



September 26, 2024

Festo CMMT-AS/ST Configuration Manual

Overview

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- 2 Necessary software
- 3 Connection with controller
- 4 Project creation
- 5 Component selection
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Introduction

This manual explains the configuration of Festo CMMT-AS/ST motor controller so that it can be operated from a UR robot using the NUTAI URCap Multi Axis Drive (MAD) Controller.

Note that this manual explains the minimum required configuration, so it is left pending for the user to complete other configuration options specific for their end application.

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Necessary software

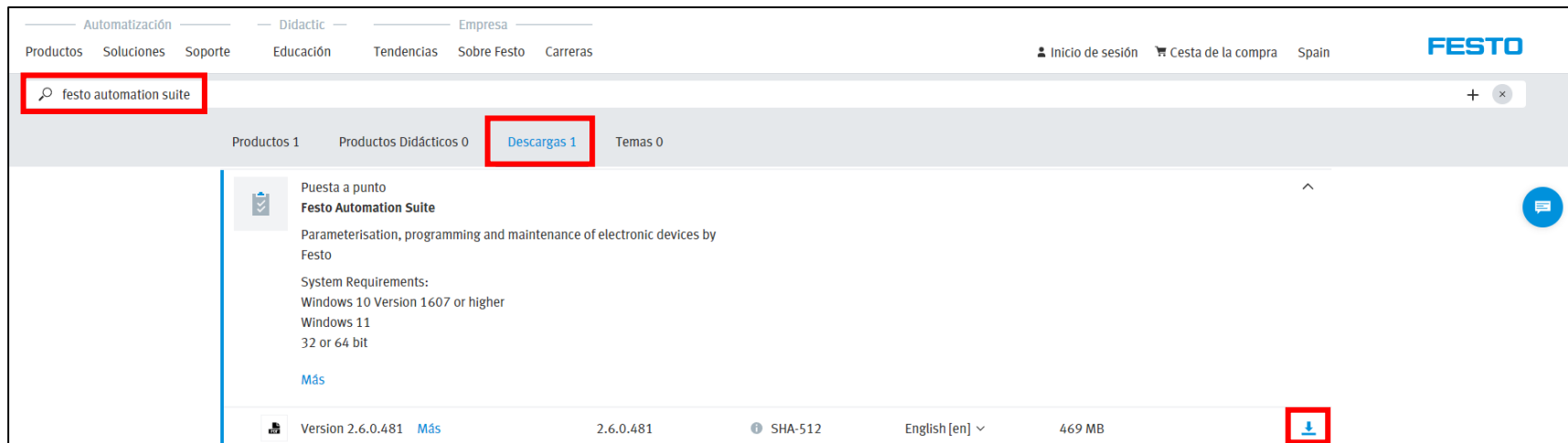
To configure the Festo CMMT-AS/ST motor controller, it will be necessary to download and install the Festo Automation Suite (FAS) software on your computer, available for Windows.

To do this, go to the Festo¹ website and download the latest version available, making sure that it is compatible with your CMMT-AS/ST controller, as indicated in the following slides.



¹ Festo oficial website:
<https://www.festo.com>

Necessary software






The screenshot shows the Festo website interface. At the top, there is a navigation menu with categories: Automización, Didactic, and Empresa. Below this, there are sub-menus for Productos, Soluciones, Soporte, Educación, Tendencias, Sobre Festo, and Carreras. On the right side, there are links for 'Inicio de sesión', 'Cesta de la compra', and 'Spain', along with the 'FESTO' logo.

A search bar contains the text 'festo automation suite'. Below the search bar, there are tabs for 'Productos 1', 'Productos Didácticos 0', 'Descargas 1', and 'Temas 0'. The 'Descargas 1' tab is selected.

The main content area displays the product details for 'Festo Automation Suite'. It includes a checklist icon, the product name, a description: 'Parameterisation, programming and maintenance of electronic devices by Festo', and system requirements: 'Windows 10 Version 1607 or higher', 'Windows 11', and '32 or 64 bit'. There is a 'Más' link below the requirements.

At the bottom of the product details, there is a table with the following information:

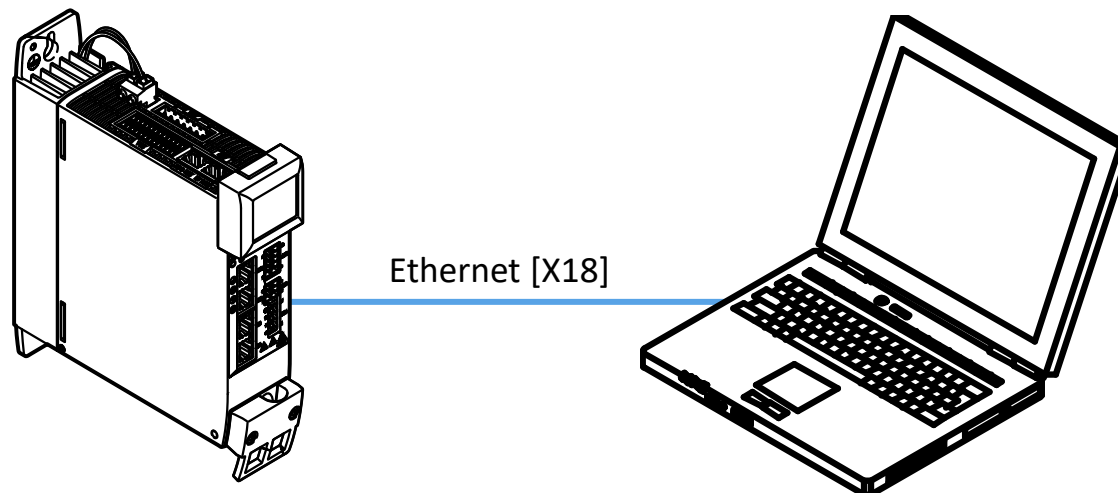
	Version 2.6.0.481 Más	2.6.0.481	 SHA-512	English [en] ▾	469 MB	
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Connection with controller

Connect your Festo CMMT-AS/ST controller to your computer —directly or through a switch— via Ethernet using the [X18] interface.

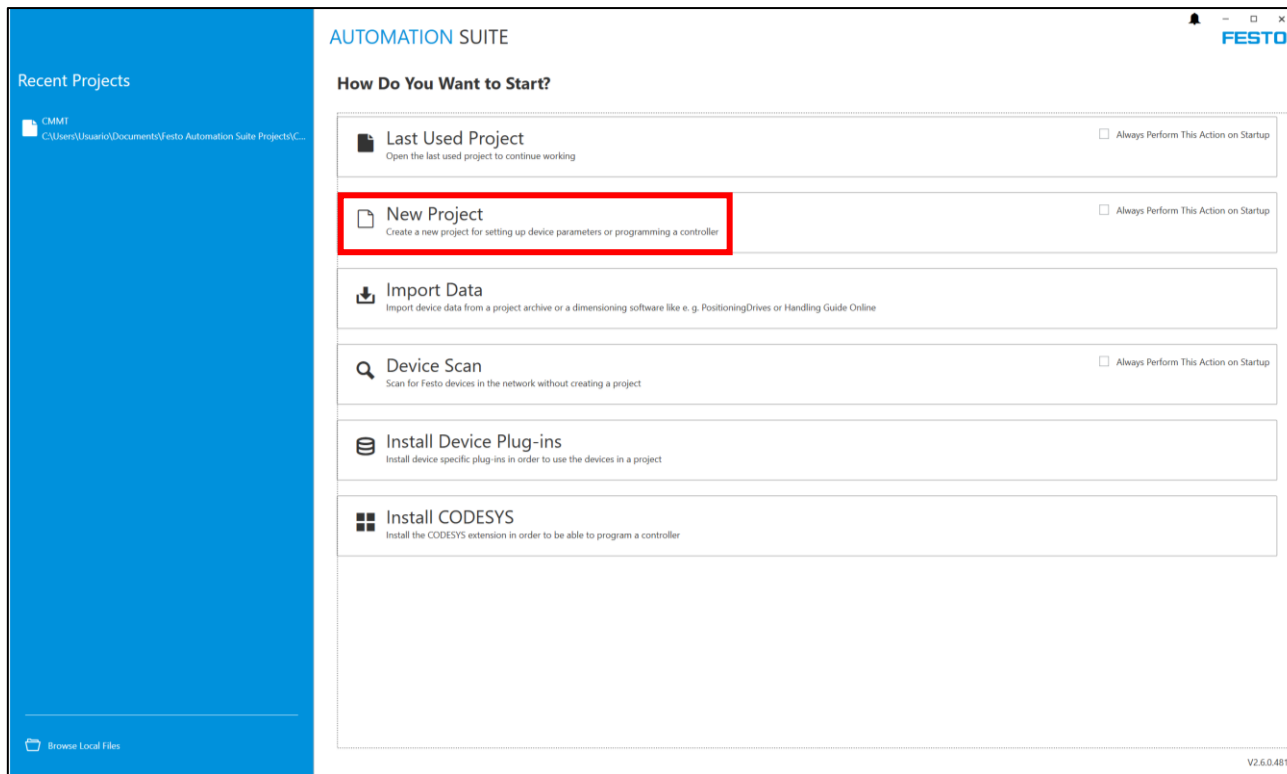


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Project creation

Start the *Festo Automation Suite* application and click *New Project*.

