FAQ Questions & Answers

FOR SERVICE PROBLEMS OR QUESTIONS:

Contact the ISP: https://www.otelco.com/contact/

Email: helpdesk@leverettnet.net

Phone: 877-643-6246, press 1 and then 2

Contact the LMLP: lmlp@leverett.ma.us

Protect your fiber connection: In order to avoid expensive repairs to the fiber-optic cable that brings LeverettNet telephone and Internet services to the premise, remember it is the property owner's responsibility to avoid damage to the fiber and the Optical Network Terminal (ONT). **The Leverett Municipal Light Plant (LMLP), in accordance with general utility company practice, holds homeowners responsible for costs to repair fiber broken or damaged by homeowner or homeowner-contracted activities, including digging, moving, tampering with, or otherwise interfering with the fiber cable or ONT. NOTE:** Conventional methods of identifying underground utility lines before digging—such as Dig-Safe flagging—are not effective with underground fiber-optic cable because the metal detectors they use cannot detect glass. **If you plan on digging, contact the LMLP at 548-9699 to get a copy of the conduit plan for your location.**

Frequently Asked Questions

The FAQ is organized in sections.

Glossary

Active Ethernet (AE): An Active Ethernet network provides each subscriber with their own fiber link to the network node switch, which links the local network to the Internet. In comparison, a GPON network uses passive optical splitters to connect up to 32 subscribers to a single fiber link to the network node. AE makes higher bandwidth possible by the direct link from the switch to the subscriber. LeverettNet employs AE.

Ethernet: a system for connecting computer systems, with protocols to control the passing of information and to avoid simultaneous transmission by two or more systems. **For more information about Ethernet wiring in your home, see the Technical section below.**

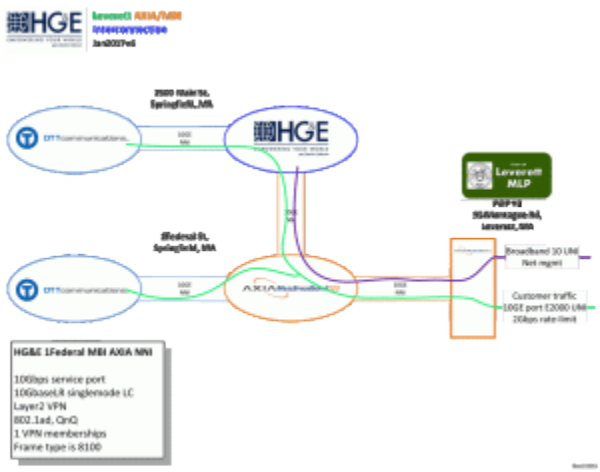
Fiber-Optic: Optical fiber is a strand of glass about as thin as a human hair that transmits light pulses carrying digital information. The light pulses are generated, received, and converted from / to electrical signals by electronic equipment at each end of the fiber, to form a communications network. Fibers are grouped in bundles in cables throughout the network. Optical fiber is less expensive and lighter weight than copper wires and can transmit more data with less power and signal degradation over longer distances. Optical fiber is electrically non-conductive and not subject to electromagnetic interference.

FTTx (Fiber-to-the-x): Fiber to the *x* (FTTX) is a generic term for any broadband network architecture using optical fiber to provide all or part of a last mile telecommunications system. Fiber-to-the-home (FTTH) refers to fiber optic cable connections to individual residences; also known as Fiber-to-the-premise (FTTP); LeverettNet deploys this architecture. Fiber-to-the-curb (FTTC) refers to fiber optic cable extended along a street or road, passing individual premises.

Gigabit (Gb): A Gigabit of Internet bandwidth is 1,000 Megabits (Mb). A Gigabit network can provide data transfer rates of one gigabit per second (Gbps) over fiber. Most end-user devices process data at slower speeds than fiber.

*Gigabit as a measure of **bandwidth*** is *not to be confused with Gigabit as a measure of **data**. **Bandwidth (what engineers call bitrate) refers to data transfer rates:** how fast information can move between devices.* A Gigabit of **data**, in contrast**,** is a measurement of quantity: one billion bits of data. It takes eight bits (referred to as a byte) to store a single character of text.

ISP (Internet Services Provider): an entity that provides Internet service over the network. OTELCO is the ISP for LeverettNet.



