microDRIVE|LP

Datasheet

Version 1.0
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Hargrave
Technologies

hargravetechnologies.com

Contents

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.

microDRIVE LP is rated for submersion in fresh water at 1 m (3ft) depth for 30 minutes. Exceeding this can result in unit failure.

Do not attempt to disassemble or modify the product in any way. 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.

microDRIVE LP is the smallest unit in our DRIVE Series, optimised for minimum weight and a micro form factor.

With a modern communications and telemetry suite and advanced environmental protection, microDRIVE LP is ready to tackle the most demanding UAS applications.

02 At a Glance

15 – 60 V
INPUT VOLTAGE

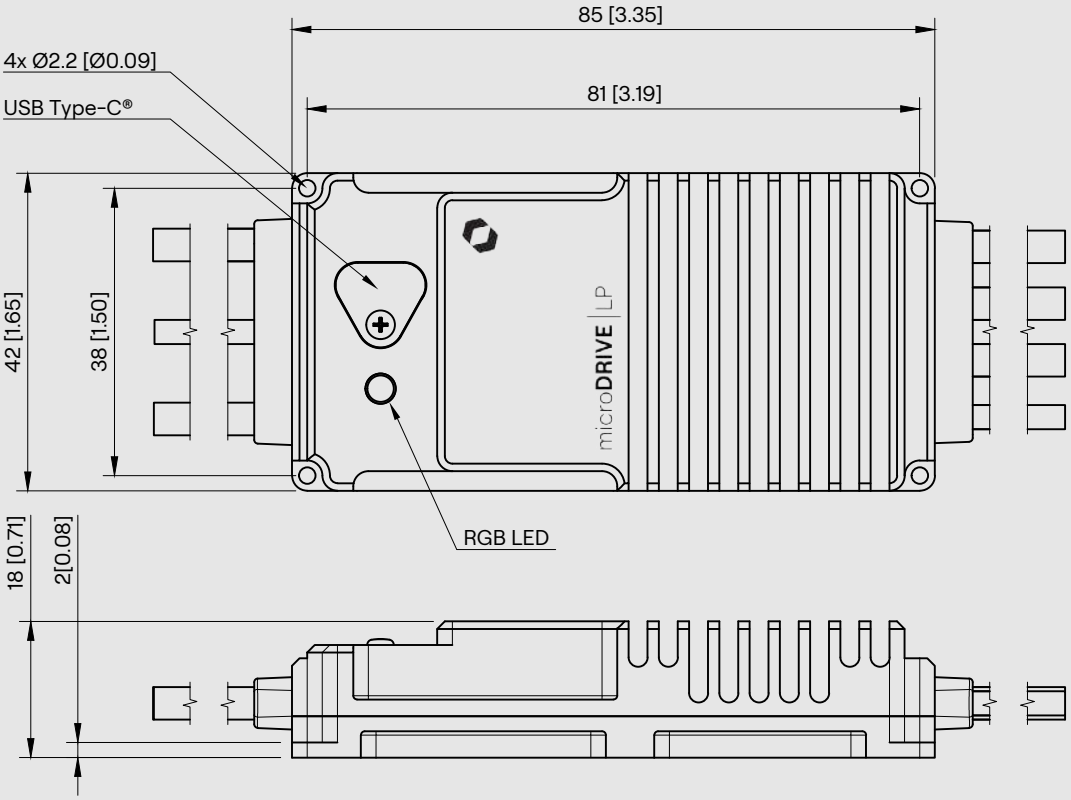
60 A
CONTINUOUS CURRENT

FOCAL
+ TRAPEZOIDAL

DroneCAN
+ DSHOT, PWM

94 g
BASE WEIGHT

IP67
PROTECTION



All dimensions in mm [inches].

See page 15 for cable lengths.

