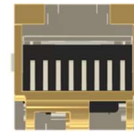


T.C12.RS232I

Industrial SFP Serial to IP Converter

Product Features

- Industrial & Intelligent Serial to IP (Ethernet) Converter
- 100BASE-FX and/or 1000BASE-X SFP Interface
- RS-232 or RS485/422 Selectable with Software
- RS485/422 Termination Resistor Configurable with Software
- Serial Interface Speed 75 to 230400 bps
- Compatible to 3rd-Party COM-Servers
- HTTP Web GUI and Telnet CLI (Command Line Interface)
- Network Security, Three Position Switch for Normal, Management Blocked and Factory Default Mode
- Low Power (< 500mW)
- Digital Diagnostic Monitoring (DDM) Available
- Single +3.3V DC Power Supply
- Hot-pluggable SFP Converter
- Operating Temperature -40°C to +85°C
- Temperature Sensor Included
- Voltage Measurement Included
- Fully Metallic Enclosure for Low EMI
- Compliant with SFP MSA Specification
- Software Upgradable



Applications

- RS232/485/422 Access and Data transmission over IP Networks
- Industry 4.0 Applications
- Switch & Router Enhancement
- Com-Server Applications, Com Port Extender

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Laser Protection: This transceiver is a Class 1 laser product. Compliant with IEC-60825, FDA 21CFR1040.10 & FDA 21CFR1040.11 2013, Flexoptix GmbH.

Revision	Date
1.0	04.09.2023

1. Description

The new **T.C12.RS232I** low power industrial SFP (Small Form-factor Pluggable) module is a Serial Interface (RS-232/485/422) to IP (Ethernet) data converter. The **T.C12.RS232I** can be plugged into any Ethernet device with SFP ports that support 100BASE-FX and/or 1000BASE-X. The configuration is possible by Web or Telnet access. For security reasons, the web and telnet access can be set to write-protected using the switch on the SFP module.

Serial data transmission can be done using UDP or TCP protocols. The SFP module is fully compatible to 3rd-Party COM-Servers. You can use the SFP module for COM Port Extenders and Virtual Serial Ports.

2. Ordering Information

Table 1. Ordering Information

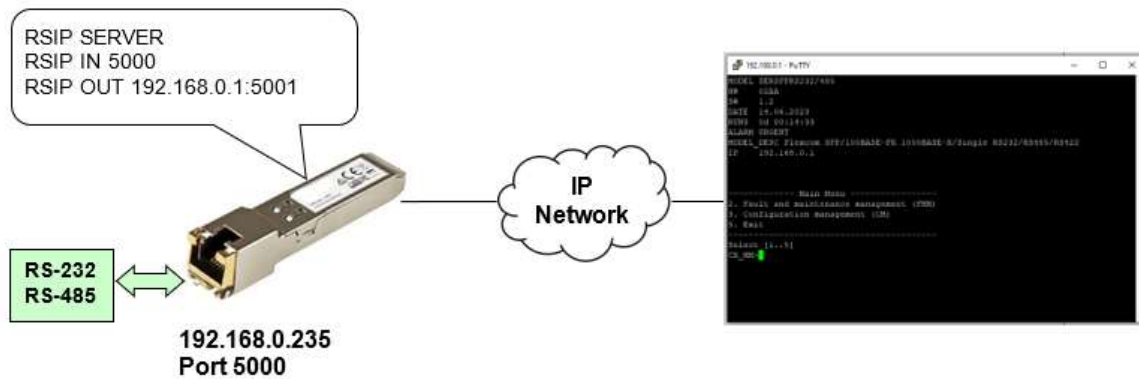
Part Number	Description
T.C12.RS232I	Industrial SFP Serial to IP Converter, RS-232 or RS485/422/100BASE-FX / 1000BASE-X, -40°C to 85°C

3. Applications

Serial data transmission can be done using UDP or TCP protocols. The UDP protocol allows operating in both Point-To-Point (PTP) and Point-To-MultiPoint (PTMP) modes. Point-To-MultiPoint mode allows to set up several broadcasting nodes and to build a broadcast configuration. The TCP/IP protocol allows only working in Point-To-Point mode.



Serial to IP Converter Mode



In this mode one serial data endpoint should be configured with the opposite IP Address from your remote computer. For more information regarding configuration – see 8.1 “Connect via IP”

UDP Point-To-Point

In this mode two serial data endpoints should be configured with each other's IP Address and PORT Number as illustrated on following picture. It means one side with IP_Address1:PORT_Number1 sends data to the other side with IP_Adress2:PORT_Number2 and vice versa.

