# Building Management Software

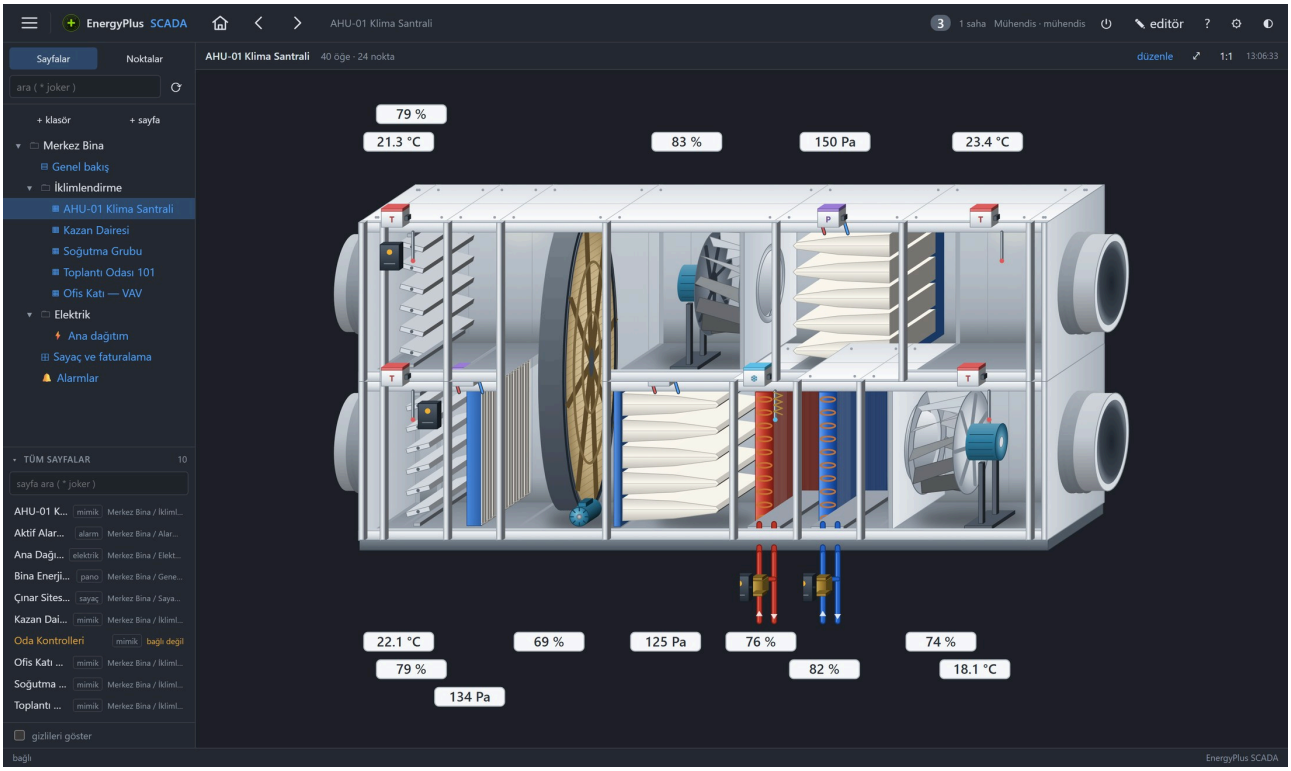
EnergyPlus SCADA · Worker · Tags Editor

EPL-SSUP

Installation Guide · V1.4

17.11.2026

SCADA 1.48.7 · Worker 4.15.2 · Tags Editor 2.23.2



## SAFETY WARNINGS

Read this guide before you start. Follow the installation, licensing and first-setup sections in order. The software can start and stop building systems remotely, so installation and permissions must be handled only by authorised technical staff.

- ⚠ The installers require administrator rights. Obtain the packages only from Energyplus.
- ⚠ Change the default administrator password that SCADA asks for at first sign-in immediately.
- ⚠ Give permission to write commands to site only to users who need it; every command is recorded in the audit trail.
- ⚠ If Worker or SCADA is exposed to the network, use TLS (HTTPS) and keep the Worker API key secret.
- ⚠ Turn on scheduled backups. If you encrypt backups with a password, do not lose it; the backup cannot be opened without it.
- ⚠ Do not set the server clock back; license validation detects a clock that was turned back.

Using the software contrary to the items above may cause unintended plant operation, data loss or unauthorised access. Energyplus Teknoloji accepts no responsibility for such situations caused by the user.

## SYMBOLS

| SYMBOL DESCRIPTIONS | |
|---|---|
| ⚠ | Points that cause problems if skipped |
| ! | Important information |
| ⟳ | In settings: the change takes effect when the service restarts |
| `text` | Value, file path or command to type |

The user interface is in Turkish. This guide gives the Turkish label as it appears on screen, followed by its English meaning, for example **Ayarlar** (Settings).

