

OxyRadio **Radiocontrol Interface** **for Oxydium** **& MAF60 serie II systems**



Manual

Oct 2023 with firmware PN200267G of June 2, 2020

This manual is dedicated to the Oxyradio communication system, it is to be associated with the manuals of the Oxydium console and the MAF60 series II. The firmware of the Oxydium must be the v3.8

This operating manual is only valid for products corresponding to the version described in this manual and sold from the date mentioned above. Before use, carefully read these instructions and you'll be fully satisfied with your new hardware. Always comply to the safety instructions.

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This radio transmission system is intended to replace an impossible wired link between the Oxydium console (or the wired remote control MAF60 serie II) and the MAF60 serie II satellites.

Each Oxyradio module is composed of two distinct subsets: an Oxyradio interface associated with a standard radio module (*Blizzard® model from RF solutions manufacturer*).

To simplify, it will be understood by the term "module" the set consisting of the Blizzard® radio module and the Oxyradio interface.

The basic configuration consists of :

- A coded HF "master" module to be connected to the Oxydium console, or to the wired remote control of the MAF60 series II.
- A coded HF "slave" module to be connected to the MAF60 series II satellite.

This system uses a bidirectional radio link in the 869Mhz range. The firing orders generated by the Oxydium (or the MAF60 serie II remote control) are sent by the master module to one or more slave modules which redistribute them to the MAF60 serie II satellites.

The modules are bidirectional (both transmitters and receivers) and are physically identical. The settings made with the OxyRadio software allow them to be configured as a master module or a slave module. This has the advantage of being able to reconfigure a fleet of equipment as required. In addition to the color of the "Status" led, a colored ring (interchangeable) is to be affixed to the base of the antenna in order to identify them (red for master configuration, blue for slave configuration).

When purchasing an OXYRADIO set, the modules are already configured * and paired together: a single master to one or more slaves (up to 16).

In case of separate acquisition of additional modules, the modules will be delivered configured in slave mode * by default, but you will have to pair them so that they can recognize the master module already in your possession .

For security reasons: a master module can control several slave modules, but a slave module can only recognize one master module. Each synchronization operation of a slave on a new master erases the previously memorized master.

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*except specifically customer request.

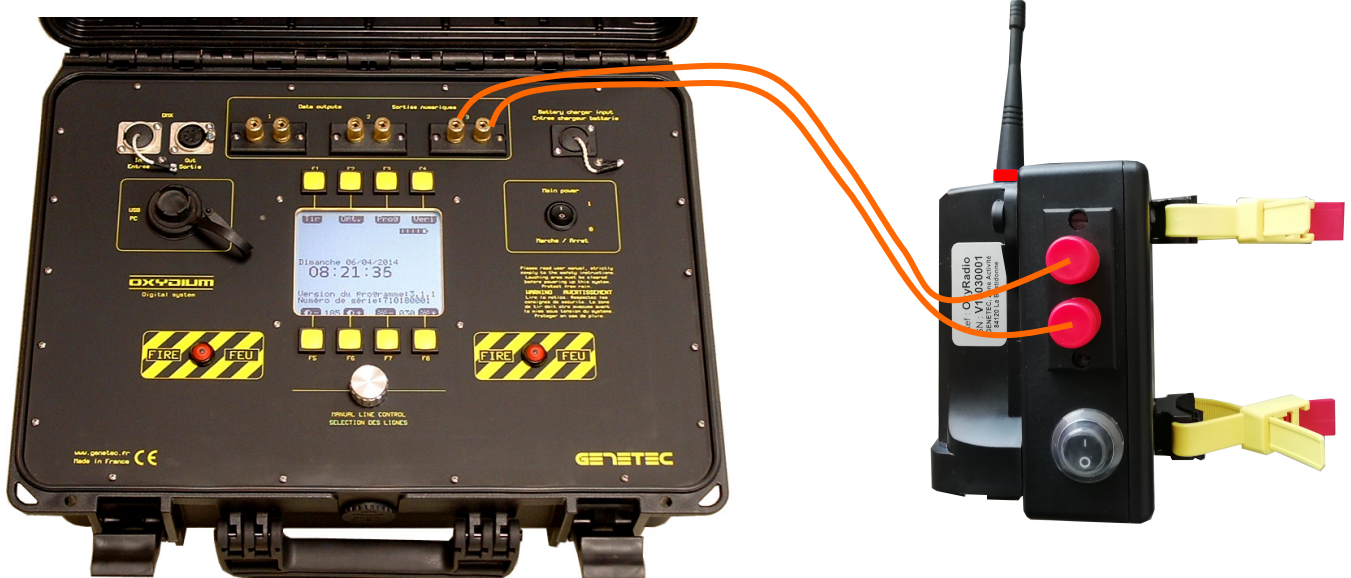
MASTER MODULE

Recognizable by its status LED which only flashes orange 4 seconds after switching ON (and its interchangeable red ring at the base of the antenna). With the module off, fix the antenna vertically upwards on a mast with the quick clamps on the back of the box and lock with the red tabs. The antenna rod must be cleared completely from the mast, and must not be hidden by the latter.

Unscrew and wire on the two red knurled terminals located on the side of the master module to the two knurled terminals of one of the three Oxydium outputs (*or on that of the wired remote control MAF60*). On the Oxydium, this output should only be dedicated to the Master radio module, and if you also have satellites to connect by wire, use the other two remaining modem outputs.

The connection between the Oxydium (or the MAF60 remote control) and the master module can go up to several hundred meters in good conditions, however it is advisable to run the two-wire cable away from potential sources of interference (lines electrical, transformers, sound or lighting devices, walkie-talkies, phones, etc.).

Only one master module must be used on the same firework display or same site.



Connection on Oxydium console

Oxyradio Master module

As the OxyRadio modules are bidirectional, they allow direct visualization of the presence of the slave modules on the LED bargraph of the master module, and as well as with an Oxydium console on its LCD screen in order to carry out advanced satellite checks (Oxydium must have the v3.8 firmware).

In this second case, refer to the Oxydium instructions, proceed in the same way as for wired connections (Network learning, Check satellite status, etc.).

Note that for these feedbacks a double check is carried out by the system, as such it is possible to repeat immediately a 2nd time the learning (or checking) operation if all the satellites do not displayed on the Oxydium LCD screen the first time. On the other hand, if the same satellite always remains absent despite several successive tests close together, then the latter may really be missing.

Just as with wired, in order not to make this satellite control procedure more cumbersome, we advise you to leave in the memory of the Oxydium only the satellites actually used during your services. Indeed when a satellite is not found by the Oxydium (because for example not used on the show), the Oxydium will still search for it for almost 5 seconds before declaring it absent (so for example if you only have one satellite on a firework, but your entire fleet of 25 satellites is stored in the Oxydium, the initial network learning procedure could then last nearly 2 minutes).

