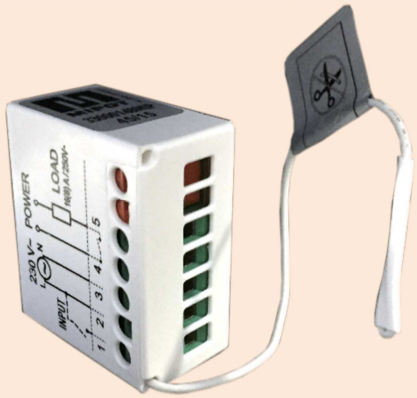
MINI-RECEIVER FOR RECESSED INSTALLATION WITH 230Vac MAINS OPERATION – 16 A

Product Code: **33000148MIP**

PRODUCT SUMMARY :



Extremely compact receiver for recessed installation capable to drive **loads up to 16 A**, powered directly from the 230 Vac mains.
A **single key** allows full programming of the and an **LED indicator** displays the state of the menu.

The radio frequency receiver is the **super-heterodyne** type, controlled by microcontroller with decoding functions, remote control learning and anti-noise digital filter.

The use of a SAW filter provides excellent selectivity and suppresses off-band signals, allowing the use of the product even in the presence of disturbances.

Power is supplied by an efficient low power supply (standby ≤1.5W), characterized by a wide range of operating voltage and is protected against over voltages on the mains input.

The module has been certified according to Radio Equipment **Directive (RED) 2014/53/EU.**
Compliant with **REACH** and **RoHS** directives.

APPLICATIONS :

Wireless actuator to control loads such as lights, motors, etc., intelligent management of lighting, adding spot lights, energy saving, actuators for home automation, etc.

MECHANICAL CHARACTERISTICS

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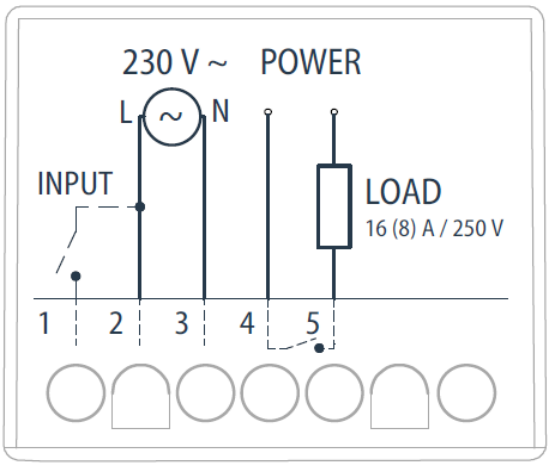

EXTERNAL DIMENSIONS :

Height	=	36 mm
Width	=	42 mm
Length	=	21 mm

TERMINAL BOARD CONNECTIONS :

1 – Local input
(*active when connected to 2*)
2 – power supply (line)
3 – power supply (neutral)
4 – relay common
5 – relay output

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ABS. MAX. RATINGS

Supply voltage:	253 Vac	
Output contacts current:	16 A / 4000 VA @ 250 Vac	Cosφ = 1
	16 A / 480 W @ 30 Vdc	Resistive Load
Max output current (with closed contact):	16 A	
Storage temperature:	- 10 to + 70 °C	
Operating temperature:	0 to + 40 °C	

ELECTRICAL CHARACTERISTICS

Parameter	*Min.*	*Typ.*	*Max.*	*Unit*	*Notes*
Supply voltage (Vac - 50/60Hz)	207	-	253	Vac	
Power consumption (Standby)	-	1,5	-	W	
Operating frequency (radio)	-	433,92	-	MHz	
Free space range	-	150	-	m	Note 1
Range inside buildings	-	20	-	m	Note 1
Nr. of storable remote controls	-	-	30	-	
Startup time	-	-	1	s	Note 2
Time for command execution	-	-	0,5	s	Note 3
Time for output status updating after blackout	-	-	0,5	s	Note 4
Minimum time between 2 consecutive command executions with local input	1	-	-	s	Note 5
Minimum time between 2 consecutive command executions with remote input	1	-	-	s	Note 5
Output contacts current VAC	-	-	16A/4000VA @ 250Vac	Aac	Cosφ = 1
			6,4A/1600VA @ 250Vac	Aac	Cosφ = 0.4
Output contacts current VDC	-	-	16A/480W @ 30Vdc	Adc	Resistive load
IP level	-	IP20	-	-	

Note 1: The estimated range has to be considered as purely indicative, since the reception is susceptible to interference due to other nearby devices operating at the same frequency as well as the nature and disposition of any obstacles interposed between transmitter and receiver.

