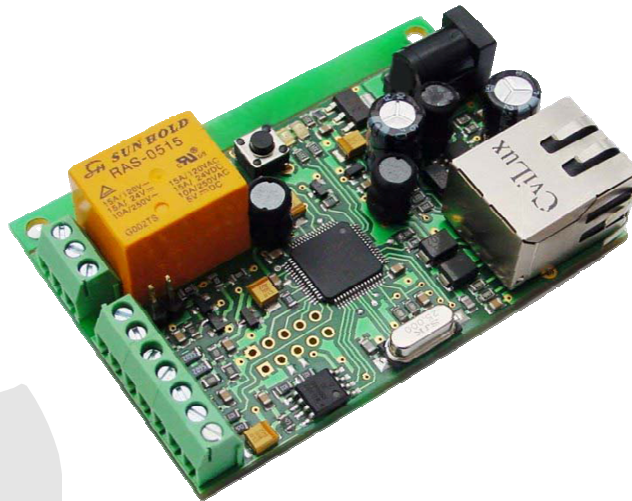




Ethernet controller TCW110

Users manual



1. Short description

TCW110 is a multifunctional device for remote monitoring and management. It is an Ethernet based controller, which is designed to work in IP-based networks and managed by WEB interface or SNMP programs. Its I/O interface - relay output, analog and digital input is suitable for solving specific problems in various fields such as remote control, alarm systems, industrial process automation, control and management of computer networks etc. High precision digital temperature sensor is option.

2. Features

- 10 Mbit Ethernet connectivity
- Password protected, web based configuration and control
- 1 digital input, 1 analog input
- 3A/24VDC Relay output
- Sending SNMP Traps messages under certain conditions
- Optional high precision temperature sensor
- Sending E-mail messages under certain conditions
- Relay restart on ping/echo timeout
- SNMP v.1, SMTP, ICMP, VLAN support
- **TCW110** can be used as standalone device or as a part of control and monitoring system
- MAC Address filtering
- Remote FTP firmware update

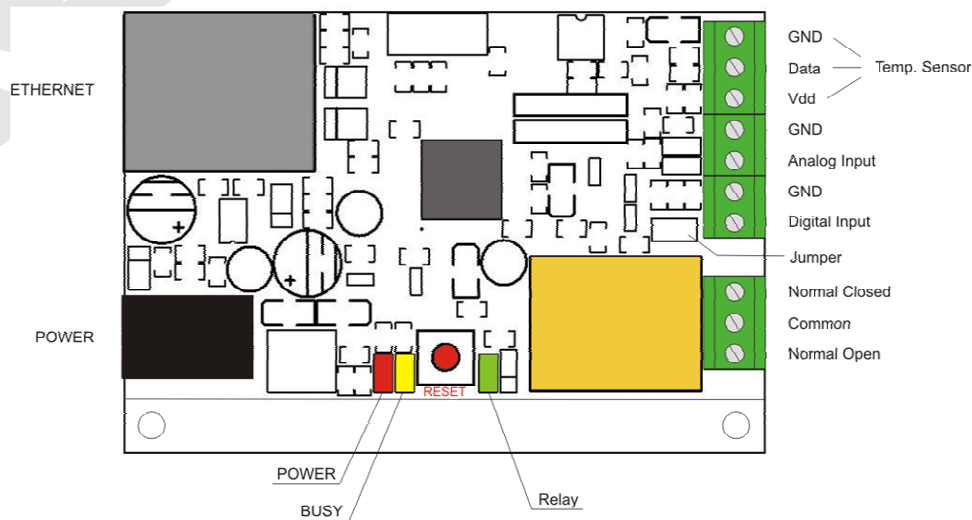


3. Technical parameters

Supply Voltage, VDC	12
Weight, g	40
Dimensions, mm	72 x 50 x 18
Operating temperature, °C	0 ÷ 40
Storage temperature, °C	-40 ÷ 85
Analog input range, VDC	0 ÷ 100
Minimum high level input voltage, V	2.5
Maximum low level input voltage, V	0.8
Maximum input voltage for digital inputs, V	5.5
Max. switchable current (at 220 VAC), A	3
Max. switchable voltage, VAC/VDC	250/110

4. Connectors & LED indicators

The location of the connectors is shown in the figure below ;



The following indicators show the status of the controller :

