DK103M IP Converter

Installation User Manual

Table of Contents

Chapter 1. Safety Measures

Before using the product.

This product complies with all safety rules. However, improper use of any electric device can cause fires and severe damage. In order to avoid accidents, please read this Manual carefully before you start using this door

Follow this Operation Manual.

Do not use or store the IP converter in severe environment:

- Avoid extremely low and high temperatures (The operating temperature of this IP converter is $0°\sim+50°$).
- Avoid prolonged exposure to direct sunlight, do not install near water and heat sources.
- Do not install near electromagnetic transmitters
- Avoid exposure to high vibration.

In case of:

- Smoke or strange smell coming from the device.
- Water or foreign matter getting inside the device.
- The device getting damaged:

Do the following:

- Unplug the power cord and disconnect all other cords from the IP converter.
- Contact our Service Center. You can find our contact information on our website: http://www.beward.ru/.

Transportation

Transport the IP converter carefully, using the original box and protective packing

Air flow

In order to avoid overheating, ensure that nothing is blocking the air circulation around the IP converter!

Cleaning

Use a soft dry cloth to clean the surface of the device. To remove obstinate stains, apply a small amount of detergent on the cloth, then wipe the surface dry

Do not use volatile solvents (alcohol-containing products, Benzene etc.) to avoid damaging the device.

Chapter 2. Description

BEWARD DK103M IP Converter is designed for organizing IP intercome systems based on already existing local networks without using any additional equipment (e.g. separate internal monitors). To start using the device you only have to install the software on your PC or Smartphone device and set it up. This device is:

- Low-cost
- Easy to install
- Remote Access Supported

Pic. 2.1

DK103M is used for analog-to-digital conversion and managing analog wired matrix intercom devices. In other words, this device converts analog intercoms into digital intercoms, while retaining the ability to use the analog monitor. The device allows for establishing video and audio connection between the *Guest* and the *Client*, conducting surveillance of the nearby territory, control of other devices that are connected to the single-user door station (electronic locks, garage door openers, light switches, alarm systems etc.) via Ethernet. The device is supported by modern network technologies, allowing it to be used a part of a complex IP Surveilance system.

DK103M is connected to the network via-T/100BASE-TX Ethernet interface. Its power is supplied from a DC 12V power source.

The device is even more reliable due to its SD card support that prevents loss of data in case of network failures.

2.1.1. Key Features

- Simultaneous encoding: H.264/H264, H.264/MJPEG, MJPEG /MJPEG
- Built-in web server for viewing and adjusting settings
- Built-in player for recorded videos
- Build-in microphone and speaker
- Power: DC 12 V
- Temperature: -0°C~+50°C

- Supported protocols: TCP/IP, SIP v.2.0, VPN, STUN, HTTP, HTTPS, FTP, SMTP, DDNS, DHCP, PPPoE, RTP, RTSP, UDP, UPnP, NTP, ONVIF v.2.41

- ONVIF v.2.41 support

2.1.2. Package contents

- DK103M IP Converter

- Self-tapping screws

- Wi-Fi antenna (for DKxxxW option)

- 4G USB modem (for DKxxx4G option)

- Terminal block (4 pcs.)

- CD with software and documentation

ATTENTION!

Package contents and device specification are subject to change without notice

Chapter 3. Overview

3.1. IP converter

The front view of the IP converter is given below:

Pic. 3.1

1 – Reset button: press this button 3 times with intervals not less than 1 second during 10 seconds to set device settings by default.

2 – Micro SD: slot for mounting a MicroSD memory card (up to 32 Gb).

3 – Ethernet: RJ45 socket for connecting the device to Ethernet

4 – DC 12V: socket for connecting a DC 12V power supply (power equal or more than 12W)

5 – Power indicator: If the device is activated, the red light is ON.

6 – Multiuser Unit socket: used for connecting multi-user wired matrix videointercoms.

7 – Outdoor Unit socket: used for connecting single-user analog videointercoms.

8 – Monitor socket: used for connecting monitors of single-user analog videointercoms. Prior to using the IP converter, the monitors are connected directly to their analog videointercoms.

9 – RS-485 socket: used for attaching extension controllers

Pic. 3.2

**USB:** this socket (*Pic. 3.2*) is used for connecting Huawei E3372 4G modem (purchased seperately).

Wi-Fi: this socket (Pic*. 3.2*) is only present for DK103MW models. It is used for connecting Wi-Fi antennas (included in the DK103MW package). If you are using DK103MW, you must connect the antenna to transfer data via Wi-Fi.

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Chapter 4. IP Converter Installation

4.1. General Information

The IP Converter must be connected to a local network (or the Internet) via Ethernet cable . The device can be connected direcrlt to the PC or via auxiliary network devices (router, switch).
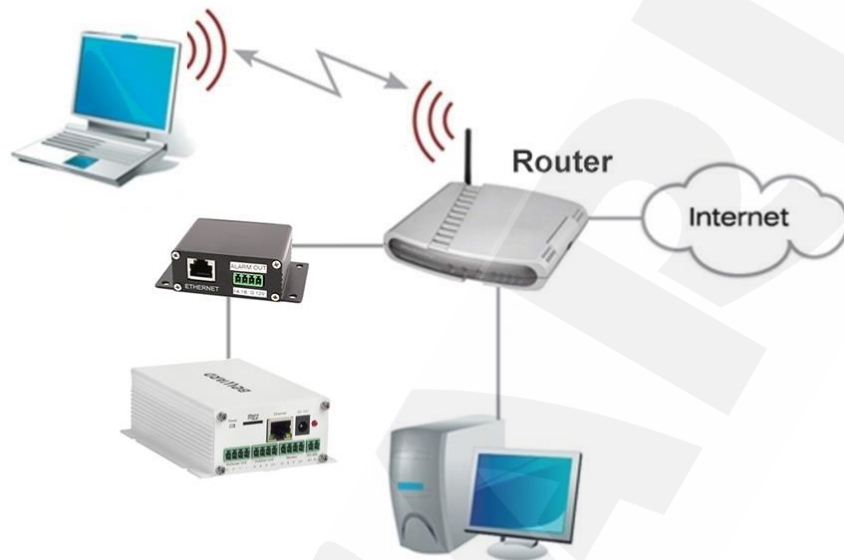
Pic. 4.1

The general instructions and installation recommendations are given below.

4.2. Installation Recommendations

This paragraph contains a short list of recommendations necessary for the correct installation of DK103M.

Recommendations for placement:

- The operating temperature range is 0°C to +50°C.
- Avoid exposure to direct sunlight and do not place the device near any heat sources.
- Avoid exposure to water.
- Do not locate the device near any electrical appliances which can be electromagnetic transmitters.
- When installing the device, make sure the cables are laid in a safe and ergonomic way..
- Avoid unstable installation, which may allow exposure to high vibration. This may reduce motion detection performance and image quality in general.

Recommendations for twisted pair cable routing:

- In corridors, it is advisable to install electric and feeble-current cables in different conduits that are disposed on different walls.
- Twisted pair and electric cables can be installed in the same conduit using different sections of the cable that have solid longitudinal partitions with at least 0.25 h of fire resistance, which are made of non-combustible material and should be positioned in work areas at distance of 15 meters max. if the electrical power does not exceed 5 kW.
- Electric and feeble-current cables should be placed in parallel to each other at distance of at least 50 mm in different conduits or different sections of conduit. If the electric field strength from the electric cables exceeds 3 V/m, you should increase the distance between the electric and feeble-current cables or reduce the electromagnetic noise.
- Twisted pair and electric cables should cross each other at right angles.
- Unshielded twisted pair cables should be located at distance of at least 125 mm from fluorescent gas-discharge lamps or from other high-voltage discharge devices.
- Unshielded twisted pair cables should be located at distance of at least 1.5 meters from electromagnetic interference sources that produce electric field strength exceeding 3 V/m.
- Switchboards with pinned unshielded twisted pair cables should be located at distance of at least 3 meters from electromagnetic interference sources that produce electric field strength exceeding 3 V/m.
- Cable runs should be arranged between the points of connection such a way so the overall cable path length is as short as possible.

- Minimum cable bending radius is four times the cable diameter (or 1 inch=2.5 cm). It is also acceptable to install the cable so that the cable bending radius is 2 inches (5 cm).
- Maximum length of the entire segment is 100 meters.

4.3. IP converter Mounting

Follow the steps below:

Step 1: Mount the device to a flat surface via 4 screws (included in the package).

See the connection scheme below:
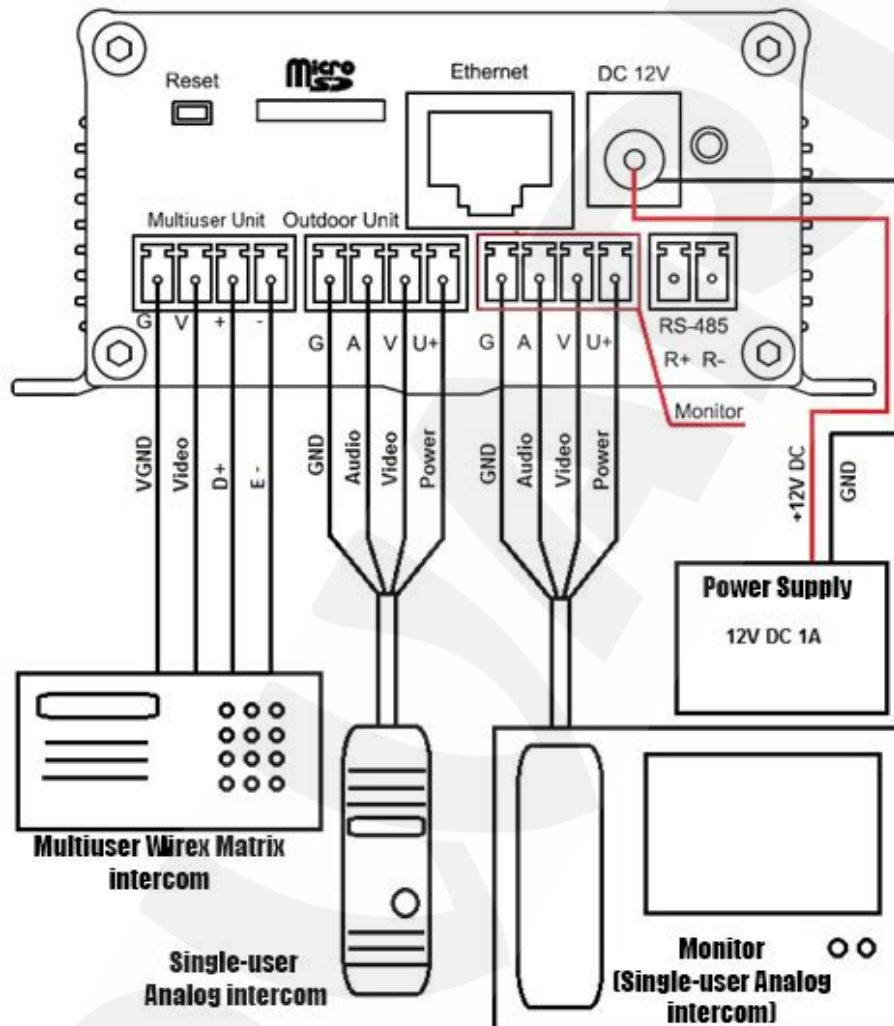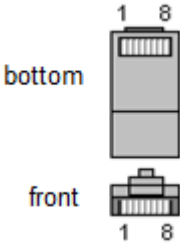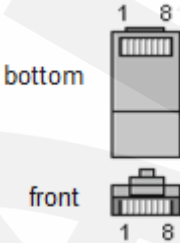

Pic. 4.2

4.4. Memory Card Installation

Switch off the device before mounting/ejecting the memory card. The hot swap of a memory card is not supported by the device and may damage the equipment or cause a data loss.

