



Wire Harness Manufacturing: Faster to Production

January 2021

Whitepaper

Fast to Series Production with Kitconnect and Kabelporter

Faster to pilot series

Faster to series production

More flexible production volumes

Faster to productive personnel deployment

Wire Harness Manufacturing 2021

Do you manufacture wire harnesses for your customers? Then you are surely experiencing the daily challenges of today's market. Customers are giving you ever shorter deadlines for delivery of the pilot series and for the start of series production. They expect you to be flexible in adjusting delivery quantities, to take changes into account without bureaucracy, but also to provide documented quality, all while facing price pressure from competitors in China. On the other hand, you are finding fewer and fewer employees with a basic understanding of electrical engineering. At the same time, language barriers and cultural differences are becoming more prevalent. To help you gain an advantage in this environment, we offer a complete range of tools for efficient wire harness production, short setup times, and maximum flexibility. We offer you our support in every phase of the life cycle:

Prototypes / Pilot Series / Small Series

Quick setup of the assembly board on the Devboard with guide elements from Panduit, measurement with Kabelassistent and measurement adapters from the Kitconnect modular system

Series Production

Quick transition from pilot series setup to the Prodboard

Scaling of Production

Quickly duplicate assembly boards at any location with Devboard and Prodboard, guide elements from Panduit, and Kitconnect measuring adapters

End of production

Complete recycling of all parts used in the assembly boards

Reorders

Quick, short-term reassembly of an assembly board instead of keeping it in stock after the end of production

Prototypes / Pilot Series / Small Series

Many wire harnesses are developed based on practical experience. This means that you will only receive a sample wire harness once your customer has dismantled the first prototype of the end product after successful testing. With fast delivery of the pilot series, direct communication, and flexible response to change requests, you as a local partner have competitive advantages over suppliers on the other side of the globe.

Phase 1:

Procurement of materials and preparation of measurement adapters

Parallel to your customer's development work, you clarify the components of the wire harness. Even if there is no cut list or sample wire harness yet, it is probably already largely clear which contacts the individual strands will have, which connector housings the wire harness will have, and how it should be bound.

During this phase, you can already assemble the measuring adapters for Kabelassistent in advance using the Kitconnect measuring adapter construction kit.

With Kitconnect, assembly is a rapid process. The sturdy GRP mounting plate for attaching

the connector housing is pre-punched. Even connector housings that are not designed for permanent mounting can be easily attached to it. They can be glued with hot glue or superglue, tied with binding wire, or screwed on. There is always enough space under the mounting plate for nuts or screw heads. Because the mounting plates are made of plastic, they do not conduct electricity, which could falsify the results of the Kabelassistent. You can therefore also screw bare contacts directly onto the mounting plate.

Phase 2:

Setup for the pilot series

Once you have received the cutting list and sample wire harness from the customer, start assembling the individual strands and setting up the laying board at the same time.

To do this, equip the Kabelporter system assembly table with the Devboard grid assembly boards. Place a coordinate plot on the Devboards, on which you can later easily sketch a laying plan. You can either purchase the coordinate plots ready-plotted from Hirsch Digital Assembling Systems or download the template from the website and print it out on your own plotter. Auf dem Koordinatenplot legen Sie den Musterkabelbaum aus. Insert the prepared measurement adapters and guide elements through the coordinate paper on the Devboard. If something does not fit, you can easily reposition elements on the Devboard. Then connect the measurement adapters to the transfer modules of the measurement channels on the table using flat cables and connect free channels to each other with the next measurement adapter. All you need to do is cut the coordinate paper with a cutter along the vertical slots on the Devboard, then you can neatly arrange all the flat cables in the slots. If the slots get in the way, tape them over with adhesive tape after inserting the flat cables.

Once all the elements are in the right order, use a felt-tip pen to write the names of the connectors or terminals and their connections to the transfer modules or other measurement adapters next to the measurement adapters. Also draw in the guide elements and cable ties. You can scan the layout plan sketch you have created or transfer it to a CAD drawing.

Series Production

After the pilot series, there can be many forms of series production. Hirsch Digital Assembling Systems provides you with a whole range of tools for the full spectrum from occasional small series to large-scale series production in parallel on many assembly boards over many years at several production sites.

