UNIVERSAL ROBOTS

Installation- and User guide for

UR Connect

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UR Connect

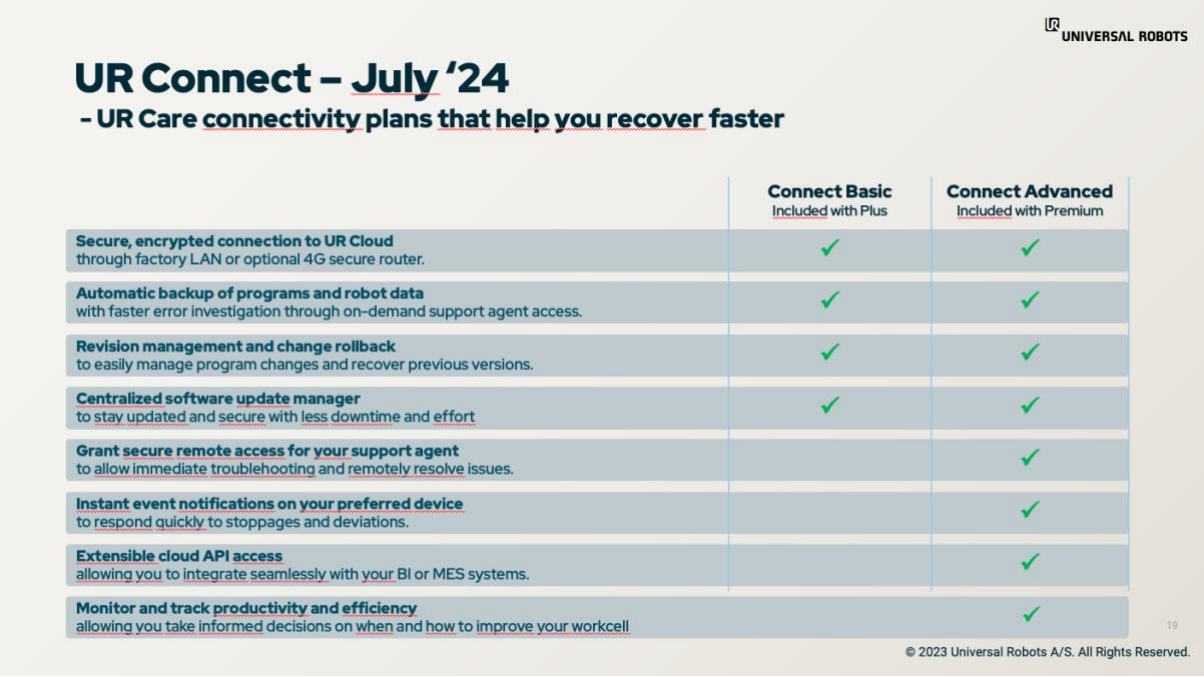
Contents

Revision History

Date	Changes
June 1st 2024	First Release
November 18th 2024	UR Connect V2. Added remote access, historical data and notifications
March 1st 2025	Added remote access view-only mode and USB-ETH adapter support

UR Connect Product Variations

Depending on whether you have a UR Care Plus or Premium, the enabled features within UR Connect vary. See the table below for more details.



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UR Connect – July '24

- UR Care connectivity plans that help you recover faster

	Connect Basic Included with Plus	Connect Advanced Included with Premium
Secure, encrypted connection to UR Cloud through factory LAN or optional 4G secure router.	✓	✓
Automatic backup of programs and robot data with faster error investigation through on-demand support agent access.	✓	✓
Revision management and change rollback to easily manage program changes and recover previous versions.	✓	✓
Centralized software update manager to stay updated and secure with less downtime and effort	✓	✓
Grant secure remote access for your support agent to allow immediate troubleshooting and remotely resolve issues.		✓
Instant event notifications on your preferred device to respond quickly to stoppages and deviations.		✓
Extensible cloud API access allowing you to integrate seamlessly with your BI or MES systems.		✓
Monitor and track productivity and efficiency allowing you take informed decisions on when and how to improve your workcell		✓

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UR Connect Requirements

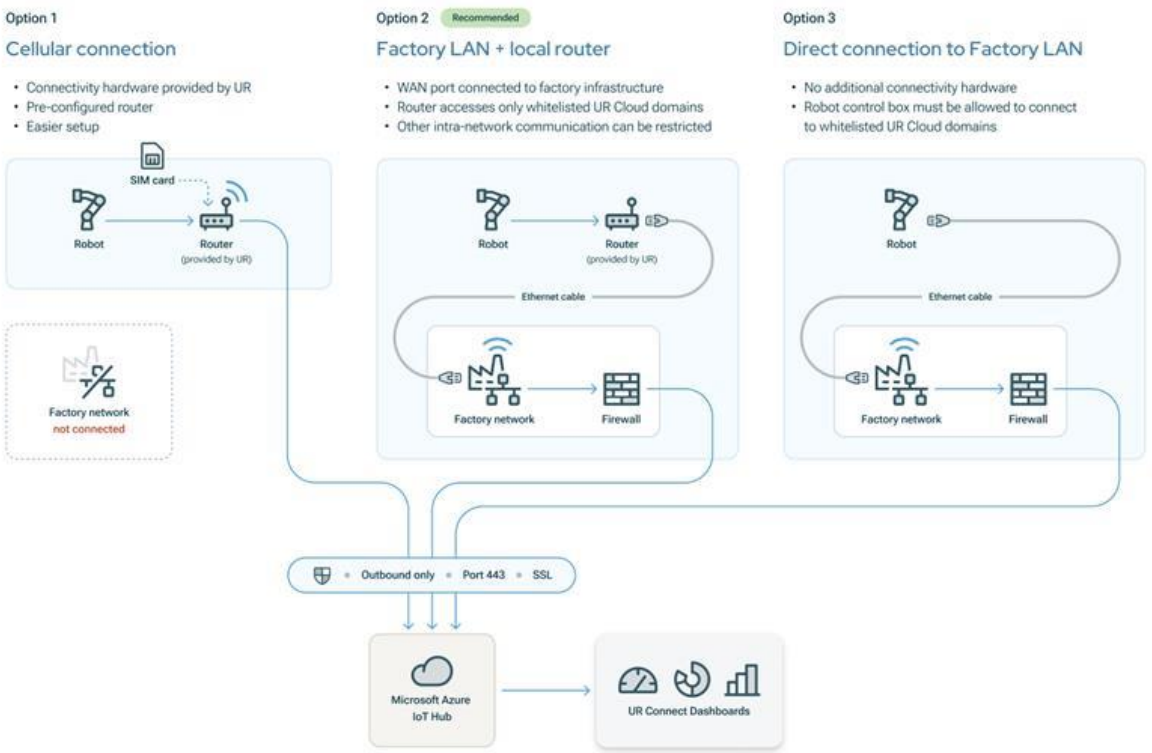
The following requirements are required to run UR Connect:

- An active myUR account is required.
- The robot must run Polyscope 5.17 or higher to connect.
- An active UR Care Plus or Premium service plan or an active UR Connect Trial License

Installation

Physical Connectivity and Cyber Security

UR Connect offers three separate options for connecting the physical robot work cell in the factory to the UR Cloud (Azure IoT Hub). The three options are offered to allow flexibility for the user to opt for a topology best suitable for their factory IT infrastructure and IT policies. A Connectivity Kit is provided with the paid version of UR Connect through a UR Care Service Plan. The Connectivity Kit is a secure router, that is preconfigured with a security configuration that only allows connection to the UR Cloud exclusively and blocks any inbound access.



