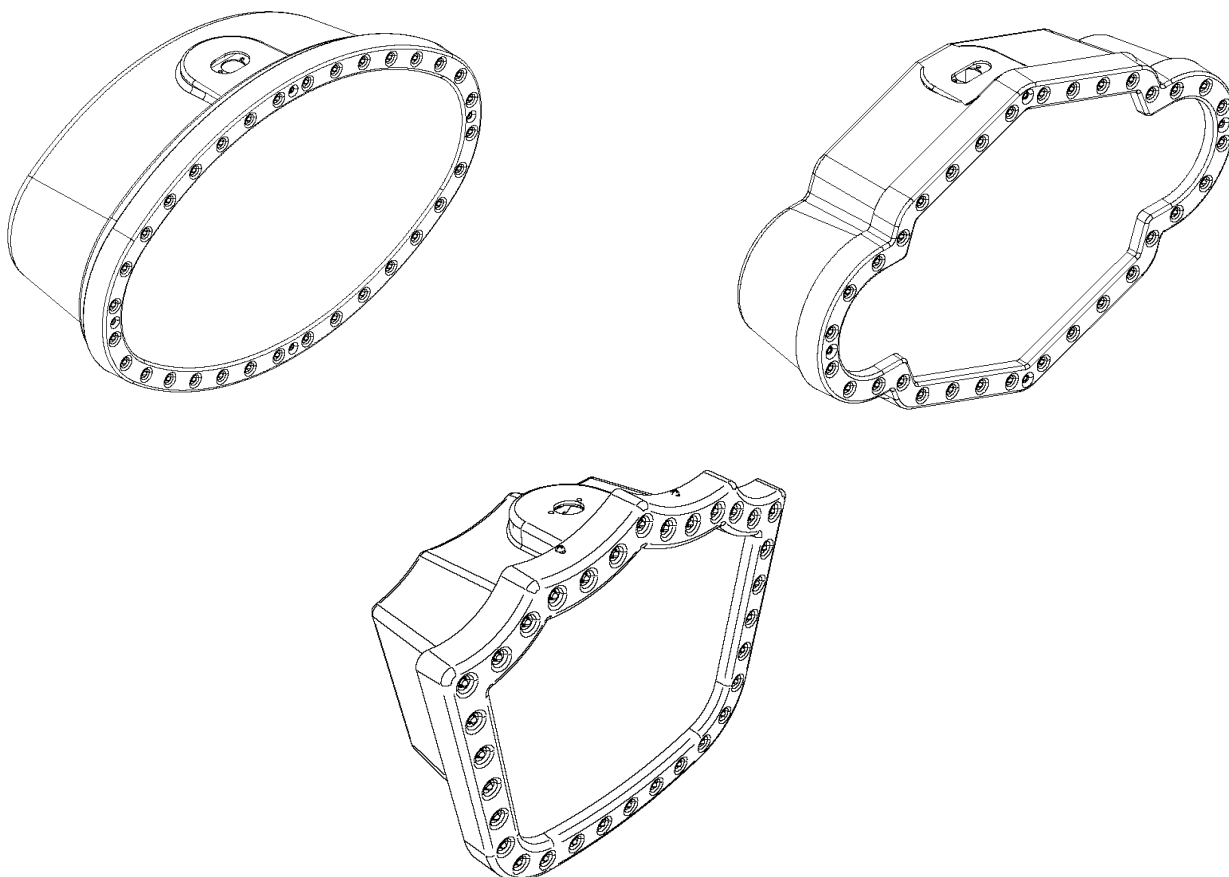




GAMING, AMUSEMENT AND INDUSTRIAL COMPONENTS

Network Topper



Project : Network Topper
Revision : 0.2
Company : Suzo International (NL) BV

Revision History

Revision	Date	Comment	By
0.1	9 jan 2007	Initial Release	R.T.
0.2	8 maart 2010	- Renamed Synchrone Topper to Network Topper - Added PCB product nr 104-0051 - Deleted chapters about network communication	R.T.

