

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure <small>Document Type</small></p> <p style="text-align: center;">Page 1 of 36</p>

Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type Page 2 of 36

Table of contents

1.	Foreword	3
2.	Ethernet (TCP/IP) module used by the ROTRONIC devices	3
3.	Digi Device Discovery utility	3
4.	Digi module web interface	3
5.	ROTRONIC device configuration certificate	4
6.	Baud rate compatibility requirements	4
7.	Device discovery with HW4	5
8.	TCP/IP configuration with Digi Device Discovery	6
9.	TCP/IP configuration with a web browser	10
9.1	Preparations	10
9.2	Procedure for a wired connection	10
9.3	Procedure for a wireless connection	11
9.3.1	Wireless security	11
9.3.2	Configuration wireless router	12
9.3.3	Procedure	12
10.	Changing the Digi web interface user name and password	16
11.	Changing the Digi module Baud rate	18
12.	Wireless Digi module master reset	21
12.1	Procedure	21
12.2	Default settings after a master reset	22
12.3	Configuring the Digi module after a master reset	22
13.	Basic TCP/IP concepts	28
13.1	Local area network hardware infrastructure	28
13.2	IP address	29
13.3	Subnet Mask	30
13.4	Default Gateway Address	30
13.5	TCP port	30
13.6	DHCP	30
13.7	MAC Address	30
13.8	LAN Compatibility requirements	31
14.	Configuring a PC Network Interface Card	32
15.	Windows XP ipconfig Command	35
16.	Document releases	36

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	Procedure <small>Document Type</small> Page 3 of 36

1. Foreword

The procedures described in this document can be used to configure a ROTRONIC device with Ethernet (TCP/IP) interface so as to ensure compatibility with the LAN to which the HW4 PC is connected and allow the device to be used with the HW4 software.

Prior to connecting and configuring any device to your local area network, you may want to read “**Basic TCP/IP concepts**” in this manual or consult with your network administrator.

2. Ethernet (TCP/IP) module used by the ROTRONIC devices

ROTRONIC devices with an Ethernet (TCP/IP) interface presently use an internal module manufactured by Digi International (Digi Connect ME for a wired connection, Digi Connect WI-ME for a wireless connection). Both types of module feature a web interface that is used to configure the module.

3. Digi Device Discovery utility

During installation of the ROTRONIC HW4 software, a device discovery utility (**Digi Device Discovery**) is automatically copied to the HW4 installation directory (usually, C:\Program Files\HW4). The name of the corresponding file is **dgdiscvr.exe**.

Digi Device Discovery is designed to automatically recognize Ethernet modules manufactured by Digi International that are on the same LAN as the PC, and to allow the configuration of such modules as well as access to the module web interface.

The Digi Device Discovery utility can be started in two different manners:

- Double click with the mouse on the file **dgdiscvr.exe** located in the ROTRONIC HW4 software installation directory.
- In the HW4 main menu bar > Settings and Tools, click on **Ethernet Configuration Tool**.

NOTE: Digi Device Discovery is not compatible with devices that have a web server such as docking station DS-U4WEB. For this type of device, use the **FINDER.exe** utility.

4. Digi module web interface

The Digi module web interface can be accessed using any of the following methods:

- With the Digi Device Discovery utility open and with the module discovered and selected in the right pane, click on Open web interface under Device Tasks (left pane)
- Type the module IP address directly in a web browser (http:// IP address)

IMPORTANT: Port 80 must be enabled to communicate with the web interface.

Access to the Digi Ethernet module web interface requires both a User Name and a Password. Both are configured by ROTRONIC at the factory (see ROTRONIC device configuration certificate). If for any reason the Digi Module has to be reset, both the user name and password revert to the original Digi default: **root** (user name) and **dbps** (password).

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type Page 4 of 36

5. ROTRONIC device configuration certificate

ROTRONIC devices with an Ethernet interface (both wired and wireless) are shipped with a Device Configuration Certificate that provides information about the factory configuration settings of both the Ethernet module and device. See example below:

Setting	Value
DHCP or Static Address	Static
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.0
TCP Port	2101 and 80
MAC Address	00:40:9D:28:2D:2A
Firmware Release (device)	1.4
User Name (web interface)	rotronic
Password (web interface)	wlan
Serial Port Configuration Profile	TCP Sockets
Basic Serial Settings	
Baud Rate	57600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

IMPORTANT: Communication between the Digi Module and the ROTRONIC device requires both the Digi Module and the ROTRONIC device to use the same Baud rate. See “Baud rate compatibility requirements”.

6. Baud rate compatibility requirements

Depending on the model, devices from ROTRONIC use one of the following Baud rates as the factory default:

- 57600 bps: HygroLog NT data logger and docking stations
- 19200 bps: HygroPalm and HygroLab indicators, HygroFlex and M33 transmitters, HygroClip Alarm programmable alarm card, HygroClip DI interface, HygroStat MB Thermo-Hygrostat

IMPORTANT:

- All devices connected to a RS-485 multi-drop network (master and slaves) must use the same Baud rate
- In the case of a device with an Ethernet (TCP/IP) module, the Baud rate of the module must be the same as the Baud rate of the device

Devices and internal Ethernet modules with mismatched Baud rate will not communicate together.

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	Procedure <small>Document Type</small> Page 5 of 36

Mismatched Baud rates can be an issue when a new docking station is going to be used with a previously configured data logger.

The Baud rate configuration of a ROTRONIC device can be changed with the **Device Manager** function (Digital Interface tab) available from within the HW4 software.

The Baud rate of a Digi Module can be changed only from the module web interface. See "Changing the Digi module Baud rate".

IMPORTANT: Prior to using a new docking station with a previously configured data logger, you should always do the following:

- Connect the logger to the HW4 PC using a docking station with RS-232 or USB interface or using a docking station with Ethernet interface that is known to work with this particular data logger
- Verify the Baud rate used by the data logger and, if necessary, use HW4 **Device Manager** to change the Baud to the factory standard of 57600 bps

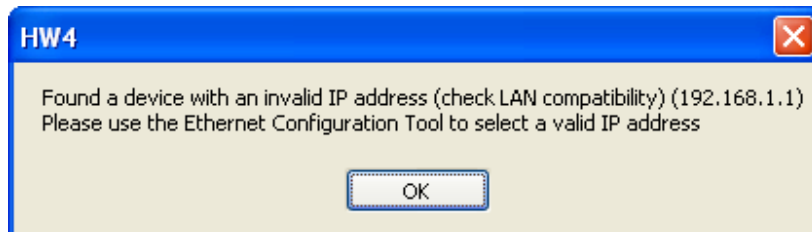
7. Device discovery with HW4

NOTE: the following procedure works only with devices with TCP/IP settings that are compatible with the local area network.

PROCEDURE:

- Connect the ROTRONIC device to the same LAN as the HW4 PC. In the case of a new docking station used with a previously configured HygroLog NT data logger, install the data logger on the docking station after making sure that the data logger Baud rate is set to 57600 bps.
- Open HW4 and in the main menu bar click on Devices and Groups > Search for Ethernet Masters.

When the TCP/IP settings of the device are not compatible with the local area network, HW4 displays the following message box:



Use the Digi Device Discovery tool to change the TCP/IP settings of the device so as to make it compatible with the local area network.

