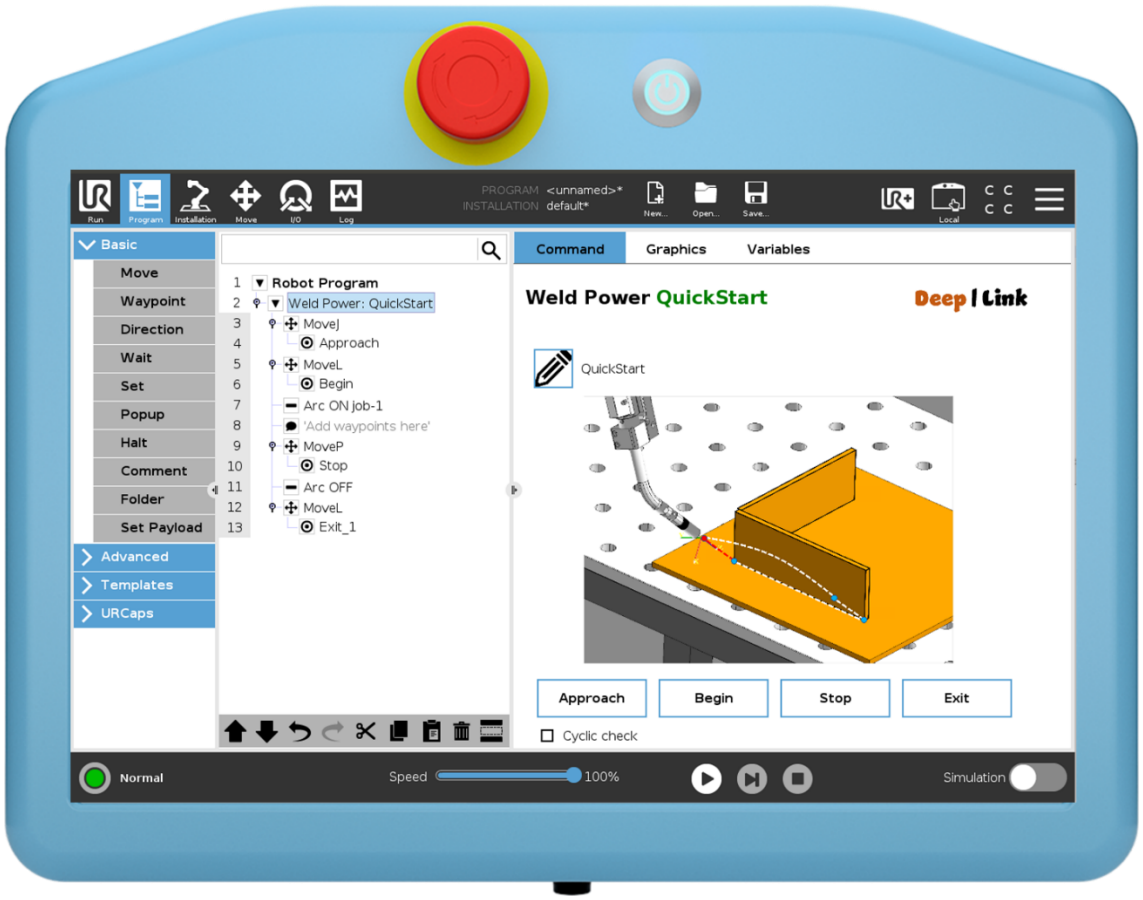
Deep | Link

V 1.0.3

Weld Power Manual

Deep | Link
Published 2023-June, HangZhou



Copyright

Version:	V 1.0.1 to newer
Date:	2022-June-15
Language:	English and Chinese

***** English Documentation ******

1. Brief Introduction

This URCap provides an add-in software to facilitate teaching with UR robot, it provides **flexibility to communicate with various Welding Power Source Brands** which makes the product very adaptive to use with, it implements an Arc Node to start or stop welding with configurated quick start template. It also has implemented Multipass with **unlimited pass quantity**. This URCap software is implemented with maximum compatibility so it can be working together with **Deep-Link Weaving URCap**, as well as **Deep-Link Smart Tool URCap**, eventually forming a comprehensive welding solution. To continue with Deep-Link's design DNA, it always prioritizes lean concept, user just needs **13 clicks** on Teach pendant to create a runnable welding program, **7 clicks to make a multipass program**, which will dramatically minimize your welding teaching time.

The compatibility minimum requirement is:

Universal Robots
e-series: 5.19 or newer.

2. Installation

1st step: click hamburger menu on top right of Polyscope.

Figure 1 Installation 1st step.

2nd step: Select Settings / System / URCaps, then click "+" button on button area.

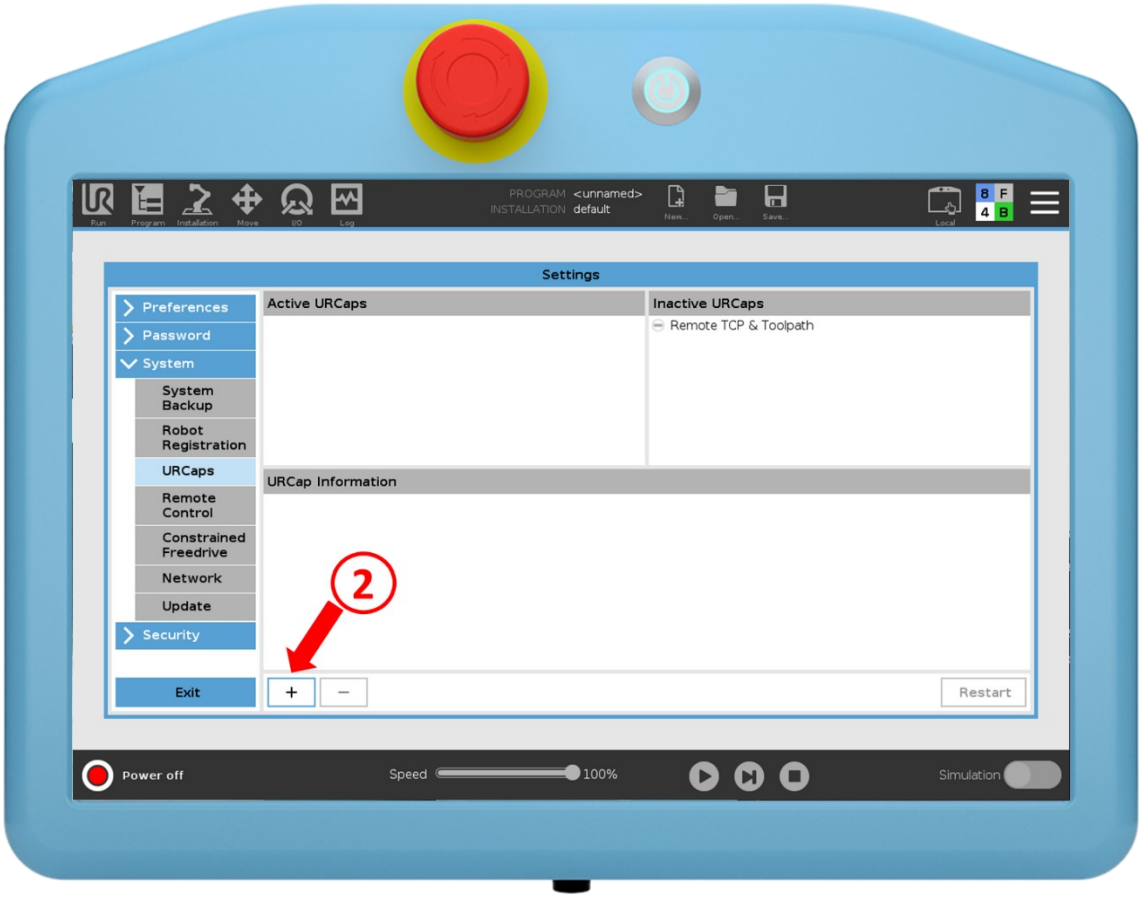


Figure 2 Installation 2nd step

3rd step: select the < WeldPower-1.0.x .urcap> file in the folder browser and click **Open** button, then click **Restart**. After restart Polyscope, it will display as below figure.

Figure 3 Installation 3rd step

4th step: Click **Toolbar** License Import button and select your license file in USB sticker device, subsequently, click Activate button until you get Figure 5 green icon means license check is cleared.

Figure 4 Installation 4th step

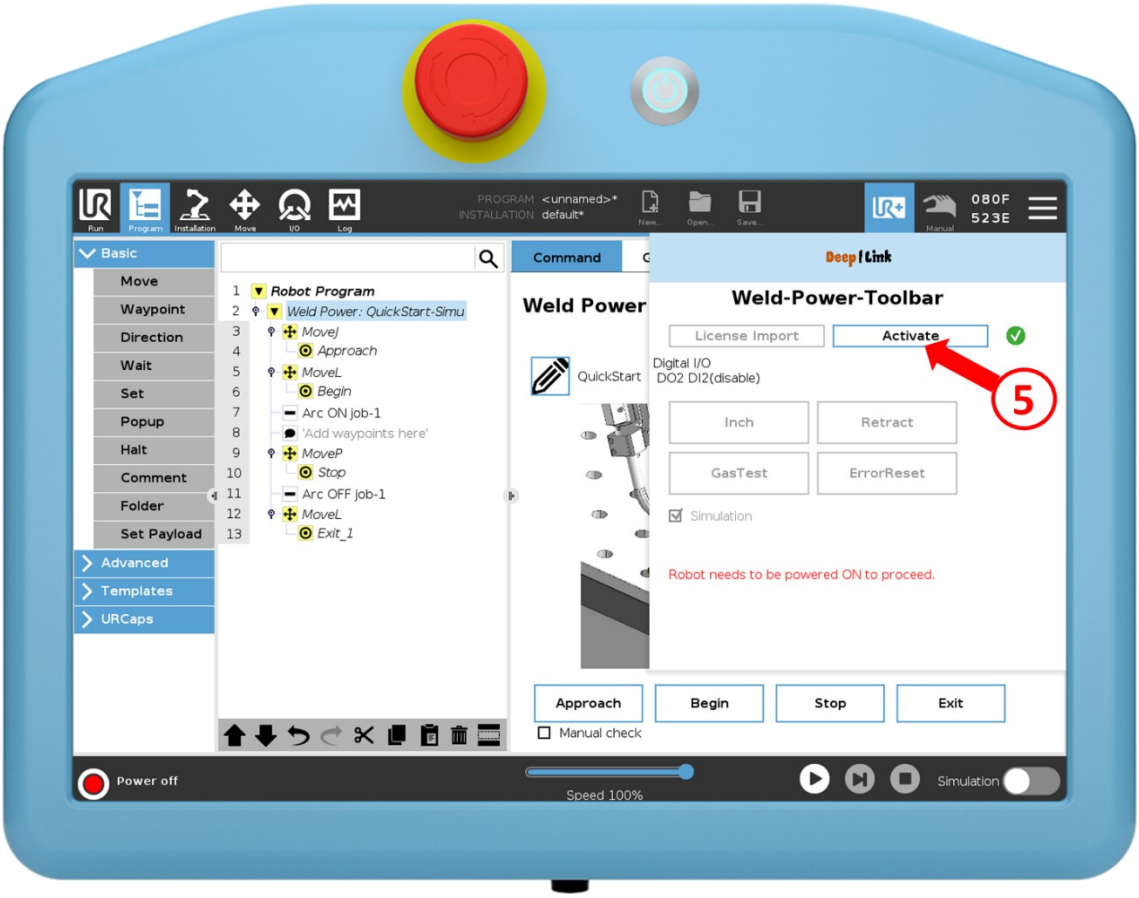


Figure 5 Installation activation view

5th step: configure workbench feature.

Every time relocate cobot, it will need to configure the workbench feature, as cobot needs to know which direction of workbench coordinate Z-axis is for further calculation. The definition of a plane feature is carried out in Polyscope Installation -> Features -> Plane, as Figure 6 shown, the X-axis and Y-axis can be arbitrary however

Z-aix should be always perpendicular to workbench surface and pointing direction up. As Figure 7 shown.

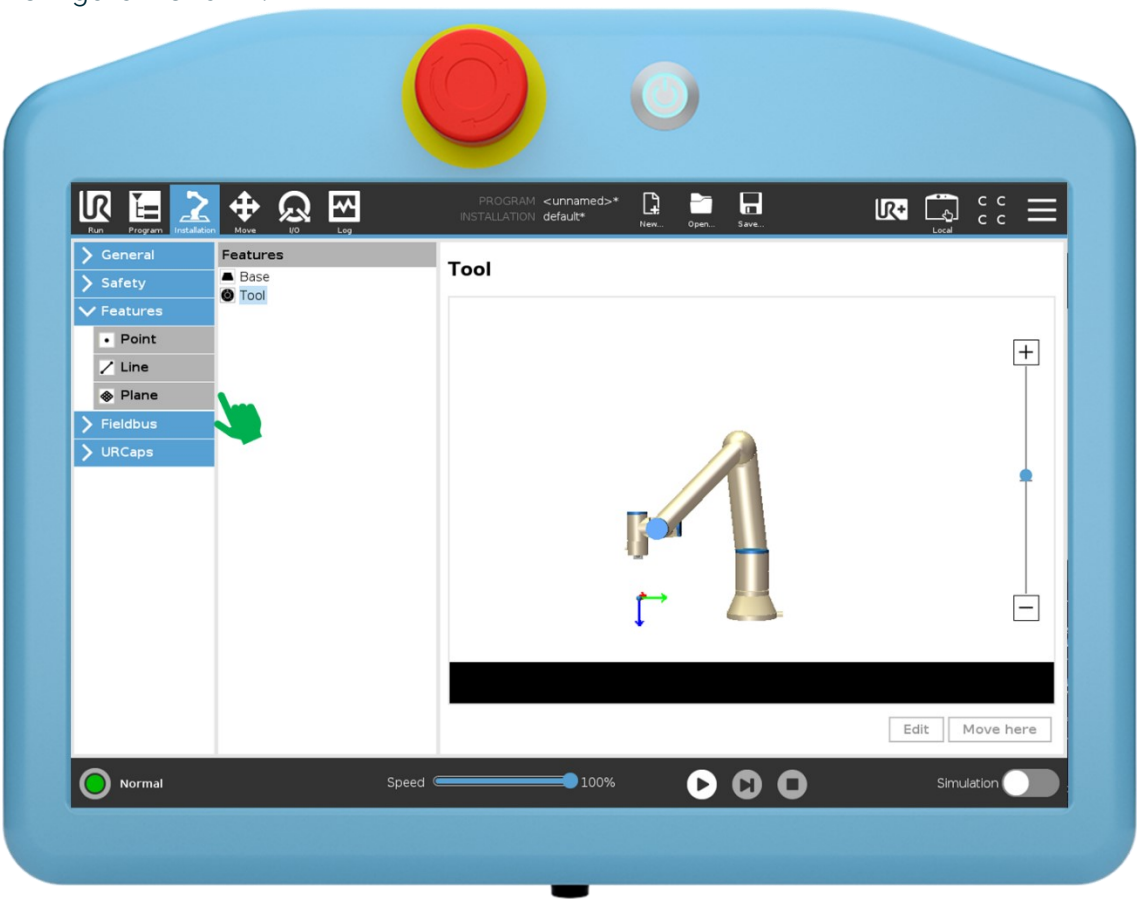


Figure 6 Creating workbench Plane feature

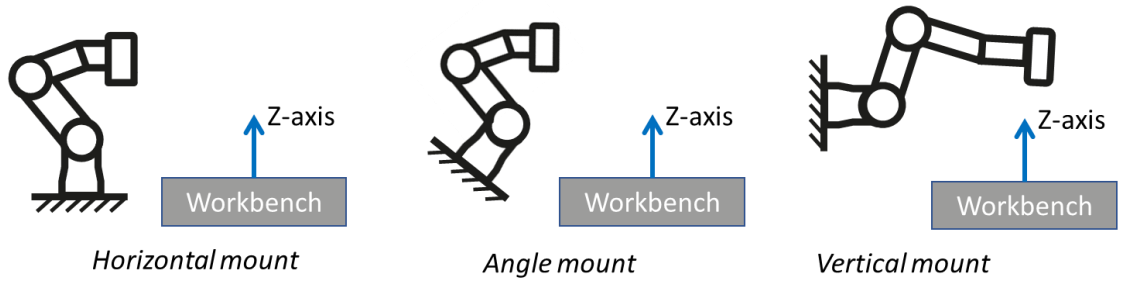


Figure 7 Workbench Plane feature Z-direction

After creating a Plane feature that reflect Workbench feature, subsequently, you can go to Polyscope Installation -> URCaps -> Weld Power -> General Configuration -> Workbench Feature to select the one you've just created, shown as Figure 8.

