EnergyLink360 EMS User Manual

Welcome to the official guide for EnergyLink360 EMS — a web-based energy management platform for monitoring, metering, reporting, and administration across multi-site facilities.

About this manual

This manual is organized like an online book. Use the table of contents on the left to jump between chapters. The outline on the right (on wide screens) lists sections within the current chapter. Use the search box to find topics across all chapters, or print the full manual from the toolbar.

> **TIP**
>
> Bookmark a chapter by copying the page address with its section link, for example the Troubleshooting chapter (`#troubleshoot`).

What is EnergyLink360 EMS?

EnergyLink360 EMS (Energy Management System) collects real-time and historical data from connected meters and controllers, organizes it by site and group, and presents it through dashboards, trend charts, alarms, an interactive E-Map, and billing reports.

Administrators configure devices, models, users, and permissions. Operators monitor live data, review trends, respond to alarms, and generate reports for day-to-day energy management.

Who should read which chapter?

Audience	Recommended chapters
New users	Overview, System Concepts, Operator Guide
System administrators	All chapters, especially Administrator Guide and Troubleshooting
Support / IT	System Concepts, Modules, Troubleshooting / FAQ, Version History

System Concepts

Understanding these core terms will help you navigate EMS menus, configure devices, and interpret reports consistently.

Core terminology

Term	Description
Site	A top-level facility or building entry under the *Sites* sidebar menu (e.g. Rojana, Demo). Used to organize folders and group items for navigation and reporting.
Site folder	A subfolder inside a site (e.g. Floor A, Folder B). Folders can contain other folders or group items.
Group item	A device collection under a site or folder (e.g. Group Energy, Monthly Report). Opens a live point/tag table where operators monitor selected registers from connected devices.
Configuration group	A separate concept under *Configuration ? Group-Template* — reusable device layouts, not the same as a Sites group item.
Device / Loop	A physical meter, controller, or gateway connected via Modbus, BACnet, MBUS, or another supported protocol.
Point	An individual register on a device — voltage, current, power, energy, status, or alarm.
Model	A reusable template defining points, scaling, and units for a device type. Applied when adding new devices.
Permission Group	View / Add / Edit / Remove rights per menu item, assigned to user accounts.

How data flows through the system

Field devices are polled over their communication protocol. Readings are stored in the EMS database. The web interface reads that data to render dashboards, trends, alarms, the E-Map, and billing reports.

Configuration changes — adding devices, models, group templates, or users — are made through the Configuration and Administration menus and take effect immediately for users with the appropriate permissions.

1. Devices communicate with EMS polling services (Modbus, BACnet, etc.).
2. Services write readings and status into the database.
3. The web UI reads from the database for live views, history, and exports.
4. Administrators change configuration through EMS pages; operators consume the results.

Supported device and protocol types

Protocol / type	Typical use
Digital Meter	Native EMS digital metering devices
BACnet	Building automation controllers and meters
Modbus TCP / RTU	Industrial meters and gateways
MBUS	Utility meters (heat, water, gas where supported)
Link 360	Link 360 device integration
Virtual Meter	Calculated or derived values from other points
Custom	Site-specific or custom integrations

Modules

EMS integrates the modules below. Each entry shows where to find it in the sidebar menu.

Module	Menu path	Description
Sites	*Home ? Sites*	Organize facilities into sites, folders, and group items; browse live point collections. See Operator Guide ? Sites, folders, and group items.
Site Explorer & Devices	*Devices*	Browse protocol loops and individual meters; view live point values for all supported protocols.
Groups & Group Templates	*Configuration ? Group-Template*	Organize devices into groups; save layouts as reusable templates.
Models	*Configuration ? Models*	Define reusable point templates (registers, scaling, units) for device types. Click a model name to open the **Model Editor**.
Model Library	*Configuration ? Models ? Library*	Central repository for sharing device models across EMS sites. Publish, download, rate, and version-control point templates. See the Model Library chapter.
E-Map	*E-Map*	Visual floor-plan / site map for device location and status.
Trend & History	*Trend & History*	Historical trend charts (General) and real-time Demand Chart.
Alarms & Events	*Alarms*	Offline devices, pending alarms, and event history.
Billing	*Billing*	Fixed Rate, TOD, TOU, and site-specific energy bill formats.
Reports	*Reports*	Solar Energy Comparison, CPM Monthly Operation Log Sheet, and related exports.
Administration	*Administration*	Users, permissions, database tools, license, hardware info, services.
Preferences	*Preferences*	Personal font, date/time, regional, and interface settings.
Plug-ins	*Plug-ins*	Node-RED, Line, email alerts, and site-specific integrations.

Billing formats

Depending on your site license and configuration, billing may include Normal (Fixed Rate), Time of Day (TOD), Time of Use (TOU), or custom formats such as Hotel, Plaza, MS Siam Tower, SAP, SathonPrime, and Boonthavorn.

Administrator Guide

Step-by-step procedures for configuring and maintaining the EMS platform.

Managing users and permission groups

1. Open *Administration ? Users ? Manage*.
2. Create, edit, or disable user accounts and assign each user to a permission group.
3. Open *Administration ? Users ? Permission*.
4. For each menu item, set View, Add, Edit, and Remove rights per group.
5. Save changes. Users may need to refresh or re-login to see updated menu access.

> **NOTE**
>
> New menu modules are hidden from all existing groups by default. Enable View (and Add/Edit/Remove as needed) before users in that group can see or use the module.

Adding devices and models

1. Define a model under *Configuration ? Models* — register addresses, data types, scaling, and units. Alternatively, download a ready-made model from the Model Library.
2. Add device instances under *Devices ? [protocol]*.
3. Assign the model and enter connection details (IP address, unit ID, port, etc.).
4. Verify live data appears in Site Explorer.
5. Optionally save a group layout as a template under *Configuration ? Group-Template* for reuse at similar sites.

For step-by-step instructions on defining MODBUS points inside a model, see Model Editor — MODBUS Registers below.

Model Editor — MODBUS Registers

The **Model Editor** is where you define every MODBUS point in a device model — register address, data type, scaling, units, and display options. Devices that use this model inherit these point definitions when polling the field.

Opening the Model Editor

1. Open *Configuration ? Models* from the sidebar.
2. In the model list, click the **model name** link (document icon) for the model you want to edit.
3. The page opens with the model name in the header and the subtitle *MODBUS registers*.
4. You can bookmark the page in your browser (users still need login and permission to open it).

Page layout

Area	Description
Header bar	Back button, model name, and **Action** dropdown (Import, Export, Open Link).
Add form (top panel)	Form for creating *new* points only. Click **Add** to save, or **Clear** to reset all fields to defaults. Editing existing points uses a separate popup (see below).
Point list table (bottom)	Points in the model (12 per page). Columns include Point ID, View, Point Name, Description, Unit, Register Type, Data Type, Register, Bit, Category, Scale, Byte Order, and row actions: **Edit**, **Copy**, **Remove**.
Pagination	**Previous** / **Next** buttons below the table. The list shows **12 points per page**.

> **ADD VS EDIT VS COPY**
>
> **Add** uses the form at the top of the page. **Edit** opens the **Edit Point** popup (pencil icon). **Copy** (copy icon) duplicates a row — either into another model immediately, or into the Add form via **Paste to Add form** so you can review before clicking Add.

Permissions

Access is controlled under *Administration ? Users ? Permission* for the **Models** menu item:

Right	What you can do on Model Editor
View	Open the page and read the point list. Without Add/Edit, form fields and action buttons are hidden or read-only.
Add	Use **Add** and **Clear** on the add form, **Upload Image**, **Import**, **Export** in the Action menu, and the **Copy** icon on table rows.
Edit	Click the pencil (**Edit**) icon to open the Edit Point popup and change an existing point.
Remove	Click the trash (**Remove**) icon to delete a point from the model.

