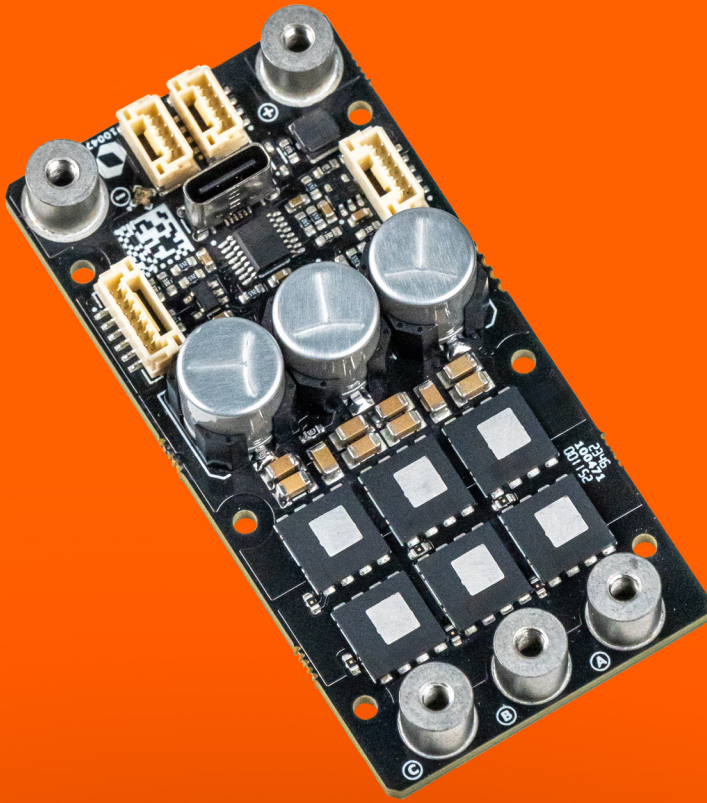




Datasheet

Version 1.0
12/04/24



Hargrave
Technologies



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01 Safety

This is not the sort of safety page you skip! We take the utmost care in development and assurance of our products, but power electronics have inherent risk. Used improperly, there is risk of fire, serious injury and damage to property. Please read this datasheet carefully prior to integration.



Motor controllers channel substantial power. Fault currents can exceed 1 kA and while extremely rare, major failures can result in fire. Design your vehicle accordingly. ESCs should be fused from batteries and isolated from flammable components.



Always ensure you are connecting the motor controller with the correct polarity. Failure to do so can result in a fire.



Never exceed the rated voltage of the motor controller. Failure to do so can result in premature failure or a fire.



micro**DRIVE** LPi is a bare board that requires the user to provide it appropriate environmental protection for its use case. Direct exposure to water or dust can result in a failure.



Do not attempt to disassemble or modify the product. Doing so will void your warranty and more importantly, cause damage that results in a failure.



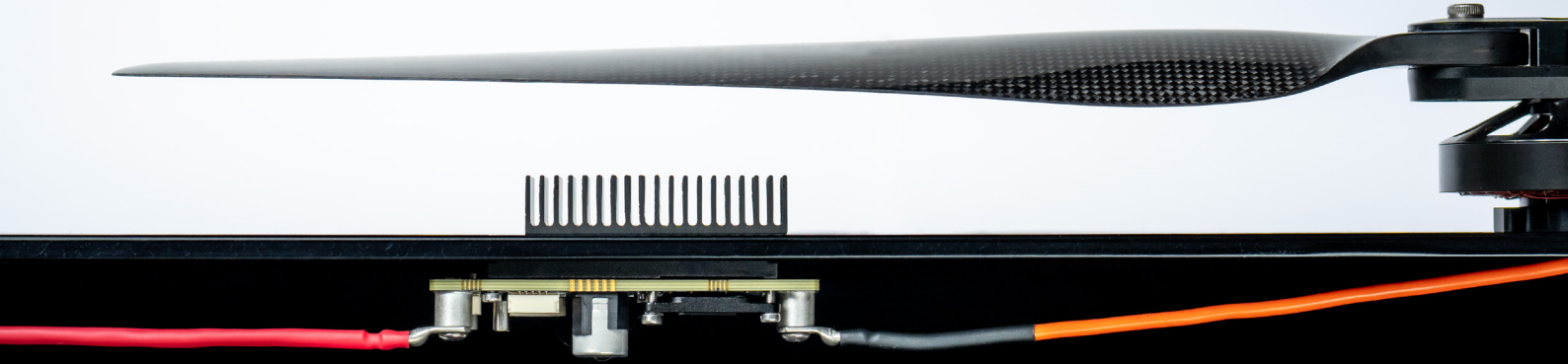
This controller will regeneratively brake by default. Synchronous rectification must be turned off to use it with a one-way power source.



Do not extend the leads beyond recommended values without consulting Hargrave. This may result in insufficient capacitance and subsequent failure.



While there are multiple fail safes in place, it should be assumed that a powered ESC can start a motor at any time. Take appropriate precautions.



Made for the dynamic needs of the UAS industry, the micro**DRIVE** LPi embodies versatility without sacrificing performance.

With a modern communications and telemetry suite, micro**DRIVE** LPi is ready to power the most demanding UAS applications.

