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Thinking e-mobility

FLOATBRIDGE

IT-Network

Setup, Operation, Basics and Forms

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REQUIREMENTS FLOATBRIDGE NETWORK

Floatbridge Network

This document explains in a simple way how the network is structured, how the devices are connected and how everything works together. It is intended not only for IT or electrical professionals, but also for people without any technical background, so the network is easy to understand.

The IT network is the core of every modern charging infrastructure. For the Floatbridge load management system to operate reliably, all devices must be able to communicate with each other. The Connect-Box, charging stations, energy meters, as well as routers and switches must all be connected through the network.

This network forms the foundation for data exchange between all devices. If the network is properly planned and built correctly, the devices can communicate reliably. Data is transmitted accurately, devices are clearly identified, and the entire system runs in a stable way. A well designed network also simplifies commissioning, day to day operation, and future expansions.

Minimum requirements

Network:
- Network cables Cat5e or higher
- RJ45 connectors
- Gigabit capable switch or router with sufficient ports

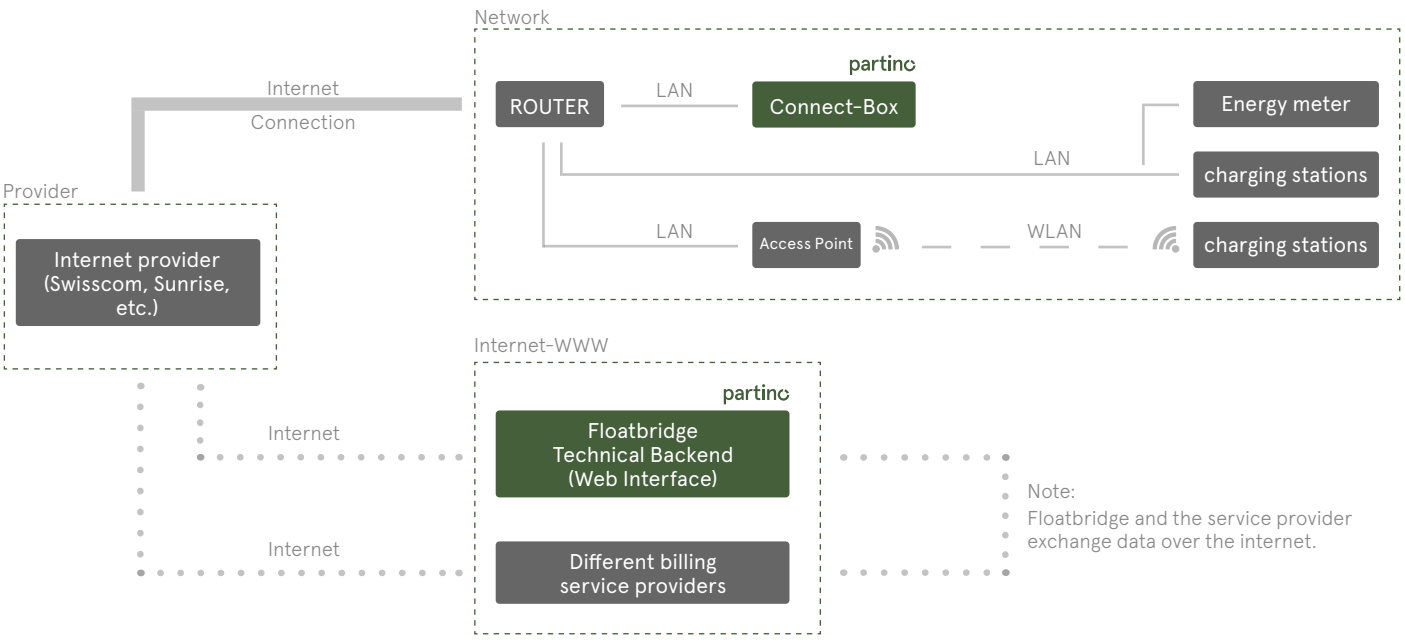
IP addresses:
- DHCP for charging stations
- Static for Connect-Box and energy meters

WLAN:
- Optional only, must be stable
- Proper channel planning when using multiple access points

Communication:
- All devices must be able to reach each other

- Connectivity:
  Speed 100 or 1000 Mbit per second

Communication and connection flow



NETWORK STRUCTURE

Structure and variants

The Floatbridge can be configured in different ways. The variant used depends on the size of the system and the existing IT environment.

