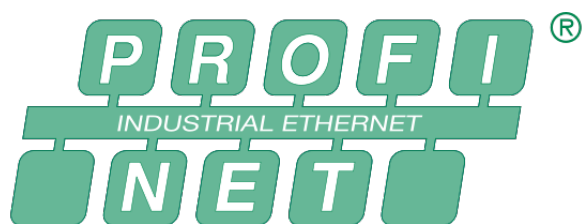


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LinMot[®]



MC-Link with ProfiNet Interface

User Manual

This document applies to the following controllers:
B8050-ML-PN

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1 System overview

The LinMot ProfiNet-ML controllers have the following functionalities:

Device Property	Value / Remark
Minimal ProfiNetcycle time	2 ms

ProfiNet is the open real-time Ethernet network originally developed by Siemens. The LinMot act as Slave in this network and is implemented with the standard ASIC TPS 1 from Renesas.

For further information on the ProfiNet fieldbus please visit:

<http://www.ProfiNet.org/>

1.1 References


All user manuals are distributed with the LinMot-Talk configuration software the newest version can be downloaded from the LinMot homepage under the download section.

Ref	Title	Source
1	User Manual Motion Control SW	www.linmot.com
2	LinMot Drive Configuration over Fieldbus Interfaces SG4	www.linmot.com
3	Usermanual_MC_Link_with_ProfiNet_SG5.pdf	www.linmot.com

2 Connecting to the ProfiNet Network

2.1 Pin Assignment of the Connectors X17-X18

The Ethernet connectors are standard RJ45 female connectors with a pin assignment as defined by EIA/TIA T568B:

X17 – X18		RealTime Ethernet Connector	
	Pin	Wire color code	Assignment 100BASE-TX
	1	WHT/ORG	Rx+
	2	ORG	Rx-
	3	WHT/GRN	Tx+
	4	BLU	-
	5	WHT/BLU	-
	6	GRN	Tx-
	7	WHT/BRN	-
	8	BRN	-
case	-	-	
RJ-45	Use standard patch cables (twisted pair, S/UTP, AWG26) for wiring. This type of cable is usually referred to as a "Cat5e-Cable".		

X17 is the ProfiNet input and X18 the ProfiNet Output Connector.

3 Setup in the PLC

In the following steps the integration of a LinMot ProfiNet controller in the PLC is described. In the example a Siemens master PLC is used.

3.1 Adding the GSDML to the Hardware Catalogue

The LinMot controller is described with *.gsdml device description file distributed with the LinMot-Talk software.

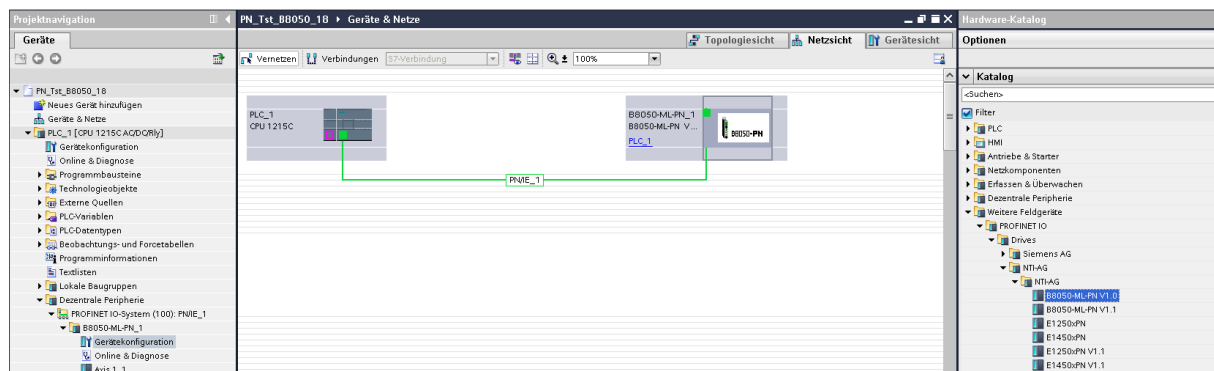
Copy this file to PLC so it can access it.

Example Source path of ProfiNet Device description file:

```
C:\Program Files (x86)\LinMot\LinMot-Talk 5.1 Build
20121010\Firmware\Interfaces\ProfiNet_ML\GSDML\GSDML-V2.2-NTI-ML-PN_IO-V1.0-
20130206.xml
```

3.2 Adding the B8050-ML-PN V1.x ProfiNet slave device

With drag and drop the B8050-ML-PN device could be added from the HW catalogue to the desired ProfiNet network:



Add the B8050-ML-PN V1.x ProfiNet slave devices to the ProfiNet

4 ProfiNet Parameters

4.1 Parameters

The ProfiNet Interface has an additional parameter tree branch (Parameters → ProfiNet), which can be configured with the distributed LinMot-Talk software.

With these parameters, the ProfiNet interface can be enabled or disabled.

The LinMot-Talk software can be downloaded from <http://www.linmot.com> under the section download\software and manuals\Servo Drives\.

ProfiNet Dis-/Enable

With the Dis-/Enable parameter the LinMot bus module can be run without the Ethernet ProfiNet interface going online. So in a first step the system can be configured and run without any bus connection.