Connecting with Connectivity Kit

The connectivity kit enables seamless connection from the robot to your local network, or the UR Cloud. The kit includes:

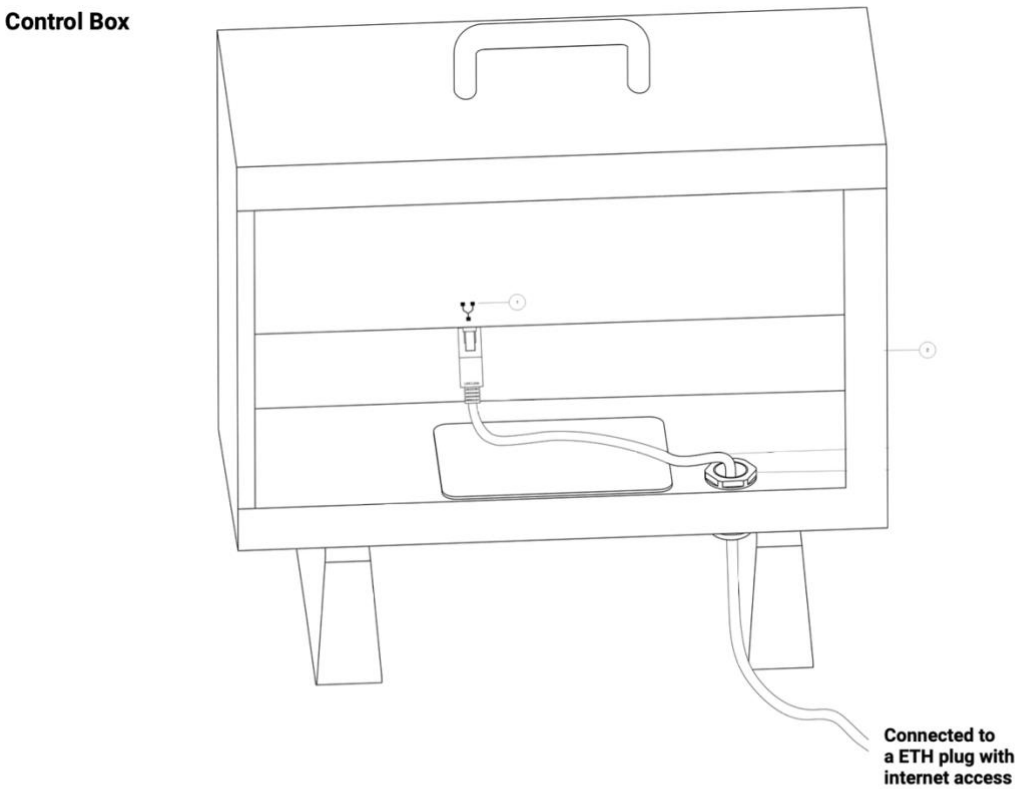
- Industrial 4-Port 4G/WiFi/WAN router
- USB to ETH Adapter
- Global 4G SIM Card. *For UR Care subscribers, a pre-paid global 4G subscription is included.*

Please refer to your Connectivity Kit Manual accessible from the following link Connectivity Manual Link on how to connect using the connectivity kit.

Connecting without Connectivity Kit

There are currently no restrictions on how you connect the robot to the internet. You can use any hardware and routing you prefer.

If you wish to connect the robot directly using an ethernet cable, please see how on the figure below. If your network has a firewall, please make sure outbound port 443 is open. See FAQ at the end of this document for more details



1	Ethernet port	2	UR Control Box
3	LAN cable	4	Cable gland **Not Required**

Cyber Security prerequisites

Connecting a Universal Robots robot to a network can introduce cybersecurity risks. These risks can be mitigated by using qualified personnel and implementing specific measures for protecting the robot's cyber security. Implementing cyber security measures requires conducting a risk assessment. The purpose of the risk assessment is to:

- Identify threats
- Define trust zones and conduits
- Specify the requirements of each component in the application

Failure to conduct a cybersecurity risk assessment can place the robot at risk. Only competent, qualified personnel shall be responsible for determining the need for specific cybersecurity measures and for providing the required cybersecurity measures.

Facility requirements

Before your system can reach a secure state of operation, the following criteria must be met:

- Operating personnel have a thorough understanding of general cybersecurity principles and advanced technologies as used in the UR robot.
- Physical security measures are in implemented to allow only authorized personnel physical access to the robot.
- Unauthorized persons are not allowed near the robot and other equipment
- There is adequate control of: locks in the doors, badge systems, physical access control in general.

Network configuration requirements

Connecting the robot to a network that is not properly secured, can introduce security and safety risks. Only connect your robot to a trusted and properly secured network. Use a firewall to restrict inbound and outbound access to/from the Internet.

1. Only trusted devices are allowed to be connected to the local network.
2. There are no inbound connections from adjacent networks to the robot.
3. Outgoing connections from the robot are restricted to allow the smallest relevant set of specific ports, protocols and addresses.
4. SSH tunneling is used for accessing robot interfaces from other devices.
5. Only URCaps and magic scripts from trusted partners can be used, and only after verifying their authenticity and integrity

Robot setup requirements

- Change the default password to a new, strong password.

- Disable the "Magic Files" when not actively used (PolyScope 5).
- Disable SSH access when not needed. Prefer key-based authentication over password-based authentication
- Set the robot firewall to the most restrictive usable settings and disable all unused interfaces and services, close ports and restrict IP addresses
- Use local port forwarding to setup an authenticated and secure connection, if you require remote access to the motion controlling interfaces of the robot. For example: the Dashboard Server and the Primary/Secondary/Realtime Client Interfaces.
- Some communication interfaces have no method of authenticating connections made. In some applications this is a security and safety liability.
- For detailed information about setting an admin password and local port forwarding, refer to the Settings chapter in the UR Robot User Manual.
- For guide to securely setting up the robot, please see the following documentation Polyscope Security Setup.

URCap Installation

This section will guide you to install our myUR URCap. Follow these simple steps to get started.

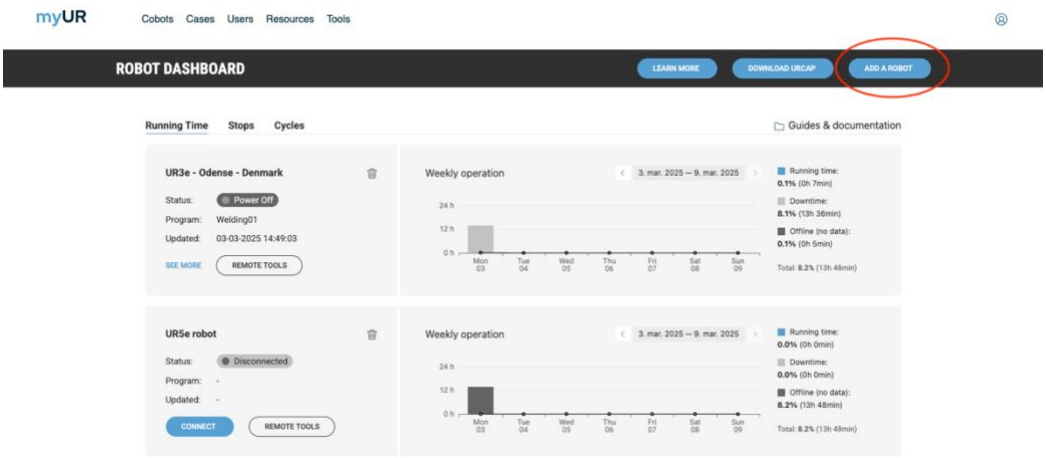
If you are running Polyscope 5.18 or above, the URCap is preinstalled on Polyscope. Please skip this section in this case.

