# Lightware

User's Manual

**Bootloader software** 



# Lightware

# Table of contents

1.	INT	RODUCTION	3
2.	INS	TALLING THE BOOTLOADER	3
2	2.1.	INSTALLING AND LAUNCHING THE BOOTLOADER SOFTWARE	3
3.	UPC	GRADE PROCESS	5
3	3.1. 3.2. 3.3.	TIPS FOR THE UPGRADE PROCESS FIRMWARE UPGRADE TROUBLESHOOTING	5 6 2
4.	APF	PENDIX A – CONTROLLER TYPES 1	5
5.	APF	PENDIX B – LIST OF DEVICES AND UPGRADE INTERFACES 1	6
6.	DOC	CUMENT REVISION HISTORY 1	8

### 1. Introduction

Dear Customer,

Thank you for purchasing products of Lightware Visual Engineering. This User's Manual is meant to help customers perform firmware upgrades on our products by giving a few tips on how to start and by explaining the features of the Bootloader software.

# 2. Installing the Bootloader

Lightware devices can be upgraded using Lightware Bootloader from a Windows based PC or Laptop via Ethernet, RS-232 or USB port.

#### 2.1. Installing and launching the Bootloader software

**Step 1.** Run Installer\_LW\_bootloader\_vX\_X\_X.exe (X\_X\_X denotes the 3-digit firmware version of the Bootloader)



Step 2. Select destination folder and select **Install** (Using the default path is highly recommended)

🖫 Installer_LW_bootloader_v3_2_0 Set	up: Installati 🖃 🗆 🔀								
Setup will install Installer_LW_bootloader_v3_2_0 in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.									
Destination Folder									
C:\Program Files\Lightware	Browse								
Space required: 1010.0KB									
Space available: 143.8GB									
Cancel Nullsoft Install System v2,37	< Back Install								



Pinstaller	r_LW_bootloader_v3_1_9 Setup: Installing 📃 🗔 🔀 te shortcut: C:\Documents and Settings\feti\Start Menu\Programs\Ligh
Show <u>d</u> et	ails
	🚏 Installer_LW_bootloader_v3_1_9 S 🔀
	Do you want create icon(s) on the desktop?
	Yes No
Cancel	Nullsoft Install System v2.37

Step 3. If you want to create desktop icon select Yes in the next pop-up window:

Step 4. After the files have been copied, the following message appears:

📳 Installer	r_LW_bootloader_v3_2_0 Setup: Installing 🛛 🖃 🗖 🔀
Crea	te shortcut: C:\Documents and Settings\feti\Asztal\LW_bootloader_v3
Show det	ails
	🕼 Installer_LW_bootloader_v3_2_0 S 🔀
	Installation was successful.
	ОК
Cancel	Nullsoft Install System v2,37

Step 5. To finish the installation process, click on the Close button.

🗒 Installer_LV	/_bootloader_v3_2_0 Se	tup: Completed	
Show <u>d</u> etails			
Cancel	Nullsoft Install System v2.37	< <u>B</u> ack	Close

Step 6. To run Lightware Bootloader, find the shortcut icon in Start menu → Programs → Lightware → LW\_bootloader\_vX\_X\_X or on the desktop, and double click on it:



#### Uninstalling

To uninstall the Bootloader software, double click on: Start menu  $\rightarrow$  Programs  $\rightarrow$  Lightware  $\rightarrow$  Uninstall\_LW\_bootloader\_vX\_X\_X.exe

## 3. Upgrade process

#### 3.1. Tips for the upgrade process

#### Cross UTP connection

To avoid packet loss caused by an overloaded network, it is recommended to use cross UTP connection directly from the upgrading PC to the Lightware device.

#### **Disable other Ethernet devices**

The Bootloader software always queries the PC's primary Ethernet adapter (which is usually the adapter that is connected to the Internet) for available Lightware devices. It is recommended to disable every other Ethernet device (secondary LAN, Wi-Fi, 3G modem) for the time of the upgrade. If the Bootloader cannot find the Lightware device because the device is connected to the secondary Ethernet adapter (cross UTP connection), you need to disable the primary adapter (Internet). This way the Ethernet adapter which is connected to the Lightware devices. If you disable an Ethernet adapter while the Bootloader can query it for Lightware devices. If you disable an Ethernet adapter while the Bootloader is running, you need to restart the Bootloader to be able to query the Ethernet adapter again.

