

Resolve Display



A 1.75" round AMOLED gauge for EV conversions. It reads the CAN bus and shows battery charge, motor torque, gear and temperature while driving, and charging power while charging. It can also be a G-force meter or a battery power graph.

It is made for the **Resolve Controller** and Nissan Leaf drive parts (battery, inverter, charger). The power graph can also read other batteries' signals.

You change its settings and update it from the browser over USB-C. Nothing to install.

Pages

- **Installation:** mounting, wiring and pinout.
- **Screens:** what each screen shows.
- **Settings:** connecting over USB, and every setting.
- **Firmware updates:** updating, and recovering a display that does not connect.
- **Specifications:** display, dimensions, electrical.

- **Troubleshooting:** dark screen, errors, connection problems.
- **Console:** the Resolve Controller's browser console.

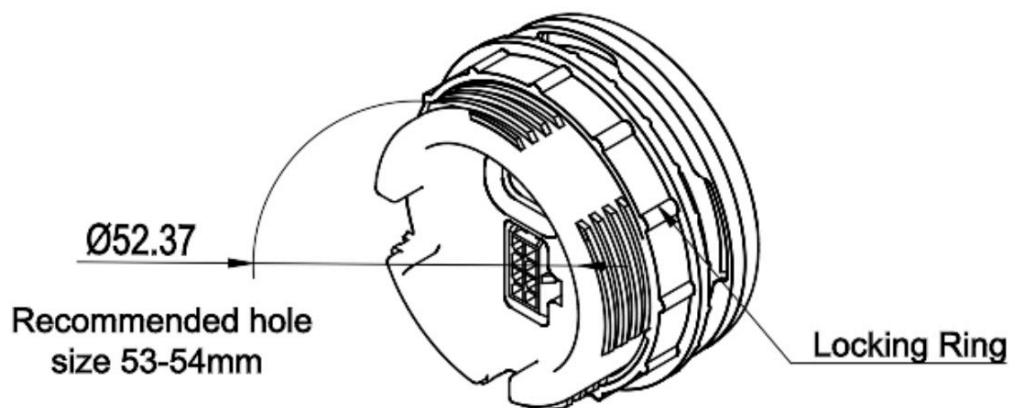
Installation

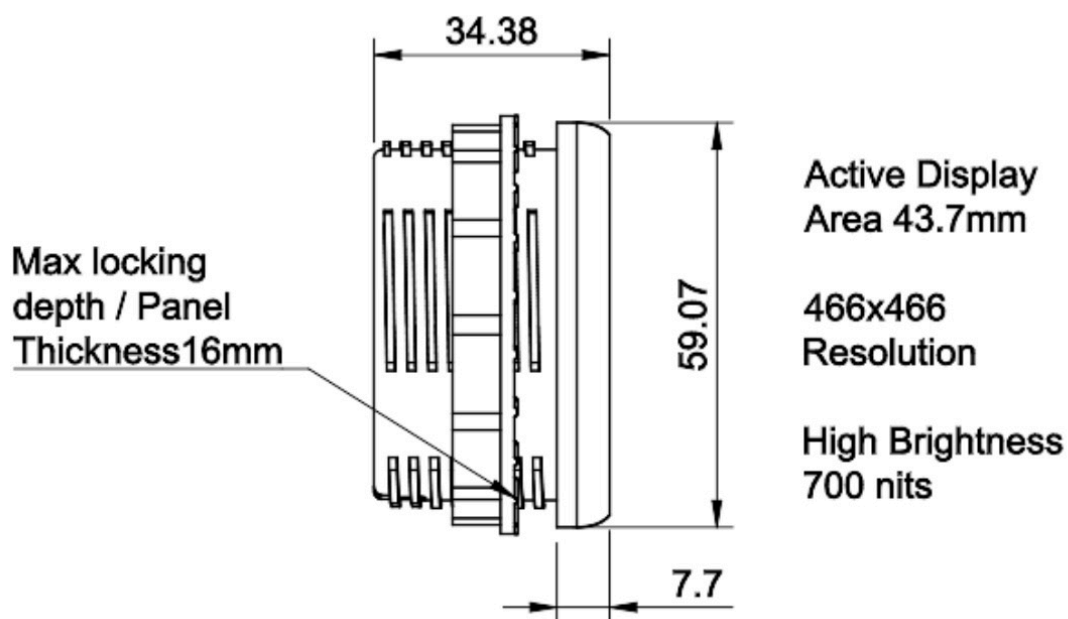
Mounting

The display fits a round hole and is held from behind by its locking ring.

