

USER MANUAL

DynoX RTS Pro 20

20 kgf Thrust and Torque Test Bench
Assembly, DAQ Setup and Commissioning

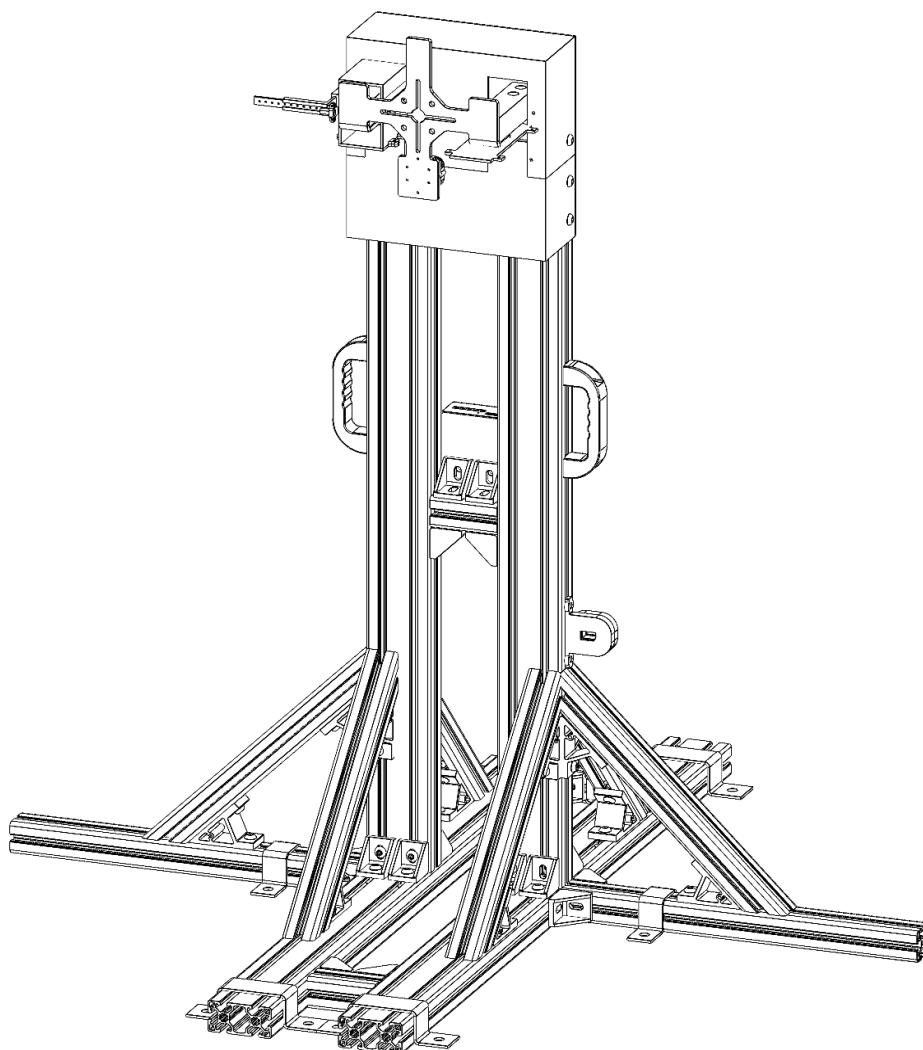


Figure 1 — DynoX RTS Pro 20 thrust stand, complete assembly

READ THIS MANUAL COMPLETELY BEFORE ASSEMBLY OR OPERATION

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1 INTRODUCTION

1.1 Purpose and Scope

This manual describes the assembly, data-acquisition setup, commissioning and safe operation of the DynoX RTS Pro 20 thrust stand. It applies to technicians and engineers with basic mechanical and electrical competence. Section 4 covers mechanical assembly in seven steps. Sections 5 to 7 cover the Data Acquisition (DAQ) unit, wiring and firmware testing.

1.2 System Overview

The DynoX 20 is an engineering-grade propulsion test platform for the characterisation and validation of UAV motors, propellers, ESCs and power systems up to 20 kgf of thrust. It comprises a bolted aluminium extrusion frame, an integrated motor mount carrying the thrust and torque sensor, and a DAQ unit that conditions and digitises all sensor signals for the ROTRIX desktop application.

The DAQ measures:

- Thrust / Torque
- Motor speed / temperature
- ESC temperature
- Vibration
- Battery voltage / current.

Signal route: Thrust-stand sensors → DynoX DAQ → USB → ROTRIXConnect.exe → ROTRIX

1.3 Technical Specifications

Parameter	Value	Parameter	Value
Thrust range	0 – 20 kgf	Vibration range	±16 g
Torque range	0 – 20 N·m	Temperature range	0 – 125 °C
Motor speed range	0 – 25,000 RPM	DAQ supply voltage	9 – 24 V DC
Voltage range	3S – 12S	DAQ power interface	POWER 1 barrel plug POWER 2 XT30
Current range	5 – 150 A	PC interface	USB-C
Propulsion battery	3S – 12S	Motor type	BLDC (brushless DC)
Footprint	845 × 1100 mm	Clear working zone	1745 × 2000 mm

IMPORTANT

The propulsion battery powers the motor and ESC only. The DAQ requires a separate 9 – 24 V DC supply. Never connect the propulsion battery to a DAQ power input.

The frame is suitable for indoor and sheltered use. The sensors, DAQ enclosure and cabling are not weatherproof.

2 SAFETY

2.1 Signal Words

Signal word	Meaning
DANGER	A hazard that will cause death or serious injury if not avoided.
WARNING	A hazard that could cause death or serious injury if not avoided.
CAUTION	A hazard that could cause minor injury, or damage to the bench or the unit under test.
IMPORTANT	A step that must be performed correctly or the assembly cannot be completed, or will not measure accurately.

2.2 Personal Protective Equipment

Operation	Mandatory PPE
Unpacking and handling extrusions	Cut-resistant gloves, safety footwear
Drilling floor anchors	Safety goggles, hearing protection, dust mask, gloves
Mechanical assembly	Safety goggles, gloves
Electrical installation	Safety goggles; remove rings, watches and metal wristbands
Any test with a propeller fitted	Safety goggles or face shield, hearing protection

2.3 General Safety Rules

Always put safety first. It is your responsibility.

1. Do not assemble or lift the frame alone. Additional manpower is required for safe handling. Do not allow children or unauthorised persons in the test area.
2. Confirm that every component and tool listed in Section 3 is present before starting work.
3. Verify that every slide nut is fully engaged in its extrusion channel before applying load. A partly engaged slide nut will pull out of the T-slot under thrust.
4. Inspect all fasteners before every test and re-torque after the first hour of running-in.
5. The stand must be anchored to a solid floor such as reinforced concrete. A soft floor allows resonance at certain rotation speeds, which can destroy the load cell.
6. Never operate the stand with a propeller fitted unless it is inside a guarded enclosure or behind a certified shatterproof barrier, and never stand in the plane of the rotating propeller or directly behind it.
7. Always disconnect the power source and wait for the propeller to stop completely before approaching the stand. Confirm that an emergency stop is within reach of the operator and functions correctly before the first run of each session.
8. Keep the work area clean and free of oil, loose metal chips, flammable liquids and gases. Do not store anything near, above or behind the stand during a test.
9. Do not wear jewellery, loose clothing or lanyards. Tie back long hair.
10. Never exceed the rated limits of 20 kgf thrust, 20 N·m torque, 150 A current and 12S pack voltage. Do not substitute parts, drill additional holes or otherwise modify the frame or the instrument.

3 ITEM CHECKLIST

Unpack the crate on a clean, flat surface and verify every item below against the packing list. Tick each line as you confirm it. Do not begin assembly with missing or damaged parts. Report any shortage or damage to REUDE support before starting work.

ITEMS ARE SUPPLIED PART-ASSEMBLED

All corner brackets, angle brackets and slide nuts are factory-fitted to their extrusions in the positions shown in the step diagrams. You do not need to load slide nuts into the channels.

DO NOT REMOVE OR SLIDE OUT THE PRE-FITTED SLIDE NUTS. These nuts enter a channel from an open end only. Once a joint closes that end they cannot be replaced without dismantling the assembly.

Assembly therefore consists of aligning the supplied sub-assemblies and tightening the M8 bolts at the marked junction points.