4.5. Wired Connection to a Network

Connect the device to the local network (to the router's LAN interface) using a twisted pair cable with RJ45 connectors.

You can purchase the network cable separately or if you have materials, tools and skills, you can make it by yourself.

A straight RJ-45 cable (UTP category 5e)

Side A		Side B	
bottom front	1: White and orange	bottom front	1: White and orange
	2: Orange		2: Orange
	3: White and green		3: White and green
	4: Blue		4: Blue
	5: White and blue		5: White and blue
	6: Green		6: Green
	7: White and brown		7: White and brown
	8: Brown		8: Brown

To make a network cable, you need the following materials: a UTP category 5e cable, two RJ-45 connectors and an RJ-45 crimping tool.

Assembling the pairs of wires in the correct order (see the table above) ensures data transfer speed of 100 Mbps.

Chapter 5. Wired Connection Setting

To make the IP Converter work together with computers, laptops and other devices in your local network, you need to connect it to the network according to the network parameters. This chapter explains how to set the network parameters.
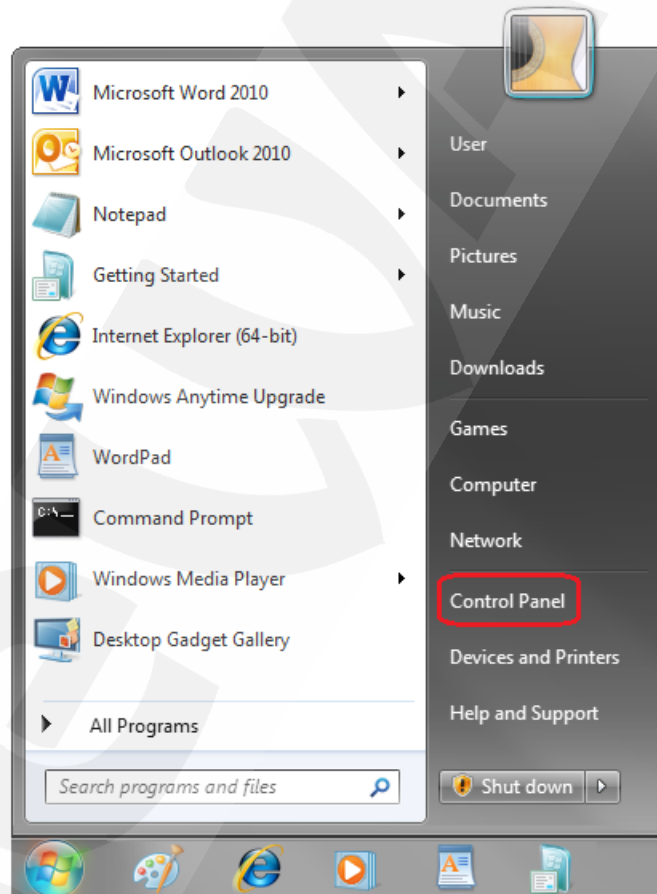
NOTE:

The connection establishment process is shown for OS Windows 7 Ultimate. Despite titles of system menus and options may differ from the titles of system menus and options that appear in other Windows versions, the procedure of the connection establishment process is universal.

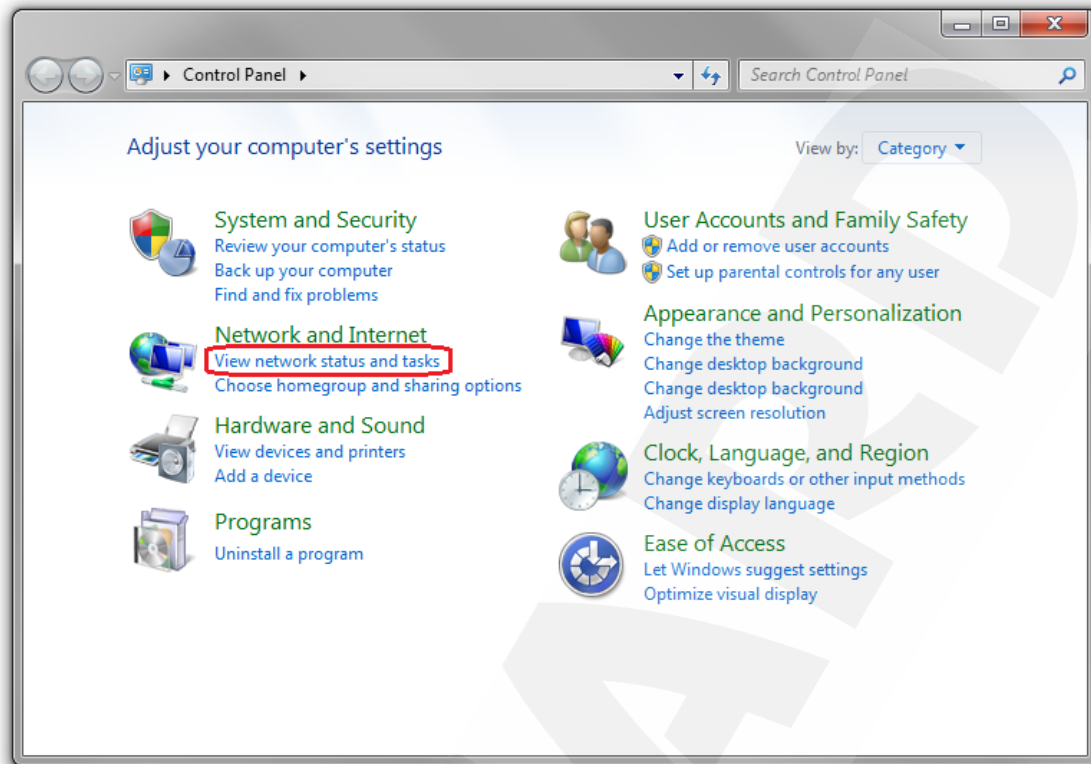## 5.1. Defining the Local Network Parameters for Wired Connection

When connecting the device via Ethernet cable, you need to set local network parameters.

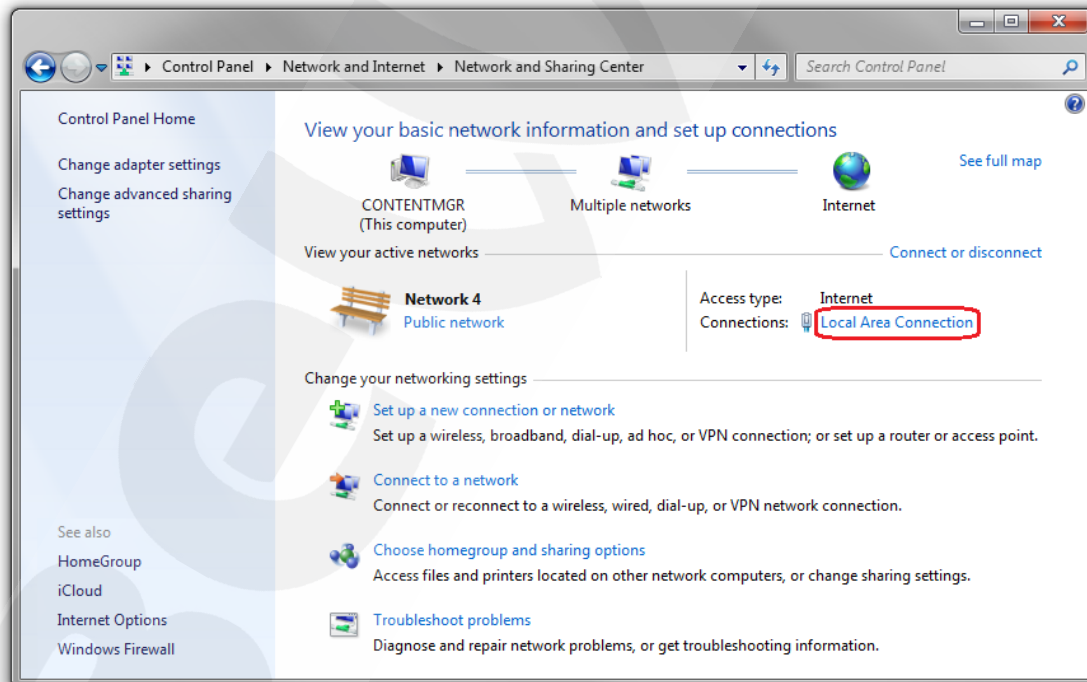To do so, go to ***Start – Control Panel*** (*Pic. 5.1*).

Pic. 5.1

In the new window click **[View network status and tasks]** in the **[Network and Internet]** section (*Pic. 5.2*).

Pic. 5.2

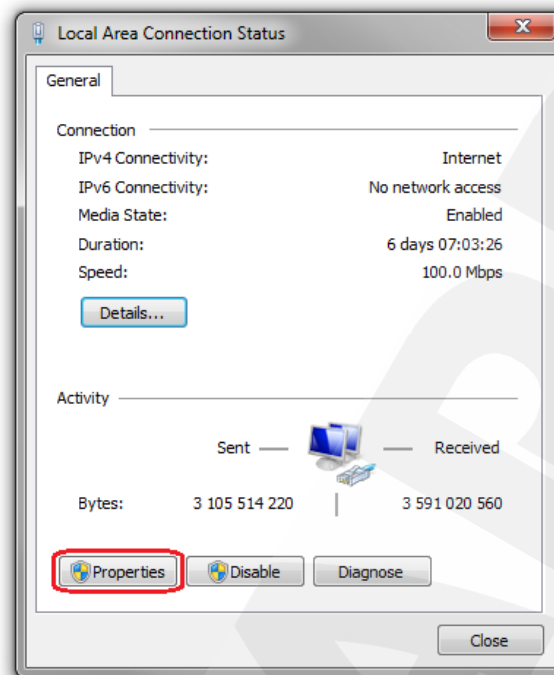In the new window click **[Local Area Connection]** (*Pic. 5.3*).
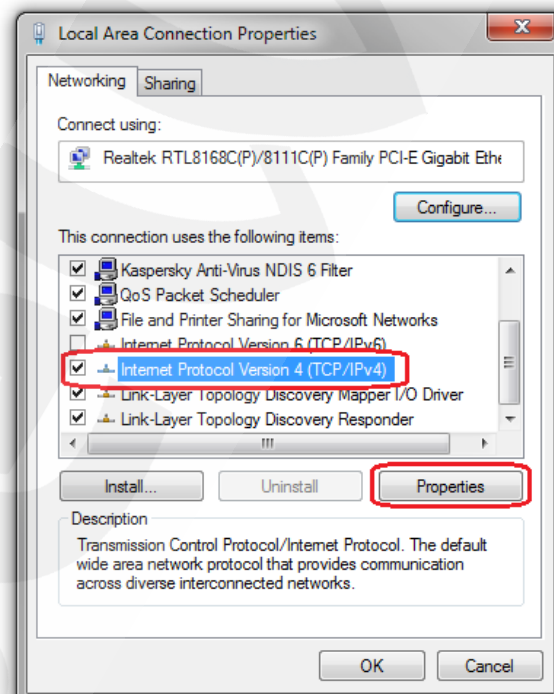

Pic. 5.3

NOTE:

If there are several active networks, choose the one that you are going to connect your device to.

In the new window click the **[Properties]** button (*Pic. 5.4*).

