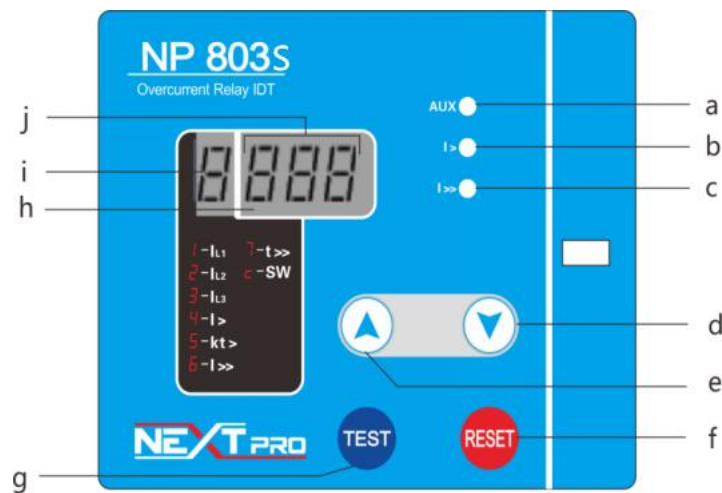


NP803S Over-Current Relay (IDT) User Manual

A BRIEF OVERVIEW



a - Auxiliary Power Supply Indicator

b - Low-Set Start/Trip Status Indicator

c - High-Set Start/Trip Status Indicator

d - Down Key

e - Up Key

f - Reset Key

g - Test Key

h - DP LED Indicator

i - FUNCTION LED Indicator

j - DATA LED Indicator

IL1 - L1 Current

IL2 - L2 Current

IL3 - L3 Current

I> - Over-Current Low-Set

Kt> - Over-Current Time Multiplier/ Time Delay

I>> - Over-Current High-Set

t>> - Over-Current High-Set Time Delay

SW - Soft Switches

1. General Description

The NP803S Over-Current relay is a microprocessor based numerical relay. It uses fundamental frequency current measurement for excellent harmonic current rejection.

The relay provides three independent phase Over-Current elements which are connected

to the current transformers of the feeder to be protected.

The Over-Current elements consist of independent Low-Set units and High-Set units. The time current characteristic of the Low-Set units is selectable between Inverse Definite Time (IDT) and Definite Time. The High-Set units are the Definite Time type, Instantaneous Tripping is made possible by setting the time to minimum.

The NP803S incorporates a 4-digit LED indicator which allows direct numerical readout of Set Values, Actual Measured Value, Recorded Value and System Indication. All Current Measurements and Current Settings are based on 5A Current Transformer (CT).

2. Light indication

The indicators display the status of the system as follow;

LED Indicator					Status
Aux	I>	I>>	FUNCTION	DATA	
0	0	0	0	0	No Auxiliary Power Supply.
1	0	0	X	X	Normal Condition, No Tripping.
1	1	0	X	X	Low-Set Triggered, Time Delay Countdown Started.
1	0	1	X	X	High-Set Triggered, Time Delay Countdown Started.
1	B	0	B	B	Low-Set Tripped, Function LED Indicates Tripping Source, Data LED Shows Tripped Value.
1	0	B	B	B	High-Set Tripped, Function LED Indicates Tripping Source Data LED Shows Tripped Value.
1	X	X	B	1	Programming Mode.

Table1: System State 1= ON 0 = OFF X= Don' t Care, Not Blinking B = Blinking

Indicator		
FUNCTION	DP	DATA
1	OFF	L1 Load Current.
2	OFF	L2 Load Current.
3	OFF	L3 Load Current.
1	BLINK	Previous L1 Tripped Current.
2	BLINK	Previous L2 Tripped Current.
3	BLINK	Previous L3 Tripped Current.
4	OFF	Over-Current Low-Set Current Setting.
5	OFF	Over-Current Time Multiplier/ Delay Setting.
6	OFF	Over-Current High-Set Current Setting.
7	OFF	Over-Current High-Set Time Delay Setting.
c	OFF	Soft Switch Setting.

Table 2: Function Codes

Note: Under normal operating condition, The 4-digit display is off. When the RESET key is pressed, the 4-digit display will light up. The display will switch off automatically after 6 minutes if no further key is pressed.

3. Push-buttons Operation

(1) Trip Test: Press the "TEST" button to simulate a trip condition.

- (2) Trip Reset: Press the "RESET" button to reset the relay when tripped
- (3) View Setting: When the relay is not under tripped condition, pressing the "RESET" button will scroll through the various functions.

