

IO-LINK INTERFACE ABSOLUTE ENCODER  
QUICK MANUAL



- ▶ Sample: UCD-LK00B-1516-L10S-PRM
- ▶ PLC: SIEMENS S7-1200
- ▶ IO-Link Master: SM1278



## REQUIREMENT

### BOM

Item	Name	Brand	Type	Version
1	IO-Link encoder	POSITAL	UCD-LK00B-1516-L10S-PRM	Software version V1.2 Encoder version on type label V01
2	Encoder cable	POSITAL	POS M12 5pin-A Female+2m PUR Cable	N/A
3	CPU	SIEMENS	6ES7 215-1AG40-0XB0	V4.2
4	SM1278	SIEMENS	6ES7 278-4BD32-0XB0	V2.0

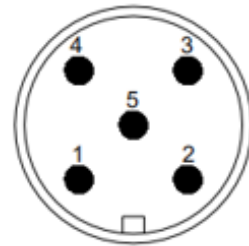
### Software

Item	Name	Vendor	Version
1	IODD	POSITAL	Posital-Fraba-LK_MT-20220202-IODD1.1
2	TIA	SIEMENS	Version V15
3	S7-PCT	SIEMENS	V3.5 SP2 Upd1

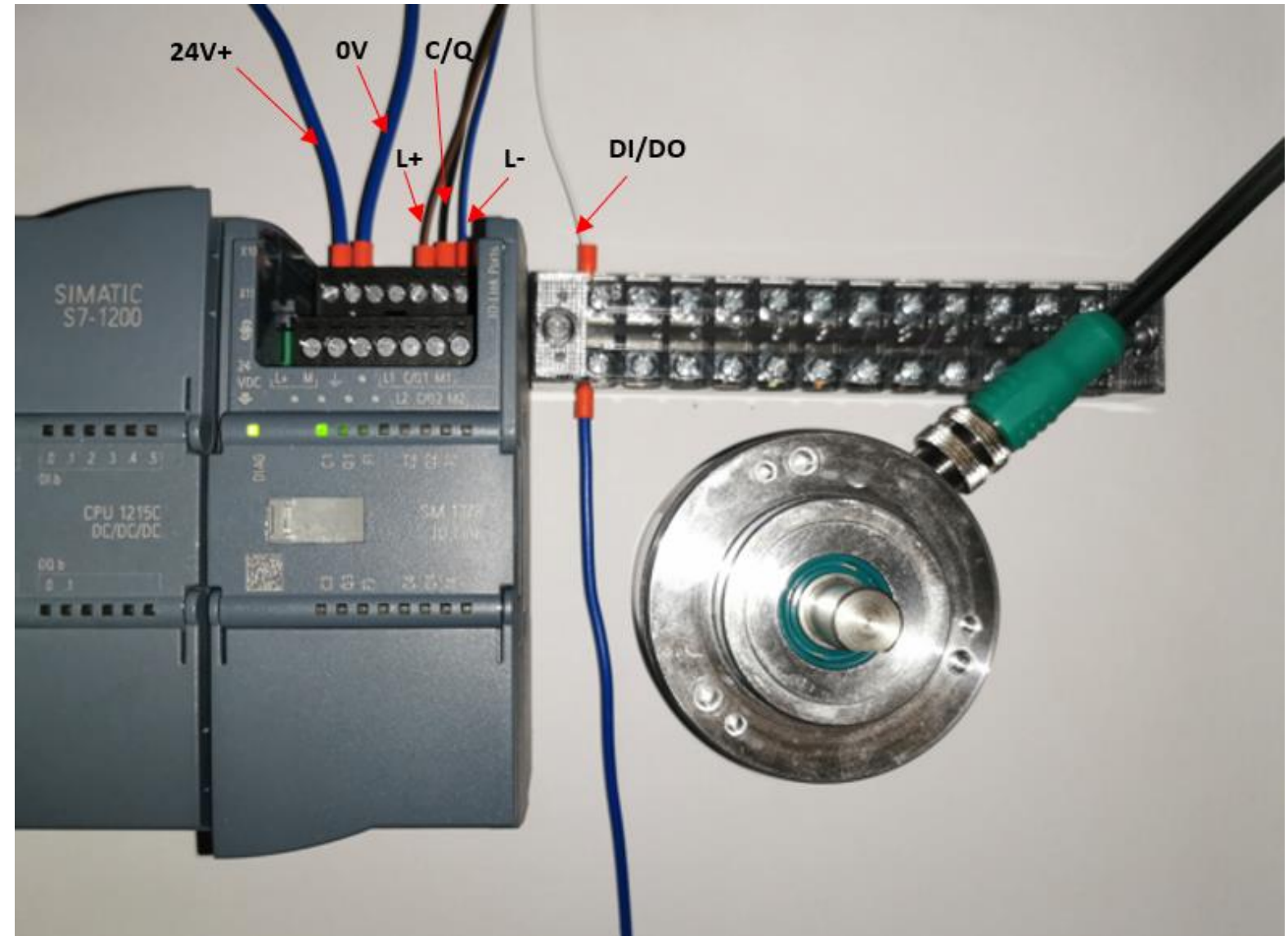
# 1. CONNECTION

## 1. IO-Link encoder Connector

Signal	5 pin round connector M12
24 V Power supply (L+)	1
Digital Input / Output (DI/DQ)	2
GND (L-)	3
IO-Link Communication (C/Q)	4
Not connected	5

