

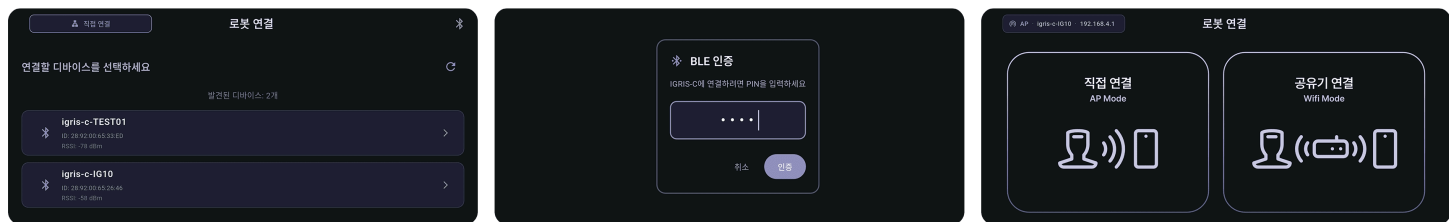
Mobile Control App

1. Robot Connection

This screen allows you to discover nearby robots, pair with them via Bluetooth, and configure the network required for device control.

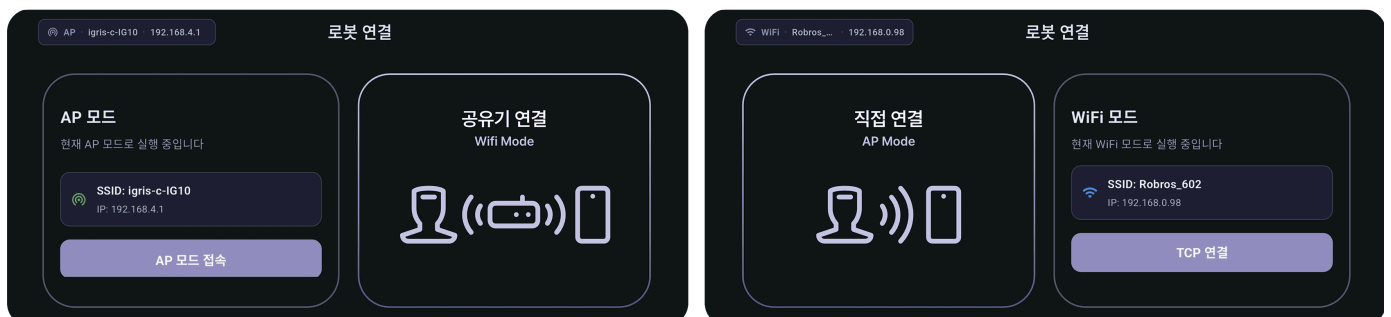
Robot Discovery

- 1. Robot Discovery and Pairing:** When the app is launched, it automatically scans for nearby **IGRIS** robots via Bluetooth for approximately 10 seconds and displays the detected devices. Tap the desired robot from the list to establish a Bluetooth connection within a few seconds.
- 2. PIN Authentication:** After the Bluetooth connection is established, enter the 4-digit PIN code and tap **[Authenticate]**.
- 3. Select Connection Method:** Once authentication is complete, **AP Mode** and **Wi-Fi Mode** cards are displayed. Check the robot's current network status in the upper-left corner, then select the desired connection method.



