

## User's manual MAF 60 serie II

April 2024



You have chosen a firing system for fireworks of the GENETEC range and we thank you. Before use, please read these operating instructions carefully and you will be fully satisfied with your new MAF60 serie II. **Strictly comply to the safety instructions.**

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S.A.R.L. au Capital de 192 000,00 € RCS Avignon B 432 851 814 SIREN : 432 851 814 00017 N° TVA Intra communautaire : FR 61 432 851 814

## Introduction :

The MAF60 series II is a 60 Ways firing system, with a wired remote control, and a step by step automatic advance.

The basic configuration is one wired remote control and one satellite. The satellite is equipped with 60 Ways output, but one remote control can drive 180 different lines (with 3 satellites).

The satellite is powered with a 12V rechargeable battery (the charger is provided), and delivers 70 volts by impulses (duration 27ms, with a regulated current at 1,2A) at the outputs. The 60 led indicators of the line resistance are calibrated on 70 ohms. The remote control is connected to the satellite by your traditional two-wire, thus not need to envisage an expensive numerical cable. This connection can go up to 5 kilometers. The satellite is equipped with a key to enable the firing mode and with a beacon indicator to check the good wired connection to the remote control.

The operator's remote control is easy to use : a luminous display for the selected Way, an automatic step by step advance Way after Way after each shot, two pushbuttons (to advance or move back) for a manual selection of the Way, two firing pushbuttons, two terminals on which you easily connect your two-wire cable which will be connected to all satellites MAF60 series II.

This manual mainly deals with the basic MAF60 serie II system with its manual 180-ways remote control. When using the MAF60 serie II satellite with an OXYDIUM console, refer to the operating instructions supplied with it.

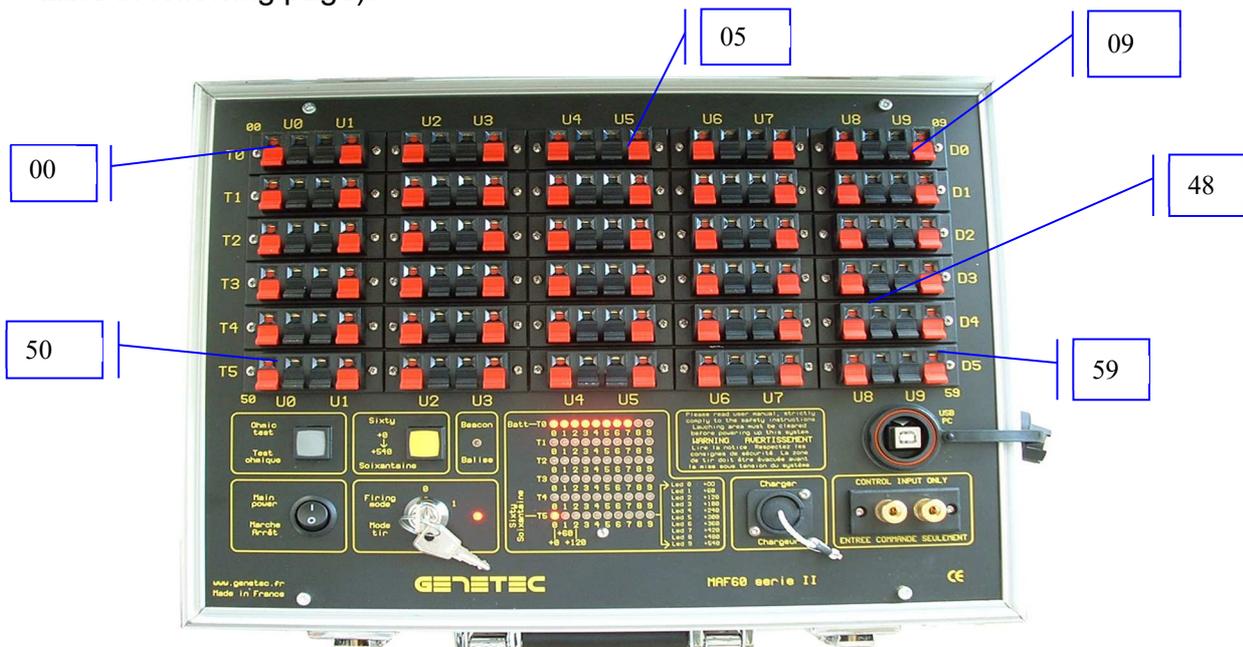
This system is provided with a USB cable for updating the firmware (free on our website). Always check all the items of your system have all the last version of the firmware.

## LINES INSTALLATION : Main power on 0 + firing mode key on 0.

Your MAF60 serie II has 60 Ways outputs. The push-terminals are numbered by lines and columns: by lines for the tens, and columns for the units. An example: to connect an igniter on Way output n°48, locate the line corresponding to ten 4 (T4), and go horizontally to the column corresponding to unit 8 (U8): The two terminals (red and black) being with the intersection of 4 horizontal and 8 vertical is the way 48.