Pic. 5.4

In the opened window select the **[Internet Protocol Version 4 (TCP/IPv4)]** menu item and click the **[Properties]** button (*Pic. 5.5*).


Pic. 5.5

The window opens displaying information about the network connection settings. There are two ways to configure the IP address:
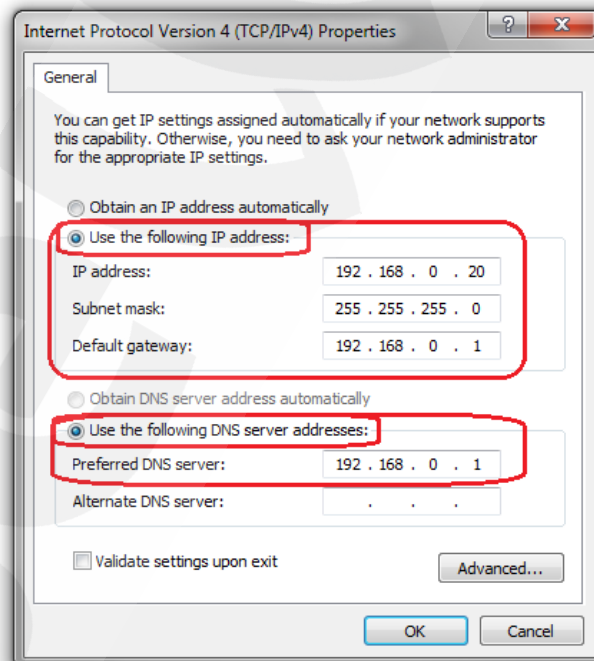
1. Obtain an IP address automatically: select this option to obtain the IP address automatically from a DHCP-server on your network (*Pic. 5.6*). If the IP address is assigned to your computer automatically, go to paragraph 5.1.1 to define the network parameters.
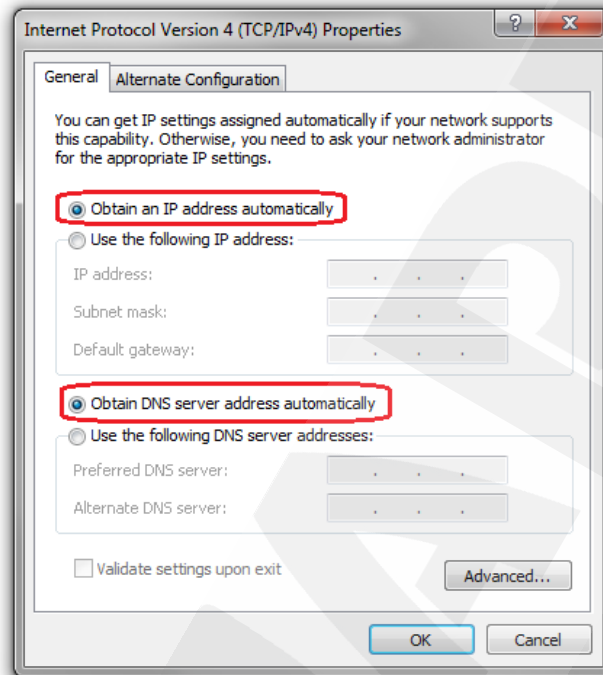
Pic. 5.6

2. Use the following IP address: an IP address is specified manually (*Pic. 5.7*).

Pic. 5.7

Memorize or write down the following parameters: IP address, Subnet mask, Default gateway, DNS server.

ATTENTION!

If you forget the network parameters it is impossible to return the computer's network settings to their original state and to connect it to a local network or the Internet after configuring the device.

5.1.1. Defining the Local Network Parameters When Using a Dynamic IP Address

NOTE:

This paragraph explains how to define the local network parameters if an IP address is assigned to your computer automatically (by DHCP-server).
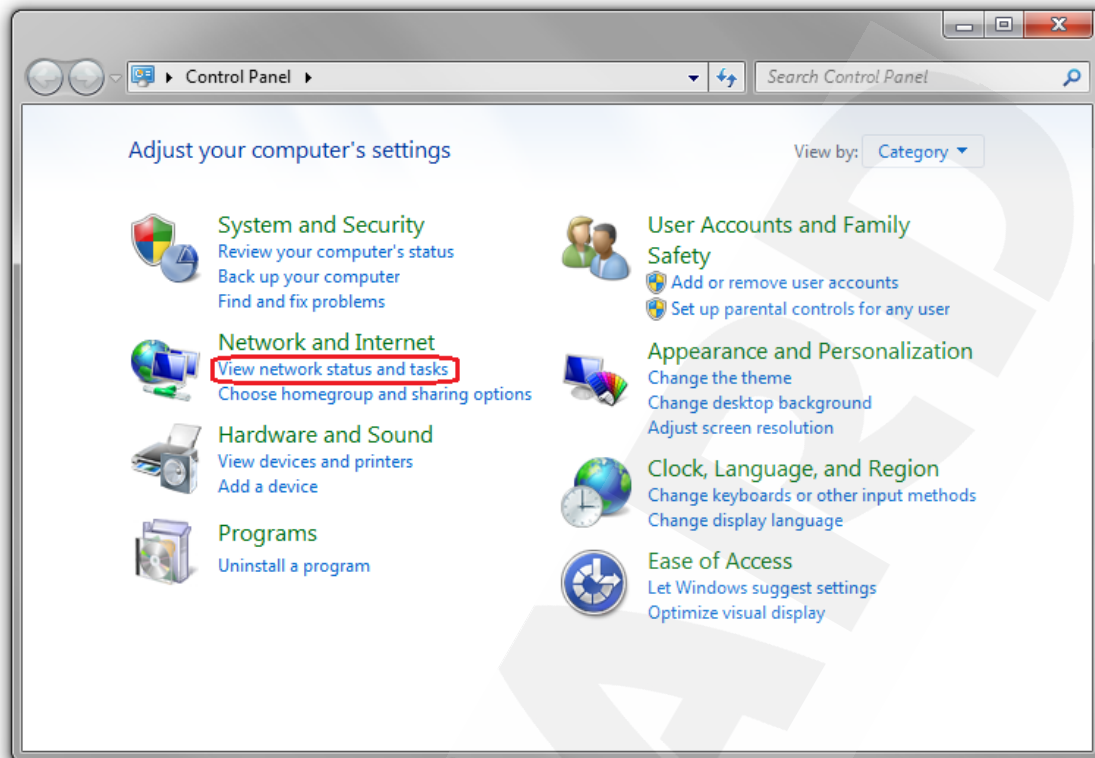
Connect a computer (laptop) to your local network using a network cable and wait till the connection process completing.

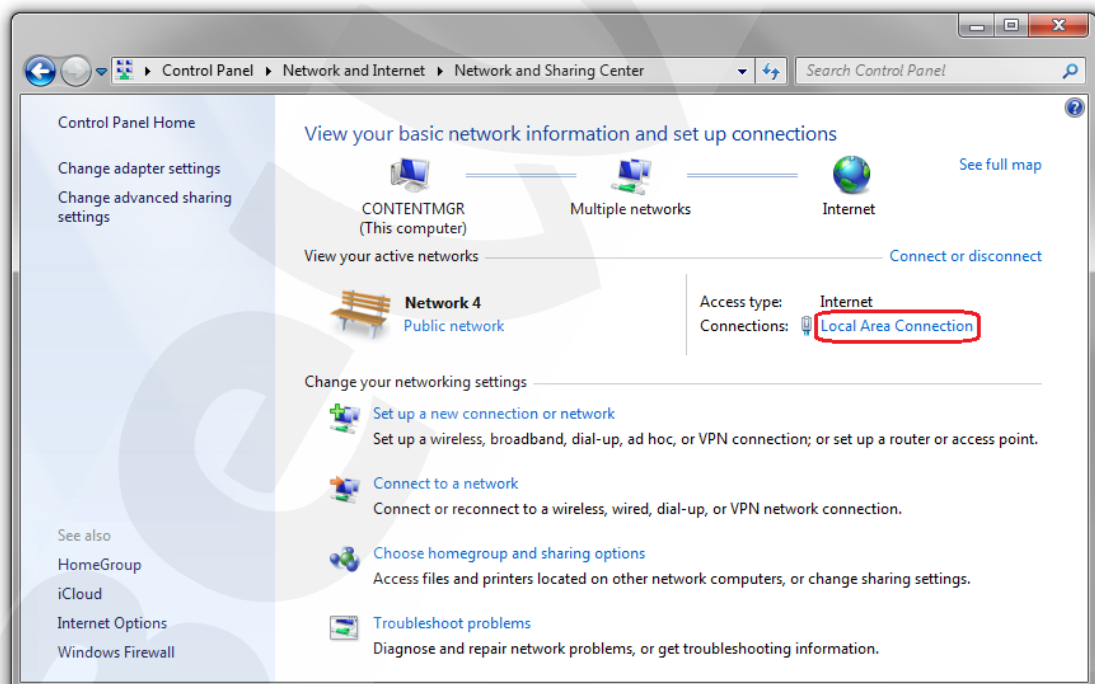To define the local network settings, go to *Start – Control Panel* (*Pic. 5.8*).
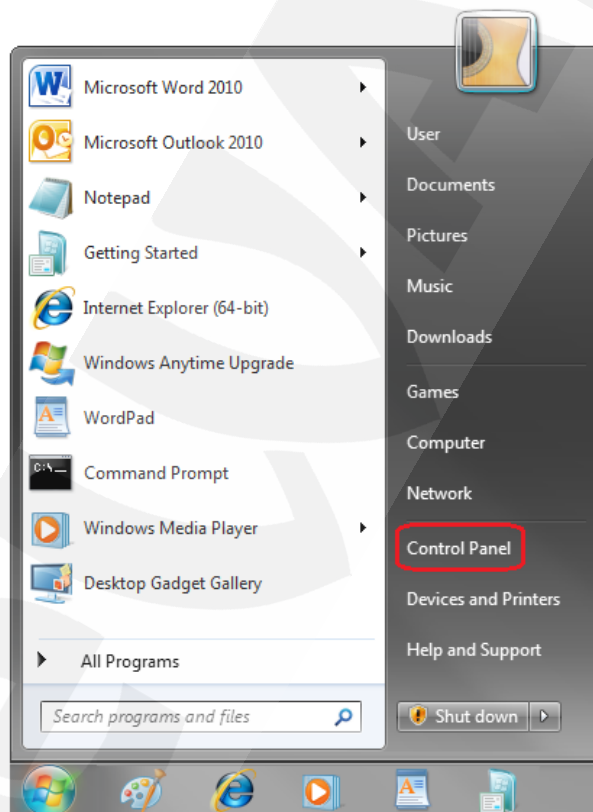
Pic. 5.8

In the opened window click **[View network status and tasks]** in the **[Network and Internet]** section (*Pic. 5.9*).

