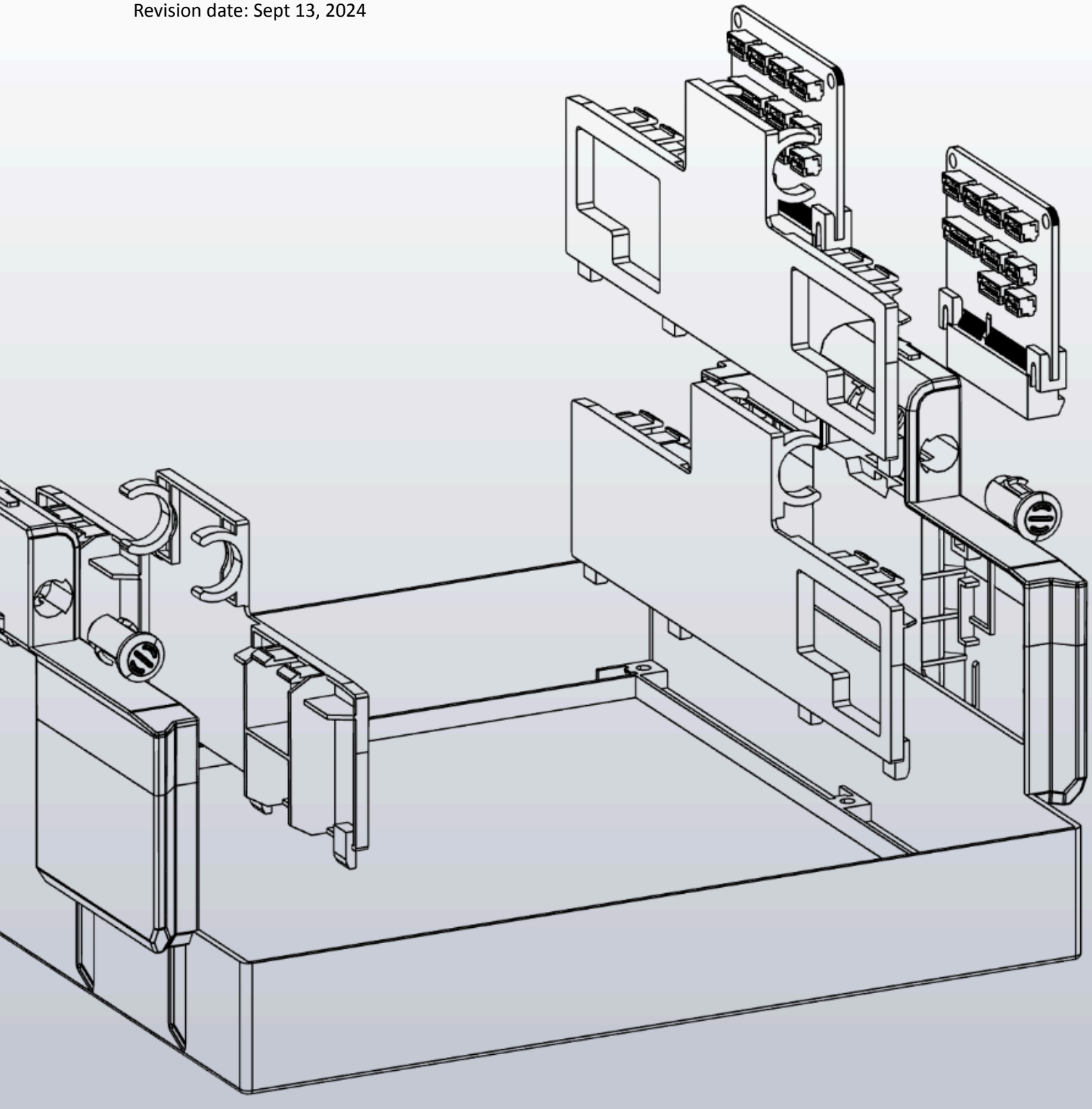
DELTAQUAD

Custom Payloads

Datasheet

Revision: 0.1.0
Revision date: Sept 13, 2024



Document Information

Revision	Date	Description
DRAFT	September 13, 2024	Preliminary release of the datasheet