1. Drill or cut a **53-54 mm** hole. The body is Ø 52.37 mm.
2. Push the display in from the front. The panel can be up to **16 mm** thick.
3. Screw the locking ring on from behind until the display is held firmly.

Leave about 27 mm behind the panel for the display, plus room for the plug and its wires.

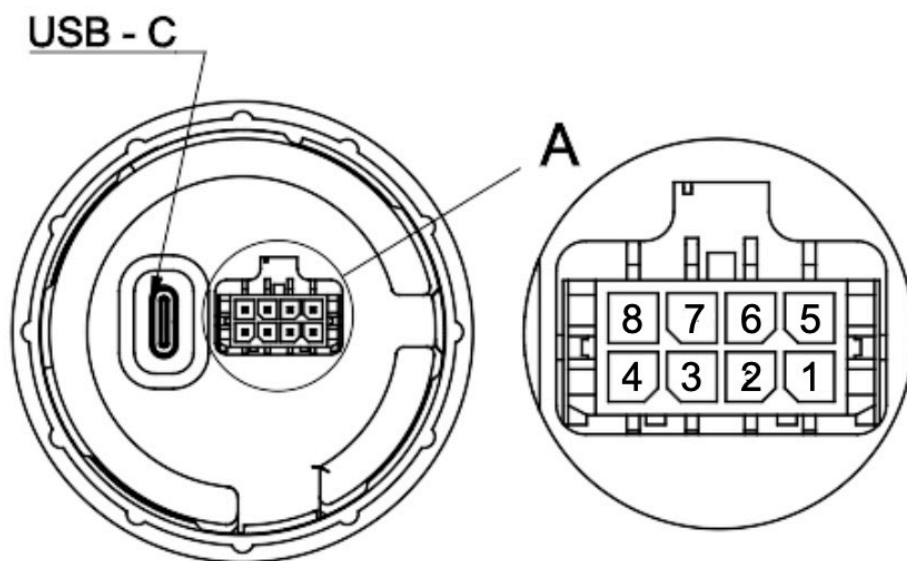




Dimensions in mm.

Connector and pinout

On the back are the 8-pin connector and the USB-C port.



Pin numbers, looking at the back of the display.

Pin	Signal	Wire colour	Connect to
1	GND	Black	Ground
2	CAN L	Green	Vehicle CAN low
3	n/a	<i>TBC</i>	Not used
4	n/a	<i>TBC</i>	Not used
5	12 V	Red	12 V supply, fused
6	CAN H	Blue	Vehicle CAN high
7	Ignition	Pink	Switched 12 V. Optional: only with the "Ignition wire (pin 7)" setting
8	n/a	<i>TBC</i>	Not used

The connector is a Molex Micro-Fit 3.0, 2 × 4 pins.

Wiring

- **Power:** connect 12 V (pin 5) through a fuse, and ground (pin 1). On a permanent 12 V supply the display sleeps when the car is off (10.2 mW) and wakes by itself.
- **CAN:** connect CAN H and CAN L to the bus that carries the Resolve Controller's and the Leaf parts' messages (500 kbit/s). Twist the pair.

NO TERMINATION RESISTOR

The display has **no** 120 Ω termination. Connect it as a branch of a bus that is already terminated at both ends: about 60 Ω between CAN H and CAN L, measured with everything off. Keep the branch short.

Ignition: when the display turns on

The **Ignition source** setting decides what turns the display on and off:

Setting	The display is on	Pin 7
CAN signal (Display on) (default)	while the Display on CAN signal is 1: by default the Resolve Controller is on (ignition on, or charging)	not connected
Ignition wire (pin 7)	while pin 7 has 12 V	switched 12 V that is on with the ignition

With **CAN signal** the display is also on while the car charges. A charge cable on its own does not turn it on; it only chooses the charging screen. While the settings page is connected over USB, the display stays on.

The Display on signal. By default it is the Resolve Controller's own "system on" flag (message 0x539, bit 16), so with a Resolve Controller there is nothing to set. Another controller, or a car without one, can turn the display on with any CAN flag of its own: set it under **General → Display on CAN signal** on the [settings page](#), like the other CAN signals (paste the DBC line or fill in the ID and bits). The display is on while the signal is 1 or more, and turns off when it is 0 or its message has stopped for 2 seconds. **Reset** goes back to the Resolve Controller's flag.

