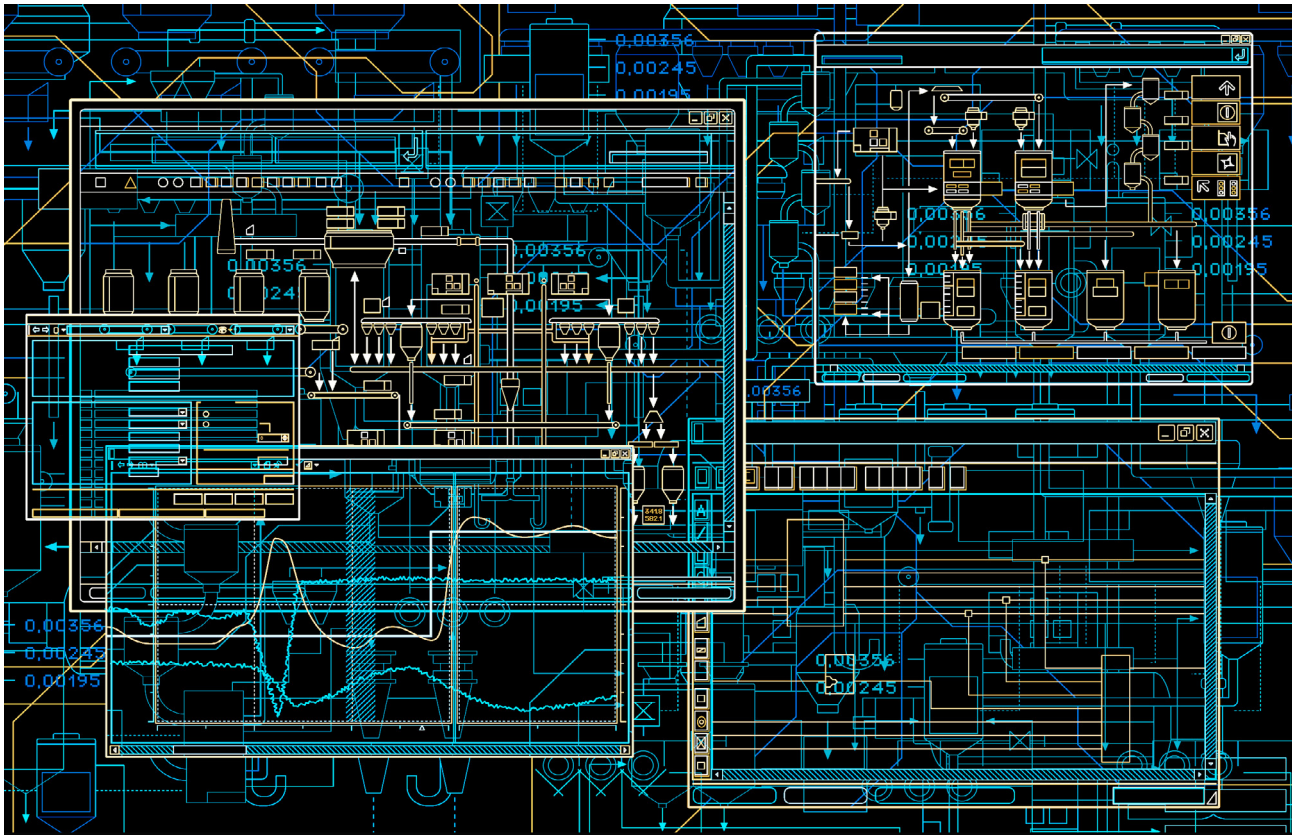

800xA Networks

NE810

User Manual

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Table of Contents

Safety

Warning

Do not look directly into fibre optical fibre port or any connected fibre although this unit is designed to meet the Class 1 Laser regulations.

When this unit is operated at an ambient temperature above 55°C, the External Surface of Equipment may exceed Touch Temperature Limit according to EN/IEC/UL 60950-1. To reduce the risk of fire, use on No. 26 AWG or larger telecommunication line cord.

Licensing Information

This device contains public available software which is under the GPL license. For more information see legal.pdf included with all firmware releases. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit-http://www.openssl.org.

