

LANCOM Management Cloud (LMC) Rollout

Particularly in larger projects with many devices, individual device configuration not only leads to high susceptibility to errors, but also to costly and time-consuming deployments of IT staff, if the configuration is even carried out at the installation site.

The LANCOM Management Cloud (LMC) replaces these previously manual individual device configurations with an automated configuration. This means that the administrator only has to specify the framework conditions for the network design via the LMC.

Auto-configuration and zero-touch deployment implement an automated rollout with maximum security. Zero-touch deployment or zero-touch commissioning means that a device only has to be set up and connected at the right location—assuming Internet access is working. Thanks to auto-configuration via the cloud, the device does not need to be touched by the network administrator. It is immediately ready to operate. This means that the devices can be mounted and the cables connected on-site by non-specialist personnel.

In this document we briefly explain the various rollout options available with the LMC.

Requirements for device rollout

The following article assumes that a project has been created and that the networks and locations are already defined. The project includes definitions for the locations, and these facilitate the configuration by SmartConfig, including add-ins if applicable. Subsequently, a configuration created in this way can be implemented fully automatically for a device that is new to the project or location. Also see the LANCOM techpaper [“Concepts of the LANCOM Management Cloud”](#).

Rolling out devices

The basis of any network is the devices that make it up: Gateways / routers, switches, access points, and Unified Firewalls. Any recent LANCOM device can be paired with a project in the LMC, and thus managed by it. But even older devices are cloud-ready if the following minimum requirements are met:



- LCOS 10.12.0147 SU3 for gateways / routers
- LCOS FX 10.4 for Unified Firewalls
- LCOS LX 5.20 Rel for access points
- LCOS SX 3.30.0417 RU3 for switches

We always recommend the use of the current firmware version, because some functions of the LMC require a current firmware version.

Manual assignment

You can assign this device to a project and a location at the same time. Just enter the serial number found on the device or on the outside of the box, along with the cloud PIN, which is provided on a separate information sheet shipped with every device. In the LMC, go to **Devices > Add new device** and click **With serial number and PIN**.

Add new device

Please enter here the serial number and PIN of your LANCOM device. The serial number is located on the bottom side of the device. The PIN is printed on a sheet which is enclosed with the original box. You can use the printed LAN MAC address of the device on this sheet to identify the correct device if sheet and device have been separated.

Serial number

PIN

Assign a site to use its software-defined configuration on this device.

Figure 1:
Add new device
per manual assignment

This method is ideal for projects where the positioning of the devices has to be determined beforehand. Irrespective of the number of devices, this is the required procedure for allocating devices to an LMC project if they are not yet connected to the Internet, have yet to be paired with the LMC, and should be commissioned by zero-touch.

This firmly binds the device to this project, and it cannot be moved to another project without your intervention. If at a later date you want to pair the device with a different project, you have to delete it from the first project or transfer it directly to the other

project. You can do this in the device view section. Use the action menu of the devices and **Transfer**.

Assignment by Rollout Assistant

The Rollout Assistant is a web application. The Rollout Assistant uses a device equipped with a camera and Internet access, such as a smartphone, tablet or notebook, to read the serial number and PIN. It offers an extremely easy way to connect the device to the LMC.

To start the Rollout Assistant, just enter the URL cloud.lancom.de/rollout into a browser. The Rollout Assistant opens with the adjacent login screen.

