

2021

**ML2000 User Manual
3D-Score 100
(AI Translated)**



Megalink AS

v.21.36

ML2000 Manual

3D-Score 100

(AI Translated)

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1 About Megalink 3D-Score 100

- Optical detection without paper or rubber.
- Detection range: 530mm diameter
- Measuring bullet speed.
- Designed for everything from Air to Hunting ammunition (cal 9.3)

The 3D-Score-100m is part of Megalink's new generation of targets. The target detects the bullet optically and there are therefore no wear parts that affect the precision as on acoustic targets. This dial detects everything from air bullets to high-velocity coarse-caliber bullets. The target can be put in a lift and used on 15m indoor courts if desired. The precision of the dial is also not affected by temperature fluctuations, so the center of the dial remains stable.

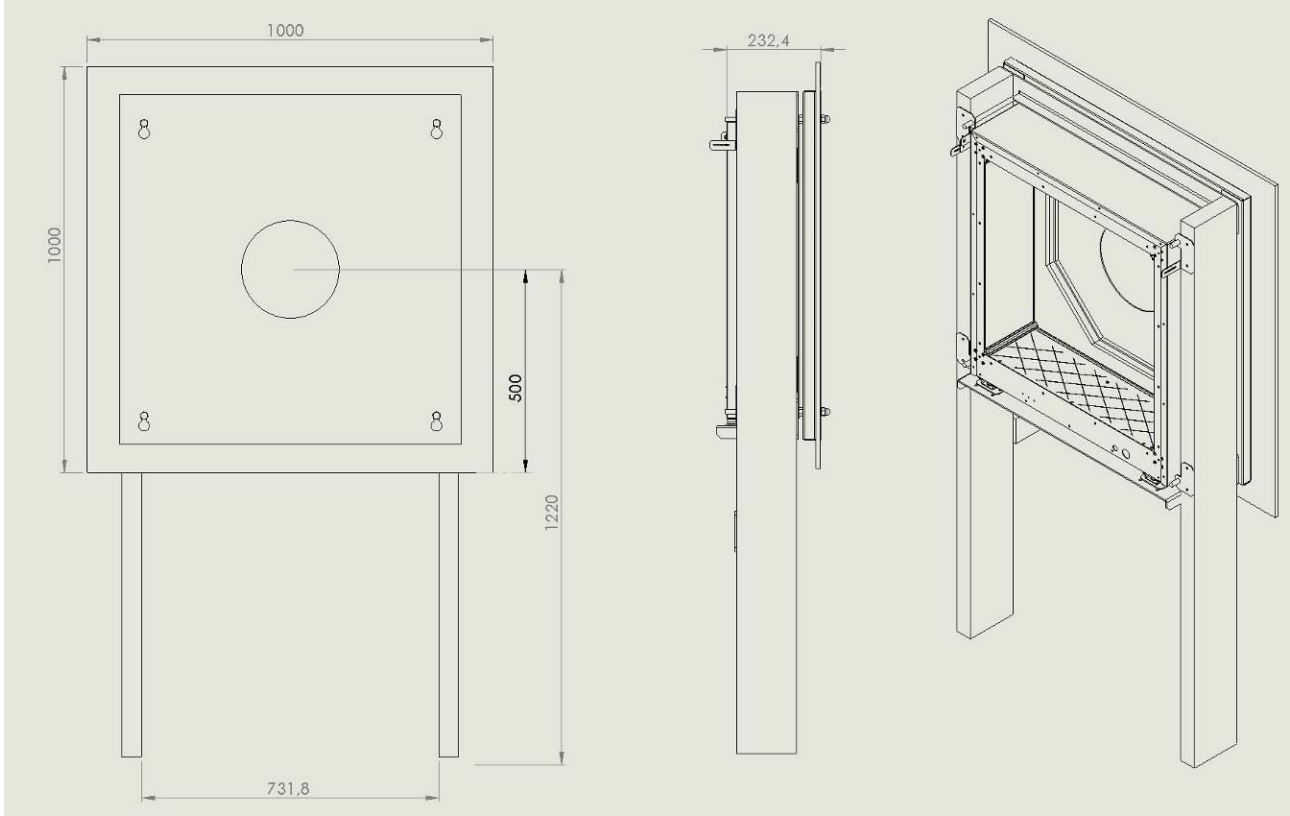
Note: Armour-piercing ammunition must not be used on the 3D-Score 100 meters as the protective plate does not stop this.

1.1 Outdoor use

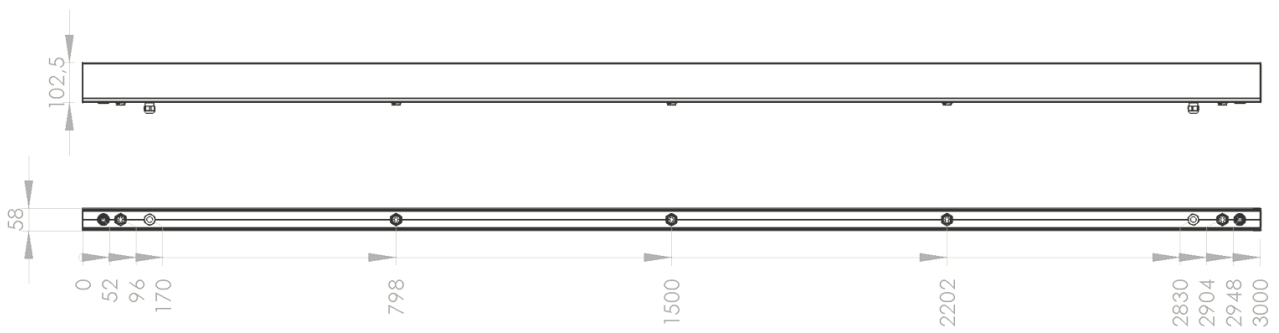
- The target is designed to withstand moisture, but must be protected from direct rain. Therefore, mount the washer under a roof
- Position the dial so that direct sunlight is avoided on sight targets. The target will normally also work with sunlight on target targets, but here sun angles may cause the target not to indicate. Normally it goes well, but this must be tested out and basically it should be placed in the shade. If it works (indicates) in the sun, that's fine.
- The target is an open optical target. The black sighting is an optical illusion. Therefore, make sure that no light enters from behind.
- If the sight beacon is not completely black, this can be achieved by placing some black behind the target. For example, used rubber roller from old targets, possibly shade bullet traps, roof further behind the target etc, this must be tried out on the relevant track

1.2 Goal

1.2.1 Target Unit



1.2.2 Powerlist



2 Fitting

2.1 Generally

The target frame must be mounted firmly to a concrete wall/floor or similar so that vibration in connection with shots does not cause a change of position. The sensor frame is placed inside the frame from the back.

It is important that the target is mounted perpendicular to the stand position of the target in question, both vertically and horizontally

Make sure that cables down from each washer are routed behind bulletproof material

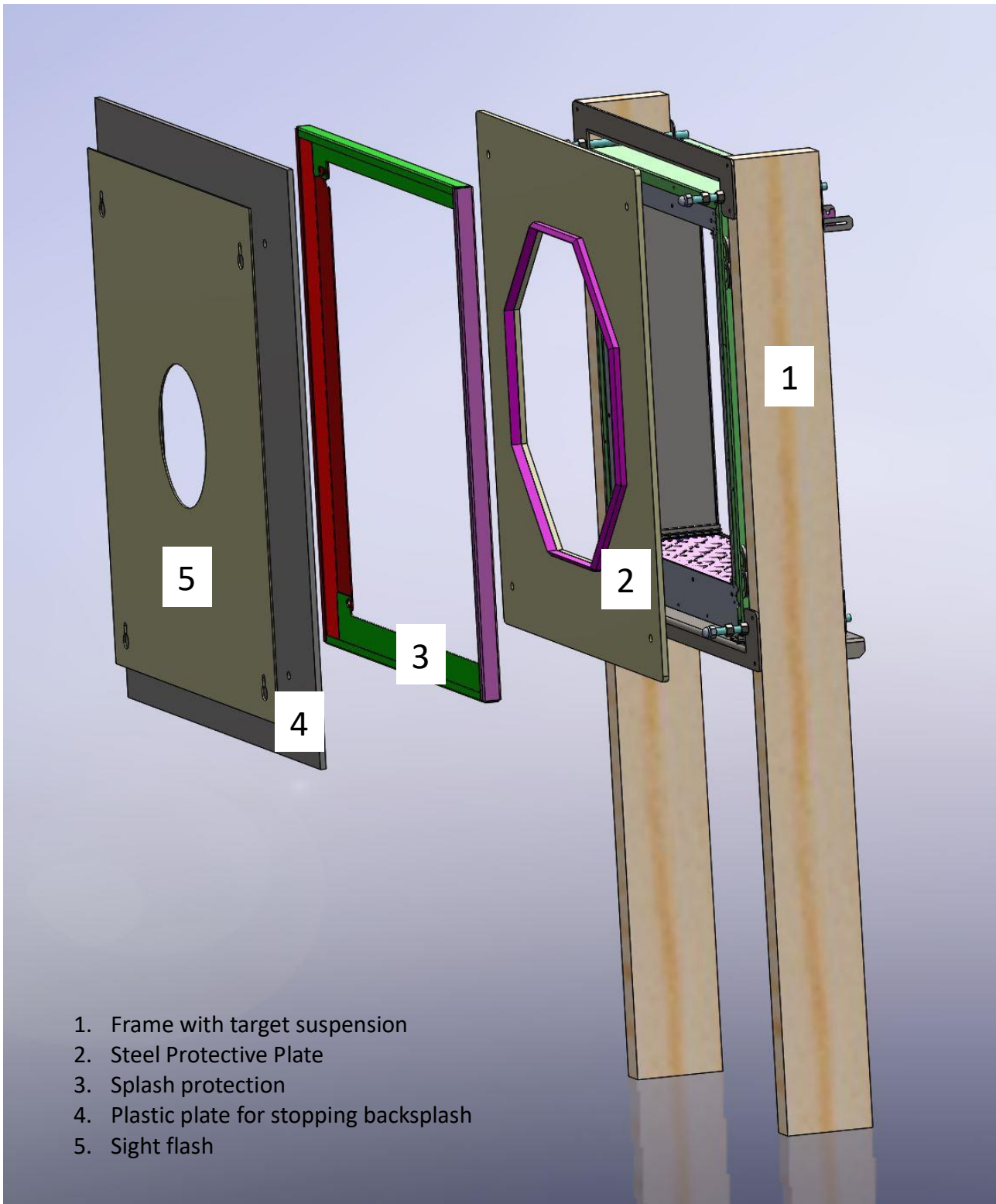
Avoid the risk of splashing into the target when booming outside the target, especially below the target on most tracks.



2.2 Establish black sight flash

In the center of the front target there is a round hole that defines the black sight flash. Therefore, something that is perceived as black must be established behind the album. This can be solved in different ways, depending on how advanced you want to make it. The easy way is to hang rubber bands over a batten behind the targets. In this way, you get 2 layers of rubber that can be shifted and will prevent light transmission even if they are heavily worn. The disadvantages of this are that it creates microplastics and you have got a wear part. If you have a 200m track, you may be able to use worn-out bands from there. To circumvent this, you can create a dark room that encompasses the bullet impact. This can be done with a tunnel for each target that is covered by the steel plate on the target, and which is long enough that the sun does not shine on the impact. The tunnel can be made of decking and black UV-resistant foundation plastic, for example. Or you make a common roof with side walls and a vertical front with holes for each target, which corresponds to black sight lights. A problem can be snow loads and mass movements due to bullet impacts.

2.3 Protective plate and sight flash



2.4 Mounting the power strip/s

Attaches in a suitable place protected against shots below/behind washers adapted to cable lengths to the various washers, and current. More about cabling under section 3.1

2.5 Roofing

The target requires a superstructure of some kind because it must not be exposed to sun or rain. It can withstand the sun in most cases, but when the light comes quite directly from the side, the target can become blocked. It is most vulnerable at the back, because it is completely open.

If the protrusion is not long enough, raindrops can penetrate the opening in the front and create unwanted triggers. This is mainly expected to happen when the target is in a sensitive fine. In production, we test for watertightness at the bottom of the sensor opening (glue the joints along the edges of the plastic plate), but we cannot guarantee that this will last over time. Therefore, we recommend protecting the target from rain, but it will withstand a few raindrops from time to time.

2.5.1 Example of superstructure

Figs. 1-4 show an example of the principles for a superstructure. Each individual shooting team must be responsible for dimensioning, as it must be calculated for different stresses (wind and snow load) depending on where in the country the facility is located. Megalink also has no expertise in this area. The choice of materials and execution can be done in many ways. Instead of sleepers, you can, for example, use post shoes that are glued with anchor compound. In some places, black UV-resistant foundation plastic can be used instead of panels or plates. You just have to make sure to get sufficient rigidity in the structure both transversely and lengthwise.

