



Sennheiser MobileConnect

User Guide for the

IT Administrator



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About the Product

Sennheiser MobileConnect is an Assistive Listening solution. The system streams audio content via WiFi live and in superior quality to any mobile device. Following the Bring-Your-Own-Device concept, it is an easy-to-use and intuitive Assistive Listening system. Costs and maintenance effort for operators are kept at a minimum. MobileConnect is optimized for use in higher education institutions.

The MobileConnect system consists of three components: the MobileConnect Station, the MobileConnect Manager, and the MobileConnect App. The MobileConnect Station is integrated into the existing campus network and distributes the audio content via WiFi to the MobileConnect App on the user's personal smartphone. With the MobileConnect Manager, all MobileConnect Stations in the network can be conveniently administered and remotely managed from anywhere on the campus.



You have access to the following documents:

MobileConnect User Guide for the IT Administrator

MobileConnect Network Whitepaper

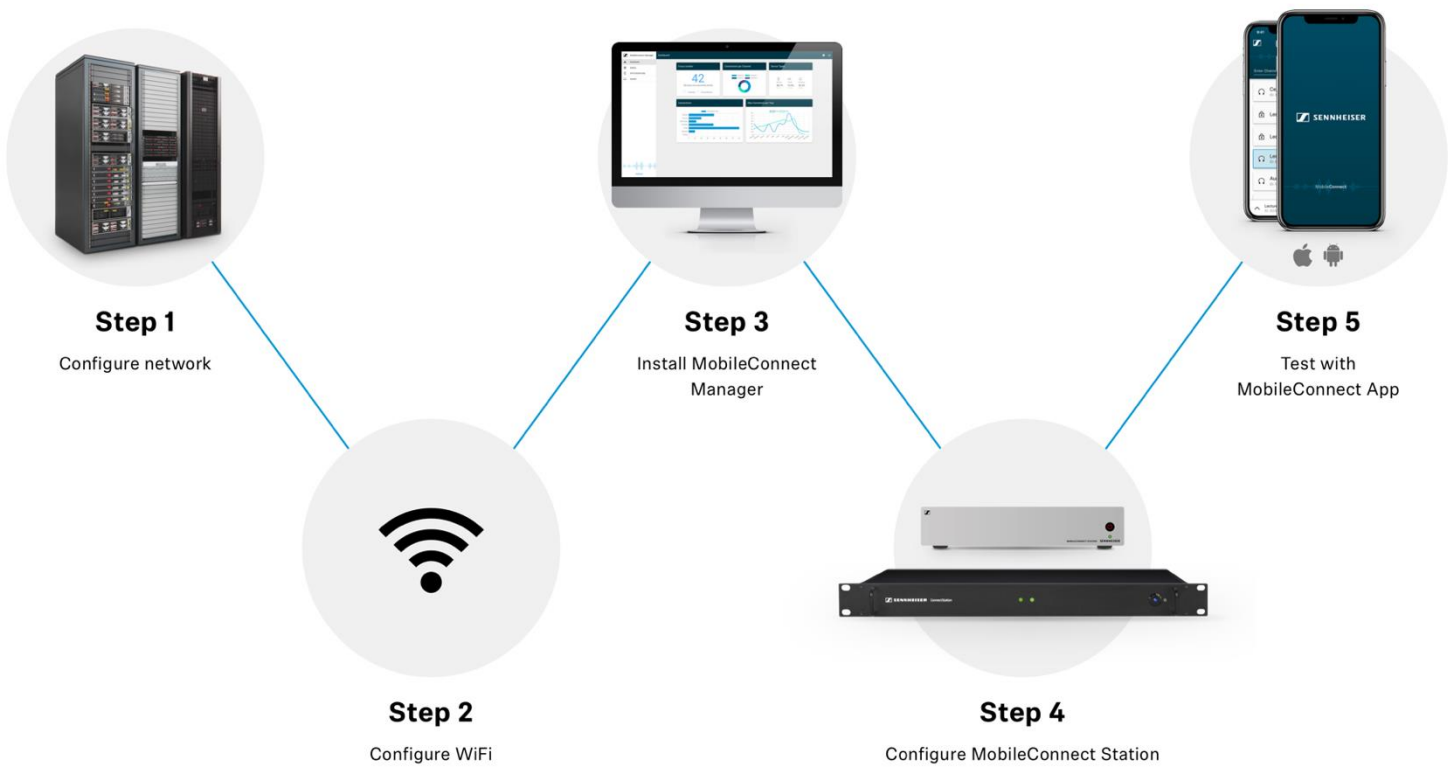
MobileConnect WiFi Whitepaper

MobileConnect Station Quick Guide (also provided with the hardware)



Quick Setup

You can configure the MobileConnect system in 5 steps:





Step 1. Configure your network

You can use one single network or two separate networks for streaming and control (for more see section [Network Setup](#)). In both cases, you need to configure the following in **each network**:

DNS

The system needs a single SRV record of `_mcal._tcp` per network, which points to the MobileConnect Manager. You need to provide your own DNS server. The following example shows the configuration needed for a DNS server, adapt it to your DNS server in use.

Service Name	TTL	Class	Type	Priority	Weight	Port	Target
<code>_mcal._tcp.yourdomain.com</code>	3600	IN	SRV	0	0	8000	<code>mc-manager.yourdomain.com.</code>
<code>mc-manager.yourdomain.com</code>	3600	IN	A				<i>IP address of mc-manager</i>

- Replace "*yourdomain.com*" with your own domain
- Use FQDN and not a direct IP address for the SRV "Target"
- The target hostname "mc-manager" can be replaced with any hostname you want to give to the MobileConnect Manager. Above you can see an example of the A record.

DHCP

The following DHCP settings are required so that the MobileConnect Apps and the MobileConnect Station can discover the MobileConnect Manager:

- For Android → configure the "Domain name" option of the DHCP protocol (DHCP Option 15). Android ignores the "Search Domains" option (DHCP Option 119).
- For iOS → if you only use one search domain, set the "Domain Name" option of the DHCP protocol. If you use multiple search domains, the domain must be also set in the "Search domains" option.
- The MobileConnect Station respects both options "Domain Name" and "Search Domains".



Step 2. Configure your WiFi

Configure traffic prioritization on your Access Points:

- streaming uses **DSCP EF** value
- control uses **DSCP CS3** value

Without prioritization you cannot achieve good audio quality and low latency. We strongly advise not to use MobileConnect without it.

Step 3. Install the MobileConnect Manager

The MobileConnect Manager is a dockerized application which you need to install on a Linux server, accessible in your network. It runs on **Linux x86-64 (amd64), Ubuntu 20.04.x**, the steps provided below are for this Ubuntu version.

