iXRLabs Engineering

User Manual

A complete guide to Machine Modules, Industrial Tours, and Experiments

Platform: Meta Quest | Controllers: Touch Controllers

3 Module Types • Machine Modules | Industrial Tours | Experiments

Version 1.0 • For internal distributionc

Wrapper App

Welcome to Wrapper App — your gateway to interactive and immersive learning experiences. Designed to simplify technical education, Wrapper App allows users to log in and explore a wide range of engaging learning modules tailored for modern industrial and educational training.

Inside the app, users can access:

- **Machine Modules**
- **Industrial Tours**
- **Experiments**

Wrapper App combines technology with education to create an easy, accessible, and effective learning platform for students, trainees, and professionals.

- Wrapper App Installation:

The iXRLabs VR platform can be accessed on any compatible Meta Quest device, including **Meta Quest 2, Meta Quest 3, Meta Quest 3S, and Meta Quest Pro**.

To download and access the iXRLabs application, please ensure that your Meta Quest headset is signed in using the same active Meta Quest ID on which the iXRLabs invite link has been shared.

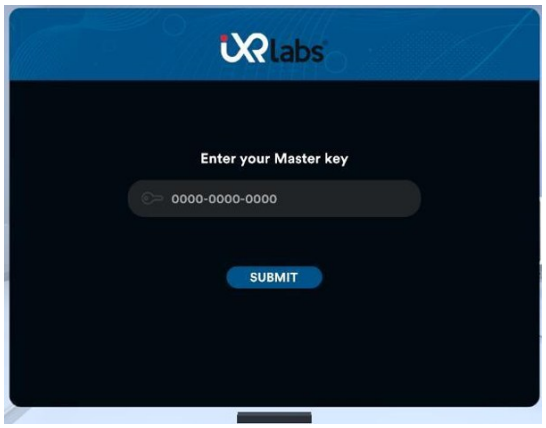
You would have received the iXRLabs application invite link on your registered Meta Quest email ID. Please open the invite link and accept the invitation using the same Meta Quest account.

Once the invite is accepted, the iXRLabs application will become available on the Meta Quest headset linked to that email ID. You can then download and install the application directly on the headset.

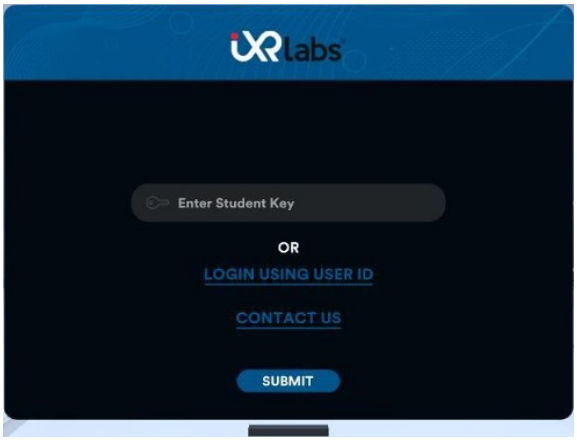
After installation, open the iXRLabs application on the headset and proceed using the license credentials shared separately by the iXRLabs team.

- Wrapper Working:

Login:
After opening the application, the user will be prompted to enter a Master License Key.



Once the Master License Key has been entered successfully, the user will then be asked to enter a Student Key.

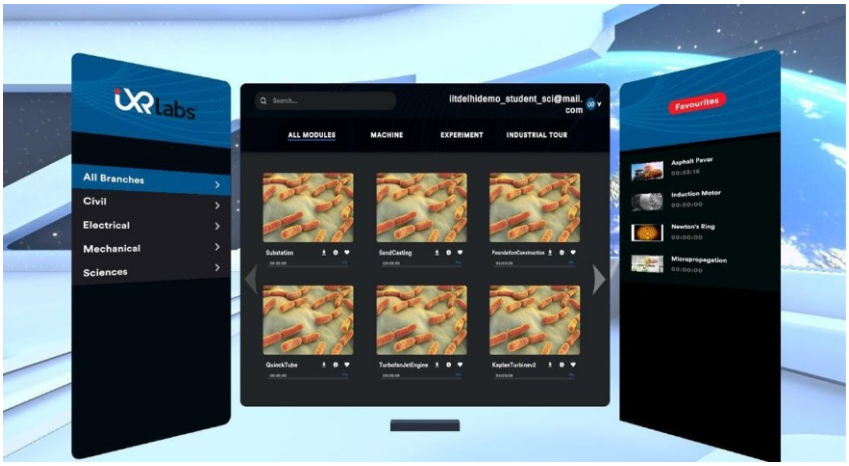


Main Menu

Upon logging in, the user will be directed to the Main Menu screen, where all available learning modules are displayed.

The interface is divided into multiple sections for easier navigation:

- **Branch Selection Panel (Left Side):**
  Users can browse modules based on different branches such as Civil, Electrical, Mechanical, and Sciences.
- **Module Display Area (Center):**
  This section displays all available modules under categories such as Machine Modules, Experiments, and Industrial Tours. Users can select any module to begin learning.
- **Favorites Panel (Right Side):**
  Clicking the **heart icon** on a module adds that module to the **Favorites** list. Favorite modules are displayed in the **Favorites panel** located on the right side of the main menu.
- **Search option**:
  Available at the top of the Main Menu allows users to quickly search for specific modules.



Clicking on the **Information (i) button** available under a module will open the module details section.