✓	Item	Description (as supplied)	Qty	Step
☐	Base rail assembly	Extrusion 40 × 80, corner brackets and slide nuts pre-fitted	2	1
☐	Base cross member	Extrusion 40 × 80 joint block with brackets pre-fitted	2	1
☐	Vertical column assembly	Twin-pillar column with motor mount, load cell and foot brackets pre-fitted	2	2
☐	Front / back support	Inclined extrusion with end brackets and slide nuts pre-fitted	4	3
☐	Side Support Inclined setup	Inclined extrusion assembled with base extrusion with end brackets and slide nuts pre-fitted	2	4
☐	Side support	Side Support Inclined setup with end brackets and slide nuts pre-fitted	2	4
☐	DAQ unit	Enclosure with mounting bracket and slide nuts pre-fitted	1	5
☐	Current sensor assembly	Sensor with mounting bracket and slide nuts pre-fitted	1	6
☐	Fastener kit	M8 button socket head bolts, spare slide nuts, hex keys	1 set	1 – 6
☐	Sensor cable set	Labelled cables: THRUST, TORQUE1, TORQUE2, RPM, MOT TEMP, ESC TEMP, VIBRATION, VOLTAGE, CURRENT	1 set	5 – 6
☐	DAQ power cable	POWER 1 barrel plug lead and POWER 2 XT30 lead	1 set	6
☐	USB-C cable	DAQ to PC communication	1	7
☐	Anchor bolt set	M12 anchors for floor fixing	12	1
☐	Test and Calibration certificate	Traceable certificate and activation package	1	—

3.1 Tools required

Tool	Specification	Tool	Specification
Hex key set, metric	2.0 – 8.0 mm, ball-end	Tape measure	2 m
Torque wrench	Calibrated, 5 – 25 N·m	Rotary hammer drill	With Ø12 mm masonry bit
Hex bit sockets	5 mm and 6 mm	Vacuum or blow-out pump	For clearing anchor holes
Precision square	150 – 300 mm	Soft-faced mallet	Nylon or rubber
Spirit level	600 mm minimum	Marker	For fastener witness marks

Principal fasteners

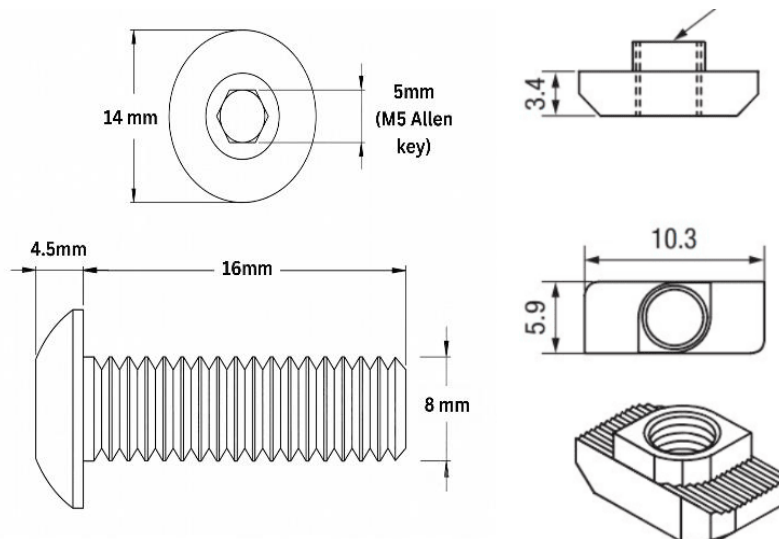


Figure 3.1 — (left) Button socket head bolt, M8. 14 mm head diameter, 4.5 mm head height, 5 mm hex socket (M5 Allen key); (right) Slide nut, T90 series, for 8 mm extrusion T-slot

IMPORTANT — Fastener count discrepancy (open item)

Counting the fasteners called out step by step gives 52 slide nuts and 52 bolts. Verify the bolt count on receipt and raise a shortage with REUDE support before starting work, rather than discovering it mid-assembly.

The bolt length is also unresolved: the checklist specifies M8 × 10 while the assembly drawing (Figure 2) dimensions an M8 × 16. Confirm which length ships with your crate before torquing anything.

3.2 Site and Installation Requirements

Confirm all of the following before the bench is unpacked. Correcting a site deficiency after assembly means dismantling the frame.

Floor and anchorage

- The bench must be anchored to a solid, level reinforced-concrete floor slab capable of resisting the full dynamic thrust and the off-axis torque reaction.
- Anchor pattern: 12 no. Ø12 mm holes for M12 anchor bolts, on the pattern shown in Figure 1.4. Overall footprint 845 × 1100 mm.
- Set anchors to the anchor manufacturer's stated embedment depth, edge distance and installation torque. Clear all dust from the holes before setting.

Clear working zone

- Minimum clear working zone around the bench: 1745 × 2000 mm, as dimensioned in Figure 1.4. This zone must be free of storage, walkways and services.
- Maintain a safety perimeter of 1.7 – 2.0 m around the test bed during powered running, controlled by barrier or exclusion marking.
- Minimum clear height above the propeller plane: 1.0 m, free of light fittings, cable trays and ducts.

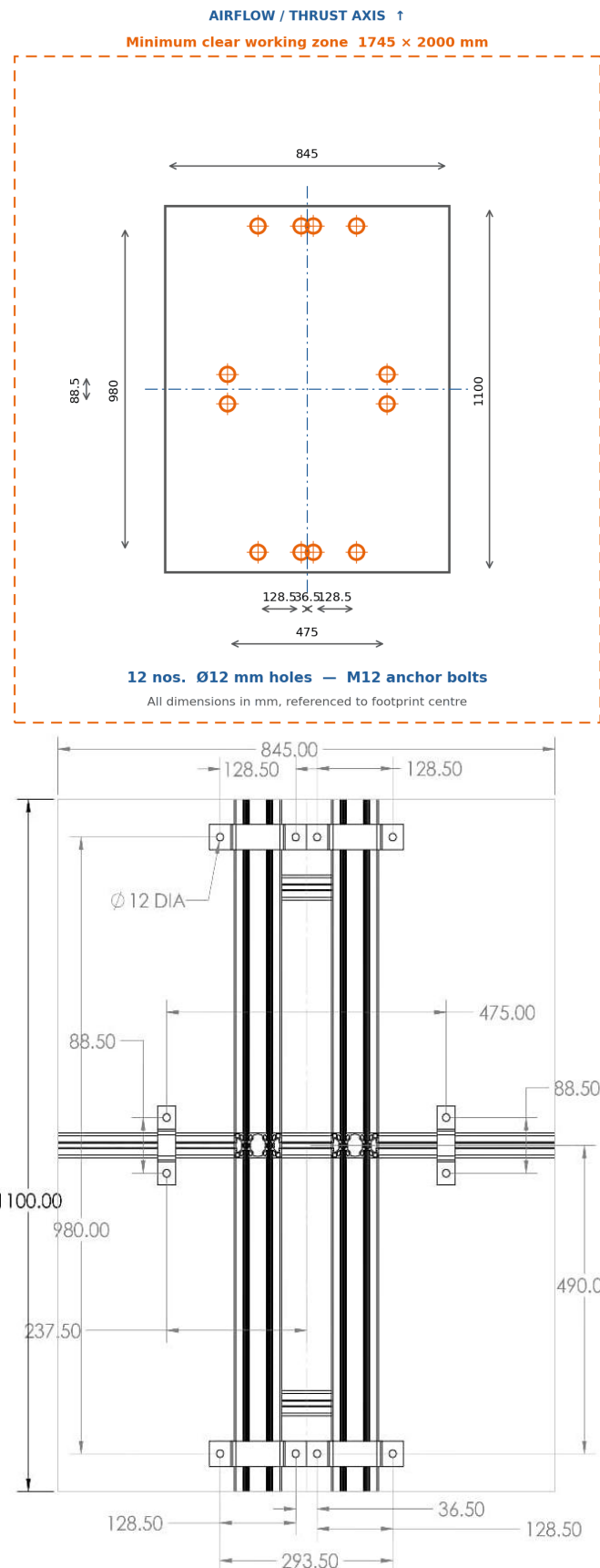


Figure 3.2 — Floor anchor layout, plan view. All dimensions in mm, referenced to footprint centre.

4 ASSEMBLY PROCEDURE

Drawing convention. In the step diagrams a dashed outline marks the assembly fit area, and a circle marks a junction point at which fasteners must be tightened. Circles are lettered A, B ... and referenced in the procedure text.