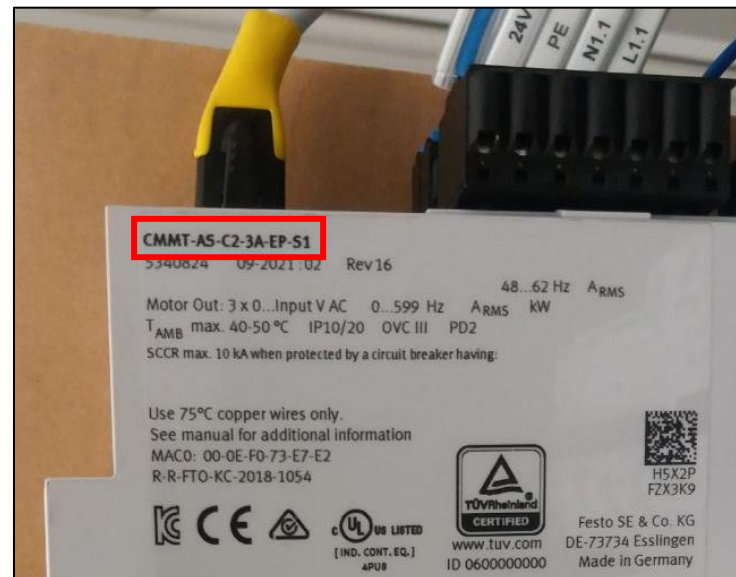


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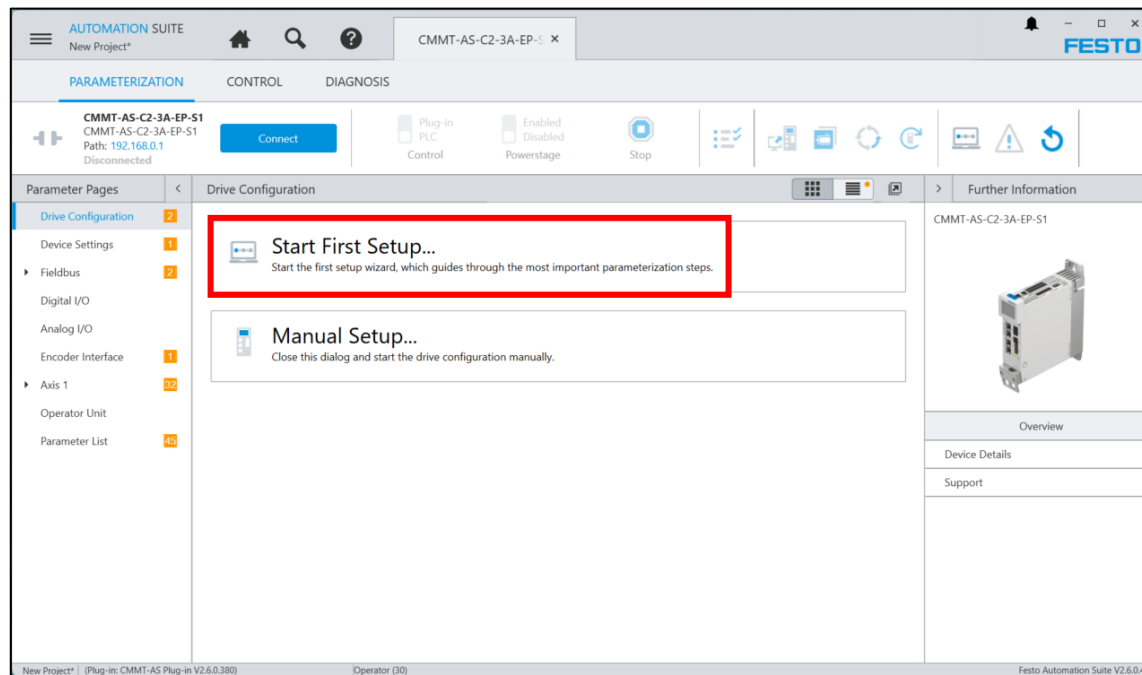
Component selection

Once the project is created, first indicate the model of your CMMT-AS/ST motor controller and click on the result found.



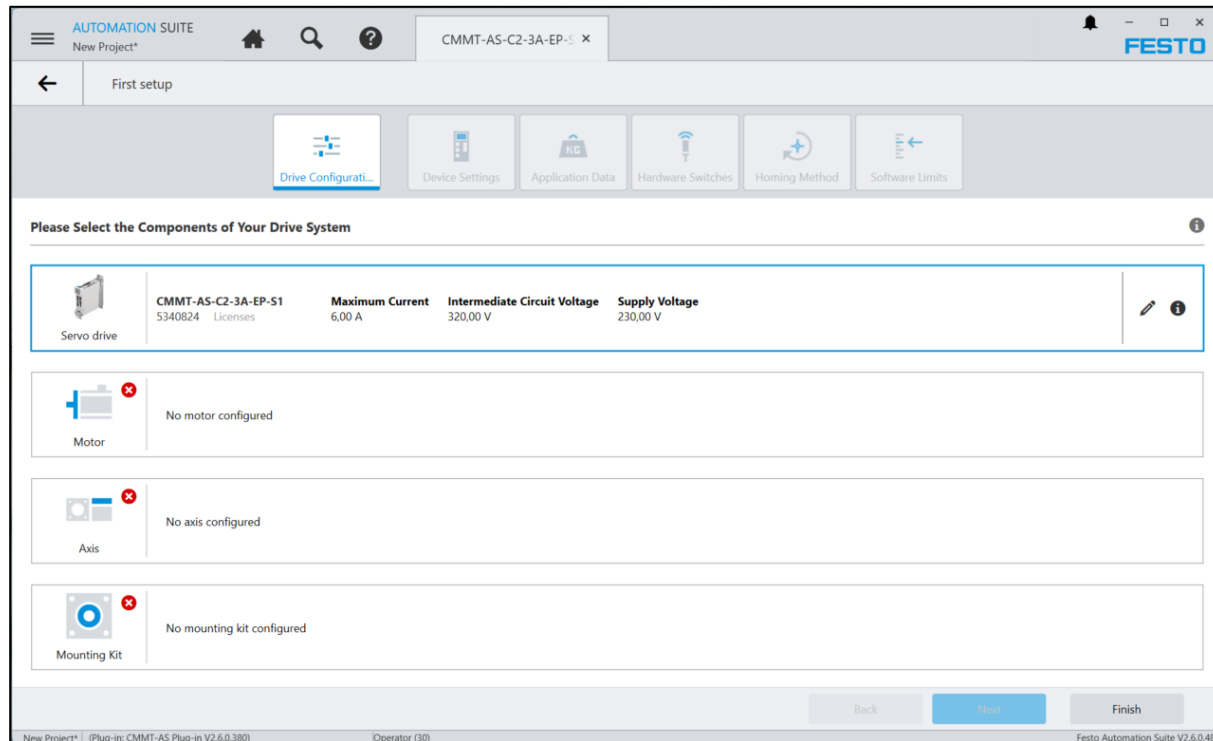
Component selection

Then, click on the image of your controller and wait for the controller plug-in to load. Once loaded, select the type of configuration to perform. In this case, the *Start First Setup* option will be selected.



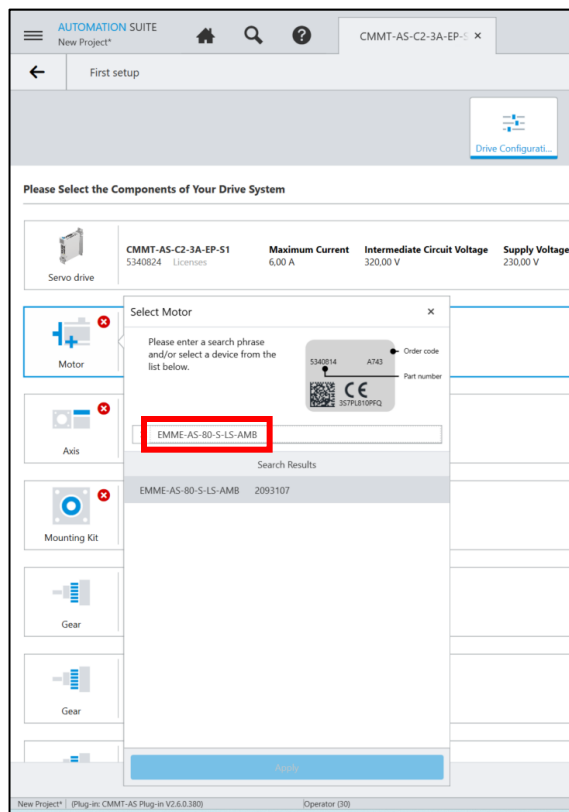
Component selection

Next, the rest of the system components will be configured: motor, axis, gear, etc.



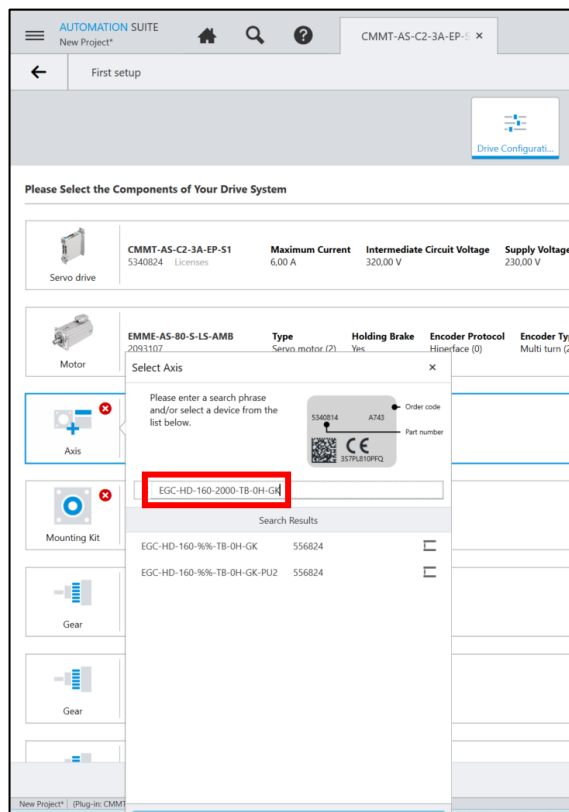
Component selection

We will start by indicating the motor to use.



Component selection

We will continue indicating the axis to use.




Component selection

Once the axis has been indicated, we will choose the units we want to use.

