Unity DIF
a SoCollaborative Software
User Manual

11/2013

Schneider Electric

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

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

Table of Contents

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, 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 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 or serious injury.

⚠ CAUTION

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

NOTICE

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

PLEASE NOTE

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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.

About the Book

At a Glance

Document Scope

This manual describes the installation and the using of Unity DIF software.

Validity Note

This documentation is valid for Unity DIF version 8.0.

Related Documents

Title of Documentation	Reference Number
Unity Pro Software Reference Manual	35056144
Schneider Electric License Manager User Manual	EIO0000001070

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

Chapter 1
Overview

General Introduction

Overview

Unity DIF is a comparison software that compares the Unity Pro project files and displays the differences graphically with a similar look and feel of Unity Pro. This enables the user to understand the project differences easily. The result of the comparison is displayed in the Unity DIF main window, which can be printed/saved as *.pdf* or *.txt* format.

NOTE: The software compares the project files with *.xef, .zef, .stu,* and *.sta* extensions.

Function

The software provides differences of the following sections after comparison:
- PLC configuration (Hardware and network)
- Derived Data Types
- Derived FB Types
- Variables and FB Instance
- Motion
- Communication
- Programs
- Animation Table
- Operator Screen
- DTM Catalog
- Project settings

EIO0000001720 11/2013

Chapter 2
Hardware and Software Requirements

Overview

This chapter describes the system requirements and the steps to install and activate the software.

What Is in This Chapter?

This chapter contains the following topics:

System Requirements

Introduction

Unity DIF requires the following hardware and software configuration. The configuration type determines the level of expected performance.

The performance of Unity DIF software is affected by the following:
- Opening several windows simultaneously
- Accessing large quantities of animated data
- Using a large application

Hardware Requirements

This table describes the minimum hardware requirements to run Unity DIF on Microsoft Windows 7 Professional (32/64 bit), Windows 8 Pro (32/64 bit), and Windows Server 2008 R2 (64 bit):

Requirement	Minimum
System	2.4 GHz or higher
RAM	3 GB, Recommended 8 GB
Hard disk	50 GB
Monitor	1024 x 768 with high color 24 bit

NOTE: The installation of Windows 7 Service Pack 1 (SP1) is mandatory on Windows 7 (64 bit) system.

This table describes the minimum hardware requirements to run Unity DIF on Microsoft Windows XP Professional:

Requirement	Minimum
System	Pentium Processor 1.2 GHz or higher
RAM	1 GB; Recommended 3 GB
Hard disk	5 GB; Recommended 10 GB
Monitor	1024 x 768 with high color 24 bit

NOTE: Refer to Unity Pro readme for the minimum system requirements to install Unity Pro for comparing *.stu* and *.sta* files.

Software Requirements

Unity DIF installation requires the following software:

Software	Edition	Special Consideration
Microsoft.NET Framework	V4.0	–

NOTE: The user needs Administrator access rights to install Unity DIF, but the User access rights are sufficient for using the software.

Unity DIF on a Virtual Machine

Unity DIF runs on the following virtual machines:
- VMWare
- VirtualBox

VMWare

VMWare requires the given configurations:

Operating System of VMware machine	Operating System of Computer
Windows 7 (64 bit)	Windows 7 (64 bit)
Optional Configurations	
Windows 7 (32 bit)	Windows 7 (32 bit)
Windows XP	Windows 7 (64 bit)

VirtualBox

VirtualBox requires the given configurations:

Operating System of VirtualBox machine	Operating System of Computer
Windows 7 (32 bit)	Windows 7 (64 bit) (recommended) Or Windows 7 (32 bit)

Installation and Uninstallation

Introduction

This topic describes installation and uninstallation of Unity DIF.

How to Install

This table describes the installation of this software:

Step	Action
1	Insert the Unity DIF CD-ROM.
2	Click *setup.exe*. **Result: InstallShield Wizard** starts and the installation startup screen appears.
3	Click **Next** to continue.
4	After reading the read me, release notes, and license agreement, check **I accept the terms of the license agreement** option and click **Next** to continue. **NOTE:** You can print the license agreement using Print option.
5	Enter the following information and click **Next** to continue: ● First name ● Last name ● Company **NOTE:** Check Only for Me option if you do not want to install the software for other users.
6	Select the folder where the setup has to install the files and click **Next** to continue. **NOTE:** The default directory is *C:\Program Files\Schneider Electric*.
7	Select **Create a shortcut on the desktop** option, **Create a Quick Launch icon** option and click **Next** to continue.
8	Click **Install** to configure and launch the installation. **Result:** When the installation is complete, the exit screen appears.

How to Uninstall

This table describes the steps to remove the software from your PC:

Step	Action
1	Click **Start**.
2	Select **Settings** →**Control Panel**. **Result:** The **Control Panel** window appears displaying the categories.
3	Click **Add or Remove Programs** from the window.

Installation over Existing Version

If an older version of Unity DIF is present, the setup removes the previous version (including documentation, samples, tools, and so on) before the installation of the new version.

License Activation

Introduction

Unity DIF requires to be activated after 21 days of trail period to use for free. After the trail period, the tool cannot be launched.
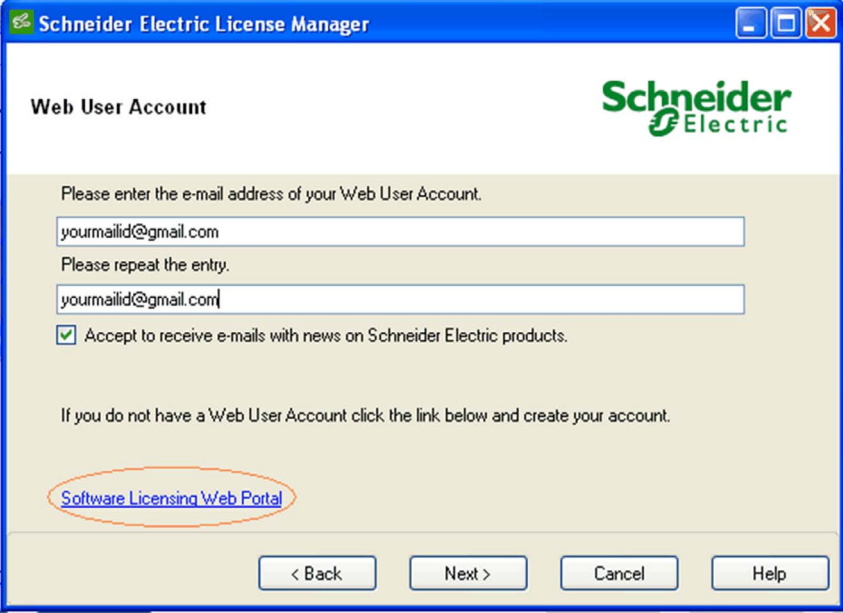
The license can be activated on any number of systems. The conditions for activating the Unity DIF license on a PC are the following:

- Activation is required after 21 days.
- Activation is done by Web.
- User has to enter the e-mail address for activation.
- Return, update, and repair are not allowed.

How to Activate the License

This table describes the steps to activate the license of Unity DIF:

Step	Action
1	Launch the Schneider Electric License Manager.
2	Click **Activate** in the **Local** tab. **Result:** The **Activation Method** dialog box appears.
3	Select **By web** as activation method. **Result:** A short procedure description of this method is displayed in the text box. The user can print this description using the Print option.
4	Click **Next**. **Result:** The **Activation ID** dialog box appears.
5	Enter the activation ID `A-UJPB-FC95-L44U`. **Result:** The **Next** option is enabled.
6	Click **Next**. **Result:** The E-mail Address dialog box opens.
NOTE: Refer to Activation Methods *(see Schneider Electric License Manager, User Manual)*.	

