How To

Download and Upload Your Latest Source Code User Guide

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Schneider Electric

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

Table of Contents

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

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.

BEFORE YOU BEGIN

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.

⚠ WARNING

UNGUARDED EQUIPMENT

- 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.

This automation equipment and related software is used to control a variety of industrial processes. The type or model of automation equipment suitable for each application will vary depending on factors such as the control function required, degree of protection required, production methods, unusual conditions, government regulations, etc. In some applications, more than one processor may be required, as when backup redundancy is needed.

Only you, the user, machine builder or system integrator can be aware of all the conditions and factors present during setup, operation, and maintenance of the machine and, therefore, can determine the automation equipment and the related safeties and interlocks which can be properly used. When selecting automation and control equipment and related software for a particular application, you should refer to the applicable local and national standards and regulations. The National Safety Council's Accident Prevention Manual (nationally recognized in the United States of America) also provides much useful information.

In some applications, such as packaging machinery, additional operator protection such as point-of-operation guarding must be provided. This is necessary if the operator's hands and other parts of the body are free to enter the pinch points or other hazardous areas and 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.

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 Function Block Library, System User Guide, or other implementation referenced in this documentation.

START-UP AND TEST

Before using electrical control and automation equipment for regular operation after installation, the system should be given a start-up test by qualified personnel to verify correct operation of the equipment. It is important that arrangements for such a check be made and that enough time is allowed to perform complete and satisfactory testing.

⚠ WARNING

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 death, serious injury, or equipment damage.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future references.

Software testing must be done in both simulated and real environments.

Verify that the completed system is free from all short circuits and temporary grounds that are not installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Remove all temporary grounds from incoming power lines.
- Perform all start-up tests recommended by the manufacturer.

OPERATION AND ADJUSTMENTS

The following precautions are from the NEMA Standards Publication ICS 7.1-1995 (English version prevails):

- 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 operated.
- It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.
- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

About the Book

At a Glance

Document Scope

This document describes a method to connect with your controller for which the latest version of the project is available and usable directly from the controller and not only from your PC servers.

The following knowledge is required:

- programming in the FBD, LD, ST, IL or CFC language
- information on functionality, structure and configuration of the controllers
- information in using of USB memory key or gateway

Validity Note

This document has been updated for the release of SoMachine V4.3.

Related Documents

Title of Documentation	Reference Number
Modicon M241 Logic Controller Hardware Guide	*EIO0000001456 (ENG)*; *EIO0000001457 (FRE)*; *EIO0000001458 (GER)*; *EIO0000001459 (SPA)*; *EIO0000001460 (ITA)*; *EIO0000001461 (CHS)*
Modicon M251 Logic Controller Hardware Guide	*EIO0000001486 (ENG)*; *EIO0000001487 (FRE)*; *EIO0000001488 (GER)*; *EIO0000001489 (SPA)*; *EIO0000001490 (ITA)*; *EIO0000001491 (CHS)*
Modicon M258 Logic Controller Hardware Guide	*EIO0000000432 (ENG)*; *EIO0000000433 (FRE)*; *EIO0000000434 (GER)*; *EIO0000000435 (SPA)*; *EIO0000000436 (ITA)*; *EIO0000000437 (CHS)*

Title of Documentation	Reference Number
Altivar ATV IMC Drive Controller Hardware Guide	S1A10252 (ENG); S1A34915 (FRE); S1A34916 (GER); S1A34918 (SPA); S1A34917 (ITA); S1A34919 (CHS)
Modicon LMC058 Motion Controller Hardware Guide	EIO0000000438 (ENG); EIO0000000439 (FRE); EIO0000000440 (GER); EIO0000000441 (SPA); EIO0000000442 (ITA); EIO0000000443 (CHS)
Modicon LMC078 Motion Controller Hardware Guide	EIO0000001925 (ENG); EIO0000001926 (FRE); EIO0000001927 (GER); EIO0000001928 (SPA); EIO0000001929 (ITA); EIO0000001930 (CHS) EIO0000001932 (TUR)

You can download these technical publications and other technical information from our website at http://www.schneider-electric.com/en/download

Product Related Information

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines.[1]
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

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

[1] For additional information, refer to NEMA ICS 1.1 (latest edition), "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition), "Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems" or their equivalent governing your particular location.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Only use software approved by Schneider Electric for use with this equipment.
- Update your application program every time you change the physical hardware configuration.

