



**Product Concept
for
Tarsier Software Solutions'
Cable Trunking Electrical Power Bar Hanger**

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Executive Summary

Introduction

Tarsier Software Solutions develops product concepts and licenses them to larger companies. These companies are able to utilise their domain knowledge, sales, marketing and distribution infrastructure to successfully commercialise our ideas for both companies' mutual financial benefit.

Product Overview

Cable trunking is an elegant means to hide power cables in an office. However there is no space to place or to access an electrical distribution power bar within it, which means that the power bar must be placed on the floor. This reduces the aesthetics, forces the user to climb under the desk in order to switch sockets on and off and results in the power bar being kicked or knocked in general use or when the floor is cleaned.

Our power bar hangers are designed to hang a power bar from the cable trunking. Hanging the power bar from under the cable trunking;

1. provides easy access to the sockets,
2. keeps the power bar safely off the floor,
3. improves the aesthetics.

The electrical distribution power bar is hung from the cable trunking using two plastic hangers that are clamped in place under the cable trunking. Screws, screwed into the hangers secure the electrical distribution power bar to the hanger, as if it was being fixed to a wall.

The following photograph shows a desk with a power bar hanging from an IKEA Signum cable trunking using a prototype of our Electrical Power Bar Hangers.



Product Description

Introduction

Our Power Bar Hangers are designed based on the IKEA Signum cable trunking and enable an electrical distribution power bar to be hung from the cable trunking, but it could be used on any frame based trunking.

Hanging the power bar from the cable trunking;

- provides easier access to the sockets than when they are on the floor. Placing the power bar on the floor forces a person to climb under the desk in order to switch the socket on and off or to remove the plug. Leaving the connected appliance on is wasteful of energy and increases the risk of fire.

With the 60 cm wide EFFEKTIV desk it is possible to reach under the desk and operate the socket switches while seated, while the 80 cm wide EFFEKTIV desk does require a person to crouch down, but because the socket is elevated, it is closer and easier to reach than if it was on the floor.

- keeps the power bar safely off the floor. On the floor the power bar can be kicked or knocked in general use or when the floor is cleaned.
- improves the aesthetics as there are no cables dropping down from the desk to a electrical distribution power bar on the floor.

The electrical distribution power bar is hung from the cable trunking using two plastic hangers that are clamped in place under the cable trunking. Self tapping screws, screwed into the hangers secure the electrical distribution power bar to the hanger, as if it was being fixed to a wall.

The following photograph shows an electrical distribution power bar hanging from an IKEA Signum cable trunking using a prototype of our Power Bar Hangers.



Design Feasibility Testing

Prototype Design

Tarsier Software Solutions is primarily a software development company so we do not have the facilities to create a complete prototype of the Power Bar Hangers. However, we developed a basic prototype from components with the required functionality and appropriate dimensions.

The power bar was hung from the cable trunking using two plastic hangers that are clamped in place under the cable trunking.



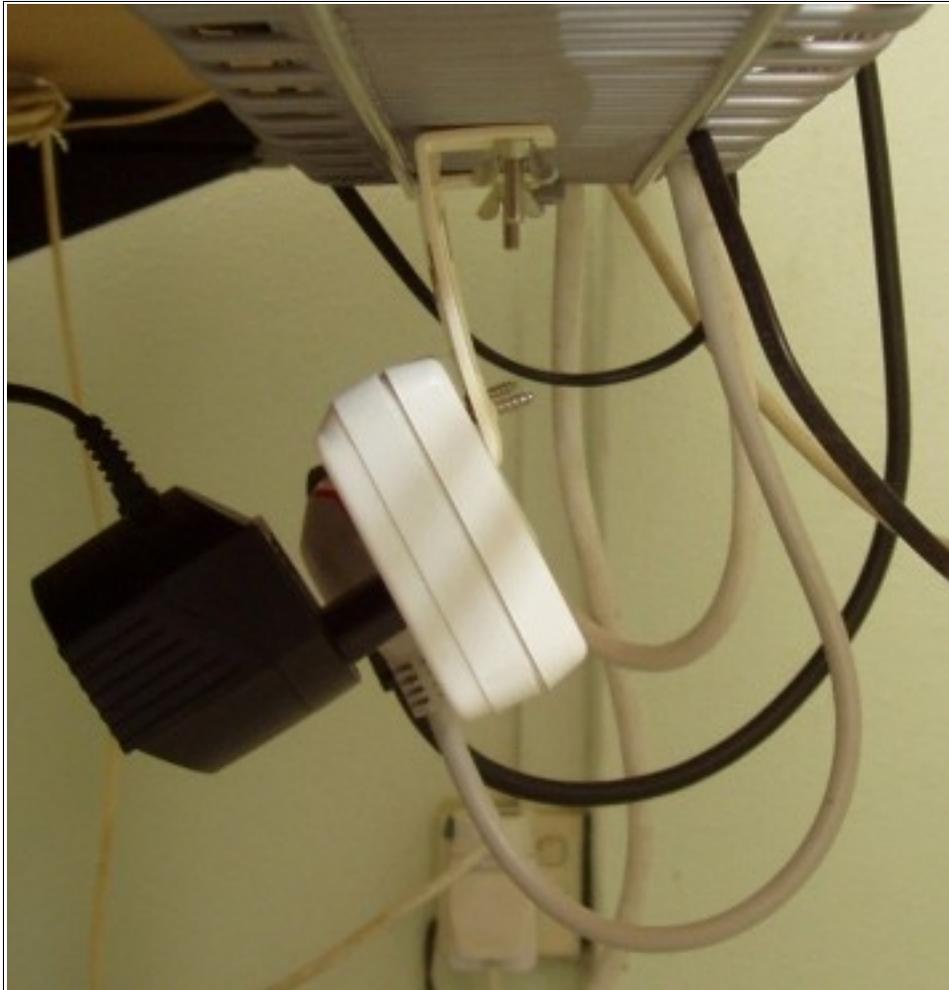
The prototype Power Bar Hanger (above) was made from the following readily available components,