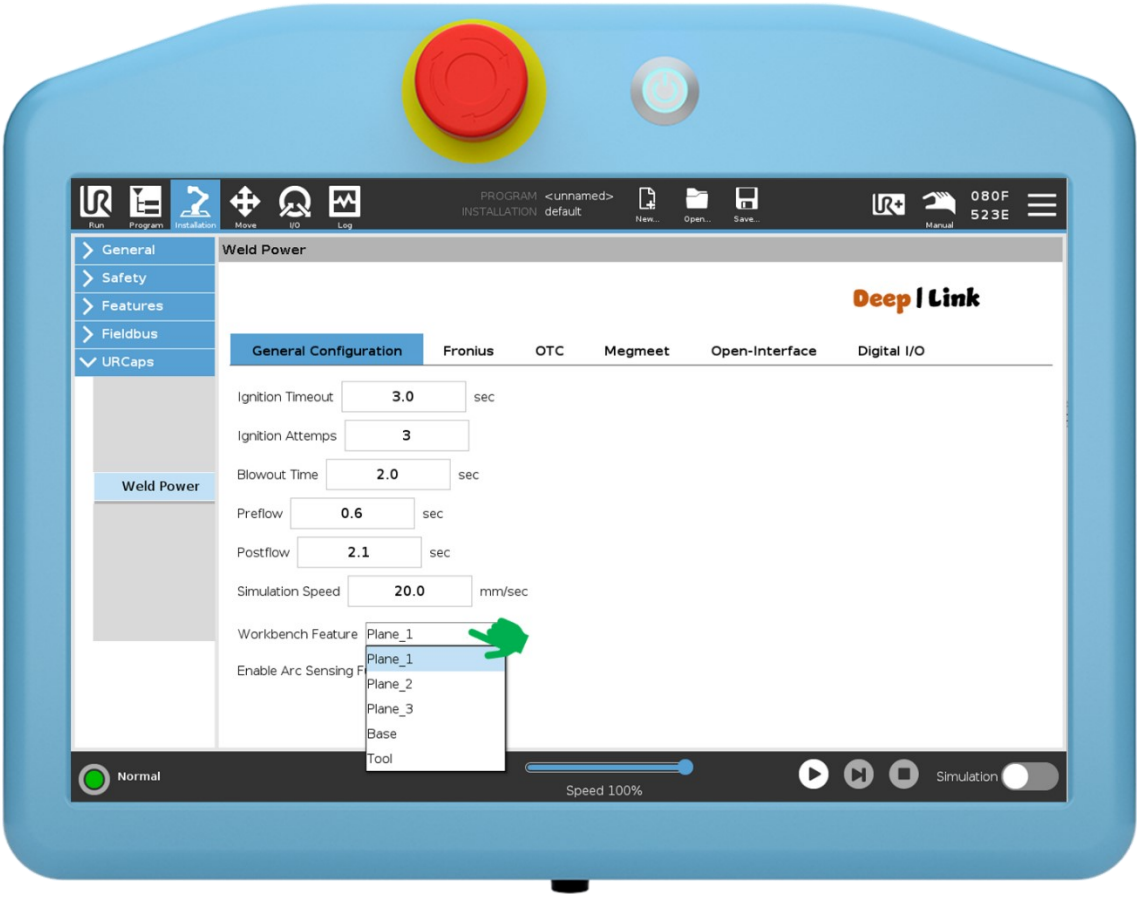


Figure 8 Configure Workbench Feature

6th step: click tool bar button on Polyscope top Save / Save Installation As… to save current license so user won't have to configure Installation every time. And now all installation is complete.

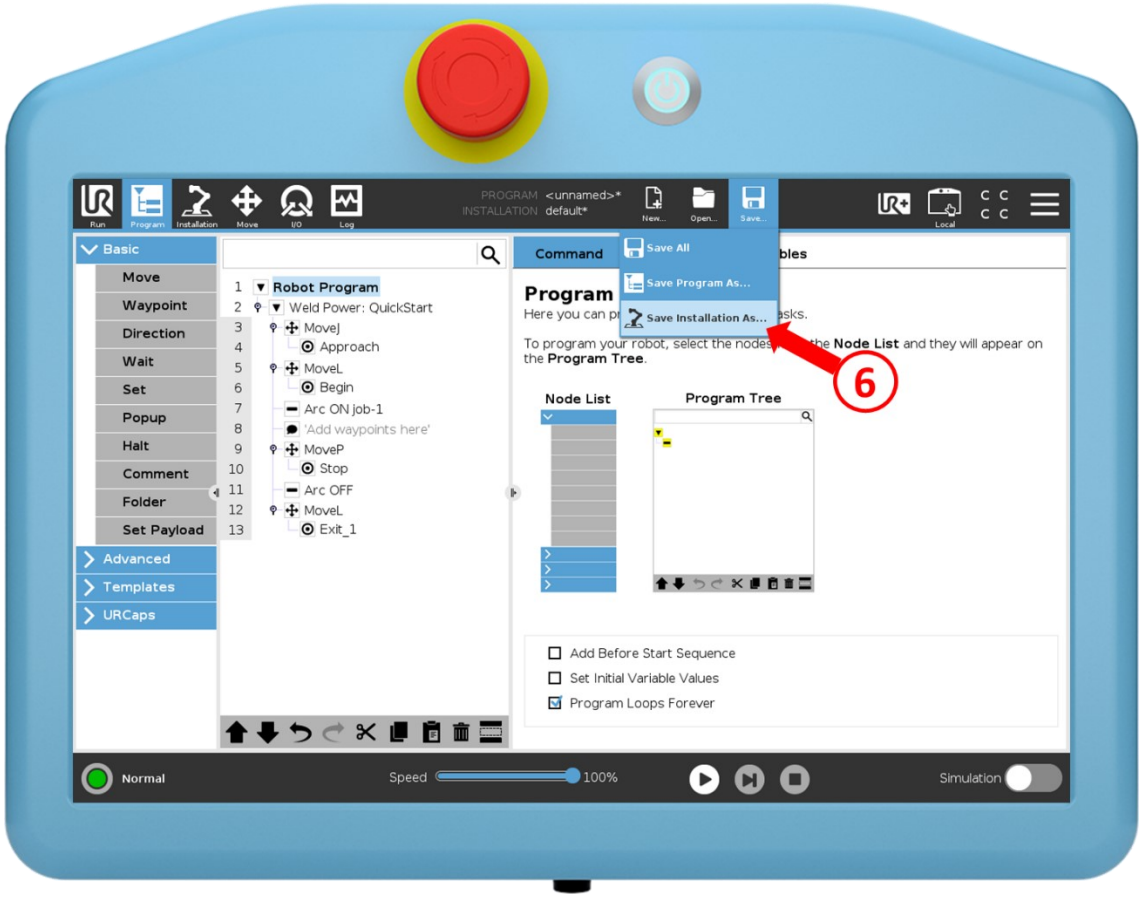
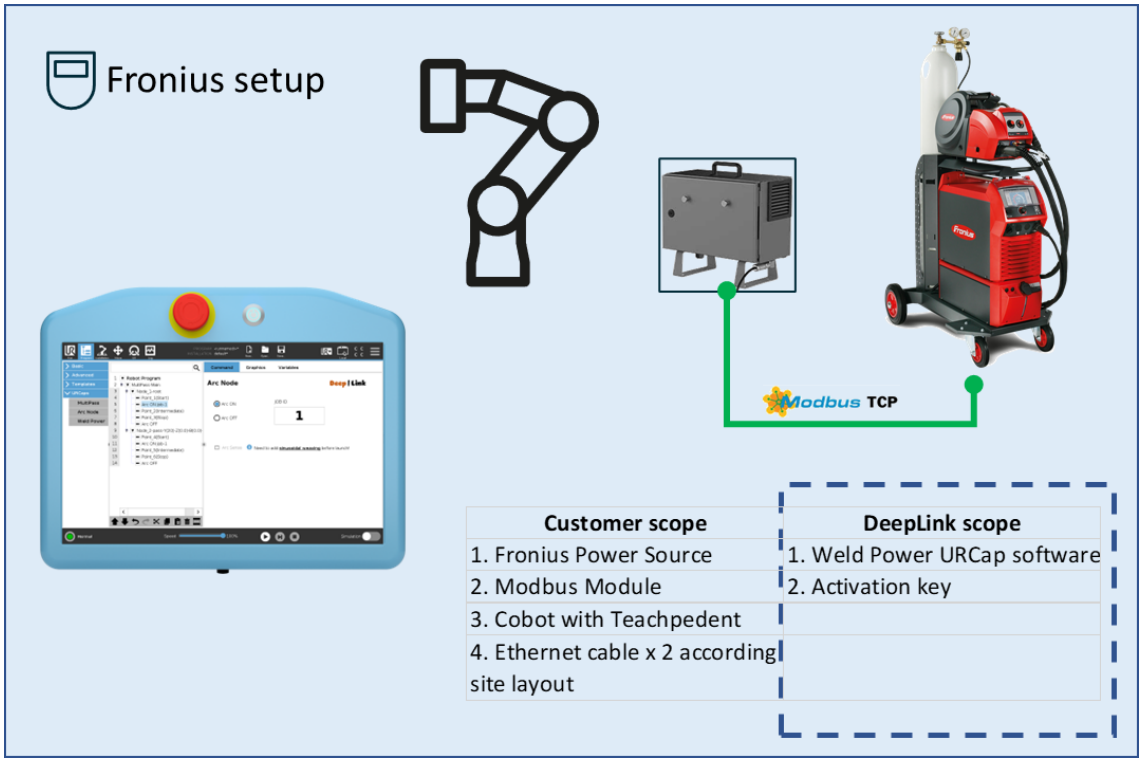


Figure 9 Save installation configuration.

3. Product Specification & Mechanics

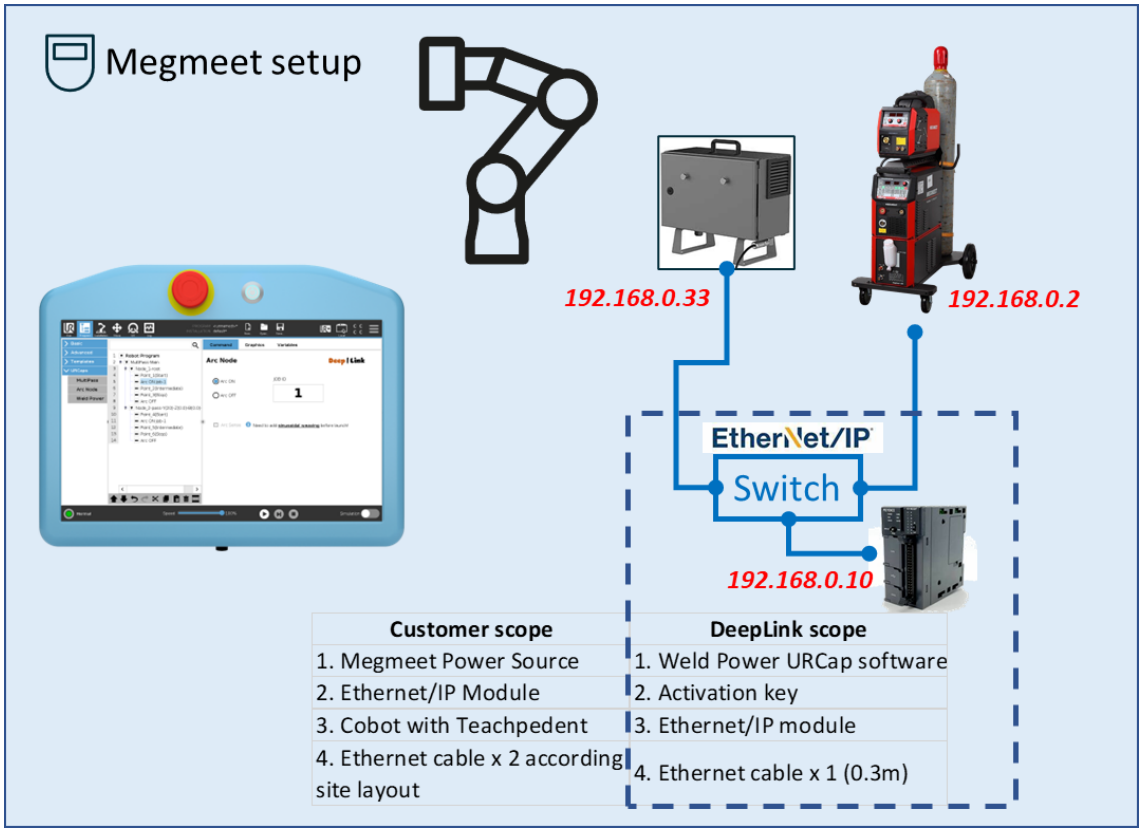
ITEMS	VALUE
Features	Arc On/Off with Job mode, Welding Program QuickStart, Multipass with unlimited pass quantity, Simulation mode, Support in one Robot Program using multi-Job number. [Optional] Integrated weaving with zigzag/sin/pendulum/circle/triangle patterns
Compatible welding machine brand	Fronius, Megmeet, Lincoln Electric, Aotai, Panasonic, ESAB, DIGIWave.
Fronius communication interface	Modbus TCP
Open-Interface communication interface	Ethernet/IP
Digital I/O	Control powersource with configurable digital I/O
Tool bar	Simulation enable/disable, Quick access to manual commands on: WireInch/WireRetract/GasTest/ErrorReset/SpotWeld/BlowOut
Dependency	Polyscope 5.19+
Software Compatibility	Deep-Link weld weave, Deep-Link Smart Tool,
Packing list	Ethernet/IP Com. module x1 [optional] USB sticker with Weld Power URCap x1 [optional] Shown as below Figure 10, Figure 11

PLC Program Version 001.015.027



Customer scope	DeepLink scope
1. Fronius Power Source	1. Weld Power URCap software
2. Modbus Module	2. Activation key
3. Cobot with Teachpedent	
4. Ethernet cable x 2 according site layout	

Figure 10 Fronius Power Source setup structure and Deep-Link deliverable scope



Customer scope	DeepLink scope
1. Megmeet Power Source	1. Weld Power URCap software
2. Ethernet/IP Module	2. Activation key
3. Cobot with Teachpedent	3. Ethernet/IP module
4. Ethernet cable x 2 according site layout	4. Ethernet cable x 1 (0.3m)

Figure 11 Megmeet Power Source setup structure and Deep-Link deliverable scope

4. Activation

Send your question or request at mailbox: info@deep-link.cn

5. Context configuration

This section demonstrates the URCapInstallationNode.

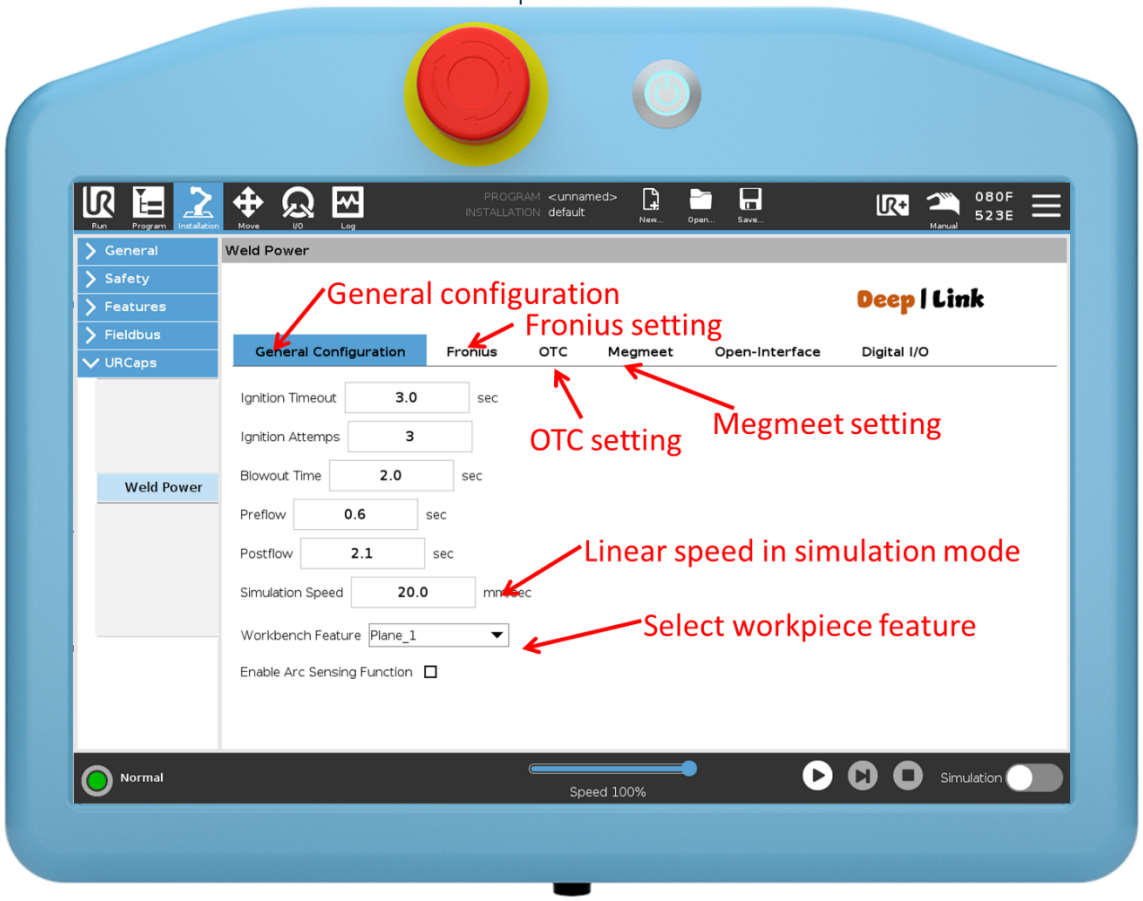


Figure 12 Installation Node Configuration

5.1 Fronius configuration

It needs to make sure that power source has modbus hardware of *4.044.014* of FB module and *41.0018.0087* of Modbus module.

Figure 13 Fronius communication hardware: 4.044.014 of FB module and 41.0018.0087 of Modbus module.

Subsequently it will need to select Enable radio button in Fronius tab, Com. Type as Modbus, please check below picture to make sure the configuration is correct with your hardware case.
This will all instruction that is needed to configurate your URCap with Fronius Power Source.

Figure 14 Fronius communication setting.

