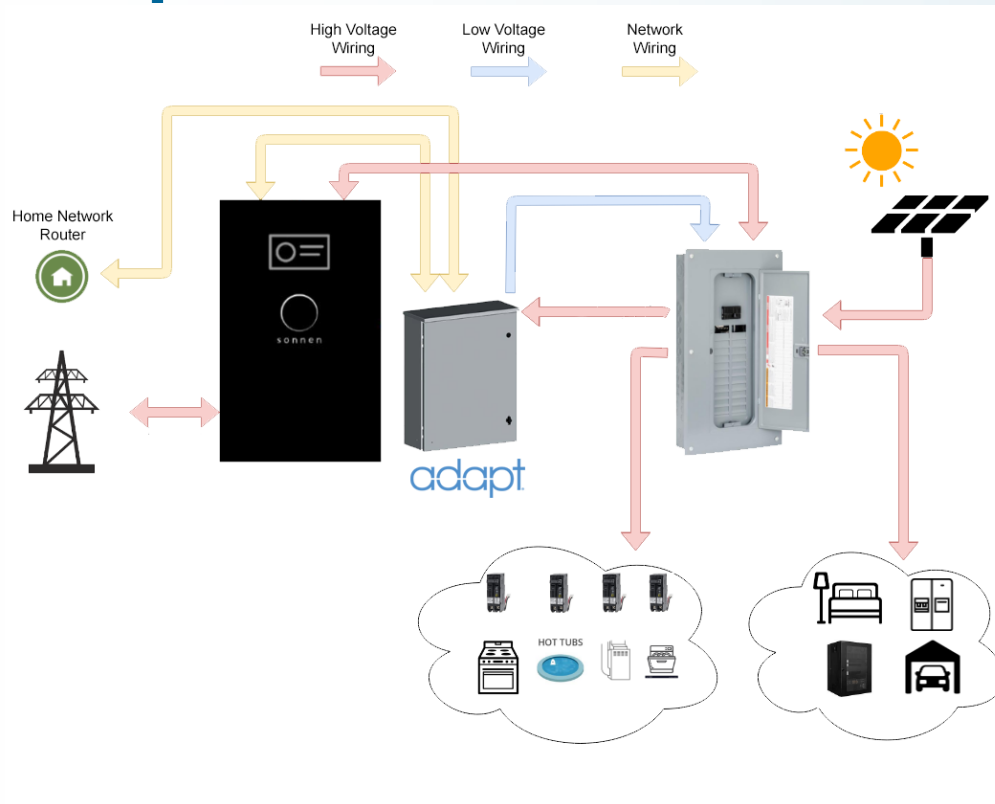# adapt Energy Automation (EA)

What is Energy Automation

Energy Automation is the convergence of home automation, intelligent energy storage, controllable breakers and solar technologies working seamlessly together. The operation of a smart home can be significantly enhanced when energy management is incorporated into the solution. While traditional home automation systems focus on providing comfort to the home owner by tailoring the system to their specific wants and needs, energy automation takes that experience to another level. By managing energy functions within the home, energy automation not only ensures that the home is powered in the cleanest most efficient way possible, but also ensures the homeowner is protected, even during an outage, with little or no interaction from the homeowner or disruption to their daily lifestyle.

For the first time, we have an intelligent energy storage system - the sonnen ecoLinx - that allows ADAPT to gather information about the home's energy usage and storage, weather data, solar production data and much more. With this data, ADAPT is able to make smart energy decisions for the homeowner throughout the day and night, including during a power outage, relative to other systems in the home.

Power Protection

Another benefit of adding sonnen ecoLinx to the home is the watchful eye on grid power. It's truly one of the best "insurance policies" for the hundreds of thousands of dollars our clients spend on technology in their homes. No longer will they have to deal with brown outs that often cause major problems for electronics. If the grid becomes unstable, devices remain in their "happy state," receiving clean power from the sonnen ecoLinx battery.

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What's in an Energy Automation System?