Step	Action
7	Enter your e-mail address and repeat the entry in the second line. **NOTE:** To activate a free tool, the user has to enter an e-mail address of a Web User Account. **NOTE:** If you do not have a **Web User Account**, click the link as shown in the figure and follow the steps to create a new account. After the new account is created, you will get a confirmation mail on your given e-mail id. Click and activate to enable your account. **Result:** The **Next** option is enabled. **NOTE:** De-activate the **Receive e-mails with news on Schneider Electric products** option by not selecting the checkbox.
8	Click **Next**. **Result:** The **Activation in Progress** dialog box opens. **NOTE:** The information about the internal processing of license activation is displayed in this text box.
9	Click **Finish** after the license is successfully created. **Result:** The **Local** tab of the **Schneider Electric License Manager** is displayed with each activated license in a new line.
NOTE: Refer to Activation Methods *(see Schneider Electric License Manager, User Manual)*.	

Chapter 3
Using Unity DIF

Overview

This chapter describes the usage of this software.

What Is in This Chapter?

This chapter contains the following sections:

Section 3.1
Launch

Launching Unity DIF

Overview

This section describes the launching of this software.

The user can launch the software using the following methods:
- Launch from desktop
- Launch in Windows environment
- Launch from Unity Pro
- Launch from Windows Context menu

How to Launch from the Desktop

The normal installation process places a Unity DIF program icon on your desktop.

To launch the Unity DIF Software, double-click this icon.

How to Launch in Windows Environment

This table describes the steps to launch the software in the Windows environment:

Step	Action
1	Click **Start**.
2	Select **Schneider Electric** from **All Programs**.
3	Click **SoCollaborative** →**Unity DIF** from the program list.

How to Launch from Unity Pro

This table describes the steps to launch the software from Unity Pro:

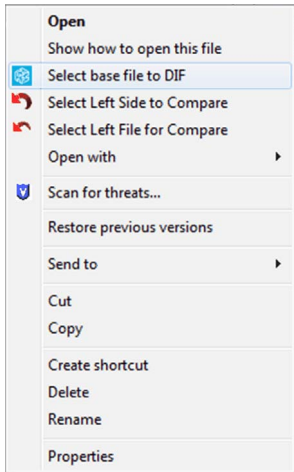| Step	Action
1	Click **Tools** from the menu bar.
2	Select **Project Comparison**.
3	Browse in **Compare File** field in the **Open Files** dialog box to select a file for comparison. **NOTE:** The file that is currently open in Unity Pro is selected as the base file by default.
4	Click **Compare** to start the comparison.

NOTE:

The **Project Comparison** menu entry is disabled in the following cases:
● If a project is not open in Unity Pro
● Unity Pro is reinstalled
● Unity DIF is uninstalled

It is enabled after Unity DIF is reinstalled.

How to Launch from Windows Context Menu

This table describes the steps to launch the software from Windows context menu:

Step	Action
1	Right-click the selected Unity Pro project file. **Result**: A Windows context menu appears.
2	Choose **Select Base file to DIF** option from the menu.

Step	Action
3	Right-click the desired Unity Pro project file for comparison and select **DIF with "xxx"** option.

NOTE: The **xxx** represents the name of the base file that is selected.

Section 3.2
User Interface

Overview

The DIF project window opens when the user launches the software. The Project Browser, Main Window, Attribute Window, and Result Window is displayed only after the comparison of the Unity Pro project files.

This window comprises of the following sections:
- Project Browser
- Main Window
- Attribute Window
- Result Window
- Menus
- Tool bar
- Status bar

This figure displays the DIF project window:
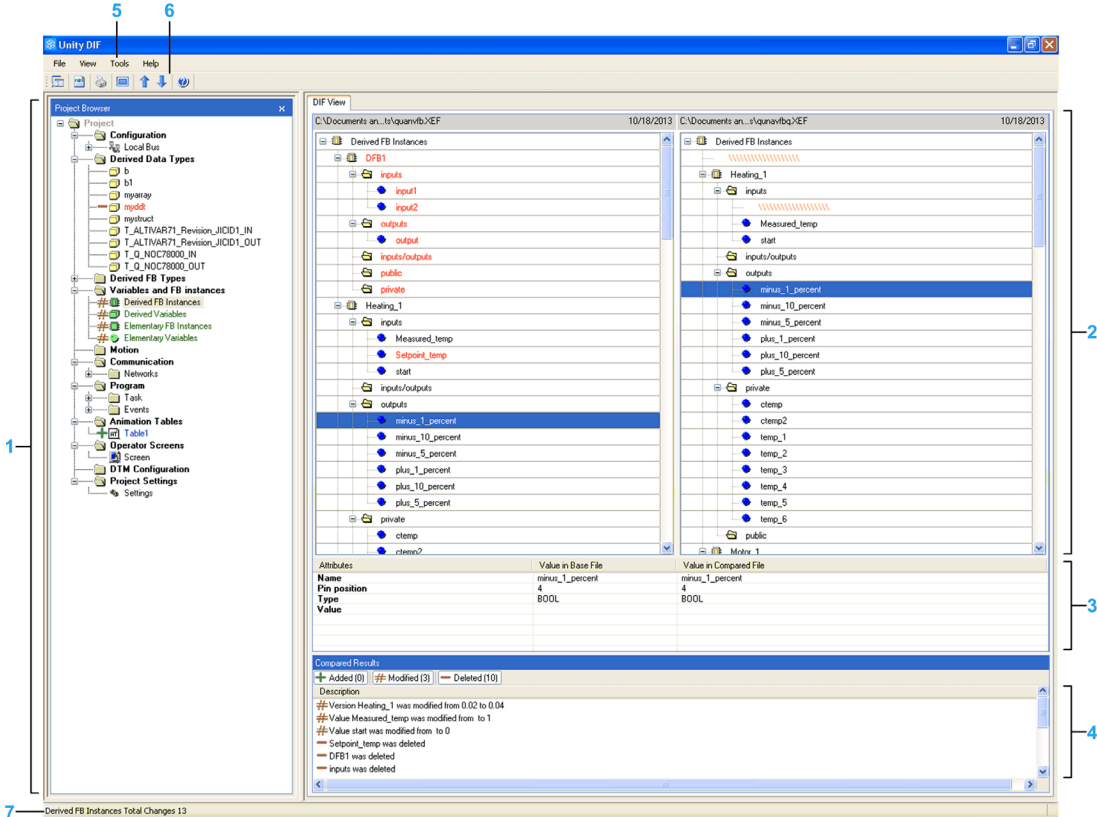
1	Project browser
2	Main window
3	Attribute window
4	Result window
5	Menus
6	Tool bar
7	Status bar

What Is in This Section?

This section contains the following topics:

Project Browser

Introduction

The Project Browser displays the different sections of the project. The browser is aligned to the left side of the application window by default but it is movable either to right or left. The Project Browser structure is the combination of base and compared project nodes after comparison. The sections that are not selected for comparison are grayed out.

The user can select any node from the Project Browser and the corresponding node difference is displayed on the Main Window.

The main features of Project Browser are:
- Sub menu
- Key navigation

Sub Menu

The sub menu item **Open files in Unity Pro** enables the user to open the files in Unity Pro. Select this option by right-clicking the programming language section in the Project Browser. If Unity Pro is not installed on the PC, a popup appears displaying the message **Unity Pro is not installed on this PC**.

