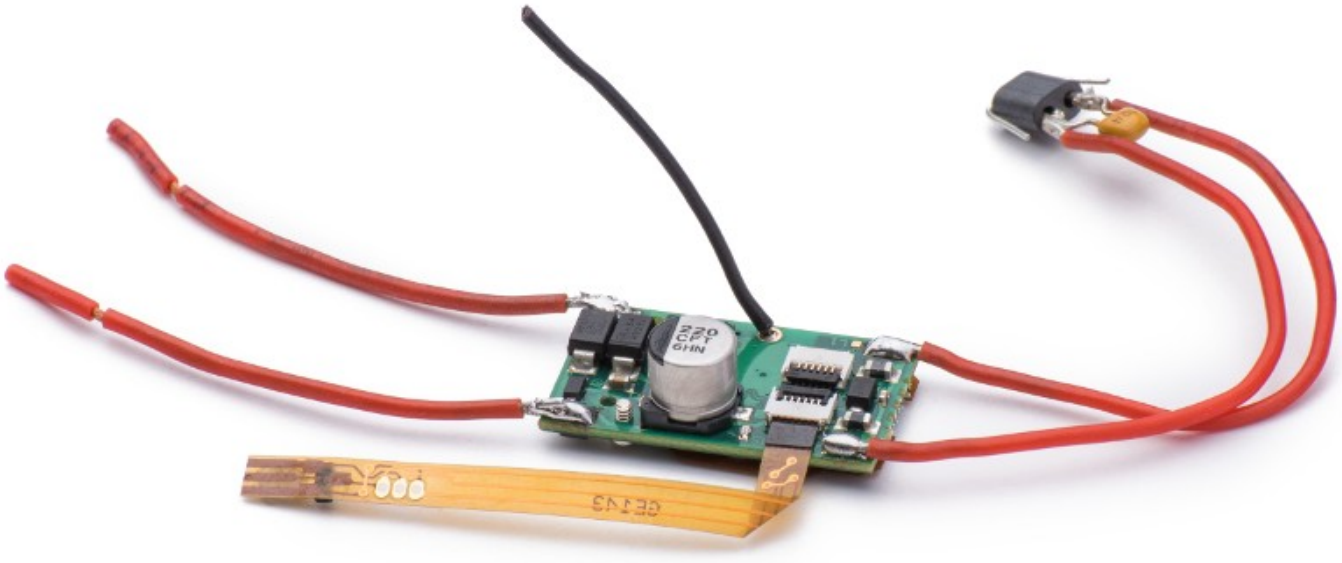
The 'C' type chip

The type 'C' chip is a compact and powerful device.

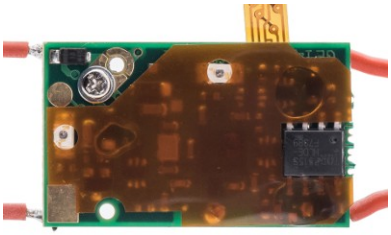


It's a universal unit, being natively compatible with oXigen, Scalextric SSD, and Carrera digital. 'Compatible' means that the chip performs like any SSD or Carrera 132 original system once the proper software is loaded. In other words, when appropriately programmed, you can use this chip on either Scalextric SSD, or Carrera D132, as if it was a 'standard' device for the said system.

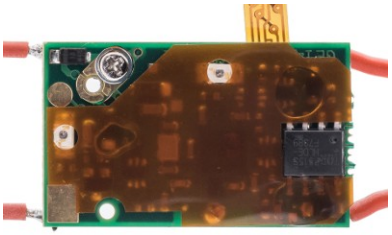
Known limits: on Carrera, it doesn't support Ghost and Pace car modes. The advanced 'Slot.it Autonomous car', under development, will replace Ghost car for all systems, analog included. Fast pairing will be supported but it is not, currently. Analog mode as defined by Carrera and SSD is also not supported, but the chip works properly on any analog tracks when used with a oXigen compatible controller, provided the track is powered with a fixed voltage.

Scalextric and Carrera made two incompatible choices when they started developing their systems: they both send command data on rails, but while Scalextric SSD runs on AC power, Carrera uses DC. oXigen is different as it communicates via 2.4 GHz radio. It runs with both AC and DC, but DC is advisable.

