OUTPUTS EXPANDER WITH POWER SUPPLY
CA-64 OPS-
OC/R/ROC

CE

The CA-64 OPS-OC (R; ROC) expander is a device designed to interface with the CA-64 alarm control panel. It makes possible expansion of the alarm system by eight outputs having the same functional features as the main board outputs. The module has a built-in power supply of a 2.2A capacity. It is also fitted with short-circuit protection of the supply output and with battery charging and testing circuits, providing for disconnection of discharged battery. The expander comes in three versions which differ from each other by the type of their outputs:
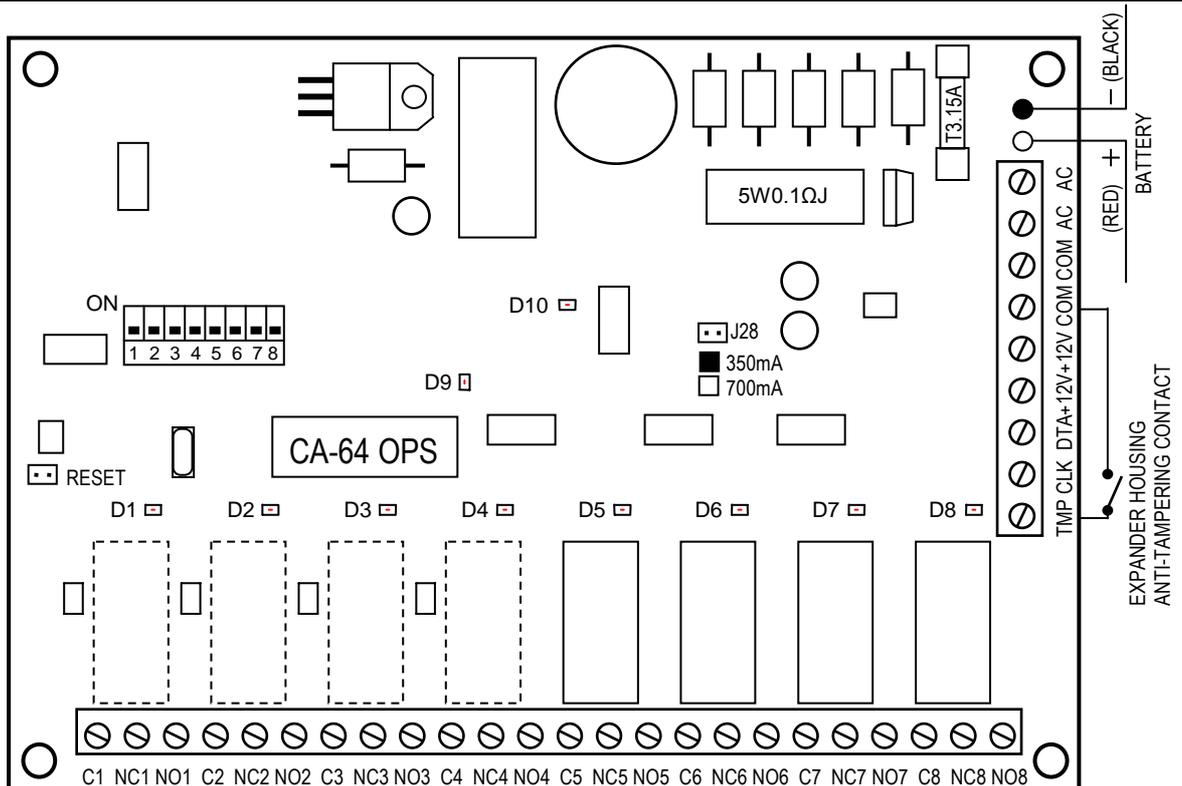
CA-64 O-OC   expander with 8 OC type outputs,
CA-64 O-R   expander with 8 relay type outputs,
CA-64 O-ROC expander with 4 OC type outputs and 4 relay outputs.

Each of the outputs is individually programmed and can be assigned one of a few dozen types of the output signal.

MODULE DESCRIPTION

Fig 1. View of expander board in „ROC" version (4 OC type outputs plus 4 relay outputs).

EXPANDER TERMINALS:

C1 to **C8**	- OC type output or relay common terminals	**+12V**	- power supply output
NC1 to **NC8**	- relay terminals	**COM**	- ground
NO1 to **NO8**	- relay terminals	**AC**	- module supply 17...24V AC
CLK, **DTA**	- expander bus		
TMP	- expander anti-tampering circuit input (NC)		

The **AC terminals** serve to connect the secondary winding leads of a mains transformer. The value of the <u>alternating supply voltage</u> can be **17...24V**. The minimum value of input voltage at the **maximum load** of the transformer by the module is **16V** (AC).

The **set of switches** situated on the board serves to set up the individual expander address.

Ten LED indicators are provided on the board:

D1-D8 Eight LEDs situated next to the relays (or the places for relays), indicating the status of individual expander outputs.

D9 The LED situated near the address switches indicates the communication process between the control panel and the expander. During normal operation of the module, the LED is blinking with a changing frequency.

