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AKD PDMM™
Quick Start



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Valid for Hardware Revision DB
Patents Pending
Part Number 903-200014-00
Keep all manuals as a product component during the life span of the product.
Pass all manuals to future users / owners of the product.

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Before You Begin

Safety Precautions

Before installing, review the safety instructions included in the *AKD PDMM Installation Manual*. Failure to follow these safety instructions may result in user injury or damage to equipment. The *AKD PDMM Installation Manual* is available on the CD included with the *AKD PDMM*, and also on the Kollmorgen website: www.kollmorgen.com.

Required Tools and Equipment

- Two M4 hexagon socket cap screws (DIN 912)
- 3 mm T-handle Allen key
- No. 2 Phillips head screwdriver
- Small slotted screwdriver
- Microsoft Windows XP or Windows 7 equipped PC with an available Ethernet port for connecting to the PDMM. Windows screenshots in this guide show the XP envi ronment.

Installing the PDMM

Install the hardware by following the steps detailed in this guide:

Step 1 Secure the Drive and Connect the Protective Earth (PE) **5**
Step 2 Connect Logic Power and STO (X1 Connector) **5**
Step 3 Connect Motor Power (X2 Connector) **6**
Step 4 Connect Feedback (X10 Connector) **7**
Step 5 Connect I/O (X7, X8, X35, and X36 Connectors) **8**
Step 6 Connect AC Input Power (X3 and X4 Connectors) **9**
Step 7 Connect Drive Communication (X32) **10**
Step 8 Confirm Connections **13**

After installing the hardware, install the Kollmorgen Automation Suite Integrated Development Environment (KAS IDE) from the CD or website and configure the drive through your PC as follows:

Step 9 Install and Start KAS IDE **15**
Step 10 Starting a New Project in the KAS IDE **17**
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AKD PDMM Wiring Diagram

Figure 1 summarizes wiring of the AKD PDMM. Detailed wiring diagrams are included at the end of this Quick Start guide.

Steps 1 through 8 of this guide provide detailed information for each connection shown below:

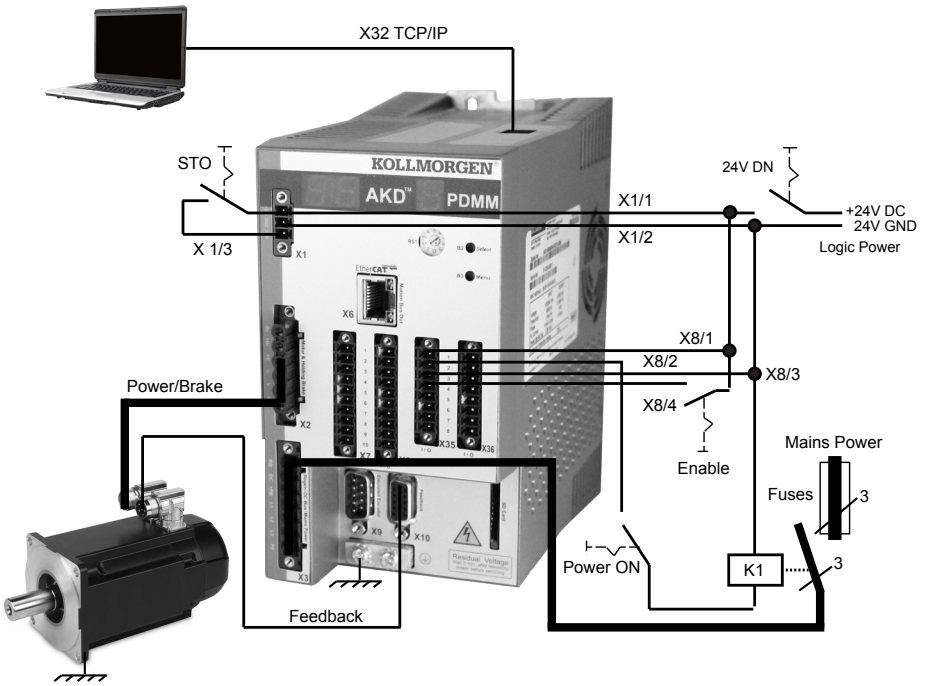


Figure 1. AKD PDMM Wiring Diagram

Step 1: Secure the Drive and Connect the Protective Earth

Tools:
- Two M4 hexagon socket cap screws (DIN 912)
- 3 mm T-handle Allen key
- No. 2 Phillips head screwdriver

Bolt the AKD PDMM to a conductive metal plate. See the *AKD PDMM Installation Manual* for the dimensions and mounting information on your specific drive model.

Connect the protective earth (PE) to any ground screw on the drive grounding lug shown in **Figure 2**.

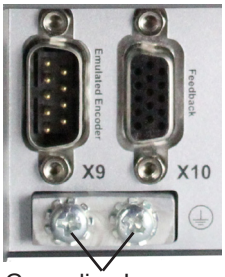
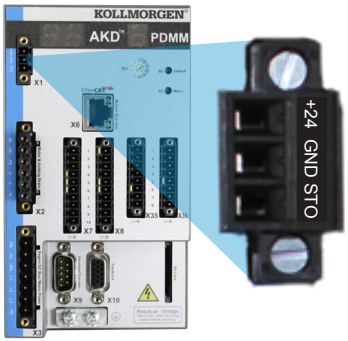


Figure 2. Protective Earth (PE) Connection

Step 2: Connect Logic Power and STO (X1 Connector)

Safe Torque Off (STO) is a restart lock safety feature that protects personnel by preventing an unintentional system restart. To use this feature, the STO pin must be connected to the output of a security control or a safety relay. The safety relay must comply with the requirements of the SIL 2 according to IEC 61800-5-2, PL d according to ISO 13849-1.

Connect logic supply and safe torque off (STO) as shown in **Figure 3**.



Pin	Signal	Description
1	+24 Vdc	Logic power
2	24 V GND	Supply GND
3	STO	STO enable

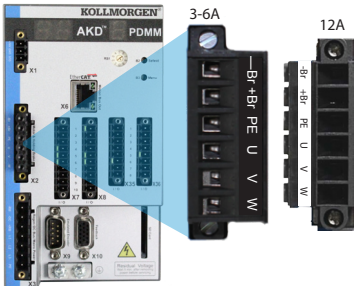
Figure 3. Logic Supply Pin Configuration

Please note the following when connecting logic power supply:

- Input current of up to 2A is required. If the brake relay is used, current of up to 4A must be supplied.
- Check your motor holding brake amperage requirements in order to size the 24 Vdc power supply.
- If STO is not needed, then pin 3 must be connected directly with +24 Vdc. The STO is then bypassed and cannot be used.
- Consult the installation manual for the proper wiring and use of STO.

