OpenDeskLab Documentation

Release 1.0.0

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Contents

CHAPTER 1

Project Description

OpenDeskLab aims at creating an open design for laboratory desks that is

- Modular structure
- Reconfigurable dimensions
- Safe
- Easy to build
- Low cost
- Highly functional

The material used for the structure of is mostly melamine boards, that can be precut by any CNC supplier to the given dimensions. The assembly of an OpenDeskLab is designed so as to require only the basic of the tools, such as a Pozidriv screwdriver. The desk itself can be configured in many different ways, and the materials as well as the aesthetics can be customized according to the owners taste.

All the materials chosen for the OpenDeskLab (and their respective sockets) are dimensioned according to the International standards and can be sourced online or in many local stores. The desk can be assembled easily, following the instructive videos provided for each component. Various components are provided, although anyone can design his own component to pair with the already developed ones.

OpenDeskLab can be built in three, four and five module variants. The builder may choose the modules that will form his desk according to his needs, and the modular design will accommodate every customization (with some minor limitations) possible.

1.1 Applications

The main audience that OpenDeskLab targets are high school laboratories and home/diy/hackerspace/fablab places. Due to its' modular nature, OpenDeskLab can be used in a variety of applications, including (but not limited to) electrical, chemical and general use workbenches. It can provide electrical as well as gas connections, water supply

and drain and of course ventilation. A hazardous materials storage is also provided that is the only fully self-contained module that can provide a safe storage for chemicals and flammables.

CHAPTER 2

Specifications & Requirements

According to the rules and regulations of the EU and most International Standards committees, there are some safety rules that must be taken into account for manufacturing laboratory equipment. However, although OpenDeskLab is designed according to those rules, it must be noted that the authors and creators of OpenDeskLab are **not** eligible for any kind of damage that may happen while building or using the desk. A laboratory that is used in professional environments **must** be certified by an authorized person, and OpenDeskLab is neither certified nor can fullfil all the regulations of every standard in the world.

Warning: OpenDeskLab is not certified for professional use. The authors are not eligible for any damage that may occur while building or using the product.

2.1 Safety

- Central ventilation is required in laboratory facilities
- Water tap within 15 meters or 10 seconds of the users
- Chemical storage must have edges protected for spillage
- Flammable materials must be stored in UL/NFPA certified storage areas
- Acids and bases must be stored separately
- Compressed air canisters must me fixed securely with fire resistant strands
- Toxic wastes must be handled according to specific regulations
- All storage areas must be clearly signed
- Labels must be placed for
  - Water
  - Electricity
  - Chemicals
  - Flammables
  - Acids/Bases

2.2 Specifications

OpenDeskLab is comprised of the following modules:

- Cable Routing
- Desk Back
- Desk Side
- Double Cabinet
- Drawer Cabinet
- Hazardous Materials Cabinet
- Lighting and Ventilation
- Single Cabinet
- Sink Cabinet
- Worktop

These can be combined in any desirable way to formulate a – three, four or five module wide – self-contained laboratory desk.

2.3 Materials

OpenDeskLab Materials	
Melamine	Electric Plug
Plywood	Electric Cable
Cam Lock	Pneumatic Coupling
Cam Bolt	Pneumatic Tubing
Wooden Dowel Pin	Sink
Concealed Hinge	Water Tap
Hinge Mounting Plate	Hydraulic Hose
Plastic Adjustable Leg	Plastic Tube
Metal Adjustable Leg	Silicone Caulk
Knob	LED Lighting
Electric Switch	Insulating Tape
Intumescent Paint	

CHAPTER 3

Modules

OpenDeskLab is comprised of different modules that can be assembled following some basic guidelines.

3.1 Assembly Procedure

The modules are assembled together using M6 connecting screws through the four holes that exist in every module.

