

800xA Networks

NE802

User Manual

Power and productivity
for a better world™



800xA Networks

NE802
User Manual

NOTICE

This document contains information about one or more ABB products and may include a description of or a reference to one or more standards that may be generally relevant to the ABB products. The presence of any such description of a standard or reference to a standard is not a representation that all of the ABB products referenced in this document support all of the features of the described or referenced standard. In order to determine the specific features supported by a particular ABB product, the reader should consult the product specifications for the particular ABB product.

ABB may have one or more patents or pending patent applications protecting the intellectual property in the ABB products described in this document.

The information in this document is subject to change without notice and should not be construed as a commitment by ABB. ABB assumes no responsibility for any errors that may appear in this document.

In no event shall ABB be liable for direct, indirect, special, incidental or consequential damages of any nature or kind arising from the use of this document, nor shall ABB be liable for incidental or consequential damages arising from use of any software or hardware described in this document.

This document and parts thereof must not be reproduced or copied without written permission from ABB, and the contents thereof must not be imparted to a third party nor used for any unauthorized purpose.

The software or hardware described in this document is furnished under a license and may be used, copied, or disclosed only in accordance with the terms of such license. This product meets the requirements specified in EMC Directive 2014/30/EU and in Low Voltage Directive 2014/35/EU.

TRADEMARKS

All rights to copyrights, registered trademarks, and trademarks reside with their respective owners.

Copyright © 2013-2016 by ABB.
All rights reserved.

Release: December 2015
Document number: 3BSE083678

Table of Contents

Safety	7
Warning	7
Section 1 Industrial Ethernet 5-port Switch	9
Description	9
Section 2 Interface Specifications	10
Connections	11
Power	12
TX	12
FI G, 1 SFP slot	13
DIP switch settings	14
LED indicators	18
Section 3 Installation	19
Mounting	19
Removal	19
Cooling	19
Fibre Optic Handling	20
Maintenance	20
Cleaning of the optical connectors	20
Agency approvals and standards compliance	20
Type tests and environmental conditions	21

Safety

Warning



Equipment intended for installation in “Restricted Access Location” or equivalent.

Do not look directly into fibre optical fibre port or any connected fibre although this unit is designed to comply with Class 1 laser products, 21 CFR 1040.10 and 1040.11.

To reduce the risk of fire, use only No. 26 (e.g. 24 AWG) UL listed or CSA Certified Telecommunication Line Cord.

Section 1 Industrial Ethernet 5-port Switch

Description

NE802 is an unmanaged 5-port switch with one SFP fibre port supporting 100 Mbit/s or Gbit Ethernet, and four copper ports supporting 10/100 Mbit/s or Gbit Ethernet. The ABB range of Small Form-factor Pluggable (SFP) transceivers are available as multimode, singlemode or Bi-Di transceivers with distance up to 120 km.

The unit is designed for use in industrial applications with dual 9.6 to 57.6 VDC power input. The unique “tri-galvanic” isolation provides isolation between all ports, power supply and between each chassis screen avoiding ground loop currents. The IP21 rating ensures that the unit can be installed in locations where condensed water may occur. Only industrial grade components are used which gives the units an MTBF of 1.182.000 hours and ensures a long service life. A wide operating temperature range of –40 to +74 °C (–40 to +165 °F) can be achieved with no moving parts.

The unit has been tested both by ABB and external test houses to meet EMC, isolation, vibration and shock standards, all to the highest levels suitable for heavy industrial, trackside and maritime environments.

Network diagnostics are simplified with the inclusion of port mirroring on one port allowing data flow through the switch to be monitored using a network analyzer. All five ports can have data rate and full or half duplex locked by DIP switch which can eliminate problems with old legacy Ethernet equipment that is unable to support auto negotiation.

Section 2 Interface Specifications

Power	
Operating voltage	Rated: 12 to 48 VDC Operating: 9.6 to 57.6 VDC
Rated current	12 – 48 VDC; 260 – 65 mA
Rated frequency	DC
Inrush current, I _{2t}	22.7·10 ⁻³ A ² s @ 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.

