4-channel identification receiver type

>>> IDO-1000 <<<
>   v1.12   <

Operating manual

Version 1.00

1. Table of contents

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2. IDO-1000 receiver characteristics

2.1. Field of application

Common fields of application of IDO-1000 receiver are as follows:
- entrance gates and exit gates of buildings and estates,
- user identification systems connected with switching-on and switching-off of various actuators, signaling devices, gates, engines, etc.,
- devices remote control systems.

2.2. IDO-1000 receiver basic features

- memory up to 1000 transmitters (remote controls)
- memory up to 1024 events (presses)
- information about transmitters (26 chars) shown on the display
- separate resetting of transmitters from the relay's memory
- low battery alert
- improper amount of „presses" alert (for instance hacking attempt by means of an intercepted code)
- selection of one of 4 relay working programs for each remote control
- full Keeloq system operation (manufactured by Microchip) with a so-called rolling code
- clock events (alerts) triggered off when the real-time clock reaches a given date and hour
- direct or alternating current supply (9-24V)
- built-in antenna or Digital Line Amplifier connection (jumper optional)
- PC joint connection (RS232 cable included)

2.3. Short operation description

Having connected IDO-1000 to a power source, the device undertakes the autotest procedure. It will inform the user in case of a critical error. If the test is considered positive, the display will show information concerning software version.

```
>>> IDO-1000 <<<
>      v1.10      <
```

Several seconds later it displays a clock (or other notice).
From this very moment the receiver reaches the state of watch. If any Keeloq system transmitter was used in its vicinity, IDO-1000 shifts into data frame decoding.
The frame sent by the transmitter comprises of, among others, serial number of the transmitter, number of the pressed button (key) and a press-o-meter.
IDO-1000 searches in the transmitter's memory of an appropriate serial number and checks the press-o-meter. In case of finding one, IDO-1000:
- initiates a proper program associated with relay operation, depending on the pressed button,
- information concerning the transmitter are shown on the display
- transfers information concerning the transmitter on RS232 port.

A model operation:

NAD-0002/03!BAT!
Jan Kowalski ul.

The display shows information about the transmitter's number (0002) and the button used (03). What is more, it has low battery (!BAT!)
The transmitter's name is winding below its number (Jan Kowalski ul. Cicha 102).

An example of printout created during IDO-1000 operation is presented below:

```
2009-06-03  15:11:45  NAD-0002/02  -----  Jan  Kowalski  ul. Cicha  102
2009-06-03  15:11:49  NAD-0001/05  -----  Ireneusz  Nowak  ul.Prosta  3
2009-06-03  15:11:50  NAD-0002/02  -----  Jan  Kowalski  ul. Cicha  102
2009-06-03  15:11:53  NAD-0007/01  !BAT!  Piotr  Wysoki  ul.Kreta  33/1
2009-06-03  15:11:54  NAD-0007/01  !BAT!  Piotr  Wysoki  ul.Kreta  33/1
2009-06-03  15:11:56  NAD-0002/02  -----  Jan  Kowalski  ul. Cicha  102
2009-06-03  15:11:56  NAD-0001/06  -----  Ireneusz  Nowak  ul.Prosta  3
2009-06-03  15:12:00  NAD-0002/02  -----  Jan  Kowalski  ul. Cicha  102
```

It can be seen that transmitter 0007 has low battery that needs exchanging.

When no transmitter is found in the memory, IDO-1000 reacts by a short sound and animation seen in the top right corner of the display.

3. Relays and their working modes

3.1. Relays
IDO-1000 possesses 4 relays of 10A contact rating.
Only joints NO (Normally Open), C (Common), NC (Normally Closed) are connected with the terminal block.
The relay is considered as working when a diode over it is on.
When it is working, NO joint is shortened with C joint and NC joint is shortened with C joint.

3.2. Relays' working modes
Every relay may work in any of the following modes. The way which relay works in which mode depends on: firstly, on the program ascribed to a given relay; secondly, on the button used in a given relay.

