

Energi Savr Node System Wireless Networks

In order to program an Energi Savr Node (ESN) system with an iOS device (Apple iPod Touch, iPad or iPhone), the installer will need a Wi-Fi network. Below you will find information on the limiting factors of the network components in a wireless network. On this page and the next page, you will find some typical configurations that may be needed in order to have Wi-Fi coverage for your entire ESN system. Pages 3 and 4 cover technical and procedural considerations for placing Ethernet-capable ESN devices on an existing network.

Maximum Ethernet Length and Wi-Fi Ranges

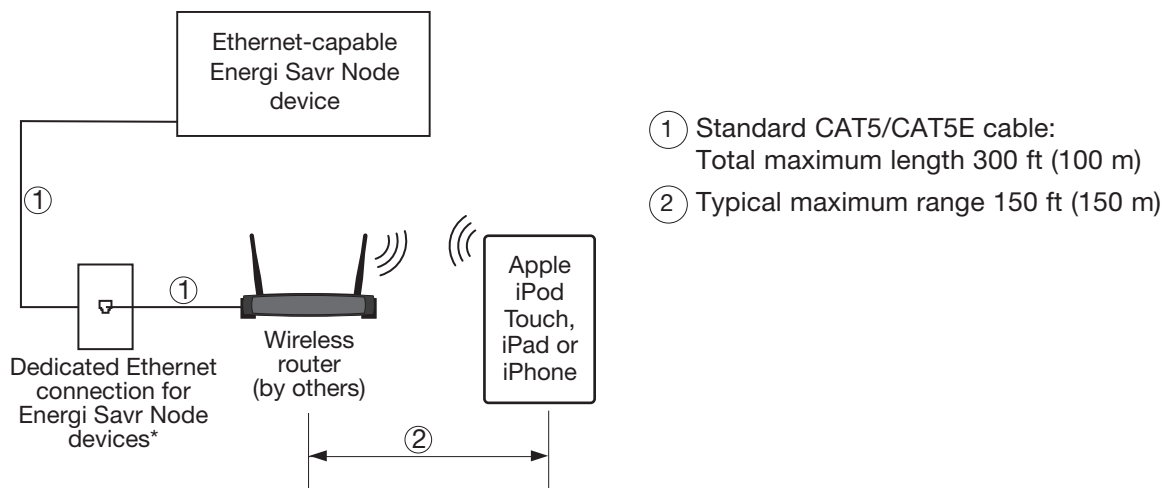
To cover large areas with Wi-Fi coverage, the installer must take into account the capabilities of the devices that make up a network. Ethernet connections cannot exceed certain lengths and the installer will need Wi-Fi coverage to be able to move freely with their iOS device (Apple iPod Touch, iPad or iPhone).

The maximum distance between any two wired Ethernet devices is 300 ft (100 m). Ethernet devices include switches, routers and Ethernet-capable ESN devices (QSN-2ECO-S, QSN-1ECO-S, QSNE-2ECO-D, QSNE-2DAL-D, QSE-CI-AP-D). To connect distant Ethernet-capable ESN devices, place an Ethernet switch every 300 ft (100 m) or less. It is important to note that a Dedicated Ethernet Connection, as seen below in the Typical Layouts, does not count as an Ethernet device. Therefore, the total wire length on both sides of the Dedicated Ethernet Connection together cannot exceed 300 ft (100 m).

The wireless range of a Wi-Fi device is affected by many factors. Wireless routers and iOS devices (Apple iPod Touch, iPad or iPhone) are Wi-Fi devices. There are no standard maximum distances for Wi-Fi devices. Typical distances indoors are around 150 ft (50 m). Lutron recommends placing a Dedicated Ethernet Connection every 100 ft (33 m) or less. The wireless router can then be moved around the space and plugged in at any one of these jacks in order to achieve Wi-Fi coverage.

Typical Layouts

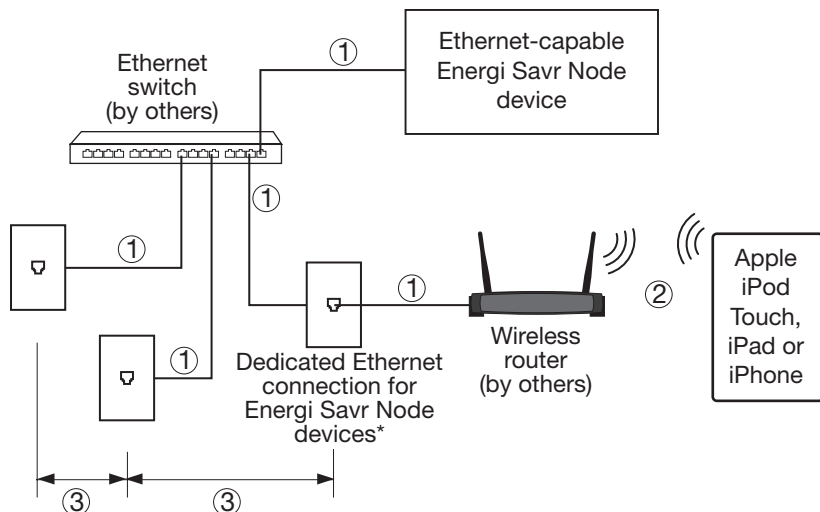
Example 1: Small Area that can be Covered by a Wireless Router in a Single Location



* Energi Savr Node units are not designed to connect to an open network. Connection to an open network could result in reduced performance and Ethernet connectivity issues.

