

DOCSIS 3.1 – FIRST MOVER SIGNIFICANT NETWORK & OPEX IMPROVEMENT – PROVEN!



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OUT -1 4dB

DKT

DOCSIS 3.1 YOU THINK IT, WE DID IT!

Based on the world's first complete upgrade to DOCSIS 3.1 in Denmark, we can say that we offer proven higher network performance measured on MER, and a much more cost efficient network measured on service/support.



"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 impact."

FACTSOF THEHUAWEI CASE



Denmark



Huawei, no. 1 telecom manufacturer in the world



TDC, Danish Incumbent



Project dates:

Trial April 2016 Rollout August 2016



No. of customers upgraded:

1.1 million



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



Frequencies:





Modulation index:

QAM 4096

Supplier of passive equipment:

DKT A/S

"... 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, former Managing Director Huawei Denmark

FIRST MOVER

We know what works, because we have done it. As part of the Huawei Gigaspeed project, we know the tips & tricks on the upgrade of your passive network and we can prove it!



DKT offers a full portfolio of DOCSIS 3.1 passives!

When upgrading to DOCSIS 3.1 you need to exchange the passive electronic infrastructure to handle higher frequencies, but you also need to align the network to handle a narrower window in the return path-signal level and to significantly reduce noise to implement an increased modulation index. We know all about that!

HERE IS WHAT YOU NEED

Demarcation point /Outlets

Significantly improved screening efficiency to eliminate noise and with a design that can handle changes in frequences. We recommend using our PIO outlet.

Home network interface

Terminating the D 3.1 stream at the doorstep; eliminating return path noise generated in the home network, either via a DVU or a PIO outlet.

Splitters & taps

The NiTin brass connectors eliminate the primary cause of network faults; loosening of connectors due to the "cold-flow" phenomenon. This significantly reduces the noise.

Trunk passives

A robust and well proven construction that has been refined over the years, of course ready for D3.1.

Filters

Band-Stop-Filters to handle TV packages to end-users. Steep slopes efficient stop band attenuation and low insertion loss.

Equalizers & attenuators

Efficient inline equalizers and attenuators are required to align the signal levels of the return path to reach the correct SNR.













PRODUCT FOCUS 1: DON'T MAKE THE PASSIVE NETWORK THE WEAKEST LINK IN YOUR NETWORK!

Signia Line, quality that pays

With the Signia line we have created a construction that gives unique advantages on the Operational Expenditure (OPEX). Passives with NiTin brass connectors are naturally more expensive, 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 CPD, on **www.dktcomega.com/signia**

PRODUCT FOCUS 2: PREPARE FOR FUTURE UPGRADES!

PIO (Push in Outlet)

The outlet and home installation are some of the major challenges in future upgrades. In order to ensure the home is prepared for changes in frequencies, DKT has developed the **PIO**.

It all starts with the first outlet in the home. Here DKT offers PIO as an innovative solution that separates the DOCSIS 3.1 signal from the home network. This gives the possibility to simplify the change of frequencies and minimize the cost of future upgrades.



TIP 1: IMPROVING MER LEVEL BY > 2 DB; REDUCING OPEX > 60%, PROVEN!

How? By exchanging the distribution passives in your network.



Distribution of modems against US MER

An upgrade project showed that a "passive upgrade" to DKT Signia Line passives improves the average MER by an astonishing 2.5 dB. Each existing tap and splitter was exchanged with the exact same type without project calculation.

In a second step the network was properly planned for DOCSIS 3.1 operation, and all passives and amplifiers were exchanged in the "total upgrade" to achieve an additional 3 dB improvement of the average MER.

WITH THE SIGNIA LINE PASSIVES THE OPEX IS REDUCED BY > 60%

How? The connection between the cable and the passive is secure and stable; no spurious noise is generated in the interface because:

- The Signia Line brass connectors prevent self-loosening of the connection; the connector does not cold-flow under stress and temperature variations.
- The Signia Line nickel-tin plated connectors prevent corrosion; no CPD noise is generated.
- ► > 60% improvement in service/support.



"During the three years of using the DKT Signia Line in the network, not a single loose connection has been found."

- Senior Danish Installer

TIP 2: DOCSIS 3.1 BITRATES ONLY BY INCORPORATING EQUALIZERS IN THE DISTRIBUTION NETWORK

Narrowing the signal level window in both directions:



LEFT: The forward path is projected to have the signal level at each subscriber within a narrow window, that is the attenuation from the amplifier to each subscriber must be equal; the example shows 38 dB and 42 dB at 1218 MHz. However, the frequency dependent cable losses have a large spread in the return path. The example shows 29 dB and 16 dB at 20 MHz. **RIGHT:** By adding Equalizers in the passive distribution network, the attenuation at the low frequencies increases, but is almost unchanged at the highest frequencies. The example shows 29 dB and 30 dB at 20 MHz, and 38 dB and 44 dB at 1218 MHz.

Equalizers force a higher attenuation for the far end subscriber's signal level in the return band.

- ← Cable Modem to increase its output level.
- Narrow Window size is met, CNR improved, meets QAM requirements.
- Possible to decrease modem transmission level giving margin to higher bandwidth.
- ← Full benefits of DOCSIS 3.1 bit rates.

The sturdy DKT series of equalizers keeps the connection, every year, every day, every hour, every second. Made in brass with nickel-tin plating.



OUR VISION

IMPROVE LIVING STANDARDS VIA BROADBAND NETWORK PERFORMANCE



COAXIAL DISTRIBUTION

Proven higher performance and more cost efficient networks! We can prove > 60% improvement in service / support, and MER improvement of > 2dB in network performance



FTTH GATEWAYS

Optimize lifetime and flexibility!

A simple and manageable demarcation point improves your business case and freedom to optimize your services, such as WiFi.



HOME NETWORKS

Do not ignore the weakest point in the network!

Let us **empower** your customers, helping you own the **customer** experience and minimize **churn**.

DKTCOMEGA

For further information, visit: **WWW.DKTCOMEGA.COM**