XVGU Communication Driver

Driver for USB Communication between Studio and Schneider Electric Harmony XVGU Tower Light devices

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Introduction

The XVGU driver enables communication between Studio system and Schneider Electric Harmony XVGU Tower Light using USB cable connection, according to the specifications discussed in this publication.

This publication was designed to help you install, configure, and execute the XVGU driver to enable communication with the Siemens devices. The information in this publication is organized as follows:

- Introduction: Provides an overview of the XVGU driver documentation.
- General Information: Provides information needed to identify all the required components (hardware and software) used to implement communication between Studio and the XVGU driver.
- Installing the Driver: Explains how to install the XVGU driver.
- Configuring the Driver: Explains how to configure the communication driver.
- Executing the Driver: Explains how to execute the driver to verify that you have installed and configured the driver correctly.
- Troubleshooting: Lists the most common error codes for this protocol.
- Sample Application: Explains how to use a sample application to test the driver configuration.
- **Revision History**: Provides a log of all modifications made to the driver and the documentation.

Notes:

- This document assumes that you have read the "Development Environment" chapter in the product's *Technical Reference Manual.*
- This document also assumes that you are familiar with the Windows 7/8/10 environment. If you are unfamiliar with Windows 7/8/10, we suggest using the **Help** feature (available from the Windows desktop **Start** menu) as you work through this guide.

General Information

This chapter explains how to identify all the hardware and software components used to implement communication between the XVGU driver and XVGU Tower Light.

The information is organized into the following sections:

- Device Characteristics
- Link Characteristics
- Driver Characteristics
- Conformance Testing

Device Characteristics

This driver has been tested successfully with the following devices:

- Manufacturer: Schneider Electric
- Compatible Equipment: Schneider Electric Harmony XVGU Tower Light devices XVGU3SHAV and XVGU3SWV.
- Programmer Software: Not required.
- OS Device Driver : Install device USB DnA PC driver (MCHPWinUSBDevice_v2.inf) see Appendix A

Link Characteristics

To establish communication, you must use links with the following specifications:

Device Communication Port: USB Port

Driver Characteristics

The XVGU driver is composed of the following files:

- **XVGU.INI**: Internal driver file. You must not modify this file.
- **XVGU.MSG**: Internal driver file containing error messages for each error code. *You must not modify this file.*
- **XVGU.PDF**: Document providing detailed information about the XVGU driver.
- **XVGU.DLL**: Compiled driver.

>> Notes:

The XVGU driver requires the LibXVGUTowerLight.DLL, which is automatically installed along with the driver at the /DRV/API sub-folder from STUDIO.

Moreover, in addition to the aforementioned driver files, you must install the operating system (OS) device driver USB DnA PC driver (MCHPWinUSBDevice_v2.inf) – see Appendix A for more information.

You can use the XVGU driver on the following operating systems:

Windows 7/8/10 and Servers 2008/2012

Conformance Testing

The following hardware/software was used for conformance testing:

Hardware: Schneider Electric Harmony XVGU Tower Light XVGU3SHAV

Driver Version	Studio Version	Operating System	Equipment
1.0	8.0 + SP1	Windows 7/8/10	XVGU 3SHAV

Installing the Driver

When you install Studio, all of the communication drivers are installed automatically. You must select the driver that is appropriate for the application you are using.

Perform the following steps to select the driver from within the application:

- 1. Open Studio from the Start menu.
- 2. From the Studio main menu bar, select File \rightarrow Open Project to open your application.
- 3. Select Insert \rightarrow Driver from the main menu bar to open the Communication Drivers dialog.
- 4. Select the XVGU driver from the Available Drivers list, and then click the Select button:

Communication Drivers

Available dri	vers:		
DLL	Description	^	Help
9154	9154 - Controller 9154, Toledo Balance [v1.00]		
A2420	ALTUS, ALNET I Protocol with AL2420 [v1.04]		
ABBTF	Driver for ABBTotalFlow [1.0]		
ABCIP	Allen Bradley Ethernet CIP Protocol (CE) [v11.9]		
ABENI	Allen Bradley, AB-1761-NET-ENI Giateway interface (UE) [v1.11]		
ABKE	Allen Bradley, DFT Protocol (PLU2, PLU5 and SLU500) Families (UE) [VT0.5]	~	
<		>	Select>>
Selected driv	vers:		
DLL	Description		>> Remove
XVGU	Schneider Electric Harmony XVGU TowerLight [v1.0.0]		
<		>	
		ПК	Cancel
		OK	Cancer

Communication Drivers Dialog

5. When the **XVGU** driver displays in the *Selected Drivers* list, click the **OK** button to close the dialog.

Attention:

For safety reasons, you must take precautions when installing the physical hardware. Consult the hardware manufacturer's documentation for specific installation instructions.