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, refer to page 6 for performance data.
Peak Phase Current	(A)	110	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)	550	Integrated 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 sensored 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)	94 [3.3 oz]	Base weight only, not including cables.
Operating Temperature	(°C)	-20 – 110 [-4 - 230°F]	Continuous operation above 85°C [185°F] may reduce lifetime of unit.
IP Rating		IP67*	*Internally validated, external certification pending.
Cables		✓	See page 15 for ordering options.
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 Performance

Many factors influence the final performance of an ESC in any real world use. This section is intended to provide a simplified method of evaluating ESC performance based on the most critical factors. 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.*

Continuous Phase Current

The continuous phase current capability of the micro**DRIVE** LP is dependent on a number of factors. You can calculate this using the nominal phase current rating, and condition modifiers, which you can determine using these steps:

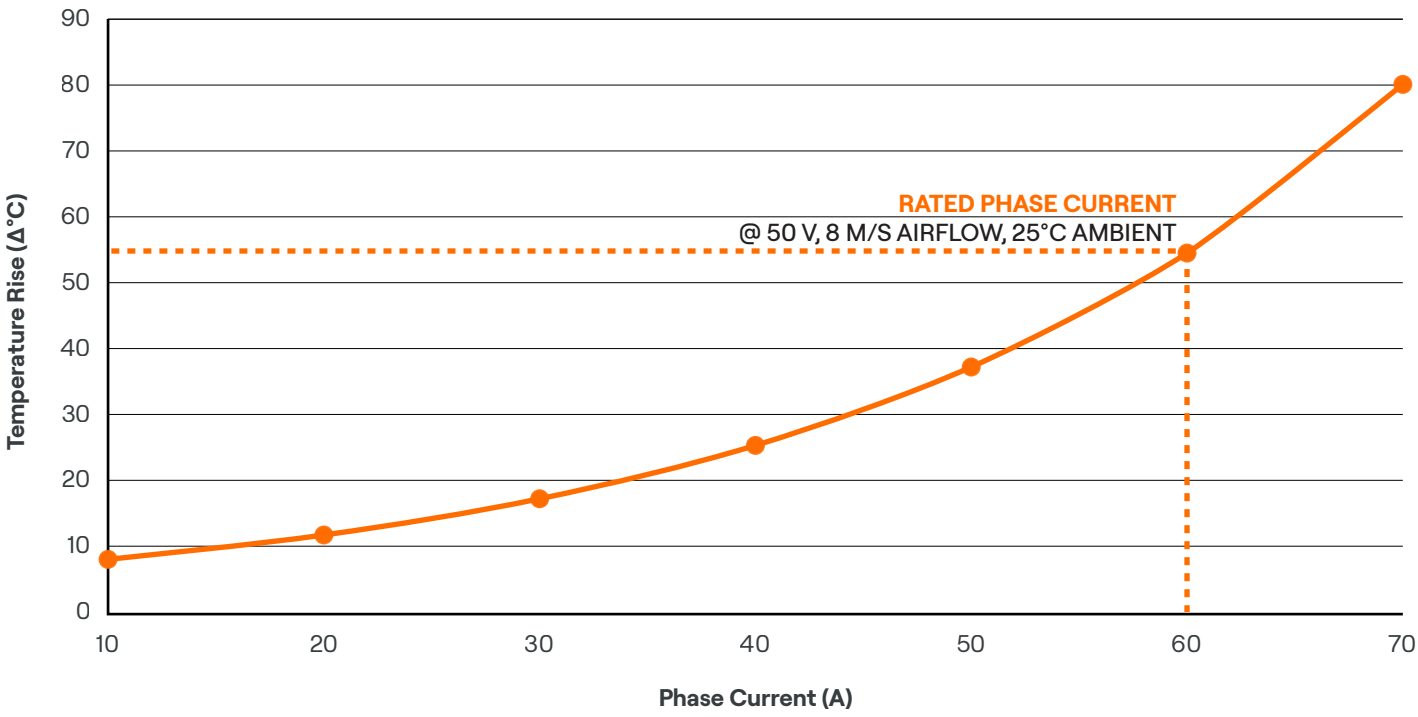
1. Calculate allowable temperature rise for your application.

   $$\text{Allowable } \Delta T = T_{\text{limit}} - T_{\text{amb}}$$

   We recommend a T_{limit} of 85°C [185°F] for long term reliability.
   Up to 110°C [230°F] is available for short term use.
2. Use the allowable temperature rise in the Temperature Rise Graph to work out Rated Phase Current.
3. From the Airflow, Ambient Temperature and Bus Voltage modifier graphs, determine your conditional phase current modifiers.
4. Multiply the calculated Rated Phase Current and conditional Phase Current Modifiers to determine the maximum continuous phase current.

   $$I_{\text{cont}} = I_{\text{rated}} \times M_{\text{airflow}} \times M_{\text{ambient}} \times M_{V_{\text{bus}}}$$

