Access Control Panel

ACCO-NT

Installer Manual

IMPORTANT

The access control system should be installed by qualified personnel.

Prior to installation, please read carefully this manual in order to avoid mistakes that can lead to malfunction or even damage to the equipment.

Disconnect power before making any electrical connections.

Changes, modifications or repairs not authorized by the manufacturer shall void your rights under the warranty.

The device uses FreeRTOS v 6.1.0 – licensed under Modified GPL license (www.freertos.org).

SATEL's goal is to continually upgrade the quality of its products, which may result in alterations of their technical specifications and firmware. The current information on the introduced modifications is available on our website.
Please visit us at:
https://support.satel.eu

The declaration of conformity may be consulted at www.satel.eu/ce

The following symbols may be used in this manual:

- i - note,

- ⚠ - caution.

CONTENTS

1. Introduction

The ACCO NET access control system consists of software and devices manufactured by Satel. The guide to ACCO NET system software installation is available on the www.satel.eu website.

This manual covers installation of the ACCO-NT access control panel (electronics version 1.7, firmware version 1.14.026). It also describes the rules for configuring the control panel network settings by using the ACCO-NT Conf program and the way of installing the devices which make up the ACCO NET access control system. These include:

- access control modules (firmware version 3.05):
  - ACCO-KP,
  - ACCO-KP-PS,
  - ACCO-KPWG,
  - ACCO-KPWG-PS.
- expansion modules:
  - INT-E,
  - INT-O,
  - INT-PP,
  - INT-RX-S (firmware version 1.02 or newer),
  - INT-ORS,
  - INT-IORS.

2. Features

System structure

- Any number of objects in the system.
- Any number of access control panels in the object (the number of devices is only limited by server performance).
- Up to 255 access control modules supported by the access control panel.
- Up to 255 zones in 1 access control panel.
- Up to 255 access control modules in 1 zone.
- Up to 16 access pathways.
- Up to 16 zones in 1 pathway.
- Any number of INTEGRA or INTEGRA Plus alarm control panels integrated with 1 access control panel.

i *You can integrate INTEGRA / INTEGRA Plus control panels, firmware version 1.17 (or newer).*

Inputs

- 8 programmable inputs on control panel mainboard:
  - digital mode (NO, NC),
  - different input types.
- Maximum number of programmable inputs: up to 264.

Outputs

- 8 programmable outputs on control panel mainboard:
  - low-current outputs, OC type,
  - different output functions,
  - execution of non-standard control functions due to the capability of programming complex logic operations on outputs.
- Maximum number of programmable outputs: up to 264.
- 3 high-current outputs on the control panel mainboard, performing the function of power outputs (AUX outputs: 0.5 A / 12 V DC, +EX output: 0.5 A / 12 V DC).

Communication buses

- 2 RS-485 buses.
- Expander bus for connecting up to 32 expansion modules.

Event memory

- Events saved to microSD (2GB or more) memory card:
  - up to one million events from control panel;
  - up to 100 thousand events read from each access control module.

Users

- 1 administrator.
- 8 thousand users in zone / control panel.
- Up to 65 thousand users in the entire ACCO NET system.
- User can be assigned:
  - code,
  - proximity card (passive transponder, which may be in the form of card, key tag, etc.),
  - DALLAS chips (iButtons),
  - keyfob.
- Up to 4 proximity cards / DALLAS iButtons can be assigned to each user.

Time schedules

- Up to 256 access calendars.
- Up to 256 weekly schedules.
- Up to 256 daily schedules.
- Up to 256 time slots.

Additional features

- Optional blocking / unblocking zones at a specified time, according to access calendar or holding the card to the reader.
- Execution of logical function on inputs and outputs.
- Support for turnstiles.
- Control of the control panel outputs by using keyfobs.
- Arming / disarming the integrated alarm system partitions.
- Signaling of alarms that occurred in the integrated alarm system partitions.
- Real-time supervision of power supply status.
- Capability to update the firmware of devices connected to the system.

- Remote update of the control panel firmware and firmware of the access control modules.

Programming

- Local programming (only control panel network settings and time):
  – computer with ACCO-NT Conf program installed, connected to control panel USB port.
- Remote programming via the Ethernet network:
  – computer with ACCO Soft program installed;
  – web browser (ACCO-WEB application – see: ACCO-WEB manual).

Mainboard

- Built-in reader of microSD memory cards.
- USB MINI-B port to enable:
  – configuring the network settings by means of computer with ACCO-NT Conf program installed,
  – updating the control panel firmware without having to dismantle the panel.
- Real time clock with calendar and battery backup.
- LEDs indicating the status of:
  – communication between the control panel and RS-485 buses, computer and server,
  – power supply system,
  – microSD card.
- Electrical protection for all inputs and outputs as well as communication buses.
- Connector socket for APS-412 power supply.
- Option to install the control panel in OPU-3 P or OPU-4 P enclosure.

3. Mainboard description

Explanations for Fig. 1:

① connector socket for APS-412 power supply.

② LEDs LD1 – LD8 indicating the current status of control panel and communication (see section "LED lighting pattern").

③ lithium battery for clock backup.

④ USB MINI-B port.

⑤ microSD memory card.

⑥ RJ-45 socket for Ethernet network connection. Provided with two LEDs:
  green   - indicates connection to the network and data transmission,
  yellow   - indicates negotiated transmission rate (ON: 100 Mb; OFF: 10 Mb).

⑦ SD LED indicating the status of microSD card (see section "LED lighting pattern").

