Electrical Pack

The Electrical Pack: utility protocols, an electrical template and live single line diagrams for power systems on FrameworX.

What the Electrical Pack is

The Electrical Pack puts a ready power system toolkit on any FrameworX license. It adds IEC 61850, IEC 60870-5-101 and 104, and DNP3 connectivity, an electrical template with breakers, disconnectors, transformers and generators, and single line diagrams that energize live through a built in power flow engine. Operators switch with select before operate and interlocks. Every FrameworX module remains included.

Who it is for

- **Substations and utilities**: transmission and distribution substations, bus transfer, tap changers, protection status.
- **Solar and generation plants**: collector substations, inverter blocks, reactive power control.
- **Data centers**: 2N power distribution, utility and generator transfer, UPS and critical buses.
- **Mining and heavy industry**: main substations, motor feeders, motor control centers, emergency generation.

What the Electrical Pack contains

Content	What you get	Page
Electrical Template	A ready solution with layouts, menu, header, alarm bar, security, alarms, historian, 144 symbols, equipment models, operator dialogs and four demo diagrams with simulators	Electrical Template
Single line diagrams and power flow	Draw the network with electrical symbols and the Connector tool. At runtime the power flow engine energizes it from its sources and colors every line by voltage level	Single Line Diagrams and Power Flow
IEC 61850 Client	Connection to IEC 61850 IEDs	IEC 61850 Client
IEC 60870-5-101 and 104	Master and slave connectors, serial (101) and TCP/IP (104)	IEC 60870-5-101 and 104
DNP3	Master and slave server connectors	DNP3

Requirements

Requirement	Value
License	A FrameworX license that includes the Electrical Pack. The Electrical Pack works with any edition.
Solution platform	Windows (.NET 4.8) solutions. The Electrical Template is offered in New Solution when the Windows platform is selected.
Display clients	Rich Client and Smart Client. HTML5 clients show the single line diagrams; the equipment dialog and the interlock diagram open in the Rich Client and Smart Client.

Licensing

The Electrical Pack is enabled by the license. There is nothing to activate inside the solution: the license that runs FrameworX on a computer enables the Electrical Pack on that computer. Solution Center shows the Electrical Pack on the License page among the licensed options.

Without the Electrical Pack in the license

- The New Solution list does not offer the Electrical Template.
- The power flow engine does not run: a single line diagram opens with its symbols in their design colors and shows no energization.
- The solution stays fully editable. Displays, tags, UserTypes and scripts open and change in the Designer as usual, and alarms, historian, dialogs and simulators run as regular solution content.

How the runtime decides

When a display opens, the runtime starts the power flow engine for that display when both conditions are true:

1. The license includes the Electrical Pack.
2. The display contains electrical symbols connected to each other.

See Single Line Diagrams and Power Flow for what the engine does in each cycle.

How it works in four steps

1. **Create** a solution from the Electrical Template.
2. **Model** the equipment: one tag per breaker, transformer or generator, typed with the matching UserType.
3. **Draw** the single line diagram with the electrical symbols and the Connector tool, and bind each symbol to its tag.
4. **Run**: the diagram energizes, and the operator controls the equipment from its dialog.

Start with Electrical Template.

In this section...

- DNP3
- Electrical Template
- IEC 60870-5-101 and 104
- IEC 61850 Client
- Single Line Diagrams and Power Flow