



# TELEMETRY

## Briefing

1. Overview & Integration
2. Mounting Guidelines
3. Telemetry Race Processes

<https://telemetry.sem-app.com>

Trace: [start](#) [intro](#)

[Home](#)

[Student Documentation](#)

[Team Telemetry Data](#)

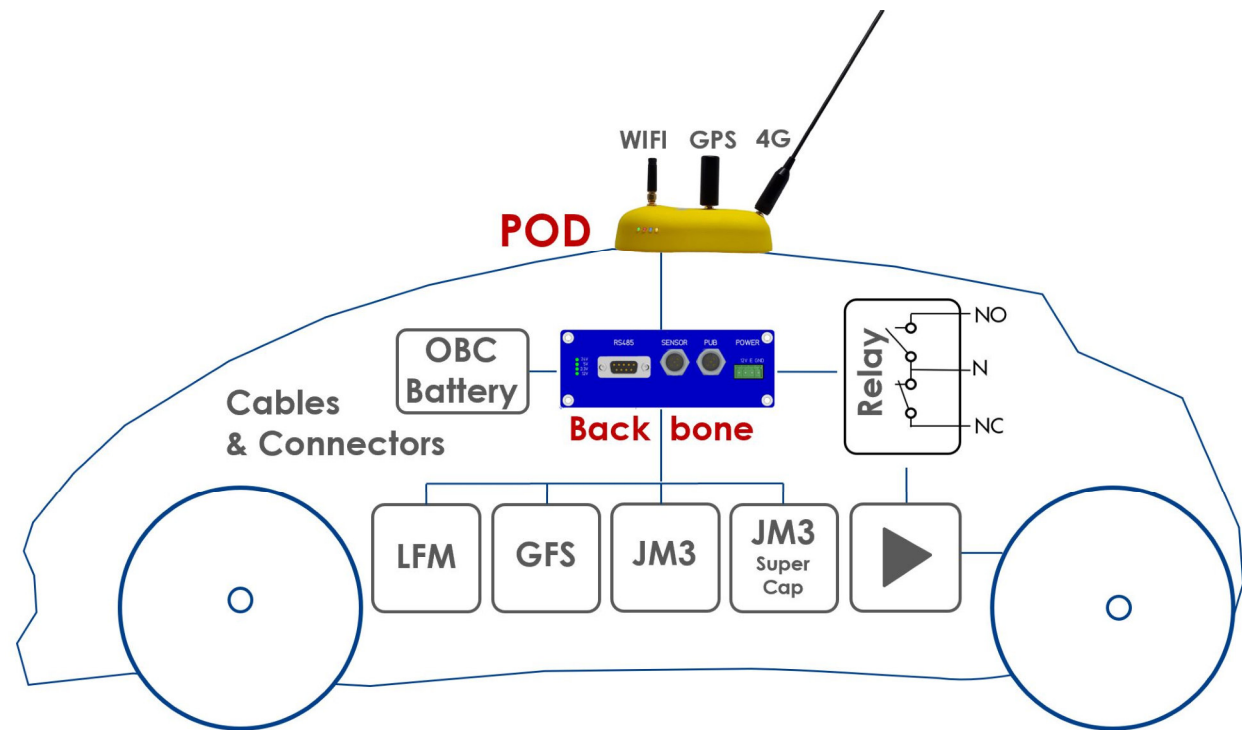
[Volunteers](#)

[Telemetry Team](#)

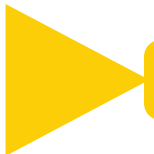
[Frequently Asked Questions](#)

student\_documentation:intro

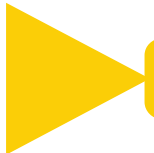
## Student Documentation



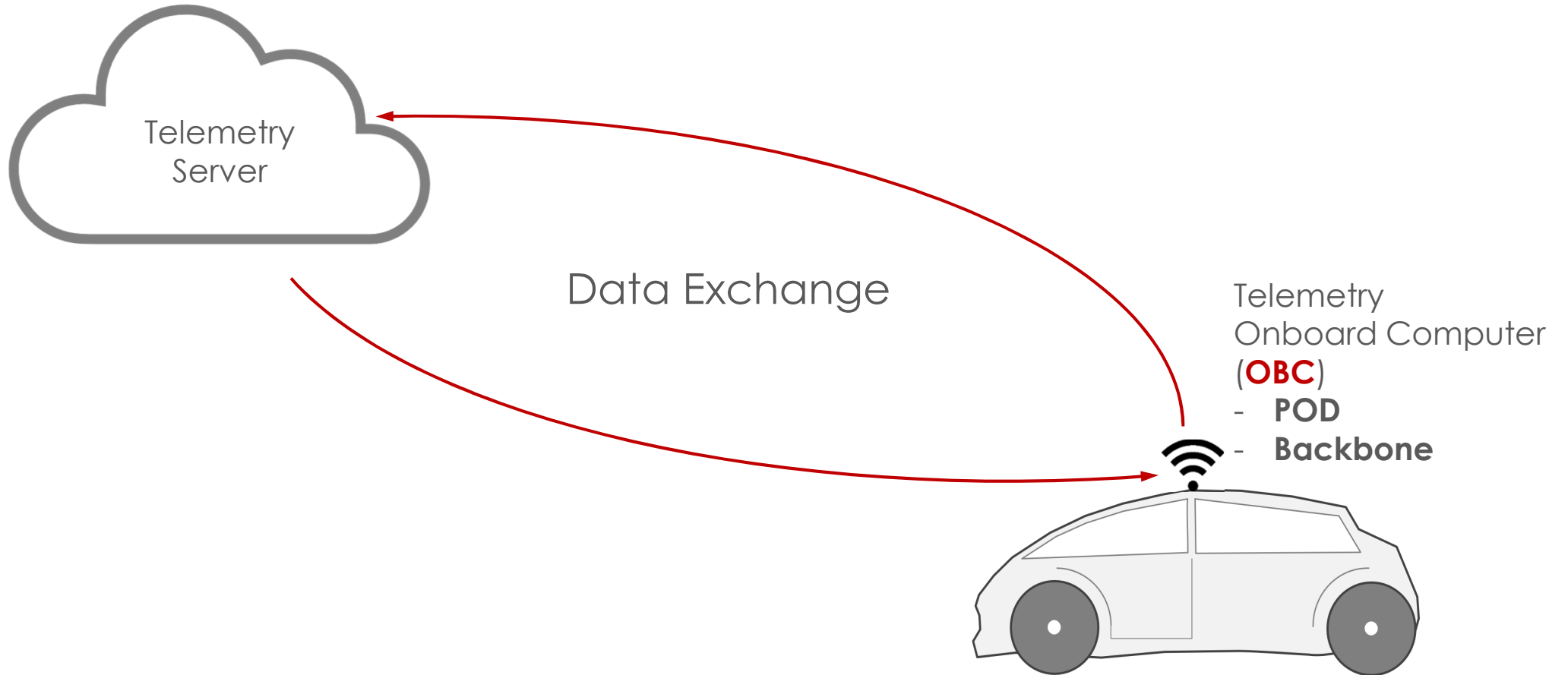
Info Point



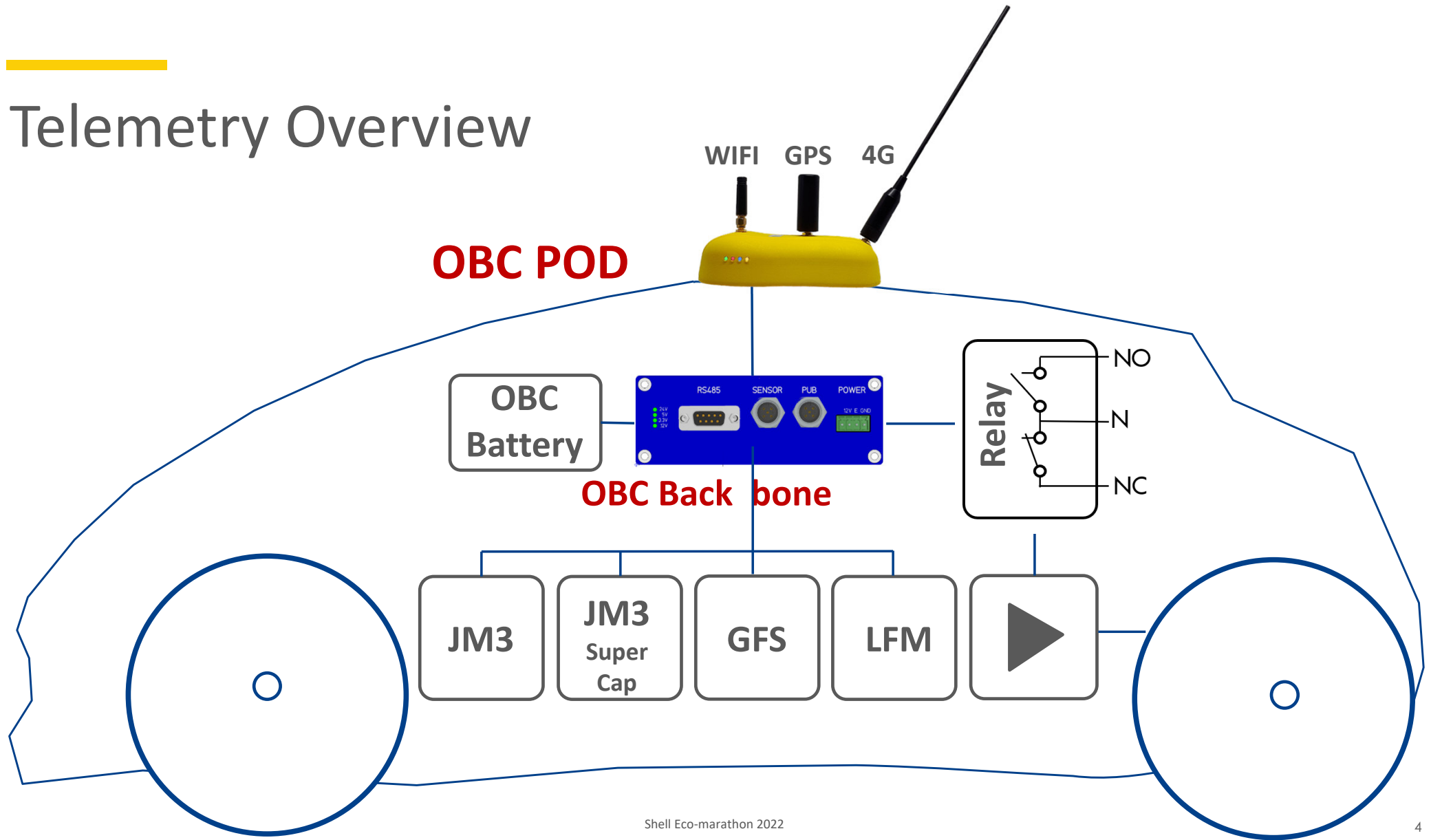
FAQ



# What is Telemetry?



# Telemetry Overview





# Telemetry Inspection Checklist

## Generic Part

- OBC-Pod** mounted correctly
  - OBC Pod unobstructed field of view of 90° to all sides
  - OBC Pod < 20° off horizon (pitch & roll)
  - OBC Pod in driving direction
  - OBC Pod 10cm of cable lift available (a Fist)
- OBC Backbone** mounted correctly
- Battery** mounted correctly
  - removable to the side or up, no tapes
  - > 60% of charge
- Shutdown Relay** working properly
  - Start engine (if not yet running)
  - Simulate relay with supplied electronic switch
  - Engine stops

## Energy Specific Part

- Sensors** mounted correctly
  - JM3 2x **green light** (Status OK, Battery Charged)
  - JM3 Buttons accessible, LEDs visible
- Cables** mounted correctly
  - No wide loops in cables
  - Cables mounted securely
  - Strain reliefs applied
  - Connectors fastened (Check the «click» at the end)
- No direct electrical connection of OBC** to car body or chassis
- OBC** working properly
  - LEDs after 1min = **Green** Off **Blue** **Yellow**