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# 1. DESCRIPTION

EPL-SSUP is a software suite of two installation packages for monitoring and controlling building technical systems. **EnergyPlus Worker** runs on the site gateway: it reads devices, writes commands and stores history and alarms in the database. **Tags Editor** is installed with Worker and prepares the list of points to read. **EnergyPlus SCADA** is the operator interface; it connects to one or more Workers (sites).

### Typical Installation

**Field Devices**
Modbus TCP / RTU, BACnet/IP and MS/TP, KNXnet/IP, Sedona (SOX), M-Bus, MQTT broker

→

**EnergyPlus Worker**
Site gateway · Windows service
Tags Editor · SQL Server
Local API: 7171

→

**EnergyPlus SCADA**
Central · Windows service
Web: 7180
Browser or desktop shell

Worker and SCADA can also be installed on the same computer. With several sites, install one Worker per site and one SCADA centrally.

## 1.1 Package Contents

| COMPONENTS | |
|---|---|
| EnergyPlus Worker 4.15.2 | Installer `EnergyPlusWorkerMonitor-Setup-4.15.2.0.exe` ; Windows service `EnergyPlusWorkerService` and monitoring interface |
| Tags Editor 2.23.2 | Installed with the Worker package; point list editor |
| SQL Server 2022 Express | Optional in the Worker installer; embedded, no internet needed |
| EnergyPlus SCADA 1.48.7 | Installer `EnergyPlusScada-Setup-1.48.7.0.exe` ; Windows service `EnergyPlusScadaService` and desktop shell |
| License | Machine-bound license file `energyplus.license` ; both products use the same file |
| Built-in Guide | Each product carries its full installation and user guide: **F1** or Help in Worker and Tags Editor, **F1** or the **?** button in the SCADA top bar — opens at the section of the current screen (Turkish) |

## 1.2 Installation Order

1. Install Worker on the site gateway (with SQL Server Express if needed) — Section 3.
2. Install the license — Section 4.
3. Set up the database and protocols in Worker — Section 5.
4. Prepare the point list with Tags Editor — Section 6.
5. Install SCADA centrally and connect the site — Sections 7 and 8.

## 2. SYSTEM REQUIREMENTS

| SOFTWARE | |
|---|---|
| Operating System | Windows 10 / 11 or Windows Server 2016 and later, 64-bit |
| Runtime | .NET embedded in the package; no separate installation |
| SCADA Desktop Shell | Microsoft Edge WebView2 Runtime (installed by the setup from the internet if missing) |
| Client | A current web browser (Edge, Chrome) or the desktop shell |
| Database | Microsoft SQL Server; SQL Server 2022 Express optional with the installer |
| Installation | Administrator rights |

| HARDWARE | | |
|---|---|---|
| **Installation** | **Minimum** | **Recommended (comfortable)** |
| Worker + SQL Express (site gateway, up to ~2,000 points) | 2 cores x64 · 4 GB RAM · 40 GB SSD | 4 cores · 8 GB RAM · 128 GB SSD |
| SCADA server (browser clients separate) | 2 cores · 4 GB RAM · 20 GB free disk | 4 cores · 8 GB RAM · 64 GB SSD |
| Single computer: Worker + SCADA + SQL (small/medium building) | 4 cores · 8 GB RAM · 128 GB SSD | 4–6 cores · 16 GB RAM · 256 GB SSD |
| Large site (10,000–20,000 points) | 8 cores · 16 GB RAM · 256 GB SSD | 8+ cores · 32 GB RAM · 512 GB SSD, SQL Server Standard |
| Panel / operator PC (shell) | 2 cores · 4 GB RAM · 1920×1080 | 4 cores · 8 GB RAM · 1920×1080 or higher, touch |

Network: 100 Mbit Ethernet, static IP on the field network. SQL Server Express limits the database to 10 GB; for long history or more than 5,000 points SQL Server Standard is recommended. Disk: SSD is not mandatory but makes a clear difference for history writes and backups.

> **! WebView2:** the SCADA desktop shell needs the Microsoft Edge WebView2 Runtime. If it is missing, the SCADA installer installs it from the internet. Without internet, install Microsoft's "Evergreen Standalone Installer" manually; meanwhile SCADA can be used in a browser.

### 2.1 Network and Ports

| DEFAULT PORTS | |
|---|---|
| TCP 7180 | SCADA web server (configurable) |
| TCP 7171 | Worker local API — SCADA connects here (configurable) |
| TCP 7443 / 7444 | SCADA / Worker HTTPS (when TLS is on) |
| UDP 47808 | BACnet/IP |
| UDP 1876 | Sedona SOX |
| UDP 3671 | KNXnet/IP (routing, multicast 224.0.23.12) |
| TCP 1433 | SQL Server (fixed by the installer) |
| TCP 1883 / 8883 | MQTT broker (outbound; 8883 with TLS) |

The installers add firewall rules bound to the program (the rule stays valid even if the port setting changes). The SQL Server rule is bound to TCP 1433.