The output 00 is in top left, and the 59 is on below right.

The number of igniters on each output can go from only one to several tens in serial wiring according to the lengths of wire used and the source of external power supplied (see the table in following page).

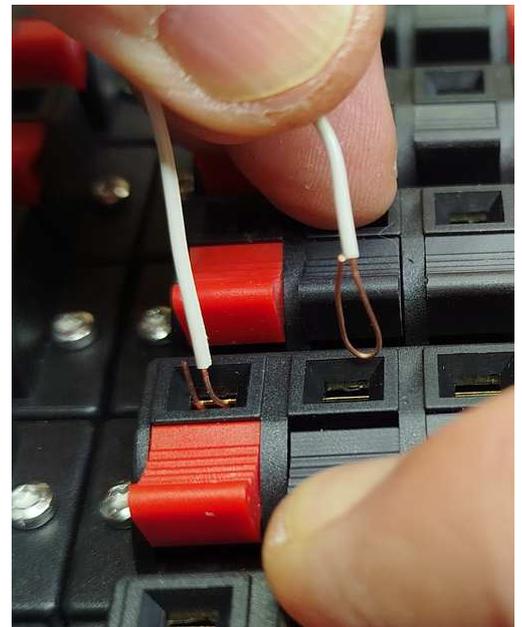


There is no common on the output plugs. Therefore, connect only one line per output (a wire on the red and the other on the black). Do not try to adapt a multicore cable or to connect wire of different lines together.

Insert the wires of your lines into the clamp terminal blocks, between the moving part and the metal contact. It is recommended to fold the stripped part back on itself by making a small loop, this improves electrical contact by doubling the contact surface, and provides better mechanical strength.

Be careful not to pinch the wire on its insulating sheath part.

Do not cut wires too long so that they do not touch each other.



*Note: these push-terminals are outputs and only outputs, never in no case apply a source of direct power supply on them (for example do not force the energising of a line with a battery).*

**Our systems take as a reference the standard of Davey-Bickford igniters (and most other brands) N28B head, namely a recommended firing current of 1 amp (reminder of the characteristics given by DaveyBickford: Intensity of 100% operation 0.6A, Recommended intensity 1A, Average initiation delay 2ms at 1A) To meet these criteria, the MAF60 satellites deliver 27ms pulses of up to 70V with automatic average regulation of the output current between 1.1A and 1.2A**

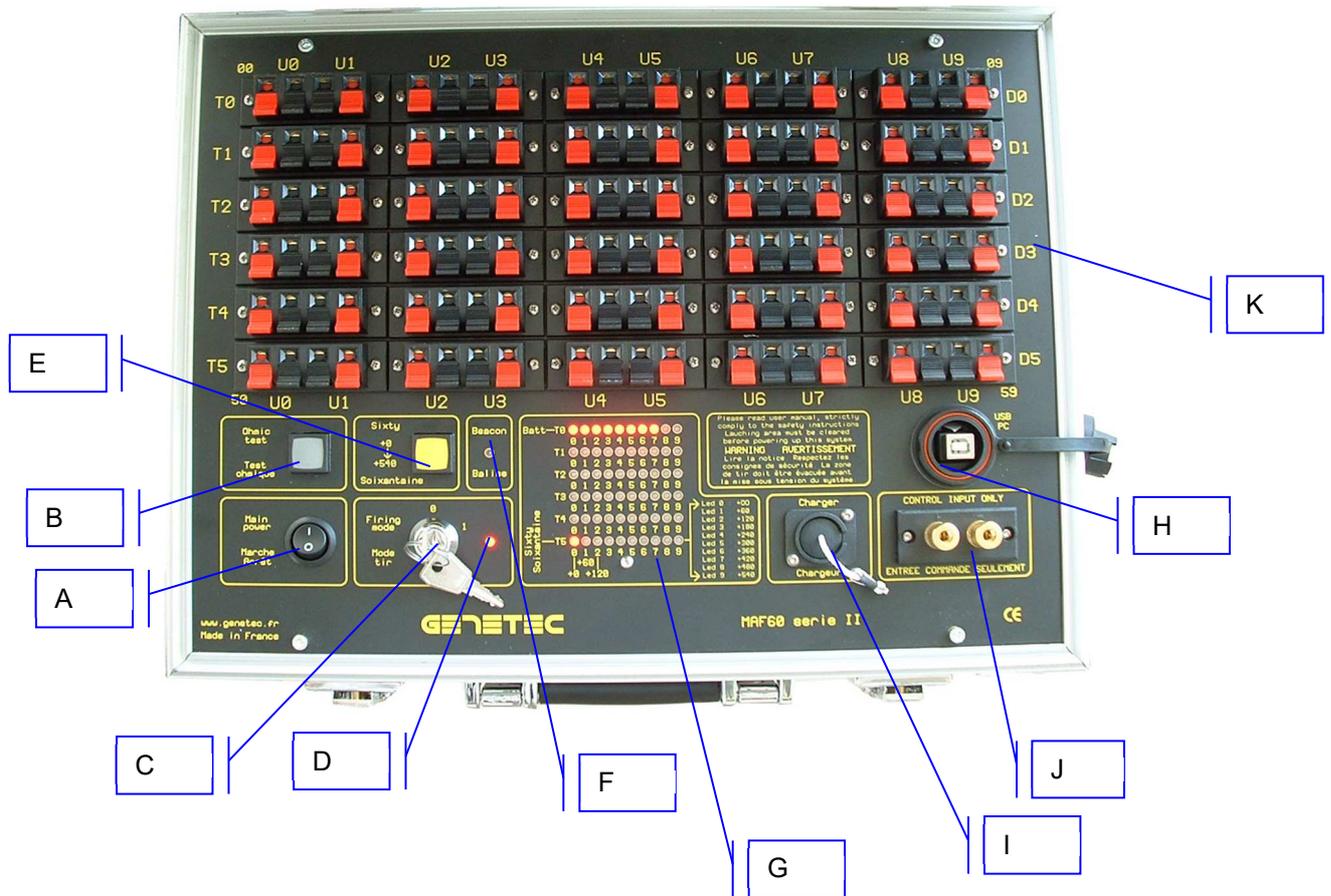
**In any case, consult the characteristics indicated by your igniter supplier. Carry out preliminary verification tests.**

