

## Ethernet Starter Kit II



# Ethernet Starter Kit II

Welcome to the Ethernet Starter Kit II.

This short description is intended to give you a quick start to working with the Ethernet Starter Kit II / Ethernet module.

First an overview about the contents of the Ethernet Starter Kit II:

- CD-ROM including Tiger-BASIC™ Lite Version
- Ethernet Prototyping Board
- TINY-Tiger™ Module TTI-TCN-1/4
- Ethernet Module EM01-ETH-S
- 2 x RJ45 cables: Standard (blue) + Crossover (grey)
- DB9/RS232 cable
- Graphic LCD, 240 x 128, b/w
- Power Supply 100-240VAC / 9V / 2A
- Ready-to-use, installed on aluminum board
- Hardware documentation of Ethernet Module & Ethernet Prototyping Board
- Ready-to-use program examples

## Manuals

Included in the Starter Kits are the Tiger-BASIC manuals as PDF files on CD-ROM. A set of three printed manuals is available separately. The manuals describe all of the instructions, functions and device drivers with easy to follow sample programs. These samples are running directly on the various hardware platforms as described in the manuals. These are: the “Plug & Play Lab” of the standard development environment and the boards of the Tiger Starter Kits. For graphical output the sample programs are suitable for the “Graphic Toolkit” and the “Graphic Demokit”.

Also datasheets, programming guide and other documents relating to Ethernet Starter Kit II are delivered as PDF files. “Datasheet\_EM01\_Eth\_S\_[Vers]\_[Vers]” contains the pin layout, the description of the features and the connection schemes of the Ethernet Adapter. “Ethernet\_Adapter\_Programming\_Guide\_[Vers]” explains how to use the subroutines of the sockets library and how to start several sample programmes. “Ethernet\_Adapter\_Protocol” introduces the communication protocol of the Ethernet Adapter and is relevant for using it with another controller, not with Tiger Basic.

## Requirements

- Power outlet within 1.5 m distance
- Network socket and/or networked Personal Computer within 3 m distance
- Personal Computer (Windows<sup>TM</sup>95 or newer) with free serial port

## Installation

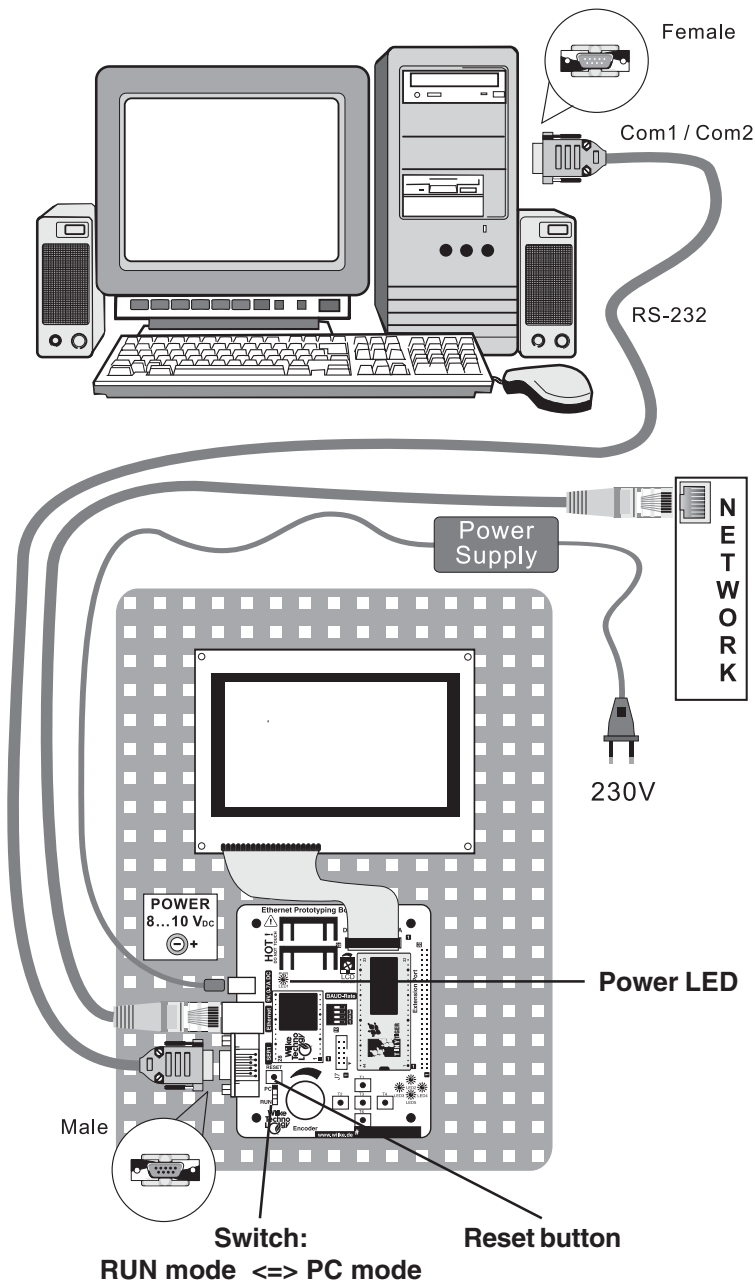
If you already have version 5.01 or higher of the Tiger-BASIC software IDE (Full or Lite Version) installed, you can leave out steps 1 to 5. If not, you should now install the development environment on your PC and can ignore step 6:

