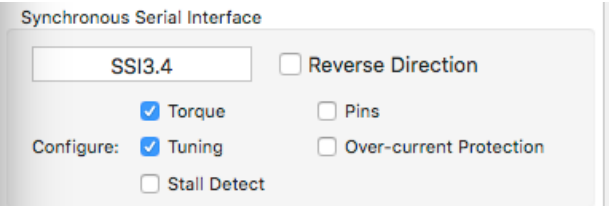
# BOOST-DRV8711 Setup

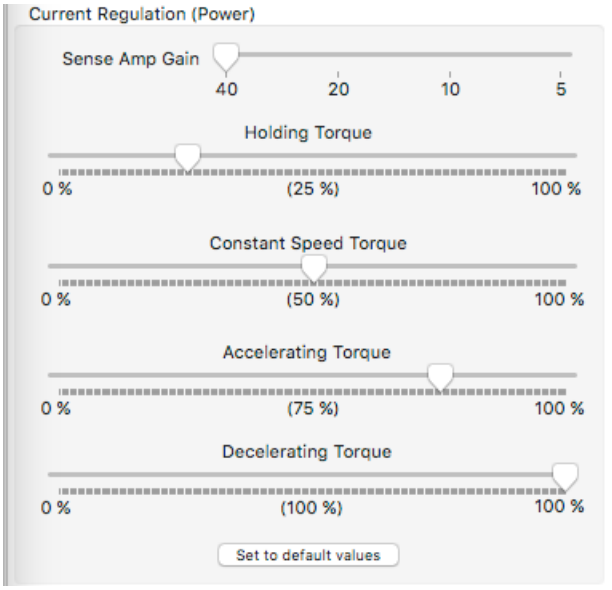
The BOOST-DRV8711 interface presents a bewildering array of parameter options, but for most parameters the user can keep the default setting. This section provides only a cursory description of some parameters. The user is referred to the TI document DRV8711 for more detail.




The SSI should also be configured for BOOST-DRV8711. Expanding the SSI in the Pins outline view, select the carrier position and drag it to the SSI textfield to make the logical connection.

Select the groupings that you want to display and edit.

## Torque Group



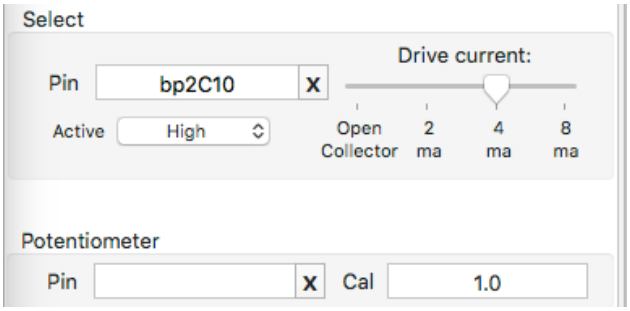

The current sense amplifier gain selects the level of current sense feed back to the current regulation and will affect the settings for the following sliders. A lower gain will increase the motor drive current, i.e., the torque. To avoid overheating your motors, use only as much current as is required to avoid step loss.

The torque is further controlled by four sliders each corresponding to one of the four motor states.

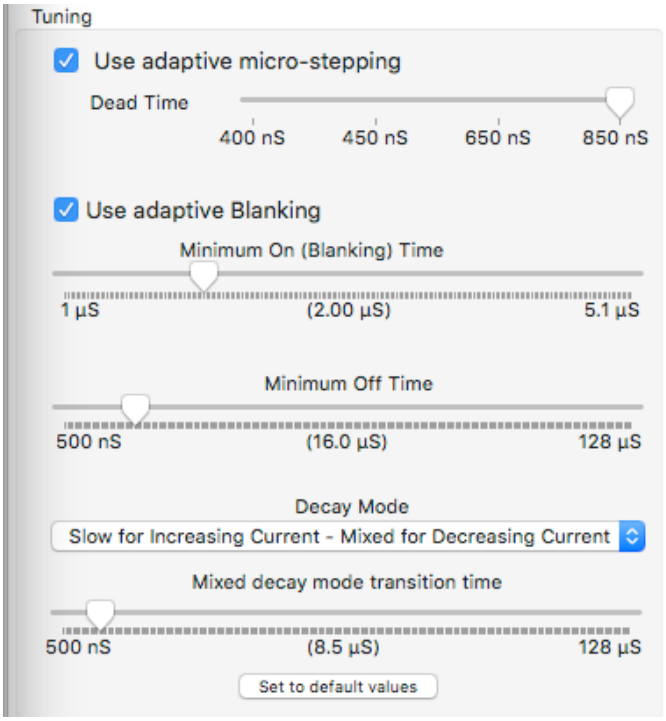
## Pins Group

Default pin assignment should appear for the discrete “Select” and “Potentiometer” pins but you can override the defaults.

Most users will not find the potentiometer input to be useful. If unused, erase the Potentiometer pin assignment to free the analog input pin.




## Tuning Group




The 1/256 micro-stepping indexer mode is suggested in combination with the adaptive micro-stepping option. Selecting the adaptive micro-stepping mode ensures that the MCU will be able to keep up higher motor speeds by dynamically adapting the micro-step indexer to take larger steps as the motor speed increases. The indexer mode is adapted back to the selected mode, e.g., 1/256, as the motor speed decreases.

