

Programming a Ferrari Alarm ECU with Alarm Remote Fobs

Alarm and Fob Basics: Ferraris arrived from the factory with three matched alarm remote fobs, one red master fob, and two black slave fobs. The red fob contains the Alarm Electronic Control Unit (ECU) Personal Identification Number (PIN) and an identification (ID) number. The black fobs contain only an ID number. The red and black fob ID numbers are combined with a rolling code to prevent compromise by thieves using a radio receiver and recorder to duplicate the ID and code and use those to gain entry, just like modern garage door openers use rolling codes to prevent compromise.

The Alarm ECU PIN is provided with the car, or with a new set of matched fobs, on a small piece of two layer paper, the top layer of which must be removed to read the PIN. A red fob and its PIN can only be used to program the Alarm ECU to accept a matched set of three alarm fobs. The red fob cannot be used to program the Alarm ECU to accept other black alarm fobs that were not part of a matched set of three fobs. The Alarm ECU only uses the PIN when the car is started with ignition key and PIN alone (fobs lost or inoperative), or when reprogramming the ECU to accept new fobs. In normal use, the Alarm ECU uses only the fob IDs and rolling codes in the red and black fobs. Reprogramming the Alarm ECU for a new set of fobs is an extension of starting the car with ignition key and PIN only.



In normal practice, there is no difference between the red and black fobs, because the Alarm ECU only uses the PIN in the red alarm fob during programming. In day to day operation, the Alarm ECU uses the ID and rolling code for each red and black alarm fob to arm and disarm the system. The Alarm ECU will accept the red fob PIN and ID and two black fob IDs only during reprogramming.

Note the fobs are transmitters only. They have no receiver capability. Alarm fobs cannot be reprogrammed; it is the Alarm ECU that is programmed to accept them.

Ferrari recommends changing the 23A/A23/MN21/21/23 12 volt battery in your fobs every six months. This is easily accomplished with a small Phillips head screwdriver to remove the screw holding together the two fob halves.

If you lose the screw, it is a #1-64 thread pitch and ¼” in length and can be purchased from McMaster at this link:

<http://www.mcmaster.com/#91773a166/=j5rao>

Part # is 91773A166. It is a Round Head Phillips Machine Screw in 18-8 stainless steel.

Changing the battery will not affect the programming in a fob’s EEPROM. (electrically erasable, programmable, read-only memory). The battery looks like a shortened AAA battery and is at the top near the chain loop. A common malfunction with fob operation is the battery contacts becoming too spread to maintain a good connection. Simply closing the gap on the contacts will fix this problem.



European and US/Canadian fobs use different transmitter frequencies and are not interchangeable. See **Note 1** and **Note 2** for frequencies and applications. By opening the case and reading the part number on the SAW (surface acoustic wave) filter just below the battery, it is possible to determine whether a fob is US (315Mhz) or European (433.9Mhz). 315Mhz filters part numbers are R2622 and RP1239. R2632 and P1308 are 433.9Mhz. The SAW filter shown is a 315Mhz RP1239 (US).



If you only have alarm key fobs and no PIN, you cannot reprogram your Alarm ECU to accept new key fobs. It is possible to clone extra key fobs to provide back-ups. Do a search in Ferrarichat.com to find who can do this. It may be possible for Ferrari North America, through its authorized dealer network, to provide you with your old PIN, along with a new PIN and set of remotes. Even though a 2006 tech bulletin stated this would no longer be possible, several owners have recently been provided their old Alarm ECU PIN for a price. One owner recently had luck contacting FNA directly, and they were able to provide proof of ownership directly to Maranello, who then sent the original PIN directly to the owner. If your dealer/FNA cannot provide your old PIN, FNA can provide you a new Alarm ECU, a new set of three remotes matching the ECU, and a new PIN number as an ultimate, but costly, solution. One enterprising owner bought a used Alarm ECU complete with three fobs and PIN from another owner who no longer needed them.

With the alarm and engine immobilizer armed, pressing a key fob will disarm both alarm and immobilizer. After 120 seconds, the engine immobilizer will rearm if the car is not started. With the immobilizer armed, the engine will turn over, but will not start. Starting the car will require one additional push on the fob to disarm the immobilizer if 120 seconds have elapsed since disarming the system. If you remove the key and open a door after returning from driving and do not arm the system with a fob, the immobilizer will arm 60 seconds after the door is opened. To reprogram the Alarm ECU to the new PIN in the red fob, make sure the immobilizer is armed and the alarm is disarmed.

