

**Ethernet addon
for *HIGHWAY* USB**

NORMAND

NORWAY

Notes

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NORWAY

Thanks for choosing our NORWAY modul !

By acquiring the NORWAY module you have chosen a high quality product. The NORWAY module expands your *HIGHWAY* USB controller by a 10MBit twisted pair network controller.

The `norway.device` from Chris Hodges allows a fast and easy integration of your networkmodule into your TCP/IP stack.

This documentation is indented to guide you through the installation process of the NORWAY module.

Please read this documentation carefully **BEFORE** trying to install software or hardware on your own. You will avoid problems and - in a worst case scenario - hardware damage to your Amiga and / or your *HIGHWAY*/NORWAY.

Most recent information as well as software updates can be found on our web site: <http://www.e3b.de/usb/>

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A.1.3 JTAG interface

The JTAG interface on the NORWAY is intended for bus interface logic upgrades..

Upgrades are only available by authorized support.
This connector is not intended for use by customers.

WARNING: Do not connect any cable to this port !
Your NORWAY can be rendered unusable by doing so.
You have been warned.

A.2. Programming information

A.2.1 Autoconfig data

The NORWAY module is addressed as addon module of the *HIGHWAY* and does not appear in the autoconfig list.

A.2.2 Memory map

Information on NORWAY memory map is available from E3B.

Please contact us if you are interested..

A.2.3 Register definition

Information on register mapping of the NORWAY module are available for interested programmers on request. We will support any efforts like driver development for NetBSD or Linux.

NORWAY

1. Unpacking

Your NORWAY package should contain the following items:

- one NORWAY modul
- one holding plate with SUBD9 connector
- one adaptor SUBD9 to RJ45
- this documentation
- one sticker for SUBD connector labelling

Please check your NORWAY package after unpacking for missing parts ! Missing parts should immediately be reported to your dealer.

Please fill out the registration card completely and return it to us. Support and software updates will be available for registered customers only.

Moreover, you help us making our products better.

2. Specifications NORWAY

- ethernet controller for *HIGHWAY* expansion port
- 10MBit data transfer rate
- twisted pair connector (10BASE2)
- 8k x 16 integrated buffer memory
- NE2000 compatible
- four status LEDs (TX, RX, COL, LNK)
- low power technology
- INT2 / INT6 selection by software possible (NetBSD / Linux)
- officially assigned unique MAC address (EEPROM)

NORWAY

3. General hints

Your NORWAY module has been designed for the internal expansion port of the *HIGHWAY* Zorro card. The connector is not compatible with Zorro cards or modules from individual computers due to other pinouts.

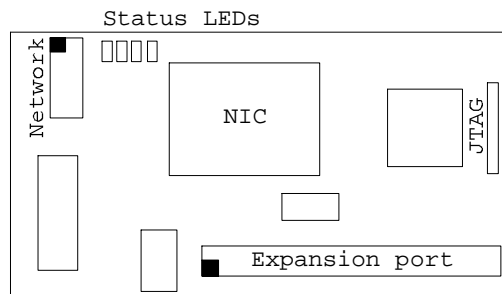
Be careful: the NORWAY module may not be connected to the expansion port the wrong way !

Damages caused by incorrectly fitted boards on the NORWAY, on the *HIGHWAY* and / or your Amiga are **not** covered by guarantee. Please check page 5 for a detailed installation guide.

3.1 Connectors of NORWAY

The NORWAY has two connectors: the expansion port (38 pin header) for connection to *HIGHWAY* and a 10 pin header for connecting the network cable.

Please have a look at figure 1; all connector positions and PCB markings can be found there for reference issues.



[Fig. 1] Connectors on the NORWAY. (top side view)

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Appendix A

A.1. Connector pinout

A.1.1 Expansion port

Connector pinout of this 38 pin header can be found in your *HIGHWAY* manual. This port is **not** compatible to the VarIO port or other individual computer modules.

A.1.2 Network port

The 10 pin header on the NORWAY has the following pinout:

PIN1	n.c.	● ●	n.c.
	TX-	● ●	TX+
	n.c.	● ●	n.c.
	RX-	● ●	RX+
	n.c.	● ●	n.c.

[Abb. 3] Netzwerkstecker auf der NORWAY (Aufsicht)

Do not use any other cables on this port than the one enclosed in your package. Replacement parts are available through your Amiga dealer.

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5. First steps

Do **not** connect a network cable to the NORWAY. After you have completed the hardware installation and closed your Amiga's housing you can switch on your computer.

Should you recognize any unusual behaviour of your Amiga, please switch it off immediately. Please consult chapter 5.2 and 5.3 for trouble shooting instructions.

5.1. A first test

After booting your Amiga please read the software installation manual in the AmigaGuide file "Software Manual" on the disk enclosed in your package. You can also use the program `nwtest` (available on our website) to check the NORWAY module and display hardware and firmware revision as well as the NIC MAC address..

Installation is quite easy: check if the directory `devs:Networks` already exists. If not, create it by "`makedir devs:Networks`" and copy the file `norway.device` into this directory.