Team: Checklist Complete

Inspector

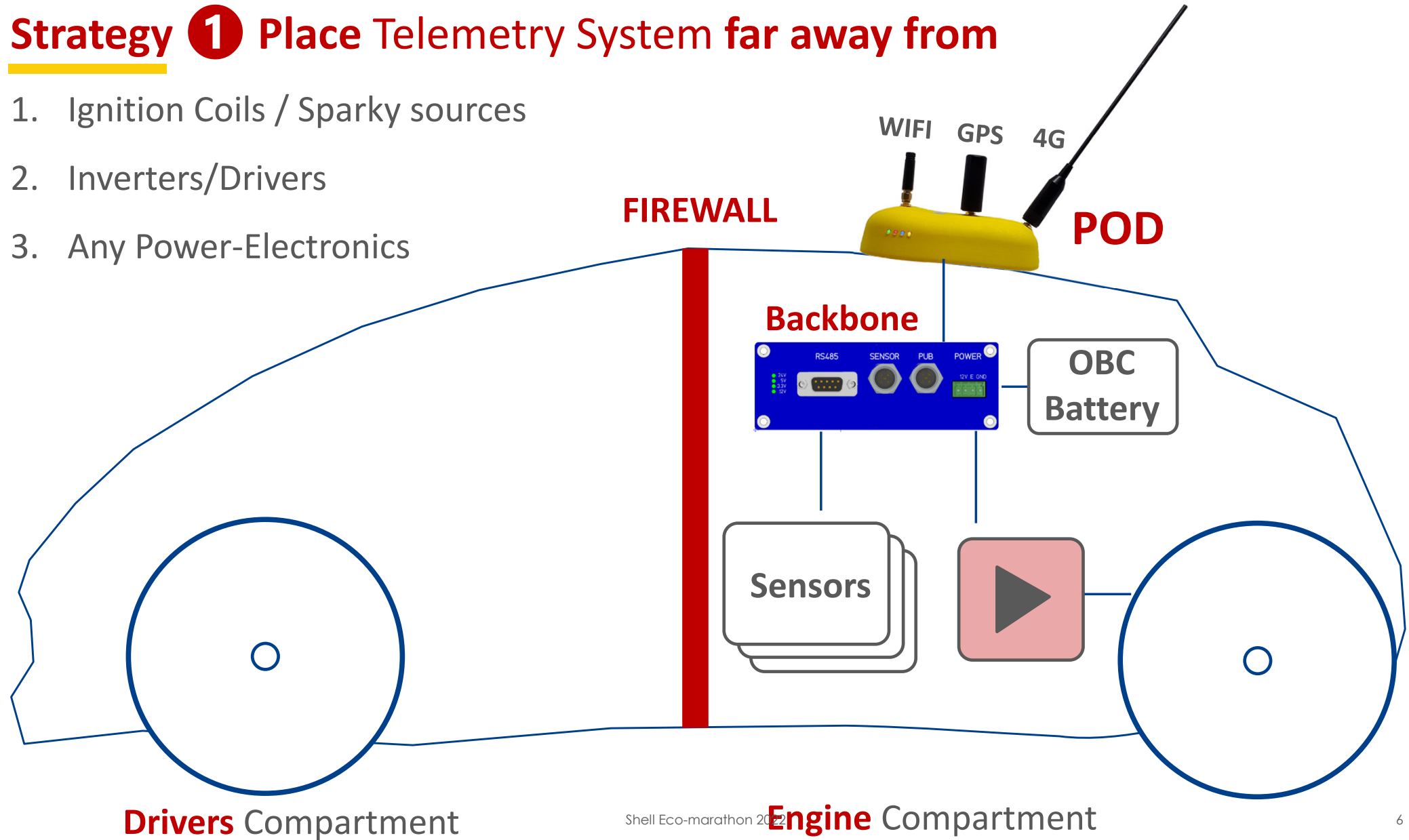
Date	Name	Signature

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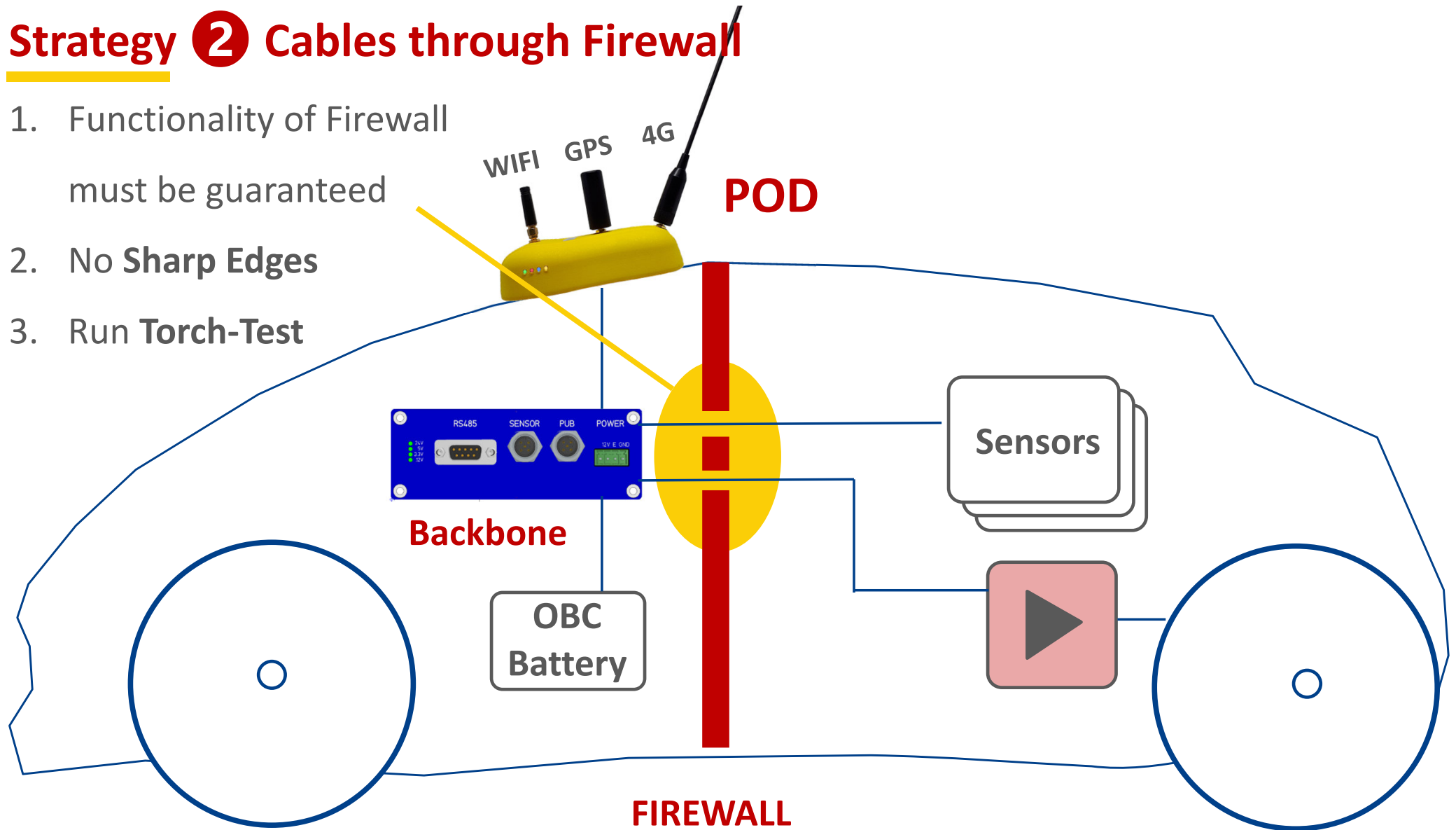
## Strategy 1 Place Telemetry System far away from

1. Ignition Coils / Sparky sources
2. Inverters/Drivers
3. Any Power-Electronics



## Strategy ② Cables through Firewall

1. Functionality of Firewall must be guaranteed
2. No Sharp Edges
3. Run Torch-Test



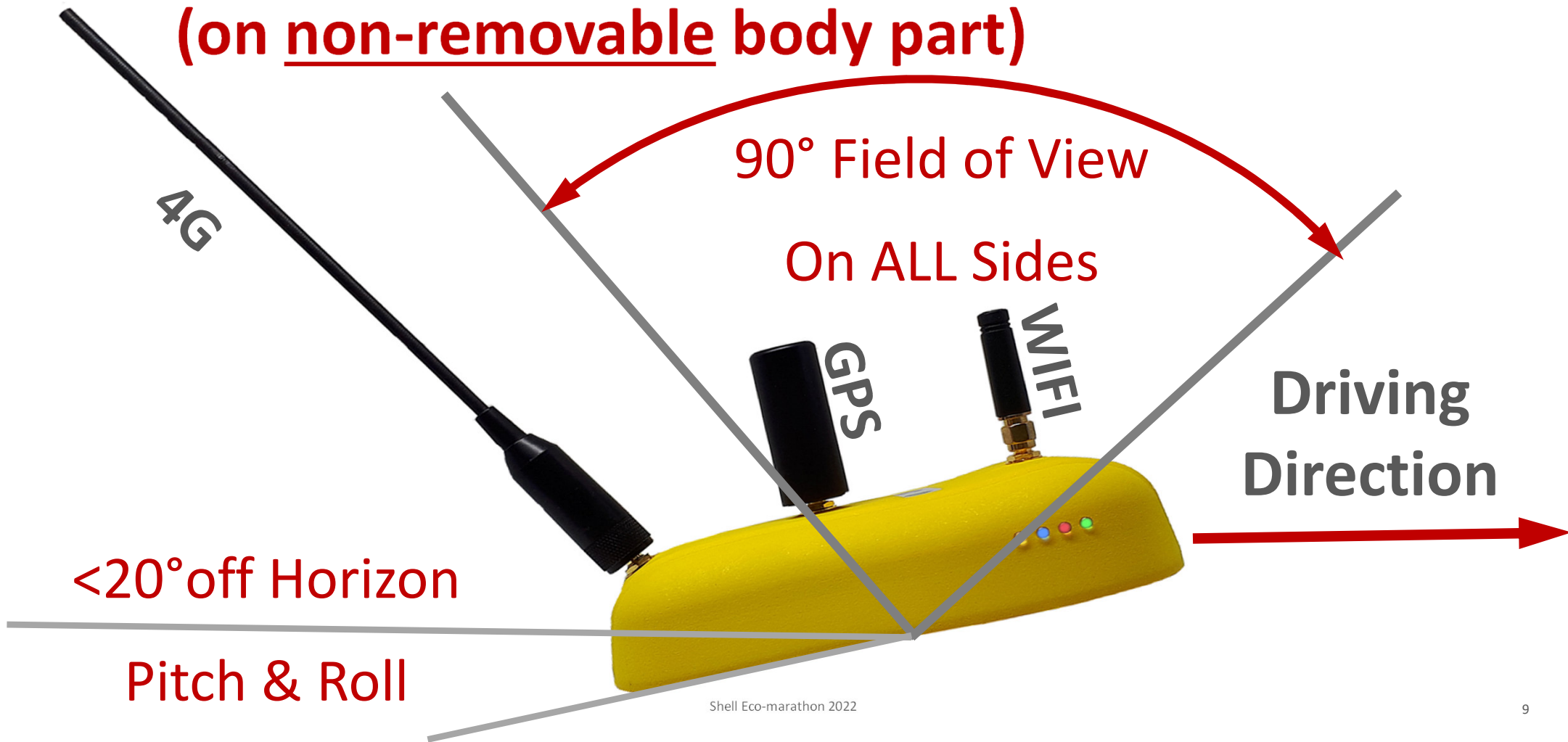
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# Telemetry System

## Overview & Integration

# 1.0

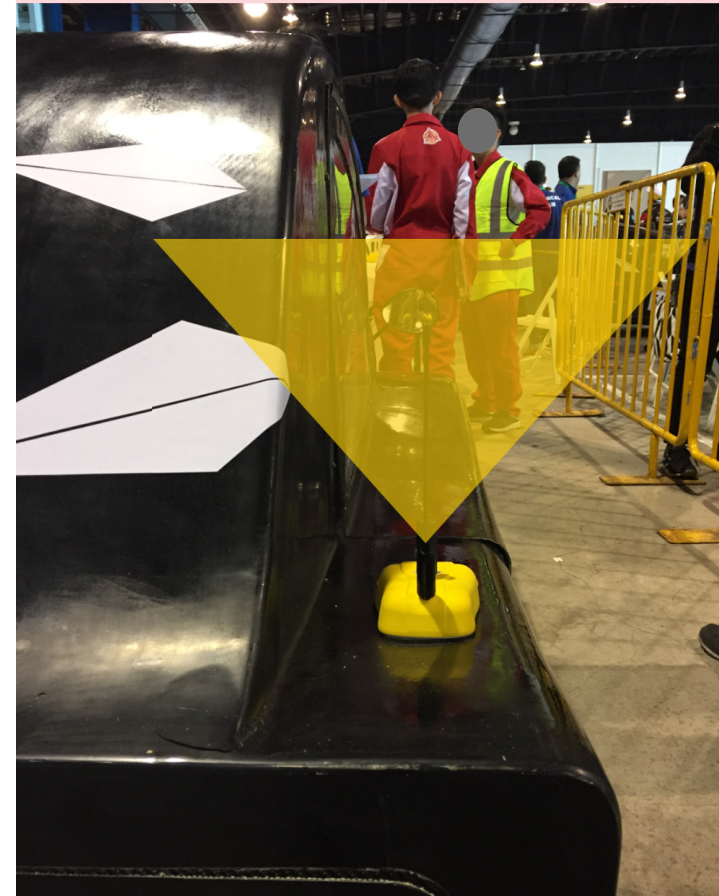
**Onboard-Computer (OBC) Pod mounting  
(on non-removable body part)**