Pic. 5.9

In the new window click **[Local Area Connection]** (*Pic. 5.10*).
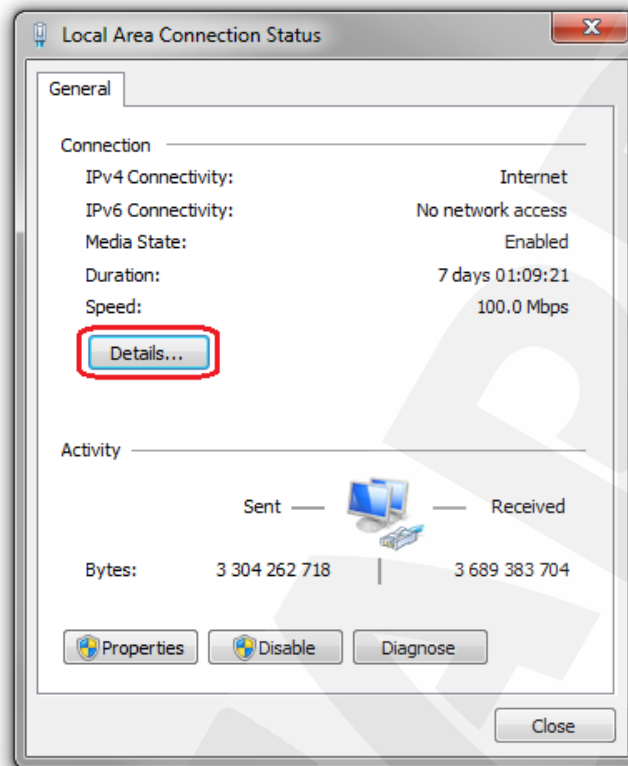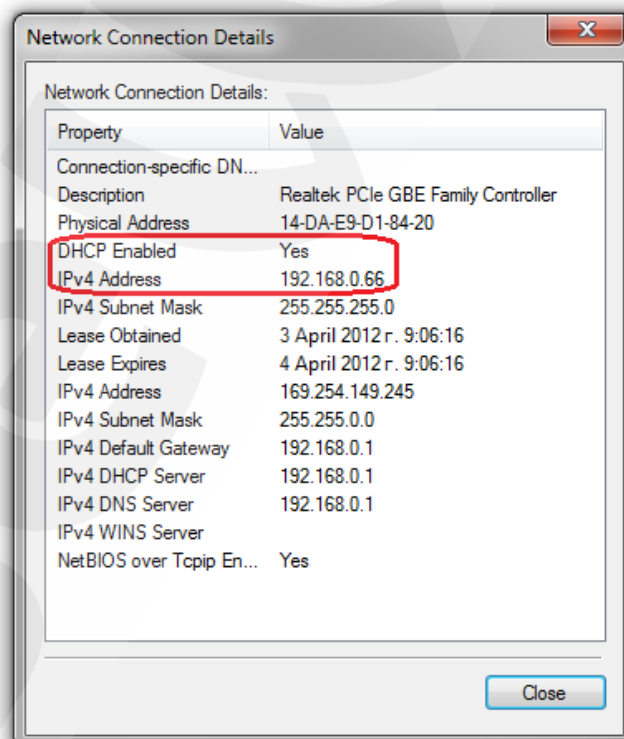

Pic. 5.10

NOTE:

If there are several active networks, choose the one that you are going to connect your device to.

In the opened window click the **[Details]** button (*Pic. 5.11*).

Pic. 5.11

In the opened window you can see the current network connection details (*Pic. 5.12*).

Pic. 5.12

If you will see the following information in the opened window: **[DHCP Enabled – Yes]**, **[IPv4 Address – xxx.xxx.xxx.xxx]** (where xxx.xxx.xxx.xxx is an IP address value), it means that your computer is assigned the IP address displayed in the **[IPv4 Address]** line, the subnet mask displayed in the **[IPv4 Subnet Mask]** line, the gateway address displayed in the **[IPv4 Default Gateway]** line, the DNS server address displayed in the **[IPv4 DNS Server]** line. Memorize or write down these parameters.

ATTENTION!

If you forget the network parameters, it is impossible to return the computer's network settings to their original state and to connect it to a local network or Internet after configuring the device.

ATTENTION!

If there is the following information in the **[Network Connection Details]** window: **[DHCP Enabled – Yes]**, **[IPv4 Address Autoconfiguration – xxx.xxx.xxx.xxx]** (where xxx.xxx.xxx.xxx is an IP address value), it means that wired connection was not established and a DHCP-server did not assign your computer an IP address. Please check the connection settings or contact your system administrator.

5.2. Changing the Local Network Parameters

The default IP address of the device is 192.168.0.99. To connect to the device, make sure it is on the same subnet as your computer. Note that each device must have a unique IP address.

ATTENTION!

The device's default IP address is **192.168.0.99**. If you use several stations, you need to change their default IP addresses to avoid IP address conflict.
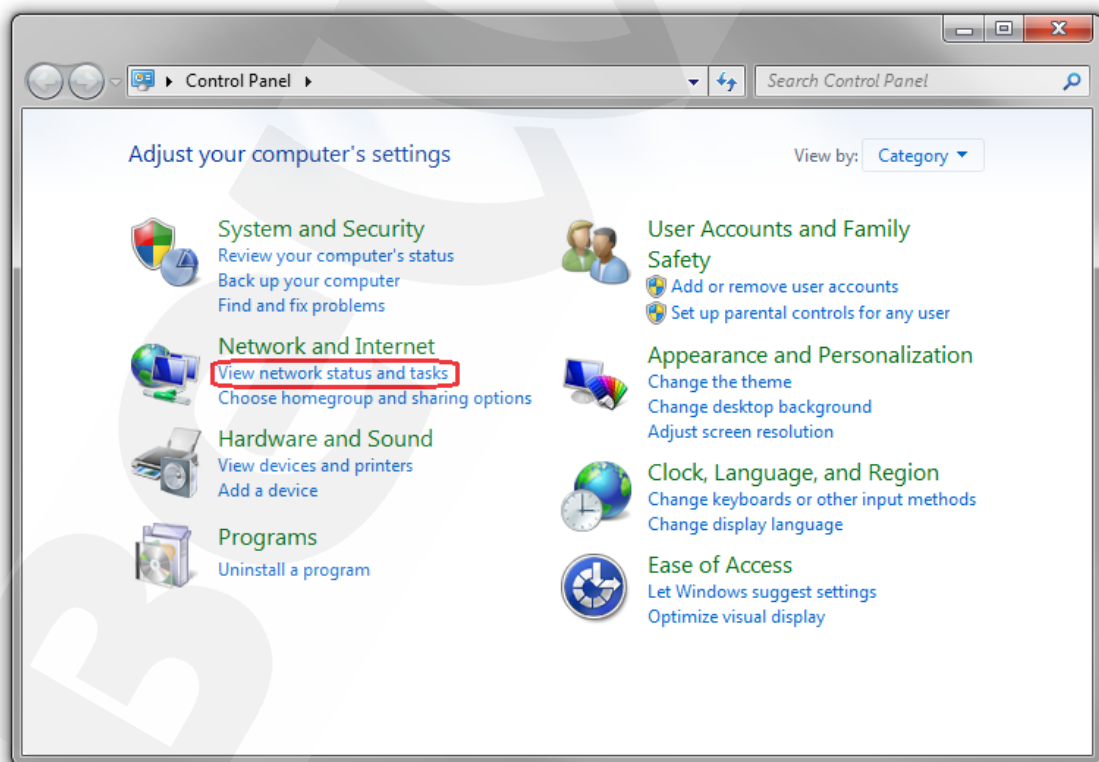
ATTENTION!

If you are sure that your computer and your device are on the same subnet, you can skip this paragraph and go to paragraph 5.3.

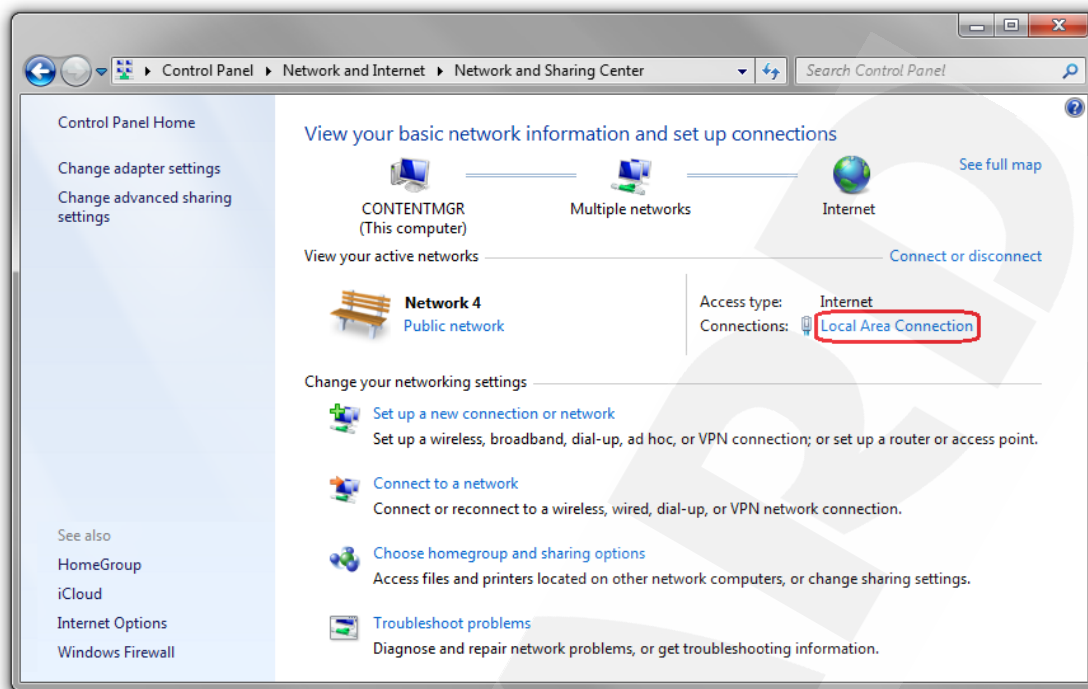To change your computer current network settings, go to ***Start – Control Panel*** (*Pic. 5.13*).
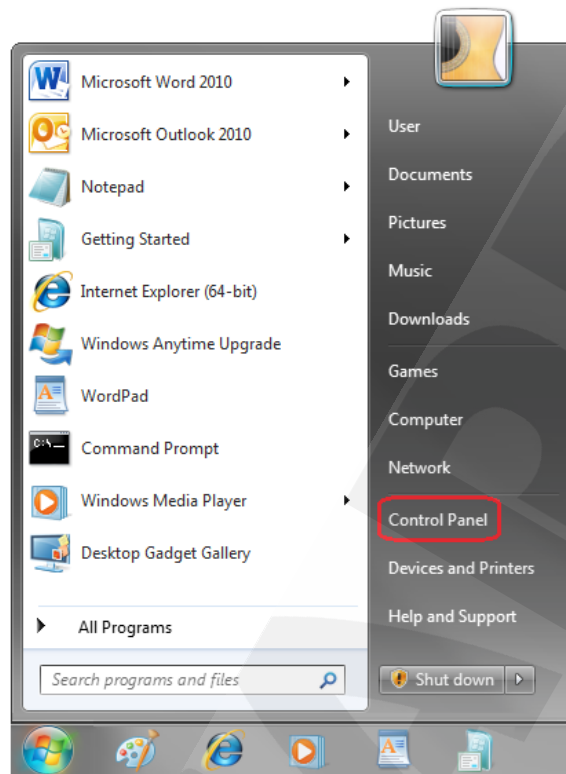
Pic. 5.13

In the new window click **[View network status and tasks]** in the **[Network and Internet]** section (*Pic. 5.14*).

