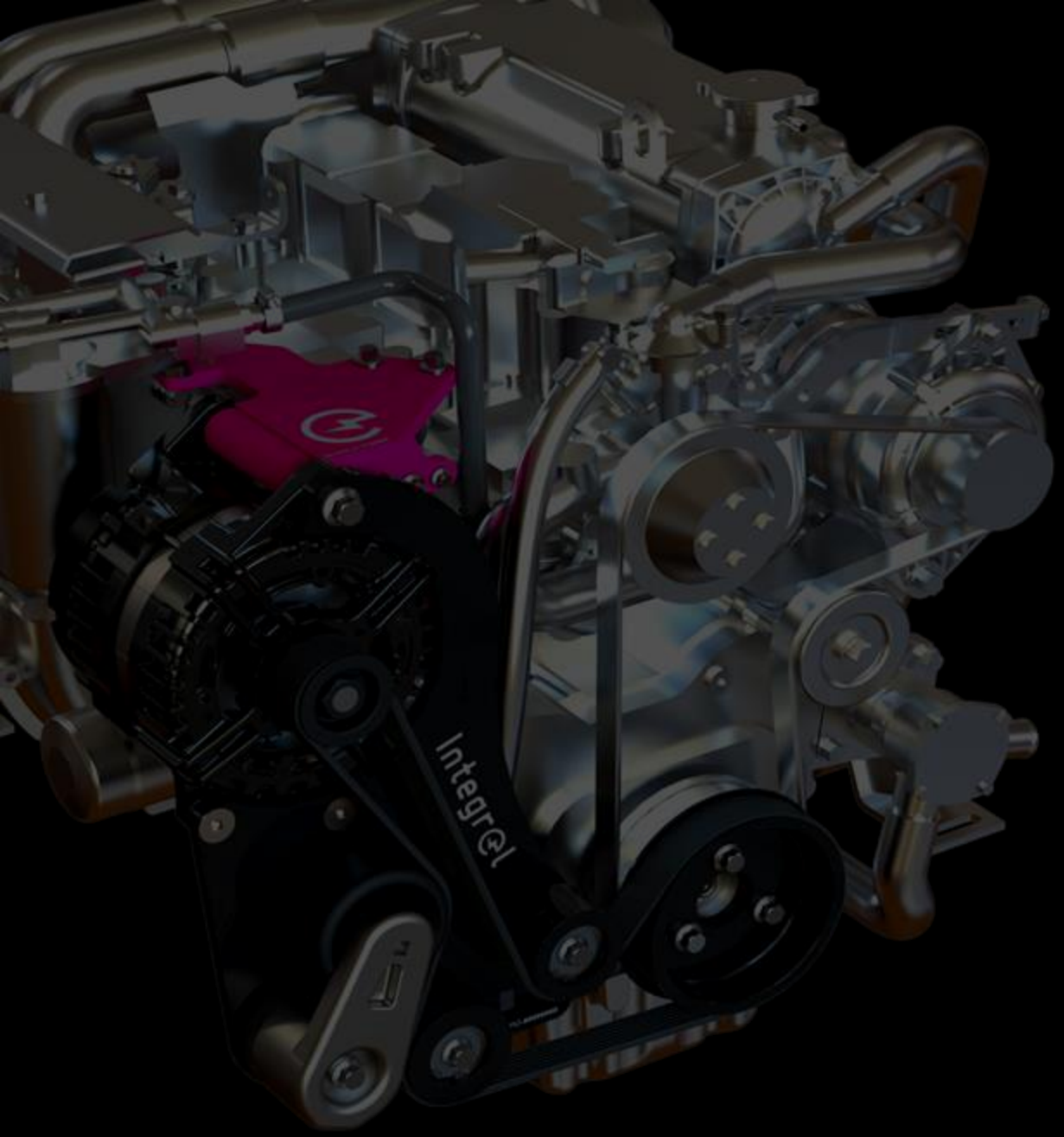


Integrel
solutions

E-Power Technical Overview

Providing energy freedom on the water

About Integrel

- Over 20 years researching and developing fuel-efficient power generation and storage technologies for the marine world.
- Committed to driving the marine industry towards sustainable power generation while enabling customers to eliminate polluting fossil fuel generators without sacrificing onboard luxuries.
- “Our goal is to become the first-choice option for boat owners that are looking for power generation options but want to steer away from generators.”