- ❶ Put the “BASIC-Tiger Info-CD” into your CD-ROM drive
- ❷ On the CD, open the folder “TIGER-Basic\_Lite\_Version”. In this folder start the program “TigerBasic\_[Vers]\_Lite\_Bilingual.exe” by double-clicking it.
- ❸ The setup program comes up with a welcome screen. From there on please follow the instructions on the screen.
- ❹ Start the Tiger-BASIC development environment on your PC through the Start menu or by double-clicking the desktop icon.
- ❺ Choose **Communication** from the menu **Options** and in the dialog box set the COM port to which the Prototyping Board is connected. The baudrate is always 38,400 Bd.
- ❻ Finally, please install the special software for Ethernet functionality. On the CD, again open the folder of your requested language, and then the folders “Ethernet\_Web\_Adapter” and “Software”. In that folder start the program “EthernetWebAdapter\_[Vers].exe” by double-clicking it.

The installation of the hardware is also done in just a few simple steps:

- ❷ Upon delivery, the modules are already plugged into the appropriate sockets of the Ethernet Prototyping board. Otherwise, plug the TINY-Tiger<sup>TM</sup> module and the Ethernet module into the appropriate sockets of the Ethernet Prototyping Board (see fig. 1).
- ❸ Connect the Ethernet Prototyping Board to your network with the RJ45 standard (blue) cable or directly to your PC, using the RJ45 crossover (grey) cable.
- ❹ Connect the serial port of the Ethernet Prototyping Board to a serial port of your PC, using the serial cable coming with the Starter Kit.
- ❺ Connect the Ethernet Prototyping Board to the power supply.

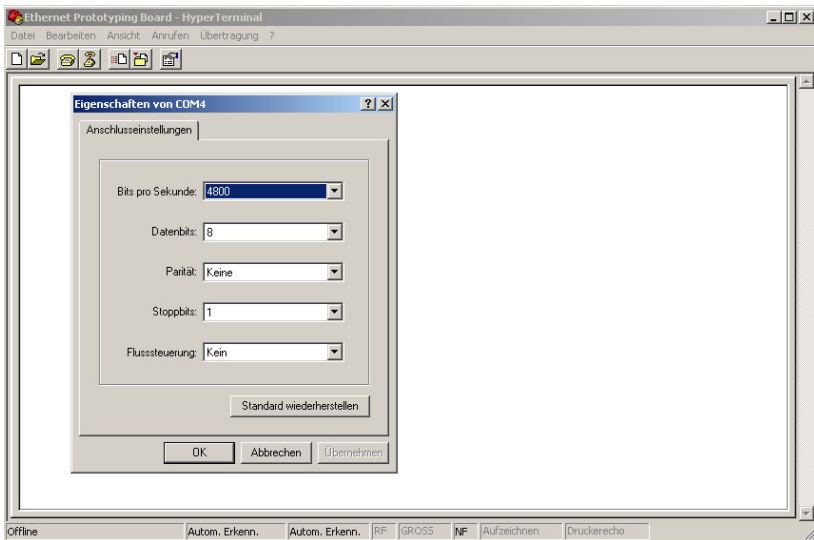
**Fig. 1: Connections for Ethernet Starter Kit II**



