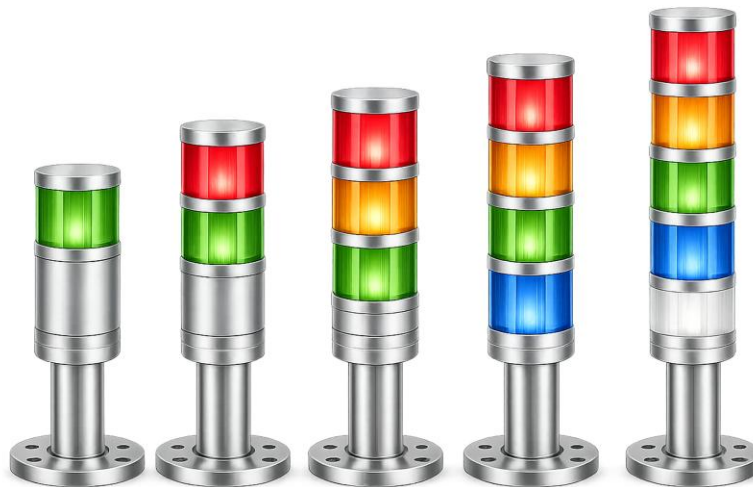


Standard Signal Light URCapX

Quickstart Guide



Overview

Signal Multi LED is a PolyScopeX URCap for controlling multi-color signal lights and buzzers via the Universal Robot's digital outputs. The software offers:

Key Features

- ☒ **Flexible LED Configuration:** Up to 8 LED slots + 1 buzzer individually configurable
- ☒ **Automatic Event Handlers:** LEDs automatically react to robot states
 1. Safety Status (Normal / Reduced / Protective Stop / Emergency Stop)
 2. Robot Mode (Running / Idle / Freedrive / Error)
 3. Runtime State (Playing / Paused / Stopped)
- ☒ **Program Control:** Switch LEDs via program nodes (ON/OFF)
- ☒ **Live Monitoring:** Real-time display of all LED states in sidebar
- ☒ **Manual Control:** Control LEDs by click (testing & commissioning)
- ☒ **License System:** Demo mode (3×5 min) or full version

Typical Use Cases

- Signal robot status to operators (Green=OK, Yellow=Warning, Red=Error)
- Visualize process progress (e.g., production steps)
- Quality control (OK/NOK indication via LED)
- Acoustic warnings via buzzer

Installation

Requirements

- Universal Robot with **PolyScopeX**
- Signal light with separate digital inputs (no RGB control)
- Buzzer (optional)

Install URCap

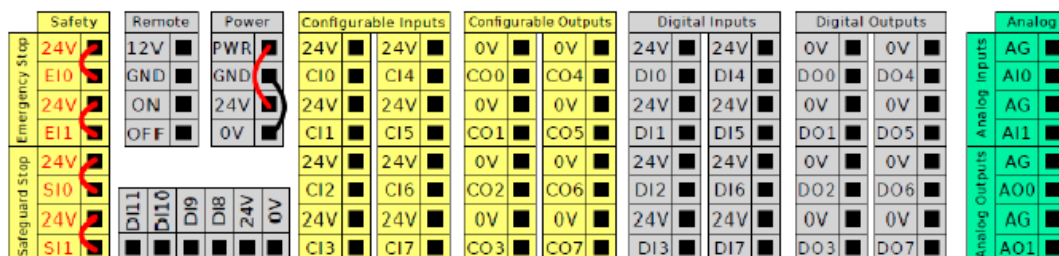
1. Copy URCap file to USB stick
2. Start robot and navigate in PolyScopeX to:
Settings → System → URCaps → Install
3. Select URCap file and confirm installation
4. **Restart the robot** after installation

Wiring

Connect the signal light outputs to the robot's digital outputs:

Component	Example	Robot Output
LED Green	Normal operation	Digital Output 0
LED Yellow	Warning	Digital Output 1
LED Red	Error/Stop	Digital Output 2
LED Blue	User-defined	Digital Output 3
LED White	User-defined	Digital Output 4
Buzzer	Acoustic signal	Digital Output 5

⚠ Important: Each LED/buzzer requires its **own digital output**. RGB lights with color mixing are not supported.



