INOVANCE

WL432 Series IoT Module Hardware Guide

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Preface

■ Introduction

This series of 4G smart hardware products can collect local device data including running status and faults and interwork with Inovance's Internet of Things (IoT) server using 4G, Wi-Fi, or Ethernet to enable remote commissioning and maintenance functions. Users can access the web server to monitor status and analyze faults of local devices. Featuring security, reliability, wide application, and strong stability, this series of products are widely used for elevators, air compressors, and cranes.

Before using the product, read this user guide carefully to fully understand the features of the product and ensure safe use. This user guide mainly describes specifications, installation dimensions, ports, performance parameters, wiring, and typical applications of this series of products.

■ Acquisition

The information in this user guide is subject to change without notice. You can acquire the latest document version from your product distributor or Inovance's website http://www.inovance.com.

■ Purchase Information

No.	Model	Product Code	Platform	Standard Configuration
1	WL432-DB	01100136	Elevator/Air compressor platform	1. 4G antenna (1.5 m) 2. No SIM card 3. RS485 cable (1 m)
2	WL432-DE	01100123	General-purpose Uweb platform	1. 4G antenna (1.5 m) 2. SIM card
3	WL432-DK	01100124	General-purpose Uweb platform	1. 4G antenna (1.5 m) 2. SIM card

■ Options

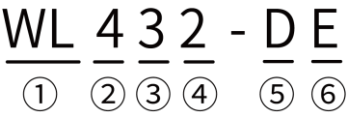
No.	Name	Code	Specifications
1	Wi-Fi antenna	15310001	2.4G sucker antenna - 1.5 m - RG316 white cable internal thread female pin

Safety Instructions

- The user name and password are used for authentication of remote device operations. Therefore, save them securely and take necessary measures to prevent account stealing. If the user name and password are stolen, great losses may be caused.
- Before performing remote device operations, contact on-site engineers to ensure safety situations. Otherwise, great losses may be caused.
- This series of products are used for industrial control with remote data exchange based on network technologies. Inovance has taken necessary technical measures to ensure data security. However, network risks (such as hacking) that Inovance cannot control may still exist, and Inovance is not responsible for losses caused by such network risks.

Product Information

■ **Model number**



WL: WAN LINE external network communication Internet product	3: 430 series	D: 12–24 VDC power supply
4: 4G, IoT	2: Overseas version	B: Elevator/Air compressor product E: Remote LAN K: Remote serial port V: High-end version

■ **Functional Advantage**

Functional Advantage	Description	Model Supported
Serial port data collection	Connected to local device controllers using the RS485 or RS232 port, this product obtains data from local device controllers and uploads the data to the server using 3G, 4G, Ethernet, or Wi-Fi, or transmits control commands delivered by the server to the local device controllers.	WL432–DK WL432–DB
Network port data collection	Connected to LAN where the target device locates using the LAN port, this product obtains data from multiple local target devices and uploads the data to the server using 3G, 4G, Ethernet, or Wi-Fi, or transmits control commands delivered by the server to local device controllers.	WL432–DE

Functional Advantage	Description	Model Supported
Remote safety commissioning	Based on SSL VPN, the safety of remote commissioning, upgrade, and maintenance of target devices is ensured.	WL432–DE WL432–DK
Power failure reporting	When an external power supply failure occurs, the product automatically reports the power supply failure event to a specified server and saves the event in the memory.	All models
Other advantages	• Transparent or encrypted wireless data transmission is supported. • Fault alarms are available. • Industrial terminals are adopted to meet industrial field application requirements. • Remote upgrade and maintenance are supported. • Using a special DIN rail, this product is small in volume, simplifying integration for users.	All models
Applicable industry	General	WL432–DE WL432–DK
	Elevator and air compressor industry	WL432–DB
Monitoring data collection mode	The data is collected through macro instructions.	WL432–DB
	The data is collected through development tookit on the platform.	WL432–DE WL432–DK

