SD-xxx-5 SERIES

Cameras
motorized
AHD / analog

INTRODUCTION

Speed dome cameras are fully remote controllable cameras. They allow an operator to rotate the camera in all directions and to zoom at will on the most interesting scenes. They can also perform pre-programmed automatic movements based on specific surveillance needs.

What is PTZ

Remote controlled cameras are also referred to as PTZ, which stands for PAN / TILT / ZOOM. PAN is the horizontal movement, TILT the vertical movement and ZOOM the control of the focal length of the lens.

Control of PTZ cameras

The speed-dome cameras are controlled with special control consoles or through DSE digital video recorders. Digital video recorders also allow remote control of cameras via network or Internet, using both PCs and smartphones or tablets.
The cameras are controlled on a twisted pair with Pelco D protocol, now a consolidated industry standard. These cameras also allow control over coaxial cable with UTC protocol.

INSTALLING THE CAMERA

SD series cameras are carefully packed to prevent damage in transit. First of all, it is necessary to check the material received. The speed dome camera you have purchased is protected by packing elements which must be carefully removed before using it.

Realization of the wiring with command from RS485

A cable with the following connections comes out of an SD Series Speed Dome camera:

- **1**12VDC power supply with 5.5 mm plug.
- **Video output**BNC female
- **2 Cables**BUS RS485 YELLOW (A +) / ORANGE (B-)

To structure a Speed Dome camera system, 3 types of cabling must be prepared:

- **Diet**. It is possible to power the camera locally with a 220VAC / 12VDC adapter of at least 3A (not supplied) or arrange a 12VDC network with cables of adequate section in order to avoid excessive voltage drops.
- **Video connection.**It is realized as for any traditional analog CCTV camera. The video signal produced by this camera can be set to composite video CVBS or AHD / CVI / TVI depending on the DVR to be connected to, but there are no differences in the type of cabling of these two technologies. RG59 coaxial cable is generally used for distances up to 2-300 meters. It is also possible to carry the video signal on twisted pairs using special converters (RE-BNCRJ1) up to about 200 m. The twisted pair converters are also available in the active version to reach distances over 200 m.
- **Telemetry.**This is the serial connection that conducts motion commands to the camera. The SD series cameras use an RS485 serial line (BUS RS485) which must be created with a pair of twisted cables. It is essential that the 2 cables are wound together and not parallel. Theoretically, the RS485 serial line can extend up to 1200 meters in length and the devices are connected in cascade along it. The section of the cables strictly depends on the length of the connection: for medium distances a section of 0.5 mm is sufficient, while if it is necessary to reach considerable distances (max. 1200 m.), Higher sections of 1 mm or even 2.5 mm must be used. When carrying out the wiring, it is advisable, but not essential, to use a shielded cable. The CAT5 network cable,

The cameras and consoles must be connected in cascade, i.e. entering and exiting the 2 terminals RS485A and RS485B. It is important not to invert the two cables (AB) when connecting the equipment. The order in which the devices are connected to the BUS does not matter. Each device will be identified by its own unique address, which can be set via microswitches, which will allow the instructions to be correctly addressed. Up to 256 cameras can be connected to the same BUS. The consoles do not require any addressing, while for the cameras it is necessary to set a different address for each camera, as described below.

Realization of wiring with UTC command on video cable

If you have a UTC controlled DVR, such as our RK Series DVRs, you can send commands to the camera over the video cable without having to wire the twisted pair. To use this command, UTC must be selected as the protocol in the NVR instead of Pelco D. The RS485 connectors are left unused.
Note that if the camera receives commands via UTC, some functions may not be usable with respect to the RS485 connection.

Command bodies

The movements of these cameras are controlled via the common PELCO P / D protocol, now a consolidated industry standard. It is possible to send the commands with the special consoles for speed dome cameras or through the DVRs equipped with RS485 port.
UTC-controlled DVRs can control these motorized cameras with just the video cable

Address, protocol and Baud Rate

After connecting the camera, it is necessary to set the communication parameters so that it is able to communicate with the control units.
All the elements of the RS485 BUS, both cameras and control units, must use the same protocol (PELCO D

standard) and the same transmission speed (2400,4800,9600 baud)
Each camera must have a different address from the others in order to be identified along the BUS.
These 3 parameters: Protocol, Baud rate and Address are set in the camera OSD menu.

