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# INTRODUCTION

Thank you for purchasing this radio control. Before using it you are advised to read this instruction manual carefully. Each paragraph will give you all the information you need on how to carry out the individual operations correctly.

SERIES KIT CONSISTING OF:

1 (one) receiver

1 (one) TR12RFMC-xF series transmitter

## INSTRUCTIONS FOR USE

### *CORRECT INSTALLATION*

The receiver has an IP65 seal, and external installation is therefore possible. However, you are advised to install the unit in a sheltered position (bearing in mind that if you use the internal aerial the latter must not be shielded by any metal structures).

- Mount the aerial (where provided) on a metal base if possible, in a visible position well away from sources of electromagnetic disturbance (motorised circular flashers, etc.).
- Connect the other cables (output, input, and auxiliary).
- Bring the power supply to the unit directly from the BATTERY using:
  - a) a protection fuse of appropriate capacity (solenoid valve + auxiliary current);
  - b) cables of sufficient diameter for the load to be piloted.
- Connect the aerial cable terminal, where provided.

The output voltage of the selected function is the same as the unit power supply voltage.

## **RECEIVER**

The unit is fully integrated and is run by a micro-controller with a fully shielded 433.920 MHz superheterodyne FM/FSK receiver realized in SMT technology, on multi-layer printed circuit in compliance with the ETS 300 220 Europeans standards.

The unit has:

- A red led lamp indicating:
  - ✓ If the light is on and continuous: shut-down.
  - ✓ Blinking light: the board is connected to the power but lacks transmitter recognition codes (the board is not operational because it needs at least one acquired transmitter).
- RED mushroom-head button: shut-down control.
- GREEN button: reset control.
- Buzzer: active function signalling.
- Lever selector: manual functions UP and DOWN.

The unit has two stop activating modes, one at radio frequency (STOP from the transmitter) and a manual one which is carried out by pressing on the RED mushroom-head STOP button.

The emergency shut-down status (activated by using the local mushroom-head button) is signalled by the red LED. In this condition the unit is no longer operational and all outputs are blocked.

To reset normal operating it is necessary to:

- disconnect the red mushroom-head button by rotating it clockwise;
- press the green run button.

## **TECHNICAL CHARACTERISTICS**

433.920 MHz SUPERHETERODYNE FM/FSK receiver.

Reception sensitivity: -105 dBm with 25 KHz SWING.

Pass band: 200 KHz.

Attenuation of out-of-band signals: 50 dB.

Power supply: 10 Vdc / 30 Vdc.

Power consumption: 30 mA when idle;

190 mA (24 Vdc) with function activated (without load).

Outputs: ON/OFF to relay 10A – 24Vdc (8A – 30 Vdc).

Temperature working range: -20 °C ÷ +70 °C.

## **ENGLISH**

### **CONNECTIONS:**

- ✓ **Wire N°1-N°8:** function output 1-8 activated by key 1-8 of transmitter.
- ✓ **Wire N°9:** UP function output activated by lever selector.
- ✓ **Wire N°10:** DOWN function output activated by lever selector.
- ✓ **Wire N°11:** AUX function output activated at each transmitter operation.
- ✓ **Wire N°12:** VCE function output always activated except in shut-down status.
- ✓ **Wire N°13:** EO function output activated by the STOP transmitter command.
- ✓ **Wire N°14:** + Vdc 12 – 24Vdc supply (connect to battery positive through a fuse).
- ✓ **Wire N°15:** GND connects to the supply ground (possibly direct to the battery negative pole).

### **INSERTION OF TRANSMITTER CODES**

Every transmitter has a different code. The generated code consists of a customer code and the personal code of the transmitter: it is necessary to arrange for acquisition of the transmitter codes by the receiver, as only commands coming from “recognised” transmitters are carried out.

To acquire the code of a new transmitter:

1. disconnect the power supply from the unit using the key switch (if there is one);
2. press the RED stop mushroom-head button on the unit and hold it down;
3. switch on the transmitter (press the ON key until a beep is heard);
4. reconnect the power supply to the receiver; the red Led light comes on;
5. carry out the following **instructions in no more than two minutes:**
6. press the GREEN RESET button on the unit and hold it down;
7. the red LED light switches off to show that the memory access mode has been activated;
8. it is now possible to press one of the functions keys of the transmitter in order to insert the code, keeping the key held down until the LED indicator light starts flashing;
9. release the key on the transmitter;
10. release the GREEN RESET button;
11. the red LED light comes on steady;
12. unlock the red mushroom-head button;

13. press the GREEN RUN button to reset normal operating of the unit;
14. the red LED light switching-off, the procedure is finished.

Commands sent by the remote control will be decoded only if the unit recognises the personalised transmitter code.

**!** ATTENTION! The system is provided with a customer's code: only the transmitters with the same code as the receiver can be inserted.

The personalisation of the code ensures additional protection against undesired activation (e.g. external disturbance or signals emitted by other remote controls within the same operating radius).