Getting Started – Basic Configuration

After installation, a new “**Multi LED**” tile appears in the application list.

1. Open Settings Tile

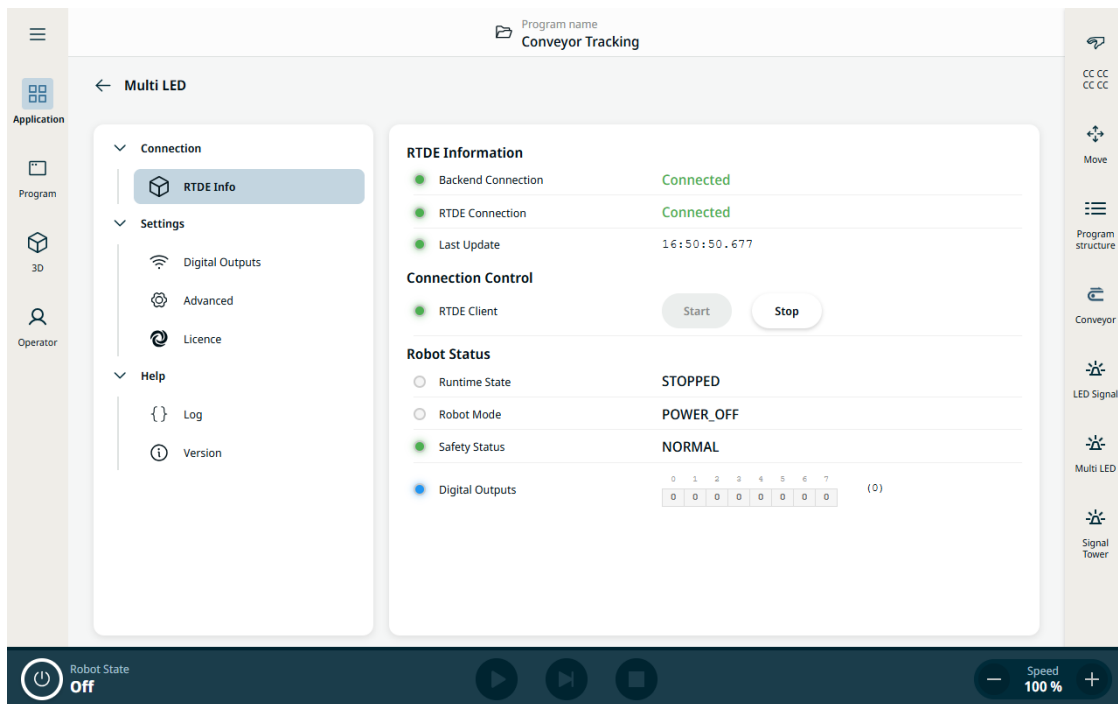
1. Switch to “**Applications**” in PolyScopeX
2. Open “**Multi LED**” tile

2. Check RTDE Connection

In the “**RTDE Info**” tab, check the connection status:

- ☒ **Backend Connection:** Must show “Connected”
- ☒ **RTDE Connection:** Must show “Connected”
(Host: urcontrol-rtde, Port: 30004)
- ☒ **XML-RPC Gateway:** Must show “Connected”

If a connection is missing, make sure that robot was restarted after URCap installation.



Configure LED Outputs

In the “**Digital Outputs**” (Settings IO) tab, configure your signal light.