This feature is available only for the following programming languages:
- IL: Instruction list
- ST: Structured text
- LD: Ladder diagram
- FBD: Functional block diagram
- LL984: Ladder logic 984
- SFC: Sequential function chart

Key Navigation

The navigation keys include:
- F7: Previous difference
- F8: Next difference

Icon Representation

This table displays the icon representation and its description:

Icons	Description
#	Indicates the node modification.
—	Indicates the node deletion.
+	Indicates the node addition.
⊗	Indicates that the node is not compared.

The color schema for the icons (that is for added, modified, and deleted) differs with the selection of colors from Options *(see page 53)* menu.

Main Window

Introduction

The Main Window displays the difference results of a selected section from the base and compared files. The results are displayed in different formats (textual, graphical, and tabular), for better understanding of the user based on the section selected from the Project Browser.

Features of Main Window

This table describes the features of the Main Window:

Features	Description
Navigation	This feature helps the user to navigate through the differences.
Blank section	If a section is not present either on the base or compared file, the corresponding data window of the file in which the section is not present remains blank.
Synchronization	This feature synchronizes the scroll bars of the windows that display the data from the base and compared files. For more information, refer to Scrolling *(see page 54)*.
Space pattern insertion	The space pattern is inserted between lines and objects to match and show the corresponding difference in the base and compared files.
Difference highlighting	The selection of a particular difference in the Result Window highlights the corresponding line or object in the Main Window and the associated object attributes in the Attribute Window. The differences (that is added, modified, or deleted objects) in the sections are highlighted in various colors depending on the user selection. For more information, refer to Color Format *(see page 53)*.
Textual representation	The difference is displayed as 2 separate windows on the Main Window in textual format. The line number is shown for the sections that display the differences in textual format.
Graphical representation	The selected sections from the base and compared files display their differences in graphical format.
Tabular representation	The differences after comparison are displayed in tabular format for certain selected sections (**Communication**, **Animation Table**, **Variables and FB Instances**, **Motion**, and **Project Settings**).
Zoom-in and zoom-out	Zoom-in and zoom-out are enabled for sections that display their differences in graphical format.

Attribute Window

Introduction

The Attribute Window displays the attributes of the selected sections/nodes/variables.

Features of Attribute Window

The Attribute Window includes 3 columns, namely **Attribute Name**, **Value in base file**, and **Value in Compared file**.

The value field remains empty if the associated value is not available in the file. The color codes differentiate the changes for easy understanding.

Result Window

Introduction

The result is displayed in the Result Window after the completion of comparison. The software uses Unity Pro vocabulary and syntax to display the attributes. The selection of a particular difference in the Result Window highlights the corresponding line or object on the Main Window.

Filters

The following filters are available for filtering the DIF results:

- Added: Lists the added item.
- Modified: Lists the modified items.
- Deleted: Lists the deleted items.

NOTE: The icon representation of each result differentiates the changes when the filters are enabled.

Menus

Introduction

The menu structure comprises of the following:
- **File**
- **View**
- **Tools**
- **Help**

Menu Structure

The functions of these menu items are described in the given table:

Menu	Menu Item	Shortcut	Description
File	**Compare**	CTRL + M	Enables the user to select the base and compared files for comparison using **Open File** dialog box. For more information, refer to File Compare *(see page 37)*.
	XML View	–	Enables the user to view the source XML difference of a selected section using **XML View**. For more information, refer to XML Source *(see page 50)*.
	Print Setup	–	Enables the user to configure the printer using **Print Setup** dialog box.
	Print	CTRL + P	Enables the user to select the modified sections and print a difference report. This feature is enabled after comparison. For more information, refer to Print *(see page 51)*.
	Exit	CTRL + X	Allows the user to stop and exit Unity DIF.

Menu	Menu Item	Shortcut	Description
View	**Toolbar**	–	Allows the user to display or hide the Tool bar. For more information, refer to Tool bar *(see page 33)*.
	Status bar	–	Allows the user to display or hide the Status bar.
	Project Browser	–	Allows the user to display or hide the Project Browser. For more information, refer to Project Browser *(see page 26)*.
	Full Screen Mode	F5	Allows the user to view the differences in full screen without the menu bar, Tool bar, Status bar, and Project Browser.
	Previous Difference	F7	Allows the user to navigate to the previous and the next difference respectively after comparison.
	Next Difference	F8	
Tools	**Option**	CTRL + O	Allows the user to change the settings. For more information, refer to Options *(see page 53)*.
Help	**Index**	F1	Lists the help elements in the alphabetical order.
	Find	F1	Allows the user to search an element in the compared files using keywords.
	Help Topics	F1	Allows the user to navigate to help topics on any particular content in the file.
	About Unity DIF	–	Opens the **About** window.

Tool bar

Introduction

The toolbar consists of the following tool bar items:
1. Compare
2. XML view
3. Print
4. Full screen
5. Previous difference
6. Next difference
7. Help

Compare

The compare action opens the **Open Files** dialog box allowing the user to select the base and compare files for comparison. This option is disabled when the comparison is in-progress.

For more information, refer to File Compare *(see page 37)*.

XML View

The **XML View** option displays the source XML differences of a selected section and is enabled after comparison.

For more information, refer to XML Source *(see page 50)*.

Print

The **Print** option allows the user to select and print the difference report for the sections that have differences and is enabled after comparison.

For more information, refer to Print *(see page 51)*.

Full Screen

The **Full screen mode** option enables the user to view the differences in full screen without the menu bar, Tool bar, Status bar, and Project Browser. This feature is enabled after comparison.

Previous Difference (F7)

This option allows the user to navigate to the previous difference and is enabled only after the comparison results are available.

To view the previous difference, click **View** →**Previous difference** from the menu bar or click the toolbar shortcut.

Next Difference (F8)

This option allows the user to navigate to the next difference and is enabled only after the comparison results are available.

To view the next difference, click **View →Next difference** from the menu bar or click the toolbar shortcut.

Help

This option opens the online help in the content page.

Status bar

Introduction

Status bar is visible at the bottom of the DIF project window when the software is launched. This is an option available in the **View** menu, which enables the user to display and hide the Status bar.

Features

This table describes the different Status bar messages and its instances:

Status bar Message	Instance
Ready to compare	When the user launches the software, this message is displayed in the Status bar.
File comparison is started	When the user clicks **Compare** after the selection of the desired Unity Pro project files.
Compare in progress	When the Unity Pro project files are being compared.
Project Total Changes	By default, when the root node is selected after the comparison is complete. **NOTE:** The selection of different sections in the Project Browser displays the message **Total Changes** on the status bar for that particular section.

Section 3.3
Compare

Overview

This section describes the steps to compare Unity Pro project files, file compatibility, and the compared and not compared elements.

What Is in This Section?