Work hand-tight throughout each step and apply final torque only where the step instructs. Tighten in an alternating cross pattern. Mark each torqued fastener with a paint witness line so that later loosening is visible.

Step 1 Base Support with Vibration Pad and Clamp Assembly

Lay the two base rail assemblies parallel on a flat surface with the top channels facing upward. Bring the two base cross members into the channels at the positions shown.

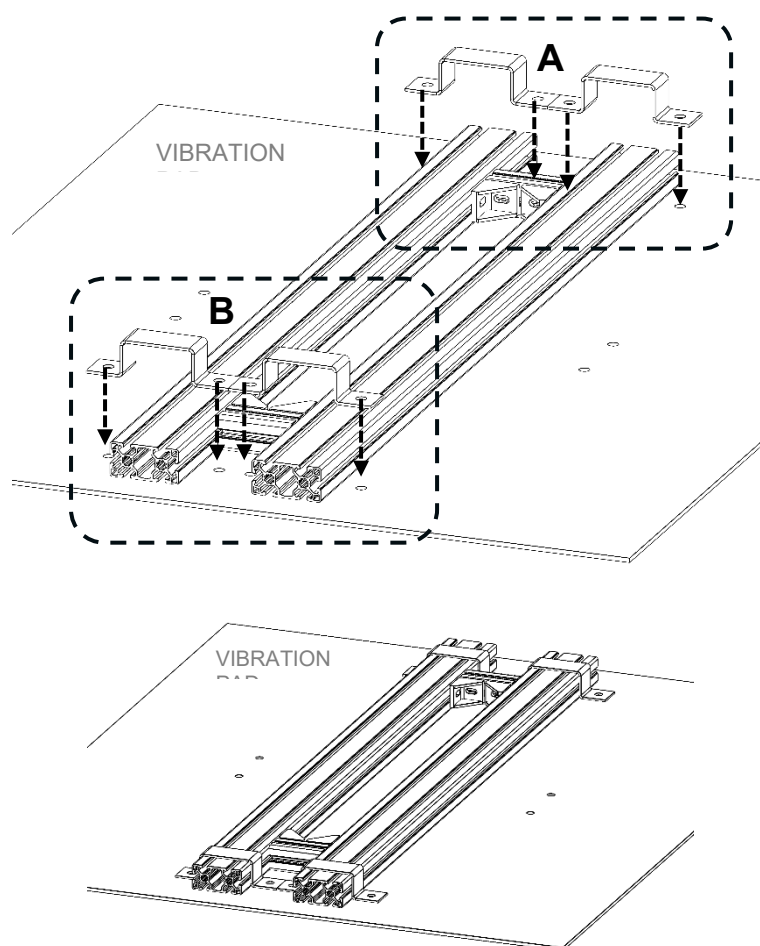


Figure 4.1 — Step 1: base support. A and B are the cross-member junction points with base clamp support

1. Align the cross-member bracket at junction A with the pre-fitted slide nuts and clamp assembly in the rail channel.
2. Repeat at junction B on the opposite rail.
3. Insert and hand-tighten the M8 bolts at A and B.
4. Measure both diagonals of the rectangle formed by the rails and cross members. Adjust until the diagonals are equal within 1 mm.
5. Torque the bolts at A and B in an alternating cross pattern.

Step 2 Vertical Structure and Motor Mount with Base Support

The vertical column is supplied fully assembled with the motor mount and thrust/torque sensor fitted. Handle it by the extrusion, never by the sensor head.

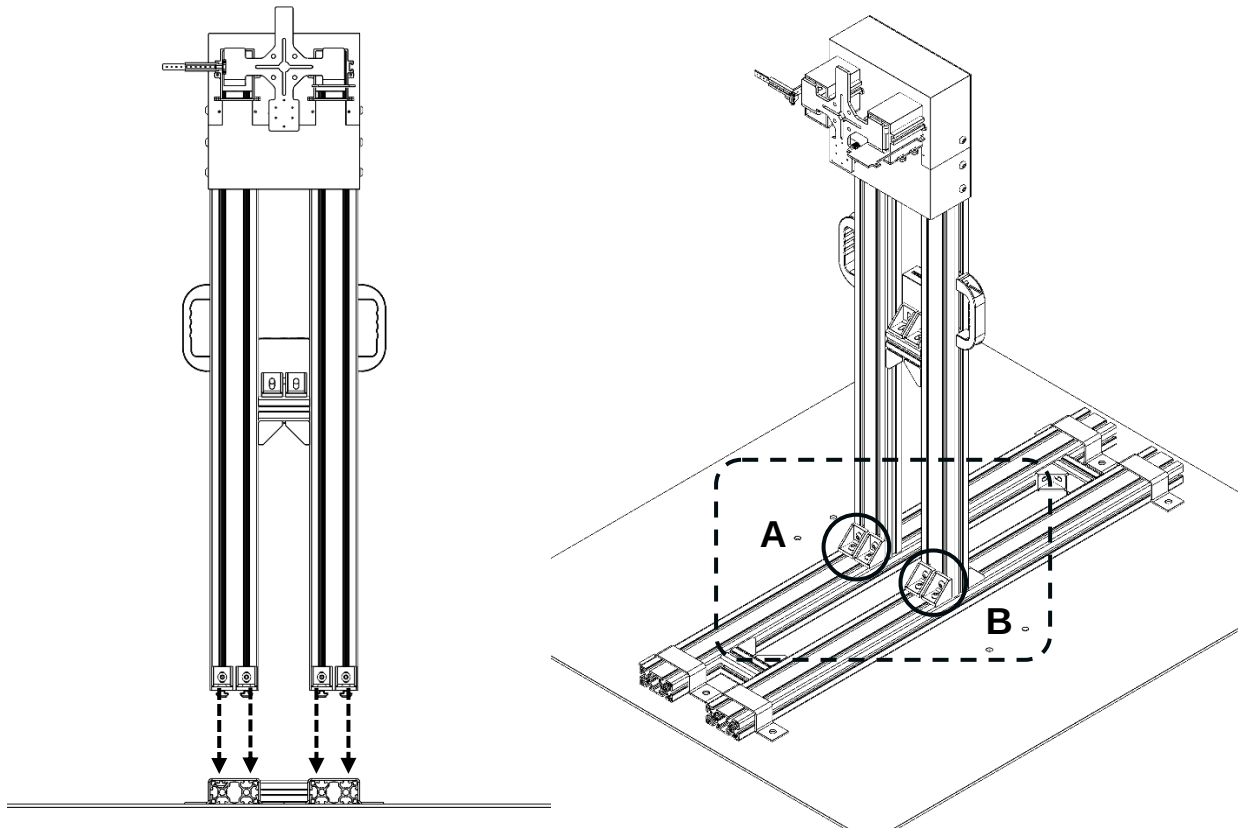


Figure 4.2 — Step 2: vertical column assembly (left) and installation on the base support (right). A and B are the column foot function points.

1. With two people assisting, lift the vertical column assembly and lower it onto the centre junction of the base support.
2. Seat the column so that both feet sit flat and flush on the upper face of base rails, within marked outline.
3. Engage the foot brackets at junctions A and B with the pre-fitted slide nuts in the base rail channels.
4. Insert and hand-tighten all foot bracket bolts.
5. Place an engineer's precision square against the column and the base rail. Adjust until the column stands at a true 90.0° to the base in both the front and side planes.
6. Confirm that the two pillars are parallel and have not splayed.
7. Torque all foot bracket bolts in an alternating cross pattern.

CAUTION — LOAD CELL HANDLING

Do not drop, lever against or apply point loads to the sensor head. Do not loosen any fastener marked as a safety or calibration screw on the sensor body; doing so invalidates the calibration certificate.

Step 3 Front and Back Inclined Extrusion with Base and Vertical Support

Four inclined supports triangulate the structure and resist fore-and-aft movement under thrust. The stand must not be operated without them.