LeverettNet Interconnect Diagram. Click to view larger.

"Middle Mile": the network that provides connectivity from local "last mile" networks to the Internet. The "middle mile" for LeverettNet is owned by the Massachusetts Broadband Institute and operated by Axia NGNetworks.

MLP (Municipal Light Plant): a municipal entity under Massachusetts law, established to provide utilities (gas, electricity, telecommunications) to residents and businesses. The MLP budget and administration

are separate and distinct from the general town budget and administration (similar to an enterprise fund under MA law).

NO (Network Operator): an entity that monitors the performance of the network and takes corrective action in the event the network is not functioning properly. Holyoke Gas & Electric Telecom Division is the NO for LeverettNet.

ONT (Optical Network Terminal): a network interface device used with fiber-optic systems. The ONT is the demarcation point between the LeverettNet fiber-optic network and the subscriber premises Ethernet wiring. The subscriber router connects to the ONT and serves the subscriber's devices. The ONT converts optical signals into electrical signals, and vice-versa. The ONT terminates the fiber optic line in an inner compartment and the premises Ethernet and telephone wiring in an outer compartment. The ONT is powered from the subscriber premises electrical system, through an uninterruptible power supply (UPS) unit.

NOTE: The ONT is the property of the Town of Leverett. It is not to be painted, moved, adjusted, or tampered with.

The homeowner may access only the outer compartment behind the weatherproof exterior door—which is secured by an ordinary slotted screw—for ports to connect premises Ethernet and telephone wiring. Operational status lights are visible in this outer compartment.

ONT connections.

Point of Presence: A Point of Presence is a demarcation and access point to the Internet. It is a physical location that houses electronic equipment necessary to connect the "last mile" network to the "middle mile," which connects through the ISP to the Internet.

Symmetrical Bandwidth: equal upload and download capacity. Download (or downstream) bandwidth is the path that brings information from the network to a subscriber's device. Upload (or upstream) is the path that carries information from the subscriber's device into the network. All Internet activity involves both paths. Video streaming is an example of an activity that uses more downstream than up. Cloud services, telehealth, and video conferencing are examples of activity that uses up and down streams more evenly and may use upstream more than down.

UPS (Uninterruptible Power Supply): contains a battery backup to provide short-term power to the ONT in the event of a grid power outage. Converts AC (alternating current) from the electrical grid into DC (direct current) to the ONT and keeps the battery charged. The apparatus provides surge protection and filtering to correct some common utility grid problems—voltage and frequency instabilities. The UPS is connected to the ONT with two power wires and five signal wires. The battery in the UPS unit is a sealed, maintenance-free lead-acid type. **For more information about the UPS, see the Technical section below.** A product overview for the UPS is available from the CyberPowerSystems

General

What is Leverettnet.net?
LeverettNet.net is the domain name of the fiber-optic broadband network serving residents and businesses in the Town of Leverett, Massachusetts. Email addresses provided by the ISP are in the leverettnet.net domain.

What is LMLP?
Leverett Municipal Light Plant, the custodian of LeverettNet.

Who owns the network?
The Town of Leverett owns the network.

Services

What services are available over LeverettNet?

Internet service with 1Gps (one gigabit per second) symmetrical (upload and download) access to the 2Gbps (two gigabits per second) "middle-mile," with no data cap.

Telephone service with unlimited calling to 50 states plus Extended domestic ; calls outside the 48 states billed at published International rates; call waiting; caller ID; caller name ID; voicemail; call forwarding; call forwarding busy, do not answer, and fixed; enhanced call forwarding do not answer; caller ID blocking and unblocking; message waiting indication (stutter tone); 411 directory service.

These services may be subscribed to separately or as a bundle. More information is available on the ISP page.

Can I make international calls?

Yes. But, in an effort to protect you from expensive international toll fraud, international calling is initially automatically blocked from your phone as a safeguard. Lifting this block is easy and effective. If you would like to unblock International Calling, please complete the waiver form. If you have questions, please call OTELCO at **877-643-6246**.

What email options exist on LeverettNet?

Email accounts (POP and IMAP), up to 5 per Subscriber, at 5GB minimum storage per account, with the domain name leverettnet.net are included with Internet service subscriptions.