Adding a new point

1. Fill in the add form at the top of the page (see Field reference below).
2. Select an unused **Point ID** from the dropdown (IDs already in use are not listed).
3. Enter a **Point Name** (required). Optionally fill Description, Unit, and register settings.
4. Click **Add**.
5. On success, the new row appears in the table and the Point ID dropdown refreshes. The **Register** field auto-advances to the next address based on the selected **Data Type** (e.g. Float32 skips 2 registers).

To discard entries and start over, click **Clear** next to Add. This resets text fields, checkboxes, and dropdowns to default values (including your last saved choices for Register Type, Data Type, Category, and related options) and reloads the next free Point ID.

> **TIP**
>
> Hover the **help icons** (`?` circle) next to fields such as Bit, Scale factor, CT Scale, Byte Order, Invert Bit, Formula, and Multi State Text for short explanations.

Editing an existing point

1. In the point list table, click the **Edit** (pencil) icon on the row you want to change.
2. The **Edit Point** popup opens with all fields loaded for that point, including the same help icons as the add form.
3. Change values as needed. The **Point ID** dropdown lists available IDs (the current point remains selectable).
4. Click **Save Change** to apply, or **Cancel** / the **X** button / `Esc` / click outside the popup to close without saving.
5. On success, the table row updates in place and the popup closes.

Copying a point

Each table row has a **Copy** icon (between Edit and Remove). Click it to open the **Copy Point** popup. Requires **Add** permission.

Action in Copy Point popup	Description
Paste to Add form	Loads the source point's register settings into the **Add form** on the current page. Point ID is set to the next free ID automatically; the name becomes `original name copy`. The page scrolls to the add form so you can adjust values and click **Add**. Use this to duplicate a point in the same model with small changes.
Copy to model	Creates a new point immediately in the selected **Target Model**. **New Point ID** is auto-selected (next free ID 1–255); you can change it and edit the new name before confirming. If the target is the current model, the table refreshes after success.

1. Click the **Copy** icon on a row.
2. Review the source Point ID and name shown at the top of the popup.
3. Either click **Paste to Add form** (review in add form, then Add), or choose a **Target Model**, confirm **New Point ID** and **New Point Name**, then click **Copy to model**.

> **TIP**
>
> To clone many similar registers in one model, use **Paste to Add form** repeatedly: copy a row, paste, tweak Register or name, Add, then repeat.

Removing a point

1. Click the **Remove** (trash) icon on the row.
2. Confirm the deletion when prompted.
3. The row is removed and the Point ID becomes available again in the add form dropdown.

> **WARNING**
>
> Removing a point from a model may affect devices already using that model and any formulas referencing `pid.<n>`. Review dependent devices and virtual points before deleting.

Browsing the point list

- Use **Previous** and **Next** to move through pages of 12 points.
- After adding or editing a point, the table scrolls to the page containing that Point ID when possible.
- The **View** column shows a checked icon when the point is visible in device views, or a hidden-eye icon when View is disabled.

Action menu (header)

Click **Action** in the top-right corner of the page:

Menu item	Description
Import	Import point definitions from a CSV file into this model (replaces or merges points depending on file content). Requires **Add** permission.
Export	Download the current model points as a CSV file. You can edit the file name in the confirmation dialog. Requires **Add** permission.
Open Link	Opens the current Model Editor URL in a new browser tab — useful for side-by-side comparison or sharing with a colleague.

Importing points from CSV

1. Click **Action ? Import**. The **Import Model** popup opens.
2. Confirm the model ID and name (read-only).
3. Choose **File Version**:
   - **Energy Link 360 (.csv)** — current EMS export format (recommended).
   - **E-Data (old) (.csv)** — legacy format for older exports.
4. Use **File Selected ? Upload** to choose your CSV. Wait until the file name appears (not `---`).
5. Click **Import**. A loading message appears while the file is processed; the point table reloads when import completes.

6. A success message asks whether to **reset the system** so polling services pick up the new model immediately. Choose **Yes, reset now** on production changes, or **No, just close** if you will reset later from Administration.

Exporting a model to CSV

1. Click **Action ? Export**.
2. A brief **Exporting model…** message appears while data is prepared.
3. Enter the file name when prompted (defaults to the model name).
4. Confirm to download a `.csv` file containing all points in the model.
5. Use this file for backup, editing in a spreadsheet, or importing into another model.

Uploading a model image

1. In the add form panel, click **Upload Image** below the model picture (left side).
2. Select an image file. The preview updates after upload.
3. The image is stored with the model and shown on the Models list and Model Editor header area.

Field reference

Field	Description
View	When checked, the point appears in device / site views. Uncheck to hide from operators while keeping the register mapped.
Category	Groups the point for menus and reports (e.g. Voltage, Current, Energy). Changing category may show or hide CT-related fields.
CT Scale Multiply	Enable when the meter requires CT ratio scaling for current, kW, and kWh. Shows **CT Primary** and **CT Secondary** fields.
Point ID	Unique number (1–255) for this point in the model. Referenced in formulas as `pid.<id>` .
Write enable	Allows write commands to this register when supported by the device and protocol.
Point Name	Display name (required). Shown in Site Explorer, trends, and reports.
Description	Optional longer description for documentation.
Unit	Engineering unit shown with values (e.g. V, A, kW, kWh).
Register Type	MODBUS table: Coil, Discrete Input, Holding Registers, or Input Registers.
Data Type	How raw register words are interpreted — Bit, Int16, UInt16, Int32, Float32, Float64, etc.
Register	Starting MODBUS register address (1-based in this editor).
Bit (Begin..End)	For bit extraction within a word, e.g. `0..15` for the full 16-bit range.

Field	Description
Scale factor	Multiplier applied to the raw value (default `1.0`).
Offset	Value added after scaling.
Byte Order	**Little endian** or **Big endian** for multi-byte types.
State text (true) / (false)	Display labels for boolean / coil points (e.g. ON / OFF).
CT Primary / CT Secondary	Current transformer ratio (e.g. 50 / 5) when CT Scale Multiply is enabled.
Invert Bit	Swaps 0 and 1 for boolean values.
Formula Expression	Optional calculated value. Use `=x + 15` or reference other points: `=x + pid.1 + (pid.2 + pid.3)` where `x` is the current raw value.
Multi State Text	Maps integer states to labels, e.g. `{0:OFF, 1:ON, 2:ERROR, 3:UNKNOWN}`.

Remembered defaults and Clear

When you add points in one session, EMS remembers your last choices for Register Type, Data Type, Byte Order, Category, CT Scale, and Invert Bit in this browser. The next point you add starts with those defaults — useful when entering a block of similar registers.

Click **Clear** on the add form to restore those defaults and empty text fields without reloading the page.

Typical workflow — new meter model

1. Create the model shell under *Configuration ? Models* (name and description).
2. Open the model in the Model Editor.
3. Optionally upload a device photo.
4. Add points one by one, use **Copy ? Paste to Add form** to duplicate similar registers, or **Import** from a manufacturer CSV / a previous EMS export.
5. Verify Register addresses and Data Types match the meter manual.
6. **Export** a backup CSV when finished.
7. Assign the model when adding Modbus devices under *Devices*.
8. Confirm live values in Site Explorer match expected units and scaling.

Typical workflow — copy points to another model

1. Open the source model in the Model Editor.
2. Click **Copy** on the row to duplicate.
3. Choose the destination under **Target Model**, confirm auto Point ID and name, then click **Copy to model**.

4. Open the target model and verify the new row. Reset the system if devices must reload the model immediately.

Database maintenance

1. Before any update on production, run *Administration ? Database ? Backup*.
2. Run *Administration ? Database ? Update* to apply database changes for new versions or modules.
3. Use *Restore* only when you need to recover from a known-good backup.

> **WARNING**
>
> Always take a backup before running Database Update on a production system. Restore overwrites current data.

System administration

Administration ? System provides Hardware Info (server diagnostics), Software License / License Terms, and Services (background polling status). If devices stop updating, check Services first.

Software License

Administration ? System ? Software License manages the license key(s) that authorize this installation and shows how many field devices are currently in use against how many are licensed.

