

Servo Drives

Quick Start Guide MINAS A6 Multi

PANATERM for Safety
Safe Speed Monitoring (SSM)



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1 Introduction

1.1 Before you start

Before operating this product, read the safety instructions in the following manuals:

- [“SX-DSV03514, MINAS A6 Multi, Technical Reference – Integrated Safety Part”](#)
- [“SX-DSV03508, MINAS A6 Multi, Programming Manual – PANATERM for Safety”](#)

This product is for industrial use only.

Electrical connections must be made by qualified electrical personnel.

1.2 About this document

This “Quick Start Guide” is intended to help you set up a MINAS A6 Multi servo drive system. It is based on information from the MINAS A6 Multi series manuals and the practical experience of our engineers.

Step by step instructions will guide you through configuring and programming the Safe Speed Monitoring function (SSM) with the programming software PANATERM for Safety.

Please refer to the original documentation of our servo drive systems for detailed information. It is available free of charge in our [Panasonic Download Center](#).

1.3 Related documents

Select the following links to download the documents from our Panasonic Download Center.

- Safety specifications:
[“SX-DSV03514, MINAS A6 Multi, Technical Reference – Integrated Safety Part”](#)
- Information on wiring the MINAS A6 Multi servo drive system:
[“SX-DSV03454, MINAS A6 Multi, Reference Specifications – Driver Module”](#)
- Information on wiring the MINAS A6 Multi power supply module:
[“SX-DSV03452, MINAS A6 Multi, Reference Specifications – Power Supply Module”](#)
- Information on EtherCAT communication:
[“SX-DSV03456, MINAS A6 Multi, Technical Reference – EtherCAT Communication Specification”](#)
- Description of the servo driver functions:
[“SX-DSV03455, MINAS A6 Multi, Technical Reference – Functional Specification”](#)
- Information on safety programming:

[“SX-DSV03508, MINAS A6 Multi, Programming Manual – PANATERM for Safety”](#)

- Information on how to reduce electromagnetic interference (EMI):
[“Recommendations for EMC-compliant wiring of servo drivers and motors”](#)
- Related Quick Start Guides:
[“QS10000, MINAS A6 Multi, Position control with Beckhoff host controller over EtherCAT”](#)
[“QS10001, MINAS A6 Multi, Ethernet over EtherCAT with PANATERM”](#)
[“QS10002, MINAS A6 Multi, Safe Torque Off \(STO\)”](#)
[“QS10003, MINAS A6 Multi, Safe Stop 1 \(SS1\)”](#)
[“QS10005, MINAS A6 Multi, Position control with Omron host controller over EtherCAT”](#)
[“QS10006, MINAS A6 Multi, Position control with TRIO host controller over EtherCAT”](#)

1.4 Available software

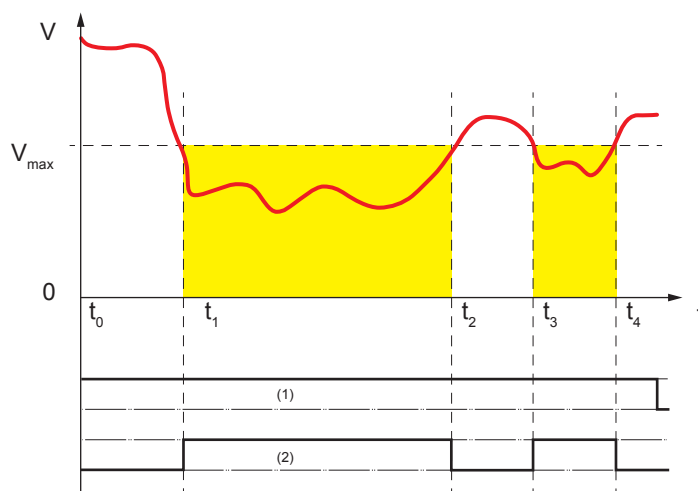
The following software is available free of charge in our [Panasonic Download Center](#):

- Programming software PANATERM for Safety for MINAS A6 Multi

2 Functional overview

Use the Safe Stop Monitoring function (SSM) to monitor the speed of the drive and to output a signal when the speed drops below a specified threshold.