3.2 Drawings

`Tall OpenDeskLab`

`Short OpenDeskLab`

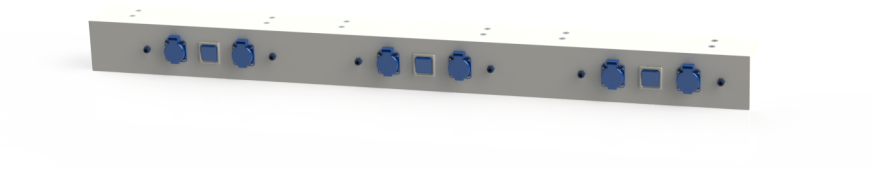
OpenDeskLab modules with bakelite doors		
		
1. Single Cabinet	2. Double Cabinet	3. Drawer Cabinet

3.3 Module List

3.3.1 Cable Routing

The cable routing module lies on top of the worktop, providing power and air connections for the users. The width of the melamine parts depends on the number of modules the desk will be built with.

Important:



Tools Needed:

- Pozidriv Screwdriver
- Wire Cutter
- Tube Cutter
- Scissors

When choosing the appropriate connections (for electricity and pneumatics) choose the appropriate plugs for your country and the correct International Protection Marking (IP Code). In laboratory environments, IP54 is the minimum requirement, and in some cases even more strict protection might be required.

IP Code	Object Protection	Liquid Protection
0	No protection	No protection
1	>50 mm	Dripping water
2	>12.5 mm	Dripping water when tilted up to 15°
3	>2.5 mm	Spraying water
4	>1 mm	Splashing of water
5	Dust protected	Water jets
6	Dust tight	Powerful water jets
6K	N/A	Powerful water jets with increased pressure
7	N/A	Immersion up to 1 m
8	N/A	Immersion beyond 1 m
9k	N/A	Powerful high temperature water jets

Warning: Electrical connections must be made from an authorized electrician. The authors are not responsible for any damage or incorrect installation by the builders.

Assembly Procedure

The assembly of the cable routing module is perhaps the hardest part of OpenDeskLab, as it requires electrical as well as pneumatic connections. The front melamine part has predrilled holes that can be used to connect AC or DC eletric outlets or switches for the Lighting and Ventilation module.

The pneumatic connectors are predrilled on either side of the electric outlets, and can be configured either as input/output connects or as outputs only.

The cable routing module provides 3 electric connections and two pneumatic connections above each module, therefore providing 9 electric and 6 pneumatic plugs for the three module-wide desk.

Cable management for all the connections goes through the Desk Back to their respective sources.

Drawings

Drawings are provided for the three module-wide version, for the other versions nothing changes besides the overall length of the module.

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Cable Routing Top 3M
Cable Routing Front 3M
Cable Routing
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Bill of Materials

Cable Routing 3M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	12	0.148€	1.776€
Cam Bolt 6mm x 45.5mm	6	0.880€	5.280€
Wooden Dowel Pin 8mm x 30mm	9	0.029€	0.261€
Melamine 18mm	0.333	6.718€/m2	2.237€
Electric Plugs	6	2.790€	16.740€
Electric Cable	5	0.835€/m	4.175€
Pneumatic Coupling	6	3.520€	21.120€
Pneumatic Tubing	5	1.191€/m	5.955€
Switch	3	6.770€	20.310€
Insulating Tape	3	0.0645€/m	0.193€
Total Cost			78.048€

Cable Routing 4M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	16	0.148€	2.368€
Cam Bolt 6mm x 45.5mm	8	0.880€	7.040€
Wooden Dowel Pin 8mm x 30mm	12	0.029€	0.348€
Melamine 18mm	0.444	6.718€/m2	2.983€
Electric Plugs	8	2.790€	22.320€
Electric Cable	7	0.835€/m	5.845€
Pneumatic Coupling	8	3.520€	28.160€
Pneumatic Tubing	7	1.191€/m	8.337€
Switch	4	6.770€	27.080€
Insulating Tape	3	0.0645€/m	0.193€
Total Cost			104.675€