When the display is off and nothing is plugged into USB, it sleeps after 10 seconds. With **CAN signal** it also waits for the CAN bus to go quiet, and wakes on CAN traffic. With **Ignition wire (pin 7)** it wakes when pin 7 gets 12 V.

After installing

1. Connect the display to the [settings page](#) and choose the **Mode** and the **Ignition source**.

2. For the G-force meter: level it once it is mounted (see [Settings](#)).

Screens

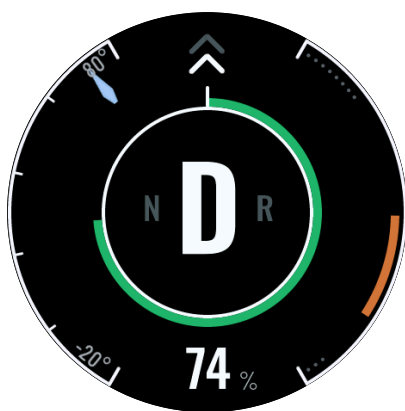
The **Mode** setting picks what the display shows:

Mode	Screens
Standard	Driving screen; the charging screen while a charge cable is plugged in
G-force meter	G-force screen
Power graph	Battery power graph

The brightness is a setting, together with the Detail color that can make every white detail grey for night driving: [Brightness and night driving](#).

Colours, units and scales are [settings](#). The pictures show the defaults.

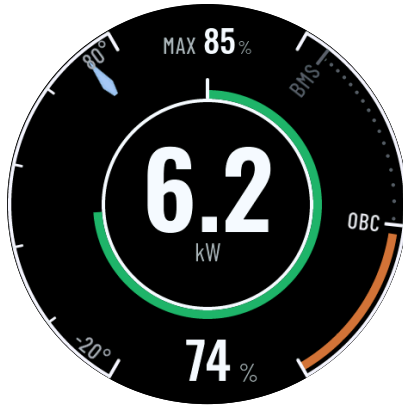
Driving



- **Centre:** the gear (D, N or R) with the other gears beside it.
- **Green ring and number:** battery state of charge.
- **Right bar:** motor torque. Orange upwards when driving; downwards in the regen colour when regenerating. The dots mark the most torque the battery and motor allow right now, for drive and for regen. The top of the bar is the inverter's maximum.
- **Left gauge:** motor temperature, -20 to 80 °C (0 to 180 °F), or the 12 V battery, 10 to 16 V (setting **Left gauge**).

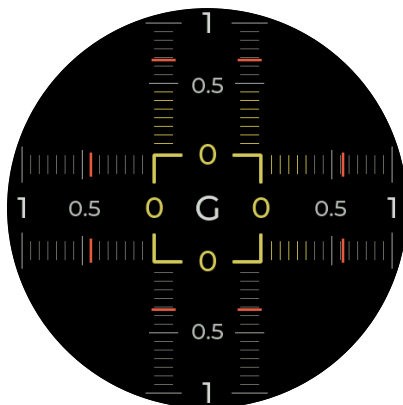
- **Chevrons at the top:** regen strength, none, one or two lit.

Charging



- **Centre:** charging power in kW.
- **Right bar:** charging power, 0 to 50 kW. The scale is stretched at the bottom, so slow AC charging still shows. **BMS** marks the most the battery accepts now, **OBC** the most the charger delivers.
- **MAX at the top:** the charge level where charging will stop, while max charge is on. To switch it on or off: cable in, car in neutral, press N (below 80 % charge). The level is the Resolve Controller's Charge Limit setting (default 85 %).
- **Ring and left gauge:** as on the driving screen.

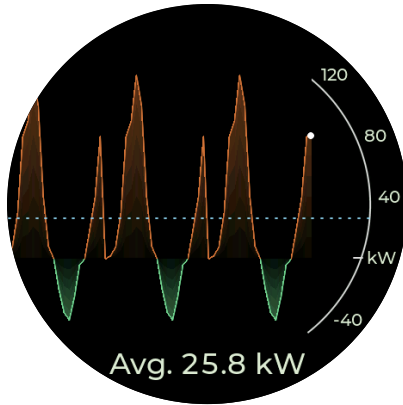
G-force meter



The rails show the force you feel: left and right on the horizontal rails, accelerating and braking on the vertical ones. Lit segments show the force now. The red marks show the highest force this drive: they start again each time the car is switched on. The scale is 1, 2 or 3 G (setting **G-force scale**).

