FIREMASTER® PLUS V

USER'S MANUAL REV.201120

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SUMMARY

1. COMMAND UNIT MODEL TX6000

1.1. FRONT-PANEL DIAGRAM

1. **Resistive LCD touch screen**, color RGB 800x480 pixels
2. **Main Antenna. Turret for the attachment of the whip antenna supplied with the instrument.** The antenna resonates at λ/4 on 40,675MHz. NOTE: use the original antenna only.
3. **R.F. OUTPUT –** BNC coaxial connector 50-ohm impedance. Output for external antenna connection (in place of the standard whip antenna) or to interconnect the Remote Units to the TX Base Station using COAXIAL CABLE.
4. **USB CONNECTOR:** 4-pole standard USB female "A" connector, dedicated for a direct download of the Show program through an USB pen drive.
5. **USB CONNECTOR:** 4-pole standard USB female "A" connector, dedicated for general use, like usb-lamp.
6. **LAN CONNECTOR**
7. **TX ON indicator**. When turns ON, the radio transmitter is ACTIVE and sending a message to the remote units.
8. **WLAN indicator.** When turns ON, Wlan system inside TX is ACTIVE
9. **FIRE Pushbutton:** When pressed **together with** the ARM key, starts immediately the firing, if pressed alone, have NO EFFECT.

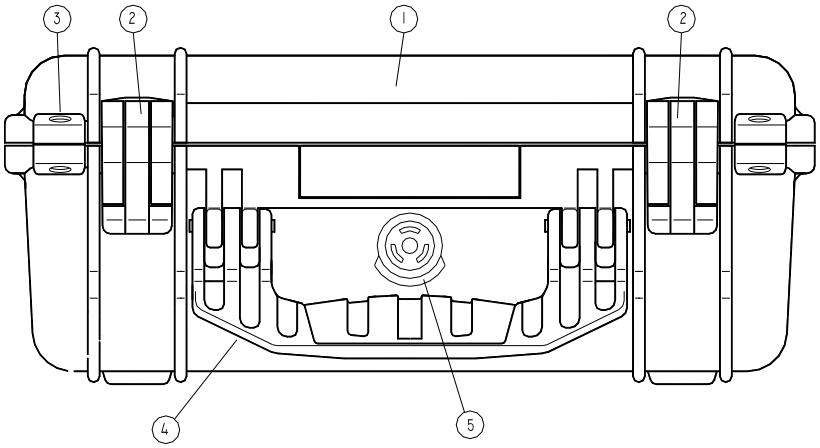
10. **Selector Key:** 3-position switch with safety key
    - **OFF/CHARGE** – system switched OFF. If the TX is connected to the main when the switch is in this position, the battery charging sequence will start immediately.
    - **SAFE** – in this mode it will be possible to test/check/modify all field units, WITHOUT ANY RISK TO activate a FIRE condition.
    - **FIRE** – in this mode the show parameters cannot be changed anymore, but it will be only possible to address the needed sequence and to FIRE it.

    NOTE: even if apparently possible, the operation in SAFE or FIRE position with the mains cord connected, IS NOT RECOMMENDED.
11. **Numeric keypad:** it allows the entry and modification of the numeric parameters inside the functions**.**
12. **ARM Pushbutton**
13. **AUDIO TONE IN:** RCA and JACK type connector. Accepts an AUDIO input synchronism coded signal to synchronize the FIRE command with the musical base during the show.
14. **SMPTE IN:** 3-pole "XLR" female connector. Accepts a standard SMPTE/EBU timecode signal. It can be used to synchronize the firing sequence to an external timing source.
15. **GENERAL PURPOSE I/O:** 6-pole female DIN connector.
16. **SYNC indicator:** It is turned ON when the audio synchronism feature has been enabled ("tools" menu) and whenever a valid audio sync signal is received at TONE IN connector (11).
17. **REC indicator:** It turns ON when the audio synchronism feature has been enabled ("tools" menu) and the RECORDING mode selected.
18. **PLAY indicator:** It turns ON when the audio synchronism feature has been enabled ("tools" menu) and the PLAY mode selected.
19. **BATTERY CHARGE indicators.**
20. **LINE 110/240Va.c.** two-pole mains receptacle. It accepts standard 2-pole cables to be plugged directly into the mains receptacle for battery charging. The internal supply accepts automatically voltages from 110V up to 240V a.c. 50 or 60Hz without need for range switching.

NOTE:

Since the TX-6000 Unit IS NOT PROVIDED with a LINE SWITCH, the Unit itself, during the charging process, must be suitably placed in order to allow the easy removal of the LINE CORD at any moment, in case of emergency.

1.2. CASE DESCRIPTION

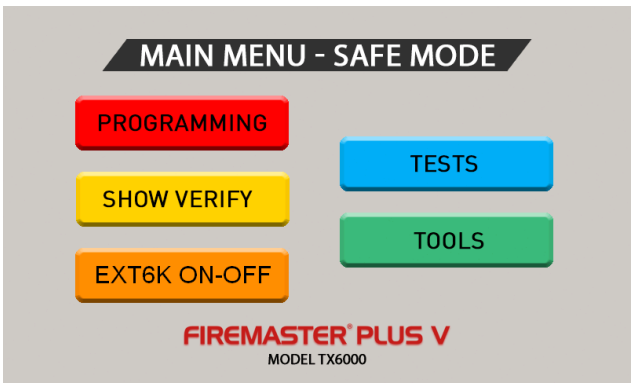


1. IP67 Ultra High Impact Copolymer Polypropylene case. 40.6 x 33 x 17.4 mm
2. Double-step latches
3. Stainless steel reinforced padlock protector
4. Fold-down and rubberized handle
5. Automatic pressure equalization valve

1.3. TX USAGE PROCEDURE

1.3.1. MAIN MENU

Turn the key selector on **SAFE** position, a picture with a graphic logo "FIREMASTER PLUS V" will appear, touch the screen to enter in MAIN MENU.
In this operating mode it is **TOTALLY INHIBITED** the transmission of a **particular code** regarded by all Remote Units as a **FIRE COMMAND.** All Remote Units have thus the batteries powering the lines, PHYSICALLY DISCONNECTED. In this way all test operations can be carried-out with the maximum safety degree and, even if a severe failure should occur to one or more Units, IT NEVER WILL BE POSSIBLE TO HAVE A PREMATURE OR UNDUE FIRING OF ANY SQUIB CONNECTED TO THE SYSTEM.



1.3.2. EXT6K ON-OFF

With this function is possible to activate (or de-activate) all EXT6K directly from the TX6000.

That's mean that all EXT6K connected to a RX6000 (switched ON), can be de-activate by radio, in order to save batteries consumption.

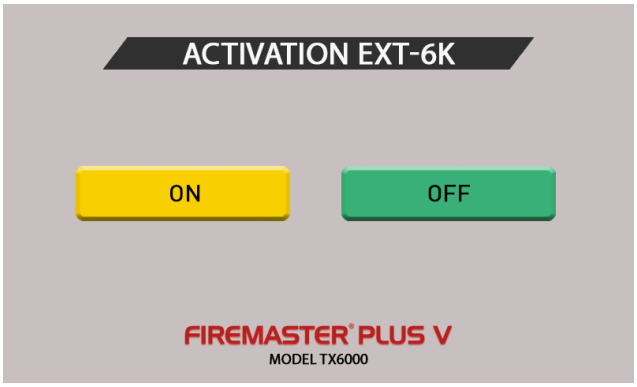
EXT6K, MUST BE ACTIVATED AGAIN FOR ANY KIND OF TEST OR SETTING.

After the activation, need to wait some seconds (at least 55 sec) in order to give the time to the RX6000 to make their AUTO CHECK to all EXT6K connected.

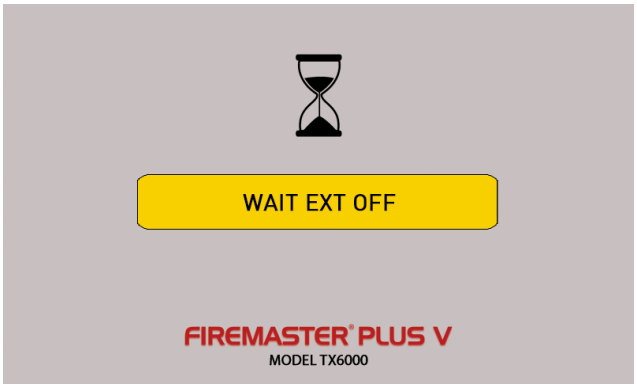
THE ACTIVATION WILL ALSO HAPPEN AUTOMATICALLY JUST TURNING THE KEY IN FIRE POSITION.

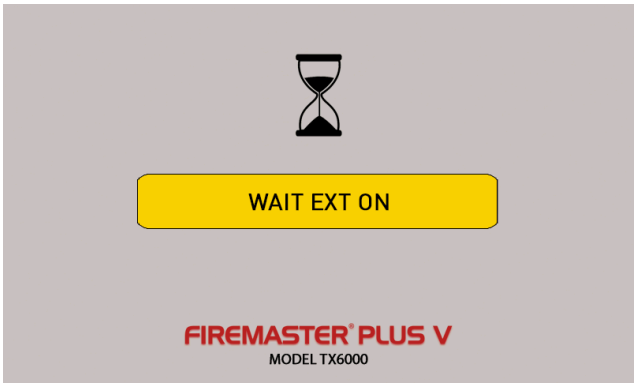
To activate or de-activate the EXT6K, simply press **ON** or **OFF** key.

To refresh the AUTO CHECK of all EXT6K, simply press **ON** again.



A wait message will appear just after that process.

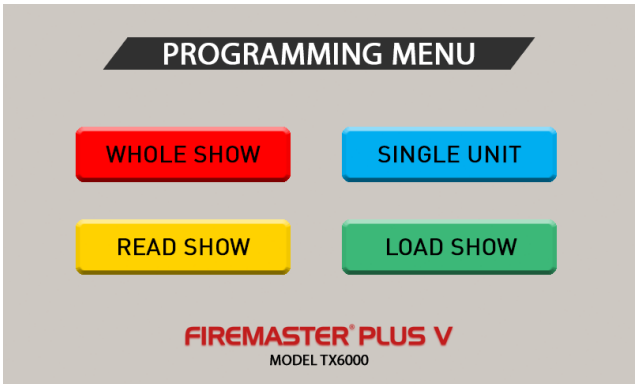




At the end a message of Confirmation will appear on the screen.

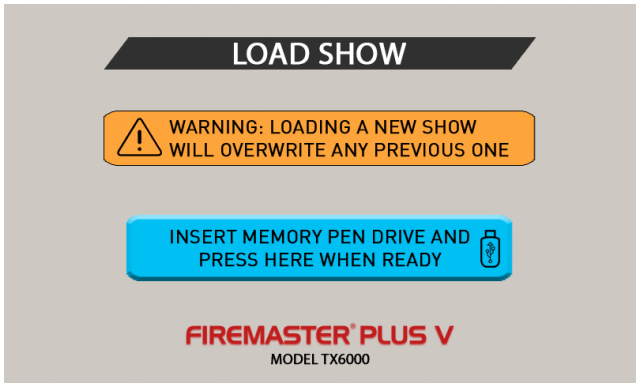
1.3.3. PROGRAMMING MENU

Once the show data have been loaded and stored in the memory of the TX6000, it will be necessary to send these data to each Remote Units.
First of all, switch ON (or activate)all Units and wait for the auto-test procedure.
From MAIN MENU, press on **PROGRAMMING** key to enter in **PROGRAMMING MENU**.



1.3.3.1. LOAD SHOW

To load the show program inside the memory of the TX6000, save the show file on one Pen Drive (The show file must to be renamed as **TX.txt**, only in that way can be recognised directly from the System), press on **LOAD SHOW** key, insert memory pen drive in the USB port and press the proper key when ready.



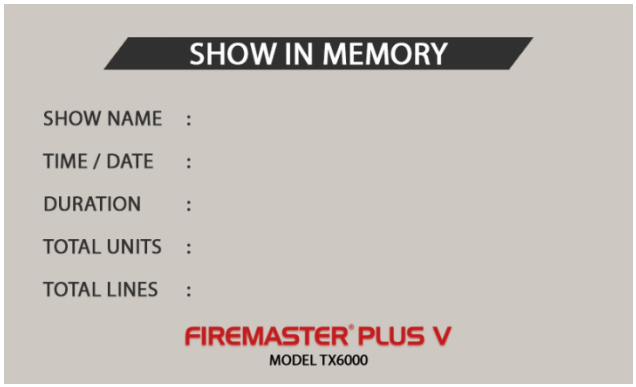
At end will appear mask with a proper message as following:

It is possible to have in the pen Drive up to 4 different shows (**TX, TX1, TX2, TX3**) and it is possible to decide what show can be loaded in that way:

- Show named as TX, simply press directly the proper blue key when is ready
- Show named ad TX1, pressing **F1** key on the keyboard, just before to press the screen blue key
- Show named ad TX2, pressing **F2** key on the keyboard, just before to press the screen blue key
- Show named ad TX3, pressing **F3** key on the keyboard, just before to press the screen blue key

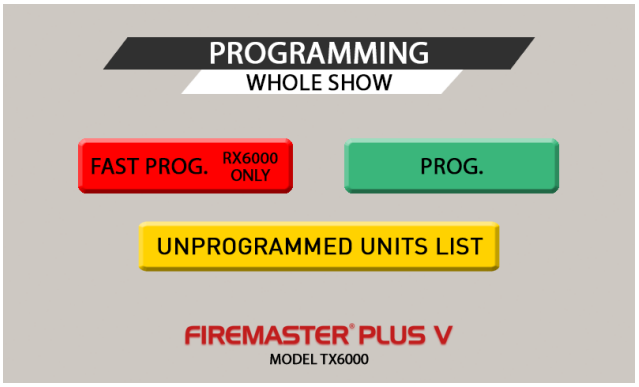
1.3.3.2. READ SHOW

Enter in **READ SHOW** mask to read details of the program saved on TX6000 memory. Be sure to check that details are correct.



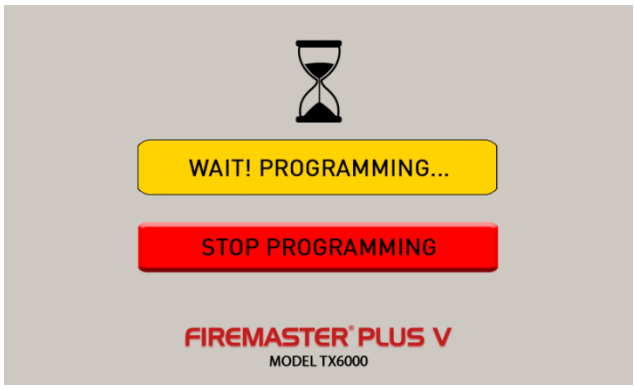
1.3.3.3. WHOLE SHOW

Press on WHOLE SHOW key to start to program all show Units.



After press key **PROG.**, the TX6000 start to call and send the program to each Unit (this operation could require several minutes if the show does use several Remote Units), at end will appear a message **"OK DONE"**. (compatible with FM3, FM4 and FM5)

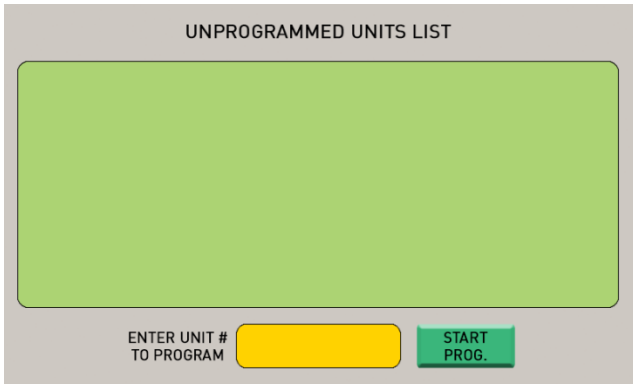
IN CASE OF USING ONLY FM5 SYSTEM, it's possible to use the function **FAST PROG. RX6000 only**, in that way will be sent to each RX6000 the full package of the program of each Remote Units connected.

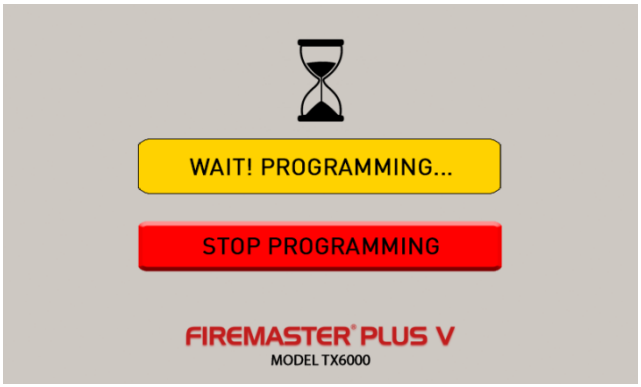


Otherwise, if any error occurred during the programming, the System will jump automatically to the "**UNPROGRAMMED UNITS LIST**" mask in order to display a list of all RX not well programmed.

The TX6000 makes 3 attempts when any Receivers (Rx6000 or Rx48) shouldn't "answer" to the programming, then the next RX will be addressed and so on for all the Units specified in the show file.

From this mask is possible to try to program again each single RX, only typing with TX Keypad (or directly on the screen), the unit number in the yellow mask.





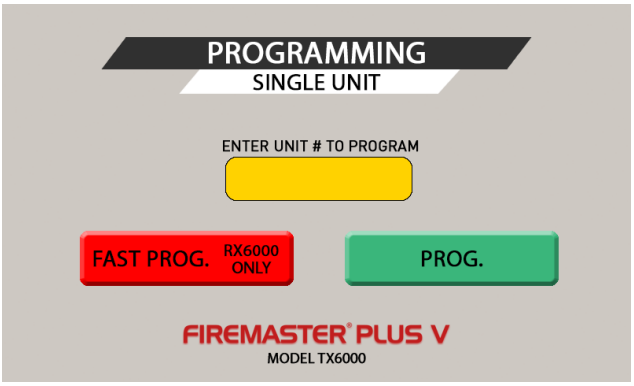
At end will appear mask with a proper message:

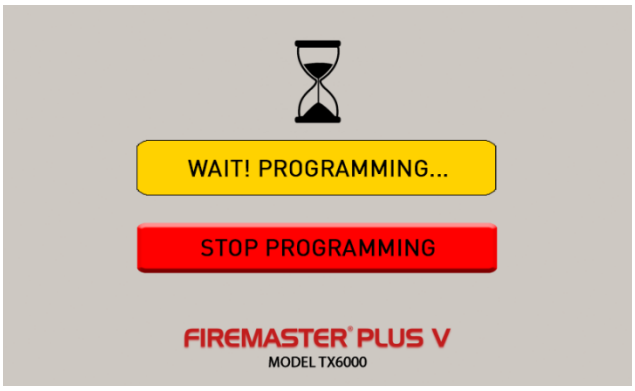
AFTER PROGRAMMING A RX6000, PLEASE WAIT AT LEAST 1 MINUTE BEFORE TESTING.

1.3.3.4. SINGLE UNIT

Press on **SINGLE UNIT** key to start to program a single unit, type with TX Keypad, the unit number in the yellow mask and press **PROG**.

