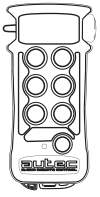
autec
RADIO REMOTE CONTROL

Transmitter System

MANUALE D'USO
USER'S MANUAL
BETRIEBSANLEITUNG
MANUEL DE L'UTILISATEUR
MANUAL DE USUARIO

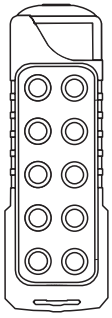


Light Series

CE

Transmitter System

MANUALE D'USO
USER'S MANUAL
BETRIEBSANLEITUNG
MANUEL DE L'UTILISATEUR
MANUAL DE USUARIO



E16 Series

1
INDEX AND CONVENTIONS

INDEX

CONVENTIONS

In this manual, all important information is indicated using the following symbols and conventions:

abcd. . . : WARNINGS

abcd. . . : INSTRUCTIONS

abcd. . . : TECHNICAL DATA

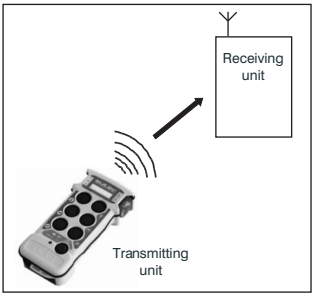
abcd. . . : IMPORTANT TEXTS

THIS MANUAL REFERS EXCLUSIVELY TO THE TRANSMITTING UNIT: THE INSTALLATION WARNINGS ARE GIVEN IN THE RECEIVING UNIT MANUAL.

BEFORE INSTALLING, STARTING AND USING THE RADIO REMOTE CONTROL, THIS MANUAL MUST BE READ AND UNDERSTOOD CAREFULLY BY ALL PEOPLE WHO INSTALL, USE AND CARRY OUT MAINTENANCE ON THE RADIO REMOTE CONTROL.

2
INTRODUCTION TO LIGHT SERIES

Industrial radio remote controls of the **LIGHT series** are used to command machines from a distance. Each industrial radio remote control is made up of a portable transmitting unit, from which the user can remotely control the machine, and a receiving unit installed on board the machine itself.
The transmitting unit uses radio frequencies to transmit a coded message which contains a value called address. Each receiving unit can only decode the messages coming from a transmitting unit with the same address.
This excludes the possibility of an interference activating any system function. If the radio frequency transmission is disturbed, incorrect or interrupted, the receiving unit autonomously stops the whole system.



Each LIGHT series radio remote control is in conformity with the R&TTE 99/05/CE Directive and all its essential requirements.
Each radio remote control is also in conformity with the standards given in the EC conformity declaration supplied with this manual.

Autec cannot be held responsible if the radio remote control is installed on applications that are different from those permitted:

PERMITTED USES

Material lifting machines (construction cranes, industrial bridge cranes, machines for moving material in general, . . .).

FORBIDDEN USES

Machines installed in areas where equipment with explosion-proof characteristics are being used.
Machines for moving, raising and transporting people.

LIMITATIONS & AUTHORISATIONS

It should be remembered that in some countries must be respected rules which control:
- the use and/or possession of a radio remote control;
- the use of operational frequencies which have not yet been harmonised in Europe.

All the indications that must be observed can be found in the "Limitations & Authorisations" document, which is included in the product's documentation.

As required by the Machines Directive and relative harmonised standards, all machines must undergo a risk analysis; therefore it is necessary to evaluate, within the limits of this analysis, if the machine can be radio remote controlled.
The machine producer and/or the person who decides upon radio remote control use and installation is responsible for this analysis.
Autec cannot be held responsible if the risk analysis is not carried out correctly.

To guarantee correct radio remote control operation, all current regulations regarding safety at work and accident prevention should be respected. All current user country national laws regarding the use of both the machine and the radio remote control MUST ALWAYS be respected.
Autec cannot be held responsible if the radio remote control is used in unlawful working conditions.

In any cases of emergencies, faults or damaged parts, ALWAYS stop the "machine + radio remote control" system until the problem has been solved.

Any damaged parts can ONLY be replaced by authorised Autec personnel, and only using original Autec spare parts.

INSTRUCTIONS FOR DOCUMENT MANAGEMENT

The following minimum documentation is supplied with each radio remote control:
- transmitting unit manual
- receiving unit manual
- battery charger manual
- a CE conformity declaration
- a guarantee certificate
- the radio remote control technical data sheet
- the enclosed "Limitations & Authorisations".
Make sure that the following documents have been supplied: if they are not, request them from Autec. Please specify the radio remote control serial number.

