

two-way
wireless
system **abax**

WIRELESS SYSTEM CONTROLLER

ACU-100

Program version 1.05

User Manual

Satel  [®]

CE 1471 



IMPORTANT

The controller incorporates electronic components sensitive to electrostatic discharges. Prior to installation, remove the electrostatic discharges and avoid touching the controller board components in the process of installation.

Do not deform the controller antenna, as this may adversely affect the quality of radio communication.

DECLARATION OF CONFORMITY		CE1471!
Product: ACU-100 - Controller of ABAX Wireless System	Manufacturer: SATEL sp. z o.o. ul. Schuberta 79 80-172 Gdańsk, POLAND tel. (+48 58) 320-94-00 fax. (+48 58) 320-94-01	
Product description: The ACU-100 wireless system controller designed for interaction with other elements of the ABAX wireless system. The device operates in the 868.0MHz – 868.6MHz frequency band, and is supplied from a 12V DC source. The controller is intended to be used in burglary and panic alarm systems and can be connected to any type of the alarm control panel.		
This product conforms to the following EU Directives: R&TTE 1999/5/EC		
This product meets requirements of the harmonized standards: R&TTE: ETSI EN 300 220-1: v.1.3.1; ETSI EN 300 220-3: v.1.1.1; EMC: ETSI EN 301 489-1: v.1.5.1.; EN 301 489-3: v.1.4.1 Safety: EN60950-1:2001		
Notified body taking part in conformity evaluation: Identification No.: 1471		
Gdańsk, Poland 2005-07-15	Head of Test Laboratory: Michał Konarski	
The list of countries where the ACU-100 has been approved for use - please see the website www.satel.pl		

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1. GENERAL

The ACU-100 controller allows communication between any alarm control panel and the ABAX system wireless devices. It enables wire-operated security systems to be expanded by addition of wireless devices. The ABAX system is based on two-way communication. All messages sent by the devices are acknowledged, which ensures that the equipment status information will reach the controller and allows online check of the devices for their presence in the system. Configuration of parameters and testing of the wireless devices is performed by radio, without the need to dismantle their housings. Coded communication between the units takes place within the frequency band of 868.0MHz – 868.6MHz.

2. DESCRIPTION OF ACU-100 WIRELESS SYSTEM CONTROLLER

The ACU-100 controller supervises and coordinates operation of up to 48 wireless devices. The status of devices is signaled on the OC type outputs. It can also be transmitted to the control panel through the communication bus.

The controller settings and wireless equipment parameters are programmed by means of an LCD keypad or a PC computer.

2.1 ELECTRONICS BOARD

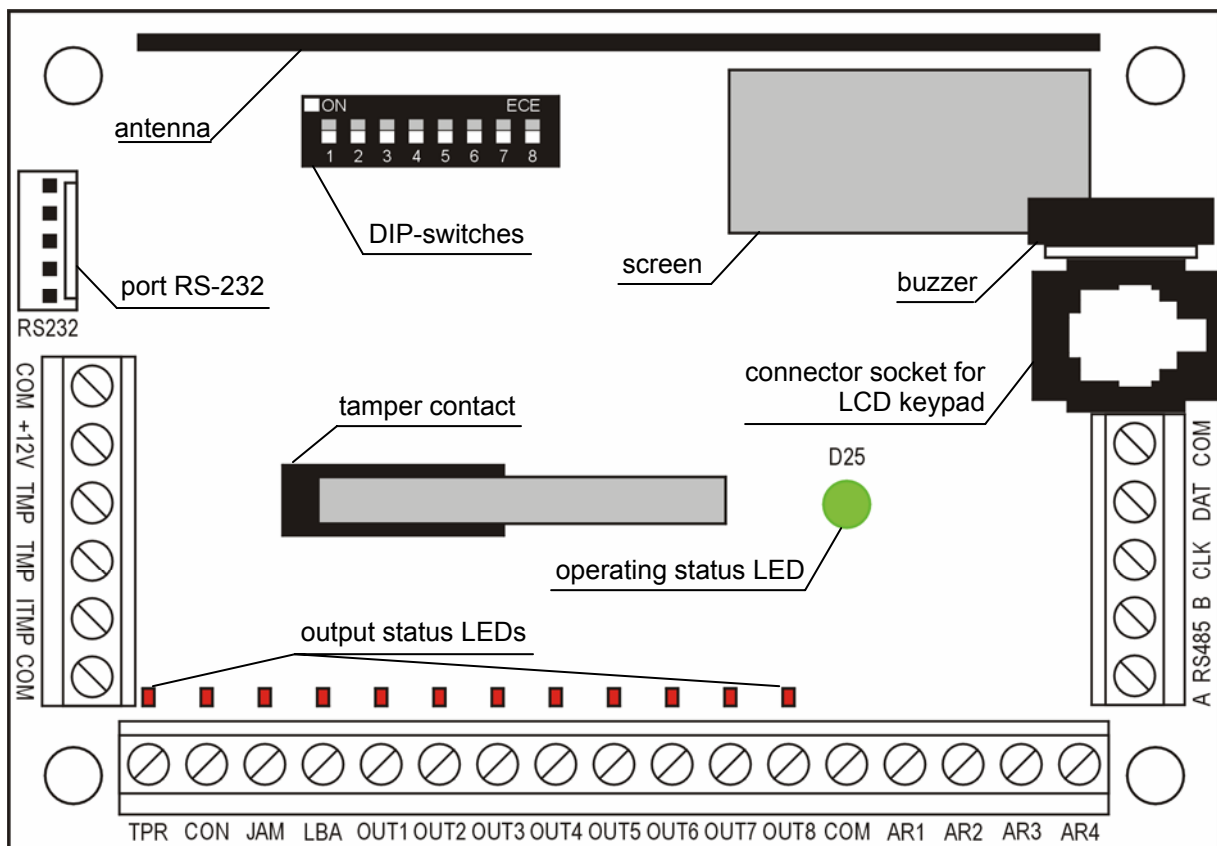


Fig. 1. Schematic view of ACU-100 controller PCB.

Description of terminals:

- COM** - common (ground)
- +12V** - power supply input
- TMP** - controller tamper terminals (NC)
- ITMP** - input for connecting controller tamper circuit
- TPR** - information output - tampers

CON	- information output - no radio communication with wireless device
JAM	- information output - radio jamming
LBA	- information output - problems with wireless device power supply
OUT1...OUT8	- information output - wireless equipment status
AR1...AR4	- control inputs
A RS485 B	- RS-485 port terminals (not used)
CLK, DAT	- communication bus

The tamper contact reacts to of the controller housing being opened. You can use the TMP terminals in two ways:

- connect the terminals to the tamper circuit of the control panel;
- connect one of the TMP terminals to the ITMP tamper circuit input, and the other to the COM ground terminal – information of the controller tamper will be fed to the TPR output and to the communication bus.

Note: *If the TMP terminals are not connected to the controller tamper circuit, the ITMP terminal must be shorted to the common ground.*

The package of DIP-switches on the board is used to set individual addresses of the devices and to configure some working parameters of the controller (see FUNCTIONS OF DIP-SWITCHES).

The LED indicates the controller status. The mode of lighting depends on the controller working configuration:

- interaction with CA-64 or INTEGRA alarm control panels:
 - green steady light – no communication with the control panel;
 - green blinking light – correct communication with the control panel.
- interaction with other alarm control panels:
 - green steady light – normal operation of the controller;
 - green blinking light – synchronization in the process;
 - alternate green and red blinking light – occurrence of one of the problems signaled on functional outputs (see: FUNCTIONAL OUTPUTS).

The buzzer informs of occurrence of one of the problems signaled on functional outputs (it does not apply to the controller interfacing with the INTEGRA series alarm control panels).

The RS-232 port with optoisolation enables a PC computer with DLOAD10 program to be connected for the time of programming.

The RJ-11 socket is used to connect an LCD keypad for the time of programming. The controller interfaces with LCD keypads for operating the CA-64 or INTEGRA series control panels.

Notes:

- *The controller cannot be simultaneously programmed by means of computer and LCD keypad.*
- *When working with the INTEGRA alarm control panels, the controller can be programmed by means of the control panel, with no need for connecting the keypad or computer to the controller sockets.*

The communication bus (CLK, DAT) of the controller enables direct connection to the control panel communication bus (INTEGRA, CA-64, CA-10) or expansion of the system by adding the ACX-100 input/output expansion modules.

2.2 FUNCTIONS OF DIP-SWITCHES

Controller function	DIP-switch number							
	1	2	3	4	5	6	7	8
Wireless device module for all control panels	I ₁	I ₂	I ₃	x	P	0	0	0
Expander for CA-10 with 1 keypad (6 zones)	A	B	C	D	P	1	0	0
Expander for CA-10 with 2 keypads (4 zones)	A	B	C	D	P	0	1	0
Expander for CA-10 with 3 keypads– (2 zones)	A	B	C	D	P	1	1	0
Addressable zone expander for CA-64	A ₁	A ₂	A ₃	A ₄	A ₅	P	0	1
Wireless device expander for INTEGRA control panels	A ₁	A ₂	A ₃	A ₄	A ₅	x	1	1

Table 1. The way of using DIP-switches for controller configuration.

0 – DIP-switch in OFF position

1 – DIP-switch in ON position

P – selection of controller programming mode:

- DIP-switch in OFF position – through RS-232 port (DLOAD10 program)
- DIP-switch in ON position – by means of LCD keypad

I₁, I₂, I₃ – DIP-switches for setting the number of ACX-100 modules connected to the computer. To determine this number, tot up the values set on individual DIP-switches as per Table 2.

DIP-switch number	1	2	3
Numerical value (for switch in ON position)	1	2	4

Table 2.

The controller accepts up to 5 input/output expansion modules, hence if a higher value is set on the DIP-switches, it will be also recognized as 5.

A, B, C, D – DIP-switches for setting the controller address in the same way as with the CA-10 zone expanders. When in the ON position, the switch value is 1.

A₁, A₂, A₃, A₄, A₅ - DIP-switches for setting the controller address. In order to determine the controller address, add up the values set on individual DIP-switches as per Table 3.

DIP-switch number	1	2	3	4	5
Numerical value (for switch in ON position)	1	2	4	8	16

Table 3.

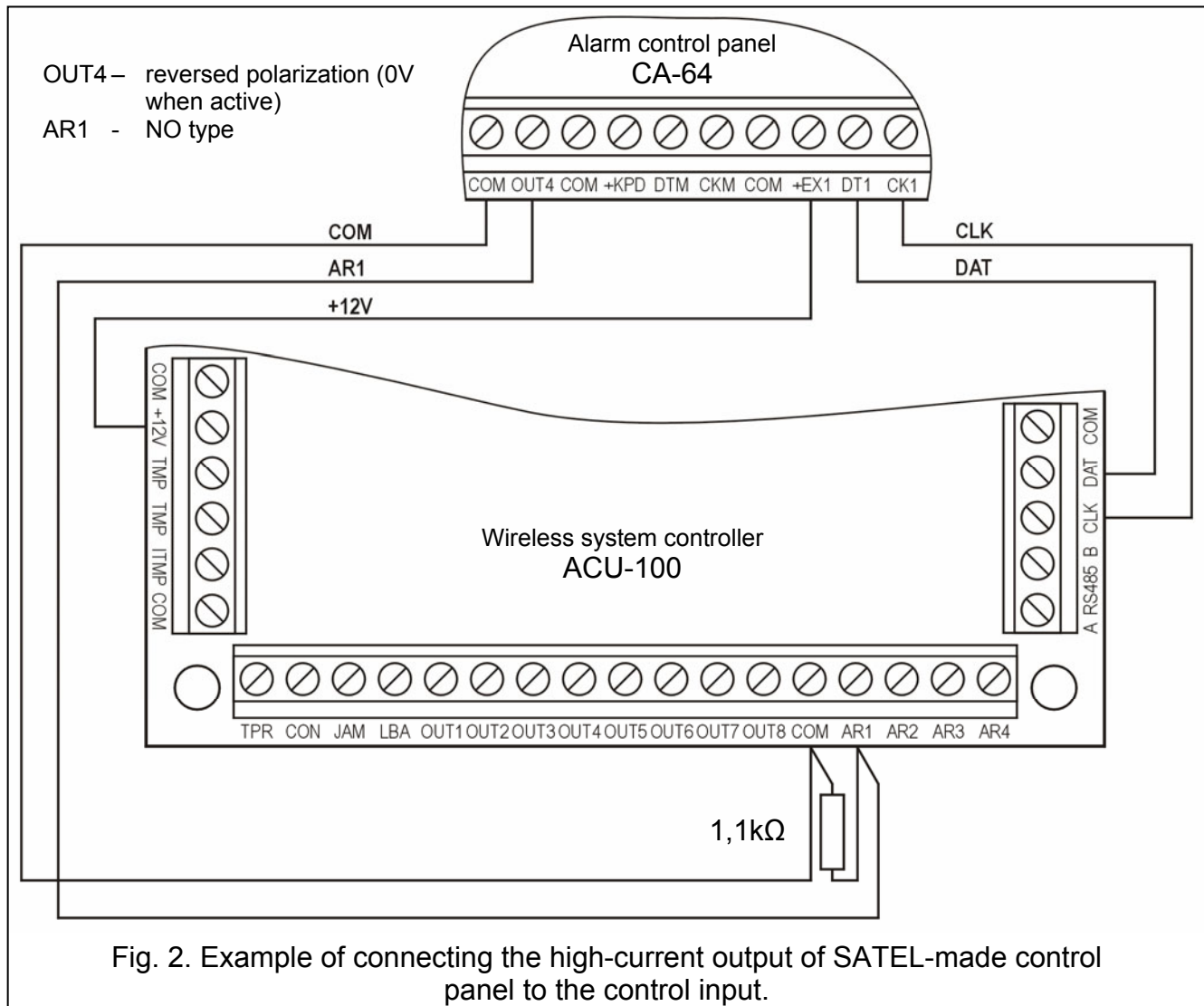
x - unused DIP-switch

2.3 CONTROL INPUTS

The ACU-100 PCB incorporates 4 control inputs. These inputs make it possible to control operation of wireless equipment (detectors, sirens). How the device will respond to activation of the input (shorting to common ground / opening connection) depends on the type of the device controlled by the input (e.g. the detectors will change to active status, the sirens will trigger alarm signal, the 230V AC wireless controllers will turn on electrical equipment connected to their sockets, etc.). The control inputs are disabled when the controller operates with the INTEGRA control panels.

The controller inputs can be programmed as NO (normally open) or NC (normally shorted to ground).

In order to control the ACU-100 controller inputs you can use any alarm control panel outputs (OC, high-current, low-current, relay type). Where the control is effected by means of the high-current output of a SATEL-made control panel, it is necessary to connect a 1.1k Ω resistor to the controller input (see Fig. 2).



The control panel outputs which are to control the ACU-100 controller inputs should be properly configured (their type, polarization, cutoff time, etc.).

To control operation of the wireless detectors, the control panel output can be programmed e.g. as the ARM STATUS. Arming in the control panel will activate the detectors, while disarming will deactivate them. It should be remembered that activation/deactivation of the detectors is delayed in relation to arming/disarming (see: WIRELESS DETECTORS IN ABAX SYSTEM).

By having programmed the exit time in the control panel, you can avoid delay in activating the detectors in relation to arming. The output programmed as the ARM STATUS will only get active after expiry of the exit time. However, some control panels allow you to choose another function, which activates the output immediately after arming command is given to the control panel. For example, the output can be programmed in the CA-10 as type 35: POWER SUPPLY ON ARMED MODE, and in the CA-64 as type 42: POWER SUPPLY IN ARMED STATE. The delay effect in activating the detectors as against the arming can only be avoided when the exit time exceeds the RESPONSE PERIOD.

The control input of the controller can also be programmed as always active. When this option is chosen, the detectors will remain permanently in active state.

In order to control the operation of sirens, you should connect the control panel alarm signaling output to the controller input. Activating the control panel output will trigger the siren.