# New Feature Test: GPS RTK







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SZ+mergy

Driving Direction 

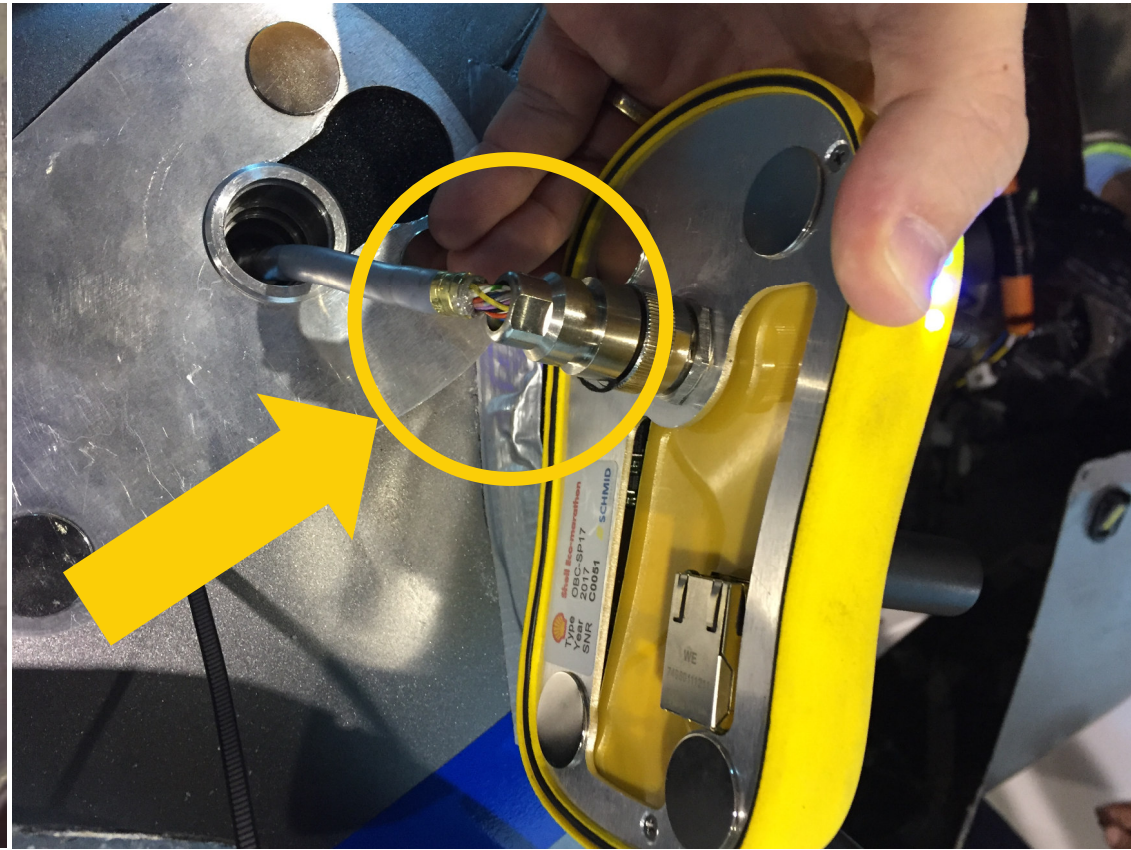
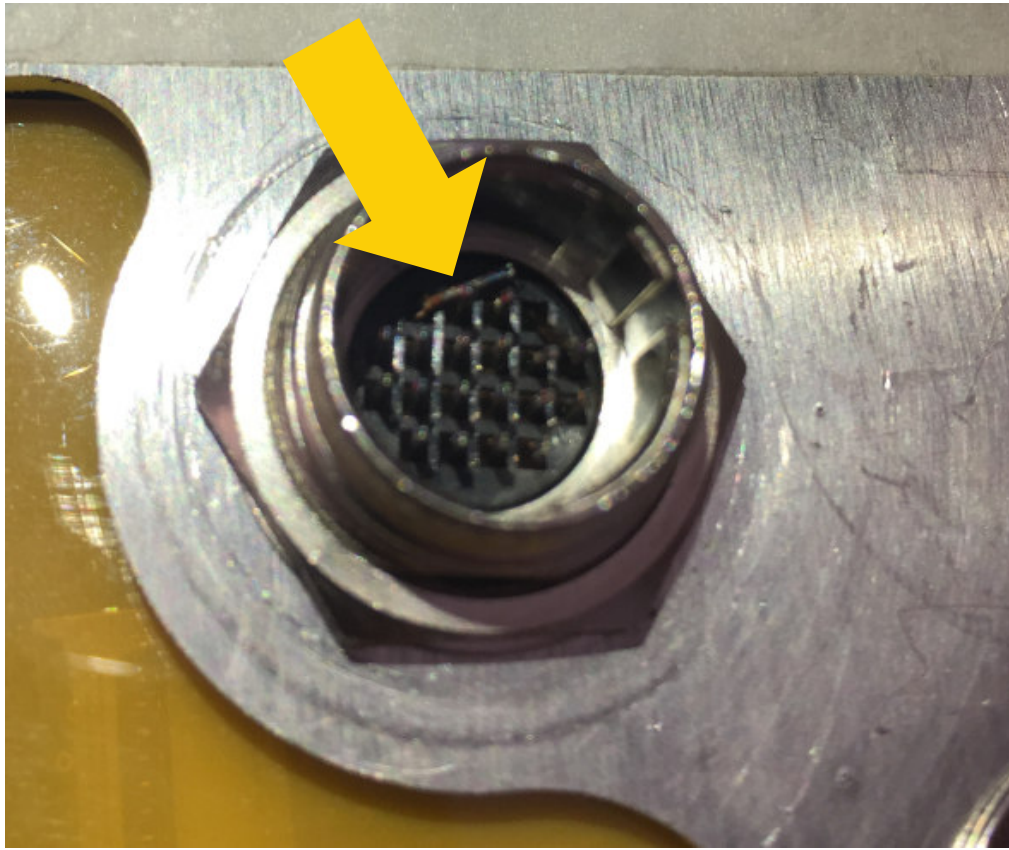




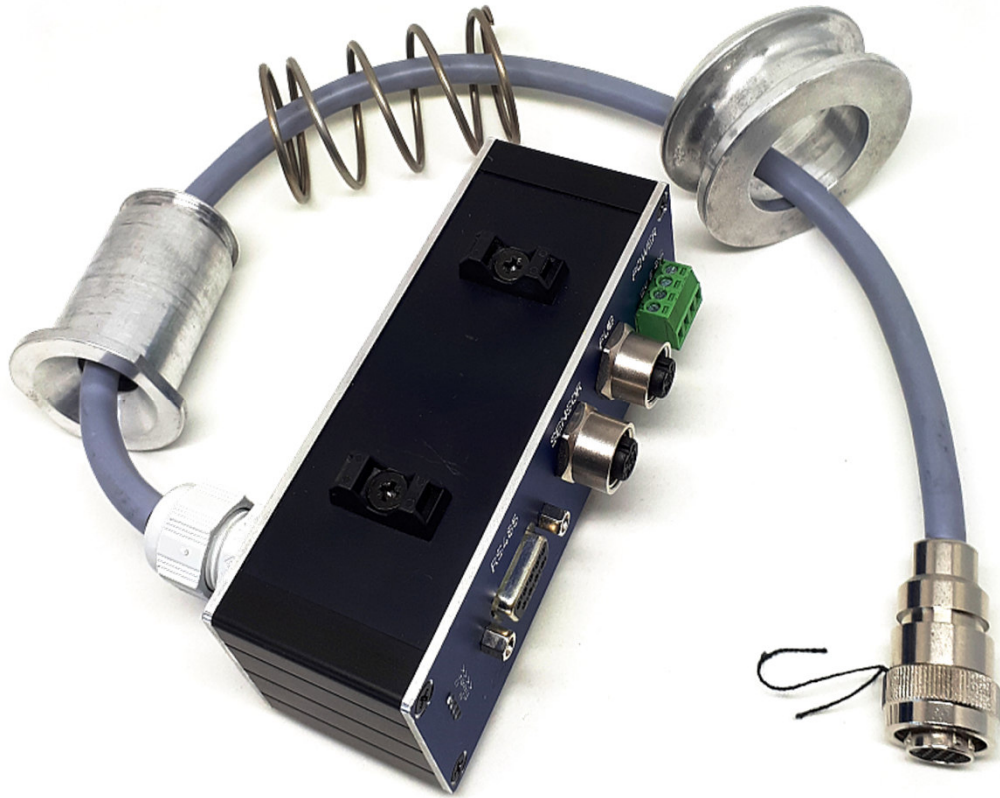
Driving Direction







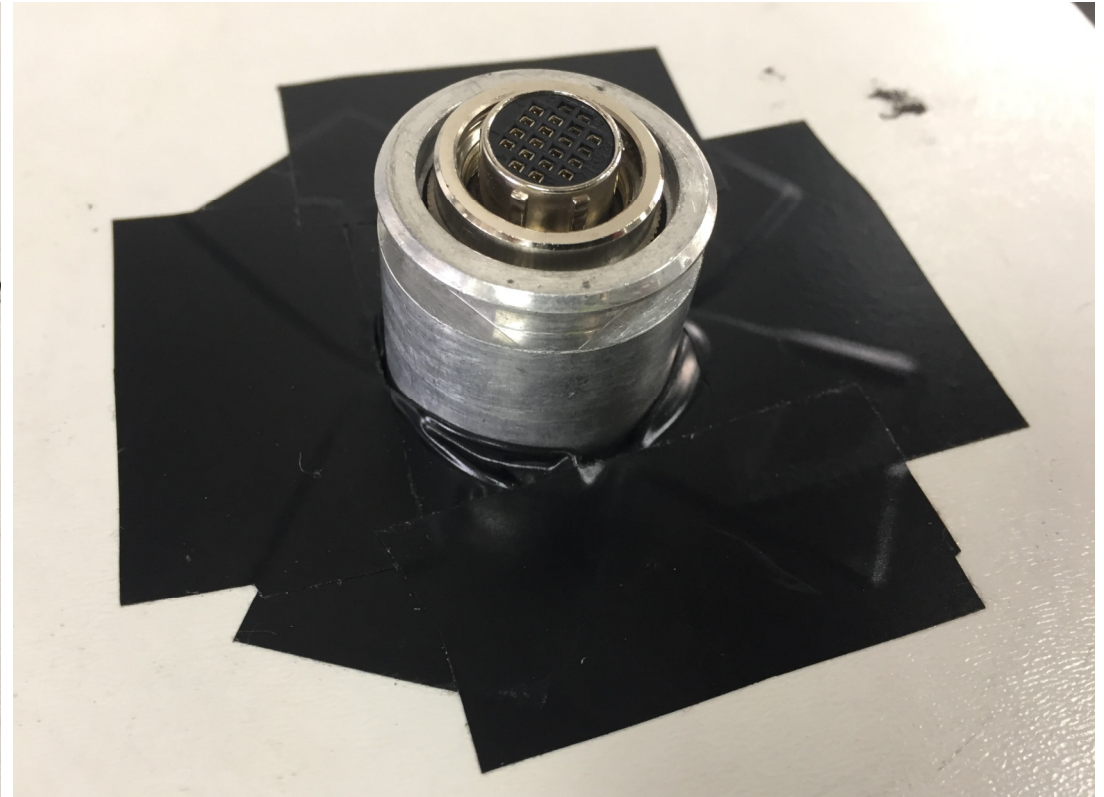
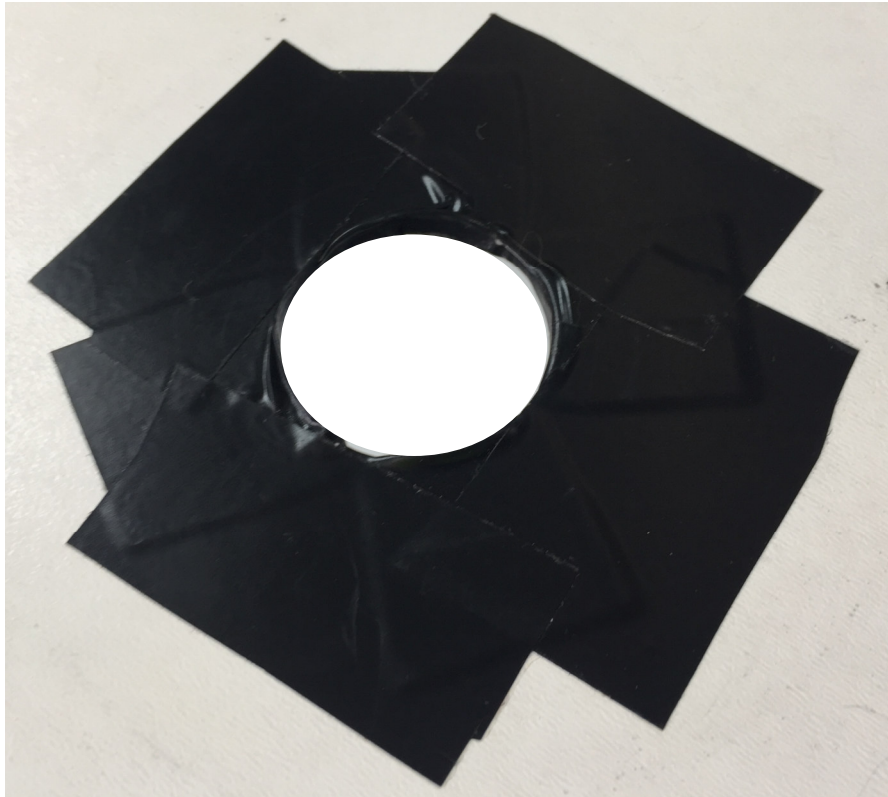
## Onboard-Computer Backbone Mounting