- A plastic door hanger with one side cut off to make a right angle.
- A bolt and wing nut to form a clamp which grips the Signum cable trunking base, (see following picture). The upper jaw was made from a piece of the plastic cut from the door hanger.

The self-tapping screw forms the hook the electrical power distribution bar hangs from.

Prototype Performance Results

The prototype revealed the following issues which needed to be addressed in the production design.



1. The hanger rigidity

With the prototype hanger the power bar was found to hang off the vertical, as can be seen in the photograph above.

This was a combination of the plastic door hanger not forming a perfect right-angle and not having sufficient rigidity. Adding a fillet will strengthen the right-angle. This will also ensure the hanger does not bend when plugs are inserted or removed from the electrical power distribution bar.

Additionally a higher placement of the power bar fixing screw and / or extending the length of the hanger will also stop the power bar hanging off the vertical. In the prototype the hanger was 70mm long, with power bar fixing screw was placed 60mm from the top. Trails indicate that the power bar fixing screw can be raised to 50mm from the top of the hanger and still provide sufficient space for plugs with an integral transformer. Electrical power distribution bars were found to be typically 60 mm high.

2. Improvements to the design of the clamp for ease of installation.

When the hangers were fixed to a cable trunking that was already installed under a desk it was found that the prototype's use of a bolt and wing nut to form the jaws to clamp around the cable tray installation was tricky as the bolt head spins when the wing nut is tightened or when trying to put the wing nut on the head of the bolt.

The prototypes were installed by lying underneath the desk with one hand inserted in the narrow gap between the trunking and the underside of the desk, to hold the bolt head. The hanger was then slid onto the bolt followed by the wing nut which had to be threaded onto the bolt with a single hand while hanger was held clear. This was very tricky and the wing nut would often fall off onto the face of the installer. Safety goggles had to be worn to prevent eye injuries.

The design drawings for the production version detail the design of the jaws so that the hanger can be easily and safely attached to installed cable trunking.

3. Safety Guard for the exposed thread of the power bar fixing screw.

The original design for the hanger was to have studs that were integral to the hanger. For the prototype this wasn't possible as Tarsier Software Solutions does not have access to an injection moulding machine to manufacture the hanger with an integral stud. A self tapping screw was used instead.

The above photograph of the prototype hanger shows the use of screws to make the studs resulted in the tip of the screw and most of the shank being dangerously exposed.

This wasn't expected to be a problem, as the power bar hook was expected to be a stud moulded from the hanger. However testing revealed that different power bars have different sized screw head sockets (diameter and depth). Consequently a single sized stud would not guarantee that the Power Bar Hangers would be universal. Therefore using screws as a means to hang the power bar off the hangers ensures the hangers can be used with any power bar.

The hanger design therefore needs to include a means to shield the screw shank and tip.

