

## CN8E, Octal NMEA/CAN/Ethernet LWE interface U/N 9545B



**Note! The default ip address of the unit is 172.16.0.2 from SW 99061.0.1.18 onwards!**

### 1 Description

The CN8E interface is intended as a gateway between standard “LWE” IEC 91162-450 Ethernet bridge networks and standard NMEA 0183/IEC 61162-1/-2 interfaces and CAN-bus interfaces.

It should be noted that the software was originally designed against the IEC TC80 WG6 committee draft of IEC 61162-450 as of summer 2009, which means that there are a number of settings available to maintain compatibility with these early versions which are implemented in customer's system. The current SW version is fully compatible with the published IEC 61162-450 with on major exception and that is that “multicast” UDP is not yet implemented.

NMEA inputs are fully isolated from DC power supply and from network connection.

The unit can be powered from a DC supply in the range 10 – 40 V.

### 2 Technical Data

- Dimensions:                   Boxed 134 x 152 x 22 mm.
- Serial inputs 1-6:           Opto coupler isolated inputs, compliant with NMEA 0183 and IEC 61162-1 at 4800 b/s. Although not part of the standard, inputs also supports 9600 b/s.
- Serial inputs 7-8:           Opto coupler isolated inputs, compliant with NMEA 0183/0183HS and IEC 61162-1 and -2.
- Serial outputs 7-8:         Compliant with NMEA 0183/0183HS and IEC 61162-1 and-2.

Network port:	10/100 Mbit Ethernet, using standard RJ45 connector. The network protocol implemented is IEC 61162-450 with the exception that UDP multicast is currently not implemented, only unicast and broadcast.
Connectors:	Phoenix screw terminals, accepting up to 1.5 mm <sup>2</sup> cable.
Power requirements:	10 – 40 V DC, less than 200 mA at 24 V.
Environmental:	Meets or exceeds IEC 60945 class “Protected”

### 3 Indications

- ▲ NMEA input and outputs have yellow LED's, indicating channel activity.
- ▲ Green LED above DC input flashes at 1 Hz indicating active unit.
- ▲ Red error LED indicating buffer overflow etc.
- ▲ Green and yellow industry-standard LED's for Ethernet port.

### 4 Installation, setup

The unit should be bolted to a flat surface, preferably vertically and with wiring from below.

#### 4.1 Wiring termination

On the lower part of the unit an area is provided for securing the cables using wire straps. Connection should be done using shielded cable and making sure the installation will be compliant with the EMC requirements of IEC 60945 it is necessary to make sure that the outer cable shield is securely connected to the chassis if the unit.



The simplest way to accomplish this is to remove the outer insulation of the cable and to fold down the screen on the outside of the insulation and to secure the cable with the straps supplied.

#### 4.2. Input connection

When connected to an output, the yellow input LED should light when the digital input goes active. With a normally working NMEA connection, this LED will flash as data are received and will be unlit between messages. If the opposite indication is observed, the input terminals “A” and “B” should be reversed.

#### 4.3. Output connection

When outputting serial data, the yellow output LED should light when the digital output goes active. With a normally working NMEA connection, this LED will flash as data is output and will be unlit between messages.

