

MB LAB TECHNOLOGY

Everything talks.

How fourteen applications, the boards they run on and every instrument on the bench reach each other — over one bench, one building, or one planet.

Most bench data dies where it is measured

- A logger writes a CSV somebody opens tomorrow.
- An instrument has a screen, and nothing else can see it.
- A PLC knows the answer, and the spreadsheet that needs it does not.
- Every link between them is a bespoke script somebody has to maintain.

The value is not in any one measurement. It is in the thread between them — and the thread is the part nobody sells.

One rule makes the whole set connect

Whatever reads a value re-serves it on a standard protocol.

It reads

- Serial ports
- TCP sockets
- Modbus TCP and RTU
- CAN, with a DBC
- SCPI instruments
- A sound card
- A CSV file

It re-serves

- Modbus TCP
- OPC UA
- MQTT
- SCPI, VISA-reachable
- A raw stream
- Excel cells, as real numbers

So the next thing

- Does not have to be mine
- Does not need a driver written
- Does not need a cloud account
- Can be on another machine
- Can be in another country

What each one speaks, in and out

Application	Serial	TCP	Modbus	OPC UA	MQTT	SCPI	CAN	HTTP
MBLT PLC	both	both	both 1502	out 4840	out	both 5025	both	in
MBLT HMI	both	both	both 1503	both 4841	both	—	—	in
HardwareRTD	both	both 5200	both	—	—	both	in	—
SignalScope	both	both 5211	both	—	—	both 5025	in	—
DataStreamerX	both	both	both	—	—	both	both	—
AOI Inspector	both	both 5025	—	—	—	both 5025	—	out 5026
MB Lab Vision	both	both 5027	—	—	—	both 5027	—	out 5028

in = reads only · both = reads and writes, and where a port is given it listens on it too · out = serves only.

ComBridge is deliberately absent — it is the adapter for the other direction, bridging the command line and COM automation on one machine.

One limit switch. Six places it ends up.

Nothing in this chain is custom integration work.

From a switch closing to a Microsoft Project plan

- 1 A limit switch closes**

Wired to a digital input on an ESP32-S3 running a ladder program.
- 2 MBLT PLC publishes it**

The same tag on Modbus TCP 1502, OPC UA 4840, MQTT and stream 5221.
- 3 MBLT HMI picks it up**

Alarm with deadband and delay, logged to SQL Server behind a disk queue.
- 4 HardwareRTD takes the same tag**

Into an Excel cell as a real number, so the sheet keeps doing its maths.
- 5 SignalScope plots it**

Beside an analogue channel and a decoded CAN bus, on one timebase.
- 6 The dispatcher merges the run**

Every application's tasks into a single project plan.

The link is an ordinary socket

Which means distance stops being a design problem.

Same PC

in-process, or loopback

Same bench

a serial cable or the LAN

Next building

the site network

A contract manufacturer

their line PC, over a VPN

A third-party test lab

a chamber you do not own

The field, another continent

a unit that dials in

It is the same socket in every one of these.

Capable is not the same as advisable

- All of this crosses the public internet, because TCP does. That does not mean it should.
- Modbus and raw streams have no authentication at all — they were never designed for it.
- Put it on a VPN or a private link. A bench reachable from anywhere is reachable by anyone who finds it.
- Prefer the read-only paths: HardwareRTD's remote end discards anything sent to it, deliberately — a formula on another machine should not be able to move a drive.

No cloud. No account. No broker to rent.

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MB Lab servers in the middle

0

accounts to create

0

internet required, ever

The applications talk to each other directly, on your network, with your addresses. Nothing phones home, and the licence check needs no internet connection — which is the only reason any of it works on a shop-floor machine that has never been online.

A system, not a drawer of utilities.

Fourteen applications, eight boards, and one rule that makes them one thing. Built by one engineer, and heading towards open.