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DE WIJS
THE ART OF VIEWING

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Design and production of stereoscopic instruments.

User manual of the 10 slide rotary viewer model 2025
25-02-AM
motor advance



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Introduction

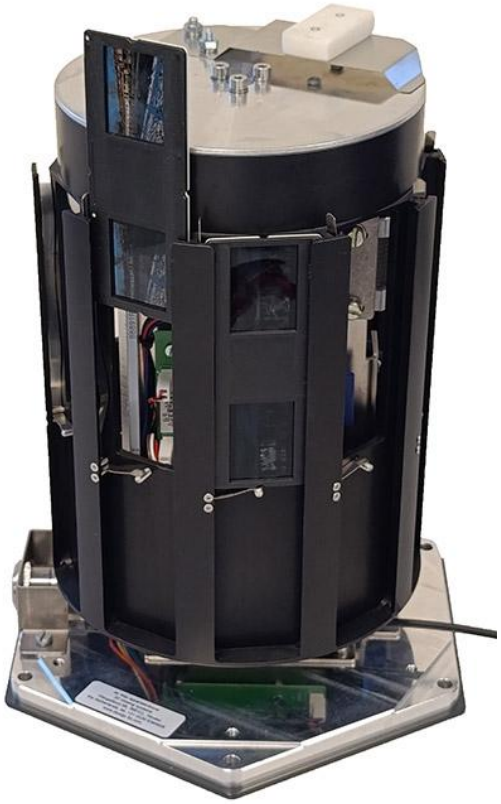
This viewer is the result 40 years of experience in building high quality 3D slide viewers for public use. Each change in the previous models extended the durability, stability and the quality. Especially this 10-slide rotary viewer has been adapted for the demand to show short 3D slide series to large amounts of visitors to be informed.

1. First indications for operational use

1.1 Opening the viewer for exchanging the slides.

- For exchanging the slides you have to remove the right cover of the hexagon housing; see the image. That is the side where the text window and the pushbutton are located.
- Remove the 6 screws.
- Remove the DC adapter plug from the rear side of the drum.
- Now pull gently the right cover out of the main hexagon housing and place it right up on a table.
- You can insert or exchange your slides and text cards. Keep the order and position of the slides in mind that they won't be presented upside down or in reverse order!





Picture 2

1.2 Where to integrate the viewer in your exhibit?

Obviously a spot has been chosen for the viewer in your museum, exhibition or other public environment. Some considerations that might help you to check the situation;

- Keep in mind the height of the viewer. Children and grown-ups both want to look in the viewer! 1.4 metres lens height under an angle of 30º allows most viewers to have access.
- Depending on the popularity of the viewer, people might form a queue. This could cause congestion in narrow pass ways.
- Avoid sunlight to enter the lenses! The lenses will act like burn glasses on the slides. Just a short moment is enough to cause damage to the slide that much, that it needs be replaced. Within 1 day, in worst case, you have to replace all the slides. You can see this on the slide like tiny little spots showing the track of the sun during the day.
- Avoid spotlights to be shinning into the lenses. The slides are not going to be burned but it does shorten the lifecycle of the slide.
- When the viewer needs to be mounted inside some kind of panel, check that there is easy access to the viewer for replacing the slides.

1.3 How do I mount the viewer against a wall?

The 10 slide rotary viewer holds a bracket at the rear allowing to attach the viewer with screws or bolts against a wall.

1. Remove the 3 screws on the top of the bracket (see the image) and the screws at the underside of the viewer to detach the viewer housing off the bracket.
2. Position the bracket against the wall ad fix it firmly with at least 4 screws. The viewer is solid enough to accept the weight of a child hanging on the lens barrels.
3. Provide a way to feed the viewer with power. The bracket is constructed in a way public is unable to reach any cables when the power is provided coming out of the wall behind the frame.