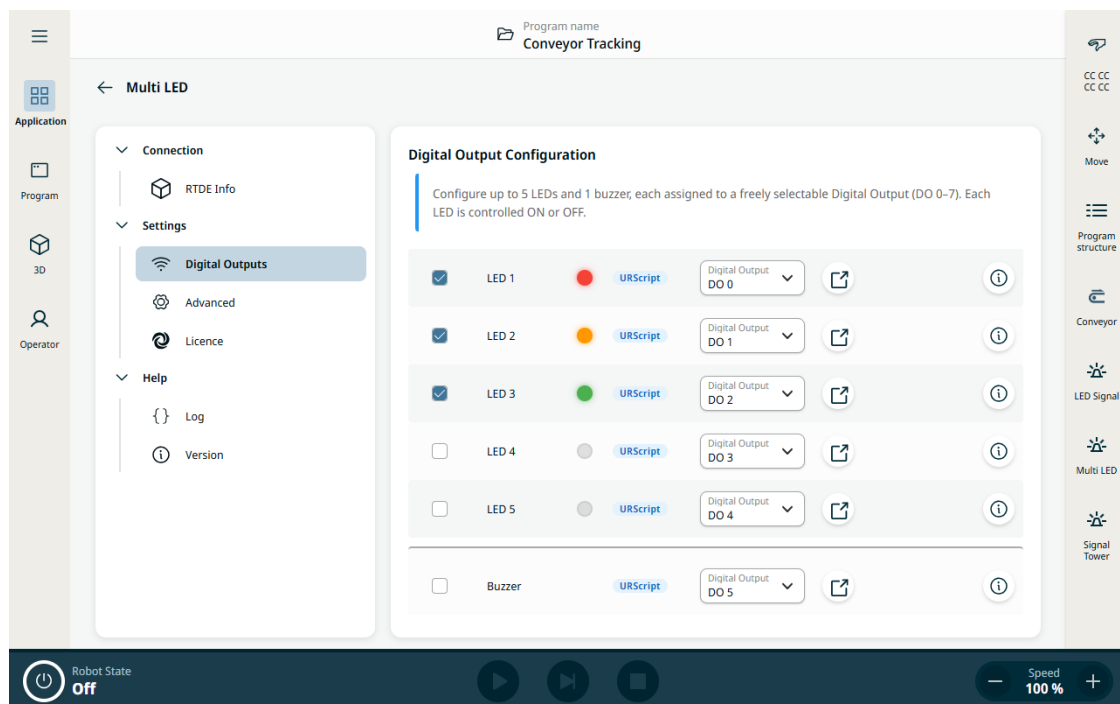
Activate LED

1. Click checkbox
2. Configure the following settings for each LED

 **Important:** Click the **configuration button** next to the digital output to set the control mode: - **URScript:** LED is manually controlled in program (Program Node) - **Event Control:** LED reacts automatically to Safety/Robot/Runtime Events

Details see chapter  [Configure LED Control Mode](#).

3. Add more LEDs
4. Optional: Configure buzzer (separate section below LEDs)



Configure Buzzer

If you're using a buzzer

1. In the “Buzzer” section Select Digital Output (e.g., Pin 5)
2. Check Enabled

Configure LED Control Mode (Event vs. URScript)

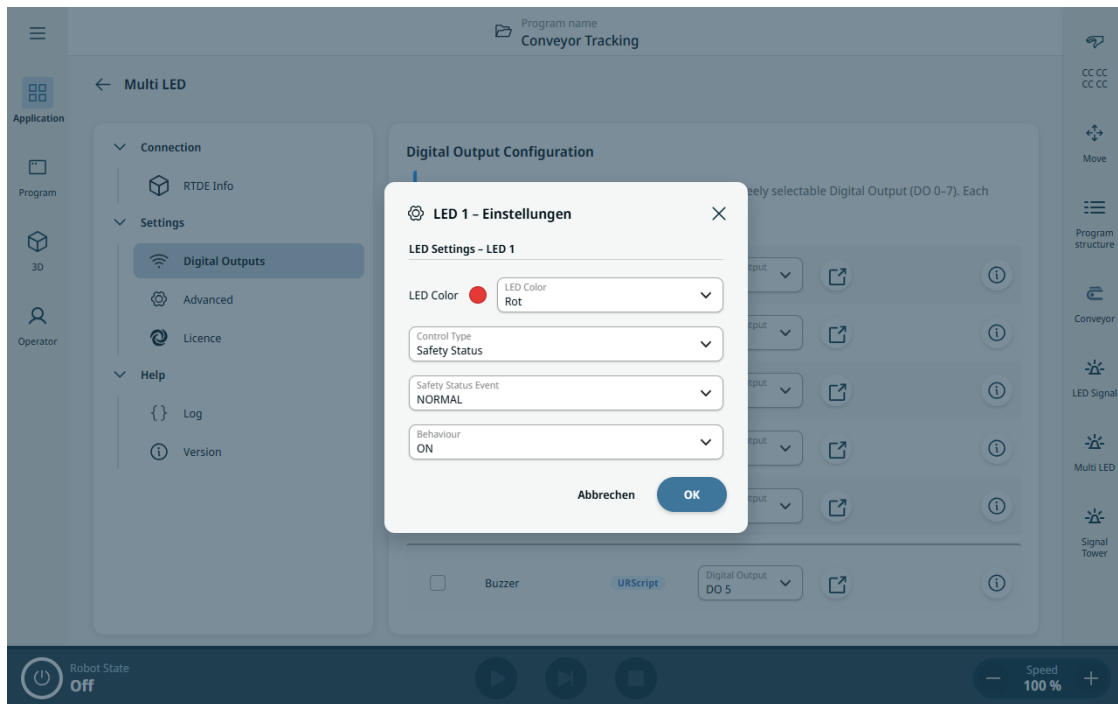
Each LED can be configured individually:

1. **URScript Control:** LED is controlled exclusively via Program Nodes (manual control in program)
2. **Event Control:** LED reacts automatically to robot states (without running program)

Change LED Control Mode

In the **“Digital Outputs”** (Settings IO) tab, there is a **configuration button** for each LED:

1. Click the **configuration button** next to the digital output
2. Dialog opens: **“LED Configuration – [LED Name]”**



Dialog Options

Field	Description	Options
Color	Display color of LED	Red, Yellow, Green, Blue, White
Config Type	Control mode	• URScript (Program Node) • Safety Status (Auto) • Robot Mode (Auto) • Runtime State (Auto)
Event	Specific event (Auto only)	Depends on Config Type
Behavior	Behavior on event (Auto only)	• ON (Turn on) • OFF (Turn off)

LED Control in Programs

Use the **Program Node** to control LEDs directly in your robot program.

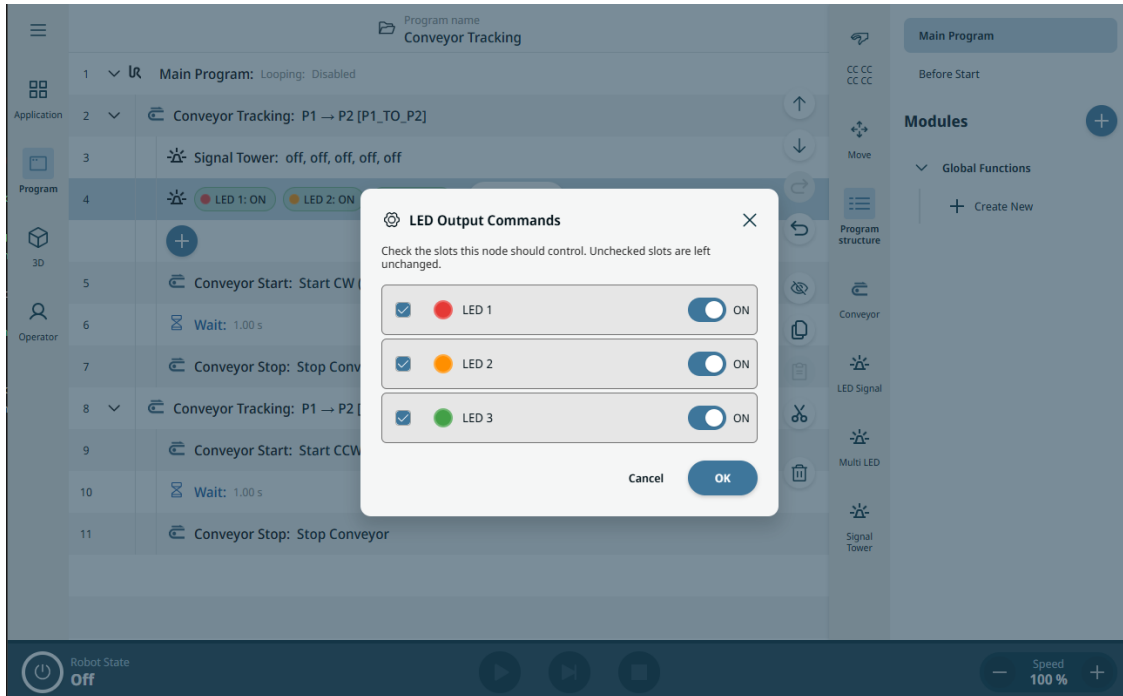
Add Program Node

1. Open or create a program
2. In “**Program Structure**”, click “+”
3. Select “**Multi LED**” node

Configure LED Commands

After adding, the node appears in the program structure:

