

Reference Manual

uLog

Version 3.5

Noldus
Information Technology

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1 Introduction

WHAT IS ULOG?

uLog is a tool for automatic recording of user-computer interaction. With uLog you can log basic computer events such as mouse clicks, scrolling, activating windows and typing words. It creates .odx log files that can be imported into The Observer XT, synchronized with manually scored events and other data, and analyzed in this program.

Logging computer events can be started and stopped manually, but you can also control uLog with commands from The Observer XT. This allows easy synchronization of logged events with manually scored events in The Observer XT.

The following computer events are logged with uLog.

- Key presses.
- Strings, which are a sequence of related characters, like words.
- Special keys like **Ctrl** and **Alt**.
- Combinations of keys with special keys like **Ctrl + S**.
- Mouse clicks and double-clicks.
- Mouse drags.
- Position of mouse clicks, double-clicks and drags.
- Mouse wheel turns.
- Starting and closing applications.
- Windows activated.
- Message boxes activated.



Please note that uLog logs all keyboard and mouse activity, so also typed passwords. Please make sure your test participants are aware of this before you start the test.

Special keys that require double key presses like ', or ~ may not be logged properly with some keyboard layouts. Change the keyboard layout if you notice this. To do so choose **Control Panel > Region and Language > Keyboards and Languages**. Click **Change keyboards** and choose another one from the list.

INFORMATION ABOUT THE OBSERVER XT

uLog 3.5 is supported with The Observer XT 12.5 or higher. We assume that you are familiar with the procedures of The Observer XT. The Observer XT Help can be accessed with the shortcut on the desktop of computer with The Observer XT. It is also available on The Observer XT installation USB stick. Copy the folder to your computer and open the file **Index.html**. You can download all documentation for The Observer XT and uLog on www.noldus.com/downloads.

2 Installation

REQUIREMENTS

uLog 3.5 was tested with The Observer XT 14 on computers with the 64-bit Professional editions of Windows 7 (Service Pack 1) and Windows 10. It was tested with the US English language pack. It is possible that certain local language versions of Windows may affect how well the program runs.

INSTALLATION

To install uLog:

1. Insert the uLog USB stick into a USB port of your computer on which you want to log the computer events.
2. Copy the file **uLogInstaller.exe** to a location on the PC where you want to start uLog from.
3. Double-click the file **uLogInstaller.exe** to install uLog. This creates a folder **uLog** with the program file **uLog.exe**. Note this location, because this is where you start the program from. Alternatively, right-click the file **uLog.exe** and choose **Send to > Desktop (create shortcut)**.

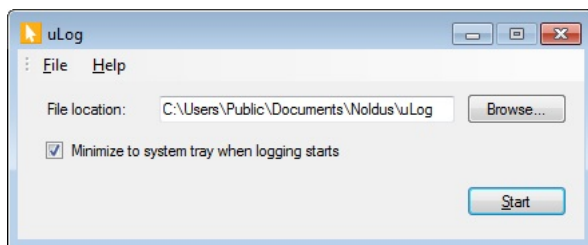
It also creates a folder uLog in the folder **C:\Users\Public\Public Documents\Noldus\uLog**. This is the default location where the log files are stored.

3 Logging

You can start and stop uLog manually on the test PC. Alternatively, you can start and stop uLog with commands from The Observer XT. If uLog runs on another computer than The Observer XT, you need the program PsExec (see page 12) to send commands from the computer with The Observer XT to the computer with uLog.

START AND STOP ULOG MANUALLY


1. Double-click the file **uLog.exe** in the folder **uLog** that was created during installation (see step 2 on page 6).
2. Optionally, change the folder where uLog saves its log files in the **File location** field.



3. Optionally, select the checkbox **Minimize to system tray when logging starts**. This removes the **uLog** window from the screen of the test computer when the test starts.
4. Click **Start**.
5. When the test ends, click the arrow in the bottom right corner of the screen, to open the system tray.
6. Double-click the **uLog** icon.
7. Click **Stop**.