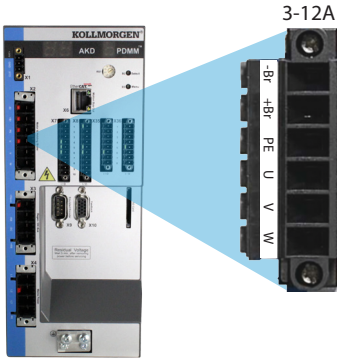
Step 3: Connect Motor Power (X2 Connector)

Wire the motor power cable to the X2 mating connector according to **Figures 4**, **5**, and **6** as appropriate.



Pin	Signal	Description
1	-Br	Motor holding brake, negative
2	+Br	Motor holding brake, positive
3	PE	Protective earth (motor housing)
4	U	Motor phase U
5	V	Motor phase V
6	W	Motor phase W

Figure 4. Connector X2, AKD PDMM- xxxx06



Pin	Signal	Description
1	-Br	Motor holding brake, negative
2	+Br	Motor holding brake, positive
3	PE	Protective earth (motor housing)
4	U	Motor phase U
5	V	Motor phase V
6	W	Motor phase W

Figure 5. Connector X2, AKD PDMM-xxxx07

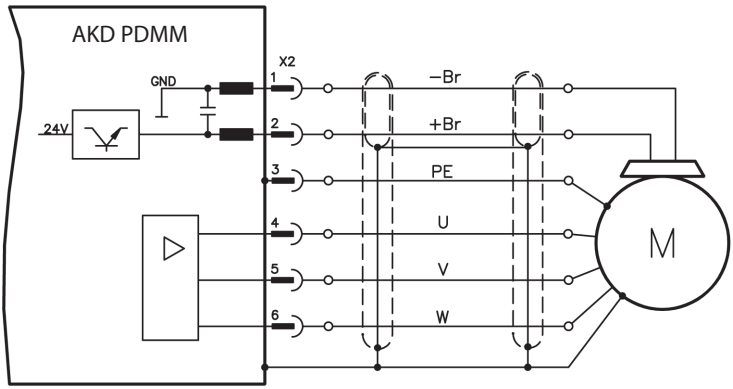


Figure 6. Motor Power Wiring Details, Cable length <= 25 m

Please note the following when connecting motor power:

- Refer to the wiring diagram included with your cable before connecting motor power.
- Some drive models do not have brake leads.
- Wire gauge required varies with drive amperage.

Step 4: Connect Feedback (X10 Connector)

Connect the feedback from the motor to the X10 connector according to **Figure 7**. Standard Kollmorgen motor feedbacks are plug-and-play and require no parameter setting for motor recognition and commutation to occur.

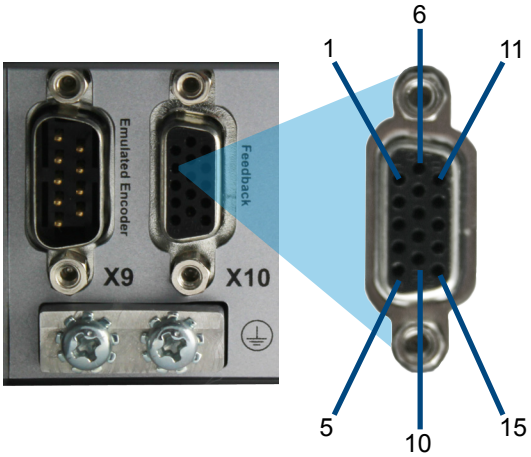


Figure 7. Feedback connection

Step 5: Connect I/O (X7, X8, X35, and X36 Connectors)

Connect required I/O according to the configuration shown in **Figure 8**. All pins are configurable; factory presets are shown in the pin configuration table.

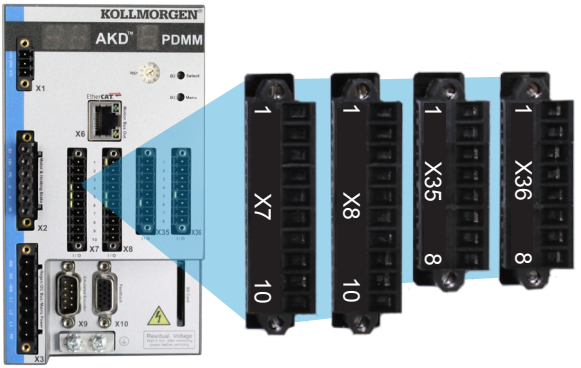


Figure 8. I/0 Connection Pin Configuration

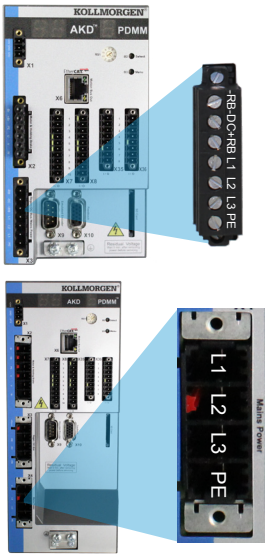
Connector	Pin	Signal	Recommended Function	Specials
X7	1	Digital Common X7	Common line for X7 pins 2,3,4,9	N/A
X7	2	Digital Input 7	Programmable	N/A
X7	3	Digital Input 4	Programmable	N/A
X7	4	Digital Input 3	Programmable	N/A
X7	5	Digital Output 2-	Programmable	N/A
X7	6	Digital Output 2+	Programmable	N/A
X7	7	Digital Output 1-	Programmable	N/A
X7	8	Digital Output 1+	Programmable	N/A
X7	9	Digital Input 2	Reference Point	High speed
X7	10	Digital Input 1	Home Switch	High speed
X8	1	Fault Relay Output	N/A	N/A
X8	2	Fault Relay Output	N/A	N/A
X8	3	Digital Common X8	Common line for X8 pins 4, 5, 6	N/A
X8	4	Digital Input 8	Hardware enable	Not programmable
X8	5	Digital Input 6	Negative limit switch	N/A
X8	6	Digital Input 5	Positive limit switch	N/A
X8	7	Analog Ground	Analog GND	N/A
X8	8	Analog Output +	Actual velocity voltage	N/A
X8	9	Analog Input -		N/A
X8	10	Analog Input +		N/A