*GENETEC recommends the igniters DAVEY-BICKFORD*

Theoretical table given as an indication only and calculated with the igniters N28B Davey Bickfords assembled in series, with wire 0.17 ohm/meter at an ambient temperature of 25 ° C (by cold time in winter the energy yields are lower, by security reduce these values by 50%).

<b>Length of the wire on the line (metres)</b>	<b>Maximal number of igniters (inside voltage booster 70V)</b>
500	1
400	1
300	10
200	21
100	32
90	32
80	33
70	34
60	35
50	36
40	37
30	38
20	39
10	40

# THE SATELLITE :



- A : Main power switch 0/1.
- B : Pushbutton for ohmic test.
- C : Firing mode key.
- D : Firing mode led.
- E : Pushbutton to select the group of sixty.
- F : Led to check the automatic beacon transmitted from the remote control.
- G : Multi-checks display with 60 leds.
- H : USB connexion.
- I : Plug for the battery charger.
- J : Input from the remote control (or HF receiver).
- K : 60 outputs for the igniter lines.



View of satellite MAF60 in its IP65 (closed) case.

### **TO SWITCH ON THE SATELLITE (A) :**

The switch A power up the satellite : On position 1, the satellite is switched ON (and on 0, the satellite is switched OFF). The led D lights up continuous if switched ON. *The battery level is displayed on the first leds line 0 to 9 (9 is the full charge, and 0 the lower charge, if 0 flashing the battery is empty).*



**The powering up of the satellite MAF60 serie II must be done only if the key “Firing Mode” is on 0 and the launching area is cleared.**

### **CONTROL OF THE WIRING AND OHMIC TEST (B) :**

Once your connections are done, to check the ohmic resistance of the lines :

1. Switch on the MAF60 series II with the switch A on position 1.
2. Then, press and maintain the pushbutton B of ohmic test. The sweeping of measurement of the 60 lines is approximatively 2 seconds duration. Check all the red led indicators of the panel G corresponding geographically to the wired outputs lights up. If a line's circuit is cut or too resistive (>70 ohms +-5%) the light indicator is unlighted.

Also, you can check with a standard numerical ohmmeter (for a measurement with the ohmmeter, the line must be unplugged from the MAF60 series II).

As soon as the pushbutton B is released the ohmic test stop.

If you have some work to do again on the firework's wiring, switch off completely the MAF60.

*Note : It is impossible to do the ohmic test if the key C is on position 1.*

### **SELECTION OF THE GROUP OF SIXTY (E) :**

With the E pushbutton. With this selection it is possible for the satellite to work in mode 0 to 59 (add +0), or 60 to 119 (add +60), or 120 to 179 (add +120). Thus with your remote control, you will be able to control 180 different Ways numbered from 0 to 179 according to the selected group of sixty.

A satellite can drive 60 different lines. By selecting the group of sixty with the push button E, you choose the sixty of reaction on the satellites.

If you have only one satellite, select the group of sixty +0 (thus it will work from 0 to 59). In this case, on the display panel G, on the low line, only the light +0 must be lighted. In the same way, two satellites regulated on the same sixty will function simultaneously.

To choose the Ways 60 to 119, press once more on E and on the display panel G indicator +60 lights on (the indicator +0 remains also lighted). To choose the Ways 120 to 179, press once more on E and on the display panel G the indicator +120 lights on (indicators +0 and +60 remain them also lighted).