Cable Routing 5M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	20	0.148€	2.960€
Cam Bolt 6mm x 45.5mm	10	0.880€	8.800€
Wooden Dowel Pin 8mm x 30mm	15	0.029€	0.435€
Melamine 18mm	0.555	6.718€/m2	3.728€
Electric Plugs	10	2.790€	27.900€
Electric Cable	9	0.835€/m	7.515€
Pneumatic Coupling	10	3.520€	35.200€
Pneumatic Tubing	9	1.191€/m	10.720€
Switch	5	6.770€	33.850€
Insulating Tape	3	0.0645€/m	0.193€
Total Cost			131.302€

3.3.2 Desk Back

OpenDeskLab can be configured with either a tall back or a short one. The tall back provides support for embedded lighting and connection to the room ventilation system, while the short back only goes up to the Cable Routing height, allowing the user (and the superviser) to have visual contact with the installed facilities.

> **Warning:** In some countries it may be against the regulations to install a short back for safety reasons. It is up to the builder to choose the correct version if safety rules must apply.

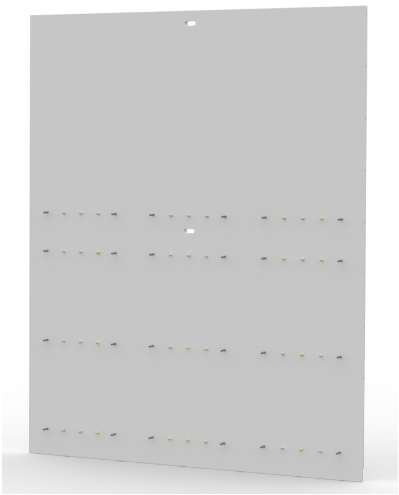
The width of the back depends on the number of modules that the desk will be comprised. The assembly procedure however remains the same, although more bolts, locks and dowel pins are needed in the bigger desks.

Important:

Tools Needed:

- Pozidriv Screwdriver

Tall back



Assembly Procedure

To assemble the back panel of the desk, all you have to do is insert the Cam Bolts, the Wooden Dowel Pins and the Cam Locks (without locking them).

Drawings

Drawings are provided for the three module-wide version, for the other versions nothing changes besides the overall length of the module.

`Tall Desk Back 3M`

Bill of Materials

Tall Desk Back 3M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	24	0.148€	3.552€
Cam Bolt 6mm x 45.5mm	24	0.880€	21.120€
Wooden Dowel Pin 8mm x 30mm	36	0.029€	1.044€
Melamine 25mm	2.745	8.958€/m2	24.590€
Total Cost			50.306€

Tall Desk Back 4M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	26	0.148€	3.848€
Cam Bolt 6mm x 45.5mm	32	0.880€	28.160€
Wooden Dowel Pin 8mm x 30mm	48	0.029€	1.392€
Melamine 25mm	3.660	8.958€/m2	32.786€
Total Cost			66.186€

Tall Desk Back 5M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	28	0.148€	4.144€
Cam Bolt 6mm x 45.5mm	40	0.880€	35.200€
Wooden Dowel Pin 8mm x 30mm	60	0.029€	1.740€
Melamine 25mm	4.575	8.958€/m2	40.983€
Total Cost			82.067€

Short back

Assembly Procedure

The procedure for the short back is the same as the tall one, only fewer components are needed.

Drawings

Drawings are provided for the three module-wide version, for the other versions nothing changes besides the overall length of the module.