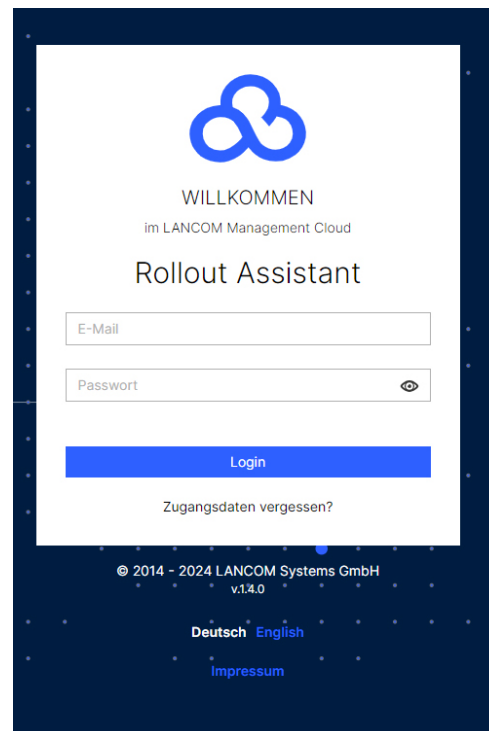


Figure 2:
Login screen of the
Rollout Assistant

You select the desired language and login to the LMC using your credentials. On the next page, first select a project. You can then add new devices to this project.

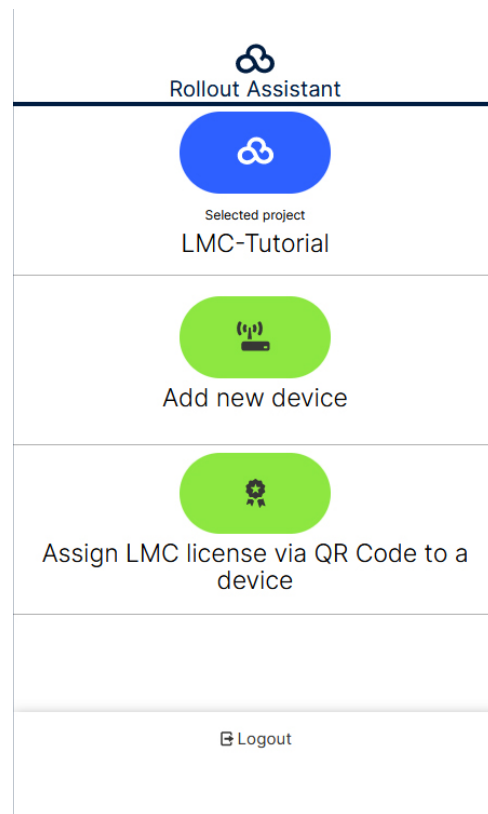


Figure 3:
Add new device
per Rollout Assistant

Do this by tapping the green button and scanning the serial number. The Rollout Assistant may request access to the camera on the device to do this. You scan the serial number either on the underside of the device or alternatively from the barcode on the packaging box. The latter option is recommended if the barcode sticker on the device is very small. Otherwise, you can enter the serial number manually.

Next, scan the cloud PIN from the information sheet enclosed with the device. Here, too, you have the option of entering the PIN manually.



Figure 4:
Scan Cloud PIN

Now you can select one of the locations available in the project, or optionally use **No location** to leave this item open. Bear in mind that the location is an important setting for the configuration by LMC.

In the next step, you assign various properties to the device. You give the device a name, optionally enter an address for the location, and take a photo of the installation. The address can be determined using the GPS information from your device. Not only is this information helpful for managing the devices, it can also be useful for a remote administrator communicating with an on-site technician.

In the final step, the information is displayed once again for checking. If you find any errors, simply go back and correct the corresponding entry.

The device is paired with the LMC using **Add device**. It is immediately visible in your project, and you can make further settings if necessary. As soon as you connect the device and it connects with the LMC, it is provisioned with an initial operating configuration, and the status changes to "online".

Assignment by activation code

Devices that are managed by LANconfig are easily transferred to the LMC simply by means of an activation code. In the LMC go to **Devices**, click on **Activation codes** and then on **Create activation code**. This creates a temporary activation code. While it remains valid, this code can be used to activate any number of LANCOM devices, i.e. to transfer them to the LMC.

In LANconfig, mark one or more devices that you want to manage via the LMC and then select the menu item **Device > Pair device with LANCOM Management Cloud**. Enter the activation code. This pairs the devices with the cloud and assigns them to the project where the activation code was created.

Figure 5:
Add new device with
activation code via LANconfig

This firmly binds the device to this project, and it cannot be moved to another project without your intervention. As described earlier, you can make this change in the device view section. Use the action menu of the devices and **Transfer**.