**You must ensure that you always selected the correct group of sixty, because if not your satellite will not react.**

Note 1 : The choice of the group of sixty is memorized in the satellite, even if the satellite is powered off. Therefore, check systematically at each new service if the system is not still on the sixty of the previous firework.

Note 2 : The led numbered 3 to 9 corresponding to extra groups of sixty for the Oxydium system (+180, +240...). If you work with the standard basic remote only the 3 first groups of sixty must be used (+0, +60, +120), or the addressing mode (see next page).

## ADDRESSING MODE PERSONALIZED :

This function allows to change the numbering of the 60 physical Way outputs of the satellite. This function is not of interest if you have only one satellite MAF60, however is very useful for several satellites because it allows recombination of Way outputs allowing both simultaneous and alternate shooting between different satellites.

### **Introduction :**

We saw previously that is possible to addressing the outputs of satellites by groups of 60 Ways (because indeed we can set the satellite or on the first group of sixty for having physical outputs that correspond to the Ways 00 to 59, on the 2<sup>nd</sup> group of sixty for having physical outputs correspond to the Ways 60 to 119, on the 3<sup>rd</sup> group of sixty for having physical outputs correspond to the Ways 120-179).

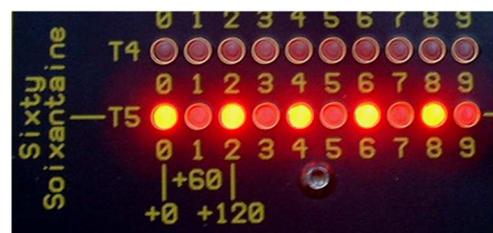
The personalized addressing of physical outputs is still based on the same principle, but it is not by group of 60 outputs, it works by individual physical output : each output is individually configurable. The aim is to create a new group of sixty fully personalized. For example, the physical output 00 of the satellite can become any Way value between 000 and 179 in the context of use with the remote control MAF60 serie II (or up to 599 with a Oxydium console).

The principle is simple: we redefined a new assignment of the 60 physical outputs of the satellite with the "Oxydium suite" software\*.

Then successively reprogram the satellites by connecting the PC for they record each new assignments of their outputs.

Even the satellites reprogrammed, they continue to operate normally on the first ten groups of sixty (LEDs 0-9). But after the tenth group of sixty, one more push on the select of sixty button is to active the mode "addressing" personalized, with your own renumbering its outputs.

The selection of this addressing mode on the satellite is visible by the display on the bottom LEDs line will light alternative one LED on two.



\*To use this personalized addressing mode, download the free software "Oxydium suite" (minimum version 3.5) available on our website [www.genetec.fr](http://www.genetec.fr), and the instructions of the Oxydium (in the second part, you'll find the instructions to use the software with all the necessary explanations concerning the personalized addressing of satellites MAF60 series II).

*Note: If you do not use this function and you have never reprogrammed your satellite for personalized addressing, selecting this mode on the satellite will be equivalent to the first group of sixty (00-59). The ohmic test remains unchanged: each led still continues to display the status of the physical output to which it corresponds geographically.*

**THE BEACON TO CHECK THE COMMUNICATION (F) :** The satellite has an indicator F to check if the orders coming from the remote control are received and correctly interpreted by the satellite. Thus, the control of the wired connection between these two elements is largely facilitated. A beacon signal is automatically emitted by the remote control each 2 seconds, therefore the indicator F lights on approximately 0,5 second each 2 seconds. If it is not the case (no received beacon, or skipped signals of beacon) the communication is bad and it is advisable to check the wire of connection from remote control to satellite.

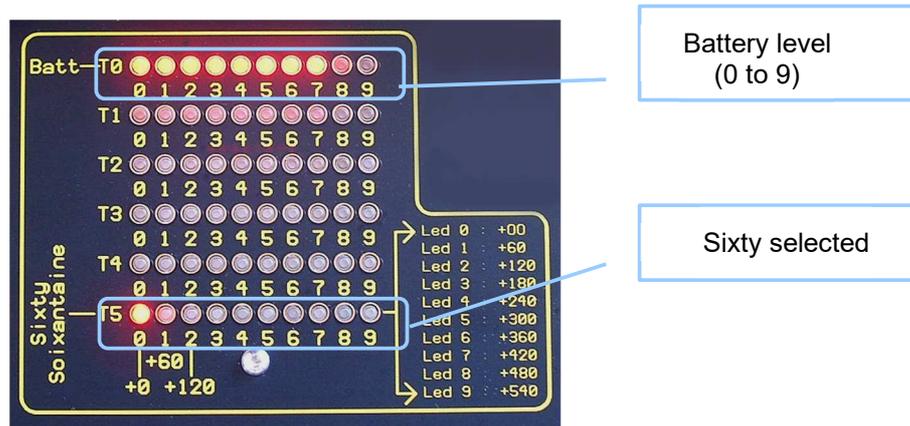
*Note: as soon as the key C is in position 1, the control of beacon reception is shut off.*

**DISPLAY PANEL MULTI-CHECK (G):** Block G with 60 red leds is on the satellite. This panel gives several functions for the checking :

1/ The top line indicates the voltage battery level of the satellite. It is permanently displayed (except during the ohmic test) by the leds 0 to 9 (9 is the maximum charge of the battery, and 0 the minimal one, if 0 flashing the battery level is critical).