X35	1	Digital Common X35	Common line for X35 pins 2,3,4	N/A
X35	2	Digital Input 21	Programmable	N/A
X35	3	Digital Input 22	Programmable	N/A
X35	4	Digital Input 23	Programmable	N/A
X35	7	Digital Output 21-	Programmable	N/A
X35	8	Digital Output 21+	Programmable	N/A
X36	1	Digital Common X36	Common line for X36 pins 2,3,4	N/A
X36	2	Digital Input 24	Programmable	N/A
X36	3	Digital Input 25	Programmable	N/A
X36	4	Digital Input 26	Programmable	N/A
X36	7	Digital Output 22-	Programmable	N/A
X36	8	Digital Output 22+	Programmable	N/A

Digital common lines for X7,X8, X35, and X36 are not common to each other.
Connect the DCOMx line to the 0V of the I/O supply when using “source” type sensors with digital inputs. Connect the DCOMx line to the 24 V of the I/O supply when using “sink” type sensors with digital inputs.

Step 6: Connect AC Input Power (X3 and X4 Connectors)

Connect AC input power for your AKD PDMM model as shown in **Figures 9** and **10**. Do not apply power until all hardware connections are made.



Pin	Signal	Description
AKD PDMM-x00306 to AKD PDMM-x00606 (X3)		
4	L1	Line 1
5	L2	Line 2
6	L3	Line 3
7	PE	Protective Earth
AKD PDMM-x01206 (X3)		
5	L1	Line 1
6	L2	Line 2
7	L3	Line 3
8	PE	Protective Earth

Figure 9. Input power pin configurations

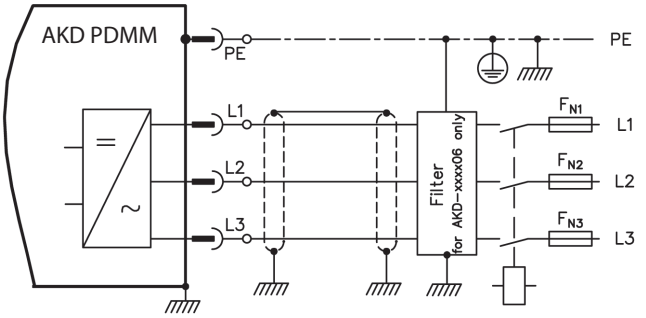


Figure 10. AC Input power wiring diagram

Please note the following when connecting AC input power:

- Single-phase operation is available on AKD PDMM-x00306, AKD PDMM-x00606, and AKD PDMM-x01206 models. For a single phase AC line, connect L1 and L2, with L3 left open circuited. The PE is connected in the same manner as 3-phase operation.
- A pre-installed jumper is included if the unit has internal braking resistor. For external braking resistor use, please consult the installation manual.

Step 7: Connect AKD PDMM Communication (X32)

1. Assign an IP Address
To establish communication between the PC and the AKD PDMM, you must first set the AKD PDMM IP address using either static or dynamic IP addressing.

a. Static IP addressing (switch setting 1 to 9):
The S1 rotary switch on the front panel of the AKD PDMM corresponds to its IP address setting.

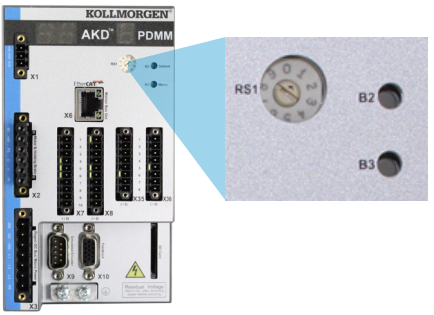


Figure 11. Rotary switch for static IP addressing

IP address = 192.168.0.S1
For example, if S1 is set to 3, then the IP address is 192.168.0.103

b. Dynamic IP addressing (DHCP and Auto-IP):

If the S1 switch is set at 0, then the drive is in Dynamic Host Configuration Protocol (DHCP) mode. The AKD PDMM will acquire its IP address from an external DHCP server if one is present in the network.

If a DHCP server is not present, then the AKD PDMM will assume an automatic private IP address of the form 169.254.0.xx. If your PC is directly connected to the AKD PDMM and set to obtain an IP address automatically in the TCP/IP settings, then a connection is established between the devices using compatible automatically generated addresses. This connection can require as long as a minute to complete.

c. Displaying the IP Address

Press the B3 button to display the IP menu item, then press B2 to activate the selection. The IP address will then be displayed on the 7-segment LED. If an Ethernet cable is connected at power-on, the IP address will automatically be displayed on the 7-segment LED during the power-on boot sequence.

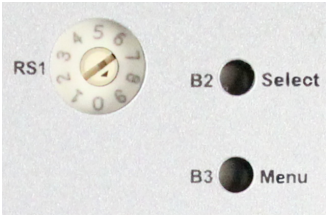


Figure 12. B2 & B3 Pushbuttons

d. Changing the IP address:

If the AKD PDMM is not powered on, then you can change the IP address using the rotary switch, and the change takes effect upon AKD PDMM restart. You can also change the IP address while the AKD PDMM is powered on. If you move the rotary switch while 24 V logic power is supplied to the drive, then you must unplug the network cable from the AKD PDMM for three seconds or longer. This action will reset the address and the new address will take effect when the cable is plugged in again.

2. Connect the AKD PDMM to the Network

After you have assigned the AKD PDMM IP address, you have two connection options: direct connection or hub/switch/router connection.

Option A: Direct Connection

1. Connect the AKD PDMM directly to the PC using a standard Ethernet (straight) patch cable. You can also use a crossover cable, since the drive detects the cable type automatically. Use static IP addressing for a direct connection.