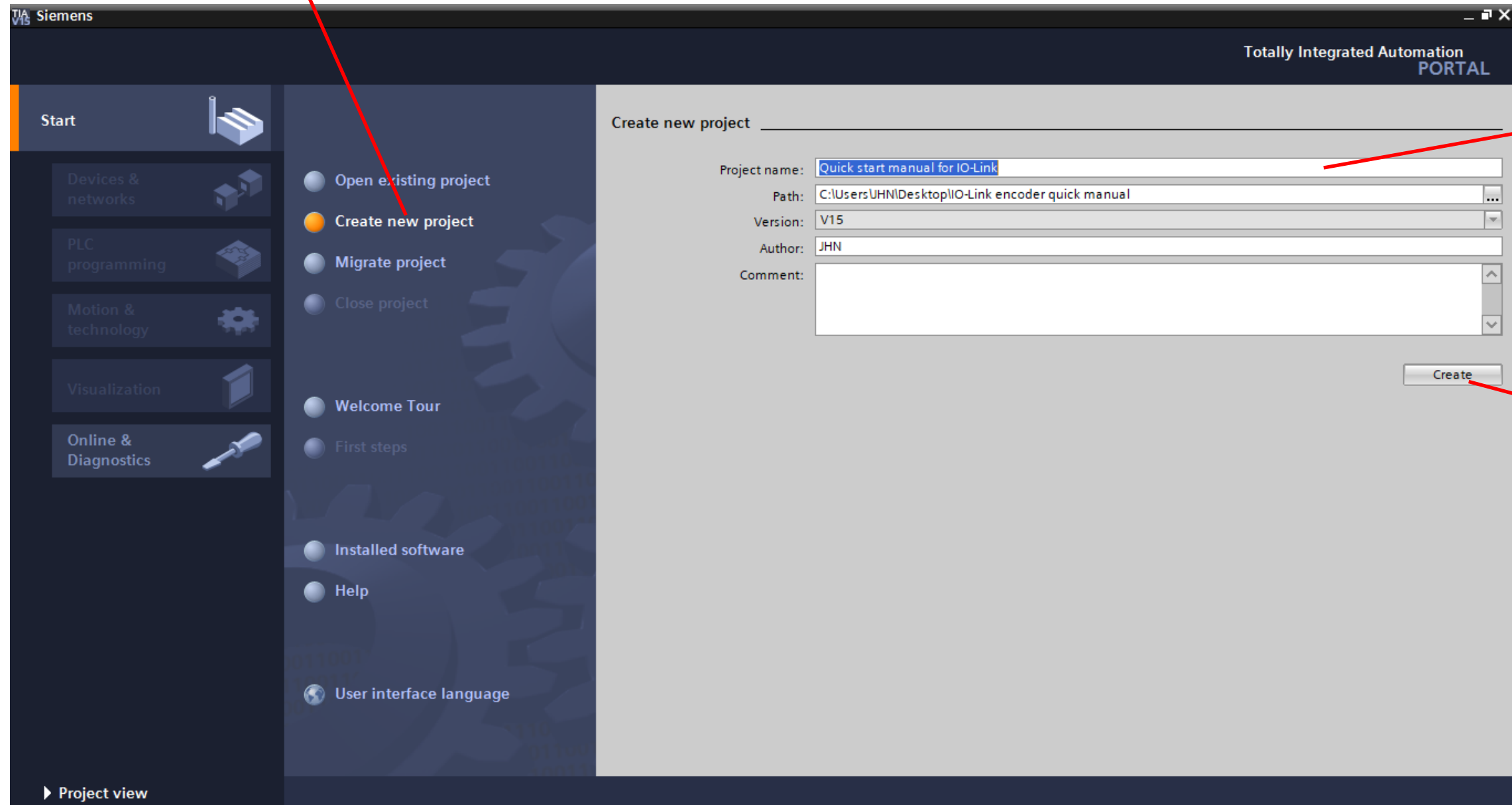


## 2. POSITAL encoder cable (Order No.:10048547)



## 2.PROJECT CREATION

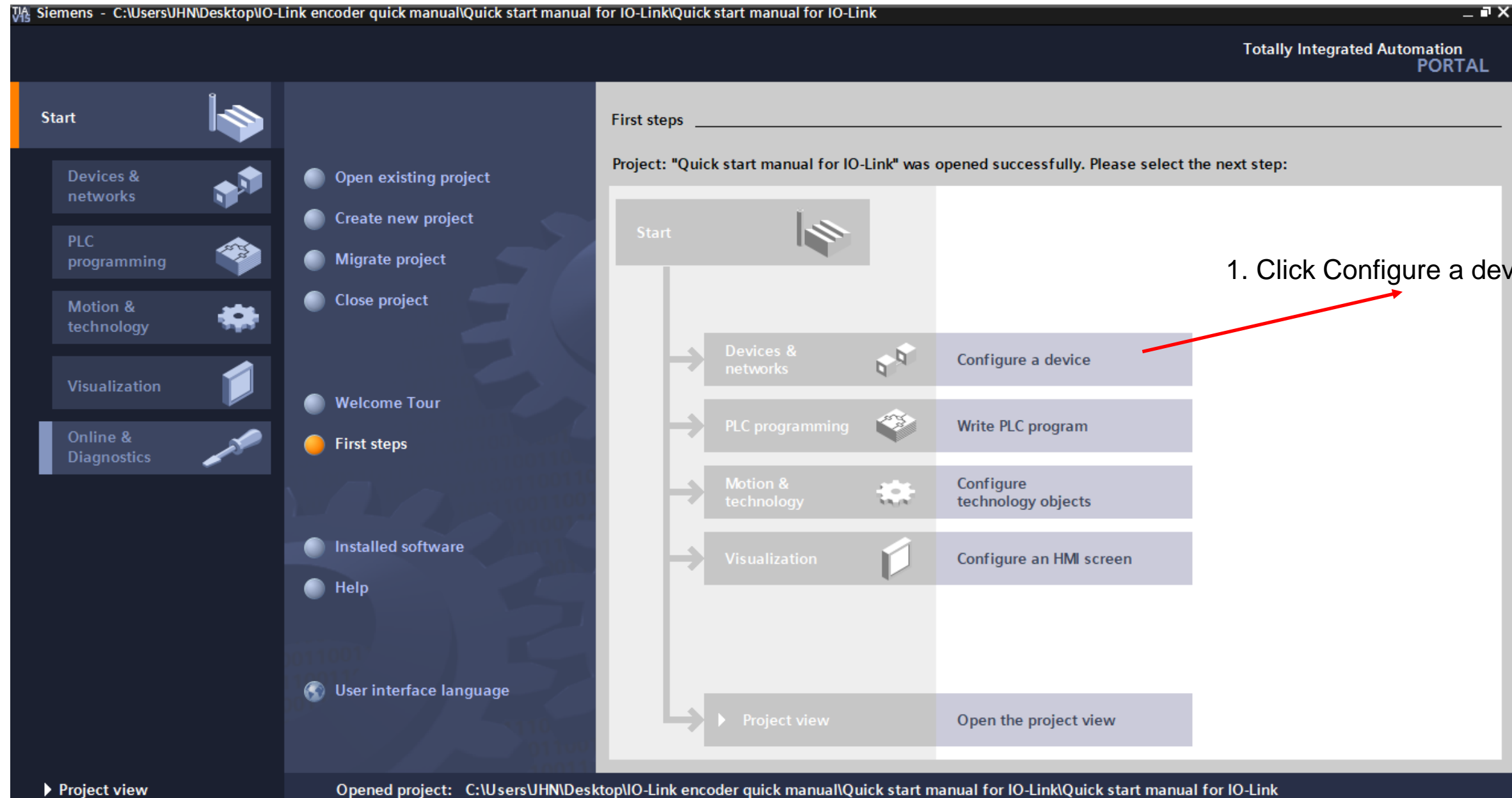
1. Create a new project.



2. Set project name.

3. Click on the create.

### 3.HARDWARE CONFIGURATION



The screenshot shows the Siemens Totally Integrated Automation PORTAL interface. The title bar indicates the file path: C:\Users\UHN\Desktop\IO-Link encoder quick manual\Quick start manual for IO-Link\Quick start manual for IO-Link. The main window displays a 'First steps' section with a message: 'Project: "Quick start manual for IO-Link" was opened successfully. Please select the next step:'. Below this message is a list of options:

- Start
- Devices & networks: Configure a device
- PLC programming: Write PLC program
- Motion & technology: Configure technology objects
- Visualization: Configure an HMI screen
- Project view: Open the project view

A red arrow points to the 'Configure a device' option under 'Devices & networks' with the text '1. Click Configure a device.'.

On the left side, there is a navigation menu with the following items:

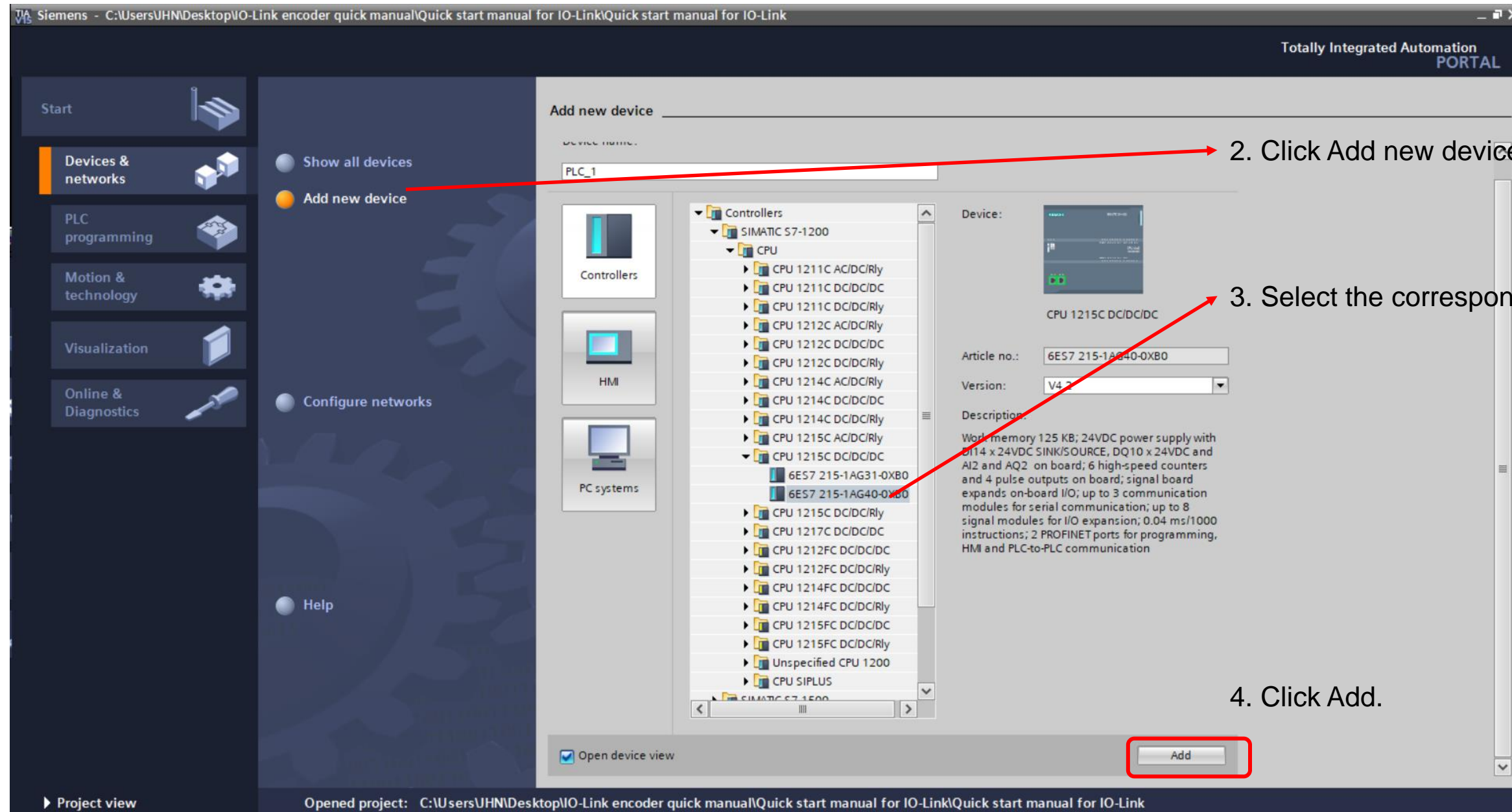
- Start
- Devices & networks
- PLC programming
- Motion & technology
- Visualization
- Online & Diagnostics