	EGC-HD-160-2000-TB-0H-GK 556824	Axis Size 160	Feed Constant 125,00 mm/rev	Working Stroke 2000,00 mm	Design Single axis (0)	
---	---	-------------------------	---------------------------------------	-------------------------------------	----------------------------------	---



Select Axis ×



EGC-HD-160-2000-TB-0H-GK
556824

Search Results
Selected Component

Actual user unit Metric [m, m/s, ...] (6) ▾

Motion Linear

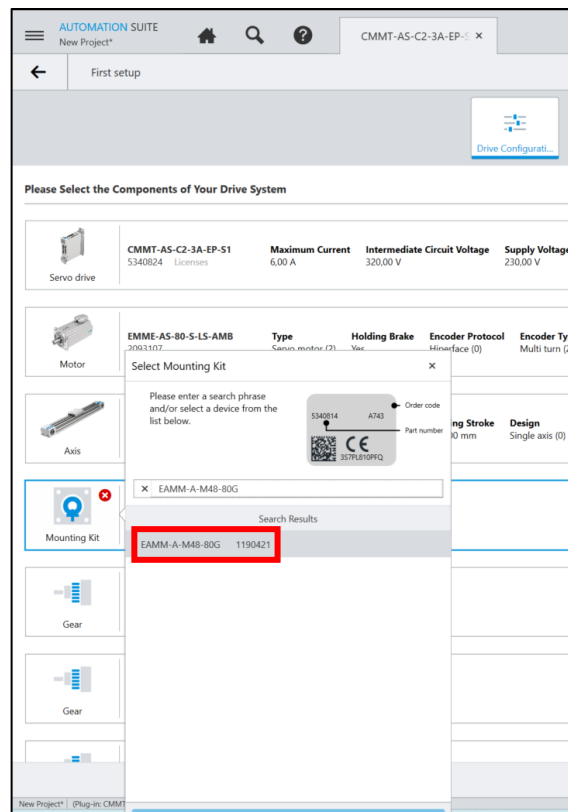
Technology Tooth belt

Axis Size 160

Working Stroke
 mm

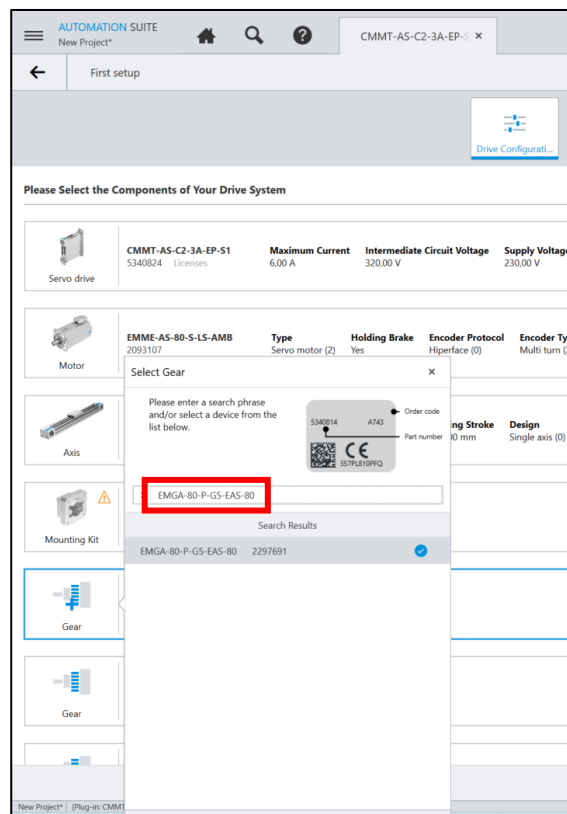
Component selection

Subsequently, we indicate the mounting kit to be used.



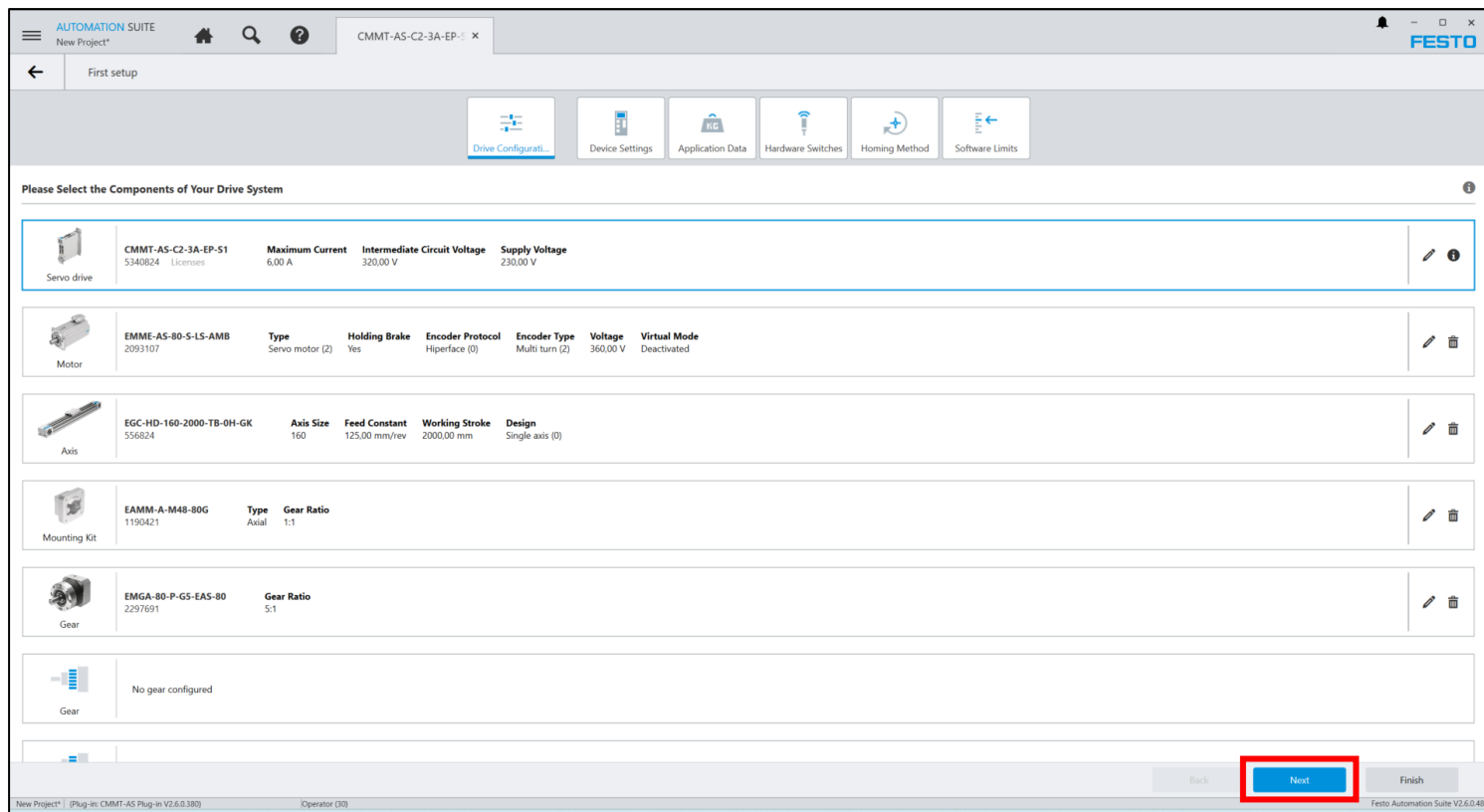
Component selection

Finally, we indicate the gear to be used.



Component selection

Finally, verify that the configuration is correct and click *Next*.



The screenshot shows the 'First setup' screen in the FESTO Automation Suite. The main heading is 'Please Select the Components of Your Drive System'. Below this, several components are listed in a table-like format, each with an icon, a name, and various technical specifications. The 'Next' button at the bottom right is highlighted with a red box.

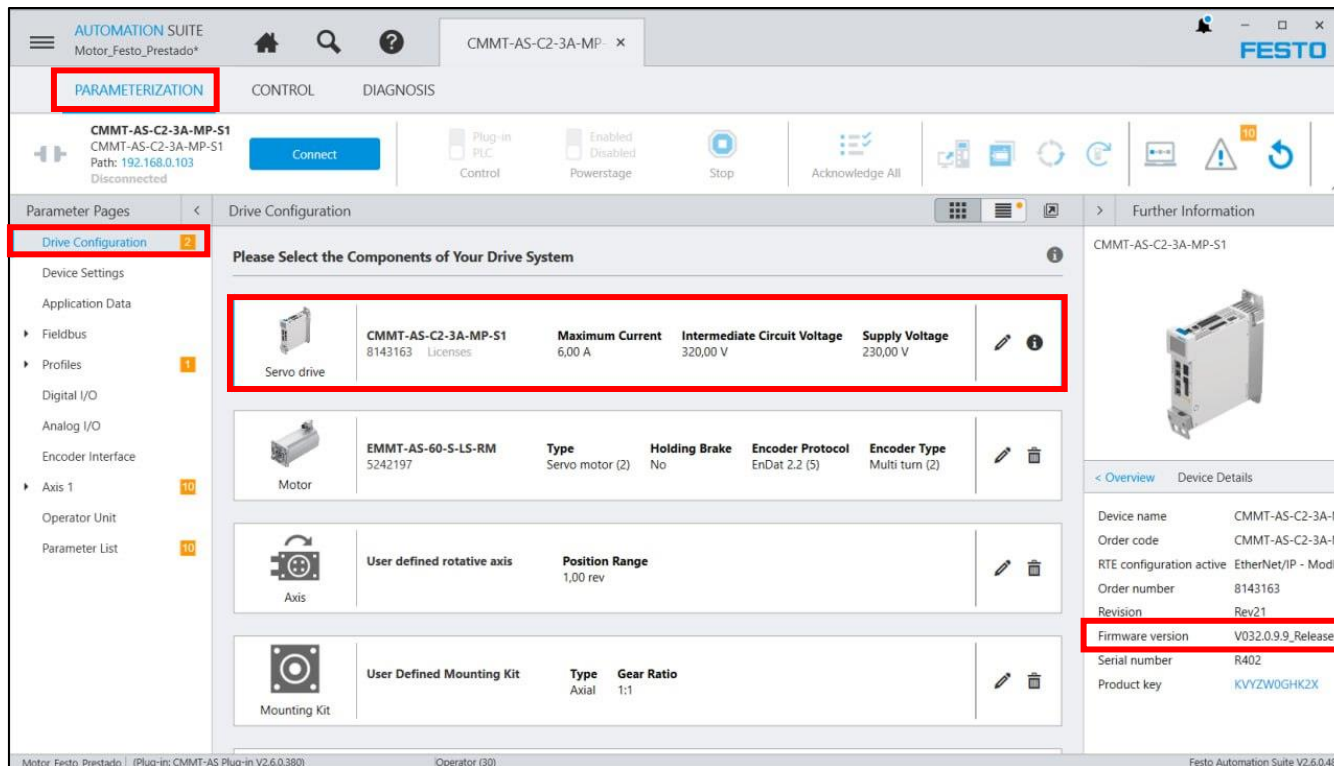
Component	Model/ID	Specifications
Servo drive	CMMT-AS-C2-3A-EP-S1 5340824 Licenses	Maximum Current: 6.00 A Intermediate Circuit Voltage: 320.00 V Supply Voltage: 230.00 V
Motor	EMME-AS-80-S-LS-AMB 2093107	Type: Servo motor (2) Holding Brake: Yes Encoder Protocol: Hiperface (0) Encoder Type: Multi turn (2) Voltage: 360.00 V Virtual Mode: Deactivated
Axis	EGC-HD-160-2000-TB-0H-GK 556824	Axis Size: 160 Feed Constant: 125.00 mm/rev Working Stroke: 2000.00 mm Design: Single axis (0)
Mounting Kit	EAMM-A-M48-80G 1190421	Type: Axial Gear Ratio: 1:1
Gear	EMGA-80-P-G5-EAS-80 2297691	Gear Ratio: 5:1
Gear	No gear configured	

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Configuration

To avoid possible incompatibilities, it is necessary to verify the firmware version of the motor controller (see next slide).