The sequence of selection is as follow:

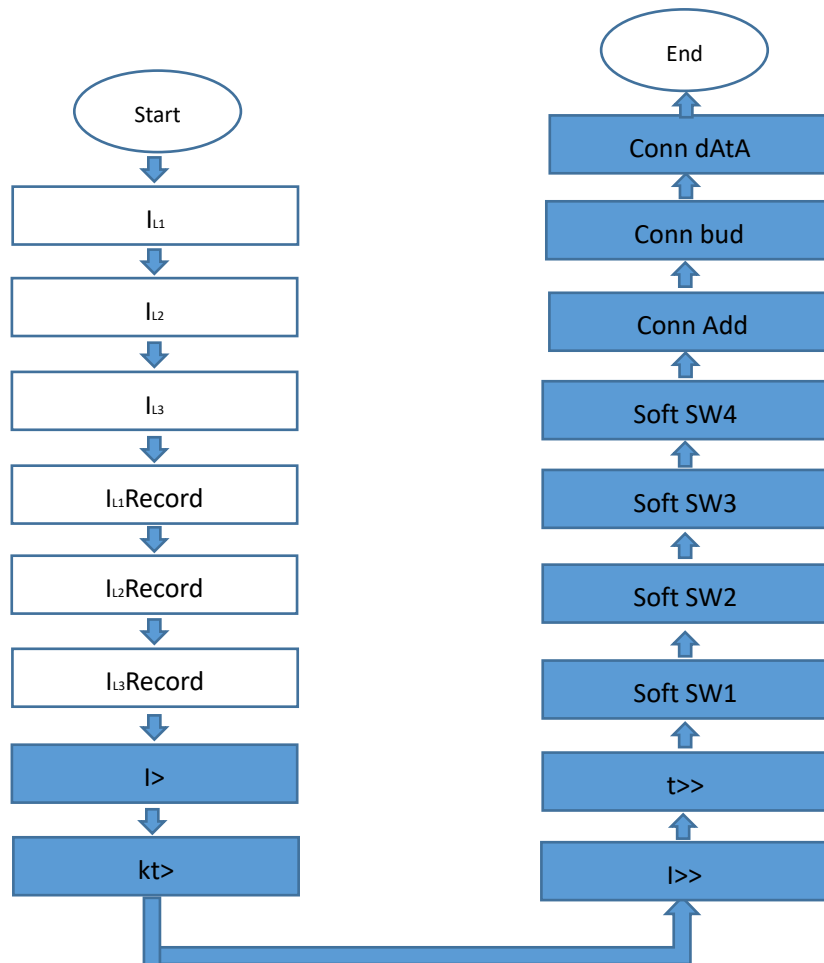


Figure 1: Scroll Sequence



Programmable Items

(4) Programming Setting:

To program the setting for I>, kt>, I>>, t>>, soft SW1, soft SW2, soft SW3, soft SW4, d: ID Address, E: Baud Rate and F: DATA.

Step 1: Press "RESET" key until the Function LED shows the required function.

Step 2: Press the "UP" and "DOWN" key simultaneously to enter programming mode.

Address: No. 31-B, Jalan 20/14, Paramount Garden, 46300 Petaling Jaya, Selangor Darul Ehsan, Malaysia.

The Function LED blinks to indicates the relay is in programming mode.

Step 3: Use the "UP" or "DOWN" key to select the desired value.

Step 4: To save the selected value, press the "UP" and "DOWN" key simultaneously again. It will exit the programming mode with the Data LED displaying the newly set value.

To exit programming mode without saving the selected setting, press the "RESET" key once.

Example 1: To set Over-current Low-Set setting from 5.00A(100%) to 6.00A(120%)

Procedures	Expected Output	Display
(i) Press "Reset" key until over-current Low-Set setting function. i.e., Function 4.	Function LED shows "4". Data LED shows default setting is 5.00A	4 5.00
(ii) Press "Up" & "Down" keys simultaneously.	Function LED blinks. Relay is in programming mode.	4 5.00
(iii) Press "Up" key to alter the setting until desired value display. i.e., 6.00A.	Data LED shows set value increasing until it shows "6.00"	4 6.00
(iv) Press "Up" & "Down" keys simultaneously to save new value and exit programming mode.	Function LED stop blinking, DATA LED displays the new setting. i.e., 6.00A	4 6.00

Output Contacts

The NP803S has two relay outputs (R1 and R2). The output contacts can be programmed as follow:

Soft-switches. When the function LED displays "c", it means that the relay is in the soft-switch setting mode.

- i) Linked to Over-Current Trip Signal.
- ii) Manual Reset or Auto Reset Type.

For Auto Reset type, the contact remains activated until the fault current is removed.

For Manual Reset type, the contact remains activated even with the removal of fault current.

This contact can only be reset by pressing the "RESET" key.

4. Soft Switches

The NP803S incorporates 4 soft switches for system configuration. When the Function LED shows "c", the relay is in "Soft Switch Setting" mode.

