

# NovaNet

The world is moving faster and becoming more complex and your systems always mirror this world. NovaNet was designed to meet the growing demands on routing systems of the future: high availability and reliability, scalability and flexibility. NovaNet not just interconnects matrices to ensure future extensibility; it implements a user-definable mapping of matrices to networked routing systems ensuring the flexibility needed for almost any customer project. In this way it is possible to build nearly any variation from one matrix based on multiple routing systems to one routing system divided into multiple matrices. The benefit is evident: NovaNet offers cost-effective, customer-oriented solutions for your specific needs. If you have to build a new system with major complexity, NovaNet will be your solution!

## Reliability

Time is money. Each second of lost air time results in lost revenue and audience frustration. Imagine your central matrix being completely down for minutes until a piece of defective hardware has been replaced. NovaNet is based on high quality components designed for high availability with many redundancy options available.

## Scalability

NovaNet is highly scalable by design. It allows for future growth and protects your investments. Further components are integrated seamlessly in a complex of networked routers. Our open architecture results in a system that fits your needs rather than compromising your needs to fit an inadequate system.

## Flexibility

NovaNet is not only capable of routing audio streams; it also routes serial data streams and integrated control data for the system. In project-specific configurations it offers transparent routing between sources and targets with different sampling frequencies.

With NovaNet it is possible to build systems for almost any broadcasting or production application. The user orientation is exemplary and one of the main factors for our customer satisfaction worldwide.





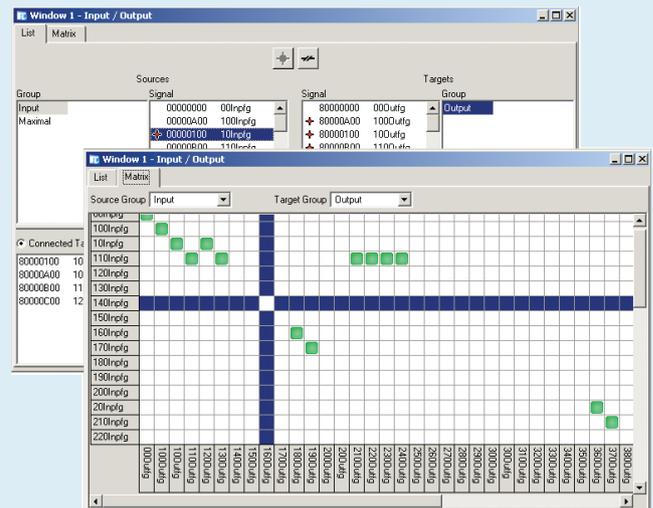
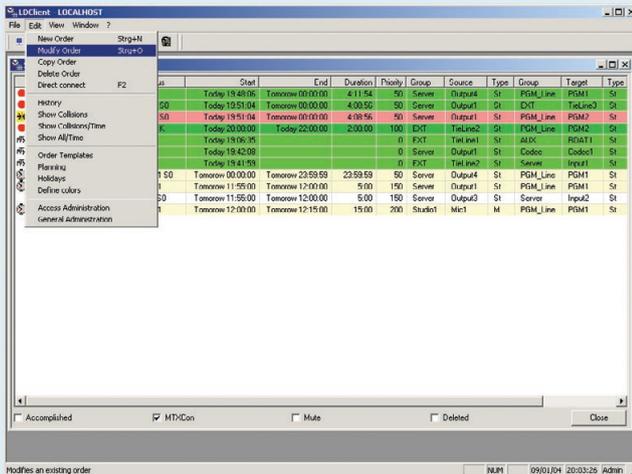
There are several tools to control a Lawo matrix system, each one specialised for specific users or specific-use cases. NovaControl is the most basic tool designed for ease of use in a system level environment which fits the needs of service technicians and comes with every Lawo matrix system. It provides a source target view, an XY view and a message log window. NovaControl receives all configuration data directly from the matrix system via the control network. There is no need for further setup besides entering the IP address of the matrix controller, after which connections or basic audio settings can be made.

For applications in main switching room environments additional features like restricted views, salvos and controlling of more advanced audio features are essential. In this case more specialised software is necessary. For example the Line Scheduler software system is able to control your time related connecting. Scheduled lines are checked for conflicts already in the scheduling phase, fades drive automatically and the DSP resources integrated in our matrices are controlled exactly as planned.



The graphical configuration application is highly integrated into the Studio Manager. Any changes that you perform are immediately available for the system. There is no need for downloading setups or waiting for system parts to reboot. Just make your changes and you are done. The system proves to be especially valuable in highly demanding environments like OB trucks or even main switching rooms. With the sophisticated operator guidance of the panel system almost any user convenience should be possible. The Studio Manager controllers can be redundant if necessary.

Last to mention: if you like the matrix to be controlled with your very own software system the Lawo remote control protocol is a well documented way to get in contact with a matrix: IP based, easy to use and offering a wide variety of possibilities.



With the Studio Manager even automatically managed tie-lines, multilayer switches, tally management and GPIO control are at your fingertips, especially when using the control panel series which comes with multicolour buttons if desired. Another option is to use the virtual panel interfaces on touch screens.

## APPLICATION EXAMPLE

## Redundancy Considerations

Lawo routing systems incorporate comprehensive redundancy features to ensure the continuous operation of your business.

### I/O system

In the I/O frames, every module has a direct point-to-point connection with the controller rather than sharing a bus structure. Consequently, a fault on any module will affect only that module, and not the whole system. In addition, an optional, redundant controller may be added to provide a parallel point-to-point connection; with this option, there is no single point-of-failure.

### Core

The system core uses a similar structure to that used in the I/O frames; it too is organised around an internal Dual Star topology that connects, point to point, two central router modules with all other modules. The direct nature of switched communications increases reliability by enabling faults to be isolated at single endpoints – in contrast to bus-based systems in which an errant component can hang up an entire bus. Further, point-to-point connections are inherently friendly to hot-swapping (device insertion and/or removal on an active system). This combination of the Dual Star organisation in both the I/O frames and the Nova73 system core, creates what we call the Star<sup>2</sup> Topology. Star<sup>2</sup> provides an architecture with no single point-of-failure within the central components of the system. The only problem that can cause audio loss is the failure of a single plug-in card in a breakout frame, but that will only affect the I/O on that module, and not anything else in the system.

### Cabling

In some installations, the fibre connections between the core and the I/O frames are considered to be critical components (they could for example, be damaged by construction work). A further level of redundancy is provided by doubling-up the fibre links. In this configuration, the fibres are connected to double ports at both ends of the link, and if one connection goes down, the problem is automatically 'healed' by switching to the other.

### System

For complete redundancy – to protect against the destruction of the system core installation – a dual-core system can be deployed. The second core can be located in another room or even another building. In installations of this type, the fibre connections have a star-like configuration, and therefore this is often called 'Dual Star Redundancy'.

This approach is very powerful, and at first glance would seem to be the universal – the ultimate – solution. However on closer examination, it will be seen that if any essential system component fails (eg. a fibre), the entire system core functionality must be switched to the redundant core. To avoid this overhead, a good system design should provide self-fixing methods that localise repairs where possible, as well as a second (redundant) system in another location.

The solution offered by Lawo is a dual-star architecture with additional 'self-healing' links between the two system cores. If a link goes down, it is not necessary to switch the whole system to the alternative core; instead, only the broken component needs to be repaired. That's why we call it the 'Dual Self Healing Star' architecture – Nova DSHS.

APPLICATION EXAMPLE

