Unity Pro

Unity Loader
User Manual

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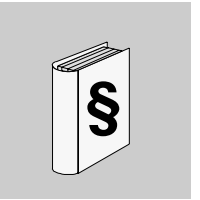
Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, 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 an imminently hazardous situation, which, if not avoided, **will result** in death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

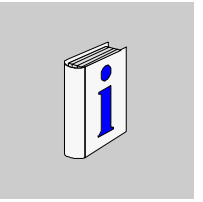
⚠ CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

About the Book



At a Glance

Document Scope

This document describes the Unity Loader stand-alone tool.

The Unity Loader transfers Unity Pro applications bidirectionally between a PC and an M340 PLC. It also transfers firmware (FW) mono-directionally from a PC to an M340 PLC.

You can download additional technical publications and other technical information from our website at *www.telemecanique.com*.

Validity Note

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User Comments

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Unity Loader General Information

1

At a Glance

Overview

This chapter comprises general information about the Unity Loader and the dedicated hardware platform M340.

What's in this Chapter?

This chapter contains the following topics:

General

Overview

The Unity Loader is a stand-alone software tool dedicated to the M340 hardware platform. A Unity Pro license is not required to use the loader.

The Unity Loader software provides the following transfer features:

- transfer of a Unity Pro application from a PC to a PLC
- transfer of a Unity Pro application from a PLC to a PC
- transfer of firmware (FW) from a PC to a PLC or to a module with firmware

Note: The Unity Loader software requires one of the following operating systems:
- Windows Professional Edition 32
- Windows XP
- Windows Vista Professional Edition 32

Installation

Overview

Insert the CD **Unity Loader** in the CD-ROM drive.

Autorun launches the setup automatically. If not, double-click *Setup.exe*.

The Unity Loader Installation Wizard will guide you through the installation.

Cautions and Preconditions

Before FW Transfer

Note: Save the PLC program and other data before transferring firmware (FW) from a PC to a PLC or to a module with firmware.

⚠ WARNING

RISK OF UNINTENDED EQUIPMENT OPERATION

Before transferring data to a PLC make sure that you have selected the correct project and firmware files and entered the correct target address. Verify the address by comparing the MAC address printed on the device with the MAC address shown in the **Firmware** tab.

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

PLC in Stop Mode

Stop the PLC before you start firmware (FW) transfer.

If you do not stop the PLC before trying to transfer firmware (FW), you will be informed by the Unity Loader that the PLC must be stopped.

After confirming this message, the Unity Loader will stop the PLC automatically.

Communication

2

Target Devices

Overview

The Unity Loader target devices are as follows:

- processors (CPUs) of the Modicon M340 platform
- Ethernet modules of the Modicon M340 platform
- other modules (with firmware) of the Modicon M340 platform

Run/Stop Command

The Unity Loader can send a run or stop command to the processor.

⚠ WARNING

RISK OF UNINTENDED EQUIPMENT OPERATION

Before starting/stopping a PLC make sure that you are connected to the correct target address. Verify the address by comparing the MAC address printed on the device with the MAC address shown in the **Firmware** tab.

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

⚠ WARNING

UNKNOWN OPERATIONAL STATE OF EQUIPMENT

Evaluate operational state of equipment before starting or stopping a PLC. Hazardous situations can occur if system state is not confirmed prior to starting or stopping a PLC.

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

Communication

- CPUs are accessible through their USB or Ethernet ports
- Ethernet modules are accessible through their own Ethernet port (crossover cable, point to point)
- Other modules (with firmware) of the Modicon M340 platform are accessible through the CPU (connection on a CPU port).
  These modules can not be accessed through Ethernet modules.

Unity Loader Dialog Box

3

At a Glance

Overview

This chapter comprises information about the tabs of the Unity Loader dialog box.

What's in this Chapter?

This chapter contains the following topics:

General Description of the Dialog Box

Overview

The user interface of the Unity Loader is a dialog box with 4 different tabs:

- Project tab
  transfer of a Unity Pro application (program, data, user files) from a PC to a PLC or vice versa
- Firmware tab
  transfer of firmware (FW) from a PC to a PLC or to a module with firmware
- Options tab
  general settings for the Unity Loader
- About tab
  information about your Unity Loader (version, copyright, etc.)

Transfer FW or Transfer Project

⚠ WARNING

RISK OF UNINTENDED EQUIPMENT OPERATION

Before transferring data to a PLC make sure that you have selected the correct project and firmware files and entered the correct target address. Verify the address by comparing the MAC address printed on the device with the MAC address shown in the **Firmware** tab.

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

Start PLC / Stop PLC

⚠ WARNING

RISK OF UNINTENDED EQUIPMENT OPERATION

Before starting/stopping a PLC make sure that you are connected to the correct target address. Verify the address by comparing the MAC address printed on the device with the MAC address shown in the **Firmware** tab.

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

⚠ WARNING

UNKNOWN OPERATIONAL STATE OF EQUIPMENT

Evaluate operational state of equipment before starting or stopping a PLC. Hazardous situations can occur if system state is not confirmed prior to starting or stopping a PLC.

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

Launching the Unity Loader

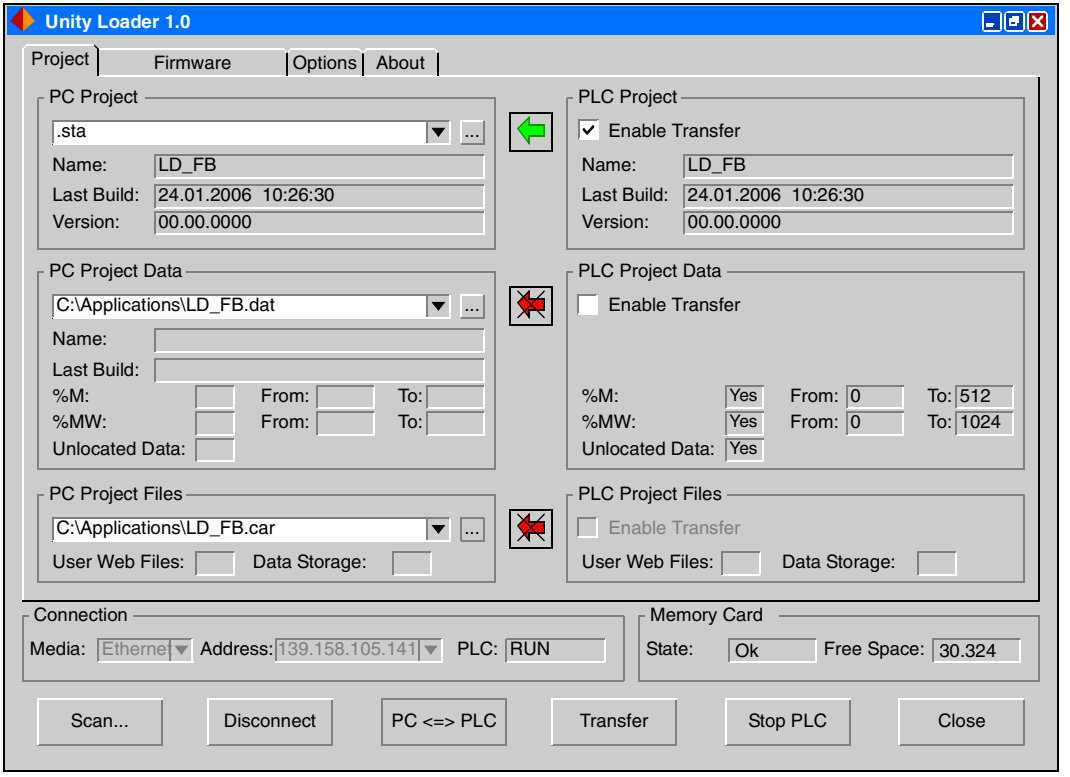
Launch the Unity Loader via **Start** → **Programs** → **Schneider Electric** → **Unity Loader**.

General Structure

The following areas are included in each of the 4 tabs:

- tab selection (at the top of the dialog box)
- tab specific area
- Connection
- Memory Card
- command buttons (at the bottom of the dialog box)

After launching the Unity Loader, the dialog box will open with the **Project** tab.



Tab Selection

To select a tab click the respective tab selector (**Project**, **Firmware**, **Options**, **About**).

Tab Specific Area

The content of the tab specific area depends on the individual tab. For more information see the respective tab description.