2/ The low line (sixty), those 10 led indicators display the group of sixty which was selected (see page 6).

3/ The totality of the panel displays the line resistances during the ohmic test (the previous display disappears). It is arranged according to the same method as the outputs : by horizontal lines (which correspond to tens) and vertical columns (which correspond to the units) (see page 6).



LED Number :	Satellite works on Ways :
0 only	00 to 59
0+1	60 to 119
0 up to 2	120 to 179
0 up to 3	180 to 239 (for using with Oxydium)
0 up to 4	240 to 299 (for using with Oxydium)
0 up to 5	300 to 359 (for using with Oxydium)
0 up to 6	360 to 419 (for using with Oxydium)
0 up to 7	420 to 479 (for using with Oxydium)
0 up to 8	480 to 539 (for using with Oxydium)
0 up to 9	540 to 599 (for using with Oxydium)
0+2+4+6+8	Personnalized addressing mode

**ACTIVATION OF THE FIRING MODE :** Chronology to be respected: First, switch on the satellite with A. Then after, turn the key C in position 1. And not the reverse. At this step the satellite is armed and ready to shoot according to the orders transmitted by the remote control.

### **GENERAL POWER SUPPLY AND CHARGE OF THE INTERNAL BATTERY (I) :**

The MAF60 serie II operate with an integrated lead battery 12V 3.2Ah conferring to the satellite an autonomy of approximately 10 hours.

#### **To check the battery voltage :**

Switch on the satellite MAF60 serie II with the general power button 0/1 (A). The level displayed on the first line of leds, 0 to 9. 9 is the maximal charge and 0 is the lower charge of the battery. Under the level 0, the power supply is too low to supply correctly the system. If led 0 flashing the battery level is critical.

#### **To charge the internal battery (I) :**

The MAF60 serie II must be switched off.

First, remove the cap (I). Connect on the XLR plug (I) the automatic charger provided. The necessary time can be a few minutes to several hours, in proportion of the initial level of the battery. As soon as the charger is plugged, the light of the charger lights on. When the battery is full charged, this led lights off progressively. Then, unplug the charger and always replace the protection cap.

*For a long life of the battery : never discharge completely the battery. Charge the battery after each show, or every 2 month if not used.*

*Note : Charge the battery when you buy the MAF60 serie II, before the first use.*

**CONNECTION WITH A COMPUTER PC (H):** The normal use of MAF60 serie II does not require computer. Nevertheless, there is an USB input (H) for doing updates allowing to optimize the system, or to program the outputs for using the addressing mode. The updates are free and available on our website [www.genetec.fr](http://www.genetec.fr) . Before updating, don't forget to download the driver on our website and install it on your PC.

**CONNECTION OF THE REMOTE CONTROL (J) :** It is on these two terminals that you connect the two simple wires who link up the satellite to the remote control. The items must be turned off for the connection.

This input is not polarized, it's unnecessary to mark the wires. This link can go up to 5 kilometres with good conditions, nevertheless it is necessary to pass the wire away from potential sources of perturbations (electrical lines, radio-electric systems, HiFi...).

If you need to connect one second satellite MAF60 serie II, you can connect it on those terminals (J) by linking it up simply in parallel .You can lightly twist the stripped wires together to perfect the electrical connection.

Do not over tighten to prevent cutting the wire.



If you have to connect one 3rd satellite MAF60 series II, you must do it starting from this connector block by quite simply connecting it in parallel on 2nd, so on : ones following the others. Avoid if it's possible "Y" or "X" connections (see page 12).

The number of satellites controlled by a single remote control is not unlimited, that mainly because the repartition weakens the signal in the circuits : with more than 5 satellites controlled from only one remote control, it is necessary to check attentively the beacon.

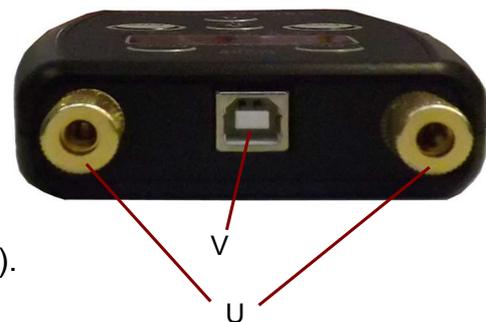
Important: this input (J) is designed to be connected to the remote control and only the remote control. Never plug it on a source of power supply (battery...) : there is a main risk of deterioration of the electronic circuits.

