Telia
Yritysnetti

Installation and set-up instructions
Cisco C-1111 / C-1117 / C-1131

Contents

Thank you for choosing Telia

You have chosen a subscription that combines the best features of Telia's fixed and mobile data connections for your company. With one agreement, you get a wired and mobile Internet connection as well as information security.

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 connection and static, public IPv4 addresses.

As a supplementary service, you can use the wireless LAN built into the customerpremises equipment that supports the IEEE 802.11a/b/g/n/ac wifi standards with WPA2 traffic encryption.

If you are using both a wired and a mobile connection, the service automatically includes a back-up Internet connection: in the event of a fixed connection failure, the communication is automatically switched over to the back-up mobile data connection. Whenever this happens, you do not need to make any changes to your local area network devices, but the service will remain seamlessly available.

The service is also available as a pure mobile solution, with Internet traffic routed only through Telia's mobile data connections. You have received ready-to-use customer-premises equipment (i.e., a router), through which you can immediately connect devices on your local area network to the Internet using a mobile connection. Any fixed connection that may be included in your order (fibre optic cable/Ethernet/ADSL/VDSL) may not be completed until later; the connections required for its installation will be performed by a Telia technician.

This guide provides you with instructions on how to install the Cisco C1111-8PLTEW or C1117-4PMLTEW router included in the service and connect your devices to the network.

Telia owns the customer-premises equipment and the SIM card used with Yritysnetti subscriptions and, as the customer, you have the right to use them. Telia maintains and manages the device, and its settings cannot

Setting up the customer-premises equipment included in the service

In the Yritysnetti service, the customer-premises equipment is a Cisco router, either C1111-8PLTEW or C1117-4PMLTEW. The router model used for the subscription depends on how you connect to the Internet. You can check the model on the label located on the back of the router at the bottom left corner (see figures 3 and 6). The device also has a label indicating your subscription ID (as INNxxxxx). You will need the subscription ID when communicating with Telia. With the ID, we can find your subscription details quickly.

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. Customer instructions
6. A SIM card for the mobile connection (installed in the device and ready for use).
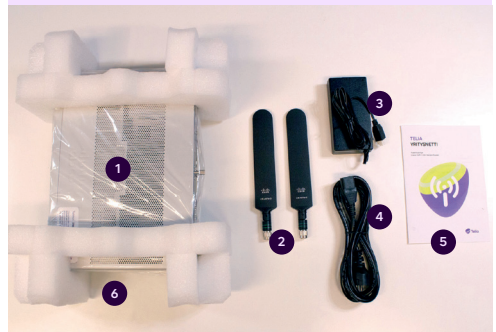

Figure 1. C1111-8PLTEW/ C1117-4PMLTEW router

Figure 2. Contents of the Yritysnetti subscription delivery package

Cisco C1111-8PLTEW

A Cisco C1111 router is used for subscriptions for which the fixed Internet connection is implemented with Ethernet or fibre optic technology, or if the connection has been implemented through a mobile data connection only.

The look, indicator lights and most important connectors of the Cisco C1111 router are presented below.

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

Figure 4. The indicator lights on the front panel of a C1111-8PLTEW/C1117-4PMLTEW 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 = Wifi 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)
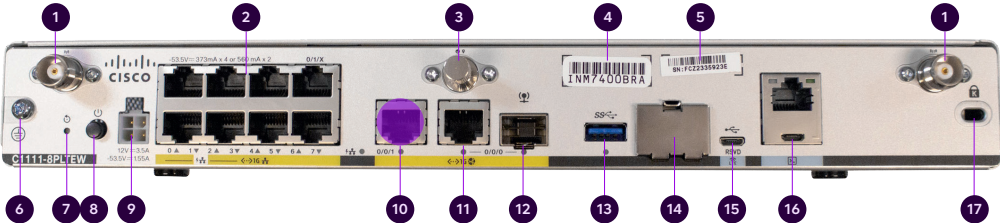
Figure 5. Interfaces on the back of a C1111-8PLTEW router, the port used for the supplementary service open Internet is highlighted in purple in the figure.

	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 customer 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 0/0/1 port	Open Internet (supplementary service), highlighted in purple
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	

C1111-8PLTEW 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 0/1/0–0/1/7 to connect LAN devices to the firewall-protected default network (see figure 5), connectors 2.

8 The supplementary wifi service (wireless local area network) uses the firewallprotected default network. The settings required for wifi use: the SSID and encryption key are delivered by e-mail using a technical form and can also be found on a label on the device. The wifi base station takes approximately an additional 10 minutes to start after the router starts.

9 The supplementary service open Internet is available through the router port GE 0/0/1 (highlighted in purple in figure 5). The IP addresses required for the open Internet connection have been delivered with the technical form in connection with the order. The IP addresses used for open Internet access are distributed using DHCP. You can also manually assign the IP addresses to use to LAN devices so that they will stay unchanged, as long as the device's network connection is active.