The conservative dead time of 850 nanoseconds is the default to ensure that no “shoot-through” will occur as the drivers switch direction. A shoot-through will waste power and may overheat the drivers. A user should monitor the current if reducing the dead time.

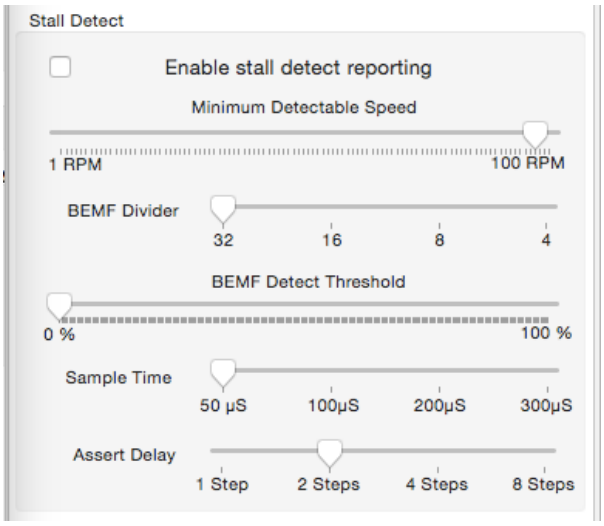
A minimum on time is required for the current regulation logic to obtain a reliable sample of the current, however, less time is required for low impedance motors.
Minimum on time will provide a holding current even if the holding current power level setting is zero. If your motor is overheating while idle, try reducing the minimum on time.

The minimum off time parameter can reduce the switching frequency of the driver. If the motor becomes audible while holding, try reducing this time.

A number of decay modes are available. The default “Slow for Increasing Current - Mixed for Decreasing Current” may provide the best overall performance. Mixed decay mode will start as fast decay then transition to slow decay. Refer to the TI documentation for a description of decay modes. TI also has an online video presentation describing decay modes.

The “Mixed decay mode transition time” is used only for a decay mode selection including mixed decay.

## Stall Detect Group




The stall detect section configures the “Back Electro-Motive Force” stall detection feature of the 8711. However, the logic does not seem to work well for small motors and at slower motor speeds. Stall detect will also not work with a maximum torque setting because the output must be switching. The stall detect logic and the stall detect LED cannot be disabled - only ignored.

A stall threshold voltage is set by the combination of the BEMF divider and the threshold slider. A stall is detected if the sampled BEMF is below the threshold after the selected sample time.
The device will wait the “Assert delay” steps before reporting a stall detection.

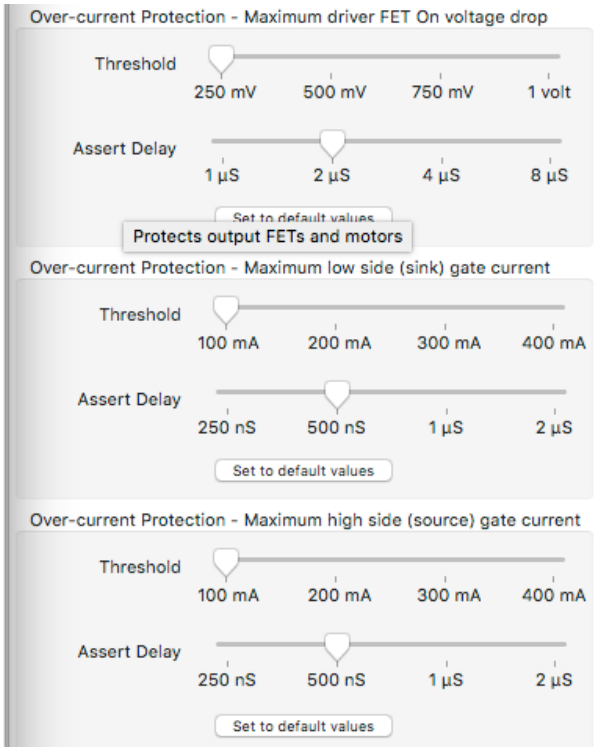
## Over-current Protection Group

Designed for high power motors in industrial applications, the device is well protected from overload conditions. However, some parameters can be set to fine tune the protection logic.

A motor over-current is detected by sampling the voltage drop across the driver FETs while the FETs are switched on and after the “Assert Delay”. For small motors, use the conservative minimum threshold voltage.

Over-current protection for the gate current outputs, both high side and low side protect the 8711 from a blown driver FET. If this status is reported, then the board will probably need repair.

There are no settings for the over-temperature shutdown protection.


Over-current Protection - Maximum driver FET On voltage drop
Threshold
250 mV
500 mV
750 mV
1 volt
Assert Delay
1 µS
2 µS
4 µS
8 µS
Set to default values
Protects output FETs and motors
Over-current Protection - Maximum low side (sink) gate current
Threshold
100 mA
200 mA
300 mA
400 mA
Assert Delay
250 nS
500 nS
1 µS
2 µS
Set to default values
Over-current Protection - Maximum high side (source) gate current
Threshold
100 mA
200 mA
300 mA
400 mA
Assert Delay
250 nS
500 nS
1 µS
2 µS
Set to default values