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Ready for 100GbE: Largest Swiss university implements modular cabling solution from tde - trans data elektronik GmbH

Flexible, modular, reliable: University of Zurich relies on MPO technology in OM5



2250 Mbit/s was the average data speed at the University of Zurich (UZH) in 2019 - and the trend is rising. In order to be able to respond to all requirements at any time and to be able to flexibly and reliably convert and upgrade the cabling infrastructure technologically, those responsible at UZH's Central IT Department ('Zentrale Informatik') opted for the modular tML solution from tde trans data elektronik. With success: thanks to the new cabling concept, the University of Zurich benefits from better utilisation of its data centre space as well as the racks and is equipped for transmission rates of currently up to 400GbE/Gigabit.

With more than 28,000 students, the University of Zurich is currently the largest of all twelve Swiss universities. It is one of the leading European research institutions and a member of the "League of European Research Universities". The Central IT Department is responsible for the efficient and stable communication network: Together with the decentralised IT managers

of the institutes, its primary task is to ensure the basic supply of all members of the university with the required information resources. In doing so, the decentralised organisations prefer to take care of the respective workplace infrastructure and subject-specific applications, while the Central IT Department operates services across the board. This includes the operation of central components at three locations: a data centre at the Irchel campus and computer rooms at Affoltern- and Rämistrasse. In addition, the Central IT Department ensures the provision of the server, server virtualisation, storage, archive and backup infrastructure as well as the planning, construction, operation and monitoring of the entire network and WLAN infrastructure of the UZH.

In 2013, the IT managers began to fundamentally renovate the existing data centre at the Irchel site. The integration of flexible cabling solutions played a decisive role from the very beginning: "The previous classic cabling solution was cumbersome and did not allow us to install special combinations of cabling elements at any point in the data centre," remembers Teodoro Brasacchio, responsible for IT infrastructure at Central IT Department. "That's why we were looking for a modular and flexible system."

Highly professional right from the start

Brasacchio became aware of the cabling concept of tde trans data elektronik GmbH through the Swiss distributor Arimax AG. From the very beginning, the network specialist and its sales partner convinced Brasacchio with their high level of solution competence and the very good service and consulting performance: "Especially when a new concept is to be implemented, consulting is essential. At the same time, our bar was high: we had specific requirements and wanted to plan for the next ten to 15 years in order to obtain long-term investment

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protection. Arimax and tde supported us professionally in this, advised us without imposing things on us and communicated their experience values clearly and openly. "I can recommend the cooperative partnership on the part of tde and Arimax to anyone," says Brasacchio. All components of the cabling solution were procured through Arimax.

Custom-fit solution: tML system with OM5

For the demanding needs of the University of Zurich, tde developed a custom-fit solution based on the tML system. The system, which consists of the three key components module, trunk cable and rack mount enclosure, has a modular design. Heart of the system are the rear 12-fibre MPO/MTP connectors, which can be used to connect up to six ports at once. Thus, 6 x 10/25/50 Gbit/s links were installed in a single step. Fibre optic and TP modules can be used together in a module carrier with very high port density. The University of Zurich uses the tML(standard) cabling system with the 12-fibre MPO in fibre class OM5. It is optimised for Short Wave Division Multiplexing (SWDM) technology and offers even more options for migration to higher transmission rates, currently up to 400Gbit/s. This is made possible by the multiplexing method: It uses four different wavelengths between 850 and 950nm for transmission, enabling a fourfold increase in transmission performance. In combination with the MPO technology, the University of Zurich benefits from the multiplication of transmission rates: "We deliberately chose the new fibre standard so we can keep all options open when migrating to higher transmission rates," says Brasacchio and continues: "If the requirements increase in the near future, we can keep up. This is where the tde cabling system once again shows its advantages of modularity and flexibility, allowing us to use all conceivable combinations of connectors. At the same time, the solution scores with its cost-benefit efficiency."



The University of Zurich relies on the tML(standard) cabling system with the 12-fibre MPO in fibre class OM5. Image source: University of Zurich, photographer Teodoro Brasacchio

Packing density saves space in the racks

With the tML system, the University of Zurich can increase its transmission rates from previously 10 to currently up to 400GbE, adapted to the transceiver technology used in each case. For this purpose, the backbone cabling is based on the 12-fibre MPO. It is used in two variants: on the one hand as a direct MPO connection with feed-through couplings. In this variant, up to 400 gigabit link transmission can currently be realised via the SR4 or SR4.2 protocol, in which four transmit and four receive fibres are used. In parallel, LC connectors with transmissions of up to 50 Gbit are used in combination with corresponding modules: 12-fibre MPO on 6x LC duplex with integrated shutters. By making dust caps obsolete, the integrated shutters make an important contribution to avoiding dirt-related malfunctions.