## THE REMOTE CONTROL :

The MAF60 serie II satellite is designed to be controlled remotely. For that it is necessary to wire a specific line on the connector block (J) "REMOTE CONTROL ONLY". You must connect this line to your satellite, satellite MAF60 series II not having button of shooting directly on its panel. *Note: If you have several systems MAF60 series II, the elements satellite and remote controls are interchangeable (if they have all the last updates).*



- M : On/Off pushbutton.
- N : Beacon indicator light transmitted and firing mode of the remote control.
- O : Switch of beacon mode or firing mode.
- P : Display of the Way to shoot.
- Q : Left firing push-button.
- R : Right firing push-button.
- S : Manual selection of the line (up).
- T : Manual selection of the line (down).
- U : Terminals for wiring connection to the satellite.
- V : USB input for firmware updates (PC computer).
- W : Various indicators (inoperative on this model).
- X : Batteries (bottom).



This remote control needs two alkaline batteries AA 1V5 (in the batteries holder X under the box). Respect the polarity, and to preserve the elasticity of the contact blades insert first the + of the batteries, and only after press on the – to finalize the insertion. When the remote control is switched on, if the batteries are low the display indicates « bat ».

**SWITCHING ON/OFF THE REMOTE CONTROL (M) :** Push one time the pushbutton M to switch on, another press to switch off. Immediately when the remote control is switched on, it is in automatic beacon mode (a beacon signal transmits each 2 seconds, the indicator N lights up each time).

In beacon mode, the display P in beacon mode indicates « - - - » and the pushbuttons Q, R, S, T are inoperative.

**SELECTION OF THE BEACON MODE OR FIRING MODE (O) :** To activate the firing mode, push one time the pushbutton O : the beacon mode is off. The indicator N lights continuously and the display P indicated the Way selected to shoot (from 0 to 179). The pushbuttons Q, R, S, T become actives. There is no automatic beacon signal transmitted when the firing mode is enabled.

**FIRING PUSHBUTTON (Q and R) :** A simultaneous push on these two pushbuttons gives the firing order of the displayed Way. The line is fired within approximately 0.1 to 0.2 sec. A push on only one of these two buttons is without effect. After each shooting, the remote control goes up automatically to the following Way. It is necessary for firing that the remote control and the satellite(s) are all in firing mode. If the satellite is switched on, and its key C on “1”, all order of shooting will be effective.

**MANUAL SELECTION OF THE LINE (S and T) :** It can be useful to have to select another Way to shoot that the one given by the step by step automatic advance. At this time there, each push on the arrow “Up” (S) makes it possible to jump a Way. Each pressure on the arrow “Down” (T) makes it possible to move back.

Note: if the displayed Way is 0, a push on “Down” makes it possible to go directly to 179 or if the displayed line is 179, a push on “Up” makes it possible to go directly to 0.

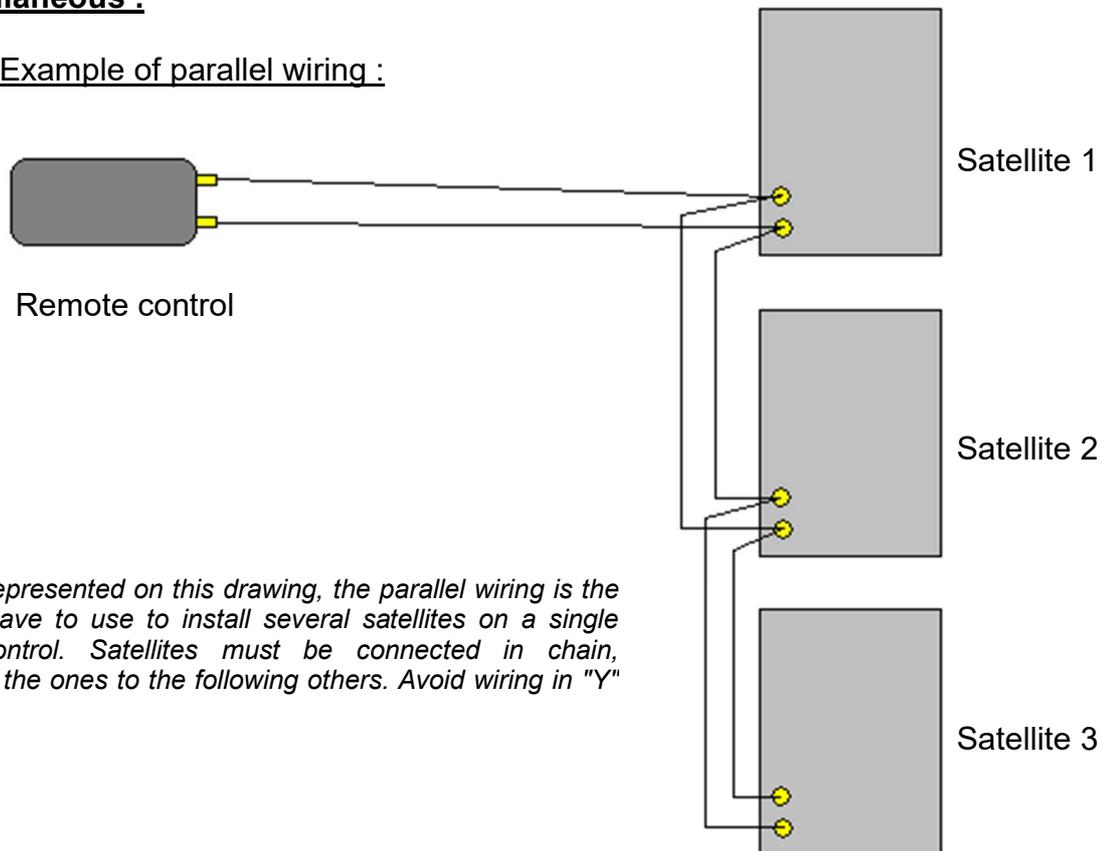
**CONNECTION WITH THE SATELLITE (U) :** To be able to transmit the signals of beacon and firing, the remote control needs to be connected with the satellite by two single wires. It is on these terminal plugs that you connect two simple wires which connect the remote control with the satellite(s) inputs (J). This output is not polarized, thus useless to mark the wires. If you have to connect several satellites MAF60 serie II, if possible avoid making it directly from these two plugs, but prefer a connection in chain of a satellite towards the following one. Do not do short circuit between these two plugs.