## Quick Start / First Steps

Directly after delivery the demo program “Ethernet\_Demo1\_[Vers].TIG” is already installed and you can ignore the following steps 1 to 4. If you have changed the module, or have downloaded a different program before, you will first have to load the demo program into the Tiger module again. Please follow the following steps:

- ❶ Run the Tiger-BASIC IDE and load the application with the command **Open** from the menu **File**. It has been installed to the “Ethernet\_Web\_Examples” folder of your Tiger-BASIC installation, subdirectory “Ethernet\_Demo”.
- ❷ Ensure that the module is in PC mode:
  - Switch on Ethernet Prototyping Board to position “PC”.
  - Reset module by pressing the reset button.
- ❸ Start the program with the command **Run** from the menu **Start** or by pressing **F5**. The program will be compiled first, then transmitted into the module, where it is started automatically.
- ❹ Close the Tiger-BASIC IDE.
- ❺ If you are using the serial interface, please start a terminal program, like e.g. Hyperterminal, directly from Windows. Now open the serial port with which the Ethernet Prototyping Board is connected and set it to 4800 baud, 8 databits, 1 stopbit no parity and no handshake. Ensure that the local echo is turned off, because this part is taken by the Tiger.



- ⑥ Restart the program in RUN mode:
  - Switch on Ethernet Prototyping Board to position “Run”.
  - Reset module by pressing the reset button.
- ⑦ Now please set your required parameters. Using the terminal program, you should press “?” first the get an overview of all valid commands. If you have the graphical LCD connected, you can easily move through the menus only by using the encoder. You can set/change the local IP, local subnetmask, local gateway and logical port of the Ethernet module according to your network requirements.

**Please ask your network administrator for valid specifications. Setting faulty data here may cause the application to not work (correctly) or even disturb other network participants.**



There is also the possibility to save your settings or to load previously saved settings. The most recent settings are saved in Tiger-FLASH automatically and are available at next program start.

```

Ethernet Prototyping Board - Hyperterminal
Datei Bearbeiten Ansicht Anrufen Übertragung ?

actual settings:
IP-ADDRESS: 192.168.1.1
SUBNETMASK: 255.255.255.0
GATEWAY: 192.168.1.253
PORT: 8000
for help type "?"
?
Information about the different commands to
set the parameters for ethernet-board:

command:      parameters:      function:
setIP         <IP-adress>      sets local ip-adress

example: setIP 192.168.1.1
setGateway   <gateway>       sets local gateway
example: setGateway 192.168.1.253
setSubnetmask <subnetmask>    sets local subnetmask
example: setSubnetmask 255.255.255.0
setPort      <Port>          sets log. port
example: setPort 8000

startDemo    ---
saveDir      --- shows saves
saveNew      --- creates a new save with actual settings
save         <save name>    overwrite save
example save save1
load         <save name>    load settings
example load save1

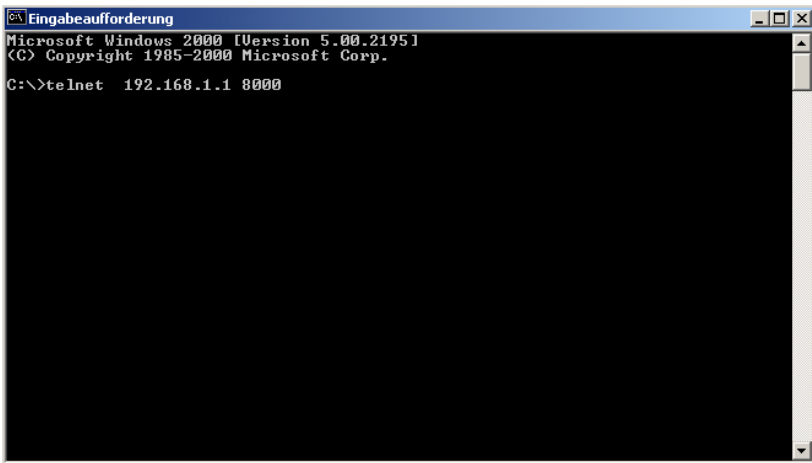
You can write parameters also in hexadecimal with a $ before
example setPort $02AF

actual settings:
IP-ADDRESS: 192.168.1.1
SUBNETMASK: 255.255.255.0
GATEWAY: 192.168.1.253
PORT: 8000

Verbunden 00:00:40      Autom. Erkenn.      4800 8-N-1      RF      GROSS      NF      Aufzeichnen      Druckerecho
  
