

MANUAL  
RS04/Web - Quick Start

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RS04/Web - Quick Start  
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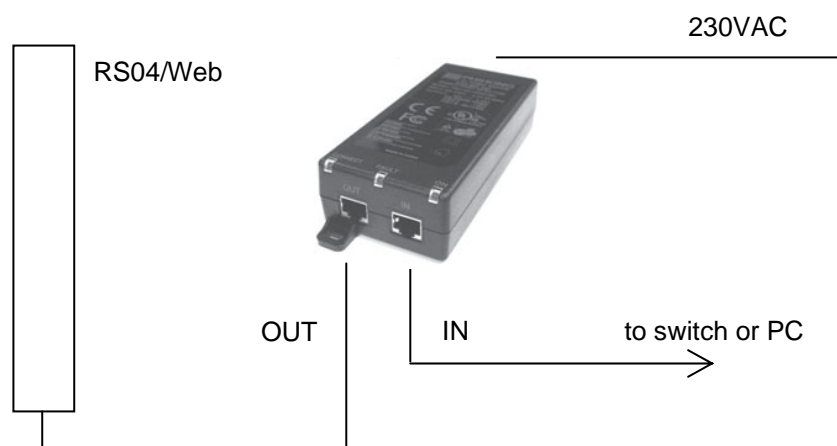
## 1 Purpose of this document and recommendations

This document shall allow any user to put a RS04/Web – gamma detector into operation. But it is strongly recommended to get the help of someone who is familiar with networking and at best with Linux too!

## 2 Main parts and how to connect them

For running a RS04/Web, you need a compatible power supply, network cables as well as the network infrastructure where the probe has to be connected.

1. Mount the special Ethernet protection clip on the network cable
2. Connect the cable to the probe
3. Connect the other side to the port of the power supply, labeled with “OUT”.
4. Connect a second network cable to port of the power supply labeled with “IN”.
5. Connect the other side of the second network cable to your network infrastructure. (eg. hub, switch, etc..). Instead of a straight network cable you can of course use a cross link cable to connect directly to your PC.



## 3 Assigning an IP address

### 3.1 Via DHCP

The probe is configured to receive its IP address from a DHCP server by default. So, all necessary configuration is then done automatically, which is considered the easiest way. You just have to find out which IP address has been assigned to your probe. You can do this by having a look onto the DHCP server, or you can search for the (unique) MAC address, which is labeled on the probe, by means of a MAC scanner software. DHCP is the recommended mode.

### 3.2 Manually

If you want to do the network configuration of the probe manually, then you have to stick to the default IP address first.

If the IP address can not be achieved from a DHCP server, the probe will **fallback to the following IP: 192.168.0.90**. (Subnetmask: 255.255.255.0). (This takes some time!)

If you have a DHCP server available in your network, you can force the fallback by directly connecting to your PC by means of a cross link Ethernet cable! In this case it is important to have all the network cables connected before connecting the power cable.

For further configuration you need to set the IP of your PC to an IP address within the default range of the probe. eg.: 192.168.0.1 (Subnetmask: 255.255.255.0)

In manual mode some, maybe necessary settings like DNS entries are not done automatically. So, if these settings are needed it is necessary to do them manually too!