CERTIFICATE OF GUARANTEE

The conditions of the radio remote control guarantee are given in the "Certificate of Guarantee" contained in this manual.
The electronic components which have a 3 year guarantee are: E16STXEU_, E16SRXEU_ and E16SCHEU_.

TECHNICAL DATA SHEET

The technical data sheet shows the wiring system between the receiving unit and the machine. It should be compiled and checked by the installer, who has the responsibility of correct wiring. Once all necessary checks have taken place the installer must sign the technical data sheet, which must be kept with the user's manual (always keep a copy of this data sheet in case it is needed for administrative purposes).

IDENTIFICATION PLATES

The radio remote control identification and approval data is given on plates that are on both the transmitting unit and the receiving unit.
The plates MUST NOT be removed from where they are placed or damaged otherwise the warranty will be forfeited.

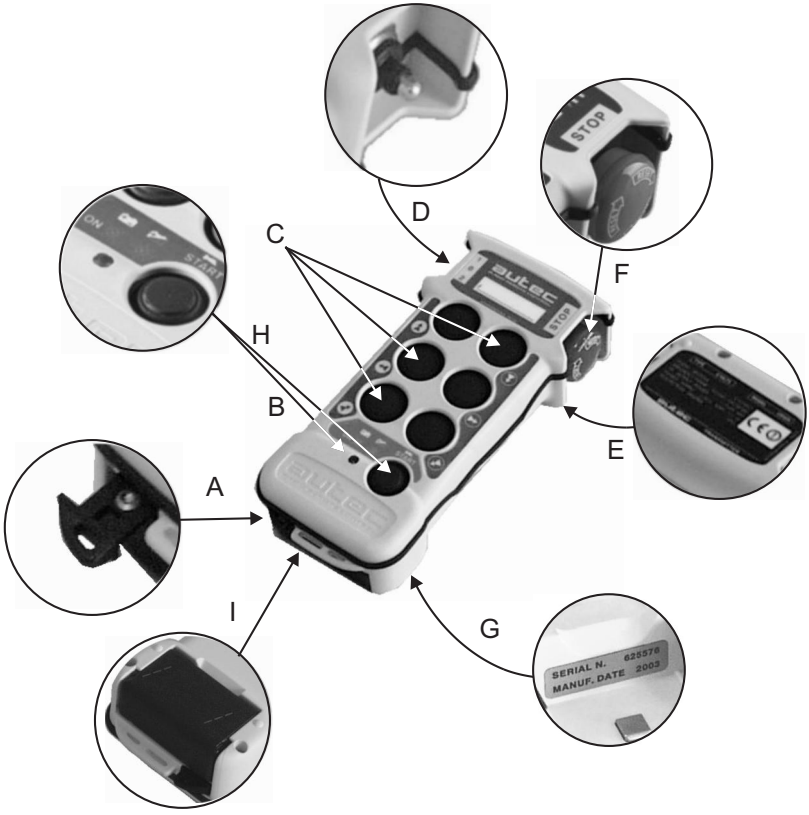
LIGHT SERIES TECHNICAL DATA

Frequency band with radio module E16STXEU1 *	**434.040 - 434.790 MHz**
	or 433.050 - 434.790 MHz
Frequency band with radio module E16STXEU2	**869.700 - 870.000 MHz**
Programmable radio channel	**16 (434.040 - 434.790 MHz)**
	32 (433.050 - 434.790 Mhz)
	12 (869.700 - 870.000 Mhz)
Channel spacing	**25kHz**
Hamming distance	**8**
Probability of non-recognition of error	**<10 exp-11**
Typical working range	**100 m**
Time of reply to commands	**<100 ms**
Time of reply to STOP	**<100 ms**
Passive emergency time	**** 0,35 / 1 sec.**

* refer to the "Limitations & Authorisations" insert to select the permitted working band and paragraph 8 "Programming" if setting is necessary.
** refer to paragraph "Programming" in the receiving unit manual, DIP nr. 1 settings.

3
LK TRANSMITTING UNIT

A LK transmitting unit can be used with one of the following receiving units:
- Type R102
- Type R202
- Type R302.



A	starting keyswitch	**F**	STOP button
B	green signalling LED	**G**	identification plate
C	actuators pushbutton	**H**	START pushbutton
D	selector *(optional)*	**I**	battery
E	technical data plate		

The LK transmitter has different configuration according to the number of available pushbutton actuators.