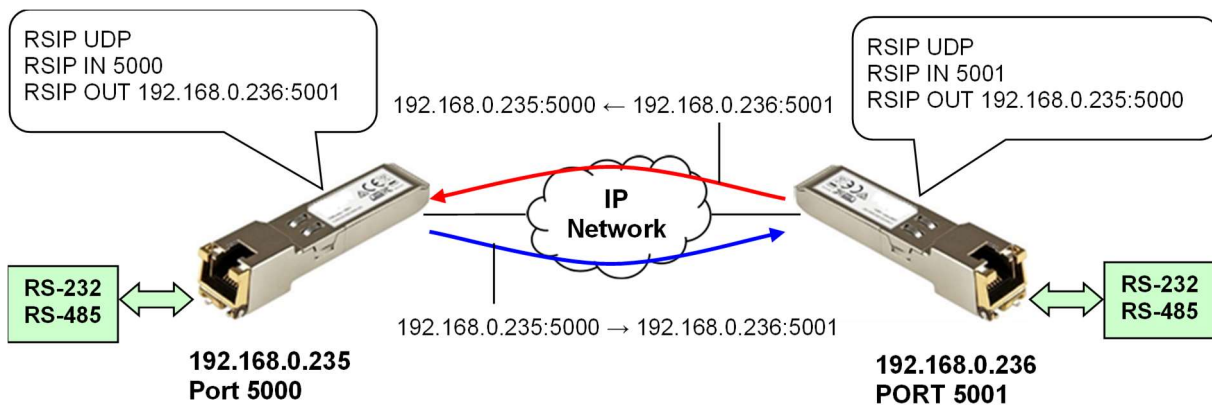


Figure 1: Serial Data Transmission with UDP Point-To-Point

UDP Point-To-MultiPoint

In Point-To-MultiPoint mode the endpoint (“Master”) should have configured to send serial data with a multicast IP Address (IPM) and some PORT Number (PORTM) as outgoing address. Outgoing data of such an endpoint will reach all other endpoints. Endpoints with input PORT Number PORTM will accept received data and other endpoints will discard it.

Non broadcasting endpoints should be configured as they work with “Master” endpoint in Point-to-Point mode with incoming PORT Number set to PORTM.

Any multicast address acceptable in the application network can be used. Endpoints distinguish incoming broadcast data by destination PORT Number (PORTM). Multicast addresses are IP Addresses in range from 224.0.0.0 to 239.255.255.255.