Integrel solutions

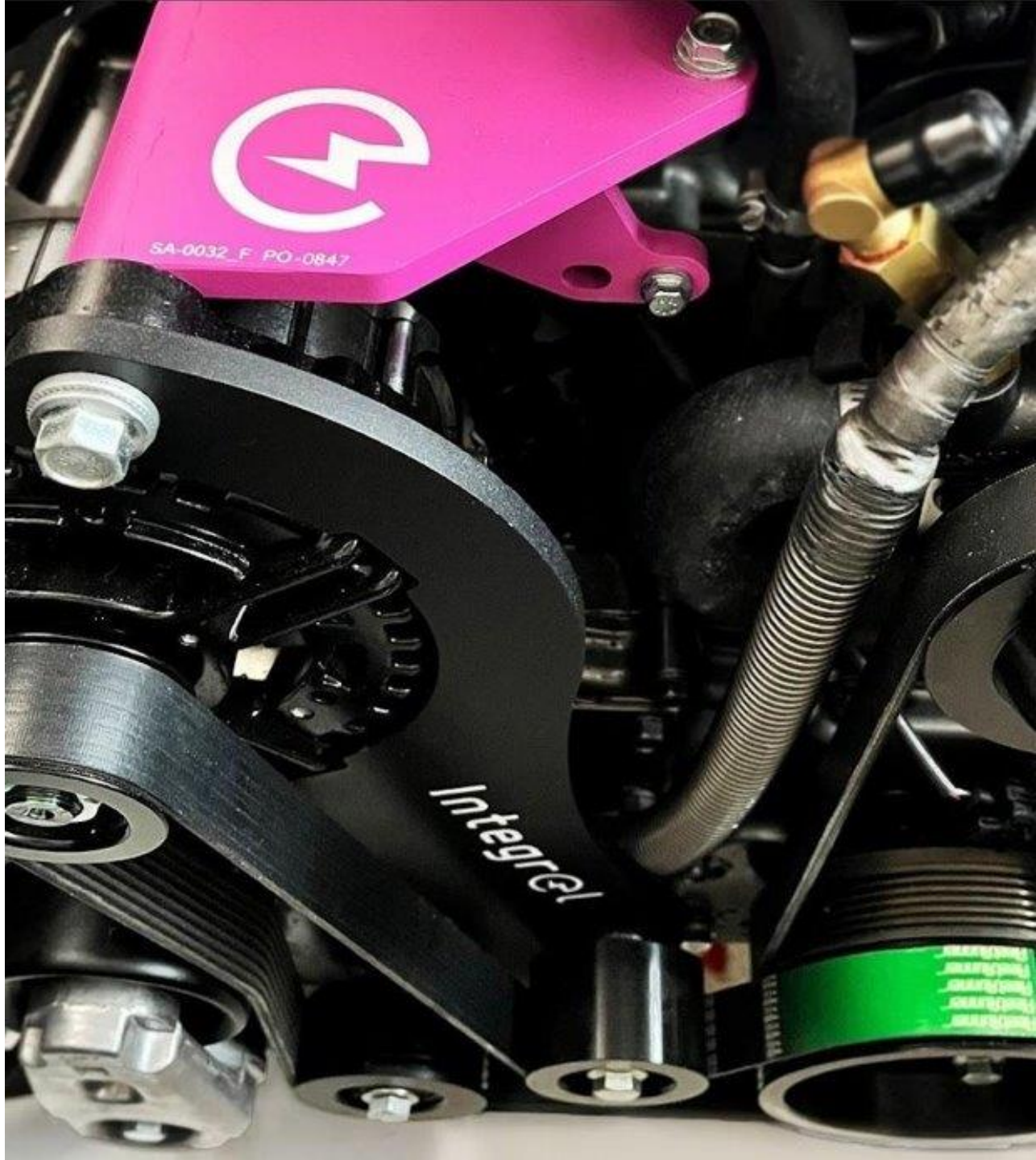
Integrel E-Power

- Charges 48V lithium batteries
- Generates up to 9kW
- CAN.bus integration for Mastervolt, Victron, MG Energy
- Dynamic current management
- Full Victron integration with GX devices

Engine Support (1)

- Yanmar
    - 3JH
    - 3YM30
    - 4JH45
    - 4JH57
    - 4JH80
    - 4JH110
    - 4JH-5E
    - 4JH-5CE
    - 4JH4-HTE
    - 4LV150
    - 4LHA-HTP

...

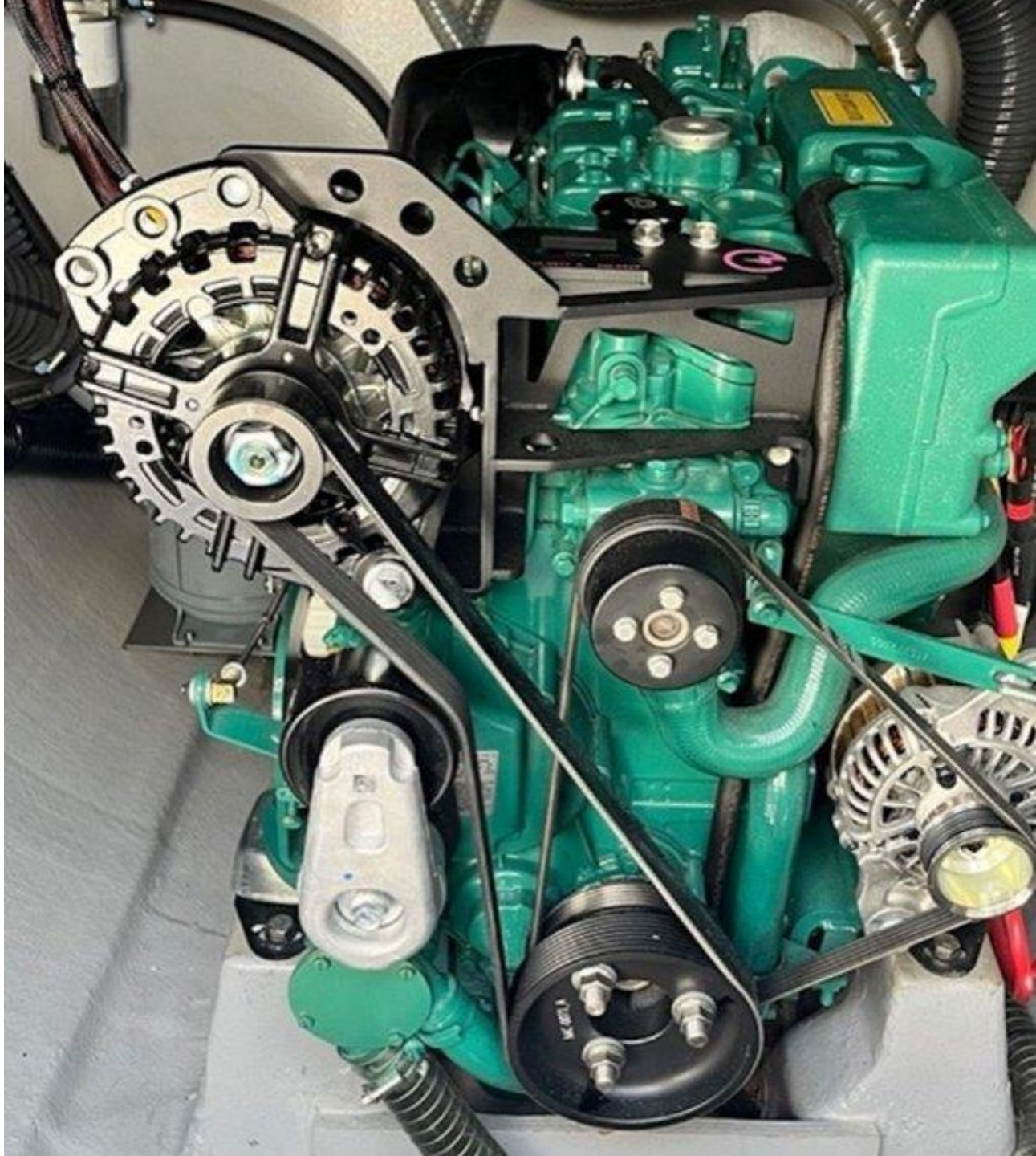


Integrel solutions

Engine Support (2)

- Volvo
  - D2-40
  - D2-50
  - D2-60
  - D2-75
  - D3-110
- Beta
  - 75
- Vetus
  - 45

... more in development.

