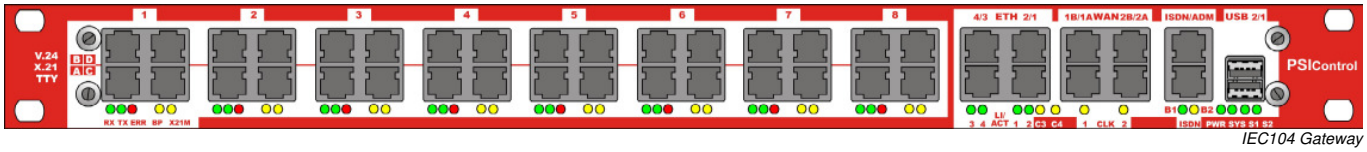
Smart Protocol Converter

IEC104 Gateway

Data Sheet



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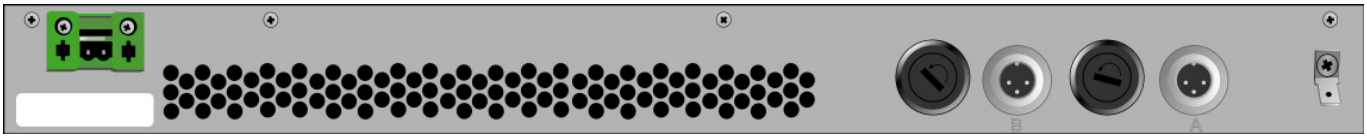
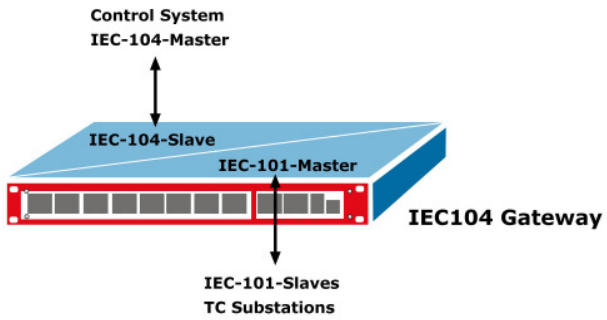


Rear panel

The IEC104 Gateway allows an easy connection of up to eight IEC 60870-5-101 based telecontrol substations to modern IEC 60870-5-104 based control systems. This provides excellent conditions for the change-over to the TCP/IP capable IEC 60870-5-104 protocol. At the same time the IEC104 Gateway guarantees that IEC 60870-5-101 protocol based telecontrol substations within the installation can still be used.



Data packets are transmitted via IEC104 Gateway between the control system and the telecontrol substation in control and in monitoring direction. In the direction of the control system the IEC104 Gateway acts as IEC 60870-5-104 slave and as IEC 60870-5-101 master in the direction of the substations. The IEC104 Gateway takes over the protocol specific time stamp adaptation as well as the adaptation of the configured field length for the Common Address (CA), Information Object Address (IOA) and Cause of Transmission (COT).

Application

Gateway between IEC 60870-5-101 telecontrol substations and IEC 60870-5-104 control systems

Main Features

- Protocol conversion between IEC 60870-5-101 and IEC 60870-5-104 protocol
- Multiplexing of IEC 60870-5-101 connections to one serial line (party line)
- Redundant connection to the control system

Configurable Parameters (extract)

In the direction of telecontrol substations/control direction

- Transmission method (balanced/unbalanced)
- Link Address length
- Common Address (CA) length
- Information Object Address (IOA) length
- Cause of Transmission (COT) length

In the direction of the control system/monitoring direction

- TCP/UDP port for the connection to the IEC104 master
- Control system IP address

Models

- IEC104 Gateway with 8 serial interfaces
- IEC104 Gateway with 4 serial interfaces
- IEC104 Gateway with 2 serial interfaces

Addtional Modules

- Modem module for DSL, UMTS/GPRS or TETRA
- VPN license for the data encryption via VPN tunnels according to IPSec standard

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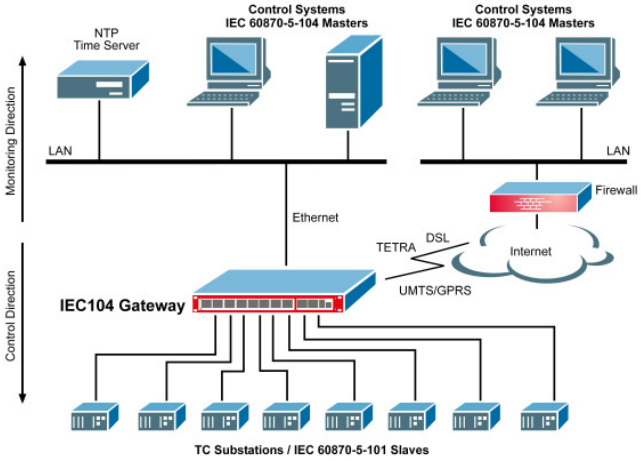
Flexibility

With its large number of interfaces the IEC104 Gateway offers a suitable connection solution for any topology. Ethernet and DSL connections as well as radio communication via GPRS/UMTS or TETRA are used as transport routes between the control systems and the IEC104 Gateway.