Use the programming software PANATERM for Safety to set up this function for the MINAS A6 Multi servo drive system.



(1) Enabled

(2) Result output

Safe Speed Monitoring (SSM)

$[t_0, t_1[$	Speed is above the parametrized threshold. SSM result is "0".
$[t_1, t_2[$	Speed is below the parametrized threshold. SSM result is "1".
$[t_2, t_3[$	Speed is above the parametrized threshold. SSM result is "0" again.
$[t_3, t_4[$	Speed is below the parametrized threshold. SSM result is "1" again.

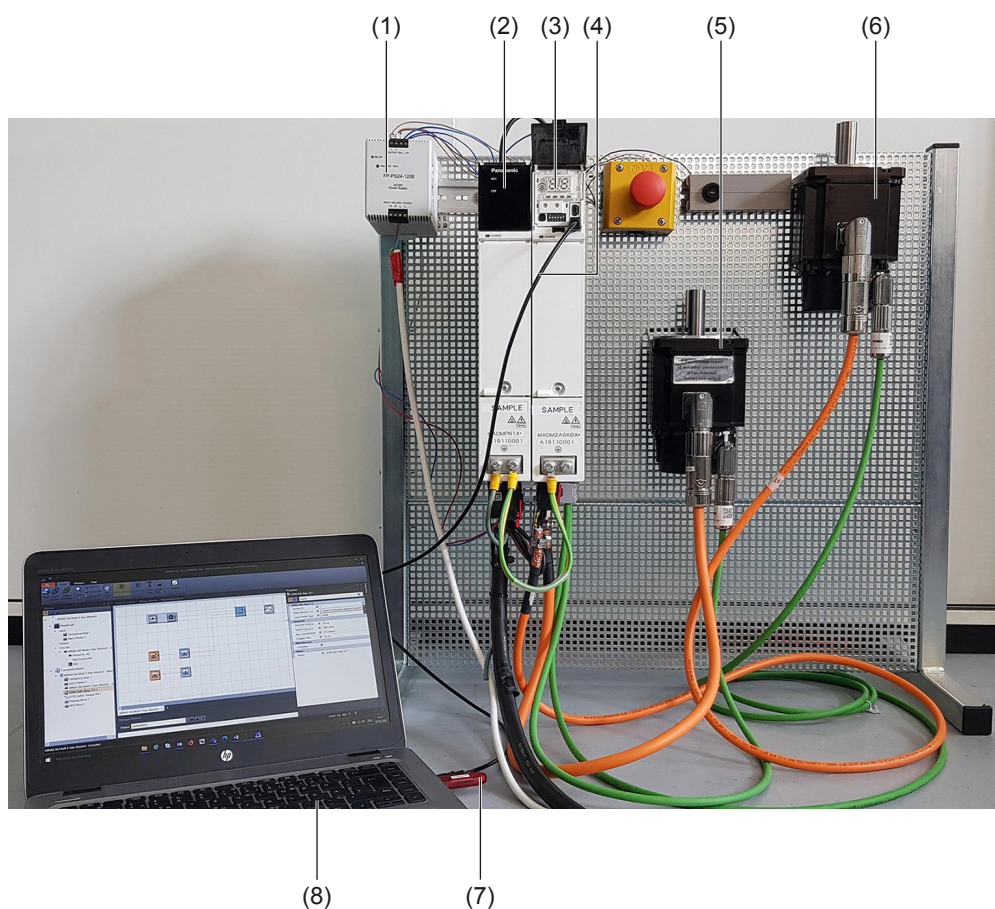
Example

A servo drive system, consisting of a 15kW power supply module, an A-size 1.5kW two-axis driver module, and two servo motors with 1.0kW and 1.5kW, is connected to a PC by a USB cable.

