Magic Leap 2

Scaled Deployment Guide
Version 1.0

Contents

Learn how to deploy and manage Magic Leap 2

This guide covers best practices for deploying 10 or more Magic Leap 2 devices in an enterprise environment where an identified application is used.

Setup Requirements

Hardware

Magic Leap 2

This guide is based on a Magic Leap 2 running on OS 1.4.1 or later. There is an OS Updater that can be used on the device to update the device to the latest OS or use the Hub to update to the latest OS.

Lens Kits and/or Prescription Inserts (Optional)

Lens kits and/or prescription inserts are prescription insert lenses that are required if the user wears prescription glasses or contacts. For more information, refer to the Prescription Inserts sections.

Software Application (Required)

It is required to have the enterprise solution's application or Android Package (aka APK) available and/or the Independent Software Vendor (ISV) solution application.

The Hub

Magic Leap Hub is a piece of software for managing your Magic Leap 2 development tools and connecting your device to your computer to sideload applications. It can be downloaded from our Magic Leap 2 Developer Portal. You'll need to enable Developer Mode to use ML Hub. To enable Developer Mode, refer to Enable Developer Mode.

MDM Solution (Recommended)

It is recommended to use a mobile device management (MDM) solution to set up, configure,and manage Magic Leap 2 devices. There is a wide range of providers. that are supported by Magic Leap 2. For more information to deploy, refer to the MDM section.

Inventory/Asset Management Systems (Recommended)

It is recommended to inventory the headset and controller in the enterprise's existing inventory/asset management systems. For more information on how and when to inventory devices, refer to the Inventory Devices section.

License Activation (Optional)

If an enterprise or developer pro license was purchased with the device, have the email that states the license key readily available during setup. For more information, refer to the License Activation section.

Single Sign-On (Optional)

Connecting to an identity management system using OAuth is available on Magic Leap 2, depending on the security posture of the enterprise. Providers such as Microsoft Entra or OKTA are supported. For more information, refer to the Device Identity Management section.

Network Configuration

Magic Leap 2 fits seamlessly into your existing IT infrastructure network. No internet connection is required for Magic Leap 2 devices. Magic Leap first-party applications and ISV applications may require a network connection. MDM solutions require a network connection.

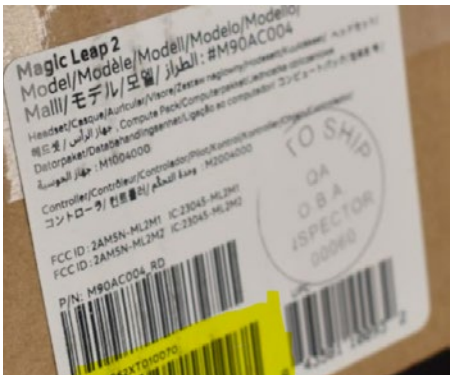
If an internet connection is required, you should follow your organization's established network best practices and procedures for connecting Magic Leap 2. New connections will default to DHCP addressing. If more advanced network configurations are required (static addresses, 802.1x authentication, etc.), refer to more in-depth Magic Leap documentation

Let’s get started with pre-deployment

This process can take 5 to 10 minutes per unit.

Magic Leap 2 Unboxing

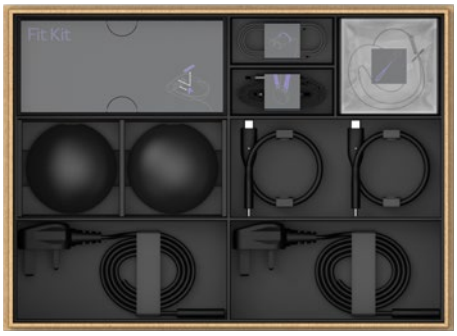
Magic Leap 2 will arrive in a shipping box and a product box. The shipping box and product box will have the Serial Number (highlighted below) on the outside. This serial number can be used if the Magic Leap 2 is being identified in an inventory/asset management system. The serial number can also be found on the device.



Box containing a label with a serial number.

Magic Leap 2 Product Box

The product box has the Carry case, the Magic Leap 2 headset, controller, compute pack, and accessories. Here are the details of what is in the box and a video explaining what's included.



Magic Leap product box with accessories.