5.2 Megmeet configuration

Before connecting with Megmeet power source, it needs to perform several configurations on Power Source panel as below:

Channel	Value	Picture
N10	ON	
N00	FNE	

P02	DN	

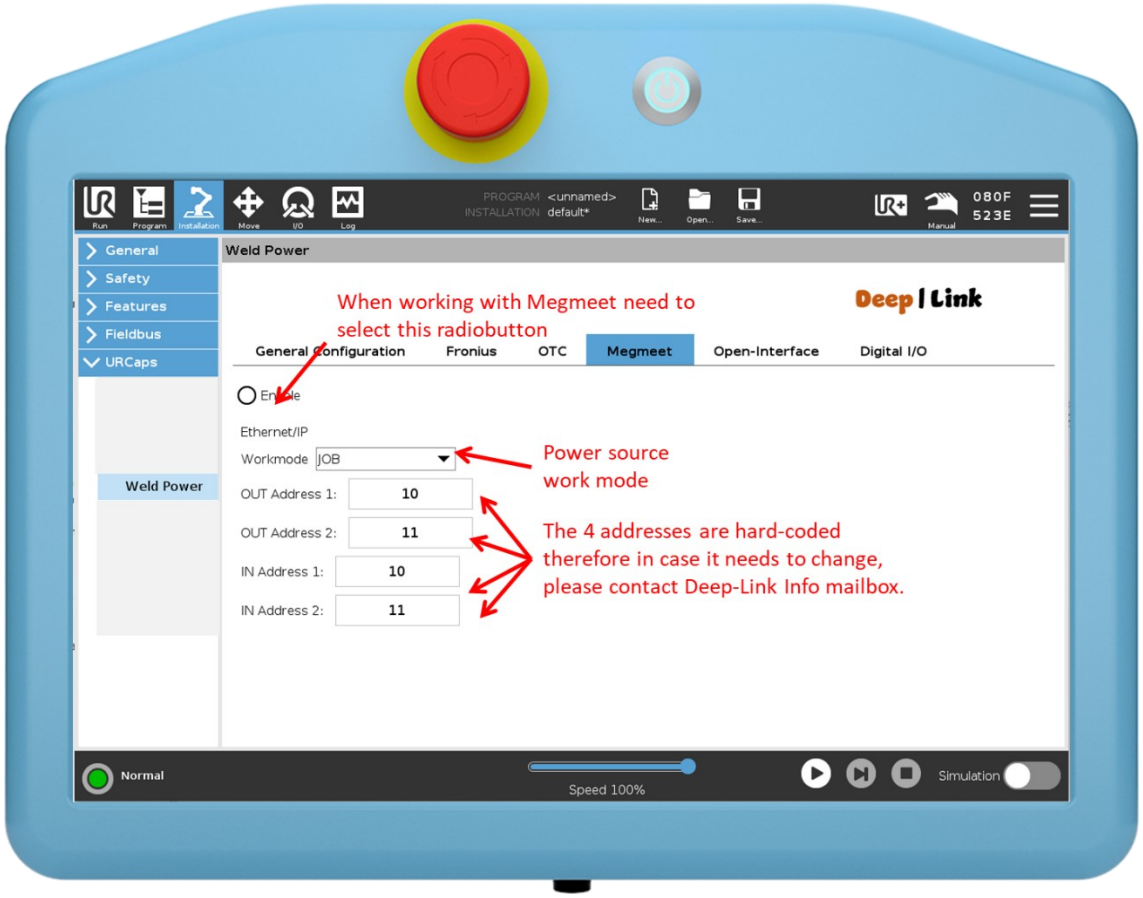


Figure 15 Megmeet Power Source setting.

The default Ethernet/IP module contains a Keyence (KV Nano series) PLC and an Ethernet/IP Scanner module, the default IP address is *192.168.0.10*. Robot should be with IP address of *192.168.0.33*, and Powersource should be with IP address of *192.168.0.2*. To change PLC IP address will need to proceed in KV Studio software.

The Ethernet/IP communication set-up procedure contains of below steps:

1. Go to Hemberger menu -> Settings -> System -> Network to change cobot IP address to the same segment.

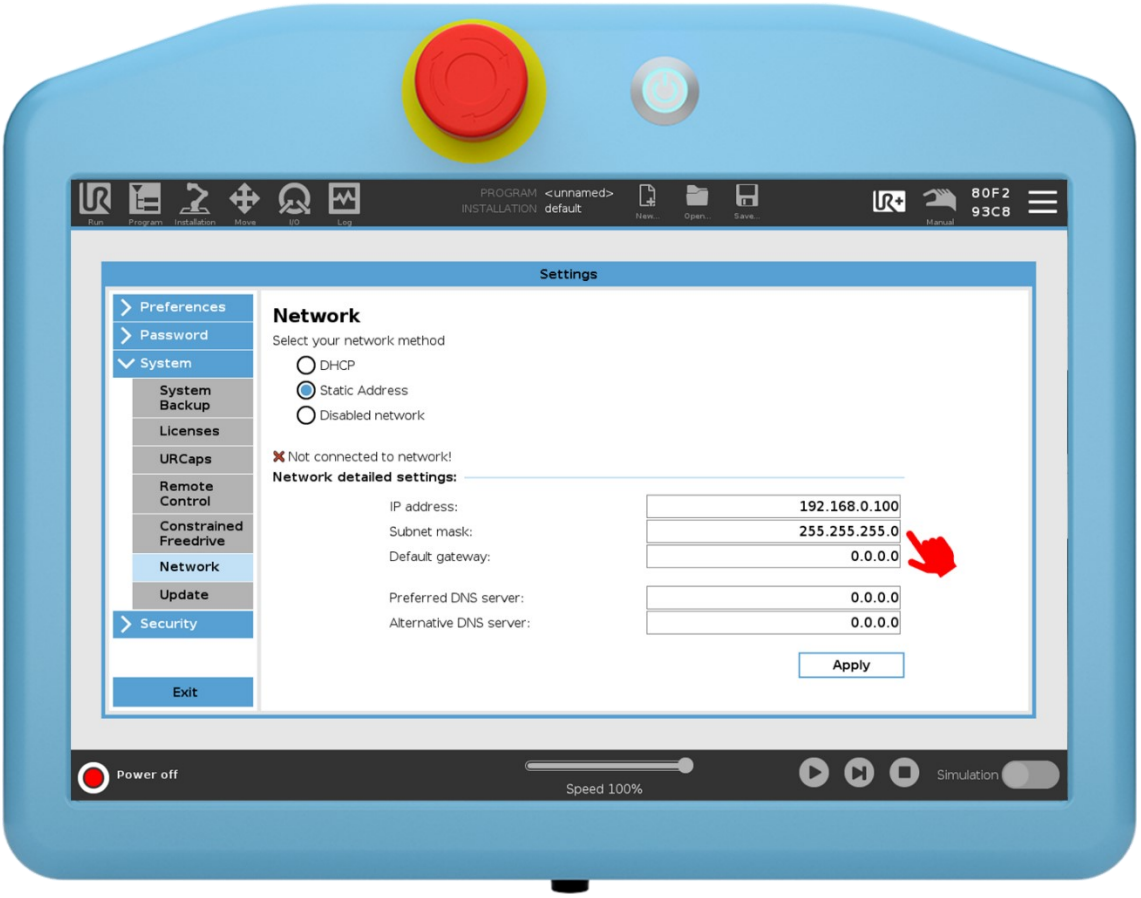


Figure 16 change cobot ip address for Ethernet/IP communication set-up, it should stay in same segment with PLC as well as Powersource, for instance: 192.168.0.33

2. Enabling cobot Ethernet/IP communication in Installation -> EtherNet/IP -> click <Enable> button.

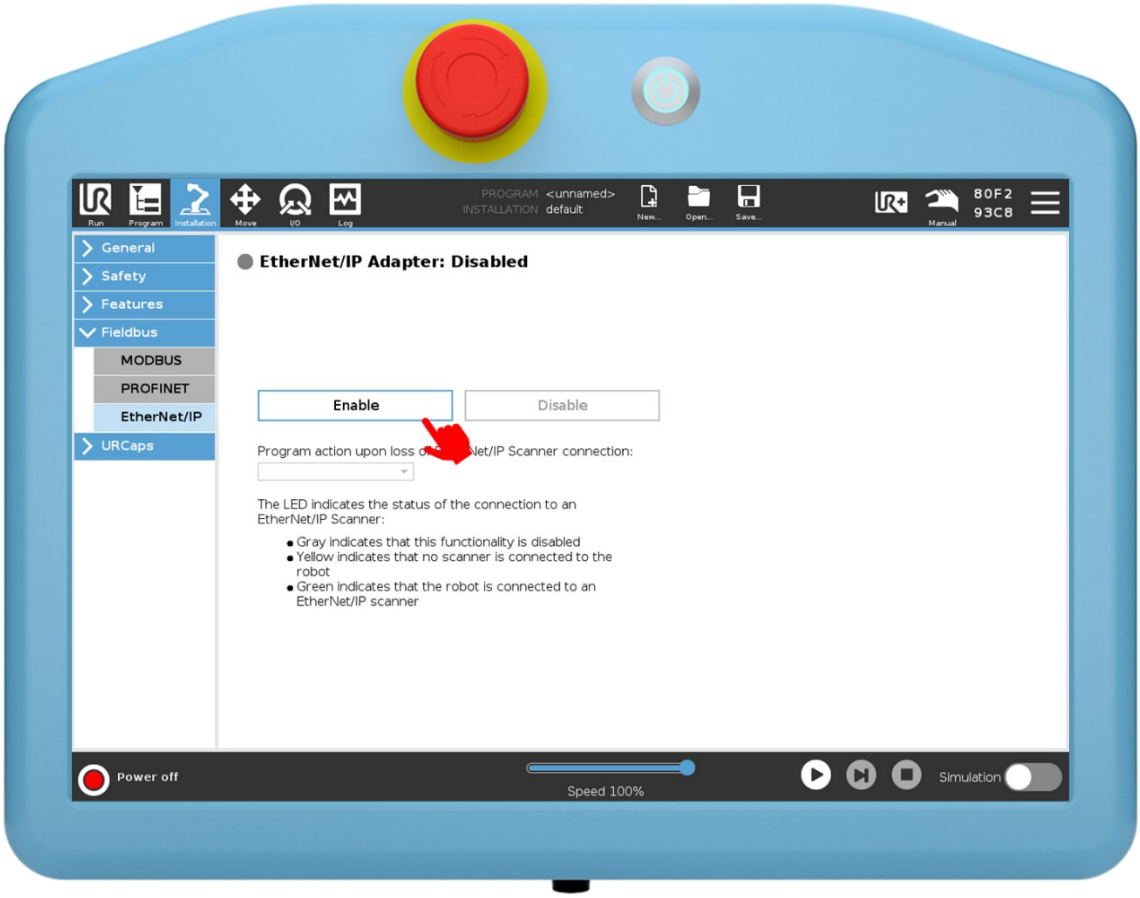


Figure 17 Enabling cobot EtherNet/IP communication.

3. The hardware wiring is illustrated in below figure:

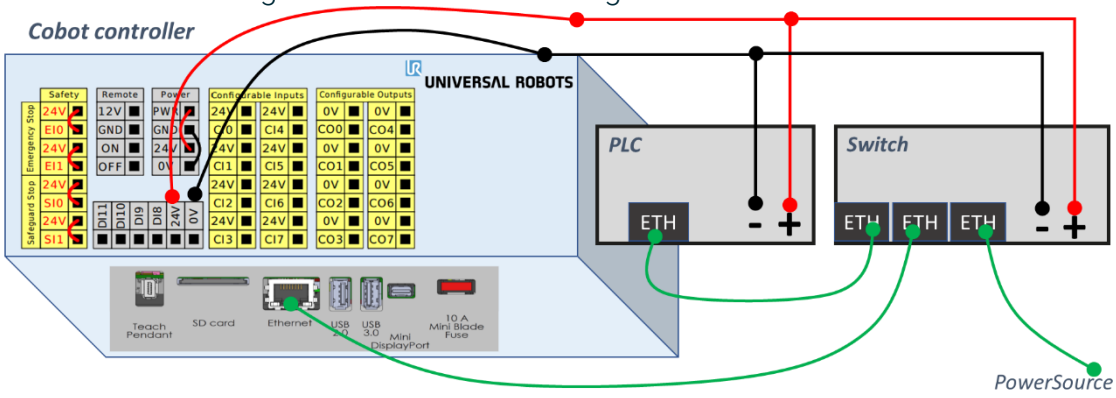


Figure 18 Ethernet/IP electrical wiring illustration

5.3 Open-Interface configuration

5.3.1 Lincoln Electric Signal Mapping

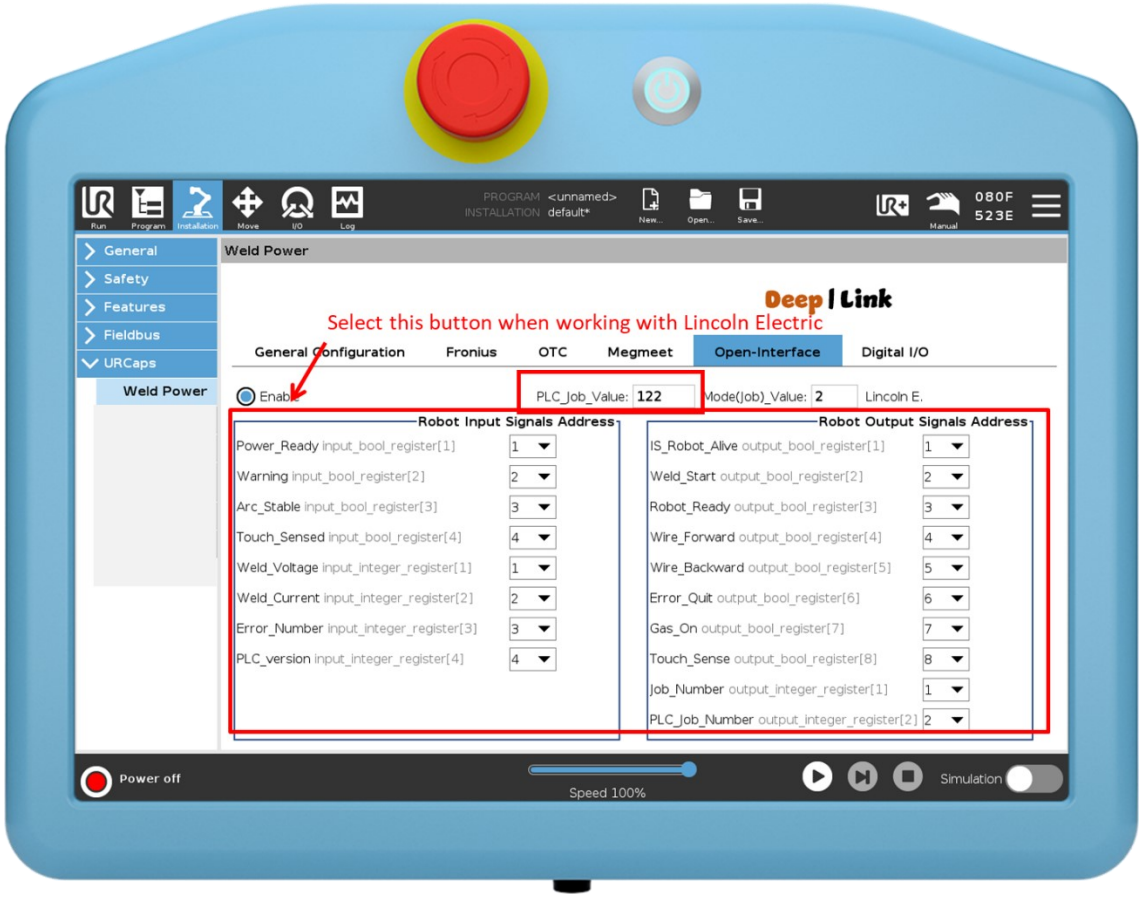


Figure 19 Lincoln Electric Powersource configuration interface, default Lincoln Electric IP address 192.168.0.12

5.3.2 Aotai Signal Mapping

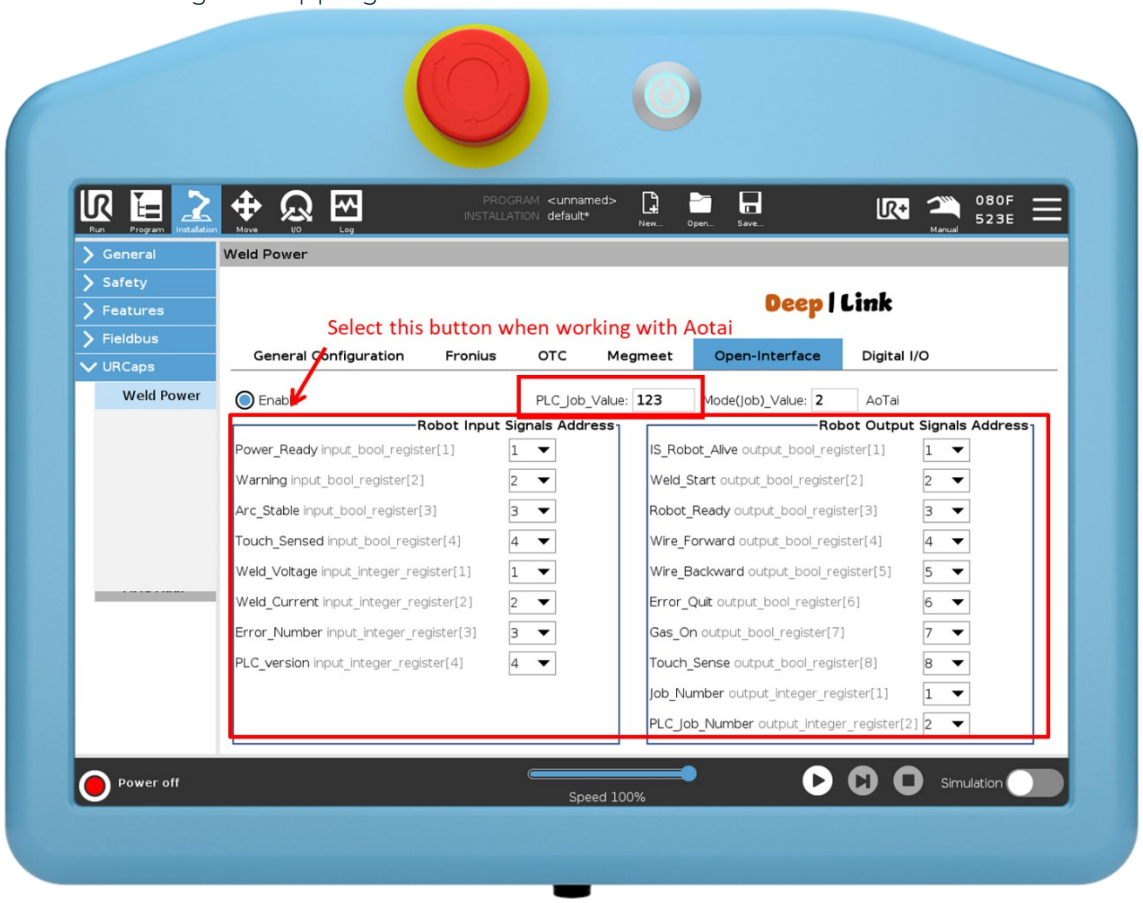


Figure 20 Aotai powersource configuration interface. Default Aotai IP address 192.168.0.8, mode 2 (Job).