In case of programming a full RX6000, type with TX Keypad, the RX6000 unit number (that correspond at the first Remote Units of that net) in the yellow mask and simply press **FAST PROG. RX6000 only**, in that way all Remote Units program of that RX6000 will be sent in one time.





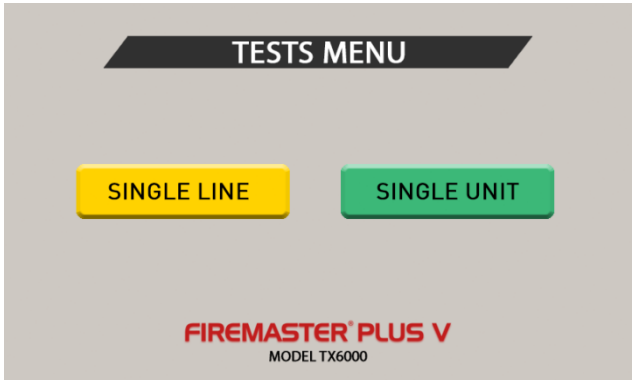
At end will appear a mask with a proper message as following:

AFTER PROGRAMMING A RX6000, PLEASE WAIT AT LEAST 1 MINUTE BEFORE TESTING, in order to give the time to the RX to send program to each Ext6K.

1.3.4. TESTS MENU

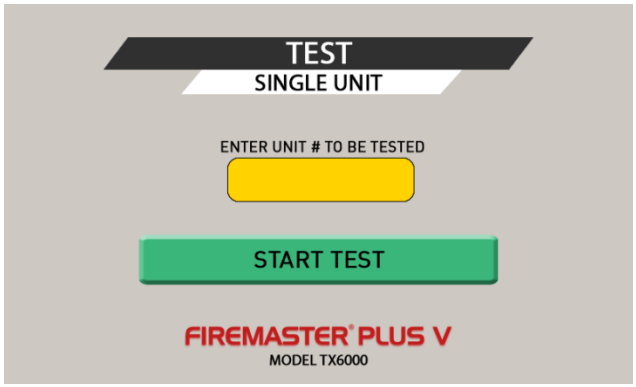
This mask can be selected from the **MAIN MENU** in order to verify if the content of the Remote Units does match exactly the show data stored in memory by the TX6000. In order to allow that verify can be correctly executed, ALL the Remote Units must be already programmed, switched ON and fully operative granting a solid communication link with the TX6000.

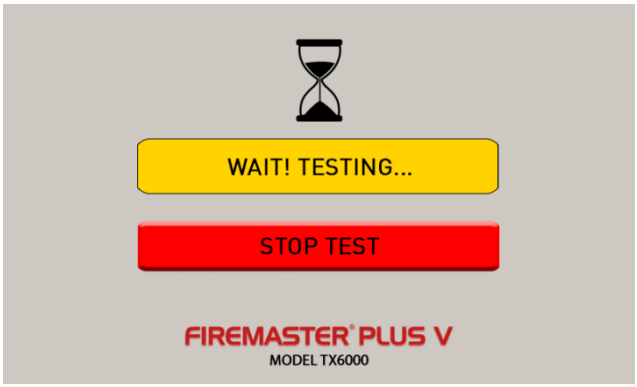
Two possible verifying modes are allowed:



1.3.4.1. SINGLE UNIT

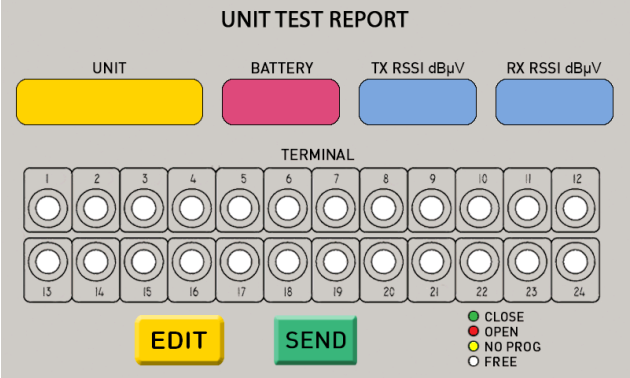
This function allows to display, with a single command, the complete situation relative to all 24 lines of a selected Remote Unit. Type with TX Keypad, the unit number in the yellow mask and press **START TEST**.





If unit doesn't response will appear a mask with a proper message as following:

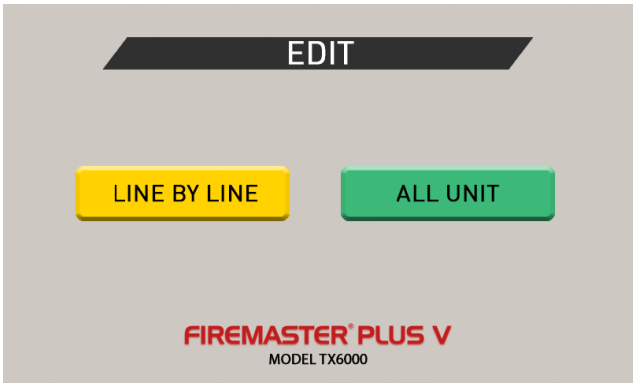
If Unit response, will appear the following mask with all necessary's information (unit number, battery voltage, Transmission radio signal, Receiver radio signal, status of each lines)



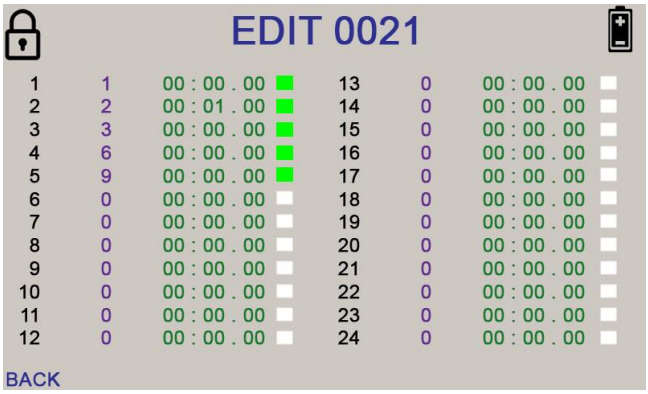
Different colours will mark the status of each line:

- GREEN – mean that line circuit is close and so is GOOD
- RED – mean that line circuit is open and so is NOT GOOD
- YELLOW – mean that there is line connected, but it's not in the program
- WHITE - mean that this line is empty and not used in the program

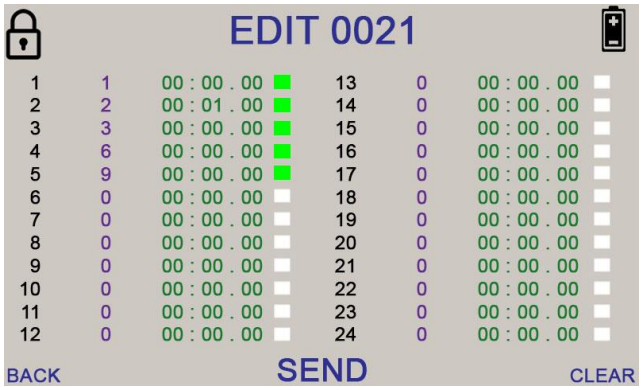
To refresh or to call again the Unit, you need to press **SEND** key.
To change Unit, you need to press on the Unit yellow slot, write the number with keypad, press **ENTER** button to confirm, and press **SEND** key to call.
To check or edit the program of this Unit, press **EDIT** key, and will appear the following mask, where you can decide to EDIT **LINE BY LINE** or EDIT **ALL UNIT**.



Edit **LINE BY LINE**: in this mask each time you modify one line, the TX will send the data to the Unit. To modify need simply press on the screen to select the LINE

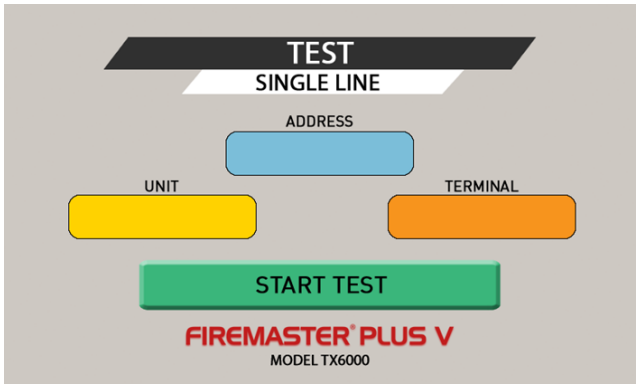


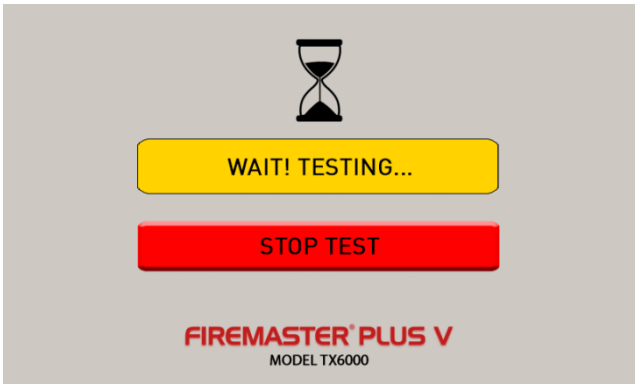
Edit **ALL UNIT**, in this mask you can modify all Unit, the TX will send all the data to the Unit in one time, only after pressing **SEND**. It's also possible to clear all Unit program, simply press the CLEAR key in the bottom of the screen.



1.3.4.2. SINGLE LINE

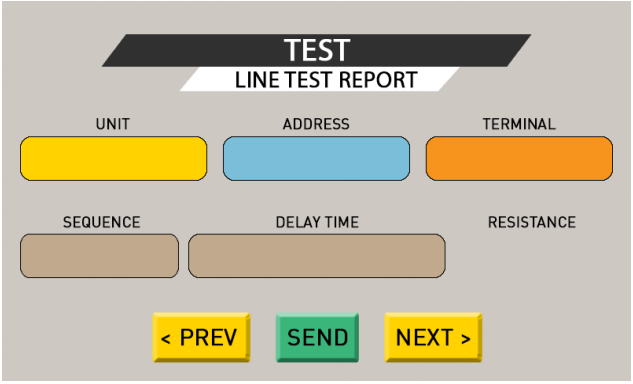
This function allows to display, the complete situation relative to a single line of one Remote Unit. Type with TX Keypad, the unit number, the terminal or directly the address, in the proper mask and press **START TEST**.





If unit doesn't response will appear a mask with a proper message as following:

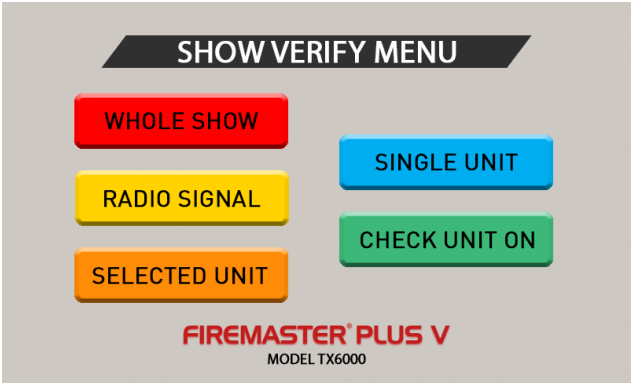
If Unit response, will appear the following mask with all necessaries information (unit number, address number, terminal number, sequence number, delay time and ohm resistance)



To refresh or to call again the Unit, you need to press **SEND** key.
To Edit, press the proper slot and write with keypad, press **ENTER** button to confirm, and press **SEND** key to send data to Unit.

1.3.5. SHOW VERIFY MENU

This function is necessary to verify if the content of Remote Units does match exactly the show data stored in memory by the TX.
In order to allow that verify can be correctly executed, ALL Remote Units must be already programmed, switched ON and fully operative granting a solid communication link with the TX.

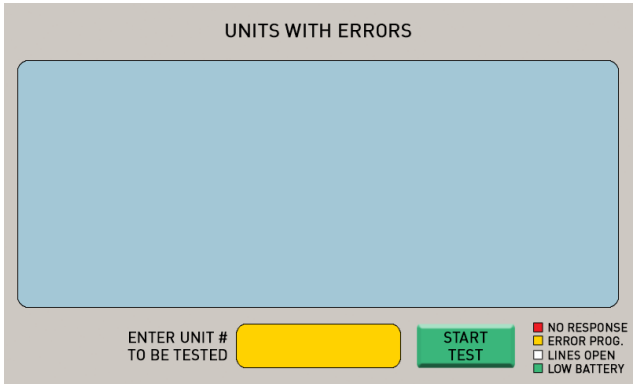


1.3.5.1. WHOLE SHOW

This function allows verifying all units listed in the show stored in the memory of the TX.

After press on **START VERIFY**, the TX6000 will wait 55 sec. in order to refresh the AUTOCHECK of each RX6000, and only after that will start to check the program to each Unit (this operation could require several minutes if the show does use several Remote Units), at end will appear a message **"OK! VERIFY DONE"**.

Otherwise, if any error occurred during the verify, the System will jump automatically to the "**UNITS WITH ERRORS"** list mask in order to display a list of all units with errors or problem.
The TX makes 3 attempts when any Remote Unit shouldn't "answer" to the verify, then the next Unit will be addressed and so on for all the Units specified in the show file.
From this mask is possible to try to test again each single unit (and so enter in SINGLE UNIT MENU), only typing with TX Keypad (or press directly on the screen), the unit number in the yellow mask.

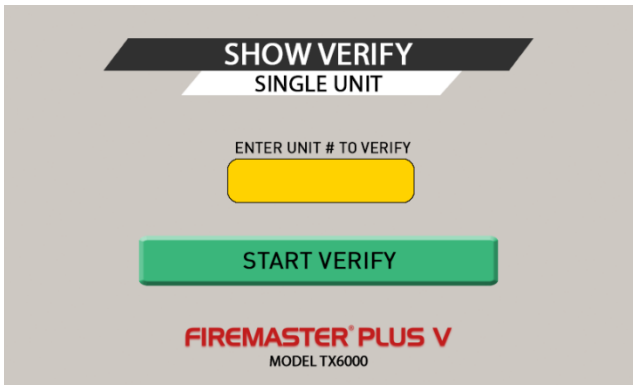


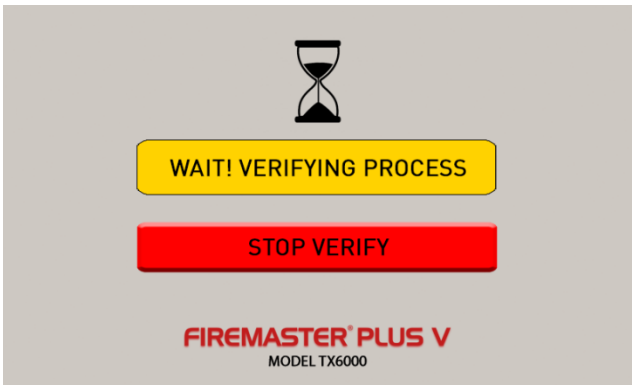
By the colors of the Unit is possible to understand immediately the type of Error:

- RED: Unit no RESPONSE
- YELLOW: There is problem on the program of the Unit, or there is something connected in lines not programmed.
- WHITE: there are one or more lines open on the Unit
- GREEN: there are some problem on the Unit Power supply

1.3.5.2. SINGLE UNIT

This function allows selecting, among all the available Remote Units listed for the show, only the ones requiring a Verify. Type with TX Keypad, the unit number in the yellow mask and press **START TEST**.

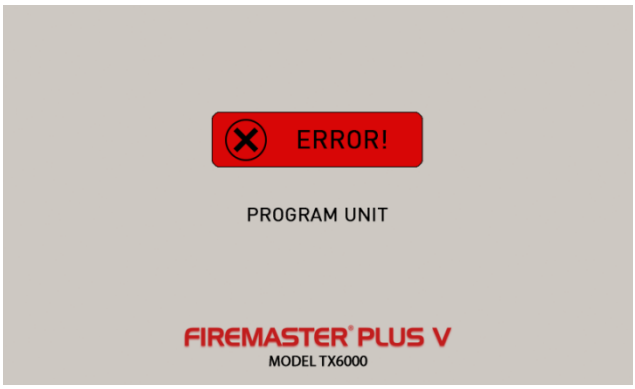




If Unit response, will appear the following mask

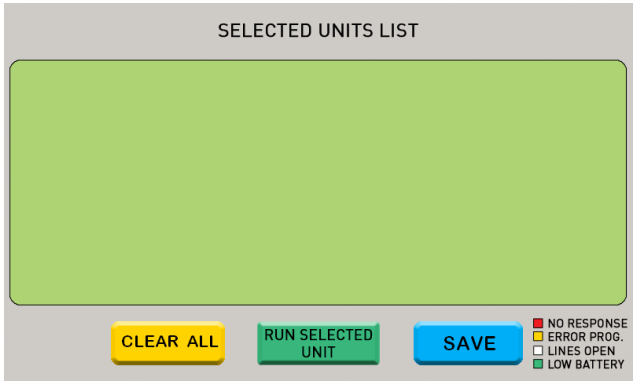
Otherwise, if any error occurred during the verify, the System will jump automatically to the "**UNITS WITH ERRORS"** list mask in order to display a list of all units with errors or problem.

If problem is not related to "lines Open", will appear the following error mask

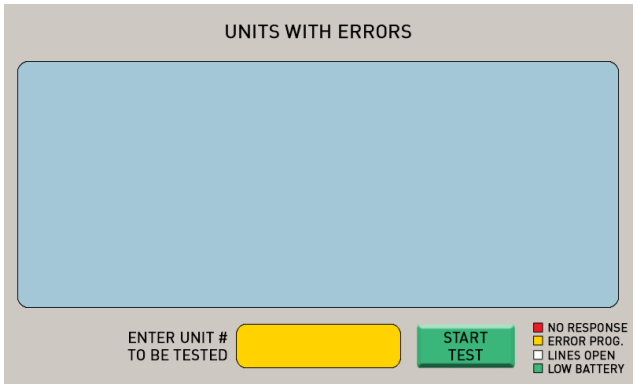


1.3.5.3. SELECTED UNIT

This function allows selecting all together, among all the available Remote Units listed for the show, only the ones requiring a Verify.
Press on the screen and type, the unit numbers that need to check and press Enter to confirm.
Press **SAVE** to keep the listed Units saved on the Mask.
Press **RUN SELECTED UNIT** to launch the verify test only of the list Units.
Press **CLEAR** all to reset the Unit List.

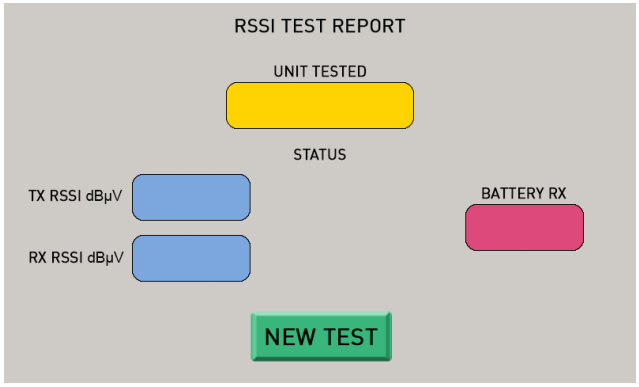


If any error occurred during the verify, the System will jump automatically to the "**UNITS WITH ERRORS"** list mask in order to display a list of all units with errors or problem.