Allow for **10cm** of cable lift available (A “Fist” in between)

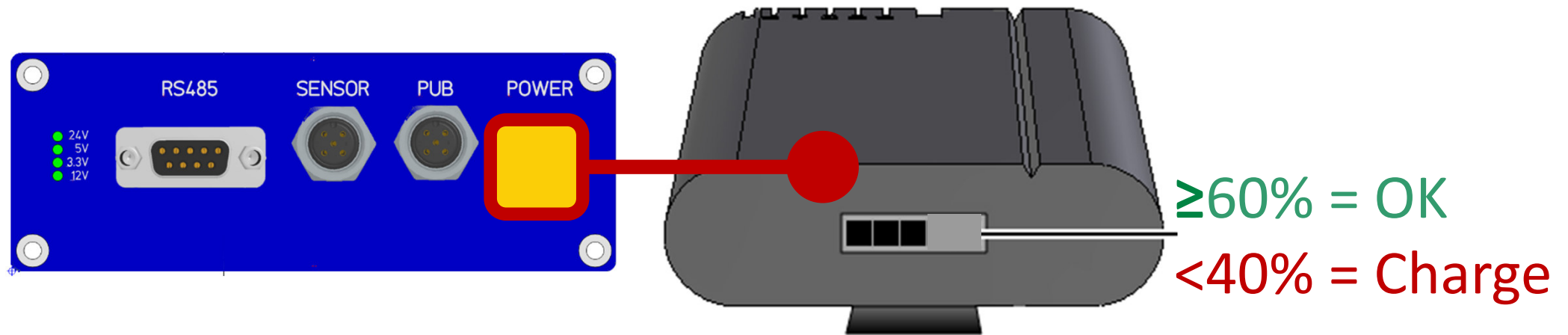


## POD and Backbone Mounting

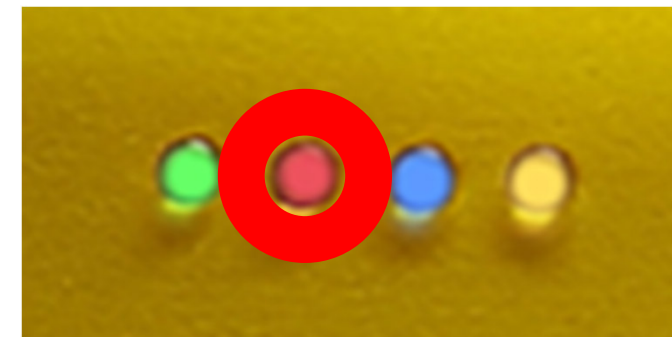


**No direct electrical connection to Chassis & Body**

# Onboard Computer Battery

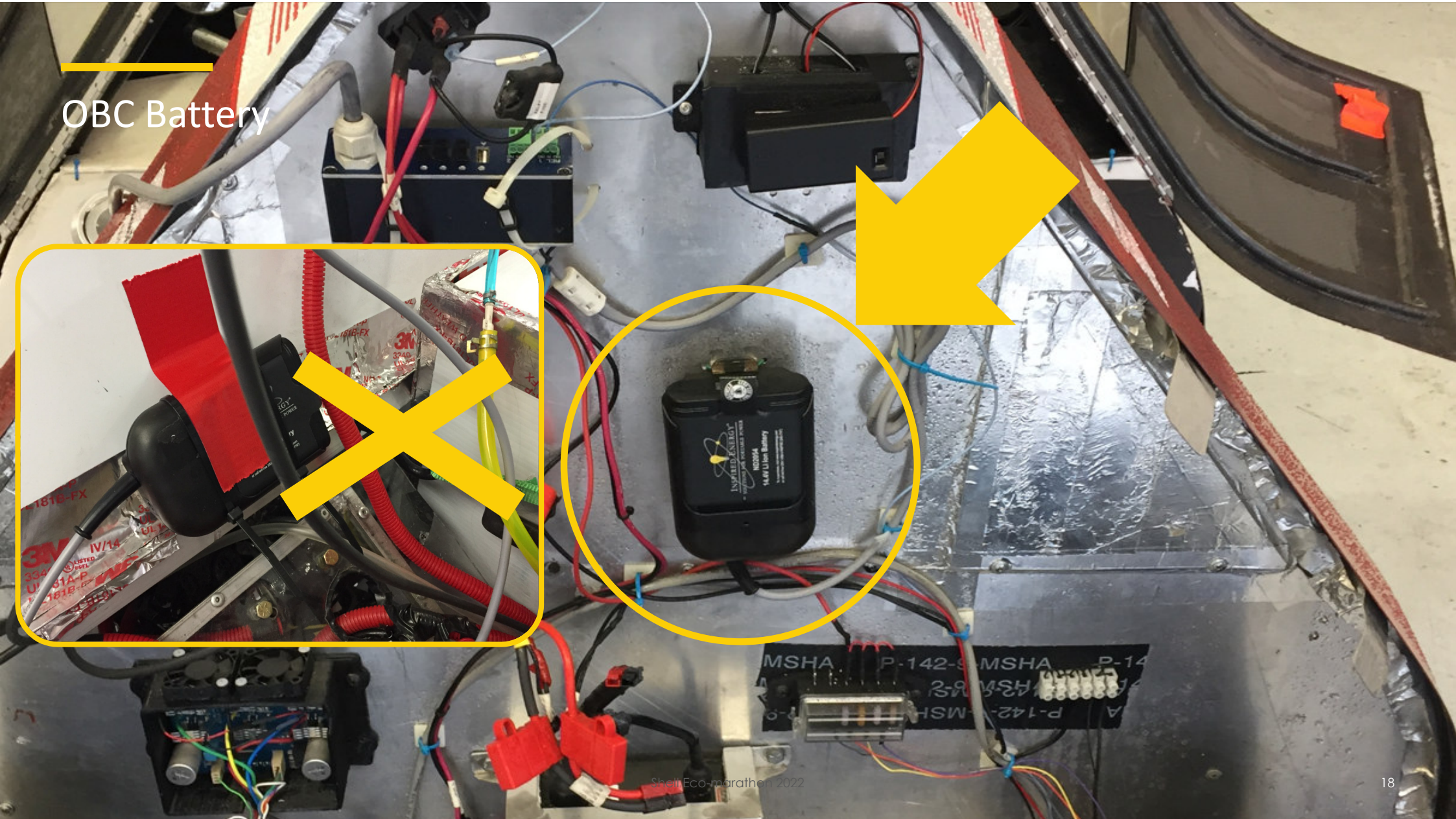


Hint: Delayed Access To Track  
if **red Light** on POD is Flashing !

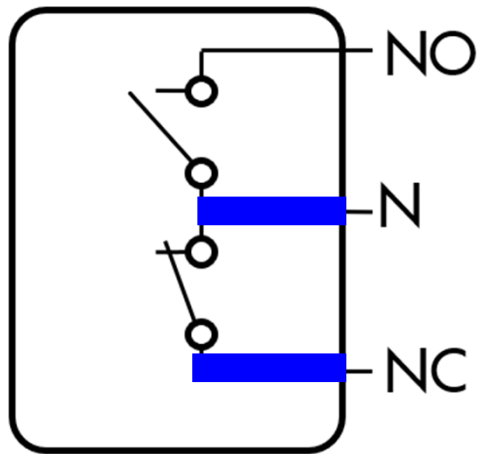




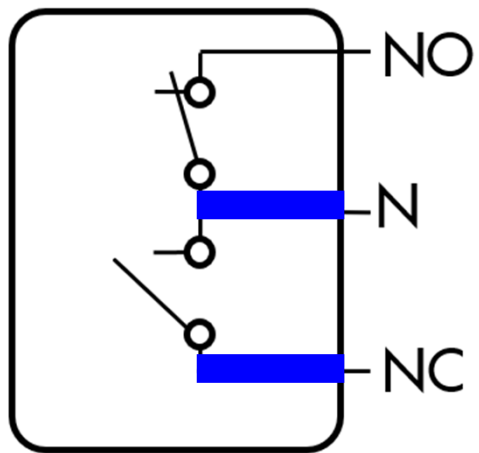
OBC Battery



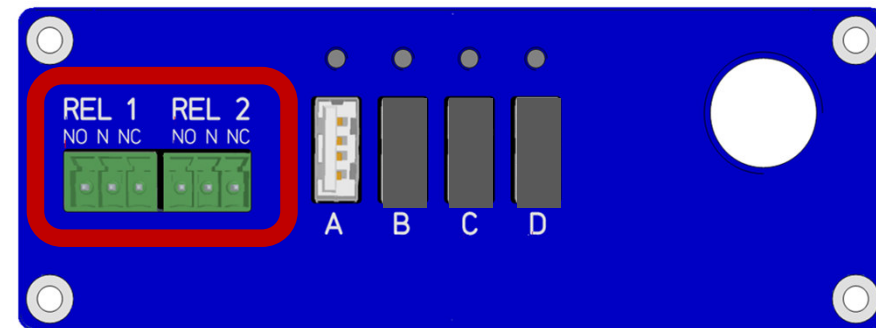
# Shutdown relay eg **NC** (Normally Closed)