Import the log files into The Observer XT


1. Copy the **.odx** file from the folder you set in step 2 on page 7 to the computer with The Observer XT.
2. On the computer with The Observer XT, open the project and then the observation into which you want to import the log file. If you do not have an observation yet, see the note below.
3. Click the **Import data** button on the tool bar and select **Import Observational data**. 
4. Locate the **.odx** file and click **Import**.
5. In the window that appears select **Yes import new coding scheme elements**. The log file is now imported as a new observation.



If you do not have an observation yet, choose **File > Import > Observational Data** and continue with step 4 above. The log file is imported as a new observation.

Synchronization

If you did not start logging at exactly the same time as you started the observation, you need to synchronize the log file with the observation. Do so in the following way:

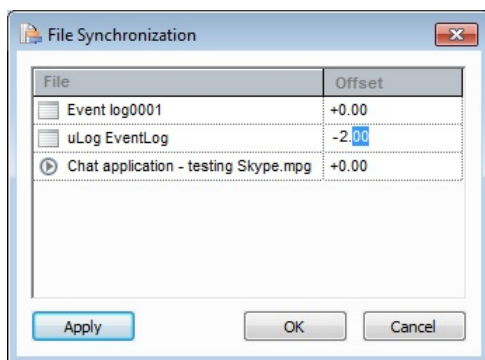
1. Click the **Offset** button on the Component tool bar, then choose **Numerical Offset**. 

Result – The **File Synchronization** window appears.

This window lists the event log currently open, the video files and the imported uLog data.

2. Locate the data set (event, video, uLog data) of which you want to change the synchronization point relative to others, and click the **Offset** cell.

3. Enter the offset value.



Example – If you started logging two seconds before the Event Log started, enter an offset of -2 for the uLog Event Log.

4. Click **Apply**.



For more information on synchronizing, see **Synchronize data sets** in **Carry out an Observation** in The Observer XT Help.

START AND STOP ULOG WITH THE OBSERVER XT

You can send commands from The Observer XT to start uLog when you create a new observation and to start and stop logging automatically when you start and stop an observation. To do so, select **uLog.exe** as external program and specify which command you want to use. This program is present in the folder **uLog** that was created during installation (see step 2 on page 6).

The following commands are available:

- **No parameter or /E** — Starts uLog.
- **/R** — Starts logging.
- **/S** — Stops logging.
- **/X** — Closes uLog.



Opening uLog requires time. When a command “Start logging” is sent before uLog is open, logging does not start. So make sure uLog is open when you start an observation.

Settings in The Observer XT

1. In The Observer XT, choose **Setup >Project Setup**.
2. Under **Observation Source**, select **Live Observation**. The **Devices** window opens. If not, click the **Devices** button.
3. Click the **Add External Program** button. In the **Add External Program** window that opens, under **Name**, type in a name for the commands (only for viewing purposes). For example, *Control uLog*.
4. Select the checkbox next to **New Observation**.
5. In the same row, click the ellipsis button and browse to the file **uLog.exe**.



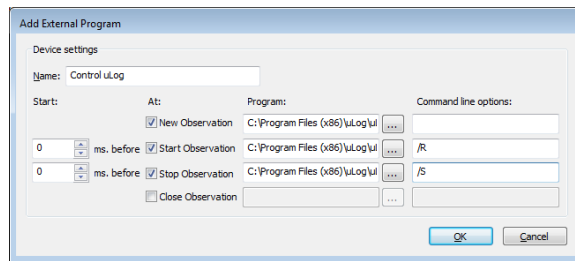
6. In the same row, leave the space under **Command line options** empty. You can also type the command **/E** in this field. This results in The Observer XT starting uLog when creating a new observation.
7. Select the checkbox next to **Start observation**.
8. In the same row, click the ellipsis button and browse to the file **uLog.exe**.
9. In the same row, under **Command line options**, type the command **/R**. This way recording starts when you start an observation in The Observer XT.

10. Select the checkbox next to **Stop observation**.
11. In the same row, click the ellipsis button and browse to the file **uLog.exe**.
12. In the same row, under **Command line options**, type the command **/S**. This way recording stops when you stop an observation in The Observer XT.



