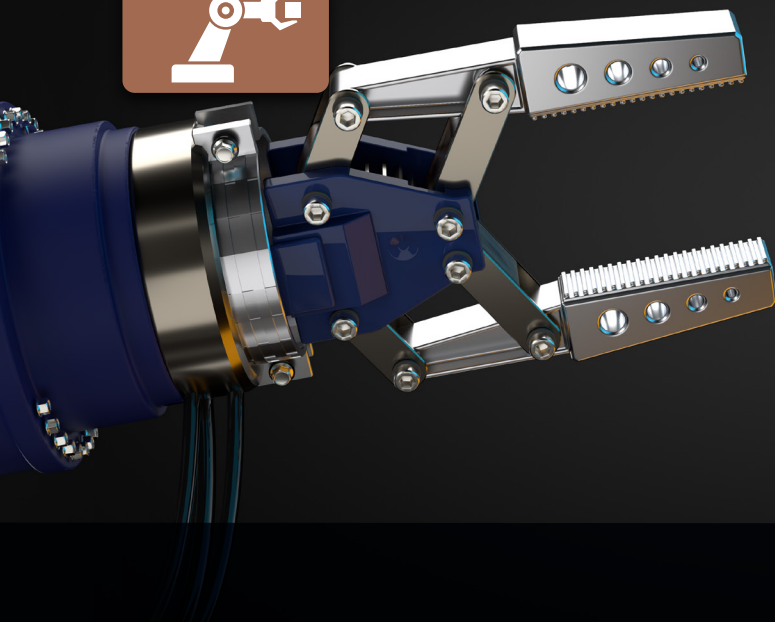




Whitepaper

Industrial



Value added services (VAS): faster, simpler and more flexible

By Ronald Velda, Director Supplier Marketing Europe Connectors, TTI

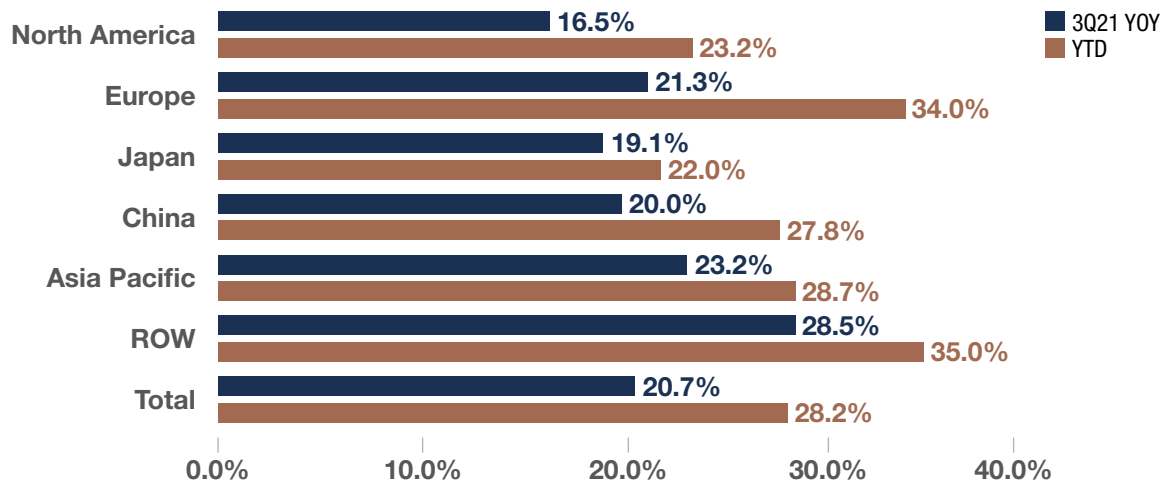
Meeting industry challenges

The electronics industry is dealing with component shortages, rising costs, and long-running disruptions due to COVID-19. Despite this, growth rates are strong, and demand for technology products continues to rise. For example, worldwide connector sales in Q3 2021 were up 20 per cent year-on-year, at more than \$20 billion¹.

Time to market is a constant pressure – and manufacturers of circular connectors face some challenges here. To stay competitive, they must make sure their products are designed, built, and distributed as fast as possible and in economical quantities. At the same time, they must control costs while maintaining quality and offer quick solutions to customers across a broad geography. Once the product is designed and in production this is where circular connector manufacturers consider value added services and connector assembly via distributors such as TTI to provide solutions for the challenges mentioned.