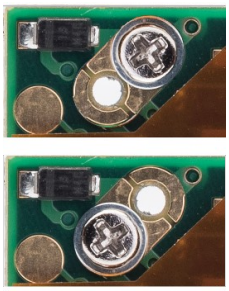
Type C can either be run in DC mode for oXigen or Carrera systems, or AC mode for Scalextric SSD. Switching between the two is done by changing a small screw's position on the PCB: no soldering is required.



AC mode for Scalextric SSD



DC mode for Carrera D132



C mode (top) / AC mode (bottom)

The little screw detailed above from DC to AC. For

System ↓ Power →	AC	DC
Carrera D132	X	OK
Scalextric SSD	OK	X
Slot.it oXigen	OK	OK

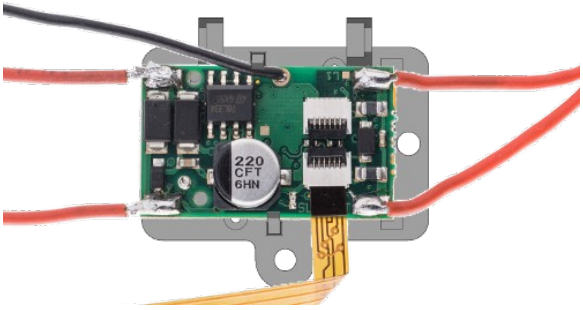
In DC mode, the power is routed through one diode only, which keeps the voltage loss to a minimum.. The AC mode setup, required to race the car on a Scalextric SSD system, makes it run both ways. For oXigen, either AC or DC can be used, but AC will deliver about 0.5V less to the motor. Carrera needs DC.

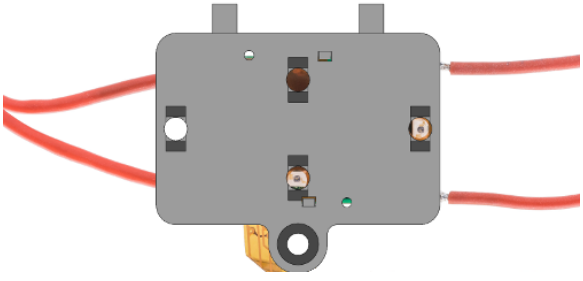
Keep in mind that the polarity on Carrera track is opposite to the majority of other slot cars systems. Therefore, it may be necessary to swap wires on the pickup compared to, say, oXigen. Future versions of the chip may come with a cable with the same clip as Carrera, and an inverting optional cable. An alternative may be to leave cables in Carrera wiring, and use SSD and oXigen in AC mode.

Be very careful when changing the position of the screw! A screwdriver slipping from the screws’ head and hitting the PCB may damage yor chip.

The chip size is smaller than type B. It measures 15*25mm and fits on a Scalextric DPR latch, in which case its double LEDs match the proper position for all of the above said systems, but, due to the dual LED on board, can also be used when rotated 90° in an oXigen or SSD system.

The special DPR latch is available from Slot.it Shapeways online shop as part S99-S04 - also available in 2 pieces unit S99-S04-2pcs, to save you some penny on the unit cost, as Shapeways has a fixed fee per print.

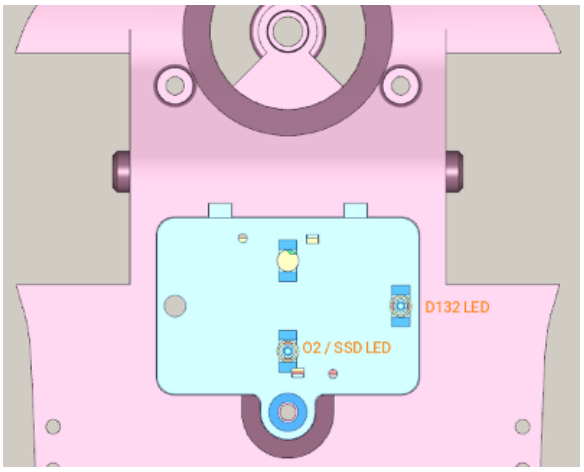


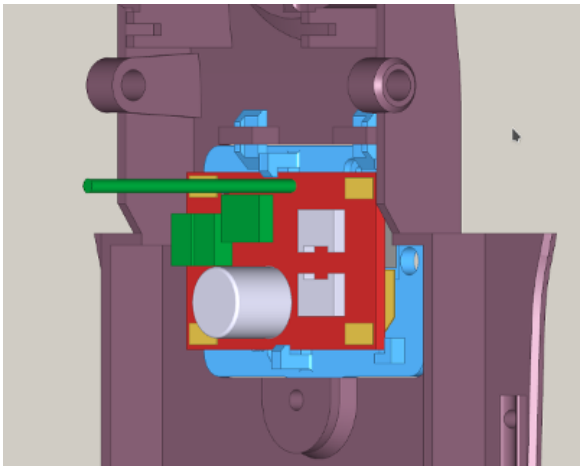


Here is how.