A second option in this case is that if you know the IP address and port number of the Lightware device, you may use the **Add IP** button which is described in section 1.1 Step 3.

#### Remove I/O connections

It is recommended to remove all video input and output connections from the Lightware device. Video sources and display devices may try to communicate with the Lightware device or send noise through the cable which may interfere with the upgrade process.

#### Latest Bootloader

Always perform the firmware upgrade with the latest Bootloader software. To get the latest Bootloader software, contact your local sales representatives or Lightware's support team at <a href="mailto:support@lightware.eu">support@lightware.eu</a>

#### Finishing the process with older versions of the Bootloader

Bootloader versions that are **older than v3.1.8** do not close the connection with the Lightware device automatically upon finishing the upgrade process. With these versions, if you remove the UTP cable or restart the Lightware device before you properly exit the Bootloader, the Lightware device will stay in a so called 'bootload mode' and will not return to normal operating mode. In such cases connect to the Lightware device with the Bootloader again and exit from it properly.

#### **Restart the device**

After a successful firmware upgrade, the device will restart itself but it is recommended to power down and up the device after finishing the upgrade.



#### 3.2. Firmware upgrade

Lightware devices can be upgraded from a Windows based PC using Lightware Bootloader software via Ethernet, RS-232 or USB port (the steps are the same).

Step 1. Connect the Lightware device and the computer via

- Ethernet (hub, switch, router)
- Ethernet directly (with cross UTP cable)
- RS-232
- USB (listed as COM ports in the Available Devices window)

If you are connecting via **hub, switch or router**, then you can either set the Lightware device to have a fix IP (in which case make sure that there is no IP conflict on the network) or you can set the Lightware device to DHCP mode (in which case the Lightware device will acquire an IP address automatically). In this case the network must have a DHCP server. These settings can be done from the front panel LCD menu or via the supplied Lightware Matrix Controller software.

If you are connecting directly, via a cross UTP cable, you need to set up a fix IP and subnet mask on the Lightware device and the PC.

#### Step 2. Start the application

To run the Bootloader software, double click on the icon of the software on the desktop or select proper shortcut from Start Menu  $\rightarrow$  Programs  $\rightarrow$  Lightware folder.



	0	
	U	0
Add IP Available devices on Ethernet		
EIND Device Name:		
Serial Number:		
UPGRADE IP address:		
FIRMWARES Available COM Ports MAC address:		
ABOUT	sum verification only)	
Communication		
Controller Type Hardware Version Bootloader Version Firmware Version Browse	New Firmware	_

Figure 1. Bootloader software startup

#### Step 3. Find devices

Make sure that no active connection is made to the device (Lightware Matrix Controller software or web browser connected to the built-in website). Then click on the **FIND** button to query the Ethernet for Lightware devices. COM ports do not list any information about the connected devices, users must know which COM port is connected to the Lightware device.

			Lightware	Bootlo	ader v3.2.0			Х
LIGHTWARE	0	•	0	•	0		0	0
	Augusta bia daviana	on Ethomot	Add		enice Decembra			
		2 (MX32x32DVI FF	AME) (SN:1234)		evice Propertie	5		
FIND					Device Name:			
UPGRADE			s	earching				
SELECTED								
FIRMWARES	Available COM F	orts			MAC address:			
	COM3				Quick Bootlo	ad (checksu	m verification only	a
ABOUT								
				De	ommunication- vicelist length: 6			~
				De	vicelist length: 7			
Controller Ty	/pe Hardwa	re Version E	ootloader Version	Firmwa	re Version	Browse Ne	w Firmware	
Log file: 0 KB								

Figure 2. Searching for devices

The Bootloader software always queries the PC's primary Ethernet adapter (which is usually the adapter that is connected to the Internet) for available Lightware devices. It is recommended to disable every other Ethernet device (secondary LAN, Wi-Fi, 3G modem) for the time of the upgrade. If the Bootloader cannot find the Lightware device because the device is connected to the secondary Ethernet adapter (cross UTP connection), you need to disable the primary adapter (Internet). This way the Ethernet adapter which is connected to the Lightware devices. If you disable an Ethernet adapter while the Bootloader can query it for Lightware devices. If you disable an Ethernet adapter while the Bootloader is running, you need to <u>restart the Bootloader</u> to be able to query the Ethernet adapter again.

