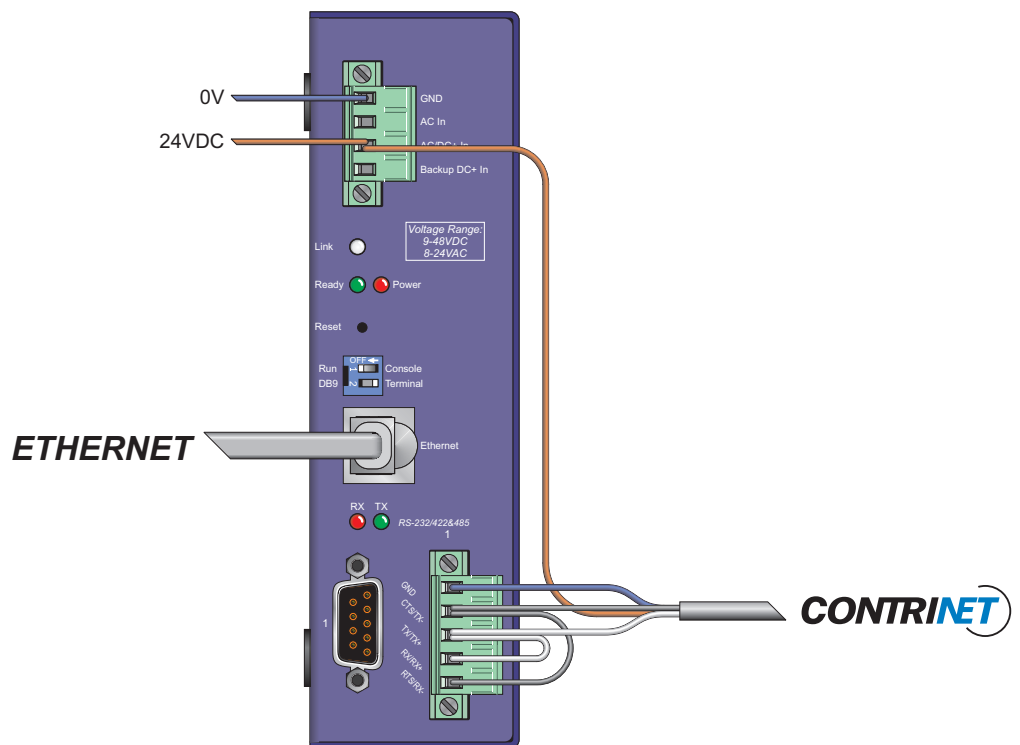


## INDUSTRIAL TCP/IP INTERFACE RIS-1613-400





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# USER MANUAL FOR INDUSTRIAL TCP/IP INTERFACE

## INDUSTRIAL TCP/IP INTERFACE PACKAGE

### Hardware and principle

#### Definition of TCP/IP

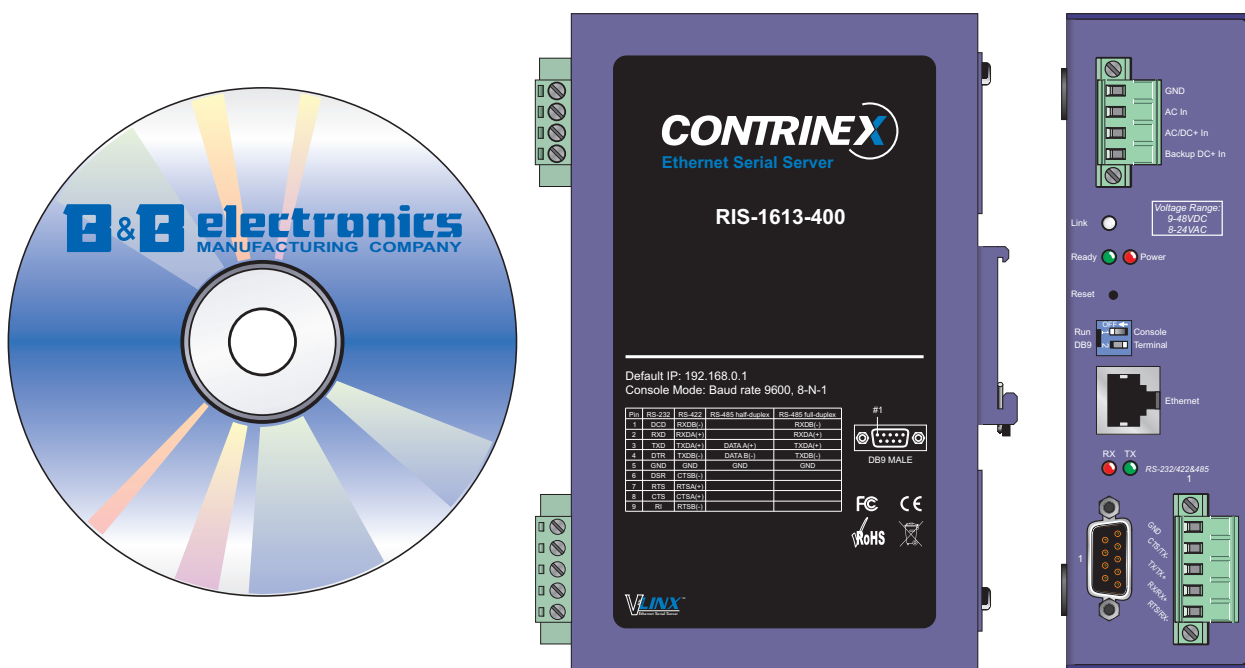
The acronym TCP/IP means “Transmission Control Protocol / Internet Protocol”.

TCP/IP is a set of all the communication rules on Internet and is based on the concept of IP addressing, that means that it provides an IP address to every machine on the network in order to deliver data packets. TCP/IP was originally created for military purposes and it is designed to meet a certain number of criteria including:

- splitting messages into packets;
- using a system of addresses;
- routing of data over the network;
- error checking of data transmission.

#### Content of the Industrial TCP/IP package

The Industrial TCP/IP Interface package contains the interface RIS-1016-400, a CD ROM with the VLINX ESP Software and the complete User Manual and a Quick Start Guide.



#### Typenspektrum / Types disponibles / Available types:

Artikelnummer Numéro d'article Part number	Typenbezeichnung Désignation Part reference	
720 200 032	RIS-1613-400	Industrial TCP/IP Interface

#### Comment

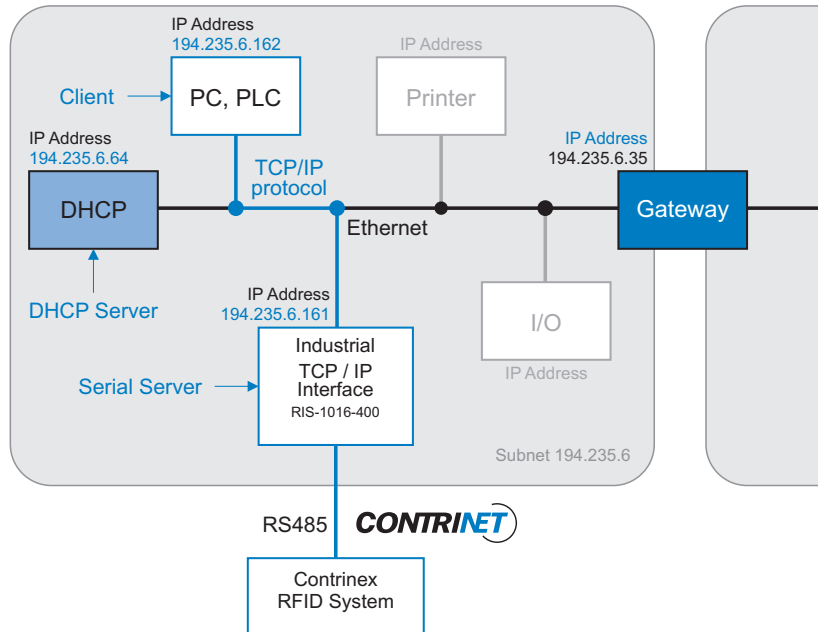
The Industrial TCP/IP Interface needs a power supply in the range 9 to 48VDC or 8 to 24VAC. Contrinex recommends the use of a 24VDC power supply which will also supply its RFID systems.

# Operating principle

## Block diagram of an Ethernet network

Ethernet (also known as international standard ISO/IEC 8802-3) is a standard data transmission for local area network (LAN) based on the following principle: all machines on an Ethernet network are connected to one line of communication made up of cylindrical cables.

Figure below shows an Ethernet network.