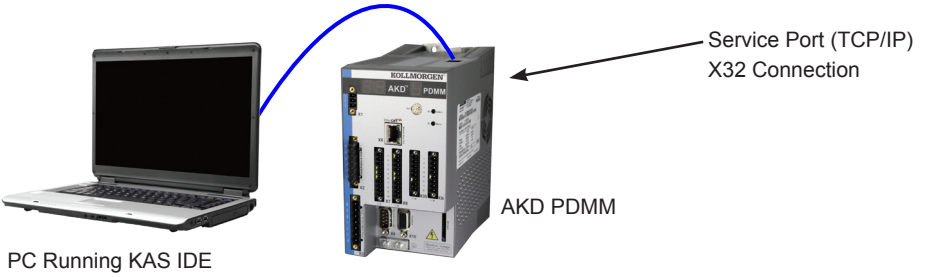


Figure 13. Option A. Direct Connection

2. Set the PC IP address. In Windows, select **Start>Control Panel>Network Connections**. Choose the correct network connection for the port over which you will connect to the AKD PDMM.

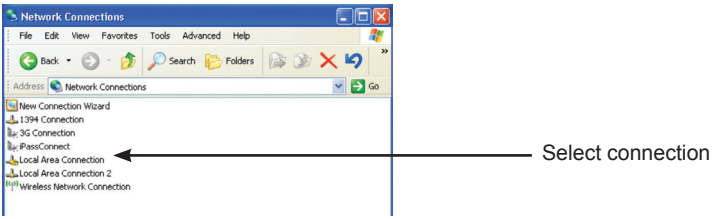


Figure 14. Network Connection Selection

3. In the network connection window, scroll to Internet Protocol (TCP/IP) and then select **Properties**. Configure the TCP/IP properties as shown below and click **OK**.

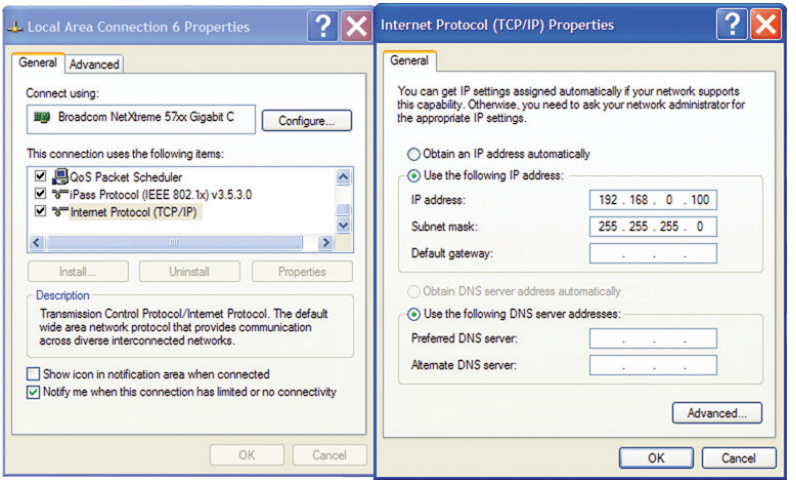


Figure 15. Network Connection Properties

4. Check the AKD PDMM address setting and make sure that S1 is set to a nonzero value (static IP connection).

The connection is now configured to establish a point-to-point direct connection between the AKD PDMM and the PC using the KAS IDE. You can now skip to Step 8.

Option B: Network device connection

1. Set the rotary switch on the AKD PDMM to zero.

2. Connect the AKD PDMM and the PC to the network. The network must include a DHCP server (usually standard in corporate networks). If the network does not have a DHCP server, you can connect using a stand-alone router with a built-in DHCP server. In either case, both the PC and the AKD PDMM acquire IP addresses auto matically.

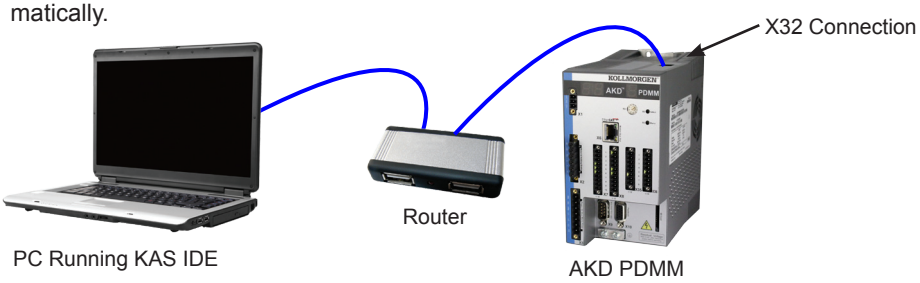


Figure 16. Option B: Connection to a Router

Step 8: Confirm Connections

After completing Steps 1 through 7, you can turn on logic power to the AKD PDMM through the X1 connector (bus voltage is not needed for communications). The AKD PDMM has two LED displays:



Figure 17. LED Displays

Left Display (Drive LED)

Step	Display	Description
1		Power on
2		

Step	Display	Description
3		
4		Drive operational mode (not enabled)
5		Drive operational mode (enabled)

Right Display (Controller LED):

Step	Display	Description
1		Power on
2		Boot sequence
3		IP address
4		Operational - program not running
5		Operational - program running

Confirm that the link LEDs on the AKD PDMM(green LED on the RJ45 connector) and on your PC are both illuminated. If both LEDs are illuminated, then you have a working electrical connection.

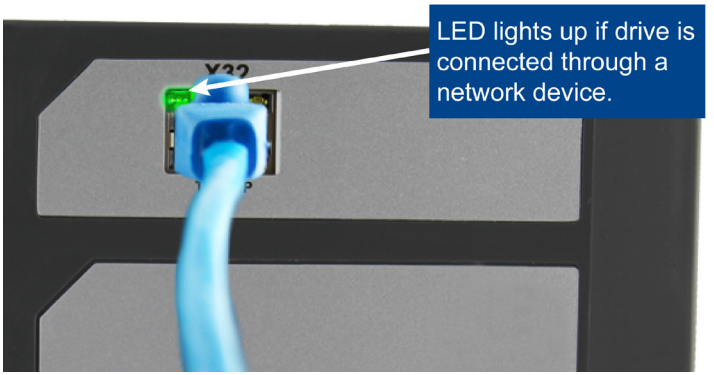


Figure 18. Active connection LED

While the PC is connecting, your taskbar will show the following acquiring icon:



Wait for this icon to change to the limited functionality icon (this process can take up to one minute).



Although Windows displays this limited functionality icon for the AKD PDMM connection, the PC can communicate fully with the AKD PDMM. Using the KAS IDE, you can now configure the AKD PDMM through this connection.

Software Setup

Step 9: Install and Start the KAS IDE

Once the Kollmorgen Automation Suite Integrated Development Environment (KAS IDE) installation is complete, click the IDE icon to launch the program.