A second option in this case is that if you know the IP address and port number of the Lightware device, you may use the **Add IP** button above the Available Devices on Ethernet window.

IP Address:	Add	Cancel
Use the following TCP Port:		
Port:		

Figure 3. Add IP

If the Lightware device is connected to the secondary Ethernet adapter (or for any other reason) and the Bootloader doesn't list it in the available devices window, you can manually add its IP address and TCP Port number. This way the device name and IP address won't be displayed, but double clicking on the IP address will establish the connection.

#### Step 4. Connect to a device

If the Bootloader finds one or more Lightware devices then they will be listed in the tree view window. This window shows the device type, IP address and serial number of the found Lightware devices. COM ports do not query these information, users must know which COM port is connected to the Lightware device. Double click on one of the available devices. The Bootloader will ask if you really want to connect to the device. Select **YES** to establish the connection. It will take 10-15 seconds to get all the information from the Lightware device. After establishing the connection the device enters bootload mode and suspends normal operation.

			Lightwar	e Bootloade	r v3.2.0		Х
Lightware	•	•	•	•	•	0	0
	-Available devices r	n Ethornot	A	dd IP	Droportion		
		(MX32x32DVI F	RAME) (SN:1234)		r ropentes		
FIND				Devid	ce Name:		
				Seria	al Number:		
UPGRADE				10	Liber and		
SELECTED				IP ac	idress:		
FIRMWARES	Available COM Po	rts		мас	addraec:		
ADOUT	COM3	comm			d (chec	ksum verification onl	y)
ADUUT			you want to establish i	connenction with the	ion with the device?		
	<b>M</b> LUM13		Yes	No			>
							~
Controller Ty	/pe Hardware	Version E	Bootloader Versio	n Firmware V	ersion Browse	e New Firmware	
Log file: 0 KB							

Figure 4. Establishing connection

#### Step 5. Requesting device information

After clicking on the **YES** button, the device name, serial number, IP address, MAC Address and current firmware versions are displayed.

			Lightware	Boo	tloader v3.2.0		Х
LIGHTWARE	•	•	•	•	) 0	0	0
			Add	IP			
	Availab	le devices on Ethernet- 92 168 2 122 (MY22-32DV)	ERAME) (SN-1224)		Device Propertie	35	
FIND		02.100.2.122 (01102002011	rinane)(ort.ieor)		Device Name:	MX32×32DVI FRAME	
					Serial Number	SN:1234	
SELECTED					IP address:	192.168.2.122	
FIRMWARES	Availab	le COM Ports		_	MAC address:	00-20-4A-B1-41-46	
					Quick Bootload (checksum verification only)		
ABOUT	()P2						
		COM13			-Communication		
					select_GPI0 6 No card found		
							<b>~</b>
Controller Tv	pe	Hardware Version	Bootloader Version	Firr	nware Version	Browse New Firmware	
MX-DVI-CPU		HW:1.1	FW:1.1.1	FW	12.4.3		
MX-DVI-EDID	)	HW:1.1	FW:1.0.2	FW	:3.1.8		
MX-CP1		HW:2.0	FW:1.0.2	FW	1.0.4		
MX-CP2		HW:2.0	FW:1.0.2	FW	1.0.4		
Web Server				FW	1.10.0		
Web Content	t			FW	1.2.6		
Log file: 27 KB		(					

Figure 5. Details of the device

#### Step 6. Select firmwares to upgrade

To upgrade a firmware, click in the field in the line of the controller (marked with pink in the picture below). Click on **YES** in the pop-up window to modify the path to the new firmware file. Controller types are described in <u>Appendix A</u>.