02 At a Glance



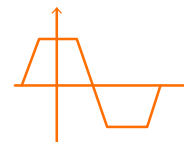
15 – 60 V

INPUT
VOLTAGE



60 A

CONTINUOUS
CURRENT



FOCAL

+ TRAPEZOIDAL



DroneCAN

+ DSHOT, PWM



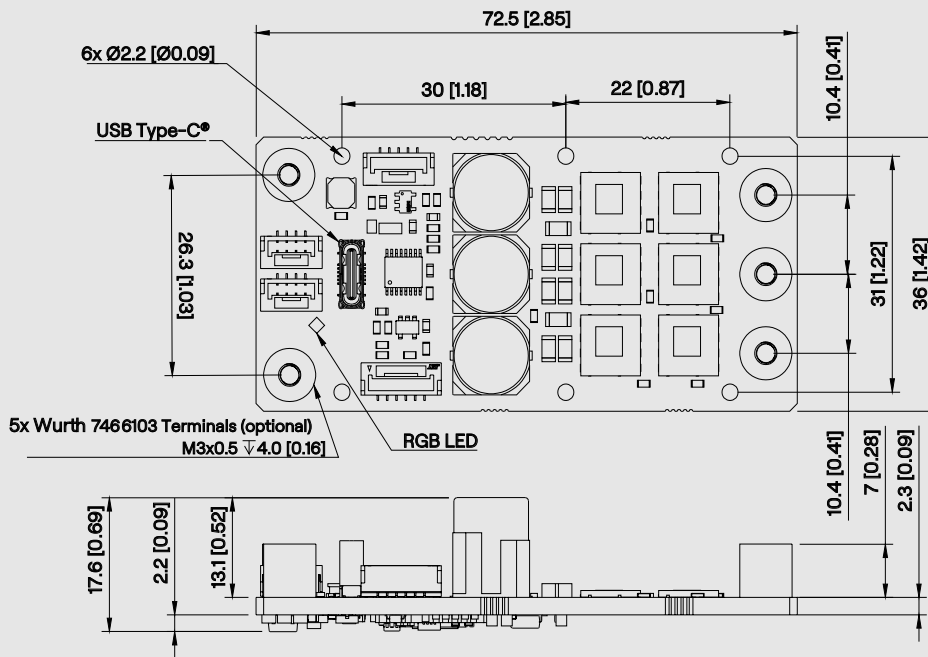
34 g

BASE WEIGHT



Integrable

MOUNTING &
COOLING



All dimensions in mm [inches].

03 Specifications

Electrical

PARAMETER (UNIT)	VALUE	NOTES
Nominal Power Supply Voltage (V)	15 – 60 [4S – 14S]	The recommended operating range for the units.
Absolute Power Supply Voltage (V)	12 – 63	Breaching absolute limits will result in unexpected shutdowns or unit failures.
Rated Phase Current (A)	60	Indefinitely, when appropriately cooled.
Peak Phase Current (A)	110	When appropriately cooled.
Voltage Measurement Accuracy (%)	± 5	Input voltage measurement accuracy across the full-scale range.
Current Measurement Accuracy (%)	± 5	Input current measurement accuracy across the full-scale range.
Decoupling Capacitance (µF)	370	Onboard capacitor bank for up to 3 m of input lead length.
Regenerative Braking	✓	Configurable operation.
Max. Regenerative Current (A)	60	Indefinitely, appropriately cooled.
Motor Temperature Sensing	✓	NTC or PTC supported, software configurable.
Isolated Serial Input and Output	✓	DShot/PWM are isolated, including telemetry.
Data Logging	✓	Configurable rate, automatic circular logging.
Hardware Self Tests	✓	Unit will test bridge hardware on power up.
Self-Correcting Memory	✓	Use of onboard backups and ECC memory.



Motor Control

PARAMETER (UNIT)	VALUE	NOTES
Minimum Switching Frequency (kHz)	4	Automatic switching, configurable range.
Maximum Switching Frequency (kHz)	64	Automatic switching, configurable range.
Commutation Types	FOCAL and Trapezoidal	Configurable motor control algorithm.
Efficiency	Up to 99%	Maximum achievable efficiency.
Maximum RPM (Trapezoidal) (eRPM)	500,000	2-pole motor speed.
Maximum RPM (FOCAL) (eRPM)	200,000	2-pole motor speed.
Bi-Directional Drive	✓	Throttle input can be mapped to cover reverse and forward rotation.
Protection Mechanisms	✓	Temperature (Bridge and Motor), Current, Voltage, Demagnetisation, RPM.
Propeller Parking	✓	Supports active parking with external hall sensor.
Sensorless Drive	✓	–
Sensored Drive	Optional	Units have hardware capability for hall-effect sensed drive if motor cable is installed. This will become available as a firmware update.
Motor Type	BLDC, PMSM	–

Communications

PARAMETER (UNIT)	VALUE	NOTES
CAN Bus Support	DroneCAN	Other protocols can be requested.
CAN Bus Termination	✓	Software-controlled termination resistor.
Telemetry	✓	CAN, Serial and PWM telemetry supported.
Firmware Updates	✓	USB and CAN interfaces are supported.
DShot Support	DShot150 – DShot600	Standard and Bi-Directional DShot supported.
Servo PWM Support	✓	50-499 Hz input frequencies supported.
Input Resolution	10-bit	Resolution on DShot and PWM input signals.

Physical

PARAMETER (UNIT)	VALUE	NOTES
Weight (g)	34 [1.2 oz]	Base weight only, not including screw terminals.
Operating Temperature (°C)	-20 – 95 [-4 – 203°F]	Continuous operation above 75°C [167°F] may reduce lifetime of unit.
IP Rating	–	No ingress protection, this unit relies on the user to provide an appropriate enclosure.
Cables	–	Bare solder pads or M3 thread terminals available.
RGB Indication LED	✓	See page 11 for indications.
USB	✓	USB Type-C® for configuration and log access.
Configuration Tool	✓	USB or CAN accessible configuration.
NDAA Compliance	Optional	See page 15 for further details.
Country of Origin	Australia	–
RoHS/REACH Compliance	✓	–



04 Cooling and Performance

Many factors influence the final performance of an ESC in any real world application, but thermal management is one of the biggest. This section is intended to provide a simplified method to determine the required cooling to achieve the desired ESC performance. Results from this method should be considered indicative only.

Required Phase Current

It is important to make the distinction between bus current and phase current. Motor controllers are rated based on phase current, as this is the primary factor in thermal load.

Our ESCs vary motor speed by changing the phase voltage. For a given input power, dropping phase voltage requires boosting the phase current.