Connector Sales Performance by Region (Bishop ©2021)



Distributors such as TTI have the expertise and resources to take on many of the complex tasks involved in the assembly of circular connectors, saving cost and minimizing time to market. Whether it's for bigger volumes, or customized small runs, the right value added distributor can be an essential link in the production chain.

Value added services from TTI

TTI is the best-in-class distributor of passive, interconnect, electromechanical, and discrete components. We also offer a range of value-added services (VAS). As part of our VAS services TTI offers an extensive circular connector assembly portfolio from industry leading manufacturers.

Why choose TTI for value added services? Some of the key benefits are reducing inventory by offering lower MOQ's, minimizing storage, reducing time to market with short lead times (48 hours), and reducing the total cost of ownership. We also give you the flexibility to order different part numbers, and to customize production for a specific product.

As part of its VAS offering, TTI provides an expert service, with our specialists on hand to help customers. TTI's specialists listen to you and your requirements and can then suggest the best connector configuration and type that's appropriate for your application – for example, should the connector be from metal or can a plastic connector do?

By working with TTI, you can take advantage of our vast experience, to ensure you make the right choice on suitable connectors and additional services such as kitting, custom length pin header and cable respooling. This approach is particularly advantageous for the industrial automation markets, as well as avionics and defense – TTI's connector assembly service conforms to the latest QPL certification issued by the manufacturers.

We continue to grow and invest in value added services, and we aim to be the first choice of customers as the value added distributor for connector assembly in Europe. Although we service all vertical markets the focus for our connector assembly is on three key areas: industrial, transportation and defense/aerospace.

The recent integration of COSY GmbH, a specialist assembler of circular connectors partnered with ITT Cannon, has enabled us to double our output, and tripled our working space for connector assembly and services, to around 6000m². From a previous of output of about 350,000 connectors per year, and 450,000 connectors per year by COSY, we plan to grow this in 2022 to about 1 million pieces.

Value Added Services from TTI include:

- Wire and cable re-spooling to customised length
- Heat-shrink tubing cutting to customised length
- Pin header modifications
- Terminal de-reeling
- Kitting
- Customised printing
- Barcode labelling
- Customised kitting
- Documentation and traceability
- ESD packaging, international shipping and documentation
- Military inspection standards

Connector assembly

Let's look at value added services in a little more detail. What can a distributor actually do for you, and why would that be helpful?

One of the most important value-added services is connector assembly. Here at TTI Europe, we specialize in distributing connectors and interconnect solutions from top suppliers recognized around the world. We carry a large inventory level of connector components that enables TTI to custom create to market requirements

Selecting connectors can be time-consuming: searching for the right product, choosing the best connector, and deciding on any associated cabling. Many hours or days can be lost getting information and making decisions. TTI can provide the necessary support and guidance in such instances.

For many applications, there will also be standards that must be conformed to, which can add further complexity. Connectors must comply with relevant specifications, which may vary from country to country, or for different applications and end markets. Companies must be able to demonstrate this compliance if asked – which means providing the correct certifications, approvals and accreditations.

Often, customers look for customization of connectors below the manufacturer's minimum order quantities (MOQ), or special kittings which are not directly offered by a supplier. This is particularly true if a customized product is needed in a very short timeframe.

To overcome these issues, design engineers and procurement teams can turn to their supply chain for help. TTI can provide value added services that include assembling the connectors which helps to streamline processes, minimize problems, and significantly cut time to market. This means that customers can receive customized products quickly, which are exactly tailored to their needs.

TTI also adds value by being quick to market with samples when a new product is introduced. Other supply chain services from TTI include holding stock of finished goods to buffer customers' demands, as well as providing a 'one stop shop' when components from multiple suppliers are required, so a customer doesn't have to waste time going to multiple sources.

You might expect that connector manufacturers would be an equally valuable source of assistance. They are, but, in practice, they tend to focus more on their core businesses like developing new products and production, rather than inventory or assistance in stock management or supplying small quantities. For these types of requirements it means that customers are better placed going to TTI for help.