# 3. INSTALLING WORKER

1. Run `EnergyPlusWorkerMonitor-Setup-4.15.2.0.exe` as administrator. The package is unsigned, so Windows SmartScreen may warn: "More info" › "Run anyway".
2. Read the license agreement and select "I accept"; setup cannot continue otherwise.
3. Confirm the folder (default `C:\Program Files\EnergyPlus Worker Monitor`). The installer is available in Turkish and English.
4. Choose the tasks (table below). If there is no SQL Server on site, tick "SQL Server 2022 Express kur".
5. At the end, open it with "Arayuzu simdi baslat" (start the interface now). If SQL was selected, the result window shows server, database and user; the connection is written to the Worker settings automatically.

| INSTALLER TASKS | |
|---|---|
| Windows servisi olarak kur | Install as a Windows service — on by default. Starts automatically and restarts itself after a failure. |
| Worker desktop shortcut | On by default |
| Tags Editor desktop shortcut | Off by default (always in the Start menu) |
| Firewall rules | On by default: BACnet/IP, Sedona SOX and local API |
| SQL Server 2022 Express kur | Install SQL Server Express — off by default. Leave it off if the site already has a SQL Server. |

## 3.1 SQL Server Express

- Instance `SQLEXPRESS`, database `energyplus`, user `sa`, fixed TCP port `1433`.
- If a SQL Server instance already exists, its installation is skipped; the TCP, database and firewall steps still run.
- If SQL cannot be installed, Worker installation still completes. The reason is shown in the result window and in `%TEMP%\energyplus-sql-kurulum.log`.

> ! If you installed SQL Server yourself, enter the connection in Worker as in Section 5.1. Worker creates the database and tables on first connection.

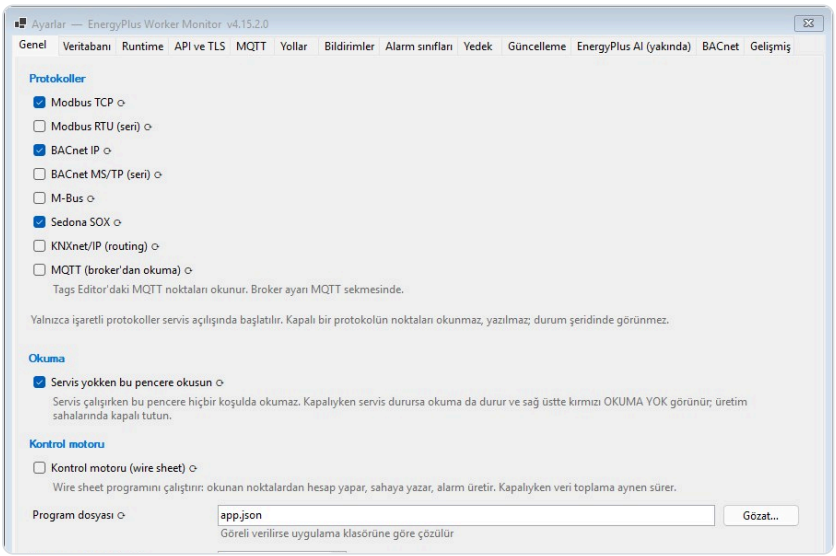



Figure 3.1 – Worker settings window, Genel (General) tab

# 4. LICENSE

The license is bound to the machine. Every computer has a **machine code** ( `Win-XXXX-XXXX-XXXX-XXXX` ) and the license is issued for that code. If Windows is reinstalled the code changes and a new license is needed. Worker and SCADA on the same computer share one license file.

## 4.1 Worker

1. Without a license the Worker interface opens the **Lisans** (License) window. The Start menu item "Makine lisans kodu" (machine license code) also shows the code and copies it to the clipboard.
2. Send the machine code to Energyplus.
3. When the license is ready: with internet use **Sunucudan İndir** (download from server); with a file use **Dosyadan Yükle...** (load from file); as text use **Panodan Yükle** (load from clipboard).
4. After "Lisans kuruldu" (license installed) the application restarts; restart the service too if it is installed.