NOTE The KVB software used for developing an HMI display does not install with the KAS IDE and must be installed separately.

Begin a new project in the KAS IDE by selecting **File > New**. This will launch the **Add a New Controller** window.

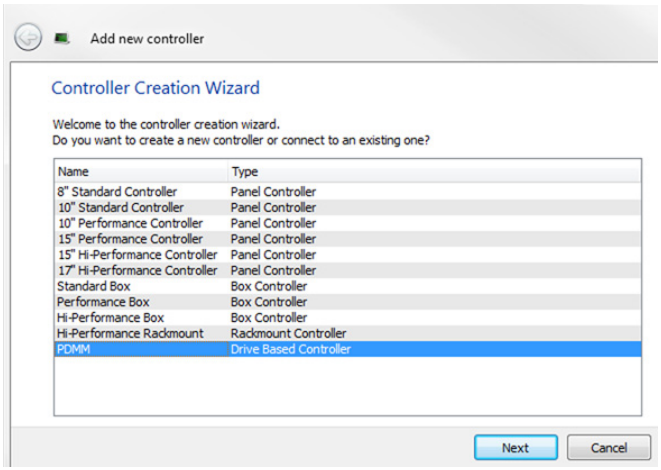


Figure 19. Add a New Controller

Select your AKD PDMM model from the list and click Next. You will then be prompted to select an application template:

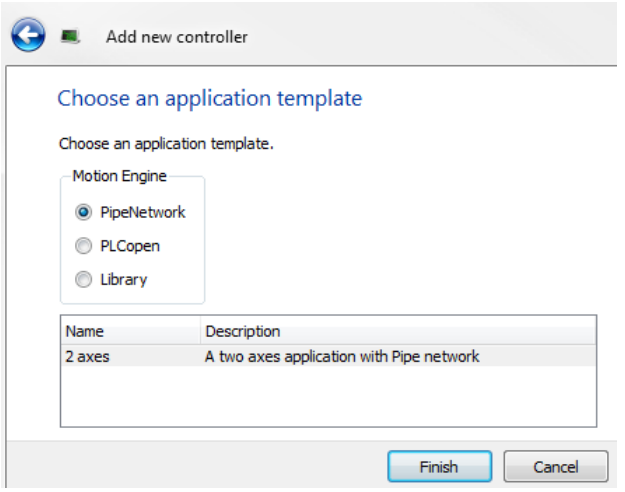


Figure 20. Select Application Template

Choose from PipeNetwork, PLCopen, or Library, and click Finish. The controller will then be added to the project view.

To associate the project with the IP address of the PDMM controller, right click on the Controller option in the Project View.

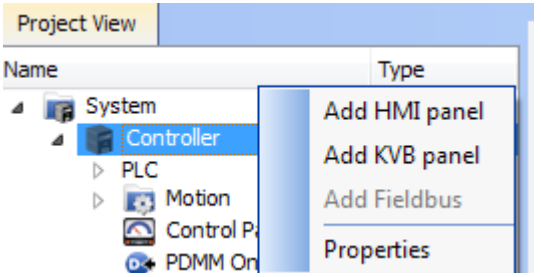


Figure 21. Controller Selection

Select Properties and the following screen appears:

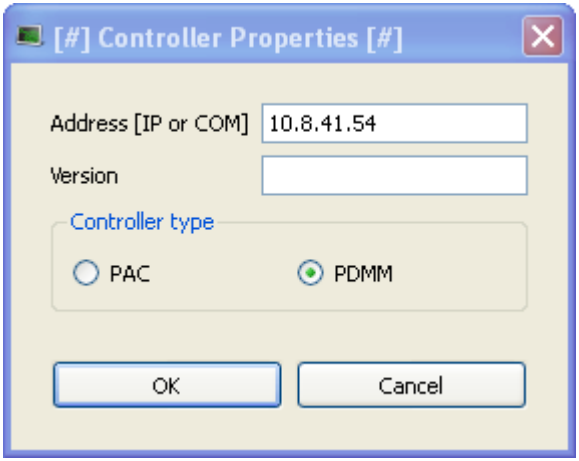


Figure 22. Controller Properties

Type in the IP address of the PDMM, set the Controller Type to PDMM and click OK.

Step 10: KAS IDE Project View

The KAS IDE contains tools for configuring the EtherCAT network, setting up and tuning the drives, adding and configuring HMIs, and creating a PLC program. For more complete information see the KAS IDE User Guide.

Once a project (new or saved) is opened, the user can open a variety of items to build a project from the Project Explorer:

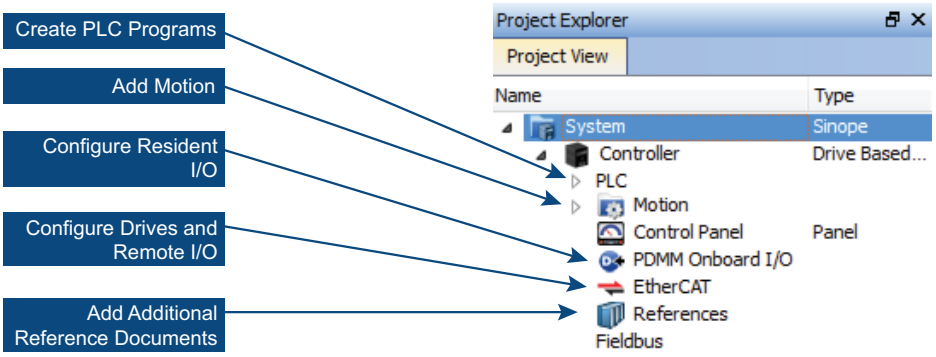


Figure 23. Project View

Step 11: Configuring the Drives and Remote I/O

All drives, including the drive in the PDMM itself and the Remote I/O, can be configured by the IDE. In order to connect to an EtherCAT device you must first compile your project. After the project is compiled you must connect to the target:



Figure 24. Compile and Connect

Next click on the EtherCAT item in the project view to bring up the EtherCAT Devices screen in the IDE workspace. Click on **Scan Devices** and the IDE will launch a view which automatically identifies your connected device(s). Click OK, to add these devices to the project.