Below the navigation menu, there are several options with radio buttons:

- Open existing project
- Create new project
- Migrate project
- Close project
- Welcome Tour
- First steps (selected)
- Installed software
- Help
- User interface language

At the bottom of the window, it says 'Opened project: C:\Users\UHN\Desktop\IO-Link encoder quick manual\Quick start manual for IO-Link\Quick start manual for IO-Link'.

### 3.HARDWARE CONFIGURATION



Siemens - C:\Users\JHND\Desktop\IO-Link encoder quick manual\Quick start manual for IO-Link\Quick start manual for IO-Link

Totally Integrated Automation  
PORTAL

Start

Devices & networks

PLC programming

Motion & technology

Visualization

Online & Diagnostics

Show all devices

Add new device

Configure networks

Help

Add new device

Device name: PLC\_1

Controllers

HMI

PC systems

Controllers

SIMATIC 57-1200

CPU

CPU 1211C AC/DC/Rly

CPU 1211C DC/DC/DC

CPU 1211C DC/DC/Rly

CPU 1212C AC/DC/Rly

CPU 1212C DC/DC/DC

CPU 1212C DC/DC/Rly

CPU 1214C AC/DC/Rly

CPU 1214C DC/DC/DC

CPU 1214C DC/DC/Rly

CPU 1215C AC/DC/Rly

CPU 1215C DC/DC/DC

6ES7 215-1AG31-0XB0

6ES7 215-1AG40-0XB0

CPU 1215C DC/DC/Rly

CPU 1217C DC/DC/DC

CPU 1212FC DC/DC/DC

CPU 1212FC DC/DC/Rly

CPU 1214FC DC/DC/DC

CPU 1214FC DC/DC/Rly

CPU 1215FC DC/DC/DC

CPU 1215FC DC/DC/Rly

Unspecified CPU 1200

CPU SIPLUS

Device:

CPU 1215C DC/DC/DC

Article no.: 6ES7 215-1AG40-0XB0

Version: V4.0

Description:

Work memory 125 KB; 24VDC power supply with 0/14 x 24VDC SINK/SOURCE, DQ10 x 24VDC and AI2 and AQ2 on board; 6 high-speed counters and 4 pulse outputs on board; signal board expands on-board I/O; up to 3 communication modules for serial communication; up to 8 signal modules for I/O expansion; 0.04 ms/1000 instructions; 2 PROFINET ports for programming, HMI and PLC-to-PLC communication

Open device view

Add

2. Click Add new device.

3. Select the corresponding CPU model.

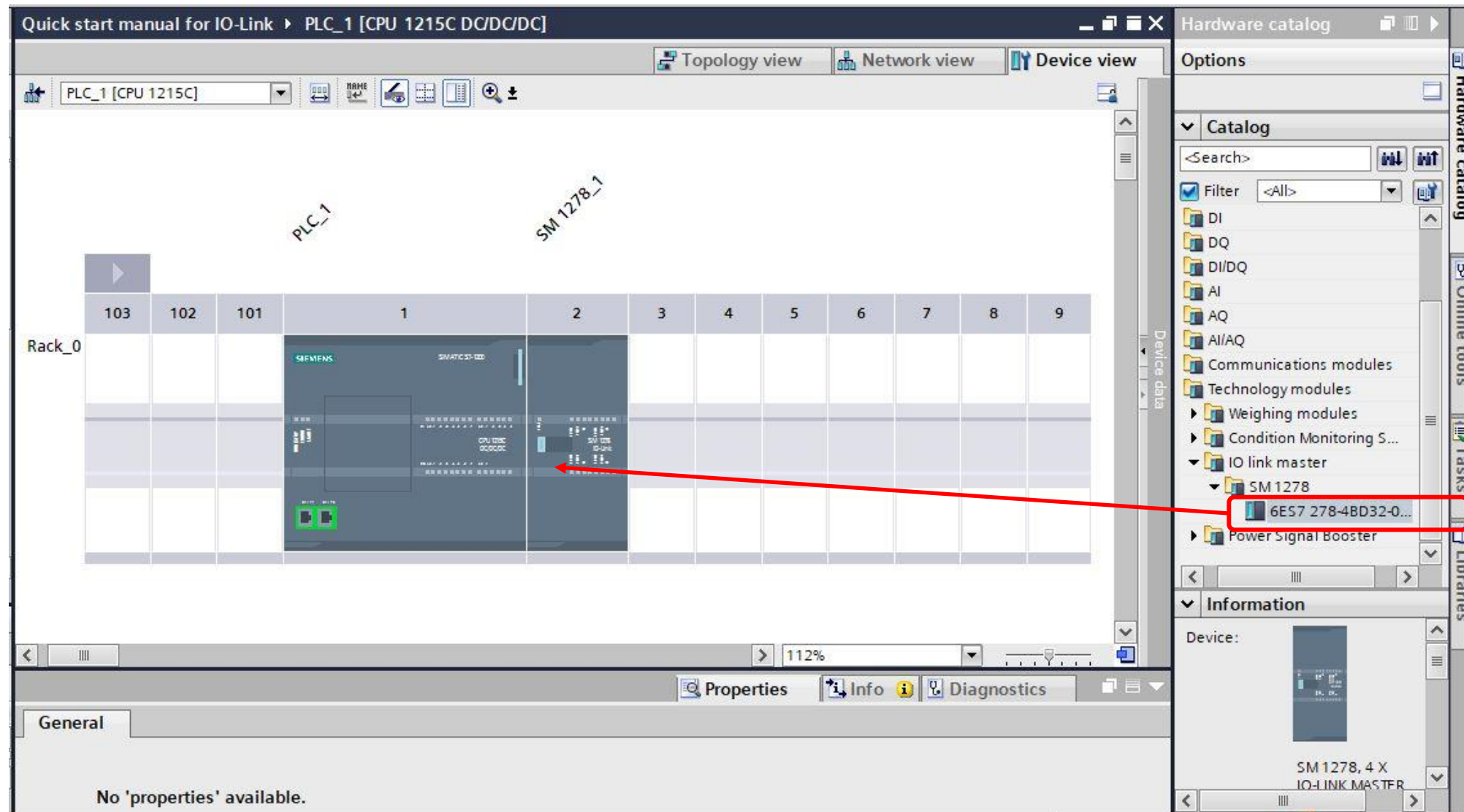
4. Click Add.