- **Relay** (green) – this LED is illuminated whenever the relay is closed (the Normally Open contact is closed and the Normally Closed contact is open);
- **Power** (red) – this LED flashes when the power supply is turned on;
- **Busy** (yellow) – this LED indicates that someone is connected to the controller through web interface;



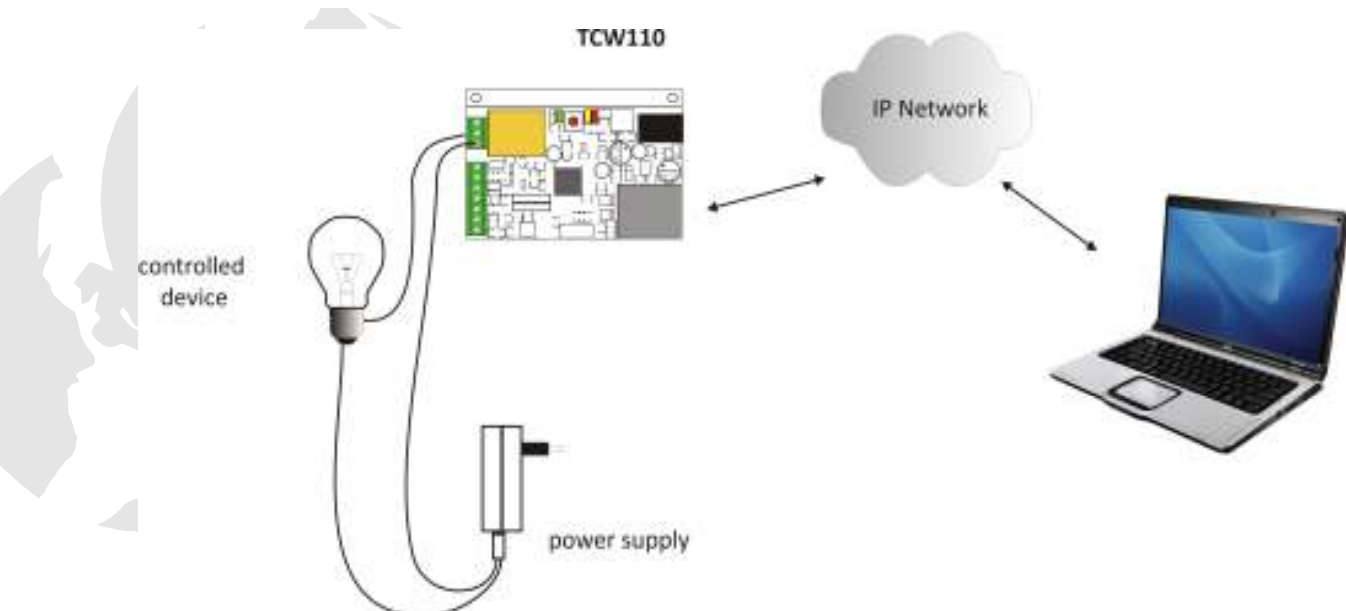
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- **Link** (green) – this LED is located on the Ethernet connector. It indicates that the device is connected to the network ;
- **Act** (yellow) – this LED is located on the Ethernet connector. It flashes when activity is detected on the network.

5. Application examples

5.1 Remote control

The controlled device is connected in series with the relay contact. Users can operate **TCW110** using a web browser or by using custom SNMP applications.