## Description

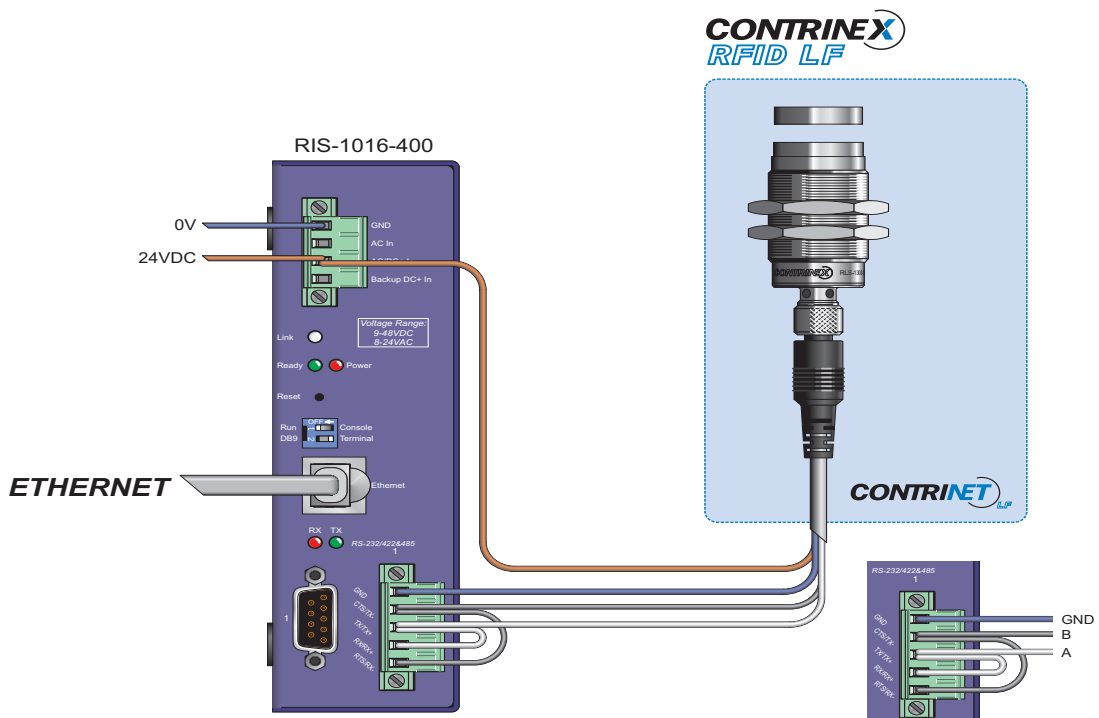
All entities connected to the network have an IP address.

DHCP (Dynamic Host Configuration Protocol) server automatically assigns an IP address to a machine when this one is connected to the network.

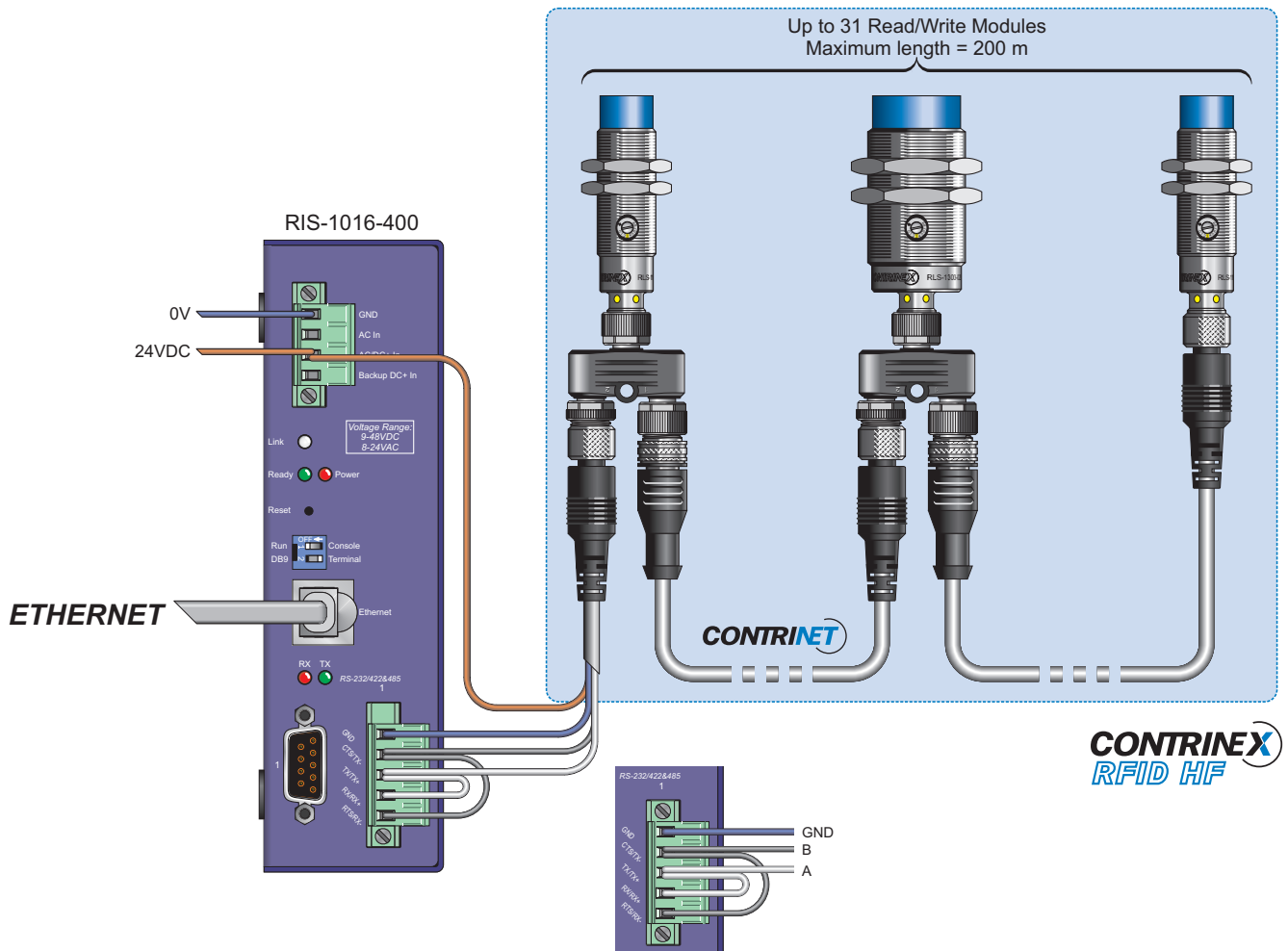
It is possible to have multiple subnets. Gateways between the subnets allows them to communicate together.

The client (PC, PLC, etc) can communicate with Contrinex RFID system through the serial server (TCP/IP interface) using a TCP/IP protocol.

## Connecting the hardware for a Low Frequency (LF) application



## Connecting the hardware for a High Frequency (HF) application



### Description

Connect the 24V power supply to the interface. It is also dedicated to supply the Read/Write Module(s) (RWM) of the RFID system.

Connect the Ethernet cable to the LAN or to a computer Ethernet port.

When power is applied to the interface, the **Power** LED lights, the **Ready** LED flashes. When an Ethernet connection is made, the **Link** LED flashes.

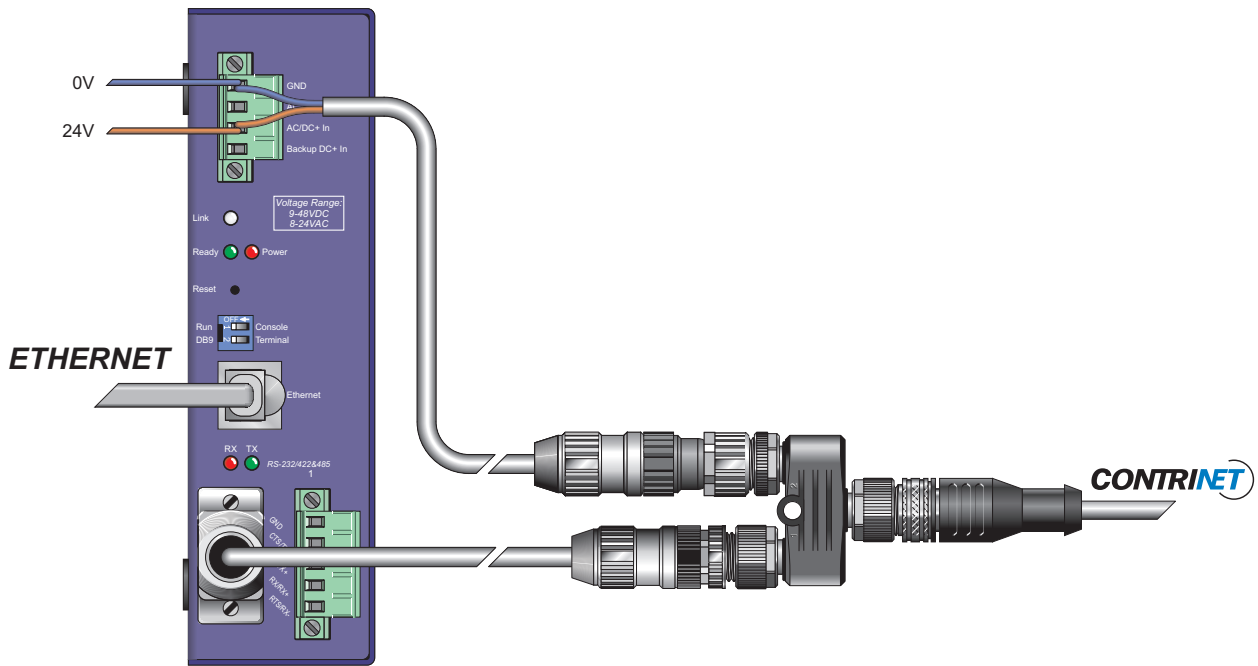
When power is applied to the RWM, the LED lights up (or flashes when a transponder is in front of the RWM).