Project view

Opened project: C:\Users\JHND\Desktop\IO-Link encoder quick manual\Quick start manual for IO-Link\Quick start manual for IO-Link

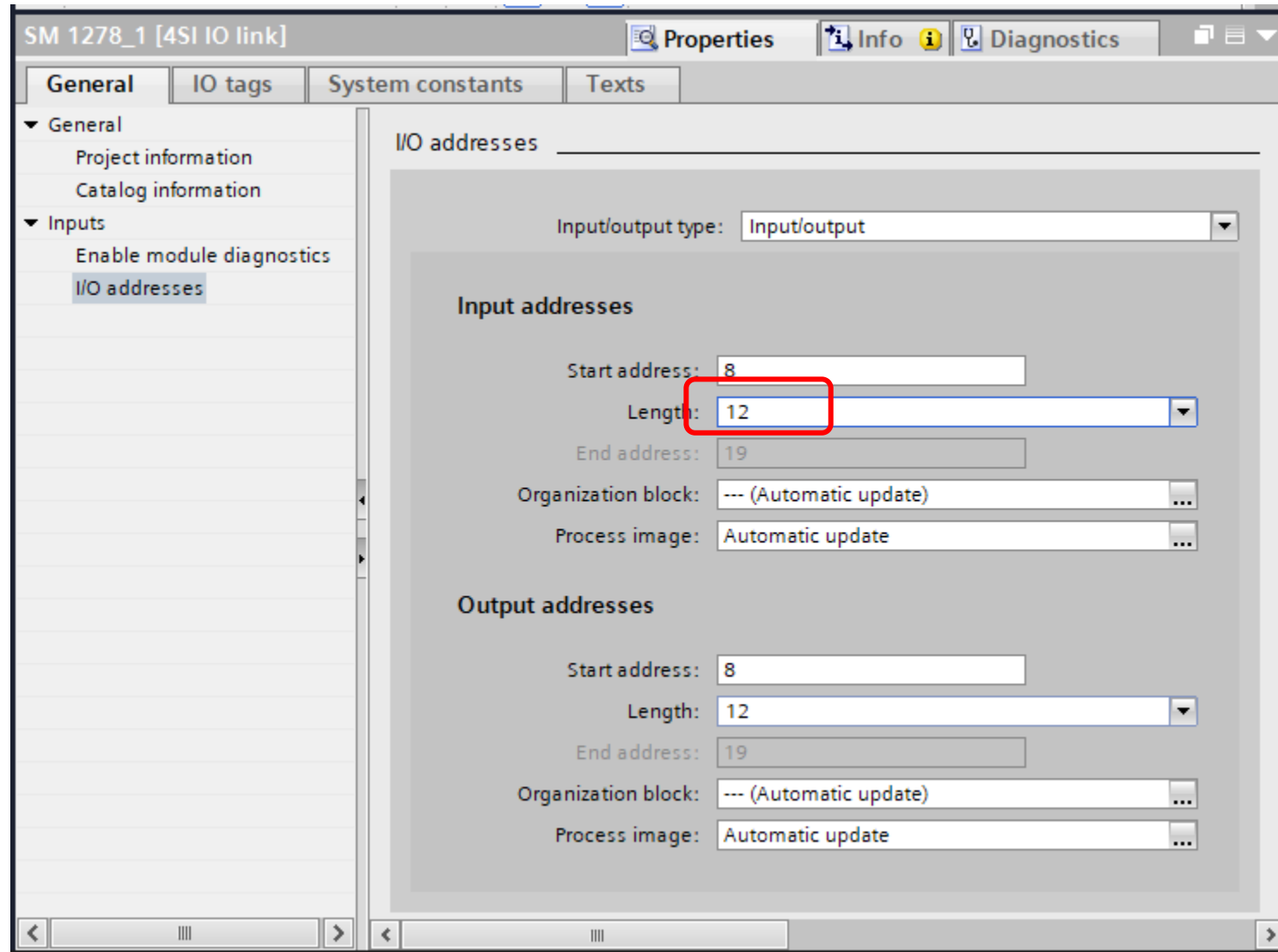
## 4.IO-LINK MASTER SETTING

1. Select the corresponding communication module under “device view”. Drag the communication module to the left of the PLC.

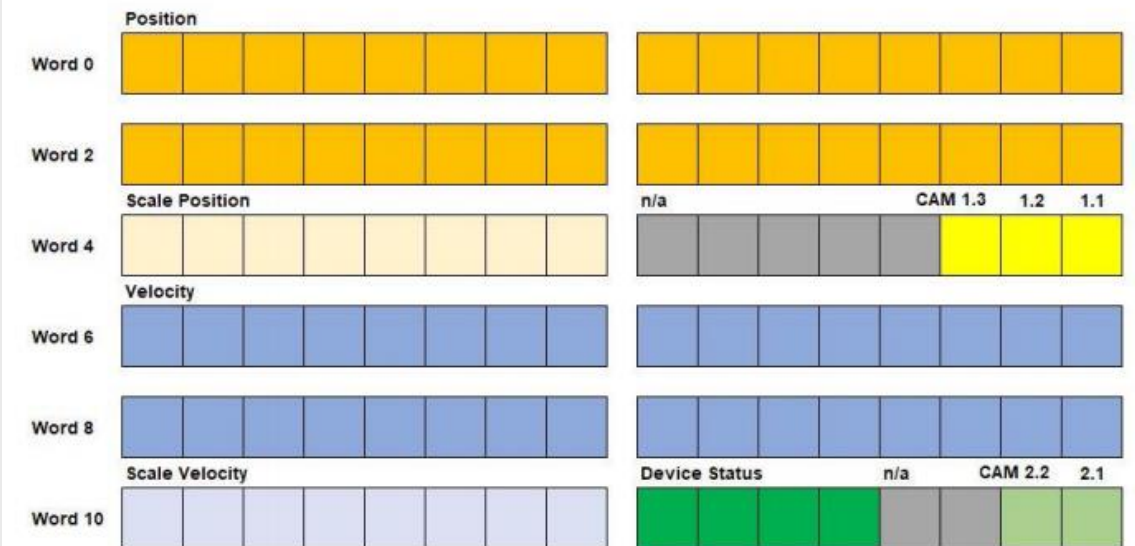


## 4.IO-LINK MASTER SETTING

- Select the right IO length(12) of SM 1278 in “General” tag. In this manual, the start address is set to 8. The process word comprises 12 byte. Therefore, the length value in TIA is to be set to 12.



### Process Data



Scale Position: Scale factor for the process value 'Position' (from WORD 0) is always '1'

Scale Velocity: A PLC function block calculates the velocity part of the process data (from WORD 6) into the unit [rpm]

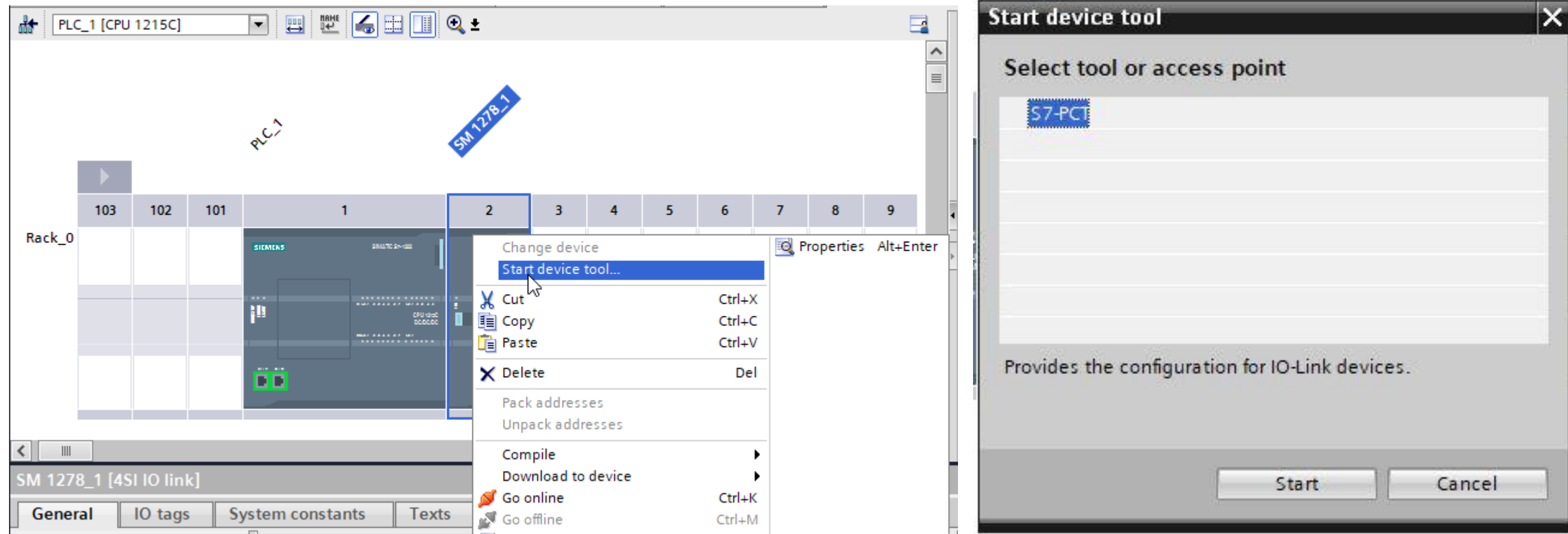
n/a: Not available area, used to cover structured process data mapping