Local network

A local network includes all devices at a single location that operate behind the same router. All devices are within the same IP address range and can communicate directly with each other. *(see image a)*
"A local network is like a multi socket for data." IP addresses are usually assigned automatically via DHCP*. This variant is easy to implement. *(for more details, see page 6)*

Application for:
- Small to medium sized systems
- Low IT infrastructure
- One router / one network
- Simple operation

Characteristics:
- One router
- One IP range
- All devices can see each other directly
- Low configuration effort

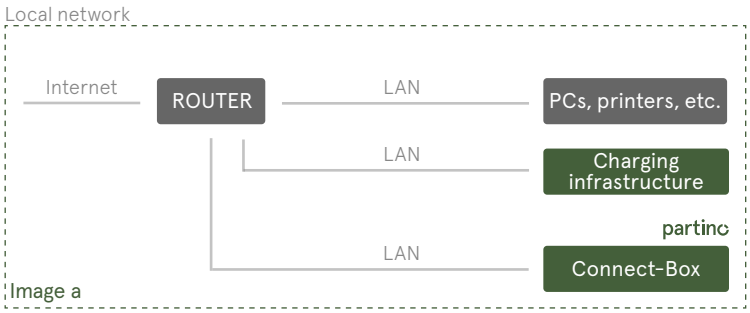


Image a

VLAN/subnet

A subnet is a logical division of a local network into several separate IP ranges.
Physically, devices remain connected to the same network, but logically they are separated from each other. Each subnet has its own IP range. *"A VLAN/subnet is like multiple rooms in the same building. All are in the same house, but the doors between them are controlled." (see image b)*
Communication between subnets takes place via router or firewall and must be explicitly permitted.
VLANs/subnets are used in larger systems with multiple building areas or increased security requirements. *(for more details, see page 7)*

Application for:
- Large systems
- Multiple buildings or areas
- Higher security requirements
- Integration with existing company IT infrastructure

Characteristics:
- Multiple IP ranges
- Logical separation of devices
- Communication only via router or firewall
- More planning effort but higher control

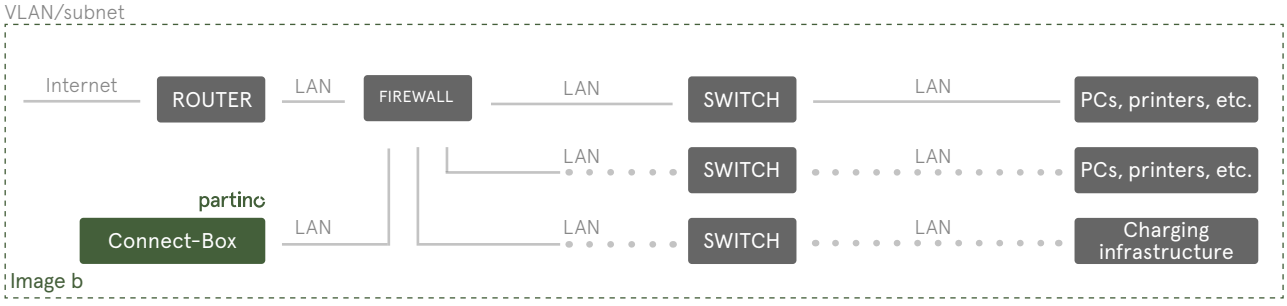


Image b

***DHCP (Dynamic Host Configuration Protocol)**
DHCP automatically assigns an IP address to devices, so no manual configuration is needed.
Connect the charging station to the network and it will automatically receive an IP address.

NETWORK - COMPONENTS

Introduction to the legend

This legend provides an overview of the charging infrastructure and the associated network components. It shows at a glance which components are present and what functions they provide. The goal is to clearly present the structure and networking of the Floatbridge infrastructure and to simplify planning and operation.