5.2. Troubleshooting the expansion port

Should problems occur during the first test, please carefully check if:

- the NORWAY has been mounted in the right orientation ?
- there are there any left-over pins at the expansion port ?
- any cables have been removed or damaged during installation ?

5.3. Troubleshooting the network

Please check carefully if:

- you are using the right cable type (straightforward / crossover) ?
- the hubport you are using is activated ?
- your network support 10MBit connections ?

Your status LEDs should show short pulses on both TX and RX LEDs, no COL and a statically activated LNK LED.

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4. Hardware installation

Your NORWAY module has been designed for the internal expansion port of the *HIGHWAY* Zorro card from E3B. Connection with other manufacturers' cards is not possible and can lead to damage of either the NORWAY, the other module and / or your Amiga.

4.1. Safety recommendations

Please follow these recommendations
for your own safety:

- ▶ Switch off your Amiga before installation.
- ▶ Remove the power supply AC cable.
- ▶ Disconnect all external devices.
- ▶ Avoid static charge.
- ▶ Follow your computer manufacturer's installation guide for expansion cards.

4.2. List of required material

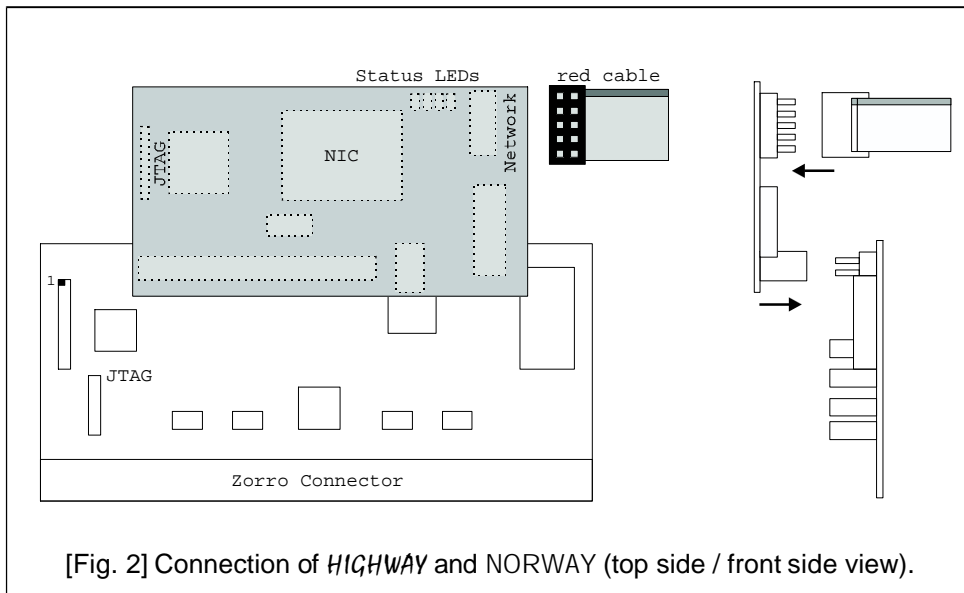
- NORWAY module
- HIGHWAY* Zorro card
- one holding plate with SUBD9 connector
- one adaptor SUBD9 to RJ45
- Philips style screw driver

NORWAY

4.3. Installation on *HIGHWAY*

Open your Amiga computer housing (see your computer's manual for detailed instructions) by removing the holding screws on the back and / or the sides. Afterwards, the upper part of the housing can easily be removed.

Remove the *HIGHWAY* from its Zorro slot and put it on the table, with the SMD parts looking upwards. The Zorro connector should face to you, the USB connector to the right.



The NORWAY is now attached to the expansion port of the *HIGHWAY* with the SMD parts facing downwards. Please check care fully that both connectors fit perfectly and that **no pins are left over on any side**.

Misplacing the NORWAY can lead to damages.

Insert the *HIGHWAY/NORWAY* combicard into its Zorro slot.

NORWAY

4.4. Connecting the network cable

The small size of the NORWAY opens many possibilities where to place the SUBD9 connector carrying the network signals.

Connect the 10pin female connector with the flat ribbon cable (see figure 2) to the NORWAY. The red cable must face away from the *HIGHWAY* card. Now fix the holding plate in a free slot. You also can mount this connector in a spare plate position (like in the A4000 CPU plate on the backside). Place the enclosed sticker "Ethernet" next to the connector to avoid confusion when connection cables !

The SUBD9 to RJ45 adaptor enclosed in your package is now connected to the holding plate you just mounted. Fixate the adaptor with its screws to get a secure connection to the network.

Your twisted pair network cable can directly be connected to the adaptor. Use a normal, straightforward cable for connections to hubs or switches. For a direct connection between two computers a crossover cable is needed. Both cable types should be on stock at your computer dealer.

Close your computer before reconnecting the AC power cable.

4.5. Status LEDs

Your NORWAY is equipped with four LEDs which allow control of network traffic. They are located between the network connector and the NIC on the NORWAY module.

The LEDs show the following signal(left to right):

- TX green Data transfer to network
- RX green Data transfer from network
- COL red Collision
- LNK orange Carrier found