## 5.CONFIGURE SM 1278 WITH S7-PCT

1. Right click on SM 1278 and select “Start device tool” (\*).

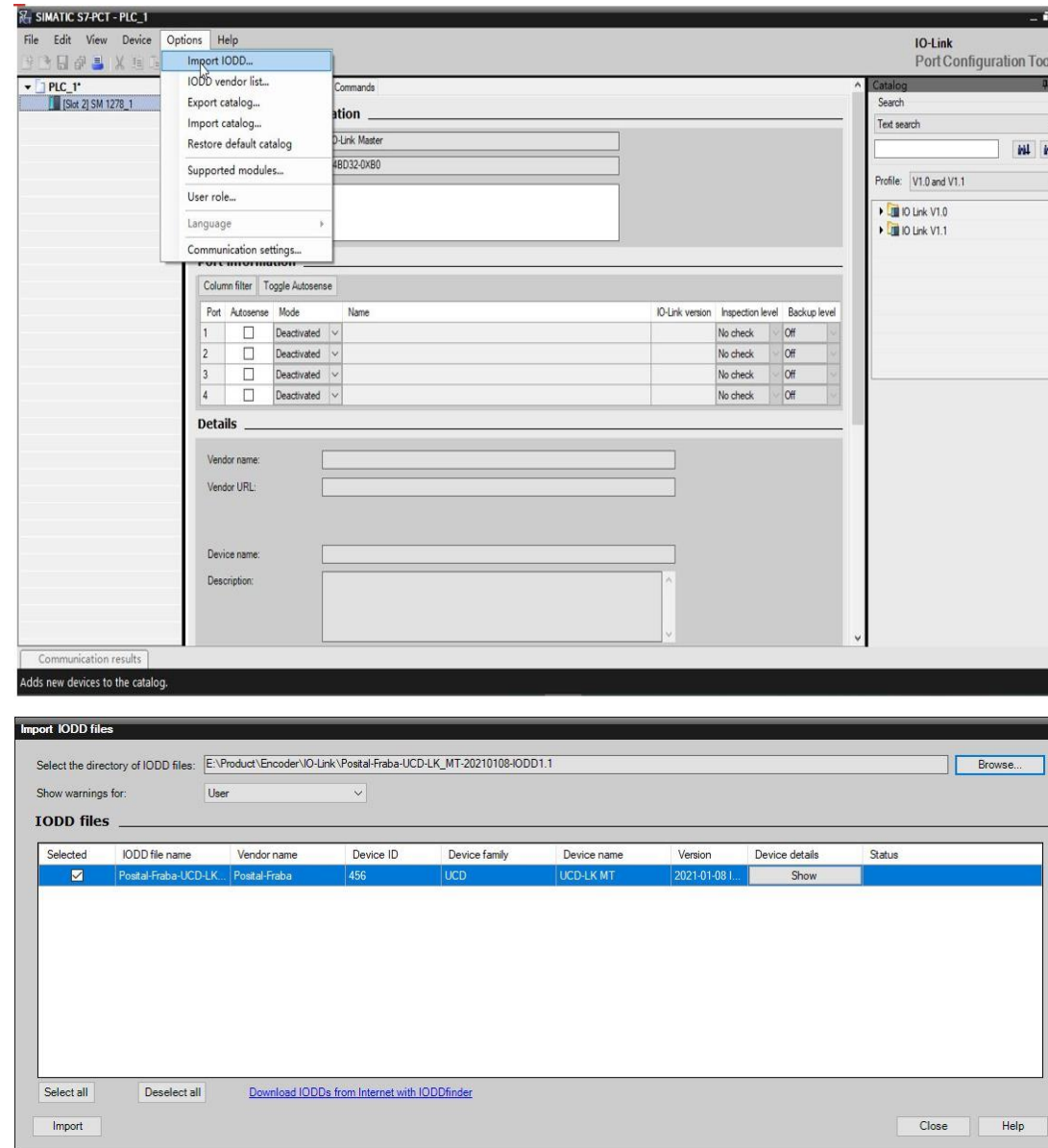
2. Select “S7-PCT” and click Start.



(\*) Notes: The software S7-PCT should be installed first otherwise the option is unavailable.

## 6. IMPORT IODD FILE

2. Under options, select “Import IODD”.



1. Download the corresponding IODD file from the right side of the product data page of the official website of POSITAL and save it to the desktop.


### Downloads

 Datasheet

 2D Drawing

 Manual

 **Configuration File**

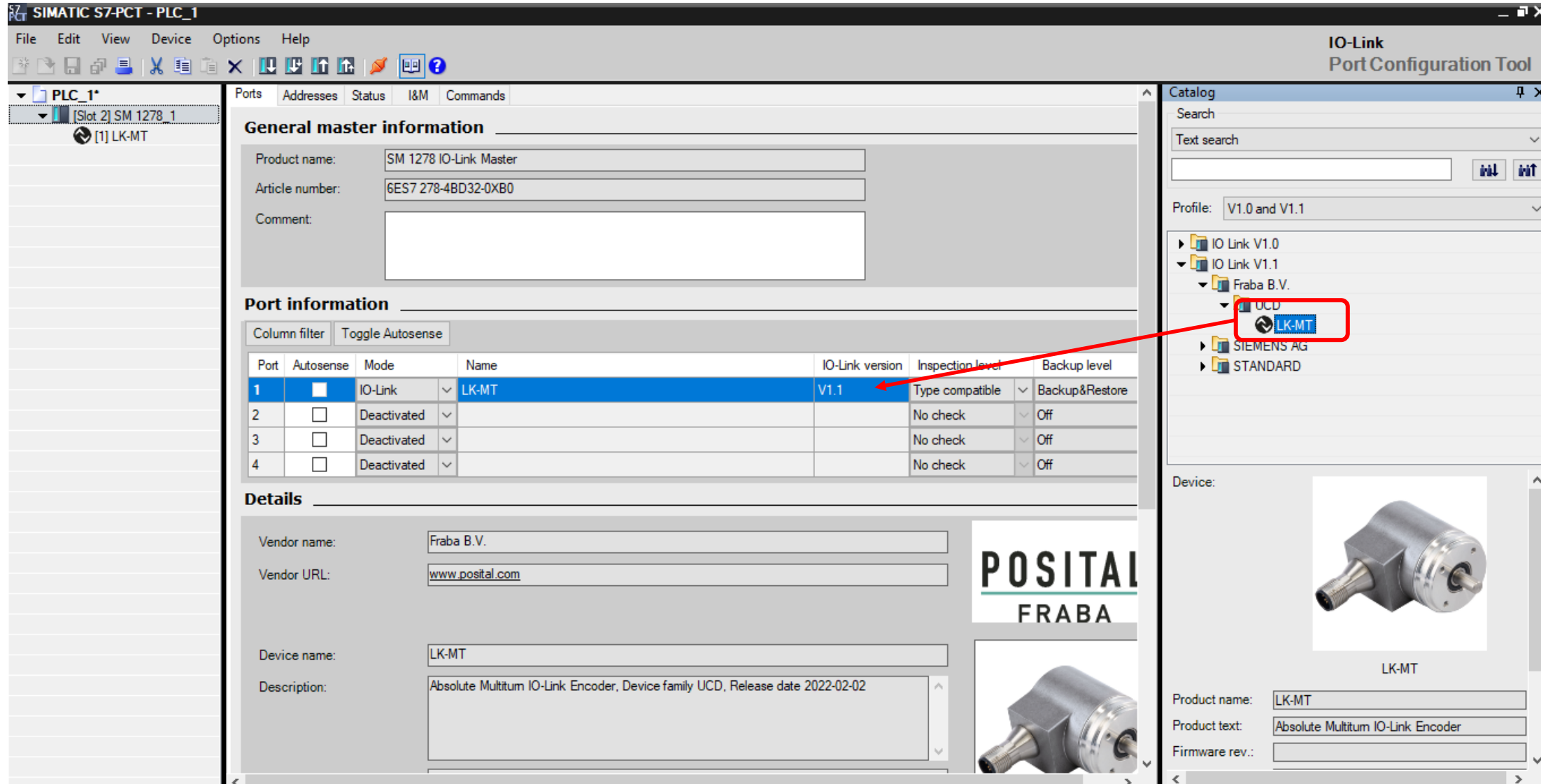
 **3D  configuration-iodd-ixarc-ucd-lk-mt.zip**