Enter the delay to start uLog in the **ms before** fields. This way the uLog log file will be synchronous with the observation in The Observer XT. See **Delay** on page 12 how to determine this delay.

The **Add External Program** window will look like this:



13. Click **OK**. A new row *Control uLog* appears in the **Devices** window. You can now start observing in The Observer XT. uLog opens when you create a new observation and logging starts and stops when you start and stop an observation.
14. Import the log file in the observation. See **Import the log files into The Observer XT** on page 8 for the procedure. If you set the delay correctly in the **ms. before** fields of the **Add External Program** window (see **Delay** below), the uLog events are synchronized with the manually scored events of The Observer XT.

Delay

To assess the delay between the start of the observation and the moment uLog starts logging, define a behavior with a keycode. Press this key during the observation in The Observer XT while simultaneously logging with uLog. When you press this key, this event is recorded in The Observer XT and also in the log file. Import the log file into The Observer XT and calculate the offset from the difference between time stamps in milliseconds for this event. Enter this value in the **ms, before** fields in the **Add External Programs** window (see **Settings in The Observer XT** on page 10).

If you of make a video recording of the observation with Media Recorder as well, make a recording where the camera points at your keyboard. When you press a key for an event, the event is recorded in The Observer XT event log, the video and in the log file. You can then visualize video and event data to estimate the time difference between the event recorded, the key logged and the corresponding video footage when the key was pressed. Synchronize the video with the logged events (see **Synchronization** on page 8).

START AND STOP ULOG WITH THE OBSERVER XT ON ANOTHER COMPUTER

Psexec

PSEXEC is a light-weight program that allows you to execute processes on a remote computer. The program allows you to access the command-prompt of the remote computer. With PSEXEC you can start uLog on one computer with The Observer XT on another computer.

PSEXEC is part of the PsTools suite from Microsoft Corporation. A full description of the PSEXEC commands does not belong to the scope of this document. For a complete overview go to <http://technet.microsoft.com/en-us/sysinternals/bb897553.aspx>

Installation

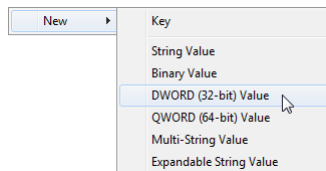
To install PSEXEC, go to the website <http://technet.microsoft.com/en-us/sysinternals/bb897553.aspx> and click **Download PsTools**. Locate the

downloaded zip-folder with Windows Explorer and open it. Double-click **PsExec** and choose **Extract all**. Browse to the location where you want to store the executable and click **Extract**. The program is copied to the specified location on your computer.

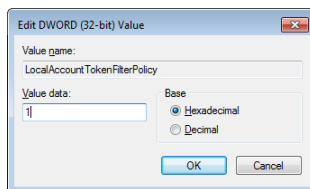
Registry entry

To ensure you connect to the remote computer as a full administrator, you must add a key to the registry of both computers. To do so:

- **Windows 7** — open the **Start** menu and type **regedit** in the **Search programs and files** field. Then click the program **regedit.exe**.
 - **Windows 10** — type **regedit** in the **Start** window with tiles and right-click the **regedit** app and run it as administrator.
1. Browse to
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System.
 2. Right-click in the right field and select **New** and then **DWORD Value**.



3. Name the registry entry **LocalAccountTokenFilterPolicy**.
4. Right-click the entry and select **Modify**. In the **Edit DWORD Value** window that appears enter **1** in the field under **Value data**:



5. Click **OK** and close all windows.



More information about this registry entry can be found on <http://support.microsoft.com/kb/951016>

Firewall


Some anti-virus scanners report that one or more of the tools are infected with a "remote admin" virus. None of the PsTools contain viruses, but they have been used by viruses, which is why they trigger virus notifications. You may need to create an exception for PsExec in the firewall or virus scanner of both computers. The procedure to create an exception in Windows Firewall is described below. If you have another firewall, consult its manual for the correct procedure.