ProfiNet\ Dis-/Enable	
Disable	Bus Module runs without ProfiNet.
Enable	Bus Module runs with ProfiNet connection.



IMPORTANT: If the ProfiNet interface is disabled, the integrated ProfiNet-ASIC rests in reset state! No messages will be sent to other devices connected to the ProfiNet-Network via the BM8050-PN Bus Module.

5 Realtime IO Data Mapping

For each axis a container of data is exchanged, which allows to control the axis and even to configure it over the exchanged real time data.

5.1 IO Data Mapping of each Axis

With this real time IO configuration, an additional configuration module is mapped into the IO data communication. The functionality of this module is the same for all the different fieldbus interfaces. For this reason, the functionality is described in documentation [2] "Controller Configuration over Fieldbus".

5.1.1 Output Data Mapping of one axis

In this real time IO mapping the 16 bit control word, the 16 bit motion command header and the motion command parameters are exchanged. The size of this mapping is 32 bytes or **16 words** for each configured axis.

Output Data Mapping of one Axis		
Byte Offset	Description	Size / Type
00h	MC SW ControlWord	Uint16 / Bit coded
02h	MC SW MotionCommandHeader	Uint16 / 12Bit Command 4Bit count nibble
04h	MC SW MotionCommandPar Bytes 00..03	Uint32 / Command specific
08h	MC SW MotionCommandPar Bytes 04..07	Uint32 / Command specific
0Ch	MC SW MotionCommandPar Bytes 08..11	Uint32 / Command specific
10h	MC SW MotionCommandPar Bytes 12..15	Uint32 / Command specific
14h	MC SW MotionCommandPar Bytes 16..19	Uint32 / Command specific
18h	Cfg Module Control Word	Uint16
1Ah	Cfg Module Index/..	Uint16
1Ch	Cfg Module Value/..	Uint32/Sint32

5.1.2 Input Data Mapping of one axis

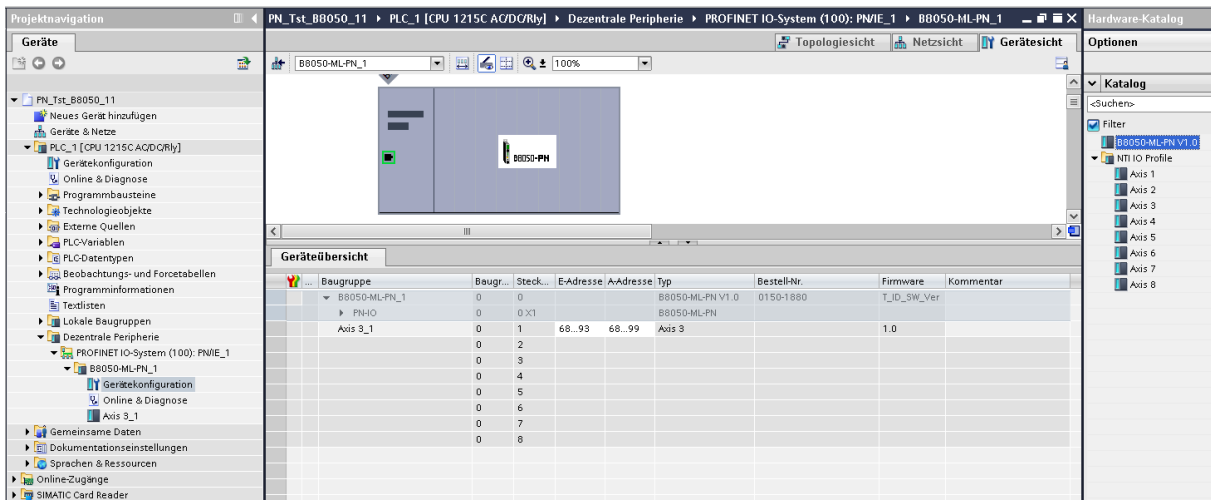
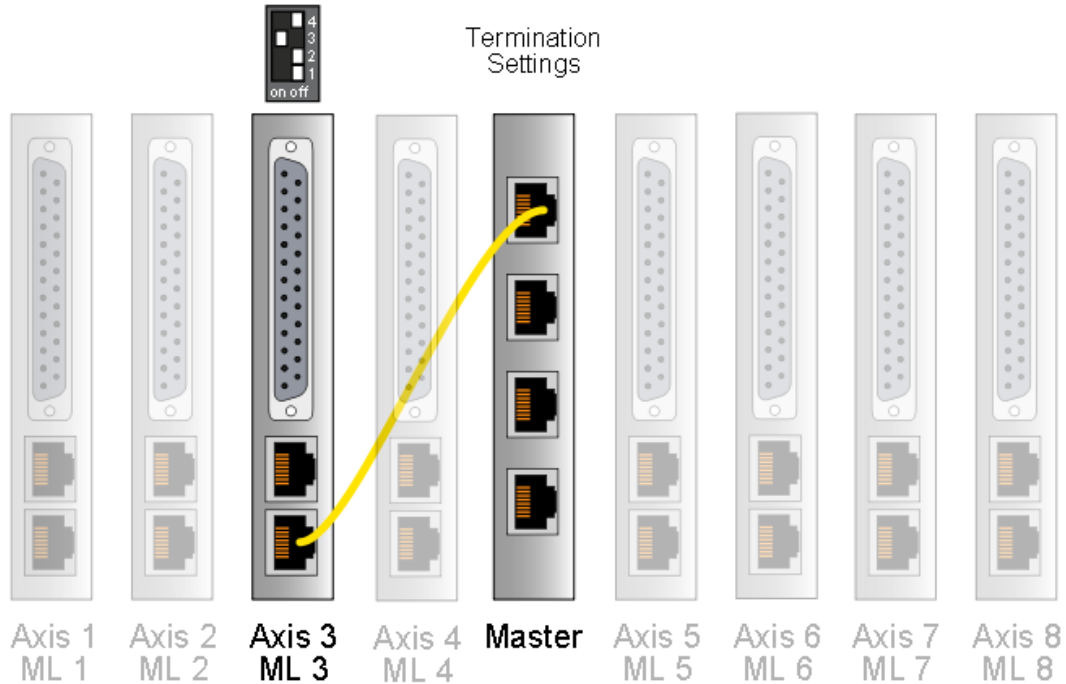
In this real time IO mapping the StateVar for the main state machine and several other helpful data are exchanged. The size of this mapping is 26 bytes or **13 words** for each configured axis.

