



# Ethernet controller TCW120

## Users manual



### 1. Short description

**TCW120** 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 outputs, analog and digital inputs, 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
- 2 digital inputs, 2 analog inputs
- Two 3A/24V relay outputs
- SNMP v.1, SMTP, ICMP, VLAN support
- Sending SNMP Traps messages under certain conditions
- Sending E-mail messages under certain conditions
- Relay restart on ping/echo timeout
- **TCW120** can be used as standalone device or as a part of control and monitoring system
- MAC Address filtering
- Remote FTP firmware update

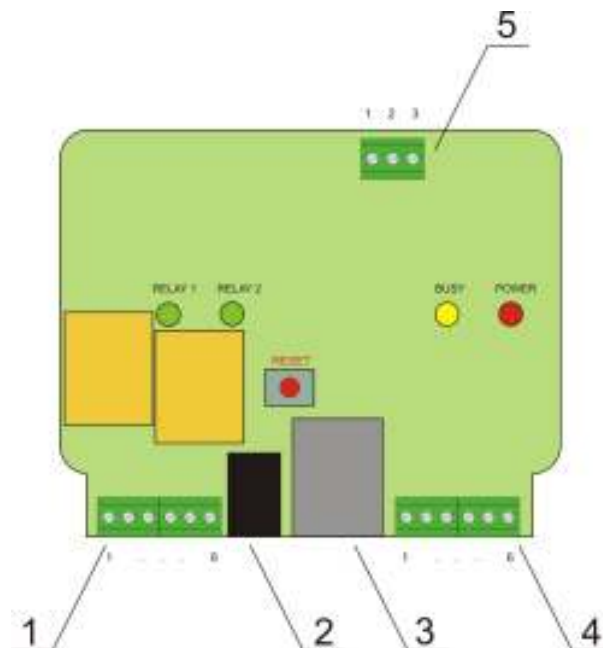


### 3. Technical parameters

Supply Voltage, VDC		12
Weight, g		120
Dimensions, mm		72 x 50 x 18
Operating temperature, °C		0 ÷ 40
Storage temperature, °C		-40 ÷ 85
Analog input range, VDC	Ain1	0 ÷ 20
	Ain2	0 ÷ 100
Minimum high level input voltage, V		2.5
Maximum high 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

Inputs and outputs locations are shown below:





**Connector 1** – 6-pin connector pinout is shown in the table below:

Pin	description
1	Relay1 normally open
2	Relay1 common
3	Relay1 normally closed
4	Relay2 normally open
5	Relay2 common
6	Relay2 normally closed

**Connector 2** – power connector.

**Connector 3** – RJ45 Ethernet connector

**Connector 4** – 6-pin connector pinout is shown in the table below:

Pin	description
1	Digital input 1 ( <b>Din1</b> )
2	GND
3	Digital input 2 ( <b>Din2</b> )
4	Analog input 1 ( <b>Ain1</b> )
5	GND
6	Analog input 2 ( <b>Ain2</b> )

**Connector 5** –3-pin connector pinout is shown in the table below:

Pin	description
1	GND – Temp. Sensor
2	Data – Temp. Sensor
3	Vdd – Temp. Sensor

## 5. LED indicators

The following indicators show the status of the controller :

- **Relay1/Relay2** (green) – these LEDs are illuminated whenever the corresponding relay is closed (the Normally Open contact is closed and the Normally Closed contact is open);
- **Power** (red) – this flashes when the power supply is turned on;
- **Busy** (yellow) – this LED indicates that someone is connected to the controller through web interface;
- **Link** (green) – this LED is located on the Ethernet connector. It indicates that the device is connected to the network ;