Use the following accessories:

- 1 x 400V AC power supply cable
Connects the MINAS A6 Multi power supply module to the main power supply (400V AC).
- 1 x 24V DC power supply cable
Connects the power supply unit (24V DC) and the host controller.
- 1 x grounding wire (M4 round terminal)
Connects the PE terminals of the power supply module and the driver module.
- 2 x Panasonic motor cable
Connects the motor and the driver module.

- 2 x Panasonic encoder cable
Connects the encoder and the driver module.
- 1 x RJ11 communication cable (2 x RJ11 plug)
Connects the power supply module and the driver module.
- 1 x feed bus bar (50mm) with end cap for the DC link bus (535V DC to 675V DC)
Connects the power supply module and the driver module.
- 1 x feed bus bar (50mm) with end cap for the control bus (24V DC)
Connects the power supply module and the driver module.
- 1 x USB license dongle
- 1 x USB cable



- (1) Power supply unit (24V DC)
- (2) MINAS A6 Multi power supply module (400V AC, 15kW)
- (3) Two-axis MINAS A6 Multi driver module (1.5kW)
- (4) USB cable between PC and driver module
- (5) MINAS A6 servo motor B (1.5kW)
- (6) MINAS A6 servo motor A (1kW)
- (7) USB license dongle for PANATERM for Safety
- (8) PC with PANATERM for Safety

Set-up of a MINAS A6 Multi servo drive system - Safe Speed Monitoring (SSM)

3 Wiring

3.1 Basic wiring of the MINAS A6 Multi

Check the hardware connections of your servo drive system:

- 24V DC control power supply connected to X11
- 400V AC main power supply cable connected to X102
- Motor cable for servo motor A connected to X105A
- Motor cable for servo motor B connected to X105B
- Encoder cable for servo motor A connected to X9A
- Encoder cable for servo motor B connected to X9B
- X1 and X1A connected with RJ11 communication cable
- Bus bars attached to X104 and X12
- PE terminals of power supply module and driver module connected by grounding wire

For details on how to do the wiring of the MINAS A6 Multi servo drive system, refer to “Wiring” in [“QS10000, MINAS A6 Multi, Position control with Beckhoff host controller over EtherCAT”](#).

3.2 USB license dongle

A USB license dongle is required to compile and download the functional safety configuration to the driver module. Connect the license dongle to a USB port of your PC.



USB license dongle

3.3 Connect the PC and the driver module

Connect your PC and the driver module with an Ethernet cable or with a USB cable. In this example, we use a USB cable that is connected to X8 of the driver module.

X8 connector (for functional safety configuration)

Use a commercially available USB A to mini-B cable to connect the PC to the driver module.



(1) X8: USB connector on driver module

4 Functional safety configuration

4.1 Install PANATERM for Safety on your PC

The programming software PANATERM for Safety provides a graphical environment to create PLC-based monitoring programs for the MINAS A6 Multi servo drive system.

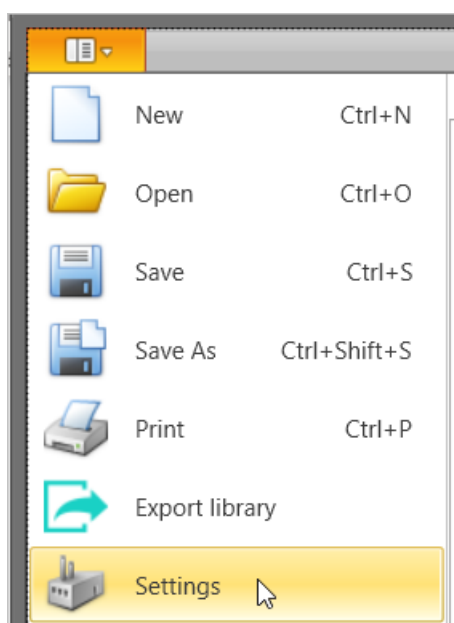
Install the software on your PC.

For details, refer to the [“SX-DSV03508, MINAS A6 Multi, Programming Manual – PANATERM for Safety”](#).

