product Description

The AL-2434 module connects asset management stations to PROFIBUS network through the PROFIBUS-DPV1 protocol. This module complements the Altus solution for asset management, thus allowing the connection between a client hosted on a management station and a PROFIBUS-DP network, which employs the HART on PROFIBUS network profile. Since the fieldbus is responsible for the industrial plant process control, the module allows accessing the assets information without interfering in the PROFIBUS network determinism. It operates as a class II master network PROFIBUS-DP and makes use of the Protocol DPV1 extension to access the remotes with this feature.

The AL-2434 has the following features:

- Operates as class II PROFIBUS master, accessing the remotes with HART devices or other PROFIBUS assets
- Monitors the status of the devices connected to the PROFIBUS network
- Supports FDT/DTM and EDDL technologies
- Central setup of field devices, calibration and diagnostics via setup tools, such as: FieldCare provided by Endress+Hauser, FieldMate provided by Yokogawa, PACTware or Emerson AMS Suite
- Independence of process control system or PLC manufacturer
- Resource management support for smart devices
- Ensures the PROFIBUS network determinism
- PROFIBUS network complete diagnosis through bundling web Server
- Supports DHCP protocol

Ordering Information

Included Items

The product package contains the following items:

- AL-2434
- Installation Guide

Product Code

The following code should be used to purchase the product:

Code	Denomination
AL-2434	Asset Management DPV1 Scanner

Related Products

The following products must be purchased separately when necessary:

Code	Denomination
AL-2303	Type A PROFIBUS network cable
AL-2601	Derivator connector for PROFIBUS network
AL-2602	Terminator connector for PROFIBUS network

Notes

AL-2303: standardized cable for installing PROFIBUS network. No other cable should be used for this type of network.

AL-2601: derivator connector which is used to connect the module to the PROFIBUS network, in case the termination is not necessary (module in the middle of the network segment).

AL-2602: this derivator connector is employed to connect the module to the PROFIBUS network, in case the termination is necessary (module at both ends of the network segment).

General Features

	AL-2434
Module type	DPV1 Scanner
Ethernet interface	RJ45 (10/100Base-TX)
PROFIBUS interface	DB9 (RS-485)
Diagnosis indications	Ethernet interface LEDs, LED ETH, LED RUN, LED PB
Power supply voltage	19.2 to 28.8 Vdc
Maximum current per point	200 mA
Dissipated power	3.7 W
PROFIBUS transfer rate	PROFIBUS network access mode: from 9.6 Kbps to 12 Mbps Integrated PROFIBUS access mode: from 9.6 Kbps to 1.5 Mbps
Operation temperature	0 to 50 °C
Storage temperature	0 to 50 °C
Operation humidity	20 to 80% relative humidity, no condensation
Installation	35 mm DIN rail
Front panel protection	IP20
Dimensions	22.5 x 99.0 x 114.5 mm
Weight	120 g (approximately)