Set the factory log data in the operating unit

The cameras support the standard PELCO P and PELCO D command protocols, which are supported by most consoles and DVRs. Protocol recognition is automatic.
The communication parameters of the speed (baud rate) and address of the camera are set in the OSD menu of the camera. To access the menu, at least initially, your control unit (DVR or console) must be set to the factory parameters of the camera, which are:

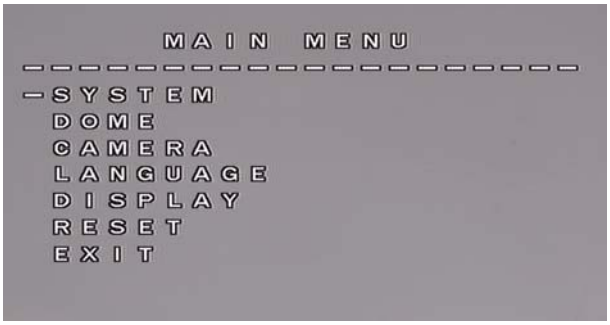
The factory setting is:
BAUD RATE: 2400 BPS
ADDRESS 1

The communication data set in the camera is superimposed on the image

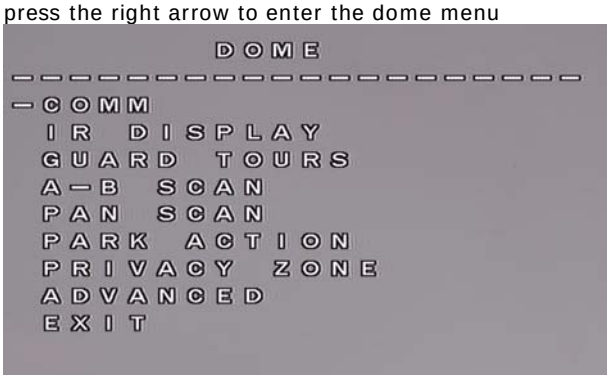
Set the final protocol data of the camera

Once the control center has been set to the PelcoD / 2400 / ID1 communication parameters, it is possible to set the final ID and speed of the camera. In fact, if you have only one PTZ camera, you can keep the Factory ID, but if there are more than one, you have to assign them different addresses.
Proceed as follows:

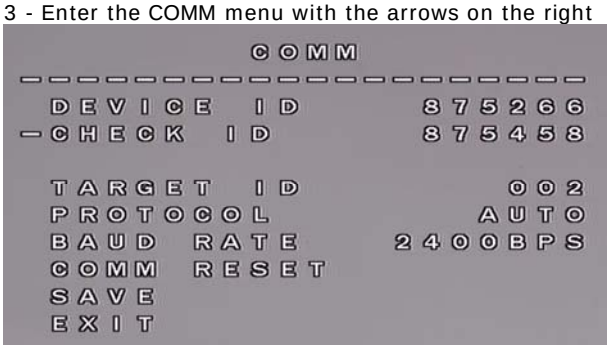
1 - Call up PRESET 95 to open the OSD menu



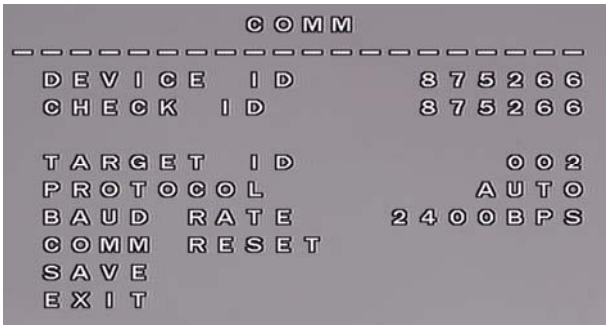
2 - Move to DOME with the up and down arrows, then press the right arrow to enter the dome menu



3 - Enter the COMM menu with the arrows on the right



4 - In order to modify the communication parameters, the CHECKID must be written identical to the DEVICE ID. This procedure is to avoid that the communication parameters are modified in an unconscious way. Move to CHECKID and press the right arrow to then modify the value with the up and down arrows until it is equal to the DEVICE ID



5 - Change the TARGET ID (camera ID) and BAUD RATE (protocol speed) as desired

6 - Go to SAVE and save with the arrow on the right
7 - Exit with the left arrow several times

Once the address or the protocol speed has been changed, the camera will no longer respond to commands and it will be necessary to change the settings of the control unit in a manner consistent with the new settings.

