Installation and Programming Manual

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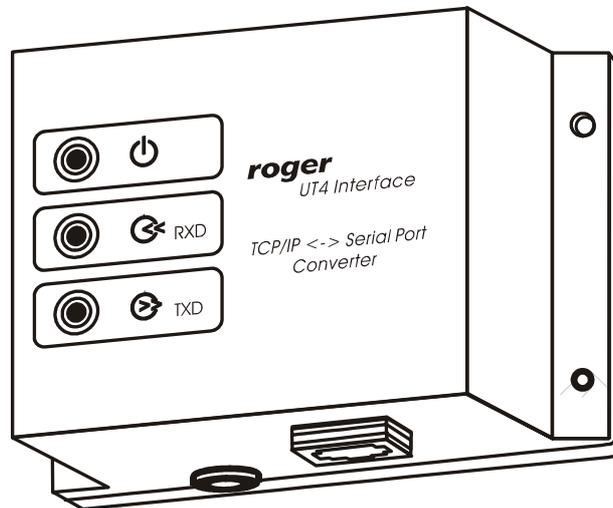
UT-4 v2.0

Communication Interface

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1.   Introduction

UT-4 interface enables communication with devices equipped with serial port trough a computer network. Interface is equipped with serial port which can be configured to RS232, RS422 or RS485 and connected to 100BaseT Ethernet computer network. UT-4 is identified in computer network by its IP address assigned during installation process and factory pre-programmed MAC number. The main component of the interface is the **Digi Connect ME** network module manufactured by **Digi Corp.** All Digi software tools dedicated to this module may be also directly used for UT-4 interface. More information about Digi Connect ME can be found on: www.digi.com.

2.   Limitations of using interface

In most cases utilizing UT-4 interface successfully replaces using physical serial ports, however in some (rare) circumstances it may cause problems with communication or
in extreme situations completely disable it. The main reason for the problems with using
UT-4 are time conditions which exist during sending data packets trough the computer network. These problems may occur especially when communication is realized trough VPN network. Large time delays during data transfer may occur in this type of network. In result it may disable proper data exchange between PC and remote device or control system equipped with serial port. Sometimes the UT-4 can be reconfigured and adopted for specific circumstances. The Digi Connect ME represents high level of advanced technology nevertheless in some situations communication with remotely located device (or system) through UT-4 will not be satisfactory because of specific characteristic of a serial protocol.

> **Note:** To avoid potential problems, it's recommended to perform series of tests in individual installation before purchasing a device.

3.   Controlling data flow in RS485

The control of data flow in RS485 interface is realized on a time base. Normally, when UT-4 is not receiving any data from a the host device (PC), the RS485 operates in *receiving mode* – in this state all data coming from the RS485 serial interface is immediately converted to TCP data frames and forwarded to PC computer. With the first byte of data send from PC to a serial port UT-4 immediately switches to *transmission mode* and all data coming from the host PC is transmitted over RS485. The UT-4 remains in *transmission mode* till moment when PC stops sending data to serial port, return from transmission to receiving mode occurs automatically after ~1.5 ms from the moment of last transmitted bit of data. The flow control method described above is compatible with specification of RACS communication protocol, however in case when UT-4 configured for RS485 and is intended for communication with other devices or systems this method might not be successful.

4.   Using UT-4 interface in RACS

RACS software package was specially adopted for operation with access network connected to PC through computer network. There is a special option **Communication port timeout** which is available in *Network* properties window of PR Master program:

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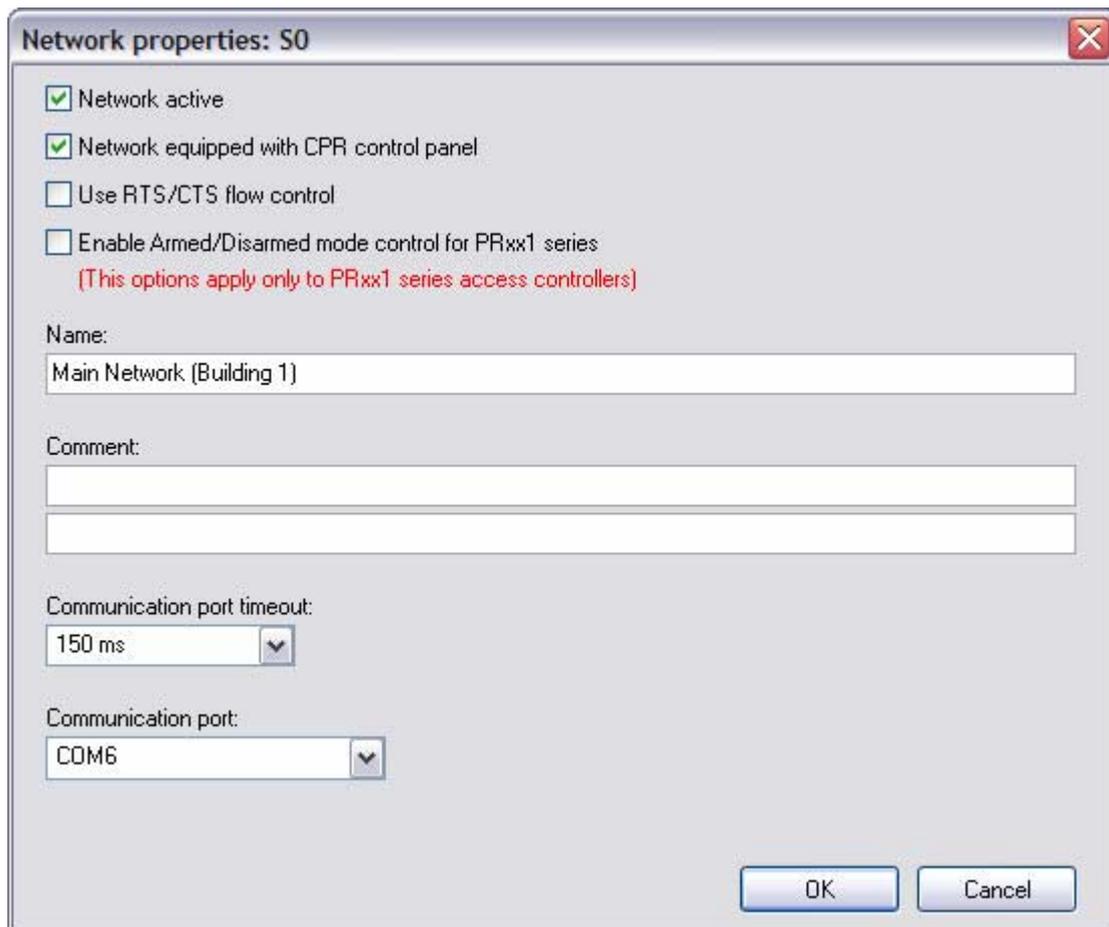
This parameter enables you to adopt the PR Master program for specific conditions of particular TCP connection. It's recommended to set parameter to the highest value of time delay which is expected in communication between PC and remotely located access control system. Remember not to exaggerate with setting the value because it may cause in some situations unnecessary communication slowdown. Practically, it's assumed that *Communication port timeout* which is set for the remote access network connected through LAN or WAN should be defined to value approximately two times higher than average time of TCP packet round-trip. To estimate the round-trip time enter PING [IP Address] –t in CMD console.
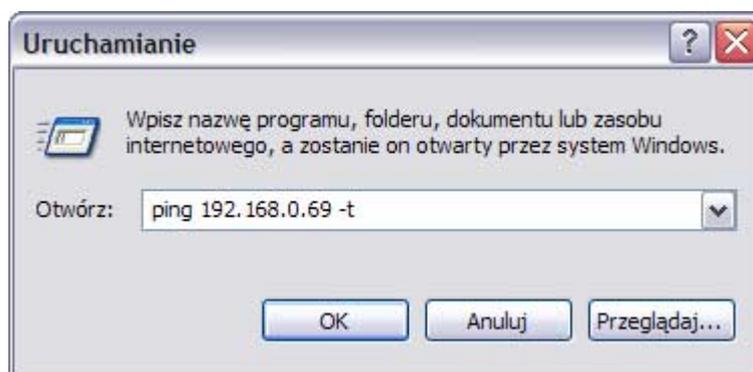
It works by sending ICMP "echo request" packets to the target UT-4 interface and listening for replies (ICMP "echo response" packets). Ping additionally provides estimates of the round-trip time and packet loss rate between host and UT-4. Test should be carried out in time not shorter than 1 minute when network is highly loaded. In case the round-trip time exceeds 200-300ms, it's highly probable that in this case problems with communication between remote access control system and PC computer will occur. You should turn to your network administrator regarding this issue and ask for some action which could reduce delays in computer network.