5.3.3 Panasonic Signal Mapping

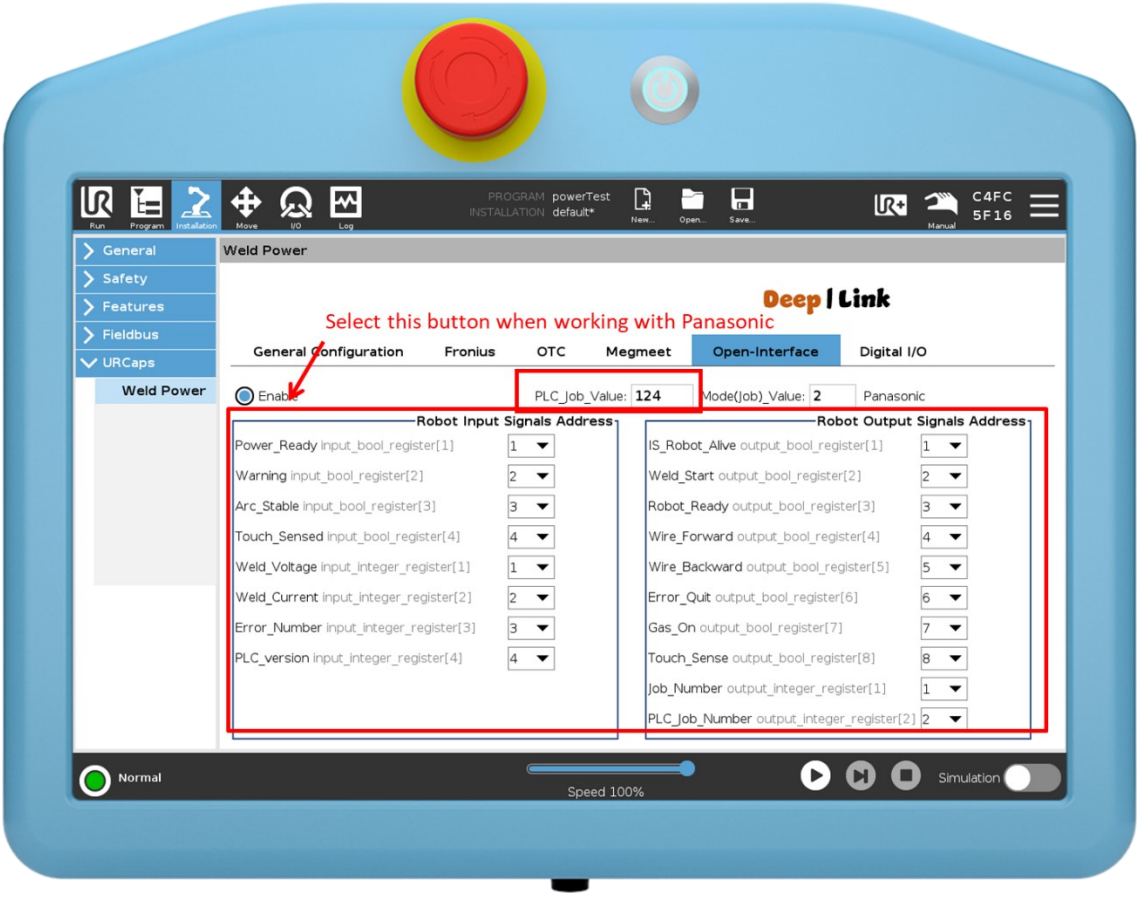


Figure 21 Panasonic powersource configuration interface, default Panasonic IP address 192.168.0.6, mode 4 (Job).

5.3.4 ESAB Signal Mapping

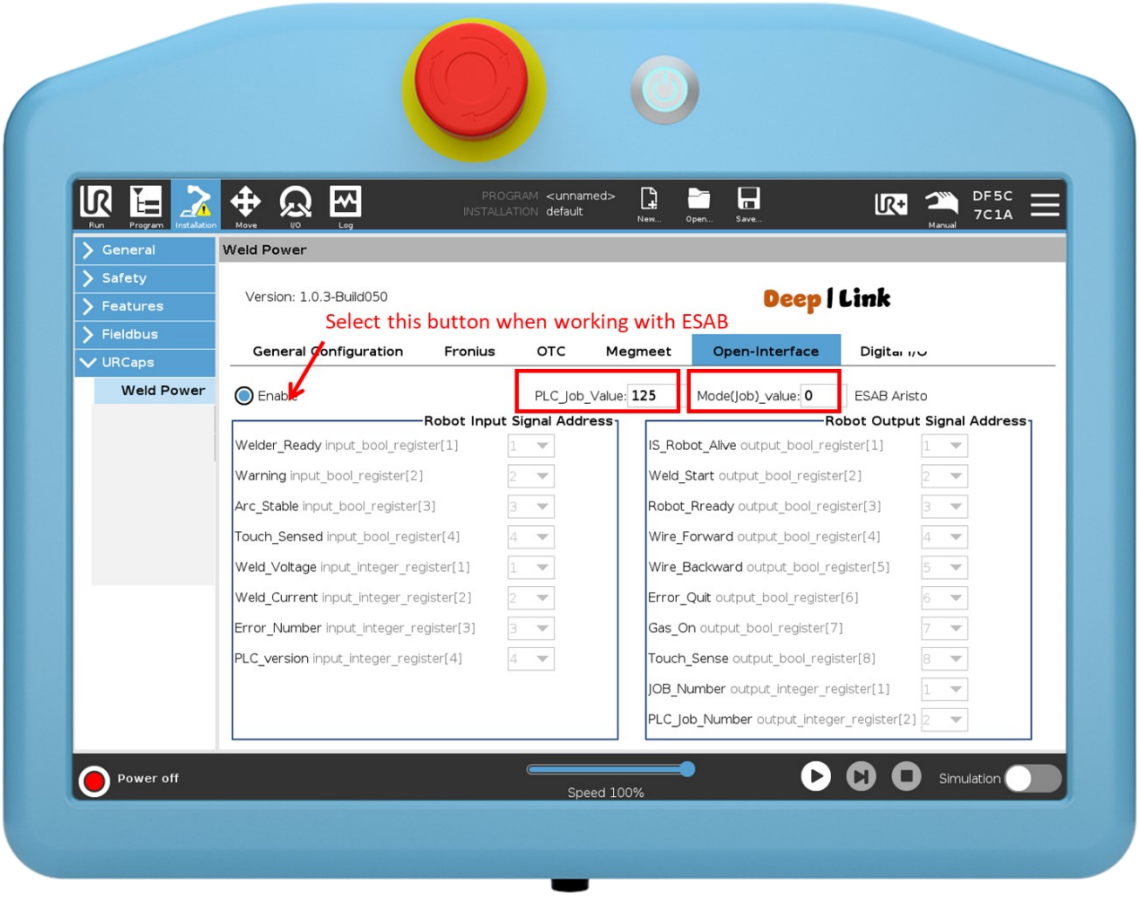


Figure 22 ESAB powersource configuration interface, default ESAB IP address 192.168.0.3, mode 0 (Job).

5.3.5 DIGIWave Signal Mapping

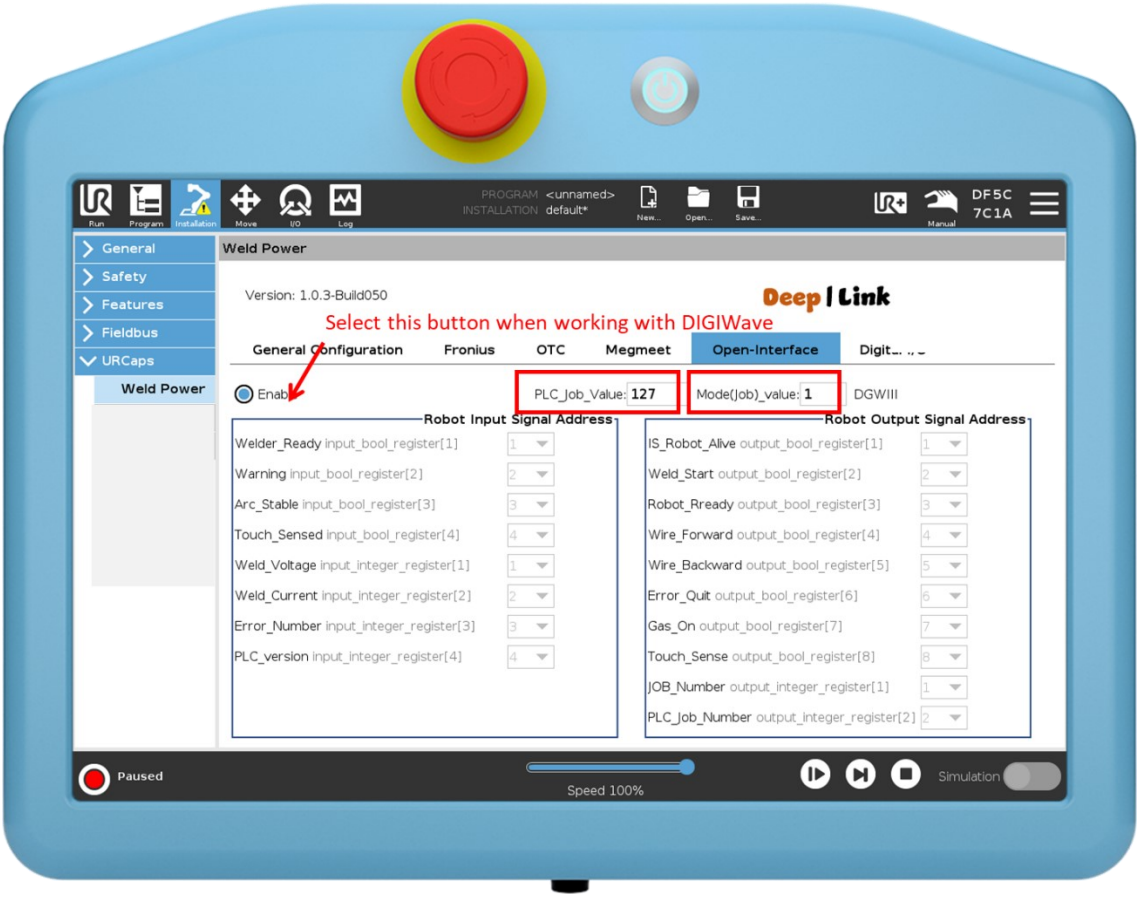


Figure 23 DIGIWave powersource configuration interface, default DIGIWave IP address 192.168.0.7, Mode 1.

5.4 Digital I/O configuration

TYPE	NAME	CONTENT
Radio button	Enable Digital I/O option	Enable
Combobox	Weld start output signal	Weld_Start (standard_digital_out) 1
Combobox	Arc On stable feedback signal, if not enable program will not consider the feedback during process.	Arc_Stable (standard_digital_in) 5 Input Enable

6. Arc Node

Currently it only supports Job approach to work with Fronius & Megmeet power source. It is possible to configure Arc Node to Arc On which will trigger power source start welding with a defined job number, or to configure it to Arc Off which will stop welding. The Arc On and Arc Off should always be coupled.

With Fronius it is possible to change job number in course of welding, it needs to insert an Arc Node and configured to <Change Job> option, as Figure 24 shown.

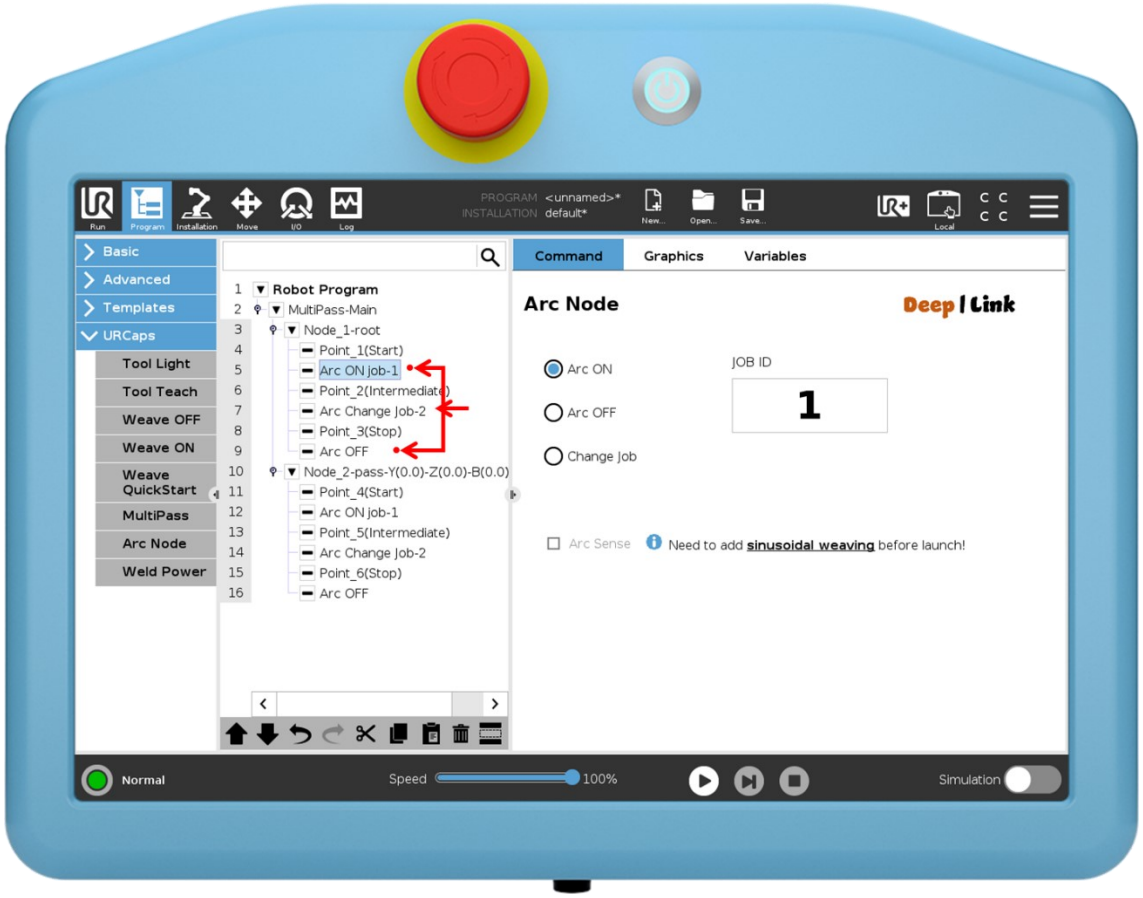


Figure 24 Arc Node presentation

7. MultiPass

7.1 Multipass Main Node

MultiPass Program starts from MultiPass-Main node, it can be found in Program tab -> URCaps -> Multipass.

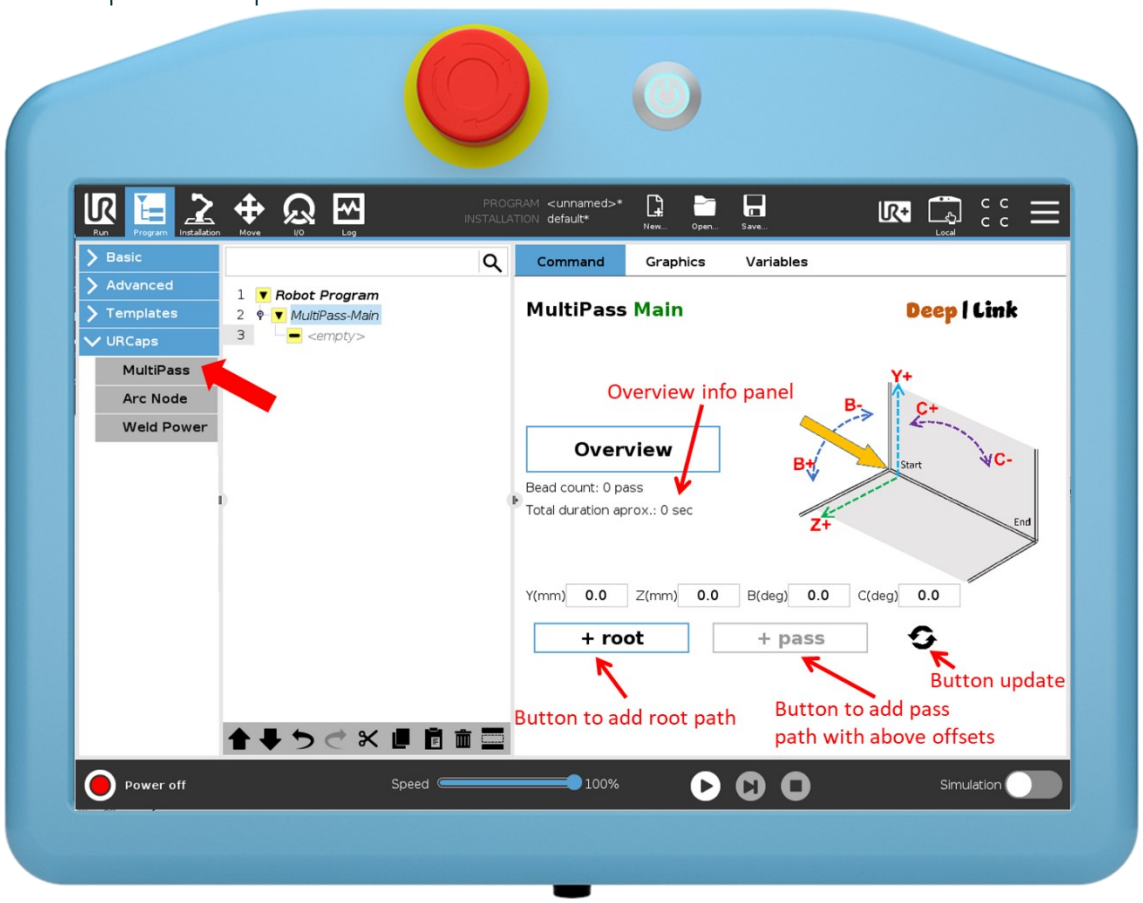


Figure 25 MultiPass Main node presentation

7.2 Pass Node – root/pass.

Pass Node can only be insert by clicking buttons +root or +pass button. Literately, the Pass Node inserted by approach of +root will be configured as root node, further pass node will be built in function of root path and each pass offset parameters.