In this section, the user can:

- View the **module description**
- Watch the **module introduction or learning video**
- Access and participate in the **quiz section** to test their understanding of the module content

Additionally, pressing the **Download button** will download the selected module to the device for access and learning.

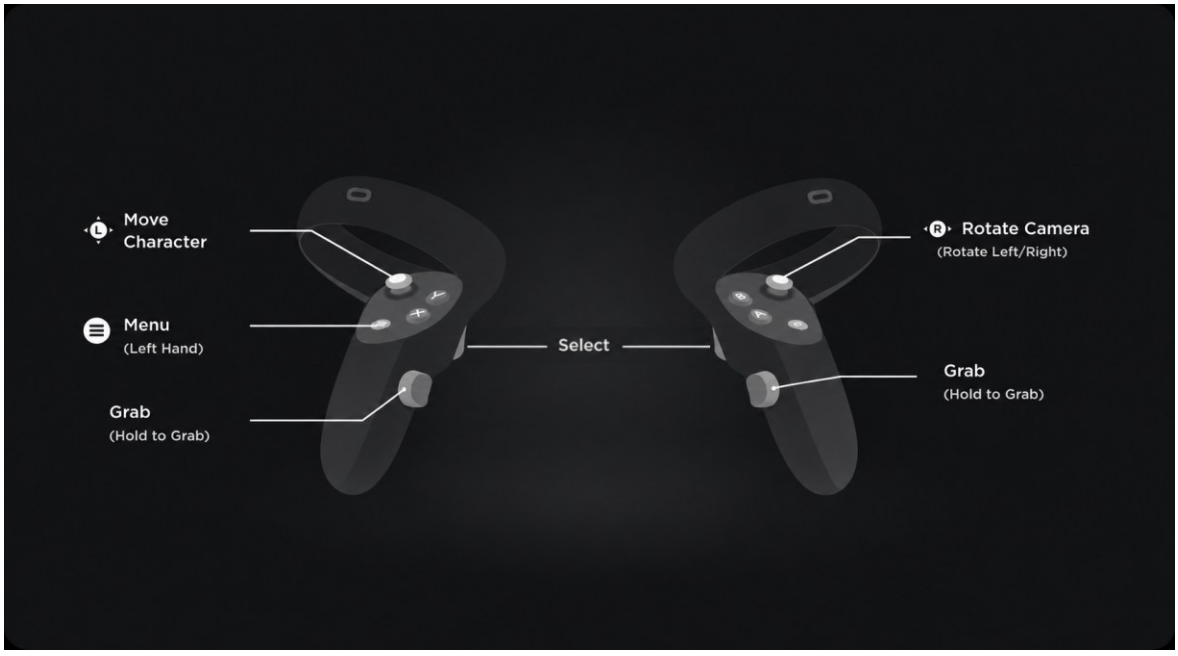
1. Introduction

Welcome to iXRLabs Engineering — a virtual reality platform designed to make complex engineering concepts tangible through immersive 3D experiences. The platform contains three types of modules, each built for a different learning mode. All three share the same Meta Quest controller scheme, so mastering the controls once gives you access to every module on the platform.

Module Type	What It Is	Primary Interaction
Machine Modules	Explore, disassemble, inspect, and understand real engineering machines in 3D	Left-hand radial menu + Grab to manipulate parts
Industrial Tours	Walk through large-scale industrial environments in Explore or Guided mode	Trigger Button to advance steps; free movement in Explore mode
Experiments	Perform hands-on virtual engineering experiments step by step	Grab Button for objects + Trigger Button for UI

2. Controller Overview

The Meta Quest Touch controllers (one per hand) are used across all module types. The table below describes the full controller mapping for the iXRLabs Engineering platform.



Hand	Button	Action	When to Use
Left Hand	**X Button**	Open / expand the radial menu	Any time in Machine Modules — to access modes and options
Left Hand	**Left Joystick**	Scroll through radial menu options	After opening the radial menu — highlight the option you want
Left Hand	**Trigger Button**	Select the highlighted menu option	Confirming a selection in the radial menu
Right Hand	**Trigger Button**	Interact with all UI elements (buttons, panels, menus)	Pressing any on-screen button, advancing guided tour steps, UI confirmations
Right Hand	**Grab Button**	Grab, move, rotate, and inspect 3D objects and parts	Handling machine parts, experiment equipment, specimens
Either Hand	**Thumbstick**	Locomotion — walk, strafe, or rotate view	Moving around the environment in all module types
Left Hand	**Menu Button**	Return to the module selection list	Exiting any active module and going back to choose another
Right Hand	**Oculus Button**	Return to Meta Quest home	Emergency exit or switching applications

2.1 The Two Core Interactions

Across all three module types, these two interactions are constant:

GRAB BUTTON Right Hand — Side / Grip	TRIGGER BUTTON Right Hand — Index Finger
Use for: 3D Objects & Parts • Machine components and assemblies • Parts in Separate / X-Ray modes • Experiment equipment and specimens • Rotate, move, and inspect objects	**Use for: UI Elements** • Buttons, panels, and menus • Next / Previous in Guided tours • Confirmation dialogs • Experiment step confirmations

2.2 The Left-Hand Radial Menu (Machine Modules Only)

Machine Modules feature a special left-hand radial menu that gives you quick access to viewing modes and options without leaving the 3D environment. This is unique to Machine Modules and is not used in Industrial Tours or Experiments.

How to use the radial menu:

1. Press the X Button on your left controller to open the radial menu. A circular menu appears around your left hand.
2. Tilt or push the Left Joystick to scroll through the available options. The currently highlighted option is visually indicated.
3. Press the Left Trigger Button to select the highlighted option. The menu closes and the selected mode activates.
4. To close the menu without selecting, press the X Button again.