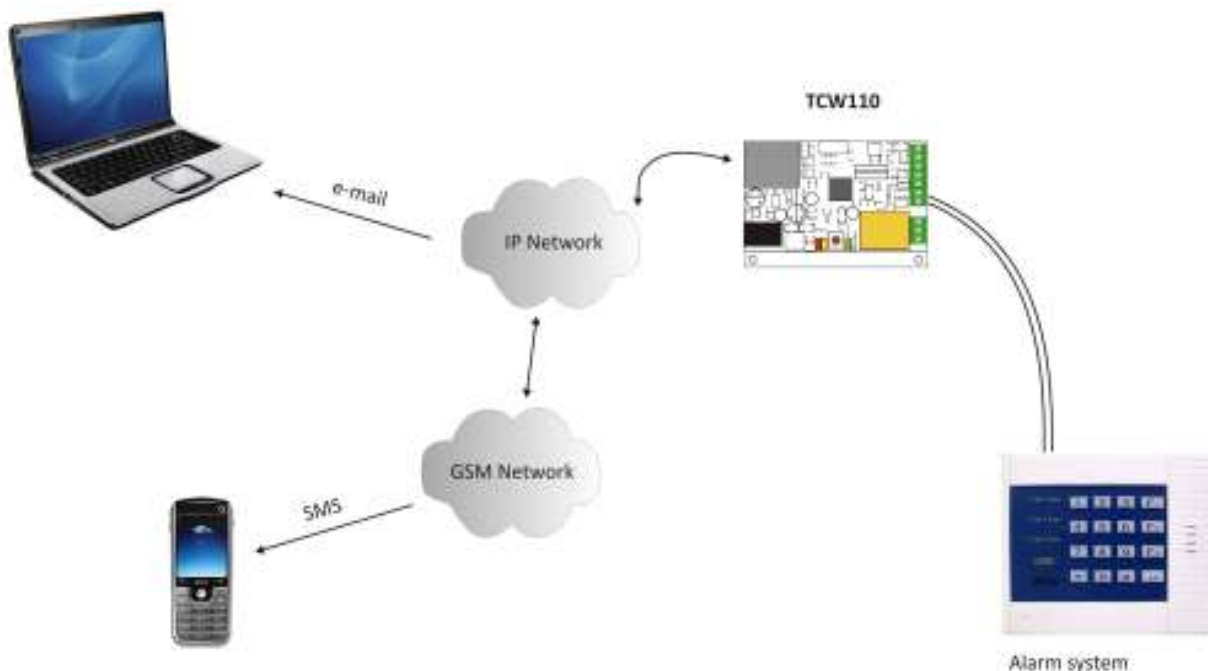


5.2 Remote monitoring

A relay output from the monitored device is connected to digital input of **TCW110**. When an event occurs – the controller sends an E-mail message to a predefined e-mail address. SNMP Trap message is sent if custom SNMP monitoring software is used.



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6. Installation

Please follow the steps below for proper installation :

1. Mount the controller in a dry and ventilated place.
2. Connect the Ethernet port to a 10/100 Base T Ethernet connection. For direct connection to a PC use a “crossover” cable.
3. Connect the I/O pins of the controller according to the required application.
4. Connect the power supply.

If the Power LED is blinking, it indicates that the power supply is OK. By default **TCW110** comes with the following network settings:

IP:192.168.1.2 , Subnet Mask: 255.255.255.0 , Default Gateway: 192.168.1.1

Communication with **TCW110** may be established by assigning a temporary IP address to your computer that is on the same network (for example 192.168.1.5). To get access to the web interface of the controller, you should type the following URL into the browser : <http://192.168.1.2> . If the network settings are correct, the “Login” page will appear.

7. Web-based setup

The web interface allows the **TCW110** to be configured, controlled and monitored via web browser. Recommended programs are Mozilla Firefox, Chrome and Internet Explorer 6 (or higher version) at 1024x768 resolution.

7.1 Login page



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After opening the Login page, authorization data must be entered (by default username=admin , password=admin). It is recommended to change the username and password to prevent unauthorized access to the controller.



Depending on the username and password, there are two access levels to the controller - user and administrator. This is done to restrict the access to certain functions. Both access levels are described in table below :

	administrator	user
Account Administration	✓	
Monitoring	✓	✓
Network Setup	✓	
I/O Setup	✓	✓
SNMP Setup	✓	