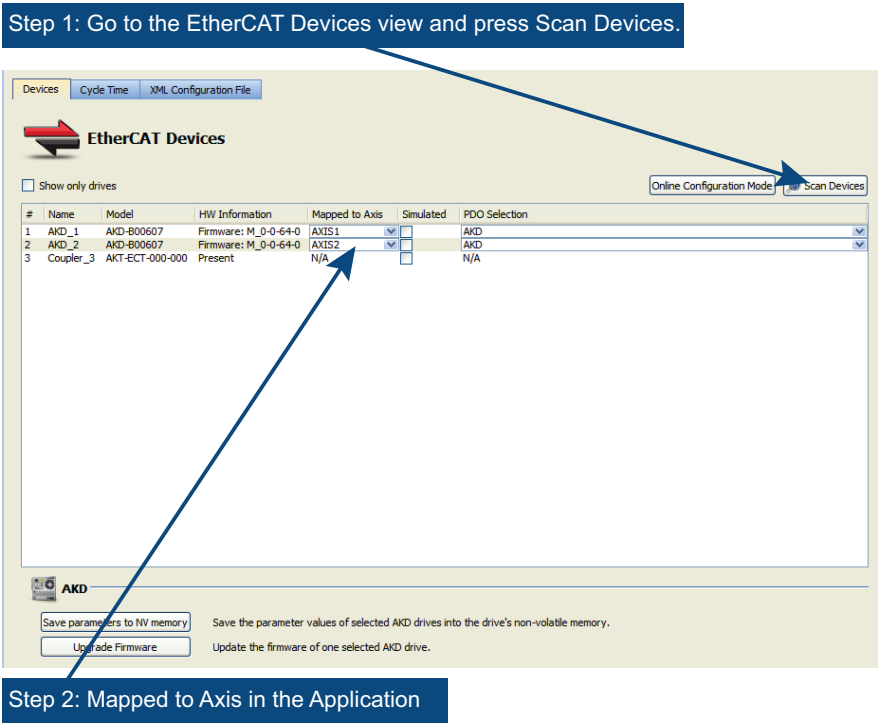


Figure 25. Scan Devices & Mapped to Axis

The devices are added to the project view:

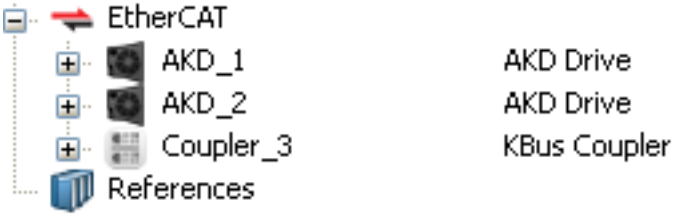


Figure 26. Devices Added to Project

To communicate directly with a drive without running a project, first compile and download the project:

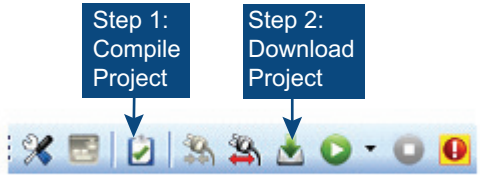


Figure 27. Compile and Download

Online Configuration Mode must also be active. Click on the EtherCAT item in the project tree and then click on the **OnlIne Configuration Mode** button next to Scan Devices:

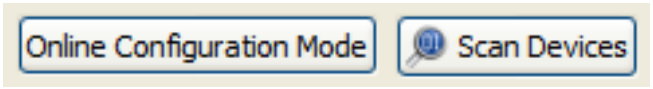


Figure 28. Online Configuration Mode

Online Configuration Mode is now active. To configure a particular item in the EtherCAT network, click on the item in the project tree. A set of screens will open in the work space that enable the user to completely configure the selected drive:

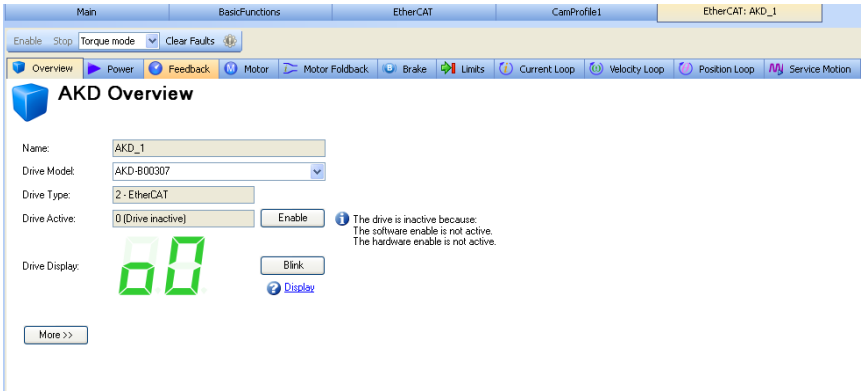


Figure 29. AKD GUI screens

Additionally, the setup wizard will guide you through a set of configuration steps:

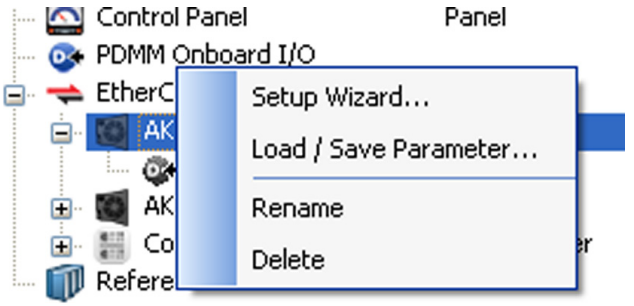


Figure 30. Setup Wizard

Step 12: Running the Axis

To perform basic motion without running a project, use the Service Motion view with the drive set to Position Mode:

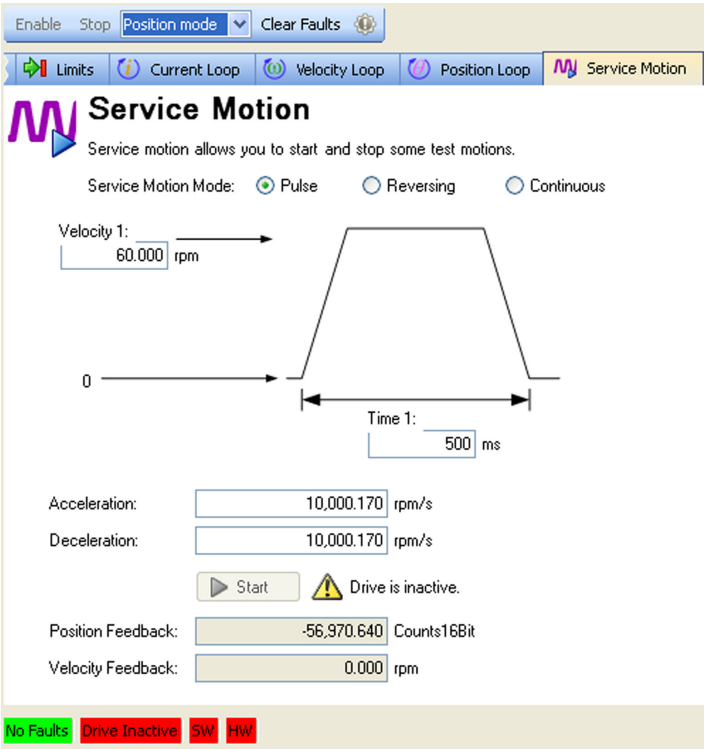
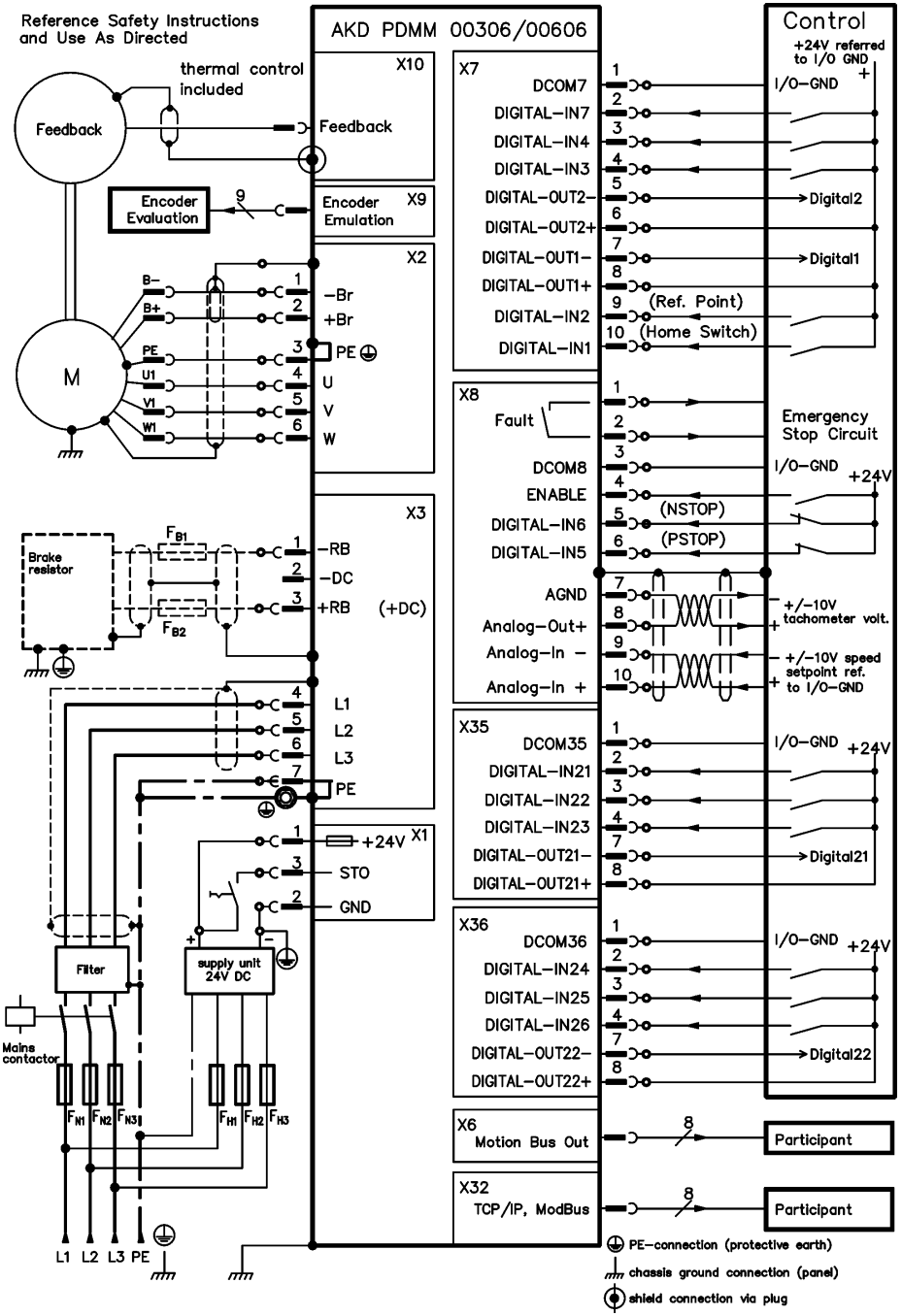