You can estimate the instantaneous phase current required using:

$$I_{\text{phase}} = P_{\text{bus}} \times \frac{KV}{RPM}$$

where:

P_{bus} = Expected Bus Power. (W)

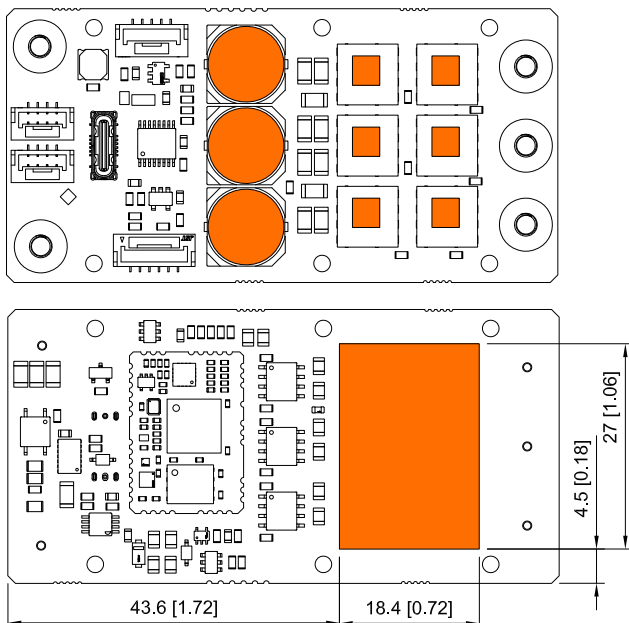
KV = Loaded* Motor KV. (rpm/V)

RPM = Operational RPM. (rpm)

**Motor manufacturers typically report unloaded KV, whereas loaded KV should be used. Note this is often substantially different to unloaded KV.*

Thermal Zones

The heat generating zones on the microDRIVE LPi are highlighted on the below drawing.



The heat generated by the MOSFETs is designed to flow through the board and be cooled at the large copper surface on the opposite face. Ensure the primary cooling solution is applied at the copper surface on the bottom of the motor controller.

To thermally connect the copper surface on the motor controller to the thermal solution, a thermal interface material (TIM) with the following criterion should be used -

- >8W/mK thermal conductivity
- Non electrically conductive

Our recommended pad is the Laird Tflex SF10 in the 0.5mm thickness. Make sure to check compatibility with mounting surfaces/materials used. Always follow manufacturer instructions for installing and compressing a TIM. For a detailed guide on how to mechanically mount the microDRIVE LPi to your vehicle, see **06 Integration** (Page 9-10).

Thermal Output

To ensure the microDRIVE LPi can operate continuously at the required phase current, you need a cooling solution that can effectively dissipate the thermal power from the unit to ambient. To find the thermal power that the cooling solution will need to dissipate, use the below graph as well as the bus voltage modifier:

$$Thermal\ Power_{actual} = Thermal\ Power_{rated} \times M_{V_{bus}}$$

The cooling solution will need to dissipate the calculated thermal power, while maintaining a junction temperature** that is below the T_{limit} . The ambient temperature of the system is also an important factor to consider when determining your cooling needs.

Recommended T_{limit} for long term reliability is 75°C [167°F]. Up to 95°C [203°F] is available for short term use. Furthermore, the electrolytic capacitors output 1-3 W of heat per capacitor. Care should be taken in ensuring these stay below 105°C [221°F].

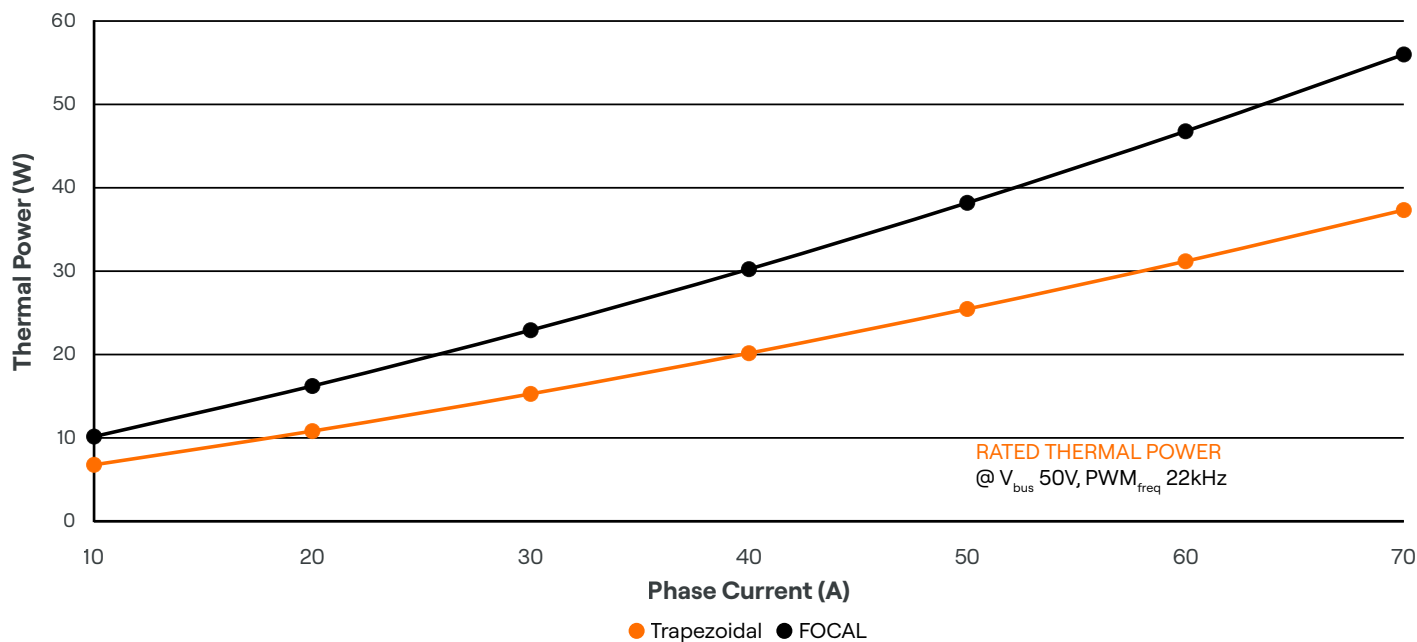
Lastly, consider the burst phase current that your application will require, and its duration. Design a cooling solution that has the necessary thermal time constant to handle these burst loads.