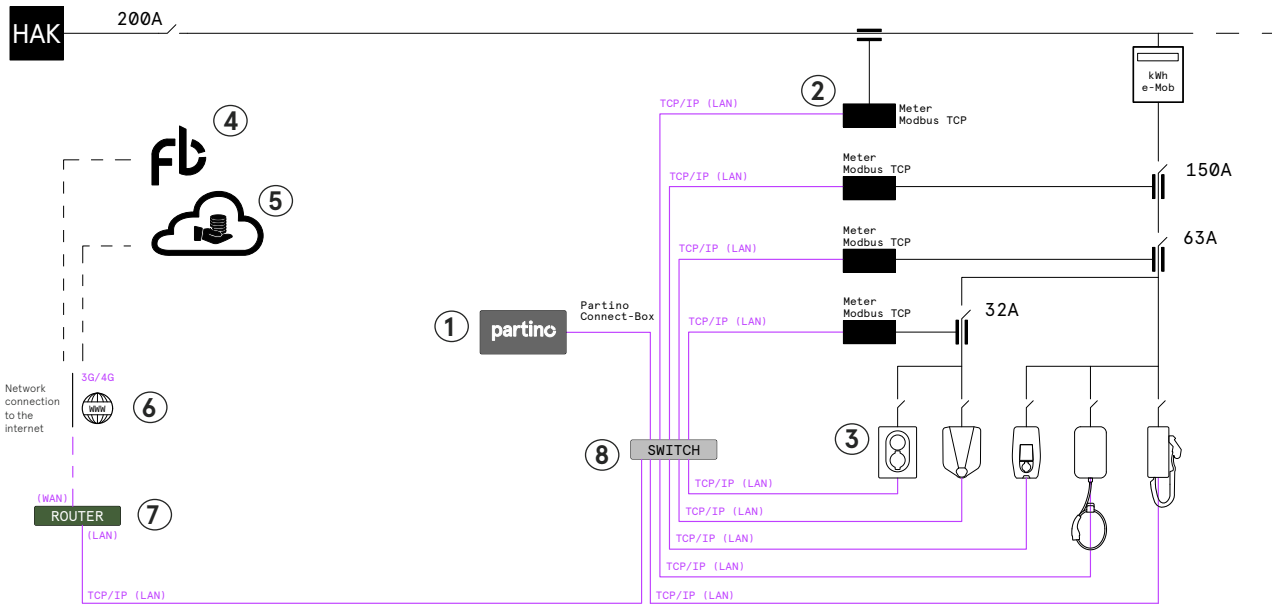
Legend – Charging infrastructure components

1. Connect-Box	(Partino Server) = Communication interface between charging stations, energy meters, billing service providers and third party systems
2. Energy meter	Monitoring of electrical circuits (measurement of energy consumption)
3. Charging stations	Manufacturer-independent charging stations (OCPP)
4. Floatbridge	WEB Interface (technical Backend)
5. Backend	Various billing service providers

Legend – Network components

6. Fixed connection	Main connection from the internet provider, for example Swisscom, Sunrise, etc.
7. Router	Internet-Box
8. Switch	Connects multiple devices in the local network and distributes data
9. AccessPoint*	Connects devices wirelessly (WiFi) to the network (optional)*
10. Firewall*	Protects the network against unauthorised access (optional)*