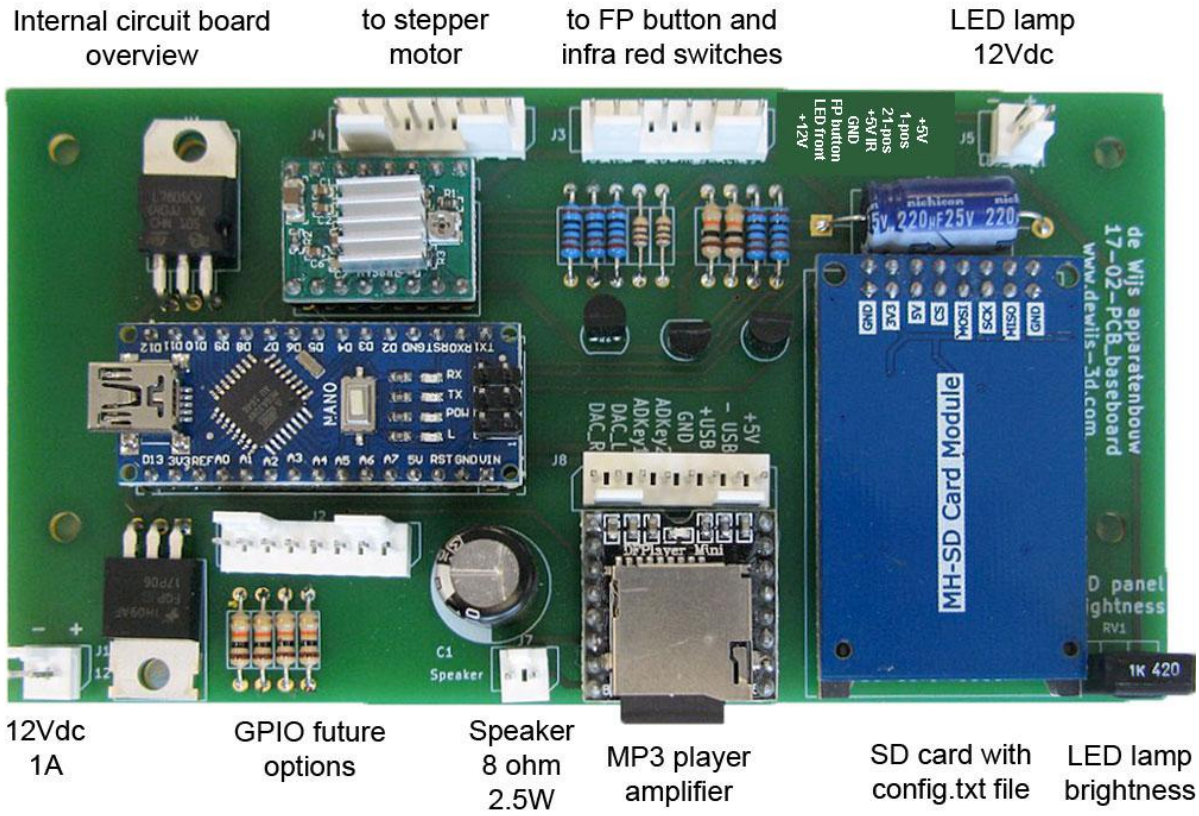


2. Operation

The advance of the slide is done by a stepper motor. A small micro controller allows to be configured for a customized presentation. It holds an Arduino© micro controller with an SD card with presentation settings and a small MP3 player for audible guidance for each slide.

2.1: How to change show settings.

The baseboard of the viewer holds, besides the Arduino, several modules with specific tasks. Bellow an overview is given.



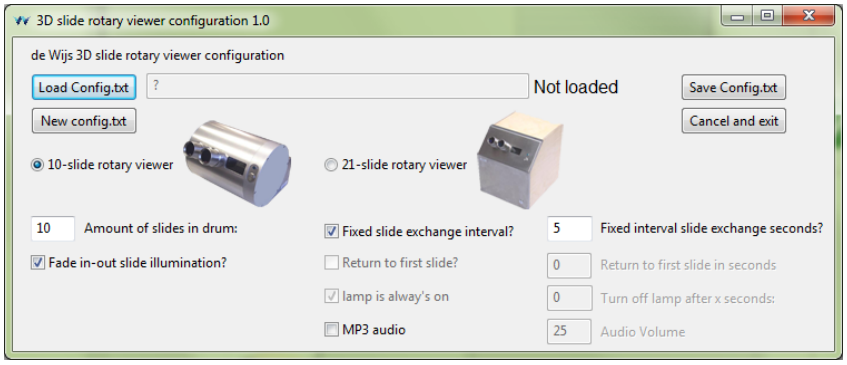
The back light illumination brightness maximum can be set with a small trimmer at the right lower corner of the circuit board.
See right picture to get access with a small screw driver to adjust this trimmer.



The baseboard holds an SD card slot. This SD card's only purpose is to store show settings. These settings are stored by means of a config.txt file in the root directory.
In Chapter 1.1. you can see how to open the viewer to get access to the slide drum as well as she SD card slots. Take the big SD card out of its slot and insert it into a Windows based computer.



When you have inserted the SD card into your computer, browse to the root directory of this SD card where you can see **config.txt** and **rotary_config.exe.** You can edit the config.txt file by using notepad or, more safe, use the rotary_config.exe program to make the correct settings. When you execute this program, it looks like this:



Turning on or off specific functions, automatically disables or enables some other functions because of relevancy in that situation.

2.2: Loading current config.txt.

When starting up rotary_config.exe, it would automatically try to load config.txt in the same directory as the program itself is stored. You will be notified in the program whether it is loaded or not.
You can have the program itself dragged to another location on your computer and execute it from another place. Although this relocation requires the user to manually find the config.txt file by clicking on 'Load Config.txt'.
It is recommended not to relocate the rotary_config.exe file and leave it on the SD card.

2.3 New config.txt.

In the situation that config.txt is not loaded, corrupt or not found in the root directory of the program. You can choose for 'New config.txt'. it creates default settings in the program and, when saving, it creates a new config.txt in its root directory of the program.

2.4 Saving Config.txt

When you are finished editing the show settings. You can press on ‘Save Config.txt’. The config.txt file is stored in the path of the loaded config.txt. After a successful save, you can exit the program.