With the LANCOM devices registered in a project, they can be assigned to their locations. This information can be supplemented with a photo and a description of where the device is installed (19" rack, suspended ceiling, ...) as a help to administrators working remotely. This can be useful for communicating with on-site technicians.

As soon as the devices at their respective locations are connected, they contact the LMC. The assigned project is already known from the activation code and the device is displayed in the corresponding project. The configuration will now be rolled out automatically. If you can use one of the methods for automatic location detection outlined below, a corresponding SmartConfig can also be used. Otherwise the location must first be assigned manually.

This method is particularly suitable for migrating existing projects to the LMC. If you wish to get rid of any "ballast" and operate exclusively on the basis of the LMC SmartConfig, an option is available to create a new configuration based on the system default for each device. With this type of migration, the auto-configuration may overwrite existing configurations. Your planning should take this into account in advance. Discuss this with

your contact person at LANCOM in order to identify any problems in good time. We can then create anything that is required for the desired operating mode by adjusting the SmartConfig and any add-ins, if applicable.

Assignment by pre-configuration

A pre-configuration allows you to commission devices fully automatically. You create a detailed configuration at an early stage without a physical device being on hand. The advantage: Devices simply have to be connected up on location and are immediately ready to operate! Under **Devices > Add device** you have the **Create pre-configuration** option.

Give the device a unique name, select a device model, select the firmware you require and, if necessary, specify a location.

[Devices](#) > Preconfigure device

Preconfigure Device

You can create configurations for selected device models and firmwares and set up those devices before you physically integrate them into your project. You can merge these devices at any later time with a physical LANCOM device of the same model.

* Required fields

* Name

AP-Office-3.12

Will be used as device hostname

* Model

Please select a device model

Must match the physical device

* Target firmware ⓘ

Basis for the configuration

Site

No location

Cancel

Create

Figure 6:
Assignment per pre-configuration

Then click the **Create** button and the pre-configuration is prepared.

As soon as you have physical access to the device, click in the row of the previously created pre-configuration and select the serial number column.

- An editable field opens.
- Here you enter the serial number of the physical device.
- Click on the check mark next to this field and accept the entry.

Now add the device in the usual way with the activation code or serial number / PIN. As soon as the device connects to the LMC, the firmware is adjusted and then the pre-configuration is transferred to the new device.

Assignment via CSV import (bulk import)

This procedure is the mass-market variant of entering the serial number and PIN. It is suitable for any project, especially for medium to large-scale projects.

For the correct format, use the sample file available for downloaded from the LMC under **Devices > Add Device** under **CSV import**. The serial number and PIN are required here. Additionally, you can specify an optional location and a device name.

Use a spreadsheet program to enter the serial number (found on the device or on the outside of the box) and the cloud PIN (found on a separate information sheet shipped with every device) into your CSV file. The serial number and cloud PIN are also available in barcode format and can be scanned in.

Enter the location if this is already known. Often you do not yet know which device is to be delivered to which location. For cases like this, help is available with the automatic assignment to a location by IP address or DHCP server, as described below.

Upload your file to the LMC under **Devices > Add device** by clicking **CSV import**.



Our tip: A barcode scanner can be used to enter the information directly, e.g. into Excel, just as if it were a keyboard entry. You can scan the data from the devices and write the CSV file for the bulk import, which avoids making errors with the serial numbers and Cloud PINs.

Serial number listing by LANCOM

With very large projects involving 1,000 devices or more, devices delivered directly to the customer in batches of 200 pieces or more can be supplied with the serial numbers and Cloud PINs compiled in a CSV file as prepared by LANCOM. This should be clarified in advance with your LANCOM representative.

The result of this is that these devices can be automatically integrated into the respective LMC project in advance by means of a bulk import. Devices contacting the LMC for the first time are automatically assigned to the correct project, where they are automatically configured and put into operation (zero-touch / auto-configuration).

WEBconfig Rollout Wizard

As of LCOS 10.20 RU1, you can also add devices to the LMC with the Rollout Wizard in WEBconfig. To do this, use WEBconfig to open the configuration of the device being integrated into the LMC and execute **Setup Wizards > Rollout**.