Notes

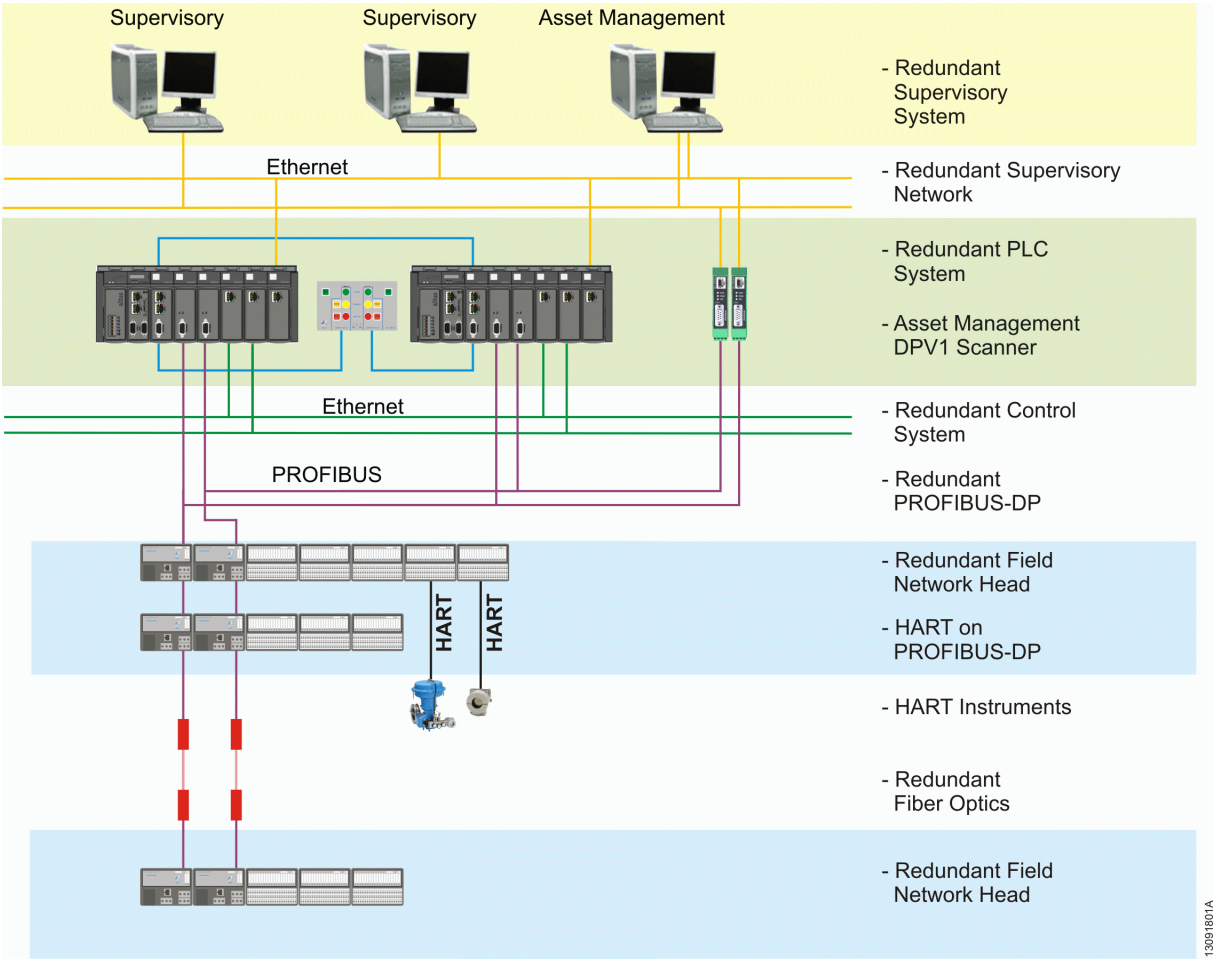
Dimensions: the dimensions presented in the table represent respectively: width x height x depth.

System Requirements for AL-2434 Use

	System Requirement
Operating system	Windows 2000, XP or Server 2003 (software application dependent on the operating system)
Browser	Internet Explorer 6, 7 or equivalent software
Applications	Applications for PROFIBUS setup
Enabled ports	80 and 2364

HART Architecture on PROFIBUS for Asset Management

The following architecture shows a system of redundant PLCs using two modules AL-2434 to manage HART instruments. The remote bus heads are PO5064 or PO5065 PROFIBUS, which send information to the PO1114 input and PO2134 output HART analog modules, which manage this data and effectively establish the communication with HART devices connected to PROFIBUS remote HART modules.



Configuration in Ethernet Channel

Depending on the Ethernet network employed, there are two connection options for the device:

- Ethernet network with a DHCP server, enabling automatic and dynamic allocation of IP addresses or Ethernet network with manual allocation of IP addresses. Both connections are conducted with Ethernet cable network via hub or switch.
- Point-to-point Ethernet network, allowing manual allocation of IP addresses. The connection is conducted via Ethernet network cable.

Connection on a DHCP Network (Dynamic Host Configuration Protocol)

When a device is adjusted to operate on an Ethernet network with a DHCP server, an IP address is automatically assigned to it. This operation mode does not require adjustments.

> ATTENTION:
> The routine for DHCP identification runs only during the device initialization. If the Ethernet connection is performed with the power supply already connected, a failure can occur and the DHCP will not be identified. Restart the source for a DHCP new identification.