Temperature Rise



Transient Temperature Response

You can also calculate the transient temperature response using the following:

$$T = T_{amb} + T_{ss} - (T_{ss} + T_{amb} - T_{start})\, e^{-\frac{t}{\tau}}$$

where:

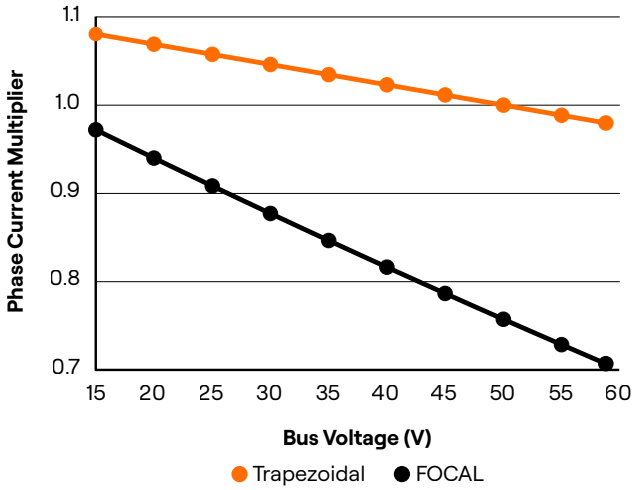
T_{amb}	= Ambient Temperature	(°C)
T_{ss}	= Temperature Rise, using I_{phase}	(°C)
T_{start}	= Unit Temperature at t = 0	(°C)
τ	= Thermal Time Constant	(s)
t	= Time since start	(s)

Speak to us

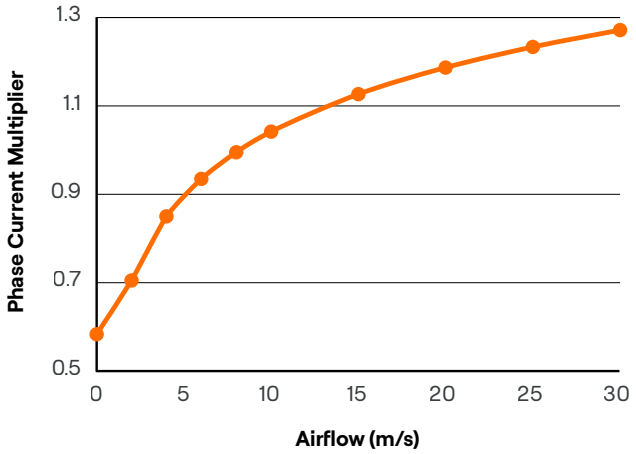
If you have any questions about performance in your application, reach out to our engineering team at:

contact@hargravetechnologies.com

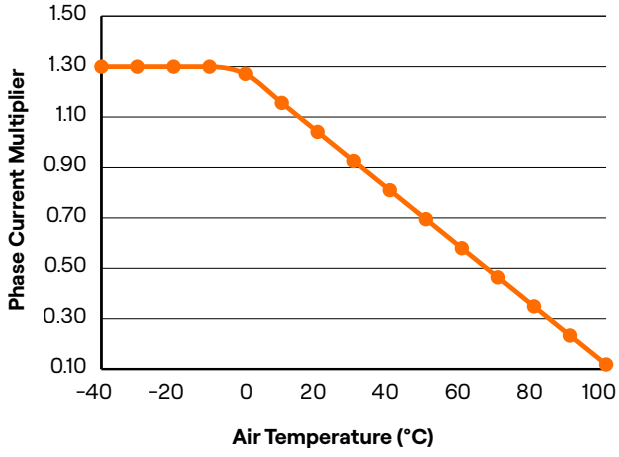
Bus Voltage Modifier $M_{V_{\text{bus}}}$



