

STREAM 60

Operating Manual

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This operating manual applies to the STREAM 60S, STREAM 60L and STREAM 60M product models.

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Note: Please be patient the first time you power on your device, as it may take more time than normal to boot up while the device flashes its internal modem firmware. Three blinking signal LEDs will indicate that this process is currently in progress and should last about 30 seconds to 1 minute.

PRODUCT BOX CONTENTS

Please consider recycling our eco-friendly product packaging.

Item	Qty
STREAM 605, STREAM 60L or STREAM 60M 60GHz unit w/ attached mounting back plate	1
SIL MNT3 Three Axis Tilt and Swivel Mounting Bracket Kit	1
48V 0.65A PoE adapter and power cable	1
Quick start guide insert	1



MEANING OF DEVICE LEDs

SIGNAL LEVEL LEDs

Signal LEDs are updated at a ~4 second interval.

Behaviour	Meaning
All signal LEDs are off	The device is powered off.
All three LEDs are on & blinking fast	The device is currently updating its firmware. This only happens at boot after a firmware upgrade.
The Eth LED is on	The device is on and is currently scanning or has a low signal strength.
The 75% RX LED is on and blinking	The device is currently scanning for its partner device
The 75% RX LED is on and not blinking	The device is currently connected to its partner with a medium signal strength.
The 100% RX LED is on and not blinking	The device is currently connected to its partner with a high signal strength.



ETHERNET PORT LEDs

2.5G ETH0: The link light will turn on when a link is established, and the power light will turn on once the device is supplied with power.

POWERING YOUR DEVICE

INPUT POWER

Important Notes

- The input power should be 48VDC and a minimum of .5A (24W) is recommended.

The STREAM 60x can only be powered via the Power over Ethernet (PoE) port.

The input power should be 48VDC and a minimum of .5A (24W) is recommended.

Although not recommended, a lower input voltage may be used (as low as 24VDC). However, there are two main limitations when using a lower input voltage:

- The cable run should be as short as possible and the use of larger gauge cable such as CAT6+ is highly recommended. On longer cable runs, the voltage drop will be higher due to the higher current needed to meet the needs of the radio.

DEVICE ACCESS FOR INITIAL CONFIGURATION

You will need a modern web browser in order to access the device's Web UI to configure your device.

1. First, power on the device. You can do this by using the included PoE adapter. If using the PoE adapter, plug the power cable attached to the PoE adapter into the wall. Next, plug one side of an ethernet cable into the adapter's POE port, and the other into the device's 2.5G ETH0 PoE-in port.
2. Connect your laptop's ethernet cable into either the data port of the PoE adapter (2.5G) or the ETH1 (1G) port on the device, in order to give your laptop or device connectivity. By default, DHCP client is enabled on the main management network bridge of the device. If your device cannot obtain an IP from an upstream DHCP server, it will fall back to 192.168.1.1, unless otherwise configured.
3. Log in to your device's local web UI in your web browser at the DHCP-assigned IP, or the fallback IP previously mentioned, using the default credentials of admin/password. **Please change the default user credentials after you login for the first time.**
4. Go to the configuration settings tab via the main nav menu on the left in order to configure your device. Please refer to the full web UI manual for details about each setting or continue reading below about how to make a link.

MAKING A LINK

STREAM 60M & STREAM 60S

By default, the STREAM 60M is configured to operate in AP mode on IP address 192.168.0.229 and the STREAM 60S is configured to operate in station mode on IP address 192.168.0.228

STREAM 605 Link

By default, one end of the STREAM 605 is configured to operate in AP mode on IP address 192.168.0.229 and the other is configured to operate in station mode on IP address 192.168.0.228

STREAM 60L Link

By default, one end of the STREAM 60L is configured to operate in AP mode on IP address 192.168.0.229 and the other is configured to operate in station mode on IP address 192.168.0.228

All are configured with the SSID 'SilverNetWireless60' and all are configured to use the encryption key value of 'SilverNetWireless60'.

