

# QUANTUM LITE

## INSTALLATION GUIDE



**Product reference : 200-003-001**

*Version : V1.2*

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## 1 DELIVERED WITH THE PRODUCT

Fixing : 3M Dual Lock removable adhesive tape.

Plugs : 3 Binder 620 connectors.

## 2 HARDWARE SPECIFICATIONS

	Quantum Lite	Quantum Ultima	On demand
<b>CPU Core</b>			
<b>CPU</b>	ARM v8 Quad-core, 64 bits, 1.5Ghz	ARM v8 Quad-core, 64 bits, 1.5Ghz	Up to 2.4Ghz with overclocking.
<b>Memory</b>			
<b>RAM</b>	4GB LPDDR4	8GB LPDDR4	-
<b>µSD-Card</b>	64GB 1536 TBW 10 years 24h in sea water	256GB 1536 TBW 10 years 24h in sea water	Up to 1TB
<b>eMMC</b>	-	32GB	-
<b>External Storage</b>	Via USB3, IP, cloud	Via IP, cloud	-
<b>Network &amp; Wireless</b>			
<b>LAN</b>	1000Mbps Ethernet		More LAN with USB3 interface
<b>Wireless</b>	WIFI 2.4/5.0 GHz, Bluetooth 5.0, BLE		Long Range Wifi, LoRa, SigFox, Zigbee, Cellular... possible using an external USB or Ethernet expansion
<b>I/O</b>			
<b>CANbus</b>	1x CANbus (1Mbps) 1x Isolated CANbus (1Mbps)		More CANbus with USB or Ethernet expansion
<b>Serial</b>	1x RS232 port (460Kbps / 2-wire) 1x RS232 port with PPS input (3-wire) 1x isolated Multifunction RS232/422/485 port (250Kbps or 1Mbps / 4-wire)		More Serials with USB or Ethernet expansion
<b>USB</b>	2x USB2.0 ports 2x USB3.0 ports	-	-
<b>Other</b>	-		2 PWM outputs
<b>System</b>			
<b>RTC</b>	+/- 5PPM On-board coin-cell battery GNSS-PPS clock synchronisation		+/- 1PPM
<b>Watchdog</b>	Parametrable Watchdog		-
<b>Electrical Specifications</b>			
<b>Supply Voltage</b>	8 to 18V		-
<b>Power Consumption</b>	2.5 - 5W depending on system load	3 - 6W depending on system load	-
<b>Mechanical Specifications</b>			
<b>Dimensions</b>	96 x 76 x 34mm	116 x 76 x 34mm	OEM boards on demand