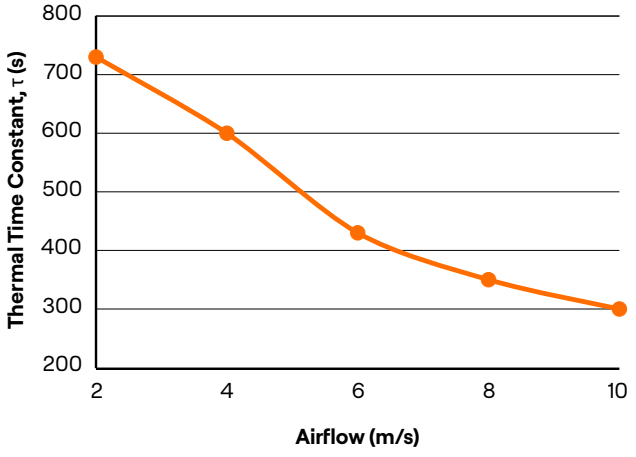
Airflow Modifier M_{airflow}

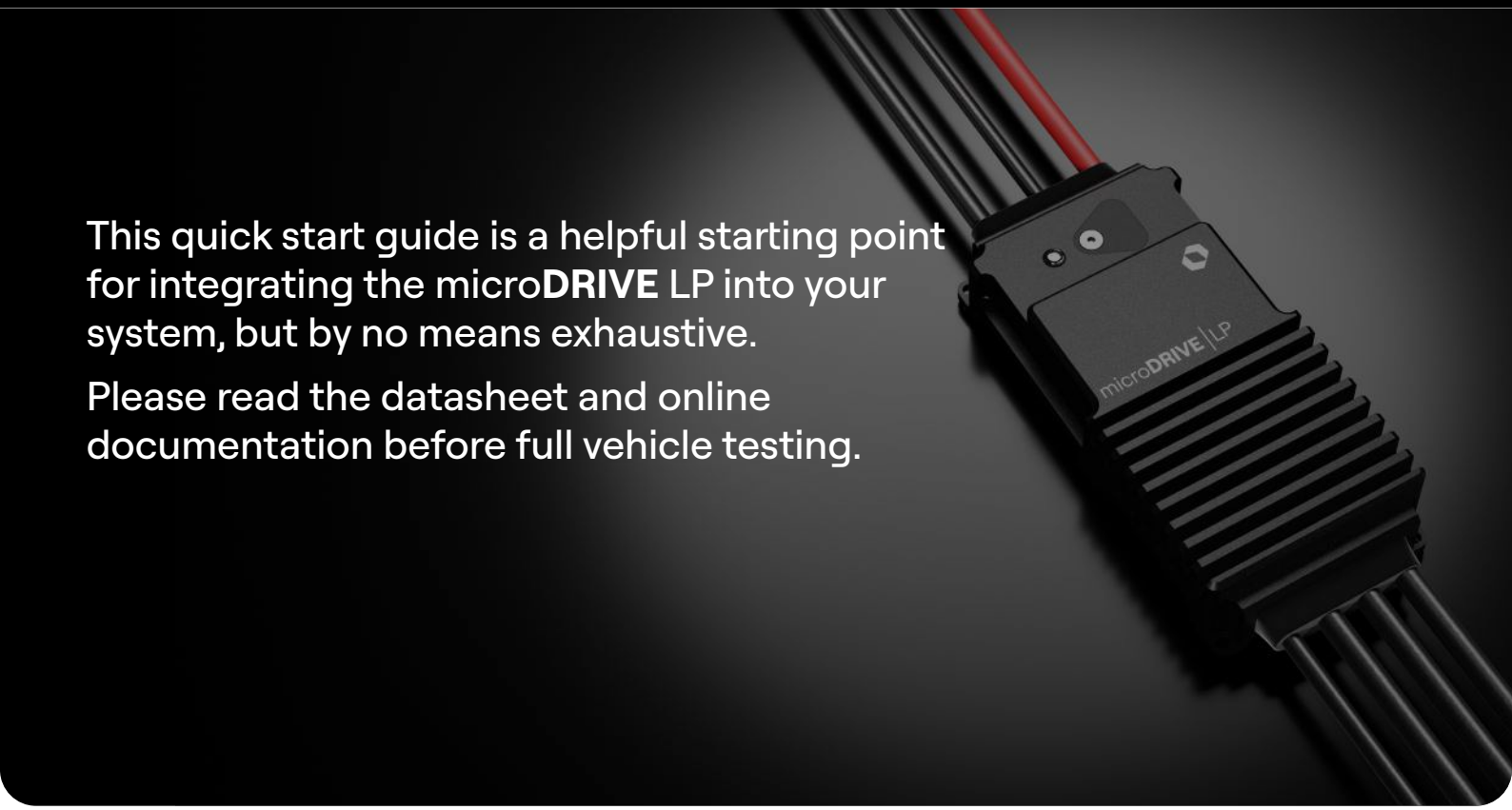


Air Temperature Modifier M_{ambient}



Thermal Time Constant τ





This quick start guide is a helpful starting point for integrating the micro**DRIVE** LP 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** LP with the Hargrave Configurator Tool at:

configurator.hargravetechnologies.com

All settings are also available 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.
- Minimise cable bending radii. Tight bending at the seal may promote water and dust ingress.