Topologie - Floatbridge



Optional, see pages 8-9 for the Access Point and Firewall

LOCAL NETWORK

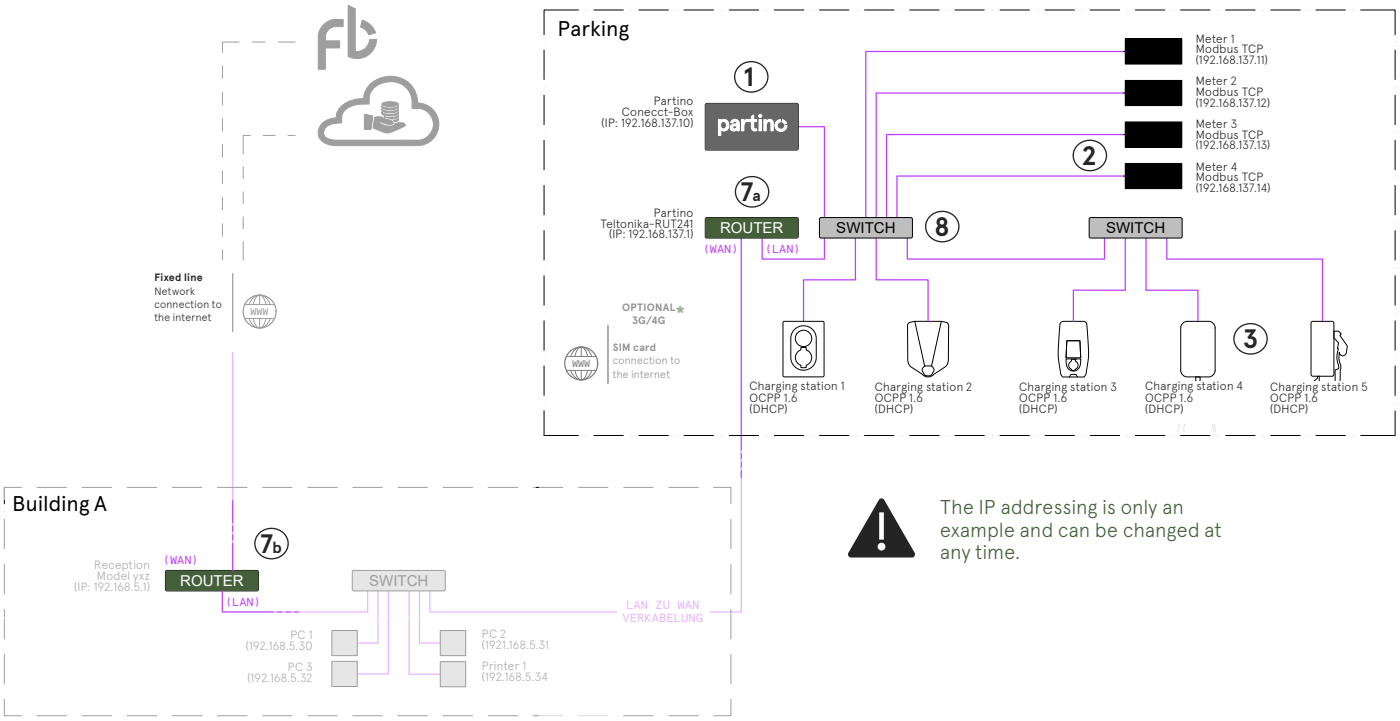
Local network with internet connection (fixed line)

For smaller or individual installations, a local network, also called a private network, is usually sufficient and operated via a router (7a) (for example Teltonika RUT241 / Partino Art. 3000431).
All components Connect-Box (1), energy meters (2), switches (8) and charging stations (3) are connected via this router. The router assigns IP addresses, manages data traffic and can be connected to the internet via a second router (7b) (LAN to WAN).

Advantages of this solution:

- Simple setup and maintenance
- No dependence on external IT infrastructure
- Direct control over all devices
- Ideal for small to medium sized systems

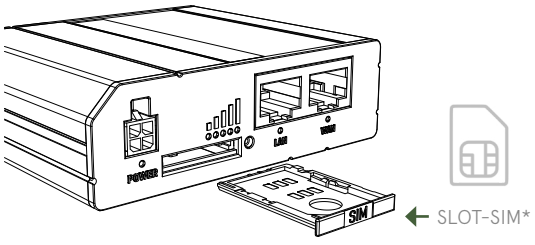
Topology – Local network



The IP addressing is only an example and can be changed at any time.

Local network with internet connection (3G / 4G / LTE)*

Thanks to the integrated SIM card slot, the router can connect the system directly to the internet without requiring a fixed line connection. This means the system is immediately online and can be monitored remotely, and settings can be changed.



VLAN/SUBNET CHARGING INFRASTRUCTURE

Own VLAN/subnet and mixed VLAN/subnet at a glance

For larger charging installations, a single network is often not sufficient. Therefore, the charging infrastructure is divided into subnetworks. A subnet is a part of the network with its own IP addresses that organizes data traffic. A VLAN (Virtual Local Area Network) is a virtual network segment that separates devices from each other, even if they are connected to the same physical network, like an invisible wall. VLANs and subnets are often used together to operate the charging infrastructure securely and in a structured way.

Dedicated VLAN/subnet = Dedicated network used only for the charging infrastructure *(see image a)*
Mixed VLAN/subnet = Charging infrastructure distributed across multiple existing networks *(see image b)*

Dedicated VLAN/subnet – charging infrastructure

With a dedicated subnet, the entire charging infrastructure is operated within its own network segment. All charging stations and energy meters are located in the same subnet. The Connect-Box is also connected within the same *VLAN/subnet* as the firewall and router to ensure smooth communication. Even with a dedicated *VLAN/subnet*, the router and firewall must be configured correctly so that all devices are reachable and the internet connection works properly. This network segment is used exclusively for the charging infrastructure. Other devices such as office computers, printers, or WiFi are not included. This separation keeps the charging infrastructure clear, stable, and easy to maintain. This approach is recommended for newly built installations or when a clear separation from the existing IT environment is desired. *(for more details, see page 8)*

