

# TECHNICAL REFERENCE MANUAL

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Version 4.00 - September 2013



## XHub3.





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# Table of Contents

<b>TABLE OF CONTENTS</b> .....	<b>III</b>
<b>WHAT'S NEW?</b> .....	<b>IV</b>
<b>1. INTRODUCTION</b> .....	<b>1</b>
<b>2. HARDWARE</b> .....	<b>2</b>
2.1. Dimensions .....	2
2.2. Front Panel .....	3
2.3. Rear Panel .....	6
2.4. Interconnecting XHubs .....	7
<b>3. SOFTWARE</b> .....	<b>9</b>
3.1. Identifying the XHub Software Version .....	9
3.2. Upgrading the XHub Software .....	10

# What's New?

In the XHub3 Technical Reference manual, the icon **NEW!** has been added on the left margin to highlight information on new and updated features.

The changes linked to new features in version 4.00 are listed below.

## **Changed behavior for Speed LED**

- See section "Front Panel" on page 3.

## **LED status for XHub3 v.4.00**

- See section "Identifying the XHub Software Version" on page 9.

# 1. Introduction

XHub3 is an 8-port SDTI hub for the XNet. It provides information about general network status and status of individual branches of the network, automatically isolating faulty branches in case of unexpected problems, and protects the other sections of the network to guarantee continued operation.

It is possible to connect another XHub to an XHub port to create a new branch and increase the number of available ports. Maximum 29 devices can be connected to the same SDTI network.



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**Note**

It is not allowed to connect more than one device (EVS server, XHub, XF2, etc.) per XHub port.

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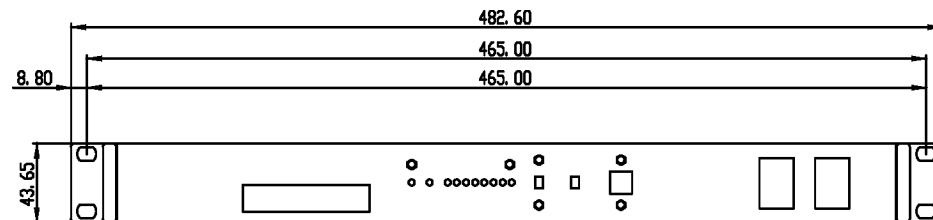
## 2. Hardware