Inventory Devices

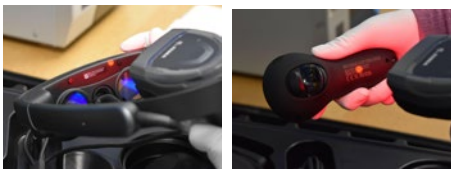
Whether you are using an inventory management system or leveraging the MDM to inventory devices, it’s important to know what devices are assigned to whom or what team. When inventorying the devices, it is recommended to use the serial number.

Serial Number (or device ID)

The serial number is found on the shipping box, the product box, behind the forehead pad on the headset, and on the back of the controller. When the device is turned on, the serial number can be found in the Home menu under Settings -> About -> Model & Hardware.

IMPORTANT NOTE: The device warranty is associated with the device serial number.

There is a QR Code on the headset behind the forehead pad and the controller. These codes can be scanned for easy data entry into the inventory management system. Once the shipping box and product box are opened, the Carry Case with the Magic Leap 2 will be visible.



Magic Leap headset and controller being scanned for inventory management

Note: Additional QR codes can be created with a QR code generator using the serial number.

Labeling

When inventorying the device, it is helpful to label each headset and controller, whether they're assigned to a person or team. We recommend placing the name of the person or team on the device and controller.

Note: If an Inventory Management System is being used, the smaller items (i.e. Fit Kit) do not have an item number or IDs. Therefore, they are typically not entered into an inventory system. It's up to the discretion of the organization on whether you enter these smaller items into the inventory system. If these items are misplaced or more are required, they can be purchased separately from the reseller.

The Fit Kit and charger should be provided to the end user. The overhead strap and shoulder strap should be provided to the end user based on need and environment. There are additional accessories that can be purchased depending on the environment. Refer to the Accessories section for more information.

Provision Devices

This process can take 5 to 10 minutes per unit. It is recommended to use a mobile device management (MDM) solution to configure and distribute Settings to Magic Leap 2 devices.

Mobile Device Management (MDM)

MDMs manage and control an organization's extended reality (XR) hardware and software. It involves the administration, configuration, security enforcement, and application management of XR devices. Magic Leap 2 supports several MDMs. These solutions provide remote device control, application distribution, security enforcement, and analytics features, enabling organizations to manage and optimize customers' XR device deployments efficiently.

Note: Available MDM features depend on the type of MDM. All MDMs listed in the link above currently offer the basic recommended feature set, such as OS Updates, application management, and user groups.more information.

Types of MDM Setups

There are two types of MDM setups during device setup or after device setup. Please refer to the provider's documentation on how to setup with either method. Below is a description of both and what is needed before setup.

MDM Setup Type	Description
During device setup	A QR code must be generated and entered DURING the first turn-on of the device setup. The QR code may contain details on the Wi-Fi information or user settings.
After device setup	After completing the device setup, the user connects the device to a computer to set up the user. No QR code is required.

Note: If Wi-Fi was preconfigured for the profile, ensure the Wi-Fi used to set up the device matches the Wi-Fi that the device will be associated with during the setup process.

Types of MDM Setups

MDM identifies the device by its serial number. Instructions for locating the device serial number can be found in the serial number section.

Refer to the Third Party Software Maintenance Best Practices Section for more information on the most commonly used features on an MDM platform.

Device Setup

This process can take 5 minutes per unit. Device setup should be performed by an administrator who sets up the device for employees. As mentioned in the MDM section, if the MDM requires a QR code, be sure to have it available. Turn on the device with the power button, and put the headset on then go through the first-time device setup steps.

License Activation

Once the first-time device setup is completed, the user can now enter their license key to unlock the enterprise features. To set up the license, enter the license key from the email with the license key and follow these instructions. **This will have to be done manually for every device setup.**

After the license is set up, all **enterprise features** will appear on the device UI, such as Iris ID and OpenID Connect/OAuth2 user setup.

Device Identity Management Setup

This feature applies to situations where the enterprise would like Magic Leap 2 end users to leverage their enterprise credentials to log in to their devices. This feature must be set up before end users log in to the device with their credentials to ensure the connection between the device and the identity management system is established. To set up this feature, follow these instructions. *Note that only the MDMs that are sideloaded support this feature.*

Once the device is set up for these enterprise accounts, a new user can be created from the Settings menu or the Lock screen by following these instructions. A total of 99 user profiles are supported, and these user profiles must be manually created and manually deleted.

