

**Operating Instructions**  
**for**  
**Configuration Set/HART<sup>®</sup>-Modem**  
**Model: NGM-HART**

# Configuration Set NGM-HART

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We don't accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

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### 2. Note

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Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The instruction manuals on our website [www.kobold.com](http://www.kobold.com) are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email ([info.de@kobold.com](mailto:info.de@kobold.com)) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EC-machine guidelines.

### 3. Instrument Inspection

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Instruments are inspected before shipping and sent out in perfect condition.

Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

## 4. Installation

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### 4.1 Hard- and Software requirements

To run the configuration tool the following requirements are necessary:

- Windows PC with available USB port
- Operating system: Windows 10, 8.1, Server 2012, Server 2008 R2, 7, Vista, Server 2003, XP, ME, 98
- Microsoft Excel version from 2007 (32 Bit and 64 Bit version!)
- Excel-Configuration-Sheet „NGM configuration tool LA V177.xls” (since 01/2022)
- DC supply 24V@30mA (for powering the NGM meter)
- Kobold-HART-Modem with USB connector (Order code HARTCOMM) or any similar standard HART modems available on the market.
- Communication resistor approx. 250 Ohm
- NGM level probe

## 4.2 Electrical connection

The supplied HART® modem must be connected on the device side via a current loop resistor (250 Ohm, in the scope of supply).  
On the PC side is a normal USB connection required.



Figure 1

The complete wiring is shown in Figure 2:

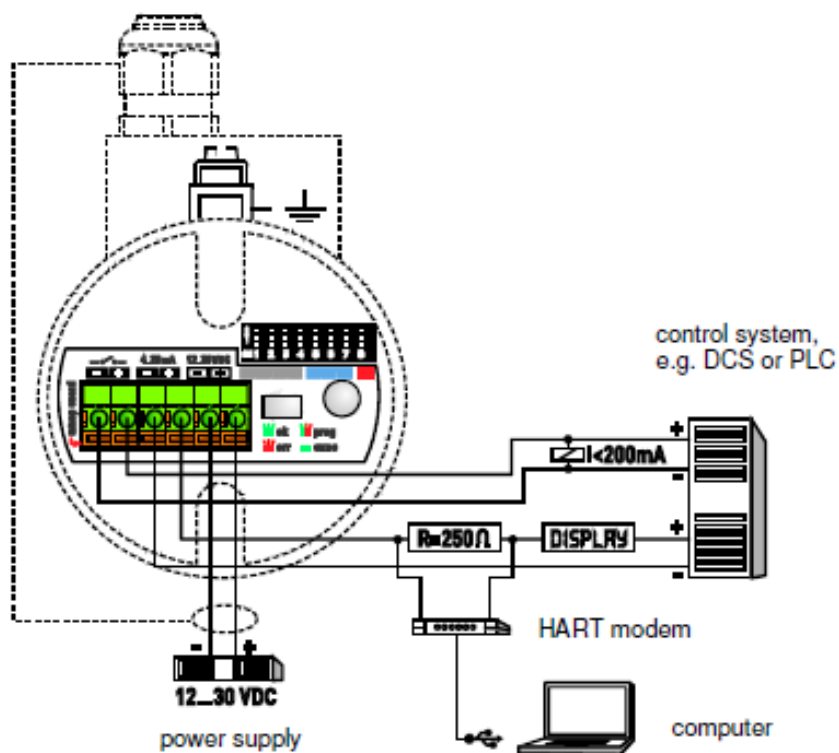


Figure 2

# Configuration Set NGM-HART

## 4.3 Commissioning

Before commissioning the hardware drivers for the HART® modem should be installed.