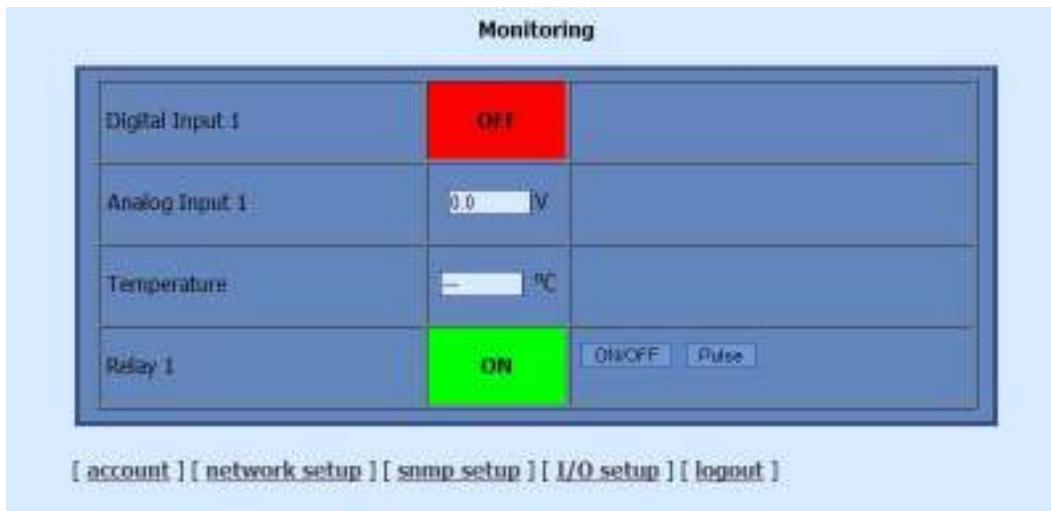
The controller supports only one active session – only one user (administrator) can operate the device. If another user tries to login, the following message appears: “Someone’s logged in”



The active session will be terminated automatically, if the current user stays inactive for 2 minutes.

7.2 Monitoring page

After successful authorization, the Monitoring page appears:

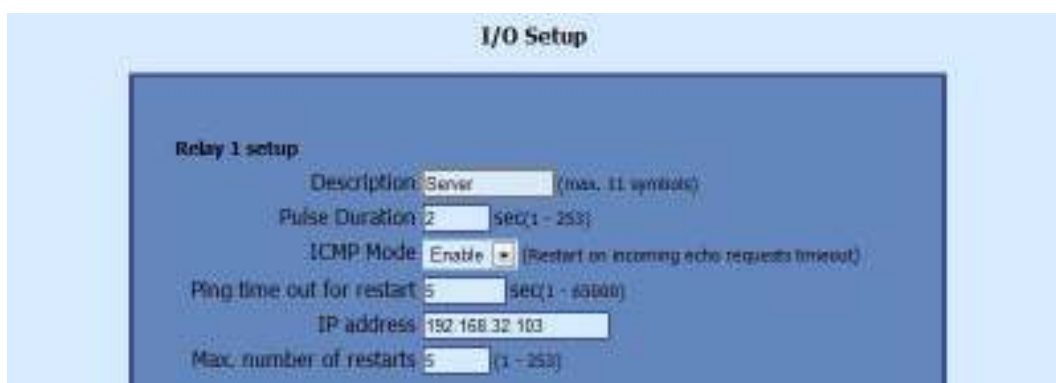


The Monitoring page provides information about the state of the digital and analog inputs, relay state and the temperature (if temperature sensor is connected to the controller) .

7.3 I/O setup page

The input and output settings are made in "I/O Setup" page. The following parameters can be set :

- **Description** – brief description of the output, maximum 11 characters should be used.
- **Pulse Duration** – time for which the relay changes its state, by pushing the "Pulse" button on "Monitoring" page.
- **ICMP Mode** – this is an operational mode, in which the controller restarts the relay output, if no ICMP echo-request (ping) is received from specified IP Address for specified time (Ping timeout for restart) .
- **Ping time out for restart** – timeout for restart for **Relay 1** .
- **IP address** - IP address of the host from which ping is expected.
- **Maximum number of restarts** – maximum number of restarts after timeout for restart has expired





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In the configuration example above, the controller expects ping from host with IP Address 192.168.32.103. If, within 5 seconds the controller receives no ping, the Relay will be restarted for a period of 2 seconds, as the maximum number of consecutive restarts is limited to 5.

One of the possibilities of **TCW110** is to send e-mail messages when the status of the digital input **Digital Input 1** is changed. To do this, the following parameters must be set:

- **Description** – brief description of the input, maximum 11 characters should be used.
- **Subject** – message subject, maximum 11 characters should be used
- **Message** – message body, maximum 22 characters should be used

In the example above, if an event occurs (closing contact) the controller will send e-mail message to test@yahoo.com with subject: "Alarm" and the text: "Alarm is activated".

Important! It is necessary to set SMTP server settings on "Network Setup" page, to successfully send e-mail messages.

Only the field "Description" can be changed for the **Analog Input 1**. Maximum 11 characters may be used.