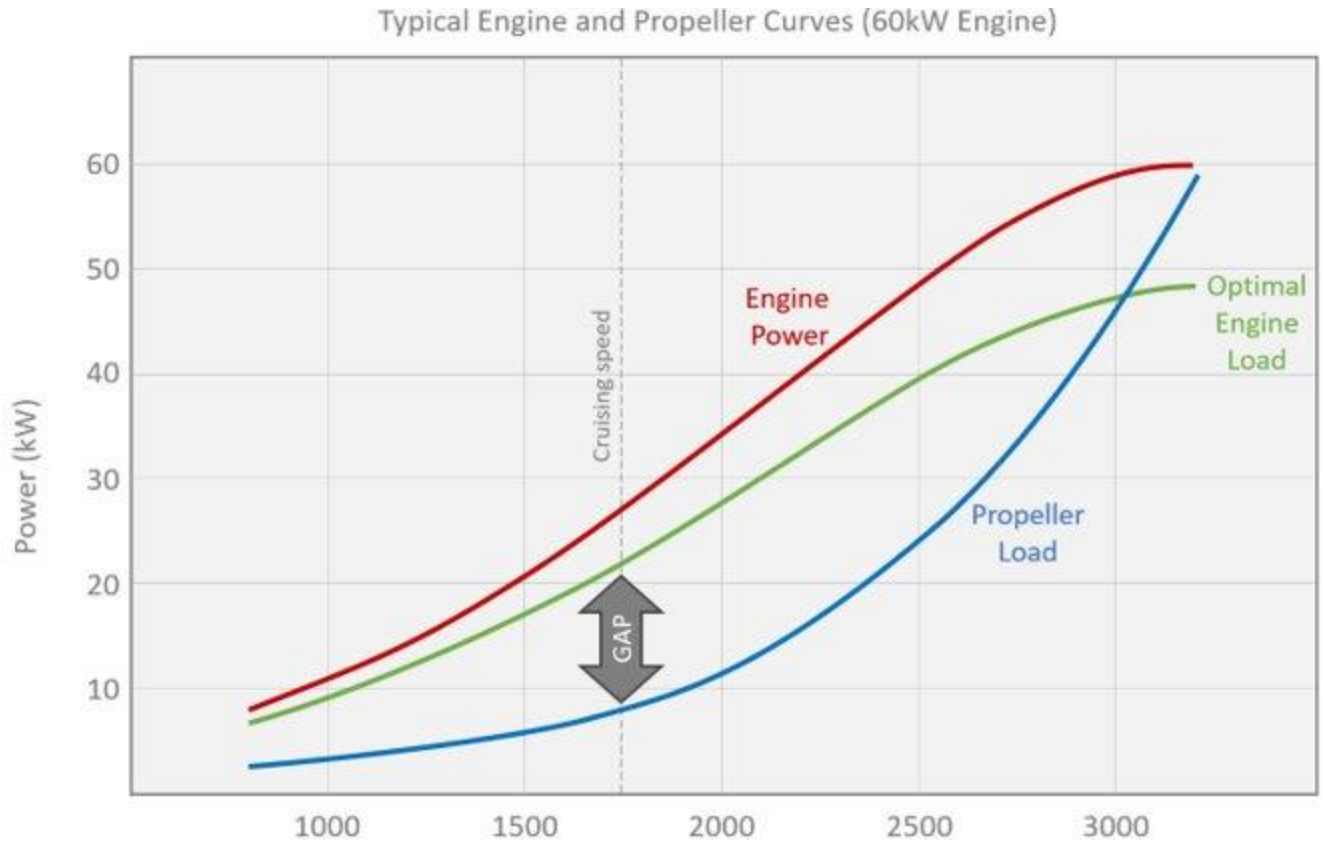


The Intelligent Generation of Electricity

Integrel E-Power exploits the fact that there is a significant power gap between the optimum efficiency load line of an engine and the load applied by the propeller.

Integrel E-Power is used as a precisely managed variable load in addition to the propellor load to operate the engine at, or near optimum, efficiency.

The result is one engine doing two jobs: turning the propeller and generating electricity, both tasks delivered with the best possible fuel efficiency.



System Components

9kW On-Engine Generator (OEG)
The electrical power source of the Integrel System.

System Controller
The 'black box' that monitors and controls system components.

Engine Mounting Kit
Each kit is designed specifically to suit the make/model of the propulsion engine.

Battery Sensor(s)
Monitors the state of a battery bank (aka 'string' of batteries)

Integrel Smart Switch
Disconnects battery(s) if a safety or battery critical event occurs (48V and 24V @ 400A. 500A on request)