Note 2: Time by power-on to valid data reception.

Note 3: Time by command transmission (pushing of remote or local key) and execution (activation of the relay contact).

Note 4: Time by power supply recovering after blackout to output status updating**.**

Note 5: Minimum time between the acknowledgment of a command and the following.

Note 6: unless otherwise specified, the measurements were performed at ambient temperature of 25 °C.

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GENERAL WARNINGS

- **This document contains important instructions for your safety and for a correct use of the device, please observe these specifications and keep them for the life of the product.**
- **The receiver has been developed to control single-phase electric devices such as lamps or motors not exceeding the maximum specified ratings, any other use is prohibited.**
- **The product is under dangerous electrical voltage.**
- **Do not open the product: no user serviceable part inside. Internal parts are under dangerous voltage even after disconnection from mains.**
- **All connections must be made in the absence of voltage.**
- **The device must not be used as disconnecting switch for live circuits: the opening of the output does not ensure in any way the absence of voltage on the controlled loads!**
- **If you open the local input during a voltage drop, at voltage recovery the output will be still active and under potentially fatal voltage!**
- **Prior to work on any loads controlled by the product, and in general on any connection upstream and downstream the product, you need to disconnect power to the entire electrical system where the product is connected!**
- **The installation of the device and the connected equipment should be performed by qualified personnel only, in compliance with current regulations and with this document; non-compliant installation can lead to serious danger.**
- **The product is intended to operate only within junction boxes or electrical socket boxes thus its casing does not have any degree of protection against ingress of liquids and only a basic protection against contact with solids (IP20). It is strictly forbidden to use the product in other than its intended use.**
- **Do not open or drill the plastic casing of the product, the underlying circuits are live; do not cut or strip the wire antenna since it is under line voltage.**

INSTALLATION

- **The controls (buttons or switches) and the connecting cables must have adequate insulation characteristics for use in electrical systems with an operating voltage of at least 300 VAC**
- **The device does not offer protection against overloads or short circuits on the outputs, it is therefore necessary to provide adequate protection to the loads installed (fuse or circuit breaker) on the power line.**
- **The power supply lines must be protected by means of a circuit breaker (2P or**

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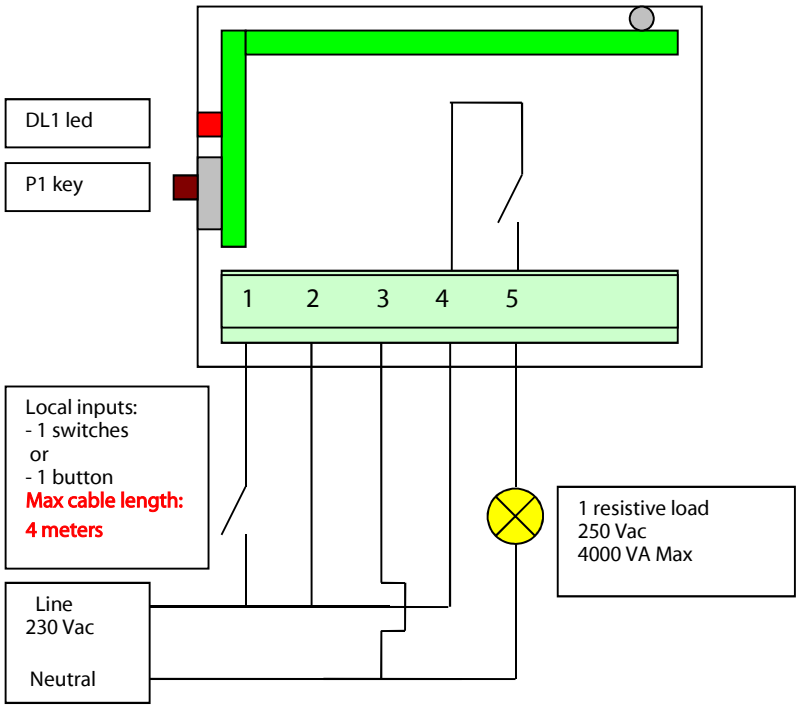
1P + N, Type B, rated current not exceeding 16 A, breaking capacity not less than 6 kA, with overvoltage category III or contact gap greater than or equal to 3.5 mm) with differential protection (2P or 1P + N, rated current of at least 16 A, Idn = 30 mA, for type B differential currents) ensuring the omnipolar sectioning from the mains in case of failure (provided indications refer to a typical installation in residential environments; the installation of the devices, the layout and size of the lines must be made by qualified personnel, we cannot accept responsibility for damage to persons or property due to installation not in accordance with applicable regulations and product specifications).
If the switching device is not close to the equipment you must have add another breaker device or a locking system to prevent the unauthorized connection.