Input Data Mapping of one Axis		
Byte Offset	Description	Size / Type
00h	MC SW StateVar	Uint16 / coded state depending
02h	MC SW StatusWord	Uint16 / Bit coded
04h	MC SW WarnWord	Uint16 / Bit coded
06h	MC SW DemandPosition	Int32 / Position [100nm]
0Ah	MC SW ActualPosition	Int32 / Position [100nm]
0Eh	MC SW DemandCurrent	Int32 / Current [1mA]
12h	Cfg Module Status Word	Uint16
14h	Cfg Module Index/..	Uint16
16h	Cfg Module Value/..	Uint32/Sint32

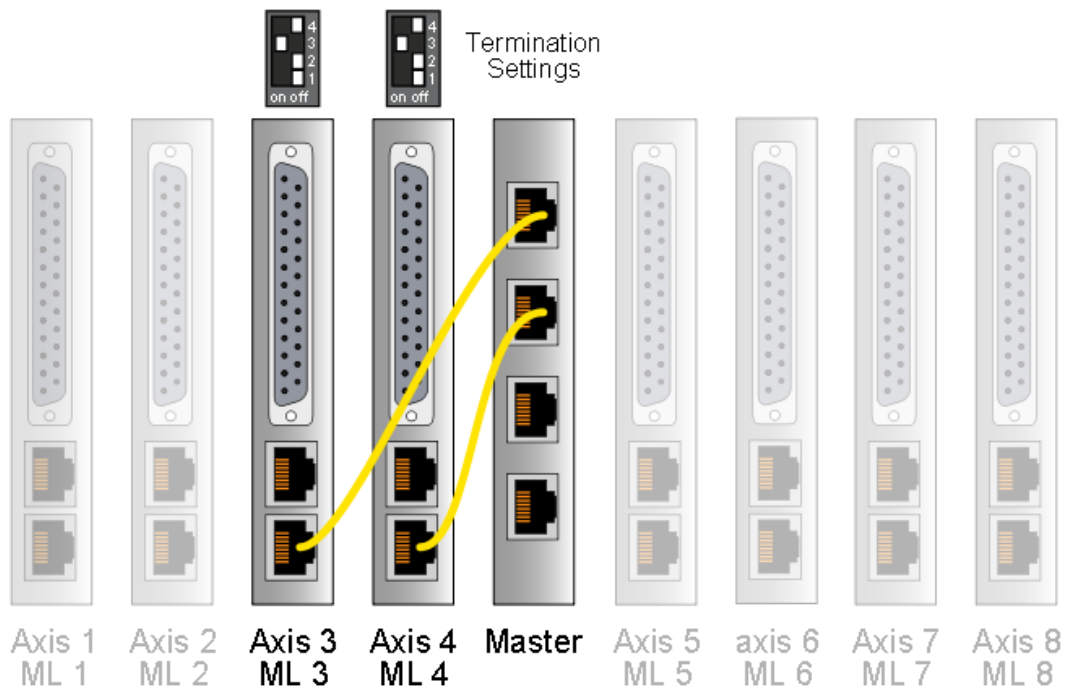
The use of the Control word and Motion Command interface is described in [1]. The real time configuration module is described in [2].