This means once you power up the devices within range of each other, they should link up without any additional configuration (default channel is 5), and immediately start passing traffic.

For minimal setup, it is recommended to change the SSID to a unique identifier and to set a unique encryption key.

To do to this, login to the Web UI, navigate to the wireless->60 GHz radio settings, and input the new settings on both devices (and subsequent client radios). Click save to apply the changes. If the channel width or operation mode has been changed, it will require the device to reboot to take effect.

In order for the devices to link together, the SSID, channel width, and encryption type/key must all match.

Lightly aim the two devices and they should connect up and pass traffic immediately. In close range such as lab setups, it may be difficult to reach full performance due to the strength of the signal and high-power reflections caused by walls and other objects.

You can see the status of the links between the AP and client on the dashboard page of the Web UI.

HOW TO SELECT CHANNEL PARAMETERS

Please use the link calculator on our website and corresponding guide to determine the optimal target distance and channel(s) to use for your installation. Also keep in mind that the 60 GHz frequency requires LOS and is affected by rain fade as well as significant oxygen absorption in the lower frequencies.

60GHz Wireless Link Calculator

Distance (m):

Receiver Base Radio:

Transmitter Client Radio:



STREAM 605

[View Product](#)



STREAM 605

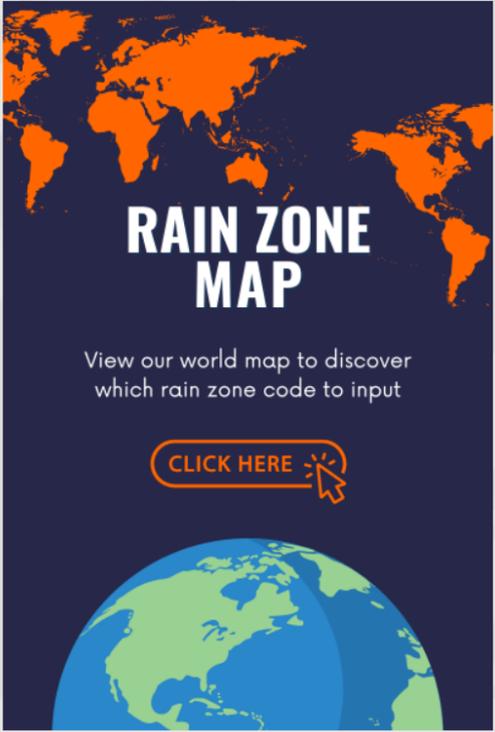
[View Product](#)

Target (Data Rate) MCS Rate:

Half Channel:
Yes

Rain Zone:

[Calculate](#)



RAIN ZONE MAP

View our world map to discover which rain zone code to input

CLICK HERE

Channel Number	Frequency (MHz)	Expected RSSI at Target MCS Rate (dBm)	Maximum Expected Raw Data Rate	Maximum Rain Rate in Which Link Will Operate	Availability of Link During a Typical Year
Channel 1	58320	-63	MCS8 (2310 Mbps)	Heavy Rain (43.4 mm/hr)	> 99.99%
Channel 2	60480	-65	MCS7 (1925 Mbps)	Heavy Rain (26.9 mm/hr)	> 99.97%
Channel 3	62640	-64	MCS8 (2310 Mbps)	Heavy Rain (32.9 mm/hr)	> 99.99%
Channel 4	64800	-62	MCS9 (2502 Mbps)	Heavy Rain (47.4 mm/hr)	> 99.99%
Channel 5	66960	-59	MCS9 (2502 Mbps)	Downpour (71.9 mm/hr)	> 99.997%
Channel 6	69120	-59	MCS9 (2502 Mbps)	Downpour (70.7 mm/hr)	> 99.997%

TROUBLESHOOTING YOUR LINK

Please take the following steps to troubleshoot any wireless links that have sub-optimal performance:

1. Check to see if the devices are running the latest firmware. The latest firmware can be found [here](#).
2. Check to see if the devices are within the coverage areas of each other and have line of sight to each other.
3. Check to see if the link parameters in use are capable to create a link as estimated by the link calculator.
4. If the devices are connected but the connection quality is poor, it could be due to a destructive reflection on the path. To solve this, try moving your STREAM 60x station up or down, or left/right in small increments. Up/down movements are generally more helpful in these cases assuming the reflection is from the ground plane (e.g. the ground, nearby rooftops in the path, etc.). Changing the channel may also resolve this issue since different frequencies will have different channel characteristics.