You can increase the number of inputs by adding the ACX-100 expansion modules to the controller. The maximum number of inputs can be 24 (controller + 5 ACX-100 modules). The number of inputs can only be increased when the controller does not connect to the control panel by means of communication bus.

2.4 OUTPUTS

The PCB of the ACU-100 controller incorporates eight OC type outputs, to which wireless devices are assigned (by default, each newly added device is assigned to output 1). Any number of wireless devices can be assigned to one output. The output activates after receiving suitable information from a wireless device assigned to it, the information depending on the device type:

- the wireless detectors signal violations;
- the ASP-105 siren inform of a discharged battery and a failure of +12V DC external power supply.
- the ASP-205 sirens inform of battery discharge;
- the ACX-200 expanders signal zone violation;
- the ASW-100 E and ASW-100 F controllers inform that the button was depressed in Mode 0 or the electric circuit was closed in Mode 1 and 2.

The outputs can be programmed as NO (normally open) or NC (normally shorted to ground). All the outputs (of the controller and the ACX-100 modules connected to it) are being programmed at the same time. Depending on how the outputs have been programmed, activation of the output is indicated as follows:

- LED assigned to the output comes ON (outputs programmed as the NO type);
- LED assigned to the output comes OFF (outputs programmed as the NC type).

The outputs can be connected to the control panel zones. It does not apply to controllers configured for operation with the CA-64 / INTEGRA alarm control panels.

The number of outputs can be increased by connecting the ACX-100 expansion modules to the controller. The maximum number of outputs 48 (controller + 5 ACX-100 modules). The number of outputs can only be increased when the controller does not connect to the control panel by means of communication bus.

2.5 FUNCTIONAL OUTPUTS

The ACU-100 controller PCB incorporates four OC type outputs to signal:

TPR - wireless device tampers, lack of communication with ACX-100 modules, and also controller tampers (provided the TMP terminals are connected to the controller tamper circuit);

CON - lack of communication with wireless devices;

JAM - jamming the radio signal for the ABAX system to the degree which makes communication impossible;

LBA - problems with power supply of a wireless device: low battery, discharged storage battery, or loss of external power supply.

Depending on how the outputs have been programmed (see OUTPUTS), activation of the functional output is indicated as follows:

- LED assigned to the output comes ON (outputs programmed as the NO type);
- LED assigned to the output comes OFF (outputs programmed as the NC type).

The functional outputs may be connected to suitably programmed zones of the control panel (zone type, way of reaction, etc.). Thus the control panel will inform of any problem indicated by the controller functional output. Having obtained information on the occurrence of a problem, it can be thoroughly diagnosed by means of an LCD keypad or a computer connected to the controller.

If the controller operates in conjunction with the CA-64 control panel, connecting the TPR output is unnecessary, because information on tampers of wireless devices is transmitted through the communication bus.

Where the controller operates together with the INTEGRA series alarm control panels, the functional outputs need not be connected. In this configuration all problem-related information is sent to the control panel through the communication bus.

3. WIRELESS DEVICES INTERFACING WITH THE CONTROLLER

3.1 ACX-100 INPUT & OUTPUT EXPANSION MODULE

- 4 control inputs
- 8 outputs, OC type
- communication bus
- tamper contact
- power supply: direct voltage 12V ($\pm 15\%$)

3.2 ACX-200 HARDWIRED ZONE & OUTPUT EXPANDER

- 4 zones
- 4 relay outputs
- tamper contact
- power supply: direct voltage 12V ($\pm 15\%$)

3.3 APD-100 WIRELESS PASSIVE INFRARED DETECTOR

- digitally processed signal from pyroelement
- high resistance to interference
- adjustable detection sensitivity
- remote configuration of parameters
- changeable Fresnel lenses
- tamper contact
- power supply: lithium battery, CR123A 3V

3.4 AMD-100 WIRELESS MAGNETIC DETECTOR WITH ADDITIONAL INPUT

- two reed switches
- input to connect any outdoor detector of NC type
- remote configuration of parameters
- tamper contact
- power supply: lithium battery, CR123A 3V

3.5 AMD-101 WIRELESS MAGNETIC DETECTOR WITH ADDITIONAL INDEPENDENT INPUT

- two reed switches
- individually identifiable input to connect any outdoor detector of NC type
- remote configuration of parameters
- tamper contact
- power supply: lithium battery, CR123A 3V

3.6 ASP-105 WIRELESS OUTDOOR SIREN

- optical and acoustic signaling, triggered independently by radio
- acoustic signaling: piezoelectric transducer
- remote configuration of acoustic signaling (selection of one of four acoustic signals and duration of signaling)
- optical signaling: xenon (flash) lamp
- tamper contact
- power supply: direct voltage 12V ($\pm 15\%$)
- emergency power supply: 6V 1.2Ah battery

3.7 ASP-205 WIRELESS INDOOR SIREN

- acoustic signaling: piezoelectric transducer
- optical signaling: LED indicators
- remote configuration of 2 signaling modes (acoustic signaling duration, switching acoustic signaling ON / OFF, selecting one of 3 sound signals, switching optical signaling ON / OFF)
- tamper contact
- power supply: lithium battery CR123A 3V

3.8 ASW-100 E 230V AC WIRELESS CONTROLLER

- remote switch ON / switch OFF of devices to be connected to 230V sockets
- type of controller socket: E
- button for manual control of 230V electric circuit
- LED indicator of controller status
- power supply: 230V AC

3.9 ASW-100 F 230V AC WIRELESS CONTROLLER

- remote switch ON / OFF of devices to be connected to 230V sockets
- type of controller socket: F
- button for manual control of 230V electric circuit
- LED indicator of controller status
- power supply: 230V AC

3.10 ARF-100 RADIO SIGNAL LEVEL TESTER

- checking the level of radio signal received by controller from tester, or by tester from controller

- simulating radio communication of devices to be supplied from battery or external sources
- LED indicator showing the radio signal level
- buzzer
- power supply: alkaline battery 9V 6LR61

4. INSTALLATION



The ABAX two-way wireless system should be installed so as to ensure a suitable level of radio signal from devices working together with the controller. This will allow the communication problems to be avoided.

All electrical connections may only be made with power supply disconnected.

Before proceeding to the system installation you should plan the arrangement of all the devices. The installation place for the controller should be chosen so that all devices to be supervised by it are within its range. It is recommended that the controller and the wireless devices be mounted at a high position, which will enable a better range of radio communication to be reached, while avoiding a risk of incidental masking of the controller and devices by people moving around the facility.

Before permanently mounting the system components, you should check the level of signal received by the controller from individual devices. If the signal level from a particular unit is too low (less than 40%), a change of the device position will be necessary. At times, it is sufficient to move the device some ten to twenty centimeters to get a significant improvement of the signal quality. Having reached the optimal level of radio signal from all devices, you can proceed to permanently mounting them in position.

The ABAX system radio communication has been designed so as to enable several ACU-100 controllers to work within each other's range. Synchronization with the wireless systems already in use is always performed when the controller is switched on, and after each operation of addition/removal of supported devices. The synchronization is performed automatically. The number of wireless devices already working within the range of each other depends on the RESPONSE PERIOD (see DESCRIPTION OF FUNCTIONS, OPTIONS AND COMMANDS) and can vary from 150 to 450. The higher the response frequency, the lower the number of devices that can work within each other's range.

4.1 INSTALLATION OF ACU-100 WIRELESS SYSTEM CONTROLLER

The ACU-100 controller should be installed indoors, in spaces with normal air humidity. Its electronics board is mounted in the **OPU-1 A** plastic housing. Before fastening the controller to the wall, make inlets/outlets in the rear wall of the housing for cables to connect the controller to the control panel or ACX-100 expansion modules.

Caution: *The cables should not be laid in the close vicinity of the antenna, as this may cause radio communication interference.*

If the controller is not used together with the INTEGRA series control panels, it requires the LCD or computer to be connected for registration of the wireless devices and software. Such connections are temporary, for the time of programming or diagnostics.

4.2 CONNECTING LCD KEYPAD TO THE CONTROLLER

If the ACU-100 controller is to be programmed by means of LCD keypad, the keypad must be connected to the RJ-11 socket with four-wire cable. Connection of the keypad communication bus to the RJ-11 socket is shown in Fig. 3.

Address of the keypad to be connected to the ACU-100 controller must be set as 0.

If properly connected, the keypad will display a message, the upper line of which will include the device name and program version info. If the TROUBLE LED goes on in the keypad, one of the functional outputs is active. In order to start the service mode, the service code must be entered. The service mode is indicated by lighting of the SERVICE LED.

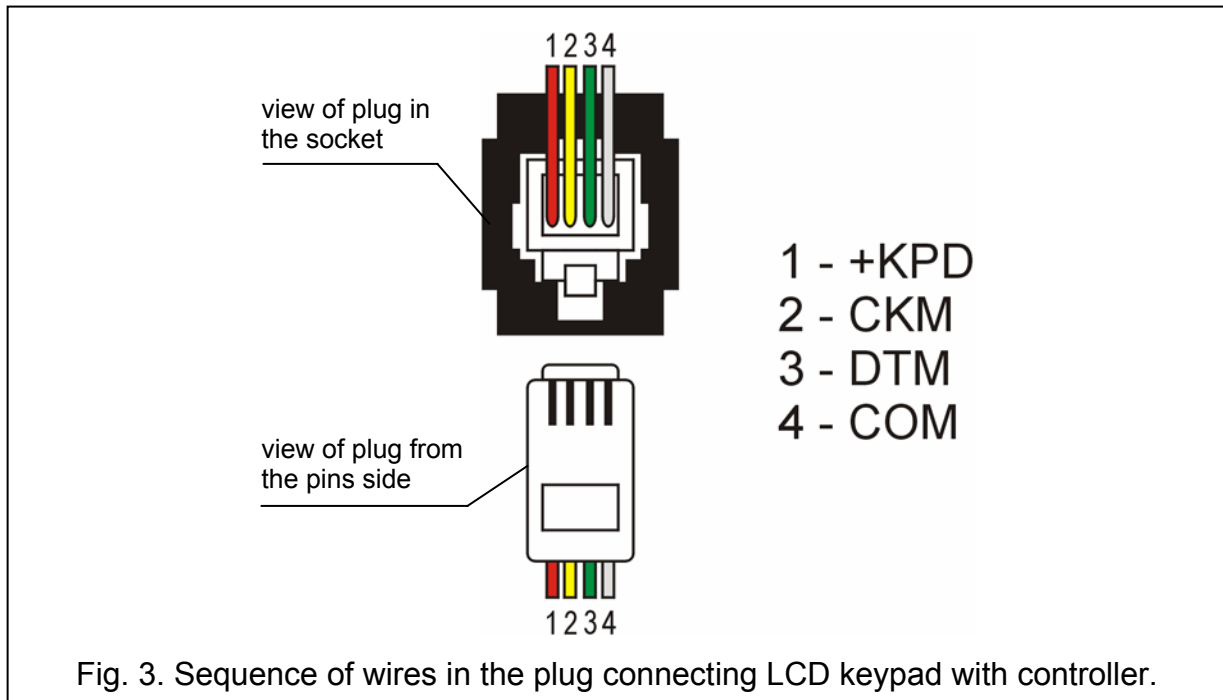


Fig. 3. Sequence of wires in the plug connecting LCD keypad with controller.

If the a.m. message fails to appear on the display after connection, you should:

- check that the option of programming by means of LCD keypad has been selected on the controller DIP-switches;
- check that the cables connecting the keypad with controller have been properly connected;
- check that address 0 has been set in the LCD keypad.

In order to check the keypad address and, if necessary, to change it:

1. Disconnect the +KPD keypad power supply and the data bus cables (CKM, DTM).
2. Short the CKM, DTM keypad terminals.
3. Connect the keypad power supply.
4. The keypad address will be displayed:

```

This LCD address
(n, 0-7): _
  
```

n=0...7, current address of the keypad

Fig. 4. Programming the keypad address

5. Change the address to 0, if necessary. The keypad will acknowledge performance of the function with four short and one long beeps.
6. Connect the keypad to the ACU-100 controller as required (CKM, DTM).

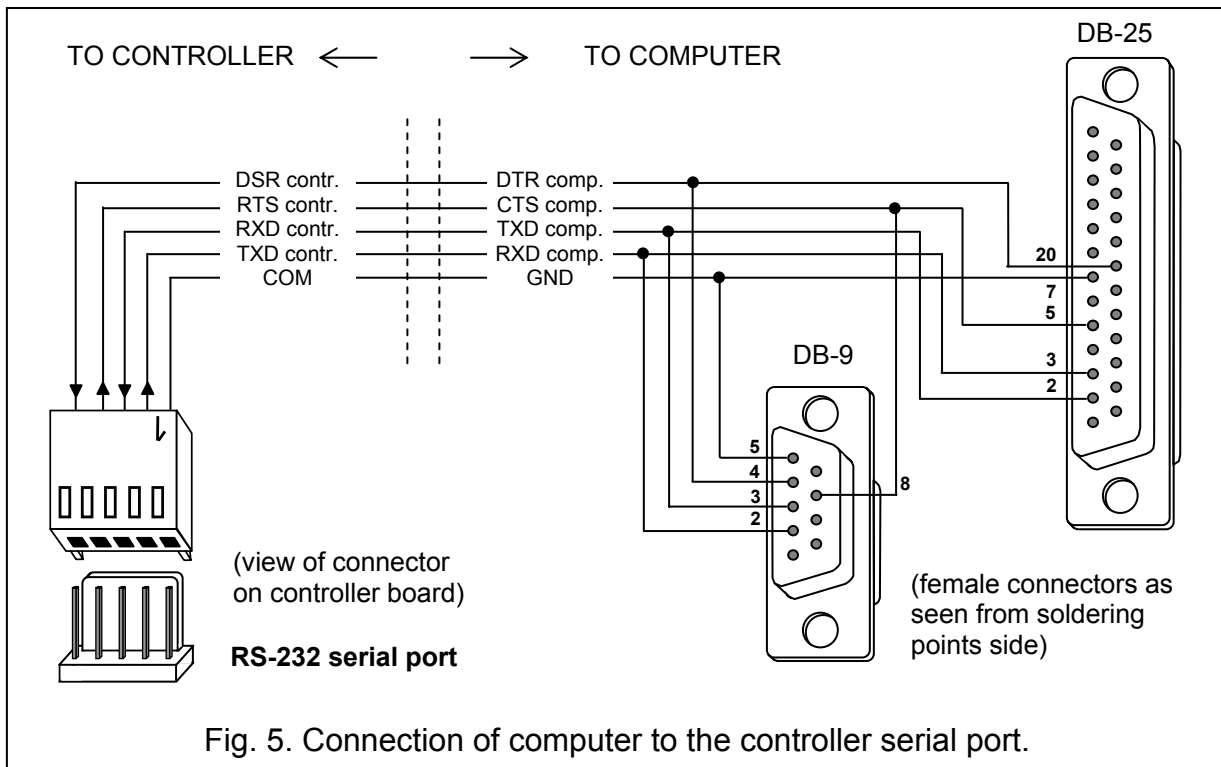
4.3 CONNECTING COMPUTER TO THE CONTROLLER

If the ACU-100 controller is to be programmed by means of a computer, the computer must be connected to the RS-232 port.

Notes:

- Do not short or touch the RS-232 port with your fingers.

- Prior to connecting the cable, remove preliminarily the electrostatic charge, e.g. by touching a grounded piece of equipment (faucet, heater, etc.) with top of your palm.
- It is recommended that the cable be first connected to the controller port.



If the DLOAD10 program fails to communicate with the computer after connection of the RS-232 port, you should:

- check that the option of programming by means of RS-232 port has been selected on the controller DIP-switches;
- check that the port through which the computer communicates with the controller has been properly selected in the DLOAD10 program;
- check that the cables connecting the computer with controller have been properly connected.