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> **Note:** It's strongly recommended not to use a UT-4 interface for management of PRxx1 access controllers (e.g. PR301, PR201 and PR311). When during transmission of settings to those types of controllers the communication will be broken the only way to restore controller's operation is to perform *Memory Reset* procedure. The *Memory Reset* requires intervention inside device's casing which might be very inconvenient when access controller is located in remote locations. This threat doesn't concern the PRxx2 series access controllers, those devices employs *transactional* method for transmission of settings. This method guarantee that in case of transmission failure controller will automatically restore its previous configuration settings and operator will be allowed to repeat transmission to controller without visiting remote location where controller is installed.

5. Purpose of this document

This document describes installation process and configuration of the UT-4 interface for a *Virtual Serial Port*. This document is not intended to describe in details all potentials configuration of Digi Connect ME network module in details. In case when UT-4 have to be used in other configuration you must refer to full documentation of Digi Connect ME module available on manufacturer's web site or refer to documentation and software delivered with device.

> **Note:** Because the Digi Connect ME network module is constantly improved and enhanced, we recommend to get the most actual version of firmware and documentation direct from Digi Corp. web site.

6. Installation

Installation process consist of electrical connection and software installation on PC as well. Connection method according to appropriate communication standard is demonstrated on pictures attached to this manual. Below, you may find a list of installation steps which guide you trough configuration of UT-4 as a virtual serial port in various operating systems.

7. Installation in MS Windows XP and 2K

Installation is carried out by **Digi Device Setup Wizard.**

1. Before installation, check the following issues:

- Interface is connected and powered up
- You know the MAC address of individual UT-4. This number is written on the white label placed on a Digi Connect ME module (to see this label you must disassembly a plastic cover of UT-4). The MAC number is helpful to identify the UT-4 in case you have more then one UT-4 assigned to the same IP number. The factory new UT-4s have the same IP number so the MAC address might be necessary.
- Make sure that you do not have any firewall software running on the computer. Firewall software will prevent the setup wizard from discovering the device on your local network.

2. Start **Digi Device Setup Wizard**

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3. Click *Next >* to continue
4. The following window with listed UT-4 interfaces will appear:
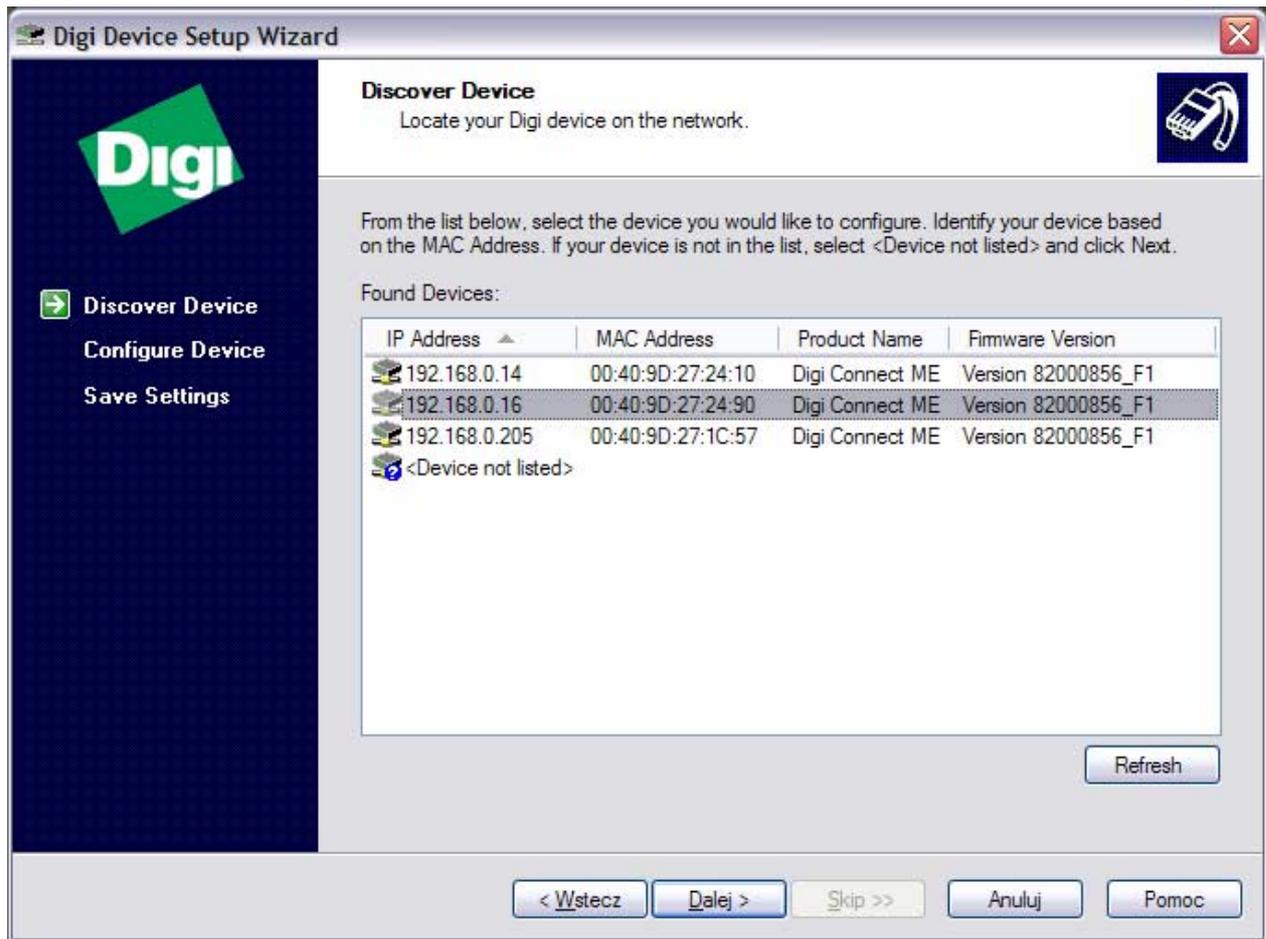
5. Select device which you want to configure. To identify your interface you may use MAC address. Click *Refresh* to rediscover procedure.

List displays information about IP, MAC address, device name and firmware version.