The available relay working modes are presented below:

No.	Mode	Abbrev.	Description	Working time	Delay	Applications
1	monostable	M__	the relay is switched on on a given period of time	optional: timer0, timer1, timer2, timer3	n/a	- entrance gate operation (for instance joints shortage for 2 seconds)
2	monostable delayed	Mo_	the relay is switched on on a given period of time after a given delay time	optional: timer0, timer1, timer2, timer3	optional: delay0, delay1, delay2, delay3	- opening of subsequent door after a given period of time
3	monostable with early reset	M_k	the relay is switche d on on a given period of time and the button's reuse causes the relay's switch-off	optional:timer0, timer1, timer2, timer3	n/a	- switching-on the light (for instance for night-time) with earlier switch-off possibility
4	monostable delayed with early reset	Mok	the relay is turned on on a given period of time and the button's reuse causes the relay's turn-off	optional: timer0, timer1, timer2, timer3	optional: delay0, delay1, delay2, delay3	- designing lighting „tracing" the user with early switch-off option
5	bistable	B__	the relay is switched into opposite state	n/a	optional: delay0, delay1, delay2, delay3	- opposite state necessity control (mixing unit)
6	bistable delayed	Bo_	the relay is switched into opposite state after a given period of time (delay)	n/a	optional: delay0, delay1, delay2, delay3	- opposite state necessity control (mixing unit)
7	turn-on	Z__	the relay is turned on permanently after a given period of time (until another mode is activated or there is no supply voltage)	n/a	n/a	- lighting control
8	delayed turn-on	Zo_	the relay is turned on permanently after a given period of time (until another mode is activated or there is no supply voltage)	n/a	optional: delay0, delay1, delay2, delay3	- night lighting control
9	switch-off	W__	the relay is switched off permanently after a given period of time (until another mode is activated)	n/a	n/a	- lighting control
10	delayed switch-off	Wo_	the relay is switched off permanently after a given period of time (until another mode is activated)	n/a	optional: delay0, delay1, delay2, delay3	- night lighting control
11	temporary	C__	the relay is turned on as long as the transmitter's button is pressed.	n/a	n/a	- control depends on the stroke time
12	no action	___	no relay state change	n/a	n/a	

3.3. Working times and delays

In case of the monostable modes, the selection of one of four timers counting down the relays' working time is possible (each of them is set within the range of 0-24h with 0,1s step).
In case of the delayed ones the selection of one of four timers counting down the time necessary to the program's start (each of them is set within the range of 0-24h with 0,1s step).

3.4. Clock events

Up to four so-called clock events can be configured within IDO-1000 receiver, e.g. events occurring when the real-time clock (RTC) reaches a given date and hour. The clock events are assigned to transmitters 1001-1004 and treated so as a common transmitter would have been used (all relay working modes are available). This feature allows to control the relays automatically on specific hours.
What is more, a „no-matter" digit can be assigned when date/hour is being described. It enables the clock events to be triggered off in a cyclical pattern.

Example 1:
We want to use IDO-1000 to turn off the lights on the staircase.
We set the date/hour of this event on:
`20**-**-**  23:00:00` - what causes that the clock event will be done everyday at 23:00:00 in the years: 2000-2099.

Example 2:
In July (when we are on holiday) we automatically switch the aquarium filter on.
We set the clock event:
`20**-07-**  15:00:15`   it will be done in July at 15:00:15.

Example 3:
In December, from 19:00 to 21:00, we want to switch the information board on and off consecutively.
We employ here two clock events:
The first clock event is designed to control the relay from 19:00:00 to 19:59:59
`20**-12-**  19:**:**`
The second clock event is designed to control the relay from 20:00:00 to 20:59:59
`20**-12-**  20:**:**`
In both cases we use the same button and program number which should be programmed as bistable. It will be done every second from 19 to 21.

4. Operation

IDO-1000 is controlled by means of NO, -, +, YES buttons:
- the YES button serves as an entry to the menu and its submenus, as well as an acceptance of the selections made,
- the NO button serves as an exit from the menu and its submenus, as well as cancelation means of all selections and operations,
- the „-„ i „+" buttons help choose an option from the menu, as well as change various parameters.

4.1. Main menu   - available after pressing any button.

4.1.1. Relay learning - Nauka nad. [Relay learn.]

Allows to program remote controls (transmitters) to IDO-1000 memory. Having found a free space in the memory, IDO-1000 requests for pressing the transmitter being implemented two times.

4.1.2. Relay reset - Kasowanie nad. [Relay reset]

We choose the desired transmitter to be reset by means of +/- buttons and accept the choice by pressing the „YES" button. When the remote control number is displayed, the * mark means that the memory is full (remote control programmed in compliance with IDO-1000).

4.1.3. Program selection - Wybor scenar. [Program sel.]

Allows to choose the relay working program assigned to a given remote control. The first thing to do is to choose a transmitter and then the program should be selected, which will be activated by means of this transmitter.

4.1.4. Events log - Historia zd. [Events log]

Allows to browse events in the receiver's memory.
The event can be selected by +/- buttons. The display shows: on the left date and hour of the event, on the right its number, on the bottom the remote control's and button's number.

