Wireless peripherals

EYE-02 GSM Security Camera

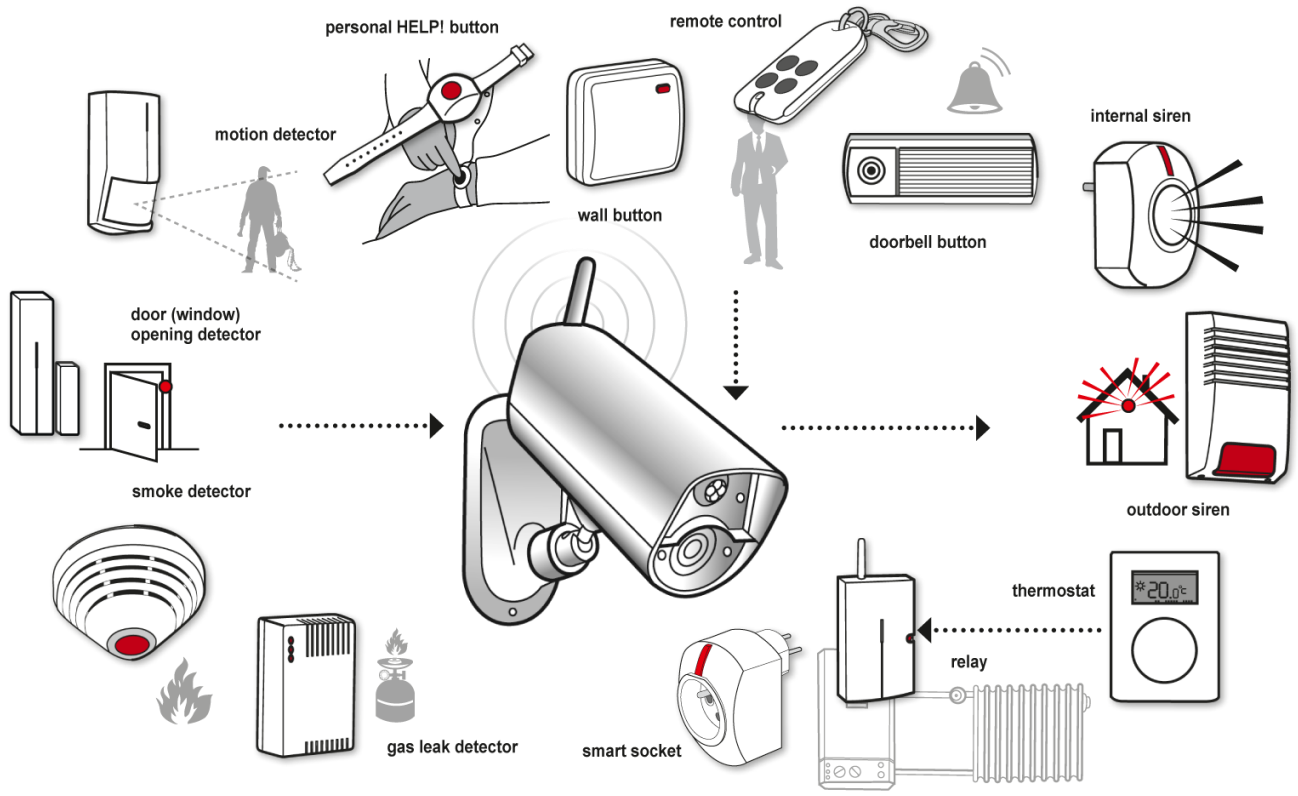
Application note

1 INTRODUCTION

The application note describes possibilities of using camera EYE-02 with wireless peripherals from the OASiS system manufactured by Jablotron Alarms. OASiS system is based on the principle of control panel communicating with wireless peripherals. When the peripherals are used with camera EYE-02, the camera plays the role of the control panel. Camera EYE-02 is equipped with 7 internal detectors and 2 programmable switches. Wireless peripherals further expand camera capabilities.

1.1 Overview of peripherals

Five types of peripherals can be used with the camera: wireless buttons, detectors, sirens, relays and thermostats.



Picture 1: Examples of peripherals used with EYE-02

Up to 20 wireless peripherals can be used with the camera at the same time. Operating range of peripherals is 100m in free space.

Wireless buttons, detectors and sirens are powered by batteries with typical lifetime of at least 2 years. Exact battery lifetime depends on the battery type used and it is mentioned in the manual of each peripheral.