2.5 What type of viewer do you have.

The program is designed for both the 10-slide as the 21-slide table rotary viewer. Setting to one of these viewers, prevents users to make higher slide number settings then allowed.

2.5.1 Amounts of slides in the drum.

This field sets the amount of slides in the drum. You are allowed to insert les slides then the drum can hold. The system skips empty slide slot positions at the end of a series. With less slides in the drum, requires that all slides are inserted without gaps in the queue.

2.5.2 Fade in-out slide illumination.

For ‘Ease of use’ reasons, the backlight illumination of the slide can be set to fade off and on during slide transitions or set to a hard turn off-on transition.

2.5.3 Fixed slide exchange interval

This will set the interval time of the slide exchange. You can set it between 5 and 300 seconds. It could avoid visitors to stand too long watching images while other wait. However the visitor can interrupt the elapse of time by pressing the front panel button to advance earlier.

2.5.4 Return to the first slide

This function will ‘reset’ the show order for the next visitor. Especially when the drum holds an order of images to tell a story. When the visitor leaves the viewer in the middle of a story it is kind of ‘service’ to return to start position for the next visitor. The setting is accompanied with a duration setting in seconds; the time elapsed after the last button press before it decides to revolve back to start position (slide 1).

2.5.5 Backlight is always on

Activating this setting will always have the backlight of the slide turned on. Except during slide transitions.
Turning this setting off will allow to turn off the backlight after a specified amount of seconds of inactivity which saves the lifespan of the slides. The backlight is also off when the drum is in start position (slide 1).

2.5.6 MP3 audio.

When enabling this feature, the system is able to play MP3 files on the micro SD card. Each slide is associated with MP3 files like 0001xxxx.MP3, 0002xxxx.MP3, 0003xxxx.MP3, etc.
On the baseboard, a 2 pin header allows to connect an 8 Ohm speaker. The tiny on-board amplifier is able to produce a maximum of 2.5 Watts.
This setting is accompanied with an Audio Volume setting.
It can be set between 0-30.

2.5.7 Other configurations

The Arduino micro controller is loaded with a program (firmware) specifically made for the de Wijs viewers. Through the micro USB plug, new firmware can be loaded. Do not upload other firmware or experiments. The Arduino does not have a ‘return to factory defaults’ option. Uploading new firmware requires the Arduino IDE and knowledge about programming or the update tool provided on the website. It is recommended to contact de Wijs to do this job.

4 Data

4.1 Technical specifications of the rotary viewer

Slides:

- Slide frame format; 41x101 mm.
- Maximum picture size; 23x33 mm.
- Compatible with RBT frames, mounted between glass maximum 3 mm. Thickness.
- The drum can hold 10 slides and accompanying text cards.

Optics:

- One lens barrel holds 2 achromatic lenses of ∅ 37 mm. f= 120 mm. each.
- Total focal distance is 60 mm.; magnification: 4.2 x
- Lenses are coated on all sides
- Lens separation is fixed to 62 mm.

Illumination:

- The slide is illuminated by a LED backlight.
- The colour temperature is 4300 Kelvin. R0.85-0.95
- The spectral colour band starts after 400nm wavelength.
- The lamp runs on 12 Volts dc at ± 65mA at full brightness.
- Replacement part: 14-13-LED60x130_4200K at de Wijs (custom made panel)
- PWM fading of light at a frequency of 1Khz.

Mechanics;

- The Housing of the viewer is made of powder coated stainless steel. The lens barrels are made of stainless steel as well.
- The slide drum revolves on ball bearings and does not need additional lubrication.
- A stepper motor using a cock wheel mechanism revolves the drum.
  Replacement part: NEMA17 model: 42BYGHW609, 1.7A, 1.8º/step
- Important screws inside the viewer that keep the drum and frame column assembled, are additionally secured with lock-tide glue.

Electronics;

- The viewer runs internally on 12 Volts and 5 Volts dc. The viewer comes with an AC adapter giving **12 Volts dc. at 1000mA 5.5/2.1**
- Depending on the state of operation, the viewers power consumption fluctuates from 2 up to 10 Watts. The lowest power is at ‘wait state’; no illumination, motor not running and no audio.
- The audible power output J7 is at 8 ohms 2.5 Watts maximum.

4.2 Technical data for maintenance / repair purposes.

Header J1 pin information; Power input.