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure Document Type</p> <p style="text-align: center;">Page 6 of 36</p>

8. TCP/IP configuration with Digi Device Discovery

Notes:

- **The following procedure does not apply to a wireless connection**
- Do not connect more than one new, non-configured device at a time to the local area network.

NOTE: The Digi Device Discovery utility is known on occasions not to recognize all devices connected to the same LAN as the PC. In the situation where the Digi Device Discovery utility fails to recognize a device, the internal module web interface can be accessed from a web browser by typing the module IP address as explained under **TCP/IP configuration with a web browser**.

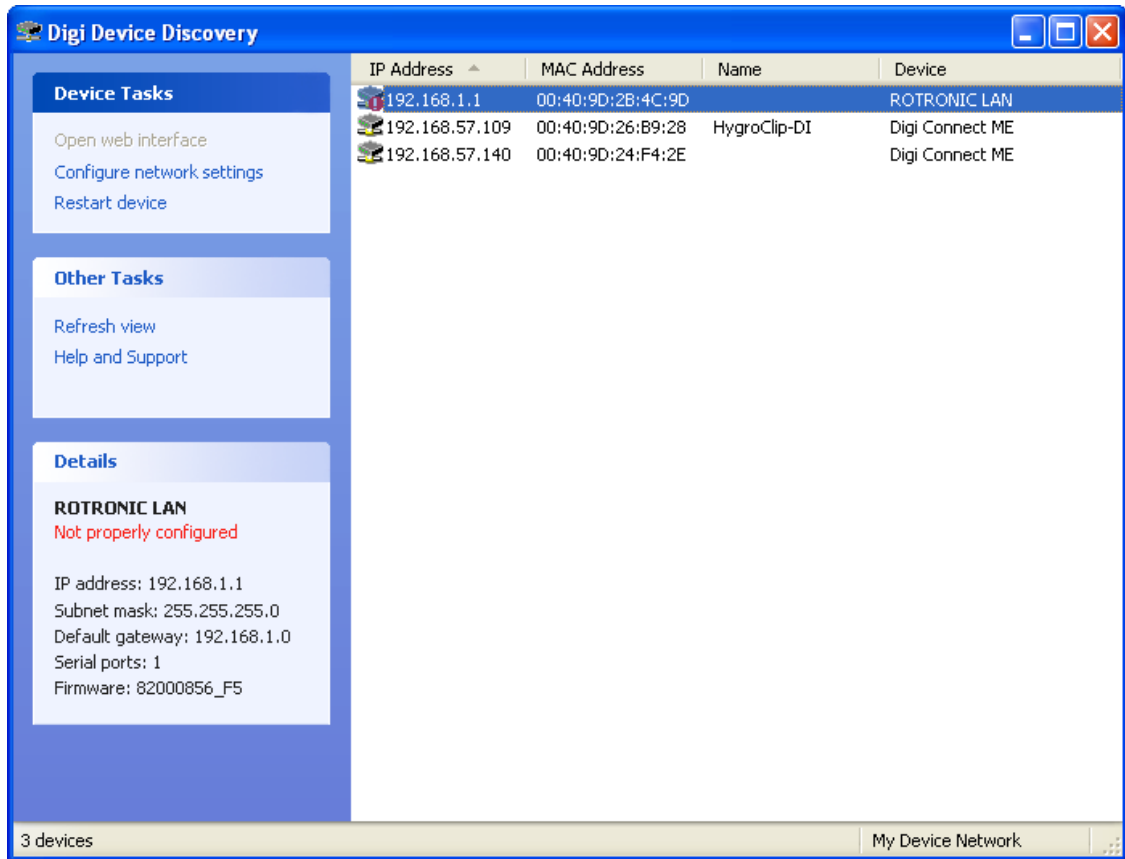
PREPARATIONS: Before you begin, make sure that the following is available to you:

- An unused static IP address that is compatible with the HW4 PC LAN
- The subnet mask of the HW4 PC LAN
- The local IP address of the router used on the same LAN as the HW4 PC LAN, or the default gateway used by all devices on the LAN

PROCEDURE:

- Connect the device to be configured to the same LAN as the HW4 PC. In the case of a new docking station used with a previously configured HygroLog NT data logger, install the data logger on the docking station after making sure that the data logger Baud rate is set to 57600 bps.
- Start Digi Device Discovery (see Device Discovery utility).
- When activated, Digi Device Discovery automatically detects any Digi module present on the LAN and provides a list of all such modules.
- The following example shows how Digi Device reports a device that is not compatible with the local area network (in this example, the first device):

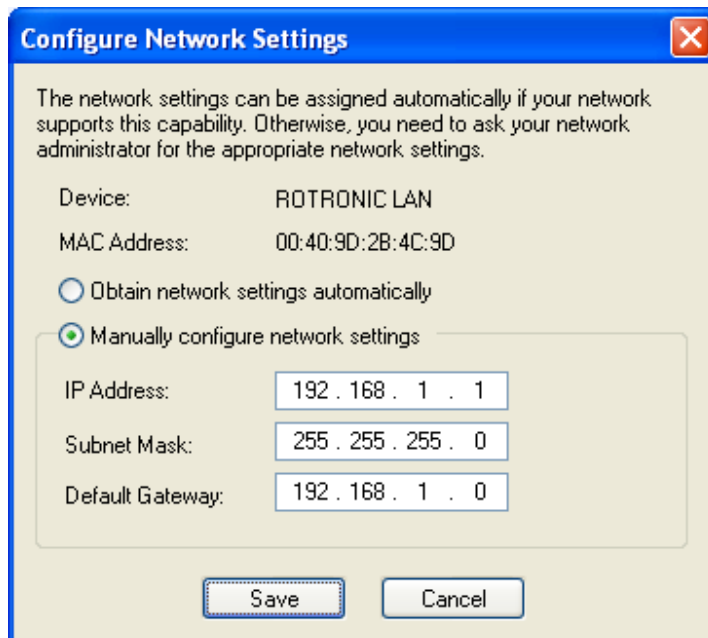
IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
Page 7 of 36	



The red warning on the left side of the screen shows that the current module configuration is not compatible with the LAN and must be changed.

- With the device highlighted, click on “Configure network settings” in the left pane to open the dialog box shown below.

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 8 of 36



Preference should be given to the choice: Manually configure network settings (static IP address) because a dynamic IP address (DHCP) is subject to change.

Enter the following:

- An unused static IP address that is compatible with the HW4 PC LAN
- The subnet mask of the HW4 PC LAN
- The local IP address of the router used on the HW4 PC LAN or the default gateway used by all devices on the HW4 PC LAN
- Complete the procedure by clicking on Save and reboot the device.