The STREAM 60x (as well as most other PTP & PTMP devices operating in the 60GHz band) use a single carrier PHY for transmitting data. Single carrier PHYs are more susceptible to destructive reflections than some other methods such as OFDM.

I'M STILL HAVING TROUBLE WITH MY LINK, WHAT DO I DO NEXT?

Please collect the troubleshooting files for both sides of the link you're trying to make, and send them to us at support@silversnet.com, along with any other relevant info you might have about your install such as:

1. Link distance
2. Your rain region and expected RSSI of the link, based on results from the link calculator
3. Wireless speed test results (assuming a link can be made)
4. How you are powering the devices
5. What other accessories (cameras, other radios, etc) are connected to the device, and how they're powered.
6. Relevant environmental details, such as how far off the ground the AP and STA(s) are installed, if there are any metal structures nearby, large bodies of water, etc.

You can find the link to download a device's troubleshooting file from the menu located under the gear/settings icon in the web UI, in the upper right corner (see below screenshot under the "Updating firmware" section).

QUICK SETUP FAQs

Why does the MCS rates of my link seem lower than it should be given a solid RSSI?

You will need to run traffic over your link in order the data rates to modulate to the higher values.

Why doesn't the speedtest cause a spike in traffic on the throughput graph?

The speed test only sends a very quick burst of packets, so won't have that much of an impact on the overall throughput graph results.

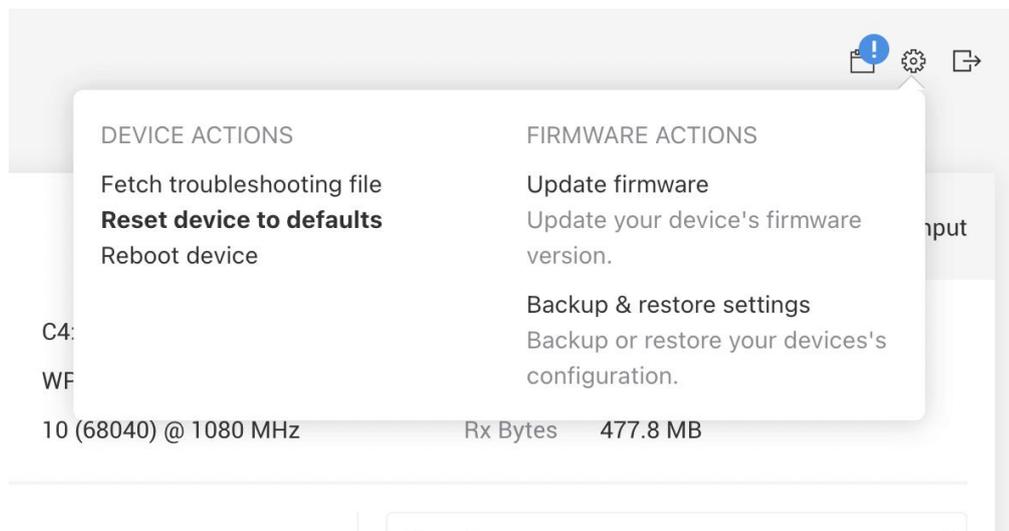
What does tx/rx sector mean?

You can read more about how to interpret [tx and rx sector numbers here](#). We will also be adding visualizations to the web UI in the future.