6. Click *Next >* to continue, the following window will appear:

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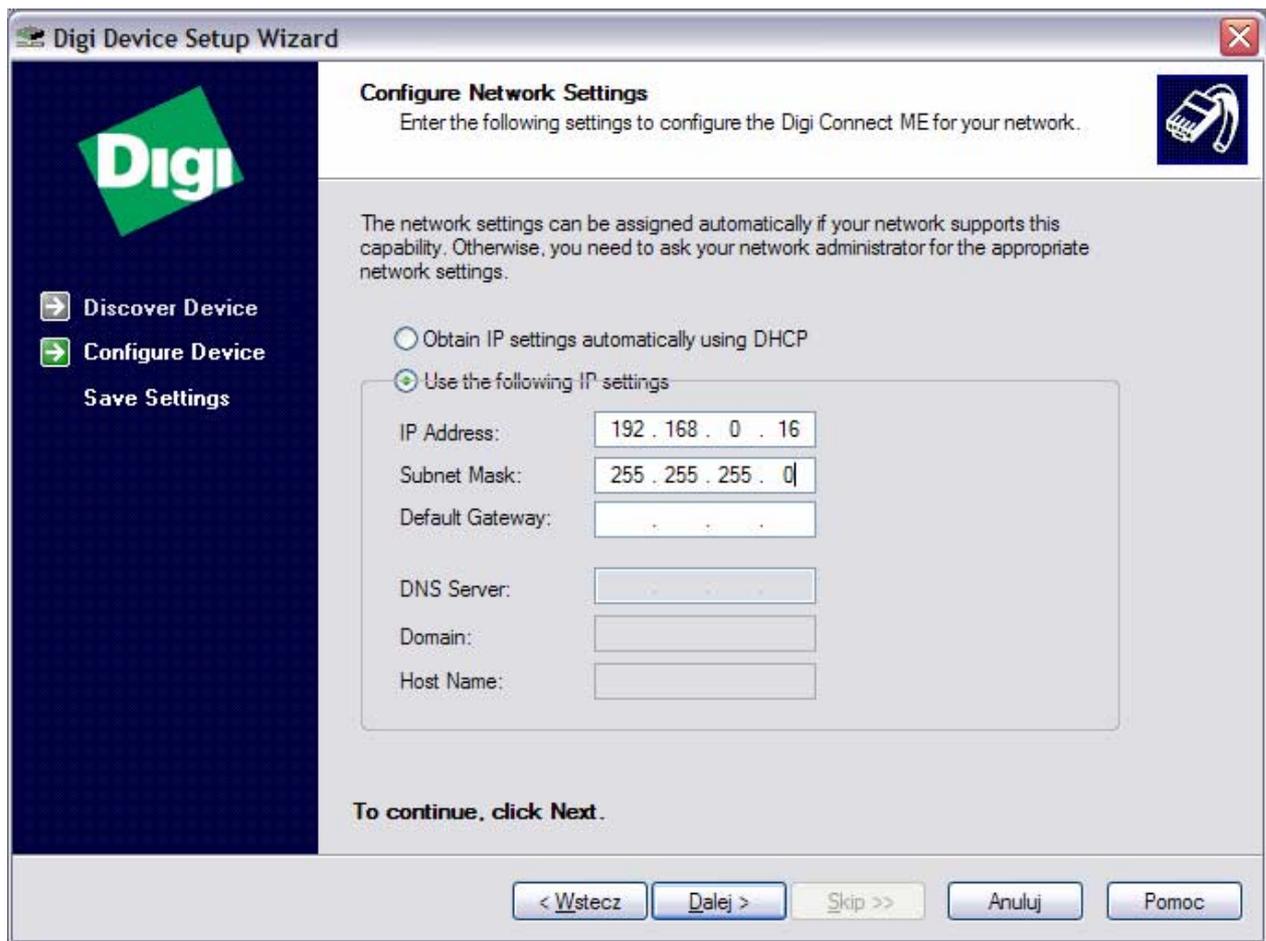
7. To configure network settings, make selections on this page:

- **Obtain IP Address settings automatically using DHCP** - this option requires a DHCP server to assign network settings. The UT-4 is shiped with the DHCP client feature enabled. So if your site has a DHCP server, choose this setting and your UT-4 will request network settings from the server.
- **Use the following IP settings**

8. The second selection requires that you gather network setting information from your network administrator and then input it on this wizard page. The **IP address** and **subnet mask** are required, other fields are optional.

9. Click **Next >** to continue, the following window will appear:

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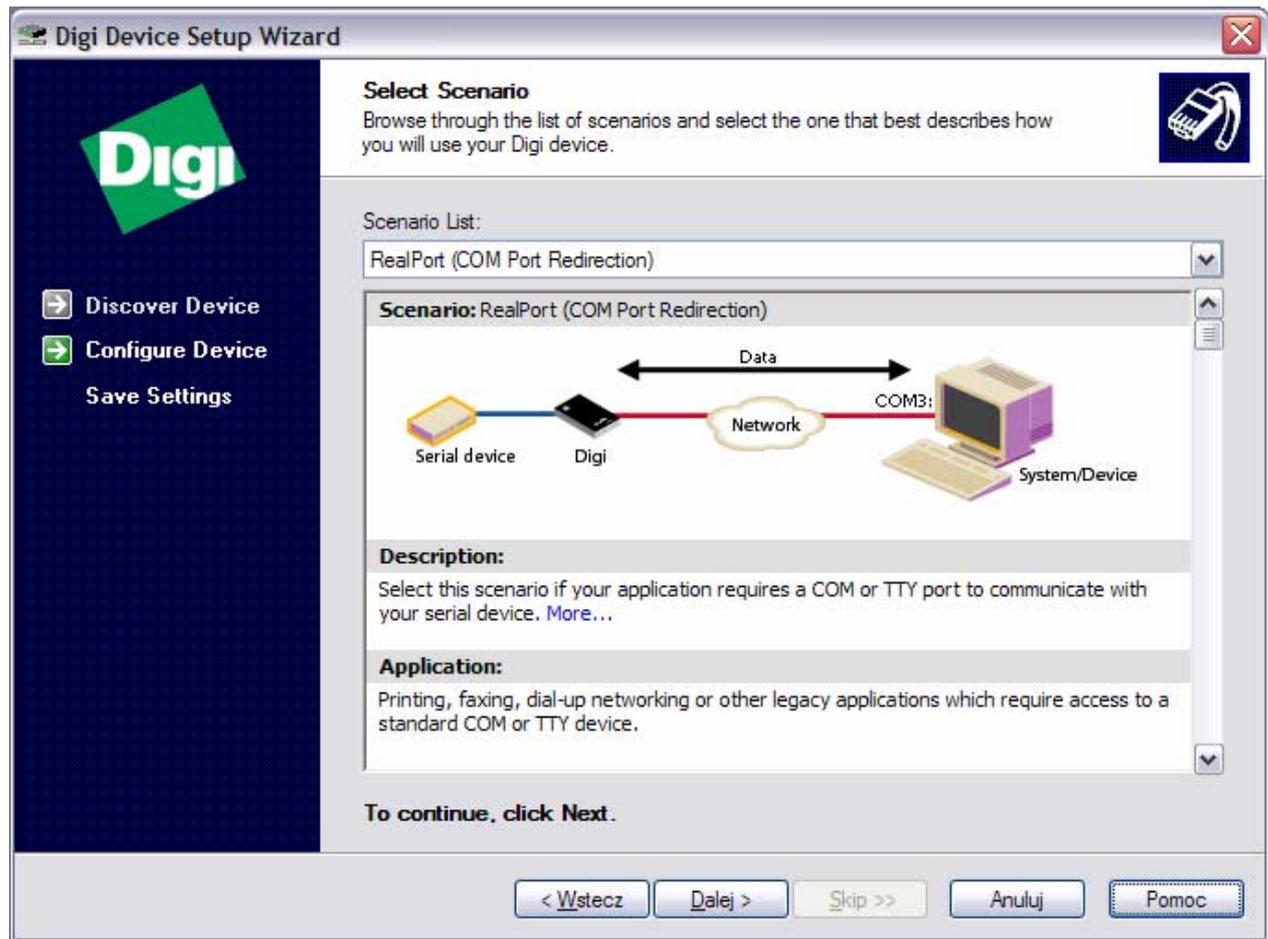
10. Select *RealPort (COM Port Redirection)* option from *Scenario List.* With the *RealPort* technology you will obtain a new virtual COM port in you computer. This new COM port can be used by various application as it was a real serial port like COM1, all data send/receive to/from this virtual COM port will be in fact redirected to UT-4 Digi module.