Detectors and sirens communicate with the EYE-02 camera, i.e. they report information about device status. The camera obtains information

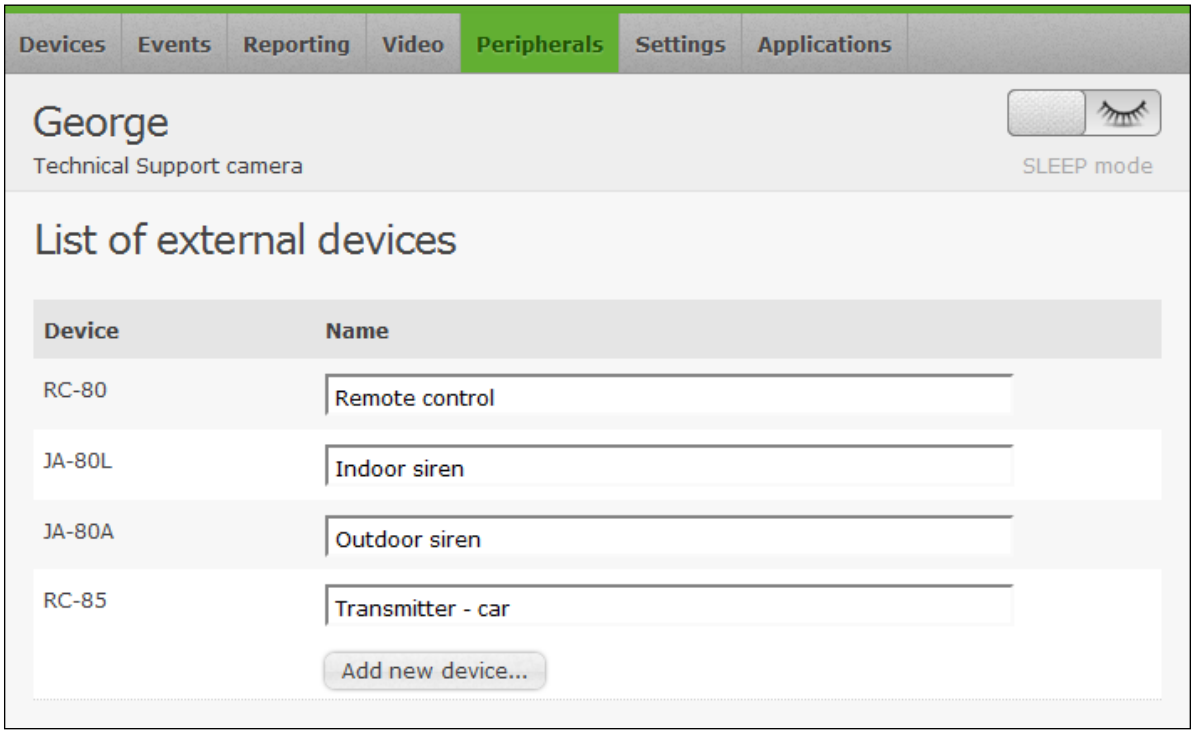
- when camera does not receive regular reports from the peripheral (communication with peripheral is interrupted) or camera starts receiving regular reports from the peripheral again (communication with peripheral is recovered).
- when detector battery is low or there is failure in AC power when detector is powered from the mains.
- when tampering (unauthorized manipulation) into detectors or sirens happened. Information is sent by the peripheral even when the camera is in SLEEP mode. *If you need to replace the battery in the peripheral, switch the camera to CONFIG mode to avoid false alarms.*

1.2 Enrolling peripherals

When you enroll new peripherals you will need to switch the camera into Enroll mode. This is possible by

1. Using wireless remote control RC-80
   - Press simultaneously both buttons in the right column
   - Press button with the symbol "+"
2. Using JabloTool via internet
   - Connect to your camera via www.jablotool.com
   - Go to tab Peripherals
   - Click on Add new device
3. Using JabloTool via USB cable
   - Click on the icon of camera in the list of on-line devices
   - Go to Configuration, External devices and click on Add new device

Exact enrolment procedure is described separately for each category of peripherals. Enrolled wireless devices can be further configured in Jablotool via internet or via USB cable. Wireless devices are described in more detail in user manual of each peripheral on www.jablotron.cz.

