

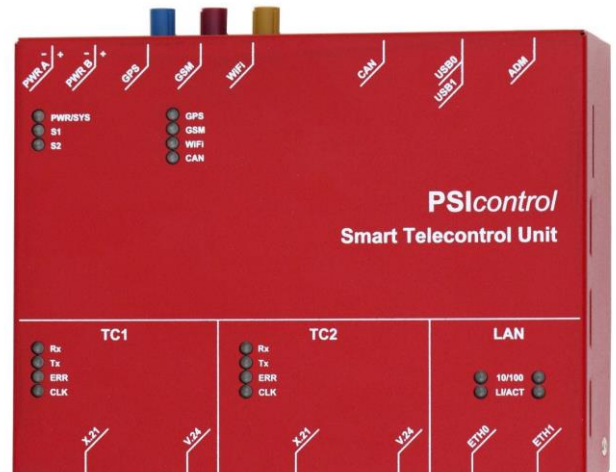
The **Smart Telecontrol Unit** (STU) has been developed to enable intelligent power grids, so-called smart grids. The STU's compact and modular design in a DIN rail enclosure ensures maximum flexibility for multiple applications.

For the secure process interfacing, all proven functionality from the well-known Telecontrol Gateway product family is available. On low voltage level the STU operates as remote terminal unit for substation automation. Sensors are connected via field buses and integrated PLC functionality based on IEC 61131-3. The STU is prepared to control and monitor micro grids and to transfer smart meter data.

The versatile communication interfaces of the STU provide high availability and scalability using a wide range of transmission mediums. Intelligent applications can be loaded to the STU on demand and availability. System and data security is ensured by comprehensive security features including central user authentication, system hardening, communication encryption via VPN tunnels, and an integrated firewall.

Application Areas

- **Telecontrol Gateway**
Data preprocessing, protocol conversion and data transmission via IP networks
- **Micro Grid Controller**
Autonomous controlling and monitoring of small decentralized power grids
- **Feed-in Controller**
Balancing between producers and consumers for stable supply networks
- **Smart Meter Gateway**
Data concentrator to collect, store and forward smart meter data



Security

- BDEW and NERC CIP compliant security features
- Integrated controlling and alarm features

Configuration

- Command Line Interface (CLI)
- Web interface
- Automated start-up and configuration

Interfaces

- Telecontrol interfaces with galvanical isolation; selection of interface type (V.24, X.21, RS485) via software configuration
- Ethernet interfaces (10/100 Mbps)
- RS232 interface
- USB host interfaces
- CAN interface
- GPS interface

Options

- Mobile radio interface, Wi-Fi module (on request)
- External modules: xDSL, TETRA, Powerline
- Supplies: external DIN rail power supply unit

Gateway for Secure Smart Grids

Smart Telecontrol Unit

Preliminary Data Sheet



Mechanics	
Chassis	DIN rail enclosure
Dimensions	163 × 132 × 45 mm ³ (w/h/d)
Cooling	Convection cooling
Environment	
Operation	EN 60721-3-3: 1995 / A2:1997 class 3K7, -40 °C to +70 °C, 10% to 100% rel. humidity (not condensing)
EMC	
Emission	EN 55022:2010 Klasse B
Noise immunity	EN 55024:2010 EN 61850-3:2002
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/ redundancy	4 pin screw ring 0,20 - 1,5 mm ² (IEC) 28 - 16 AWG (UL) Pins 3 and 4 for redundant connection
Redundancy	Second DC connector (hot standby)
Electronics	
Main processor	Freescall Power PC
Program memory	SD card, SDHC up to 8 GB
Main memory	256 MB, optionally 512 MB (DDR2-RAM)

INTERFACES	
Telecontrol interface V.24	
Type	V.24 (RS232)
Purpose	Level adjustment and galvanical isolation
Signal transmission	TXD, RXD, RTS, CTS, DTR, DCD, (CLK)
Baud rate	50 bis 19200 Baud
Electrical values	conforming to V.28
Isolation	1kV eff
Connector	8 pin RJ45 plug (ISO 8877)
Telecontrol interface X.21	
Type	X.21
Purpose	Level adjustment and galvanical isolation
Signal transmission	T+, T-, R+, R-, S+, S-, C+, C-, I+, I-, X+, X-
Baud rate	50 bis 64000 Baud, asynchron (V11) und synchron (X21-64Kbit/s)
Electrical values	conforming to V.11 (RS422)
Isolation	1kV eff
Connector	2 × 8 pin RJ45 plug (ISO 8877)
Telecontrol interface RS 485	
Type	RS 485
Purpose	connection of RS 485 based field buses, e. g. Modbus
Signal lines	2 or 4 wire
Baud rate	50 to 1000 kbaud
Electrical values	conforming to V.11 (RS422)
Isolation	1kV eff
Connector	8 pin RJ45 plug (ISO 8877)

LAN interfaces	
Type	10/100 Mbps Twisted-Pair interface (TP)
Purpose	uplink to control center, process interfacing
Electrical values	conforming to IEEE 802.3I (100Base-T), Impedance: 100 Ω (symmetrical)
Connector	8 pin RJ45 plug (ISO 8877)
RS-232 interface	
Purpose	Configuration and service access
Electrical values	38.400 baud, 8N1, conforming to V.24
Connector	8 pin RJ45 plug (ISO 8877)
USB host interfaces	
Purpose	extensions
Function	connection of external USB devices
Connector	USB 2.0 host interface
CAN interface	
Purpose	connection of CAN based field bus components (analog/digital sensors)
Operating mode	2.0B extended frames with 29 bit identifier
Connector	2 pin screw clamp
GPS	
Type	integrated GPS receiver
Update rate (max.)	1 Hz
Number of channels	48
Accuracy	2,5 m CEP
Protocol	NMEA
Connector	SMBA (FAKRA), encoding C