11. Click *Next >* to continue, the following window will appear:

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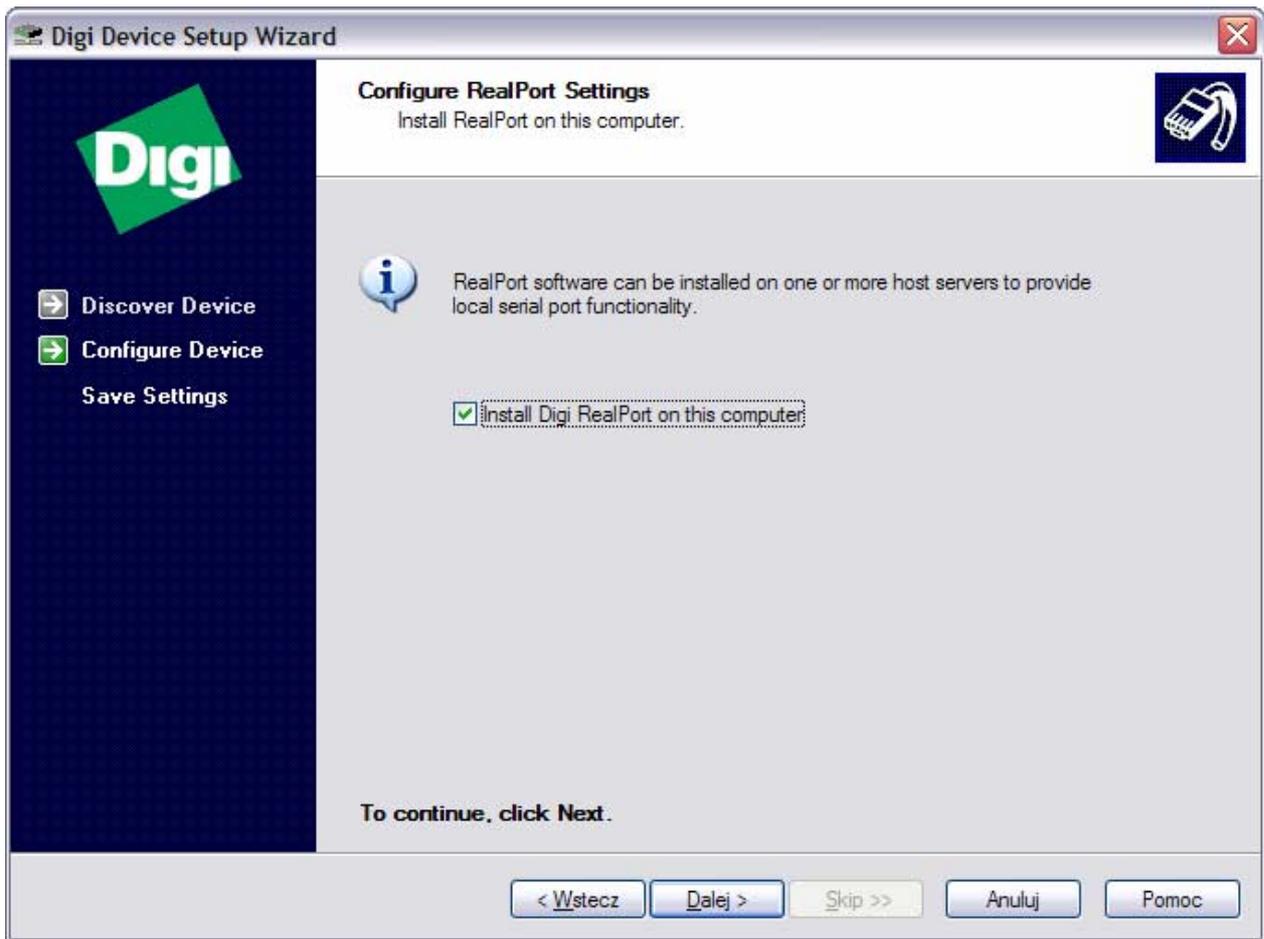
 12. Check option: *Install Digi RealPort on this computer* and click *Next >* to proceed to
the next step.

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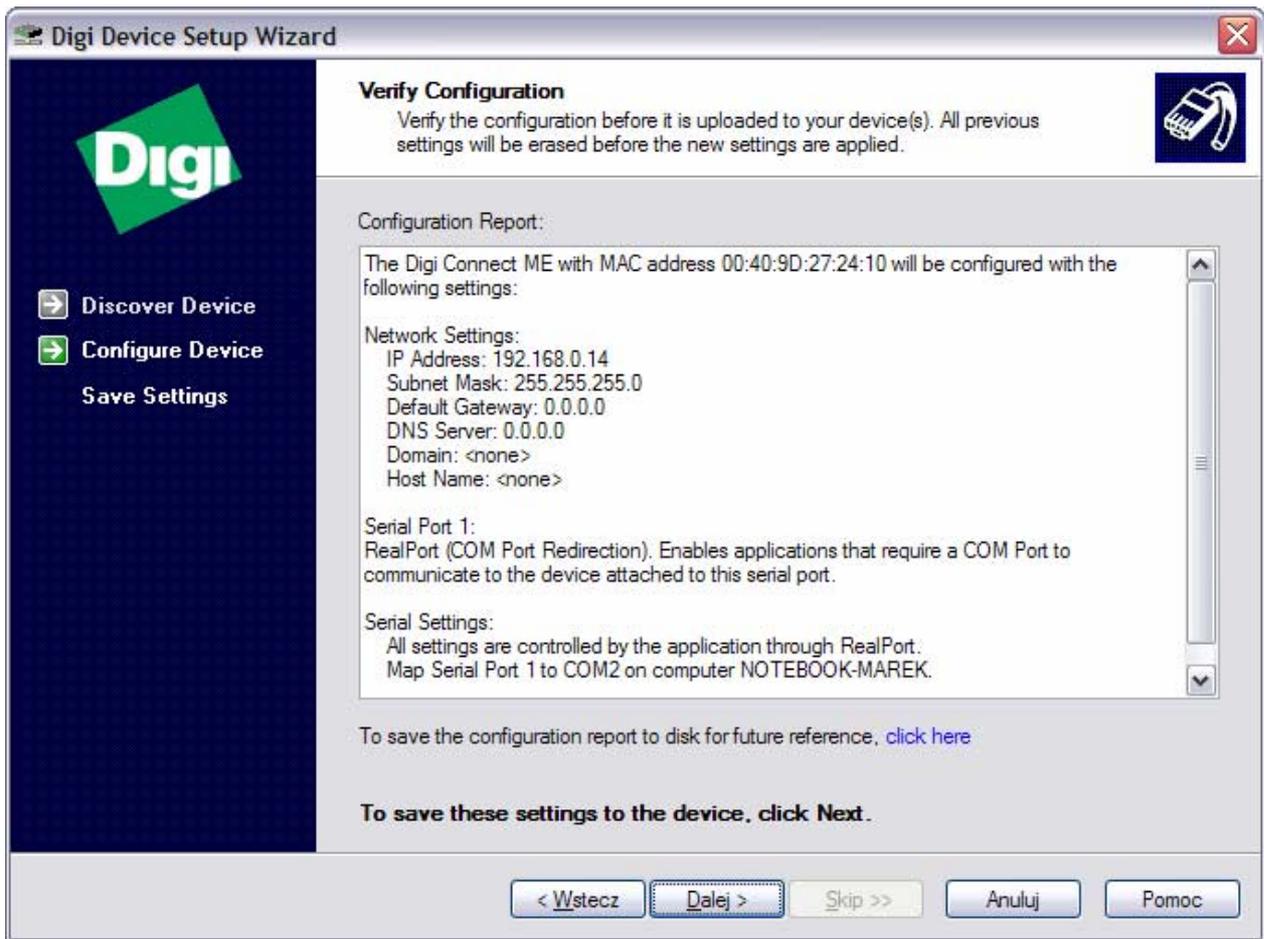
13. Verify the device and port configurations. If you are satisfied with the configurations, click **Next >** to apply them to the device. Otherwise, if you would like to change any of the configurations, click **< Back**.