1. Open the **Control Panel** and click **Windows Firewall**.
2. Click **Allow a program or feature through Windows Firewall**.
3. Click **Add another program**, browse to **PsExec.exe** and click **Add**.
4. Select all checkboxes next to **Execute processes remotely**. Then close the Control Panel.

Allow programs to communicate through Windows Firewall

To add, change, or remove allowed programs and ports, click Change settings.

What are the risks of allowing a program to communicate?

 Change settings

 For your security, some settings are managed by your system administrator.

Allowed programs and features:

| Name | Domain | Home/Work (Pri... | Public | Group Policy |
|--|-------------------------------------|-------------------------------------|-------------------------------------|--------------|
| <input checked="" type="checkbox"/> Execute processes remotely | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | No |

If PsExec still does not work properly, you may disable the firewall or anti-virus scanner completely on the remote computer during the time PsExec is used. The procedure to disable Windows Firewall is described below. If you have another firewall or virus scanning software, consult its manual for information on how to disable it.

1. Open the **Control Panel** and open **Windows FireWall**
2. Click **Turn Windows FireWall on or off**.

3. Select **Turn off Windows Firewall (not recommended)** for all networks.

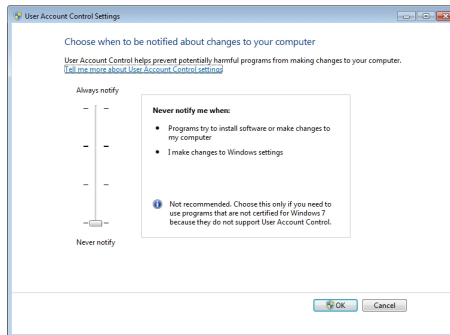


Remember to turn the FireWall on again after you finished working with PsExec.

User Account Control settings

If PsExec does not work, although you followed the procedure above and disabled the firewall as well (see page 14), adjust the **User Account Control Settings**. To do so:

1. Open the **Control Panel** and click **User Accounts**.
2. Click **Change User Account Control Settings**.
3. Move the slider completely towards **Never notify**.



4. Click **OK** and close the Control Panel. Now restart the computer.

User Account

If PsExec still does not work, although you followed all the steps above, let your system administrator create a new user account with administrator rights on the computer with uLog. Log on with this new user account.

Settings in The Observer XT

1. Open The Observer XT.
2. In The Observer XT, choose **Setup >Project Setup**.
3. Under **Observation Source**, select **Live Observation**. The **Devices** window opens. If not, click the **Devices** button.
4. Click the **Add External Program** button. In the **Add External Program** window that opens:
 - a In the field next to **Name**, type in a name for the commands (only for viewing purposes). For example, *Control uLog*.
 - b Select the checkbox next to **New Observation**. In the same row: browse to the program **PsExec.exe** and type the following command in the field under **Command line options**:
`-d -i -s \\remote-computer -u username -p password "location ulog.exe"`
 - c Select the checkbox next to **Start Observation**. In the same row: browse to the program **PsExec.exe** and type the following command in the field under **Command line options**:
`-d -i -s \\remote-computer -u username -p password "location ulog.exe" /R`
Enter the delay to start uLog in the field next to **ms, before** (See **Delay** on page 12).
 - d Select the checkbox next to **Stop Observation**. In the same row: browse to the program **PsExec.exe** and type the following command in the field under **Command line options**:
`-d -i -s \\remote-computer -u username -p password "location ulog.exe" /S`
Enter the delay to start uLog in the field next to **ms, before** (See **Delay** on page 12).



"location ulog.exe" is the path to the program file **ulog.exe**. This path depends on the folder in which you installed uLog (see step 2 on page 6) and can be, for example, "**C:\Program Files (x86)\ulog\ulog.exe**".

The **Add External Program** window will look like this.