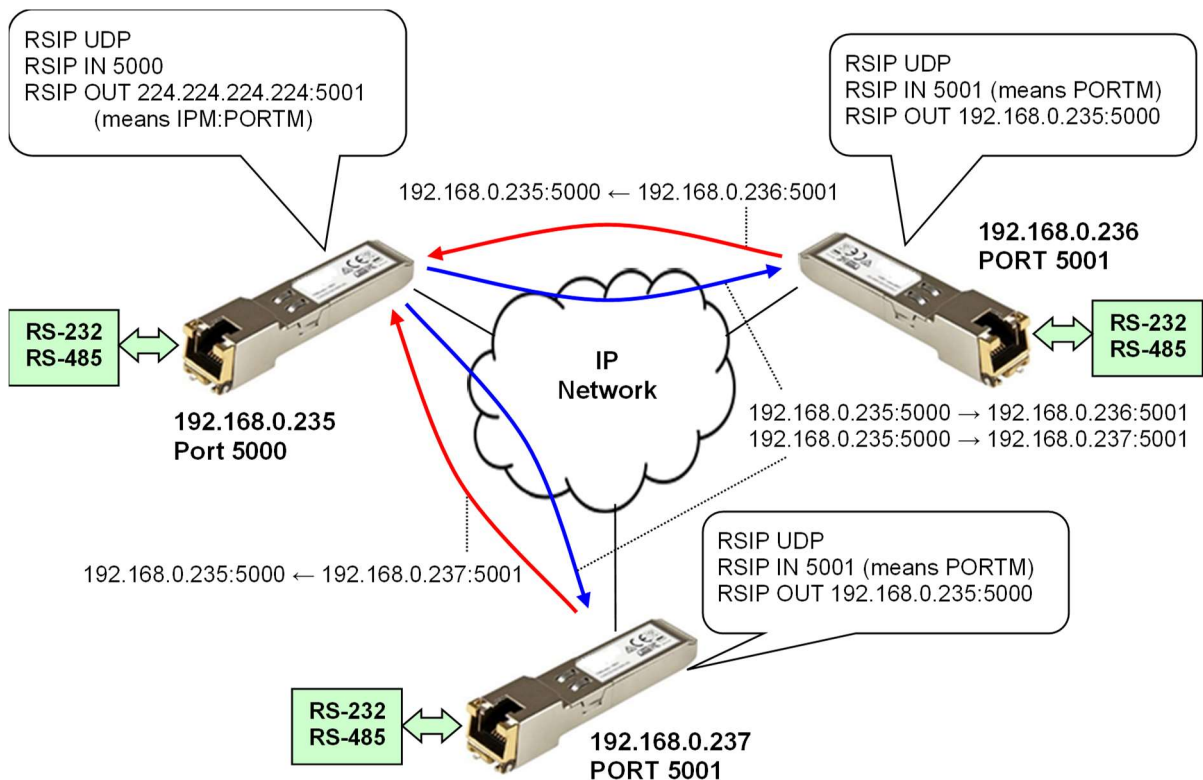


Figure 2: Serial Data Transmission with UDP Point-To-MultiPoint



UDP Broadcast Mode

In this mode the endpoints should be configured to send their serial data to the multicast IP Address (IPM). Incoming and outgoing PORT Number (PORTM) should be the same for all endpoints to receive each other's serial data.

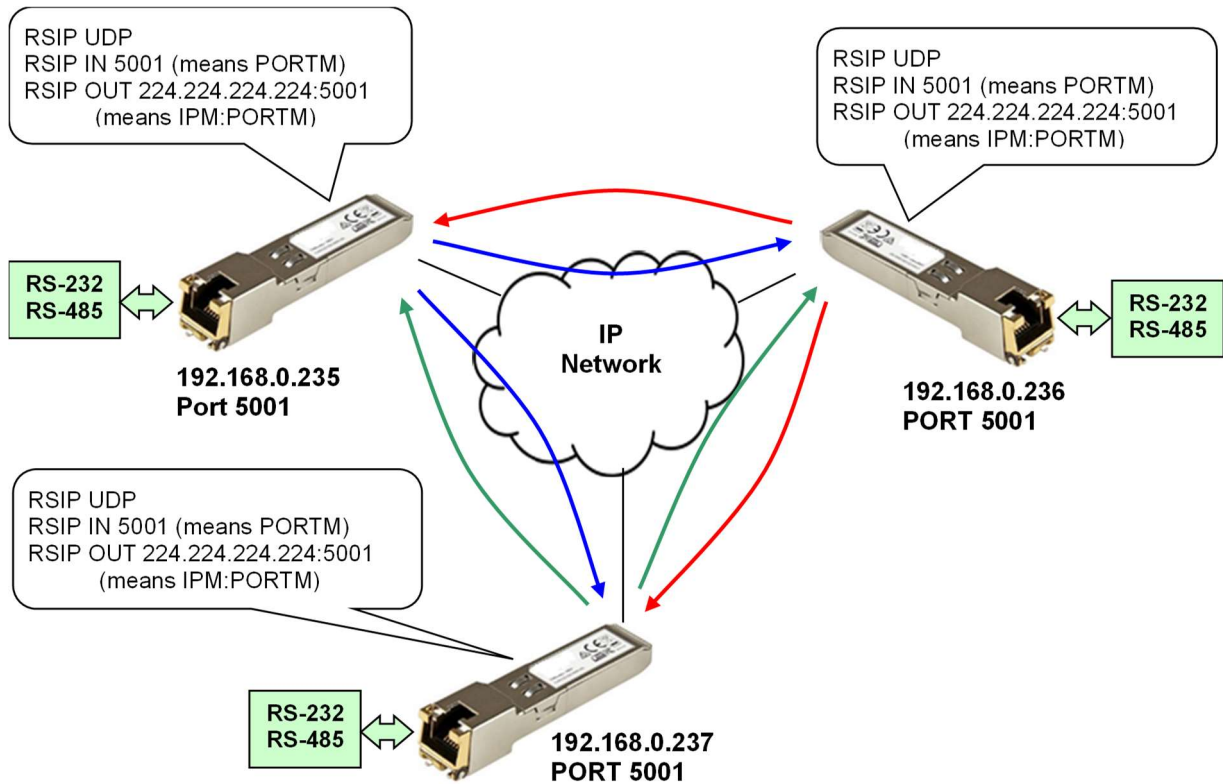


Figure 3: Serial Data Transmission with UDP Broadcast



TCP Point-To-Point

In this mode one serial data endpoint should be configured as Server and the other as Client. Client configuration is the same as UDP endpoint. On the Server endpoint the Client IP Address and incoming PORT Number should be specified.