Connection on a IP Manual Assignment Network

The following settings are required for devices on an Ethernet network without a DHCP server:

- TCP/IP adjustments for this network
- A computer with web browser
- An Ethernet cable network between the computer and the device (point-to-point connection) or an Ethernet network cable via hub or switch (connection on an Ethernet network)

> ATTENTION:
> The computer and the device must be on the same subnet.

> ATTENTION:
> Always consult your system administrator before allocating IP addresses.
> If the same address is assigned more than once, other devices on the network may be disabled and therefore affect communication.

	Manufacturer Setup
IP address	169.254.0.1
Subnet mask	255.255.0.0
Default gateway	0.0.0.0

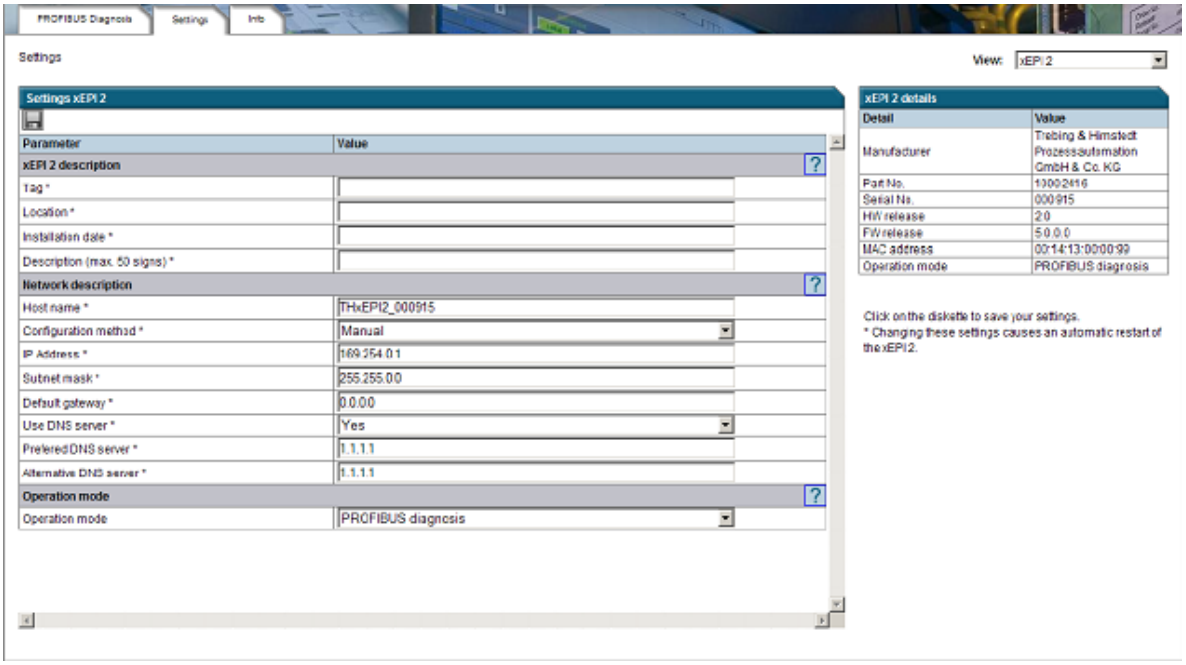
Determining Network Addresses

Check with the system administrator as for IP addresses or follow these steps:

- Connect the computer to an Ethernet network to which the device is integrated
- Start the command prompt via menu *Start, Programs* and *Accessories*
- Type *ipconfig–all-*
- All settings on this network should be displayed. Write down the *Subnet Mask* and *Default Gateway* fields settings

Assigning New IP and Network Addresses

- Connect an Ethernet network cable to the device
- Connect the computer to the Ethernet network cable
- Open a web browser on the computer
- Enter the following IP address: *http://169.254.0.1* (valid when changing the manufacturer IP address) and press *ENTER*. The AL-2434 webpage must be loaded and will open a window. Read carefully the information and then close the window
- Click on the tab *Settings*. The device information will be displayed in the web browser
- Select *Manual* in the *Configuration method*, on the tab *Network description*
- Type the new IP address into *the IP address* field
- Enter the new value for *Subnet mask* and *Default gateway* into the text fields
- Write down the IP address set
- To use a DNS server, type in the IP addresses. Otherwise, select the option *No*
- Click on the disk icon to save the settings. The device will reboot afterwards



ATTENTION:

The device saves the settings. Write down the IP address set. Access to the device configuration page can only be carried out by using this new address.