Unused interfaces can be deactivated to prevent unauthorized access. The galvanic separation of the serial interfaces of the IEC104 Gateway guarantees an undisturbed operation.



Virtual RTU

To activate or deactivate single serial connections or telecontrol substations by the control system and to get their status information, within the overall system the IEC104 Gateway itself can be addressed as telecontrol substations by the control system. Status changes at the serial connections or telecontrol substations are reported to the control system with the aid of specific Information Object Addresses.

The time synchronization for the IEC104 Gateway is made via NTP time server, manual input or by sending an IEC time synchronization message to the Common Address of the IEC104 Gateway. The time synchronization in the direction of the telecontrol substations is made after the connection setup to the telecontrol substation and if required in a configurable time interval.

High Availability

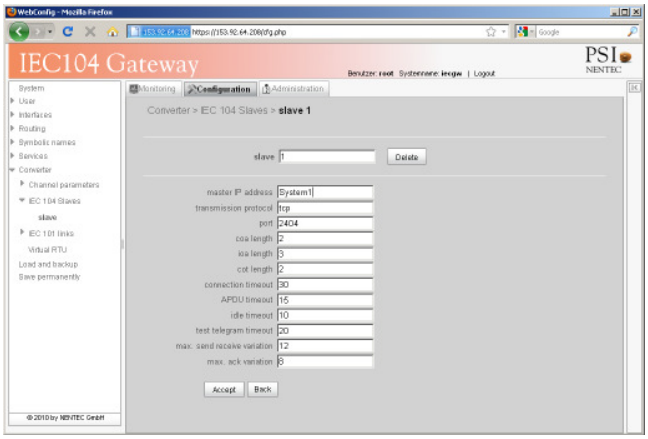
Use the IEC104 Gateway to realize redundant connections with only one device. The redundant connection to the control system is realised through the different interfaces. The device itself provides two power supply inputs to guarantee a redundant supply.

Security

With the VPN Security package the complete data traffic from and to the control system can be encrypted via VPN tunnel according to IPSec standard. This optimally protects your security-relevant data on the transport routes.

Configuration

The IEC104 Gateway configuration can be alternatively done via an intuitive Web interface, a command line interface or by directly editing the configuration file.



Project specific details should be discussed at first to guarantee a correct operation in the respective environment. We offer you broad consulting services on the basis of your existing installation.

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Software	
Operating system:	NENUX (Linux kernel 2.6)
Software version:	1.0
Basic features:	protocol conversion between IEC 60870-5-101 and IEC 60870-5-104 protocol packaging of telecontrol protocols logical telecontrol line control dynamic IP routing between WAN and LAN interfaces
TC protocols:	IEC 60870-5-101, IEC 60870-5-104
Management:	configuration via web interface and command line interface (CLI)
Statistics & diagnosis:	statistic commands, diagnosis via integrated trace system

Mechanics	
Chassis	19´´ rack mount chassis (1 RU)
Dimension	$436 \times 44.45 \times 276$ mm^3 (W/H/H) according to DIN 41494, part 5
Packaging dimension	$54 \times 15 \times 37$ cm^3 (W/H/D)
Weight / gross weight	3.6 kg / 4.6 kg
Wärmeabfuhr	convection cooling
Environment	
Operation	EN 60721-3-3: 1995 / A2:1997 class 3K3, 0 °C to +40 °C, 30 % to 80 % rel. humidity (not condensing)
Transport	EN 60721-3-2: 1997 class 2K3, -20 °C to +85 °C, 5 % to 95 % rel. humidity (not condensing)
Storage (in packaging)	EN 60721-3-1: 1997 class 1K3, -20 °C to +85 °C, 5 % to 95 % rel. humidity (not condensing)
EMC	
Emission	EN 55022:2006+A1:2007 class A EN 61000-3-2:2006 EN 61000-3-3:1995+A1:01+A2:05
Noise immunity	EN 55024:1998+A1:2001+A2:2003 EN 61850-3:2002 for telecontrol lines with enhanced values for substations: IEC 10004-2:2008: 8 kV Kontakt-entladung, 15 kV Luftentladung IEC 1000-4-4:1995: 4 kV Datenleitungen IEC 1000-4-5:1995: 2 kV Datenleitungen
Product safety	
Electrical safety	EN 60950, low voltage directive (2006/95/EG)
Conformity	CE

