



**TORQUE**  
600AMP CONTROLLER POWERED BY NAVITAS

A DIVISION OF



## TORQUE Controller Product Knowledge

### TORQUE CONTROLLER .....KEY FEATURES

#### 1.1 Personalize The Driving Experience in Real-Time

- The Operator can adjust the Top Speed, Acceleration and Regenerative Braking while driving

#### 1.2 Increases the Range of the Vehicle

- The On-The-Fly Programmer auto-tunes the motor to use significantly less current for the same Torque at lower speeds

#### 1.3 Increases the Pulling Power of the Vehicle

- Provides up to 600 Amps of current to the motor

#### 1.4 Unprecedented Safety Features

- Automatic Hill-Holdback for backing down steep grades.
- Speed and Acceleration Lock-Out with a key
- Adjustable Regenerative Braking in Forward and Reverse

#### 1.5 Ultra Efficient

- Almost all of the energy coming into the controller is used to drive the vehicle
- No cooling fans required to dissipate wasted energy

#### 1.6 No Complicated Programming or Field Mapping Required

- The OTF Programmer Dynamically Adjusts the field map according to the user settings

#### 1.7 Plug and Play Installation

- Compact Footprint fits most OEM mounting locations without drilling or cutting

#### 1.8 Works “Out of the Box” with Stock Club Car, E-Z-GO and Yamaha Motors

- One Controller SKU works with all Major OEM and most Aftermarket Motors

#### 1.9 Built-In Protection to Prevent Motor Burn-Out

- The controller modulates motor power to prevent overheating

#### 1.10 The most Economical way to Upgrade the Power & Speed of your Vehicle

- In many cases will not be necessary to purchase a larger motor

#### 1.11 Controller Provides Both Simplified & Traditional Diagnostics

- Our New Simplified Diagnostics provides Feedback by acknowledging Operator inputs from the Controller’s perspective.



On-The-Fly Programmer



**TORQUE**



Vehicle Specific Harness/Module



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- Traditional Diagnostics are focused on the controller itself

### **1.12 Minimized Dealer / Distributor Inventory Investment**

- The same controller can be used in most SEPEX DC Motor Applications by selecting the correct wiring harness module to fit the Native OEM wiring harness.

### **1.13 Also works with Series and Permanent Magnet Motors**

- The controller can be reconfigured for Series or Permanent Magnet Applications

### **1.14 Works with Silverwolf 4WD Upgrade Packages**

- Harness Modules are pre-wired for Plug and Play 4WD Upgrades



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### **2. Frequently Asked Questions**

#### **2.1 Why do other Controller manufacturers recommend motor upgrades with their High Power Controllers?**

With **TORQUE** Controllers, in many cases, it is not necessary to upgrade the motor.

Simply increasing the power output of the motor is not harmful. Overheating is normally what damages electric motors. Our Controller monitors the energy going into the motor and when it deems that the motor is getting too hot it notifies the operator by flashing a diagnostic, cutting the power, and reducing the speed of the vehicle.

In our off-road experience most users rarely trip the thermal fold-back feature of the Controller. However, if the specific application requires continuous high-power, we recommend that the motor be upgraded to one which is purposely designed for that application.

#### **2.2 What if I don't want the Controller to reduce the power or speed?**

If the operator cycles the key switch on and off, the energy accumulator will be reset to zero.

The roll of the Controller is to notify the operator that the motor is being overheated and to attempt to protect the motor. The Operator can decide to continue at full power. The controller has done its job by notifying the Operator that if they persist, the motor may fail completely.

#### **2.3 Will your 600 Amp Controller drain my battery quicker than a 400 or 500 Amp Controller?**

Clearly, a 600A Controller is capable of draining a battery pack quicker than a 400A unit, but in reality the Controller supplies only as much current as the vehicle requires.

Ultimately it is the demand curve of the vehicle, which determines how quickly your battery pack will be drained. For example, 600 Amps would be required briefly to get you over a hump or out of a steep ditch.

Once you are rolling, the vehicle is probably using less than 100 Amps. At this point it will be the efficiency of the Controller that determines how much battery current is needed.

#### **2.4 Why is your Controller more efficient than most others?**

Our Controller uses premium electronic components and finely tuned power boards. It does not generate much waste heat. Therefore it runs cooler. This means that we can package our Controller into a smaller footprint and that we do not need any external cooling fans to dissipate wasted energy.

#### **2.5 Why do you say your Controller can increase the range of my golf car?**

When using the On-The-Fly Programmer, turning the speed limit down reconfigures the Controller and adjusts the motor so that it uses less energy to push the vehicle. This





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significantly reduces the current demand on the battery and leads to a noticeable increase in range.