On the front there is a vertical bar for every other dial. Doors have been drawn on the front, but this is optional. LED lights to illuminate the target can be fitted as required. If it is installed, it is an advantage if the light that passes through the hole in the front does not illuminate, what should appear as a black sight flash.

The front half of the roof can advantageously consist of milky white corrugated panels, which let some light through and eliminate some of the shadow created by the superstructure. If you choose the solution with black rubber on the back wall, you must make sure that it is relatively dark in the space behind the targets, but do not create anything that binds the targets together.

The dimensions of the drawing are only indicative. There should be room to walk both in front of and behind the targets. The distance from the front target to the front of the superstructure will determine how much oblique rain can come, before it enters the target. It can be customized according to local conditions.

There is a post between every other target on the front. If the distance between the posts is greater than twice the distance to the washers, the doors on the front must be folded to make room for them when they are opened.

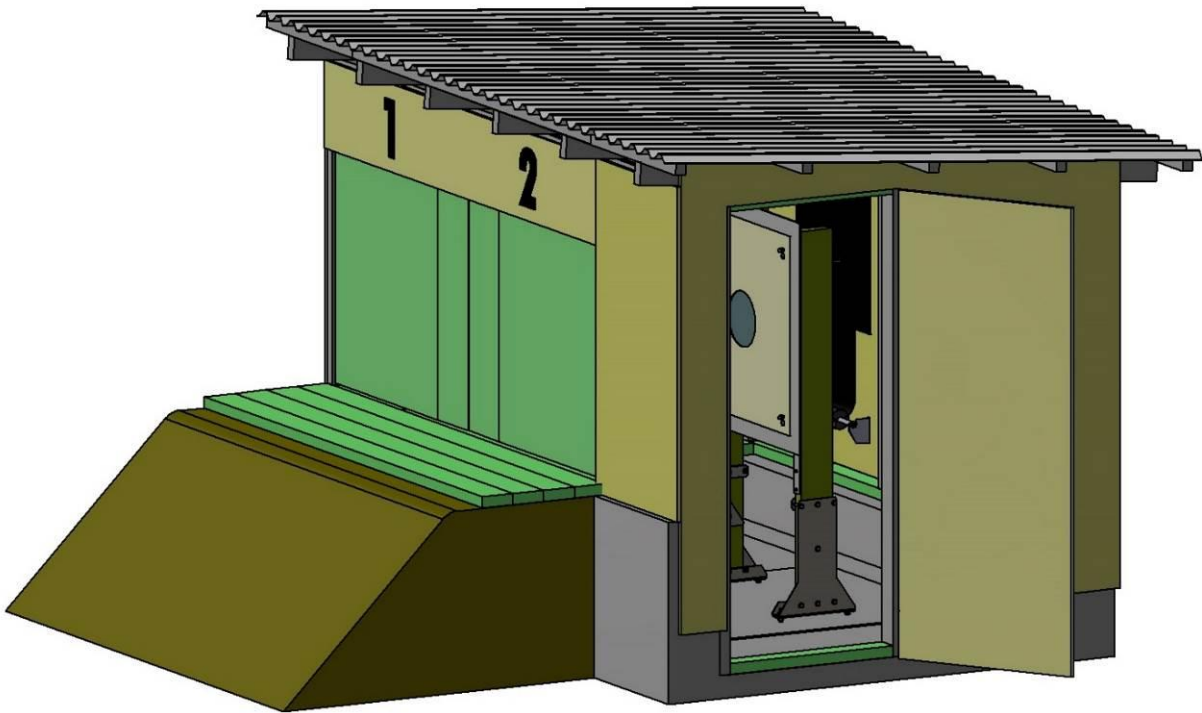


Fig. 1

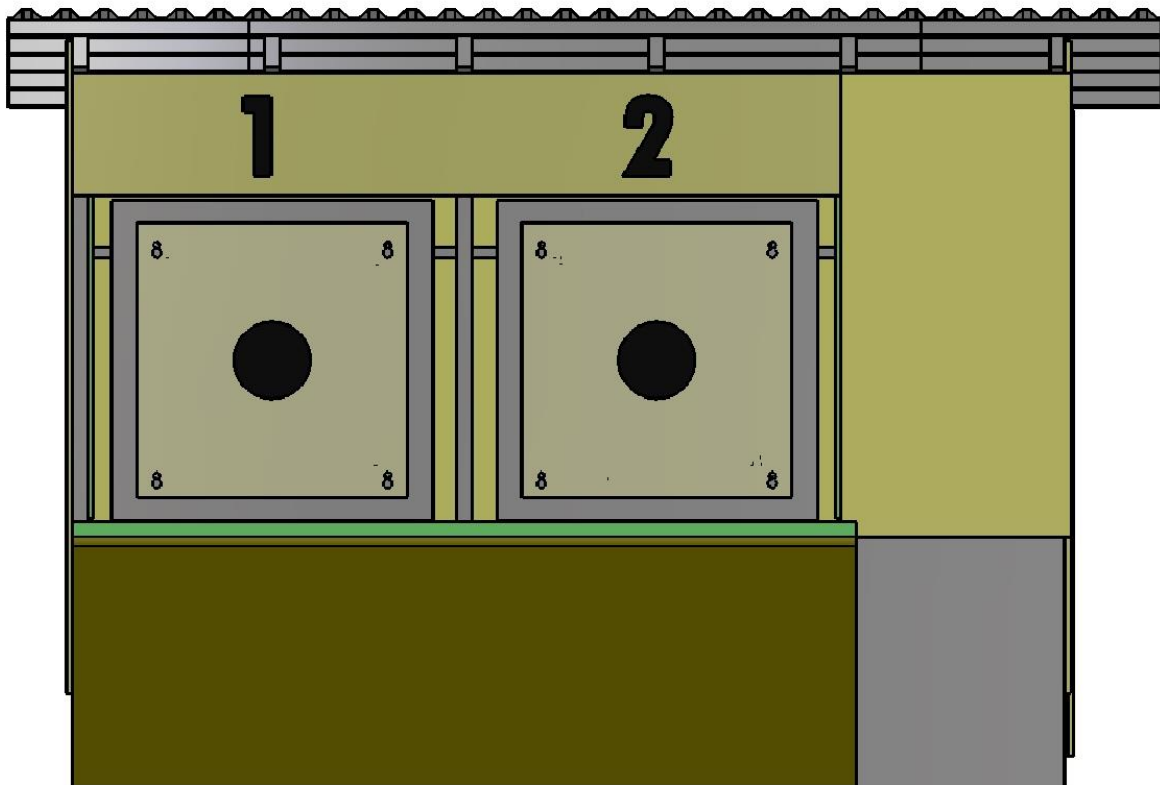


Fig. 2

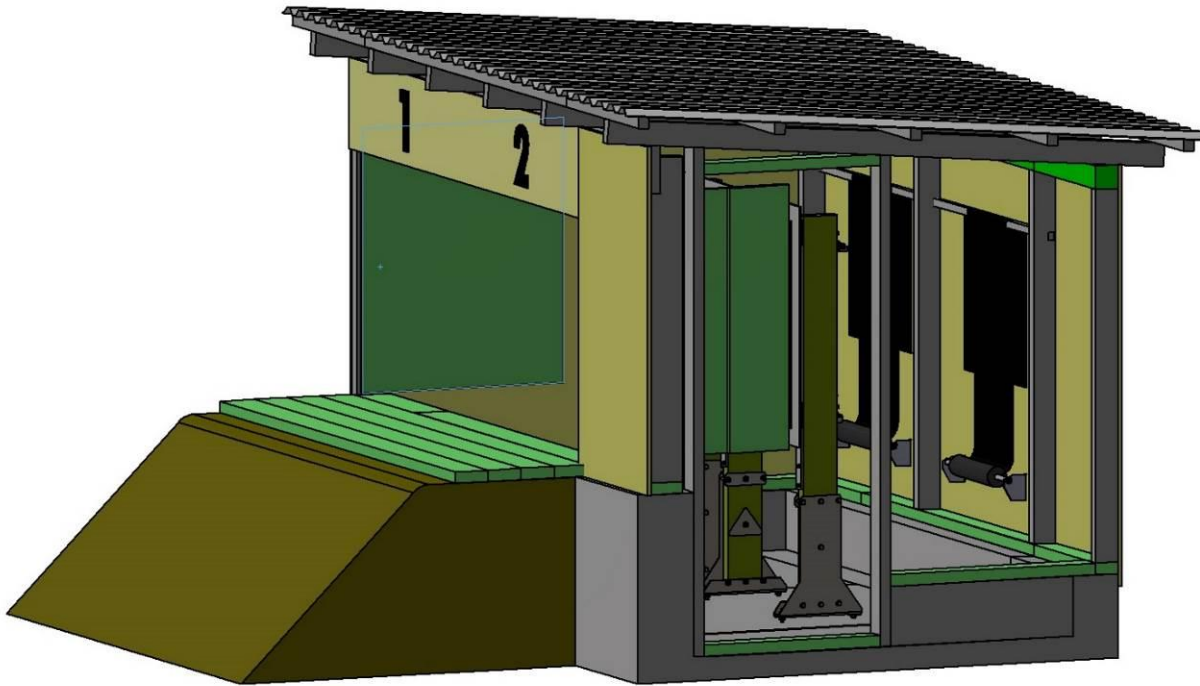
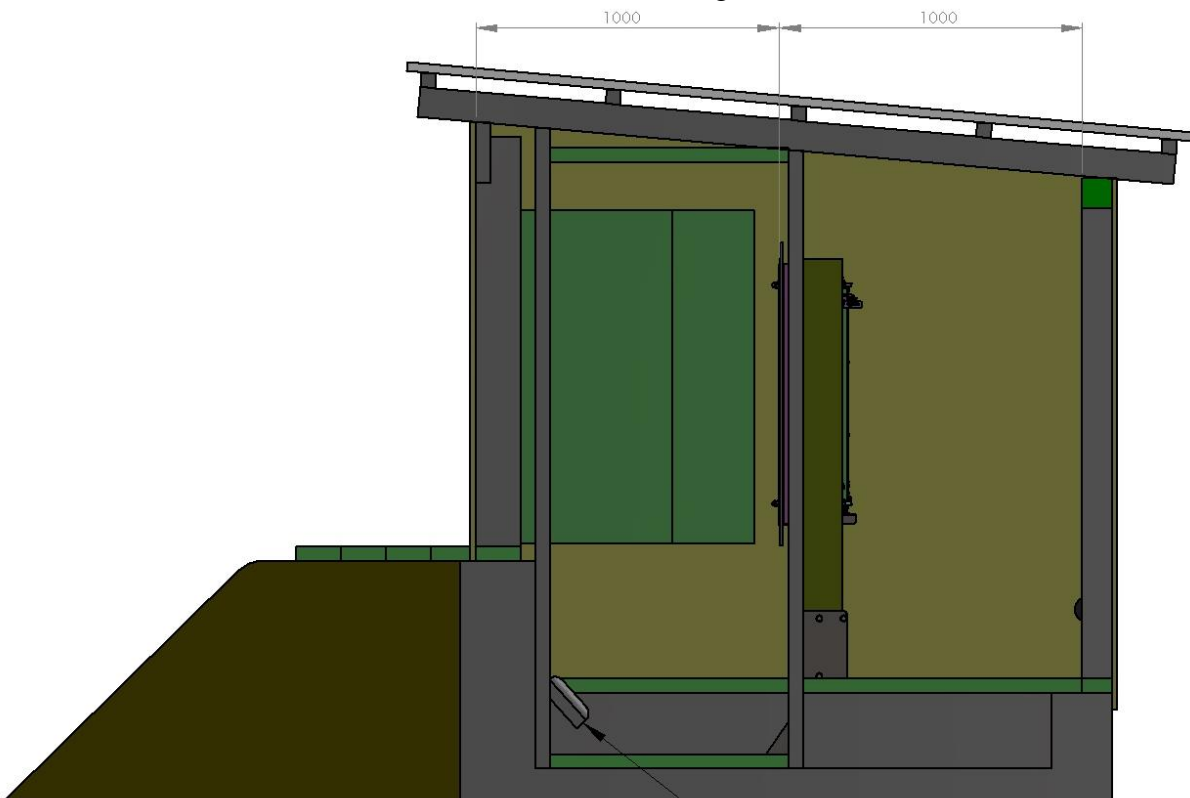


Fig. 3



LED lys

Fig. 4

2.6 Installation on concrete floors

When using Megalink's attachment art. 4146 (see appendix), the installation can be done as shown below. It is an advantage if the steel plate is not attached during installation. Screw the fastener

onto both target legs as shown in Fig.1. If 3 holes $\text{Ø}10$ have not been drilled in the middle of the target bone, it must be done. Screw the mounting bracket in place with the 4 outermost screws, which do not go through the washer bone, and use the bracket as the drill template. Leave 5-6mm air gap between the bracket and the end of the target bone.