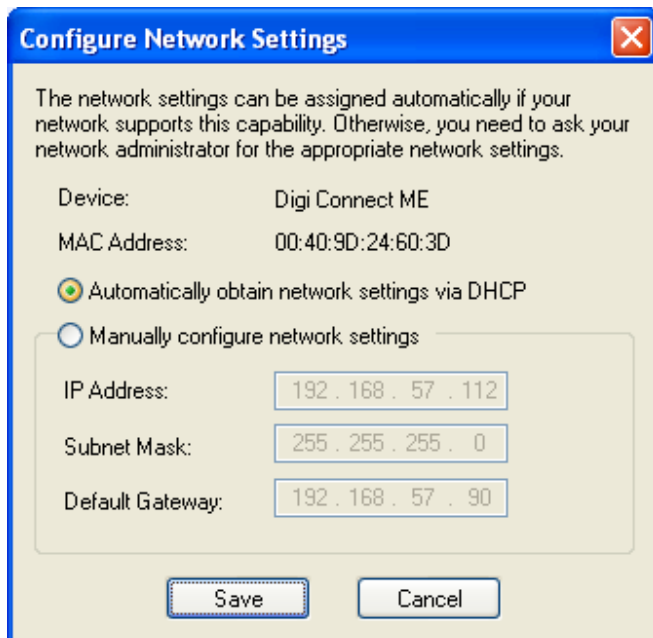
When in doubt as to which settings to enter manually, select “automatically obtain network settings via DHCP” (requires a LAN with DHCP server such as a router). Using DHCP ensures that the device settings that are compatible with the LAN (subnet mask and default gateway) and that the IP address does not generate any conflict on the network.

Click on Save, Reboot the device and click on Refresh View.

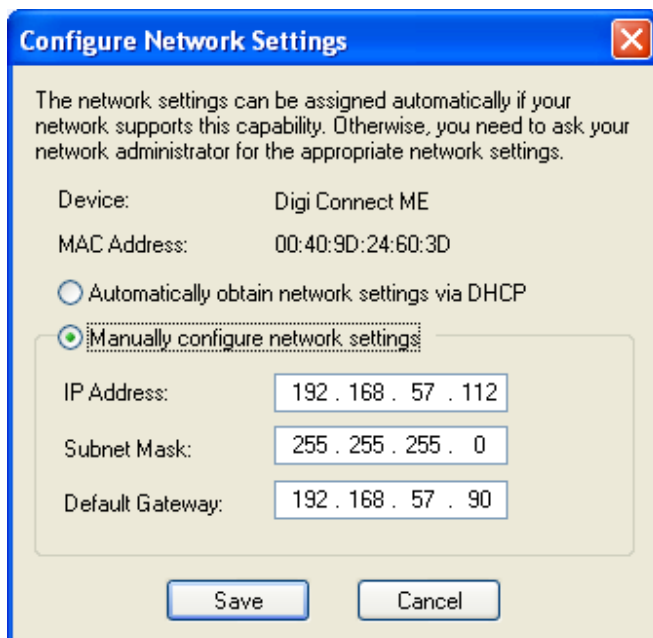
You should now change the device configuration from dynamic IP address (DHCP) to static IP address (manual).

To do this, click again on “Configure network settings”. The current settings of the device (IP address, subnet mask, etc.) appear in light gray.

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	Procedure <small>Document Type</small>
<small>Document title</small>	Page 9 of 36



Click on “Manually configure network settings”.



Change the device IP address to an address that is both currently unused on the LAN and outside of the range of dynamic IP addresses used by the DHCP server. To select a proper address, you may want to consult your network administrator.

Leave the subnet mask and default gateway settings that were given by the DHCP server.

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type Page 10 of 36

9. TCP/IP configuration with a web browser

9.1 Preparations

The following preparations apply both to a wired and a wireless connection.

Before you begin, make sure that the following is available to you:

- ROTRONIC factory configuration of the device (Device Configuration Certificate)
- An unused static IP address that is compatible with the HW4 PC LAN.
Example: 192.168.57.200
- The subnet mask of the HW4 PC LAN. Example: 255.255.255.0
- The local IP address of the router used on the HW4 PC LAN or the default gateway used by all devices on the HW4 PC LAN. Example: 192.168.57.90

Additional information required for a wireless connection:

- The wireless network name (SSID)
- The security mode (WAP, WEP or other) used by the HW4 network and the key or keys used by the security mode.

IMPORTANT: write down the current settings of the HW4 PC network interface card

Example:

IP Address : 192.168.57.25
Subnet mask : 255.255.255.0
Default gateway : 192.168.57.90

9.2 Procedure for a wired connection

- Disconnect the HW4 PC from the LAN
- Reconfigure the HW4 PC Network interface card to be compatible with the ROTRONIC device (see ROTRONIC device configuration certificate). See example below:

ROTRONIC factory configuration as per Device Configuration Certificate:

IP Address : 192.168.1.1
Subnet mask : 255.255.255.0
Default gateway : 192.168.1.0

New PC configuration (see : Configuring a PC Network Interface Card)

IP Address : 192.168.1.2
Subnet mask : 255.255.255.0 (as per Device Configuration Certificate)
Default gateway : 192.168.1.0 (as per Device Configuration Certificate)

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 11 of 36

- Connect the ROTRONIC device to the HW4 PC, using a patch cable. In the case of a new docking station, install the data logger on the docking station after making sure that the data logger Baud rate is set to the factory default of 57600 bps.
- Use the web browser of the HW4 PC to access the Digi module web interface (use the IP address provided in the Device Configuration Certificate supplied with the ROTRONIC device - example: type http://192.168.1.1).
- Configure the Digi module to be compatible with the HW4 PC LAN. See example below:
 - IP Address : 192.168.57.200
 - Subnet mask : 255.255.255.0
 - Default gateway : 192.168.57.90
- Disconnect the ROTRONIC device from the HW4 PC and connect it to the HW4 PC LAN.
- Return the HW4 PC network interface card to its original configuration. See example below:
 - IP Address : 192.168.57.25
 - Subnet mask : 255.255.255.0
 - Default gateway : 192.168.57.90
- Reconnect the HW4 PC to the LAN
- To complete the procedure, open HW4 and search for the Ethernet device

9.3 Procedure for a wireless connection

9.3.1 Wireless security

It is customary to protect a wireless network against interference from neighboring networks and against malicious users.

A wireless router can be configured to use a wireless network name (SSID). This name will be shared by all devices using a wireless connection to the network. Using an SSID should prevent network devices from connecting to other networks and to devices attached to these networks. The router can be made to broadcast the SSID so that it is visible. To enhance security, broadcasting of the SSID can be disabled.

Additional security is provided by requiring that an encoded key be provided by any device that tries to access the network. Most wireless routers offer a choice of several security modes (WPA, WEP, etc.).

IMPORTANT: make sure to select a security mode that is available both on the wireless router and the Digi wireless module.

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure Document Type</p> <p style="text-align: center;">Page 12 of 36</p>

9.3.2 Configuration wireless router

The internal Digi module WI-ME used by wireless ROTRONIC devices does not allow a wired connection to a LAN and must be configured using a wireless connection. Allowing a new wireless device to connect would require the HW4 network wireless router to be temporarily reconfigured and the network security to be disabled. This is clearly not practical for most users and we recommend using a dedicated wireless router for the purpose of configuring a wireless ROTRONIC device.

The dedicated router should be configured as follows:

- Wireless network mode: (802.11b or 802.11g or both). Setting the router to “both” is recommended.
- Wireless channel (6 - 2.437 GHz or 5 - 2.432 GHz, etc.). All devices connected to the wireless network should use the same channel in order to communicate. Channels 5 and 6 are the most frequently used. By default the Digi module is configured to auto-scan all wireless channels.