The MobileConnect Manager requires Internet access for its **installation** as well as **operation**.

A. First, select your **hardware**:

Minimum hardware requirements

- CPU with 4 cores
- Regular (not boost) clock speed on all cores at least 2.4 GHz
- 8 GB of RAM
- 200 GB of hard drive space

Recommended hardware requirements

- CPU with 8 cores
- Regular (not boost) clock speed on all cores at least 3.0 GHz
- 16 GB of RAM (or more)
- 500 GB of hard drive space



B. Install **Ubuntu 20.04.x**

- You can choose between **Ubuntu 20.04, Desktop or Server** version, in **64-bit architecture**

You can find them here: <https://releases.ubuntu.com/20.04/>

- The kernel version for **Ubuntu 20.04** must be at least 5.4.0-33. You can check it with the command:
- If the kernel version is lower, you need to update it with:

```
uname -r
```

```
sudo apt update
sudo apt upgrade
reboot
```

C. Configure the **hostname** → you can use "mc-manager" or any of your choice.

- Make sure it matches your DNS configuration (see [Step 1. Configure your network](#)).

D. Install **docker** and **docker-compose**:

- The Manager supports docker version 19 or higher and docker-compose version 1.22 or higher.
- **Install docker and docker-compose on Ubuntu 20.04:**
 - First uninstall old versions with:

```
sudo apt remove docker docker.io containerd runc
sudo snap remove docker docker-compose docker.io runc
```

- This command will remove existing packages or show a warning if such packages cannot be located. You can ignore the warning.
- Install the desired docker and docker-compose versions with:

```
sudo apt install docker.io docker-compose
```

- You might be asked to restart services during the installation, select "Yes".
- **Note: do not install using snap.**
- **Create a docker group.** If a warning is shown that the group already exists, you can ignore it.

```
sudo groupadd docker
```



- Add your user to the docker group and reboot.

```
sudo usermod -aG docker $USER
sudo reboot
```

For more information on managing docker as a non-root user, see here:

<https://docs.docker.com/engine/install/linux-postinstall/>

- Enable the docker service to start at boot.

```
sudo systemctl enable docker
```

For more information about installing docker and docker-compose, see here:

<https://docs.docker.com/install/linux/docker-ce/ubuntu>

<https://docs.docker.com/compose/install>

E. Obtain the MobileConnect **Manager installation package**:

- First you need to create a MobileConnect account as described in [Create an Account](#).
- Then register and obtain your Manager following the steps in [Register a Manager](#).

F. **Install** the MobileConnect Manager:

- Create an installation directory with a name/path of your choice. We recommend installing as a normal user in your home directory.

```
mkdir /home/$USER/mcmanager
```

- Copy the MobileConnect Manager installation package which you obtained in the previous step to the installation directory.

```
cp MobileConnectManager.zip /home/$USER/mcmanager
```

- Enter the directory.

```
cd /home/$USER/mcmanager
```

- Extract the archive.

```
sudo apt install unzip
unzip MobileConnectManager.zip
```




- Set your database password as local environment variable.

The password must be at least 8 characters long and contain characters from three of the following four sets: Uppercase letters, Lowercase letters, Base 10 Digits and Symbols.

```
export SA_PASSWORD='MyPass123'
```

- **If you use special symbols, make sure the password is enclosed with single quotes.**
 - An environment variable is set, run all docker-compose commands in the same terminal.
 - **Make sure you keep the password. You will need to export it for every call to docker-compose you do (for example when starting or shutting down the Manager or when upgrading the MobileConnect Manager in the future).**
- Install and run the MobileConnect Manager with:

```
docker-compose pull  
docker-compose up -d
```

- Wait for 3 to 5 minutes until the initialization of the MobileConnect Manager is completed.
- Open a browser and navigate to the URL you configured for your MobileConnect Manager, e.g. *https://mcmanager.yourdomain.com*.
 - The MobileConnect Manager web interface is using a self-signed certificate, you need to accept it to access. You can install your own certificate, for more information see [Installing a Custom SSL Certificate](#).
 - Currently the Manager supports the Chrome and Firefox browsers.
- Login with the credentials you used when registering your account (see [Create an Account](#)). The MobileConnect Manager is now ready to use.



Step 4. Install the MobileConnect Station

There are two versions of MobileConnect Station (MCS) hardware:

MCS v1



MCS v2



In order to use a MCS v1, you need to upgrade its firmware. For details, see section [Upgrading a legacy MobileConnect Station](#).

- Connect your MCS to the network
 - Use **LAN2** (MCS v1) or **PoE/Stream** (MCS v2) port to connect your streaming network.
 - Use **LAN3** (MCS v1) or **Ctrl** (MCS v2) port optionally to connect a second network for configuration. If you do not wish to use a separate network, and the port is not connected, the system will use the streaming network for control as well.
 - **Note:** The network ports use DHCP by default. To configure a static IP using the local admin interface see [Configure Your Station Using the Local Admin Interface](#).
- Connect your audio inputs
 - For MCS v1 you can connect any of the four analog inputs.
 - For MCS v2 you can use the analog or Dante inputs.
- Power on
 - For MCS v1 press the power button.
 - For MCS v2 connect the PoE port.
- Check the MobileConnect Station in your Manager web interface.
 - Open the MobileConnect Manager interface (e.g. at <https://mc-manager.yourdomain.com> or <https://your-manager-hostname>).
 - Your MobileConnect Station should be shown in the Stations list.
 - Depending on the firmware version you may be required to update it and authorized it. For more information see [Security & Authorization](#).

For more advanced features see section [Manager and Station configuration](#).

- In case of problems, see section [Troubleshooting](#).



Step 5. Test with the MobileConnect App

- Install the **Sennheiser MobileConnect** App from the Apple AppStore or Google PlayStore.