Relay not activated  
→ **Motor ENABLED**

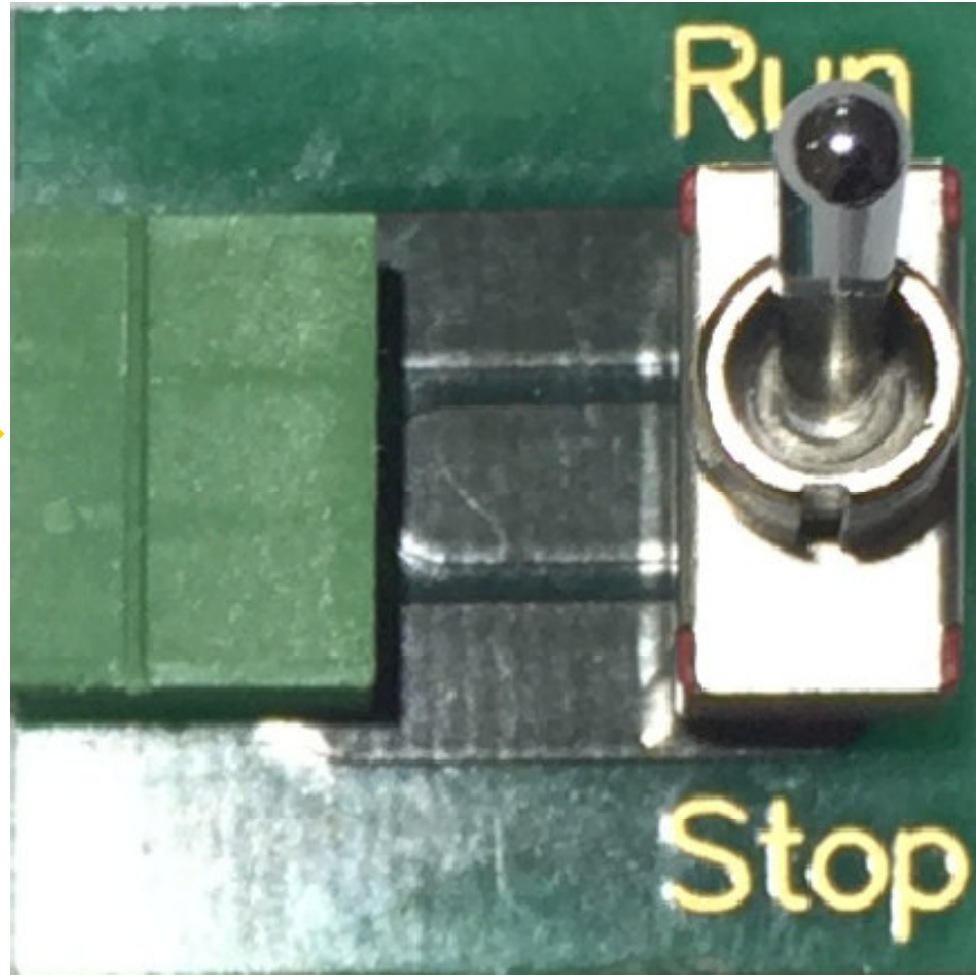
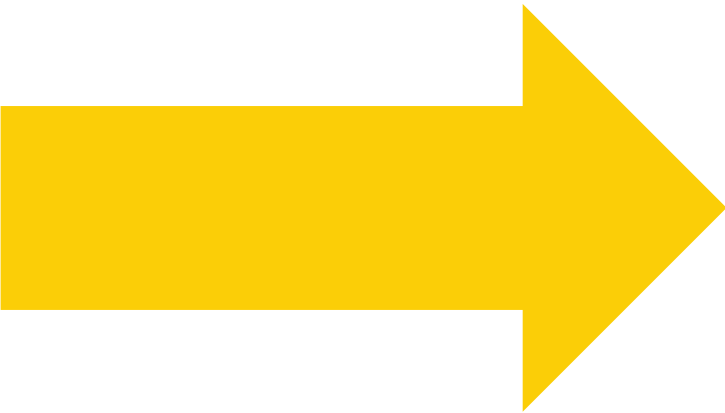


Relay activated  
→ **Motor DISABLED**



**ICE: Do NOT connect  
via IGNITION COIL,  
use ECU instead**

Relay Tester



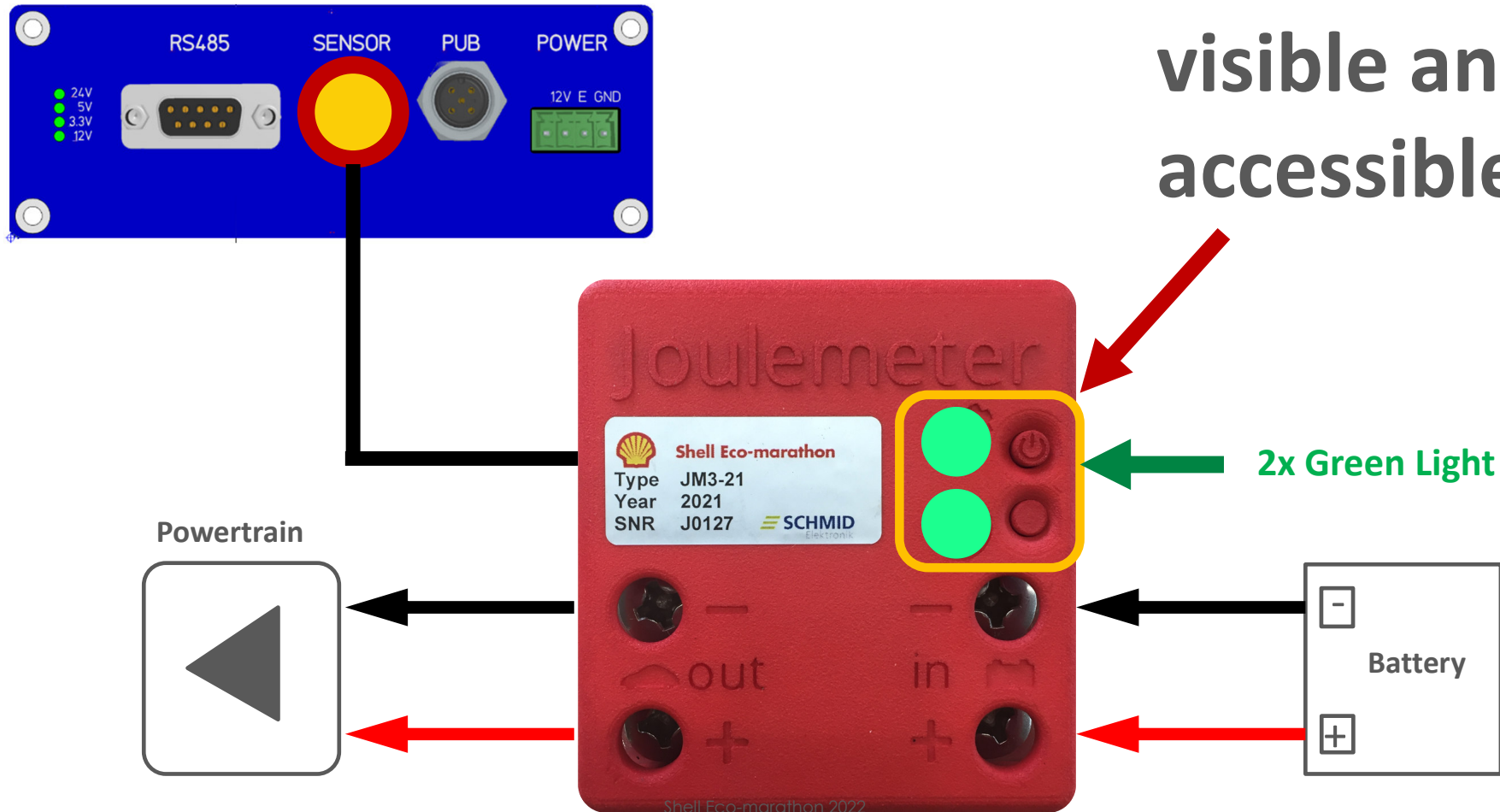
**Motor  
Enabled**

**Motor  
Disabled**



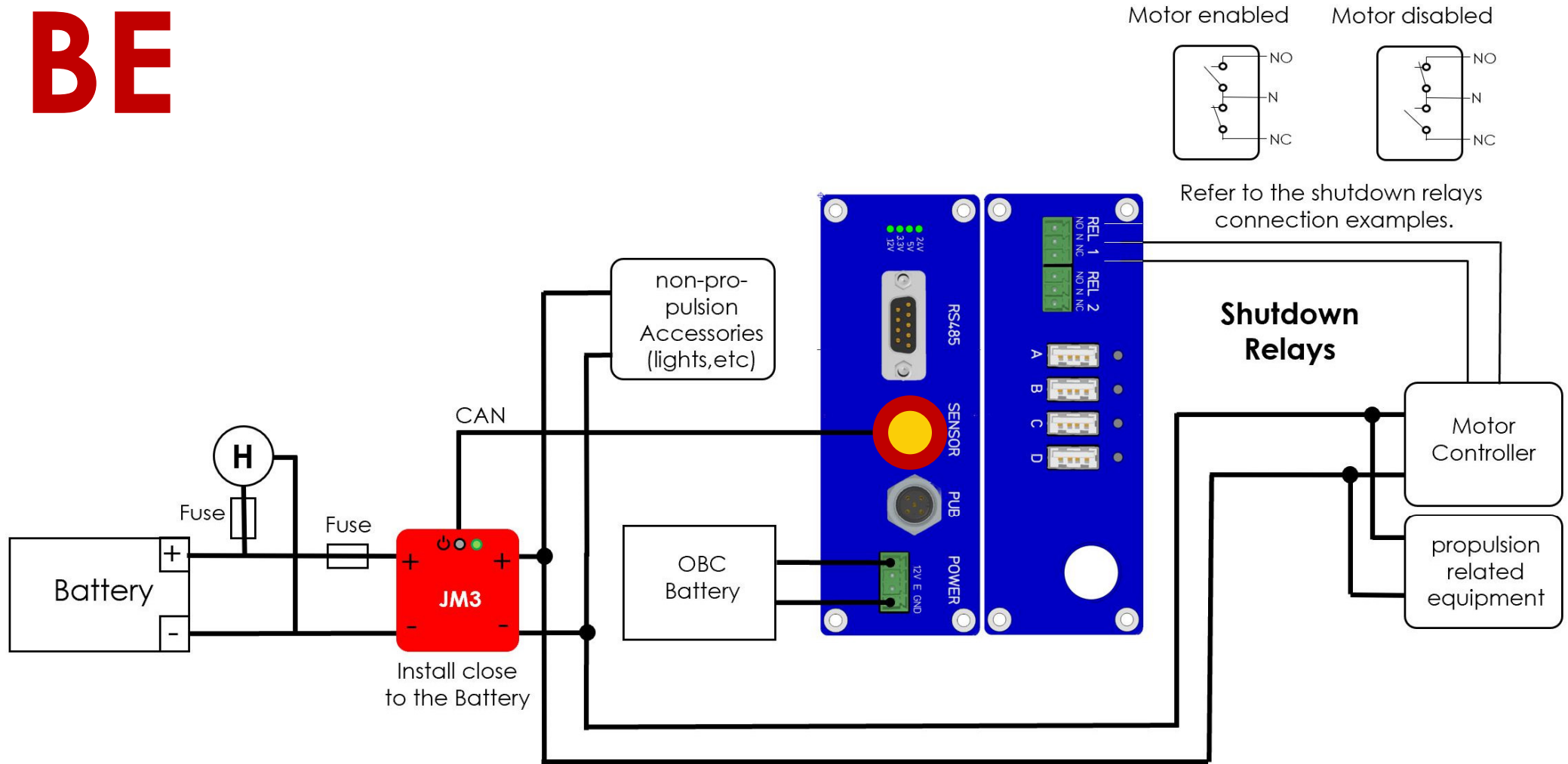
# All: Joulemeter (JM3)