4.4 CONNECTING THE ACX-100 INPUT & OUTPUT EXPANSION MODULES

The ACU-100 controller communication bus can accept up to five ACX-100 input & output expansion modules. **The modules can only be connected when the controller is configured as a wireless device module interfacing with any alarm control panel.**

The ACX-100 expansion modules should be connected to the controller bus in parallel. The connection can be made with a typical unscreened cable, as used in the security systems (e.g. DY8x0,5). When connecting the modules, remember to set the correct number of ACX-100 modules connected to the controller on the controller DIP-switches. Lack of communication with the module will be signaled on the TPR output as tamper.

Each module connected to the bus must have a different address set from the range 0 to 4. These addresses must correspond to the number of a next module, as shown in Table 4. If one ACX-100 module is connected to the controller, it must have address 0 set, if two, one of them must have address 0 set, and the other address 1, etc.

The numeration of control inputs and outputs of the expansion module in the system depends on the address set in it, i.e. on the module number. The numbers of control inputs and outputs in consecutive expansion modules are shown in Table 4.

Consecutive module number	Module address	Control input numbers	Output numbers
1	0	5-8	9-16
2	1	9-12	17-24
3	2	13-16	25-32
4	3	17-20	33-40
5	4	21-24	41-48

Table 4.

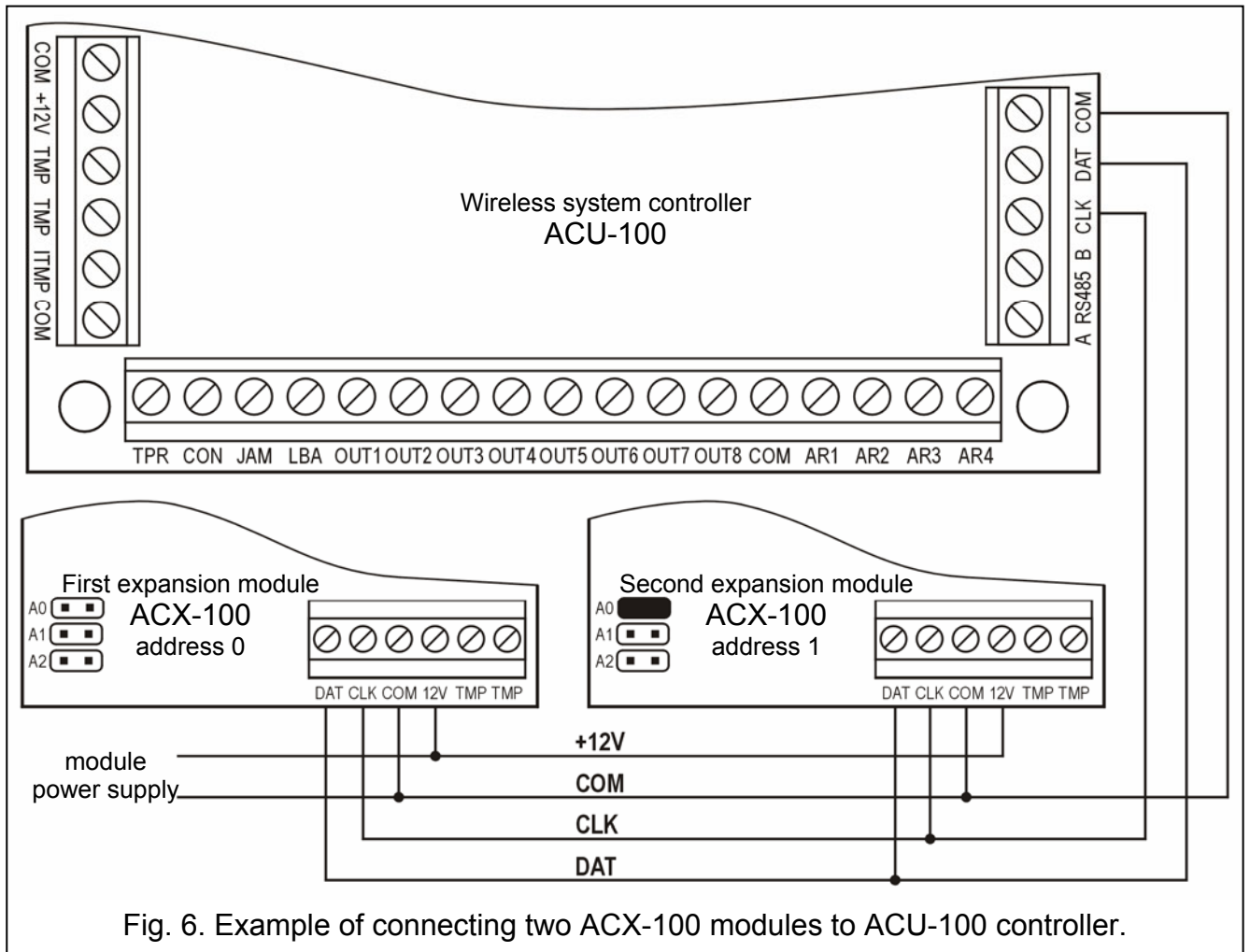


Fig. 6. Example of connecting two ACX-100 modules to ACU-100 controller.

The module TMP terminals must be connected to the control panel tamper circuit.

4.5 ADDING NEW WIRELESS DEVICES

4.5.1 DLOAD10 and DLOADX programs

In order to add a new wireless device to the system, do the following:

1. Press the NEW DEVICE button in the program.
2. A window will appear, in which you should enter the 7-digit serial number of the device being added. The serial number can be found on the electronics board or on the housing. Each ARF-100 tester has the serial number 0000500.
3. Depending on which device is to be added to the system:
 - turn on power supply of the ACX-200 expander – immediately after start-up (power-up), the expander will send a single signal to enable registration,

- turn on the ARF-100 tester – immediately after start-up, the tester will send a single signal to enable registration,
- plug the ASW-100 E / ASW-100 F wireless controller into the 230V socket – immediately after being plugged into the socket, the controller will send a single signal to enable registration,
- violate (open) the tamper contact in case of the other devices.

If an invalid serial number has been entered, you will be informed of it by a suitable message. Then you should enter the correct serial number and repeat the above mentioned step.

4. A confirmation message will be displayed that a new device has been added. Click your mouse on the „OK” button to finish the procedure of new device addition. You can cancel addition of the new device by pressing the „Abort” button. You can also add a next wireless device by pressing the „Next” button.

Note: *If the ACU-100 controller is configured for operation as the expander with the CA-64 or INTEGRA control panels, the procedure of adding new wireless devices to the system must be followed by the procedure of expander identification in the control panel.*

4.5.2 LCD keypad connected to the controller

In order to add a new wireless device to the system, do the following:

1. Start the NEW DEVICE function.
2. Enter the 7-digit serial number of the device to be added and press the [#] key. The serial number can be found on the electronics board or on the housing. Each radio signal level tester has the serial number 0000500.
3. Depending on which device is to be added to the system:
 - turn on power supply of the ACX-200 expander – immediately after start-up (power-up), the expander will send a single signal to enable registration,
 - turn on the ARF-100 tester – immediately after start-up, the tester will send a single signal to enable registration,
 - plug the ASW-100 E / ASW-100 F wireless controller into the 230V socket – immediately after being plugged into the socket, the controller will send a single signal to enable registration,
 - violate (open) the tamper contact in case of the other devices.

If the entered serial number is different from that of the device being added, or a device with this number has already been registered, a message with suitable information will be displayed, followed by the automatic return to the main menu.

4. A message will confirm addition of the new device with the serial number shown on the display. Press the [#] key to finish the procedure of adding the new device. You can cancel the new device addition by pressing the [*] key.

4.5.3 LCD keypad of INTEGRA alarm system

In order to add a new wireless device to the system, do the following:

1. Start the function NEW DEVICE (→SERVICE MODE →STRUCTURE →HARDWARE →EXPANDERS →SETTINGS →*controller name* →NEW DEVICE)
2. Enter the 7-digit serial number of the device and press the [#] key. The serial number can be found on the electronics board or on the housing. Each radio signal level tester has the serial number 0000500.

If a device with the entered serial number is already registered in the system, the keypad will signal it by 3 long beeps and will fail to proceed to the next step of the procedure.

3. After the „Open device tamper” is displayed:
 - turn on power supply of the ACX-200 expander – immediately after start-up (power-up), the expander will send a single signal to enable registration,
 - turn on the ARF-100 tester – immediately after start-up, the tester will send a single signal to enable registration,
 - plug the ASW-100 E / ASW-100 F wireless controller into the 230V socket – immediately after being plugged into the socket, the controller will send a single signal to enable registration,
 - violate (open) the tamper contact in case of the other devices.

If the serial number of the device to be added is different from the one previously entered, a suitable information message will be displayed. Press the [*] key and then start the procedure of device addition from the beginning.

4. The new device name and serial number will be displayed. Press the key 1 to proceed to the next step of the procedure (press any other key to terminate the procedure of adding a new device).
5. A list of system zones which can be assigned to the device will be displayed. Select one of them (use the ▼ and ▲ keys to scroll the list) and press the [#] key (press the [*] key to terminate the procedure of new device addition). If the device takes up more than one zone in the system (e.g. AMD-101 magnetic detector, ASP-105 siren, or ACX-200 expander), additional zones will be automatically assigned to it (subsequent in order to the indicated one). The zone(s) will be given a name consisting of the device name and serial number. If the device takes up outputs in the system, they will be given a name consisting of the name and serial number of the device, too.
6. Automatic identification of the expanders will be carried out (and a suitable information message will be displayed).

4.6 REMOVAL OF WIRELESS DEVICES

4.6.1 DLOAD10 and DLOADX programs

In order to remove a wireless device from the system by means of the LCD keypad you should:

1. Start the REMOVE DEVICE function.
2. Select from the list the device to be removed from the system and press [#].
3. Following the displayed instruction, press the key with digit 1, to remove the device. Removal of the device will be acknowledged by the keypad with four short and one long beeps.

Note: *Pressing any key instead of the key [1] will take you back to the selection list of wireless devices.*

4.6.2 LCD keypad

In order to remove a wireless device from the system by means of the DLOAD10 or DLOADX programs do the following:

1. Click on the device you want to be removed.
2. Press the "Remove device" button.
3. Following the displayed instruction, press the "Yes" button to confirm your intention to remove the device. The device will be removed.

Note: *If the ACU-100 controller is configured for operation of the expander with CA-64 or INTEGRA control panels, a new identification of expanders must be carried out after completion of the procedure of removal of a new wireless device from the system.*

4.7 HARDWIRED ZONE / OUTPUT EXPANDER IN ABAX SYSTEM

The ACX-200 expander takes up 4 positions on the list of devices supported by the controller. Up to 12 ACX-200 expanders can work together with the ACU-100 controller. The expander sends to the controller information on the status of zones and receives commands to change the status of relay outputs. The transmission of zone status information as well as the output control are performed in real time mode. Only the information on expander zone settings is sent during the response period. When polling, the controller will send information to the expander, regarding configuration of one zone. This means that 4 response periods are needed to send information on the settings of 4 zones. Consequently, even more than 2 minutes can elapse from the moment the new settings are programmed to the moment they are actually saved in the expander (if the response period is 36 seconds). The settings of expander zones are stored in non-volatile memory, hence the loss of power supply will not mean any loss of preprogrammed settings.

Note: *If the communication with the ACU-100 controller is lost, all of the previously activated outputs will enter the inactive state after 20 response periods.*

In order to install the ACX-200 hardwired zone/output expander in the system, do as follows:

1. Open the housing.
2. Make cable inlets in the rear panel of the housing for power cables / cables connecting the expander with hardwired devices.
3. Prepare a temporary source of 12V DC power supply and add the ACX-200 expander to the wireless system (see: ADDING NEW WIRELESS DEVICES).
4. Select the place where the ACX-200 expander is to be installed and attach it there temporarily. It is recommended that the expander be installed as high as possible. Thus a better radio communication range can be obtained and the risk of the expander being accidentally covered by personnel moving around the premises.
5. Check the level of signal received by the controller from the expander. Change the place of installation, if necessary.
6. Having obtained the optimum signal level, install the expander permanently.
7. Connect the tamper contact to one of the expander zones. Program this zone as the tamper zone. You can also connect the tamper contact in series with a 2EOL configured device (detector), connected to one of the expander zones.
8. Connect wire devices to the expander zones/outputs.

Note: *The cables (for power supply, connection between the expander and hardwired devices, etc.) should not be run in the immediate vicinity of the antenna, since it may cause radio interference.*

9. Configure the expander zones as required.

4.7.1 Configuration of ACX-200 expander zones/outputs for ACU-100 controller operation with INTEGRA control panel

The ACX-200 expander occupies 4 zones and 4 outputs in the security alarm system. Parameters of the ACX-200 zones and outputs are to be programmed in the same way as those of the other hardwired zones and outputs of the control panel. However, it should be borne in mind that the actual sensitivity of the ACX-200 zones may be different from that programmed by means of the keypad or DLOADX program. Within the range of 20ms to 140ms it will precisely correspond to the programmed value. Above 140ms, only some sensitivity values are available in the expander (300ms, 500ms, 700ms, etc., in 200ms increments). The values above 140ms, programmed by means of the LCD keypad or the DLOADX program, are rounded to the nearest value supported by the expander zones.

4.7.2 Configuration of ACX-200 expander zones/outputs for ACU-100 controller operation with CA-64 control panel

The ACX-200 expander occupies 4 zones in the alarm system. Parameters of the ACX-200 zones are to be programmed in the same way as those of the other hardwired zones of the control panel. The DLOAD64 program or the alarm system keypad can be used for this purpose. You must take into account the same limitations regarding the zone sensitivity as in case of the ACX-200 expander working together with the INTEGRA control panel.

In order to configure the ACX-200 expander outputs, indicate the corresponding ACU-100 control inputs, which will control the expander outputs. It can be done by means of the LCD keypad connected to the controller, or through the DLOAD10 program. The control inputs should be connected to the suitably programmed outputs of the control panel.

4.7.3 Configuration of ACX-200 expander zones/outputs for ACU-100 controller operation with other control panels

Programming the zones/outputs of the ACX-200 expander is possible by using the keypad connected to the controller or by means of the DLOAD10 program.

It is necessary that operating configuration of the detector connected to the expander be determined and sensitivity defined for each expander zone. Additionally, the ACX-200 expander zones should be assigned to the selected controller outputs. Irrespective of how the ACX-200 expander zones will be programmed, the control panel zones to which the ACU-100 controller outputs will be connected, are to be configured as NO type (see also section INTERACTION WITH ALARM CONTROL PANELS).

In the LCD keypad, any changes of the zone type and sensitivity level are to be done by means of the CONFIGURATION function. The ▲ and ▼ keys make it possible to change the parameter values. The ◀ and ▶ keys allow you to move between the top and bottom lines of the display, i.e. between the parameters to be programmed.

In the DLOAD10 program, click in the „Configuration” column on the field referring to the expander zone for which type and sensitivity are to be programmed. These parameters are separated by a dash. The first position indicates the zone type. Using the keypad, you can enter here a digit from the 0 to 5 range, according to Table 5.

Digit	Zone type
0	no detector
1	NC
2	NO
3	EOL
4	2EOL/NO
5	2EOL/NC

Table 5.

The second position indicates the zone sensitivity. Using the keypad you can enter a value from the 20ms to 5100ms range. Within the range of 20ms to 140ms, it is possible to enter values every 20ms (20ms, 40ms, 60ms, etc.). The next value that can be entered is 300ms. Within the range of 300ms to 5100ms, you can enter values every 200ms (300ms, 500ms, 700ms, etc.). If a number different from the above values is entered, it will be rounded up to the next supported value (e.g. after entering 301, the next value to be entered is 500ms).

In order to configure the ACX-200 expander outputs, indicate the appropriate ACU-100 control inputs which will control the expander outputs. The control inputs are to be connected to the suitably programmed outputs of the alarm control panel.

4.8 WIRELESS DETECTORS IN ABAX SYSTEM

The wireless detectors send information on violations, tampers, and battery status to the ACU-100 controller. The detectors may be in either **passive state** (the system is disarmed) or in **active state** (the system is armed). When in the passive state (battery-saving mode), the detectors mainly communicate with the controller in time intervals determined by the RESPONSE PERIOD option. Then the information on violations and battery status is sent. Only the detector tamper messages are sent immediately. When in the active state, both the violations and tampers are sent to the controller right away.

