

GENERATION & NETWORK

Network Check Synchronizing Relay

NPSC800-1 performs check of synchronism between two power supplies. It is usually used to authorize the closing order of a paralleling circuit breaker. NPSC800-2 allows in addition the operating of live (or dead) line and live (or dead) bus. It also allows, with a dedicated output relay, the reconnection of two bus sections fed by the same supply.

As well as the usual protection functions, NP800 relays provide monitoring, measurement and recording of the electrical quantities of the network. The relays can be set by the RS232 port, or remotely using the RS485 port. Reading, measurement and recording are all available locally or remotely.

NPSC800



- Multifunction
- Measurement
- Recording / event log
- Disturbance recording
- Local MMI

Common functions for NPSC800-1 and NPSC800-2

- Synchro- check [25]

Specific functions for NPSC800-2

- Dead Line – Dead Bus (**DLDB**)
- Dead Line – Live Bus (**DLLB**)
- Live Line – Dead Bus (**LLDB**)
- **Reconnection** of two bus section from the same source

CHARACTERISTICS NPSC800

Auxiliary Supply

- Auxiliary supply ranges 19 to 70 – 85 to 255 / Vdc or Vac 50 or 60 Hz
- Typical burden 6 W (CC), 6 VA (CA)
- Memory backup 72 hours

Analogue Inputs

- Phase voltage inputs Un: 55 to 120 V
input impedance > 80 KΩ
continuous rating 240 V, short duration withstand 275V - 1 min
measurement from 3 to 240 V
- Frequency (50Hz or 60Hz) VT setting: primary value from 220 V to 250 kV
measurement: 45-55 Hz or 55-65 Hz
measurement: 30 to 70 Hz (from V1.50)

Digital Inputs (4 for NPSC800-1, 8 for NPSC800-2)

- Polarizing voltage 20 to 70 Vdc, range 19 to 70 V
- Level 0 37 to 140 Vdc, range 85 to 255 V
- Level 1 < 10Vdc range 19 to 70 V – < 33Vdc range 85 to 255 V
- Burden > 20Vdc range 19 to 70 V – > 37Vdc range 85 to 255 V
-

Relay Outputs (3* for NPSC800-1 + 1 WD, 7 for NPSC800-2 + 1 WD)

- Relays A*, B*, E, F double contact NO, permanent current 8 A
closing capacity 12 A / 4 s
short circuit current withstand 100 A / 30 ms
breaking capacity DC with L/R = 40 ms: 50 W
breaking capacity AC with cos φ = 0.4: 1250 VA
changeover contact, permanent current 16 A
closing capacity 25 A / 4 s
short circuit current withstand 250 A / 30 ms
breaking capacity DC with L/R = 40 ms: 50 W
breaking capacity AC with cos φ = 0.4: 1250 VA
- Relays C*, WD, D, G

Characteristics of the function [25]

- Blocking of the output relay C possible by digital input (output relay use for paralleling authorisation)
50 to 100 % Un
- Threshold U line mini for authorisation [25]
- Threshold accuracy 2% of Un
- Setting of voltage difference: ΔU thresholds +/- : 1% to 15% Un, with step of 1% Un
- Voltage difference accuracy ± 5% of the set value
- Setting of angular difference: Δφ thresholds +/- : 1° to 20°, with step of 1°
- Angular difference accuracy ± 2%
- Setting of frequency difference: ΔF thresholds +/- : 0.01 to 1.5 Hz, with step of 0.01 Hz
- Frequency difference accuracy ± 5% of the set value
- Setting of rate of frequency change: ΔF/dt thresholds +/- : 0.01 to 0.2 Hz/s, with step of 0.01 Hz/s
- Rate of frequency change accuracy ± 2%
- Time lag before authorisation 0 ms to 300 s
- Accuracy of the time delays ± 2% or 20 ms
- Accuracy of displayed measures 3% from 3 to 240 V

Characteristics of line and bus functions**: DLDB - DLLB - LLDB

- Activation of functions by setting software and dedicated DI (non exclusive mode)
- Information function activated HMI, dedicated DO, communication and setting software with PC
- Operating mode paralleling authorisation by the output relay C
- Threshold U> Live Line 5 to 120 % Un
- Threshold U< Dead Line 5 to 120 % Un
- Threshold U> Live Bus 5 to 120 % Un
- Threshold U< Dead Bus 5 to 120 % Un
- Thresholds accuracy 2% of Un
- Time lag before authorisation 0 ms to 300 s (3 settings: DLDB, DLLB and LLDB)
- Accuracy of the time delays ± 2% or 20 ms