Phase 1:

Assembly Board for Production

For larger series, you need a robust assembly board. We offer the Prodboard as a basis. The external dimensions and cable slots are identical to those of the Devboard, so you can transfer the laying plan directly from the Devboard. Instead of screwing the guide elements and measuring adapters onto Panduit Quick-Build mounting plates, you screw them directly onto the Prodboard.

If you are wrapping the wire harnesses by hand, it is more practical to mount the measuring adapters and guide elements on spacer columns at a height that allows the rolls

At the same time as setting up the assembly board, you can already import the connection list into Kabelassistent.

As a final step, disconnect the sample wire harness from the mating connectors. Open the page for measuring the wiring in Kabelassistent. Now all you need to do is tap the contacts of the mating connectors with a test probe in the suggested order. Kabelassistent then saves the complete wiring of the mating connectors on the layout board with the measurement technology.

After measuring, start laying in Kabelassistent and reconnect the sample wire harness. This step allows you to check whether the wiring of the sample wire harness matches the connection list.

Phase 3:

Removal of the assembly board

After producing the pilot series or a small series, remove the layout board from the Devboard. This frees up your Devboard for new jobs, but more importantly, allows you to scan the layout plan sketch.

If you do not have your own large-format scanner, a reproduction service in your area or an online service such as repro-online.de can do this for around €10 to €20 in one day.

The scan allows you to archive the layout board setup with minimal effort. You can also use the scan of the sketch to create a precisely drawn layout plan for the series using a CAD program.

of wrapping material to fit between the wire harness and the assembly board. We offer suitable aluminum spacer profiles for this purpose.

Depending on your requirements, you can unscrew the measuring adapters from the Panduit Quick-Build mounting plates and screw them onto the Devboard, or you can build your own set of measuring adapters for production. In this case, using Kitconnect also gives you a time advantage over mounting mating connectors directly onto the assembly board. You can have several employees assemble the set of measuring adapters at separate workstations at the same time without getting in each other's way.

You will quickly reconnect the cabling to the measurement technology as noted on the laying plan. To insert the cables into the slots on the Prodboard, cut into the laying plan again. Then seal the slots with adhesive tape.

To be able to quickly reconnect the assembly board after a change, label the ribbon cables of the measurement technology on the side of the transfer modules. We are happy to offer you suitable pre-labeled cable markers.

If you have prefabricated the measurement adapters, you can assemble an assembly board with around 100 individual strands in one day, ready for production.

Phase 2:

Increasing Productivity

Scaling of Production

As a supplier of a core component, you have to keep up with fluctuations in sales of your customer's end products, often on a just-in-time basis. Shift work is one possible solution for short-term increases in demand. However, Kabelassistent with Kitconnect offers you even more options.

Short-term Capacity Expansion

To expand capacity at short notice, you can once again rely on the Devboard. It is practical to have the necessary guide elements and measuring adapters in stock. If you have at least the mating connectors with the connected pigtails in stock, you can use Kitconnect to build measuring adapters in no time at all. Thanks to the color system of the pigtails and the uniform pin splitters, this can be done error-free and with just a few different stock items. All you need to do is print out the laying plan. Thanks to the network-based structure of Kabelassistent, the measurement technology, pick-by-light, and cable route projection are immediately available at every Kabelporter table.

Long-term Capacity Expansion

If you anticipate producing a large number of items over the long term, all you need to do is replicate the assembly boards using the existing laying plans.

Production on additional Kabelporter tables also only requires the necessary infrastructure for network connections and power supply. Because Kabelassistent runs on a server, you only need to register new tables with the valid license number and you can start production immediately. The same applies to the Vario Trolley stranded wire trolleys.

If a server's performance ever reaches its limit, even these can be easily copied.

To enable employees with less technical expertise to lay the wire harnesses, you now need to set up the worker guidance system using pick-by-light on the vario trolley.

While this work is being carried out, you can already start production in free assembly. Once you have entered the photos of the connectors in Kabelassistent and created the work sequence with Pick-By-Light, it will be available on all assembly boards for the same item.