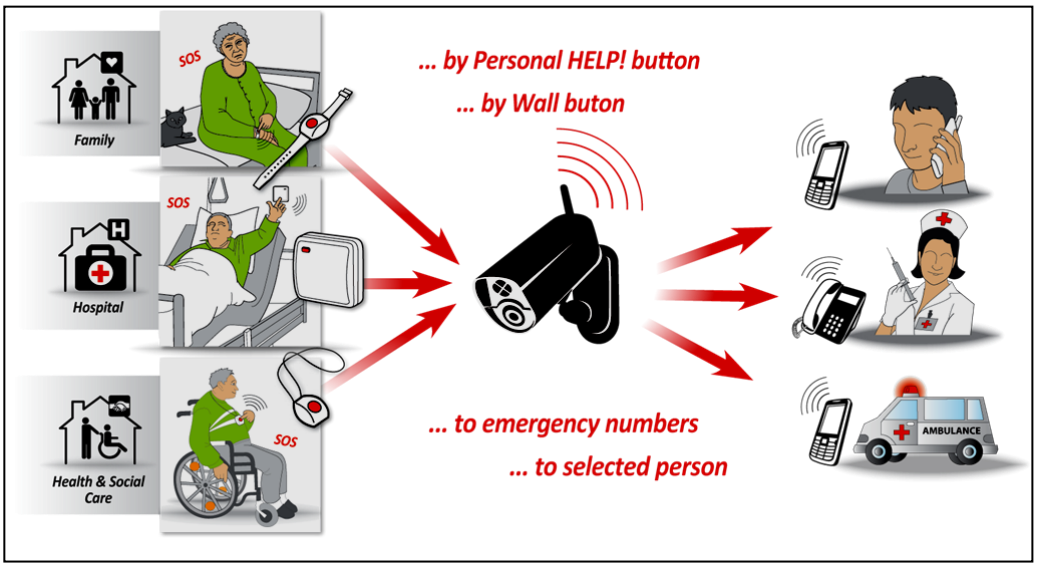


Picture 2: Screenshot from JabloTool via internet, tab Peripherals

2 WIRELESS BUTTONS

Wireless buttons inform the camera and its user when a person presses them.

	**4-button wireless remote control RC-80** Remote control can switch camera into WATCH, SLEEP, CONFIG and ENROL mode. User can also test camera internal detectors. This remote control is delivered with the camera. Additional controls allow more people to operate the camera independently.



Picture 3: Using EYE-02 with wireless buttons RC-87 and RC-88

	**Help! button RC-87** Pushing the button causes Panic alarm even if EYE-02 is in SLEEP mode. Example of use: Elderly people who may be in emergency due to sudden drop in their health condition simply press the panic button and the camera will report the Panic alarm via SMS, MMS, call, email or JabloTool server and contact parents, neighbours or hospital for help.
RC-88  RC-89 	**Wireless wall button RC-88** **Wireless doorbell button RC-89** Pressing the button generates Panic alarm even when EYE-02 is in SLEEP mode. Example of use: The camera is focusing on entrance area in a building. Pressing the doorbell button wakes the camera up. The camera registers this person without generating ALARM and begins to record video of entrance area. The doorbell button RC-89 can be used in combination with indoor siren JA-80L which sounds a melody after the doorbell button is pressed.
	**Wireless transmitter RC-85** It switches the EYE-02 into SLEEP and WATCH mode or generates Panic alarm. Example of use: You have a water pump in remote location and you wish to be informed when the pump is turned on. You set the RC-85 to generate Panic alarm when the electric circuit is closed. The camera will then record video of the reservoir with the water pump and it will also inform you by SMS, MMS, e-mail or by sending information to JabloTool server.

2.1 Enrolling wireless buttons

- Switch the camera into Enroll mode. Go to JabloTool via internet, tab Peripherals and click on Add new device. Other possibilities of switching camera to Enroll mode are described in chapter 1.2.

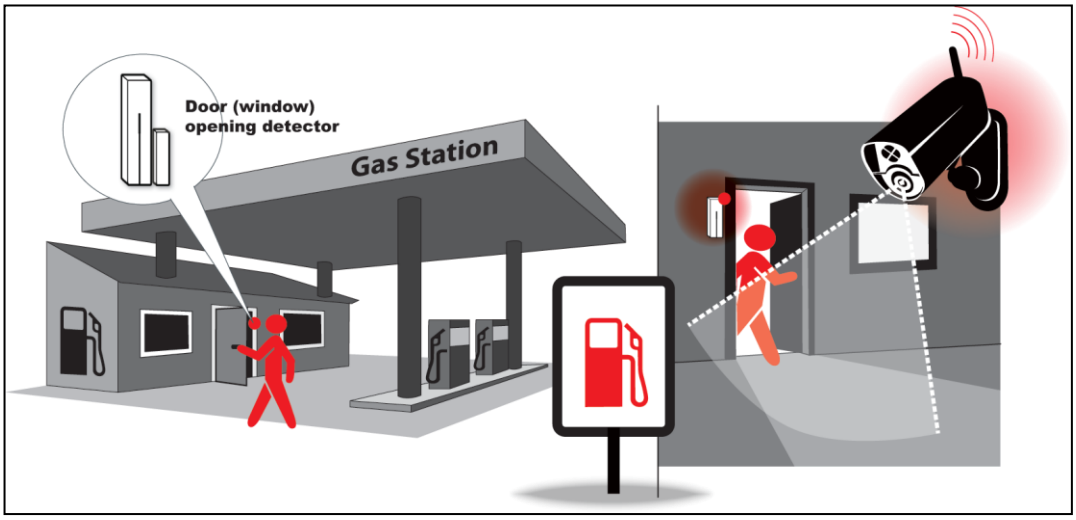
- Press (any) button on wireless buttons: RC-80, RC-85, RC-87 or
- Insert battery into RC-88, RC-89