- **Do not install the receiver in sections of SELV system plant (e.g. bell circuits, video, 12/24 V lights, LED circuits, etc.).**

- **The maximum length of the local input cables (terminal 1, see below) is 4 meters.**

SCHEMATIC WIRING INDICATIONS:



Schematic 1. Schematic indications for the control of one load

Warning: the maximum length of the cable connected to the local input is 4 meters.

Make sure the connections are correct before powering up the module: incorrect connection may damage the equipment and cause danger to personal safety.

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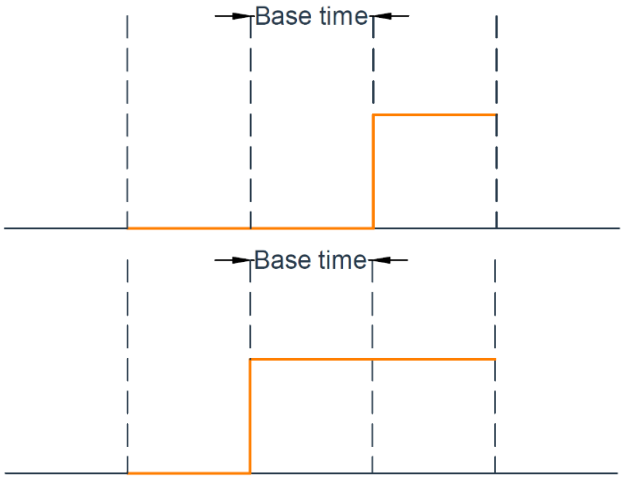
CHARACTERISTIC OF RECEIVABLE FRAMES

The receiver is capable to correctly recognize remote controls with either FIXED CODE or HCS (ROLLING CODE). The characteristics of valid FIX codes are:

- **Base time**: from 300 us to 1 ms
- **Start bit:** high for one base time duration
- **Format**:
  - **0 bit:** low signal for one base time duration followed by high signal for two base times
  - **1 bit:** low signal for two base times duration followed by high signal for one base time
- **Bit Amount**: from 12 to 40
- Minimum number of decoded frames: 2



“One” bit **“Zero” bit**

In case of fixed codes, the base time is measured during the learning process; the command is executed when a received frame has a base time within +/-10% of the measured value.

Note: if you learn rolling code remote controls, you cannot learn fixed code remote controls, and vice versa unless you erase the remote controls memory before. Simultaneous reception of fixed and HCS remote controls is not possible.

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1. DESCRIPTION

This receiver has been developed for recessed installation into wall outlets and permits the control of devices remotely or locally (e.g. via a control panel or standard wall-recessed switches) with a maximum 16 A load. It is directly powered from the 230 Vac mains. For remote operation, you can use any ASK or OOK remote control operating at 433.92 MHz, **FIXED or ROLLING code**.