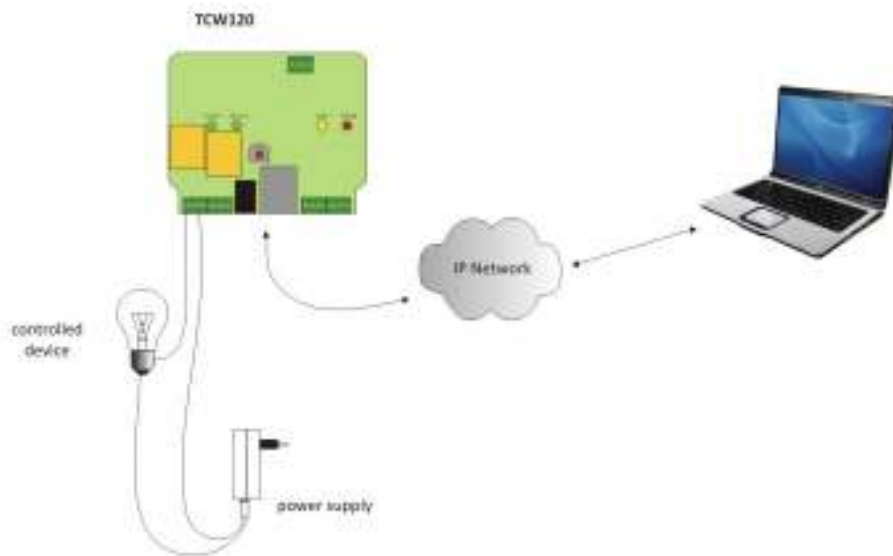
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- **Act** (yellow) – this LED is located on the Ethernet connector. It flashes when activity is detected on the network.

## 6. Example Applications

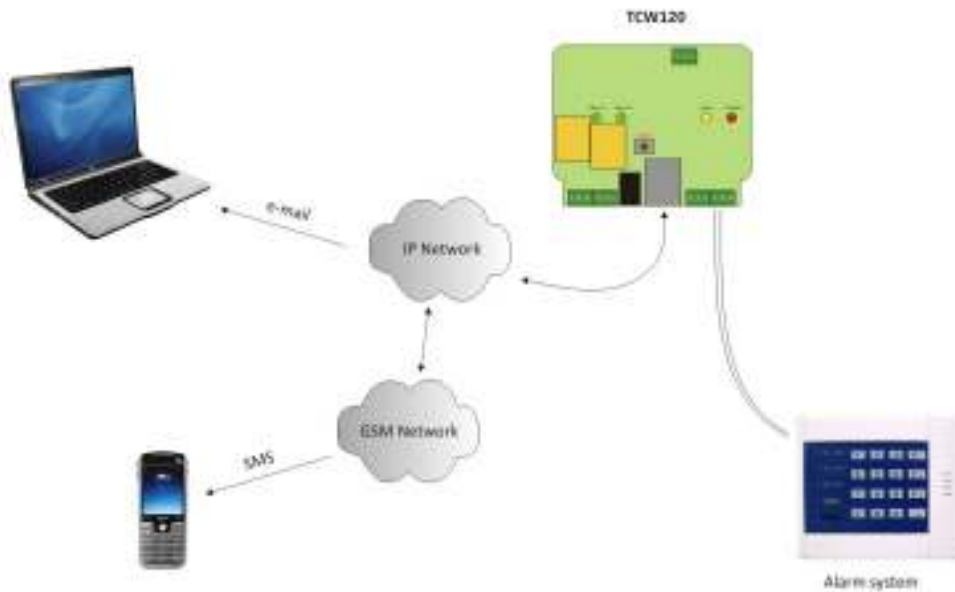
### 6.1 Remote control

The controlled device is connected in series with the relay contacts. Users can operate **TCW120** using a web browser or by using custom SNMP applications. Both relay outputs are managed independently of each other.



### 6.2 Remote monitoring

A relay output from the monitored device is connected to one of the digital inputs of **TCW120**. 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. Two independent devices (relay contacts) can be controlled.



## 7. 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 red LED is blinking, it indicates that the power supply is OK. By default **TCW120** 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 **TCW120** may be established by assigning a temporary IP address to the configuration computer that is on the same network (for example 192.168.1. 3). 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.