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 it's 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 Hargrave if you have any concerns about the capacitance in your application.

Signal Isolator Supply

micro**DRIVE** LP 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.

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** LP offers 4 mounting holes to secure the unit to your application. 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 micro**DRIVE** LP 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 chance of cable joints failing, and improve the reliability of the sealing.

Ingress Protection

The micro**DRIVE** LP is rated to IP67 (IEC 60529).

For water ingress, this allows for immersion in 1 m [3 ft] of water for 30 minutes. Exceeding this could result in damage or failure of the unit.

For dust ingress, the unit is placed under vacuum for up to 8 hours in a dust filled chamber to draw dust in. No dust ingress can be observed.

Any Questions?

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

contact@hargravetechnologies.com

Thermal Management

The micro**DRIVE** LP is offered with an integrated housing that fulfils the thermal management requirements for the unit in most applications. To achieve the full 60 A phase current rating in this configuration, the heatsink will require at least 8 m/s airflow parallel to the heatsink.

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** LP at:

hargravetechnologies.com

Input Signals

The micro**DRIVE** LP 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** LP 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 micro**DRIVE** LP 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** LP 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

XXXXXX - A00 - B00 - C00 - D00

Variant
100500 : Standard
100550 : NDAA*

Control Signal Cable (8 x 28 AWG)
TERMINATION

A : Bare Wire
B : CAN (JST GHR-04V-S)
C : DShot (JST GHR-05V-S)

LENGTH

01 :	50 mm	(1.97 in)
03 :	**150 mm**	**(5.91 in)**
06 :	300 mm	(11.81 in)
12 :	600 mm	(19.69 in)
20 :	1000 mm	(39.37 in)
30 :	1500 mm	(59.06 in)

Bus Power Cables (12 AWG)
TERMINATION

A : Bare Wire
B : XT60

LENGTH

01 :	50 mm	(1.97 in)
03 :	**150 mm**	**(5.91 in)**
06 :	300 mm	(11.81 in)
12 :	600 mm	(19.69 in)
20 :	1000 mm	(39.37 in)
30 :	1500 mm	(59.06 in)

Motor Signal Cable (6 x 28 AWG)
TERMINATION

0 : No Cable
A : Bare Wire
B : Motor (JST GHR-06V-S)

LENGTH

01 :	50 mm	(1.97 in)
03 :	150 mm	(5.91 in)
06 :	300 mm	(11.81 in)
12 :	600 mm	(19.69 in)
20 :	1000 mm	(39.37 in)
30 :	1500 mm	(59.06 in)

Motor Power Cables (12 AWG)
TERMINATION

A : Bare Wire
B : MR30

LENGTH

01 :	50 mm	(1.97 in)
03 :	**150 mm**	**(5.91 in)**
06 :	300 mm	(11.81 in)
12 :	600 mm	(19.69 in)
20 :	1000 mm	(39.37 in)
30 :	1500 mm	(59.06 in)

Bolded options represent default configuration.
For example, this configuration would be 100500-B03-A03-0-A03

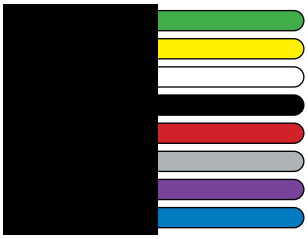
*The secret is in the source

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.

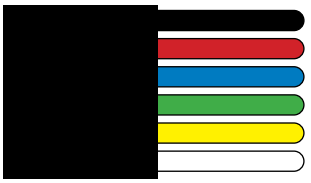
11 Pinouts

Control Signal - Bare Wire



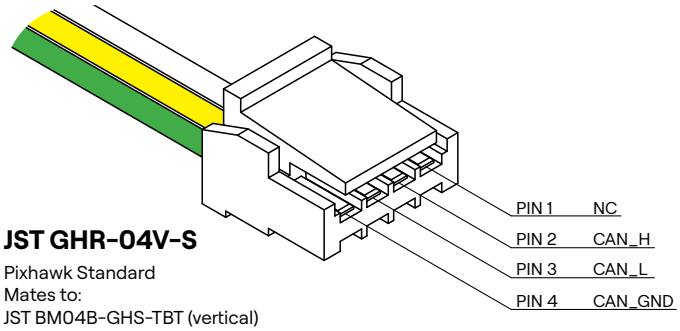
GREEN	CAN_GND
YELLOW	CAN_L
WHITE	CAN_H
BLACK	DSHOT_GND
RED	DSHOT_V+
GREY	DSHOT
PURPLE	DSHOT_TLM
BLUE	RXD