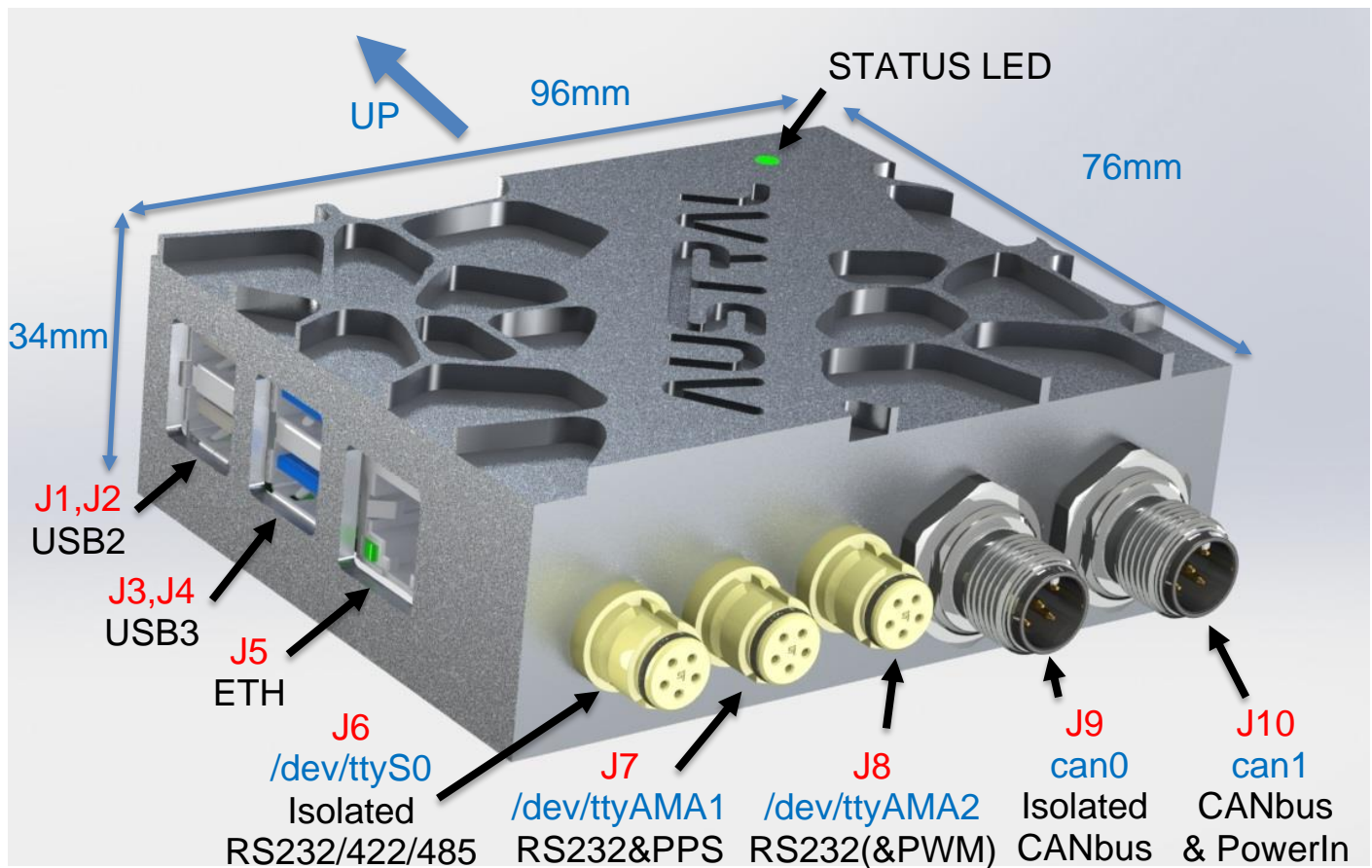
<b>Protection</b>	IP20	<b>IP67</b>	-
<b>Enclosure Material</b>	Anodized aluminium housing		-
Cooling	Passive cooling, fanless design		-
Weight	300 gram	360 gram	-
<b>Compliance</b>			
Regulatory	CE (*)		FCC (*)
Marine	-	NF EN 60945:2002 + Corrigendum 2008 (*)	Specifics Standards on demand
Radio	Europe (Directive 2014/53/EU), US (FCC Part 15)		-
Spectrum	EN 300 328, EN 301 893		-
EMC	EN 55032/5, EN 61000-6-2, EN 61000-6-3 (*) Components : EN 301 489-1 et -17, EN 55032 et EN 55024 Class B		-
Safety	EN/UL/IEC 62368-1 (*) Components : EC 60950-1:2005, EN 62311:2008, UL 2500V, CSA, VDE, DIN EN 60747-5-2 (VDE 0884 Part2): 2003-01		-
ROHS	Directive 2015/863/EU		-
<b>Reliability and Environmental</b>			
MTTF	>200 000 hours		-
Warranty	2 Years		5 Years
Operation Temperature	0°C to +50°C	<b>-20 to +85°C</b>	Extended range testing on demand
Storage Temperature	-25°C to 85°C		-
Relative Humidity	10% to 90% (operation) 5% to 95% (storage)		-

(\*) In progress



Contain a cell coin battery

### 3 MECHANICAL INSTALLATION



The product is fixed with 2 or 4 pads with the delivered 3M Dual Lock.  
This requires an acetone cleaning.

#### Notes :

Reserve 61mm on the USB/Ethernet (left) side for connectors and cables  
Reserve 72mm on the Serial/CANbus (down) side for connectors and cables

## 4 ELECTRICAL INTERFACES

### 4.1 Sockets :

Ref	Function	Type	Linux Device
J1/J2	USB2	Type A	
J3/J4	USB3	Type A	
J5	Ethernet	RJ45	
J6	Isolated software configurable Multifunction RS232/RS422/RS485	Binder 620 series 5 pins female	<a href="#">/dev/ttyS0</a>
J7	RS232 with PPS input (Hardware option for 2 PWMs outputs)	Binder 620 series 5 pins female	<a href="#">/dev/ttyAMA1</a>
J8	RS232 (Hardware option for PWMs output)	Binder 620 series 5 pins female	<a href="#">/dev/ttyAMA2</a>
J9	Isolated CANBus	M12, 5 pins male A-coded shielded (NMEA2000 standard)	<a href="#">can0</a>
J10	CANBus and Power Input	M12, 5 pins male A-coded shielded (NMEA2000 standard)	<a href="#">can1</a>