⑧ LEDs indicating the status of outputs.

⑨ AUX OK LED indicating the status of AUX power supply outputs.

⑩ +EX OK LED indicating the status of +EX power supply output.
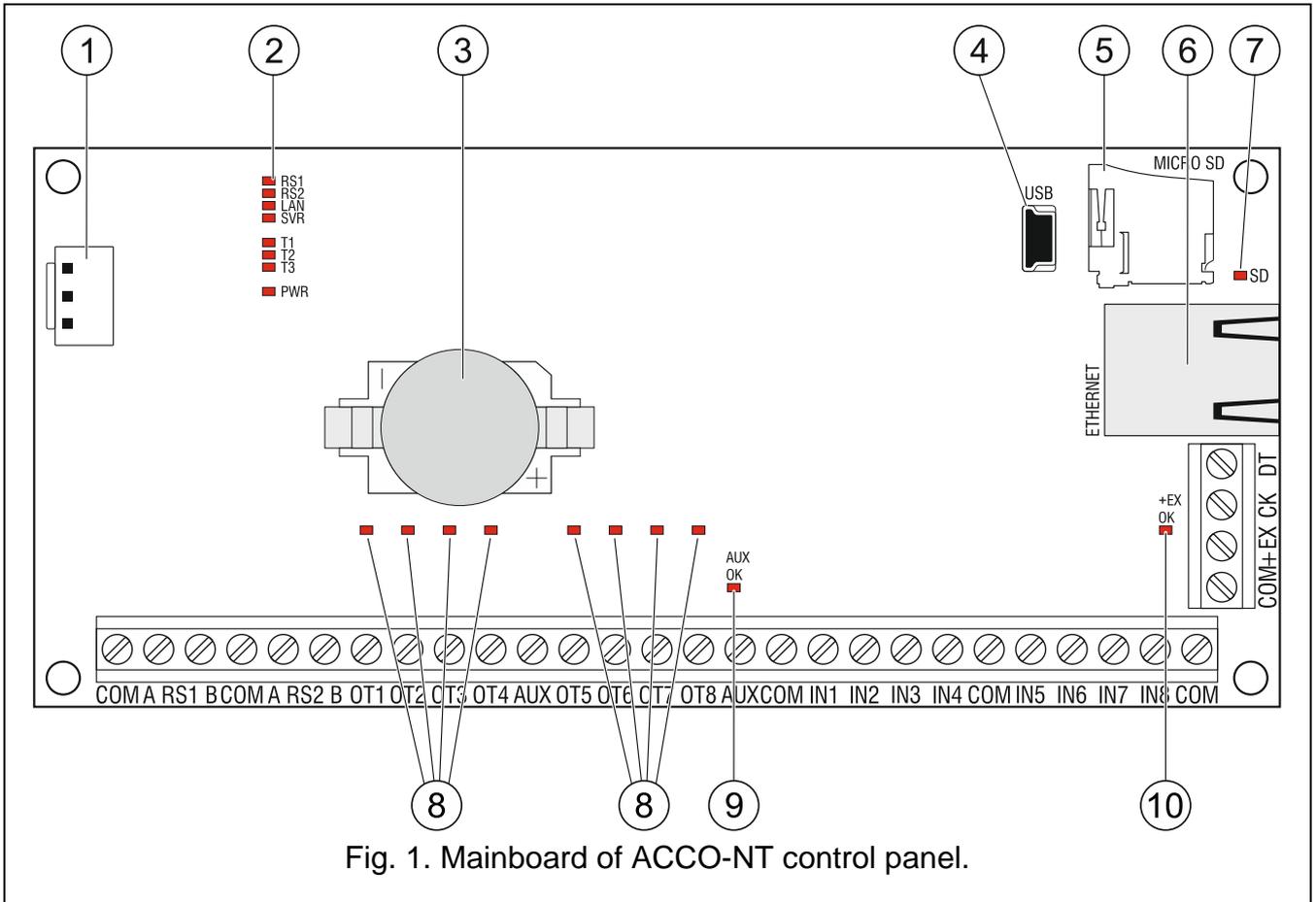
Fig. 1. Mainboard of ACCO-NT control panel.

Description of terminals:

COM – common ground

A RS1 B – terminals to connect the first RS-485 bus

A RS2 B – terminals to connect the second RS-485 bus

OT1…OT8 – programmable outputs

AUX – +12 V DC supply outputs

IN1…IN8 – inputs

+EX – +12 V DC supply output (dedicated supply output for devices connected to expander bus)

CK – expander bus clock

DT – expander bus data

3.1 MicroSD memory card

The purpose of microSD memory card is to:

• store the configuration data of ACCO NET system;

• save the events from access control panel and downloaded from access control modules.

The control panel supports microSD and microSDHC memory cards.

i *Do not remove the memory card when the access control system works.*

If the microSD card fails:

– *no events will be saved,*

– *configuration of the ACCO NET system will be impossible.*

After inserting the microSD card into the operating control panel, the SD LED will start flashing. The control panel will be checking data stored on the card.

3.1.1 Inserting microSD card

1. Open the control panel enclosure.
2. Insert the card into its slot and push until it clicks into place. The card contacts should be directed towards the Ethernet socket.
3. Close the control panel enclosure.

3.1.2 Removing microSD card

1. Open the control panel enclosure.
2. Push the card to release it.
3. Remove the card from its slot.

3.2 LED lighting pattern

RS1 LED:

flashing – communication with the access control modules connected to the first RS-485 bus proceeds normally;

OFF – no communication with the access control modules connected to the first RS-485 bus.