 3D Drawing Housing

 CE Certificate

3. Select the FRABA IODD file and import it.

## 7.ENCODER PARAMETER SETTING



**General master information**

Product name: SM 1278 IO-Link Master  
 Article number: 6ES7 278-4BD32-0XB0  
 Comment:

**Port information**

Port	Autosense	Mode	Name	IO-Link version	Inspection level	Backup level
1	<input checked="" type="checkbox"/>	IO-Link	LK-MT	V1.1	Type compatible	Backup&Restore
2	<input type="checkbox"/>	Deactivated			No check	Off
3	<input type="checkbox"/>	Deactivated			No check	Off
4	<input type="checkbox"/>	Deactivated			No check	Off

**Details**

Vendor name: Fraba B.V.  
 Vendor URL: [www.posita.com](http://www.posita.com)  
 Device name: LK-MT  
 Description: Absolute Multitum IO-Link Encoder, Device family UCD, Release date 2022-02-02

**IO-Link Port Configuration Tool**

Catalog


Search

Text search

Profile: V1.0 and V1.1

- IO Link V1.0
- IO Link V1.1
  - Fraba B.V.
    - UCD
      - LK-MT**
  - SIEMENS AG
  - STANDARD

Device:



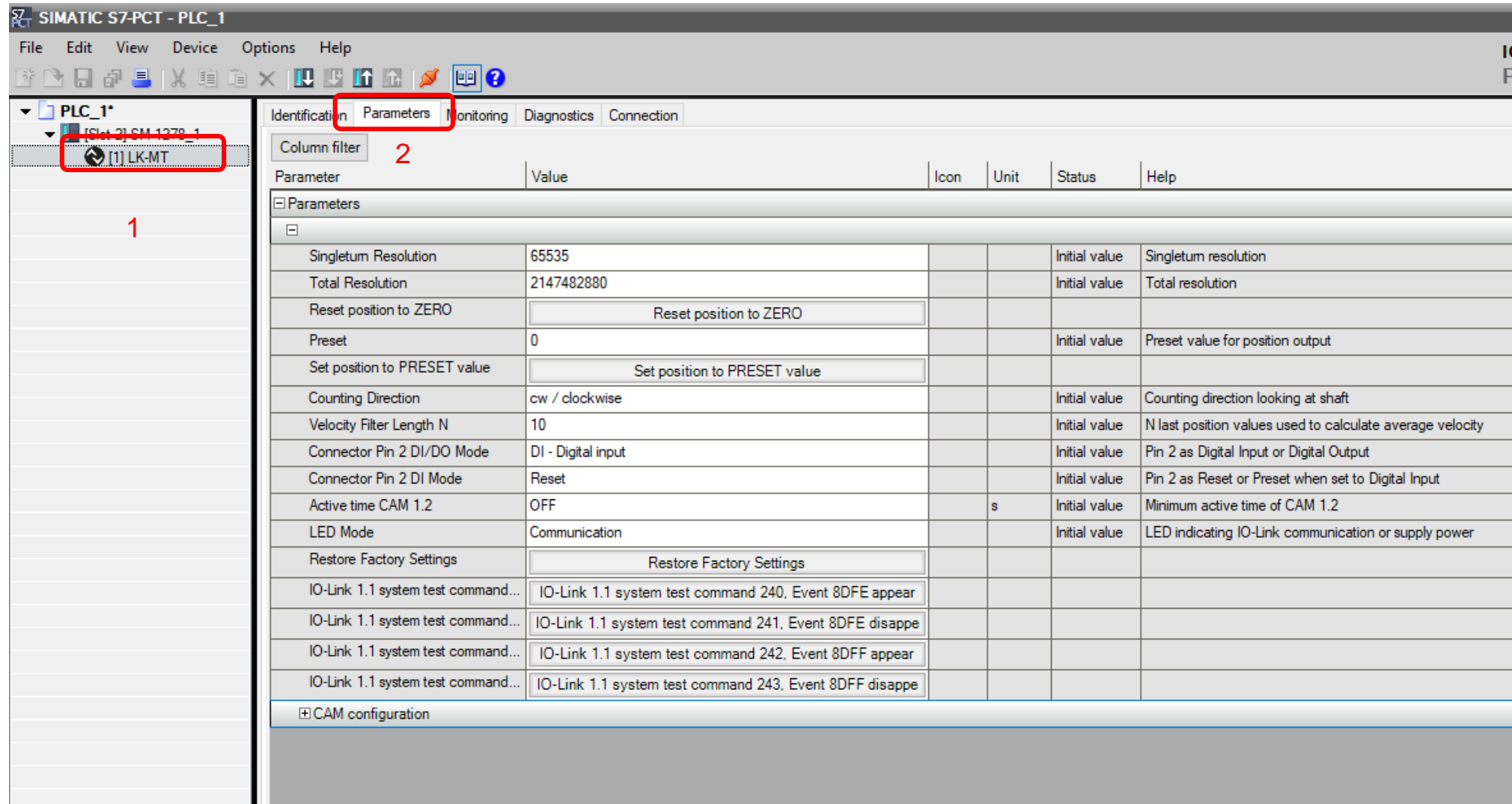
LK-MT

Product name: LK-MT  
 Product text: Absolute Multitum IO-Link Encoder  
 Firmware rev.:

After the IODD import, we can find Fraba IO-Link encoder on the right.

IO Link V1.1—> Fraba B.V  
 Drag “LK-MT” to the 1 Channel of SM 1278

## 7.ENCODER PARAMETER SETTING



The screenshot shows the SIMATIC Manager interface for a SIMATIC S7-PLC. The left sidebar shows a tree view with 'PLC\_1\*' expanded and '[1] LK-MT' selected, indicated by a red box and the number '1'. The main window has the 'Parameters' tab selected, indicated by a red box and the number '2'. The 'Parameters' table is displayed with the following data:

Parameter	Value	Icon	Unit	Status	Help
Parameters					
Singleturn Resolution	65535			Initial value	Singleturn resolution
Total Resolution	2147482880			Initial value	Total resolution
Reset position to ZERO	<input type="button" value="Reset position to ZERO"/>				
Preset	0			Initial value	Preset value for position output
Set position to PRESET value	<input type="button" value="Set position to PRESET value"/>				
Counting Direction	cw / clockwise			Initial value	Counting direction looking at shaft
Velocity Filter Length N	10			Initial value	N last position values used to calculate average velocity
Connector Pin 2 DI/DO Mode	DI - Digital input			Initial value	Pin 2 as Digital Input or Digital Output
Connector Pin 2 DI Mode	Reset			Initial value	Pin 2 as Reset or Preset when set to Digital Input
Active time CAM 1.2	OFF		s	Initial value	Minimum active time of CAM 1.2
LED Mode	Communication			Initial value	LED indicating IO-Link communication or supply power
Restore Factory Settings	<input type="button" value="Restore Factory Settings"/>				
IO-Link 1.1 system test command...	<input type="button" value="IO-Link 1.1 system test command 240, Event 8DFE appear"/>				
IO-Link 1.1 system test command...	<input type="button" value="IO-Link 1.1 system test command 241, Event 8DFE disappe"/>				
IO-Link 1.1 system test command...	<input type="button" value="IO-Link 1.1 system test command 242, Event 8DFF appear"/>				
IO-Link 1.1 system test command...	<input type="button" value="IO-Link 1.1 system test command 243, Event 8DFF disappe"/>				
CAM configuration					

Click the IO-Link encoder icon on the left. On the “Parameter” tag, there are encoder parameter setting:

- 1.Singleturn Resolution
- 2.Total Resolution
- 3.Reset position to ZERO
- 4.Preset
- 5.Set position to PRESET value
- 6.Counting Direction
- 7.Velocity Filter Length N
- 8.Connector Pin 2 DI/DO Mode
- 9. Connector Pin 2 DI Mode
- 10.Active time CAM 1.2. Default is OFF
- 11.LED Mode
- 12. Restore Factory Settings.
- 13. Test command
- 14. CAM configuration

## 7.ENCODER PARAMETER SETTING

On the “Identification” tag, there are device ID information of encoder, such as Vendor Name, Product Name, etc.