### 4.2 Pinouts :

Pin	J6 (6) ISO RS422	J6 (6) ISO RS485	J6 ISO RS232	J7 RS232 & PPS	J8 RS232 (& PWM)	J9 ISO CANbus	J10 CANbus & POWER
5	TXD-	DATA-	TXD	TXD	TXD (2)	CAN-Low <a href="#">Blue</a>	CAN-Low <a href="#">Blue</a>
4	RXD-	-	-	PWR-OUT (3)	PWR-OUT (3)	CAN-High <a href="#">White</a>	CAN-High <a href="#">White</a>
3	RXD+	-	RXD	RXD	RXD	GND-CAN <a href="#">Black</a> (1)	GND <a href="#">Black</a>
2	TXD+	DATA+	-	PPS-IN (4)	- (2)	- <a href="#">Red</a>	PWR-IN <a href="#">Red</a> (5)
1	GND-SER (1)	GND-SER (1)	GND-SER (1)	GND	GND	Shield (1)	Shield

(1) Isolated ports

(2) Can be a PWM out (Hardware Option)

(3) Repeat PWR-IN voltage after reverse and over voltage protections and high-side switch. Can be use to power a low power sensor by the calculator (3A internal SMT fuse).

(4) Connected to the CTS, +/- 12V tolerant

(5) The calculator is powered by the NMEA2000 (Reverse battery protection and Internal SMT fuse)

(6) The 120 ohm termination resistor is not include.

### 4.3 Power supply :

The Quantum calculator is powered by the J10 CANbus Connector.  
Note that the specified NMEA2000 voltage range is 9V to 15 Volts.

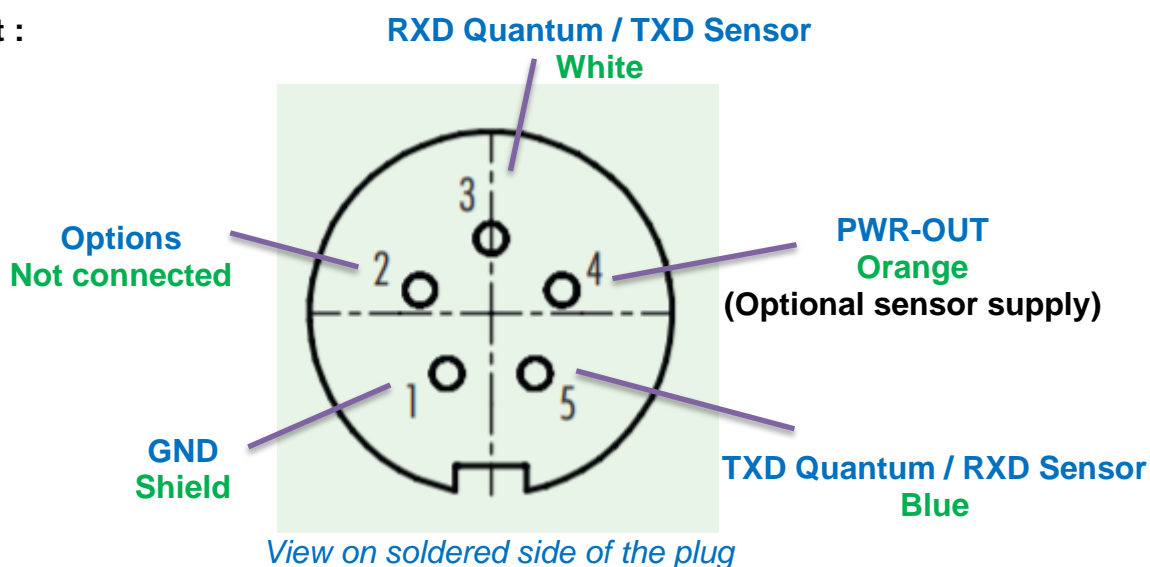
### 4.4 RS232 CABLE :