The screenshot displays the FESTO Automation Suite interface for configuring a CMMT-AS-C2-3A-MP-S1 motor controller. The 'PARAMETERIZATION' tab is selected. The 'Drive Configuration' section is highlighted, showing a table of components. The 'Servo drive' component is highlighted with a red box. The 'Further Information' section on the right shows the 'Firmware version' as 'V032.0.9.9_Release', which is also highlighted with a red box.

Component	Model	Serial	License	Maximum Current	Intermediate Circuit Voltage	Supply Voltage
Servo drive	CMMT-AS-C2-3A-MP-S1	8143163	Licenses	6,00 A	320,00 V	230,00 V
Motor	EMMT-AS-60-S-LS-RM	5242197		Type: Servo motor (2)	Holding Brake: No	Encoder Protocol: EnDat 2.2 (5)
Axis	User defined rotative axis			Position Range: 1,00 rev		Encoder Type: Multi turn (2)
Mounting Kit	User Defined Mounting Kit			Type: Axial	Gear Ratio: 1:1	

Further Information:

Device name	CMMT-AS-C2-3A-I
Order code	CMMT-AS-C2-3A-I
RTE configuration active	EtherNet/IP - Modl
Order number	8143163
Revision	Rev21
Firmware version	V032.0.9.9_Release
Serial number	R402
Product key	KVYZW0GHK2X

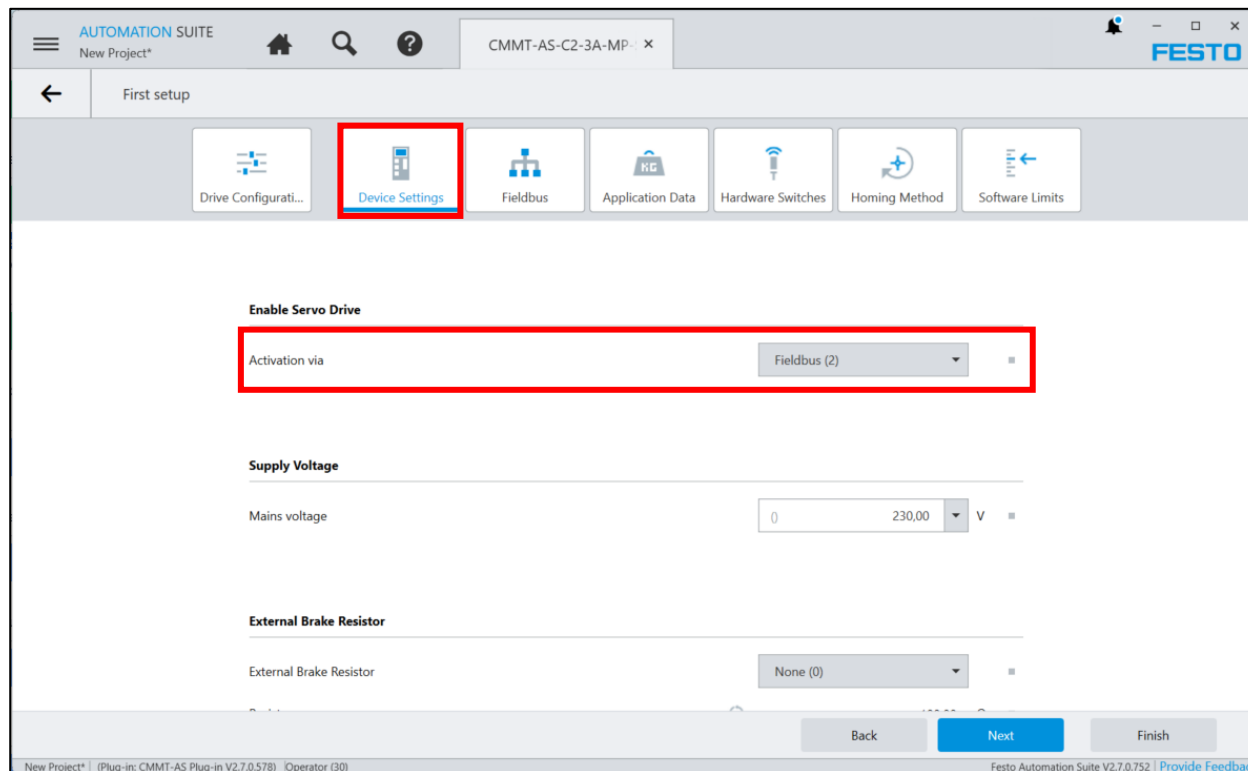
Configuration

Depending on your motor controller model, verify that the firmware version is the following to avoid possible connection problems:

- CMMT-AS-...-MP:
Firmware 32.0.9.9.
- CMMT-ST-...-MP:
Firmware 32.0.10.10.
- CMMT-AS-...-EP
Firmware 24.0.2.94 and modify the timeout using the following [instructions](#).

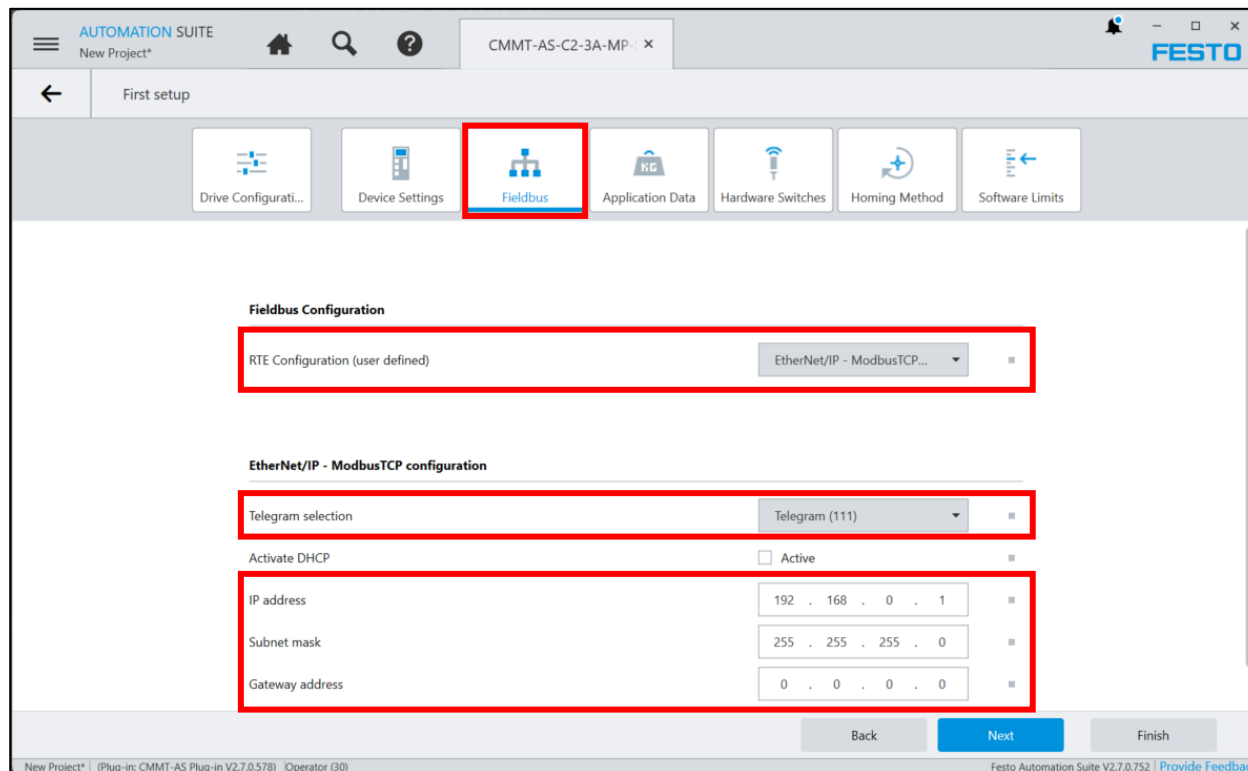
Configuration

First of all, the device configuration is performed. Select the *Fieldbus (2)* activation via.



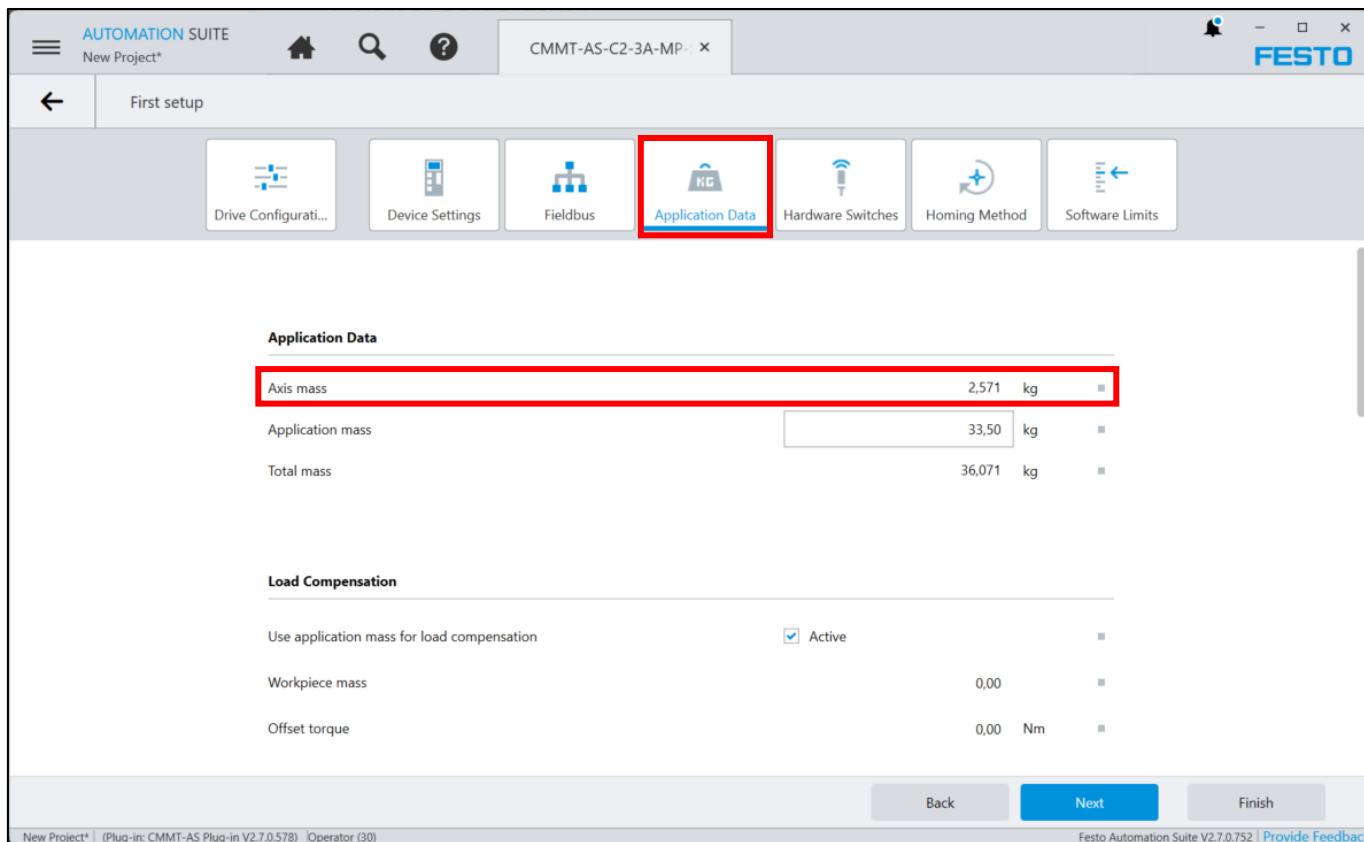
Configuration

The fieldbus configuration is then carried out. Select the *EtherNet/IP – ModbusTCP (3)* bus, the telegram 111 and set the desired IP address.



