

Technical
Overview



NSD570 Teleprotection Equipment



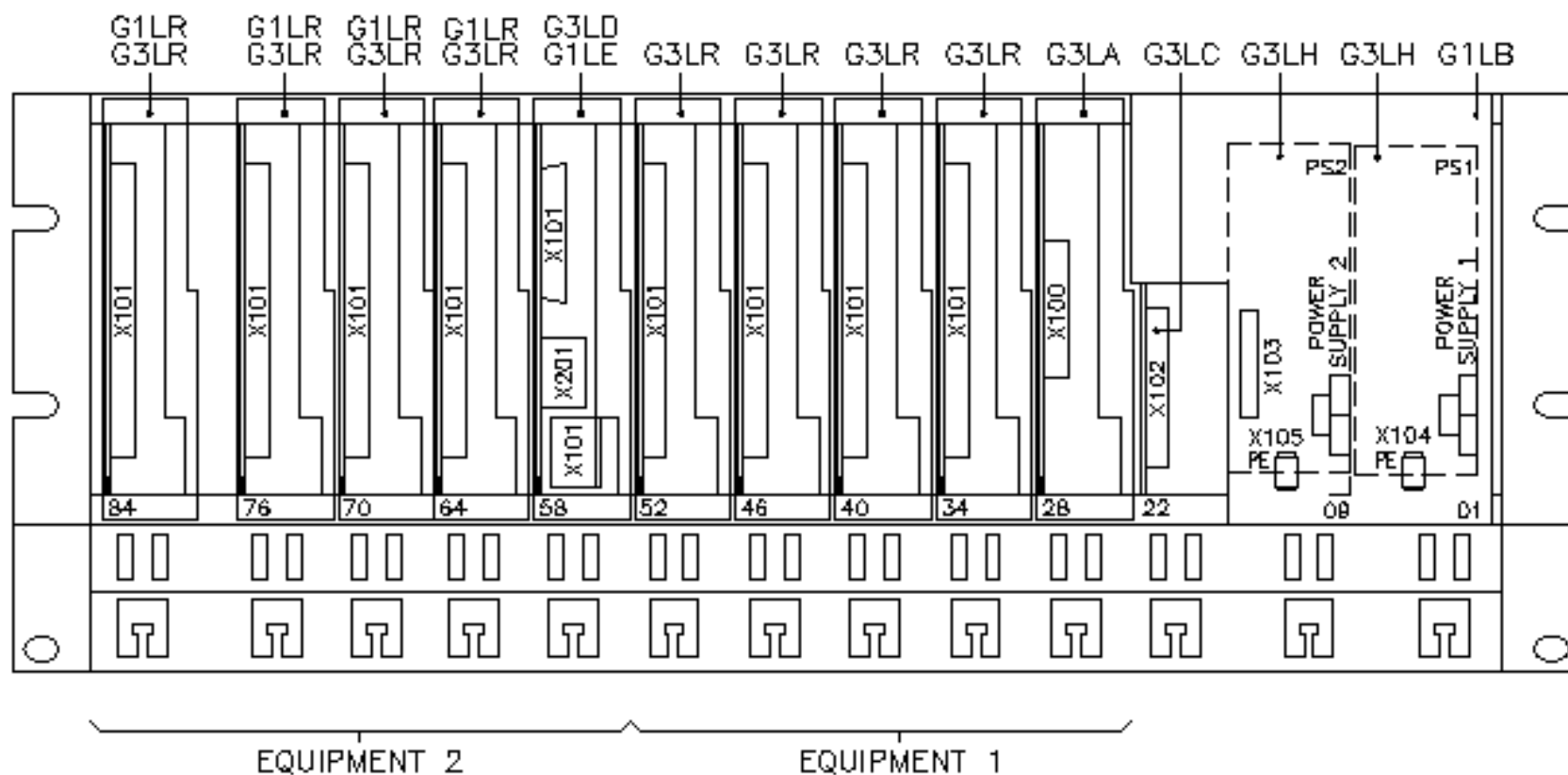
NSD570 - Overview

- Modular design
 - 19 inch rack, 3 height units (3U),
 - 1U for cable duct, connectors, etc.
- Module types
 - Power Supply Unit
 - Analog Line Interface
 - Digital Line Interface
 - Protection Relay Interface
 - Ethernet/LAN Interface (optional)
- One or two systems in one rack
 - 1 line interface plus up to 4 relay interfaces per system
- Mix of analog and digital system in same rack is possible
- Single or redundant power supply (one module only, covers the whole a.c. and d.c. supply voltage range)