D10 The LED situated closer to the pins designated as **J28** is on when the battery status is being tested by the module and when discharged battery is being charged.
During testing, the processor will reduce the power supply voltage and the consumers will switch over to battery operation. The testing takes place every 4 minutes and lasts less than twenty seconds.

The **J28 pins** are intended to set the battery charging current:

350mA   - pins shorted,
700mA   - pins open.

The **two leads** (red and black) serve to connect the battery.

The **RESET pins** are used in the production process and are not to be shorted.

The **TMP** input is intended for connecting the anti-tampering contact of the expander housing and, if not used, it should be **shorted to ground**.

Also other electric energy consumers (detectors, modules without power supply, alarms, etc.) can be connected to the expander power supply. However, be careful so as not to cause an overload. It is advisable to prepare the power supply **load balance**. The total of current inputs for all consumers and battery charging current is not to exceed the capacity of power supply unit.
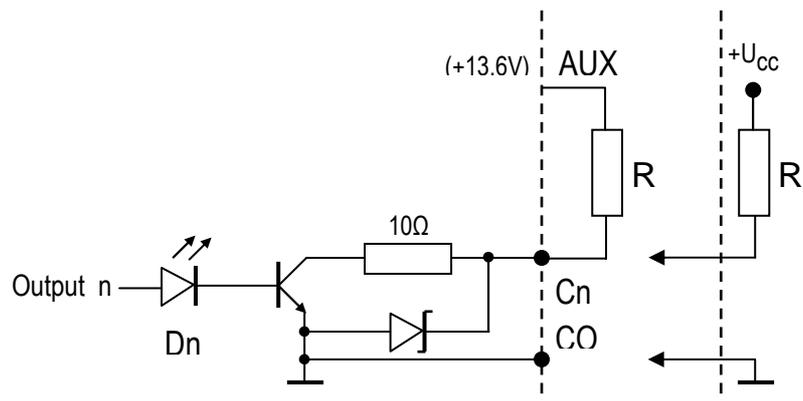

OUTPUT TYPES

The terminals C1 to C8 serve various purposes depending on the type of output.

OC TYPE OUTPUT (collector open)

The output intended for connecting the voltage controlled equipment (e.g.: radio messaging, alarms with own power supply). Direct connection of a load (e.g. a relay) to the output is possible provided such a load will not force a current flow in excess of 50mA through the output transistor. When the LED indicating the output status is on, the Cn output terminal is shorted to ground, and when the LED is off, the Cn terminal is isolated.

The output structure and the ways of connecting a load
are presented in the diagram
on the right.

R - load resistance
Dn - LED indicator
n - expander output number

RELAY OUTPUT

The output controls the status of the relay situated on the expander board. With this type of output the Cn, NCn and NOn terminals are galvanically isolated from electrical circuits of the expander. When the output status LED is on, the Cn terminal is shorted to the NCn terminal, whereas the NOn terminal is isolated. Consequently, when the LED is off, the Cn terminal is shorted to the Non terminal, and the NCn terminal is isolated. The output structure is shown in the diagram on the right.
Position of the contacts of the relay presented in the figure
refers to the condition, when
the LED is off.

P - relay winding
Dn - LED indicator
n - expander output number
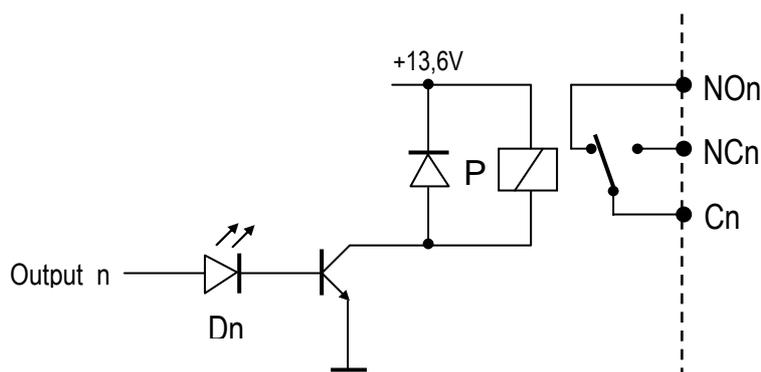
INSTALLATION

The outputs expander with power supply may be mounted in the CA-64 OBU-EXB housing (with a 50W transformer and a place for 17Ah battery). The housing makes possible installation of any type of expander with power supply and an additional inputs expander without power supply. Installation should begin with placement of distance pins inside the housing.

EXPANDER CONNECTION AND POWER SUPPLY ACTIVATION

The expander power supply unit should work being permanently connected to ~230V AC mains supply. Therefore, before you commence on the cabling work, make yourself familiar with the electrical system of the site. Choose a circuit that is always live to power the module. The circuit should be protected with a suitable fuse.

CAUTION ! Before connecting the power supply unit to the circuit it is to be supplied from, switch off voltage in that circuit.

Prior to the commencement of connecting the module to the existing alarm system, turn off power supply of the whole system.

The first-time expander activation is recommended to be carried out without battery connected. The expander power supply is provided with safeguards which make it possible to avoid damage to alarm system components as a result of installation faults.