- Project tab (see *Project Tab, p. 22*)
- Firmware tab (see *Firmware Tab, p. 29*)
- Options tab (see *Options Tab, p. 37*)
- About tab (see *About Tab, p. 39*)

Connection

The connection area comprises the following elements:

Element	Description
Media	This list box displays one of the 2 PC ports: • USB (default) • Ethernet To select a PC port click the arrow and select the respective port in the list.
Address:	This list box displays the address of the target device e.g. SYS or 139.158.105.141 (Ethernet). To select another address click the arrow and select the respective address in the list or type the address you want to connect to.
PLC:	This box indicates the state of the PLC: • RUN • STOP • HALT • LOADING • NOCONF • ERROR

Note: Devices are addressed by TCP/IP addresses or through point-to-point connection via USB (default). The address can either specify a CPU or an Ethernet module.

Memory Card

The memory card area comprises the following elements:

Element	Description
State:	This box indicates the state of the memory card installed in the connected PLC: • OK • Absent • Read only
Free Space:	This box indicates the free space available on the memory card file system partition of the connected PLC.

The following data are stored in the file system partition of the memory card:

- User Web Files (CPUs with Ethernet and NOEs)
  - the Factory Cast default Web site
  - potentially custom web pages
  - some user files relative to the Web site
- Data Storage (CPUs only)
  - user files managed by the application with the file management function blocks or
  - files transferred by the user with FTP
- Firmware (FW)
  files transferred by the Unity Loader for FW upgrade

Note: To transfer firmware (FW) to PLC, a memory card must be installed in the PLC because the FW is temporarily stored on the memory card.

Note: The **Free Space** shown for **Memory Card** is relative to the whole file system partition. Please refer to the memory card characteristics to see what is the maximum size that can be allocated to the user files. FW update will not be possible in case of insufficient free space.

Command Buttons

The text of some buttons changes depending on the actual situation (e.g. Connect/ Disconnect). Grayed buttons are disabled.

The command button area comprises the following buttons:

Button	Description
Scan...	Click this button to open the **Scan Network** dialog box. Network scanning is used to detect IP addresses available in the network. For more information see *Scan Network Dialog Box, p. 41*.
Connect / Disconnect	Click this button to connect/disconnect the Unity Loader to/from the selected PLC.
PC<=>PLC	Click this button to select the data transfer from PC to PLC or from PLC to PC, depending on the selected transfer direction. The current transfer direction is indicated by transfer signs (arrows) in the tab specific area of the **Project** tab and the **Firmware** tab. The transfer direction can only be selected for all 3 transfer signs (arrows) at the same time. **Note:** It is not possible to transfer the FW from PLC to PC. For the **Firmware** tab the **PC<=>PLC** button is disabled.
Transfer	Click this button to start the transfer between the PC and the PLC or from PLC to PC depending on the preselected transfer direction. The **Transferring data** dialog box opens (see *Transferring Data Dialog Box, p. 43*).
Start PLC / Stop PLC	Click this button to start/stop the PLC. See **Safety Message** in the following paragraph.
Close	Click this button to close the Unity Loader dialog box. The **Close** button is disabled during transfer.

Help Button

Note: There is no **Help** button available in the dialog box. To launch online help press F1 or click the button in the title bar.

Project Tab

Overview

This tab comprises the following services:

- project transfer
  - transfer of a Unity Pro application from a PC file (*.STU, *.STA, *.STM) to a PLC
  - transfer of a Unity Pro application from a PLC to a PC file (*.STA, *.STM)
- project data transfer
  - save application data values from a PLC to a PC file (*.DAT)
  - restore application data values from a PC file (*.DAT) to a PLC
- project files transfer
  - save user files (data storage files and/or user files in the embedded Web site) from a PLC to a PC file (*.CAR)
  - restore user files from a PC file (*.CAR) to a PLC

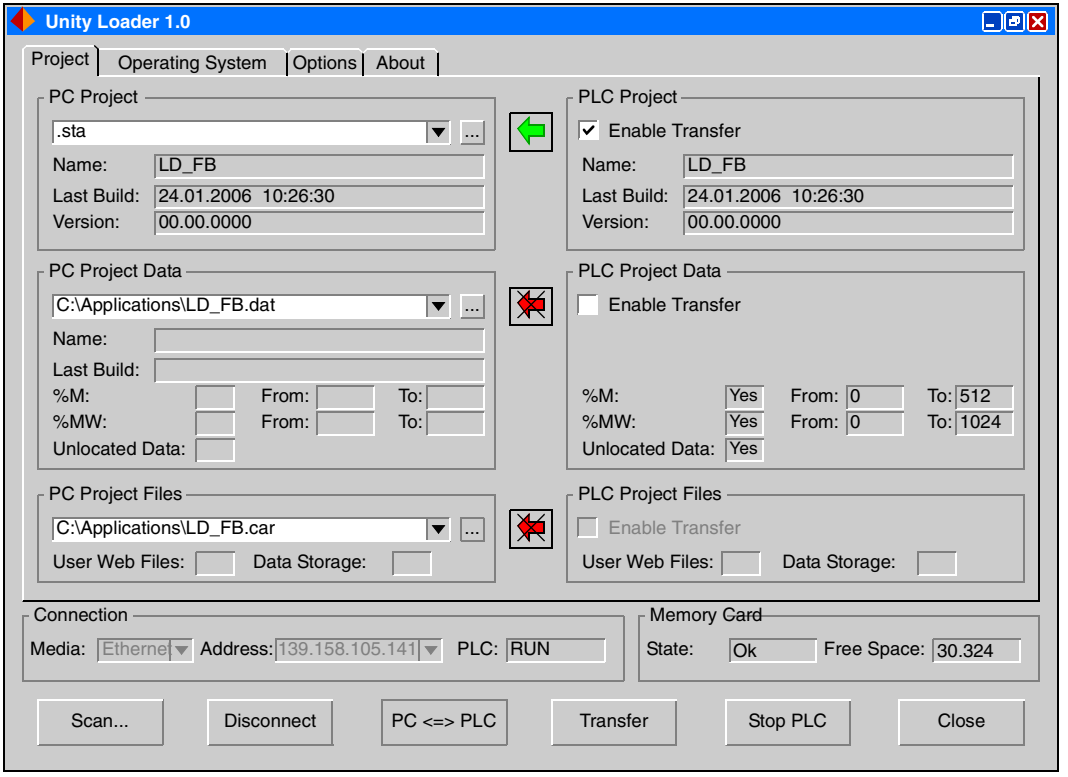
Main Parts

The specific area of the project tab consists of 2 main parts:

- PC Project properties on the left specify the content of the files stored on the PC.
- PLC Project properties on the right specify the current status of the files stored on the connected PLC.

The transfer signs (arrows) between the 2 property areas indicate the transfer direction and significant comparison results between PC project and PLC project.

Representation After launching the Unity Loader, the dialog box will open with the **Project** tab.



PC Project Properties

The PC Project section consists of the following elements:

Element	Description
PC Project	The list box at the top displays the current project file with its path. To select a prior transferred project file click the arrow and select the respective project file. To select any other project file click the **...** button (...). This opens the dialog box **Select application file** where you can select the desired Unity Pro project file. Further project file information: ● **Name:** name of the Unity Pro project (default is STATION) ● **Last Build:** date and time of the last Unity Pro project build ● **Version:** version of the Unity Pro project
PC Project Data	The list box at the top displays the current project data file with its path. To select a prior transferred project data file click the arrow and select the respective project data file. To select any other project data file click the **...** button (...). This opens the dialog box **Select a data file** where you can select the desired Unity Pro project data file. Further project data file information: ● **Name:** name of the Unity Pro project data file ● **Last Build:** date and time of the last Unity Pro project build ● **%M:** located variables (bits) ● **%MW:** located variables (words) ● **Unlocated Data:** data of function blocks and application
PC Project Files	The list box at the top displays the current project files archive with its path. To select a prior transferred project files archive click the arrow and select the respective project files archive. To select any other project files archive click the **...** button (...). This opens the dialog box **Select a storage file** where you can select the desired Unity Pro project files archive. **Note:** The project files archive (*.CAR) is a backup file only and can not be edited with other tools. The following files are stored as parts of the *.CAR file, if existent on the PLC. ● **User Web Files:** user web files stored on the memory card of the PLC ● **Data Storage:** user files stored on the memory card of the PLC via special function blocks

PLC Project Properties

The PLC Project section consists of the following elements:

Element	Description
PLC Project	**Enable Transfer** see below. Project file information: ● **Name:** name of the Unity Pro project (default is STATION) ● **Last Build:** date and time of the last Unity Pro project build ● **Version:** version of the Unity Pro project
PLC Project Data	**Enable Transfer** see below. Project data file information: ● **Name:** name of the Unity Pro project data file ● **Last Build:** date and time of the last Unity Pro project build ● **%M:** located variables (bits) ● **%MW:** located variables (words) ● **Unlocated Data:** data of function blocks and application
PLC Project Files	**Enable Transfer** see below. The following files are stored as parts of the *.CAR file, if existent on the PLC. ● **User Web Files:** user web files stored on the memory card of the PLC ● **Data Storage:** user files stored on the memory card of the PLC via special function blocks

Enable Transfer (Check Boxes)

The specific area of the project tab provides the possibility to transfer 3 different parts of a Unity Pro project:

- project (**.stu, *.sta, *.stm*)
- project data (**.dat*)
- project files (**.car*)

By default all parts are selected, which allows a transfer of a complete project in one operation.