### 2.1. Dimensions

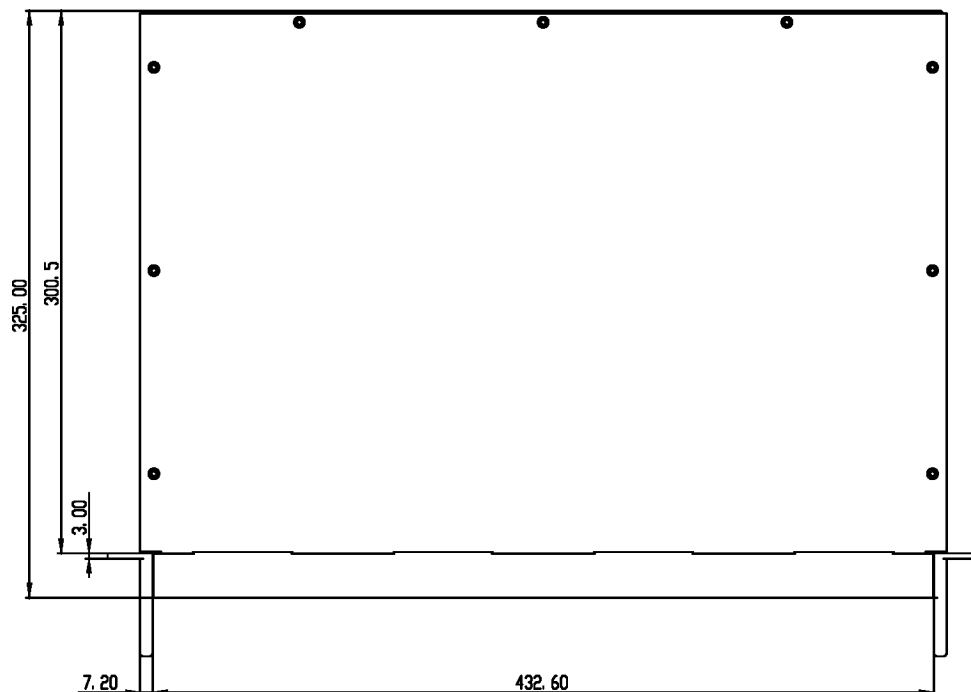
#### Overview

- 1RU 19" rackmount
- 110/220V auto-switch redundant power supply

#### Front View

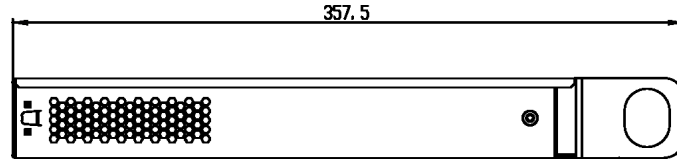


#### Top View



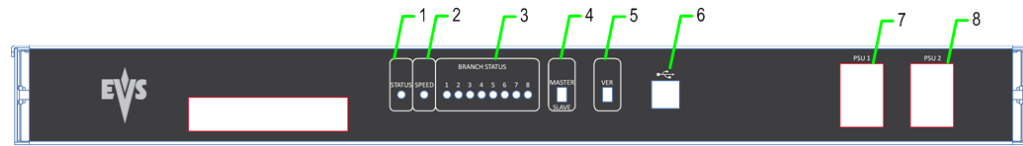


### Left View



## 2.2. Front Panel

### Overview



#	Element
1.	Status LED
2.	Speed LED
3.	Branch Status LEDs
4.	Master / Slave switch
5.	Version switch
6.	USB port (B type)
7.	Power switch 1
8.	Power switch 2

### Status LED



The Status LED will flash green when the XHub3 is in operation.

**NEW !** Speed LED



When all the dip switches are up (normal operation mode), the speed LED behaves as follows:

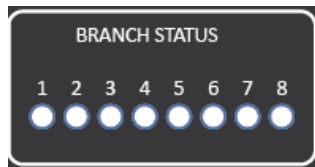
LED behavior	Meaning
Off	not operating
Flashing slow	XNet operating at 540 Mbps
Flashing fast	XNet operating at 1485 Mbps
Green	XNet operating at 2970 Mbps This XNet speed will be available in a future Multicam release.
Red	no network



**Note**

From Multicam 10.05 and higher, the XNet will no longer operate in 540 Mbps. XHub3 v4.00 will however still be able to work in this bitrate.

**Network Branch Status LED**



The eight LEDs give indication on the status of each of the eight XHub3 branches:

LED behavior	Meaning
Flashing green	Branch status OK, some systems are present on that branch and communicating on the XNet.
Fast flashing green	Branch status OK, the SDTI server is present on that branch and connected to XNet.
Steady green	Branch status OK, no system connected to the network on that branch.



LED behavior	Meaning
Flashing red	Branch status FAULTY, with an illegal signal on the connector of that branch, or the branch is open.
Steady red	Branch status FAULTY, no signal is detected on the SDTI IN connector of that branch. This is the case when the SDTI IN connector from a server is connected (instead of the SDTI OUT connector) to the SDTI IN connector of an XHub.

## Master / Slave Switch



An XHub3 can be set as the master by moving the switch up to MASTER. To set a XHub3 as slave, move the switch down to SLAVE.

See section "Interconnecting XHubs" on page 7 for more information.

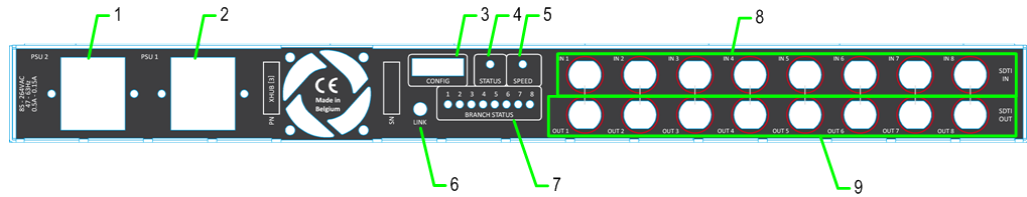
## Version Switch



The Version switch allows the identification of the XHub3 software version. When the switch is moved up, it is in Version Detection mode. When it is moved down, it is in normal operation mode. Refer to section 3.1 'Identifying the XHub Software Version' on page 9 for more information.

## 2.3. Rear Panel

### Overview



#	Element
1.	Power supply 2 (IEC connector)
2.	Power supply 1 (IEC connector)
3.	Configuration DIP switch matrix
4.	Status LED
5.	Speed LED
6.	Link connector
7.	Branch status LEDs
8.	Input connectors
9.	Output connectors

### Configuration DIP Switch Matrix

All 8 switches must be up for normal operations.