3 DETECTORS

Detectors expand the area which camera monitors and also enable the camera to report additional events, e.g. Fire alarm generated by Fire and smoke detector.

	**Wireless PIR motion detector JA-80P** Connecting of additional PIR sensors allows extending of the monitored area for spaces that do not need to be monitored visually. External PIR sensors also extend the distance at which the camera can detect motion by passive infrared detection. Example of use: Using detectors JA-80P to monitor motion in big factory hall.
	**Wireless PIR motion/glass-break detector JA-80PB** The detector combines PIR motion detector and dual glass-break detector. This combination makes it suitable for areas accessible through windows. JA-80PB enrols into the camera as two independent detectors. The enrolment procedure is described in the detector manual. It is analogical with enrolment procedure of detector into the Jablotron OASiS control panel.
	**Wireless PIR + MW microwave detector JA-80W** JA-80W is PIR motion detector combined with microwave (MW) motion detector. It is designed to detect human body movement inside buildings. When PIR detector registers movement, the MW detector is activated and confirms activation of the PIR detector. After the confirmation, the detector reports Alarm to the camera. The detector is enrolled as one peripheral into the camera.
	**Wireless dual-zone PIR motion detector JA-86P** The detector is used indoor where you need to detect movement of persons and avoid false alarms triggered by moving domestic animals and pets. Alarm is generated when motion is detected by both PIR sensors.
	**Wireless outdoor PIR detector JA-88P** The detector is used outdoor. It is product of company Optex supplemented by transmitters from the OASiS system. Mask foils supplied with the detector can be applied to adjust the detection area. Detector is protected from dust and flushing water (IP55).
JA-80M  JA-81M 	**Wireless magnetic door detector JA-80M** **Wireless magnetic door detector & universal transmitter JA-81M** **Universal transmitter JA-80D** JA-80M and JA-81M contain a magnetic sensor which is activated when the other magnetic part of detector is moved away, e.g. when a door or a window is opened. Example of use: A user wants to have a list of people who entered a building. Opening the door causes an alarm event and the camera records video for selected time after the door was opened. JA-80M, JA-81M and JA-80D also have terminal point to which an additional detector can be connected by wires. Universal transmitter JA-80D wirelessly indicates status of connected peripheral, typically a detector. Any comercially available external sensor can be used. JA-80D does not have its own magnetic sensor.

JA-80D 	JA-81M is also equipped with wireless transmitter of device status. Example of use: JA-80M or JA-81M is placed on the door to a room. On the floor of the room there is also a step-on sensor (any commercially available) that closes electrical circuit when a person steps on it (normally open sensor). Peripherals then report to the camera that external sensor has been activated. External sensor which disconnects the electrical circuit after its activation (normally closed sensor) can be also used. JA-81M can be used with Shutter-movement detector CT-01 which detects unauthorized movement of external shutters on buildings. It can be also used with flood detector LD-81 that signals flooding of rooms or cellars.
	**Wireless magnetic window and door detector JA-82M** JA-82M is an "invisible" magnetic sensor which can be easily installed on the majority of window and door frames. Its magnetic sensor is activated when the other magnetic part of detector is moved away. Detector then causes Alarm when camera is in WATCH mode. Detector can be enrolled into wireless internal siren JA-80L that will signalize with melody when windows or doors are open.