Ports

<table>
<tr><th>Port</th><th>Terminal</th><th colspan="2">Description</th></tr>
<tr><td rowspan="6">7-pin socket</td><td>24V</td><td colspan="2" rowspan="2">The voltage range of DC power ports is 12 V to 24 V. 24V and 0V indicate the positive pole and negative pole of the power supply, respectively. The maximum input current is 0.8 A.</td></tr>
<tr><td>0V</td></tr>
<tr><td>485+</td><td>Standard RS485 serial port</td><td rowspan="5">• RS232 and RS485 cannot be used together.
• For WL432-DE, this port is unavailable.</td></tr>
<tr><td>485-</td><td>Standard RS485 serial port</td></tr>
<tr><td>GND1</td><td>RS232 and RS485 share the same reference ground.</td></tr>
<tr><td>RXD</td><td>Standard RS232 serial port for module data receiving</td></tr>
<tr><td>TXD</td><td>Standard RS232 serial port for module data sending</td></tr>
<tr><td>4G antenna</td><td>4G</td><td colspan="2">Standard configuration, sucker antenna with internal threads and inner male pin</td></tr>
<tr><td>Wi-Fi antenna</td><td>Wi-Fi</td><td colspan="2">Optional, sucker antenna with internal threads and inner female pin</td></tr>
<tr><td>SIM card slot</td><td>/</td><td colspan="2">Standard card dimension: 25 mm x 15 mm
Note: It is not recommended that users change SIM cards. If users have such requirements, contact Inovance's technical engineers.</td></tr>
<tr><td>Reset key</td><td>/</td><td colspan="2">Short press (for 1s to 20s) to restore Wi-Fi parameters.
Long press (for over 20s) to restore factory settings.</td></tr>
</table>

Ethernet	WAN	This port is used to connect external networks. 10 M and 100 M networks are supported.
	LAN	This port is used to connect local devices. 10 M and 100 M networks are supported.

Port	Terminal	Description
LED indicators		Cloud service state indicator (green)
		Data communication indicator (green)
		Fault indicator (red)
		4G or Wi-Fi signal strength indicator (green)

The specific states indicated by the LED indicators are described as follows.

	Steady Off	Steady On	Blinking
Cloud service state indicator 	No network	• Device online • Starting (within 33s) • Button restoring triggered	IP obtained, connecting to the server
Data communication indicator 	No data transceiving	• WL432-DE/WL432-DK: Blinking indicates normal communication. The higher the communication rate is, the quicker the blinking is. • WL432-DB: Steady on indicates normal communication. Slow blinking indicates that a password is used for the controller.	
Fault indicator 	Normal	• Starting (within 33s) • Button restoring triggered	• Disconnected from the target device • Network registering • Poor 4G signal

Signal intensity indicator 	One bar: poor signal Two bars: fair signal Three bars: good signal All off: no available signal, no network connection, or poor network

Wireless Indicators

Table –1 Wireless Indicators

2.4G WIFI	RF output power (ERP/EIRP)	＜20dBm
	Frequency band (MHz)	2412－2462Mhz
	Modulation	DSSS, OFDM
GSM	RF output power (ERP/EIRP)	GSM850: 30 dBm ± 2 dB PCS1900: 24 dBm ± 2 dB
	Frequency band (MHz)	GSM850、PCS1900
	Modulation	GMSK and 8PSK
WCDMA	RF output power (ERP/EIRP)	WCDMA: 24 dBm + 1/-3 dB
	Frequency band (MHz)	WCDMA Band II、WCDMA Band IV、WCDMA Band V、WCDMA Band VIII
	Modulation	QPSK
LTE	RF output power (ERP/EIRP)	LTE FDD: 23 dBm ± 2 dB LTE TDD: 23 dBm ± 2 dB
	Frequency band (MHz)	LTE Band 2、LTE Band 4、LTE Band 5 、LTE Band 7、LTE Band 12
	Modulation	QPSK and 16QAM

Table –2 Other Technical Indicators

Port	Parameter	Specifications
Wi-Fi	Operating mode	AP (default) and Wi-Fi. For details about the switchover operations, see the commissioning method in "Operations"onpage17.
	Wireless indicators	802.11 b/g/n
	Transmission rate	Max. 150 Mbps
	Frequency band (MHz)	2412–2462Mhz
	Encryption mode	The latest wireless security standards including 64 bit and 128 bit WEP, WAP-PSK, and WPA2-PSK are supported.
	Default hot spot	Operating mode: AP mode User name: IOT_"Device ID" (See Device ID on the front of the device.) Password: "Device ID" (For example, if the device ID is , the user name is and password is .)
	Transmission distance	100 m (open space)
RS485	Transmission rate	Baud rate ≤ 115200 bit/s
RS232	Transmission rate	Baud rate ≤ 115200 bit/s

