



SetMultiturnEncoder

TIA V13/S7-1200/1500 –
LXM32M – Profibus





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Introduction

Overview

This chapter gives the introduction.

Contents of this chapter

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Before You Begin

General

The products specified in this document have been tested under actual service conditions. Of course, your specific application requirements may be different from those assumed for this and any related examples described herein. In that case, you will have to adapt the information provided in this and other related documents to your particular needs. To do so, you will need to consult the specific product documentation of the hardware and/or software components that you may add or substitute for any examples specified in this documentation. Pay particular attention and conform to any safety information, different electrical requirements and normative standards that would apply to your adaptation.

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WARNING

REGULATORY INCOMPATIBILITY

Be sure that all equipment applied and systems designed comply with all applicable local, regional and national regulations and standards

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved. Failure to observe this information can result in injury or equipment damage.



The use and application of the information contained herein require expertise in the design and programming of automated control systems. Only the user or integrator can be aware of all the conditions and factors present during installation and setup, operation, and maintenance of the machine or process, and can therefore determine the automation and associated equipment and the related safeties and interlocks which can be effectively and properly used. When selecting automation and control equipment, and any other related equipment or software, for a particular application, the user or integrator must also consider any applicable local, regional or national standards and/or regulations.

Some of the major software functions and/or hardware components used in the proposed architectures and examples described in this document cannot be substituted without significantly compromising the performance of your application. Further, any such substitutions or alterations may completely invalidate any proposed architectures, descriptions, examples, instructions, wiring diagrams and/or compatibilities between the various hardware components and software functions specified herein and in related documentation. You must be aware of the consequences of any modifications, additions or substitutions.

A residual risk, as defined by EN/ISO 12100-1, Article 5, will remain if

- it is necessary to modify the recommended logic and if the added or modified components are not properly integrated in the control circuit.
- you do not follow the required standards applicable to the operation of the machine, or if the adjustments to and the maintenance of the machine are not properly made (it is essential to strictly follow the prescribed machine maintenance schedule).
- the devices connected to any safety outputs do not have mechanically-linked contacts.

CAUTION

EQUIPMENT INCOMPATIBILITY

Read and thoroughly understand all device and software documentation before attempting any component substitutions or other changes related to the application examples provided in the document

Failure to follow these instructions can result in injury, or equipment damage.



Start-Up and Test

Before using electrical control and automation equipment after design and installation, the application and associated functional safety system must be subjected to a start-up test by qualified personnel to verify correct operation of the equipment. It is important that arrangements for such testing be made and that enough time is allowed to perform complete and satisfactory testing.

CAUTION

EQUIPMENT OPERATION HAZARD

- Verify that all installation and set up procedures have been completed.
- Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices
- Remove tools, meters, and debris from equipment.

Failure to follow these instructions can result in injury, or equipment damage.

Verify that the completed system, including the functional safety system, is free from all short circuits and grounds, except those grounds installed according to local regulations. If high-potential voltage testing is necessary, follow the recommendations in equipment documentation to help prevent injury or equipment damage.



Operations and Adjustments

General

Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly installed and operated.

In some applications, such as packaging machinery, additional operator protection such as point-of-operation guarding must be provided. This is necessary if the hands and other parts of the body are free to enter the pinch points or other hazardous areas where serious injury can occur. Software products alone cannot protect an operator from injury. For this reason, the software cannot be substituted for or take the place of point-of-operation protection.

WARNING

UNGUARDED MACHINERY CAN CAUSE SERIOUS INJURY

- Do not use this software and related automation equipment on equipment which does not have point-of-operation protection.
- Do not reach into machinery during operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Ensure that appropriate safeties and mechanical/electrical interlocks related to point-of-operation protection have been installed and are operational before placing the equipment into service. All interlocks and safeties related to point-of-operation protection must be coordinated with the related automation equipment and software programming.

NOTE: Coordination of safeties and mechanical/electrical interlocks for point-of-operation protection is outside the scope of the examples and implementations suggested herein. It is sometimes possible to adjust the equipment incorrectly and this produce unsatisfactory or unsafe operation. Always use the manufacturer instructions as a guide to functional adjustments. Personnel who have access to these adjustments must be familiar with the equipment manufacturer instructions and the machinery used with the electrical equipment. Only those operational adjustments actually required by the machine operator should be accessible to the operator. Access to other controls should be restricted to help prevent unauthorized changes in operating characteristics.



Components

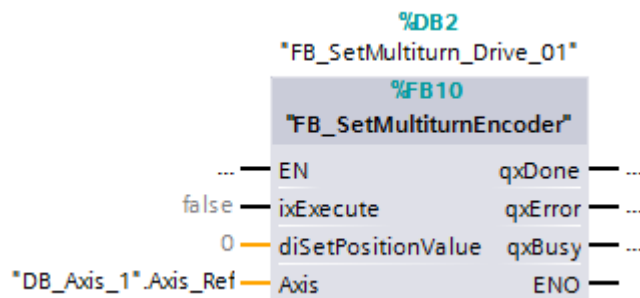
Hardware/Software

- TIA V13 SP1 Update 2 Software
- S7-1200/1500 PLC with Profibus Master
- LXM32M with Profibus Module



Description

Sequence



This example function block can be used to set the absolute position value of a multiturn encoder.