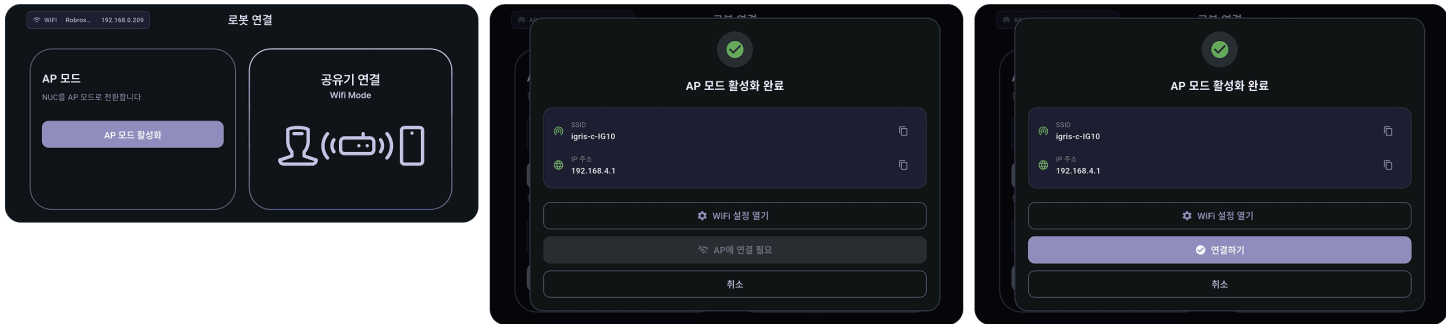
Robot Connection

- Connect Using an Existing AP:** The current AP information (SSID and IP address) is displayed in **green**. If your smartphone is already connected to the same Wi-Fi network, simply tap **[Connect AP Mode]** to establish the connection.
- Connect Using an Existing WiFi:** The current Wi-Fi information (SSID and IP address) is displayed in **blue**. If your smartphone is already connected to the same Wi-Fi network, simply tap **[TCP Connect]** to establish the connection.



- **Create a New AP Connection**

1. **Enable AP Mode:** Select the **Direct Connection** card, then tap **[Enable AP Mode]** to create the robot's own Wi-Fi access point.
2. **Connect Your Smartphone:** Tap **[Open Wi-Fi Settings]** to open your smartphone's Wi-Fi settings and connect to the robot's Wi-Fi network. Once connected, the **[Connect]** button in the app is automatically enabled.
3. **Complete the Connection:** Tap **[Connect]** to establish the final connection with the robot. When the connection is complete, the app automatically navigates to the Home screen.

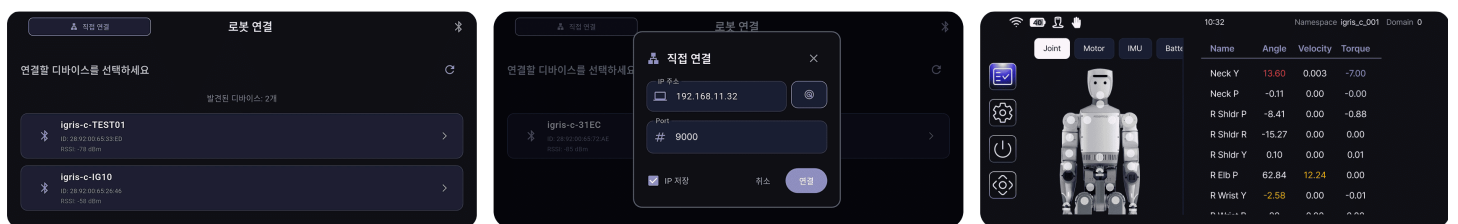


- **New WiFi Connection**

1. **Scan for Wi-Fi Networks:** Select the **Router Connection** card, then tap **[Scan Wi-Fi]** to search for nearby Wi-Fi networks.
2. **Select a Network:** When the scan is complete, choose the Wi-Fi network that the robot will connect to.
3. **Enter the Password:** Enter the password for the selected Wi-Fi network, then tap **[Connect Wi-Fi]**. The robot will attempt to connect to the network, which may take up to **30 seconds**.
4. **Connect Your Smartphone:** Tap **[Open Wi-Fi Settings]** to open your smartphone's Wi-Fi settings and connect to the same Wi-Fi network. Once connected, the **[Connect]** button in the app is automatically enabled.
5. **Complete the Connection:** Tap **[Connect]** to establish the final connection with the robot. When the connection is complete, the app automatically navigates to the Home screen.



- **If Connection Fails:** If the robot cannot be connected using the procedures above, use the manual connection method described below.
 1. **Connect to the Same Network:** Connect your smartphone to the same Wi-Fi network (or AP) as the robot, then tap **[Direct Connection]** in the upper-left corner of the Bluetooth discovery screen.
 2. **Enter the IP Address**
 - a. Enter the robot's **IP address** and **port number** (default: **9000**), then tap **[Connect]**.
 - b. If you do not know the robot's IP address, tap **[Network Scan]** to search for robots on the current network.
 - c. Select the desired robot from the scanned list, and its IP address will be filled in automatically.
 - d. **Complete the Connection:** Once communication with the robot has been established successfully, the app automatically navigates to the Home screen.