After changing the TCP/IP setting properties, the device always starts with the last saved configuration even if the power supply has been disconnected for a short period of time.

Checking the Ethernet Connection Up to the Device

You can check the device on your Ethernet network only if:

- The device is integrated with the Ethernet network
- The device is powered
- The computer is on the same Ethernet network

Procedures

Start the web browser on your computer:

- Via DHCP: enter the default host name (formed by THxEPI2_+ serial number) located on the device type label (e.g. THxEPI2_000915) and then press *ENTER*
- IP manual setup: enter the fixed IP address (manufacturer IP 169.254.0.1 0.1 or the last saved IP) and press *ENTER*

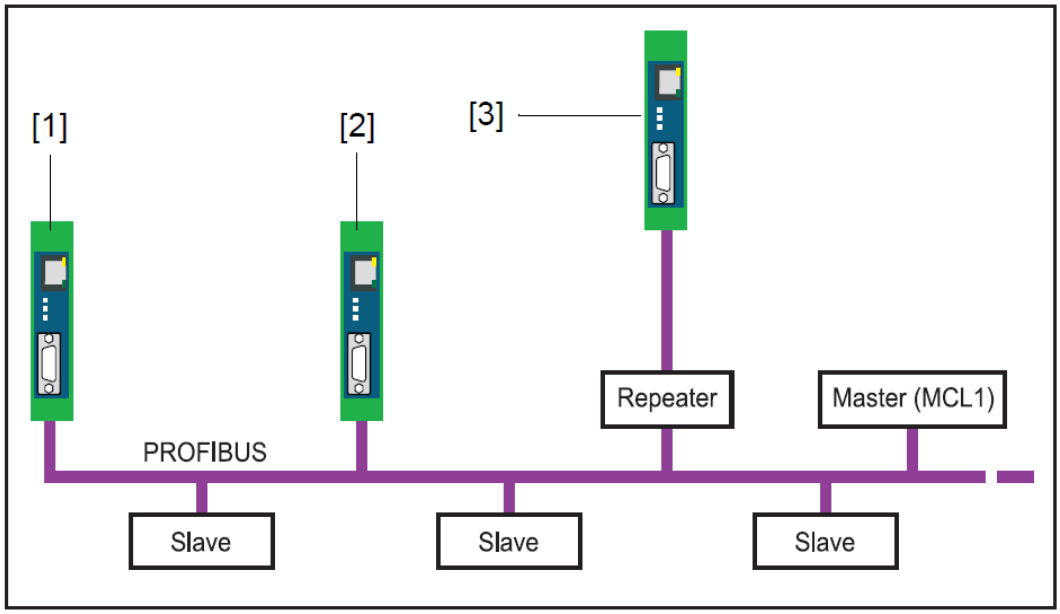
The PROFIBUS network information is shown in the web browser.

Connecting PROFIBUS

The DB9 connector is used for this connection.

- Use only default PROFIBUS cables and connectors
- Connect the cable PROFIBUS connector to the device connector, observing the correct pin assignment
- Fasten the connector with screws
- If the device is installed either at the beginning or at the end of the PROFIBUS cable segment, it is necessary to use a termination resistor (see "Bus Termination Resistors" below) or use termination connectors
- When termination connectors are used, select the key to the bus termination resistor on the PROFIBUS connector in order to reach the required position (on/off)

ATTENTION:
Do not use connection deviation lines. If local conditions do not allow direct connection, use a Repeater (and do the connection according to the PROFIBUS standard).