Adding and activating a license

1. Open *Administration ? System ? Software License*.
2. Click the **+** button in the header and enter the license key you were given, then **Add**. The key appears in the table with status **Inactive**.
3. Click **Activate** on that row. The Activate dialog shows this machine's **HW ID** (hardware id) and license key.
4. Click **Get Online Token Key** to request an activation token automatically (requires internet access to the license server), or paste a token you were given manually (offline activation).
5. Click **Activate**. On success you are prompted to restart the EMS service so it picks up the new license immediately.

> **NOTE**
>
> A license token is bound to this machine's HW ID. Activating on one machine and copying the token to another fails with an HWID mismatch error — request a new token for the other machine's HW ID instead.

Reading the license status

Where	What it shows

License page banner	Whether any license is currently active, and (if active) devices used vs. licensed.
Bell (notification) menu — top navbar	Bell turns red and the License row shows **Inactive**, **Over limit**, or a live "Stops in Xh Ym" countdown.
Sidebar banner (bottom of the tree)	Appears only while the background service is actually counting down its grace period (see below), with a **Fix now** link to this page.

Grace period and device limit

If the background EMS service does not find a valid, matching license for this machine at startup (no license activated, wrong HW ID, or the license has expired), it does **not** stop immediately — Modbus, BACnet, and meter polling keep running normally for a grace period (a few hours) so live monitoring is not interrupted. A countdown to when the service will stop is shown in the places listed above. Restarting the service (after activating a valid license) grants a fresh grace period and clears the countdown.

Separately, once a license **is** active, adding new field devices is blocked once the number of enabled devices reaches the licensed quota. Remove or disable unused devices, or activate a license with a higher device count, to add more.

> **TIP**
>
> An install that has never activated any license is **not** subject to the device-limit block — the block only applies once a license has actually been activated on this machine.

Audit Log

Administration ? Audit Log records significant account and configuration activity: logins (success and failed attempts) and logouts, user and permission changes, password changes, device commands and service restarts, data create/update/delete actions, and report exports.

1. Open *Administration ? Audit Log*.
2. Use the filters (date range, user, category, action, status, free text) and click **Filter** to narrow the list, or **Clear** to reset.
3. Click **View** in the Details column to see the full details for an entry in a popup.
4. Use the export buttons in the page header to export the filtered results to PDF or Excel.

> **NOTE**
>
> The Audit Log is view-only and available to Administrators by default.

Audit log retention

Audit log entries are kept for a configurable number of days, then removed automatically by a scheduled background job.

1. Open *Administration ? General*.
2. Set **Keep Audit Log (Days)** to the number of days to retain entries (default 90).
3. Click **Save**.

Enabling a new menu module

1. Confirm the module appears in the sidebar for an administrator account.
2. Open *Administration ? Users ? Permission*.
3. Select each affected permission group.
4. Enable View for the new menu item; enable Add, Edit, Remove as required.
5. Ask affected users to refresh the browser or log in again.

Model Library

Model Library Central is a shared repository for device models. Teams can publish, download, rate, and version-control MODBUS point templates across multiple EMS sites from a single library.

Overview

Instead of recreating point definitions on every EMS installation, engineers publish a model once to the central library. Other sites can then download it — with the correct registers, data types, scaling, and units — in seconds. The library also keeps a full revision history so you can roll back to any previous version.

Feature	Description
Publish / Update	Push a local model (with points and image) from EMS to the central library.
Download / Import	Pull a model from the library into the local EMS — as a new model or to update an existing one.
Revision history	Every publish or point-change snapshot creates a version. Older versions can be downloaded or rolled back.
Star rating	Each site can rate a model 1–5 stars. Ratings appear in the model list to help engineers pick proven templates.
CSV import	Upload point definitions from a legacy EMS CSV export directly into the library — data-type codes and byte-order are converted automatically.
Documents & Notes	Attach datasheets, manuals, or Modbus maps to a model. Add comments for team discussion.

How Model Library Central works

Model Library Central is a separate site that stores shared device models. Each EMS installation connects using an access key configured by your administrator.

Component	Description
Library Central website	Browse, upload, rate, and manage models in a web dashboard.
EMS integration	**Publish**, **Pull**, and **Import from Library** on *Configuration ? Models*.

Initial setup

1. Your administrator installs Model Library Central on the library server and completes the first-time setup wizard.
2. Copy the **admin access key** shown during setup — it is displayed only once.

3. On this EMS site, ask your administrator or EMS support to register the library connection URL and access key.
4. Log in to Library Central with the administrator account created during setup (change the default password on first login).

> **NOTE**
>
> Each EMS site that connects to the library should use its own access key. Additional keys are created under *API Keys* in Library Central (admin only).

Publishing a model to the library

Publishing sends a local model (with all points and image) from EMS to the central library. If the model was published before, it updates the existing library entry and bumps the version.

1. Open *Configuration ? Models*.
2. In the model list, click the **three-dot menu** (?) on the row of the model you want to publish.
3. Select **Publish to Library**.
4. Enter a **device name** (project/site name for identification in the library) and click **Publish**.
5. On success, the toast shows *"Published v1"* (first time) or *"Updated to v3"* (subsequent publishes).

> **TIP**
>
> After the first publish, the model stays linked to the same library entry. Subsequent publishes update that entry. The previous version is saved as a revision automatically.

Downloading a model from the library

You can download a model from the library to create a new local model — either from the **Add Model** dialog or the **Model Library** browser.

From Add Model dialog

1. Open *Configuration ? Models* and click the **+** button.
2. Switch to the **From Library** tab.
3. Search or browse the model list. Star ratings are shown next to each model if rated.
4. Click a model to open the **detail view**.
5. The detail view shows:
   - Model info — name, description, brand, category, point count.
   - **Rating** — average stars and your own rating (click stars to rate).
   - **Version selector** — radio buttons for each version. The latest version is pre-selected with a *Latest* + *Recommended* badge.

6. Select a version and click **Download**.
7. The model is imported as a new local model with all points and image.

From Model Library browser

1. In the model list header, click the **three-dot menu** (?) ? **Model Library**.
2. The library opens as a large dialog with search. Click any model for the same detail/version/rating view.
3. Select version and click **Download**.

Pulling updates from the library

If a model was previously published (linked to the library), you can pull the latest version to replace local points.

1. Open *Configuration ? Models*.
2. Click the **three-dot menu** (?) on the linked model ? **Pull from Library**.
3. Confirm the pull. A snapshot of the current local points is saved before overwriting.
4. On success, the toast shows the new version and point count.

> **NOTE**
>
> Pull replaces all local points with the library version. If there are no changes since the last pull or publish, the pull is skipped with a message.

Rolling back to a snapshot

Every pull creates a local snapshot. You can roll back to any previous snapshot if a pull introduced unwanted changes.

1. Click the **three-dot menu** (?) ? **Rollback** on the model row.
2. A list of up to 10 recent snapshots appears (with date, action, and source version).
3. Select a snapshot and click **Restore**. The current points are saved as a *before_rollback* snapshot first.

Star rating

When browsing models in the *From Library* tab or the *Model Library* browser, each model shows its average star rating and rating count. Ratings help engineers identify proven, widely-used templates.

1. Open a model's detail view (click the model row).
2. In the **Your rating** area, hover over the stars and click to rate 1–5.
3. The rating is saved immediately and the average updates.

Each EMS site (API key) can rate a model once. Re-rating updates the previous vote.

Revision history and Save Revision

The library tracks model versions. A new revision is created when:

- A model is published or updated from EMS (automatic).
- An administrator clicks **Save Revision** in the Library Central UI after editing points.

Saving a revision in Library Central

1. Open a model in Library Central.
2. Edit, add, or delete points as needed. A dark bar appears at the top: *"Points have been modified — N changes"*.
3. Click **Save Revision**.
4. Enter an optional change note (e.g. *"Added Voltage L3, fixed Energy register"*) and confirm.
5. The current points are snapshotted, the version bumps (e.g. v2 ? v3), and the bar clears.