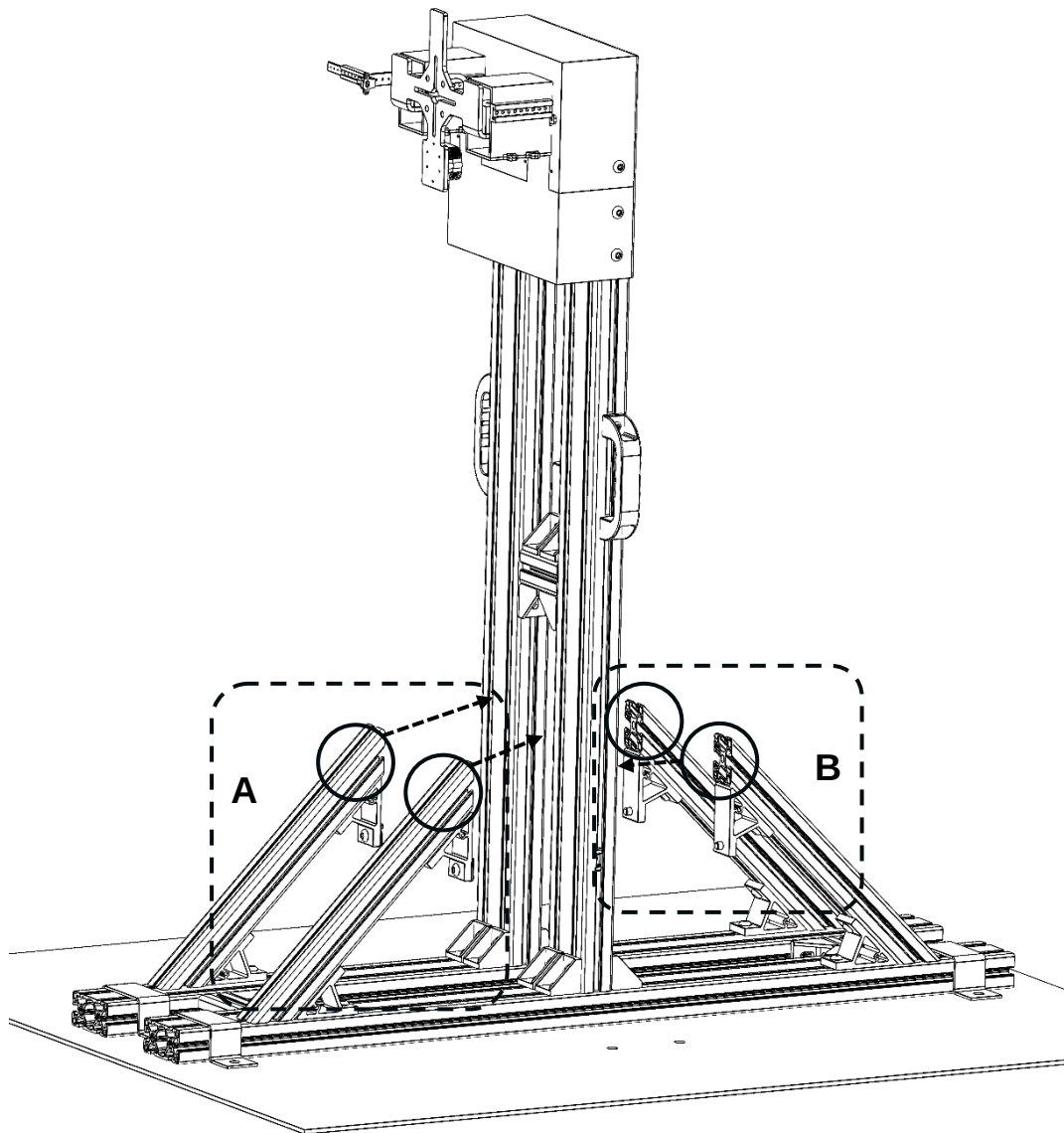


Figure 4.3 — Step 3: front and back supports. A and B are the upper bracket junction points.

1. Rest the lower end of a support on the base rail channel and lean the upper end against the column channel.
2. Engage the upper bracket at junction A with the pre-fitted slide nuts in the column channel, and the lower bracket with the nuts in the base rail channel.
3. Insert and hand-tighten the bolts at both ends. Repeat at junction B and for all four supports — two at the front, two at the back.
4. Re-verify with the precision square that the column remains at a true 90.0°. The supports must not push the column out of vertical.
5. Torque all bolts in an alternating cross pattern.

Step 4 Side Support Inclined Extrusion with Base and Vertical Support

Two side supports brace the structure laterally. Each is supplied as a sub-assembly of a 40 × 40 inclined extrusion joined to its base extrusion.

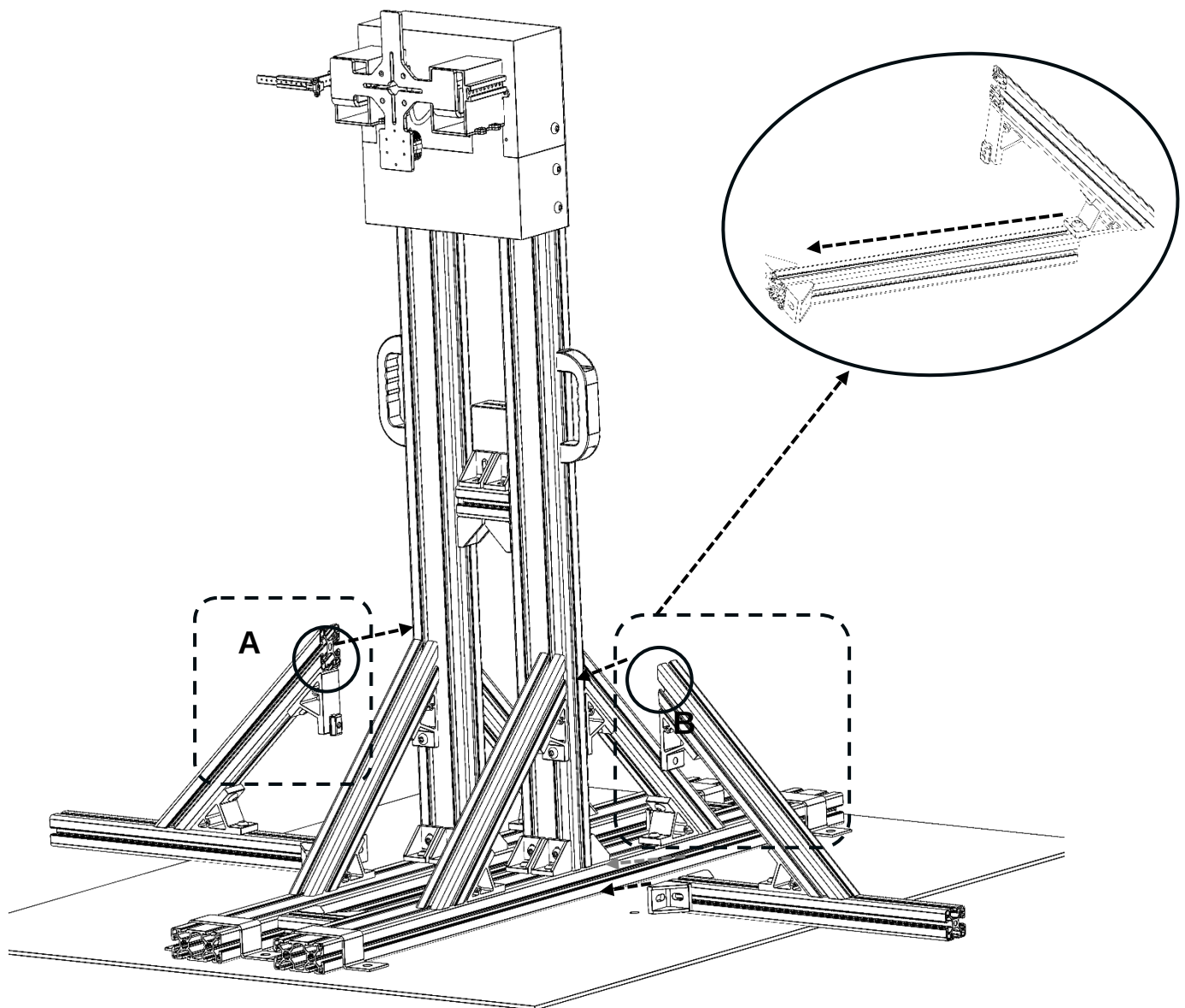


Figure 4.4 — (top) Step 4.1: side support sub-assembly of 40x40 inclined extrusion with end brackets and slide nuts; (bottom) side supports. A and B are the bracket junction points with end brackets and slide nuts.