This section contains the following topics:
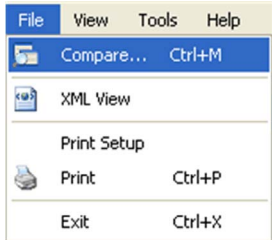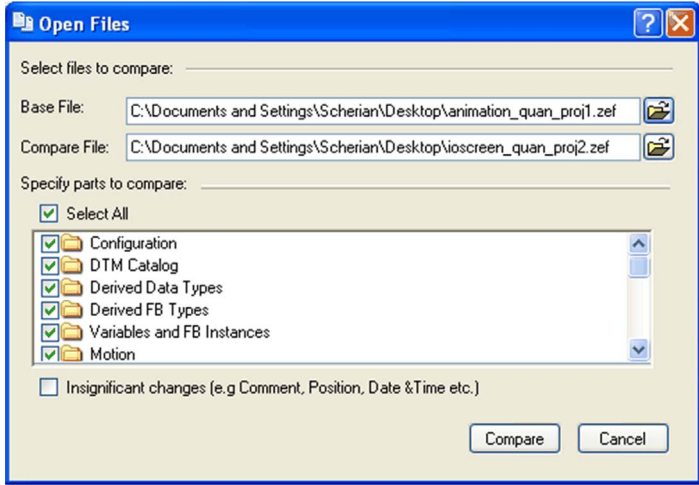
File Compare

Introduction

The **Compare** option enables the user to select and compare 2 Unity Pro project files with *.xef*, *.zef*, *.sta*, or *.stu* extensions.

How to Compare

This table describes the steps to compare:

Step	Action
1	Click **File →Compare**. **Result**: The **Open files** dialog box appears.
2	Browse for the base and compare files in the respective fields.
NOTE: The software registers the information of the detected errors and warnings in a log file during the comparison process. The name of the log file is *UnityDifError.log* and it is located at *%application path%/UnityDIF*.	

| Step	Action
3	Select or unselect the section that has to be compared. **NOTE:** Select atleast one section to start the comparison.
4	Select the insignificant changes such as comments, positions, and so on if it needs to be compared.
5	Click **Compare** to start comparison. **NOTE:** • If a *.sta* or *.stu* file is selected and Unity Pro is not installed on the system, a popup appears informing the user that Unity Pro is not available and the comparison stops. • The software requires more time to compare due to the following reasons: **a.** The file size or the number of variables are more. **b.** *.sta* and *.stu* files as it converts the files with Unity Pro. • A popup appears to verify the login credentials of the user if the **Security Editor** feature is enabled during comparison. • If the project or section is password protected, the project file has to be unprotected and compared again. • If one of the selected *.stu* file is saved on the server, confirm that the server is accessible in Read/Write mode to perform the comparison.

NOTE: The software registers the information of the detected errors and warnings in a log file during the comparison process. The name of the log file is *UnityDifError.log* and it is located at *%application path%/UnityDIF*.

Security Editor

A popup dialog box appears to verify the login credentials if the **Security Editor** feature is enabled on the PC during the comparison of *.sta* or *.stu* project files. The cancellation of this dialog or entering incorrect credentials stops the comparison.

This figure displays the **Security Editor** feature:
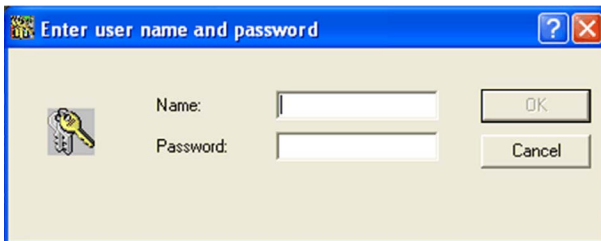
Click **Cancel** to stop the comparison.

Compatibility

Introduction

The software is compatible from Unity Pro V2.0 onwards for XLs, XL, L, M, and S for the following Unity Pro PLC platforms:
- Quantum
- Premium
- M340
- MDI
- M580

Compatibility Table

This table describes the compatibility of Unity Pro project files:

Unity Pro Version Installed	Base File	Compared Files							
		STU n-1	STU n	STA n-1	STA n	XEF n-1	XEF n	ZEF n-1	ZEF n
Vn-1	**STU n-1**	Yes	No	Yes	Yes(*)	Yes	Yes(*)	Yes	Yes(*)
Vn	**STU n**	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vn-1	**STA n-1**	Yes	No	Yes	Yes(*)	Yes	Yes(*)	Yes	Yes(*)
Vn	**STA n**	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vn-1	**XEF n-1**	Yes	No	Yes	Yes(*)	Yes	Yes(*)	Yes	Yes(*)
Vn	**XEF n**	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vn-1	**ZEF n-1**	Yes	No	Yes	Yes(*)	Yes	Yes(*)	Yes	Yes(*)
Vn	**ZEF n**	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- **(*)**: No Unity Pro Vn feature is used in the project.
- **Application of level Vn**: Application is developed using Unity Pro Vn.
- **Unity Pro Vn**: Unity Pro version that supports applications of level ⩽n.
  Example: If the installed version of Unity Pro is 8.0, then n = 8.0 and the last version is 7.0 (n-1 = 7.0).

NOTE:

The Unity Pro project files has the following features:
- *.stu* files from previous versions of Unity Pro are not readable in the new versions.
- *.sta* files are archive files compatible between different versions of Unity Pro.
- *.xef* files are used for exporting the XML source format.

Compared Elements

Introduction

This table describes the compared sections and attributes of the project files. The remaining sections and attributes are not compared:

Elements	Sections	Compared Attributes
`PLC Configuration`	Quantum Rack	• `Rack name` • `Rack position`
	Quantum PLC	Configuration Tab • `Module name` • `Vendor name` • `Version` • `Rack` • `Position` • `Cold Start only` • `Automatic start in Run` • `State RAM` • `Online modification in RUN or STOP` • `Maximum Unity data exchanged by PLC scan` • `%Mwi Reset`
	Quantum Drop	• `Drop name` • `Hold up time` • `Starting address status table` • `Version` • `Rack`
	Quantum I/O	• `Module name` • `Vendor name` • `Version` • `Rack` • `Position` • `Task` • `Starting address` • `Mapping`
	Quantum - Other modules	• `Module name` • `Vendor name` • `Version` • `Rack` • `Position`

Elements	Sections	Compared Attributes
continued...	Premium Rack	• `Rack name` • `Rack position`
	Premium PLC	Configuration Tab • `Module name` • `Vendor name` • `Version` • `Rack` • `Position` • `Cold Start only` • `Automatic start in Run` • `Initialize %MWi on Cold Start`
	Premium Drop	• `Drop name` • `Version` • `Rack`
	Premium - Other modules	• `Module name` • `Vendor name` • `Version` • `Rack` • `Position`
	M340 Rack	• `Rack name` • `Rack position`
	M340 PLC	Configuration Tab • `Module name` • `Vendor name` • `Version` • `Rack` • `Position` • `Cold Start only` • `Automatic start in Run` • `Initialize %MWi on Cold Start`
	M340 Drop	• `Drop name` • `Version` • `Comment` • `Rack`
	M340 - Other modules	• `Module name` • `Vendor name` • `Version` • `Rack` • `Position`
	M580 Rack	• `Rack name` • `Rack position`

Elements	Sections	Compared Attributes
continued...	M580 PLC	Configuration Tab • `Module name` • `Vendor name` • `Version` • `Rack` • `Position` • `Cold Start only` • `Automatic start in Run` • `Initialize %MWi on Cold Start` • `Maximum Unity data exchanged by PLC scan`
	M580 Drop	• `Drop name` • `Version` • `Rack`
	M580 - Other modules	• `Module name` • `Vendor name` • `Version` • `Rack` • `Position`
	MDI Rack	• `Rack name` • `Rack position`
	MDI PLC	Configuration Tab • `Module name` • `Vendor name` • `Version` • `Rack` • `Position` • `Cold Start only` • `Automatic start in Run` • `Initialize %MWi on Cold Start`
	MDI Drop	• `Drop name` • `Version` • `Rack` • `Comment`
	MDI - Other modules	• `Module name` • `Vendor name` • `Version` • `Rack` • `Position`
`Derived Data Types`	–	• `Name` • `Type` • `Version` • `Comment`