If the cooling solution for the microDRIVE LPi is highly restricted, you can use the calculations in reverse to determine the maximum phase current that it can handle under those restrictions. Pushing beyond the defined performance can result in unit failure.

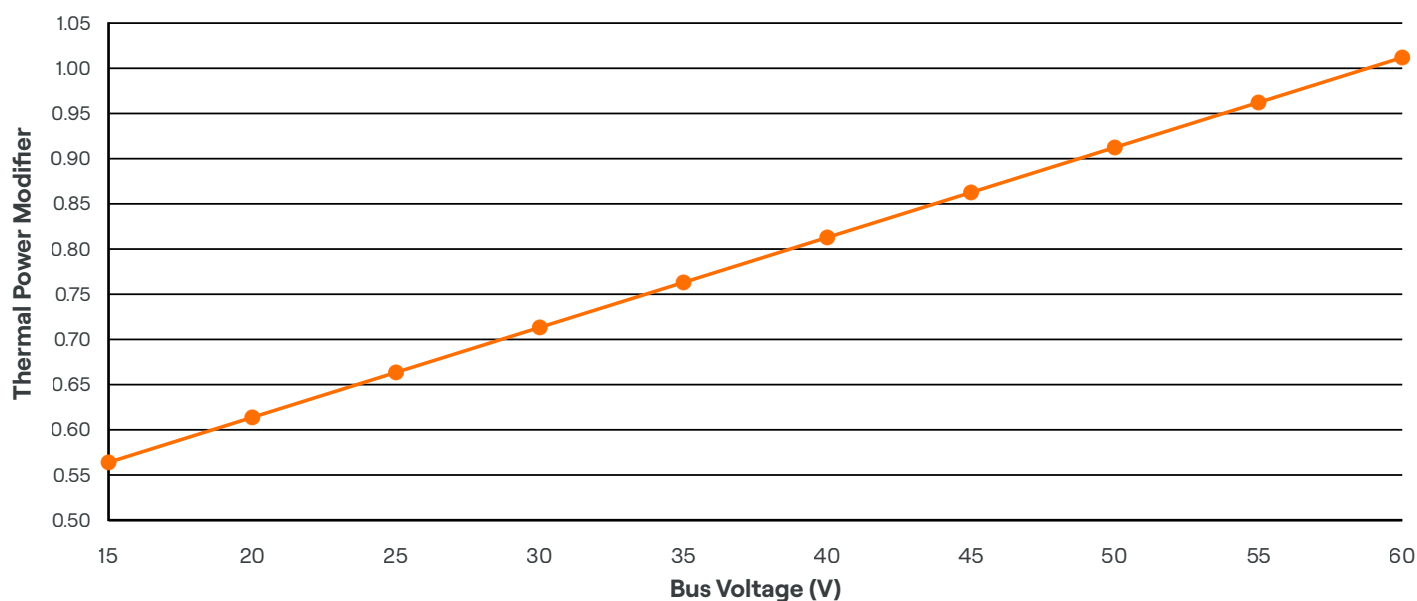
***Junction temperature for the microDRIVE LPi is to be measured at the interface between the copper thermal surface and the cooling solution, not where the MOSFET's are located.*



Thermal Output



Bus Voltage Modifier



Speak to us

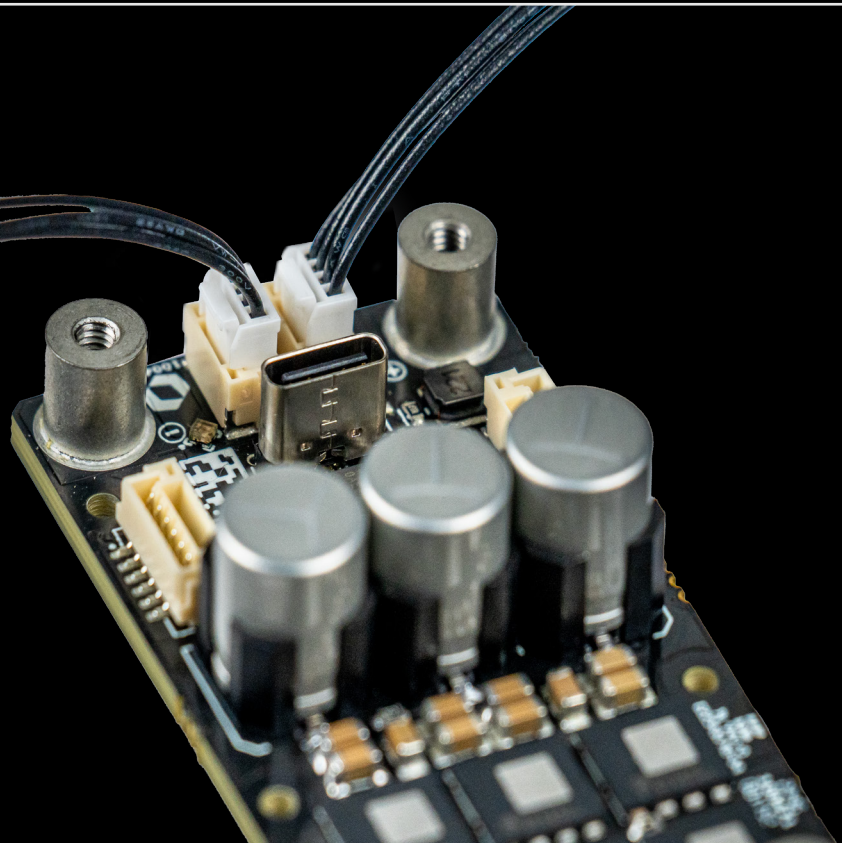
If you have any questions about performance in your application, reach out to our engineering team at:

contact@hargravetechnologies.com



This quick start guide is a helpful starting point for integrating the micro**DRIVE** LPi into your system, but by no means exhaustive.