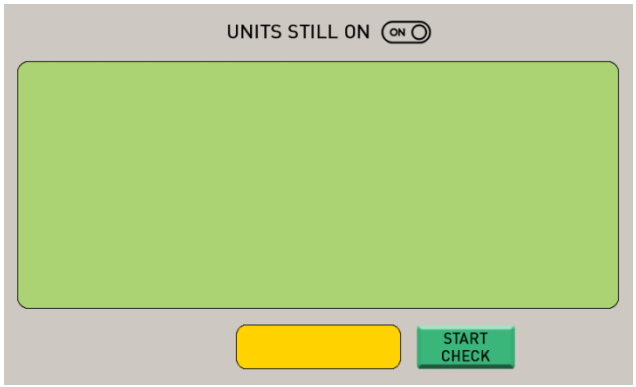
1.3.5.4. RADIO SIGNAL

This function allows verifying quickly the radio signal of a Remote Unit
Press on the Unit yellow slot, write the number with keypad, press **ENTER** button to confirm, and press **NEW TEST** key to call.



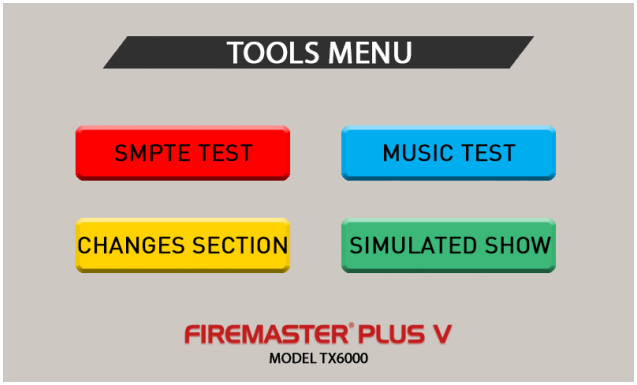
1.3.5.5. CHECK UNITS ON

This function allows verifying quickly if all Remote Units of the show, are correctly switch off.
If not Units Numbers will be typed on the green mask, a message **"OK DONE"** will appear on the screen.



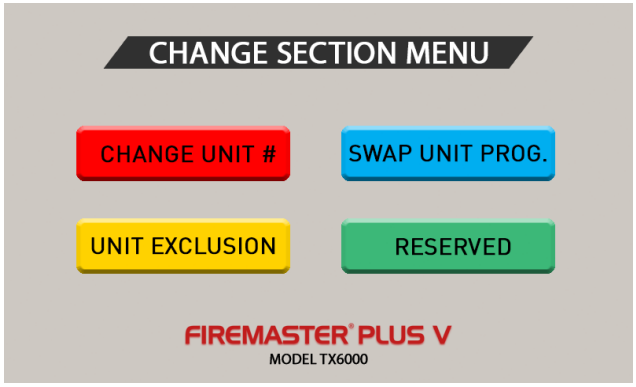
1.3.6. TOOLS MENU

In this menu there are auxiliary and system setup functions.



1.3.6.1. CHANGE SECTION MENU

This submenu allows special changing in show program, in the TX and in Remote Units.

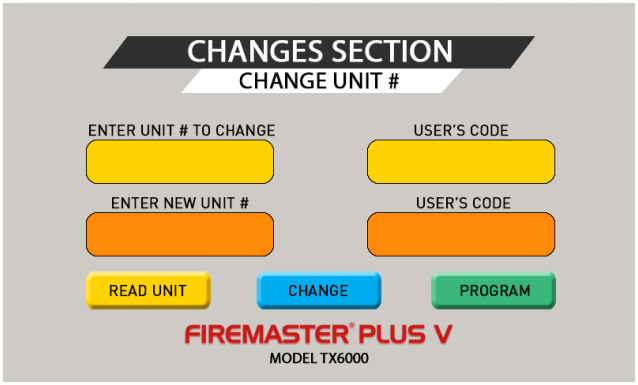


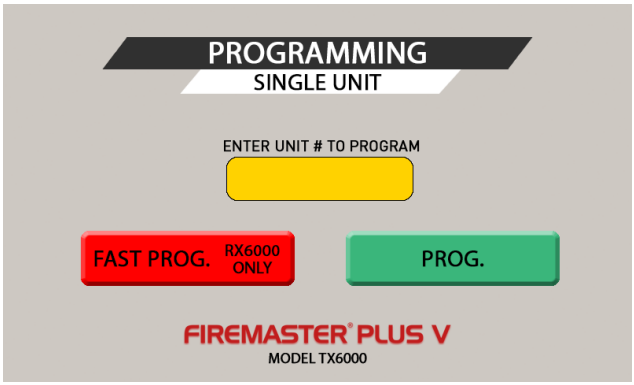
1.3.6.1.1. CHANGE UNIT NUMBER

This utility allows changing of units' numbers between units with same user's code.

This function it can be very useful if one or more Remote Units must be substituted on field just before the show. Once entered the unit number to change (on the Yellow slot), need to press **READ UNIT** to have a positive reply (will appear user's code), only after this, it's possible to type the new Unit number (on the Orange slot) and press **CHANGE** to execute it.

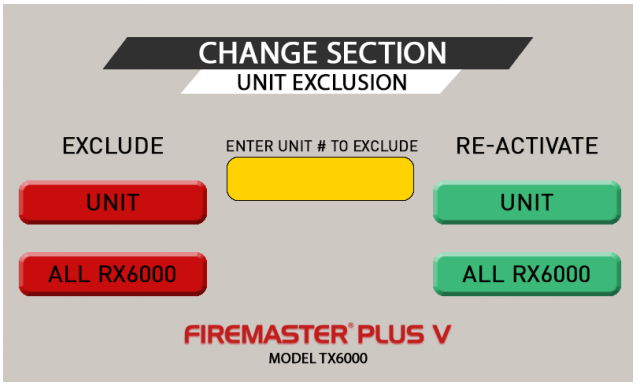
After CHANGE operation, the new Unit **MUST BE PROGRAMMED** with the data previously contained in the discarded Unit, and so simply pressing PROGRAM key the system will open SINGLE UNIT PROGRAMMING MENU.





1.3.6.1.2. UNIT EXCLUSION

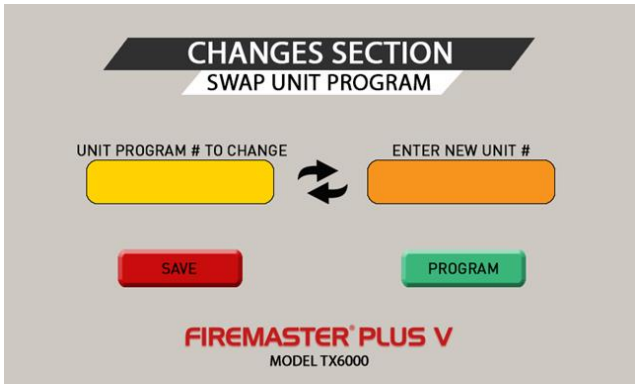
This utility allows a radio deactivation of specific remote units.
This function it can be very useful if one or more Remote Units only must be immediately stopped during the show.
After typing Unit Number, only pressing EXCLUDE **UNIT** to deactivate and **RE-ACTIVATE** to restore the radio communication.
To Exclude the RX6000 (and so all his Units connected), type the RX Unit Number (that correspond to the first Remote Unit of the RX6000) and simply press the key **ALL RX6000**.
For safety reason the Radio Communication will be automatically restored as soon as the Unit will be switched off and on.



1.3.6.1.3. SWAP UNIT PROGRAM

This utility can be very useful if one or more Remote Units must be substituted on field just before the show. This function allows transferring the show program from one unit to another, in order to have an immediate substitution in case of necessity.

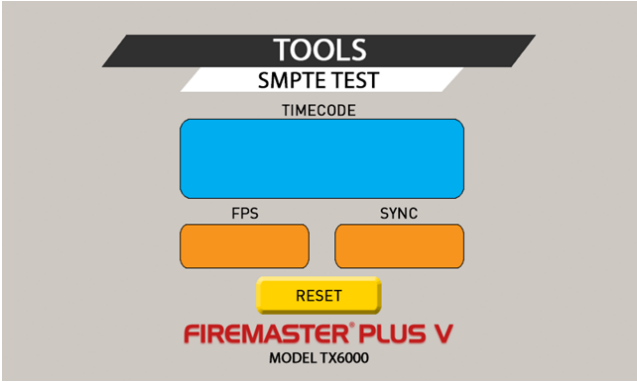
Once entred the two units numbers, need to SAVE (pressing SAVE key) the new unit number in the show program in TX memory, only after that a confirmation symbol will appear.



After any SWAP operation, the new Unit **MUST BE PROGRAMMED** with the data previously contained in the discarded Unit, and so simply pressing PROGRAM key the system will open SINGLE UNIT PROGRAMMING MENU.

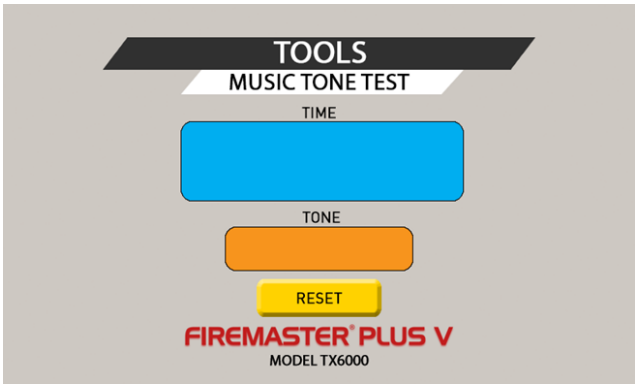
1.3.6.2. SMPTE TEST

This menu allows TO TEST the SMPTE signal of the TIME CODE.
The SYSTEM FIREMASTER is provided with a dedicated decoder receiving this signal and using it to synchronize all firing activities with the common time reference. The SMPTE/EBU time code must be of LTC type (Lateral Time Code).
With a valid timecode, the system will start to decode the incoming signal and the mask will display the type of SMPTE decoded (24, 25, 30 fps) and the "SYNCHRONIZED" message.



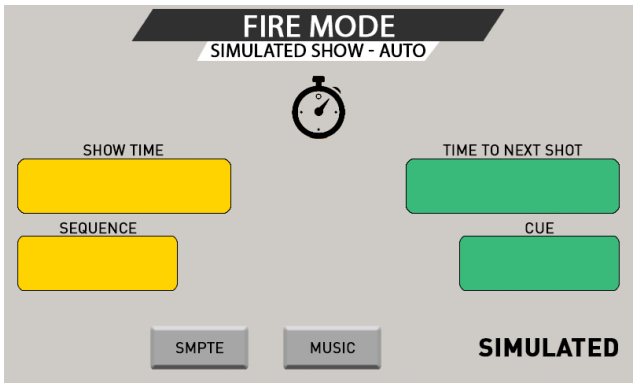
1.3.6.3. MUSIC TONE TEST (BEEP)

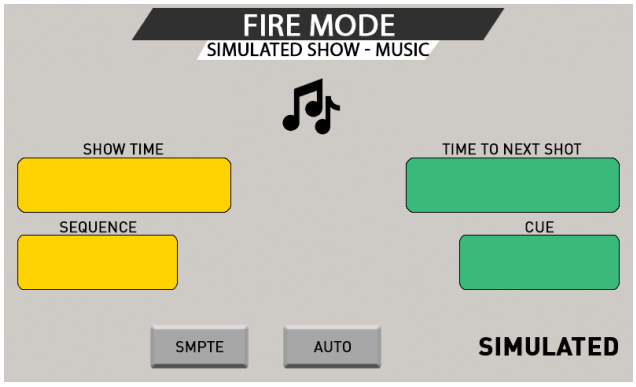
This menu allows TO TEST the Firemaster music tone (a BEEP sound supplied with system) that are necessary to Synchronize each shot with music soundtrack. Each time a valid audio tone is received; a count on the LCD screen will increase by one unit along with a buzzer beep.
This special Tone need to be recorded on a dedicated musical channel in order to obtain a synchronism with the music soundtrack during the pyromusical show.
The RESET button will restart the count, and the Time will start from zero from the receiving of the first tone.

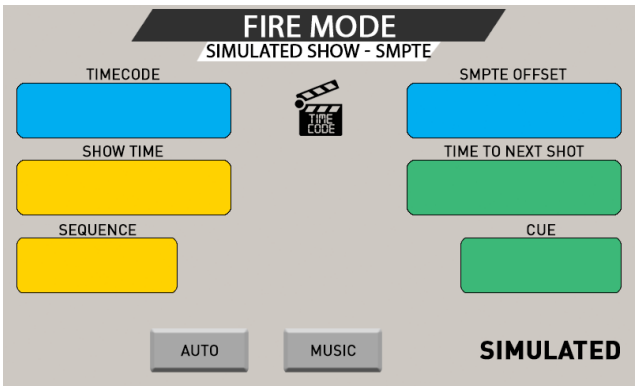


1.3.6.4. SIMULATED SHOW

The SIMULATION SHOW menu allows to EXECUTE THE WHOLE SHOW stored in the TX memory IN VIRTUAL FIRE MODE (selector key in SAFE position).
This function is very useful to check if the show behaves exactly as needed respecting the times and modes.
During the SIMULATION running the TX will have its TRANSMITTER DISABLED and NO DATA WILL BE SENT TO THE REMOTE UNITS. This function can be then used safely even with the show already set and all Remote Units already wired to the squibs.
The SIMULATED SHOW mask is similar to the FIRE MODE, but not ORANGE background and with the presence of the SIMULATED signal on the bottom.







1.3.7. FIRE MODE

When the System is switched to the FIRE MODE, the show program stored in memory (if there is) is arranged and sorted in a list following the fire sequence.

There are two main show modalities:

1. NO SHOW: The User can fire all SEQUENCES (**SEQ**) without following the show program loaded in the memory of the TX.
2. SHOW: The User can fire all **CUE** of the show previously downloaded into the memory of the TX6000.

THE FOLLOWING PARAMETERS ARE VERY IMPORTANT FOR UNDERSTANDING THE FIRING LOGIC OF THE SYSTEM.

CUE is a progressive number indicating the sequence of fire inside the show. It will start from "1" and will increase progressively. **CUE** is intended as the order of the **SEQ**, only in SHOW modality in fact we can shoot more than one-time determinate SEQUENCES, in the order that we desire.

SEQ normally follows the same value of **CUE**. It will differ only when a particular line(s), already fired, must be FIRED again (this happens when the line drives not a squib but an automatic sequencer or similar device). **SEQ** is the **SEQUENCE** number. A sequence can have any value (but usually an increasing value starting from 1 is given). A SEQUENCE can be indifferently:

- A SINGLE LINE
- SEVERAL LINES firing together at the same moment
- a FAST-TIMED SUCCESSION of shots. **As, for reasons related to radio transmission, the minimum firing time between each SEQ is set to ONE (01) second, to shoot faster (up to 0,01 sec), need to create a SEQ of lines that have same START TIME but different DELAY TIME.** The operator can abort, at any moment, any timed sequence IMMEDIATELY simply switching the key on the "TEST-SAFE" position. In this case the TX will send a specific "TURN-OFF" CODE that is received immediately and recognized by ALL Remote Units.

All shots of fast timed sequence will have:

- THE SAME **SEQ** VALUE
- THE SAME **START** TIME VALUE

- DIFFERENT **DELAY** VALUES
- THE SAME **GROUP** VALUE
- DIFFERENT **ADDRESS** VALUES

START is a parameter that represents the **absolute** START TIME of a specific **CUE** to be fired inside the show. The data format is: hh.mm.ss,00 or hh:mm:ss,00

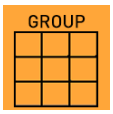
DELAY, this parameter represents the **relative** DELAY TIME (the time spacing between the shots) of a SEQ (shooting at a rate less than ONE second). Data format is mm.ss,00 or mm:ss,00

ADDRESS is the PHYSICAL address of the line. This number is given by the multiplication of the UNIT number with the TERM number, **[(Unit - 1) x 24 + Term]**.

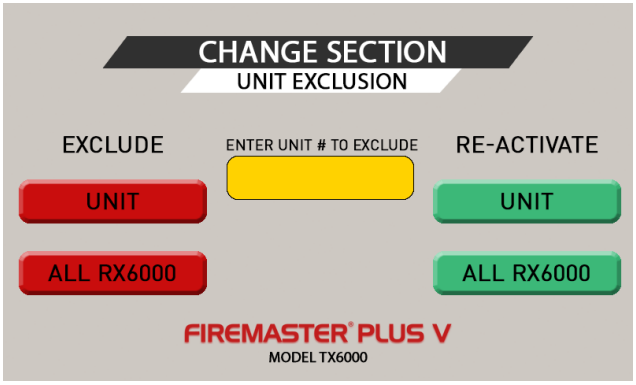
UNIT (or EXT6K) is the Remote Unit Number.

TERM (terminal) is the PHYSICAL pin where line will be connected. This value can be only from 1 to 24 (because each UNIT has maximum 24 lines).

GROUP allows to specify a particular section of the show that can be enabled/disabled during the execution. **GROUP** is a parameter usually set by default to "0". If, for some reason, during FIRE (SHOW modality only) the user needs to remove determinates **SEQ**, he can use GROUP parameter**.** A value from 1 to 9 can be set in the show program to each SEQ**.** During FIRE (**SHOW mode only**), the user can decide to exclude (and re-insert) GROUP, simply pressing and selecting GROUP grid and digit the specific number that he wants to exclude, and pressing again to de-select. Group number will disappear from the grid.

GROUP ICON 

EXCLUSION, during Fire, the user can decide to exclude a Units or a RX6000 (and all his Units), simply press **F1** key. Automatically will appear Unit Exclusion Mask



Mask will be cancelled only pressing **ARM** button or at next shot.

PAUSE, during fire, is possible to change Fire modality only pressing PAUSE key on the keyboard before. Once press Pause Key, a proper icon will appear on the screen.

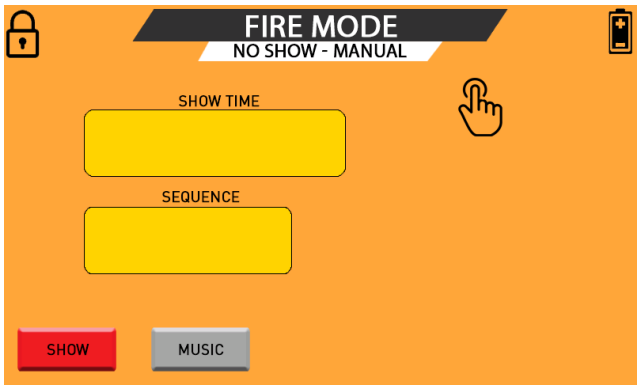
PAUSE ICON 

1.3.7.1. NO SHOW – MANUAL

By default, NO SHOW MANUAL operating modes will be selected. In this modality the User can fire manually all SEQUENCES without following the show program (NO SHOW MODALITY) loaded in the memory of the TX6000.
If it should be necessary to fire a sequence other than the displayed one, it will be sufficient to type the sequence number on the numeric keypad and confirm with "ENTER". To move 1 digit more or less with respect the displayed value, the two "arrows" ↑ ↓ keys can be used instead.
To send the FIRE command, it will be necessary to press in rapid succession the pushbuttons "ARM" and "FIRE". Pressing only one pushbutton (indifferently ARM or FIRE), the system will "***arm***" itself and the FIRE command will be immediately sent when the other button will be pressed.