 \times

Configuring the Driver

After opening Studio and selecting the XVGU driver, you must configure the driver. The XVGU driver's configuration is done in a part:

Defining communication tags and controls in the Communication tables or Driver worksheet

Worksheets are divided into two sections, a *Header* and a *Body*. The fields contained in these two sections are standard for all communications drivers — except the **Station**, **Header** and **Address** fields, which are driver-specific. This document explains how to configure the **Station**, **Header** and **Address** fields only.

> Notes:

For a detailed description of the Studio *Standard* and *MAIN* Driver Worksheets, and information about configuring the standard fields, review the product's *Technical Reference Manual*.

Configuring the Driver Worksheet

This section explains how to configure a *Standard Driver Worksheet* (or Communication table) to associate application tags with the TowerLight addresses. You can configure multiple *Driver* worksheets — each of which is divided into a *Header* section and a *Body* section.

Use the following steps to create a new Standard Driver worksheet:

- 1. From the Studio development environment, select the **Comm** tab, located below the *Workspace* pane.
- 2. In the *Workspace* pane, expand the *Drivers* folder, and right-click the *XVGU* subfolder.
- 3. When the pop-up menu displays, select the Insert option:





>> Note:

To optimize communication and ensure better system performance, you must tie the tags in different driver worksheets to the events that trigger communication between each tag group and the period in which each tag group must be read or written. Also, we recommend configuring the communication addresses in sequential blocks to improve performance.

The XVGU.drv dialog displays (similar to the following figure):

XVGU001.DRV ×			
Description			
Standard Driver Sheet		Increase priority	
Read Trigger	Enable Read when Ide	Read Completed	Read Statue:
Wells Trigger.	Enable Write on Tag Change	 Write Completed: 	Wite Status:
Station	Header:		_ Min
			L Max
Tag Name	Addres	s Div	Add
🔍 Filter text	C Filler text	C Filter text	Q. Fitter text
Tag_SetLight	SETLIGHT	0.000000	
Tag_SetBuzzer	SETBUZZER	0.000000	
1			

XVGU Driver Worksheet

In general, all parameters on the *Driver* worksheet (except the **Station**, **Header** and **Address** fields) are standard for all communication drivers, and they will not be discussed in this publication. For detailed information about configuring the standard parameters, consult the Studio *Technical Reference Manual*.

4. Use the following information to complete the **Station**, **Header**, and **Address** fields on this worksheet:

Station: this field is not used for XVGU driver. It must be in blank.

Header: this field is not used for XVGU driver. It must be in blank.

Address field: Use the information provided in the following table to associate each tag to its respective function that will change a Tower Light configuration.

Type the tag from your application database into the **Tag Name** column. This tag will set the device's behavior through the address. The address must comply with the following syntax:

<Function> (for example: SETLIGHT)

Where:

• **<Function>:** defines the command that will be set on the device.

The following table show all the address possibilities.

	Sample Address Configuration						
Header Field	Address Field	Description					
	SETLIGHT	Set a specified layer's color and mode.					
	SETLIGHTTOP	Set the top layer's color and mode.					
	SETLIGHTMIDDLE	Set the middle layer's color and mode.					
	SETLIGHTBOTTOM	Set the bottom layer's color and mode.					
	SETBUZZER	Set a buzzer with a specified tone, volume and pattern.					
	CONFIGPATTERN	Write customized patterns into the ROM of the TowerLight device.					
	RUNPATTERN	Run a saved target pattern.					
	RESETALL	Turn off all lights and buzzer.					

Tag value format

When the driver addresses are set, the respective tags value need to have some parameters configured. These will be sent to the TowerLight. In the following, it will be briefly explained how each address works and its parameters.

SETLIGHT

Set the light status of any layer. The tag value format for this address is:

<Layer>:<Color>:<Mode>

Where:

<Layer>: BOTTOM (0), MIDDLE (1) or TOP (2). <Color>: RED (0), YELLOW (1), GREEN (2), BLUE, (3) or ORANGE (4). <Mode>: OFF (0), ON (1), BLINK (2) or FLASH (3).