**Buttons and LEDs must be visible and accessible**

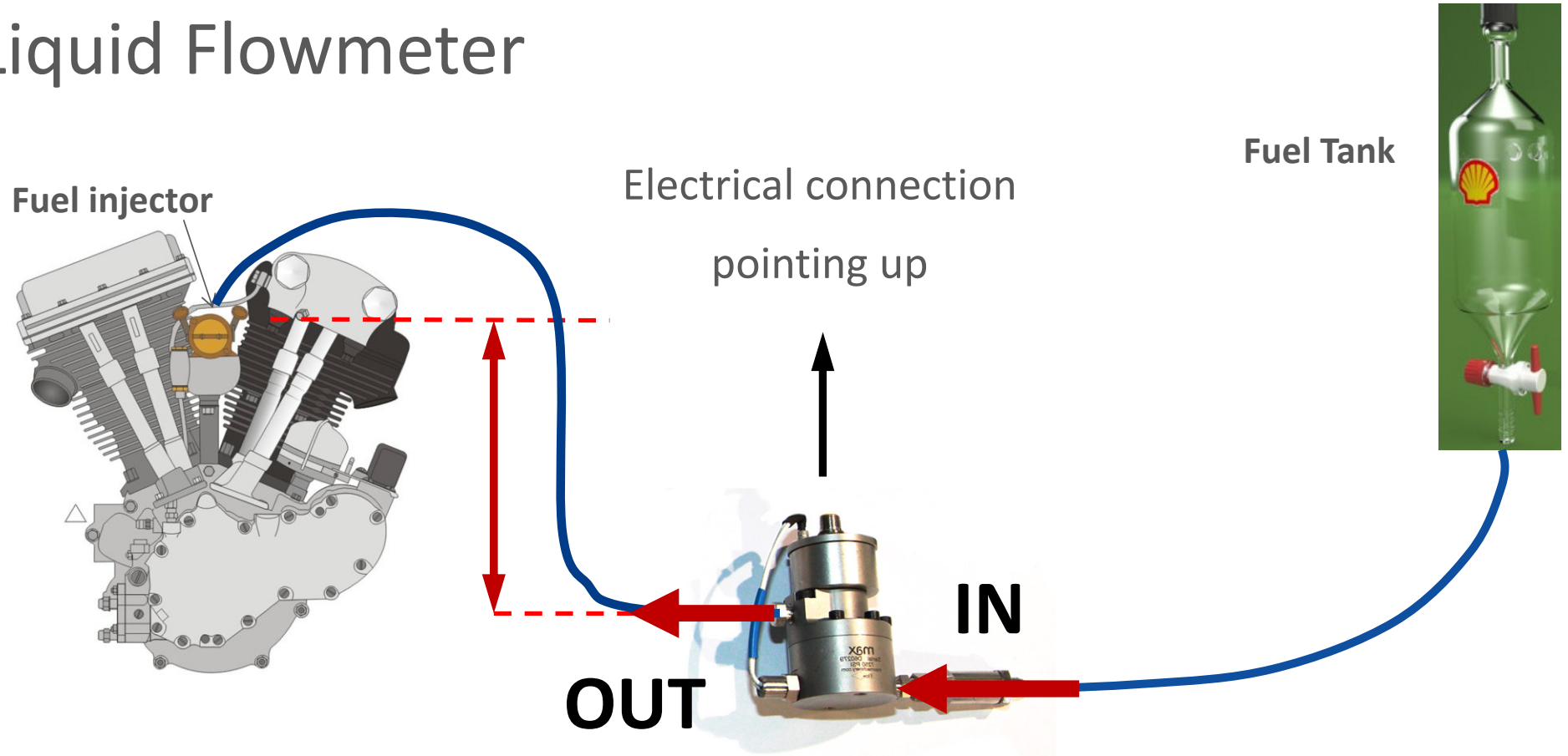


BE

<https://telemetry.sem-app.com>



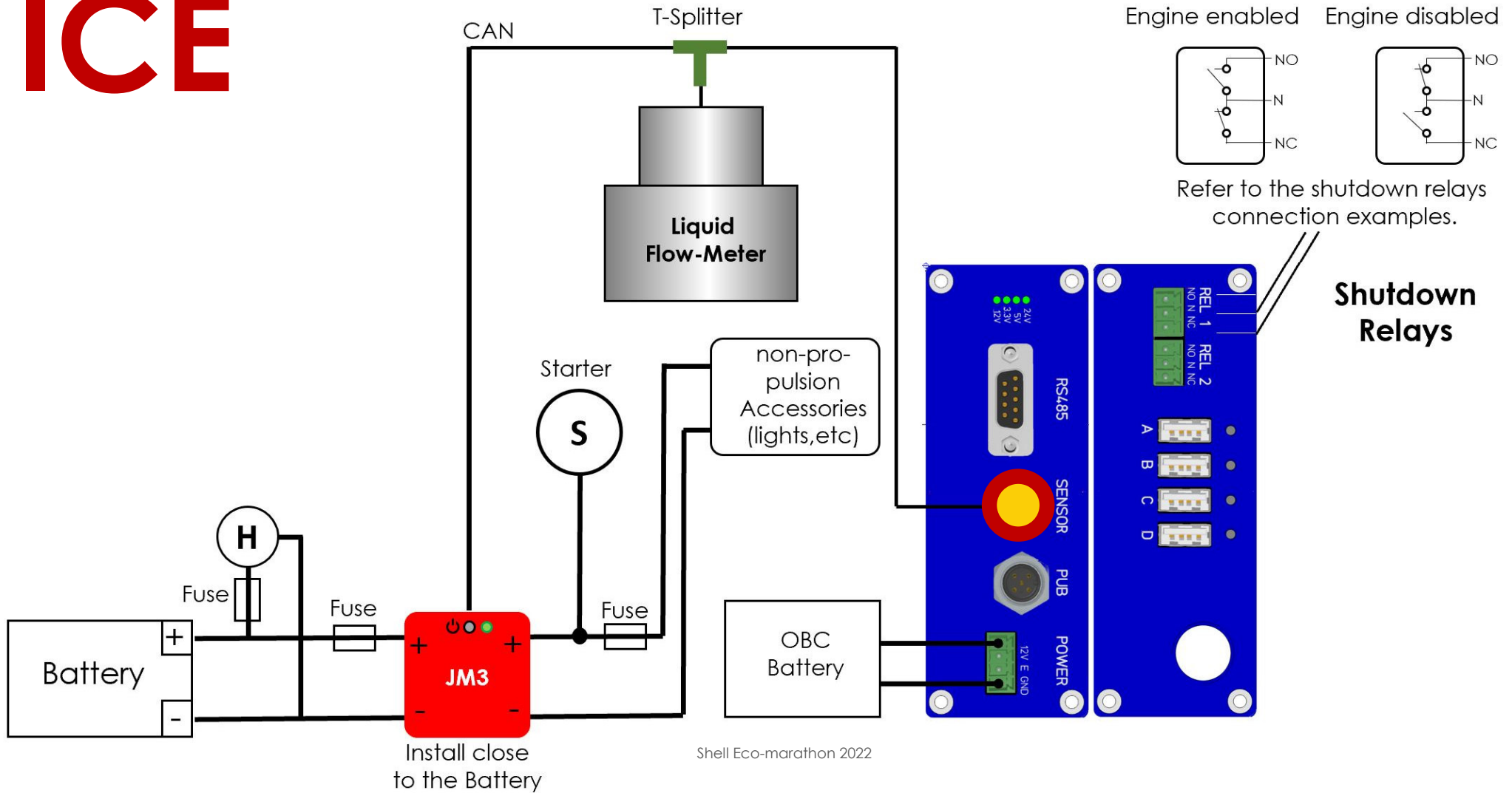
# ICE: Liquid Flowmeter



LFM mounted vertically and below injector&fuel tank

<https://telemetry.sem-app.com>

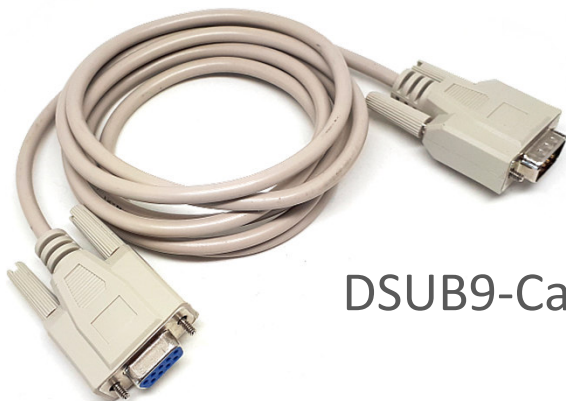
# ICE



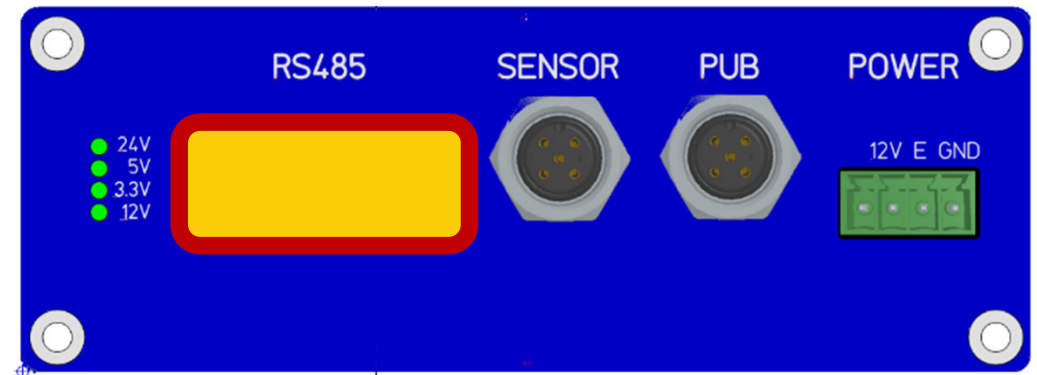
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# Hydrogen Gasflowmeter