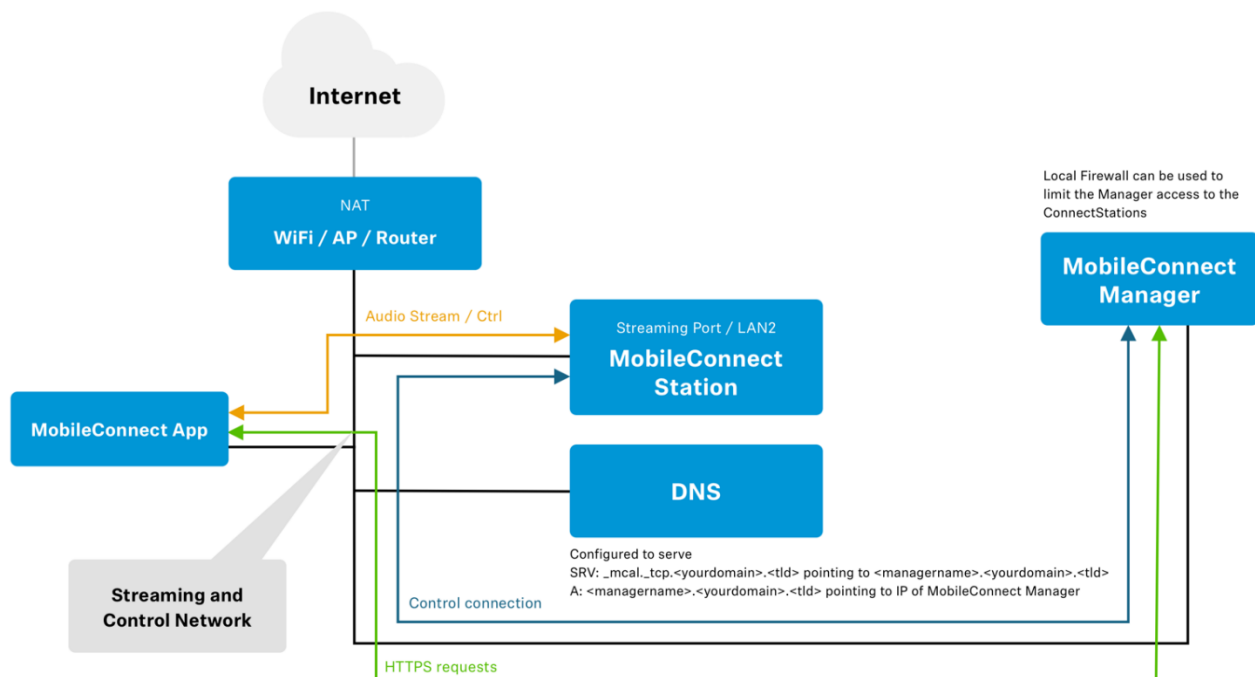
- Connect to the user WiFi network.
- Start the app.
- You should see a channel list and be able to select a channel and stream audio.
- In case of problems, see section [Troubleshooting](#).



Network Setup

The MobileConnect system supports several network scenarios, described in detail in the [MobileConnect Network Whitepaper](#). You can choose the most suitable one for your network architecture. Below you can find the simplest setup using a single network for streaming and control.

- Streaming network - used for the public devices
- Control network - used for control of the MobileConnect Station and access to the MobileConnect Manager web interface



The MobileConnect system also supports **NAT** and **Eduroam**.

More advanced scenarios and recommendations are covered in detail in the Network Whitepaper, such as:

- Using two separate networks for streaming and control, for better network separation and improved security. **Make sure the two networks use different IP ranges.**
- Add a proxy to limit access to the MobileConnect Manager



- Firewall recommendations

The MobileConnect Manager requires the following ports to be open:

- Port 8000 needs to be accessible from the mobile clients.
- Port 80/443 needs to be accessible from the MobileConnect Station and the systems used to access the Manager interface.
- Port 8383 needs to be accessible from the MobileConnect Station.

The MobileConnect Station requires the following ports to not be filtered:

- Port 8005, incoming, TCP
- Port range 3200 to 3400, UDP



Manager Access Management

The MobileConnect Manager is running on premise in your network. This section explains how to register a new Manager and manage the roles of its members.

Create an Account

First you need to create an account in order to register and later access a MobileConnect Manager for your organization.

- Go to the MobileConnect Accounts portal at <https://accounts.sennheiser-connect.com/>
- Click “Sign up”.
- Enter your email address and click “Send verification code”.
- Enter the verification code that was sent to you by email into the “Verification code” field and click “Verify code”.
- If you did not receive a code after 10 minutes via email you should check your spam folder. To receive a new code, click “Send new code”.
- Enter and confirm your password.
- Enter your name.
- Accept the terms of use and the privacy policy.
- Click the “Create” button.

You will now be automatically logged into the MobileConnect Accounts portal. There you can do the following:

- View the MobileConnect documentation
- View/edit your Profile
- Configure your Manager and its members

You can invite additional members to your Manager. This feature is supported only for Manager version 1.2.0 and higher. For more see [Managing Members](#).

You can now proceed with [Register a Manager](#).



Register a Manager

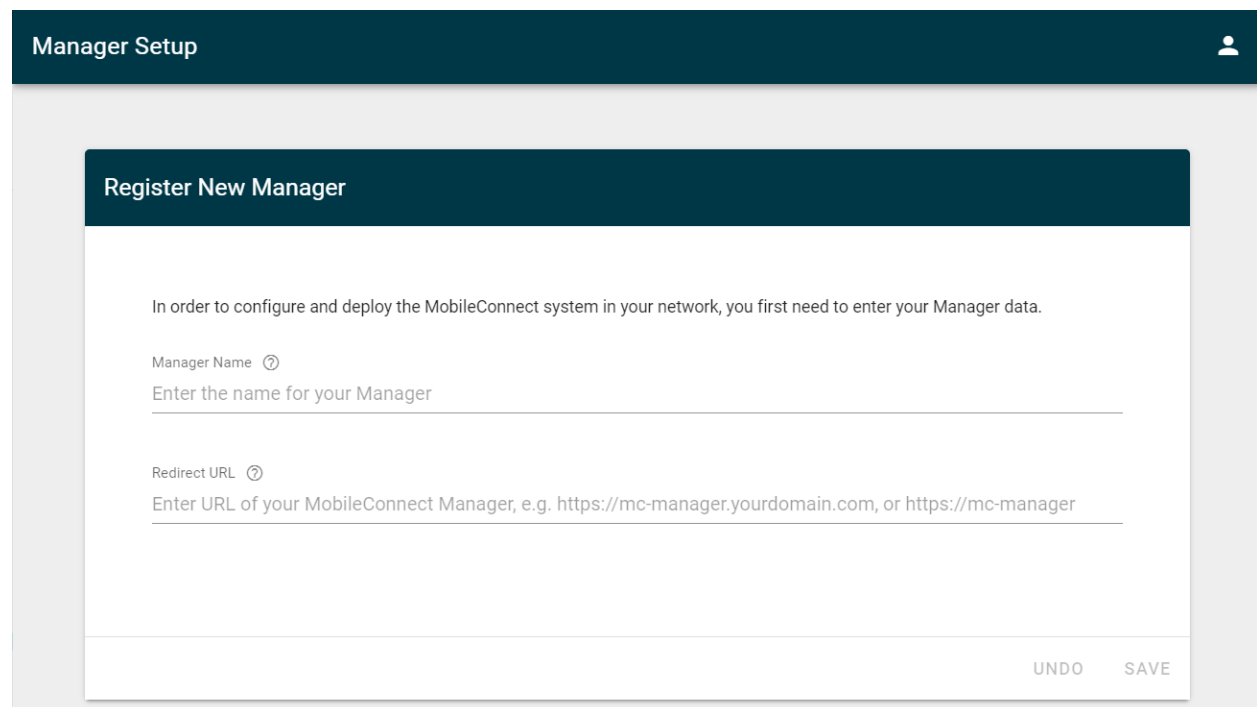
Once you have created an account (see the previous section) you are ready to register and obtain your MobileConnect Manager.

