



Small differences big impact



Coaxial distribution



FTTH networks



Home networks

WWW.DKTCOMEGA.COM



Our vision

"Improve living standards in Europe via broadband network performance"

At DKT we want to improve broadband network performance, network economy and end-user satisfaction via clever designs and high quality products. We will always have an in-depth understanding of the real issues in broadband networks and base our product design on existing and future challenges related to three areas: performance, economy and satisfaction.

"By combining an innovative mentality with our extensive experience, we at DKT have developed a mindset for problem solving, which has enabled us to be first movers within the industry. At DKT, we believe that the competitive advantages of our customers lie in the details. That is why we say, small differences, big impacts."



- Christian Emborg, Managing Director, CEO DKT A/S.

40 years of broadband connectivity

In 1977 Hardy Christian Hansen and Brita Emborg Hansen founded DKT, an entrepreneur and solution provider for the cable-TV industry. Throughout the 80s, DKT began to import products for cable TV networks, to be used both for their own solutions and by installers. During the 90s, DKT launched its COMEGA series of passives, and soon after established itself as a premium brand. In 2006, Christian Emborg took over and became CEO, and has since launched a number of successful initiatives, such as the homeconnect.me portal, the world's first support platform for cable-TV subscribers with focus on do-it-yourself installations. Today, DKT as a company focusses mainly on Home connect products, such as our new Mesh products, Fiber-to-the-Home, and our DOCSIS 3.1 passives for the coax network.

With 40 years of industry experience, DKT has shown time and time again, that within broadband connectivity, the best results are achieved by being excessively detail oriented, by being innovative, and by being one step ahead of the market, and in particular, understand the dynamics. That is why DKT already in 2013 made the strategic decision that all of its coaxial network products would be DOCSIS 3.1 ready/aware.

In 2016 DKT became part of the world's first complete DOCSIS 3.1 upgrade.

It has been quite a journey, and the world has changed much since we started in 1977.

It is because of our innovative mindset that many of our products are created by involving our customers already in the development phase. By combining their experiences with our expertise and know how, we can ensure that the small details in our products create long term advantages for our customers.

We are quite proud of how far we have come during our 40 years in the industry, and intend to celebrate our anniversary throughout the year.

Our view on DOCSIS 3.1

We believe DOCSIS 3.1 represents game changing possibilities. The ability to offer more than 1 Gbit/s connections by using the existing coaxial cables means that upgrading for the Internet of the future is far less costly.

That is why DKT has been focused on the DOCSIS 3.1 technology since 2013.

It wasn't long ago that the only connected device for many households was a modem. Imagine that and fast forward to 2017 where tablets, computers, phones, heaters, fridges, smart TVs, gaming consoles, security systems and even lights, require stable fast internet connections to help empower our lives and fully benefit from the manufacturers intended designs.

And if this blows you away, add virtual reality, mixed reality, augmented reality, autonomous vehicles connected to the home and the canvas for connectivity and broadband performance is multiplied by a factor 10 versus what is common in most homes today.

All of these technologies will require a fast, stable and robust connection to the Internet. This development in Internet usage is something we at DKT believe will soon be seen everywhere, and that is why we are strong believers that

DOCSIS 3.1 is the answer to the consumer demands of the future.

Optimising performance with DOCSIS 3.1 products

Upgrading to DOCSIS 3.1 involves exchanging the passive electronic infrastructure to handle higher frequencies - this gives an opportunity to optimize the general performance of the passive network which is essential for the customer experience and for the operational cost.

The DKT solution provides a complete product portfolio which results in optimized technical performance and reduced OPEX.

Equalizers &

Attenuators

DKTCOMEC

IN





Filters

Outlets

Gbit/s











Splitters & Taps

Trunk Passives





The coaxial outlets of the future broadband network

The outlet and home in general is one of the major issues in bringing future broadband services to the end user's gadgets.

