

EcoStruxure™ Control Expert OS Loader User Manual

Original instructions

07/2020

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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.

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Table of Contents



	Safety Information	5
	About the Book	9
Part I	OSLoader General Information	11
Chapter 1	Presentation of OSLoader	13
	General	14
	Installation of OSLoader	15
	Security Management	16
	Cautions and Preconditions	17
Chapter 2	Communication Principles	19
	Device Types	20
	Communication Types Used and Associated Cables	21
Chapter 3	Updating Operating Systems	23
	Upgrading Principles	23
Part II	Upgrading and Checking Procedures	25
Chapter 4	Upgrading Operating Systems	27
	Downloading the Intermediate OS to the Device	28
	Downloading the Final OS to the Device	30
	Downloading the OS to Ethernet Devices	32
Chapter 5	Checking the Operating System on Hardware	35
	Checking the OS on the Device	36
	Description of the Device Properties Screen	38
Part III	Description of OSLoader Screens	39
Chapter 6	OSLoader Screens	41
	Welcome Screen	42
	Communication Protocol Screen	44
	Communication Protocol: Uni-Telway Target Screen	45
	Communication Protocol: Modbus Plus Target Screen	48
	Communication Protocol: Modbus Target Screen	52
	Communication Protocol: FTP Target Screen	56
	Operation Screen	59
	File and Device Info Screen	61
	Summary Screen	64
	Progress Screen	65

Part IV	Errors and Limitations	67
Chapter 7	Communication Errors and Limits During Download	69
	Communication Interruptions	70
	Operating Limits	71
	Firewall Configuration under Windows Servers for OSloader	72
Appendices	73
Appendix A	Compatibility Between Programming Software and Processors	75
	Compatibility of Software (PL7 and Unity Pro) to Processors (Premium and Atrium Range), and TSX ETY Modules	76
	Compatibility of Software (Concept and Unity Pro) to Processors (Quantum Range), and NOE Modules	78
Appendix B	Upgrading Operating Systems for Premium Processors and TSX ETY xxxx	81
	Upgrading TSX ETY xxxx Modules and Embedded Ethernet Port of Premium Processors for Unity 2.xx	82
	Upgrading PL7 Processors to Unity 2.xx	85
	Upgrading Unity 1.0 Processors to Unity 2.xx	89
	Upgrading Premium Unity Processors from 2.yy to 2.xx	93
Appendix C	Upgrading Operating Systems for Quantum CPU and Modules	97
	Upgrading Operating Systems for Modicon Quantum	97
Index	99

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 documentation presents OS Loader software and describes the communication principle with a CPU or module that can be updated.

Complementary information on the firmware update procedure is available in the EcoStruxure Control Expert online help or in dedicated documents for the following platforms:

Modicon Quantum: Modicon Quantum, Update Procedure, User Guide

Modicon Premium: PLC Operating System Upgrade and Update Procedure (Premium Part)

Update Procedure

The update procedure is a maintenance operation that consists in changing a CPU or module embedded software. It requires the CPU to be in `STOP` mode and disconnected from the systems and applications it affects. When a module is addressed through the CPU, the CPU must be in `STOP` mode and no functional communication traffic occur between the CPU and the module.

<h2><i>NOTICE</i></h2>
<p>INOPERABLE EQUIPMENT</p> <p>Stop the CPU before any firmware update or firmware check with OS Loader software.</p> <p>Failure to follow these instructions can result in equipment damage.</p>

Validity Note

This documentation is valid for EcoStruxure™ Control Expert 15.0 or later.

Related Documents

Title of documentation	Reference number
EcoStruxure™ Control Expert, Operating Modes	33003101 (English), 33003102 (French), 33003103 (German), 33003104 (Spanish), 33003696 (Italian), 33003697 (Chinese)
Quantum using EcoStruxure™ Control Expert, Experts and Communication, Reference Manual	35010574 (English), 35010575 (French), 35010576 (German), 35014012 (Italian), 35010577 (Spanish), 35012187 (Chinese)
Modicon Quantum, Update Procedure, User Guide	EIO0000002381 (English)
PLC Operating System Upgrade and Update Procedure (Premium Part)	–

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

Product Related Information

 WARNING
<p>UNINTENDED EQUIPMENT OPERATION</p> <p>The application of this product requires expertise in the design and programming of control systems. Only persons with such expertise should be allowed to program, install, alter, and apply this product.</p> <p>Follow all local and national safety codes and standards.</p> <p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>

Part I

OSLoader General Information

Introduction

This part gives general information about OSLoader and the hardware that it is able to update.

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
1	Presentation of OSLoader	13
2	Communication Principles	19
3	Updating Operating Systems	23

Chapter 1

Presentation of OSLoader

Introduction

This chapter introduces the OSLoader software.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
General	14
Installation of OSLoader	15
Security Management	16
Cautions and Preconditions	17

General

At a Glance

OSLoader software included with Control Expert is used to upgrade the operating system or firmware of:

- Quantum/Premium processors.
- Quantum/Premium processors with Ethernet ports.
- Quantum processors with Hot Standby coprocessors.
- Quantum/Premium Ethernet modules (140 NOE 771 ••, 140 NOC 78• ••, 140 CRP 312 00, TSX ETY ••••).
- Quantum S908 RIO communication modules (140 CRP 93• 00, 140 CRA 93• 00).

NOTE: OSLoader is compatible with the operating systems that can be used by Control Expert.

Installation of OSLoader

Installation

OSLoader software is installed on the PC during Control Expert installation.

To launch OSLoader, click **Start → Programs → EcoStruxure Control Expert → OS Loader**.

Security Management

Introduction

OSLoader influences the PLC behavior. While the processor is being upgraded, the controller is stopped.

For this reason, when starting OSLoader, authentication of access rights is required to authorize its execution.

Security Management

The OSLoader security is managed using the **Security Editor** tool.

Two profiles are available:

- **ReadOnly**: No transfer authorized.
- **Program**: OSLoader functions are available.

NOTE: Other profiles than the default profiles can be added.

For detailed information, refer to *EcoStruxure™ Control Expert, Security Editor, Operation Guide*.

Cautions and Preconditions

Before OS Upgrade

NOTE: The PLC program and data must be saved before starting the upgrade process.

CAUTION

IRREPARABLE EQUIPMENT DAMAGE

Do not use a *.bin* file located on the network. If the network access were to go down, it would interrupt the download process and cause irreparable damage to the device.

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

NOTE: Download of the firmware may not operate correctly when performed through a Modbus Plus network with several nodes. In this case, please transfer the firmware through a peer to peer mode between the PC and the PLC.

During Download

CAUTION

IRREPARABLE EQUIPMENT DAMAGE

During OS transfer:

- Never interrupt the power supply to the CPU.
- Never interrupt the OS transfer process.
- Never interrupt the communication between PC and PLC.

Interrupting the transfer process before it has completed can cause irreparable damage to the device.

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

Upgrade Duration

The upgrade action using Modbus or Uni-Telway can take more than an hour.

Downgrade Processors

NOTICE

PROCESSOR DAMAGE

Do not download a firmware V2.31 or lower in the processors listed below, otherwise, you will not be able to change the firmware version:

- 140 CPU 65 150 / 150C / 160 / 160C PV \geq 15
- 140 CPU 67 160 / 160C PV \geq 13

Failure to follow these instructions can result in equipment damage.

NOTICE

ETHERNET COPROCESSOR DAMAGE

Do not download a firmware version V2.8 or lower in the CoPro Ethernet Port of processors listed below:

- 140 CPU 65 150 / 150C / 160 / 160C PV \geq 27
- 140 CPU 65 260 PV \geq 14
- 140 CPU 65 260C PV \geq 11
- TSX P57 4634M PV \geq 22
- TSX P57 4634MC / 5634MC / 6634M PV \geq 10
- TSX P57 5634M PV \geq 27
- TSX P57 6634MC PV \geq 08

Do not download a firmware version V2.82 or lower in the CoPro Ethernet Port of processors listed below:

- TSX H57 24M PV \geq 09
- TSX H57 24MC PV \geq 08
- TSX H57 44M PV \geq 10
- TSX H57 44MC PV \geq 08

Otherwise, you will not be able to use the Ethernet link anymore (for Hot Standby processors, it means the Hot Standby functionality will not work anymore). The operation is not reversible.

Failure to follow these instructions can result in equipment damage.

PLC in Stop Mode

The PLC must be stopped during the download.

Chapter 2

Communication Principles

Introduction

This section describes OSLoader's communication links.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Device Types	20
Communication Types Used and Associated Cables	21

Device Types

Introduction

The OSLoader target devices are as follows:

- processors
- devices directly connected to the communication link but that have no application program
- in-rack modules
- remote modules

Processors and Other Devices

For devices directly connected to the OSLoader communication link (processors etc.), standard addressing provides the connection.

OSLoader can execute the processor's run (**RUN**) and stop (**STOP**) commands for the devices (processors etc.).

In-Rack Modules

OSLoader communicates with the in-rack modules through the processor.

The messages are sent to the processor with an address indicating the position of the target module in the rack.

Remote Modules

OSLoader communicates with the remote modules through the processor and an input/output module.

The messages are sent with an address made up of two different parts:

- the first part indicates to the processor the position of the input/output module
- the second part indicates the address of the target remote module on the input/output bus to the input/output module

Communication Types Used and Associated Cables

Communication Types

The communication types used by OSLoader are as follows:

- Modbus Plus (*see page 48*)
- Modbus (*see page 52*)
- Uni-Telway (*see page 45*)
- FTP (*see page 56*)

Communication Drivers

The communication drivers used by OSLoader are as follows:

Device Type	Communication Driver
Premium processor	UNTLW01 (Uni-Telway, Terminal port)
Quantum processor	MODBUS01/MBPLUS02/FTP (Modbus/Modbus Plus/Ethernet, processor and coprocessor port)
TSX ETY *** module	FTP (Ethernet port)
140 NOE 771 ** module	FTP (Ethernet port)
140 NOC 78** module	FTP (Ethernet port)
140 CRP 312 00 module	FTP (Ethernet port)
140 CRP 93• 00 module	MODBUS01/MBPLUS02 (Modbus/Modbus Plus, processor port)
140 CRA 93• 00 module	

Communication Cables

The following table lists the cables to use according to the type of communication between OSLoader and processor:

Communication	Module restrictions	Cable
Uni-Telway (terminal port)	No restriction	TSX PCX 1031
Modbus (processor port)	140 CPU 311 **, 140 CPU 434 **, 140 CPU 534 ** processor	• 990 NAA 263 x0 (x= 2, or 5)
	140 CPU 6** *(S) processors	• 110 XCA 282 0x (x= 1, 2, or 3), and • the 110 XCA 203 00 adapter
Modbus Plus (processor port)	140 CPU 311 **, 140 CPU 434 **, 140 CPU 534 ** processor	• 990 NAD 211 x0 ((x= 1, or 3)
	140 CPU 6** *(S) processors	• 990 NAD 218 x0 (x= 1, or 3)
FTP	If using a switch between module and PC, the right Ethernet cable is needed, otherwise use a cross cable.	