Other email accounts (gmail, yahoo, etc . . .) can be used separately or forwarded to a leverettnet address (or vice versa).

What television options exist on LeverettNet?

LeverettNet does not offer separate television service (often referred to as cable), but does provide access to television and video streaming services over the Internet (sometimes referred to as video "over the top").

Video streaming services include Netflix, Hulu, HBO, Amazon Video, Vudu, YouTube, Sling TV, and many others. Some satellite television providers—like Dish TV and Directtv—also provide access via an Internet connection, without needing a satellite dish. 'Smart' TVs and stand-alone streaming media hardware devices—

for example, Roku, Apple TV, Chromecast, Fire TV Stick, etc.—allow television sets to connect to "over-the-top" content.

How do I …subscribe for services? …call for customer support?

Contact the ISP: https://www.otelco.com/contact/ ; phone 877-643-6246 Option 1

How do I get service at a new house or location?

A new home connection to LeverettNet requires a fiber-optic drop line from the network distribution line at a roadside utility pole to an Optical Network Terminal (ONT) on the house. Unless the homeowner provides a passable buried conduit (minimum size 1¼"), the drop line will be aerial. The ONT is powered by an Uninterruptible Power Supply (UPS) connected to the house electric system. The drop line and associated equipment remain the property of the Town. The LMLP has contracted with Collins Electric to install new connections, as follows:

Generic Scope of work:

- * Up to 500′ aerial or in passable conduit minimum size 1¼"
- * One 2-fiber cable drop from distribution pole closure to house
- * One Calix 711GE ONT at approved owner location
- * One UPS and 7-conductor line to ONT
- * Splicing one pigtail SC/APC at customer location
- Estimated Base Price: $2,400.00.
- * Collins will track installation time and the actual cost may be lower or higher.
- * Collins will provide a specific cost estimate, for a fee of $150.
- * Homeowner must provide 120-volt outlet for UPS.
- * Homeowner is responsible for interior network wiring (Ethernet, router, etc.).

To initiate the process for a new connection to LeverettNet, submit a complete and signed LMLP Homeowner Easement and Right of Access Form to Town Hall, Leverett. Contact Town Administrator Margie McGinnis—413-548-9699—for further information.

Can I subscribe to more than one LeverettNet account?

The ONT has two Ethernet ports and two telephone ports, where the homeowner's cable(s) connect to inside wiring. Each port can be provisioned by the ISP to carry a separate Internet or telephone account. Arrangements for additional LeverettNet accounts can be made directly with the ISP. It is also possible to arrange with the ISP to install an ONT with more than two ports for even more accounts.

May I resell the use of my LeverettNet connection?

The Leverett Municipal Light Plant as a matter of policy forbids resale of a LeverettNet connection. Anyone seeking a commercial arrangement for LeverettNet usage should contact the LMLP, which will review requests and, if approved, establish terms that ensure network build, maintenance, and operating costs are shared appropriately.

Where do I report a problem like a tree on a fiber cable?

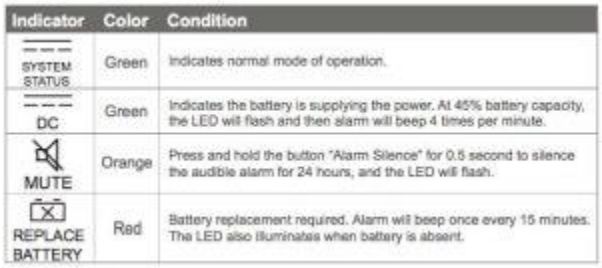
Use the Tree Trim or Removal Request Form on this website to report trees that are endangering cables. Your report will be sent to the LMLP, the Leverett Tree Warden, and the electric company to remedy the problem.

For emergencies, contact the ISP, https://www.otelco.com/contact/: phone **833-683-5261** or email helpdesk@leverettnet.net.

Technical

What do the indicator lights mean on the UPS?

- System Status: Green = normal operation
- DC: Green = battery is supplying power (see diagram below for alarm details)
- Mute: Orange = alarm muted (see diagram below for muting instructions)
- Replace Battery: Red = battery replacement required



Indicator	Color	Condition
SYSTEM STATUS	Green	Indicates normal mode of operation.
DC	Green	Indicates the battery is supplying the power. At 45% battery capacity, the LED will flash and then alarm will beep 4 times per minute.
MUTE	Orange	Press and hold the button "Alarm Silence" for 0.5 second to silence the audible alarm for 24 hours, and the LED will flash.
REPLACE BATTERY	Red	Battery replacement required. Alarm will beep once every 15 minutes. The LED also illuminates when battery is absent.