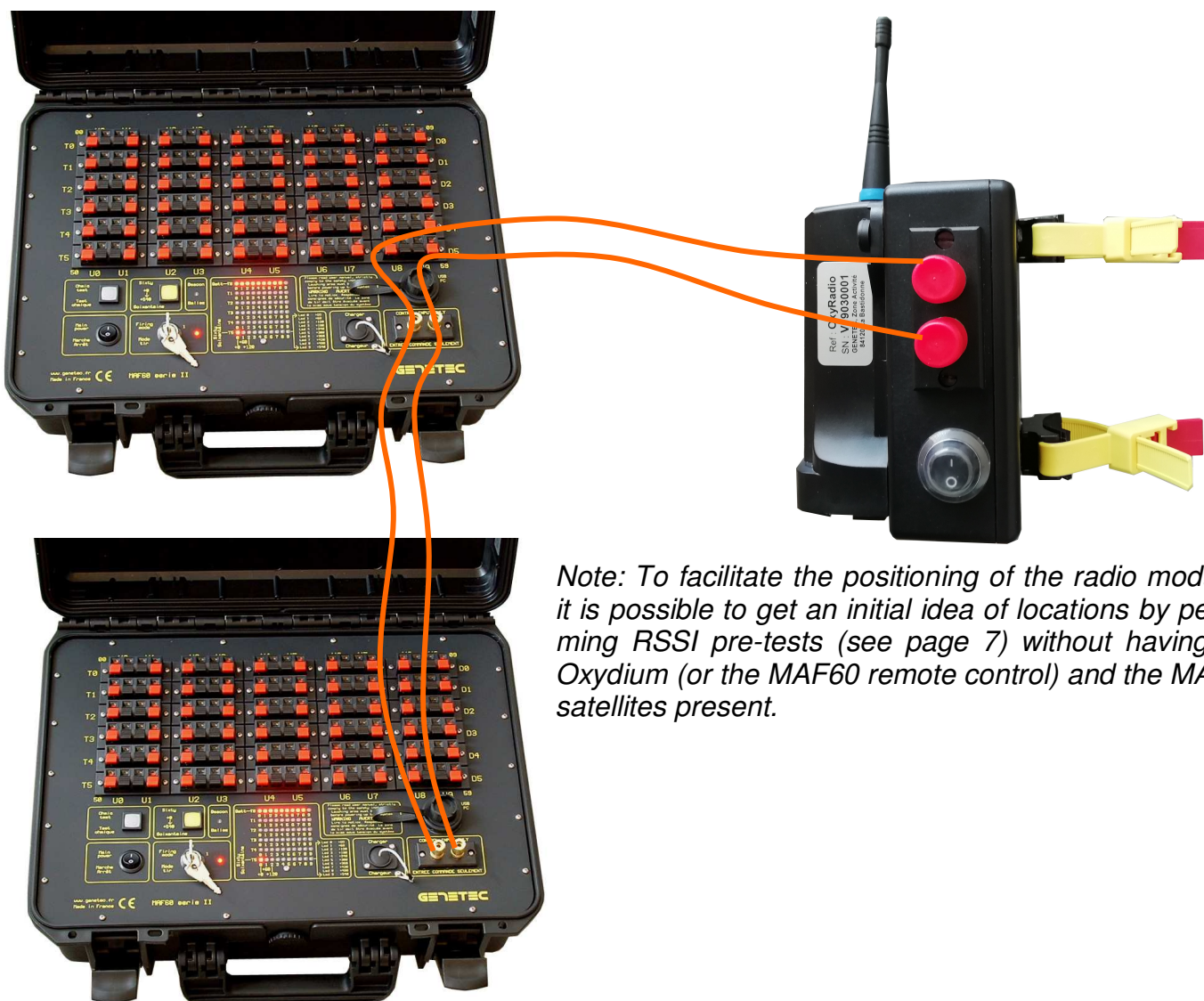
SLAVE MODULE

Recognizable by its status LED which only flashes blue 4 seconds after switching ON (and its interchangeable blue ring at the base of the antenna). With the module off, fix the antenna vertically upwards on a mast with the quick clamps on the back of the box and lock with the red tabs. The antenna rod must be cleared completely from the mast, and must not be hidden by the latter.

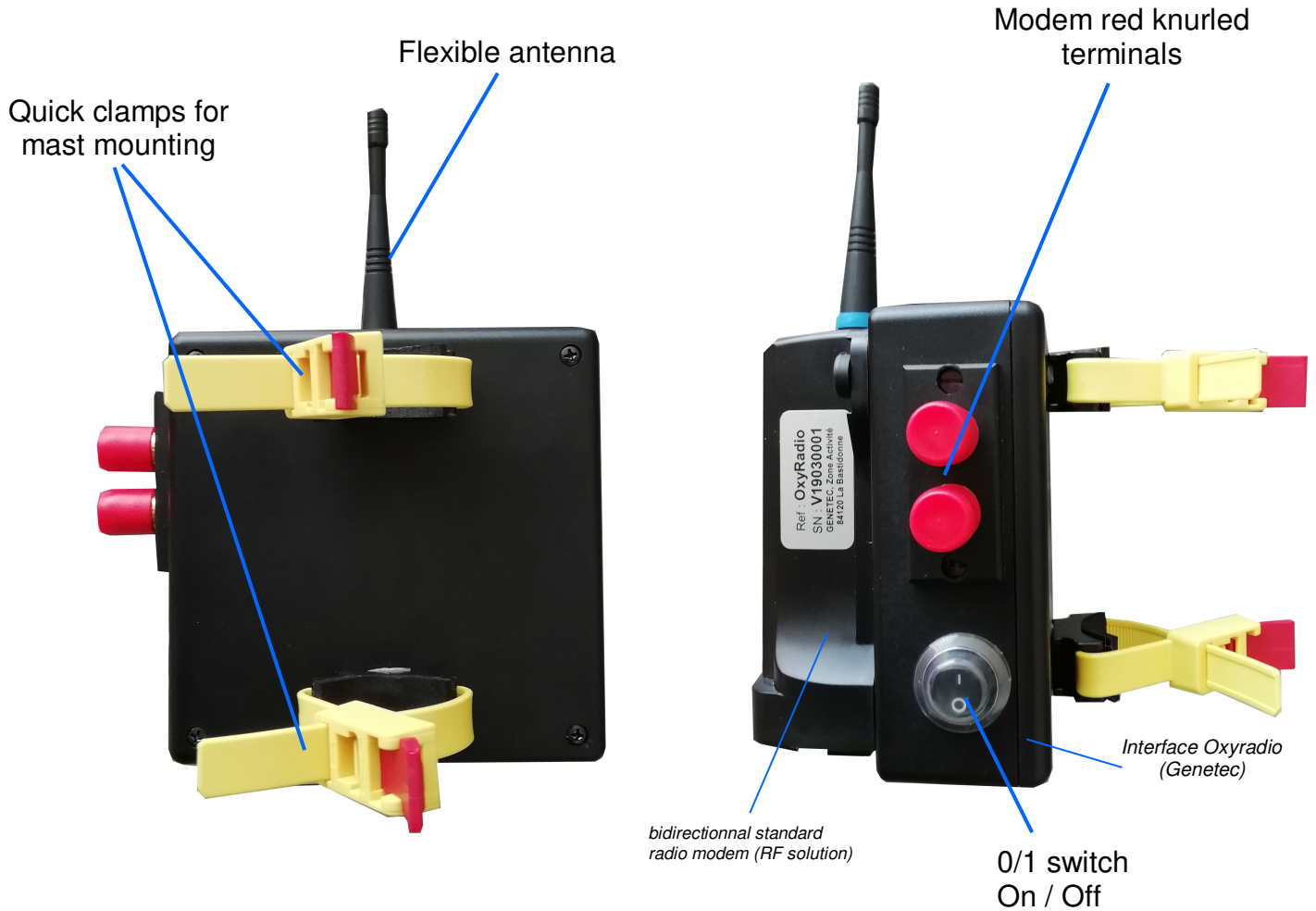
Unscrew and wire the two red knurled terminals located on the side of the slave module to the two knurled terminals of the MAF60 satellite. The connection between the satellite and the slave module can go up to several hundred meters in good conditions, however it is advisable to run the two-wire cable away from potential sources of interference (lines electrical, transformers, sound or lighting devices, walkie-talkies, phones, etc.).

If you have to connect a 2nd MAF60 series II satellite, you must do in parallel from the knurled terminal block of the first MAF60 series II satellite. If you have to connect a 3rd MAF60 series II satellite, you must do so from the terminal block of the 2nd satellite by simply connecting it in parallel, so on: one after the other.

