

MT467

User Guide

Version 2.0



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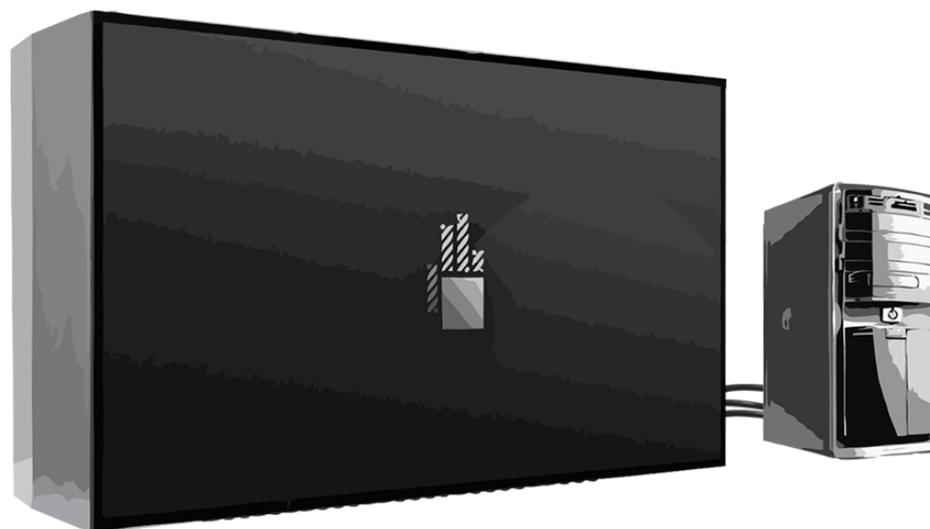
INTRODUCTION

MultiTouch Cells are multi-touch, modular LCD displays intended for (but in no way limited to) retail businesses, advertising, exhibitions, museums, education, and design installations.

'Multi-touch' means that Cells can track and react to several people interacting with them simultaneously. Moreover, the system tracks a person's *hands* instead of points of contact only, further enhancing interactive possibilities. The LCD displays deliver Full HD picture quality, have a long life-span, and need hardly any maintenance.

'Modular' means that Cells can be easily connected to each other to create a single large display array showing interactive content split into the various screens, while reacting to multiple users' touch.

The system welcomes customisation. Work on Linux, Mac, or Windows environments, and create your own tailored apps through the **MultiTouch Cornerstone SDK** or many other supported methods.



A MULTITOUCH CELL CONNECTED VIA
USB, FIREWIRE AND DVI TO A PC RUNNING
THE CORNERSTORE SOFTWARE

OVERVIEW

The most basic configuration required to deploy a MultiTouch Cell consists of the Cell itself and a proper connection (through the supplied USB, Firewire and DVI cables) to a PC or Mac computer running the **MultiTouch Cornerstone** software engine.

BOX CONTENTS

Verify that you have received the following:

- User Guide
- Production Test Report
- Warranty Card

UP-TO-DATE SOFTWARE SUPPORT

Remember that your personal *Username* and *Password* (e-mailed to you during the purchase process) will grant you access to the customers' **DOWNLOADS** section of the **Cornerstone** website:

<http://www.multitouch.fi/developers/>

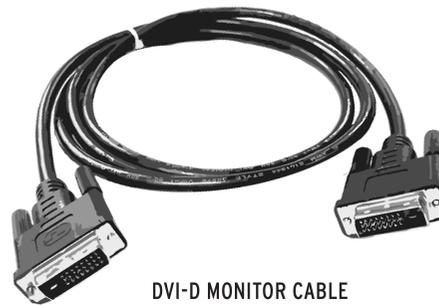
There you can retrieve the most up-to-date software packages for your specific system.

REQUIRED CABLES

- AC Power Cords (US, GB and German)
- DVI-D Monitor cable
- USB cable
- FireWire 400 cable