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1. Introduction

Stand alone running toppers have the disadvantage that the patterns shown do not run at exactly the same speed. In order to make the displayed patterns exactly the same on a number of running toppers, the toppers clocks needs to be synchronized to each other. This is realized by connecting all toppers to each other. Standard ethernet patch cables are selected to do this. Besides synchronisation of static topper patterns, 2 dynamic patterns using multiple toppers are added.

One topper is now chosen to generate the clock for all other attached toppers.

But what pattern should each topper display at the clock signal?

This is solved by a master unit. The master unit tells each topper which pattern should be displayed on the next clock cycle. The master unit can be one of the toppers in the network.

Making a topper the master topper in the network is done by simply shorting 3 jumpers on the control board inside the topper.

2. Physical network interface

Toppers are physically connected using standard UTP ethernet cables (straight).

These are cheap and good available.

Toppers are daisy chained to each other.

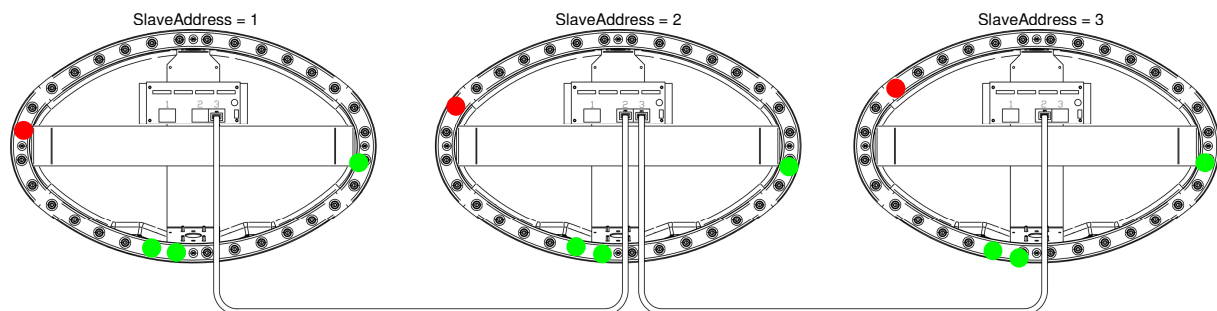


Figure 1: Toppers daisy chained

A topper is usually powered by a gaming machine. Coupling all toppers directly without opto-couplers could give unwanted ghost currents and signal distortions through the topper network interface.

That's why the topper network interface is opto-coupled to the topper electronics. Between the actual data lines and the opto-couplers is a RS485 line driver. This driver ensures good communication over long lines.

The physical network is powered by the master topper, by placing some jumpers on the master topper PCB.

2.1 Topper slave address

Each topper must have a unique slave address. The slave address is shown on the first 8 topper leds for 3 seconds just after the power is applied to a topper. See red dots in figure 1. This address can be changed by pressing the intensity button during power up. By pressing the intensity button again the slave address can be changed (from 1-8). After 3 seconds the topper starts again.

2.2 Master topper

In case all toppers are controlled by a master topper, the topper with the highest slave address must be set in master mode. This is done by placing 3 jumpers on the board. In figure 1 topper with slave address 3 should be configured as the master topper. See 4.1 Master topper jumpers.

2.3 Topper Software version

The topper software version is displayed on the lower half of the topper during power up: Major version on leds 24 to 31 and the minor version on leds 16 to 23. See green dots in Figure 1.

V2.1 is shown here.

3. Topper patterns

There are a few prebuild patterns inside the topper that are shown after each other. Between each pattern the leds blink a few times to indicate the start of a new pattern. There are 2 sorts of patterns: Static patterns and Dynamic patterns.

Static patterns are patterns that are the same on each topper at any time. This patterns are only synchronized among all toppers so that they run equal on all toppers.