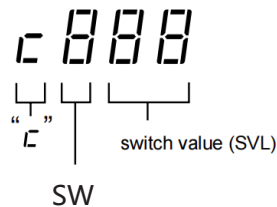


Figure 2: Soft Switch Indication

Example 2: To change contact R1 from Auto Reset to Manual Reset.

Procedures	Expected Output	Display
(i) Press "Reset" key until soft switch 1 setting function.	Function LED shows "c". Switch number (SW) shows "1" Switch Value (SVL) shows "01".	c 01
(ii) Press "Up" & "Down" keys simultaneously.	Function LED blinks. Relay is in programming mode.	:c 01
(iii) Press "Up" key to alter the setting until desired value display.	Switch Value (SVL) changed to "11". (Refer Table 3 for soft switch configuration).	:c 11
(iv) Press "Up" & "Down" keys simultaneously to save new value and exit programming mode.	Function LED stop blinking, Switch Value (SVL) shows the new setting. i.e., "11".	c 11

SW	SVL	System Configuration
----	-----	----------------------

1	01	R1 Auto Reset Type, Linked to O/C.
	11	R1 Manual Reset Type, Linked to O/C.
2	01	R2 Auto Reset Type, Linked to O/C.
	11	R2 Manual Reset Type, Linked to O/C.
3	00	O/C High-Set Disabled.
	01	O/C High-Set Enabled.
4	00	O/C IDT Normal Inverse.
	05	O/C Definite time.

Table 3: Soft Switches Setting O/C = Over-Current; R1 = Relay DO1; R2 = Relay DO2

5. Technical Data

Ratings

Rated Current In.....5.00A

Frequency.....50 Hz

Burden.....<0.30VA at In

Auxiliary Supply

Supply Voltage.....220~240VAC

Supply Frequency.....50 Hz

VA Rating.....3.00VA Typical

Setting Ranges

Over-Current Elements

Low-Set Setting I>0.10 - 10.0A (2%-200%)

Low-Set Time Multiplier K_t >	0.01 - 1.00
Low-Set Time Delay t >	0.05 – 20.0s
High-Set Setting I >	0.50 – 100A (10% - 2000%)
High-Set Time Delay t >	0.05 – 20.0s
Outputs	
Trip Contacts(R1&R2):	
Rated Voltage	250VAC
Continuous Carry	5.00A ($\cos\phi = 1.0$)
Make and Carry for 0.20s	30.0A
Expected Electrical Life	10^5 Operations
Expected Mechanical Life	5×10^6 Operations
Indicators	
Auxiliary Supply	Red LED Indicator
Pick Up	Red LED Indicator
Trip	Red LED Indicator
Mechanical	
Mounting	Panel Mounting
Front Panel	Standard DIN 96x96mm
Approximate Weight	0.43Kg