Configuration

Subsequently, the approximate total load is configured in the application data.



The screenshot displays the 'Application Data' configuration screen in the FESTO Automation Suite. The 'Application Data' tab is selected and highlighted with a red box. Below the tab, the 'Application Data' section is visible, containing a table with the following data:

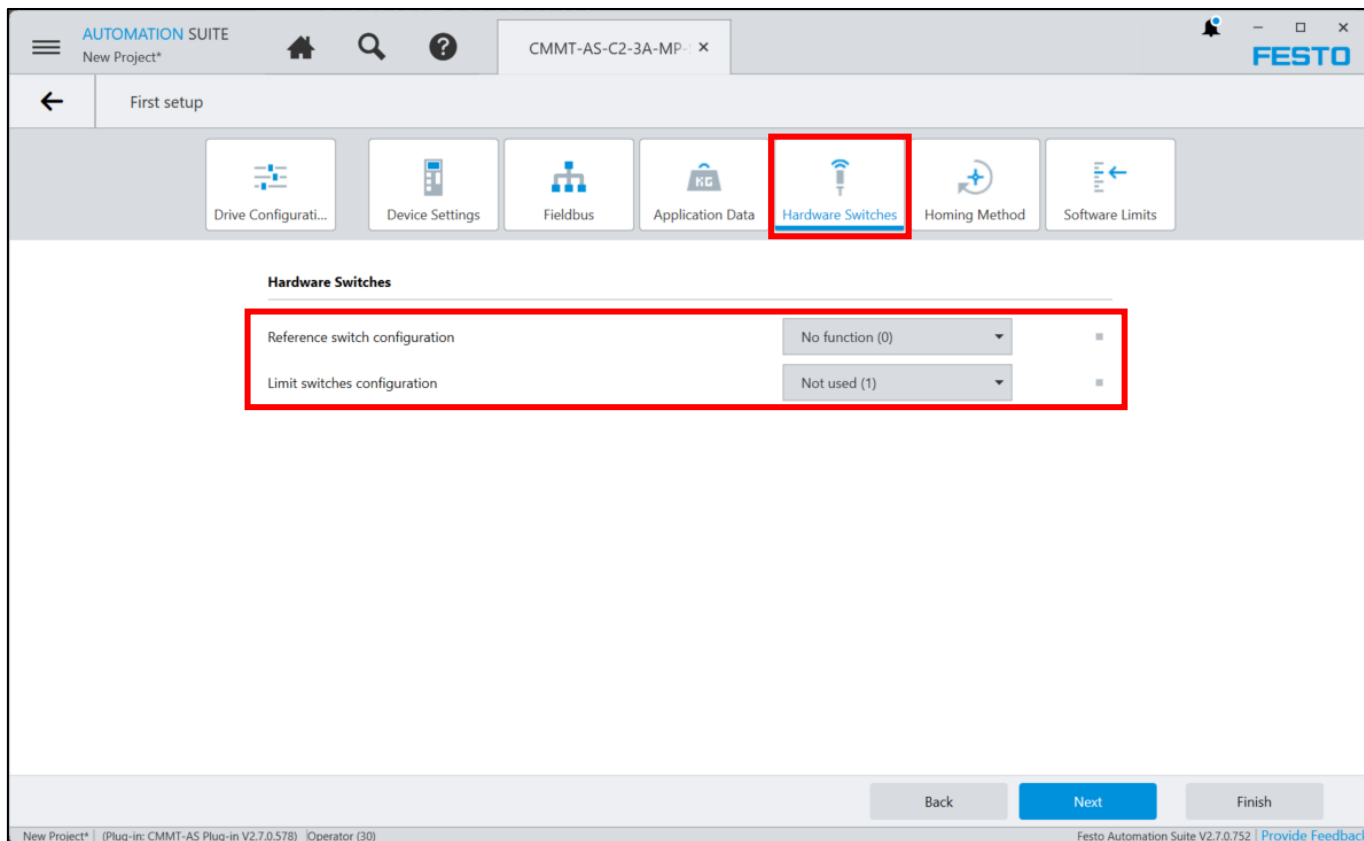
Parameter	Value	Unit
Axis mass	2,571	kg
Application mass	33,50	kg
Total mass	36,071	kg

Below the 'Application Data' section, the 'Load Compensation' section is visible, featuring a checkbox for 'Use application mass for load compensation' which is checked and labeled 'Active'. Other parameters include 'Workpiece mass' (0,00) and 'Offset torque' (0,00 Nm).

At the bottom of the screen, there are 'Back', 'Next', and 'Finish' buttons. The status bar at the very bottom indicates 'New Project*' (Plug-in: CMMT-AS Plug-in V2.7.0.578) Operator (30) and 'Festo Automation Suite V2.7.0.752 | Provide Feedback'.

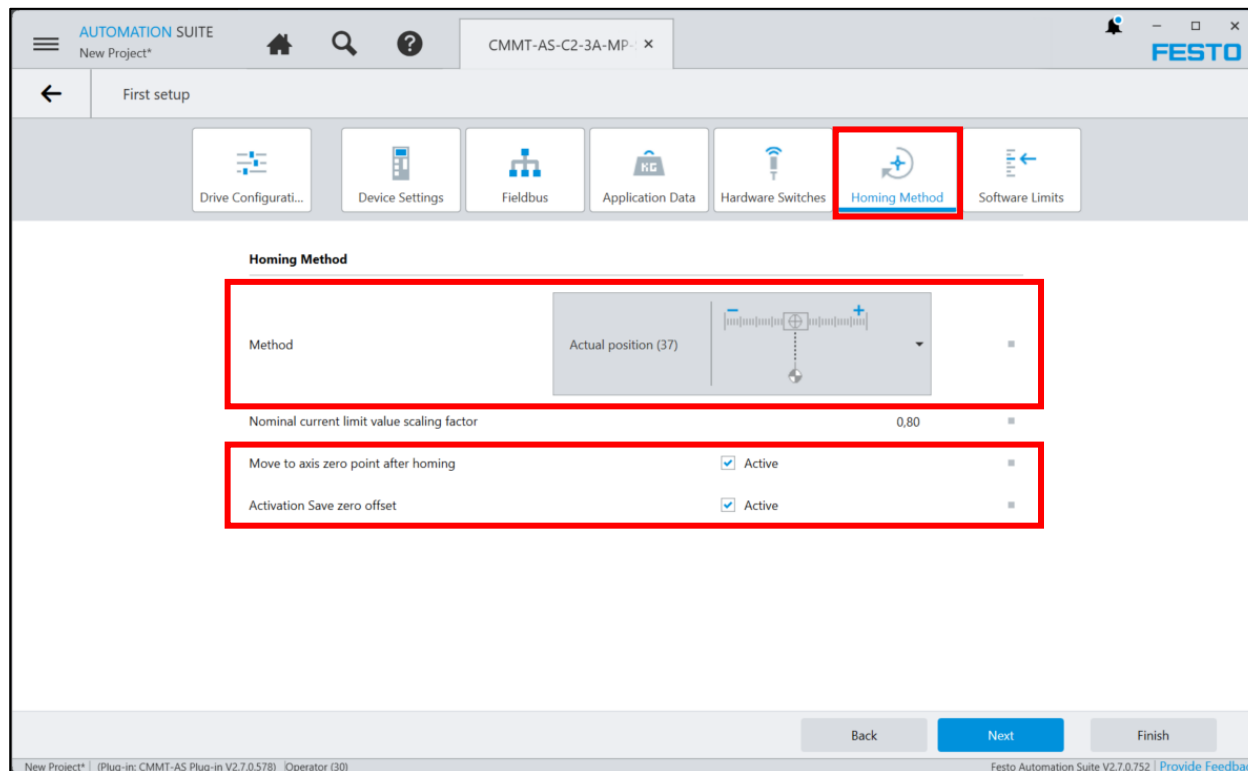
Configuration

Next, the hardware limits are configured, if any.