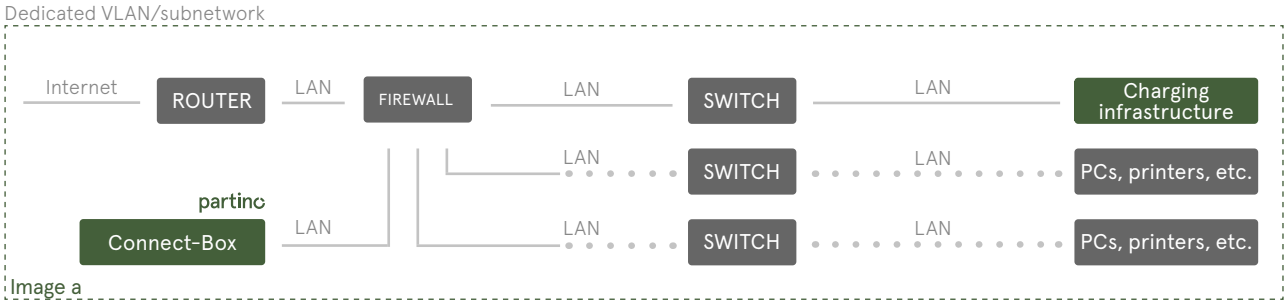


Image a

Mixed subnet – charging infrastructure

With a mixed subnet, the charging infrastructure is distributed across multiple existing network segments. Charging stations and energy meters are located in different subnets. The Connect-Box is connected to the same subnet as the firewall and router to ensure communication between the different areas. Communication between the network segments takes place via router or firewall and must be configured accordingly. This setup is used when existing network structures are to be reused or when the charging infrastructure is physically distributed. The planning and configuration effort is higher than with a dedicated subnet. Clear documentation of the individual network segments is essential.
(for more details, see page 9)

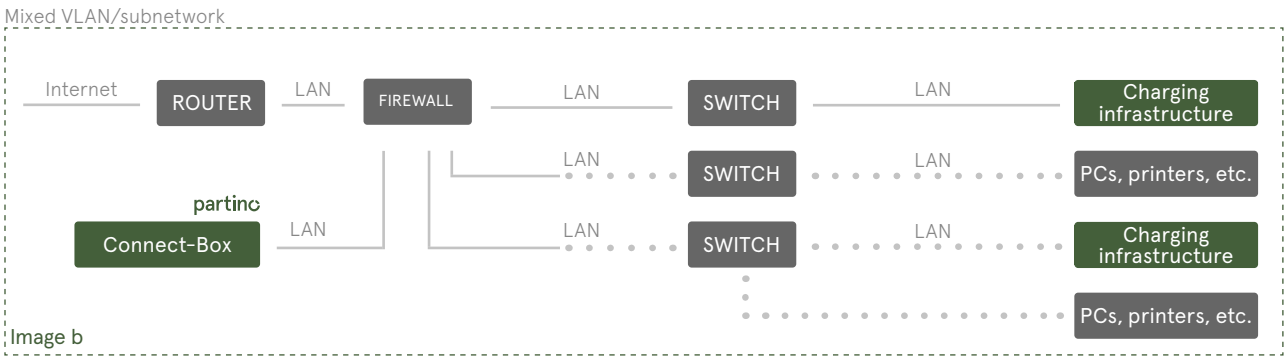


Image b

DEDICATED SUBNET FOR CHARGING INFRASTRUCTURE

With a dedicated subnet for the charging infrastructure, it is recommended to operate charging stations (3) and energy meters (2) in separate VLANs/subnets. Additional charging stations and energy meters can be added, but they must always remain within the same VLAN/subnet.

To ensure reliable communication, routers (7), firewalls (10), the Connect-Box (1), and switches (8) must be correctly configured by an IT specialist. A consistent IP addressing scheme, proper VLAN assignment, thorough documentation and final testing ensure the accessibility and functionality of the entire infrastructure.