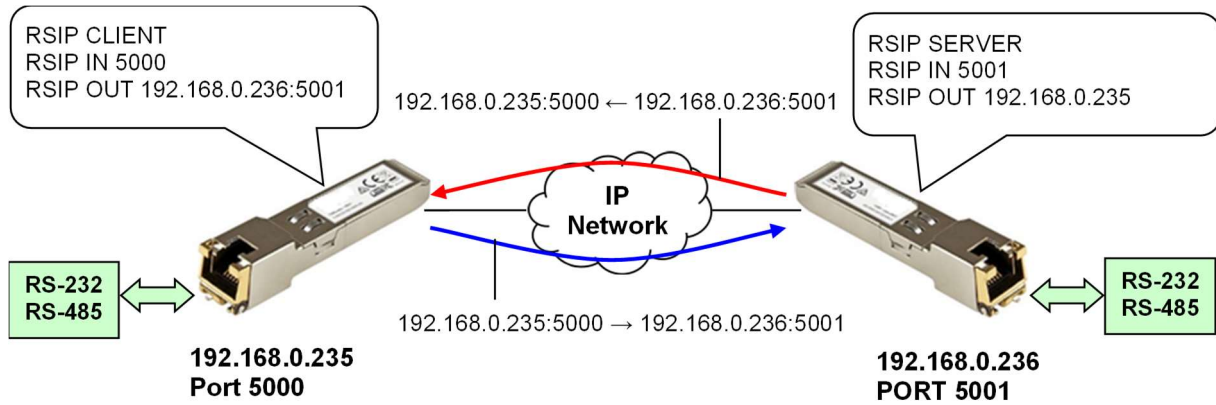


Figure 4: Serial Data Transmission with TCP Point-To-Point



4. Web Interface Configuration

SUMMARY	<h3>Summary</h3> <hr/> <p>Model: SERSFPRS232/485 Model Description: Flexcom SFP/100BASE-FX 1000BASE-X/Single RS232/RS485/RS422 HW: 02AA SW: 1.0, 28.03.2023 SN: BPR230300001 Runs: 0d 00:08:45 Alarm: URGENT IP Address: 192.168.0.1 MAC Address: 00-0F-D9-00-B3-09</p>
STATUS	
CONFIGURATION	
MISCELLANEOUS	
COMMAND REFERENCE	

SUMMARY	<h3>Status</h3> <hr/> <p>LAN / FC: 1000F / on RSIP: up / UDP RS>>ETH: 0 / 0 ETH>>RS: 0 / 0 Voltage: 3.16 V Temperature: 31.94 °C SW: ok SFP Switch: normal</p> <p style="text-align: center;"><input type="button" value="Reset statistics"/></p>
STATUS	
CONFIGURATION	
MISCELLANEOUS	
COMMAND REFERENCE	

SUMMARY	<h3>Configuration</h3> <hr/> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>Network</p> <p>IP address: <input type="text" value="192.168.0.1"/></p> <p>Subnet mask: <input type="text" value="255.0.0.0"/></p> <p>Gateway: <input type="text" value="192.168.0.254"/></p> <p>Speed: <input type="text" value="AUTO"/></p> <p>Flow control <input checked="" type="checkbox"/></p> </div> <div style="width: 48%;"> <p>RS</p> <p>Mode: <input type="text" value="RS232"/></p> <p>Rate: <input type="text" value="9600"/></p> <p>Data bits: <input type="text" value="8"/></p> <p>Parity: <input type="text" value="NONE"/></p> <p>Stop bits: <input type="text" value="1"/></p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> <p>Services</p> <p>Telnet <input checked="" type="checkbox"/> HTTP <input checked="" type="checkbox"/></p> </div> <div style="width: 48%;"> <p>RS<->IP</p> <p>Status: <input type="text" value="ON"/></p> <p>Mode: <input type="text" value="UDP"/></p> <p>Local port: <input type="text" value="5000"/></p> <p>Remote IP: <input type="text" value="192.168.0.235"/></p> <p>Remote port: <input type="text" value="5000"/></p> <p>Signaling: <input type="text" value="OFF"/></p> <p>HS mode: <input type="text" value="OFF"/></p> </div> </div> <div style="margin-top: 10px;"> <p>TFTP</p> <p>Server IP: <input type="text" value="192.168.0.14"/></p> <p>Retries: <input type="text" value="3"/></p> <p>Timeout: <input type="text" value="10"/></p> <p>SW file path: <input type="text" value="SFPRS_V0-1.bin"/></p> </div> <p style="text-align: center; margin-top: 10px;"><input type="button" value="Save"/></p>
STATUS	
CONFIGURATION	
MISCELLANEOUS	
COMMAND REFERENCE	

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Laser Protection: This transceiver is a Class 1 laser product. Compliant with IEC-60825, FDA 21CFR1040.10 & FDA 21CFR1040.11 2013, Flexoptix GmbH.