In a low frequency application, one RWM can be connected directly on the TCP/IP interface. It is also possible to connect to the RIS-1016-400 an RIT/RIS-149X-000 interface which allows to communicate with up to 4 RWMs.

In a high frequency application, the interface allows to connect up to 32 RWMs on the Contrinet (RS485 field-bus).

### Comment

Instead using the five-terminal removable terminal block, Contrinex offers the possibility to use the DB-9M connector by means of a special cable. As the DB9 terminal doesn't provide the power supply for the Contrinex RFID system, a special cable for the power supply is available. In order to connect these two special cables to the ContriNet network, a T-Connector is required (see figure below).



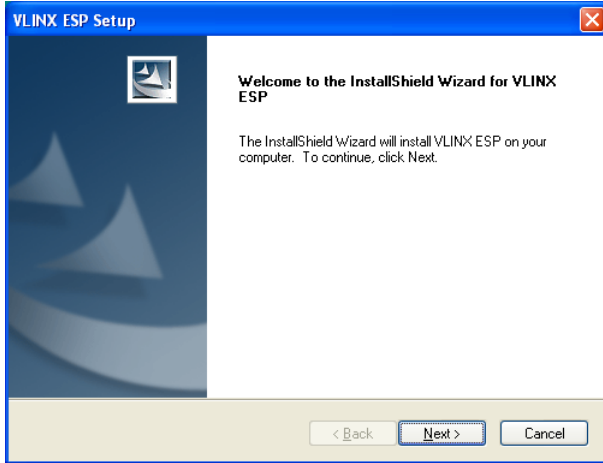


# VLINX ESP MANAGER

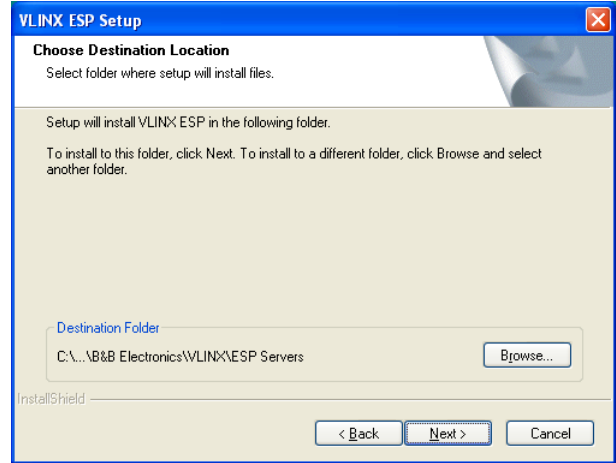
## Installing the VLINX ESP Manager Software

### Description

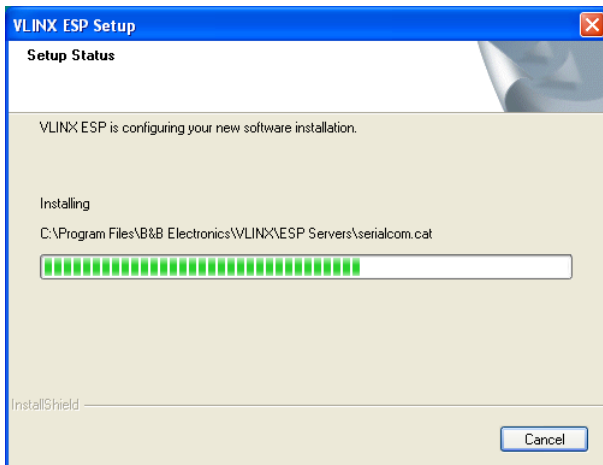
Below are the display which will be encountered when installing the VLINX ESP Manager Software. A detailed Manual is on the CD-ROM.



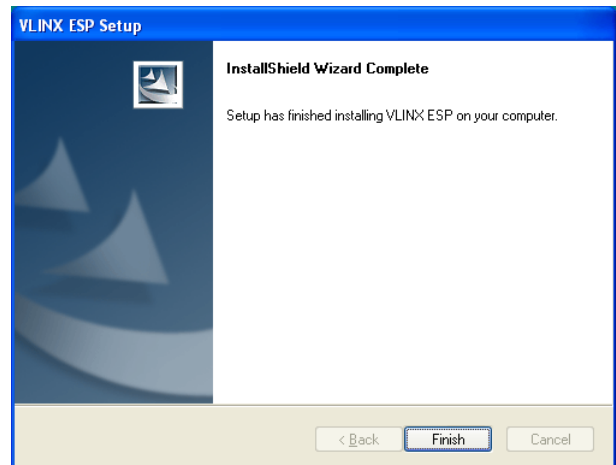
1. Welcome display. Click **Next**.



2. Choose destination and click **Next**.



3. Installation.  
Warning concerning the compatibility with Windows are ignored.



4. VLINX ESP Manager has been successfully installed. Click on **Finish**.

### Features of VLINX ESP Manager software

VLINX ESP Manager software allows to:

- Search for servers connected to the network
- Display and change the configuration of those servers
- Install virtual COM port on the computer
- Display and configure virtual COM ports
- Uninstall virtual COM port on the computer

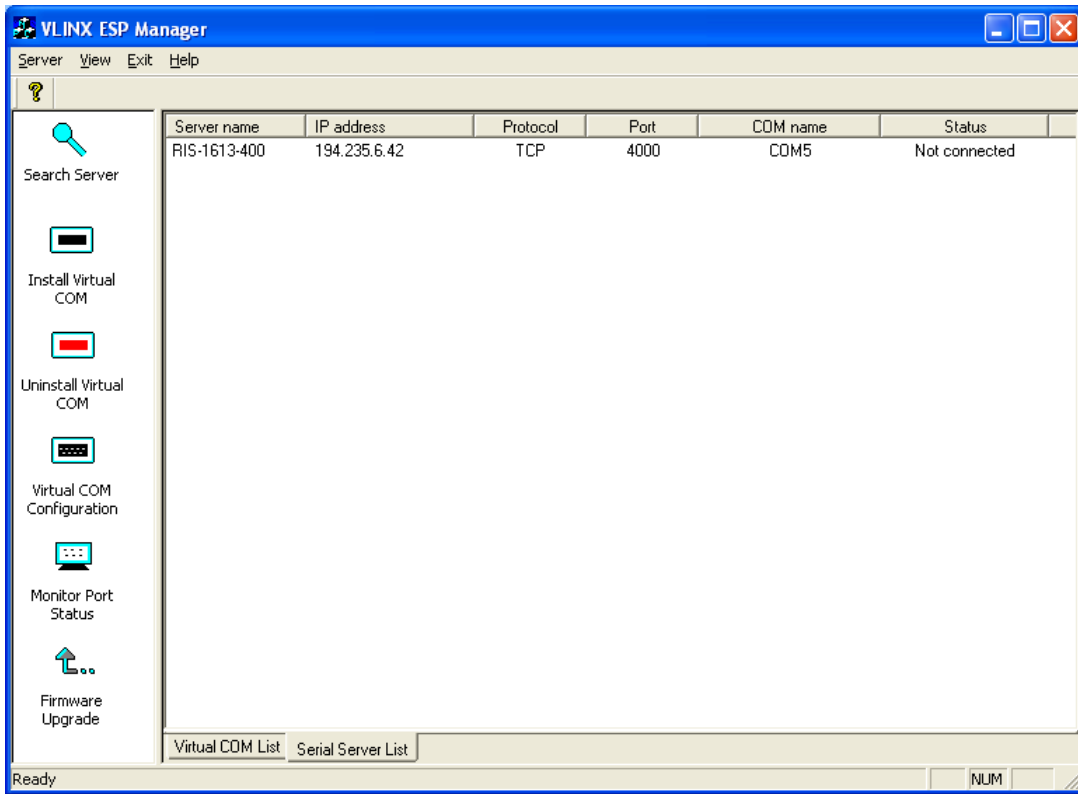
A complete description of the features of VLINX ESP Manager is given in the User Manual. Topics covered in this booklet will enable the user to understand and to test the Industrial TCP / IP Interface with Contrinex RFID systems.

## Starting the VLINX Manager

To run the VLINX ESP Manager click:

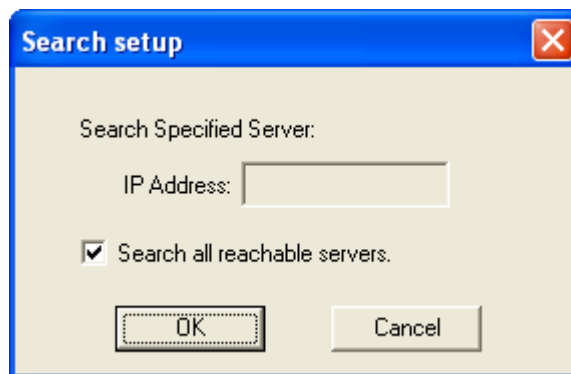
**Start > Programs > B&B Electronics > Vlinx > ESP Servers > VLINX ESP Manager**

When the software starts, it searches automatically all the serial servers which are on the network and displays the Serial Server List.