Pic. 5.14

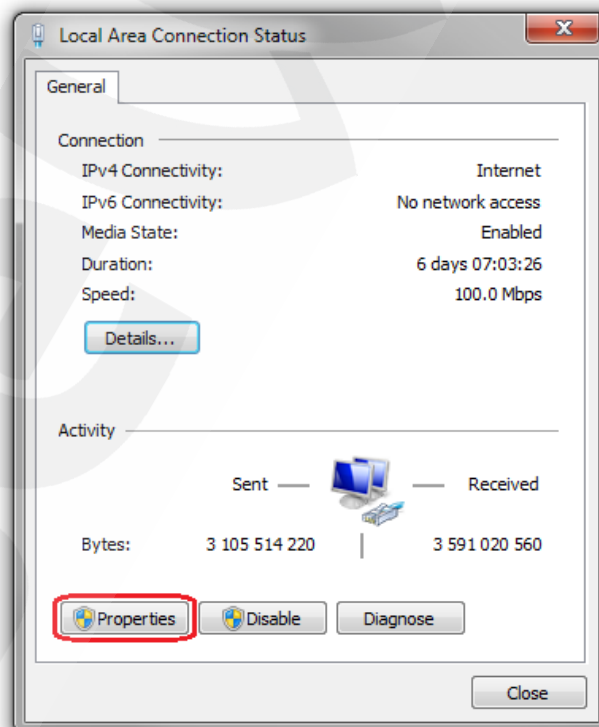In the new window, click **[Local Area Connection]** (*Pic. 5.15*).
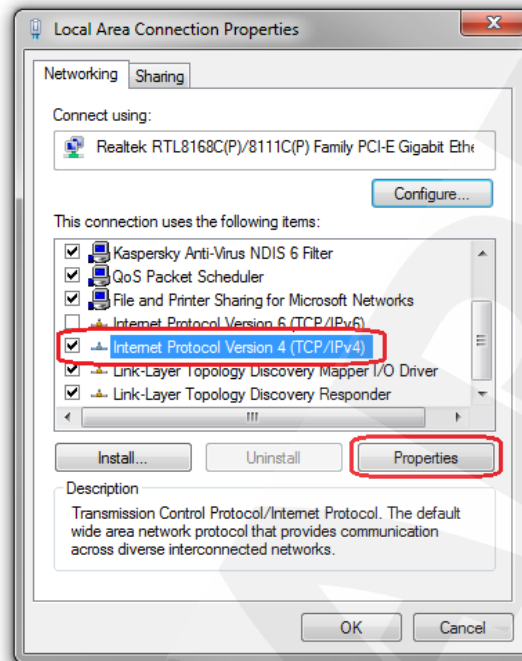
Pic. 5.15

NOTE:

If there are several active networks, choose the one that you are going to connect your device to.

In the new window, click the **[Properties]** button (*Pic. 5.16*).

Pic. 5.16

In the connection properties window select the **[Internet Protocol Version 4 (TCP/IPv4)]** menu item and click the **[Properties]** button (*Pic. 5.17*).

Pic. 5.17

In the new window you need to specify an IP address and a subnet mask. Click the **[Use the following IP address]** and type an unused IP address from the same subnet as the IP converter, for example, 192.168.0.20, and 255.255.255.0 in the **[Subnet mask]** field. You can skip the other parameters (*Pic. 5.18)*.
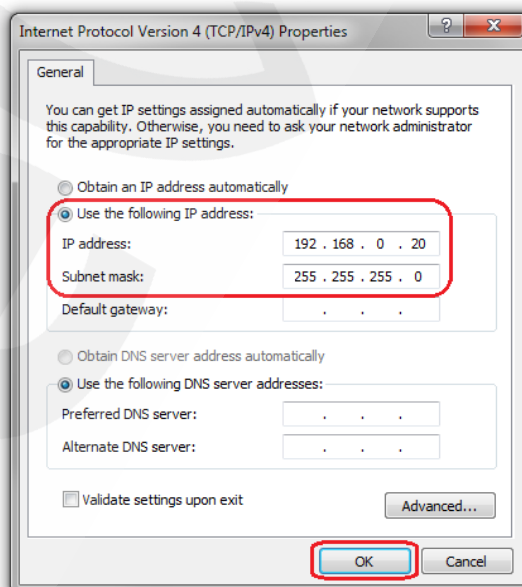
Pic. 5.18

Click the **[OK]** button in all opened windows to save the changes.

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5.3. Accessing the IP Converter Using Internet Explorer

Launch Internet Explorer to access the IP converter web user interface (WUI).

NOTE:
To use the IP converter web interface Internet Explorer 11.0 or later is required.
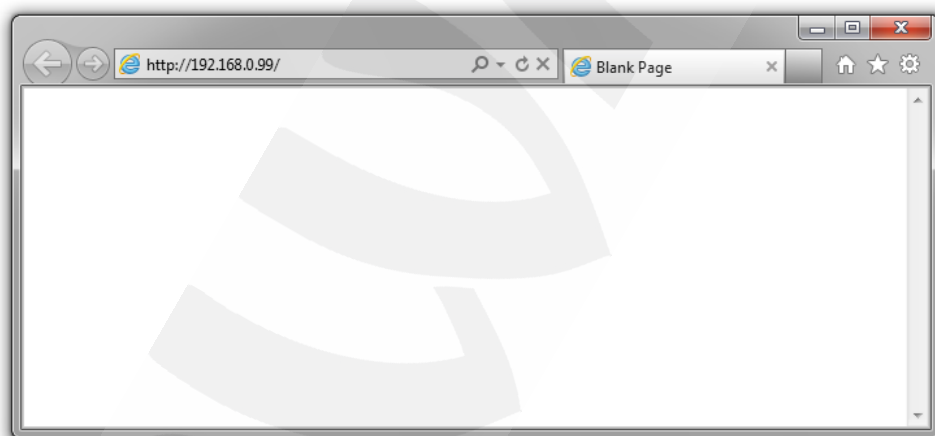
Enter the following path in the address field: **http://<IP>:<port>/**, where **<IP>** is the IP address of the IP converter, **<port>** is the number of the port that is used for HTTP connection to the IP converter (*Pic. 5.19*).

ATTENTION!
By default, the IP address of the IP converter is 192.168.0.99 and the http-port is 80.

NOTE:
You do not need enter a port number if you connect via the default HTTP port 80.

Pic. 5.19

## 5.4. Accessing the IP Converter via Web Interface

If the path is correct you will see the authorization window (*Pic. 5.20*).

To work with the IP Converter web interface you need to install the ActiveX add-on. You will see the system notification at the bottom of the window: **"This webpage wants to run the following add-on: "AxMediaControl ActiveX Control Module" from "BEWARD Co., Ltd"** (*Pic. 5.20*).
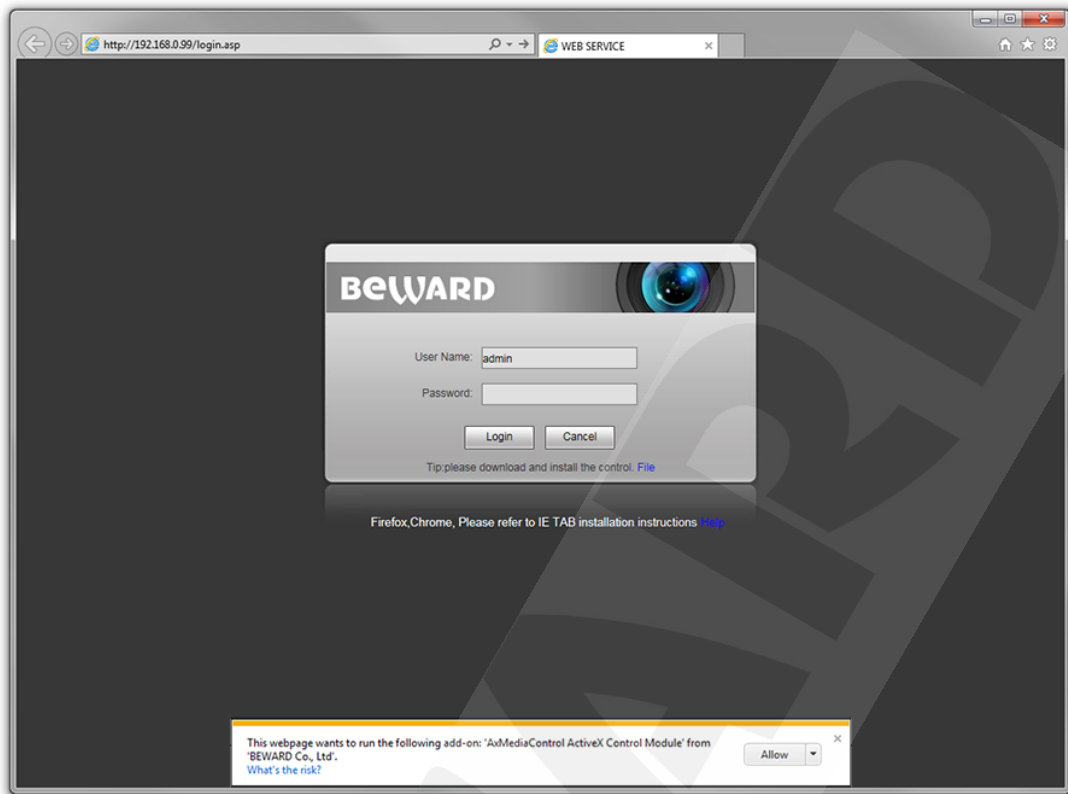
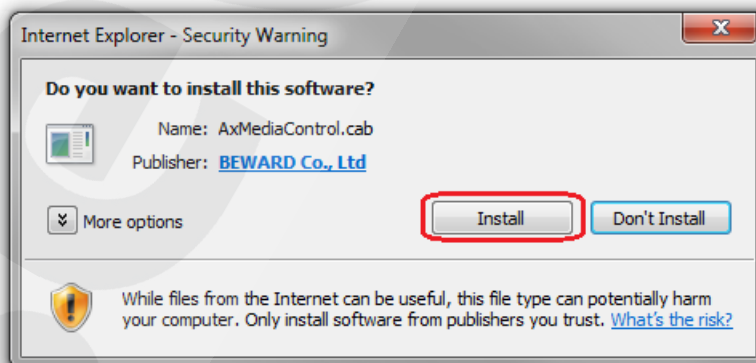*Pic. 5.20*

Click **[Allow]** to start installation.

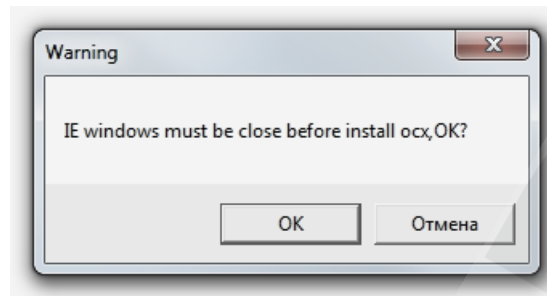By default, the Internet Explorer security system blocks ActiveX installation. Click **[Install]** to continue (*Pic. 5.21*).
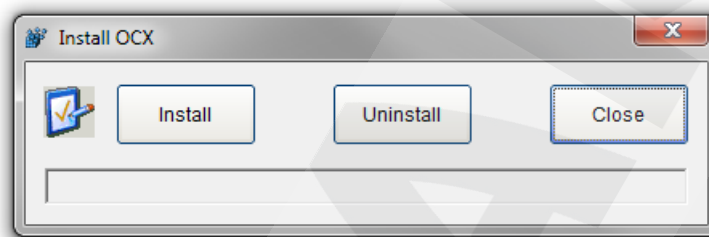

Pic. 5.21

Then you will see the following window (*Pic. 5.22*):

Pic. 5.22

Close Internet Explorer and click **[OK]**. You need close the browser before installation anyway, whether the window on the *Picture 5.22* will appear or not.

The installation window will appear. Click **[Install]** (*Pic. 5.23*).