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

Terminology Derived from Standards

The technical terms, terminology, symbols and the corresponding descriptions in this manual, or that appear in or on the products themselves, are generally derived from the terms or definitions of international standards.

In the area of functional safety systems, drives and general automation, this may include, but is not limited to, terms such as *safety*, *safety function*, *safe state*, *fault*, *fault reset*, *malfunction*, *failure*, *error*, *error message*, *dangerous*, etc.

Among others, these standards include:

Standard	Description
EN 61131-2:2007	Programmable controllers, part 2: Equipment requirements and tests.
ISO 13849-1:2008	Safety of machinery: Safety related parts of control systems. General principles for design.
EN 61496-1:2013	Safety of machinery: Electro-sensitive protective equipment. Part 1: General requirements and tests.
ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 60204-1:2006	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 1088:2008 ISO 14119:2013	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection
ISO 13850:2006	Safety of machinery - Emergency stop - Principles for design
EN/IEC 62061:2005	Safety of machinery - Functional safety of safety-related electrical, electronic, and electronic programmable control systems
IEC 61508-1:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: General requirements.
IEC 61508-2:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: Requirements for electrical/electronic/programmable electronic safety-related systems.

Standard	Description
IEC 61508-3:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: Software requirements.
IEC 61784-3:2008	Digital data communication for measurement and control: Functional safety field buses.
2006/42/EC	Machinery Directive
2014/30/EU	Electromagnetic Compatibility Directive
2014/35/EU	Low Voltage Directive

In addition, terms used in the present document may tangentially be used as they are derived from other standards such as:

Standard	Description
IEC 60034 series	Rotating electrical machines
IEC 61800 series	Adjustable speed electrical power drive systems
IEC 61158 series	Digital data communications for measurement and control – Fieldbus for use in industrial control systems

Finally, the term *zone of operation* may be used in conjunction with the description of specific hazards, and is defined as it is for a *hazard zone* or *danger zone* in the *Machinery Directive* (*2006/42/EC*) and *ISO 12100:2010*.

NOTE: The aforementioned standards may or may not apply to the specific products cited in the present documentation. For more information concerning the individual standards applicable to the products described herein, see the characteristics tables for those product references.

Short Description

Overview

This document describes a method to connect with your controller for which the latest version of the project is available and usable directly from the controller and not only from your PC servers.

System Requirements and Limitations

The procedure has been tested with the components listed in the table:

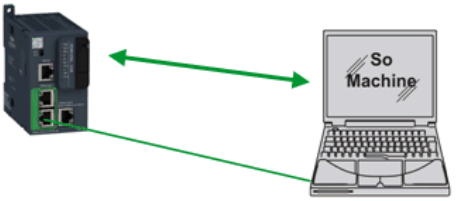
Component	Type and Version
Software	SoMachine V4.3 or greater
Controller	• Modicon M241 Logic Controller • Modicon M251 Logic Controller • Modicon M258 Logic Controller • Altivar ATV IMC Drive Controller • Modicon LMC078 Motion Controller
Additional devices	RJ45 connector **NOTE:** The concepts presented in the example procedure are transferable to other programming port connections of your controller.

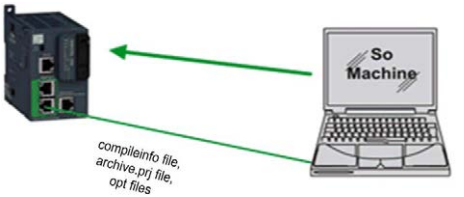
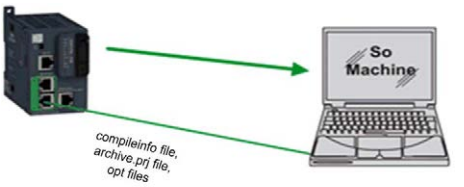
Example Overview

Download and upload source code operation allows you to save your project source code onto a controller and to retrieve it later on. With this retrieved SoMachine project file, you can connect to the controller without the need to first load the application into SoMachine, for example, for maintenance purposes.