Ethernet TX	
Electrical specification	IEEE std 802.3. 2005 Edition
Data rate	10 Mbit/s, 100 Mbit/s, 1000 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	4

* Refer to “Safety” section.

** 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 or 1000 Mbit/s transceivers supported
Duplex	Full or Auto, depending on transceiver
Transmission range	Depending on transceiver
Connection	SFP slot holding fibre transceiver or copper transceiver
Number of ports	1

Connections

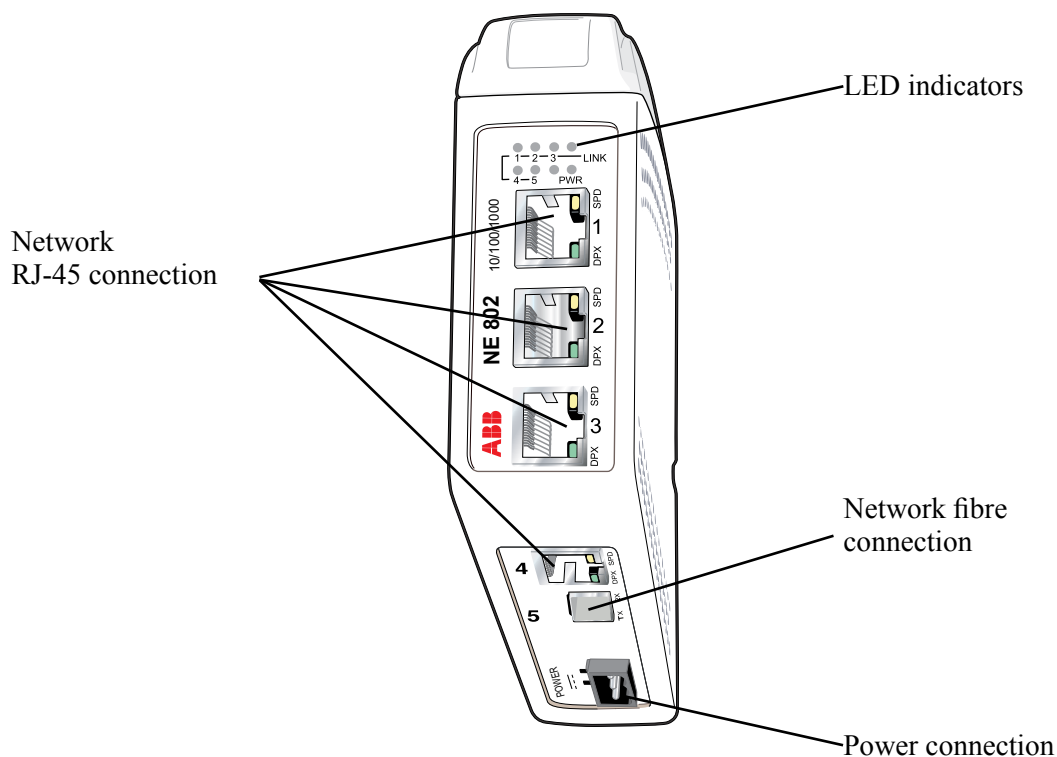
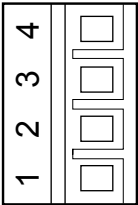


Figure 1. Interface

Power

NE802 supports redundant power connection. The positive inputs are +DC1 and +DC2, the negative inputs for both supplies are COM. The power is drawn from the input with the highest voltage

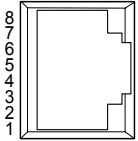
4-pos screw terminal	Description	Power
1	COM	0 V
2	+DC1	9.6–57.6 VDC
3	+DC2	9.6–57.6 VDC
4	COM	0 V



TX

Ethernet TX connection (RJ-45 connector), automatic MDI/MDI-X crossover.