Pic. 5.23

After the installation is complete you will see the following notification: «Register OCX success(C:\)» (*Pic. 5.24*). Click **[Close]** to finish ActiveX installation.
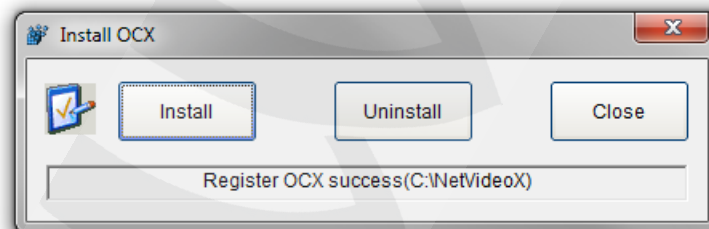
Pic. 5.24

NOTE:

Titles of system menus and options in Windows 7 and Internet Explorer 11.0 may differ from other operating systems and web browsers.

NOTE:

There is one more ActiveX installation blocking in Windows 7 with enabled user account control. In this case you will see an additional system notification. Give a positive answer in the notification window to permit installation.

Open Internet Explorer, enter door station's IP address and press **[Enter]**. Enter username and password (admin / admin) and click **[Login]** (*Pic. 5.25*).

ATTENTION!

You can change login and password in the menu *Config – System – Access Policy* after authorization. If you lost your login or password, you can restore the default settings of the door station. To set the device by default press the reset button 3 times during 10 seconds with 1 second or more between the pushes.
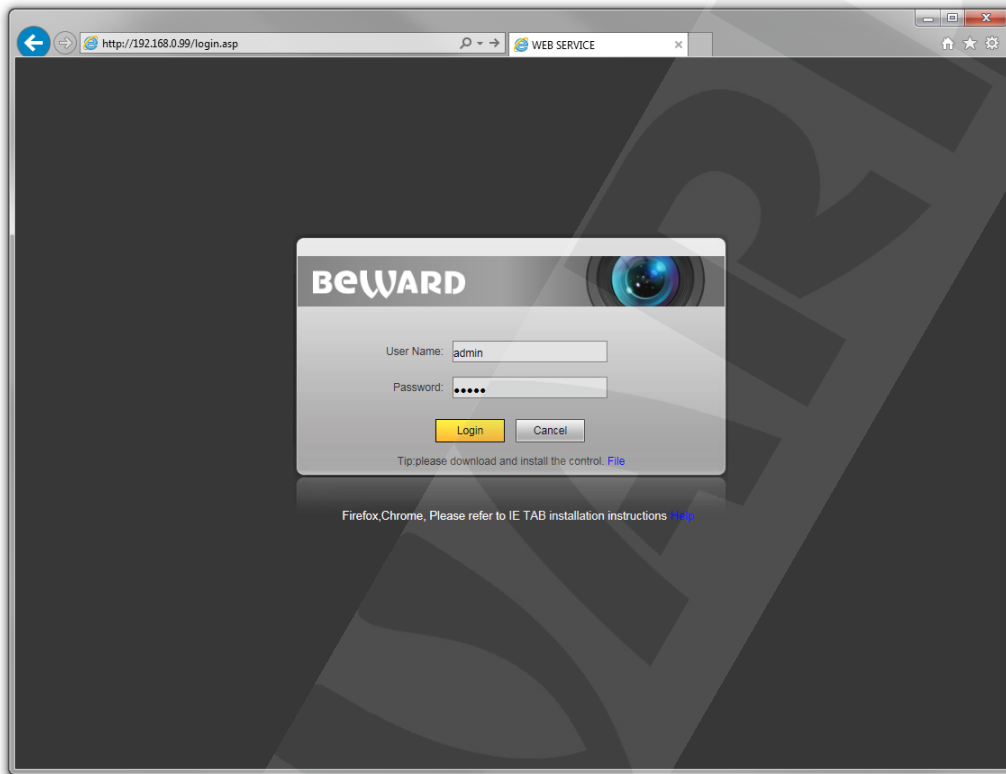
Pic. 5.25

If everything is done correctly, you will start receiving the video stream from the door station's camera (*Pic. 5.26*).
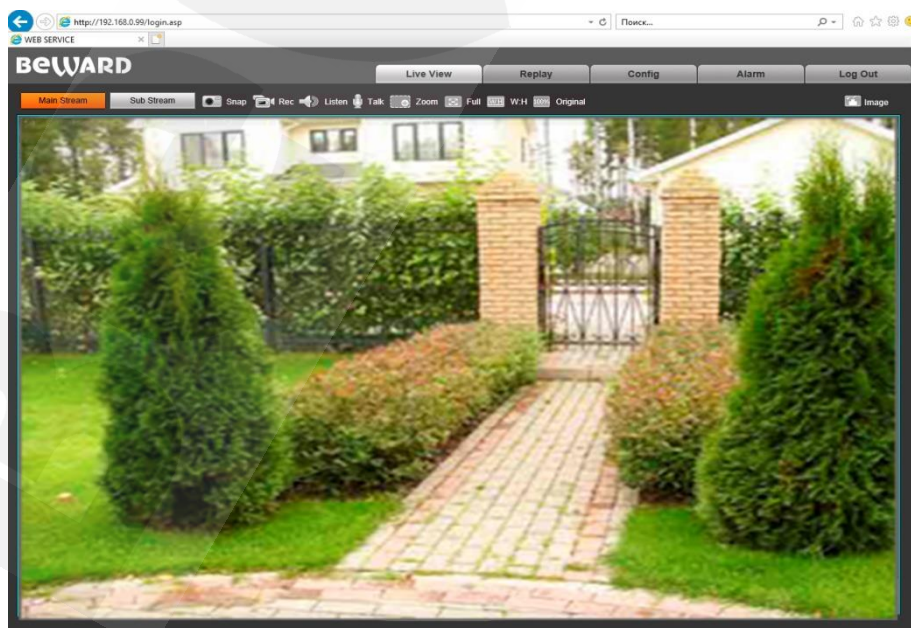
Pic. 5.26

If you failed to install ActiveX correctly you can do it again by clicking the link in the authorization window (*Pic. 5.27*) and following the instructions above.

Pic. 5.27

5.5. Configuring IP Converter Network Settings via Web Interface

After connecting the IP Converter to the local network you need to change its network parameters to get it and your other devices (e.g. computer, laptop etc.) to the same subnet.

ATTENTION!
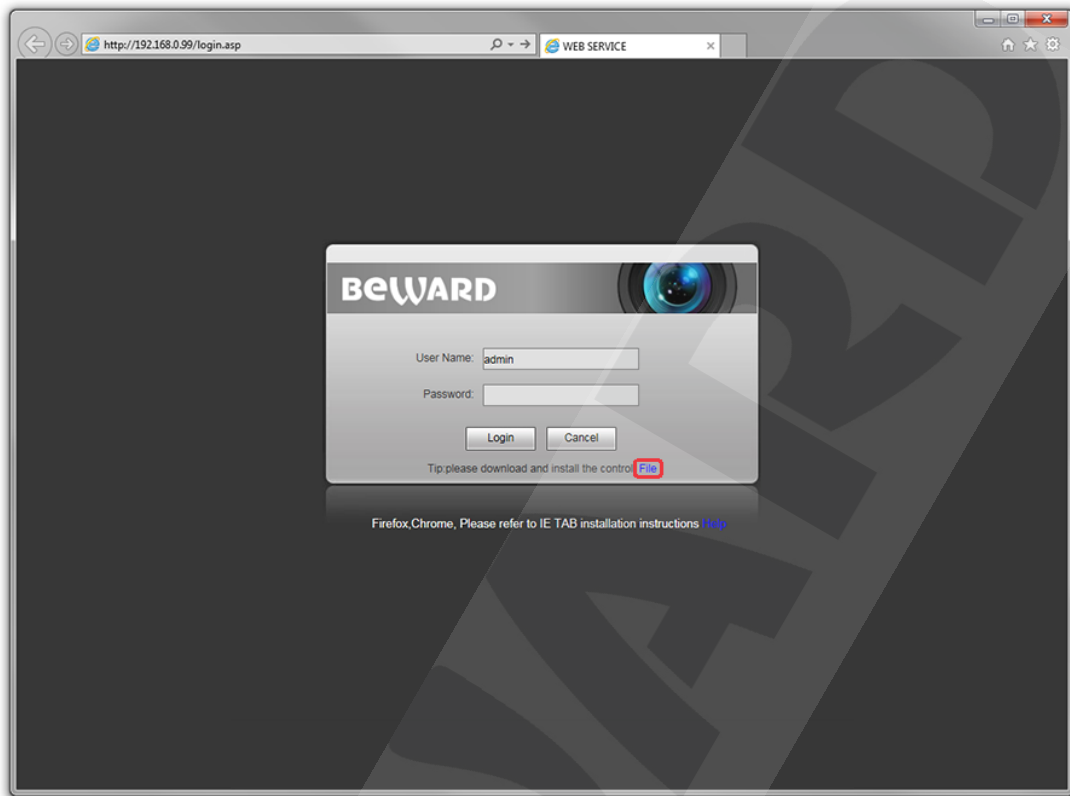
To make your IP converter and your computer work together, the first three parts of their IP addresses must be identical but the fourth must differ.

For example, the IP address of your computer is 192.168.0.40. An IP address consists of four octets separated by dots. In the provided example, the 1st octet is 192, the 2nd octet is 168, the 3rd octet is 0, and the 4th octet is 40. You need to change the IP address of your IP Converter so that the first three octets of its IP address were the same as your computer's IP address. Therefore, the IP address of your Ip Converter must be of the form 192.168.0.xxx. You only need to change the fourth octet to a number different from the IP address of your computer and other network devices.

To configure the network settings through the web interface, click the **[Config]** button and go to the *Network Settings – LAN* (*Pic. 5.28*).

Pic. 5.28

In the fields **[IP Address]**, **[Subnet Mask]**, **[Gateway]**, **[Main DNS]**, **[Sub DNS]** you need to enter such values which provide joint work of the IP converter and other devices in the same subnet. To do so apply to the settings you had to write out or save in the paragraphs 5.1 or 5.1.1.

NOTE:

Contact your system administrator if you need help.

Click **[Save]** to save the changes.
After rebooting, the IP converter will be available on the IP address you specified.
Configuriation process of the IP converter network settings is complete.

5.6. Restoring Network Settings of PC to the Previous Values

To restore the wired connection settings to their previous values, follow the steps below.