Section 1 Industrial Ethernet 10-port Switch

NE810 is an Industrial switch made for harsh enviroments. The switch can be used in either 100 Mbit or Gigabit networks due to our multi-rate SFP solution. Our unique FRNT (Fast Recovery of Network Topology) technology is the fastest protocol on the market to re-configure a network in the event of any link or hardware failure. That is why NE810 is also used in safety critical applications such as tunnels, traffic signal control and railway systems.

Installations in harsh environments and places with heavy electrical interference require the use of a reliable media. NE810 provides a number of solutions using fibre optic transceivers. Multi- or singlemode transceivers can be used to build point-to-point or redundant ring networks with ranges up to 120 km between each switch. Our BIDI transceiver, which transmits and receives data on a single fibre can be used in applications where the number of fibre cores are limited.

Real-time properties are implemented in the switch in order to achieve determinism for real time critical applications. NE810 supports QoS (Quality of Service) with four priority queues and strict priority scheduling as well as HoL (Head of Line Blocking Prevention). All to assure that the data network is deterministic.

Section 2 Interface specifications

Power	
Operating voltage	Rated: 24 to 48 VDC Operating: 19 to 60 VDC
Rated Current	240 mA @ 24 VDC 120 mA @ 48 VDC
Inrush current, I2t	22.7·10-3 A2s @ 48 VDC
Startup current*	2 x Rated current
Polarity	Reverse polarity protected
Redundant power input	Yes
Isolation to	All other
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)
Shielded cable	Not required

* External supply current capability for proper start-up

I/O / Relay output	
Maximum voltage/current	60 VDC / 80 mA
Contact resistance	Max 30
Isolation to	All other
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm^2 Ω (AWG 24 – 12)

I/O / Digital input	
Maximum voltage/load current	60 VDC / 2 mA
Voltage levels	Logic one: >12V Logic zero: <1V
Isolation to	All other
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)

Ethernet TX	
Electrical specification	IEEE std 802.3. 2005 Edition
Data rate	10 Mbit/s, 100 Mbit/s, manual or auto
Duplex	Full or half, manual or auto
Circuit type	TNV-1
Transmission range	Up to 150 m with CAT5e cable or better*
Isolation to	All other
Connection	RJ-45, auto MDI/MDI-X
Shielded cable	Not required, except when installed in Railway applications as signalling and telecommunications apparatus and located close to rails.**
Conductive housing	Yes
Number of ports	8

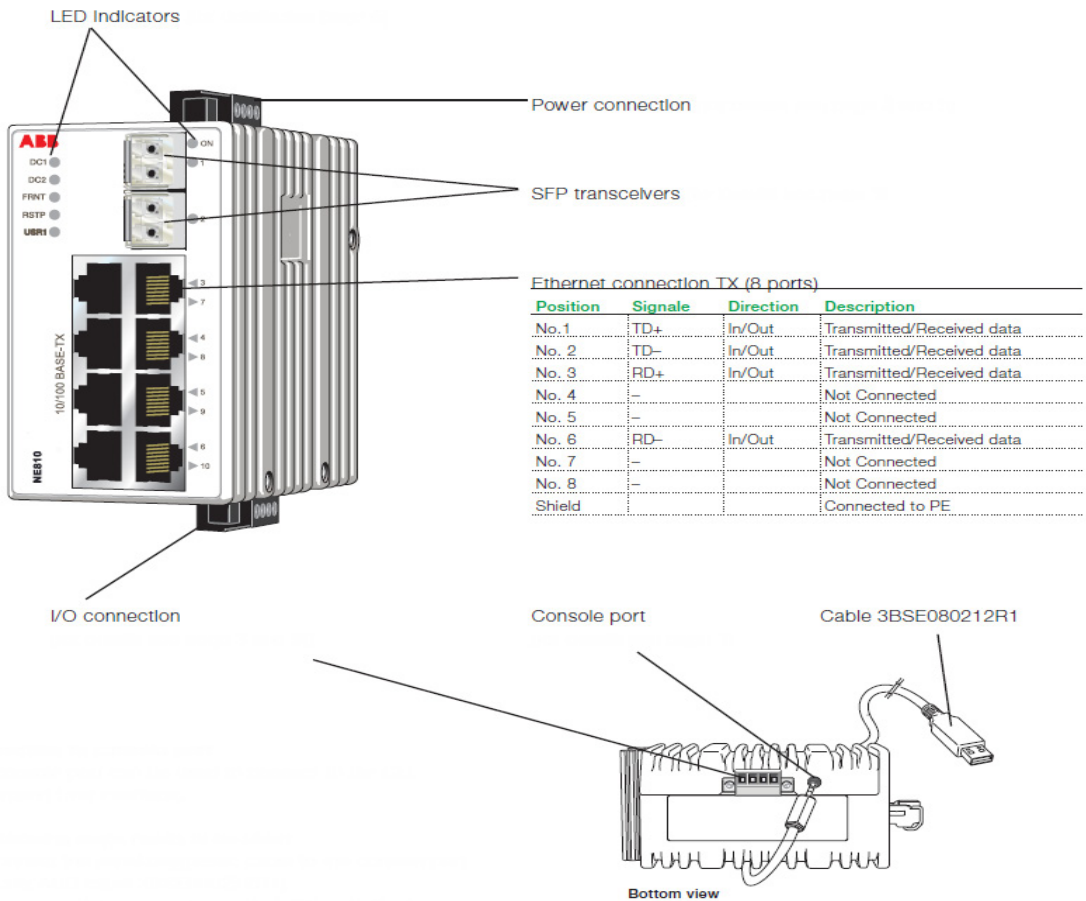
Console	
Electrical specification	TTL-level
Data rate	115.2 kbit/s
Data format	8 data bits, no parity, 1 stop bit, no flow control
Circuit type	SELV
Connection	2.5 mm jack, use only ABB cable 3BSE080212R1
SFP Transceivers	
See separate data sheet	