Picture 4: EYE-02 camera used with Magnetic door (window) opening detector JA-80M

	**Wireless shock and tilt detector JA-82SH** JA-82SH is able to detect vibration and tilt of doors and windows. Example of use: You need to guard a factory hall with high level of noise (e.g. machines running). Glass break detector would not notice the specific sound of breaking glass in the noisy environment. So shock and tilt detector will inform you when someone breaks or opens the window at night.
	**Wireless fire (smoke and temperature) detector JA-80S** JA-80S detects the presence of fire inside a building. It reacts to visible smoke or when a critical temperature in the room is exceeded. It contains a built-in local warning siren. The detector complies with EU Directives 98/34/ES and 98/48/ES stating the obligation to mount fire detectors in new buildings. Please contact the manufacturer Jablotron for more information.
	**Wireless gas leak detector JA-80G** JA-80G is activated by combustive gases or fume leakages. This detector is mains-powered (230V AC) because of higher power consumption. Besides wireless signalling to EYE-02, it also provides a relay switch to shut down an electric gas inlet valve, if installed.

	**Wireless optical barrier JA-80IR** JA-80IR optical barrier indicates breach into a protected area by crossing the infra-red line between the transmitter and the receiver. It is a product of company Optex supplemented with transmitters compatible with OASiS system. The transmitter and receiver are enrolled into the EYE-02 as one device each, together as two devices. There can be up to 60m distance between the units. JA-80IR can well be used in outdoor environment, it is protected from dust and flushing water.
	**Mini-size wireless PIR motion detector JA-85P** JA-85P is a mini-size PIR sensor suitable for protecting small rooms, it can be fit on ceiling.
	**Mini-size wireless glass-break detector JA-85B** JA-85B detects breaking of a window at the distance of up to 9 meters. It uses digital signal processing to avoid false alarms.

3.1 Enrolling detectors

- Switch the camera into Enroll mode. Go to JabloTool via internet, tab Peripherals and click on Add new device. Other possibilities of switching camera to Enroll mode are described in chapter 1.2
- Press (any) button on these detectors: RC-80, RC-85, RC-87, RC-88, RC-89
- Insert battery into these detectors: JA-80D, JA-80IR, JA-80M, JA-80P, JA-80PB, JA-80S, JA-80W, JA-81M, JA-82M, JA-82SH, JA-85B, JA-85P, JA-86P, JA-88P
- Plug the detector JA-80G into the mains.

Detectors should be at least 1 meter away from the camera during enrolment.

4 SIRENS

The primary function of sirens is to inform visually and acoustically about Alarm events.

	**Wireless internal siren JA-80L** JA-80L is a mains-powered (230V AC) siren with multiple functions. It sounds when Alarm in the camera occurs. The sounding can be activated and its length adjusted between 0 seconds and 4 minutes (go to JabloTool, Peripherals, then click on the enrolled JA-80L). The same length of alarm indication applies to the siren JA-80A if it is enrolled in same the camera. The siren confirms intruder alarm to the camera when it is disconnected from power during the time while it sounds an Alarm. Siren can signalize entrance or exit delay with a beep. Entrance and exit delay can be adjusted in JabloTool, tab Settings. Detectors from the group RC-8x and JA-8x can be enrolled into the siren. The siren plays a melody after the detector is triggered. Different melodies can be associated with different detectors. Example of use: Siren plays a melody after a (Doorbell button RC-89) at the entrance is pressed. The siren plays a different melody when that back door at home is open (Door detector JA-80M). The siren sounds Alarm when there is a fire in the kitchen (Fire and smoke detector JA-80S). More detectors can be enrolled at the same time.

Wireless outdoor siren JA-80A

JA-80A is completely wire-free siren in a solid housing. It signalizes intruder alarm acoustically and by red LED lights. The length of sounding in case of an alarm event can be set between 0 seconds and 4 minutes (go to JabloTool, Peripherals, then click on the enrolled JA-80A). If the internal siren JA-80L is also enrolled, it sounds alarm for the same period of time.

The siren is battery powered. Maximum battery lifetime is 3 years.

Opening the cover signalizes Alarm (unauthorized manipulation) to the camera.

LED lights keep flashing for 30 minutes after Alarm.

4.1 Enrolling sirens

Siren should be at least 2 meters away from the camera during enrolment.

4.1.1 Enrolling JA-80L

1. Reset the siren if it has been previously enrolled in another device
   - Unplug the siren from the mains socket.
   - Press and hold the siren button and plug the siren in the mains socket.
   - Keep the button pressed until two beeps are heard which confirms a reset.
2. The indicator keeps flashing after reset (device is in enrolment mode).
3. Send the enrollment signal from the camera.
   - Go to JabloTool via internet, tab Peripherals and click on Add new device, or
   - Go to JabloTool via USB, click on the icon of camera in the list of on-line devices, go to Configuration, External devices and click on Add new device, or
     Note: Do not use remote control to switch the camera in the Enrol mode when siren is in Enroll mode because the remote control would then enroll into the siren.