The special SSD latch can be purchased from Slot.it's 3D print shop.

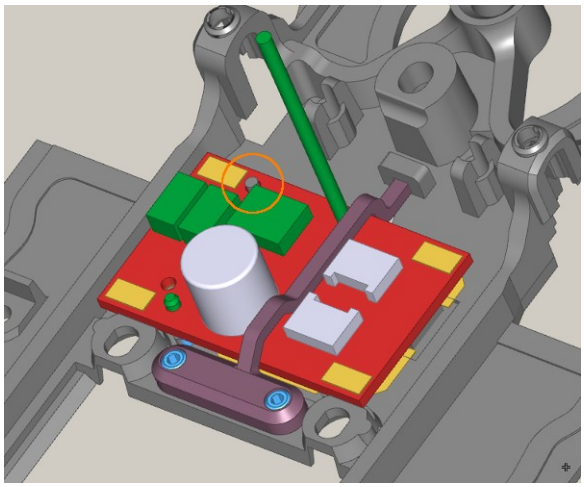
On a DPR ready Scalextric, or PCR chassis, installation is straightforward.





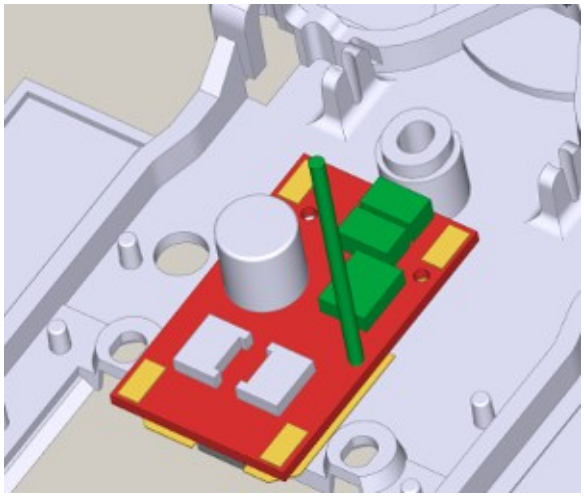
Note that on some very narrow PCR cars such as the BMW E30, it may not be possible to use this chip on the special DPR latch due to dimensional constraints.

Recent Slot.it models come equipped with a very simple mounting mechanism: make sure that the reference pin on the chassis and the correspondent hole on the circuit are matched:

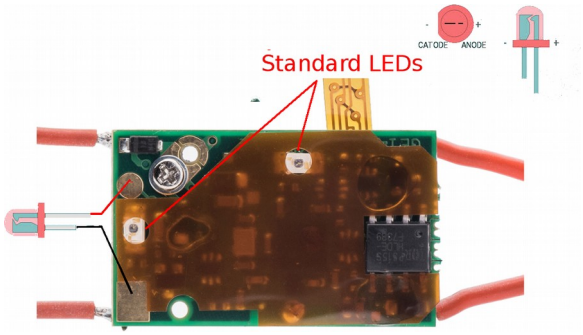


This design places the chip in the proper position for all systems, when used on a recent Slot.it car.