*Note : The number of satellites controlled by a single remote control is not unlimited, that mainly because of the repartition weakens the signal in the circuits : with more than 4 or 5 satellites controlled starting from only one remote control, it is necessary to check attentively the beacon. If it is necessary to have satellites in more large number, it is advised to use several remote controls, or one Oxydium system.*

**CONNECTION WITH A PC COMPUTER (V) :** The use of MAF60 serie II remote does not require computer. Nevertheless, there is an USB input (V) for update the firmware allowing to optimize the functioning. These updates are free and are available on our website [www.genetec.fr](http://www.genetec.fr)

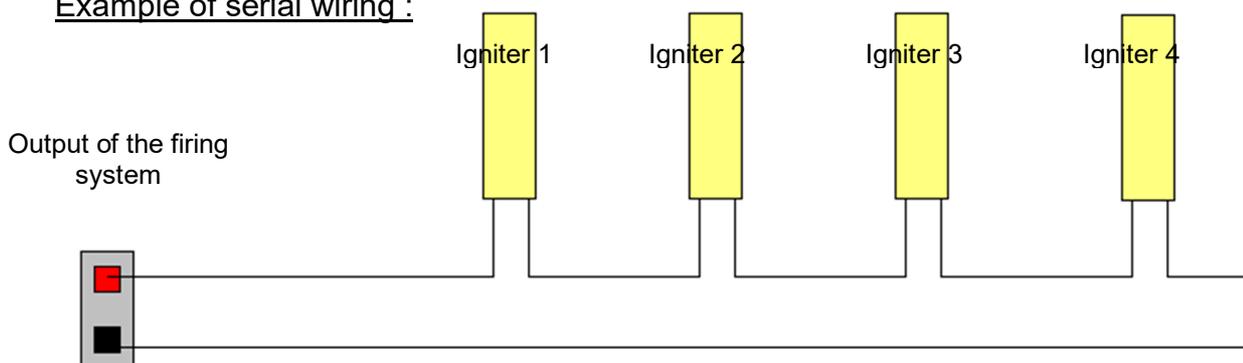
## Miscellaneous :

### Example of parallel wiring :



*Note: as represented on this drawing, the parallel wiring is the one you have to use to install several satellites on a single remote control. Satellites must be connected in chain, connected the ones to the following others. Avoid wiring in "Y" or "X".*

### Example of serial wiring :



*Note : Only the serial wiring must be used for the igniters.*

### Chronology installation of a full wired MAF60 serie II system :

- 1/ Place the satellite(s) and make the connection with the remote control (installed on the definitive place of the operator).
- 2/ Switch on all the MAF60 systems in beacon mode, and check the good transmission of the beacon signals on the satellite(s).
- 3/ Switch off all the MAF60 systems (remote and satellites). Wire the output lines (firing area must be cleared), do the settings, the checks, etc...
- 4/ Before the show, first switch on the remote control in beacon mode, after switch on the satellite(s) in beacon mode and check on more time if the beacon signals are still good. Switch off the remote control, and then select the firing mode on the satellite(s). After, switch on the remote control and select the firing mode to do the show. At the end of the show, all the systems must be switched off.