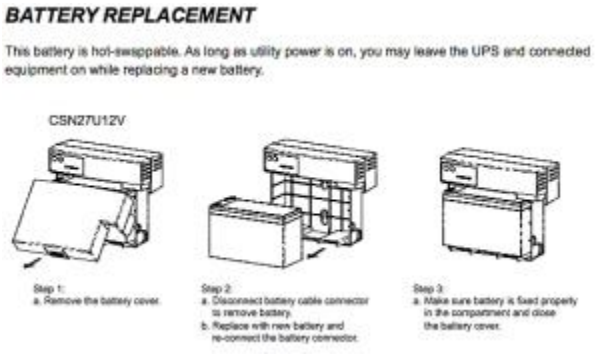
Uninterruptible power supply indicator lights. Click image to view larger.

When to replace the battery in the UPS?

The indicator lights on the UPS, shown above, include battery status information. When the battery is at 45% capacity, the DC status light will begin to flash and the unit will begin to beep four times per minute. When the battery is depleted, the REPLACE BATTERY light will turn red. The typical life of the battery used in the UPS is around 4 years. We recommend replacing the battery before then to ensure reliability. The subscriber may replace the battery directly (see below) or contact an electrician. The folowing local electricians are certified by LeverettNet to work on ONT and UPS issues: Ryan Gahagan [Grace Electrical Services, 860-805-3683]; Lee Edelberg [H. 413-549-8963; M. 413-522-0356]; Mark Pereira [M. 413-774-7689].

How to replace the UPS battery myself?

The battery is hot-swappable. You may replace it while the UPS is connected to the ONT. See diagram below for details.



UPS battery replacement. Click image to view larger.

The UPS battery charges when it is connected to utility power. The battery charges fully during the first 24 hours of normal operation. Do not expect full battery run capability during this initial charge period. The typical life of the battery used in the ONT UPS is around 4 years. **We recommend replacing a 4-year old battery to ensure best reliability.** We also recommend putting a tag on the battery or the UPS giving the date when the battery was replaced.

What battery to use for replacement?

The battery that is supplied in the CyberPower UPS power supply is a sealed, maintenance-free, lead acid battery rated 12Vdc and 7.2 amp-hour, and having 1/4″ terminals (called T2 or F2 style). It should be replaced with a substantially identical battery, having the same style terminals. 12V 7Ah would be appropriate if 7.2Ah cannot be found.

CyberPower, the manufacturer of the UPS that is used with the ONTs in Leverett has stated, "The unit requires use of SLA 12V/7.2Ah, part# RB1270." Technical data available at https://www.cyberpowersystems.com/product/fttx/csn27u12v/

We recommend having the replacement done by one of the Town electricians (see "when to replace," above). If you are certain you can find and install an appropriate replacement, that is permissible, but you then take responsibility for the correct functioning of the unit. DO NOT substitute batteries of other chemistries (e.g., lithium, nickel-cadmium, etc.) or of a different physical size (8Ah batteries, for example are too large). **Using an incorrect battery may cause damage or risk of energy hazard.** The old battery you replace can be deposited with an attendant at the Leverett Transfer Station for proper disposal.

What inside premises wiring is needed for Internet connections?

Fiber-to-the-home premises equipment and wiring.

The ONT converts signals carried as pulses of light on the optical fiber into electrical signals carried over low voltage twisted pair wire copper wiring referred to as "Ethernet" wiring. Ethernet carries the electrical signals from a port on the ONT to the subscriber's equipment, typically a router. For network administration and security reasons, **you should not connect a computer directly to the ONT,** unless you are requested to do so by a service technician. The data rate of the signals to and from the ONT is one gigabit per second (that is, one thousand million bits transferred over the wire per second), often abbreviated as 1gbs. Categories of ethernet wire suitable for that data rate are Cat 5 and higher. Cat 5e is normally considered entirely suitable for all but the longest and most interference-prone installations. A typical residential network will connect computers, printers, and other devices via wired jacks or wirelessly. In either instance, a router will be connected by Ethernet wire to an Ethernet port in the ONT (behind the outer weatherproof door) and will serve the inside network via wireless or a mix of wireless and wired connections. Ethernet wiring can be installed by electricians, but may also be installed by others having appropriate skills. It is not highly complex to install.