1. Position a side support on each side of the column, engaging the brackets at junctions A and B with the pre-fitted slide nuts.
2. Insert and hand-tighten all bolts, then re-check that the column remains vertical and the base remains square.
3. Torque all bolts. The completed structure must feel rigid in both the fore-aft and lateral directions.

Step 5 Side Support with Vibration Pad and Clamp Assembly

A vibration pad and clamp assembly is fitted beneath the outboard foot of each side support. The pads isolate the structure from floor-borne vibration and spread the reaction load into the slab.

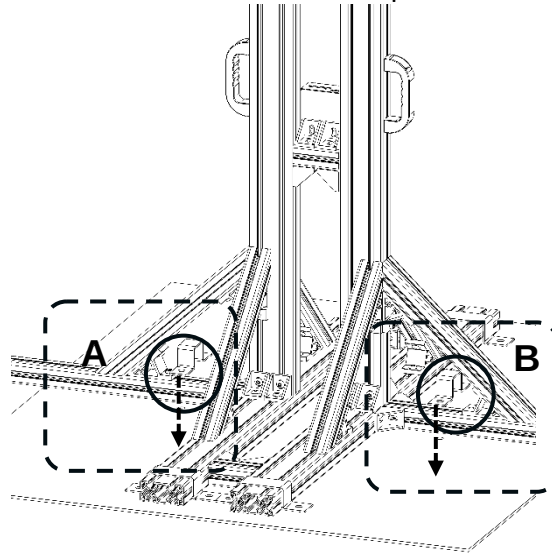


Figure 4.5 — Step 5: side support vibration pad and clamp assembly.

1. Position a vibration pad beneath the outboard foot of each side support.
2. Locate the clamp over the pad and engage its bracket with the pre-fitted slide nuts in the base extrusion channel.
3. Insert and hand-tighten the M8 bolts.
4. Confirm that the pad is seated flat and bears evenly across its full face, with no gap between the pad, the clamp and the extrusion.
5. Torque the bolts, then re-check that the base is level and the column remains at a true 90.0°.

Step 6 DAQ Unit Mounting

The DAQ unit mounts on the column spine, clear of the propeller plane and close to sensor harness.

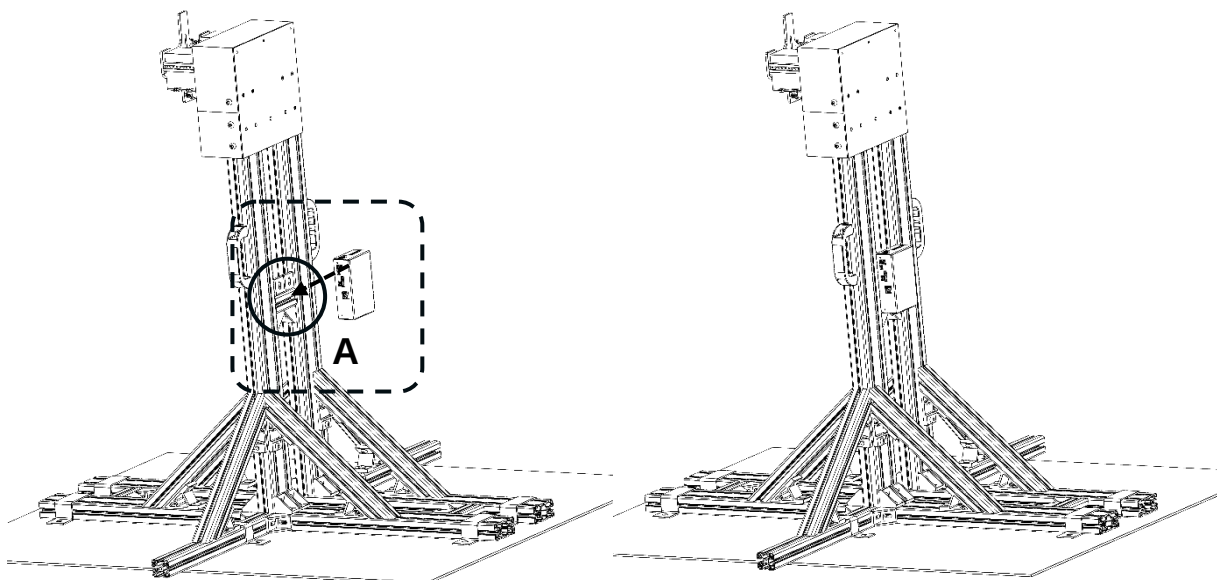


Figure 4.6 — Step 5: DAQ unit position (left) and mounted (right). A is the DAQ mounting junction point.

1. Orient the DAQ unit so that the connector faces are accessible and cables route downward, away from the propeller plane.
2. Engage the mounting bracket at junction A with the pre-fitted slide nuts in the column channel.
3. Slide the unit to its final height and tighten the mounting bolts until the enclosure is firmly locked to the spine.
4. Confirm that every connector is accessible and that a cable can be inserted and removed without fouling the frame.

Step 7 Current Sensor Assembly

The current sensor is installed in the propulsion power path. Its positive wire passes through the sensor to measure battery current.

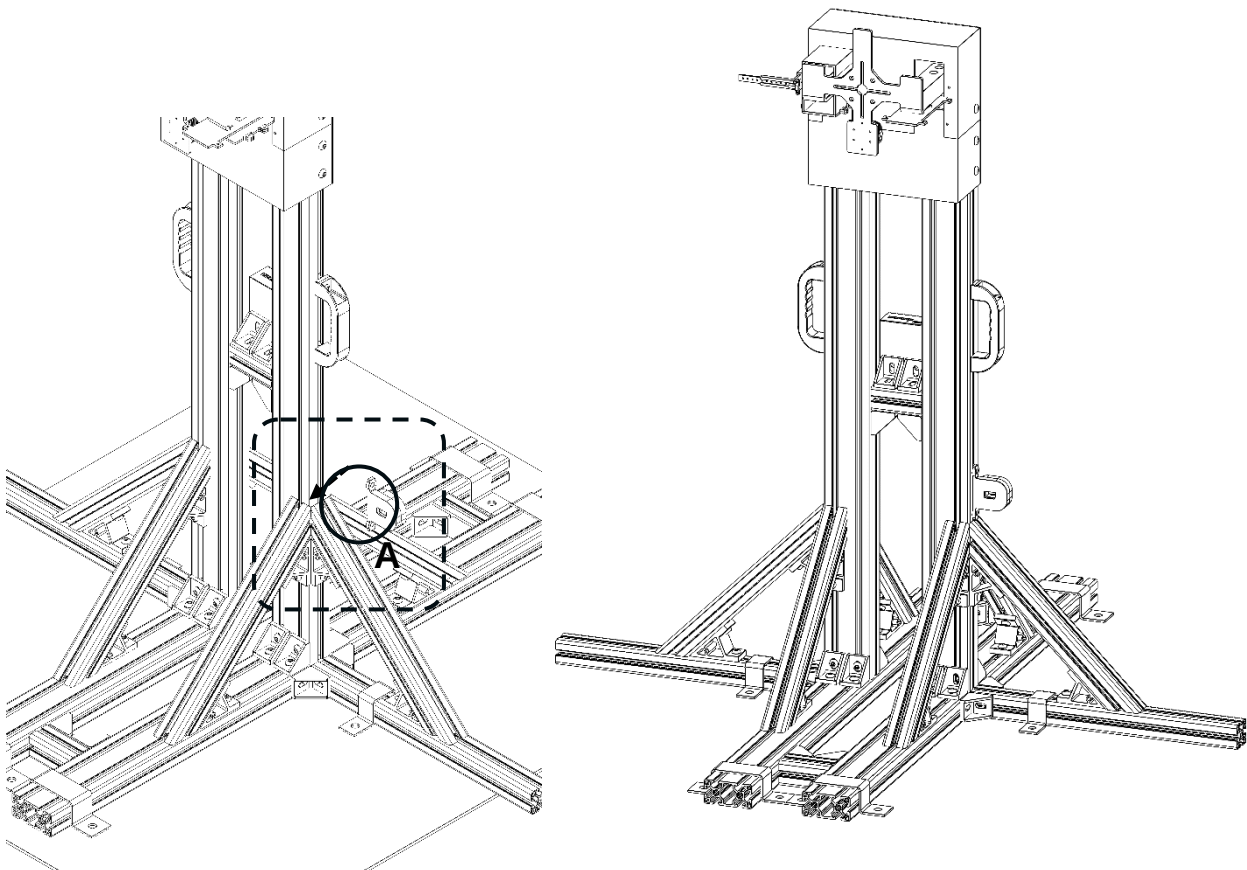


Figure 4.7 — Step 6: current sensor position (left) and completed stand (right). A is the sensor mounting junction point.