Note: This login type can also be leveraged by applications that have set up the identity management login type as well. The IT administrator determines the token renewal period. Therefore, it will ask the end user to log in as often as the token must be renewed.

Although not required, OAuth and PIN can both be enabled on your device, with PIN requested first during an unlock sequence. Note that this feature sits behind the other logins. For example, a PIN would not be required when a user logs in with enterprise credentials. For device admin users and secondary users, credentials can be leveraged when logging into enterprise applications. To set this feature up, refer to this article.

Third-Party Software Application

Whether the application used with the Magic Leap 2 is created by the enterprise or by an ISV it would need to be added to the device. There are a few ways to transfer the APK to the device.

1. Push the application to the device using Wi-Fi with the MDM

2. Sideload the application by connecting the Magic Leap 2 to a computer and using the Hub. For instructions on installing and uninstalling applications to Magic Leap 2 using this method, refer to this article.

Shared versus personal devices scenarios

Shared devices should be located in a space where all users have access to the device. For example, if the shared device is used in a manufacturing bay, the device should be located either at the front or back of the bay in a dedicated space, such as on a table or a wall. These spaces should be agreed-upon spaces with the end-users who will be using them. Protocols for device use should also be communicated to end-users. Employees should know where devices are and when and how to use them. Below are recommendations for storing shared devices, depending on the environment.

# of devices	Types of Storage	Cleaning Protocol
1-3	If there are only one or two devices in a location, a charging stand should be sufficient to make them easily accessible when used.	If charging stations are used, it is recommended to have cleaning cloths next to the device after each use.
+4	For more than four devices in one location, it's recommended to store the devices in charging stations that store, charge, and clean the device. These can be purchased from the reseller or custom-built.	Charging stations provide UV cleaning.

IMPORTANT: For shared devices it is recommended they should be kept ON at all times. This enables employees to leverage features such as Iris ID without requiring an administrator to unlock the device.

Magic Leap 2 Accessories

Accessories are critical to the use of Magic Leap 2. Here is a list of the accessories found within the box. The accessories required for the end user will depend on the environment and use case.

Fit Kit Box with nose pieces and forehead pads

Controllers (optional)

Whether the controller is required depends on the deployment environment. These controllers are easily interchangeable with any Magic Leap 2 device by plugging them into the Compute Pack with the USB-C cable. For more information on the controller refer to this guide.

Magic Leap 2 Accessories (cont.)

Prescription Inserts: Lens Kit and Prescription Inserts (optional)

Prescription Inserts provide easy snap-in installation and removal by magnetically attaching to the Magic Leap 2 device for an optimized visual experience. The Prescription Inserts provide corrective vision without degradation of eye tracking performance. For more details on Prescription Inserts, refer to the Customer Care Article.

Prescription Insert Type	Period of Use; Storage	Supported Prescription	Purchase from
Lens Kits	Short-term use; stored at a shared location	Support 8 prescriptions to suit varied visual needs: +1.50, -1.0, -1.5, -2.0, -2.5, -3.0, -4.0, -5.0	Frame of Choice by Rochester
Prescription Insert	Long-term or everyday use; personally stored	Support for an expanded prescription range Single vision: SPH: -10.0 to +5.0 | CYL: up to -5.0 | Total Power (SPH+CYL): -10.0 to +5.0 Progressive: SPH: -10.0 to +5.0 | CYL: up to -5.0 | Total Power (SPH+CYL): -10.0 to +5.0; Add power up to +4.0	Frame of Choice by Rochester

NOTE: Lens Kits are typically purchased with the device, while Prescription Inserts are typically purchased by the end user who would be wearing the device continuously. If Prescription Inserts are purchased by the end user, they would not need to share their prescription information with their employer as they could purchase the Prescription Inserts from the provider and get reimbursed (depending on your organization's reimbursement policy).