5.2 PLC Setup with different numbers of Axis

5.2.1 PLC Setup with 1 Axis



5.2.2 PLC Setup with 2 Axis



Projektnavigation PN_Tst_BB050_12 > PLC_1 [CPU 1215C AC/DC/Rly] > Dezentrale Peripherie > PROFINET IO-System (100)-PN/E_1 > BB050-ML-PN_1

Hardware-Katalog

Geräte

Geräteübersicht

Baugruppe	Baugr...	Steck...	E-Adresse	A-Adresse	Typ	Bestell-Nr.	Firmware	Kommentar
BB050-ML-PN_1	0	0			BB050-ML-PN V1.0	0150-1880	T_ID_SW_Ver	
PN-I/O	0	0 x1			BB050-ML-PN			
Axis 3_1	0	1	60...93	60...99	Axis 3		1.0	
Axis 4_1	0	2	94...119	100...131	Axis 4		1.0	
	0	3						
	0	4						
	0	5						
	0	6						
	0	7						
	0	8						

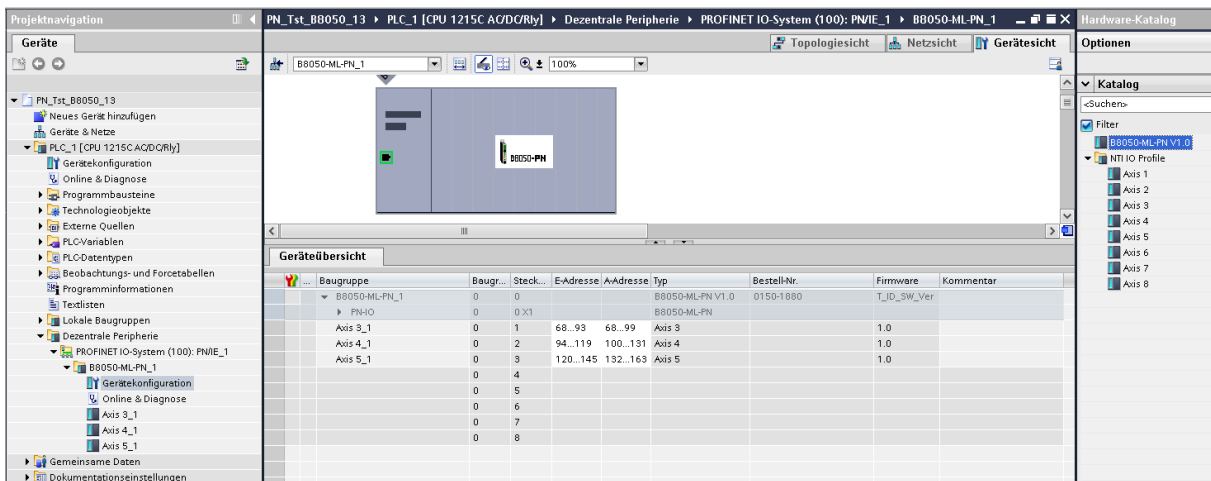
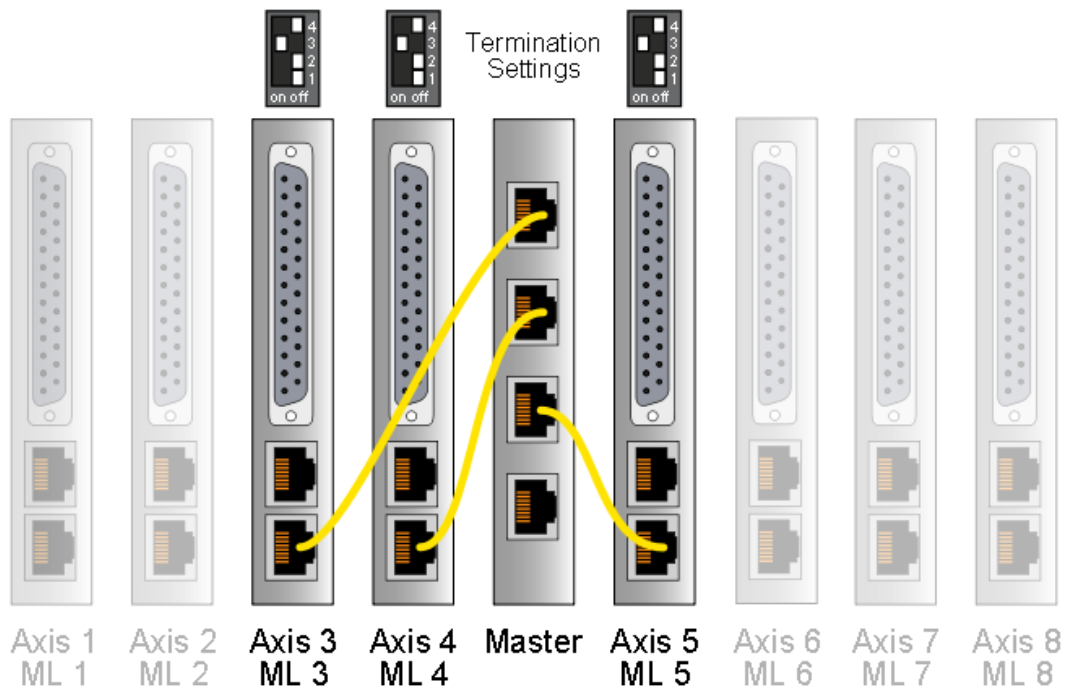
Options

