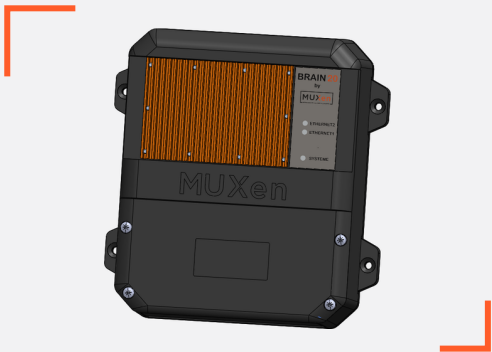


THE ONBOARD COMPUTER OF THE MUXEN NETWORK

BRAIN 2.0

The MUXEN computer holds the management tools: it bridges the MUXEN CAN bus and NMEA 2000, drives the displays over HDMI, logs data, allows remote access and runs the smart automations. The devices keep doing their own work even with the Brain off: the smart features stop, but the distributed safety functions do not.

Brain 2.0 can be upgraded using a USB stick, or from an OTA server when connected by Ethernet or Wi-Fi. Firmware is signed to ensure the integrity of the update.



BRAIN 2.0

KEY SPECIFICATIONS

Processor		NXP i.MX 8M Plus
Memory		2 GB
Storage		8 GB eMMC · microSD slot
CAN ports	MUXEN	500 kbit/s
	NMEA 2000	250 kbit/s
Ethernet		Uplink, DHCP client Onboard network, DHCP server
USB		USB-C with power delivery · two USB-A host ports
Display		HDMI, carrying its own audio
Wireless	OPTIONAL	Wi-Fi 802.11ac · Bluetooth 5.0 SMA female connector, antenna included
Position		u-blox MAX-M10S GNSS receiver with PPS SMA female connector (antenna not included)
Onboard sensors		Six-axis motion · barometric pressure · temperature
Real-time clock		Battery-backed, kept through a shutdown
Firmware update		Two system slots, signed · automatic rollback
Diagnostics		Two system LEDs · reset button
Size		210 × 191 × 68 mm
Weight		650 g
IP rating		IP65

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ON THE BOAT

WHAT IT DOES

One box and one firmware cover all of the features highlighted below.

> IT RUNS THE BOAT

Every MUXEN service lives here: the alarms, the energy balance, the sensors, the automations and the logging. Each device keeps doing its own work without the Brain.

> IT UPDATES ITSELF

The Brain keeps two copies of its own system. An update goes into the spare one, and the Brain only switches over once it has started properly. If it does not, the boat carries on with the system it had.

> TWO CAN BUSES, TWO WORLDS

The first CAN port carries the MUXEN network, the second is for navigation using NMEA 2000. The Brain is what stands between them, so a MUXEN screen can aggregate both worlds.

> IT COMES BACK

A watchdog restarts it if it ever stops answering, the clock is kept by its own cell through a shutdown, and USB-C power delivery charges the battery that keeps it running through a power cut.

> IT FITS THE INSTALLATION

Two Ethernet ports and Wi-Fi mean the same box fits the installation it lands in. It can be the boat's own network and hand out the addresses, join a network already there, or hold the two apart: screens on one side, the marina or a satellite link on the other.

> THE INTERNAL BATTERY

The battery keeps the Brain up after the boat's power goes, so a black-out is logged rather than ending the log. What failed, and in what order, can be read back. It also wakes a laid-up boat on a schedule, to check for water while nobody is aboard.

> DATALOGGER

Readings are written to a history on board, not to somebody's cloud: tank levels over a season, solar production, and how the boat is actually used.

> ANY SCREEN

A touchscreen is all it takes, with nothing to set up: the picture out over HDMI, the touch back over USB. A large Raymarine MFD shows it over the network instead, with no second screen to fit.

WHAT RUNS ON IT

The Brain serves the owner's interface, the Raken configuration tool and their handbooks from its own storage, so the boat is configured and read from a browser with no internet connection.