> **Radial Menu Tip**
> You can open the radial menu at any time during a Machine Module session without losing your current position or progress. Use it freely to switch between viewing modes as needed.

3. Getting Started

Follow these steps each time you launch an iXRLabs Engineering module:

5. Put on your Meta Quest headset and confirm both controllers are in hand and tracking.
6. From the Meta Quest home screen, open the iXRLabs Engineering application.
7. Select your module type from the main menu, then choose a specific module — use the Right Trigger Button to click your chosen tile.
8. Read the Learning Objectives screen. Press the on-screen button (Right Trigger) to begin.
9. You will be placed in the virtual environment. Take a moment to orient yourself before proceeding.
10. Follow on-screen prompts and highlighted elements to start the experience.

4. Machine Modules

Machine Modules place you inside a 3D virtual engineering machine — such as an engine, turbine, pump, or mechanical assembly. You can explore, disassemble, and inspect the machine using multiple viewing modes. Each mode gives you a different perspective on how the machine is built and how it works.

4.1 Starting a Machine Module

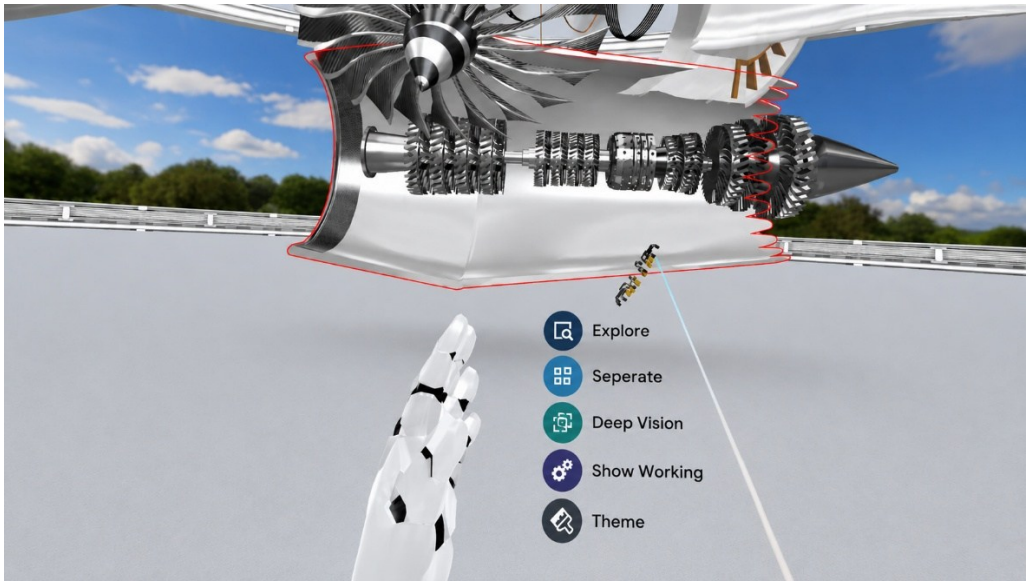
After selecting a Machine Module, you will see a Learning Objectives page outlining what you will explore. Press the "Let's Explore" button (Right Trigger) to enter the module and begin interacting with the 3D machine model.



4.1 - Let's Explore

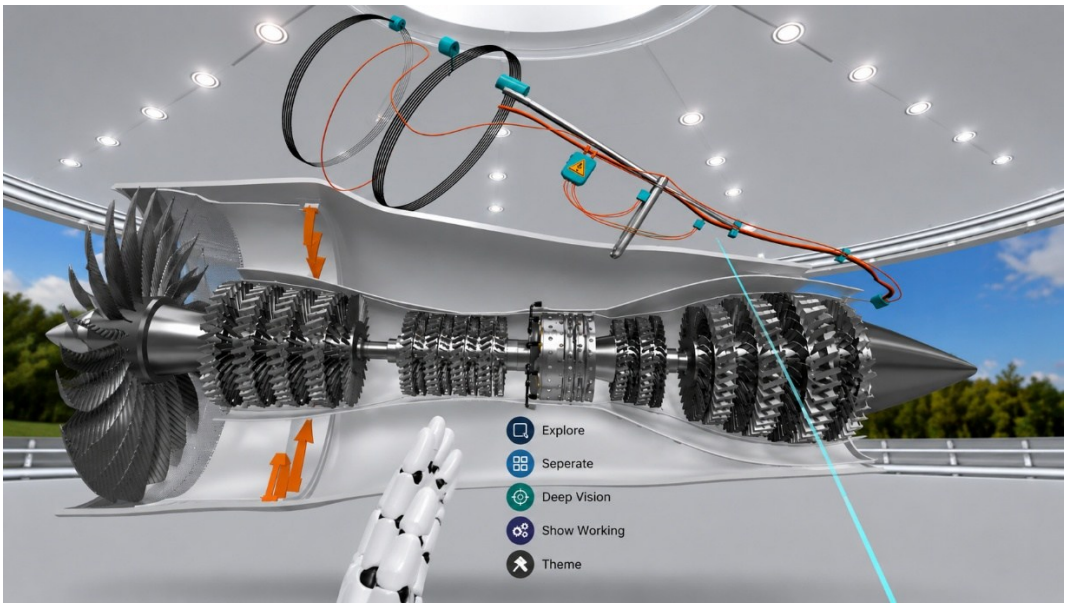
4.2 Viewing Modes

Each Machine Module includes up to four viewing modes, accessible at any time via the left-hand radial menu (X Button). Switch between modes freely as you explore.