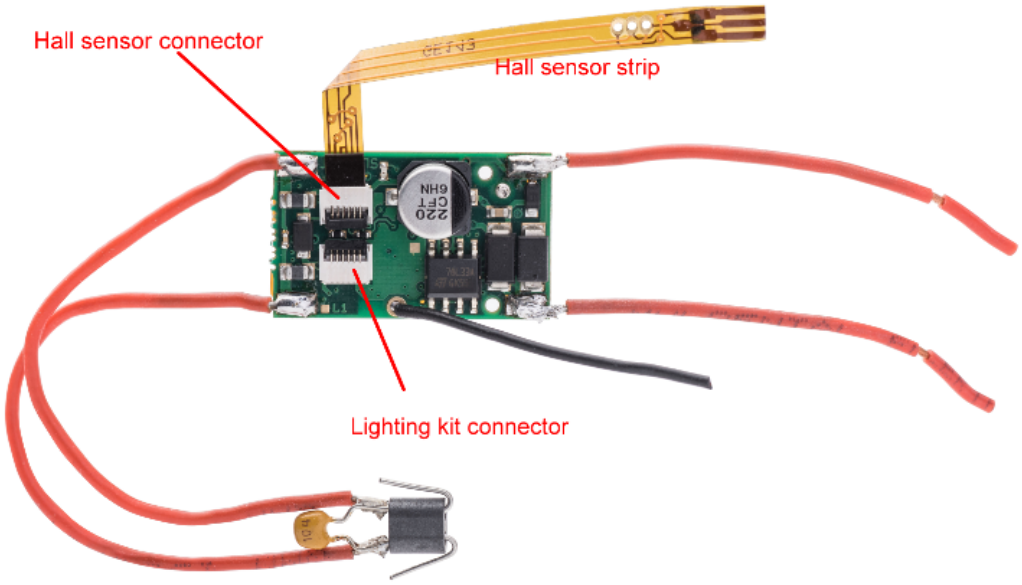
There may be cases, however, where an 'inline' mounting of the chip may be useful, especially in older Slot.it cars:



Once the chip is properly placed inside the car chassis, make sure the LED can be seen through the chassis hole. The chip also provides extra pads to wire an external additional lane changer LED. There is no need to remove the standard LEDs, which are mounted directly on the board. If you are running on Carrera D132 instead of oXigen or SSD, use the wired LED and place it so that it aligns with the Carrera receiver that can be found on the track, right before the lane changing mechanism.



A “kapton” protective cover is glued to the bottom side of the chip to protect the electronic components. Don't remove this protection to avoid damaging the chip and loss of warranty.



Two connectors are placed on the top of the chip. A flat flexible cable with a unipolar Hall sensor is plugged to the connector on the left. The sensor works as lap and finish line detector, sensing the magnetic field created by magnets that, when placed under the track, delimit the finish line and pit lane. Said Hall sensor must be fixed to the chassis of the car so that it faces down as described in the picture below; otherwise the sensor won't work (unless the magnets are also wrongly placed!).
If you are using the chip on Scalextric SSD or Carrera D132, you can ignore this sensor.
The other connector is for the lighting kit (under development).
Type 'C' comes with a red LED mounted on the top face which blinks according to the following table:

Blinking type	Meaning
fixed	power is on, no link
fixed	power is on, UP arrow pressed
quick flashing	linked, no button pressed
off	no power
off	power is on, DOWN arrow pressed

The antenna, which is the 2.5cm long piece of wire coming out from the top of the chip, should be kept vertical, within the realms of possible. It is not recommended to lay the antenna flat down on the chip or close to the motor. It will work, but it's not good practice.

Updating Firmware

Type C chip is compatible with oXigen Bootloader (BL) and all the standard procedures such as cloning apply.

Firmware upgrade, though, is done differently, as it is handled through BT pairing with either an Android or iOS device, using the *nRF Toolbox app* released by Nordic Semiconductors.

To perform a firmware upgrade, chip must be in ***DFU* mode (Direct Firmware Update)**. We've tried to make it easy for customers, especially for those who only use type C chip as a SSD or D132 unit, without dongle.

- **If your chip is loaded with Scalextric SSD or Carrera D132 digital firmware:**
  Power it on with a fixed 12V DC (e.g. any analog track with trigger pulled), and after 5 seconds it will enter *DFU. In other words* DFU is activated whenever the chip is reset and no SSD or D132 system is detected within five seconds (5”).
- **If your chip is loaded with oXigen firmware:**
  Place yur model on a SSD (AC mode) or Carrera digital system, don’t switch any controllers paired to the car on, and after 5 seconds it will enter *DFU. Alternatively,*follow the usual oXigen bootloading procedure which is detailed in the general oXigen manual (i.e. make sure no controllers are linked to the chip, power it on, and contact it with the BL pc application). *Once the bootloader app has made contact with the chip,* click on *UPDATE FIRMWARE* button. This makes chip enter *DFU mode*.
- **For all systems:**
  chip also enters *DFU* mode when power on (12V DC) while the Hall sensor is placed on a magnet (with the right polarity as detailed in the O2 manual)

The LED blinks briefly when entering DFU mode.

The following paragraphs explain how to perform the update.