Static patterns are:

1. Growing snake
2. Twinkling stars
3. Rotating wheels

Dynamic patterns are patterns that are not the same on each topper at any time, but are created dynamically over multiple toppers.

Dynamic patterns are:

1. Sweep
2. Moving snake

3.1 Fixing a pattern

A pattern can be fixed by pressing the intensity button for a period of 2 seconds. Unfixing a pattern is done by pressing the intensity button again for 2 seconds.

3.2 Intensity control

The intensity of the topper leds can be changed by pressing the intensity button during normal operation for less than a second. 8 levels of intensity are defined. The intensity is shown on the first 8 leds of the topper. If the intensity button is not pressed again for 1 second, the pattern show is displayed again.

4. Connectors

The figure below shows the connector layout.
Note that the text on the PCB may be different.

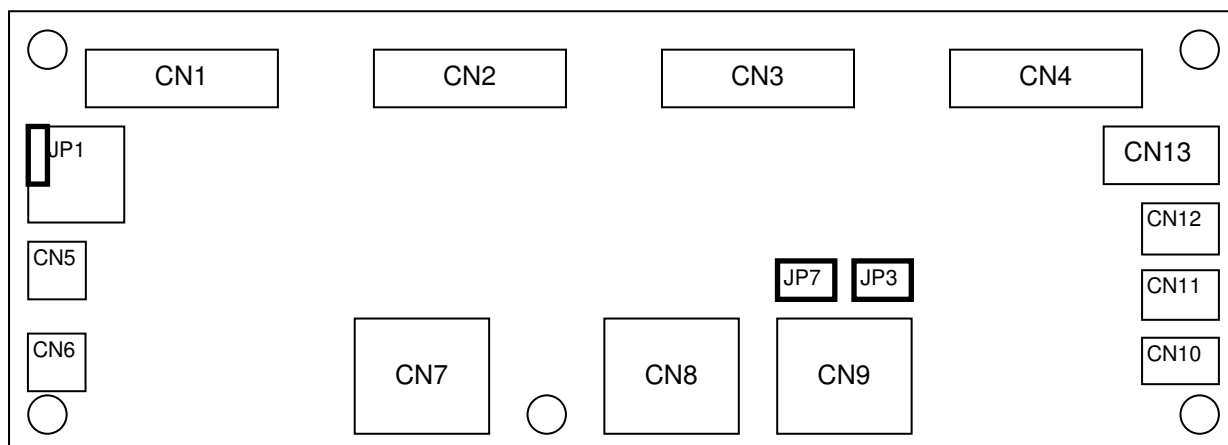


Figure 2: Connector layout

Connector	Description
CN1	Connector for Led 0 .. 7 (upper left)
CN2	Connector for Led 8 .. 15 (upper right)
CN3	Connector for Led 16 .. 23 (lower right)
CN4	Connector for Led 24 .. 31 (lower left)
JP1	uP program connector and also used as a jumper for the Master Topper
JP7	RS485 power plus
JP3	RS485 power gnd
CN5	Connector for external intensity button
CN6	Input for external control signal (example: win pattern control)
CN7	RS485 bus entry
CN8	RS485 bus entry
CN9	RS485 bus entry
CN10	Topper power supply output (pin1 is 12Vdc, pin2 is Gnd)
CN11	Topper power supply input (pin1 is 12Vdc, pin2 is Gnd)
CN12	Topper backligh supply output (pin1 is 12Vdc, pin2 is Gnd)
CN13	Backlight control output (open drain)

Table 1: Connector Description

4.1 Master topper jumpers

Short JP1, JP3 and JP7 to put a hopper in master mode

4.2 External control unit

An external control unit (product nr. xxx) can be ordered that can be connected to CN12, so that the intensity and pattern fixation can be adjusted outside from the topper.