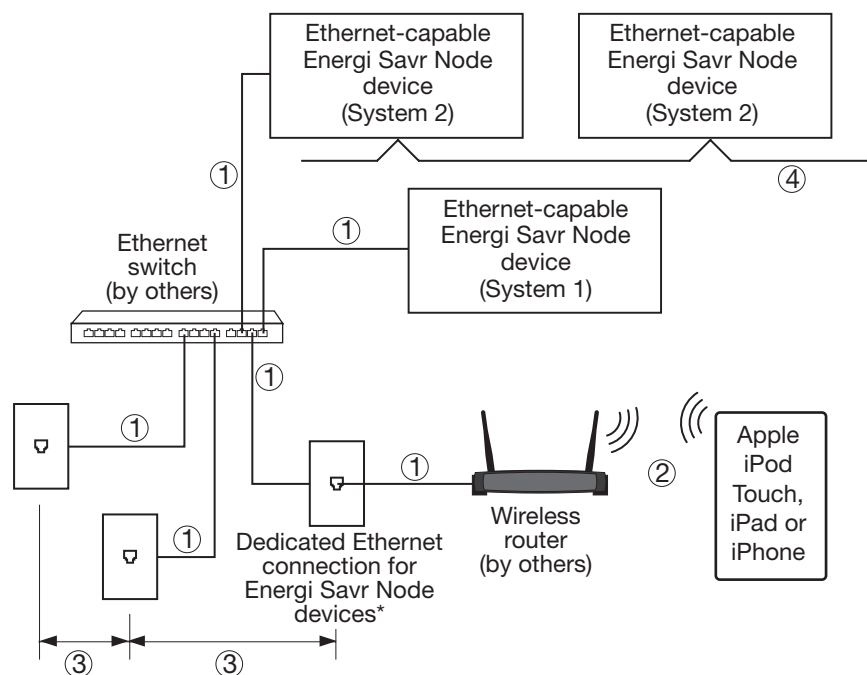
Example 2: Large Area Requiring a Router

The router may need to be moved about in order to program each device.



- ① Standard CAT5/CAT5E cable:
Total maximum length 300 ft (100 m)
- ② Typical maximum range 150 ft (150 m)
- ③ Recommended minimum distance
100 ft (33 m)

Example 3: Large or Small Area with Separate ESN Systems not Connected by the QS Link



- ① Standard CAT5/CAT5E cable:
Total maximum length 300 ft (100 m)
- ② Typical maximum range 150 ft (150 m)
- ③ Recommended minimum distance
100 ft (33 m)
- ④ Lutron cable:
GRX-CBL-346S for distances less than
500 ft (153 m)
GRX-CBL-46L for distances from
500 ft (153 m) to
2000 ft (610 m)

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Layout Tips

- To increase the range of the wireless router, do not set it directly on the floor or a metal surface. These surfaces will cause interference and will greatly diminish the communication range.
- Plug only one wireless router at a time into a dedicated Ethernet connection. Plugging in more than one wireless router at a time will cause problems with the network because the dedicated Ethernet connections are connected together by the same Ethernet switch.
- Some Ethernet-capable ESN devices reside in a metal enclosure. Using a pass-through Ethernet connector (such as the Molex ENSP1F5) on the metal enclosure for these devices will make it easier to connect and disconnect Ethernet cables. Using this connector will also require a 1 ft (0.3 m) Ethernet patch cable inside the enclosure to connect the Ethernet-capable ESN device to the pass-through connector.

Placing Ethernet-Capable ESN Devices on a Corporate Network

Lutron generally does not recommend placing Ethernet-capable ESN devices on a corporate network. The primary reason for this is that Ethernet-capable ESN devices are not designed to exist in high-traffic network environments. However, with the proper configuration in place to limit traffic on the ESN portion of the infrastructure, it is possible to place devices on a corporate network. Each facility will have its own characteristics, but this section outlines the guidelines and requirements for the infrastructure to support the Ethernet-capable ESN devices.