Contact	Direction	Description/Remark
1	In/Out	BI_DA+
2	In/Out	BI_DA-
3	In/Out	BI_DB+
4	In/Out	BI_DC+
5	In/Out	BI_DC-
6	In/Out	BI_DB-
7	In/Out	BI_DD+
8	In/Out	BI_DD-
Shield	In/Out	Connected to PE



CAT 5 cable is recommended.

Unshielded (UTP) or shielded (STP) connector might be used.

F1G, 1 SFP slot

The F1G interface has one SFP slot supporting Ethernet 100/1000 BaseFX/X. Each slot can hold one SFP transceiver for copper or fibre cable. For supported transceivers, see [SFP transceivers user guide](#) (art no. 3BSE080641) available in ABB Solutions Bank.

F1G	
Optical/Electrical specification	IEEE std 802.3. 2005 Edition
Data rate	100 or 1000 Mbit/s
Duplex	Full or half, manual or auto
Transmission range	Depending on transceiver
Connection	SFP slot holding fibre transceiver or copper transceiver
Number of ports	4

DIP switch settings

DIP-switches are accessible under the lid on top of the unit. DIP-switches are used to configure the unit.



Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap), before the lid on top/front of the unit is removed.



Prevent access to hazardous voltages by disconnecting the unit from AC/DC mains supply and all other electrical connections.

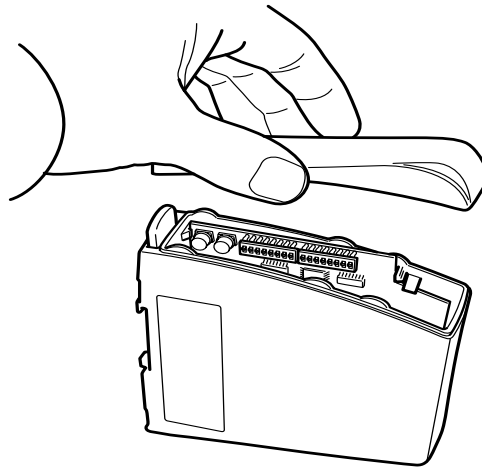


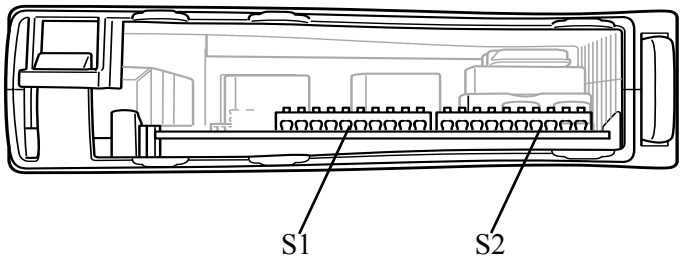
Figure 2. Dip switch



When configuration via DIP-switches, the settings of DIP-switches configure the unit only after a reboot (power off/on).

To be observed when the DIP-switches are configured;

- Speed and duplex setting only valid when auto-negotiation is disabled.
- When monitoring selected all outgoing packets from the switch is also copied to the port 1.
- Speed and duplex switch settings are ignored for FX ports.
- If auto-negotiation and auto MDI/MDI-X disabled all TX ports support MDI-X configuration.
- If Hub mode is selected, all incoming and outgoing packets are distributed on all other ports.
- Speed and duplex switch settings are ignored for FX ports.
- If auto-negotiation and auto MDI/MDI-X disabled all TX ports support MDI-X configuration.



Port 1 settings

S1

ON	1	2	3	4	5	6	7	8	9	10
■										

Auto-negotiation enabled
10/100/1000 Mbit/s speed selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■	■									

100 Mbit/s speed selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■	■									

10 Mbit/s speed selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■		■								

Full duplex selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■			■							

Half duplex selected

Port 3 settings

S1

ON	1	2	3	4	5	6	7	8	9	10
■							■			

Auto-negotiation enabled
10/100/1000 Mbit/s speed selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■							■	■		

100 Mbit/s speed selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■							■	■		

10 Mbit/s speed selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■									■	

Full duplex selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■										■

Half duplex selected

Port 2 settings

S1

ON	1	2	3	4	5	6	7	8	9	10
■				■						

Auto-negotiation enabled
10/100/1000 Mbit/s speed selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■				■	■					

