User's manual (short)

NVR-7716P16-H2

NOVUS®

IMPORTANT SAFEGUARDS AND WARNINGS

EMC (2014/30/EU) and LVD (2014/35/EU) Directives CE Marking

Our products are manufactured to comply with requirements of following directives and national regulations implementing the directives:

Electromagnetic compatibility EMC 2014/30/EU; Low voltage LVD 2014/35/EU with further amendment. The Directive applies to electrical equipment designed for use with a voltage rating of between 50VAC and 1000VAC as well as 75VDC and 1500VDC.

WEEE Directive 2002/96/EC Information on Disposal for Users of Waste Electrical and Electronic Equipment

This appliance is marked according to the European Directive on Waste Electrical and Electronic Equipment (2002/96/EC) and further amendments. By ensuring this product is disposed of correctly, you will help to prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product.

The symbol on the product, or the documents accompanying the product, indicates that this appliance may not be treated as household waste. It shall be handed over to the applicable collection point for the waste electrical and electronic equipment for recycling purpose. For more information about recycling of this product, please contact your local authorities, your household waste disposal service or the shop where you purchased the product.

RoHS Directive 2002/95/EC

Concerning for human health protection and friendly environment, we assure that our products falling under RoHS Directive regulations, regarding the restriction of the use of hazardous substances in electrical and electronic equipment, were designed and manufactured in compliance with mentioned regulation. Simultaneously, we claim that our products were tested and do not contain hazardous substances exceeding limits which could have negative impact on human health or natural environment.

Information

The device, as a part of professional CCTV system used for surveillance and control, is not designed for self installation in households by individuals without technical knowledge. The manufacturer is not responsible for defects and damages resulted from improper or inconsistent with user 's manual installation of the device in the system.

ATTENTION!

PRIOR TO UNDERTAKING ANY ACTION THAT IS NOT PROVISIONED FOR THE GIVEN PRODUCT IN ITS USER 'S MANUAL AND OTHER DOCUMENTS DELIVERED WITH THE PRODUCT, OR THAT ARISES FROM THE NORMAL APPLICATION OF THE PRODUCT, ITS MANUFACTURER MUST BE CONTACTED OR THE RESPONSIBILITY OF THE MANUFACTURER FOR THE RESULTS OF SUCH AN ACTION SHELL BE EXCLUDED.

1. Prior to undertaking any action please consult the following manual and read all the safety and operating instructions before starting the device.
2. Please keep this manual for the lifespan of the device in case referring to the contents of this manual is necessary;
3. All the safety precautions referred to in this manual should be strictly followed, as they have a direct influence on user 's safety and durability and reliability of the device;
4. All actions conducted by the servicemen and users must be accomplished in accordance with the user 's manual;
5. The device should be disconnected from power sources during maintenance procedures;
6. Usage of additional devices and components neither provided nor recommended by the producer is forbidden;
7. You are not allowed to use the device in high humidity environment (i.e. close to swimming pools, bath tubs, damp basements);
8. Mounting the device in places where proper ventilation cannot be provided (e. g. closed lockers etc.) is not recommended since it may lead to heat build - up and damaging the device itself as a consequence;
9. Mounting the device on unstable surface or using not recommended mounts is forbidden. Improperly mounted device may cause a fatal accident or may be seriously damaged itself. The device must be mounted by qualified personnel with proper authorization, in accordance with this user 's manual.
10. Device should be supplied only from a power sources whose parameters are in accordance with those specified by the producer in the devices technical datasheet. Therefore, it is forbidden to supply the devices from a power sources with unknown parameters, unstable or not meeting producer' s requirements;
11. You cannot allow any metal objects get inside the recorder. It might cause serious damage. If a metal object gets inside the device contact the authorised Novus service immediately.
12. The manufacturer does not bear responsibility for damage or loss of data stored on HDDs or other media occurred during the usage of the product.

Due to the product being constantly enhanced and optimized, certain parameters and functions described in the manual in question may change without further notice. We strongly suggest visiting the www.novuscctv.com website to access the newest manual .

Technical changes reserved without prior notice and printing errors possible.

1. FOREWORD INFORMATION

1.1. Network recorder's technical data

NVR-7716P16-H2	
VIDEO	
IP Cameras	16 channels at 3840 x 2160 resolution (video + audio)
Supported Cameras/Protocols	NOVUS, ONVIF
Supported Resolution	max. 3840 x 2160
Compression	H.264, H.264+, H.265
Monitor Output	main (split screen, full screen, sequence): 1 x VGA, 1 x HDMI (4K UltraHD) (up to 2 monitors simultaneously)
Dualstreaming Support	yes*
AUDIO	
Audio Output	1 x line-out (RCA) 1 x HDMI
RECORDING	
Recording Speed	480 kl/s (16 x 30 kl/s dla 3840 x 2160)
Stream Size	160 Mb/s in total from all cameras
Recording Mode	time-lapse, triggered by: manual, alarm input, motion detection
Schedule	individual settings for: each camera, each day of the week, configuration with an accuracy of: 15 min, possibility of combining individual recording modes
Prealarm/Postalarm	up to 30 s/up to 180 s
DISPLAY	
Display Speed	480 fps (16 x 30 fps)**
PLAYBACK	
Playback Speed	480 fps (16 x 30 fps for 3840 x 2160) **
Recorded Data Search	by date/time, events
BACKUP	
Backup Methods	USB port (HDD or Flash memory), network
Backup File Format	AVI, DAT
STORAGE	
Internal storage for recording	available mount: 2 x HDD 3.5" 8 TB SATA
Total Capacity	16 TB
ALARM	
Internal Alarm Input/Output	4/1 relay type
Motion Detection	supports camera's motion detection*
System Reaction to Alarm Events	buzzer, alarm output activation, recording activation, PTZ, e-mail with atatchment
NETWORK	
Network Interface	1 x Ethernet - RJ-45 interface, 10/100/1000 Mbit/s
	16 x Ethernet PoE (IEEE802.3af-15.4W) - RJ-45 interface, 10/100 Mbit/s
Network Protocols Support	HTTP, TCP/IP, IPv4, UDP, FTP, DHCP, DNS, DDNS, NTP, RTSP, UPnP, SMTP
ONVIF Protocol Support	Profile S (ONVIF 2.2 or higher)
PC/MAC Software	NMS, Internet Explorer, Firefox, Chrome, Opera/Safari
Smartphone Software	NVR 7000 Viewer (iPhone, Android)
Max. Number of Connections with NVR	2
Bandwidth	160 Mb/s in total to all client workstations
PTZ	
PTZ Functions	pan/tilt/zoom, preset commands*
AUXILIARY INTERFACES	
USB Ports	1 x USB 2.0, 1 x USB 3.0
OPERATING SYSTEM	
Operating System	Linux
Operation Mode	triplex
OSD	languages: Polish, English, others
Control	PC mouse (in-set included), network
System Diagnostic	automatic control of: HDDs, network, camera connection loss
Security	password protection, IP filtering, MAC filtering
INSTALLATION PARAMETERS	
Dimensions (mm)	340 (W) x 77 (H) x 217 (D)
Weight	3.2 kg
Power Supply	100 ~ 240 VAC
Power Consumption	40 W (with 2 HDDs) + 200 W PoE
Operating Temperature	0°C ~ 50°C

* Function depends on communication protocol

** Available with dual streaming mode

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FOREWORD INFORMATION

1.2. Main characteristics

- Supports resolution up to 3840 x 2160

- 16 x Ethernet PoE (IEEE802.3af-15.4W) - RJ-45 interface, 10/100 Mbit/s

- Supported protocols: ONVIF

- Monitor outputs: 2 (HDMI, VGA)

- Recording speed up to 480 fps at 3840 x 2160

- Recorded stream size up to 160 Mb/s in total from all cameras

- Internal HDDs mount up to 2

WARNING!