1. Click “**Multi LED**” node
2. Click “**Settings**” button
3. Dialog opens with all configured LED slots



Dialog Options

In the dialog you'll see:

Column	Description
☐ Checkbox	Control LED in this node?
Name	LED designation (from Settings)
Color	Color indicator
Action	• Turn ON • Turn OFF

LED slots with event handler (🔒): - Displayed grayed out - Tooltip: *"Controlled by RTDE events – not editable here"* - **Cannot** be changed in Program Node

Node Display in Program

In the program tree, the current state is displayed:

Multi LED: Status Green: ON, Status Red: OFF

💡 **Tip:** Use multiple "Multi LED" nodes in your program to switch different combinations.

Sidebar – Live Monitoring & Manual Control

The **Sidebar** provides real-time monitoring and manual control during program execution.

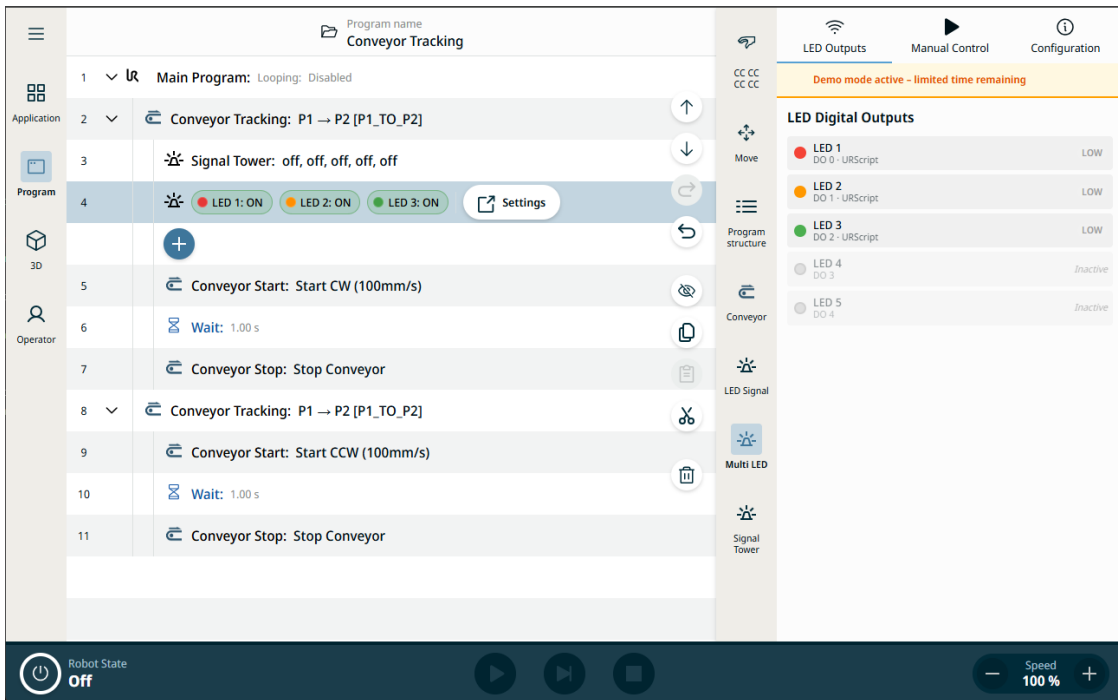
Open Sidebar

1. Show the **Sidebar** in PolyScopeX (button top right)
2. Click “**Multi LED**”

Tab 1: LED Outputs

Shows the **current status** of all configured LEDs in real-time:

-  Green /  Yellow /  Red / etc. (depending on configuration)
- Status: **ON** / **OFF**
- Buzzer: **Active** / **Inactive**



The screenshot shows the NAST Automation PolyScopeX interface. The main window displays a list of LED outputs with their current status (ON/OFF) and a 'Settings' button. The bottom status bar shows 'Robot State Off' and 'Speed 100%'.