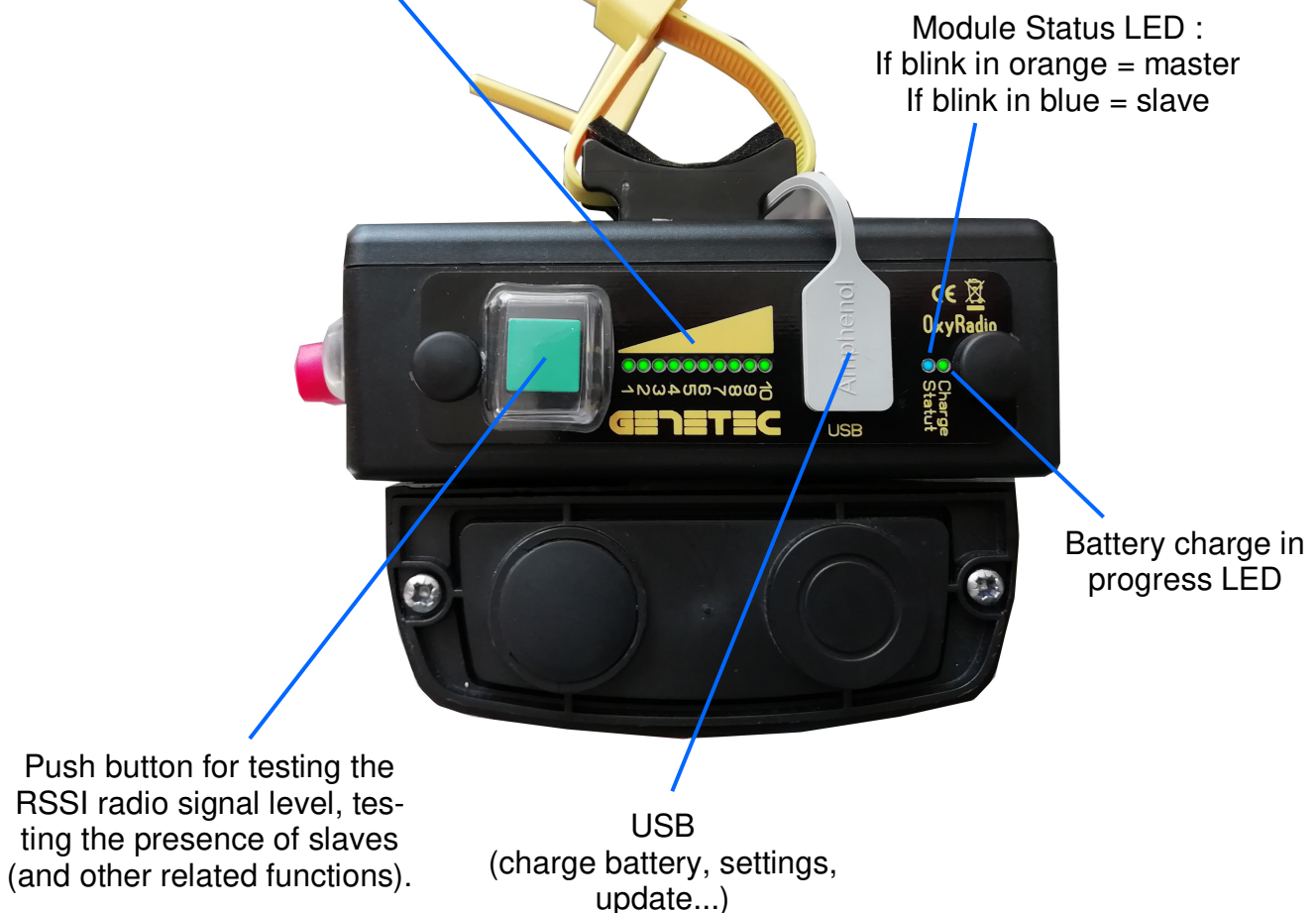
Note: The quantity of satellites controlled by a single slave module is not unlimited ("dilution" of the signal in the circuits and the lengths of wires). Above 3 or 4 satellites connected to a single slave module, check the reception of beacons on MAF60 satellites. Five satellites is the maximum limit on the modem output of a slave module.



Note: To facilitate the positioning of the radio modules, it is possible to get an initial idea of locations by performing RSSI pre-tests (see page 7) without having the Oxydium (or the MAF60 remote control) and the MAF60 satellites present.

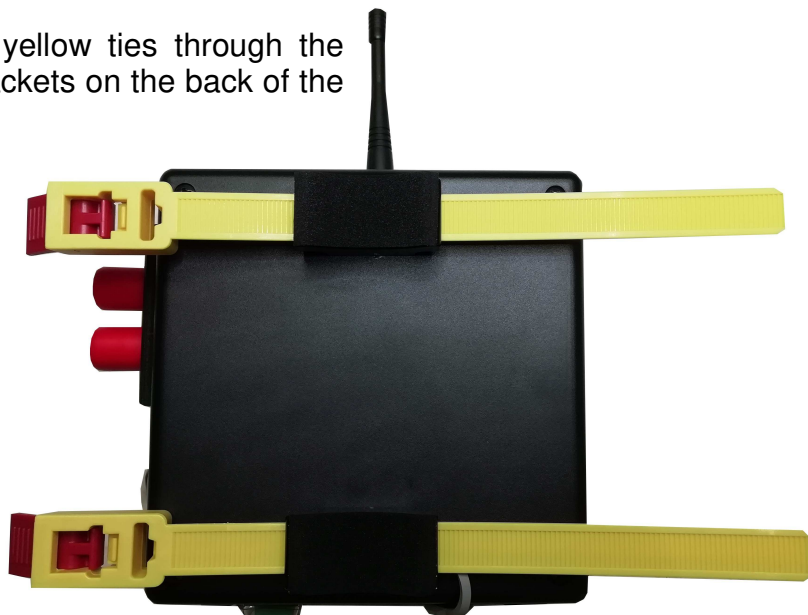


Display of the battery level, the radio reception level (RSSI) on the slave modules, the presence of the slaves on the master module

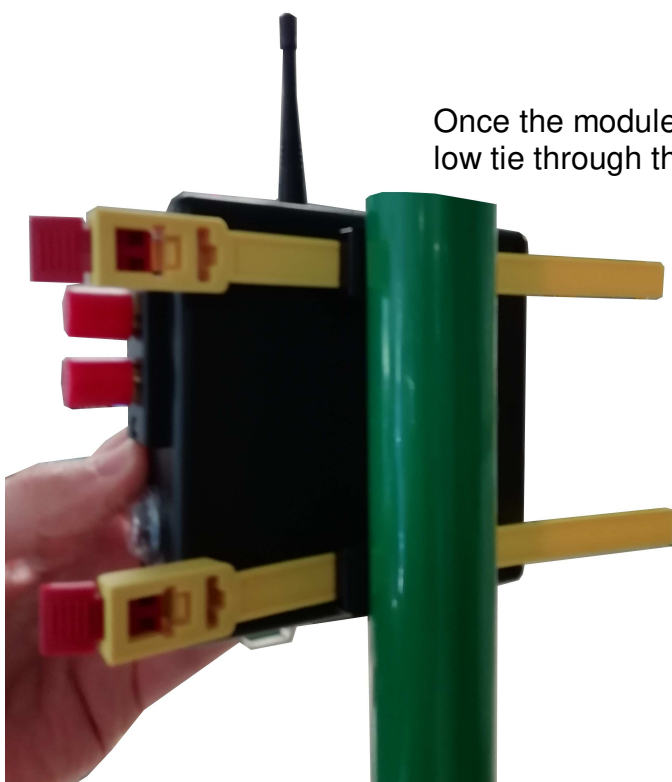


MAST MOUNTING

Pass the two reusable yellow ties through the slots in the mounting brackets on the back of the box.



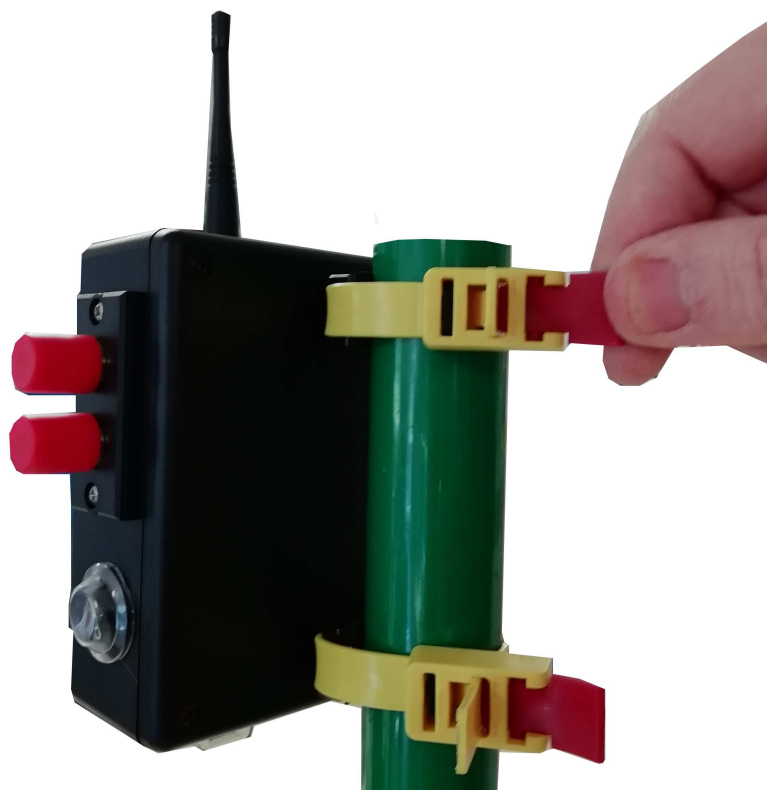
Once the module is positioned against the mast, pass each yellow tie through the slot in the red locking lever.



Hand tighten the tie by squeezing it, and lock with the red lever. Check that the module does not slide on the mast.

The modules must be installed at least one meter from any other device (MAF60 satellite, Oxydium, etc.).

To adjust the module position if necessary, always unlock the red levers beforehand.