1.1 General Characteristics

- Power supply: 230 Vac 50-60 Hz
- Operating frequency of radio receiver: 433.92 MHz
- Modulation: ASK/OOK
- 1 relay output: maximum current **16 Ampere**. Examples:
  - **Pmax (230 Vac) = 3680 VA** per **cosφ=1,**
  - **Pmax (230 Vac = (3680 x cosφ) VA** per **cosφ < 1**
  - **Pmax (115 Vac) = 1840 VA** per **cosφ =1,**
  - **Pmax (115 Vac) = (1840 x cosφ) VA** per **cosφ < 1**
- 1 local input
- 3 output control modes:
  - **monostable**
  - **bistable (factory default)**
  - **timed**
- Key for learning / configuration
- Led during learning / configuration
- **Up to 30 storable remote-controls** (the number is depending upon the coding used)

1.2 I/O terminal board

2 Description of I/O terminal board connections:

- **Terminal 1**: input (cabled) for local control of relay
- **Terminal 2**: power supply input (line/positive)
- **Terminal 3**: power supply input (neutral/negative)
- **Terminal 4**: relay common
- **Terminal 5**: relay output

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2. OPERATION

2.1. Remote input operation (remote control)

Pressing one of the buttons of the memory stored remote controls enables or disables the output of the receiver according to the functions described in paragraph **2.3 Functions Definitions**.

The remote controls buttons are learned individually (you cannot learn a whole remote button set just by learning one of its transmission keys). The remote controls are learned according to the procedure described in paragraph **0**

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RADIO PROCEDURES.

When you turn on the device, it informs the installer about the presence of previously stored remote controls:

- One LED flash of ½ second if there is at least one stored remote
- Two LED flashes if there are no remote controls stored

2.2. Local input operation (cabled)

The output functions of the device are the same as the previous case, besides that the command is not given via radio, but from a hardwired input.

The entrance is located on the local **terminal 1** and the change of state occurs when it is connected / disconnected to/from the **line**.

Standard recessed devices (buttons or switches) can be connected to the local input (i.e. between terminal 1 and LINE).

To enable these two options the following operating logic is implemented:

- If the contact is kept closed for less than one second (or when using a standard button), the command is executed only at the contact closing
- If the contact is kept closed for a longer time (i.e. when using a standard switch), the command is executed at both the closing and the reopening of the contact.

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2.3 Functions Definitions

Device can be programmed to execute the following functions:

FUNCTIONS	
Function	***Description***
Monostable	The selected output is activated when pressing any one of the corresponding buttons on the remote control. If the output is already active (for example, during the corresponding activation of the local command), a subsequent activation command (e.g. pressing the corresponding button on the remote control) is ignored. In case of voltage drop, when power returns the mini receiver maintains the state of the outputs (if the local input status is not changed during the power failure). **Caution: if the output was active before the voltage dip, at voltage recovery the output will remain in any case active for a fraction of a second!**
Bistable	The outputs are controlled as follows: - First press of the button: the stored output on the corresponding button is activated - Second press of the remote control: the output is disabled In addition, when the local switch is closed, and its output is active, if you press the corresponding button on the remote control the output turns off, and when you reopen the switch the output is activated again. Finally, the bistable is the default mode in which receivers come out of the factory, it is automatically reset after erasing the memory. In case of voltage drop, when power returns the mini receiver maintains the state of the outputs (if the local input status is not changed during the power failure). **Caution: if the output was active before the voltage dip, at voltage recovery the output will remain in any case active for a fraction of a second!**
Time	In this mode, the selected output is switched at the pressure of any of the corresponding buttons o the remote control and remains active for a period of time (timeout) previously stored in the device. The output can be turned off when you press the button after a minimum time of 5 seconds. The output can be controlled similarly also through the local input. (E.g.: if the switch is closed, the output is turned on for the set time, then it turns off. If you then open the switch, the output is activated and the timer starts again. Changing the status of the switch is equivalent to pressing the button: it causes the deactivation of the output, after a minimum time of 5 seconds). In case of voltage drop, when power returns the mini receiver maintains the outputs OFF. **Caution: if the output was active before the voltage dip, at voltage recovery the output will remain in any case active for a fraction of a second!**

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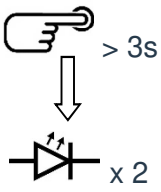
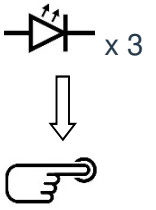
The functions described above apply to all remotes stored in memory. You cannot assign different functions to different remote controls.

The change of function is as described in paragraph **3. PROCEDURES - OUTPUT FUNCTIONS PROGRAMMING.**

A change of function does not erase the memory of stored remote controls.