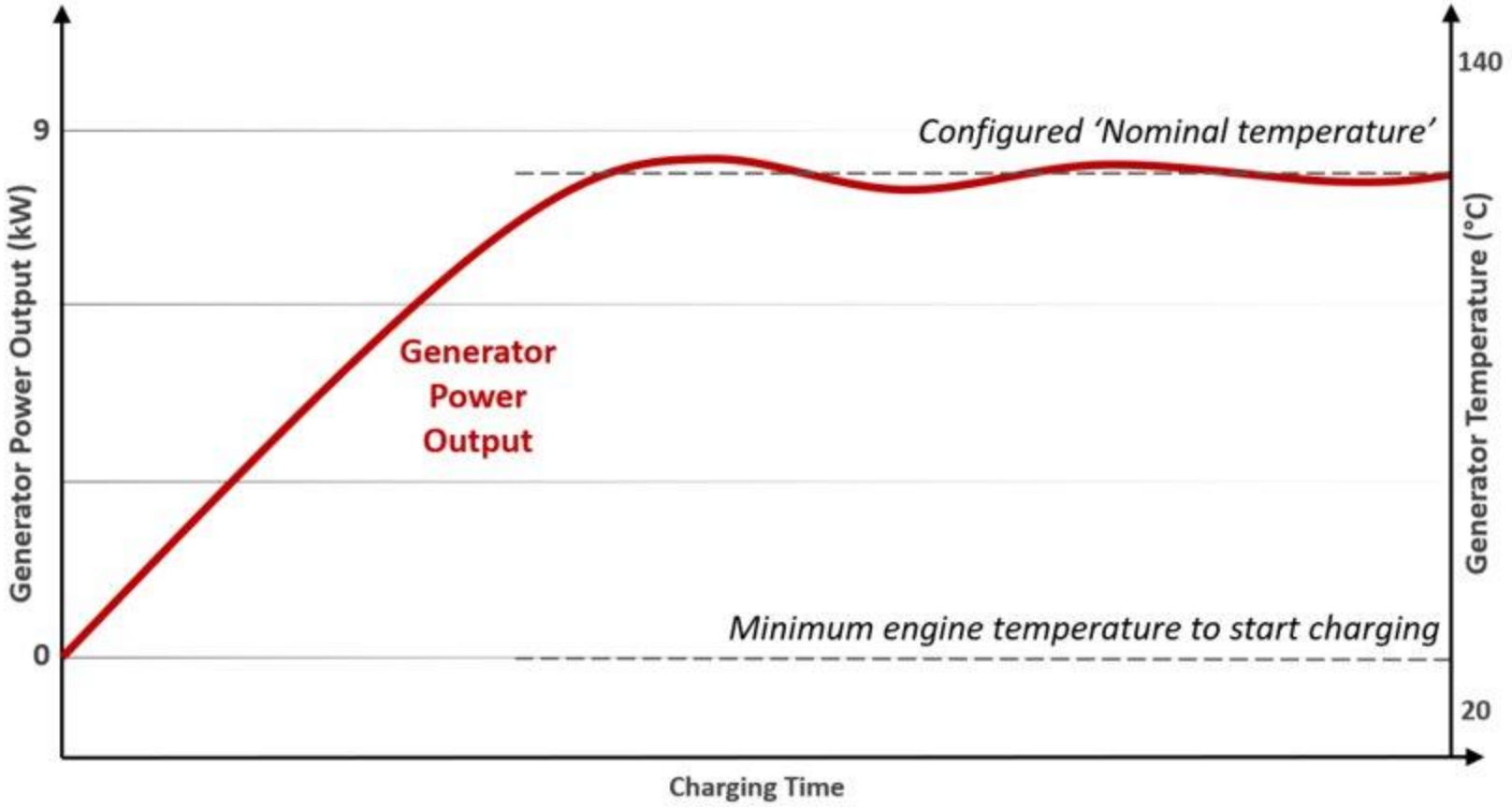
Integrel Touchscreen
Monitors and controls the Integrel System, and allows viewing of engine and battery data

Integrel Junction Box
Provides a connection point for the Integrel (Argo) CAN bus network

Integrel Breaker Switch Panel
The panel switch is fitted with breaker switches. Thiss provides a way to power the system ON/OFF as well as a protection device.

Power vs. Temperature

- Integrel E-Power is air cooled.
- When the Integrel E-Power OEG reaches ~110°C (230°F), the system reduces power output to limit the maximum temperature to 120-130°C (248-266°F).
- When the OEG begins to cool, the charging power increases again.



Power output stops under the following conditions:

- When the engine is below minimum operating temperature
- When a gear shift is detected
- When the boat is manoeuvring
- If there is a rapid change in engine speed (RPM) typically around 15%
- At approximately 75% of wide-open throttle and above

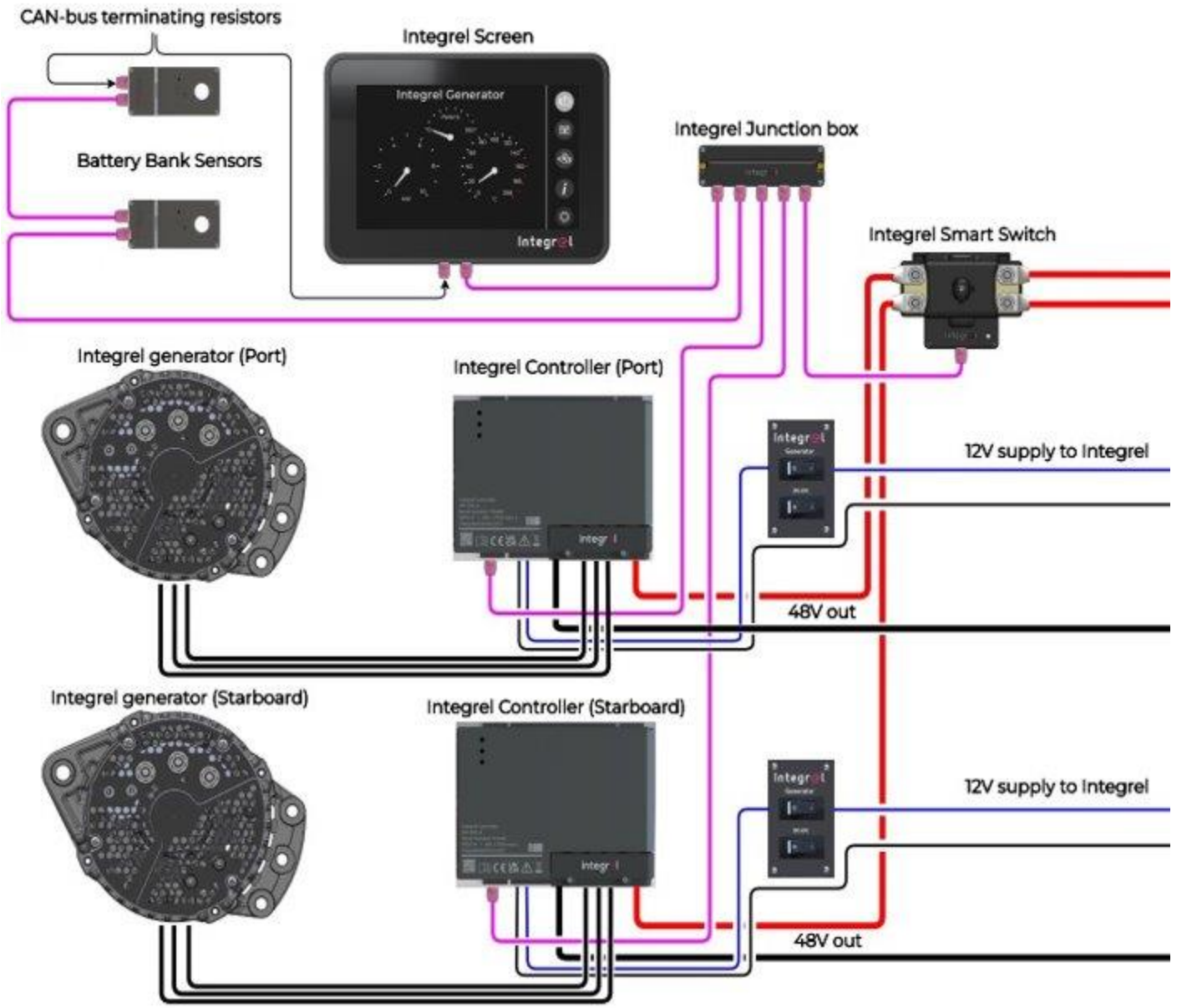
This behaviour ensures that when manoeuvring, or in circumstances where you need propulsion quickly, the entire engine power is available to drive the propeller.