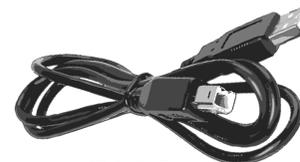
AC POWER CABLE



DVI-D MONITOR CABLE



FIREWIRE 400 CABLE

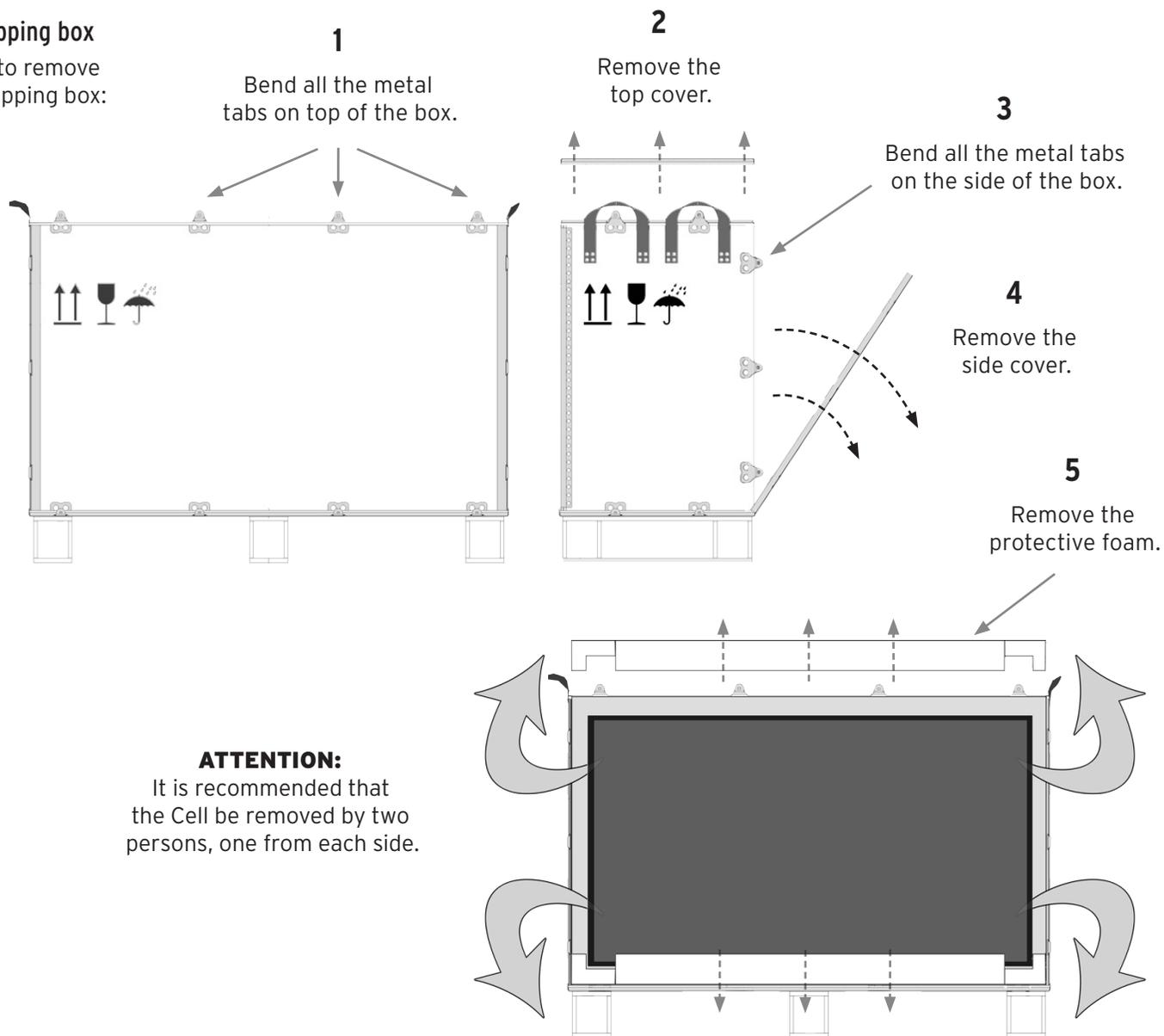


USB CABLE

UNPACKING THE CELL

Removing from shipping box

Follow these steps to remove the Cell from its shipping box:

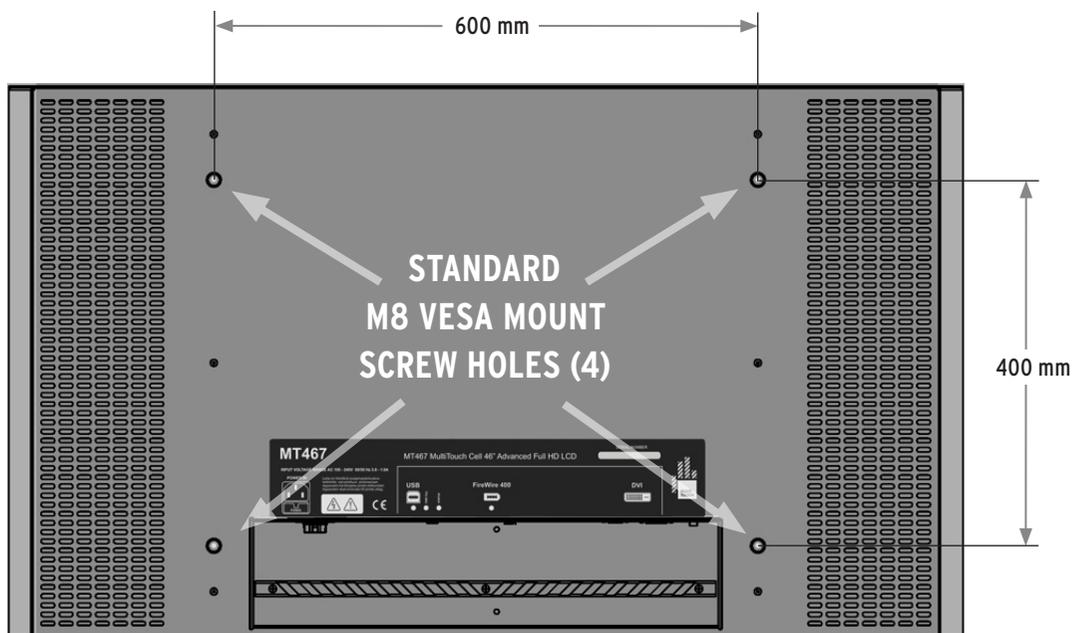
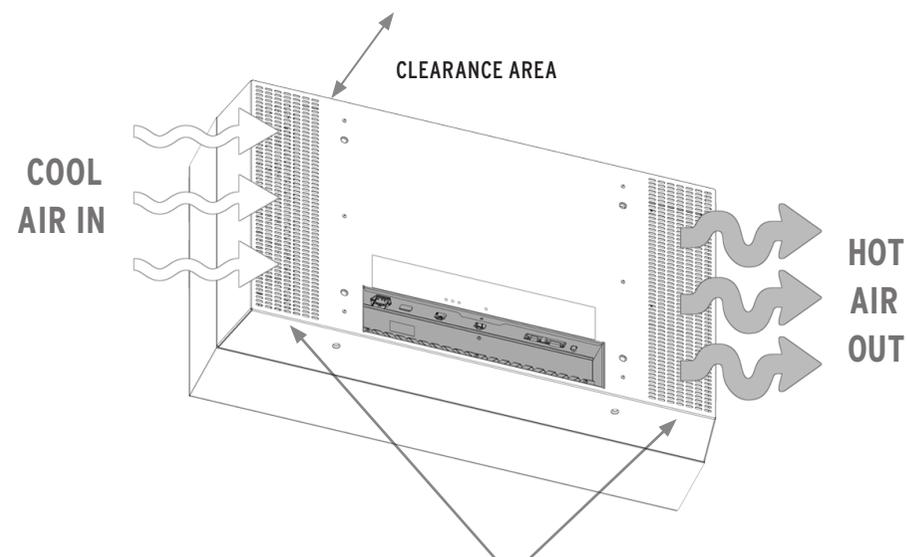