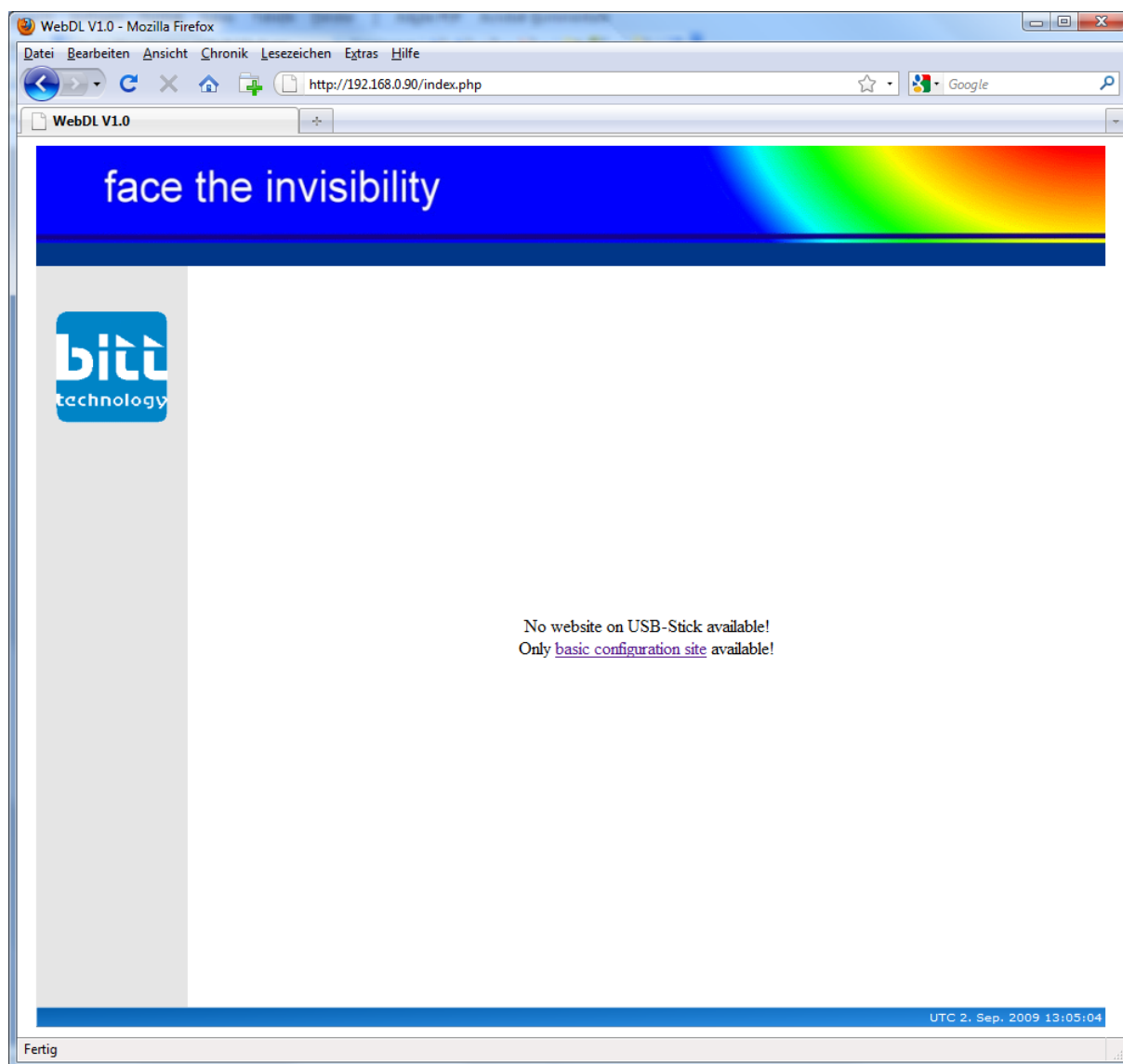
If there are troubles to connect to the probe, it is always possible to tell your client to link a specific MAC address to a specific IP address. When using Windows as OS you do that by means of the “arp” command.

(eg.: `arp -s 192.168.0.111 00-aa-bb-cc-dd-ee` )