Katalog

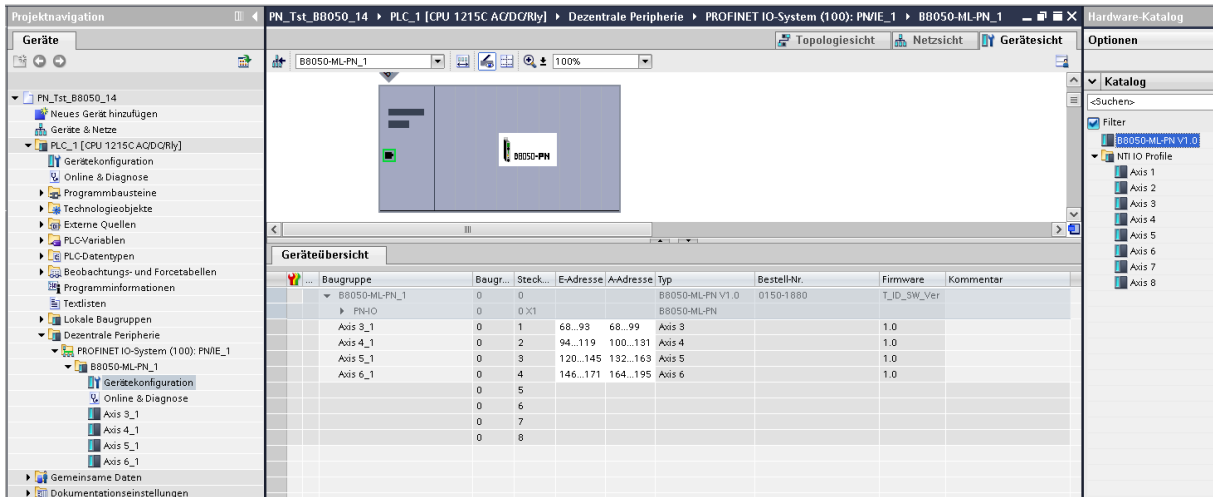
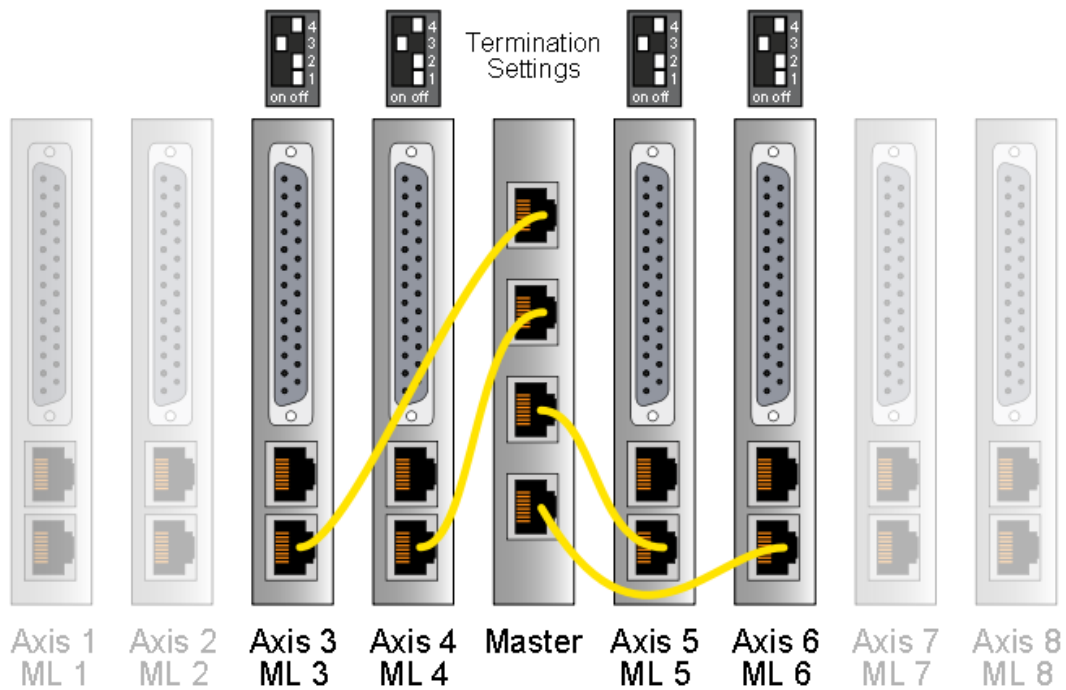
Filter

- BB050-ML-PN V1.0
 - NTI IO Profile
 - Axis 1
 - Axis 2
 - Axis 3
 - Axis 4
 - Axis 5
 - Axis 6
 - Axis 7
 - Axis 8