Starting a Ferrari without a Key Fob: The first step in reprogramming the Alarm ECU to accept new key fobs is the same process used to start a Ferrari if all remote alarm fobs are lost, inoperative or unavailable and you only have the ignition key and know the four digit Alarm ECU PIN. This procedure is spelled out in the Alarm System Manual supplied by Ferrari. Here is the procedure from the Ferrari copyright Alarm System Manual:

Through the "PIN code" you can disarm the whole system without the wireless control, using the ignition key, as described here below:

During this operation, the key shouldn't be left in position "II" - "0" for more than 2 seconds.

A. make sure that the ignition key has been left in "0" position for more than 20 seconds.

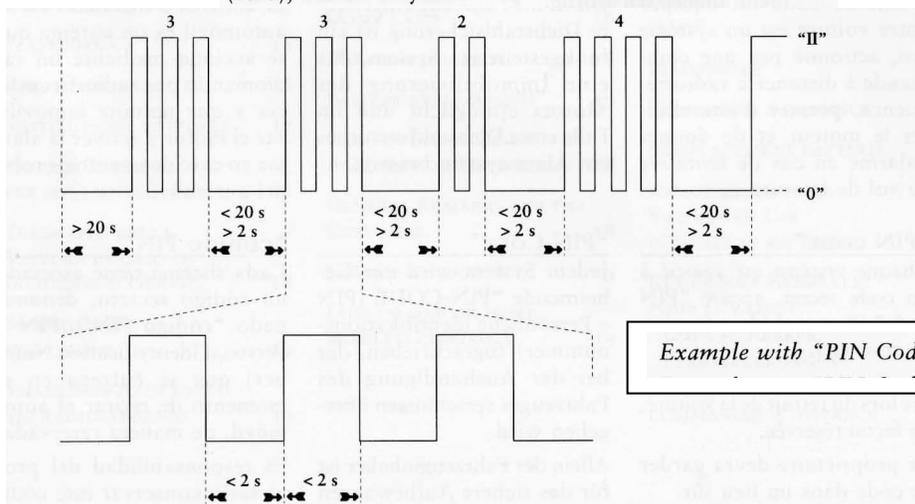
C. Leave the ignition key in position "0" from 2 to 20 seconds.

B. Digit the first number of the "PIN code" putting the ignition key in position "II" - "0" as many times as the concerned number.

D. Repeat the steps "B." and "C." for the remaining three numbers.

If the entered code isn't correct, wait at least 20 seconds with the ignition key in position "0" before repeating the whole procedure.

E.g.: first number = 3 → 3 cycles "II" - "0". For the 0 (zero), make 10 cycles.



If this seems rather cryptic, here is what it means:

Drive your car to make sure the battery is fully charged in case you foul up the procedure so you do not run down your battery.

Remember the times important in this sequence. Key off-on-off cycles representing PIN numbers must be made in less than two seconds. After PIN numbers are entered by the required number of key off-on-off cycles, a pause of more than 2 seconds and less than 20 seconds must be made before entering the next PIN number. If your PIN has a zero, it is represented by 10 off-on-off cycles of the ignition key. If you foul up, you must wait at least 20 seconds before starting over. So here is the procedure after you have driven the car and waited 60 seconds after removing the key and opening the door or 120 seconds after removing the key and not opening the door so the immobilizer is armed.

PIN Code **3204** is used as an example for this case. This is different from the code 3324 in the Ferrari illustration above. Ignition switch position "0" mentioned above is off and position "II" is on.

- 1) **Insert the ignition key and wait at least 20 seconds with the ignition key in off.**
- 2) **Turn the key from off to on and back to off as quickly as possible (less than 2 seconds for all PIN numbers) 3 times (count to 3 out loud) for the first PIN number “3”.**
- 3) **Count to 5 out loud (a good compromise between more than 2 and less than 20 seconds) before starting the second PIN number.**
- 4) **Turn the key off-on-off 2 times for the second PIN number “2”.**
- 5) **Count to 5.**
- 6) **Turn the key off-on-off 10 times for the third PIN number “0”.**
- 7) **Count to 5.**
- 8) **Turn the key off-on-off four times for the fourth and last PIN number “4”.**
- 9) **At this point the PIN is entered. After 5 seconds or so, turn the key back to on and after 2 seconds or a bit more with the key in the on position, the alarm light emitting diode (LED) will go off and you can start the car. Starting the car confirms you can correctly enter the PIN, the first step in reprogramming the Alarm ECU to accept new remote alarm fobs. Keep trying if you do not succeed the first time, remembering to wait more than 20 seconds before the next attempt.**

Programming the Alarm ECU for New Fobs: Ferrari also provided procedures for reprogramming the Alarm ECU to accept new remote alarm fobs. This process is described as putting the Alarm ECU in “self-learning” mode in Ferrari Workshop Manuals, the first step of which is entering the Alarm ECU PIN as described above.