#### 4.4. Configuration

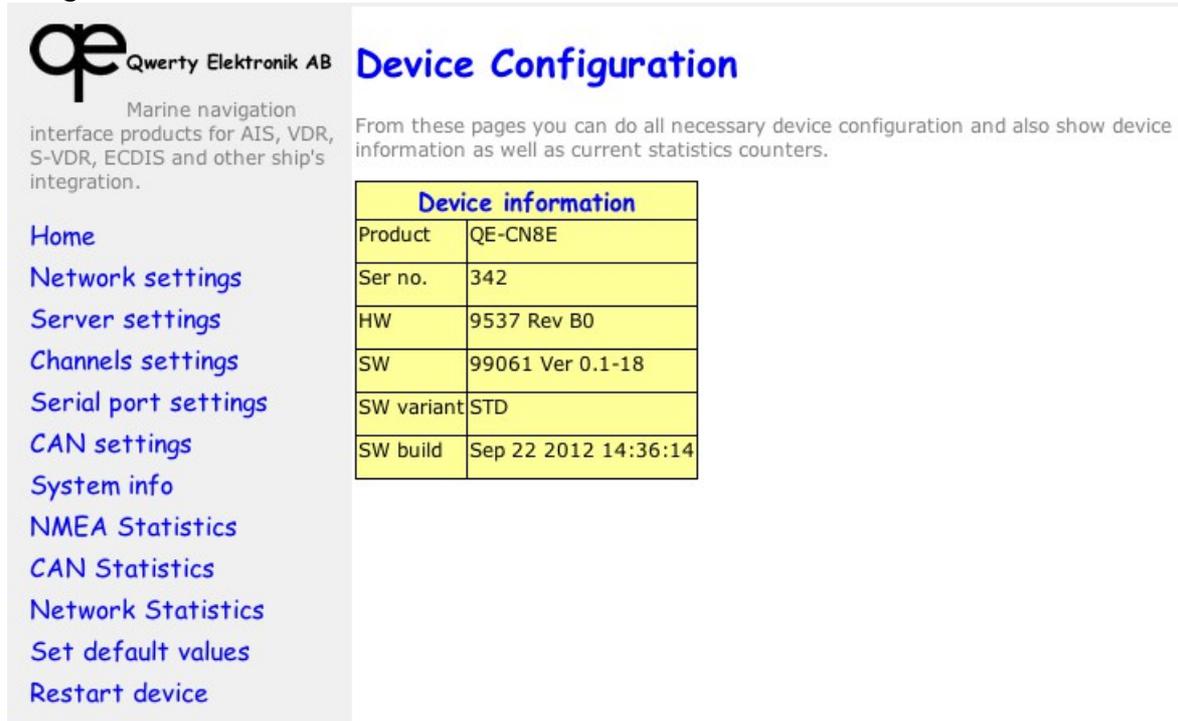
The unit can be configured via an internal server via the network port using a standard browser (such as for instance FireFox).

It is however essential that the ip address of the unit is known. When the unit is delivered, its default ip address is 172.16.0.2. Since this address can be set to any value and since it is necessary to always have the possibility to bring the unit to a pre-determined ip address, a set-up jumper will force the unit to a known ip address. This jumper is placed directly above the

DC input terminal connection and inserting this jumper forces the unit to a common home/office range ip address 192.168.5.33.

To enter set-up, make sure that the computer hosting the browser is connected to the same network and set to the same sub-net as the CN8E. Then enter the unit's ip address directly in the browser's address field.

This will show a start page, which can be used to view and change various network and port settings of the unit:



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## Device Configuration

From these pages you can do all necessary device configuration and also show device information as well as current statistics counters.

Device information	
Product	QE-CN8E
Ser no.	342
HW	9537 Rev B0
SW	99061 Ver 0.1-18
SW variant	STD
SW build	Sep 22 2012 14:36:14

Home  
Network settings  
Server settings  
Channels settings  
Serial port settings  
CAN settings  
System info  
NMEA Statistics  
CAN Statistics  
Network Statistics  
Set default values  
Restart device

The links in the left column are clickable and can be used to enter sub-pages for network, server, channel, serial port setting etc.