Chapter 3

Updating Operating Systems

Upgrading Principles

.bin File

OSLoader uses a *.bin* file to upgrade a hardware OS.

According to the hardware and software used, the upgrade procedure uses one or two *.bin* files:

- Intermediate file.
- Final file.

These files are available:

- On the OS CD-ROM.
- On www.schneider-electric.com global website.

NOTE: Use a local *.bin* file. If the desired file is on a network, download it to the local disk before using it.

CAUTION

IRREPARABLE EQUIPMENT DAMAGE

During OS transfer:

- Never interrupt the power supply to the CPU.
- Never interrupt the OS transfer process.
- Never interrupt the communication between the PC and CPU or module.

Interrupting the transfer process before it has completed can cause irreparable damage to the device.

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

Application

The following examples of Premium operating system upgrades are described in this document:

- PL7 to Unity 2.00
- Unity 1.0 to Unity 2.00
- Unity 2.yy to Unity 2.xx
- Unity 2.00 to PL7

Part II

Upgrading and Checking Procedures

Introduction

This part explains how to use OSLoader to upgrade operating systems on various types of hardware and how to check their properties.

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
4	Upgrading Operating Systems	27
5	Checking the Operating System on Hardware	35

Chapter 4

Upgrading Operating Systems

Introduction

This chapter describes how to upgrade the operating system using OSLoader.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Downloading the Intermediate OS to the Device	28
Downloading the Final OS to the Device	30
Downloading the OS to Ethernet Devices	32

Downloading the Intermediate OS to the Device

Intermediate OS

An intermediate *.bin* file must be used for some processors and software versions before upgrading with the final *.bin* file.

This intermediate file must be used when upgrading a Premium processor as follows:

- PL7 to Unity 2.♦♦
- Unity 1.0 to Unity 2.♦♦
- Unity 2.♦♦ to PL7

Procedure

The following table describes the procedure for downloading the intermediate OS.

Step	Action	Result
1	To launch OS Loader, click Start → Programs → EcoStruxure Control Expert → OS Loader .	The Welcome (<i>see page 42</i>) window is displayed.
2	Keep the default settings of the context file and proceed to the next step by clicking Next...	The Communication Protocol (<i>see page 44</i>) window is displayed.
3	Select the driver to be used for communication between the PC and the PLC. <ul style="list-style-type: none"> ● for a Premium processor select UNTLW01 ● for an Ethernet port select FTP Proceed to the next step by clicking Next...	The protocol (<i>see page 41</i>) window is displayed.
4	As Device Type : <ul style="list-style-type: none"> ● select Processor for a processor or Direct Device for an Ethernet port, and ● select Local Head for a Local Head device or Remote I/O Drop for a remote module Remark 1: for the Local Head , the Slot Number indicates the position of the target module in the rack. Remark 2: for the Remote I/O Drop , the Slot Number indicates the position of the target module in the rack and the Drop Number indicates the remote target module address.	
5	For a Premium processor, click Connect . For an Ethernet port: <ul style="list-style-type: none"> ● Select the FTP Address of the target device specific to the FTP communication type, ● Click Connect. 	In the Device area the active node Node: SYS-PLC is displayed (Premium).
6	Select the active node Node: SYS-PLC . Remark: If the PLC is not stopped at this moment, the Stop PLC button can be used. Proceed to the next step by clicking Next...	The Operation (<i>see page 59</i>) window is displayed.
7	Select Download OS to device , click Browse... and select the file..	
8	Proceed to the next step by clicking Next...	A message is displayed.

Step	Action	Result
9	Click OK . Green markers must be present. If not, the selected file and device are incompatible. The filename and device name must be identical.	The File and Device Info (<i>see page 61</i>) window is displayed.
10	Proceed to the next step by clicking Next...	The Summary (<i>see page 64</i>) window is displayed.
11	Click Download .	The Progress - Initialization (<i>see page 65</i>) window is displayed meaning that the intermediate operating system is downloaded to the processor.
12	When the download is completed, the Progress (100%) window appears, click Close in the different windows to exit OSLoader.	
13	For a Premium processor, press the processor Reset button.	
14	Re-start OSLoader to download the final OS binary. Check (<i>see page 36</i>) the new OS version before downloading the final OS binary.	

Downloading the Final OS to the Device

Final OS

The final *.bin* file must be downloaded to the device in every case. Some devices require downloading the final *.bin* file after the intermediate *.bin* file.

Procedure

Using Modbus or Modbus Plus ports on High End Quantum CPUs, only address 1 is allowed for downloading. If not set to 1, change the Modbus or Modbus Plus address of the CPU to 1 with the keyboard functions before launching OSLoader. Ensure that no other device on the network is using address 1.

The following table describes the procedure for downloading the final OS.

Step	Action	Result
1	To launch OS Loader, click Start → Programs → EcoStruxure Control Expert → OS Loader .	The Welcome (<i>see page 42</i>) window is displayed.
2	Keep the default settings of the context file and proceed to the next step by clicking Next...	The Communication Protocol (<i>see page 44</i>) window is displayed.
3	Select the driver to be used for communication between the PC and the PLC. <ul style="list-style-type: none"> For a Premium processor select UNTLW01, For a Quantum processor select MODBUS01 or MBPLUS02, For an Ethernet port select FTP. Proceed to the next step by clicking Next...	The protocol (<i>see page 41</i>) window is displayed.
4	<p>As Device Type:</p> <ul style="list-style-type: none"> select Processor for a processor or Direct Device for an Ethernet port, and select Local Head for a Local Head device or Remote I/O Drop for a remote module. <p>Remark 1: for the Local Head, the Slot Number indicates the position of the target module in the rack.</p> <p>Remark 2: for the Remote I/O Drop, the Slot Number indicates the position of the target module in the rack and the Drop Number indicates the remote target module address.</p>	
5	<p>For a Premium processor, click Connect.</p> <p>For a Quantum processor or other target device:</p> <ul style="list-style-type: none"> Select the Modbus Address (make sure that the processor is also configured to same Address, rotary switches or keypad display) or the Modbus Plus Address. If using a Modbus Plus Target, specify that the target device must be accessed through its Modbus Plus connection. Click Connect. <p>For an Ethernet port:</p> <ul style="list-style-type: none"> Select the FTP Address of the target device specific to the FTP communication type, Click Connect. 	In the Device area the active node Node: SYS-PLC is displayed (Premium).

Step	Action	Result
6	Select the active node Node: SYS-PLC . Remark: If the PLC is not already stopped, Stop PLC button can be used, this action is password protected on Safety PLCs, otherwise, the PLC will be stopped at step 11. Make sure no other Control Expert is connected to the PLC. Proceed to the next step by clicking Next...	The Operation (<i>see page 59</i>) window is displayed.
7	Select Download OS to device , click Browse... and select the file.	
8	Proceed to the next step by clicking Next...	A message is displayed.
9	Click OK . Green markers must be present. If not, the selected file and device are incompatible. The filename and device name must be identical.	The File and Device Info (<i>see page 61</i>) window is displayed.
10	Proceed to the next step by clicking Next...	The Summary (<i>see page 64</i>) window is displayed.
11	Click Download . Remark: If the PLC is not already stopped, you are asked to do so, this action is password protected on Safety PLCs. Make sure no other Control Expert is connected to the PLC.	A message is displayed.
12	Click Yes .	The Progress - Initialization (<i>see page 65</i>) window is displayed meaning that the final operating system is downloaded to the processor.
13	When the download is completed, the Progress (100%) window appears, click Close in the different windows to exit OSLoader.	

Downloading the OS to Ethernet Devices

Overview

The procedure below is for upgrading:

- processor Ethernet ports
- processors with Ethernet Copro
- 140 NOE 771 •• modules
- 140 NOC 78• •• modules
- 140 CRP 312 00 modules
- TSX ETY •••• modules

Preconditions

Check if the hardware can be upgraded (*see page 82*).

In Control Expert or PL7:

- Configure a rack with:
 - a power supply
 - the processor, and
 - the Ethernet module if needed
- Configure the embedded Ethernet port or the Ethernet module IP address.
- No program is necessary.
- Check that only the PC with OSLoader and the PLC rack are on the Ethernet network.

NOTE: This note concerns the Ethernet Copros of Safety PLCs CPU 6x1 60S products. It is possible to download a new version of the Ethernet processor firmware into the Quantum Safety CPU with the OSLoader even in Safety Mode without stopping the PLC. However, Schneider Electric recommends not to download the Ethernet processor firmware in run state of the Safety Mode.

Procedure

The following table describes the procedure for downloading the OS to Ethernet devices.

Step	Action	Result
1	To launch OS Loader, click Start → Programs → EcoStruxure Control Expert → OS Loader .	The Welcome (<i>see page 42</i>) window is displayed.
2	Keep the default settings of the context file and proceed to the next step by clicking Next...	The Communication Protocol (<i>see page 44</i>) window is displayed.
3	Select the FTP communication driver. Proceed to the next step by clicking Next...	The FTP Target (<i>see page 56</i>) window is displayed.
4	Select Direct Device , enter the IP address in the FTP Address field (see preconditions) and click Connect . Remark: If requested, enter the MAC address of the target PLC. The MAC address can be found on the front of the module.	
5	Click Next > .	The Operation window is displayed.
6	Select Download OS to device , click Browse... and select the file.	
7	Proceed to the next step by clicking Next... Green markers must be present. If not, the selected file and device are incompatible. The filename and device name must be identical.	The File and Device Info (<i>see page 61</i>) window is displayed.
8	Proceed to the next step by clicking Next...	The Summary (<i>see page 64</i>) window is displayed.
9	Click Download .	The Progress - Initialization (<i>see page 65</i>) window is displayed meaning that the operating system is downloaded to the processor.
10	When the download is completed, the Progress (100%) window appears, click Close in the different windows to exit OSLoader.	
11	The device needs at least 60 seconds to reboot and implement the new Exec files. When this process is completed, the RUN and STS LEDs on the module are lit for at least 30 seconds. Remark: If the RUN and STS LEDs do not lit steady during 30 seconds after 2 minutes, perform a power cycle on the module. Check (<i>see page 36</i>) the new OS version.	
12	Repeat the procedure as many times as needed to transfer the various files (<i>see page 82</i>).	

Chapter 5

Checking the Operating System on Hardware

Introduction

This chapter explains how to use OSLoader to check the operating system installed on hardware.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Checking the OS on the Device	36
Description of the Device Properties Screen	38

Checking the OS on the Device

Overview

The operating system can be checked in order to:

- Identify the OS version before transferring.
- Check the OS version after transferring.
- Find the project name loaded on the processor.

Procedure

The following table describes the procedure for checking the OS version.