## 4 Basic configuration

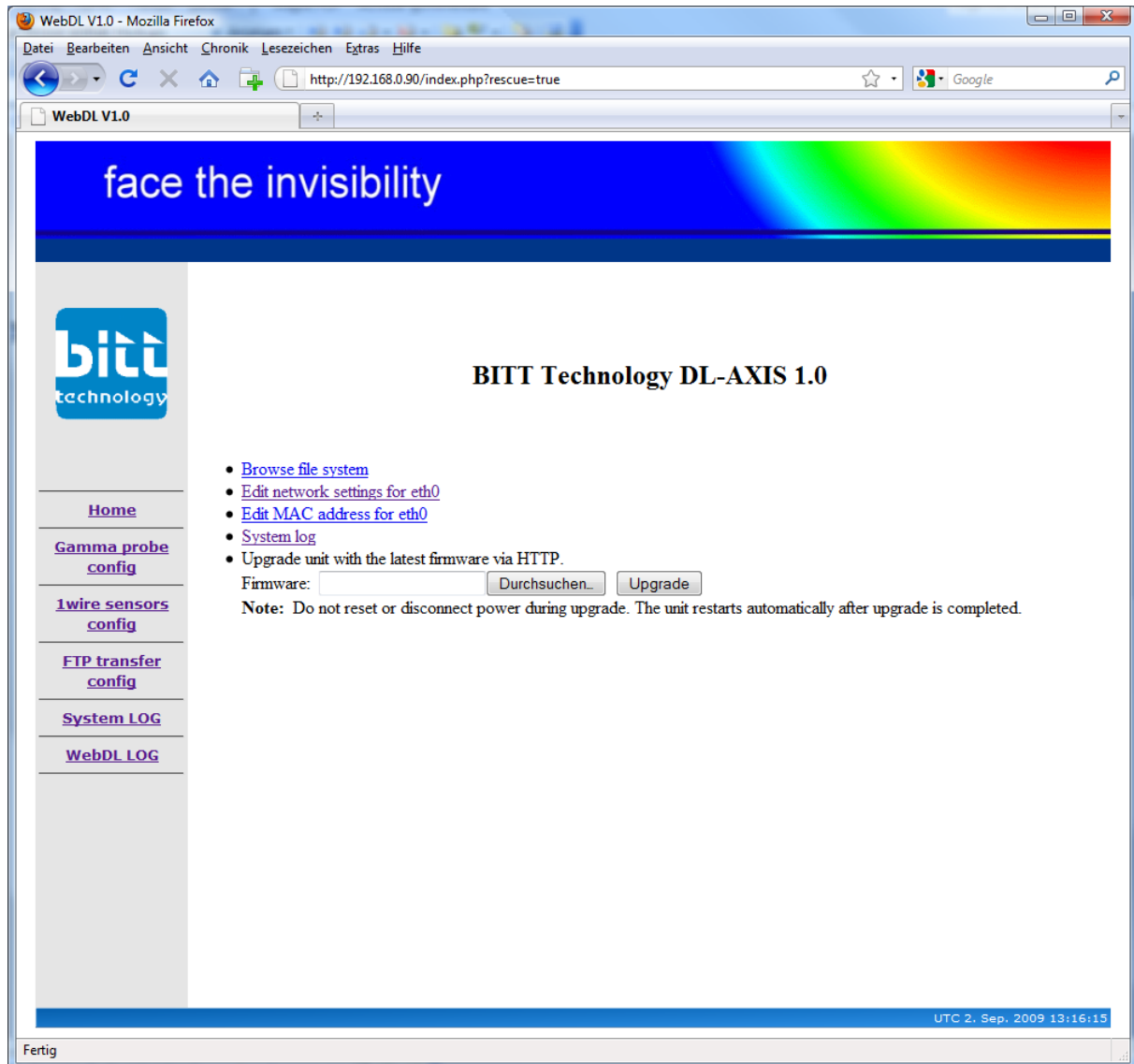
After step 2 (assigning an IP address), you can continue with adapting the configuration of your probe. This mode is configured by default, if not otherwise specified in the order!

Therefore open your favorite browser and go to the assigned IP address. In the following example it is 192.168.0.90.



Because only the configuration site is available, you will get the screen above. Click on “basic configuration site”. And enter the user credentials in the appearing box. **The default username is “root” and the default password is “Hebitt”.** Please note that Linux is case sensitive.

The next screen shows you the basic configuration screen. Starting from here it is possible to edit the most important configuration files as well as to browse the full file system. So please be careful which files you edit. A mistake can lead to serious problems and it may be necessary to send the probe to BITT headquarters. So far its safe to click everywhere, but when clicking on a “save file”-button please make sure that you are aware of your actions.



The most important config files have short links on first page or “home”. All these important config files have comments, so that it should be easy to edit them.

#### 4.1 **Network configuration**

To open the network settings, click on “Edit network settings for Eth0”. The most often needed configuration is to switch between “DHCP” and “manual” mode. Therefore just edit the value “BOOTPROTO” accordingly to the comments in the config file. Further important values may be “IP”, “NETMASK”, “BROADCAST” and “GATEWAY”.

The MAC address is unique, if you want to change it anyway use the link “Edit MAC address for eth0”.

## 5 The two modes of operation

After step 2 (assigning an IP address), you can continue with adapting the configuration of your probe.