Select the video format AHD CVI TVI CVBS

This cameras support AHD technology with 5MP resolution

AHD technology is the latest evolution in analogue CCTV. These AHD cameras, combined with the latest generation AHD video recorders, provide megapixel resolution, without latency, while maintaining all the simplicity of installation of an analog system. In order to use the AHD 5MP video signal you need a VCR that supports this technology and this resolution.
If your DVR supports AHD 5MP there is no need to change the video format of the camera. If not you can change the video format of the camera to CVI, TVI or even CVBS which is traditional analog video.
It is possible to switch by calling up the following presets twice consecutively:

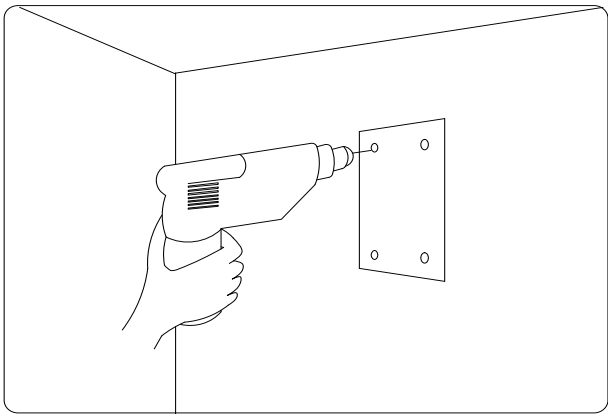
CVBS	Call preset 140 twice
AHD	Call preset 137 twice
TVI	Call preset 138 twice
CVI	Call preset 139 twice

ATTENTION - These control presets only work with RS485 protocol, they do not work with UTC control on video cables.

As an alternative to the signal switching presets it is possible to switch the video signals in the camera OSD menu which opens by calling preset 102 twice. In the camera OSD menu it is also possible to change the video resolution of the camera.
The camera OSD menu is explained later in the manual.

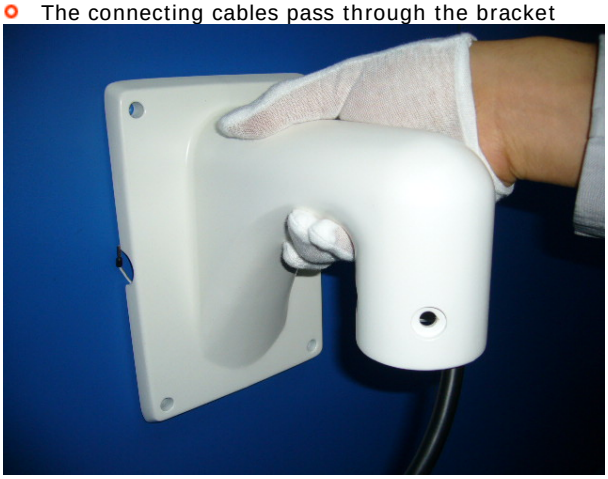
Wall mounting

The SD series speed dome cameras are supplied with a wall mount bracket. The camera cable in this case must pass through the bracket. In the following photographs the example of installation of the wall bracket



- Fix the bracket to the wall using plugs, taking care to leave the cables exit in the center between the fixing holes.

- The connecting cables pass through the bracket



- Connect the camera and secure it to the bracket with the supplied screws.

Other types of brackets are optionally available.

BASIC OPERATIONS

Once the camera has been correctly installed and at least one control unit (keyboard or DVR) has been set up, it is possible to test the first operating commands.
Below we list the main commands through which it is possible to control the speed dome cameras.

Power on and self test

Powering the camera starts a sequence of automatic operations. The camera performs a series of movements and checks the operation of the horizontal movement, the vertical movement and the camera body.
The communication data of the camera is shown as an overlay.
At the end of the automatic test, the camera is ready to receive the commands coming from the console.