## Network settings



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### Network Configuration

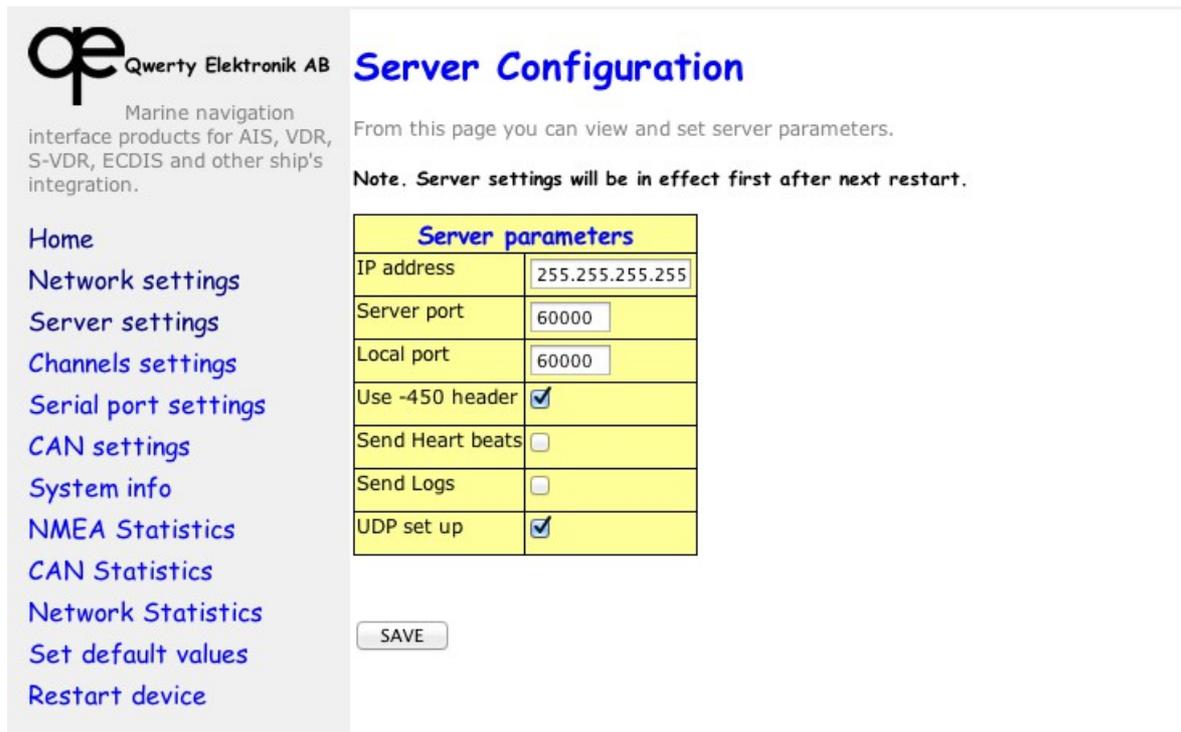
From this page you can view and set network parameters.

**Note.** Network settings will be in effect first after next restart.

Network parameters	
MAC addr	00:14:36:41:01:56
NetBIOS name	QE-CN8E-342
IP address	<input type="text" value="172.16.0.2"/>
Gateway	<input type="text" value="172.16.0.1"/>
Network mask	<input type="text" value="255.255.0.0"/>

In this subpage, ip adress, gateway and network mask can be entered. Note that for these settings to take effect, a restart of the unit is always necessary. This can be done be cycling power or using the last menu "Restart device".

**Server settings:**



**Server Configuration**

From this page you can view and set server parameters.

**Note.** Server settings will be in effect first after next restart.

Server parameters	
IP address	255.255.255.255
Server port	60000
Local port	60000
Use -450 header	<input checked="" type="checkbox"/>
Send Heart beats	<input type="checkbox"/>
Send Logs	<input type="checkbox"/>
UDP set up	<input checked="" type="checkbox"/>

SAVE

This subpage is used to choose destination and port numbers. The default setting is broadcast (255.255.255.255) as shown.

The "Use -450 header" setting is included to maintain system compatibility with older versions. It is recommended to use this in new designs.

The "UDP set up" is not yet implemented, but the plan is to make it possible to enter a pre-set complete setting of the unit in order to ease system integration.

**Channels settings:**

**Channel Configuration**

From this page you can view and set channel parameters.

Channel parameters	
NMEA-1	II0001
NMEA-2	II0002
NMEA-3	II0003
NMEA-4	II0004
NMEA-5	II0005
NMEA-6	II0006
NMEA-7	II0007
NMEA-8	II0008
CAN	II0020
SET-UP	II0999

SAVE

This subpage is used to give source tags for the telegram UDP's. Early draft versions of IEC 61162-450 used two digits, II01-99 etc, and it is possible to set this also.

Normal use of this is to adhere to the NMEA 0183/IEC 61162-1 source identifier. A typical setting for the ship's no 1 GPS would then be GP0001.

The unit can be used to transport CAN frames over the network and the CAN channel is assigned a channel also, defaulted to II0020.

Set-up using UDP is not yet implemented.