The screenshot shows the 'Add External Program' window. It has a 'Device settings' section with a 'Name' field containing 'Control uLog'. Below this are four columns: 'Start:', 'Alt:', 'Program:', and 'Command line options:'. The 'Start:' column has three rows with values '0', '0', and '0' in the first column, and 'ms. before' in the second. The 'Alt:' column has three rows with checkboxes for 'New Observation', 'Start Observation', and 'Stop Observation'. The 'Program:' column has three rows with the path 'C:\Program Files (x86)\PsTools'. The 'Command line options:' column has three rows with the command '-d -i -s \\NIT-L190-OKR -u OKR -f'. There is also a 'Close Observation' checkbox. At the bottom right are 'OK' and 'Cancel' buttons.

5. Click **OK**. A new row *Control uLog* appears in the **Devices** window. You can now start observing in The Observer XT. uLog opens when you create a new observation and logging starts and stops when you start and stop an observation.
6. Import the log file into the observation. See **Import the log files into The Observer XT** on page 8 for the procedure. If you set the delay correctly in the **ms. before** fields of the **Add External Program** window (see **Delay** on page 12), the uLog events are synchronized with the manually scored events of The Observer XT.

4 uLog data in The Observer XT

CODING SCHEME

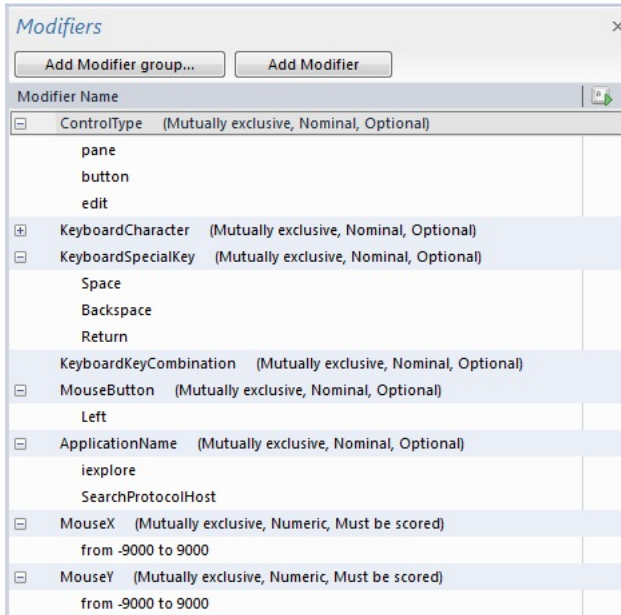
Only uLog events that have been logged are added to the coding scheme when a log file is imported in The Observer XT. Three different event types are added as mutually exclusive behavior groups:

- **Mouse events** – With the mouse clicks, double-clicks, hovering, mousewheel turns and mouse drags as point events.
- **Keyboard events** – With the characters and keys typed as point events. This group also contains the behavior **String**, which combines the key presses separated by a pressing a special key, like the space bar, enter key, or backspace key, to words.
- **Other events** – With events like starting and stopping applications, activation of windows and browsing behavior.

| Behaviors | | | |
|--|--|---------------|--|
| Add Behavior group... | | Add Behavior | |
| Behavior Name | | Behavior Type | Modifiers |
| ☐ Mouse events (Mutually exclusive) | | | |
| Mouse click | | Point Event | MouseX, MouseY, ControlType, MouseButton |
| Mouse doubleclick | | Point Event | MouseX, MouseY, ControlType, MouseButton |
| Mouse hover | | Point Event | ControlType |
| Mousewheel turn | | Point Event | ControlType |
| Mouse drag | | Point Event | <Click here to add Modifier groups> |
| ☐ Keyboard events (Mutually exclusive) | | | |
| Character | | Point Event | KeyboardCharacter |
| Special key | | Point Event | KeyboardSpecialKey |
| String | | Point Event | <Click here to add Modifier groups> |
| Key combination | | Point Event | KeyboardKeyCombination |
| ☐ Other events (Mutually exclusive) | | | |
| Focus changed | | Point Event | ControlType, TargetControlType |
| Window activated | | Point Event | <Click here to add Modifier groups> |
| Browser URL chang... | | Point Event | ApplicationName |
| MessageBox activat... | | Point Event | <Click here to add Modifier groups> |
| Application started | | Point Event | ApplicationName |
| Application exited | | Point Event | ApplicationName |