Elements	Sections	Compared Attributes
Derived FB Types	–	- Name - Type - Version - Comment - Value - Pin position
Variables and FB Instances	Elementary Variables	- Name - Type - Address - Value - Comment - Time stamping
	Derived Variables - Device DTT - IODTT - DTT	- Name - Type - Address - Value - Version - Comment
	Elementary FB Instances	- Name - Type - Address - Value - Comment
	Derived FB Instances	- Name - Pin position - Type - Value - Comment
Motion	Axis Parameters	- Name - CANOpen handler variable name - List of compatible address - Axis reference variable name - List of available drive - Network type - Part number - Software version
	Recipe Parameters	- Recipe variable name - Parameter description - Initial values saving enabled

Elements	Sections	Compared Attributes
Communication	Ethernet	• Name • Model family • Rack • Module • Comment
		IP configuration • IP Address • Subnet mask • Gateway address • Ethernet configuration
		Messaging • Name • Access control • Access
		IO scanning • Health block (%I/%IW) • Device control block (%MW) • Repetitive rate step • Name • IP address • Unit ID • Slave syntax • Health Timeout (ms) • Repetitive rate (ms) • RD Master object • RD Ref slave • RD length • Last value (Input) • WR Master object • WR Ref slave • WR length • Gateway/Bridge device • Description
		Global data • Health timeout • Distribution period • Multicast filtering • Group address • Group name • Health bit block

Elements	Sections	Compared Attributes
continued...	Ethernet	**SNMP** • IP address manager 1 • IP address manager 2 • Location • Contact • SNMP Manager • Set community name • Get community name • Trap community name • Enable Authentication Failure trap
		Address server • Locked in operation • Password • MAC address • Name • IP address • Netmask • Gateway
		NTP • IP address of Primary NTP Server • IP address of Seconadry NTP Server • Polling period • Automatically adjust clock for daylight saving
		Bandwidth • Estimated publishers period (ms) • Estimated transaction received (per second) • Global data • IO Scanning • Messaging • Others

Elements	Sections	Compared Attributes
continued...	Modbus Plus	• `Name` • `Time Out` (ms) • `Input fallback mode` • `Station number` • `PeerCop` • `Comment` **Global** • `Name` • `Length` • `Bin/BCD` **Specific** • `Name` • `Length` • `Bin/BCD`
	Fipway	• `Name` • `Rack` • `Module` • `Network number` • `Table start address (%MW)` • `Product zone address (%MW)` • `Length of produced zone in words`
`Program`	FBD section/SR section	–
	ST section/ SR section	
	IL section/ SR section	
	LD section/ SR section	
	SFC section/SR section	
	LL984 section/SR section	
`Animation Tables`	–	• `Name` • `Version` • `Extended string animation` • `Extended string animation characters length`

Elements	Sections	Compared Attributes
Operator Screen	–	• Animation variable name • Animation variable type • Display condition • Animation display type • Animation display • Flashing background • Flash color • Number of characters • Character shift • Associated text • Controlled variable name • Controlled type • Controlled variable low range • Controlled variable high range • Text animation message number • Text animation message shift • Trend low threshold • Trend high threshold • Trend sampling • Trend pixels • Trend line color • Bar chart low threshold • Bar chart high threshold • Bar chart default minimum value • Bar chart default maximum value • Bar chart color • Instruction type • Channel type
DTM Catalog/ Browser	–	• Alias name • DTM name • DTM version • DTM creation version • Address • Device name • Device vendor • Device creation version • Is MasterDTM
Project Settings	–	• General • Operator Screens • Program • Variables

Section 3.4
Features

Overview

This section describes the features of this software.

What Is in This Section?

This section contains the following topics:

DIF Summary

Introduction

This feature displays the consolidated summary of differences between the base and compared file in graphical format. The DIF summary is displayed by default after comparison. The user can view the DIF summary by choosing the root node or the required section from the Project Browser any time after comparison.

The selection of the root node displays the consolidated summary of difference between the base and compared files.

This figure displays the summary of differences between the selected files:
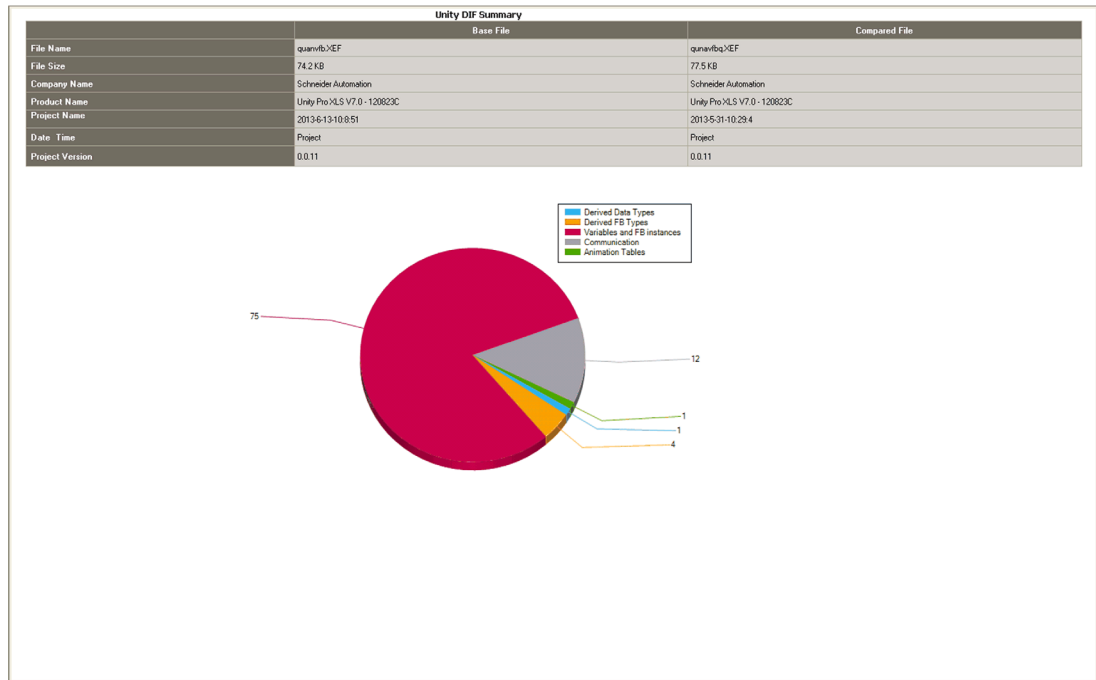
Features

The DIF summary view has the following features:
- Displays the basic file properties and the consolidated summary of the base and compared files.
- Displays the difference summary of the particular section by selecting the section header node from the Project Browser.

XML Source

Introduction

This feature enables the user to view the source XML content of a selected section. The user can identify the possible differences in the XML sources, which are not compared during the DIF comparison.