6. Case Dimension

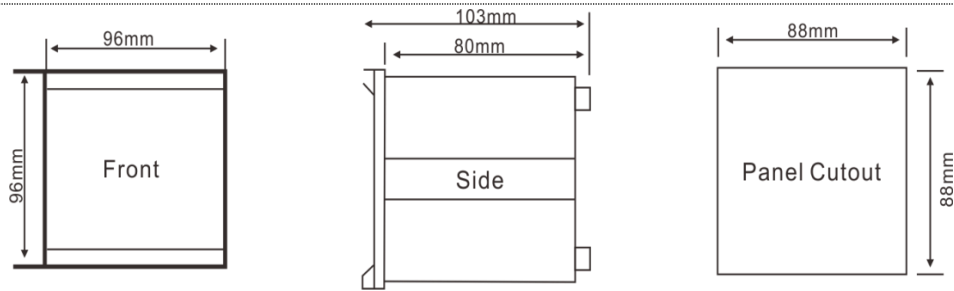


Figure3: Case Dimension

7. Connection Diagram

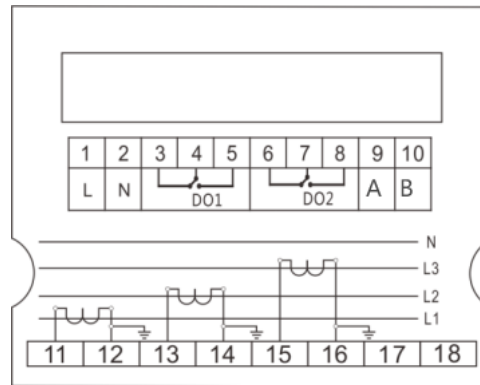
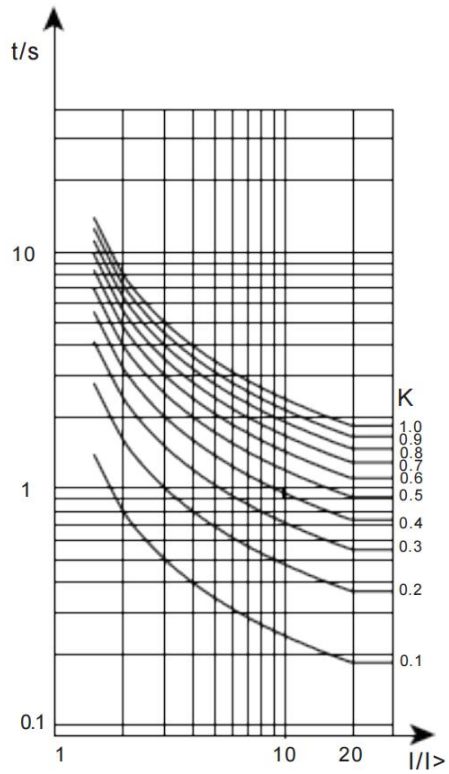


Figure4: Connection Diagram

8. Time-current Characteristic

IDT Normal Inverse



9. Communication address table:

Address	Parameter	Data type (length)	Numeric Range	Factory setting value (If set according to customer's customized requirements)	Read and write properties	Remark
Readable and writable data area						
0x0008	Communication port 1 baud rate	Word	0x00→0x06		W/R	Effective immediately
0x0009	Communication port 1 verification method	Word	0x00→0x01		W/R	Effective immediately
0x000B	Communication port 1 address	Word	0x01→0xFF		W/R	Effective immediately
Protection parameter setting						
0x0050	Overcurrent protection low setting rated value	Word	50→1000	500	W/R	0.01A
0x0051	Overcurrent protection low setting K coefficient	Word	5→100	5	W/R	0.01
0x0052	Overcurrent protection low setting delay	Word	5→9900	500	W/R	0.01S
0x0053	Overcurrent protection high setting value	Word	50→9999	5000	W/R	0.01A
0x0054	Overcurrent protection high setting delay	Word	5→250	5	W/R	0.01S

0x0055	Low setting protection curve	Word	0→5	0	W/R	0:3/10 1:1.3/10 2:Long Time Inverse 3: Very Invers 4:Extremely Inverse 5:Definite Time
0x0060	Leakage protection low setting rated value	Word	50→1000	200	W/R	0.01A
0x0061	Leakage protection low setting K coefficient	Word	5→100	5	W/R	0.01
0x0062	Leakage protection low setting delay	Word	5→9900	500	W/R	0.01S
0x0063	Leakage protection high setting value	Word	50→9999	1000	W/R	0.01A
0x0064	Leakage protection high setting delay	Word	5—>250	5	W/R	0.01S
0x0065	Leakage protection curve	Word	0→5	0	W/R	0:3/10 1:1.3/10 2:Long Time Inverse 3: Very Invers 4:Extremely Inverse 5:Definite Time
Protection function action mode selection						
0x0090	High setting protection function selection	Word	0→3	3	W/R	0: Overcurrent off/leakage off 1: Leakage off/overcurrent on 2: Leakage on/overcurrent off 3: Leakage on/overcurrent on

Relay output function selection						
0x00C0	Relay 1 output function	Word	0→5	0	W/R	0: Automatic reset, connection overcurrent
0x00C1	Relay 2 output function	Word	0→5	1	W/R	1: Automatic reset connection leakage 2: Automatic reset connection leakage/overcurrent 3: Manual reset, connection overcurrent 4: Manual reset connection leakage 5: Manual reset, connection leakage/overcurrent
Read-only data area						
0x0200	L1 current	WORD			R	0.01A
0x0201	L2 current	WORD			R	0.01A
0x0202	L3 current	WORD			R	0.01A
0x0203	L0 current	WORD			R	0.01A
0x0204	Maximum current	WORD			R	0.01A
0x0205	L1 current percentage	WORD			R	0.1%
0x0206	L2 current percentage	WORD			R	0.1%
0x0207	L3 current percentage	WORD			R	0.1%
0x0208	L0 current percentage	WORD			R	0. 1%
0x0209	Maximum current percentage	WORD			R	0. 1%
0x020A	Frequency	WORD			R	0.01Hz
0x020B	Main circuit thermal capacity	WORD			R	1%
0x020C	Residual current circuit thermal capacity	WORD			R	1%



Next Protection Sdn Bhd

0x025B	Software version number	Word			R	0.01
0x025C	Hardware version number	Word			R	0.01
0x0300	L1 data when a fault occurs	Word			R	0.01A
0x0301	L2 data when a fault occurs	Word			R	0.01A
0x0302	L3 data when a fault occurs	Word			R	0.01A
0x0303	L4 data when a fault occurs	Word			R	0.01A