* Refer to Safety.

** To minimise the risk of interference, a shielded cable is recommended when the cable is located inside 3 m boundary or the cable is longer than 30 m and inside 10 m boundary to the rails and connected to this port.

Ethernet SFP pluggable connections (FX or TX)	
Electrical specification	IEEE std 802.3. 2005 Edition
Data rate	100 Mbit/s or 1000 Mbit/s transceivers supported
Duplex	Full or Auto, depending on transceiver
Transmission range	Depending on tranceiver
Connection	SFP slot holding fibre transceiver or copper transceiver
Number of ports	2

Section 3 Location of interface ports and LED‘s



Position	Signale	Direction	Description
No.1	TD+	In/Out	Transmitted/Received data
No. 2	TD–	In/Out	Transmitted/Received data
No. 3	RD+	In/Out	Transmitted/Received data
No. 4	–		Not Connected
No. 5	–		Not Connected
No. 6	RD–	In/Out	Transmitted/Received data
No. 7	–		Not Connected
No. 8	–		Not Connected
Shield			Connected to PE

Figure 1. Location of interface ports and LED‘s

Connection to console port

The console port can be used to connect to the CLI (Command Line Interface).

The following steps needs to be taken:

1. Connect the serial diagnostic cable to the console port (use only ABB cable 3BSE080212R1).
2. Connect cable to your computer (USB port, if drivers are needed they can be downloaded from our Web page).
3. Use a terminal emulator and connect with correct speed and format (115200, 8N1) to the assigned port.

For more information about the CLI, see the ***NEOS User Manual***.

Power connection

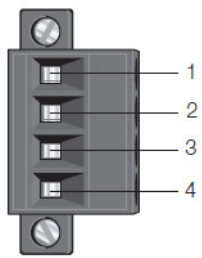


Figure 2. Power Connection

4-position	Product marking	Direction	Description
No. 1	+DC1	Input	Supply voltage input DC1
No. 2	+DC2	Input	Supply voltage input DC2
No. 3	-COM	Input	Common
No. 4	-COM	Input	Common

NE810 supports redundant power connection. The positive inputs are +DC1 and +DC2, the negative input for both supplies are –COM. Connect the primary voltage (e.g. +24 VDC) to the +DC1 pin and return to one of the –COM pins on the power input.

I/O Connection

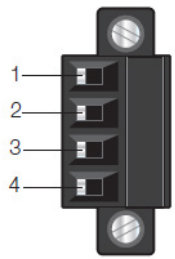


Figure 3. I/O Connection

4-position	Product marking	Direction	Description
No. 1	Status +	Output	Alarm relay (status) contact
No. 2	Status –	Output	Alarm relay (status) contact
No. 3	Digital in +	Input	Digital in +
No. 4	Digital in –	Input	Digital in –

The Status output is a potential free, opto-isolated normally closed solid-state relay. This can be configured to monitor various alarm events within the NE810 unit, see *NEOS User Manual*.