The same applies to the wire harness projection on the assembly board. Employees with greater expertise can already produce wire harnesses according to the laying plan and connection list. You make it easier for other employees to learn how to lay an item correctly and also to get back into the swing of things with a new batch after a production break.

Relocation

In the short or long term, you may want to relocate the production site for an item. Instead of shipping an entire assembly board to the new location, all you need to do is take the mating connectors on the mounting plate with the connected pigtails to the new location. The transport volume shrinks from a full pallet to a shoebox. At the new location, the mating connectors are quickly screwed back onto the base rails and connected with the pin splitters. You can download the laying plan directly from Kabelassistent and print it out. A few hours later, the assembly board can be ready for use at the new location.

The Kabelassistent servers are exact copies of each other at every location. The local servers retrieve the descriptions of all items and the corresponding assembly boards from the central database.

This means that everything you set up at a table with the first assembly board for an item is immediately available worldwide at every location. Both the wiring of the assembly board and all entries for pick-by-light and cable route projection are immediately available worldwide. Kabelassistent has already taken the step towards Industry 4.0.

Conversely, you have central access to the current production statuses at all locations. And to clarify any questions, you or your IT specialist can log into the measurement

controllers, Pick-By-Light control devices, or local servers at any time and provide support.

Whether from the company headquarters or from your home office.

End of Production

Every item reaches the end of its production cycle at some point. With conventional assembly boards, there is often a hesitation before final dismantling, in case the customer unexpectedly reorders the wire harness. Once you have decided that you no longer have any use for an assembly board, scrapping it is often the most economical solution. With Kitconnect, we have created a solution for you that offers maximum reusability in two stages.

Step 1

Reusing the Prodboard and Measurement Adapters

Unscrew all guide elements and measuring adapters from the Prodboard. The guide elements and the Prodboard itself are standard parts that you can reuse directly for a new assembly board. The set of numbered connection cables for the measuring technology also fits unchanged for the next assembly board.

If the top of a Prodboard has too many screw holes to be reused, we offer to cover it with new top plates. This is cheaper and more sustainable than buying a new Prodboard.

You can reuse the measurement adapters in their assembled state if the adapted mating

connector is still used in current or future wire harnesses.

Step 2

Disassembling the Measuring Adapters

If you do not expect to need the mating connector that you have mounted on a measurement adapter again, disassemble the measurement adapter. The base rail, pin splitters, and connectors are standard parts that you can reuse for new measuring adapters. All that remains is the mating connector with the mounting plate and the connected pigtails. This small remnant has such a small storage volume that you can store it for future use. And if you do decide to scrap it, it only means a minimal loss of material.

Reorders

Some products last longer than planned, sometimes even outliving their own manufacturers. In today's online retail market, there is a larger market for spare parts, even for older devices. With Kitconnect, you don't have to start from scratch when you receive a request from your customer or a third-party supplier; instead, you can respond quickly and cost-effectively.

Replica of an Archived Wire Harness

All data relating to a wire harness that you have created with Kabelassistent is stored in the database. Even after many years, you can still retrieve and print the routing plan. If you have also kept the mating connectors, you can use Kitconnect to reassemble measurement adapters in no time at all.

With the printed laying plan, you can quickly rebuild a laying board on a Devboard.

With the data from the wiring harness, Kabelassistent has also saved all specifications for pick-by-light and cable routing projection. With these production aids, your employees will be able to find their way around the production steps for the wiring harness even after a long break in production.

Kitconnect and Kabelassistent

Hirsch Digital Assembling Systems offers you two product lines for flexible wire harness production in the age of digitalization: Kitconnect and Kabelassistent. Together with Panduit Quick-Build, Panduit's cable laying board accessories, and Kabelporter tables, you have a complete tool system for building wire harnesses at your disposal. This provides you with the technical basis for a suitable response to the demands of the globalized market.



Hirsch Digital Assembling Systems

Ruländerstraße 11
D-79418 Schliengen
Germany

Voice: ++49-7635-82716-0

Fax: ++49-7635-82716-20

info@kabelassistent.eu

www.kabelassistent.eu