Integrel solutions

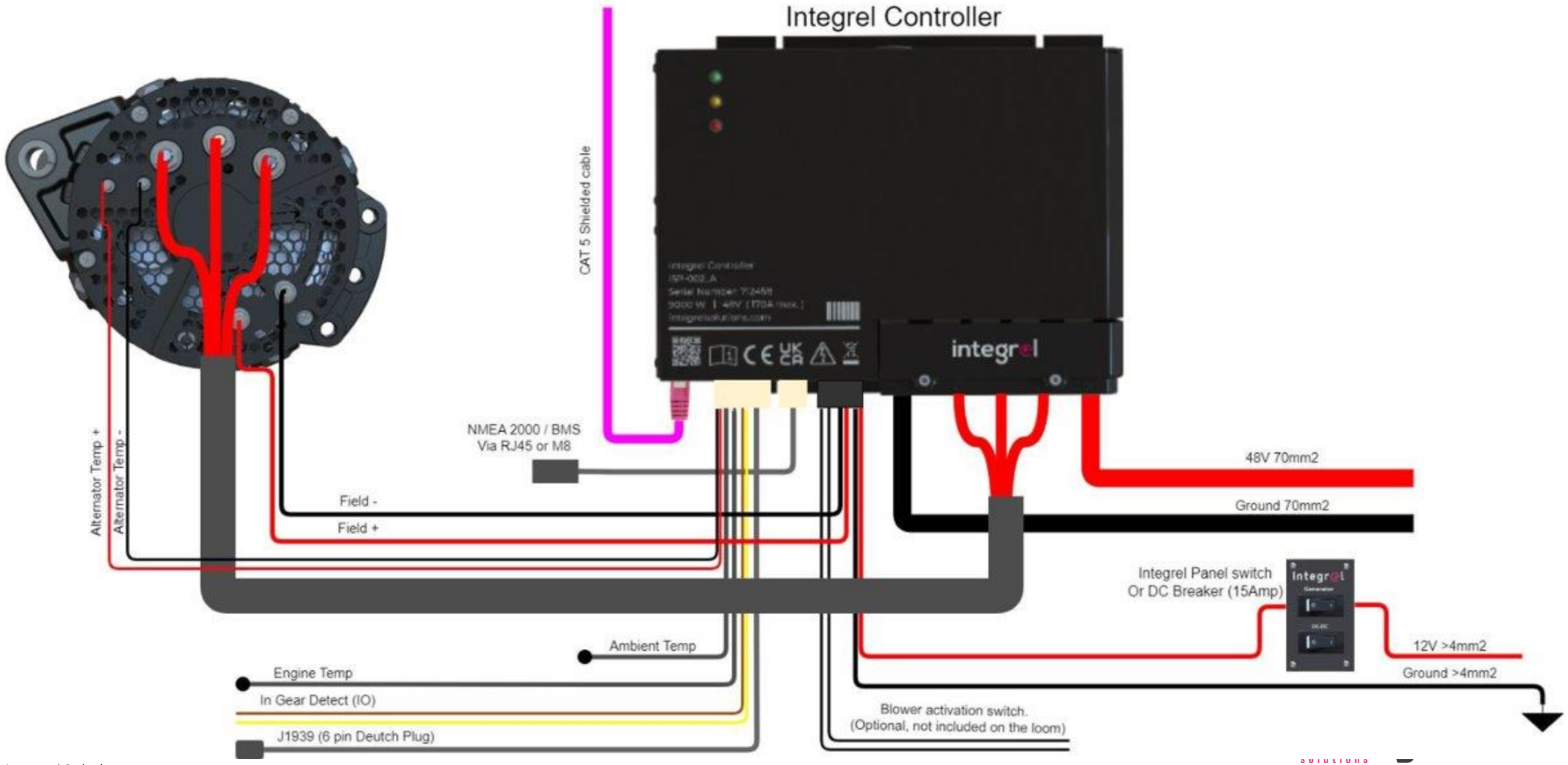
The Integrel (Argo) Network

CAT-5 cables are shown in pink.