### Note 1!

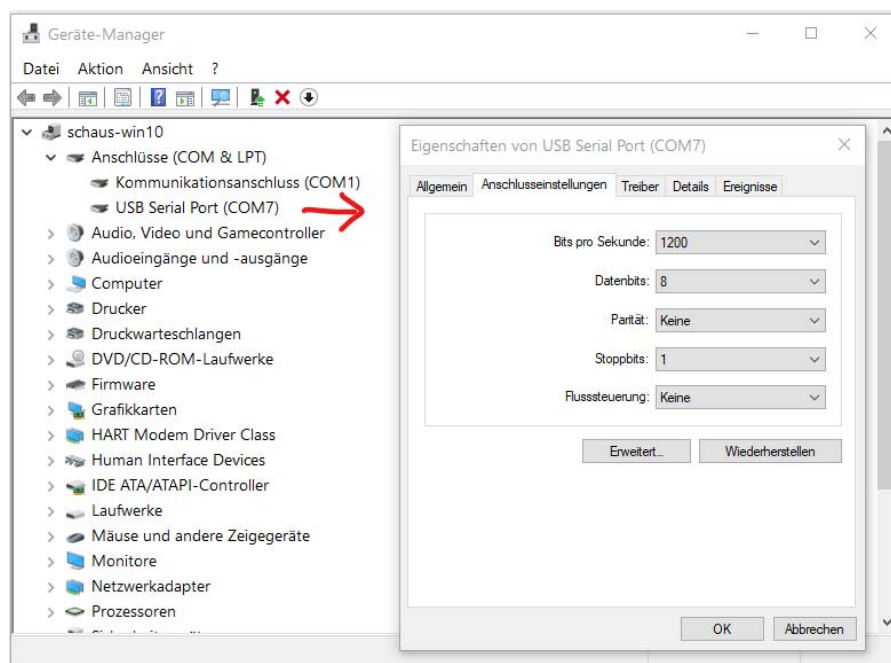


The current Excel file for configuring the NGM sensor, as well as the drivers for the modem, can also be downloaded from our homepage [www.kobold.com](http://www.kobold.com), under Product search "NGM" / Downloads.

### Note 2!



When using the configuration of the NGM with a HART modem, the baud rate of your USB communication "must" be reduced to 1200 bits/s! This is set to 9600Bit/s in the standard. If the parameter is not set, no communication between NGM and EXCEL programming tool can be established.