4. 2mm thick plastic is suitable

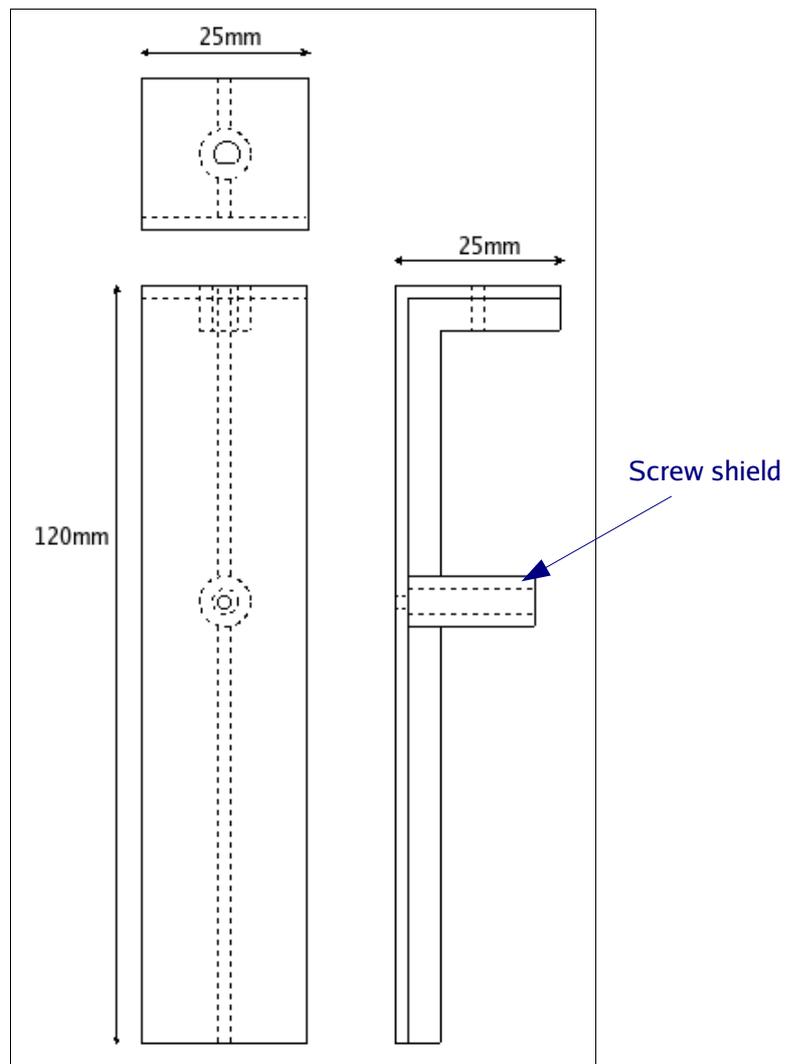
The 2mm thick plastic (presumably ABS) door hanger that was used to make the prototype was suitable for both the construction of the upper jaw (which supports the weight of the power bar) and to provide enough grip for the power bar fixing (self tapping) screw, from which the power bar hangs off the hanger, to hold the power bar securely.

Production Unit Design

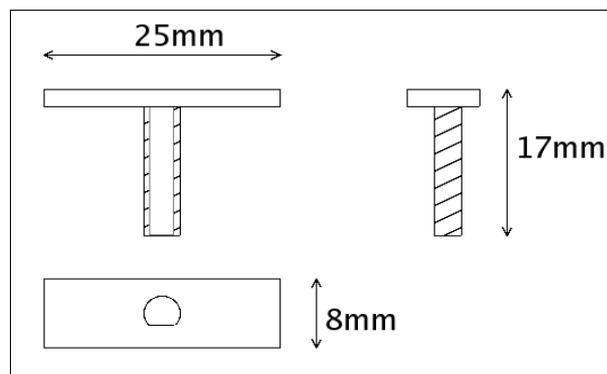
Engineering Design

The follow drawings show the design for the production version of our Electrical Power Distribution Bar hanger.