				Lightware	Bootic	ader v3.2	.0		X
LIGHTWARE	C	) 0		•	•		•	0	0
				Add	IP				
	Availab	le devices on Ethe	met IODVA ED AMEN	(NL1004)		Jevice Prope	erties-		
FIND	<u>*</u>	32. 100. Z. 122 (MA32X3	20VI FRAME)	5N:1234)		Device Nan	ne:	MX32x32DVI FRAME	
						Serial Num	ber:	SN:1234	
UPGRADE SELECTED						IP address:		192.168.2.122	
FIRMWARES	Availab	le COM Ports				MAC addre	ss:	00-20-4A-B1-41-46	
		COM1 COM3	Confirm		_				
ABOUT		COM4 COM10	? Do	you really want to	o modify th	e path?	otload	(checksum verification only)	
	-	COM13	~			t	ion		
				Yes	ancel	E			^
			L						~
Controller Ty	me	Hardware Versio	n Bootlo	ader Version	Firmer	are Version	Br	owce New Firmware	
MX-DVI-CPL	J J	HW-1.1	FW-1	1.1	FW 2 4	4.3			
MX-DVI-EDI	D	HVV:1.1	FW:1.	3.2	FW:3.	1.8			
MX-CP1		HVV:2.0	EW:1.	0.2	EW:1.	0.4			
MX-CP2		HW:2.0	FW:1.	3.2	FW:1.	0.4			
Web Server					FW:1.	10.0			
Web Conter	nt				FW:1.	2.6			
Log file: 27 KB									

Figure 6. Selecting new firmware files

Step 7. Enable the upgrade and Quick Bootload mode

After selecting the new firmware file, <u>you must enable the upgrade</u> by clicking the checkbox left to the controller type (marked with a red circle in the picture below). You may enable Quick Bootload mode by clicking the checkbox next to it (marked with a red rectangle in the picture below). Quick Bootload mode speeds up the process by not reading back the written data, only verifying the checksum. It can be enabled and disabled any time during the upgrade process.

			Lightware	Boot	loader v3.2.0		Х
Lightware	•	•	•	•	0	0	0
	Availab	le devices on Ethernet 92.168.2.122 (MX32x32DV	Add	IP	-Device Propertio	86	
FIND					Device Name: Serial Number	MX32x32DVI FRAME	
UPGRADE SELECTED					IP address:	192.168.2.122	
FIRMWARES	Availab	Ie COM Ports			MAC address:	00-20-4A-B1-41-46	
ABOUT	1	COM4 COM10			Quick Bootl	oad (checksum verification only)	
		СОМ13			-Communication -> select_GPI0 0 -> select_GPI0 6 No card found		~
Controller Ty	/ре	Hardware Version	Bootloader Version	Firm	ware Version	Browse New Firmware	
X-DVI-CPU	J	HVV:1.1	EW:1.1.1	FW:2	2.4.3	mx_dvi_cpu-ver_2_4_4.hex	
MX-DVI-EDI	D	HVV:1.1	FW:1.0.2	FW:3.1.8			
MX-CP1		HVV:2.0	FW:1.0.2	FW:1.0.4			
MX-CP2		HVV:2.0	FW:1.0.2	FW:	1.0.4		
Web Server				FW:	1.10.0		
Web Content				FW:	1.2.6		
Les files 27 KD							
Log rile: 27 KB							

Figure 7. Enabling the upgrade and Quick Bootload mode

#### Step 8. Starting the upgrade process

After selecting all the firmwares that need to be upgraded, click on the **UPGRADE SELECTED FIRMWARES** button. Then click on **YES** in the appearing window to start the process.

			Lightwa	re Bootloader	v3.2.0		Х
Lightware		• •	•	•	•	0	0
	Availab	le devices on Ethe	met	Add IP Device	Properties-		
FIND		192.168.2.122 (MX32x3	2DVI FRAME) (SN:1234)	Devic	e Name:	MX32x32DVI FRAME	
				Seria	Number:	SN:1234	
UPGRADE SELECTED				IP ad	dress:	192.168.2.122	
FIRMWARES	Availab	Ie COM Ports	Confirm		address:	00-20-4A-B1-41-46	
ABOUT	1	COM3 COM4 COM10	Do you really	want to upgrade?	k Bootload	d (checksum verification only)	
		COM13	Yes	Cancel	PIO 0 PIO 6 and		<ul><li></li><li></li></ul>
CastralianT		Lieuria Manaia	Deatherstan	Einer M	union D	hanna Nan Cinanaa	_
MX-DVI-CPI	ype T	Haruware versio	EW/111	EW/243	ersion B	rowse new Firmware	_
MX-DVI-EDI	- D	HW/11	EW:102	EVV:3.1.8		an_opa 101_2_1_1.110x	_
MX-CP1		HW:2.0	FW:1.0.2	FW:1.0.4			
MX-CP2		HW:2.0	FW:1.0.2	FW:1.0.4			
Web Server				FW:1.10.0			
Web Conter	nt			FW:1.2.6			
Log hile: 27 KB							