- IP settings:

IP Address : 192.168.1.0 (as per Device Configuration Certificate)
Subnet mask : 255.255.255.0 (as per Device Configuration Certificate)

The router LAN IP address should be the same as the IP address of the default gateway provided in the Device Configuration Certificate

- DHCP Server

Enabled
Start IP Address : 192.168.1.10
Number of Addresses : 5

- Wireless security

SSID : none (blank)
SSID Broadcast : disabled
Security mode : disabled
Network access : no restriction

9.3.3 Procedure

- Disconnect the HW4 PC from the LAN
- Reconfigure the HW4 PC Network interface card to be compatible with both the “configuration” wireless router (thereafter referred to as the router) and the ROTRONIC wireless device (see Configuring a PC Network Interface Card).

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 13 of 36

Example.

IP Address : 192.168.1.2
Subnet mask : 255.255.255.0
Default gateway : 192.168.1.0

- Connect the wireless router to the HW4 PC, using a patch cable
- Position the ROTRONIC device at close proximity of the wireless router so as to avoid interference from neighboring networks. In the case of a new docking station, install the data logger on the docking station after making sure that the data logger Baud rate is set to the factory default of 57600 bps.
- Use the web browser of the HW4 PC to access the Digi module web interface (use the IP address provided in the Device Configuration Certificate supplied with the ROTRONIC device - example: type http://192.168.1.1).
- In the left pane of the web interface, under Configuration, click on Network. Enter IP settings that are compatible with the HW4 network. See example below.

Network Configuration

▼ IP Settings

Obtain an IP address automatically using DHCP *

Use the following IP address:

* IP Address:

* Subnet Mask:

Default Gateway:

* Primary DNS:

* Secondary DNS:

* Changes to DHCP, IP address, Subnet Mask, and DNS may effect your browser connection.

▶ Wireless LAN Settings

▶ Wireless Security Settings

- At this time, **do not click on the Apply button**

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	Procedure <small>Document Type</small>
Page 14 of 36	

- Click on Wireless LAN Settings and enter the SSID that is used by the HW4 wireless network. See example below.

Network Configuration

▶ IP Settings

▼ **Wireless LAN Settings**

Network name: (SSID)

Connect to any available wireless network
 Connect to access point (infrastructure) networks only
 Connect to peer-to-peer (ad-hoc) networks only

Country: ▼

Channel: ▼

Transmit power: ▼

Enable Short Preamble

Apply

▶ Wireless Security Settings

▶ Wireless 802.1x Authentication Settings

- At this time, **do not click on the Apply button**

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	Procedure <small>Document Type</small> Page 15 of 36

- Click on Wireless Security Settings and enter settings that are identical to the security settings of the HW4 wireless network. See example below (assuming that WEP keys are being used)

Network Configuration

▶ IP Settings

▶ Wireless LAN Settings

▼ **Wireless Security Settings**

Network Authentication

Use any available authentication method
 Use the following selected method(s):

- Open System
- Shared Key
- WEP with 802.1x authentication
- WPA with pre-shared key (WPA-PSK)
- WPA with 802.1x authentication
- Cisco LEAP

Data Encryption

Use any available encryption method
 Use the following selected method(s):

- Open System (no encryption)
- WEP
- TKIP
- CCMP

WEP Keys

Transmit key: 1 2 3 4

Encryption Keys:

1:

- **CAUTION:** verify that all your settings are correct before clicking on the Apply button located at the bottom of the screen. After clicking on Apply, all communication with both the configuration router and HW4 PC will be lost.

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 16 of 36

- Disconnect the wireless router from the HW4 PC
- Return the HW4 PC network interface card to its original configuration. See example below.

IP Address : 192.168.57.25
Subnet mask : 255.255.255.0
Default gateway : 192.168.57.90

- Reconnect the HW4 PC to the LAN
- To complete the procedure, open HW4 and search for the Ethernet device

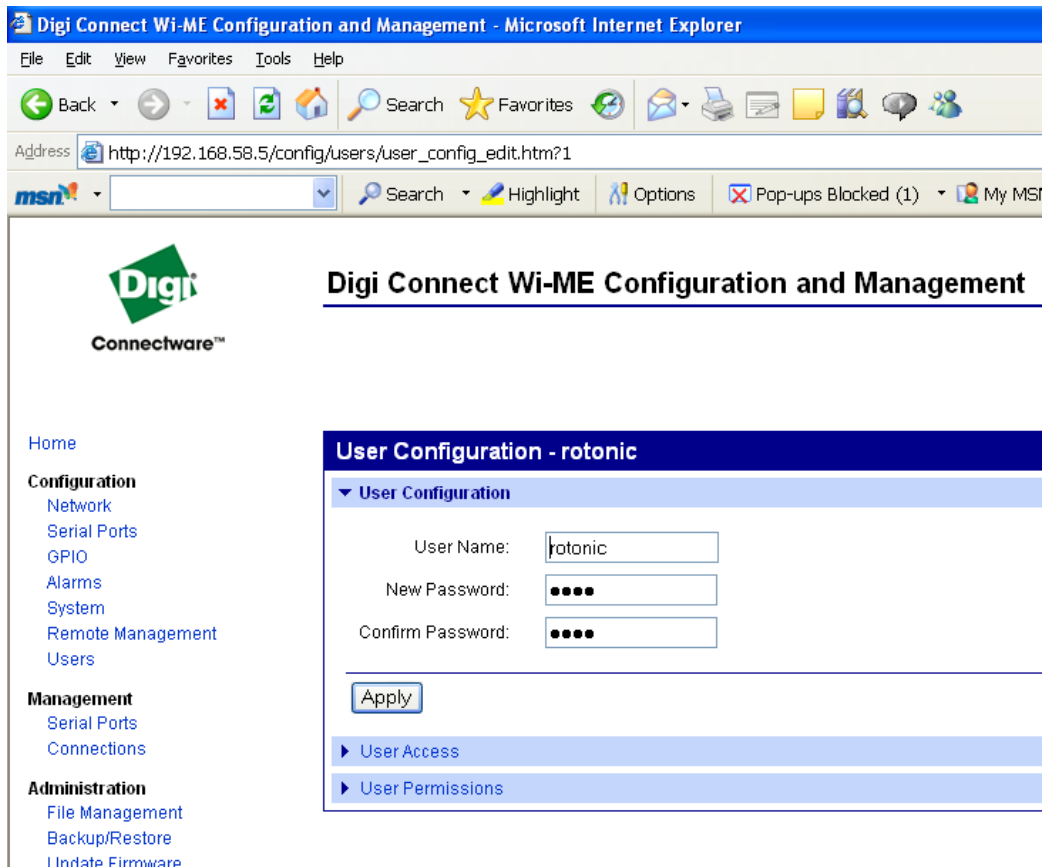
10. Changing the Digi web interface user name and password

- Open the web interface and click on Configuration – Users

The screenshot shows the Digi Connect Wi-ME Configuration and Management web interface. The browser is Microsoft Internet Explorer, and the address bar displays the URL `http://192.168.58.5/config/users/user_info.htm`. The page title is "Digi Connect Wi-ME Configuration and Management". The Digi logo and Connectware™ are visible in the top left corner. A navigation menu on the left includes "Home", "Configuration", "Network", "Serial Ports", "GPIO", "Alarms", "System", "Remote Management", and "Users". The main content area is titled "Users Configuration" and shows a table with columns "User Name" and "Action". The table contains one entry: "rotronic". Below the table is a "New..." button.