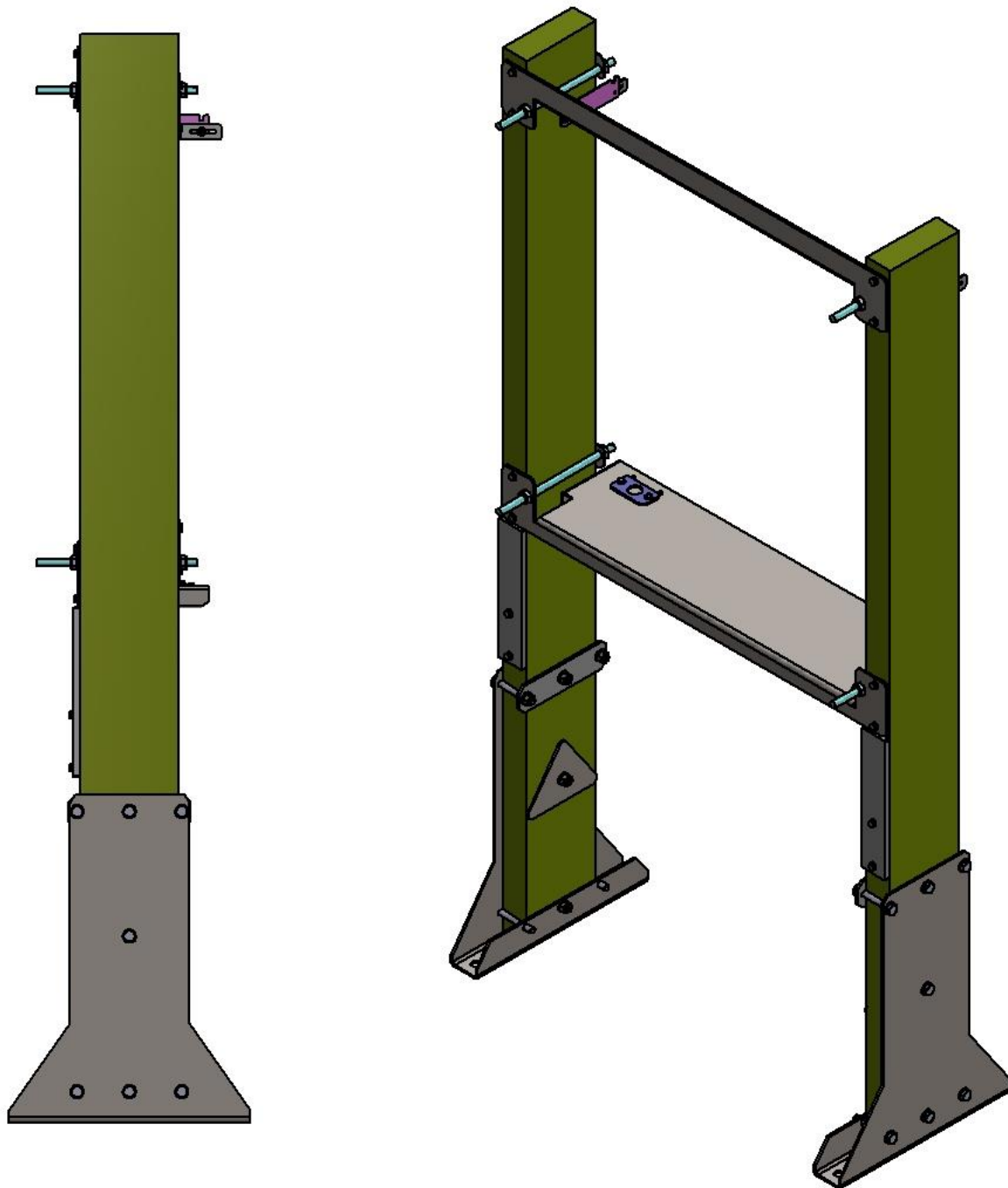


Fig. 1

Install the brackets on all the washers and number the washers. The bottom 3 screws are not tightened so hard that the bracket deforms at this point.

Decide where the washers will be mounted and pull a string from one end of the grave to the other. The targets are placed on the floor with the correct distance between each other and with 4 wooden blocks underneath (thickness 20-30mm). Install the drill gauge on target 1. The template makes it easier to drill vertically.

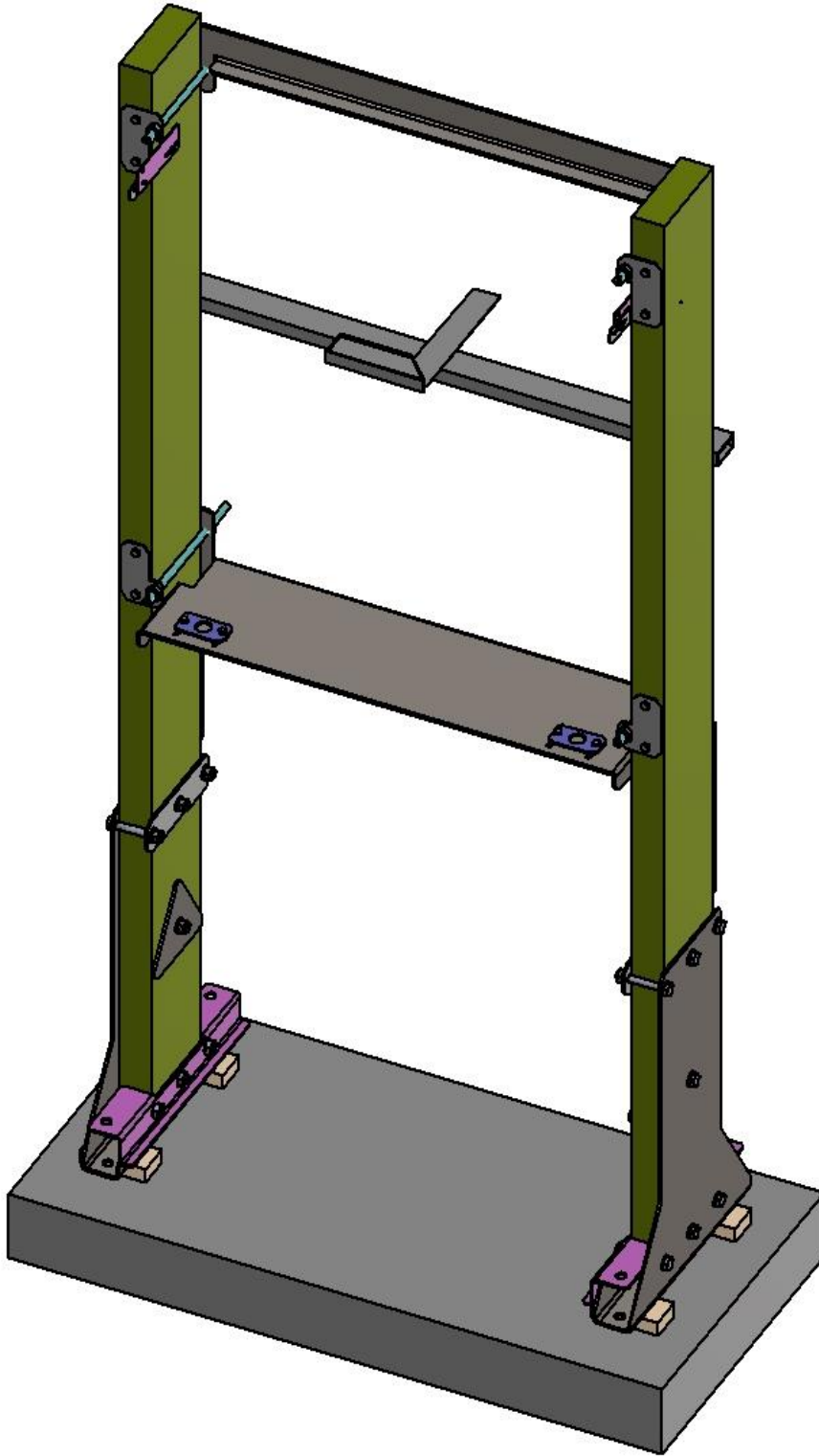


Fig. 2

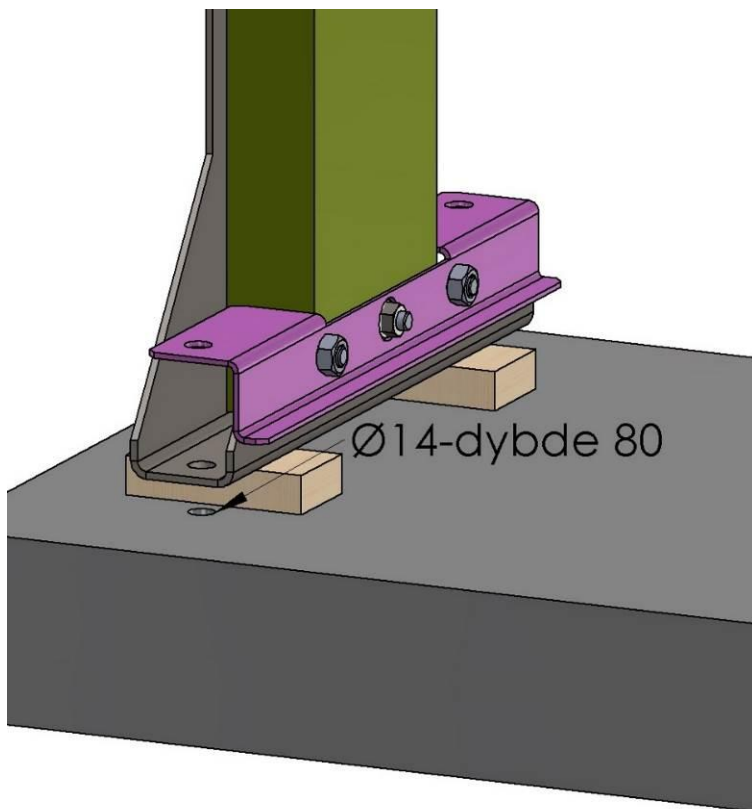


Fig. 3

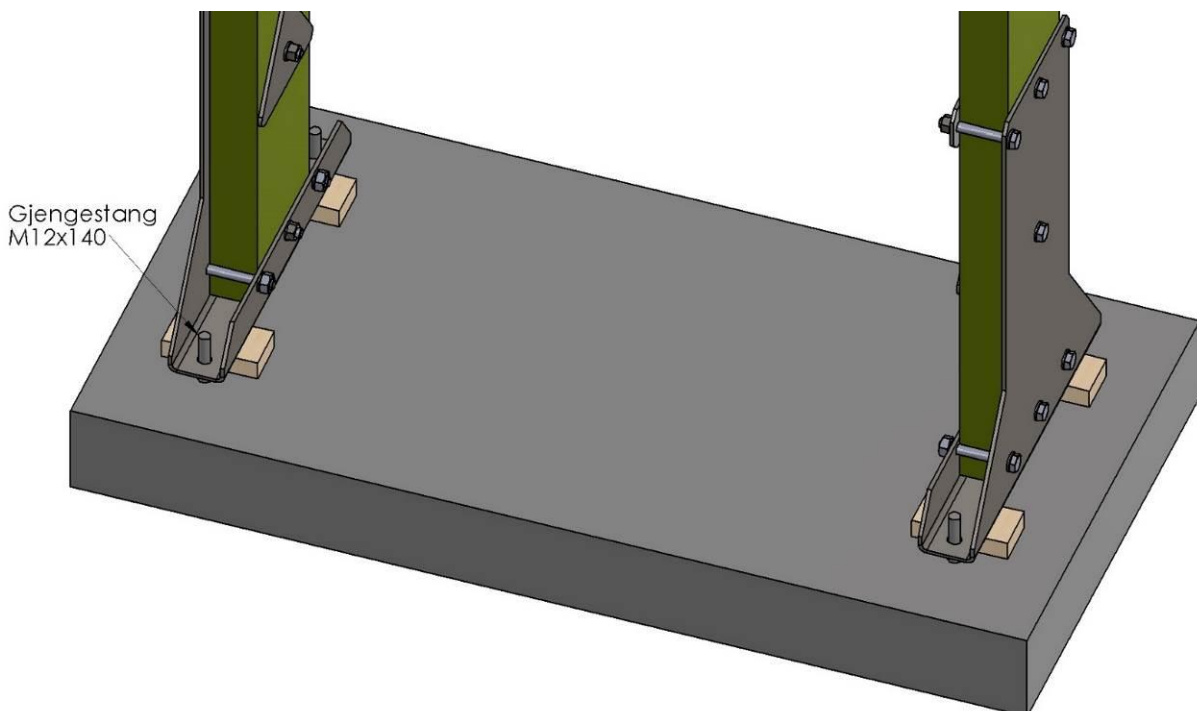


Fig. 4

Dial 1 is placed almost against the string and place an angle as shown in Fig. 2. Aim along the angle and turn the dial if necessary until the line of sight hits stand 1. When the target is in the right place and has the right direction, drill 4 x fixing holes $\text{Ø}14\text{mm}$ in the concrete floor with an impact drill. If the drill has a depth stop, set it to 80mm. Blow the holes clean with compressed air or a hand pump. It is important that the holes are free of dust. Refer to the enclosed assembly instructions. Move the drill templates to Slice 2 and repeat the same procedure as for Slice 1.