4.1.2 Enrolling JA-80A

1. Reset the siren by unplugging its battery. Do the reset if another device has been previously enrolled in the siren.
2. Switch the camera into enroll mode. The options are described in the chapter 1.2.
3. Insert battery into the siren.

The siren stops flashing after it is enrolled.

5 SMART SOCKET AND RELAY MODULES

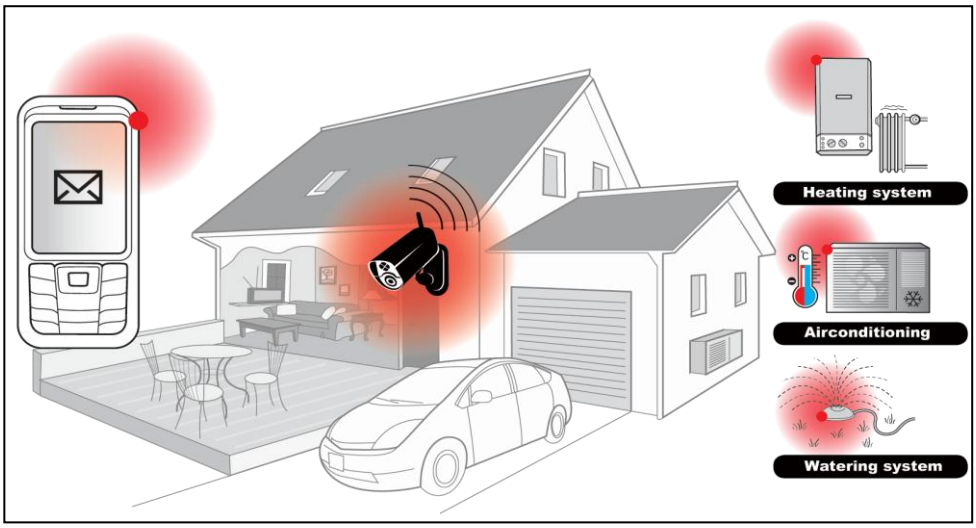
Relay modules make or disconnect electrical contact to the commands by the camera. Relays may have the shape of AC power socket that can be directly plugged into the AC 230V mains or boxes to which wires of electric circuit are attached.

The relays are powered by the mains AC 230V (relays AC-82 and AC-83) or by 12V DC (relays UC-82).

5.1 Using smart socket and relay modules

Camera EYE-02 is equipped with two virtual switches. These switches work as wirelessly sent commands to relays to make or disconnect their contact. The switches can be remotely controlled in JabloTool via internet or via USB cable. They can also be controlled by SMS commands.

When the peripherals are turned ON by the camera they make contact and appliances powered via these peripherals are turned ON. When they are turned OFF they disconnect contact and appliances are turned OFF. Relays can also be set to inverse mode - they disconnect the contact when they are turned ON and vice versa.



Picture 5: Using EYE-02 camera with relays

Example 1: On your cottage you have a watering system with water pump placed in the well. You connect the power supply of the pump via the relay AC-82. Then you remotely turn on the watering in your cottage. You can adjust the time for which you turn on the watering depending on the weather. You can also turn the watering on for unlimited period of time until you remotely turn the watering off.

Example 2: You automatically turn off domestic appliances by switching the camera into WATCH mode when you leave home. You connect the appliances into the mains via the smart socket AC-88. After you return you switch the camera into SLEEP mode and the appliances will turn on again. This minimizes the risk of fire when you are not at home and it reduces consumption of electricity.

Example 3: You leave home for a longer time. Before you return, you would like to have your home heated to comfortable temperature. You will use the relay AC-83 together with thermostat TP-83. You will remotely turn ON the relay. The thermostat will start controlling the relay which will turn on the heating. Your rooms will be heated to predefined temperature before you arrive. If you wish to maintain only minimum economical temperature you switch the relay OFF.

Camera switches can be configured to several modes.