SUMMARY

STATUS

CONFIGURATION

MISCELLANEOUS

COMMAND

REFERENCE

Configuration

Network

IP address:

Subnet mask:

Gateway:

Speed:

Flow control

RS

Mode:

Rate:

Data bits:

Parity:

Stop bits:

Duplex:

Termination:

Services

Telnet HTTP

TFTP

Server IP:

Retries:

Timeout:

SW file path:

RS<->IP

Status:

Mode:

Local port:

Remote IP:

Remote port:

Signaling:

HS mode:

5. Telnet CLI Command Structure


The command structure is according to ITU-T Rec. M.3400 (Telecommunication Management Networks). Please see the Help for the command descriptions in the CLI or the COMMAND REFERENCE Menu in the WEB interface for further information.

Main Menu		
PM	FMM	CM
Performance management	Fault and maintenance management	Configuration management
	SFPVIEW RESET RSIPSTATRESET SERNUM SOFTUPDATE SOFTINFO STATUS TFTP SOFTUPDATE M(AIN) H(ELP)	ETHSD FC GATEWAY NETCONFIG NETMASK SETIP TFTPPIP TFTP RETRIES TFTP TIMEOUT TFTP FILEPATH TELNET ON/OFF HTTP ON/OFF RSIP RS 232/485 RSRATE RSFORMAT RSDUPLEX (only if 485 Mode) RSTERM (only if 485 Mode) SOFTSELECT 1/2 FACTORY DEFAULT APPLY M(AIN) H(ELP)



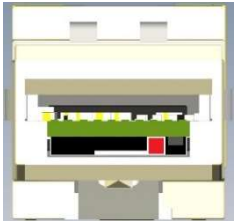
6. Connector & Pin Description

Table 2. Serial Connector & Pin Description

RJ45	Pin No.	RS232		RS485 / RS422		RS485	
		IO	Description (EIA TIA 56)	IO	Description Full Duplex	IO	Description Half Duplex
	1						
	2						
	3						
	4		GND		GND		GND
	5	Output	RxD	Output	Rx- (neg)	In/Out	Dx- (neg)
	6	Input	TxD	Input	Tx+ (pos)		
	7	Output	CTS	Output	Rx+ (pos)	In/Out	Dx+ (pos)
	8	Input	RTS	Input	Tx- (neg)		

7. Switch Position Description

Table 3. Possible Switch Positions

Switch Positions	Left	Center	Right
	<p>Factory Default</p>	<p>Management Blocking</p>	<p>Normal Mode (default setup)</p>

Normal Mode
Management Blocking

The unit works in standard mode.
It's only possible to read out values in the CLI and/or WEB interface.
(write protected)

Factory Default

During start-up the unit will be setup to its default values **ANYTIME**.
Setup the switch to Normal or Management Blocking position after Factory-Default start-up.



8. Technical Specification

Table 4. SFP Host Interface

SFP Host Connector Power (MSA Compliant)						
Parameter	Symbol	Min	Typical	Max	Unit	Note
Input Voltage	Vcc	3.135	3.3	3.465	V DC	
Input Current	Icc		120	140	mA	

SFP Host Connector Data (MSA Compliant)						
Parameter	Symbol	Min	Typical	Max	Unit	Note
Data Rate	TD/RD		100		Mbps	100Base-FX
Data Rate	TD/RD		1000		Mbps	1000Base-X

Table 5. SFP Converter Interface

Serial RS-232/485/422 Interface	
Standard	ITU-T Rec RS-232/V28 or RS485/422
Bit Rate RS-232/485/422 (bps)	75, 150, 200, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 56000, 57600, 115200, 128000, 230400, 256000
Format RS-232/485/422	Bits: 5...8 Stop bits: 1 or 2 Parity: none / even / odd

Table 6. Environment

Operating Conditions						
Parameter	Symbol	Min	Typical	Max	Unit	Note
Storage Temperature	Ts	-40		+85	°C	
Operating Temperature	To	-40		+85	°C	
Relative Humidity	RH	5		95	%	non-condensing

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Laser Protection: This transceiver is a Class 1 laser product. Compliant with IEC-60825, FDA 21CFR1040.10 & FDA 21CFR1040.11 2013, Flexoptix GmbH.

9. Connection

Configure the T.C12.RS232I with the Flexbox to one of the compatibilities available. Plug it into one of the SFP ports and wait for the port to come up.

Open your local internet browser and connect to the WEB interface by typing in the IP address of the T.C12.RS232I module.

The default IP settings are:

IP address: 192.168.0.1
Subnet mask: 255.255.255.0
Gateway: 192.168.0.254
TFTP-Server IP: 192.168.0.2

Note: You can change the default settings in the WEB Interface

Go to the “**CONFIGURATION**” page and adjust the settings under the “**RS<->IP**” section.