Cisco C1131-8PLTEPW

A Cisco C1131 router is used for subscriptions for which the fixed Internet connection is implemented with Ethernet or fibre optic technology, or if the connection has been implemented through a mobile data connection only.

The look, indicator lights and most important connectors of the Cisco C1131 router are presented below.

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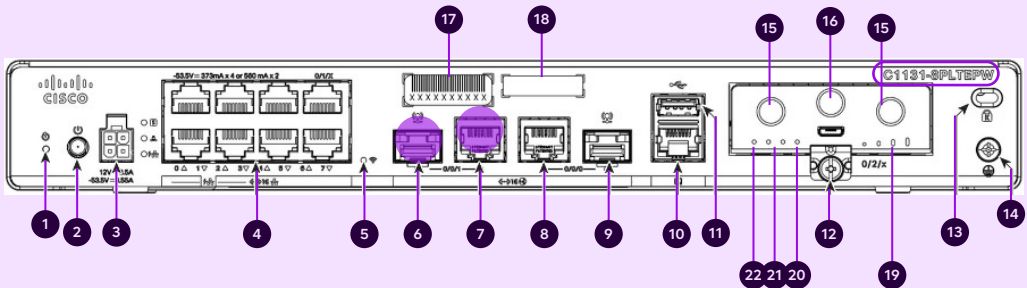
Figure 6. Interfaces on the back of a C1131-8PLTEPW + PoE router

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.

The supplementary wireless local area

8 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 Räätälöity DHCP (Custom DHCP).

Cisco C1117-4PMLTEW

The Cisco C1117-4PMLTEW router is used if the fixed Internet connection is implemented with ADSL or VDSL technology.

The look, indicator lights and most important interfaces of the Cisco C1117-4PMLTEW router are presented below.

The C1117-4PMLTEW router's front looks similar to the front of the C1111-8PLTEW router, described in the previous chapter. The indicator lights on the front panel and their interpretation are also identical. For a description of the indicators, see the previous chapter (figure 4).

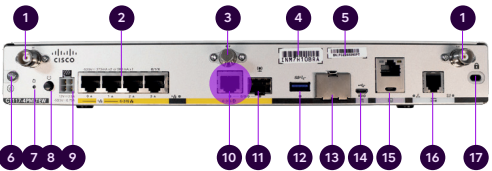**Figure 7.** Rear view of a C1117-4PMLTEW router and device model label

Figure 8. Interfaces on the back of a C1117-4PMLTEW router, the port used for the supplementary service open Internet is highlighted in purple in the figure.

	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 customer 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	Open Internet (supplementary service), highlighted in purple
11	GE 0/0/0 – SFP	SFP slot, not operational, cannot be used for LAN connections
12	USB 3.0 port	Not used
13	SIM card slot cover	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	ADSL / VDSL – WAN (internet)
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, connectors 2 in figure 7.

8 The supplementary wifi service (wireless local area network) uses the firewallprotected default network. The settings required for wifi use: the SSID and encryption key are delivered by e-mail using a technical form and can also be found on a label on the device. The wifi base station takes approximately an additional 10 minutes to start after the router starts.

9 The supplementary service open Internet is available through the router port GE 0/0/0 (highlighted in purple in figure 8). The IP addresses required for the open Internet connection have been delivered with the technical form in connection with the order. The IP addresses used for open Internet access are distributed using DHCP. You can also manually assign the IP addresses to use to LAN devices so that they will stay unchanged, as long as the device's network connection is active.

Yritysnetti 5G

Yritysnetti 5G uses the Cisco C1111-8PLTEW or Cisco C1131-8PLTEPW router. For descriptions of the indicator lights and connectors of this router, see the previous pages of this guide.

An Yritysnetti 5G subscription (XL or XXL) also includes an outdoor (IP68-rated) receiver with predetermined orientation and positioning. A Telia engineer has installed the receiver ready for you to use. Note! If necessary, the receiver can also be installed indoors.

Yritysnetti 5G implementation

The 5G outdoor unit gets the operating power it needs from an indoor Yritysnetti router via the Ethernet cable using power over Ethernet (PoE). No separate power supply is required for the 5G outdoor unit. An Ethernet cable is required between the router and the 5G outdoor unit. The cable is used to power the 5G outdoor unit and to relay customer traffic to and from the Internet.
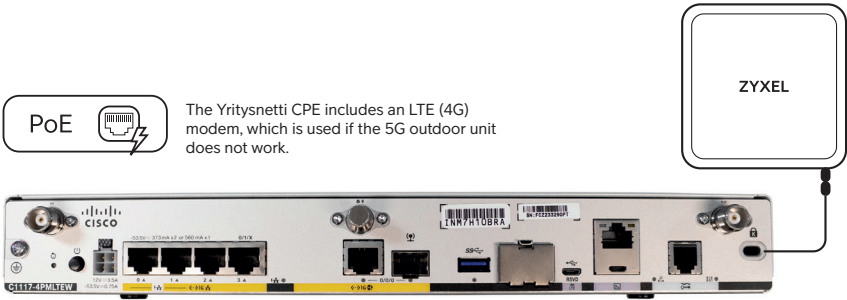
PoE

The Yritysnetti CPE includes an LTE (4G) modem, which is used if the 5G outdoor unit does not work.