This figure displays the XML view of the compared files:
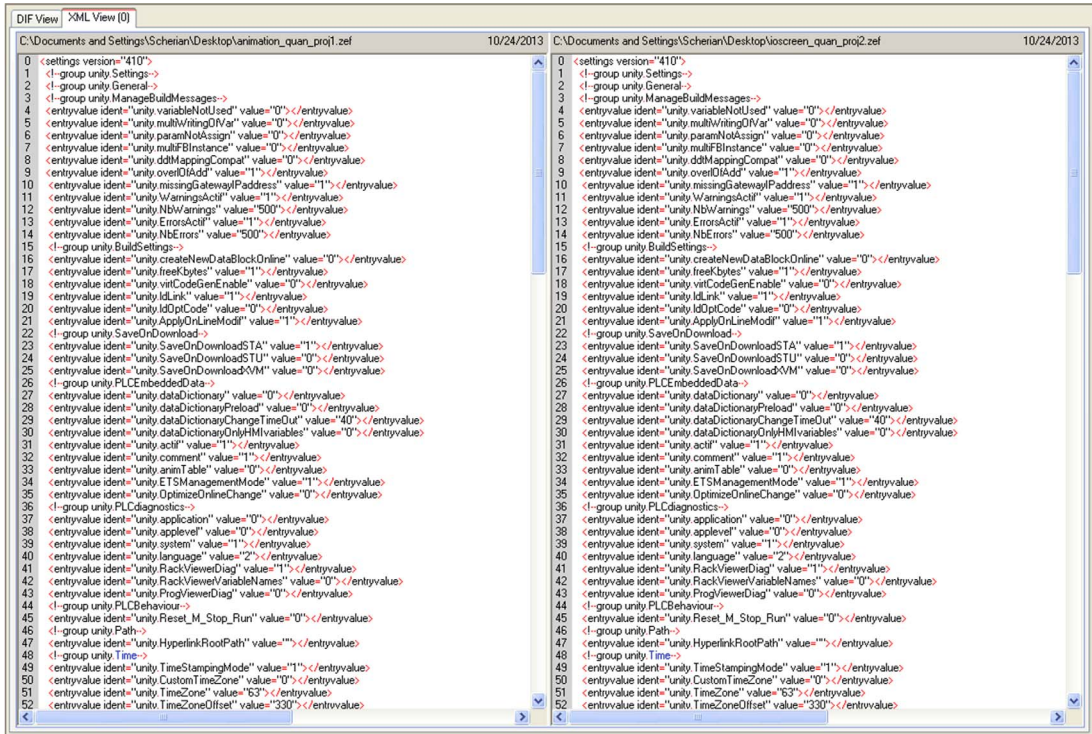
To view the XML difference, click **File** →**XML View** from the menu bar or click the toolbar shortcut.

Features

The features for this option are similar to that offered in the textual representation. The DIF navigation keys allow the user to navigate through the differences.

Print

Introduction

This feature enables the user to print the project differences or save the same in *.txt* or *.pdf* format.

Print

The **Print** dialog box lists the sections with differences. The user has the privilege to select and unselect the required sections. All the sections are selected to print by default.

This figure displays the **Print** dialog box:
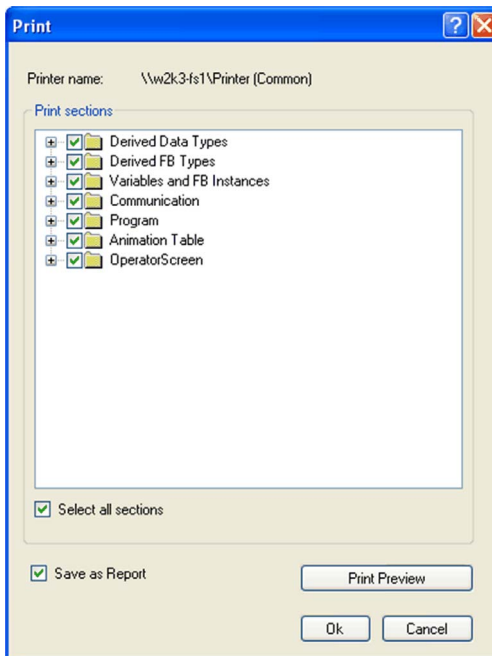
This table describes how to select and unselect the sections necessary for printing:

Step	Action
1	Click **File →Print**. **Result:** The **Print** dialog box appears.
2	Uncheck the **Select all Sections** option.
3	Select the required sections in the list.
4	Click **OK** to confirm the print action. **NOTE:** Click **Cancel** to abort the print.

Print Setup

The **Print Setup** dialog box allows the user to select the required printer and configure the features that reflect when the report is printed.

The **File →Print Setup** menu item launches the **Print Setup** dialog box.

This figure displays the **Print Setup** dialog box:
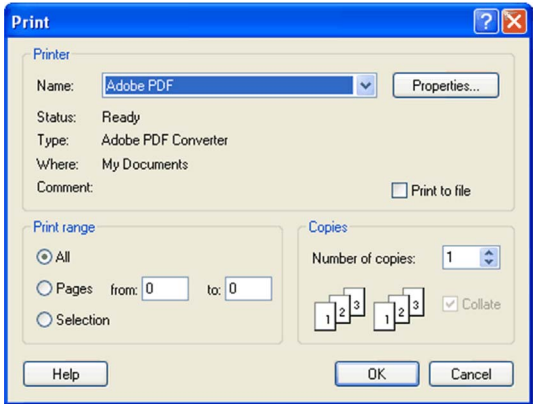
Print Preview

The **Print Preview** option enables the user to preview the report prior to printing.

This table describes how to select the **Print Preview** option:

Step	Action
1	Click **File →Print**. **Result:** The **Print** dialog box appears.
2	Select the required sections in the list.
3	Click **Print Preview** to preview the print.

Save as Report

This table describes how to save the differences as a report:

Step	Action
1	Check the **Save as Report** option in the **Print** dialog box.
2	Click **OK**. **Result:** A popup appears prompting the user to select the file type to save the differences. For example, *.txt* or *.pdf*.
3	Select the location and click **Save**.

The *.pdf* file includes the textual and graphical formats of the difference.

Options

Introduction

The **Options** menu enables the user to customize the following parameters:
- **Colors**
- **Zoom**

Colors

The color format setting helps to represent and format the differences on the Main Window. The colors are set as per the user preferences.

The user can set the color representation for the following parameters:
- Added
- Modified
- Deleted
- Highlight difference (for text sections)
- Blank area indicator

This figure displays **Colors** option:
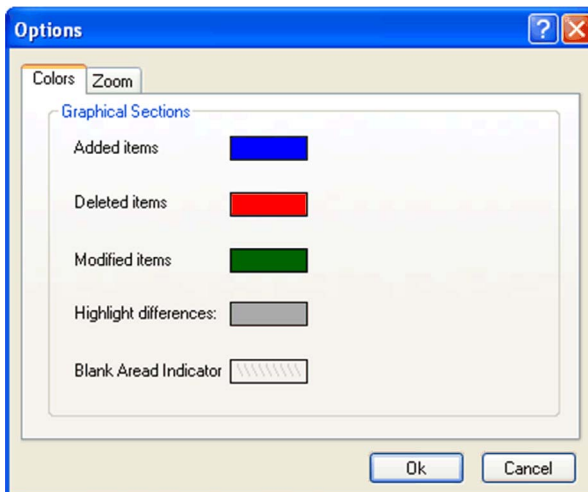
Zoom

This feature enables the user to synchronize the scrolling on the Main Window. Unselect this option to zoom and scroll the split windows individually.