UPDATING FIRMWARE

Firmware can be updated in two ways:

1. **Via the web UI:** Download the latest firmware from our support site, and upload it via the web UI:

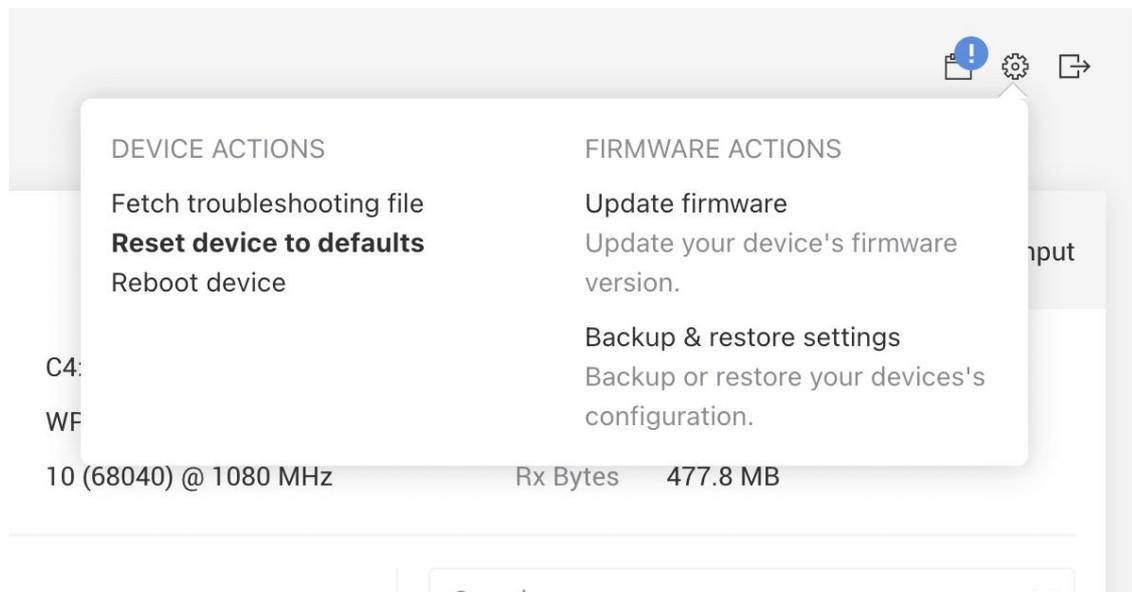


All STREAM 60x series devices have two bootbanks. In the event that a firmware upgrade fails (power flicker, etc) and the device cannot boot up, it will revert back to the firmware flashed on the previous bootbank.

RESETTING YOUR DEVICE

You can reset your device to factory defaults 2 ways:

1. **Reset button:** Find a paperclip, or something similar, and use it to press and hold the physical reset button on the device for 20 seconds or more. This will not have any affect if the reset button is disabled in software.
2. **Via the web UI:** Once you're logged in, click the gear icon in the upper right corner, as shown below, and you'll see the reset option:



MOUNTING YOUR DEVICE

WALL MOUNTING



POLE MOUNTING



FCC/IC WARNING

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference , and
2. This device must accept any interference received , including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

ISED/C WARNING

NOTICE: This radio is intended for use in occupational/controlled conditions where users have full knowledge of their exposure and can exercise control over their exposure to meet the occupational limits in FCC/ISED/C and International standards. This radio device is not authorized for general population consumer use.

RF EXPOSURE REQUIREMENTS:

To control your exposure and ensure compliance with the occupational/controlled environmental exposure limits, always adhere to the following procedures.

GUIDELINES:

User awareness instructions should accompany device when transferred to other users. Do not use this device if the operational requirements described herein are not met.

OPERATING INSTRUCTIONS:

Keep the radio unit at least 2.5 cm away from the face. Keeping the radio at the proper distance is important as RF exposure decreases with distance from the antenna. The antenna should be kept away from the face and eyes.

Use of non-approved antennas, batteries, and accessories causes the radio to exceed the FCC/ISED RF exposure guidelines.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Innovation, Science and Economic Development Canada licence-exempt RSS standard (s). Operation is subject to the following two conditions:

1. this device may not cause interference, and
 2. this device must accept any interference, including interference that may cause undesired operation of the device.
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