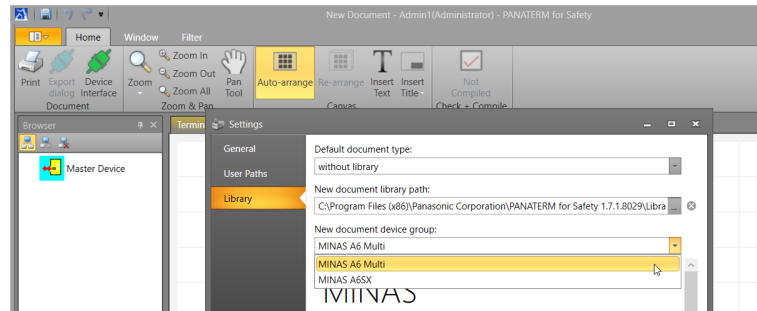
4.2 Create a safety program

The general workflow for creating a safety program is to add the devices of your servo drive system to your project, to place them in the “Terminal Scheme” screen, and to configure the safety functions in the “Functional Scheme” screen.

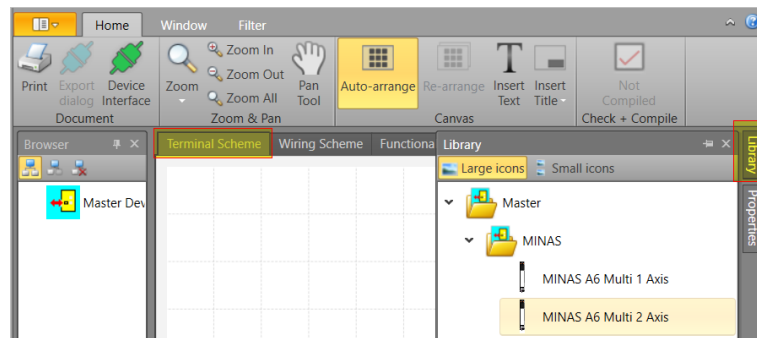
1. Start PANATERM for Safety.
2. Select the “Settings” tab.



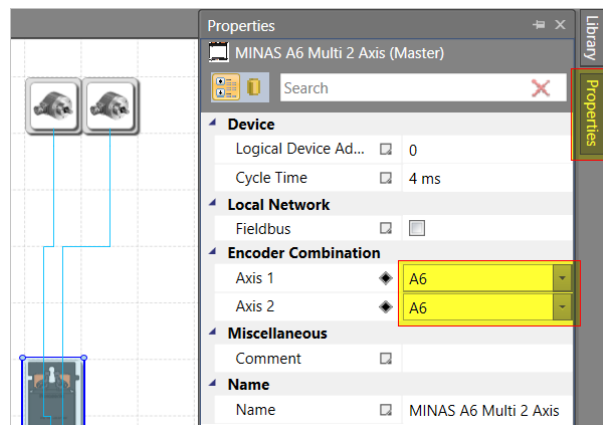
3. Select “Library” and then “MINAS A6 Multi” under “New document device group”.



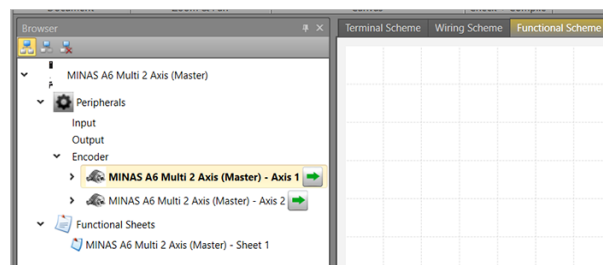
4. Select “MINAS A6 Multi 2 Axis” from the “Library” window and drag the element into the “Terminal Scheme” window.