2. Home Page

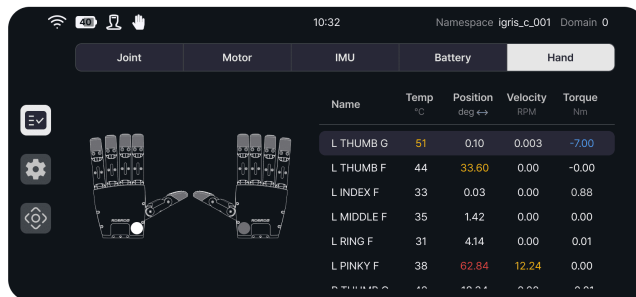
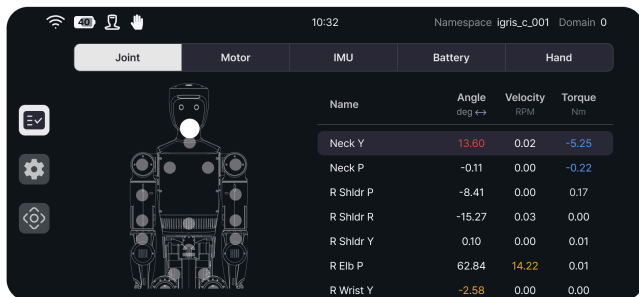
A dashboard for checking the robot's connection status at a glance and quickly navigating to key features.

Monitoring

: Monitor the robot's key operating data in real time.

- **Joint:** Displays the current joint **Angle**, **Velocity**, and **Torque** of each robot joint in real time.

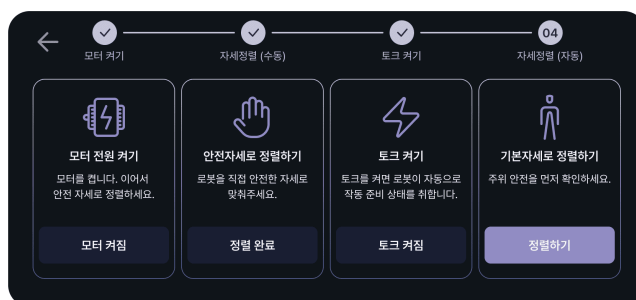
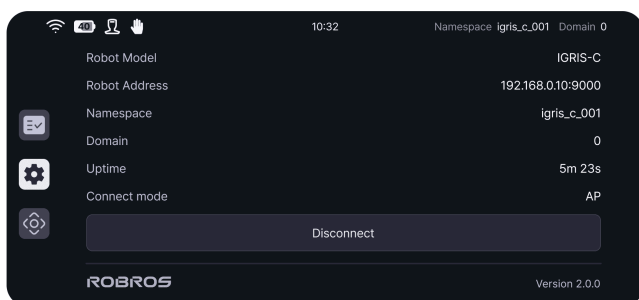
- **IMU:** Displays real-time measurements from the robot's IMU sensors, including **Roll, Pitch, Yaw (RPY), Quaternion (Quat), Gyroscope (Gyro), and Accelerometer (Accel)**.
- **Motor:** Displays the motor's operating status, including **Position, Velocity, Torque, and Temperature**, in real time.
- **Battery:** Displays the current battery level and operating status in real time.



Settings

: View robot information and manage the current connection.

- Displays the robot ID, IP address, uptime, and connection mode. You can also disconnect the currently connected robot.
- **Disconnect:** Disconnects the app from the robot.
- **Starting Process:** Performs the required checks and configuration before entering the robot control screen.