Table of Contents

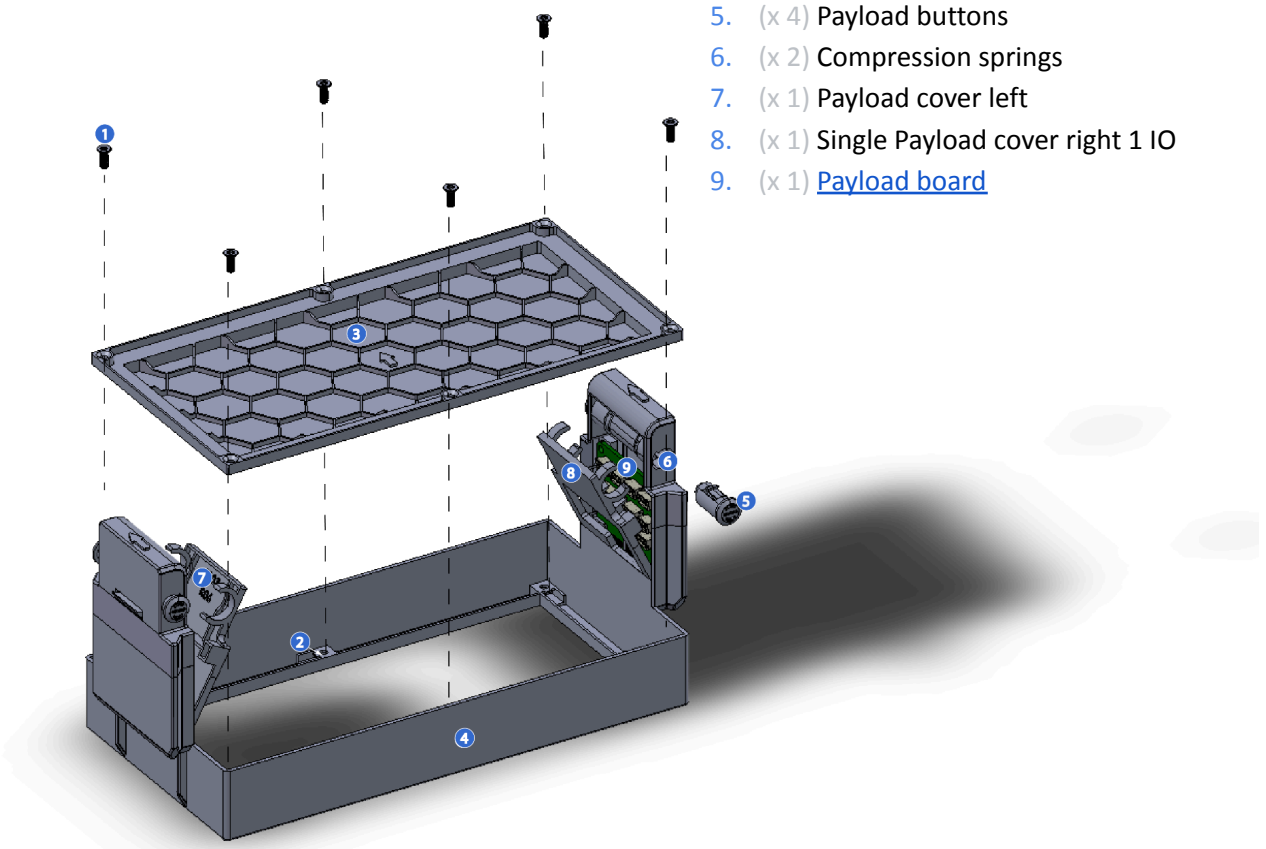
Product Description

The DeltaQuad Custom Payloads products are custom development kits that come with everything required to design and integrate your own payload. The 3D models are available and can be modified to mount your payload, attaching it directly to the provided box/bracket/plate, so the payload can be tool-less integrated into any Evo unit.