Manual Pan Tilt control

The first command to check correct communication between the camera and the console is the RIGHT / LEFT (PAN) and UP / DOWN (TILT) movement using the console joystick.
If the camera does not react to console commands, it means that something is incorrect in the communication. Check in the order:
1 - That the two twisted cables leading the RS485 are connected and not inverted (A with A and B with B).
2 - That the console or the DVR has been set up with the PELCO D protocol and that the speed chosen is the same as that set in the camera (2400 at the factory)
3 - That the address of the camera to be controlled has been selected on the console or DVR (1 in the factory).

It is possible to check the address and protocol speed directly on the camera

Manual ZOOM control

The cameras are equipped with optical zoom. To control the zoom, it is possible to use the ZOOM +/- (or TELE / WIDE, depending on the console) keyboard buttons. If you are using a so-called 3D console it is also possible to control the zoom by rotating the joystick head.
If necessary, you can change the focus by pressing the FOCUS +/- buttons (or NEAR / FAR depending on the console), but it is generally more practical to allow the camera to use the autofocus function. The IRIS +/- aperture commands are generally not allowed by the factory settings of the cameras.

PRESET setting

The cameras are able to memorize predefined positions that can be quickly recalled without having to manually operate the joystick.
Each camera is able to manage 256 PRESETS, each one distinguished by its own XY, ZOOM and FOCUS coordinate value.
In reality, not all of these presets are available to the user to be customized as some have predefined features that we will see later and which are called SYSTEM PRESETS.
To set a preset act as follows:

- Select the camera to control
- Using the Joystick, position the camera in the preferred point and adjust the zoom
- On the keyboard, dial the number of the preset to be set, for example: 1 and send the SET PRESET command (see console manual)
- The camera stores the preposition.

Each control unit uses different wordings and sequences. Consult the documentation attached to the control unit to know the exact sequence to be dialed.

Recalling PRESETS

After having memorized the presets of interest, they can be easily recalled from the keyboard by acting as follows:

- Check if you have selected the camera
- Dial the PRESET number
- Press the PRESET recall button, usually CALL or PREVIEW or GO TO depending on the consoles.

The camera moves automatically until it reaches the stored position.
Each control unit uses different wordings and sequences. Consult the documentation attached to the control unit to know the exact sequence to be dialed.

Automatic movements

The cameras can perform automatic movements such as panoramic scans or preposition sequences. These movements are set in the programming menu which is described below. These movements are started with the commands of the control unit or using the system presets.

System PRESET

Not all 255 camera presets are available for user customization; some presets are used by the camera for particular functions and are called SYSTEM PRESET.
The system presets allow you to access the camera configuration and to quickly issue the main commands, such as starting SCAN, CRUISE and PATTERN. The control consoles and DVRs also have buttons to start automatic movements, but often, due to the imperfect standardization of the PELCO communication protocol, they may not be effective. The use of system presets, on the other hand, always works on any type of control unit.
The cameras of this range allow many operations with the system presets, making the use of the OSD menu that we will describe later unnecessary.

PRESET	COMMAND	FUNCTION	DESCRIPTION
GENERAL COMMANDS			
34	CALL	Reset	Reboot the camera
81 (41)	CALL	Day / Night by car	Set Day / Night switching to automatic
82 (42)	CALL	Day / Night over night	Force night mode (B&W)
83	CALL	Day / Night on day	Force day mode (color)
84	CALL	IR max	Force maximum IR illumination
85	CALL	IR min	Force minimal IR illumination
ninety two	CALL	Start AB scan	Start scanning between two limit switches (AB) The continuous horizontal movement between 2 limit switch limits with the same TILT level is defined as AB SCAN
94	CALL	Close OSD menu	Closes the overlay menu for camera configuration
95	CALL	Opens OSD menu	Activate the overlay menu for camera configuration
96	CALL	Start Tour 3	Start the tour 3 A TOUR is the sequential display of various presets.
97	CALL	Start Tour 2	Start tour 2
98 (38)	CALL	Start Tour 1	Start tour 1
99 (39)	CALL	Start 360 ° Scan	Start the 360 ° panoramic scan
COMMANDS FOR VIDEO SIGNAL SETTING			
137	CALL 2 times	Set AHD video	Call the preset twice to set the video signal in AHD, used by DSE DVR
138	CALL 2 times	Set up TVI video	Call the preset twice to set the TVI video signal, used by HikVision DVR
139	CALL 2 times	Set up CVI video	Call the preset twice to set the CVI video signal, used by Dahua DVR
140	CALL 2 times	Set up CVBS video	Call the preset twice to set the CVBS video signal, the standard analog composite video
115	CALL 2 times	Set NTSC video	Call the preset twice to set the video signal in NTSC format
116	CALL 2 times	Set PAL video	Call the preset twice to set the video signal in PAL format
102	CALL 2 times	Opens room module settings	The camera module contains some settings on the video signal of the camera. In the camera menu, preset 102 is also called up as the ENTER key