3. Control Page

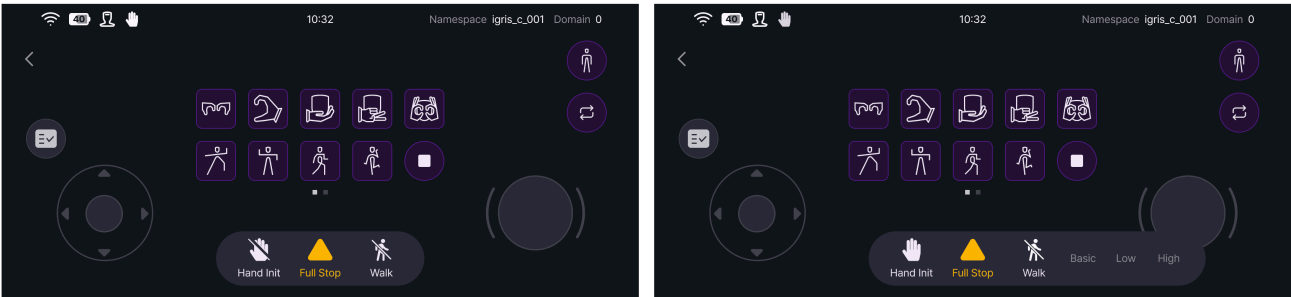
The primary control interface for directly operating the robot via joystick and preset functions, with real-time monitoring.

Status Bar

- The status bar at the top of the screen provides an at-a-glance view of the connected robot's network and hardware state.

Item	Description
WiFi	Network connection status
Battery	Current robot battery level
Robot Connection	Communication and connection status with the robot
Hand Initialize	Whether the robot hand has been initialized
Namespace	Namespace currently in use by the system
Domain	Current domain ID or control zone information

Main Control Page



- **Controls**
 - **Hand Initialize (Hand Init):** Resets the position and state of the robot's hands. Only needs to be run once for normal operation. Initialization status is visible in the status bar.
 - **Full Stop:** Immediately halts all robot motion and locks the preset functions. Use in emergencies or when motion must be interrupted. After releasing Full Stop, you **must** tap **[Home Position]** first to return the robot to a safe state.
 - **Walk Mode (Walk / Locomotion + Upper Body Control):** Controls both locomotion and upper body simultaneously via joystick. Internally executes the WALKMODE_ON command.

*Risk of damage. Only activate while the robot is securely mounted on the hoist and stably placed on the floor.
- **Joystick**

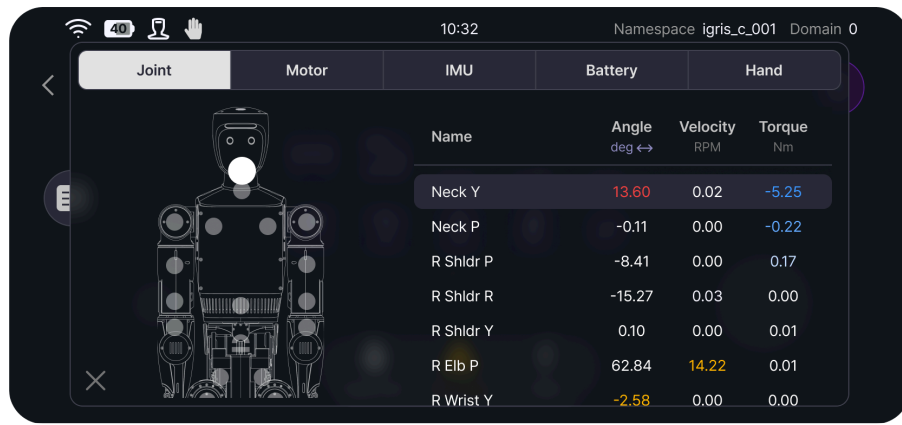
- **Left Joystick:** Controls the robot's walking direction (forward / backward / lateral movement).
- **Right Joystick:** Controls the robot's upper body rotation (left / right turn).
- **Preset**
 - Executes predefined motion sequences. Can only be initiated in HIGH_LEVEL_MODE or HIGH_LEVEL_WALK_MODE.
 - **Motion Stop:** The stop button at the bottom-right of the preset area. Immediately halts the current preset motion; lower-body locomotion continues.
 - **Repeat Preset:** Continuously repeats the selected preset motion.
 - **Home Position:** Returns the robot to its default posture after a preset finishes, preparing it safely for the next motion. **Must be pressed after releasing Full Stop or Motion Stop.**
- **Walk Mode Safety Checklist**
 1. Confirm the robot is mounted on the hoist.
 2. Confirm the robot is stably placed on the floor.
 3. Confirm no personnel or obstacles are in the surrounding area.
 4. Be ready to tap **[Full Stop]** immediately in an emergency.
- **Control Mode Transition Reference**
 - Each button in the app internally executes one of the Control Mode commands listed below. Please verify the prerequisites for switching between control modes before use.