Power supply	
Type	DC
Power consumption	15 VA
Input voltage	12 .. 24 VDC ±10 %
Connector	3 pin connector conforming to IEC 60130-9 (IP 40) with screw ring
Redundancy	second DC connector (hot standby)
External power supply unit	
Model	wall-mount power adapter (Made in Germany)
Primary voltage	100 .. 240 VAC/50 .. 60 Hz
Secondary voltage	15 VDC (controlled)
Output power	18 VA (overload protection, short-circuit-proof)
Primary connector	exchangeable system: Euro, UK, USA/Japan, AUS, IEC 320
Cable length	approx. 2 m
Reliability	200.000 hours @ 25 °C
Redundancy operation	additional power supply needed
Supplies (optional)	second power supply (TCG WPS) central power supply (TCG CPS) DIN rail power supply (TCG DPS)
Electronics	
Main processor	32 Bit RISC Processor @533 MHz
Program memory	256 MB
Main memory	128 MB, max. 256 MB (SDRAM)

Interfaces	IEC104GW-8	IEC104GW-4	IEC104GW-2
Telecontrol interfaces	8	4	2
Ethernet interfaces	4	2	2
RS232 interface	1	1	1
USB host interfaces	2	2	2
X.21 interface	2	2	2
ISDN-S_0 interfaces	1	1	1

Telecontrol interface V.24/V.28	
Type	V.24 (RS232)
Purpose	level adjustment and galvanical isolation
Signal transmission	TXD, RXD, RTS, CTS, DTR, DCD
Interface rate	50 to 19200 baud
Electrical parameters	conforming to V.28
Isolation	1kV eff
Bus capability	possibility to passivate sender (party line)
Connector	8 pin RJ45 socket (ISO 8877)

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LAN interfaces	
Type	10/100 Mbps Twisted-Pair (TP)
Purpose	uplinks to the control systems
Electrical parameters	conforming to IEEE 802.3l (100Base-T), impedance: 100 Ω (symmetrical)
Connector	8 pin RJ45 socket (ISO 8877)
RS-232 interface	
Purpose	configuration and servicing access
Electrical parameters	38400 baud conforming to V.24
Connector	8 ping RJ45 socket (ISO 8877)
USB host interfaces	
Purpose	extensions
Funktion	USB 2.0 host, Hi-Speed
Connector	USB host interface
X.21 interfaces (optional)	
Connection control	point-to-point connection
Transmission rate	2.4 Kbps to 2048 Kbps
Electrical parameters	conforming to ITU X.27 or V.11/ITU X.24
Betriebsart	leased line
Connector	8 pin RJ45 socket (ISO 8877)
ISDN-S_0 interface (optional)	
Channel structure	2 × B64 + 1 × D16
Transmission rate	64 Kbps each B channel
Electrical parameters	ETS 300 012
Overvoltage security	ETS 300 047-3
D channel protocol	DSS1 (Euro-ISDN)
Connector	8 pin RJ45 socket (ISO 8877)
Configuration	ISDN operating mode DSS1 (Euro-ISDN), dial-up and point-to-point connections
Connection control	software controlled
UMTS/GPRS interface (optional)	
Purpose	data communication via UMTS/GPRS-mobile network
Type	integrated UMTS/GPRS transceiver with modem functionality
Radio frequencies	UMTS 1900/2000 MHz
Operating modes	data transfer: GPRS: max. 48 Kbps downlink UMTS: max. 384 Kbps downlink EDGE: max. 384 Kbps downlink HSDPA: max. 3.2 Mbps downlink, max. 7.2 Mbps downlink (projected)
Connector	FME antenna connector

TETRA interface (optional)	
Type	integrated TETRA data modem
Purpose	data communication via TETRA digital trunk radio communication system
Radio network	TETRA (400 MHz band)
Transmission rate	1 W (compl. to EN303035-1, class 4)
Betriebsart	Packet Data Application (PDA); encrypted
Connector	FME antenna connector
DSL interface (optional)	
Purpose	data communication via ADSL modem
Function	integrated ADSL modem
Access type	ADSL/ADSL2/ADSL2+
Transmission rate	depending on the access type up to 24 Mbps downstream and up to 3.5 Mbps upstream
Connector	2-wire-interface

Function indicators	
System	LEDs for system messages (SYS) and power supply (PWR A, PWR B)
LAN interfaces	LEDs for activity and TP connection status (LI/ACT)
Telecontrol interfaces	LEDs for line activity (RX, TX), error (ERR)
ISDN-S_0 interface	S_0 B cannel LEDs (B1, B2)
X.21 interfaces	clock pulse active LED (CLK)
Signalling contact	potential free alert contact with max. capacity 230 VAC/60 VDC/1 A

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