There are two modes of operation available, which are completely different!

### 5.1 Datalogger mode

The probe is configured to work as a data logger by default. Data can be stored from weeks to decades dependant on the version of the probe. The data is averaged and stored accordingly to the applied configuration. The latest data is always sent automatically to a specified FTP server by default. But it is also possible to connect to the probe as an FTP client and get the data. So the probe supports push and pull of data!

### 5.2 Direct data mode

The probe is configured to send its data directly via TCP/IP. This means that there is no data logger, no averaging and no storage of data. The direct data is generated every few seconds. To get this data connect to port 3000 of the network probe! (eg. by means of putty). Of course it is also possible to use a 3<sup>rd</sup> party virtual comport software which links to this port.

## 6 Configuration in data logger mode

### 6.1 Probe configuration

The default averaging period is 10 minutes. The corresponding value in the configuration file – click on “Gamma probe config” - is “periodtime”, where the value is given in minutes. The user might want to change the 8 different warning levels as well.

### 6.2 FTP configuration

For changing the FTP push configuration, go to “FTP transfer config”. You might want to change the value “checktime”. For a LAN the default value of 10 seconds is a good choice. For remote applications this might cause a too high amount of data because the connection check is done according to “checktime”. Set this value to eg. 300 seconds in case of a remote application to reduce the amount of data.

Where to send the data is configured by the values with the mask “ftp\*”. You need to specify host, username, password and an optional directory. This should be self explaining.

## 7 Special direct data operation mode

For setting up this configuration, you need to edit the file “/etc/inittab”. Under Linux this file is something like a startup script. For editing use your favorite browser and use the link “Browse file system”.

You need to comment and uncomment some lines in the inittab. This is done by a leading “#”

Put the data logger program under comment, it should then look like this:

```
#det:3:respawn:/mnt/flash/root/det -d 0
```

Uncomment the software for direct data push, it should look like this:

```
tcpser:3:once:/mnt/flash/root/tcpser
```

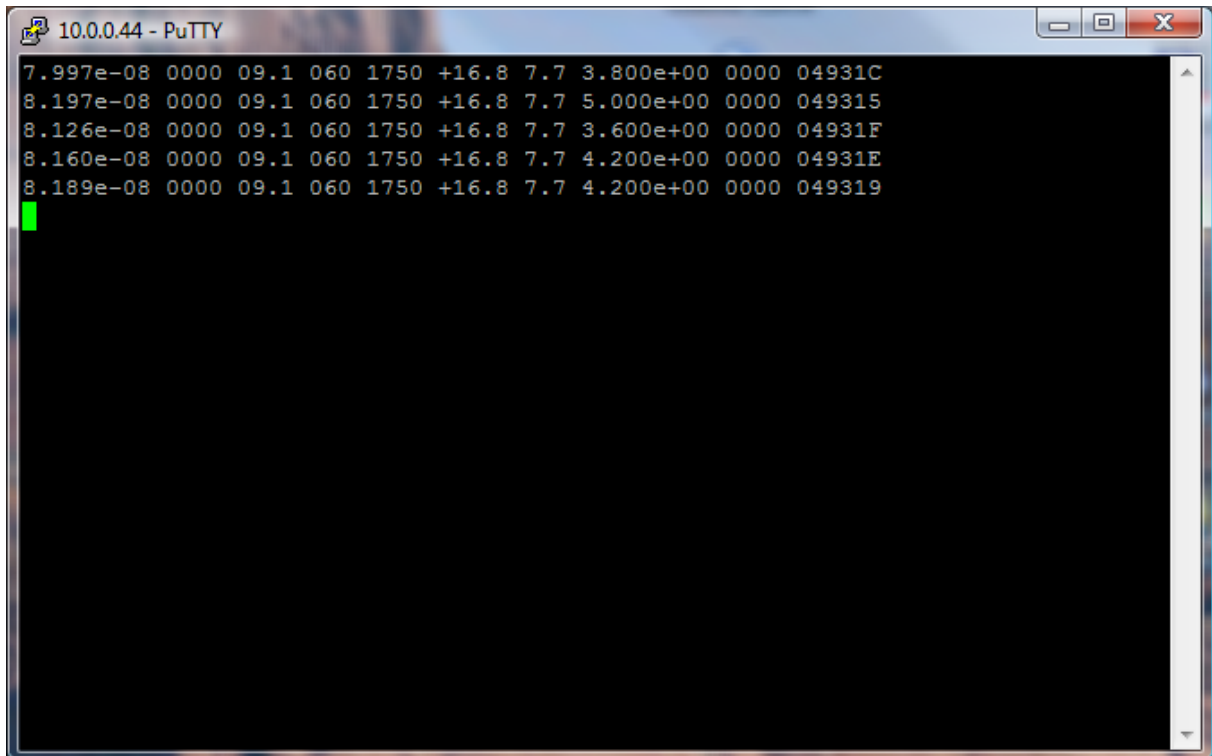
Then save the file, wait for completion and reboot the probe – use a cold reset!