When all holes have been drilled, you can start gluing the threaded rods in place. It is an advantage that the bonding is a continuous process due to the fact that the glue is an anchor compound consisting of two components with a mixing nozzle. Fill the fit with glue in the 4 fixing holes with the target in place, and blocks underneath. Screw the M12x140 threaded rods into the holes and center them in relation to the holes in the mounting brackets.

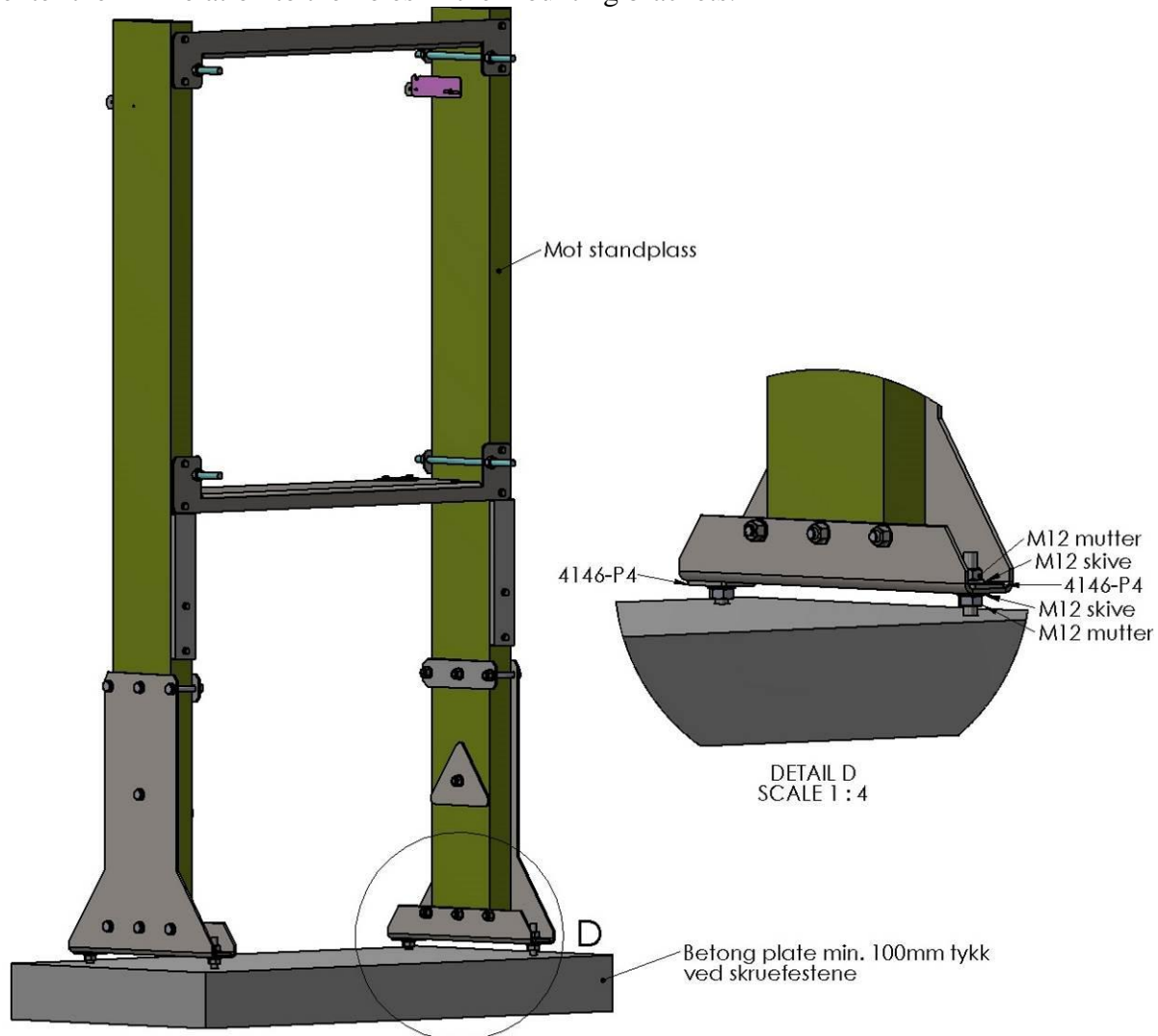


Fig. 5

After the glue has hardened, the target and wooden blocks are removed. Excess glue is beaten away with a hammer. Install nuts and washers as shown in Fig. 5. In particular, note that the 4146-P4 should be under the rear bracket and on top of the front. Align the target vertically (use a spirit level). Loosen the top nuts and align with the nuts under the bracket. Take both sides at the same time to avoid tension. Check that the washer is pointing in the right direction horizontally and tighten the nuts. Now the bottom 3 screws on the brackets can be tightened hard.

See Fig. 6. Loosely replace the steel plate. NB! Turn the plate the right way. The distance between the hole and the edge should be greatest at the top and bottom, least on the sides. Put on the splash guard at the top and bottom, and then the ones on the sides. The splash guard at the top and bottom should be closest to the steel plate.

Tighten the nuts that hold the steel plate. Thread on the plastic plate and on top of it a relevant sight flasher.

100m sight flashes can be delivered in channel plastic or 2mm white rubber (both with holes in the middle). The channel plastic sight target can in some rare cases give a little misdirection with shots in the white.

When white sieve rubber is not in use, store them in a black plastic bag.

We can also deliver a selection of fine-field figures and Wild Reindeer figures for big game test.

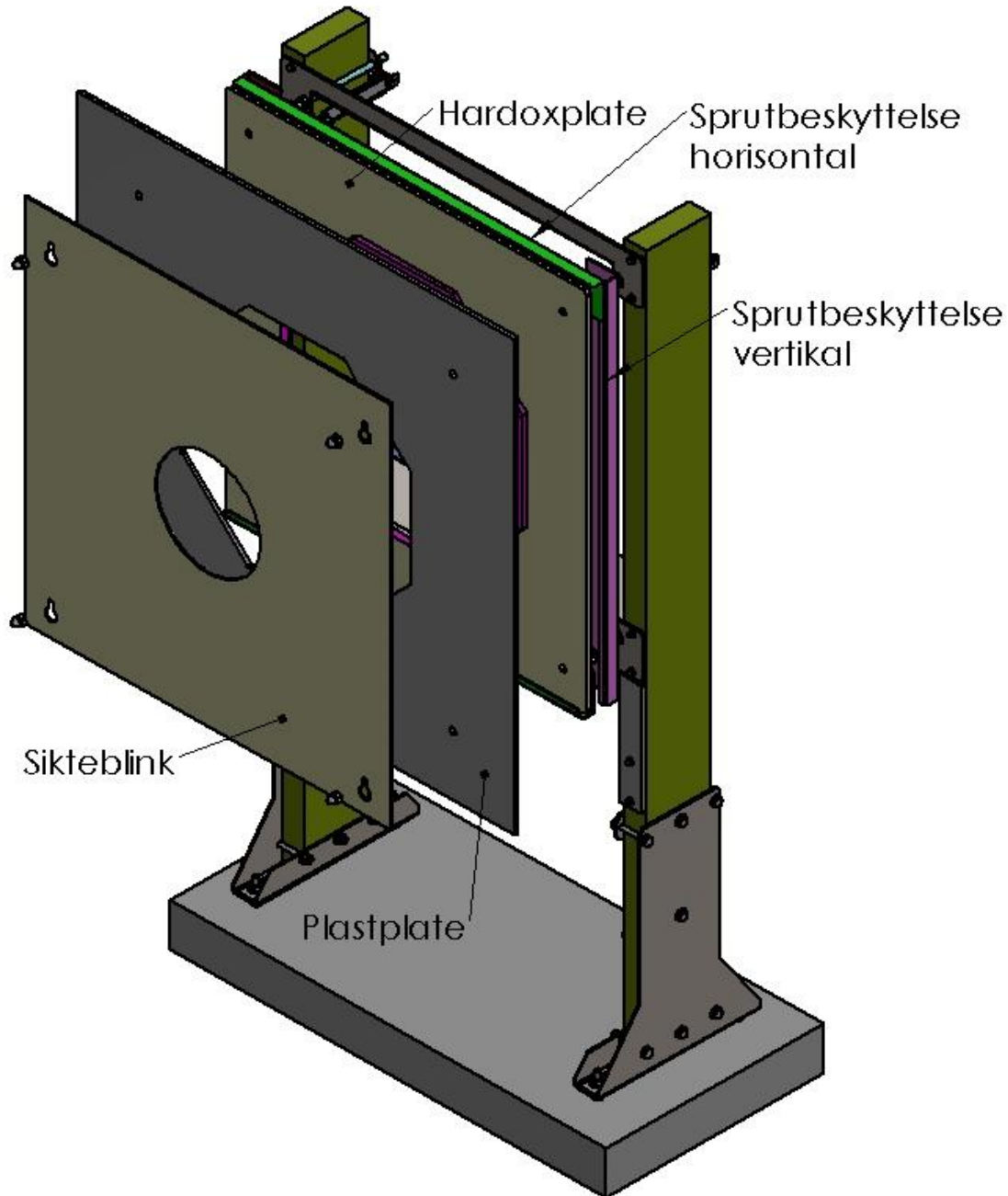


Fig. 6

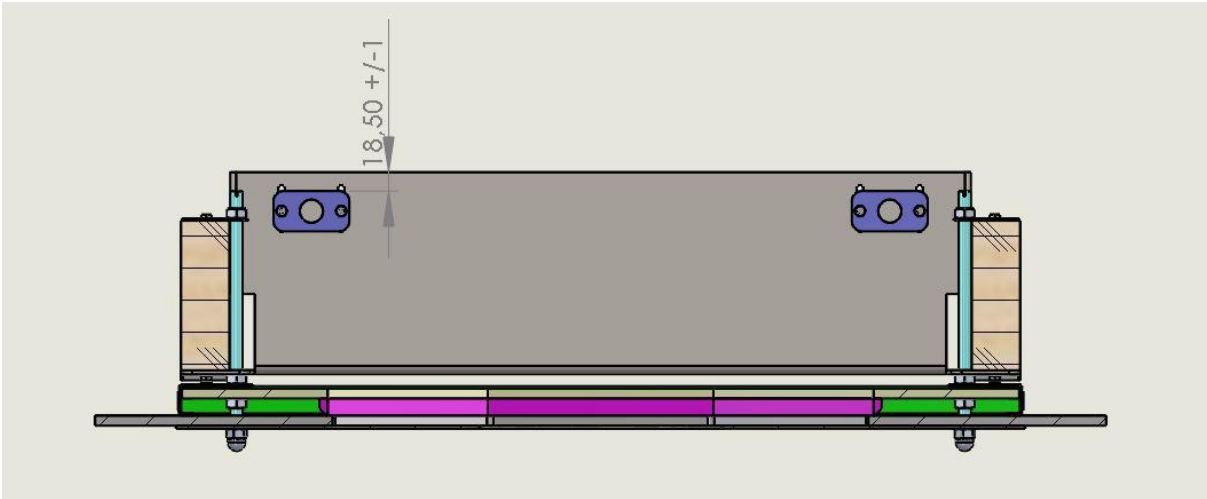


Fig. 7

Adjust the plates on the shelf as shown in Fig.4 (18.5mm +/-1). Tighten the wing nuts on the underside.

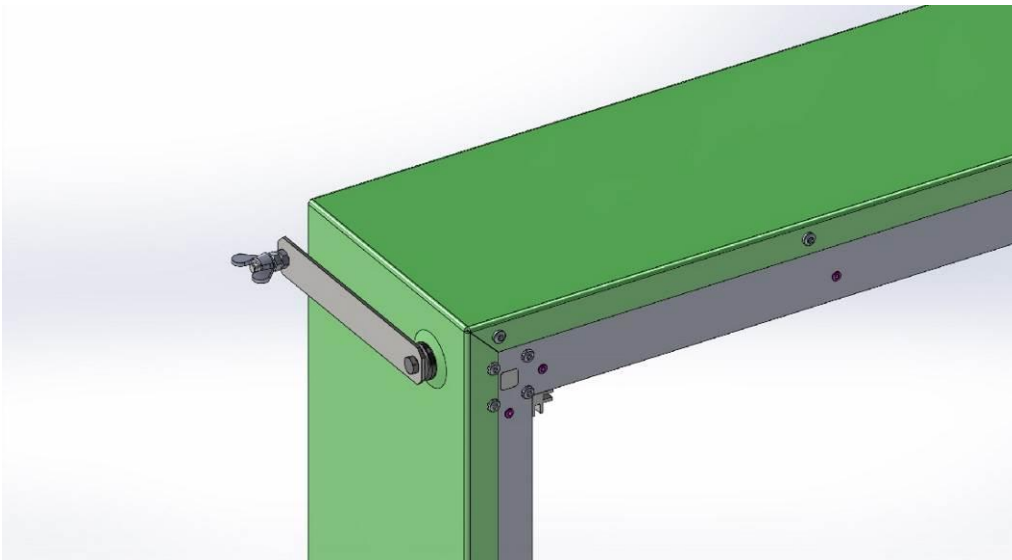


Fig. 8

Fit the strut (one on each side) that holds the sensor frame in place at the top (Fig. 6). Insert the sensor frame into the turntable rack. Make sure the rubber feet are in place in the circular holes.