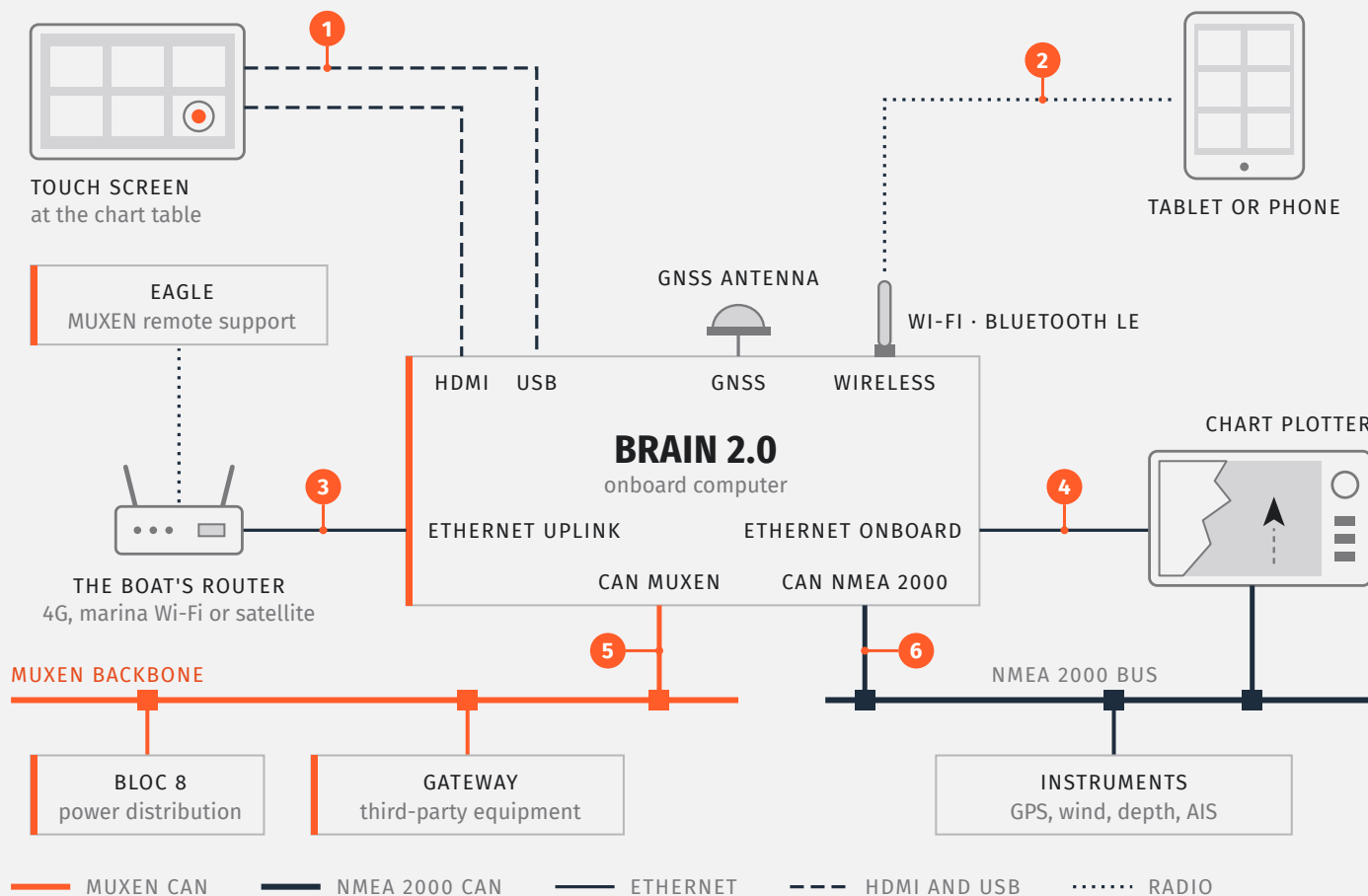
Contact us by email: contact@muxen.fr

WIRING IT IN

TYPICAL INSTALLATION

One Brain 2.0 between the MUXEN backbone and the boat's NMEA 2000 bus, with its touch screen. A chart plotter and a tablet show the same pages, and remote support comes through the boat's router.

ONE BRAIN, TWO CAN BUSES, TWO NETWORKS



1 THE TOUCH SCREEN

The screen at the chart table takes two cables: **HDMI** for the picture and **USB** for the touch. Any touch screen will do, with nothing to set up.

2 WI-FI AND BLUETOOTH LE

With the Wi-Fi option, a **tablet or a phone** opens the same pages as the screen. Over Bluetooth LE, a guest's phone controls its own cabin with the My Cabin app.

3 THE UPLINK

The uplink port gets its address from the boat's router. As soon as it has a route to the internet, the Brain joins MUXEN's **remote support** automatically.

4 THE ONBOARD NETWORK

The second Ethernet port is the boat's own network. A **Raymarine Axiom** plotter cabled to it shows the boat's screens as one of its own apps.

5 THE MUXEN BUS

The Brain goes on the backbone through a distributor, like any other module. It takes its **supply** from the bus, through the same port.

6 NMEA 2000, A SEPARATE BUS

The navigation bus has **its own terminators**: never wire it to the MUXEN backbone. The Brain is a normal device on it, and the bridge between the two.