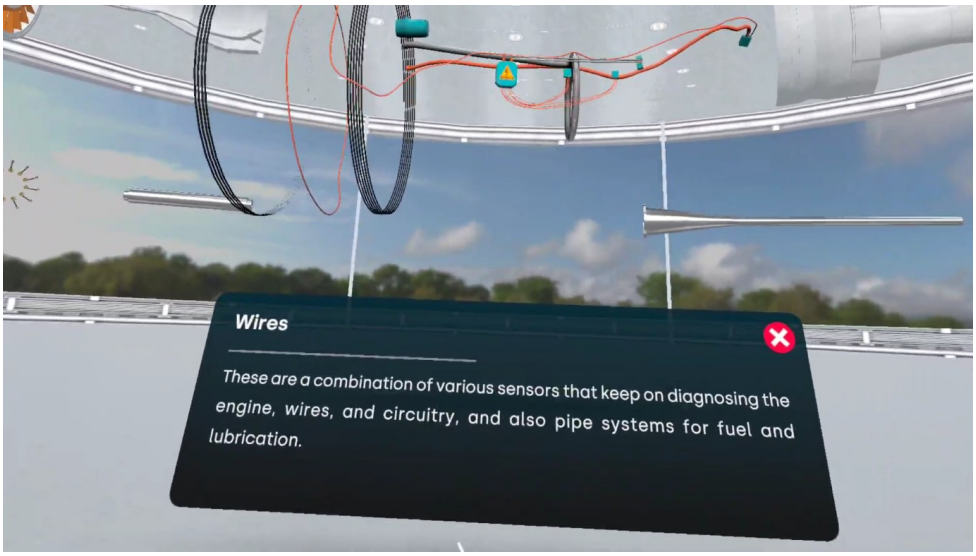
4.2 – Menu Screen

Mode	What You See	How to Interact	Learning Purpose
Explore	Complete assembled machine	Grab, rotate, and move parts freely	Free exploration — understand the full assembly and spatial layout
Separate	Exploded / disassembled view	Grab individual parts to reveal information panels	Learn part names, functions, and positions within the assembly
Deep-Vision	Transparent layered view	Click on the Arrows to navigate between the parts in X-Ray View	Understand internal structure and hidden mechanisms
Working	Animated machine in operation	Watch step-by-step operational animation	See how the machine functions — observe movement and process flow



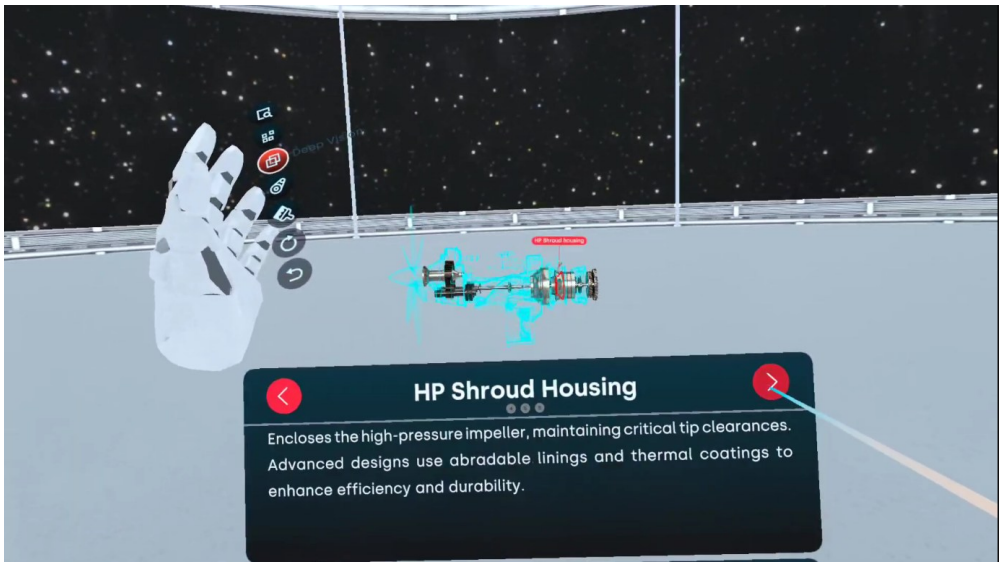
Explore Mode

Grab, rotate, and move parts freely using the Grab button and rotate the parts using joysticks.



Seperate Mode

Click on each part using the Trigger Button to know deeply about them.



Deep Vision

Click on the Arrows to navigate between the parts in X-Ray View



Show Working

Watch step-by-step operational animation and navigate between the slides by clicking on Previous and Next button using the Trigger Button.
After Completing the Module user can return to the module selection list using the left controller **Menu** button.

4.3 Interacting with Parts

- **Grabbing parts:** Move your right hand close to any component until it highlights, then squeeze the Grab Button. Move your hand to reposition the part.
- **Information panels:** In Separate mode, grabbing a part opens a floating information panel showing the part name, function, and specifications.
- **Releasing parts:** Release the Grab Button to drop or place the part. Parts snap back to their original position if released without being placed.