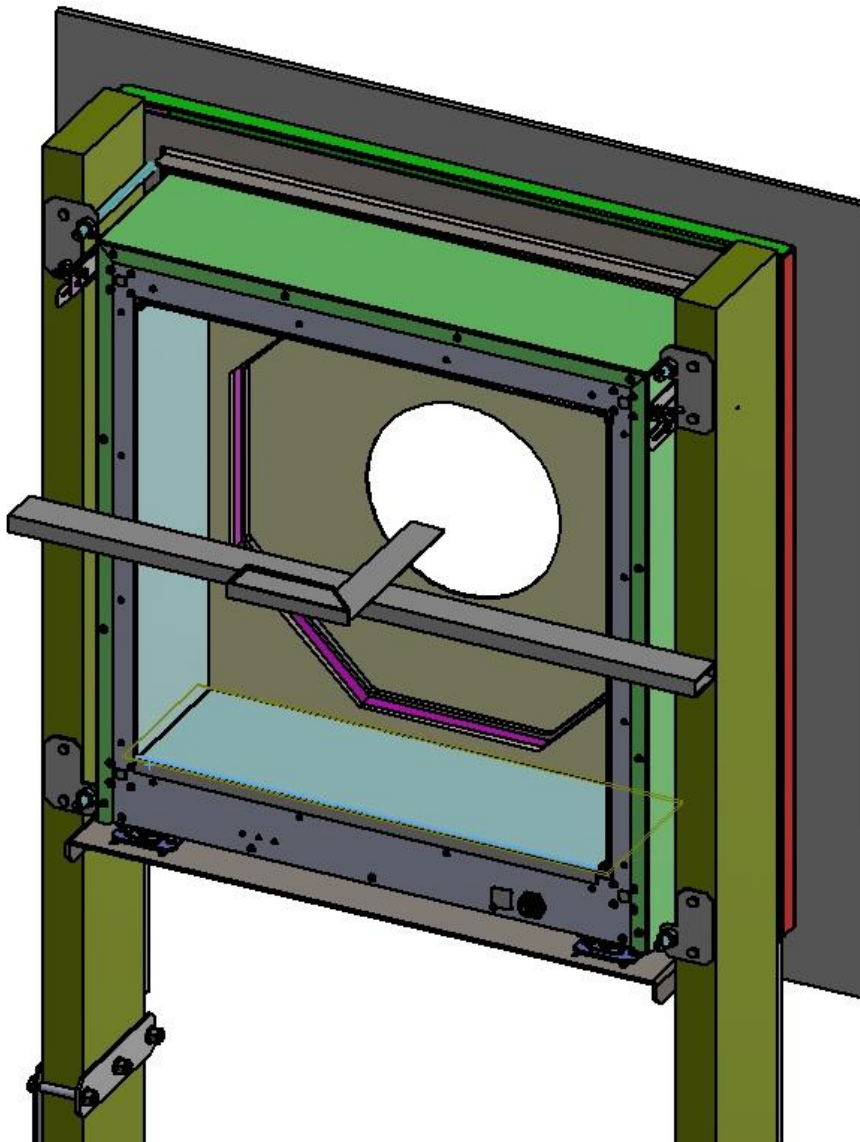


Fig.7

Check that the line of sight points to the correct place on the stand. If not, loosen the wing nuts on the underside and adjust the target.

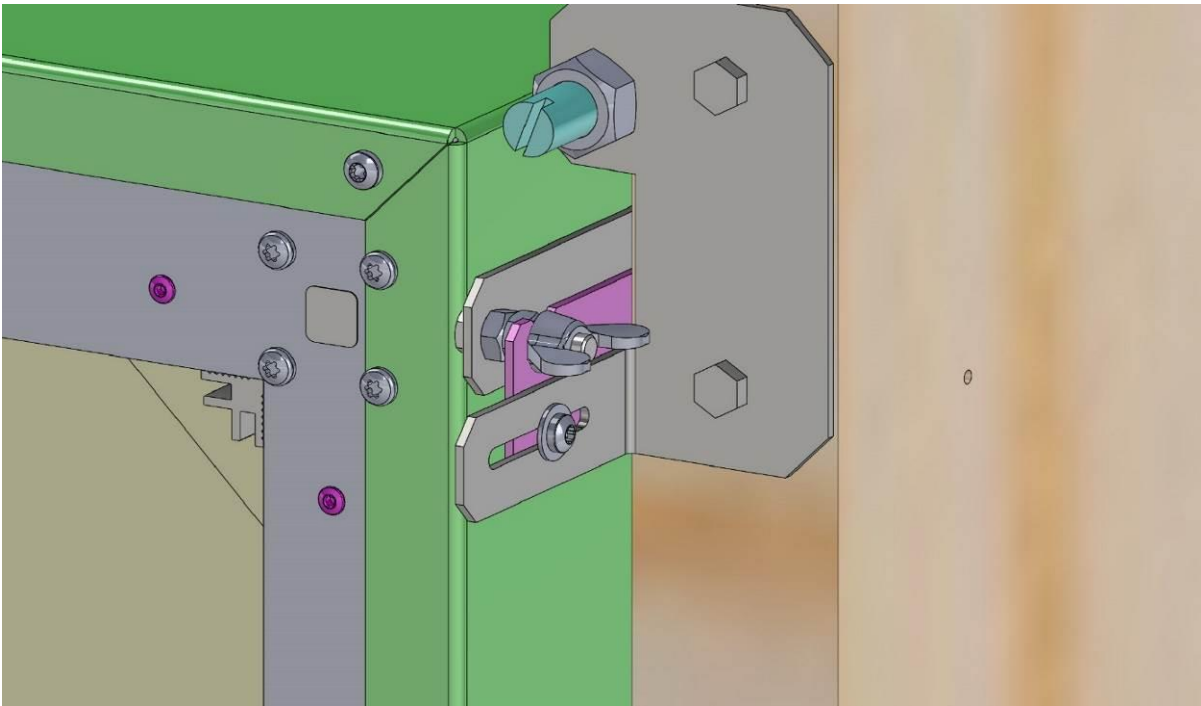


Fig.8

Loosen the M4 screw on both sides. The violet plate should then be able to be pushed back and forth. Tighten the wing nut.

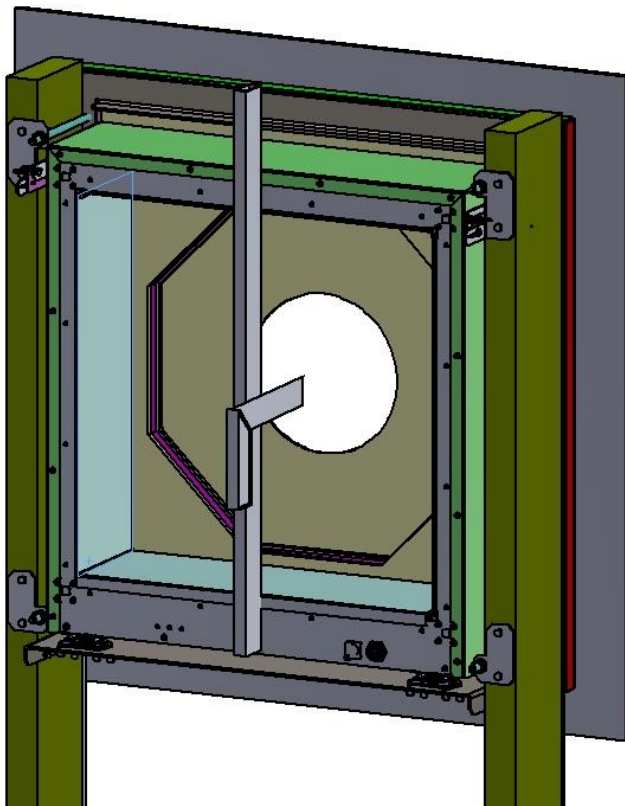


Fig.9

Check that the line of sight hits 30-40 cm above the floor of the stand (fig. 9). If not, adjust and tighten the M4 screws firmly. When the sensor frame is later removed, only the wing nuts are loosened and the target will be in the right place when it is reinserted.

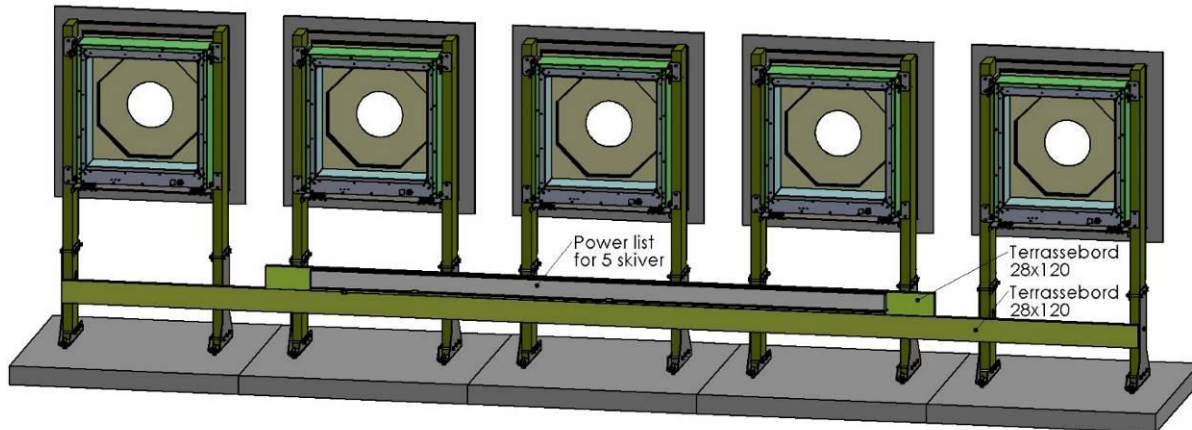



Fig.10

Fig. 10 shows the installation of the Power Supply Strip. The target cables are led down the back middle of the target bone (then they are protected) and down to the Power Supply List. The cables are attached to adhesive pads with strips (the pads are screwed on), or stapled in place with staples. The power supply strip also has a connection for communication over pairs of wires. One version also has a connection for optical fiber (multimode fiber).

For å oppnå sikker og godkjent montering er det viktig at du følger instruksene trinn for trinn.

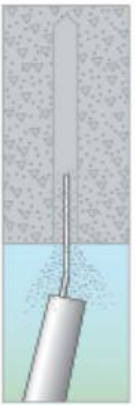
1 Bor

Hulldiameteren skal opp til M16 være 2 mm større enn jernbolten som skal forankres. Se "Tekniske data" for mer informasjon.



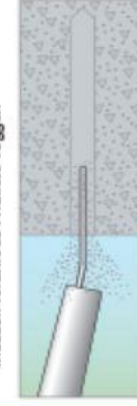
2 Blås

Blås rent hull et par ganger til. Husk alltid å blåse fra bunnen av hull.



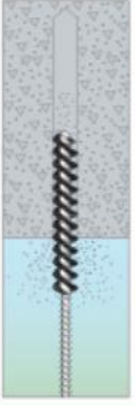
3 Børst

Børst ut hullveggen med børsten minst fire ganger.



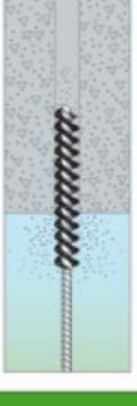
4 Blås

Blås rent hull et par ganger til. Husk alltid å blåse fra bunnen av hull.




5 Børst

Børst ut av hull et par ganger til. Føder børsten nedover og trekk den ut.



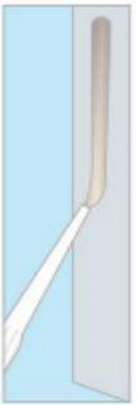
6 Blås

Blås rent hull et par ganger til. Husk alltid å blåse fra bunnen av hull.



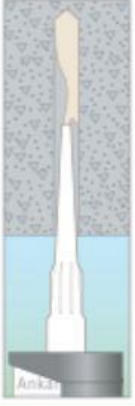
7 Bland

Bland massen med en streng til massen får en jevn lysgrå farge (ca. 2 pumpinger). Blandingen foregår ved at massen og bassen blandes i det tilhørende munstykkets labyrintsystem.*




8 Fyll og forankre

Fyll minst 2/3 av hull et par ganger til. Føder børsten nedover og trekk den ut.