`Short Desk Back 3M`

Bill of Materials

Short Desk Back 3M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	16	0.148€	2.368€
Cam Bolt 6mm x 45.5mm	24	0.880€	21.120€
Wooden Dowel Pin 8mm x 30mm	36	0.029€	1.044€
Melamine 25mm	1.530	8.958€/m2	13.705€
Total Cost			38.238€

Short Desk Back 4M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	18	0.148€	2.664€
Cam Bolt 6mm x 45.5mm	32	0.880€	28.160€
Wooden Dowel Pin 8mm x 30mm	48	0.029€	1.392€
Melamine 25mm	2.040	8.958€/m2	18.274€
Total Cost			50.490€

Short Desk Back 5M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	20	0.148€	2.960€
Cam Bolt 6mm x 45.5mm	40	0.880€	35.200€
Wooden Dowel Pin 8mm x 30mm	60	0.029€	1.740€
Melamine 25mm	2.550	8.958€/m2	22.843€
Total Cost			62.743€

3.3.3 Desk Side

Depending on the Desk Back configuration, the side panels also differentiate accordingly, with two different versions, a tall and a short one.

Important:

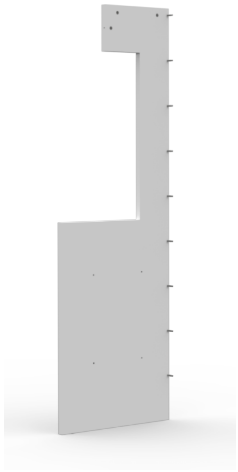
Tools Needed:

- Pozidriv Screwdriver

Tall side

Assembly Procedure

The assembly procedure is fairly simple, just screw in the Cam Bolts and insert the Dowel Pins on the melamine board. The Cam Lock can also be inserted without however locking them in place.



Drawings

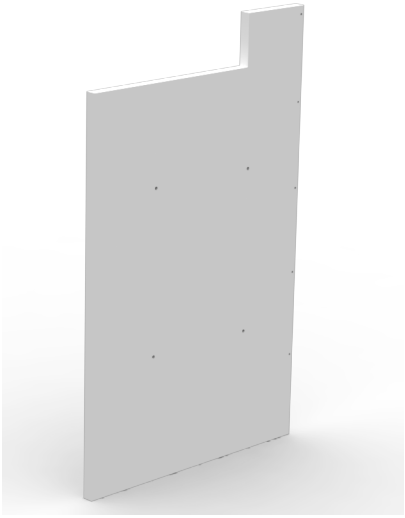
Drawings are provided for the left melamine side, the right side is changed accordingly.

`Tall Desk Side`

Bill of Materials

Tall Desk Side - Bill of Materials (For both side panels)			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	6	0.148€	0.888€
Cam Bolt 6mm x 45.5mm	18	0.880€	15.840€
M6 x 40 Connecting Screws	4	0.753€	3.012€
Melamine 25mm	1.530	8.958€/m2	13.710€
Total Cost			33.450€

Short side



Assembly Procedure

The short side module is also very simple to assemble, fewer components are needed than the taller version.

Drawings

Drawings are provided for the left melamine side, the right side is changed accordingly.

`Short Desk Side`

Bill of Materials

Short Desk Side - Bill of Materials (For both side panels)			
Item	Quantity	Price/Pcs	Total Price
Cam Bolt 6mm x 45.5mm	10	0.880€	8.800€
M6 x 40 Connecting Screws	4	0.753€	3.012€
Melamine 25mm	1.167	8.958€/m2	10.454€
Total Cost			22.266€

3.3.4 Double Cabinet

The double cabinet is a double module for the OpenDeskLab. It is comprised of the five melamine boards that form the frame and the two melamine doors.

The hinges are standardized and all the holes can be predrilled in the CNC mill of the melamine supplier.

Important:

Tools Needed:

- Pozidriv Screwdriver
- Electric Screwdriver for the six plastic legs

Assembly Procedure

The assembly procedure is very simple, first you assemble the two side panels using the Cam Bolts and the Wooden Dowel Pins, and then you mount the Hinge Mounting Plates on the left and the right side panels.

Then you create the door assemblies by mounting the Concealed Hinges with the provided screws (3.5mm x 16mm) and lastly you screw in the Knobs.