## 4.2 SCADA

1. Without a license SCADA shows the "SCADA lisansı yok" (no SCADA license) screen and the machine code on every page.
2. Pick the license file with **Dosyadan yükle...** (from file — installs on selection), or use **Panodan yapıştır** (paste) and press **Kur** (install). The page reloads itself.
3. When licensed, remaining days, features and points used per protocol appear in **Ayarlar › Lisans**. A warning starts 30 days before expiry.

| LICENSE FILE | |
|---|---|
| File Name | `energyplus.license` (saved under this name whatever it arrives as) |
| Shared Location | `%ProgramData%\EnergyPlus\security\` |
| Features | modbus, bacnet, mbus, sox, knx, mqtt, scada, wiresheet, guiwiresheet (wire sheet editing from SCADA) |
| On Expiry | Worker stops reading; SCADA does not open until a new license is installed |

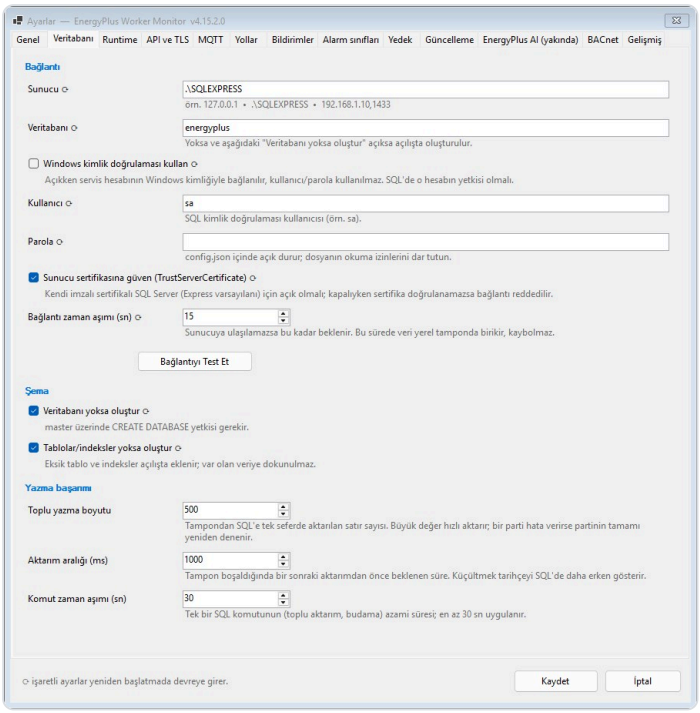
! If a license is rejected, the message gives the reason, for example "başka bir makineye ait" (belongs to another machine), "dijital imzası geçersiz" (invalid signature) or "bu ürün için özellik içermiyor" (no feature for this product). Check the machine code and send it to Energyplus again.

# 5. WORKER FIRST SETUP

Open **Ayarlar** (Settings) in the Worker interface. Fields marked ⟳ take effect when the service restarts; when you press **Kaydet** (Save), Worker offers to restart.

## 5.1 Database (Veritabanı)

- **Sunucu** (server): `.\SQLEXPRESS` for Express on the same machine; `192.168.1.10,1433` for a server on the network
- **Veritabanı** (database): `energyplus`
- Windows authentication, or user name and password
- "Sunucu sertifikasına güven" (trust server certificate) for servers with self-signed certificates
- Verify with **Bağlantıyı Test Et** (test connection) and save




Readings are not lost while the database is unreachable: Worker buffers them on disk and writes them when the connection returns.

## 5.2 Protocols

On the **Genel** (General) tab tick the protocols in use: Modbus TCP, Modbus RTU (serial), BACnet IP, BACnet MS/TP (serial), M-Bus, Sedona SOX, KNXnet/IP (routing), MQTT (read from broker). Protocols not in the license are not read. The BACnet UDP port is on the BACnet tab (default 47808); KNX settings are on the **Gelişmiş** (Advanced) tab.

## 5.3 SCADA Access (Local API)

- On the **API ve TLS** tab, "Anlık değerleri dışarıya aç" (expose live values) must be on (default). Port 7171.
- Authentication mode "Ağdan gelen istekler anahtar ister" (network requests need a key — recommended). Copy the **API key** with **Panoya kopyala**; it is needed when adding the site in SCADA (Section 8).
- **For a SCADA on another computer** tick "Ağdan erişime aç" (open to the network) and save; Worker restarts. When off (default) only a SCADA on the same computer can connect. Turning on HTTPS as well is recommended (Section 9.1).

# 6. TAGS EDITOR — POINT LIST

Tags Editor opens from the Start menu. Each protocol's points are kept in their own file; Worker reads these files at start-up.

