



Micron Radio Control
+44 1653 696008
www.micronradiocontrol.co.uk

Using an external ESC with Spektrum AR6400

All modified ESC are tested before dispatch so if it does not work, the problem is likely to be either that your AR6400 is not set to external ESC mode or there is a fault with your installation. Please read the section at the end of these notes, if you need to change any ESC parameters.

ESC to AR6400 Wiring

All ESC modified by Micron R/C for use with AR6400 receivers will have a yellow dot or a yellow heatshrink sleeve on the signal connector. There are two styles of AR6400 lead:

1. Combined signal and power connector: the positive, negative and signal leads from the ESC are wired to a 3 pin connector that fits the AR6400 ESC socket. The 3 pin connector should be inserted with the yellow dot uppermost.
2. Separate signal and power connectors: the positive and negative leads from the ESC are wired to a 'UM' power connector that fits the AR6400 battery socket and the signal lead is wired to a single pin plug that should be inserted into the left hand side of the 3 pin ESC connector on the AR6400 PCB – this is the side nearest to the aerial wire (refer to your AR6400 user guide if you are unsure).

Single cell ESC (e.g. the XP-3A) will, when requested, be wired with a 'UM' socket for connection of the drive battery. The ESC power wiring will supply the receiver and servos. ESC for use with 2S LiPo will have a diode wired in series with the positive lead from ESC to AR6400 to drop the BEC output voltage to a safe level for the AR6400 (4.3V).

Do not use the AR6400 battery connector to attach a motor drive battery – i.e. powering the ESC and motor via the AR6400. The AR6400 PCB tracks may be insufficient for carrying the motor current.

The wires and connectors used are necessarily small. Do not tug on the wires when removing a connector – you may either snap the wire or pull it out of the crimp terminal. If you cannot grip the connector body then use a pair of fine nose tweezers to lever the connector plug out of a socket.

Setting AR6400 for External ESC

The Spektrum AR6400 micro receiver module can be connected to an external speed controller to enable use of a more powerful brushless motor or a brushed motor that requires a 2S battery. The same socket on the receiver module is employed both for connecting a motor to the internal brushed speed controller and for supplying a control signal to the external speed controller. The AR6400 achieves this by supporting 2 ESC modes of operation. As supplied, the internal brushed ESC is enabled. In order to drive the external ESC, the internal ESC must be disabled. The instructions for switching modes are described in the AR6400 user guide but, in case you have lost yours, the following steps should be followed.

- With the AR6400 powered off, turn on your TX and place the throttle stick to maximum and the rudder stick to left – make sure that these controls are not reversed on your TX programming
- While holding the above stick positions, apply power to the AR6400.
- The receiver LED will light and within 5 seconds will flash 3 times – this indicates that the AR6400 has accepted the setup change.

The AR6400 switches ESC modes each time the above steps are actioned. A quick way of verifying which ESC mode is configured is to plug a brushed motor into the motor/ESC socket. If the AR6400 is in external ESC mode, the motor will run continuously and not respond to the throttle stick. Not having external ESC mode set is the most common issue when customers call Micron to say that their ESC is not working.

If the AR6400 is in brushed motor mode, an external ESC will fail to initialise properly. The motor PWM signal can (at various throttle settings) be interpreted by an external ESC as a valid PPM signal. A common effect is that the external ESC will not emit its initialisation tones until the throttle stick is in the middle.

Some AR6400 receivers take longer than normal to initialise (4+ seconds) and this can cause initialisation problems with some ESC. If your ESC will not initialise, and you are sure that the AR6400 is in external ESC mode, try the following:

- Connect power to the ESC / AR6400 and wait for the AR6400 to start operating
- Disconnect and re-connect the power within 1-2 seconds. This allows the ESC to restart but there is sufficient charge in the AR6400 smoothing capacitor for it to restart quickly.

Programming the ESC

Many brushless ESC require a high throttle signal on startup to enter program/setup mode. This will not work with the AR6400 as the receiver itself uses high throttle for programming. If you have no other method of programming your ESC before connection to the AR6400, use the following sequence to access your ESC's program mode. There are separate procedures for the two power wiring options:

1. Combined signal and power connector:

- Disconnect ESC from AR6400 ESC socket
- Turn on TX with throttle set to low
- Connect single cell LiPo to AR6400 battery connector
- Wait for AR6400 to initialise
- Set throttle stick to high
- Connect ESC to AR6400 ESC socket and apply power to the ESC, disconnect battery from AR6400

Although it seems wrong to have the AR6400 single cell connected in parallel with the BEC output of the ESC, this is not done for long and the LiPo will come to no harm for this short period.

2. Separate power and signal connectors:

- Disconnect ESC power connector from AR6400 power socket
- Connect ESC signal connector to AR6400 ESC socket
- Turn on TX with throttle set to low
- Connect single cell LiPo to AR6400 battery connector
- Wait for AR6400 to initialise
- Set throttle stock to high
- Connect drive battery to ESC power connector

After following the steps appropriate for the style of wiring on your ESC, it should now be in program mode and you can configure as directed in the ESC instructions. Please contact Micron if you are unsure of any of these instructions.