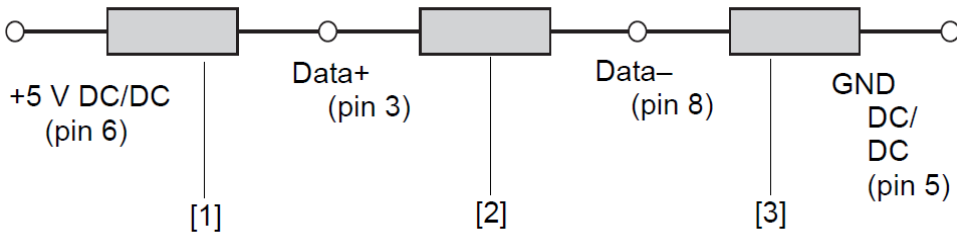


The previous diagram shows the connection possibilities on a PROFIBUS network:
1 - Initial/end bus connection with termination resistor
2 - Connection in the middle of segment 1 PROFIBUS
3 - Connection in a separate PROFIBUS segment after the Repeater

Bus Termination Resistors

Each one of the terminations in a PROFIBUS segment must be ended with a terminator resistor. Use standard plugs containing terminator resistors.
The following diagram displays the bus terminator setup for PROFIBUS (according to IEC 61158):

1 - 390 Ω pull-up resistor, from pin 3 up to the power supply voltage in pin 6
2 - 220 Ω termination cable resistor, between pins 3 and 8
3 - 390 Ω pull-down resistor, from pin 8 up to the potential of data reference in pin 5



ATTENTION:

The PROFIBUS connection is off if the device is used with a passive terminator resistor (device power supply voltage) and the device is disconnected. This may cause the interruption or the complete failure of the PROFIBUS communication.

Use active resistors to avoid this problem. In this case, the termination resistors are fed with +5 V and the grounding line is the device.

PROFIBUS Parameters Setup

Depending on the application used (not included in delivery), the device may be a passive (without its own station address) or an active station (class II PROFIBUS master).

The PROFIBUS parameter setup is required only if the device is used as class II PROFIBUS master or in operation mode PROFIBUS network access. The PROFIBUS parameters are given by the class I PROFIBUS master.

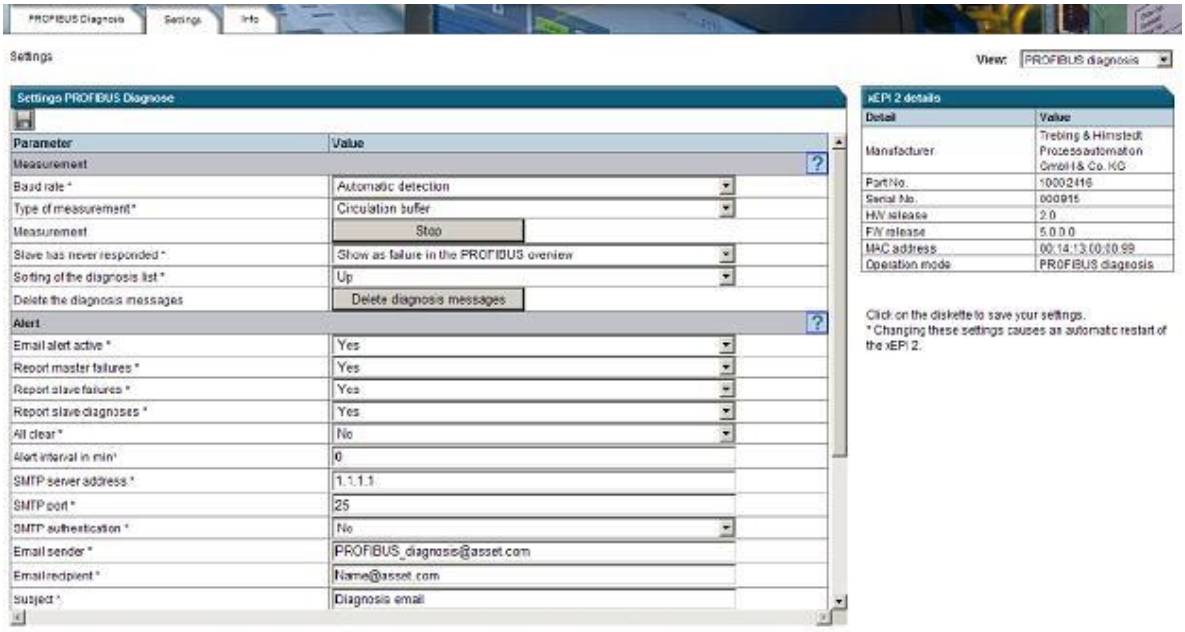
AL-2434 Operation Modes

PROFIBUS Diagnosis

The device default setting at delivery is the PROFIBUS diagnosis mode. This mode enables the monitoring of the PROFIBUS network input and it can be set up as showed in the following figure.