14. You can save configuration report. To do this **click here.**

15. To transfer configuration settings to the device, click **Next >**.

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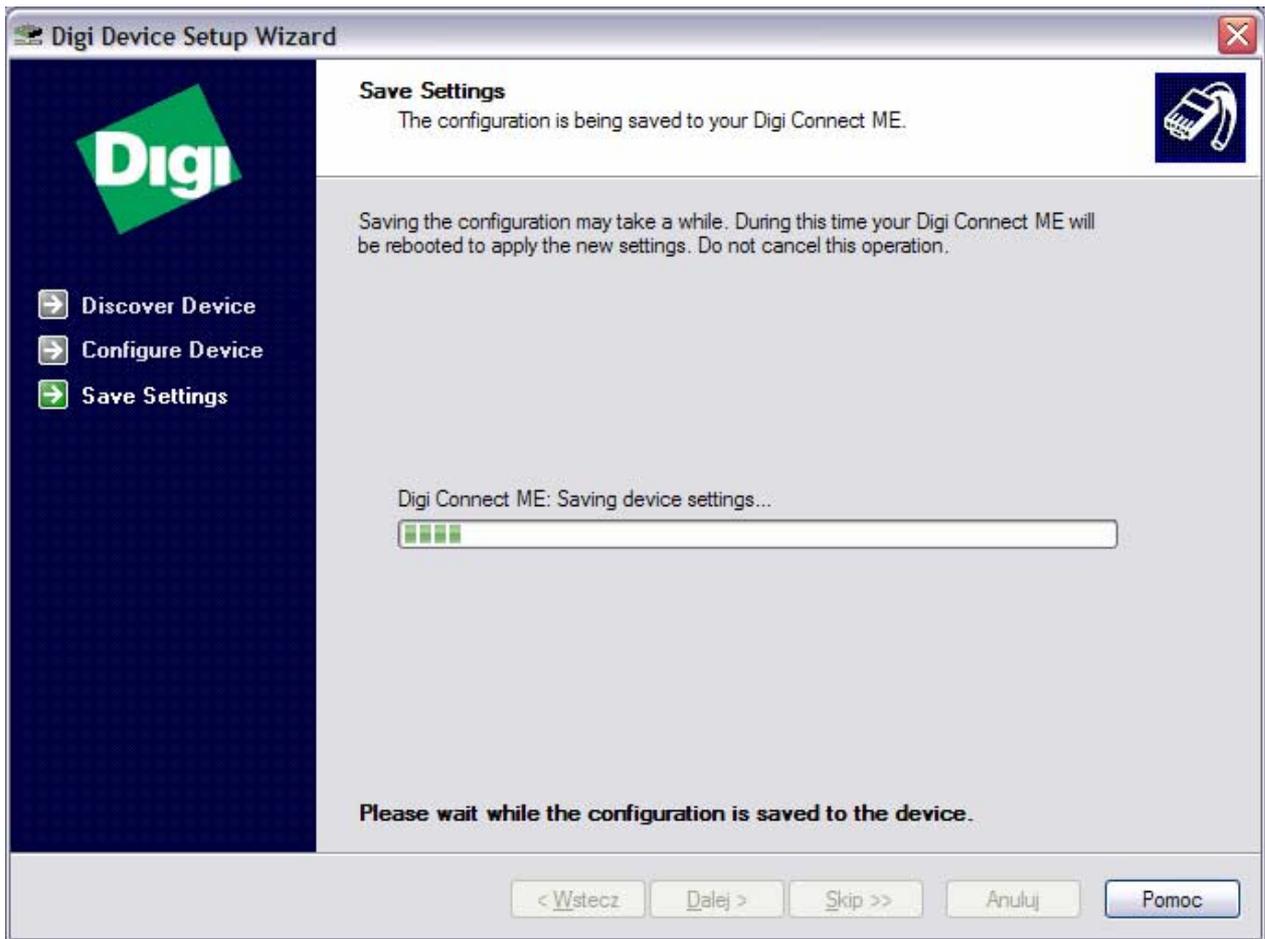
Do not cancel this operation, after the installation the following window will appear:

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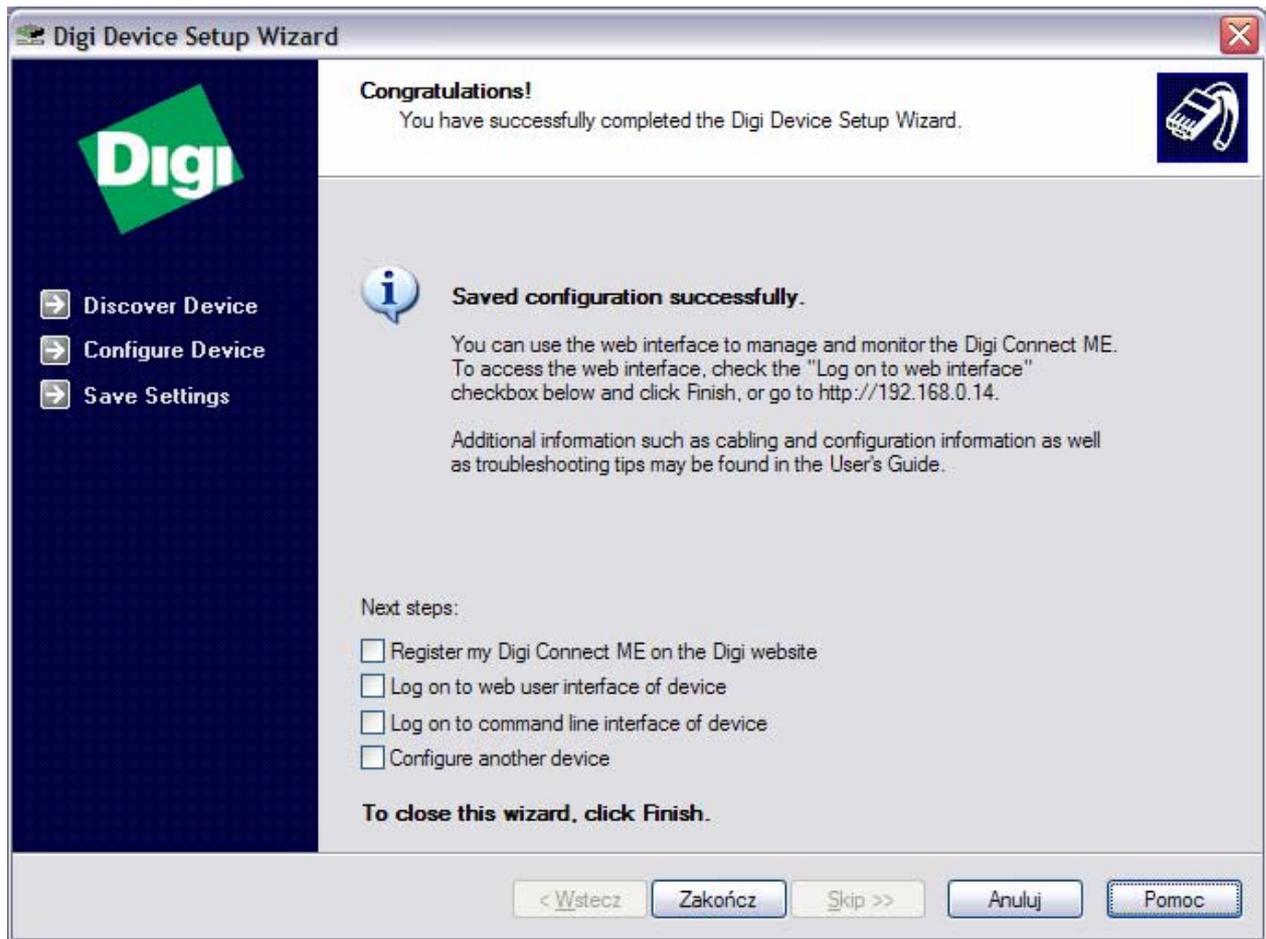
16. Configuration has been successfully transmitted to the device. Click Finish to close this wizard.

After the installation a new serial port will appear in Device Manager. This port can be used on the same rules as it was a real one.