```

- ⑧ Now please start the demo to activate the Ethernet module as server. When using the graphical LCD, click menu item “forward...” with the encoder. In the new menu shown, please select “start demo”. In Hyperterminal, just enter “startdemo”. After the demo is started, you need a client to communicate with the Tiger. So you should open the MS-DOS command prompt on your PC under “Start / Programs / Accessories” and type in

“telnet <IP> <Port>”, followed by <Return>. For <IP> you type the local IP address and for <Port> the logical port that you entered before on step 7. Next you should see “>connected” on your monitor. Type anything you want, and see the results. The Tiger should now echo everything that you type in. Communication is shown in Telnet, on the Terminal and on the graphical LCD. Also try pressing the buttons or move the Encoder on your Prototyping-Board. You will see the LEDs blinking and an appropriate text is shown on the LCD, on the Terminal and in Telnet. It's a simple application, but it demonstrates fast and stable communication between your PC and a Tiger through Ethernet.



```
Eingabeaufforderung
Microsoft Windows [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.
C:\>telnet 192.168.1.1 8000
```

- ⑨ The exit the demo just enter “q” or “quit” in telnet and the socket closes, so the connection is broken. You can start a new connection if you want, but wait for the text “listening” at your graphic LCD or terminal.

In this demo application only one connection is possible, but you can open up to 6 sockets simultaneously.



## Further information

This should give you a first impression on how to work with the Ethernet Starter Kit II. Detailed information about hardware, the development environment and many other topics can be found in the supplied PDF documents, which after installation of IDE and Ethernet software are located in the directory “Manual\Ethernet\_Web\_Manual”.

There are also many other program examples that you can try out. These are:

- **Client\_Simple\_Ethe.tig**  
Implements a simple TCP client that actively opens connection and communicates with an echo server.
- **Client\_Dhcp\_Ethe.tig**  
Demonstrates how to get dynamic IP address (subnet mask and gateway) from DHCP server and starts a simple client that actively opens connection and communicates with an echo server.
- **Client\_Dns\_Ethe.tig**  
Demonstrates how to get an IP address corresponding to a host name from DNS server and starts a simple client that actively opens connection using the obtained IP address and communicates with an echo server.
- **Client\_Ethe.tig**  
Gets dynamic IP address (subnet mask and gateway) from DHCP server, gets an IP address corresponding to a host name from DNS server and starts a simple client that actively opens connection using the obtained IP address and communicates with an echo server.
- **Client\_Send\_File\_Ethe.tig**  
Implements simple TCP client that optionally uses the DHCP or DNS features and sends some flash data to server.
- **Smtp\_Client\_Ethe.tig**  
Demonstrates how to send an email using SMTP (RFC 821, RFC 1651) protocol. The protocol is implemented in Tiger-BASIC language, it is delivered as source code and can be changed by the user to comply with the requirements of the particular SMTP server.
- **Server\_Ethe.tig**  
Implements simple TCP server that waits passively for someone to contact the Ethernet Adapter and sends in loop simple messages to the remote peer.

Most of the sample programs are described in details in the "Ethernet\_Adapter\_\_Programming\_Guide\_[Vers].pdf".

Have fun working with the Ethernet Starter Kit II!

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