Parameter	Value	Icon	Unit	Status	Help
[-] Identification					
[-]					
Vendor Name	Posital-Fraba			loaded	The vendor name that is assigned to a Vendor ID.
Vendor Text	www.posital.com			loaded	Additional information about the vendor.
Product Name	UCD-LK			loaded	Complete product name.
Product Text	Magnetic IO-Link Multitum Encoder			loaded	Additional product information for the device.
Product ID	UCD-LK			loaded	Vendor-specific product or type identification (e.g., item number or model nu...
Serial Number	005371292			loaded	Unique, vendor-specific identifier of the individual device.
Hardware Revision	V3 (*)			loaded	Unique, vendor-specific identifier of the hardware revision of the individual d...
Firmware Revision	V1.2 (*)			loaded	Unique, vendor-specific identifier of the firmware revision of the individual de...
Application-specific Tag	***			loaded	Possibility to mark a device with user- or application-specific information.
Function Tag	***			loaded	Plant designation, describes the device functionality
Location Tag	***			loaded	Location designation, identifies the device location
LED Flash On					
LED Flash Off					

(\*) Note: Hardware and Firmware Revision depends on the encoder. Hardware Revision of the sample in this manual is V3 and the Firmware Revision is V1.2.  
From February 1 2022 onwards, the Firmware Revision will be v1.4

## 7.ENCODER PARAMETER SETTING

On the “Monitoring” tag, there are process data of encoder, such as Position and Angular Velocity , etc.

Parameter	Value	Icon	Unit	Status	Help
Monitoring					
Process Data Input/Output					
Position					
Process Data Input/Output - P...	20.0			loaded	Current position value
Angular Velocity					
Process Data Input/Output - A...	0.0		rpm	loaded	Current angular velocity value
Process Data Input/Output - AUX	OFF			loaded	Current status of the digital signal [AUX]
Process Data Input/Output - CA...	OFF			loaded	Current status of the digital signal [CAM 1.3]
Process Data Input/Output - CA...	OFF			loaded	Current status of the digital signal [CAM 1.2]
Process Data Input/Output - CA...	OFF			loaded	Current status of the digital signal [CAM 1.1]
Process Data Input/Output - De...	Device is OK			loaded	Current device status, a copy of the parameter [Device Status, Index 36] in ...
Process Data Input/Output - CA...	OFF			loaded	Current status of the digital signal [CAM 2.2]
Process Data Input/Output - CA...	On			loaded	Current status of the digital signal [CAM 2.1]

## 8.DOWNLOAD SM1278 TO THE PROJECT

### 1.Download SM1278 to the project

SIMATIC S7-PCT - IO-Link encoder quick start block

File Edit View Device Options Help

IO-Link Port Configuration Tool

IO-Link encoder quick start block [Slot 2] SM 1278\_1 [1] LK-MT

Identification Parameters Monitoring Diagnostics Connection

Column filter

Parameter	Value	Icon	Unit	Status	Help
[-] Identification					
Vendor Name	Posital-Fraba			loaded	The vendor name that is assigned to a Vendor ID.
Vendor Text	www.posital.com			loaded	Additional information about the vendor.
Product Name				Initial value	Complete product name.
Product Text	Magnetic IO-Link Multitum Encoder			Initial value	Additional product information for the device.
Product ID				Initial value	Vendor-specific product or type identification (e.g., item number or mod...)
Serial Number				Initial value	Unique, vendor-specific identifier of the individual device.
Hardware Revision				Initial value	Unique, vendor-specific identifier of the hardware revision of the individ...
Firmware Revision				Initial value	Unique, vendor-specific identifier of the firmware revision of the individu...
Application-specific Tag	***			Initial value	Possibility to mark a device with user- or application-specific information.
Function Tag	***			Initial value	Plant designation, describes the device functionality
Location Tag	***			Initial value	Location designation, identifies the device location
LED Flash On	LED Flash On				
LED Flash Off	LED Flash Off				


Catalog

Search

Text search

Profile: V1.0 and V1.1

- IO Link V1.0
- IO Link V1.1
  - Fraba B.V.
    - UCD
      - LK-MT
  - SIEMENS AG
  - STANDARD



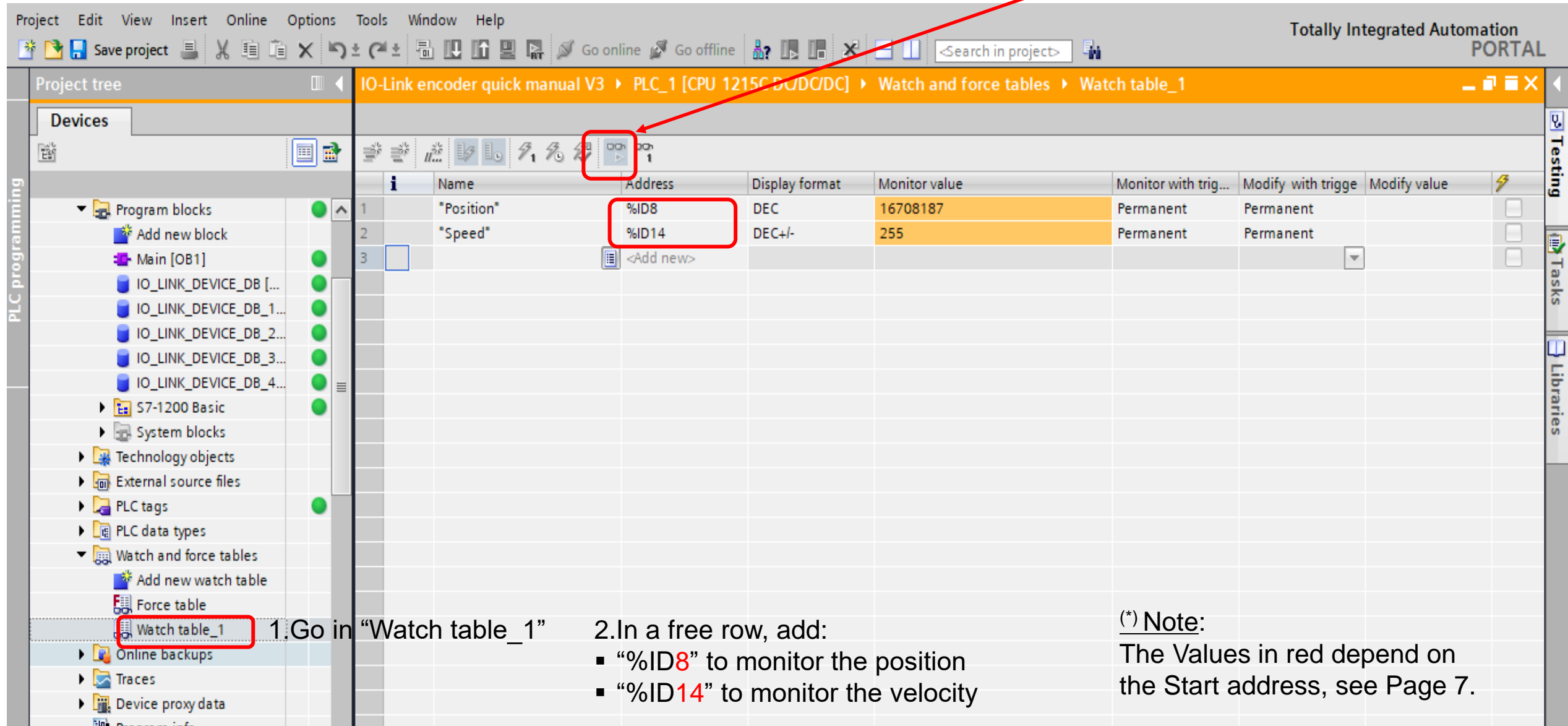
LK-MT

...-MT

...olute Multitum IO-Link Encoder

## 9.MONITOR POSITION & VELOCITY(\*)

3.Click on “Monitor all”



Project Edit View Insert Online Options Tools Window Help

Totally Integrated Automation PORTAL

Project tree IO-Link encoder quick manual V3 ▶ PLC\_1 [CPU 1215C DC/DC] ▶ Watch and force tables ▶ Watch table\_1

Devices

PLC programming

Name	Address	Display format	Monitor value	Monitor with trig...	Modify with trigge	Modify value
1 "Position"	%ID8	DEC	16708187	Permanent	Permanent	<input type="checkbox"/>
2 "Speed"	%ID14	DEC+/-	255	Permanent	Permanent	<input type="checkbox"/>
3	<Add new>					<input type="checkbox"/>

1.Go in “Watch table\_1”

2.In a free row, add:

- “%ID8” to monitor the position
- “%ID14” to monitor the velocity

(\*) Note:  
The Values in red depend on the Start address, see Page 7.

