

(http://nethix.com)

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Hardware manual

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1. Overview

The WE500 is a remote monitoring, data logging and system control device based on GSM/UMTS wireless networks that allows to continuously monitor unmanned processes and to remotely control devices and electronic systems.

The WE500 provides a built-in web server that allows the configuration, monitoring and system control of a given device through a LAN, WLAN or GPRS/HSPA connection.

The WE500 is a powerful wireless generic platform with the following characteristics:

2. Technical characteristics

Characteristic	Description
CPU	CPU ARM9 AT91SAM9260 @ 210MHz
RAM	64 MBytes
Flash	1 GByte NAND
Operating System	Linux 2.6
Ethernet	10/100 Mbit/s
Modem	3G
	14.4Mbps downlink / 5.76Mbps uplink (HSPA)
	Quad band GSM/GPRS/EDGE
	Quad band HSDPA/HSUPA
	2G
	Quad band GSM/GPRS
	Dual modem
	3G + 2G with above characteristics
Communication	2 RS232 serial ports
	1 RS485 serial port
Digital inputs	8 inputs, non isolated, dry contact
Analog inputs	2 inputs, non isolated, 0-5V, 0-10V 020mA
	(configurable for 420 mA), NTC 10K
Digital outpus	2 relays, 1A 30VDC

Characteristic	Description
Power source	9 - 32 VDC
Average absorption	300 mA @ 12VDC
Peak absorption	500 mA @ 12VDC
Weight	275 gr
Dimensions (L x W x H)	45 x 120 x 100 mm
Box	Plastic, DIN bar mountable
Storage temperature	-25° C - +85° C
Working temperature	-10° C - +60° C
Humidity	5% - 95% (non condensing)

If the analog inputs are 0..20 mA, they can be used in the 4..20 mA by simply setting an offset when configuring the analog input.

3. Connections





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Connector	Description
1	Top connector
	Pluggable screw terminal, 10 poles, 3.81 mm step
2	Bottom connector
	Pluggable screw terminal, 20 poles, 3.81 mm step
3	RF SMA antenna connector
4	SIM card slot
5	Ethernet 10/100 MB/s RJ-45 connector
6	Front panel button

3.1. Top connector

Connector	Description
GND	GND for UART1
RX1	RS232 RX UART1
TX1	RS232 TX UART1
GND	GND for UART2
RX2	RS232 RX UART2

Connector	Description
TX2	RS232 TX UART2
GND	GND for RS485
В	RS485 signal B (-)
A	RS485 signal A (+)
+VAUX	+5VDC out

The Pluggable screw terminals are listed from the front to the back of the device.

3.2. Bottom connector

Connector	Description
GND	Digital inputs ground
DI1	Digital input 1
DI2	Digital input 2
DI3	Digital input 3
DI4	Digital input 4
GND	Digital inputs ground
DI5	Digital input 5
DI6	Digital input 6
DI7	Digital input 7
DI8	Digital input 8
GND	Analog inputs ground
AN1	Analog input 1
GND	Analog inputs ground
AN2	Analog input 2
GND	Power source ground

Connector	Description
+VIN	Power source input +VDC
RL1A	Relay 1
RL1B	Relay 1
RL2A	Relay 2
RL2B	Relay 2

The pluggable screw terminals are listed from the front to the back of the device.

3.2.1. Connector electrical characteristics

Power source

Polarized VDC input, with internal protection diode compatible with the following tension rate: Vnom = 12VDC [9.6V – 32V]

Analog input

Factory configured non isolated Analog Inputs



Admissible input range: 0 – 5 V 0 – 10 V 0..20 mA (4..20 mA configurable via software) NTC

Digital input

Dry contact, non isolated, low tension Digital Input



Еггог

These inputs were design to operate at low tensions, avoid to connect them directly to 230VAC network.

Relays

Relay load: 1A at 30VDC



Еггог

Avoid to connect them directly to 230VAC network.

Serial ports

There are three serial ports:

- Serial 1: Standard RS 232
- Serial 2: Standard RS 232
- Standard RS 485

3.3. Front panel



(../_images/front_panel1.png)

LED	Description
GPRS	HSPA/GPRS connection
	Turned on when the HSPA/GPRS data connection is active
MODEM	Modem activity
	Turned on when the modem is active, even if there is no data connection active.

4. Installation

This chapter describes the installation procedure and first device start up.

In order to have a normal operating device, it is necessary to have a SIM card that allows to establish an HSPA/GPRS data connections. Please check the carrier's data planning for prices and costs of the service.

Verify that the device is installed in a physical position in which it receives sufficient 2G/3G network coverage.

Note

The device has been tested and verified with SIM cards of the major European carriers such as Vodafone (Italy), T-Mobile (Germany) and O2 (Ireland). It has also been used with SIM cards of carriers in different parts of the world such as Africa and Asia. However, there is no warranty that it will work with all the existent SIM cards in the market. Please contact Nethix for further information.