Characteristics of the reconnection function**

- Active only in synchronous mode concomitance of Line and Bus frequencies
- Activation of the function by setting software and dedicated DI
- Setting of ΔU and Δφ common settings with function [25]
- Information function activated HMI, dedicated DO, communication and setting software with PC
- Setting of voltage difference: ±ΔU 1% to 15% Un, step of 1% Un
- Time delay for controlling the reconnection conditions 40 ms to 300 s
- Hold time of the output relay G 100 ms to 500 ms (output relay dedicated to the reconnection function)
- Accuracy of the time delays ± 2% or 20 ms

** only NPSC800-2

CHARACTERISTICS NPSC800

Phase shift

- Line voltage / bus voltage

0 to 360°, step of 1°

Digital inputs assignment

- Input 1
- Input 2
- Input 3
- Input 4
- Input 5 (NPSC800-2 only)
- Input 6 (NPSC800-2 only)
- Input 7 (NPSC800-2 only)
- Input 8 (NPSC800-2 only)

(see application guide)

activation set 2

inhibition of the function [25]

paralleling order (management of disturbance recording and events)

contact o/o of the Circuit Breaker (management of events)

enable mode DL-DB

enable mode DL-LB

enable mode LL-DB

enable mode reconnection

Digital output assignment

- Relay A
- Relay B
- Relay C
- Relay D (NPSC800-2 only)
- Relay E (NPSC800-2 only)
- Relay F (NPSC800-2 only)
- Relay G (NPSC800-2 only)

(see application guide)

set 2 activated

function [25] inhibited

paralleling authorisation (permanent order if conditions are valid)

mode DL-DB selected

mode DL-LB selected

mode LL-DB selected

reconnection order

Signalling LEDs assignment

- LED 1
- LED 2
- LED 3
- LED 4

info ΔU OK

info Δφ OK

info ΔF OK

paralleling authorised

Man Machine Interface

- Relay display
Language
- Configuration and operating software
Language

2 lines of 16 characters

French, English, Spanish, Italian

Windows® 2000, XP, Vista and 7 compatible

French, English, Spanish, Italian

MODBUS® Communication (option)

- Transmission
- Interface
- Transmission speed

asynchronous series, 2 wires

RS 485

300 to 115 200 bauds

Disturbance recording

- Number of recordings
- Total duration
- Pre fault time

4

170 cycles per recording (12 samples / cycle)

adjustable from 0 to 170 cycles

Climatic withstand in operation

- Cold exposure
- Dry heat exposure
- Damp heat exposure
- Temperature variation with specified variation rate

IEC / EN 60068-2-1: class Ad, -10 °C

IEC / EN 60068-2-2: class Bd, +55 °C

IEC / EN 60068-2-3: class Ca, 93 % HR, 40 °C, 56 days

IEC / EN 60068-2-14: class Nb, -10 °C à +55 °C, 3 °C/min

Storage

- Cold exposure
- Dry heat exposure

IEC / EN 60068-2-1: class Ad, -25 °C

IEC / EN 60068-2-2: class Bd, +70 °C

Electrical safety

- Ground bond test current
- Impulse voltage withstand
- Dielectric withstand: 50Hz
- Insulation resistance
- Clearances and creepage distances

IEC / EN 61010-1: 30 A

IEC / EN 60255-5: 5 kV MC, 5 kV MD

except outputs TOR, 1 kV MD

except RS485, 3 kV MC

IEC / EN 60255-5: common mode 2 kV_{rms} – 1 min

Differential outputs mode TOR 1 kV_{rms} – 1 min

(open contact type)

IEC / EN 60255-5: 500 Vdc - 1 s: > 100 MΩ

IEC / EN 60255-5: rated insulation voltage: 250 V

Pollution degree: 2

Overvoltage category: III

CHARACTERISTICS NPSC800

Enclosure safety

- Degrees of protection provided by enclosures (IP code)

IEC / EN 60529: IP51, with front face

Immunity – Conducted disturbances

- Immunity to RF conducted disturbances
- Fast transients
- Oscillatory waves disturbance 1 MHz
- Surge immunity
- Supply interruptions

IEC / EN 61000-4-6: class III, 10 V
IEC / EN 60255-22-4 / IEC / EN 61000-4-4: class IV
IEC / EN 60255-22-1: class III, 2.5 kV MC, 1 kV MD
except RS485, class II, 1 kV MC
IEC / EN 61000-4-5: class III
IEC / EN 60255-11: 100% 20 ms

Immunity – Radiated disturbances

- Immunity to RF radiated fields
- Electrostatic discharges
- Power frequency magnetic field immunity test

IEC / EN 60255-22-3 /
IEC / EN 61000-4-3: class III, 10 V/m
IEC / EN 60255-22-2 /
IEC / EN 61000-4-2: class III, 8 kV air / 6 kV contact
IEC / EN 61000-4-8: class IV, 30 A/m permanent, 300 A/m
1 to 3 s

