



RAPIDOSCAN[®]
CLASSIC

UDP Server Demo | EN

Version 0.2

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1 Preface

The RapidoScan is a very fast measuring light curtain with the ability for outputting all measuring data from every scan cycle. In combination with the very high scanning rate the user will get a very lot of data.

On starting with the integration of the RapidoScan there is nearly always the need for a quick check regarding the received data:

- Do I get meaningful measuring data from the RapidoScan?
- How do the measuring results look like?
- Is there any easy plug and play solution for reading data and storing them in a file preferably without programming overhead?

This Application Note gives answers to above questions and shows how to quickly setup the system for these first integration checks.

2 Modbus TCP | AutoSend-Channel

The RapidoScan is able to run with various data interfaces. One of it is the Modbus interface which is supported by nearly every PLC and a very lot of PC software. So the Modbus interface is well known by technicians and it is relatively easy to get familiar with its protocol.

2.1 Modbus TCP port for Parameterization

Using the Modbus protocol the RapidoScan can be fully parameterized. Of course the measurement results can be read via Modbus telegrams too. But because of the master - slave principle of Modbus a controlled polling by a master unit is necessary.

Therefore to transmit a measurement result via Modbus an additional query telegram is required. This not only means more telegrams but it also means that some mechanism must be implemented in the Modbus master to do so cyclically. And this might become a timing and performance problem in a control system as the update rates are getting higher.

The principle for speeding up the data rate is to make measuring data not only available through polling but also to support automatic sending of measuring data from a slave to a master.

2.2 AutoSend-Channel optimized for Measuring Data

Therefore this approach is implemented in RapidoScan. On the one hand the RapidoScan communicates via standardized Modbus TCP telegrams. But moreover an additional port can be opened which allows communication independently from the Modbus link what we call the AutoSend channel. This second channel adds the opportunity for automatically sending of results independently of the Modbus connection. On the receiving side the only task is to fetch the incoming data from the receive buffer.

To meet different customer requirements the AutoSend channel can be parameterized within wide ranges. It is also possible to choose the communication setup behaviour.

After having connected the AutoSend channel the AutoSend functionality is enabled and the RapidoScan starts self-sending its preconfigured data.

As long as the connection is held active the measurement data will be transmitted cyclically with each single measurement or with each complete package of multiple measurements depending on its configuration.

The AutoSend channel works completely independent of the Modbus TCP functionality. If the configuration is done using the integrated web server of the RapidoScan then the implementation of Modbus TCP can be even completely eliminated.

2.3 Setting up the AutoSend Channel using the integrated Web Interface

First connect to the Web-Server of the RapidoScan using your standard browser. If you haven't changed the settings of the RapidoScan then its IP address will be **192.168.0.223** when using **LAN**.

If your RapidoScan provides WLAN too then you can use the built in Soft-AP functionality of the RapidoScan. Here the standard IP address is **192.168.1.1** and the network key of the **WLAN** is **87654321**.

Log in as **service** user. The default password is "**service**":