It is also possible to obtain this list by clicking on the icon **Search Server**.

In this case the **Search Setup** is displayed so that the user can choose to search one specific server or all the servers which are connected on the network.



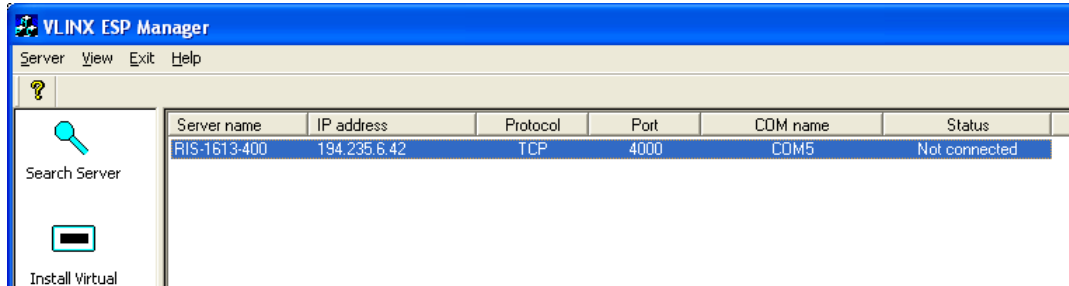
# INTERFACE (SERIAL SERVER) CONFIGURATION

Two types of possibilities to configure the interface are described in the present User manual:

- Configuration through VLINX ESP Manager Software
- Configuration through Webserver

## Configuring the interface through VLINX ESP Manager Software

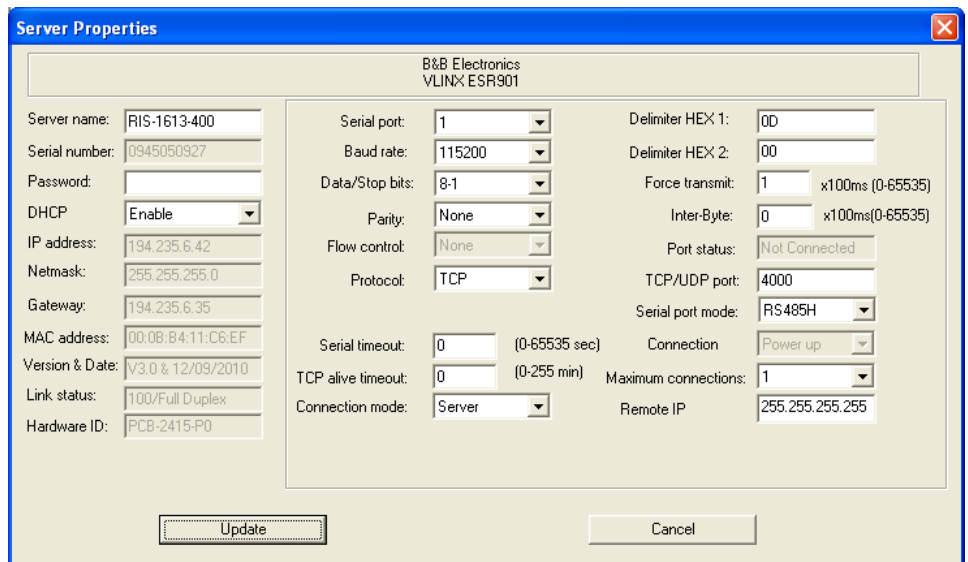
After having selected a server, it is possible to configure it by double clicking on its line.



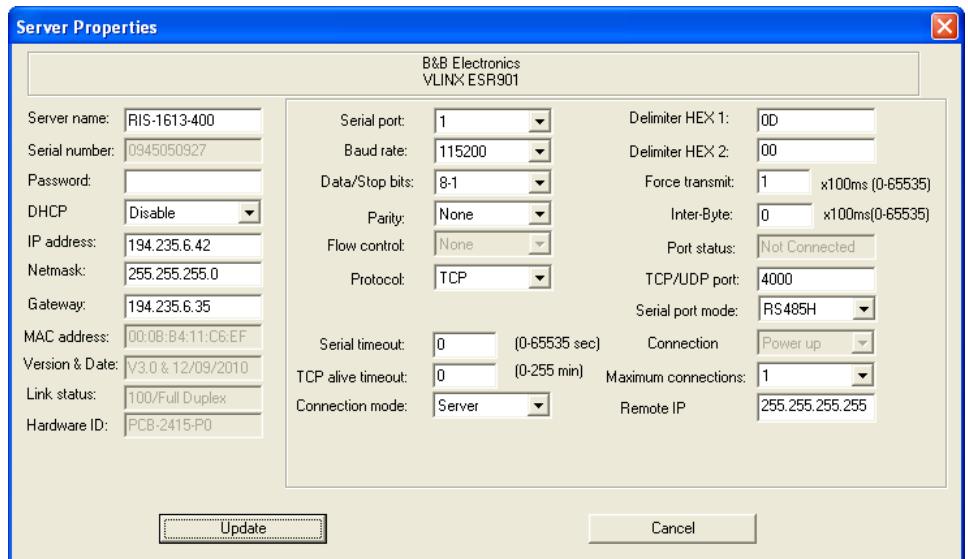
### Configuring the system

Depending on the DHCP (Dynamic Host Configuration Protocol) status, one of the two windows shown below will be displayed. DHCP is a server, generally present on a LAN, which ensures automatically the configuration of the parameters of a station, assigning it an IP address and a netmask.

DHCP server is enabled and it is possible only to attribute a name (up to 16 characters) and a password to the chosen server.



DHCP server is disabled and it will be possible to change the name (up to 16 characters) of the chosen server, to attribute it a password, an IP address, a netmask and to attribute also an IP address to the gateway.



### Configuring the serial port

The right part of the preceding two windows is dedicated to the configuration of the serial port. The serial port **Baud rate** on the interface must match the serial baud rate of the connected devices.

Set the **Data/Stop bits**, the **Parity** and the **Flow control** to match the data format used by the connected serial device.

Select TCP mode. TCP (Transmission Control Protocol) guarantees reliable communication with error checking. UDP (User Datagram Protocol) provides faster transmission.

TCP Port is the port number setted for each connection. The default port number for the interface is 4000.

The serial type is RS-485H (Half duplex)

Changes must be **Updated** or the Serial Server will not retain them.

#### Serial port configuration for low frequency RFID

Serial port:	1	Delimiter HEX 1:	0D
Baud rate:	19200	Delimiter HEX 2:	00
Data/Stop bits:	8-1	Force transmit:	1 x100ms (0-65535)
Parity:	None	Inter-Byte:	0 x100ms(0-65535)
Flow control:	None	Port status:	Not Connected
Protocol:	TCP	TCP/UDP port:	4000
		Serial port mode:	RS485H
Serial timeout:	0 (0-65535 sec)	Connection:	Power up
TCP alive timeout:	0 (0-255 min)	Maximum connections:	1
Connection mode:	Server	Remote IP:	255.255.255.255

#### Serial port configuration for high frequency RFID

Serial port:	1	Delimiter HEX 1:	F0
Baud rate:	115200	Delimiter HEX 2:	00
Data/Stop bits:	8-1	Force transmit:	1 x100ms (0-65535)
Parity:	None	Inter-Byte:	0 x100ms(0-65535)
Flow control:	None	Port status:	Not Connected
Protocol:	TCP	TCP/UDP port:	4000
		Serial port mode:	RS485H
Serial timeout:	0 (0-65535 sec)	Connection:	Power up
TCP alive timeout:	0 (0-255 min)	Maximum connections:	1
Connection mode:	Server	Remote IP:	255.255.255.255

## Configuring the interface through Webserver

Typing <http://XXX.XXX.XXX.XXX> (IP address of the Serial Server) allows to configure the interface through Webserver. If there is no DHCP, the default IP address, printed on the label of the interface, should be used (Default IP address: 192.168.0.1).

Changes must be **Applied** or the Serial Server will not retain them.

### Configuring the system

Depending on the DHCP (Dynamic Host Configuration Protocol) status, one of the two windows shown below will be displayed. DHCP is a server, generally present on a LAN, which ensures automatically the configuration of the parameters of a station, assigning it an IP address and a netmask.

VLINX ESR901 Web Configuration - RIS-1613-400

*Note: If you leave this page without saving, all changes will be ignored!*

Server name:

Serial number:

Version & Date:

Password:

DHCP:

IP address:

Netmask:

Gateway:

MAC address:

Link status:

Hardware ID:

*Note: If you leave this page without saving, all changes will be ignored!*

DHCP server is enabled and it is possible only to attribute a name (up to 16 characters) and a password to the chosen server.

VLINX ESR901 Web Configuration - RIS-1613-400

*Note: If you leave this page without saving, all changes will be ignored!*

Server name:

Serial number:

Version & Date:

Password:

DHCP:

IP address:

Netmask:

Gateway:

MAC address:

Link status:

Hardware ID:

*Note: If you leave this page without saving, all changes will be ignored!*

DHCP server is disabled and it will be possible to change the name (up to 16 characters) of the chosen server, to attribute it a password, an IP address, a netmask and to attribute also an IP address to the gateway.