Each part of a project can be excluded from transfer by clearing the respective **Enable Transfer** check box. A deselected part is grayed and its transfer sign (arrow) is red and crossed out.

Even for excluded parts the available information is displayed to provide the context information.

Note: For the following reasons, the check boxes are disabled and the color of the arrows is switched to red:
- invalid files (e.g. files not created with Unity, but with valid extension)
- PLC in NOCONF state (not configured)

Transfer Signs (Arrows)

Transfer signs (arrows between the PC´s and PLC´s property areas) indicate:

- the transfer direction
- significant comparison results between the PC and the PLC projects

The transfer direction can be changed by clicking the **PC<=>PLC** button. The transfer direction can only be changed for all 3 signs (arrows) at the same time.

Comparison Results

Comparison is only done for transfer from PC to PLC.

The comparison results are represented by different colors of the arrows:

- Green indicates that these parts of the PC and the PLC projects are compatible.
- Yellow indicates that these parts of the projects are compatible but errors may occur.
- Red indicates that these parts are not compatible. In this case the transfer sign is additionally crossed out.

Note: If the **Unlocated Data** part is not compatible with the project embedded inside the PLC, only the located variables (%M, %MW) are transferred. A warning message is displayed and the arrow color switches to yellow.

Transfer from PLC to PC

Note: For transferring a project from PLC to PC no comparison is done and therefore color indication is not available. If you try to transfer a file that already exists, you have to confirm to overwrite it.

If you transfer a project from PLC to PC the appropriate boxes at PC side (**PC Project**, **PC Project Data**, **PC Project Files**) are filled automatically by the Unity Loader.

- If a history exists for the selected project, the boxes are filled with historic input.
- For new projects the names are generated from the **Default backup directory** (to be set on the **Options** tab) and the project name on PLC.
  If, for example, the project name on PLC is *Motor_01* and the default backup directory is *C:\Applications*, the following names will be generated:
  - PC Project: *C:\Applications\Motor01.sta*
  - PC Project Data: *C:\Applications\Motor01.dat*
  - PC Project Files: *C:\Applications\Motor01.car*

Entering File Names

The dialog box supports you in entering file names:

- If you already specified names, the respective boxes are automatically filled with historic input.
- If you enter new names in 1 of the list boxes, a proposed entry is automatically entered in the next list box. Example: If you enter *C:\Applications\Motor_01.stu* in the **PC Project** box and you click the empty **PC Project Data** box afterwards, it will automatically be filled with *C:\Applications\Motor_01.dat*. You can confirm this proposal or overwrite it.

File Format

File Format	Description	Comment
*.STU	Unity Pro project file	complete project including source code and Unity Pro workspace data
*.STA	Unity Pro archive file	complete project including source code but without Unity Pro workspace data This archive file is very compressed.
*.STM	Unity Loader specific project file	binary project data only, required for execution on PLC It contains no source code and can therefore not be read by Unity Pro. **Note:** This file format can be used to backup the PLC project data.

To transfer a project from PC to PLC you can select a file in one of the three formats.

The Unity Loader will save a project, transferred from PLC to PC in *.STA or *.STM format, depending on the project settings in Unity Pro (Upload Information Include/ Without Upload Information). See table below.

Upload Information Included

Unity Pro		Unity Loader		PLC
Via **Tools** → **Project Settings** → **Build** the checkbox **Upload Information Included** is selected. A project is saved/archived in *.STU or *.STA format	->	Such a binary project can be transferred to PLC with the Unity Loader.	->	The binary project runs on the PLC.
Such a file in *.STA format can be opened with Unity Pro (but without the former workspace data.)	<-	Such a binary project can be transferred from PLC to PC with the Unity Loader and is saved in *.STA format.	<-	The binary project runs on the PLC.

Without Upload Information

Unity Pro		Unity Loader		PLC
Via **Tools** → **Project Settings** → **Build** the checkbox **Without Upload Information** is selected. A project is saved/archived in *.STU or *.STA format	**->**	Such a binary project can be transferred to PLC with the Unity Loader.	**->**	The binary project runs on the PLC.
Such a file in *.STM format can **not** be opened with Unity Pro.	**<-**	Such a binary project can be transferred from PLC to PC with the Unity Loader and is saved in *.STM format.	**<-**	The binary project runs on the PLC.
-	**-**	A file in *.STM format can be transferred from PC to PLC with the Unity Loader.	**->**	The binary project runs on the PLC.

Note: To save space on the PLC, the checkbox **Without Upload Information** should be selected.

For detailed information about *.STA format and Upload Information please refer to the *Unity Pro Operating Modes Manual.*

File Format After Online Modification

Online modifications of a project via Unity Pro can result in *.STM file format.

- In Unity Pro you built a project with the checkbox **Upload Information Included** selected.
- With the Unity Loader you transferred such a binary project to PLC.
- With Unity Pro you online modified the program in the PLC. (The upload information is no longer up-to-date).

Note: Either Unity Pro or the Unity Loader can be connected to a PLC at the same time.

- Now you try to disconnect the PLC from Unity Pro and a dialog box informs you, that the upload information is not up-to-date.
- If you confirm to update the upload information (with **Yes**) it is updated.
- If you negate to update the upload information (with **No**) it is **not** updated.
- Trying to transfer such a **not** updated project from PLC to PC with the Unity Loader, you will be informed that the upload information is not up-to-date and the project will be stored in *.STM format.

Firmware Tab

Overview

This tab comprises the following services:

- immediate firmware (FW) upgrade (or downgrade) of the target device (CPU, NOE or other modules with firmware)
- generating a memory card to be used later for firmware upgrade of another PLC

Main Parts

The specific area of the **Firmware** tab consists of 2 main parts:

- PC firmware properties on the left specify the content of the files stored on the PC.
- PLC firmware properties on the right specify the content of the files stored on the PLC.

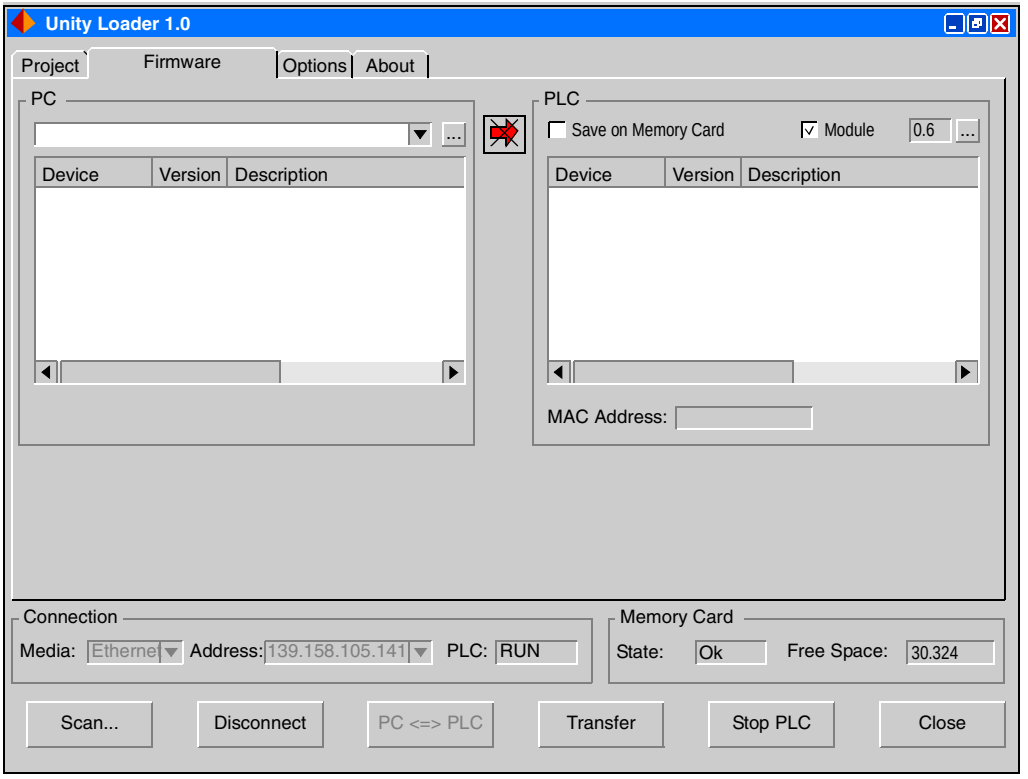
The transfer sign (arrow) between the 2 property areas indicates the transfer direction and significant comparison results between PC and PLC firmware (FW).