**Serial port settings:**



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## Serial port Configuration

From this page you can view and set serial port parameters.

**Note. Serial port settings will be in effect first after next restart.**

Serial port parameters	
NMEA-1	4800 bits/s
NMEA-2	4800 bits/s
NMEA-3	4800 bits/s
NMEA-4	4800 bits/s
NMEA-5	9600 bits/s
NMEA-6	4800 bits/s
NMEA-7	38400 bits/s <input type="checkbox"/> Src ID <input checked="" type="checkbox"/> Dst ID
NMEA-8	38400 bits/s <input type="checkbox"/> Src ID <input checked="" type="checkbox"/> Dst ID

This subpage is used to set baud rates for the eight NMEA 0183/IEC 61162-1, -2 channels.

Channels 1 – 6 allow 4800 and nonstandard 9600 b/s, while channels 7 and 8 allow any standard bitrate 1200 - 115200 b/s. Note however that standard values allowed in NMEA 0183/0183HS and IEC 61162-1/-2 are only 4 800 and 38 400 b/s

## CAN Settings



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### CAN Configuration

From this page you can view and set CAN parameters.

**Note. CAN settings will be in effect first after next restart.**

CAN parameters	
Bit rate	250k <input type="text"/> bits/s <input type="checkbox"/> Listen only
UDP id format	<input type="checkbox"/> Hex
Send on	<input type="checkbox"/> Src ID <input checked="" type="checkbox"/> Dst ID
Time filter	<input type="checkbox"/> On <input type="checkbox"/> Block same T <input type="text" value="100"/> ms
Frame filters	<input checked="" type="radio"/> Off <input type="radio"/> Accept <input type="radio"/> Block
Filter # 1	<input type="checkbox"/> On <input checked="" type="checkbox"/> Ext <input type="checkbox"/> T-flt <input type="text" value="00000000"/> Hex
Filter # 2	<input type="checkbox"/> On <input checked="" type="checkbox"/> Ext <input type="checkbox"/> T-flt <input type="text" value="00000000"/> Hex
Filter # 3	<input type="checkbox"/> On <input checked="" type="checkbox"/> Ext <input type="checkbox"/> T-flt <input type="text" value="00000000"/> Hex
Filter # 4	<input type="checkbox"/> On <input checked="" type="checkbox"/> Ext <input type="checkbox"/> T-flt <input type="text" value="00000000"/> Hex
Filter # 5	<input type="checkbox"/> On <input checked="" type="checkbox"/> Ext <input type="checkbox"/> T-flt <input type="text" value="00000000"/> Hex
Filter # 6	<input type="checkbox"/> On <input checked="" type="checkbox"/> Ext <input type="checkbox"/> T-flt <input type="text" value="00000000"/> Hex
Filter # 7	<input type="checkbox"/> On <input checked="" type="checkbox"/> Ext <input type="checkbox"/> T-flt <input type="text" value="00000000"/> Hex
Filter # 8	<input type="checkbox"/> On <input checked="" type="checkbox"/> Ext <input type="checkbox"/> T-flt <input type="text" value="00000000"/> Hex

The CAN bus is widely used in ships, both in navigation equipment and for general automation and engine monitoring.

The CAN frames are transmitted "as is" as UDP's. One large class of CAN communication is the NMEA 2000/IEC 61162-3 navigation bus. It should be observed that the NMEA 2000 PGN's are not decoded or processed in any way by the CN8E, but that they will have to be decoded by the receiving equipment.

Some engine data is transmitted with high bandwidth and extensive filtering has been built into the unit where frames can be filtered or blocked.