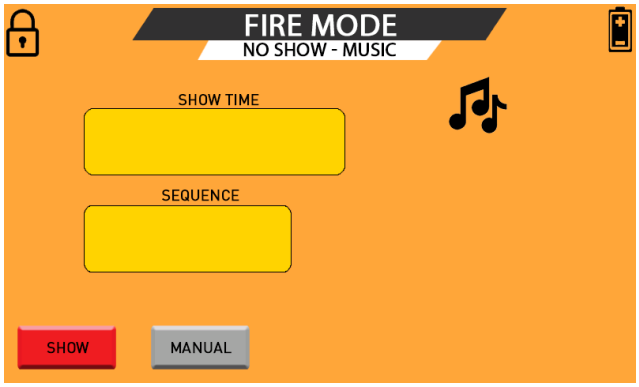
ARM ICON  **FIRE ICON** 

To proceed with the NEXT SHOT, it is necessary to release first BOTH BUTTONS.
Pressing once the "AUTO INCREMENT" key, the icon "**AUTO**" will appear and the sequence value will be automatically incremented by one after each FIRING and upon releasing BOTH ARM and FIRE buttons.
The "SHOW TIME" indicator can be used just as REFERENCE: it starts to count the time immediately after the first shot and stops turning the key switch to the "SAFE-TEST" position or PAUSING the System using the key **PAUSE**. When the time count is halted in this mode, the icon **"Pause"** is displayed on the screen. To reset the SHOW TIME, simply press on the yellow slot, one time the system is on PAUSE.



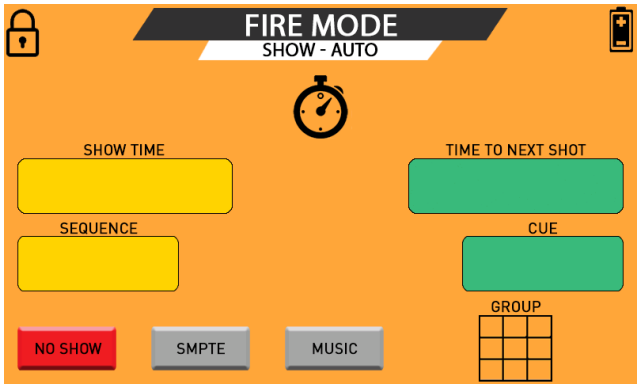
1.3.7.2. NO SHOW – MUSIC

The operating mode is similar to the MANUAL one with one exception: the "ARM" and "FIRE" buttons will be "pressed" automatically each time the system decoder will recognize a valid FIRE command in form of the audio TONE coming from the EXTERNAL sound system.
As a matter of precaution, the "ARM" and "FIRE" keys will remain active**:** should a sync tone, for any reason, be lost, the operator can enter manually at any time a FIRE command filling the gap.
"AUTO INCREMENT" option is AUTOMATICALLY SELECTED



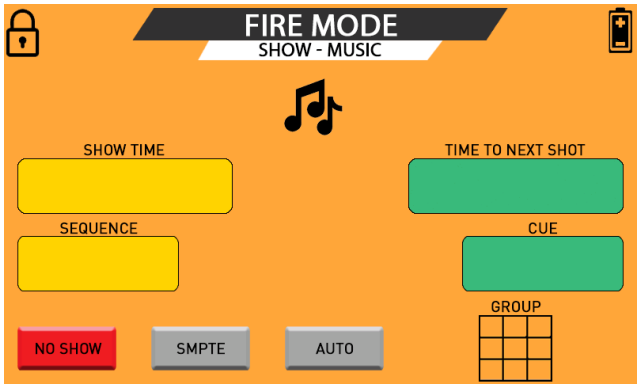
1.3.7.3. SHOW – AUTO

In all SHOW modalities "SHOW TIME" and "TIME TO NEXT SHOT" counters will be automatically set to zero. Both counters will start to count with the first FIRE command. The timers can be momentarily stopped as in NO SHOW modality.
This operating mode DOES use the time references to FIRE AUTOMATICALLY the CUES in the given sequence.



1.3.7.4. SHOW – MUSIC

This shooting mode is identical to the NO SHOW MUSIC one previously described, but in this case, the TX will shoot the CUE and not the SEQUENCE.
In PYROMUSICAL SHOW mode, the operator has no control over the show progression: the EQUIVALENT action of the FIRE and ARM buttons will be automatically executed whenever a valid AUDIO SYNCHRONIZATION TONE (coming from the external AUDIO system) is recognized by the TX.
Once more again the TIME data will be ignored and the show will be timed in perfect synchronism with the music tone (BEEP), inserted on the Soundtrack.
Also, in SHOW-MUSIC mode, "AUTO INCREMENT" option is AUTOMATICALLY SELECTED



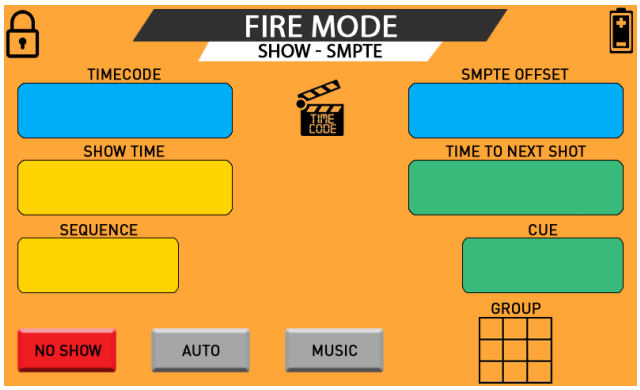
1.3.7.5. SHOW – SMPTE

The Firemaster System includes, inside the TX, all the necessary resources to automatically synchronize the execution of a pyrotechnic show with a SMPTE *timecode*.
The connector mounted on the TX panel is a 3-pole XLR FEMALE.
A pyrotechnic show synchronized by the SMPTE *timecode,* is COMPLETELY CONTROLLED BY THIS SIGNAL and its lack, even momentarily, could certainly produce undesired interruptions of the pyrotechnic show leading rapidly to a **complete lack of synchronization** with all other show events.
The TX6000 can correctly decode SMPTE signals with audio levels in the range 0,5Vpp - 5Vpp.

SMPTE LOCKED, in this operating mode, the show is executed FOLLOWING EXACTLY THE EXTERNAL TIME VALUES SENT WITH THE SMPTE SIGNAL and INDEPENDENTLY FROM AN EVENTUAL DIFFERENT CUE SUCCESSION.

This synchronizing method forces to fire all shots exactly in correspondence of the (ABSOLUTE) times sent with the SMPTE signal. The SMPTE clock can STOP, PAUSE, RESTART or JUMP (only forward of course!), etc. and the fired shots will be exactly the ones having the ABSOLUTE TIME VALUE corresponding to the INSTANTANEOUS READING OF THE SMPTE SIGNAL (within 1 second).

The pyrotechnic must then pay the highest attention during the show editing at PC level, to assign THE EXACT TIME VALUES FOR EACH SEQUENCE, because, during the show execution, THE TIME VALUES ONLY will control the launch progression. It will be also managed in order to grant the accuracy and continuity of the SMPTE signal coming to the TX6000, since in "LOCKED" mode it will be TOTALLY CONTROLLED BY THIS SIGNAL. Even if in this operating mode the CUE value is DON'T CARE, it will be anyway good practice to write always the program in order to have the TIME PROGRESSION AND THE CUE NUMBERS to RUN PARALLEL: this will allow, in case of an EMERGENCY with the SMPTE signal LOST, to proceed ANYWAY with the show using the AUTOMATIC or MANUAL SHOW modes.



1.3.7.6. MAIN AND SPARE FUNCTION

Firemaster System allows managing a pyrotechnic show using more than ONE TX at the same time.
There are some limitations to this operating mode and they must be strictly respected:

- IN case of SHOW MODALITY, the memory of BOTH TX must be loaded with the same show file.
- Only One of the TX must be pre-set as **MAIN**, all others must be set as **SPARE.**

After the POWER ON, the TX6000 IS ALWAYS IN THE MASTER CONDITION, and so SPARE modality will expire one time the TX6000 will switch off.

To set the TX6000 in SPARE condition, proceed as following:

- Key switch in **FIRE** position
- Unit in PAUSED condition (if not already paused, use the **PAUSE** key on the Keyboard)
- Press MENU key on the Keyboard and will change in SPARE modality (SPARE icon will appear on the screen):

SPARE ICON 

From this moment the TX6000 on SPARE will perform exactly as the MAIN, with only a difference: it will NOT SEND ANY RADIO SIGNAL, NOR FIRE COMMAND.

In this way it will be possible to use more TX in parallel without any risk of cross interferences.

The SPARE TX must be connected to the eventual music synchronization system IN PARALLEL WITH THE MAIN UNIT in order to receive the SAME TIMING SIGNALS.

The two TX will advance now **IN PARALLEL** and fully **SYNCHRONIZED**, but the MAIN only will send the FIRE commands to the Remote Units, maintaining the exclusive show control.

If, at any moment, it should be necessary to switch the TX6000 from SPARE to MAIN:

1. **ON THE MAIN TX.** Press **PAUSE** and immediately after the **MENU** key: this will switch the TX in SPARE mode (of course if the necessity of replacement is due to a failure of the MASTER, it will be sufficient TO SWITCHT IT OFF).
2. **ON THE SPARE TX.** Press **PAUSE** and **MENU**, or simply **ARM**: this will switch immediately the TX in MAIN mode. This TX will keep immediately the show control without interruptions.

In order to perform the Unit swap as quick as possible, then reducing to the very minimum the eventual loss of one or more shots, it is advisable the presence OF TWO OPERATORS working at the right time and in good accordance each other.

2. REMOTE UNIT MODEL RX6000

2.1. FRONT-PANEL DIAGRAM

1. Polycarbonate waterproof panel.

2. **LCD** display.

3. **RS-485** standard SERIAL Port.

4. **(AVAILABLE ON REQUEST ONLY)**Binding posts for the **REMOTE ON/OFF** switching. SHORTING the two connectors together, will SWITCH OFF the Unit: it will remain OFF until the connection lasts and it is switched ON as soon the connection is OPEN. The current draw on the line is about 10mA and lines up to 300 meters can be safely used.

5. **Main power switch** with 2 positions:

- **ON Position:** Unit switched ON and ACTIVE. The INTERNAL batteries **cannot be re-charged while operating**.

- **OFF/CHARGE Position:** Unit switched OFF. In this position the internal batteries can be RECHARGED simply connecting the line cord to the mains receptacle.

6. **CONNECTOR** for the EXTERNAL Battery Pack. 3-pole DIN connector male. To be used (at Unit switched OFF) for direct connection to the **EBG6K** Emergency Battery Pack using the included cable.

7. **LINE 230/115Va.c**. two-pole mains receptacle. It accepts standard 2-pole cables to be plugged directly into the mains receptacle for battery charging. The internal supply accepts automatically voltages from 90V up to 240V a.c. 50 or 60Hz without need for range switching.

   NOTE: since the RX6000 IS NOT FITTED WITH A MAINS SWITCH, the Unit must be placed, during the recharge operations in such a way to grant the quick and easy LINE CORD DISCONNECTION in emergency case.

8. **Charge Line LED** (blue). This LED indicator turns ON whenever the Unit is connected to a suitable MAINS receptacle for battery charging. The charging process takes place automatically when the MAINS is connected and the lever switch is in the OFF position.

9. **CHARGE LED** (Red / Green / Yellow). This indicator LED turns ON after all the internal batteries have been successfully tested and the charging process is running.

10. **RX SAFE green LED**. It flashes shortly every time the Unit receives and decodes a radio signal containing its User's Code (even if the command was not directed to that particular Unit). It could be used as status indicator for the correct performance of the RADIO RECEIVER.

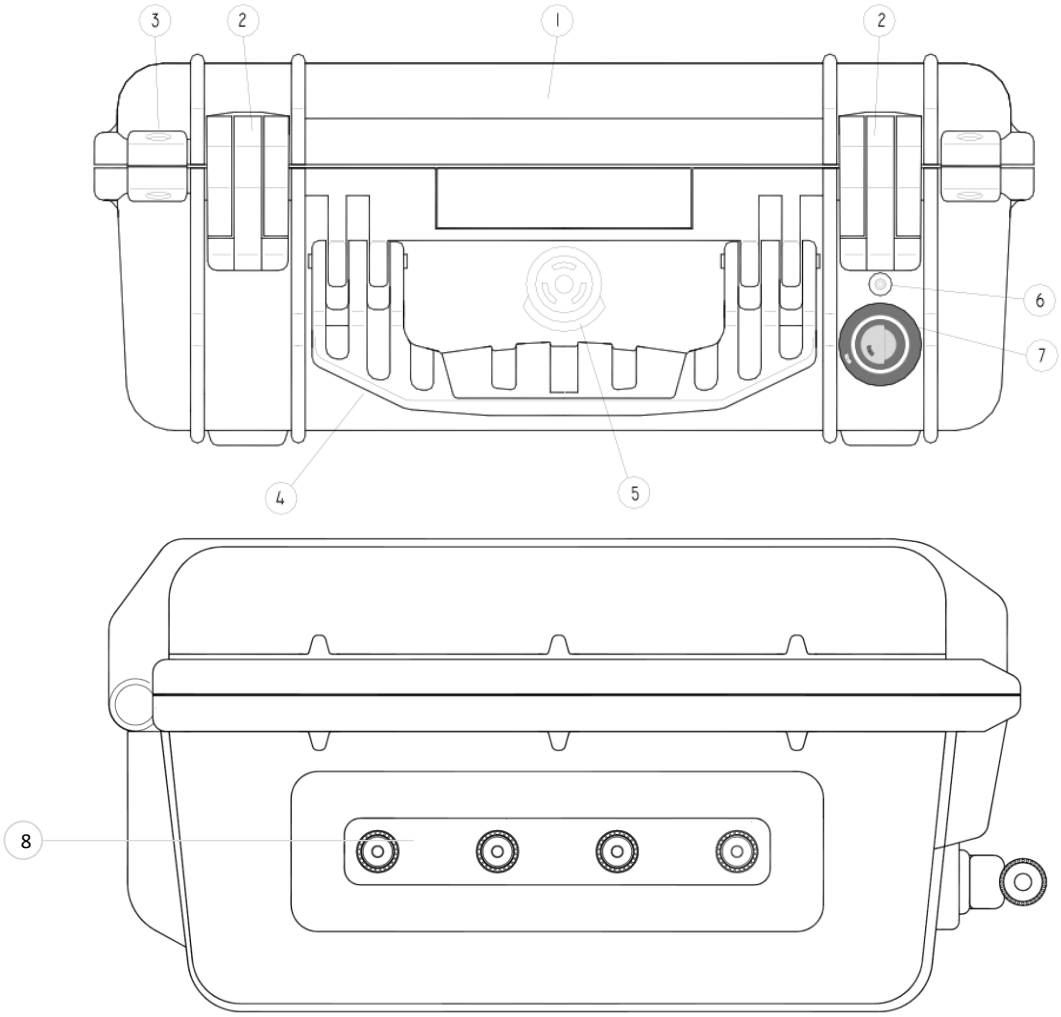
11. **RX FIRE red LED** it flashes shortly every time the Unit receives a FIRE COMMAND addressed specifically to it.

12. **TX R.F. blue LED** It flashes shortly when the TRANSMITTER of the Unit is ON (typically when the Unit is answering to a command of the TX or when it is sending data).

13. **EXTENSION LED** (Green / Red) This indicator LED turns ON after test and check all the Extension EXT6K connected to each line.

14. **USB CONNECTOR:** 4-pole standard USB female "A" connector.
15. **Keypad:** it allows the entry and modification of the parameters inside the functions**.**

2.2.CASE DESCRIPTION



1. IP67 Ultra High Impact Copolymer Polypropylene case. Size 40.6 x 33 x 17.4 mm
2. Double-step latches
3. Stainless steel reinforced padlock protector
4. Fold-down and rubberized handle
5. Automatic pressure equalization valve
6. SMB coaxial connector for 50ohm antenna with protection cap
7. Turret connection for the whip antenna
8. UHF coaxial connectors to interconnect the RX6000 to the EXT6K using COAXIAL CABLE.

2.3.GENERAL DESCRIPTION

- ✓ Up to **500** RX6000 (**9999** Remote Units EKT6K) can be used at the same time with **01 TX6000**, for a maximum count of **239.976 independent lines**!
- ✓ Up to 480 lines per Receiver (20 Extensions of 24 lines each)
- ✓ All Remote Units are **individually marked with a progressive number (multiple of 20)**
- ✓ Each RX6000 is provided with 4 UHF connectors. Each connector supplies BOTH the signal and commands and supply voltage.
- ✓ Each RX6000 provides automatically to recognize, test and validate all the connected EXT6K.
- ✓ Remotely (from TX6000), it is possible to activate and deactivate (and therefore remove power supply and signal) to the various EXT6Ks connected to each RX6000. This will greatly increase the life of the batteries.
- ✓ The batteries (up to 3) can be charged with the power switch on the OFF position, simply connecting the line cord to any suitable mains outlet (90 to 240Va.c. 50 or 60Hz). The whole process of test and charge is automatically performed by a dedicated microcontroller. During the test and charge operations, the Unit **cannot be used**.
- ✓ **In case of necessity to use the RX6000 directly with power source, need to use a special external power supply accessory.**
- ✓ The program for the fire sequences is **permanently stored** inside the memory of each single RX6000 and EXT6K, and it is maintained until the operator will overwrite it with new data.
- ✓ The fire sequences can be altered at any moment, even few minutes before the show take place, with the maximum of ease, REMOTELY, by radio link and without need for the personnel to be present on the fire site.

2.4.UNITS FIELD USAGE

2.4.1. PROTECTION

1) The Remote Units RX6000 on field are subject to burning fallout with consistent risk of permanent damage of the plastic front-panel. The sturdy plastic case and the top cover offer an excellent protection.
2) Should the user decide to provide otherwise to the Units protection, it is suggested to cover the top panel with aluminium foil paying great attention to AVOID ANY CONTACT WITH THE ANTENNA CONNECTOR (it must be always perfectly insulated and must be never in contact with other metal parts).
3) The reinforced plastic case of the FIREMASTER SYSTEM, thanks to the particular structure and the IP67 grade, grants a perfect protection against water spillage or raining. A partial immersion of the Unit on the water, snow, mud is also possible provided some precautions are respected:
   - The protection plug must be applied to the External Antenna connector, the cover must be CLOSED AND LATCHED (see figure "A")
   - When the ANTENNA is connected and the normal operation is required, the immersion is possible ONLY IF THE ANTENNA AND ITS CONNECTORS ARE COMPLETELY ABOVE THE WATER LEVEL.
   - When the normal operation (with the antenna connected) is required under extreme raining conditions, it is strongly suggested to operate the Unit WITH THE CASE PLACED VERTICALLY: this will give much more space between the ANTENNA base and the water surface or wet soil (see figure "B").