RS<->IP	
Status:	ON
Mode:	SERVER
Local port:	5001
Remote IP:	192.168.0.3
Remote port:	5000
Signaling:	LOCAL
HS mode:	RTS-CTS

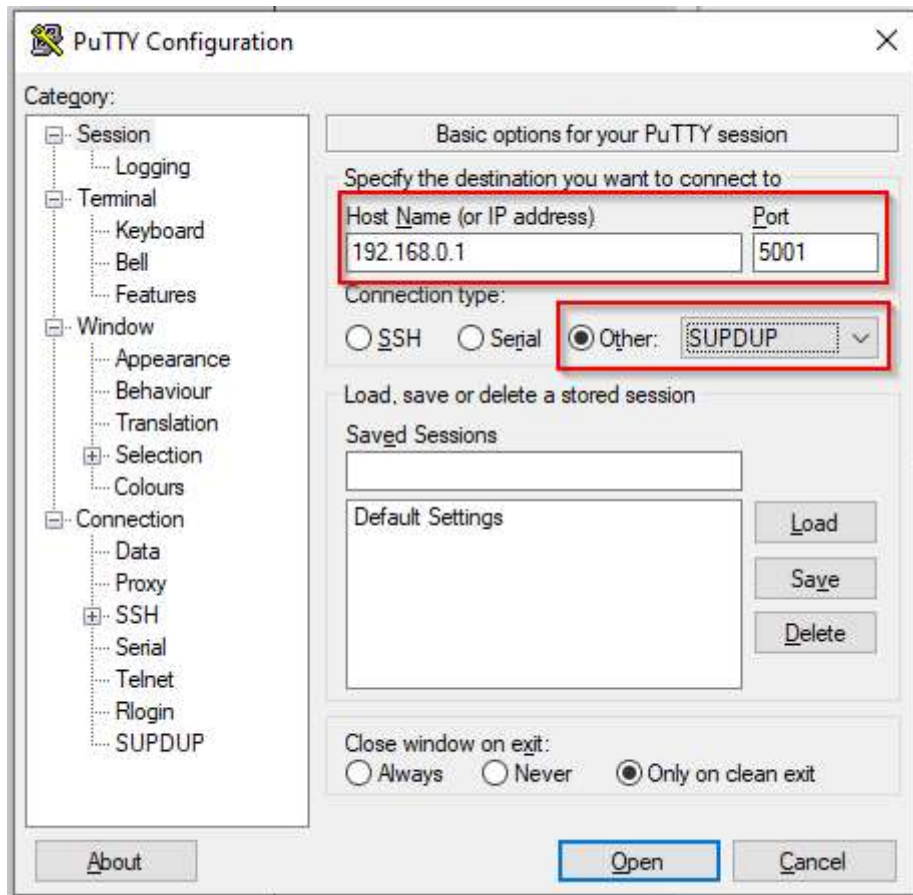
- Set your local computer IP Address as Remote-IP
- Set Signaling to "local"
- Use "Local Port" for your IP connection



9.1. Connect via IP

To connect via IP open PuTTY. Go to **“Session”** and change the IP Address and Port to the default settings or to the values if you changed them in the WEB interface.