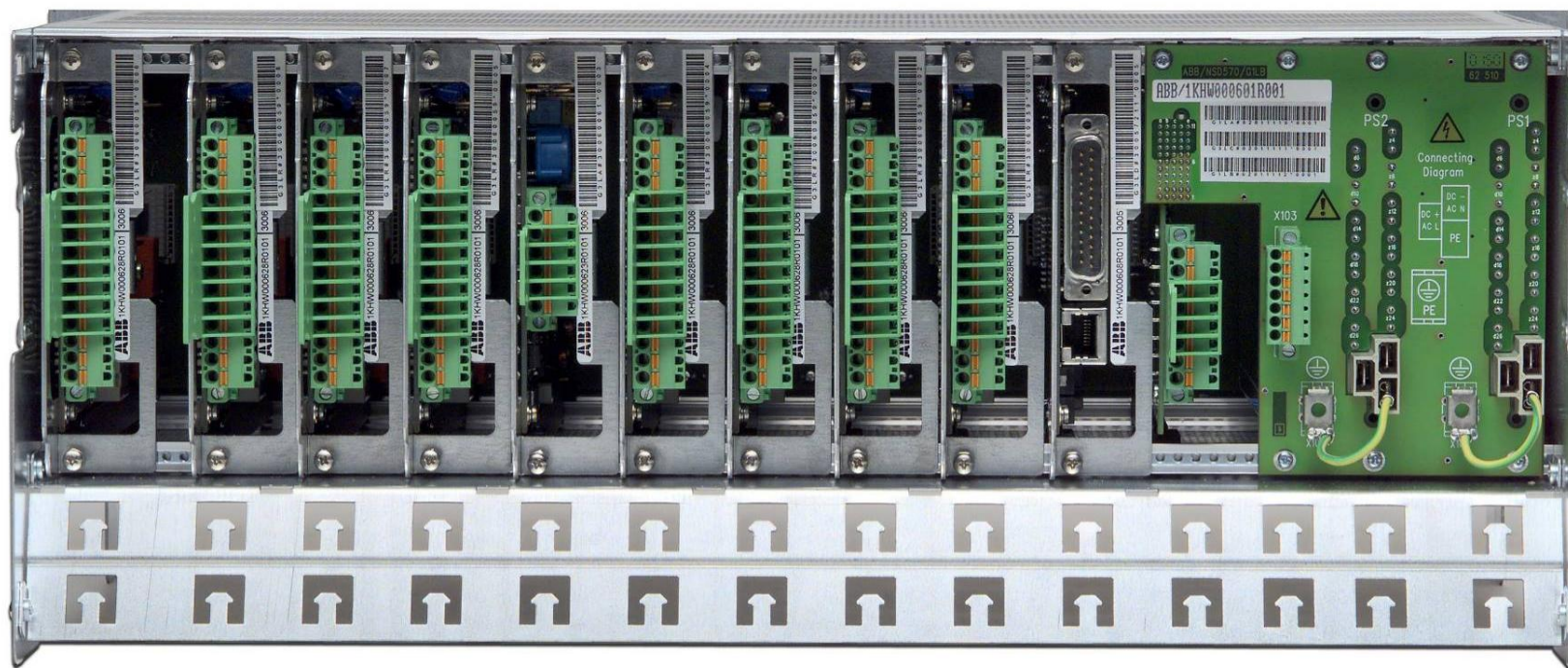


NSD570 - Module Rack (II)

G7BI
REAR VIEW
(COVER REMOVED)



NSD570 - Module Rack (III)