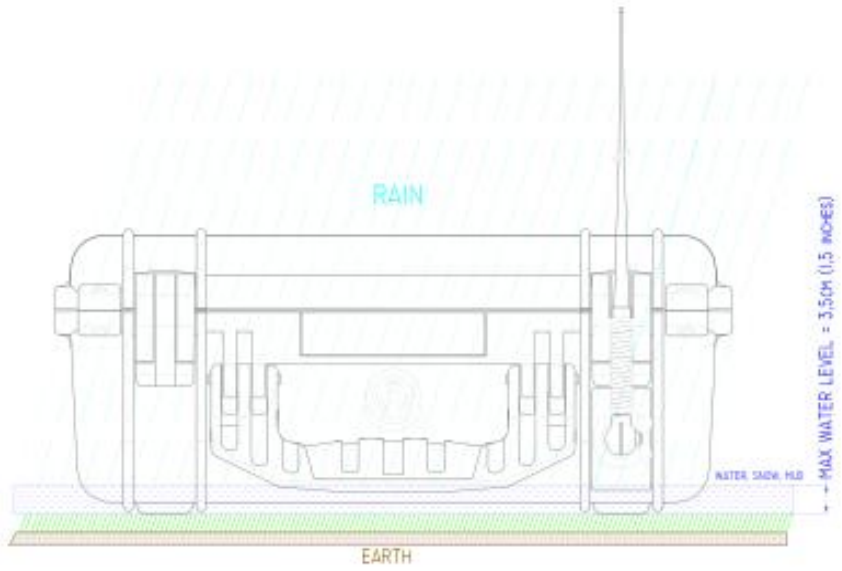


FIGURE "A"

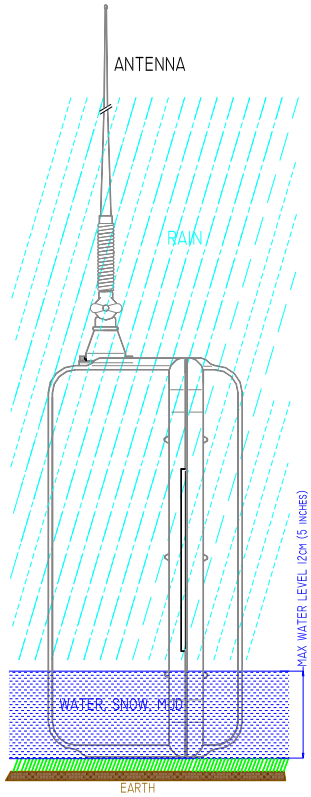


FIGURE "B"

2.4.2. ANTENNAS

1) The antenna supplied with the FIREMASTER is INTEGRAL WITH THE INSTRUMENT and it is used the same type both for TX6000 and RX600. These antennas are whip type in λ/4 resonating at 40,700MHz. The antenna is realized completely in fiberglass and aluminium; it is very flexible and fire resistant. The connection to the Unit is pivot-type one with wing nut.

2) The antenna is supplied in TWO PIECES: the bottom one is made of aluminium and is provided with a strain-relief spring and the wing nut. The top section is a fiberglass whip.

3) In order to obtain the best results concerning the radio coverage field, even in presence of natural or artificial obstacles, the Remote Units should be placed at least ONE METER above the ground. Remember as, consistently with the terrain type and the show's needs, **HIGHER THE ANTENNAS ARE PLACED, MORE COVERAGE RANGE IS OBTAINED AND THE SAFETY MARGIN IS INCREASED ACCORDINGLY**.

4) The metal parts of the antennas (CONNECTOR, SPRING and WING NUT) **ARE ELECTRICALLY ACTIVE: AVOID ANY CONTACT WITH ANY OTHER METAL PART OR EXTERNAL WIRING**. Avoid also any contact with the antennas of the next Units and other metal objects. IN GENERAL: the antennas must be installed in VERTICAL POSITION, far from any other object by at least 2 meters.

5) The reading of the field strength, in dBμV, displayed on the base Unit TX, give a good indication about the system ability to communicate. Avoid to operate when the reading is BELOW 15dBμV: it could happen some problem of partial data decoding with the result of SOME MISFIRE AT THE FIRST ATTEMPT **(IN ANY CASE IT IS ABSOLUTELY EXCLUDED ANY RISK OF PREMATURE OR UNDUE FIRE!!!).**

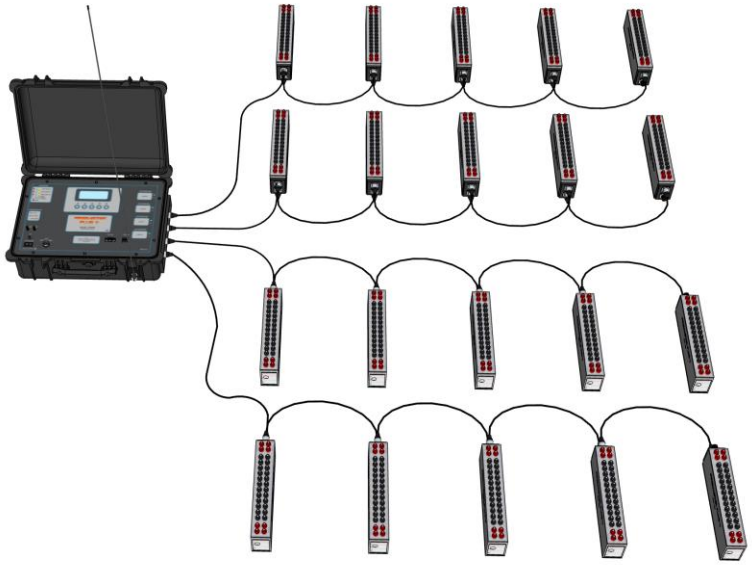
6) The RX6000 case is provided with a SMB COAXIAL CONNECTOR placed EXTERNALLY near to the handle and covered by a protection cap. This connector allows direct connection for a coaxial cable when the CABLE connection is required in place of the RADIO link or when an EXTERNAL aerial (e.g.: a GROUND PLANE antenna) is preferred in place of the standard antenna (for very critical propagation conditions). SPECIAL ADAPTORS are supplied on request to convert the SMB connector to a BNC one for the connection of an EXTERNAL ANTENNA or when the CABLE CONNECTION is required. When not in use, we suggest to REMOVE always the antenna adaptor and to place the cover cap in order to grant the best protection of the whole Unit against any possibility of humidity or water penetration inside the case.

2.4.3. CONNECTIONS

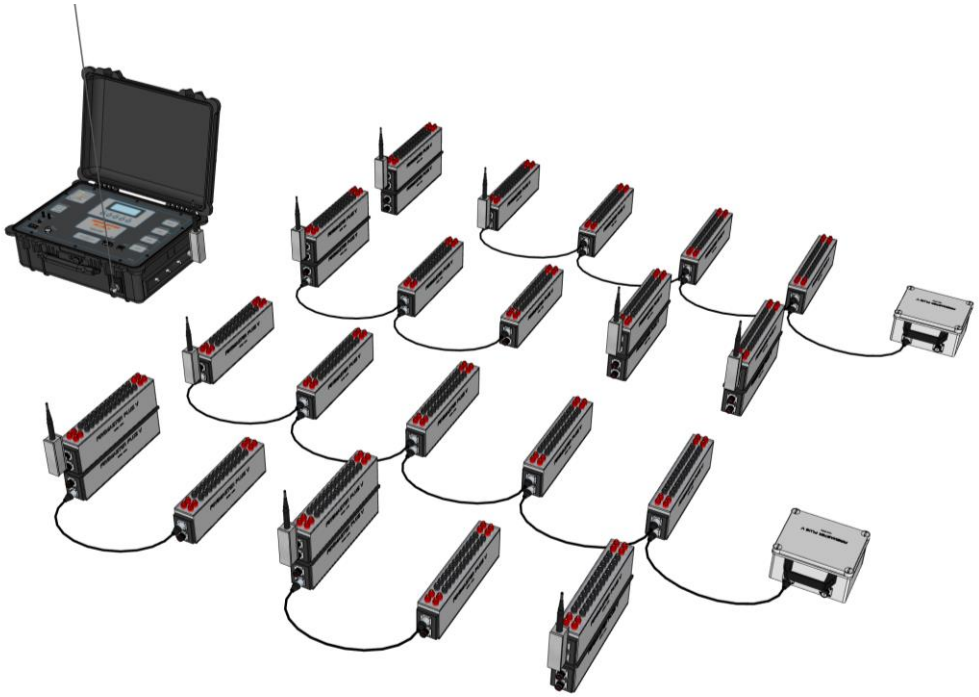
2.4.3.1. EXTENSION EXT6K

Each RX6000 can manage UP TO 20 EXT6K, this extensions (UNIT) can be connected in 3 different ways:

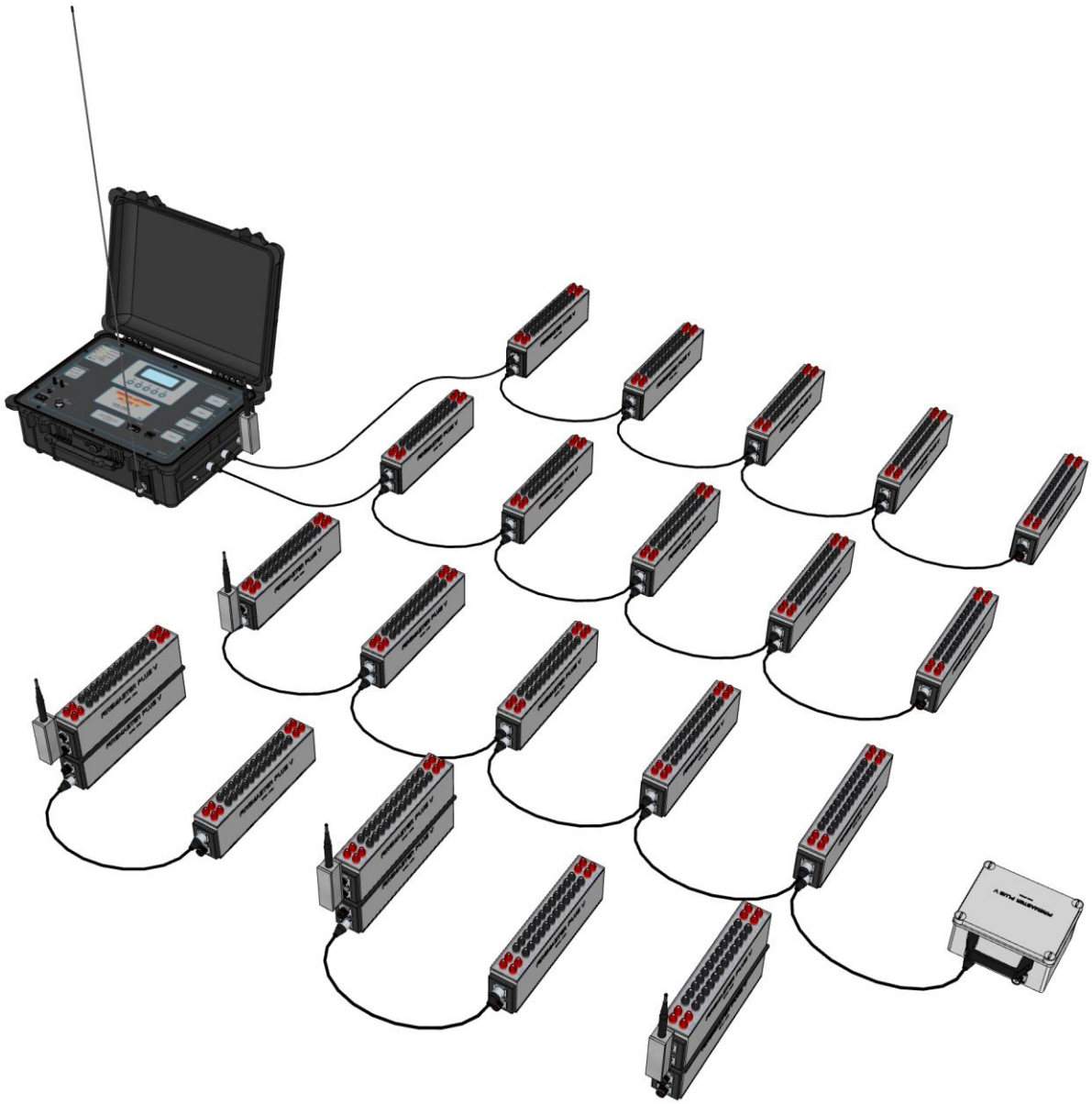
- BY CABLE ONLY (RG-58 cable), using the 4 connectors on the side of the RX. Each line can manage up to 5 EXT6K (suggested).



- WIRELESS ONLY. Need to connect the little Antenna (BW6K) in the first (**LINE#1 only**) connector.
  Each EXT6K must be connected to an External battery pack (BPK6K or BPK6KB), and 1 Antenna (BW6K).
  Each external battery pack can manage more than one EXT6K, that's depend of the model used:
  BPK6K up to 2 (suggested); BPK6KB up to 5 (suggested)



- MIXED (CABLE AND WIRELESS)



2.4.3.2. EXTERNAL ANTENNAS

The RX6000 are supplied with a whip antenna (following the law for the LPRS devices). In exceptional cases (and under the full user's responsibility) it is however possible to connect to the Remote Unit a different antenna type in order to improve the radio field coverage or when it is necessary to install the antenna far from the Unit when this is located in places with poor radio field.

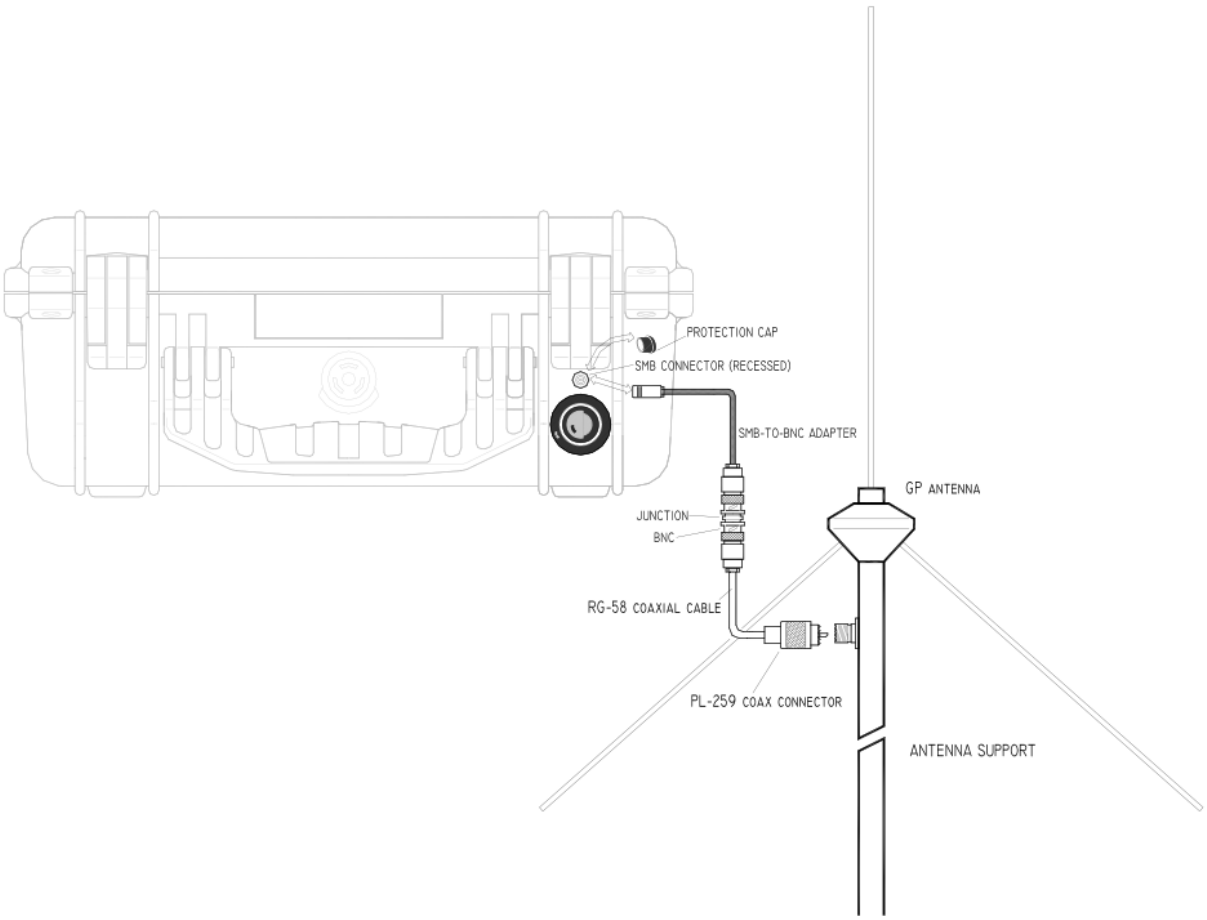
In particular, it can be supplied on special request, a ***"Ground-Plane" (GP-01)*** antenna. This model can be installed on a vertical mast at quite high level with respect the Unit, granting much more wide radio coverage.

It is not recommended to exceed 10 meters of cable, so as not to have signal drops.

The GP antenna is usually used on the TX-6000 only, while the Remote Units operate with the standard whip antenna.

To connect an **EXTERNAL ANTENNA, THE STANDARD WHIP MUST BE FIRST REMOVED.**

The external GP antenna is connected to the SMB connector (BNC on the TX6000) using a RG-58 cable of suitable length and via an eventual adaptor.

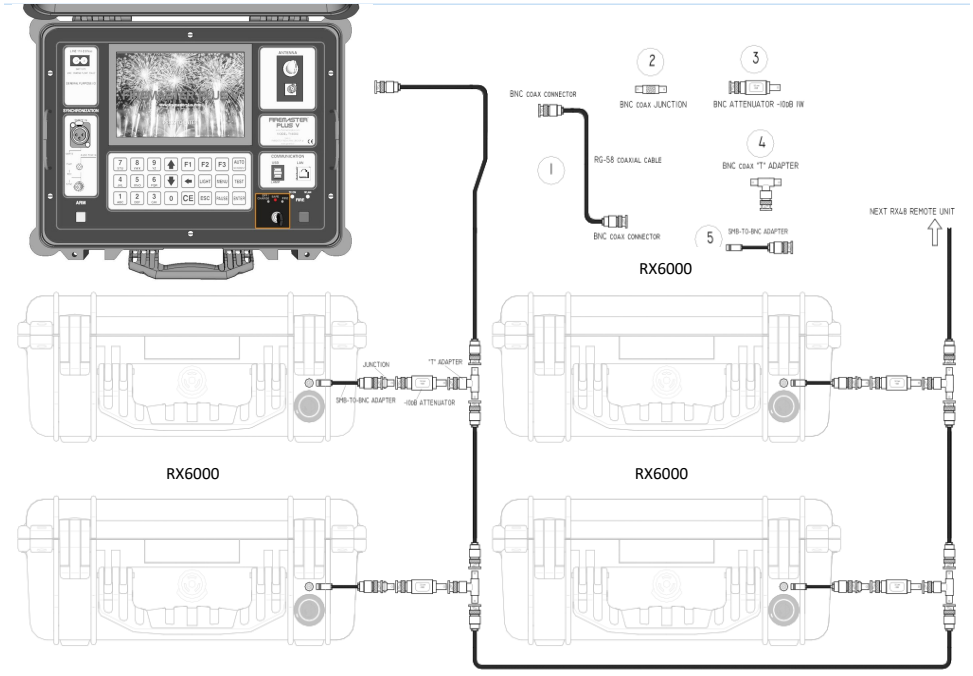


2.4.3.3. CABLE CONNECTION FROM TX TO RX

Should extreme conditions require it, the FIREMASTER System can be still used with the RADIO LINK ("RADIO" mode), but **with all units connected each other with coaxial cable**: any type of antenna will be in this case REMOVED.