Proceed as in “Checking the Ethernet Connection Up to the Device”. (See “Procedure”).

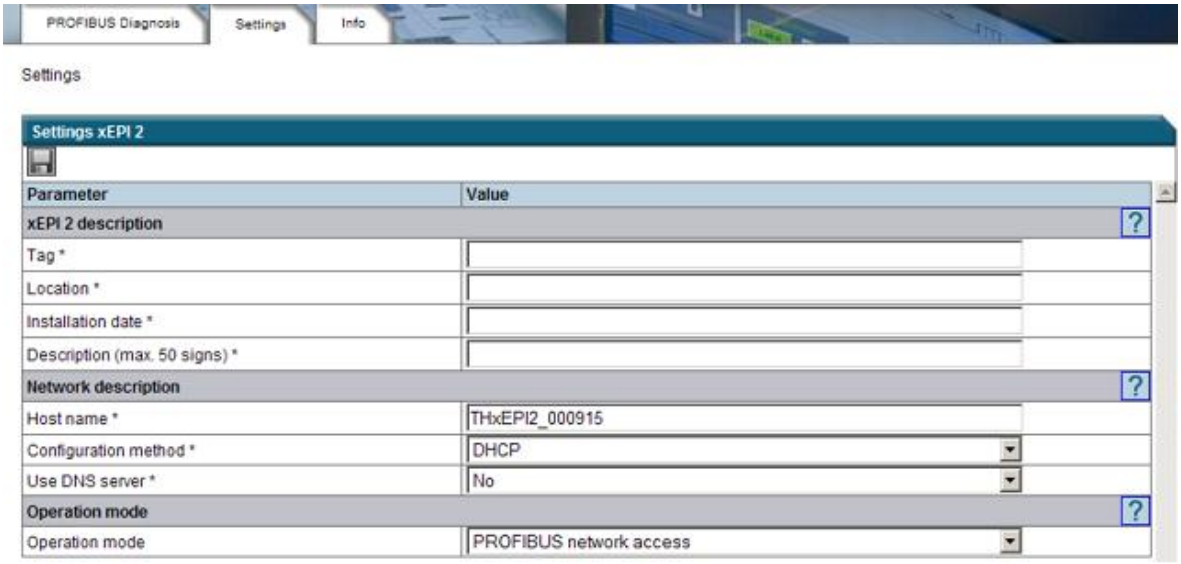
Click on the tab *Settings* and select *View* (upper-right corner) – PROFIBUS *diagnosis*. It is possible to set up the *Measurement*, *Alert* and *Time Server* properties. For help, click on the question mark.



PROFIBUS Network Access

The PROFIBUS network access operation mode uses AL-2434 for other applications. Among these applications is the use of FDT/DTM such as Pactware, FieldCare and FieldMate or EDDL (Emerson AMS Suite).

Proceed as “Checking Ethernet Connection Up to the Device” (See “Procedures”).Click on the tab *Settings* and select *View* (upper-right corner) – *PROFIBUS diagnosis*. Click on *Stop* to stop measuring. In V*iew*, change to xEPI2. Then select *PROFIBUS network access* as *Operation Mode* and save the properties by right-clicking on the disk, as showed in the next figure.