The tML system scores with high packing density: tde and Arimax were able to accommodate both the different connection types, such as the LC connectors and the MPO connections, on one height unit. This saves valuable space in the racks and thus in the space, which also requires no cooling. Thanks to the high flexibility of the tML solution, the Central IT Department is also able to quickly change and upgrade technologicaly.

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When it comes to the topology of its data centre, the University of Zurich relies on the common star topology: it offers high flexibility and higher bandwidth, as switching functions can be used in active hubs. Redundancy to the central office/main distributors ensures reliability.

Reduced installation times - quick and easy implementation

The tML system components, which were pre-assembled and tested under laboratory conditions in the German tde factory, proved to be particularly advantageous: they enabled the University of Zurich to completely wire more than 1,500 fibres with three network technicians in just a few days, including installation and measuring of the fibres. "With classic cabling, the time required would have been many times greater," explains Danny Stelter, Area Sales Manager at Arimax Distribution AG. "However, thanks to the plug-and-play connectivity, we were able to connect 12 fibres at a time, which significantly simplified and shortened the plugging and installation processes."

With the implementation of the tML system, the University of Zurich is realising the static cabling of the network components. The successful rollout took place at the end of September 2020. As a result, the Central IT Department is able to scale back very many existing fibres and can concentrate and consolidate its IT infrastructure in the future. This is an important aspect because the requirements on the part of research are enormous. With the so-called 'Institutszone', a new area was created as well, which went into operation in mid-October 2020. Here, all 24 new racks are equipped with the new tML solution.



Thanks to the tML cabling concept from tde trans data elektronik GmbH, the University of Zurich benefits from better efficiency in its data centre space and racks and is equipped for transmission rates of currently up to 400GbE/Gigabit. Image source: University of Zurich Photographer: Teodoro Brassacchio

From the end of this year, all new 100 GBit high-end connections will run over the tML cabling at all three locations (Irchel campus/ Affoltern- and Rämistrasse computer rooms) and supply the about 220 buildings of the university: "Compared to other cabling systems we already had in use, the modularity and flexibility of the tML system completely convinced us," sums up Brassacchio. "We choose each solution carefully. Our goal was to design the cabling for a long service life - because we plan with foresight. Therefore, we are already happy to have a reliable option for the future thanks to the tde solution."

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About the University of Zurich

With its 28,000 enrolled students, the University of Zurich (UZH) is Switzerland's largest university. Founded in the year 1833, UZH was Europe's first university to be established by a democratic political system. Today, UZH is one of the foremost universities in the German-speaking world. Made up of seven faculties covering some 100 different subject areas, the University offers a wide variety of Bachelor's, Master's and PhD programs. In addition, UZH's continuing education programs offer excellent learning opportunities.

About Arimax Distribution AG

Arimax was founded in Sihlbrugg in 1993 under the name Arimax Distribution AG. Today's Arimax Distribution AG, based in Zurich, is a Premier Partner and Value-Add Reseller of IT infrastructure solutions from Daxten, Avocent, Koldlok, NetBotz, PlenaFill, PlenaForm and Starline for the entire Swiss market. Arimax is one of the leading Swiss providers of data centre solutions. The distributor specialises in products and services in the areas of monitoring, optimisation and management of critical IT and data centre infrastructure. Arimax's goal is to make the work of IT administrators and facility managers easier, to spare companies critical downtime and to constantly increase the efficiency of IT in terms of cooling and energy consumption.

About tde – trans data elektronik GmbH

For more than 25 years the tde - trans data elektronik GmbH, an internationally successful company, has specialised in the development and production of scalable cabling systems for highest packing density. The nuclear research centre CERN relies on the know-how of the leading company in multi-fibre technics (MPO) as well. The company's portfolio "Made in Germany" contains complete system solutions with a focus on Plug-and-play for highspeed applications in the field of data-com, telecom, industry, medical and defence. tde offers both planning and installation services through its own service department and supports the "European Code of Conduct" when it comes to energy efficiency in data centres. For more information, visit www.tde.de as well as LinkedIn and Twitter.

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