Should the normal RADIO connection be ***forbidden or impractical,*** and the cable connection becomes mandatory, using this type of connection. With this kind of connections:

- All the *bi-directional* functions, typical of the FIREMASTER system, remain available.
- The interconnection of all Units is simply made using sections of coaxial cable of any length and BNC "T" adaptors without need to respect a specific connection order.
- All command signals are sent ON CABLE and cannot be longer interfered nor causing interferences to other sensitive devices. The data transmission integrity is 100% proof!
- In order to realize this type of connection, it will be necessary to use A COAXIAL ATTENUATOR at the R.F. OUTPUT of each Unit, before the connection cable to the next Unit is connected.
- Coaxial cable, attenuators, "T" adapters and other accessories for this configuration mode, can be supplied on request by Parente Fireworks.
- The following figure shows how the different Units can be connected each other to implement this communication mode.



1. Coaxial cable link. RG-58U, any length as needed, terminated both ends with MALE BNC connectors.
2. MALE-to-MALE BNC junction
3. BNC coaxial attenuator (male-female). 50ohm, -10dB, 1W
4. BNC "T" adaptor, 50ohm
5. SMB to BNC coaxial adaptor

2.4.4. MENU FUNCTIONS

When turned on, will appear on the screen for around one sec some information of the RX6000 included the version of the software installed inside.

Later on the screen will appear the following information:

- USER: the user code
- UNIT: the RX6000 Unit number, that correspond at the first EXT6K (letter A)
- Batteries Voltage of the RX6000
- F: the number of sequences (SEQ) fired from this RX6000 during last show realized.

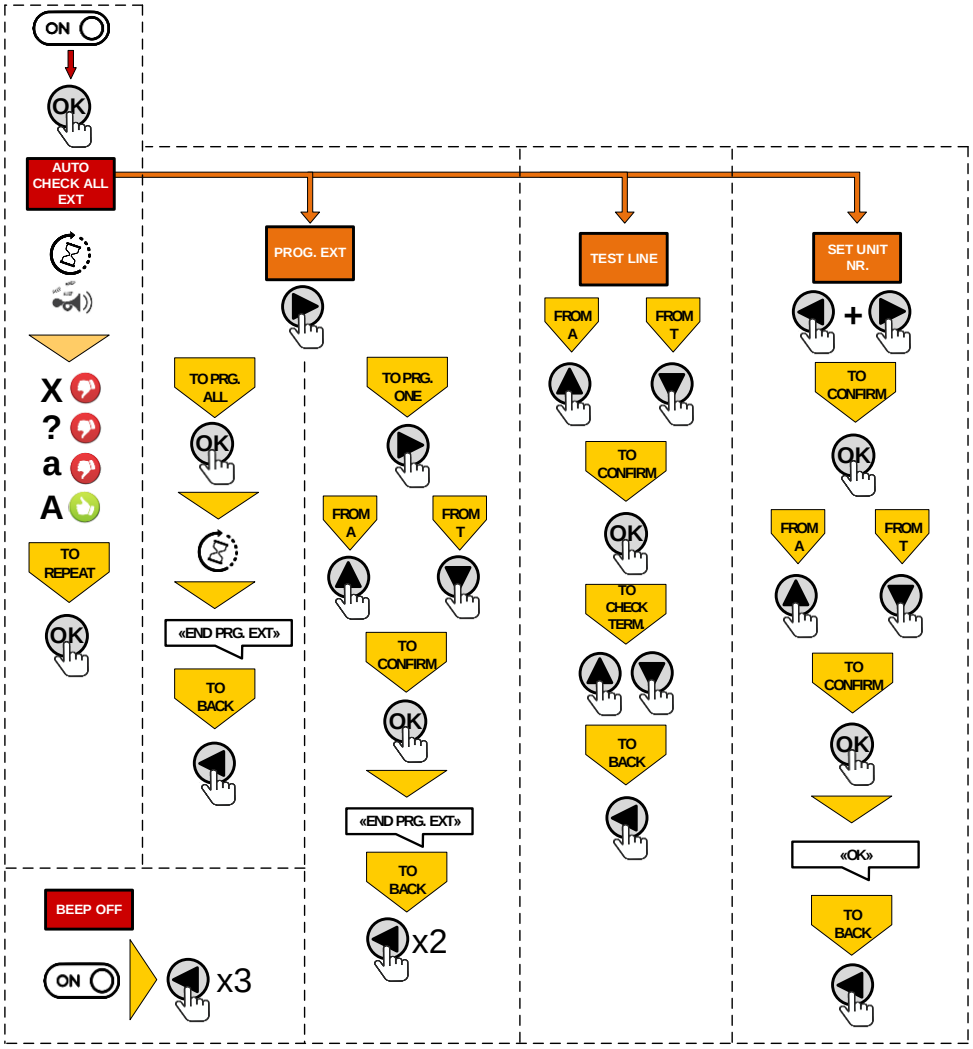
Each RX6000 can manage up to 20 EXT6K (from letter A to letter T). The RX6000 number will match the Letter Extension Unit A.

According to RX6000 numbering, all extensions will have a progressive numbering.

Each RX6000 will then handle **MULTIPLE OF 20 UNITS.**

E.g.:RX6000 n°1 will handle from U:01 (A) to U:20 (T); RX6000 n°21 will handle from U:21 (A) to U:40 (T)

Below, a quick scheme of the various functions possible through the keyboard placed directly on the Receiver.



2.4.4.1. EXT6K CHECK

Press (**OK**) key to start a full check of the extensions (the same function can be executed from TX6000), up to that moment all EXT6K are not active.

During this check, will blink the writing **CHECK EXTENS.**, and at same time will blink also the green led of the 4 LINES on the panel.

The Red Led of the 4 LINES will turn on one by one during this Check.

Letters (from A to T) will appear on the screen, to indicate the max 20 Unit connected.

After a while, the RX6000 make an automatic local Verify test with his internal show and the program of each EXT6K.

If Verify is OK, each letter became **CAPITAL (A-B-C-D-E-F.....)**.

If there are some errors (like: lines are open), letters became **LOWERCASE (a-b-c-d-e-f.....)**.

If program doesn't match with that inside RX6000, letters became **a question mark (?)**.

If there are some other serious problem, like Bad connection, defective cable, or others, letters became "**X**"

If there are some problem of power supply (external battery lower than 10v), letters became **"+"**

Three consecutive beep sound will inform that check is finished.

This is a quick way to understand if there is something wrong on field, without using the TX.

To repeat this check, need to press again (**OK**) key on the Keyboard.

On the screen will appear also NUMBER of EXT6K connected

2.4.4.2. EXT6K PROGRAMMING

All EXT6K can be programmed also directly from the RX6000, but before need to be sure that show program inside the Receiver is the right one.

Simply pressing RIGHT ARROW (►), to enter in PROGRAMMING Section.

Pressing (**OK**), to start immediately the programming of all EXT6K connected.

Pressing again RIGHT ARROW (►) is possible to program each Extension individually, with (▲▼) is possible to select the EXT6K that need to be program. Press (**OK**) to confirm.

A writing END PROGRAMMING EXTENSIONS and the number of the extensions programmed will appear on the screen at the end of the execution. Also a Beep Sound will mark that programming is end.

Press 2 times (◄) to exit from the PROGRAMMING section.

2.4.4.3. EXT6K TEST

All EXT6K can be tested also directly from the RX6000. In this section is possible to test the ohm resistance of all 24 terminals in each Extension.

Simply pressing (▲▼) is possible to select the EXT6K that need to be tested, after decide the corresponding Letter (from A to T) and pressing (**OK**) to confirm, with (▲▼) is possible to view the 24 Terminals ohm resistance. All lines open will be marked with **OP,** otherwise will appear the ohm resistance number.

2.4.4.4. EXT6K SET NUMBER

In this section is possible to set (or change) the UNIT LETTERS (and so the Units Number) of each EXT6K.

TO SET THE UNIT LETTERS MUST BE SURE TO HAVE CONNECTED (BY CABLE OR BY WIRELESS) ONLY THE EXTENSION THAT WE WANT TO CHANGE. NO OTHER EXT6K HAVE TO BE CONNECTED, AND POWERED IN CASE BY WIRELESS (ALSO IF RELATED TO OTHER RX6000).

To enter in SET section, press one time (◄) and, immediately after, one time (►), and then (**OK**) to confirm, at this time, simply pressing (▲▼) is possible to select the EXT6K LETTER that we want to set as new, after decide it need to press (**OK**) to confirm.

2.4.4.5. RX6000 BEEP OFF

A sound beep will automatically activate after around 10 minutes that RX6000 is switched on.

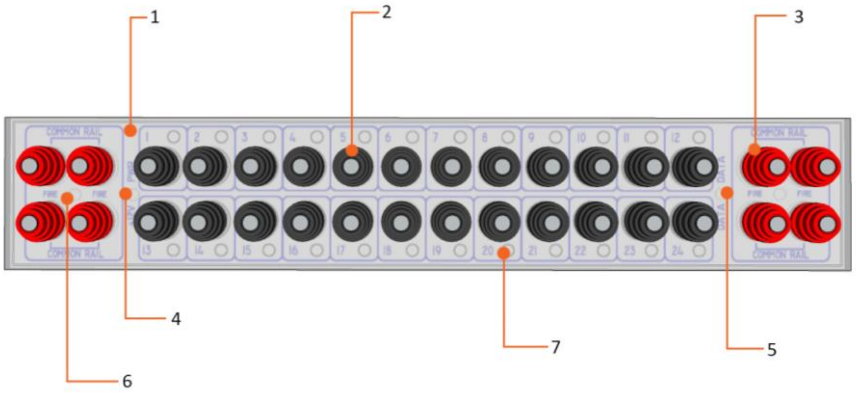
This sound is only a signal to remember that system is ON.

To de-activate the BEEP sound of the RX6000, you simply need to press 3 times (◄◄◄), **JUST AFTER SWITCHING ON**.

The sound will be re-activated automatically one time the RX6000 will be turned off.

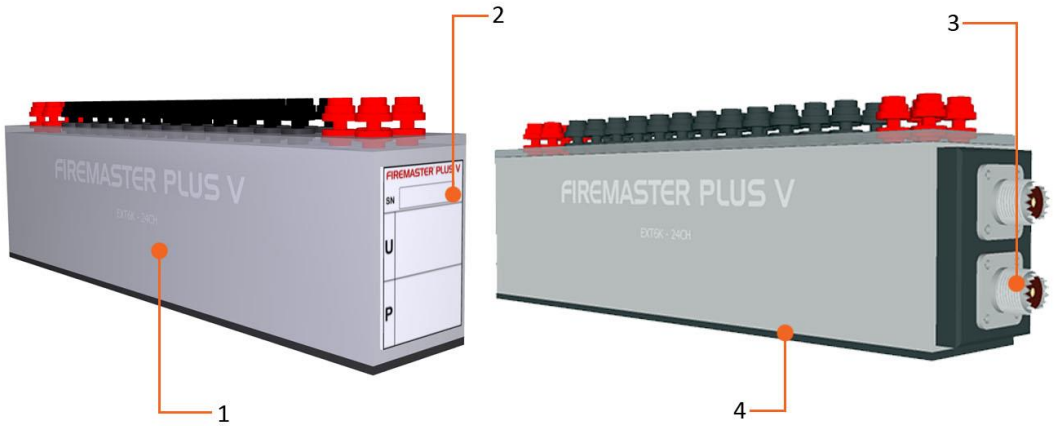
3. EXTENSIONS EXT6K

3.1. FRONT-PANEL DIAGRAM



1. PMMA panel.
2. BLACK BINDING POSTS with quick-connection feature. Used to connect the squibs lines.
3. RED BINDING POSTS (COMMON RAIL) with quick-connection feature. Used to connect all common of squibs lines. Each 3 lines can be connected together in one COMMON
4. POWER LED indicator (blue)
5. DATA LED indicator (green)
6. FIRE LED indicator (red)
7. LINES LED indicator (red)

3.2.CASE DESCRIPTION



1. IP67 NICKEL SILVER case. 280 x 50 x 80 mm
2. PVC label with SERIAL NUMBER
3. POM plate with UHF female connectors

4. Protective rubber and M6 metal insert

3.3. GENERAL DESCRIPTION

The EXT6K is made inside a rugged metal (60% copper, 20% nickel and 20% zinc) case, size 280 x 50 x 75 mm.

On top there is a PMMA [Poly (methyl methacrylate)] panel with the necessaries binding post to connect 24 separated lines.

All necessaries indicator LED are in the Front Panel.

On one side there is a POM (Polyoxymethylene) plate with 2 UHF female connectors, connected in series.

On the other side there is a PVC label with serial number, that could be used also to mark the Unit number and the eventual position. The labels can be written on with an indelible pen and are easy to clean.

On the bottom there is a protective rubber and also a M6 metal insert for eventual fixing use.

The EXT6K has no internal batteries and it receives the +12V power directly from the RX6000 Unit (when it is wire-connected) or from any external +12V local source (when operates in WIRELESS MODE).

A large internal set of capacitors supplies the required firing energy even when all 24 lines must be fired SIMULTANEOUSLY. The capacitors bank, charged to the incoming +12V supply when in steady state, is automatically RAISED and maintained CONSTANT to +24V by an internal INVERTER when the EXT6K is switched in FIRING MODE, in order to grant a very large PEAK firing energy exactly when required.

Whenever the +12V supply voltage is removed from the EXT6K, a dedicated circuit provides to DISCHARGE COMPLETELY within 2 seconds the capacitors bank: the EXT6K turns to be immediately a COMPLETELY PASSIVE DEVICE allowing to be transported and managed SAFELY even with all the squibs ALREADY CONNECTED.

3.4. EXTENSION EXT6K FIELD USAGE

3.4.1. PROTECTION

The EXT6K Units on field are subject to burning fallout with consistent risk of permanent damage of the plastic front-panel. To avoid this problem, need to use the special COVER supplied as an accessory for the EXT6K.

The special Cover of the EXT6K, thanks to the particular silicon structure, grants a good protection against burning, water spillage or raining.

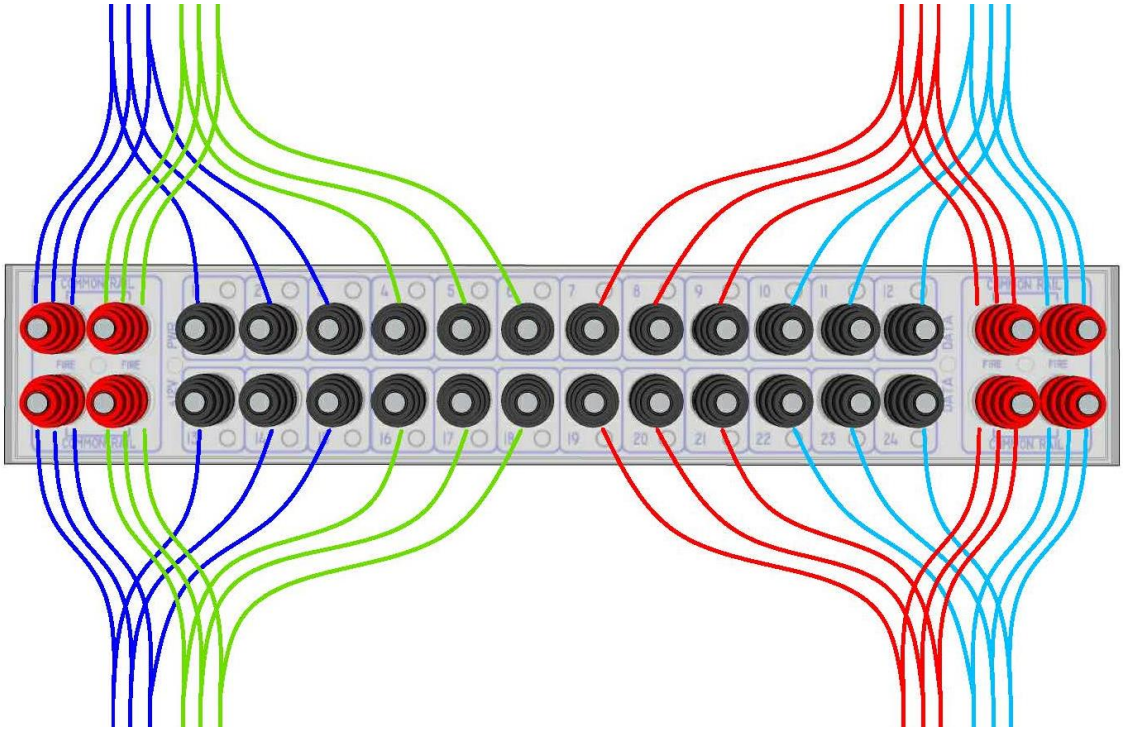
3.4.2. CONNECTIONS

3.4.2.1. FIRING LINES

Each EXT6K is provided with 24 SINGLE binding posts, to connect a total of **24 independent** firing lines.

Each line must use one of the 8 COMMON RAIL available, that's mean that in each common rail binding posts can be connected 3 common of 3 different lines.

Below you can see a diagram that explains how the wiring could be done.



Each line is powered by the internal CAPACITOR, at 24V.

Using standard igniters with a resistance of 1.5 to 2 ohm, it will possible to connect **no more than 10 devices IN SERIES and no more than 8 IN PARALLEL** (the latter configuration **IS NOT SUGGESTED** anyway).

Using non-standard igniters, it will be possible to calculate approximately the maximum number of devices to be connected IN SERIES, taking into account for the resistance value and the minimum firing current (specifications supplied by the manufacturer). Proceed first calculating the maximum allowable resistance on a firing line **Rmax** given by:

$$Rmax = \frac{Vfire}{Imin} - Rline$$

Where:

Vfire=24V
Imin=minimum fire current of each (in amperes, as declared by the manufacturer).
Rline=resistance (in OHM) of the connection wires to the Unit.

It will be then calculated the maximum number of igniters **Nmax** to be connected IN SERIES to a single line using the following equation:

$$N\max = \frac{R\max}{Rign} - 2$$

where:

Rmax is the value obtained from the previous calculation
Rign is the resistance value of a **single igniter**
E.g.: a connection line of 25 meters made of copper wire (section 0,22mm^2), ***daveyfire X_2*** igniters with 5meter of connection cables, it will be obtained:

Vfire=24V, I min=0.8A, Rline=3ohm (about)

$$R\max = \frac{24}{0.8} - 3 = 27ohm \qquad N\max = \frac{27}{3} - 2 = 7$$

From the above calculations, it will be possible to connect IN SERIES up to 7 igniters of this type with a 100% warranty of ignitions. **These calculations are very prudential and theoretical**: in practice it would be possible to connect in series a lot more igniters (giving up some safety margin).

In any case, when more igniters are to be connected in series, it is mandatory using devices each other identical: not only of the same brand and model, but possibly also coming from the SAME PRODUCTION LOT.

THE PARALLEL OR, WHORSE THE MIXED SERIES-PARALLEL CONNECTIONS, MUST BE AVOIDED.

ALSO THE SERIES CONNECTIONS SHOULD BE REDUCED TO THE MINIMUM POSSIBLE.