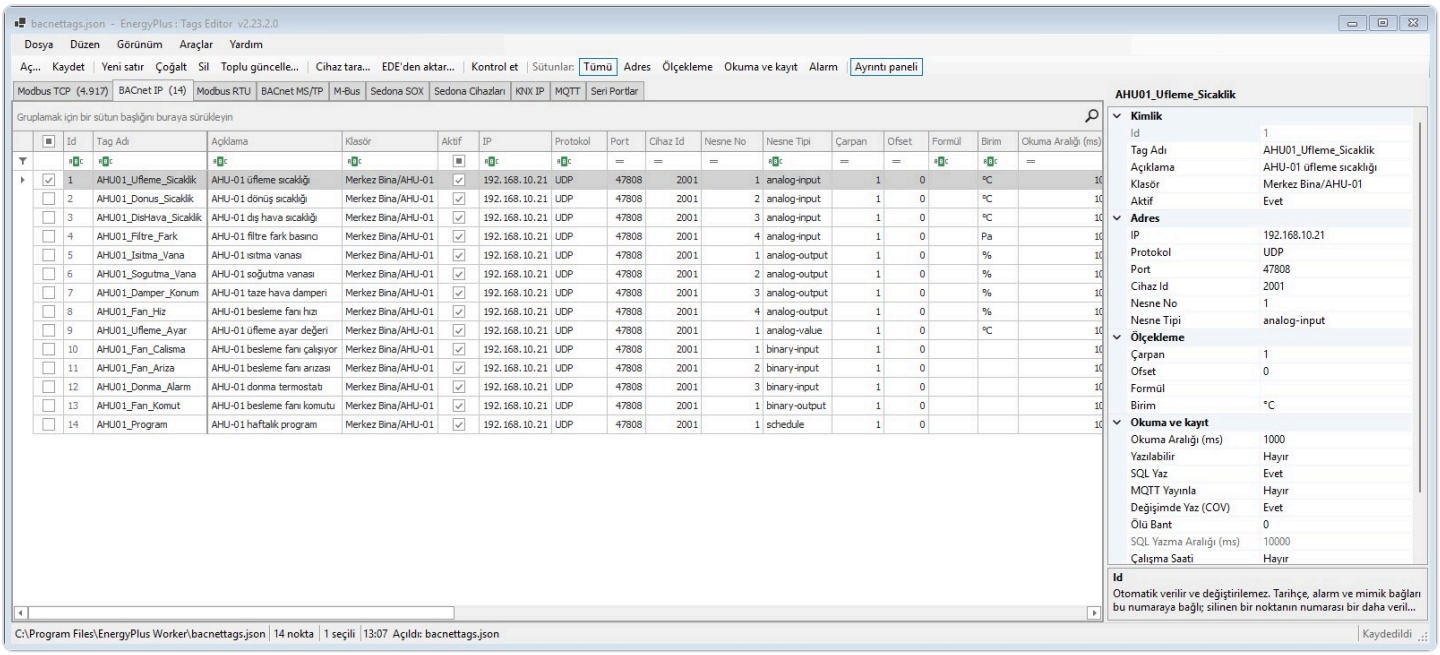



Figure 6.1 – Tags Editor, BACnet IP point grid

1. Pick the protocol from the tabs at the top; the file Worker uses opens automatically. For another file use **Dosya › Aç...** (File › Open).
2. Add points: by hand (**Yeni satır**, new row), from Excel (**Dosya › Excel / CSV'den içe aktar**; **Boş Excel şablonu** gives an empty template) or with the toolbar's **Cihaz tara** (scan), **EDE'den aktar** and **ETS'ten aktar**.
3. Edit settings in the grid or in the **detail panel** on the right: fields are grouped and explained, and alarm fields follow the selected alarm type. The **Sütunlar** (columns) buttons narrow the grid.
4. **Kontrol et** (F7, check) lists empty or duplicate addresses and incomplete alarm settings at the bottom.
5. **Kaydet** (Ctrl+S, save): errors are reported first and a backup of the old file is kept. Restart the Worker service so new points are read.

## PROTOCOL AND FILE

| | |
|---|---|
| Modbus TCP | `modbustags.json` · Cihaz Tara (scan) |
| Bacnet IP | `bacnettags.json` · scan, EDE import |
| Modbus RTU | `modbusrtutags.json` · scan (define Seri Portlar first) |
| Bacnet MS/TP | `bacnetmstptags.json` · scan, EDE import (define Seri Portlar first) |
| M-Bus | `mbustags.json` · scan |
| Sedona SOX | `soxtags.json` · Cihaza Gözat (browse device; define Sedona Cihazları first) |
| Sedona Cihazları | `soxdevices.json` · Cihaz Ara (find devices) |
| KNX IP | `knxtags.json` · ETS import |
| MQTT | `mqtttags.json` · Broker'dan Bul (find on broker: listens to topics and suggests points) |
| Seri Portlar | `serialports.json` · serial lines for RTU and MS/TP |

Tags Editor refuses to save one protocol's rows into another protocol's file.

## 6.1 MQTT

Worker connects to an MQTT broker and uses that one connection for three jobs: reading points from broker topics, publishing other protocols' values to the broker, and optionally accepting write commands from the broker. There is one broker setting: Worker › **Ayarlar** › **MQTT**. The license needs the `mqtt` feature.