Set the **“Connection type”** to **“Other → SUPDUP”**

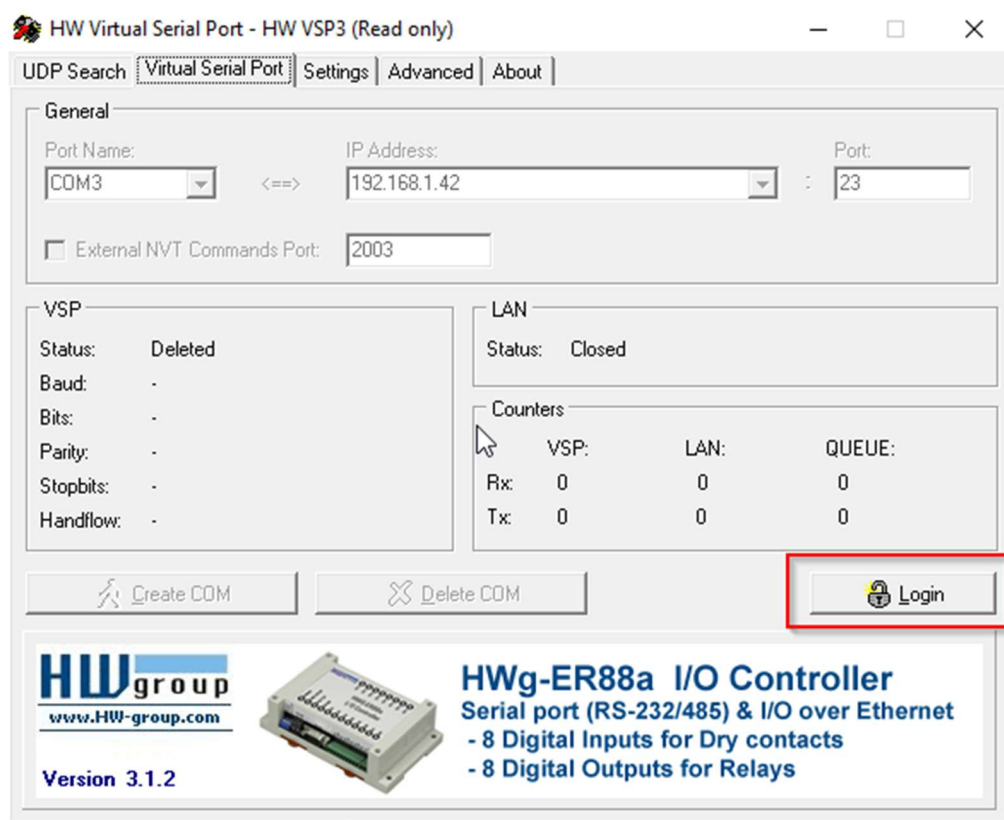


9.2. Connect via Virtual Com Port and open a Serial Console

To establish a connection over a virtual Com Port, please download and install HW Virtual Serial Port - HW VSP3 Software.

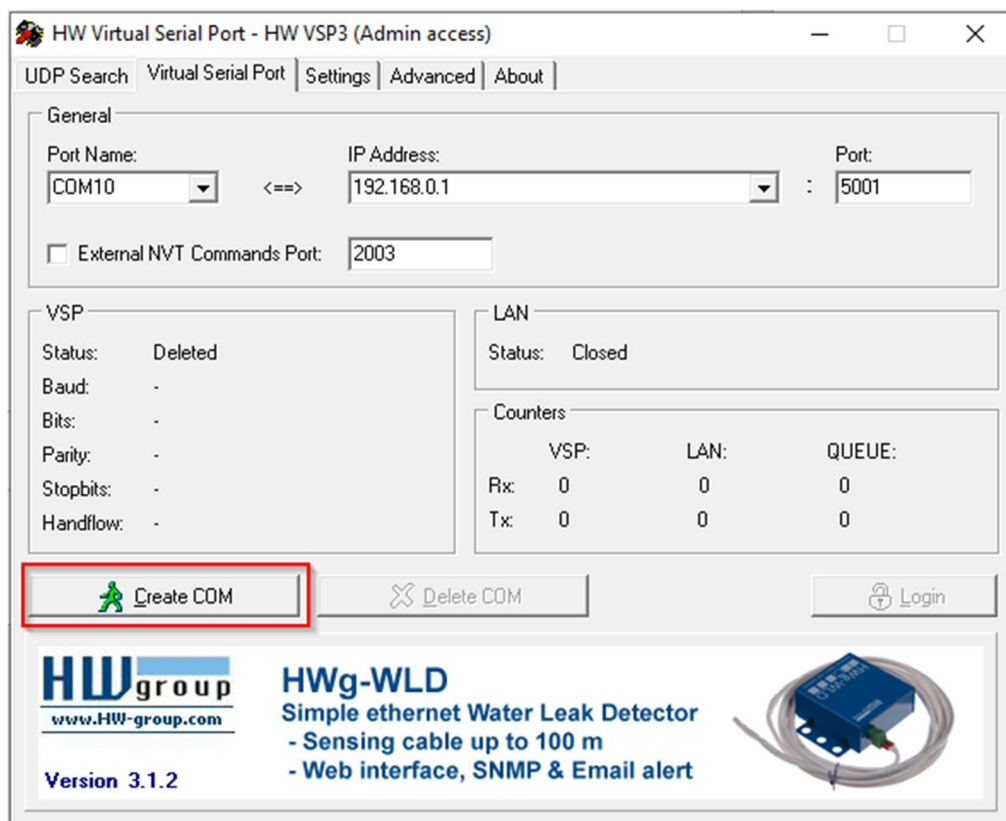
<https://www.hw-group.com/software/hw-vsp3-virtual-serial-port>

Open the Software and click on "Login". Confirm the password, which is by default "admin" and automatically written into the dialogue window.