Note: It is not possible to transfer FW from PLC to PC.

Precondition

To transfer firmware (FW) to a PLC, a memory card must be available at the PLC because the firmware is temporarily stored on the memory card.

Representation Firmware tab



PC FW Properties

The PC firmware (FW) properties area consists of the following elements:

Element	Description
PC	The list box at the top displays the selected FW file with its path. To select a prior transferred FW file click the arrow and select the respective FW file. To select any other FW file click the **...** button (...). This opens the dialog box **Select a Firmware File** where you can select the desired FW file. Further information: ● **Device:** name of the device ● **Version:** version of the FW ● **Description:** description of the FW

PLC FW Properties

The PLC firmware (FW) properties area consists of the following elements:

Element	Description
PLC	• **Device:** name of the device • **Version:** version of the FW • **Description:** description of the FW • **MAC Address:** MAC address of the PLC

Firmware (FW) Information

There may be more than 1 FW to be displayed and compared for 1 device. This information is displayed in additional rows.

By default, main information (device name and version) is displayed. Use the horizontal scroll bar to display the entire information.

Position the mouse pointer on a listed FW to display all related information (tool tip).

Firmware (FW) File

The FW file (**.ldx*) is a zip file that contains:

- a script for the Unity Loader defining the information and the way it will be transferred
- several FW parts for each device, which have to be kept consistent

So you have to select only 1 file to guarantee consistency.

MAC Address

The MAC address is displayed for Ethernet devices.

This helps you to identify the device more securely.

The MAC address is not available for intelligent modules (see below).

Hardware ID

The hardware ID must match. If not, the transfer sign is marked red and crossed out. Transfer is disabled.

FW Version

The firmware (FW) version to be transferred should be later than the current one. If not, the transfer sign is marked yellow.

Transfer Sign (Arrow)

Transfer sign (arrow between the PC´s and PLC´s property areas) indicates:

- the transfer direction
- significant comparison results between the PC´s and the PLC´s FW

Comparison Results

Comparison is only done for transfer from PC to PLC.

The comparison results are represented by colors:

- Green indicates that the FWs of the PC and the PLC are compatible.
- Yellow indicates that the FW of the PC is earlier than the FW of the PLC.
- Red indicates that the FWs are not compatible. In this case the transfer sign is additionally crossed out.

FW Partial Transfer

If not all parts inside the selected firmware (FW) file (**.ldx*) are compatible, the Unity Loader offers a partial download of the compatible FW parts.

A warning message is displayed that must be confirmed before partial download.

FW Transfer from PLC to PC

It is not possible to transfer the FW from PLC to PC.

In the **Firmware** tab the **PC<=>PLC** button is disabled.

Addressing Modules

The **Module** check box enables you to upgrade other modules (with firmware) of the Modicon M340 (e.g. BMX ART 0414).

Step	Action
1	Activate the **Module** check box to display **Rack.Slot** of the device connected via Ethernet (e.g. **0.6**).
2	Click the **...** button right beside the **Module** check box to open the **Module Address** dialog where you can enter **Rack Index** and **Slot Index** of the module you want to upgrade.
3	Enter **Rack Index** and **Slot Index** and subsequently clicking **OK**.
4	Now you can upgrade the specified module.

Restrictions for Upgrading Modules

The following restrictions apply to the upgrading modules feature:

- This feature is not applicable to Ethernet modules. Ethernet modules can be upgraded by direct connection only (same as for CPUs).
- After upgrading a module (with firmware), the FW version displayed in Unity Loader is not refreshed automatically.
  To display the FW properties after upgrading you must perform a hardware reset of the PLC by pressing the reset button of the power supply or by power cycling the PLC.
- After upgrading a module (with firmware) by using the **Save on Memory Card** feature, you must perform a hardware reset of the PLC by pressing the reset button of the power supply or by power cycling the PLC (else the module remains blocked in a non operational state).

Save on Memory Card

Please refer to *Save on Memory Card, p. 33*.

Save on Memory Card

Overview

The **Save on Memory Card** feature provides the possibility to generate a memory card that can be used later for firmware (FW) upgrade of another PLC.

As an upgrade by means of the memory card does not require the presence of Unity Loader, this option could be useful to upgrade PLCs that can not be connected to the Unity Loader directly.

Save on Memory Card Unchecked

By default **Save on Memory Card** is unchecked.

The Unity Loader sends a request to upgrade the PLC immediately after the firmware (FW) is transferred to the memory card.

All FW files are stored only temporarily on the memory card and will be removed after upgrade is completed.

Save on Memory Card Checked

If **Save on Memory Card** is checked, the unzipped firmware (FW) files are transferred to the memory card of the PLC.

The files are marked for automatic upgrade.

At the end of the transfer you are asked to perform a manual reset of the PLC.

A reset will upgrade the FW of the PLC automatically, if the current version of the PLC is earlier than the version on the memory card and the FW on the memory card is compatible to FW on the PLC.

The files related to FW will be removed after upgrade.

Note: As it is not possible to display the data on the memory card, it is recommended to label the card after saving FW on the card.

Source/Target PLC

You can use a memory card for firmware (FW) upgrade of another PLC.

- Source PLC
  On the source PLC you generate a memory card, remove it from the PLC and send it to the target PLC (e.g. to another site/country).
- Target PLC
  On the target PLC you insert the memory card and upgrade the FW.

Note: The memory card must remain on the target PLC.

Upgrading a PLC with Memory Card

To upgrade the target PLC using the memory card, created at the source PLC, proceed as follows:

Step	Action
1	Check **Save on Memory Card** and start the transfer. **Result:** ● The unzipped firmware (FW) files are transferred to the memory card of the PLC. ● The files are marked for automatic upgrade.
2	Remove the memory card from the source PLC.
3	Insert the memory card to the target PLC.
4	Perform a manual reset at the target PLC. **Result:** ● The firmware (FW) of the target PLC is upgraded automatically, if the current version of the PLC is earlier than the version on the memory card and the FW on the memory card is compatible to FW on the PLC. **Note:** The files on the memory card related to FW **are removed** after upgrade. **Note:** The memory card must remain on the target PLC.

Only 1 FW on Memory Card

Only 1 firmware (FW) can be saved on a memory card.

Each transfer, whether **Save on Memory Card** is checked or not, will erase the FW folder first.

Memory Card Write Protect

Note: If the memory card is write protected, it is not possible to perform an upgrade using the memory card.

Addressing Modules

For addressing modules (with firmware) please refer to *Addressing Modules, p. 32*.

Project on Memory Card

If there is a memory card present at a Modicon M340 and you transfer data using the **Project** tab of the Unity Loader, the following data are stored on the memory card for backup reasons:

- Project (Unity Pro application)
- Project Files
  - Data Storage files
  - User Web Files

Note: Other user files (like Word, Excel, Adobe) and **Project Data** (%M, %MW, values of unlocated data) are not stored on the memory card.

Project and FW at Once

If you transferred data to a memory card (on the **Project** tab) as described above and you are using the **Save on Memory Card** feature on the **Firmware** tab, both data are present at the memory card.

Note: It is also possible to upgrade a project only without upgrading the firmware (FW).

Inserting the memory card into another PLC and performing a manual reset, the project and the FW are updated.

The memory card must remain on the target PLC.

Note: Take care to have the appropriate project on the memory card.

One Shot/Multi Shot

For using the memory card there are 2 modes:

- One shot
  With the one shot mode, you need 1 memory card for 1 upgrade.
- Multi shot
  With the multi shot mode, you can use a memory card, generated on a source PLC, to update several target PLCs (for Unity Pro applications only).