INSTALLING THE CELL (I)

The MT467 display must be installed before use. Choose an installation setup among the following.

VESA Mounting

In concordance with the **VESA Mounting Interface Standard (MIS-F)**, the Cell features in its back panel four (4) screw holes of the VESA M8 MIS-F 600, 400, 8 type. Attach any pedestal or wall mount that conforms to the standard, always observing the requirements for cooling and air ventilation.



ATTENTION: Maintain the ventilation slots free of blockages at all times and leave enough space behind the Cell to allow proper air circulation and cooling between the display and walls or panels:

Single Cell installations
at least 10 cm (4 inches)

Multi-Cell installations
at least 15 cm (6 inches)

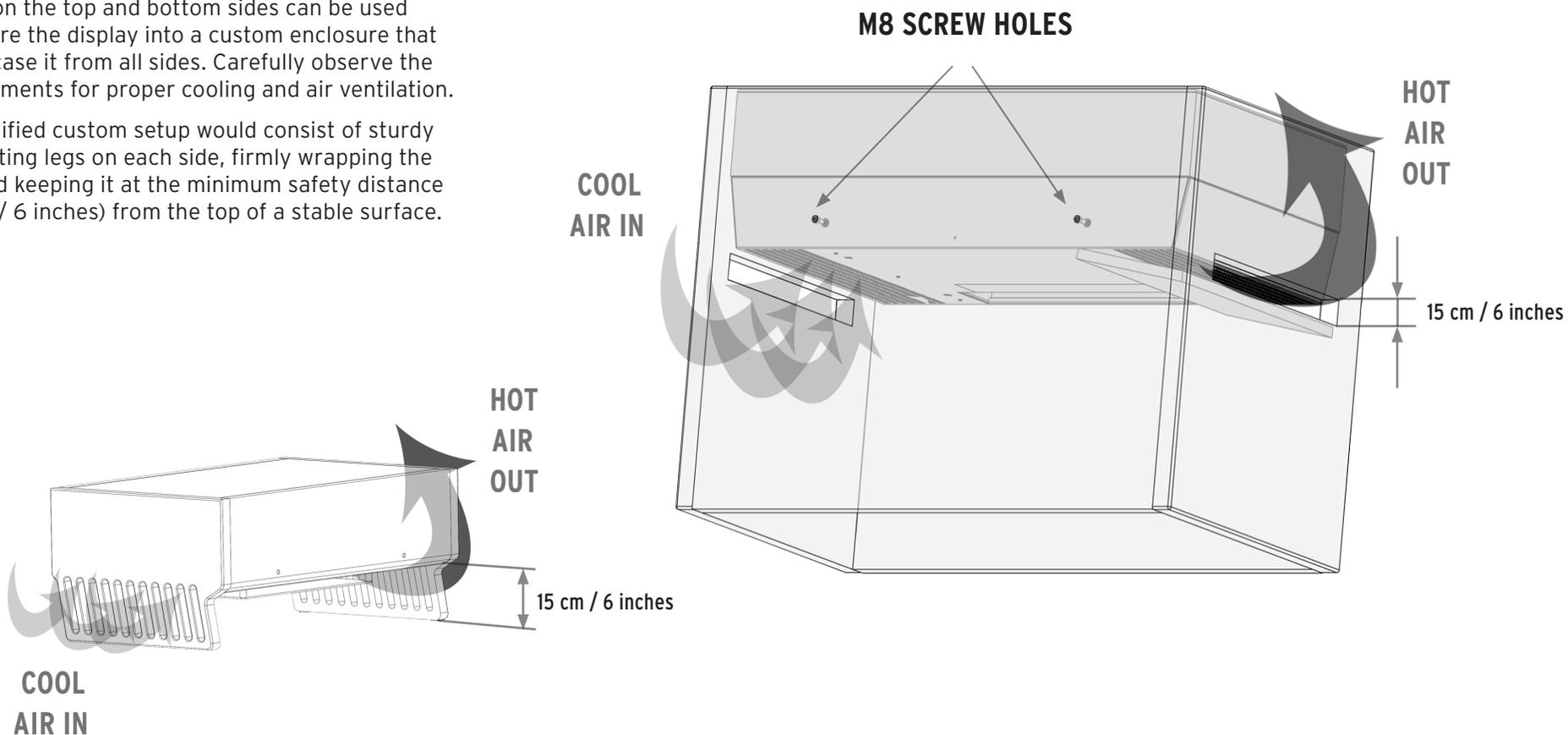
Heat build-up reduces the system's life and can cause hardware failure.