### Configuring the serial port

Clicking on the “Serial port” item of the menu, the window shown below will be displayed.

The serial port is identified by its number.

Serial type is RS-485H (Half duplex).

The serial port **Baud rate** on the interface must match the serial baud rate of the connected devices.

Set the **Data/Stop bits**, the **Parity** and the **Flow control** to match the data format used by the connected serial device.

The screenshot shows the 'Serial Port' configuration page. The title is 'VLINX ESR901 Web Configuration - RIS-1613-400'. A note at the top states: 'Note: If you leave this page without saving, all changes will be ignored!'. The configuration fields are as follows:

Serial port:	1
Serial port mode:	RS-485H
Baud rate:	115200
Data/Stop bits:	8-1
Parity:	None
Flow control:	None
Delimiter Hex 1:	0D
Delimiter Hex 2:	00
Force transmit:	1 (x100ms (0-65535))
Inter-byte:	0 (x100ms (0-65535))
Port status:	Not connected

Buttons: Save, Default, Running, Reset

Note: If you leave this page without saving, all changes will be ignored!

### Configuring the operation mode

Clicking on the “Operation mode” item of the menu, the window shown below will be displayed.

Select TCP mode. TCP guarantees reliable communication with error checking. UDP (User Datagram Protocol) provides faster transmission.

TCP Port is the port number setted for each connection. The default port number for the interface is 4000.

The screenshot shows the 'Operation mode' configuration page. The title is 'VLINX ESR901 Web Configuration - RIS-1613-400'. A note at the top states: 'Note: If you leave this page without saving, all changes will be ignored!'. The configuration fields are as follows:

Serial port:	1
Port number:	4000
Mode:	<input checked="" type="radio"/> TCP
Serial Timeout:	0 (0-65535 sec)
TCP alive Timeout:	0 (0-255 min)
Connection mode:	Server
Connection at:	Power up
Maximum connections:	1
Remote IP address:	255.255.255.255
Mode:	<input type="radio"/> UDP
Destination IP address range:	0.0.0.0 to 0.0.0.0 Port 4000
	0.0.0.0 to 0.0.0.0 Port 4000

Buttons: Save, Default, Running, Reset

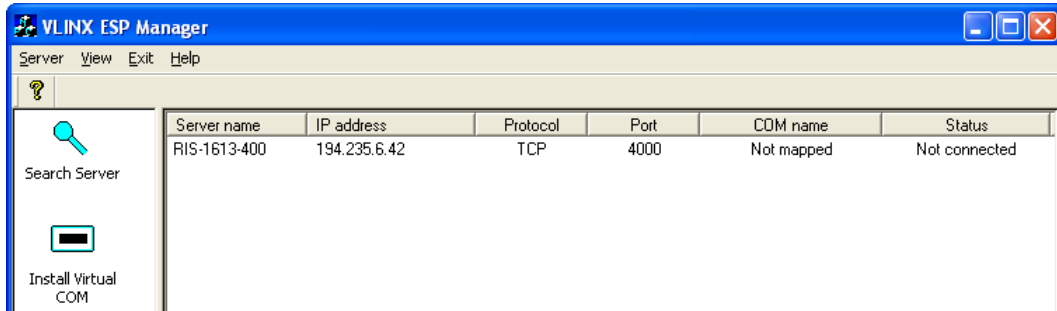
Note: If you leave this page without saving, all changes will be ignored!

# CONFIGURING A VIRTUAL COM PORT

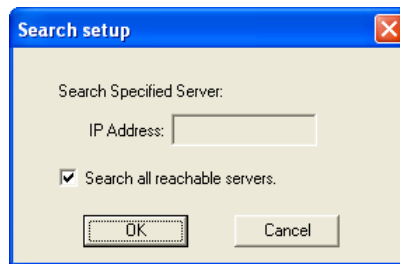
## Installation

### Launching the installation

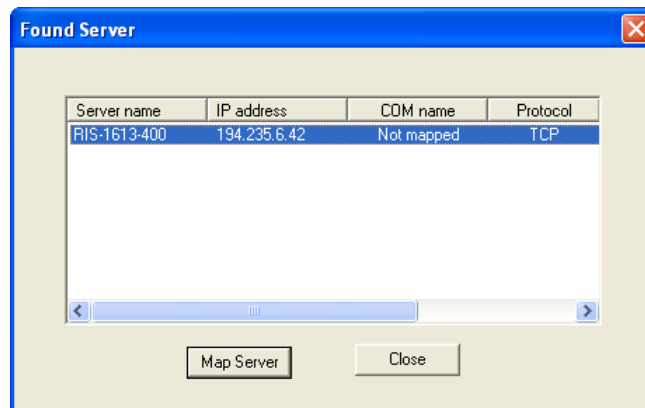
Click on “Install Virtual COM”.



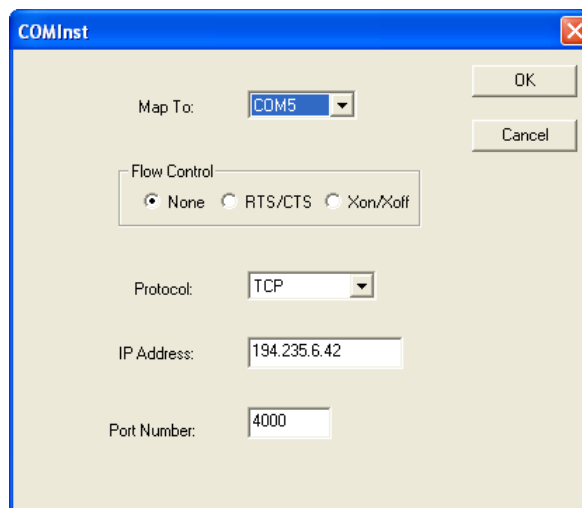
The window below invites the user to search an IP address or the IP addresses of all the servers which are connected.



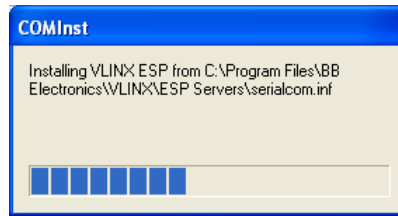
The server has been found and it is displayed that the COM port is not mapped. In order to do it, click on “Map Server”.



The window below is then displayed and it is possible to choose a still free COM port in the drop-down list.



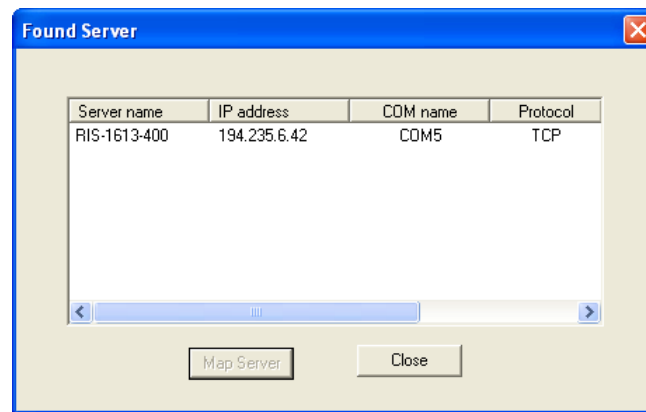
Clicking on **OK** will start the installation of the Virtual COM Port.



During the installation, the warning concerning the compatibility with Windows is to be ignored. At the end of the installation, the message box below appears indicating that the operation was successful.



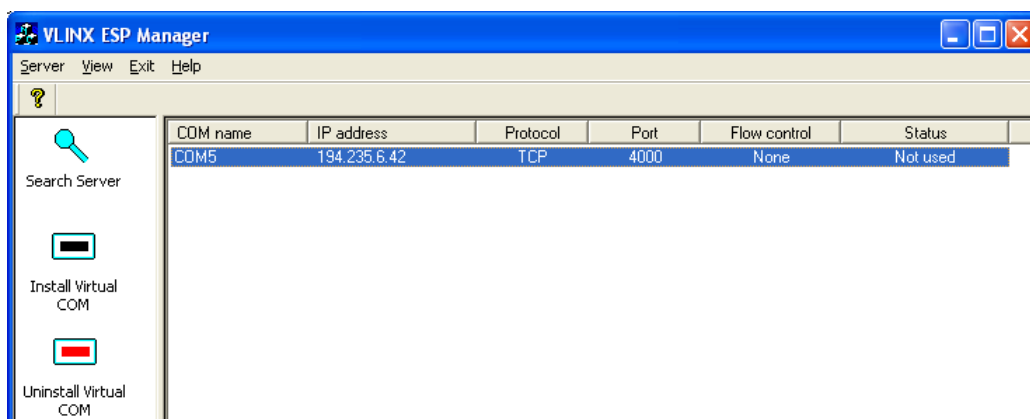
Clicking on **OK** let appear the Found Server window which shows that the COM port is now mapped.



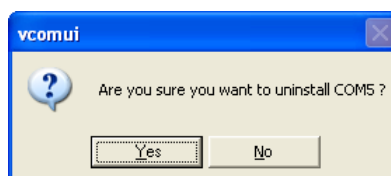
## Uninstallation

### Launching the uninstallation

Choose a virtual COM and click on "Uninstall Virtual COM".