Figure 26 Pass Node - root presentation.

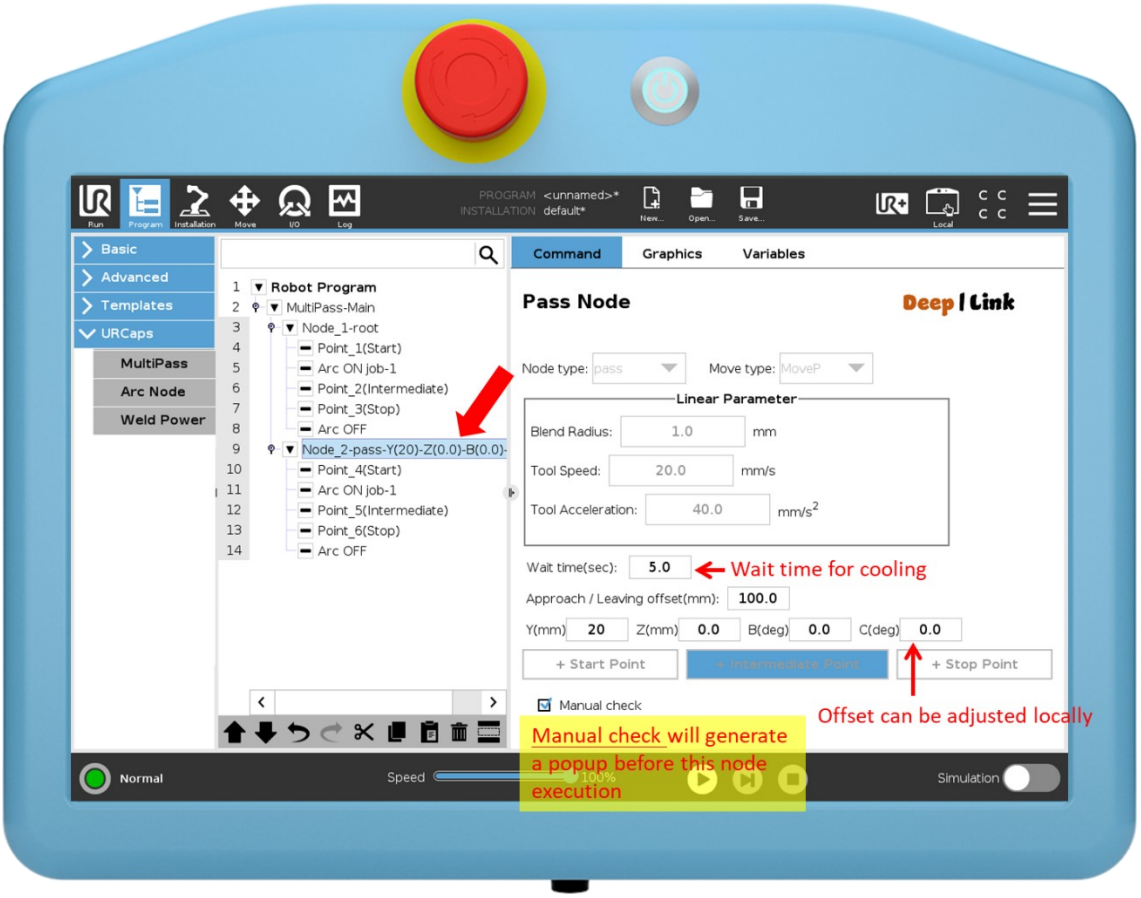


Figure 27 Pass Node - pass presentation.

Multipass root path is possible to update, after changing waypoint or change Motion parameter on Pass Node (root), you need to go to MultiPass-Main node to clear misalignment errors by clicking the update icon, refers to Figure 28***.***

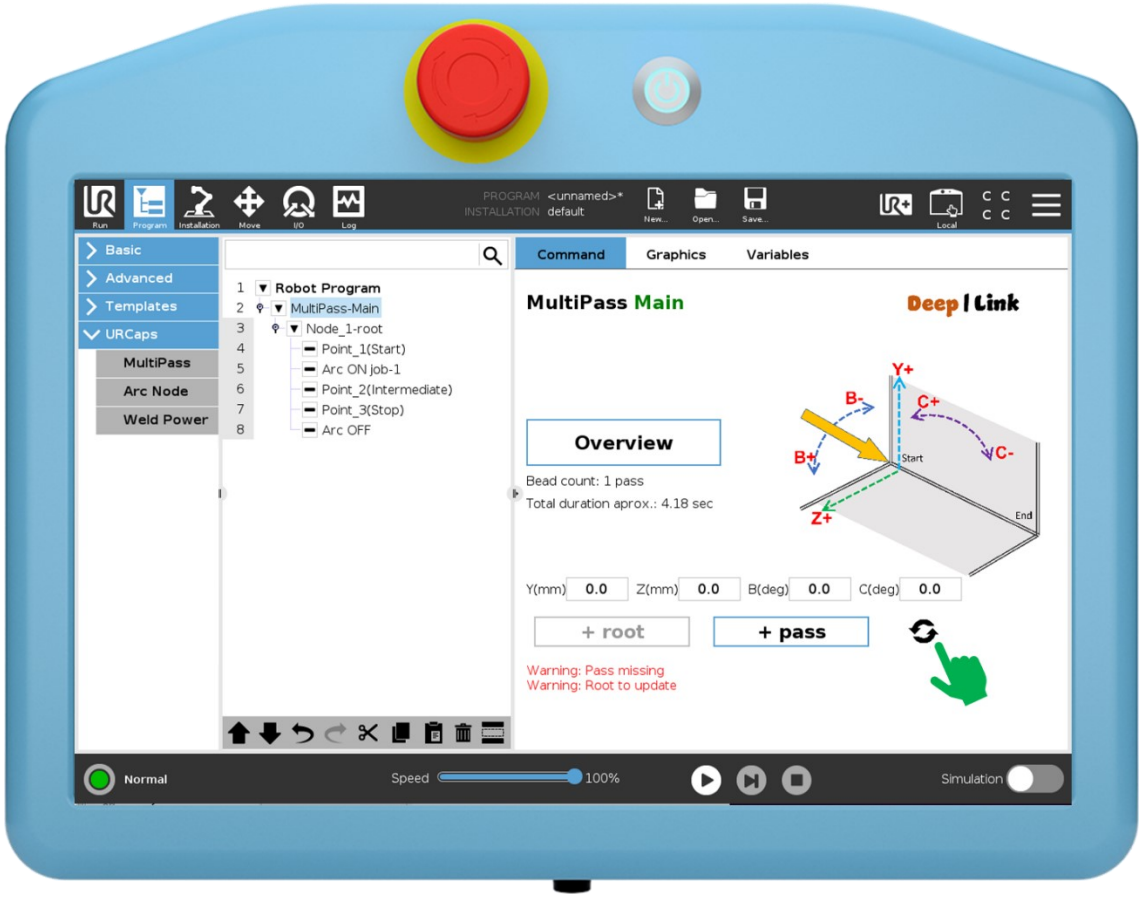


Figure 28 Clear error when updating Multipass root path.

It is possible to insert several <Intermediate Point> in middle When you are trying to build a more complex MultiPass root path.

To build a valid Multipass root path, it should start with a <Start Point>, and end with <Stop Point>, the Arc On/Off nodes are attached automatically to <Start Point> and <Stop Point>, respectively.

7.3 Adding weaving function

The weave function is implemented by another Deep-Link Product <Weld Weaving URCap>, it is a pure URCap product, and after installation, it will show up 2 extra URCapProgramNode in Polyscope URCaps tab **<Weave ON>** and **<Weave OFF>**.
You will need to nest Wave ON node inside of Arc ON/OFF scope therefore it will achieve an effect: After Arc ON, torch start moving with Weaving, when achieving Stop point, torch stops weaving, subsequently turn arc off, the example robot program tree is shown in Figure 29.

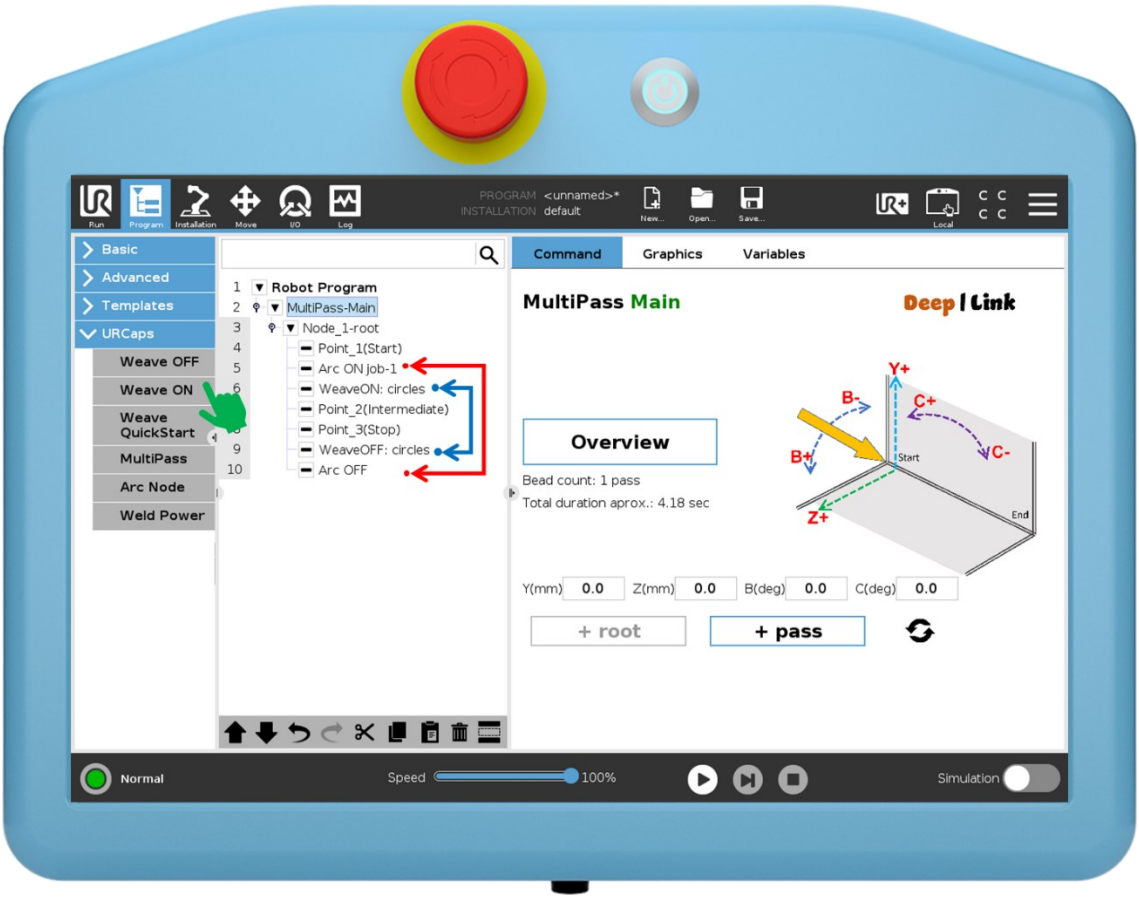


Figure 29 Multipass with weaving function

8. QuickStart Node

It also provides a QuickStart node named "Weld Power" in Program tab to quickly start a welding project programming. The program tree template is pre-set as welding sequence, velocity, arc controls are all configured in the template, so user would be able to create a welding task with minimized programming time. The parameters are all open for user further adjustment therefore it provides both maximum efficiency and flexibility to contribute your quick welding work.

After inserting the Quick Start node by clicking on <Weld Power> node, as Figure 30 shown. It will create subsequently a robot program tree, all you need to do is to teach the 4 Waypoints of Approach -> Begin -> Stop -> Exit, and/or adjust your power source job number.
There is a checkbox <Cycle check> if it is selected, it will popup a checking message in every cycle beginning.

Figure 30 QuickStart Node

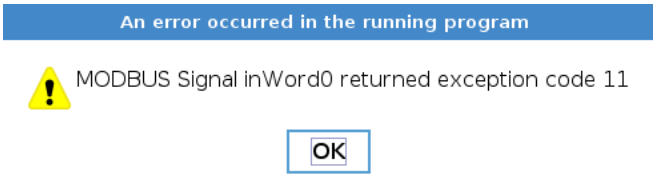
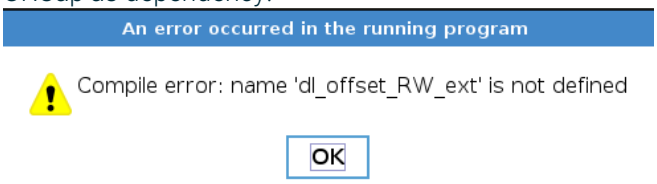
9. Toolbar

The toolbar provides URCap Activation field, as well as some command buttons to send quick command on power source operation. In addition, the Simulation mode enable/disable by using the checkbox in Toolbar zone.

Figure 31 Toolbar presentation, starting from version 1.0.3-Build026, a spot-welding button has been added in Toolbar panel, the job number is fixed at 22 for all power source brands.

10. Error instruction

CATEGORY		NUMBER	DESCRIPTION
Warning		001	Robot needs to be powered ON to proceed. -> Please power on cobot
Information		002	Welding station in Simulation mode. -> In toolbar the Simulation checkbox is selected, it would be useful when robot trajectory can be simulated without Arc On/Off.
Warning		003	There may have some warning issue in Installation that needs to eliminate before running. -> Please good to Installation URCap page to check detail warning message.
Information		004	Welding station license missing. -> Please contact info@deep-link.cn for activation. It is possible to work without being activated, and there will be several limited functionalities unavailable.
Error			Compile error: name 'dl_angle_RO_ext' is not defined. -> this may be caused by activating Root Record function while did not install Weld Weaving URCap [another Deep-Link product in dependency with this function]. An error occurred in the running program Compile error: name 'dl_angle_RO_ext' is not defined OK
Error			MODBUS Signal inWord0 returned exception code 11. ->

			This is caused cobot has detected missing of Powersource as modbus server. 
Error			Compile error: name 'dl_offset_RW_ext' is not defined. -> Activated Arc Sensing function while missing Weld Weave URCap as dependency. 