1. Engage the current sensor mounting bracket at junction A with the pre-fitted slide nuts in the column channel.
2. Insert and tighten the mounting bolts. Position the sensor so that the power cable run to the ESC is short and direct.
3. Anchor the stand to the floor using the 12 M12 anchors on the pattern in Figure 4. Level the base with full-width steel shims where required — never with stacked washers.
4. Torque the anchors to the anchor manufacturer's stated installation figure and re-check that the column remains at a true 90.0°.
5. Re-check every fastener installed in Steps 1 to 7 and apply a witness mark to each before proceeding to Section 5.

5 DAQ SETUP AND WIRING

5.1 DAQ Unit and Architecture

The DynoX DAQ unit is the central measurement interface for the thrust stand. It receives the signals from the integrated sensors, conditions and digitises them, and sends the measurement data to the host PC running ROTRIX.

Two power domains are involved and must never be mixed. The propulsion battery powers the motor and ESC only. The DAQ is powered separately from a 9 – 24 V DC supply. The USB link carries communication only and does not power the DAQ.



Figure 5.1 — DynoX DAQ Unit

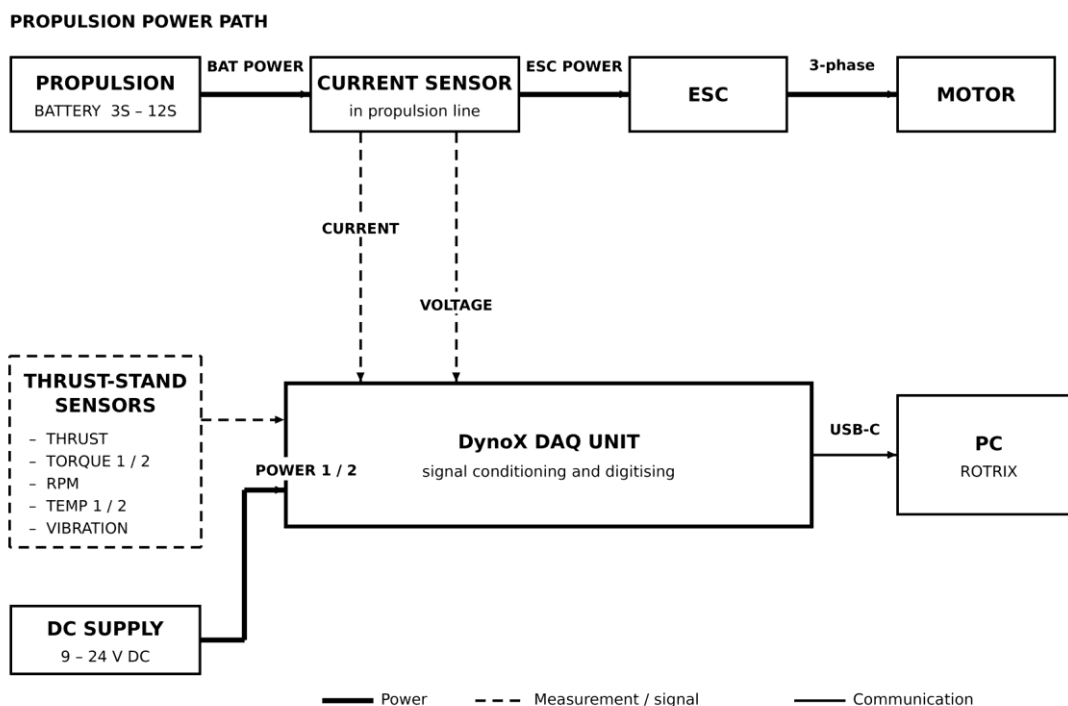


Figure 5.2 — Power and Signal Architecture

5.2 DAQ Connector Faces

The DAQ enclosure carries dedicated connectors on its top, left and right faces. Every connector is labelled by sensor or function. Always match the label on the cable to the label on the DAQ port.

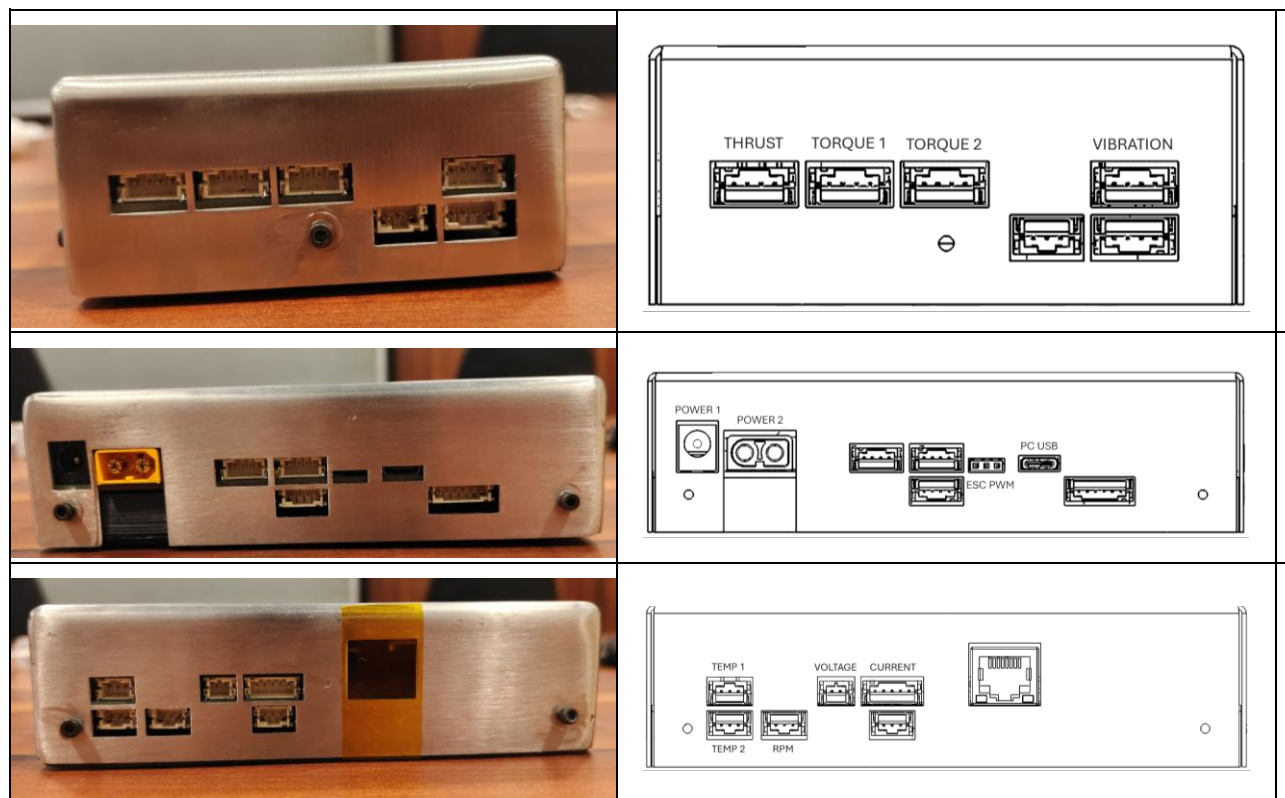


Figure 5.3 — DAQ top face (top); DAQ left face (middle) and DAQ right face (bottom)

5.3 Sensor Cable to DAQ Port Mapping

Connect each cable to the port carrying the identical label. Tick each line as it is made off and verified.

✓	Cable label	DAQ port	Function	✓	Cable label	DAQ port	Function
☐	THRUST	THRUST	Thrust	☐	VIBRATION	VIBRATION	Vibration
☐	TORQUE1	TORQUE 1	Torque ch. 1	☐	VOLTAGE	VOLTAGE	Battery voltage
☐	TORQUE2	TORQUE 2	Torque ch. 2	☐	CURRENT	CURRENT	Battery current
☐	RPM	RPM	Motor speed	☐	POWER1	POWER 1	DAQ power, barrel
☐	MOT TEMP	TEMP 1	Motor temp.	☐	3S battery	POWER 2	DAQ power, XT30
☐	ESC TEMP	TEMP 2	ESC temp.				