NSD570 - for Analog Channels

- Up to 4 independent commands
- Programmable Bandwidth
 - 120 / 240 / 360 / 480 / 960 / 1200 / 2400 / **2800 Hz** **New**
- Programmable center frequencies
 - from 360 Hz to **3900 Hz** in 60 Hz steps
- No need to set transmission times
 - Adaptive signal processing always ensures shortest transmission times **New**
- Each command configurable for blocking, permissive or direct tripping **New**
- EOC (embedded operation channel) for remote monitoring and display of remote alarms
 - operated in the guard channel - needs no additional bandwidth **New**
- Boosting facility (internal or by means of contact signalling)



New

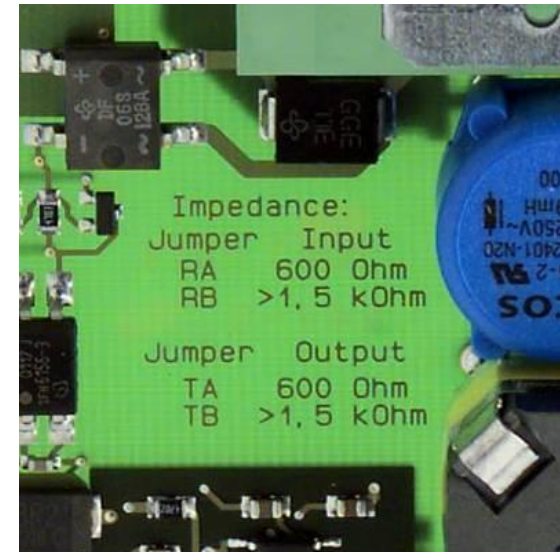
**3
patents
pending**

New

ABB

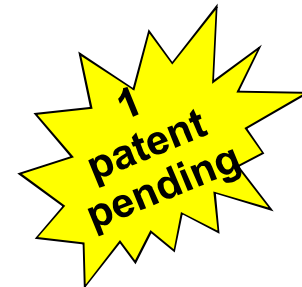
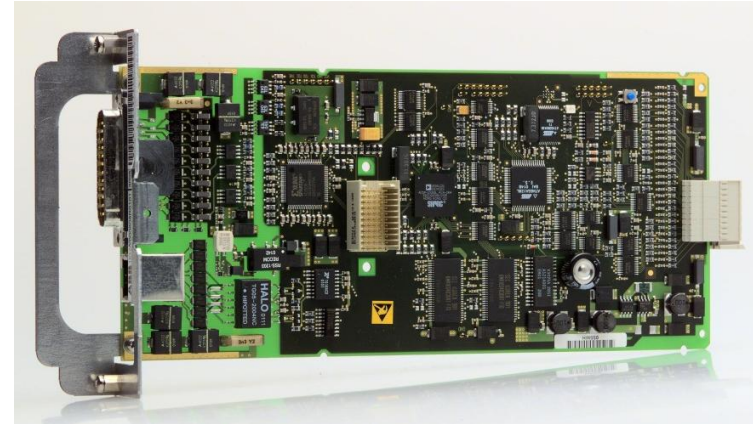
Analog Interface Type G3LA

- 4-wire circuit, 2-wire circuit
- 600 Ohm impedance, or high impedance (to be programmed by jumper settings)
- Transmit level
 - 24 dBm ... +11 dBm (incl. boost)
- Receive level -30 dBm ... +2 dBm
- Receiver dynamic range -> ± 15 dB from nominal
- Power boosting range -> 0 to 9 dB in steps of 1 dB



NSD570 - for Digital Channels

- Up to 8 independent commands
- Set of digital line interfaces:
 - 56 / 64 kbps RS-422 / V.11 / X.24, X.21, RS-530, RS-449
 - 64 kbps G.703 codirectional
 - 2.048 Mbps E1 or 1.544 Mbps T1
- No need to set transmission times
 - Adaptive signal processing always ensures shortest transmission times
- Each command configurable for blocking, permissive or direct tripping
- EOC (embedded operation channel) for remote monitoring and display of remote alarms
- Terminal addressing to prevent unwanted tripping in case of channel crossovers in switched or routed telecom networks