Customers can also rely on TTI, to keep on top of new developments in the market, and to respond with expert advice. For example, in the automotive sector, more control units and sensors become more important. We also see that the markets are developing new plating which is RoHS/REACH compliant like Zinc-Tin J-plating.

Connector assembly capabilities

TTI Europe's connector assembly lines are QPL approved and are all officially authorised by our supplier partners.

We can build more than one million different variants of connectors and we hold an outstanding stock level of components. This means we can ensure short lead times with a 48-hour turnaround compared to perhaps an eight-to-ten-week lead time directly from a supplier – although we have the flexibility to deliver higher volumes when that's what you need. Additionally, TTI is well able to deliver below a manufacturer's minimum order quantity (MOQ) to support customers' needs

Working with TTI also adds flexibility to the manufacturing process and provides a good solution for small to mid-size requirements of up to 200 pieces, which can be particularly helpful during the prototyping phase. We can ship to your forecast requirements, or look at unique supply chain solutions to support your business requirements.

A large part of our assembly focus is on circular military connector like the MIL-DTL-38999 Series I & III, HE308, VG96912, VG95328, VG95234, MIL-DTL-26482, rectangular connectors like MIL-DIL-24308 and industrial and harsh environments like SJT, 851, 97 Series and the EN2997.

TTI's facilities near Munich, Germany can provide assembly and kitting for the 38999 series I & III including Amphenol's VG series 96912, 95328 and 95234 circular connectors, as well as Souriau connectors to the EN 3645 qualification. All D38999 products from both manufacturers are QPL-certified and can be produced, on request, within 48 hours.

With our recent integration of COSY Connector Systems, we now also specialize in the assembly of circular connectors from the world-recognized manufacturer ITT Cannon/ VEAM. The full COSY portfolio (Cannon: VG95234, CA-B, CA, VG95328, KPSE, KPT, KPTC, CGL / VEAM: FRCIR, CIR) is now part of TTI.

We build custom-fit circular connectors on-demand, from the largest European inventory of individual components such as inserts, barrels, back shells, O-rings and contacts. Our team focuses on the latest technology with a sophisticated workflow, enabling a quick turnaround time.

To support your requirements, we can provide:

- Different housing materials:
 - Stainless steel
 - Marine bronze
 - Aluminium
 - Different platings:
 - Olive drab cadmium
 - Electroless nickel
 - Zinc cobalt black
 - Zinc nickel blue
 - Black zinc nickel plating
 - Epoxyurethanic varnish black
 - Zinc Tin (new J-plating)
 - Different contacts:
 - Signal (solder & crimp)
 - Power
 - Coaxial
 - PCB, including stand-off
 - Adapters and boots
 - Back shells and accessories
 - Cable management components
- Other services include barcode labelling, documentation and traceability, Mil-Spec certifications, and ESD packaging, international shipping, and documentation.

Moving to assembly

Once you're ready to move your design into production, TTI can help through each stage. Figure 1 shows the assembly process which is fast and straightforward.

Figure 1: Flowchart of value-added assembly services (source TTI)

