



Telia Yrityksinternet Plus Langaton

Installation and getting started guide

C1111-8PLTEEAW + PoE

C1131-8PLTEPW + PoE

C1117-4PMLTEW

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Thank you for choosing Telia

Yritysinternet Plus Langaton (Wireless) is a business Internet solution implemented with mobile technology. Highly customisable, it features versatile supplementary services.

Yritysinternet Plus Langaton (Wireless) operates in Telia's high-speed mobile network in Finland.

Service overview

Use this installation guide to set up the Cisco ISR1100 series router included in the service. Telia owns the customer device and SIM card used in Yritysinternet Plus Langaton (Wireless) subscriptions. You have the right to use the customer device included in the service. Telia manages and maintains the customer device.

The service includes high-quality customer-premises equipment, by default protected by a firewall for secure Internet connectivity. At your discretion, you can also use a fully open Internet service with static, public IPv4 or IPv6 addresses.

As a supplementary service, you can use the wireless LAN built into the customer-premises equipment that supports the IEEE 802.11a/b/g/n/ac Wi-Fi standards with WPA2 traffic encryption. It is possible to extend the coverage area of the wireless LAN with a separate wireless access point, available as a supplementary service. It is also possible to implement a guest network in the wireless network service for users external to the company. The guest network traffic is completely isolated from the company's internal network.

Setting up the customer-premises equipment included in the service

The Yritysinternet Plus Langaton (Wireless) service uses Cisco ISR1100 series router as a customer device. You can check the model on the label located on the back of the router at the bottom left corner (see figure 3). The device also has a label indicating your subscription ID (as INxxxxx). You will need the subscription ID when communicating with Telia. With the ID, we can find your subscription details quickly.



Figure 1. C1111-8PLTEEAW + PoE

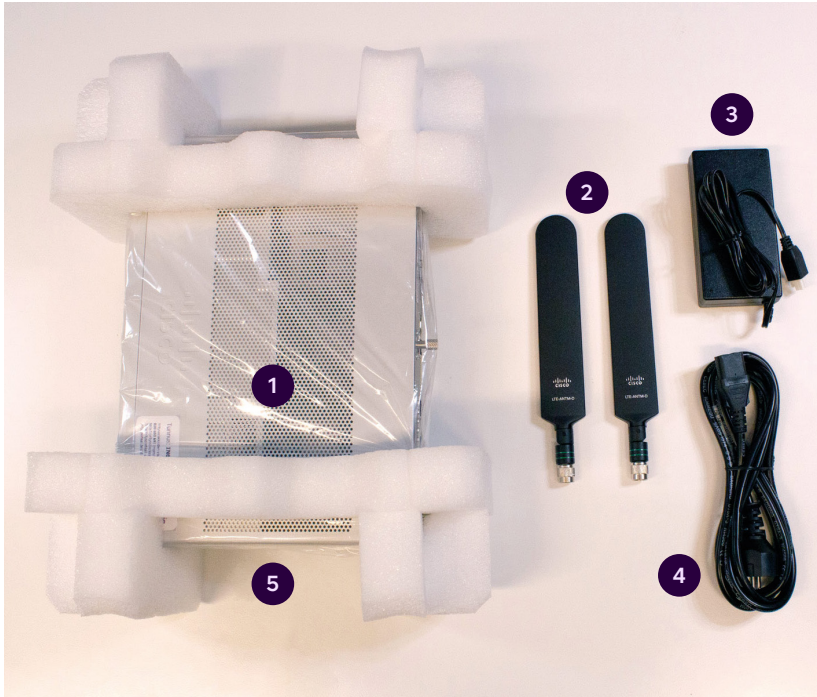


Figure 2. Contents of the Yritysinternet Plus Langaton subscription delivery package

The delivery includes the components listed below. Please check that you have received them all. If you notice that any components are missing, please contact Telia.

1. Router
2. Two LTE antennas
3. Power supply
4. Power cable
5. A SIM card for the mobile connection (installed in the device and ready for use).

Cisco - C1111-8PLTEEAW + PoE

The look, indicator lights and most important connectors of the C1111-8PLTEEAW + PoE router are presented below.