7.4 Network Setup page

The Network parameters are set on this page. The following parameters can be changed:

- **IP configuration** – IP Address configuration can be static or dynamic (DHCP)
- **IP address, Subnet mask, Default gateway** – these fields are active if IP address is static
- **Host Name**
- **MAC** – device MAC address



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The screenshot shows the 'Network Setup' configuration page. It includes the following fields:

- IP configuration:**
 - IP configuration: Static (dropdown)
 - IP address: 192.168.32.7
 - Subnet mask: 255.255.255.0
 - Default gateway: 192.168.32.1
 - Host Name: CW100
- MAC Address:**
 - MAC: 00-04-A3-AA-00-99 (with a placeholder for the last octet: xxx-xx-xx-xx-xx-xx)

If multiply **TCW110** controllers are used on the same network, please change the IP address after connecting the device to the network. This will avoid devices installed on the network with the same factory default IP address at the same time. It may be necessary to clear the arp cache each time you connect new device to the network. This is done by typing `arp -d` in the command prompt of a Windows computer.

In order to reduce network traffic and to limit the access, the controller supports VLAN and MAC address filtering. In addition to the MAC address of the Default Gateway, another 2 MAC addresses can be added to the filter. The filter is enabled by marking the appropriate check box after the MAC address.

The screenshot shows the 'VLAN configuration' and 'MAC Filter' sections. It includes the following fields:

- VLAN configuration:**
 - VLAN Status: Disabled (dropdown)
 - VLAN ID: 0
- MAC Filter:**
 - MAC Address 1: 00-DC-42-53-F8-5B (checkbox: (Default Gateway))
 - MAC Address 2: FF-FF-FF-FF-FF-FF (checkbox: xxx-xx-xx-xx-xx-xx)
 - MAC Address 3: FF-FF-FF-FF-FF-FF (checkbox: xxx-xx-xx-xx-xx-xx)
- SMTP:**
 - Mailserver IP: 0.0.0.0
 - E-mail: (checkbox: sender e-mail)

To set up the SMTP server the following fields should be completed

- **Mailserver IP** – IP address of SMTP mail server, note that **TCW110** don't support SMTP authentication
- **E-mail** – sender e-mail

7.5 SNMP Setup page

TCW110 supports SNMP v.1 that enables trap delivery to an SNMP management application. This enables the device to be part of large monitoring and control networks. The possible settings are:

- **SNMP Configuration** – enable SNMP v.1



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- **Read-Write community** – performs client authentication
- **Read-Only community** – performs client authentication

SNMP Setup

SNMP

SNMP Configuration: Enable

Read-Write community: private

Read-Only community: public

SNMP Traps

SNMP Traps: Enable

IP address: 0.0.0.0

Community string: public

Trap Interval: 10

Max. number of Traps: 255

Save

[account] [monitoring] [network setup] [I/O setup] [logout]

SNMP trap messages are sent for the following conditions:

- when event occurs on **Digital Input 1** (the signal changes its state)
- measured voltage on **Analog Input 1** is outside the predefined range
- measured temperature is outside the predefined range
- restart

Setting range for sending SNMP trap messages is done only through SNMP. The following parameters can be changed:

- **SNMP Traps** – enable SNMP trap messages
- **IP address** – IP address of the receiving host
- **Community string** – performs client authentication
- **Trap Interval** - time interval for SNMP trap messages
- **Max. number of Traps** – maximum number of SNMP trap messages sent, if trap condition is present



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8. Control and monitoring using SNMP

TCW110 can be configured and monitored through SNMP (Simple Network Management Protocol). This could be done using every SNMP v.1 compatible program. Parameters that can be changed, are grouped according to their functions in the tables below. To obtain a valid OID number it is necessary to replace the “**x**” symbol with the prefix “**.1.3.6.1.4.1.17095**”. To save the changes you should set a value “1” of the **configurationSaved** (OID **x.8.0**).