Furthermore, with our On-The-Fly Programmer, you can increase the amount of regenerative braking as you are going down hills. This will not only put energy back into your battery pack, it will also save wear and tear on your brakes.

Finally, by limiting the acceleration of the vehicle, you can reduce the size of the current peaks drawn from the batteries. This also will lead to an increase in range.

### **2.6 Why do I not need to change the field maps if I put the controller onto different vehicles with different motors?**

With our On-The-Fly Programmer our Controller dynamically changes the field map to operate your motor at an efficient point.

If you encounter a motor that we have not tested, the OTF can still be used to adjust the motor to operate within acceptable performance parameters.

You can always call our Tech Support if you need detailed assistance.

### **2.7 What does the On-The-Fly (OTF) Programmer do?**

- It is used by Dealer to set up the vehicles according to the preferences of the customers. The Dealer can adjust the Top Speed, Acceleration & Regenerative Braking rate of the vehicle.
- The OTF allows Operators to Personalize the Driving Experience by changing the Top Speed, Acceleration and Regenerative Braking of the vehicle in Real-Time while they are driving.

### **2.8 What if I don't want someone to change the Top Speed or Acceleration of the Vehicle?**

The OTF Programmer includes a lock and key. This allows the Dealer or Owner to lock in the setting so that the programmer becomes in-active and can even be physically removed from the vehicle without affecting the settings.

This is ideal for:

- Rental Fleets where range needs to be maximized
- Commercial /Industrial / Institutional settings where speed needs to be limited
- Crowded environments where acceleration must be controlled

### **2.9 As an End User, do I need to purchase the OTF to operate the Controller?**

No, the Controller will operate fine with the default factory settings. Most of our Dealers will have an OTF Programmer to set up the car to your specifications.



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However, we feel that you will likely want to purchase an OTF for yourself. They are economical and they give you the ability to fully control your Driving Experience as conditions change.

### **2.10 As a Dealer, do I need to purchase the OTF to operate the Controller?**

No, the Controller will operate “out of the box” using the set of factory default parameters.

However, if the customer is not happy with the default parameters a dealer will need to have access to an OTF Programmer.

### **2.11 Will your Controller make my car go faster?**

Yes, OEM Controllers generally limit the top speed of the vehicle. In some cases you will need to purchase a speed code to change it. With our OTF Programmer, you will not be required to purchase a speed code. You can adjust the speed of the vehicle to the maximum capabilities of your motor.

### **2.12 As a Dealer, how are you reducing my need to carry Inventory?**

With **TORQUE**, you only need to purchase one 600 Amp Controller. The Wiring Adaptor Modules can then be used to mate up the Controller to the OEM’s native wiring harness for plug and play installation. These modules are very economically priced.

For example, using our system, a \$900 investment (one Controller and 10 modules) will cover 10 separate applications, whereas those same 10 applications would require a \$5,000 investment (10 controllers with Native OEM Connectors) in a competitor’s products.

### **2.13 What is the difference between your Wiring Adaptor Modules and the Native OEM Connectors used by other Manufacturers?**

A Native OEM Connector is hard-wired into the controller. For example, such a controller for a Yamaha application can only be used on that specific Yamaha model.

Our Wiring Adaptor Modules are the interface to the specific OEM the wiring harness.

### **2.14 What is the difference between “Simplified Diagnostics” and Traditional Diagnostics**

Traditional Diagnostics are used to identify non-standard operating conditions within the Controller such as high temperatures, low voltages and high currents. These are then used to diagnose vehicle or controller related problems.

Simplified Diagnostics represent an innovative way to provide the Driver with a continuous overview of the vehicle’s operation (from the Controller’s perspective). These are used to directly identify the most common vehicle issues.

Every time a Driver changes something, they receive a subtle acknowledgement from the Controller in the form of a slight pulse or flash on the OTF.



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For example, the Controller will acknowledge that the accelerator pedal is being depressed and then once again when it sees the signal for maximum acceleration.

### **2.15 Can I use your Controller for other Voltages and other DC Motors such as Series wound or Permanent Magnet Motors**

Yes. If the voltage is less than 60V, just a special set of Parameters will be required. If the vehicle requires 64V or 72V, a hardware upgrade is needed. Call our Technical Support number for more information.

### **2.16 Other Controllers are also programmable. Why is the OTF a better solution?**

There are several reasons:

- With the OTF you can adjust the Driving Experience in Real-Time vs. the Off-Line Programming available with traditional Controllers
- Other Controllers require Lap-top computers or dedicated devices which are expensive to buy and difficult to operate.
- Programming other controllers is complicated and often requires a level of expertise that is not available at the Dealer level. Inappropriate parameter modifications can have severe unintended consequences including unexpected behavior and severe equipment damage.