USE :

Range and communication tests during installation :

Once the installation is completed, it is necessary to check the quality of the radio link. These tests must be carried out with the "Firing mode" key of the satellite (s) in position 0. The satellite (s) and radio module (s) must be placed in a secure area for personnel.

There are **THREE** quick and essential tests to perform:

TEST #1, RSSI (Received Signal Strength Indication) :

Switch ON the master radio module, the Oxydium console (or the basic MAF60 remote control) and the slave radio module to be tested.

Wait a few seconds for the modules to finish starting (the appearance of the green battery level display indicates that the module has finished starting, otherwise reboot the module) and check the strength of the radio signal reception level directly on the slave module by pressing once on its push button: a test communication is then established between the master module and the requesting slave module for approximately 10 to 15 seconds, the reception level can be read in blue on the bar graph LEDs of the slave (10 LEDs = maximum RSSI), the "status" LED flashes rapidly in orange during this test.

You cannot perform an RSSI test from the master module, but only from the slave to be checked.

Once the RSSI reception level has been validated (level 4 to 5 minimum recommended), go to test #2 on the following page.



Never install at the limit of range, always keep a safety margin.

If the reception level is not satisfactory, reposition the modules until a sufficient reception level is obtained.

If several slave modules are present on the same site : to avoid any risk of interaction during the evaluation of the RSSI level, it is recommended for all the other slave modules to be switched OFF and to have, except the master module, only the slave module to check switched ON.

Only the slave having requested the RSSI test will display it, if other slaves are present and powered ON (which is therefore not recommended) they will during this time display a blue and red led chaser. It will then be necessary to carry out this radio signal level control operation on each of them also in turn.

During an RSSI test (15 seconds max) the master module cannot send a firing order, so do not launch an RSSI test during the show.

What to do if :

If nothing happens when the push button is pressed (the green flashing battery display remains visible), the master module has not received the RSSI request sent by the slave module:

It is possible to have to request the RSSI test again if the initial request has been done at exactly the same time as an automatic beacon generated by oxydium or the MAF60 remote control (to avoid this it is possible to perform the RSSI tests with the oxydium or the MAF60 remote control off, but this will then require you to return after to the control station to switch ON to carry out test #2).

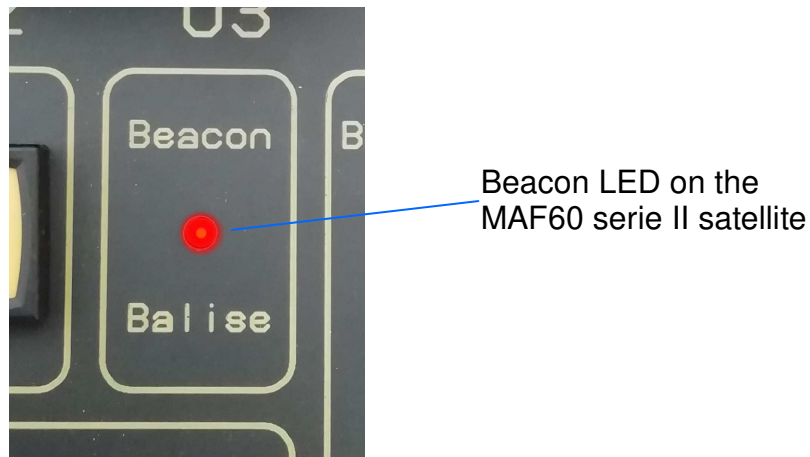
If nothing still happens, reboot the affected radio modules and repeat the RSSI test operation.

Finally, check that the modules are not out of range, are not inverted, that the master is not switched off, that the pairing is correct, or that the statuses of the modules are not incorrect. If the phenomenon persists, the conditions are not conducive to a suitable radio link, use the wired connection.

TEST #2, Beacons :

As in ordinary wired link mode, the Oxydium (or the MAF60 wired remote control) will automatically generate beacons at regular intervals. It is imperative to check the good reception of these beacons on the satellite (s).

This 2nd test taking place in the continuity of test #1, we consider that the Oxydium (or the wired remote control MAF60) and the Oxyradio modules are already powered ON.



Proceed according to the following chronology:

1. Switch on the MAF60 series II satellites (see MAF60SII manual). The "firing mode" key of the MAF60SII satellite must be on 0.
2. Check that the "Beacon" lights (* 1) are correctly blinking on each satellite and if at this step the fire is imminent, DO NOT TOUCH THE SLAVE RADIO MODULES any more, it is then possible to switch the satellite directly to firing mode (* 2) .
3. Go to test #3 explained on next page.

*(*1) Each blink of the beacon led indicator attests that an automatic test beacon generated by the Oxydium or the MAF60 remote control is correctly received and identified by the satellite. Wait to receive a dozen regular beacons without skipping them to validate this test.*

If the beacons are received irregularly (or not at all), the test is negative (for information, an Oxydium sends 20 beacons per minute at regular intervals, and a MAF60 remote control sends 29 beacons per minute at regular intervals).

If the RSSI is good but there is no received beacon, reboot the satellite concerned and carry out the same checks as in wired mode: namely that the satellite is not in firing mode, as the wires of link are correctly wired, that the Oxydium console (or MAF60 remote control) is ON and in beacon mode and not in firing mode...

(*2) provided that all the controls linked to the MAF60 satellite itself (such as line resistances, choice of sixty, etc.) have been carried out beforehand.

Note: To reboot a module or device, turn it off, wait a few seconds, then turn it back on.

TEST #3, Presence control of slave modules directly from the master module:

By pressing once on the square push button of the master module (only), all paired slaves stored in the master's memory are searched by that one.

If they are detected, the LED corresponding to each identified slave lights up in blue.

If they are not detected, the corresponding LED for each missing slave lights up in red.

The slaves are displayed according to their historical pairing order.

If only one slave has been paired with the master, the display will only be done on LED 1 and the other LEDs will remain off. If two slaves have been paired, the display will only be done on LEDs 1 and 2 and the other LEDs will remain off, and so on. If the number of paired slaves is higher than 10 (it can go up to 16), the master module will first display the status of the first 10 slaves for a few seconds, then will flash 6 times, then display the status of the modules higher than 10 (thus it will light 6 LEDs if for example 16 slaves had been paired).

At the end of the test, the module's LEDs flash 6 times, then the module automatically returns to the normal green display of the battery level.



Example with a master module paired with 5 slave modules: the master indicates 4 slave modules are present and one is absent (which can be normal if for example it is not used on the show).

This particularly useful function is even more useful when used with the MAF60 wired remote control (Oxydium has an information feedback display on its LCD screen).

Notes :

- Unlike the RSSI test, this presence test only monopolizes the bandwidth briefly. It is therefore possible to perform a test for the presence of slaves during the show (however avoid doing this during a series of shots).

- It is possible to have to restart a presence test again if the initial request has been done at exactly the same time as an automatic beacon generated by the Oxydium or the MAF60 remote control (which would visually result in the absence of one or more slave modules on the LEDs of master module). To avoid this, note that it is possible to carry out the presence test with the Oxydium or the MAF60 remote control off.

Firing mode activation (once the tests 1, 2 and 3 performed) :

The activation to firing mode must be carried out, without skipping a step, according to the following chronology:

1. **Switch ON the Oxyradio Master module**
2. **Switch ON the Oxydium (or MAF60 basic remote) console in beacon mode**
3. **Switch ON the Oxyradio Slave module (and possibly redo an ultimate RSSI)**
4. **Switch ON the MAF60 satellite, firing mode key on 0**
5. **Check a last time the good beacon blinking directly on the satellite, and from there DON'T TOUCH SLAVE MODULES anymore**
6. **Switch ON the firing mode of satellite : « Firing Mode » key on 1**
7. **Perform an ultimate test of Slave presence from the Master module (test #3)**
8. **Perform a test from Oxydium of the status of satellite(s). (if Oxydium only).**
9. **Turn ON Oxydium (or the MAF60 basic remote) to the firing mode**
10. **System is armed.**

PAIRING A SLAVE MODULE WITH A MASTER MODULE :

A slave module must be paired with the master module which must control it. Otherwise the coded communication will not be able to be established between them and no valid order will be able to pass.

This association is already made at the factory when purchasing a kit. If modules are purchased at retail later, this operation must be carried out because, for security reasons, it is necessary to have physical access to the modules to be paired.

Only slaves can be associated with a master, but there can be only one master per slave.

Note: do not attempt to associate slaves with one another, or masters with one another.

