

From IP to FM radio with Astro

Kabel Deutschland installing IP converters at regional headends across Germany

IP-based signal transportation in the backbones of the broadband cable networks necessitates the conversion of the IP signals into digital DVB programs so that the signal can be fed into the Level 4 network and the household distribution networks for the famous “final mile”. Customer devices are not suitable for IP-based TV and radio. Astro Strobel Kommunikationssysteme developed a modular IP headend system in the form of the U series at an early stage. The basic device can accommodate up to three signal converters (IP> PAL> QAM and> FM). The system has been proven with many network operators. Kabel Deutschland has fitted its headends with U modules for IP-to-PAL conversion; over the last few months it has also installed IP-to-FM converters in its regional headends. 150 sites have been converted to this new IP-based technology. “In this way,” says Michael Scharf, head of central network planning and building in Unterföhring, “we are able to supply just about all of our



Kabel Deutschland
Ein Vodafone Unternehmen.

customers with TV and radio content.

The experience gained from major IP/PAL projects has allowed ASTRO to consider all operating conditions in large IP backbone networks. In addition to acknowledged transmission parameters, the U 100 series also offers sophisticated redundancy and equivalent circuit designs for optimum signal availability. One special feature of the signal converters is the integrated IP frontend. In this way, each module has independent IP receivers, meaning that they can be operated autonomously in a base device. Consequently, it is possible to confine an error occurring in the IP frontend or signal feed to a single module. The standard module is the U 124 range for converting 4 IP gigabit Ethernet multicast groups into 16 standard FM programs, which are led out as two groups of eight.

With the installation of IP-FM converters, Kabel Deutschland has abandoned the previous system of decentralized terrestrial reception using conventional on-site technology in favor of a new central program delivery system using backbone-based content distribution. As Michael Scharf emphasizes, the primary motivation was initially economic: “The main rationale for these installations was the optimization of the system with a small number of redundant reception sites with backbone-based program distribution and central monitor-



Michael Scharf, head of central network planning and building at Kabel Deutschland

ing to improve service availability. At the same time, it was possible to prevent the rising susceptibility to disruption typical of conventional technology over an extend period of time.”

However, Kabel Deutschland did not merely use off-the-shelf Astro solutions but required a number of modifications. Astro enhanced the U 124 series with the development of the U 125, which is now able to convert a total of 40 channels per module. Scharf explains that Kabel Deutschland demands for a very compact design and high efficiency, such as two 20 FM channels on a single module, triggered these enhancements. In addition, the field testing performed by Kabel Deutschland resulted in the optimized development of customer-relevant services such as RDS functionality. The decision to install Astro IP converters was based on the “very powerful hardware base, the swift and uncomplicated implementation of our requirements for a made-to-fit solution with a very good price-performance ra-



Headend installation at Kabel Deutschland

tion,” according to Scharf. A further factor was the compatibility of the Astro Edge devices by means of software updates, e.g. for implementing EdgePal in accordance with EdgeQAM. The uniform hardware design implemented in the U100 series allows EdgePal and EdgeFM modules to be operated on the same chassis without any need to replace the backplane. This means that no particular installation routines are necessary.

IP distribution and regional radio and FM conversion do not have any effect on existing radio programming or much-

discussed DAB+ radio. As Michael Scharf explains, it is technically possible to implement DAB in the cable network; however, what is decisive is customer acceptance and economic viability.

All local FM programs broadcast



U 125-Model von Astro

by public and private stations are being distributed across the Kabel Deutschland (KD) network. In addition, KD offers numerous digital radio programs which can be accessed via cable receivers and TV devices. The company currently has no plans for other types of IP conversion, e.g. for reception on mobile devices. However, as all FM signals are available on KD's backbone and network due to its specific network structure and feed-in via the backbone, further innovative steps for radio reception are fundamentally possible in the future.