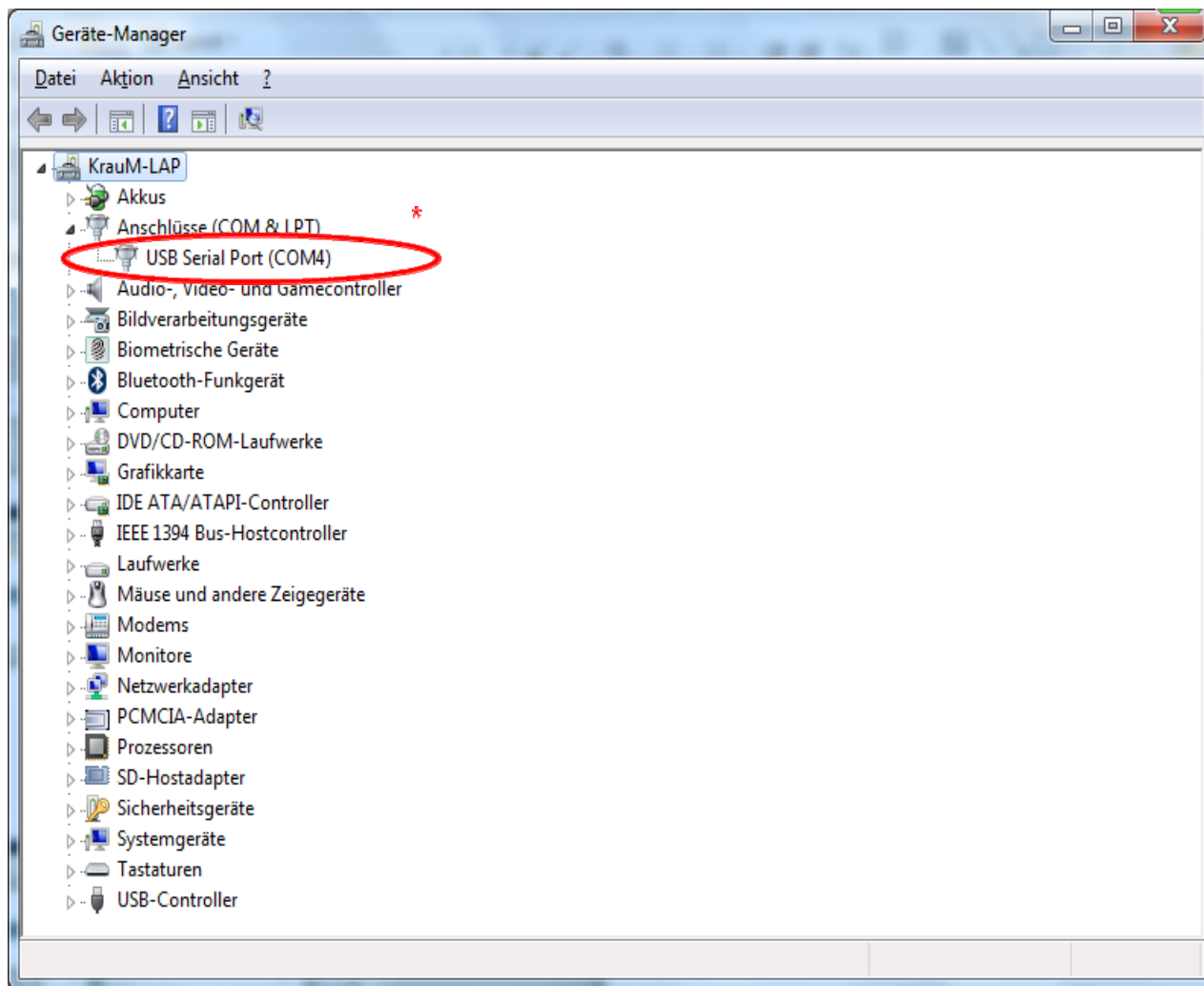
After the installation the USB plug of the modem should be plugged into the USB port and the PC will recognize the modem as "USB Serial Device" and is assigned a virtual COM port.

After opening the Excel configuration tool, the security level should be set to the lowest setting for the execution of MACROS.

### 4.3.1 Connection of a NGM Probe to a PC

- Check the COM port assignment of the PC to the USB HART® modem with the Device Manager