Hanger

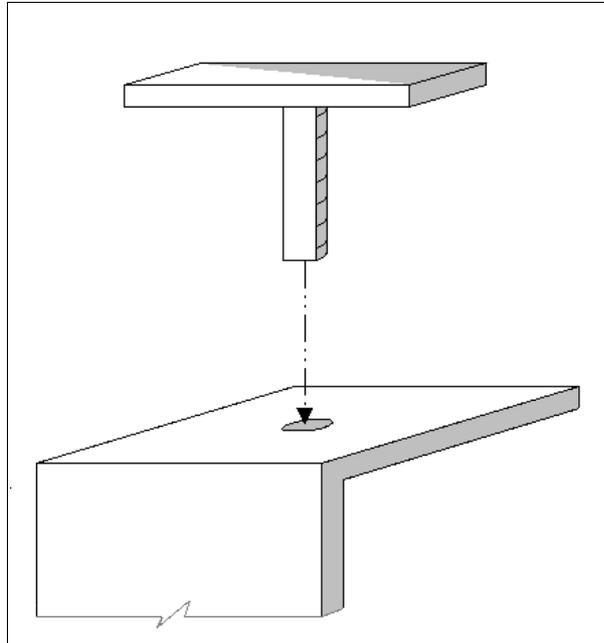


Upper Jaw

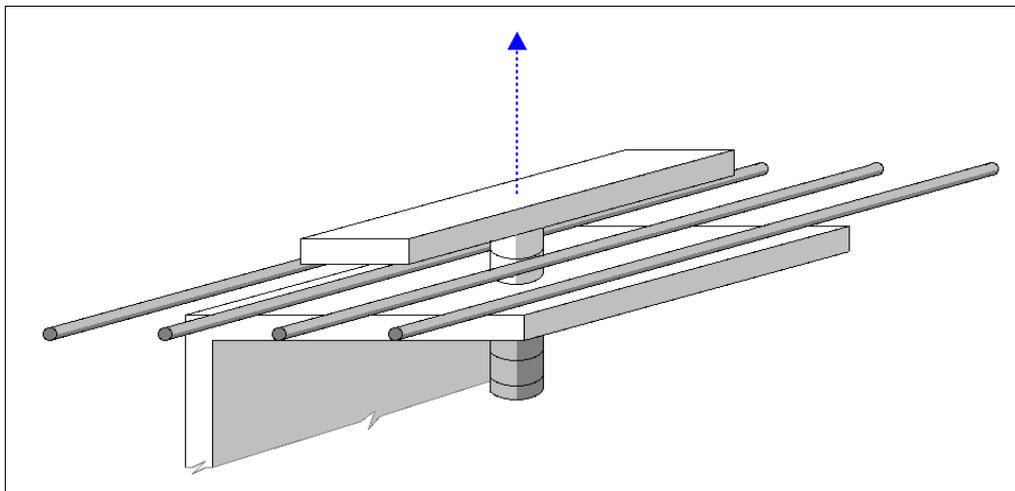


Installation Method

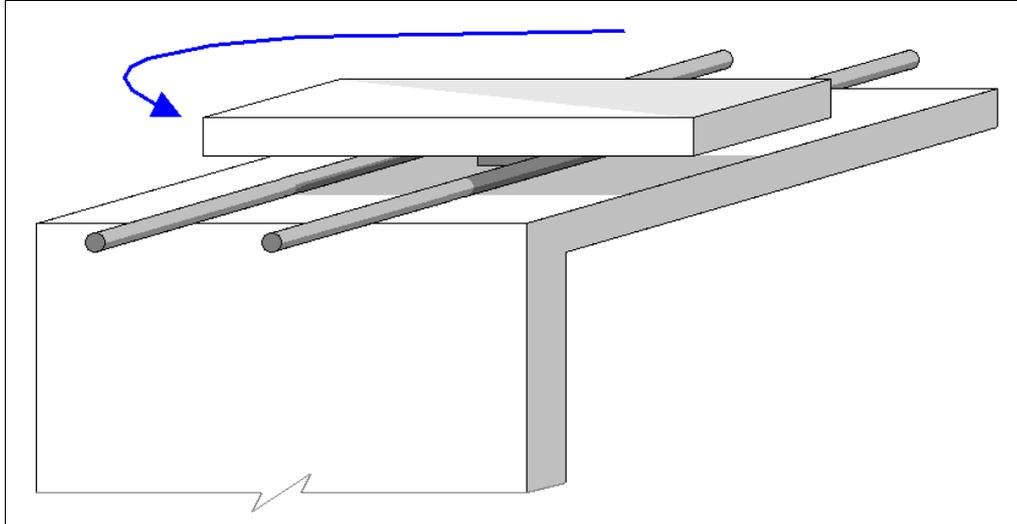
1. Insert the upper jaw into the hanger and secure loosely with the wing / butterfly nut so that the upper jaw is free to move vertically.



2. From below the Signum cable trunking, insert the upper jaw between the wire frame of the trunking.



3. Rotate the hanger so that it faces out allowing the power bar to be attached. This also rotates the upper jaw over the bars forming the trunking. Tighten the wing / butterfly nut so that the hanger is secure.



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If you are interested in licensing this Product Concept, please e-mail us at tarsiersoft@tarsiersoft.com referring to our **Electrical Power Bar Hanger** product concept, reference **PC07-001**, for our standard Licensing Agreement.