Network specifications
- Optimizing uptime, security and quality

Purpose of this guide
By default, we will deliver a router for your VoIP solution, which will run on a dedicated internet connection. If you have chosen us to deliver the network for your solution (internet connection and router), you can ignore this guide. Some customers wish to manage their network and equipment by themselves. For those customers we have made this guide, which will explain the prerequisites and requirements for the IP-phones so we can guarantee the quality

Bandwidth
The number of concurrent calls depends on the speed of your internet connection. We recommend, that a separate internet connection is used for the phones if your current internet connection is not fast enough. This is to ensure the quality of the conversations.
One active call with an IP-phone will approximately use 100 kbps in both download and upload.
A 5/2 Mbps ADSL connection will, therefore, be able to handle 20 concurrent calls, given that the connection is not being used for anything else. Note, that ADSL connections usually do not have the same upload speed as download speed. Because of this, the lowest speed is what determines the number of concurrent calls.

If you have a fiber connection, which usually has the same speed in download and upload, we recommend that you configure QoS (Quality of Service). Doing this dedicates a certain amount of bandwidth for the phones and the rest for all other traffic. Contact your IT-provider to hear about the possibilities.

Firewall
All IP-phones must be behind a firewall with NAT. You should never configure port-forwards to the IP-phones.
It is important that the correct ports are open in your firewall, so the IP-phone system works smoothly and without interruptions.

In the firewall, the following must be configured:
· SIP Inspection of packets must be turned off. ETC. SIP ALG or similar
· UDP Timeout must be at least 300 sec. or higher.
· The IP-phones need access to a functioning DNS-server.
· All outgoing traffic on IP range should not be blocked (IP-range owned by ipnordic):
    · 185.72.208.0/22
· In case we need to monitor the uptime of your internet connection, ICMP from WAN must be allowed.

Software
In the firewall, the following should be configured as follows for you to use our software:
Outgoing TCP traffic to IP range (for specific ports, see the next page):
· 185.72.208.0/22
· 80.63.32.192/27

Integration between phone and software
To get the full functionality of our software, it is required that the PC's and the IP-phones can communicate via HTTP on port 80 & ICMP.
This means that if the telephones are being installed on a separate network, a route needs to be configured between the PC and telephone network.

Please contact us if you wish for more specific information, etc. port numbers, and if you are working with IPV6.
Please note that we reserve the right to make any changes to the above network requirements without warning.
Please note that if your network is extraordinarily secure, this document might not be sufficient.

Network requirements – Ports

Inbound established and related connections must be allowed. This is usually already configured in most routers.

Network specifications for IP-telephony

These ports must be allowed to the following IP-addresses on the phone-network:

Function	Port	IP Scope	Domain*
Provisioning of settings	80 TCP	185.72.208.0/22	config.ipnordic.dk
Provisioning of settings	443 TCP	185.72.208.0/22	prov.ipnordic.dk
Phone firmware update	80 TCP	185.72.208.0/22	firmware.ipnordic.dk
Synchronization of DND, call forward between phone and software	443 TCP	185.72.208.0/22	prov.ipnordic.dk
Basic telephone functions Basic telephone functions Basic telephone functions over TLS (encrypted calls)	5060 UDP 5060 TCP 5061 TCP	185.72.208.0/22	sip.ipnordic.dk sip.ipnordic.dk sip.ipnordic.dk
Basic telephone functions (sound)	10000-65000 UDP	185.72.208.0/22	sip.ipnordic.dk
Time synchronization of telephones	123 UDP	185.72.208.0/22	sip.ipnordic.dk

If you are using **SNOM** or Gigaset phones, the following ports must also be allowed:

Brand	Port	Domain*
SNOM	80 and 443 TCP	provisioning.snom.com
Gigaset	80 and 443 TCP	profile.gigaset.net
Gigaset	80 and 443 TCP	update.gigaset.net
Gigaset	80 and 443 TCP	prov.gigaset.net

Network specification for Wi-Fi-calling

These ports must be allowed to the following IP-addresses on the Wi-Fi-network of your mobile clients:

Port	IP Addresses	Domain*
500 UDP 4500 UDP 50 IPSEC 51 IPSEC	195.41.220.240 195.41.220.241 195.215.224.64 195.215.226.64 195.249.18.64	epdg.epc.mnc001.mcc238.pub.3gppnetwork.org

Each device using Wi-Fi-calling should be expected to use 128kbps per call. So, the bandwidth of the Wi-Fi network the mobiles are using should be configured accordingly.

To get the most out of your Wi-Fi-calls we recommend following these tips.
· Access points should have overlapping Wi-Fi coverage.
· Access points should be configured with the same SSID.
· Access points should be running on the same frequency band on 5 GHz (2.4 GHz is not recommended).
· SSID must have same subnet on all access points.

Network specification for ipnordic-software

These ports must be allowed to the following IP-addresses on the data network.

Software	Port	IP Scope	Domain*
Communicator software (PC)	4058 TCP	185.72.208.0/22	win9.ipnordic.dk win10.ipnordic.dk win11.ipnordic.dk win13.ipnordic.dk win14.ipnordic.dk win15.ipnordic.dk win16.ipnordic.dk

Software	Port	IP Scope	Domain*
Mobil Communicator Communicator software (PC)	443 TCP	185.72.210.100	lb-prod.ipnordic.dk

*Please note: Some domains points to more than one IP-address. The specific IP-address that a domain is pointing at, might change without further notice.
Due to the continuing maintenance of servers, the above information is subject to change.
You are always welcome to contact us for the latest technical information about the ports.