This figure displays the **Zoom** option:
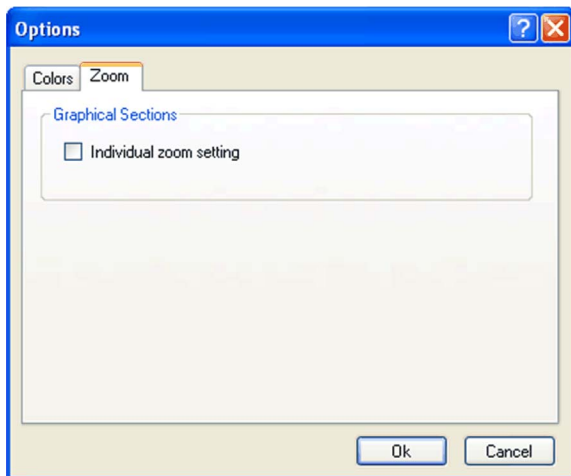
Chapter 4
Comparison Modes

Overview

This chapter describes 2 other methods (Command-line mode and server mode) to launch Unity DIF. The comparison is done and the report is generated by the command-line mode. Unity DIF allows the command-line mode to be launched directly through the command prompt without an interactive window.

The comparison done by the command-line mode includes the following list of functionalities:
- Launch the compare function with a parameter to display the result in the GUI.
- Launch the compare function with a parameter to generate the summary report (*.txt* format).

NOTE: Sample projects are provided as part of the build for command-line and server modes. This helps the user to understand the features.

What Is in This Chapter?

This chapter contains the following topics:

Command-Line Mode

Introduction

The command-line mode (the Windows command prompt) is used instead of the DIF user interface to compare Unity Pro projects. This is useful either to integrate DIF with other applications or to generate DIF comparison report without user interface.

How to Launch Command-Line Mode

This table describes the procedure to execute the software in command-line mode from the keyboard:

Step	Action
1	Click **Start** →**Run**. **Result: Run** dialog box appears.
2	Click **OK** after entering cmd in **Open** field. **Result:** Command prompt screen appears.
3	Enter the *UnityDif.exe* file path in the command prompt screen.

NOTE: By default, *UnityDIF.exe* will be available in *C:\Program Files\Schneider Electric\Unity Dif*.

Syntax

Run Unity DIF from the command-line mode using the syntax:

```
UnityDif.exe [option].
```

Command-Line Arguments

This table describes the command-line arguments:

Options	Description	Usage Example
-h or -?	Helps to provide information about all the options.	UnityDif.exe -? or UnityDif.exe -h
-c	Compares 2 Unity Pro project files and displays the result in the Main Window.[1] **Syntax:** UnityDif.exe - c [/path/[base File]][/path/ [compare File]][optional: security Editor UserName] [optional: security Editor Password]	UnityDif.exe - c ~\basefile.stu ~\comparefile.stu username password
(1) The username and password parameters are optional and required only when Unity Pro **Security Editor** is ON.		

Options	Description	Usage Example
`-cr`	Compares 2 Unity Pro files and generates\stores the result in *.txt* format in the given path.[1] **Syntax:** `UnityDif.exe -cr [/path/[base File]][/path/ [compare File]][optional: security Editor UserName] [optional: security Editor Password] [/path/[report Name]]` **NOTE:** The result is stored in the text format by default.	`UnityDif.exe -cr ~\basefile.stu ~\comparefile.stu username password ~\basefile.stu ~\result`
`-v`	Validates the 2 DIF report files and saves the result in the given location. **Syntax:** `UnityDif.exe -v [/path/[report File]][/path/ [resultFileName.txt]]` **NOTE:** After the checksum verification, a message box appears with the result. It displays **Identical** if the report is validated and **Different** in the other case.	`UnityDif.exe -v ~\resultFile.txt ~\ ~\resultFileName.txt`
(1) The username and password parameters are optional and required only when Unity Pro **Security Editor** is ON.		

Server Mode

Introduction

The server mode enables the user to develop an application using Unity DIF functions. The functionalities of these interfaces are same as the command-line mode parameters, but a different syntax is used.

Description

This table describes the interfaces:

Interface Syntax	Description
`int CompareFilesWithGUI (string baseFilePath, string compareFilePath, string userName, string password)`	Compares 2 Unity Pro project files and opens the results in DIF window. Parameters: ● `baseFilePath`: Valid base file with full path. ● `compareFilePath`: Valid compare file with full path. ● `userName`: Valid **Security Editor** user name. ● `password`: Valid **Security Editor** password. **NOTE:** The valid username and password are required only if the **Security Editor** is ON, otherwise null is ignored. Detected error codes: ● `UDS_E_SUCCESS_NO_DIFF`: No differences between base and compared files. ● `UDS_E_SUCCESS_WITH_DIFF`: Differences found between base and compared files. ● `UDS_E_CONVERT_FAILED`: File conversion unsuccessful. ● `UDS_E_INVALID_FILE`: Invalid file. ● `UDS_E_COMPARE_FAILED`: Comparison unsuccessful. ● `UDS_E_USER_PASSWORD_NOT_VALID`: Invalid user name or password.

Interface Syntax	Description
`int CompareFilesWithReport (string baseFilePath, string compareFilePath, string reportFilePath, string userName, string password)`	Compares 2 Unity Pro project files and generates the report. Parameters: ● `baseFilePath`: Valid base file with full path. ● `compareFilePath`: Valid compare file with full path. ● `reportFilePath`: Valid path to save the result report. ● `userName`: Valid **Security Editor** user name. ● `password`: Valid **Security Editor** password. **NOTE:** The valid username and password are required only if the **Security Editor** is ON, otherwise null is ignored. Detected error codes: ● `UDS_E_SUCCESS_NO_DIFF`: No differences between base and compared files. ● `UDS_E_SUCCESS_WITH_DIFF`: Differences found between base and compared files. ● `UDS_E_CONVERT_FAILED`: File conversion unsuccessful. ● `UDS_E_INVALID_FILE`: Invalid file. ● `UDS_E_COMPARE_FAILED`: Comparison unsuccessful. ● `UDS_E_USER_PASSWORD_NOT_VALID`: Invalid user name or password.
`int ValidateReport(string reportFilePath)`	Verifies the file content against checksum. Parameters: ● `reportFilePath`: Valid report file with full path. Detected error codes: ● `UDS_E_FILE_NOT_FOUND`: Report file not found. ● `UDS_E_FILE_DIFFERENT`: Report file modified. ● `1UDS_E_FILE_IDENTICAL`: Report file identical.

Error Codes

The table describes the error codes that are returned by the interfaces:

Integer Values	Error Codes	Description
1	UDS_E_SUCCESS_NO_DIFF	No differences between the 2 files.
2	UDS_E_SUCCESS_WITH_DIFF	Differences found between the 2 files.
3	UDS_E_PRODUCT_TRIALPERIOD_OVER	Product trial version over.
4	UDS_E_CONVERT_FAILED	File conversion unsuccessful.
5	UDS_E_INVALID_FILE	Invalid file.
6	UDS_E_COMPARE_FAILED	Comparison unsuccessful.
7	UDS_E_USER_PASSWORD_NOT_VALID	Invalid username or password.
8	UDS_E_FILE_NOT_FOUND	Report file not found.
9	UDS_E_FILE_DIFFERENT	Report file is modified.
10	UDS_E_FILE_IDENTICAL	Report file is identical.
12	UDS_E_APP_PWD_NOT_VALID	Invalid application password.

Chapter 5
Troubleshooting

Diagnostic Management

Introduction

The reasons and solutions of the main errors detected during a comparison are described here.