The LIGHT series is equipped with a safety function called SAFETY that protects the "radio remote control + machine" system, when it is in neutral (rest position), from involuntary movements caused by possible radio remote control faults.

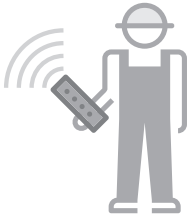
LK TRANSMITTING UNIT TECHNICAL DATA

Power supply (battery pack LBM02MH)	*** NiMH 2,4Vdc**
Antenna	**internal**
Transmitting power (frequency 433 MHz)	**< 10 mW ERP**
Transmitting power (frequency 870 MHz)	**< 5 mW ERP**
Housing	**PA66 (50% fg)**
Minimum protection grade	**IP65**
Working temperature	**-20°C - +55°C**
Dimensions	**80x185x43 mm**
Weight	**420 gr**
Autonomy with fully charged battery (at 20°C)	**~ 12 hours**
Warning of low battery charge	**3,5 minutes**

* refer to battery technical data in the battery charger manual.

4
WARNINGS FOR USE

THE OPERATOR MUST ALWAYS



VISUALLY FOLLOW all movements of the machine and its load remaining inside radio remote control typical working range.

BE POSITIONED in a way that permits him to see the "machine + radio remote control" system, and above all the load, in the best possible way.

Before using the radio remote control ALWAYS MAKE SURE that the STOP push-button can be pressed and released: if it does not work, do not use the radio remote control.

SWITCH OFF the transmitting unit when work is interrupted. Avoid leaving the load suspended in the air (even when changing the battery).

NEVER LEAVE the transmitting unit unguarded when the starting keyswitch is inserted.

ONLY SWITCH ON OR USE the transmitting unit when starting work: improper use could be hazardous.

NEVER SWITCH ON OR USE the transmitting unit in closed spaces, with the machine not in sight, or outside the typical working range.

PRESS immediately the STOP button in case of hazard.

PAY ATTENTION to the entire work area. Press the STOP button in case of hazard.

PAY ATTENTION not to let elements such as cement, sand, lime, etc. deposit on the transmitting unit because they can compromise transmitting unit use and safety.

In case of malfunctions and/or damaged and/or faulty parts, PUT the radio remote control out of use until the problem has been completely eliminated.

5
WARNINGS FOR MAINTENANCE

ENSURE THAT THE BATTERY HAS BEEN REMOVED FROM THE TRANSMITTING UNIT BEFORE CARRYING OUT ANY MAINTENANCE WORK.

Any faults should be repaired by authorised Autec personnel using original Autec spare parts only.

No particular maintenance needs to be carried out on the transmitting unit, but the following should be done in order to always keep it reliable and safe:

BEFORE USING:
- make sure that the unit is integral ,
- make sure that the gaskets, bellows and the actuator hoods (selectors and pushbuttons) are whole, soft and elastic, and that the symbols on the panel can be seen clearly.

AFTER USE:
- always store the unit in a clean dry place,
- make sure that the battery seat is and contacts are clean,
- remove dust or any other material that has deposited on the transmitting unit with a cloth that has been dampened with water (never use solvents or flammable/corrosive materials to clean, and do not use high pressure water cleaners or stream cleaners).

SERVICE

When it is necessary to carry out special maintenance (radio remote control repair and replacement of damaged or faulty parts), do not contact anyone other than our Assistance Service. In order to make the intervention faster and more reliable, please help us identify the radio remote control correctly and completely by giving:
- the serial number
- the purchase date (given on the guarantee)
- description of the problem found
- the address and telephone number of the place where the radio remote control is being used
- the name of the person to be contacted
- the name of the company that supplied the radio remote control.

Before calling the Assistance technicians, it is advisable to make sure that the given instructions have been followed correctly.

SCRAPPING

When scrapping, entrust the radio remote control to the separate scrap collecting services in the user country.

6
LK TRANSMITTING UNIT OPERATION

POWER ON AND STARTING

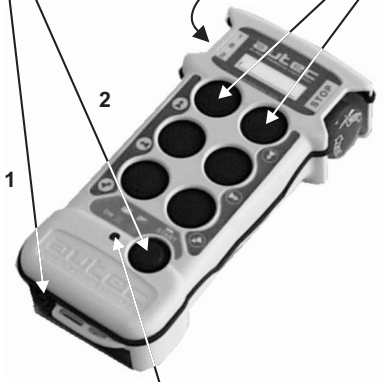
1 Switch on the transmitter unit by inserting the key in the appropriate slot.