> **TIP**
>
> You can make multiple point changes and then save one revision. The revision captures the state at the moment you click **Save Revision**, not each individual edit.

Downloading a specific revision

When downloading from the library (Add Model ? From Library), the version selector shows all available revisions. Select an older version to download its point snapshot instead of the latest.

Uploading models (JSON and CSV)

Library Central accepts model files in **JSON** (exported from EMS or the library) and **CSV** (legacy EMS export format).

JSON upload

Drop or browse a `.json` file exported from EMS or the library. The preview shows model name, points, and image. Fill in the **From Project** field and click **Publish to Library**.

CSV upload (legacy EMS format)

For models exported from older EMS versions as CSV, the upload page converts them automatically:

1. Drop or browse a `.csv` file. The file badge shows CSV.
2. The parser detects headers automatically and converts old data-type codes (16?UInt16, 64?Float32, etc.).
3. A preview table shows the parsed points with converted data types.
4. Enter a **Model Name** (CSV files do not contain a name), **From Project**, and optional overrides.
5. Click **Publish to Library**.

> **DATA TYPE CONVERSION**
>
> The CSV parser maps old EMS codes to standard codes: `16?UInt16`, `24?Int16`, `32?UInt32`, `36?Int32`, `64?Float32`. Swap variants (e.g. `Float32(Swap)`, code 128) set byte order to Little Endian automatically. The `@` separator in formula and multi-state fields is converted back to commas.

Documents and notes

In the Library Central UI, each model has a **Documents** tab and inline **Notes** (comments).

Documents

1. Open a model detail page and switch to the **Documents** tab.
2. Click **Add Document**, select a type (Manual, Modbus, Catalog, Datasheet, Other), and upload a file (PDF, DOC, XLS, CSV, TXT, PNG, JPG, ZIP — max 20 MB).
3. Documents are shown with a type badge and download link in both the model list and detail page.

Notes

In the model list, click the comment icon next to a model name to expand the notes panel. Type a comment and press `Enter` or click the send button. Notes are visible to all library users.

API key management

Each EMS site needs an API key to connect. Keys are managed in the Library Central UI under *API Keys* (admin only).

Permission	Allowed actions
read	List, detail, image, revisions, documents, notes (read-only access).
write	All read actions plus publish, update, delete, rate, add points/notes/docs.
admin	Full access including user and key management.

Library Central UI pages

Page	Description
Models	Browse all models with search, category/brand filter, ratings, document icons, and notes. Duplicate, export, or delete models.
Upload	Upload JSON or CSV files to create new models in the library.
Model Detail	View/edit model info, points (add, edit, delete), documents, revision history. Save Revision button after changes.
Users	Manage library UI users (admin only). Separate from EMS user accounts.

Page	Description
API Keys	Create/revoke API keys for EMS sites (admin only).
Activity	Audit log of all library actions — publish, update, delete, duplicate, etc.

Troubleshooting

"Model Library not configured"

The library connection URL or access key is not set on this EMS site. Ask your administrator to complete Model Library setup, then refresh the page.

"Cannot connect to Library"

1. Confirm Library Central is running and reachable from the EMS server (same network or VPN).
2. Ask your administrator to verify the library site was installed and updated successfully.
3. Check that the connection URL in EMS settings matches the address you use in a browser.

"Invalid API key" (403)

The access key in EMS does not match a key registered in Library Central. Create a new key in Library Central or re-enter the correct key in EMS settings.

"This API key does not have write permission"

The key is read-only. An administrator must grant **write** or **admin** permission on the *API Keys* page in Library Central.

Model name already exists when importing

A local model with the same name exists. Rename the local model first, or use Pull instead of Import if it is the same model.

"Already up to date" when pulling

The local points are identical to the library version. No changes were made since the last pull or publish.

E-Map Editor

The E-Map Editor is a full-featured vector drawing tool for creating interactive floor plans, single-line diagrams, and SCADA-style dashboards. Maps can display live data from connected meters through data binding.

Opening the editor

Navigate to **E-Map** in the sidebar, then double-click a map name or click **Edit** on a map entry.

You can also open a map in *view-only* mode from the map list when available. In view mode, press `E` to switch to editing.

Workspace layout

The editor workspace is divided into several areas:

Area	Location	Description
Menu bar	Top-left	File, Edit, View, Layers, Object menus
Action toolbar	Top row, center	Save, Copy, Cut, Paste, Undo, Redo, Delete buttons
Text toolbar	Top row, after actions	Font family, Bold, Italic, font size, fill/stroke color pickers, text position
Drawing toolbar	Top row, right side	Drawing tools (Pointer, Rectangle, Circle, Arc, Line, Polygon, Image, Text), Group/Ungroup, Lock/Unlock, Settings, Align
View toolbar	Top-right corner	Grid, Snap, Fit-to-screen, Pan, Zoom In/Out, Reset view, Preview
Canvas	Center	The drawing area — scroll to pan, mouse wheel to zoom
Properties panel	Right sidebar	Position, size, rotation, corner radius, opacity, and data binding for the selected object
Layer selector	Toolbar, beside drawing tools	Choose which layer to draw on. Click the layer icon to open the layer manager
Status bar	Bottom	Mouse coordinates (x, y) and save status

Menus

File menu

Item	Description

Save to Database	Saves the current map to the server database
Load from Database	Reloads the last saved version, discarding local changes
Open JSON file	Opens a local `.json` file exported previously
Import JSON (merge)	Merges objects from a JSON file into the current map
Export as JSON	Downloads the map as a `.json` file for backup or transfer
Page Properties	Set canvas width/height (100 – 10,000 px), background color, and linked template
Preferences	Default text font/size/color, default shape fill/stroke, grid size, and snap settings
Open in new tab	Opens the runtime (preview) view in a new browser tab

Edit menu

Item	Shortcut
Undo	`Ctrl+Z`
Redo	`Ctrl+Y` or `Ctrl+Shift+Z`
Cut	`Ctrl+X`
Copy	`Ctrl+C`
Paste	`Ctrl+V`
Delete	`Delete` or `Backspace`

Undo/Redo supports up to 10 levels of history.

View menu

Item	Description
Zoom In / Out	Scale the canvas view
Fit to Screen	Auto-zoom to show the entire canvas
Reset View	Center canvas at 100% zoom
Properties Panel	Toggle the right-side properties panel
Pan Mode	Toggle hand/pan tool for scrolling the canvas
Show Grid	Toggle the background grid overlay
Snap to Grid	Toggle snapping objects to grid intersections
Show Template	Toggle display of the linked template layer behind the map

Item	Description
Widget Library	Open the pre-built widget panel (icons, electrical symbols, gauges, etc.)
Preview / Play	Enter preview mode to see live data and test interactions
3D View	Open the 3D floor view (if configured)

Layers menu

Click **Add Layer** to open the layer manager. Layers allow you to organize objects by function (e.g. background, equipment, labels). Each layer has:

- **Name** — editable label
- **Visibility** — show/hide all objects on the layer
- **Opacity** — adjust transparency (0 – 100%)
- **Reorder** — drag to change the stacking order
- **Delete** — remove a layer (objects move to the default layer)

The active drawing layer is selected from the toolbar dropdown beside the drawing tools.

Object menu

Item	Shortcut	Description
Group	`Ctrl+G`	Combine selected objects into one group
Ungroup	`Ctrl+U` or `Ctrl+Shift+G`	Break a group back into individual objects
Lock	—	Prevent an object from being moved or edited
Unlock	—	Re-enable editing for a locked object
Rotate 90°	—	Rotate the selected object 90 degrees clockwise
Flip Horizontal	—	Mirror the object left-to-right
Flip Vertical	—	Mirror the object top-to-bottom

Alignment (requires 2+ selected objects)

Action	Description
Align Left / Center / Right	Align selected objects horizontally
Align Top / Middle / Bottom	Align selected objects vertically
Distribute Horizontal	Space objects evenly side-by-side (requires 3+)
Distribute Vertical	Space objects evenly top-to-bottom (requires 3+)

Drawing tools

Select a drawing tool from the toolbar, then click and drag on the canvas to create a shape. Press `Escape` to cancel and return to the Pointer tool.