Issues Detected in Standalone Mode

This table describes the reasons and solutions of possible issues detected in standalone mode or when it is launched from Unity Pro:

Possible Detected Issues	Why	When	Reason/Possible Solution
Installation is interrupted or not launching.	• PC does not have the required operating system. • Older version is not uninstalled properly.	During installation of Unity DIF.	• Change the operating system of the PC. • Uninstall the older version manuallly.
Incorrect element.	The project file version is incompatible.	When you click **OK** to launch the comparison.	• The version of the .*stu* file is not the same as the installed version of Unity Pro. • The version of the .*xef* files are corrupted.
The report is not generated.	• The disk space is limited while generating the project. • Incorrect format used for a report validation. • Generating report with large number of modified sections.	During generation.	• Free the space on your hard disk. • The report file format has to be .*txt*.
The project name does not appear in the **Open Files** dialog box.	The project is not saved.	When the same file that was compared from Unity Pro is selected for a new comparison.	Save the project before launching the first comparison.
The **Project Comparison** sub menu item is disabled on Unity Pro **Tools** menu.	Unity Pro is reinstalled.	When the user tries to launch Unity DIF from Unity Pro.	Repair or reinstall Unity DIF.

Issues Detected in Command-Line Mode and Server Mode

This table describes the possible issues detected in command-line mode and server mode:

Mode	Possible Detected Issues	Why	Reason/Possible Solution
Command-line mode	Output is not visible at the command prompt.	Output is not displayed at the command prompt but redirected to the console.	Redirect output to a file.
	The Unity DIF user interface is not displayed after using -c option.	The input file may be corrupt.	Redirect output to a file and check the output file for detected errors indicated.
	The report is not created after using -cr option.	The input file may be corrupt.	Redirect output to a file and check the output file for detected errors indicated.
Server mode	Runtime error detected during client execution.	The client is not present in Unity DIF root folder (for example, *C:\Program Files\Schneider Electric\Unity Dif*).	Copy the client executable and related files to the Unity DIF root folder.
	Runtime error detected during client execution even if files are in Unity DIF root folder.	Incomplete registration of Unity DIF.	Reinstall the software.

Glossary

D

DDT

DDT is the abbreviation of Derived Data Type.

A derived data type is a set of elements of the same type (ARRAY) or of various types (structure)

DFB

DFB is the abbreviation of Derived Function Block.

DFB types are function blocks that can be programmed by the user ST, IL, LD or FBD.

By using DFB types in an application, it is possible to:

- simplify the design and input of the program,
- increase the legibility of the program,
- facilitate the debugging of the program,
- reduce the volume of the generated code.

DFB instance

A DFB type instance occurs when an instance is called from a language editor.

The instance possesses a name, input/output interfaces, the public and private variables are duplicated (one duplication per instance, the code is not duplicated).

A DFB type can have several instances.

DTM

A Device Type Manager (DTM) is a kind of device driver, which is provided by the field device vendor. The DTM contains the device specific information and provides a graphical user interface.

You can use the DTM to perform monitoring and configuration tasks on the specific device.

A DTM is not a standalone application. It always requires an FDT Frame Application to run.

E

EDT

EDT is the abbreviation of Elementary Data Type.

These types are as follows:
- BOOL,
- EBOOL,
- WORD,
- DWORD,
- INT,
- DINT,
- UINT,
- UDINT,
- REAL,
- DATE,
- TOD,
- DT.

EF

Is the abbreviation of Elementary Function.

This is a block which is used in a program, and which performs a predefined software function.

A function has no internal status information. Multiple invocations of the same function using the same input parameters supply the same output values. Details of the graphic form of the function invocation can be found in the "[Functional block (instance)] ". In contrast to the invocation of the function blocks, function invocations only have a single unnamed output, whose name is the same as the function. In FBD each invocation is denoted by a unique [number] via the graphic block, this number is automatically generated and can not be altered.

You position and set up these functions in your program in order to carry out your application.

You can also develop other functions using the SDKC development kit.

EFB

Is the abbreviation for Elementary Function Block.

This is a block which is used in a program, and which performs a predefined software function.

EFBs have internal statuses and parameters. Even where the inputs are identical, the output values may be different. For example, a counter has an output which indicates that the preselection value has been reached. This output is set to 1 when the current value is equal to the preselection value.

F

FBD

FBD is the abbreviation of Function Block Diagram.

FBD is a graphic programming language that operates as a logic diagram. In addition to the simple logic blocks (AND, OR, etc.), each function or function block of the program is represented using this graphic form. For each block, the inputs are located to the left and the outputs to the right side of the block. The outputs of the blocks can be linked to the inputs of other blocks to form complex expressions.

FFB

Collective term for EF (Elementary Function), EFB (Elementary Function Block) and DFB (Derived Function block)

I

IL

IL is the abbreviation of Instruction List.

This language is a series of basic instructions.

This language is very close to the assembly language used to program processors.

Each instruction is composed of an instruction code and an operand.

IODDT

IODDT is the abbreviation of Input/Output Derived Data Type.

The term IODDT designates a structured data type representing a module or a channel of a PLC module. Each application expert module possesses its own IODDTs.

L

LD

LD is the abbreviation of Ladder Diagram.

LD is a programming language, representing the instructions to be carried out in the form of graphic diagrams very close to a schematic electrical diagram (contacts, coils, etc.).

LL984

LL984 is the abbreviation of ladder logic 984.

Electrotechnicians use a ladder diagram to display an electrical circuit (using electrical symbols).

Ladder diagram shows the course of events but does not show the existing wires, which connect the parts with each other.

A usual user interface for controlling the actions of automation devices allows a ladder diagram interface, so that electrotechnicians do not have to learn new programming languages to implement a control program.

N

Network

Mainly used in communication, a network is a group of stations which communicate among one another. The term network is also used to define a group of interconnected graphic elements. This group forms then a part of a program which may be composed of a group of networks.

O

Operator screen

This is an editor that is integrated into Unity Pro, which is used to facilitate the operation of an automated process. The user regulates and monitors the operation of the installation, and, in the event of any problems, can act quickly and simply.

P

Protection

Option preventing the contents of a program element to be read (read protected), or to write or modify the contents of a program element (read/write protected).

The protection is confirmed by a password.

S

Section

Program module belonging to a task which can be written in the language chosen by the programmer (FBD, LD, ST, IL, LL984, or SFC).

A task can be composed of several sections, the order of execution of the sections corresponding to the order in which they are created, and being modifiable.

SFC

SFC is the abbreviation of Sequential Function Chart.

SFC enables the operation of a sequential automation device to be represented graphically and in a structured manner. This graphic description of the sequential behavior of an automation device, and the various situations which result from it, is performed using simple graphic symbols.

SFC objects

An SFC object is a data structure representing the status properties of an action or transition of a sequential chart.

ST

ST is the abbreviation of Structured Text language.

Structured Text language is an elaborated language close to computer programming languages. It enables you to structure series of instructions.

T

Task

A group of sections and subroutines, executed cyclically or periodically for the MAST task, or periodically for the FAST task.

A task possesses a level of priority and is linked to inputs and outputs of the PLC. These I/O are refreshed in consequence.

V

Variable

Memory entity of the type `BOOL`, `WORD`, `DWORD`, etc., whose contents can be modified by the program during execution.

Index

Symbols

hardware and software requirements
   system requirements, *12*

C

compare
   compared elements, *40*
   comparing 2 files, *37*
   compatibility, *39*
comparison modes
   command-line mode, *56*
   server mode, *58*

F

features
   DIF summary, *49*
   options, *53*
   print, *51*
   XML source, *50*

H

hardware and software requirements
   installation and uninstallation, *14*
   license activation, *16*

L

launch
   launching Unity DIF, *20*

O

overview
   general introduction, *9*

T

troubleshooting
   diagnostic management, *61*

U

user interface
   attribute window, *29*
   main window, *28*
   menus, *31*
   project browser, *26*
   result window, *30*
   status bar, *35*
   tool bar, *33*