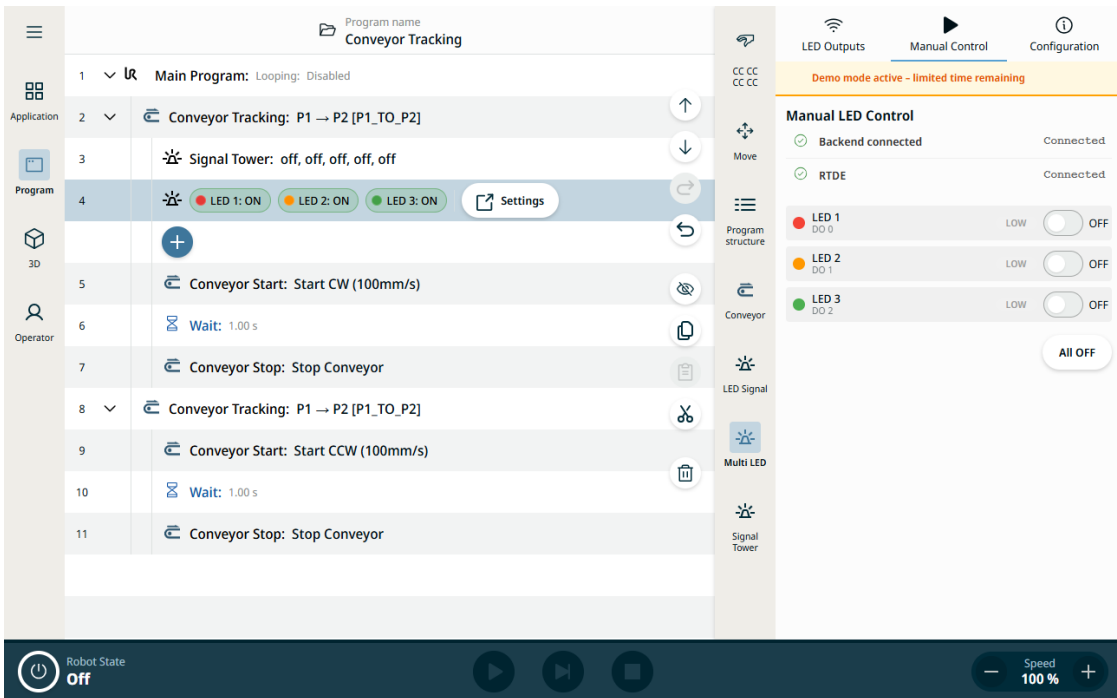
LED	Status
LED 1	ON
LED 2	ON
LED 3	ON
LED 4	OFF
LED 5	OFF

Tab 2: Manual Control

In the “**Manual Control**” tab you can:

1. **Check LED status:**
 1. ☒ Backend connected
 2. ☒ RTDE connected
2. **Manually switch LEDs:**
 3. Per LED: Button “**ON**” / “**OFF**”
 4. Buzzer: Button “**ON**” / “**OFF**”
3. **Turn off all LEDs:**
 5. Button “**All OFF**”

⚠ Note: Manual control is only active when backend & RTDE are connected.



The screenshot displays the NAST Automation software interface. On the left, a sidebar contains icons for Application, Program, 3D, and Operator. The main area shows a program list for 'Conveyor Tracking' with steps 1 through 11. Step 4 is highlighted, showing LED status: LED 1: ON, LED 2: ON, LED 3: ON. The right-hand panel, titled 'Manual LED Control', shows the status of the backend and RTDE as 'Connected'. It also displays the status of three LEDs (LED 1, LED 2, LED 3) with their respective DO numbers and a 'LOW' indicator. Each LED has a toggle switch set to 'OFF'. An 'All OFF' button is located at the bottom of the LED control section. The bottom status bar indicates 'Robot State Off' and 'Speed 100%'.