An external load in series with an external voltage source is required for proper functionality. The Digital in is an opto-isolated digital input which can be used to monitor external events. For voltage/current ratings, see Interface specifications.

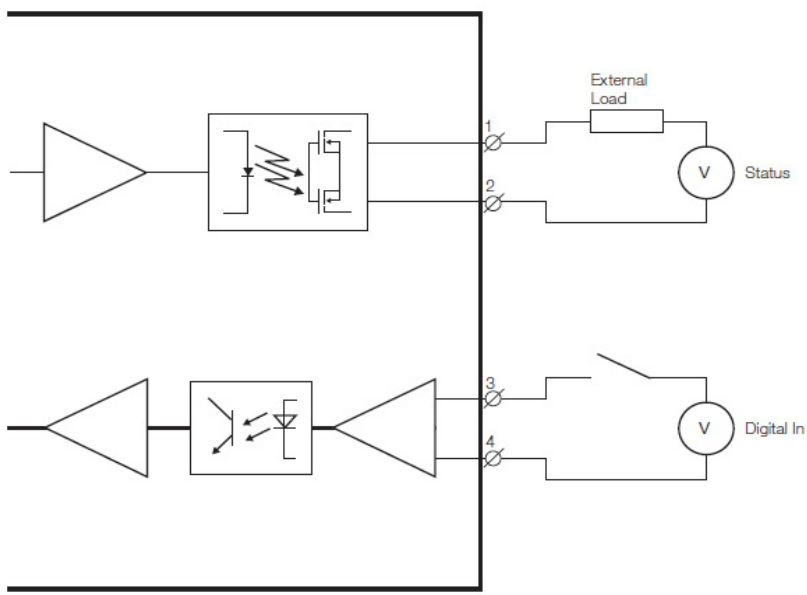


Figure 4. Digital in

LED Indicators

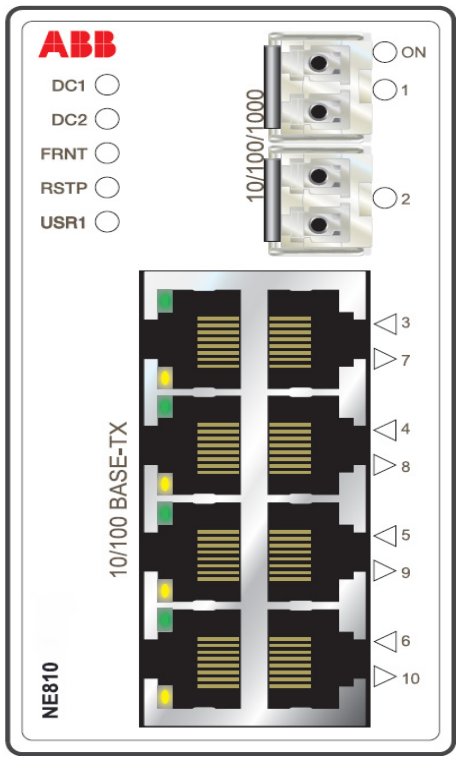


Figure 5. LED Indicators

LED	Status	Description
ON	OFF	Unit has no power
	GREEN	All OK, no alarm condition
	RED	Alarm condition, or until unit has started up. (Alarm conditions are configurable,see, *NEOS User Manual*)
	BLINK	Location indicator **"Here I am"**. Activated when connected to IPConfig Tool, or upon request from Web or CLI
DC1	OFF	Unit has no power
	GREEN	Power OK on DC1
	RED	Power failure on +DC1
DC2	OFF	Unit has no power
	GREEN	Power OK on DC2
	RED	Power failure on +DC2
FRNT	OFF	FRNT disabled
	GREEN	FRNT OK
	RED	FRNT Error
	BLINK	Unit configured as FRNT Focal Point
RSTP	OFF	RSTP disabled
	GREEN	RSTP enabled
	BLINK	Unit elected as RSTP/STP root switch
USR1	OFF	Configurable, see *NEOS User Manual*
	GREEN	
	RED	
1 to 10	OFF	No Link
	GREEN	Link established
	GREEN FLASH	Data traffic indication
	YELLOW	Port alarm and no link. Or if RFNT or RSTP mode, port is blocked

Mounting

This unit should be mounted on 35 mm DIN-rail, which is horizontally mounted inside an apparatus cabinet or similar. It is recommended that the DIN-rail is connected to ground. Snap on mounting, see Figure 6.