Please read the datasheet and online documentation before full vehicle testing.



05 Quick Start

Wiring

- If using a tethered system or unidirectional power supply for input power, confirm the AFW setting is disabled.
- Check V_{cc} is supplied when using DShot or PWM.

Configurator

Try our guided Quick Start and configure your micro**DRIVE** LPi with the Hargrave Configurator Tool at:

configurator.hargravetechnologies.com

All settings are also accessible over DroneCAN.

Communications

- When using CAN Bus communication, ensure CAN Bus is enabled. The unit will use DroneCAN for control and telemetry. The input of DShot and PWM is disabled. Disabling this setting enables other protocols.
- If using CAN, set the DroneCAN ESC Index as per the flight controller output number. This designates the ESC position within the system/aircraft.
- Set the motor pole pairs setting to match the motor connected, such that mechanical RPM is reported (rather than electrical RPM).
- Enable the CAN terminator on the unit furthest away from flight controller if no other CAN devices are terminating the bus.

Mounting

- Ensure cables are externally strain-relieved for long-term reliability.
- Ensure that the micro**DRIVE** LPi is mounted by compressing through the thermal surface and MOSFETS, and not by bolting to the board directly. Bending and twisting of the board can result in unit failure. See **06 Integration** (Page 9-10) for more detail.
- Mounting Kits for the micro**DRIVE** LPi are available. Contact us for more information.
- Ensure the motor controller is mounted in a location with appropriate environmental protection.

Protection Systems



Activation of protection mechanisms may cause unexpected system responses, including motor shut down. It is important you understand these behaviours and configure them for your system. You can find more information on page 12.

Documentation

You can find more detailed operational information in our product documentation at:

docs.hargravetechnologies.com



06 Integration

Unidirectional Power Supplies

If you are using the inverter with a power source that is not able to sink current, such as a unidirectional power supply, it is **critical** that you disable synchronous rectification. This is to prevent regenerative braking from causing damage to the controller or power supply.

Capacitance

Sufficient input capacitance is essential for reliable operation of any motor controller. It's important that you measure that there is enough capacitance in your specific application.

To do this, install the motor controller in its intended use application and apply the maximum load the unit will see in service. Measure the voltage ripple at the input terminals to the motor controller. The ripple should not exceed 5% of the bus voltage.

Please contact the Hargrave team if you have any concerns about the capacitance in your application.

contact@hargravetechnologies.com

Signal Isolator Supply

microDRIVE LPI requires a 3.3 – 18 V source alongside the signal. The power is used for the onboard isolation, providing galvanic isolation from the power ground for increased noise immunity. Ground connections should be star connected at the flight computer wherever possible.

Power Sequencing

- CAN is available when $V_{BUS} > V_{MIN}$.
- DShot/PWM is enabled 140 ms after V_{Dshot} present AND $V_{BUS} > V_{MIN}$.
- Powering down V_{Dshot} should not be used as a make-safe, as the isolator may be powered by the DShot/PWM signal.
- Do not switch the isolated PSU by severing the Signal GND connection.

Environmental Protection

The microDRIVE LPI is a bare-board motor controller with exposed electrical connections. Contact with water or significant amounts of dust/particulate can result in unit failure. Ensure that the microDRIVE LPI is mounted in a location with appropriate environmental protection to reflect the UAV's operating conditions.

Port and Pin Electrical Tolerances

PORT/PIN	MAX. CURRENT (mA)	ABS. MAX. VOLTAGE (V)	ABS. MIN. VOLTAGE (V)	PASSIVE LOADING
Main Bus (V_{BUS})	—	63	- 0.4	—
Motor Phases	—	$V_{BUS} + 0.6$	- 0.4	—
V_{CC} In	30	Sig_GND + 18	Sig_GND + 3.3	—
CAN_H, CAN_L	115, Differential Mode	CAN_GND + 12	CAN_GND - 12	Switchable 120 Ohm termination when powered.
CAN_GND	—	Bus_GND + 0.6	Bus_GND - 0.7	—
UART RX	10	Sig_GND + 5.5	Sig_GND - 0.3	Pulled to 3.3 V via 5.1k resistor.
TLM	10	Sig_GND + 5.5	Sig_GND - 0.3	Open drain, pulled to 3.3 V via 5.1k resistor.
SIG	10	Sig_GND + 5.5	Sig_GND - 0.3	Pulled to 3.3 V via 5.1k resistor. Bidirectional DShot response driven with output impedance of 120 Ohms.
HALL A, B, C	1	Bus_GND + 5.5	Bus_GND - 0.2	Pulled to 3.3 V via 2.7k resistor.
NTC	0.33	Bus_GND + 3.3	Bus_GND	—
5 V Out	20	5.25	4.75	—



Mounting

The micro**DRIVE** LPi offers 6 mounting holes to secure the unit to your cooling solution/aircraft. These are best suited to M2 socket head bolts. Ensure you use a tightening torque appropriate to the fastener and mounting material you are using. The mounting holes accommodate a head diameter/washer diameter of 4mm.

The micro**DRIVE** LPi board should not be placed under high stress and torsional loads. To appropriately compress the thermal interface material (TIM) between the motor controller and the cooling solution, the micro**DRIVE** LPi should be mounted in a floating arrangement. A backing plate that contacts the copper cooling surface (and has clearance for the surrounding electronics) should be used in conjunction with a compression plate on the MOSFET side to sandwich the micro**DRIVE** LPi. See the diagram below for details.

Ensure the TIM is selected and compressed in accordance with cooling requirements in **04 Requirements** (Pages 6-7). In particular, having an electrically insulative TIM is critical. All other electronics should be kept at an air-gap of 0.6mm to conductive materials in the mounting assembly, cooling assembly or airframe. The main keep-out zones of the micro**DRIVE** LPi can be found in the CAD model which can be downloaded [here](#).