        09-05-28 ab12 B!
        11:53:20 0002/02

'B' and '!' symbols may be seen in the top right corner of the display - they mean low battery and inadequate value of the press-o-meter (more details can be viewed in the section for advanced users).

4.1.5. Other options - Pozostale [Other opt.]

4.1.5.6. Relay learning with place selection   Nauka nad. z wyborem [Relay learn. with place sel.]

Allows to select such memory space, within which the transmitter will be programmed.

4.1.5.7. Events selection-based sending Wysylanie zd. z wyborem [Events sel.-based send.]

Allows to choose the first and the last event in the memory and transfer it to a computer or a printer.

5. Interaction with computer and printer

IDO-1000 has a built-in RS232 port (described on the circuit board as PC) enabling to connect it to a PC computer. In order to use IDO-1000 in full, it is necessary to operate a computer with software installed from the disc included in the unit.

It is also possible to connect IDO-1000 to any serial printer (for instance a thermal one, KAFKA type). The printer will be constantly printing date, hours, numbers and names of the transmitters received. It is feasible to transfer the IDO-1000 events log to a printer or computer, too.

6. Display options

IDO-1000 can be set so as the display in the standby mode will show:
- current time,
- current date and time (displayed consequently)
- the transmitter recently turned on
- notice implemented by the user

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7. Advanced options

The transmitter in the Keeloq® system sends information about the battery condition. If IDO-1000 receives such information, that the transmitter has low battery, the display and the printer (or computer) will show !BAT! notice. Even in the events log, along with the event number, a 'B' letter appears meaning that the given device has low battery.

In the Keeloq® system the transmitter also sends a coded, internal press-o-meter reading, which is being increased of 1 per 1 button stroke.
IDO-1000 checks, if any incoming information from the transmitter possesses an appropriate press-o-meter reading.
The possible situations are as follows:

- the press-o-meter reading sending by the transmitter is 1 higher than the previously remembered one - an usual situation;
- the press-o-meter reading is higher not more than 16 than the previously put down one - an usual situation but the user wasted his/her time on the device; the Keeloq® system allows to press the transmitter button 16 times with no consequences taken;
- the press-o-meter reading is higher more than 16 than the previously saved one, but not more than 32768 - then IDO-1000 switches into the press-o-meter re-synchronization state; in such a situation the first use of the transmitter is of no effect, only the second one causes the meter to be updated in the memory and the relays to be turned on; the display shows !SCN! symbol next to the transmitter number;
- the press-o-meter reading is lower or higher more than 32768 from the memory state; in such a case IDO-1000 claims that the remote control to be damaged, false readings occurred during the transmission or a person tries to act as a transmitter; then the information regarding the transmitter will be written in the IDO-1000 memory but the transmitters will undertake no program; the display shows !LNA! symbol, whereas along the event number in the event log a '!' will appear.

It should be remembered that the press-o-meter's reading sending by the transmitter is coded and any „forgery" of its factual value is impossible. Taking this into account, the probability of choosing a proper code is lower than 1 to $7,38 \times 10^{19}$ (according to the Microchip records).

IDO-1000 receiver interacts with any Gorke Electronic transmitter (except for NRP-102K). Working ranges, depending on the transmitter's type, amount up from 200 to 1000 meters (apply to open space, when the transmitter and receiver „see each other").

8. Technical data

Power supply:

Supply voltage:	9-24V of alternating/direct current
Current input in standby mode:	0.09A (Uzas=9V), 0.05A(12V), 0.03A(24V)
Maximum current input:	0.34A (Uzas=9V), 0.24A(12V), 0.12A(24V)

Radio part:

Superheterodyne receiver

Frequency:	433MHz
sensitivity:	-115dBm
aerial cell:	BNC, 50Ω
aerial:	rod 1/4λ provided

or

WLC receiver (not included in the unit)

Receiver standard:	Keeloq ® produced by Microchip
	Keeloq ® produced by Microchip

Relays

Number:	
Contact rating :	4
	10A/277V AC
	12A/125V AC

Transmitter memory:

Transmitter description:	1000 transmitters
Events log:	maximum 26 chars
	1024 events

Display:

Char type:	
Backlight	2 lines, 16 chars each
Contrast:	LED, PWM-controlled
	regulated by means of a potentiometer

Clock

Real-time clock with calendar
Battery-supplied

Battery type:	CR1220

Clock events (alarms)

Number	4
Assigned transmitter number	1001-1004

Timers

Monostable mode regulation range	0-23:59:59 with 0.1s step
Delay regulation range	0-23:59:59 with 0.1s step

The timers are not synchronized with the real-time clocks.