100 Mbit/s speed selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■				■	■					

10 Mbit/s speed selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■						■				

Full duplex selected

S1

ON	1	2	3	4	5	6	7	8	9	10
■									■	

Half duplex selected

Port 4 settings

S1

ON	1	2	3	4	5	6	7	8	9	10
■										■

Auto-negotiation enabled
10/100/1000 Mbit/s speed selected

S1

ON	6	7	8	9	10
■					

S2

ON	1	2	3	4	5
■					

100 Mbit/s speed selected

S1

ON	6	7	8	9	10
■					

S2

ON	1	2	3	4	5
■					

10 Mbit/s speed selected

S2

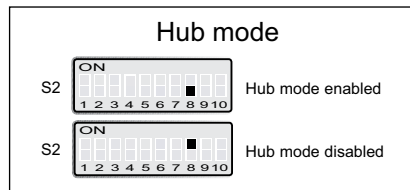
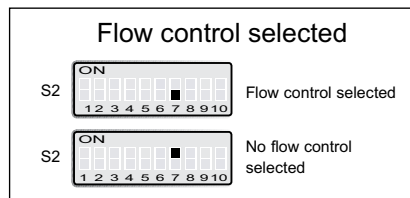
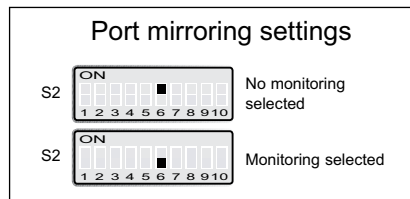
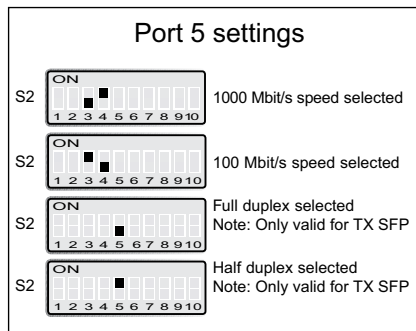
ON	1	2	3	4	5	6	7	8	9	10
■										

Full duplex selected

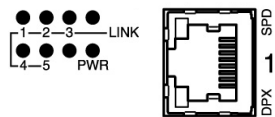
S2

ON	1	2	3	4	5	6	7	8	9	10
■										

Half duplex selected



LED indicators



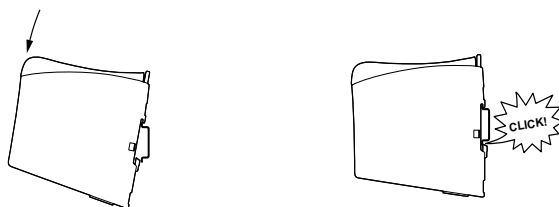
Indicators (LED)
 Power (PWR)
 Link (LINK) of every port
 Speed (SPD) and duplex (DPX) of TX ports

LED	Status	Description
PWR	ON	Internal power, initialising OK
	Slow flash	Initialisation progressing
	Fast flash	Initialisation error
LINK/SPD	OFF	No Ethernet link
	ON	Good Ethernet link
	Flash	Ethernet data is transmitted or received, traffic indication
	Flash 3 Hz	10 Mbit/s
	Flash 6 Hz	100 Mbit/s
	Flash 12 Hz	1000 Mbit/s
DPX	OFF	Half duplex
(TX only)	ON	Full duplex

Section 3 Installation

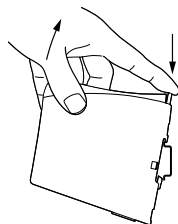
Mounting

This unit should be mounted on 35 mm DIN-rail, which is horizontally mounted on a wall or cabinet backplate. Snap on mounting, see figure.



