

EnergyFlow for Tesla

The EnergyFlow for Tesla driver suite enables seamless Control4 integration with Tesla Energy products including Tesla Powerwall, solar installations, and energy management systems. The suite includes:

- **EnergyFlow for Tesla:** The main proxy driver for Tesla API connection
- **Battery Display:** Represents individual Powerwall units
- **Grid Display:** Shows grid connection status and power flow
- **Solar Display:** Displays solar production information
- **Load Display:** Shows house power consumption
- **Storm Mode Display:** Controls and displays storm mode status

Installation and Updating

Installation Steps

1. Unzip the driver package.
2. In Composer Pro:
 - Go to **Driver > Add or Update Driver or Agent**
 - Add all bundled drivers from the package
 - All drivers must be added before proceeding with configuration

Prerequisites

1. Energy products must be provisioned by Tesla installers
2. Customer must have an active Tesla account with access to their energy products
3. Tesla account must have the energy products registered and visible in the Tesla mobile app

Configuration

Initial Setup

1. In **System Design**, add **EnergyFlow for Tesla** to the project
2. Select the driver in the project. In the **Properties** tab:
 - In the **Actions** property dropdown, select **Authenticate** and click **Set**
 - Copy the **Authentication URL** that appears
3. Send the authentication link to the customer. The authentication link will direct them to the Tesla authentication site where they will:
 - Enter their Tesla credentials
 - Grant "EnergyFlow Control4 Driver" access to:
 - **Profile Information:** Required to determine customer region for correct API endpoint
 - **Energy Product Information:** Access to installed energy products like Powerwall
 - **Energy Product Commands:** Permission to modify settings such as backup reserve percentage

Note: The authentication process will time out after 30 minutes. If the customer takes longer, restart the process with a new **Authenticate** action.

4. Monitor authentication status. The driver will periodically check for completion. Upon successful authentication:
 - **API Status** will display **Successfully authenticated**
 - Status will update to **Last API request was successful**
 - Customer will not need to re-authenticate unless access is revoked
5. After authentication, the driver automatically discovers energy products and creates connection bindings for each Site and feature:
 - **Battery** (Powerwall)
 - **Grid** connection
 - **Solar** panels (if installed)
 - **Load** (House consumption)
 - **Storm Mode**

Adding Device Drivers

Automatic (Recommended)

1. In the **Actions** property, choose **Add Devices** and click **Set**
2. The driver will:
 - Create a display driver for each discovered energy component
 - Automatically bind connections between main driver and display drivers
 - Place devices in the current room (move to appropriate rooms as needed)

Manual (Optional)

1. In **Actions**, run `Create Bindings`
2. Add individual display drivers to the project:
 - **Battery Display** for Powerwall units
 - **Grid Display** for grid connection
 - **Solar Display** for solar production
 - **Load Display** for house consumption
 - **Storm Mode Display** for storm mode control
3. Connect bindings manually through the **Connections** tab

Driver Properties

EnergyFlow for Tesla (Main Driver)

Status Properties

- **Cloud Status:** License activation status and update availability
- **Automatic Updates:** Automatically update the driver when updates are available. (Recommend setting to `On`)
- **Driver Version:** Current driver version number
- **Authentication URL:** Authentication link (visible during setup only)
- **API Status:** Last API request status and error messages
- **User Region:** Tesla API region (automatically detected)

Configuration Properties

- **Actions:** Driver management actions (Authenticate, Update Sites, Add Devices)
- **Log Level:** Debug output level (`Off` , `Debug` , `Trace` , `Trace with API Calls`). `Trace with API Calls` will output the raw API responses for maximum debugging.
- **Poll Time Minutes:** API polling frequency (default: 5 minutes, minimum: 5 minutes)
- **Combine Solar Inverters with Battery:** Aggregate solar data with battery metrics. Most installs should leave this set to `Yes` . For customers with more than one solar inverter, metrics will be aggregated into one set of display drivers. If set to `No` , each inverter will have separate device drivers and there will also be aggregated drivers, as well, causing confusion. Setting this property to `No` may be desired if the install does not include a CT clamp monitoring total combined solar output.