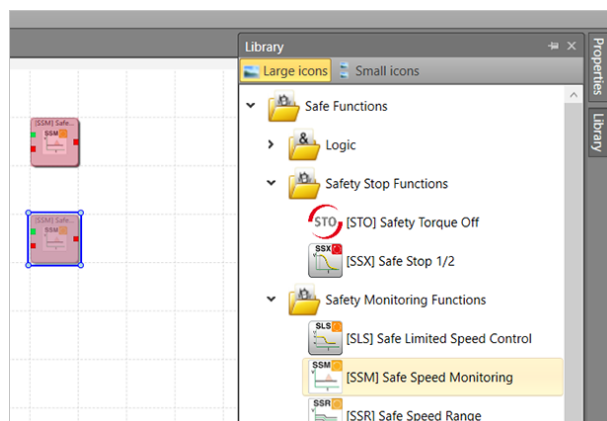
5. Go to the “Properties” window and select the A6 encoder for both axes.



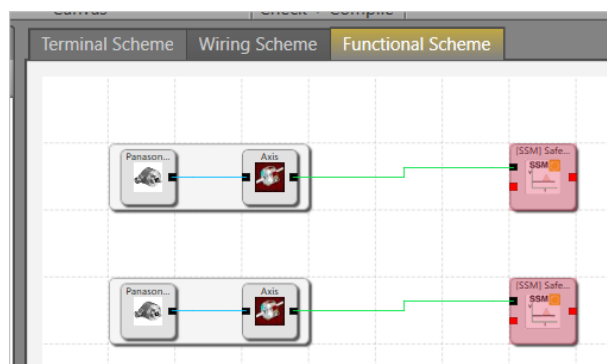
6. Select the encoder elements from the “Browser” window and drag them into the “Functional Scheme” window.



7. Select the safety function “[SSM] Safe Speed Monitoring” from the “Library” window and drag it into the “Functional Scheme” window. For two axes, you need the function twice.

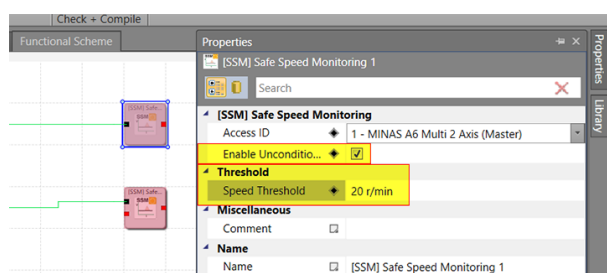


8. Use the mouse to connect the elements.

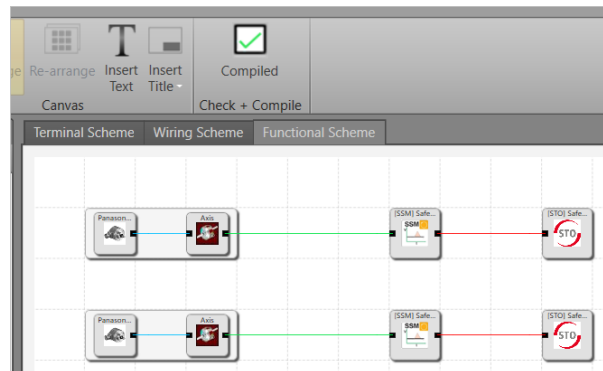


9. Select the “[SSM] Safe Speed Monitoring 2” function in the “Terminal Scheme” window, and make the settings in the “Properties” window as shown in the screenshot.

The threshold value for speed is a sample value that can be adjusted according to the requirements of the machine.



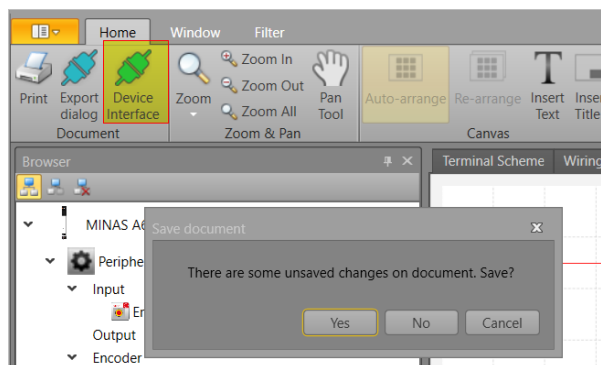
10. Select “Check + Compile” in the ribbon to compile your project