5. Topper Model options



Figure 3: Ellipse model

Order numbers Ellipse models

Gold: 104-05490 (optional adaption kit)
Chrome: 104-05890 (default model)
Black Chrome: 104-05090 (optional adaption kit)

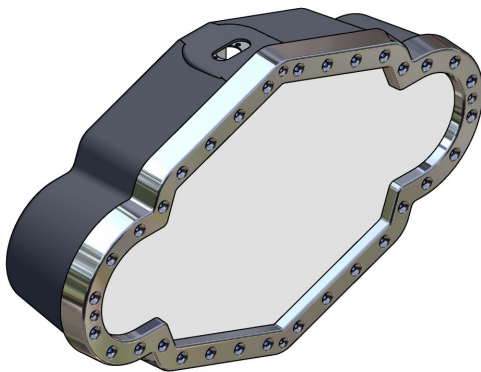


Figure 4: Ringo model

Order numbers Ringo models

Gold: 104-03490 (optional adaption kit)
Chrome: 104-03890 (default model)
Black Chrome: 104-03090 (optional adaption kit)

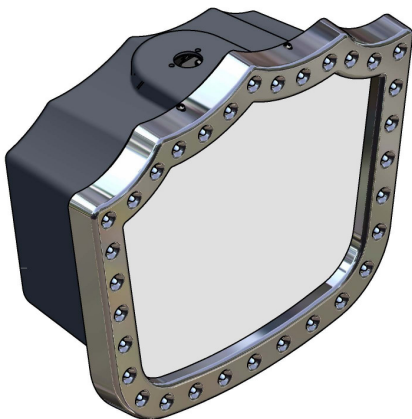


Figure 5: Shield model

Order numbers Shield models

Gold: 104-04490 (optional adaption kit)
Chrome: 104-04890 (default model)
Black Chrome: 104-04090 (optional adaption kit)

6. Topper Base options

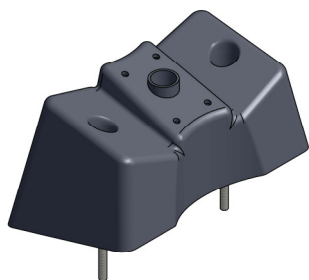


Figure 6: Base UniTopper 15 degrees slanting (104-0010-1)

See Section 12.1 for the exact dimensions.



Figure 7: Base UniTopper R260 curved (104-0015-1)

See Section 12.2 for the exact dimensions.



Figure 8: Base UniTopper flat mounting (104-0020-1)

See Section 12.3 for the exact dimensions.

7. Installation

Important: Shut-off the power from the host machine until any installation work is completed.

Power supply must be 12VDC, 2Amp.

9.1 Connection

Wire color	Description	Pin	Topper connector type	Machine connector type
Orange	Power 12Vdc	1	03-09-2022	
Black	Power Ground	2		
Black	Common Towerlight	1	03-09-2049	
Yellow	Lamp 2nd from bottom	2		
White	Lamp bottom	3		
Blue	Lamp 3th from bottom	4		
Tinned Strap	Earth bonding strap	-	-	Ring Terminal 4mm

Table 2: Wire connection

8. Technical specifications

8.1 Electrical ratings

Parameter	Value	Units
Power Supply	12	Vdc
Current consumption	1.5	A
Intensity levels	8	

Table 3: Technical specifications

8.2 Lamp Assembly

The following lamp type is used in the topper unit:

Art. nr. RE250-008-00 : Light Tube FLS/E 11W 2G7 6500K

The cable assembly for the lamp:

Art. nr. RS623-E17-00 : Cable Assy 2P/2C 500mm

8.3 Ethernet cables

The following ethernet cables are available:

Art. nr. RE078-623-14 : Cable Assy RJ-45 4000mm, Blue

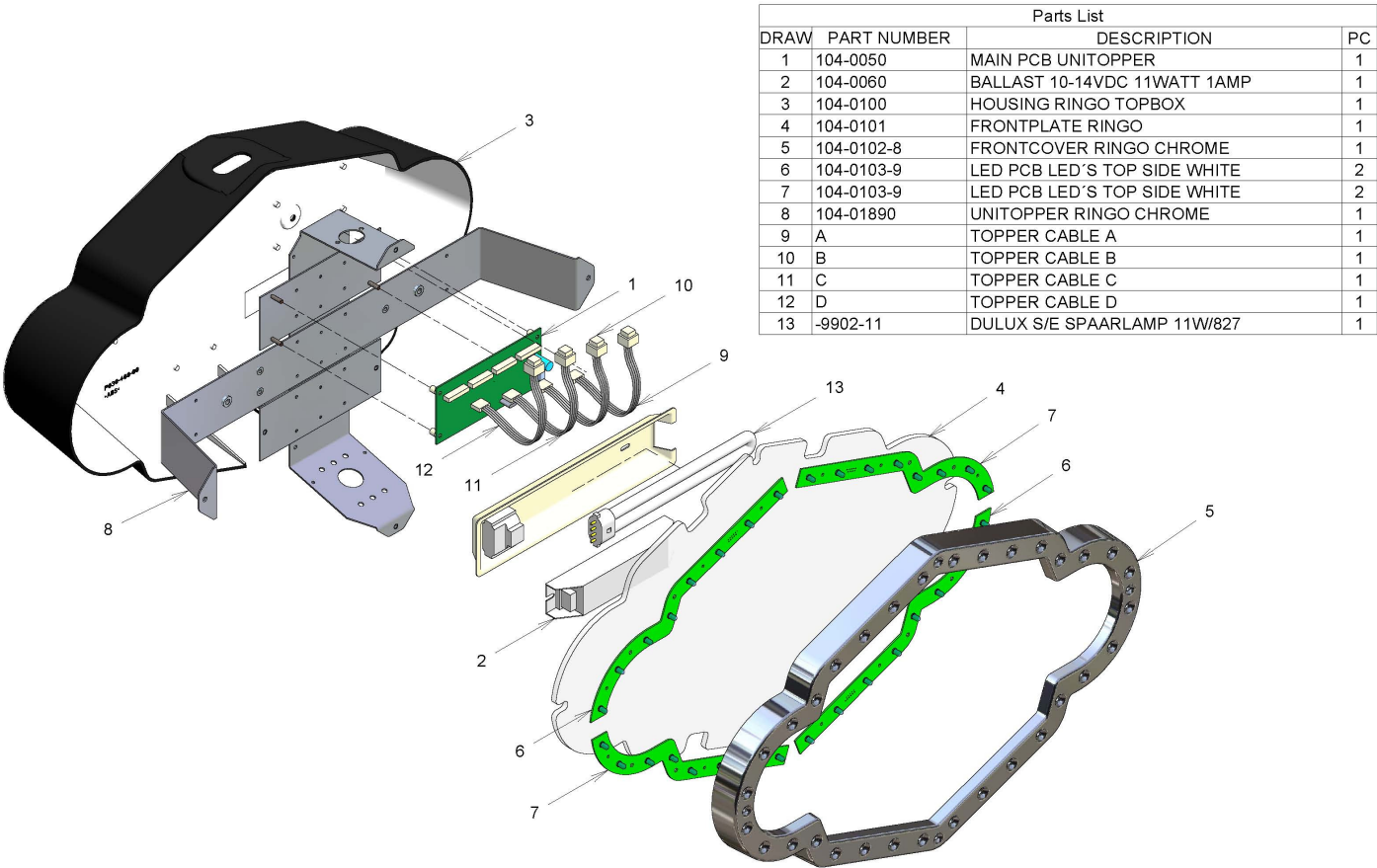
Art. nr. RE078-623-15 : Cable Assy RJ-45 4000mm, Gray

8.4 Remote control

The following part is the remote control switch:

Art. nr. RS623-E17-00 CABLE ASSY 2P/2C 500MM

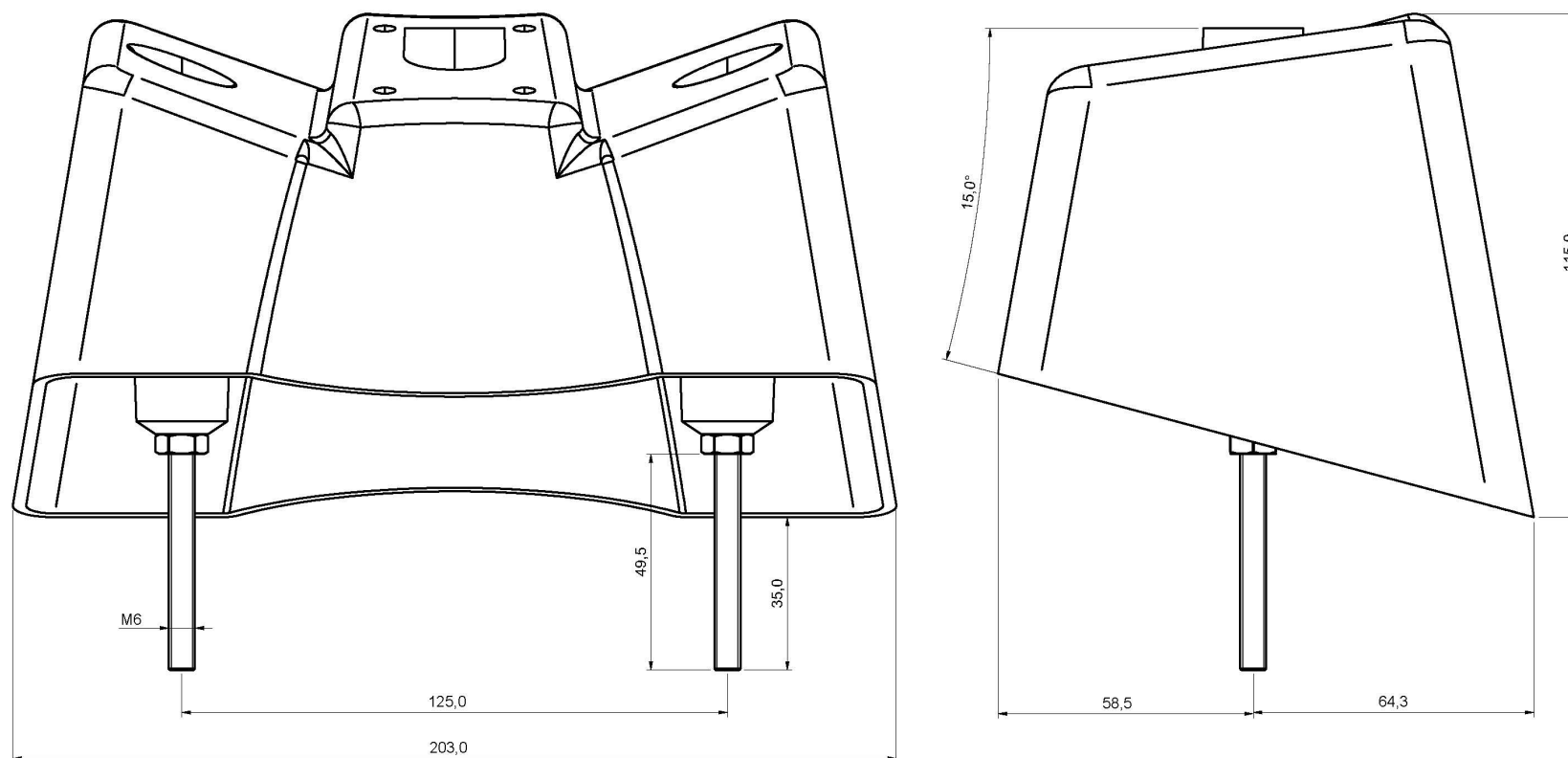
9. Exploded View Ringo Topper



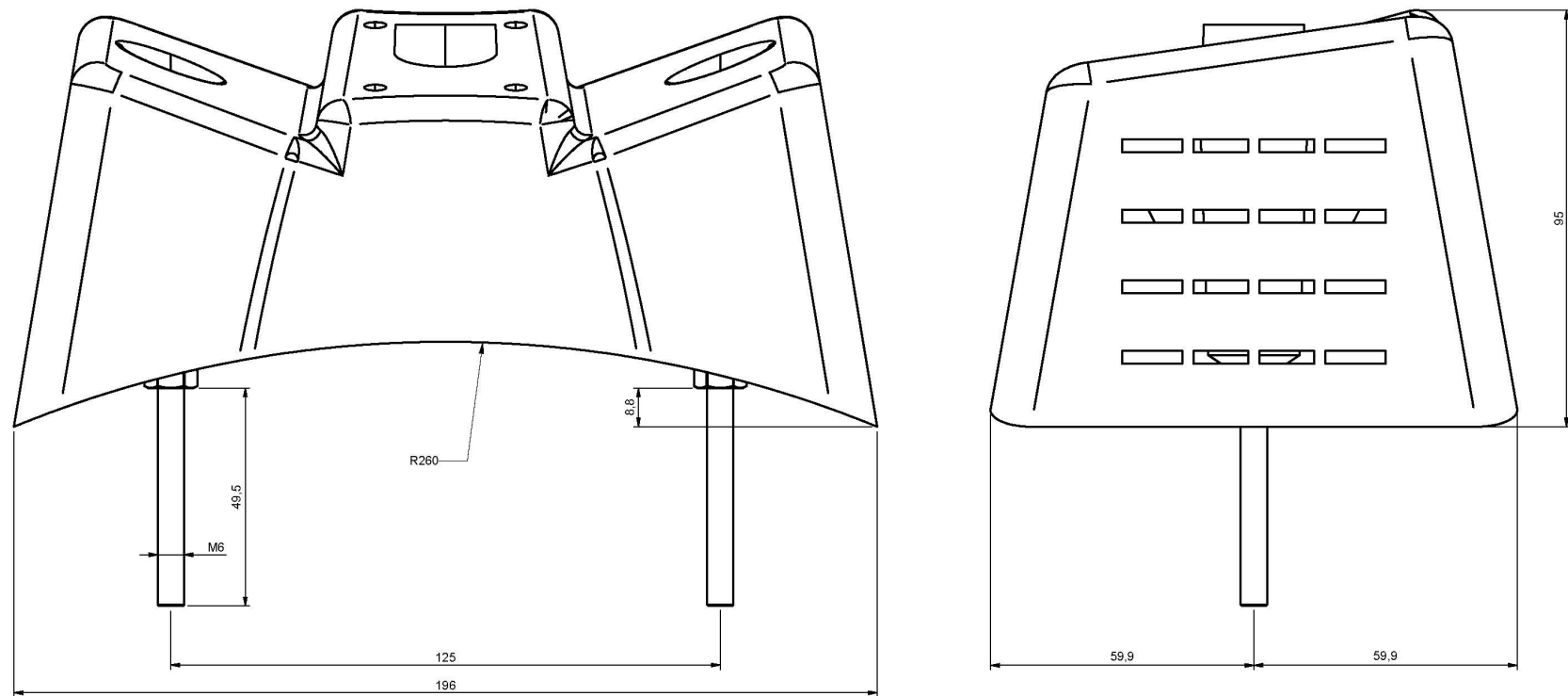
Note: The part number for the PCB with network control is 104-0051.

10. Topper Base dimensions

10.1 Base UniTopper 15 Degrees slanting (104-0010-1)



10.2 Base UniTopper R260 curved (104-0015-1)



10.3 Base UniTopper flat mounting (104-0020-1)