It all starts with the first outlet in the home. Here DKT offers an innovative solution that separates the DOCSIS 3.1 signal from the home network. This gives the possibility to change frequencies in a smooth way without sending a technician to the home, thereby saving cost for the operator and without troubling the end user.

The solution is called PIO (Push-In-Outlet), and is a concept where the signal is once and for all professionally terminated in the home.

This solves two major issues - providing very high screening efficiency where it matters most, and creating an interchangeable "inner-piece" of the outlet for future upgrades. All this because you never know what will happen in the future concerning frequency allocations.

Due to noise, it is essential to terminate the DOCSIS 3.1 return path in the first outlet and distribute IP via Wi-Fi/Mesh/PDS/MoCA and TV as before. FM is removed to create room in the return path. Because the modem is placed by the first outlet, the remaining outlets can only have one output with full spectrum, therefore DKT has invented a new "Single-Outlet-System" that provides full flexibility. It is easy to use/mount, and once and for all, it takes care of possible screening issues, based on the concept "simple is beautiful".

Trunk cascade and network linearity

To maximize the benefits of the DOCSIS 3.1 network, it is essential that variations in system gain and losses are kept to a minimum. With the enhancement of the upper network frequency to 1218 MHz, high demands are placed on variation in losses in the network passives.

DKT has developed a new series of trunk network power splitters, which have insertion losses with the same frequency dependence as coax cable.

The combination of equalization in the amplifier and the DKT power splitter frequency characteristic, ensures minimum loss variation in the DOCSIS 3.1 frequency band. Using these power splitters, and as observed in field trials, the high speed 4k QAM downstream becomes possible.



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Distribution passives Don't make it your weakest link in the network!

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Signia Line, quality that pays off

With the Signia line we have made a construction that gives unique advantages on the Operational Expenditure (OPEX). Making passives with NiTin brass connectors is indeed an expensive construction, but the return on investment is incredible. They are literally maintenance-free and thus create a unique OPEX advantage, this being improved earnings - proven by industry leaders! Learn more regarding the extra advantages such as surge protection, screening and climate shielding, on our website, and keep in mind that it can be costly to buy cheap!

Basic Line, traditional and optimized for D3.1

In addition to the Signia line, we have made a Basic line of passives with high performance. Just like Signia, they are optimized for DOCSIS 3.1. The missing feature is the NiTin brass connectors, meaning the construction and manufacturing is more optimized on cost and this gives an advantage on the Capital Expenditure (CAPEX).

We have developed a DOCSIS 3.1 calculator on dktcomega.com. Here you can find further information regarding how OPEX and CAPEX savings can be achieved by upgrading to DOCSIS 3.1.



The truly smallest form factor FTU

The DKT Fiber Termination Unit (FTU) and Active CPE allow unique flexibility and agility via a Technology "agnostic" design and service activation by the end-user.

The most flexible and admired gateway for P2P networks.

A separation in Layer 1, 2 and 3 will make a better business case and user experience:

- Flexible and fast roll-out and upgrades. _
- Better lifetime/depreciation.
- Decreased truck roll/OPEX.
- Improved customer satisfaction/churn. _
- Reduced call center cost and truck roll.

The solution will work with all 3rd party products, which results in optimized interoperability/flexibility, better Wi-Fi coverage and better sourcing opportunities.

CPE Gateway

Great flexibility in a small form. The small form factor and its easy installation and modularity, make our solution the most flexible CPE with optimized handling/efficiency in the industry.

- 1 or 4 manageable Gbps Ethernet ports. -
- Low initial investment with the FTU baseplate and easily upgradeable with the active _ layer, even by the end-user => fast rollout and without a "truck-roll".
- 1 Gbps, high performance. _
- Technology "agnostic" based on an open standard.
- Neutral discrete design. _



Home amplifiers, what is important

When there is a need for several TV sets in the home, there is typically a need for an in-home amplifier. This amplifier must have sufficient gain to compensate for in-home distribution losses, and at the same time, must have a large window of linearity to preserve the signal quality, even in the case of a fully loaded DOCSIS 3.1 spectrum. Automatic Gain Control is suitable functionality to ensure this.