You can always find the latest version of URCap at https://myur.universal-robots.com/tools/dashboard. Requires an active myUR account.

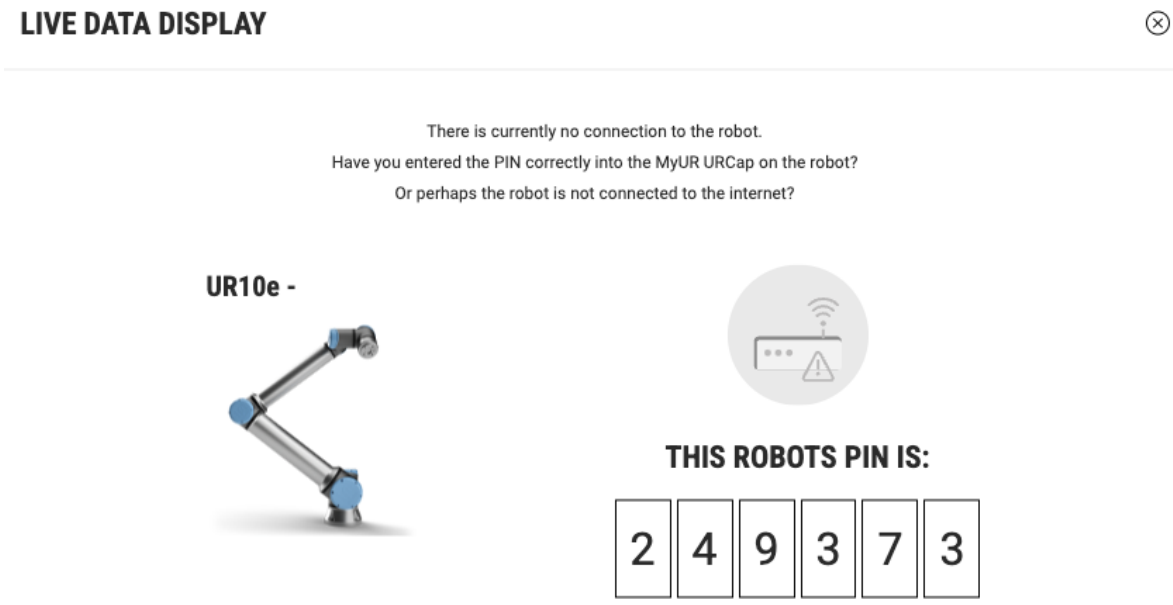
1. Put the provided URCap on a USB pen (latest version can be found on the Robot Dashboard page on myUR)
2. Insert the USB pen into the USB-slot in the teach pendant upper right corner
3. On the teach pendant go to:
   Upper right corner burger menu -> Settings -> System -> URCaps
4. Click the + button in the lower left corner next to the Exit button
5. Click the USB Pen (usually something like usbdisk_0)
6. Select the URCap and the "OK" button
7. Restart the robot

Connecting to UR Connect

1) Go to https://myur.universal-robots.com/tools/dashboard (make sure you are logged into myUR already, otherwise login and try again)
2) Click "Add a Robot" and select the robot with an active license you wish to test.



3) The robot should now appear on the dashboard. Click on the tile and remember the PIN Code



4) Go to your robot's Teach Pendant and navigate to Installation -> URCaps -> UR Connect. Type in the 6-digit Pin Code. The connection will be established after a few seconds.
    a. If you are experiencing issues with connecting, ensure the robot has a network connection through network settings in Polyscope and you have an active internet connection on the robot.
    b. If the above doesn't work, please follow our Troubleshootin section at the bottom of this document.
    c. Should you still encounter issues, please contact connected@universal-robots.com for assistance.

Features

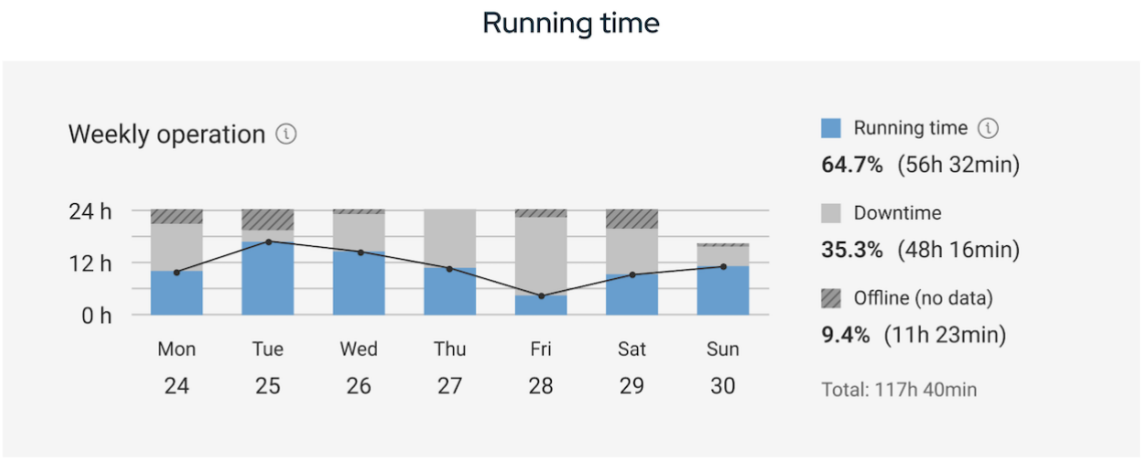
Dashboard Monitoring

On the main page of your dashboard, you can monitor historically data week by week for the following parameters:

- Runtime
- Stops
- Cycles

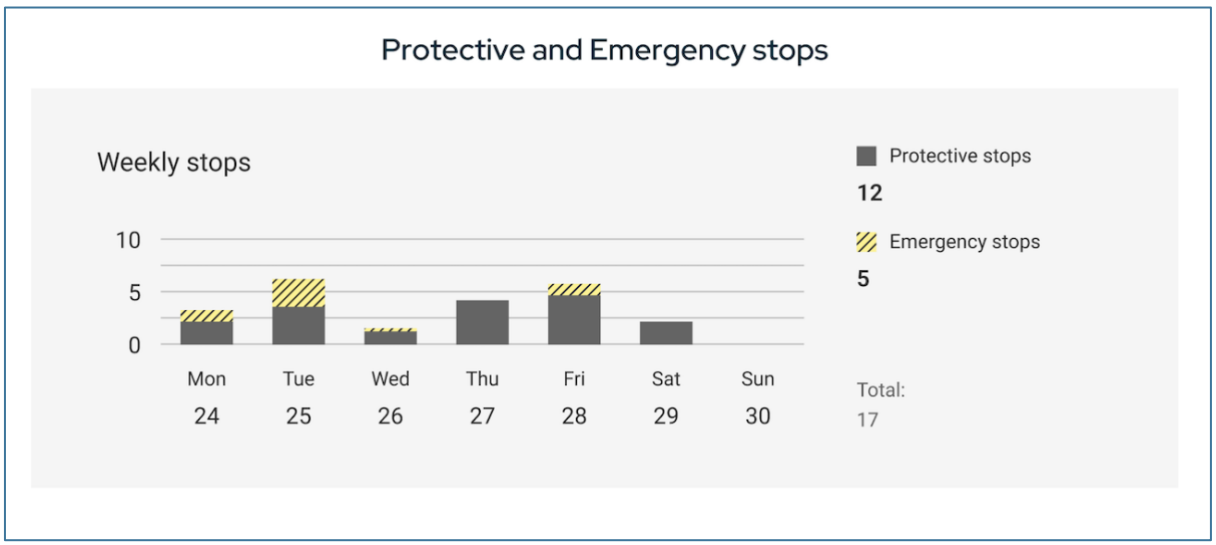
Runtime

Display how much your robot has been running an actual program during a 24 hours cycle. The runtime will start counting once a program is in the Play state.



Stops

Displays number of protective and emergency stops during a day week by week.

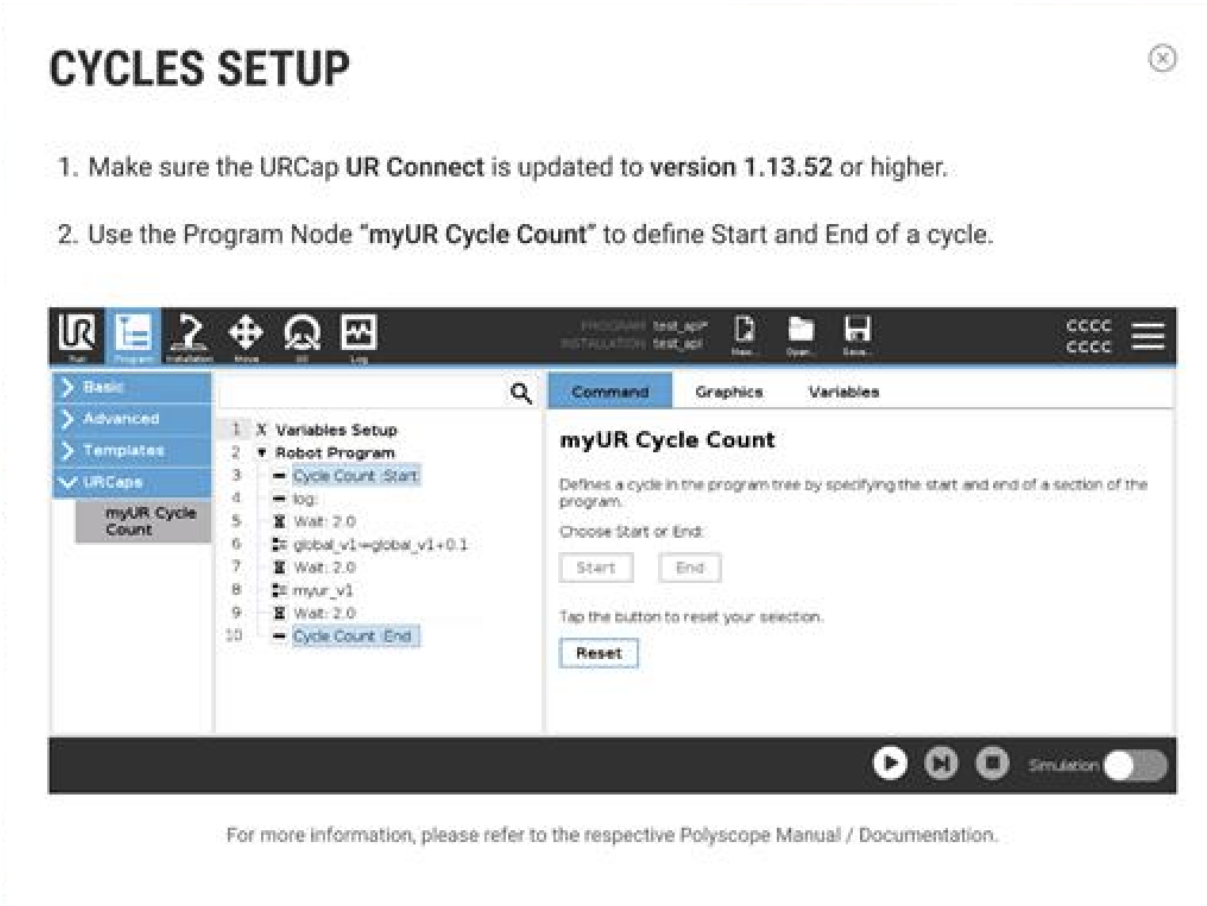


Cycles

Display the number of cycles completed.

To calculate the cycles completed, you must insert the Cycle Count Program Node in your program.

1) Put Cycle Count Start at the start of your program cycle
2) Put Cycle Count End at the end of your program cycle.