## 8. Web-based setup.

The web based interface allows the **TCW120** 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.

### 8.1 Login page

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.



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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.

### 8.2 Monitoring page

After successful authorization, the Monitoring page appears:



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**Monitoring**

Digital Input 1	OFF	
Digital Input 2	ON	
Analog Input 1	11.9 V	
Analog Input 2	4.8 V	
Temperature	39.6 °C	
Relay 1	OFF	<input type="button" value="ON/OFF"/> <input type="button" value="Pulse"/>
Relay 2	ON	<input type="button" value="ON/OFF"/> <input type="button" value="Pulse"/>

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

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

To change the state of the relays , the "ON/OFF" buttons should be pressed. If the *Pulse* button is pressed the relay will pulse for the time specified in the "Pulse Duration" field in the "I/O Setup " page.



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### 8.3 I/O setup page

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

- **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 its relays, if no ICMP echo-request (ping) or ICMP echo-reply (echo) is received from specified IP Address for specified time (Ping timeout for restart) . This mode can be activated for each of the relays. **Relay 1** will be restarted if no ping is present, and **Relay 2** if no *echo* is present.
- **Ping time out for restart** – timeout for restart for **Relay 1** and **Relay 2** .
- **IP address** - IP address of the host from which is expected ping or echo.
- **Maximum number of restarts** – maximum number of restarts after timeout for restart has expired

The screenshot shows the "I/O Setup" page with two sections: "Relay 1 setup" and "Relay 2 setup".

**Relay 1 setup:**

- Description: (max. 11 symbols)
- Pulse Duration: 10 SEC (max. 253 sec)
- ICMP Mode: Disable (Restart on incoming echo requests timeout)
- Ping time out for restart: 0 SEC (max. 65000 sec)
- IP address: 0.0.0.0
- Max. number of restarts: 5 (max. 253)

**Relay 2 setup:**

- Description: File server (max. 11 symbols)
- Pulse Duration: 5 SEC (max. 253 sec)
- ICMP Mode: Enable (Restart on remote address timeout)
- Ping time out for restart: 10 SEC (max. 65000 sec)
- IP address: 192.168.32.10
- Max. number of restarts: 5 (max. 253)

In the configuration example above, the controller sends ping to the host with IP Address 192.168.32.10. If, within 10 seconds the controller receives no echo, Relay 2 will be restarted for a period of 5 seconds as the maximum number of consecutive restarts is limited to 5.

One of the possibilities of **TCW120** is to send e-mail messages when the status of digital inputs **Digital Input 1** and **Digital Input 2** 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

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



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**Digital Input 1 setup**  
Description: Alarm home (max. 11 symbols)  
if OFF-TO-ON, then mail\_to: test@gmail.com (recipient e-mail)  
subject: Alarm3 (max. 11 symbols)  
message: Alarm 3 activated (max. 22 symbols)

**Digital Input 2 setup**  
Description: (max. 11 symbols)  
if OFF-TO-ON, then no\_action (recipient e-mail)  
subject: (max. 11 symbols)  
message: (max. 22 symbols)

In the example above, if an event occurs (closing contact) the controller will send e-mail message to [test@gmail.com](mailto:test@gmail.com) with subject "Alarm 3" and the text "Alarm 3 activated".

Only the field "Description" can be changed for the **Analog Input 1** and **Analog Input 2**. Maximum 11 characters may be used.

**Analog Input 1**  
Description: (max. 11 symbols)

**Analog Input 2**  
Description: (max. 11 symbols)

### 8.5 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

**Network Setup**

**IP configuration**  
IP configuration: Static  
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-00-95 (xx-xx-xx-xx-xx-xx)

If multiply **TCW120** 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



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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.