<http://www.computerhope.com/issues/ch000833.htm>

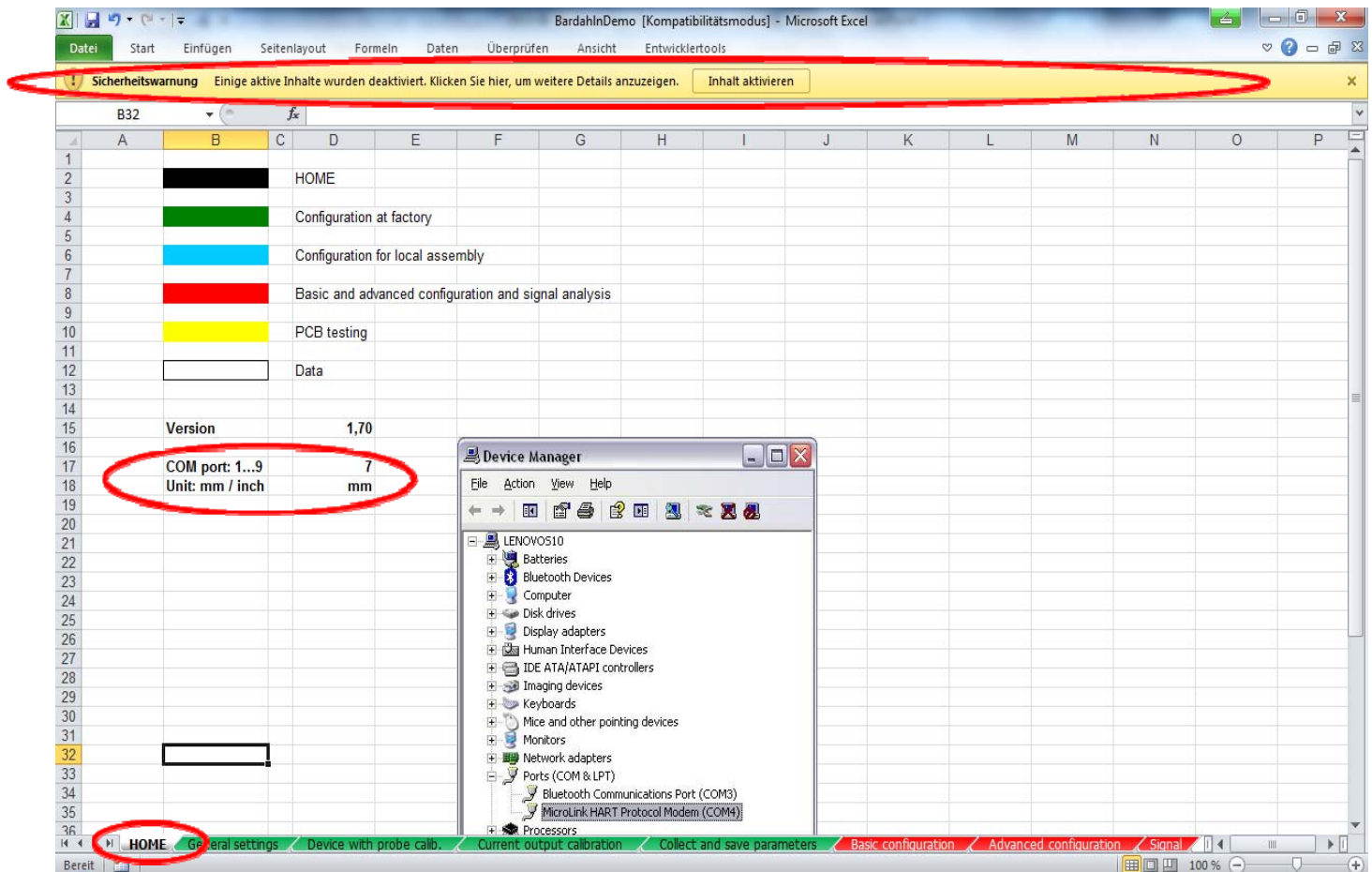


\* In this case COM port 4 has been assigned to the HART® modem

# Configuration Set NGM-HART

## 4.3.2 First Steps with the Excel Tool

1. Open the Excel file
2. Prerequisite: worksheet is active and the macros are running  
(Hint: A restart of the Excel file might help to activate the Macros.)
3. HOME
4. Enter the assigned COM port indicated at the device manager.



For the usage of the Excel tool, a click on the necessary cell activates the communication and/or parameters can be changed. For re-sending the command, click on a free cell elsewhere and move back to the required cell. The OK status has to return for a successful communication.