SMS ON/OFF	Switch will turn ON or OFF after pressing a button in JabloTool or after sending an SMS command. *Example of use: Turning ON or OFF heating at home.*
*SMS ON/OFF (*pulse)	Switch turns ON for a specified period of time after which it turns OFF again. The period of time can be specified in SMS command. If no time is specified the Switch will turn OFF automatically after 2 seconds. *Example of use: Switching garden sprinkler ON for 2 hours.*
WATCH (camera switched into WATCH mode)	Switch will turn ON and will remain turned ON as long as camera is in WATCH mode.
Panic alarm (external detector generated Panic alarm),	Switch will turn ON for 120 seconds.
Fire alarm (external detector generated Fire alarm)	Switch will turn ON for 120 seconds.
Alarm (detector generated Alarm)	Switch will turn ON for 120 seconds.
Wake-up (camera was woken up)	Switch will turn ON for the predefined wake-up time. The time can be configured in JabloTool via USB > Configuration, General settings.
AC fault (AC power failed)	Switch will turn ON and remain turned ON until AC power is recovered. *Example of use: Relay UC-82 will turn ON diesel power generator after AC power failure.*
Light ON (camera infrared illumination was turned ON).	Switch will turn ON and remain turned ON as long as camera infrared illumination is turned ON. *Example of use: Smart socket AC-88 will turn ON external infrared illumination after camera activates its internal infrared illumination. This will increase the reach at which pictures can be taken at night.*

Camera switches can be controlled and configured in JabloTool via internet (www.jablotool.com, tab Peripherals), or in JabloTool via USB cable (tab Configuration, External devices). Switches can also be controlled by SMS commands if they are switched to SMS ON/OFF or SMS ON/OFF (pulse) mode. Switches are called Devices in SMS commands.

Example of SMS command: "<Remote Access Password> DeviceX ON" will switch the DeviceX ON)
Example of SMS command: "<Remote Access Password> DeviceX ON 02:00:00" will switch the DeviceX ON for 2 hours.

For more information on SMS commands see the camera manual.

	**Wireless socket AC-88** It is relay made as do-it-yourself solution. You can remotely turn ON and OFF all domestic appliances, lighting, heating, watering, etc. powered by the mains (AC 230V). It can be also used in the inverse mode - it disconnects contact when it is turned ON.
UC-82  AC-82, AC-83 	**Wireless relay output module** UC-82 **Wireless relay output module AC-82** **Wireless relay output module for heating control AC-83** UC-82 and AC-82 have two remotely controllable relay outputs for a wide range of appliances like turning ON/OFF lighting, heating, watering, etc. Relay module AC-83 provides three remotely controllable relays. The module automatically makes contact on all its three relays once in 7 days. This function reduces the amount of sediments in heating system and it cannot be disabled. AC-83 is suitable only for control of heating systems.

5.2 Enrolling smart socket and relay modules

A relay needs to know which camera it should listen to. That is why the camera needs to be enrolled into the relay.

5.2.1 Enrolling AC-88

1. First reset the socket. You can skip this step if no other device is enrolled there.
   - Unplug the socket from the mains and plug it in again. The LED indicator will flash for a short moment.
   - Then press the button on the socket within 10 seconds after plugging in (the LED indicator will flash once) and hold it until the LED indicator starts flashing four times per second.
   - Release the button to enter the reset mode.
   - To perform the reset press the button and hold it again until the LED indicator goes off (approx. 3 seconds)
   - Unplug the socket from the mains
2. Plug the socket into the mains, LED indicator will flash for a short moment.
3. Press the socket button within 10 seconds after plugging in and hold it
   - until the LED indicator flashes once in intervals - the socket enters the Switch ON (normal) mode. The socket will make contact if camera switch is turned ON, or
   - until the LED indicator flashes twice in intervals - the socket enters the Switch OFF (inverse) mode. The socket will disconnect contact if camera switch is turned ON. It will make contact if camera switch is turned OFF.
4. Send the enrolment signal from the camera
   - Go to JabloTool via internet, tab Peripherals and click on Add new device. Other options are described in the chapter 4.1.1., step 3.

Now the smart socket will respond to switching ON or OFF the first camera switch (DeviceX).

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5.2.2 Enrolling AC-82 and UC-82

1. First reset the relay. You can skip this step if no other device is enrolled there.
   - Undo the cover and repeatedly press the button of the first relay (X), achieve the highest number of LED flashes (4, or if not possible, then 3)
   - Press the same button and keep it pressed until all the LEDs flash a couple of times (=reset)

- Repeat the reset procedure with button of the second relay (Y)

2. Enroll the camera into relay X or Y. Repeatedly press the relevant X or Y button until 4 LED lights flash.
3. Send the enrolment signal from the camera
   - Go to JabloTool via internet, tab Peripherals and click on Add new device. Other options are described in the chapter 4.1.1., step 3.

Relay will now respond to wireless instructions of camera switches. If you enrolled the camera into the first relay switch (X), the relay will be controlled by camera switch DeviceX. If you enrolled the camera into second relay switch (Y), the relay will respond to instructions of the camera switch DeviceY.

