

**Astro 020 Geared Motor**  
**020 Geared System with control p/n 803G**  
**020 Geared Motor only.....p/n 803GM**

Congratulations you have just purchased one of the finest brushless geared motors made for electric model. The new Astro 020 Brushless Geared Motor has the latest advances in hi-tech, a samarium cobalt rotor and a sensorless speed controller.

**The Astro 020 Motor** is very small. It is only 0.975 inches in diameter, 1.75 inches long and weighs only 2.5 ounces. On a three cells Lithium pack or a ten cell Nimh pack, the Astro 020 Geared motor can handle over 300 watts. .

**The Sensorless Control** has a decoder for the radio receiver signal and a micro processor for controlling the motor. Actual commutation is done by a six phase Mosfet bridge housed in six tiny surface mount packages. The control can safely handle 25 amps but the motor should be limited to 20 amps **maximum**. If you decide to use a different prop **We recommend choosing a propeller that limits the current draw on the ground to a maximum of 25 amps on a fully charged nicad pack**. This way the current draw in the air will be between 15 and 20 amps for best motor efficiency and longest flights. The entire control is very small measuring 1.3 inches by 1 inch and 1/8 inch thick. The control weighs 1/2 ounce. One side of the circuit board contains the 1 amp BEC circuit and the other side contains the commutation control chip and the power mosfets. The control comes with baoth Astro 2 pin and 3 pin connectors.

**No Adjustments** The sensorless speed control has no adjustments and is set up to work with any airplane radio control unit. The control adjusts to your radio low throttle command as long as the command is between 1ms and 1.3 ms.

Motor speed will increase linearly up to full throttle as the transmitter pulse width is increased by 0.7 ms.

**Safe Start** The speed control has a safe start feature. The soft ware requires a continuous low throttle command between 1ms and 1.3ms for five seconds after battery power is applied before it allows the motor to start. When first setting up your transmitter you may have to set the throttle trim low and the throttle stick low before advancing the throttle stick to get the motor to run. Once the motor starts running the control will respond to radio command as long as battery power is present. If the motor does not start, set your throttle gain to plus 100% and minus 100% and set the transmitter throttle reversing switch to reverse position.

**Brakes** The control is manufactured with brakes. The brakes can be activated and de-activated. To de-activate the brakes disconnect battery power and set the transmitter to **Full throttle**.

1. Connect battery power and wait for led to flash.
  2. Go to **half throttle** and wait for flash.
  3. Go to **full throttle** and wait for flash.
  4. Go to **half throttle** and wait for flash.
  5. Go to **low throttle**, then disconnect motor battery.
- Next time you power up the brakes it will be de-activated. To re-activate the brakes, repeat the above procedure except at step 5 go to **Full throttle**.

**Reverse** The Mighty Micro Brushless 020 Motor can be run in either direction. To reverse motor direction interchange any two of the three motor wires connecting the motor to control.

**BEC** This speed control has a BEC circuit so that you do not need to install a separate receiver Nicad in your model.

**Auto Voltage cut off** This speed control has auto voltage cut off to prevent your battery from being discharged too far. This is especially important for Lithium Polymer batteries.

## Astro 020 Motor Characteristics

<b>Part No.</b>	<b>803G</b>
<b>Name</b>	<b>020 Geared</b>
<b>Winding</b>	<b>5 turns #20</b>
<b>Kv of motor</b>	<b>2567 rpm/volt</b>
<b>Winding Resistance</b>	<b>0.070 ohms</b>
<b>Gear Ratio</b>	<b>3.3 to 1</b>
<b>Kv of Geared Motor</b>	<b>778 rpm/volt</b>
<b>No load current</b>	<b>1 amp</b>
<b>Magnets</b>	<b>Sm Cobalt</b>
<b>Bearings</b>	<b>Ball Bearings</b>
<b>Motor Diameter</b>	<b>0.98 inches</b>
<b>Length Geared Motor</b>	<b>2.75 inches</b>
<b>Weight Geared Motor</b>	<b>3.4 ounces</b>
<b>Motor Shaft Diameter</b>	<b>1/8 inch</b>
<b>Prop Drive Diameter</b>	<b>3/16 inch</b>
<b>Control Type</b>	<b>Sensorless</b>
<b>Control Rating</b>	<b>25 Amps</b>
<b>B. E. C. Rating</b>	<b>1 A @ 5V</b>
<b>Voltage cut off</b>	<b>Automatic for Lipo</b>
<b>Power Connector</b>	<b>Astro 2 pin</b>
<b>Servo Connector</b>	<b>Universal</b>
<b>Voltage Range</b>	<b>6 to 12 volts</b>
<b>Maximum Current</b>	<b>25 amps</b>
<b>Maximum Power</b>	<b>300 watts</b>

**Astro 803G geared motor on 3 Lithium cells**

Prop	Rpm	Thrust	Volts	Amps	Watts
10 x 5	8,000	30 oz	11 V	12.5 A	138 W
10x7	7,600	31 OZ	11 V	15 A	164 W
11x7	7,300	41 OZ	11 V	20 A	220 W
12x6	7,000	46 OZ	11V	22 A	240 W
12x8	6,600	44 OZ	11 V	24 A	266 W
13x6.5	6,600	54 OZ	11 V	24 A	266 W

**Other parts you may need**

Stock No	Name
101	Super Whattmeter
105	Servo Tester
109	Lithium charger
110	Deluxe Digital Charger 1-24 cells
202	Speed Control for 803 motor
521	Astro 3 pin connector
525	Astro 2 pin connector
710	Helical Gear Box 3.3 ratio
763	APC 11 x 7 E prop
765	APC 12 x 8 E prop

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