When the confirmation window appears, click on **Yes**.





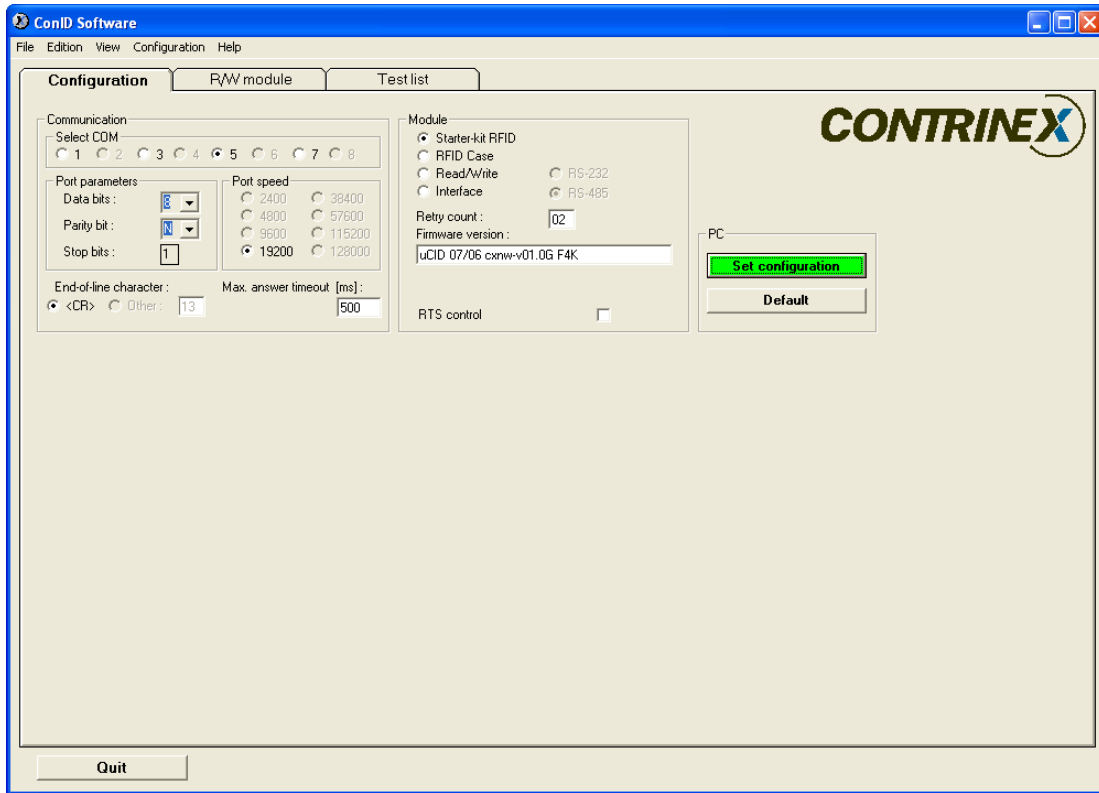
# ConID LF Software using the Virtual COM Port

## Configuration

After having started ConID (LF) Software, the system is connected to the Virtual COM Port defined in the previous step by selecting it.

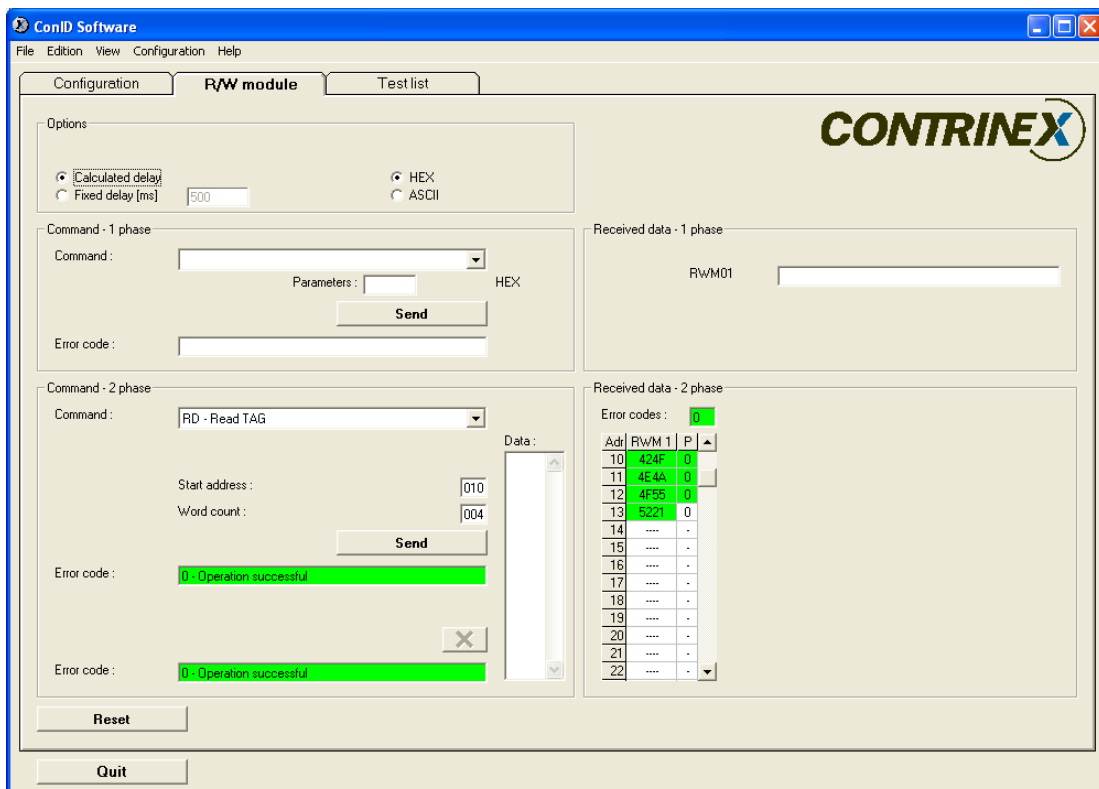
The Module to choose is the Starter-kit RFID.

The baudrate (19'200 bauds) is determined by the software.



Once the configuration is set successfully, it is possible to communicate with the Read/Write Module (RWM) by clicking the corresponding tab (**R/W module**).

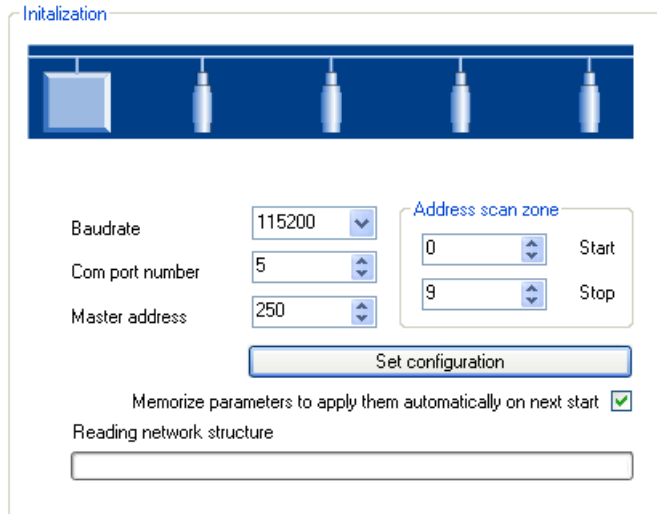
All the commands related to the RWM are now accessible as demonstrated by the below example.



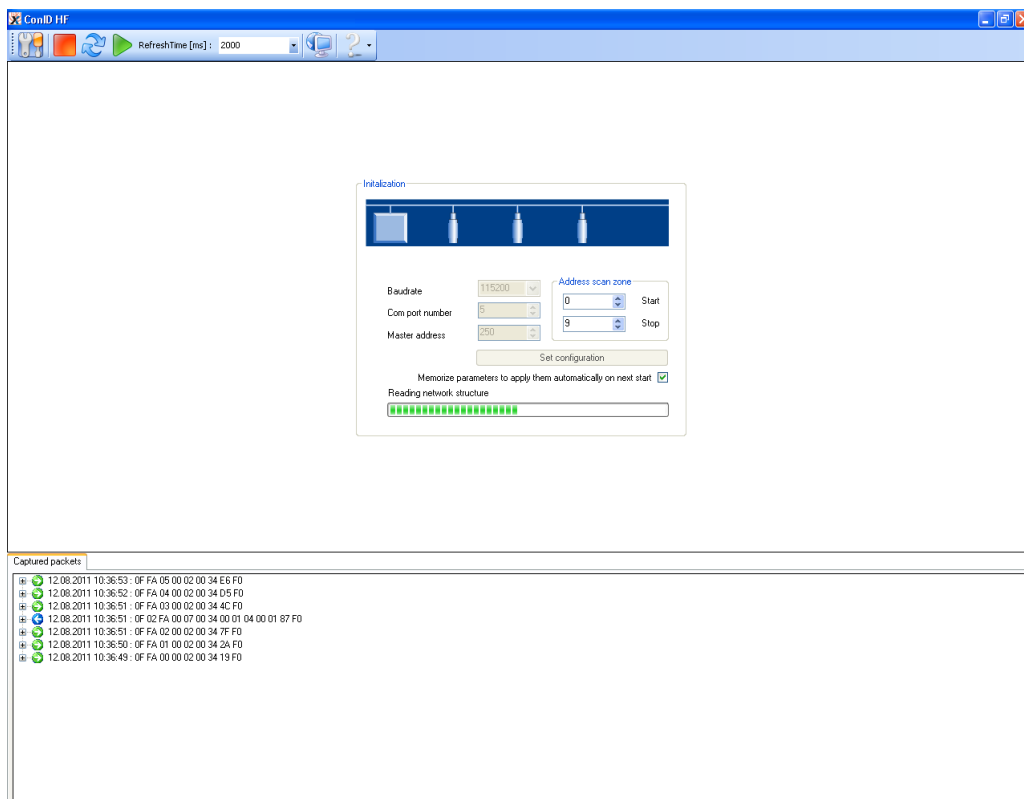
# ConID HF Software using the Virtual COM Port

## Configuration

The first window of the ConID HF Software is a prompt to enter the initialization parameters.