For changing back to the data logger mode undo the above changes.

After the reboot, the direct data will be provided at port 3000. Please note that only one client can connect to this port. More than one is not supported! In the following examples, this means either Putty or the COM port redirector can be used!

## 7.1 View direct data by means of Putty

After the reboot you can try to connect to the probe by means of eg. Putty for viewing live data. Putty is a Telnet/SSH client which can be found on the Internet for free. Enter the IP address as well as the port “3000” and select the “RAW” protocol. You’ll get the output like here.



The screenshot shows a PuTTY terminal window titled "10.0.0.44 - PuTTY". The terminal displays five lines of raw data in a fixed-width format. Each line contains 11 fields separated by spaces. The first field is a scientific notation value, the second is a four-digit hex value, and the remaining fields are a mix of integers and scientific notation values. A green cursor is visible at the start of the sixth line.

```
7.997e-08 0000 09.1 060 1750 +16.8 7.7 3.800e+00 0000 04931C
8.197e-08 0000 09.1 060 1750 +16.8 7.7 5.000e+00 0000 049315
8.126e-08 0000 09.1 060 1750 +16.8 7.7 3.600e+00 0000 04931F
8.160e-08 0000 09.1 060 1750 +16.8 7.7 4.200e+00 0000 04931E
8.189e-08 0000 09.1 060 1750 +16.8 7.7 4.200e+00 0000 049319
```

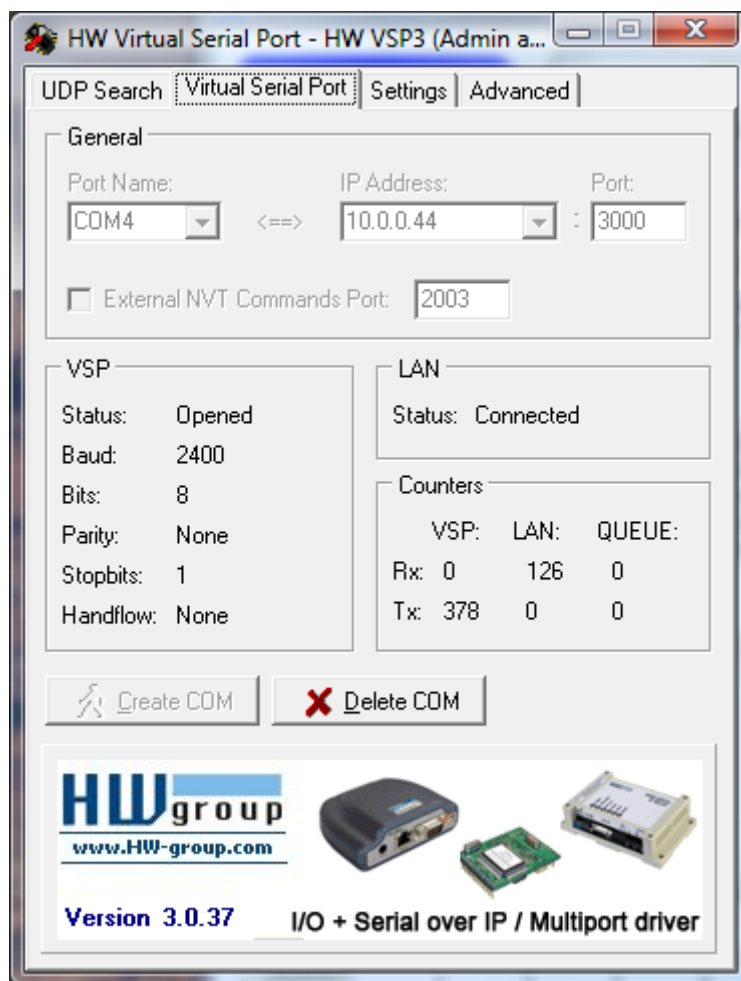
The above protocol format is configured by default, its called OSSENS. The description of the format is included in the RS04 manual. The changes to other protocol formats like shown in the RS04 manual are also possible with the RS04/Web in the direct data mode!