Display Drivers

Each display driver includes:

Status Properties

- **Cloud Status:** License and update status
- **Automatic Updates:** Automatically update the driver when updates are available. (Recommend setting to `On`)
- **Driver Version:** Current driver version number

Configuration Properties

- **Log Level:** Debug output level (Off, Debug, Trace)

Current State Properties

- **Varies based on driver**

Composer Pro Programming

See **Programming Reference** below for comprehensive lists of events, commands, variables, and conditionals available for programming.

Programming Reference

Events

EnergyFlow for Tesla (Main Driver):

- When a variable changes

Battery Display:

- Battery is low
- Battery is charging
- Battery is discharging
- When a variable changes

Solar Display:

- Starts producing power
- Stops producing power
- When a variable changes

Grid Display:

- Starts importing power
- Starts exporting power
- Stops importing or exporting power
- Goes off grid
- Reconnects to grid
- When a variable changes

Load Display:

- When a variable changes

Storm Mode:

- Storm mode is enabled
- Storm mode is disabled
- When a variable changes

Variables

EnergyFlow for Tesla (Main Driver):

Variable	Description	Type
{SITE_NAME}_BACKUP_RESERVE_PERCENT	Battery backup reserve percentage	Number
{SITE_NAME}_BATTERY_IS_CHARGING	Battery charging status	Boolean
{SITE_NAME}_BATTERY_IS_DISCHARGING	Battery discharging status	Boolean
{SITE_NAME}_BATTERY_PERCENT	Current battery charge level	Number
{SITE_NAME}_BATTERY_POWER_WATTS	Battery power (+ charging, - discharging)	Number
{SITE_NAME}_GRID_POWER_WATTS	Grid power (+ importing, - exporting)	Number
{SITE_NAME}_GRID_STATUS	Grid connection status (Active, Inactive)	String
{SITE_NAME}_ISLAND_STATUS	Grid mode status (on_grid, off_grid, off_grid_intentional)	String
{SITE_NAME}_LOAD_POWER_WATTS	House power consumption	Number
{SITE_NAME}_SOLAR_POWER_WATTS	Solar power production	Number
{SITE_NAME}_STORM_MODE_ENABLED	Storm mode activation status	Boolean

Battery Display:

Variable	Description	Type
POWERWALL_PERCENT	Current charge percentage	Number
POWERWALL_POWER_WATTS	Current power flow	Number
POWERWALL_IS_CHARGING	Charging status	Boolean
POWERWALL_IS_DISCHARGING	Discharging status	Boolean
POWERWALL_LAST_UPDATED	The date/time the variables were last updated	String

Solar Display:

Variable	Description	Type
SOLAR_POWER_WATTS	Current production	Number
SOLAR_LAST_UPDATED	The date/time the variables were last updated	String

Grid Display:

Variable	Description	Type
GRID_POWER_WATTS	Current grid power flow	Number
GRID_STATUS	Grid connection status (Active, Inactive)	String
GRID_LAST_UPDATED	The date/time the variables were last updated	String

Load Display:

Variable	Description	Type
LOAD_POWER_WATTS	Current home consumption	Number
LOAD_LAST_UPDATED	The date/time the variables were last updated	String

Storm Mode:

Variable	Description	Type
STORM_MODE_ENABLED	Storm mode enabled status	Boolean
STORM_MODE_MINUTES_REMAINING	If enabled, how many minutes remain before storm mode is disabled	Number

Advanced Features

Multi-Site Support

For customers with multiple Tesla Energy installations:

- Each site creates separate device bindings
- Site names are prefixed to all main driver variables
- Independent control and monitoring per site

Troubleshooting

Common Issues

Authentication Failures:

- Verify customer Tesla account access
- Check if energy products are visible in Tesla app
- Ensure authentication completed within 30-minute window

API Connection Issues:

- Check `API Status` property for error messages
- Review log output for detailed error information
- Confirm Tesla service availability

Missing Device Bindings:

- Run `Update Energy Sites` action
- Verify products are active in Tesla account

Data Update Problems:

- Check polling interval settings
- Review network connectivity
- Confirm Tesla account permissions

Support

1. **Primary Support:** Contact Driver Central support as first step
2. **Escalation:** Driver Central will escalate to Blessing Innovations LLC when necessary
3. **Feature Requests:** Submit issues at <https://gitlab.com/dblessing/c4-energyflow-for-tesla/-/issues>