- The line connectors must be clean and free from oxidation (this will increase the total line resistance).
- Make sure the connection wire has a sufficient section in order to grant a good contact to the binding post. **WITH THIS KIND OF BINDING POST IS NOT NECESSARY BEND THE TERMINAL PART OF THE WIRE.**
- Make sure the terminal part of the wire inserted in the binding post is completely free from the insulating sleeve
- Make sure the unprotected parts of the wire, eventually coming out of the connector, don't contact any other metal parts of the EXT6K (cover, connectors of other lines, etc.).

3.4.2.2. COAXIAL WIRING

With RG-58 cable, terminated both ends with MALE UHF connectors, is possible to connect up to 5 EXT6K in series.

FOR AN OPTIMAL CONNECTION, IT IS RECOMMENDED TO KEEP THE CONNECTORS WELL CLEANED FROM ANY RESIDUES CAUSED BY OXIDATION OR SAND.

The connection cable from the main RX Unit and all Extensions can be managed based on the number of extensions connected.

E.g.: *with RX6000 well charged (12,6V) and using 70 m of cable [annealed tinned copper (16x0,20 mm)] to connect 5 EXT6K, last EXT6K of the line will receive 10V, still enough power to charge capacitor and manage signals.*

3.4.2.3. WIFI CONNECTION

The Extension can be powered also with a external battery pack (BPK6K) and the communication with the RX6000 will be realized COMPLETELY WIRELESS, and so no cable connection is necessary from the extension and the RX.

The change is quite immediate: any cable connection is removed from both the Extension(s) and the RX Unit, an external battery pack (EBG6K) is connected to one of the connectors of the Extension while the other is fitted with a special antenna (BW6K).

Another antenna (BW6K) is connected to the first UHF connectors on the RX Unit (Line#1): of course all remaining Extension can remain connected BY WIRE as before.

4. EXTERNAL BATTERIES PACK

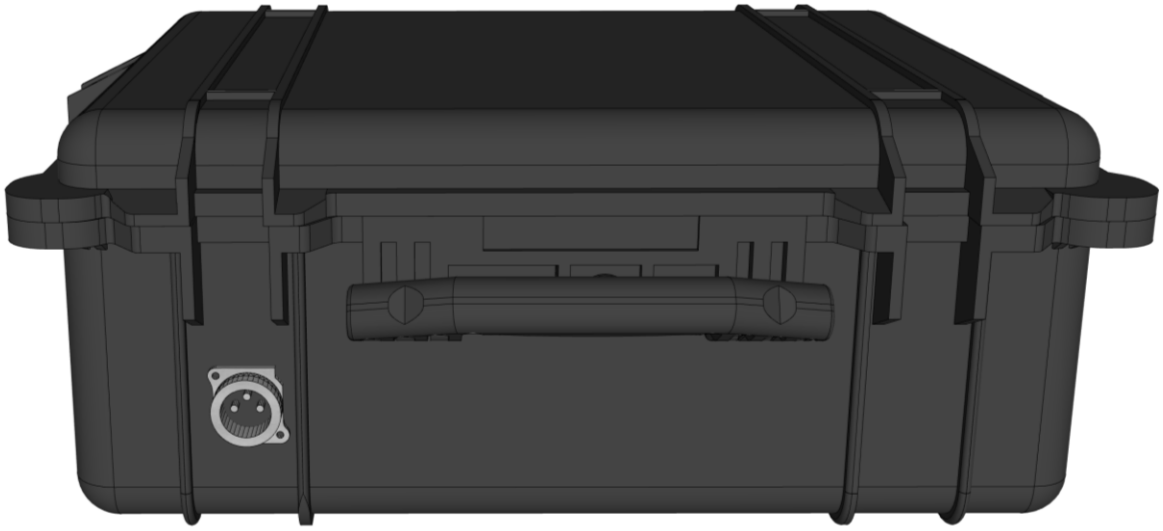
4.1.EBG6K (EMERGENCY BATTERY GROUP)

4.1.1. DESCRIPTION

The Emergency Battery Group **EBG6K** is an autonomous Unit (size 258x230x123 mm) containing ONE big Battery of 12V 18Ah, for the RX6000 System supply.

It will be supplied together with the EBG6K:

- A special external charger
- A special cable for connection to the RX6000



4.1.2. USE

The **EBG6K** is intended to be used IN EMERGENCY when the INTERNAL BATTERIES of the RX6000 Units should fail to pass the initial test or when the charge level is considered too low to grant a reliable performance during the whole show.

The **EBG6K** can be immediately connected to the corresponding socket (placed OUTSIDE the case near to the handle) of any RX6000 Unit.

BEFORE CONNECTING the **EBG6K** to any RX6000 Unit, MAKE SURE THE POWER SWITCH OF THE RX 60000 IS PLACED ON THE **OFF/CHARGE** position in order to be powered from **EBG6K.**

WHEN THE RX6000 IS CONNECTED TO AN EBG6K, THE LINE CORD MUST REMAIN DIS-CONNECTED (i.e.: the charge process IS NOT ALLOWED)

4.2.BPK6K (EXTERNAL BATTERY PACK)

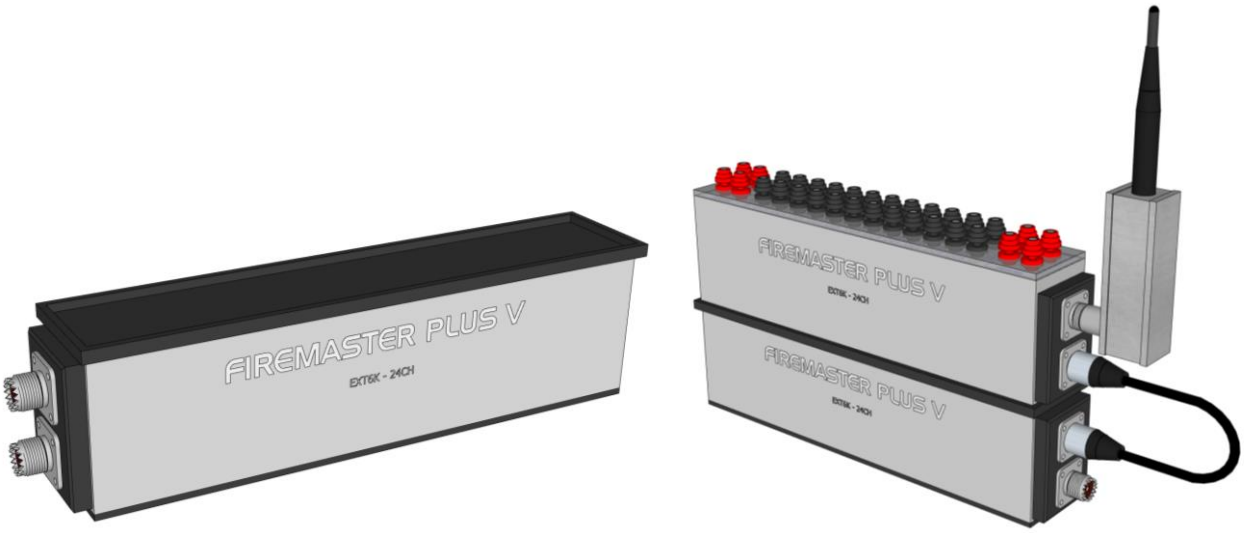
4.2.1. DESCRIPTION

The External Battery Pack **BPK6K** is an autonomous Unit containing ONE 12V battery that is necessary to supply power to one or more EXT6K when is connected WIFI with the RX6000.

The internal batteries can be RECHARGED simply connecting the special external battery charger (supplied) to one of the 2 UHF sockets.

There are 2 different type of BPK6K:

1. BPK6K standard model: made inside a NICKEL SILVER case size 280 x 50 x 80 mm (same case of EXT6K), is closed on top with a POM plate. The top is made to contain the EXT6K. On one side there is a POM (Polyoxymethylene) plate with 2 UHF female connectors, connected in series. On the other side there is a PVC label with serial number. The labels can be written on with an indelible pen and are easy to clean. On the bottom there is a protective rubber and also a M6 metal insert for eventual fixing use. The battery inside is 12V 2Ah.



2. BPK6KB is the larger model, is made inside a plastic box, size 170 x 140 x 90 m. On one side there is a comfortable plastic handle, that protect also the 2 UHF female connectors, connected in series. The battery inside is 12V 7Ah.

4.3. BATTERIES

All batteries used by the FIREMASTER SYSTEM, are of SEALED lead-acid type with GEL solid electrolyte. These are very reliable batteries requiring very little precautions and need PRACTICALLY NO SERVICE.

Need to realize ACCURATE AND FREQUENT CONTROLS of the battery situation, in particular:

1) Avoid exposing the battery to **extreme temperatures (below 0°C or OVER 45°C)** for long periods.

2) When the SYSTEM is NOT IN USE, provide to charge regularly the batteries: the lead-acid batteries have a much longer life if maintained ALWAYS FULLY CHARGED. It is suggested a charge cycle of **24 hours every 30 days.** The internal microprocessor system will take care to maintain the optimum charge level in any condition.

3) When the System is NORMALLY USED (periodic duty), it is suggested to have a 24-hour charge before all shows.

4) If the batteries have been DEEPLY DISCHARGED, it is suggested to have a full charge for at least **24 hours** (eventually repeat TWICE the automatic charge cycle).

5) Make periodic controls of the battery status at least every 6 months by visual inspection after removing it from the container: if any swelling, spot, salt or liquid spills are noticed, DISCARD IMMEDIATELY THE SUSPECT DEVICE even if apparently it does still give energy enough.

6) If measured OPEN CIRCUIT (without any load applied) all lead-acid batteries, when a common voltmeter (tester) is used, **always give 12V <u>even if quite completely discharged</u>**. It will be then necessary to always measure the battery voltage while a suitable load is applied. To do that, REMOVE the batteries from the Unit case, measure the voltage across the terminal with a voltmeter and connect **<u>momentarily</u>** a load sinking about **1A current**. For a 12V battery a common wire-wound resistor rated **10ohm 10W** can be used or optionally a 12V car bulb (e.g.: the one used for the headlight). The DIFFERENCE between the voltage measured OPEN CIRCUIT and UNDER LOAD shouldn't be MORE THAN 10% - 15%. E.g.: if a battery measured OPEN CIRCUIT gives a reading of 12,2V and, when LOADED with the resistor or the lamp, the reading decreases to 11,5V, it can be still regarded as a GOOD ONE. On the contrary, if the voltage measured UNDER LOAD should fall below 11V (or less), it will be then necessary to have a full charge for at least 12 hours and then the test will be repeated. If, after the charge, the test above is passed, OK: the battery was just discharged and can be still used. If otherwise the battery still exhibits an excessive voltage reduction under load, then it **MUST BE IMPERATIVELY DISCARDED** AND REPLACED WITH A NEW ONE.

NOTE: all batteries installed inside the RX Units, are AUTOMATICALLY TESTED with the above method.

7) The MEAN LIFE of a lead-acid battery is ABOUT 2 YEARS or 500 charging cycles (whichever is less). It is thus suggested, in a prudential way, to CHECK YEARLY with great care all batteries and to replace all devices giving test results LESS THAN PERFECT (even if apparently acceptable).

8) ✋**We recall here the RECYCLING RULES concerning the battery disposal: it must absolutely avoided to dispose the failed batteries with the common garbage, call instead a specialized collecting center enabled for the recycling of this polluting waste!**

4.4. CHARGING BATTERY

4.4.1. TX6000 BATTERY CHARGING SYSTEM

The Base Unit TX6000 has ITS OWN INTERNAL CHARGING SYSTEM controlled by a dedicated microprocessor and a series of control circuits providing to the continuous monitoring of the charge state and the operating conditions.

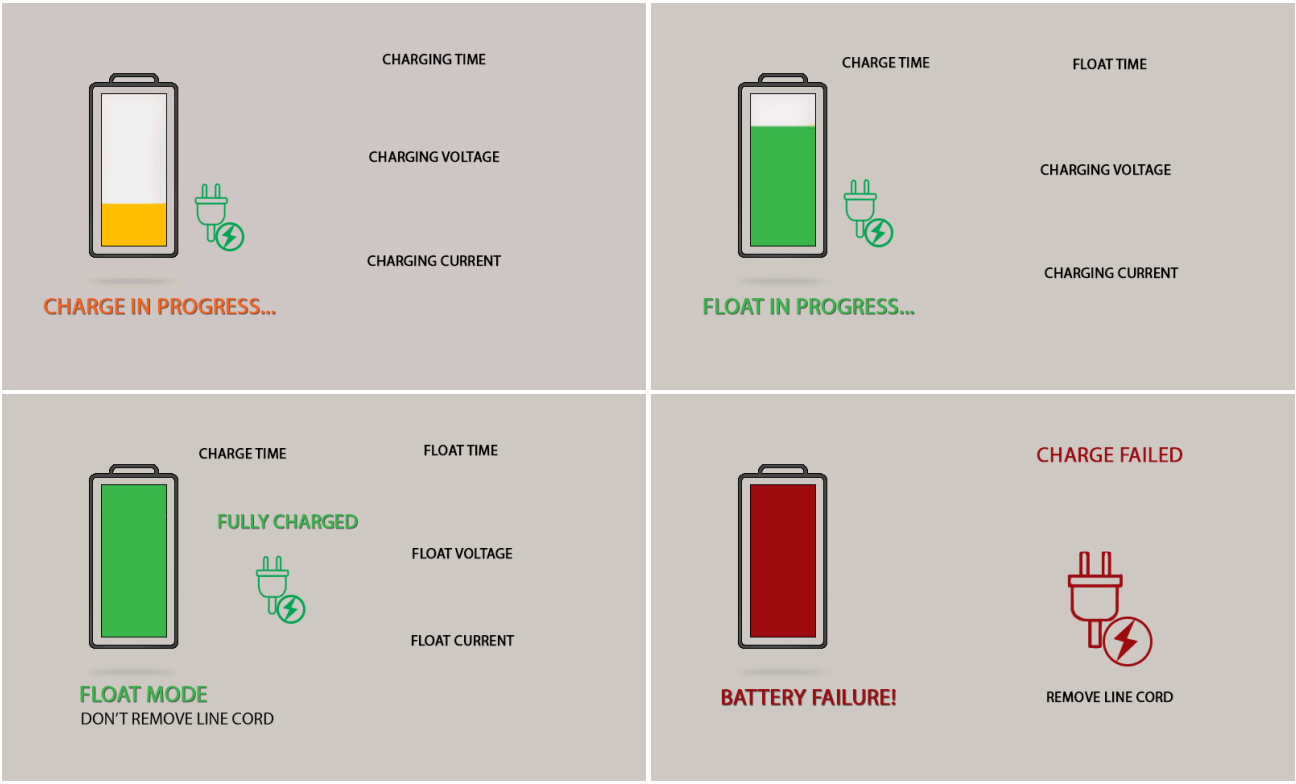
The charging process of the internal battery must be carried out with the TX SWITCHED OFF.

The charging process starts immediately upon connection of the line cord to the receptacle on the TX front panel.

The mains voltage can be any value between 100 and 240V c.a. 50 or 60Hz.

Initially the LCD screen on the TX6000 Unit turns ON and the following information are displayed:

- CHARGING TIME
- CHARGING VOLTAGE
- CHARGING CURRENT
- CHARGE TIME
- FLOAT TIME



4.4.2.RX6000 BATTERY CHARGING SYSTEM

The RX6000 has ITS OWN INTERNAL CHARGING SYSTEM controlled by a dedicated microprocessor and a series of control circuits providing to the continuous monitoring of the charge state and the operating conditions.

The charging process of the internal battery must be carried out with the RX SWITCHED OFF.

The charging process starts immediately upon connection of the line cord to the receptacle on the RX front panel.

The mains voltage can be any value between 100 and 240V c.a. 50 or 60Hz.

Initially the LCD screen on the RX6000 Unit turns ON and the following information are displayed:

- CHARGE BATTERY = is the charging voltage set for the charger
- Vb1 (Vb2 or Vb3) = is the charging voltage of each battery
- Ib1 (Ib2 or Ib3) = is the charging current of each battery
- TIME: is the charging time

Need to press (OK) key to visualize from Charging voltage to Charging Current

5. EXTENSIONS ANTENNA

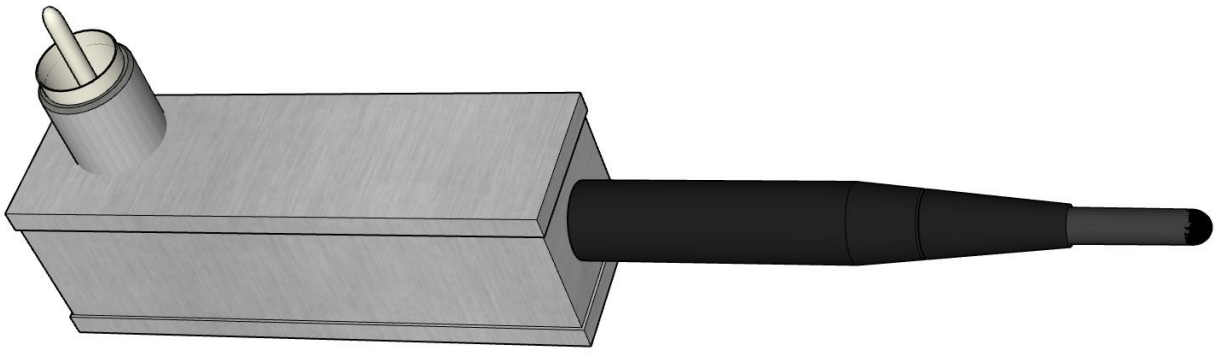
5.1.ANTENNA BW-6K (LONG RANGE ANTENNA FOR EXT6K)

5.1.1. DESCRIPTION

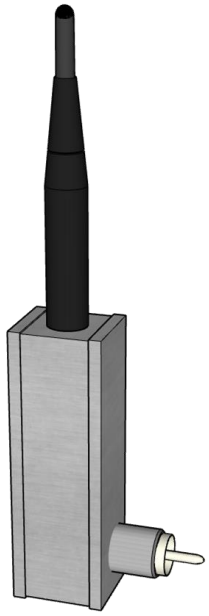
The BW6K, is a special antenna needed for the communication from RX6000 to EXT6K.

The BW6K is composed of one body made inside a NICKEL SILVER case size 90x 30 x 25 mm, one Male UHF connector and one rubber antenna. The total size is 175 x 25 x 60mm (connector included).

The radio frequency of the BW6K is operating in the 868MHz SRD band, and in open field (with a very good frequency condition) can cover a range of also around 500 meters. Each BW6K can be programmed in 5 different Channels, in order to avoid any interference between each RX6000 communication. That's mean that in the range of the radio operating, only 5 different RX6000 can operate at same time. Each channel includes one RX6000 complete of 20 EXT6K (Units). More than one RX6000 with same channel cannot operate together inside the same cover range.



Here below a chart that display to how will be set the 5 channels for each RX6000:



BW6K	CHANNELS				
	CH1	CH2	CH3	CH4	CH5
RX6000	1	21	41	61	81
	101	121	141	161	181
	201	221	241	261	281
	301	321	341	361	381
	401	421	441	461	481
	501	521	541	561	581
	601	621	641	661	681
	701	721	741	761	781
	801	821	841	861	881
	901	921	941	961	981

5.1.2.SET BW6K CHANNEL

To Set the channel of each BW6K need to proceed as follow:

1. **CONNECT ON LINE#1** the BW6K to their RX6000.