RS2 LED:

flashing – communication with the access control modules connected to the second RS-485 bus proceeds normally;

OFF – no communication with the access control modules connected to the second RS-485 bus.

LAN LED:

flashing – communication with Ethernet network proceeds normally;

OFF – no communication with Ethernet network.

SVR LED:

flashing – communication with ACCO Server proceeds normally;

OFF – no communication with ACCO Server.

T1 LED:

flashing – communication with the computer proceeds normally;

OFF – no communication with the computer.

T2…T3 LEDs: not used.

PWR LED:

ON – power ON;

OFF – power OFF.

SD LED:

ON – microSD card installed;

flashing – data writing to or reading from the card;

OFF – no card is installed or the card installed in control panel is faulty.

LEDs indicating the output status:

ON – output active;

OFF – output inactive.

AUX OK LED:

ON – working properly;

OFF – trouble.

+EX OK LED:

ON – working properly;

OFF – trouble.

4.   Access control modules

The access control modules are to be connected to the two RS-485 buses provided on the ACCO-NT control panel board. Altogether, 255 controllers can be connected. Up to 128 devices can be connected to one bus. It is recommended that both buses be evenly loaded.

i   *Firmware version 3.04 of the access control module is required.*

     The access control modules can only be configured using a computer with ACCO Soft program installed.

     For description of the electronics boards of ACCO access control modules and the methods of their installation, refer to the manuals delivered with respective devices.

5.   Expansion modules

The modules connectable to the expander bus make it possible to increase the number of available inputs and outputs. They also expand the access control system by adding extra functionality.

INT-RX-S. 433 MHz keyfobs receiver expansion module. Enables operation of the access control system using the 433 MHz keyfobs.

INT-E. Input expander. Adds 8 programmable hardwired inputs (NO, NC) to the system.

INT-O. Output expander. Adds 8 programmable hardwired outputs to the system.

INT-PP. Input/output expander. Adds 8 programmable hardwired inputs (NO, NC) and 8 programmable hardwired outputs (4 relay and 4 OC type) to the system.

INT-IORS. Input/output expander. Adds 8 programmable hardwired inputs (NO, NC) and 8 programmable relay outputs to the system.

INT-ORS. Output expander. Adds 8 programmable relay outputs to the system.

i   *The expansion modules can only be configured by means of a computer with ACCO Soft program installed.*

     For description of the electronics boards of expansion modules and the methods of their installation, refer to the manuals delivered with respective devices.

6.   Installation of the system

⚠   **Disconnect power before making any electrical connections.**

The following tools will be useful during installation:

- blade screwdriver 2.5 mm,
- Phillips screwdriver,

- precision pliers,
- flat nose pliers,
- driller c/w a set of drill bits.

6.1 Installation plan

Installation should be preceded by preparation of a plan of the access control system. It is advisable to draw a sketch of the building, showing lay-out of all devices to be included in the system, i.e. control panel, access control modules, terminals, activators, door sensors, expansion modules, detectors, signaling devices, etc.

6.2 Estimation of the system current consumption

At the stage of planning the access control system, you should sum up all the currents consumed by all devices included in the system (control panel mainboard, access control modules, expanders, etc.). The calculation must also include the current for charging the battery connected to the power supply unit. If the sum of currents exceeds the current output of the power supply connected to the control panel, an additional power supply unit must be used in the system.

The sum of currents consumed by devices connected to the additional power supply must not exceed its current output.

When planning connection of devices to individual supply outputs (control panel, access control modules, etc.), you should bear in mind that the sum of currents consumed by those devices must not exceed the maximum current-carrying capacity of these outputs.

Current-carrying capacity of the +EX supply output on control panel mainboard is 0.5 A, and that of the AUX outputs is 0.5 A in total.

6.3 Cabling

For the RS-485 communication bus, use the twisted-pair type of cable (e.g. UTP – unscreened twisted-pair cable).

To make connections between the control panel and the devices connected to the expander bus, it is advisable to use the unshielded non-twisted cable (using the twisted-pair type of cable, e.g. UTP, STP, FTP, is not recommendable).

Select cross-section of the power supply wires so that the supply voltage drop between the power supply and the supplied device should not exceed 1 V as against the output voltage.

In order to guarantee correct functioning of the system components it is important that resistance and capacitance of the signal wires be as low as possible. When the distances between the devices are greater, several wires connected in parallel may have to be used for each signal, in order to reduce conductor resistance. This, however, may lead in consequence to an increase in conductor capacitance. Too high resistance or capacitance of the cables connecting the control panel to expansion modules can prevent the devices from working correctly. When selecting the length of cables, follow recommendations set out in sections on connection of particular types of devices.

When making the cabling, remember that there must be sufficient distance between the low-voltage wires and the 230 V AC power supply wires. Avoid running the signal cables in parallel to and in close proximity of the 230 V AC supply cables.

6.4 Installing the control panel mainboard

⚠️ **The control panel mainboard contains electronic components sensitive to electric charges.**

Prior to connecting the power supply to the mainboard, complete all work related to the installation of devices (connecting the access control modules, expansion modules, etc.).

The control panel should be installed indoors, in spaces with normal air humidity. The control panel must be protected against unauthorized access.

A 230 V AC power supply circuit with protective grounding must be available at the control panel installation place.