8.1 product

OID	Name	Access	Description	Syntax
x.1.1.0	name	read-only	Device name	String
x.1.2.0	version	read-only	Software version	String
x.1.3.0	date	read-only	Date of the version	String

8.2 SNMP Setup

OID	Name	Access	Description	Syntax
x.2.1.1.0	trapEnabled	read-write	TRAP messages enable/disable	INTEGER { Yes(1), No(0) }
x.2.1.2.0	trapReceiverIPAddress	read-write	TRAP messages receiver address	IpAddress
x.2.1.3.0	trapCommunity	read-write	TRAP community	String (SIZE (0..13))
x.2.1.4.0	trapInterval	read-write	TRAP messages interval	INTEGER (0..255)
x.2.1.5.0	maxNumberOfTraps	read-write	maximum number SNMP TRAP messages	INTEGER (0..255)
x.2.1.6.0	digitalInput1State	read-write	Digital input 1 trap status	INTEGER { ON(1), OFF(0) }
x.2.1.8.1.0	voltage1minimum	read-write	Voltage1 lower range	String (SIZE (0..13))
x.2.1.8.2.0	voltage1maximum	read-write	Voltage1 higher range	String (SIZE (0..13))
x.2.1.10.1.0	temperatureMinimum	read-write	Temperature lower range	String (SIZE (0..6))
x.2.1.10.2.0	temperatureMaximum	read-write	Temperature higher range	String (SIZE (0..6))
x.2.2.0	SNMPConfiguration	read-write	SNMP Configuration	INTEGER { ENABLED(1), DISABLED(0) }
x.2.3.0	readCommunity	read-write	SNMP Read Community	String (SIZE (0..13))
x.2.4.0	writeCommunity	read-write	SNMP Write Community	String (SIZE (0..13))

8.3 monitor

OID	Name	Access	Description	Syntax
x.3.1.1.0	relay_1	read-write	relay 1 status	INTEGER { ON(1), OFF(0) }
x.3.1.3.0	pulse_1	read-write	relay 1 pulse status	INTEGER { ON(1), OFF(0) }
x.3.2.1.0	voltage1	read-only	Analog Input 1 voltage	String (SIZE (0..4))
x.3.2.2.0	vol1int	read-only	Analog Input 1 voltage (integer x100mV)	INTEGER (0..65000)
x.3.3.1.0	digitalInput1	read-only	Digital Input 1 status	INTEGER { ON(1), OFF(0) }
x.3.4.0	temperature	read-only	temperature	String (SIZE (0..4))
x.3.5.0	tempx10int	read-only	Temperature (integer x 10)	INTEGER (-550..1250)



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8.4 network

OID	Name	Access	Description	Syntax
x.4.1.0	deviceIPAddress	read-write	Device IP address	IpAddress
x.4.2.0	subnetMask	read-write	Subnet Mask	IpAddress
x.4.3.0	gateway	read-write	Gateway	IpAddress
x.4.4.0	deviceMACAddress	read-write	Device MAC Address	OCTET STRING (SIZE(6))
x.4.5.0	dhcpConfig	read-write	DHCP ON/OFF	INTEGER { ON(1), OFF(0) }
x.4.6.1.1.0	filterMACAddress1	read-write	MAC Filter 1	OCTET STRING (SIZE(6))
x.4.6.1.2.0	filterMACEnable1	read-write	MAC Filter 1 ON/OFF	INTEGER { ENABLED(1), DISABLED(0) }
x.4.6.2.1.0	filterMACAddress2	read-write	MAC Filter 2	OCTET STRING (SIZE(6))
x.4.6.2.2.0	filterMACEnable2	read-write	MAC Filter 2 ON/OFF	INTEGER { ENABLED(1), DISABLED(0) }
x.4.6.3.1.0	filterMACAddress3	read-write	MAC Filter 3	OCTET STRING (SIZE(6))
x.4.6.3.2.0	filterMACEnable3	read-write	MAC Filter 3 ON/OFF	INTEGER { ENABLED(1), DISABLED(0) }
x.4.7.1.0	smtpServerIPAddress	read-write	SMTP server IP address	IpAddress
x.4.7.2.0	senderEmailAddress	read-write	Sender e-mail address	String (SIZE (0..38))
x.4.8.1.0	VLANStatus	read-write	VLAN status	INTEGER { ENABLED(1), DISABLED(0) }
x.4.8.2.0	VlanId	read-write	VLAN ID	INTEGER (0..4095)