App Button	Internal Command	Transition Condition
Run Preset	MOTION_PRESET	Available in HIGH_LEVEL_MODE or HIGH_LEVEL_WALK_MODE
Repeat Preset	MOTION_PRESET_CYCLE_TOGGLE	Available while a preset is running
Motion Stop	MOTION_STOP	Available during preset motion in HIGH_LEVEL_WALK_MODE; stops upper body only, locomotion continues
Full Stop	All motion halted + preset locked	Available at any time; Home Position required after release
Walk Mode	WALKMODE_ON	Enters walk mode (WALK_MODE)
Home Position	HOME preset	Available in HIGH_LEVEL_MODE

- **Common Prerequisites (Applies to All Mode Transitions)**
 - The controller accepts mode transitions only when the **robot power is ON**, **joint torque is ON**, and the **E-Stop is released**.
 - If any of these conditions are not met, the controller automatically switches to **TORQUE_OFF_MODE** and rejects the requested mode transition for safety.
 - Mode transitions are blocked while the robot is in the **Stopped** state (after **Full Stop** or **Motion Stop**). Before switching modes, restore the robot by executing the **HOME preset (Default Pose Alignment)**.
 - Executing a preset while in **LOW_LEVEL_WALK_MODE** or **WALK_MODE** automatically switches the controller to **HIGH_LEVEL_WALK_MODE**.

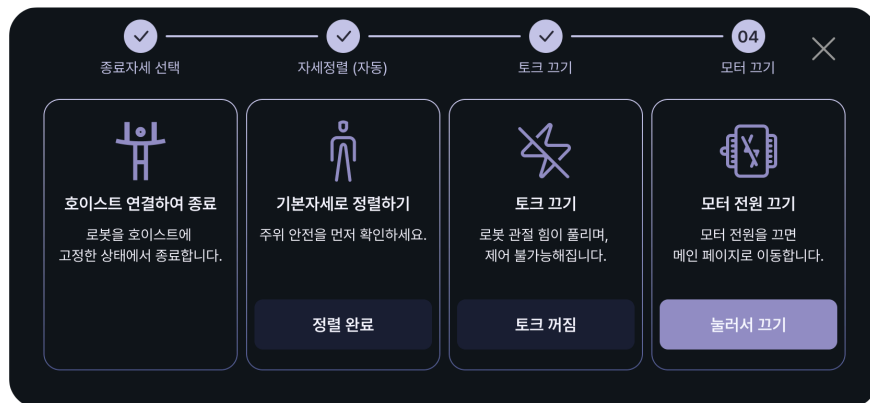
Monitoring

: Displays the robot's key operating data in real time while controlling the robot



Item	Display Color	Status
Torque	White → Blue Gradient	Load level
Angle, Velocity, Temperature, Position	White	Normal
Angle, Velocity, Temperature, Position	Yellow	Warning
Angle, Velocity, Temperature, Position	Red	Critical

Back



- Ends the control session and starts the safe shutdown process before returning to the **Home** screen.
 - Select Exit Posture:** Exit with hoist connected — shut down with the robot secured to the hoist.
 - Align Posture (Auto):** Automatically aligns to the default posture. Ensure the surrounding area is clear first.
 - Torque Off:** Disables joint torque. Once torque is off, the robot cannot be controlled.
 - Motor Off:** Powers down the motors. The app then navigates to the final page.

LED Status Indicators

1. Head LED Indicator

Head LED Indicator

: Robot system information

Head LED 정보는 로봇 시스템 전반의 상황을 표기 합니다.
Torque LED와는 별개의 정보입니다.



- The Head LED Indicator displays different colors and patterns depending on the robot's operating status, as described below.