6.5 Connecting the access control modules to RS-485 bus

ℹ️ *To connect each of the RS-485 buses, two pairs of conductors from one cable are used (one to connect the COM terminals, the other to connect the A RS485 B terminals).*

*The length of one RS-485 bus can be up to **1200 m**.*

In total, up to 255 modules can be connected to the two buses (127 to one of them, and 128 to the other one).

The access control modules should be power supplied as per description contained in the manuals delivered with respective devices.

The access control modules should be connected to the ACCO-NT control panel using the bus topology (using the "star" topology is not recommended). The RS-485 bus structure is shown in Fig. 2.

6.5.1 Addressing the access control modules

When connecting the modules to the buses, keep in mind that they must have their individual address set. The address must not be repeated even for devices connected to different buses! Address 0 must never be set in any module.

6.5.2 Connecting the devices interacting with access control modules

The access control modules perform their functions in conjunction with:

- user identification devices (LCD keypads, keypads, proximity card / iButton readers),
- controlled door activating devices (electromagnetic locks, gate controllers, turnstiles, etc.),
- door status control sensors.

For how they are to be connected, refer to the manual delivered with the ACCO access control module.
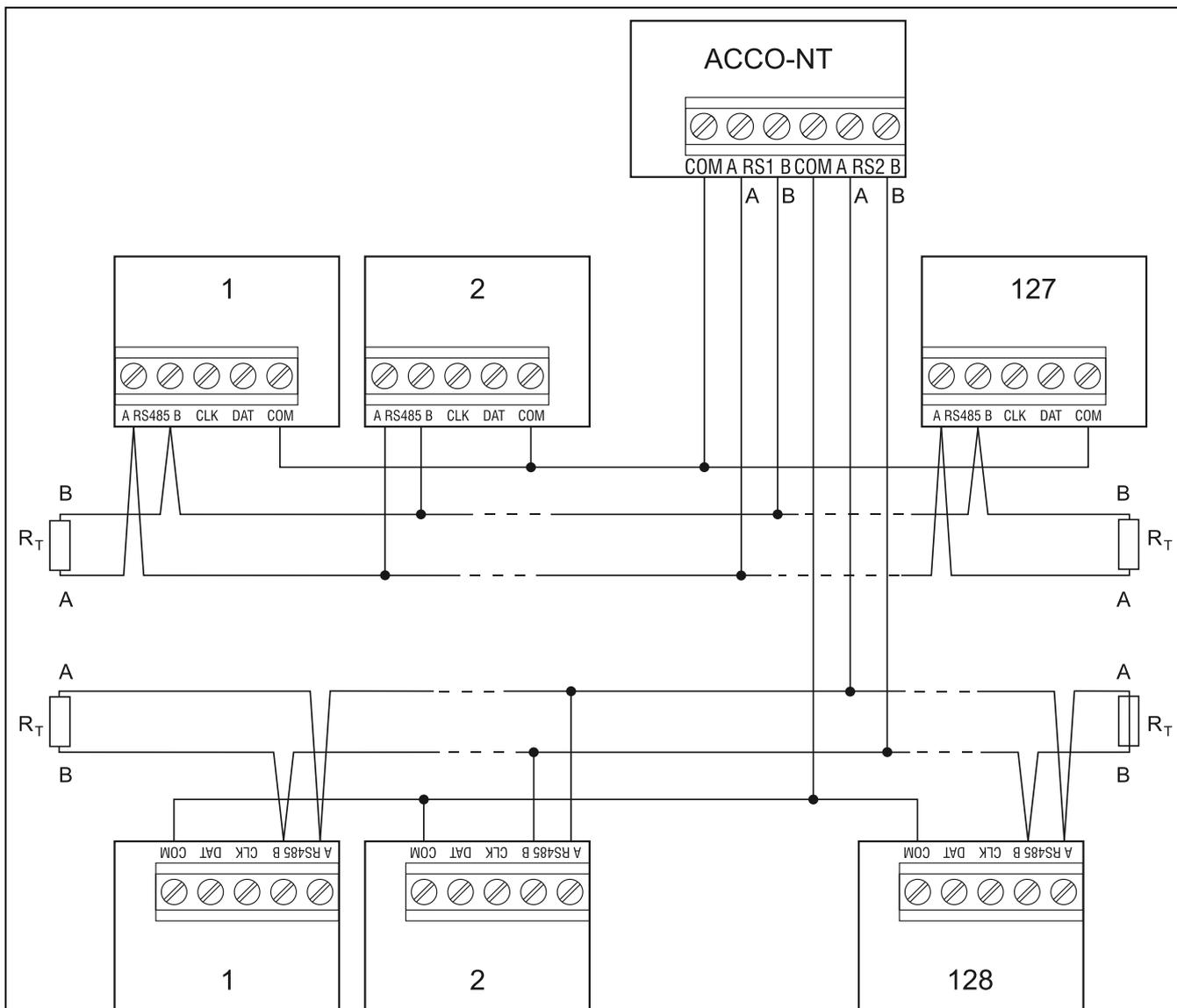
Fig. 2. Diagram showing how the access control modules are connected to the ACCO-NT control panel. The control panel can be connected to the bus at any point. Place 100 Ω (± 10%) resistors at the beginning and at the end of the bus. Connect the COM terminals of all modules and control panel with an additional cable. The modules in the drawing are designated by ordinal numbers, not addresses.

6.6 Connecting the devices to expander bus

The bus wires must be run in one cable.

*The total length of expander bus must not exceed **1000 m**.*

The expanders should be power supplied in accordance with description contained in the manuals delivered with respective devices.

