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NRK Produksjon

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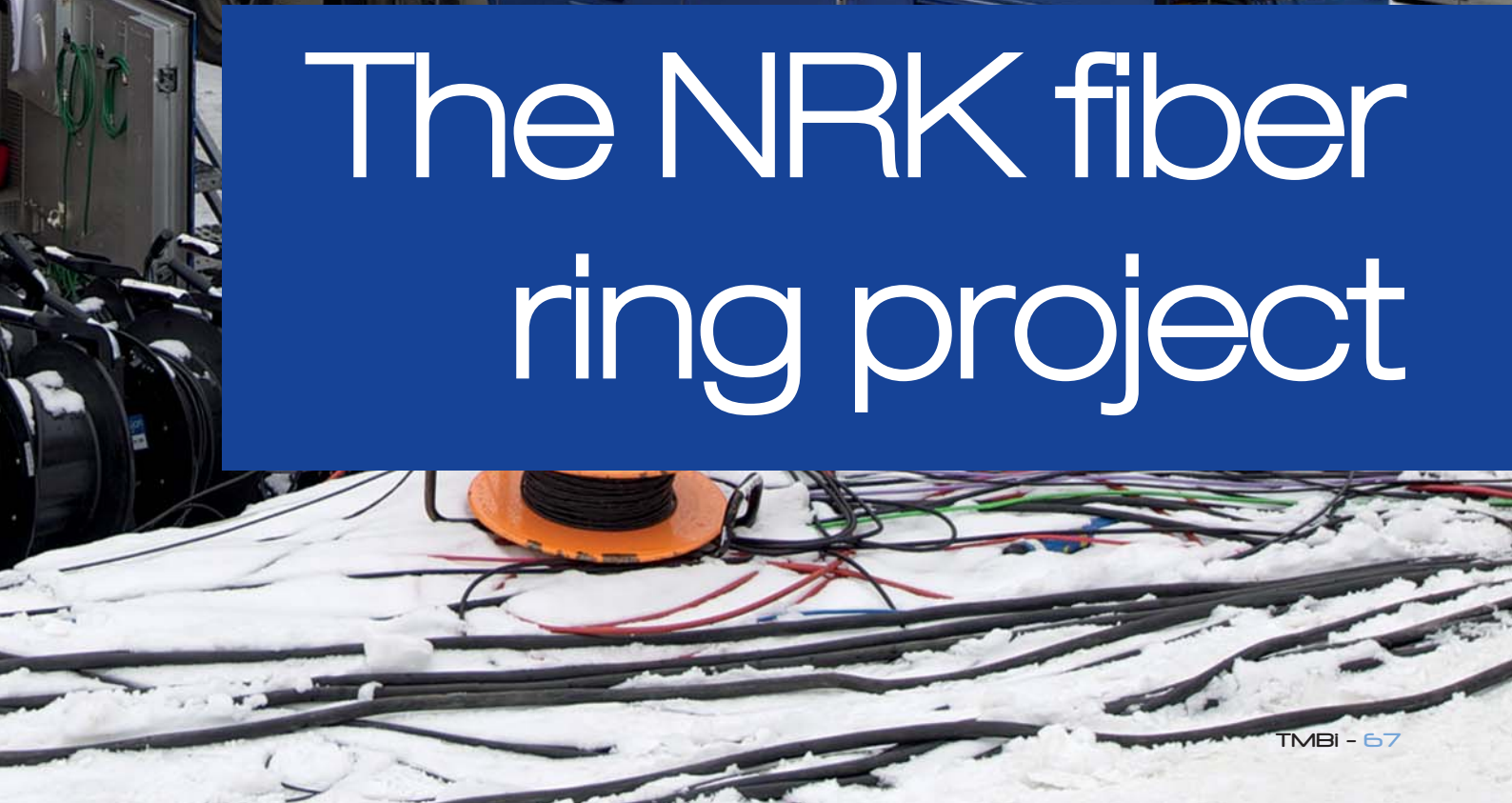
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The NRK fiber ring project





With an increasing need for live broadcasting within the metro area of Oslo, Norway it was decided by NRK to build an optical video and data network that could be used for SDI, IP and file transfer access to archives back at the main station. The optical ring would encompass the entire Oslo area and cover 12 key sites.

NRK needed one optical network for news related work and another for event services. NRK wanted both ring networks to pass through 12 major sites which included a Master Control site and its backup site. All

sites had to be 'On-Air' and running simultaneously over a single fiber for each network in an East/West backup configuration. They wanted to be able to inject and drop signals at any point within the ring

The Solution.