ONVIF protocol support was verified with IP cameras based on ONVIF ver. 2.2 and compatible with the "PROFILE S".

Implementation of the ONVIF protocol by different manufacturers may vary by some functions, which can make them work improperly or not in accordance with expectation. AAT HOLDING Company is not responsible for incompatibility problems resulting from cameras of other brands than NOVUS, which are using ONVIF protocol. If you are using ONVIF protocol cameras other than NOVUS brand it is recommended to test each time whether required functions work correctly.

1.3. Package contents

Unpack the device carefully. After unpacking, please ensure that package contains the following items:

- Network Video Recorder

- USB Mouse

- Power cord

- User's manual (short)

If any of the elements has been damaged during transport, pack all the elements back into the original packaging and contact your supplier.

2. STARTING THE DEVICE

2.1 Electrical connection and other back panel elements.

NVR-7716P16-H2 back panel
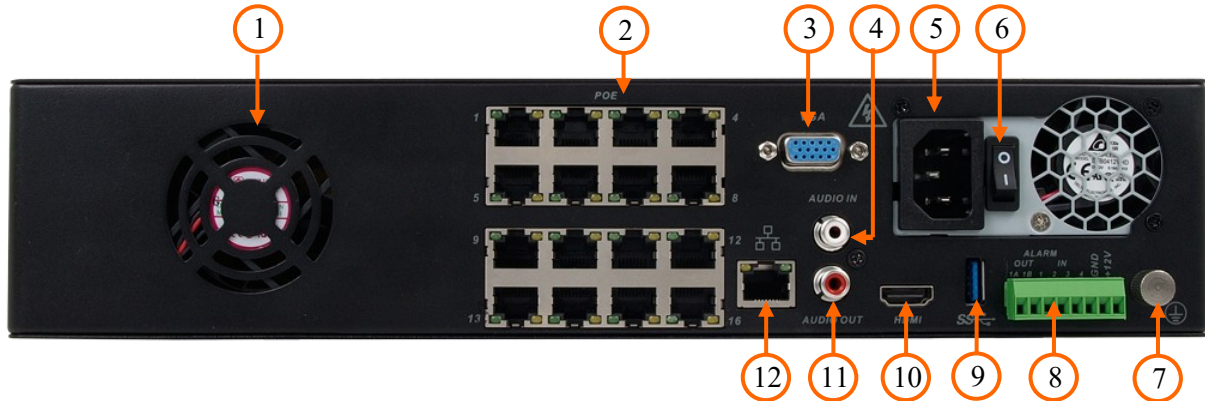
1.	**FAN:**	NVR fan, do not cover it.
2.	**IPC LAN:**	16 x RJ-45 connector ports with PoE support for IP cameras
3.	**VGA:**	Main monitor connectors, use the D-SUB VGA cable to connect monitor
4.	**AUDIO IN:**	Audio mono inputs to connect microphones*.
5.	**POWER SOCKET:**	To plug in the power cord
6.	**POWER SW:**	NVR power switch.
7.	**GROUND CONNECTOR:**	To connect ground cable
8.	**TERMINAL:**	Alarm input, alarm output, RS-485* interface.
9.	**SS:**	USB 3.0 port for external Flash memory and other USB devices.
10.	**HDMI:**	Main monitor connectors, use the HDMI cable to connect monitor.
11.	**AUDIO OUT:**	Port to connect local speaker with pre-amplifier.
12.	**LAN:**	RJ-45 connector port to connect to the local network and internet.

* Will be available in the future.

STARTING THE DEVICE

2.2 HDD mounting

Novus NVR-7716P16-H2 supports 2 internal SATA HDD

WARNING!

In order to find information regarding the compatible models of HDDs and their maximum capacities, please contact Novus distributor or check the information presented at www.novuscctv.com. AAT HOLDING Company is not responsible for any problems caused by using not recommended hard drives.

The list of compatible HDDs contains all the HDDs that can be used with a given DVR including HDDs designed for office use - so called desktop disks. However, due to the fact that reliability of the recording process and data safety are paramount factors of any CCTV system, we strongly advise to use HDDs designed for continuous (24/7) operation.

You need to format disks if they were used in a different device. All data saved on HDD prior to format will be lost.

Installation HDD

In order to mount HDD, please move front HDD cover to the right, and next open it.

There are two HDD brackets inside. To remove bracket carefully push lock switch (A) to the right side and then pull out the bracket.

When you have removed HDD bracket carefully unlock bracket connector (B) and open the bracket. Next mount HDD on place, close the bracket and lock by connector (D). Notice that you don't have to use any screw to install HDD, installing one HDD take less than 30s.
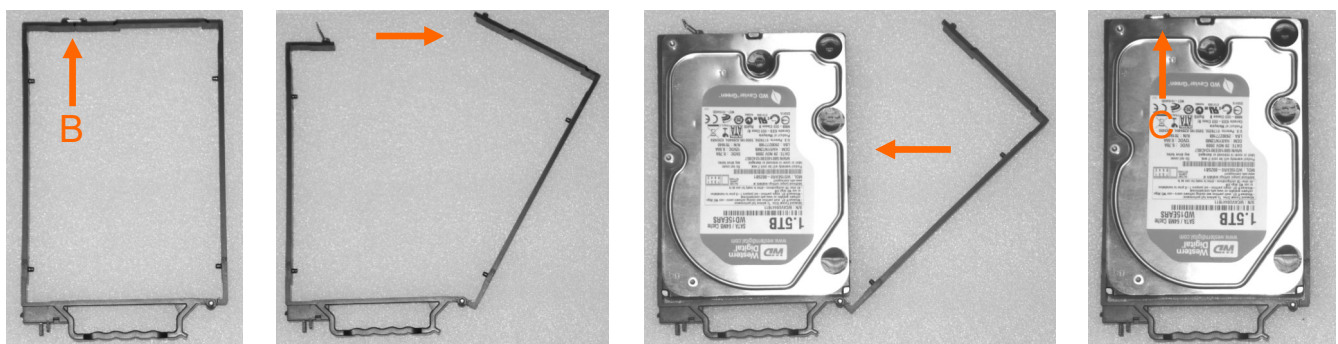
STARTING THE DEVICE

Next put bracket with HDD on it's place, and carefully push it into NVR socket. The same way install HDD2 if necessary. After installing all HDD close the front cover.