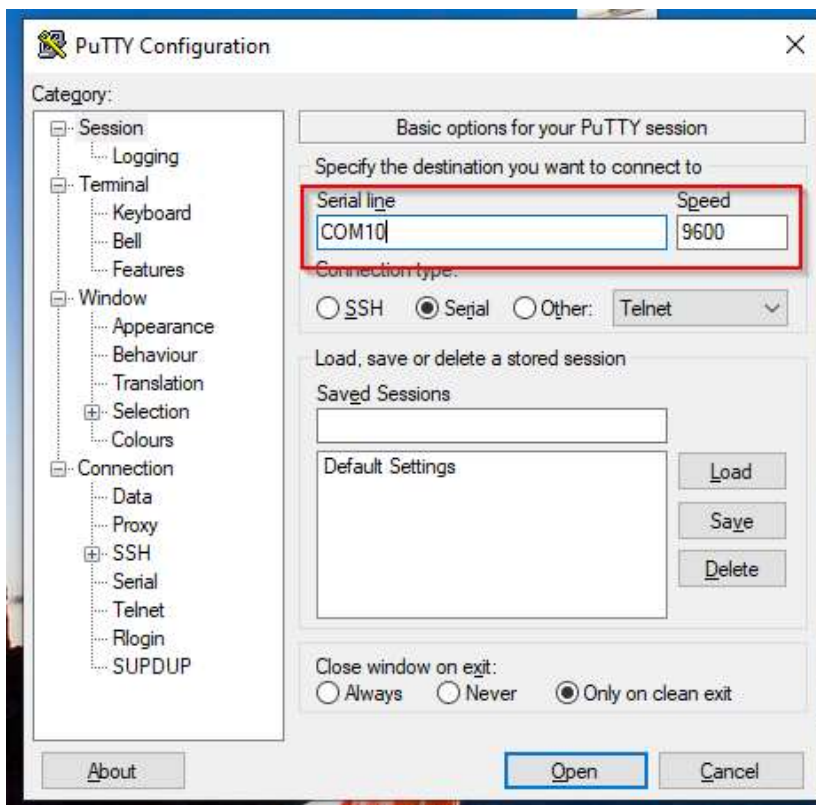


You can now adjust the settings for your virtual COM-Port and when you are finished, click "Create COM".

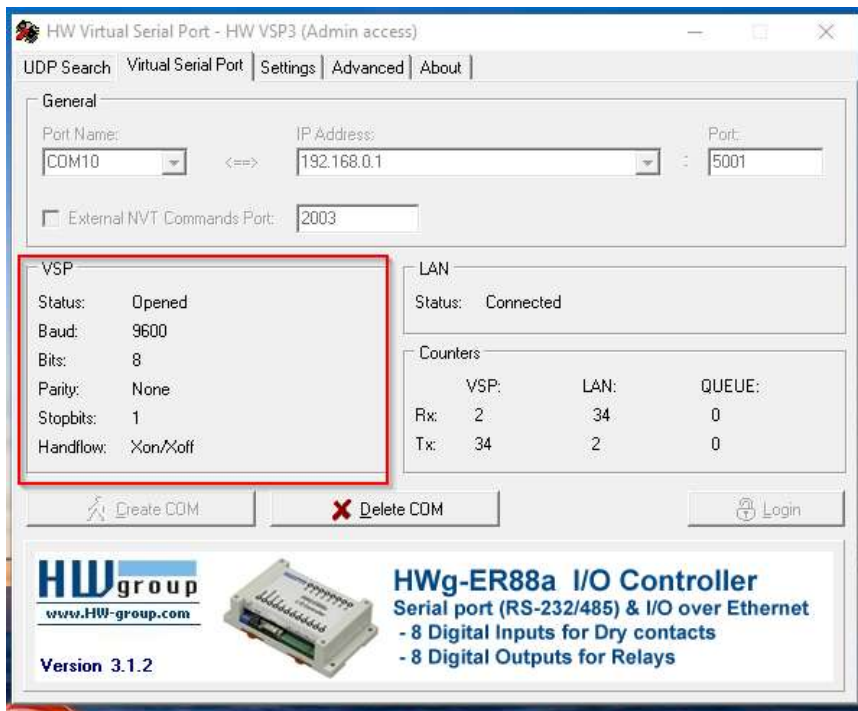




Now open PuTTY and open the “Session” tab. Set the “Connection type” to “Serial → [COM-Port]” adjust the “Speed” to 9600.



You can check the status of your connection in HW Virtual Serial Port and the WEB Interface of the T.C12.RS232I under the "STATUS" section.



SUMMARY

STATUS

CONFIGURATION

MISCELLANEOUS

COMMAND REFERENCE

Status

LAN / FC: 1000F / on

RSIP: up / SERVER

RS>>ETH: 219 / 34

ETH>>RS: 2 / 2

Voltage: 3.345 V

Temperature: 45.94 °C

SW: ok

SFP Switch: normal

[Reset statistics](#)

FLEXOPTIX GmbH
 Mühlalstr. 153
 64297 Darmstadt
 GERMANY
 Technical Questions: support@flexoptix.net