INSTALLING THE CELL (II)

Custom Installation

As an alternative to the **VESA** mount, the Cell can be installed as a table in either horizontal or tilted position. Four screw holes of the M8 type (8 mm) found on the top and bottom sides can be used to secure the display into a custom enclosure that will encase it from all sides. Carefully observe the requirements for proper cooling and air ventilation.

A simplified custom setup would consist of sturdy supporting legs on each side, firmly wrapping the Cell and keeping it at the minimum safety distance (15 cm / 6 inches) from the top of a stable surface.



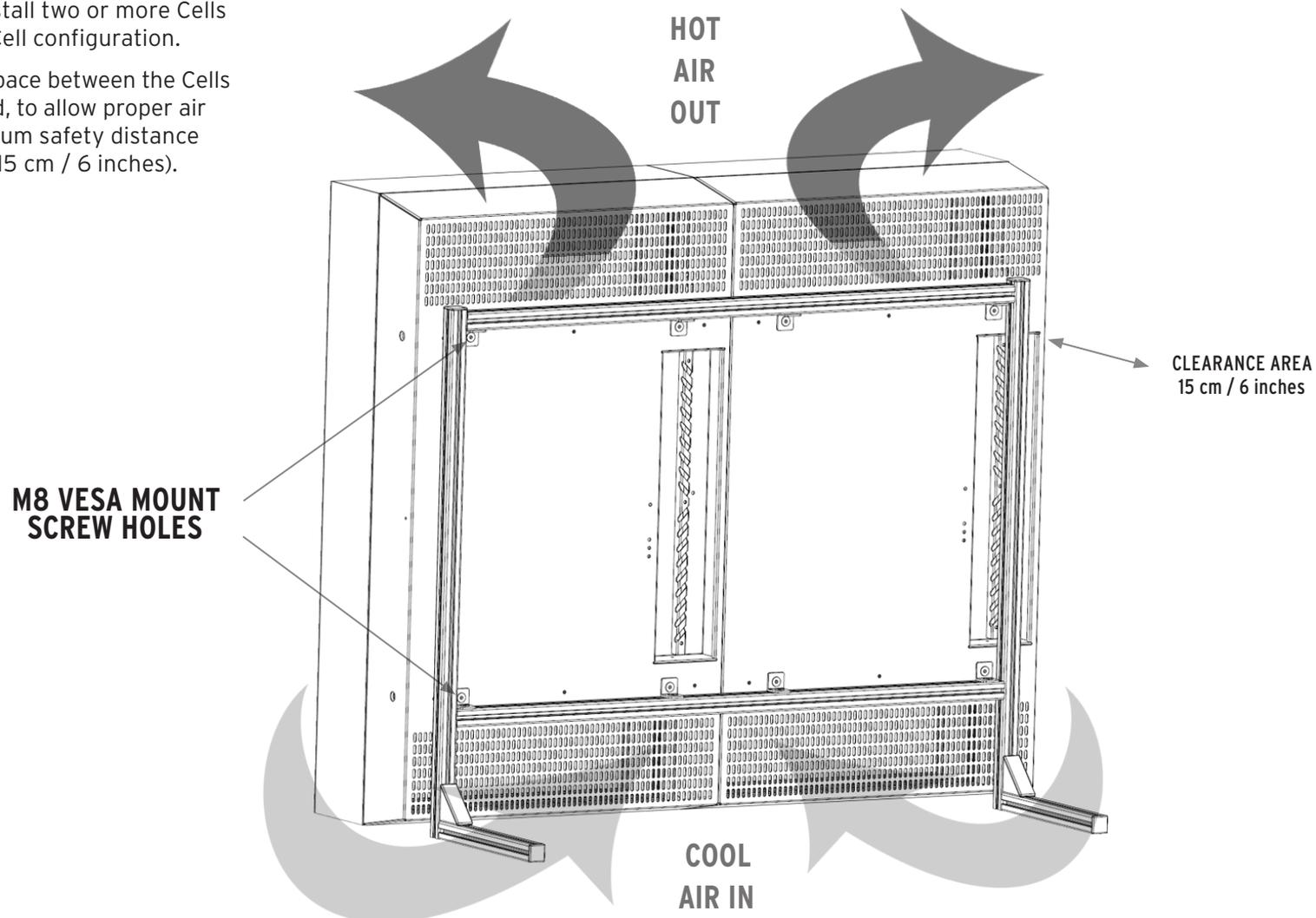
**WARNING: NEVER INSTALL A CELL
INSIDE A FULLY ENCLOSED SPACE!
RISK OF HARDWARE FAILURE!**

INSTALLING THE CELL (III)

Multi-Cell Installation

Using the **VESA** mounts and a custom sturdy metal frame, firmly and securely install two or more Cells together to operate in Multi-Cell configuration.

Remember to leave enough space between the Cells and any walls or panels behind, to allow proper air circulation and cooling (minimum safety distance for a Multi-Cell installation is 15 cm / 6 inches).