Examples of subnets:

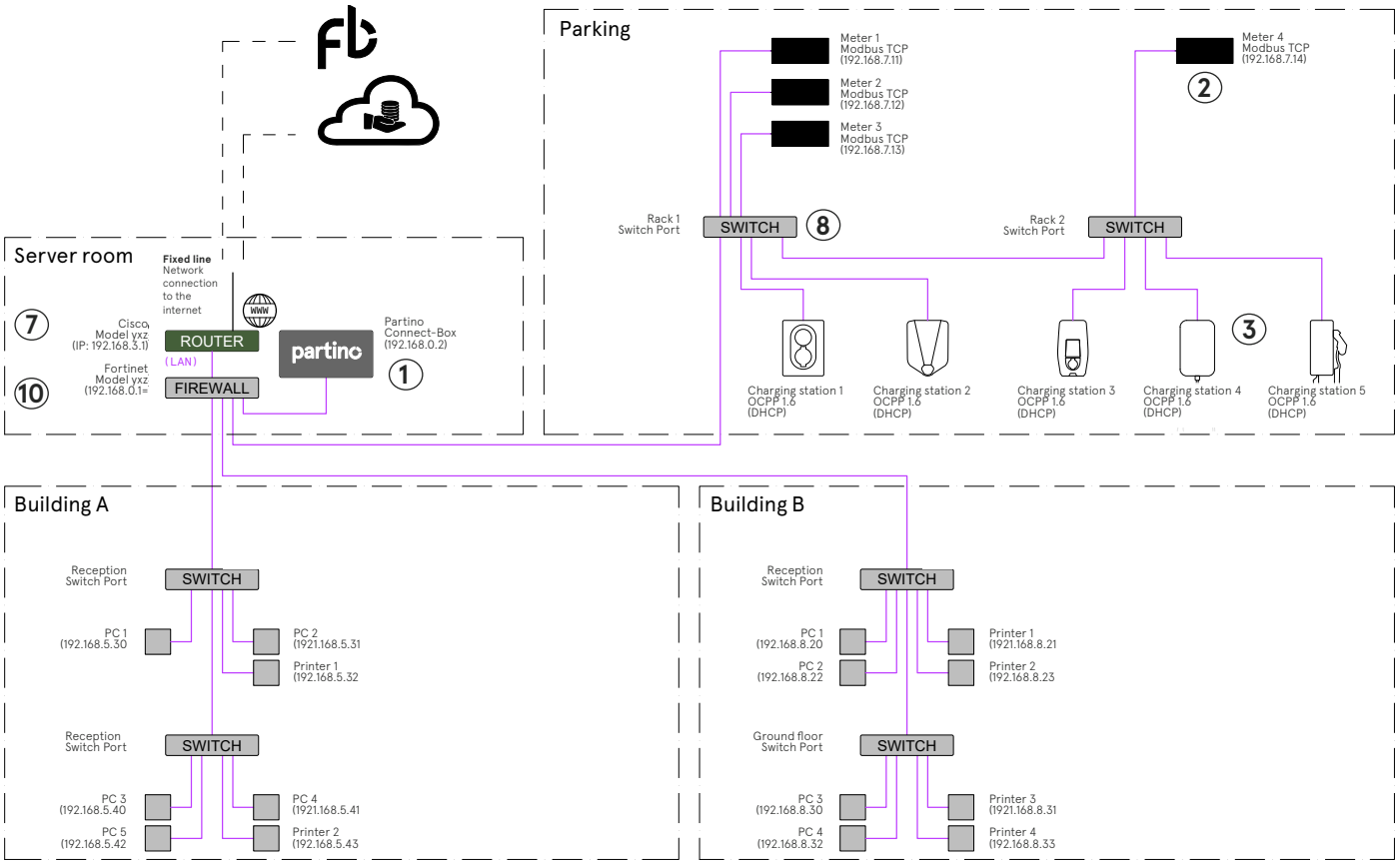
- Building A: 192.168.8.xxx
- Building B: 192.168.5.xxx
- Parking charging stations: 192.168.7.xxx

The IP addressing is only an example and can be changed at any time.

Each device requires a unique IP address, which acts like a **"telephone number"** in the network. Devices that need to be permanently accessible, such as energy meters (2) or the Connect-Box (1), must be assigned static IP addresses, while charging stations (3) can obtain an IP address automatically via DHCP*.

Topology – dedicated subnet for charging stations and energy meters

The topology shows the network structure with VLANs for each building or the parking area, managed via a central router (7) and a firewall (10) in the server room. Each VLAN/subnet logically separates the areas, while the router forwards traffic between them and the firewall restricts access to authorized connections.



***DHCP (Dynamic Host Configuration Protocol)**
DHCP automatically assigns an IP address to devices, so no manual configuration is needed. Connect the charging station to the network and it will automatically receive an IP address.