Table 2 shows the number of conductors required for correct connection of the device to the expander bus if 0.5 mm diameter conductors are used.

	CK	DT	COM
Distance	**Number of wires**		
up to 300 m	1	1	1
300 – 600 m	2	2	2
600 – 1000 m	2	2	4

Table 2.
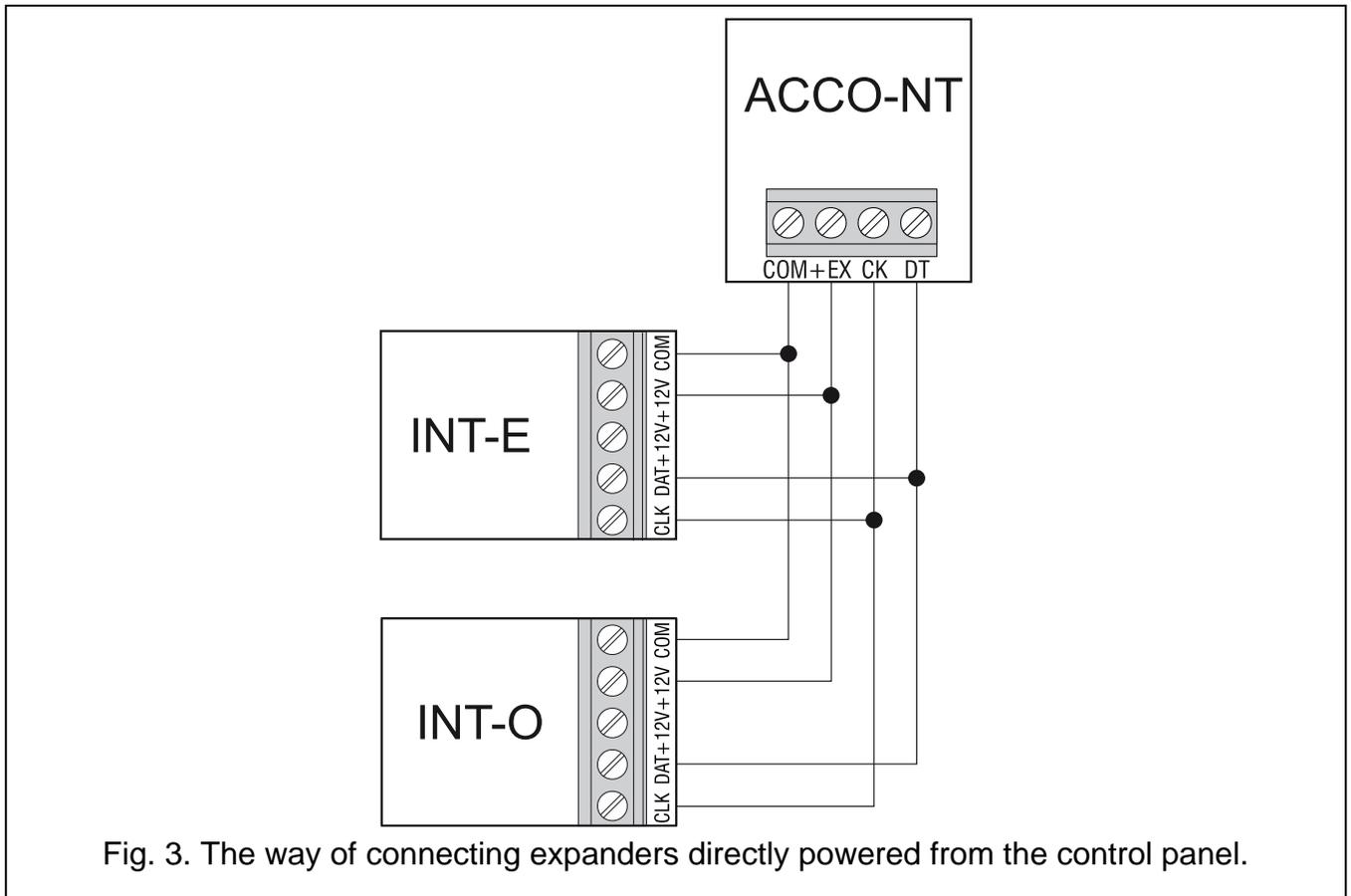
Fig. 3. The way of connecting expanders directly powered from the control panel.
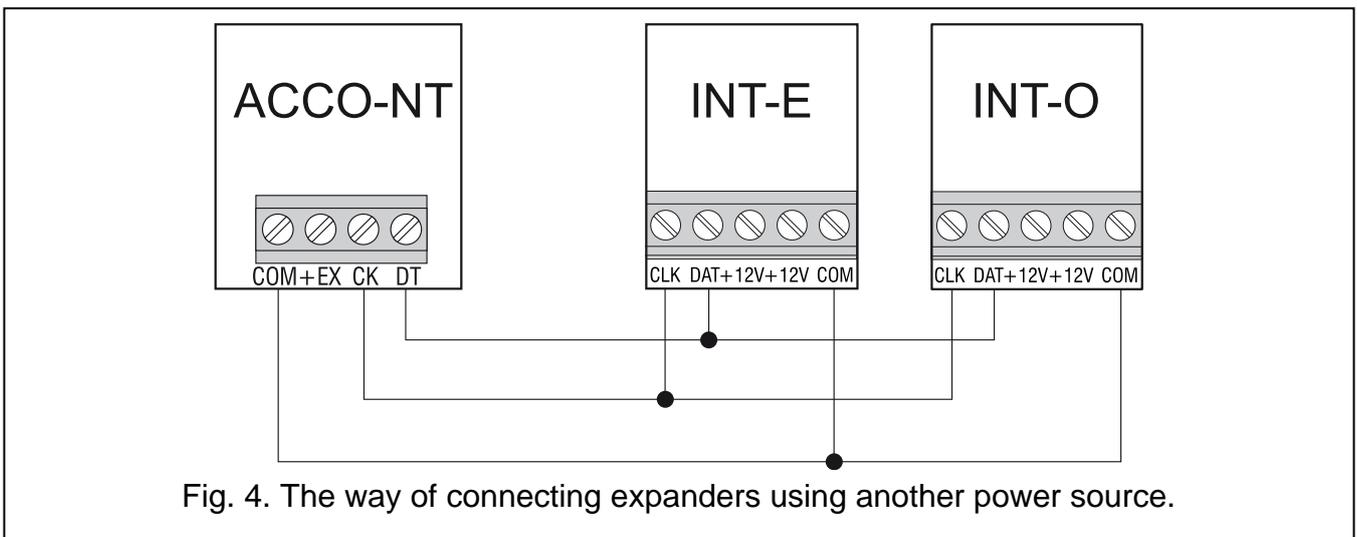
Fig. 4. The way of connecting expanders using another power source.