Product Variants

Custom Single Payload

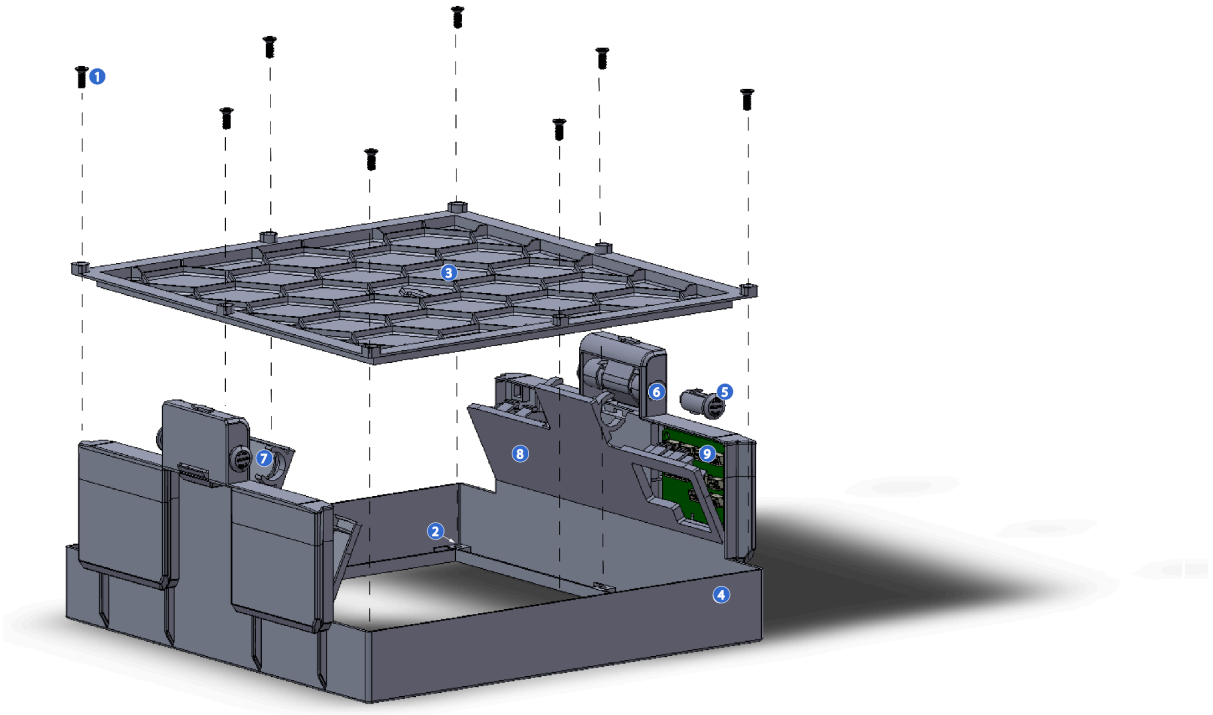
Empty Dimensions	225.6 x 103 x 107.5 mm W x D x H
Components	1. (x 6) M3 x 8 mm Torx 10 countersunk screws[1] 2. (x 6) M3 square nut 3. (x 1) Custom Single Payload plate[2] 4. (x 1) Custom Single Payload box 5. (x 4) Payload buttons 6. (x 2) Compression springs 7. (x 1) Payload cover left 8. (x 1) Single Payload cover right 1 IO 9. (x 1) Payload board



[1] Default screws used with the default DeltaQuad Custom Single Payload plate.
[2] Default empty plate design. Can be customised.