MIXED SUBNET CHARGING INFRASTRUCTURE

With a mixed subnet for the charging infrastructure, charging stations (3) and energy meters (2) can be flexibly distributed across different VLANs/subnets. Additional charging stations and energy meters can also be added in the various areas.

To ensure reliable communication, routers (7), firewalls (10), the Connect-Box (1), and switches (8) must be correctly configured by an IT specialist. Consistent IP addressing, proper VLAN assignment, thorough documentation, and final testing ensure the accessibility and functionality of the entire infrastructure.

Examples of subnets:

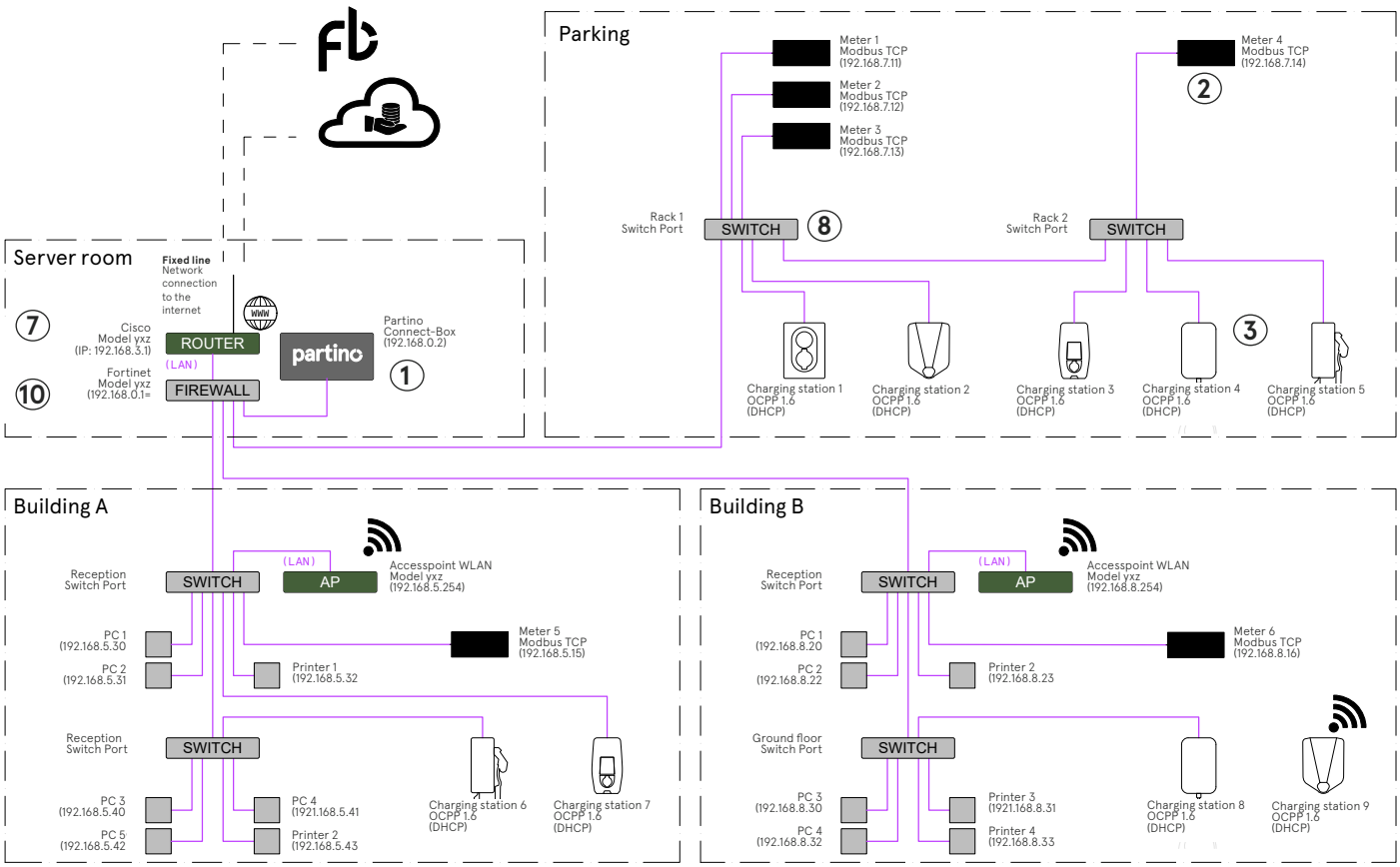
- Building A: 192.168.8.xxx
- Building B: 192.168.5.xxx
- Parking charging stations: 192.168.7.xxx

The IP addressing is only an example and can be changed at any time.