Third-party Accessories

Interoperability characteristics for third-party accessories or peripherals can be found here. Below is an example scenario, environment, and solution where a third-party peripheral is required:

Example	Environmental conditions	Solution Example
An operator goes into a bay and uses shared devices to troubleshoot a machine.	The machines in the bay make it difficult to hear the support staff as they assist the operator while using Magic Leap 2, with the Equivalent Continuous Sound Pressure Level (dB(A)) over 80.	Bluetooth-enabled bone conduction headphones increase the quality of the device's audio output while reducing the need for sanitation between users. Bystanders will also not be able to hear the audio output.

Employee Device Training

In the past, customers have altered the quick start guide to their needs with a QR code to show how to turn on and put on the device. In a formal training setting, others have gone in-depth into how to wear the device, how to use the controller and Magic Leap 2's important features needed for the specific use case. If the device is a shared device, it is recommended to train the user on how to clean the device after use. Here is an example cleaning protocol.

More hands-on training may be required, depending on the device features that will be used with the application. The Fundamental application guides (1.8.0) the user in learning what AR is, and how to use inputs, such as hand tracking and the controller.

Magic Leap 2 Maintenance

Hardware and software maintenance is required as the devices are used over time.

Software Maintenance and Best Practices: Developer Portal

We provide a Developer portal, which includes API documentation, forums, snippets, migration guides (e.g., Magic Leap 1 or Hololens 2 to Magic Leap 2), sample apps, issue reporting, and bug tracking. Developers will have access to a Developer Support team, ready to help resolve issues as they arise.

MDM Best Practices

OS updates: These can occur over the air and should occur when the device is turned on in Normal mode or in Standby mode. If the device is in Sleep mode, the update will not work. However, opportunities for OS updates can vary by MDM. ArborXR downloads the image, while other MDMs can require the IT admin to download the image. The image can be found on the Hub under OS Installer, if a device is not plugged in there is an option to download and install the desired OS. Note: Depending on the update or number of updates, the device is not supported by -4 versions. Refer to the update path for more information.

Device groups: This provides the capability to manage settings and application catalogs for multiple devices.

Application Management: Applications can be pushed or erased with an MDM or manually by using the HUB.

User Profile Maintenance: If multi-user is being leveraged, user profiles are required to be manually added and deleted.

Kiosk mode: This prevents users from entering the home menu or exiting the app; disables notification pop-ups; and allows remote start/stop apps and an option to auto-restart apps. Kiosk mode can be enabled via ADB commands or with an MDM.

Application Management

Each organization will be different, whether a custom application was created or an ISV application is being used. The management of that application by the available OS is critical to the success of the deployment. Here are a few scenarios:

— The enterprise created its application and is constantly performing updates. The organization must provide the new OS updates to the general population of end users, who should only receive the updated application and OS once the development team has tested the application with that OS.

— The enterprise is using an ISV application that provides an updated version regularly, and the company chooses to update the application and OS regularly. The ISV application should only be updated with the OS version that it is suggested to use.

IMPORTANT NOTE: It is critical that the IT administrator validates the ISV or application developed works with the OS version on the devices before the application is pushed out on the devices as each OS update change impacts the application.

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File management

When the Magic Leap 2 takes a photo or a video that information is stored locally on the Magic Leap 2 Compute Pack (256 GB) and retrieved using the Hub. The Hub allows access to digital files such as pictures, videos, and bug reports.

The following are other ways that files can be transferred from the device to external storage:

1. Connect the device to external storage via USB-C cable. Transfer of large file sizes is enabled by the exFAT drivers on Magic Leap 2.
2. Connect the Magic Leap 2 device to networked storage over Wi-Fi. Note that the transfer speed is slow.

Example speeds: For a 9 GB file, it may take ~5.5 min to transfer from host to device using adb-over-Wi-Fi. Copying the same size file from a flash drive may take ~30 sec. Transferring the file from the device to the host may take ~7.5 min using adb-over-Wi-Fi and ~2 min using the flash drive. The flash drive always outperforms adb-over-Wi-Fi.

Hardware Maintenance and Best Practices

Charging Magic Leap 2

To charge the device, Magic Leap 2 requires a USB Type-C charging cable. Magic Leap 2 Compute Pack takes 110 minutes to charge to 90%, and 180 minutes to charge to 100%. Assuming the use of AC power, the controller takes 150 minutes to charge to 100%.