SETLIGHTBOTTOM, SETLIGHTMIDDLE and SETLIGHTTOP.

Where:

<Color>: RED (0), YELLOW (1), GREEN (2), BLUE, (3) or ORANGE (4). <Mode>: OFF (0), ON (1), BLINK (2) or FLASH (3).

The meaning of these addresses is that the layer is already set in the command call.

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SETBUZZER

Set the buzzer sound. The tag value format for this address is:

<Tone>:<Volume>:<BuzzerPattern>

Where:

<Tone>: HIGH (0) or LOW (1). <Volume>: MAXIMUM (0), MIDDLE (1) or MINIMUM (2). <BuzzerPattern>: OFF (0), PATTERN1 (1), PATTERN2 (2), PATTERN3 (3) or PATTERN4 (4).

CONFIGPATTERN

Defines a pattern to operate TowerLight that can be saved in the device. The tag value format for this address is:

<PatternNumber>:<BottomColor>:<BottomMode>: <MiddleColor>:<MiddleMode>:<TopColor>:<TopMode>: <Tone>:<Volume>:<BuzzerPattern>

Where:

<PatternNumber>: 0 - 7. <BottomColor >: RED (0), YELLOW (1), GREEN (2), BLUE, (3) or ORANGE (4). <BottomMode >: OFF (0), ON (1), BLINK (2) or FLASH (3). <MiddleColor >: RED (0), YELLOW (1), GREEN (2), BLUE, (3) or ORANGE (4). <MiddleMode >: OFF (0), ON (1), BLINK (2) or FLASH (3). <TopColor >: RED (0), YELLOW (1), GREEN (2), BLUE, (3) or ORANGE (4). <TopMode >: OFF (0), ON (1), BLINK (2) or FLASH (3). <Tope>: HIGH (0) or LOW (1). <Volume>: MAXIMUM (0), MIDDLE (1) or MINIMUM (2). <BuzzerPattern>: OFF (0), PATTERN1 (1), PATTERN2 (2), PATTERN3 (3) or PATTERN4 (4).

RUNPATTERN

Run a saved pattern to operate TowerLight. The tag value format for this address is:

<PatternNumber>

Where:

<PatternNumber>: 0 – 7.

RESETALL

Turn off lights and buzzer when value changes between 0 and 1.

>> Note:

This driver only supports Write actions and does not support Read actions. Please configure the Action field on the Main Driver Sheet to be Write for all the items. The fields Read Trigger, Enable Read when Idle, Read Completed, Read Status must be left blank on the Standard Driver Worksheets.

Examples of Tag Values in Standard Driver Sheet

Address Field	Tag Values
SETLIGHT	TOP:RED:ON
	MIDDLE:ORANGE:FLASH
SETLIGHTTOP	RED:ON
	1:2
	GREEN:0
SETLIGHTMIDDLE	ORANGE:FLASH
SETLIGHTBOTTOM	BLUE:OFF
	YELLOW:BLINK
SETBUZZER	LOW:MINIMUM:PATTERN1
	HIGH:MAXIMUM:OFF
CONFIGPATTERN	1:RED:ON:GREEN:ON:ORANGE:FLASH:LOW:MINIMUM:PATTERN1
	1:0:0:0:0:0:0:0:0:0:0
RUNPATTERN	0,1,2,3,4,5,6,7
RESETALL	Tag change between (for example 0 or 1

Main Driver Sheet (MDS)

When the driver is inserted into the application, the *MAIN DRIVER SHEET* is automatically added to the driver folder.