Step	Action	Result
1	To launch OS Loader, click Start → Programs → EcoStruxure Control Expert → OS Loader .	The Welcome window is displayed.
2	Keep the default settings of the context file and click Next...	The Communication Protocol window is displayed.
3	Choose the communication protocol according to the hardware and click Next...	The protocol window is displayed.
4	<ul style="list-style-type: none"> ● In the Device Type field, check the box corresponding to the desired type of target device. ● In the Device area click Node: SYS-Not connected. ● In the Target Address field, enter the address of the target device. The addressing mode is specific to the communication type chosen. ● Click Connect. 	In the Device area the active node Node: SYS-PLC is displayed.

Step	Action	Result
5	Select the active node Node: SYS-PLC and click the Properties button.	The Device Properties window is displayed: 
6	Check: <ul style="list-style-type: none">● The project name in the Project Name field. After a download, the field is empty.● The OS version in the OS version field.	
7	Click the Close button to exit.	

Description of the Device Properties Screen

Device Properties

The **Device Properties** dialog box, which is accessible by pressing the **Properties** button in the **Devices** field of the **Protocol Target** window, gives access to information concerning the device selected.

Display of the **Device Properties** dialog box:

NOTE: In order to identify at a glance a safety processor (140 CPU 6*1 60S), the background of the description field is red.

Elements of the **Device Properties** dialog box:

Element	Description	Exemple
Project name	Name of the project loaded into the controller	Station
PLC state	Status of the corresponding PLC (RUNNING, STOPPED, INIT, NOT CONFIGURED, WAITING, PAUSED, ERROR)	RUNNING
Device Name	Device product name	TSX P57 304
Hardware ID	32-bit number used to uniquely identify a device type in a specific OS	0008 0101
OS version	Number used to uniquely identify the OS delivered	1.00
Description	Device description	Premium TSX P57 304 OS V1.0

Use the **Close** button to return to the **Protocol Target** screen.

Part III

Description of OSLoader Screens

Chapter 6

OSLoader Screens

Introduction

This chapter describes the various OSLoader screens.

What Is in This Chapter?

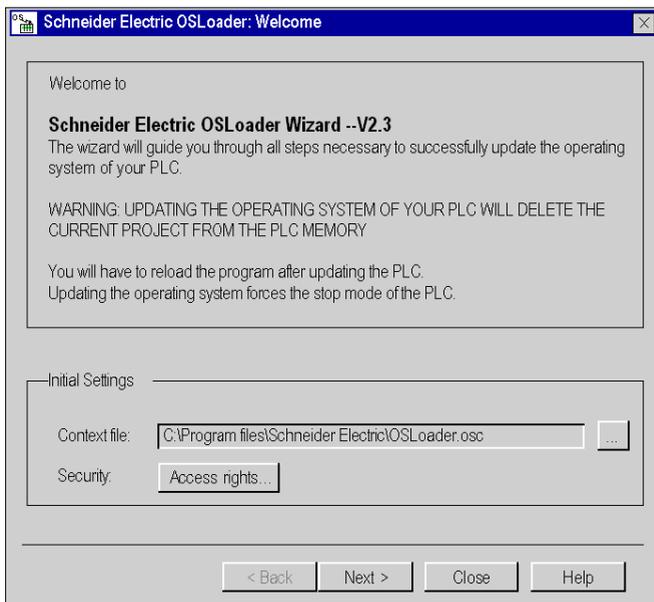
This chapter contains the following topics:

Topic	Page
Welcome Screen	42
Communication Protocol Screen	44
Communication Protocol: Uni-Telway Target Screen	45
Communication Protocol: Modbus Plus Target Screen	48
Communication Protocol: Modbus Target Screen	52
Communication Protocol: FTP Target Screen	56
Operation Screen	59
File and Device Info Screen	61
Summary Screen	64
Progress Screen	65

Welcome Screen

Illustration

The following sections describe major elements of the **Welcome** screen which appears at OSLoader startup.



Context File

Choose the context file in this field. The last communication type, devices detected and the addresses are saved in this file. When OSLoader is reopened, details are available immediately.

The last context file used is shown in the input field.

Use the ... (Find) button to choose the context file (or its path) in which OSLoader will operate.

Security

Use the **Access rights...** button to view the rights associated with the current user profile. If you click on the **Access rights...** button while the security function is turned off, an error message is displayed.

Navigation Buttons

Use the navigation buttons, located at the bottom of the screen, as follows:

Next: to proceed to the next step

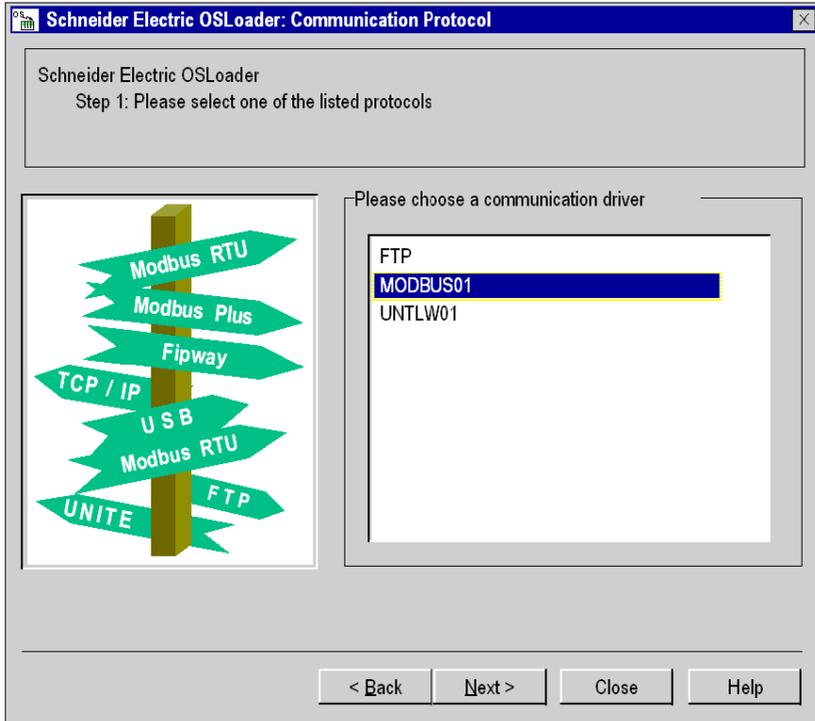
Close: to exit the software

Help: to access the online help

Communication Protocol Screen

Illustration

The main elements of the **Communication Protocol** screen are described here.



Communication Protocol

In the **Choose a communication driver** area, choose a communication type in the list. The drivers of the list are those installed previously by NetAccess.

Navigation Buttons

Use the navigation buttons, located at the bottom of the screen, as follow:

Back: to return to the previous step

Next: to proceed to the next step

Close: to exit the software

Help: to access the online help

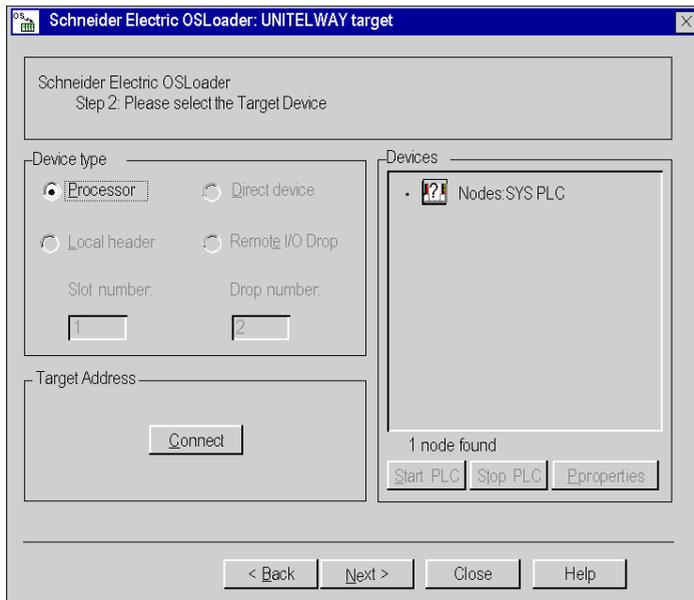
Communication Protocol: Uni-Telway Target Screen

General

In this screen, you choose the target device according to the Uni-Telway communication type selected in the previous step.

Illustration

The main elements of the **Uni-Telway Target** screen are described in the following paragraphs.



Device Type

The device types supported by OSLoader (*see page 20*) and available for the Uni-Telway communication type are displayed in the **Device Type** area. **Processor** is the only Uni-Telway target enabled.

Target Address

Press the **Connect** button in the **Target Address** area to connect OsLoader to the device.

If the connection is established, the target device is added to the directory tree in the **Devices** area.

If the connection cannot be established, an error message explaining the reason is displayed.

Devices: Directory Tree

The directory tree in the **Devices** area displays the list of connected devices. At OSLoader startup, when no connection is enabled, the directory tree is empty.

The following table shows the list of icons used in the directory tree and the corresponding description.

Icon	Description
	Processor in stop mode (Stop)
	Processor in run mode (Run)
	Processor is not configured (no application was ever loaded into the PLC)
	Host adapter (SA85 or PCMCIA Modbus Plus card)
	Bridge or Bridge plus or Bridge mux
	Input/output port
	Remote input/output module
	Device unknown

Proceed to the **Device Properties** dialog box by double-clicking on a specific device.

Devices: Start and Stop

The **Start PLC** and **Stop PLC** buttons are only available if a processor in the directory tree of the **Devices** field is selected. In other cases, they are disabled.

Stop the processor by pressing the **Stop PLC** button.

Restart the processor by pressing the **Start PLC** button.

Device Properties

The **Device Properties** dialog box (*see page 38*), which is accessible by pressing the **Properties** button in the **Devices** area, gives access to information concerning the selected device.

Navigation Buttons

Use the navigation buttons, located at the bottom of the screen, as follows:

Back: to return to the previous step

Next: to proceed to the next step

Close: to exit the software

Help: to access the online help

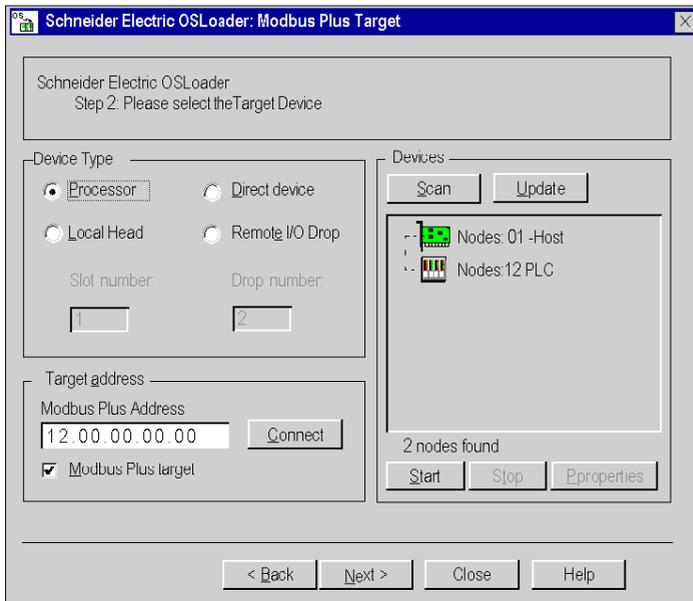
Communication Protocol: Modbus Plus Target Screen

General

The **Modbus Plus Target** dialog box allows you to choose the target device according to the Modbus Plus communication type.