Tool	Icon	How to use
Pointer		Click to select objects. Click empty area to deselect. Drag to marquee-select multiple objects. Hold `Shift` to add/remove from selection
Rectangle		Click and drag to draw a rectangle. Hold `Shift` to constrain to a square
Circle		Click and drag to draw an ellipse. Hold `Shift` to constrain to a perfect circle
Arc		Click and drag to draw an arc shape
Line		Click and drag to draw a line. Hold `Shift` to constrain to 0°/45°/90° angles. Lines support arrow endpoints (set via context menu or properties)
Polygon		Click to place vertices. Double-click or press `Enter` to finish. Press `Escape` to cancel. Creates a closed polygon shape
Image		Opens a file dialog to select an image (PNG, JPG, SVG). The image is placed on the canvas at the cursor position
Text		Click on the canvas to place a text box, then type. Double-click existing text to edit it

> **TIP**
>
> After drawing a shape, the tool automatically switches back to the Pointer. To draw multiple shapes of the same type, re-select the tool after each draw.

Selecting and manipulating objects

- **Click** an object to select it — blue handles appear around the object
- **Shift+Click** to add or remove an object from the selection
- **Marquee select**: click on empty canvas and drag a rectangle to select all objects inside
- **Ctrl+A**: select all objects on the canvas
- **Click empty area**: deselect all
- **Drag** a selected object to move it
- **Drag a handle** to resize
- **Arrow keys**: nudge selected objects by 1 pixel (hold `Shift` for 10 px steps)

Text editing

Use the text toolbar to set font, size, style, and colors *before* placing text, or select existing text to change its properties.

- **Font family**: choose from the font dropdown (Arial, Roboto, Courier New, etc.)
- **Bold / Italic**: toggle with toolbar buttons or use the style options
- **Font size**: type a value (6 – 200 px)
- **Fill color**: background fill of the text box
- **Stroke color**: text foreground color
- **Text position**: choose where the label appears relative to a marker (Top, Bottom, Left, Right, Center, Hidden)

Double-click on existing text to enter inline editing mode. Press `Escape` or click outside to finish.

Shape styling

Selected shapes can be styled via the toolbar, properties panel, or right-click context menu:

Fill

- **Solid color** — pick from color swatches or the native color picker
- **Linear gradient** — two-color gradient with direction control
- **Radial gradient** — circular gradient from center outward
- **No fill** — transparent background

Stroke (border)

- **Color** — pick stroke color from the color picker
- **Width** — 0 (none), 1, 1.5, 2, 3, 4, or 6 px
- **Style** — Solid, Dashed, Dotted, Dash-dot, Long dash
- **No stroke** — remove the border entirely

Line arrows

Lines and polygons can display arrow endpoints. Set via the context menu > Appearance > Line Arrow:

- No Arrow, End arrow, Start arrow, Both ends, Triangle, Round cap, Square cap

Opacity

Set object transparency from the context menu > Appearance > Opacity (10% – 100%).

Corner radius

Rectangles support rounded corners. Set the radius in the Properties panel (right sidebar).

Polygon node editing

After drawing a polygon, you can edit individual vertices:

1. Select a polygon and double-click it (or right-click > **Edit Nodes**)

2. Blue vertex handles appear — drag them to reshape the polygon
3. Right-click a vertex to access node options:
   - **Add Node** — insert a new vertex between this point and the next
   - **Delete Node** — remove this vertex (also available via `Delete` key)
   - **Corner** — make this vertex a sharp corner
   - **Smooth** — convert this vertex to a Bézier curve
   - **Finish Editing** — exit node edit mode
4. You can also convert multiple lines into a single polygon via the context menu > **Convert Lines to Polygon**

Press `Escape` to exit polygon node editing mode.

Object ordering (z-order)

Control which objects appear in front of or behind others:

Action	Shortcut	Context menu
Move one level up	`Page Up`	Ordering > Move Up
Move one level down	`Page Down`	Ordering > Move Down
Bring to front	`End`	Ordering > Bring to Top
Send to back	`Home`	Ordering > Send to Bottom

Context menu (right-click)

Right-click on any object to access quick actions:

- **Cut / Copy / Paste / Delete**
- **Group / Ungroup**
- **Lock / Unlock**
- **Rotate 90°**
- **Ordering** — submenu for z-order (Top, Up, Down, Bottom)
- **Move to Layer** — reassign the object to a different layer
- **Appearance** — submenus for Fill type, Stroke, Line width, Line style, Line arrows, Opacity
- **Widget Properties** — open advanced properties for widgets
- **Polygon node editing** — Add Node, Delete Node, Corner, Smooth, Finish Editing (when editing polygon vertices)
- **Convert Lines to Polygon** — merge connected lines into a polygon

Grid and snapping

The grid and snap features help align objects precisely:

- **Toggle Grid** (toolbar button or View menu): show/hide a dot grid on the canvas
- **Toggle Snap** (toolbar button or View menu): when enabled, objects snap to the nearest grid intersection while moving or resizing
- **Grid size**: configurable in File > Preferences (range: 2 – 200 px, default: 20 px)

Panning and zooming

- **Scroll wheel**: zoom in/out centered on the cursor position
- **Middle-click drag** or **Shift+drag** on empty area: pan the canvas
- **Pan tool** (): click to toggle pan mode — drag anywhere to scroll. Press `Escape` to exit pan mode
- **Zoom In / Zoom Out** buttons: step zoom from the toolbar
- **Fit to Screen** (): auto-zoom to show the entire canvas
- **Reset View** (): center canvas at 100% zoom

Widget Library

Open the Widget Library from **View > Widget Library** or the toolbar. It contains 77 pre-built widgets in 5 categories:

Icons (50+ items)

Scalable vector icons for building equipment and systems:

- **HVAC**: Fan, Exhaust Fan, Chiller/AC, Temperature, Ventilation, Pump, Water, Boiler
- **Electrical**: Bolt, Power Plug, Charging Station, Battery/UPS, Solar Panel, Lighting, Power Tower
- **Safety**: Fire, Extinguisher, Security Shield, CCTV, Monitoring, Alarm, Siren
- **Access**: Door Open, Door Closed, Locked, Unlocked, Key, Elevator, Stairs, Building
- **Network**: WiFi, Network, Server, Sensor/IoT, Satellite
- **Status**: Check OK, Error/Fail, Warning, Info, Power Off

Electrical Engineering (EE)

Standard single-line diagram symbols: Transformer, Circuit Breaker, Fuse, Ammeter, Voltmeter, Motor, Generator, Capacitor Bank, Switchgear, Bus Bar, Ground, Lightning Arrester, and more.

Buttons

Interactive UI elements: Push Button, Toggle Switch, Alert Button, Status LED, Alarm Indicator, Flat buttons (Primary, Success, Warning, Danger), Outline buttons, 3D buttons, Pill buttons, Power/Play/Stop icon buttons.

Gauges

Analog-style dial gauges that can display live values via data binding.

Graphs

Embeddable chart widgets that can display trend data from bound data points.

To use a widget: click it in the library panel — it will be placed on the canvas at the center of the current view.

Properties panel

The right-side panel shows properties for the selected object. Toggle it from View > Properties Panel.

Property	Description
X, Y	Position on the canvas (top-left corner)
W, H	Width and height in pixels
Rotation	Rotation angle in degrees
Corner Radius	Rounded corners for rectangles (0 = sharp)
Opacity	Transparency (0 – 100%)

Data binding

Any shape, text, or widget can be bound to a live data point from a connected meter. When the map is in **Preview** or **Runtime** mode, bound objects update automatically.