After you have assembled both sides and the door assemblies you can proceed to the next step. Attach the three Melamine parts on one of the side panels and then carefully align the second side panel on the assembly. After that, screw in the Cam Locks to secure the subassembly. Lie the subassembly down and screw in the six plastic legs on the bottom of the cabinet. Lastly, attach the already assembled doors on the cabinet by attaching the Concealed Hinges on their respective Hinge Mounting Plates and screw them in.

Drawings

`Shelf`

`Door`

`Side`

`Double Cabinet`

Bill of Materials

Double Cabinet - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	24	0.148€	3.552€
Cam Bolt 6mm x 45.5mm	12	0.880€	10.560€
Wooden Dowel Pin 8mm x 30mm	18	0.029€	0.522€
Concealed Hinge (9mm Overlay)	4	1.690€	6.760€
Hinge Mounting Plate	4	0.980€	3.920€
Plastic Adjustable Legs 100mm	6	0.750€	4.500€
M6 x 40 Connecting Screws	4	0.753€	3.012€
Melamine 18mm	3.228	6.718€/m2	21.691€
Door Knob	2	1.080€	2.160€
Total Cost			56.677€

3.3.5 Drawer Cabinet

The drawer cabinet is a single module for the OpenDeskLab. It is comprised of a drawer and a small cabinet.

Important:

Tools Needed:

- Pozidriv Screwdriver
- Electric Screwdriver for the four plastic legs

Assembly Procedure

First you assemble the drawer, which is comprised of two side panels, one bottom panel, one back panel and the front drawer panel.

Then you assemble the rest of the cabinet the same way the Single Cabinet and the Double Cabinet are assembled.

Drawings

`Drawer`

`Drawer Left Side`

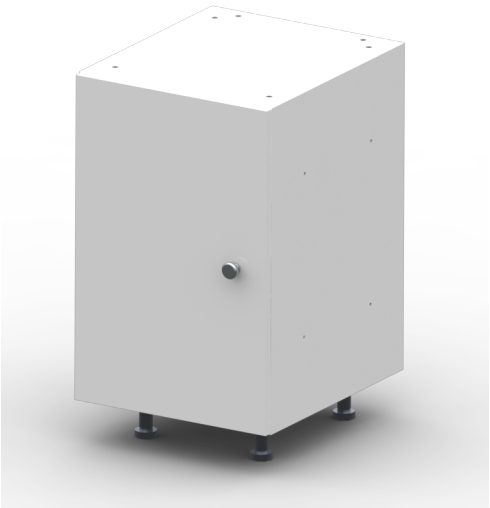
`Drawer Door`

`Drawer Cabinet`

`Drawer Shelf`

Bill of Materials

Drawer Cabinet - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	30	0.148€	4.440€
Cam Bolt 6mm x 45.5mm	24	0.880€	21.120€
Wooden Dowel Pin 8mm x 30mm	18	0.029€	0.522€
Concealed Hinge (9mm Overlay)	2	1.690€	3.380€
Hinge Mounting Plate	2	0.980€	1.960€
Plastic Adjustable Legs 100mm	4	0.750€	3.000€
M6 x 40 Connecting Screws	4	0.753€	3.012€
Melamine 18mm	2.432	6.718€/m2	16.341€
Door Knob	2	1.080€	2.160€
Total Cost			55.935€



3.3.6 Hazardous Materials Cabinet

The hazardous materials cabinet is a single module for the OpenDeskLab. It is very similar to the Single Cabinet module, but it is made of plywood and it includes a back panel that protects it's contents. The shelves have a front cover that prevents accidents from spillage.

The sides of the frame can be used to mount the door either as right swing or as left swing, with no modifications on the frame or the door itself. The hinges are standardized and all the holes can be predrilled in the CNC mill of the plywood supplier.

> **Warning:** The Hazardous Materials Cabinet is **not** fireproof. This cabinet is designed to keep flames away from your flammables for 10 minutes so you have time to escape a fire.