Go to **Start – Control Panel** (*Pic. 5.29*).
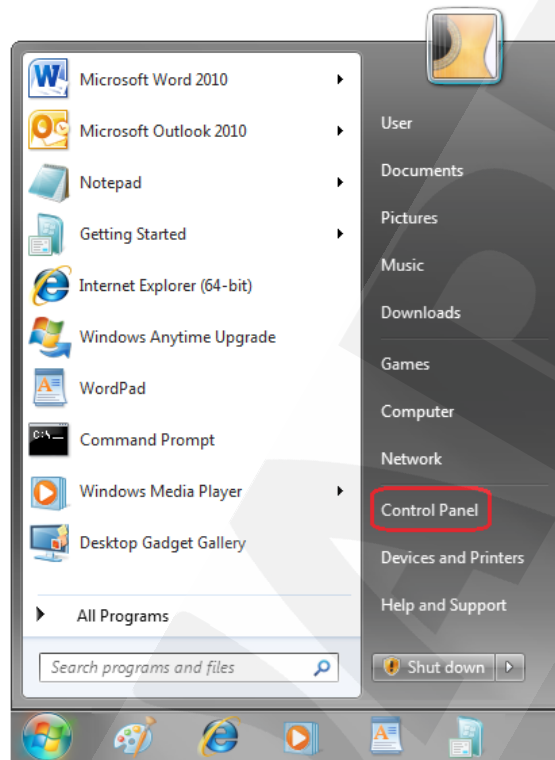
Pic. 5.29

In the new window, click **[View network status and tasks]** in the **[Network and Internet]** section (*Pic. 5.30*).
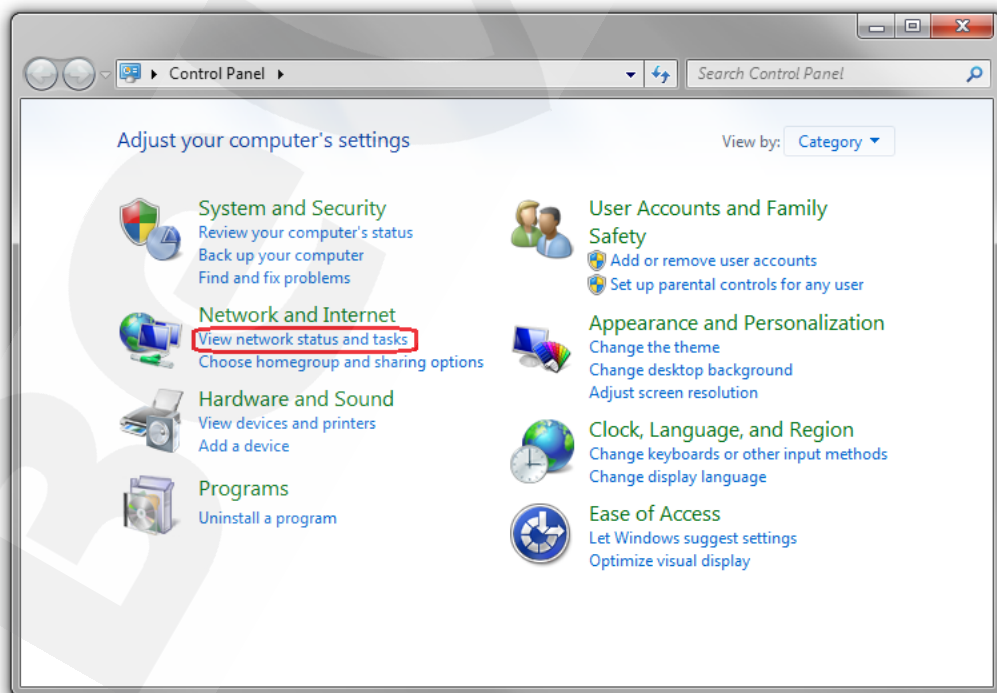
Pic. 5.30

In the new window, click **[Local Area Connection]** (*Pic. 5.31*).
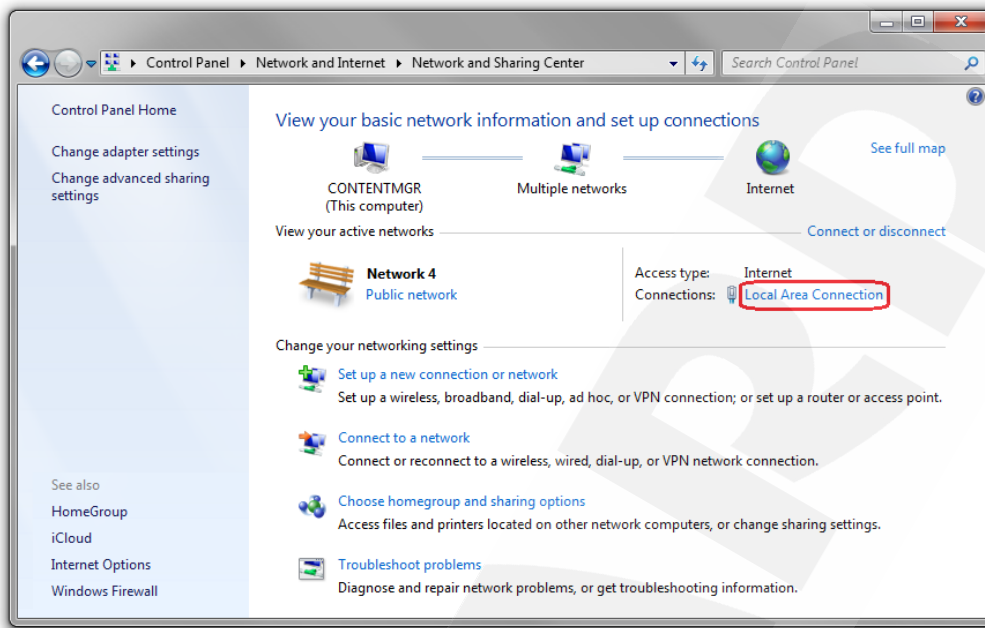
Pic. 5.31

In the new window, click the **[Properties]** button (*Pic. 5.32*).
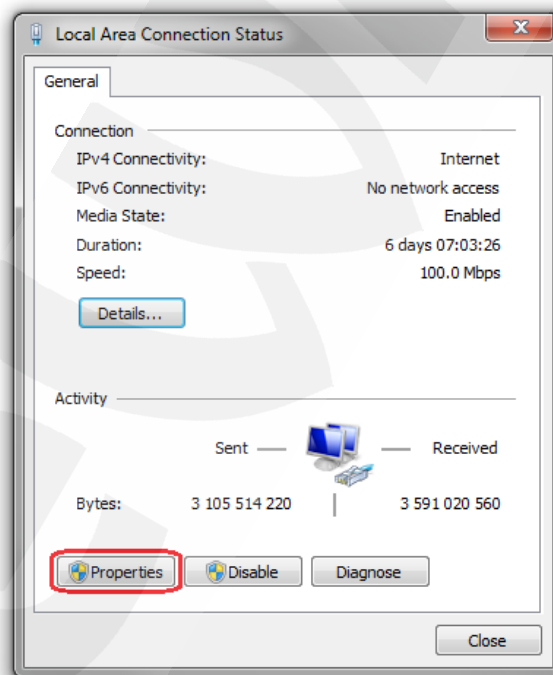
Pic. 5.32

Select the **[Internet Protocol Version 4 (TCP/IPv4)]** menu and click the **[Properties]** button (*Pic. 5.33*).
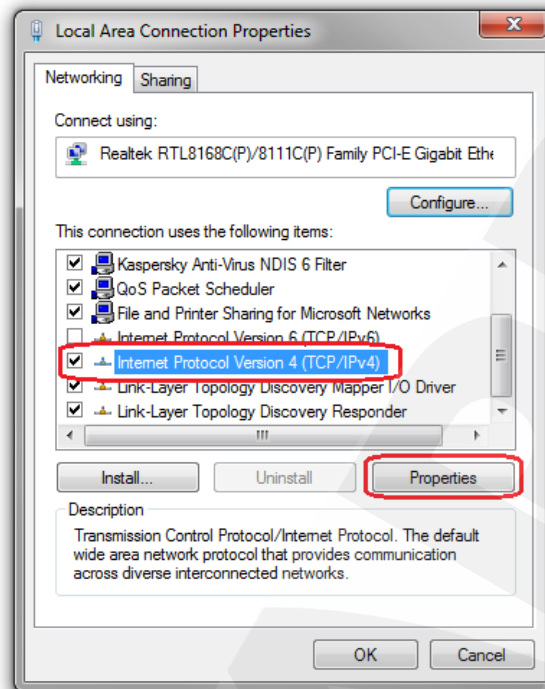
Pic. 5.33

In the new connection properties window you need to specify your initial network settings (see paragraphs 5.1, 5.1.1).

If the IP settings were assigned automatically, use the **[Obtain an IP address automatically]** and the **[Obtain DNS server address automatically]** options (*Pic. 5.34*), then click **[OK]**.
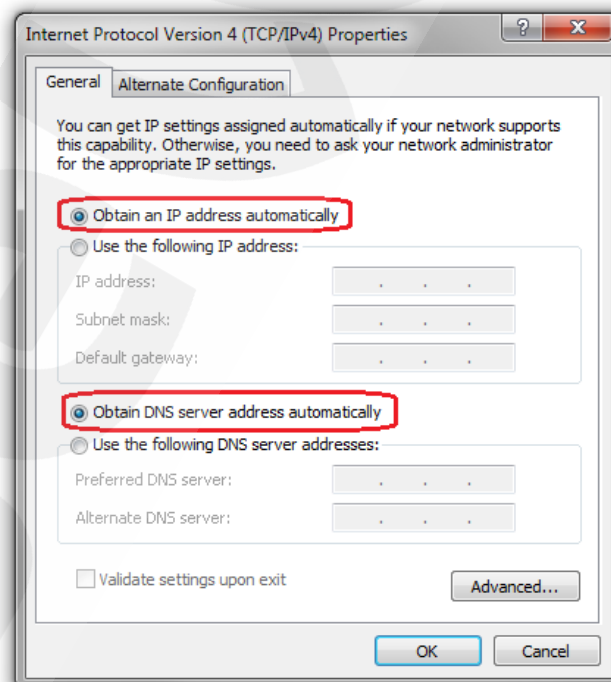
Pic. 5.34

If the IP settings were specified manually, use the **[Use the following IP address]** and the **[Use the following DNS server addresses]** options and complete the required fields (see paragraph 5.1), then click **[OK]** (*Pic. 5.35*).
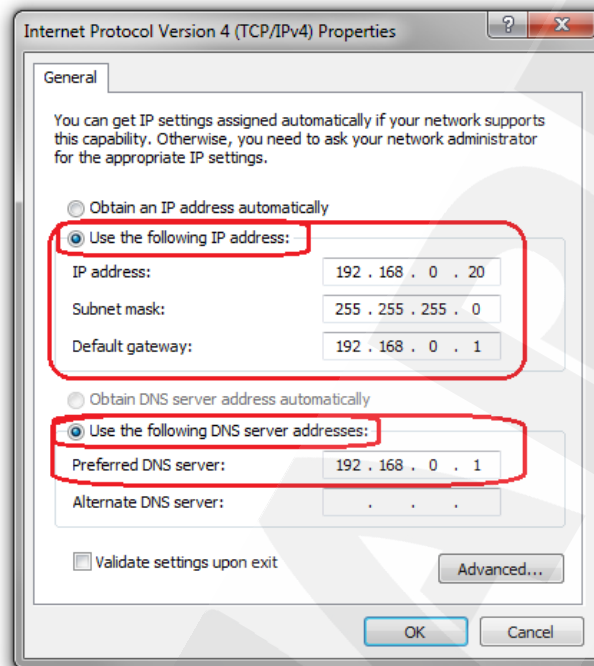
Pic. 5.35

5.7. Verifying the Connection Settings

To verify the network settings of your IP converter and your computer, you must access the station via Internet Explorer.

To launch Internet Explorer go to *Start – All Programs* and click **[Internet Explorer]**.

Enter the IP address of your IP converter in the address field (e.g. http://192.168.0.99) (*Pic. 5.36*).
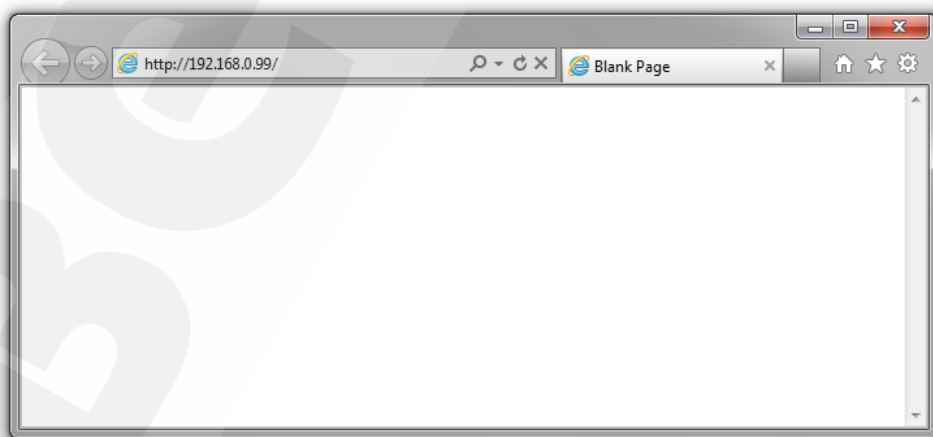
Pic. 5.36

If the settings are correct, the authorization window will appear. Enter the username and password, then click **[OK]** (*Pic. 5.37*).