Custom Dual Payload 1 IO Board

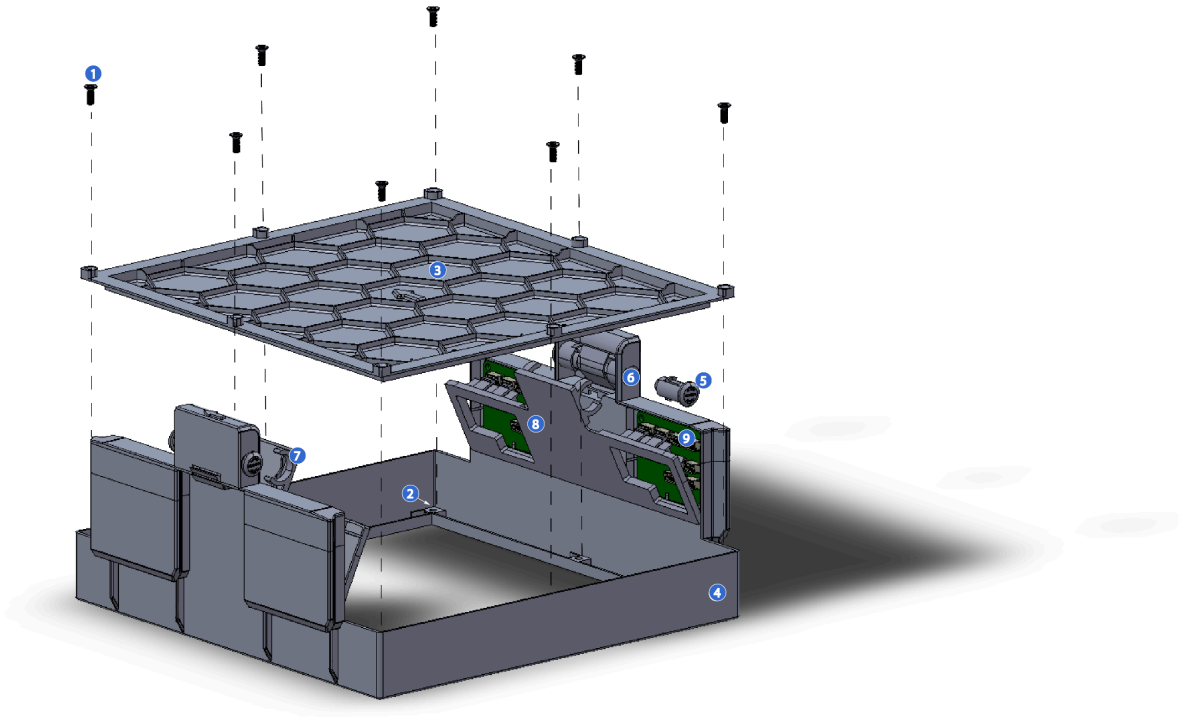
Empty Dimensions	225.6 x 207 x 107.5 mm W x D x H
Components	1. (x 8) M3 x 8 mm Torx 10 countersunk screws[3] 2. (x 8) M3 square nut 3. (x 1) Custom Dual Payload plate[4] 4. (x 1) Custom Duel Payload box 5. (x 4) Payload buttons 6. (x 2) Compression springs 7. (x 1) Payload cover left 8. (x 1) Dual Payload cover right 1 IO 9. (x 1) Payload board



[3] Default screws used with the default DeltaQuad Custom Dual Payload plate.
[4] Default empty plate design. Can be customised.

Custom Dual Payload 2 IO Boards

Empty Dimensions	225.6 x 207 x 107.5 mm W x D x H
Components	1. (x 8) M3 x 8 mm Torx 10 countersunk screw[5] 2. (x 8) M3 square nut 3. (x 1) Custom Dual Payload plate[6] 4. (x 1) Custom Dual Payload box 5. (x 4) Payload buttons 6. (x 2) Compression springs 7. (x 1) Payload cover left 8. (x 1) Dual Payload cover right 2 IO 9. (x 2) Payload board