### Broker

1. Tick "MQTT açık" (MQTT on); broker address, port (1883 plain, 8883 TLS), TLS if required, user and password.
2. Verify with **Bağlantıyı Test Et** (test connection) and save; Worker restarts.

### Reading from the broker

1. On the **Genel** tab tick **MQTT (broker'dan okuma)**.
2. In Tags Editor select the **MQTT** protocol. **Broker'dan Bul** listens for a while and lists every topic, and every numeric field of JSON messages, as a row; ticked rows are added.
3. To add by hand: **Konu** (topic, e.g. `building/floor1/room101/sensor`) and, for JSON, **JSON Yolu** (path, e.g. `temperature`, `data.p_total`). Plain numbers, true/false and ON/OFF are recognised.
4. For writable points set **Yazma Konusu** (write topic) and optionally **Yazma Bicimi** (format: `{v}` value, `{o}` ON/OFF, e.g. `{"value": {v}}`).
5. With "Zaman Asimi (sn)" (timeout) set, a point goes stale when no message arrives in time.

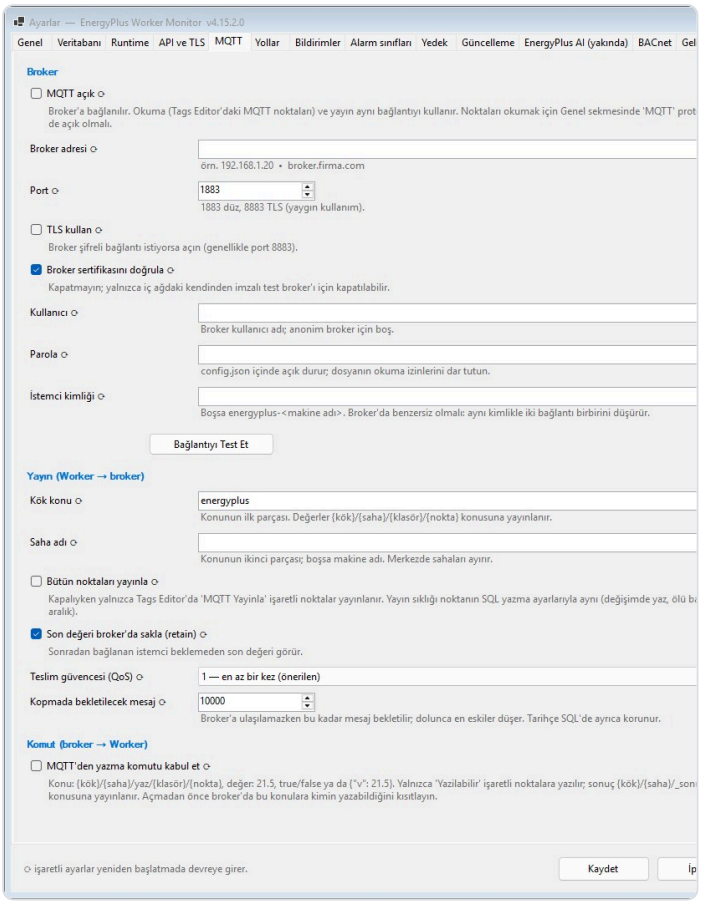



Figure 6.2 – Worker, MQTT tab

### Publishing and commands

| TOPICS | |
|---|---|
| Value | `{root}/{site}/{folder}/{point}` – JSON: `{"v":21.3,"q":"OK","t":…,"u":"°C"}` |
| Command | `{root}/{site}/yaz/{folder}/{point}` – 21.5, true/false or {"v":21.5} |
| Command result | `{root}/{site}/_sonuc` |
| Status | `{root}/{site}/_durum` – cevrimici / cevrimdisi (online/offline; the broker publishes it if Worker drops) |

- Only points ticked **MQTT Yayinla** in Tags Editor are published (or tick "publish all points"). The rate follows the point's SQL logging settings: on change, with dead band, or by interval.
- Accepting commands is **off** by default; even when on, only "Yazilabilir" (writable) points are written. Before turning it on, restrict who can publish to `…/yaz/#` on the broker.
- While the broker is unreachable messages are buffered (10,000 by default); history is kept in SQL separately.