Figure 3. Rear view of a C1111-8PLTEW router, device model label

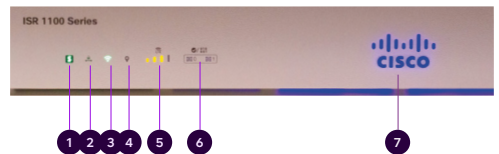


Figure 4. The indicator lights on the front panel of a C1111-8PLTEW router

Name	Description
1 Status	Green = The router works normally (=normal status) Orange blinking = BIOS/ROMmon starting Orange = BIOS/ROMmon started, firmware starting Off = The system is restarting or the software has failed
2 VPN	Green = At least one VPN tunnel is in use Off = No VPN tunnels used (=normal status)
3 WLAN	Green = Wireless local area network is operational and at least one wireless device is connected Orange = Software update is in progress Red = Wifi not in use
4 GPS	Off = GPS positioning feature is not enabled (=normal status)
5 LTE RSSI/Mode	Green = The device is connected to an LTE (4G) network Orange = The device is connected to a 3G network 1 LED lit = Poor mobile network reception (RSSI below -100 dBm) 2 LEDs lit = Low mobile network reception (-99 dBm < RSSI < -90 dBm) 3 LEDs lit = Average mobile network reception (-89 dBm < RSSI < -70 dBm) 4 LEDs lit = Good mobile network reception (RSSI exceeds -69 dBm)
6 LTE DATA/SIM	Green blinking = Data is being transferred over the mobile data connection Orange = The modem is ready for use and a SIM card has been inserted, but the connection is not active. Off = The modem is not ready for use, or the modem is ready for use, except that a SIM card has not been inserted
7 Cisco Logo	Blue = Device power supply is OK (=normal status)

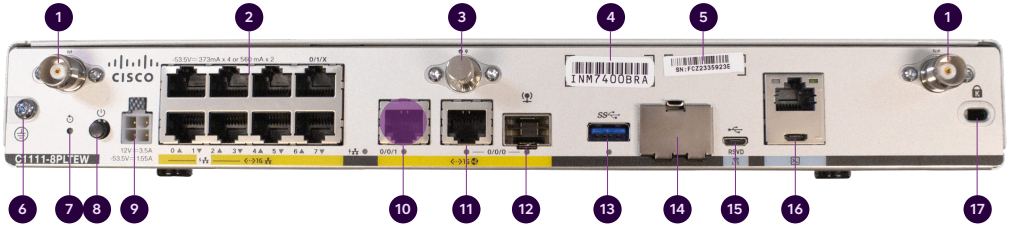


Figure 5. C1111-8PLTEW rear connections.

Name	Note
1 LTE antenna connectors – 2 pcs, Main and Diversity	Both antennas must be connected
2 Ethernet switch, ports 0/1/0–0/1/7	Ports for connecting the client's devices (see figure 8 for switch ports in use!)
3 GPS antenna connector	Not used
4 CLEI ID	Common Language Equipment Identifier (CLEI)
5 Device serial number	
6 Earthing point	
7 Reset button	Not used
8 Power switch	
9 Power cable connector	
10 GE 0/0/1 port	Not used
11 GE 0/0/0 – RJ45	Ethernet WAN (Internet), cannot be used for connecting LAN devices
12 GE 0/0/0 – SFP	Fibre WAN (Internet), cannot be used for connecting LAN devices
13 USB 3.0 port	Not used
14 SIM card slots	Do not open – The SIM card must not be removed
15 LTE Diagnostic port (RSVD)	Not used
16 RJ45/Micro USB console	
17 Kensington lock	

C1111-8PLTEEAWE + PoE router set-up

- 1 Connect both LTE antennas to the connectors numbered with 1 in figure 5. Note! Both antennas must be connected to ensure mobile reception.
- 2 Connect the power cable to the power supply and the power supply to the customer-premises equipment, connector 9 in figure 5.
- 3 Turn the device on, switch 8 in figure 5.
- 4 Wait for approximately **10 minutes** until the device has started.
- 5 Check the mobile network reception with the front panel indicators (see figure 4), indicator light 5.
- 6 Your connection is ready for use.
- 7 Use ports 0/1/2–0/1/7 to connect LAN devices to the firewall-protected default network (see figure 5), connectors 2.
- 8 The supplementary wireless local area network service (WLAN) uses the firewall-protected default network. The settings required using the service: The SSID and encryption key are delivered on a technical form with the delivery and can also be found on a label on the device. The wireless access point takes approximately an additional 10 minutes to start after the router starts.
- 9 If a supplementary Avoin Internet (Open Internet) service has been ordered for the subscription, it is available in all LAN ports from 0/1/2 to 0/1/7 (see figure 5), connectors 2. The IP addresses required for the supplementary Avoin Internet (Open Internet) connection service have been delivered with the technical form in connection with the delivery. The IPv4 addresses used in the supplementary Avoin Internet (Open Internet) service for LAN devices must be configured manually. If you want to distribute IPv4 addresses used in the supplementary Avoin Internet (Open Internet) service by the device's DHCP server, you must select the supplementary service Räätlöity DHCP (Custom DHCP).