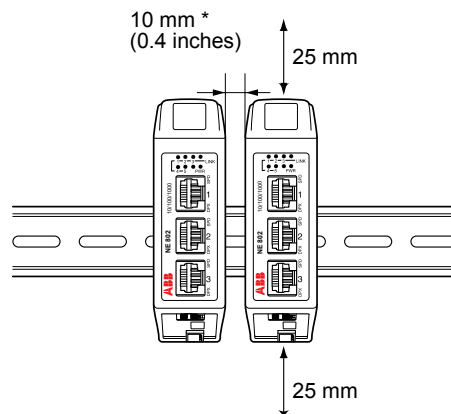
Removal

Press down the black support at the back of the unit, see figure.



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



* Spacing (left/right) recommended for full operating temperature range

Fibre Optic Handling

Fibre optic equipment needs special treatment. It is very sensitive to dust and dirt. If the fibre will be disconnected from the modem the protective hood on the transmitter/receiver must be connected. The protective hood must be kept on during transportation.

The fibre optic cable must also be handled the same way.

If this recommendation is not followed it can jeopardise the warranty.

Maintenance

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

Cleaning of the optical connectors

In the event of contamination, the optical connectors should be cleaned by the use of forced nitrogen and some kind of cleaning stick.

Recommended cleaning fluids:

- Methyl-, ethyl-, isopropyl- or isobutyl-alcohol
- Hexane
- Naphtha

Agency approvals and standards compliance

Type	Approval / Compliance
EMC	EN 50121-4, Railway applications – Electromagnetic compatibility – Emission and immunity of the signalling and telecommunications apparatus
	EN 61000-6-1, Immunity residential environments
	EN 61000-6-2, Immunity industrial environments
	EN 61000-6-4, Emission industrial environments
Safety	EN/IEC/UL 60950-1 IT equipment

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
Surge	EN 61000-4-5	Power port	Line to earth: ± 2 kV Line to line: ± 1 kV
		Signal ports	Line to earth: ± 2 kV Line to line: ± 1 kV
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	20 V/m @ (80 – 2700) MHz 10 V/m @ (2700 – 6500) 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
Radiated RF emission	CISPR 16-2-3	Enclosure	Class B (30 – 6000 MHz)
	ANSI C63,4 (FCC Part 15)		Class B (30 – 6500 MHz)
Conducted RF emission	CISPR 16-2-1	Power port	Class B
		Signal ports	Class B
Dielectric strength	EN 60950-1	Power interface to all other	1.5kV AC @ 60s duration
		TX signal interface to all other	1.5kV AC @ 60s duration
		TX shield interface to all other	1.5kV AC @ 60s duration

Environmental			
Temperatures	EN 60068-2-1 EN 60068-2-2	Operating	–40 to +74 °C (–40 to +165 °F)
		Storage and transport	–50 to +85 °C (–58 to +185 °F)
Relative humidity	EN 60068-2-30	Operating	5 to 95 % (non-condensing)
		Storage and transport	5 to 95 % (condensation allowed outside packaging)
Altitude		Operating	2 000 m/70 kPa
Service life		Operating	10 year
Reliability prediction (MTBF)	MIL-HDBK-217F	Operating	1.182.000 hours
Vibration	IEC 60068-2-6 (sine)	Operating	5–9 Hz ±6 mm 9–500 Hz ±2 g
Shock	IEC 60068-2-27	Operating	15 g, 11 ms
Mechanical			
Enclosure	EN 60950-1	Plastic	Fire enclosure
Dimension WxHxD			34 x 123 x 121 mm
Weight			0.2 kg
Mounting		DIN-rail	
Degree of protection	EN 60529	Enclosure	IP21
Cooling			Convection
Configuration			
Auto configured (auto-negotiation) or manually setting of speed and duplex of individual TX port, by DIP-switches. Port mirror function is possible to set with DIP-switch. With the port mirror function active the switch will copy all outgoing traffic to port 1. This can be used to monitor all traffic going out from the switch. Packets may be discarded if the total throughput exceeds the port speed of port 1.			

Contact us

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

Copyright© 2016 ABB.
All rights reserved.

3BSE083678

Power and productivity
for a better world™