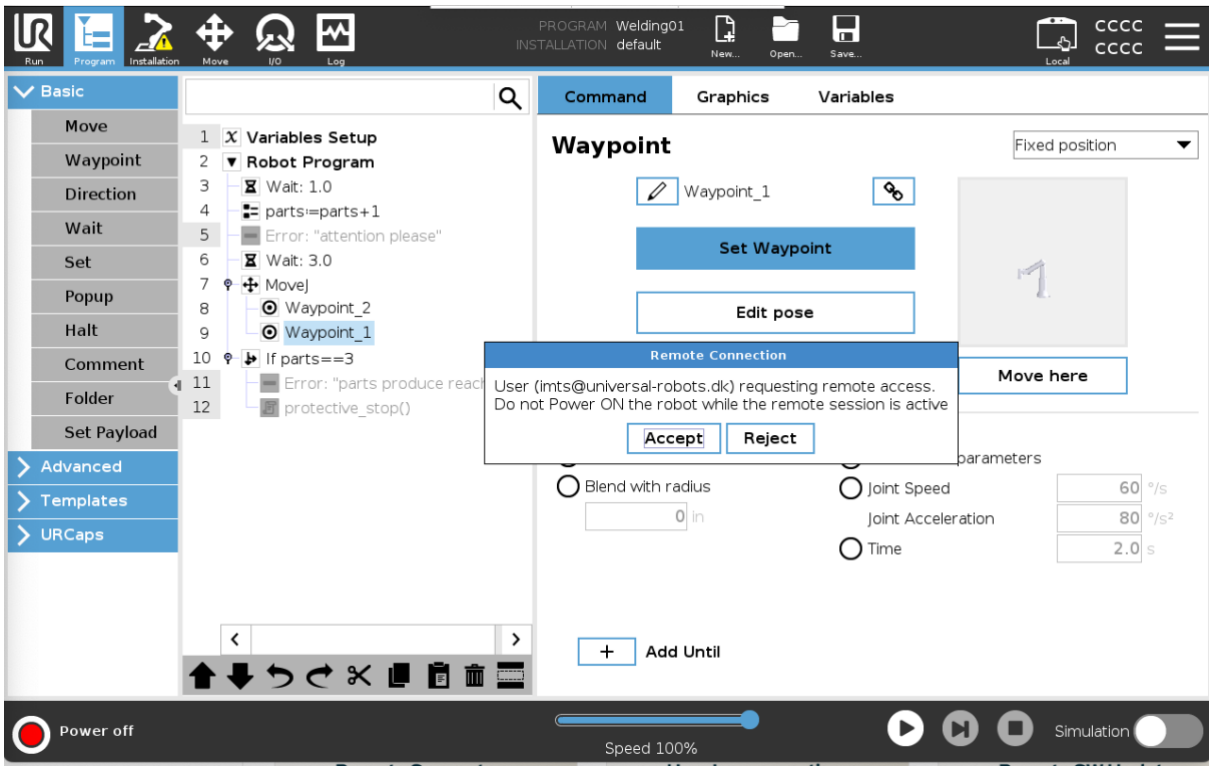
Remote Support

To use the Remote Support Tools, click on the “Support” text on the robot tile

Remote PolyScope Access

Remotely requesting control of the Teach Pendant can be done by clicking the “Request Access” button. Please note that to start a session, you must have the robot’s controller powered off to prevent the robot from moving physically.

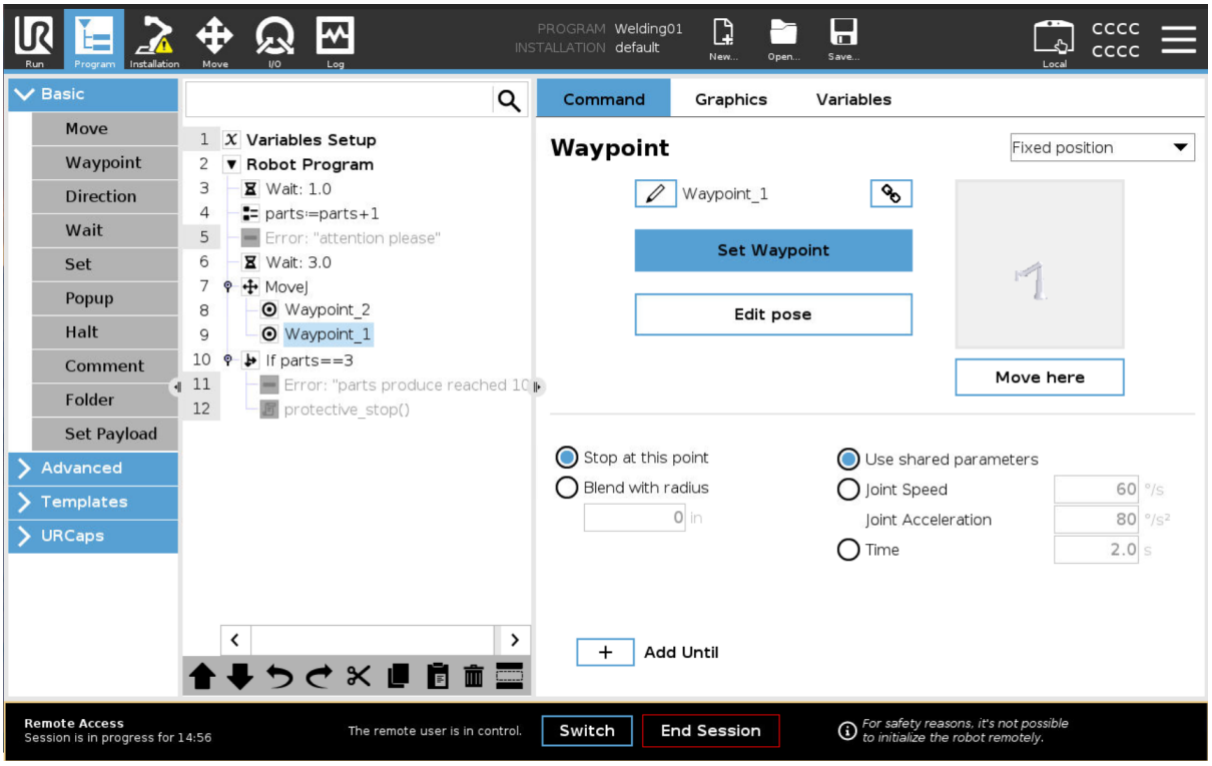
1) Click the Request Access button.
2) A request will be sent to the robot. You must have someone, or yourself, physically present at the robot’s Teach Pendant to approve the request. A popup will appear in PolyScope.



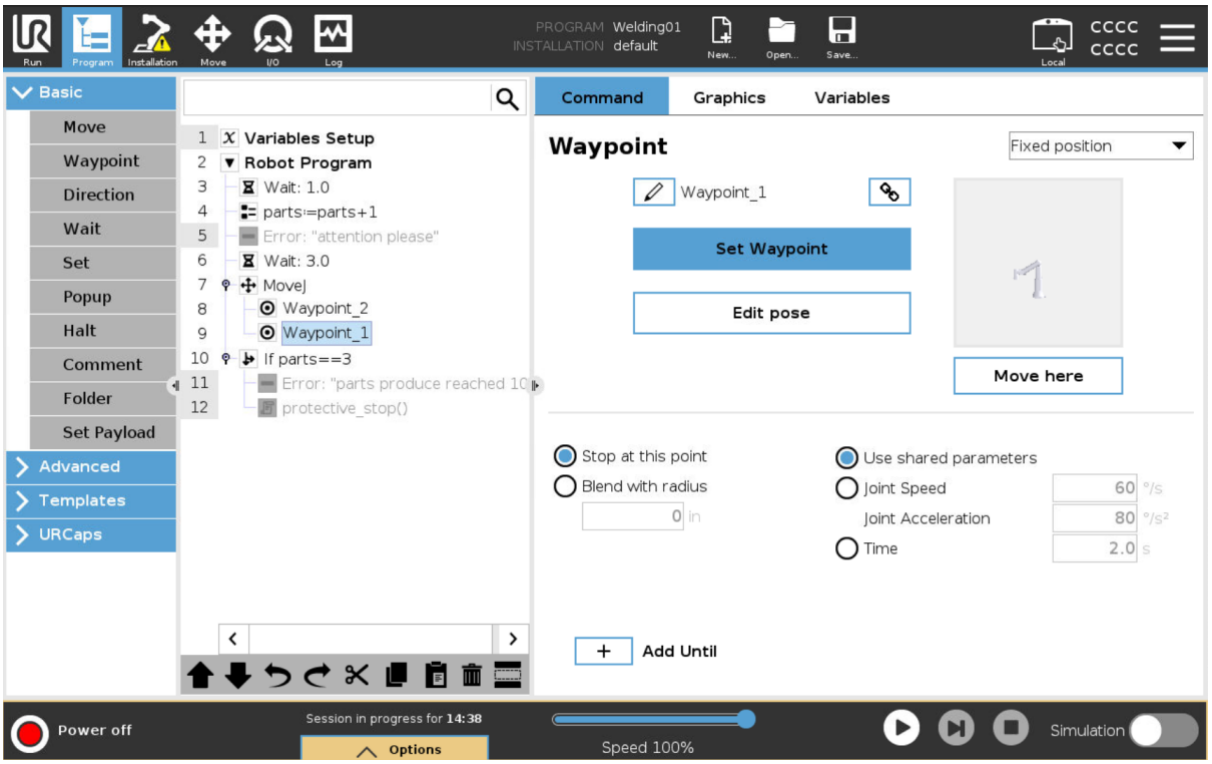
3) Once the request is approved, you will get a link to the Teach Pendant's screen, which includes your email as a login and a unique one-time password.
    a. OBS: *If you are prompted a SECOND password, this is the admin password on your robot.*