It is possible to memorise up to 16 different transmitters on the same central unit using the procedure given above. If a seventeenth transmitter is inserted the code of the first transmitter that was memorised is cancelled.

Note: the unit can acquire a maximum of 16 different transmitters. If a further code (no.17) is inserted, this will replace the first code that was acquired, and so on.

### ***CLEARING OUT THE TRANSMITTER CODES***

In case of need (for example following the loss of a transmitter) it is possible to cancel all the acquired codes.

**IT IS NEVERTHELESS RECOMMENDED TO FOLLOW THIS PROCEDURE ONLY IN CASE OF REAL NEED**

1. disconnect the power supply from the unit using the key switch (if there is one);
2. press the RED stop mushroom-head button on the unit and hold it down;
3. reconnect the power supply to the receiver; the red LED light comes on;
4. carry out the following instructions **within a time limit of two minutes**;
5. press the GREEN RESET button of the unit holding it down;
6. the red LED light switches off to show that the memory access mode has been activated;
7. continue holding the green reset button down, without carrying out any other operation, until the LED indicator lamp starts flashing (16 seconds);
8. release the GREEN RESET button;
9. the red LED light comes on steady;
10. unlock the red stop mushroom-head button;
11. press the GREEN RUN button to reset normal operating;

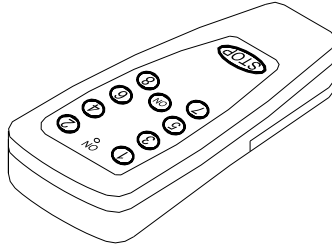
**ENGLISH**

12. The LED indicator lamp will continue flashing, showing that there are no transmitter codes in the memory and the unit will therefore not connect with any transmitter.

At least one transmitter must be identified to make the receiver operational.

# TRANSMITTER

## *TR12RFMC*



### ***CHARACTERISTICS OF THE TRANSMITTER***

The TR12RFMC transmitter is the result of a multi-year experience gained in the sector of radio controls and is designed to remotely control RXFM8 receivers.

The salient characteristics of the transmitter are as follows:

- ✓ up to 8 functions;
- ✓ transmission type: FM;
- ✓ ample range;
- ✓ powered by standard 9V battery;
- ✓ extremely low power consumption;
- ✓ case made of shock-resistant ABS;
- ✓ highly reliable membrane keyboard;
- ✓ easily identifiable function keys and quick stop function;
- ✓ exclusive design.
- ✓ Back-lighted with EL light for use in low light conditions;
- ✓ fitted with battery charger adapter

## *INSTRUCTIONS FOR USE*

### **Activation of the transmitter**



Remove the cover of the battery compartment on the back of the transmitter (unscrewing the two fixing screws), insert a (new) 9V battery in the appropriate space and hook on the transmitter clip, making sure that it is properly in contact, then close the compartment and the relative cover. The transmitter is now operational: the led indicator ON comes on.

### **Use of the transmitter**

If the transmitter is not yet in use, just press the ON key and hold it down until a prolonged beep signals that the transmitter is on.

With the transmitter operational (and the LED lamp flashing) a function can be activated using the appropriate key: the corresponding output of the unit will remain active until the key is released. The transmitter is designed to carry out only exclusive operations, and so it is not possible to activate more than one function at a time (the only exception is the shutdown function, which takes priority over all others).

There is a battery-saving function that provides for automatic switch-off if the transmitter remains unused for more than 3 minutes. After that inactivity period the transmitter switches itself off and signals the procedure by means of three brief acoustic signals. The purpose of this function is not only to reduce power consumption but also to avoid accidental use of the functions. To switch the transmitter on again press the ON key.

### **Batteries**

When switched the transmitter monitors the battery charge signalling when the battery is discharged by emitting a series of acoustic signals in rapid sequence. It is however possible to continue working for a while, although it is advisable to replace the battery.

### **Shutdown status**

When necessary all functions can be shut down using the special red STOP key. This has priority over all other keys, so the stop command can be given even when other functions are on.

When the stop function is activated the transmitter emits a series of stop commands, signals the function by means of brief acoustic signals, and switches itself off. To reset the transmitter carry out the procedure for turning it on.



## Use of the rear lighting



The rear (back) lighting allows for quick, easy identification of the keys even in low-light conditions: to light up the keyboard with the transmitter operational press the ON key and hold it down until the rear lamp comes on (signalled by two beeps). If the transmitter is off, prolong the pressure on the ON key until the rear lamp comes on.

Use of the rear lighting involves higher power consumption and consequently shorter battery life: you are advised to use it only when necessary.

## Transmission Code Selection << 31 Bit – 39 Bit >>

Communication between transmitter and the receiver is based on a digital code transmission. This code can have different bit. Our products use now a 39 bit code: it guarantees an optimal reliability and minimal probability of error during the communication. There are products that still work with 31 bit code transmission. When working with these receivers (as CT12MCU) it is necessary to switch code from 39 (default) to 31bit.