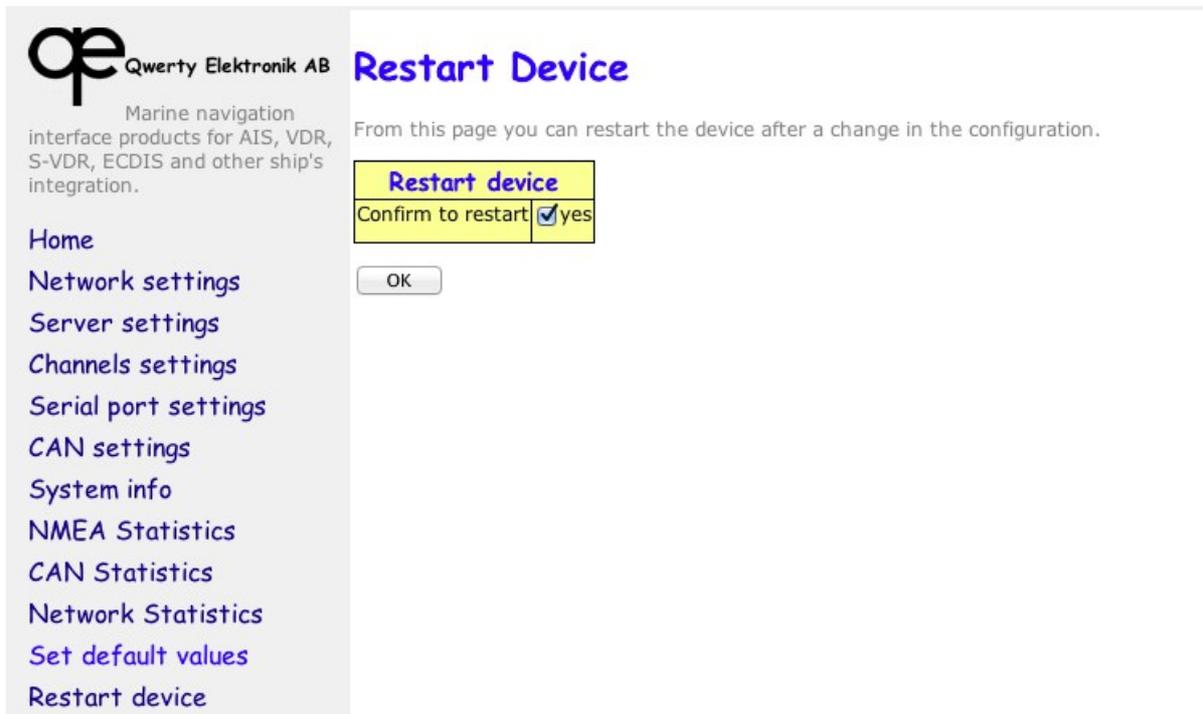
Please consult us for a closer definition of settings.

The Subpages **System info**, **NMEA Statistics**, **CAN Statistics** and **Network Statistics** can be used to evaluate performance and trace problems.

It should be noted that the unit can handle back-to-back NMEA communication without problem. It should however be noted that such intense message load will induce a lot of activity in other connected systems even if the Ethernet bus will handle enormous loads. Care should therefore be taken from a system design point of view to ensure that vital information is not lost.

**Set default values** restores all settings to factory condition.

All changes entered will only take effect after a restart of the device, which is accomplished by the last sub-page:



**Restart Device**

From this page you can restart the device after a change in the configuration.

**Restart device**

Confirm to restart  yes

OK

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#### 4.4. Test tool (used for system integrators)

To test and evaluate the unit, there is a python script utility “qeth.py”. Python 2 is available for virtually any operating system, see [www.python.org](http://www.python.org) for more information and download.

In order to start this, open a terminal window and start the script by entering “qeth.py -?”, which will present a list of all available options.

It is many cases desirable to use two instances of qeth.py, where one is used as a UDP listener and the other one can be used as to transmit messages to the unit.

An application note for Ethernet-based units N1E and CN8E, doc no 9546, is available on request or from [www.qe.se](http://www.qe.se).

## **5 CE Declaration of conformity**

**according to the EMC Directive 89/336/EEC and amendments**

### **CN8E NMEA / CAN / LWE interface U/N 9545B**

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Equipment: CN8E NMEA/CAN/LWE interface U/N 9545B

The above equipment has been tested and, when connected to serial navigation data conforming to IEC 61162-1 or -2 it will communicate using the LWE draft standard as described in the manual.

The unit is CERTIFIED as complying with all environmental standards requirements as defined by IEC 60945: 2002 and as tested by accredited test authorities.

**Date 2010-06-18**

**Signature: Anders Jangö, QA Manager**