Mechanical robustness - energised

- Vibrations
- Shocks

IEC / EN 60255-21-1: class 1, 0.5 Gn
IEC / EN 60255-21-2: class 1, 5 Gn / 11 ms

Mechanical robustness - not energised

- Vibrations
- Shocks
- Bumps
- Free falls

IEC / EN 60255-21-1: class 1, 1 Gn
IEC / EN 60255-21-2: class 1, 15 Gn / 11 ms
IEC / EN 60255-21-2: class 1, 10 Gn / 16 ms
IEC / EN 60068-2-32: class 1, 250 mm

Electromagnetic compatibility (EMC)

- Radiated field emissivity
- Conducted disturbance emissivity

EN 55022: class A
EN 55022: class A

Presentation

- Height
- Width
- Brackets 19" rack mounting

4U
1/4 19"
option (see drawing D37739)

Case

- H, W, D without connectors
- Net weight

173 x 106.3 x 250 mm (see drawing D37739)
3.6 kg

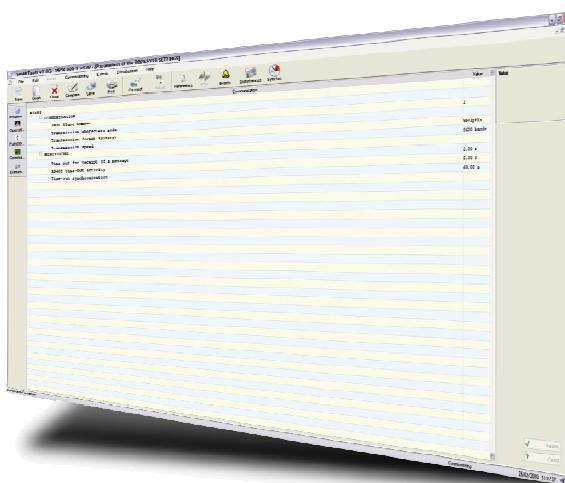
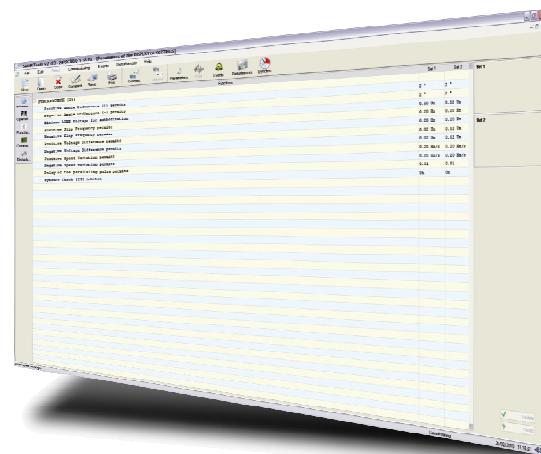
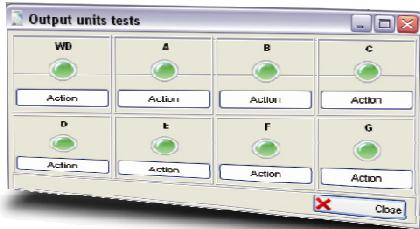
Connection - codification

- NPSC800-1
- NPSC800-2

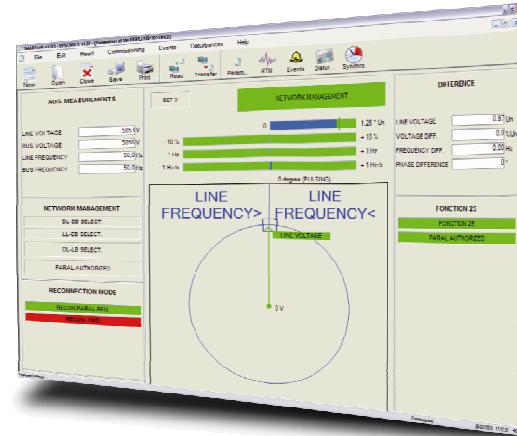
see diagram S38893
see diagram S39609

SMARTsoft

SMARTsoft, integrated software for the Industry, Railway and Transmission ranges, helps the User get the best from NP800 series relays.