6.6.1 Addressing the devices connected to expander bus

Each device to be connected to the expander bus must have its own individual address from the 0 to 31 range. The addresses of the devices must not repeat (the control panel does not support devices having identical addresses). It is recommended that consecutive addresses be assigned starting from 0. The address is set by means of DIP-switches.

i | *The address affects numeration of inputs and outputs in the system (see section "Numeration of inputs and outputs in the system").*

6.7 Connecting the devices to control panel and expander inputs

Devices must be connected to inputs in a manner which suits wiring type selected for the given input (see: ACCO Soft manual). The inputs on control panel mainboard and the inputs on expander boards support the following wiring types:

NO – dedicated to connecting devices with the NO (normally open) alarm output.

NC – dedicated to connecting devices with the NC (normally closed) alarm output.

According to output – do not connect devices to this input. The input status depends solely on the status of selected output (the output is not to be physically connected with the input).

6.8 Connecting to the Ethernet network

⚠ | **The device is designed to be used only in the local area networks (LAN). It must not be connected directly to the public computer network (MAN, WAN). For establishing connection with public networks, use a router or xDSL modem.**

Connect Ethernet cable to the RJ-45 port on control panel electronics board. Use a 100Base-TX standard compliant cable (identical to that used for connecting computers to the network).

6.9 Connecting the power supply

⚠ | **Do not connect power supply untill the installation work is completed.**

The APS-412 power supply unit, manufactured by Satel, is required to power the ACCO-NT control panel. For description of the power supply installation, please refer to the manual delivered with the device.

6.9.1 Control panel power-up / start-up procedure

1. Connect the power supply unit to the dedicated socket on control panel electronics board.
2. Turn on 230 V AC supply in the circuit to which the power supply unit is connected. The control panel will start up.

i | *If it is necessary to power off the control panel, turn off the power supply unit.*

7. Numeration of inputs and outputs in the system

Inputs and outputs are given numbers in the following way:

- inputs and outputs on the control panel electronics board have numbers from 1 to 8.
- the numbers of inputs and outputs in expanders depend on the expander address in the system (inputs in expander with a lower address will be given lower numbers than the inputs in expander with a higher address e.g. if the INT-E expanders with addresses 0 and 1 are connected to the control panel, the inputs in INT-E expander with address 0 will have

numbers from 9 to 16; the inputs in INT-E expander with address 1 will have numbers from 17 to 24, etc.).

8.   Configuring network settings of the ACCO-NT control panel

Use the ACCO-NT Conf program to configure the ACCO-NT control panel network settings.

8.1   System requirements

For operation of the ACCO-NT Conf program version 1.07, the Java environment version 8 is required. Download this program version and install it on your computer.

8.2 Installing the ACCO-NT Conf program

1. Start the web browser.
2. In the address field, enter: https://[address of the computer on which ACCO Server is installed].
3. Log in to the ACCO-WEB application as the Administrator (by default: login "admin" and password "admin").
4. In the menu on the left side of the screen, click on the "Programs" command. Links to the installation files will be displayed.
5. Click on the ACCO-NT Conf link and download the program installation file.

8.3 Connecting the ACCO-NT control panel to computer for the first time

i *Supply voltage from the computer USB port is sufficient to supply the control panel for the configuration purposes using the ACCO-NT Conf program.*

When the control panel is connected with the computer by means of the USB cable, the supply outputs, expander bus and RS-485 buses are disabled.

1. Connect the USB MINI-B port on control panel electronics board with the computer USB port by means of a suitable cable. All LEDs indicating the current status of control panel and communication will come on for 2 seconds, and then only the PWR LED will come on steady.
2. The Windows system will automatically detect connection of a new device and will install suitable drivers for the new hardware.
3. Start the ACCO-NT Conf. The application will automatically connect to the device.

i *If two or more control panels are connected to the computer, the program will select the first of them from the list displayed in the "Selected device" list.*

4. A message prompt will appear asking for synchronization of the control panel and computer time. When the data reading from control panel is in progress, the T1 LED will start flashing.
5. Having read the data from control panel, you can start configuring the control panel.