2.3. Connecting the power supply.

 Please connect provided power cord in the rear power port of the NVR like depicted below.

To start the unit turn on the power switch on back panel. Initialization lasts approximately 60 seconds. During this time executing any device functions and pressing any buttons is prohibited. To shut down the device please use the appropriate function of menu.
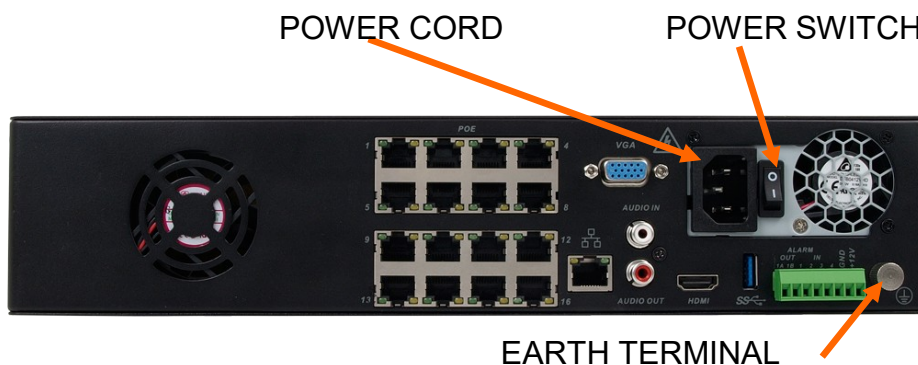
CAUTION:

Make connection when the power is not applied and the power switch is turned off.

Do not place the power cord under the carpet or rug. The power cord is usually earth-grounded. However, even if it's not earth-grounded, never modify it on your own for earth-grounding.

Make sure that power adapter is placed near of NVR and secured from accidental disconnection.

If the device was brought from a location with lower temperature, please wait until it reaches the temperature of location it is currently in. Turning the device on immediately after bringing it from a location with lower ambient temperature is forbidden, as the condensing water vapour may cause short-circuits and damage the device as a result.

Before starting the device familiarize yourself with the description and the role of particular inputs, outputs and adjusting elements that the device is equipped with.

If the electrical system does not provide grounding in the power cord, connect the ground wire to ground terminal.

STARTING THE DEVICE

2.4. Connecting monitor

This product supports following interfaces for main monitor: HDMI, VGA.

For HDMI and VGA outputs following resolutions are supported: 800x600, 1024x768, 1280x720 1280x1024, 1366x768, 1440x900, 1920x1080, 3840x2160

After changing resolution you have to confirm it by clicking YES. In case of monitor does not display anything please wait 8 seconds, then previous resolution will be restored.

2.5. Connecting camera and Network

NVRs have built-in 16 PoE ports RJ-45 with PoE support, which can be used for connecting cameras. Please notice that the Ethernet connection is effective within 100 meter distance. To connect IP cameras please connect cables like on image and follow the described below.

- In case of adding IP cameras to built-in PoE switch, you don not have to set up any parameters of camera. After connecting camera to RJ45 port it would be automatically powered, discovered in network and connected to NVR.

- In case of connecting cameras by using external switch you have to configure its network settings (according to NVR LAN setting) like it is described in Camera User Manual.

Note:

NVR saves password automatically. If you provide unique password while adding one camera it would be automatically used for connecting with other cameras.
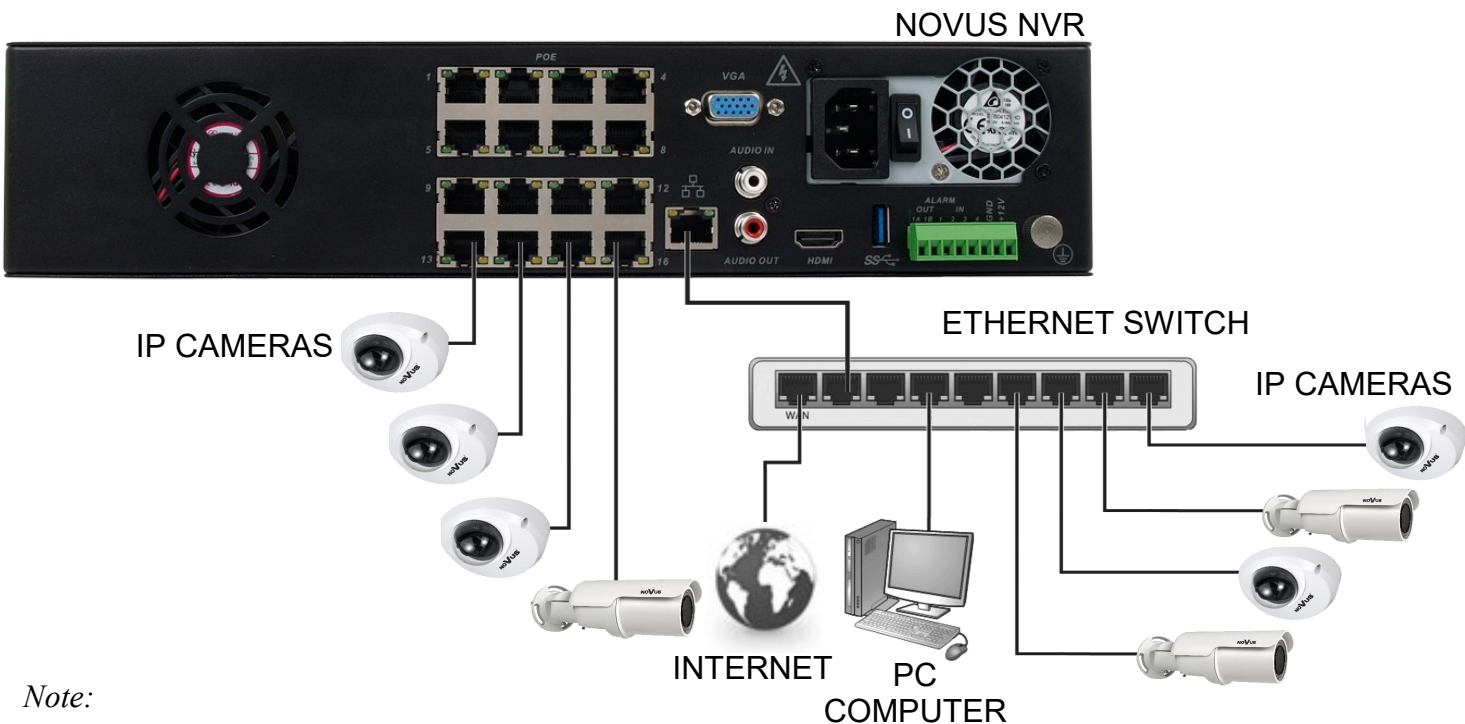
Note:

To ensure recording stability from an overloaded network traffic, or unauthorised access, it is strongly recommended to create separate network secured by router firewall from the user network. If you use a switch to connect additional cameras it is recommended not to exceed 60% of the maximum throughput of the network interface. When connecting more than 6 cameras via a external switch we recommend you to use a 1000 Mbit switch

STARTING THE DEVICE

2.6. Connecting external devices

- Connecting audio ports

Audio output signal normally are above 200mV 1kΩ. You can connect to it the audio amplifier with the external speakers.