Important:

Tools Needed:

- Pozidriv Screwdriver
- Electric Screwdriver for the four metal legs
- Paint Brush

Assembly Procedure

The hazardous materials cabinet must be carefully assembled to provide the required protection. After the carefull assembly of the cabinet, before connecting the door, the silicone caulk must be used to provide an airtight seal when closed. The hinges used for this cabinet **should** be self-closing.

This cabinet is the only one that must be painted, using a special fire-retardant paint. You should paint the panels before assembling them together, since after the assembly it can be very difficult to paint everything evenly.

First you assemble the side panels

Then you assemble the door

And you combine them all together

Drawings

`Side`

`Shelf`

`Lip`

`Back Panel`

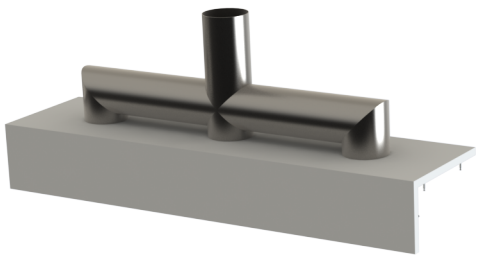
`Door`

`Hazardous Materials Cabinet`

Bill of Materials

Hazardous Materials Cabinet - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	22	0.148€	3.256€
Cam Bolt 6mm x 45.5mm	16	0.880€	14.080€
Wooden Dowel Pin 8mm x 30mm	18	0.029€	0.522€
Self Closing Concealed Hinge (9mm Overlay)	2	2.010€	4.020€
Hinge Mounting Plate	2	0.980€	1.960€
Metal Adjustable Legs 100mm	4	3.370€	13.480€
M6 x 40 Connecting Screws	4	0.753€	3.012€
Plywood 18mm	2.388	13.770€/m2	32.842€
Intumescent (Fire-retardant) paint	1	149.070€	149.070€
Silicone Caulk	1	2.640€	2.640€
Knob	1	1.080€	1.080€
Total Cost			225.962€

3.3.7 Lighting and Ventilation



The lighting module connects on the tall Desk Back module and provides lighting to the worktop using a LED stripe. The LED stripe can be turned on and off using the switch that is attached on the Cable Routing module.

The lighting module can be predrilled for ventilation installation.

Important:

Tools Needed:

- Pozidriv Screwdriver
- Wire Cutter
- Scissors

Assembly Procedure

First you assemble the top panel

Then you assemble the front panel

Lastly you attach them together

Drawings

The drawings provided show the three module-wide versions, change accordingly for the longer versions.

`Front`

`Top`

`Lighting Ventilation`

Bill of Materials

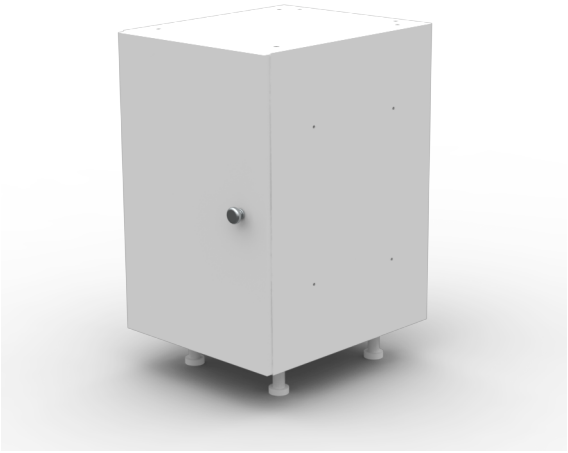
Lighting 3M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	6	0.148€	0.888€
Cam Bolt 6mm x 45.5mm	12	0.880€	10.560€
Wooden Dowel Pin 8mm x 30mm	18	0.029€	0.522€
Melamine 25mm	0.930	8.958€/m2	8.331€
Electric Cable	3	0.835€/m	2.505€
LED Strip (12V, 300lm)	1.5	1.624€/m	2.436€
Total Cost			25.242€