5.4 Sensors Placement

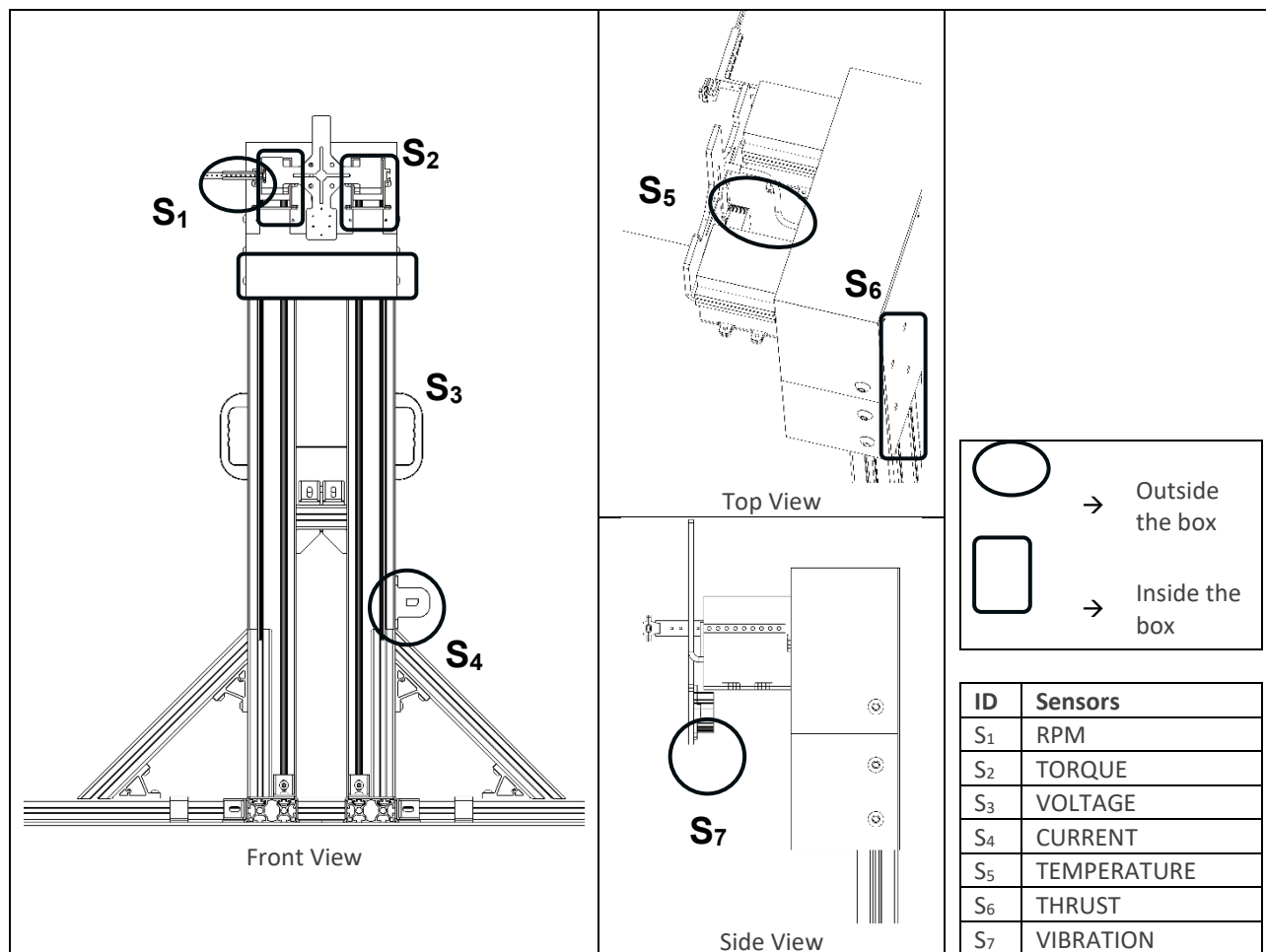


Figure 5.4 — DAQ Sensor Placement – Front View (left); Top View (top-right) and Side View (bottom-right)

5.5 Wiring Sequence

Wire the system in the order below. Each stage is verified before the next introduces energy, and the propulsion battery is connected last, removed first.

Stage	Action	Verify before proceeding
1	Mechanical assembly completed/anchored (1-7)	All fasteners torqued and witness-marked
2	Connect all sensor cables to the DAQ	Every cable label matches its port label
3	Connect DAQ DC supply to POWER 1 or POWER 2	Supply is 9 – 24 V DC and polarity is correct
4	Connect USB-C to the PC and open ROTRIX	All channels present, updating and plausible
5	Connect ESC signal lead and motor phase cables	ESC has its own power; no cable near rotors
6	Fit the current sensor in the propulsion line	Positive conductor passes through the sensor
7	Connect the propulsion battery — LAST	Pre-test checks in Section 7.3 complete

WARNING — ORDER OF CONNECTION

Connect the propulsion battery last, disconnect it first; never to a DAQ power input. Reversed polarity, over-voltage or a loose connection can damage the DAQ, ESC, motor, sensors or battery.

5.6 General Wiring Procedure

1. Ensure the DAQ is switched off and disconnected from all power sources.
2. Inspect connectors for bent pins, contamination, loose contacts or damage.
3. Match every cable label to the corresponding DAQ port and insert each connector straight in until fully seated.
4. Route cables away from rotating parts, sharp edges, hot surfaces and high-current wiring.
5. Provide strain relief so that cable movement does not load the sensor connectors.
6. Check all signal wiring before connecting DAQ power.
7. Connect the USB cable only after the DAQ has been powered and the signal wiring verified.

Do not force a connector. If a connector does not mate smoothly, remove it and check its orientation and port assignment.

5.7 Noise Control

ESCs and motors generate high-frequency switching noise and large current transients. To reduce measurement interference:

- Keep sensor cables away from battery, motor-phase and ESC cables,
- Avoid running sensor and high-current cables in parallel.
- Keep sensor cables short and avoid unnecessary loops.
- Secure the USB cable away from ESC and battery wiring.
- Confirm that signal grounds are not unintentionally connected to the mechanical structure.
- Do not add external ground connections without checking for ground-loop risks.
- Inspect connector engagement and cable retention before every test.

If noise changes when the PC is connected, investigate USB shielding, enclosure bonding and signal-ground paths before modifying software filter settings.

5.8 RPM Sensor Setup

The RPM sensor uses optical IR detection.

- Apply a matte white target of at least 40×40 mm to the area viewed by the sensor.
- If the motor surface is glossy, first cover the circumference with black masking tape.
- Apply a matte white section at least $40 \text{ mm} \times 40 \text{ mm}$ over the black tape.
- Align the sensor within 5 mm of the target.
- Keep the sensor securely mounted and clear of rotating parts.

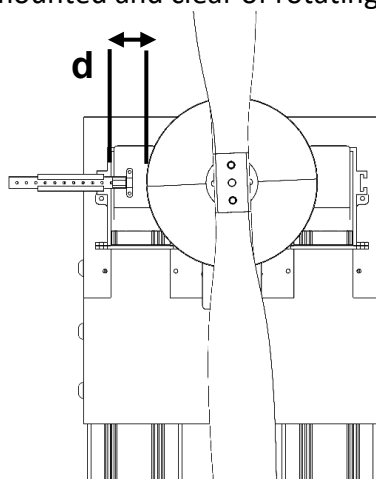


Figure 5.5 — RPM sensor mounted on the contactless sensor bracket. The bracket adjusts in the X and Z axes to suit varying motor diameters. Set the sensor-to-motor gap to a minimum of $d = 5 \text{ mm}$.

6 POWER CONNECTIONS

Cable or connection	DAQ port	Function
POWER1 cable	DAQ POWER 1	DAQ power input
3S battery connector	DAQ POWER 2	DAQ power input through XT30
ESC power connector	ESC POWER	ESC connection through the current sensor
Motor battery connector	BAT POWER	Propulsion battery connection through the current sensor

Use only the approved power cables and connectors supplied with the DynoX system for the current sensor and DAQ power.