- Connecting USB devices

NVR has 1 x USB 2.0 port on front and one 1 x USB 3.0 on back. They could be used for connecting external Flash memory, USB HDD, mouse connection and other USB compatible devices. To connect storage memory it is recommended to use port USB 3.0

- Connecting alarms ports

NVR-7000 series has local alarm input and output. To connect alarm input please refer to diagram below:
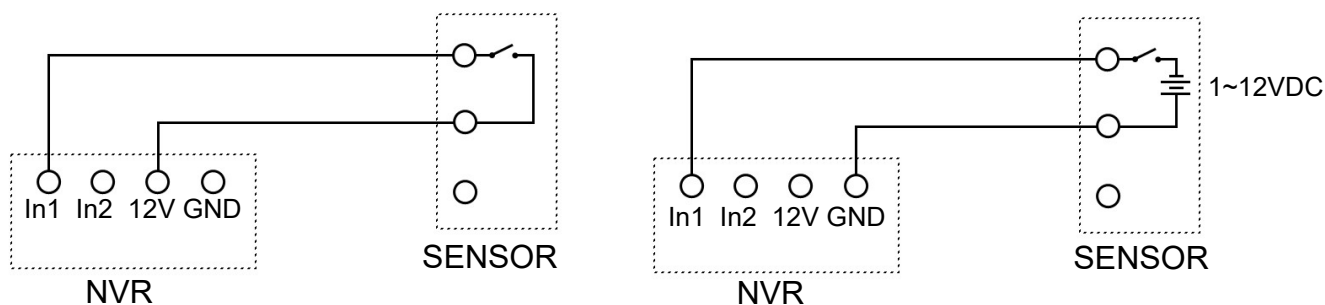
To activate alarm input (1,2,etc) connect it to +12V pin from NVR, or connect (between pin GND and alarm input) external voltage from range 1~12VDC.

Depending of sensor type select in NVR N.O. or N.C. mode.

To connect alarm input please refer to diagram below:
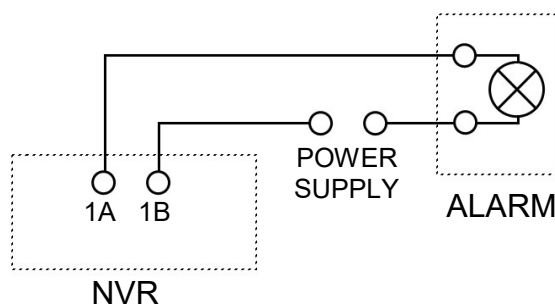
Alarm output it's a relay with 2 connectors 1A and 1B. Do not exceed maximum relay parameters: voltage 24V AC/DC and current 1A.

NVR OPERATING

3. NVR OPERATING

3.1. Front panel description

1.	**ON/OFF**	Reset button (maintenance only) / Hardware turn on/off button.
2.	**USB**	USB 2.0 port for external Flash memory and mouse connection.
3.	**LED**	Shows power, recording, network connection or active alarm statuses.

3.2. Controlling via USB mouse

It is possible to control NVR via an USB mouse connected to the USB port. Double-click on any camera in split screen display mode switches the display to full-screen mode. Subsequent double-click returns to previous display mode. Move cursor to the top or click the right key of mouse to bring up MAIN MENU and select START icon.

Certain positions allow to select them via mouse scroll. Depending on NVR operating mode, pressing RMB (Right Mouse Button) displays a corresponding function menu.

3.3. System operations

To start NVR plug power cable and switch on power button. The power led turns on. After booting, the video output default is multi-window output mode.

Note:

If the currently selected NVR menu language is not as expected, to change it, please follow the procedure described in chapter 4.3 of this manual.

NVR OPERATING

By default local authorization of NVR is disabled so you can manipulate NVR without any username or password. After configuring NVR it is strongly recommended to set up user password.

Default login/password is root/pass. For safety reasons, it is recommended to change default user name and password.
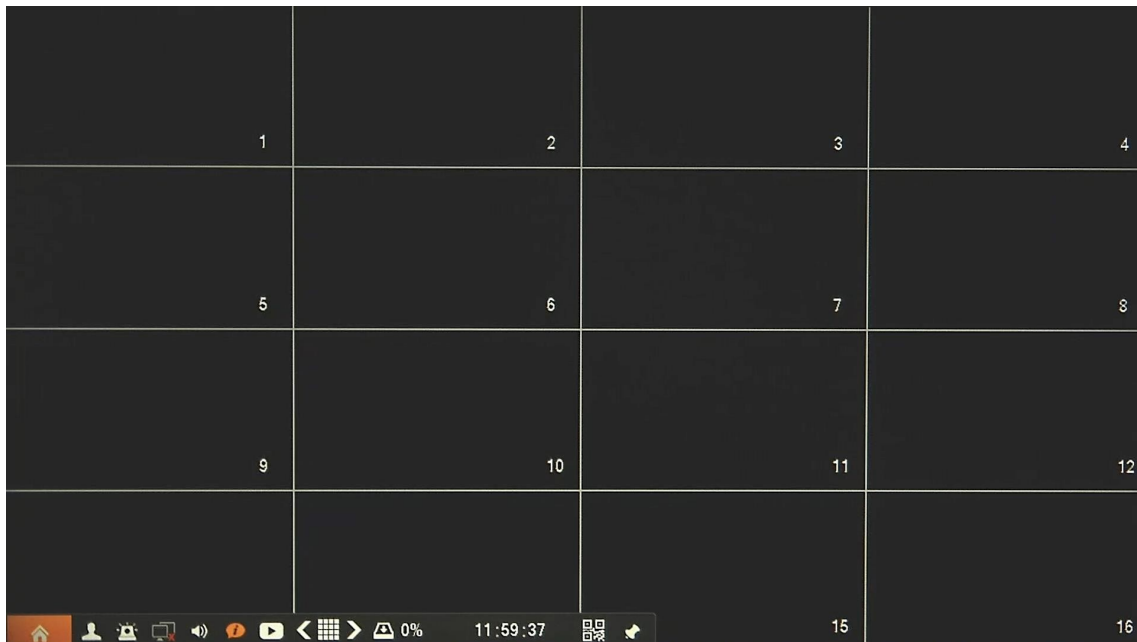
In order to shutdown or reboot NVR you should move cursor to the bottom icon [icon] or click the right key of mouse and select START icon [icon]. Next click the SYSTEM MAINTAINANCE and SYSTEM SHUTDOWN. You could also use button at front or rear panel turn bring shutdown menu.