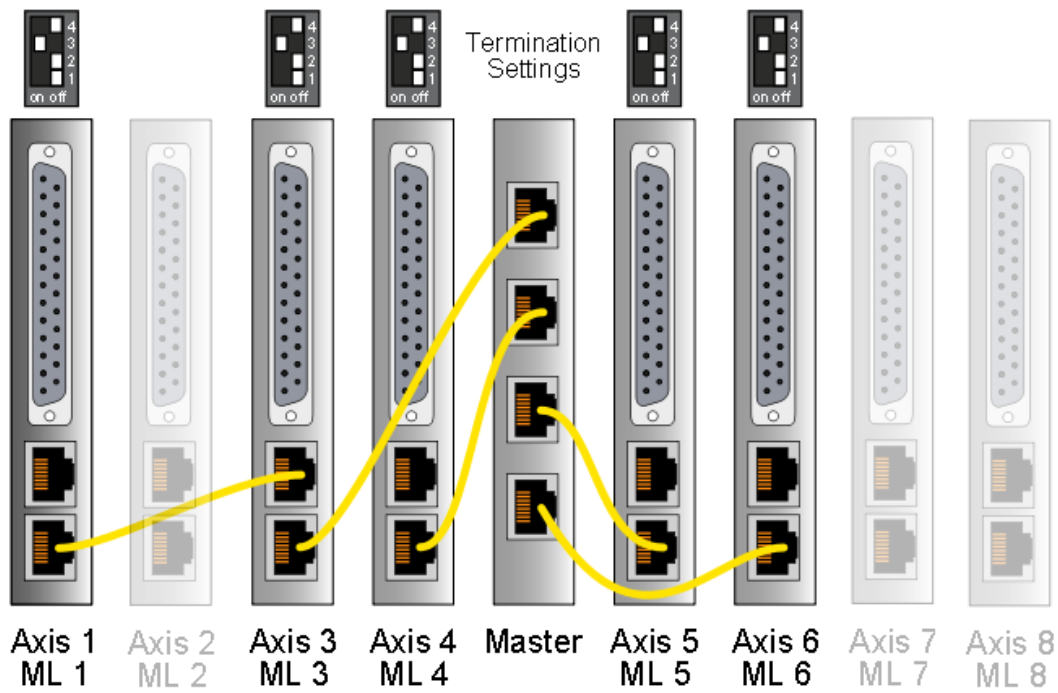
5.2.3 PLC Setup with 3 Axis



5.2.4 PLC Setup with 4 Axis

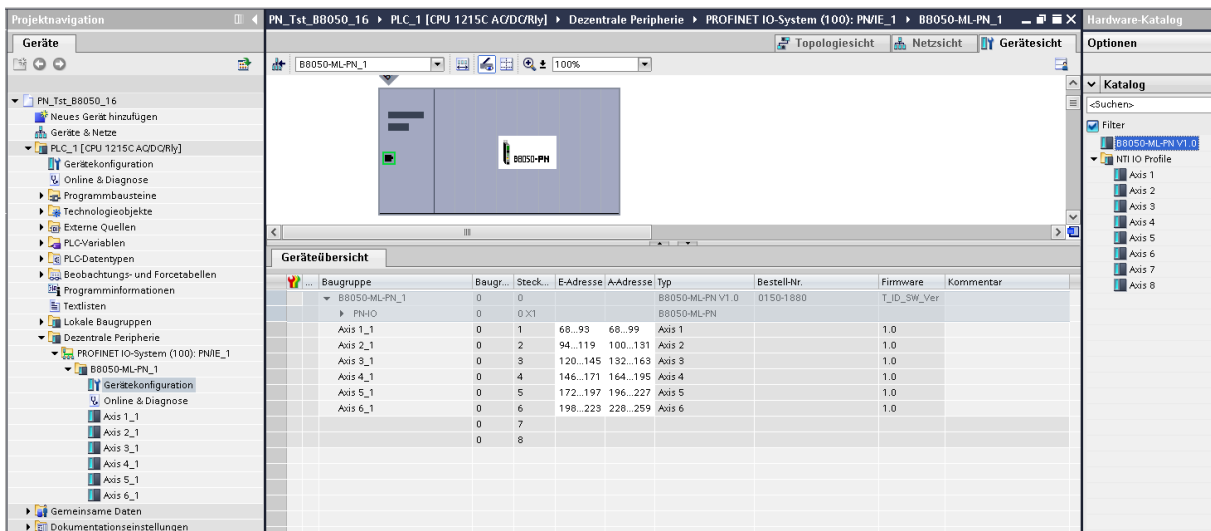
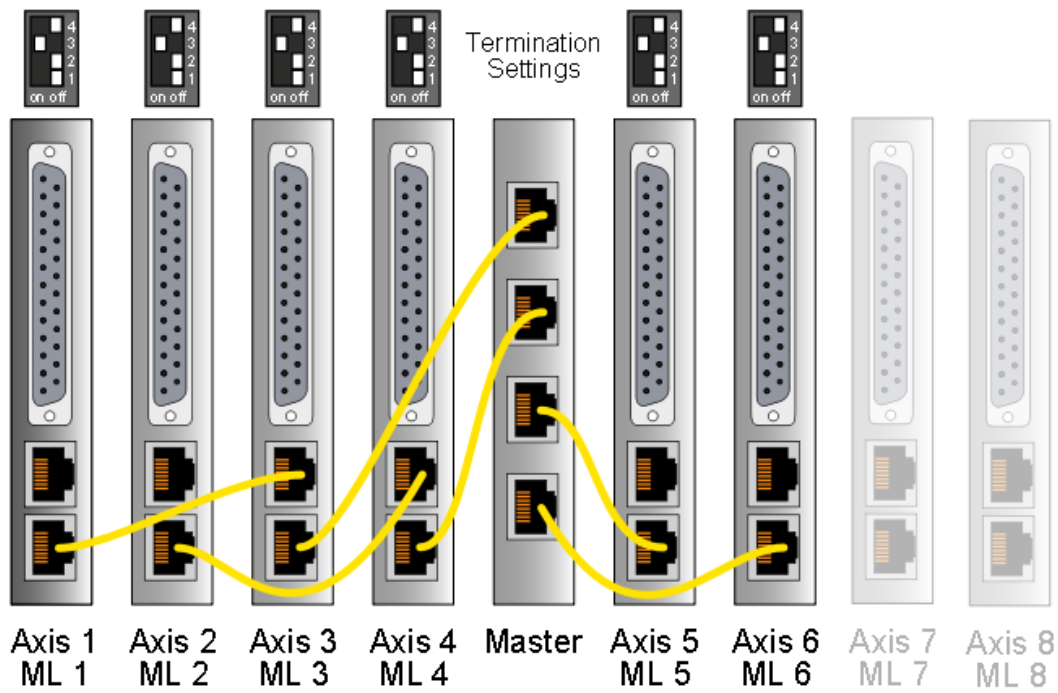