The ultimate smart home is driven by energy automation. To reap the benefits of energy automation, it is important that the sonnen ecoLinx "energy ecosystem" includes a combination of home automation and renewable energy devices, such as:

- sonnen ecoLinx: This is the energy storage system that provides storage, grid and solar information to the ADAPT EA Package.
- ADAPT EA Package: The hardware and software that manages energy by controlling breakers and connecting to leading home automation systems.
- Renewable Energy Source (solar): Alternative source of energy that not only charges the ecoLinx, but also off-sets use of the utility grid during the day by using solar energy to power loads in the home, even during an outage.
- Lighting Control: Manages lights accordingly during the day/night to maximize energy while also providing lighting during power-related and grid outage events.
- Shade Control: Manages shade scenes to enhance the atmosphere and lower internal heat in the home.
- Climate Control: Manages set points of HVAC systems relative to grid loss or other events.
- Controllable Breakers: Provide the ability to dynamically change what is powered by the ecoLinx battery.
- AV Systems: Speakers, televisions and media all tied together.

Use Cases for Energy Automation

Smart Configurable Backup

Systems with controllable breakers, a sonnen ecoLinx battery and an ADAPT EA Package can benefit from the smart configurable backup functionality. The image on page 1 details a main panel installation that allows for dynamic smart configurable backup strategies with controllable breakers. This allows the system to not only focus on managing excess energy production over what is consumed, but further tailors energy consumption based on need and priority defined by the homeowner.   In the event of a power outage, the system will provide backup power to specific circuits based on pre-defined rules in the ADAPT EA Package. An example scenario is as follows:

A power outage occurs and the sonnen ecoLinx begins providing backup power to the main panel (which is also powering the home network equipment). First, the user is notified by ADAPT that the sonnen ecoLinx is providing backup power to the home and is then presented with options on what they want to power with the sonnen ecoLinx battery. If no option is selected, the system can be configured to default to a pre-defined mode of operation.

The ADAPT EA Package then sends the selected profile to the controllable breakers, which then actuate the selected circuits to an "on" or "off" position based on the user's selection or pre-defined mode of operation.

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Use Cases for Energy Automation – cont.

Smart Weather Forecasting

This sonnen ecoLinx feature makes use of weather forecast information from the ADAPT EA Package to dynamically modify the battery's backup reserve setting. For example, if the ADAPT EA Package detects a severe thunderstorm warning in the user's area, the system will automatically increase the sonnen ecoLinx's energy reserve to 100% to prepare the user for the incoming storm and potential loss of grid power.

This further enhances the level of system flexibility by reserving the battery capacity for backup power when it is needed most. Furthermore, the ADAPT EA Package will notify other Home Automation systems — like lighting, shades, thermostats and other devices — which can be adjusted to support the needs of the home.

Smart Demand Control and Load Management

The ADAPT EA Package optimizes the use of available clean energy when it is abundant and less expensive (ie; during low tariff or off-peak times) and maximizes the use of clean energy when it is less abundant and grid energy is more expensive (ie; during peak periods). By working together, the ADAPT EA Package and sonnen ecoLinx systems decrease load usage and discharge the battery when appropriate to fully manage and maximize energy usage in the home.

For example, during a time-of-use (TOU) window, the ecoLinx and ADAPT EA Package can make adjustments in the home to drastically reduce energy usage, without disruption to the homeowner. First, the ecoLinx system could effectively "flood the peak period" by using clean, stored energy to power the home rather than relying on the grid. Secondly, load shedding commands could be deployed to maximize and extend the ecoLinx's stored energy. As an example, lowering the shades, dimming the lights, increasing the thermostat and turning off non-essential loads could decrease energy consumption by 2,000 W - for a 10kWh sonnen ecoLinx system, that's an additional 2 hours worth of energy!

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ADAPT EA Package ($7,000.00 USD)

- ADAPT EA Processor

- UPS for devices in enclosure only

- Network switch for battery and processor only

- EA enclosure 14 3/8" X 23 1/2"

- System Requirements Document, Help File, Drawings

- 4 hours offsite support

- Ground shipping (U.S. and surrounding)

Features

- Control of up to 16 relay-controlled breakers

- Smart Weather Forecasting & Backup

- Smart Configurable Backup (for up to 16 relay-controlled breakers)

- Easy web utility setup

- Information and control from iPhone or android phone app

- Built-in UPS to sustain initial power loss (EA equipment only)

- Built-in ethernet switch to connect to existing network (ecoLinx and EA processor only)

Not Included — anything not specified above

- sonnen ecoLinx battery

- Relay-controlled breakers

- Required wiring outside of EA enclosure

- On-site support

- Taxes

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Estimations

While the numbers below reflect averages and typical scenarios based on many years of experience with Home Automation Systems, they should not be used to price a Home Automation or Energy Automation System. These numbers are relative to the average size of a home being 2,600 sq ft, based on the Federal Census Bureau as of 2018. Design, engineering, installation and software are not included in the below estimates. To achieve accurate pricing, each system needs to be individually designed and engineered based on the unique needs of the home.