## 7.2 View direct data by means of COM port redirect and BITTSENS SL

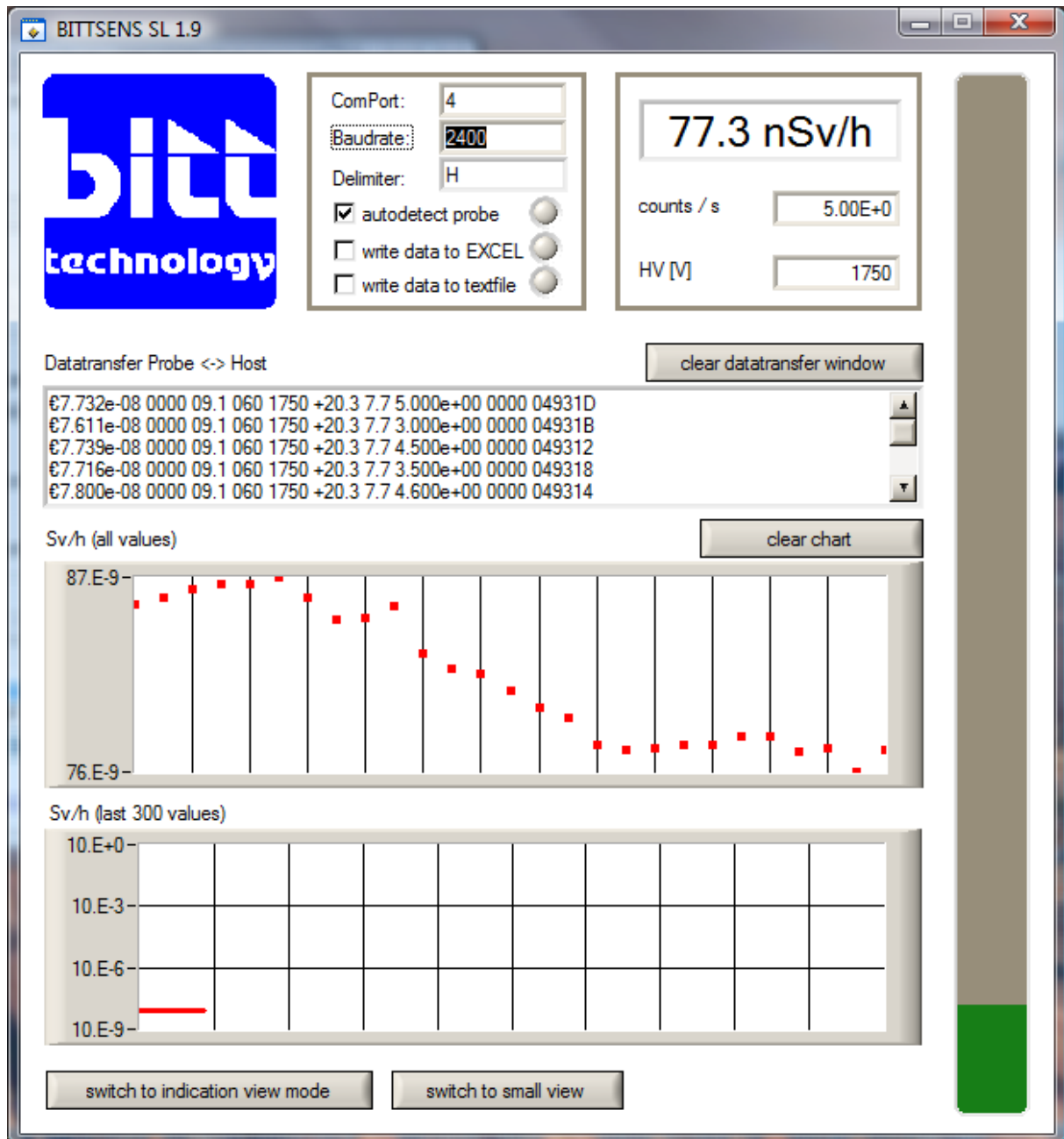
For doing this you need to install a COM port redirector which is capable of connecting to a TCP socket. And you need to install a software which can handle the provided data! In this example BITTSENS SL and the “HW Virtual Serial Port” software are used. BITTSENS SL can be installed by taking defaults. The com port redirector shall be installed in “standalone mode”. This is a free 3<sup>rd</sup> party software.