Level the meter after mounting, so that a still car reads zero (see [Settings](#)).

Power graph

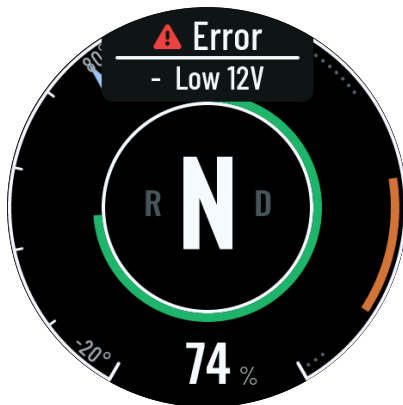


Battery power over the last 1, 2, 5 or 10 minutes (setting **Time frame**), newest on the right.

- **Orange, above zero:** power taken from the battery.
- **Green, below zero:** regen into the battery.
- **White dot:** now.
- **Dotted line and "Avg.":** the average over what is on screen.

The scale adjusts to what is on screen. The power comes from CAN signals you can set; see [Settings](#).

Errors



In Standard mode, problems show on a card at the top of the screen, 5 seconds after the display turns on. What to do: [Troubleshooting](#).

BMS error codes and the isolation fault come from the Resolve Controller. Its [Owner's Manual](#) explains them.

Message	Meaning
Missing VCU	No message from the Resolve Controller for 1 second
Missing INV	No message from the inverter for 1 second
Missing BMS	No message from the battery for 1 second
Missing OBC	No message from the on-board charger for 1 second
Low 12V	12 V supply below 11.8 V (clears above 12.0 V)
Isolation fault	Low insulation resistance between the high-voltage system and the car (code 21x in the Owner's Manual). Stays until the display restarts
BMS error 201-207	The battery reports a fault: 201 drive stop, 202 charge stop, 204 caution lamp, and their sums for combinations (206 = caution lamp and charge stop). Details: Owner's Manual

Settings

Settings are changed on the [Resolve Display page](#) of resolve-ev.com, over USB. The display saves them and keeps them through firmware updates.

Connecting

You need desktop **Chrome or Edge** (they support Web Serial; Safari, Firefox and phones do not) and a USB-C cable that carries data.

1. Plug the display into the computer. USB powers it; 12 V is not needed.
2. Open the [Resolve Display page](#) and click **Connect**.
3. Pick **USB JTAG/serial debug unit** in the browser's list.

While connected the display stays on. Changes show on the display as you make them and are saved a moment later. Click **Disconnect** when done, or just unplug.

General

Setting	What it does
HW version	The display's hardware version, e.g. R0002
FW version	The firmware on the display, whether an update is available, and Flash to install one (Firmware updates)
Restarts	Restarts the display did not expect (a crash or a power drop). If there are any, please tell us what it says. Clear resets the count
Display brightness	0–100 %, the whole screen (Brightness and night driving). Set here only: tapping the screen does not change it
Ignition source	CAN signal (Display on) or Ignition wire (pin 7) (called IN_1 in earlier firmware): what turns the display on (Installation)
Display on CAN signal	With the CAN ignition source: the CAN signal that turns the display on. Default: the Resolve Controller's "system on" (0x539, bit 16); change it for another controller (Installation)
Detail color	Every white detail on every screen: text, numbers, rails, scale marks and outlines. A grey here dims all of them at once, while the coloured bars stay as bright as they are (Brightness and night driving). Reset goes back to white
Mode	Standard , G-force meter or Power graph (Screens). The settings below it change with the mode

Brightness and night driving

Two settings decide how bright the display is.

Display brightness turns the whole screen up or down, everything on it equally. 100 % is right for daylight; in the dark 25–50 % is usually enough. It is set on the

Resolve Display page only: tapping the screen does not change it.

Detail color lets you go further at night without losing the colours. The display is an AMOLED: every pixel makes its own light, and white pixels are the brightest there are. Most of a screen's light comes from its white details: the numbers, the text, the rails and the scale marks. Make the Detail color grey instead of white and all of those give off less light, while the coloured bars (state of charge, torque, regen, G-force) keep their full colour and stay easy to see. Black stays black, so the screen around them doesn't glow.

Detail color	Effect
White (default, Reset)	Brightest; best in daylight
Light grey, e.g. #B4B4B4	About half the light from the details; still crisp
Mid grey, e.g. #808080	About a fifth; a good night setting
Dark grey, e.g. #5A5A5A	About a tenth: very calm on a dark road; check the numbers are still readable

A good start for night driving: Display brightness 50 % and a mid grey Detail color. The darker the grey, the less the details stand out, so check that you can still read the numbers at a glance from your seat. Coloured parts have their own colour settings below: a darker colour there dims that part too.