1. Switch OFF (lateral button 0/1 on 0) the both Oxyradio modules to be paired.
2. Indifferently on one of the two modules, first press the push button then, without releasing it, switch on with the 0/1 button. A red led chaser will appear after 5 seconds: still do not release the button until the pink led chaser appears (about 10 seconds longer).
3. Only then, release the push button and repeat step 2 on the other module.
4. When the leds chasers of the both modules change from pink to green / orange the pairing is finished.
5. Switch off the two modules to finalize the operation. This setting is memorized (no need to repeat it each time if there is no change of configuration).

Note: a short video on pairing is available on www.genetec.fr, section Faq.



Repeat the operation from step 1 to pair a new slave module.



Any synchronization of a slave on a new master erases the master previously stored in the slave's memory.

A master module can memorize up to 16 slave modules.

Attention beyond, additional pairings will not be taken into account: To be able to memorize new modules, it is necessary to free up space by deleting unused slave modules from the master's memory. To manage or modify the pairings, see page 15.

After a new pairing always check it by launching an RSSI test between the modules: indeed only modules correctly paired can perform successfully an RSSI test.

POWER SUPPLY AND BATTERY RECHARGE :

Each OXYRADIO module works with a built-in rechargeable Lithium-ion battery.

Check of the voltage of this battery :

Switch ON the module with the lateral button (0/1). After a few seconds the battery voltage level is displayed, flashing permanently in green by the 10-LED bargraph (10 LEDs being the maximum charge). Make sure to recharge the batteries regularly, and before each show. With only 2 or 3 LEDs the level is very low and the battery must be recharged.

Autonomy is 8 hours approximately.



Battery recharge :

Module switched OFF (lateral 0/1 on 0).

First remove the grey protective rubber cover from the connector marked USB and connect the supplied USB cable to a standard charger with a USB output (standard phone charger for example, PC USB-3 port, etc.).

The charging time can range from a few tens of minutes to several hours depending on the level of discharge of the battery and the power of the charger.

As soon as the charger is plugged in, the green "CHARGE" LED on the module lights up continuously. When the battery is charged the LED go off. Disconnect USB and replace the grey protective cap.

OBSERVATIONS, ADVICES :

- Before first use, to familiarize yourself with this system, make simulations exercises. Have full control of the functions before any show.
- Do not confuse the master module with the slave module (orange status led for the master and blue status led for the slave). The ring colored on the antenna also allows the master / slave identification (provided that it has not been modified by mistake), however the color of the status led (or the status response given by the software by connection PC) takes precedence over the colored ring.
- Do not cover the modules with a metal protection (aluminum foil, etc.) as it will be a barrier to the radio waves. Be aware to the range following a weather change. Being IP53, the modules correctly installed vertically can occasionally withstand normal rain within reason, it is nevertheless possible to protect them with for example a plastic bag by allowing the antenna strand to protrude (however beware of electrostatic discharges can be generated by the bag during installation or removal, during this phase preferably turn off the module).
- In normal use, the OxyRadio modules must be mounted on a mast, they are not intended to be hand-held, worn on the belt, placed on the ground or on a table.
- The Oxyradio modules have a 20 second buffer on feedback information : this means that after a change on a satellite you must wait this period of time before rerunning a test so that it is updated on the Oxydium LCD screen.
- Do not use a solvent (acetone, methylated spirits, etc.) to clean the system, but only water (possibly added with glass cleaning agent) on a soft cloth.
- The RSSI radio reception level indicator is not to be considered as a measuring device, but as a simple indicator giving information at a given time.
- After switching on a module, before any action (for example pressing the push button) wait a few seconds for the module to finish starting (this is done as soon as the green battery level display appears). If the push button is pressed too early (<3 seconds), the module returns to update waiting for 30 seconds. To exit this mode without waiting 30 seconds, simply reboot the module.
- To reboot a module or device, turn it off, wait a few seconds, then turn it back on.

MAIN FEATURES :

Power supply : battery lithium-ion rechargeable 3,7V

Battery level display : 10 green LED (*autonomy 8 hours approximately*)

Charging current : internal limitation set at 400mA

Average Consumption : 190mA (0,7W).

869MHz range bidirectional (see sticker on module), TX 100mW (+20dbm). Sensibility RX -116dbm.

Additional HF transmission delay : about 0,15 second (150 millisec.).

Working radio range : up to 500 metres*.

Theoric radio range : up to 1km* (from HF module manufacturer data)

Residual radio range : several kilometers*

RSSI display : 10 blue LED

Radio modem part : manufacturer RF Solutions. Blizzard® modem without licence, RTTE EN300-220 compliant.

Dimensions & weight : H 210mm x l 147mm x thickness 104mm (without bracking tie). 0.56kg.

IP53 (module vertically mounted with antenna to the top)

Storage case: 464x366x176mm IP67 and OTAN STANAG4280

Temperature of use : from +5°C up to +45°C.

Warranty : 2 years

* as an indication, variable according to the local conditions of installation on site. In free field, and antenna installed on a mast as indicated on pages 3 & 4.

SAFETY :

- **Never work on fireworks items when the system is in operation. Switch the devices off completely during installation or in the event of an intervention.**
- **The devices must be placed at a sufficient safety distance from the fireworks items to allow a secure intervention. Switch off the firing mode key and completely switch off the MAF60SII satellites when installing the fireworks items or in the event of an intervention.**
- **The devices must only be switched on if the "Firing mode" key of the MAF60SII satellites is previously set to 0.**
- **Line resistance checks should only be performed when all personnel have left the hazardous area.**
- **ABSOLUTELY NO STAFF IN THE HAZARDOUS AREA WHEN POWERING ON THE SYSTEM. THE FIRING MANAGER MUST ENSURE THAT THESE INSTRUCTIONS ARE OBSERVED.**
- **The control post must be sufficiently away from the firing area, even during tests.**
- **Comply to the usual safety and common sense guidelines of the profession.**
- **Storage, recharging, transport: The devices must be switched OFF and away from pyrotechnic products.**
- **The user must know this user manual.**
- **The safety of people is a priority.**

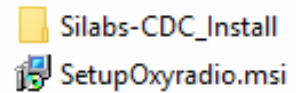
OXYRADIO SOFTWARE

This software provides access to update functions, synchronization checks between modules, change of module status.

« Oxyradio_Software&driver » can be downloaded free of charge from our website www.genetec.fr directly in the section « Products / Accessories for Oxydium (and MAF60 serie II) ».

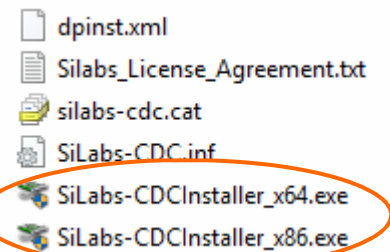
Once downloaded, open this folder, you will find 2 elements:

- A sub-folder with the Oxyradio modules USB driver.
- The OxyRadio software installer (SetupOxyradio.msi)



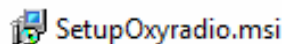
First install the USB driver of the modules so that they are recognized by your PC. Double-click on the Silabs-CDC_Install sub-folder, then in the list of elements found there:

- If your PC is 64 bits :
double click on SiLabs-CDCInstaller_x64.exe
- If your PC is 32 bits :
double click on SiLabs-CDCInstaller_x86.exe



Follow the instructions given as you go along. Once the driver installation is complete, go to the next step.

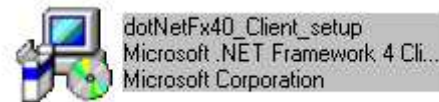
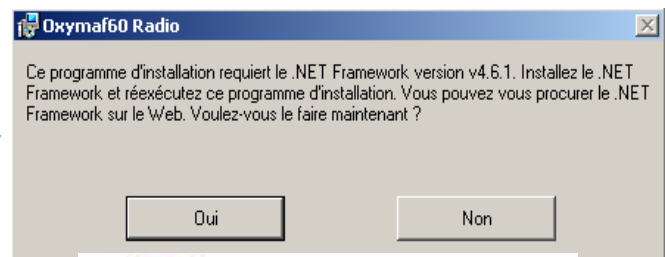
1/ Installation of Oxyradio software :



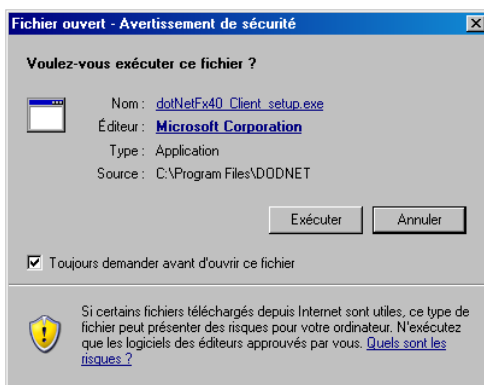
Go back to the main folder, and double click on SetupOxyradio.msi. The software installation starts, follow the instructions as you go.

