

WHY MULTIPLEX A BOAT OR A VEHICLE?

MULTIPLEXING

One shared cable instead of a wire for every function: less wiring, and the whole boat on one screen.

Boats and vehicles carry more equipment and more comfort every year. Traditionally, each new function meant new wires: a power cable out to the device, and a wire for every sensor that watches it. The harness grows with every option, and so do its weight, the time it takes to fit, and the number of connections that can fail.

Multiplexing replaces that bundle with a data network: one simple cable that runs through the boat. Every device connected to it can read the information it carries and add its own. It is not new: your car has worked this way for twenty years.

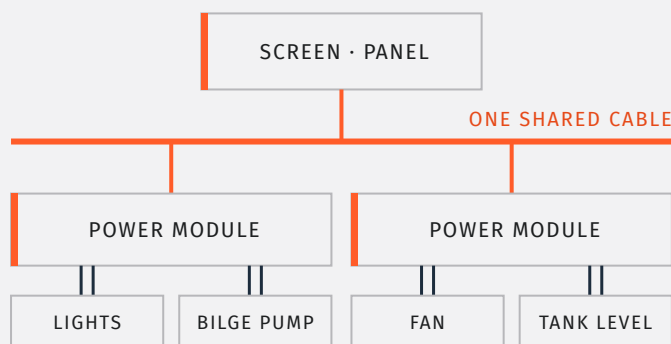
MUXEN designs and builds this equipment: the modules that switch and protect the power, the links to other brands' equipment, and the screens that show it all. Our products were born on offshore racing boats.

WITHOUT MULTIPLEXING



A LONG WIRE PAIR PER FUNCTION

WITH MULTIPLEXING



SHORT POWER RUNS, NEXT TO THE LOADS

WHAT IT CHANGES

01 LESS WIRING ON BOARD

One thin cable crosses the boat instead of a bundle. Less copper to buy, to fit and to carry.

02 EVERY DEVICE SEES EVERYTHING

Each device reads what the others say and acts on what concerns it, with no wire of its own.

03 ONE SCREEN FOR EVERYTHING

Batteries, solar panels, engines, generator: read them and control them all from the same screen.

04 REMOTE HELP

The after-sales service can reach the boat over the internet, and help without a trip to the marina.

05 EVERY EVENT RECORDED

The boat keeps its own history: see why a fault happened, and size the equipment to real use.

06 OPTIONS WITHOUT NEW CABLES

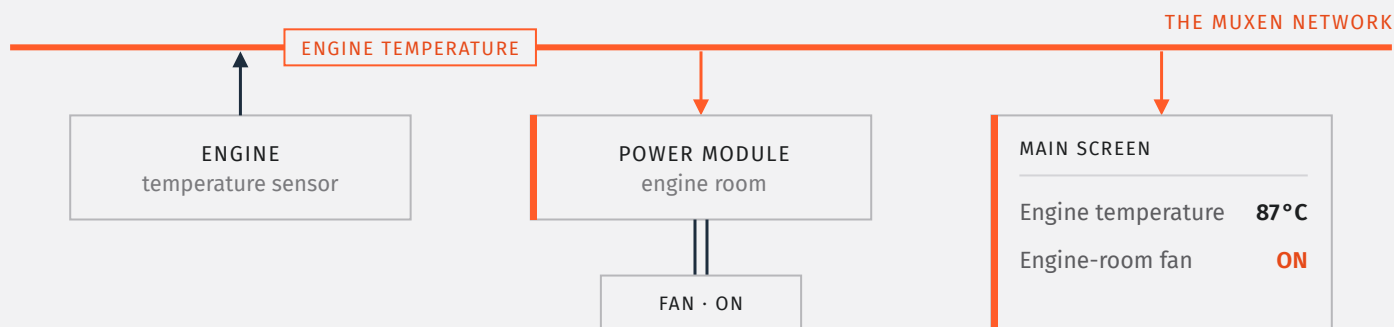
Adding a function becomes a setting on the network, not a new cable run through the boat.

ONE CABLE, MANY MESSAGES

HOW IT WORKS

Every device connected to the network **sees everything** that travels on it, and sends its own information too. Each one simply picks out what concerns it and acts on it. No wire runs from a sensor to the device that needs its reading: the network carries it to everyone.

EXAMPLE — THE ENGINE-ROOM FAN



01 THE ENGINE REPORTS

The engine's temperature is put on the network. It is sent once, and every device on board can read it.

02 THE POWER MODULE ACTS

In the engine room, a power module sees that temperature reach the value set for it, and switches the fan on.

03 THE SCREEN SHOWS IT

On the main screen at the chart table, the engine temperature is shown and the fan's indicator lights up.

THE BRAIN: THE WHOLE INSTALLATION ON ONE SCREEN

Multiplexing also brings every control and every reading to one place, without running a huge bundle of cables to it. At MUXEN that is the job of the **Brain**: it listens to the whole network, shows it on the screen, and passes the crew's commands back.