Assumptions

- 2,600 sq ft home

- (1) ecoLinx 20

- 8kW solar system

- 2,000 watts of battery consumption

- 10 hours of battery life during grid outage

Estimates (based on 2,600 sq ft and USD):

- Climate Control System - 2 Thermostats ($500 each) - ($1,000)

- Lighting Control System - 40 Dimmed/Switched Loads ($200 each) - ($8,000.00)

- Shade Control System - 15 Single–Shade Windows ($1000 each) - ($15,000.00)

- Breaker Control - 16 Relay-Controlled Breakers ($100 each) - ($1,600.00)

- Solar System - 8kW Solar System (excluding tax credits) - ($31,000.00)

- ADAPT Energy Automation Package - Required for integration - ($7,000.00)

- Battery Storage - sonnen ecoLinx 20 (excluding tax credits) - (38,500.00)

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FAQ

What is needed for the most basic Energy Automation System?

A sonnen ecoLinx battery and the ADAPT EA Package with controllable breakers.

What does a basic Energy Automation system do?

Smart Weather Forecasting & Smart Configurable Backup along with the standard ecoLinx features.

How many ADAPT EA Packages are needed per project?

You will need (1) ADAPT EA Package for each ecoLinx unit.

Does an Energy Automation System require solar?

No, the ecoLinx system can charge from the grid when energy is more abundant and "clean" during off-peak times and re-deploy it during peak periods. All energy automation functionality and applications are still possible (smart weather forecasting, smart configurable backup, smart demand control and load management).

Where do I get the ADAPT EA Package?

You will purchase the ADAPT EA Package from PanTech Design.

Which controllable breakers do I need?

The breakers required are manufactured by Schneider Electric. They are SquareD breakers in the QOPLILC line. NOTE: PLILC is a very important part of the product description, as it designates the breaker as part of the Power Link series and can be controlled with a relay.

Example Part Number: (single-pole 15 amp controllable breaker) QO115PLILC

Click here for QO115PLILC

Where do I buy the controllable breakers?

The controllable breakers can be purchased from PanTech Design or a stocking distributor. PanTech Design will sell the single-pole breakers for $60.00 USD and the double-pole breakers for $80.00 USD. This price does not include shipping or tax.

Which breaker panel do I need for the QOPL Series Breakers?

Any QO Series load center from Schneider Electric can support the QOPL Series breakers. Please note that the QOPL Series breakers are not compatible with the Schneider Electric HomeLine series load centers.

Click here for QO Series Load Centers

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FAQ

Does ecoLinx "talk" directly to home automation systems?

No, an ADAPT EA Package is required to connect the sonnen ecoLinx to other home automation systems

How do I know which loads require controllable breakers?

Controllable breakers are not needed for every load. In fact, they are only needed for loads that need to be dynamically turned ON or OFF during a grid outage. There are three types of loads:

Massive Loads: should always be OFF in an outage situation ie; water heater, hot tub, etc. These may not need controllable breakers at all depending on the design. Any load over 7,000 watts must be treated as a massive load.

Critical Loads: should always remain ON in an outage no matter the circumstances ie; fridge, network, router, ADAPT EA Package, etc. These do not need controllable breakers but in some cases may require it.

Dynamic (optional) Loads: loads the customer may wish to "pick and choose" to stay ON depending on the outage situation ie; Smart Configurable Backup. These are loads that should be focused on when specifying the load center for the "worst case scenario" to ensure that the ecoLinx can support both the Critical and Dynamic loads when they are all on.

How do I know what size breakers I need?

These will be sized just like you always have done and will be based on an electrical design done by an electrician in conjunction with sonnen (which could depend on your location).

How do I eliminate the Protected Loads Panel (PLP)?

By placing controllable breakers in the main panel that will turn ON and dynamically manage loads in the event of an outage. In this instance, any load that will need to be turned ON in an outage (including critical loads) will require a controllable breaker.

Does the sonnen ecoLinx directly control the breakers?

No, an ADAPT Energy Automation Package is required in order to control the breakers.

What are my next steps?

For more information, and to help us better assist you with next steps, please complete the Energy Automation Inquiry Form.