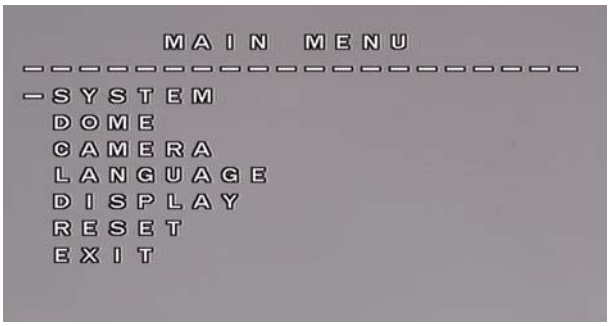
ATTENTION - Some of the system presets, like all the video setting commands, only work with the RS485 protocol and cannot be used with UTC control on video cables.

SPEED DOME OSD MENU

In the camera configuration menu it is possible to set all the operating parameters of the camera and its movement.
Access to the menu is not necessary for the normal operation of the speed dome as the main control functions can be operated via the system presets as described above, however, there are further controls in the OSD menu.

Access to the general OSD menu

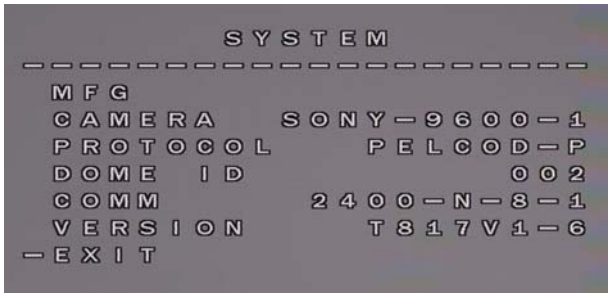
To access the OSD configuration menu, simply call up from the console or DVR the:
System PRESET 95.
Typically you must first select the address of the camera you want to program, then type 95 and then press CALL or PREVIEW or GO TO (consult the console manual on how to recall a preset)



HOW TO OPERATE
To move within the general OSD menu, use the joystick or the UP DOWN navigation arrows.
To select a menu item or to exit, use the joystick or the DX SX movement arrows

System

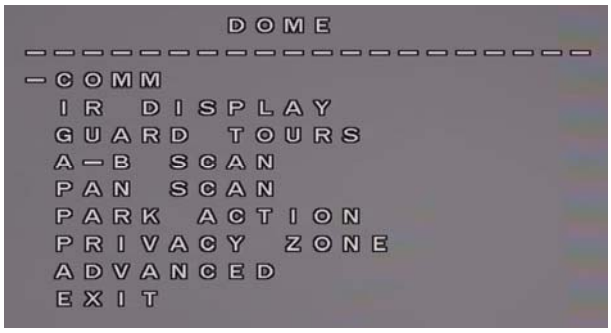
This menu item provides all information about the camera. This is an information-only panel where nothing can be set.



- CAMERA - Camera module.
- PROTOCOL - Supported RS485 protocol
- DOME ID - Address of the camera on the RS485 BUS.
- COMM - Settings of the communication protocol used on the RS-485 bus
- VERSION - Product version