11. Revision notes

Version	Description	Time
1.0.1-Build019	Initial release	2023-June-15
1.0.2-Build002	Add simulation speed modification; Adjust program tree in CN language; Add weave function working with multipass; Add simulation speed adjustment. Root path is able to be adjusted by user after inserting; Check root conformbility; Optimize delay function around Arc OFF.	2023-July-11
1.0.2-Build003	PassNode motion parameters can be adjusted. ArcNode add an option of <Change Job>, it ONLY works with Fronius.	2023-July-15
1.0.2-Build015	Fix Modbus communication bug with Fronius	2023-August-01
1.0.2-Build016	Toolbar functionality is more completed with warning message.	2023-August-06
1.0.2-Build021	Improve toolbar button reaction time; Add PLC program version information; Remove IPAddress in Megmeet installation tab.	2023-August-15
1.0.2-Build023	Add Open-Interface	2023-August-21
1.0.2-Build024	Fix bug of workbench feature default setting	2023-August-26
1.0.2-Build026	Optimize Arc sensing feature by adding poka-yoke between Installation and Program.	2023-September-13
1.0.3-Build002	Add Digital I/O control interface. Enhance manual EIP setting section.	2023-November-14
1.0.3-Build003	Fix bug of Megmeet job mode	2023-Nobember-15
1.0.3-Build004	Fix bug of trial mode	2023-November-16

1.0.3-Build006	Add Megmeet changeJob function Adjust maximum Quickstart node quantity. Adjust Chinese translation	2023-December-18
1.0.3-Build007	Optimize activation approach	2023-December-26
1.0.3-Build010	Add ArcSensing function	2024-Feburary-27
1.0.3-Build012	Add OpenInterface with Touch Sense Enable & Feedback signal	2024-March-27
1.0.3-Build017	Update license format, Add Lincoln Electric via Open Interface No. 122	2024-April-7
1.0.3-Build019	Fix error of loading multipass program; Fix error of multipass root-pass alignment.	2024-April-26
1.0.3-Build021	Add multipass before/after offset options; Update Simulation toggler button; Add allowBreakpointOnNode; Add allowStartFromChildNode; Enable MoveHere button in Pass node; Optimize multipass path generation; Change manual check sequence in Weld Power template node and Pass node; Add MAC info display.	2024-May-06
1.0.3-Build023	Add Aotai via Open Interface No. 123; Fix error Workbench feature selection; Improve Toolbar initialization procedure.	2024-May-16
1.0.3-Build026	Eliminate error of Multipass Pass node generating. Add spot weld button in Toolbar. Simplified Fronius communication. Relocate Workbench feature selection from Installation to Program. Fix ArcSensing final stage error. Switch to ursim-5.15.0.126572	2024-July-12
1.0.3-Build030	Add Pass's child node sequence verification. Fix PassNode getduration out-bounding error. Add Panasonic via Open Interface No.124. PLC version: 001.015.025 Improve Activation when importing wrong file name. Fix Installation icon deformation. Fix Fronius com. bug.	2024-October-20
1.0.3-Build039	Improve PassNode, Toolbar responsiveness. Improve Multipass-Main node title with workbench feature info. Add Digital-IO mode's spot weld button. Add ESAB (Aristo series) via Open Interface No.125. Fix Automultipass updating error in Main node.	2025-Febuaray-20

	Improve Open Interface GUI with automatic mapping completion. Add spot weld reminder with interval 5 min. Add simulator variant. Add Pass Node delete button for easier node management. PLC version: 001.015.027. Update activation configuration. Add circular multipass feature. Update ignition Timeout default to 2.0 sec Update ignition Attempts default to 3 Update Postflow default to 2.0 sec. Create an inertia feature for Arc Node.	
1.0.3-Build041	Fix backend reachable bug, Add Bonjour node.	2025-March-15
1.0.3-Build042	Add data monitor feature. Fix spot weld button bug. Add IsMPMainUnlockable property configuration. Change BlendRadius range to 0.1-5 mm. Adjust BlendRadius in simulation/manual/auto use cases multipass. Simulation r_intermediate=4 mm r_stop = 0 mm Manual r_intermediate =0 mm r_stop = 0 mm Auto r_intermediate=value set in GUI. r_stop = 0 mm Add Air point in Multipass. Add ArcNode offset indicator. Remove Program Running Mask panel [in green background color].	2025-April-07
1.0.3-Build050	Fix Bonjour node running bug. Fix Bonjour node LED malfunction. Bonjour node adds Manual Check when task done. Change Linear BlendRadius minimum to 1 mm. Fix multipass Intermediate point accuracy error. Streamline MP Main node GUI refresh service. Add DIGIWave via Open Interface No.127.	2025-April-30
1.0.3-Build052-Essen	Rebase Polyscope version to 5.19.0. Rebase to URCap API 1.15.	2025-June-12

	Rebase URSIM to 5.19.0.1210631. Adjust Bonjour node approaching speed to 50 mm/s. Adjust BlendRadius minimum limit to 0.1mm aligned with Polyscope 5.18 update. And setting default BlendRadius value to 0.1mm to enhance welding trajectory accuracy. Merge Weave URCap [*based on v1.0.6-Build023*] and Power URCap to automize weaving insertion both in Quickstart node and in Multipass nodes. Add error-proof check in Mulpass-Pass Node about weave on-off imparity, disordering, overlapping, etc. Optimize Pass Node refreshing efficiency. Fix Arc Node ChangeJob chocking bug.	
1.0.3-Build052-Thrust	Fix ignition timeout error counting issue. Change Postflow literature to "ArcOff Wait Time"	2025-June-24
1.0.3-Build055-Semiramis	Add spirit text Ajust linear acceleration minimum to 0.5 mm/s2(this change will be applied to all nodes except Bonjour node) ** hidden function Fix error with power source work-mode setting. Adjust "daemon" terminology in CN/TW translation.	2025-September-29
1.0.3-Build056-Athena	Re-implementWeldPower QuickStart node waypoint teaching. Set daemon service start by default configurable. Fix QuickStart renaming bug.	2025-October-20
1.0.3-Build057-Athena	Add QuickStart 2 capability of attaching additional Approach/Retreat (waypoint) and Circle (segment). Add configurable feature of activating Smart Tool in Weld Power Installation Node.	2025-November-22
1.0.3-Build059	Optimize file-chooser for Activation & AutoMultipass process. Streamline non-activation behavior => it needs to reboot after a successful activation. Enhance Bonjour&QuickStart2 Node to accommodate Smart Tool input. Improve Multipass Task name validation. Further enhance Pass Node responsiveness. General update Weave URCap	2025-December-22

	[based on v1.0.6-Build025]	
1.0.4-Build062		

***** Chinese Documentation / 中文文档 ******

1. 基本介绍

Weld Power 是为 Universal-Robots 机器人定制开发的软件插件，用来帮助机器人和**多品牌焊机通讯**并实现焊接任务编程。Weld Power 实现了电弧控制 (Arc Node) 节点用来起弧、收弧；实现了无数量限值的多层多道 (Multipass)功能；还实现了快速编程 (QuickStart)模板。
这个产品可以和 Deep-Link **摆焊** URCap，Smart Tool 联合工作，组成功能更完善的焊接系统。同时这个产品延续了 Deep-Link 一贯的简易设计理念，使用最科学的设计让用户能在**最快的速度**完成现场编程提高效率。比如，**只需触碰示教器 13 下**就可以创建一个可执行的焊接程序，**只触碰示教器 7 下**就可以完成一个多层多道程序。

此 URCap 和机器人系统兼容性:

Universal Robots
e-series: 5.19 或更新版本.

2. 安装

第 1 步: 点击示教器右上角的汉堡菜单。

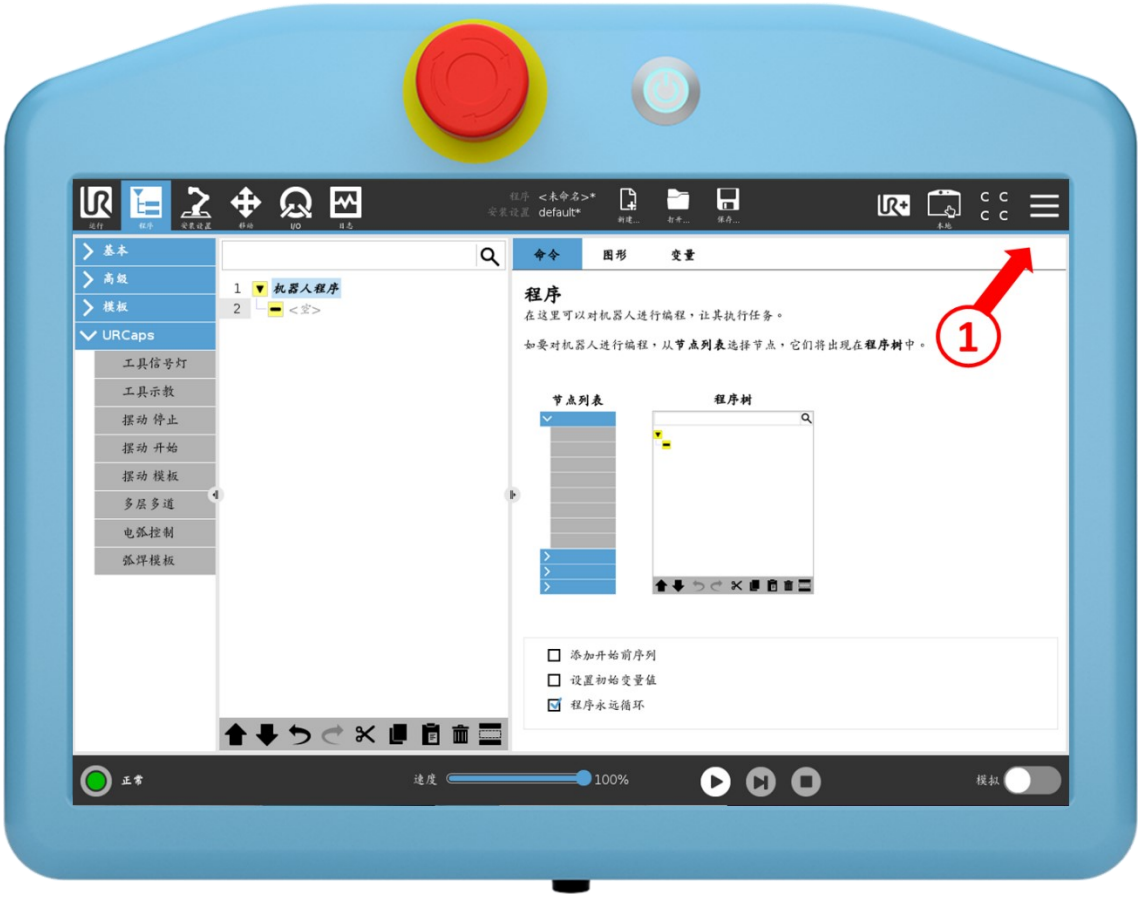


Figure 32 安装第一步

第 2 步: 选择**设置 / 系统 / URCaps**, 随后点屏幕下方的 “**+**”按钮。

Figure 33 安装第 2 步

第 3 步: 从文件浏览器中选择 < WeldPower-1.0.x .urcap> 文件 并 点击 **打开** 按钮, 随后点击 **重新启动**。

Figure 34　安装第 3 步

第 4 步: 点击 **工具菜单(Toolbar)** 并点击授权导入按钮，并选择 U 盘中对应的激活文件，随后点击激活按钮直到显示如 Figure 36 所示绿色确认✅图标。

Figure 35　安装第 4 步

Figure 36　安装激活界面

第 5 步: 设置工作台特征平面

每次机器人重新移位安装都需要设置工作台特征平面，因为机器人在多层多道程序中需要知道工作台 Z 轴方向来决定偏移计算。定义特征平面由示教器标配功能实现，它

位于示教器**安装设置-> 特征 -> 平面**， 如图所示 Figure 37, X 轴和 Y 轴方向随意，Z 轴应垂直工作台平面并指向上方，如图所示 Figure 38。

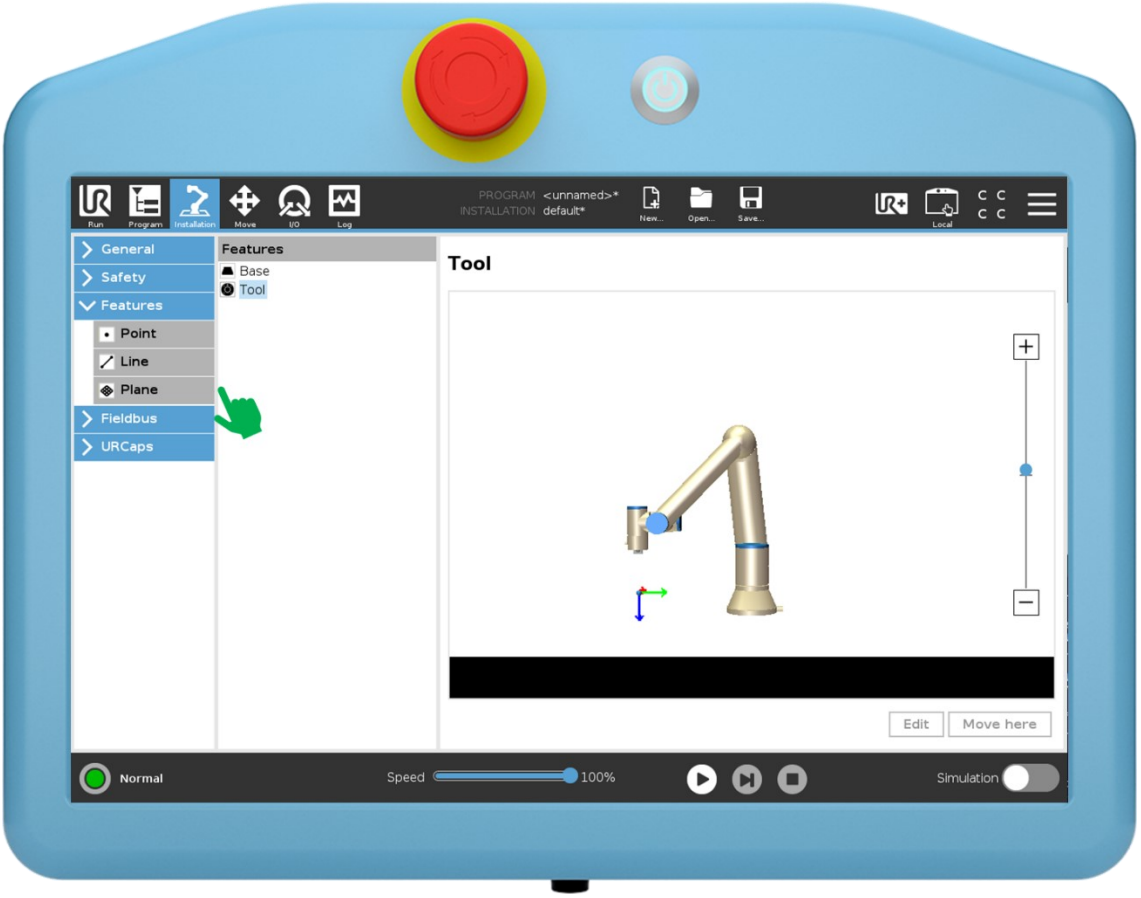


Figure 37 创建特征平面

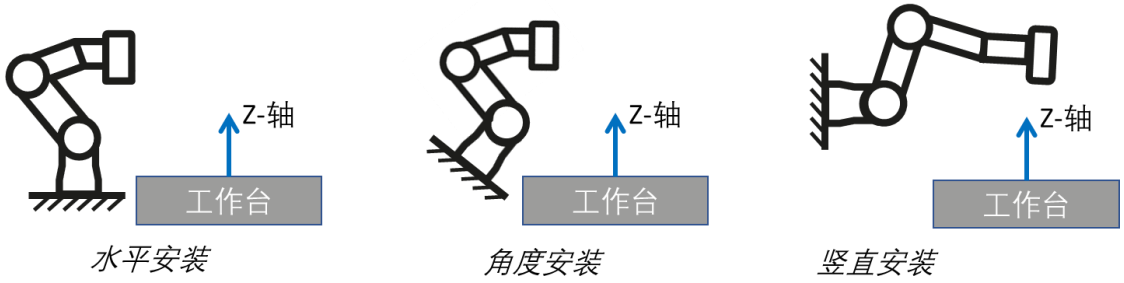


Figure 38 工作台特征平面Z 轴方向示意

创建工作台的特征平面后，可以在示教器界面：安装 -> URCaps -> 焊机配置 -> 常规配置 -> 工作台特征平面选择刚创建的特征。如图所示 Figure 39.

Figure 39 配置工作台特征平面

第 6 步: 点击示教器上方的 **安装设置另存为...** 以保存当前设置，这样下次开机时就不用重新设置了。至此，安装工作完成。

Figure 40 保存安装配置

3. 产品技术参数和机械设计

栏目	内容
功能	起弧/收弧 使用 JOB 模式, QuickStart 快速开始模板, 多层多道(数量无限值), 仿真模式, 支持同一程序中使用多个 Job 号。 [可选项] 集成摆焊工艺，支持 zigzag/正弦/钟摆/圆形/三角形摆动样式。
兼容焊机品牌	Fronius, Megmeet, Lincoln Electric, Aotai, Panasonic, ESAB, DIGIWAVE
Fronius 通讯接口	Modbus TCP
Open-Interface 通讯接口	Ethernet/IP
数字输入输出接口	使用数字输入输出控制焊机
工具栏功能	仿真使能/去使能 焊机手动快速操作按钮：点动送丝/反抽送丝/气体检测/故障复位/电焊/清枪吹气.
依赖	Polyscope 5.19+
软件兼容性	Deep-Link 摆焊 URCap, Deep-Link Smart Tool URCap,
包装清单	Ethernet/IP 通讯模块 x1 [选配] 软件 U 盘 x1 [选配] 如图所示 Figure 41, Figure 42