Others

Tamper joint (SAB) :	opened during the casing's opening
sound signaling device	

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IDO-1000 Configuration program **(v1.12)**

Delivered along with IDO-1000 receiver, it allows to its full use and enables:
- naming the transmitters (or remote controls),
- checking the IDO-1000 memory condition,
- selecting program of the assigned transmitter,
- creating working relay programs,
- configuring relay working times and delays, - selection of information shown on the IDO-1000 display,
- configuring clock events,
- resetting all IDO-1000 memory,
- receiving events from IDO-1000.

IDO-1000 Configuration program operation

In order to connect IDO-1000 to a computer with IDO-1000 Configuration program, the cable included in the unit should be used. It should be inserted into a free COM computer port from one side and to „PC" joint on the IDO-1000 circuit board from the second. The plug has an appropriate notch allowing to put the cable correctly into.

Then the IDO-1000 Configuration program should be started and the serial port should be chosen, through which the communication with IDO-1000 will be made.

The program comprises of a row of bookmarks, in connection with which the receiver's parameters should be configured.

All IDO-1000 settings can be fully deciphered (by the „READ ALL SETTINGS FROM IDO-1000" button) and later edited or, on the subsequent bookmarks, re-deciphered, amended and saved into IDO-1000.

These settings can also be saved to IDO-1000 (by the „SAVE ALL SETTINGS TO IDO-1000" button).

### „REMOTE CONTROLS" bookmark

It allows to assign names to remote controls and preview the IDO-1000 memory contents.

The bookmark's central place is occupied by a sheet displaying the IDO-1000 memory state. Every programmed remote control (transmitter) is symbolized by „#" mark.

Clicking on a given place on the sheet we select a proper transmitter and it may be named and has the program set in case when the signal will be received.

Edition of individual transmitters is also possible. In order to do that, buttons „READ A GIVEN REMOTE CONTROL FROM IDO-1000" and „SAVE THE SELECTED REMOTE CONTROL TO IDO-1000" buttons. It allows to edit the transmitter quickly without reading all IDO-1000 memory (it usually lasts around a minute).

It can be seen that in this receiver 6 transmitters are programmed. The chosen one i no. 5. Its name is displayed in the window below the sheet.
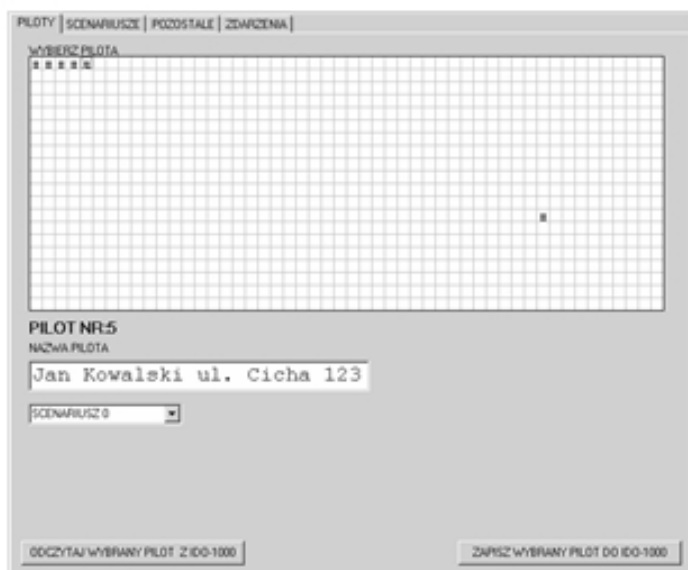
*[**Legend**: PILOTY - Remote controls, SCENARIUSZE - Programs, POZOSTAŁE - Others, ZDARZENIA - Events, WYBIERZ PILOTA - Select remote control, NAZWA PILOTA - Choose a control, ODCZYTAJ WYBRANY PILOT Z IDO-1000 - READ A GIVEN REMOTE CONTROL FROM IDO-1000, ZAPISZ WYBRANY PILOT DO IDO-1000 - SAVE THE SELECTED REMOTE CONTROL TO IDO-1000]*

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„PROGRAMS" bookmark

Allows to manage the relays working programs.
4 independent ones can be chosen. Each of them reveals operation details of every relay depending on the transmitter's pressed button together with their working times and delays.