Binding a data point

1. Select an object on the canvas
2. In the Properties panel, find the **Data Binding** section
3. Choose a meter point using the point picker (supports Modbus and BACnet points)
4. Configure one or more **display actions**

Display actions

Action	Description
Display Value	Show the live numeric/text value on the object. Configure format string and suffix (e.g. “kWh”, “°C”)
Text Color	Change the text color based on value conditions (e.g. red when > 100)
Hide / Show	Toggle object visibility based on value conditions (e.g. show alarm icon when value = 1)

Action	Description
Blink / Flash	Make the object blink when conditions are met. Speed options: slow, normal, fast
Rotate	Animate rotation when conditions are met. Configure speed and direction (clockwise/counter-clockwise)

Each action supports condition rules: compare the live value against thresholds using operators (=, ?, >, <, ? , ?) and apply the effect when the condition is true.

Preview mode

Preview mode shows the map as end users will see it, with live data polling and interactive widgets.

- Enter preview: click on the toolbar, or **View > Preview**, or press `Ctrl+R`
- If there are unsaved changes, a prompt asks to save or discard first
- In preview mode, all toolbar and panels are hidden; only the map is visible
- Data binding actions activate: values update, colors change, objects blink or rotate

Preview shortcuts

Key	Action
`Esc`	Exit preview, return to editor
`E`	Exit preview, return to editor
`Ctrl+R`	Open runtime view in a new tab
`F11`	Toggle fullscreen

Page properties

Access from **File > Page Properties**. Configure:

- **Canvas width** (100 – 10,000 px)
- **Canvas height** (100 – 10,000 px)
- **Background color**
- **Linked template** — overlay a template map behind the current map (useful for floor plan backgrounds)

Preferences

Access from **File > Preferences**. Settings are saved per-browser using localStorage:

- **Default text**: font family, font size, text color
- **Default shape**: fill color, stroke color, stroke width

- **Grid size**: spacing in pixels (2 – 200)
- **Snap to grid**: on/off by default

Keyboard shortcuts reference

Shortcut	Action	Context
`Ctrl+S`	Save map to database	Editor
`Ctrl+Z`	Undo	Editor
`Ctrl+Y`	Redo	Editor
`Ctrl+Shift+Z`	Redo (alternative)	Editor
`Ctrl+A`	Select all objects	Editor
`Ctrl+C`	Copy selected objects	Editor
`Ctrl+X`	Cut selected objects	Editor
`Ctrl+V`	Paste from clipboard	Editor
`Ctrl+G`	Group selected objects	Editor
`Ctrl+U`	Ungroup	Editor
`Ctrl+Shift+G`	Ungroup (alternative)	Editor
`Ctrl+R`	Enter Preview mode	Editor
`Delete` / `Backspace`	Delete selected objects	Editor
`Escape`	Cancel current operation / exit polygon edit / exit pan mode	Editor
`Arrow keys`	Nudge selection by 1 px	Editor
`Shift+Arrow keys`	Nudge selection by 10 px	Editor
`Page Up`	Move object one level up (z-order)	Editor
`Page Down`	Move object one level down (z-order)	Editor
`End`	Bring to front	Editor
`Home`	Send to back	Editor
`Shift+Drag`	Constrain shape / snap line angle (0°/45°/90°)	Drawing
`Enter`	Finish polygon drawing	Polygon tool
`Esc`	Exit preview mode	Preview
`E`	Switch to editor	Preview

Shortcut	Action	Context
`F11`	Toggle fullscreen	Preview
`Scroll wheel`	Zoom in / out	Editor
`Middle-click drag`	Pan the canvas	Editor

Tips and best practices

> **TIP — COPY AND PASTE MARKERS**
>
> When you copy a marker icon (`Ctrl+C`) and paste (`Ctrl+V`), the name auto-increments. For example, *Door1* becomes *Door2*, *Door3*, and so on.

> **TIP — PASTE IMAGES FROM CLIPBOARD**
>
> You can paste images directly from your clipboard (`Ctrl+V`). Screenshot a floor plan, copy it, and paste it directly onto the canvas as a background image.

> **TIP — USE LAYERS FOR COMPLEX MAPS**
>
> Organize your map into layers: put the floor plan image on a bottom layer, equipment icons on a middle layer, and labels/text on the top layer. Lock the background layer to avoid accidentally moving the floor plan.

> **TIP — TEMPLATES FOR CONSISTENT LAYOUTS**
>
> Create a template map with your building floor plan, then link it in **Page Properties**. The template appears as a non-editable background, keeping your layout consistent across multiple maps.

> **TIP — ALIGN OBJECTS PRECISELY**
>
> Select multiple objects, then use **Object > Align** or the align toolbar dropdown to line them up evenly. Use **Distribute** (requires 3+ objects) to space them equally.

> **TIP — QUICK ZOOM NAVIGATION**
>
> Use the scroll wheel to zoom in/out centered on your cursor. Click **Fit to Screen** to see the full map, or **Reset View** to return to 100% zoom.

> **TIP — LINE CONNECTIONS**
>
> When drawing lines, endpoints snap to nearby shapes automatically. This creates visual connections for single-line diagrams. Drag a line endpoint near a shape border to attach it.

TIP — EXPORT AND BACKUP

Regularly export your maps as JSON files (**File > Export as JSON**) for backup. You can import them on another system or restore after accidental changes.

TIP — DRAG POINTS FROM THE TREE

You can drag meter points from the sidebar tree directly onto the canvas to create bound marker icons. This is the fastest way to populate a map with live data points.

Operator Guide

Day-to-day tasks for monitoring energy data and responding to events.

Logging in and navigating

1. Log in with your assigned username and password.
2. Use the sidebar treeview to open modules — each item loads in the main content area.
3. Click folder (caret) items to expand groups; click a leaf item to open that page.

Sites, folders, and group items

The *Sites* menu (under *Home ? Sites* in the sidebar) is the main way to organize facilities and curated point collections for day-to-day monitoring. Changes made in the list view and in the sidebar treeview stay synchronized — adding, renaming, or deleting an item updates both panes without a full page reload.

Hierarchy

Level	Example	What it is
Sites root	*Sites*	Top of the Sites tree. Lists all site entries.
Site	Rojana	A facility or building. Can contain folders and group items directly.
Folder	Folder A	Organizes items inside a site. Can contain subfolders and group items.
Group item	Group Energy, Monthly Report	A named collection of device points/tags shown as a live data table.

Icons and colors

Icons are consistent in the sidebar tree and in the list view:

Item type	Icon	Color	Opens
Site	Building	Default (dark)	Folder list for that site
Folder	Folder	Slate gray	Contents of that folder
Group item	Layer group (stacked layers)	Blue	Live point/tag table for the collection

View modes

Each Sites page has a **List View** dropdown in the header:

- **Icon View** — large cards for quick visual browsing.
- **List View** — compact table with name and description (default for most levels).

- **Edit** — shows reorder handles, edit, and delete controls. Drag rows to change display order.
- **Open Link** — opens the current page in a new browser tab.

Inside a **group item**, the dropdown also offers **Export Live Data**, **Export History**, and **Export Consumption** for spreadsheet export of the collection.

Adding items from the list view

Toolbar buttons depend on the current level. You need **Add** permission on the Sites menu.

Page	Toolbar buttons	Creates
Sites root	Add Site	A new top-level site entry
Inside a site or folder	Add Group Item Collection Add Folder	A group item or subfolder
Inside a group item	Add tag or point	A point or tag row in the live table

Fill in the modal form and click **Add**. The name field is required — empty or whitespace-only names are blocked with an inline hint before save. The modal stays open if validation fails so you can correct the input.

Adding items from the sidebar tree

1. Right-click a Sites node (or use the tree context menu where available).
2. Choose **Add**:
   - On *Sites* root — **Site** or **Folder**.
   - Inside a site folder — **Folder** (subfolder) or **Item** (group item / device collection).
3. Enter the name and optional description in the prompt.

The new node appears in the tree and in the open list view for that parent.

Editing and deleting

- **From Edit view** — click the pencil icon on a row to change name, description, and parent folder. Click the trash icon to delete.
- **From the tree** — right-click ? **Rename** or **Delete**. Rename updates the tree label and refreshes the list view.
- **Inside a group item** — switch to **Edit** to reorder, edit, or remove individual points. Use **Empty (All)** to clear every point in the collection (requires **Remove** permission).