The detectors are switched over from the passive state to the active state, and vice versa, during the response time, hence performance of this operation is delayed in relation to the moment of switchover command. This delay, depending on the chosen response frequency, can be up to 12, 24 or 36 seconds.

The RESPONSE PERIOD has an effect on the detector energy consumption level. The battery use by the detector decreases as the frequency of communication between the controller and the wireless device lowers.

It is advisable in some situations that the detector be always active. For example, the user wants to be sure that no window is open in the facility at the moment of arming. Switching over the window protection magnetic detector permanently in active state allows to avoid the risk that the window will be opened just before arming, but the information about it has not yet come.

The manner of permanently switching the detector to its active state depends on the controller working configuration. If the controller operates together with the INTEGRA series control panels, select the corresponding option for wireless detector. Otherwise, the controller input for detector control should be programmed as always active.



The batteries ensure operation of the detectors for a period of about 2 years, provided that they remain in the passive state for some portion of that period, and the RESPONSE PERIOD is 12 seconds. The lifetime of batteries in the detectors which are permanently switched to the active state will be reduced. On the other hand, decreasing the response frequency will extend the battery life. For example, the battery in magnetic detector for window protection will be sufficient for a period longer than specified, even if it has been permanently switched over to the active state, if the RESPONSE PERIOD is set at 36 seconds. The number of possible violations of this detector will be lower than the number of extra transmissions with the response time of 12 seconds.

Do not leave batteries inside the detectors which are not installed in the system. If there is no communication with the controller for 10 minutes, the detector will enter the sampling mode. When in this mode, the detector will check for 38 seconds if it is being polled by the controller. If it fails to establish communication with the controller, it will enter the sleep mode for 20 minutes, and then it will check again for 38 seconds if it is being polled by the controller, etc.

4.8.1 Installation of APD-100 detectors

In order to install the APD-100 passive infrared detector in the system you should:

1. Install battery in the detector.
2. Add the detector to the system (see: ADDING NEW WIRELESS DEVICES).
3. Select the location where you want the detector installed, and mount it temporarily in position.
4. Check the level of signal received by the controller from the detector, and change the detector installation place, if necessary.
5. Having reached the optimal signal level, install the detector permanently.

6. Enter the test mode and set the required detector range. If necessary, modify the position of electronics board (pyroelement) in the housing, or the position of installed detector.

Sensitivity of the APD-100 detectors is set by using the CONFIGURATION functions. In the LCD keypad, the sensitivity level can be changed by means of the arrow keys. In the DLOAD10 and DLAODX programs, click the box corresponding to the detector whose sensitivity is to be changed in the "Configuration" column, and then enter from the keypad a number from the 1 to 3 range as per Table 6.

Number	Detector sensitivity
1	low
2	medium
3	high

Table 6.

4.8.2 Installation of AMD-100, AMD-101 detectors

In order to install the AMD-100 or AMD-101 magnetic detector in the system you should:

1. Install battery in the detector.
2. Add the detector to the system (see: ADDING NEW WIRELESS DEVICES).
3. Select the location where you want the detector installed, and mount it temporarily in position.
4. Check the level of signal received by the controller from the detector, and change the detector installation place, if necessary.
5. Having reached the optimal signal level, install the detector permanently.
6. Enter the test mode and check the detector for proper functioning.

The AMD-101 wireless magnetic detector with an extra independent input occupies 2 positions on the list of devices supported by the controller (i.e. reed switch and the extra input, to which an outdoor detector of NC type can be connected). This means that these detectors will use 2 zones in the security system (unless the status of both detectors is transmitted to the control panel by means of one controller output).

4.9 WIRELESS SIGNALING DEVICES IN ABAX SYSTEM

The wireless sirens sent information on tampers and (storage) battery / power supply status to the ACU-100 controller. The information on tampers is sent immediately, while all the other information - at the response time (see: RESPONSE PERIOD).

Note: *Tamper alarm signaling is blocked after starting the service mode in the event of operation with the INTEGRA series control panels, or the TEST MODE in any other configuration, and also for 40 seconds after connecting power supply to the siren.*

4.9.1 Installation of ASP-105 sirens

To install the ASP-105 outdoor siren in the system, follow the procedure below:

1. Connect accumulator battery to the siren.
2. Add the siren to the system (see: ADDING NEW WIRELESS DEVICES).
3. Select the location where you want the siren to be installed, and mount it temporarily in position.
4. Check the level of signal received by the controller from the siren, and, if necessary, change the siren installation place.
5. Install the siren permanently and connect 12V DC external power supply to it.
6. Configure the siren as required.

The ASP-105 outdoor siren occupies two positions on the list of devices supported by the controller (separately acoustic and optical signaling). In the security system, the ASP-105 outdoor siren uses two zones through which it transmits information on the power supply status (battery and external power supply). When operating with the INTEGRA control panels, the ASP-105 siren will use 2 outputs and 2 zones.

For the acoustic signaling, additional options are available which allow you to chose the kind of sound, as well as its duration. These options are set by software means with the use of the CONFIGURATION function. In the LCD keypad, the options are changed by means of arrow keys. In the DLOAD10 and DLOADX programs, you should click on the box of acoustic signaling options, "Configuration" column, and then type in a two-digit sequence according to Table 7.

Numerical sequence	Option
11	sound 1 – duration 1 min.
12	sound 1 – duration 3 min.
13	sound 1 – duration 6 min.
14	sound 1 – duration 9 min.
21	sound 2 – duration 1 min.
22	sound 2 – duration 3 min.
23	sound 2 – duration 6 min.
24	sound 2 – duration 9 min.
31	sound 3 – duration 1 min.
32	sound 3 – duration 3 min.
33	sound 3 – duration 6 min.
34	sound 3 – duration 9 min.
41	sound 4 – duration 1 min.
42	sound 4 – duration 3 min.
43	sound 4 – duration 6 min.
44	sound 4 – duration 9 min.

Table 7.

The optical signaling is "on" for the period of activity of the control panel output (controller operating with the INTEGRA series panels) or for the time when the control signal is fed onto the controller input (controller operating in other configurations).

The ASP-105 siren is power supplied from a battery and from an external power source. The status of both supply sources is supervised in the controller. A battery failure will activate the controller output to which the acoustic signaling is assigned, while a failure of the external source will activate the output to which the optical signaling is assigned. Similarly, the same principle applies to the control panel inputs which are assigned to the siren (violation of the input means a failure).

4.9.2 Installation of ASP-205 sirens



Do not leave the ASP-205 siren with its battery inside, if the siren is not installed in the system. If there is no communication between the siren and the controller for 10 minutes, the siren will enter the sampling mode. When in this mode, the siren will check for 38 seconds if it is polled by the controller. If it establishes no communication with the controller during that time, the siren will be hibernated for 20 minutes, and then it will check again for 38 seconds, if it is polled, etc.

In order to install the ASP-205 wireless indoor siren in the ABAX system, do the following:

1. Open the siren housing, install battery and add the siren to the wireless system (see: ADDING NEW WIRELESS DEVICES). Placed on the piezoelectric transducer is a sticker with

the 7-digit serial number which is to be entered when registering the expander in the system.

2. Select the place where the ASP-205 siren is to be installed and attach it there temporarily.
3. Check the level of signal received by the controller from the siren. Select another place of installation, if necessary.
4. Having obtained the optimum signal level, install the siren permanently.
5. Configure the siren, as required.

The ASP-205 wireless indoor siren takes up two positions on the list of wireless devices supported by the controller. Thus programming of 2 independently triggered signaling modes is possible. For each of the signaling modes:

- define duration of signaling,
- select one of 3 sound signals, or disable the audible signaling,
- enable / disable the optical signaling.

Such a flexible solution allows the installer to determine whether there should be independently triggered optical and acoustic signaling in the siren, or various alarms (e.g. burglary and fire) should be signaled in a different way.

The signaling options in the LCD keypad are programmed by means of the CONFIGURATION function. Having started the function, select one of the zones to which the siren is assigned (LCD keypad in the INTEGRA system) or one of the two positions taken up by the siren on the list of devices (LCD keypad connected to the controller) and press the [#] or ► key. The ◀ and ► keys enable movement between the parameters being programmed. The type of sound is programmed in the top line of the display. You can change this parameter by using the ▲ and ▼ keys. The LCD keypad of INTEGRA system provides also the option to directly enter the numerical value. The following values can be entered:

- 0 – sound signaling disabled (this state is indicated on the display by the · symbol);
- 1 – sound type 1;
- 2 – sound type 2;
- 3 – sound type 3.

In the lower left-hand part of the display, you can program duration of the signaling. This parameter can be changed by using the ▲ and ▼ keys. In the LCD keypad of INTEGRA system, you can also directly enter the numerical value. The following values can be programmed: 1, 3, 6 or 9 minutes.

In the bottom right-hand part of the display, you can determine whether the optical signaling is to be enabled or disabled. If disabled, the optical signaling is indicated on the display by the · symbol. If enabled, the optical signaling is indicated by the **I** symbol. In order to enable /disable the optical signaling, press any numeric key in the keypad.

In the DLOAD10 and DLOADX programs, click on the signaling parameter field in the „Configuration” column and enter 3 digits corresponding to the selected parameters, in accordance with Table 8. For example, entering the 4-3-1 value means that the signaling duration will be 9 minutes, sound type 3 has been selected and the optical signaling has been enabled.

1st digit		2nd digit		3rd digit	
digit	signaling duration	digit	acoustic signaling	digit	optical signaling
1	1 minute	0	none	0	disabled
2	3 minutes	1	sound type 1	1	enabled
3	6 minutes	2	sound type 2	-	-
4	9 minutes	3	sound type 3	-	-

Table 8.

A command to trigger the signaling is only send to the siren during the response time.

Hence the cutoff time of the control panel outputs which control the ASP-205 wireless indoor siren must be longer than the response time. It is recommended that this time correspond to the signaling duration, as programmed in the siren.

Violation of the siren tamper contact will generate tamper alarm, which will last 3 minutes (sound type 1 and optical signaling). For 40 seconds after power-up and during the TEST MODE, and in case of the controller operation with the INTEGRA control panel - also during the service mode, the tamper alarm signaling is blocked. This is indicated by blinking LEDs of the siren.

When the ACU-100 controller operates together with the INTGERA control panel, the siren takes up 2 zones and 2 outputs in the alarm system. The outputs which are to trigger signaling must be suitably programmed. Information on the siren battery status is supplied to both zones.

If the ACU-100 controller operates together with the CA-64 control panel, the siren takes up two zones in the alarm system and information on the siren battery status is supplied to both of them. In order to activate the signaling, indicate the control inputs for each position taken up by the siren and then connect these inputs to suitably programmed outputs of the control panel.

If the ACU-100 controller works together with another control panel, the number of zones that will be occupied in the system by the siren will depend on the system installer. He can assign both positions taken up by the siren to one controller output, and so just one zone will be taken up in the alarm system. Information on the siren battery status will be send to this zone. Similarly as with the CA-64 control panel, to trigger signaling you must indicate control inputs for both positions occupied by the siren, and then connect these inputs to the suitably programmed outputs of the control panel.

4.10 ASW-100 230V AC WIRELESS CONTROLLERS IN ABAX SYSTEM



Before plugging the ASW-100 wireless controller into the 230V socket, familiarize yourself thoroughly with the electrical system in the premises. The phase conductor in the socket into which the controller is to be plugged should be on the left-hand side, and the neutral conductor - on the right-hand side.

To install the ASW-100 E or ASW-100 F controller in the ABAX system, proceed as follows:

1. Add the ASW-100 controller to the wireless system (refer: ADDING NEW WIRELESS DEVICES).
2. Plug the ASW-100 controller into the selected 230V socket.
3. Check the level of signal received by the ASW-100 controller from the ACU-100 controller. If necessary, select another socket and re-check the signal level.
4. Having obtained the optimum signal level, configure the ASW-100 controller as required.

The 230V AC wireless controller takes up 1 position on the list of wireless devices supported by the ACU-100 controller.

The ASW-100 E and ASW-100 F controllers can work in three modes (given in square brackets is mode description in the LCD keypad of INTEGRA system):

- mode 0 [button: inactive] – the electric circuit is only remotely controlled;
- mode 1 [button: interim control] – the electric circuit can be controlled remotely or manually;
- mode 2 [button: combined control] – the electric circuit can be controlled remotely or manually, but remote control can be manually overridden.

The operating mode in the LCD keypad is programmed by means of the CONFIGURATION function. The ▲ and ▼ keys are used for selection of the mode. In the DLOAD10 and DLOADX programs, click on the field corresponding to the ASW-100 controller operating mode in the „Configuration” column and then enter 0 for mode 0, 1 for mode 1 or 2 for mode 2. The new settings are sent to the controller during the response time (see: RESPONSE PERIOD).

The commands to close / open the 230V electric circuit are received by the ASW-100 controller from the ACU-100 controller in real time. If the ACU-100 controller operates in configuration of expander of wireless devices for the INTEGRA control panels, the 230V electric circuit status will change upon activation of the control panel output to which the ASW-100 controller is assigned. The control panel output shall be configured to suit the needs. If the ACU-100 controller is otherwise configured, the 230V electric circuit status will change upon activation of the control input selected for the ASW-100 controller. A suitably programmed output of the control panel should be connected to the control input of the ACU-100 controller.

Depending on the operating mode, the ASW-100 controller will send to the ACU-100 controller information on the status of the ASW-100 controller button (mode 0) or on the electric circuit status (mode 1 and mode 2). Information on the button status is sent in real time. Information on the electric circuit status is sent during response time (see: RESPONSE PERIOD). If the ACU-100 controller is working together with the INTEGRA or CA-64 control panel, pressing the button / closing the electric circuit will activate the alarm system zone to which the ASW-100 controller is assigned. In other configurations, pressing the button / closing the electric circuit will activate the ACU-100 controller output to which the ASW-100 controller is assigned. This output is to be connected to the control panel zone. The control panel zone to which information on the status of button / 230V electric circuit is supplied, should be suitably programmed.

When configuring the ASW-100 E or ASW-100 F controller, carefully select the FILTER value, i.e. the number of response periods with no response, after which loss of communication with the ASW-100 controller will be reported. The 230V sockets are installed at low position, hence the ASW-100 controllers mounted in them are exposed to the risk of being covered by personnel moving around the premises.

4.11 RADIO SIGNAL LEVEL TESTER IN ABAX SYSTEM




The ARF-100 tester takes up one position on the list of devices supported by the ACU-100 controller. The tester enables checking the level of radio signal received either by the controller from the tester, or by the tester from the controller. The signal level is displayed on the tester LEDs, when the ACU-100 controller is running in the test mode.

Note: *Each tester has the serial number 0000500.*

In order to check the radio signal level and find the optimum installation position for the wireless device by means of the tester, do the following:

1. Install battery in the tester.
2. Add the tester to the wireless system (see: ADDING NEW WIRELESS DEVICES). If the ACU-100 controller is configured for the expander operation with the CA-64 or INTEGRA

control panels, it is recommended that the ARF-100 tester be added as the last wireless device (after the other devices to be installed in the ABAX system). This will prevent creating an unnecessary gap due to unused zone after the tester is removed from the system.

3. Using the  designated button, select the power supply mode for the wireless device which is to be installed and simulated by the tester.
4. Start the test mode in the controller. During response time, the level of radio signal received by the tester from the controller will be displayed on the LED indicator. Press the  designated button to see the level of signal received by controller from the tester. The signal level is always refreshed during the response time (which is signaled by 1 short beep). If a higher update frequency is required, activate the dense polling mode by means of the  button. The signal level displayed on the LEDs will be refreshed every 2 seconds. Information update will be signaled by 2 short beeps.
5. Find the optimum location to install the new wireless device.
6. Having completed the test, switch off the tester and remove it from the ABAX wireless system.

Note: If not used, the tester will switch off automatically after 10 minutes.