Selecting **31 bit** code:

1. press ON to turn transmitter on and wait for the LED to start flashing. The transmitter is now operational;
2. press again the ON key for at least 10 sec: the transmitter emits a series of 4 beeps signaling that the selection modality is active, release the key;
3. press key 2: the transmitter emits a beep;
4. releasing the key the transmitter exits from the programming procedure and emits a series of beeps accompanied by an equal number of flashes of the ON led;
5. now the transmitter is operating with a **31 bit** based code.

Selecting **39 bit** code:

1. press ON to turn transmitter on and wait for the LED to start flashing. The transmitter is now operational;
2. press again the ON key for at least 10 sec: the transmitter emits a series of 4 beeps signaling that the selection modality is active, release the key;
3. press key 1: the transmitter emits a beep;
4. releasing the key the transmitter exits from the programming procedure and emits a series of beeps accompanied by an equal number of flashes of the ON led;

## **ENGLISH**

5. now the transmitter is operating with a **39 bit** based code.

**WARNING:** before activating this procedure be sure that the transmitter is a **TR12RFMC-xF** by checking the data provided on the label, on the back.

### ***TECHNICAL CHARACTERISTICS***

Working frequency: 433.920 MHz  $\pm$  15 KHz at 22 °C.

Type of modulation: FM negative  $\geq$  20KHz.

Transmitter power: EIRP  $\leq$  10mW.

Power supply: MIN 7V - MAX 10V.

Average consumption @9V:

- Transmitter on: 1.2mA
- Transmitter in transmission: 15mA
- Transmitter in sleep status: 10uA.

Transmission code of the 39 bit digital type.

## BATTERY CHARGER (OPTIONAL)



The battery charger (supplied as an optional) is capable of accepting an input voltage of 12 to 24 volts and is fitted with a plug for connection to the cigarette lighter of vehicles.

### To recharge the battery:



The battery charger supplied with the transmitter is of the type without memory effect, so charging can be carried out at any time. First insert the small plug in the socket on the right side of the transmitter. Recharging can take place with the transmitter on or off (it makes no difference).

When charging begins the transmitter comes on, the keyboard lamp lights up, and a long acoustic signal is given. The ON LED lamp lights up, flashing frequently, and remains in this state throughout the charging period.

The transmitter is operational and remains so for 3 minutes; it can be used as usual: the LED lamp will however flash more frequently than usual to indicate that charging is under way. Recharging also continues with the transmitter off (the LED lamp continues flashing), until the battery is fully charged.

When replacing the rechargeable battery you are advised to use a battery of the NiMH type and to carry out a long charge (24H) before using the transmitter.

## **EXTERNAL VEHICLE AERIAL**

*(OPTIONAL)*



### ***CHARACTERISTICS OF THE AERIAL***

The range of the radio control can be greatly extended by using the vehicle aerial.

Its use is advisable if you have to operate at a substantial distance from the base position (the receiving unit).

The aerial is made of an extremely flexible and very strong innovative material whose gain is great than that of any other aerial as it has been designed and made for this specific application taking account of the system characteristics.

### ***CORRECT INSTALLATION***

Mount the aerial in the vertical position, if possible on a metal base and well away from sources of electromagnetic interference (motorised circular flashing lights, etc.), placing it in a visible position on the outside of the bodywork of the vehicle.

## CE MARKING

This product meets the essential requirements laid down by the directive 99/5/EC.

Its conformity with the above-mentioned essential requirements is certified by application of the CE marking on the product.

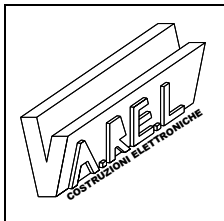
Attention is drawn to the following actions that could compromise the above-testified conformity, apart from, of course, the product characteristics:

- incorrect electrical supply;
- incorrect installation or incorrect or improper use or use that does not comply with the warnings given in the user manual supplied with the product;
- replacement of original components or accessories with others of a type not approved by the maker, or carried out by unauthorised persons.

## CERTIFICATE OF GUARANTEE

1. The device is guaranteed for a year from the date of purchase, the date being certified by a transport or delivery document that shows the model of the device and the buyer's name.
2. The guarantee covers replacement or repair free of charge of component parts of the device recognised as being defective because of manufacturing faults.
3. The guarantee does not cover any parts that are defective as a result of negligence or careless use, or incorrect installation or maintenance, work carried out by unauthorised persons, transport carried out without the necessary precautions, or from any other circumstances that cannot be attributed to manufacturing defects.
4. VA.RE.L declines any responsibility for any harm that may occur, directly or indirectly, to persons or things as a result of failure to observe all the indications given in the instructions for use as regards, especially, the warnings concerning installation, use and maintenance of the device.
5. The device will be repaired at the main office of the VA.RE.L company. The costs and risks of transport from and to the said office will be at the purchaser's expense.
6. Replacement of the device and extension of the guarantee following a repair operation is not possible.

VA.RE.L reserves the right to modify the characteristics given in this manual without prior notice.



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