Illustration

The main elements of the **Modbus Plus Target** screen are described in the following paragraphs.



Device Type

The device types supported by OSLoader (*see page 20*) and available for the Modbus Plus communication type are displayed in the **Device Type** area. Check the box corresponding to the device desired.

The **Slot number** and **Drop number** boxes may be enabled or disabled according to the device type selected.

The following table shows the four possible cases.

Device Type Selected	Slot Number	Drop Number
Processor	Disabled	Disabled
Local Head	Enabled	Disabled
Remote I/O Drop	Enabled	Enabled
Direct device	Disabled	Disabled

Target Address

The following elements are displayed in the **Target Address** area.

Fields	Description
Modbus Plus Address	In this field, you must enter the address of the target device specific to the Modbus Plus communication type.
Modbus Plus Target	Activate the checkbox IF the device is finally reached by a Modbus Plus communication port.
Connect	Press this button to connect OsLoader to the target device whose address is specified in the Modbus Address Plus entry field. If the connection is established, the target device is added to the directory tree in the Devices area.

Devices: Directory Tree

The directory tree in the **Devices** area displays the list of connected devices. At OSLoader startup, when no connection is enabled, the directory tree is empty.

The following table shows the list of icons used in the directory tree and the corresponding description.

Icon	Description
	Processor in stop mode (Stop)
	Processor in run mode (Run)
	Processor is not configured (no application was ever loaded into the PLC)
	Host adapter (SA85 or PCMCIA Modbus Plus card)
	Bridge or Bridge plus or Bridge mux
	Input/output port
	Remote input/output module
	Device unknown

When you click on a specific device, the **Modbus Plus address** entry field of the **Target Address** area is automatically updated.

Proceed to the **Device Properties** dialog box by double-clicking on a specific device.

Devices: Scan and Update

Press the **Scan** button to launch a sniffing program on the network. When a device is detected, its name and address are added to the directory tree in the **Devices** area. If a bridge is detected, the devices behind are added as sub-branches in the same directory tree.

Press the **Update** button to update the on/off status of the processors contained in the directory tree.

Devices: Start and Stop

The **Start** and **Stop** buttons are only available if a processor in the directory tree of the **Devices** field is selected. In other cases, they are disabled.

Stop the processor by pressing the **Stop** button.

Restart the processor by pressing the **Start** button.

NOTE: For safety PLCs (Control Expert XLS) the **Start/Stop PLC** functions are password protected. If you try to start or stop the processor a dialog box is displayed and you are asked to enter the password.

Device Properties

The **Device Properties** dialog box (*see page 38*), which is accessible by pressing the **Properties** button in the **Devices** area, gives access to information concerning the device selected.

Navigation Buttons

Use the navigation buttons, located at the bottom of the screen, as follows:

Back: to return to the previous step

Next: to proceed to the next step

Close: to exit the software

Help: to access the online help

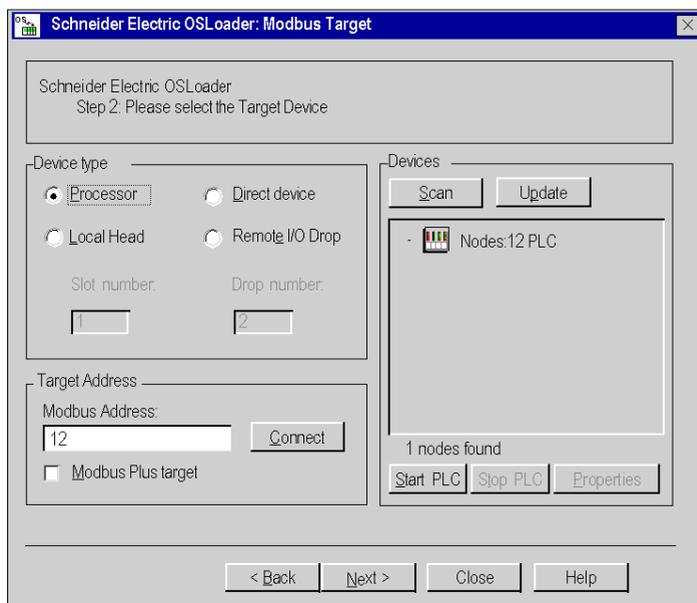
Communication Protocol: Modbus Target Screen

General

The **Modbus Target** dialog box allows you to choose the target device according to the Modbus communication type.

Illustration

The main elements of the **Modbus Target** screen are described in the following paragraphs.



Device Type

The device types supported by OSLoader (*see page 20*) and available for the Modbus RTU communication type are displayed in the **Device Type** area. Check the box corresponding to the device desired.

The **Slot number** and **Drop number** boxes may be enabled or disabled according to the device type selected.

The following table shows the four possible cases.

Device Type Selected	Slot Number	Drop Number
Processor	Disabled	Disabled
Local Head	Enabled	Disabled
Remote I/O Drop	Enabled	Enabled
Direct device	Disabled	Disabled

Target Address

The following elements are displayed in the **Target Address** area.

Field	Description
Modbus Address	Enter the address of the target device specific to the Modbus communication type.
Modbus Plus Target	Activate the checkbox IF the device is finally reached by a Modbus Plus communication port.
Connect	Press this button to connect OsLoader to the target device whose address is specified in the Modbus Address entry field. If the connection is established, the target device is added to the directory tree in the Devices area.

Devices: Directory Tree

The directory tree in the **Devices** area displays the list of connected devices. At OSLoader startup, when no connection is enabled, the directory tree is empty.

The following table shows the list of icons used in the directory tree and the corresponding description.

Icon	Description
	Processor in stop mode (Stop)
	Processor in run mode (Run)
	Processor is not configured (no application was ever loaded into the PLC)
	Host adapter (SA85 or PCMCIA Modbus Plus card)
	Bridge or Bridge plus or Bridge mux
	Input/output port
	Remote input/output module
	Device unknown

When you click on a specific device, the **Modbus Address** entry field of the **Target Address** area is automatically updated.

Proceed to the **Device Properties** dialog box by double-clicking on a specific device.

Devices: Scan and Update

Press the **Scan** button to launch a sniffing program on the network. When a device is detected, its name and address are added to the directory tree in the **Devices** area. If a bridge is detected, the devices behind are added as sub-branches in the same directory tree.

Press the **Update** button to update the on/off status of the processors contained in the directory tree.

Devices: Start and Stop

The **Start** and **Stop** buttons are only available if a processor in the directory tree of the **Devices** field is selected. In other cases, they are disabled.

Stop the processor by pressing the **Stop** button.

Restart the processor by pressing the **Start** button.

NOTE: For safety PLCs (Control Expert XLS) the **Start/Stop PLC** functions are password protected. If you try to start or stop the processor a dialog box is displayed and you are asked to enter the password.

Device Properties

The **Device Properties** dialog box (*see page 38*), which is accessible by pressing the **Properties** button in the **Devices** area, gives access to information concerning the device selected.

Navigation Buttons

Use the navigation buttons, located at the bottom of the screen, as follows:

Back: to return to the previous step

Next: to proceed to the next step

Close: to exit the software

Help: to access the online help

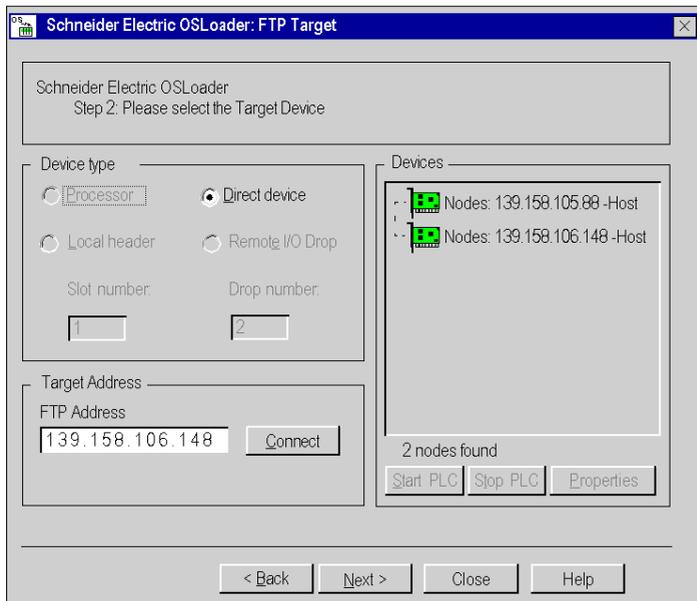
Communication Protocol: FTP Target Screen

General

This screen is displayed if the driver selected in the previous step is the FTP driver.

Illustration

The main elements of the **FTP Target** screen are described in the following paragraphs.



Device Type

The device types supported by OSLoader (*see page 20*) and available for the Ethernet/FTP communication type are displayed in the **Device Type** area. **Direct Device** is the only FTP target enabled.

Target Address

The following elements are displayed in the **Target Address** area.

Fields	Description
FTP Address	Enter the address of the target device specific to the FTP communication type. To be valid, the address must be made up of 4 numbers between 0 and 255 (TCP/IP address).
Connect	Press this button to connect OsLoader to the target device whose address is specified in the FTP Address entry field. For some devices, a MAC address can be requested before the connection. Generally this can be found on the device or can be read on the Quantum processor display. If the connection is established, the target device is added to the directory tree in the Devices area. If the connection cannot be established, an error message explaining the reason is displayed.

Devices: Directory Tree

The directory tree in the **Devices** area displays the list of connected devices. At OSLoader startup, when no connection is enabled, the directory tree is empty.

The following table shows the list of icons used in the directory tree and the corresponding description.

Icon	Description
	Processor in stop mode (Stop)
	Processor in run mode (Run)
	Processor is not configured (no application was ever loaded into the PLC)
	Host adapter (SA85 or PCMCIA Modbus Plus card)
	Bridge or Bridge plus or Bridge mux
	Input/output port
	Remote input/output module
	Device unknown

When you click on a specific device, the **FTP Address** entry field of the **Target Address** area is automatically updated.

Proceed to the **Device Properties** dialog box by double-clicking on a specific device.

Device Properties

The **Device Properties** dialog box (*see page 38*), which is accessible by pressing the **Properties** button in the **Devices** area, gives access to information concerning the selected device.