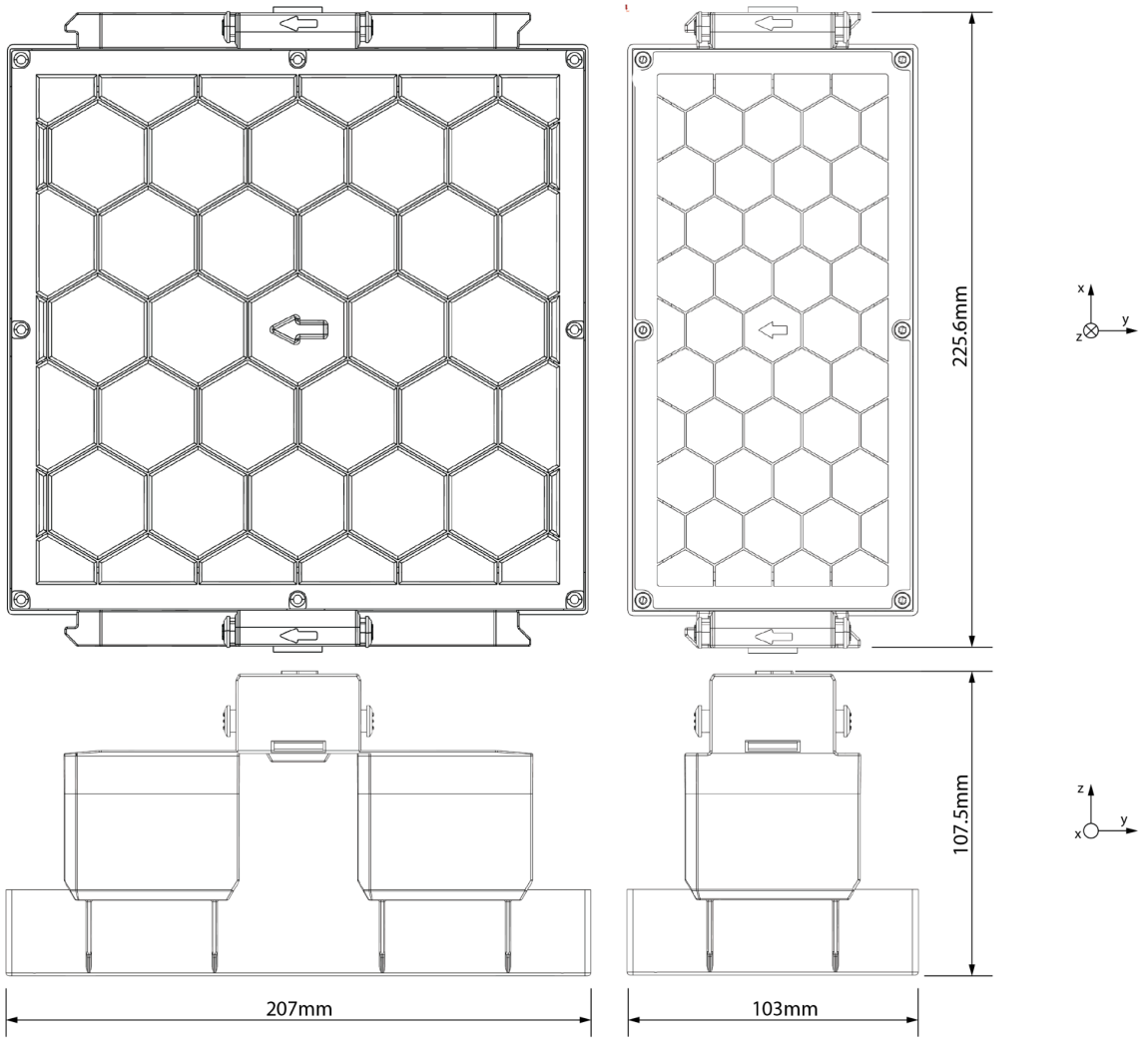


[5] Default screws used with the default DeltaQuad Custom Dual Payload plate.
[6] Default empty plate design. Can be customised.

Payload Plate specifications

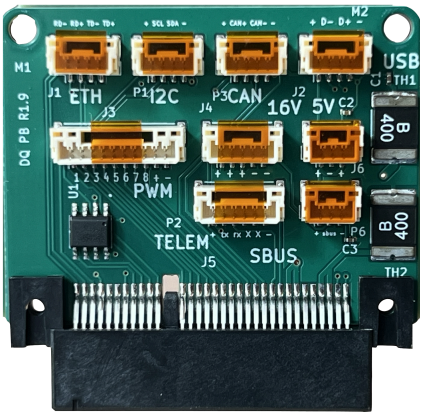
DeltaQuad Custom Payload Plate	*Custom Single Payload plate*	*Custom Dual Payload plate*
	Weight: 22 g CAD File (STEP)	Weight: 32 g CAD File (STEP)
Self Custom Payload Plate	Plates can be designed by the user for custom operation. The DeltaQuad Payload plate CAD files can be used as the initial starting point of the customised Payload plate. The 8 M3 screw holes should remain aligned.	

Empty Custom Payloads Dimensions



Payload Board Specifications

General



Main Benefit	The PCB includes an EPROM chip designed to store payload characteristics based on custom connections.
Interfaces	1x Ethl, 1x I2C, 1x CAN, 1x USB , 8x PWM 1x 16v, 1x 5.3V 1x UART 1x SBUS
Number of boards per payload	Single Payload: 1 Dual Payload: 1 or 2
Total power	The total power drawn from the board should not exceed 2 amps on 5V and 2 amps on 16V. If more power is needed use two Payload boards in parallel. Note that the total current for all payload boards combined should not exceed 4 amps on both 5V and 16V.
Connectors	Standard JST Rx plugs will be used to connect your payload to the PCB, with the pin count (x) adjustable based on your requirements.