Follow the instructions in the wizard to specify the LMC domain for a private LMC (if applicable), an activation code, a project name, a location, and how the device is to function (as a gateway, access point, or manually defined). The latter is required for future extensions of the LMC to include further device functions. This allows you to use these functions in the future without having to update to the latest LCOS.

This would allow, for example, multiple routers to be set to operate as gateways. Working in this way allows the LMC to be used to roll out an automated VPN configuration for redundant central-site VPN gateways.

The device then connects to the LMC and receives its configuration.

Zero-touch & auto-configuration

A LANCOM device in its factory settings will initially try to contact the LMC. If it succeeds, i.e. the device has Internet access, then the LMC can check whether the device is already assigned to a project. In this case, it rolls out the auto-configuration created in the LMC to the device.

If the location has an upstream Internet router with an activated DHCP server, a gateway with a dedicated WAN Ethernet port can be connected to this and automatically has access to the LMC. Another possibility here are the xDSL connections from certain providers that provide dial-in without authentication (BNG). These connections also enable gateways as of LCOS 10.40 to access the LMC automatically.

This eliminates the basic configuration and the router immediately receives the correct configuration. What this means is that you do not actually have to carry out any on-site configuration of the access points, switches and (if applicable) the router, i.e. "zero touch" for the administrator.

Further information can be found in the [LANCOM Knowledge Base](#).

Automatic rollback

Each time the LMC changes the configuration of a device, it then checks for connectivity to the LMC. If the LMC cannot be reached within five minutes, the device returns to its previous configuration.

Even though this automation does not prevent misconfigurations, you are protected from the worst effects such as a “lock-out”. You can use this time to rectify the incorrect configuration.

Automatic location assignment by IP source address

If the IP subnets are uniquely assigned to the managed locations within the LMC, during the rollout the LMC can automatically assign a device to a location based on its source address. The prerequisite for this is that the management network containing the LANCOM devices has a unique IP address range at each different location, so that devices reporting to the LMC with their IP address can be assigned to their location unambiguously. The associated configuration is then automatically rolled out to the device when it is commissioned.

You have to activate this option in the project specifications. Under the **Project specifications**, click on the **Device startup** widget. In the section **Site specifications**, enable the option **Site allocation based on device IP address**.

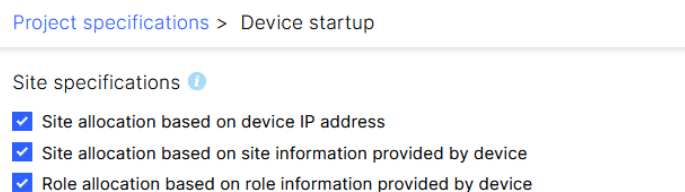


Figure 7:
Assignment by IP source address

Automatic location assignment by DHCP

Using a LANCOM-specific DHCP option, the DHCP server can communicate information about the current location to connected devices. Using this information, devices can be automatically assigned to a location by the LMC even without a unique source address. If the DHCP server on a LANCOM router is also managed via the LMC, the DHCP option is automatically configured when the following feature is enabled: **Project specifications > Device startup > Site specifications > Site allocation based on site information provided by device**.

Alternatively, you can configure these settings for the DHCP server in the LANCOM router using LANconfig for LCOS under **IPv4 > DHCPv4 > LMC parameter** and for LCOS LX under **Management > LMC**:

Figure 8:
Assignment via DHCP

You can also use this DHCP option to inform the device about the domain used by the private LMC.

If you use an external DHCP server, information is transmitted to the LANCOM devices via DHCP option 43 with the following vendor-specific IDs:

→ LMC domain: max. 64 characters, vendor-specific ID: 18

→ Rollout project ID: max. 36 characters, vendor-specific ID: 21

(Automatic project selection is not yet supported by the LMC. This parameter is intended for future use. The devices have to be previously assigned to a project via serial number / PIN.)