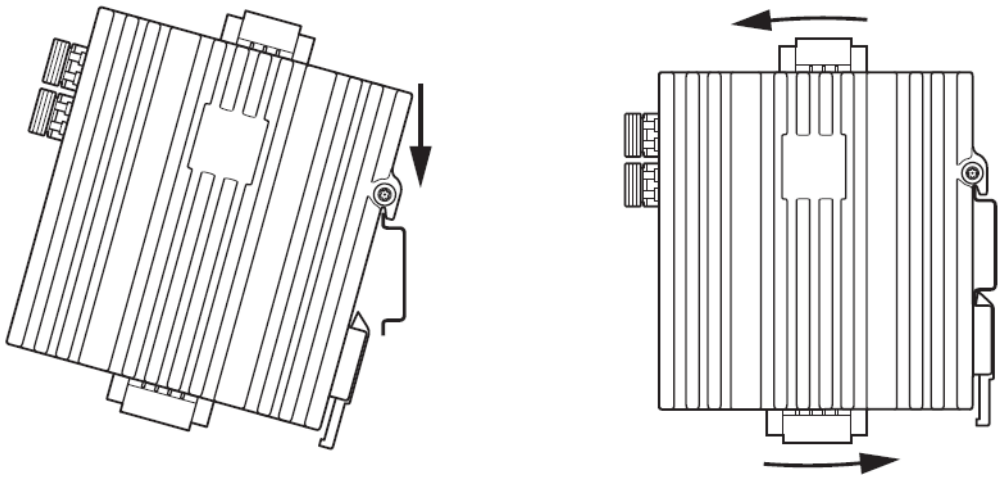


Figure 6. Mounting NE810 with integrated DIN-clip

Removal

Press down the support at the back of the unit using a screwdriver. See Figure 7.

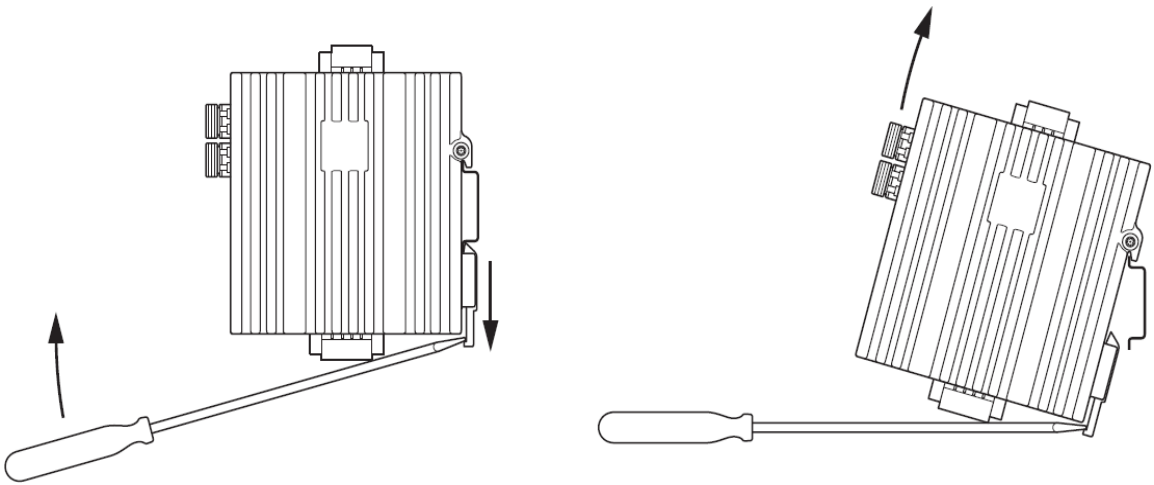


Figure 7. Removing NE810 with integrated DIN-clip

Cooling

This unit uses convection cooling. To avoid obstructing the airflow around the unit, use the following spacing rules. Minimum spacing 25 mm (1.0 inch) above / below and 10 mm (0.4 inches) left / right the unit.

