cyber-diode

Data Diodes for Secure Networking of Industrial Plants and Critical Infrastructure

The control of industrial plants is increasingly being performed via the Internet. This method is also used by embedded systems in vehicles, medical instruments and many other areas. The trend towards networked plant and systems will continue strongly in the future, introducing the obvious advantages of continually available operating and sensor data and the possibility of central monitoring. You have everything under control, are able to react to small changes and, for example, to carry out maintenance work before serious problems or damage can happen. This results in efficient procedures and considerable reductions in costs.

Protection of Connected Control Systems

Machinery — Operation and Sensor Data — cyber-diode — Control Center

Data Transfer in Separated High-Security Networks

Insecure Network — E.g. E-mail, Video Data, Software Updates — cyber-diode — High-Security Network

Protecting Network Control Systems

Widespread networking has, however, a downside: every system that sends data over the Internet is, in principle, also accessible. This means networked systems have to be protected from infection by malware and other forms of unauthorized access. A particularly high need for protection exists with systems which control critical infrastructure or other plants, where incorrect functioning could lead to extensive damage or loss of life. Examples here would be power station turbines, chemical production, industrial robots in production lines and medical equipment in intensive care.

One-Way Data Transfer Using cyber-diode

Use the cyber-diode to exclude the risks of networking highly critical control systems. The cyber-diode controls network connections and only allows one-way data transfer – information flow in the opposite direction is strictly blocked. Once protected by our data diode, control systems can transmit data via the Internet without risking their integrity. The cyber-diode also solves a further security problem: when information such as e-mails, video data or software updates from areas outside a high security network is required within the network, the cyber-diode can implement an interface for one-way transfers. This will allow data transfer into the high security network without the risk of sensitive information leaking to unprotected areas.

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Security first.

Quick and Reliable Data Transfer

The cyber-diode meets high performance requirements with transfer rates of up to 1 Gbit/s for TCP and UDP. The protocols FTP for data transfer and SMTP for e-mails are also supported. With this performance you can implement real-time applications, while the TCP, FTP, and SMTP protocols guarantee reliable data transfer. Quick, reliable and secure – superior to any other diode solution. How do we achieve this? In order to transfer data quickly and reliably from A from to B, B has to be able to report back to A that the data has been correctly and completely transferred. This is an integral part of the TCP, FTP and SMTP protocols. Optic fiber diodes without a physical feedback channel are not able to transport this information. The cyber-diode however has such a feedback channel, and can therefore utilize the benefits of these protocols.

High Security through Low Complexity

It is extremely important to ensure the feedback channel only carries protocol messages and no other data. This is safeguarded by state of the art diode technology: its programming has been kept to a minimum – which only has a few hundred lines of programe code – and it runs on a microkernel operating system that has also been reduced to an absolute minimum. The diode processes have been simplified as far as possible, making them easier to analyze, and all code can be audited line by line to ensure that it is error free. This compact construction principle is our guarantee that the cyber-diode provides absolutely reliable one-way data transfers. The degree of security this solution provides can be seen with our vs-diode, which uses the same technology and is currently undergoing certification for use up to the SECRET security level at the German Federal Office for Information Security (BSI). This ensures that you will be able to achieve a very high degree of security with the cyber-diode.

Hardware Models and Customer Services

The cyber-diode is available on several hardware models that meet a range of performance requirements. In addition, several systems can be clustered to handle high availability connections. Although the cyber-diode is easy to operate due to its minimalist construction, we will be happy to assist you with installation and support if required – a service straight from the manufacturer.

The cyber-diode at a Glance:

- High security one-way data transfer across sensitive interfaces
- Reliable, high speed data transfer via FTP, SMTP, TCP and UDP
- Up to 1 Gbit/s data throughput
- Very reliable high availability clusters
- Customer service straight from the manufacturer

About genua

genua is a German IT security specialist. Since our company was founded in 1992, we have been involved in securing networks and developing sophisticated solutions. Our business activities include firewalls certified to the international Common Criteria (CC) standard, high-security gateways and diodes for sensitive network interfaces, VPN and remote maintenance systems, mobile security solutions, and a wide range of services. Our solutions are developed and manufactured in Germany. Many companies and public authorities rely on solutions from genua to protect their IT.

Further information:

www.genua.eu/cyber-diode

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