If your Manager is already registered by another member of your organization, you do not need to register a new one. Instead request to be invited as a member to the existing Manager. For more information see [Managing Members](#).

- Log into your account at <https://accounts.sennheiser-connect.com/>.
- Click "Manage Manager" in the top right of the page.



- Click "Register New Manager" and you will see the following page.



Manager Setup

Register New Manager

In order to configure and deploy the MobileConnect system in your network, you first need to enter your Manager data.

Manager Name ⓘ
Enter the name for your Manager

Redirect URL ⓘ
Enter URL of your MobileConnect Manager, e.g. <https://mc-manager.yourdomain.com>, or <https://mc-manager>

UNDO SAVE

- Enter the name of your Manager. The name can be the name of your organization, e.g. "Sennheiser Streaming Technologies".



- Add a **redirect URL** that you plan to use as URL/domain name to access the MobileConnect Manager in your network.

To access your MobileConnect Manager after installation, open a browser and open the redirect URL. It can be a private domain or URL, but not an IP address or "localhost".

- Click "Save" and wait for your Manager to be registered. A new Manager section is shown on the page.

2. Get your MobileConnect Manager

After making sure you configured the Manager data above, you can download the installation files for your MobileConnect Manager.

- By downloading the MobileConnect Manager, you agree to our [Terms of Use](#) and [Privacy policy](#).
- By downloading the MobileConnect Manager, you agree to use [3rd Party Docker Containers](#).

DOWNLOAD MANAGER

The Manager installation steps are described in detail in the MobileConnect user guide under "Documentation".

- Select "Download Manager" to obtain installation and configuration files for the MobileConnect Manager.
- Your account has **owner** role for the Manager that you created. For more see [Managing Members](#).

Managing Members

If you have an owner account for the MobileConnect Manager, you can manage its members.

Inviting additional members is supported only for Manager **version 1.2.0** and higher. Check your MobileConnect Manager version (bottom right corner) and upgrade following the steps in section [MobileConnect Manager Upgrade and Redeploy](#).

- You can invite or remove members from your Manager.



- Members have access to view and/or edit Manager configuration.

MobileConnect **users streaming audio** on their mobile devices do not require access to the MobileConnect Manager or any registration/invitation process.

- A Manager can have multiple owners.
- A Manager needs to have at least one owner, e.g. the last owner cannot be removed.
- A user with a MobileConnect account can be a member of several MobileConnect Managers.
 - The user's profile page at <https://accounts.sennheiser-connect.com/> lists all Managers they are a member of.
 - The user can switch between MobileConnect Managers using the menu on the top right.

Roles

A member can have one of the following roles:

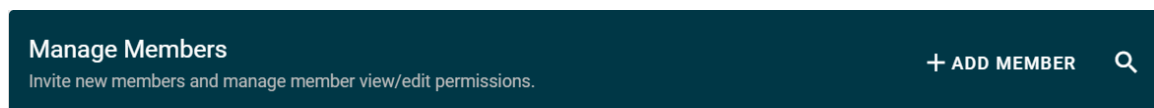
Role	Description
Owner	Can view/edit Manager data and its members. Has full access to the MobileConnect Manager.
Admin	Has full access to the MobileConnect Manager.
Moderator	Has limited access to the MobileConnect Manager, i.e. can access Mobile App Configuration.

Invite members

You can invite new members to your Manager.

Inviting members requires owner role.

- Log into your account at <https://accounts.sennheiser-connect.com/>.
- Access the "Members" menu item.
- Click "Add member" to invite another member to your Manager.



- Add the member's name, email, and select their role.
- Click "Save".



Send Invitation

Send this text in a separate email to **test@test.com**

Email text

Hi Testy McTest,
You are invited to join the assistive listening system MobileConnect.
Please create an account [here](#) using test@test.com and accept the invitation.

You can then access your [MobileConnect Manager](#).

CLOSE

- Copy the generated message and share it with the invited member using your email.

Invited members are listed as "Pending" on the member page. To revoke or edit the invitation click the edit button.

- The invited member can view all open invitations on their profile page. There they can accept or reject any pending invitation.

Edit members

You can edit and remove members of a Manager.

Editing members requires owner role.

- Log into your account at <https://accounts.sennheiser-connect.com/>.
- Access the "Members" menu item.
- Click the edit button next to a member to remove or edit them.



Security & Authorization

Security is becoming an increasing need for all digital solutions to protect our sensitive data and we need to stay up to date in secure measures to have an efficient solution. As a result, we also decided to increase the security of the MobileConnect solution (incl. the MobileConnect Manager and Station). The solution makes use of industry standard IoT security practices in combination with a proprietary implementation to upgrade the security of the MobileConnect system. The solution intends to provide the best security practices with most ease-of use to the customers. The solution provides the following secure features:

- Identification and authentication of MobileConnect Station devices connecting to MobileConnect software.
- Encrypted data flow between MobileConnect Manager and MobileConnect Stations.
- Re-authentication of devices in case of suspicion/wrongful rejection of MobileConnect Station devices.

To make use of the secure solution, please upgrade your MobileConnect software:

- Upgrade the Manager software to newest version (1.2.0 or higher) by following the steps in [MobileConnect Manager Upgrade and Redeploy](#).
- Update the Station firmware to version 6.1.0 or higher using the Manager (1.2.0 or higher) web interface.

Authorize a Station

If a new Station with firmware version 6.1.0 or higher needs to be installed in the MobileConnect system for the first time, please follow the steps below.

Pre-requisites:

- MobileConnect Manager version is 1.2.0 or higher.
- MobileConnect Station firmware version is 6.1.0 or higher.

Steps to authorize a Station:

1. Connect the Station to your network and power it on.
2. Open the Manager web interface and log in.
3. Go to the Station list page. It should show the MobileConnect Station with the status **“Unauthorized”**.