In pop-up window choose LOGOUT, SHUTDOWN or RESTART and wait until it will be finish.

To prevent unauthorized access, it is recommended to log out when you leave the screen, or set up AUTOLOCK feature.

Note:

When user is not login or has limited rights all inactive icon and menus are greyed out.

CAUTION:

If you turn off the system in an abnormal manner such as removing the power cord while the system is working, the disk will acquire or increase the numbers of bad sectors, causing data loss and shortened life cycle of the disk.

NVR OPERATING

3.4. Startup configuration

Prior to using NVR for the first time, initial setup is strongly advised. Before you connect the IP cameras to the NVR, please set up network and stream parameters of IP cameras in the right way.

Note:

For suggested values for IP camera setting please refer to the "Cameras Capability Table" available on the www.novuscctv.com website. If you set wrong values some problems may appear: the NVR cannot search the IP camera, the stream cannot be connected, the image is not fluent, the image quality is bad and so on.

In case of first NVR start QUICK SETTING menu window appears (if function wasn't disabled earlier). To configure NVR please follow procedure like below, after step 5 NVR will be ready to work:

I.   Cloud Service: menu allows to enable cloud access to NVR. After changing parameters click SAVE button. There are also two QR codes to scan in mobile device, first is link for mobile software, and second is serial number of NVR to easy connect NVR.

II.   Time Settings: menu allows to configure NVR local time and NTP settings. After changing parameters click SAVE button for each submenu.

III.   Network Settings: set up network parameters : IP   (by default it is 192.168.1.100) SUBNET MASK (by default it is 255.255.255.0).   Optionally if you are going to connect NVR to the Internet (for cloud access, sending email, etc) set up GATEWAY, PRIMARY and BACKUP DNS. You can alternatively check DHCP mode (DHCP server is required in this method in target network) then all settings will be set up automatically.

Note:

When you use DHCP server check IP address lease and its linking with NVR MAC address to avoid changing or losing IP address during device operation or network/DHCP server breakdown. This solution is not recommended for security systems.
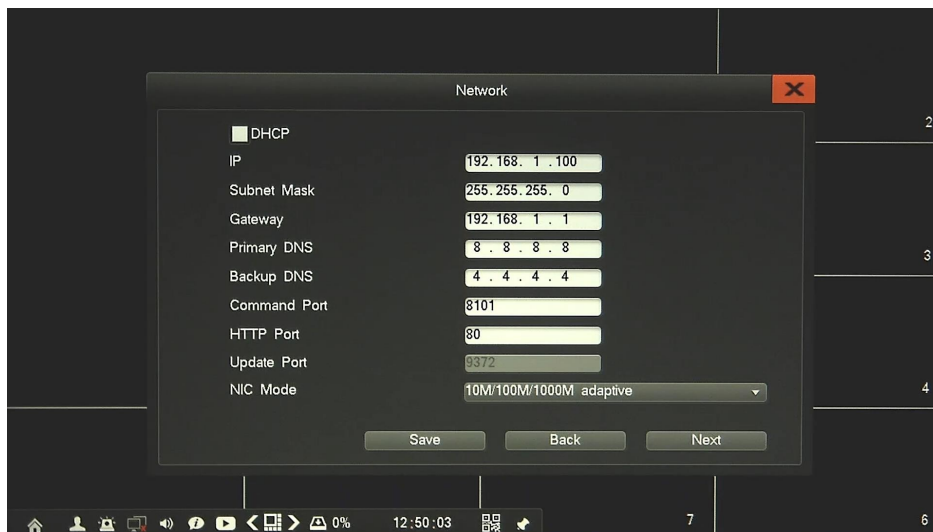
Note:

Be sure that IP addresses and subnet mask of the NVR and the IP cameras are in the same network subnet (e.g. for the NVR IP address 192.168.1.188, and mask 255.255.255.0 appropriate address for the camera ranges from 192.168.1.1 to 192.168.1.254, for example 192.168.1.201). It is not allowed to set the same addresses for multiple devices.

IV.   HDD Manage: menu allows to prepare new installed hard disk to work. If you run it for the first time simply click ALL FORMAT button, and wait until progress will finish.

NVR OPERATING

V.   IP Camera Management: menu allows to manage IP cameras connected to the system. There are two possibility to connect IP cameras:

- Camera is connected to build-in PoE switch. In such situation camera will be automatically discovered and added to NVR at channel corresponding to PoE port of NVR (A selection). Also no need to provide camera password if it's camera default password. If you modify password you have to fill it in by clicking EDIT channel. I it will also fit to other cameras it would be automatically used for them.
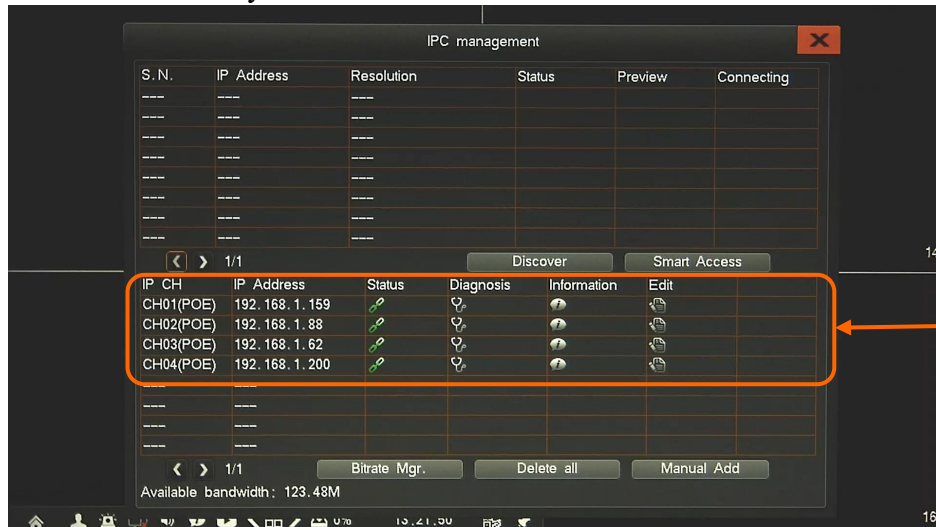
Note:

NVR has included automating camera IP assign. If IP conflict will be detected IP addresses of conflicted cameras would be changed automatically.

