

ORCA IRELAND

Timing Bridge Setup Guide

How to install and run the transponder decoder bridge that feeds laps into race control.
Suitable for a Raspberry Pi, a Windows laptop, or a Mac.

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1. What this is

The **timing bridge** is a small background app that reads laps from the transponder decoder and feeds them to the race control website. It replaces the old setup where one specific laptop had to be on the decoder — any device on the club network can now run it, including a Raspberry Pi kept permanently at the track.

You only need **one** bridge running at a time. Everyone else — race control, spectators — just points their browser at the site.

2. Before you start

You will need:

- **A machine to run the bridge on.** A Raspberry Pi is ideal because it stays plugged in permanently. Any Mac or Windows laptop also works for testing or as a fallback.
- **Node.js installed on that machine.** Free download from nodejs.org — always pick the **LTS** installer and accept all the defaults. Takes one minute.
- **A network connection between the bridge machine and the decoder.** Usually plugging both into the same router or switch. The decoder needs an IP address the bridge can reach.
- **Access to the ORCA admin panel.** To download the installer file that matches your operating system.

Tip: You can do the whole setup today without a real decoder. The bridge has a **simulator mode** that invents fake transponder crossings every few seconds, letting you verify that race control is seeing laps end-to-end before any hardware shows up.

3. Install on a laptop (Windows or Mac)

Use this option for testing, one-off events, or as a backup if the Pi is unavailable. The club laptop works just as well as a Pi.

Step 1 - Install Node.js

Go to <https://nodejs.org>, click the green LTS download button, run the installer, and click Next through every screen. Nothing needs to be configured. Close the installer when it finishes.

Step 2 - Download the bridge installer

Sign in to the ORCA Ireland website as an admin. Open the **Admin** tab and find the **Timing Decoder Bridge** panel. Click the button that matches your computer:

- **Windows** → downloads *orca-bridge-windows.zip*
- **Mac** → downloads *orca-bridge-mac.zip*

Step 3 - Run the installer

Open the zip file (double-click it). Inside you will find one file — *install-windows.bat* on Windows or *install-mac.command* on Mac. Double-click it.

First-run warning on Mac or Windows: because the file came from the internet, your computer may block it the first time.

On Mac: Open **System Settings** → **Privacy & Security**. Scroll down; there will be a line saying the installer was blocked, with an **Open Anyway** button. Click it, then try again.

On Windows: A blue SmartScreen box appears. Click **More info**, then **Run anyway**.

A terminal window opens and the installer runs. It will install some dependencies (takes about a minute), then print "Installation complete". Close the window.

Step 4 - Start the bridge

The installer drops a shortcut called **run-orca-bridge** on your Desktop. Double-click it any time you want to run the bridge. A terminal window opens and shows log lines. **Leave that window open** while you want the bridge to run; closing it stops the bridge.

Step 5 - Verify with race control

Open the ORCA Ireland site in your browser, go to race control, and sign in. On the setup screen you will see a **Decoder Bridge** card with two status lines: **Bridge** and **Decoder**. Within a second or two they should both go green:

```
Bridge: Connected · localhost:2346  
Decoder: AMB online · simulator
```

If you start a race day now, simulated transponders (10001, 10002, 10003, 10004) will cross the loop every 8 to 14 seconds. You can assign these to drivers in setup to see laps flow through the whole system without any hardware.

4. Install on a Raspberry Pi (permanent setup)

This is the recommended long-term configuration. Once set up, the Pi lives in a box at the track, starts the bridge automatically at power-on, and needs no attention.

What you need

Any Raspberry Pi from a Pi 3 onwards (a Pi Zero 2 W also works), an SD card of 8 GB or more, a power supply, and a way to connect the Pi to the club network — Ethernet cable is easiest and most reliable.

Step 1 - Flash Raspberry Pi OS

Download the **Raspberry Pi Imager** from [raspberrypi.com](https://www.raspberrypi.com). Insert the SD card into your computer, run the imager, choose **Raspberry Pi OS Lite (64-bit)**, and select your SD card. Before writing, open the gear icon (advanced options) and:

- Enable SSH with a password you will remember
- Set the user to **pi**
- Set the hostname to something memorable like **orca-bridge**
- Fill in Wi-Fi details if you are not using Ethernet

Click Write. Once it finishes, slot the SD card into the Pi and power it on. Give it a minute to boot.

Step 2 - SSH into the Pi

From any computer on the same network, open a terminal and run:

```
ssh pi@orca-bridge.local
```

Enter the password you set in the imager. You should see a command prompt.

