

► General description

WE110 is a GSM/SMS based remote control device. With a digital input, a relay output and a thermistor, WE110 is especially suited for remote control of heating and air conditioning systems. WE110 can be used also in several other remote control applications, such as: home automation, industrial remote monitoring and control, remote switching and gate opening systems. Setup and installation are very easy. The upper panel is provided with two LEDs and a pushbutton to monitor the device status and to allow local control and diagnostic.

► Installation and Setup

- Disable the PIN for the SIM card to be used in the WE110, using a standard GSM cell phone. Refer to the phone user manual for details.
- Insert the SIM card in the upper slot as shown in the picture.
- Connect the thermistor. Connect the input and output signals to the controlled device as required by the application.
- Screw the antenna provided in the upper SMA RF connector, then connect power leads and power on the device.

System startup takes approximately 45 seconds, during which the LEDs in the upper panel show diagnostic information as detailed in the following table.

LED	Meaning of LEDs
◯	Blinking RED, device initialization in progress
◯	Fast blinking RED, network registration error
◯	Slow blinking RED, GSM network not available
◯	RED, network registration successful
◯	Blinking RED and GREEN, end of initialization – success
◯	Fast blinking GREEN, SIM card error

All setup and control activities of the device are carried out sending and receiving SMS messages. In the following the most common programming and operating SMS messages are shown. Text in bold shows strings to type and send to the device (for example **STATUS** means that you have to send an SMS containing the word "STATUS" to the device).

WE110 can operate in two different ways, that can be selected using the SET command, as explained below:

- thermostat (for both air conditioning and heating applications)
- remote control for general use.

WE110 is factory preset to operate in heating thermostat mode.

To request systems status you have to send a message to the device with the **STATUS** command. The device replies with a SMS carrying all the status information.

To enable the thermostat function and preset temperature to 20 degrees (°C) send **ON 20**. To switch off the thermostat relay send **OFF** command.

LED	GREEN LED in Thermostat mode
◯	GREEN ON, thermostat enabled, heating on
◯	Blinking GREEN, thermostat enabled, heating off
◯	GREEN OFF, thermostat disabled, heating off

To switch on the relay output, in general remote control mode, send **ON** command. To switch off the relay send **OFF**.

In both operating modes (thermostat and remote control) output switch-on and switch-off can be controlled also sending a RING (i.e. calling the number of the WE110 device on the phone). WE110 drops the line and sends back a RING to the caller to confirm that the command has been received and executed. Note: this way of controlling output is enabled only if the caller number has previously been inserted in the users list, through the USER command explained below.

LED	GREEN LED in general remote control mode
◯	GREEN on, output active, relay contact closed
◯	Blinking GREEN, output active in pulsed mode
◯	GREEN off, output disabled, relay contact open

WE110 can be programmed to reply with a confirmation message every time a command is received and executed. To enable the confirmation message send the command **CONFIRM ON**. To disable the feature send **CONFIRM OFF**.



► Technical data

- Power supply: 9-32VDC/12-24VAC
- Current consumption: average 100mA, transmitting 400mA, max pulsed 1,8A
- Dual band GSM/GPRS Modem, with SIM card reader
- Operating temperature: -20°C +55°C
- Relay output rating: 1A 24V
- Thermistor input: NTC 10kΩ
- Digital input: dry contact
- Two leds and a local control button
- Size : L x W x H = 70 x 57 x 30 mm

► Safety information

Every radio device may present a hazard if used in proximity to personal medical electronic devices. WE110 must not be used in hospitals or onboard aircraft. Do not install WE110 next to oil stations, fuel tanks, chemical plants or in any other environment where combustible vapours or explosives may be present. In order to avoid possible damage or hazard, Nethix recommends the use of original accessories. The manufacturer does not warrant against defects, malfunction, hazard or damage caused by unauthorized or improper use of the device. **IMPORTANT – The product is designed to be used in machine-to-machine or man-to-machine applications (M2M) and is intended to be used by system integrators or technical personnel. The product is not targeted to the end-user. Installation must be carried out by qualified personnel.**

► Pinout and connection

PIN	DESCRIPTION
1	Power supply +VDC / VAC1
2	Power supply -VDC / VAC2
3-4	Relay contact output (max. 1A-24V), pins 3-4
5-6	Digital input, pins 5-6
7-8	Thermistor inputs, pins 7-8

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► User management

Up to five users can be inserted in the users list. Only registered users will be able to operate the device and will receive messages in case of alarms or programmed input conditions.

To add user no. 1 to the list send the following command:

USER 1 <tel number>

For example:

USER 1 +39347123456 – Adds user no. 1 having phone number +39347123456

USER 2 +3933522233344 – Adds user no. 2 with a phone number +3933522233344

To delete users from the list send the **USER** command followed by the number of the user to delete.