Continues on the next page…

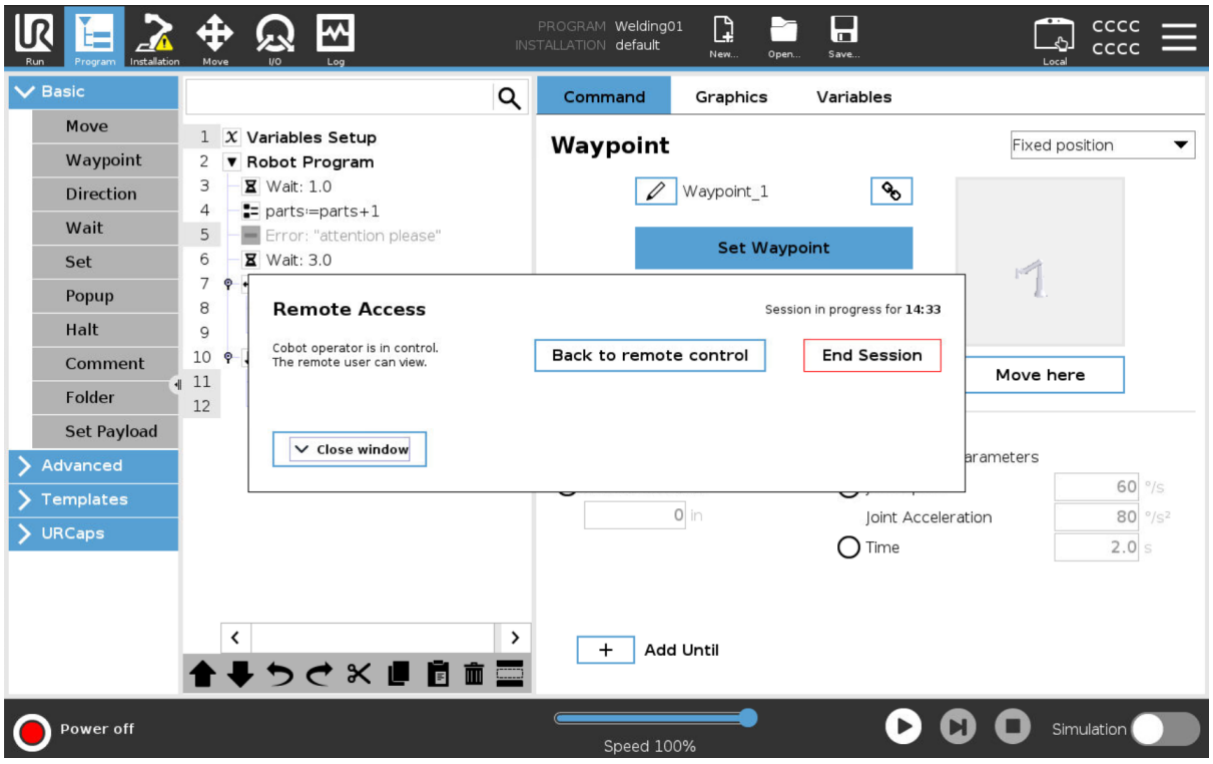
4) The session will be active for 15 minutes. Due to cyber security concerns, a new session must be created if more time is required.



5) Once changes have been made, you can give control back to the operator, while maintaining the connection. Your screen will enter a View-Only mode.



6) The operator can turn on the robot, test the program, all while you see the same remotely on the Teach Pendant as the operator.
7) In case further assistance is required, the operator can turn off the robot and give you back control



8) You can now repeat steps 5 – 7.

Software Update

PolyScope software from version 5.17 and above can be applied to this new feature. Please note that a USB must be inserted into the robot's controller or the Teach Pendant for this feature to work. At least 2GB is required on the USB.

1) If a new update is available, click "Update Available".
2) Choose which version you wish to update or downgrade to.
3) Click Download. The URUP file is now being downloaded to the robot.
4) Once the download is complete, you can request to update the robot. A user at the robot must approve the request on the teach pendant to start the update.

Program and Installation Backup and Revision

When a program or installation file is saved in PolyScope, a new version is pushed to the cloud. If there's no connection, the files are cached until the internet is reestablished, ensuring no data is lost.

You can do the following:

Restore Files

Any program or installation can be restored on the robot. This action will automatically take the file from the cloud and restore it on the robot.

Backup File

If the file hasn't been synchronized from the robot to the cloud, the file will be synchronized from the robot to the cloud.

Download

Download the file locally onto your computer.

Show Versions

This will list all the previous versions of the file. From the modal you can choose to "Restore" or "Download" any of the files.

Icons

When the robot icon is **not** faded, the file has been successfully located on the robot.

When the cloud icon is **not** faded, the file has been successfully synchronized to the cloud.

Notifications

Enabling notifications in myUR Profile

To enable notifications:

1) Log into https://myur.universal-robots.com and access the Profile section
2) Enter the desired phone country code and phone number to receive notification
3) Selected the desired notifications type for the current user.
   The notification types are described in the table below.
   Creating customized notifications

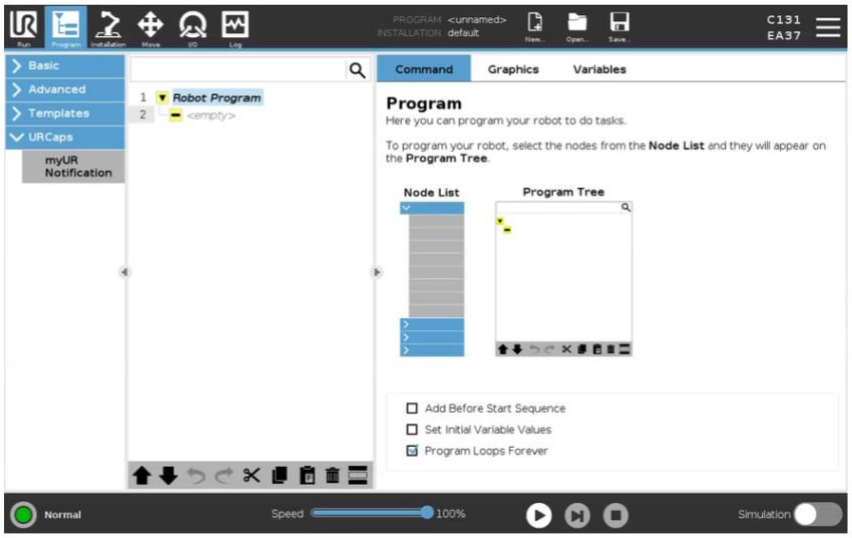
Notification type	Description	Typical recipient role
Unscheduled system stops	Any unplanned system stops, that are not related to safety, such as: • Protective stops • Safeguard stops • E-stops • Faults • Violations • Run-time exceptions	Operator and technician
Attention messages	Defined in the robot program as myUR Notifications.	Operator
Error messages	Defined in the robot program as myUR Notifications.	Technician