Overview				
Device	Status ↑	Firmware Version	Control IP	Streaming IP
1100000208	Unauthorized	6.1.0	Connected	Connected

4. Click on the device and you will be prompted to authorize it. The authorize page will display the serial number, the MAC address of the streaming interface and the MAC address of the control Interface. Check these details to make sure the Station is the one you intend to connect to.
5. Additionally, you can verify the **fingerprint** of the Station. Because the fingerprint acts as a digital signature of the device, we strongly recommend you execute this step, in order to verify the Station is exactly the device you intend to connect. Make sure the displayed fingerprint matches the fingerprint displayed in the local admin interface of the MobileConnect Station. To access this interface, follow the steps described in [Configure Your Station Using the Local Admin Interface](#).
6. Once you have verified the Station is legitimate please click on “Accept”. The Station then becomes part of the MobileConnect system. If you find the device to be illegitimate, click on “Reject” to deny access and ignore all further authorization requests from this device.
7. If you rejected a Station by mistake, see [Re-Authorize a Rejected Station](#).

Update and Authorize a Station

If a new Station with firmware version lower than 6.1.0 needs to be installed in to the MobileConnect system, please follow the steps below.

Pre-requisites:

- MobileConnect Manager version is 1.2.0 or higher.
- MobileConnect Station firmware version is lower than 6.1.0 (valid versions are 6.0.2, 6.0.3, 6.0.4, 6.0.5, 6.0.6, 6.0.7).

Steps to authorize a Station:

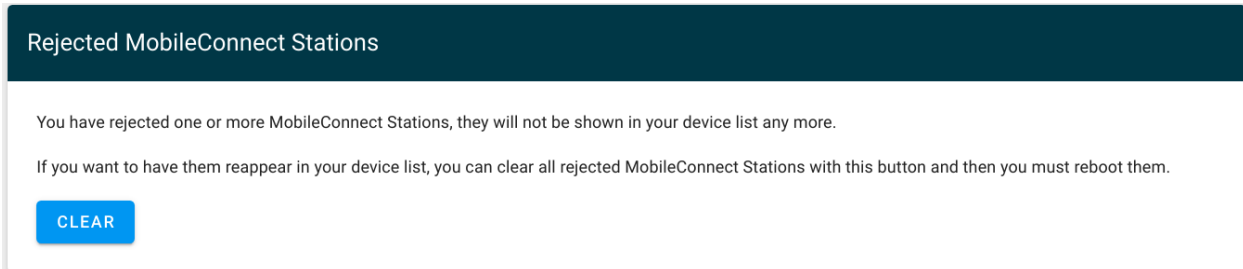
1. Connect the Station to your network and power it on.
2. Open the Manager web interface and log in.
3. Go to the Station list page. It should show the MobileConnect Station with the status **“Update Required”**.
4. Open the Station details page by clicking on the device. Start the firmware update of the Station to the newest available (6.1.0 or higher) by clicking on “Start Update”.
5. The MobileConnect Station will update and reboot into the new version.
6. The Manager device list page now shows Station with the status “Unauthorized”. Proceed with authorizing the Station, following the steps in [Authorize a Station](#).



Re-Authorize a Rejected Station

In case you rejected a MobileConnect Station by clicking on the “Reject” button, you can re-initiate the authorization process by following these steps:

1. Go to the Manager web interface and open the Devices page.
2. There should be a “Rejected MobileConnect Stations” section below your device list.
3. Click on the “Clear” button in the “Rejected MobileConnect Stations” as shown below:



4. Now reboot the rejected MobileConnect Station. The MobileConnect Station will reboot and enter the authorization mode. The Station will be available in the device list page with status “Unauthorized”. Proceed with authorizing the Station, following the steps in [Authorize a Station](#).

Reset Authorization

There are two different ways to reset the authorization status on the MobileConnect Station, depending on whether your Station’s status is shown in the Manager as “Running” or “Not Running”.

- In case of “Running”, please see “Reset Authorization – Manager”.
- In case of “Not Running”, please see “Reset Authorization – Mini Admin”.

Reset Authorization with the Manager

It is possible for you to re-initiate the authorization process of an already authorized MobileConnect Station with the following steps:

- Open the Manager web interface and click on the Station. Select the “Reset Device” button.
- A pop-up window appears with an option “Delete Authentication”. Please select this option. This option resets the authentication details and initiates a reboot of the MobileConnect Station.
- After the reboot is completed the Station enters the authorization state. You can now re-authorize the Station following the steps in [Authorize a Station](#).



Reset Authorization with the Local Admin Interface

In case the device has status “Not Running” in the Manager, you can still re-initiate the authorization process of an already authorized MobileConnect Station with the following steps:

- Open the Manager web interface and click the Station with status “Not Running”.
- Now click on the “Remove Device” button.
- A pop-up window appears. Click “Remove” to remove the Station from your Manager list of devices.
- Connect to the local admin interface of your MobileConnect Station, following the steps in [Configure Your Station Using the Local Admin Interface](#).
- Click on the “Reset Device” button.
- A pop-up window appears with two options, “Delete Configuration” and “Delete Authentication”. Please select the option “Delete Authentication”. This option resets the authentication details and initiates a reboot of the MobileConnect Station.
- After the reboot is completed the Station enters the authorization state. You can now re-authorize the Station in the Manager following the steps in [Authorize a Station](#).

Security Recommendations

1. In case you deleted the authorization using the local admin interface and did not remove the Station from the Manager first, the following steps are needed to authorize the MobileConnect Station again:
 - a. Remove the Station from the Manager.
 - b. Reboot the Station by using the local admin interface or power cycle.
2. If you changed the network configuration in an incompatible way and want to reset it using the local admin interface, make sure to only delete the configuration, keeping the authorization intact (“Delete authentication” unchecked).
3. You can always force a re-authentication by removing the Station from the Manager.
4. When putting a Station into storage for a longer period, it is recommended to remove the Station from the Manager.
5. If a Station leaves your premise, we strongly suggest resetting it completely using the local admin interface, by selecting the checkboxes for “Delete Configuration” and “Delete Authentication”.



MobileConnect Configuration

Configure Your System Using the Manager

In order to configure your MobileConnect Stations and App, simply open the MobileConnect Manager interface in a browser at the URL you configured (e.g. at <https://mc-manager.yourdomain.com> or <https://your-manager-hostname>).

- The MobileConnect Manager currently supports the **Chrome** and **Firefox** browsers.