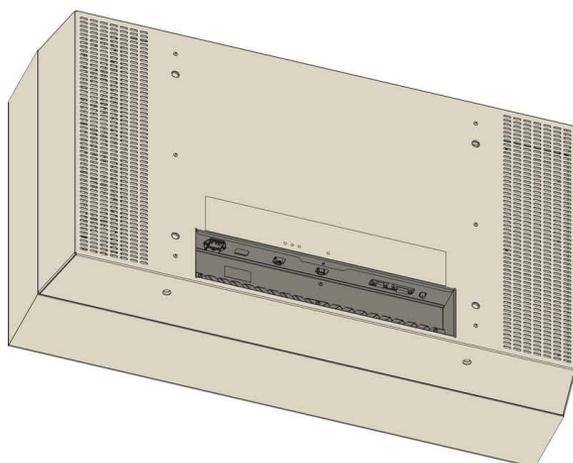
CONNECTING THE CELL

The connection panel at the back of the display holds all the sockets for connecting the Cell to a controlling computer, and to the mains supply.

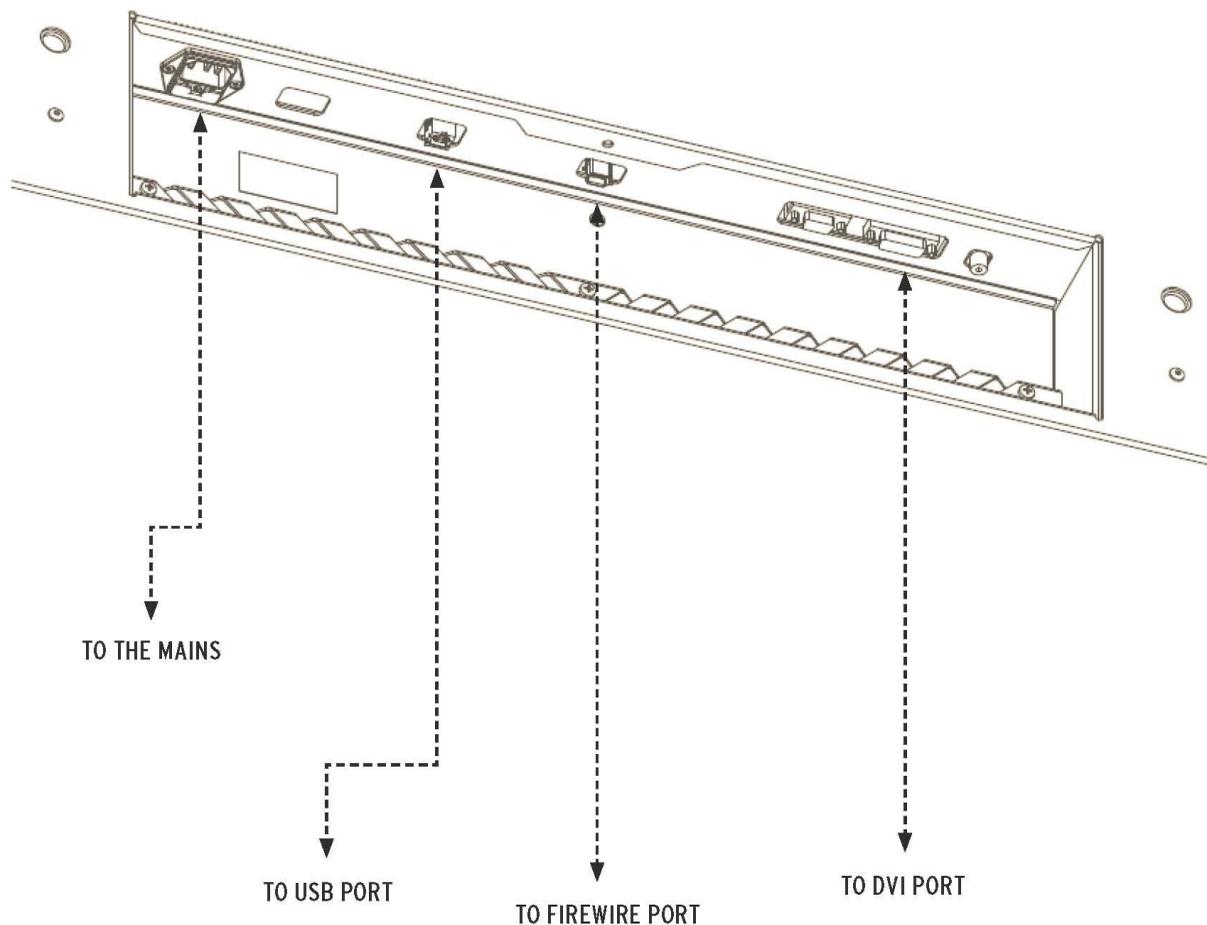
Make the connections with both the display and the computer disconnected from the mains, using the appropriate type of cables.

After all connections are set, connect both the Cell and the computer to the mains supply. The display can only be switched off completely by disconnecting it from the mains.

Ensure there is no stress or tension on any of the connected cables. Route and fasten all cables out of the way to prevent accidents to people moving around the display, and to avoid the mains cable to be tugged free from the socket.



CAUTION
DOUBLE POLE/NEUTRAL FUSING



OPERATIONS GUIDELINE

Observing the following guidelines will ensure an optimum and extended performance from a Cell.

THE PROPER ENVIRONMENT

Choose a well-ventilated, cool space for setting up the display.

Infrared sources (like halogen spots) may harmfully interfere with the tracking sensors, therefore keep the Cell display away from strong spot-light areas.

ATTENTION: AVOID DIRECT SUNLIGHT ON THE DISPLAY AREA (FRONT PANEL)!

GUARANTEEING MAXIMUM PERFORMANCE

Cells are designed to operate normally for extended periods of time (under 20 hours per day). However, notice that static images drawn on-screen for a long while can create “ghosting” (afterimages that are “burnt” on the display and remain permanently).