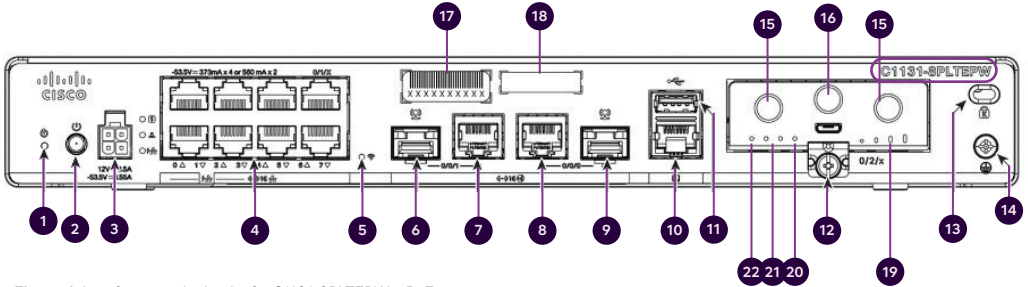


Figure 6. Interfaces on the back of a C1131-8PLTEPW + PoE router

Name	Note!
1 Reset button	Not used
2 Power switch	
3 Power cable connector	
4 Ethernet switch, ports 0/1/0 – 0/1/7	Ports for connecting customer devices
5 Wi-Fi status	
6 GE 0/0/1 port –SFP	Not used
7 GE 0/0/1 port –RJ45	Not used
8 GE 0/0/0 – RJ45	Ethernet WAN (Internet), cannot be used for connecting
9 GE 0/0/0 – SFP	Fibre WAN (Internet), cannot be used for connecting
10 Console port	
11 USB 2.0 port	Not used
12 LTE Module installed	The module and SIM card must not be removed
13 Kensington lock	
14 Earthing point	
15 LTE antenna connectors – 2 pcs, Main and Diversity	Both antennas must be connected
16 GPS antenna connector	Not used
17 CLEI ID	Common Language Equipment Identifier (CLEI)
18 Device serial number	
19 LTE RSSI/Mode	Green = The device is connected to an LTE (4G) network Orange = The device is connected to a 3G network 1 LED lit = Poor mobile network reception 2 LEDs lit = Low mobile network reception 3 LEDs lit = Average mobile network reception 4 LEDs lit = Good mobile network reception
20 GPS	Off = GPS positioning feature is not enabled (=normal status)
21 LTE Data/SIM 0 and 1	Green flashing in the other = Data is being transferred over the mobile data connection
22 Status	Green = The router works normally (=normal status)

C1131-8PLTEPW + PoE router set-up

- 1 Connect both LTE antennas to the connectors numbered with 15 in figure 6. Note! Both antennas must be connected to ensure mobile reception.
- 2 Connect the power cable to the power supply and the power supply to the customer-premises equipment, connector 3 in figure 6.
- 3 Turn the device on, switch 2 in figure 6.
- 4 Wait for approximately **10 minutes** until the device has started.
- 5 Check the mobile network reception with the front panel indicators (see figure 6), indicator light 19.
- 6 Your connection is ready for use.
- 7 Use ports 0/1/2–0/1/7 to connect LAN devices to the firewall-protected default network (see figure 6), connectors 4.
- 8 The supplementary wireless local area network service (WLAN) uses the firewall-protected default network. The settings required using the service: The SSID and encryption key are delivered on a technical form with the delivery and can also be found on a label on the device. The wireless access point takes approximately an additional 10 minutes to start after the router starts.
- 9 If a supplementary Avoin Internet (Open Internet) service has been ordered for the subscription, it is available in all LAN ports from 0/1/2 to 0/1/7 (see figure 6), connectors 4. The IP addresses required for the supplementary Avoin Internet (Open Internet) connection service have been delivered with the technical form in connection with the delivery. The IPv4 addresses used in the supplementary Avoin Internet (Open Internet) service for LAN devices must be configured manually. If you want to distribute IPv4 addresses used in the supplementary Avoin Internet (Open Internet) service by the device's DHCP server, you must select the supplementary service Räättälöity DHCP (Custom DHCP).