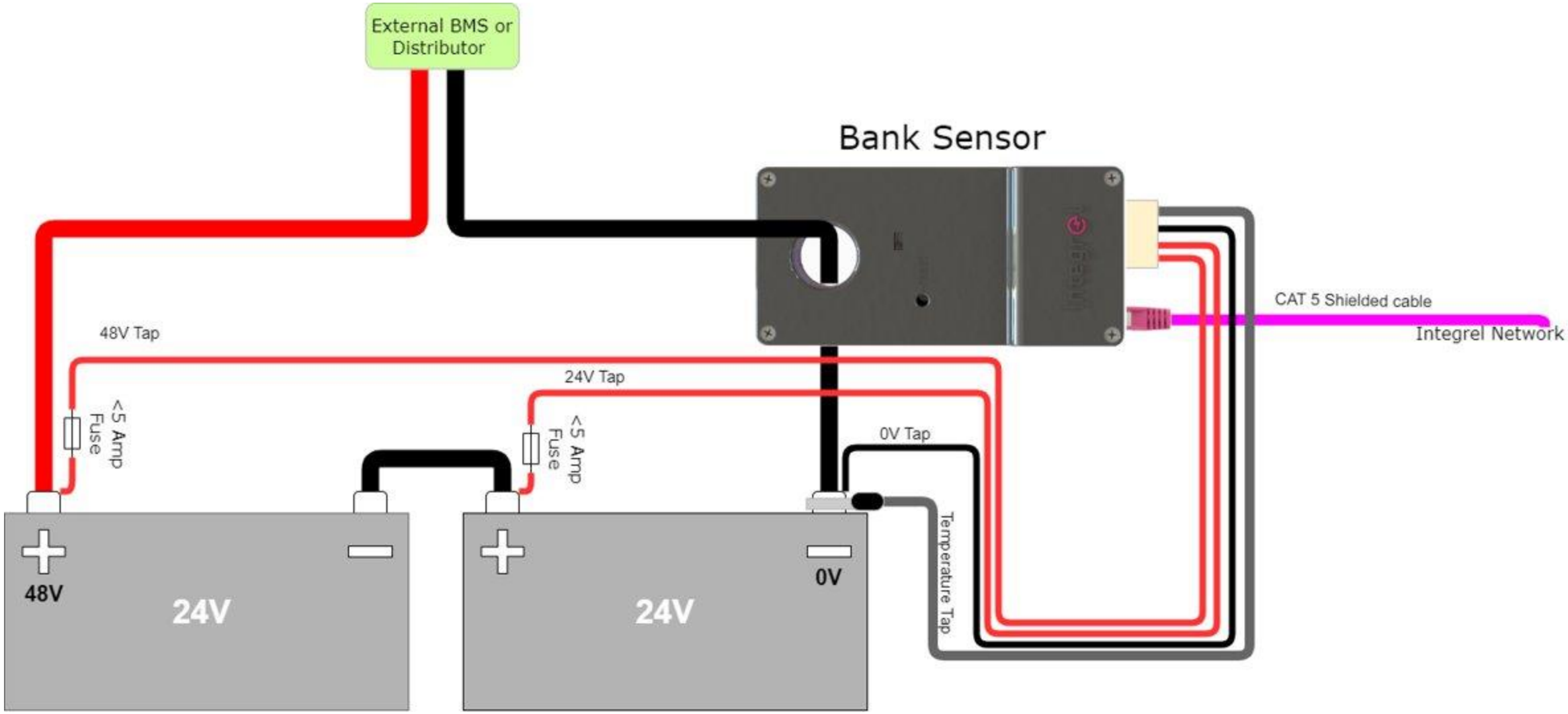
- Must only be used for Integrel Devices
- Other systems should NOT be connected to the Integrel Argo network (VE.CAN etc).
- Termination resistors should be placed at the *end of the two longest cable runs*.