Having clicked on the bookmark, a table presenting the current relay mode for all transmitters' buttons is seen. Buttons from 1 to 14 and relays from 1 to 4 are available. Clicking on the intersection between „RELAY" („PRZEKAŹNIK") and „BUTTON" („PRZYCISK") columns, there is a possibility of selecting:

- program
- working time timer (for monostable modes)
- delay timer (for delayed modes)

Having selected an appropriate button and relay, further configuration shall be made in the „WORKING MODE" („TRYB DZIAŁANIA") window.

We select the relay working mode (that is its reaction on pressing a button) - monostable, monostable delayed, monostabled with reset, bistable, bistable with reset, turn-on, delayed turn-on, switch-off, delayed switch-off, temporary and no action.
Below we choose timer (clock) counting down the relay working time (for monostable modes).
Then (lower) we choose the delay with which the given mode will be started (for delayed modes).
If for any chosen mode (monostable, for instance) the „delay" has no sense, further options are unavailable.
Timers working times can be set in the table „TIMERS, DELAYS" („TIMERY, OPÓŹNIENIA"). Choose TIMER0-3 and DELAY0-3.
Time can be set from 0.1s to 23:59:59.1s

Having adjusted all program parameters, they can be transfered to IDO-1000 by means of the „SAVE PROGRAMS TO IDO-1000" („ZAPISZ SCENARIUSZE DO IDO-1000") button - it should be remembered that the current IDO-1000 settings will be overwritten.

The „DEFAULT CONFIGURATION" („USTAWIENIA DOMYŚLNE") button triggers off loading of the most common programs used in installations.
The systems' configuration system (modes, times, delays selection) allows to unlimited relay reactions arrangement by means of pressing the transmitters' buttons. It should be remembered that loading of new relay working mode causes inactivation of the old mode. For instance, when we set the monostable mode for a given relay, its working time for an hour and we switch the relay on, and at the same time for the same relay we activate the bistable mode, the monostable one will be deactivated. After an hour there will be NO relay switch-off. The monostable mode have been substituted with the bistable one.

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„OTHERS" bookmark

Allows to set the clock in IDO-1000 and the display condition, as well as configure the clock events and fully delete the receiver's memory.

In the „DISPLAY" („NA WYŚWIETLACZU") section we may implement a piece of information which can be seen on the display in standby mode. We can select:
 - the clock,
 - the clock and date alternately,
 - the latest transmitter received and found in the memory
 - a notice set by the user (for instance a commercial banner, telephone number, etc.)

Using the „READ OUT OF IDO-1000" and „SEND TO IDO-1000" („ODCZYTAJ Z IDO-1000" i „WYŚLIJ DO IDO-1000") buttons, information concerning the display state may be received from and sent to IDO-1000.

In the „CLOCK EVENTS" („ZDARZENIA ZEGAROWE") section we can configure all events triggered off in the very moment of reaching by the clock a given hour and date.

Such events are described as transmitters 1001-1004. Any event may be determined by hour and date when it shall be revealed with the possibility of entering the „*" mark, meaning any value of a given parameter. We define the button and the program occurring in the moment of reaching a given date and hour, set the event name and claim whether it shall be active or not. Using the „READ OUT OF IDO-1000" and „SEND TO IDO-1000" (ODCZYTAJ Z IDO-1000" i „WYŚLIJ DO IDO-1000") buttons, we can quickly receive and send the settings to IDO-1000. The clock events system enables (along with connecting relays parallel or in series) some processes to be automated. For example, it can be arranged that opening a gate will be possible only from 7:00 to 20:00, that the light will be automatically turned off or on, etc.

The „DELETE IDO-1000 MEMORY" („SKASUJ PAMIĘĆ IDO-1000") button causes the IDO-1000 receiver's memory to be completely deleted (both the transmitters' and the events' memory).

„EVENTS" bookmark

Allows to peek at events coming out of IDO-1000. It shall be remembered that activating this function blocks data receiving and sending on all other bookmarks.

The „RECEIVE THE EVENTS LOG FROM IDO-1000" („ODBIERZ HISTORIĘ ZDARZEŃ Z IDO-1000") button gets the events from the receiver.

The „SAVE TO FILE" („ZAPISZ DO PLIKU") button allows to save a window's content to a text file.

The „PRINT" („DRUKUJ") button prints a window's content on a default printer.

In order to receive the events from IDO-1000, any terminal program may be used, setting the connection parameters as follows:
- speed 9600 bits/sec
- word count: 8 bits
- parity: no
- stop bits: 1

9600/8N1 in brief.

An example of events reception from IDO-1000, by means of the Hyper Terminal program (in Windows OS), is presented on the right.