### Link Connector

For EVS user only.

### Status, Speed and Branch Status LEDs

Those LEDs match the corresponding front LEDs.



## Input and Output BNC Connectors

8 input BNC connectors and 8 output BNC connectors are used to connect devices in the SDTI network.

**Note**

The IN and OUT connectors are located opposite compared to the XHub[2] hardware. On a XHub3, the input connectors are located on the top row.

## 2.4. Interconnecting XHubs

### Purpose

When more than 8 XNet branches are required, it is possible to connect several XHubs to a Master XHub to obtain the required number of branches. In this case please make sure that the rules specified below are followed.

### Rules

- One and only one XHub must be configured as Master XHub. All other hubs must be configured as Slave XHubs.
- The 1st branch of a Slave XHub must be used as the uplink branch to the Master XHub.
- All Slave XHubs must connect directly back to the Master XHub; a Slave XHub cannot be connected to another Slave XHub. Maximum configuration is therefore 1 Master XHub connected to up to 8 Slave XHubs.
- A Master XHub does not need to have any servers connected to it, and can consist completely of 8 Slave Hubs.

## Maximum Cable Lengths

The following table specifies the maximum cable lengths depending on the cable type, and the SDTI network speed. The 540Mbps is only supported up to Multicam 10.04.

Cable Type	@ 2970 Mbps	@ 1485 Mbps	@ 540 Mbps
<b>RG59</b>	30 m / 98 ft	45 m / 148 ft	100 m / 328 ft
<b>RG6</b>	70 m / 230 ft	100 m / 328 ft	180 m / 590 ft
<b>RG11</b>	85 m / 279 ft	120 m / 394 ft	250 m / 820 ft
<b>Fiber</b>	55 km *	80 km *	200 km *

\* 55km/80km/200km is the total length of the return path, i.e. the actual distances between the 2 servers connected via the fiber link is half of this value, i.e. 40 km @ 1485 Mbps.



### Note

When using reclockers, the total delay induced by these reclockers between 2 active servers on the network must not exceed 15 $\mu$ s.



## 3. Software

### 3.1. Identifying the XHub Software Version

#### How to Identify the XHub Version

The version run by XHub3 can be determined by means of the version switch on the front panel. This does not require switching off the XHub and it maintains normal operations during the version check state.

To identify the XHub version, proceed as follows:

1. Move up the version switch. The branch status LEDs show the software major and minor version in a binary pattern explained below.
2. To return to normal LED behavior, move down the version switch.

#### Display Sequence of Branch Status LEDs

When the version switch is moved up, the branch status LEDs display the major version, minor version and build number in a binary pattern, in the following sequence:

1. all green LEDs
2. version build number
3. all red LEDs
4. version major . minor as explained in the section below

#### Display Pattern of Branch Status LEDs

The table below shows the LED status for version 4.00.

The red LED corresponds to the dot position for a decimal value, while the green LEDs are managed as a binary count in each section. This means that:

- LEDs 1, 2, 3 are one binary section that can total a value of 7 when all green
- LEDs 5, 6, 7, 8 are another binary section that can total a value of 15 when all are green.

Branch LED #	1	2	3	4	5	6	7	8
<b>NEW !</b> v.4.00	green			red				

## 3.2. Upgrading the XHub Software

The upgrade of the XHub3 software is performed via USB cable. The USB driver and the software upgrade can be done at the same time.

1. Connect ...

- the USB cable between the XHub3 (Standard-B type connector)