PLC 软件版本 001.015.027

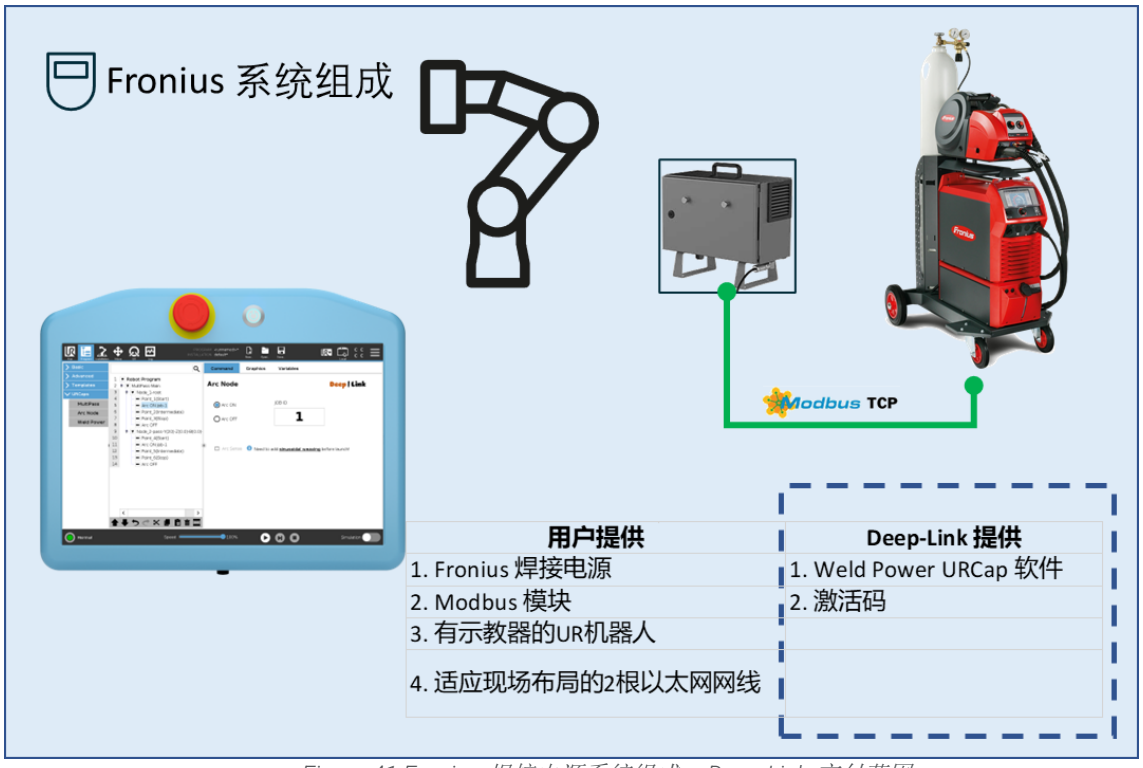


Figure 41 Fronius 焊接电源系统组成， Deep-Link 交付范围

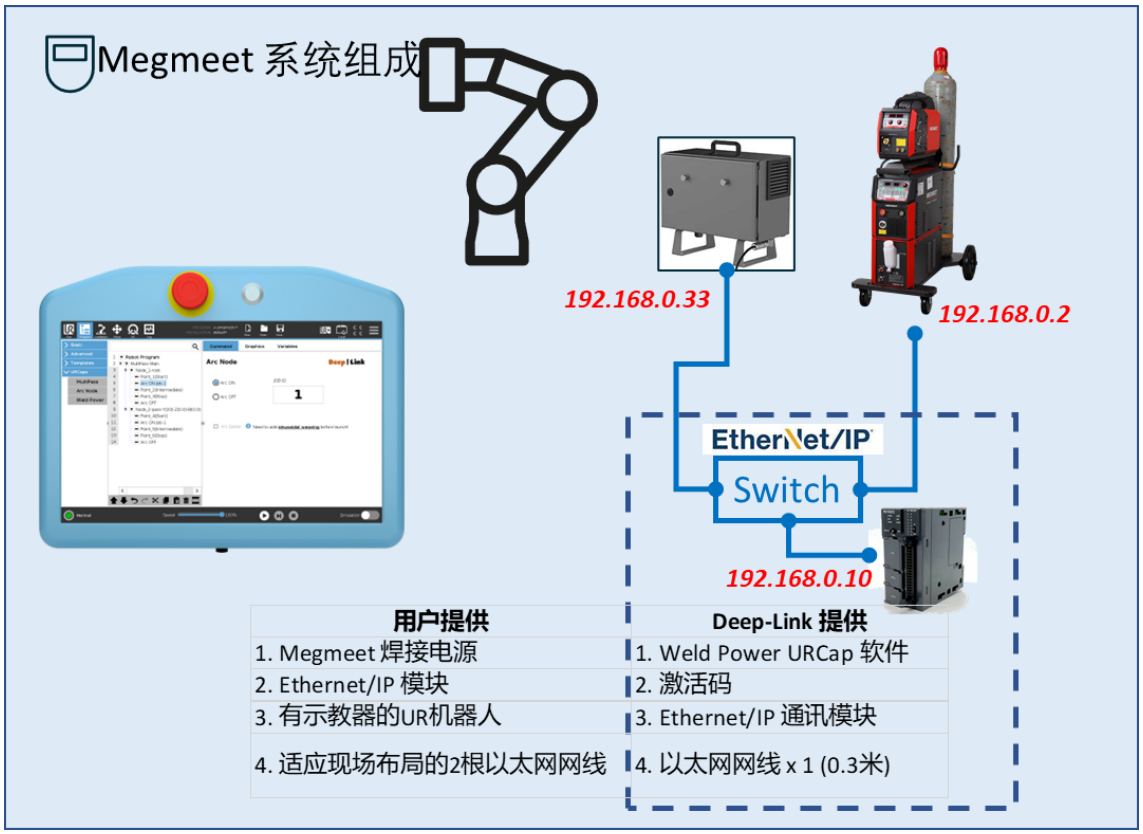


Figure 42 Megmeet 系统组成，Deep-Link 交付范围

4. 激活

请将您的激活需求或问题发送邮件至: info@deep-link.cn

5. 场景配置

此部分将介绍 URCap 安装节点的配置。

Figure 43 安装节点配置

5.1 Fronius 配置

需要确认焊机带有 modbus 通讯模块，FB 模块物料号码为 *4.044.014*，modbus 模块物料号码为 *41.0018.0087*.

Figure 44 Fronius 通讯硬件: 4.044.014 为FB 模块 和 41.0018.0087 Modbus 模块.

随后，需要在示教器的 Fronius 标签页做以下配置：

类别	名称	内容
单选框	使能	使能
下拉菜单	通讯协议	通讯协议 Modbus
下拉菜单	工作模式	工作模式 Job
下拉菜单	焊机版本	焊机版本 Standard
文本输入框	焊机 IP 地址	根据实际焊机配置输入
文本输入框	Modbus 从站编号	Modbus从站编号 255

5.2 Megmeet 配置

在和焊机连接之前，需要对焊机做以下设置:

通道	值	图片
N10	ON	
N00	FNE	
P02	DN	

Figure 45 Megmeet 焊机示教器的配置.

标配的 EtherNet/IP 模块包括一台基恩士(KV Nano series) PLC 和一个 EtherNet/IP Scanner 模块，默认地址是 *192.168.0.10*，机器人应设定网址为 *192.168.0.33*，焊机应设定网址为 *192.168.0.2*。修改 PLC 网络地址需要在 KV Studio 软件中进行，如下图界面所示 Figure 46。

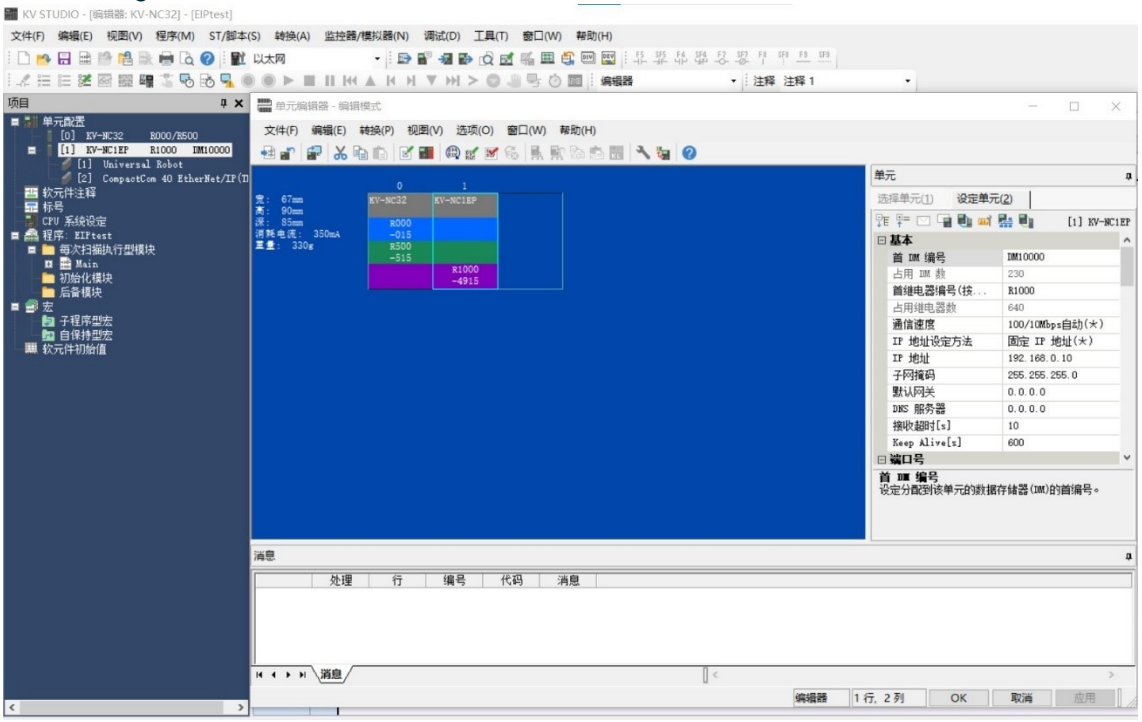


Figure 46 修改 PLC 软件界面。

EtherNet/IP 通讯建立设置步骤如下：

1. 示教器汉堡菜单 -> 设置 -> 系统 -> 网络，修改机器人 IP 地址到同一网段。
2. 在安装设置菜单-> 现场总线 -> EtherNet/IP 中点击 <使能> 按钮。

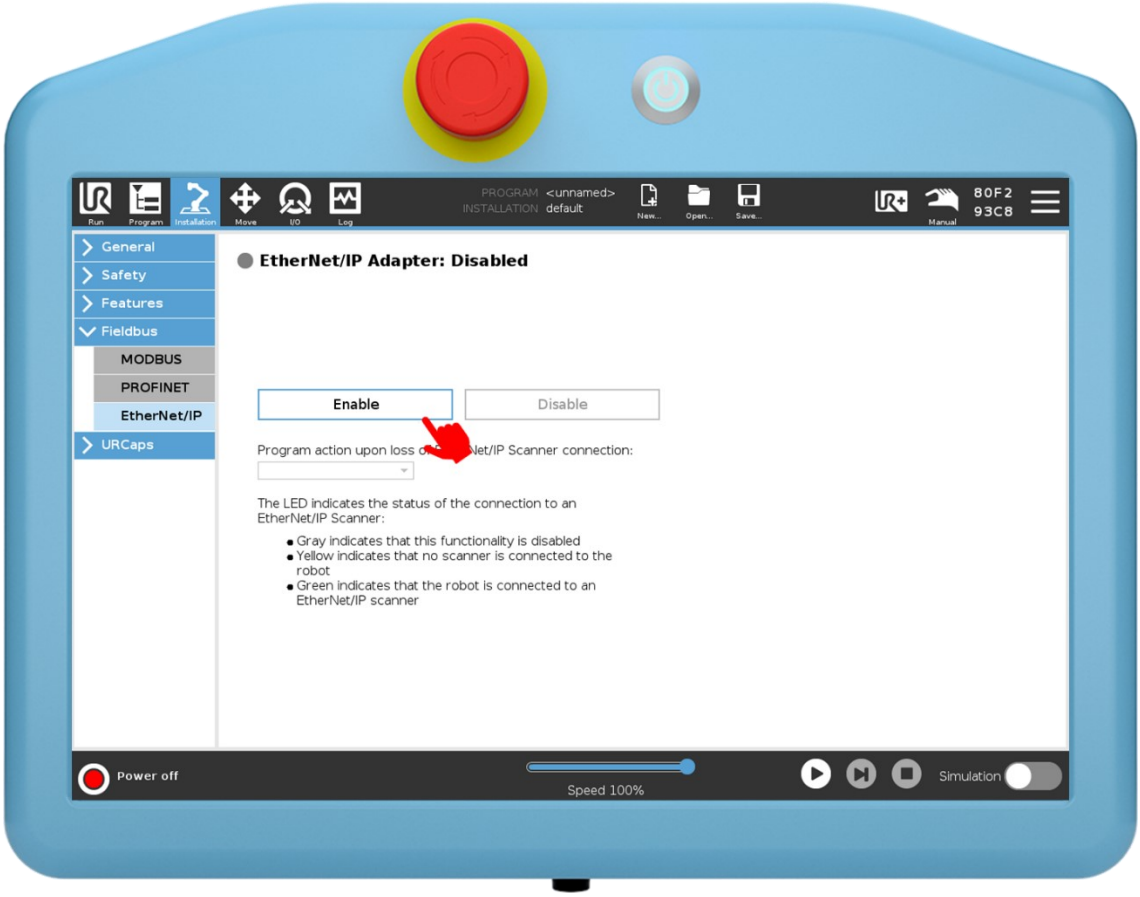


Figure 47 Ethernet/IP 通讯使能。

3. 硬件连接示意图如下：

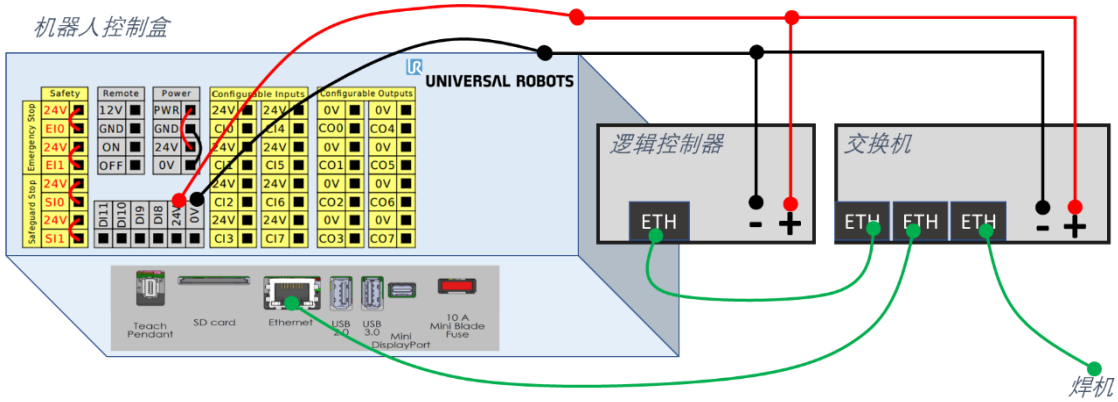


Figure 48 Ethernet/IP 线路连接示意图。

5.3 Open-Interface 配置

5.3.1 Lincoln Electric 焊机配置和信号映射

Figure 49 Lincoln Electric 焊机配置界面，默认 Lincoln Electric 焊机 IP 地址为 192.168.0.12.

5.3.2 奥太焊机配置和信号映射

Figure 50 奥太焊机配置界面，默认奥太焊机 IP 地址为 192.168.0.8, 工作模式 2 (Job).

5.3.3 松下焊机配置和信号映射

Figure 51 松下焊机配置界面，默认松下焊机 IP 地址为 192.168.0.6. 工作模式 4 (Job).

5.3.4 ESAB 焊机配置和信号映射

Figure 52 松下焊机配置界面，默认松下焊机 IP 地址为 192.168.0.3. 工作模式 0 (Job).

5.3.5 DIGIWave 焊机配置和信号映射

Figure 53 DIGIWave 焊机配置界面，默认 DIGIWave 焊机 IP 地址为192.168.0.7 工作模式为1 (Job).

5.4 数字 IO 控制

类别	名称	内容
单选框	使能	使能
下拉菜单	起弧信号通道选择	起弧信号 (standard_digital_out) 1
下拉菜单	起弧成功反馈信号，如果不使能则在工作中不会考虑焊机的反馈信号	起弧成功 (standard_digital_in) 5 输入使能

6. 电弧控制节点(Arc Node)

目前 Weld Power 仅支持通过 Job 模式和 Fronius 或 Megmeet 焊接配合。它可以实现对应 Job 号的起弧、收弧。On 和 Off 推荐始终配套使用，在焊接过程成如果需要在线修改 JOB 号，方法如所示：

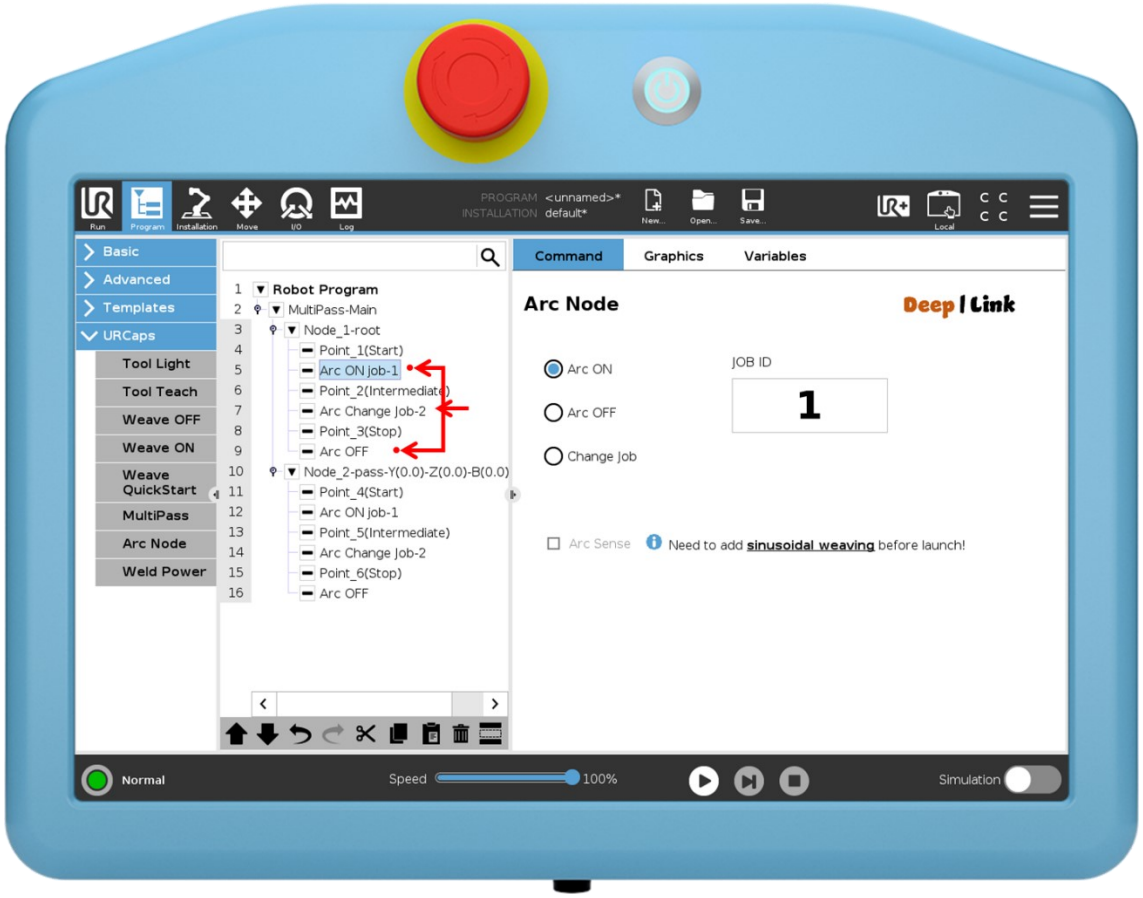


Figure 54 电弧控制节点编程示例。

7. MultiPass 多层多道

7.1 Multipass Main Node 主节点

多层多道的编程入孔为多层多道-主节点(MultiPass-Main), 它位于示教器 **程序 - > URCaps -> 多层多道**

Figure 55 多层多道-主节点页面

7.2 Pass Node – 基路径(root)/偏移路径(pass)

Pass Node 可以通过按钮 +基路径 或者 +偏移路径 添加。通过按钮 +root 添加的节点将被配置为基路径节点，随后偏移路径将基于基路径和给定的偏移量进行偏移，所以设定一条准确、稳定的基路径是建立高质量多层多道程序的关键。

Figure 56 多层多道-基路径节点页面

Figure 57 偏移路径节点页面

多层多道的基路径中的路点支持更新，在改变路点位置或者改变了基路径运动参数后，需要回到主节点 点击 更新图标重新更新路径，不这样做会导致偏移路径无法生效！如图所示 Figure 58.

