

MOTION CONTROLLER ESPRIT

INSTALLATION GUIDE



Motion controller Esprit (15A model without option)

Products references : 200-001-001 (15A Model) and 200-002-001 (25A Model)

Version : V1.4

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1 DELIVERED WITH THE PRODUCT

ITEM	15A Model	25A Model
Plug P1 without cable	AMASS XT30ULW-F	AMASS XT60H-F
Plug P3 without cable	AMASS MR30-FB	AMASS MT60-F
Cable P4 (2m)	Binder 79-3465-52-06	

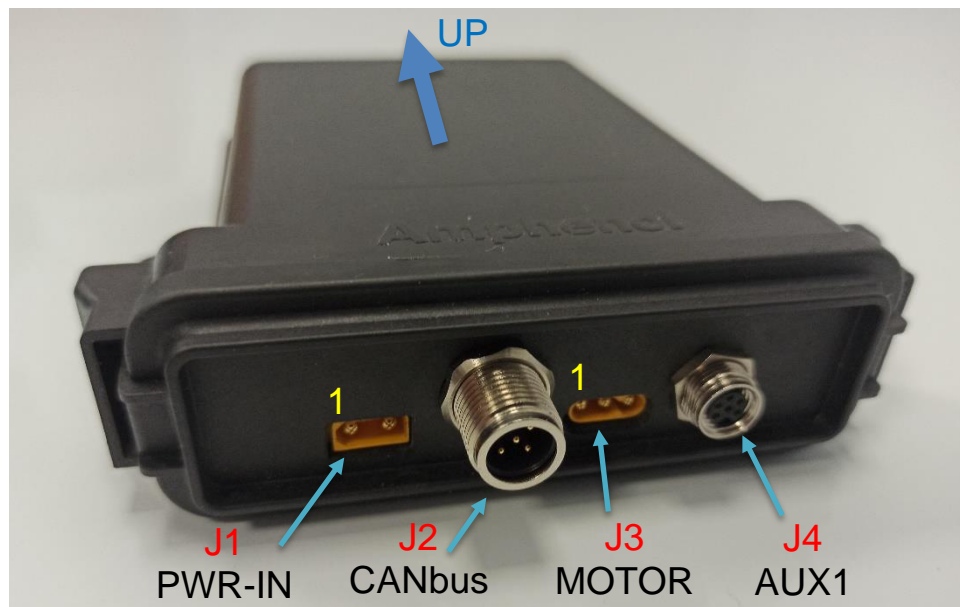
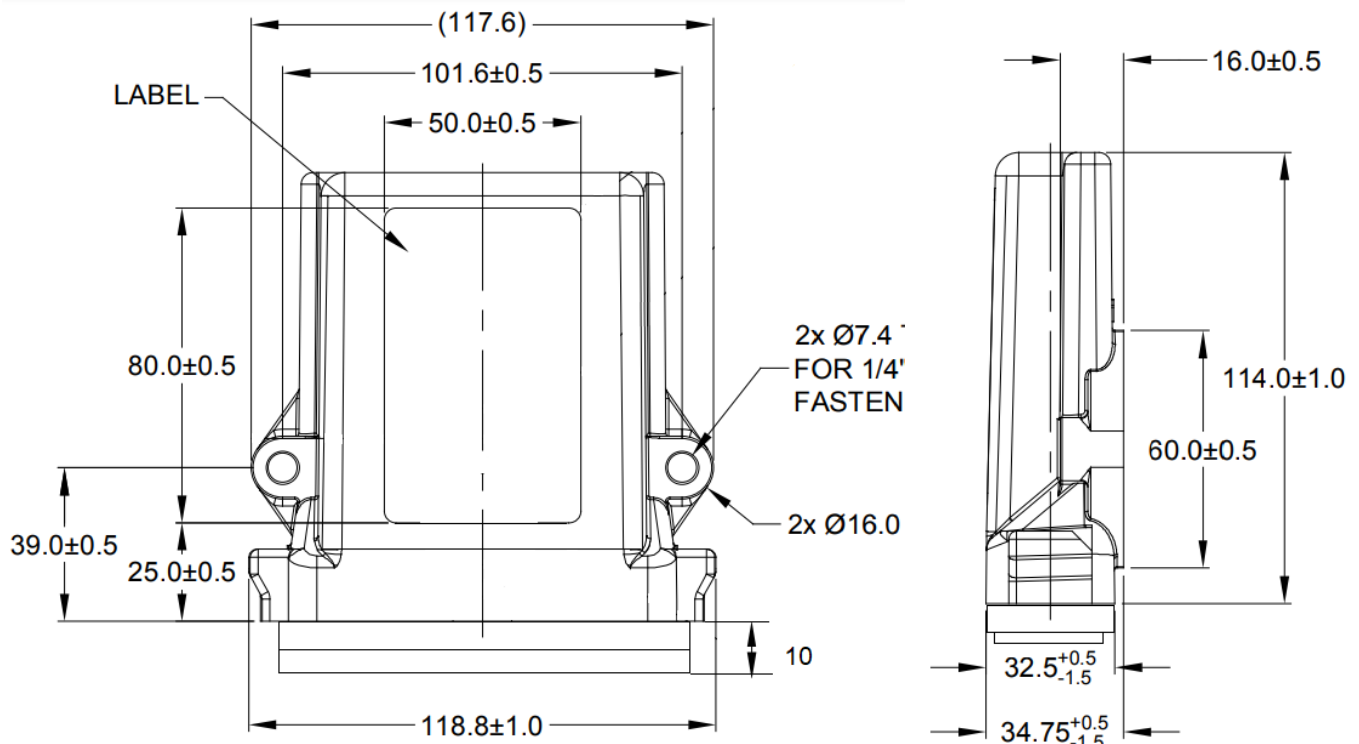
2 HARDWARE SPECIFICATIONS