# 7. INSTALLING SCADA

1. Run `EnergyPlusScada-Setup-1.48.7.0.exe` as administrator (default folder `C:\Program Files\EnergyPlus SCADA`) and accept the license agreement.
2. Choose the tasks: Windows service (on), desktop shortcut (on), firewall rule (on), and for panel PCs "Windows acilisinda kabugu baslat" (start the shell at Windows start-up — off).
3. The installer updates the symbol library, installs WebView2 if needed and starts the service. Open the shell with "SCADA'yi simdi baslat".

| AFTER INSTALLATION | |
|---|---|
| Service | `EnergyPlusScadaService` — starts automatically, restarts after a failure |
| Address | `http://127.0.0.1:7180/` — also opens in a browser on the same machine |
| Settings and Pages | `%ProgramData%\EnergyPlus SCADA\` |
| On Update | Pages, users and your own symbols are kept; the product library is refreshed |

## 7.1 First Sign-in

1. Sign in with user name `admin` and password `admin`.
2. In the "Parola değiştirin" (change password) window type the new password twice (at least 4 characters, different from the old one). No screen opens until the password is changed.
3. Create operator and engineer accounts in **Ayarlar › Kullanıcılar** (users) and decide who sees and writes which page in **Ayarlar › Sayfa yetkileri** (page permissions).

| ROLES | |
|---|---|
| Operatör (Operator) | Views pages, acknowledges alarms; writes commands on pages where permitted |
| Mühendis (Engineer) | As Operator, plus edits pages, point groups, weekly schedules, equipment info and maintenance records |
| Yönetici (Administrator) | As Engineer, plus manages users, page permissions and settings |

## 7.2 Access from Other Computers

By default SCADA is reachable only from its own machine. For network PCs and tablets set **Ayarlar › API ve TLS ›** "dinlenen adres" (listen address) to `http://+:7180/`, and restart the service. No extra permission is needed as SCADA runs as a service, and setup adds the firewall rule; the server's own shell stays connected. Client address: `http://<server-ip>:7180/`

**Access from the internet:** before exposing SCADA, enable HTTPS (Section 9.1) and change the `admin` password. Failed sign-in attempts are throttled automatically. If SCADA sits behind a reverse proxy, enter the proxy's IP in **Ayarlar › API ve TLS ›** "güvenilir vekil adresleri" (trusted proxy addresses); the audit trail then shows the real client address.

**Kiosk:** in **Ayarlar › Kabuk** (shell) kiosk mode opens the shell borderless and full screen; exit with `Ctrl+Shift+X`.

## 8. CONNECTING SCADA TO A SITE

1. In SCADA open **Ayarlar › Sahalar** (sites) › **+ saha ekle** (add site).
2. Fill in the fields (table below). Get the API key from Worker › **Ayarlar › API ve TLS › Panoya kopyala**.
3. Press **Sına** (test). Once connected (over HTTPS) the certificate fingerprint is filled in automatically.
4. Save. The site's points appear in SCADA; add graphics and dashboards from the page tree.

| SITE FIELDS | |
|---|---|
| anahtar (key) | Prefix of point IDs. Do NOT change it later; page bindings depend on it. |
| görünen ad (display name) | Name of the site in the interface |
| Worker adresi (address) | `http://192.168.1.10:7171` or with TLS `https://…:7444` |
| API anahtarı (API key) | Required if Worker is not on the same machine; never shown again once saved |
| sertifika parmak izi | Certificate fingerprint — https addresses only; the value from Worker › API ve TLS |
| yoklama (ms) | Polling interval — default 500, minimum 250 |

⚠ "Worker kimlik doğrulama istiyor — API anahtarını girin." (Worker requires authentication — enter the API key) means the key is missing, wrong or renewed. If **Yeni anahtar üret** (generate new key) is pressed in Worker, the key must be re-entered in every SCADA.

## 9. SECURITY, BACKUP AND UPDATES

### 9.1 TLS (HTTPS)

1. Worker: **Ayarlar › API ve TLS › Sertifika üret** (generate certificate — self-signed, valid 10 years), or for a corporate CA **.pfx yükle…** / **CSR üret…**. Tick "HTTPS dinleyicisini aç" (enable HTTPS listener, port 7444). These operations run while the Worker service is running.
2. In SCADA change the site address to `https://…:7444` ; **Sına** picks up the fingerprint.
3. For SCADA itself: **Ayarlar › API ve TLS › Sertifika üret**, "HTTPS açık"; install the file from **Sertifikayı indir (.cer)** on clients under "Trusted Root Certification Authorities".
4. Only AFTER every connection uses https, tick "Düz HTTP'yi kapat" (disable plain HTTP).
5. Default HTTPS ports are 7443 for SCADA and 7444 for Worker, so they do not clash on one machine. If an older Worker installation is still on 7443, change one of them.

### 9.2 Backup

- **Worker** › **Ayarlar › Yedek**: scheduled backup, frequency (daily, weekly, monthly), time and number of backups kept. "Yedeği parolayla şifrele" uses AES-256. **Yedeği şimdi al** (back up now), **Yedekten geri yükle...** (restore).
- **SCADA** › **Ayarlar › Yedek**: scheduled backup (default 03:00, 30 kept), database backup, "Worker yedeğini de tetikle" (also trigger Worker backup), encryption. **Yedeği indir** (download), **Zip'ten geri yükle** (restore from zip — replaces, does not merge).