5.2.5 PLC Setup with 5 Axis

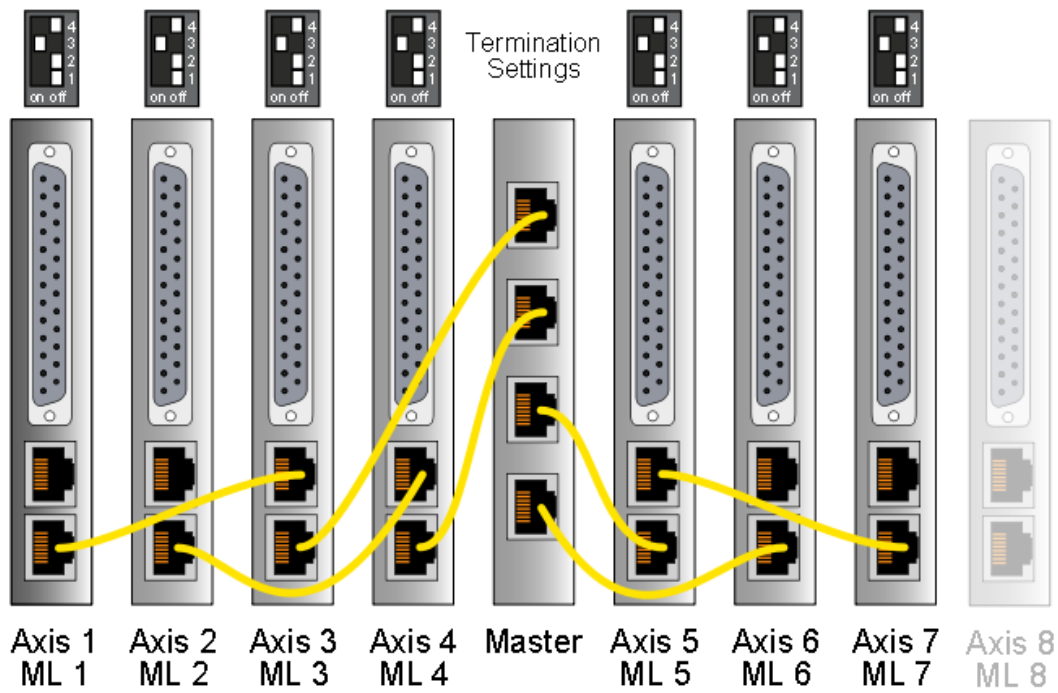


Y	Baugruppe	Baugr...	Steck...	E-Adresse	A-Adresse	Typ	Bestell-Nr.	Firmware	Kommentar
	B8050-ML-PN_1	0	0			B8050-ML-PN V1.0	0150-1880	T_ID_SW_Ver	
	PH-IO	0	0 X1			B8050-ML-PN			
	Axis 1_1	0	1	68...93	68...99	Axis 1		1.0	
	Axis 3_1	0	2	94...119	100...131	Axis 3		1.0	
	Axis 4_1	0	3	120...145	132...163	Axis 4		1.0	
	Axis 5_1	0	4	146...171	164...195	Axis 5		1.0	
	Axis 6_1	0	5	172...197	196...227	Axis 6		1.0	
		0	6						
		0	7						
		0	8						