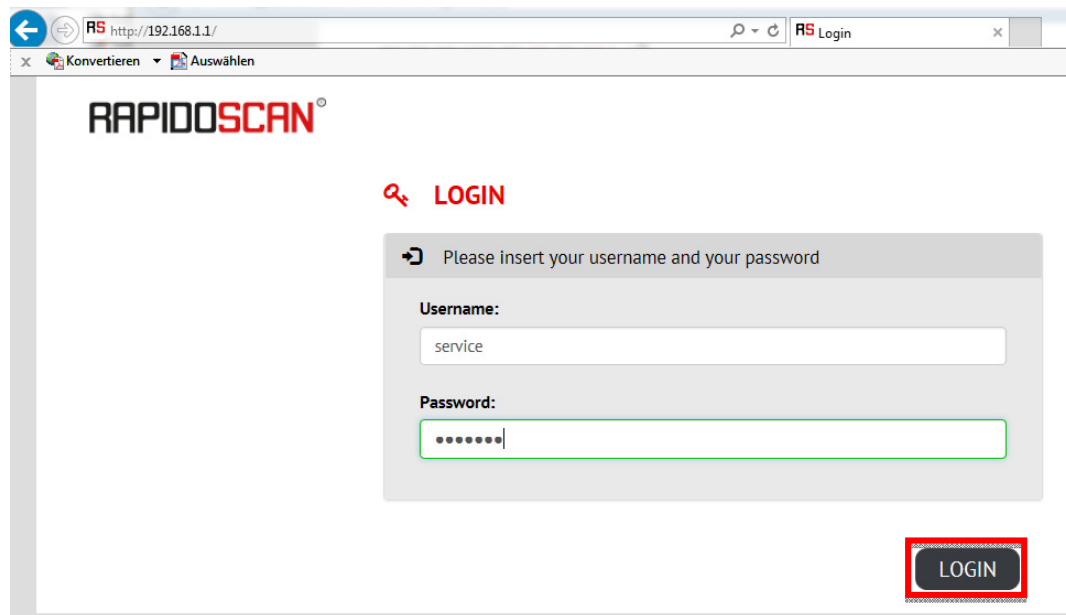


Fig.: 2-1

Next press **LOGIN** (Fig.: 2-1).

2.3.1 IP-Address setting of the RapidoScan

Navigate to the **Connectivity** page (Fig.: 2-2) for configuration.

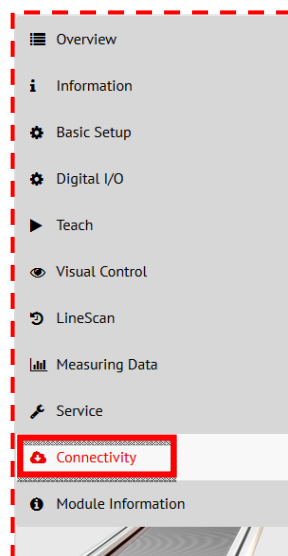
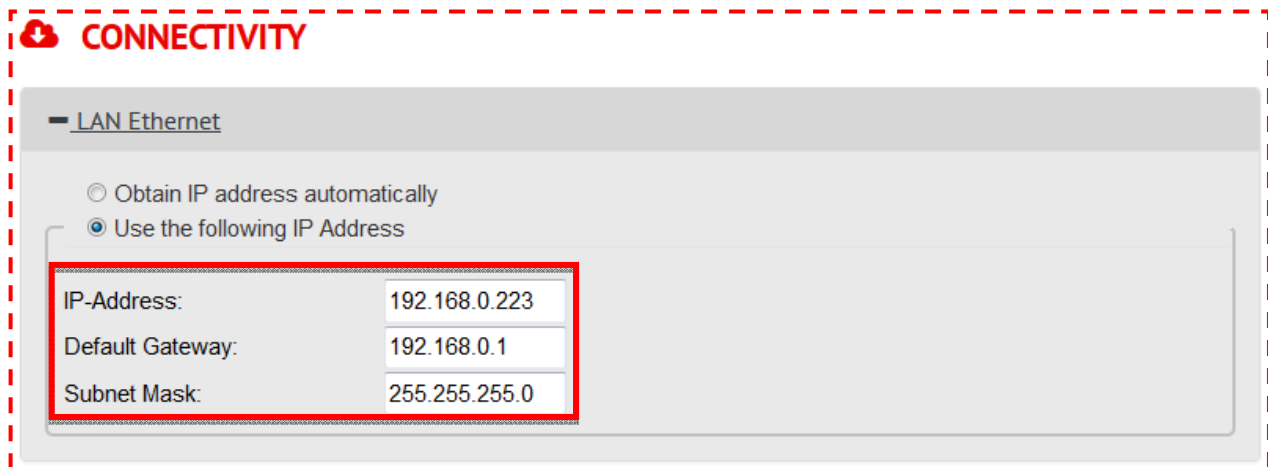


Fig.: 2-2

At first open the **LAN Ethernet** folder to setup the general network settings.

The pre-set standard value is shown below:



CONNECTIVITY

LAN Ethernet

☐ Obtain IP address automatically

☒ Use the following IP Address

IP-Address:	192.168.0.223
Default Gateway:	192.168.0.1
Subnet Mask:	255.255.255.0

Fig.: 2-3

2.3.2 Port setting for Modbus TCP

In case you are using Modbus TCP you have to configure the Modbus TCP port

Afterward expand **ModbusTCP Settings**



ModbusTCP Settings

TCP Port:	502
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Fig.: 2-4

The standard **TCP port** (Fig.: 2-4) for Modbus TCP is: **502**

Using this settings, the RapidoScan will do the Modbus Communication at: 192.168.0.223:502

For transferring the setup to the RapidoScan please press the **Write to Device** button and afterwards do not forget to make the setup persistent by pressing the **SAVE** button on the upper left corner.