With the MobileConnect Manager, you can configure the following features:

- MobileConnect App:
 - Rename channel names.
 - Hide or unhide channels.
 - View/Change/Download QR codes and Channel IDs for your streaming channels.
- MobileConnect Stations:
 - Rename a MobileConnect Station.
 - Set the Station audio configuration.
 - Configure the Station network interfaces.
 - Update the software of MobileConnect Stations.
 - Reset of MobileConnect Stations.
 - Remove a Station from the Manager.
 - Since MobileConnect Station firmware version 6.0.5, it is possible to reboot a Station using the Manager.

Configure Your Station Using the Local Admin Interface

Your MobileConnect Stations can be configured using a local admin interface. The preferred way to configure a Station is using the Manager (for more information see [Configure Your System Using the Manager](#)). Here are some examples when the local admin interface can be used:

- You want to configure your Station's network interfaces, before connecting the Station to the Manager.
- Your Station is not connecting to the Manager and you want to download its logs.
- You want to authorize a Station (affects Station firmware 6.1.0 and higher (for more information see [Authorize a Station](#))).

The steps how to connect to the **local admin interface** are given below:



- Configure your PC with the static IP address 192.168.0.2, netmask: 255.255.255.0.
- Connect the Station's LAN1 or Ctrl port directly to your PC.
- Open a browser and navigate to <http://192.168.0.10> to open the local admin interface.

Installing a Custom SSL Certificate

If you want to use your own certificate you can replace the preinstalled self-signed certificate that the MobileConnect Manager uses.

Make sure your certificate matches the host name of the redirect URL entered during the MobileConnect Manager creation at <https://accounts.sennheiser-connect.com>.

- Enter the traefik subfolder in your MobileConnect Manager installation directory.

```
cd /home/$USER/mcmanager/traefik
```

- Replace certificate.cert with your certificate and privatekey.key with your private key (both files must be in PEM format).
- The changes will take affect after restarting the gateway service, using the command below.

```
docker restart mcm_gateway
```

For additional information about configuring certificates visit <https://docs.traefik.io/https/tls/>.



Software Upgrade/Downgrade, System Reset

MobileConnect Manager Upgrade and Redeploy

You can perform an update or redeploy of the Manager the same way the initial installation is done.

First, we recommend that you perform a backup of the Manager database before updating your Manager. See section [MobileConnect Manager database](#).

- Enter your installation directory.

```
cd /home/$USER/mcmanager
```

- Set your previously configured database password as local environment variable and stop the Manager.

```
export SA_PASSWORD='MyPass123'  
docker-compose down
```

In case of “Invalid interpolation format” error after using the docker-compose command -> reinstall docker-compose following the instructions in “MobileConnect Manager docker-compose” in **MobileConnect Manager**.

- Open a browser and go to <https://accounts.sennheiser-connect.com>. Login with your credentials and download the latest installation package from the “Manager setup” page. Always download the latest Manager configuration files to make sure you have the latest version and configuration.
- Copy the installation package to the installation directory and extract the archive.
- Install and run with:

```
docker-compose pull  
docker-compose up -d
```

For more details, see section [Step 3. Install the MobileConnect Manager](#).



MobileConnect Manager Database

The MobileConnect system uses a SQL Server 2019 database running in a Docker container. We recommend that you do a backup of your MobileConnect database regularly. Here is an example of how to do that.

1. Backup

```
# Example PATH_FOR_BACKUP=~/.backup
export PATH_FOR_BACKUP=~/.backup
docker stop mcm_database

mkdir -p $PATH_FOR_BACKUP

docker run --rm --volumes-from mcm_database -v
$PATH_FOR_BACKUP:/backup --name mcm_database_backup ubuntu bash -c
"cd /var/opt/mssql && tar cf /backup/mcm_database.tar ."

docker rm -f mcm_database_backup
docker start mcm_database

# Check the database volume name (needed for restoring), with
docker volume ls | grep sqldata
```

2. Restore

```
# Example PATH_FOR_BACKUP=~/.backup
export PATH_FOR_BACKUP=~/.backup

# Example DATABASE_VOLUME=mcmanager_sqldata
export DATABASE_VOLUME=mcmanager_sqldata

docker stop mcm_database

docker volume create $DATABASE_VOLUME

docker run --rm -v $DATABASE_VOLUME:/recover -v
$PATH_FOR_BACKUP:/backup ubuntu bash -c "cd /recover && tar xvf
/backup/mcm_database.tar"

docker start mcm_database
```



Stop and Remove the MobileConnect Manager

You can **stop** your MobileConnect Manager in the following way:

- Navigate to the MobileConnect Manager installation directory.
- Always set your database password before running docker-compose commands
- Run the command docker-compose down, which will stop the Manager containers and remove the related containers and networks

```
cd YOUR_MANAGER_INSTALLATION_DIR
export SA_PASSWORD='MyPass123'
docker-compose down
```

You can do a more complete **Manager system cleanup** of all containers, images and volumes, created by the MobileConnect Manager installation. Simply run the three commands provided below.

```
docker container rm mcm_messagebroker mcm_database mcm_gateway
mcm_registry mcm_configuration_api mcm_lister_api mcm_updater_api
mcm_manager_web
docker image rm mcmanager.azurecr.io/configuration_api
mcmanager.azurecr.io/lister_api mcmanager.azurecr.io/updater_api
mcmanager.azurecr.io/manager_web
docker volume rm mcmanager_sqldata mcmanager_vernemq
```

- The above docker volume command is valid for installation directory “/home/\$USER/mcmanager”. If your installation directory differs, check the list of volumes with the command below and remove the ones belonging to your installation.

```
docker volume ls
```

Alternative removal method is to **remove all docker data** with the docker prune commands. Only do this if you have no other docker applications.

```
docker container prune
docker image prune -a
docker volume prune
```

Finally, **remove all Manager installation files** by navigating out of the installation directory and removing it.

```
cd ..
sudo rm -rf YOUR_MANAGER_INSTALLATION_DIR
```



MobileConnect Station Update

The software upgrade and downgrade of a MobileConnect Station can be performed using the MobileConnect Manager.

- Connect your MobileConnect Station to your MobileConnect network.
- Open the MobileConnect Manager and go to Stations.
- Select your device.
- Click "recheck firmware versions" to check for the latest firmware version.
- Click "Start update".
- Select a version and click "Update now".
 - In case of errors shown on the Manager during the firmware update which are not resolved over time, reboot the MobileConnect Station.
 - Since Station version 6.0.6, the reboot can be performed via the Manager.

For upgrading a MCS v1 from software version 5.1.0 to higher, see section [Upgrading a Legacy MobileConnect Station](#).

MobileConnect Station Reset

A software reset of the MobileConnect Station can be performed using the MobileConnect Manager.