Main Driver Sheet

The MAIN DRIVER SHEET provides a simple way to associate Studio tags to addresses in the TowerLight. Most of the MAIN DRIVER SHEET entries are standard for any driver. Refer to the Studio *Technical Reference Manual* about the configuration of the standard fields. The fields that require specific syntax for this driver are described below:

	🗷 XVGU - MAIN DRIVER SH	ieet ×							
[Description:								
MAIN DRIVER SHEET									
[)isable:								
	Read Completed: Read	Status:							
			koliner						
,	Write Completed: Write	Status:							
			Max:						
	Tag Name	Station	I/O Address	Action		Scan		Div	Add
	🔍 Filter text	🔍 Filter text	🔍 Filter text	🔍 (All)	\checkmark	🔍 (All)	¥	🔍 Filter text	🔍 Filter text
1	t1		SETLIGHT	Write	v	Always	¥	0.000000	
2	t2		SETLIGHTTOP	Write	v	Always	¥		
3	t3		SETLIGHTMIDDLE	Write	¥	Always	¥		
4	t4		SETLIGHTBOTTOM	Write	¥	Always	¥		
5	t5		SETBUZZER	Write	¥	Always	¥		
6	t6		CONFIGPATTERN	Write	v	Always	¥		
7	t7		RUNPATTERN	Write	۷	Always	¥		
8	t8		RESETALL	Write	¥	Always	Y		
*				Read+Write	¥	Always	Y		
*				Read+Write	¥	Always	Y		
*				Read+Write	¥	Always	Y		
*				Read+Write	¥	Always	¥		
*				Read+Write	v	Always	¥		

Main Driver Sheet

- Station: this field is not used for XVGU driver. It must be in blank.
- I/O Address: Please see Address Field in the Standard Driver Sheet section.

>> Note:

This driver only supports Write actions and does not support Read actions. Please configure the Action field on the Main Driver Sheet to be Write for all the items. The fields Read Trigger, Enable Read when Idle, Read Completed, Read Status must be left blank on the Standard Driver Worksheets.

Executing the Driver

After adding the XVGU driver to a project, Studio sets the project to execute the driver automatically when you start the run-time environment.

To verify that the driver run-time task is enabled and will start correctly, perform the following steps:

1. Select $Project \rightarrow Status$ from the main menu bar.

The Project Status dialog displays:

Task	Status	Startup	
Background Task	Started	Automatic	Start
Core Buntime	Started	Automatic	S. Street, Str
Database/ERP Runtime	Clartog	Manual	Stop
Driver Runtime		Automatic	
Mobile Access Runtime		Manual	
OPC DA 2.05 Client Runtin	me	Manual	Startup
OPC UA Client Runtime		Manual	
Studio Scada OPCServer	8	Manual	
TCP/IP Client Runtime		Manual	
Karter TCP/IP Server Runtime	Started	Automatic	
Viewer		Manual	

Project Status Dialog

2. Verify that the *Driver Runtime* task is set to Automatic.

If the setting is correct, click **OK** to close the dialog.

If the Driver Runtime task is set to Manual, select the Driver Runtime line. When the Startup button becomes active, click the button to toggle the *Startup* mode to Automatic.

- 3. Click OK to close the Project Status dialog.
- 4. Start the application to run the driver.

Troubleshooting

If the XVGU driver fails to communicate with the device, the tag you configured for the **Read Status** or **Write Status** fields will receive an error code. Use this error code and the following table to identify what kind of failure occurred.

Error Code	Description
0	XVGU TowerLight is working correctly
1	XVGU TowerLight library was not found
2	XVGU TowerLight library is not valid
3	Function not found in XVGU TowerLight
4	Connection to TowerLight failed
5	Address is write-only. Read operation is not allowed
6	Invalid pattern number
7	Invalid layer
8	Invalid mode
9	Invalid color
10	Invalid tone
11	Invalid volume
12	Invalid buzzer pattern
13	Invalid pattern definition
14	Invalid number of parameters

⇔ Tip:

You can verify communication status using the Studio development environment *Output* window (*LogWin* module). To establish an event log for **Field Read Commands**, **Field Write Commands**, and **Protocol Analyzer**, right-click in the *Output* window. When the pop-up menu displays, select the option to set the log events.

If you must contact us for technical support, please have the following information available:

- Operating system (type and version): To find this information, select Tools → System Information.
- Project Information: To find this information, select $\text{Help} \rightarrow \text{Support Information}.$
- Driver version and communication log: Displays in the Studio *Output* window when the driver is running.
- Device model and boards: Consult the hardware manufacturer's documentation for this information.

Revision History

Doc. Revision	Driver Version	Author	Date	Description of Changes
A	1.0	Felipe Santos Anushree Phanse	Oct-27-2016	First version

Appendix – A : Installing Device USB PC driver

This section describes how to install and configure the USB DnA PC driver (MCHPWinUSBDevice_v2.inf) for the XVGU device. Please contact your device support provider for the driver installer.