Magic Leap 2 charging cable provided Charger Outputs (DC) can switch between three power output combinations to charge the controller and compute pack:

- 05V 3A / 15W
- 09V 3A / 27W
- 15V 3A / 45W

IMPORTANT: It's recommended to leave the device charging at a charging station. If the device is left to charge, then the device will automatically trigger battery-saver mode.

Power consumption is heavily influenced by how the device is used, given the number of sensors, the level of access provided to the platform, and the sheer number of variables related to CPU/GPU utilization, settings, environmental conditions, etc. The application must be tested to determine practical battery life while running in the target environment.

Magic Leap 2 Settings and Configurations for Battery Optimization

The following sensors and features can be disabled or managed to optimize battery and performance:

- Dynamic Dimming™ technology: Can be turned off in Settings
- Bluetooth: Can be turned off in Settings
- Wi-fi: Can be turned off in Settings
- Camera: Can be turned off when not in use
- Microphone: Can be turned off when not in use

The following device settings can be disabled or managed to optimize battery and performance. However, this depends on the features required to power the experience. The general rule is to disable a setting if it is not used.

- Display:
  - Display Modes: Set to Manual.
  - Brightness: Lower brightness consumes fewer resources, but the setting should be calibrated to the ambiance of the room.
  - Segmented Dimming: Turn OFF
- Apps and Notifications
  - Notifications: Disable/Turn OFF,
  - Permission Manager: Turn OFF all Magic Leap permissions except for those that are required for the experience.
- Gestures & Inputs
  - Hand Tracking: Turn OFF if not using.
  - Voice Input: Turn Off if not using.
- Network
  - Bluetooth - Turn OFF. If the controller is needed (Eg, for troubleshooting the device), connecting the controller via USB-C will automatically Turn ON Bluetooth.

Managing heat/thermals

Magic Leap 2 does generate heat while in use like any electronic. As the device starts to heat up, the compute pack fan will turn on. It is recommended that the compute pack be unobstructed to provide airflow. If the heat on the compute pack becomes unmanageable for the device, the high-temperature warning notification is triggered.

Optimal operating environment temperatures are:

- Operating environment: 10°-30° C or F/ -95% Relative Humidity / 2000m equivalent
- Non-operating storage: -20° C-45° C or F / 5-95% Relative Humidity

Customers who must operate Magic Leap 2 for extended periods should ensure the compute pack has enough airflow to dispense the heat. For more information refer to the safety guide.

Regulatory information

Magic Leap 2 regulatory information includes information on temperature range, disposal, radio and TV interference, and more.

Environmental Considerations

Magic Leap 2 blends the digital and physical worlds by placing digital content in your surroundings. When using an application, digital content will fill your surroundings as you see and move around your space. There are environmental considerations when using the device. This article goes into depth into how headpose is impacted by the environment.

Lighting

When an environment is too bright, digital content may not appear as dense, which can impact device functionality, depending on the features used.

- For digital content that does not appear as dense, a user can leverage the Segmented Dimming™ feature when the environment is too bright. Read this resource for more information on the Segmented Dimming™ feature
- If the area is too dark (i.e. low light scenarios with <10 lux), headpose (tracking of the headset in the environment) may occur. Then, the headpose will not be able to handle fast motions as well and may not be able to recover from tracking lost events.

Cleaning Protocol

The Magic Leap 2 is made of plastic and glass components that are meant to be cleaned after use if it's a shared device. Here are the instructions to clean the device.

Magic Leap 2 Device Troubleshooting Best Practices

Below are a list of the most common issues customers face and a link on how to resolve them.

- OS update failure either from the OS Installer failing in ML Hub or running into an error during flashing resulting in a boot loop.
- The controller is unresponsive or the controller fails to update
- Headpose is lost and digital content is shifted, digital content is flying away or digital content appears tilted
- Try restarting the device if you have an issue. If it does not resolve the issue perform a hard reset

Customer Support

If there are issues that persist, it is recommended to reach out to the Customer Care team.

Magic Leap 2 Warranty

Magic Leap 2 warranty is identified with the product serial number. For more information on the warranty, view this resource.

Magic Leap 2 Disposal

When the Magic Leap 2 (and the batteries inside it) reach their end of life, they should be disposed of in accordance with local, state, and federal regulations. For more information, refer to the Magic Leap Environmental Information page.