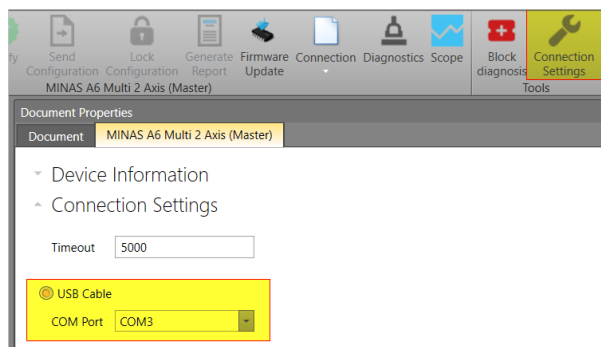
4.3 Download the safety program to the driver module

Remember that a USB license dongle is required to compile and save your program.

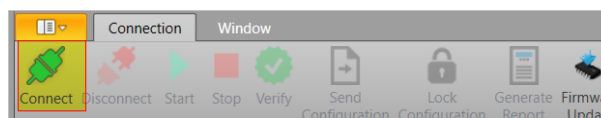
1. Select “Device Interface” in the ribbon and save your project.



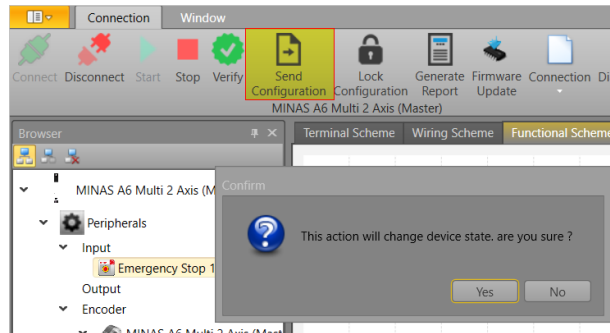
2. Select “Connection Settings” in the ribbon and then “USB Cable”.



3. Select “Connect” in the ribbon.



4. Select “Send Configuration” in the ribbon.
Select “Yes” to confirm the message that this action will change the device state.

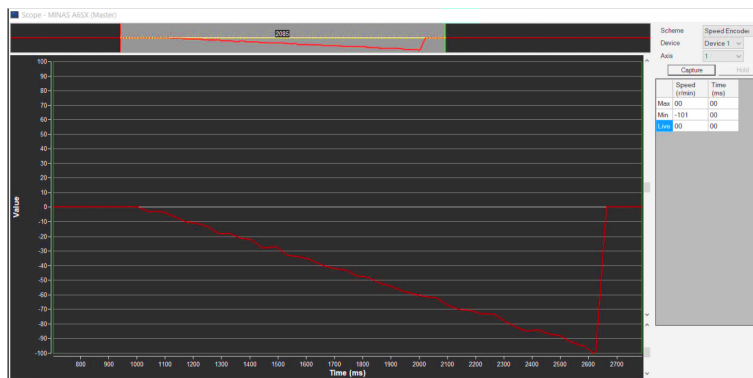


5. Wait until the configuration is transmitted to the driver module and then reboot the driver module.
The safety function is now active.
6. To check the current status of the safety function, go to “Diagnostics” and select the “Functional Scheme” window.
A yellow line means that the emergency stop button was not yet pressed. If it is red, the emergency button has been pressed and STO is active.

4.4 Monitor the behavior of the SSM safety function

Select “Scope” in the ribbon to monitor the behavior of the SSM function.

You can adjust the threshold values set in the “Properties” window according to your needs. For details, refer to the [“SX-DSV03508, MINAS A6 Multi, Programming Manual – PANATERM for Safety”](#).



5 Help us improve

Please feel free to contact us if you have any questions, or if you have any suggestions for improvement. In that case, we ask you to include the Quick Start Guide number in the email subject line. You can find the number starting with "QS" on the cover page.

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6 Record of changes

QS10004_V1.0_EN, 2020.11

First edition

7 Panasonic hotline

If you have questions that cannot be clarified by the manuals or online help, please contact your sales office.

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