When the network is supplied by others, the customer must ensure that the network is operational before the Lutron field service engineer arrives on-site for system start-up. The system start-up cannot be completed without reliable connectivity between Ethernet-capable ESN devices, the iOS device (Apple iPod touch, iPad or iPhone), and the network. If start-up cannot be completed because the network is not installed or because any networking equipment required to ensure connectivity between Ethernet-capable ESN components is not operational and properly configured, the customer will be required to schedule an additional field service visit at an additional charge.

The Lutron field service engineer and supporting personnel must have access to all network equipment to ensure communication between Lutron components on the network. They must be able to connect to any portion of the network utilized by the Lutron system and employ Ethernet network analysis tools for the purpose of system verification and/or troubleshooting. If access to network equipment and/or use of network analysis tools is not permitted, the customer must ensure that qualified network support personnel are on site and available to support the Lutron field service engineer during the commissioning process. Lack of support may require scheduling additional field service visits at an additional charge.

If the Lutron equipment connected to the network is required to have customer-specified static IP addresses, subnet masks, and gateway addresses, this configuration information must be supplied to Lutron prior to the Lutron field service engineer's arrival on-site to commission the system.

Lutron recommends that the customer employ qualified network support personnel that will maintain the reliability and health of the network post-occupancy. These network support personnel should have industry-recognized certifications to configure and support the installed network.

Physical and administrative access to network equipment should be limited to authorized personnel only.

Placing Ethernet-Capable ESN Devices on a Corporate Network: Technical Requirements

The Ethernet port on Ethernet-capable ESN devices requires CAT5 wiring. This CAT5 wiring must follow the standard Ethernet wiring rules for distance and separation. Network communication between Ethernet-capable ESN devices and the iOS device (Apple iPod Touch, iPad or iPhone) requires a Wi-Fi network. It is possible to use an Ethernet and Wi-Fi infrastructure installed in the building for ESN Ethernet and Wi-Fi communications. When this is done, the customer, network installer, and network administrator must be aware of the ESN system requirements for this network.

The ESN system uses packet types (UDP multicast packets) that are not commonly found on data networks. This packet type is used because it ensures the performance of the control system. Most corporate IT networks are configured to block these packet types because they are not typically used in data networks. The customer-provided network must be configured to allow this traffic between the Ethernet-capable ESN components on the network. This can be accomplished in several ways and it is the responsibility of the network provider to ensure the network reliability and security.

All Lutron equipment connected to the network must be on the same subnet. Multiple subnets can be used if the appropriate routers/gateways are configured to ensure connectivity between all Lutron equipment on the network. All ESN system components connected to the network will be factory programmed to use DHCP and the following network settings:

- Subnet Mask: 255.255.255.0
- UDP Multicast Address: 224.0.37.42

Effective October 2014: All network equipment ports connected to Ethernet-capable ESN devices must be capable of working at 10 Mb/sec. The port can either be forced to 10 Mb/sec or can be left as auto-detect. Ethernet-capable ESN devices do not support 1 GB/sec network speeds.

All network equipment required to enable connectivity between Lutron equipment must allow the following Ethernet traffic and have the following ports open:

- UDP multicast Ethernet traffic
- Telnet on port 23
- Device Discovery on port 2647

* All network equipment required to enable connectivity between Lutron equipment must have all ports and protocols mentioned enabled/opened by default after a power-up to prevent system downtime after a power-cycle.

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Lutron Contact Numbers

WORLD HEADQUARTERS USA

Lutron Electronics Co., Inc.
7200 Suter Road
Coopersburg, PA 18036-1299
TEL: +1.610.282.3800
FAX: +1.610.282.1243

support@lutron.com
www.lutron.com/support

**North & South America
Customer Assistance**
USA, Canada, Caribbean:
1.844.LUTRON1 (1.844.588.7661)
Mexico:
+1.888.235.2910
Central/South America:
+1.610.282.6701

EUROPEAN HEADQUARTERS

United Kingdom
Lutron EA Limited
125 Finsbury Pavement
4th floor, London EC2A 1NQ
United Kingdom
TEL: +44.(0)20.7702.0657
FAX: +44.(0)20.7480.6899
FREEPHONE (UK): 0800.282.107
Technical Support: +44.(0)20.7680.4481
lutronlondon@lutron.com

ASIAN HEADQUARTERS

Singapore
Lutron GL Ltd.
390 Havelock Road
#07-04 King's Centre
Singapore 169662
TEL: +65.6220.4666
FAX: +65.6220.4333
Technical Support: 800.120.4491
lutronsea@lutron.com

Asia Technical Hotlines

Northern China: 10.800.712.1536
Southern China: 10.800.120.1536
Hong Kong: 800.901.849
Indonesia: 001.803.011.3994
Japan: +81.3.5575.8411
Macau: 0800.401
Taiwan: 00.801.137.737
Thailand: 001.800.120.665853
Other Countries: +65.6220.4666