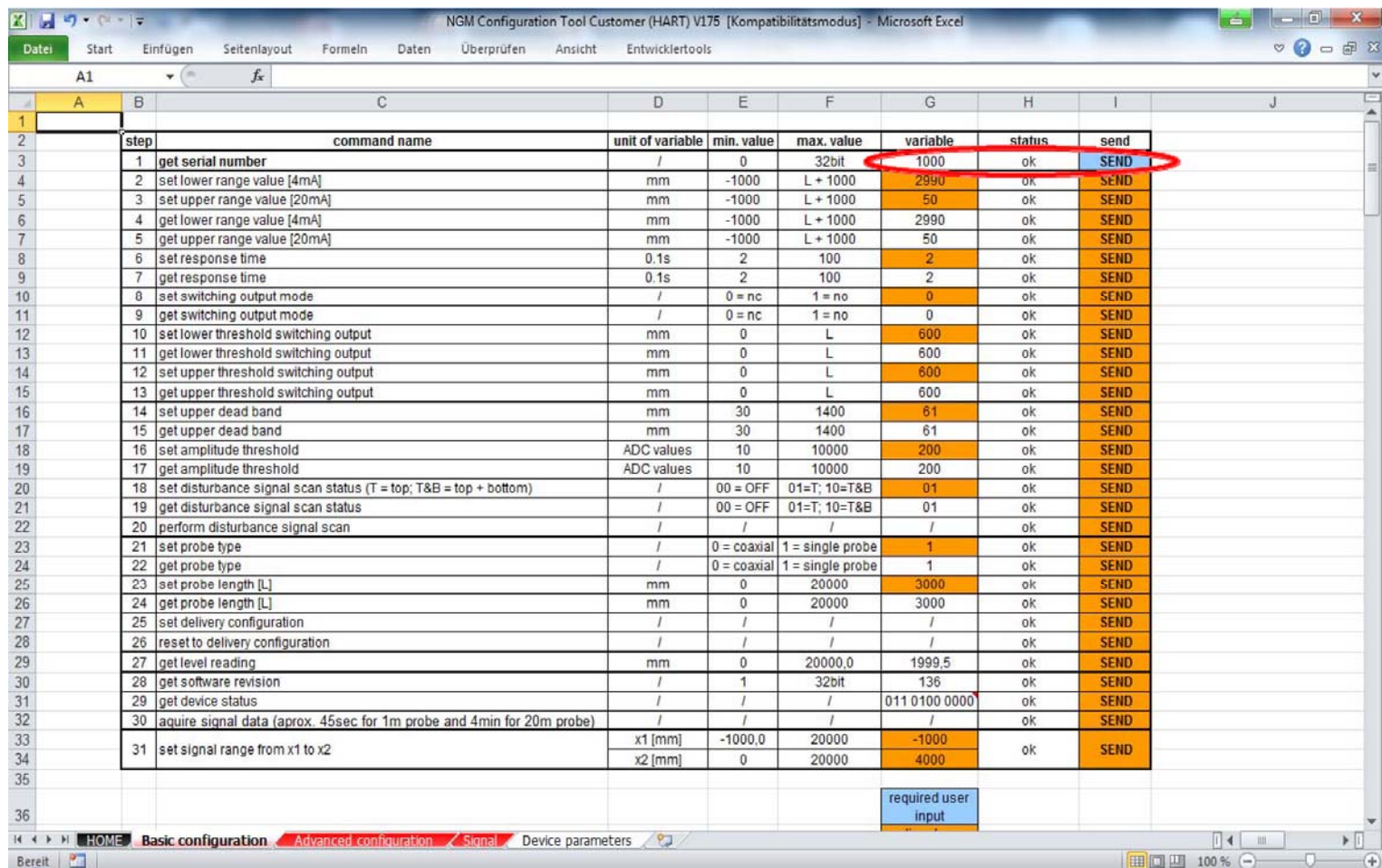


## 5. Configuration

### 5.1 Basic Configuration

Establishing a HART® communication:

- Serial number obtainable by clicking on the light blue SEND button J2 in step 1 “get serial number”
- Macros are running
- OK status (H2) disappears and reappears after serial number read out and shown in G2



step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000,0	1999,5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000,0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000		



If OK status does not reappear, check the connection or the COM port settings

Now the HART® communication is established and the modification of device-specific parameter as well as the read-out of the echo curve can be performed.

