

MRU-FIELD

A guest node for the W1M3A buoy: technical summary for CNR

Will Binns, Northforge ApS · 16 October 2026 · ahead of the call on Tuesday 20 October, 11:00 CEST · EMSO Physical Access, PA_202610_LOI_01

A small industrial Linux board in a DIN-rail case that runs Mru's fault-tolerance software and injects faults into itself on a stored schedule. To the buoy it is one more guest instrument: DC power in, a short ASCII record out, nothing needed from shore.

The node

Reference board: Sfera Labs Strato Pi CM Duo with a Raspberry Pi Compute Module 4S, a plug-in industrial module your lab can mount and wire like your own equipment. Vendor figures; the node is not built yet.

ITEM	VALUE	NOTE
Size	36.3 × 90.5 × 62.0 mm	Two-module DIN-rail case, included in the figure.
Mass	160 g	Including the Compute Module.
Supply	9 to 28 V DC, 24 V nominal	Reverse-polarity protection, 1.1 A resettable fuse. 12 V or 24 V bus.
Draw, vendor	12 V: 170 mA low, 410 mA full 24 V: 100 mA low, 220 mA full	2.0 W low and 4.9 W full on 12 V; 2.4 W and 5.3 W on 24 V.
Draw, this run	About 2 W average, under 6 W peak	About 50 Wh a day continuous. Mru caps its CPU share at 5%. Measured on the bench before shipping.
Power allowance	Whatever you can give	Power it on a schedule (10 minutes per hour is about 8 Wh a day), shed it first when the bank runs low, or run it continuously. It survives every cut. Rationing is the experiment.
Temperature	-20 to +50 °C operating	-30 to +80 °C storage.
Data out	1 line per hour, about 200 bytes	Under 10 kB a day, down to 1 kB if the link is tight. NMEA-style line, CSV, or a file over Ethernet, to match your logger.
Interfaces	RS-485, Ethernet 10/100, 2 × USB 2.0	RS-485 half-duplex, optoisolated, 1,200 to 115,200 baud. You pick one. RS-232 via USB adapter if you prefer.
Data in	None required	Optional: a copy of one buoy data stream, so data triage runs on real data.
Resilience	2 × microSD, watchdog, RTC	Boot failover between two industrial cards, read-only root, capped logs. Restarts after a cut and resumes from the clock.
Radio, own battery, wet or moving parts	None	Wireless off, no antenna. Power from the buoy, so no lithium on board; ships as a parcel.

Vendor figures: Sfera Labs product page and Raspberry Pi documentation, read 16 October 2026.

What the node needs, and what it never needs

FROM W1M3A 1. A dry slot in the electronics enclosure: a DIN rail, or a flat surface for the clip. 2. One DC feed from the buoy's battery bus, 12 or 24 V, under 0.5 A, that you can switch off at any time. 3. One serial or Ethernet line into the acquisition and control system, so the hourly record rides your satellite transmission.	NEVER - Commands from shore. - Its own antenna or modem. - A hull penetration, or anything in the water. - A battery of its own. It runs on the buoy's DC bus. - Attention between service visits.
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Who supplies what

NORTHFORGE	CNR LAB, AS HARDWARE ADAPTATION
Board and Compute Module, two microSD cards, software image, fault schedule, bench test before shipping, remote reading of the record during the run.	Mounting (DIN rail or bracket), DC and data cables and connectors, the line in your acquisition software that stores the record, installation and recovery on planned service visits.

EMSO's grant covers "hardware adaptations (mechanical and electrical)" so a facility can host a user's equipment. We propose these parts and your hours sit in the "Funding for Regional Facility" column, so EMSO pays CNR directly.