5. Industrial Tours

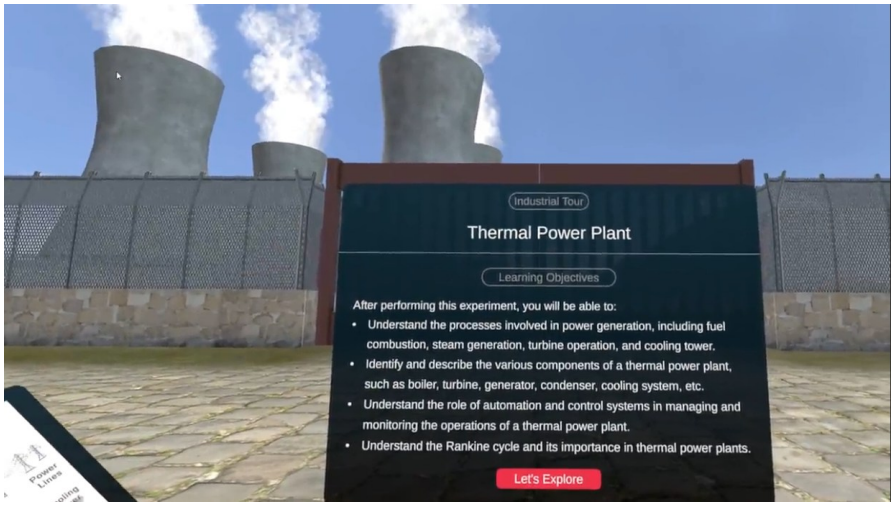
Industrial Tours place you inside large-scale virtual industrial environments — factories, plants, refineries, or facilities. You can walk through the space and learn about the processes that take place there. Tours are available in two modes: Explore and Guided.

	Explore Mode	Guided Mode
Movement	Walk freely throughout the entire environment using the thumbstick	Automatically carried along a fixed path between stages
Interaction	Move physically to a point of interest to trigger its content	Press Next / Previous (Right Trigger) to advance or go back between stages

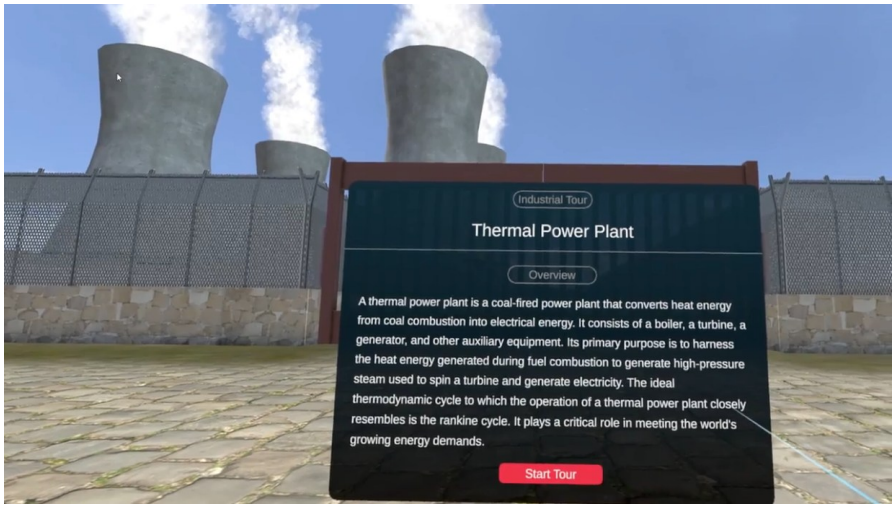
	Explore Mode	Guided Mode
Content	Info panels and labels appear when you approach relevant areas	3D animations, process explanations, and narration play at each stage
Pacing	Self-directed — explore at your own speed and order	Structured — content is delivered in a set sequence
Best for	Overview familiarization, spatial understanding of the facility	Deep learning of a specific process or workflow

Starting an Industrial Tour.

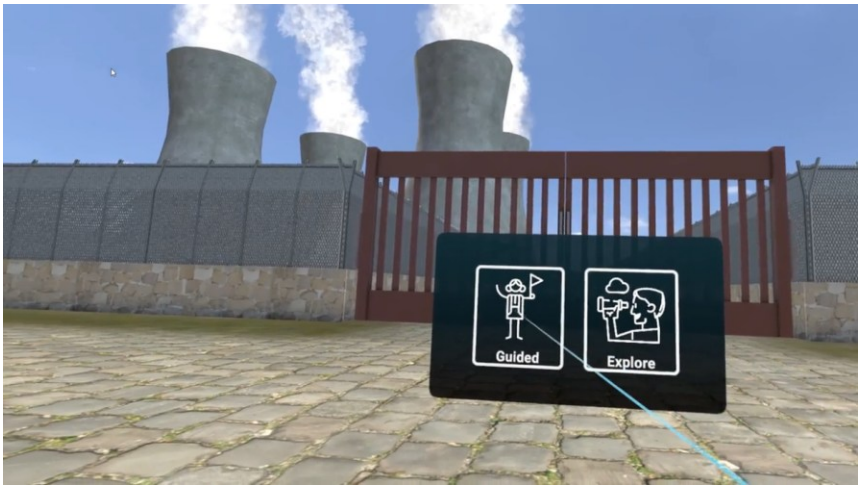
After selecting an Industrial Module, you will see a Learning Objectives page outlining what you will explore. Press the "Let's Explore" button (Right Trigger) to enter the module.



After Pressing the “Let’s Explore” Button, you will see an Overview page. Press the "Start Tour" button (Right Trigger) to Start the Industrial Tour.



After Pressing the “Start Tour” Button, User will be taker to the next screen where they can select “Explore” or “Guided” mode to Begin with.



5.1 Explore Mode

In Explore mode you have full freedom of movement throughout the industrial environment.