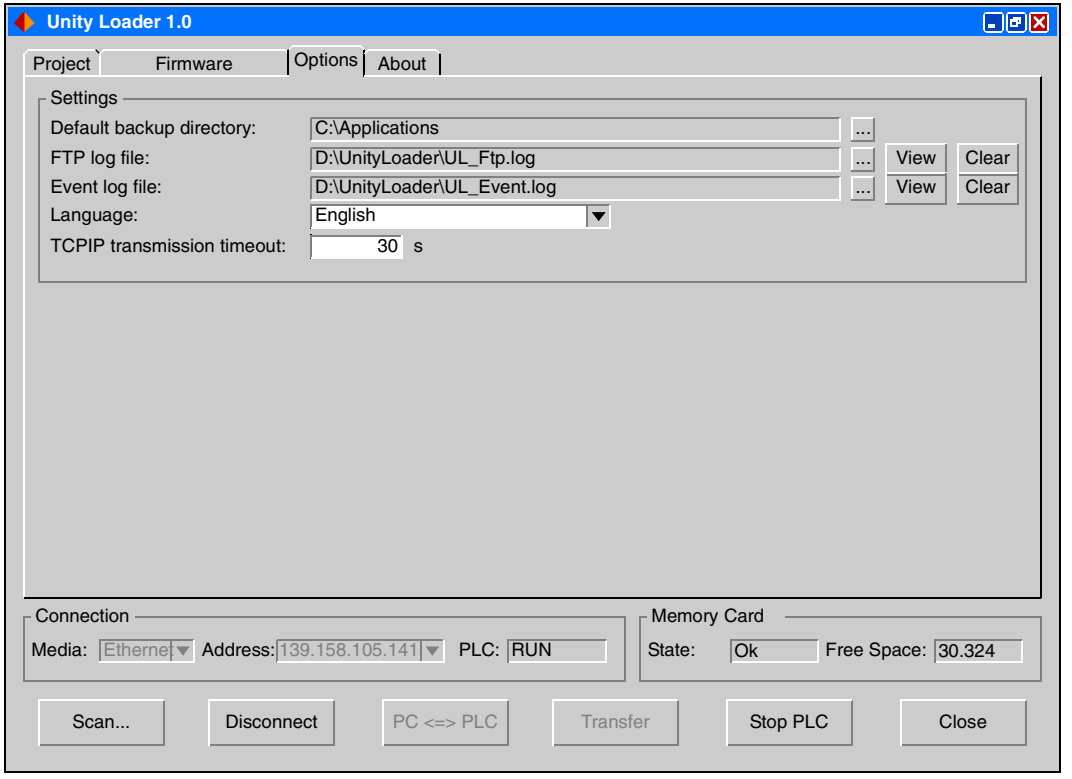
For the possible use cases of the memory card please refer to the table below.

Area	Description	One Shot	Multi Shot
System Area (**Firmware** tab)	1 firmware (FW) (including Web pages if available)	Need 1 memory card per FW and per machine.	not supported (The system removes all upgrade information after upgrade).
User´s Area (**Project** tab)	**Project** (Unity Pro application)	No need to provoke a backup, the new memory card remains in the PLC.	You need to provoke a backup.
	Data Storage files	The new memory card remains in the PLC.	not supported
	User Web Files		
	other user files (like Word, Excel, Adobe)		
	Project Data (%M, %MW, unlocated data)	not supported	not supported

Options Tab

Overview The **Options** tab comprises a set of general settings for the Unity Loader.

Representation Options tab



Settings

Element	Description
Default backup directory:	backup directory for Unity Loader files (e.g. *C:\Applications*) The default backup directory and the project name on the PLC are used to generate new project names (including path) automatically while transferring a project from PLC to PC. See *Transfer from PLC to PC, p. 26*.
FTP log file:	name and path of the FTP log file In this file, requests and replies exchanged between the loader´s FTP client and the PLC´s FTP server are logged. Click the **View** button to look at the log file. Click the **Clear** button to empty the log file.
Event log file:	name and path of the event log file In this file, all major events, such as FW transfer, PLC start / stop or unexpected events (errors) are logged. Click the **View** button to look at the log file. Click the **Clear** button to empty the log file.
Language:	This list box displays the languages provided for the Unity Loader user interface. • English • French • German • Italian • Spanish • Chinese To switch to another language click the arrow and select the respective language in the list. **Note:** After switching to another language you have to close and launch again the Unity Loader.
TCPIP transmission timeout:	delay used for failure recovery while TCP/IP transmission (seconds)

Transfer Button

In the **Options** tab the **Transfer** button is disabled.

About Tab

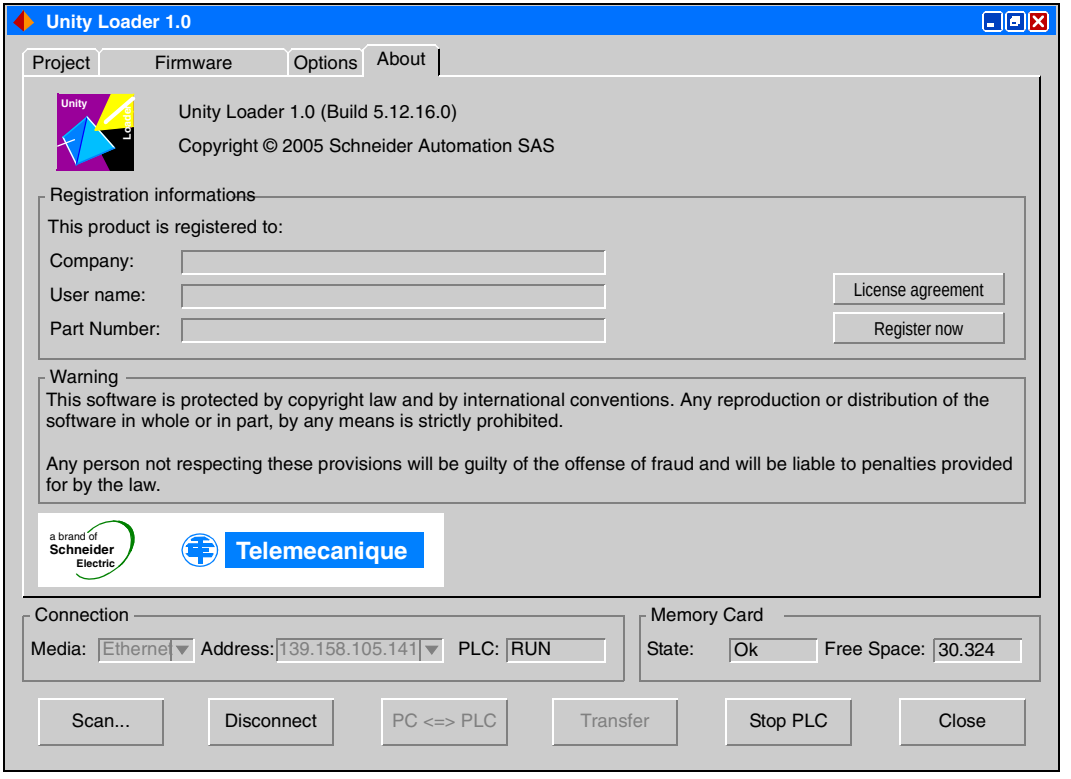
Overview

The **About** tab comprises information about your Unity Loader:

- version
- build
- copyright information
- license agreement
- registration information

Representation

About tab



License Agreement	Click the **License agreement** button to display the license agreement for your Unity Loader software.
Register Button	Click the **Register now** button to register your Unity Loader software.
Transfer Button	In the **About** tab the **Transfer** button is disabled.

Scan Network Dialog Box

Overview

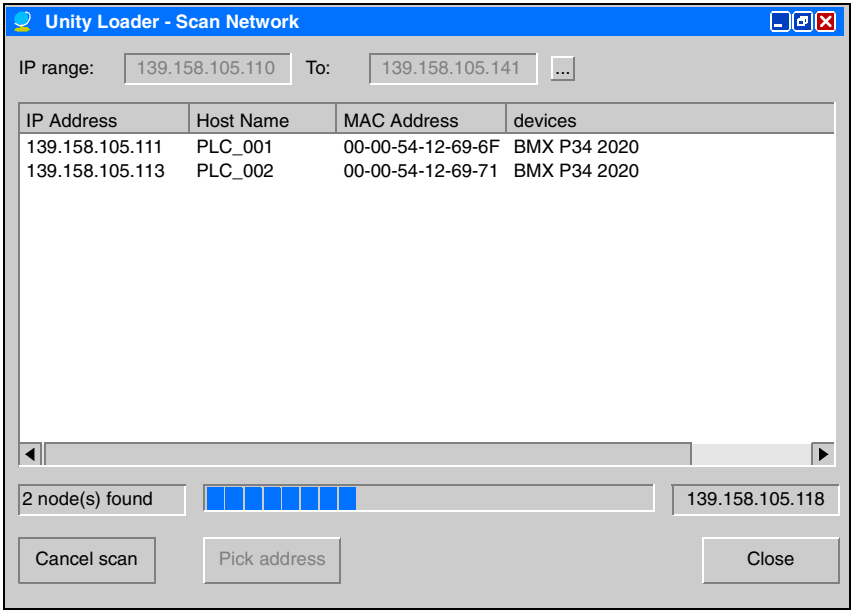
Clicking the **Scan...** button opens this dialog box.