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
Page 17 of 36	

- Click on the user name text box:



- Change the user name and password as desired.
- To complete the procedure, click on the Apply button.

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 18 of 36

11. Changing the Digi module Baud rate

When a ROTONIC Ethernet device is used as the master device in a RS-485 multi-drop network, it may be necessary to change the factory default baud rate because the other devices in the RS-485 multi-drop use a different Baud rate. All devices in a RS-485 multi-drop must use the same baud rate.

Changing the baud rate of an Ethernet device is a two step process:

- 1) Change the device baud rate in HW4 > Device Manager > Digital Interface (see HW4 manual)
 - 2) Change the baud rate of the Digi module using the Digi web interface: Configuration > Serial Port > Basic Serial Settings (see the procedure provided below)
- Open the home page of the Digi module web interface (similar to the following example):

The screenshot shows the Digi module web interface home page. On the left is a sidebar with a dark blue background and white text, containing sections: **Home**, **Configuration** (Network, Serial Port, GPIO, Alarms, Security, System), **Management** (Serial Ports, Connections), **Administration** (File Management, Backup/Restore, Update Firmware, Factory Default Settings, System Information, Reboot), and Logout. The main content area has a dark blue header with 'Home' and a light blue background. It contains sections: **Getting Started**, **Tutorial** (with a link 'Not sure what to do next? This Tutorial can help.'), **System Summary** (with fields: **Model:** Digi Connect ME, **IP Address:** 192.168.57.152, **MAC Address:** 00:40:9D:24:60:3D, **Description:** JPL Test1, **Contact:** JPL Test 1, **Location:** JPL Test 1), and **User Interfaces** (with 'Web Interface (Default)' and 'Custom Interface' buttons, and 'Launch' and 'Set as Default' buttons).

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 19 of 36

The left hand side of the web server home page displays a menu.

- Left click with the mouse on Configuration > Serial Ports to gain access to the Serial Port Configuration page:

Serial Port Configuration			
Port	Description	Profile	Serial Configuration
Port 1	HygroLog NT	TCP Sockets	57600 8N1

- Click on Port 1 (blue link)

Serial Port Configuration - HygroLog NT	
▼ Port Profile Settings	
Current Port Profile: TCP Sockets Change Profile...	
The TCP Sockets Profile allows a serial device to communicate over a TCP r	
TCP Server Settings	
Connect directly to the serial device using the following TCP ports on the n	
<input checked="" type="checkbox"/> Enable Telnet access using TCP Port:	<input type="text" value="2001"/>
<input checked="" type="checkbox"/> Enable Raw TCP access using TCP Port:	<input type="text" value="2101"/>
<input checked="" type="checkbox"/> Enable Secure Socket access using TCP Port:	<input type="text" value="2601"/>

Warning: This page should be exactly as shown above and no configuration should be required on this page. In particular, “Enable raw TCP access using TCP port” should be checked and the port number should be 2101.

- At the bottom of the page, click on basic serial settings

<input type="button" value="Apply"/>
▶ Basic Serial Settings
▶ Advanced Serial Settings

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 20 of 36

- Use the next page to change the Baud rate of the Digi module to match the Baud rate of the ROTRONIC Ethernet device:



Digi Connect ME Configuration and Management

Home

Configuration

Network

Serial Port

GPIO

Alarms

Security

System

Management

Serial Ports

Connections

Administration

File Management

Backup/Restore

Update Firmware

Factory Default Settings

System Information

Reboot

Serial Port Configuration - HygroLog NT

▶ Port Profile Settings

▼ Basic Serial Settings

Description:

Baud Rate: ▼

Data Bits: ▼

Parity: ▼

Stop Bits: ▼

Flow Control: ▼

▶ Advanced Serial Settings

- To complete the process, click on the Apply button.

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure <small>Document Type</small></p> <p style="text-align: center;">Page 21 of 36</p>

12. Wireless Digi module master reset

A master reset of the wireless Digi module may be required when:

- The IP settings of the module are unknown and the module cannot be found using Digi Device Discovery
- The user name and/or the password for the Digi web interface have been lost
- A malfunction of the module has caused the module to freeze or some critical settings to be lost
- An error was made during the configuration of the module and communication with the module cannot be re-established.

WARNING

Do a master reset of the Digi module only when absolutely necessary. After a master reset, all module settings must be re-configured by the user.

12.1 Procedure

The following procedure is written for a wireless docking station and may be slightly different for other types of ROTRONIC wireless device.

- Remove the AC adapter (power) from the docking station
- Remove the HygroLog NT from the docking station
- Connect pins 7 and 8 of the docking station 15-pin connector (see picture below)

WARNING: make a clean connection between the two pins (use a jumper or a connector). An accidental connection with other pins, or between other pins, may damage the module



- Connect the AC adapter to the docking station
- The docking station yellow LED flashes after about 10 seconds
- Wait at least 2 minutes (during this time the yellow LED will flash several times)
- Remove the connection between pins 7 and 8 of the docking station 15-pin connector. Do not disconnect the AC adapter from the docking station.
- During the next 2 minutes, no LED should be flashing
- After about 2 minutes, the Digi module restarts automatically. The yellow LED comes up first (solid) and then the green LED starts flashing.

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type Page 22 of 36

12.2 Default settings after a master reset

Setting	Value
DHCP or Static Address	DHCP (dynamic)
IP Address	Will be set by DHCP server
Subnet Mask	Will be set by DHCP server
Default Gateway	Will be set by DHCP server
TCP Port	Not set
MAC Address	00:40:9D:28:2D:2A (example)
Firmware Release (device)	1.4 (example)
User Name (web interface)	root
Password (web interface)	dbps
Serial Port Configuration Profile	No configuration profile
Basic Serial Settings	
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

12.3 Configuring the Digi module after a master reset

After a master reset, use a separate wireless modem configured as explained under 9.3.2

- Disconnect the HW4 PC from the LAN
- Reconfigure the HW4 PC Network interface card to be compatible with both the “configuration” wireless router (thereafter referred to as the router) and the ROTRONIC wireless device (see Configuring a PC Network Interface Card).

Example:

IP Address : 192.168.1.2
Subnet mask : 255.255.255.0
Default gateway : 192.168.1.0

- Connect the wireless router to the HW4 PC, using a patch cable
- Position the ROTRONIC device at close proximity of the wireless router so as to avoid interference from neighboring networks. In the case of a docking station, install the data logger on the docking station after making sure that the data logger Baud rate is set to the factory default of 57600 bps.
- Use the web browser of the HW4 PC to access the Digi web interface (type <http://192.168.1.10> – this is the first address that was defined for the range of addresses allocated to the router DHCP server – see 9.3.2).

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 23 of 36

- In the left pane of the web interface, under Configuration, click on Serial Ports. The following page opens.

Home Configuration Network Serial Ports	Serial Port Configuration								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Port</th> <th style="text-align: left;">Description</th> <th style="text-align: left;">Profile</th> <th style="text-align: left;">Serial Configuration</th> </tr> </thead> <tbody> <tr> <td>Port 1</td> <td>None</td> <td><Unassigned></td> <td>9600 8N1</td> </tr> </tbody> </table>	Port	Description	Profile	Serial Configuration	Port 1	None	<Unassigned>	9600 8N1
Port	Description	Profile	Serial Configuration						
Port 1	None	<Unassigned>	9600 8N1						

After a master reset a profile must be assigned to the port. Click on Port 1 (blue) to open the following page. Select **TCP Sockets**:

Select Port Profile...