How to update firmware – Android and iOS

1. Download the *nRF toolbox app* from the *Google Play store*.



2. Download the firmware version that you want to put on your chip from our website (http://www.slot.it – oXigen Download Firmware area) on the Android device. Note where it is being saved. Remember that Your firmware has a name and the name follows this convention: *O201c-sys-reldate.zip* file, where:

   sys: system oXigen (O2), Scalextric SSD (SSD) or Carrera digital (D132)
   rel: firmware release number
   date: firmware release date
   Example:

   O201c-O2-170823.zip: oXigen firmware released on Aug 23, 2017

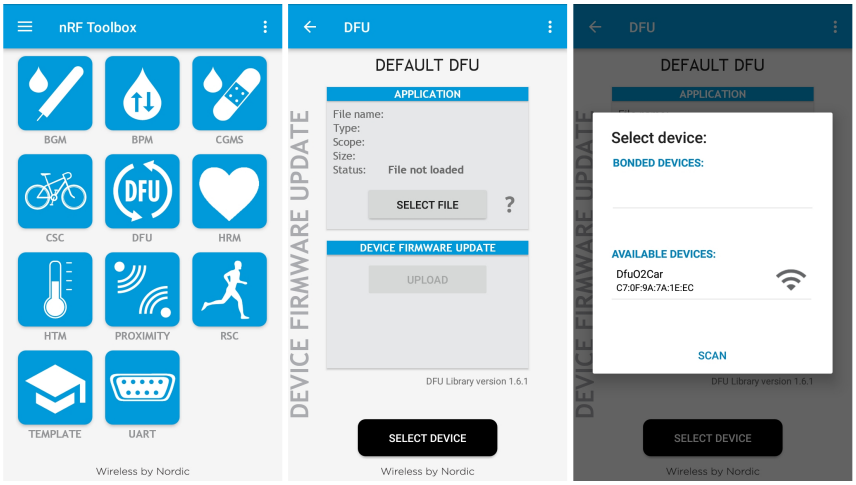
   O201c-SSD-180423.zip: SSD firmware released on Apr 23, 2018

   O201c-D132-180502.zip: D132 firmware released on May 2, 2018

3. Start the *nRF Toolbox app* on the device and select DFU button



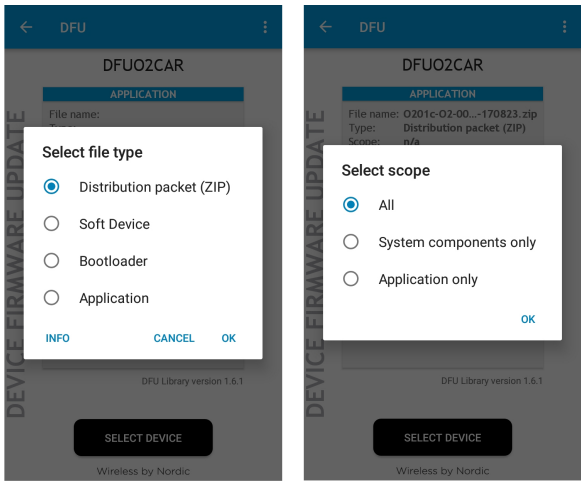
4. Tap on *SELECT DEVICE* and choose *DfuO2Car* which should appear in the list of available devices, under your list of paired/bonded devices. If it is not present, repeat the steps above to set the chip to *DFU* mode.



5. Tap on *SELECT FILE*

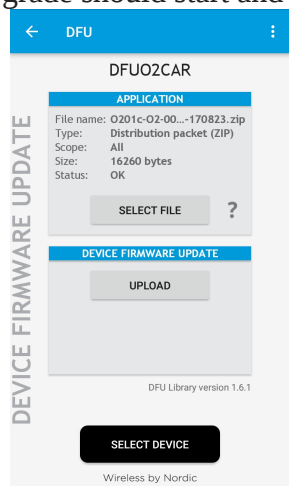
6. Choose ***Distribution packet (ZIP)*** and press *OK* .

   Now locate the file you just downloaded at step 2, select it, then select ***Scope***: All



If given a choice, choose the whole file, not a part of it. Once the file has been selected, the app returns to the *DFU* screen.

7. Tap on *UPLOAD:* Firmware upgrade should start and be finished in a few seconds.



8. The chip resets automatically after being upgraded, but you may need to lift and put the car back on the track before using it.
9. The area of memory which is reserved to pairing info and other setup values is not overwritten during the update of the firmware, therefore your pairing will not be lost.