Inputs:

- `ixExecute`: A rising edge starts the internal sequence
- `diSetPositionValue`: New encoder position

Outputs:

- `qxBusy`: Function block is busy
- `qxDone`: Function block is finished without error
- `qxError`: Function block is finished with error.

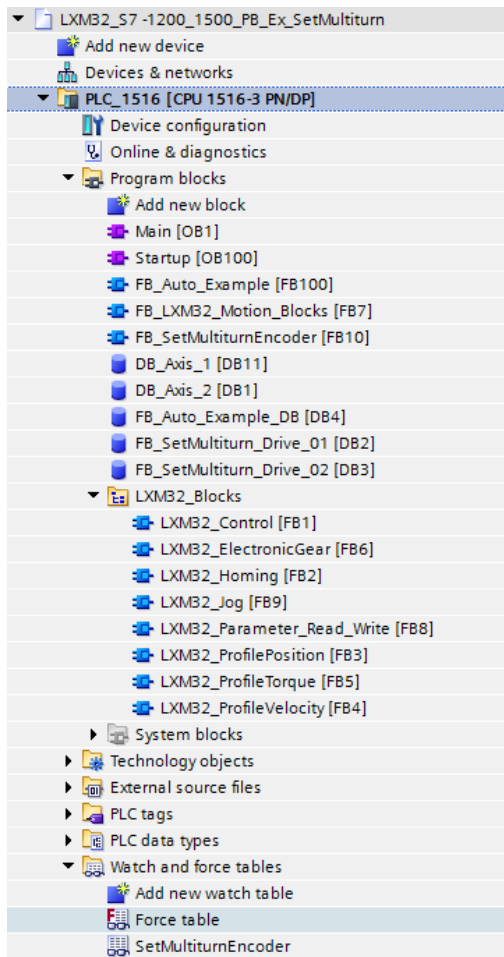
Sequence:

After a rising edge on the input `ixExecute` the function block signs `qxBusy = TRUE`.

1. Writing the new position value to the LXM32 object 1324.
2. Wait Time of 1.2 s
3. Writing EXPERT access level to LXM32 (Object 278 / Length 4 bytes / Value: 0x54455354)
4. Send reboot command to LXM32M (Object 314 / Length 2 bytes / Value: 0xA55A)
5. During the reboot of LXM32M the profibus communication will be lost.
6. After reboot is finished the function is monitoring the drive status. If the drive state is ≥ 3 (communication established again) the function block signs `qxBusy = FALSE` and `qxDone = TRUE`.



Used Software components



The Variable Table “SetMultiturnEncoder” can be used to test this function block.

LXM32_S7 -1200_1500_PB_Ex_SetMultiturn ▶ PLC_1516 [CPU 1516-3 PN/DP] ▶ Watch and force tables ▶ SetMultiturnEncoder					
	Name	Address	Display format	Monitor value	Modify value
1	"FB_SetMultiturn_Drive_01".iExecute		Bool	<input checked="" type="checkbox"/> TRUE	
2	"FB_SetMultiturn_Drive_01".diSetPositionValue		DEC+/-	256	
3	"FB_SetMultiturn_Drive_01".qxBusy		Bool	<input type="checkbox"/> FALSE	
4	"FB_SetMultiturn_Drive_01".qxDone		Bool	<input checked="" type="checkbox"/> TRUE	
5	"FB_SetMultiturn_Drive_01".qxError		Bool	<input type="checkbox"/> FALSE	
6	"FB_SetMultiturn_Drive_01".iState		DEC+/-	7	
7	"FB_SetMultiturn_Drive_01".byDriveState		DEC	3	
8	"FB_SetMultiturn_Drive_01".WriteParameter.i_xParameterWrite		Bool	<input type="checkbox"/> FALSE	
9					
10	"FB_SetMultiturn_Drive_02".iExecute		Bool	<input checked="" type="checkbox"/> TRUE	TRUE
11	"FB_SetMultiturn_Drive_02".diSetPositionValue		DEC+/-	500	500
12	"FB_SetMultiturn_Drive_02".qxBusy		Bool	<input type="checkbox"/> FALSE	
13	"FB_SetMultiturn_Drive_02".qxDone		Bool	<input checked="" type="checkbox"/> TRUE	
14	"FB_SetMultiturn_Drive_02".qxError		Bool	<input type="checkbox"/> FALSE	
15	"FB_SetMultiturn_Drive_02".iState		DEC+/-	7	
16	"FB_SetMultiturn_Drive_02".byDriveState		Hex	16#03	
17	"FB_SetMultiturn_Drive_02".WriteParameter.i_xParameterWrite		Bool	<input type="checkbox"/> FALSE	
18		<Add new>			