8.   Installation on MS Windows 9x/ME

1. Open *Start* -> *Settings* -> *Control Panel*

2. Locate and run the control panel named *Add New Hardware*

3. Windows indicates that it will next search for new Plug and Play devices, which may take a few moments. Choose *Next >* to continue

4. If Windows finds any new Plug and Play devices for which it has installation files, it will install them and will complete the Add New Hardware Wizard. If this happens, rerun the Add New Hardware Wizard. Otherwise, Windows may find some devices for which it doesn't have installation files and will list them now.
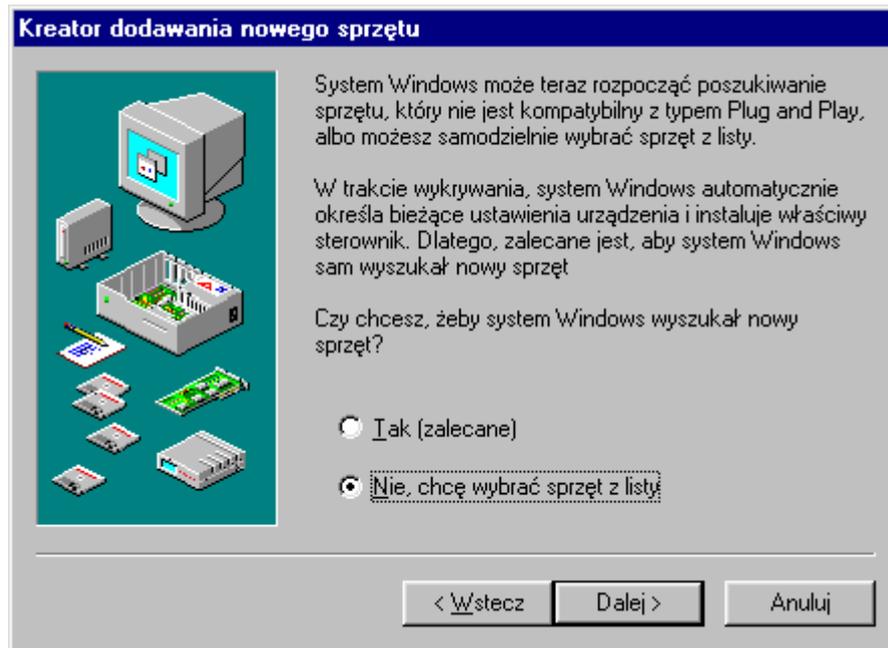
5. Click **No, the device isn't in the list.** Choose **Next >** to continue. (This dialog does not appear in Windows Me.)
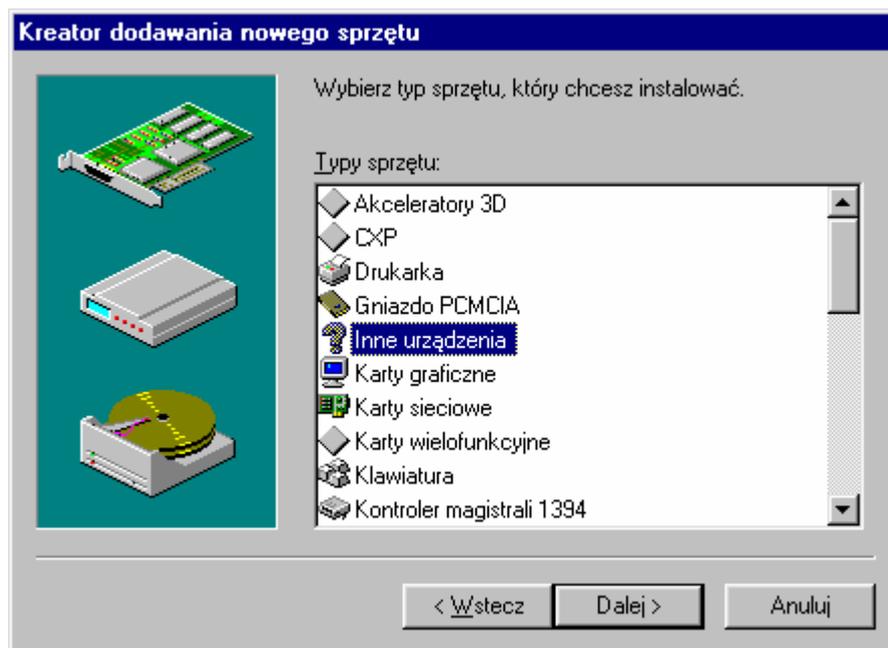
6. Windows displays a list of hardware categories. Select **Other devices** and choose **Next >** to continue.

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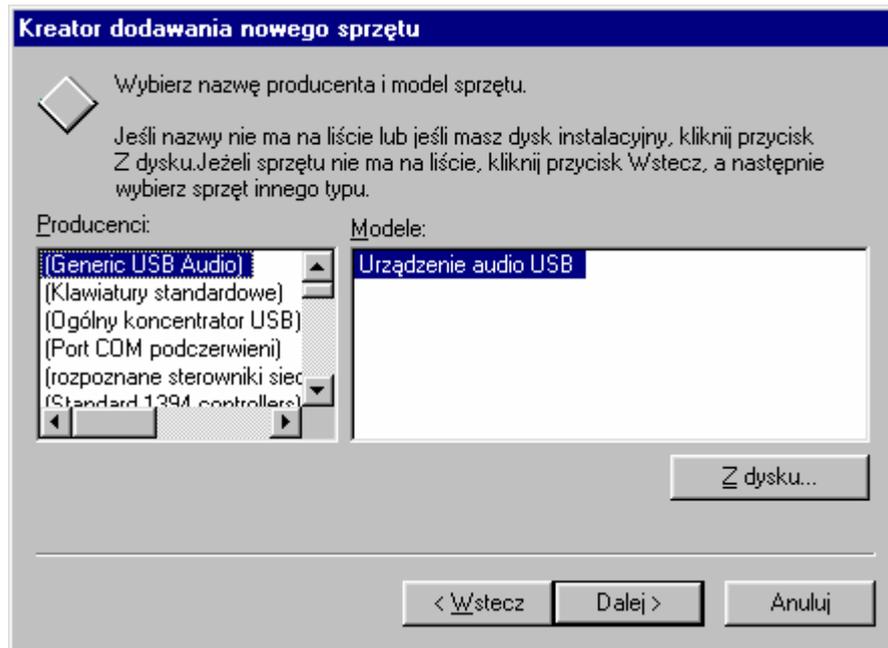
7. Windows will display a list of known hardware in the category previously selected. Don't select any device from the list. Instead, choose **Have Disk...** to point Windows to the location of the installation files.
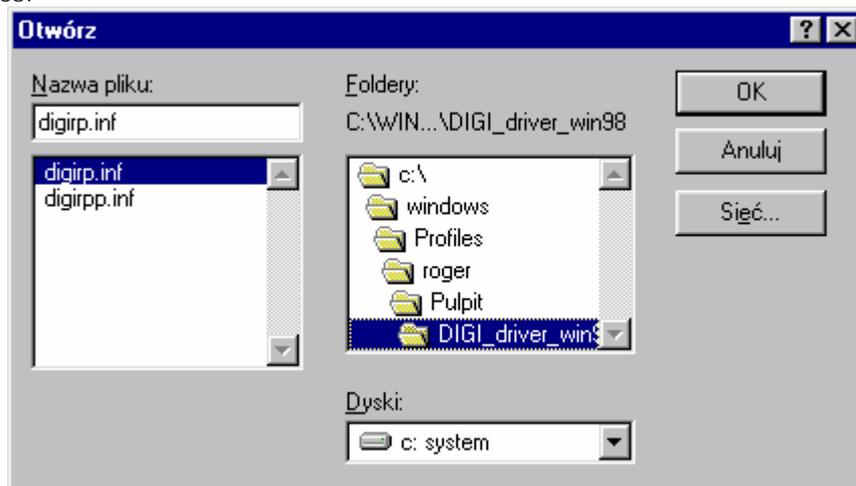
8. Enter the path to the Digi driver file and click **OK**.
(The newest version of software, drivers and firmware can be downloaded from site:
www.digi.com)