Navigation Buttons

Use the navigation buttons, located at the bottom of the screen, as follows:

Back: to return to the previous step

Next: to proceed to the next step

Close: to exit the software

Help: to access the online help

Operation Screen

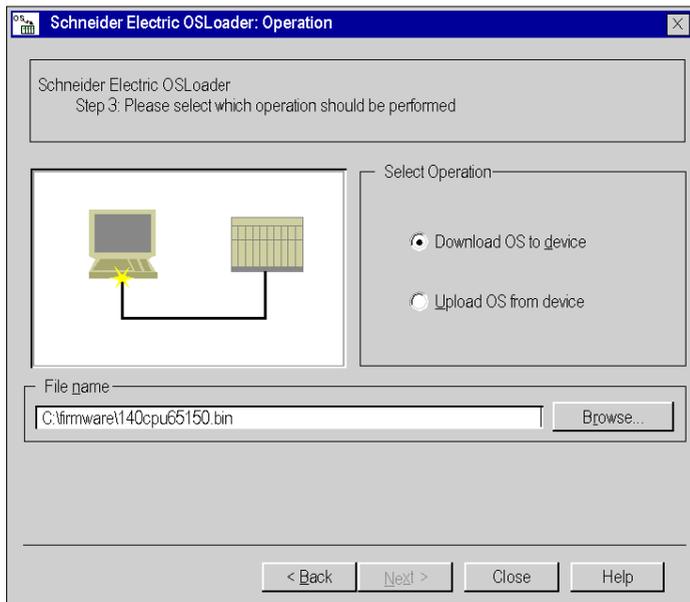
General

OSLoader can execute two different commands:

- download a new operating system to the selected device
- upload the operating system of the selected device to a file (**not for Premium processors**)

Illustration

The main elements of the **Operation** screen are described in the following paragraphs.



Select an Operation

The following table shows the two available commands.

Command	Description
Download OS to device	The new operating system replaces the existing one in the selected device (<i>see page 27</i>). All information saved earlier will be lost. After downloading, reconfigure the processor.
Upload OS from device	The existing OS in the selected device is read by OSLoader and the data are stored in a file. Note: This type of procedure is recommended as a backup operation, particularly before downloading a new OS to the selected device.

Filename

Use the **Browse...** button to select the following:

- the file to be downloaded (intermediate or OS replacement file), see the file description in the *readme.txt* on the OS CD-ROM
- the backup path of the OS image file

Navigation Buttons

Use the navigation buttons, located at the bottom of the screen, as follows:

Back: to return to the previous step

Next: to proceed to the next step

Close: to exit the software

Help: to access the online help

File and Device Info Screen

General

This screen provides a comparison between:

- The file properties to be transferred to a selected device (**File** area).
- The OS properties available in the target module (**Device** area).

Illustration

The main elements of the **File and Device Info** screen are described in the following paragraphs.

Schneider Electric OSLoader
Step 4: Final Comparison

File	Device
Device Name: Q_PhXHeos651X0	Device Name: 140 CPU 651 60
Hardware ID: 000B 0101 ✓	Hardware ID: 000B 0101
OS version: 0.67 ✓	OS version: 1.00
Description:	Crash Code: 0
	Description:

< Back Next > Close Help

Comparison

The **Comparison of File and Device** field is divided into two main parts:

- The properties of the OS file to be downloaded.
- The properties of the OS already in the target device.

NOTE: Refer to Error Codes (see *Quantum using EcoStruxure™ Control Expert, Experts and Communication, Reference Manual*) for the **Crash Code** field description.

NOTE: Colored markers make it easier when comparing properties.

Green Marker

Representation:

File		Device	
Device Name:	Q_PhxEos651X0	Device Name:	140 CPU E51 60
Hardware ID:	000B 0101	Hardware ID:	000B 0101
OS version:	1.00	OS version:	1.00

Meaning:

Property	To be transferred		Current
Hardware ID	Operating system file	=	Operating System
OS version	Operating system file	≥	Operating System

Red Marker

Representation:

File		Device	
Device Name:	Q_PhxEos651X0	Device Name:	140 CPU 651 60
Hardware ID:	000C 0205	Hardware ID:	000B 0101

Meaning:

Property	To be transferred		Current
Hardware ID	Operating system file	≠	Operating System

NOTE: Proceeding to the next step is NOT possible if the hardware identification codes are incompatible. The navigation button **Next** is then disabled.

Yellow Marker

Representation:

File		Device	
Device Name:	Q_PhxHeos651X0	Device Name:	140 CPU 651 60
Hardware ID:	000B 0101	Hardware ID:	000B 0101
OS version:	0.67	OS version:	1.00

Meaning:

Property	To be transferred		Current
Hardware ID	Operating system file	=	Operating System
OS version	Operating system file:	<	Operating System
or			
OS version	One of the version numbers cannot be determined.		

WARNING

UNEXPECTED EQUIPMENT OPERATION

You must test the application and address any safety issues before the system is returned to operation. Transfer of the operating system may cause changes in the behavior of the application.

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

Navigation Buttons

The navigation buttons, located at the bottom of the screen, are:

Back: Return to the previous step.

Next: Proceed to the next step.

Close: Exit the software.

Help: Access the online help.

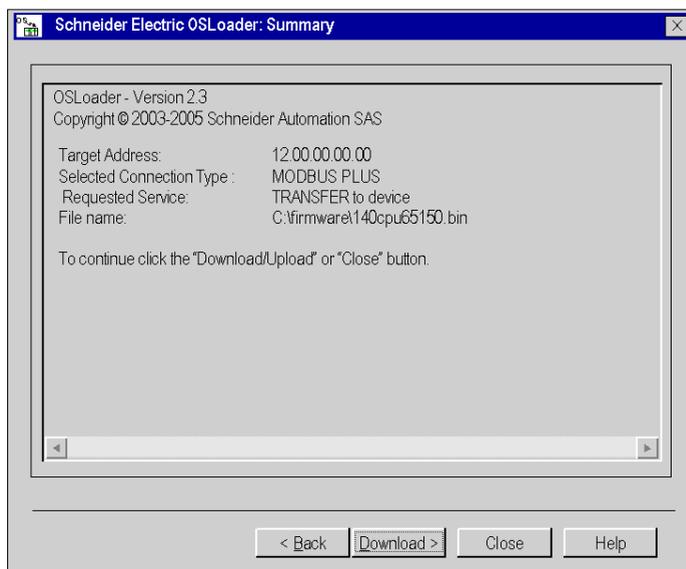
Summary Screen

General

This screen contains a summary of the main information concerning the chosen procedure and gives access to the data transfer phase.

Illustration

The main elements of the **Summary** screen are described in the following paragraph.



Navigation Buttons

Use the navigation buttons, located at the bottom of the screen, as follows:

Back: to return to the previous step

Next: to proceed to the next step

Close: to exit the software

Help: to access the online help

Progress Screen

General

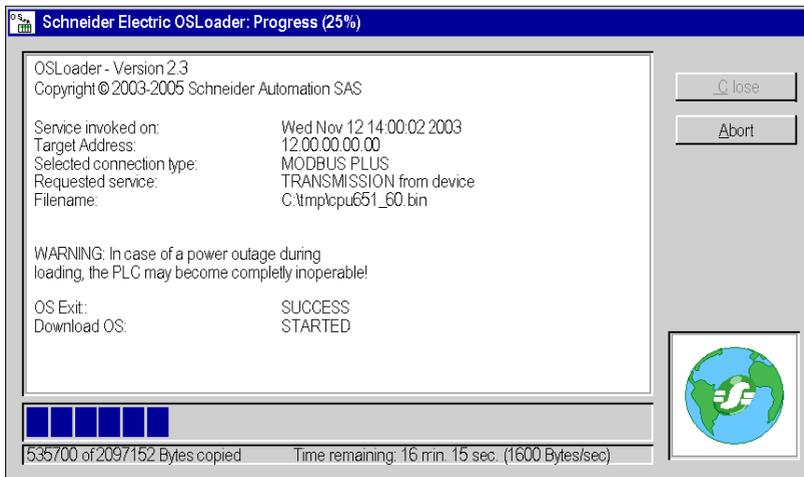
The **Progress** screen indicates:

- the OS transfer progress,
- the number of bytes downloaded,
- the remaining time,
- the transfer rate in bytes/second.

NOTE: If the target device is in RUN mode when downloading the new operating system, a dialog box displays on-screen asking for authorization to stop the PLC.

Illustration

The main elements of the data transfer progress screen are described in the following paragraphs.



⚠ WARNING

CPU POWER SUPPLY INTERRUPTION

Never interrupt the power supply to the CPU during the transfer of the operating system.

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

Information

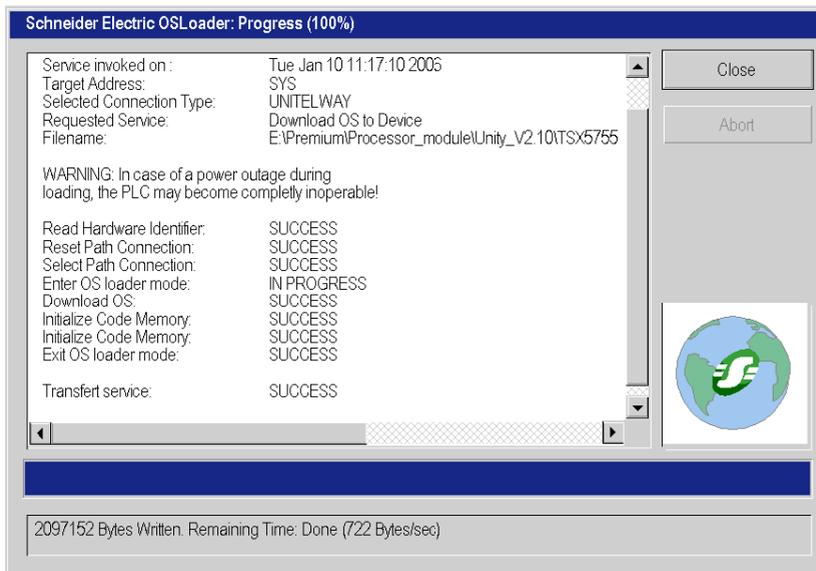
The **Progress** screen provides the main information concerning the current procedure: **UPLOADING to the device** or **DOWNLOADING from the device**.

Progress bar

The data transfer's progress status is displayed at the bottom of the **Progress** screen.

Transfer Complete

When the following **Progress 100%** window is displayed, the operation is successfully completed .



Abort and Close Buttons

The transfer procedure can be interrupted by clicking on **Abort**.

⚠ WARNING

UNEXPECTED EQUIPMENT OPERATION

If the loader is interrupted during download, the OS that is loaded may be corrupted. If this is suspected:

- attempt to reload the OS,
- if reloading is unsuccessful, return the unit to your Schneider Electric service location.