	LED Color / Pattern	Status	Description	Action
1	 Gradient  Static 	Booting	System Booting Motor Initializing	Wait for Boot Completion Wait for Motor Initialization Completion
2	 Static   Static   Dimming —  — —  Blinking - -  - - -	Normal (Battery Status)	Initialized / Battery > 30% Battery ≤ 30% Battery ≤ 20% Battery ≤ 10%	MOTOR_ON Complete (TORQUE_ON Required for Robot Control) Prepare for Charging/Recharge After Shutdown/Shutdown and Recharge Immediately
3	 Blinking - -  - - -	Error	System Error	Follow the Error Recovery Procedure
4	 Static 	EMO	EMO Activated	Release EMO and Follow the EMO Recovery Procedure
5	 Dimming —  — —	Standby		Press the Power Button or Perform MOTOR ON

- **Error Recovery Procedure**

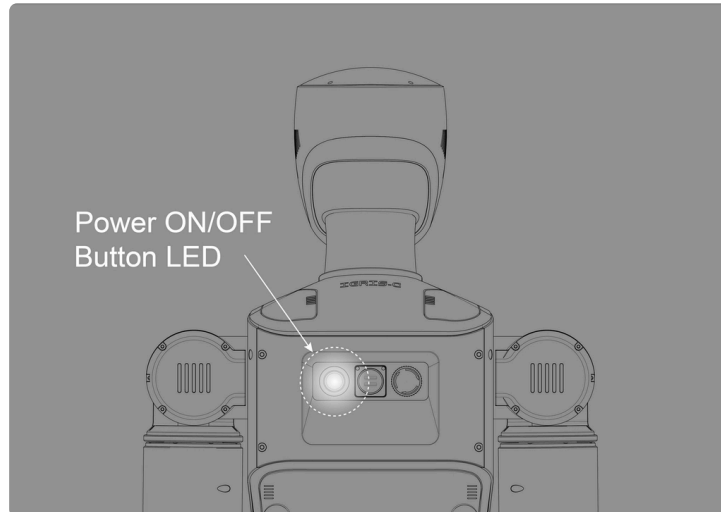
1. Reboot the robot by following the Shutdown Procedure and Startup Procedure.
2. Verify the robot status using the Head Indicator.
3. If the Head Indicator shows a normal state (White), request TORQUE ON via DDS Topic.
4. If the Head Indicator still indicates an error state, perform the Shutdown Procedure.
5. Report the abnormal condition and error code to maintenance personnel.

- **Procedure After EMO Release**

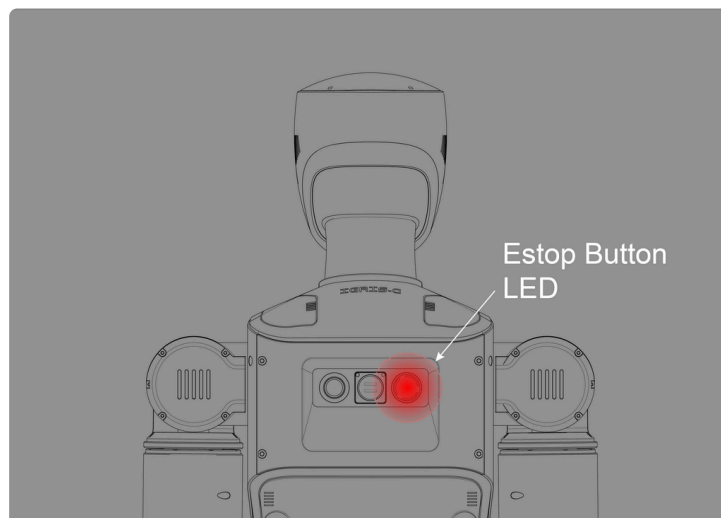
1. Once the EMO function is released, the robot enters Standby Mode. Verify the status using the Head Indicator.

2. Reboot the robot by following the Shutdown Procedure and Startup Procedure.
 - The robot must be rebooted after the EMO function has been released.
3. Verify the robot status using the Head Indicator.
4. If the Head Indicator still indicates an error state, perform the Shutdown Procedure.
5. Report the abnormal condition and error code to maintenance personnel.

2. Power Button & E-Stop Button



When the Power Button (left) on the rear of the robot is illuminated, the robot PC is powered on.



When the E-Stop Button (right) on the rear of the robot is illuminated, the EMO function is active.

3. Torque LED Indicator