- **Walking:** Use the Thumbstick to move around the facility in any direction.
- **Points of interest:** Glowing markers or highlighted zones appear at key locations. Walk towards them to trigger the related content by clicking on “Know More” button using (Right Trigger Button) — information panels, labels, or short animations will appear automatically.



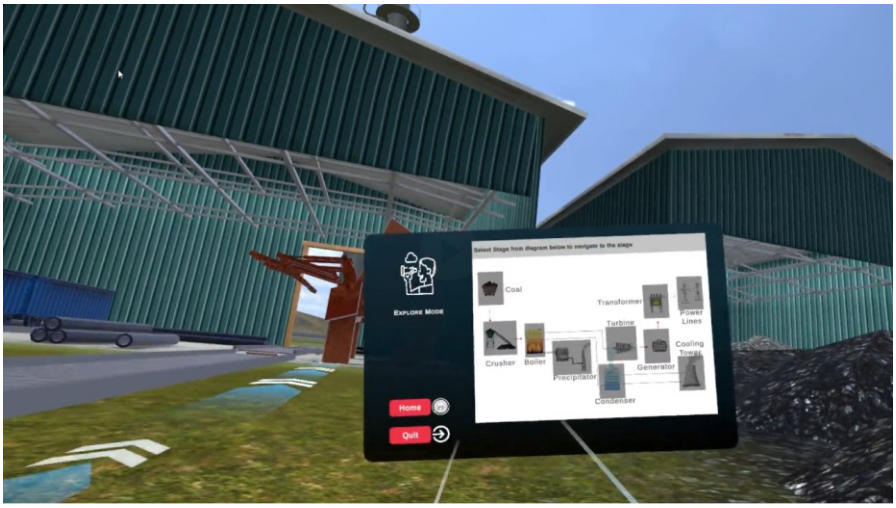
Points of interest

- **Reading panels:** UI panels that appear can be dismissed using the “Right Trigger Button” on “Exit” button shown on the panel once you have read them.



Reading panels

- **Revisiting areas:** You can walk back to any area at any time — there is no locked order in Explore mode. By using the Explore panel on the left hand user can click on any section using (Right Trigger Button) to move directly to that particular area to explore the Industrial Module.



Revisiting areas

5.2 Guided Mode

In Guided mode the experience takes you through a structured sequence of process stages. You are moved along a fixed path so you can focus entirely on the content at each stage.

- **Advancing stages:** Press the Next button (Right Trigger) to move to the next stage. The environment transitions and places you at the next point of interest.



Advancing stages

- **Going back:** Press the Previous button (Right Trigger on the back-arrow panel) to return to the previous stage if you need to review.
- **3D animations:** At each stage, a 3D animation plays showing the industrial process in action. Watch the full animation before advancing.



3D animations

- **Narration & labels:** Audio narration and on-screen labels accompany each stage. Read or listen fully before pressing Next.

- **Stage indicator:** A progress indicator shows your current stage and total number of stages so you know how far through the tour you are.



Stage indicator

On the Left Hand the menu contains “Home” Button which user can press using (Right Trigger Button) to go back to the main screen.

On clicking “Replay” Button using (Right Trigger Button) the module restarts the “Guided” or “Explore” mode whichever user is playing.

“Quit” button can be used by pressing (Right Trigger Button) to quit the module and go back to the main module selection screen.



After Completion of the “Guided Mode” user can see a panel with “Guided Tour is over”. On pressing “OK” button using (Right Trigger Button) user will be taken back to the Mode selection screen.

ℹ Guided Mode Tip

You do not need to move physically during Guided mode — the experience moves you automatically. Simply look around at each stage and use Next / Previous to control pacing.

6. Experiments

Engineering Experiments place you in a virtual lab or test environment where you carry out a specific engineering procedure step by step. The control scheme mirrors the Sciences modules: The Grab Button handles all physical object interaction, and the Trigger Button handles all UI interaction.



Virtual Lab

Advancing stages: Press the Right Arrow using (Right Trigger Button) to move to the next stage.



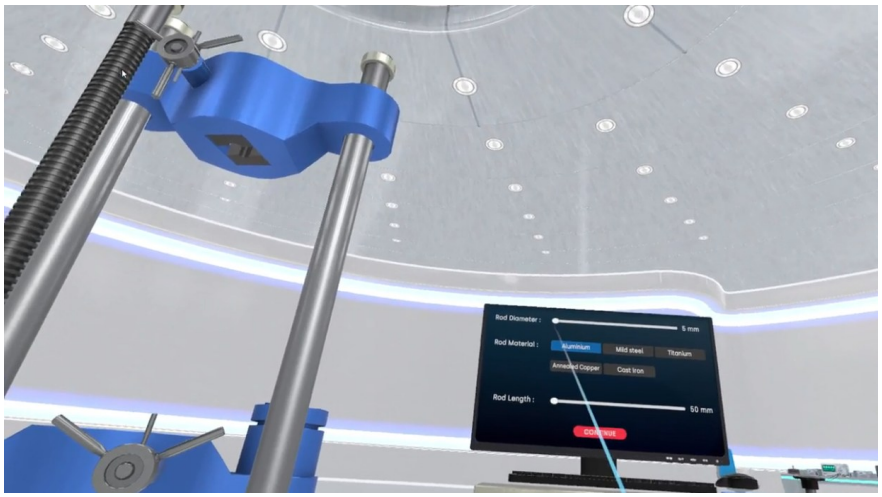
Advancing stages

Labels: User is navigated to the Labels Section where they can learn deeply about each part of the machine by clicking on the Labels visible on the screen using “Right Trigger Button”. Once the user read the description and heard the VO completely they can close the Description panel by clicking on “Close” button using “Right Trigger Button” and select other part.