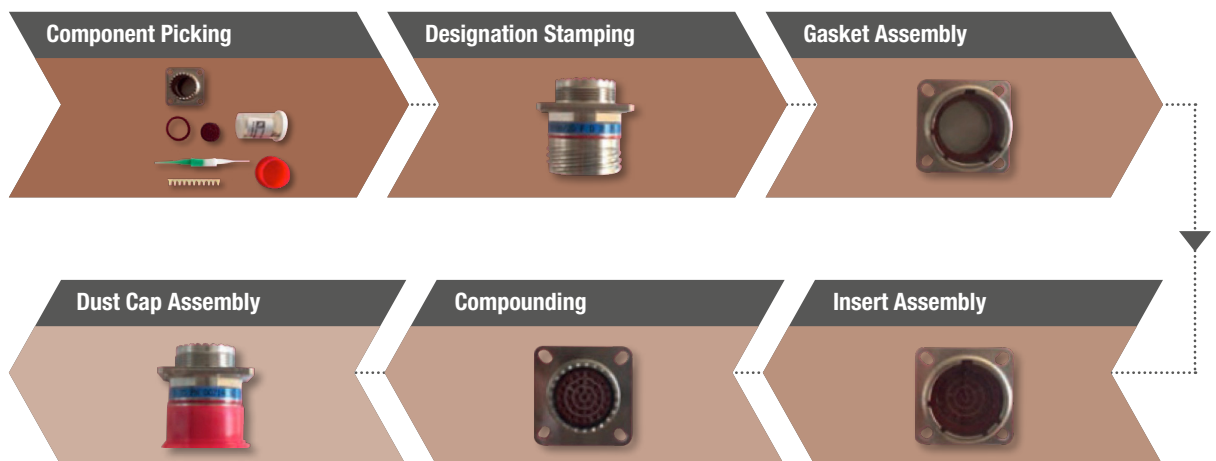


Figure 2 shows TTI's services, listed for many of the major connector manufacturers. For qualified connector assembly, TTI's capabilities focus on a group of five core suppliers: Amphenol, Souriau, Smiths Interconnect, ITT and TE Connectivity. As shown by Figure 2, you can see that other value-added services are provided for a larger group of suppliers.

Figure 2: TTI's value added services capabilities, by manufacturer²

TTI, Inc. – Connector Assembly Capability Chart

MIL QPL	Amphenol	Amphenol Matrix	Amphenol PCSD	Glennair	ITT Cannon	ITT VEAM	Souriau	TE Connectivity	TE Deutsch
MIL-DTL-12883									
MIL-DTL-24308									
Solder/1 & 3 Crimp/2 & 4 PC/Tail/23 & 24									
MIL-DTL-26482									
Series I Solder – MS311 Series I Crimp – MS312									
Series II – MS347									
MIL-DTL-26500									
MIL-DTL-28840									
MIL-DTL-28504									
MIL-DTL-38999									
Series I – MS27 odd shell sizes Series II – MS27 even shell sizes Series III Aluminum F & W Series III Composite J & M Series III Firewall K & S Series III Black Zinc Ni Z Hermetics – Series I II III									
MIL-DTL-39012									
MIL-DTL-55302									
MIL-DTL-55339									
MIL-DTL-83513									
MIL-DTL-89723									
Series III Bayonet – M83723/7 Series III Threaded – M83723/8 Series III Threaded – M83723/9									

ttieurope.com

Associated Products

TTI, Inc. – Your Value added Service Specialist

Commercial Versions	Amphenol	Amphenol Matrix	Amphenol PCSD	Glennair	ITT Cannon	ITT VEAM	Souriau	TE Connectivity	TE Deutsch
Commercial alternative for MIL-DTL-12883									
Commercial alternative for MIL-DTL-24308									
Solder/1 & 3 Crimp/2 & 4									
Commercial alternative for MIL-DTL-26482									
Series I Solder – MS311 Series I Crimp – MS312									
Commercial alternative for MIL-DTL-26500									
Commercial alternative for MIL-DTL-28840									
Commercial alternative for MIL-DTL-38999									
Series I Series II Series III Aluminum F & W Series III Composite J & M Series III Firewall K & S									
Commercial alternative for MIL-C-5015									
Commercial alternative for MIL-DTL-83513									
Commercial alternative for MIL-DTL-83723									
Series III Bayonet Series III Threaded									
AS5015 Solder – MS310 Crimp – MS345									
AS81511									
AS81714									
EN2997									
EN3645									
EN4165									
VG85328									
Solder Crimp									
VG85234									
BOEING 787 BACC									

Cutting and respooling

We provide cutting and respooling services for many different ranges of cable, wire and heat shrink tubing, all customized to your requirements. This helps avoid redundant inventory and minimizes the storage needed, and can handle challenges due to awkward sizes, weights, or quantities – while always ensuring the quality standards are maintained.

For example, we buy some cables with 10km on a reel, and cut it and re-spool it into 250m lengths for our customers – while our minimum cut length is only 1m.

Cable types that TTI can cut, and re-spool include Automotive Composite Wall (ACW) wire, powerlink HV cable, single core wire, and sensor/control cable. We can also cut and re-spool many types of data communication cable – including cheminax/coaxial, twinax/double coaxwire, databus, quad coaxwire and network cable – as well as multi-core EPD cable and all TE Connectivity cables, and different shielding and jacket implementations.

Our cable cutting and re-spooling equipment can handle diameters from 1mm all the way up to 40mm, while we can also cut heat shrink tubing in widths up to 150mm.