> **WARNING**
>
> Deleting a site, folder, or group item removes it from navigation. Deleting points inside a group item removes them from that collection only — the underlying device registers are not deleted.

Working inside a group item

1. Open a group item from the tree or list (e.g. *Group Energy*).
2. Review live values in the paginated table. Use the header breadcrumb to move back up the hierarchy.
3. Click **Add tag or point** to pick registers from connected devices and add them to the collection.
4. Users with **Add** permission can drag devices from the sidebar tree onto the group item page to add points quickly.
5. Use export modes from the view dropdown when you need Excel output for live data, history, or energy consumption.

Permissions

Sites uses the *Sites* permission entry in *Administration ? Users ? Permission*:

Right	Controls
View	See the Sites menu, tree nodes, and list pages.
Add	Add Site / folder / group item / point buttons; drag-and-drop into a group item.
Edit	Edit view, rename, reorder, and save changes.
Remove	Delete icons, Empty (All), and tree delete.

> **TIP**
>
> If toolbar icons or styles look outdated after an upgrade, hard-refresh with `Ctrl` + `F5`. Hidden toolbar placeholders (search/export) no longer leave empty gaps when those tools are not shown for the current view mode.

Monitoring live data

1. Open *Devices* and select the protocol (Digital Meter, BACnet, Modbus, etc.).
2. Browse loops and meters to locate the device.
3. Review live readings; icons indicate online or offline status.
4. For curated multi-point views organized by facility, use *Sites* and open a **group item** instead (see Sites, folders, and group items above).

Viewing trends and history

1. Open *Trend & History ? General*, select points and a date range.
2. For peak load, open *Demand Chart* under the same menu.

Handling alarms

1. Check the Alarms section for offline devices and pending events.
2. Review alarm history and notify an administrator if action is required.

Generating reports and bills

1. Open *Billing*, select the bill type and reporting period.
2. Generate and export the report. Use *Reports* for Solar Comparison or CPM Monthly Log Sheet.

Using the E-Map

The E-Map shows sites and devices on a floor plan. Click a device icon to jump to its live data view.

Personal settings

1. Open *My Profile* to update account details and password.
2. Open *Preferences* for font, date/time, and interface options.

LINE Messaging

EMS can send alarm notifications to LINE users using rich message templates. This chapter covers setup, quota management, templates, and user registration.

Overview

The LINE Messaging system sends real-time alarm notifications (High Alarm, Low Alarm, Device Offline, etc.) as rich Flex messages to registered LINE users. It supports:

- Multi-site support with site isolation
- Customizable Flex message templates per alarm priority
- Alarm deduplication — only sends on state *change*, never repeats the same status
- Minute batching — first alarm sends immediately, subsequent alarms batch until the next minute
- FREE / PAID mode with daily message quota control

Opening LINE Messaging Setting

1. Open *Administration ? LINE Setting* from the sidebar menu.
2. The page is organized into **4 tabs**: Setting, Quota, Templates, and Users.

Tab 1 — Setting

Core configuration for the LINE bot connection.

Field	Description
Enable	Master toggle — when disabled, no LINE messages are sent regardless of alarm state.
Description	A label for this configuration (e.g. "Factory A alerts"). For your reference only.
LINE BOT	The LINE Official Account ID (e.g. `@145fxlho`). Used to identify the webhook site and fetch registered users. Upload or fetch the QR code image for easy user registration.
Webhook URL	The webhook base URL provided by your LINE Webhook Manager. Use the HTTPS address supplied for your deployment.

> **TIP**
>
> Click **Fetch QR from Webhook** to automatically load the QR code image from the Webhook Manager if it has been uploaded there.

Save & Test Push

- **Save** — persists all settings to the database.

- **Test Push** — sends a test message to all registered LINE users to verify the connection is working.

Tab 2 — Quota

Controls how many LINE messages can be sent per day to stay within the LINE API free tier limits.

Field	Description
Mode	**FREE** — enforces a daily message limit. **PAID** — unlimited messages (no quota check).
Daily Limit	Maximum messages per day in FREE mode. Default: 10. One send to 5 users counts as 5 messages.
Usage	Progress bars showing today's usage and monthly cumulative usage against the limit.

> **NOTE**
> Monthly limit is calculated as daily limit × 30 (e.g. 10/day = 300/month). This matches the LINE free tier allocation of 200–500 messages/month depending on your plan.

How quota is counted

1. When an alarm triggers, the system counts the number of active LINE users.
2. If today's usage plus the number of recipients would exceed the daily limit, the message is **skipped** and noted in the service log.
3. After a successful send, the usage count is updated for the current day.

Reset Today

Click **Reset Today** to clear today's usage count. This deletes all log entries for the current day, restoring the full daily quota. Useful if messages were sent during testing and you want to reset before production hours.

Tab 3 — Templates

Alarm notifications use Flex message templates stored in the database. Each template defines the visual appearance of the LINE notification.

Template cards

Templates are displayed as color-coded cards. Click a card to open the template editor with:

Field	Description
Name	Template display name (e.g. Critical, Warning, Info).
Color	Header background color of the Flex message.
Icon	Emoji icon shown in the template header.
Enabled	Only enabled templates can be selected in the priority mapping.

Field	Description
Flex JSON	The message layout definition. Supports placeholders: `{{site_name}}`, `{{alarm_rows}}`, `{{timestamp}}`, `{{count}}`.

Priority ? Template Mapping

Below the template cards is the priority mapping table. Each alarm priority level (P1–P10) is mapped to a template. When an alarm fires, the system selects the template based on the highest priority among the alarm events.

1. Select a template from the dropdown for each priority level.
2. Click **Save** to persist the mapping.

Tab 4 — Users

Shows all LINE users registered with the bot. Users register by adding the LINE Official Account as a friend and sending a message (e.g. "register").

Column	Description
Display Name	The user's LINE display name with profile picture.
User ID	The LINE internal user ID (starts with `U`).
Status	`active` — receives notifications. `blocked` / `unfollowed` — will not receive messages.
Registered	Date and time the user first interacted with the bot.

Click **Refresh** to reload the user list from the webhook service.

How alarm notifications work

The end-to-end flow from alarm detection to LINE delivery:

1. **Detection** — The EMS polling service detects an alarm condition (value exceeds threshold, device goes offline, binary state changes).
2. **Deduplication** — The alarm is checked against a persistent cache. If the same point already has the same status, it is skipped. Only state *changes* generate notifications.
3. **Batching** — The first alarm in a minute sends immediately. Additional alarms within the same minute are buffered and sent as a batch at the start of the next minute.
4. **Quota check** — In FREE mode, the system checks if the daily limit allows sending to all active users. If not, the message is skipped and logged.
5. **Template selection** — The alarm priority determines which Flex template to use via the priority mapping.
6. **Delivery** — The notification is sent to all active registered users.

Alarm message content

Each notification includes:

Field	Source
Time	Timestamp of the alarm event
Point name	`{Device Name} : {Alias Name}` format. Falls back to model point name if no alias is set.
Value	Current value with unit. Binary points show state text (ON/OFF) instead of 0/1.
Status	Custom alarm message if configured (e.g. "Over Voltage!"), otherwise "High Alarm" / "Low Alarm" / "Normal".

Troubleshooting LINE notifications

Problem	Solution
No messages received	Check Enable toggle is ON. Verify the Webhook URL is reachable. Ask your administrator to review EMS service status under *Administration ? System ? Services*.
Messages stopped after working	In FREE mode, the daily quota may be exhausted. Check the Quota tab. Click **Reset Today** if you were testing during the day.
Same alarm sent repeatedly	This should not happen — the system sends only when alarm status changes. If it does, restart the EMS background service so notification state reloads cleanly.
Test Push works but alarms don't	Alarm delivery uses the background polling service, not the web pages alone. Restart the EMS service from *Administration ? System ? Services* and try again.
Users not showing	Users must add the LINE Official Account as a friend and send at least one message. Click **Refresh** on the Users tab.