Labels

Experiment Setup: User will proceed to the Experiment setup where they have to follow the instructions and complete the setup.



Experiment Setup

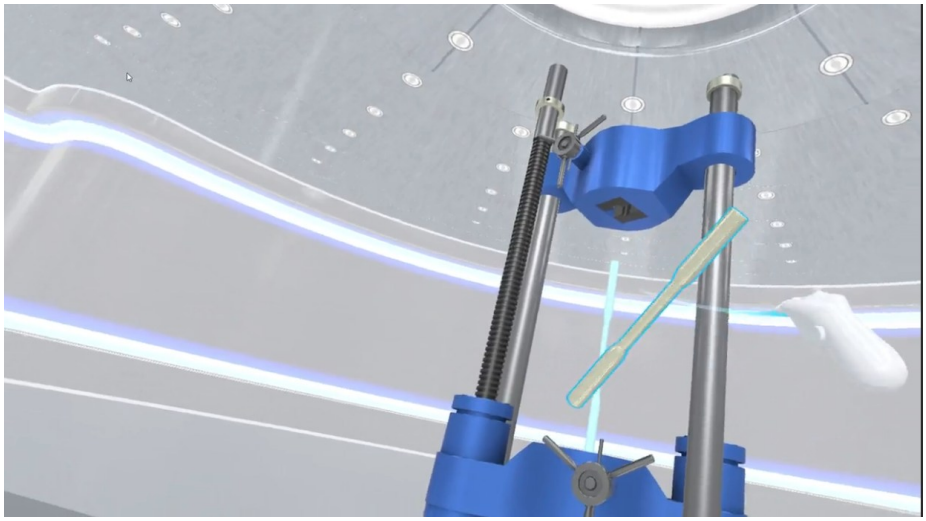
6.1 General Experiment Workflow

Step	Phase	What You Do
1	**Orientation**	Look around the workspace. Locate your equipment and read the first instruction card (Right Trigger to advance).
2	**Gather**	Use the Grab Button to collect required tools, components, or materials as instructed.
3	**Set Up**	Position equipment at the workstation. Snap indicators confirm correct placement when you release the Grab Button.

Step	Phase	What You Do
4	**Execute**	Follow each step: Grab Button for physical handling, Right Trigger to confirm actions or advance instruction panels.
5	**Observe**	Watch for visual feedback — readings on virtual instruments, animations, colour changes, or state changes.
6	**Record**	Use the Right Trigger to log observations or select answers on the interactive results panel.
7	**Complete**	A results screen appears. Trigger-click to review, then exit or start another experiment.

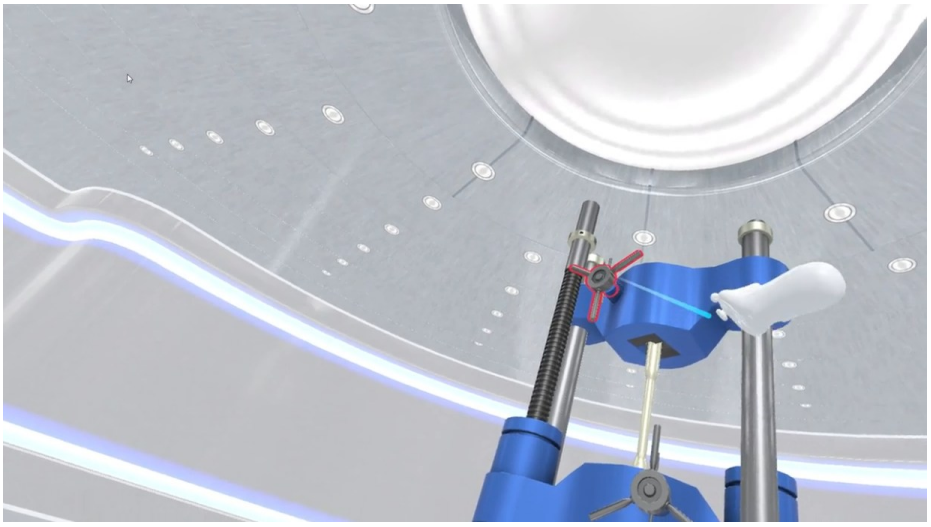
6.2 Key Interactions in Experiments

- **Grabbing tools and components:** Reach towards an object until it highlights, then squeeze the Grab Button. Hold while positioning and release to place on the highlighted area.



Grabbing tools and components

- **Rotating Parts:** Hold the part using the “Grab Button” and move the controller in clockwise or anti-clockwise direction as per the instructions.



Rotating Parts

- **Two-handed interaction:** Some assemblies require both hands. Grab with one hand, then grab the same object with the other to rotate or align with precision.
- **Snap placement:** Components snap to their correct position when released near a valid connection point. Watch for the snap indicator (glow or outline).
- **3D interactions:** Some experiments include spatial tasks such as aligning components, tracing paths, or activating mechanisms — follow on-screen prompts for each.