- NO leaks
- NO Teflon tape
- DSUB9: Must be tight

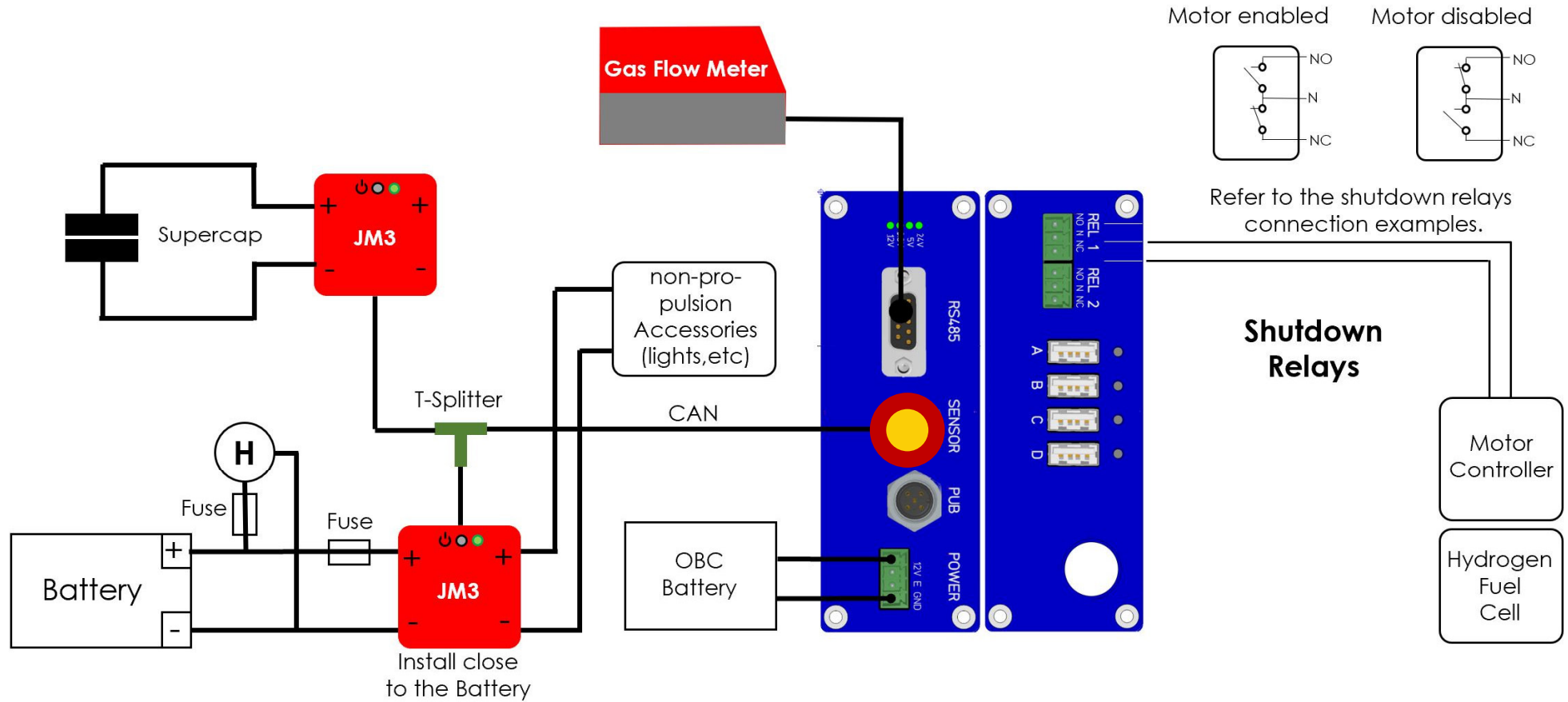


DSUB9-Cable



<https://telemetry.sem-app.com>

# H2



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# Telemetry System

## Selfcheck & Guidelines

# 2.0



## Quick **Self-Check** before inspection

- Check **OBC battery 60%**
- Switch **on** OBC
- Wait max **60** seconds





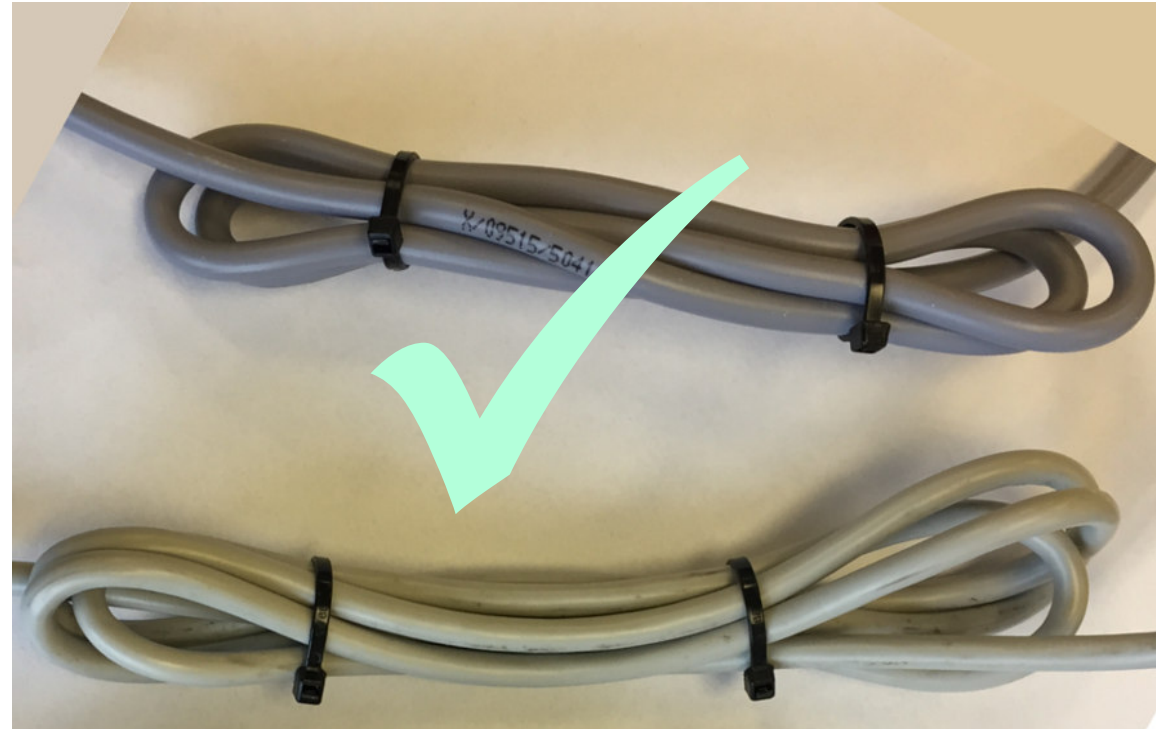
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Very Important for best EMI Compatibility

**No direct electrical connection** of Onboard-  
Computer to  
Vehicle Chassis and Body

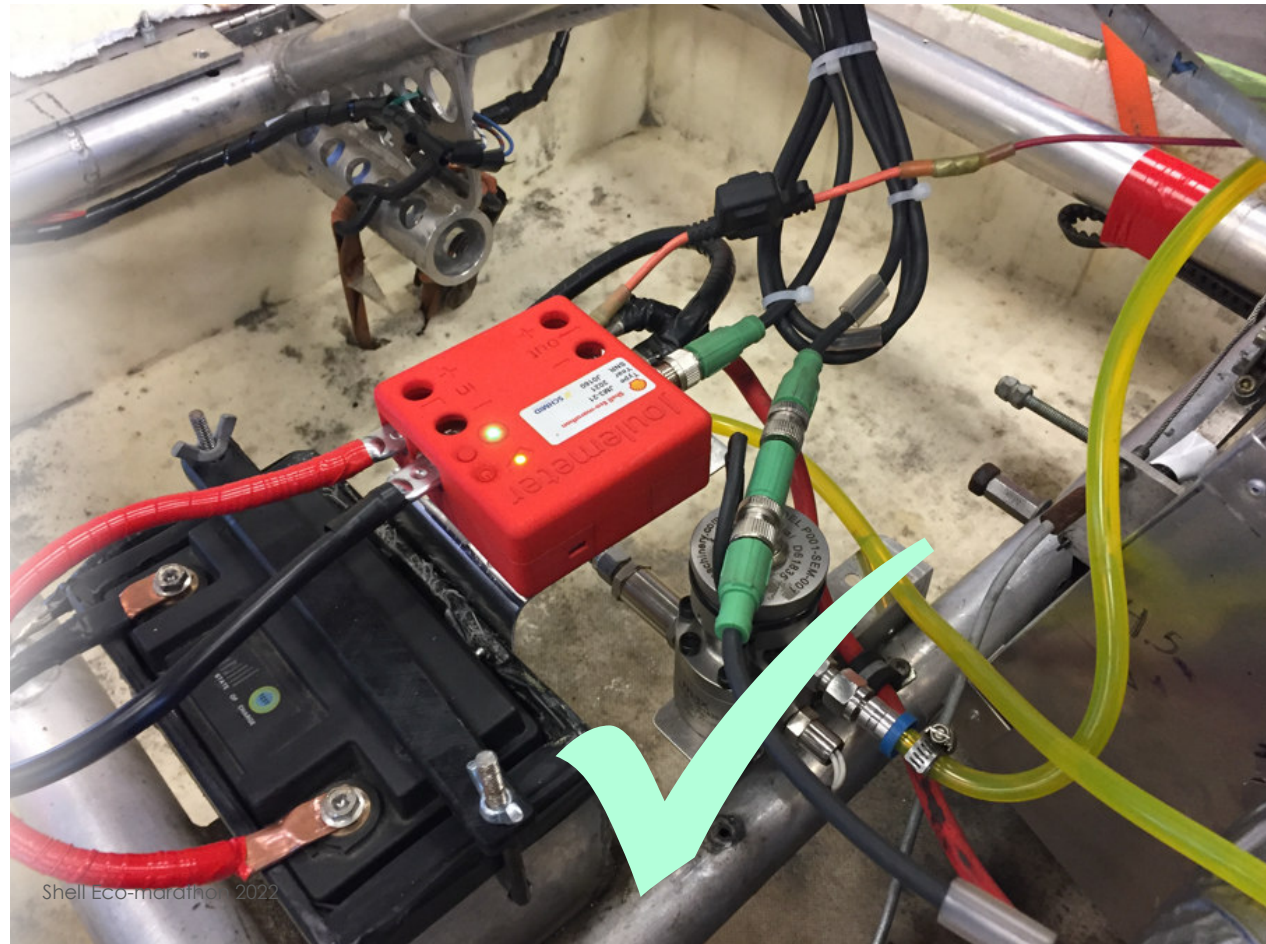
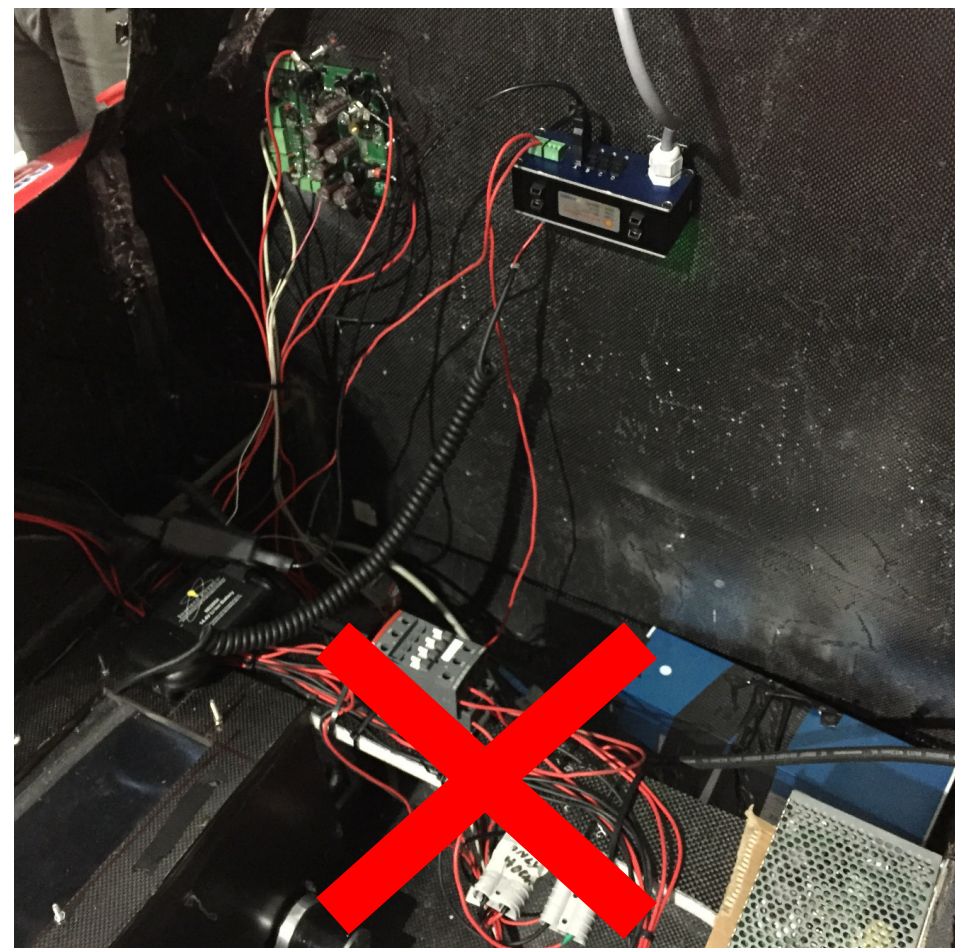
Stay away from **Electromagnetic Fields**