As prevention, combine the following:

- Run an application that regularly changes the screen's contents, alternating from static images to moving pictures (this helps refresh the display's liquid crystal). Periodical changes in background color and character are also recommended.
- Enable a screen-saver (with moving pictures or a black pattern).
- Generally avoid backgrounds and content with markedly contrasting luminance.

NORMAL OPERATING CONDITIONS

Temperature: 0 - 35 C (32 - 95 F)
Humidity: non-condensing \pm 80 %

Display pattern: a moving picture or a regularly changing animation.

NOTICE:

The Cell's Lifetime specification can be met only under the stated Normal Operating Conditions.

CLEANING THE CELL

The front glass can be wiped clean with a moist soft cloth. If needed, use only mild detergents, never solvents.

THE NEXT STEPS

After physically setting up the MultiTouch Cell, and regardless of the purpose of your particular setup, the next steps will involve:

- installing the **Cornerstone** software on a suitable computer that will control the Cell.
- Perform, if needed, the calibration process.
- Install applications.

Several resources (such as guides and videos) are available to assist you in these tasks. Follow the links indicated on this page to access them.

CALIBRATION

Advanced Cells already include built-in calibration data, therefore initial calibration should not be necessary. If particular lighting conditions require specific calibration of the Cell, please go to:

<https://cornerstone.multitouch.fi/calibration>

ON-LINE RESOURCES

Computer Recommendations

For advice regarding suitable computers:

<http://cornerstone.multitouch.fi/computer-recommendations>

Software Installation

For software installation instructions:

<http://www.multitouch.fi/cornerstone/cornerstone-documentation/getting-started>

Calibration

For calibration instructions:

<http://cornerstone.multitouch.fi/calibration>

Troubleshooting

For troubleshooting instructions:

<http://cornerstone.multitouch.fi/troubleshooting>

Support

For online support on MultiTouch Cells:

<http://cornerstone.multitouch.fi/support-form>

SDK Tutorials

For information regarding the SDK to compile new applications, etc):

<http://cornerstone.multitouch.fi/sdk-tutorials/sdk-tutorials>

THE CORNERSTORE SOFTWARE (I)

The controlling computer connected to the Cell tracks fingers, hands, and marker movements using the display's interactive surface. The next simplified guide will assist you in installing the specific drivers and software according to the operating system your computer is running.

For more detailed steps or trouble-shooting help follow the links indicated on this page.

Overview

Login to the **MultiTouch Cornerstone** website using the username and password emailed to you during purchase, and download the software packages:

<https://cornerstone.multitouch.fi/download/>

Please contact the sales department if you haven't received your username and password, or if you are having difficulties accessing the secure site.

For each platform, two alternative installation packages exist: The *run-time package*, and the *software development package* (SDK). The SDK package includes the run-time and so does not need a separate installation.

(continued on the next page)

THE CORNERSTORE SOFTWARE (II)

Choose the installation procedure for the operating system the computer connected to the Cell is using.

Windows 7 - 32/64-bits

- Download and install these packages for your version of Windows from the **Cornerstone** site:
 - Point Grey** camera drivers, for example **flycapture2.0.3.15_x64.exe**
 - Cornerstone runtime** or **SDK package**, for example **cornerstone-runtime-1.1.2-64bit.exe**
- Copy the MT467 configuration file to the correct location (i.e: from **C:\Cornerstone\share\MultiTouch\Configs\config-mt467.txt** to **C:\Users\Joe\AppData\Roaming\MultiTouch\config.txt**).
- Start **Twinkle**, **Collisions** or any other application under **C:\Cornerstone\bin**. Applications can be launched either by double-clicking them in the file manager, or via the command prompt.