The setup should be carried out by an experienced IT professional. This includes consistent assignment of IP addresses, correct VLAN mapping, clear documentation, and final testing.

Topology – mixed subnet for charging stations and energy meters

The topology shows that in a mixed subnet, charging stations (3) and energy meters (2) can be flexibly distributed across all VLANs. Individual measurement points or charging points can be expanded or moved independently of each other. The charging stations can be installed freely and do not require additional configuration via DHCP*. For energy meters, a new IP address must be assigned after relocation.



***DHCP (Dynamic Host Configuration Protocol)**
DHCP automatically assigns an IP address to devices, so no manual configuration is needed. Connect the charging station to the network and it will automatically receive an IP address.

FLOATBRIDGE NETWORK ACCESS REQUEST FORM

Project data

Please complete this form in full to ensure efficient integration.

The setup should be carried out by an experienced IT professional. This includes consistent assignment of IP addresses, correct VLAN mapping, clear documentation and final testing.

Applicant / Installer	
Client / Department	
Location(s)	
Date of application	

Network segments

Please enter the relevant network segments in this form to ensure proper communication between the devices. For each network, specify the subnet or VLAN as well as the associated gateway.

Area	Subnet / VLAN	Gateway
Source network (Connect-Box)		
Destination network 1 (charging station / meter)		
Destination network 2 (charging station / meter)		

DHCP

DHCP enabled: ☐ Yes ☐ No (Vool boxes only support DHCP; special solution possible). If No, please fill in the IP list. It must be ensured that IP addresses for the Connect-Box as well as the energy meters are exclusively reserved for these devices.

Security approval

Designation	Yes / No	
Firewall adjustment required	☐ Yes	☐ No
Routing adjustment required	☐ Yes	☐ No
Approval by IT security	☐ Yes	☐ No

Send form by email | Print form as PDF

OUTGOING CONNECTIONS CONNECT-BOX

Port forwarding

For correct operation of Floatbridge, connections on specific ports must be allowed.

No port forwarding needs to be configured. The Connect-Box does not need to be reachable from the outside. The following outbound connections must not be blocked.

Host	Protocol	Ports
torizon.io	TCP, TLS	443, 2222
amazonaws.com	TCP, TLS	443
mongodb.net	TCP, TLS	27017
docker.io	TCP, TLS	443
docker.com	TCP, TLS	443
azure.net	TCP, TLS	443
microsoftonline.com	TCP, TLS	443
azurecontainer.io	TCP, AMQP, TLS	5672
cloudflare.com	NTP	123
NTP (Zeitserver)	UDP	123
DNS	DNS	53

In addition, any billing service providers for the charging stations must be allowed.

If the billing system from Partino is used, the following host must be whitelisted.

LMS Backend

Host	Protocol	Ports
evc-net.com	TCP, TLS	80, 443

VOOL LMC

Host	Protocol	Ports
vool.com	TCP, TLS	443

MODBUS METERS

Host	Protocol	Ports
Siemens / ABB / etc.	Modbus TCP	502

TROUBLESHOOTING

Network

Router:

- Responsible for the connection between VLANs/subnets.
- Check correct IP addressing and subnet assignment.
- Set up routing between VLANs so that devices in different areas can communicate with each other.
- Check DHCP settings if devices are supposed to receive IP addresses automatically

Firewall:

- Release ports required for communication (e.g. Modbus TCP for energy meters, OCPP for charging stations).
- Configure rules so that only authorized devices have access.
- Set up VPN or secure remote connections if remote maintenance is required.

Connect-Box:

- Must be able to communicate with all VLANs/subnets.
- Assign a static IP address so it remains permanently reachable.
- Verify that all connected devices are correctly detected.

Switches:

- Check correct VLAN assignment per port.
- Test connection to router and other switches.
- For managed switches, configure QoS or prioritization if necessary so that important data packets are transmitted with priority.

General notes:

- Consistent IP addressing and documentation of all devices.
- Ensure that routers, firewalls, and switches are compatible and support VLAN and routing configurations.
- After setup, perform tests to verify that all devices are reachable.