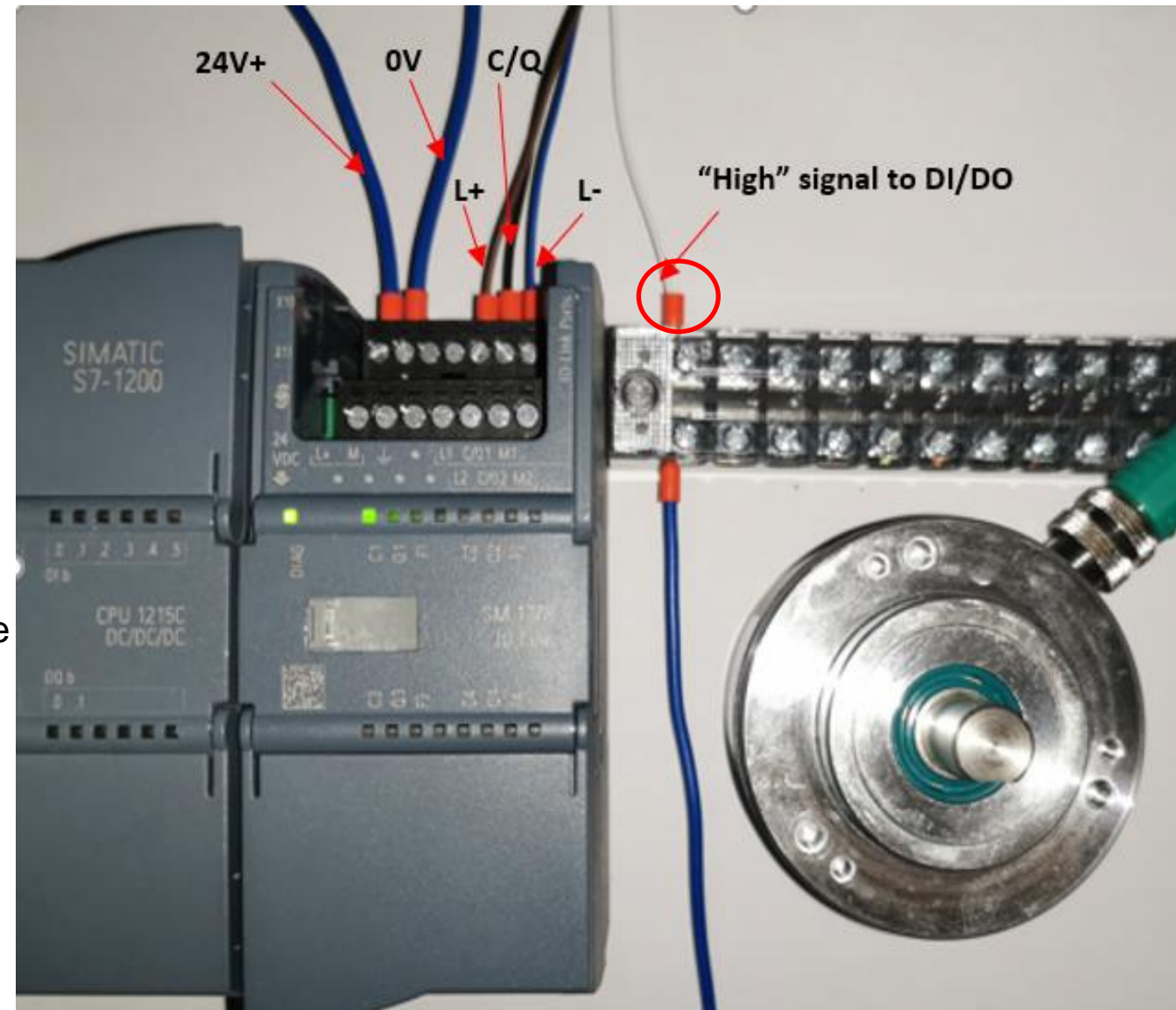


## 10.PRESET VALUE

1.Pin2 DI Mode is set to Preset

Parameter	Value
Parameters	
Singleturn Resolution	65535
Total Resolution	2147482880
Reset position to ZERO	Reset position to ZERO
Preset	0
Set position to PRESET value	Set position to PRESET value
Counting Direction	cw / clockwise
Velocity Filter Length N	10
Connector Pin 2 DI/DO Mode	DI - Digital input
Connector Pin 2 DI Mode	Preset
Active time CAM 1.2	OFF
LED Mode	Communication
Restore Factory Settings	Restore Factory Settings
IO-Link 1.1 system test command...	IO-Link 1.1 system test command 240, Event 8DFE appear
IO-Link 1.1 system test command...	IO-Link 1.1 system test command 241, Event 8DFE disappe

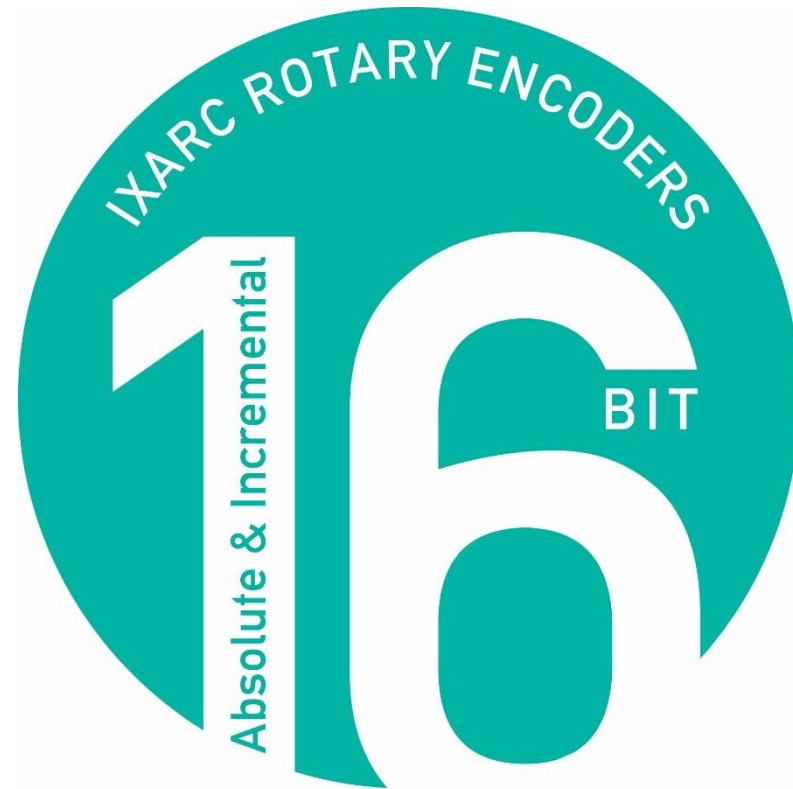
2.Apply "High" signal pulse to Pin2



3.Then the position value should be equal to Preset value

IO-Link encoder quick manual V3 ▶ PLC\_1 [CPU 1215C DC/DC/DC] ▶ V

	i	Name	Address	Display format	Monitor valu
1		"Position"	%ID8	DEC	0
2		"Speed"	%ID14	DEC+/-	0



[www.posital.com](http://www.posital.com)