The display keeps both settings through restarts and firmware updates.

Standard

Setting	Default	What it does
Left gauge	Temperature	Motor temperature or the 12 V battery on the left gauge
SOC bar color	green	The state-of-charge ring
Torque and power bar color	orange	The torque bar (driving) and the kW bar (charging)
Regen bar color	teal	The torque bar while regenerating
Temperature needle color	light blue	The temperature needle
12V needle color	white	The 12 V needle
Temperature unit	Celsius	Celsius or Fahrenheit

G-force meter

Setting	Default	What it does
G-force bar color	yellow	Lit segments, the zero box and the "0" labels
Peak marker color	red	The peak markers
G-force scale	1 G	Full scale: 1, 2 or 3 G

Level the G-force meter. With the display mounted and the car standing still on level ground, click **Level now**. The meter then reads zero at the angle it is mounted. Do it again if you move the display. **Reset** forgets the levelling (the meter then assumes the display stands upright). Both clear the peak markers.

Power graph

Setting	Default	What it does
Time frame	1 min	How much history the graph shows: 1, 2, 5 or 10 min
Power color	orange	Power taken from the battery
Regen color	green	Regen into the battery
Average line color	light blue	The dotted average line
Power source	Voltage x current	Where the power comes from: battery voltage times current, or one power signal

CAN signals

The power graph reads **Voltage** and **Current**, or **Power** when **Power source** is "Power signal". Voltage and Current default to the Nissan Leaf battery's signals; Power is empty until you set it. For another battery, click **Edit** and enter the signal as it is in the battery's DBC file:

Field	Meaning
CAN ID (hex), Frame	The message ID, and whether it is a standard or extended frame
Start bit, Length (bits)	Where the signal sits in the message, numbered as in the DBC file
Byte order	Motorola (big-endian) or Intel (little-endian)
Value type	Unsigned or signed
Factor, Offset	$\text{Value} = \text{raw} \times \text{factor} + \text{offset}$
Min, Max	Values outside this range are ignored
Multiplier	Applied last: -1 flips the sign, 0.001 turns mA into A

Or use **Paste from a DBC file**: paste the signal's `SG_` line, and its message's `B0_` line to fill in the CAN ID too. **Save** stores the signal; its live value shows on the card. **Reset to default** goes back to the default.

Positive must mean power out of the battery. The Leaf's current is the other way round (positive while charging), so its default multiplier is already -1 . If regen shows above zero, flip the sign of the current's (or the power's) multiplier: 1 becomes -1 , -1 becomes 1 .

Firmware updates

Updates are installed from the browser over USB-C, as for [settings](#). Your settings are kept.

Updating

1. Connect to the display on the [Resolve Display page](#).
2. Under **General**, **FW version** shows the firmware on the display and whether it is **Up to date** or an **Update available**.
3. Choose the version (the newest is preselected) and click **Flash**. If the browser asks for the port again, pick **USB JTAG/serial debug unit**.
4. Wait until the page says it is done (under a minute). Do not unplug the display meanwhile.
5. Click **Connect** to connect again.

If flashing stops partway, click **Flash** again. The display can always be flashed again over USB.

A display that does not connect

For a display that does not answer on the Resolve Display page, use the [firmware page](#). It installs the firmware without connecting to it first. Saved settings are kept here too.

1. Unplug the display and plug it in again.
2. Open the [firmware page](#), choose the version and click **Flash**.
3. When it is done, connect on the [Resolve Display page](#).

Specifications

TBC: to be confirmed.

Display

Type	AMOLED, round, with touch
Size	1.75"
Resolution	466 × 466 px, 273 PPI
Active area	Ø 43.7 mm
Brightness	700 cd/m ²
Contrast	100 000:1
Colour gamut	105 % NTSC
Viewing angle	85° in all directions (typical)
Cover glass	1.1 mm, hardness 6H or more, anti-fingerprint coating

Mechanical

Bezel diameter	59.07 mm
Total depth	34.38 mm, of which 7.7 mm in front of the panel
Panel hole	53-54 mm (body Ø 52.37 mm)
Panel thickness	up to 16 mm
Fixing	Locking ring from behind
Weight	<i>TBC</i>

Drawings: [Installation](#).