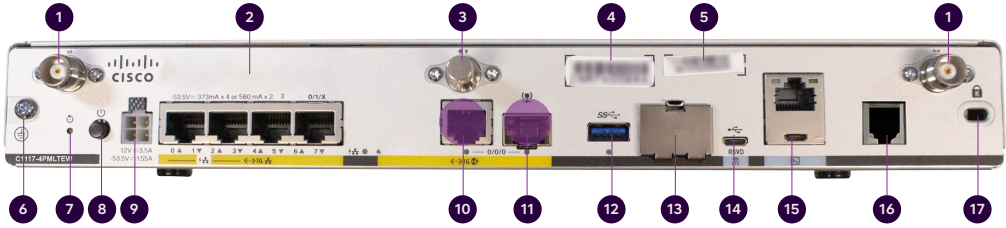


Figure 7: Cisco C1117-4PMLTEW rear connections

This section describes the Cisco C1117-4PMLTEW router main connections. The C1117-4PMLTEW router's front looks similar to the front of the C1111-8PLTEW router. The indicator lights on the front panel and

their interpretation are identical. Description of the indicators are on page 7, figure 4.

Name	Note!
1 LTE antenna connectors – 2 pcs, Main and Diversity	Both antennas must be connected
2 Ethernet switch, ports 0/1/0–0/1/3	Ports for connecting the client's devices
3 GPS antenna connector	Not used
4 CLEI ID	Common Language Equipment Identifier (CLEI)
5 Device serial number	
6 Earthing point	
7 Reset button	Not used
8 Power switch	
9 Power cable connector	
10 GE 0/0/0 – RJ45	Ethernet WAN (Internet), cannot be used for connecting LAN devices
11 GE 0/0/0-SFP	Fibre WAN (Internet), cannot be used for connecting LAN devices
12 USB 3.0 -port	Not used
13 SIM card slots	Do not open – The SIM card must not be removed
14 LTE Diagnostic port (RSVD)	Not used
15 RJ45/Micro USB console	
16 DSL connector	Not used
17 Kensington lock	

C1117-4PMLTEW router set-up

- 1 Connect both LTE antennas to the connectors numbered with 1 in figure 7. Note! Both antennas must be connected to ensure mobile reception.
- 2 Connect the power cable to the power supply and the power supply to the customer-premises equipment, connector 9 in figure 7.
- 3 Turn the device on, switch 8 in figure 7.
- 4 Wait for **10 minutes** until the device has started.
- 5 Check the mobile network reception with the front panel indicators, indicator light 5 in figure 4.
- 6 Your connection is ready for use.
- 7 Use ports 0/1/0–0/1/3 to connect LAN devices to the firewall-protected default network (see figure 7), connectors 2.
- 8 The supplementary wireless local area network service (WLAN) uses the firewall-protected default network. The settings required using the service: The SSID and encryption key are delivered on a technical form with the delivery and can also be found on a label on the device. The wireless access point takes approximately an additional 10 minutes to start after the router starts.
- 9 If a supplementary Avoin Internet (Open Internet) service has been ordered for the subscription, it is available in all LAN ports from 0/1/0 to 0/1/3 (see figure 7), connectors 2. The IP addresses required for the supplementary Avoin Internet (Open Internet) connection service have been delivered with the technical form in connection with the delivery. The IPv4 addresses used in the supplementary Avoin Internet (Open Internet) service for LAN devices must be configured manually. If you want to distribute IPv4 addresses used in the supplementary Avoin Internet (Open Internet) service by the device's DHCP server, you must select the supplementary service Räätlöity DHCP (Custom DHCP).

Router ports

The purpose of the ports is illustrated in the figure below.