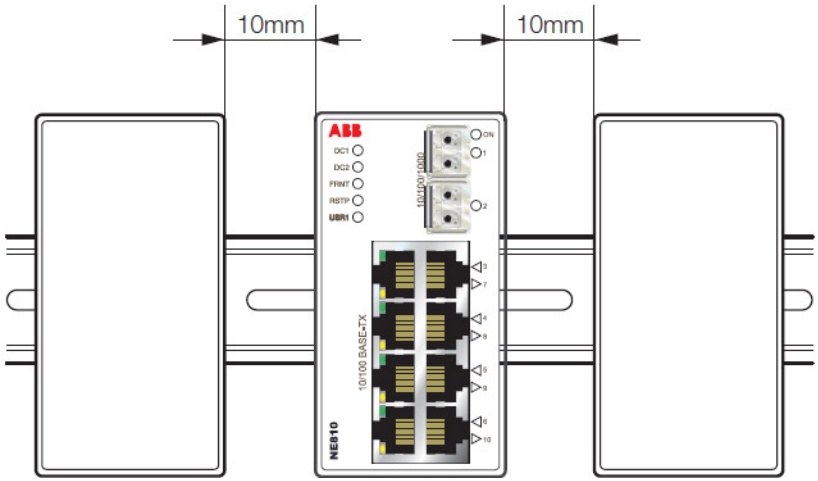


Figure 8. Convection Cooling Specifications

Spacing is recommended for the use of unit in full operating temperature range and service life.

Getting Started

This product runs ABB Network Equipment Operating System (NEOS) which provides several management tools that can be used for configuration of the unit.

- Web - Configuration of the unit using the web browser.
- CLI - Configuration of the unit via the Command Line Interface
  - Username: admin
  - Password: CS4dmin

If the computer is located in the same subnet as the switch you can easily use a web browser to configure the unit. Within the web you can configure most of the available functions. For advanced network settings and more diagnostic

information, please use the CLI. Detailed documentation is available in the chapter **The Command Line Management Tool** in the NEOS User Manual.

Factory default:

– IP address: 172.16.5.245

– Netmask: 255.255.252.0

– Gateway: Disabled

Consult your network administrator to know more on subnet.

Configuration

Configure the unit via web browser. The unit can easily be configured through a Web browser. Open the link http://172.16.5.245 in your web browser, and you will be prompted with a Login screen, where the default settings for Username and Password are:

– Username: admin

– Password: CS4dmin

Once you have logged in, you can use the extensive integrated help function describing all configuration options. Two common task when configuring a new switch is to assign appropriate IP settings, and to change the password of the admin account.

The password can be up to 64 characters long, and should consist of printable ASCII characters (ASCII 33-126); “Space” is not a valid password character.

For additional configuration information, refer to *System 800xA 6.0 Network Configuration (3BSE034463-600)* manual.

Maintenance

No maintenance is required, as long as the unit is used as intended within the specified conditions.

Agency Approvals and Standards Compliance

Type	Approval / Compliance
EMC	EN 61000-6-1, Immunity residential environments
	EN 61000-6-2, Immunity industrial environments
	EN 61000-6-4, Emission industrial environments
	EN 50121-4, Railway signalling and telecommunications apparatus
	IEC 62236-4, Railway signalling and telecommunications apparatus
Safety	UL/IEC/EN 60950-1, IT equipment
Marine	DNV GL rules for classification – Ships and offshore units

Notice: FCC Part 15.105

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice: Corrosive environment

This product has been successfully tested in a corrosion test according to IEC 60068-2-60, method 3. This means that the product meets the requirements to be placed in an environment classified as ISA-S71.04 class G3.

Note! If the product is placed in a corrosive environment, it is important that all unused connector sockets are protected with a suitable plug in order to avoid corrosion attacks on the gold plated pins in connectors.

Type Tests and Environmental Conditions

Environmental phenomena	Basic standard	Description	Test levels
ESD	EN 61000-4-2	Enclosure	Contact: ±6 kV Air: ±8 kV
Fast transients	EN 61000-4-4	Power port	±2 kV
		Signal ports	±2 kV
		Earth port	±1 kV
Surge	EN 61000-4-5	Power port	L-E: ±0.5 kV, 12 Ohm, 9 µF L-L: ±0.5 kV, 2 Ohm, 18 µF L-E: ±2 kV, 42 Ohm, 0.5 µF L-L: ±2 kV, 42 Ohm, 0.5 µF L-E: ±2 kV, 12 Ohm, 9 µF L-L: ±1 kV, 12 Ohm, 9 µF
		Signal ports	L-E: ±1 kV, 2 Ohm L-E: ±2 kV, 42Ohm, 0.5 µF
Power frequency magnetic field	EN 61000-4-8	Enclosure	300 A/m; 0, 16.7, 50 Hz