You have currently not assigned a profile to this serial port. Profiles allow you to easily configure serial ports by only displaying those items that are relevant to the current profile.

Select the profile below that best matches your configuration.

- RealPort**
The RealPort Profile allows you to map a COM or TTY port to the serial port. [More...](#)
- Console Management**
The Console Management Profile allows you to access a device's console port over a network connection. [More...](#)
- TCP Sockets**
The TCP Sockets Profile allows a serial device to communicate over a TCP network. [More...](#)
- UDP Sockets**
The UDP Sockets Profile allows a serial device to communicate using UDP. [More...](#)
- Serial Bridge**
The Serial Bridge Profile configures one side of a serial bridge. A bridge connects two serial devices over the network as if they were connected with a serial cable. [More...](#)
- Local Configuration**
The Local Configuration Profile allows you to connect standard terminals or terminal emulation programs to the serial port in order to use the serial port as a console to access the command line interface. [More...](#)
- Modem Emulation**
The Modem Emulation Profile allows you to configure the serial port to act as a modem. [More...](#)
- Custom**
The Custom Profile is an advanced option to allow full configuration of the serial port. [More...](#)

Apply
Cancel

- Click on the Apply button.

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type Page 24 of 36

- In the left pane of the web interface, under Configuration, click on Serial Ports. Configure The TCP Server Settings as shown below. Do not change the other settings.

Serial Port Configuration

▼ Port Profile Settings

Current Port Profile: **TCP Sockets** [Change Profile...](#)
The TCP Sockets Profile allows a serial device to communicate over a TCP network.

TCP Server Settings

Connect directly to the serial device using the following TCP ports on the network.

<input checked="" type="checkbox"/> Enable Telnet access using TCP Port:	2001	<input type="checkbox"/> Enable TCP Keep-Alive
<input checked="" type="checkbox"/> Enable Raw TCP access using TCP Port:	2101	<input type="checkbox"/> Enable TCP Keep-Alive
<input checked="" type="checkbox"/> Enable Secure Socket access using TCP Port:	2601	<input type="checkbox"/> Enable TCP Keep-Alive

- Move to the bottom of the page and click on Basic Serial Settings:

Apply

▶ Basic Serial Settings

▶ Advanced Serial Settings

- The following page opens:

Serial Port Configuration

▶ Port Profile Settings

▼ Basic Serial Settings

Description:

Baud Rate: ▼

Data Bits: ▼

Parity: ▼

Stop Bits: ▼

Flow Control: ▼

Apply

▶ Advanced Serial Settings

Set the Baud rate as per the Device Configuration Certificate supplied with the ROTRONIC device. Set Data Bits, Parity, Stop Bits and Flow Control as shown above.

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure <small>Document Type</small></p> <p style="text-align: center;">Page 25 of 36</p>

- Click on the Apply button.
- In the left pane of the web interface, under Configuration, click on Network. Change the selection to “Use the following IP address” and enter IP settings that are compatible with the network to which the HW4 PC is connected. See example below.

Network Configuration

▼ IP Settings

Obtain an IP address automatically using DHCP *

Use the following IP address:

* IP Address:

* Subnet Mask:

Default Gateway:

* Primary DNS:

* Secondary DNS:

* Changes to DHCP, IP address, Subnet Mask, and DNS may effect your browser connection.

▶ Wireless LAN Settings

▶ Wireless Security Settings

- At this time, **do not click on the Apply button**

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	Procedure <small>Document Type</small> Page 26 of 36

- Click on Wireless LAN Settings and enter the SSID that is used by the HW4 wireless network. See example below.

Network Configuration

▶ IP Settings

▼ **Wireless LAN Settings**

Network name: (SSID)

Connect to any available wireless network
 Connect to access point (infrastructure) networks only
 Connect to peer-to-peer (ad-hoc) networks only

Country: ▼

Channel: ▼

Transmit power: ▼

Enable Short Preamble

▶ Wireless Security Settings

▶ Wireless 802.1x Authentication Settings

- At this time, **do not click on the Apply button**

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	Procedure <small>Document Type</small> Page 27 of 36

- Click on Wireless Security Settings and enter settings that are identical to the security settings of the HW4 wireless network. See example below (assuming that WEP keys are being used)

Network Configuration

▶ IP Settings

▶ Wireless LAN Settings

▼ **Wireless Security Settings**

Network Authentication

Use any available authentication method
 Use the following selected method(s):

- Open System
- Shared Key
- WEP with 802.1x authentication
- WPA with pre-shared key (WPA-PSK)
- WPA with 802.1x authentication
- Cisco LEAP

Data Encryption

Use any available encryption method
 Use the following selected method(s):

- Open System (no encryption)
- WEP
- TKIP
- CCMP

WEP Keys

Transmit key: 1 2 3 4

Encryption Keys:

1:

- **CAUTION:** verify that all your settings are correct before clicking on the Apply button located at the bottom of the screen. After clicking on Apply, all communication with both the configuration router and HW4 PC will be lost.

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure Document Type</p> <p style="text-align: center;">Page 28 of 36</p>

- Disconnect the wireless router from the HW4 PC
- Return the HW4 PC network interface card to its original configuration. See example below.

IP Address : 192.168.57.25
 Subnet mask : 255.255.255.0
 Default gateway : 192.168.57.90

- Reconnect the HW4 PC to the LAN
- To complete the procedure, open HW4 and search for the Ethernet device

13. Basic TCP/IP concepts

13.1 Local area network hardware infrastructure

An Ethernet hub is a device used for connecting multiple Ethernet devices (or hosts) together to form a local area network (LAN), also called a single broadcast domain. On a LAN, each host must have a unique IP address and share the same subnet mask and gateway address (see further down for a definition of these terms). Modern local area networks typically use a **network switch** as the Ethernet hub. Wireless network switches are available to connect wireless devices to the local area network.

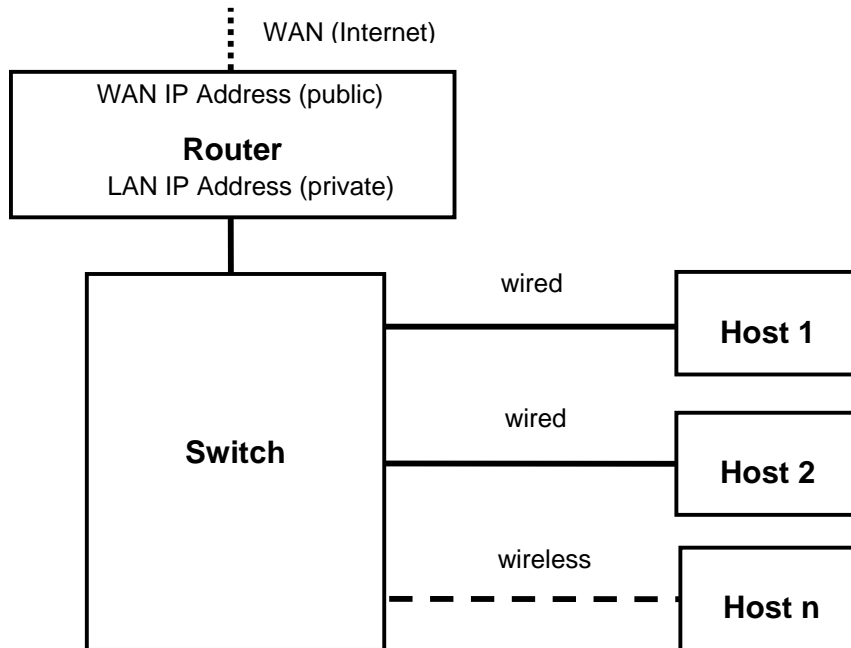
A **router** is computer networking device that acts as an interface between two or more networks to transfer data packets among them. For example, a router may be used to connect a local area network with the network of an Internet service provider. Routing can be done by a dedicated hardware device (router) or it can be done by a computer configured to route the traffic from the LAN workstations to the outside. Routers frequently perform additional functions such as providing a firewall or acting as the DHCP server for the devices (hosts) connected to the LAN (Dynamic Host Configuration Protocol).