Motor Signal - Bare Wire



BLACK	GND
RED	5V
BLUE	HALL_C
GREEN	HALL_B
YELLOW	HALL_A
WHITE	MOT_NTC

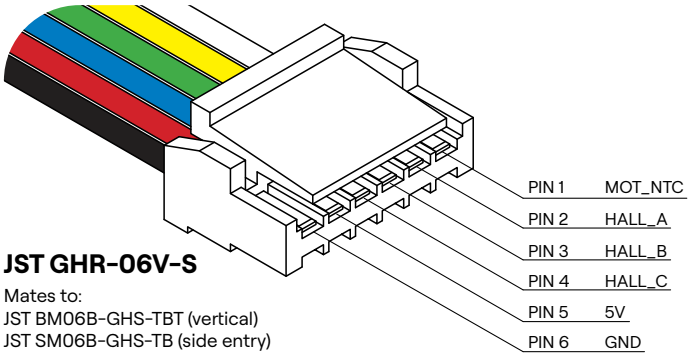
Control Signal - CAN



JST GHR-04V-S

Pixhawk Standard
Mates to:
JST BM04B-GHS-TBT (vertical)
JST SM04B-GHS-TB (side entry)

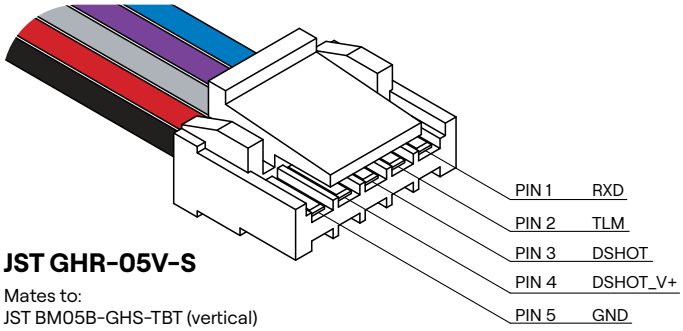
Motor Signal - JST GH



JST GHR-06V-S

Mates to:
JST BM06B-GHS-TBT (vertical)
JST SM06B-GHS-TB (side entry)

Control Signal - DShot



JST GHR-05V-S

Mates to:
JST BM05B-GHS-TBT (vertical)
JST SM05B-GHS-TB (side entry)

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 LP, 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:

contact@hargravetechnologies.com

13 Revisions

Revision	Date	Description
0	16/02/2024	Initial Release

14 Disclaimer

This electronic speed controller (ESC) datasheet is provided for informational purposes only. This ESC is designed and intended solely for use in uncrewed aerial vehicles (UAVs) and drones. It is not intended for any other applications in which a malfunction or failure may cause loss of life, injury or property damage, including but not limited to crewed aviation.

Hargrave Technologies Pty Ltd (ABN 45 670 453 120) and its Related Bodies Corporate are collectively referred to as "Hargrave". Hardware, software and related technologies described in this document are collectively referred to as "Product".

By using Product, you agree that:

1. Product is specifically designed only for use in UAV propulsion. Any other use is not supported or recommended without consultation with Hargrave.
2. Hargrave Technologies reserve the right to change the data provided in this datasheet at any time without prior notice. It is the responsibility of the user to ensure that they have the most up-to-date information.
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5. Reverse engineering of Product, including but not limited to disassembly, decompilation, or any other attempt to derive the source code or underlying technology, is strictly prohibited.
6. Hargrave shall not be liable for any damages, injuries, or losses arising from the use of Product in unspecified applications.
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11. It is the responsibility of the user to seek guidance from Hargrave for any applications other than UAVs to determine suitability, compliance, and safety.
12. By using Product, you acknowledge and agree to abide by the terms of this disclaimer. If you do not agree with these terms, you must not use Product for any purpose.

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