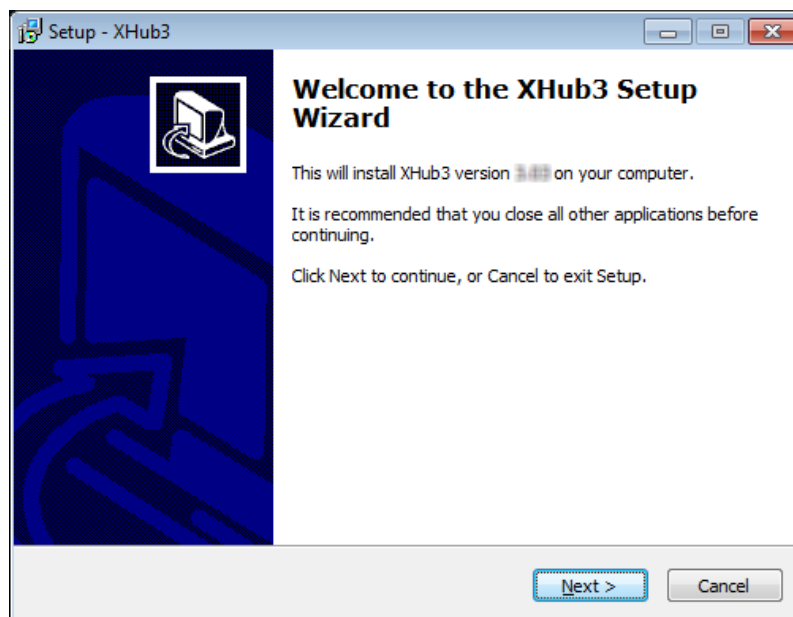


- to the computer (Standard-A type connector).



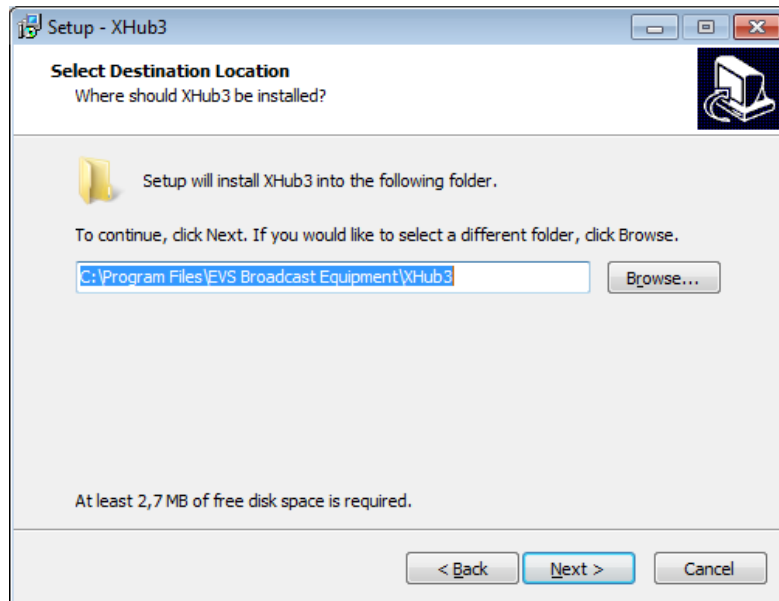
Windows detects the new peripheral.

2. Execute the XHub3\_Drv\_1.3.0\_Bin\_x.xx.exe (currently x.xx = 4.00) :

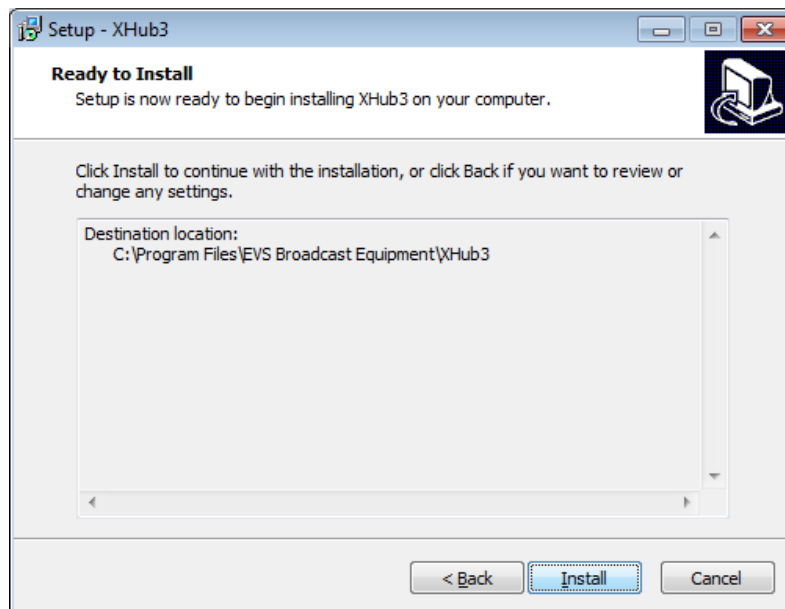




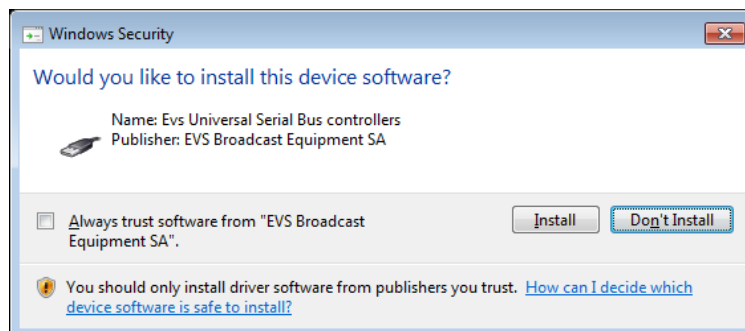
3. Click **Next**.