Each News Node:

- miniHUB 1RU chassis w/redundant psu x 2
- OC-4B-SDI optical card x 8
- CWDM optical TX and RX components, Quantity depending on signal numbers
- Optical change-over card x 1
- 2-way Optical Splitter x 1
- CWDM – Ultra low loss filters x1

12 Nodes total in News ring structure

Event services Node:

- miniHUB 1RU chassis w/redundant psu x 2
- OC-4B-SDI optical card x 8
- CWDM optical TX and RX components, Quantity depending on signal numbers
- CWDM – Ultra low loss filters x1

2 portable systems + 2 systems in OB-vans. Node at Master control.

structure while keeping fiber continuity in case of any optical or power outage at any site in the ring. The event service ring would be two portable nodes that could be taken to any site within the 12 nodes and be deployed to provide live services back and forth to the master control. The news ring would have the same protection principles but would have live nodes across the entire ring infrastructure. This means that anyone could connect instantaneously for live reporting of events in the field. Both of these rings would need to be simple to operate, minimal components, simplified serviceability, with a low capital cost of implementation.

The system is built mostly from one highly auto configuring card module called the OC-4B-SDI. The OC-4B-SDI has Norwia's proprietary AutoSFP™ technology and gives multiple configurations depending on the user's needs, such as ring structures with redundancy features built-in.

Each node in the NRK metro ring network consists of multiple channels that either act a pass circuit for relaying signals from one point to another. They can also be used to drop signals off at one or many sites in the ring structure or to inject signals at a particular site and return these signals back

to the master control. The layering of signals is via optical multiplexing at the wavelength layer on a single fiber.

When a signal is injected, the same card can split this signal in two directions to create the diversity redundancy in case of any fiber failure. While at the receiving end both of these signals are again processed by the OC-4B-SDI on a signal level for redundancy per channel. This means that individual signals are protected as well as having received signal on individual SFP's, i.e. SFP redundancy.

Included in the ring network is a Gigabit (10G) Ethernet layer that is also redundant throughout the network. This network is used to provide data services for control signals, file access for remote editing, IP transport and also miniHUB status and ring master access.

Norwia's wide band optical change-over, OX-20-2X2 card module was used to provide continuity of the fiber circuit at a node level. If a site had total power outage, then the fiber circuit would retain continuity and still pass signals in both direction of the ring structure.

Every frame in the system is connected via the RCONmini frame manager. The information is presented in an easy viewable interface that can simplify routine

management of the individual components of the system. A recent development has been the introduction of a customized interface called 'Ring Master'. This is an intuitive graphical interface of the individual fiber rings, enabling parameters such as attenuation to be monitored for each node in the ring plus indication of signal injection points within the fiber ring. Ring Master provides a complete one-screen overview of the entire fiber system.

The second ring in the metro network caters for events such as concerts. Instead of fitting the ring structure with fixed full access points it was decided to provide two mobile units that could be deployed when needed. The mobile units are simply inserted into the fiber path. The mobile units are total independent and signals are received back at Master control.

INTERVIEW WITH ERIK HANSEN: PROJECT MANAGER NRK MEDIA

Which were the main challenges and needs of the project?

The main challenge for the project was to establish the physical fiber-ring in Oslo city to have easy access to the MCR (Master Control Room).

We needed to have access to all the sites and to find room for our equipment. Because of the distance and length of the fiber-cable, we had to struggle with signal-loss due to cable length and number

of connectors involved. We needed a failsafe and redundant system, so we had to assure that cable and/or power-failure would not affect the overall performance of the system.



Why have you chosen Norwia to carry it out?

We published an international tender issued for the electro optics part of the project.

Norwia participated together with several other bidders. NRK used a scoring regime to evaluate the bidders based on technical, functional and economic factors. Norwia

made the highest score. They could also contribute to the project with very creative solutions.

What are the main benefits of this project?

We can very quickly set up video connections from various sites in Oslo city center.

Our video-journalists can be "on air" in a couple of minutes. Before we had the fiber-ring, we had to rely on wireless video streaming (LiveU etc) or microwave camera links. Now we can contribute live from large events with full redundancy and with failsafe operation.

What about the installation/integration? It was easy?

When the fiber optic cables were connected and space for the equipment was established, the rest of the installation was quite simple. We had to establish a "frequency chart" to give each site and signal its unique channel in the CWDM system.

It is difficult to operate? What was the feedback from the field technicians?

The operation in the field is very simple. The video journalist just plug their camera into a dedicated wall-socket on the remote site. Then he/she will call the MCR and ask to be routed to the news studio. The feedback from our technicians is very good.