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

- **Mailserver IP** – IP address of SMTP mail server, note that CW100 don't support SMTP authentication
- **E-mail** – sender e-mail

### 8.6 SNMP Setup page

**TCW120** 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
- **Read-Write community** – performs client authentication
- **Read-Only community** – performs client authentication



**SNMP Setup**

**SNMP**

SNMP Configuration

Read-Write community

Read-Only community

**SNMP Traps**

SNMP Traps

IP address

Community string

Trap Interval

Max. number of Traps

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

SNMP trap messages are sent for the following conditions:

- when event occurs on **Digital Input 1** or **Digital Input 2** (the signal changes its state)
- measured voltage on **Analog Input 1** и **Analog Input 2** 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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### 9. SNMP setup

**TCW120** 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**).

#### 9.1 product

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

#### 9.2 SNMP Setup

OID	Name	Access	Description	Syntax
<b>x.2.1.1.0</b>	trapEnabled	read-write	TRAP messages enable/disable	INTEGER { Yes(1), No(0) }
<b>x.2.1.2.0</b>	trapReceiverIPAddress	read-write	TRAP messages receiver address	IpAddress
<b>x.2.1.3.0</b>	trapCommunity	read-write	TRAP community	String (SIZE (0..13))
<b>x.2.1.4.0</b>	trapInterval	read-write	TRAP messages interval	INTEGER (0..255)
<b>x.2.1.5.0</b>	maxNumberOfTraps	read-write	Maximum number SNMP messages	INTEGER (0..255)
<b>x.2.1.6.0</b>	digitalInput1State	read-write	Digital input 1 trap status	INTEGER { ON(1), OFF(0) }
<b>x.2.1.7.0</b>	digitalInput2State	read-write	Digital input 2 trap status	INTEGER { ON(1), OFF(0) }
<b>x.2.1.8.1.0</b>	voltage1minimum	read-write	Voltage1 lower range	String (SIZE (0..13))
<b>x.2.1.8.2.0</b>	voltage1maximum	read-write	Voltage1 higher range	String (SIZE (0..13))
<b>x.2.1.9.1.0</b>	voltage2minimum	read-write	Voltage2 lower range	String (SIZE (0..13))
<b>x.2.1.9.2.0</b>	voltage2maximum	read-write	Voltage2 higher range	String (SIZE (0..13))
<b>x.2.1.10.1.0</b>	temperatureMinimum	read-write	Temperature lower range	String (SIZE (0..6))
<b>x.2.1.10.2.0</b>	temperatureMaximum	read-write	Temperature higher range	String (SIZE (0..6))
<b>x.2.2.0</b>	SNMPConfiguration	read-write	SNMP Configuration	INTEGER { ENABLED(1), DISABLED(0) }
<b>x.2.3.0</b>	readCommunity	read-write	SNMP Read Community	String (SIZE (0..13))
<b>x.2.4.0</b>	writeCommunity	read-write	SNMP Write Community	String (SIZE (0..13))



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### 9.3 monitor

OID	Name	Access	Description	Syntax
x.3.1.1.0	relay_1	read-write	<b>relay 1</b> status	INTEGER { ON(1), OFF(0) }
x.3.1.2.0	relay_2	read-write	<b>relay 2</b> status	INTEGER { ON(1), OFF(0) }
x.3.1.3.0	pulse_1	read-write	<b>relay 1</b> pulse status	INTEGER { ON(1), OFF(0) }
x.3.1.4.0	pulse_2	read-write	<b>relay 2</b> pulse status	INTEGER { ON(1), OFF(0) }
x.3.2.1.0	voltage1	read-only	<b>Analog Input 1</b> voltage	String (SIZE (0..4))
x.3.2.2.0	vol1int	read-only	<b>Analog Input 1</b> voltage (integer x100mV)	INTEGER (0..65000)
x.3.2.3.0	voltage2	read-only	<b>Analog Input 2</b> voltage	String (SIZE (0..4))
x.3.2.4.0	vol2int	read-only	<b>Analog Input 2</b> voltage (integer x100mV)	INTEGER (0..65000)
x.3.3.1.0	digitalInput1	read-only	<b>Digital Input 1</b> status	INTEGER { ON(1), OFF(0) }
x.3.3.2.0	digitalInput2	read-only	<b>Digital Input 2</b> 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)