Guideline **1** No wide Loops in Cables



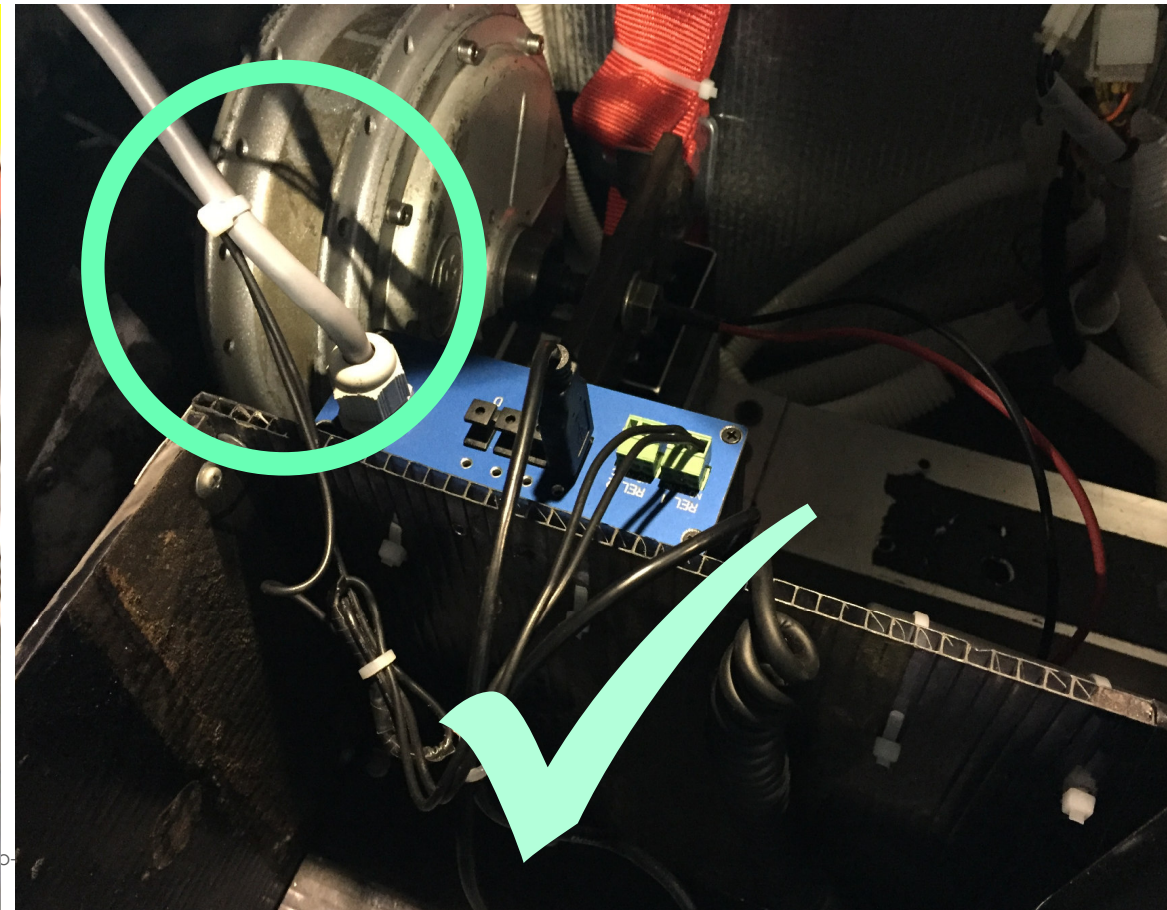


## Guideline ② Cables mounted securely

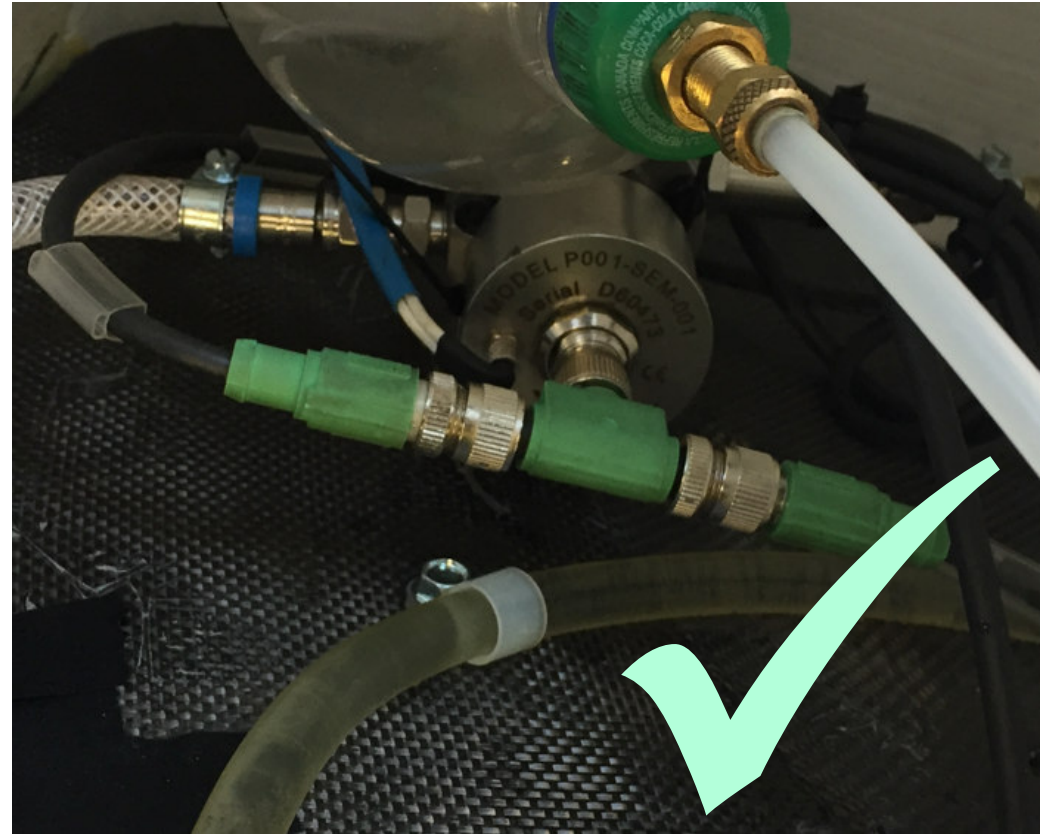
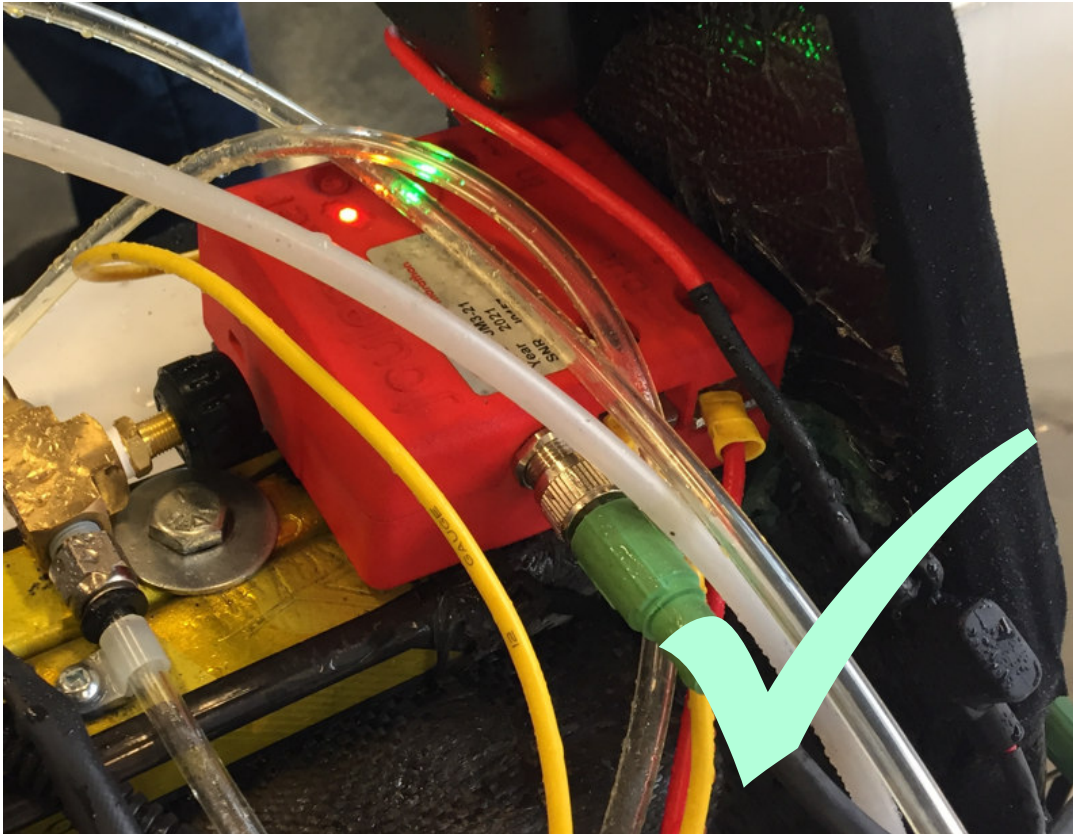




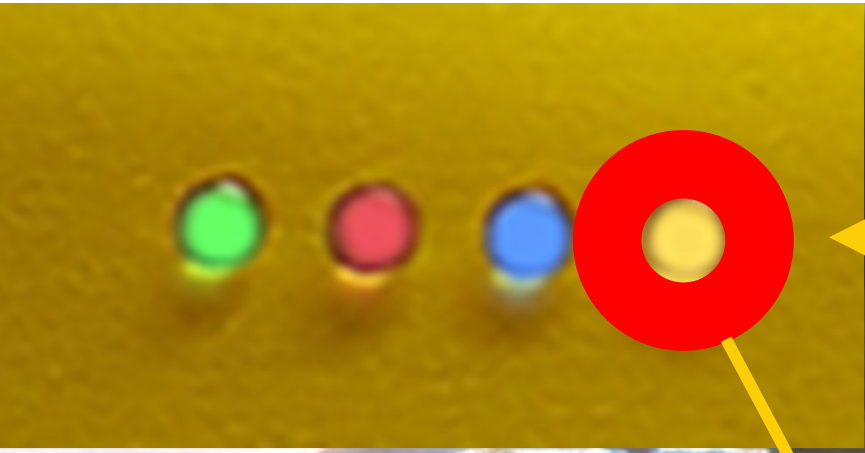
Guideline **3** Strain Relieves Applied



Guideline **4** Connectors fastened “Click”







Amber Light not Flashing



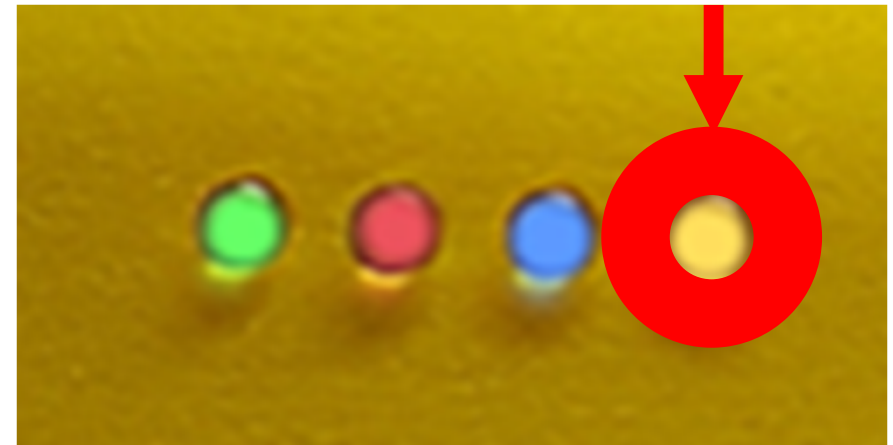
Quick Self-Check before Telemetry Inspection

# DO NOT COME TO TELEMETRY INSPECTION UNTIL:

Do not come to Telemetry Inspection until all boxes checked off

- ✓ **OBC-Pod** mounted correctly
  - ✓ OBC Pod unobstructed field of view of 90° to all sides
  - ✓ OBC Pod < 20° off horizon (pitch & roll)
  - ✓ OBC Pod in driving direction
  - ✓ OBC Pod 10cm of cable lift available (a Fist)
- ✓ **OBC Backbone** mounted correctly
- ✓ **Battery** mounted correctly
  - ✓ removable to the side or up, no tapes
  - ✓ > 60% of charge
- ✓ **Sensors** mounted correctly
  - ✓ JM3 2x **green light** (Status OK, Battery Charged)
  - ✓ JM3 Buttons accessible, LEDs visible
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  - ✓ Connectors fastened (Check the «click» at the end)
- ✓ **No direct** electrical connection of OBC to car body or chassis
- ✓ **OBC** working properly
  - ✓ LEDs after 1min = **Green Off Blue Yellow** G O B Y
- ✓ **Shutdown Relay** working properly
  - ✓ Start engine (if not yet running)
  - ✓ Simulate relay with supplied electronic switch
  - ✓ Engine stops

## Amber Light not Flashing



Team: Checklist Complete

Inspector

Date	Name	Signature
2.6.2022	John Smith	<i>J. Smith</i>

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# Telemetry System

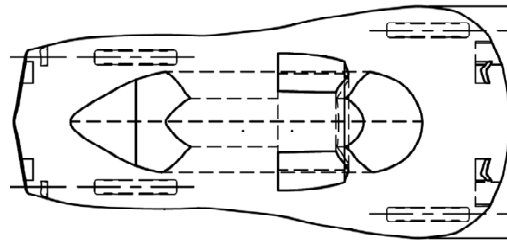
## Race Processes

# 3.0



## IMPORTANT for Practise Runs & Attempts

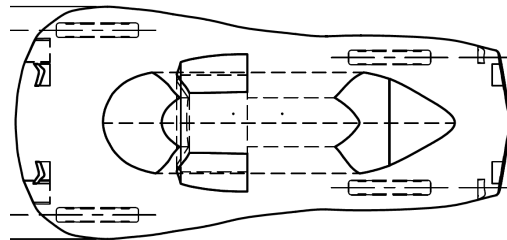
Battery  $\geq 60\%$   
Switch OBC **ON**  
Switch JM3 **ON**  
Steady Amber LED



**Start  
Area**

Outside Track: OBC and JM3 switched **OFF**

Switch OBC **OFF**  
Switch JM3 **OFF**



**Finish  
Area**



# Quick Assessment

**The Most Important  
Rules & Guidelines?**

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# Ticket

Mandalika

2022





<http://www.sem-app.com/asia18/501>

USER:

Password

**DO NOT COME TO TECHNICAL INSPECTION UNTIL:**

- Hole drilled
- Joulemeter installed
- Liquid Flowmeter, Union and barbs installed on fuel line
- Battery fully charged
- Shutdown relay connected
- Printed technical documentation
- Battery installed

For documentation, FAQ and feedback, please first visit the WIKI:

[telemetry.sem-app.com](http://telemetry.sem-app.com)

**501 ICE**

Get your  
**TELEMETRY KIT**  
at the  
Distribution Desk



**THANK YOU**



**Good Luck on the Track!**

**See you at Tech with a Steady Light**