NSD570 - Relay Interface (I)

- Electrically isolated I/O circuits
 - 2 opto-coupler inputs
 - 2 solid state outputs
 - 2 relay output with change over contacts (N/O, N/C)
- Nominal voltage range: 24 VDC ... 250 VDC
- Commands can individually be mapped on any input and output
- Configurable on any output:
 - user defined alarms/warnings
 - Tx/Rx trip acknowledge
 - unblocking
 - state of the guard signal



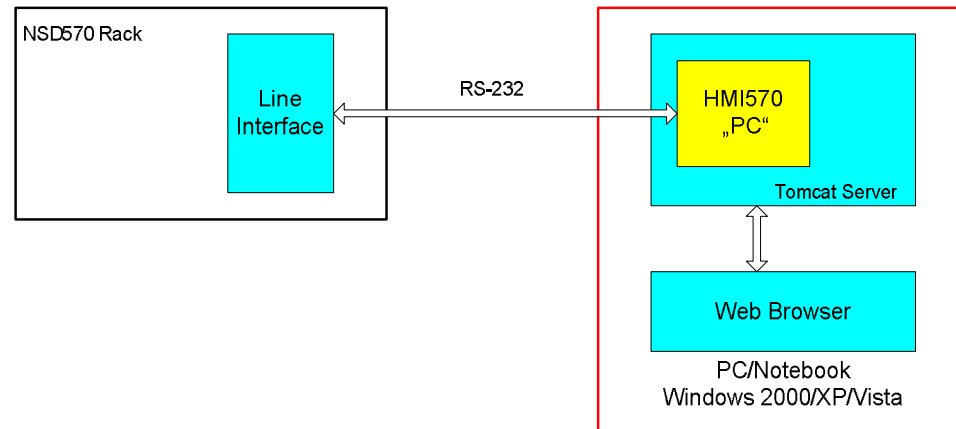
HMI570 - Human Machine Interface (I)

- Browser based
- Independent of platform and operating system
- Configuration on-line or off-line (to file for downloading)
- Testing and commissioning
- Status and alarm monitoring
- Local and remote access to
 - Configuration data, hardware inventory
 - Firmware- and software versions
- Security
 - Users have to be registered by an administrator
 - 3 password levels (admin/edit/view)
 - Secure socket layer (SSL) connection (for remote access only)

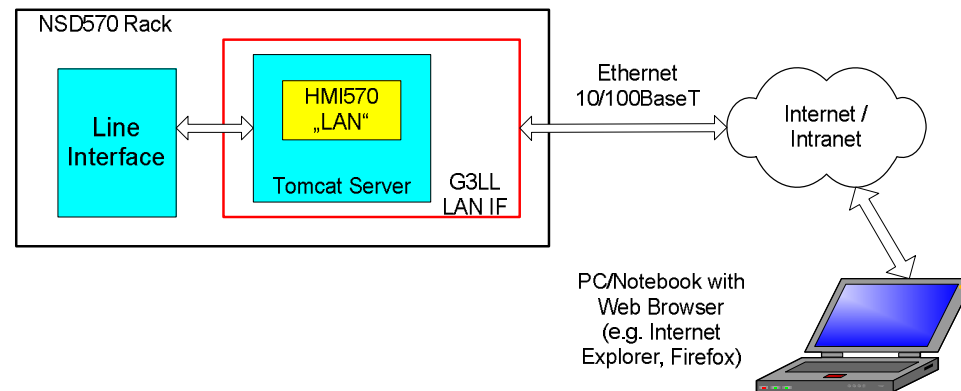


HMI570 - Human Machine Interface (II)

For direct access to the equipment, the HMI570 application program and a small Web server are to be installed on the PC



For remote access to the equipment via the Intranet/Internet, no extra installation on the PC is necessary since the HMI570 application program and the Web server are running on the LAN interface.