8.4 Description of the ACCO-NT Conf program

The icon indicating the current status of communication between control panel and computer:

 – gray color – no control panels are connected to the computer;

 – green color – control panel connected to the computer;

– orange color – writing data to the control panel;

– red color – control panel restart in progress.

Selected device – click on the drop-down menu symbol to display the list of control panels currently connected to the computer.
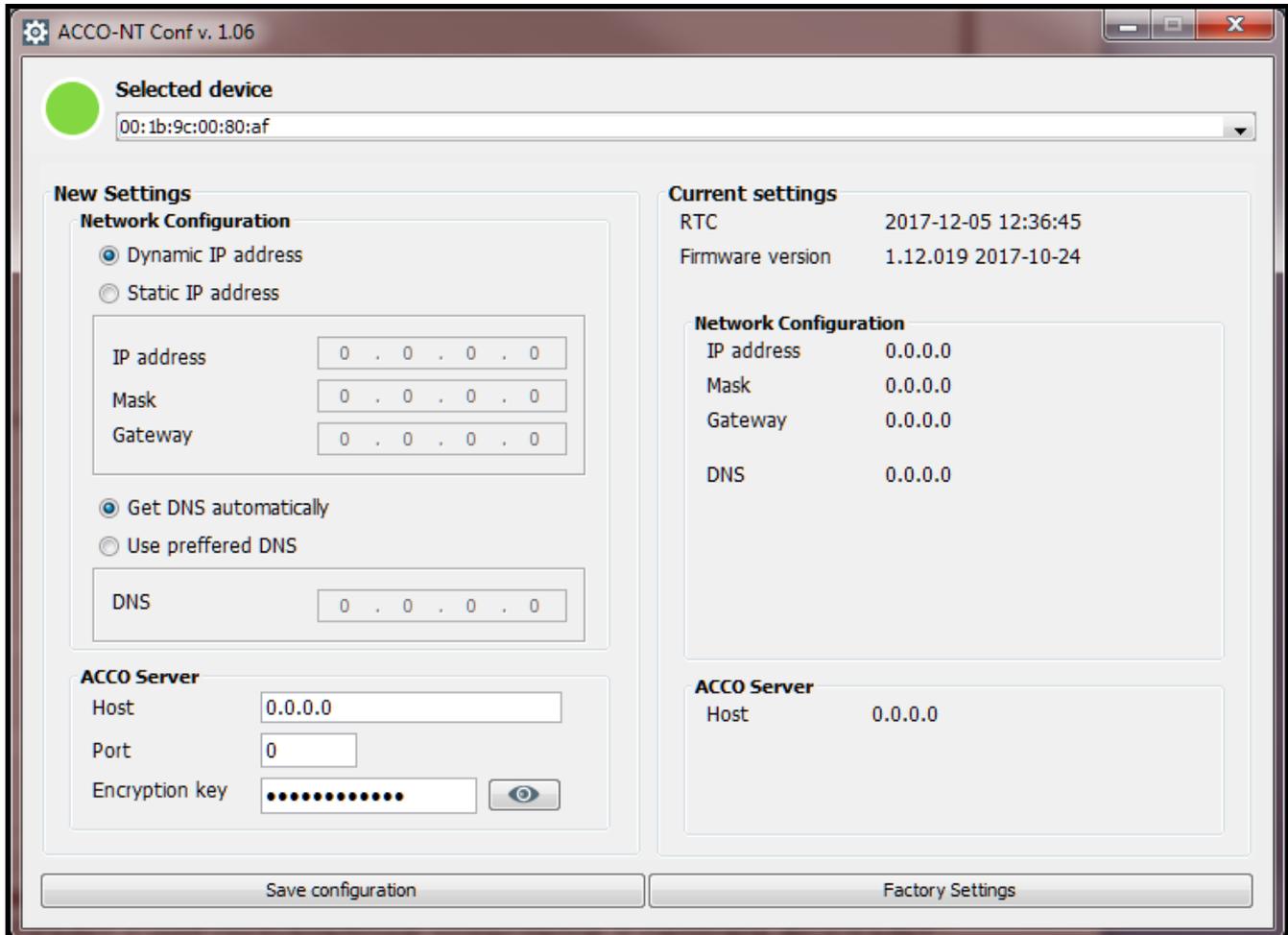
Fig. 5. ACCO-NT Conf program window (connection to ACCO-NT control panel with factory default settings).

New settings

Parameters programmed in this area refer to the settings which are to be saved to the control panel.

Network Configuration

Dynamic IP address – select this field if the control panel is to automatically download the IP address data of control panel, subnet mask and gateway from the DHCP server.

Static IP address – select this field if the IP address data of control panel, subnet mask and gateway are to be entered manually.

IP address – enter the control panel IP address in this field. The field is available if the "Static IP address" option has been selected.

Mask – enter in this field the mask of subnet in which the control panel is to operate. The field is available if the "Static IP address" option has been selected.

Gateway – enter in this field the IP address of network device by means of which the other devices of the given local network will communicate with devices in other networks. The field is available if the "Static IP address" option has been selected.

Get DNS automatically – select the field if the control panel is to download the IP address of DNS server automatically from the DHCP server.

Use preferred DNS – select the field if you want to enter the IP address of DNS server manually.

DNS – IP address of DNS server to be used by the control panel. The field is available if the "Use DNS server" option has been selected.

ACCO Server

Host – enter in this field the ACCO Server address to which the control panel is to connect. It can be entered in the form of IP address (4 decimal numbers separated by dots) or as a name (up to 32 characters).