The most critical factors are that the cable must not be allowed to kink or be secured so tightly that it is crushed.

What inside premises wiring is needed for telephone connections?

The ONT provides connection ports for telephone as well as for Ethernet. The jack on your existing telephone wiring will unplug from the telephone company service box and plug directly into a telephone port in the ONT (behind the outer weatherproof door). If you install new telephone wiring from the ONT to connect to existing telephone wiring inside your house, the following diagram shows the most common situation. In the event you end up with spare wires, cut the ends cleanly and wrap them back around the wire casing.

Telephone wire pairing. Click image to view larger.

Do I need a modem in addition to a router?

No, you do not need a modem. The ONT serves the same purpose as a modem.

What is the procedure to replace my router?

If you replace an existing router with a new router, call OTELCO Help Desk — 877-643-6246 — to discuss it with them and minimize your Internet down time. They can clear the old router information from the ONT and provide an Internet address for the new router. This process will be quicker during regular business hours: 8am – 5pm Monday – Friday.

After you speak with OTELCO, you can follow these Do-It-Yourself steps to reset the ONT yourself by powering down/up the UPS/battery back-up inside your house. Here are the steps:

- 1. Power down and disconnect the old router.
- 2. Locate the UPS/battery back-up that supplies power to the ONT. Disconnect AC power, remove the battery cover and disconnect the negative battery lead.
- 3. Wait 30 seconds.
- 4. Reconnect the negative battery lead, replace the battery cover, and reconnect AC power.
- 5. Connect and power up the new router.

What about network security?

A number of mechanisms are built into the LeverettNet network nodes and ONTs to enhance network security. Security features configured on the Leverettnet network include, but are not limited to, MAC forced forwarding, Multicast Filtering, IP DHCP Option82, IGMP snooping, IP Source Verify and limited scope VLANS. The Network Operator has deployed these features globally across the network. Additionally, the network has the ability to prioritize certain types of traffic over others. For example – telephone takes priority over Internet.

For home networks: The short answer is "Read the instructions that come with your router!" There are many variations of routers with different methods for managing security. Some are able to provide more security and are easier to set up than others. The key security feature for any router is that it have password-controlled access to the home network. **It is important to change the password for the router's "admin" or "manager" account from its factory default as soon as the router is installed.** Information about how to set both passwords will be found when you read the instructions that come with the router.

What affects network speed?

LeverettNet provides access to a gigabit speed to the Internet. Some factors can inhibit access to this speed, including:

- the network interface card on a subscriber device (1000BASE-T = gigabit capable)
- other components of subscriber devices (chipsets, motherboards, operating systems, applications, etc.)
- rating on the Ethernet cable (Cat5e = gigabit capable)
- simultaneously running bandwidth-intensive applications (e.g., video takes priority over other data)
- delay in LeverettNet and/or the Internet beyond LeverettNet and/or websites, due to traffic congestion, rerouting, etc.
    - note that websites, even speed test websites, do not necessarily run at 1Gig
- older wireless access point and/or wireless network adapter (protocol earlier than 802.11n)
    - note that wireless is inherently slower than wired; optimize wireless by locating the access point closer to devices with few barriers; use different frequencies from cordless phones; etc.

How to locate the path of buried fiber on my property?

A survey plan for the aerial or underground path of a fiber "drop" to a subscriber location is completed prior to the installation. This plan shows the approximate path to be taken and provides a good reference to use when searching for the conduit. This plan is on file with the LMLP in Town Hall. Contact the LMLP to see a copy of the plan for your location. **NOTE: The actual path of the cable is subject to conditions discovered in the course of the trenching work and for this reason may be found far from the path shown by the plan.** Underground drops are enclosed in an orange-colored conduit, buried approximately five to twelve inches below the surface. The best practice for digging anywhere between the roadway and the house ONT installation is to dig by hand for the first twelve inches of depth. The homeowner is responsible for costs to repair fiber broken or damaged by digging or other interference.