		ON DEMAND
CPU CORE		
CPU	ARM 32bits, 180Mhz with DSP and FPU	-
MEMORY		
RAM	200 Kbytes	-
FLASH	1 Mbyte	-
FRAM	2 Kbytes	-
NETWORK		
CANbus	1x Isolated CANbus 1Mbps NMEA2000 & DeviceNet Compatible	-
I/O		
Motor Driver	3x H-bridges with voltage and current measures, faults protections Compatible with DC or BLDC motors, MOSFET 200A peak @ 100°C	> 100Khz switch Freq.
Brake/Clutch Driver	1x Low-Side MOSFET PWM, 3A internal SMT Fuse, 54V over voltage protection	-
Position/Speed/Torque feedback	1x 16 bits Analog Input (0-5V, 0-10V, +/- 10V), Resolution << 0.1° 1x 5V/1A Reference Supply (Protected) Motor currents measurements J1939/NMEA2000 feedback	Up to 18 bits converter Up to 3 x additional 12 bits Analog Input 3x Hall Effect sensors Input 2x Quadrature input sensor
Serial	-	1x Isolated Multifunction RS232/485 port (Up to 20Mbps in RS485 and 1Mbps in RS232 / 2-wire, software selectable terminators)
PWM	-	2x PWM outputs
OPTIONAL HMI		
Digital Input	-	2x inputs with ESD protections (Buttons compatible)
OLED	-	Internal or External I2C OLED display
SYSTEM		
Jtag	Internal	-
Bootload	Via CANbus	-
SAFETY		
Protections	Reverse voltage 20/30A Fuse	-
Continuous Built In Test	Watchdog Continuous monitoring : Main Power, CANbus and internals voltages, H Bridge over currents & mean power, CPU and MOSFET temperatures. Shorts circuits detections.	-