## Configuration Set NGM-HART

## 5.2 Upper / Lower Range Value

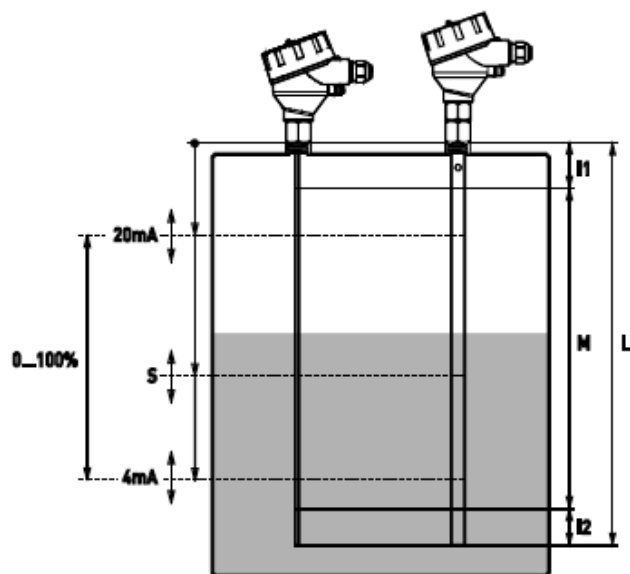
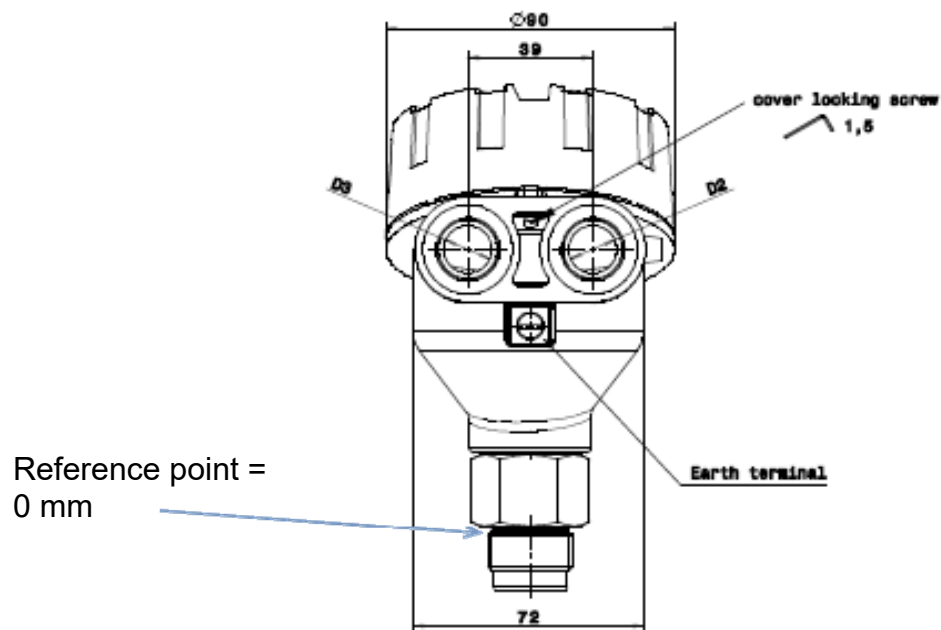
## BASIC CONFIGURATION

- Read out actual 4...20mA settings by clicking on I6 and I7

With the command “get lower / upper range value”, the actual 4...20 mA values in mm are shown after the OK status disappeared and is visible again.

- Change actual 4...20 mA settings by changing the values in G4 and G5 and clicking on I4 and I5 “set lower / upper range value”
- Verify changes by clicking again on I6 and I7 “get lower / upper range value”

step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000.0	1999.5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000	ok	SEND



# Configuration Set NGM-HART

## 5.3 Response Time

### BASIC CONFIGURATION

- Read out actual response time, by clicking on I9.

Field G9 is showing the actual response time multiplied with 0,1ms.

- Change actual response time within a range of 2 ... 100 (0,2 ... 10 sec) in field G8 and clicking on I8 “set response time”.



Use high response times for storage tanks with slow level movements. Use low response times for buffer and process tanks.

step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01 = T; 10 = T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01 = T; 10 = T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000,0	1999,5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000,0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000	ok	SEND



Verify changes by clicking again on I9 “get response time”