1. Secure the expander board on the distance pins installed in the housing.

2. Connect the bus leads (the first bus: CK1, DT1, COM; the second bus: CK2, DT2, COM - as designated on the control panel main board) to the terminals CLK, DAT and COM. Up to 32 modules of various types can be connected to one bus. 6 outputs expanders can be installed in the system (the total - maximum - number of outputs is 64). For details concerning the cable connections, see the CA-64 alarm control panel manual „System Description and Installation".

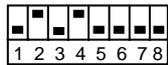3. Using the switches, set up the expander address.

   The address is to be set up by means of the switches 1 to 5. Status of the other switches (6, 7, 8) is irrelevant. In order to determine the expander address, add the numbers corresponding to the switches set in position ON, according to the table:

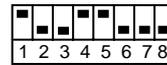 | Switch number | 1 | 2 | 3 | 4 | 5 |
   |---|---|---|---|---|---|
   | **Numerical equivalent** | **1** | **2** | **4** | **8** | **16** |

   Examples of addressing:
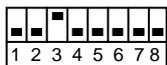
    address = 4   address =2+8=10   address =1+8+16=25

   Five switches allow addresses to be assigned to 32 expanders (Numbers from 0 to 31).

   Addresses of expanders connected to one bus may not be repeated, while the sequence of addressing is optional.

4. Connect the leads of the controlled equipment.

5. Connect the leads of the housing anti-tampering contact to the TMP. Where two expanders are installed in the housing, the TMP input of one of them is to be shorted to ground, and the contact leads are to be connected to the TMP input of the other expander.

6. Connect the consumer power supply leads to the terminals +12V and COM on expander board.

7. Connect the 230V alternating voltage leads to the transformer terminals marked "AC 230V".

8. Connect the wire of the electric shock protection circuit to the terminal block provided next to the transformer and marked with the ground symbol ⏚ . This circuit should also be connected to the control panel protective terminal.

CAUTION! As the expander module has no switch to permit of disconnection of the mains supply, it is important that you inform the owner or user of the equipment, how to disconnect it from the mains (e.g. by showing him the fuse which protects the expander supply circuit).

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9. Connect the alternating voltage transformer lead-outs to the terminals designated with the "AC" symbol on the expander board. Do not connect two expanders with power supply to one transformer.

10. Using the J28 jumper, set up the battery charging current (350mA or 700mA).

11. Switch on the expander ~230VAC power supply. Measure the voltage on battery cables, making sure it has the correct value of approx. 13.7V, and check that all consumers are properly powered.

12. Switch off the module power supply and connect the battery. The module will not become active on connecting the battery alone. The processor enables the module power supply to be switched over to battery operation after about 12 seconds of steady-state voltage at the AC terminals (as from 230V AC mains switching-on).

NOTE: *If the battery voltage drops below 11V, the module will signal battery malfunction to the control panel, and when the voltage drops to abt. 9.5V, the battery will be disconnected.*

When all the connections are completed and checked for correctness, you can proceed to activating the expander inputs.

MODULE ACTIVATION

NOTE: *In systems having expansion modules with their own power supply, it is recommended to start the panel first, and then the other components of the system.*

1. Switch on power supply of the alarm system and the expander (the D10 LED will go on and shine with steady light).

2. Call the function „*Identify expanders*" (→Service mode; →Structure; →Hardware) from the keypad. The D10 LED control should start blinking. After completion of the identification, all the **new** inputs will have been programmed to the factory defaults, the output type being set to zero (not used).

3. Using the DLOAD64 program, set the output parameters.

4. End the service mode operation, saving data in the FLASH memory.

NOTE: *In the process of identification, the control panel is saving in the expander memory a special (16-bit) number, which serves to check the expander presence in the system. Replacement of the expander with another (even one having the same address set up on the switches) without a new identification will trigger an alarm (module tamper - verification error).*

NUMERATION OF OUTPUTS

The identification function automatically sets up numeration of outputs in the system. The numbers 1-16 belong to the main board outputs. Further numbers are assigned to the first bus expander outputs (from the lowest to the highest expander address), and then to the second bus outputs expanders. This should be borne in mind when installing new expanders in the system. If the new expander address is lower than the address of an expander previously installed in the system, or where an expander is added to the first bus, and there is already another expander connected to the second bus, the identification function - according to the principle described above - will shift the numeration of outputs between the expanders. The new expander will take over the output numbers of the previously installed expander, which, in turn, will be given the numbers of new outputs added to the system. If this is the case, the previously assigned expander output numbers can be restored by means of the DLOAD64 program. To do so, call the function „*Advanced settings*" (→Structure; →Hardware).

TECHNICAL DATA

Number of outputs 8
Supply voltage .... AC 17V...24V
Internal power supply voltage, rated .... 13.6V...13.8V
Power supply current efficiency 2.2A
Battery charging current (switch-over) .... 350mA or 700mA
Current consumption (with no load of OC type outputs or active relays) 36mA
Current consumption by active relay 20mA
OC type output current-carrying capacity 50mA
Maximum voltage switched over by relay 24V
Maximum current switched over by relay 2A
Dimensions .... 101x142 mm

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