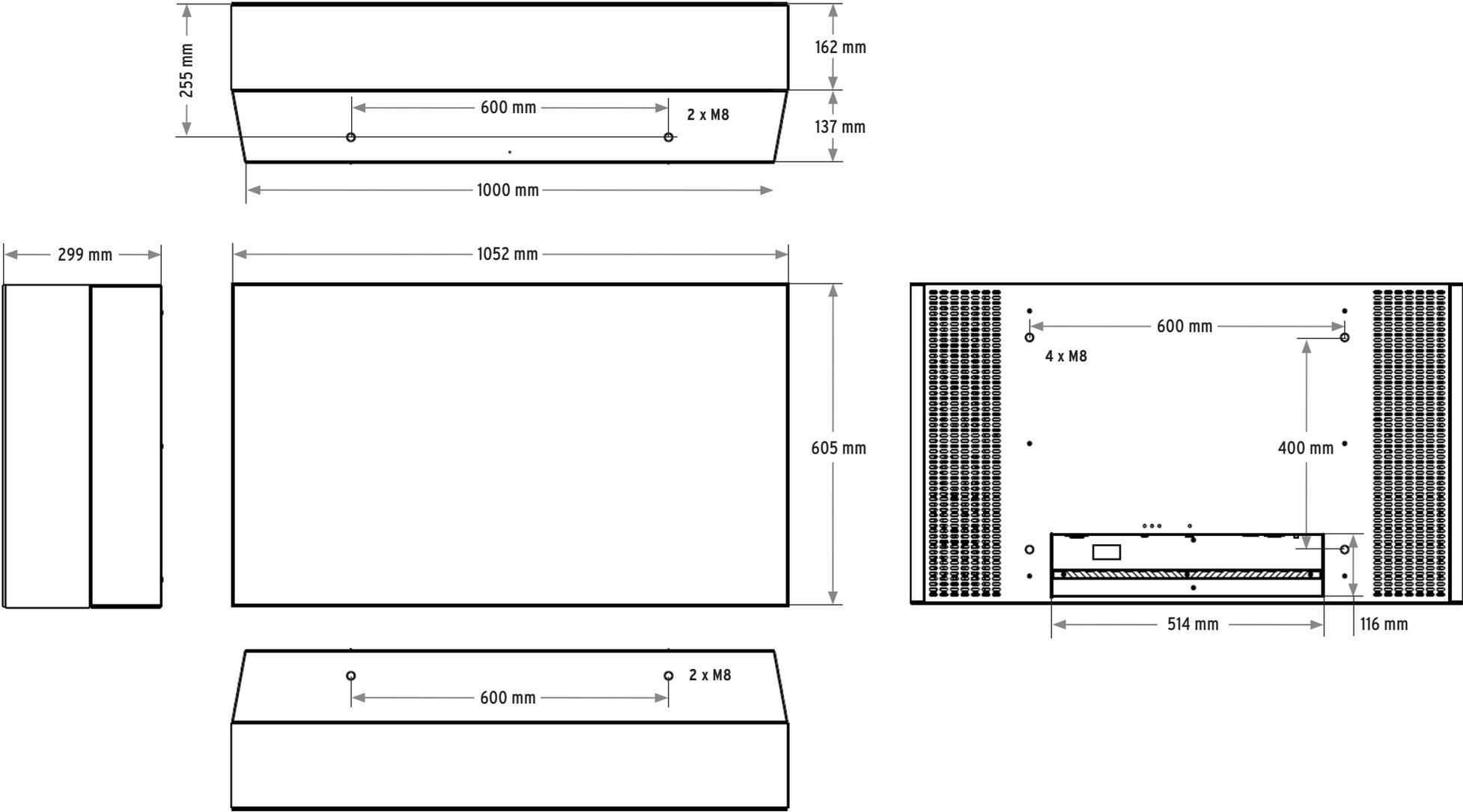
Mac OS X

- Download and install the following packages for your version of OS X:
 - Qt 4.7 libraries from **<http://get.qt.nokia.com/qt/source/qt-mac-opensource-4.7.1.dmg>**
 - FTDI drivers from the **Cornerstone** download section, for example **FTDI Drivers for Intel Macs (2_2_10).pkg.zip**.
 - CornerStone** third-party libraries from the Cornerstone download section, for example **MultiTouch-OSX-externals-2010-06-29.pkg**.
 - CornerStone** runtime or SDK package from the Cornerstone download section, for example **Cornerstone-Runtime-1.1.2.dmg**.
- Copy the MT467 configuration file to the correct location (i.e: from **/Library/Frameworks/MultiTouch.framework/data/Configs/config-mt467.txt** to **/Users/joe/Library/MultiTouch/config.txt**).
- Start **Twinkle**, **Collisions** or any other application under **/Applications/Multitouch/**. Applications can be launched either by double-clicking them in the file manager, or directly from the terminal.

Ubuntu Linux

- Download and install the following packages for your version of Ubuntu from the **Cornerstone** site. The **deb** package installation should be launched via the file manager, which will automatically start the Ubuntu software. It will also download and install all the relevant third-party packages.
 - Custom version of the FFmpeg library, like: **multitouch-ffmpeg_23005-1_amd64.deb**
 - Cornerstone runtime, or SDK packages, like: **cornerstone_1.1.2_amd64.deb**
- Copy the MT467 configuration file to the correct location (i.e: from **/usr/share/MultiTouch/Configs/config-mt467.txt** to **/home/joe/.MultiTouch/config.txt**).
- Start **Twinkle**, **Collisions** or any other application under **/usr/bin/**. Applications can be launched either by double-clicking them in the file manager, or directly from the terminal.

MULTITOUCH MT467 DIMENSIONS



MULTITOUCH MT467 SPECIFICATIONS (I)

DISPLAY SPECIFICATIONS

Display Technology	TFT LCD
Display Size	46" 16:9 Wide
Native Resolution	Full HD 1920 x 1080
Display Colors	16.7 million
DisplayActiveArea	1018mm x 573mm
Pixel Pitch	0.530 mm
Pixel Response Time	8 ms gray-to-gray
Brightness	300 CD/m2
Contrast Ratio	3000:1
Picture Frame Rate	60 Hz
Backlight	LED Matrix Array
Viewing Angle	178

TOUCH SENSING HARDWARE

Touch technology	Optical, diffuse infrared through LCD
Amount of cameras	2 hardware-synchronized cameras
Camera Interface	IEEE 1934, (FireWire 400)
Camera Type	B/W with IR pass filters
Tracking Speed	Up to 100 Hz
IR Source	IR LED Array
IR Wavelength	850 nm

TOUCH SURFACE

Display Safety Glass	Tempered 4mm Optiwhite Glass covering whole front surface
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INTERFACES

Video Input	DVI-D, VGA, Composite
Control Input	USB B
Camera Connector	IEEE 1934 (FireWire 400) 6 pin
Power Connector	IEC C14

ELECTRICAL SPECIFICATIONS

Power Supply	100-240 VAC, 50/60 Hz
Power Consumption	300 W typical, 400W max

TOUCH DETAILS

Tracking Software	MultiTouch Cornerstone Engine included (installed on a connected computer (2))
Touch Input Types	Single finger, multiple fingers, single hand, multiple hands and users, objects with optical markers Click, hold and drag