Troubleshooting & FAQ

Common issues and recommended resolution steps. Search for keywords such as *permission*, *offline*, or *Malwarebytes*.

Pages load slowly or styles fail to load

Symptoms

- Browser status shows *"Transferring data from …"* for a long time.
- Pages inside the main frame appear blank or load very slowly.
- Warnings that a stylesheet could not load even though the server is running.

Cause: browser security extensions

Extensions such as **Malwarebytes Browser Guard** inspect network requests. On local or intranet EMS addresses, this can delay or block page resources.

> **WARNING**
>
> Do not disable security software permanently. Whitelist your EMS URL instead.

Resolution steps

1. Temporarily disable the suspect extension and reload EMS.
2. Or test in a private window with extensions disabled.
3. Whitelist your EMS site address in the extension.
4. Hard-refresh (`Ctrl` + `F5`) and retry.

Still slow after whitelisting?

1. Check *Administration ? System ? Services*.
2. Review server/database performance with IT.
3. Use the browser developer tools (F12 ? Network) to find requests with long *Waiting* time.

A menu item is missing from the sidebar

Ask an administrator to enable View under *Administration ? Users ? Permission*.

A new site folder or group item does not appear in the tree

1. Confirm you have **Add** on the *Sites* permission.
2. Hard-refresh (`Ctrl` + `F5`) if the list updated but the sidebar did not.

3. Expand the parent site or folder caret in the tree — new items are added under the correct parent.
4. If you added the first child under a new empty folder, expand that folder once; the tree upgrades the node automatically.

Sites Add or Save shows a name validation hint and the modal stays open

The name field cannot be empty or whitespace only. Enter a visible name and click **Add** or **Save Change** again. This applies to sites, folders, group items, and related rename dialogs.

"Authentication failed, please login again"

Your session expired. Log in again. If this repeats, verify your account is active.

A device shows offline or values are not updating

1. Verify device network and configuration under *Devices ? [protocol]*.
2. Check *Administration ? System ? Services*.

License shows "Inactive", "HWID mismatch", or a stop countdown

1. Open *Administration ? System ? Software License* and click **Activate** on the license key row.
2. Confirm the **HW ID** shown in the Activate dialog matches the machine you requested the license for — a token generated for a different machine's HW ID always fails with an HWID mismatch, even if the license key itself is correct.
3. Request or paste a token for the correct HW ID, then **Activate** and restart the service when prompted.

If the countdown reaches zero, the background EMS service stops until the license is fixed and the service is restarted — the web pages themselves keep working, but live device data stops updating. See *Software License* in the Administrator Guide.

"Device limit reached" when adding a new device

The number of enabled devices has reached the quota on the currently active license(s). Disable or remove devices you no longer need, or activate a license with a higher device count, under *Administration ? System ? Software License*.

"No permission to add/edit/remove" when saving

An administrator can grant the missing right under *Administration ? Users ? Permission*. On the Model Editor, **Add** controls the add form (Add, Clear), Import/Export, Upload Image, and the Copy icon; **Edit** controls the Edit icon and Edit Point popup; **Remove** controls the trash icon.

Model Editor — common issues

Add, Clear, Copy, Import, or Export is missing

Your group needs **Add** on the Models permission. Ask an administrator to enable it under *Administration ? Users ? Permission*.

Edit icon or Save in popup is missing

Your group needs **Edit** on the Models permission.

"Input Point Name is empty" or "Input Register number is empty"

Point Name and Register are required before **Add** or **Save Change** will succeed.

Import or Export shows nothing / no popup

1. Hard-refresh the page (`Ctrl` + `F5`).
2. For Import, upload a CSV first — the file name must appear before **Import** will run.
3. Check the browser developer console (F12) for errors.

Edit or Copy popup does not open or only works once

1. Hard-refresh the page (`Ctrl` + `F5`) to reload the page fully.
2. Check the browser developer console (F12) for errors.
3. Ensure browser extensions are not blocking scripts (see the *Pages load slowly* section in Troubleshooting / FAQ).

"No available Point ID" when copying

All Point IDs 1–255 are used in the target model. Remove an unused point or pick another model.

Paste to Add form did not fill fields

Open the Copy popup from a row first (so source data loads), then click **Paste to Add form**. If the add form was edited manually, click **Clear** before pasting again.

Imported points do not appear on devices

After import, accept **reset the system** when prompted, or reset services from *Administration ? System ? Services* so polling reloads the model.

Point ID not in dropdown when adding

All IDs 1–255 may be in use, or the ID is reserved. Remove an unused point or choose another ID.

A report or bill export does not download

1. Allow pop-ups and downloads from the EMS site.

2. Confirm the date range contains data.
3. Wait for large exports to finish.

The page area is blank after clicking a menu item

1. Rule out browser extensions (see above).
2. Refresh (F5), clear cache, or try another browser.

A database update failed

1. Run *Administration ? Database ? Backup* before retrying.
2. Note the exact error and contact support.

Finding this manual again

Open *Administration ? User Manual*. Use the search box to find topics across all chapters. See Version History for release notes and upgrade steps.

Version History

Release notes for EnergyLink360 EMS. The installed application version is shown in the footer of most pages and in *Administration ? System*. After upgrading, run *Administration ? Database ? Update* so the database matches the new version.

> **INSTALLED VERSION**
>
> This site is running **2.7.0**. The background EMS service reports its own version on the System page — both should match after a full upgrade and service restart.

Upgrading

1. Back up the database from *Administration ? Database ? Backup*.
2. Apply the upgrade package provided by your vendor or IT team.
3. Open *Administration ? Database ? Update* and confirm all steps complete successfully — especially after restoring an older database backup.
4. Restart the EMS background service from *Administration ? System ? Services* so polling, alarms, and Logic Studio use the new release.
5. Hard-refresh the browser (`Ctrl` + `F5`) on pages you use frequently.

Release notes

Newest releases appear first. Component versions (e.g. Logic Studio) are listed when they differ from the main EMS version.

v2.7.0 Current

July 2026
Software Module simulators, Real Time Event diagnostics, and database upgrades for restored sites.

EMS Web: 2.7.0 **EMS Service:** 2.7.0 **Logic Studio:** 0.2.8

- Software Module — simulator point types: Fixed, Sine wave, Random analog (range), Random bit (configurable interval), and Other.
- Software Module — edit point Type after create; Decimal places field (0–6, default 2) for analog display.
- Database update — Software Module upgrades for simulator settings run automatically from *Administration ? Database ? Update*.
- Real Time Event — **Diagnostic** category shows service errors (serial port, loop link, Logic Studio runtime, data save failures). Filter by Category ? Diagnostic.
- Logic Studio — opens in **Run** mode by default (v0.2.8).
- Software Device — short save confirmation without countdown progress bar.

- Background service — improved serial fault reporting; compatible with databases restored from older backups after Database Update.

v2.6.88

2026

Modbus RTU trunk and session stability.

- Modbus RTU trunk support for multi-device serial loops.
- Session handling fixes for embedded device pages.

v2.6.87

2026

E-Map Editor, site treeview, and Model Library production connection.

- E-Map Editor documentation and UI colour unification for site device icons and group layers.
- Site treeview sync improvements and map UI updates.
- Model Library connection switched to production server.
- Improved site rename error handling and parent/child validation.

v2.6.86

2026

LINE settings, site management, and database update enhancements.

- Database update — LINE bot ID and QR image settings.
- Refined modal dialogs and site list pagination.
- Site management icon handling updates.

v2.6.54

2026

Model Library integration and meter UI pagination.

- Model Library central — publish, download, and revision snapshots.
- Meter points table pagination and unified modal styling across device pages.

> **OLDER VERSIONS**
>
> Installations restored from backups earlier than 2.6.54 may need a full Database Update and service restart. Contact your EMS administrator or support if errors persist after upgrading.