Pin number	Description	Comments	Leads	In -out
1	Ground	0	White	Pwr
2	Power +12 Volts	12 Volts 1000mA	Brown	In

Header J2 pin information: GPIO / future usage

Pin number	Description	Logic levels	Leads	In -out
1	Analogue in/out A0	-		-
2	Analogue in/out A1	-		-
3	Analogue in/out A2	-		-
4	Analogue in/out A3	-		-
5	Analogue in/out A6	-		-
6	Analogue in/out A7	-		-
7	Ground	0		Pwr
8	Power 5V+	1		Pwr

Header J3 pin information: internal switches / button (17-04-PCB-b_baseboard, 2020 update)

Pin number	Description	Logic levels	Leads	In -out
1	Power +12V	-	Orange	Pwr
2	LED front panel	PWM 0-5V	Bleu	Out
3	Front panel button	0=not pressed, 1=pressed.	Yellow	In
4	Ground	-	Green	Pwr
5	Power IR switches	+5V	Red	Pwr
6	Opto ‘stop’ for all slides	1 = passing slide stop	Brown	In
7	Opto first slide position	1 = first position	White	In
8	Power +5V	-	-	Pwr

Header J4 pin information: Stepper motor

Pin number	Description	Logic levels	Leads	In -out
1	Coil 1A	0-12V	Green	Out
2	Coil 1/A	0-12V	Black	Out
3	Coil 2B	0-12V	Bleu	Out
4	Coil 2/B	0-12V	Red	Out
5	n.c.			
6	n.c.			
7	n.c.			
8	n.c.			

Header J5 pin information; LED backlight

Pin number	Description	Comments	Leads	In -out
1	Ground	PWM controlled	Black	PWM-out
2	Power +12 Volts	PWM 0-12V	Red	Pwr

Header J7 pin information; Audible speaker output

Pin number	Description	Comments	Leads	In -out
1	Speaker con. 1	8 ohms impedance 2.5W max.		-
2	Speaker con. 2	-		-

Header J8 pin information: MP3 player direct control

Pin number	Description	Logic levels	Leads	In -out
1	Power +5V	1		Pwr
2	USB-			-
3	USB+			-
4	Ground	0		Pwr
5	Adkey2	Control switches, analogue levels		In
6	Adkey1	Control switches, analogue levels		In
7	Dac_L	Digital audio left		Out
8	Dac_R	Digital audio right		Out

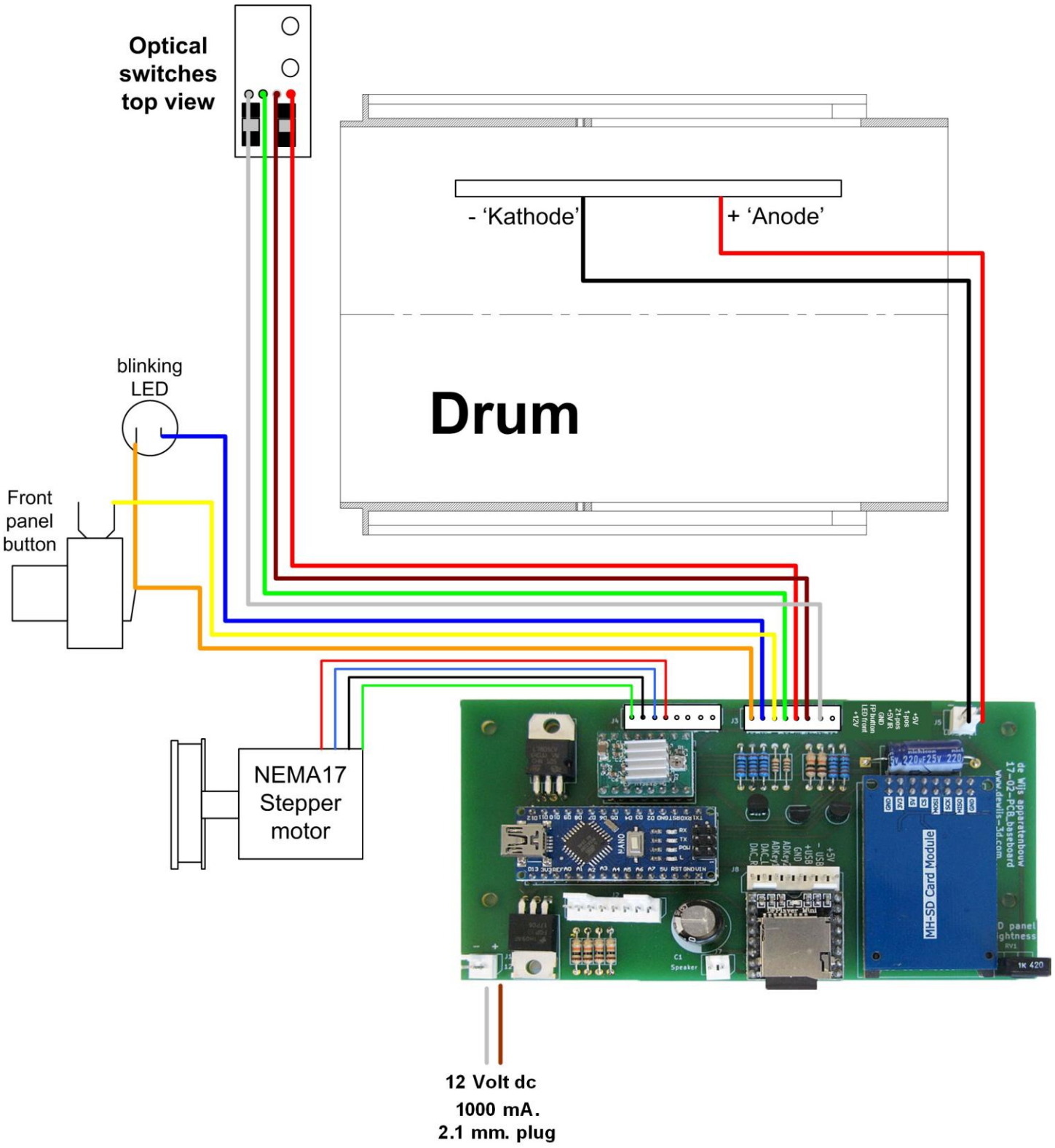
4.3 Electronic component list (2020 update, 17-02-PCB-b_baseboard)