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

Use the **Close** button available at the end of the data transfer process to exit OSLoader .

Part IV

Errors and Limitations

Chapter 7

Communication Errors and Limits During Download

Introduction

This chapter describes the main communication errors and operating limits that may arise when downloading data.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Communication Interruptions	70
Operating Limits	71
Firewall Configuration under Windows Servers for OSloader	72

Communication Interruptions

Overview

During the transfer, certain errors caused by OSLoader may arise, which may adversely influence the transfer. The following section provides information on how to deal with most common problems.

Error Type

Some events cause communication errors. These errors are of the following type:

- **Minor errors** (example: Disconnection of PG connection)
- **Serious errors** (example: Network down)

Minor Error

For minor errors a dialog box appears and gives the user the possibility of restarting or canceling the transfer.

When the cause of the error is fixed, select:

- **Repeat** to restart the transfer
- **Cancel loading** to cancel the operation

Serious Error

The PLC becomes unusable if a serious error arises. The **RUN**, **ERR**, and **I/O** LEDs light up, and communication between PG and the controller is no longer possible.

Operating Limits

Limits

The following table describes the main cases in which an operating system cannot be downloaded.

Limits	Comment
The PLC is down or is not responding.	It is impossible to establish the connection. Check that: <ul style="list-style-type: none"> ● the PLC has not suffered a power outage, ● the PLC is still connected to the terminal, ● no other tool is connected to the terminal port.
The PLC is already reserved by another tool.	Downloading is impossible. Disconnect the entity that has reserved the PLC. Restart the program.
The format of the selected file is not compatible with OSLoader.	Use a file with an appropriate format type.
The binary file to be loaded is incompatible with the target processor.	Downloading is impossible. Check the type of PLC, then select the appropriate binary file.

Firewall Configuration under Windows Servers for OSloader

Presentation

Under Windows Server 2008 and Windows Server 2012, new installed applications are not allowed to communicate through the Firewall. To download firmware with **Osloader**, you have to authorize **Osloader** application to communicate through the Firewall.

How to allow Osloader to communicate through Windows Firewall

To allow **Osloader** to communicate through Windows Firewall:

- check the **Osloader** check box in **Control Panel** → **System and Security** → **Windows Firewall** → **Allowed Applications**
- Reboot the PC.

NOTE: If **Osloader** doesn't appear in the list of applications that are allowed, click on then **Allow another app...** button and select **Osloader** in the list, check the check box and reboot the PC.

Appendices



What Is in This Appendix?

The appendix contains the following chapters:

Chapter	Chapter Name	Page
A	Compatibility Between Programming Software and Processors	75
B	Upgrading Operating Systems for Premium Processors and TSX ETY xxxx	81
C	Upgrading Operating Systems for Quantum CPU and Modules	97

Appendix A

Compatibility Between Programming Software and Processors

Introduction

This chapter contains tables showing compatibility of Schneider Electric programming software (PL7, Concept and Unity Pro/Control Expert) to Schneider Electric processors.

NOTE: Unity Pro is the old name of Control Expert for versions \leq V13.1.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Compatibility of Software (PL7 and Unity Pro) to Processors (Premium and Atrium Range), and TSX ETY Modules	76
Compatibility of Software (Concept and Unity Pro) to Processors (Quantum Range), and NOE Modules	78

Compatibility of Software (PL7 and Unity Pro) to Processors (Premium and Atrium Range), and TSX ETY Modules

Introduction

OSLoader allows the operating systems of certain processors, modules, and Ethernet modules to be upgraded. The list of processors compatible with this upgrade is indicated in the following tables.

Premium Processors Compatibility

The following table shows the compatibility of software (PL7 and Unity Pro) to processors in the Premium range.

Processors	PL7 V3	PL7 V4	Unity Pro V1	Unity Pro V2.**	Unity Pro V3.*
TSX P57 **2	x	x	-	-	-
TSX P57 **3	-	x	x (1)	x (1)	x (1)
TSX P57 *623	-	x	x (1)	x (1)	x (1)
TSX P57 **4	-	-	x	x	x
TSX P57 *634 (2)	-	-	x	x	x
TSX P57 6634	-	-	-	-	x
TSX H57 *4	-	-	-	-	x

X compatible processors

- non-compatible processors

(1) after upgrades by OSLoader to the processor's operating system

(2) includes TSX P57 *634 except for TSX P57 6634

Atrium Processors Compatibility

The following table shows the compatibility of software (PL7 and Unity Pro) to processors in the Atrium range.

Processors	PL7 V3	PL7 V4	Unity Pro V1	Unity Pro ≥ V2.**
TSX PCI 57 **4	-	-	x	x

X compatible processors

- non-compatible processors

Ethernet TSX ETY ••• Modules Compatibility

The following table shows the compatibility of software (PL7 and Unity Pro) to the TSX ETY ••• range of modules.

Processors	PL7 V3	PL7 V4	Unity Pro V1	Unity Pro ≥ V2.0
TSX ETY •102	x	x	x (1)	x (1)
TSX ETY •103	-	x	x	x

X compatible processors

- non-compatible processors

(1) after upgrades by OSLoader to the processor's operating system

Compatibility of Software (Concept and Unity Pro) to Processors (Quantum Range), and NOE Modules

Introduction

With OSLoader, the operating systems of certain processor modules can be upgraded. The list of processors compatible with this upgrade is given in the following table.

Quantum Processor Compatibility

The following table shows the compatibility of software (Concept and Unity Pro) to processors in the Quantum range.

Processors	Concept V2.6	Unity Pro V1	Unity Pro < V2.3	Unity Pro V2.3	Unity Pro ≥ V3.0
140 CPU 303 0	x	-	-	-	-
140 CPU 311 1	-	x	x	x	x
140 CPU 341 A	x	x (1)	x (1)	x (1)	x (1)
140 CPU 341 U	-	x	x	x	x
140 CPU 651 0	-	x	x	x	x
140 CPU 671 60	-	x	x	x	x
140 CPU 672 6	-	x	x	x	x
140 CPU 678 61	-	x	x	x	x
140 CPU 652 60	-	-	-	x	x
140 CPU 658 60	-	-	-	x	x
140 CPU 601 60S	-	-	-	-	x (2)

X compatible processors

- non-compatible processors

(1) after upgrades by OSLoader to the processor's operating system

(2) safety processors are compatible with Unity Pro XLS only

NOE Module Compatibility

The following table shows the compatibility of software (Concept and Unity Pro) to the NOE range of modules.

Modules	Concept V2.6	Unity Pro V1	Unity Pro ≥ V2**
140 NOE 771 •1 (exec < V3.0)	x	x (1)	x (1)
140 NOE 771 •1 (exec ≥ V3.0)	x	x (2)	x (2)
140 NOE 771 •1 (exec ≥ V3.5)	-	x	x

X compatible modules

- non-compatible modules

(1) The upgrade procedure for a NOE (exec < 3.0) or ENT on the "Unity Level" is as follows. For NOE (exec < 3.0), first upgrade the module's exec to 3.30. Use the Concept **EXECLoader** to do this. Then use OSLoader to create a "Unity V2"-compatible NOE (exec 3.5).

(2) after upgrades by OSLoader to the module's operating system

Appendix B

Upgrading Operating Systems for Premium Processors and TSX ETY xxxx

Introduction

This chapter presents the operating system upgrade principles for Premium processors and TSX ETY xxxx modules according to the type and version of programming software.

NOTE: Unity Pro is the old name of Control Expert for versions \leq V13.1.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Upgrading TSX ETY xxxx Modules and Embedded Ethernet Port of Premium Processors for Unity 2.xx	82
Upgrading PL7 Processors to Unity 2.xx	85
Upgrading Unity 1.0 Processors to Unity 2.xx	89
Upgrading Premium Unity Processors from 2.yy to 2.xx	93

Upgrading TSX ETY xxxx Modules and Embedded Ethernet Port of Premium Processors for Unity 2.xx

Overview

For the TSX ETY xxxx module and Premium processors with a Copro or embedded Ethernet port, upgrading must be done on the boot ROM and the Exec version. The number of steps to use for this upgrade depends on the hardware version.

NOTE: OS upgrades on processors must be done **after** upgrading the TSX ETY xxxx module's embedded Ethernet port.

Upgradeable Device Hardware

Each piece of hardware is identified by its module or processor type, its PV (Product Version), and its Exec Version.

Network Module Type	PV (Product Version)	Exec Version before upgrade	Boot ROM and Exec Version after upgrade	Equivalent Network Module Type in Unity Pro
TSX ETY 4102	≥ 01	2.0, 2.1	3.1	TSX ETY 4103
TSX ETY 5102	≥ 01	2.0, 2.1	3.1	TSX ETY 5103
TSX ETY 4103	≥ 01	≥ 3.0	≥ 3.1	TSX ETY 4103
TSX ETY 5103	≥ 01	≥ 3.0	≥ 3.1	TSX ETY 5103
TSX P57 2623	≥ 01	2.0, 2.1	≥ 3.1	TSX P57 2634
TSX P57 3623	≥ 01	2.0, 2.1	≥ 3.1	TSX P57 3634
TSX P57 2634	≥ 01	3.1	≥ 3.1	TSX P57 2634
TSX P57 3634	≥ 01	3.1	≥ 3.1	TSX P57 3634

Files Used for Upgrading from PL7 to Unity 2.0

The following table gives the information for upgrading the TSX ETY 0000 module and TSX P57 0000 processor Ethernet ports from PL7 to Unity 2.0:

- the number of downloads to carry out
- the names of the files to use for the downloads

NOTE: The number next to each file gives its usage order (for example: the (2)ETH_572634_V310_BOOT.bin file must be used for the second download).

Network Module Type	Number of downloads	File used to upgrade from PL7 to Unity	File used for last Exec version
TSX ETY 4102 (1)	4	(1)ETH_4103_V300.bin (2)ETH_4103_V310_BOOT.bin (3)ETH_4103_V310.bin	(4)ETH_4103_V340.bin
TSX ETY 5102 (1)	4	(1)ETH_5103_V300.bin (2)ETH_5103_V310_BOOT.bin (3)ETH_5103_V310.bin	(4)ETH_5103_V340.bin
TSX ETY 4103 (1)	1	-	(1)ETH_4103_V340.bin
TSX ETY 5103 (1)	1	-	(1)ETH_5103_V340.bin
TSX P57 2623 (2)	4	(1)ETH_572634_V300.bin (2)ETH_572634_V310_BOOT.bin (3)ETH_572634_V310.bin	(4)ETH_572634_V340.bin
TSX P57 3623 (2)	4	(1)ETH_573634_V300.bin (2)ETH_573634_V310_BOOT.bin (3)ETH_573634_V310.bin	(4)ETH_573634_V340.bin

- 1 network modules remain compatible with Premium PL7 processors after upgrading
- 2 the processor must also be upgraded (the number of downloads only corresponds to upgrades of Ethernet ports).