Port – enter in this field the number of network port, on which communication between the control panel and the ACCO Server is to take place.

Encryption key – enter in this field a sequence of up to 12 alphanumeric characters (digits, letters and special characters) to define the key for encryption of data to be transferred between the ACCO Server and the control panel. **It must correspond to the encryption key defined in the ACCO Soft program for the ACCO Server ("Encryption key" field, "Control panel settings" tab, system configuration window).** The device will only establish connection with the server which will use the right key.

[👁] – click on the button to check the value entered.

Current settings

Parameters displayed in this area refer to the current configuration settings of control panel.

RTC – date and time according to the control panel clock.

Firmware version – control panel program version (build version and release date).

Network Configuration

IP address – IP address of the control panel.

Mask – mask of subnet in which the control panel is used.

Gateway – the IP address of network device by means of which the other devices of the local network communicate with devices in other networks.

DNS – IP address of the DNS server used by the control panel.

ACCO Server

Host – IP address of the computer with ACCO Server installed, to which the control panel connects.

Buttons

Save configuration – click on the button to save the settings to the control panel. A message prompt will be displayed asking whether you want to save the changes made. After you click on the "Yes" button, the data will be saved and the control panel will restart and re-establish communication with the program.

Factory Settings – click on the button to restore factory settings in the control panel (the networking settings will be saved so that communication can be reestablished).

9. About ACCO NET system operation

All components of the system are working properly, when communication is ensured between the devices as well as between the ACCO-NT control panels and the ACCO Server program. The ACCO Server program is used as an intermediate for communication between the

access control panels, on the one hand, and the database, the ACCO Soft and ACCO-WEB programs and the ECCO-EE component, on the other hand. The database stores the system configuration settings and the event log. The ACCO Soft program enables configuration of the system, and the ACCO WEB is used for management and supervision of the system. The ACCO-EE component provides data of maps that can be created in the Map Editor program.

The access control panels decide whether the user will be granted access or not. This means that loss of communication between the ACCO-NT control panel and the ACCO Server program will not affect functioning of the access control. However, if there is no communication, configuration, management and supervision of the system will be impossible.

i | *If communication with the control panel is lost:*
- *in ACCO Soft program:*
  – *system settings cannot be written to the control panel,*
  – *there is no real-time information about the status of connected devices,*
- *in ACCO-WEB program:*
  – *you cannot view the current events.*

If communication between the access control module and the control panel is lost, the module will be working in offline mode. Access to the door supervised by this module will be granted only to part of the users (1024 users registered in the module). The module will recognize the user code and the first of the cards / iButtons. When making decision to grant access, the module will not take into consideration the access calendars, subdivision into zones, or "Anti-Passback" feature. Only the inputs and outputs of access control module will be able to control operation of the given module (status of the other inputs and outputs in the system will have no effect on the module operation).

i | *The access control modules will enter the offline mode also during remote firmware update of the module connected to the same ACCO-NT control panel.*

10. Control panel firmware update

10.1 Local update of the control panel firmware

On the **www.satel.eu** website, you can find the latest version of ACCO-NT control panel firmware and the program for updating control panel firmware. In order to replace the firmware:

1. Connect the USB MINI-B port on control panel electronics board with the computer USB port by means of a suitable cable.
2. Run the update program for control panel firmware. A window will open with information on the available version of control panel firmware and the MAC address of the connected device (if only one control panel is connected to the computer).
3. Click on the [button image] button.
4. If two or more control panels are connected to the computer, a list of connected devices will be displayed. Select the control panel whose firmware version is to be updated and double click on it.
5. If just one control panel is connected to the computer, the program will automatically start comparing the control panel firmware version with that available for update.
6. After the comparison is completed, information on the firmware version will appear, as well as the version number of control panel starter.

7. In the window that will be displayed, confirm your intention to carry out the firmware update.

8. After the procedure of firmware update is finished, respective information will appear in the window, followed by restart of the control panel. All LEDs indicating the current status of control panel and communication on control panel board will start flashing. When the MAC number of control panel reappears in the program window, the device will be identified in the system. Disconnect the control panel from the computer.

9. Now you can start programming the system.

10.2 Remote update of the control panel firmware

You can update the control panel firmware remotely from the ACCO Soft program. For description of the remote update procedure, please refer to the program manual.

10.3 Emergency procedure of the control panel firmware update

If the process of control panel firmware replacement fails, follow the procedure below:

1. Power off the control panel.
2. Disconnect the wires connected to CK and DT terminals of control panel.
3. Short together the control panel CK and DT terminals.
4. Power on the control panel. All LEDs will come on for 2 seconds, and then only the PWR LED will come on steady.
5. Open the control panel CK and DT terminals.
6. Start the program for updating the control panel firmware and update the control panel firmware according to the procedure described in section "Control panel firmware update".

11. Specifications of ACCO-NT control panel

Number of programmable inputs	8
Number of outputs: low-current, OC type	8
high-current, power supply	3
Supply voltage	12 V DC ±15%
Standby current consumption	100 mA
Maximum current consumption	140 mA
OC type outputs	50 mA / 12 V DC
+EX output	0.5 A / 12 V DC
AUX outputs (total)	0.5 A / 12 V DC
Supported memory cards	microSD, microSDHC
Environmental class	II
Operating temperature range	-10°C...+55°C
Maximum humidity	93±3%
Electronics board dimensions	150 x 68 mm
Weight	92 g