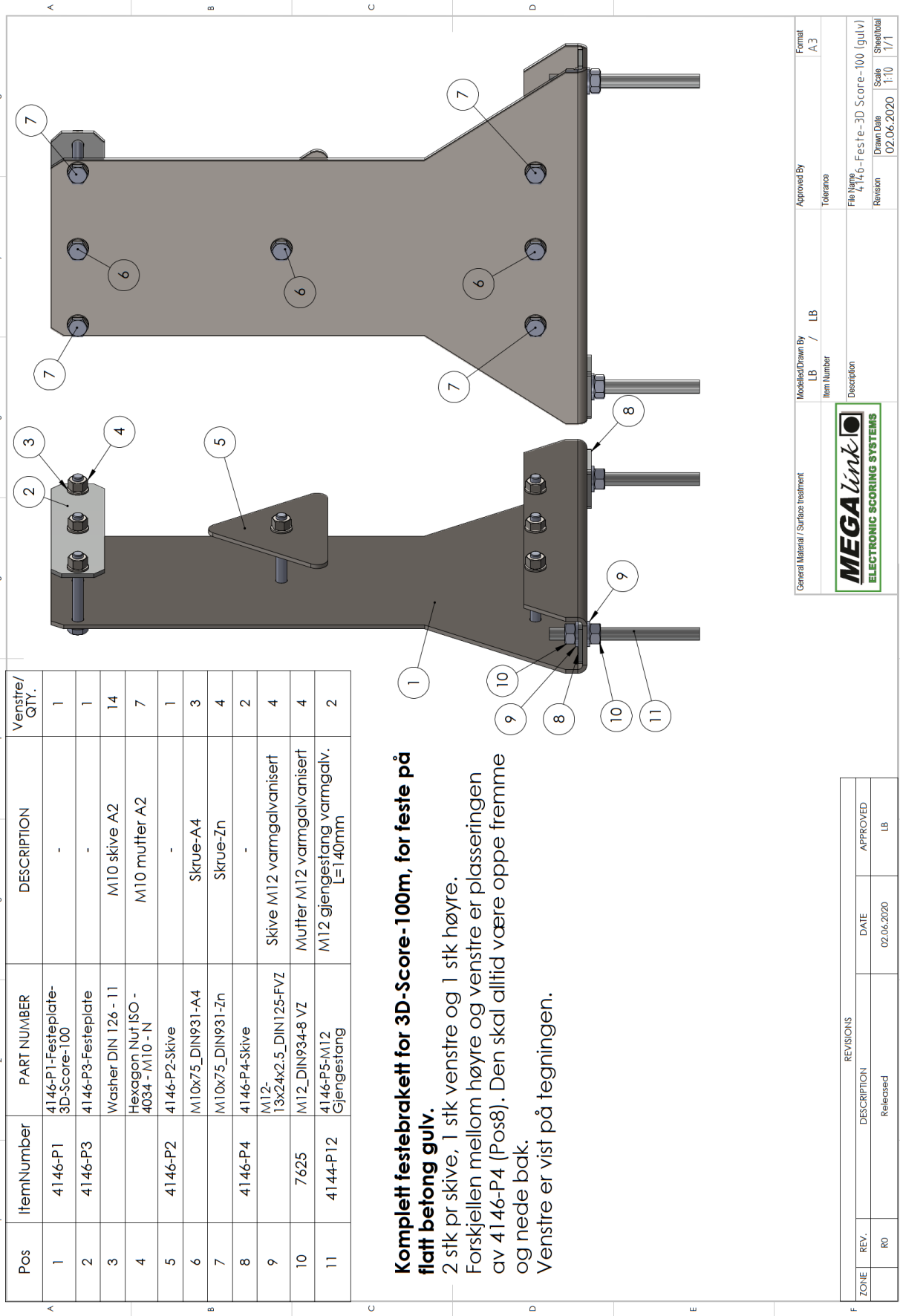
9 Herde

La forankringen herde før den belastes. Se egen tabell for bruks- og herdetider.



Riktig farge nyans

*Hver tube inneholder mer ankermasse enn det innholdsforholdet angir, for å kompensere for eventuelt spill ved blanding.



2.7 Installation on a concrete wall

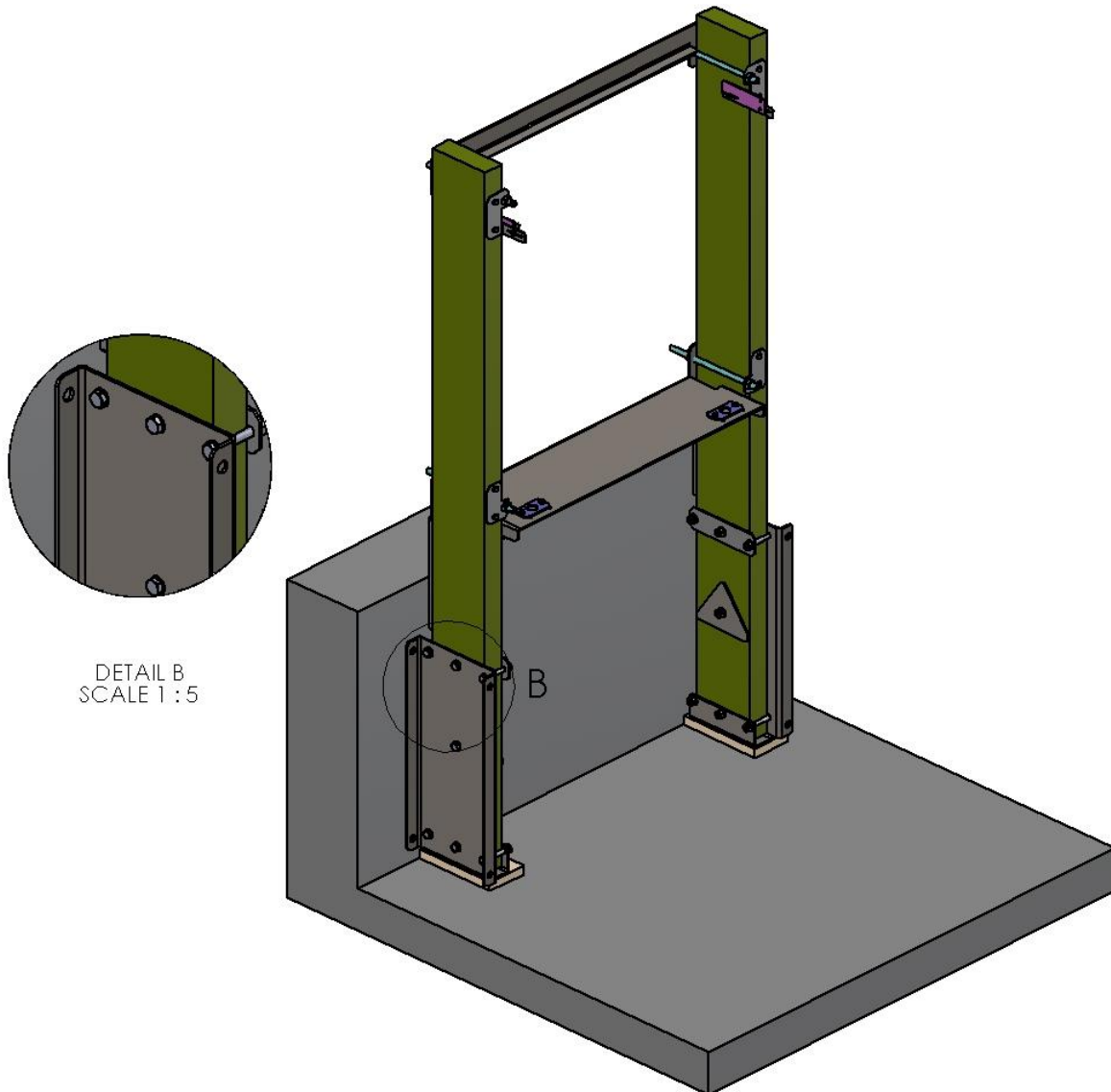


Fig. 1

Install the bracket for vertical masonry (Art. 4147, see appendix) on the target legs. Put the target in the right place, on two wooden blocks 20-30mm thick. Use a long (350-400mm) Ø14mm masonry drill bit for hammer drill. Thread the drill through the two holes in the bracket and drill 4 holes depth 80mm. Do the same with the other slices.

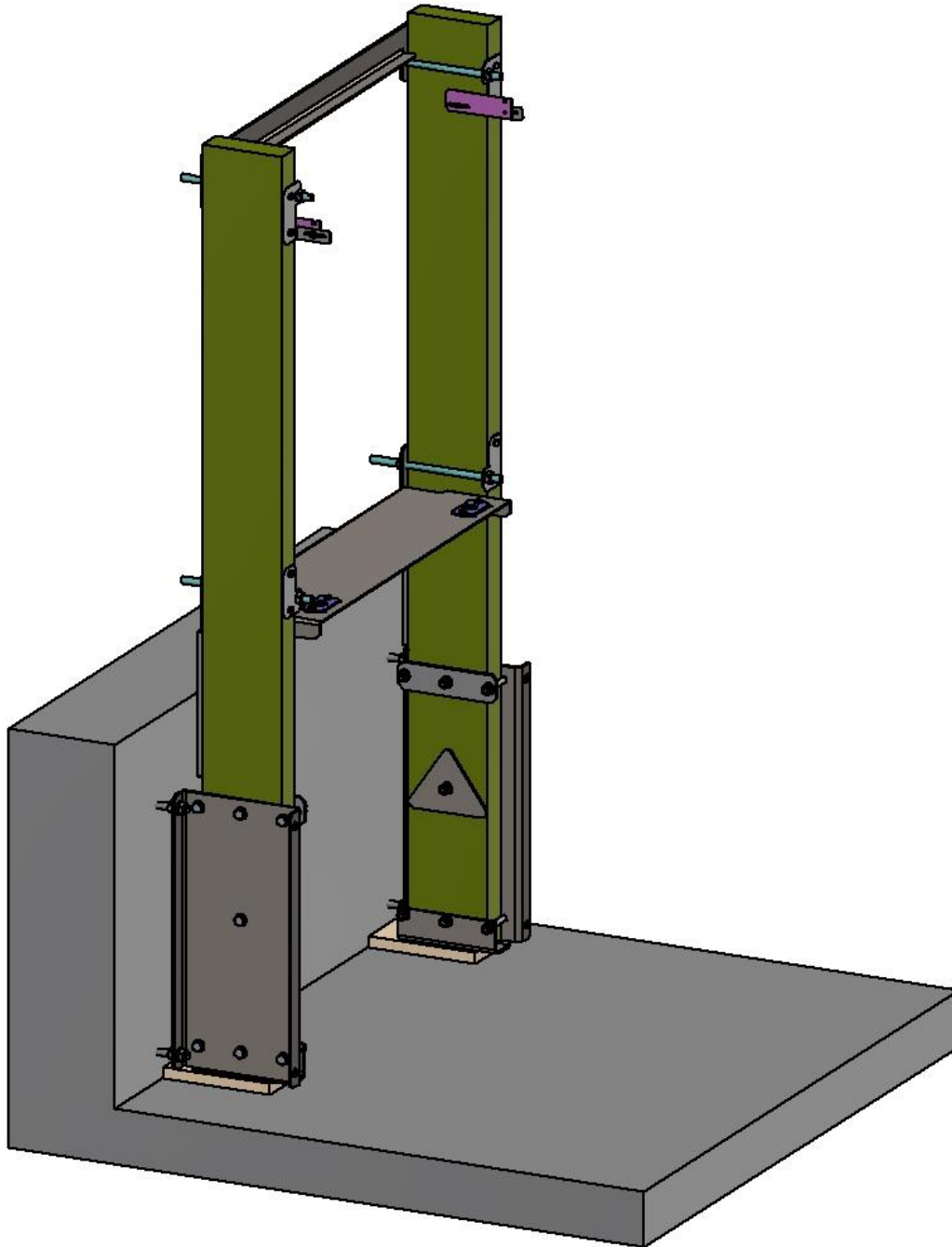


Fig. 2

Remove the target and blow the holes clean of dust with compressed air or a hand pump (see attached assembly instructions). Fill a suitable amount of anchor compound in the holes, and put the washer in place with a clearance of approx. 30mm between the bracket and the brick wall. Thread the threaded rods through the holes in the bracket and screw them into the anchor compound. The slices must be left at rest until the anchor mass has solidified. If the washers are not stable, the alternative may be to glue one of the threaded rods to one of the top holes. When the anchor compound has hardened (excess anchor compound is knocked away), an M12 nut and an M12 washer are placed on the threaded rod. The distance between the wall and the M12 washer should be approx. 30mm. The target frame is then put in place and attached with M12 washer + M12 nut. Fill anchor compound into the holes and replace the threaded rods.

Adjustment of the direction of the washers horizontally and vertically is done by screwing on the retaining nuts. Refer to the procedure for installation on the floor.

The rest of the installation is the same as for installation on the floor.