4. Select the location to save the drivers to.
5. Click **Next**.

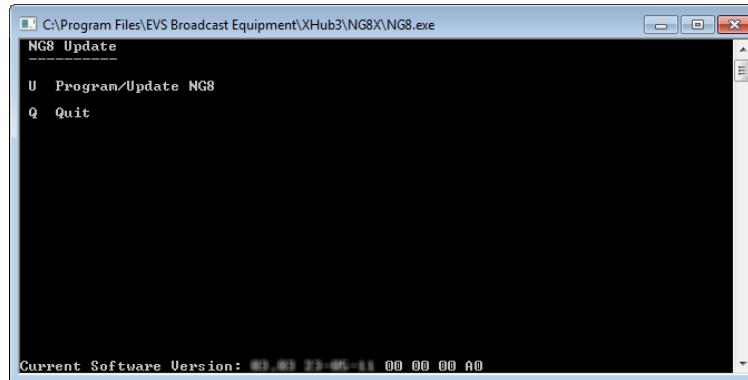


6. Click **Install**.



7. Click **Install**.

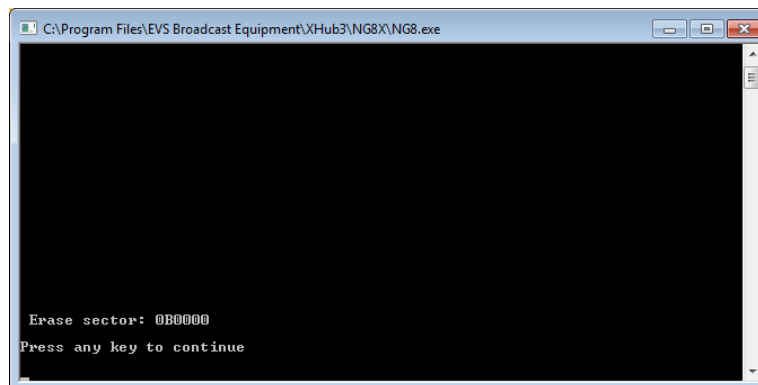
A DOS window opens for update.



The Branch Status LED on the XHub3 front panel shows the software version already installed on the XHub3 device.

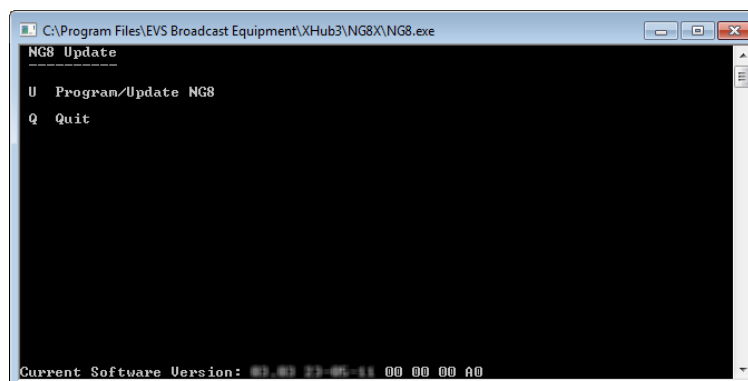
8. Press the **U** key to upgrade the software version (or press the **Q** key to quit without installing).

Once the upgrade is done, the following window opens:

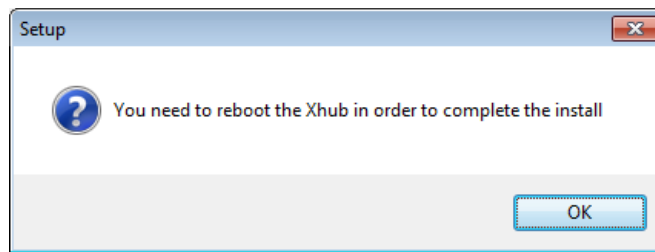


9. Press any key.

The following window appears:



10. Press **Q** to quit.



11. Click **OK** to close the Setup wizard.
12. Shut down and restart the XHub3.





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