Pulsed magnetic field	EN 61000-4-9	Enclosure	300 A/m
Radiated RF immunity	EN 61000-4-3	Enclosure	10 V/m @ (80 – 800) MHz 20 V/m @ (800 – 1000) MHz 10 V/m @ (1400 – 2100) MHz 5 V/m @ (2100 – 2500) MHz 1 V/m @ (2500 – 2700) MHz 1 kHz sine, 80% AM
Conducted RF immunity	EN 61000-4-6	Power port	10 V, 80% AM, 1 kHz; (0.15 – 80) MHz
		Signal ports	10 V, 80% AM, 1 kHz; (0.15 – 80) MHz
		Earth port	10 V, 80% AM, 1 kHz; (0.15 – 80) MHz
Radiated RF emission	EN 55022	Enclosure	Class A
	FCC Part 15		Class A
Conducted RF emission	EN 55022	Power port	Class B
		Signal ports	Class B
Dielectric strength	EN 60950-1	Power port to all other ports	1.5 kVrms, 50 Hz, 1 min
		Signal ports to all other ports	1.5 kVrms, 50 Hz, 1 min
Environmental			
Temperatures		Operating	–40 to +70°C (–40 to +158°F)*
		Storage and transport	–50 to +85°C (–58 to +185°F)
Humidity		Operating	5 to 95% relative humidity
		Storage and transport	5 to 95% relative humidity

Altitude		Operating	2 000 m / 70 kPa
Service life		Operating	10 years
Reliability prediction (MTBF)	MIL-HDBK- 217F	Operating	630 000 hours
Vibration	IEC 60068-2-6 (sine)	Operating	3 – 13.2 Hz: 1mm 13.2 – 100 Hz: 0.7 g 5.5 – 30 Hz: 1.5 g 30 – 50 Hz: 0.42 mm 50 – 500 Hz: 4.2 g**
Shock	IEC 60068-2-27	Operating	30 g, 11 ms 100 g, 6 ms**
Bump	IEC 60068-2-27	Operating	10 g, 11 ms
Packaging			
Enclosure	EN 60950-1	Zinc	Fire enclosure
Dimension W x H x D With connectors			52.5 x 100 x 101 mm 52.5 x 119 x 101 mm
Weight			0.7 kg
Degree of protection	EN 60529	Enclosure	IP 40
Cooling			Convection

* Refer to Safety section.
** Might require Ethernet cables to be fastened close to the unit.

Referring Documents

Type	Description	Document Number
User Manual	ABB NEOS User Manual	3BSE080654 en
Network Configuration Guide	System 800xA 6.0 Network Configuration Guide	3BSE034463-600 en

Cable Factory Reset on NE810

It is possible to set the unit to factory default settings by using two straight standard Ethernet RJ-45 cables.

1. Power off the switch and disconnect all Ethernet cables (copper and fibre).
2. Connect one Ethernet cable between Ethernet ports 3 and 10, and the other between Ethernet ports 6 and 7. The ports need to be connected directly by an Ethernet cable, i.e., not through a hub or switch. Use a straight cable – not a cross-over cable – when connecting the ports.
3. Power on the unit.
4. Wait for the unit to start up. Ensure that the ON LED is flashing red. The ON LED flashing indicates that the unit is now ready to be reset to factory default. You now have the choice to go ahead with the factory reset, or to skip factory reset and boot as normal.

Proceed with Factory Reset

Acknowledge that you wish to conduct the factory reset by unplugging the Ethernet cables. The ON LED will stop flashing. This initiates the factory reset process, and after approximately 1 minute the unit will restart with factory default settings.

When the switch has booted up, the ON LED will show a green light, and is now ready to use.

Skip the Factory Reset

To skip the factory reset process, just wait for approximately 30 seconds (after the ON LED starts flashing RED) without unplugging the Ethernet cables. The switch will conduct a normal boot with the existing settings.

Do not power off the unit while the factory reset process is in progress.

Contact us

www.abb.com/800xA
www.abb.com/controlsystems

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