Electrical

Supply	12 V systems (3–17 V)
Reverse-polarity protection	Yes
Current, display on	<i>TBC</i>
Power, sleeping	10.2 mW: 1.96 mA at 5.24 V (measured over USB, firmware V1.0.0)
CAN	1 × CAN, 500 kbit/s, ESD-protected transceiver, no termination resistor
Ignition input	Pin 7, 12 V = on
USB	USB-C, for settings and firmware updates; powers the display without 12 V
Connector	Molex Micro-Fit 3.0, 8 pins (pinout)

Inside

Processor	ESP32-S3, dual core, 240 MHz
Motion sensor	6-axis accelerometer and gyroscope (G-force meter)
Touch	Fitted, not used: the brightness is a setting

Environment

Operating temperature	−20 to +70 °C
Storage temperature	−40 to +80 °C

In the box

TBC

Troubleshooting

The display stays dark

1. **Check it over USB.** Connect it to the [settings page](#). The display turns on while connected. If it does, power and the screen are fine, and the problem is what turns it on (step 3).
2. **Power:** 12 V on pin 5 and ground on pin 1 ([pinout](#)), and the fuse.
3. **Ignition source:**
 - **CAN signal (Display on)** needs the Resolve Controller on the same CAN bus and switched on (ignition on, or charging), or, if you changed the **Display on CAN signal**, that signal at 1. Its card on the settings page shows the live value. Check the CAN wiring below.
 - **Ignition wire (pin 7)** needs 12 V on pin 7 with the ignition on.

Error card

Message	Check
Missing VCU, INV, BMS or OBC	That part has power, and its CAN wires reach the display's bus
All four missing	CAN H and CAN L (pins 6 and 2) the right way round, and the bus terminated at both ends (Wiring)
Low 12V	The 12 V battery's charge, and the display's 12 V and ground wires
Isolation fault	The battery reports a high-voltage insulation problem. Have the high-voltage system checked. The message stays until the display restarts
BMS error 201-207	The battery's own fault. Look up the code in the Owner's Manual ; LeafSpy shows the battery's fault in detail

Wrong or missing values

Problem	Fix
Power graph shows regen above zero	Flip the sign of the Current (or Power) signal's Multiplier : 1 becomes −1, −1 becomes 1 (CAN signals)
Power graph stays empty	Open the power graph's CAN signals on the settings page. The live value on each card shows whether the display receives it
G-force meter not at zero when standing still	Level now (G-force meter)
Temperature in the wrong unit	Temperature unit setting

The settings page does not connect

- Use desktop **Chrome or Edge**.
- Try another USB-C cable: many only charge.
- Close other tabs with the settings page, and other programs that use serial ports.
- Unplug the display and plug it in again.
- Still nothing: install the firmware from the **firmware page**.

Unexpected restarts

General → Restarts counts restarts the display did not expect. A power drop usually means a loose 12 V or ground wire. For anything else, please **contact us** with what the line says. **Clear** resets it.

Console

The **Resolve Console** is a browser tool for the **Resolve Controller**, over USB. Use it to watch live values coming off the vehicle, change the controller's settings, and export a log when something needs diagnosing.

The display itself is set up on its own page: see **Settings**.

Nothing to install — it runs in the browser and connects over Web Serial.

! BROWSER SUPPORT

Web Serial only works in Chromium-based browsers — **Chrome, Edge or Opera**, on desktop. Safari and Firefox don't support it, and nor do phones or tablets.

Connecting

1. Plug the Resolve Controller into your computer with a USB cable.
2. Open the **Console**.
3. Click **Connect** and pick the controller from the browser's port list.

If nothing appears in the list, it's almost always the cable — plenty of USB cables carry power but no data. Try another one before anything else.

Live values

Once connected, the console streams what the controller is reading from the vehicle:

Group	Values
Battery	BMS type, voltage, max charge, charge and discharge power limits
Drive	Pedal state, pedal model, effective torque, brake state
Vehicle	Ignition state, charge port, temperature

If a display screen looks wrong, these values tell you whether the problem is the data or the display.

Settings

The controller's values can be edited from the console with **Edit Value**.

Demo mode

Demo mode drives the console with simulated data instead of a real vehicle — useful for seeing how it behaves with no hardware connected.

Exporting a log

Export your data saves the session, and **Send to Resolve-EV** shares it with us directly. If you're reporting a problem, this is the single most useful thing you can attach.