2 To start the radio remote control functions, press the “START” button for 1÷2 seconds.

After starting, the green signalling LED always lights up.

COMMAND ACTIVATION

Operate the pushbutton and/or the selector actuators relevant to whatever movement or selection command is to be carried out.



LED SIGNALS

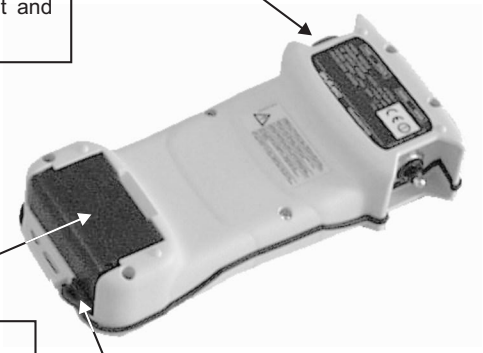
TYPE	MEANING	ACTION
Slow flash	OPERATION NORMAL	///
Fast Flash (*)	LOW BATTERY The transmitting unit switches off 3,5 minutes after the LED starts flashing	Switch off the transmitter unit and replace the battery
Steady light on starting (*)	ONE OR MORE (movement) ACTUATORS and/or STOP PUSHBUTTON INSERTED	Release actuator(s) and/or the STOP pushbutton

(*) red led if present

STOPPING

The STOP button should be used when it is necessary to stop the machine immediately in order to check any danger condition.

To **stop** the machine **immediately**, press the STOP button.
To **start working again**, after having made sure that the working conditions are safe, turn the STOP button in the direction indicated to deactivate it and repeat the starting procedure.



BATTERY

To recharge a flat battery, proceed as follows:

1. Insert the battery into its proper battery charger, which should be positioned in an area having a temperature of between +5°C and +45°C. The battery now starts charging, a state signalled by the lighting up of the “CHARGE” pilot light.
2. After a maximum of 4 hours the "CHARGE" indicator switches off: the battery is fully charged. Remove the battery from the charger (if the battery is not removed, charging continues in maintenance mode).

SWITCHING OFF

The transmitting unit should be switched off each time work is stopped by turning the ignition key to "O" and extracting it (always put the key in a safe place).

The unit may also switch off if the battery is not sufficiently charged and/or when the radio remote control is not used for more than 3,5 minutes (set DIP nr. 1: refer to paragraph 8 "Programming").

7
FREQUENCIES

The use of 869.700 - 870.000 MHz band frequencies has been harmonised in Europe. The use of 433.050 - 434.790 MHz band frequencies has not yet been harmonised in Europe.
Check for possible user's country limitations. For example, some European countries permit the use of industrial remote controls only in the 434.040 - 434.790 MHz band.

The radio frequency of AUTEC radio remote controls is included in the group of frequencies permitted by those European regulations that are current at the moment of radio remote control entry onto the market.

Each radio remote control is programmed by the producer in the **AUTOMATIC** scan mode (producer's standard programming) or **MANUAL** selection mode.

MANUAL SELECTION MODE

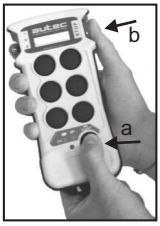
When operating in the **MANUAL** selection mode it is possible to work at a specific frequency that must be set manually by programming the dip switches in the radio modules (see "Programming" on page 12).
To set or modify this operation mode contact personnel that have been authorised by Autec.

AUTOMATIC SCAN MODE

When operating in the **AUTOMATIC** scan mode it is possible to operate at a specific frequency, which can be changed in case of interference or conflict with other radio equipment using the "Changing the operating frequency" procedure.
This mode avoids internal interventions on the transmitting unit and the receiving unit.

Working frequency change process

1 With the transmitting unit started (blinking green LED):
- press the START pushbutton and keep it pressed (a),
- press the STOP pushbutton (b)
- release the START pushbutton.



N.B.: During the work frequency changing process, the receiving unit loses radioelectric connection with the transmitting unit. After starting, some seconds may be necessary to reset connection, **therefore keep the START button pressed for about 8÷10 seconds**.