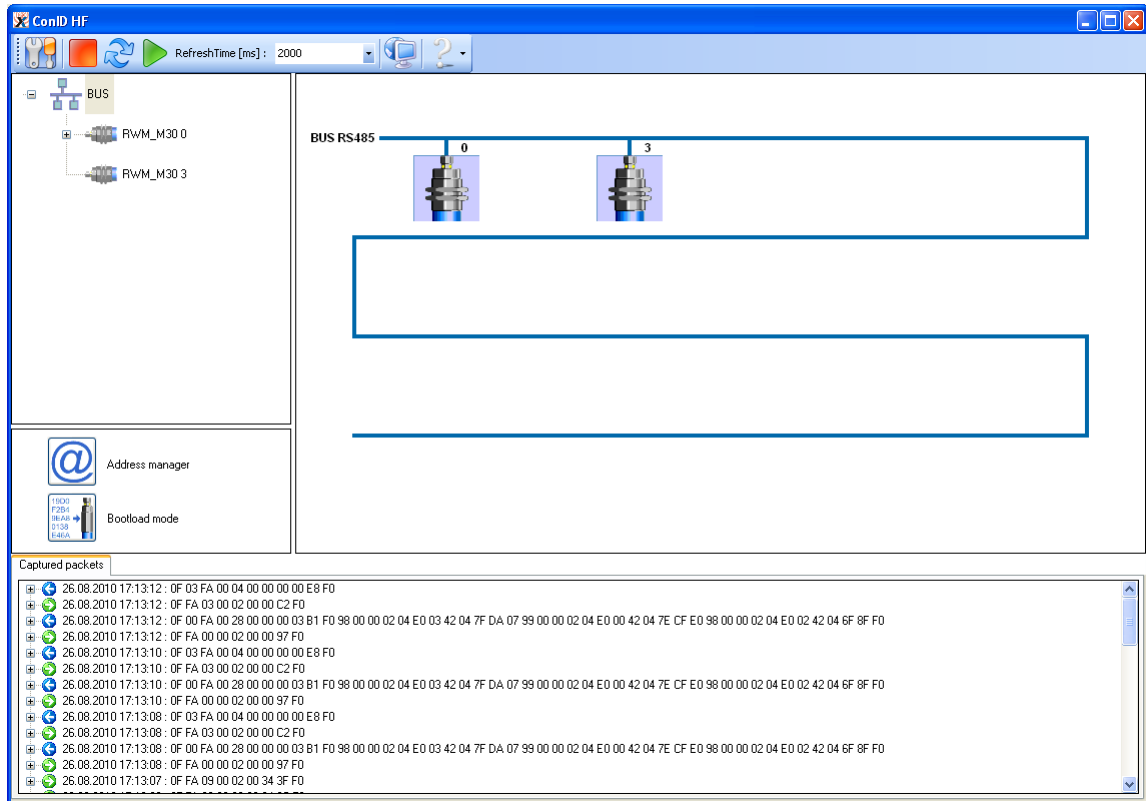
After having specified the baudrate (115'200 bauds), the Virtual COM port number defined with the V<sub>L</sub>INX Software and the Master address, the initialization process will be started by pressing **Set configuration**.



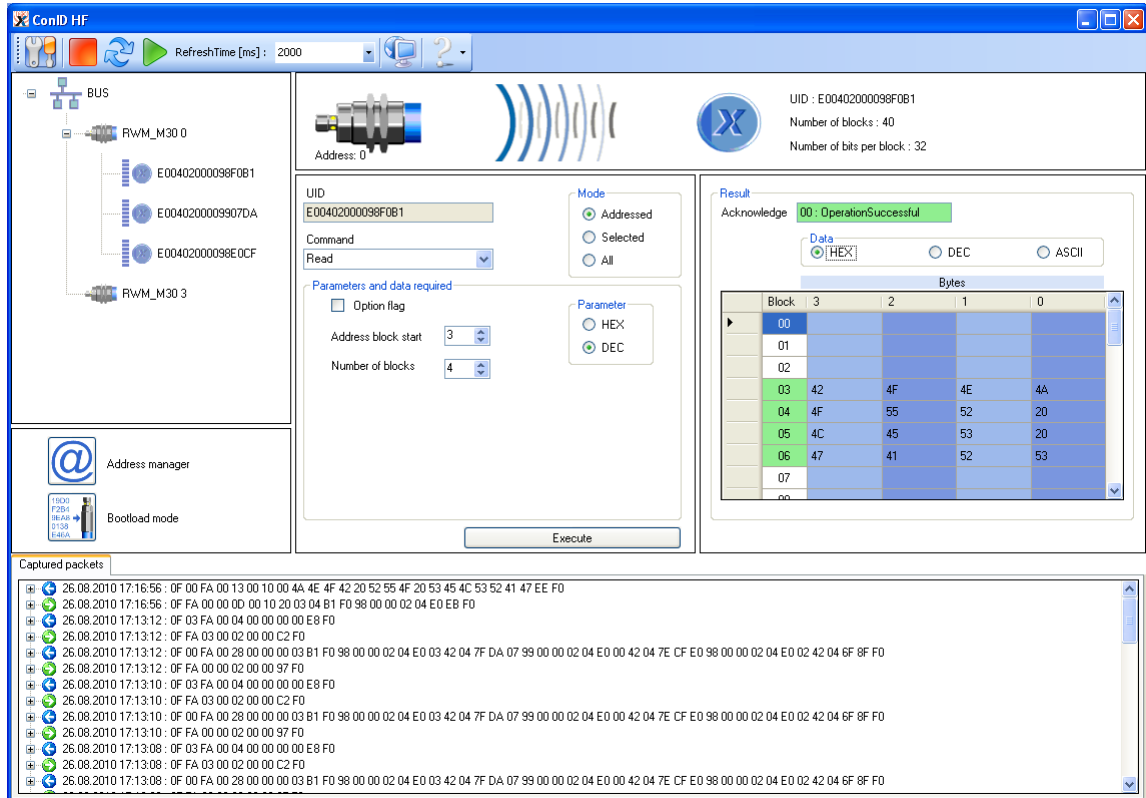
Like for Low Frequency configuration, the baudrate is determined by the software, even if another value has been chosen in the V<sub>L</sub>INX Software.

When initialization process is finished, the BUS view is displayed.

For an exhaustive information about the ConID HF Software, refer to the User manual DEMO HF which is on Contrinex website: <http://www.contrinex.com> > RFID > 4.3 User manual DEMO HF.



By developing the TREE view it will be possible to transmit all the commands, to the Read/Write module as well as to the transponder. An example of reading 4 blocks in an addressed transponder is shown in the figure below.



## TCP/IP DIRECT MODE

It is possible to command the system with the Hyperterminal. If it is relatively simple in low frequency, it becomes much more difficult in high frequency because the frame must be sent in a packet and the CRC (Cyclic Redundancy Check) must be calculated, what is not evident.

To overcome these inconveniences, Contrinex has developed a program named "TCP/IP direct mode" that calculates the CRC and sends the frames in one packet.

The advantage of such a solution is that the use of a virtual COM port is not needed.

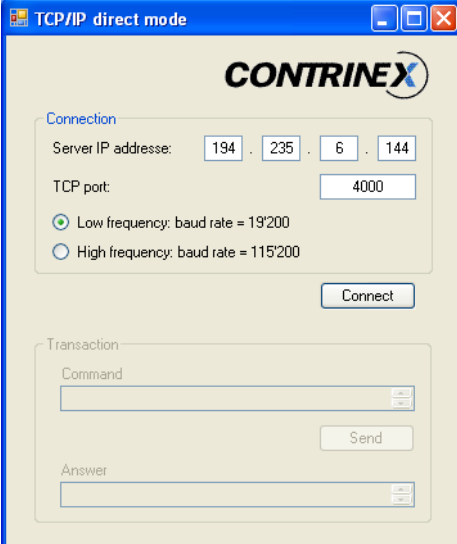
## TCP/IP direct mode in low frequency

### Connection of the LF system

To connect the system, following parameters are required:

- Server IP address
- TCP port number
- Baudrate of RFID system (19'200 for low frequency)

Click on the button "Connect" when those parameters have been fixed.