De-reeling

TTI provides a screwed contact and crimp contact de-spooling service, which enables improvements in processing time, better ship to line capability, and reduced inventory – supporting fulfillment on demand. This is all provided at a competitive cost.

Pin header cutting

TTI can also modify pin and breakaway headers exactly as required for an application. This includes cutting pin headers to custom pin counts, and removing individual pins as needed.

Kitting

To reduce the time taken in processing parts, as well as the costs involved, TTI offers customer-specific kitting options. This can also avoid the risk of unplanned downtime for your assembly line due to a part not being available, as well as minimizing the cost and stress of excess inventory.

Global warehousing system

Year after year, customers rate our inventory availability, on-time delivery, and accuracy among the very best in the industry.

That hasn't just happened by chance: TTI has many years' experience in assembling connectors and was the first distributor to have all its warehouse locations around the world certified to the ISO 9001 and ISO 14001 standards. TTI Europe is also certified to the EN9120/EN9100, IECQ-CECC and ISO/IEC 27001 standards, and all its European sales branches are ISO 9001 certified.

For the major connector manufacturers, TTI can deliver parts from stock, and we can build more than one million different variants of connector. Parts can also be shipped to an OEM's forecast or held as buffer stock to be called off as needed. This means you can minimize the amount of stock you need to hold, thus saving space and money, without the risk of a critical part not being available for your production requirements.

When it comes to stock availability, you want to make sure you're dealing with a partner that's got the right scale. TTI has more than 120,000m² of automated warehousing in North America, Europe, and Asia, all linked to a global warehouse management system, that ensures procedures and processes are the same, worldwide.

Wherever you are in the world, TTI has got you covered.



*Figure 4:
TTI's distribution
center in Munich
(source TTI)*

A reliable partner

Working with an expert distributor like TTI, and taking advantage of its value-added services, brings several key benefits:

- Avoiding the financial overhead of stocking parts or having unused inventory. Capital commitment is lower, because parts can be ordered from stock without needing to buy large quantities up-front.
- With TTI's huge stockholdings and fast turnaround times, OEMs benefit from more flexibility. They can scale orders up or down as needed to respond to changes in demand for their end product.
- Value added services accelerate the design and assembly processes. This means that manufacturers can cut time to market, often substantially, so they can get their product to market as quickly as possible – a vital competitive advantage.

TTI has developed and refined their systems for 50 years to meet the specific requirements of passive, connector, electromechanical and discrete components. This enables us to minimise processing cost, reduce risk, and maximise continuity of supply – giving our customers the lowest Total Cost of Ownership, and the peace of mind that comes from working with a safe pair of hands.

Value added services are an integral part of TTI's business strategy. From technical expertise and application advice to customised services, TTI adds value throughout the supply chain.

Overall, TTI is a trusted provider you can rely on – with our long-standing partnerships with manufacturers and our unrivalled expertise, we always keep our promises.

¹ <https://www.tti.europa.com/content/dam/tti-europe/en/resources/marketeye/Categories/connectors/me-bishop-20211213.html>

² <https://www.tti.europa.com/content/dam/tti-europe/resources/Literature/Product-ApplicationGuides/Value-Added-Service-Connector-Assembly-Chart.pdf>



About TTI

TTI, Inc., a Berkshire Hathaway company, is an authorised, specialty distributor of electronic components. Founded in 1971, the emphasis on a broad and deep product portfolio, available-to-sell inventory and sophisticated supply chain programs have established TTI as a distributor of choice to manufacturers in the industrial, defence, aerospace, transportation, medical, and communications sectors worldwide. TTI and its wholly owned subsidiaries, the TTI Family of Companies, Mouser Electronics, Sager Electronics and Exponential Technology Group employ over 8,000 people in more than 148 locations throughout North America, South America, Europe, Asia and Africa. Globally, the company maintains about 288,000 square meters of dedicated warehouse space housing over 850,000 component part numbers.

For more information about TTI, visit www.ttieurope.com.

European Headquarters:

TTI, Inc.
Ganghoferstr. 34
82216 Maisach-Gernlinden
Germany
Tel.: +49 (0)8142 6680 – 0
Fax: +49 (0)8142 6680 – 490
Email: sales@de.ttiinc.com
www.ttieurope.com

Copyright © TTI, Inc. All Rights Reserved.