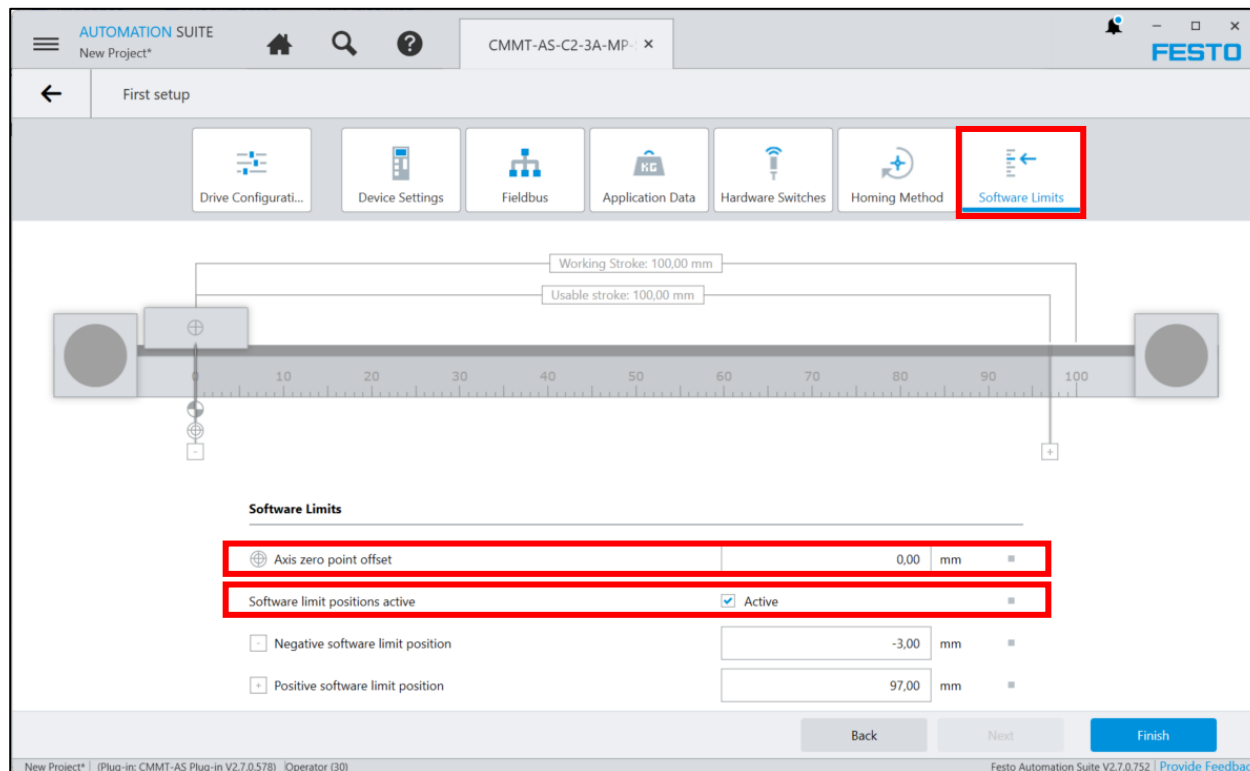
Configuration

The desired homing method is then configured, usually *Actual position (37)* for multi-turn absolute motors.



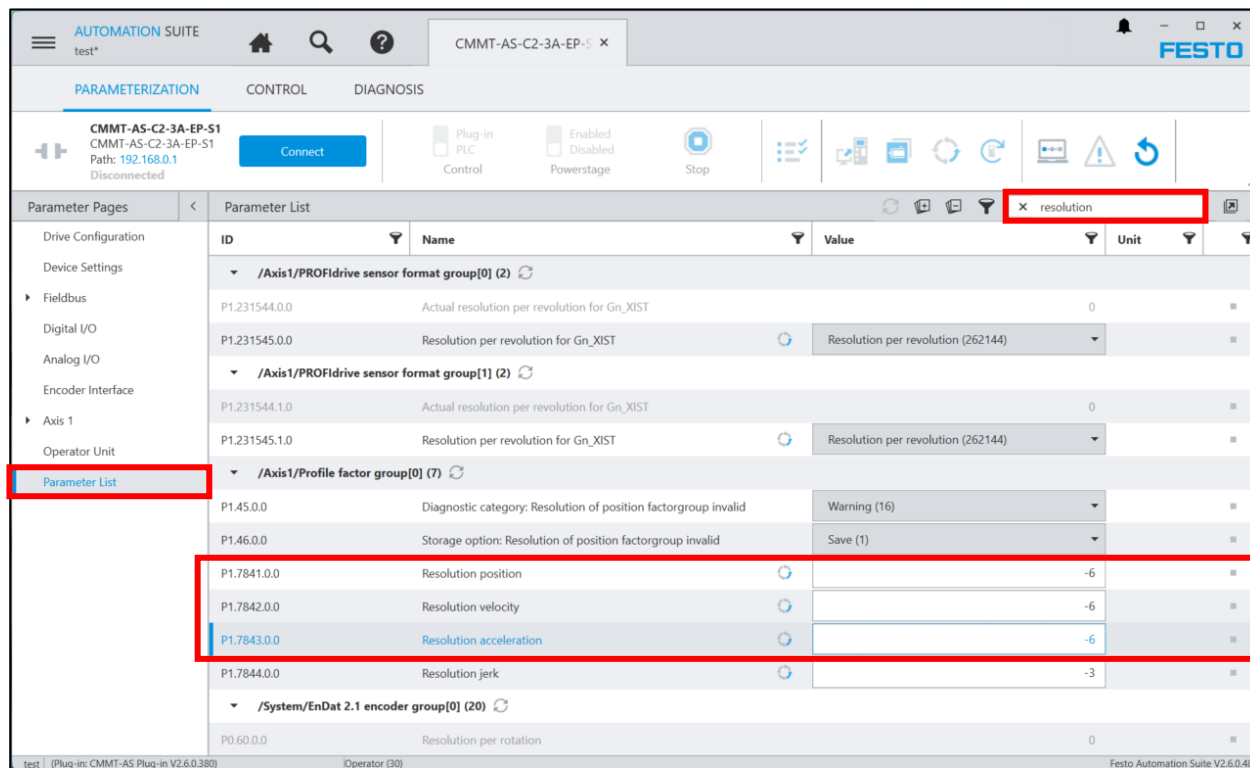
Configuration

Finally, the axis zero point offset is configured and the software limits are enabled, which can be configured later from the URCap.



Configuration

Next, we access the *Parameter List* tab and configure the resolution of the position, velocity and acceleration with a value of -6.



ID	Name	Value	Unit
/Axis1/PROFIdrive sensor format group[0] (2)			
P1.231544.0.0	Actual resolution per revolution for Gn_X1ST	0	
P1.231545.0.0	Resolution per revolution for Gn_X1ST	Resolution per revolution (262144)	
/Axis1/PROFIdrive sensor format group[1] (2)			
P1.231544.1.0	Actual resolution per revolution for Gn_X1ST	0	
P1.231545.1.0	Resolution per revolution for Gn_X1ST	Resolution per revolution (262144)	
/Axis1/Profile factor group[0] (7)			
P1.45.0.0	Diagnostic category: Resolution of position factorgroup invalid	Warning (16)	
P1.46.0.0	Storage option: Resolution of position factorgroup invalid	Save (1)	
P1.7841.0.0	Resolution position	-6	
P1.7842.0.0	Resolution velocity	-6	
P1.7843.0.0	Resolution acceleration	-6	
P1.7844.0.0	Resolution jerk	-3	
/System/EnDat 2.1 encoder group[0] (20)			
P0.60.0.0	Resolution per rotation	0	

Configuration



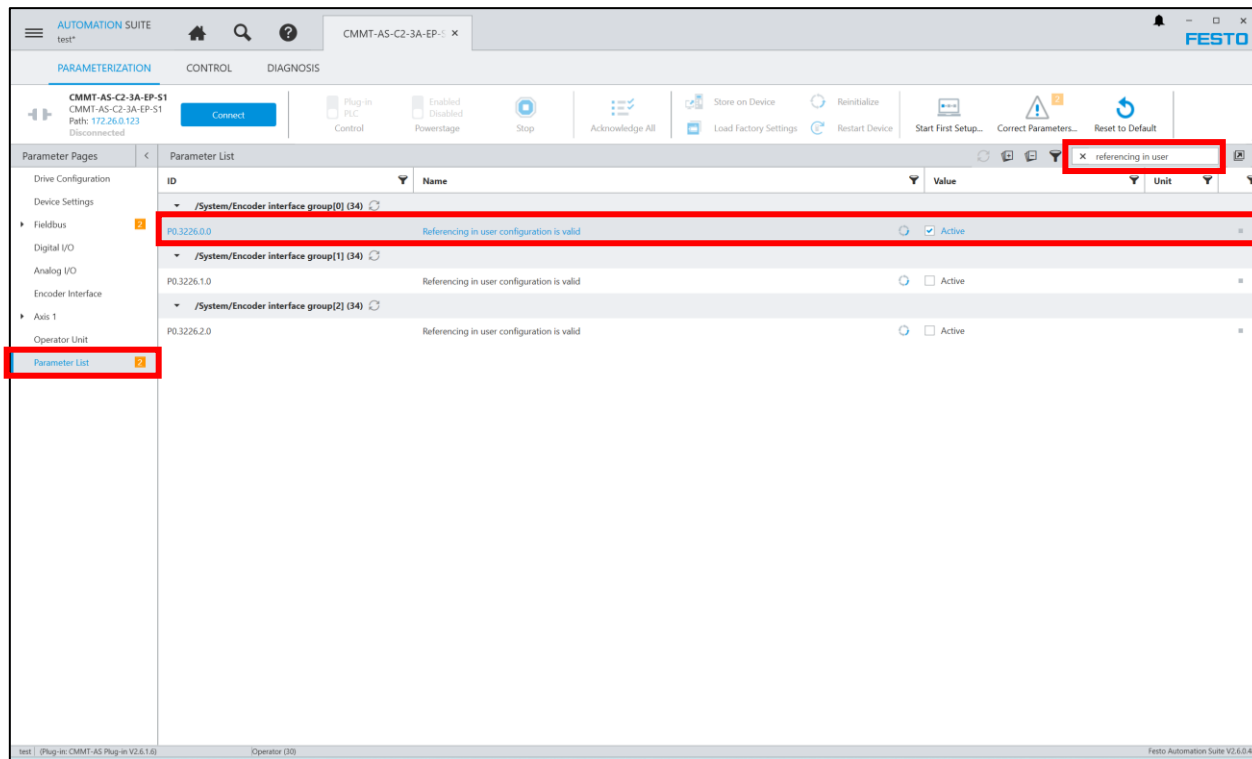
Later, from the same tab, we configure the desired speeds for manual movement (Jog) in the slow and fast phase.

