

This receiver is designed to use in remote control and access control systems with large number of key-fob transmitter users and required high level of access control verification security. To achieve intended functional performance the receiver includes the following features & functions:

- 448 key-fob transmitter user memory (model RD1-448) or 1000 key-fob transmitter users memory (model RD1-1000),
- possibility of deleting a single key-fob user without need to clear entire user memory,
- high security KEELOQ® dynamic code hopping key-fob user identification system,
- three digit bright LED display for user number display, easy programming, user learning and deleting,
- very sensitive radio superhet receiver allowing better data signal selectivity and better operating range,
- non-volatile memory log of last 6144 events (model RD1-448 only) including date, user number and key-fob button,
- TAMPER switch for receiver's case opening detection,
- wide range of power supply voltages: 10...35VDC or 24VAC.

Operation.

The use of a key-fob transmitter earlier learned to the receiver's memory sets on its one of two relay outputs for:

- certain user programmed period of time (pulse – mono stable operation), or
- until a next use of key-fob transmitter is made (on/off - bistable operation).

The digital LED display will indicate number of used key-fob transmitter while receiver's power on LED will change color (only if output one is set to on). Two pulses signal on relay set on and one pulse signal on relay set off would be generated at the receiver's signal output S. Also, the event will be memorized in non-volatile event memory log for future reference.

Event memory log.

The receiver is capable of memorizing last 6144 events. Every time a valid command from key-fob transmitter is received, it's user number (0...447) is registered in the memory log along with information on used transmitter's button (0..1) and current time. The content of the receiver's event memory log may be read/printed out for reference or verification with the help of external personal computer (PC). Connection of the receiver and the PC is made through a voltage conversion cable RS232(+12/-12V)<->TTL (0/5V) connected to the PC's RS232 serial bus. Schematic diagram of the cable is shown further on in the manual and the cable may be ordered from receiver seller. Dedicated software in English "RD reader" supporting data log reading may be downloaded free from manufacture's web site www.elmes.pl. The software allows reading out and saving of event chronological data log to PC in form of Microsoft Access® (*.mdb) data base file. Advanced editing and report listing of the *.mdb data file content may be done using Microsoft Access®, Lotus Approach® or Open Office® commercial software.

RD receiver users are advised to read out the event memory data log the more frequently the higher the number of key-fob transmitters in the receiver's memory. In a sample system with 448 key-fobs and their estimated double use daily, receiver's event log will overflow after approximately 6 days. New event data is overwritten on existing data log in the memory.

Internal clock-timer.

Though the RD receiver's memory is non-volatile type protecting data content in case of power cut off failure, the internal clock timing device is not protected and will stop on power off. Registered event data after power supply is restored will therefore have incorrect timing, proportionally to the power cut off timing. In order to maintain correct event timing, a battery backup power supply of the receiver must be used.

The RD1000 model. In this version, entire RD memory is allocated to extended 1000 user key-fob memory thus will not register any events.

Access Control.

As mentioned earlier, the event memory log may be read out with special PC software support for external back up, listing and edition. Additionally, thanks to the microprocessor special operating mode obtained by shorting its 5th and 6th pins, the RD receiver may be used to form a unique access control and user rejection system. In that case, key-fob transmitter number of every received command is made available at TX series output (*). If then, within 100ms time duration, a logical 0 is not forced to series RX connector, the receiver's relay output will remain off. This feature simplifies designing an access control system in which one or more key-fob users may be temporarily or permanently restricted from entering secured premises. **Important!** In this operating mode, the content of event memory log can not be downloaded to PC.

(*) In ASCII format as: "NNN-P" followed by CR and LF commands, where NNN stands for key-fob number and P (0 or 1) for button used.

Description of jumpers.

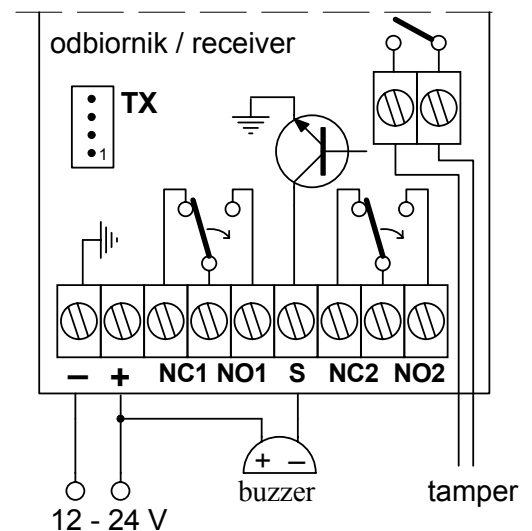
JP1 closed will result in key-fob number display for only 5 seconds. Opened will display last key-fob number until next key-fob is used.

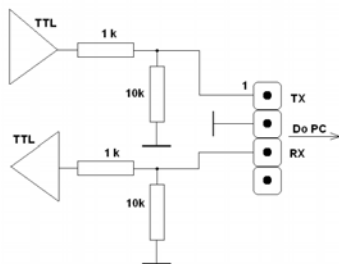
JP2 closed will result that only one output channel is active and responds to any user selected key-fob transmitter button. Opened, both output channels are active and respond to respective two buttons of used key-fob, e.g. buttons 1 & 2 or 3 & 4 of Elmes CH4H transmitter.