Interface Function Map

	Ext	Name	Main Function	Description
J1	✓	ETH	Ethernet	100 Base-TX standard ethernet.
J2	✓	USB	USB 2.0 port	USB 2.0 does not interfere with GPS while USB 3.0 does.
J3	✓	PWM	Pulse-width modulation	Up to 8 Actuators via PWM
J4	✓	5V	5V Power	Max 2 amp, 5 volt
J5	✓	16V	16V Power	Max 2 amp, 16 volt
P1	✓	I2C	Inter-integrated Circuit	I2C from/to FMU
P2	✓	TELEM	Telemetry from FMU over UART	UART TELEM to/from FMU
P3	✓	CAN	Controller Area Network	CAN to/from FMU
P6	✓	SBUS	SERVO signal	Output of all servo channels SBUS

Connector Pin Map

J1 - ETH (BM04B-GHS-TBT(LF)(SN))

Pin	Name	Dir	Lvl	Function
1	RD-	IN		Receive - (Diff.)
2	RD+	IN		Receive + (Diff.)
3	TD-	OUT		Transmit - (Diff.)
4	TD+	OUT		Transmit + (Diff.)

P1 - I2C (BM04B-GHS-TBT(LF)(SN))

Pin	Name	Dir	Lvl	Function
1	+		5.3V	Power for I2C devices , Max 1.0A
2	SCL	I/O	3.3V	I2C SCL
3	SDA	I/O	3,3V	I2C SDA
4	-			Ground

P3 - CAN (BM04B-GHS-TBT(LF)(SN))

Pin	Name	Dir	Lvl	Function
1	+		5.3V	Power for can devices, Max 1.0A
2	CAN+	I/O	5V	
3	CAN-	I/O	5V	
4	-			Ground

J2 - USB (BM04B-GHS-TBT(LF)(SN))

Pin	Name	Dir	Lvl	Function
1	+	OUT	5.3V	USB VBus, Max 1.0A
2	D-	I/O	3.3	USB D-
3	D+	I/O	3.3	USB D+
4	-			Ground

J3 - PWM (BM03B-GHS-TBT(LF)(SN)(N))

Pin	Name	Dir	Lvl	Function
1	1	OUT	3.3V	FMU CH1
2	2	OUT	3.3V	FMU CH2
3	3	OUT	3.3V	FMU CH3
4	4	OUT	3.3V	FMU CH4
5	5	OUT	3.3V	FMU CH5
6	6	OUT	3.3V	FMU CH6
7	7	OUT	3.3V	FMU CH7
8	8	OUT	3.3V	FMU CH8
9	+		5.3V	Power for servos, Max 1.0A
10	-			Ground

J4 - 16 V (BM05B-GHS-TBT(LF)(SN)(N))

Maximum current per Payload board is 2 amps. If the payload requires more current, use two combined Payload boards for a total maximum of 4 amps.

Pin	Name	Dir	Lvl	Function
1	+		16V	Max 1.0A
2	+		16V	Max 1.0A
3	+		16V	Max 1.0A
4	-			Ground
5	-			Ground

J6 - 5 (BM03B-GHS-TBT(LF)(SN)(N))

Maximum current per Payload board is 2 amps. If the payload requires more current, use two combined Payload boards for a total maximum of 4 amps.

Pin	Name	Dir	Lvl	Function
1	5V		5.3V	5V for peripherals, Max 1.0A
2	GND			Ground
3	5V		5.3V	5V for peripherals, Max 1.0A

P2 - TELEM (BM06B-GHS-TBT(LF)(SN)(N))

Pin	Name	Dir	Lvl	Function
1	+	OUT	5.3V	5.3V, Max 1.0A
2	TX	OUT	3.3V	TELEM TX
3	RX	OUT	3.3V	TELEM RX
4	X	NC		Not connected
5	X	NC		Not connected
6	-			Ground

P6 - SBUS (BM03B-GHS-TBT(LF)(SN)(N))