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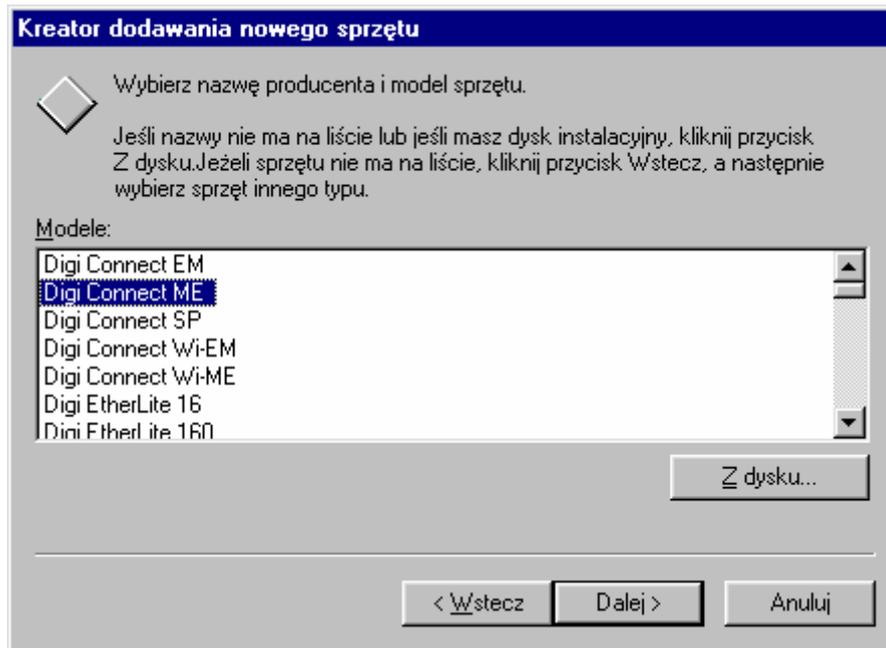
9. Windows now searches the indicated directory for installation files and displays a list of devices it can install. Select Digi Connect ME on the list, and choose *Next >*, the following window will appear.
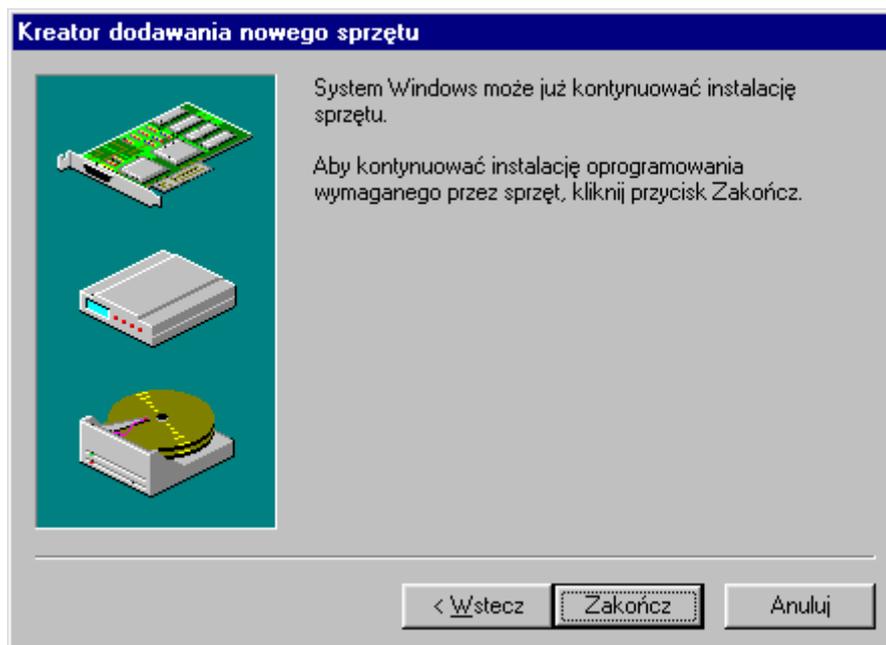
10. Choose *Finish* to continue the installation. The following window will appear:

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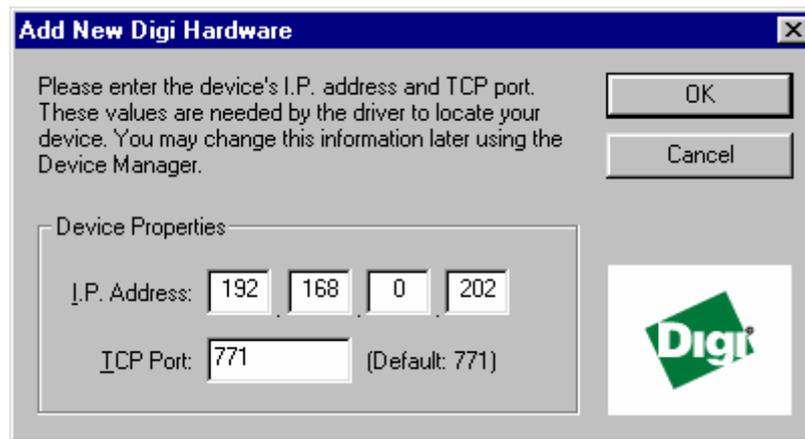
10. Enter IP Address and TCP port.
11. Click *OK* to finish installation.

After the installation a new serial port in Windows Device Manager will appear. This port can be
used on the same rules as it was the real one.

9.   Reconfiguration

Whenever required the current Digi module settings can be changed. You can either do it using
dedicated software or directly from your internet browser. To access UT-4 from web browser enter
IP address defined during configuration in address field and log. When the internet browser connect
with Digi module it will ask you for username and password, enter following:

- Username: *root*
- Password: *dbps*

Note: Reconfiguration of a Digi device requires professional knowledge of network technology and
Digi module. The information presented in this manual are not intended for detailed setup of Digi
network module.
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10. Uninstallation

To remove virtual serial port from the system follow these steps:

- click *Start* -> *Control Panel* -> *System*
- select *Hardware* tab -> click on *Device Manager*

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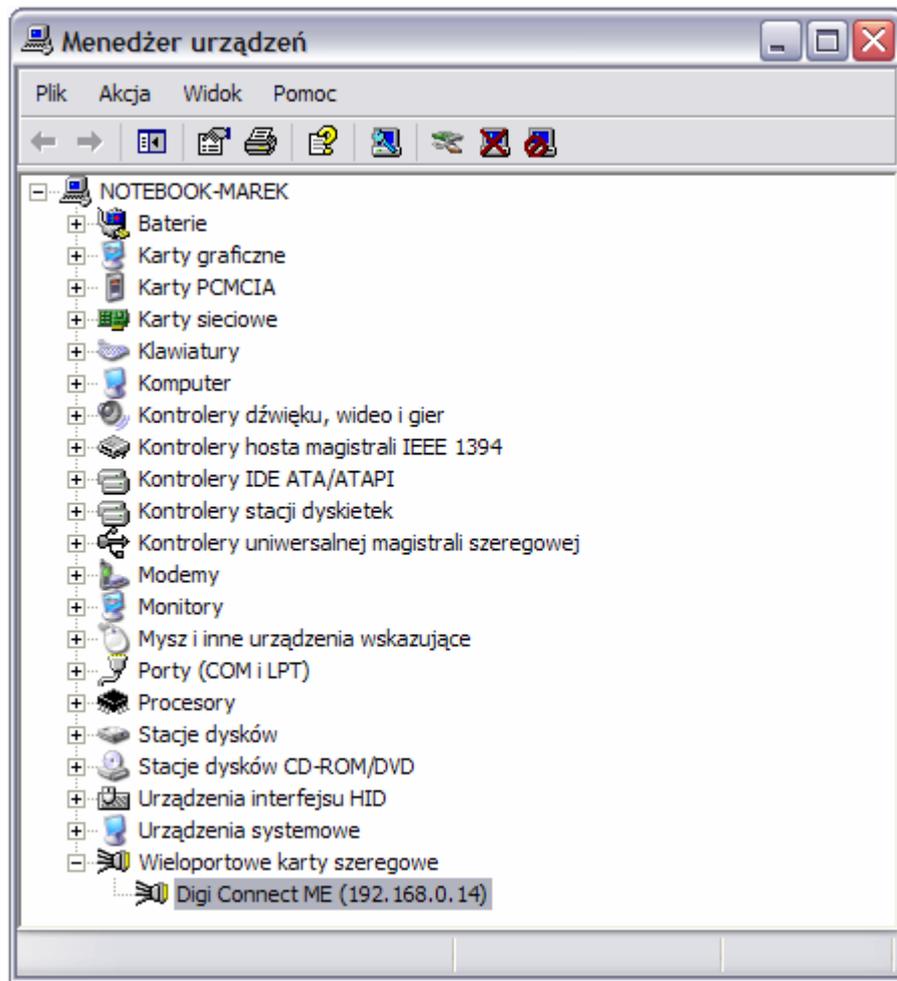
- expand **Multi-Port Serial Adapters**
- click right-mouse on port which you want to remove (Standard Realport Device) and select **Uninstall**

Note: VSP ports exist also in LPT and COM ports category. Remember: don't remove them from there. They'll be automatically removed after uninstallation of Multi-Port Serial Adapters.