- Camera is connected to external switch by LAN port. In such situation all cameras will be discovered and displayed as list (B). To add camera just click + , if its status is green then it would be added to the system at first empty channel (after PoE channels - C), if status would be red   then pop up window is dipsplayed to provide user name and password. In the same way add other cameras.
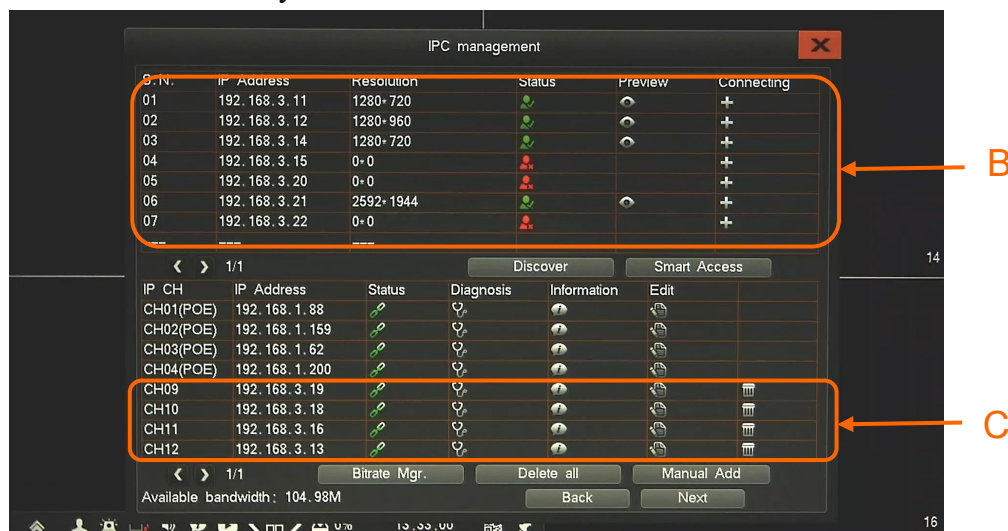
Note:

NVR saves password automatically. If you provide unique password while adding one camera it would be automatically used for connecting with other cameras.

VI.   Bitrate Integrated Management: menu allows to modify mainstream and substream values. Stream size could be chosen by user for each stream. After changing value, confirm it by SAVE button. It is also possible to set streams size automatically by using SMART CONFIG button. After pressing button streams would be set according to current image resolution and frame rate. At the bottom of screen there are displayed information about available bandwith for recording camera and amount of days, which could be stored on HDD free space.

When finished all steps close wizard by FINISH button at the bottom of screen. Now system is ready to work.

NVR MENU

4. NVR MENU

4.1. Live monitoring

NOVUS network video recorders features a multilingual OSD menu allowing to adjust the settings of the device. Available languages are: English, Polish, and others

As soon as the NVR completes its initialization process, it enters the real-time monitoring image. Displaying all cameras simultaneously is the default mode. On the bottom of screen STATUS BAR is displayed.

STATUS BAR   VIDEO WINDOW   QUICK MENU
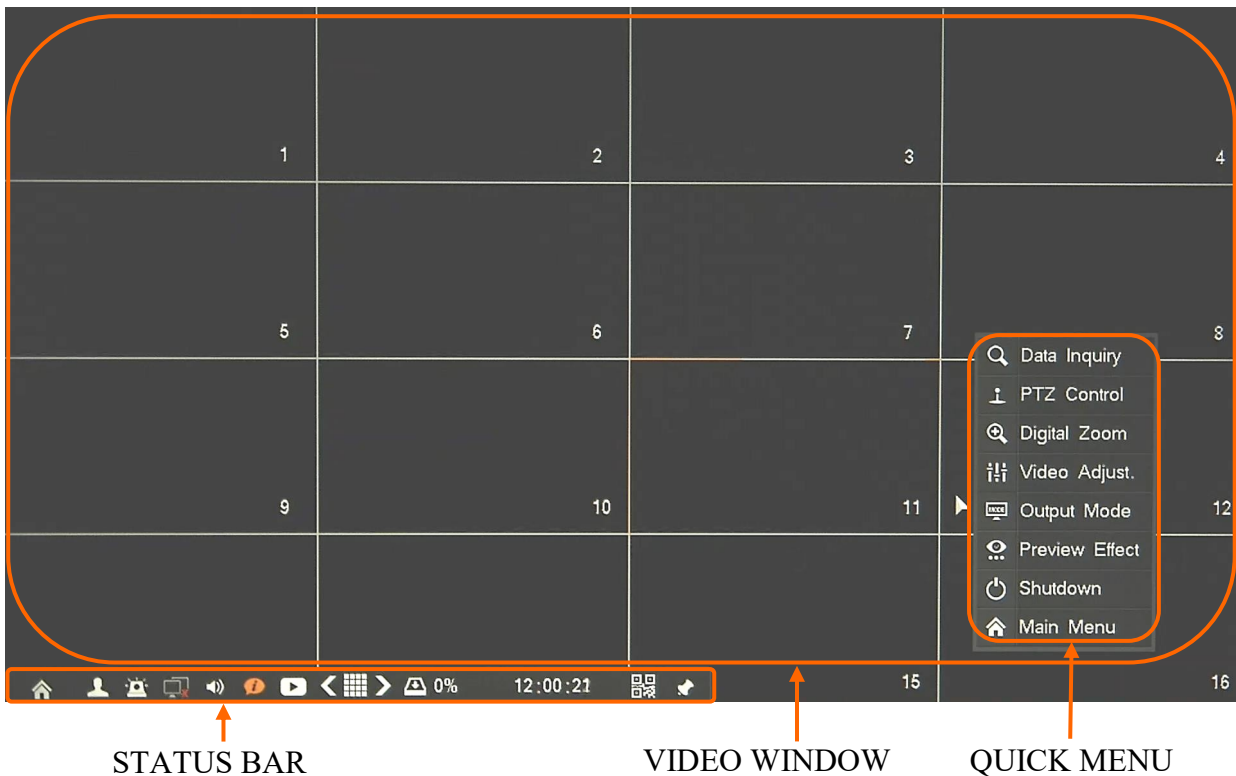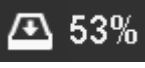
At the right top right corner of video channel, shows its channel number is shown. In the bottom right corner of each channel image, shows capture recording status icon (motion, alarm, manual) is shown.

STATUS BAR description:

Item	Icon	Description
Start		Click to run quick configuration of main NVR parameters
Login /Logout		Click to login/logout the system
Alarm		Display the alarm information and recording events.
Network		On mouse cursor display IP/MAC of device, on click open network diagnose/repair window

NVR MENU

Right mouse click on screen will bring QUICK MENU for quick operation.