Start the software, select the COM port you want to use. Type the IP of the probe and choose port 3000, like shown in the picture below. Then click “create COM”.

After that the screen looks like this:



Then start the BITTSENS SL software and choose the same COM port.



Check the boxes “write data to EXCEL” and/or “write data to textfile” if you need averaged and stored data. Writing to EXCEL needs some CPU performance, so if you have an older PC, it might not work fast enough.

Have a look into the BITTSENS SL manual and INI files for further configuration options.

## 8 Files and directories in data logger mode

Example of latest averaged dose rate value: /tmp/det.mean.txt

```
2009-09-07 10:20:06
81.6 nSv/h 10 min
Threshold 0
```

Example of latest averaged dose rate 1 min value: /tmp/det.min.txt

```
2009-09-07 10:28:06
83.2 nSv/h 1 min
Threshold 0
```

Example of latest direct dose rate value (not averaged!): /tmp/det.data.txt

```
2009-09-07 10:29:30
81.2 nSv/h
Threshold 0
```

Example of latest status values part 1: /tmp/WEBDL.1wire.main.1.txt

```
2009-09-07 10:26:03
cpu temp: +33.6 C
board temp: +29.0 C
```

Example of latest status values part 2: /tmp/WEBDL.1wire.main.2.txt

```
current: 0.029 A
vdd: 5.0 V
vad: 22.2 V
```

Averaged data to pull, if stored in RAM: /tmp/ftproot. This location is the primary send queue!

Averaged data to pull, if stored in backup: /mnt/flash/ftprootBackup. The data is moved from RAM to the backup if it can not be pushed to the specified FTP server.

## 9 File formats in data logger mode

### File format "DET" (averaged doserate):

eg.: 015,20090907,112022,10,7.570e-08

Station serial number, date, time, averaging time in minutes, averaged dose rate

### File format "BWC" (warning levels):

eg.: 9950,BWC1L038,0,1.20e-07,20090907,111338,0.00e+00,1

Station serial number, some internal status string, warning level, warning level value, date, time, current doserate, warning level trigger (see config file).

### File format "state" (status information):

Eg.:9960,BSC1L137,20090907,113042,\*0,05,\*0,\*0,\*0,\*0,\*0,0,0000,0.0,0.000e+00,0000,0000,20090304,145137,1CB8,0001,20090727,125801,\*0,\*0,\*0,\*2,000,0.00,00.0,+00.0,\*0,\*0

Station serial number, internal status string, date, time, software state, software version, sensor current state, high voltage state, temperature state, amplifier voltage state, current state, force flag, high voltage value in Volt, amplifier voltage in Volt, sensor count rate in CPS, AD value current, AD value temperature, download time of program, checksum, restart count, date of last CRR, memory state, mains state, battery state, sensor state, sensor current in Ampere, device current in Ampere, battery voltage in Volt, internal temperature, mode flag / rain status, test flag.

### File format "dose" (accumulated dose in different warning levels):

eg.:9952,20090727,120921,3.66E-05,3.44E-

07,0.00E+00,0.00E+00,0.00E+00,0.00E+00,0.00E+00,0.00E+00,0.00E+00

Station serial number, date, time, w10, w11, w12, w13, w14, w15, w16, w17, w18

The dose is accumulated since the given timestamp (date + time)

**File format “1wire” (status information):**

eg.: 023,2009-09-07,11:24:12,+46.3,+39.8,0.078,13.5,5.0

Station serial number, date, time, CPU temperature, board temperature,  
current consumption, supply voltage, 5V voltage measurement

For the checksum calculations and details of the “state” format please look into the  
RS04 manual.

## Document release

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