3. PROCEDURES

MEMORY RESET		
Phase	***Description***	***Example***
1	Press and hold the programming button of the MINI-RX until the LED on the receiver blinks twice shortly.	
2	After about 1 second by the release of the button, the LED on the receiver emits five flashes.	
3	Press the button of the receiver **during the third flash.**	
4	If cancellation is successful the receiver will emit 3 short flashes . **The memory erasure resets the device to factory default settings:** - **No remote control stored** - **Bistable mode** - **Default timings (see paragraph "TIMEOUT PROGRAMMING")**	
5	End	

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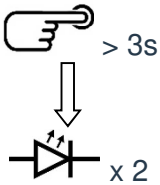
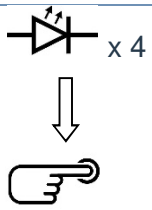
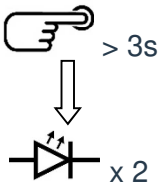
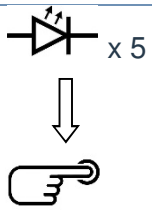
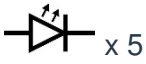
REMOTE CONTROLS MEMORY ERASURE		
Phase	***Description***	***Example***
1	Press and hold the programming button of the MINI-RX until the LED on the receiver blinks twice shortly.	
2	After about 1 second by the release of the button, the LED on the receiver emits five flashes.	
3	Press the button of the receiver **during the fourth flash**.	
4	If cancellation is successful the receiver will emit 5 short flashes. **The remote controls memory erasure does not reset the outputs settings.**	
5	End	

SINGLE REMOTE CONTROL ERASURE		
Phase	***Description***	***Example***
1	Press and hold the programming button of the MINI-RX until the LED on the receiver blinks twice shortly.	
2	After about 1 second by the release of the button, the LED on the receiver emits five flashes.	
3	Press the button of the receiver **during the fifth flash**.	
4	Push the button on the remote control you want to erase.	
5	If cancellation is successful the receiver will emit 5 short flashes. **The remote controls memory erasure does not reset the outputs settings.**	
6	To erase another transmitter, repeat step 4.	
7	To complete the procedure to wait for the 10 seconds time-out.	
8	End	

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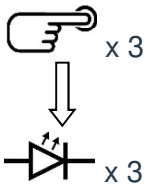
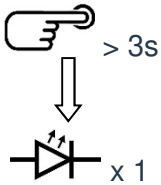
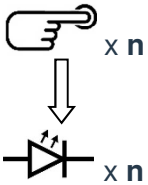
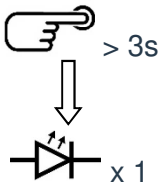
OUTPUT FUNCTIONS PROGRAMMING		
Phase	***Description***	***Example***
1	Shortly press the programming button of the MINI-RX 3 times. The LED on the receiver will blink 3 times every 2 seconds.	
2	Hold down the programming button of the MINI-RX for more than 3 seconds. The LED on the receiver will perform another blink.	
3	Press the programming button a number of times equal to the mode you want to program: 1 pressure -> Monostable 2 pressures -> Bistable 3 pressures -> Timed 4 pressures -> Roll back to Monostable The system will notify through the LED the selection the user just made, with a number of (fast) blinks equal to the selected function, repeated every 2 seconds.	
4	To store the selected mode, press and hold the programming button of the MINI-RX for more than 3 seconds. The LED on the receiver will perform another blink. **Output function change does not erase the stored**	
5	End	