Sometimes the switch and the router are combined together in a single package sold as a multiple port router (wired or wireless).

On a LAN, the **gateway** is an IP address that serves as an access point (both entry and exit) to another network. The gateway is typically associated with both a router, which determines where IP packets are sent, and a switch which provides the actual path for the packets in and out of the gateway. The **default gateway** is used by a host when an IP packet's destination address belongs to someplace outside the local area network. When a LAN includes a router, the default gateway address is usually the LAN IP address of the router. When there is no router, the default gateway address may be any IP address of the LAN that is not being used.

The following schematic illustrates some of the concepts just introduced.

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 29 of 36



13.2 IP address

An IP address consists of 4 numbers (1 to 3 digits each) separated with dots. Each IP address used on the same network should be unique.

IP addresses are classified as follows:

Class A: **1**.x.x.x to **127**.x.x.x

Class B: **128.0**.x.x to **191.255**.x.x

Class C: 192.0.0.x to 223.255.255.x

In the above, x is a number between 0 and 255.

Network ID and Host ID: within an IP address, the network ID is defined depending on the class of the IP address and is indicated above in bold. The remainder of the address is the host ID.

Typically a local area network (LAN) uses class C IP addresses. In a class C address, the first 3 numbers define the network ID and therefore, the maximum number of devices on the network is limited to 254 (host IDs of all zeros or all ones are not allowed).

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure Document Type</p> <p style="text-align: center;">Page 30 of 36</p>

13.3 Subnet Mask

The subnet mask is used to differentiate the network ID portion of an IP address from the host ID.

Class A: **255.0.0.0**
Class B: **255.255.0.0**
Class C: **255.255.255.0**

Note: if more network ID's are required, the last number of the subnet mask can be used but this reduces the maximum number of hosts available for each network ID.

13.4 Default Gateway Address

The gateway address used by the host should be the LAN IP address of the router used to interface with other networks (e.g. Internet) or sub-networks. When there is no router, you may try any unused IP address on the network.

13.5 TCP port

TCP ports are used to specify how requests are sent to a device and how a device listens to requests. HW4 makes exclusive use of port 2101 to communicate with devices on the LAN. If using a ROTRONIC Ethernet docking station, this port number is already configured and should not be changed.

13.6 DHCP

A host can be configured to enable DHCP (Dynamic Host Configuration Protocol). This makes sense only if a DHCP server such as a router is present on the network.

With DHCP enabled, the DHCP server senses when a new device (or host) is connected to the network and automatically assigns / configures the device with the next available IP address. The device is also automatically configured with the network subnet mask and gateway address. Using DHCP is simple, guarantees compatibility with the network and eliminates the possibility of conflicting IP addresses.

An IP address assigned using DHCP is also known as a dynamic address. As long as DHCP remains enabled on the host, the host IP address is subject to change. This is not desirable when using HW4.

Once the dynamic address of the host is known, and communication with the host can be established, we recommend to change the host IP address to an unused network address and to disable DHCP on the host. In this manner, the new host IP address is a static address, not subject to change.

13.7 MAC Address

Each individual Ethernet device is given by its manufacturer a unique MAC address that cannot be changed by the user. In a way the MAC address is akin to a social security number.

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure <small>Document Type</small></p> <p style="text-align: center;">Page 31 of 36</p>

13.8 LAN Compatibility requirements

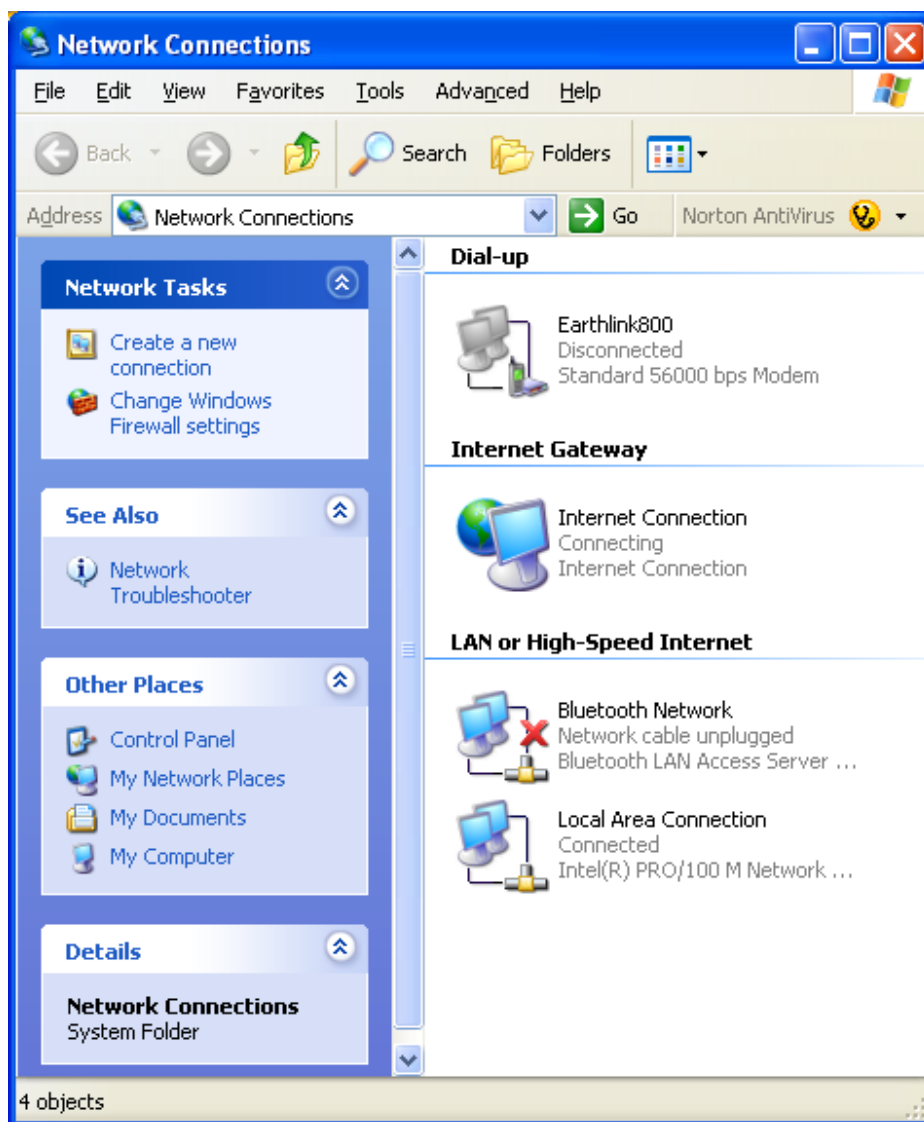
In order for devices (or host) on a LAN to be able to communicate with each other, each device must to be configured as follows:

- **IP address:** each IP address must be unique and must also contain the same network ID. Using class C addresses as an example, all addresses must share the same first 3 numbers.
- **Subnet mask:** all devices must use the same subnet mask. Using class C addresses as an example: all devices must use the subnet mask Class C: **255.255.255.0**
- **Default Gateway:** all devices must use the same default gateway IP address (usually the LAN address of the router).