HMI570 - Programming Analog Interface



Logged in as **Service**
Permissions : modify, view
Configuration : Default_TPE1_Analog.xml
Connected with **Davos** (15 local)
Analog Line Interface

[Log Off](#)
[User Administration](#)
[Connect Device](#)
[Disconnect Device](#)
[Configuration](#)
[Event Recorder](#)
[Status / Alarm](#)
[Maintenance](#)
[Commissioning](#)
[Local Alarm Polling](#)
[Network Alarm Polling](#)
[HMI570 Settings](#)
[Exit HMI570](#)

Edit Configuration

[Device Information](#)
[Hardware Versions](#)
[Firmware Versions](#)
[Device Identification](#)
[Common Settings](#)
[Analog Interface](#)
[Command Settings](#)
[Relay Interfaces](#)
[Alarm Settings](#)
[Jumper Settings](#)
[Rack Assembly](#)

Analog Interface

| | |
|-----------------------------|--|
| Line Type | four wire |
| Rx Bandwidth [Hz] | 480 |
| Rx Center Frequency [Hz] | 2400 |
| Tx Bandwidth [Hz] | 480 |
| Tx Center Frequency [Hz] | 2400 |
| Analog Operating Mode | 2 single tone commands |
| Power Boost [dB] | 1 single tone command 2 single tone commands |
| Unblocking Threshold [dBm0] | 2 dual tone commands 3 dual tone commands 4 dual tone commands |
| Tx Level [dBm] | |
| Rx Level [dBm] | -6 |
| Tx Alarm Threshold [dB] | -6 |
| Rx Alarm Threshold [+/- dB] | 6 |

update

cancel



HMI570 - Programming Digital Interface



Logged in as **Service**
Permissions : modify, view
Configuration : Default_TPE1_Digital.xml
Connected with **Davos** (15 local)
Analog Line Interface

[Log Off](#)
[User Administration](#)
[Connect Device](#)
[Disconnect Device](#)
[Configuration](#)
[Event Recorder](#)
[Status / Alarm](#)
[Maintenance](#)
[Commissioning](#)
[Local Alarm Polling](#)
[Network Alarm Polling](#)
[HMI570 Settings](#)
[Exit HMI570](#)

Edit Configuration

[Device Information](#)
[Hardware Versions](#)
[Firmware Versions](#)
[Device Identification](#)
[Common Settings](#)
[Digital Interface](#)
[Command Settings](#)
[Relay Interfaces](#)
[Alarm Settings](#)
[Jumper Settings](#)
[Rack Assembly](#)

Digital Interface

| | |
|-------------------------------|--|
| Interface Type | E1 2048 kbps |
| BER Alarm Threshold (1E...) | G.703 64 kbps codirectional RS-530 |
| Digital Address Check | E1 2048 kbps |
| Local Digital Address | T1 1544 kbps Optical Direct Fiber |
| Remote Digital Address | Optical OTERM/OPTIF Optical IEEE C37.94 |
| Long Haul | off |
| Rx Buffer | 2 Frames |
| Tx Buffer | 2 Frames |
| E1 Coding | HDB3 |
| E1 Frame Format | Double Frame |

update

cancel



HMI570 - Programming Relay Interfaces



Logged in as **Service**
 Permissions : modify, view
 Configuration : Default_TPE1_Digital.xml
 Connected with **default config TPE 1** (200 local)
 Digital Line Interface

Log Off
 User Administration
 Connect Device
 Disconnect Device
 Configuration
 Event Recorder
 Status / Alarm
 Maintenance
 Commissioning
 Local Alarm Polling
 Network Alarm Polling
 HMI570 Settings
 Exit HMI570

Edit Configuration
 Device Information
 Hardware Versions
 Firmware Versions
 Device Identification
 Common Settings
 Digital Interface
 Command Settings
 Relay Interfaces
 Alarm Settings
 Jumper Settings
 Rack Assembly