NOTE: You must maintain the coherency between the source code of the application and the compiled object code of the application. If you modify the source code, be sure to compile the application and download it as well to the controller.

The following table gives an overview of the procedure steps:

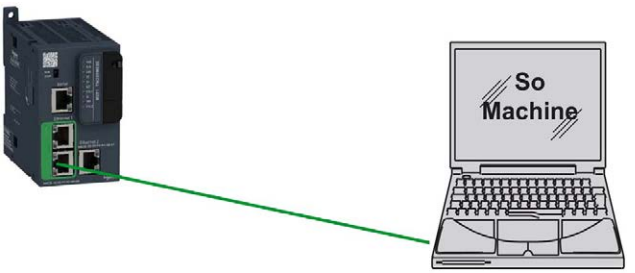
Step	Description	Graphical display
1	Develop and download your application to your controller.	

Step	Description	Graphical display
2	Download the project source code to the controller *(see page 14)*.	
3	Later on, you might have the need to modify the project, or to maintain it. ● Upload the project source code from the controller to SoMachine. ● Connect with the uploaded project to the controller. ● Modify the uploaded project and perform Online changes *(see SoMachine, Programming Guide)*.	
4	Download the project source code after modifying.	–

Hardware Configuration

Overview

Refer to the hardware guide of your controller *(see page 9)* to connect your controller.



Transfer Procedures

Downloading the Source Code of the Project to the Controller

Downloading the source code as described in the following steps:

Step	Action
1	Create or open your project.
2	Open the project settings in the Logic Builder with **Project → Project Settings...**.
3	Select **Source Download** and clear the check box **Use compact download**. Optionally, in the **Timing** area you can activate the option **Implicity at creating bootproject** so that the source download is executed at each boot project creation. **NOTE:** Other options are available, refer to the **Project Settings... → Source Download** dialog box. Click on the **Additional files...** button and activate the check box **Download information files**. **NOTE:** Select the options **Referenced devices**, **Referenced libraries**, in case your project contains libraries or devices not delivered with SoMachine, or if download and upload source are planned to be performed from different SoMachine installations (on different PCs). Select **Library Profile** and **Visualization Profile** to perform download and upload source by using different SoMachine versions.
4	Click **OK** twice to exit the windows.
5	Select **Online → Create boot application**. **Result:** The boot project is created and the source code is downloaded. **NOTE:** If you activated in step 3 the option **Only on demand** in the **Timing** area, you have to do it manually: **1.** Select **File → Source download...**. **Result:** The **Controller selection** view opens. **2.** Double-click the controller from the list where the sources shall be downloaded to. The node name at the bottom must correspond to the chosen controller at the top of the window. **3.** Click **OK**. **Result:** The progress of the source download will be indicated in the status bar.
6	In the controller device editor, open the **Files** tab to verify that the source project has been downloaded. **Result:** The new archive.prj file has been created. Verify the modification date of the file.

Upload your Project from the Controller

Upload your project from the controller as described in the following steps:

Step	Action
1	Close your project in SoMachine.
2	Connect the controller to the PC (**SoMachine Central** → **Connect Controller** button). **Result:** The **Select Controller** dialog box opens, and the Ethernet network and the USB ports are scanned for available controllers.
3	Select your controller in the displayed list and click the **Select** button.
4	In the **Options** dialog box, select the option **Upload project from controller** and click **Continue**. **Result:** After a brief delay, the **Project Archive** dialog box opens.
5	Choose an empty folder where you want to copy the extracted elements from your controller and click **Extract**. **Result:** A message is displayed, if you want to open the project in SoMachine.
6	Click **Yes**. **Result:** When the system is ready, the **Logic Builder** button is active.
7	Click the **Logic Builder** button. **Result:** Your uploaded project is opened in the Logic Builder.
8	Login to your controller.