The screenshot shows the 'PARAMETERIZATION' tab in the FESTO Automation Suite. The 'Parameter List' is displayed, showing various parameters for manual movement configuration. The 'Parameter List' tab is highlighted in the left sidebar. The table below shows the parameters for manual movement configuration:

ID	Name	Value	Unit
P1.1511.0.0	Slow jog 1 velocity		0.05 m/s
P1.1512.0.0	Slow jog 1 acceleration		1.00 m/s ²
P1.1513.0.0	Slow jog 1 jerk		100.00 m/s ³
P1.1514.0.0	Fast jog 1 velocity		0.10 m/s
P1.1515.0.0	Fast jog 1 acceleration		1.00 m/s ²
P1.1516.0.0	Fast jog 1 jerk		100.00 m/s ³
P1.214526.0.0	Activation of symmetrical jog	<input checked="" type="checkbox"/> Active	
P1.214530.0.0	Relative position jog 1		3.00 mm
P1.214535.0.0	Slow jog 2 velocity		0.05 m/s
P1.214536.0.0	Slow jog 2 acceleration		1.00 m/s ²
P1.214537.0.0	Slow jog 2 jerk		100.00 m/s ³
P1.214538.0.0	Relative position jog 2.		-3.00 mm
P1.214539.0.0	Jog duration 2 movement		2.00 s
P1.214540.0.0	Fast jog 2 velocity		0.10 m/s
P1.214541.0.0	Fast jog 2 acceleration		1.00 m/s ²

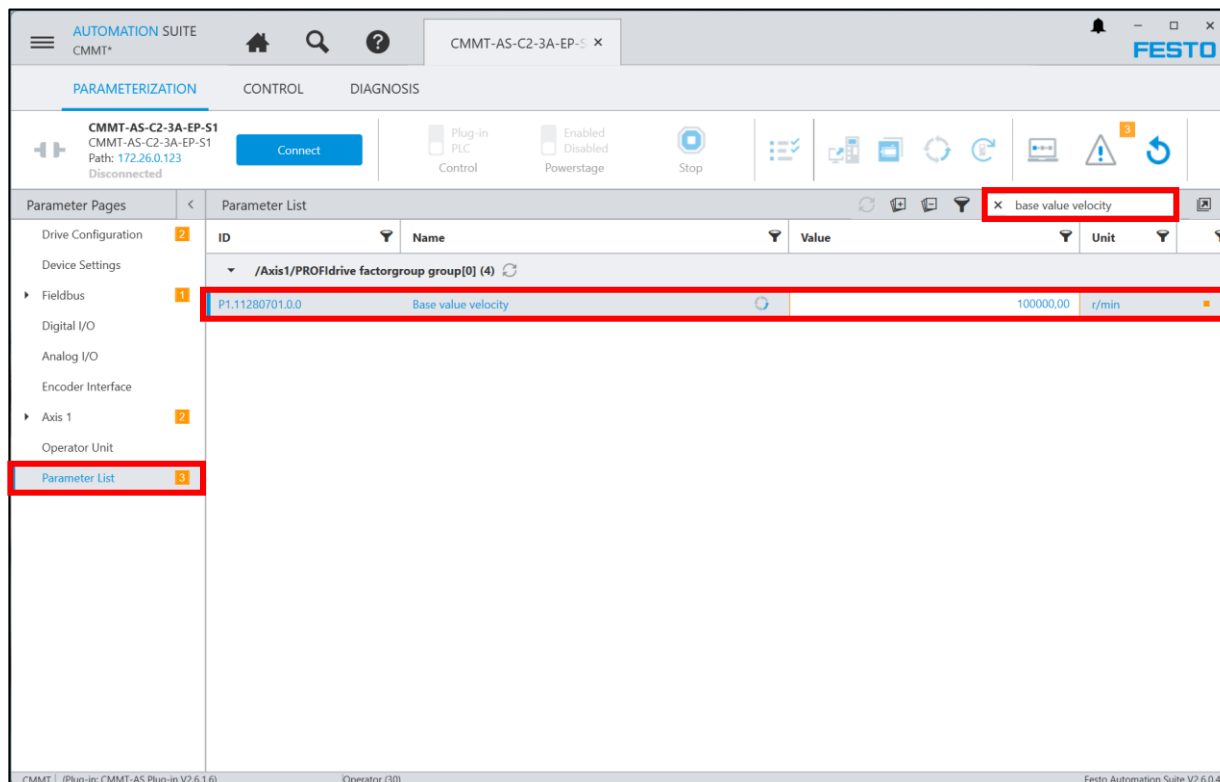
Configuration

We also verify that the *Referencing in user configuration is valid* parameter is enabled.



Configuration

Finally, we make sure to configure the *Base value velocity* parameter with a value of 100000, regardless of the units used.



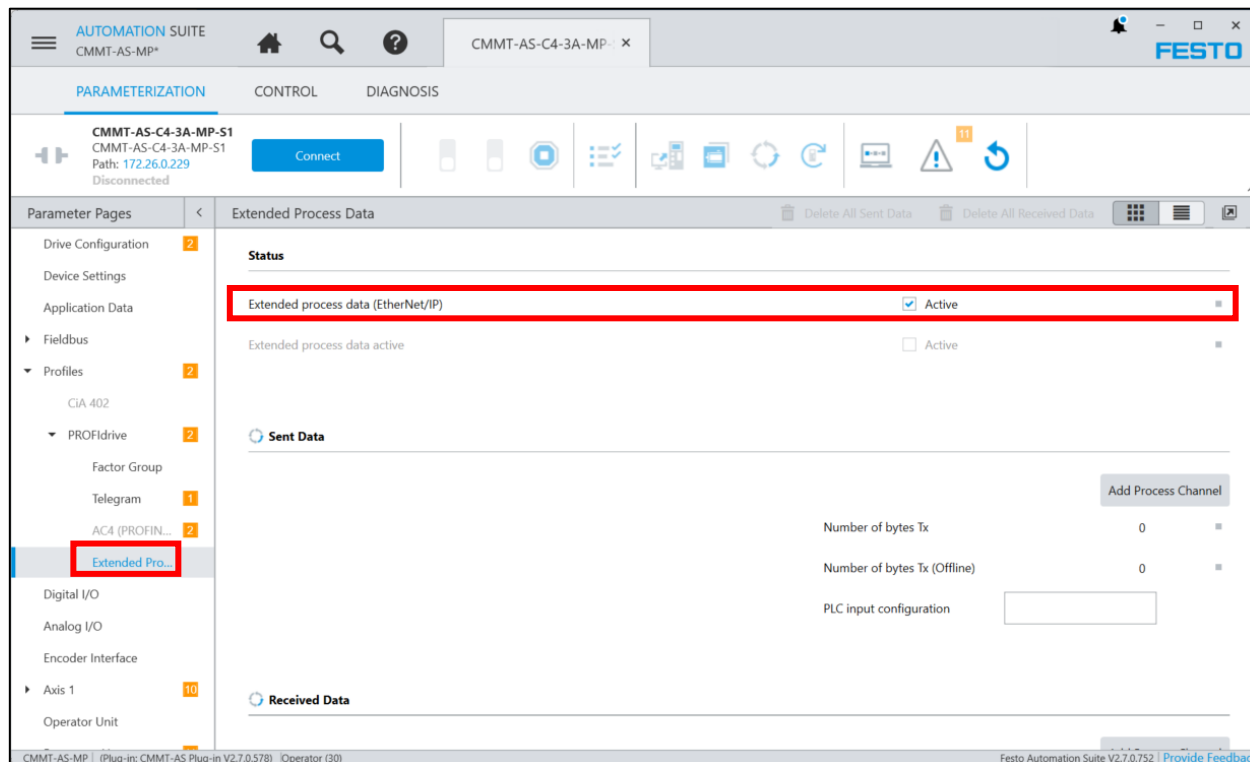
The screenshot displays the FESTO Automation Suite interface for parameterization. The main window shows the 'PARAMETERIZATION' tab selected. The device information at the top indicates 'CMMT-AS-C2-3A-EP-S1' with a path of '172.26.0.123' and a 'Disconnected' status. A search bar at the top right contains the text 'base value velocity'. The 'Parameter List' table is shown with the following data:

ID	Name	Value	Unit
P1.11280701.0.0	Base value velocity	100000.00	r/min

Red boxes highlight the search bar, the parameter row, and the 'Parameter List' tab in the left sidebar.

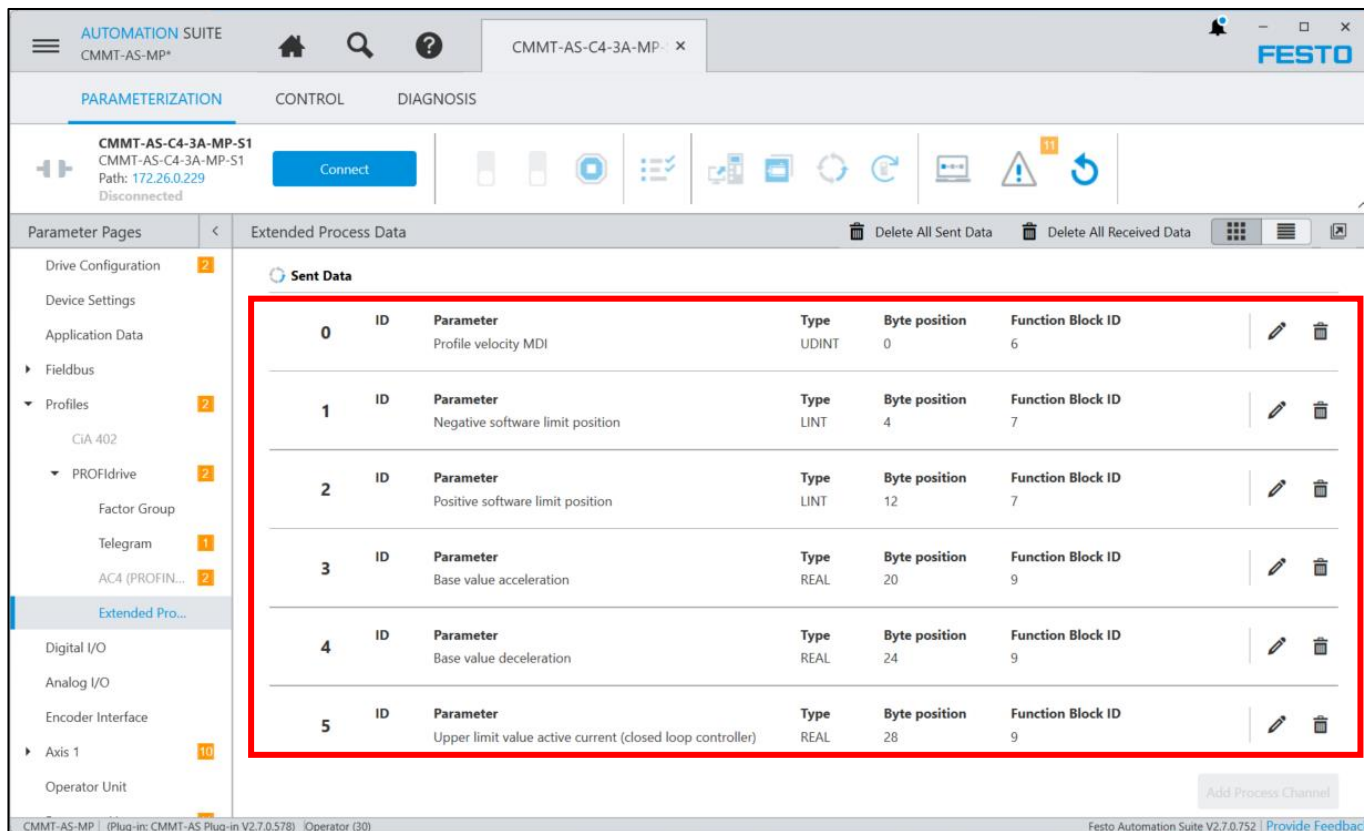
Configuration

Once the previous configuration has been made, we access *Fieldbus -> Extended Process Data* and verify that its status is *Active*.