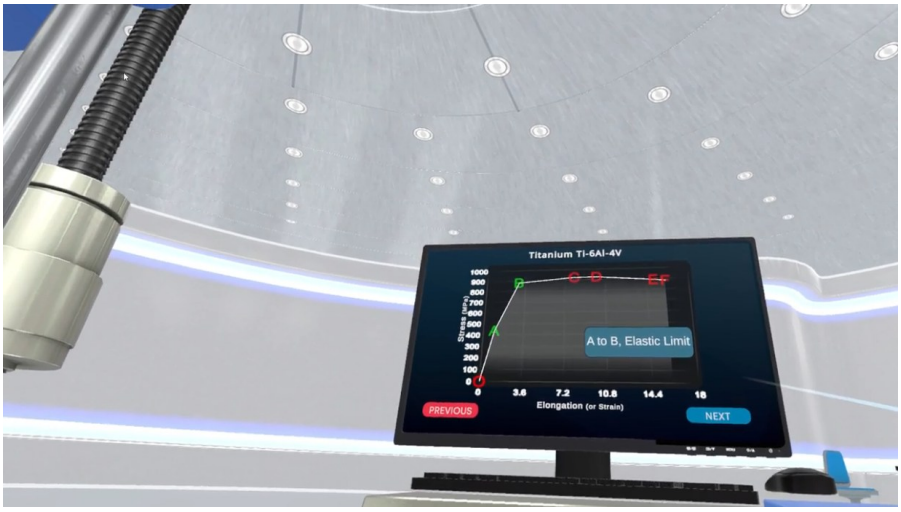
3D interactions

- **UI confirmations:** All confirmation buttons, menus, and result panels use the Right Trigger Button. Never use the Grab Button on flat UI surfaces



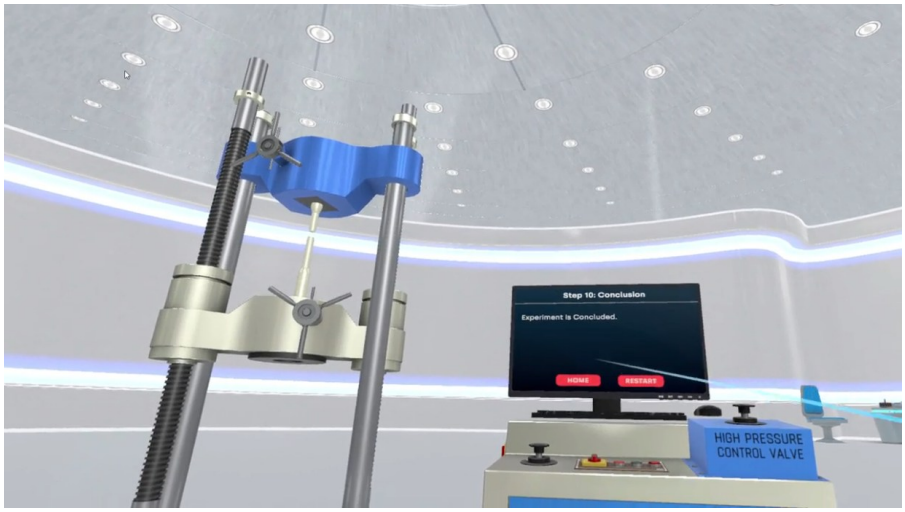
UI confirmations

Graphs: User will be presented by the Graphs as per the reading taken during the experiment. User can go to next or previous slide using “Right Trigger Button” by clicking on particular button.



Graphs

Module Completion: After completing the module user will be taken to the Conclusion screen with two options – Home or Restart. User can select any option “Restart” to restart the modules or “Home” to go back to main module selection screen using “Right Trigger Button”.



Module Completion

7. Menus & Navigation

7.1 Returning to the Module List

Press the Menu Button (left controller) at any time during any module to exit and return to the module selection list. From there you can launch a different module or close the application.

7.2 In-Module Options

Depending on module type, in-scene options panels (accessible via A/B buttons or the radial menu) offer:

- Restart the current module from the beginning
- Review the learning objectives
- Replay the current animation or step
- Access a contextual hint for the current action
- Adjust audio volume

8. Safety & Comfort Guidelines

- Clear your play area before every session and activate the Guardian boundary.
- Take at least a 10-minute break every 30 minutes of use.
- Remove the headset immediately if you feel dizzy, nauseated, or uncomfortable.

- New users should start with short 10–15 minute sessions and increase gradually.
- Seated mode is available in most modules — recommended for Guided Tours and Experiments.
- Clean headset lenses only with the supplied microfibre cloth.
- Replace controller batteries when the low-battery indicator appears in the headset.

9. Quick Reference Card

Keep this page handy during sessions.

Hand	Button	Action
Right	**Trigger Button**	Interact with all UI — buttons, panels, Next / Previous, confirmations
Right	**Grab Button**	Grab, move, rotate any 3D object or part
Left	**X Button**	Open / close the radial menu (Machine Modules)
Left	**Left Joystick**	Scroll through radial menu options (Machine Modules)
Left	**Left Trigger Button**	Select the highlighted radial menu option (Machine Modules)
Either	**Thumbstick**	Move around the environment
Left	**Menu Button**	Return to the module selection list
Right	**Oculus Button**	Return to Meta Quest home

MACHINE MODULES	INDUSTRIAL TOURS	EXPERIMENTS
• X Button → radial menu • Joystick → scroll menu • Left Trigger → select mode • Right Grab → handle parts	• Explore: walk freely • Guided: Next / Previous • Right Trigger → advance • Walk to POIs in Explore	• Right Grab → objects • Right Trigger → UI • Snap to place parts • Follow step prompts

ℹ Need Help?

If you encounter an issue not covered in this manual, contact your session administrator or refer to the iXRLabs Engineering support documentation provided with your installation.