The micro**DRIVE** LPi is primarily designed for use in aerial vehicles; vibration isolation of the unit, particularly in land-based applications, will increase the longevity of the unit.

Ensure there is appropriate mechanical strain relief on all cables attached to the unit. This will reduce the change of joints failing.

Any Questions?

We're here to help. Reach out directly to our engineering team at:

contact@hargravetechnologies.com

Looking for the CAD?

Click below to look at the micro**DRIVE** LPi CAD.

<http://hrgve.tech/LPiCAD>



Motor Selection

A motor controller is only one part of a larger propulsion system. To achieve peak performance, it is important to select an appropriate motor for your load. The loaded KV of the motor should result in the motor reaching maximum required operational speed at minimum bus voltage. This ensures the peak load on controller occurs near 100% motor duty cycle, where the controller is the most efficient.

You can find more information about selecting an appropriate motor for your micro**DRIVE** LPi at:

hargravetechnologies.com

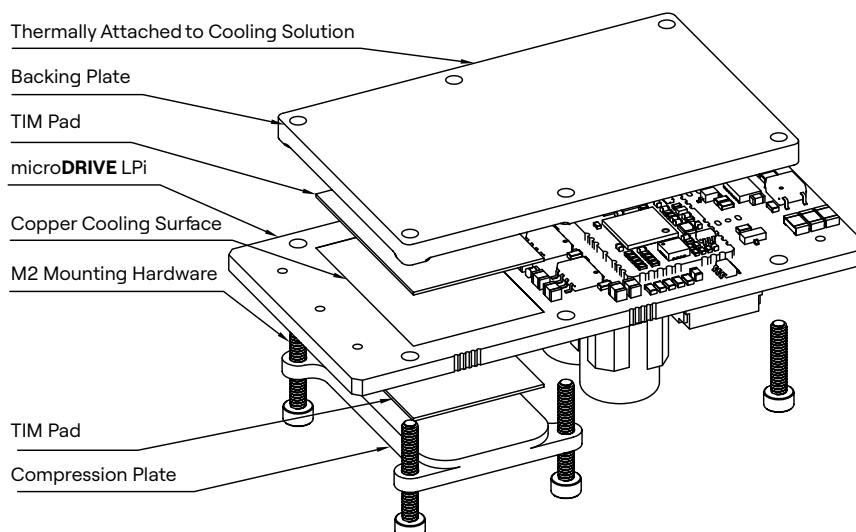
Input Signals

The micro**DRIVE** LPi supports several communications protocols:

- DShot
- Bidirectional DShot
- PWM
- DroneCAN

To maintain effective command of your motor controller, it is important to ensure good signal integrity. Do not route signal lines alongside bus or other high power, high noise wires.

You can find the appropriate pinout for your unit in the Pinouts section on page 16.





07 States

The operation of the micro**DRIVE** LPi is defined by an internal state machine. Below is an overview of these internal states and permitted transitions, depending on the operating conditions. The current running state is logged, communicated over CAN and displayed by the onboard RGB LED.

STATE	LED	PURPOSE	ACTION
Idle	Blinking PURPLE 	Unit is powered on, and awaiting detection of valid signal.	State will automatically exit with valid signal or error detected.
Disarmed	Blinking YELLOW 	Valid signal is detected, however due to safety lockout, motor drive is disabled.	State will exit when safety catch has cleared, likely due to non-zero throttle applied, or an error is detected.
Armed	Blinking AQUA 	Valid signal is detected, and zero throttle signal applied.	State will exit with an error detected, or motor drive commanded with non-zero throttle signal.
Running	Blinking GREEN 	Motor is currently operational, unit will respond to any valid input signal.	State will continue indefinitely once started, unless error is detected, throttle is set to zero or unit powered off.
Soft Error	Blinking RED 	Error was detected, and motor was shut down to prevent unwanted operation.	State will exit once all errors are cleared, or unit is power cycled.
Hard Error	Solid RED 	Critical error has occurred in firmware and recovery.	Contact Hargrave via your technical contact or at: contact@hargravetechnologies.com
Lockout	Blinking ORANGE 	Motor drive and certain features are disabled. State is used for processing incoming large data files such as firmware updates.	State will automatically exit with error or completion of file transfer.
USB Mode	Solid PINK 	Unit is in USB mode, allowing access to onboard logs, settings and firmware updates. Motor drive is disabled.	Unit will exit USB mode when repowered with no USB connection.



08 Safety Features

PROTECTION NAME	DEFAULT THRESHOLD	DEFAULT BEHAVIOUR	RESET REQUIREMENTS
Bridge Over Temperature	Bridge temperature exceeded 100°C [212°F] during operation. Threshold is configurable.	Unit will reduce maximum output duty cycle to 50%. Behaviour is configurable.	Bridge temperature dropped 5°C [9°F] below configured threshold.
Over Voltage	Bus voltage exceeded 63 V. Threshold is configurable.	Unit will shut down drive to motor. Behaviour is configurable.	Bus voltage drops to below the threshold.
Under Voltage	Bus voltage dropped to below 15 V. Threshold is configurable.	Unit will not intervene. Behaviour is configurable.	Bus voltage rises above the threshold.
Over Bus Current	Bus current exceeds 80 A during operation. Threshold is configurable.	Unit will limit maximum output duty cycle while running at threshold.	Bus current drops to below threshold.
Over Phase Current	Phase current exceeds 100 A during operation. Threshold is configurable.	Unit will limit maximum output duty cycle while running at threshold.	Phase current drops to below threshold.
Loss of Signal	No signal detected for over 500 ms (regardless of protocol). Period is configurable.	Unit will shut down drive to motor.	Signal regained, and 0% throttle supplied to resume drive.
Loss of Arming	No arming detected for over 5000ms. Period is configurable.	Unit will shut down drive to motor.	Arming regained, and if require zero throttle is set, 0% throttle supplied to resume drive.
Motor Saturation	Motor saturation detected while driving under load.	Unit will limit the maximum output duty cycle while running at saturation limit.	Automatic reset occurs once saturation clears.
Too Low RPM	KV is incorrectly selected (too low) for current bus voltage.	Maximum RPM to motor is reduced.	Correct KV and voltage combination used.
Onboard Memory Corruption	Firmware or settings was detected to be corrupt upon power on.	Unit is locked out.	Connect to configuration tool for reset options.
Motor Over Temperature (requires motor temperature sensor)	Motor temperature exceeded 120°C [248°F] during operation.	No action. Configurable to limit duty cycle.	Motor temperature dropped below configured limit.