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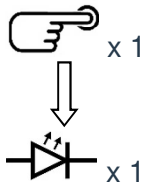
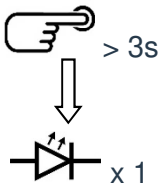
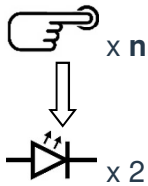
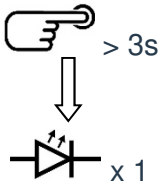
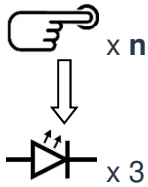
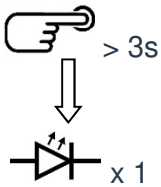
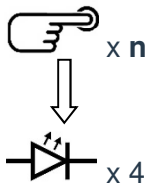
TIMEOUT PROGRAMMING:		
Phase	***Description***	***Example***
1	Shortly press the programming button of the MINI-RX. The LED on the receiver will blink every 2 seconds.	
2	Hold down the programming button of the MINI-RX for more than 3 seconds. The LED on the receiver will perform another blink.	
3	Press the programming button a number of times equal to the **hours** of activation you want to program: 1 pressure -> 0 Hour 2 pressures -> 1 Hours … 10 pressures -> 9 Hours The receiver will blink 2 times at each button pressure.	
4	Confirm the **hours** of operation by holding down the button programming of the MINI-RX for more than 3 seconds. The receiver will perform a (long) blink.	
5	Press the programming button a number of times equal to the **minutes** of activation you want to program: 1 pressure -> 0 minute 2 pressures -> 1 minutes … 60 pressures -> 59 minutes The receiver will blink 3 times at each button pressure.	
6	Confirm the **minutes** of operation by holding down the button programming of the MINI-RX for more than 3 seconds. The receiver will perform a (long) blink.	
7	Press the programming button a number of times equal to the **seconds** of activation you want to program: 1 pressure -> 1 second 2 pressures -> 2 seconds … 59 pressures -> 59 seconds The receiver will blink 4 times at each button pressure.	

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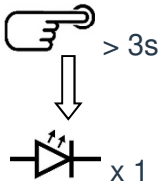
Cormons, August 27th, 2019

TIMEOUT PROGRAMMING:		
Phase	***Description***	***Example***
	(NOTE: If you try to set a time of 0 seconds, the MINI RX will set a default time of 60 seconds).	
8	Confirm the **seconds** of operation by holding down the button programming of the MINI-RX for more than 3 seconds. The receiver will perform a (long) blink. **If timeout settings are not confirmed, the previously stored timeout is maintained.**	
9	End	

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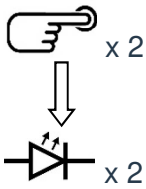
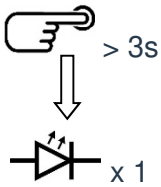
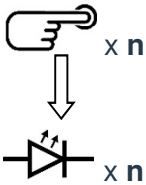
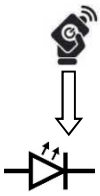
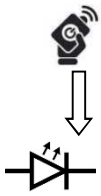
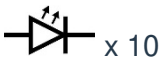
4. RADIO PROCEDURES

LEARNING THE FIRST REMOTE CONTROL OR ADDITIONAL REMOTES		
Phase	***Description***	***Example***
1	Shortly press twice the programming button of the MINI-RX. The LED on the receiver will perform 2 blinks every 2 seconds.	
2	Hold down the programming button of the MINI-RX for more than 3 seconds. The LED on the receiver will perform another blink.	
3	Press the programming button a number of times equal to the **output** you want to program: 1 pressure -> output 1 2 pressures -> output 2 3 pressures -> roll back to output 1 The system will notify the user the selection just made with a number of LED blinks (fast) equal to the selected output, repeated every 2 seconds.	
4	Press the button on the remote that you want to store. If the current pair button-remote is not stored yet, the receiver saves it in memory performing 2 long LED blinks and buzzer beeps. On the other hand, if the memory contains this information already, 2 short LED blinks and buzzer beeps will occur.	**NEW**  **PRESENT** 
5	To learn another remote (or another button), repeat steps 3 and 4.	
6	To complete the remotes learning process, wait for the programming timeout that will be indicated by a long beep and a long blink of the LED.	
Note	If the memory is full, the receiver's LED will perform 10 blinks.	
7	End	

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DECLARATION OF CONFORMITY:

We, MIPOT S.p.a.
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declare that the product **33000148MIP, 16A MINI RX** complies with the essential requirements and other relevant provisions of Directives:

- 2014/53/EU (RED Directive)
- Directive 2011/65/EU (RoHS)

The declaration of conformity can be downloaded at http://www.mipot.com/en/rf-wireless-products/16a-wireless-switch-control-rx-33000148mip/.

REVISION HISTORY

Revision	Date	Description
2.3	27-08-2019	Final release

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