Dome

This section contains all general adjustments of the speed dome camera

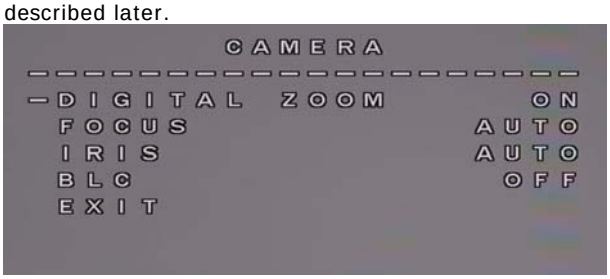


- COMM - Here you set the communication protocol data such as, protocol, bitrate and address. We described this section at the beginning of the manual.
- IR DISPLAY - Here you can set some parameters on the illuminator MODE = IR on, off and automatic
  TESTING TIME = Short time means fast day / night switching, long time safer
  OUTPUT POWER = It is possible to reduce the IR power if the shots are close together
  ILLUMINATION ON - It is the activation threshold of the LEDs on a scale from 0 to 15
  AMBIENT LIGHT - Measure the ambient light in real time when you enter the OSD menu. It is not a settable parameter.
  IR SWITCH ZOOM - This is the zoom level (1 to 10) at which the camera switches from near IR to far IR.
- GUARD TOURS - Here you set the tours, i.e. the automatic movements between different presets. The camera manages 3 tours.
  GUARD TOUR - Select tour 1,2 or 3
  SETTING - For each position of the tour it is possible to define: Preset, Dwell time and speed. Each tour can contain up to 16 locations.
  INIT - restore default tours
  CALL - Starts the selected tour
  DELETE - Clears all presets of the selected tour
- AB SCAN - It means the continuous RIGHT-LEFT movement between 2 limit switch positions.
  PRESET A - Sets the A limit switch
  PRESET B - Sets the B limit switch
  SCAN SPEED - Sets the speed of the scan
  DWELL TIME - Dwell time on each limit switch (2-60 sec.)
- PAN SCAN - This refers to the 360 ° panoramic scan
  PAN SCAN SPEED - Sets the speed of rotation
  INIT - restore default parameters
  CALL - Starts panoramic scan
- PARK ACTION - This section allows you to set the main function that the camera will automatically return to after a certain time of absence of commands from the operator
  PARK MODE - A tour, 360 scan or AB scan can be set as the main action. You can also choose ACTION to recall the last automatic movement previously recalled, or HOME to recall a specific position that you set later.
  PARK TIME - Sets the time of inactivity after which the main action is called.
  SETTING - Here you can set the HOME position which is recalled if the HOME mode has been set above. Position the shot and call Preset 1 to save.
  CALL - Recalls the main action set DELETE - Clears all settings in this section
- PRIVACY ZONE - Not available
- ADVANCED - Here are some additional adjustments
  PWR ON ACTION - You set the action that the camera automatically performs at startup. It can be a scan or a tour, or the main action set in the PARK ACTION section, or you can set MEMORY to recall the last action performed before the power failure.
  RATIO SPEED - Enables automatic speed reduction as zoom is increased
  AUTOFLIP - It must be enabled if during the vertical movement (TILT) you want the camera, having reached the vertical position, to rotate 180

° and continue the movement in the other direction (AUTOFLIP).
WIPER - Not available

Room

This section contains some camera module settings, others are contained in the camera only menu which is described later.



- DIGITAL ZOOM - Enable digital zoom, if available
- FOCUS - Sets the focus to automatic or manual.
- IRIS - Sets the camera iris to automatic or manual.
- BLC - Enables backlight compensation for shooting a dark subject on a light background.

Display

- P AND T - Shows Pan and Tilt angle overlay
- ACTION - Shows the automatic action that the camera is performing
- DOME ID - Shows the camera ID

Reset

There are several types of factory reset

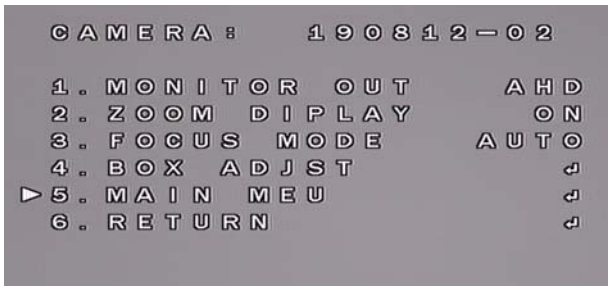
- DOME RESTART - Restarts the camera
- SYS DATA - Restore factory settings
- CAM DATA - Restore factory settings of the camera module
- PRESET - Clear all presets

CAMERA MODULE OSD MENU

Access to the OSD menu of the camera module only

There is a camera module configuration menu that allows you to adjust some advanced video parameters. It is not necessary to use this menu in most applications.
To access you need:
Call up system PRESET 102 twice

ATTENTION - This call works only with RS485 protocol and cannot be used with UTC control on video cables.