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type Page 32 of 36

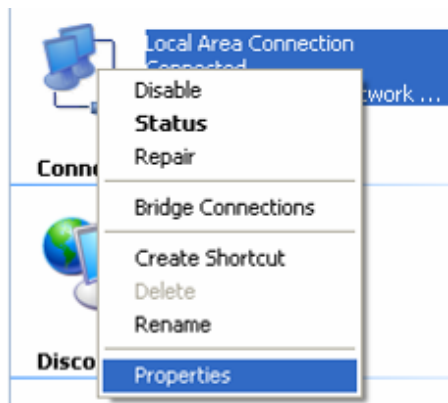
14. Configuring a PC Network Interface Card

- In Windows XP, click on Start > All Programs > Accessories > Communications > Network Connections. This opens the Network Connections folder.

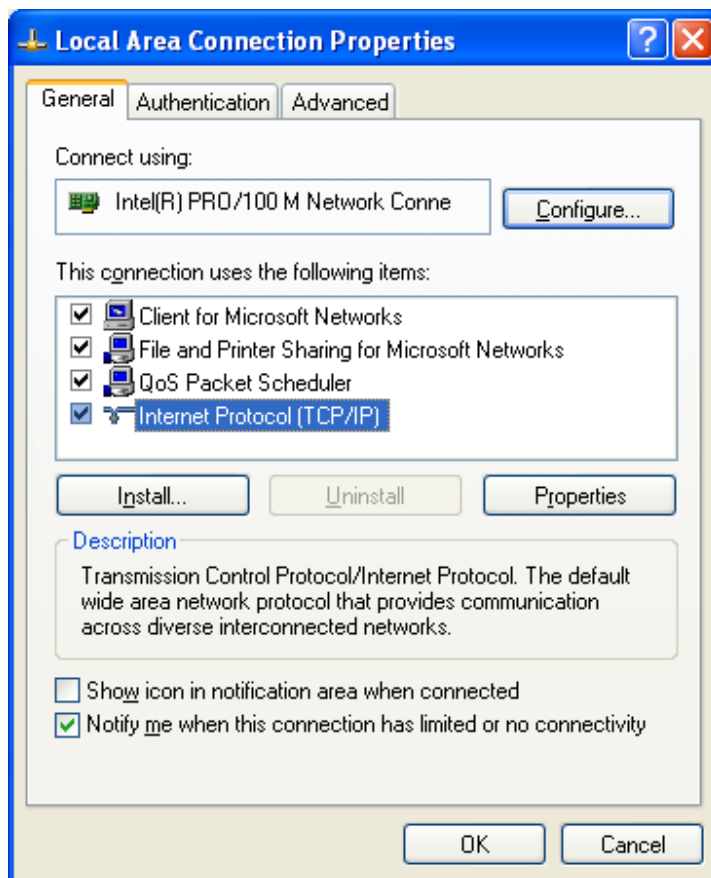


IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure <small>Document Type</small></p> <p style="text-align: center;">Page 33 of 36</p>

- Right click on Local Area Connection and click on Properties:



- In the Local Area Connections Properties, select Internet Protocol (TCP/IP) and click on the Properties button.



IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 34 of 36

Use the following box to view or modify the TCP/IP settings of the PC network interface card (NIC).

- Obtain an IP address automatically: this choice allows a DHCP server such as a router to automatically configure the network interface card. While this choice guarantees that the NIC settings will be fully compatible with the network, the IP address of the NIC is subject to change should the network go down.
- Use the following IP address: this choice causes the NIC to use a fixed IP address which has to be entered manually.

Internet Protocol (TCP/IP) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

Obtain an IP address automatically

Use the following IP address:

IP address: 192 . 168 . 57 . 25

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 192 . 168 . 57 . 90

Obtain DNS server address automatically

Use the following DNS server addresses:

Preferred DNS server: 192 . 168 . 57 . 11

Alternate DNS server: 167 . 206 . 3 . 203

Advanced...

OK Cancel

IMPORTANT:

- The IP address of the NIC must be unique on the network
- The subnet mask must be the same as used by all other devices on the network
- The default gateway must be the local network IP address of the router

IN-E-TCPIP-Conf_12 <small>Document code</small>	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> <small>Unit</small>
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface <small>Document title</small>	<p style="text-align: right;">Procedure Document Type</p> <p style="text-align: center;">Page 35 of 36</p>

15. Windows XP ipconfig Command

In the case of a PC that is set for automatic configuration of the IP settings by a DHCP server, the Windows XP ipconfig command is a very useful tool that provides information on the PC current IP settings. The command also permits a dynamic change of the IP settings without having to restart the PC.

The ipconfig command is used from within the Windows XP Command Prompt which is itself accessed by clicking on Start > All Programs > Accessories > Command Prompt

Ipconfig is used to display all current TCP/IP network configuration values and refresh Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings. Used without parameters, ipconfig displays the IP address, subnet mask, and default gateway for all adapters present on the PC.

- **ipconfig /all** : displays the full TCP/IP configuration for all adapters. Without this parameter, ipconfig displays only the IP address, subnet mask, and default gateway values for each adapter. Adapters can represent physical interfaces, such as installed network adapters, or logical interfaces, such as dial-up connections.
- **ipconfig /renew**: renews DHCP configuration for all adapters (if an adapter is not specified) or for a specific adapter if the Adapter parameter is included. This parameter is available only on computers with adapters that are configured to obtain an IP address automatically. To specify an adapter name, type the adapter name that appears when you use ipconfig without parameters.
- **ipconfig /release**: sends a DHCPRELEASE message to the DHCP server to release the current DHCP configuration and discard the IP address configuration for either all adapters (if an adapter is not specified) or for a specific adapter if the Adapter parameter is included. This parameter disables TCP/IP for adapters configured to obtain an IP address automatically. To specify an adapter name, type the adapter name that appears when you use ipconfig without parameters.

Note: To exit Command Prompt, type **exit**.

IN-E-TCPIP-Conf_12 Document code	<i>Rotronic AG</i> <i>Bassersdorf, Switzerland</i> Unit
Configuration procedures for ROTRONIC devices with Ethernet (TCP/IP) interface Document title	Procedure Document Type
	Page 36 of 36

16. Document releases

Release	Date	Notes
_10	Jan.16, 2007	Original release
_11	May 3, 2007	Made minor editorial changes
_12	May 12, 2014	Update: Port 80 must be enabled for web interface communication