Note: if installing a newer version on the same PC, uninstall the old version first (Windows control panel, add / remove program, OxyMAF60radio) before installing the new one. It is useless to reinstall the driver because already present in your PC.

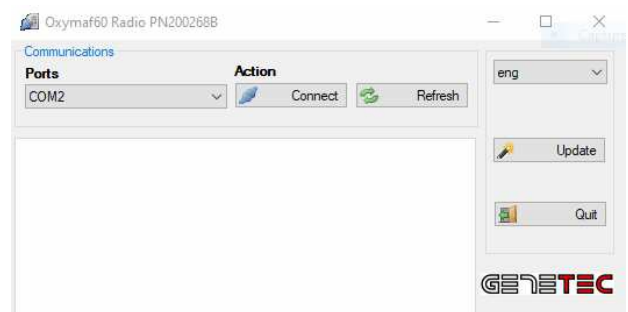
Note: This software requires the presence of the Microsoft Dotnet application. If the latter is not present on your computer, or too old, a message will automatically ask you to download it, click on "Yes", choose a destination directory (for example "My downloads") and follow the instructions.



At the end of dotNet download, open your destination directory and double click on the dotNet icon and click on Run. Wait until the dotNet installation is complete before continuing with the installation of OxyRadio.



When the installation is complete, the OxyRadio icon should appear on the computer desktop. Double click on it. The home screen of the application opens. Select « Fr » or « Eng » language.



Module status modification :

This operation makes it possible to transform a master module into a slave and vice versa, according to the needs of your configurations.

Connect the OxyRadio module to the PC with the supplied USB cable, and switch it on with the side button 0/1. Click on "Refresh" and select from the list of ports the one which corresponds to the module you have just connected (generally the one which has just appeared).

Then click on "Connect". The module is identified and its properties appear on the screen.

In the main windows there is :

- The product name, version, firmware date
- The four 4 last digits of the serial number
- The module status (master or slave)

To make the change of status :

- To transform a slave into a master click on "Master" and validate the message in the mode definition window
- To transform a master into a slave click on "Slave" and validate the message in the mode definition window

After changing the setting, "disconnect" then "connect" to update the display. Turn off and on the module to finalize the operation. Four seconds after switching on, the color of the status LED flashes in :

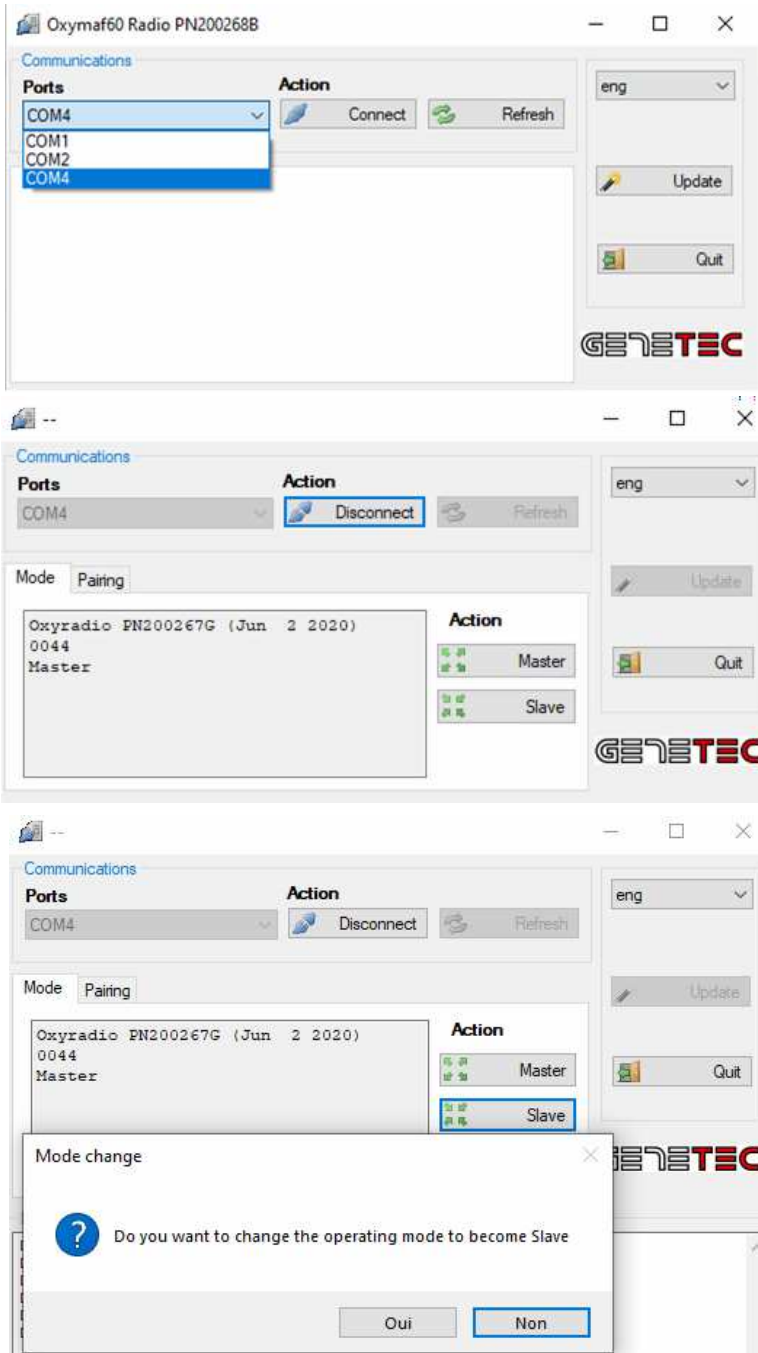
- **Blue** for a slave
- **Orange** for a master



Any change of status results a modification of the pairings. It is always necessary after changing the status of a module to carry out a new procedure for associating the modules with each other. See below.

Pairing management :

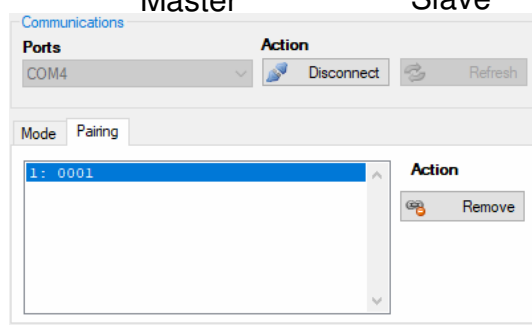
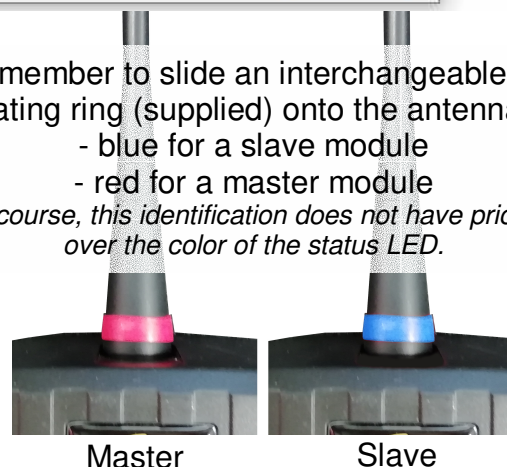
The "Pairing" tab gives the list of modules (the last 4 digits of the serial number) with which the module questioned is associated. To completely remove a pairing, it is necessary to do it on the 2 modules (the master and the slave) from this window. To do this, select in blue the module to delete, then click on "Remove". To add a pairing, see page 10.



Remember to slide an interchangeable locating ring (supplied) onto the antenna:

- blue for a slave module
- red for a master module

Of course, this identification does not have priority over the color of the status LED.