HOW TO OPERATE
To move within the OSD menu of the camera module only, do not use the joystick between the v or the navigation arrows. Move with ZOOM + / ZOOM - and modify the values of the individual items with FOCUS + / FOCUS -
The ENTER key is obtained by recalling preset 102 twice. Preset 102 must be recalled twice in each item where the ENTER symbol is present

GENERAL MENU
The initial menu of the camera module allows you to set directly

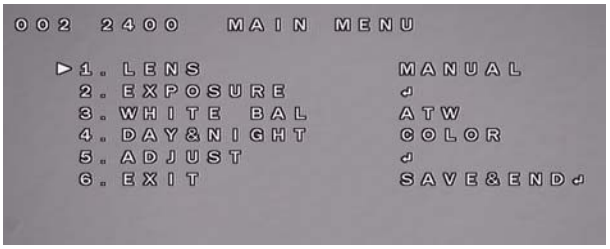
- AHD CVI TVI CVBS video signal
- Zoom value overlay (ON / OFF)
- Focus (Manual / Automatic)

It is also possible to go to BOX ADJUST and MAIN MENU and access these submenus by calling preset 102 twice.

BOX ADJUST
It is possible to go to BOX ADJUST and call preset 102 twice to access. These are internal camera functions that are not recommended to be changed.

MAIN MENU
It is possible to go to MAIN MENU and call preset 102 twice to access. You can control different camera settings.

To exit the camera menu, go to SAVE & END and call preset 102 again twice to exit.



- **LENS**- in this section it is necessary to indicate to the camera which type of lens you are using so that it can control it correctly
  - MANUAL: fixed aperture lens. The camera will use the electronic iris.
  - DC: DC drive autoiris lens.
- **EXPOSURE**- in this section you can set the operation of the electronic diaphragm.
  - SHUTTER: Sets the operation of the electronic iris. It is possible to choose AUTOMATIC (AUTO) and FLK modes whichis the compensation of images that contain small variations invisible to the human eye (neon light, PC screen, TV)
  - BRIGHTNESS: Adjusts the brightness of the image.
  - AGC: Adjusts the gain of the image.
  - DWDR: Wide Dynamic Range Digital - used for shooting areas with different brightness levels. This function allows you to make the dark area visible and the bright one at the same time.
  - BACKLIGHT: Used for shooting backlit subjects against a bright background
- **WHITE BAL**- in this section there are the options for white balance, an important function to make the image always white in any type of lighting. The options are available: ATW (Automatic), AWC→SET (manual). As a rule, the ATW setting is always recommended as the white balance is automatically adjusted as the type of lighting changes. In the MANUAL option you can adjust the white tone manually for shooting in particular lighting conditions.
- **DAY & NIGHT -**allows you to adjust the way in which the switching from color to B / W for night vision takes place. It is possible to set the camera to provide images always in color (COLOR), always in B / W (B / W) or to switch automatically from color to B / W based on the light (AUTO).
- **ADJUST -**in this section the following parameters are set:

- NR: Digital Noise Reduction is a digital video noise reduction function. Thanks to this function, especially useful in low light conditions, the video signal is cleaned of noise and a greater uniformity of colors is obtained. 2DNR and 3DNR are available
- SHARPNESS: Adjusts the image definition
- COLOR GAIN: Adjusts the colors
- LSC: Adjusts shadow effect of the lens
- MIRROR: allows you to flip the image both horizontally and vertically
- DPC: Digital signal control
- LANGUAGE: Change the menu language. It is possible to set Italian, even if in this manual we show the English language.
- FORMAT: It is possible to define the output video format AHD, CVI (CHD), TVI (THD) or CVBS.
- RESOLUTION: It is possible to set the output video resolution of the camera. The maximum value is factory set, but it can be reduced according to your DVR
- FRAMERATE: you can choose between RT (Real Time) and NRT (Non Real Time) for the maximum resolution
- VIDEO OUT: It is possible to choose between European PAL and NTSC US format
- APPLY SET: Closes the menu and saves the settings
- RETURN: Return to the main menu