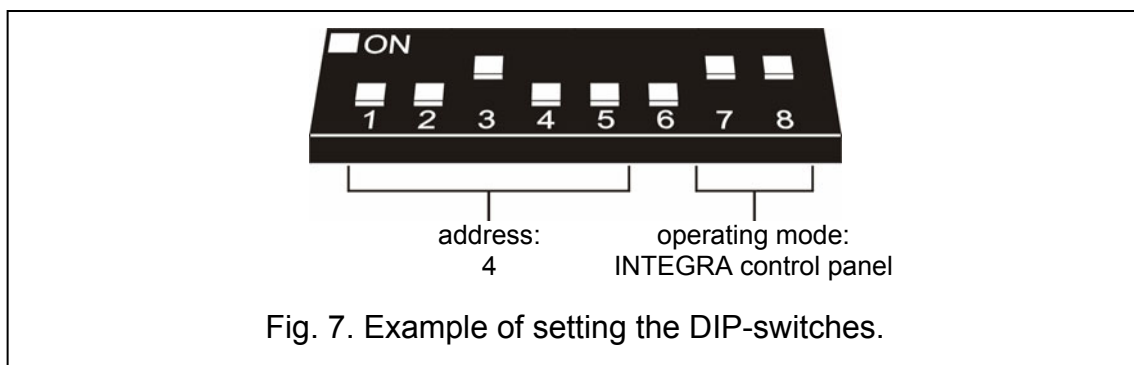
5. INTERACTION WITH ALARM CONTROL PANELS

The ACU-100 controller can work in several configurations:

- as expander of wireless devices for INTEGRA series control panels;
- as expander of addressable zones for CA-64 control panel;
- as expander of zones for CA-10 control panel;
- as wireless device module interfacing with any alarm control panel.

5.1 EXPANDER OF WIRELESS DEVICES FOR INTEGRA SERIES CONTROL PANELS

Set the suitable operating mode and address of the controller on DIP-switches.



Communication with the control panel is only effected by means of the communication bus. This way is used for transmission of information on violations of detectors, tampers and troubles of wireless devices, as well as for control of operation of wireless devices. Table 9 shows how the terminals of the controller communication bus should be connected to the communication bus terminals of the INTEGRA alarm control panels.

		ACU-100 controller terminals			
		COM	+12V	CLK	DAT
Panel terminals	INTEGRA 24 / INTEGRA 32	COM	+EX or AUX	CK	DT
	INTEGRA 64 / INTEGRA 128	COM	+EX1 +EX2	CK1 CK2	DT1 DT2

Table 9.

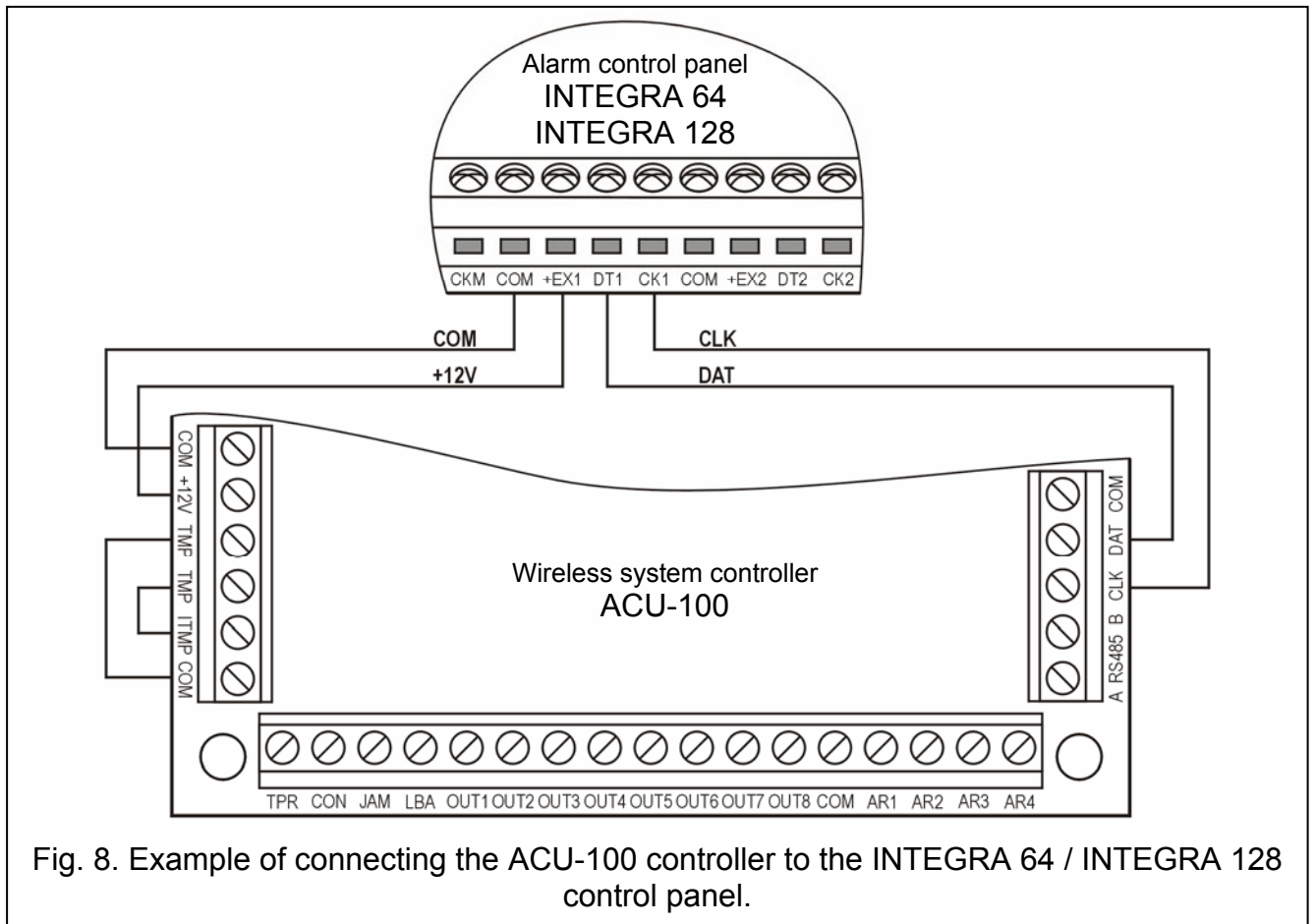


Fig. 8. Example of connecting the ACU-100 controller to the INTEGRA 64 / INTEGRA 128 control panel.

Having connected the ACU-100 controller to the control panel, start the expander identification function in the panel. In the process of addition or removal of the wireless devices, it must be borne in mind that during controller identification the INTEGRA series control panels register the zones and outputs by groups of 8. Therefore, it is important at the registration of wireless devices in the controller to maintain continuity, i.e. to avoid spaces in the list, which will eventually reduce the number of available inputs in the panel. For example, if 9 wireless devices were initially registered in the controller, but item 7 was later deleted from the list, the control panel will assign 2x8 zones to the controller, although just 8 devices will be physically connected to it (see Table 10). In case of the devices which will not only occupy the outputs but the zones as well, it is recommended that they be added to the system first, so as to maintain the continuity of using both the zones and the outputs. Table 10 presents a situation in which the first output of the siren has found itself in position 8, and the second output in position 9. As a result, 16 outputs have been reserved in the system (the eight output in the first group of 8 outputs, and the first output in the second group of 8 outputs).

Sometimes, it is impossible to avoid gaps on the list of zones / outputs. This is the case when the number of zones/outputs actually used by the devices is not a multiple of 8. Avoiding the

gaps is difficult or even impossible when, due to the size of the premises, a number of ACU-100 controllers are operating in the system.

ACU-100		INTEGRA 64 / 128				
It.	List of devices	zones		wyjścia		
		No.	Device	No.	Device	
1	detector APD-100	8	17	APD-100 detector	17	unused / unavailable
2	APD-100 detector		18	APD-100 detector	18	unused / unavailable
3	AMD-100 detector		19	AMD-100 detector	19	unused / unavailable
4	AMD-100 detector		20	AMD-100 detector	20	unused / unavailable
5	AMD-101 detector		21	AMD-101 detector	21	unused / unavailable
6	^		22	AMD-101 detector	22	unused / unavailable
7			23	unused / unavailable	23	unused / unavailable
8	ASP-105 siren		24	ASP-105 siren	24	ASP-105 siren
9	^	8	25	ASP-105 siren	25	ASP-105 siren
10			26	unused / unavailable	26	unused / unavailable
11			27	unused / unavailable	27	unused / unavailable
12			28	unused / unavailable	28	unused / unavailable
13			29	unused / unavailable	29	unused / unavailable
14			30	unused / unavailable	30	unused / unavailable
15			31	unused / unavailable	31	unused / unavailable
16			32	unused / unavailable	32	unused / unavailable

Table 10. An example of incorrect registration of wireless devices. The system must reserve 16 zones and 16 outputs, as well as 2 addresses for devices taking up 8 items. The controller with address 0 is connected to the first expander bus.

ACU-100		INTEGRA 64 / 128				
It.	List of devices	zones		wyjścia		
		No.	Device	No.	Device	
1	ASP-105 siren	8	17	ASP-105 siren	17	ASP-105 siren
2	^		18	ASP-105 siren	18	ASP-105 siren
3	APD-100 detector		19	APD-100 detector	19	unused / unavailable
4	APD-100 detector		20	APD-100 detector	20	unused / unavailable
5	AMD-100 detector		21	AMD-100 detector	21	unused / unavailable
6	AMD-100 detector		22	AMD-100 detector	22	unused / unavailable
7	AMD-101 detector		23	AMD-101 detector	23	unused / unavailable
8	^		24	AMD-101 detector	24	unused / unavailable

Table 11. An example of correct registration of wireless devices. The system has reserved 8 zones and 8 outputs, as well as 1 address, for 8 devices. The controller with address 0 is connected to the first expander bus.

Apart from assignment of zones and outputs to the controller, the panel will reserve for it an address on the expander bus. For each group of 8 zones/outputs, 1 address is reserved on the expander bus. The controller can take up from 1 to 6 addresses on the expander bus. This should be taken into account at the system design stage and the sufficient number of unoccupied addresses should be left for the controller. If, after new wireless devices are added to the controller, it turns out that further addresses are needed, but they are occupied by other devices, correct completion of the expander identification procedure will be impossible. Then it will be necessary to change the addresses of devices connected to the expander bus.

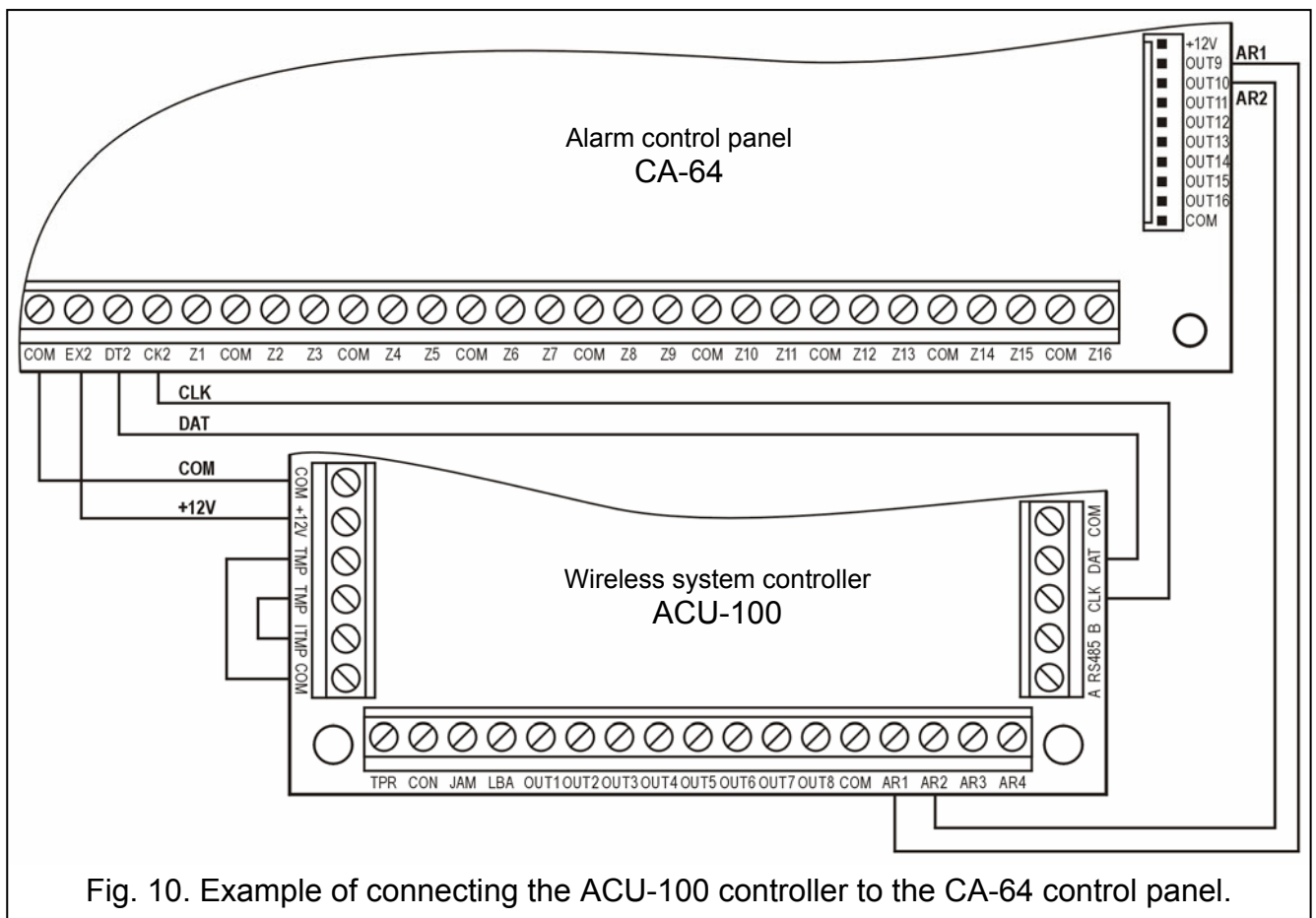
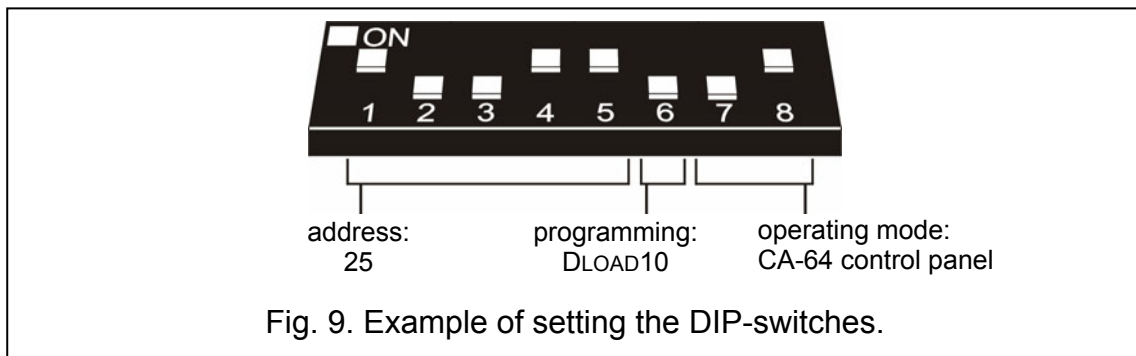
In order to simultaneously control the status of detector and tamper, the control panel zones assigned to wireless devices should be programmed as 2EOL.

Changing the wireless detectors from passive to active state takes place simultaneously with arming the partition to which the zone with wireless detector belongs. After disarming, the detectors will re-enter the passive state. It does not refer to the 24hr zones. The wireless detectors assigned to those zones remain always in the active state. Additionally, the ALWAYS ACTIVE option can be enabled for any wireless detector.

! Do not program reversed polarization for the alarm system outputs to which wireless devices are assigned, because these devices will function in reversed mode (the inactive output will arm, and the active output will disarm).