You can create customized notifications by inserting myUR notifications nodes into the Polyscope program tree. When the program execution reaches the notification node, a message is generated and appears as one of the following

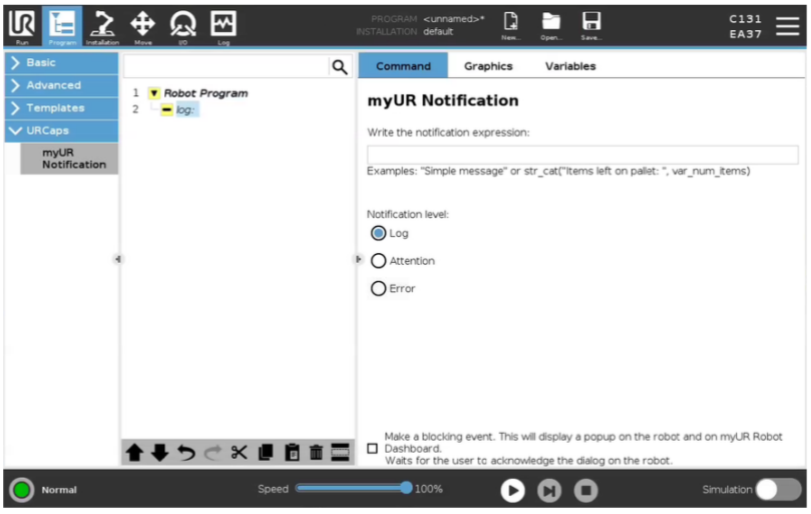
- A dashboard log entry
- A text message or email notification

To create customized notifications:

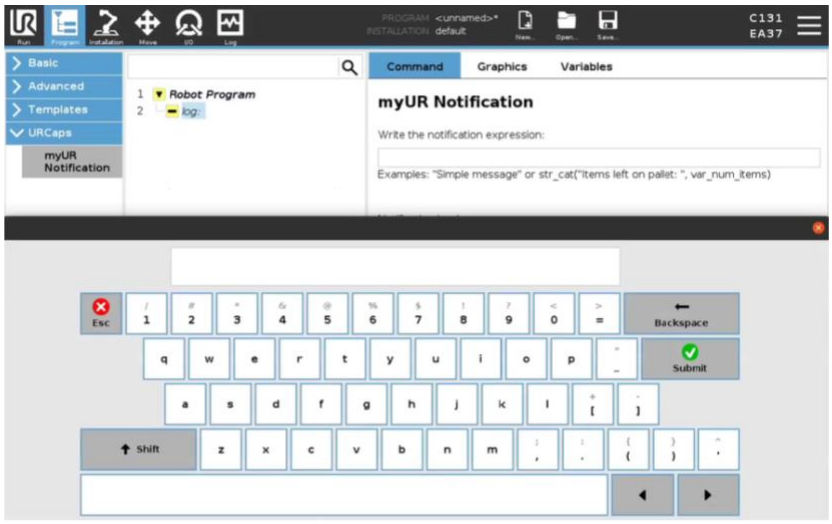
1) Navigate to Program -> URCaps -> myUR Notification



2) Insert notification program node at the desired location(s) in your program tree



3) Type the notification message to be sent when this event occurs.
Your message is evaluated as an expression, so place text in quotation marks.
You can use function calls and vaiables to generate your message.



4) Select a classification for the notification. You can choose to subscribe to notifications of attention and error types, as described in the table.

Notification class	Function	Example
Log	Logs an event in the log on the dashboard.	You can track production efficiency.
Attention	Logs an event and sends it as a text or an email.	You can notify operators of actions related to work cells.
Error	Logs an event and sends it as a text or an email.	You can notify integrators of any unknown error or advanced error.

5) Select Show pop-up if this event requires action/confirmation from an operator before program execution can continue. If selected, a notification becomes a blocking event that activates a popup on Polyscope.

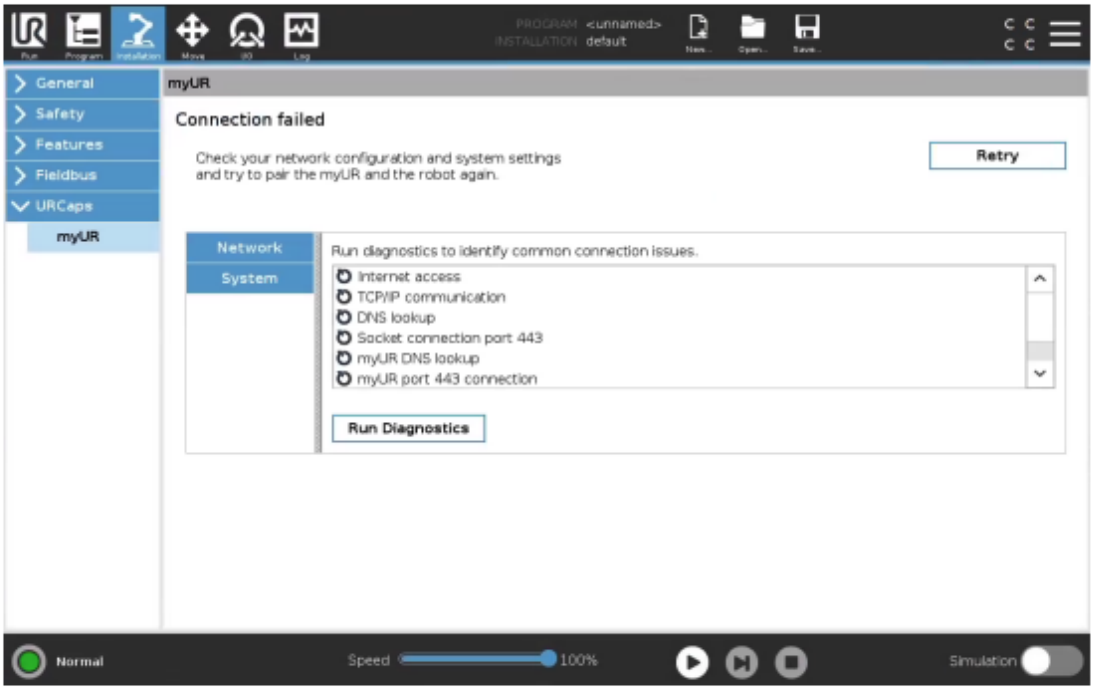
Troubleshooting

7. Troubleshooting

This chapter shows how to troubleshoot the network.

7.1. Launching troubleshooting

If the connection from the robot via the myUR URCap fails, the URCap displays troubleshooting.