- 1. Connect the USB cable of the device to PC.
- 2. If the "found new Hardware Wizard" starts, select "no, not this time", and then click Next.

(The wizard does not appear if older drivers already installed.)

If so, remove the device listed in the Device Manager "the port" field.

By running the "scan for hardware changes" and is recognized as a new device.

<u>*</u>	Computer Management		⇔ – 🗆 ×
File Action View Help			
🗢 🔿 🖄 📰 🗐 🖉 🗊	- 限 - 職 - 職 - 同		
🜆 Computer Management (Local	🔺 🚔 Anushree-PC	^	Actions
System Tools	▶ 🖡 Audio inputs and outputs		Device Manager
Task Scheduler	> 🗃 Batteries		Device Manager -
Event Viewer	Bluetooth		More Actions
Bared Folders	👂 🖳 Computer		
b 🜆 Local Users and Groups	b isk drives		
Performance	> 🎭 Display adapters		
🚔 Device Manager	DVD/CD-ROM drives		
🔺 🚰 Storage	🔈 🕼 Human Interface Devices		
📄 Disk Management	IDE ATA/ATAPI controllers		
Services and Applications	a 🔚 Imaging devices		
Internet Information Sei	📆 FJ Camera		
Services	keyboards		
WMI Control	Mice and other pointing devices		
ISQL Server Configuratic	Monitors		
	🛛 😥 Network adapters		
	⊿ 💽 Other devices		
	📠 Configurable USB Tower light		
	🚹 Unknown device		
	🚹 Unknown device		
	🚹 Unknown device		
	📗 Unknown device		
	📗 🦣 Unknown device		
	Ports (COM & LPT)		
	🛛 🗁 🖶 Print queues		
	🛛 🗁 🖶 Printers		
	Processors		
	▷ 201 Sensors		
	▷ ① Software devices		
	Sound, video and game controllers		
	Storage controllers		
	b P System devices		
< >>	Universal Serial Bus controllers	۷	

On right clicking the "Configurable USB Tower Light" -> Select Update Driver

	Configurable	USB Tower light Properties	×				
General	Driver Details E	Events					
2	Configurable USB Tower light						
	Device type:	Other devices					
	Manufacturer:	Unknown					
	Location:	Port_#0001.Hub_#0003					
Device	e status						
[The c	rivers for this device	e are not installed. (Code 28)					
There	e are no compatible (drivers for this device.					
To fin	d a driver for this de	vice, click Update Driver.					
		~					
		Update Driver					
		Close Cance	1				

3. Select "Browse my computer for driver software" and point to the folder with the driver (MCHPWinUSBDevice_v2.inf) file.

You may see this error message

	×
€	Update Driver Software - Configurable USB Tower light
	Windows encountered a problem installing the driver software for your device
	Windows found driver software for your device but encountered an error while attempting to install it.
	XVGU Series
	The third-party INF does not contain digital signature information.
	lf you know the manufacturer of your device, you can visit its website and check the support section for driver software.
	Close

4. To troubleshoot the problem, you must disable driver signature verification by going to the Troubleshooting options from the boot manager.

Follow these sub-steps:

a. Select Restart from the power options menu (on Windows 8 that's under Charms or on the login screen, and in Windows 10 it's on the Start Menu).

b. Hold down the Ctrl +Alt + Shift keys while you click Restart.

c. Once your computer has rebooted choose the Troubleshoot option.



d. Then head into Advanced options.

	refresh it without losing your files
Ċ.	Reset your PC If you want to remove all of your files, you can reset your PC completely
ίΞ	Advanced options

e. Then Startup Settings.

Advanced options

System Restore

Use a restore point recorded on your PC to restore Windows



Startup Settings

Change Windows startup behavior

<¢>

Startup Repair Fix problems that keep Windows from loading

f. Click Restart

Restart to change Windows options such as:

- · Enable low-resolution video mode
- Enable debugging mode
- Enable boot logging
- Enable Safe Mode
- · Disable driver signature enforcement
- · Disable early-launch anti-malware protection
- · Disable automatic restart on system failure

g. When you see the window below: Click F7



After following all these steps, the driver can be installed by repeating the instructions from Steps 1 through 3.

- 5. Click Install the driver anyway, if a warning message pops up after step 3.
- 6. The driver will now be installed and a message will be shown that the installation was successful.