Network scanning helps you to detect IP addresses of M340 PLCs in the network.

The **Scan Network** dialog box is modeless, i.e. the dialog box does not keep the input focus so scanning can be done in parallel.

Representation

Scan Network dialog box



IP Range

Specify the range of IP addresses, in which hosts should be searched after clicking the **Start scan** button. You can also click the auto-detect button (...). to fill in the maximum range of the PC´s network segment.

IP Address Properties

The IP Address properties comprise the following elements:

Element	Description
IP Address	IP address found in the network
Host Name	host name of the found IP address
MAC Address	MAC address of the found IP address
devices	device assigned to the found IP address

Command Buttons

The text of some buttons changes depending on the actual situation (e.g. Start Scan / Cancel Scan). Grayed buttons are disabled.

The command button area comprises the following buttons:

Button	Description
Start scan / Cancel scan	Click this button to start/cancel network scan. The status of the scan process is displayed above the command buttons.
Pick address	Click this button to fill the IP address of a selected host into the address box of the main dialog box. See *Connection, p. 19*.
Close	Click this button to close the **Scan Network** dialog box.

If the Unity Loader is connected the **Pick address** button is disabled.

Transferring Data Dialog Box

Overview

Clicking the **Transfer** button opens this dialog box.

The **Transferring data** dialog box displays a status report of the data transfer.

The dialog box is modal, i.e. you cannot return to the previous dialog box until the **Transferring data** dialog box is closed.

⚠ WARNING

RISK OF UNINTENDED EQUIPMENT OPERATION

Before transferring data to a PLC make sure that you have selected the correct project and firmware files and entered the correct target address. Verify the address by comparing the MAC address printed on the device with the MAC address shown in the **Firmware** tab.

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

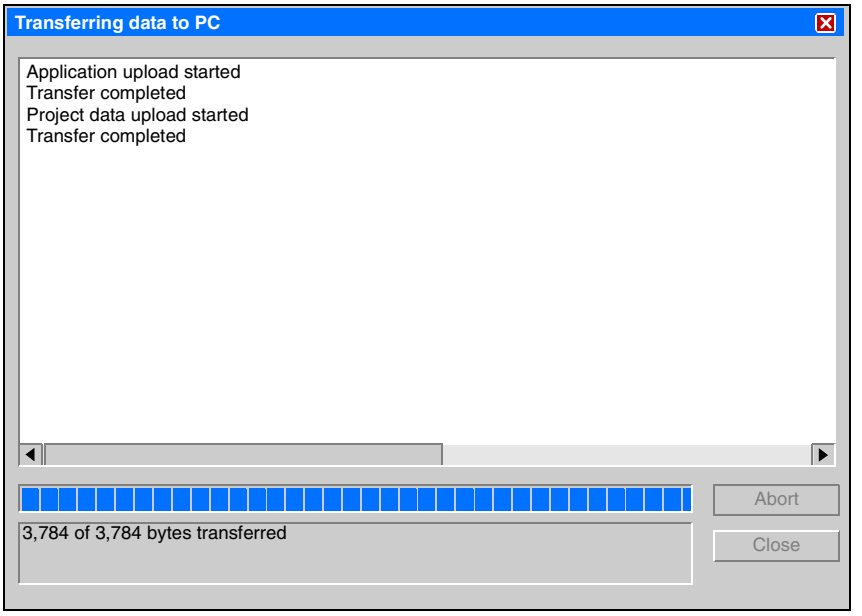
⚠ WARNING

RISK OF UNEXPECTED EQUIPMENT BEHAVIOR

If the update failed (for example, if there was a power off of the PLC during the process), the PLC is in an undetermined state. In this case restart the transfer immediately to bring the PLC again in a defined state.

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

Representation Transferring data dialog box



Status Information

For application transfer the **Transferring data** dialog box comprises the following status information:

- transfer started
- number of bytes transferred
- transfer completed

A status bar displays the transfer status.

For firmware (FW) transfer the **Transferring data** dialog box comprises the following status information:

- transfer started
- free space on memory card
- required space
- available space
- directory information
- transfer completed
- writing files to flash memory
- FW upgrade successful

A status bar displays the transfer status.

Note: The **Transferring data** dialog comprises only the main events. For detailed information please refer to the log files (*Options Tab, p. 37*).

Required Space

The amount of required space is a little bit larger than the data that should be transferred, because the firmware (FW) needs additional space for file management.

Available Space

The value of available space may be larger than the **Free Space** value displayed in the **Memory Card** status line because the calculation of available space takes into account the memory space of data that will be overwritten by new data.

Command Buttons

Grayed buttons are disabled.

Button	Description
Abort	Click this button to abort the transfer.
Close	Click this button to close the **Transferring data** dialog box.

Note: During firmware (FW) transfer the **Abort** and the **Close** buttons are disabled.

Example: Transfer of an Application from PC to PLC

4

Transfer of an Application from PC to PLC

Procedure

The following table describes the procedure for transferring a Unity Pro application from a PC to a PLC.

Step	Action
1	Connect the PC and the PLC to the network.
2	If you do not know the required IP addresses click the **Scan...** button. (See *Scan Network Dialog Box, p. 41*).
3	Enter the connection data: **Media** and **Address**. (See *Connection, p. 19*).
4	Click the **Connect** button. (See *Command Buttons, p. 21*).
5	Select the required project files (**PC Project**, **PC Project Data**, **PC Project Files**). (See *PC Project Properties, p. 24*).
6	Set/reset the required **Enable Transfer** check boxes. (See *Enable Transfer (Check Boxes), p. 25*).
7	If necessary set the transfer direction to PC->PLC by clicking the **PC<=>PLC** button. (See *Command Buttons, p. 21*) and *Transfer Signs (Arrows), p. 26*).

⚠ WARNING

RISK OF UNINTENDED EQUIPMENT OPERATION

Before stopping the PLC make sure that you connected to the correct target address. Verify the address by comparing the MAC address printed on the device with the MAC address shown in the **Firmware** tab.

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

Step	Action
8	Click the **Stop PLC** button. (See *Command Buttons, p. 21*).
9	Click the **Transfer** button. (See *Command Buttons, p. 21*). **Result:** The **Transferring data** dialog box opens and displays a status report of the data transfer. (See *Transferring Data Dialog Box, p. 43*).
10	After transfer is completed, close the **Transferring data** dialog box and click the **Start PLC** button

Appendices

At a Glance

Overview

This chapter comprises information about drivers.

What's in this Appendix?

The appendix contains the following chapters:

USB Driver

A

At a Glance

Overview

This chapter describes USB driver installation. This installation procedure can be broken down into two steps:

- installation of files on the station,
- configuration of the driver.

What's in this Chapter?

This chapter contains the following topics:

How to install the driver

At a Glance

Driver installation is a standard installation. It can be launched either:

- from the drivers' CD-ROM,
- or from disks if the station has no CD-ROM drive.

Note: The installation disks are created from the CD-ROM.