5.2.6 PLC Setup with 6 Axis



5.2.7 PLC Setup with 7 Axis

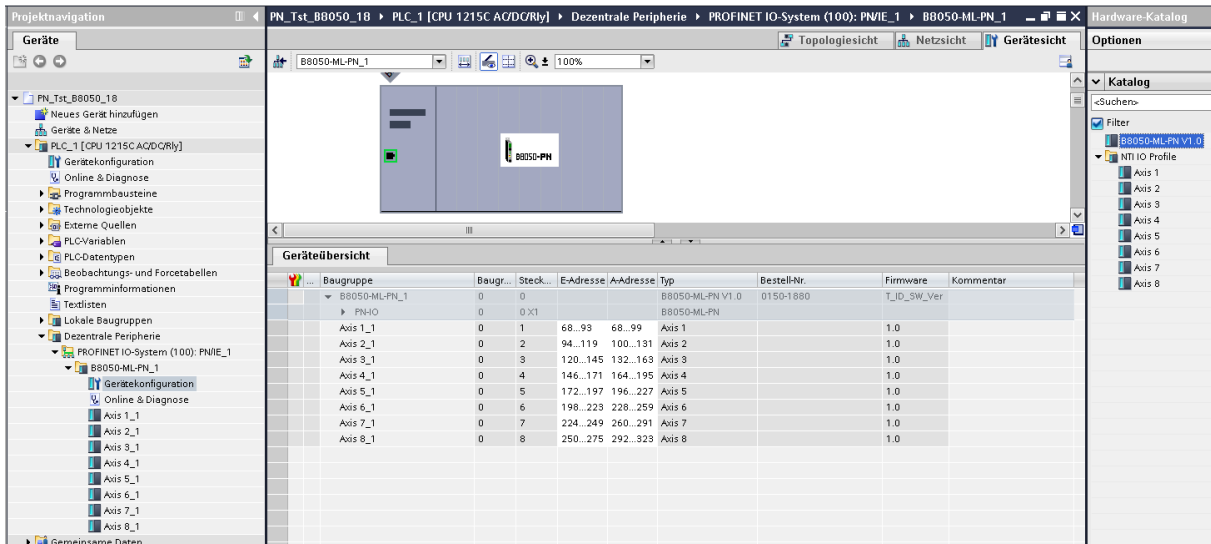
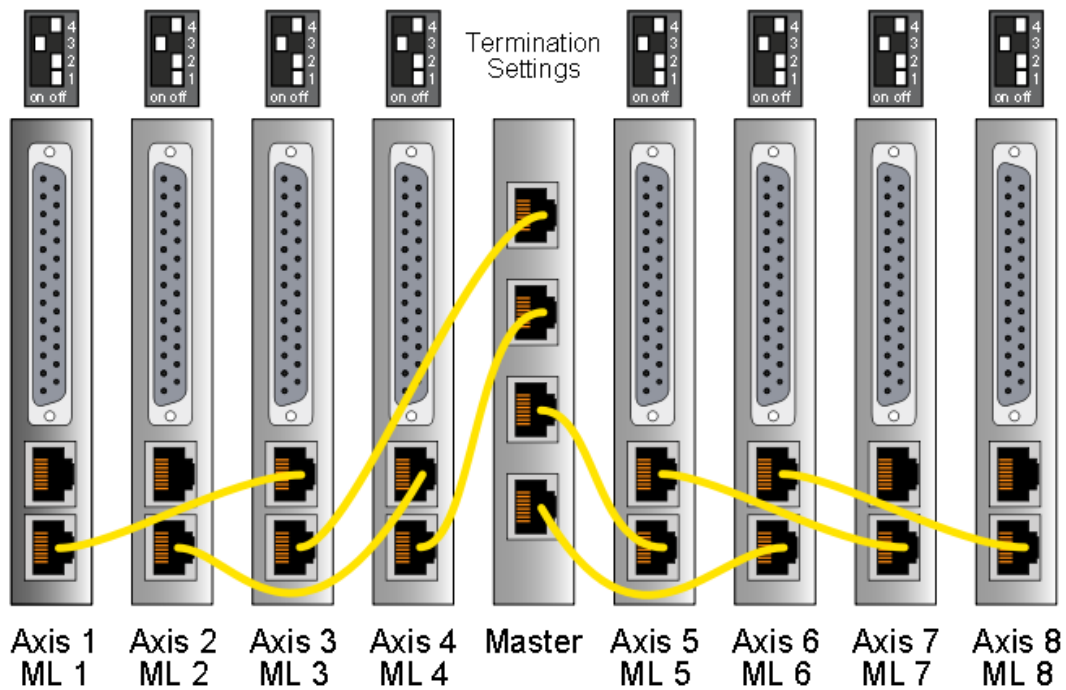


Projektnavigation: PN_Tst_BB050_17 > PLC_1 [CPU 1215C AC/DC/Rly] > Dezentrale Peripherie > PROFINET IO-System (100): PNIE_1 > BB050-ML-PN_1

Hardware-Katalog: BB050-ML-PN V1.0

Baugruppe	Baugr...	Steck...	E-Adresse	A-Adresse	Typ	Bestell-Nr.	Firmware	Kommentar
BB050-ML-PN_1	0	0			BB050-ML-PN V1.0	0150-1880	T_ID_SW_Ver	
PH-O	0	0 X1			BB050-ML-PN			
Axis 1_1	0	1	68..98	68..99	Axis 1		1.0	
Axis 2_1	0	2	94..119	100..131	Axis 2		1.0	
Axis 3_1	0	3	120..145	132..163	Axis 3		1.0	
Axis 4_1	0	4	146..171	154..195	Axis 4		1.0	
Axis 5_1	0	5	172..197	196..227	Axis 5		1.0	
Axis 6_1	0	6	198..223	228..259	Axis 6		1.0	
Axis 7_1	0	7	224..249	260..291	Axis 7		1.0	
		8						

5.2.8 PLC Setup with 8 Axis



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E-Mail: usasales@linmot.com
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Please visit <http://www.linmot.com> to find the distributor closest to you.

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