Item	Icon	Description
Volume		Click to enable/disable audio
Information		On mouse cursor display current device temperature
Fast Playback		Click to start playback of latest 5minutes of recording
Split Screen		Click to change split screen mode, click right/left to change channels
HDD status	53%	XX% informs about usage/free space of all storage, on mouse cursor display capacity and days amount which could be stored on free space. On click open HDD manage window.
QR codes		Click to open QR codes window, one to get mobile software, and second is serial number of NVR to easy connect NVR
Lock menu bar		Click to enable/disable auto hide of status bar

QUICK MENU description:

| Item	Icon	Description
Data Inquiry		Move to the playback screen, which allows to search and watch recordings.
PTZ Control		Move to the PTZ screen. You can control the PTZ operations of a PTZ‐compliant camera on the PTZ screen.
Digital Zoom		Allows to zoom in picture of selected channel
Video Adjust		Menu allows to adjust image parameters for selected channel
Output Mode		Menu allows to adjust monitor color parameter
Preview Effect		Allows to set up priority fluency or reduce delay
Shutdown		Shut down NVR
Main Menu		Enter to the NVR Main Menu

NVR MENU

After clicking ⌂ icon MAIN MENU is opened. Main menu is divided on 9 section. Table below show short description each of it:

Item	Icon	Description
Data Inquiry		Menu allows to search and playback window recordings. Also allows to manage records on disks.
Backup		Backup window, allows set up direct backup and scheduled backup.
Record		Menu allows to set up recording parameters and schedule.
Alarm		Menu allows to configure alarm events (motion, sensor, system) and reactions.
IPC Management		Allows to manage IP cameras: add, remove, change basic values of it.
Setting Management		Enter to the NVR setup, set language and parameters of: Monitor, Time, Ports, PTZ, Network.
Record		Menu for configuration NVR storage .
Sys. Info		Displays detailed information about device, channel & alarm status, power consumptions, logs, etc.
System maintenance		Menu allows to manage Quick settings, User Account, Set up and Back up configuration, upgrade and shut down system.

Detailed information about configuration, service and installation of device is available in full version of user's manual located on the www.novuscctv.com

4.2. Searching and playing recorded video

To start the playback choose DATA INQUIRY menu. Then following window appears:

CALENDAR   GRAPH WITH RECORDING
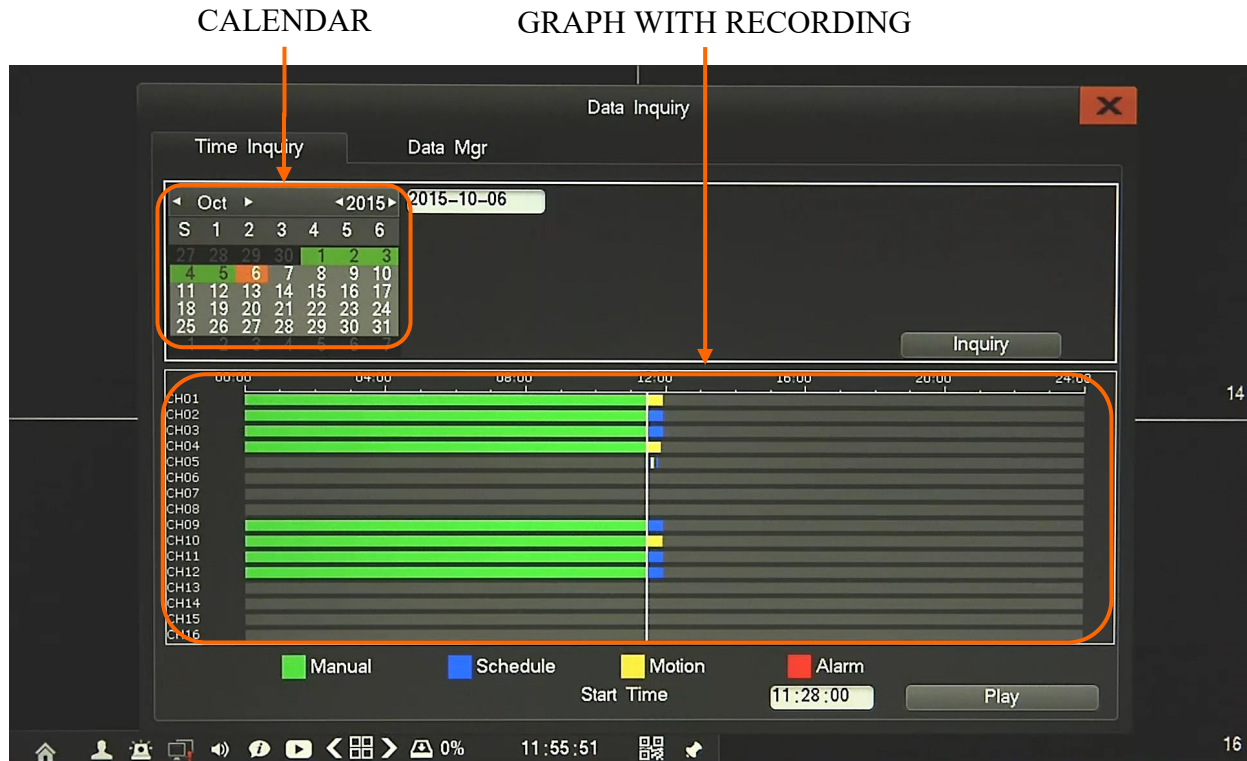
Choose the date from the calendar and press INQUIRY BUTTON to find records for selected date.

You can identify the type of the recording data by the color in the bar.

- Green (Manual) : data saved by manual recording.
- Blue (Schedule) : continuous data recording.
- Yellow (Motion) : motion event data recording.
- Red (Alarm) : alarm event data recording.

To play the searched data simply double click a desired point on or press PLAY button.