"Choosing the right amplifier for your home network is important, especially when considering DOCSIS 3.1. That is why the DKT amplifiers are self-regulating, meaning fool-proof to install. Choosing the wrong amplifier not only creates problems in your own home, they might even disturb the entire network."

- Anders Møller-Larsen, Product Manager DKT A/S



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Coaxial distribution

Passive products with focus on network performance, economy and end-user satisfaction - naturally DOCSIS 3.1 ready and proven



Home networks

Solutions for In-home connectivity via coax and Wi-Fi (Wave 2/ Mesh) - the next big trend within broadband networks



Gateways with focus on neutral design, durability and simplicity. Since 1999 DKT has made gateways for P2P and RF overlay



In-home Wi-Fi

In 2017 DKT is launching its new Wave 2 Wi-Fi mesh platform for optimized in-home Wi-Fi connectivity. DKT wants to make way for gigabit to the end appliance.

As the size of home networks grow, and because the number of client devices in a home network increases exponentially each year, there must be focus amongst cable operators to guarantee not only consistent performance in terms of throughput and connectivity, but also provide entire home coverage.

The mesh platform creates a wider, more robust and more stable Wi-Fi connection throughout the home environment.

A mesh network can be defined as a self-healing, self-forming and self-optimizing network of mesh nodes. Each node can intercommunicate using smart routing protocols, and this by choosing an optimal path to relay the data from one point to another. Mesh Access points are fast gaining attention to support home networks, mainly due to ease of installation and smart client steering algorithms.



The platform includes Qualcomm's Self-Organizing Network (SON) technology, creating a robust and stable wireless network. Hasslefree installation leads to high customer satisfaction and fewer customer calls. Transportation media independence allows use of almost any wired infrastructure in the premises.

The DKT solution features:



Wi-Fi wave 2 technology enabling MU-MIMO leads to higher wireless performance.



Self Organizing Network (SON) technology creating a robust and stable wireless network.





allowing use of almost any wired infrastructure in the premises.

Non-proprietary solution based on IEEE standards that can interoperate with 3rd party equipment.

Transportation media independence



Huawei case

"... DKT has shown its vast experience in the HFC industry, its deep understanding of customer requirements and its unique leading technologies. We are confident that with DKT we can deliver a successful project."

- Mr. Binbing Xiao, Managing Director Huawei Denmark

In 2016, DKT A/S became partners with Huawei. This was in a project to make Denmark the first country in the world to upgrade to the new standard, namely DOCSIS 3.1.

"We are proud to be selected as the first Danish company to be a technology partner for Huawei. This is the result of focused research and development and strict focus on what we do best."

- Christian Emborg, Managing Director, CEO DKT A/S

DKT is proud to be a first mover on DOCSIS 3.1, and to be the first passive coaxial product manufacturer with true DOCSIS 3.1 experience from large scale implementations. As early as 2013, DKT made the strategic decision to ensure all products were compatible with DOCSIS 3.1. The head start, when compared with other companies, has provided valuable experience that is evident in the premium standards in all DKT DOCSIS 3.1 ready products. In our innovation and product development, DKT has been focused on network performance, network economy and end-user satisfaction. We see Huawei choosing us as a partner, and the Excellence Cooperative Award we received in 2016, as a result of this.

Facts of the Huawei case





Country:

Denmark

Huawei, no. 1 telecom manufacturer in the world



Project dates:

Trial April 2016 Rollout August 2016

204/1218 MHz

No. of customers upgraded:

1.1 million



QAM 4096



Integrator:





Modulation index:

TD(

Operator:

TDC, Danish Incumbent



Services:

4k tv, 1 Gbps data, DVB-C flow TV



Supplier of passive equipment:

DKT A/S



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