For more details on the Modbus register mapping please refer to the application note "RapidoScan, Modbus TCP and Ethernet, EN.pdf"! Details about Modbus can be found at http://www.modbus.org/docs/Modbus_Application_Protocol_V1_1b.pdf.

Now the RapidoScan is ready to run!

Information: You can find some more details about the Modbus TCP and its parallel AutoSend channel by reading the application note "RapidoScan, Modbus TCP and Ethernet, EN.pdf".

3 Receiving Data using AutoSend

3.1 UDP Server Demo

The PC software “UDP Server Demo” is a plug-and-play ready piece of software that

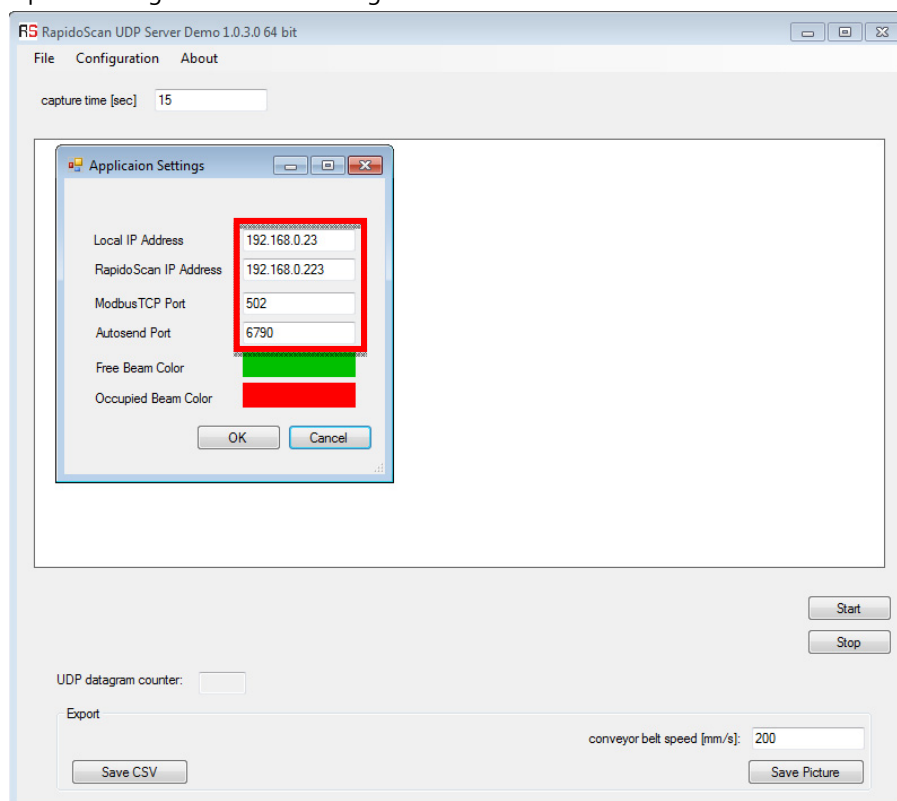
- reads in data from the RapidoScan,
- views that data for quick checkings,
- provides saving of shown results as bitmap images and
- provides saving of data in a textfile format (.csv).

The software can be downloaded from

- Beamstream data: <http://www.rapidoscan.com/service-downloads/UdpServerDemoBeamstream.zip>
- Analog data: <http://www.rapidoscan.com/service-downloads/UdpServerDemoAnalog.zip>