> EVERYTHING IN ONE PLACE

The Brain follows everything on the network and lays it out on **dedicated pages**, one for each subject: batteries, solar panels, engines, generators, the DC/AC inverter, lighting or tanks. Every reading is easy to find.

> ON A TABLET OR A PHONE

The same pages open on a **tablet** or on the boat's chart plotter, so the crew are not tied to the chart table: the boat is read and run from the cockpit, the saloon or the helm.

> A TOUCH BECOMES A COMMAND

A touch on the screen becomes a **command** the Brain sends over the network, and the device concerned carries it out. The screen then confirms that the pump, the watermaker or the air conditioning is really running.

> THE BOAT DOES NOT DEPEND ON IT

The screen shows and controls, but each device still **decides for itself**. There is no central computer everything relies on: with the screen switched off, the light switches keep working and the boat carries on.

WHO IT IS FOR

ONE SYSTEM, FOUR KINDS OF USER

The same network and the same Brain serve everyone who lives or works on the boat. Each of them gets the part of it they need, and only that part: a guest does not see what the skipper sees.

> GUESTS ON BOARD

Limited access to the boat's comfort: they switch the lighting, set the heating and follow the boat's speed. A yard can give them a dedicated **smartphone app**, paired with their own cabin by scanning a QR code.

> THE YARD

An interface drawn in the **yard's own brand**, so the screen belongs to the boat it is sold with. And remote support: settings, updates, and the detailed record of how every piece of equipment has run.

> THE SKIPPER OR THE OWNER

Full access to the whole boat, from a tablet or from the chart plotter: the propulsion, starting the generator manually, the navigation lights, moving fuel or water between tanks, emptying the black-water tank.

> THE CHARTER OPERATOR

A **quick check** between two charters: tank levels, battery charge and the time left to recharge, equipment running hours. The boat is **prepared before the guests arrive**: heating, fridge, batteries full, courtesy lights on.

FROM RACING TO CRUISING, ONE SYSTEM

Whatever the boat, the parts are the same: only how many, and what they are connected to, changes from one boat to the next. Two examples at either end of the range:



PHOTO © ULTIM 3 / SODEBO VOILE

> OFFSHORE RACING

Many IMOCA boats race the **Vendée Globe**, solo and non-stop around the world, with MUXEN equipment on board. Nobody can come and fix a failure out there: the race demands **reliability** and **redundancy**, and every edition sends that experience back into our products.

We equip boats in the Class40, Ocean Fifty, IMOCA and Ultim classes.



PHOTO © BALI-58 / CATANA GROUP

> HYBRID CRUISING CATAMARAN

Guests want to live on board as they do at home: the same comfort, but fully **self-sufficient**.

Sixteen power modules run three battery banks, a solar roof, electric motors and a generator. An installation this extensive needs a clear **overview**: one drawing of the whole system that shows its state at a glance.

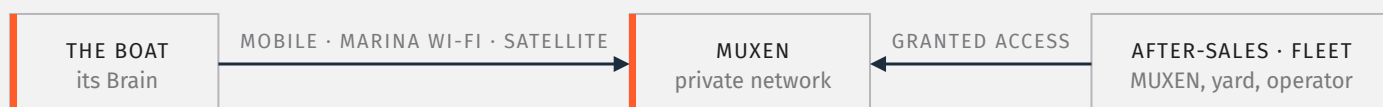
CONNECTED, AND WITH A MEMORY

BEYOND THE BOAT

Because everything on board already travels on one network, the whole installation can be reached **remotely**, and everything that happens on it can be kept. A conventional harness can offer neither.

REMOTE HELP AND CONTROL

THE BOAT CONNECTS OUT TO MUXEN — NOTHING IS OPEN ON IT BY DEFAULT



> ASSISTANCE

The after-sales service reaches the boat to read what it recorded, find a fault with the person on board, and apply a fix or an update, with **nobody travelling** to the marina.

> SETTINGS ADJUSTED ON REQUEST

If an owner would like the boat to behave differently, some **settings** can be adjusted remotely, by the people authorised to do so. Nobody has to come aboard for it.

> MONITORING

A yard or a charter operator has access to **its own fleet**, and keeps an eye on every boat it runs through the same controlled link.

> ACCESS UNDER CONTROL

Nothing is open by default. The yard decides who may reach a boat and what they may do, and the boat itself **opens the link**: no door is opened on it from the internet.

EVERY EVENT IS RECORDED

The Brain keeps every event of the installation in its memory. That history answers two questions a buyer will ask sooner or later.

> WHY DID IT HAPPEN?

Values, error codes, what happened and when: a fault can be **traced back** to its cause, instead of being guessed at after the event.

> IS THE BOAT SIZED RIGHT?

Real use turns into **statistics**, to decide whether the tanks, the battery bank or the solar panels should be resized to the way the boat is really used.

FIND OUT MORE

See our products at www.muxen.fr

Contact us by email: contact@muxen.fr