PROFIBUS Diagnosis
Settings
Info
Settings
Settings xEPI 2
Parameter
Value
xEPI 2 description
Tag *
Location *
Installation date *
Description (max. 50 signs) *
Network description
Host name *
THxEPI2_000915
Configuration method *
DHCP
Use DNS server *
No
Operation mode
Operation mode
PROFIBUS network access

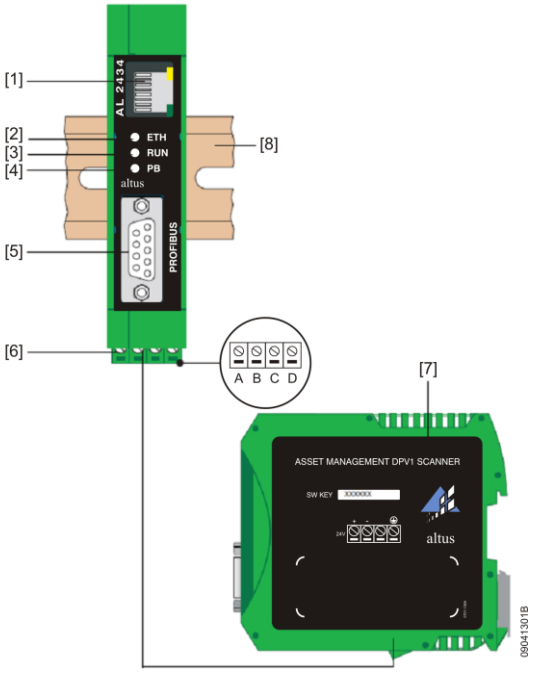
Installation

ATTENTION:
Device sensitive to static electricity (ESD). Always touch a grounded metallic object before using it.

Panels and Connections

The figure displays a detailed drawing of the AL-2434 module (front and side).

1- Ethernet Interface
2- ETH LED
3- RUN LED
4- PB LED
5- PROFIBUS interface
6- Power supply pins
7- Type tag
8- DIN rail (not included in delivery)

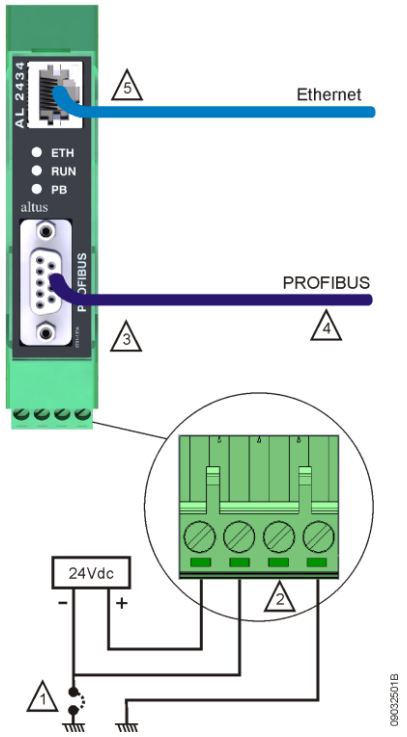


Electrical Installation

The AL-2434 module electrical installation consists in the power supply setup:

- Connect the 24 Vdc power cable and the driver of the Earth (Earth Terminal) to terminals. The terminal block can be connected and accessed with a screwdriver
- Connect the power supply. The RUN LED will be green and the ETH LED flashes red until the startup procedure is completed. Subsequently, only the RUN LED is on in green

In the following, it is shown the electrical installation process.



1 - The common point of power supply source for modules feeding (0 Vdc) can be connected to the ground line in the panel. This connection is not mandatory, but it is recommended to minimize electric noise in an automation system.

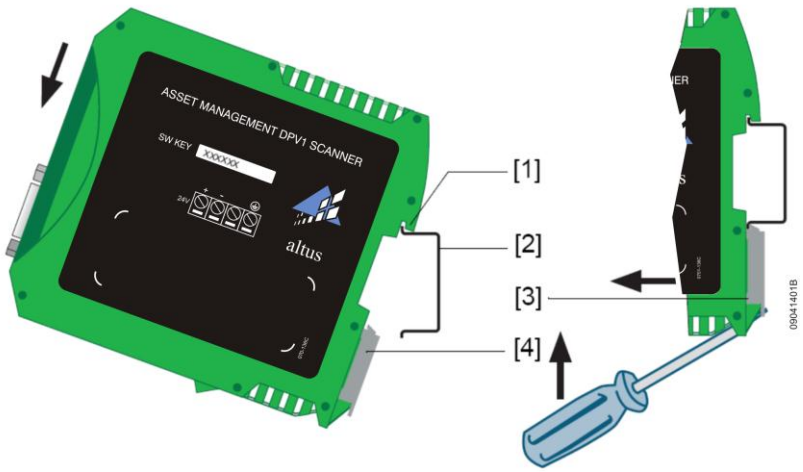
2 - The terminal shown in the diagram should not be connected and is available only for the connector polarization.