The screenshot shows the "TCP/IP direct mode" window with the Contrinex logo. Under the "Connection" section, the "Server IP address" is set to 194.235.6.144 and the "TCP port" is 4000. The "Low frequency: baud rate = 19'200" option is selected. A "Connect" button is visible at the bottom right of the connection section. Below, the "Transaction" section has empty "Command" and "Answer" input fields and a "Send" button.

### LF system connected

When connection is done, the text of the connection button has changed in "Disconnect".

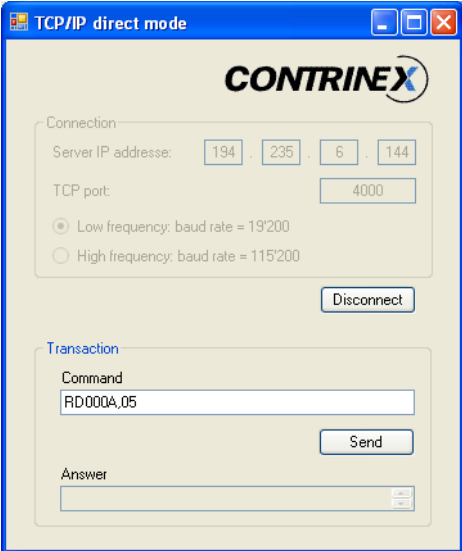
The "Transaction" group is now accessible and it is possible to write a command.



The screenshot shows the same interface as the previous one, but the "Connect" button has been replaced by a "Disconnect" button. The "Transaction" section remains empty.

### Command phase 1

The syntax of the command is entered in accordance with the data sheet of the low frequency Read/Write Module. When **Send** is clicked, a carriage return is added to the command.

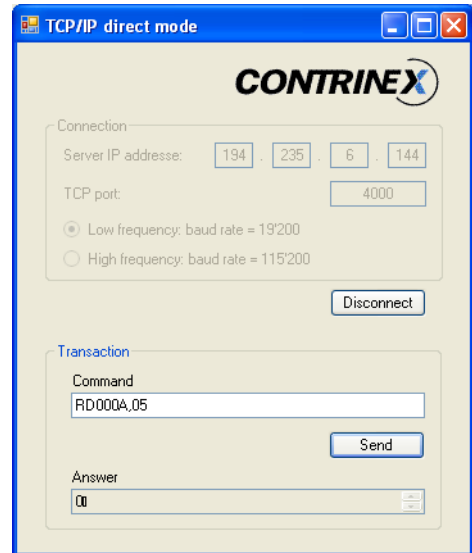


The screenshot shows the "Transaction" section with the "Command" field containing the text "RD000A,05". The "Send" button is now active.

### Answer phase 1

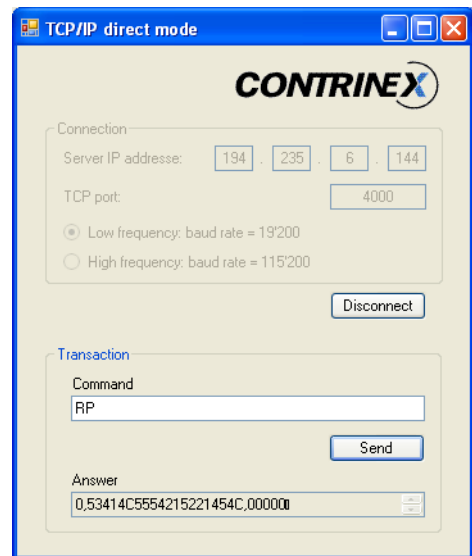
The Read/Write Module answers by its acknowledge number. The last sign is the carriage return.

As the READ command is a 2-phase command, the next command must be a Replay (RP).



### Command and Answer phase 2

After having sent RP, the answer of the transponder is displayed, always in accordance with the data sheet. Here also, the last sign is a carriage return.



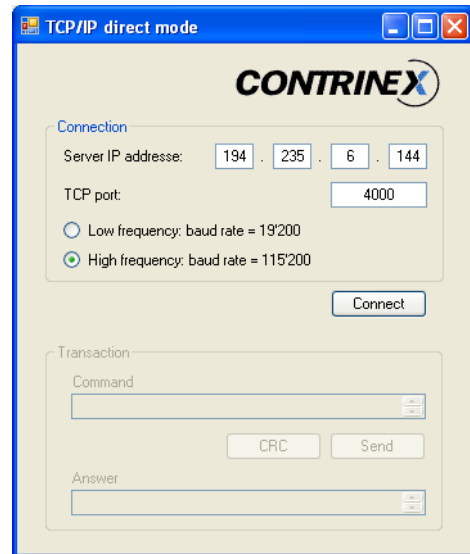
# TCP/IP direct mode in high frequency

## Connection of the HF system

To connect the system, following parameters are required:

- Server IP address
- TCP port number
- Baudrate of RFID system (115'200 for high frequency)

Click on the button "Connect" when those parameters have been fixed.

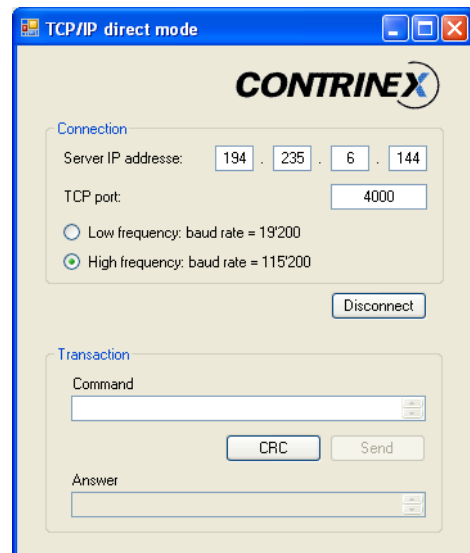


## HF system connected

When connection is done, the text of the connection button has changed in "Disconnect".

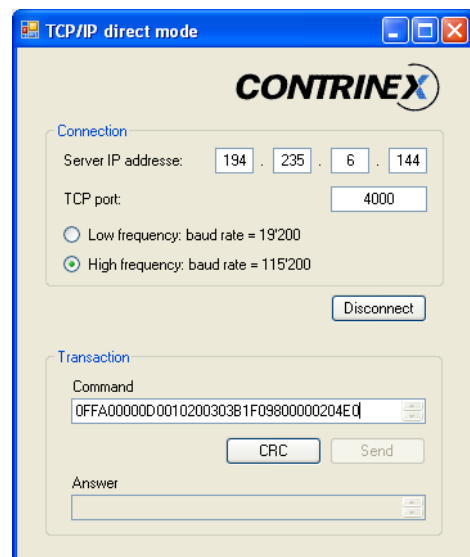
The "Transaction" group is now accessible and it is possible to write a command.

It is to be noted that a CRC button is enabled. It serves to calculate the CRC when the command has been entered.



## Command

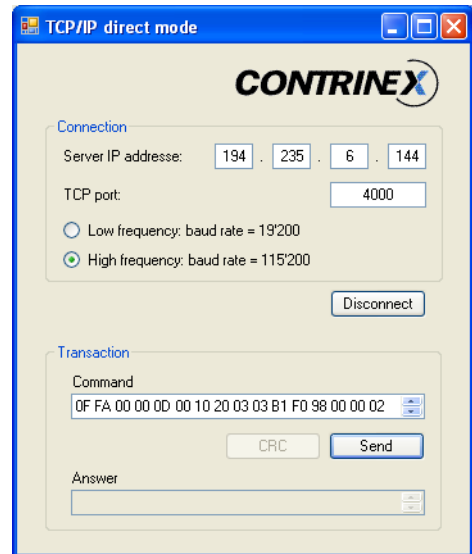
The syntax of the command is entered in accordance with the data sheet of the high frequency Read/Write Module that means that the bytes of the frame must be entered to build the frame.



## CRC and EOF

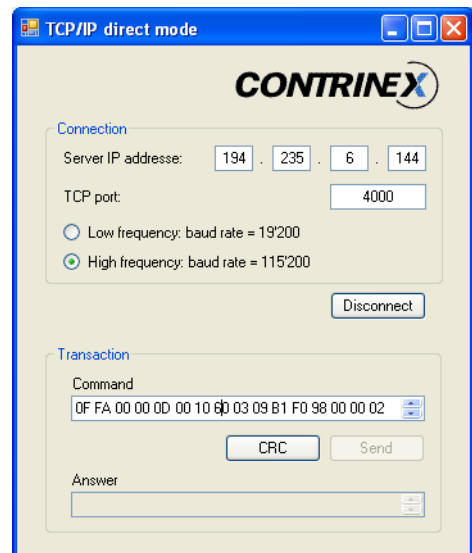
Clicking the CRC button initiates the following actions:

- Calculates the CRC
- Appends CRC and EOF (End of Frame: 0F) to the frame entered
- Rearranges the frame in order to have upper case letters and a space between the bytes



## Answer

After having sent the command, the answer is displayed in the corresponding text box. The scrollbar allows to read the entire frame.



## Modification of the command

If the command is modified, it is necessary to recalculate the CRC. It is for this reason that the CRC button is enabled and the SEND button disabled.

We find in the situation where a new command has been introduced.