8.5 inputs

OID	Name	Access	Description	Syntax
x.5.1.1.0	input1description	read-write	Digital Input 1 description	String (SIZE (0..10))
x.5.1.2.0	input1ActionEdge	read-write	Send e-mail condition	RISING-FALLING
x.5.1.3.0	input1action	read-write	Send e-mail enable/disable	INTEGER { SEND(1), DONTSEND(0) }
x.5.1.4.0	input1emailAddress	read-write	Recipient e-mail	String (SIZE (0..38))
x.5.1.5.0	input1subject	read-write	Subject	String (SIZE (0..10))
x.5.1.6.0	input1body	read-write	Message	String (SIZE (0..21))
x.5.3.0	voltage1description	read-write	Analog Input 1 description	String (SIZE (0..10))

8.6 outputs

OID	Name	Access	Description	Syntax
x.6.1.1.0	relay1description	read-write	relay 1 description	String (SIZE (0..10))
x.6.1.2.0	relay1pulseWidth	read-write	relay 1 pulse width	INTEGER (0..253)
x.6.1.3.0	relay1IcmpMode	read-write	relay 1 - ICMP ON/OFF	INTEGER { ON(1), OFF(0) }



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x.6.1.4.0	relay1IcmpTimeout	read-write	relay 1 - ICMP timeout	INTEGER (0..65000)
x.6.1.5.0	relay1IpAddress	read-write	relay 1 - ICMP IP address	IpAddress
x.6.1.6.0	relay1NumOfRestarts	read-write	relay 1 – maximum number of restarts	INTEGER (0..253)

8.7 accounts

OID	Name	Access	Description	Syntax
x.7.1.1.0	adminName	read-write	Username (Admin)	String (SIZE (0..14))
x.7.1.2.0	adminPassword	read-write	Password (Admin)	String (SIZE (0..14))
x.7.2.1.0	userName	read-write	Username (User)	String (SIZE (0..14))
x.7.2.2.0	userPassword	read-write	Password (User)	String (SIZE (0..14))

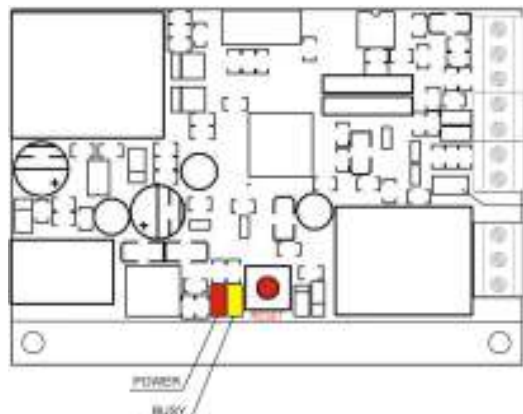
8.8 Save changes

OID	Name	Access	Description	Syntax
x.8.0	configurationSaved	read-write	Save configuration changes	INTEGER { SAVED(1), UNSAVED(0) }
x.9.0	restartDevice	read-write	Restart device	INTEGER { RESTART(1), CANCEL(0) }

9. Restoring Factory Default Settings

If the IP address or password are forgotten, **TCW110** can be restored to its original factory default settings. To do this, please follow the steps below:

- remove the power supply from the unit and open the plastic box
- press and hold the RESET button then turn on the power supply



- The leds POWER and BUSY are flashing 12 times, after that they will turn on. In this moment the RESET button should be released. The factory default settings are shown in the table below:



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User Name (Admin)	admin
Password (Admin)	admin
User Name (User)	user
Password (User)	user
IP Address	192.168.1.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.1
SNMPConfiguration	enabled
readCommunity	public
writeCommunity	private

10. Firmware update

TCW110 supports remote firmware update. To do this please follow the steps below:

- Download the latest firmware version from www.teracom.cc . The extension of the update file is .cod .
- Open Command Prompt window. In the example below in **blue** are the commands that must be entered, and in **red** are the descriptions of these commands :

```
C:\> -- go to the directory where the update file is located ( .cod extension)
```

```
C:\>ftp 212.73.154.53 -- FTP connection to the controller is made
```

```
Connected to 212.73.154.53.
```

```
220 Ready
```

```
User (212.73.154.53:(none)): admin -- enter username
```

```
331 Password required
```

```
Password: ***** -- enter password
```

```
230 Logged in
```

```
ftp> put tera_ipv1.32a.cod -- the update file is sent for update
```

```
200 Ok
```

```
150 Transferring data...
```

```
File is OK. Restarting Device... -- 2 minutes after this message appears, the device will be successfully updated
```

```
ftp: 329798 bytes sent in 92.44Seconds 3.57Kbytes/sec
```



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ftp>



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