Figure 31. Service Motion

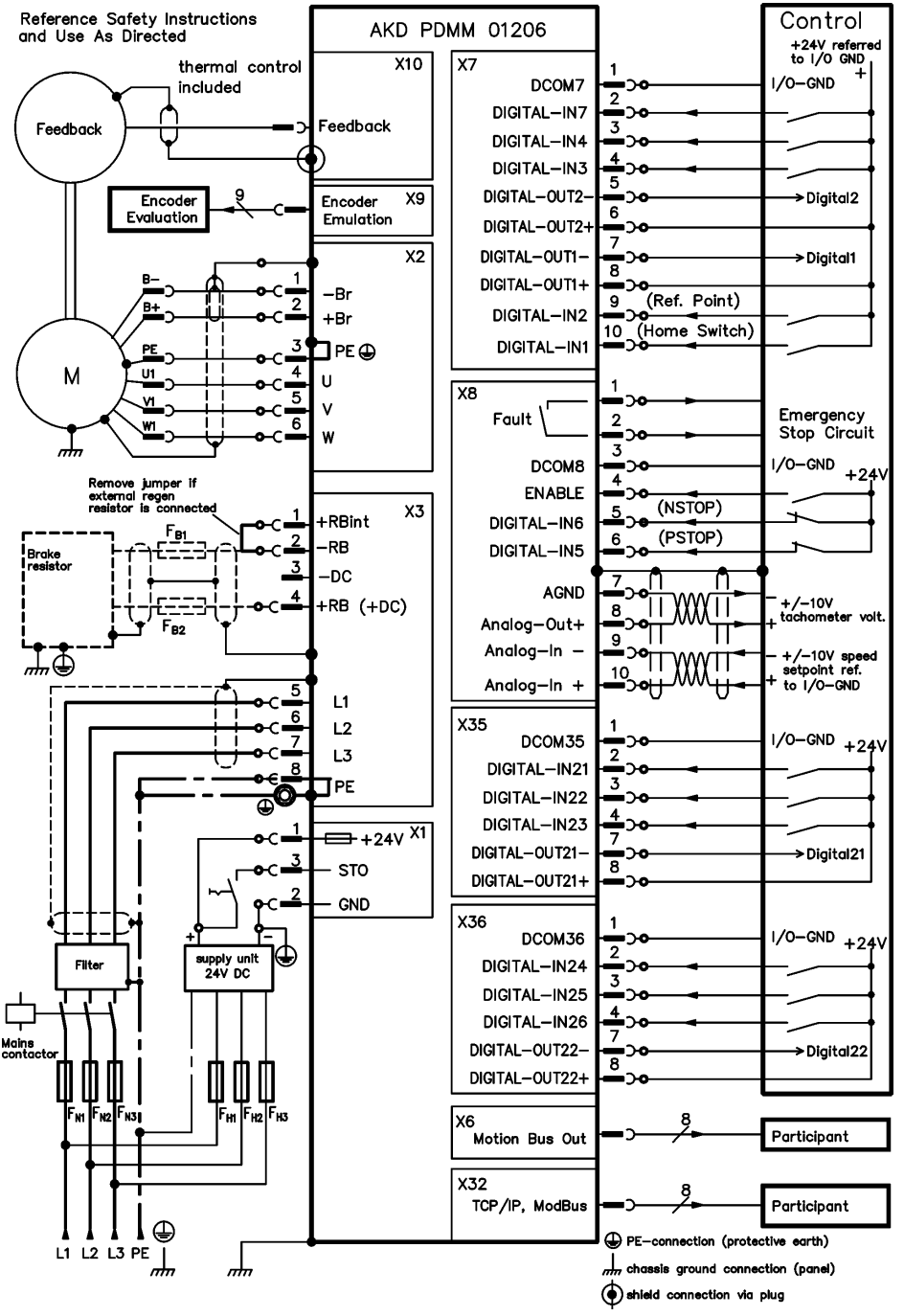
Wiring Diagram 3A and 6A, 240V

AKD PDMM-x00306 to x00606



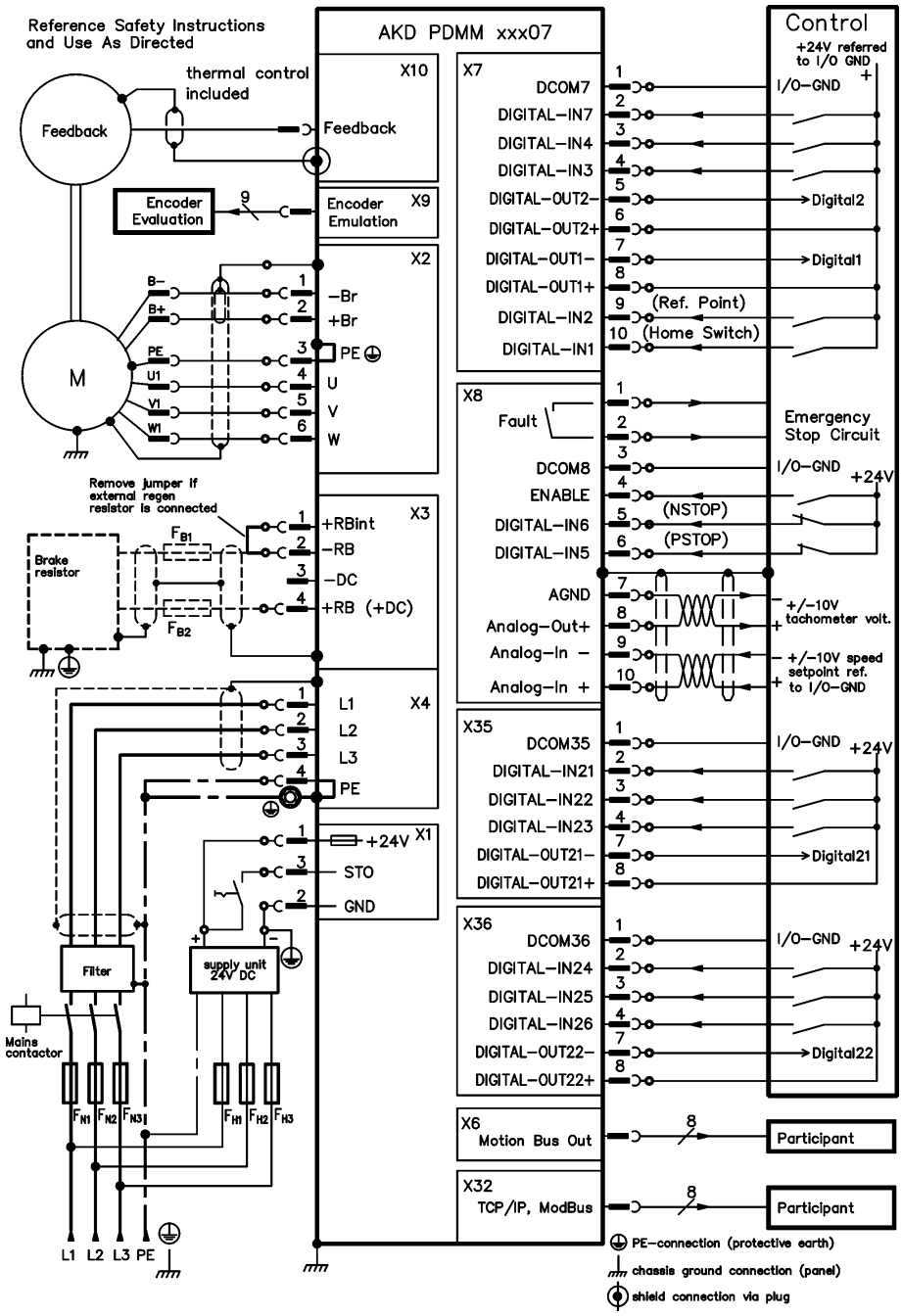
Wiring Diagram 12A, 240V

AKD PDMM-x01206



Wiring Diagram 3A, 6A, and 12A, 480V

AKD PDMM-xzzz07



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