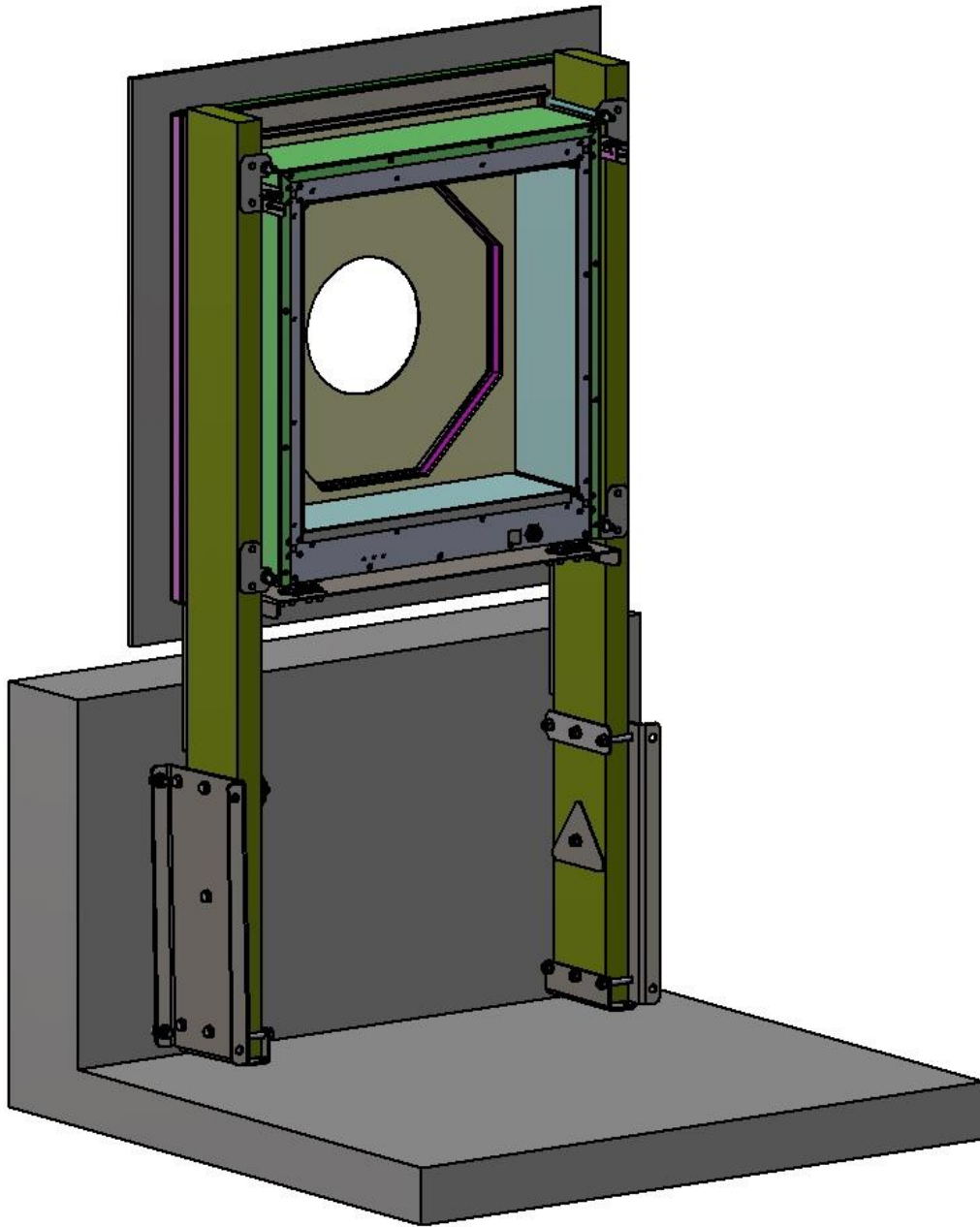


Fig. 3

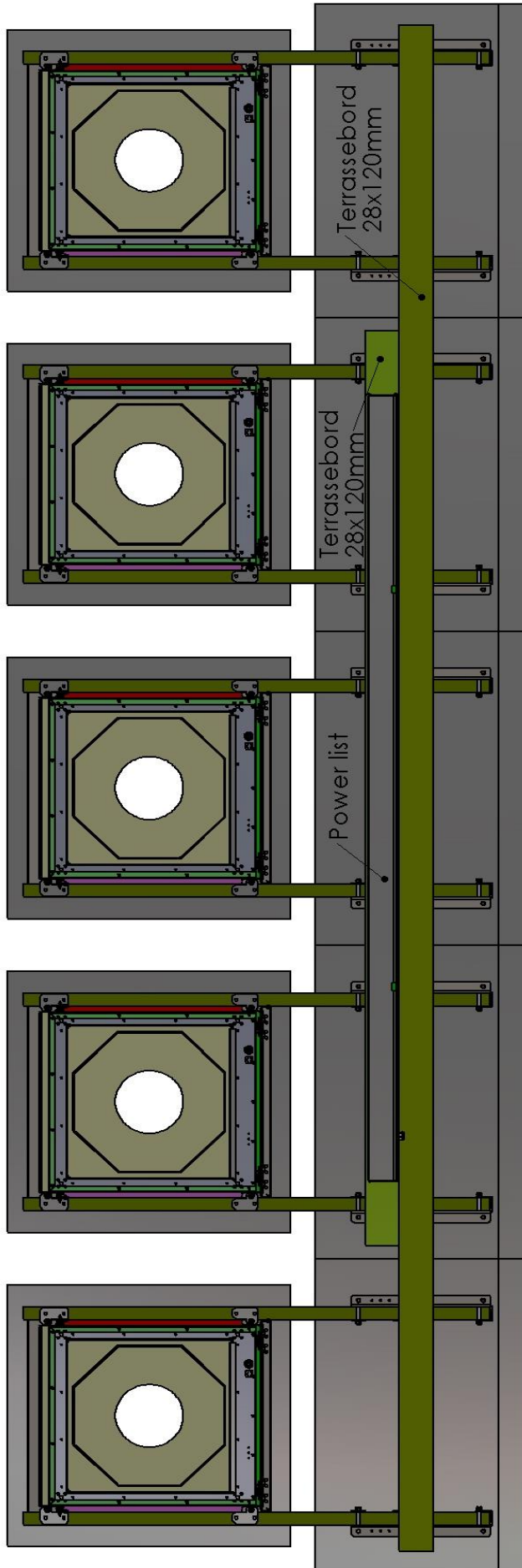


Fig. 4 shows the installation of the power supply strip. The target cables are led down the back middle of the target bone (then they are protected) and down to the Power Supply List. The cables are attached to glue pads with strips (the pads are screwed on), or stapled with staples. The power supply strip also has a connection for communication over pairs of wires. One version also has a connection for optical fiber (multimode fiber).

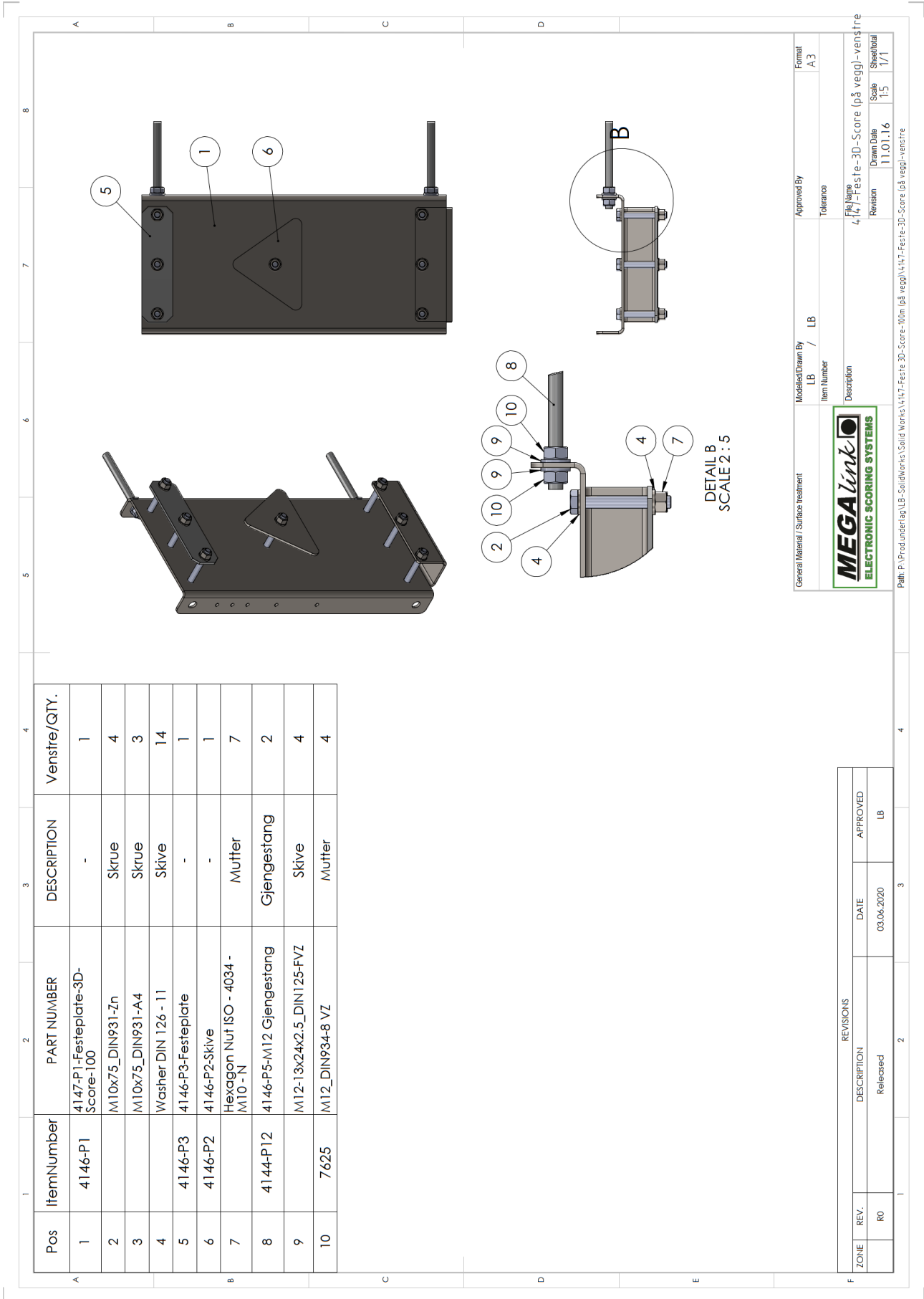
| Pos | ItemNumber | PART NUMBER | DESCRIPTION | Høyre/QTY. |
|-----|------------|----------------------------------|-------------|------------|
| 1 | 4146-P1 | 4147-P1-Festeplate-3D-Score-100 | - | 1 |
| 2 | | M10x75_DIN931-Zn | Skrue | 4 |
| 3 | | M10x75_DIN931-A4 | Skrue | 3 |
| 4 | | Washer DIN 126 - 11 | Skive | 14 |
| 5 | 4146-P3 | 4146-P3-Festeplate | - | 1 |
| 6 | 4146-P2 | 4146-P2-Skive | - | 1 |
| 7 | | Hexagon Nut ISO - 4034 - M10 - N | Mutter | 7 |
| 8 | 4144-P12 | 4146-P5-M12 Gjengestang | Gjengestang | 2 |
| 9 | | M12-13x24x2.5_DIN125-FVZ | Skive | 4 |
| 10 | 7625 | M12_DIN934-8 VZ | Mutter | 4 |

| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
|------|------|-------------|------------|----------|
| | RO | Released | 03.04.2020 | LB |

| General Material / Surface treatment | | Modelled/Drawn By | | Approved By | |
|--------------------------------------|--|-------------------|----|---------------------------------------|--|
| | | LB | LB | Tolerance | |
| | | Item Number | | | |
| | | Description | | File Name | |
| | | | | 414_P1_Feste-3D-Score (på vegg)-høyre | |
| | | | | Revision | |
| | | | | 03.06.2020 | |
| | | | | Scale | |
| | | | | 1:5 | |
| | | | | Sheet/Total | |
| | | | | 1/1 | |

Path: P:\Produkt\MLB-SolidWorks\Solid Works\4147-Feste-3D-Score-100m (på vegg)\4147-Feste-3D-Score (på vegg)-høyre

DETAIL B
SCALE 2 : 5



| REVISIONS | | DATE | APPROVED |
|-----------|------|------------|----------|
| ZONE | REV. | | |
| | RO | 03.06.2020 | LB |