SMARTsoft
User friendly
Diagnosis
Fault analysis
Maintenance tools



Functionalities

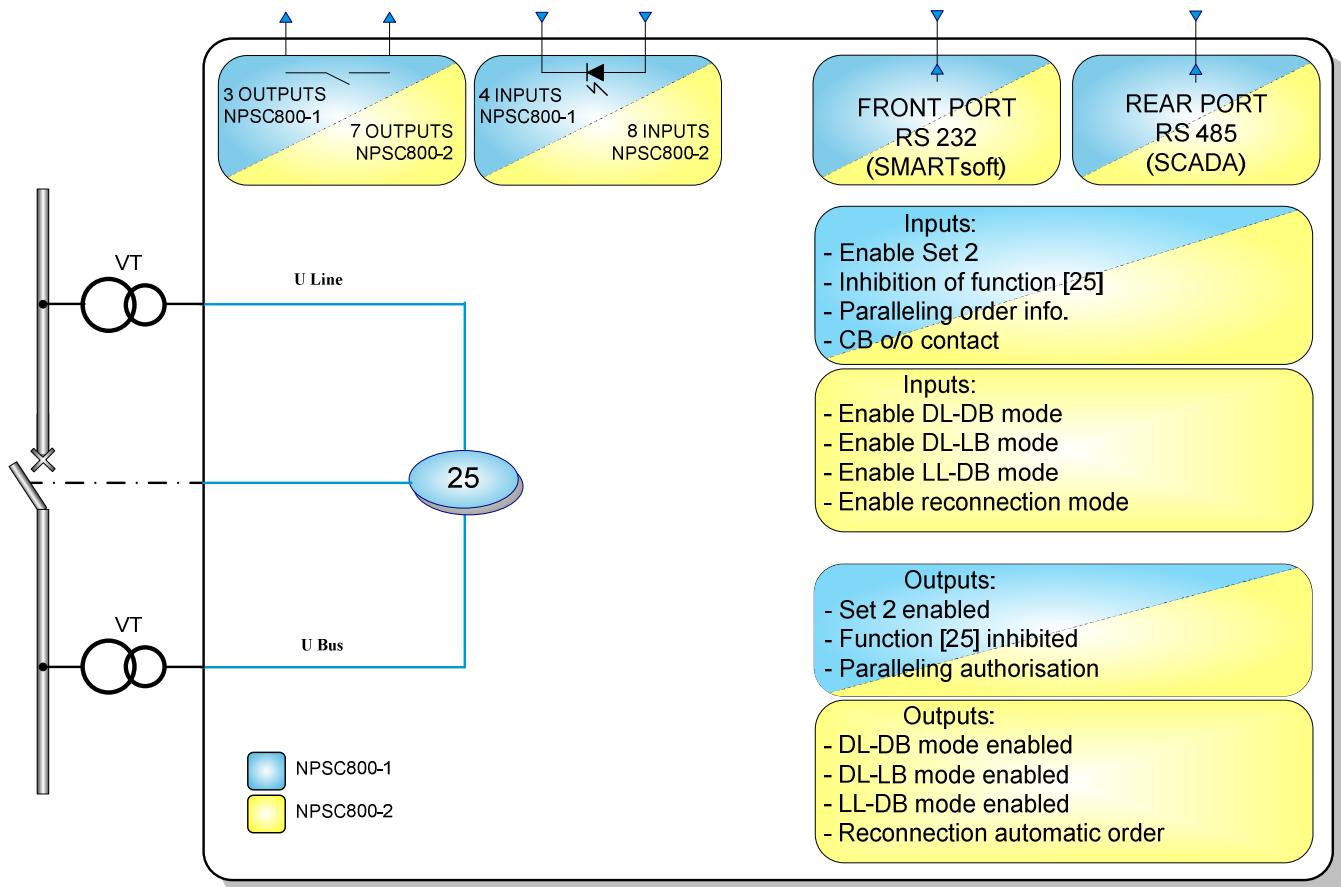
- 2 ranges of auxiliary supply
- Storage of lack and the restoration of the auxiliary voltage (events recorded)
- Configuration and parameter setting by off-line / on-line PC
- Reading and recording of configuration by PC
- Measurement of electrical quantities:
 - Phase voltages U_L , U_B
 - Frequency F_L , F_B
 - Voltage difference ΔU ($U_L - U_B$)
 - Angular difference $\Delta\phi$
 - Frequency difference ΔF ($F_L - F_B$)
 - Acceleration (Hz / s)
- Display expressed in primary values
- 2 setting groups, remotely selectable by a digital input
- Setting software compatible with Windows® 2000, XP, Vista and 7
- User interface with access to all functions

- Commissioning facilitated, the inhibition of the output relay of the [25] function allow the validation of the wiring.
- Time stamping of internal events with 10ms resolution
- Time stamping of digital inputs with 10ms resolution
- Event recording: 250 locally recorded events, 200 saved in case of loss of the auxiliary supply
- Local / remote events acknowledgment
- Disturbance recording according to Comtrade® format: storage of 4 recordings of 170 periods. Wiring of the paralleling order requested, except for reconnection function
- Remote setting, remote reading of measurements, alarms and parameters settings
- Remote reading of disturbance recording and events log
- Self-diagnosis: Memories, output relays, A/D converters, auxiliary supply, cycles of execution of the software, hardware anomaly

Options

- Communication by Modbus® RS 485
- Communication by Modbus® RS 485 with redundancy (NPSC800-2 only)

Functional diagram



The specifications and drawings given are subject to change and are not binding unless confirmed by our specialists.