- Connect your MobileConnect Station.
- Open the MobileConnect Manager and go to Stations.
- Select your station.
- Select "Reset device".
 - You can reset the Station configuration.
 - Or additionally also reset the authorization, by selecting the option "Delete Authentication". For more information see [Reset Authorization](#).



Upgrading a Legacy MobileConnect Station

There are two versions of the MobileConnect Station (MCS) hardware:

MCS v1
2015-2020

MCS v2
Current version



MCS v1

Previously, the MobileConnect system supported two network modes: integrated mode and standalone mode. It operated in a self-forming cluster. After MobileConnect Station release 6.0.0 the system has been completely redesigned. The existing modes of operation are no longer supported.

All previously bought MobileConnect Stations can be upgraded to run the new firmware version 6.0.0 and above. Before making the decision to upgrade, please consider the following:

Why you should upgrade:

- MobileConnect Station versions 6.0.0 and above are more stable, easier to integrate into existing network infrastructure and deliver a superior audio experience with the new MobileConnect App.

- Customers, who want to continue using the legacy system (firmware 5.1.0 and below), can do so and are advised to update their firmware to the latest version 5.1.0.
- However, this is the last release for the legacy system. There will be no future updates.

Use cases when to update

- You are using the MobileConnect Station in integrated mode using DNS → you can easily upgrade to the latest version.
- You are using the MobileConnect Station in integrated mode using Multicast → you can easily upgrade to the latest version, but you have to configure DNS service discovery.

- Multicast service discovery is not supported anymore, due to lack of support in some network and mobile devices.



Use cases when not to upgrade

- You are using the MobileConnect Station in standalone mode → in order to upgrade standalone mode, you need to integrate it into an existing network with Internet access, DNS service discovery, DHCP server and WiFi infrastructure.

- Standalone mode is not supported anymore.

- You are using CinemaConnect and subtitles → the latest firmware does not support subtitles.
- You cannot provide Internet access in your network → the latest firmware will not work in a network without Internet access.

How to upgrade

Follow the instructions in the [Quick Setup Guide](#) to setup your network and the MobileConnect Manager. Before completing *Step 4. Install the MobileConnect Station*, upgrade your MobileConnect Station v1 in the following way:

- To get the latest firmware image, please send an email to **mc-support@sennheiser.com**.
- Create a bootable USB flash drive (FAT 32 compatible, 16GB or more, USB 2.0 or higher).

Example command Linux:

```
dd if=ConnectStation-6.0.5-release-21-installer.wic of=/dev/sdb  
bs=4MB && sync
```

- Power off the MobileConnect Station, plug the USB flash drive into it and attach a USB keyboard, boot it, and then press enter to start the installation.
- After a few minutes, the MobileConnect Station will power off when finished. Unplug the USB flash drive.
- Continue with [Step 4. Install the MobileConnect Station](#)



Troubleshooting

MobileConnect Manager

General recommendations

- The MobileConnect Manager must always be connected to the **Internet**.
 - During all installation steps.
 - Before you can log in.
- You can only access the MobileConnect Manager using the **redirect URL**. Using the Manager server IP address will not work.

Accessing the MobileConnect Manager Web Interface

The MobileConnect Manager page shows error “This site can’t be reached”.

- The URL you are trying to access is incorrect
- The URL is not accessible in your network
- The redirect URL configured in the Manager Setup is incorrect. Update it with the correct one at <https://accounts.sennheiser-connect.com>.

Problems logging in, Third party cookies are blocked.

- Recent browser releases block cookies used on third-party sites you have not visited directly. To log into the MobileConnect Manager, your browser needs to allow third-party cookies from Microsoft (**sennheisersstdev.b2clogin.com**). Try adding this domain to the white list for your browser or unblocking third-party cookies temporarily.

Newly added members cannot log in to the MobileConnect Manager.

- If a newly added member cannot log in and gets error “Sorry, something unexpected happened”, you need to update your MobileConnect Manager. The members feature is available with Manager version 1.2.0. To update the Manager follow the instructions in [MobileConnect Manager Upgrade and Redeploy](#).

The MobileConnect Manager page shows error “403 Forbidden”.

- Check if you are already a member of this Manager on your Profile at <https://accounts.sennheiser-connect.com>.
- Check if you accepted the invitation to be a member of this Manager on your Profile.
- Try logging out and logging in again.



The MobileConnect Manager interface is showing an error "500 Web server not running" or a blank page.

- Make sure that your Manager PC has Internet connection.
- You have to accept cookies from the Managers hostname.
- You also have to accept a third-party cookie from sennheisersst.b2clogin.com.
- List all dockers with the command below and check if any have status "Restarting".

```
docker ps
```

- If some dockers are restarting, please make sure you set your database password as local environment variable during the Manager installation – see [Step 3. Install the MobileConnect Manager](#).

```
cd YOUR_MANAGER_INSTALLATION_DIR
export SA_PASSWORD=Mypass123
docker-compose down
docker-compose up -d
```

- If you are still experiencing the same problem -> try restarting all docker containers.

```
docker restart mcm_configuration_api mcm_manager_web mcm_updater_api
mcm_database mcm_lister_api mcm_gateway mcm_messagebroker
mcm_registry
```

- If the steps above did not fix this issue, it may be that you set the wrong password for the database. Please try the following:
 - Shut down your MobileConnect Manager using "docker-compose down".
 - Locate the database volume by typing "docker volume ls" and looking for a volume starting with your installation folder and ending in `_sqldata` (for example `mcmanager_sqldata`).
 - Delete the database by typing "docker volume rm <databasevolume_name>", for example "docker volume rm mcmanager_sqldata".
 - Restart your MobileConnect Manager using "docker-compose up -d"
- If you still have issues, contact us at mc-support@sennheiser.com.

MobileConnect Manager page is doing endless reloads in Firefox

- Go to "Privacy" settings in your browser. Either use the default privacy settings ("strict") or in "custom privacy settings", you have to allow third party from visited websites only. After changing the settings, you have to restart Firefox.



The MobileConnect Manager interface is showing the error message "Live updates are temporarily interrupted" often.

- This indicates there are interruptions in network connectivity.

MobileConnect Manager restart

The MobileConnect Manager is not starting after server reboot.

- After a restart of the MobileConnect Manager server or power outage, the docker containers are not always restarted properly.
- An error can also occur if there is no DNS configuration after boot.
- Make sure that automatic restart of docker is enabled as shown in [Step 3. Install the MobileConnect Manager.](#)
- Run the following commands to fix the issue:

```
cd /home/$USER/your_mcmanager_installation_dir
export SA_PASSWORD=YourPass
docker-compose down
docker-compose up -d
```

MobileConnect Manager docker-compose

Docker-compose throws "Invalid interpolation format" error.