### 9.4 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)



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### 9.5 inputs

OID	Name	Access	Description	Syntax
x.5.1.1.0	input1description	read-write	<b>Digital Input 1</b> 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.5.2.1.0	input2description	read-write	<b>Digital Input 2</b> description	String (SIZE (0..10))
x.5.2.2.0	input2ActionEdge	read-write	Send e-mail condition	RISING-FALLING
x.5.2.3.0	input2action	read-write	Send e-mail enable/disable	INTEGER { SEND(1), DONTSEND(0) }
x.5.2.4.0	input2emailAddress	read-write	Recipient e-mail	String (SIZE (0..38))
x.5.2.5.0	input2subject	read-write	subject	String (SIZE (0..10))
x.5.2.6.0	input2body	read-write	Message	String (SIZE (0..21))
x.5.3.0	voltage1description	read-write	<b>Analog Input 1</b> description	String (SIZE (0..10))
x.5.4.0	voltage2description	read-write	<b>Analog Input 2</b> description	String (SIZE (0..10))

### 9.6 outputs

OID	Name	Access	Description	Syntax
x.6.1.1.0	relay1description	read-write	<b>Relay 1</b> description	String (SIZE (0..10))
x.6.1.2.0	relay1pulseWidth	read-write	<b>Relay 1</b> pulse width	INTEGER (0..253)
x.6.1.3.0	relay1IcmpMode	read-write	<b>Relay 1</b> - ICMP ON/OFF	INTEGER { ON(1), OFF(0) }
x.6.1.4.0	relay1IcmpTimeout	read-write	<b>Relay 1</b> - ICMP timeout	INTEGER (0..65000)
x.6.1.5.0	relay1IpAddress	read-write	<b>Relay 1</b> - ICMP IP address	IpAddress
x.6.1.6.0	relay1NumOfRestarts	read-write	<b>Relay 1</b> – maximum number of restarts	INTEGER (0..253)
x.6.2.1.0	relay2description	read-write	<b>Relay 2</b> description	String (SIZE (0..10))
x.6.2.2.0	relay2pulseWidth	read-write	<b>Relay 2</b> pulse width	INTEGER (0..253)
x.6.2.3.0	relay2IcmpMode	read-write	<b>Relay 2</b> - ICMP ON/OFF	INTEGER { ON(1), OFF(0) }
x.6.2.4.0	relay2IcmpTimeout	read-write	<b>Relay 2</b> - ICMP timeout	INTEGER (0..65000)
x.6.2.5.0	relay2IpAddress	read-write	<b>Relay 2</b> - ICMP IP address	IpAddress
x.6.2.6.0	relay2NumOfRestarts	read-write	<b>Relay 2</b> – maximum number of restarts	INTEGER (0..253)

### 9.7 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))



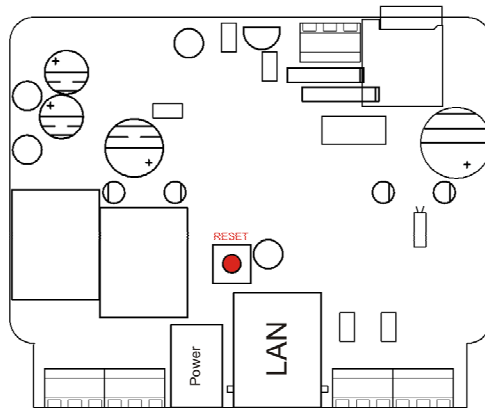
## 9.8 Save changes

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) }

## 10. Restoring Factory Default Settings

If the IP address or password are forgotten, **TCW120** 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



- wait about 5 seconds and release the RESET button. The factory default settings are shown in the table below:

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



## 11. Firmware update

TCW120 supports remote firmware update. To do this please follow the steps below:

- Download the latest firmware version from [www.teracom.cc](http://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
```

```
ftp>
```



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*Revision 1 – Nov, 2010*