To launch troubleshooting

1. On the myUR screen, tap **Run Diagnostics**, to start the troubleshooting.
2. If some network checks are red, do a check for failing networks.

   See 7.2. Checking for failing networks below
3. If all network checks are green, do a check of the system settings.

   See 7.3. Checking the system settings on page 22

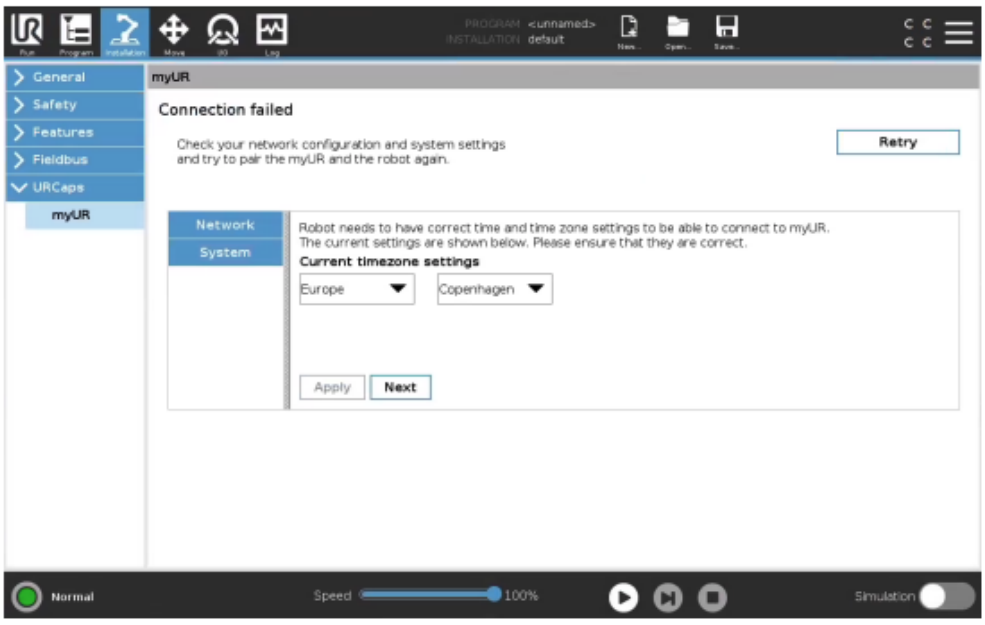
7.2. Checking for failing networks

Verify the elements listed in the table to diagnose failures in your network.

Element	Must pass	Fundamental check	Advanced check
myUR port 443 connection	yes	• Your network configuration can access myUR • Your network is open for traffic on port 443. • Your network is connected to the internet.	Bash command: telnet my-ur-fleet-prod-api.azurewebsites.net 443
Azure DNS lookup	yes	• The hosts are not block the hosts: ur-connected-cobots-hub-paid.azure-devices.net	Bash command: host ur-fleet-prod-hub.azure-devices.net
Azure port 443 connection	yes	• Your network is open for traffic on port 443. • Hosts are not blocked: ur-connected-cobots-hub-paid.azure-devices.net	Bash command: telnet ur-fleet-prod-hub.azure-devices.net 443
Compatibility with installed URCaps	yes	• Installed, or previously installed URCaps are compatible with myUR Monitoring URCap	

7.3. Checking the system settings

If all the network checks pass, and the connection still fails, verify the time zone settings.



To verify time zone settings

1. Tap System and follow the instructions to correctly set the time zone.

FAQ

Connectivity

Do I need to open any inbound ports in my firewall?

No. All connections are outbound.

What outbound traffic does UR Connect have?

TCP traffic on port 443.
Additionally, ping (ICMP request type 8) is used for diagnostics purposes.
Only a following set of domains needs to be whitelisted, everything else can be blocked:

Domain	Port
*.ur-fleet-prod-hub.azure-devices.net	443
*.my-ur-fleet-prod-api.azurewebsites.net	443
*.fleetblobprod.blob.core.windows.net	443
*.universal-robots.com	443
*.teradyne.com	443
*.mobile-industrial-robots.com	443
*.s3-eu-west-1.amazonaws.com	443

Notes

1) The asterisk (*) in the above domains is a wildcard to allow outbound access to all sub-domains on the given domain.

2) Additional security settings in PolyScope must be set up to ensure adequate level of protection. Please see the following documentation Polyscope Security Setup.

Data Protection

Is the data from my robots encrypted when transferred?

Data is transported using MQTT and encrypted using SSL.
The dashboard is only accessible through HTTPS, which is encrypted using SSL.

Where is my data sent?

The Microsoft Azure data center in Europe.

Does Universal Robots store my data?

Yes. Data is stored on the Azure Cloud.

Is the storage of my data secure?

The data is stored in Microsoft Azure data center, which uses state-of-the-art security measures.

Who owns the customer-generated UR data?
UR owns the data uploaded to UR Connect. At any time, the customer can request the deletion of all their data.

How is data being utilized and who utilizes it?
UR data generated at a customer's site is processed into UR Connect for that customer alone. That data is used by:

- The end user to monitor or troubleshoot the system
- The UR partner to help service and support the system (if explicitly given access by the customer)
- UR to support the system and drive more efficient product development in the long term

Is customer data licensed, sold, or used within UR or external parties?
UR Connects data is used within UR to improve communication with customers, speed up technical support, and design customer-tailored products in the future. The data can be used by the partner that sold the system to help support the customer if such services have been sold. End customer data is not licensed or sold to third parties.

Is any personal data streamed from the customer's site to UR Connect?
No personal data is sent from the customer to UR Connect.

Hosting and connectivity

Does UR Connect require a permanent internet connection?
A stable connection is required to operate the insights part of UR Connect. If only the remote support functionality is to be used, a connection is only required during time of support.

Where is UR Connect hosted? Can it be hosted within a customer's cloud tenant?
UR Connect is hosted in a UR-owned Microsoft Azure instance. Deploying on customer's cloud tenants is not support at this time.

User authentication and operations

What user authentication methods are implemented in UR Connect?
UR Connect employes the industry standard Oauth 2.0 protocol for authentication in all communications. Authentication is managed through existing myUR account, and the customer-owned authentication providers are currently supported.

Does UR Connect interfere with robot operations?
UR Connect minimizes operational disruptions by allowing only outbound communications.

Connectivity Kit

What is "Connectivity Kit"?
Connectivity Kit is a router that allows easy connection through 4G, or through connecting to IT infrastructure of the factory. The router is preconfigured with restrictive settings, and with unnecessary features disabled:

1. Disabled WiFi
2. Disabled VPN
3. Disabled RMS (Remote Management System)
4. Enabled attack prevention - SYN flood, ICMP limit, SSH limit, HTTP limit, HTTPS limit, Port scan
5. Disabled SSH and CLI
6. Only allowing connecting to predefined set of URLs
7. Not allowing incoming connections
8. Only allowing outgoing connections using port 443
9. Disabled SMS utilities
10. Configured VLANs to only allow direct outgoing connections from port 1. Communication is still allowed between all ports (port 1 can communicate with the WAN side, and with port 2 and 3. Ports 2 and 3 can communicate with each other, and with port 1, but not with the WAN side)

Please look in the Connectivity Kit manual for more information.