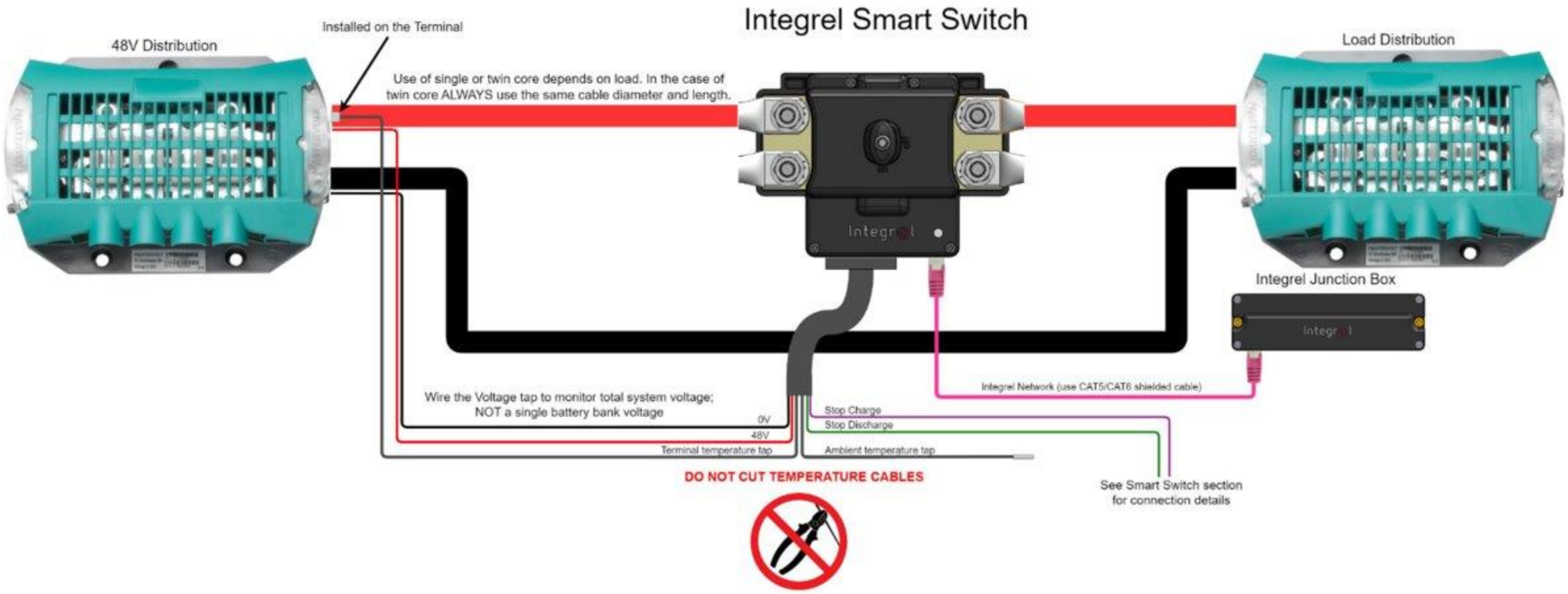
The Integrel Controller



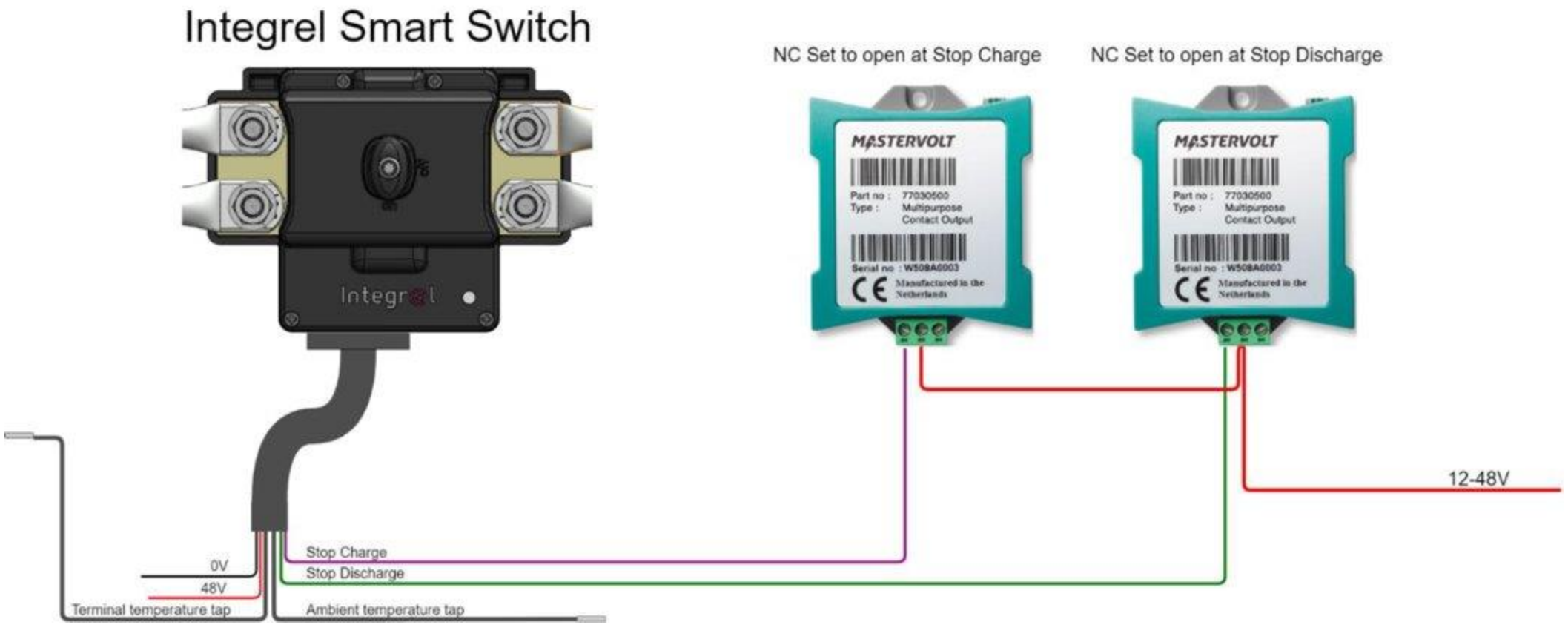
The Integrel Bank Sensor



Integrel Smart Switch Connections



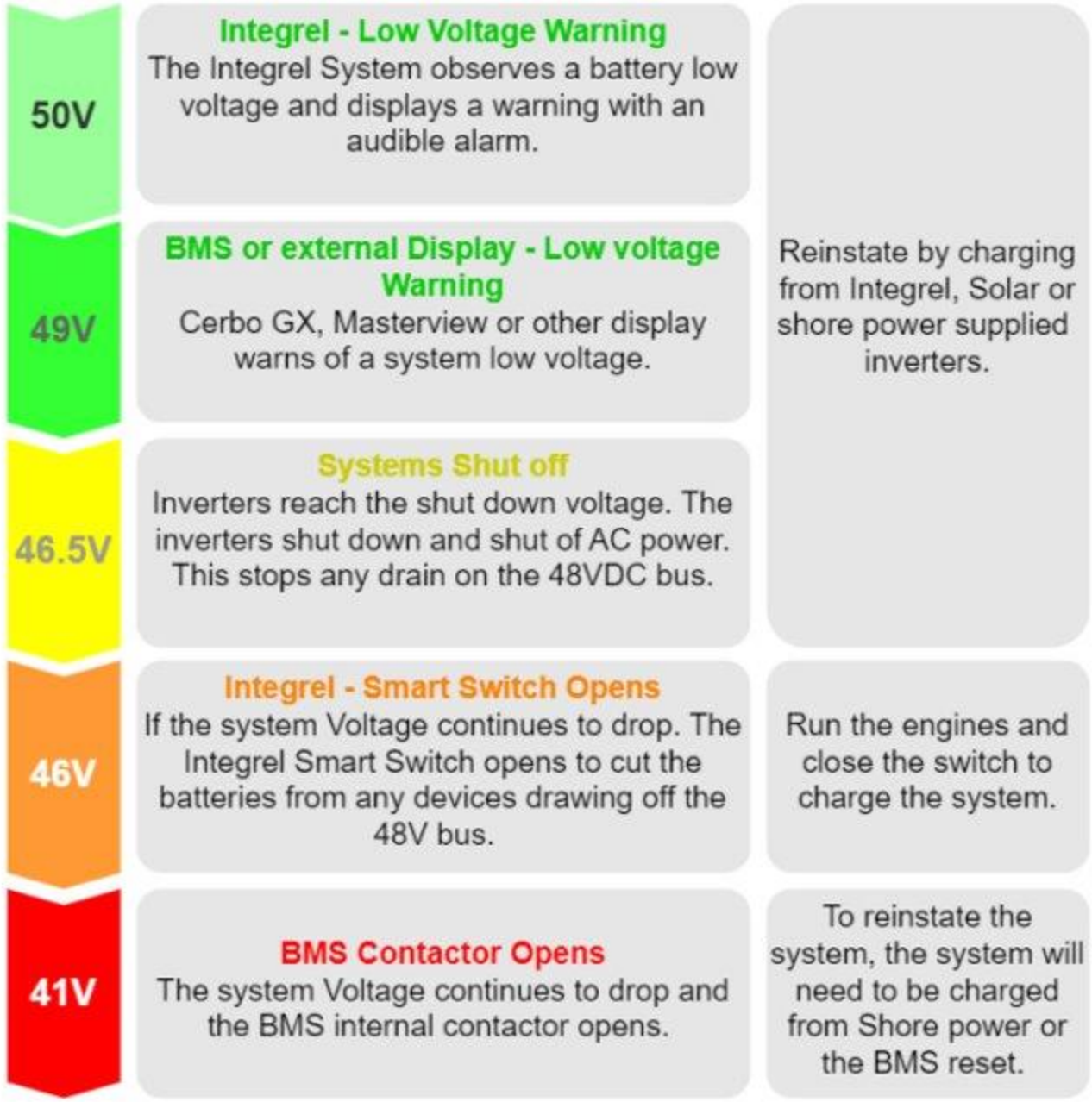
Stop Charge / Stop Discharge



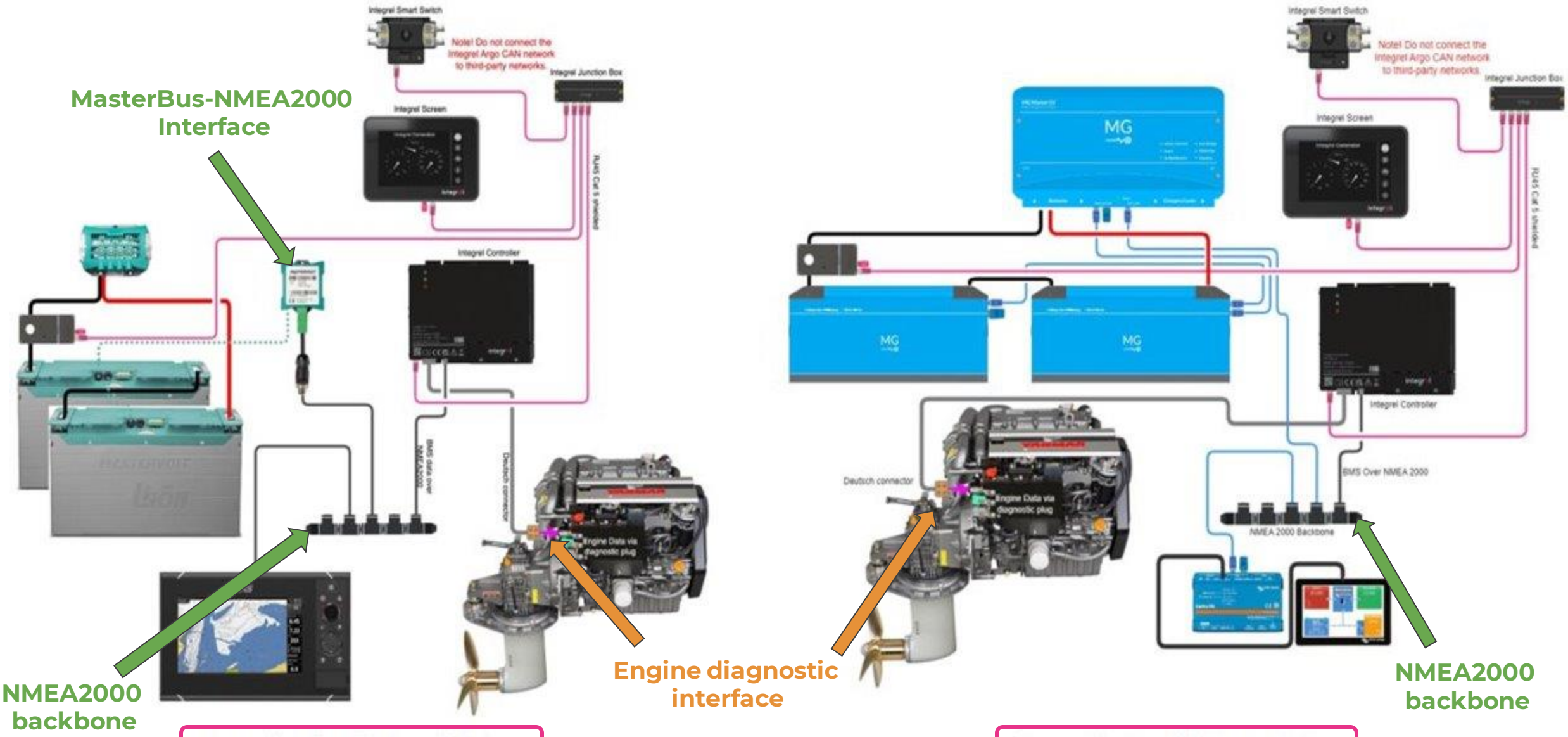
Low Voltage Protection

The Integrel Smart Switch protects the batteries from discharging below a critical voltage threshold after which shore power is required to reinstate operation.

In systems where a Lynx Smart BMS is used, the Smart Switch can be used only for Integrel and un-networked loads / sources.



NMEA 2000



Connection to a Mastervolt System

Connection to a MG Energy System

Integrel Diagnostics

Access the diagnostics with:

Settings →
Advanced →
Diagnostics

Diagnostics Reference:

- Integrel Diagnostics Guide

Questions?

Integral solutions