Driven by the load protection	Safe Brake Control (SBC) Brake output	-
Backup power	Redundant isolated power supply using CANbus	-
Chaining I/O	-	1x Isolated Input (Use Clutch Output)
Fail Operational / Autonomous steering	-	Partial automated steering possible driving a 6 Wires BLDC Motor Control using 2 Redundant Esprit Motion Controllers (ISO26262 ASIL-D compliant)
ELECTRICAL SPECIFICATIONS		
Main Supply Voltage	8 to 54V (up to 12S Li-ion)	60V
CANbus Supply Voltage	9 to 18V	-
Standby Consumption	0.6W on PWR-IN (motor off, no options, feedback and CANbus working)	-
Motor Consumption	15A Model : DC : 15A RMS, 750W BLDC : 18A RMS, 900W 25A Model : DC : 25A RMS, 1.25KW BLDC : 30A RMS, 1.5KW Note : At 45°C ambient. Power for 50V	Active cooling : DC 40A RMS, BLDC 60A RMS
MECHANICAL SPECIFICATIONS		
Dimensions	118 x 120 x 38 mm	OEM board : 93 x 86 x 21 mm
Protection	IP67	
Enclosure Material	Black Thermoplastic	Transparent Thermoplastic (For Internal OLED Display)
Cooling	Passive cooling, fanless design 25A Model : Graphite heat sink	-
Weight	250 gram	-
OVER-NORMATIVE FEATURES		
Filtering	Passive LC Power Supply Filter	Active Power Supply Filter
Underwater Acoustic Compatibility	-	Parametrable PWM Frequency TDMA
COMPLIANCE		
Regulatory	CE (*)	FCC
EMC	EN 55032/5, EN 61000-6-2, EN 61000-6-3 (*)	-
Safety	EN/UL/IEC 62368-1 (*)	-
Inflamability	UL 94 V-0	-
ROHS	Directive 2015/863/EU	-
RELIABILITY AND ENVIRONMENTAL		
MTTF	Maintenance-free, >50 000 hours	
Warranty	2 Years	5 Years
Operation Temperature	-20°C to +60°C Up to + 85°C with low or short burst motor load	Cooled : -20°C to +60°C up to 60A RMS
Storage Temperature	-25°C to 85°C	-
Relative Humidity	10% to 90% (operation) 5% to 95% (storage)	-

(*) In progress

3 MECHANICAL INSTALLATION



Esprit Motion controller (15A model without option)

Notes :

- Install the enclosure with the connectors downward.
- Reserve 60mm for the plugs and cables.

4 ELECTRICAL INTERFACES

4.1 Sockets :

Ref	Function	Type
J1	Main Power Input	15A or 25A, 2 contacts
J2	Isolated CANBus and Fail-Safe Power Input	M12, 5 pins male A-coded shielded – (NMEA2000& DeviceNet compatible)
J3	Motor outputs	15A or 25A, contacts
J4	Auxiliary 1 : Brake/Clutch solenoid and position feedback	Amphenol M8 - 6 pins male + shield

4.2 Pinouts :

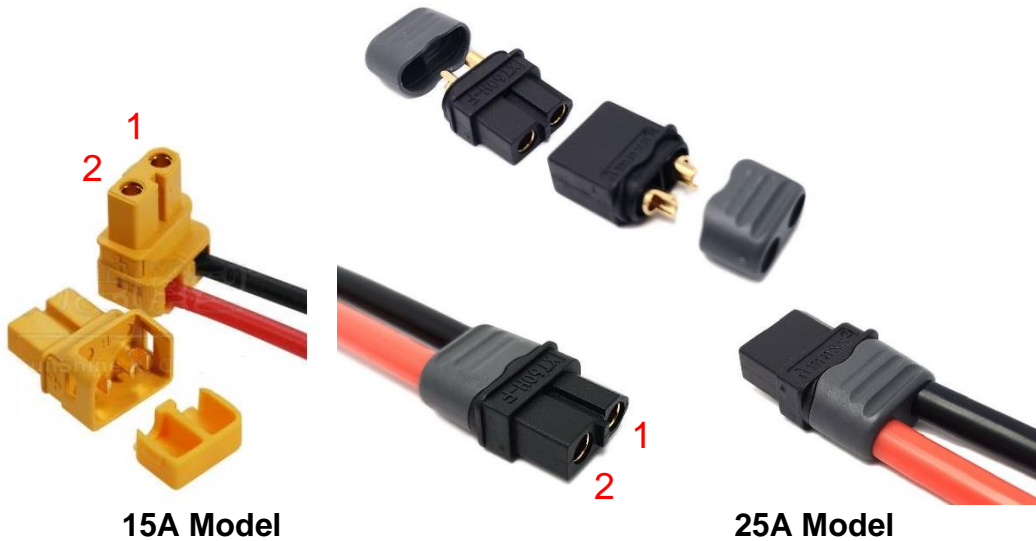
Pin	J1 PWR-IN	J2 CANbus	J7 MOTOR DC	J7 MOTOR BLDC	J4 AUX1
6	-	-	-	-	5V-OUT-ANA Pink
5	-	CAN-Low Blue	-	-	ANA-IN1 Grey
4	-	CAN-High White	-	-	PWR-OUT (2) Black
3	-	GND-CAN (1) Black	MOT-	W	SOLENOID – Blue
2	PWR-IN	FS-PWR-IN Red	-	V	SOLENOID+ White
1	GND	Shield	MOT+	U	GND-ANA (3) Brown