5.2 ADDRESSABLE ZONE EXPANDER FOR CA-64 CONTROL PANEL

Using the DIP-switches, set the suitable operating mode, address and programming mode of the ACU-100 controller.



Communication with the control panel is effected by means of the communication bus. This way is used for transmission of information on violations of detectors and tampers of wireless

devices. Control of the detectors (changeover to active / passive state), sirens (triggering alarm signal), 230V AC controller (closing / opening the electric circuit) etc. is performed through the control inputs of the ACU-100 controller. Suitably programmed outputs of the alarm control panel should be connected to the control inputs.

Fig. 10 shows a configuration example of the ACU-100 controller working together with the CA-64 control panel. The controller communication bus is connected to the second expander bus of the control panel. The OUT9 panel low-current output has been programmed as type 42: POWER SUPPLY ON ARMED and connected to the AR1 controller control input. This input is used to toggle the wireless detectors between their passive and active state. The OUT10 panel low-current output has been programmed as type 1: BURGLARY ALARM and connected to the AR2 controller control input. This input triggers the wireless siren. In the presented example, the controller information outputs (CON, JAM, LBA) remain unconnected. They can be connected to the control panel inputs so as to obtain in this way information on troubles related to operation of the wireless devices.

Having connected the ACU-100 controller to the control panel, start the expander identification function in it.

When interacting with the CA-64 control panel, the ACU-100 controller makes 48 wireless zones available to it. The zone numbers are assigned to the wireless devices registered in the controller according to the following principle:

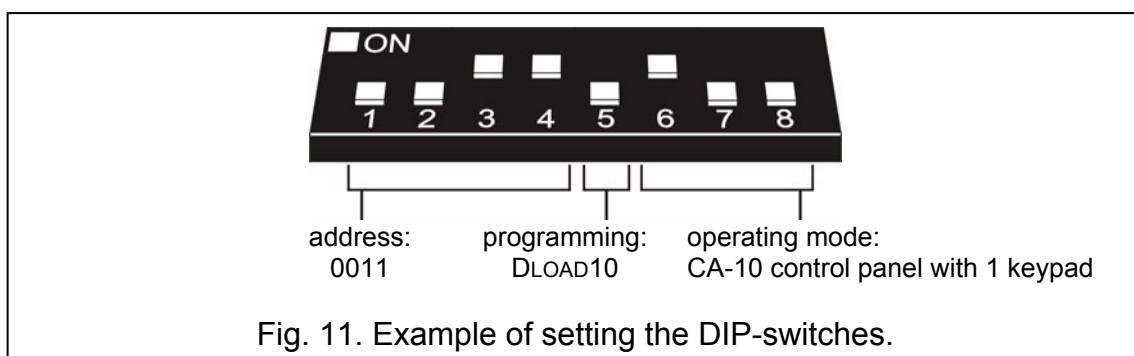
$$\text{zone number} = 16 + \text{number of the wireless device on the list}$$

In order to simultaneously control the status of detectors and tampers, the control panel zones assigned to wireless devices must be programmed as 2EOL.

Connection of the controller to the CA-64 alarm control panel excludes the possibility to connect to it the zone expanders (CA-64 E, CA-64 EPS and CA-64 ADR) as well as the CA-64 PP zones & outputs expander with power supply.

5.3 ZONE EXPANDER FOR CA-10 CONTROL PANEL

Using the DIP-switches, set the suitable operating mode, address and programming mode of the ACU-100 controller. To determine the operating mode you should take into account the number of keypads installed in the system. Depending on the number of keypads, the controller makes it possible to expand the system by 2, 4 or 6 zones.



Communication with the control panel is effected by means of the communication bus. This way is used for transmission of information on violations of detectors and tampers of wireless devices. Control of the detectors (changeover to active / passive state), sirens (triggering alarm signal), 230V AC controller (closing / opening the electric circuit) etc. is performed through the control inputs of the ACU-100 controller. Suitably programmed outputs of the alarm control panel should be connected to the control inputs. In this configuration, the alarm control panel can additionally receive information from wireless devices assigned to the eight outputs of the controller. Consequently, the wireless devices can use, as a maximum, from 10 to 14 system zones (8 controller outputs can be connected to the control panel onboard

zones and, additionally, the controller makes zones available by means of the communication bus - see Table 12).

Number of keypads in the system	Connection of CLK keypad terminals to control panel terminals	Connection of CLK controller terminals to control panel terminals	Numbers of additional system zones (zones 9 and 10 are reserved in the system for the 1 st keypad zones)					
			11	12	13	14	15	16
1	CLK1	CLK2	output 11 in controller	output 12 in controller	output 13 in controller	output 14 in controller	output 15 in controller	output 16 in controller
2	CLK1 CLK2	CLK3	zone in 2 nd keypad	zone in 2 nd keypad	output 13 in controller	output 14 in controller	output 15 in controller	output 16 in controller
3	CLK1 CLK2 CLK3	CLK4	zone in 2 nd keypad	zone in 2 nd keypad	zone in 3 rd keypad	zone in 3 rd keypad	output 15 in controller	output 16 in controller

Table 12.

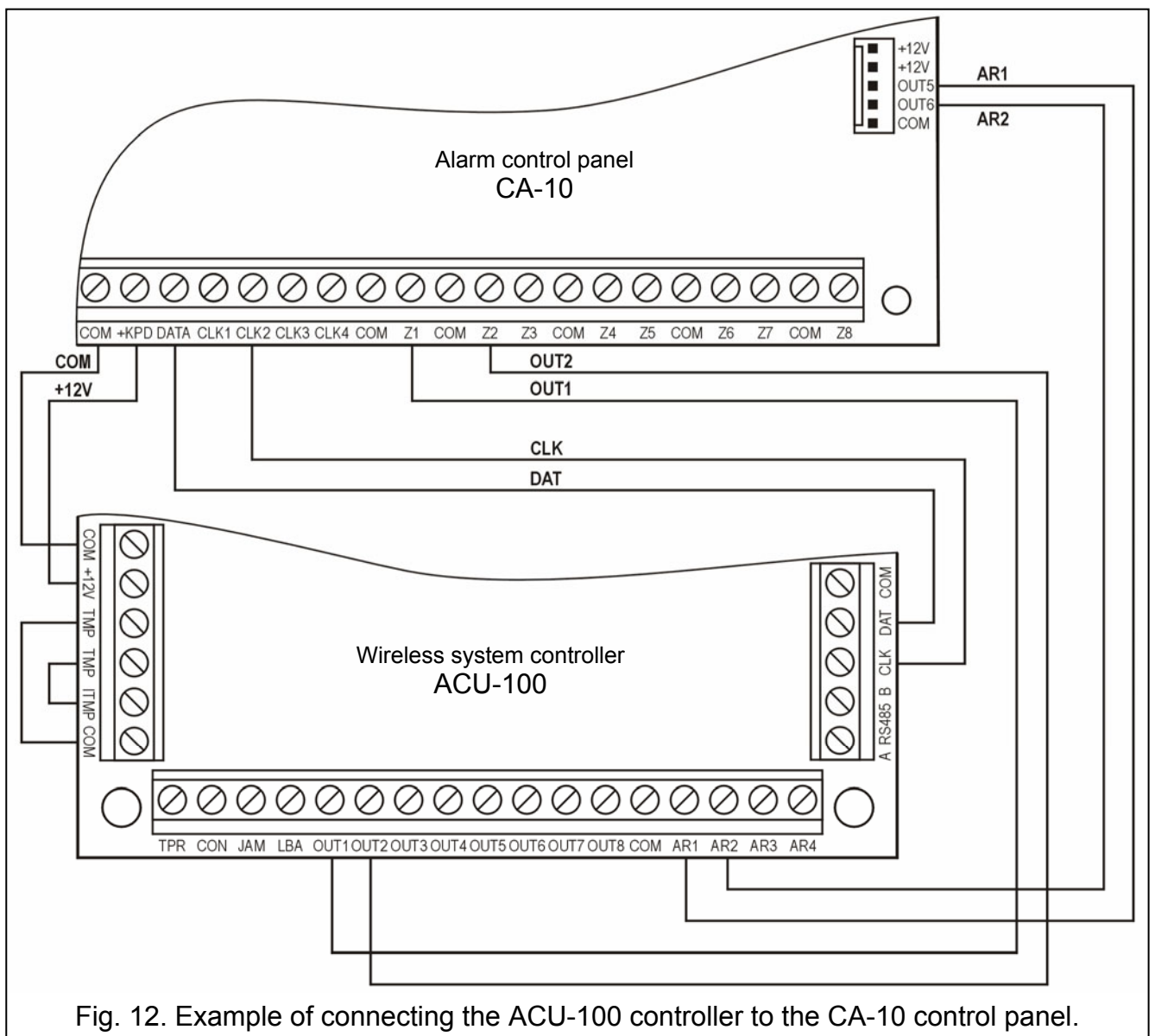


Fig. 12. Example of connecting the ACU-100 controller to the CA-10 control panel.

Fig. 12 shows an example of configuration of the ACU-100 controller interacting with the CA-10 control panel. One keypad is connected to the control panel, therefore the CLK controller terminal is connected to the CLK2 panel terminal. The zones made available by the ACU-100 controller to the control panel by means of the communication bus have in the security system numbers from 11 to 16 (controller outputs from 11 to 16). These zones should be programmed in the control panel as 2EOL/NO type. The controller outputs OUT1 and OUT2 have been connected, respectively, to the control panel zones Z1 and Z2. The control panel zones to which the controller outputs have been connected should be configured as NO type. Still available are the control panel zones from Z3 to Z8. You can connect to them wire-operated devices or consecutive controller outputs as well as wireless devices assigned to them. The OUT5 control panel low-current output has been programmed as type 35: POWER SUPPLY ON ARMED MODE and connected to the AR1 controller control input. This input switches the wireless detectors from passive to active state, and vice versa. The OUT6 control panel low-current output has been programmed as type 01: BURGLARY ALARM and connected to the AR2 controller control input. This input triggers the wireless siren. In the presented example, the controller information outputs (TPR, CON, JAM, LBA) have remained unconnected. These outputs can be connected to the control panel zones so as to obtain in this way information on problems connected with operation of wireless devices.

5.4 WIRELESS DEVICE MODULE INTERFACING WITH ANY ALARM CONTROL PANEL

Using the DIP-switches, set the suitable operating mode of the ACU-100 controller, number of ACX-100 modules which are connected to it, as well as the programming mode.

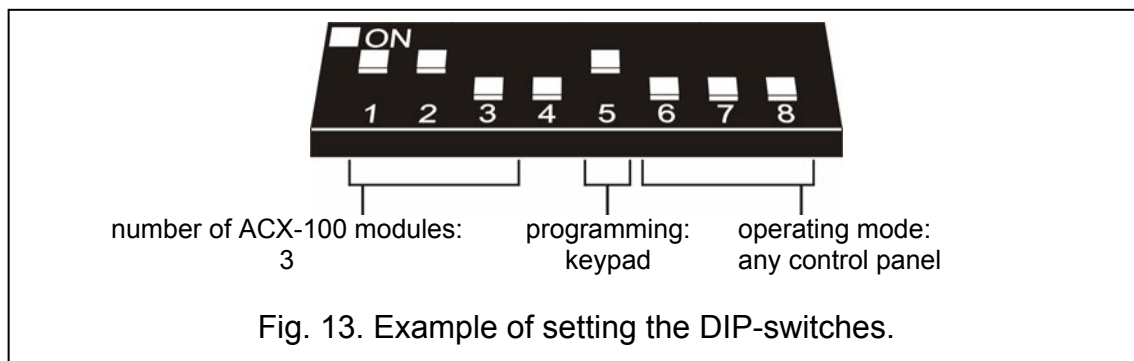


Fig. 13. Example of setting the DIP-switches.

Communication with the control panel in this configuration is effected by means of controller outputs and inputs. The controller outputs to which the wireless devices are assigned should be connected to the control panel zones. Control of the detectors (changeover to active / passive state), sirens (triggering alarm signal), 230V AC controller (closing / opening the electric circuit) etc. is performed through the control inputs of the ACU-100 controller. Suitably programmed outputs of the alarm control panel should be connected to the control inputs.

Shown in the example, Fig. 14, is the CA-6 alarm control panel of SATEL make, however it can be any other panel as well. The controller outputs OUT1 to OUT5 are connected, respectively, to the control panel zones Z1 to Z5 (preprogrammed as type NO). The TPR output, which informs of tampers of wireless devices and controller (TMP terminals connected to COM and ITMP terminals), is connected to the Z6 panel zone, preprogrammed as NO type, reaction type 24H AUDIBLE. The OUT4 panel low-current output has been programmed as type 35: POWER SUPPLY ON ARMED MODE and connected to the AR1 controller control input. This input toggles the wireless detectors between the passive and active state. The OUT5 panel low-current output has been programmed as type BURGLARY ALARM SIGNALING and connected to the AR2 controller control input. This input triggers the wireless siren.

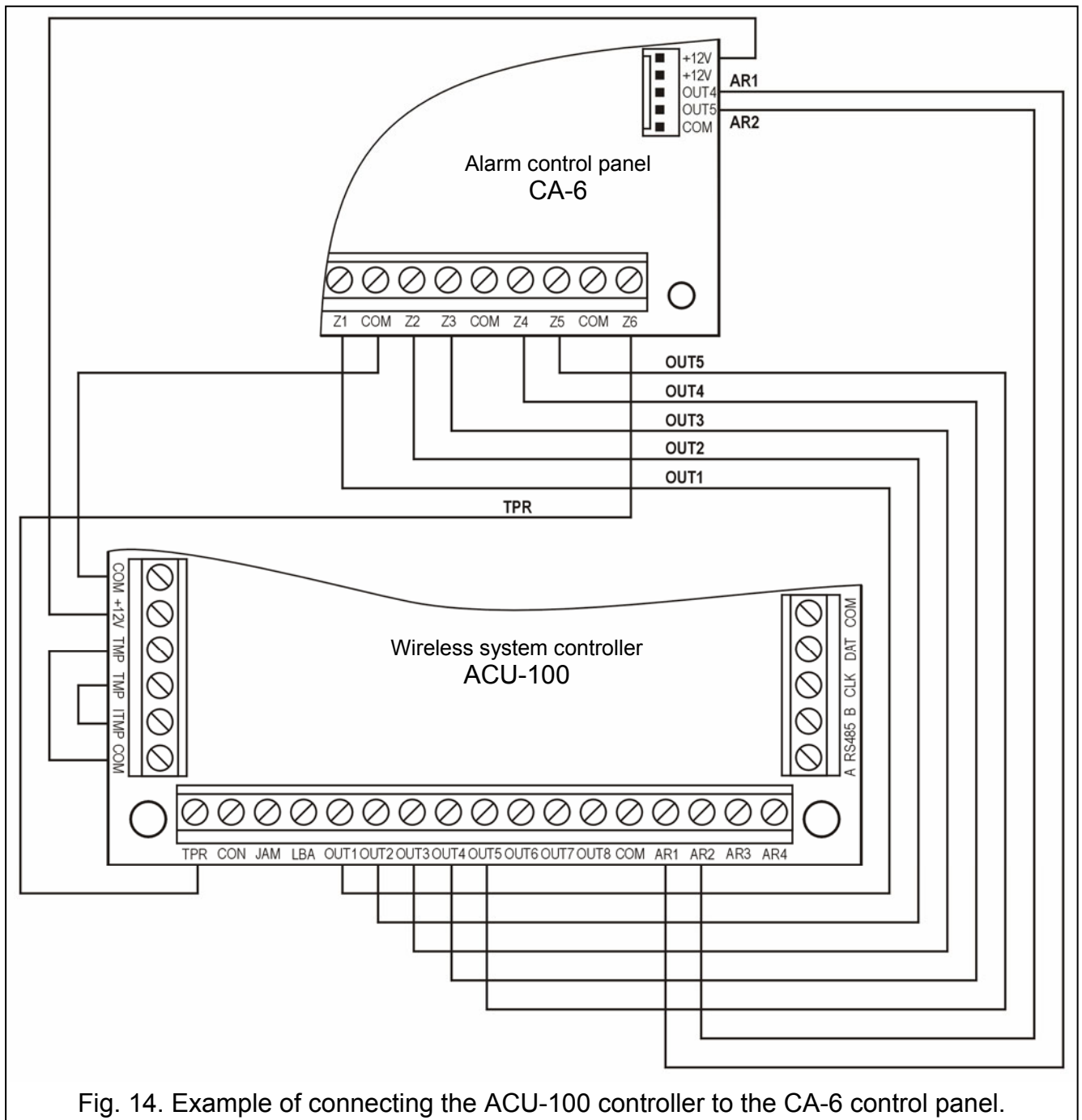


Fig. 14. Example of connecting the ACU-100 controller to the CA-6 control panel.