Files Used for Upgrading from Unity 1.00 to Unity 2.0

The following table gives the information for upgrading the TSX P57 0000 processor Ethernet ports from Unity 1.00 to Unity 2.0:

- the number of downloads to carry out
- the names of the files to use for the downloads

NOTE: The number next to each file gives its usage order (for example: the (2)ETH_573634_V310_BOOT.bin file must be used for the second download).

Network Module Type	Number of downloads (1)	File used to upgrade from Unity 1.00 to Unity 2.0	File used for last Exec version
TSX P57 2634	3	(1)ETH_572634_V310_BOOT.bin (2)ETH_572634_V310.bin	(3)ETH_572634_V340.bin

Network Module Type	Number of downloads (1)	File used to upgrade from Unity 1.00 to Unity 2.**	File used for last Exec version
TSX P57 3634	3	(1)ETH_573634_V310_BOOT.bin (2)ETH_573634_V310.bin	(3)ETH_573634_V340.bin
TSX P57 5634	1	-	Os_Eth_CoproP.bin

- 1 the processor must also be upgraded (the number of downloads only corresponds to upgrades of Ethernet ports).

Files Used for Upgrading from Unity 2.yy to Unity 2.xx

The following table gives the information for upgrading the TSX ETY **** module and TSX P57 **** processor Ethernet ports from Unity 2.yy to Unity 2.xx:

- the number of downloads to carry out
- the names of the files to use for the downloads

NOTE: The number next to each file gives its usage order (for example: the (2)ETH_573634_V310_BOOT.bin file must be used for the second download).

Network Module Type	Number of downloads	File used to upgrade from Unity 1.00 to Unity 2.**	File used for last Exec version
TSX ETY 4103	1	-	(1)ETH_4103_V34.bin
TSX ETY 5103	1	-	(1)ETH_5103_V340.bin
TSX P57 1634 (1)	3	(1)ETH_571634_V310_BOOT.bin (2)ETH_571634_V310.bin	(3)ETH_571634_V340.bin
TSX P57 2634 (1)	3	(1)ETH_572634_V310_BOOT.bin (2)ETH_572634_V310.bin	(3)ETH_572634_V340.bin
TSX P57 3634 (1)	3	(1)ETH_573634_V310_BOOT.bin (2)ETH_573634_V310.bin	(3)ETH_573634_V340.bin
TSX P57 4634 (1)	1	-	(1)Os_Eth_CoproP.bin
TSX P57 5634 (1)	1	-	(1)Os_Eth_CoproP.bin

- 1 the processor must also be upgraded (the number of downloads only corresponds to upgrades of Ethernet ports).

Upgrading PL7 Processors to Unity 2.xx

Upgradeable Premium Hardware

Each piece of hardware is identified by its processor type, PV (Product Version), and SV (Software Version).

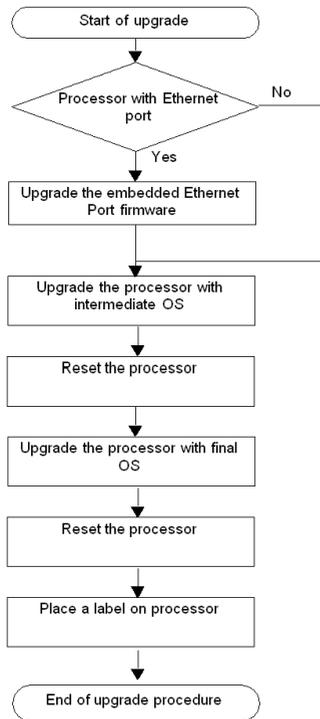
The following tables show the only Premium hardware that can be upgraded from PL7 to Unity 2.xx, and the equivalent processor types in Unity Pro.

Processor Type	PV (Product Version)	SV (Software Version)	Equivalent Processor Types in Unity Pro
TSX P57 203M	≥ 01	≥ 5.0	TSX P57 204M
TSX P57 253M	≥ 01	≥ 5.0	TSX P57 254M
TSX P57 2623M (1)	≥ 01 ≥ 01	≥ 5.4 2.0, 2.1	TSX P57 2634M
TSX P57 303M	≥ 01	≥ 5.0	TSX P57 304M
TSX P57 353M	≥ 01	≥ 5.0	TSX P57 354M
TSX P57 3623M (1)	≥ 01 ≥ 01	≥ 5.4 2.0, 2.1	TSX P57 3634M

(1) processor with an embedded Ethernet port (*see page 82*)

Upgrading PL7 to Unity OS

To upgrade the OS from PL7 to Unity 2.**, carry out the following procedure.



The following table describes the steps for upgrading a PL7 OS to Unity 2.**.

Step	Description	Associated Procedure	Communication Protocol
Upgrade the embedded Ethernet port firmware (1)	If the processor has an Ethernet port, upgrade it.	Ethernet port <i>(see page 32)</i>	FTP (Ethernet port)
Upgrade the processor with intermediate OS	The intermediate OS must be downloaded to the PLC before the final OS binary file.	Intermediate OS <i>(see page 28)</i>	UNTLW01 (Terminal port)
Reset the processor	Perform a cold start-up by pushing the PLC Reset button.	-	-
Upgrade the processor with final OS	The final OS binary file must be downloaded to the PLC.	Final OS <i>(see page 30)</i>	UNTLW01 (Terminal port)

(1) only for TSX P57 2623 and TSX P57 3623.

Location of the Files

The corresponding *.bin* files can be found:

- On www.schneider-electric.com global website, in the menu **Support** → **Documents & Software** using the **Search** field (indicate for example the module name like TSXP572623, part of the module name like TSXP57, functionality to upgrade like copro, or firmware version if it is known like v310).
- On the OS CD-ROM.

Example for the TSX P57 2623M.

File	Directory
OS Ethernet port	<i>Premium\Processor modules\PI7_to_Unity_V2.**\TSXP572623_to_2634\Eth_Os\ETH572623_to_572634V300\ETH_572634_V300.bin</i> <i>Premium\Processor modules\PI7_to_Unity_V2.**\TSXP572623_to_2634\Eth_Os\ETH572634v300_to_572634v310\ETH_572634_V310_BOOT.bin</i> <i>Premium\Processor modules\PI7_to_Unity_V2.**\TSXP572623_to_2634\Eth_Os\ETH572634v300_to_572634v310\ETH_572634_V310.bin</i> <i>Premium\Processor modules\PI7_to_Unity_V2.**\TSXP572623_to_2634\Eth_Os\ETH572634v310_to_572634v320\ETH_572634_V320.bin</i>
Intermediate OS	<i>Premium\Processor modules\PL7_to_Unity\TSXP572623_to_2634\Plc_Os\PI7_to_UnityV240_2634.bin</i>
Final OS	<i>Premium\Processor modules\PL7_to_Unity\TSXP572623_to_2634\Plc_Os\TSX_P57_2634m.bin</i>

CAUTION

IRREPARABLE EQUIPMENT DAMAGE

During OS transfer:

- Never interrupt the power supply to the processor.
- Never interrupt the OS transfer process.
- Never interrupt the communication between PC and PLC.

Interrupting the transfer process before it has completed can cause irreparable damage to the device.

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

Label the PLC

After upgrading a processor or network module from PL7 to Unity, we recommend placing a label on the front panel of the product to indicate that the processor type or network module has been upgraded.

The label should clearly display the following upgrade information for processors.

PL7 Processor Types	Upgraded to equivalent Processor Types in Unity Pro
TSX P57 203M	TSX P57 204M
TSX P57 253M	TSX P57 254M
TSX P57 2623M	TSX P57 2634M
TSX P57 303M	TSX P57 304M
TSX P57 353M	TSX P57 354M
TSX P57 3623M	TSX P57 3634M

Upgrading Unity 1.0 Processors to Unity 2.xx

Upgradeable Premium Hardware

The following tables show Premium hardware that can be upgraded from Unity 1.0 to Unity 2.xx and the equivalent processor types in Unity Pro.

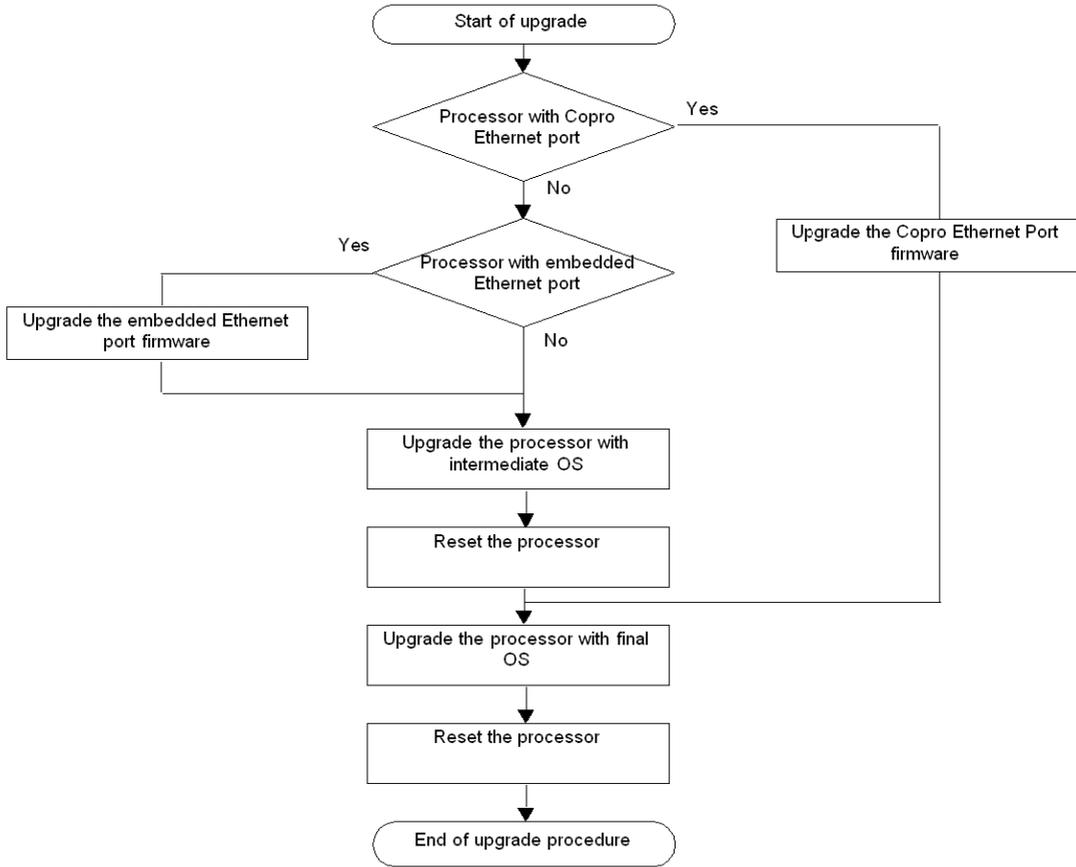
Processor Type	Equivalent Processor Types in Unity Pro
TSX P57 204M	TSX P57 204M
TSX P57 2634M	TSX P57 2634M
TSX P57 304M	TSX P57 304M
TSX P57 3634M (1)	TSX P57 3634M
TSX P57 4634M (2)	TSX P57 4634M
TSX P57 5634M (2)	TSX P57 5634M
TSX P57 6634M (2)	TSX P57 6634M
TSX PCI57 204M	TSX PCI57 204M

(1) processor with an embedded Ethernet port (*see page 82*)

(2) processor with a Copro Ethernet port (*see page 82*)

Upgrading Unity 1.0 to Unity 2.0 OS

To upgrade the OS from Unity 1.0 to Unity 2.0, carry out the following procedure.