09 Errors/Warnings

Errors

The microDRIVE LPi logs and reports two separate error sectors. Details of each entry are described below. The bits are set when the described event occurs.

Error 1

NAME	DESCRIPTION
Configuration Corrupt	Loaded configuration was corrupted on unit. Connect to the configuration tool for reset. Motor drive is disabled.
Configuration Reset	Configuration on unit was corrupt. Successfully reset to defaults.
Power Supply Fault 1	Onboard power supply for logic circuit faulted. Likely hardware issue. Contact us for assistance.
Power Supply Fault 2	Onboard power supply for logic circuit faulted. Likely hardware issue. Contact us for assistance.
Bridge Test Fault	Bridge test returned negative result, indicating hardware or motor damage. Inspect or replace unit.
Over Voltage Fault	Bus voltage exceeded unit maximum. Motor drive shut down and will resume once event clears.
Under Voltage Fault	Bus voltage dropped below unit minimum. Motor drive shut down and will resume once event clears.
Over Config Voltage Fault	Bus voltage exceeded configured maximum. Motor drive was shut down and will resume once event clears.
Under Config Voltage Fault	Bus voltage dropped below configured minimum. Motor drive was shut down and will resume once event clears.
Absolute Over Temperature Fault	Unit reached its absolute maximum over temperature limit 135°C [275°F], and motor drive disabled. Event will clear after temperature drops.
Signal Input Lost	Loss of valid signal for configured period will stop motor drive. Drive resumes when valid signal returns, and throttle is 0%.
Bootloader Reported Fault	Bootloader reported fault with either firmware or recovery sections. Likely failed update or hardware fault.

Error 2

Currently unused, reserved for future use.



Warnings

The micro**DRIVE** LPi logs and reports two separate warning sectors. Details of each entry are described below. The bits are set when the described event occurs.

Warning 1

NAME	DESCRIPTION
Motor Started	Motor is running.
Motor Saturated	ESC detected motor saturation and started reducing output drive for a period of time.
ESC Over Temperature Limit	Temperature on ESC exceeded configured temperature limit.
Bus Over Voltage Config Limit	Bus voltage crossed over configured voltage limit.
Bus Under Voltage Config Limit	Bus voltage crossed under configured voltage limit.
Bridge Tests Failed	Startup bridge tests failed, indicating a hardware failure or motor short. Unit should be inspected or replaced.
Bus Over Voltage Absolute Limit	Bus voltage crossed above absolute limits of hardware, resulting in hard shutdown.
Bus Under Voltage Absolute Limit	Bus voltage crossed below the absolute limits of hardware, resulting in hard shutdown.
Bus Voltage Maximum Ripple	Unit requires extra capacitors on bus or repairs if in service for some time (capacitors worn out).
Firmware Updated	Firmware was successfully updated within last boot-up of unit.
Firmware Corrupt	Error detected and successfully repaired in firmware section on last boot. Indicates possible firmware update failure, or less likely, a memory fault.
Recovery Corrupt	Error detected and successfully repaired in recovery section on last boot. Indicates possible firmware update failure, or less likely, a memory fault.
CAN Bus Off Occurred	Bus-off error was reported from CAN system. May indicate a hardware fault is present.
Motor Temperature Sensor Error	Motor Temperature Sensor has experienced error, typically indicating a hardware fault.
AFW Engaged	Active Freewheeling (AFW) is currently engaged. No action is necessary, useful for debugging purposes.
Not Using Calibration	Factory calibrated values are currently not in use, measurements will have more error.

Warning 2

Currently unused, reserved for future use.

More questions?

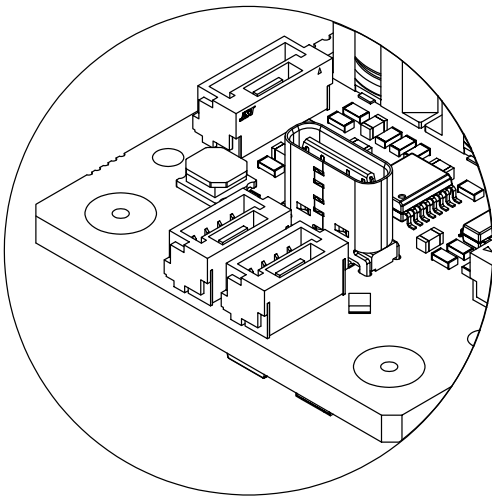
You can find more details about these warnings and errors here:

docs.hargravetechnologies.com

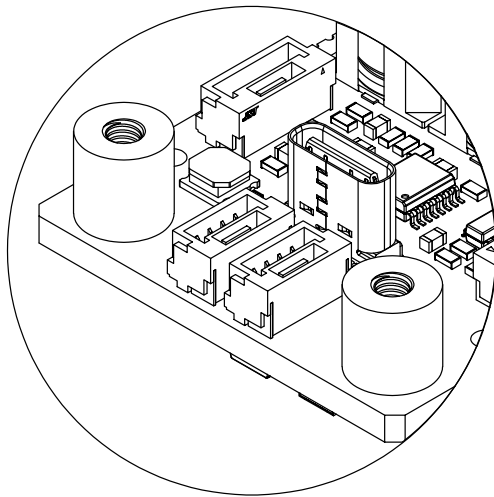


10 Ordering Options

SKU	Power Connections	NDAA Compliant*
101760 (Default)	Solder Pads	-
101759	M3 Terminals	-
101762	Solder Pads	✓
101761	M3 Terminals	✓



SOLDER PADS



M3 TERMINALS
(WURTH ELEKTRONIK 7466103)

Variants with M3 Thread Terminals have a total unit weight of 44g.