4.1. SIM card and connections



 Insert the SIM card in the WE500 as the image shows. The SIM card contacts must face the pluggable screw terminal and the cut angle faced to the front of the device.

Warning

Avoid to insert the SIM card when the device is turned on. After turning off the device and removing the power source, the SIM card can be inserted/removed.

- Mount the WE500 in a DIN bar allowing access to the SIM card and the pluggable screw terminals.
- Prepare the input and output connections to the pluggable screw terminals as required by the application.
- If required, connect the modbus cables using the signals TX1, RX1 and GND or TX2, RX2 and GND or A, B, GND for the RS232 A, RS232 B or RS485, respectively.
- Connect a quad band GSM antenna with the right cable and, if required, the extension being sure to have a satisfactory GSM signal. Check the network coverage with any mobile phone.
- Connect to the pluggable screw terminals the +VIN and GND of the bottom connector to an adequate power source.

The digital inputs are not galvanic isolated, they have an internal pull-up and are activated by closing the circuit with GND through a dry contact.

Warning

The analog inputs are not galvanic isolated. If necessary, for avoiding interference, analogical isolators can be placed externally.

4.2. System start-up

- 1. The POWER LED will turn on when the WE500 is connected to the power source.
- 2. After ~40 seconds, the RUN and BUS LEDs will turn on. At this point all the application and services will be active. The monitoring, control and logging applications will be running and the web interface will be reachable.
- 3. After ~30 seconds of step 2, the HSPA/GPRS service will become active and the GPRS LED will turn on. The services that depend on this connection such as VPN, data delivery to a portal and email will be active.

The initial WE500 configuration must take place locally in one of the two following modes:

• Point-to-point connection between the PC and the WE500 using a normal or cross Ethernet RJ-45 cable:



• LAN wired connection through a switch or hub:



The default network configuration of the WE500 is the following:

Parameter	Value
IP address	192.168.1.160
Netmask	25.255.255.0
Gateway	192.168.1.1
DNS	8.8.8.8

4.3. Logging in the web interface

In order to establish a connection enter the IP address of the device in the browser's URL:

http://192.168.1.160 (http://192.168.1.160)

The default credentials are:

Username	Password
admin	admin

Hint

It's strongly recommended to change the default

password after the first login.

It's necessary that the PC belongs to the same subnet of the device. In this case the private network 192.168.1.X. For connecting to the WE500 a standard Internet browser is needed. No drivers or specific software are required.

The recommended browsers that were also used for validating the web-interface are **Firefox** and **Chrome**. However, other browsers are known to work properly.

Successive access to the web interface can take place through different channels assuming that the device is properly configured:



The VPN can use any of the above channels to establish a secure connection between the WE500 and the PC. It needs a client software in the PC and a server that provides the service such as the Nethix Portal (http://nethix.com/en/products /portal).

5. Power off and reboot

Powering off the WE500 can be done in two ways:

- 1. Using the proper icon at the right top of web interface. Only an administrator can power off or reboot the device.
- 2. Using the Stand-by mode described later.

Ειιοι

Powering off the device by removing unexpectedly the power source could cause data loss or corruption.

6. Stand-by mode

The Stand-by functionality turns off all the system applications, such as the web server and the variables monitoring, setting the system to a low power consumption state.

Warning

This functionality must be always used before removing the power source from the device. Not doing so, could cause data loss or corruption.

6.1. Entering the Stand-by mode

For entering the Stand-by mode, press the front panel button and leave it pressed for approximately three seconds. During this time, the power LED will blink fast, then all the LEDs will blink together indicating that the system will enter the Stand-by mode

When the LEDs start blinking together fast, release the button immediately.

The power LED will turn-on again for several seconds and start blinking again slowly, approximately once every two seconds, indicating that the system has entered the Stand-by mode and that is in a low power consumption state. The whole procedure takes approximately fifteen seconds.

Warning

Notice that leaving the front panel button pressed after all LEDs blink three times starts the network recovery procedure.

6.2. Leaving the Stand-by mode

When in Stand-by mode, the power LED blinks slowly, approximately once every two seconds. Press the front panel button and leave it pressed. The power LED will start blinking fast for approximately three seconds, then it will remain turned-on. At this point the button can be released and the system will start-up normally.

7. Network recovery

For executing a Network Recovery, press the front panel button and leave it pressed for approximately six seconds. During this time the following actions will be executed twice: * The power LED will blink fast for approximately 3 seconds * Then, all the LEDs will blink together three times

After these six seconds, the power LED will turn-on and start blinking again slowly, approximately once every two seconds, indicating that the network recovery has been executed and the system is in Stand-by mode.

Execute the procedure for leaving the Stand-by mode for booting the device normally.

This is the default network configuration after the Network Recovery:

Parameter	Value
IP address	192.168.1.160
Netmask	25.255.255.0
Gateway	192.168.1.1

Notice that the Network Recovery procedure is applied only to the Ethernet interface and not to the Wi-Fi or GPRS/HSPA interfaces.

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