Figure 8. Starting the upgrade process

#### Step 9. Upgrading

The Bootloader will first erase the content of the controllers and then write the new firmware data. This process can be monitored in the communication window and the progress bar (both are marked with red rectangles in the picture below).

		Lightware	Bootloader v3.2.0	)	Х
Lightware	•	•	• •	0	0
A.,	oilabha dauisea an Etharnat	Add	IP Device Dreport	ion	
	9 192.168.2.122 (MX32x32DV	1 FRAME) (SN:1234)	Device Propert	185	
FIND			Device Name	MX32x32DVI FRAME	
			Serial Numbe	er: SN:1234	
UPGRADE			ID address;	102 109 2 122	
SELECTED			IF audress.	152.100.2.122	
FIRMWARES	ailable COM Ports		MAC addres	s: 00-20-4A-B1-41-46	
ABOUT	COM1		Quick Boo	tload (checksum verification only)	
			-Communicatio Write Flash addres Write Flash addres Write Flash addres	n s: 9100 s: 9140 s: 9180	<
		<b>B R F R R</b>			_
	Hardware version	Elactioader version	Firmware version	Browse New Firmware	_
	HW/1.1	EW/102	FW/318		- 1
MX-CP1	HW:2.0	FW:1.0.2	FW:1.0.4		
MX-CP2	HW:2.0	FW:1.0.2	FW:1.0.4		
Web Server			FW:1.10.0		
Web Content			FW:1.2.6		
Programming & Verifying MX-	DVI-CPU				

Figure 9. Upgrading

#### Step 10. Closing connections

After all controllers are upgraded, the Bootloader will close the connection with the Lightware device, which will reboot itself and return to its normal operating mode.

Warning Bootloader versions that are older than v3.1.8 will not close the connection and restore the Lightware device until you exit the Bootloader.

				Light	ware B	00	tloader v3.2.0			Х
Lightware	C	)	•	•		0	•	0		0
	-Availah	le devices on F	thernet	l	Add IP		-Device Propertie	· c		
		92.168.2.122 (MX	32x32DVI FRA	ME) (SN:1234)	I		- Denice i Topenice	. <u>.</u>		1
FIND							Device Name:	MX32x32D	VI FRAME	
								SN:1234		
UPGRADE					Closing	coni	nections	192.168.2.1	22	
SELECTED										
TIMINARES	Availab	IE COM Ports- COM1					MAC address:	00-20-4A-B	1-41-46	
ABOUT		COM3 COM4					🔽 Quick Bootla	oad (checksum verif	fication only)	
ADOUT		COM10					Communication			]
	····· 240	CUM13					-> select_GPI0 0			^
							Setup 9600 BR no pa	arity		-
	L						(			
Controller Ty	/pe	Hardware Ve	rsion Bo	otloader Ve	ersion (F	Firm	ware Version	Browse New Fir	mware	
MX-DVI-CPU	J	HW:1.1	FV	V:1.1.1	F	FW:	2.4.3			
MX-DVI-EDI	D	HW:1.1	FV	V:1.0.2	F	FW:	3.1.8			
MX-CP1		HW:2.0	FV	V:1.0.2	F	FW:	1.0.4			
MX-CP2		HW:2.0	F۷	V:1.0.2	F	FW:	1.0.4			
Web Server					F	FVV:	1.10.0			
Web Conten	t				F	FVV:	1.2.6			
Done!										

Figure 10. Closing connections

Step 11. Upgrade successful

If the connections are closed and no errors occurred, the firmware upgrade is SUCCESSFUL. Click on the **OK** button and then you may exit the Bootloader or connect to another Lightware device to perform firmware upgrades.