TOUCH DETAILS

Hand Recognition	Each finger identified to certain hand
Object Recognition	Supported with 2D fiducial markers
Number of Simultaneous Touch Inputs	Unlimited (3)
Number of Simultaneous Users	Unlimited (separate hands) (3)
Positional accuracy	5 mm
Relative accuracy	0.5 - 1 mm
Touch Latency	15 ms typical (4)
Tracking Data	Low level C++, TUIO,
Outputs/APIs	XML stream, Windows 7 Touch
Operating System Support	Windows 7 Touch, Linux, Mac OS X
Development Environment Support	Most major programming languages and environments (5)
Software Development Kit	Cornerstone SDK available for C++/OpenGL and Flash/AS3
Stackability	Up to 14 Cells can be connected to run a single Multitouch application (6)

MULTITOUCH MT467 SPECIFICATIONS (II)

ENVIRONMENT SPECIFICATIONS

Operating Temperature	0 to +35 degrees C
Storage Temperature	-10 to +60 degrees C (7)
Relative Humidity	Non-condensing 80%

DIMENSIONS AND WEIGHT

Physical Dimensions	Width 1052 mm / 41.42 inches
	Height 605 mm / 23.82 inches
	Depth 299 mm / 11.77 inches

DIMENSIONS AND WEIGHT

Bezel width	17 mm / 0.67 inches
Weight	37 kg / 81.6 lbs
Color	Black
Shipping Dimensions	tbd
Shipping Weight	tbd

DISPLAY MOUNTING

VESA Mount	MIS-F 600 x 400, 4 x M8
Mounting positions	Vertical Horizontal Angled position Table position Display Array (2-14 Units)

COOLING

Cooling system	Forced Air
Convection method	Low Noise Variable Speed Internal Fans
Noise Level	15 - 25 dBA

MISCELLANEOUS

Agency Approvals	CE
RoHS Compliant	Yes
Expected Life-time	Over 60,000 hours
Warranty	1 Year

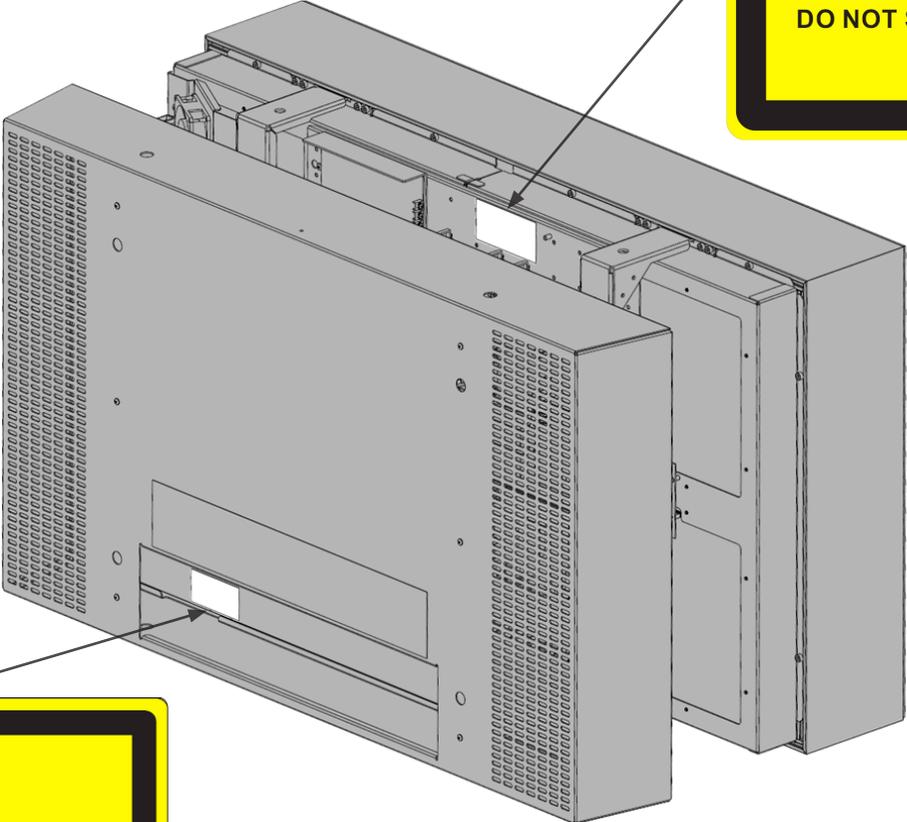
SALES PACKAGE CONTENTS

Display Unit	MT467
Power Cords	5 m, EUR, US, GB
Digital Video Cable	DVI-D 5 m
USB A-B Cable	5 m
FWire IEEE 1394 6/6 pin	4 m
Product Manual	English version
Warranty Card	
Quick Start Guide	

NOTES:

1. When used with MultiTouch Cornerstone tracking software.
2. Computer not included. See requirements at <http://cornerstone.multitouch.fi/computer-recommendations> for more information.
3. Practically limited by how many people can fit next to a display array.
4. Measured from touch to processed tracking data output in the computer. Overall latency is higher, but depends on the computer, operating system and application used.
5. See Cornerstone data sheet for more details.
6. See Compatibility chart for details.
7. Allow at least two hours for temperature normalization before switching on.

MULTITOUCH MT467 WARNING LABELS



⚠ CAUTION
CLASS 2 LED RADIATION WHEN OPEN
DO NOT STARE INTO THE BEAM
IEC 60825-1 (A2:2001)

CLASS 1 LED PRODUCT
IEC 60825-1 (A2:2001)