3 - If the network interface is connected to one physical end of the PROFIBUs network, the AL-2604 terminator should be switched or an AL-2602 connector containing the termination should be used. According to the PROFIBUS standard, the network cable shield must be interconnected to the metal body of the connector in order to be grounded for all network devices.

4 - It is mandatory the use of AL-2303 cable in its maximum lengths as specified by the PROFIBUS standard. See the PROFIBUS network Utilization Manual - MU299026. If the topology requires longer lengths, it is recommended the use of AL-2431 or AL-2432 optical repeaters.

5 - Ethernet RJ45 10/100Base-TX standard interface.

Mechanical Assembly



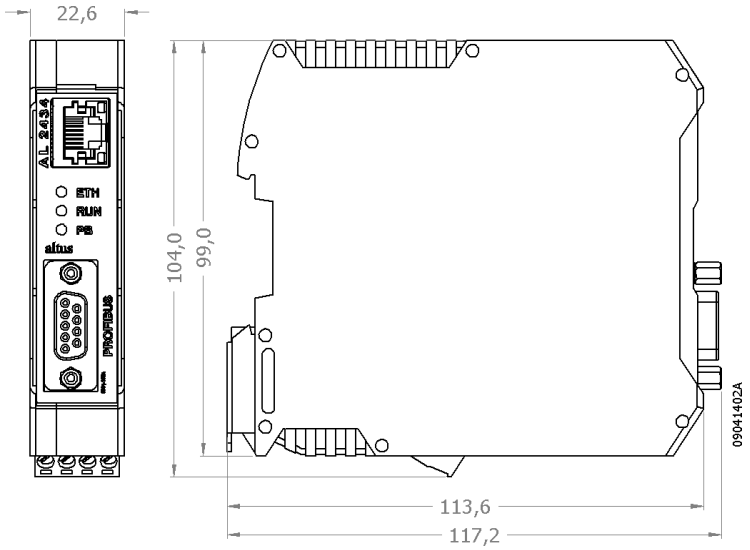
1- Device with click on the top of the rail
2- DIN Rail
3- Device on the rail
4- Fixing locker

Position the device click on the rail and move the device down until the fixing lock fastens the device on the rail.

> ATTENTION:
> Leave an area of 5 cm above and below the device for heating dissipation. The module must be mounted in the closet in vertical position, as showed in the figure, to help heat dissipation.

Physical Dimensions

Dimensions in mm.



Maintenance

The LEDs and interfaces of this module indicate the following situations and issues:

LED	LED State	Meaning
Interface Ethernet	Yellow on	Ethernet data communication
	Green on	Available physical connection
ETH	Red on	First phase of startup
	Flashing red	Boot procedure
	Flashing red or flashing red or green (error case)	Software internal failure
	Green on	Connection to application via Ethernet
RUN	Red on	Internal failure
	Green on	Source 24 Vdc ok
PB	Green on or flashing green	Device communication via PROFBUS

Interface	Status	Problem Solution
Ethernet	Device not found in the Ethernet network	Check the power source (RUN LED green)
		Check the correct connection for RJ45
		If the device is set for operation on an Ethernet network with a DHCP server, but the network server does not support DHCP, the IP address must be assigned manually (see “Connection on a Network with IP Manual Assignment”)
		When an Ethernet network cable is set directly between the computer and the device, both must be on the same network
PROFIBUS	PROFIBUS network not found	AL-2434 as passive station (*PROFIBUS diagnosis* access mode): Check the connection (see “Connecting PROFIBUS) and change S*ettings – PROFIBUS diagnosis – Measurement* of *baud rate* for *Automatic Detection*
		AL-2434 as passive station (*PROFIBUS network access*): Check the parameters for the channel employed (see the application). Each station has its own address, which can be assigned only once on the network

Manuals

For further technical details, setup, installation and programming of Ponto Series products, the following documents should be consulted:

Document Code	Description
CE109000	Features and Setup of Ponto Series
MU209020	HART Network on PROFIBUS Utilization Manual