Installation.

RD receiver operates indoor at ambient temperature range from 0 to +40°C. Installation place should be dry and far from any electromagnetic power lines, radio transmitters, metal screening and other devices that may cause interference and reduce operation range. External antenna should be used via coaxial cable connected to receiver's ANT terminals if the receiver is to be installed inside any metal screened housing. Practical tests should be taken prior to firm installation to determine exact operation range. Standard wire antenna should be let loose downwards and not fixed or glued to ground.

Receiver's installation is shown on schematic diagram. The second channel relay outputs (NC2 and NO2) are not operational with jumper JP2 closed. Integral switching power supply of the receiver allows connection of wide range of external voltages ranging from 10...35VDC to 24VAC. **Important!** External buzzer can be connected to the DC voltage powered RD receiver only (see schematic diagram).





TX connector on the receiver's board allows communication with PC and features TTL (0/5) input/output voltage levels. Special cable interface converter based on MAX232 or similar must be used to connect RD receiver directly to a PC. The cable converts PC input/output signal voltages levels (+12VDC;-12VDC) to or from the TTL level required by the RD receiver and may be optionally ordered from distributor or manufacturer. The side diagram shows schematic of the RD interface converter as seen from side of the RD receiver. Details of the interface cable converter are also available at the manufacturer's web site www.elmes.pl.

PROGRAMMING PROCEDURES

1. Learning key-fob transmitter to receiver's memory cell and deleting selected cell content:

- press shortly (<2s) „+” switch in the receiver – the LED displays „PPP”. Releasing the switch will display **first clear memory cell** to which a key-fob transmitter may be learned.
- using „+” and „-” switches select required cell number (*). Flashed dots at cell number signal that the cell is not clear.
- press shortly (<2 s) „+” and „-” switches simultaneously:

if the cell is clear (dots off), learning a key-fob transmitter is started:
within 15 seconds key-fob button must be double pressed – the LED display will start flashing and the procedure will end. For learning next key-fob transmitter follow instructions at subcl. a above.

if the cell is not clear (dots on) key-fob deleting is started: - key-fob is deleted and the dots turn to off (back to subcl. b).

(*). Longer pressed switches allow faster memory reviewing.

Exit from the procedure is made automatically if no switch is pressed within 30 seconds or, after pressing „+” and „-” switches simultaneously for longer than 2 seconds.

2. Selecting the receiver's relay output time-lapse (pulse) or bistable (on/off) operation mode (possible with key-fob learned to RD receiver):

- press and hold „+” switch until receiver's LED displays „CCC” (more than 2 and less than 8 seconds).
- within 15 seconds press key-fob button (in two channel key-fob, the button of respective programmed channel). The receiver's relay output sets to on and the display will show the key-fob number.

For selecting time-lapse mode (pulse operation):

- After passing the required lapse time (from 0.25s up to 2 hours) press the key-fob button again – output relay sets off.
- After next two seconds displayed key-fob number starts flashing confirming correct end of the procedure.

For selecting bistable mode (on/off operation):

- Double press the key-fob button with less than 2 seconds interval - output relay sets off.

3. Deleting the contents of event memory log (applicable to RD448 only):

Press and hold receiver's „+” switch until receiver's LED displays „rrr” (more than 16 seconds). Releasing the switch starts deleting contents of memory that may last up to one minute.

4. Deleting all key-fob transmitters in receiver's memory:

The RD receiver does not allow deleting all key-fobs in one programming procedure. Key-fob transmitters must be deleted individually (see subcl.1 above).

Specification:

- key-fob transmitter and receiver operating band is 433.92MHz with key-fob memory capacity of 448 as standard,
- integral switching power supply allows wide range of external voltages supply ranging from 10...35VDC to 24VAC,
- max. current requirement with “888” digits displayed and both outputs on is 130mA at 10VDC, 100mA at 12VDC and 50mA 24VDC,
- standby current is 13mA at 10VDC and 8mA at 24VDC, max. output relay load is 1A (120VA/30VDC).
- operating temperature range from -20 to + 40°Celsius,
- signal output S (1A/60V) "open collector" type and generates pulses to receiver's ground (- of the supply voltage).

Warning! Under no circumstances output S can be directly connected to + of the supply voltage - series damage may occur!



Elmes Electronic declares that the product has been manufactured and tested to comply to the following standards: EN 60950-1 :2001 electric safety, EN 301 489-1 V1.4.1 (2002-08) EMC for radio equipment, EN 301 489-3 V1.2.1 (2002-08) EMC for Short Range Devices, EN 300 220-3 V1.1.1 (2000-09) EMC and Radio Spectrum Matters.

Manufacturer's Limited Warranty:

This product carries two year manufacturer's warranty as from the date of purchase. The warranty is limited to the replacement of faulty original parts or repair defects of improper manufacture. Damage, faulty use or improper handling by the user or installer as well as any changes in product's hardware or software caused by the user viods the warranty and all due repair costs will be charged. Elmes Electronic shall not bear liability for any personal or material damage resulting from any of its products direct, indirect or partial failure to operate properly.