ATTENTION!

The default username is **admin**, the default password is **admin**.
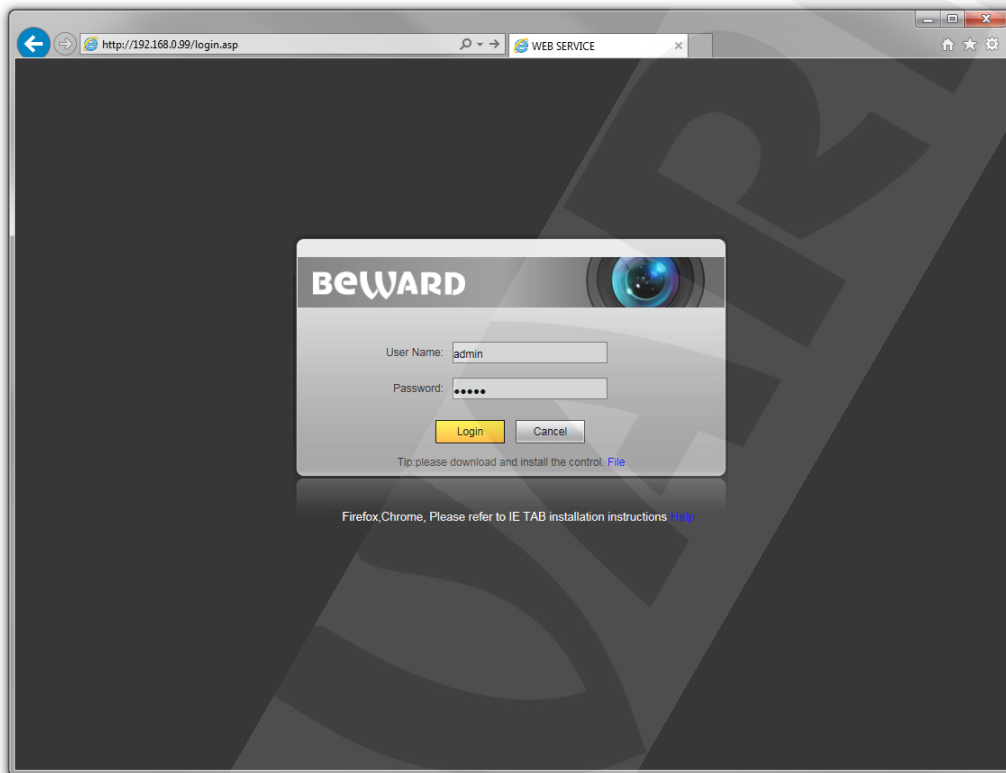
Pic. 5.37

If everything is done correctly, you will see the video image on your display (*Pic. 5.38*).
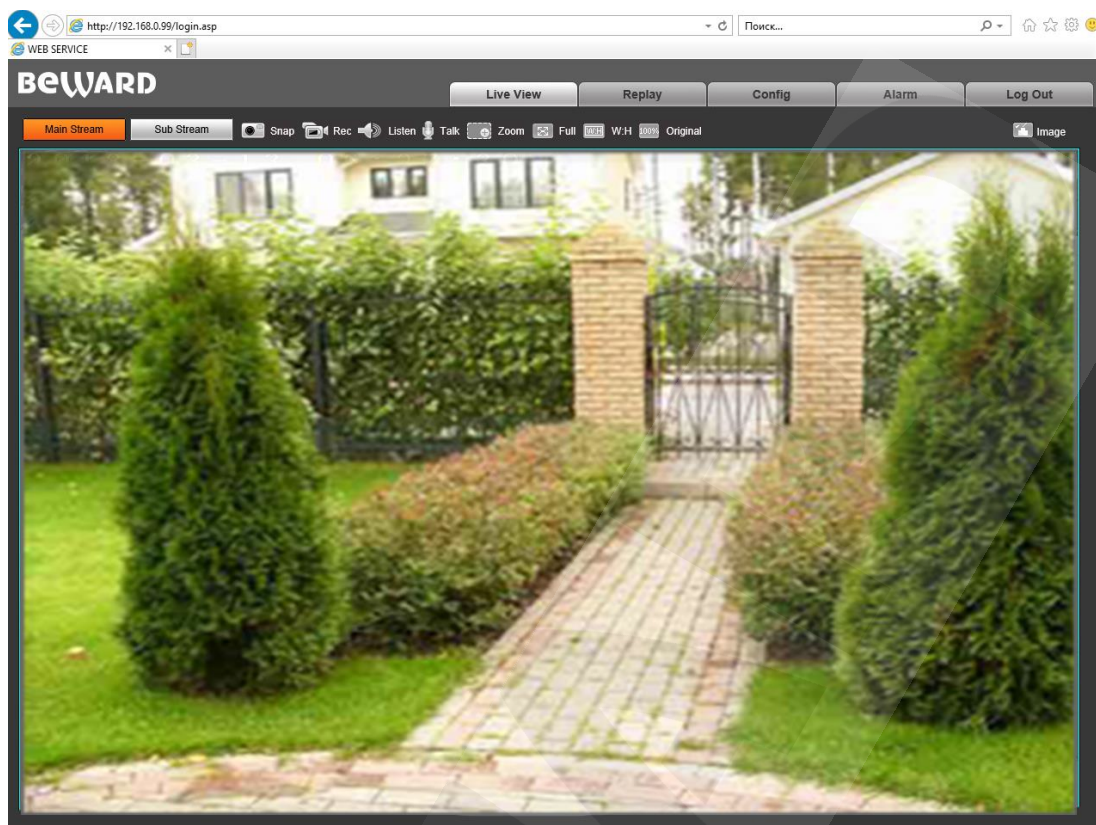
*Pi*c. 5.38

NOTE:

If the video image did not appear on your display, return to the beginning of the chapter and check the settings step by step. Contact your system administrator if you need help.

Chapter 6. Recommendations on Setting and Operation of DK103M

IP intercom systems combine different types and configurations of equipment (PCs, laptops, microphones, speakers, etc.). Therefore, correct operation of the whole system depends on proper setting of each device used taking into account the peculiarities of their joint operation.

6.1. Acoustic Echo Cancellation

Using the door station, the Client or the Guest may hear an echo feedback from their PC speakers or the door station speaker accordingly.

The echo feedback on the Guest side (door station speaker) depends on settings of audio output equipment of Client's PC as well as on audio settings in the operating system on Client's PC.

The echo feedback on the Client side (PC speakers) depends on the door station settings.

The echo feedback may occur when one or more of the following conditions are taken place:

- Microphone Boost level is too high;
- The speakers are too close to the microphone;
- The speaker volume is turned up so as the microphone hears the speakers;
- The microphone is very sensitive.

The most efficient method to remove the echo feedback effect on the Client side is use of headphones or a hands-free unit by the Client for a conversation with the Guest. If this is impossible according to some reasons, follow the recommendations below.

There are two main ways of reducing the echo feedback effect: **change of audio settings in the operating system** and **change of audio settings of the door station**.

1. To reduce the echo feedback effect on the Guest side (door station speaker) by changing settings of the operating system do as follows:

- go to *Control Panel – Sound – Recording*, double-click the recording device set by default (microphone) and ensure that the **"Listen to this device"** option is disabled on the *Listen* tab.
- go to *Control Panel – Sound – Playback*, double-click the playback device set by default and ensure that the **"Microphone"** option is disabled on the *Levels* tab (button).

It is also possible to reduce the echo feedback effect by selecting the *Enhancements* tab on the microphone's properties page and enabling one of the following options:

- Enable Noise Suppression
- Enable Acoustic Echo Cancellation

NOTE!

These settings are audio hardware and software specific and may not be available for all microphones.

NOTE!

The names of options in the OS menus may differ from the ones mentioned above.

2. Some features of functionality of the door station can be effectively used to reduce the echo feedback effect on the Client side (PC speakers). In the Web User Interface menu go to *Config – Audio Settings – Audio Parameter* and put a tick in the **"Echo Cancellation"** checkbox (see the Operation User Manual).

6.2. Sound Gain and Volume Adjusting

1. If the Client can't hear the Guest well or his voice is interrupted, or if the Guest hears his echo, then change your operating system settings as follows:

- go to *Control Panel – Sound – Recording*, double-click the recording device set by default (microphone) and reduce microphone boost level and volume level (if necessary) on the *Levels* tab. It is recommended to set microphone boost level to 0 dB, volume level to 100. It is also necessary to ensure that the **"Listen to this device"** option is disabled on the *Listen* tab.

- reduce volume level of the PC speakers to the minimal appropriate level. If it is too high, then the microphone may receive the audio waves from the speakers and, therefore, the Guest may hear his echo as well as the Client may hear the Guest with interrupts.

- place the PC microphone farther from the speakers and closer to Client's face.

Moreover, you can adjust the gain of sound transmitted from the door station microphone to the PC speakers in the Web User Interface. Go to *Config – Audio Settings – Audio Parameter* and change the **"Input Volume"** parameter to the appropriate value. The lower "Input Volume" value, the quieter Guest's voice and his echo, and vice versa.

2. If the Guest can't hear the Client well or his voice is interrupted, then change your operating system settings as follows:

- go to *Control Panel – Sound – Recording*, double-click the recording device set by default (microphone) and increase microphone boost level on the *Levels* tab. Then, set appropriate volume level. It is recommended to set microphone boost level to 0 dB, volume level to 100. Values of the parameters may vary depending on the PC microphone type.

- ensure that the **"Listen to this device"** option is disabled on the *Listen* tab.

- reduce volume level of the PC speakers to the minimal appropriate level.

Moreover, you can adjust the gain of sound transmitted from the PC microphone to the door station speaker in the Web User Interface. Go to *Config – Audio Settings – Audio Parameter* and change the **"Output Volume"** parameter to the appropriate value. The lower "Output Volume" value, the quieter Client's voice and his echo, and vice versa.

Appendices

Appendix A. Factory Defaults

Parameter	Value
IP address	**192.168.0.99**
Subnet mask	**255.255.255.0**
Gateway	**192.168.0.1**
Username (administrator)	**admin**
Password (administrator)	**admin**
HTTP port	**80**
Data port	**5000**
RTSP port	**554**
ONVIF port	**2000**

Appendix B. Glossary

Client is person who controls a door station using computer.

Door Station Controller is used for powering the door station, network connection, processing the signal of door opening and signals of other devices that can be connected to the door station.

Guest is a person who presses the call button on a door station installed outside.

IP Video Door Station is a device which is used for controlling the access to some territory or building and provides video surveillance functions due to a built-in IP video camera. The call from the Guest (as he presses the call button) is sent from the door station to the Client's PC or laptop with the installed application. The Client can see the Guest on the monitor of his PC and talk with him using a microphone and speakers / headphones. The Client can control the electronic door lock and some other devices connected to the door station controller.

PoE Injector is a device that stands between a regular Ethernet switch and the powered device (for example, door station PoE supported controller), injecting power and transferring the data via the same cable.