Lighting 4M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	8	0.148€	1.184€
Cam Bolt 6mm x 45.5mm	16	0.880€	14.080€
Wooden Dowel Pin 8mm x 30mm	24	0.029€	0.696€
Melamine 25mm	1.230	8.958€/m2	11.018€
Electric Cable	4	0.835€/m	3.340€
LED Strip (12V, 300lm)	2	1.624€/m	3.248€
Total Cost			33.566€

Lighting 5M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	10	0.148€	1.480€
Cam Bolt 6mm x 45.5mm	20	0.880€	17.600€
Wooden Dowel Pin 8mm x 30mm	30	0.029€	0.870€
Melamine 25mm	1.530	8.958€/m2	13.706€
Electric Cable	5	0.835€/m	4.175€
LED Strip (12V, 300lm)	2.5	1.624€/m	4.060€
Total Cost			41.891€

3.3.8 Single Cabinet

The single cabinet is a single module for the OpenDeskLab. It is comprised of the five melamine boards that form the frame (with the shelf) and the bakelite door that has rounded edges.



The sides of the frame can be used to mount the door either as right swing or as left swing, with no modifications on the frame or the door itself. The hinges are standardized and all the holes can be predrilled in the CNC mill of the melamine supplier.

Important:

Tools Needed:

- Pozidriv Screwdriver
- Electric Screwdriver for the four plastic legs

Assembly Procedure

The assembly procedure is very simple, first you assemble the two side panels using the Cam Bolts and the Wooden Dowel Pins, and then you mount the Hinge Mounting Plates on the left or right side panel, according to your preference.

Then you create the door assembly by mounting the Concealed Hinges with the provided screws (3.5mm x 16mm) and lastly you screw in the Knob.

After you have assembled both sides and the door assembly you can proceed to the next step. Attach the three Melamine parts on one of the side panels and then carefully align the second side panel on the assembly. After that, screw in the Cam Locks to secure the subassembly. Lie the subassembly down and screw in the four plastic legs on the bottom of the cabinet. Lastly, attach the already assembled door on the cabinet by attaching the Concealed Hinges on their respective Hinge Mounting Plates and screw them in.

Drawings

`Shelf`

`Door`

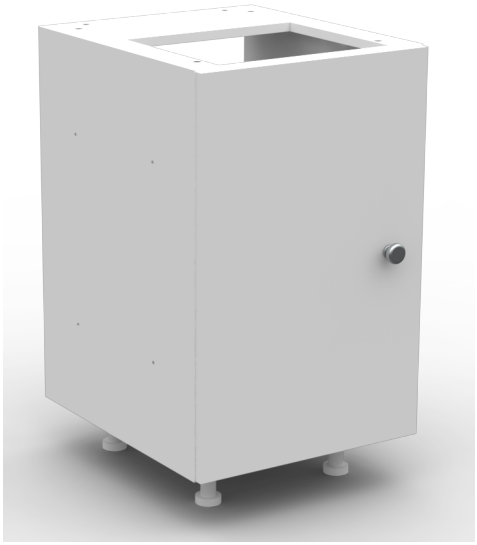
`Side`

`Single Cabinet`

Bill of Materials

Single Cabinet - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	18	0.148€	2.664€
Cam Bolt 6mm x 45.5mm	12	0.880€	10.560€
Wooden Dowel Pin 8mm x 30mm	18	0.029€	0.522€
Concealed Hinge (9mm Overlay)	2	1.690€	3.380€
Hinge Mounting Plate	2	0.980€	1.960€
Plastic Adjustable Legs 100mm	4	0.750€	3.000€
M6 x 40 Connecting Screws	4	0.753€	3.012€
Melamine 18mm	2.011	6.718€/m2	13.511€
Door Knob	1	1.080€	1.080€
Total Cost			39.689€

3.3.9 Sink Cabinet



The sink cabinet is very similar to the Single Cabinet module, however, the top shelf has a precut hole for the installation of the sink and the tap.