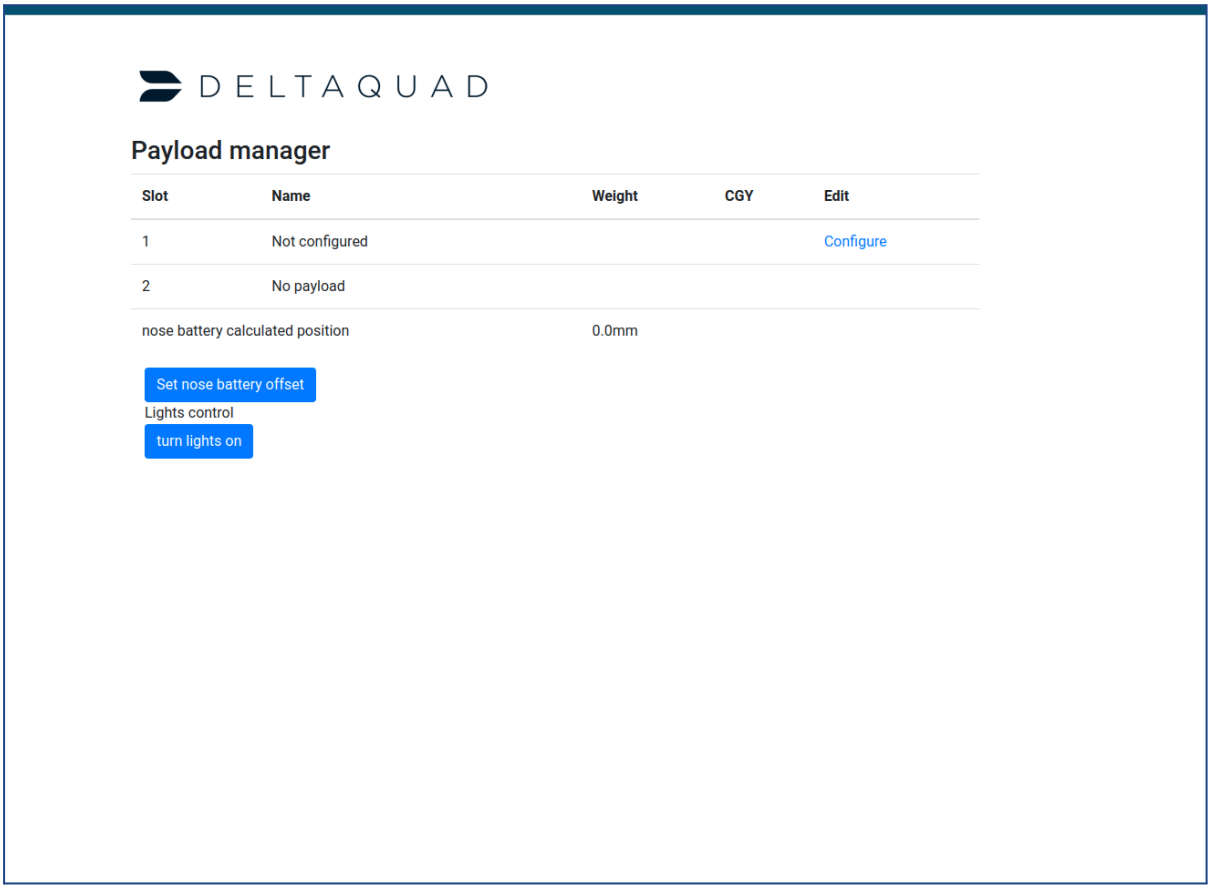
Pin	Name	Dir	Lvl	Function
1	+	OUT	5.3V	Max 1.0A
2	SBUS	OUT	3.3V	SBUS protocol out
3	-			Ground

Programming

Before programming the payload, it's essential to determine both the total weight of the payload and its Center of Gravity (CG) along both the longitudinal (CGY) and lateral (CGX) axes, with special attention to CGY. **These factors will influence the flight characteristics, so execute this step carefully!**