6. PROGRAMMING AND DIAGNOSTICS

The way of programming and the access to diagnostic functions depend on the working configuration of the controller:

- interacting with INTEGRA control panels
 - LCD keypad of INTEGRA security system in service mode;
 - computer with DLOADX program connected to INTEGRA control panel;
 - computer with DLOAD10 program connected to the RS-232 port of the controller for the duration of diagnostic test.
- interacting with other control panels
 - LCD keypad to be connected to the controller for the time of programming;

- computer with DLOAD10 program connected to controller RS-232 port for the time of programming.

6.1 LCD KEYPAD OF INTEGRA SECURITY SYSTEM

In order to configure the controller using the LCD keypad follow the instructions below:

1. Enter the service code, confirm with the [*] key and press the key 9 to get access to the service mode.
2. Proceed to the function of programming the controller settings a (→STRUCTURE →HARDWARE →EXPANDERS →SETTINGS →*controller name*).
3. Program the controller as required.
4. Quit the service mode.

The menu of service functions for the controller interfacing with the INTEGRA control panel:


- No autorst.3t.
- Tamper
- Response period
- New device
- Active mode
- Filter
- Configuration
- Remove device
- Synchronization
- Test mode on
- Test mode off

Diagnostics of the controller and the wireless devices registered in it is facilitated by using functions available in the user menu.

Overview of all functions - see Section DESCRIPTION OF FUNCTIONS, OPTIONS AND COMMANDS.

6.2 DLOADX PROGRAM

In order to configure the controller by means of the DLOADX program proceed as follows:

1. Launch the DLOADX program and establish communication with the control panel (see INSTALLER MANUAL for INTEGRA control panel).
2. Click on the  icon to open the window showing structure of the security system.
3. Select the "Hardware" tab, and then highlight the wireless system controller in the list of devices.
4. Program the controller.
5. Having finished entering the new settings, save them in the controller by clicking on the "Write" button.

Module: WIRELESS DETECTORS, address: 7 (xxx.)

Name:

Tamper signaled in part.:

No auto-reset after three module tamper alarms

Response period
 12sec. 24sec. 36sec.

No.	Name	Zone type/Function	Device type	Serial number	Always active	Configuration	Filter
1	OUT:49	ACX-200 0026000	Burglary	ACX-200 (wireless hub)	0026000	-	20
	Z:41	ACX-200 0026000	Entry/Exit (NO)	^ (Z1)			
2	OUT:50	ACX-200 0026000	FIRE alarm			-	
	Z:42	ACX-200 0026000	Instant (no TAMPER)	^ (Z2)			
3	OUT:51	ACX-200 0026000	Shutter up			-	
	Z:43	ACX-200 0026000	Instant (no TAMPER)	^ (Z3)			
4	OUT:52	ACX-200 0026000	Shutter down			-	
	Z:44	ACX-200 0026000	Instant (no TAMPER)	^ (Z4)			
5	OUT:53	ASP-205 0019158	Burglary	ASP-205 (Siren)	0019158	1-1-1:time1 min. - Sound 1 +opt.	20
	Z:45	ASP-205 0019158	Tech.-Battery low (with TAMPER)	^ (Battery state)			
6	OUT:54	ASP-205 0019158	FIRE alarm	^ (#2)		1-2-1:time1 min. - Sound 2 +opt.	
	Z:46	ASP-205 0019158	Tech.-Battery low (with TAMPER)	^ (Battery state)			
7	OUT:55	ASW-100 0019150	Outputs logical OR	ASW-100 (230V controler)	0019150	mode: 1	20
	Z:47	ASW-100 0019150	Panic-audible (with TAMPER)				
8	Z:48	APD-100 0000417	Instant (with TAMPER)	APD-100 (PIR)	0000417	1: low Sensitivity	20
9	Z:49	APD-100 0000416	Instant (with TAMPER)	APD-100 (PIR)	0000416	1: low Sensitivity	20
10	Z:50	AMD-101 0000435	Instant (no TAMPER)	AMD-101 (Magn. contact)	0000435	-	20
11	Z:51	AMD-101 0000435	Instant (no TAMPER)	^ (NC input)		-	
12	Z:52	AMD-101 0001445	Instant (no TAMPER)	AMD-101 (Magn. contact)	0001445	-	20
13	Z:53	AMD-101 0001445	Instant (no TAMPER)	^ (NC input)		-	
14	Z:54	ARF-100 0000500	Instant (with TAMPER)	ARF-100 (range tester)	0000500	-	20

Comments:

Fig. 15. Configuration of the ACU-100 controller in DLOADX program. Given under information on the module type and address is the version of its firmware. The wireless devices have been registered in the controller as recommended earlier in this manual: the devices which occupy both zones and outputs in the system were added first, while the devices taking up zones only were added after them. The radio signal level tester was added last.

Such diagnostic functions as SIGNAL LEVEL, COMMUNICATION QUALITY and RESTART COMMUNICATION TEST in the DLOADX program are available in the WIRELESS DEVICE window.

No.	Name	Device type	Serial number	Signal level	Connection quality
49	ACX-200 0026000	ACX-200 (wireless hub)	0026000	67%	100%
50	ACX-200 0026000	^	0026000	67%	100%
51	ACX-200 0026000	^	0026000	67%	100%
52	ACX-200 0026000	^	0026000	67%	100%
53	ASP-205 0019158	ASP-205 (Siren)	0019158	100%	100%
54	ASP-205 0019158	^	0019158	100%	100%
55	ASW-100 0019150	ASW-100 (230V controller)	0019150	100%	99%
48	APD-100 0000417	APD-100 (PIR)	0000417	100%	99%
49	APD-100 0000416	APD-100 (PIR)	0000416	100%	99%
50	AMD-101 0000435	AMD-101 (Magn. contact)	0000435	100%	99%
51	AMD-101 0000435	^	0000435	100%	99%
52	AMD-101 0001445	AMD-101 (Magn. contact)	0001445	100%	99%
53	AMD-101 0001445	^	0001445	100%	99%

Communication diagnostics

! Test restart Testing since 2006-11-23 10:00:54

X Close

Fig. 16. DLOADX program window showing signal level and quality of controller communication with wireless devices.

Troubles of wireless devices (no communication, low battery level, jamming) can be read out in the DLOADX program in the TROUBLES window.

6.3 LCD KEYPAD CONNECTED TO CONTROLLER

To configure the controller by means of the LCD keypad you should:

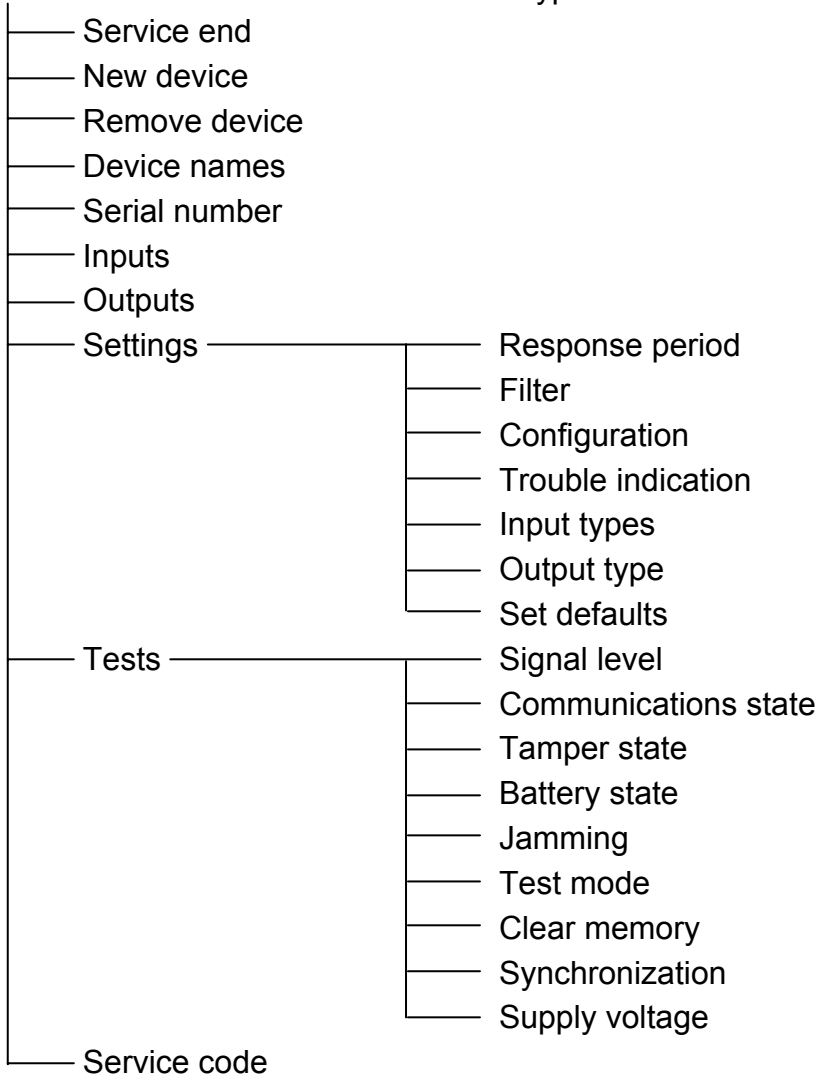
1. Set the option of programming by means of LCD keypad on the DIP-switches on the controller electronics board.
2. Connect the keypad to the controller (see: CONNECTING KEYPAD TO CONTROLLER).
3. Enter the service code and confirm by pressing the [#] key, to get access to the menu of controller service functions.
4. Program the controller as required.
5. Quit the service mode using the SERVICE END.
6. Disconnect the keypad.

6.3.1 Service mode of keypad connected to the controller

You can move through the menu and use the service functions by means of the following keypad keys:

- ▲ - scroll the functions list up;
- ▼ - scroll the functions list down;
- ▶ - enter the function/submenu;
- ◀ or [*] - exit the function/submenu without making changes (some functions can only be quitted by pressing the asterisk [*] key);
- [#] - enter the function/submenu; accept the data entered.

The menu of service mode in LCD keypad connected to the controller:



Overview of all functions - see Section DESCRIPTION OF FUNCTIONS, OPTIONS AND COMMANDS.

6.4 DLOAD10 PROGRAM

In order to configure the ACU-100 controller or carry out diagnostics of the wireless devices by means of the DLOAD10 program, do as follows:

1. Set the option of programming through the RS-232 port on the DIP-switches on the controller electronics board (this is not required when the controller operates in configuration of expander of wireless devices for the INTEGRA control panels).
2. Connect computer to the controller (see: CONNECTING COMPUTER TO THE CONTROLLER).
3. Launch the DLOAD10 program in the computer (access to the program is protected with password, which is **1234** by default and can be changed to any sequence of 16 characters – digits from 0 to 9 and letters from A to F).
4. Open the "Communication" menu, select the "Configuration" item and indicate the computer port to which the controller is connected.
5. Open the "File" menu, select "New device", and then "ACU-100".

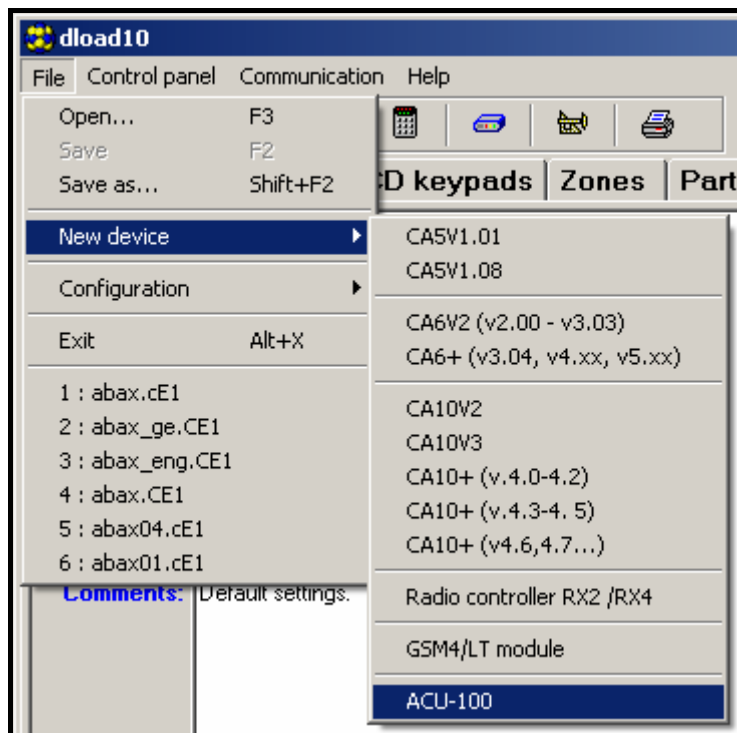




Fig. 17. Activation of the ACU-100 controller support in the DLOAD10 program.

6. Having established communication, the program will compare identifiers in computer and controller, and if they coincide, it will read data from the controller.
7. Configure the controller settings.
8. After completion of entering the new settings, save them in the controller by clicking on the  button.

A useful diagnostic tool in the DLOAD10 program is the level of signal currently received by the controller in its working radio band, which is presented as a real time diagram. It illustrates both the noise level and all registered at a particular moment signals from other radio devices operating on the same frequency band. Presented in red color are signals from wireless devices operated by the controller. To open the window showing the radio signal level, click on the  button. Also the level of radio signal received by the controller from individual devices can be represented in a diagrammatic form.

Note: When the ACU-100 controller operates in configuration of expander of wireless devices for the INTEGRA series control panels, the options regarding configuration of wireless devices are not available in the DLOAD10 program. Available are only diagnostic functions, including diagrams illustrating the radio signal levels.