Relay Interfaces

| TPE 1 | Interface 1 (N34) | Interface 2 (N40) | Interface 3 (N46) | Interface 4 (N52) |
|----------------|-------------------|-------------------|-------------------|-------------------|
| Used | on | on | on | on |
| Input 1 | Command A | Command C | Command E | Command G |
| Input 2 | Command B | Command D | Command F | Command H |
| Output 1 | Command A | Command C | Command E | Command G |
| Output 2 | Command B | Command D | Command F | Command H |
| Relay Output 1 | Ack Tx Cmd A | Ack Tx Summary | Rx Guard State | User Alarm 1 |
| Relay Output 2 | Ack Tx Cmd B | Ack Rx Summary | Unblocking | User Alarm 2 |

| TPE 2 | Interface 1 (N64) | Interface 2 (N70) | Interface 3 (N76) | Interface 4 (N84) |
|----------------|-------------------|-------------------|-------------------|-------------------|
| Used | off | off | off | off |
| Input 1 | Command A | Command A | Command A | Command A |
| Input 2 | Command B | Command B | Command B | Command B |
| Output 1 | Command A | Command A | Command A | Command A |
| Output 2 | Command B | Command B | Command B | Command B |
| Relay Output 1 | Local Alarm | HW Alarm | Transmit Alarm | System Alarm |
| Relay Output 2 | Remote Alarm | Receive Alarm | HW Warning | not used |

update cancel

Rx Guard State
 Unblocking
 HW Warning
 HW Alarm
 Link Alarm
 Transmit Alarm
 Receive Alarm
 Local Alarm
 Remote Alarm
 System Alarm
 User Alarm 1



HMI570 - Event Recorder


Event Recorder - Microsoft Internet Explorer provided by ABB

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites RSS Feeds Print Mail Send To Settings

Address http://localhost:10570/hmi570/loadEvRecorder.do Go Links

Google C Go Bookmarks Check Send to Settings



Not logged in
No configuration loaded
No device connected

[Log In](#)
[User Administration](#)
[Connect Device](#)
[Disconnect Device](#)
[Configuration](#)
[Event Recorder](#)
[Status / Alarm](#)
[Maintenance](#)
[Commissioning](#)
[HMI570 Options](#)
[Exit HMI570](#)

Event recorder successfully loaded
EventRecEI_Sauz_10_44.xml

Event Recorder NSD570

Station Name:

Event Recorder
[Load From Disk](#)
[View Events](#)
[Save To Disk](#)

| Date [yyyy-mm-dd] | Time [hh:mm:ss.millisecond] | Event Description |
|-------------------|-----------------------------|--------------------------------|
| 2005-04-29 | 09:30:47.749 | Loop test received |
| 2005-04-29 | 09:30:47.738 | Loop test sent |
| 2005-04-29 | 08:18:30.570 | Loop test reflected |
| 2005-04-29 | 05:41:54.158 | End BER Bit Error Rate alarm |
| 2005-04-29 | 05:41:38.154 | Begin BER Bit Error Rate alarm |
| 2005-04-29 | 05:15:08.293 | End Rx Command A |
| 2005-04-29 | 05:15:08.281 | End Rx Command B |
| 2005-04-29 | 05:15:08.216 | Begin Rx Command A |
| 2005-04-29 | 05:15:08.215 | Begin Rx Command B |
| 2005-04-29 | 05:14:50.904 | End Rx Command A |
| 2005-04-29 | 05:14:50.889 | End Rx Command B |
| 2005-04-29 | 05:14:50.816 | Begin Rx Command A |
| 2005-04-29 | 05:14:50.816 | Begin Rx Command B |
| 2005-04-29 | 05:14:36.637 | End Rx Command A |
| 2005-04-29 | 05:14:36.625 | End Rx Command B |

NSD570 - Event Recorder / Trip Counters

- Integrated, non-volatile
 - 7500 events (sequentially stored)
- For recording command / **alarm** / **manipulation** events
- Optional synchronisation via IRIG-B input and/or pulse per second (PPS) input
- Display -> text view (list of events with time stamp)
- Trip counter integrated, non-volatile
 - For each command (sent and received), loop test and unblocking condition
 - Max. number of counts before overflow -> 65536
 - Each counter can be cleared separately