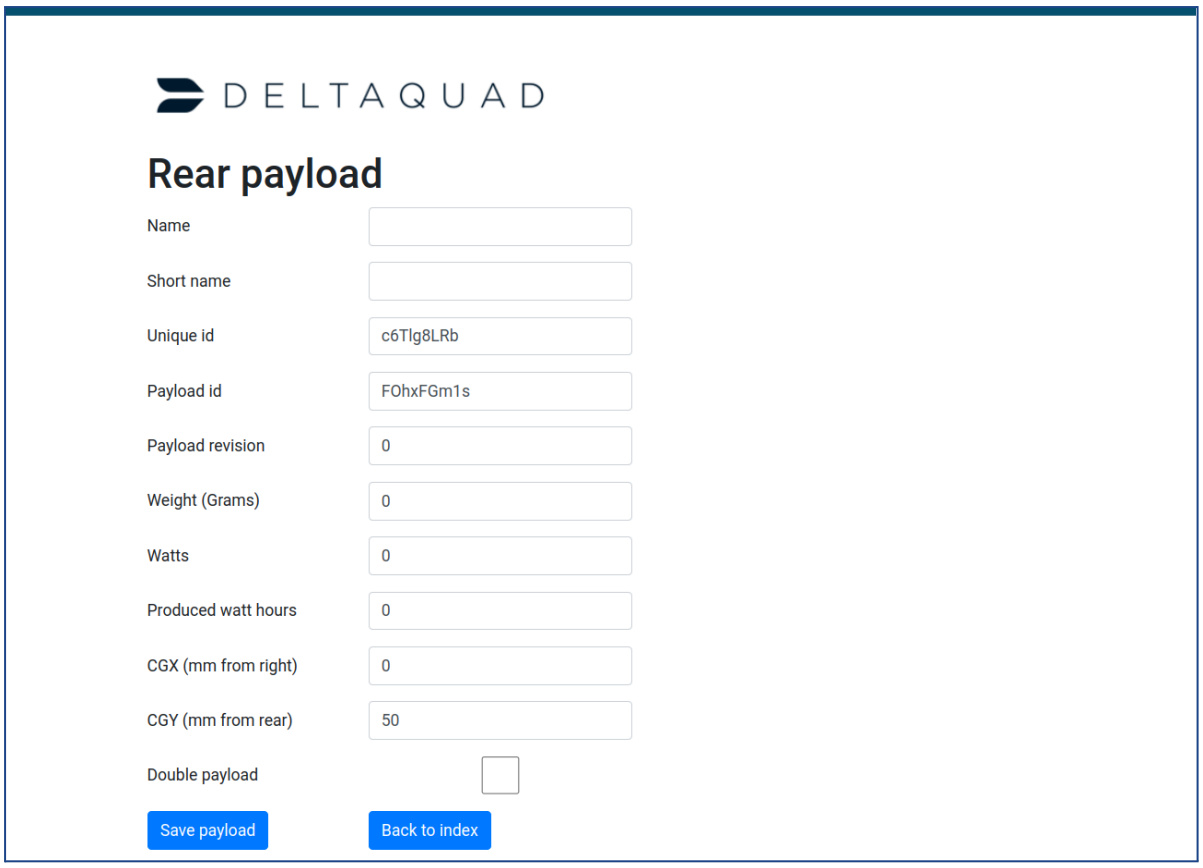
With the USB cable connected to the EVO open a Browser and navigate to 10.41.1.1:5000 or On the controller open 'Evo Control Panel' and navigate to 'Payload Manager'.

This interface will show the following:



Depending on the position of the payload, either slot 1 or slot 2 will show 'Not configured'.
For Dual Payloads with two Payload Boards, both slots will show 'Not configured'. In this case, configure slot 1 and set slot 2 weight to zero!

Click on the 'Configure' link and you will be taken to the next screen.



Here you fill in the following values:

Name	The name that will be show in this web interface
Short name	The name that will be shown on the EVO display and in the logs
Unique id	Unique ID , this will be automatically filled
Payload id	Payload ID , this will be automatically filled
Payload revision	The revision of the payload for keeping track
Weight (grams)	The total weight of the payload
Watts	The total amount of watts used by the payload
Produced watt hours	The amounts produced by the payload
CGX (mm from right)	The Center of gravity in mm from the right
CGY (mm from rear)	The Center of gravity in mm from the rear.
Double payload	Check this if it’s a double payload

Click ‘Save payload’ to store the data on the payload.