*The secret is in the source

All Hargrave Technologies products are engineered, manufactured and tested in Australia from first class components. Australia is classed as a domestic source under Title III of the United States Defense Production Act.



Because of this, we can produce units that are compliant with the United States National Defense Authorization Act 2023 - generally required for suppliers to United States Government agencies. The NDAA version is functionally identical to the Standard version, but with all legislated components sourced outside of the NDAA "countries of concern", including the People's Republic of China. It is also EO13981-compliant.

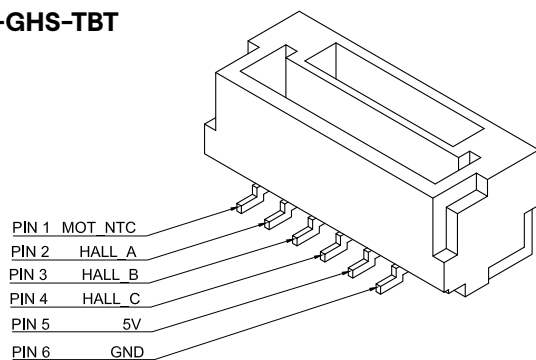


11 Pinouts

Motor Signal - JST GH

JST BM06B-GHS-TBT

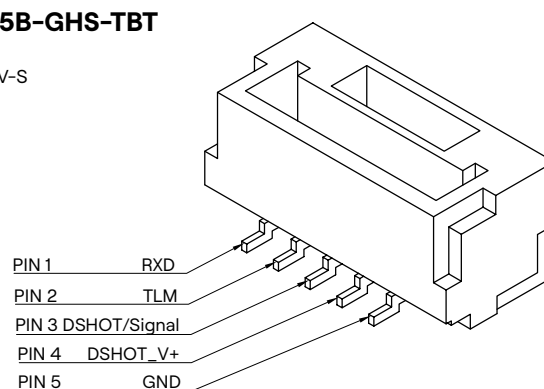
Mates to:
JST GHR-06V-S



Control Signal - DShot

JST BM05B-GHS-TBT

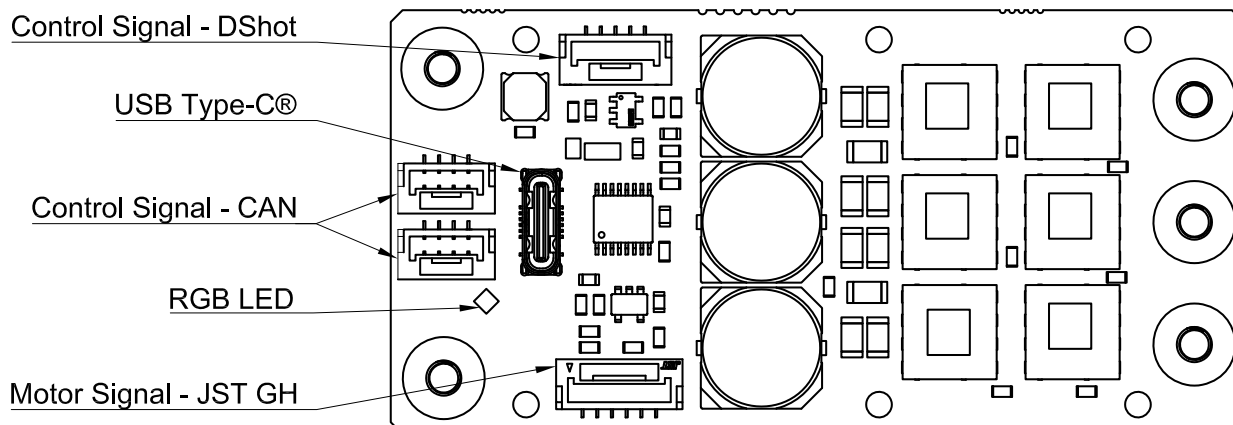
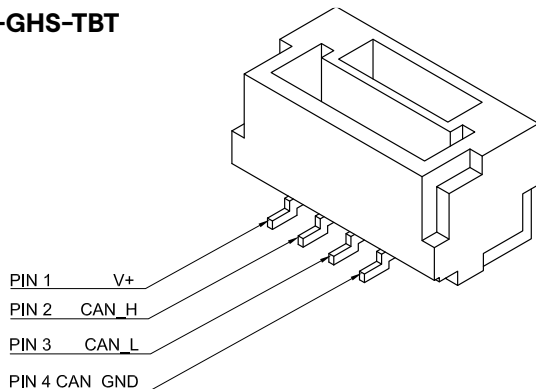
Mates to:
JST GHR-05V-S



Control Signal - CAN

JST BM04B-GHS-TBT

Mates to:
JST GHR-04V-S





12 Powered by GateKEEPER

GateKEEPER is a unified technology core that underpins the next generation of Hargrave Technologies' motor controllers. It encompasses everything we've learnt through over a million flight hours with our development partners and extends it with CAN, sensored drive, extended onboard logging and enhanced current measurement.

Using GateKEEPER, we can share a common hardware and firmware foundation across all of our inverters, so they can all benefit from the diversity and longevity of applications demanded by modern UAS. A flight hour on one GateKEEPER ESC is a flight hour across all GateKEEPER ESCs, allowing us to minimise long term reliability risks across our entire product range.

We can also use GateKEEPER to rapidly develop bespoke controllers specific to your application, with the reliability of an extensively flight-validated core shared with our COTS products.

Response Ready.

Contact us.

Sales

If you'd like to find out more about how you can take off with microDRIVE LPi, get in touch with our sales engineers at:

sales@hargravetechnologies.com

Documentation

For a detailed technical overview and operations manual, visit:

docs.hargravetechnologies.com

Technical

For any technical questions, please reach out to your technical contact at Hargrave or email us at:

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13 Revisions

Revision	Date	Description
0.9	08/04/2024	Pre Release
1.0	12/04/2024	Full Release

14 Disclaimer

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