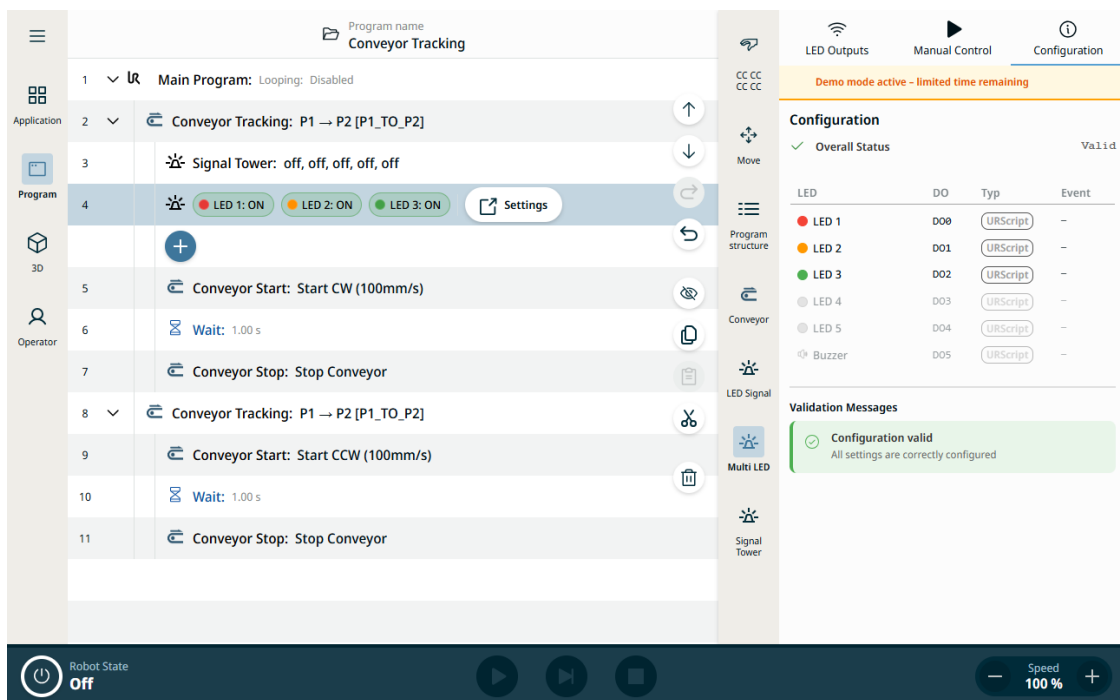
Tab 3: Configuration

Shows the **overall status** of URCap configuration:

Section	Status	Description
Overall Status	☑ Valid / ✗ Invalid	Overall validation
Digital Outputs	☑ Configured / ✗ Not configured	LED slots present?
License	☑ Valid / ⚠ Demo / ✗ None	License status
Backend Connection	☑ Connected / ✗ Disconnected	Backend reachable?

Validation Messages (if errors):

- ✗ *“URCap not activated”* → Activation missing in Settings
- ✗ *“Digital output configuration invalid”* → Duplicate pins or missing outputs
- ✗ *“RTDE not connected”* → Check backend connection



The screenshot shows the NAST Automation software interface. The main window displays a program structure for 'Conveyor Tracking' with steps 1-11. The right sidebar shows the 'Configuration' tab with a table of LED outputs and a 'Validation Messages' section indicating 'Configuration valid'.

LED	DO	Type	Event
LED 1	D00	URScript	-
LED 2	D01	URScript	-
LED 3	D02	URScript	-
LED 4	D03	URScript	-
LED 5	D04	URScript	-
Buzzer	D05	URScript	-

Validation Messages

- Configuration valid
- All settings are correctly configured

Licensing

The URCap uses a **time-based license system**.

Demo Mode

After installation, the URCap automatically starts in **Demo Mode**:

- ☒ **All features** available
-  **Sessions of 5 minutes** runtime each

Activate Full Version

1. Navigate to **“Licence”** tab (in Settings tile)
2. Enter **license key** (obtained from NAST Automation)
3. Click **“Activate”** button

Check license status:

☒ *“Valid – XX days remaining”*

 *“License expires in X days – please renew”*

Renew License

If license is about to expire:

1. Order new license from NAST Automation
2. Enter new key in **“Licence”** tab
3. Click **“Activate”**

 **Note:** The license is bound to the **robot serial number** and not transferable.

Support & Contact

NAST Automation

Website: www.nast-automation.de

Email: support@nast-automation.de

License & Legal

© 2026 NAST Automation. All rights reserved.

This URCap is protected software. Use is only permitted with a valid license.

Have fun with Standard Signal Light URCapX!

If you have any questions or problems, please contact our support.