Component number	Value	Description
R1	1K 0.25W	Carbon film resistor
R2	Wire bridge	1K 0.25W swap resistor for lower button LED voltages.
R3	100Ω 0.25W	“
R4	100Ω 0.25W	“
R5	10K 0.25W	10K for OPB620 IR switch or 470K for OPB818 switch
R6	10K 0.25W	10K for OPB620 IR switch or 470K for OPB818 switch
R7	1K 0.25W	“
R8	1K 0.25W	“
R9	10K 0.25W	“
R10	10K 0.25W	“
R11	10K 0.25W	“
R12	10K 0.25W	“
R13	1K 0.25W	“
R14	140Ω 0.25W	“
RV1	1K 0.25W	Variable resistor vertical mount
C1	1000uF 25V	Radial electrolytic capacitor
C2	220uF 10-16V	Radial electrolytic capacitor
D1	LED 5 mm.	White
D2	OPB620	Infrared slotted switch, gap 5 mm.
D3	OPB620	Infrared slotted switch, gap 5 mm.
Q1	FQP17P06	P-channel MosFET TO220
Q2	BC547B	NPN transistor
Q3	BC557B	PNP transistor
Q4	BC547B	NPN transistor
U1	LM7805	Positive voltage regulator 1 Ampère TO220
U2	A4988	Stepper motor driver module with heat sink
U3	DFPlayer	MP3 player module with micro SD and on board amplifier
U4	Arduino Nano	Micro controller
J1	2 pin header	0.1” pin spacing
J2	8 pin header	Molex Male 6410, female 2695, 0.1” pin spacing
J3	8 pin header	“
J4	8 pin header	“
J5	2 pin header	“
J6	SD card reader	for Arduino
J7	2 pin header	0.1” pin spacing
J8	8 pin header	“

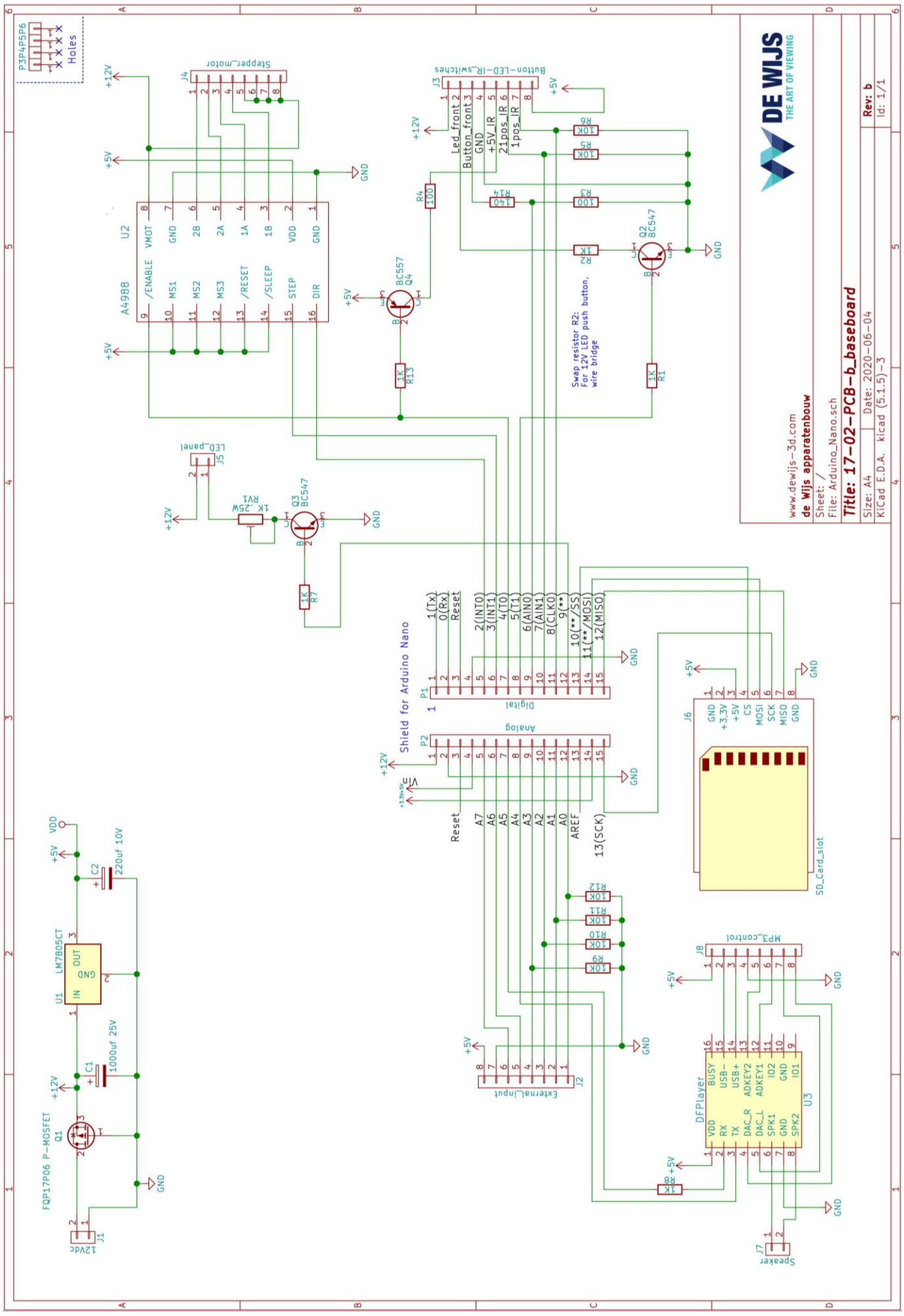
4.4 Mechanical part list for replacing parts (most common)