Installation Information

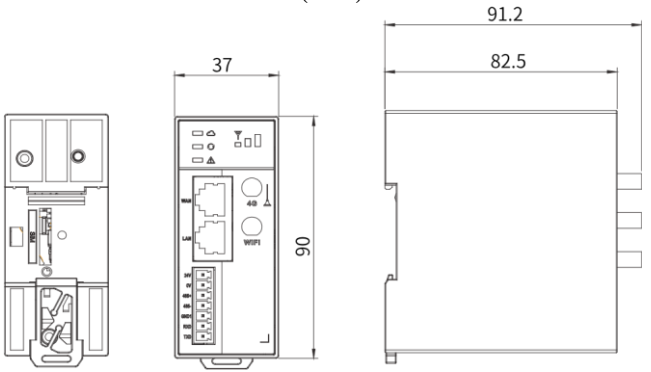
■ Operating environment

Environmental Parameters			Operating Environment	Transport Environment	Storage Environment
Category	Parameter	Unit			
Temperature	Lowest temperature	°C	-5	-40	-40
	Highest temperature	°C	55	70	70

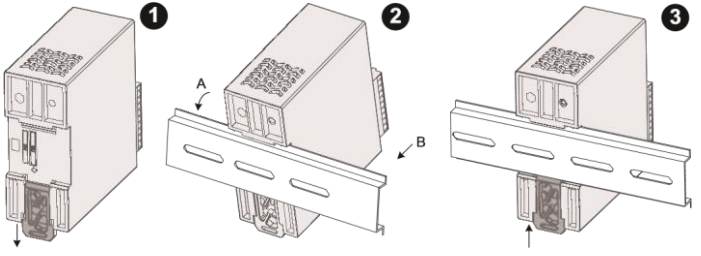
Humidity	Relative humidity	%	10–95	10–95	/
	Condensation	Yes/No	No	No	No
Air pressure	Lowest air pressure	kPa	70	70	70
	Highest air pressure	kPa	106	106	106
IP rating	IP20				

■ Installation dimensions

Specific installation dimensions are as follows (in mm).



■ Mounting on a DIN rail



1. Pull down the DIN rail mounting hook at the back of the module.

2. Hook the upper fixing jaw on the module to the top edge of the DIN tail alongdirection A, and press the module along direction B, until the module is completely embedded in the DIN rail.
3. Push up the DIN rail mounting hook until you hear a click. If the DIN rail mountinghook is out of the reach of your fingers, use a tool, such as a screwdriver.

- Keep metal objects away from the top and sides of the antenna.
- Do not put the antenna in a shielded place, such as a metal cabinet.
- Keep the antenna and its feed away from the power and signal cables to avoid mutual interference.

Typical Application

The module provides remote monitoring, commissioning, and serial port functions.

The basic data path is as follows: target device <–> module <–> server <–> user's PC.

Operations

Category	Item	Description
Remote commissioning/ monitoring	Target device	PLCs and touchscreens of Inovance, PLCs of Delta, Siemens, Mitsubishi, Panasonic, Yaskawa, and Xinjie, devices supporting Modbus TCP and Modbus RTU, and touchscreens of Kunluntongtai and WEINVIEW. Other PLCs will be supported soon. See the supported models at http://doc.dataserver.cn/web/#/4(01 Document type > Remote PLC commissioning).
	Smart hardware product with serial port	WL432-DK
	Smart hardware product with network port	WL432-DE
	Host controller software	Inovance's AutoShop (V2.93 or higher) To obtain the AutoShop software, visit http://www.inovance.com. If a third-party PLC is used, obtain the corresponding host controller software from the third-party manufacturer.
	Commissioning assistant and USB security key	Use the USB security key (model: SJK1149, material code: 72060033). Download the commissioning assistant client from the registration system website http://Domainname.dataserver.cn/. Domainname indicates the user account.

See the commissioning method in the commissioning guide, which can be downloaded from http://doc.dataserver.cn/web/#/4.

The Inovance Inovance Industry Cloud platform user guide can be downloaded from https://doc.dataserver.cn/web/#/4?page_id=110.

FCC Statement:

This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

--Reorient or relocate the receiving antenna.

--Increase the separation between the equipment and receiver.

--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

--Consult the dealer or an experienced radio/TV technician for help.

MODIFICATION: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.