Configuration

Later, we add the following parameters in the *Sent Data* section.

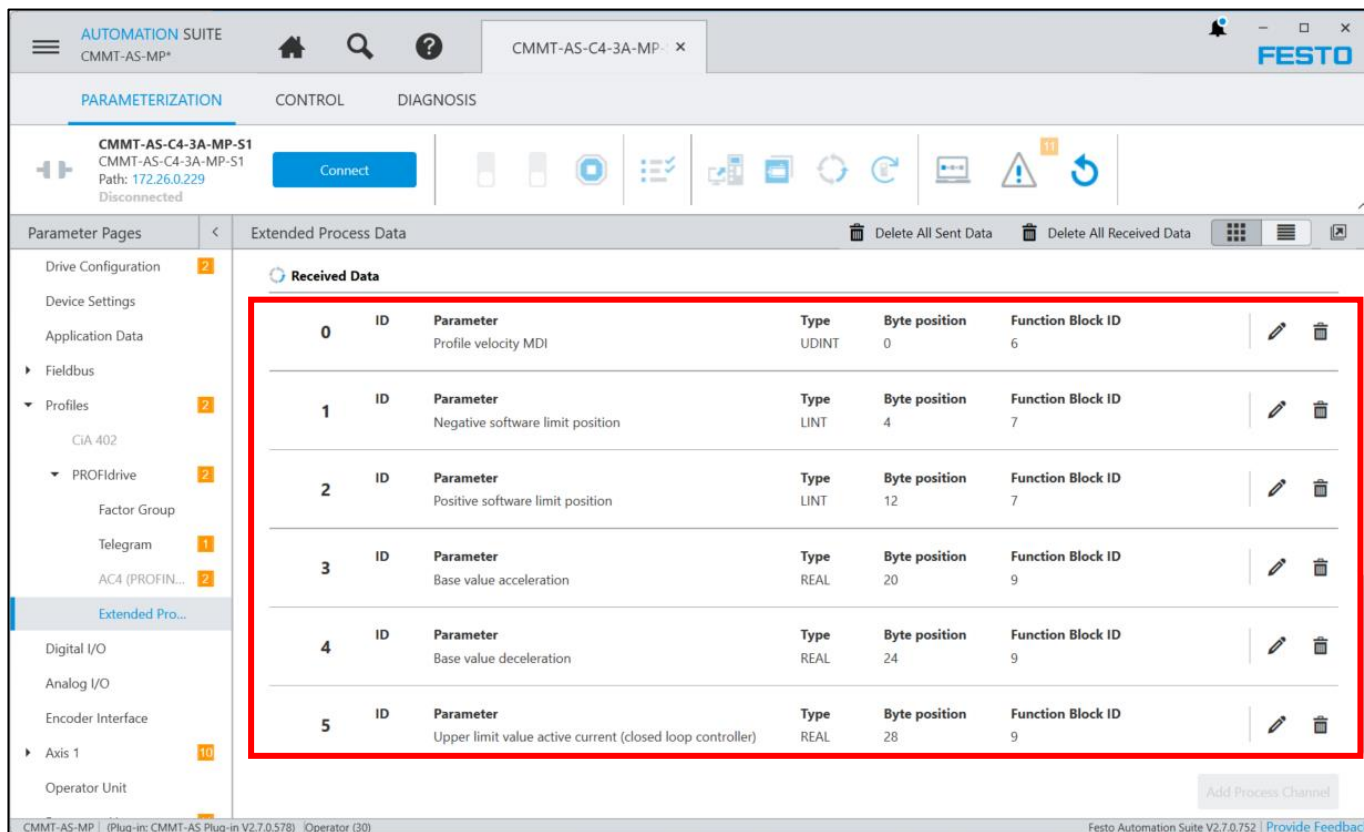














The screenshot shows the 'Sent Data' configuration section in the Festo Automation Suite. A red box highlights a table with 6 columns: ID, Parameter, Type, Byte position, and Function Block ID. The table contains 6 rows of data, each with edit and delete icons.

ID	Parameter	Type	Byte position	Function Block ID	
0	Profile velocity MDI	UDINT	0	6	 
1	Negative software limit position	LINT	4	7	 
2	Positive software limit position	LINT	12	7	 
3	Base value acceleration	REAL	20	9	 
4	Base value deceleration	REAL	24	9	 
5	Upper limit value active current (closed loop controller)	REAL	28	9	 

Configuration

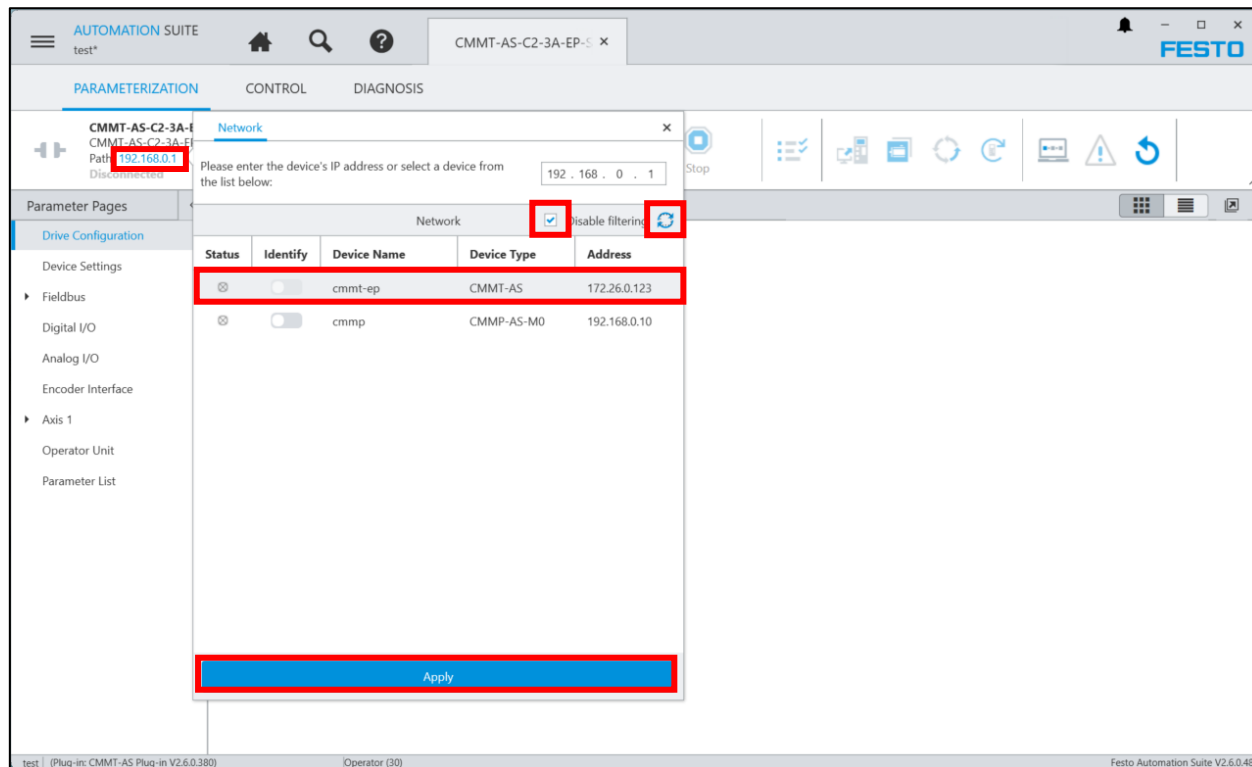
Similarly, we add the same parameters in the *Received Data* section.



ID	Parameter	Type	Byte position	Function Block ID	
0	Profile velocity MDI	UDINT	0	6	 
1	Negative software limit position	LINT	4	7	 
2	Positive software limit position	LINT	12	7	 
3	Base value acceleration	REAL	20	9	 
4	Base value deceleration	REAL	24	9	 
5	Upper limit value active current (closed loop controller)	REAL	28	9	 

Configuration

Once the configuration is complete, we will connect to the controller. To do this, we click on the IP address, perform a search and select it.



The screenshot shows the 'Network' configuration window in the Festo Automation Suite. The window title is 'CMMT-AS-C2-3A-E' and the path is '192.168.0.1'. The interface includes a search bar with the text 'Please enter the device's IP address or select a device from the list below:' and a search input field containing '192.168.0.1'. A table lists discovered devices with columns for Status, Identify, Device Name, Device Type, and Address. The first row, 'cmmt-ep' with IP '172.26.0.123', is highlighted in red. A red box also highlights the 'Apply' button at the bottom of the window.

Status	Identify	Device Name	Device Type	Address
<input type="checkbox"/>	<input type="checkbox"/>	cmmt-ep	CMMT-AS	172.26.0.123
<input type="checkbox"/>	<input type="checkbox"/>	cmmmp	CMMP-AS-M0	192.168.0.10

Configuration



Afterwards, we connect to the controller and download our configuration in the parameters synchronisation.

Parameter synchronisation

The following parameters mismatch. Please choose whether you want to transfer the parameters from the project to the device or vice versa.

ID	Name	Value in project	Unit	Value on device	Unit
P0.557.0.0	Trace delay	1715		1716	
P0.558.0.0	Recording length	2287		2289	
P0.3223.0.0	Zero point offset from user configuration	0,00	r	-88,121129065	r
P0.3226.0.0	Referencing in user configuration is valid	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
P0.3239.0.0	Serial number motor reference configuration			U7280545G	
P0.11618.0.0	Velocity filter filter time constant	0,001	s	0,002	s
P0.12002.1.0	Subnet mask	4294967040		4294901760	
P0.12003.1.0	Gateway address	0		2887385089	
P1.80.0.0	Current controller amplification gain (reactive curr	18,95591		33,61274	
P1.81.0.0	Current controller integration constant (reactive ci	13223,04		23641,86	
P1.82.0.0	Current controller amplification gain (active curren	18,95591		33,61274	
P1.83.0.0	Current controller integration constant (active cur	13223,04		23641,86	
P1.220.0.0	Position controller amplification gain	16,28033		27,00838	
P1.222.0.0	Minimum correction velocity	-0,10	m/s	-60,00	r/min

Write to device Read from device

Connected Device

Identify

Device Name CMMT-AS-C2-3A-EP-S1

Device Type CMMT-AS-C2-3A-EP-S1

IP-Address 3232235543

Product key H5X2PFZX3K9

Plug-in version 2.6.0.380

Firmware version V20.0.5.78_release

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 For further information, please contact:



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