			Lightware	Bootloa	der v3.2.0		Х
LIGHTWARE	•	•	0	•	•	0	0
	Ausilable devices on E	Thomat	Add	IP Do	ico Dronartico		
		(32x32DVI FRAME)	(SN:1234)		ace Properties-		
FIND				D	evice Name:	MX32x32DVI FRAME	
				s	erial Number:	SN:1234	
UPGRADE							
SELECTED		UPGRAD	DE PROCEDURE RE	PORT		192.168.2.122	
FIRMWARES	Available COM Ports-					00-20-4A-B1-41-46	
		MX-DVI-CPUOK				d (obselveum uprification anlu)	
ABOUT		Total re Total re	transmissions:U writes:0		0a	u (checksum vehication only)	
_					parit	tu	
		U	pgrade su	iccessf	ul	-	~
0 · · · · ·			OK				
	/pe Hardware ve	<u></u>			E	srowse new Firmware	_
Dopel							

Figure 11. Upgrade successful

#### Step 12. Restart the device

The Lightware device will restart itself automatically, but it is recommended to completely power down and power up the device after exiting the Bootloader.

#### 3.3. Troubleshooting

#### The Bootloader cannot find the matrix

The Bootloader software always queries the PC's primary Ethernet adapter (which is usually the adapter that is connected to the Internet) for available Lightware devices. It is recommended to disable every other Ethernet device (secondary LAN, Wi-Fi, 3G modem) for the time of the upgrade. If the Bootloader cannot find the Lightware device because the device is connected to the secondary Ethernet adapter (cross UTP connection), you need to disable the primary adapter (Internet). This way the Ethernet adapter which is connected to the Lightware devices. If you disable an Ethernet adapter while the Bootloader can query it for Lightware devices. If you disable an Ethernet adapter while the Bootloader is running, you need to <u>restart the Bootloader</u> to be able to query the Ethernet adapter again.

A second option in this case is that if you know the IP address and port number of the Lightware device, you may use the **Add IP** button above the Available Devices on Ethernet window. For more information see section 1.1 Step 3

#### Upgrade FAILED

If the connection is unreliable and the Bootloader cannot communicate with the Lightware device, then the following warning messages appear.

Lw_bootloader_v3_2_0 An error occured during the process Please repeat the upgrade procedure! OK	
UPGRADE PROCEDURE REPORT 	
Upgrade FAILED	

The Bootloader retries the transmission 3 times. If it doesn't succeed, then the upgrade procedure will have FAILED. In this case exit the Bootloader, try to establish a reliable connection with the Lightware device and repeat the upgrade process. It may happen that when you try to find the device again, the **Available devices** window will only show the IP address of the Lightware device but not the device type and serial number. The reason for this is that the Lightware device may still be in bootload mode and the controllers cannot send any information about themselves. You can still double-click on the IP address and the Bootloader will establish the connection.

#### No controller selected to upgrade!

If you didn't check any checkboxes left to the controller types then the **No** controller selected to upgrade! message appears. Click at least one of the checkboxes before you click on the UPGRADE SELECTED FIRMWARES button.

Lw_boot	loader_v3_2_0	X
No contro	iller selected to upgra	de!
	ОК	

#### The controller was not upgraded

Make sure that the checkbox next to the controller type is checked before you click on the **UPGRADE SELECTED FIRMWARES** button. These checkboxes enable the firmware upgrade on the different controller types.

#### An invalid file has been selected

The Bootloader checks if valid firmware files have been selected for the controllers. If an invalid file (not firmware file) has been selected, then the following warning messages appear.

Lv	/_bootloader_v3 🔯
	ОК
w	bootloader v3 2 0
WAF	RNING! rade failed: Invalid checksu
Upg	

Please select a valid firmware file.

#### Firmware selected for the wrong controller

If an otherwise valid firmware file has been selected but for the wrong controller, the following warning message appears.

Lw_bootloader_v3_2_0	
WARNING! Invalid controller type info for MX-DVI-CPU (M	X-DVI-EDID)
ОК	

Please select the appropriate firmware file for the controller.



#### Corrupt firmware file

If the correct firmware file is selected for the controller but it somehow became corrupted (the checksum is incorrect), then the following warning messages appear.