NSD570 - Special Operating Modes

■ T-Operation

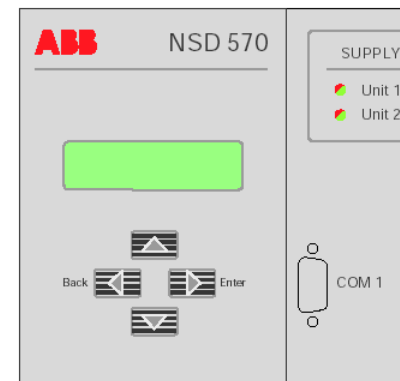
- Transit relaying of command signals in a T-station (short delay)
- Protection of teed feeders with single or multiple tee-offs
- Normal T-Operation
- Inverse T-Operation (permissive overreach)

■ 1+1 Protection

- To protect against communication path failures
- For path and equipment redundancy

NSD570 Options (I)

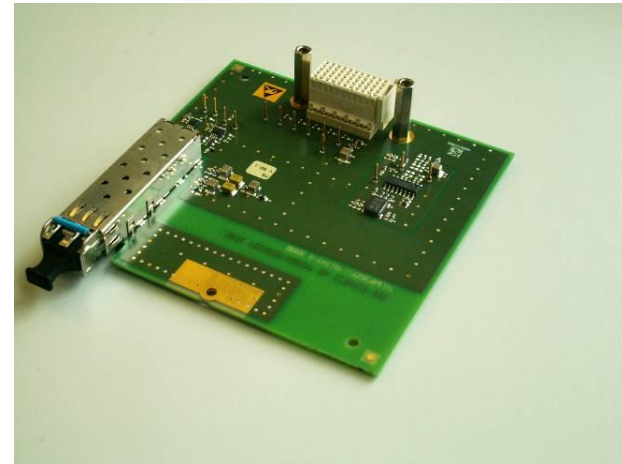
- G1LE E1/T1 Interface
 - Piggyback to be mounted on Digital Interface G3LD
 - Provides SDH or SONET interface
- G1LR Internal Tripping Voltage 24 VDC
 - Piggyback to be mounted on Relay Interface G3LR
 - Covers both inputs on G3LR
 - External tripping by a dry contact
- G1LC Display Panel
 - Instead of Blanking Cover Plate (covering power supply units)
 - For monitoring status and alarm messages of local NSD570 (and remote NSD570, if EOC is enabled)



NSD570 Options (III)

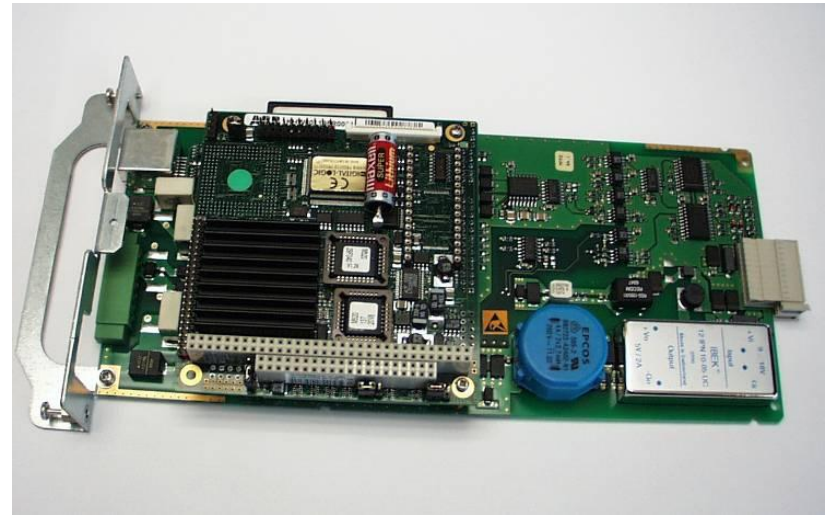
■ G1LOa Optical Interface

- Piggyback to be mounted on Digital Interface G3LD
- 3 optical SFP transceiver versions (exchangeable):
 - 840 nm, MM, > 2 km, up to 4 km, compatible with new standard for „Optical Fiber Interface Between Teleprotection and Multiplexer Equipment (IEEE C37.94)
 - 1310 nm, SM, > 30 km, up to 50 km, for C37.94, FOX/OTERM, FOX/OPTIF and Direct Fiber applications
 - 1550 nm, SM, > 120 km, up to 150 km, for extra long haul direct fiber applications
- Other SFP transceivers on request (e.g. CWDM / DWDM)