ZYXEL

Figure 9. General principle diagram of the Yritysnetti 5G implementation

The maximum length of the LAN cable is 100 metres. PoE=Power over Ethernet. The Yritysnetti CPE powers the 5G unit.

The Internet connection has been implemented with a redundant back-up for the 5G outdoor unit: the Cisco 1111-8PLTEW router has integrated 4G Internet connectivity. If the outdoor unit fails, the Internet connection will be automatically established via the router's 4G modem, and you do not need to change the LAN settings.

About the ports

The router's port 0/1/0 is reserved for the 5G outdoor unit. No other LAN devices may be connected to it.

Ports 0/1/1–0/1/3 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.

Ports 0/1/4–0/1/7 are traditional RJ45 10/100/1000 Ethernet ports and can be used to connect LAN devices to the service.

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

- Port 0/1/0 is reserved for connecting the 5G outdoor unit. No LAN devices must be connected to it.

- The RJ45 10/100/1000 Ethernet ports 0/1/1–0/1/3 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.

- GE 0/1/0 The supplementary service open Internet is available through this port.

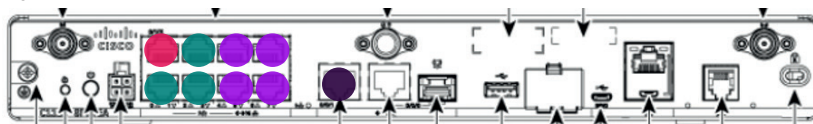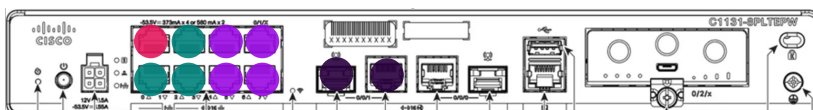**Figure 10.** Cisco 1111-8PLTEW

Figure 11. Cisco 1131-8PLTEPW

Default network and firewall

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, and it cannot be changed. 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 osoitetta)
DNS servers:	193.210.19.19, 193.210.19.190

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.

Supplementary service: wireless local area network

Figure 12
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.

Telia delivers the external wireless access point to the customer. The service does not include 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 pictures 10 and 11, page 13. 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. (Figure 13).

Figure 13
1. RJ-45 console port – not in use
2. RJ45 cable from router port 0/1/1
3. Security screw hole
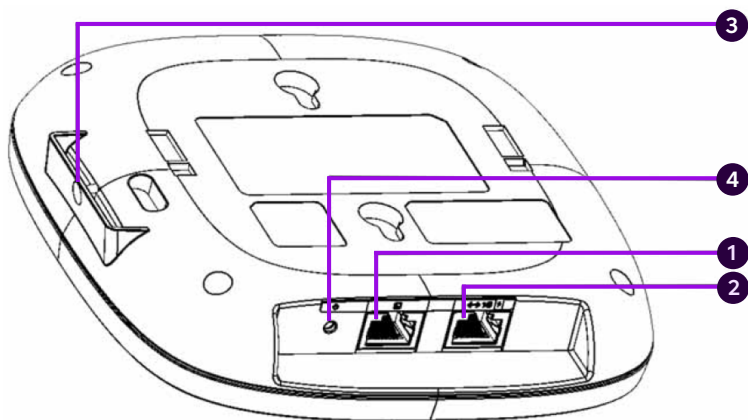4. Mode button

Figure 12. Cisco C9105AXI-E

Figure 13. Cisco C9105AXI-E

Supplementary services

Wireless local area network

If your subscription includes a 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 order using a technical form, and can also be found on a label on the device.

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.

Open Internet

The IP address details of the open Internet connection have been delivered in connection with the order, using a so-called technical form. In addition, the public IP addresses available are provided on the form accompanying the customer-premises equipment. The open Internet connection uses a public IPv4 /29 subnet, which means that public IP addresses are available for five customer devices.

By default, the IP addresses used in the open Internet service are distributed to customer devices connected to the Ethernet port specified below, using the DHCP service. The user can also assign permanent IP addresses to the customer devices used.

Telia's domain 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.

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 connection security and should pay special attention to it.

The router port that allows you to connect your device to an open Internet connection depends on the device model you are using. You can find the port information in the table below and in Figures 5 and 7 with purple highlighting.

Device model	Open Internet (public IP addresses)
C1117-4PML-TEEAWE	Gi 0/0/0
C1111-8PLTEEAWE	Gi 0/0/1
C1131-8PLTEPW	Gi 0/0/1

Note! No traffic is allowed from the subscription's open Internet connection to the firewall-protected private network.

Telia

Customer care

Contact: **telia.fi/yhteydenotto**

You can also contact Telia's customer service through
the My Telia for **telia.fi/mty**