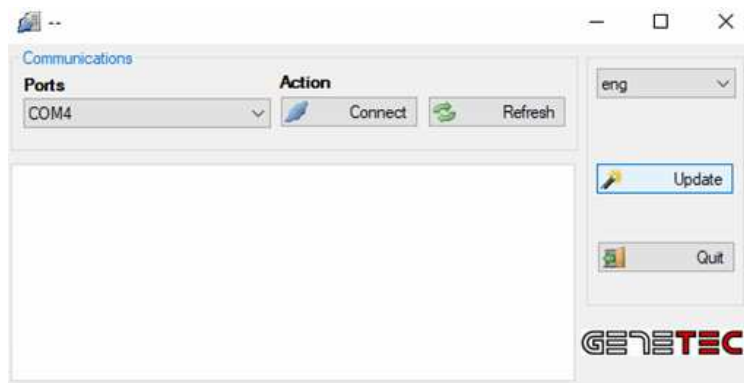
FIRMWARE UPDATING

When purchasing new Oxyradio modules, the latest firmware (internal module operating program) up to date is installed. If you already have OxyRadio modules in your possession, make sure they are up to date so that they can be compatible with the new modules.

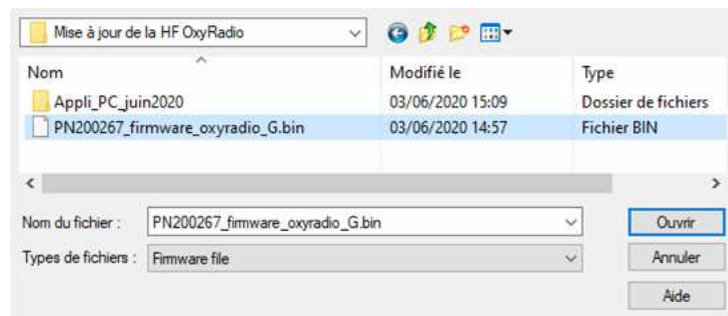
Free updates to optimize your devices can then be offered for download on our site. To do this, regularly visit our website www.genetec.fr ("updates" section). The same for OxyRadio software.

Update procedure, once the update has been downloaded (and decompressed):

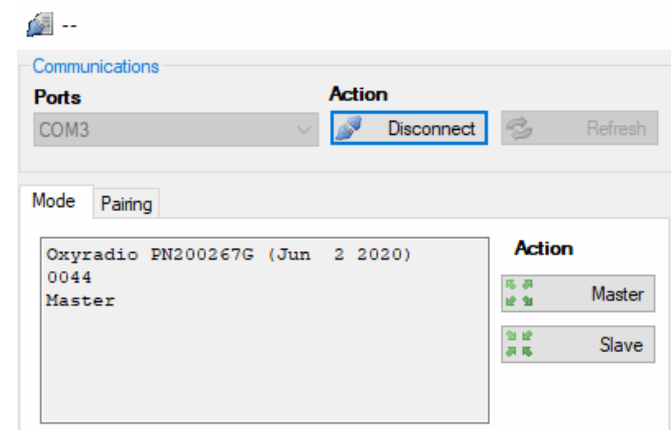
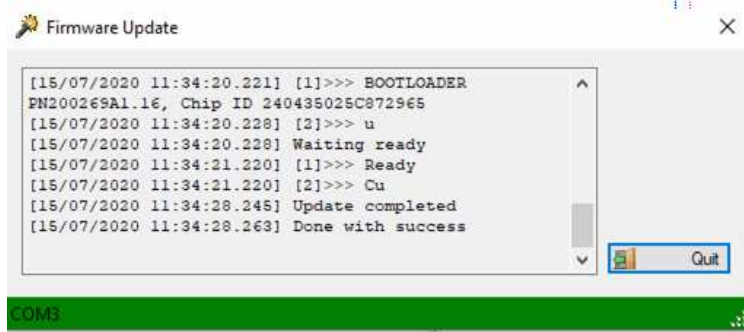
- Switch off the module : lateral button 0/1 on 0
- Connect the USB to the PC
- Run the Oxyradio software 
- This windows is displayed :
- Without connecting in click on "Update"



- The firmware choice window appears, open the downloaded update folder Select PN200267_firmware_oxyradio_x.bin
- Click on « Open »
- Respond in the affirmative to the update request.



- An operations control window appears
- Switch on the module and within 3 seconds press and release the module push button
- The status LED should turn pink
- The Oxyradio application will automatically connect to the module
- The update starts
- At the end of the update, a green banner signals the end of the update and the message "Done with success" should display.
- Click on "Quit", then stop and turn on the module to activate its update.
- Check if the firmware update has been installed by reconnecting the device (the version is indicated by a letter and starts with PN200267_ , and the date of release of the update indicated on the website appears in parentheses) .



The update does not modify the parameters of the module (pairings, statuses, etc.). From the moment the update is performed on a module, it must be done on all the others. Repeat the operation from the beginning for the update of the other modules (it is the same update for all the modules, whether they are masters or slaves).

Miscellaneous information relating to radio transmission

We recommend that you read these lines and take them into account when installing and using these systems.

The range of the radio link is very strongly influenced by the positioning of the modules. While in free field, with the antennas placed a little in height the range can theoretically reach 1km * (* characteristic given by the manufacturer of the HF modules), it is reduced as soon as there are obstacles between the modules. Choose suitable locations, carefully avoiding placing the antennas too down, or against metal surfaces that can stop the radiowaves. Avoid screen surfaces such as metal panels and structures, concrete walls, etc. Greater is the distance, weaker is the signal received.

Any radio link can be subject to electromagnetic interference depending on the radio environment in which it operates. Indeed, significant "radio pollution" due to the presence of other radio sources with similar frequencies or powerful, harmonics, or even interference of electrical origin, can disturb the good reception of the signal and alter the digital signals transmitted. Any HF system can be obsolete without prior notice following the allocation of new frequencies by the official agencies managing telecommunications.

It is therefore advisable to be very careful in cases of use where other transmitters could be received by the Oxyradio modules with for example nearby: alarms, walkie-talkies, power lines, cellular phone relays ... Unlike wired transmissions, wireless transmissions are subject to many external constraints. For example, atmospheric conditions, obstacles, geographic relief, mobility of objects constitute disturbances which must be taken into account.

Taking into account all these parameters beyond our control, a faulty radio transmission can't be blamed us.

Here are the main causes of disruption of radio transmissions:

- 1 The fading of signal

The receiver receives the algebraic sum of the waves (direct + reflected). When the waves are in phase, the received signal is amplified, on the other hand when the waves are in phase opposition, the received signal is zero and that whatever the distance.

- 2 The influence of ground and obstacles

Obstacles like the ground, but also trees, buildings, etc. reflect and reduce radio waves. Hence the appearance of reflected waves which are out of phase with the main wave along the direct transmitter-receiver path. The receiver then receives the sum of the direct and reflected waves. Consequently, the ground and the obstacles between the transmitter and the receiver are the cause of interference between the direct wave and the reflected waves. In addition to signal attenuation, these interferences also generate the fading defect.