Information about the firmwares updates : Our products are constantly in development. As soon as an evolution is found, it is made available for free on our site. They optimize the operation of devices having the latest firmware version of the device. These updates are quick and simple to do, just follow the instructions given by the program. When a system is delivered, it has the latest update. However, visit regularly our [www.genetec.fr](http://www.genetec.fr) site to see if new updates are available. The different elements are all designed to work together within your MAF60 Series II system, therefore you must update in same time all your devices of the range MAF60 Series II (and Oxydium).

## **OBSERVATIONS AND ADVICE :**

- The - (black terminations points) of the satellite are not electrically in common. It's the same thing for the + (red terminations points).
- Before use, to familiarise yourself with your MAF60, make simulations. Be sure you're able to control all functions.
- If in proximity of the fireworks area, remember to protect the system and the cable from eventual incandescent falls. Protect the system against fire, chocks, blasts, rain, water, hot sun exposure...
- If you use the case in very cold area (such in the mountains or snow), install satellites at the last moment so as to preserve the battery or protect them with an insulated box, otherwise there is a risk of a partial power loss. In winter the energy yields are lower, by security reduce the values page4 by 50%.
- Only use water or glass cleaner with a soft cloth to clean your case, do not use solvents.
- No powerful radio transmitter should be used in proximity of the control unit.

## **CHARACTERISTICS :**

- Dimensions : 464 x 360 x 176 mm (IP65 case), 160 x 88 x 25 mm (remote control).
- Weight : 6.2 Kg (satellite), 220g (remote control).
- General power supply of the satellite : Lead battery 12V 3.2Ah (average life duration 3 up to 5 years)
- Average consumption of the satellite : 100mA (1.2 Watt).
- Maximum battery current peak when firing: up to 10A
- Average residual consumption of the satellite : 0.05 up to 0.1mA.
- Average range of the satellite (stand by mode), for information only :10 hours.
- Power supply of the remote control : 2 alkaline batteries AA 1V5
- Average consumption of the remote control : from 40mA to 100mA depending of display (0.12/ 0.3 Watt)
- Average residual consumption of the remote control : 0.002mA (0.006 Watt).
- Average range of the remote control, for information only :14 hours.
- Output voltage (with unloaded circuit) : 70V (pulses of 27ms) 1.2A regulated
- Time reaction : 0.1 sec. approximatively
- Minimal time between two manual shoots : 0,5 sec.
- Automatic resistance measurement of the wired lines (displayed with 60 red leds). Set to 70 ohms.
- Battery level bargraph.
- 60 Way outputs from 0 to 59.
- Current of automatic resistance measurement : 10 mA max.
- Connexion to PC by USB
- Temperature of use : +5°C to +45°C.
- Warranty : 2 year.

GENETEC denies all responsibility for a failed fireworks show. We suggest you to take care of your material and not hesitate to check it. Follow these operating instructions carefully, and above all pay attention to the safety instructions.



## **SAFETY INSTRUCTIONS :**



- **Never work near the fireworks when the system is switched on. Switch off and always keep the key with you. It's always the last person to leave the fireworks area who should keep the key.**
- **The satellite and the remote control must be located away from the fireworks area, even throughout the checking.**
- **Switch on the satellite only if the key firing mode is on « 0 ».**
- **The line's resistance checks should not be done until everyone has left the dangerous area.**
- **Storage, recharging, transport : the firing systems must be switched off and away from pyrotechnic products.**
- **Always strictly comply to the safety instructions**
- **The user must study these operating instructions**
- **THE LAUNCHING AREA MUST BE CLEARED BEFORE POWERING UP THE SATELLITE.**

DECLARATION  
DE CONFORMITE



Nous déclarons, sous notre propre responsabilité que l'appareil suivant :

Systeme de tir marque GENETEC modèle MAF60SII (serie II)

Est conforme aux exigences essentielles listées ci-dessous :

EN55022 (1998) classe B/CISPR 22 (1985) classe B  
IEC 801-2 (1991) seconde édition/prEN 55024-2 (1992) : 4 kV CD, 8 kV AD  
IEC 801-3 (1984)/prEN 55024-3 (1992) : 3V/m  
IEC 801-4 (1988)/prEN 55024-4 (1992) : Alimentation 1kV signal 0.5kV

Ainsi qu'aux directive et normes radio

- 99/5/CE
- EN301489-3 (2000) compatibilité ERM, EMC, SRD de 9khz à 40Ghz
- EN60950 (1992 à modif A4 1997)

Information supplémentaire :

Ce produit est conforme à la CEM directive 89/336/CEE du 3 mai 1989 concernant le rapprochement des législations des états membres relatives à Compatibilité ElectroMagnétique.

Les produits ont été testés dans une configuration normale.

La Bastidonne, le 11 juin 2007.

Bertrand GAYMARD  
Gérant

A handwritten signature in black ink, appearing to be 'Bertrand Gaymard', written over a faint, stylized graphic element.