### 9.3 Updates

In Worker › **Ayarlar › Güncelleme** and SCADA › **Ayarlar › Güncelleme** press **Güncelleme var mı?** (check for updates). Updates never install on their own: they ask first, verify the file with SHA-256, stop the service for a few minutes and reopen the interface at the end. Settings, pages and the license are kept.

## 10. TROUBLESHOOTING

| MESSAGE AND SOLUTION | |
|---|---|
| Veritabanı bağlantı dizesi BOŞ | Database connection string empty — enter the server in Worker › Ayarlar › Veritabanı (with SQL Express: `<machine>\SQLEXPRESS`, `sa`). Readings are buffered meanwhile. |
| Port kullanımda | Port in use — another application uses 7171 or 7180; change the port on the API ve TLS tab. |
| Servis işlemleri için yönetici yetkisi gerekiyor | Run the Worker interface as administrator. |
| WebView2 çalışma zamanı bulunamadı | If setup ran without internet, install WebView2 manually (Section 2); meanwhile open SCADA in a browser. |
| [MQTT] ... bağlanılamadı | Cannot connect to broker — check address, port, TLS and user/password with Bağlantıyı Test Et on the MQTT tab. |
| Bu makine için sunucuda lisans bulunamadı | No license on the server for this machine — send the machine code to Energyplus and download again when ready. |
| Sistem saati geri alınmış | System clock set back — correct the server time; license validation rejects a clock turned back. |
| New points are not read | Restart the Worker service after saving in Tags Editor. |

| LOG FILES | |
|---|---|
| Worker | `<install>\Logs\worker-YYYY-MM-DD.log` · Start › Log klasoru (14 days) |
| SQL installation | `%TEMP%\energyplus-sql-kurulum.log` |
| SCADA update | `%ProgramData%\EnergyPlus SCADA\guncelleme\` |
| Setup wizard | `%TEMP%\Setup Log *.txt` |

# 11. EQUIPMENT INFO AND REPORT

Enter nameplate values for equipment such as fans, pumps and air handling units; SCADA combines them with run hours to produce an estimated energy, lifetime and maintenance report. Equipment info is attached to a folder in the page tree; it is part of the base package and needs no separate licence.

## 11.1 Defining Equipment

1. Prerequisite: the equipment's run (on/off) point must have **RunHours** ticked in Tags Editor; Worker counts run hours from then on.
2. In editor mode, right-click a symbol on the graphics page › **Ekipman bilgisi ekle...** (Add equipment info), or right-click a folder in the tree › **Ekipman bilgisi...** (Equipment info). A folder with the given name is created under the page, hidden from the menu.
3. In the card enter type, run point, motor power, efficiency and average load; optionally a speed, power or energy meter point, design life, maintenance items and working hours; then **Kaydet** (Save).
4. For an AHU, define fans and the heat recovery unit as separate equipment under a folder of type "Klima santrali" (AHU); the AHU row shows their total. Sub-equipment uses the AHU's working hours.

| CALCULATION LEVELS | |
|---|---|
| A — metered | Measured value when an energy meter or power point is set; the nameplate estimate is kept for comparison |
| B — speed point | Hour-by-hour affinity laws from the VFD speed/frequency point (about ±10–15%) |
| C — nameplate | Run hours × motor power × average load ÷ efficiency (about ±20–30%) |

## 11.2 Report, Dashboard and E-mail

- **Yeni sayfa › Ekipman raporu** (New page › Equipment report): equipment under the folder; period selection, **Excel**, **Yazdır / PDF** (Print / PDF). The **Tarife...** (Tariff) window holds the electricity price, $CO_2$ factor and maintenance alarm settings.
- Dashboard cards: equipment energy, maintenance list, top consumers, equipment status.
- Ayarlar › E-posta (Settings › E-mail) › rule type **Ekipman raporu**: daily, weekly or monthly; summary in the body, Excel attached. **Şimdi gönder (deneme)** (Send now, test) tries it without saving.
- **Bakım yapıldı** (Maintenance done; engineer and administrator): resets the item's counter and is written to the audit trail; the overdue maintenance alarm closes by itself.

> ⚠ The report warning "noktada çalışma saati sayacı yok" (no run-hour counter on the point) means RunHours is not enabled on the run point. Figures are estimates; every row shows its method and level.

## 12. UNINSTALLING

Remove the programs from Windows "Apps" or with the uninstall shortcut in the Start menu. The services and firewall rules are removed.

| KEPT ON UNINSTALL | |
|---|---|
| Worker | `config.json`, `%ProgramData%\EnergyPlus Worker Monitor\` (backups), SQL Server and the database |
| SCADA | Pages and settings (`%ProgramData%\EnergyPlus SCADA\`), your own symbols |
| License | `%ProgramData%\EnergyPlus\security\` — not asked for again on reinstall |

SQL Server Express is installed as a separate Microsoft product and is not removed with Worker.

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