- 3 Co-channel interferences

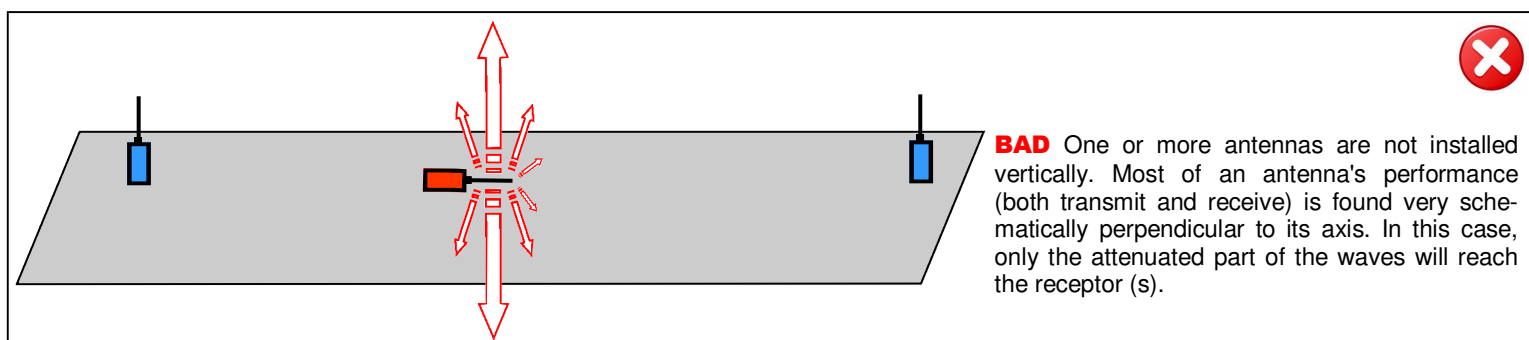
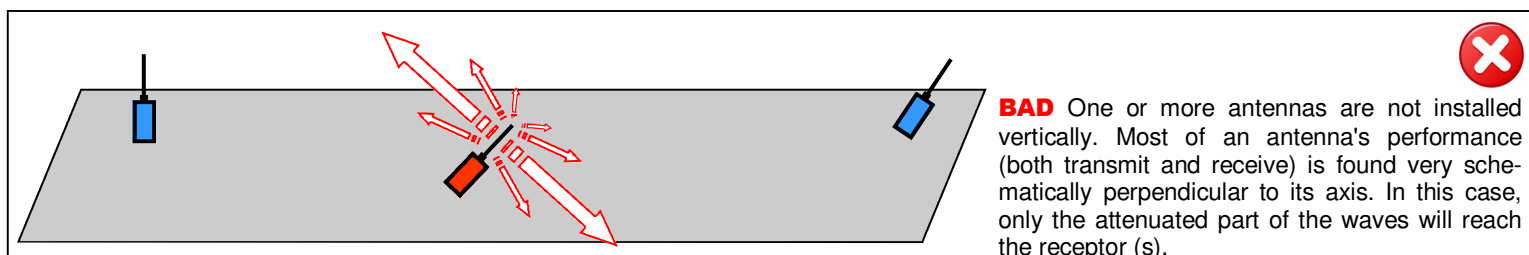
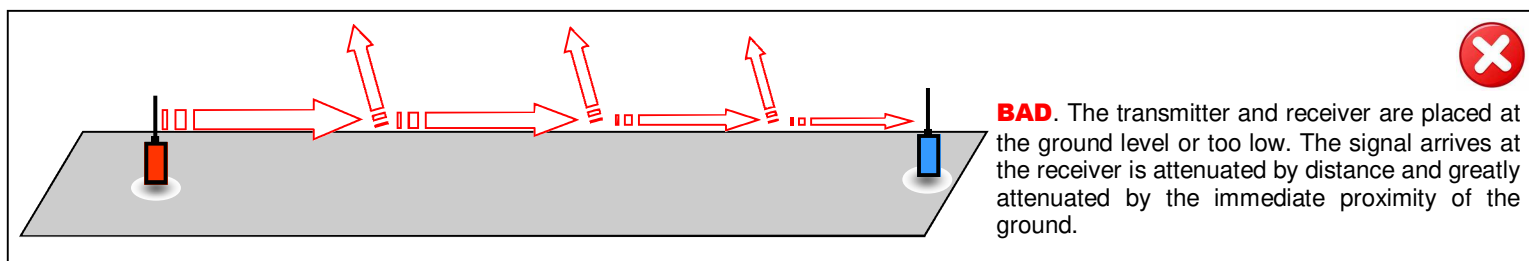
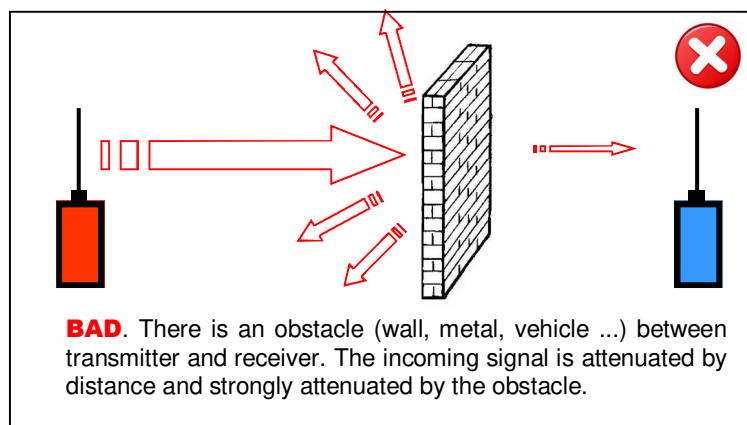
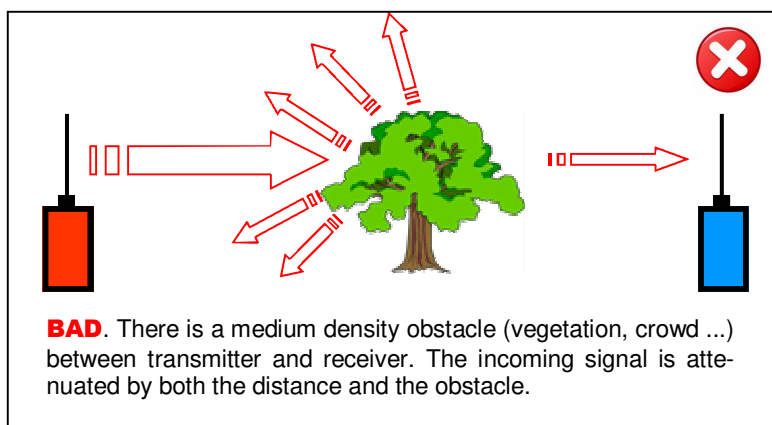
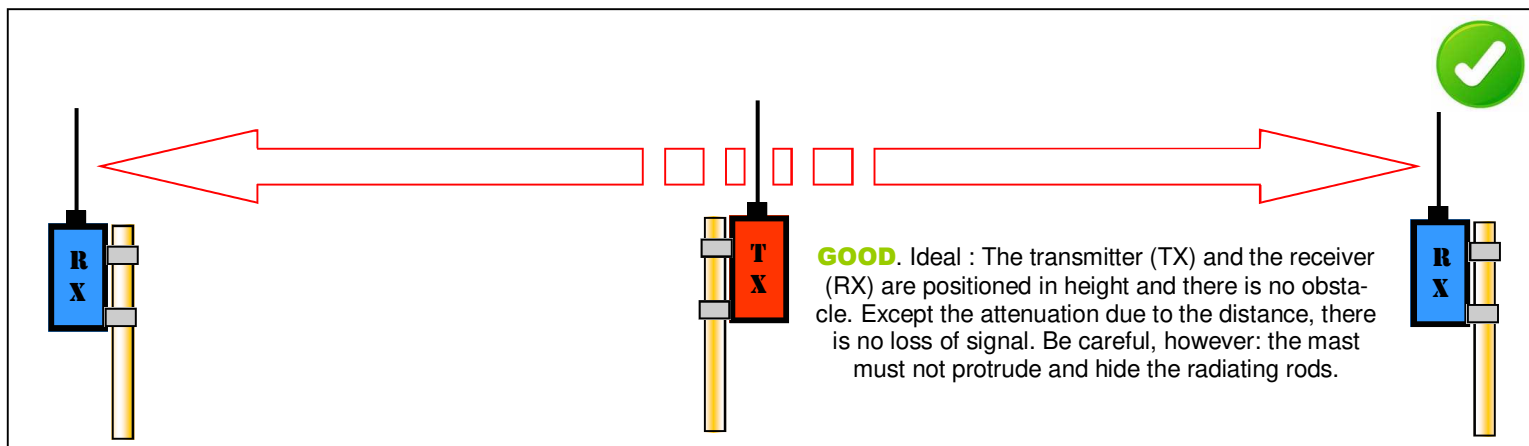
When radio transmitters transmit on the same frequency as the transmitter that you want to receive, and even if they are very far away, they can disturb reception. This defect is known as co-channel interference.

As an indication, by respecting the instructions previously given (placement of antennas, etc ...), the range in free field and in excellent environmental conditions can reach 1 kilometer (or even more, so be careful if fireworks take place in neighboring sites with yours Oxyradio, in that case be sure to re-synchronize the slave modules with the good master module).

Always take a safety margin: the practical range is generally around 300 to 500 meters. Of course, the quality of reception is inversely proportional to the distance between the transmitter and the receiver. The simple fact of placing the antennas a little in height, about 2 meters, makes it possible to very considerably increase the range. This system is designed to be used in free field.

The radio transmission is coded, therefore the risk of inadvertent firing by a transmission other than that "expected" by the system is almost zero.

On the other hand, the system can always be "blinded" by a powerful parasitic reception of another signal if the latter is simultaneous with a firing order. Beware of other systems working in the 868 / 869Mhz band, avoid using them simultaneously with this OXYRADIO system.



DECLARATION OF
CONFORMITY



We, Genetec, declare under our own responsibility that the following device :

Communication Interface Module OxyRadio PN200267

Complies with the essential requirements listed below:

EN301 489-1 , EN61000-4-3, EN61000-4-2

This product complies with the EMC directive 2014/30 / EU on the rapprochement of the laws of the member states relating to ElectroMagnetic Compatibility.

The products have been tested in a normal configuration.

La Bastidonne, February 26, 2019.

Jean-Louis Vincent, Genetec,
co manager

A handwritten signature in black ink, appearing to be 'JL Vincent', written over a large, stylized oval shape.