Achromatic lens	⍉ 37 mm. f= 120 mm. (2 pieces for each lens barrel!)
LED back light	60x130x3 mm. 4200K (custom de Wijs part)
Stepper Motor	NEMA17, 42BYGHW609, 1.7A, 1.8º/step
17-04-PCB-b_baseboard	Printed Circuit Board
14-04-PCB_IR_switches	Printed Circuit Board
C0911VAAA push button	Arcoelectric anti vandal push button. (up to 03-2021)
LAS1-AGQS-11E/B/12V	Tru components anti vandal push button illuminated bleu.
Ac wall socket adapter	12Vdc output 1000mA current output. Plug 5.5/2.1

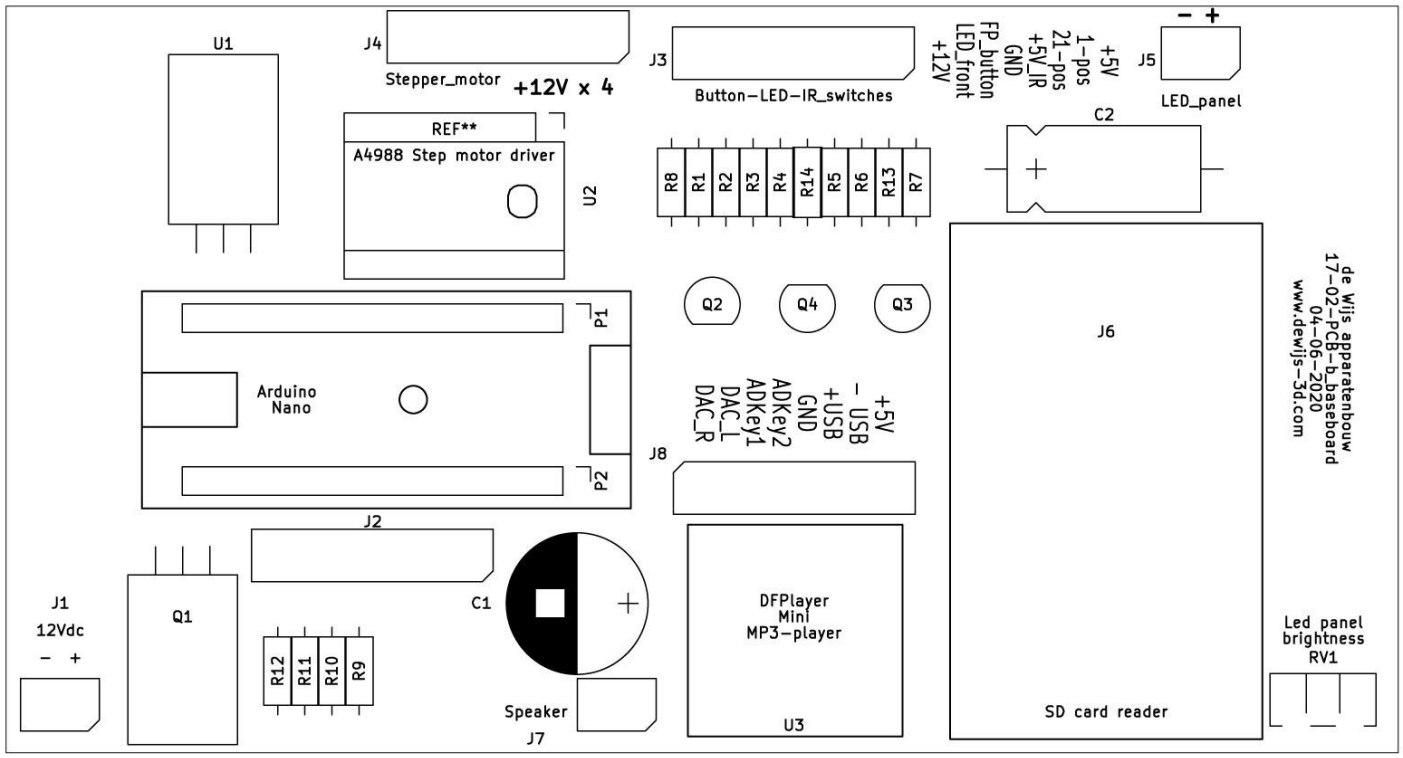
4.5 Internal electrical connection diagram.