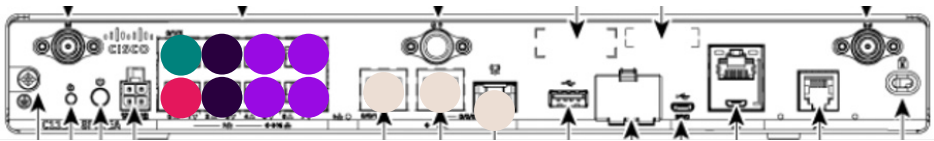


Figure 8. Router port designations for a 5G implementation

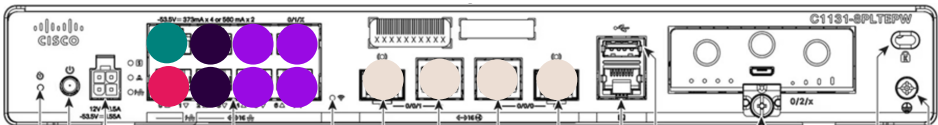
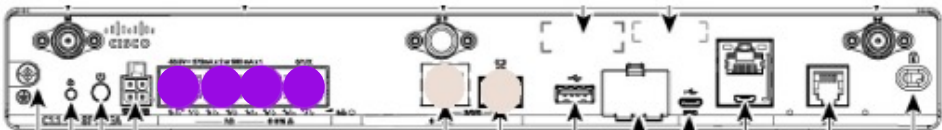


Figure 9. Cisco 1131-8PLTEPW + PoE



Kuva 10. Cisco 1117-4PMLTEW

- Port 0/1/0 is reserved for connecting the 5G outdoor unit. No LAN devices must be connected to it.
- Port 0/1/1 is reserved for an external wireless access point (supplementary service). Do not connect any local area network device to this port.
- The RJ45 10/100/1000 Ethernet ports 0/1/2–0/1/3 are intended for connecting LAN devices. The ports have PoE power supply capability.
- The RJ45 10/100/1000 Ethernet ports 0/1/4–0/1/7 are intended for connecting LAN devices. The ports do not have PoE power supply capability.
- The port is not used. Cannot be used for connecting LAN devices.

About the ports

In router models C1111 and C1131, LAN port 0/1/0 is reserved for 5G outdoor unit. No other LAN devices may be connected to it. 5G outdoor unit is not available with C1117-4PMLTEW router.

In router models C1111 and C1131, LAN port 0/1/1 is reserved for connecting an external WLAN additional base station that can be ordered as an additional service, and local network devices may not be connected to this port. Additional WLAN base station is not available with C1117-4PMLTEW router.

Ports 0/1/2–0/1/3 on the router power PoE-compliant devices. If necessary, you can connect other PoE-compliant LAN devices to these ports. The ports are also compatible with data-only connections. PoE is not available with C1117-4PMLTEW router.

Ports 0/1/4–0/1/7 are traditional RJ45 10/100/1000 Ethernet ports, with router C1117-4PMLTEW corresponding ports 0/1/0–0/1/3, and can be used to connect LAN devices to the service.

Default network and firewall

By default, the private network 192.168.200.0/24 is configured for LAN ports 0/1/x and the wireless local-area network provided as a supplementary service. This can be changed with the supplementary service Rääätälöity DHCP (Custom DHCP).

By default, the network is configured as follows:

- **Default route:** 192.168.200.254
- **Subnet mask:** 255.255.255.0
- **Static addresses available to the customer:** 192.168.200.193–192.168.200.253
- **Addresses assigned by DHCP:** 192.168.200.1–192.168.200.192 (192 addresses)
- **DNS servers:** 193.210.19.19, 193.210.19.190

If the additional Selausturva service has been ordered for the subscription, these service-specific DNS servers must be used:

- **IPv4:** 193.210.18.21, 193.210.19.21
- **IPv6:** 2001:2060:ffff::18:21, 2001:2060:ffff::19:21

The router performs a network address translation (NAT/PAT) for private IP addresses used by customer devices. Traffic from the default network is protected by a standard stateful firewall rule set that cannot be changed. All traffic from the Internet to the customer's local area network is blocked by default, but all traffic originating from the customer's network is allowed, including returning packets. The default network, address translation and firewall are enabled when no supplementary Avoin Internet (Open Internet) service is connected to the subscription.

Supplementary service: wireless local area network

If your subscription includes wireless LAN as a supplementary service, the access point used in the service is integrated into the device, and there are no external antennas.

The network name (SSID) and encryption key required for using the wireless LAN have been agreed upon in connection with the order. These details are provided in connection with the delivery using a technical form, and can also be found on a label on the device.



Figure 10. Cisco Aironet 1815i

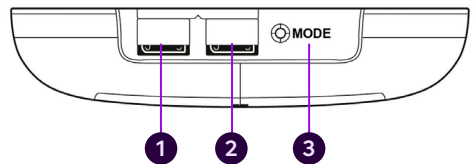


Figure 11. Cisco C9105AXI-E

When using the Internet connection over the wireless local area network, the network being used is the same firewall-protected default network that is used when connecting devices to LAN ports 0/1/x. Traffic in the wireless LAN is WPA2-encrypted. The wireless local area network supports the IEEE standards 802.11a/b/g/n/ac.