In case of loss of the key

The Client must turn to the Concessionaire/Importer, communicating the number found on the plastic card supplied with the key.

In case of loss of one or more remote controls

The Client must request a new remote control kit (1 master + 2 slave) and the card with the new "PIN CODE" to the Concessionaire/Importer.

The new remote controls must then be memorised as follows:

- Set the ECU for self-learning procedures: this status can be obtained transmitting the PIN CODE as previously described; after the last digit, wait for a lapse of time ranging between > 2 sec. and < 20 sec., then turn the key ON - OFF 10 times: each time you turn the key to ON, the LED switches on.
- Wait for the LED to switch off and turn the key back to OFF.
- Once these operations have been completed, turn the key back to ON for the eleventh time: the LED will start flashing.
- Press the button of the new "master" remote control (this procedure will allow the ECU to store the new PIN CODE which was delivered to the Client crypted, together with the new remote controls).
- Press the two "slaves" (first one, then the other) and check that the 3 new remote controls are functioning correctly.
- Return the old remote controls to the FERRARI Technical Service Department.

Again this is a bit cryptic, but the times for entering the PIN numbers still apply and less than 2 seconds is what you need to remember for the following ten key cycles noted above.

PIN number **3204** is again used as an example and the first eight steps for starting a car with PIN and ignition key alone (no fob available) are identical but given here as a complete checklist for reprogramming the Alarm ECU. The steps following PIN entry rely on watching the Alarm LED cycle from on to off ten times and eventually flashing when “self-learning” mode is fully enabled and the new alarm fob PIN (red fob only) and IDs (red and black fobs) can be entered into the Alarm ECU memory.

- 1) Insert the ignition key and wait 20 seconds with the ignition key in off.**
- 2) Turn the key from off to on and back to off as quickly as possible (less than 2 seconds for all PIN numbers) 3 times (count to 3 out loud) for the first PIN number “3”.**
- 3) Count to 5 out loud (a good compromise between more than 2 and less than 20 seconds) before starting the second PIN number.**
- 4) Turn the key off-on-off 2 times for the second PIN number “2”.**
- 5) Count to 5.**
- 6) Turn the key off-on-off 10 times for the third PIN number “0”.**
- 7) Count to 5.**
- 8) Turn the key off-on-off four times for the fourth and last PIN number “4”.**
- 9) Count to 5.**
- 10) Turn the key to on and count “1” out loud. The Alarm LED will come on and then go off.**
- 11) As soon as the LED goes off, turn the key from on to off and back to on in less than 2 seconds and count “2” out loud.**
- 12) Repeat the key cycles and LED cycles until the count reaches 10 cycles.**
- 13) After the 10th cycle, turn the key back on and the LED should start flashing.**
- 14) Press the red fob button until the LED accelerates its flashing and then stop pressing the red fob button. The LED will resume flashing slowly.**
- 15) Press the first black fob button and the LED will again accelerate its flashing. Stop pressing the black fob button and the LED will resume flashing slowly.**
- 16) Press the second black fob button and the LED will accelerate its flashing one last time. Stop pressing the second fob button and the LED will stop flashing completely.**
- 17) The Alarm ECU is now programmed to recognize all three remote alarm fobs and the fobs should be checked to ensure they are operational.**

Note: Reports have been made of the number of cycles of the LED varying from 12 to 20 or more before the LED started flashing. My 575M Alarm LED flashed on the 11th time the key was turned to on, exactly as stated in the WSM extract above.

Although this process sounds very involved, the actual ECU programming process takes less than five minutes from start to finish, assuming you make no mistakes. This is even if you are unlucky and have a couple of zeros in your PIN.

Note 1

Countries with a frequency of 433 MHz:

Italy, Denmark, Luxembourg, Austria, France, Spain, Portugal, Sweden, Finland, Germany (with specific complete ECU kit), Switzerland (with specific complete ECU kit), Belgium (with specific complete ECU kit), Netherlands (with specific complete ECU kit), United Kingdom (with specific complete ECU kit), Ireland (with specific complete ECU kit), Greece, Turkey, Cyprus, Saudi Arabia, Kuwait, Bahrain, Brunei, Hong Kong, China, Thailand, Taiwan.

Note 2

Countries with a frequency of 315 MHz:

USA, Canada, Mexico, Puerto Rico, Brazil, Argentina, Venezuela, Lebanon, United Arab Emirates, Oman, Japan, Singapore, Australia.