NVR MENU
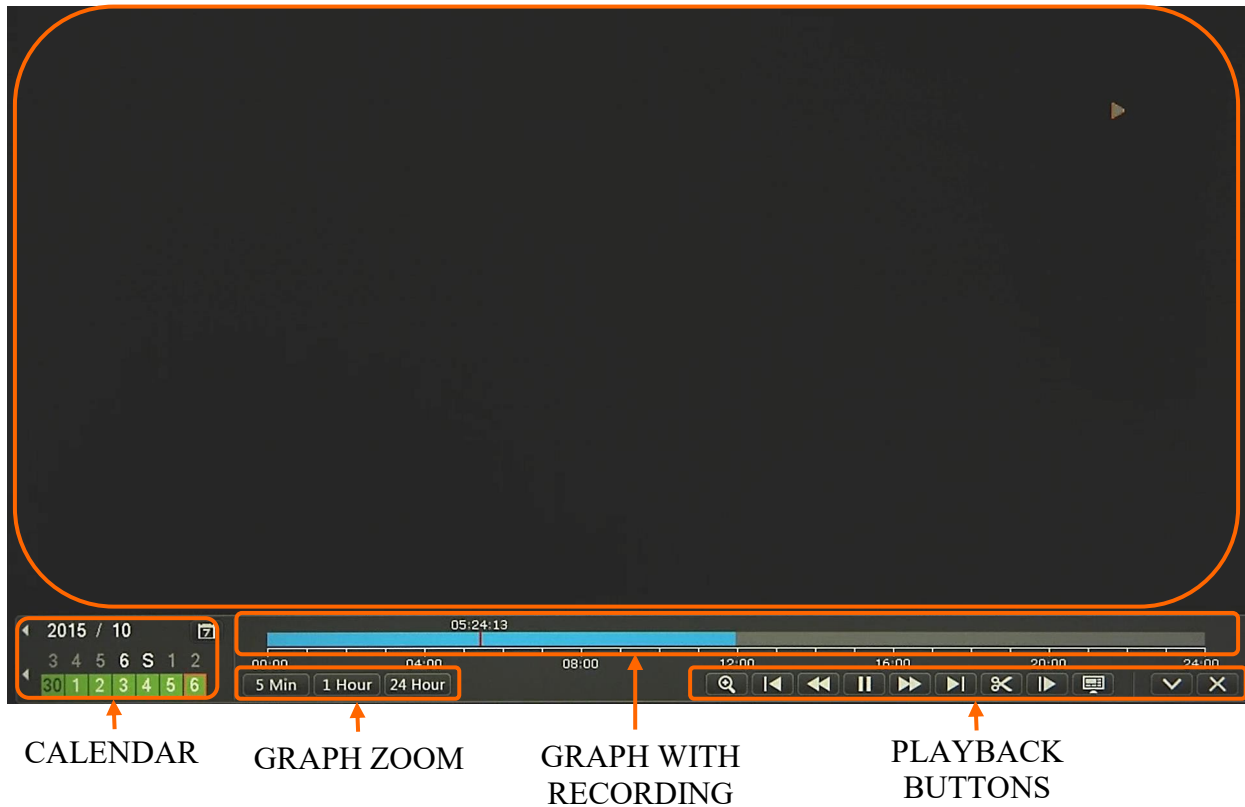
On calendar you can easy change playback range. Use graph zoom buttons to expand displaying graph on screen. Graph display sum of each channel available recordings.

Use playback buttons to operate recordings. Description of playback buttons:

- Slow backward: Slow down the backward speed. (there are: 1/2)

- Fast backward: Accelerate backward. (there are: 2, 4, 8, 16 times)

- Pause/Play: Pause the current playback image.

- Fast forward: Accelerate playback. (there are: 2, 4, 8, 16 times)

- Slow forward: Slow down the playback speed. (there are: 1/2, 1/4, 1/8, 1/16 times)

- Cutting: allows to set backup up start point and end point during playback, and backups records.

- Frame Forward: Jump forward frame by frame

- Split screen switch: change split screen view

- Player minimization: decrease size of player navigation window

4.3. Changing the menu language

If after NVR booting up the currently selected menu language is different than expected, to change it, please follow the steps below:
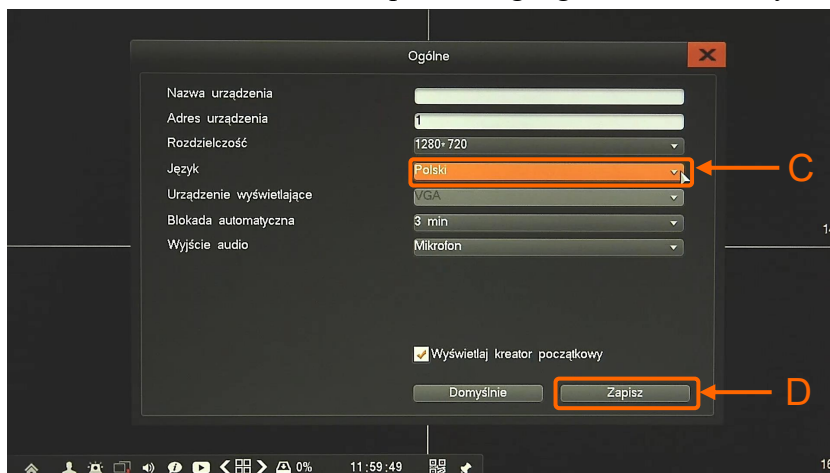
Move mouse cursor to the bottom of the screen and click ⌂ icon to display main menu.
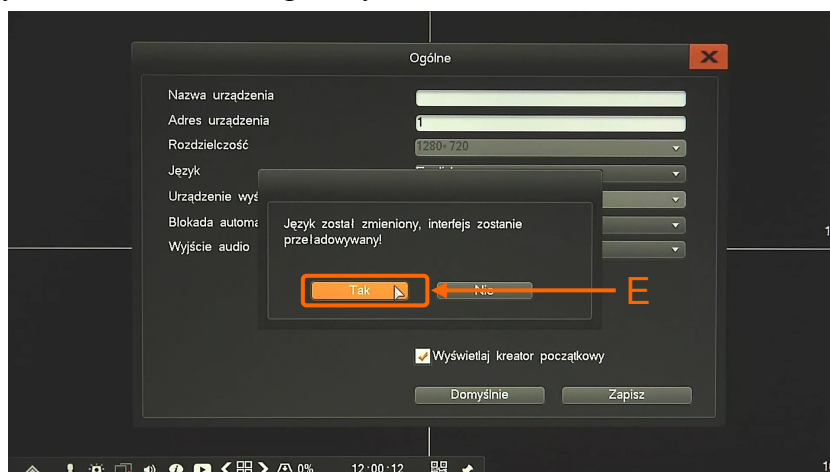
Next select A and B.
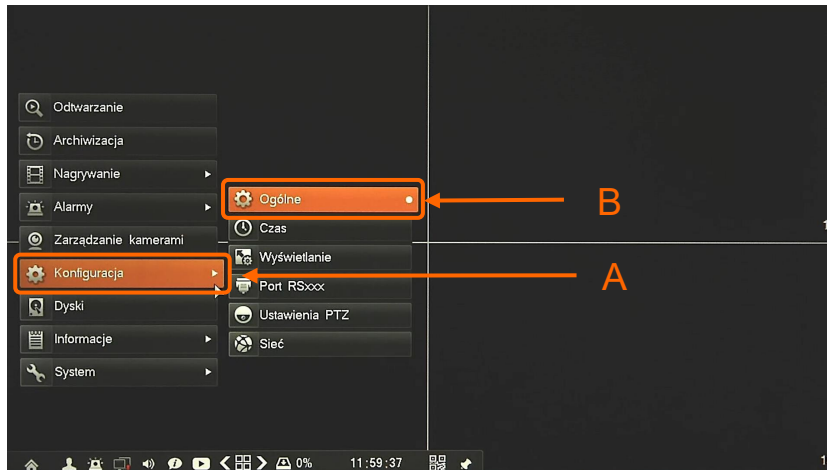
New window appear, from selection C choose required language and confirm by button D.

In pop up window you have to confirm again by E button.

After that GUI Interface is reloaded and menu language is applied.

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