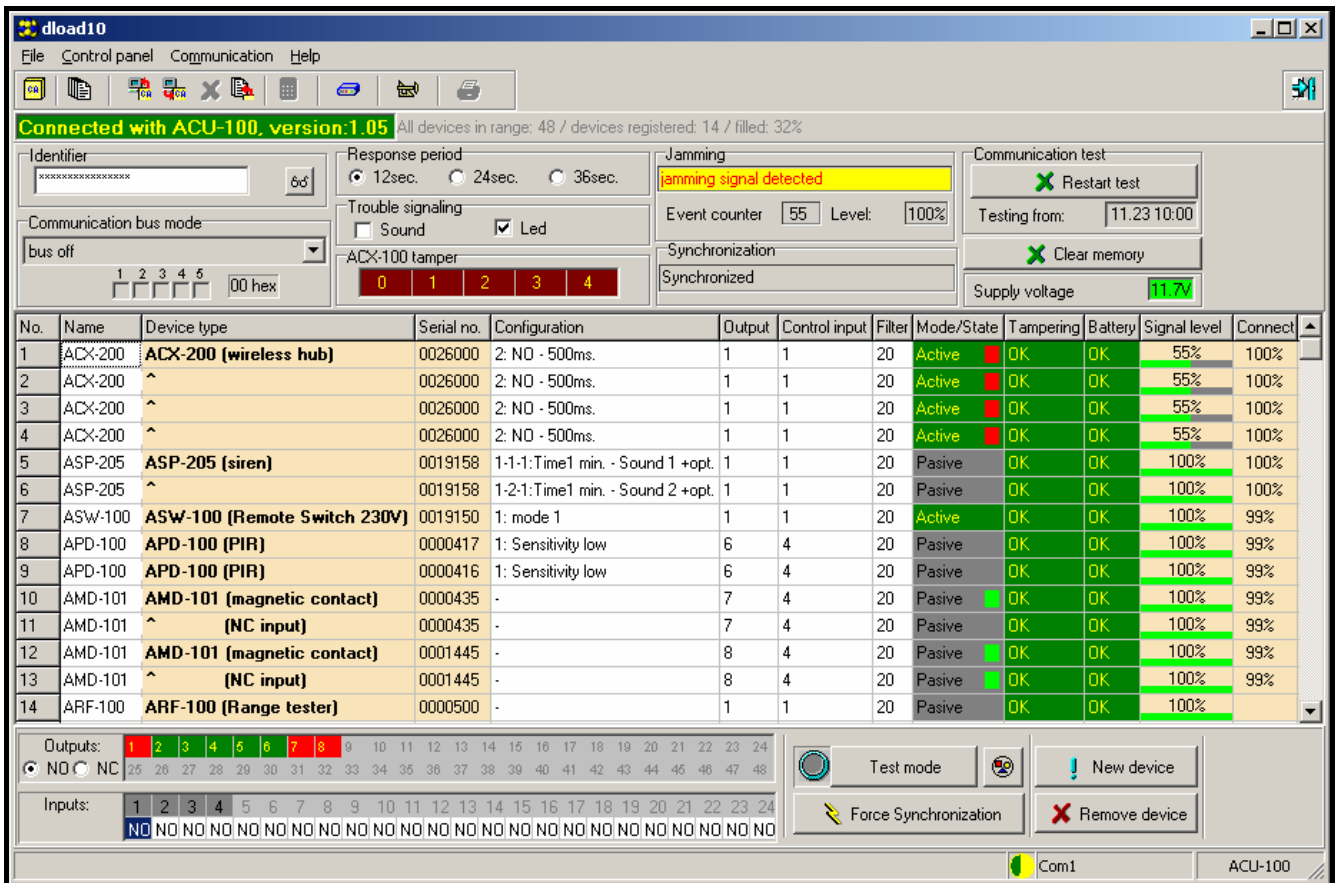


Fig. 18. ACU-100 controller operating window in the DLOAD10 program.

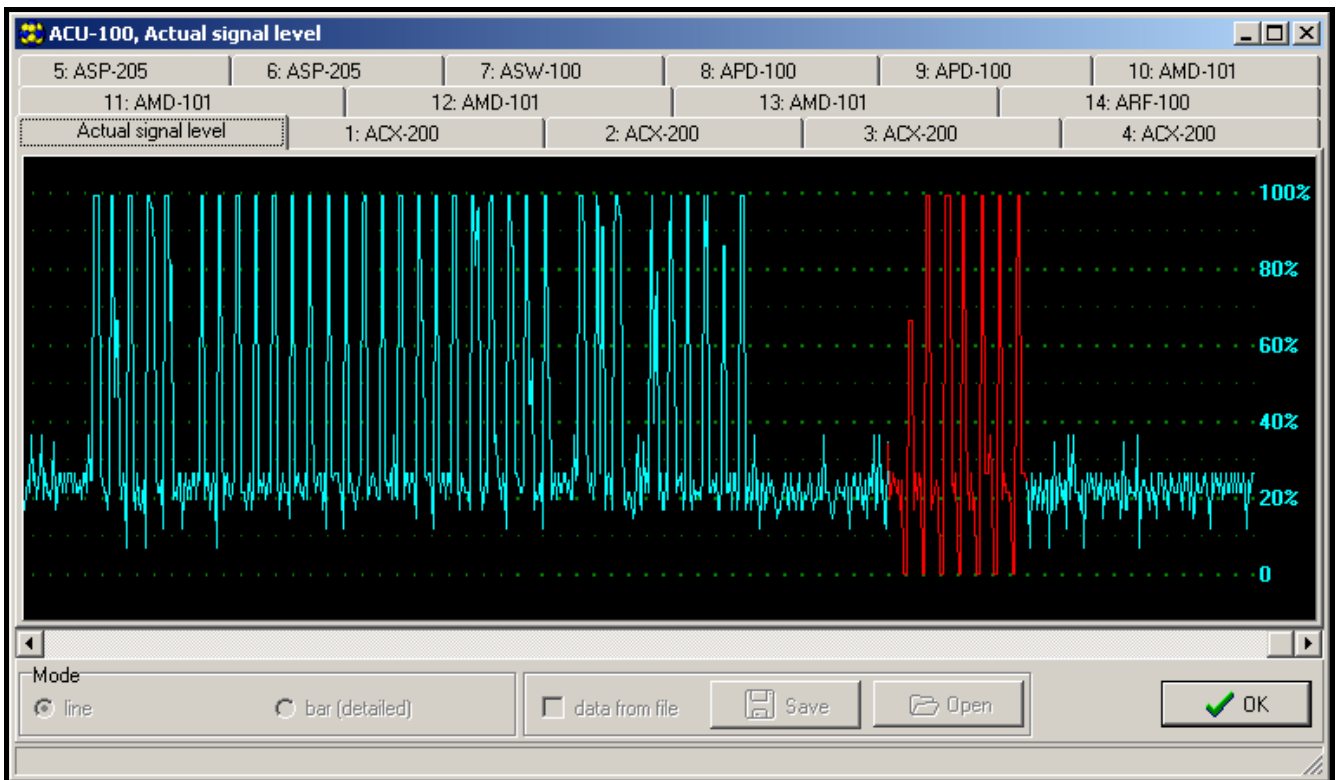


Fig. 19. DLOAD10 program window with a diagram of the level of radio signal received by the controller.

6.5 DESCRIPTION OF FUNCTIONS, OPTIONS AND COMMANDS

Identifier – the identifier in the DLOAD10 program is intended to protect the controller against an attempt of unauthorized reprogramming. The identifier consists of 16 characters. By default, these are 0 only. They can be substituted by digits from 0 to 9 and/or letters from A to F range. The program will not establish communication with the controller, unless a valid identifier is entered. If data of the system we wish to get access to were previously saved in the computer, a window will be displayed on the screen with a list of files containing data with consistent identifier. You can choose one of these files to establish communication.

Service code – the keypad code (password) is intended for protection of the controller against an attempt of unauthorized reprogramming. By default, it has the form of 12345, but it can be changed to any sequence of 8 digits. Without entering the correct code, the controller service mode cannot be started in the keypad.

New device – this command initiates the procedure of adding new wireless devices to the system.

Remove device – this command initiates the procedure of deleting wireless devices from the system.

Device names – you can assign names to the wireless devices registered in the controller. This does not apply to the controller operating together with INTEGRA series control panels.

Serial numbers – this service function in LCD keypad connected to the controller makes it possible to check the serial numbers of wireless devices included in the system. The serial number in DLOADX and DLOAD10 programs is displayed in on-line mode at each device registered in the controller.

Inputs – you should select a control input for each wireless device registered in the controller. This does not apply to the controller operating together with INTEGRA series control panels.

Notes:

- *When a new wireless device is added to the system, the input 1 is indicated by default as the control input.*
- *When the entered input number is higher than 24, the input to control the device will be always active.*

Outputs – wireless devices are assigned to particular controller outputs. This does not apply to the CA-64 (it is possible to assign the devices to outputs, but the outputs will not be used for communication with the control panel) and INTEGRA control panels.

Note: *When a new wireless device is being added to the system, it is by default assigned to the output 1.*

SETTINGS – calls submenu of the keypad connected to the computer.

Response period – the controller communicates with the wireless devices at specified time intervals. During those periods the controller gathers information on the status of devices and, if necessary, sends commands to the devices, e.g. switches the detectors to their active/passive state, activates/deactivates the test mode, and changes configuration of the devices. The response period may be **12**, **24** or **36** seconds. The rarer the communication between the controller and wireless devices, the more wireless devices can work within each other's range. The maximum number of devices for 12s is 150, for 24s - 300, and for 36s - 450. Outside the response period, information on tampers of the devices and violations of the detectors being in their active state is sent to the controller.

Filter – it is possible to define the number of unanswered polls, after which "no communication" will be reported. You may enter the values from the range of 0 to 50. Entering the digit 0 will disable control of the device for presence in the system.

Configuration – some wireless devices (e.g. APD-100 detectors, ASP-105 sirens) make extra options available, which can be configured by radio.

Problem signaling – activation of any of the controller functional outputs (TPR, CON, JAM or LBA) can be indicated by LED or sound signal. This option is unavailable when the controller interacts with INTEGRA series control panels.

Input types – the control inputs can be programmed as NO (normally open) or NC (normally closed). The control inputs are not used for interaction between the controller and the INTEGRA series panels, hence this option is then unavailable.

Output type – outputs of the controller and ACX-100 modules can be programmed as NO (normally open) or NC (normally closed). The option is not available when the controller is used in conjunction with the INTEGRA series control panels.

Set defaults – this function, which is only available in the LCD keypad connected to the controller, is used to restore the defaults.

TESTS – calls submenu of the keypad connected to the computer.

Signal level – this function, available in the LCD keypad, allows checking the level of signal received from wireless devices. The signal level is presented in percentage form. In the DLOAD10 program, the signal level is visualized graphically in on-line mode, with no need for calling any function. In the DLOADX program, information on the signal level is shown in the "Wireless device" window.

Communication state – this function, available in the LCD keypad connected to the controller, allows you to check with which devices the communication is correct, or non-existent, or was temporarily lost. In the DLOAD10 program, all the communication-related information is shown in real time, with no need for calling any function. In the INTEGRA system LCD keypad, the information on possible lack of communication is given in the user menu, TROUBLES submenu, and in the DLOADX program, in the "Troubles" window.

Tamper state – this function, available in the LCD keypad connected to the controller, allows you to check which of the wireless devices are or were tampered with. In the DLOAD10 program, all the tamper-related information is given on-line, with no need for calling any function. In the INTEGRA system LCD keypad, as well as in the DLOADX program, it is possible to check the wireless device / controller for presence of tamper by using the EVENTS function. Additionally, the information on possible tampers of wireless devices can be found in the DLOADX program in the "Zones state".

Battery status – this function, available in the LCD keypad connected to the controller, allows checking the battery status in wireless devices. In the DLOAD10 program, the low battery information is given in on-line mode, with no need for calling any function. In the INTEGRA system LCD keypad, the low battery information is given in the user menu, TROUBLES submenu, and in the DLOADX program, in the "Troubles" window. Depending on the type of device, the low battery message may indicate a low battery (detector) / loss of power supply (siren) / discharged storage battery (siren).

Note: *When low battery status is indicated, replace the battery within 2-3 weeks.*

Jamming – this function, available in the LCD keypad connected to the controller, makes it possible to check whether the wireless system operation is not jammed by any device, which emits radio waves on the same frequency. If there was a jamming event, information is given of the fact, stating how many times and what was its amplitude. In the DLOAD10 program all the information on jamming is given in on-line mode, with no need for calling any function. In the INTEGRA system LCD keypad, the information on

possible jamming is given in the user menu, TROUBLES submenu, and in the DLOADX program, in the "Troubles" window .

Test mode – activation of the test mode makes all the wireless devices indicate communication with the controller by blinking LEDs. Detectors inform on violations and tampers, using the LEDs. In the normal operating mode of the wireless devices, the signaling on LEDs is "off" for energy-saving considerations. When in the test mode, the tamper alarm signaling in sirens is disabled. After exiting the test mode, its actual termination will take place at the next response period. The test mode will be automatically exited 30 minutes after:

- it is started through the DLOADX program. If the WIRELESS DEVICES window is opened during this time in the DLOADX program, the test mode duration will be extended (the 30-minute countdown will run from closing the window),
- termination of the service mode in the INTEGRA control panel or the keypad connected to the controller,
- closing the DLOAD10 program.

Clear memory – this command will erase the memory, where information on tampers of wireless devices, low battery, and jamming is stored.

Restart communication test – the command, available in the DLOAD10 and DLOADX programs only, which resets the **communication test**. The communication test consists in monitoring the response cycle. If during a consecutive poll a device fails to establish communication with the controller, the fact is registered and presented as impairment of communication quality. The test is carried out in the on-line mode, and its results are visualized as the **Communication quality** in percentage form.

Synchronization – the ACU-100 controller checks whether other wireless systems are operating within its range, and if so, it adjusts the response time accordingly. Synchronization is performed automatically on starting the controller and after each operation of addition/removal of devices supported by it. Additionally, it can be started manually with this command.

Supply voltage – function if the LCD keypad which allows the controller supply voltage level to be checked. In the DLOAD10, DLOADX programs, the information on supply voltage is provided in on-line mode, with no need for starting any function whatever.

In/Out module tampers – information on communication of the controller with the ACX-100 input/output expansion modules, available in the DLOAD10 program only. Lack of communication is recognized as the module tamper.

Tamper alarm in partition [Expander tamper] – this option, available when the controller works together with the INTEGRA control panel, makes it possible to indicate the partition where alarm will be triggered in the event of controller tamper.

No blocking after 3 tampers – option available when interacting with the INTEGRA series control panel. The controller generates alarm on opening the tamper contact. Normally, if 3 consecutive tamper alarms are not cleared, signaling of next tamper alarms will be blocked, which prevents the same events being repeatedly saved in the control panel memory. The option allows the blocking to be disabled.

Always active – this option, available in the DLOADX program, allows the detector to be permanently switched to active state.

Service end – this function ends the service mode in the keypad.

7. RESTORING CONTROLLER DEFAULT SETTINGS

The following parameters are preprogrammed by default:

- service code: 12345;

- DLOAD10 identifier: 0000000000000000;
- response period: 24s;
- problem signaling: LED indicator;
- no registered wireless devices.

The default (factory) settings can be restored by means of the **SET DEFAULT function** in the keypad connected to the controller, or by way of **hardware restart**. In order to restore the defaults by means of the hardware restart, follow the instructions below:

1. Disconnect the controller power supply.
2. Disconnect the cables connected to the controller communication bus.
3. Short the CLK and DAT terminals.
4. Reconnect the power supply. A short while after power-up, the operating mode LED indicator will light in red. When default settings are restored, the LED color will change to green.
5. Open the CLK and DAT terminals.
6. Disconnect the controller power supply.
7. Reconnect the cables to the controller communication bus.
8. Reconnect the controller power supply.

8. TECHNICAL DATA

Operating frequency band	868.0MHz ÷ 868.6MHz
Number of supported wireless devices	48
Range	up to 150m (in open area)
Supply voltage, rated	12V DC ±15%
Current consumption, average.....	60mA ÷ 120mA (depending on configuration)
Outputs current-carrying capacity	50mA
Working temperature range	0 ÷ 55°C
Housing dimensions, OPU-1 A	126x158x32mm
Weight.....	222g

9. HISTORY OF THE MANUAL UPDATES

Described in the table below are changes as compared with the manual for the ACU-100 controller with firmware in version v1.03.

DATE	FIRMWARE VERSION	INTRODUCED CHANGES
2005-09	1.04	<ul style="list-style-type: none"> • Added information on the options of programming the outputs of the controller and ACX-100 module as NO, NC type (p. 7 and 39). • Added description of the manner to indicate active status of functional outputs (p.7). • Supplemented service mode menu of the LCD keypad connected to the controller (p. 35).
2006-11	1.05	<ul style="list-style-type: none"> • Information about new wireless devices added to section on controller outputs (p. 7). • Information added regarding new wireless devices of ABAX system: ACX-200 zone/output expander (p. 8 and 16), ASP-205 wireless indoor siren (p. 9 and 20), ASW-100 E and ASW-100 F 230V AC wireless controllers (p. 9 and 22) and ARF-100 radio signal level tester (p. 9 and 23). • Modified section on adding new devices to ABAX system (p. 13-15). • Supplemented section on interaction between ACU-100 controller and INTEGRA control panels (p. 24). • Added information on the diagnostic capability of ACU-100 controller operating in configuration of expander of wireless devices for INTEGRA series control panels, by means of DLOAD10 program (p. 31 and 36). • Supplemented information on „Test mode” (p. 40).

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