How to create a set of disks

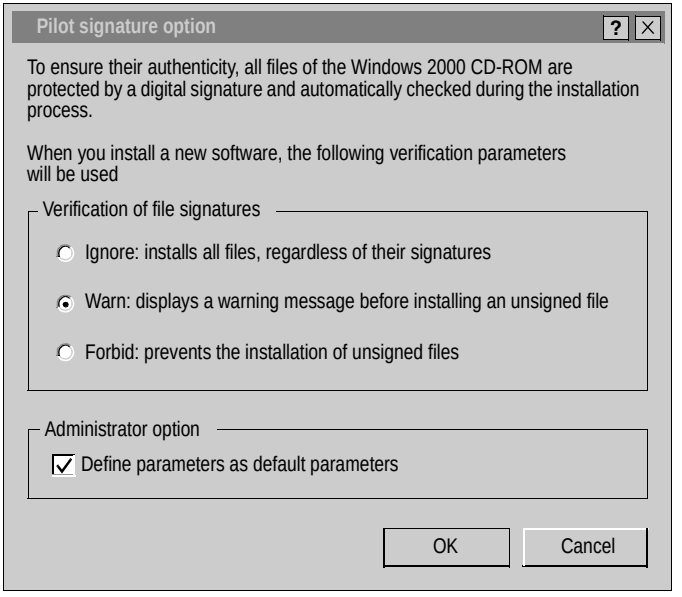
Use the following procedure to create installation disks:

Step	Action
1	Use a station which has a CD-ROM drive.
2	Insert the CD-ROM into the drive.
3	Access the directory of the driver to be copied onto disk.
4	Copy the contents of the **DISK1** directory onto a disk. Repeat this step for each **DISK** directory. **Note:** it is advisable to number the disks.

Checks

When using **Windows Professional Edition 32, Windows XP or Windows Vista Professional Edition 32**, you must check whether it is possible to install unsigned drivers on the station.

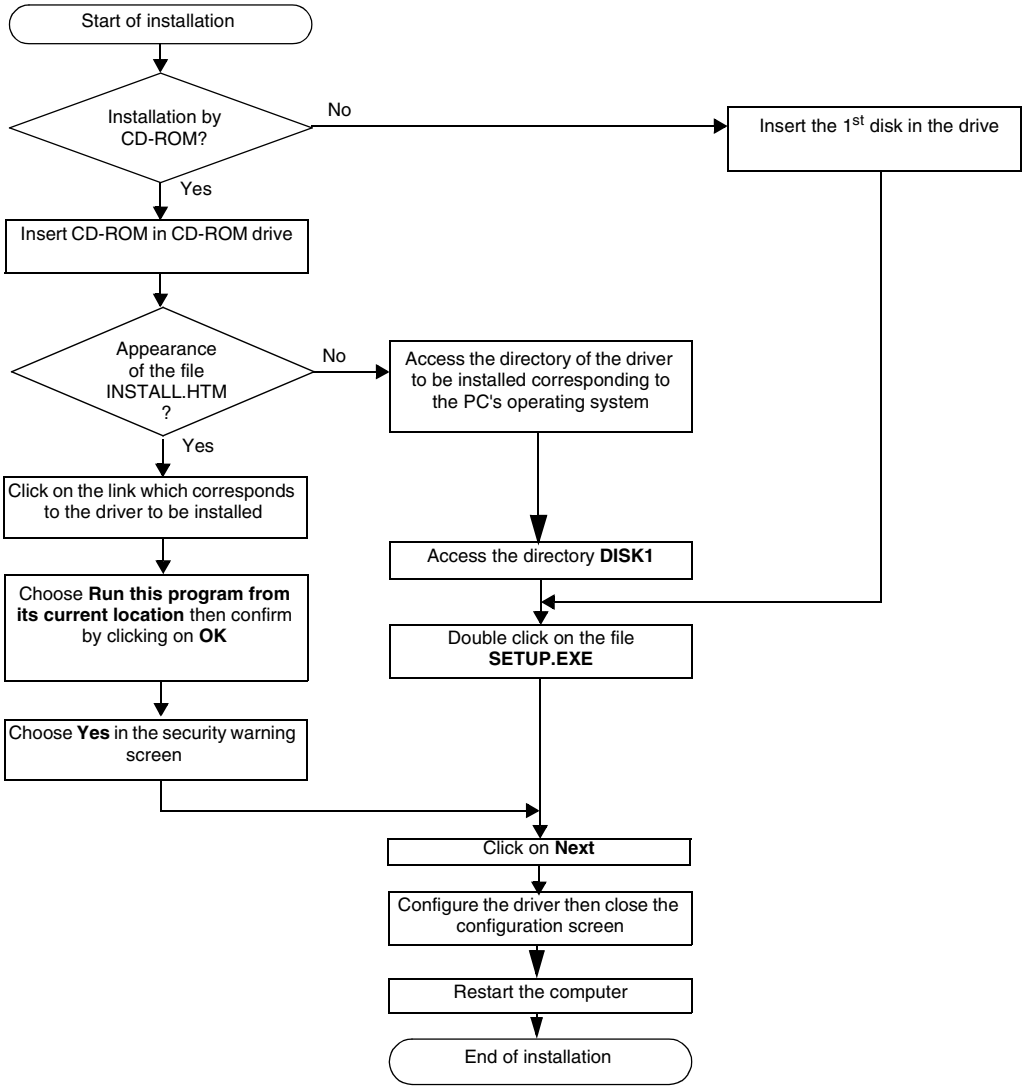
To do this, perform the following actions:

Step	Action
1	Right-click on My Computer and select **Properties**.
2	In the **System Properties** window, select the **Hardware** tab.
3	Press **Driver Signing Options...**. The following window is displayed: 
4	Select **Warn - Display...**, then confirm by clicking **OK.**

How to install the driver

Before starting the installation, **check that the USB cable is not connected to the PLC**.

To install the driver, carry out the following procedure:

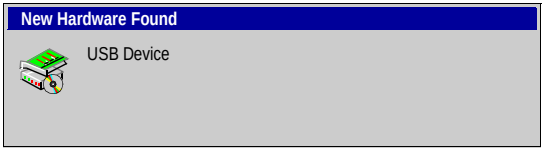
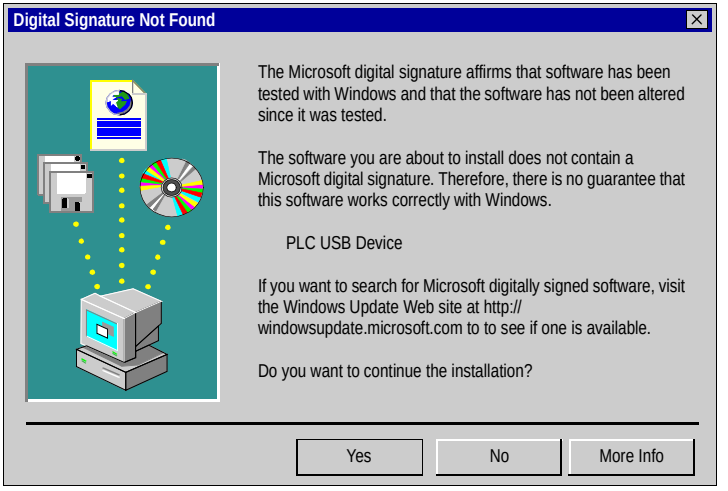


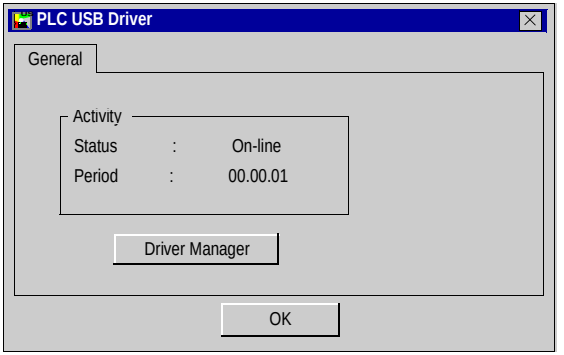
Finalizing the Installation

Procedure

After rebooting the PC you will have to configure the USB driver. The USB cable must be connected to the PLC, and then Windows will detect the PLC and install the driver.

Perform the following actions:

Step	Action
1	The following screen will be displayed: 
2	Click on **YES** 

Step	Action
3	An icon is displayed in the task bar. Double clicking on it when the USB link with the PLC is operational calls up the window.  Clicking on **" Driver Manager "** launches the tool. Clicking on **"OK"** makes an icon appear in the task bar.