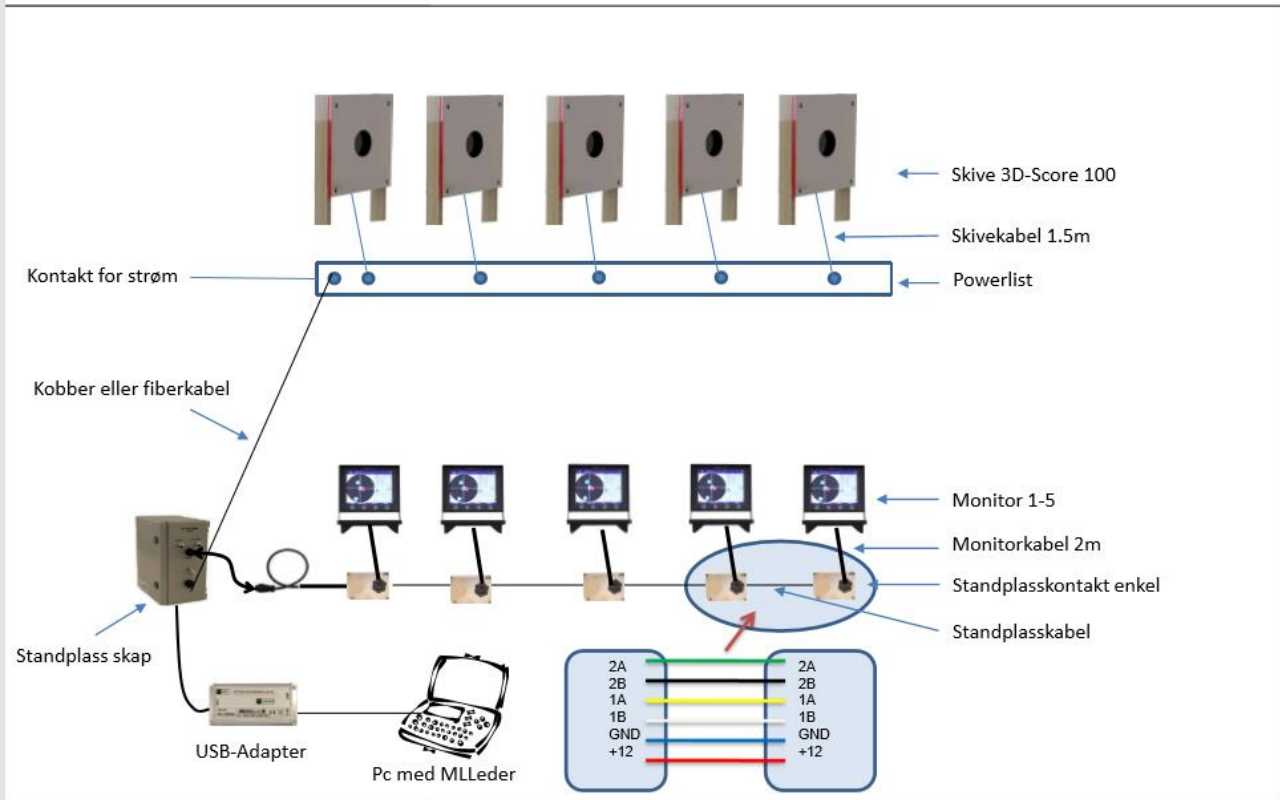
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|--------------------------------------|--|-------------|-------------|
| General Material / Surface treatment | Modelled/Drawn By | Approved By | Format |
| | LB / LB | Tolerance | A3 |
| | Item Number | | |
| | Description | | |
| | File Name | | |
| | 4147-P1-Feste-3D-Score (på vegg)-venstre | | |
| | Revision | Draw Date | Scale |
| | 11.01.16 | 1:5 | Sheet/Total |
| | | | 1/1 |

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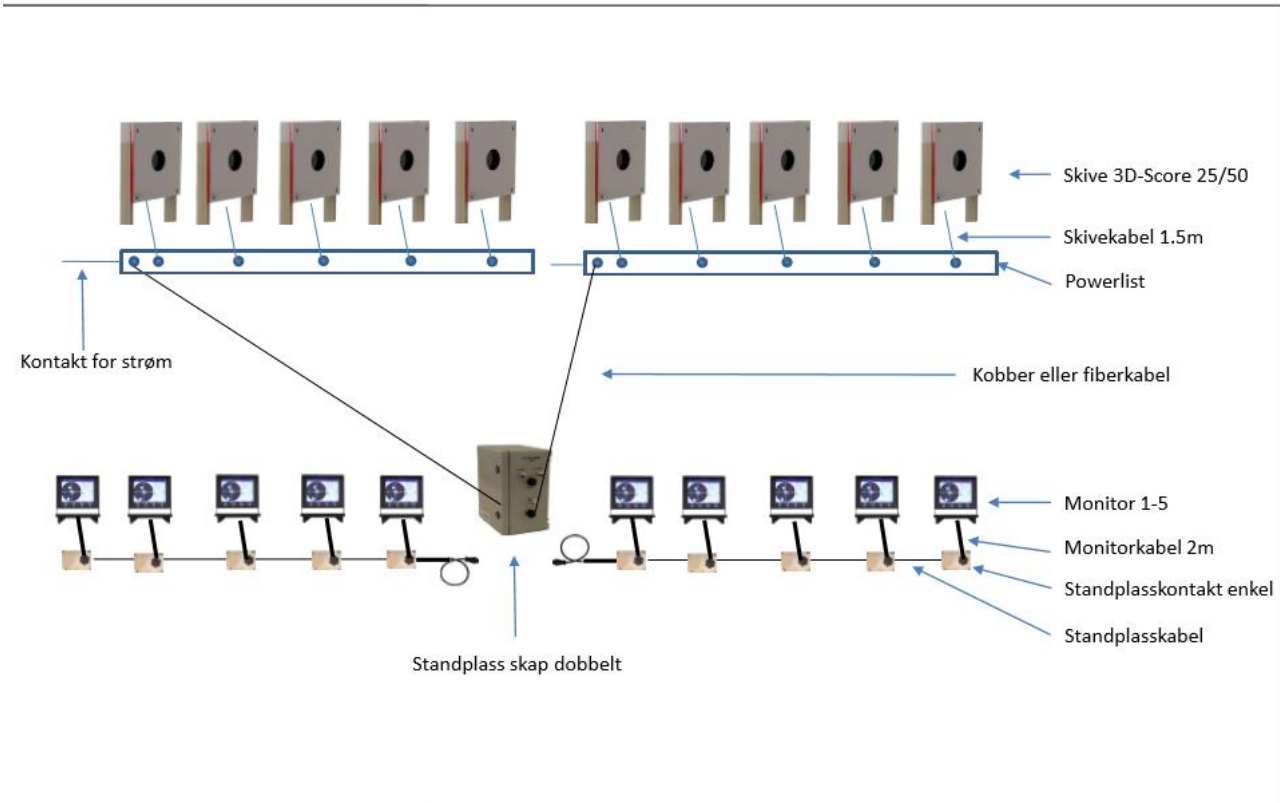
3 Cabling

3.1 ML2000 System

Oppsett av 5 skiver 3D-Score 100m



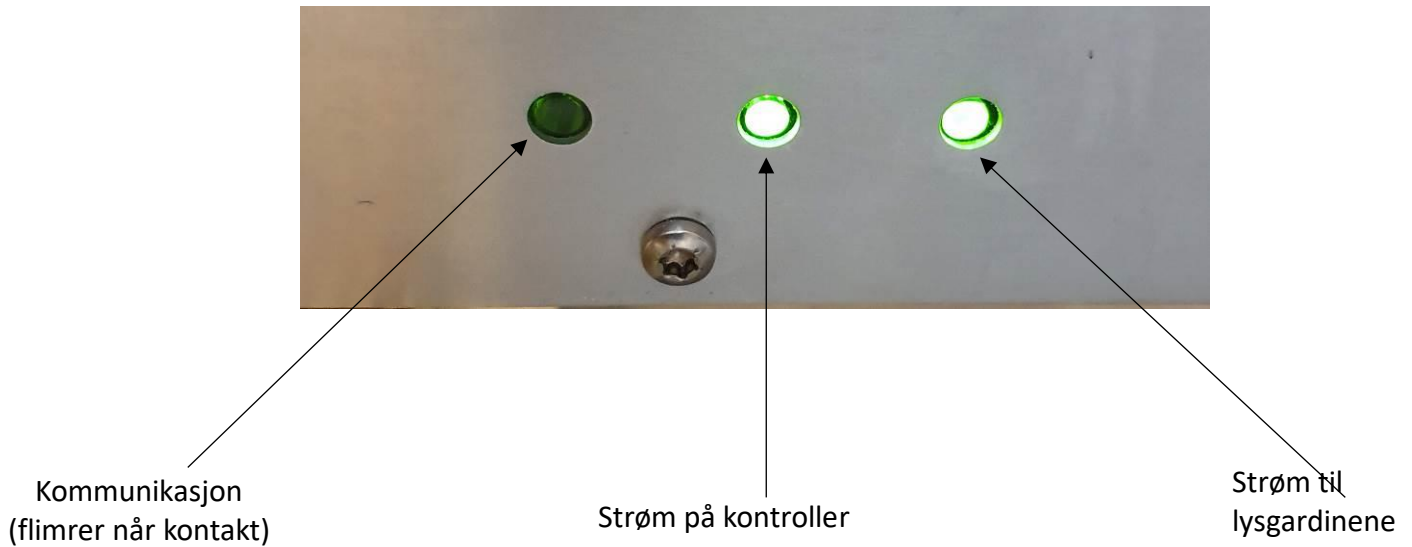
Oppsett av 10 skiver 3D-Score 100m



4 Features

4.1 Power and communication indicator

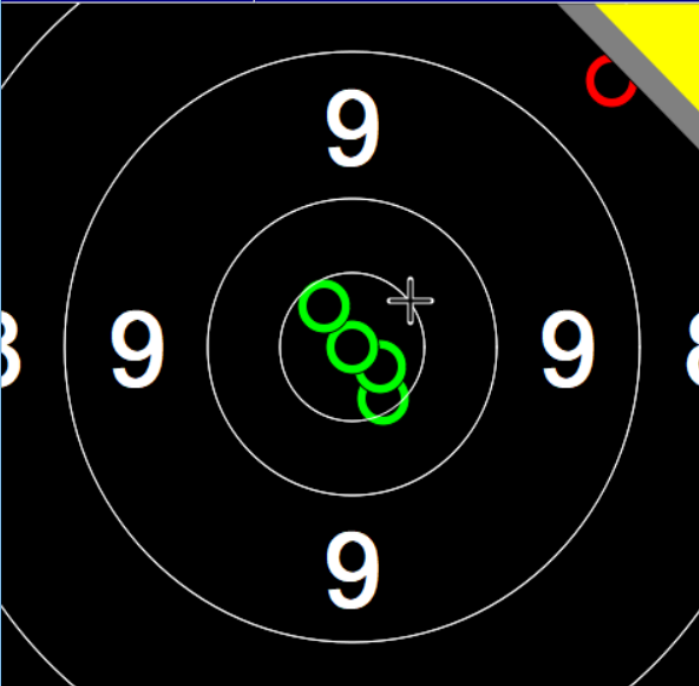
Two lights on the back of the power supply strip will glow green when connected to power. The third light will flash when there is communication with a monitor or PC.



4.2 Measuring Bullet Speed

The target automatically measures the bullet velocity of each shot. The speed is presented in meters per second on the shooter's monitor and in the change shooting card dialog in MLLeder.

| | | | |
|-----------|--|--------------------------|--|
| 33 | | DFS R/ER/1/V65/V73 | |
| | | NO-DFS 100m Rifle - Grov | |



| Prøve Liggende | Middel | 10 ↑ | 12 → |
|----------------|--------|------------------|------|
| 1. 8.7 ↘ | | | |
| 2. 8.8 ↘ | | | |
| 3. 8.9 ↘ | | | |
| 4. 8.7 ↗ | | | |
| 5. 8.5 ↗ | | | |
| Skudd 5: | | 54 ↑ | 54 → |
| 8.5 | | 175.3 m/s | |
| 0 | 0 | 0 | 0 |
| 0 | | | |
| Serie | | 0 | |
| Total | | 0 | |

| | | | |
|------|-----------|----------|---------|
| Zoom | Skiveheis | Serie... | Meny... |
|------|-----------|----------|---------|

5 Maintenance

5.1 Cleaning

The target is robust and generally requires little maintenance (a lot of redundancy). Compared to other optical targets, it is extremely robust. However, dirt should be removed when/if there is a lot, a thin layer of dust is not a problem. Blow out or wipe with a soft, dry or damp cloth.

Targetonnect the equipment from power before cleaning. Do not use spray or liquid bag. Use a damp cloth or anti-static paper.

5.2 Software upgrade

Megalink is constantly working to improve our products. The software on the target can easily be upgraded to the latest version. Refer to the *ML2000 Manual Manual - Configuration and Upgrade* for more information.

5.3 Storage / not in use

To ensure a long life of the product, it is important to turn off the power when the targets are not in use, remember to turn off the power and targetonnect the line cable when shooting ends (if copper cable, if you have recommended fiber cable, only power should be turned off).

5.4 Storage for longer

Leave the frame that is aligned with the firing direction in place, remove the sensor frame and store dry indoors (e.g. winter storage if not in use)