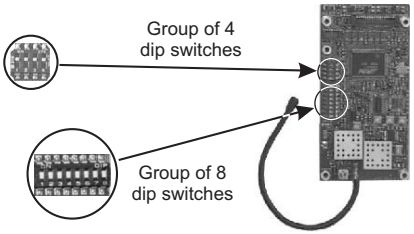
2 Unlock the STOP pushbutton by turning it as shown in the photo and repeat the starting procedure.

8
PROGRAMMING

The dip switches must be programmed with the battery removed from the transmitting unit and can be done only by authorised personnel.

DIP SWITCHES ON E16STXEU_ RADIO TRANSMITTING MODULE

The group of eight dip switches found in the module are necessary for programming some operations and setting the operating frequency.
The programming set in the other group of four dip switches must never be modified.



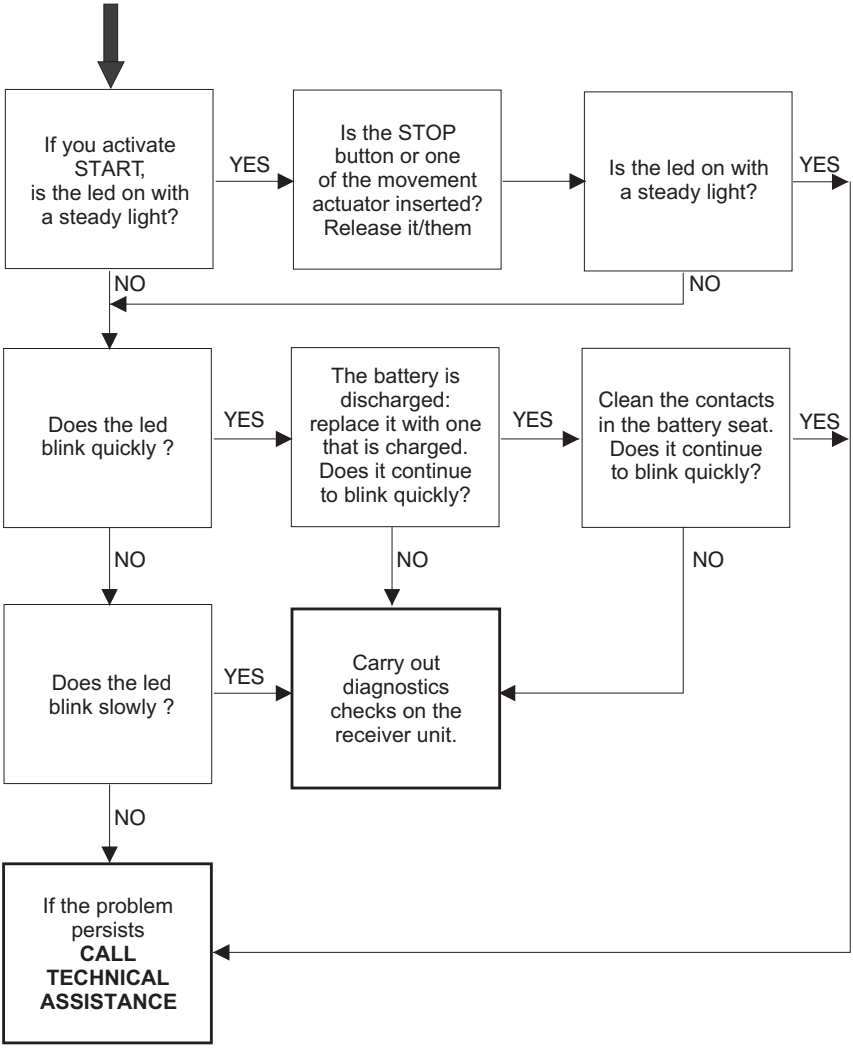
Group of 8 dip switches

DIP	MODULE	POS.	DESCRIPTION
1	E16STXEU_	ON	The transmitting unit never switches off automatically
		OFF	The transmitting unit switched on without movement commands entered switches off after approx. 3,5 minutes
2	E16STXEU_	ON	Deactivated of low battery warning from horn on machine
		OFF	Activation of low battery warning from horn on machine
3	E16STXEU1	ON	With DIP 8 OFF, automatic scan of the frequencies in the 433.050 - 434.040 MHz
		OFF	With DIP 8 OFF, automatic scan of the frequencies in the 434.050 - 434.790 MHz
	E16STXEU2	ON	DON'T USE
		OFF	With DIP 8 OFF, automatic scan of the frequencies in the 869.700 - 870.000 MHz
3 - 7	E16STXEU_	ON/OFF	With DIP 8 ON see "Appendix: Frequency Table"
8	E16STXEU_	ON	Manual selection of frequencies with DIP 3 - DIP 7 (see "Appendix: Frequency Table")
		OFF	Automatic scan mode of frequencies in the band selected with DIP 3 (DIP 4 – DIP 7 not relevant)

These eight dip switches must be programmed in the same manner as the group of 8 dip switches (excluding DIP 1) present in the radio module of the receiving unit (see manual).