Although there are standard sizes for sinks and taps in the industry, most manufacturers tend to not follow them, for design reasons. This cabinet is designed for a 375x317 sink, which is a small standard sink size, however, in the case were the builder wants to use different sink size, he can choose to cut the hole using a jigsaw.

Important:

Tools Needed:

- Pozidriv Screwdriver
- Electric Screwdriver for the four plastic legs
- Wrench
- Jigsaw (Optional)

Assembly Procedure

The assembly procedure is very simple, first you assemble the two side panels using the Cam Bolts and the Wooden Dowel Pins, and then you mount the Hinge Mounting Plates on the left or right side panel, according to your preference. (Mind there are fewer holes in the sink side panels)

Then you create the door assembly by mounting the Concealed Hinges with the provided screws (3.5mm x 16mm) and lastly you screw in the Knob.

Lastly you assemble them all together. The sink must be installed **after** the worktop is placed.

Drawings

`Shelf`

`Top`

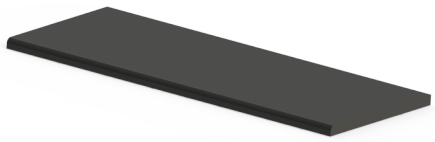
`Side`

`Sink Cabinet`

Bill of Materials

Sink Cabinet - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Cam Lock 15mm x 12.5mm	12	0.148€	1.776€
Cam Bolt 6mm x 45.5mm	8	0.880€	7.040€
Wooden Dowel Pin 8mm x 30mm	12	0.029€	0.348€
Concealed Hinge (9mm Overlay)	2	1.690€	3.380€
Hinge Mounting Plate	2	0.980€	1.960€
Plastic Adjustable Legs 100mm	4	0.750€	3.000€
M6 x 40 Connecting Screws	4	0.753€	3.012€
Melamine 18mm	1.750	6.718€/m2	11.759€
Door Knob	1	1.080€	1.080€
Total Cost			33.355€

3.3.10 Worktop



Important:

Tools Needed:

- Electric Screwdriver

Assembly Procedure

The worktop is assembled by simply screwing the top side of the cabinets with it, using the Pozidriv 3.5mm x 35mm screws. You open the doors of the cabinets, lie down on them and using an electric screwdriver you secure it in place.

If you have installed a sink cabinet module, you must also securely attach it to the worktop following the instructions provided by the sink.

Drawings

`Worktop 3M`

`Worktop Left Sink 3M`

`Worktop Right Sink 3M`

Bill of Materials

Worktop 3M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Pozidriv Screws 3.5mm x 35mm	12	0.0188€	0.225€
Worktop 40mm	1.5	22.142€/m	33.214€
Total Cost			33.439€

Worktop 4M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Pozidriv Screws 3.5mm x 35mm	16	0.0188€	0.300€
Worktop 40mm	2	22.142€/m	44.285€
Total Cost			44.586€

Worktop 5M - Bill of Materials			
Item	Quantity	Price/Pcs	Total Price
Pozidriv Screws 3.5mm x 35mm	20	0.0188€	0.376€
Worktop 40mm	2.5	22.142€/m	55.357€
Total Cost			55.733€

CHAPTER 4

Open Data

The project is licensed under the CC-BY-SA 4.0 license, and all the deliverables of this project are deliberately shared using open standards. The CAD files have been released publicly in GrabCAD, an online CAD collaboration tool. Through GrabCAD, anyone can download the files in neutral formats (STEP, IGES, STL) even if it is uploaded in a proprietary format. The files have been originally uploaded in SolidWorks 2016 format.

The parts are also shared in fully dimensioned A3 PDF files for complete openness.

CHAPTER 5

Acknowledgements

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