3.1.1 First Time Setup

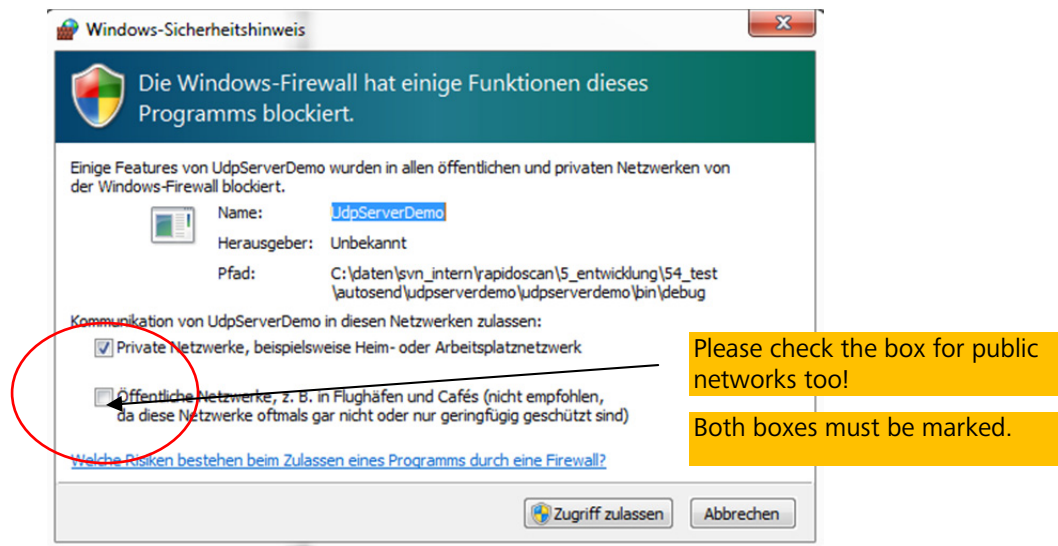
1. Open “Configuration” -> “Settings”



2. The AutoSend Channel is automatically setup throw
“Configuration” -> “RS AutoConfig”

For permanent storing/making persistent the setup, press the **SAVE** button at the integrated web server.

3. Press the “Start” button.
 - a. if you did that for the first time then your PC maybe will popup an alarm message informing you about a possibly unsafe data access from a public network:



The “UDP Server Demo” can then easily be adapted to your needs:

3.1.2 Capture Time

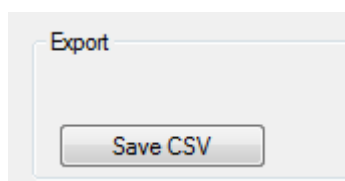
The capture time defines for how many seconds the PC software will collect measuring data:



You can track the progress at the screen. The traced measuring data will be temporarily stored in a temp.csv file which will be automatically created in the folder of the demonstration software.

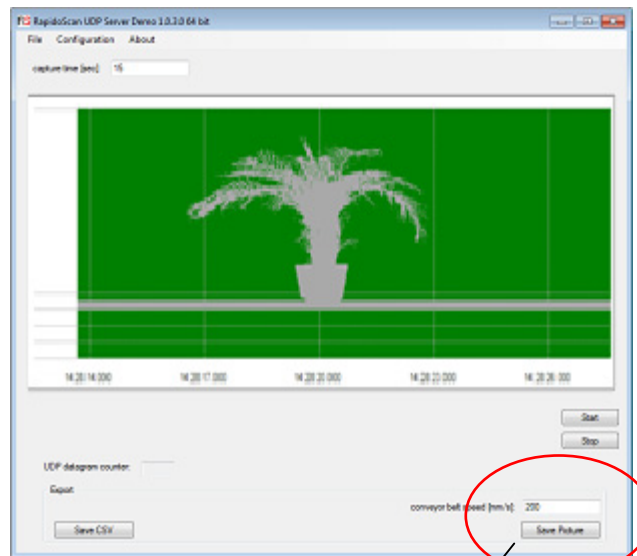
3.1.3 Saving the measuring data

Just press Save CSV to make a copy of the traced data. File name and location can be choosen as you want through a dialog box then.

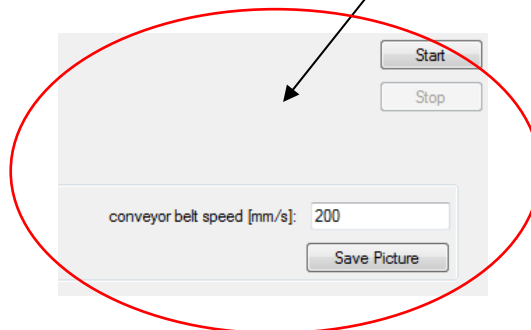


This kind of data can be post processed and filtered and much more using e.g. a standard spreadsheet software.

3.1.4 Saving the measuring data as bitmap



You can save the data as a bitmap too. This is very helpful for quick checks since you can zoom into any detail with simple picture viewing tools.



The RapidoScan works with a resolution of 2.5mm in Y-axis. The resolution in X-axis of course depends on the conveyor belt speed. So images will often look skewed:



To correct distortions in the horizontal axis you can set an approximated value for the conveyor belt speed to widely deskew the picture:



3.1.5 Phenotypic Example

As you can see in the example a very big advantage of the scanner is getting results without taking care of any special lighting equipment.

Real world plant	Bitmap of beamstream result