The Coding Scheme also contains a number of modifier groups:

- **ControlType** – Linked to the behaviors **Mouse click**, **Mouse doubleclick**, **Mouse hover**, **Mousewheel turn** and **Focus changed**. This modifier specifies, for example, where a mouse click took place. The individual modifiers are:
 - List
 - Edit
 - Tabitem
 - Combobox
 - Pane
 - Window
 - Button
- **KeyboardCharacters** – That contains the logged characters.
- **KeyboardSpecialKey** – That contains the special keys:
 - Backspace
 - Arrow
 - Return
 - Space
 - Alt key with Numpad keys
- **KeyboardKeyCombination** – That contains the key combinations like **Ctrl + S**, or **Ctrl + A**.
- **MouseButton** – Which button is used, left, right, or middle.
- **ApplicationName** – Which application is opened, or closed.
- **MouseX** – The X coordinate in pixels of the mouse event starting from the left side of your screen.
- **MouseY** – The Y coordinate in pixels of the mouse event starting from the upper side of your screen.



The name of applications and web pages in which events took place and typed text are imported as comments in the Event Log.

EVENTS IN EVENT LOG

The figure below shows an example how the events are shown in the Event Log.

- **0.00** – Activation of the uLog window.
- **1.60** – Another window is activated.
- **2.23** – The application Internet Explorer starts.
- **2.36** – The Internet Explorer window is activated.
- **3.04** – A tab is opened in Internet Explorer.

- **4.32** – Click of the left mouse button to edit the address field of Internet Explorer, that currently contains the address `www.noldus.com`. The coordinates of the mouse click are measured from the top-left corner of your screen. The coordinates are 430 pixels from the left and 38 pixels from the top.
- **5.66-8.59** – `www.google.com` is typed in the address field of Internet Explorer.
- **9.33** – The **Return** key is pressed and the string `www.google.com` is logged.

| Time | Behavior | Modifier | Comment |
|------|---------------------|---------------------------|---------------------------------|
| 0.00 | Start | | |
| 0.00 | Window activated | | uLog |
| 1.65 | Window activated | | |
| 2.23 | Application started | iexplore | |
| 2.36 | Window activated | | Internet Explorer |
| 3.04 | Application started | iexplore | |
| 4.32 | Mouse click | 430 38 edit Left | edit : http://www.noldus.com/ ; |
| 5.66 | Character | w | |
| 5.83 | Character | w | |
| 6.09 | Character | w | |
| 6.38 | Character | . | |
| 6.84 | Character | g | |
| 7.06 | Character | o | |
| 7.24 | Character | o | |
| 7.44 | Character | g | |
| 7.73 | Character | l | |
| 7.93 | Character | e | |
| 8.03 | Character | . | |
| 8.24 | Character | c | |
| 8.38 | Character | o | |
| 8.59 | Character | m | |
| 9.33 | String | | www.google.com |
| 9.33 | Special key | Return | |

A Technical Support

Noldus Help Desk

If you have any problems, questions, remarks or comments, please let us know. You can contact us via our website (www.noldus.com) and fill out a Support Request Form (preferred), or phone. We offer 24 hour support via help desks in different time zones. You can also contact us via the uLog program. From the **Help** menu choose **Noldus Online** and subsequently **Contact Help Desk**.

Before you contact the help desk, please have the following information available so our support staff can help you as quickly as possible. To find this information, go to the **Help** menu and select **About uLog**:

- The version number of your copy of uLog.
- The name of the registered user of The Observer XT (choose **Help > License Info** in The Observer XT).

Please refer to the **About Noldus - Contact** section on our website (www.noldus.com) for other contact information.

Error messages

All error messages are displayed in a **Critical Message** box. The error is displayed and, if possible, a solution. Whenever such an error occurs, a log file is created called uLog.log. The Technical Support Department may request this file when answering your support question. You can locate the file in:

C:\Users\Public\Public Documents\uLog\Log.

B License Agreement

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