	Lw_bootloader_v3 🔯					
	Invalid checksum in record 12					
Lw_bootloader_v3_2_0						
WAR Upgr Inva Inva	NING! ade failed: Invalid checksum lid controller type info for MX-DVI-CPU () lid hardware info for MX-DVI-CPU ()					
	ОК					

Please contact your local sales representative or Lightware's support team at <a href="mailto:support@lightware.eu">support@lightware.eu</a> and ask for the correct firmware files.

# 4. Appendix A – Controller types

Controller name	Description		
MX-CP	Front side control panel for modular and non-modular matrices. If multiple control panels are installed, the same firmware can be used for all of them.		
MX-DVI-CPU	The main processor in modular and non-modular matrices		
MX-DVI-EDID	The processor that handles EDID Management in modular and non-modular matrices		
MX-DVI-EDID (HDCP)	The processor that handles EDID Management in HDCP compliant modular and non-modular matrices		
MX-DVI-EDID (SLIM)	The processor that handles EDID Management in MX16x16DVI-Slim and MX12x12DVI-Slim matrices		
PWR_SUM	The controller that handles Power Management and Summarizing in redundant frames		
WEBCONTENT	The controller that handles the built-in website in devices with Ethernet port		
WEBSERVER	The controller that handles Ethernet communication in devices with Ethernet port		
WEBSERVER (MULTIUSER)	The controller that handles Ethernet communication in devices with Ethernet and with multiuser access capability		
WEBSERVER (MX-RCP)	The controller that handles Ethernet communication in MX-RCP16 and MX-RCP32 remote control panels		
DA2DVI-PRO	Main controller of DA2DVI-Pro		
DVI-DOCTOR	Main controller of DVI-Doctor		
DVI-OPT-RX220-PRO	Main controller of DVI-OPT-RX220-Pro		
DVI-OPT-TX200	Main controller of DVI-OPT-TX200		
DVI-OPT-TX220-PRO	Main controller of DVI-OPT-TX220-Pro		
DVI-TP-RX100R	Main controller of DVI-TP-RX100R		
HDMI-OPT-RX200	Main controller of HDMI-OPT-RX200		
HDMI-OPT-TX200	Main controller of HDMI-OPT-TX200		

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# 5. Appendix B – List of devices and upgrade interfaces

Device name (in alphabetical order)	Upgrade interface
DA2DVI-Pro	USB (listed as COM port)
DVI-Doctor	RS-232
DVI-OPT-RX220-PRO	RS-232
DVI-OPT-TX200	RS-232
DVI-OPT-TX220-PRO	RS-232
HDMI-OPT-RX200R	RS-232
HDMI-OPT-TX200R	RS-232
MX12x12DVI-Slim	Ethernet
MX16x16DVI-Slim	Ethernet
MX4x4DVI (1RU high)	RS-232 (not compatible with this Bootloader software, please contact support@lightware.eu)
MX4x4DVI-DL (1RU high)	RS-232 (not compatible with this Bootloader software, please contact support@lightware.eu)
MX4x4HDSDI	RS-232 (not compatible with this Bootloader software, please contact support@lightware.eu)
MX6x6DVI (3RU high)	Ethernet
MX6x6DVI-DL (3RU high)	Ethernet
MX8x4DVI-Pro	RS-232 (not compatible with this Bootloader software, please contact support@lightware.eu)
MX8x4HDSDI	RS-232 (not compatible with this Bootloader software, please contact support@lightware.eu)
MX8x8DVI (3RU high)	Ethernet
MX8x8DVI-DL (3RU high)	Ethernet
MX8x8DVI-HDCP-Pro	Ethernet
MX8x8DVI-Pro	RS-232 (not compatible with this Bootloader software, please contact support@lightware.eu)
MX8x8HDMI-Pro	Ethernet
MX8x8HDSDI	RS-232 (not compatible with this Bootloader software, please contact support@lightware.eu)
MX8x8HDSDI-DL	RS-232 (not compatible with this Bootloader software, please contact support@lightware.eu)
MX-FR16	Ethernet
MX-FR32	Ethernet

Device name (continued)	Upgrade interface
MX-FR32R	Ethernet
MX-FR80R	Ethernet
MX-RCP16 (RCP32)	Ethernet
UMX4x4-Pro	Ethernet, RS-232



# 6. Document Revision history

Document	Release Date	Changes	Checked by
Rev 1.0	05-10-2010	Released	Tibor Fejes