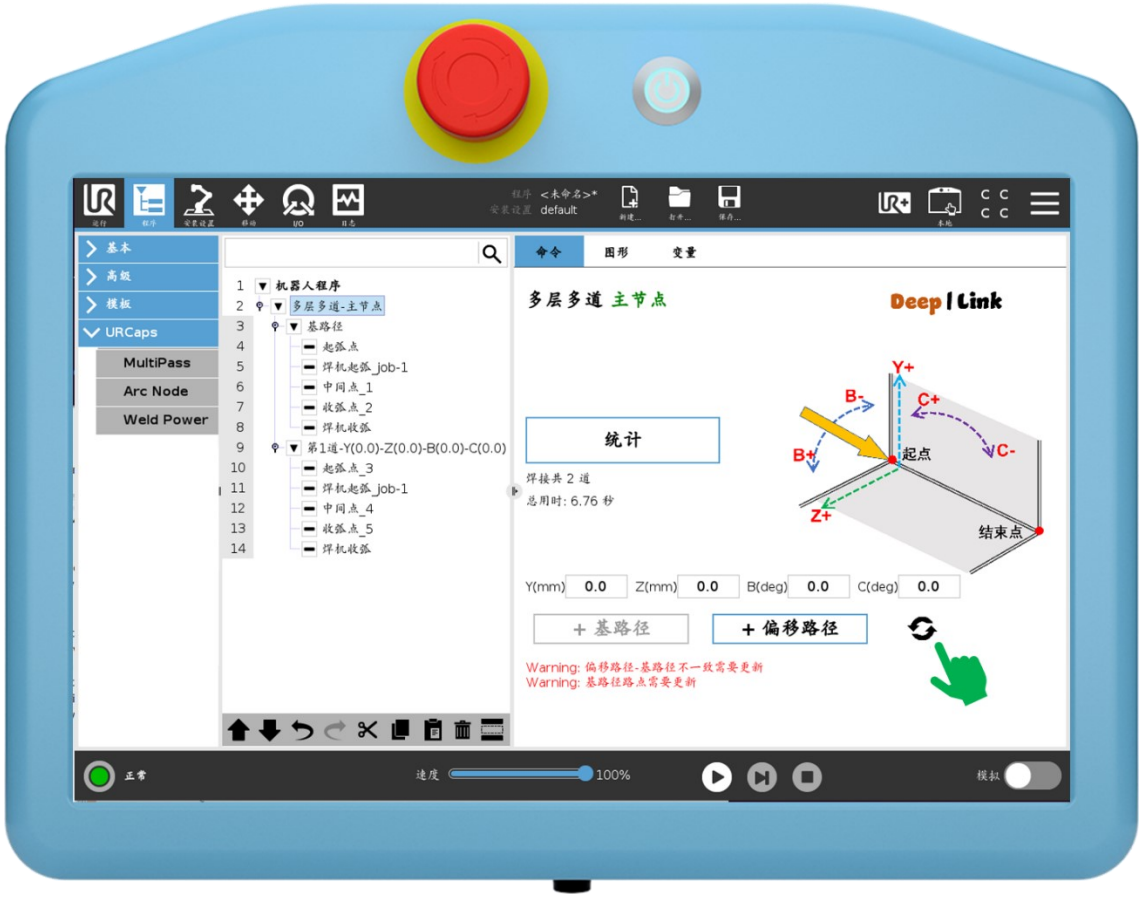


Figure 58 点击图示按钮可以 更新 基路径路点，并清除错误。

在构建一条复杂基路径时，可以在中间添加多个<中间点>。

一条合规的基路径应该以<起始点>开始，并以 <结束点>收尾，起弧/收弧将自动分别附在<起始点> 和 <结束点>之后。

7.3 添加摆焊功能

摆焊功能由 Deep-Link 另外一个产品实现 <Weld Weaving URCap>, 这是一个 URCap 产品，安装后将在示教器 URCap 区域增加两个 URCap 节点**<摆动开始>** 和 **<摆动结束>**。

摆动开始和摆动结束需要成对使用，并同时嵌套在焊机起弧和焊接收弧节点区域内，这样可以得到一个工艺流程效果：起弧后，焊枪开始行走并摆动，到达收弧点后，焊枪停止摆动，随后收弧，示例程序如图所示 Figure 59。

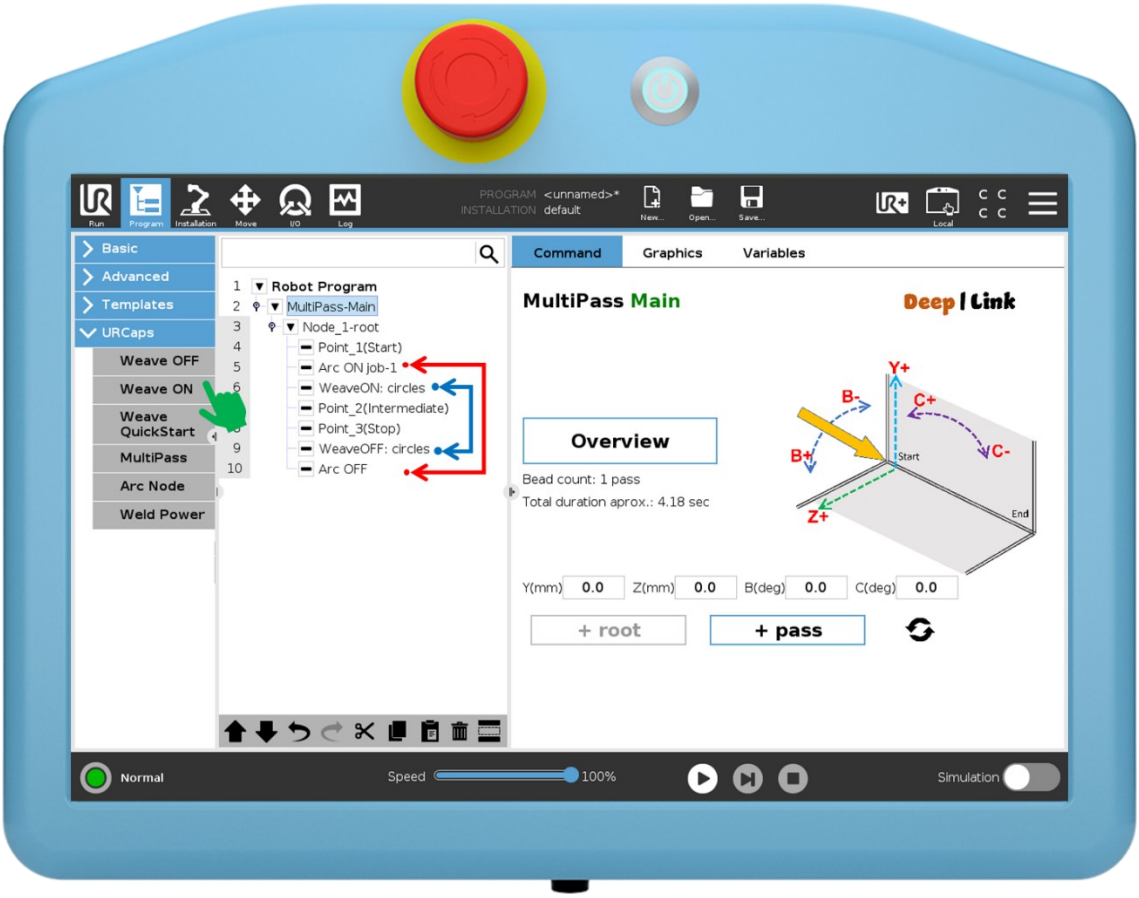


Figure 59 多层多道添加摆焊程序示例

8 QuickStart 快速开始节点

本产品还实现了一个名为“弧焊模板”的快速开始节点。模板程序已将一个标准弧焊流程，速度参数，电弧控制配置好，用户添加后仅需示教 4 个点既可以运行程序。这将极大的缩短施工现场编程时间，提高生产效率。同时参数开放修改，方便现场调节，做到效率和灵活性兼顾。

点击<弧焊模板>节点后，如图所示 Figure 60。会生成一个机器人程序树，用户仅需示教对应的 4 个路点初始路点 Approach -> 起弧路点 Begin -> 收弧路点 Stop -> 撤出路点 Exit, 同时也可以调整配套的焊机 JOB 号。

有一个勾选框<循环确认> 如果选择后，在每次运行到此节点时程序会暂停并弹窗请求人工确认。

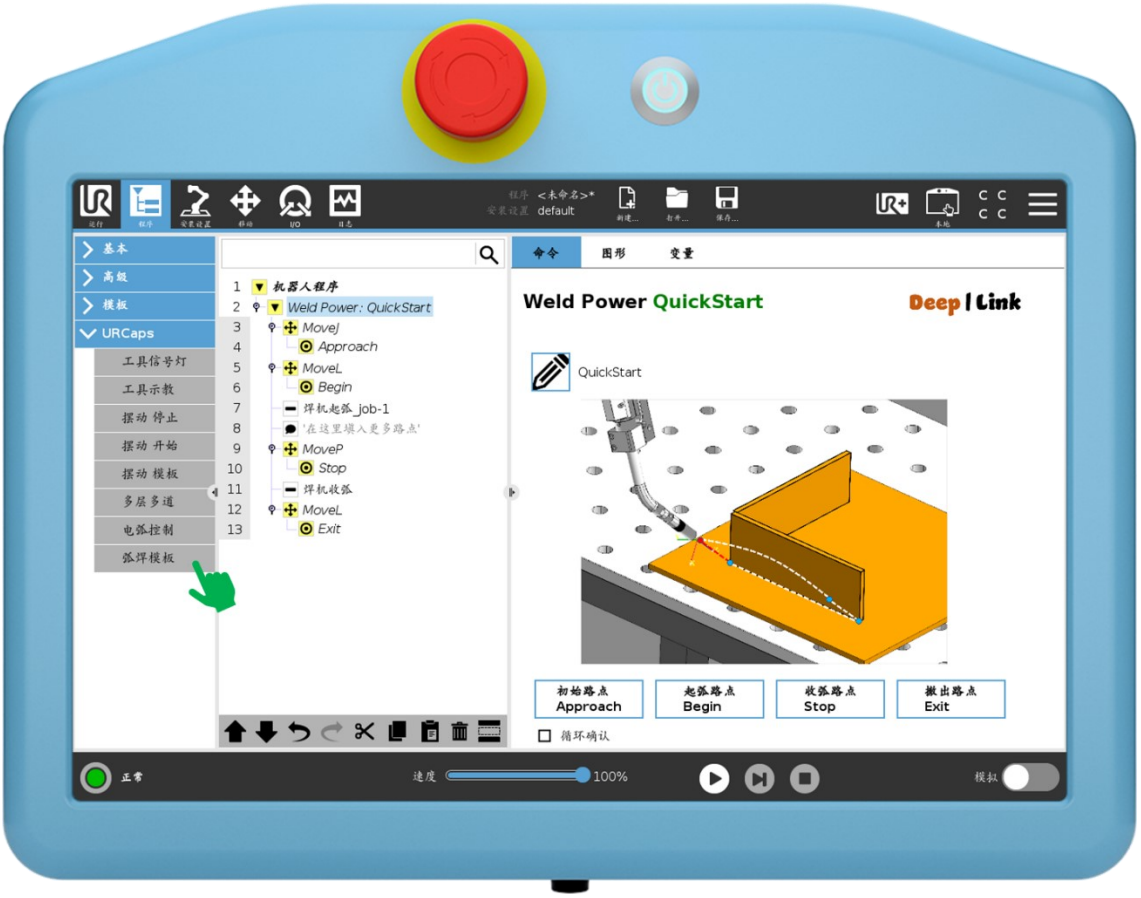


Figure 60 快速开始节点页面

9 Toolbar 工具栏菜单

Toolbar 工具栏菜单提供了 URCap 激活区域，同时也提供快速操作焊机的手动按钮，此外，焊接程序的仿真模式切换也在此界面中的勾选框中实现。

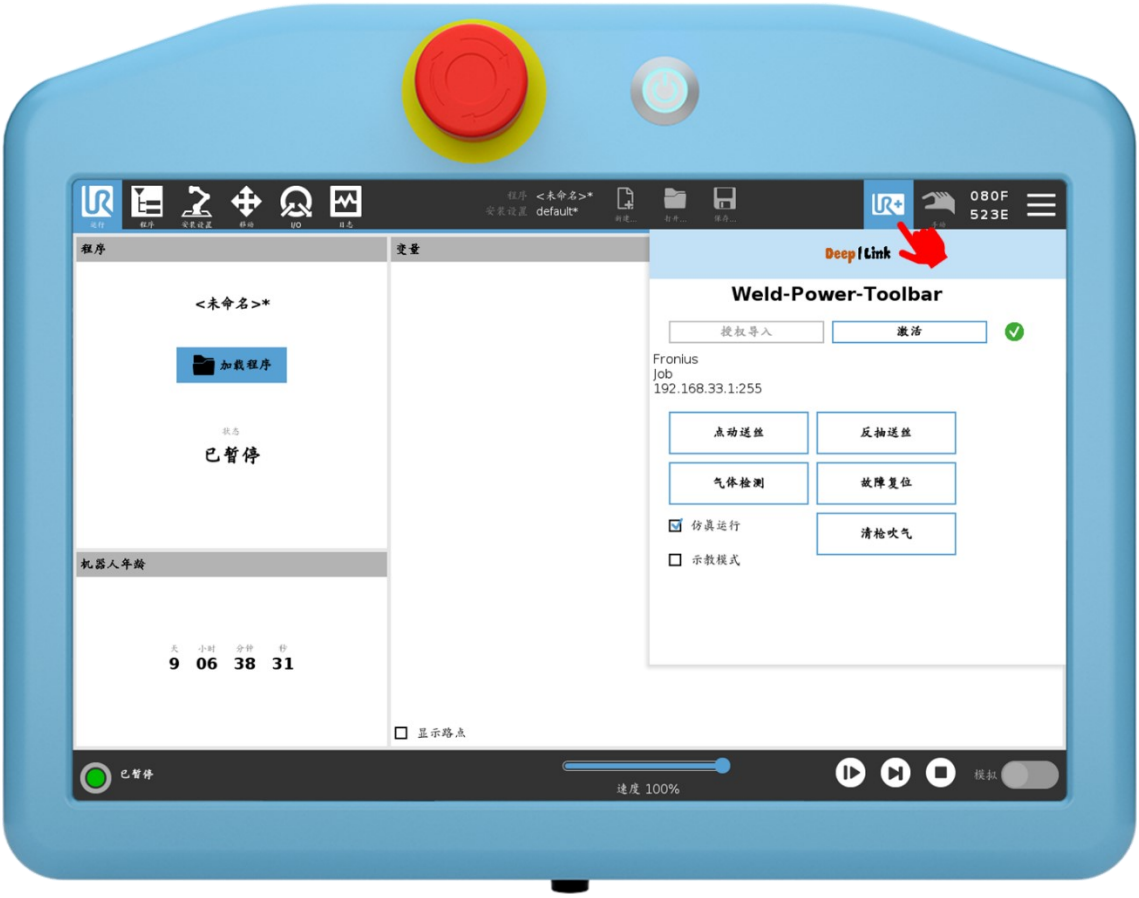
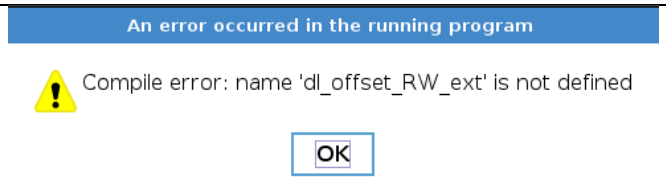


Figure 61 Toolbar 工具栏界面, 从 1.0.3-Build026 版本起 在工具栏菜单中添加了点焊按钮，对于所有焊机品牌点焊的参数 Job 号固定为22.

10 错误信息

类别	号码	描述
警告	001	机器人需要上电才可以继续操作. -> 请给机器人上电
提示	002	焊机在仿真模式. -> 工具栏(toolbar)中的仿真模式激活了，在模拟确认机器人轨迹时，这个功能将非常有用。
警告	003	继续运行程序可能会带来风险，请前往安装设置节点解决开放的报警信息. -> 请前往安装设置节点解决开放的报警信息.
提示	004	焊接站激活码缺失. -> 请联系 info@deep-link.cn 激活 urcap。未激活的状态仍然可以试用此 URCap，但会有一些功能限制导致其无法在实际生产环境使用。
Error		编译错误: 'dl_angle_RO_ext'变量未定义. -> 这是由于启用了基路径记录功能而未安装 Weld Weaving URCap [这是 Deep-Link 的另一个产品，该功能与此产品有依赖]. An error occurred in the running program Compile error: name 'dl_angle_RO_ext' is not defined OK
Error		编译错误: 'dl_offset_RW_ext' 变量未定义. -> 启用了电弧跟踪功能，未安装依赖的 Weld Weave URCap。

		
Error		MODBUS 信号 inWord0 反馈错误码 11. ->这是由于机器人未检测到焊机设备。