5.2.3 Enrolling AC-83

1. First reset the relay. You can skip this step if no other device is enrolled there.
   - Undo the cover and repeatedly press the button of the first relay switch (X) to achieve several LED flashes
   - Continuously press the same button and keep pressing it (for approx. 4 seconds) until all the LEDs flash a couple of times (= reset). Then release the button.
   - Repeat the reset procedure with button of the second relay switch (Y)
2. Enroll the camera into the relay X or Y. Use the X or Y button depending on to which relay you want to enroll the camera. Enter enrollment mode of relay (this is indicated by red LED No. 2 or 4 flashing) by pressing its button X or Y.
3. Send the enrollment signal from the camera
   - Go to JabloTool via internet, tab Peripherals and click on Add new device. Other options are described in the chapter 4.1.1., step 3.

6 THERMOSTATS

Thermostats control temperature in heated premises. They control a relay and automatically switch it ON or OFF. If temperature in the room is lower than set temperature, the thermostat sends switches the relay ON. The relay makes contact and the heating turns ON.

Camera can be enrolled into relay where thermostat is enrolled. Camera then works as a central switch. If camera switched the relay OFF, the relay will only make contact when the temperature decreases below the economical temperature. If camera switches the relay ON, the relay will always follow the command from thermostat. To work like this, the relay needs to be enrolled in the camera and thermostat needs to be enrolled in the relay.

Thermostat can be also enrolled directly to the camera. Thermostat will then report to the camera

- when battery in the thermostat is flat
- when temperature decreases below preset level (event Panic Alarm is generated in the camera); this can indicate that heating system has stopped working or there may be danger that heating system will freeze.
- when temperature exceeds 60°C (event Fire Alarm is generated in the camera)

More thermostats can be enrolled into one wireless relay. Heating is then turned ON if at least one thermostat requires this.

Wireless thermostat TP-82
Programmable wireless indoor thermostat TP-83

TP-82 and TP-83 measure and set temperature that should be maintained in a room. Temperature adjustment is performed by turning the setting knob. Thermostats are enrolled into relay modules AC-82, UC-82, AC-83 or wireless socket AC-88. These relays then control the heating according to thermostat commands. The relays can be then also enrolled into the camera so they can be remotely turned ON and OFF by the camera.

TP-83 has a programmable weekly heating schedule. It is capable of recognizing warm-up persistence characteristics (within 2 days) and it will adjust the settings accordingly. You only set at what time you wish to achieve the selected temperature and the thermostat will, within 2 days prior to this moment, adjust the heating so that the set temperature is achieved.

6.1 Enrolling thermostats into relays and enrolling relays into the camera

Relay can be controlled by both thermostat and the camera as described above. Follow these steps.

1. Enroll the thermostat into the controlling relay
   - Reset the relay AC-82, UC-82 (it is described in chapter 5.2.2, step 1) or AC-83 (it is described in the chapter 5.2.3, step 1)
   - Switch the relay into enroll mode
     - AC-82 or UC-82: Repeatedly press the relevant X or Y button of the relay until all 4 LED lights flash
     - AC-83: press the button X or Y, enroll mode is indicated by red LED number 2 or 4 flashing.
   - Insert battery into the thermostat TP-82 or TP-83.
2. Enroll the camera into the controlled relay (it is described in the chapter 5.2.2/5.2.3, steps 2 and 3).

Please note that thermostat cannot be enrolled into a relay where camera is already enrolled.

6.1.1 Enrolling thermostats into EYE-02 camera

1. Switch the camera into Enroll mode (it is described in chapter 1.2)
2. Insert battery into the thermostat TP-82 or TP-83

6.1.2 Enrolling thermostats and camera into wireless socket AC-88

1. First reset the socket. You can skip this step if no other device is enrolled there. The steps are described in the chapter 5.2.1, step 1.
2. Plug the socket into the mains. LED indicator flashes once.
3. Right afterwards, press and hold the button on the socket until the LED indicator flashes once in intervals.
4. Insert battery into the thermostat TP-82 or TP-83
5. Press the socket button to finish the enrollment mode.
6. Unplug the socket from the mains
7. Plug the socket into the mains. LED indicator flashes once.
8. Right afterwards, press and hold the button on the socket until the LED indicator flashes once in intervals.
9. Send enrollment signal from the camera. Go to JabloTool via internet, tab Peripherals, press Add new device. Other options are described in the chapter 4.1.1., step 3.

The wireless socket will now make contact if thermostat gives command to increase the temperature.