Step 3 - Install the bridge

Paste these two commands:

```
git clone https://github.com/daveyfay/orca-ireland.git
cd orca-ireland/bridge && sudo bash install.sh
```

The script installs Node.js, copies the bridge into `/opt/orca-bridge`, sets up a background service that starts at boot, and creates a default config file in simulator mode.

Step 4 - Point the bridge at your decoder

Edit the config file:

```
sudo nano /opt/orca-bridge/config.json
```

Replace the contents with your decoder details. For an AMB decoder on the network, that looks like:

```
{
  "decoder": "amb",
  "connection": "tcp",
  "host": "192.168.1.50",
  "port": 5403,
  "wsPort": 2346
}
```

Change **host** to whatever IP address your decoder has on the network. Save with **Ctrl+O** then **Enter**, exit with **Ctrl+X**. Restart the bridge:

```
sudo systemctl restart orca-bridge
```

Step 5 - Verify

Watch the live log to confirm the bridge is reading crossings:

```
journalctl -u orca-bridge -f
```

When a car with a transponder crosses the loop, a line like *[bridge] crossing t=12345* will appear. Press **Ctrl+C** to stop watching (the bridge keeps running).

In race control, the **Bridge** URL becomes **ws://orca-bridge.local:2346** (replace with the Pi's IP if *.local* doesn't resolve on your network).

5. Config reference

All settings live in **config.json** in the install folder (*/opt/orca-bridge* on the Pi, *orca-bridge* in your home folder on Mac or Windows).

Key	What it means
decoder	amb, p3, ilap, or trackmate — which parser to use.
connection	tcp (Ethernet decoder) or serial (USB cable). Inferred if omitted.
host	Decoder IP on the network (TCP mode).
port	Decoder TCP port. AMB uses 5403.
serialPort	Serial port path — e.g. /dev/ttyUSB0 (Pi) or COM3 (Windows).
serialBaud	Baud rate. AMB serial 19200, P3 115200.
wsPort	Port the bridge listens on for browsers. Default 2346 — leave as-is.
simulate	true to emit fake crossings with no hardware. Great for testing.

Rule of thumb: if you are on Ethernet, you only need **decoder**, **host**, **port**, and **wsPort**. Remove or ignore anything else.

6. Troubleshooting

Q. Race control says Bridge: Connection error.

The bridge isn't running on the machine race control is pointing at, or the URL is wrong. Check the terminal window or (on Pi) `journalctl -u orca-bridge` for errors. Confirm the URL matches the machine running the bridge.

Q. Race control says Bridge: Connected but Decoder: ... offline.

The bridge is up but can't talk to the decoder. Check the decoder is powered on and on the same network. On the Pi, run `ping 192.168.1.50` (replace with your decoder IP) to confirm network reachability. Double-check **host** and **port** in `config.json`.

Q. Simulator mode works but the real decoder shows nothing.

The AMB parser was written from the protocol spec and may need tweaks for your specific firmware. Capture a few seconds of the raw stream with `journalctl -u orca-bridge -f` and send to the site admin — usually fixable in minutes.

Q. The terminal window keeps closing on my laptop.

Double-click the Desktop shortcut again. If it closes immediately, Node.js isn't installed — go back to Step 1 of the laptop guide.

Q. I can reach the Pi from my phone but not from my laptop.

Usually a firewall on the laptop. Check that port 2346 isn't blocked, or use the Pi's IP address directly instead of its `.local` name.

Q. How do I check the bridge is still running?

On a laptop: look for the terminal window. **On the Pi:** run `systemctl status orca-bridge` — active (running) means it's up.

7. Reference — supported decoders

Decoder	Status	Connection
MyLaps / AMB RC3 & RC4	Primary target	Ethernet TCP port 5403
MyLaps P3 / TranX	Draft, unverified	Serial or TCP
I-Lap	Draft, unverified	Serial
Trackmate	Draft, unverified	Serial
Simulator	Works	None — generates fake data

Drafts will be verified and adjusted the first time we have hands on the hardware. If the club ever acquires one of the non-AMB decoders, a short capture of its data stream is usually enough to correct the parser.

Useful commands — Raspberry Pi

```
sudo systemctl restart orca-bridge # apply config changes
sudo systemctl status orca-bridge # is it running?
sudo systemctl stop orca-bridge # stop temporarily
sudo systemctl disable orca-bridge # stop auto-start at boot
journalctl -u orca-bridge -f # watch live logs
curl http://localhost:2346/status # health check
```

Getting help

Contact the ORCA Ireland site admin with the event name, approximate time, and if possible a copy of the journalctl output covering the problem window. Most issues are fixed within the same evening.