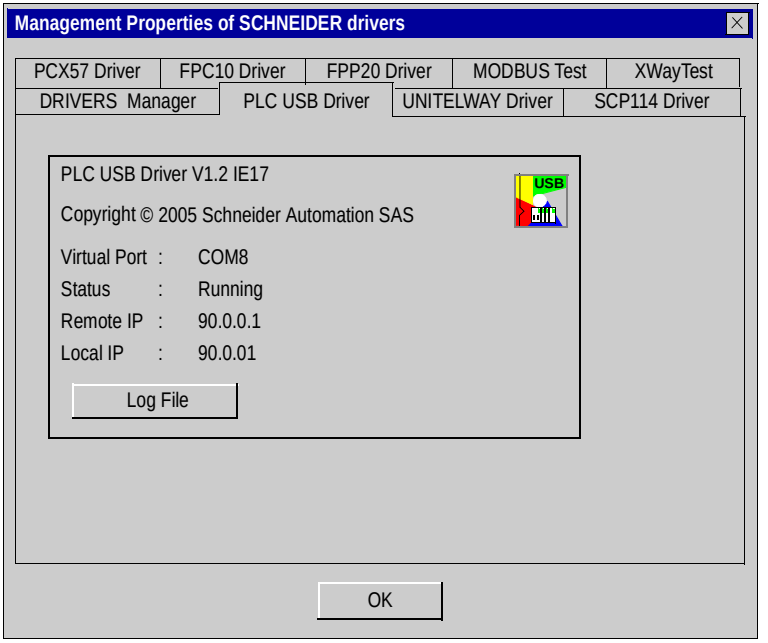
State of the USB link

At a Glance

A window showing the state of the USB link can be accessed from the taskbar:

Start → Settings → Control Panel → Driver Manager

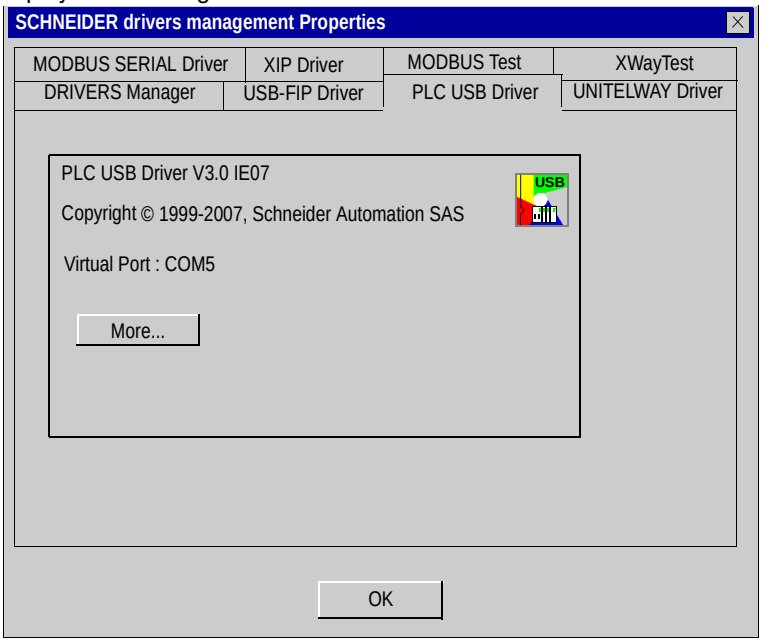
With Windows XP Professional Edition: Select the **PLC USB Driver** tab to display the following window:



Description for Windows XP Professional Edition:

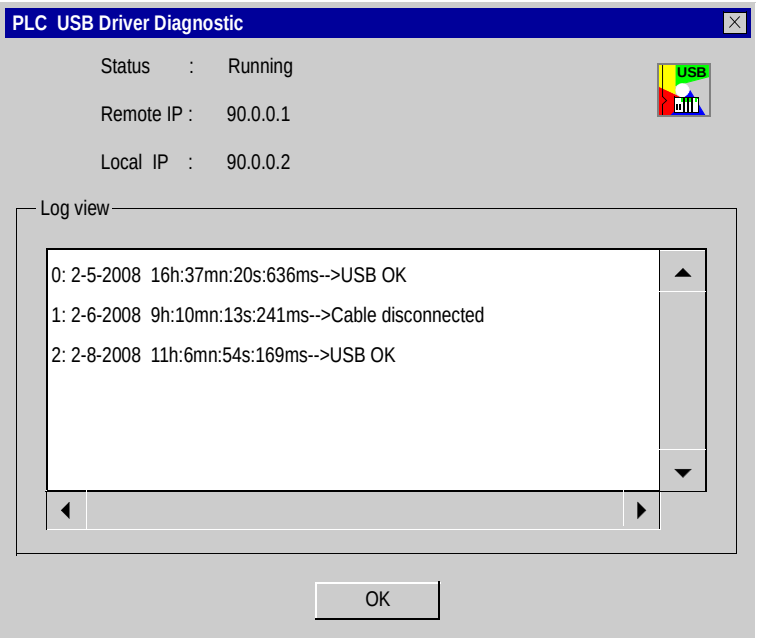
Field	Description
Virtual Port	Name of the COM port used by the driver.
Status	Contains: • **"Running"** if the driver is operating. • **"Not operational"** if the driver is not operating. • **"Disconnected"** if the USB cable is not connected.
Remote IP\Local IP	IP addresses used by the PC and PLC to communicate.
Log File	Button allowing access to a *.log file containing connection/ disconnection events on the USB line.

With Windows Vista Business Edition 32: Select the **PLC USB Driver** tab to display the following window



To see Diagnostic (Screen below) press the **more...** button.

With Windows Vista Business Edition 32: Select the **PLC USB Driver diagnostic**



Description for Windows Vista Business Edition 32:

Field	Description
Virtual Port	Name of the COM port used by the driver.
Status	Contains: ● **"Running"** if the driver is operating. ● **"Not operational"** if the driver is not operating. ● **"Disconnected"** if the USB cable is not connected.
Remote IP\Local IP	IP addresses used by the PC and PLC to communicate.
Log View	Button allowing access to a *.log View containing connection/ disconnection events on the USB line.

Memory Card Driver

B

Memory Card Driver

Overview

The purpose of the memory card driver is to operate with the Modicon M340 memory card file system directly on a PC (read/write files) without using a FTP server.

Memory cards use a file system dedicated to embedded firmwares for reliability reason against power cuts (unlike a FAT file system for instance)

By default, the files are only visible in the CPU by means of an FTP server.

But it is possible to access the files on a memory card with a PC (Windows Professional Edition 32, Windows XP or Windows Vista Professional Edition 32) after a special driver has been installed.

Note: The access through FTP or directly from a PC is restricted to user files located in the **Data Storage** folder.

Note: It is not possible to access the files on a memory card with a Linux PC or a MAC.

Installing the Driver

Install the driver as described in the following table.

Step	Action
1	Select the respective folder on the Unity Loader CD (...*memory card driver*).
2	Right click the *reliance.inf* file and select **Install** in the context menu.
3	The driver is installed automatically.

Using the File System

Once the driver is installed, you can access the new file system.

Step	Action
1	Insert a memory card in the card reader.
2	Select the respective folder in the Windows Explorer. **Result:** The files are visible.
3	You can read, write, rename or delete files and folders like in a Windows file system for (e.g. FAT or NTFS).

Transfer of Applications in Batch Mode

C

Batch Mode with the Unity Loader Command Line Interface

Overview

The Unity Loader offers the command line interfaces *UlUmas.exe* for skilled users.

UlUmas.exe provides commands for transferring applications and data files via UMAS protocol.

The main usage is to transfer applications to 1 or several PLCs by calling a script without running Unity Loader dialogs but you can also start and stop PLCs.

Commands without Additional Checks

⚠ WARNING

RISK OF UNINTENDED EQUIPMENT OPERATION

Before executing commands by means of the command line interface make sure that the commands will not result in hazardous situations for men or equipment. The command line interface executes commands on the PLC without additional checks.

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

Transfer FW or Transfer Project

⚠ WARNING

RISK OF UNINTENDED EQUIPMENT OPERATION

Before transferring data to a PLC make sure that you have selected the correct files and entered the correct target address. Verify the address by comparing the MAC address printed on the device with the MAC address shown by Unity Loader in the **Firmware** tab.

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

Start PLC / Stop PLC

⚠ WARNING

RISK OF UNINTENDED EQUIPMENT OPERATION

Before starting/stopping a PLC make sure that you are connected to the correct target address. Verify the address by comparing the MAC address printed on the device with the MAC address shown in the **Firmware** tab.

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

⚠ WARNING

UNKNOWN OPERATIONAL STATE OF EQUIPMENT

Evaluate operational state of equipment before starting or stopping a PLC. Hazardous situations can occur if system state is not confirmed prior to starting or stopping a PLC.

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

UMAS

UMAS stands for Unified Messaging Application Service, a platform independent protocol for exchanging application data.

Program

You can find the *UlUmas.exe* in the installation directory of your Unity Loader software.

Documentation

You can find a detailed documentation (*UlUmas.doc*) in the installation directory of your Unity Loader software, too.

Running the Program

On your PC select **Start** → **Run**, enter *UlUmas.exe* in the **Open** dialog and confirm with **OK**.

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