The following table describes the steps for upgrading from Unity 1.0 to Unity 2.0.

Step	Description	Associated Procedure	Communication Protocol
Upgrade the Copro Ethernet port firmware (1)	If the processor has a Copro Ethernet port, upgrade it.	Ethernet port (<i>see page 32</i>)	FTP (Ethernet port)
Upgrade the embedded Ethernet port firmware (2)	If the processor has an Ethernet port, upgrade it.		
Upgrade the processor with intermediate OS (3)	The intermediate OS must be downloaded to the PLC before the final OS binary file.	Intermediate OS (<i>see page 28</i>)	UNTLW01 (Terminal port)
Reset the processor (3)	Perform a cold start-up by pushing the PLC Reset button.	-	-
Upgrade the processor with final OS	The final OS binary file must be downloaded to the PLC.	Final OS (<i>see page 30</i>)	UNTLW01 (Terminal port)

(1) only for TSX P57 6634/5634/4634

(2) only for TSX P57 3634

(3) not for TSX P57 6634/5634/4634

Location of the Files

The corresponding *.bin* files can be found:

- on Schneider Electric web site at www.schneider-electric.com in the menu **Product** → **Product index**, click on **Automation** → **Modicon Premium** → **Software and firmware**, and
- on the OS CD-ROM.

Example for the TSX P57 2634M.

File	Directory
OS Ethernet port	<i>Premium\Processor modules\Unity_V1.0_to_Unity_V2.**\TSXP572634_V1.0_to_2634_V2.**\Eth_Os\ETH572634v310\ETH_572634_V310_BOOT.bin</i> <i>Premium\Processor modules\Unity_V1.0_to_Unity_V2.**\TSXP572634_V1.0_to_2634_V2.**\Eth_Os\ETH572634v310\ETH_572634_V310.bin</i> <i>Premium\Processor modules\Unity_V1.0_to_Unity_V2.**\TSXP572634_V1.0_to_2634_V2.**\Eth_Os\ETH572634v320\ETH_572634_V320.bin</i>
Intermediate OS	<i>Premium\Processor modules\Unity_V1.0_to_Unity_V2.**\TSXP572634_V1.0_to_2634_V2.**\Plc_Os\Unity1M2M_2634.bin</i>
Final OS	<i>Premium\Processor modules\Unity_V1.0_to_Unity_V2.**\TSXP572634_V1.0_to_2634_V2.**\Plc_Os\TSX_P57_2634_m.bin</i>

CAUTION

IRREPARABLE EQUIPMENT DAMAGE

During OS transfer:

- Never interrupt the power supply to the processor.
- Never interrupt the OS transfer process.
- Never interrupt the communication between PC and PLC.

Interrupting the transfer process before it has completed can cause irreparable damage to the device.

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

Upgrading Premium Unity Processors from 2.yy to 2.xx

Upgradeable Premium Hardware

The following tables show Premium hardware that can be upgraded from Unity 2.yy to Unity 2.xx and the equivalent processor types in Unity Pro.

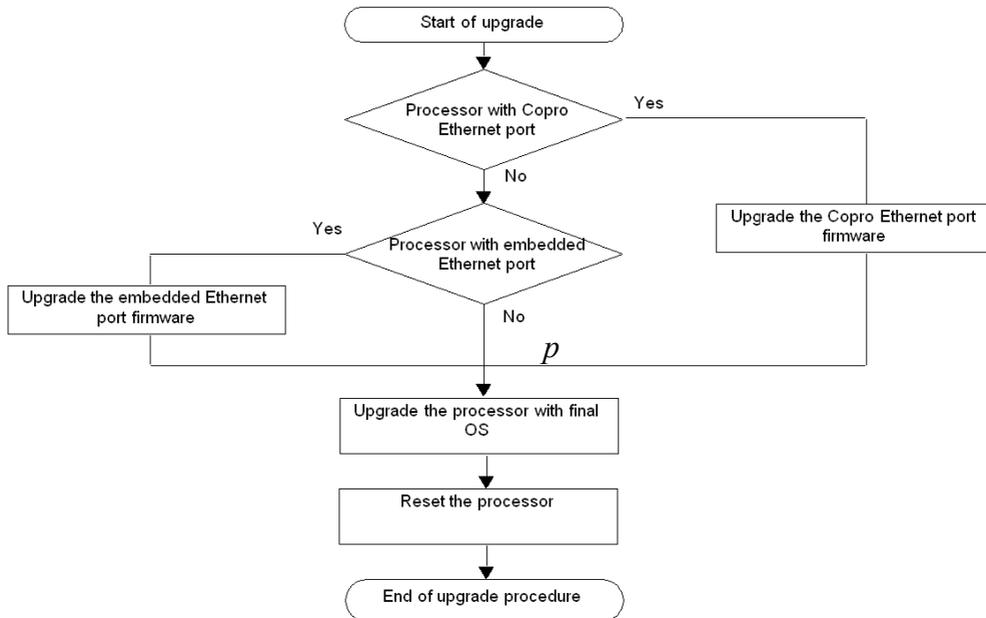
Processor Type	Equivalent Processor Types in Unity Pro
TSX P57 C024M	TSX P57 C024M
TSX P57 024M	TSX P57 024M
TSX P57 104M	TSX P57 104M
TSX P57 154M	TSX P57 154M
TSX P57 1634M (1)	TSX P57 1634M
TSX P57 204M	TSX P57 204M
TSX P57 254M	TSX P57 254M
TSX P57 2634M (1)	TSX P57 2634M
TSX P57 304M	TSX P57 304M
TSX P57 354M	TSX P57 354M
TSX P57 3634M (1)	TSX P57 3634M
TSX P57 454M	TSX P57 454M
TSX P57 4634M (2)	TSX P57 4634M
TSX P57 554M	TSX P57 554M
TSX P57 5634M (2)	TSX P57 5634M
TSX PCI57 204M	TSX PCI57 204M
TSX PCI57 354M	TSX PCI57 354M
TSX P57 6634M (2)	TSX P57 6634M
TSX H57 24M	TSX H57 24M
TSX H57 44M	TSX H57 44M

(1) processor with an embedded Ethernet port (*see page 82*)

(2) processor with a Copro Ethernet port (*see page 82*)

Upgrading Unity 2.yy to Unity 2.xx OS

To upgrade the OS from Unity 2.yy to Unity 2.xx, carry out the following procedure.



The following table describes the steps for upgrading a Unity 2.yy OS to Unity 2.xx.

Step	Description	Associated Procedure	Communication Protocol
Upgrade the Copro Ethernet port firmware (1)	If the processor has a Copro Ethernet port, upgrade it.	Ethernet port (see page 32)	FTP (Ethernet port)
Upgrade the embedded Ethernet port firmware (2)	If the processor has an Ethernet port, upgrade it.		
Upgrade the processor with final OS	The final OS binary file must be downloaded to the PLC.	Final OS (see page 30)	UNTLW01 (Terminal port)
Reset the processor	Perform a cold start-up by pushing the processor's reset button.	-	-

(1) only for TSX P57 4634, TSX P57 5634, and TSX P57 6634

(2) only for TSX P57 1634, TSX P57 2634, and TSX P57 3634

Location of the Files

The corresponding *.bin* files can be found:

- On www.schneider-electric.com global website, in the menu **Support** → **Documents & Software** using the **Search** field (indicate for example the module name like TSXP572623, part of the module name like TSXP57, functionality to upgrade like copro, or firmware version if it is known like v310).
- On the OS CD-ROM.

Example for the TSX P57 3634M.

File	Directory
OS Ethernet port	<i>Premium\Processor modules\Unity_V2.**\TSX573634\Eth_Os\ETH573634v320\ETH_573634_V320.bin</i> <i>Premium\Processor modules\Unity_V2.**\TSX573634\Eth_Os\ETH573634v340\ETH_573634_V34.bin</i>
Final OS	<i>Premium\Processor modules\Unity_V2.**\TSX573634\Plc_Os\tsx_p57_3634m.bin</i>

Appendix C

Upgrading Operating Systems for Quantum CPU and Modules

Upgrading Operating Systems for Modicon Quantum

Upgrade Principles

The Modicon Quantum CPU and modules upgrade principles are provided in the Modicon Quantum upgrade and update user guide (*see Modicon Quantum, Update Procedure, User Guide*).



A

addressing, *21*

B

before upgrade, *17*

C

cables

communication, *21*

cautions and preconditions, *17*

communication, *21*

cables, *21*

communication drivers, *21*

communication protocol, *21*

compatibility

Atrium processors, *76*

Premium processors, *76*

Quantum processors, *78*

D

Device hardware

upgradable, *82*

device properties screen, *38*

device types, *20*

downgrade, *18*

download

during, *17*

drivers

communication, *21*

duration of upgrade

using Modbus, *17*

during download, *17*

E

Ethernet TCP/IP, *21*

F

Final OS to device

check, *36*

download, *30*

FTP, *21, 56*

H

hardware

upgradable, *82*

upgradeable, *85, 89, 93*

I

installation, *15*

intermediate OS to device

download, *28*

M

media, *21*

Modbus, *21, 52*

Modbus Plus, *21, 48*

O

operating system, *14*

operating system comparison, *61*

OS

check, *36*

final to device, *30*

intermediate to device, *28*

OS Ethernet

download, *32*

P

- password protected
 - start/stop safety PLC, *51, 55*
- PLC in stop mode, *18*
- preconditions and cautions, *17*
- Premium hardware
 - upgradeable, *85, 89, 93*
- protocol, *21*
 - communication, *21*

S

- security management, *16*
- Software/processors compatibility, *75*
- start/stop safety PLC
 - password protected, *51, 55*
- stop mode
 - PLC, *18*
- Summary, *64*

T

- transferring the OS, *65*

U

- Uni-Telway, *21, 45*
- upgradable Device hardware, *82*
- upgrade
 - before, *17*
- upgrade duration
 - using Modbus, *17*
- upgradeable Premium hardware, *85, 89, 93*

W

- welcome screen, *42*
- Windows Server
 - Osloader, *72*