- If you are running Ubuntu 18.04 and previously installed docker-compose, you may see this error message when upgrading the MobileConnect Manager.
- To resolve it, you need to upgrade docker-compose.
- First, uninstall old docker and docker-compose versions with:

```
sudo apt remove docker docker-engine docker.io containerd runc
sudo apt-get purge docker-compose
```

- Install docker and docker-compose following the instructions in <https://docs.docker.com/install/linux/docker-ce/ubuntu> and <https://docs.docker.com/compose/install>.
- **Note: do not install docker-compose using snap or apt.**
- The Manager supports docker version 19 or higher and docker-compose version 1.22 or higher and version older than those will not work.
- Proceed with adding a docker group, adding your user to the docker group and enabling the docker service, as described in **Step 3. Install the MobileConnect Manager.**



MobileConnect Station

Connectivity

The MobileConnect Station is not showing in the MobileConnect Manager list of stations.

- Check the Station network connections.
- Try rebooting the Station.
- Make sure the DNS configuration is correct, see [Step 1. Configure your network](#).
- In case you have a MobileConnect Manager version 1.0.0 or 1.1.0:
 - Make sure the MobileConnect Manager is running before the MobileConnect Stations or reboot the MobileConnect Stations, after the MobileConnect Manager is started.
 - Open the local admin interface and check the Station firmware version. Station firmware version 6.1.0 is not compatible with Manager 1.0.0 or 1.1.0 due to the enhanced security feature.
 - Consider upgrading your Manager, for more see [MobileConnect Manager Upgrade and Redeploy](#).
 - You can also downgrade the Station firmware, contact us at mc-support@sennheiser.com.

The MobileConnect Station has status “Not Running” in the Manager interface.

- Check the Station network cables are connected, and the Station network configuration is correct.
- Was the Station authorization recently reset using the local admin interface (available since Station firmware version 6.1.0)? If yes, remove the Station from the Manager and restart it. For more information about authorization see [Security & Authorization](#).
- Was the Station sent back for repairs? If yes, remove the Station from the Manager and restart it.

MobileConnect Station update

The MobileConnect Station update was interrupted before it was completed.

- If the MobileConnect Station is not updated and there are no errors on the Manager interface after the interruption → retry updating.
- The MobileConnect Manager is showing an error after the interruption → restart the MobileConnect Station and try again.
- The error message is still shown after restarting the MobileConnect Station → restart the MobileConnect Manager.

```
docker restart $(docker ps -a -q)
```



The MobileConnect Station update is not started after clicking "Start update" button.

- Restart the MobileConnect Manager Docker containers and try again.

```
docker restart $(docker ps -a -q)
```

Note: this may interrupt streaming.

MobileConnect Station Network Configuration

You configured the IP address 192.168.0.10 on the LAN2/PoE/Streaming port or LAN3/Ctrl port.

- This port is used for the local administration interface and using it on the network ports may cause the local interface to become inaccessible.
- To fix → remove the network connection of the streaming interface (LAN2/PoE/Stream port) and perform a reset followed by a reboot.
- Alternatively change the IP address via the MobileConnect Manager.

You configured an IP address in the subnet 192.168.0.0 on the MCSv1 LAN2 or LAN3.

- The local admin interface may become inaccessible.
- To access it again via LAN1 → unplug the LAN2 and LAN3 cables.

MobileConnect Station Channel Configuration

All Station channels are greyed out in the Manager "Mobile App Configuration" page.

- Check whether your MobileConnect Station is "Running" in the Stations page.
- Open the Station page, by selecting it from the Stations list. Select "Network". Check the network configuration of your Station(s) and make sure that the Streaming network interface is connected and has a valid IP address (and not a link local address).
- Open the Station page, by selecting it from the Stations list. Select a channel and enter the channel page. Make sure the "This channel is enabled" checkbox is selected.



MobileConnect App

iOS devices can connect, Android cannot.

- Check if you added all necessary DHCP configuration (see [Step 1. Configure your network](#), DHCP).

MobileConnect App streaming stops after few seconds

- Open the Station page, by selecting it from the Stations list. Select "Network". Check the network configuration and make sure that the Streaming network interface is connected and has a valid IP address (and not a link local address).

MobileConnect App shows “No channels available”, “To display channels, enter the correct WiFi and scan the associated QR code..”

- Make sure that the mobile device is still connected to the MobileConnect WiFi.
- Make sure that the DNS configuration in your streaming network is correct, see [Step 1. Configure your network](#).

MobileConnect App shows “No channels available”, “There are no MobileConnect Stations available.”

- Make sure that your Station is connected to your Manager. Verify that the DNS configuration in your network is correct, for more information see [Step 1. Configure your network](#).

MobileConnect App shows “No channels are activated”, “Please report this issue to your IT.”

- Go to the Manager web interface and make sure that at least one channel is activated. Using the Manager, you can activate or deactivate a channel by going to the MobileConnect Station’s device page and selecting the channel to enter its channel details.

MobileConnect App shows “Connection Error”, “Please report this issue to your IT.”

- This error indicates that the Manager is not running or there is a firewall between the MobileConnect Manager and the app, blocking the app requests.



MobileConnect App shows “No public channels available”, “For entering hidden channels, scan the QR code or enter the channel ID.”

- There are streaming channels in your network, but they are all hidden. Go to the Manager “Mobile App Configuration” page. There you can either make the channels public or download the QR Code or Channel ID of a channel in order to provide it to your streaming users.

MobileConnect App shows “Could not connect to the MobileConnect system”.

- Check your Station network configuration is correct in the Manager web interface. Verify the IP addresses are correct.
- If you recently switched the IP configuration from DHCP to static, try restarting the Station
 - You can restart the Station using the Manager, local admin interface or simply power off and power on.

MobileConnect App shows “QR code not found”, “Make sure you’re in the right WiFi and using the right QR code. For a new channel search tap here”.

- This error indicates that you have scanned a channel QR code when using the MobileConnect Station’s standalone demo mode, but it cannot be found.
- Make sure that the mobile device is still connected to the right MobileConnect WiFi.
- Make sure that the MobileConnect Station is still running.
- Make sure that you are scanning the QR code that belongs to that specific MobileConnect Station that you are trying to reach.
- In case the Station’s network configuration was changed, you need to use the latest QR code. In standalone demo mode, go to the local admin interface and check the latest QR code.

MobileConnect App shows “QR code not found”, “For a new channel search tap here”.

- This error indicates that you have scanned a channel QR code when using the MobileConnect Station’s standalone demo mode, but it cannot be found.
- Make sure that the MobileConnect Station has booted and is still running in standalone demo mode.