NSD570 Options (IV)

- G3LL LAN Interface
 - Ethernet Interface
 - Embedded Web Server
 - For remote monitoring and configuration
 - Interface to busplane
 - Networking via station bus RS-485
 - Integrated alarm polling function



NSD570 - Additional Features

- RTC synchronisation inputs on G3LC
 - for synchronisation of the built-in real-time clock and event recorder
 - one IRIG-B input – must be configured manually to „ON“ if applied
 - one pulse per second (PPS) input – automatically detected if applied
- External connections
 - by means of wires connected directly to spring-cage terminals (no screws!) at the back of the equipment, or
 - by means of connecting cables with special terminations (knife disconnect terminal blocks)
- Built-in test facilities
 - manual loop test
 - cyclic loop test
 - local test mode
 - remote test mode

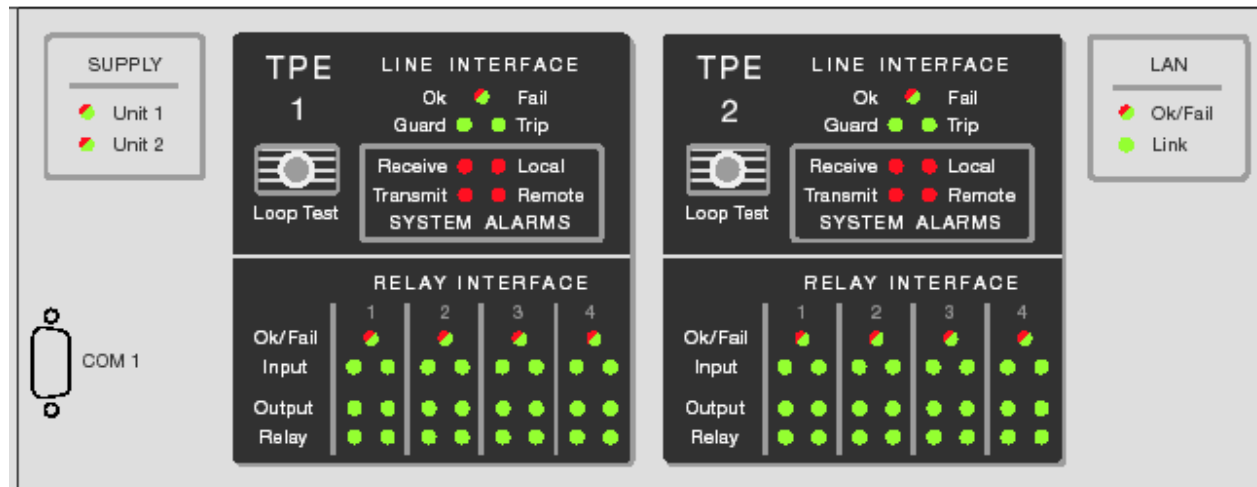


NSD570 rear view



NSD570 – Alarms (I)

- One common alarm relay for each system in the rack
- Status and alarm LEDs on the front panel:
 - One status LED per modul (green/red signals Ok/Fail)
 - One green status LED for each input/output and relay contact
 - Green status LEDs for Guard or Trip reception
 - Red alarm LEDs per system: Transmit, Receive, Local, Remote



NSD570 – Alarms (II)

- Configurable alarms (on any output of the relay interfaces):
 - HW-Warning
 - Hardware-Alarm
 - Link-Alarm
 - System-Alarm
 - Local-Alarm
 - Remote-Alarm
 - Transmit-Alarm
 - Receive-Alarm
 - User-Alarm 1 - 3
(user may select 3 special alarms by logical OR-gating of several alarm sources, e.g. SNR/BER, Tx signal, Rx signal, ...)



Power and productivity
for a better world™