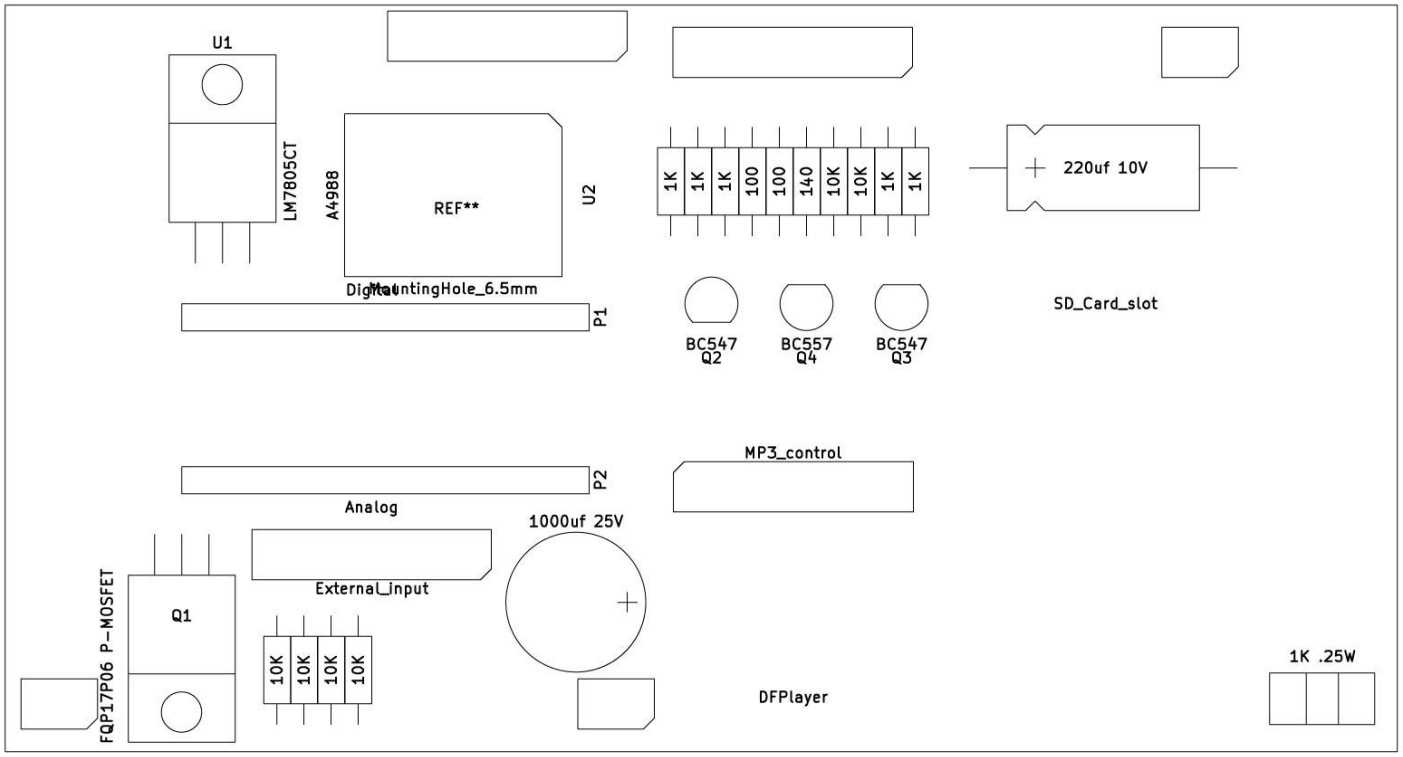


4.6 Electronic schematics (2020 update)



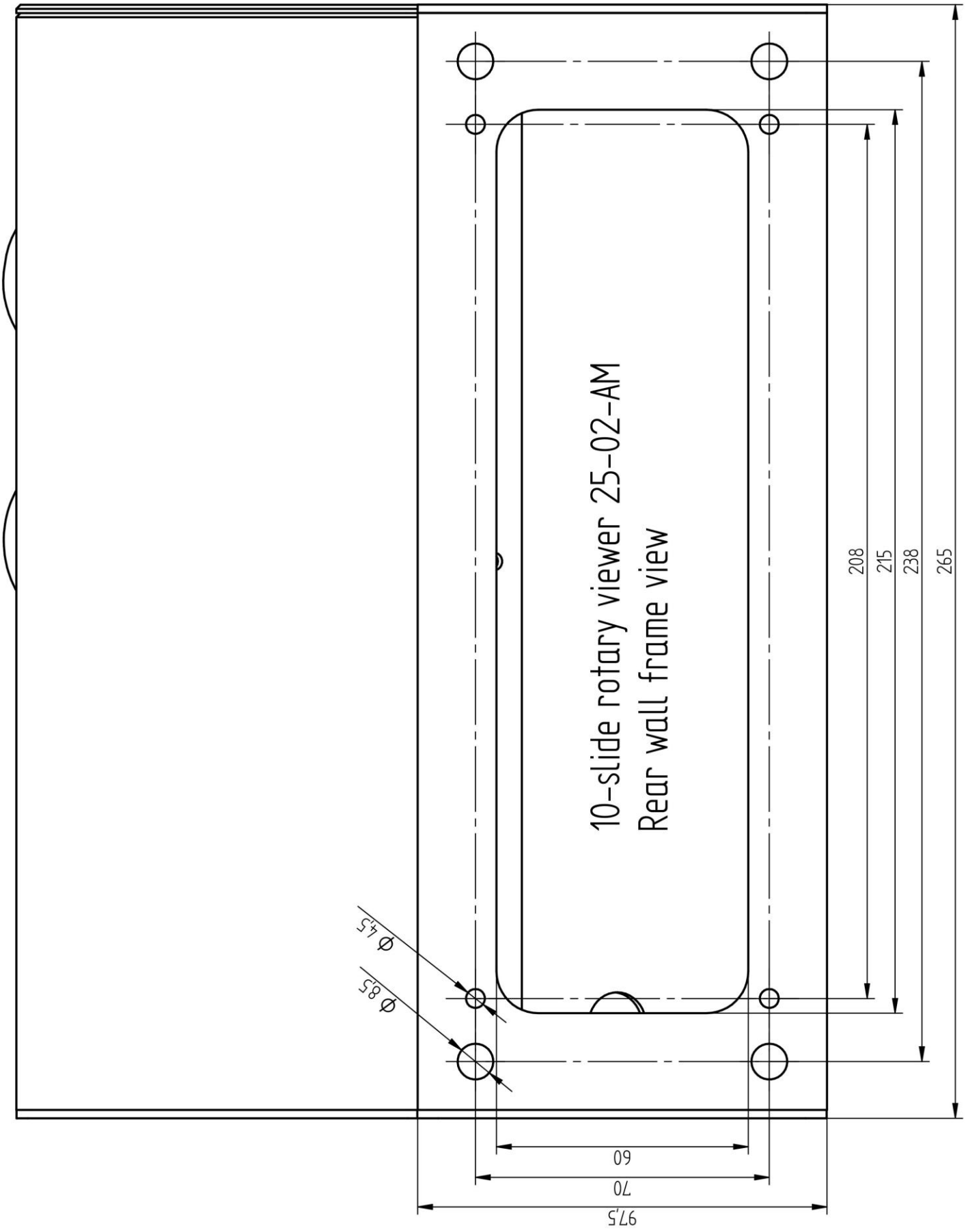
4.7 PCB layout (2020 update)





Top: part number
Bottom: part value

4.8 Rear view wall bracket



4.9 Maintanance

Cleaning Outside:
The viewer's enclosure is made of stainless steel and powder coated. It can be cleaned with 20 ºC water with a mild Ph level of soap using a soft cloth or sponge.
Lenses; gently remove dirt from the lenses as well as in the edges using a soft cloth. Do not use abrasive liquids. With a little wet cloth, you are able to clean the surface of the lenses without damaging the top coating.

Cleaning inside:
You can remove dust from slides using a soft brush or compressed air.
With a soft cloth you can clean the plastic surface of the backlight of the slides.

Mechanics:
The drum of the viewer is driven by a stepper motor which is driving a cock wheel that interlocks with the slide drum. On the left side of the drum, a nylon white block slides along the inside of the viewers enclosure to provide a smooth movement during slide advance.
This nylon block as well as the cock wheel of the motor holds some grease. In time, this might dry up or might be removed when cleaned.
Check if the grease is still doing its work right; clean it and renew it.

To have access inside the slide drum, you need to remove the 3 screws on top of the slide drum, close to the axle. These are fixed with lock- tight.
Only de- assemble the drum for maintenance purpose or exchanging the SD card for the media player.

IMPORTANT;
When replacing the slide drum back on the axle, assure its position for the screws but carefully check the ridge of the drum that drops into the U-shaped infra-red slotted switches. Avoid that it drops outside the U-shape!

Electronics:
Most electronic parts are standard components and wide spread available to replace them.
When the viewer fails in operation, first contact de Wijs to investigate the situation. Most problems can be solved through e-mail support or telephone work-through. Do not ship the viewer in return for repair without consult or directions from de Wijs.