9
LK TRANSMITTING UNIT DIAGNOSTIC

If the “machine+radio remote control” system does not start, check if the problem is caused by the radio remote control or the machine. Before carrying out any verifications, check the functioning of the machine with the cable control panel:
- if it does not switch on, the problem lies with the machine itself
- if it does switch on, the problem lies with the radio remote control. In this case, proceed as follows:



Appendix: FREQUENCY TABLE

433.050 - 434.790 MHz

MHz	DIP SWITCH 3	4	5	6	7	8	MHz	DIP SWITCH 3	4	5	6	7	8
433.125	ON	OFF	OFF	OFF	OFF	ON	434.100	OFF	OFF	OFF	OFF	OFF	ON
433.200	ON	OFF	OFF	ON	OFF	ON	434.125	OFF	OFF	OFF	ON	OFF	ON
433.250	ON	OFF	OFF	OFF	ON	ON	434.150	OFF	ON	ON	ON	OFF	ON
433.325	ON	ON	ON	OFF	ON	ON	434.225	OFF	OFF	ON	OFF	ON	ON
433.400	ON	ON	OFF	OFF	OFF	ON	434.300	OFF	ON	OFF	ON	ON	ON
433.425	ON	ON	OFF	ON	OFF	ON	434.325	OFF	ON	OFF	OFF	OFF	ON
433.475	ON	ON	OFF	OFF	ON	ON	434.350	OFF	ON	OFF	ON	OFF	ON
433.500	ON	ON	ON	ON	ON	ON	434.375	OFF	OFF	OFF	OFF	ON	ON
433.575	ON	OFF	OFF	ON	ON	ON	434.400	OFF	ON	ON	OFF	ON	ON
433.625	ON	OFF	ON	OFF	OFF	ON	434.475	OFF	OFF	ON	ON	ON	ON
433.700	ON	OFF	ON	ON	OFF	ON	434.500	OFF	OFF	ON	OFF	OFF	ON
433.775	ON	ON	OFF	ON	ON	ON	434.525	OFF	OFF	ON	ON	OFF	ON
433.825	ON	OFF	ON	OFF	ON	ON	434.600	OFF	ON	OFF	OFF	ON	ON
433.900	ON	ON	ON	OFF	OFF	ON	434.675	OFF	OFF	OFF	ON	ON	ON
433.950	ON	OFF	ON	ON	ON	ON	434.700	OFF	ON	ON	OFF	OFF	ON
434.025	ON	ON	ON	ON	OFF	ON	434.725	OFF	ON	ON	ON	ON	ON

869.700 - 870.000 MHz

MHz	DIP SWITCH 3	4	5	6	7	8
869.7125	OFF	OFF	OFF	OFF	OFF	ON
869.7375	OFF	OFF	OFF	ON	OFF	ON
869.7375	OFF	OFF	OFF	ON	ON	ON
869.7625	OFF	OFF	OFF	OFF	ON	ON
869.7875	OFF	ON	OFF	OFF	OFF	ON
869.8125	OFF	ON	OFF	ON	ON	ON
869.8125	OFF	ON	OFF	ON	OFF	ON
869.8375	OFF	ON	OFF	OFF	ON	ON
869.8625	OFF	OFF	ON	OFF	OFF	ON
869.8875	OFF	OFF	ON	ON	ON	ON
869.8875	OFF	OFF	ON	ON	OFF	ON
869.9125	OFF	OFF	ON	OFF	ON	ON
869.9375	OFF	ON	ON	OFF	OFF	ON
869.9625	OFF	ON	ON	ON	ON	ON
869.9625	OFF	ON	ON	ON	OFF	ON
869.9875	OFF	ON	ON	OFF	ON	ON

autec
RADIO REMOTE CONTROL
Via Pomaroli, 65
36030 Caldogno (VI) ITALY
Tel : ++39 - 0444/901000 r.a.
Fax: ++39 - 0444/901011
email: info@autec.it
http://www.autec.it