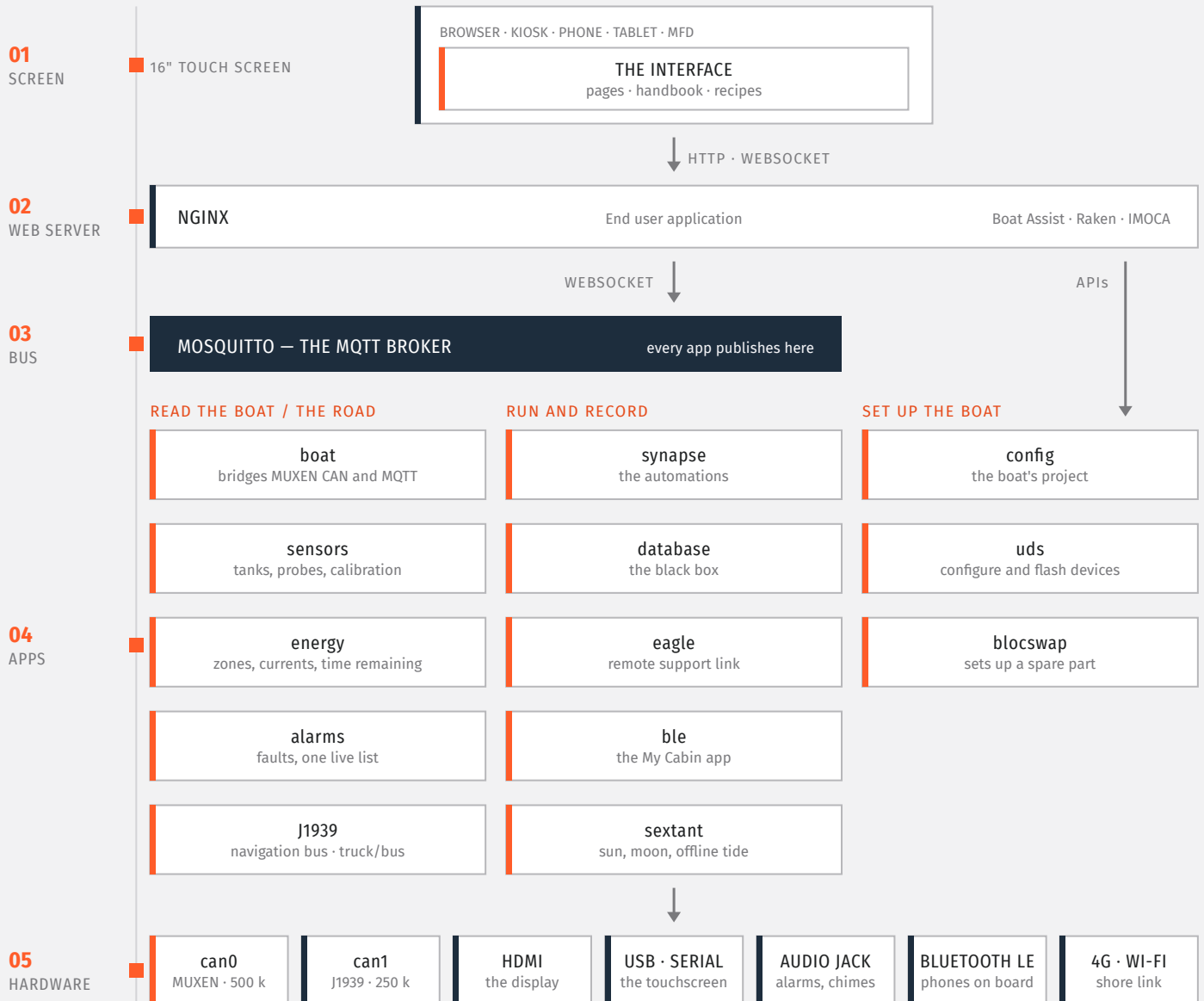
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THE SOFTWARE

INSIDE THE BRAIN

The Brain runs a collection of small independent programs working on a common **data bus**. The screen is a web page integrated in the chart table, and can also be used from a tablet over Wi-Fi.

THE STACK, FROM THE SCREEN DOWN TO THE WIRES



CUSTOM APPLICATION

Brain 2.0 is a toolbox rather than a closed product. Every app publishes what it knows on the bus and every device takes its commands there, so a new need is met by adding one piece: an automation for a rule, a page for a screen, a small program for the rest.

Contact us to turn an idea into an application.

KEEP YOUR DATA ON BOARD

No cloud needed — everything above runs on board.

The black box keeps a year of history on board.

The tide is computed on board, for 8,117 ports.

Phones and tablets talk to the Brain directly.

Updates — from a USB stick or over the internet.

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