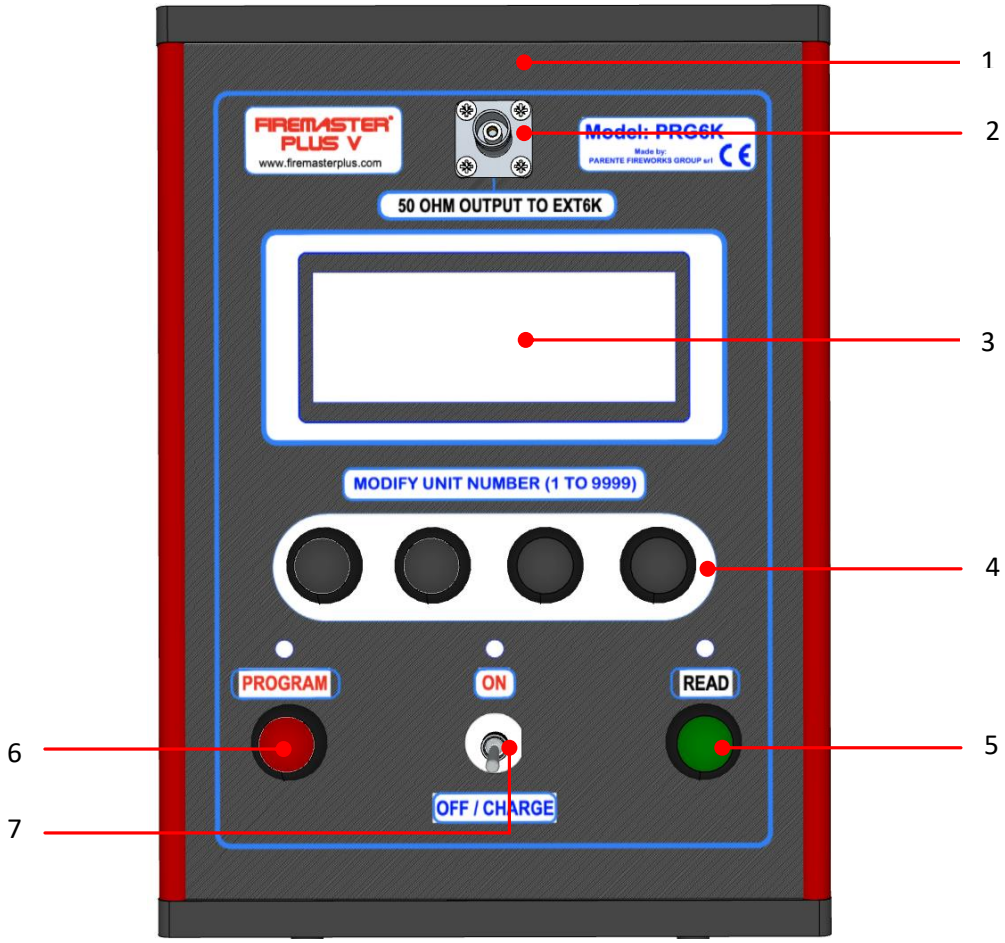
NO OTHER EXT6K HAVE TO BE CONNECTED, AND POWERED IN CASE BY WIRELESS (ALSO IF RELATED TO OTHER RX6000).

2. Switch on the RX600
3. To SET, press one time (◄) and, immediately after, one time (►), and then (**OK**) to confirm, at this time, simply pressing (**OK**) again to confirm. A message "OK SET ANTENNA" will appear, in order to have the confirmation that the BW6K is programmed. After that you can disconnect the BW6K, and We suggest you to mark the Channel or the RX6000 number, directly on the antenna, in order to recognise it immediately.
4. To SET another BW6K without switching off the RX6000, please connect on Line#1 another BW6K to their RX6000.
5. Repeat point 3

6. PROGRAMMER PRG6K

6.1. PROGRAMMER PRG6K (PROGRAMMER FOR EXT6K)

6.1.1. FRONT PANEL DIAGRAM



1. Polycarbonate panel.
2. **BNC** female socket connector.
3. **LCD** display.
4. **FOUR** digits pushbutton to modify Unit Number
5. **READ** push button
6. **PROGRAM** push button
7. **Main power switch** with 2 positions:

- **ON Position:** PRG6K switched ON and ACTIVE. The INTERNAL batteries **cannot be re-charged while operating**.

- **OFF/CHARGE Position:** PRG6K switched OFF. In this position the internal batteries can be RECHARGED simply connecting the special external battery charger to the BNC socket.

6.1.2.DESCRIPTION

The PRG6K is a special system to quickly set the EXT6K (Unit) number.

The PRG6K is made in a special Alumium body, size 230 x 150 x 70 mm, equipped of one metal handle on the side.

A special External charger is supply with the PRG6K.

6.1.3.USE

Connect, using a short cable, the EXT6K to the BNC socket, if necessary, use an adaptor BNC male/UHF Female.

Switch on the PRG6K and press (READ) button to read the actual Unit Number of the EXT6K.

The display will show the following information:

- USER: the user code of the PRG6K
- UNIT: the RX6000 Unit number of the EXT6K
- CHECK EXTENS.: The EXT6K Unit number
- Type and Version and USER code of the EXT6K

To Program a new Unit NUMBER:

1. Press one time (PROGRAM) button
2. Change the Unit Number using the FOUR digits Push buttons (each button will change a DIGIT from 0 to 9)
3. Press again one time (PROGRAM) button, to confirm
4. A message OK SET will appear

7. WARNINGS AND GENERAL SAFETY RULES

The following rules, suggestions and limitations, should be carefully followed, both to comply with the most common safety provisions and to avoid severe and permanent damages to the system FIREMASTER PLUS, still obtaining the best performance.

Use of the FIREMASTER system and its ancillary units, is strictly reserved to pyrotechnic professionals, duly authorized to fireworks use, following the law provisions of each respective Country.

Don't modify or try to adjust in any way the internal circuitry.

Don't store the units in excessively damp or dusty places nor on unstable surfaces.

Avoid any water spray on the unit's front panel. If Open, the units ARE NOT COMPLETELY WATERPROOF! Dry immediately any part subject to accidental fresh water spray or rain shower. Disconnect and put aside any unit accidentally sprayed with SEA WATER: these units must have immediate service in order to clean completely the internal parts. If an immediate technical service is not possible, try to remove the salt water using DISTILLED WATER.

Never clean the front-panels using solvents, alcohol, acids or bases. Always wipe gently the surfaces using a soft cloth with neutral and no-foam detergent. Avoid scratching the painted surfaces!

During the show execution, protect your units from the incandescent fallout closing the protection covers on the panels.

Avoid as long as possible, to place your units directly on the ground (mainly if it is wet, muddy or frozen). The units should be always raised from the ground by at least 50cm – one meter using non-flammable supports: cardboard, plastic or wood boxes must be avoided!

Avoid any contact between different units, both directly and by means of other external metallic parts or surfaces. Avoid in general any contact between different working units.

It is NOT suggested to operate the System when the ambient temperature is OVER 45°C o BELOW -15°C.

The units must be stored in dry places at temperatures between 5°C and 30°C (maximum limits).

Avoid overcharging the internal batteries exceeding the prefixed charging time. 24 hours are enough for a complete re-charge when the batteries are in good conditions.

Always switch OFF all the units before store them in the deposit.

Immediately replace all failed batteries or suspected to be detective (the price of a single battery doesn't worth a compromised show!)

Discard the failed batteries in strict accordance with the recycling and disposal rules existing for this special material.

Should any unit emit unusual smell or smoke, switch it OFF immediately and remove the internal batteries.

Avoid any accidental contact between the metallic parts of the unit and other external circuits or metallic structures.

Don't operate the units near or inside deposits of flammable material, explosives or devices sensible to electromagnetic fields.

Don't store or recharge the units inside deposits of explosives, flammables or inside restricted areas. Don't switch ON the units in presence of high concentrations of combustible dust or solvent vapors.

Never connect your units to other instruments not otherwise specified as ORIGINAL FIREMASTER ACCESSORY or expressly declared compatible by the producer.

Don't connect or dis-connect the electrical squibs while the units are switched ON. Always switch OFF your units before proceeding with the squib connection.

Don't use testers, ohmmeters or circuit checkers to test the line continuity when the wires are already connected to the unit's terminals! Always perform any measurement on the squib while it is DISCONNECTED from the unit!

Imperatively do NOT use external voltage sources trying to increase the voltage or the current of the System.

Clear the firing site from the personnel when, with mortars loaded and squibs connected, the units are switched ON. Clear the site as well during the whole programming and test steps on the lines and sequences. Always perform any programming and test operation maintaining the maximum safety condition for all the operators.

Remove the safety key from the units during all the operations involving the squib connection, mortar loading, etc. Avoid any un- authorized use of the System by personnel not qualified or in the wrong moment.

Imperatively DO NOT USE cellular phones, cordless, walkie-talkies, transmitters, brush motors, high-energy electrical devices, industrial lamps with power reactors, etc. in proximity of the FIREMASTER system and its ancillary units while operative (both in SAFE and FIRE mode) and mainly when the squibs are already connected to the system.

Strictly avoid any electrical contact between the squib lines and any other external circuit or metallic part. Also avoid any contact between the squib wires and metallic parts of the same unit. To each connector must be present only the insulated wires of a single firing line completely free from any other contact.

Carefully insulate all the squib terminal junctions and avoid any electrical leakage (wet junctions or lines) between wires of different lines or with respect the ground or metallic surfaces.

NEVER use the FIREMASTER system and its peripheral units for any other purpose but the control and firing of PYROTECHNIC SHOWS.

FAILING TO OBSERVE ONE OR MORE OF THE ABOVE WARNINGS, COULD LEAD TO SEVERE FAILURES, DAMAGES TO PEOPLE AND MATERIAL, COMPLETELY OUTSIDE OF THE PRODUCER RESPONSIBILITY, OTHER THAN PERMANENT DAMAGES AND THE IMMEDIATE WARRANTY VOIDING!

8. PRELIMINARY OPERATIONS

A. FIRST INSTALLATION

1) **Lift the units from the shipping packages (box, container, etc.)**
2) **Check carefully for any dispersed accessory (cables, antenna, software CD, etc.) before discarding the packing material.**
3) **Proceed with an accurate visual inspection of the units in order to discover possible damages, breaks, tampering, etc.**
4) **The following items should be checked in particular:**
- **Enclosure, top cover and fasteners**
- **Connectors**
- **Front panels**
5) **Shake each unit in order to discover noises due to internal parts loosening.**
6) **All contacts and other exposed metal parts should not present traces of corrosion or oxidation**
7) **No traces of liquid spillage (batteries) must be present.**

Should any of the above problems be present, DON'T OPERATE THE INSTRUMENT but contact immediately the Service Center!

The units of the FIREMASTER series are usually supplied with the batteries ALREADY INSTALLED AND READY-TO-USE: it could happen however as, due to a long storage period before the first installation, the batteries become partially discharged.

In this case the unit SHOULD BE NOT INSTALLED but a previous COMPLETE CHARGE of the batteries must be performed.

NOTE: The batteries are subject to a natural auto-discharge during the storage periods. The discharge rate is function of the battery residual life and of the ambient temperature (higher the temperature, faster the auto-discharge).

In particular climatic conditions and for very prolonged inactivity periods (over 60 days), it may happen as the batteries fall BELOW THE MINIMUM ALLOWED LEVEL FOR A REGULAR RE-CHARGE. In this case the batteries must be considered as PERMANENTLY DAMAGED. A single charging cycle can be still attempted. If this last attempt shouldn't succeed, DO NOT INSISTS AGAIN, but REPLACE THE DAMAGED BATTERIES WITH NEW ONES. Contact the Service Centre to obtain details about the batteries replacement.

We recall here the RECYCLING RULES for the battery disposal: avoid at any extent to discard the failed batteries along with the normal urban waste, but always ask to a specialized collecting center for this type of special, polluting Waste!

B. STARTUP

1) **Before switching ON any unit of the FIREMASTER series, remember to connect the antenna (only for the units fitted with this component) reading carefully the User's manual.**
2) **The continuous use of a FIREMASTER unit without the antenna properly installed, could lead to severe damage of the internal circuitry!**
3) **The unit will be switched ON using the safety key or the general power switch.**
4) **Check immediately as the unit behavior is the correct one described in the User's manual.**
5) **Should any irregular behavior be noticed or emission of smoke or sparks, SWITCH OFF THE UNIT IMMEDIATELY and DO NOT ATTEMPT A SECOND TIME! ASK IMMEDIATELY THE SERVICE CENTRE!**
6) **The FIREMASTER units don't have controls, adjustments or commands, nor internal, nor external, to be tuned by the User. In case of failure or apparent malfunction, DO NOT ATTEMPT TO OPEN THE UNITS AND MANIPULATE THE INTERNAL CIRCUITRY! (This operation, if not duly authorized by the Service Centre, WILL IMMEDIATELY VOID THE WARRANTY!)**

9. WARRANTY

PARENTE FIREWORKS GROUP s.r.l
Via Oberdan, 105
45037 MELARA (RO) -ITALY
Tel. +39-(0)425-89035
Fax +39-(0)425-89640
www.parente.it
www.firemasterplus.com
info@parente.it
service@firemasterplus.com

Manufacturer of the system FIREMASTER PLUS and its accessories, grants all Units free from manufacturing defects for a period of 12 months from the purchasing date.

All Units requiring service within the warranty period must be sent back to PARENTE FIREWORKS GROUP - ITALIA or to an authorized laboratory at Customer's charge.

Before sending any Unit or part for servicing under warranty, make sure all procedures described in the present manual have been carefully followed. ALWAYS CONTACT IN ADVANCES A PARENTE FIREWORKS GROUP REPRESENTATIVE TO OBTAIN A WRITTEN AUTHORIZATION FOR THE SERVICE DETAILS.

When the Units are sent back for servicing, please send also a short description of failures and problems encountered as well as a description of the ambient and operating conditions existing when the problem occurred.

We recall here as ALL BATTERIES are EXCLUDED from the present warranty.

10. SERVICE CENTRE FOR ASSISTANCE

For any necessity of technical service (under warranty or not), information about the instruments use, technical support for the FIREMASTER series equipment, please contact Firemaster Service Center to PARENTE FIREWORKS GROUP.

Firemaster Service Center, provides all type of technical service for all version of Firemaster Systems, both under warranty or not, except for any damage due to fraud or negligence.

COURTESY UNITS:

Should the repair time extend over the reasonable limits, it will be possible to supply (when available) the Customer with a courtesy unit, following a specific request and against payment of a money caution. The caution will be returned upon return of the unit in the original conditions.

REPAIR ADVANCEMENT:

To obtain information about the repair advancement of your Firemaster Unit, please contact directly: service@firemasterplus.com

Note: before any call to the Service Centre, it is suggested to obtain the serial number of the unit and your User's Code. Both data are available on the label placed on the unit side.

SERVICE OUTSIDE WARRANTY:

Repair of units no longer covered by warranty, is subject to special conditions. Please check in advance with the Service Centre the conditions (rates, modes and times).

SERVICE UNDER WARRANTY:

Warranty period is 12 months* both for the main units and the accessories, with exception of the batteries of FIRST INSTALLATION having a warranty period of 6 months*.

REPAIR WARRANTY:

In case of iteration of the same failure after a repair, Firemaster Service Centre, offers for all repaired units, a general warranty of 3 months. The warranty is not in addition with eventual other existing warranties

* Excepted any different provision of the law.

FIREMASTER SERVICE CENTRE - GENERAL CONDITIONS

• Warranty period is 12 months from the goods receipt date.

• Warranty doesn't cover the consumables, the rechargeable batteries and, in general, any component subject to wear, the failures due to shocks, drop, misuse or abuse, accidental causes or failures due to the transportation.

If the warranty seal is removed or tampered, the warranty is immediately void.

• Repair of failed units will be performed following the type of problem declared by the User.

• Any repair under warranty must be expressly requested.

• Pro-forma invoice must be requested expressly.

• Payment must be made BEFORE the unit is sent back.

REPAIR UNDER WARRANTY

• Repairs under warranty are always intended in our laboratories upon written authorization

• For any repair under warranty, it is requested copy of the purchase invoice or shipment document allowing to check the purchase period is within the warranty limits.

• Should the product sent for repair result in perfect conditions, the Customer will be in any case charged by the basic cost.

REPAIR OUTSIDE WARRANTY

• For any repair not covered by warranty performed in our laboratories and with written authorization, the shipment costs are at User's charge.

• With limitation to the replaced parts during the repair, the warranty of the repair service is 12 months from the unit collect.

• Should the product sent for repair result in perfect conditions, the Customer will be in any case charged by the basic cost.

REPAIR AT PURCHASER DOOR

• In case of repair directly to the purchaser's address, it will be necessary a written request with full indications of the user's data, type of instrument and nature of failure.

• Costs for the transfer of a specialized technician is related to the urgency of the service requested.

• If the system to be serviced should be still covered by warranty, only the repair cost will be not charged.

• Service time will be calculated from the departure of the technician from the Service Centre until he will be back. The return time will be evaluated on the basis of the time spent the first time.

SPARE PARTS AND CONSUMABLES

• Orders must be sent by letter, mail, e-mail or FAX specifying the part type, the client data, the shipment conditions and the fiscal data for the invoice.

• Delivery time may vary depending on the availability of the requested item.

• It is NOT allowed to send back any spare part.

• Payment will be always at goods receipt, excepted special agreements.

11. DECLARATION OF CONFORMITY

DICHIARAZIONE DI CONFORMITÀ

Declaration of conformity

La sottoscritta ditta Parente Fireworks Group srl con sede a Melara (RO) in Via Oberdan n. 105,
Parente Fireworks Group srl with registered office in Melara (RO) Via Oberdan n. 105

DICHIARA
Declares

sotto la propria esclusiva responsabilità che il sistema
under its sole responsibility that the system

Identificazione del prodotto: *Product identification:*	**FIREMASTER PLUS V**
Descrizione del prodotto: *Product description:*	**RADIO CONTROLLED FIRING DEVICE FOR PYROTECHNIC APPLICATION**
Rappresentante autorizzato: *Authirized representative:*	**Parente Fireworks Group srl** **Via Oberdan, 105** **45037 Melara (RO) – ITALY**
Costruito da: *manufactured by:*	***Idem as above***

è conforme alle prescrizioni tecniche contenute nelle seguenti norme e/o specifiche tecniche
is compliant to the technical requirements of the following standard and/or technical specifications

- EN 301489-1 V1.6.1 (2005)
- EN 301489-3 V1.4.1 (2002)
- EN 300 220-1 V2.1.1 (2006-04)
- EN 300 220-2 V2.1.2 (2007-06)
- EN 50371 (2002-03)
- EN 60950-1: 2001+A11:2004

che conferiscono presunzione di conformità ai requisiti di protezione stabiliti dalle Direttive CEE n.
which give compliance with the protection requirements stated by Directive n.

- 2014/53/UE
- 2014/30/CE
- 2014/35/CE

Melara, 24/05/2017

Parente Fireworks Group srl
Parente Antonio, CEO

PARENTE FIREWORKS GROUP S.R.L.
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PEC parentefireworksgroupsrl@cgn.legalmail.it