**Plug reference :** Binder 99-9213-400-05

**Recommended aviation cable for sailing competition and drones :**

- Nexans Filotex KU 05 – 24 (ETFE, Twisted pair, AWG24, 15.1 g/m)
- Nexans Filotex KU 06 – 24 (ETFE, 3 wires, AWG24, 18.5 g/m)

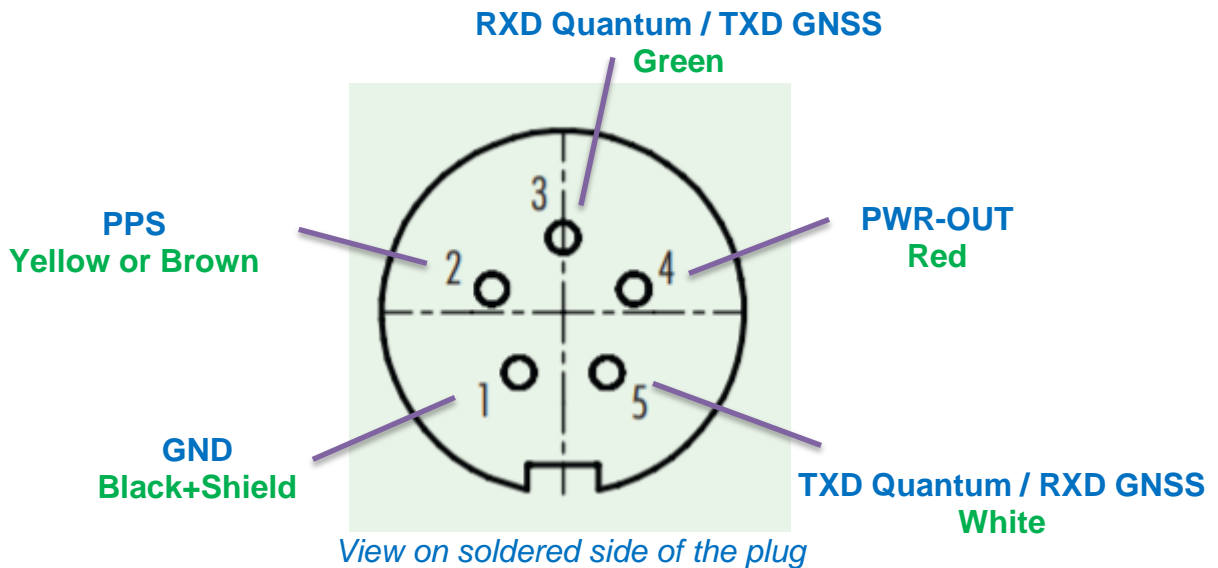
**RS232 Pinout :**



#### 4.5 GNSS TIME SYNCRONISATION :

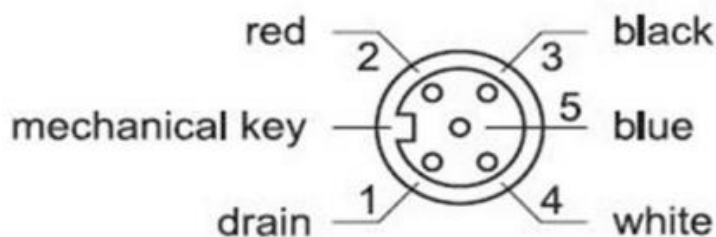
You can synchronise the time with NTPD or a USB GNSS antenna. If you require a very precise time synchronisation, we recommend to connect J7 to an RS232 GNSS antenna with PPS. Add a 1Kohm resistor between PPS and PWR-OUT if the PPS is an Open Collector type.

Note :The following colors are made for a Navilock RS232 GNSS with cutted MD6 cable.



#### 4.6 CANBUS CABLE :

We recommend to use an on the shelf NMEA2000 Micro or DeviceNet cable. The plug type is : M12, 5 pins male A-coded shielded. For a big ship and high amps wiring, you can use a Mini to Micro Adapter.



Female connector  
Backside view

Pin	NMEA Color	Function
1	Shield	Shield
2	Red	12V
3	Black	0V
4	White	CAN-H
5	Blue	CAN-L



## 5 MAINTENANCE

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This product include a CR1220 coin cell in order to maintain the Real Time Clock and datalog at startup with the correct time without waiting an NTP or GNSS time synchronisation.

The service life of this cell is more than 15 years in a protected environnement (20°C) and power off.

Contact the after sale in order to change this coin cell.