(1) Isolated port

(2) Repeat PWR-IN Voltage after protections and high side switch
A regulated 12V +/-2V is also possible (hardware option)

(3) Filtered ground connected to GND in low frequency

4.3 P1 / PWR-IN : Plug pinout

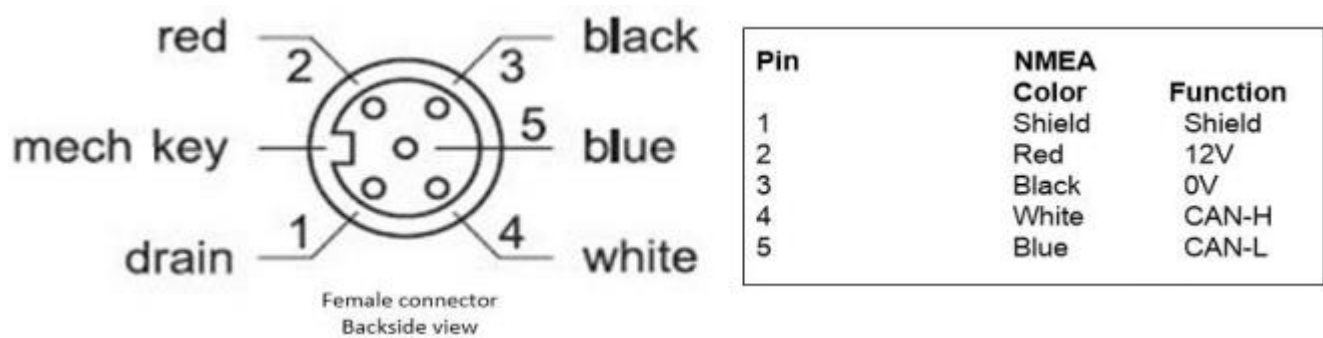


References :

15A : AMASS XT30ULW-F or AMASS XT30U-F, 2 contacts

25A : AMASS XT60H-F – 2 contacts

4.4 P2 / CANbus : NMEA2000 Plug pinout



4.5 P3 / MOTOR : Plug pinout

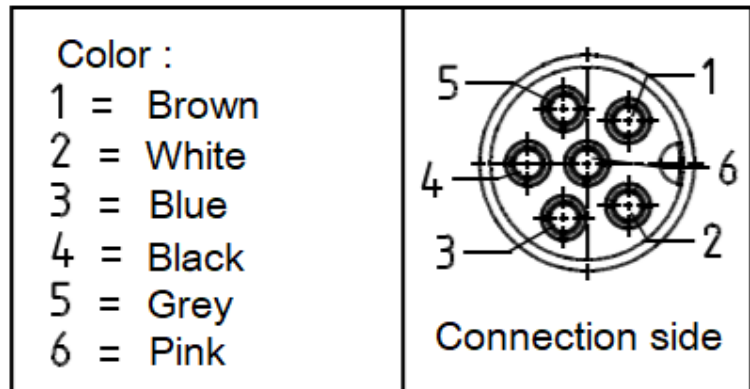


References :

15A : AMASS MR30-FB, 3 contacts

25A : AMASS MT60-F, 3 contacts

4.6 P4 / AUX1 : M8 cable pinout and colors



Reference : Binder 79-3465-52-06, L=2m

Notes :

- Potentiometer feedback : Use 5V-OUT-ANA, ANA-IN1, GND-ANA pins.
- Actuator with a clutch : Use SOLENOID+ and SOLENOID- pins.

5 MAINTENANCE

No maintenance is required for this electronic.

Note : The motion controller gives the working time of the motor for a preventive maintenance of a DC brushed motor.