Technical Specification	
Power supply :	10.0 …15VDC
Input current :	average 75mA, max. 150mA
Serial interface	RS232, lines: RXD, TXD, RTS, CTS, GND RS422, lines: TXA, TXB, RXA, RXB RS485, lines: A and B
Ethernet standard	10/100Base-T Ethernet
Range of ambient temperature: :	0..55°C
Relative humidity :	10..90%
Dimensions (W x L x H) :	100 X 68 X 35
Weight :	Approx. 110g
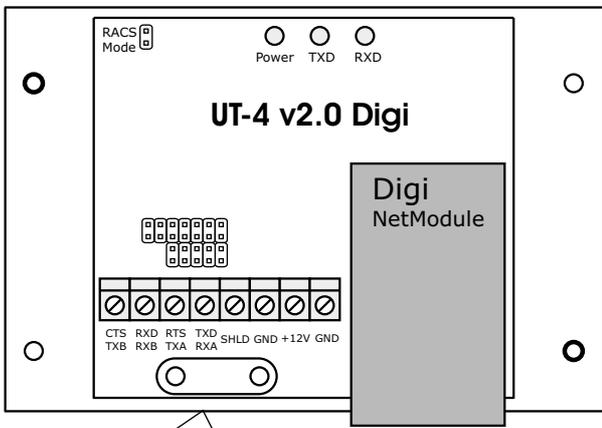
Serial Interface Selection

RS232		RACS Mode
RS485		RACS Mode
RS422		RACS Mode
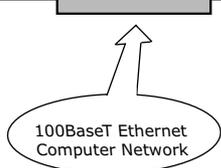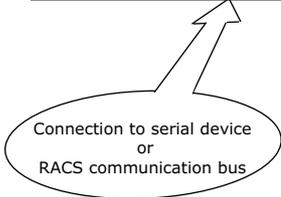
Note: The flow control (switching of the RS485 interface between transmitting and receiving) is provided by a time method. Normally, as a default, the RS485 interface operates in "receive" mode, all data which comes to RS485 lines is immediately retransmitted through TCP to host device (PC). With the first byte of data which is transmitted by host to UT-4, the RS485 interface automatically switches to "transmit" mode and remains in this mode as long as host continues sending of data. The UT-4 swicthes automatically the RS485 to "receive" mode after 1.5ms from the moment when last bit was transmitted by host unit (PC) to the UT-4.

Connection to RS232

Connection to RS485

Connection to R A C S

Note: The connection of CTS and RTS lines to CPR-32SE network controller is optional and is available for CPR firmware versions 31 and higher.

Connection to RS422

Communication between RACS system and managing computer.

Communication between two serial devices (e.g. Between CPR and PRxxx controller)
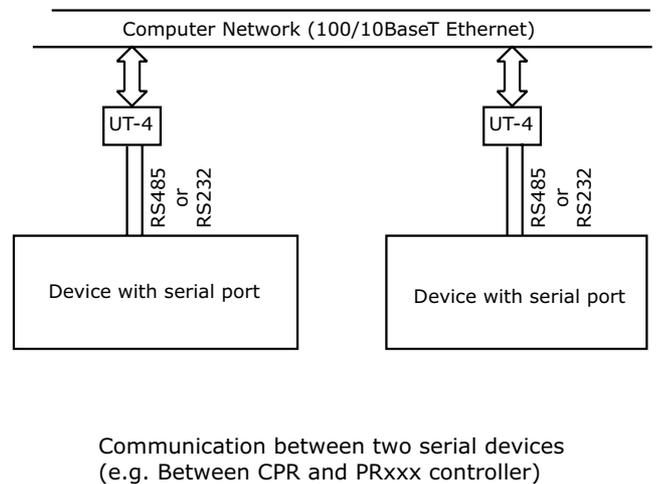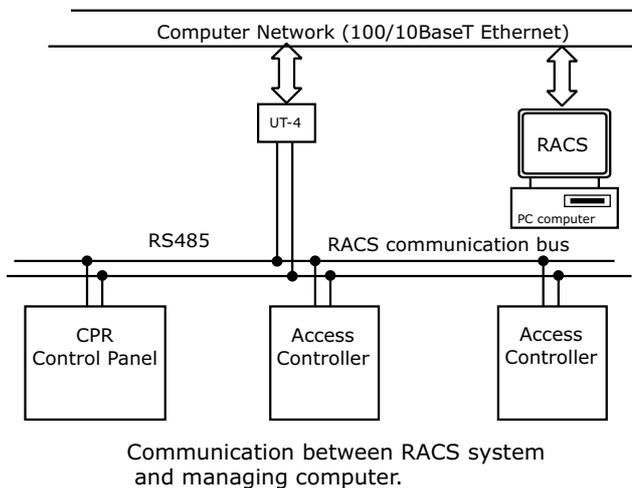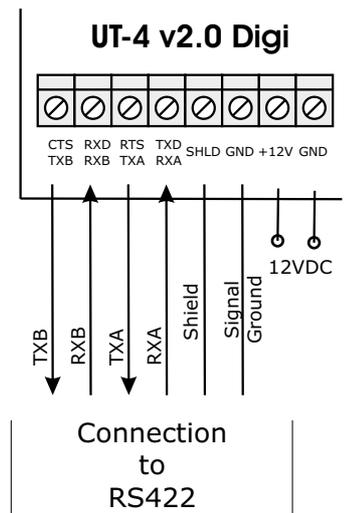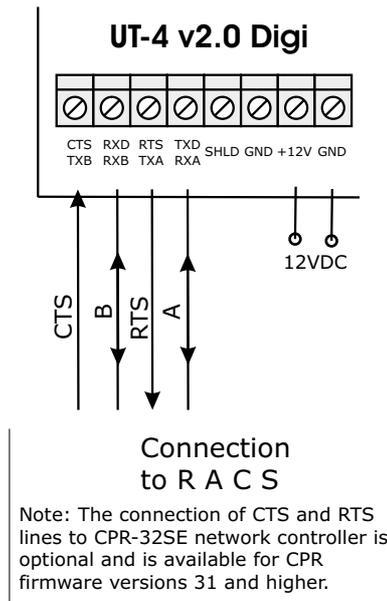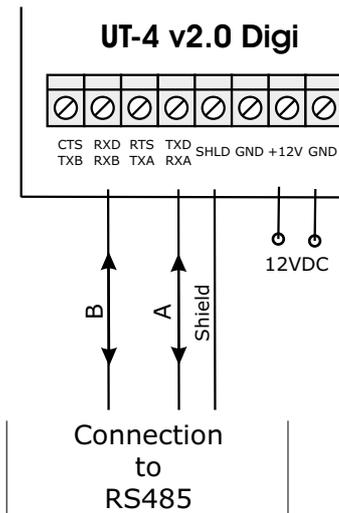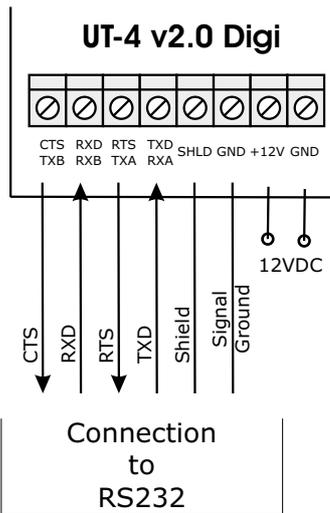
Configuration and wiring of the UT-4 v2.0 Digi

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