OPTIONS	
Mobile radio interface	
Purpose	data communication via mobile network
Function	integrated mobile radio module with mo- dem functionality
Radio networks	- FDD LTE: Band 1, Band 2, Band 3, Band 4, Band 5, Band 7, Band 8, Band 20, alle Bänder mit Diversity-Empfang - WCDMA/HSDPA/HSUPA/HSPA+: Band 1, Band 2, Band 5, Band 8, alle Bänder mit Diversity-Empfang - GSM/GPRS/EDGE: 850 MHz/900 MHz/ 1800 MHz/1900 MHz
Operating mode	- GPRS: UL 85.6 Kbps; DL 85.6 Kbps - EDGE: UL 236.8 Kbps; DL 236.8 Kbps - WCDMA CS: UL 64 Kbps; DL 64 Kbps - WCDMA PS: UL 384 Kbps; DL 384 Kbps - HSPA+: UL 5.76 Mbps; DL 21.6 Mbps - DC-HSPA+: UL 5.76 Mbps; DL 42 Mbps - TD-HSPA: UL 2.2 Mbps; DL 2.8 Mbps - TD-SCDMA PS: UL 384 Kbps; DL 2.8 Mbps - LTE FDD: UL 50 Mbps; DL 150 Mbps @20M BW cat4 - LTE TDD: UL 10 Mbps; DL 112 Mbps @20M BW cat4 (Uplink-downlink Konfiguration 2, 1:3)
Connector	SMBA (FAKRA), encoding D

Gateway for Secure Smart Grids

Smart Telecontrol Unit

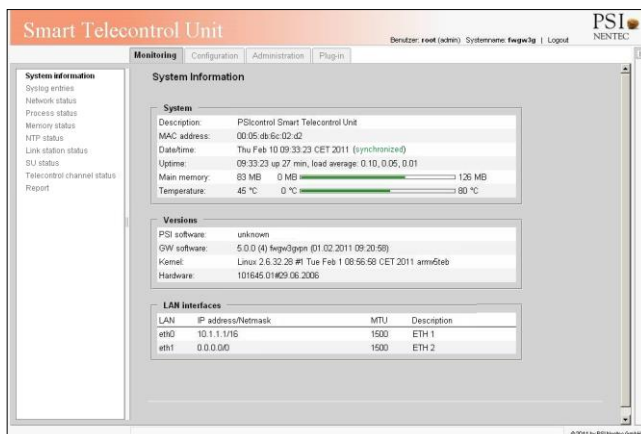
Preliminary Data Sheet



External power supply unit	
Model	DIN rail
Primary voltage	100... 240 VAC/50... 60 Hz
Secondary voltage	15 VDC (controlled)
Output power	15 VA (overload protection, circuit-proof)
Primary connector	screw clamp
Cable length	approx. 3 m
Lifetime (MTBF)	200.000 hours @ 25 °C
Redundancy operation	additional power supply needed
Supplies (optional)	DIN rail power supply (FG DPS)
External extension modules	
Communication	xDSL, TETRA, Powerline
Analog/digital sensors	connection via CANopen / Modbus, e. g. Beckhoff or WAGO

Function indicators	
System	system messages (SYS) power supply (PWR) two programmable LEDs (S1, S2)
LAN interfaces	activity/TP connection status (LI/ACT) speed (10/100 Mbps)
Telecontrol interfaces	line activity (RX, TX) error (ERR) clock pulse (CLK)
CAN interface	active/inactive
GPS/Mobile radio/ WiFi	active/inactive

Software	
Operating system	NENUX (Linux kernel 2.6)
Software version	STU software 5.0
Telecontrol functions	Controlling of telecontrol lines, packetting of telecontrol protocols
Telecontrol protocols	mostly free configurable, among others: Trans- parent-Modus, IEC-870-5-101, IEC-870-5-102, IEC-870-5-103, Siemens SINAUT-8FW, Sie- mens FW537, Siemens FW535, Siemens FW517, AEG F202, AEG SEAB, AEG Geadat 81-1GT, ABB Indactic 21, ABB RP570/571, AEG Geatrans GT-2100
RTU functionality	Soft PLC IEC 61131-3 field bus protocols: CANOpen, MODBUS MIS MODBUS UDP, MODBUS RTU, additional protocols on request telecontrol protocols: IEC 60870-5-104 slave, IEC 61850 client, additional protocols on re- quest
IP routing	between LAN and WAN interfaces, routing protocols: RIPv2, OSPF
Security	VPN tunnel according to IPSec standard, secure protocols (SSH/SSL, SFTP, HTTPS), deactiva- tion of unused interfaces and services, integrat- ed firewall, central user management, patch management
Management	Configuration via command line interface (CLI) and web interface
Statistics and diagnosis	statistics commands, diagnosis via integrated trace system (driver, decoding/encoding, packet- ting) and UNIX commands, data/packet trace functions via PSI-KETEL protocol



PSI Nentec GmbH
 Greschbachstraße 12
 76229 Karlsruhe
 Germany
 Phone +49 721 94249-0
 Fax +49 721 94249-10
 info@nentec.com
 www.nentec.com