→ Rollout location ID: max. 36 characters, vendor-specific ID: 22

When a device receives its IP from the DHCP server, the DHCP client takes on the individual parameters for the device (LCOS, LCOS SX, LCOS LX). The CLI can be used to display the transmitted values in the LMC status. At the same time, these values are used in the factory setting for the connection to the LMC. You can use DHCP to predefine the LMC domain for devices on the network. Each device logs into this LMC domain and is assigned to a project via zero touch.

A problem may occur if the device was previously connected to a different LMC domain. The existing certificate is then used for the domain as communicated via DHCP, even it was signed by a different LMC instance. It is therefore important to ensure that devices were not yet connected to the LMC, or that the local device certificate is deleted again if DHCP specifies a different domain to the one in the setup.

With the parameters Rollout Project ID and Rollout Location ID, the LMC can automatically assign the device to a project in the future and to a location right now.

Redirect mechanism for Private LMC

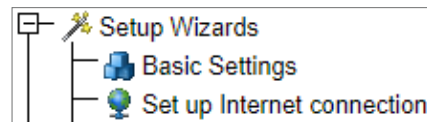
Every device in its factory default settings knows the Public LMC and will attempt to report to it. An administrator or user can bind devices to a project in a Private LMC with the help of the serial number and PIN. The Private LMC then reports this to the LANCOM Public LMC via the Internet. If one of these devices then reports to the Public LMC, it is automatically directed to the correct Private LMC. The LANCOM technician, in consultation with you, will already have set this up during the installation of the Private LMC, so you have no additional effort here.

Considerations for WAN routers

As mentioned in the “Zero-touch & auto-configuration” section above, a WAN router with a dedicated WAN Ethernet port that finds a DHCP server can also access the LMC and immediately receive the correct configuration. Otherwise, the on-site router requires a basic configuration to be carried out, e.g. by entering the access data for a DSL connection. In most cases it suffices to start the **Set up Internet connection** wizard.

To do this, use WEBconfig to open the configuration of the device being integrated into the LMC and execute **Setup Wizards > Set up Internet connection**.

Figure 9:
WEBconfig —
Set up Internet connection



All it takes is a few steps to connect to the Internet.

“Minimal touch”

LANCOM devices with a USB port and in their factory default settings (e.g. after being unpacked or reset) will read a script file from an inserted USB stick and immediately execute the configuration commands in the script. All you have to do is provide a technician with an appropriately prepared USB stick for configuring the WAN router on site. This may not be zero-touch, but at least inserting a USB stick into the WAN router is “minimal touch”. Further information can be found in the [LANCOM Knowledge Base](#).

Internet connections from some providers do not require specific PPPoE / DSL access data. In this case, this type of script can be applied universally. Talk to your LANCOM representative if you need help creating a script.

Important

DHCP/VLAN-ID

Note that when LANCOM devices in their factory settings are connected to the network, their LAN Ethernet port (or the WAN Ethernet port on WAN Ethernet routers) acts as an untagged DHCP client, i.e. data traffic is sent without a VLAN ID. Consequently, they have to reach a DHCP server and the LMC via an untagged network on this port.

Establishing communications

Communications are established exclusively from the devices to the LMC. The protocols used are DHCP, DNS, and HTTPS. For this reason, no HTTPS proxy should be operated between the devices and the LMC. You should consider this when configuring an upstream firewall.

Summary

With auto-configuration and zero-touch deployments, the LMC provides optimal support for rolling out devices in projects of any size. For smaller projects, devices are quickly and easily connected to the LMC by manually entering the serial number and Cloud PIN. In these cases, the Rollout Assistant is ideal for performing the pairing. This makes commissioning very easy, for example with a smartphone directly on site.

Pre-configuration allows you to carry out a detailed configuration of a device even without one physically at hand. The advantage: Devices simply have to be connected up on location and are immediately ready to operate!

For larger projects, the bulk import of the devices with a CSV file provides you with a convenient way to list the devices by means of a spreadsheet. All of your devices are then connected to the LMC in a single step.

With very large projects, devices delivered directly to the customer in batches of 200 pieces or more can be supplied with the serial numbers and Cloud PINs already compiled in a CSV file as prepared by LANCOM.