USER 1 – Delete user no. 1 from the list.

USER 2 – Delete user no. 2 from the list.

To receive the full list of enabled users send the **USERS** command with no other parameter following.

► GSM Signal level

To know the GSM RF signal level send the **SIGNAL** command. The device replies with a level number between 1 and 30:

- 1 to 7: too low GSM signal for a correct operation of the device
- 8 to 12: low GSM signal
- 13 to 18: good GSM signal
- Higher than 18: very good GSM coverage

► Alarm management

When using the device in thermostat mode, “too-hot” and “too-cold” thresholds can be preset. When the measured temperature trips out of the preset thresholds the device sends an alarm message to all users in the users list.

To set the “too-cold” threshold (anti-freeze feature) send the command:

NOFREEZE 6 Too-cold alarm

“Too-cold alarm” is an example text for the alarm SMS message that can be customized by the user. To set the “too-hot” threshold, send:

OVERTEMP 25 Too-hot alarm

The command **FREEZE ON** programs the device to close the relay output automatically when the measured temperature goes lower than the “too-cold” threshold. The command **FREEZE OFF** disables this feature.

When using the device in general remote control mode it's possible to program sending of an SMS when the input signal changes state. For example, with the command:

ALARM 1 ON 60 Alarm

the device sends the message “Alarm” 60 seconds after the closing of the digital input contact.

► Factory restore

To restore the device to its factory default send the command **DEFAULT**.

ADVANCED PROGRAMMING

ALARM <input state> <ON/OFF> <delay> <message>	
Enable an alarm condition: the WE110 sends the specified alarm message when the digital input changes its state. It's possible to program two alarm conditions at the same time: one for digital input contact closing and one for opening.	
<input state>	0 – send the message at contact opening 1 – send the message at contact closing
<ON/OFF>	ON to enable OFF to disable
<delay>	Delay in seconds before sending the specified message, after digital input state change
<i>Example: ALARM 1 ON 60 Alarm</i> Send the alarm message when contact closed, after 60 seconds delay	
<i>Example: ALARM 1 OFF</i> Disable the previously programmed alarm condition	

CENTER <SMS center number>	
Program the operator's SERVICE CENTER address	
<i>Example: CENTER +393492000200</i>	
Italian operators SMS service centers:	
TIM:	+393359609600 Vodafone: +393492000200
Wind:	+393205858500

SET <mode> <offset> <delay> <param>	
Preset WE110 operating mode	
<mode>	Operating mode 1: Heating Thermostat 2: Cooling Thermostat 3: Remote control for general use
<offset>	In Thermostat Mode: correction applied to the measured temperature (tenths of °C added to the measured value) In Remote Control Mode: closing time of the output relay when activated (when zero the output is always ON/OFF, otherwise the output is in pulse mode).
<delay>	In Thermostat Mode: output activation delay In Remote Control Mode: not relevant
<param>	In Thermostat Mode: thermostat hysteresis in tenths of °C In Remote Control Mode: not relevant
<i>Example: SET 1 10 120 5</i> Set WE110 to operate in heating thermostat mode, with a correction on temperature measurement of +1°C, a delay of 120 seconds and an hysteresis of 0.5°C (i.e. when thermistor measures 18°C the device switches on the output at 19.5°C and switches off at 18.5°C, after a delay of two minutes).	

CONFIG
Request device configuration
<i>Example: CONFIG</i>
<i>Reply message:</i>
<i>Thermostat:1</i>
<i>Mode:1</i>
<i>...</i>
<i>Hyst.:5</i>

VERSION
Request firmware and hardware version numbers
<i>Example: VERSION</i>
<i>Fw Version:1.0.0 Hw:1.0</i>

PIN
Set PIN code of the SIM card
<i>Example: PIN 1234</i>
Set PIN code at 1234

HELP
Show command list
<i>Example: HELP</i>
<i>STATUS ...</i>
<i>... command list follows</i>

ALL <ON/OFF>
ALL ON – Every user is allowed to program and configure the device regardless of users list content
ALL OFF – Only users included in users list are allowed to program and configure the device.
After factory preset the WE110 is working in “ALL ON” mode so every user can program and configure the device. Remember to set the device in “ALL OFF” mode after initial programming.

Local control of the device with the pushbutton
IF AN ALARM CONDITION HAS NOT BEEN PROGRAMMED
<ul style="list-style-type: none"> • In remote control mode the pushbutton available on the upper panel, when shortly pressed, lets you change the output state • In thermostat mode the pushbutton, when shortly pressed, lets you enable or disable the thermostat feature
IF AN ALARM CONDITION HAS BEEN PROGRAMMED
<ul style="list-style-type: none"> • In both modes the pushbutton closes the digital input contact; useful to force the alarm condition previously programmed