It is possible to extend the coverage area of the wireless LAN service with one additional external wireless access point. The same wireless network settings (SSID and encryption key) are used throughout the entire coverage area of the wireless network.

Figure 12. Cisco Aironet 1815i



Telia delivers the external wireless access point to the customer. **The service does not include local area network (LAN) connections or related cabling done on the customer's premises.** The external access point must be connected via the customer's LAN cabling to port 0/1/1 of the Telia-supplied router as shown in Figures 8-9.

The external wireless access point does not need separate power supply because its designated port uses PoE technology (Power over Ethernet) to supply power. The external wireless access point will be operational in approximately 1 hour and 30 minutes after the LAN connection has been made between the router and the external wireless access point. The cable is connected to port 2 of the wireless access point.

It is also possible to implement a wireless guest network as a supplementary service, in which case the guest network has its own SSID and encryption key. Internet traffic on the guest network is logically isolated from the traffic in the company's internal network.

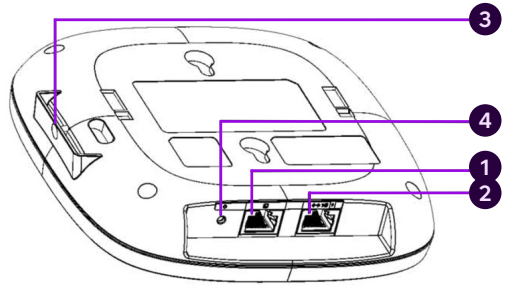
The wireless guest network is configured as follows:

Default route: 192.168.202.254
 Subnet mask: 255.255.255.0
 Addresses assigned by DHCP:
 192.168.202.1–192.168.202.253
 DNS servers: 193.210.19.19, 193.210.19.190

The router performs a network address translation (NAT/PAT) for the private IP addresses of the guest network's customer endpoint devices. No changes can be made to the IP addresses used in the guest network.

If you are using the supplementary service Avoin Internet (Open Internet), it is possible for devices in the guest network to access the devices on the internal network if adequate information security has not been ensured. If you have an external wireless access point, the visitor network is in use throughout the extended coverage area.

Figure 13. Cisco C9105AXI-E



Supplementary service: Avoin Internet (Open Internet)

The IP address details of the open Internet connection have been delivered in connection with the delivery, using a so-called technical form. In addition, the public IP addresses available are provided on the form accompanying the customer-premises equipment. An public IPv4 or IPv6 subnet is used for the open Internet connection. The number of IP addresses available depends on the customer needs. The IPv4/IPv6 addresses to be used are registered under the customer's name.

For more detailed information about the IPv4 addresses used for open Internet access, see the product's service description.

By default, the IP addresses used by the Avoin Internet (Open Internet) supplementary service are configured manually for customer devices. The Räättälöity DHCP (Custom DHCP) supplementary service makes it possible to automatically assign the IP addresses used in the supplementary Avoin Internet (Open Internet) service using the DHCP server built into the device.

Telia's name servers can be used to resolve IP addresses and network addresses. In this case, the Telia DNS servers 193.210.19.19 and 193.210.19.190 must be configured in the customer device network settings.

If the additional Selausturva service has been ordered for the subscription, these service-specific DNS servers must be used in connection with fixed public IP addresses:

—**IPv4:** 193.210.18.21, 193.210.19.21

—**IPv6:** 2001:2060:ffff::18:21,
2001:2060:ffff::19:21

The open Internet connection is fully open to the Internet and there is no port filtering in either direction. When using an open Internet connection, the customer is responsible for the connection's information security and should pay special attention to it.

Open internet access is available on ports 0/1/2–0/1/7 of the LAN switch of the client device, see figure 6, and through the wireless local area network connection available as a supplementary service.

It is also possible to enable a wireless guest visitor network with the supplementary Avoin Internet (Open Internet) service.

Supplementary service: SNMP read access

The customer can also monitor the status of its Internet access router by means of SNMP read access . Only the router part of the client device can be monitored with SNMP, no data can be obtained from the supplementary wireless local area network service with SNMP.



Customer care

Contact: telia.fi/contact-us

You can also contact Telia's customer service through the My Telia for Business at telia.fi/mtb