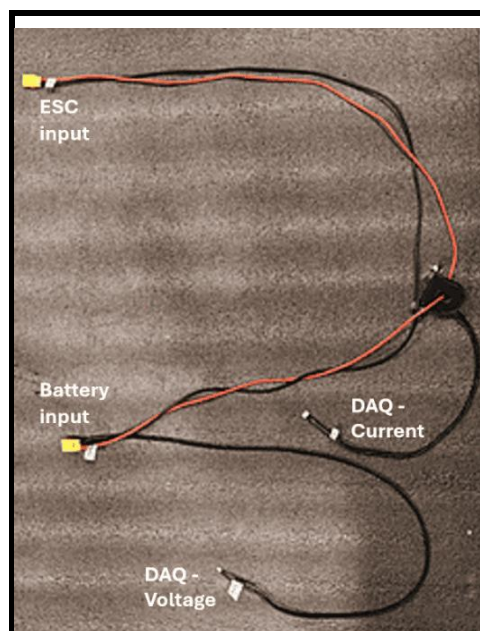
6.1 DAQ Power Connection

1. Confirm the propulsion battery is disconnected and all sensor cables are on correct DAQ ports.
2. Verify the DAQ supply is 9 – 24 V DC and confirm the supply polarity.
3. Connect the approved DAQ power cable to ONE designated input only: POWER 1 for the barrel plug, or POWER 2 for the XT30 connector.
4. Connect the battery to the input port of the current-sensor cable, and the ESC cable to its output port.
5. Verify that all connectors are fully seated and mechanically secure.

6.2 Motor and Battery Connection

Complete the mechanical assembly, install the motor, propeller, ESC, guards and restraints, connect all sensor cables to the DAQ, connect the ESC and motor power cables, and connect the DAQ power supply. Confirm that no cable can contact a rotating or hot component. Then:

1. Confirm the propulsion battery voltage and polarity.
2. Connect the propulsion battery to the input port of the current-sensor power cable.
3. Connect the ESC power cable to the output port of the current-sensor power cable.
4. Verify that all connectors are fully seated and mechanically secure.



WARNING

Incorrect polarity, excessive voltage or an incomplete connection can damage the DAQ, ESC, motor, sensors or battery. Never connect the propulsion battery to a DAQ power input. Use only the approved power cables and connectors supplied with the DynoX system.

7 FIRMWARE TESTING AND COMMISSIONING

7.1 Interface with ROTRIX

1. Connect the USB-C cable between the DAQ USB-C port and the PC.
2. Open ROTRIX, log in, and select the correct powertrain from the Analysis page.
3. Open ROTRIXConnect.exe and enter the required login credentials.
4. Select the correct COM port and baud rate, then confirm that the DynoX DAQ is detected.
5. Start a test session without starting the motor.
6. Verify that all expected measurement channels are present and updating.

The USB connection provides communication only; it does not power the DAQ. Do not begin a propulsion test if any channel is missing, frozen, saturated, unstable or implausible.

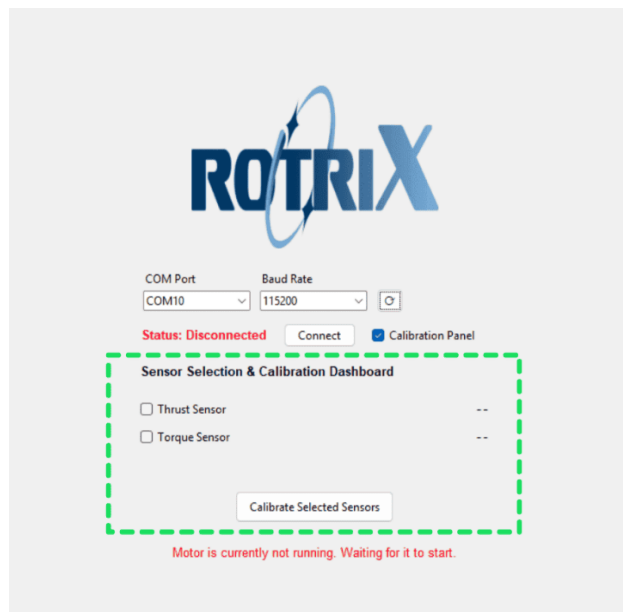


Figure 5.6 — ROTRIXConnect.exe sensor Calibration dashboard

7.2 Calibration and Tare

1. Disconnect propulsion power, secure the stand and remove all external loads from the thrust and torque sensors.
2. Ensure that no cable, fixture or structure applies force to the sensors, and allow them to reach a stable temperature.
3. Confirm that ROTRIX is receiving data and record the initial unloaded readings.
4. In ROTRIXConnect.exe select the sensors to tare, then click Calibrate Selected Sensors.
5. Confirm that thrust and torque return to the expected zero values and record the tare result.

Never tare the system while a load, cable force, fixture preload or mechanical obstruction is present.

7.3 Pre-Test Checks

Before applying propulsion power, verify the following:

✓	Check	✓	Check
☐	Motor and propeller correctly installed	☐	ROTRIX detects the DynoX DAQ
☐	Guards and restraints installed	☐	Thrust and torque stable at zero
☐	Test area clear	☐	RPM reads zero
☐	Emergency stop available and functional	☐	Temperature readings plausible
☐	All DAQ connectors on the correct ports	☐	Voltage and current readings plausible
☐	DAQ supply within 9 – 24 V DC	☐	Vibration sensor secure
☐	All mechanical fasteners secure	☐	No cable can contact a rotating or hot part
☐	Propulsion battery polarity and voltage correct	☐	Second person present; no one testing alone

8 TROUBLESHOOTING

Symptom	Possible cause	Corrective action
DAQ not detected	No DAQ power, faulty USB cable, incorrect device selected	Check DAQ power, reseal or replace the USB cable, and select the correct device
No sensor channels visible	Configuration or firmware issue	Restart the DAQ and ROTRIX; verify the approved configuration
Thrust remains at zero	Incorrect port, damaged cable, or failed load cell	Check the THRUST connection and inspect the cable and sensor
Torque channels disagree	Cable swap, mechanical imbalance, or calibration error	Restore channel assignments and repeat calibration
Zero reading drifts	Temperature change, preload, cable force, or unstable supply	Allow warm-up, remove mechanical stress, and inspect the supply
Excessive measurement noise	EMI, poor shielding, ground loop, or loose connector	Separate cables, inspect shielding and grounding, and secure connectors
Input is saturated	Excessive load or incorrect scaling	Remove load and verify configuration and wiring
RPM remains at zero	Misaligned sensor, poor target, or incorrect configuration	Check sensor alignment, target surface, cable, and input configuration
RPM is unstable	EMI, vibration, poor alignment, or incorrect threshold	Improve sensor mounting and cable routing; verify signal conditioning
Temperature is unrealistic	Incorrect sensor type, wrong port, open circuit, or short circuit	Check sensor type, wiring, and TEMP 1/TEMP 2 assignments
Voltage is incorrect	Polarity, wiring, or scaling error	Disconnect power and verify voltage wiring and configuration
Current is nonzero with no load	Sensor offset or incorrect installation	Perform a tare and verify current-sensor installation
Excessive vibration	Loose mount, imbalance, or hardware	Stop test and inspect the mechanical assembly
USB communication drops	Cable movement, EMI, or power interruption	Secure the USB cable and inspect DAQ power and grounding

9 MAINTENANCE

9.1 Before Every Test

- Inspect connectors, cable jackets, sensor mounts and enclosure hardware.
- Confirm zero readings and communication status.
- Check that all structural fastener witness marks remain aligned.

9.2 Periodic

- Re-torque all structural fasteners after the first hour of running-in, then at regular laboratory intervals.
- Verify calibration and compare voltage and current against reference instruments.
- Inspect internal wiring, review measurement noise, and confirm that the firmware and ROTRIX configuration versions are approved.
- Inspect the floor anchors and the vibration pads for movement, compression set or damage.

9.3 Recalibration Triggers

Recalibrate the system after replacing a sensor, changing a cable, modifying the mechanical structure, making any change to the DAQ electronics, or after any overload event.

10 SUPPORT

For technical support, spare parts, recalibration or commissioning services, contact **REUDE Technologies**:

Channel	Detail
Product support	support.rotrix@reude.tech
Business enquiries	business@reude.tech
Telephone	+91 6384667822
Website	www.rotrix.reude.tech
Postal address	REUDE Technologies Private Limited No. 1, Nehru Street, Vasantham Nagar, Avadi, Chennai – 600071, Tamil Nadu, India

When contacting support, please quote the stand serial number, the DAQ serial number shown in ROTRIX, and the document ID and revision printed in the header of this manual.