## 5.4 Switching Output Mode

### BASIC CONFIGURATION

- Read out actual switching output mode by clicking on I11

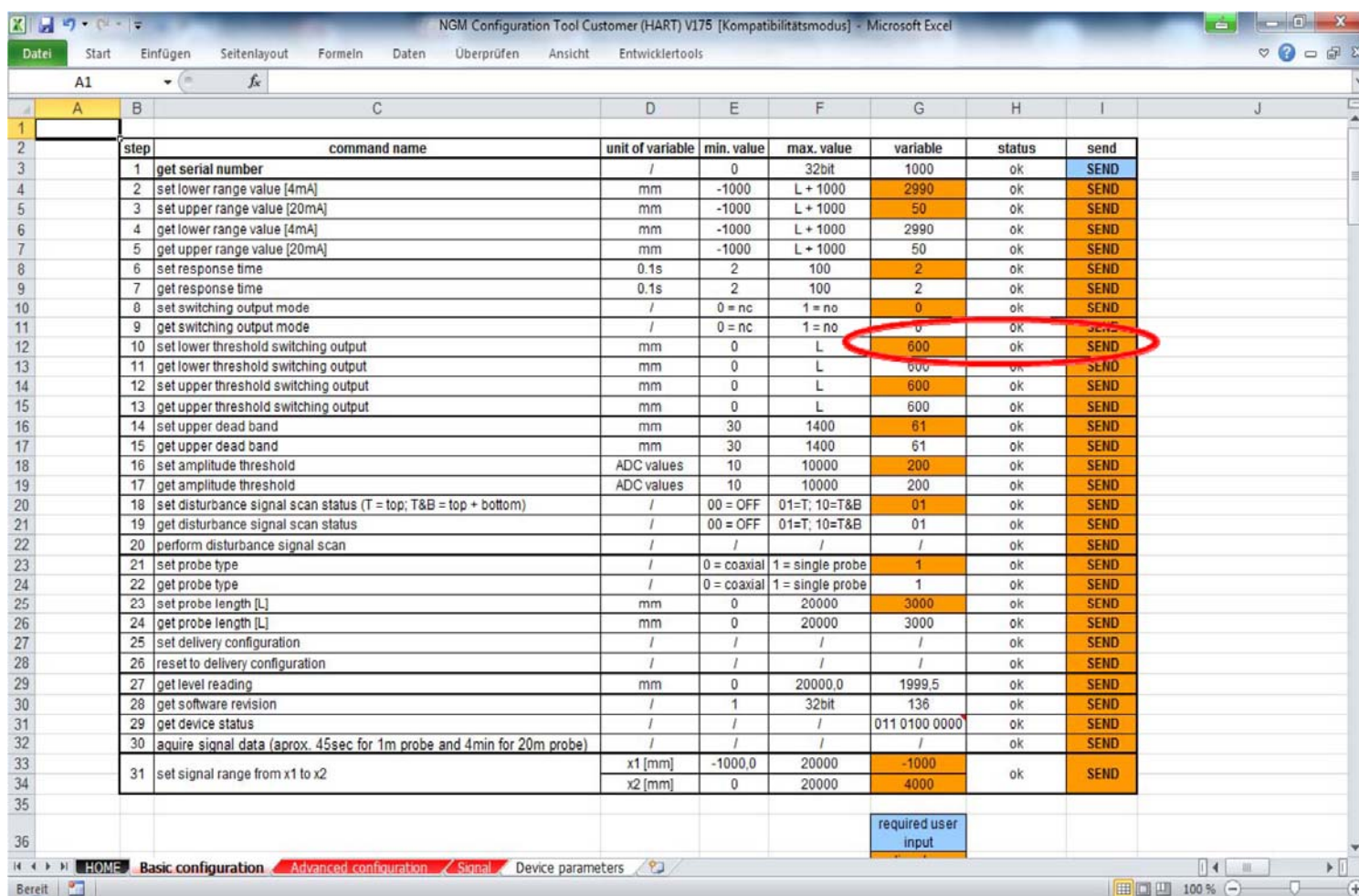
Field G11 is showing the actual switching output mode.

– 0 = nc = normally closed

– 1 = no = normally open

Once the probe is powered, the switch output can be open or closed. The standard switch output mode is set to “normally closed”, as it would open at a power failure for highest safety.

- Change actual switching output mode 0 or 1 in field G10 and clicking on I10 “set switching output mode”



step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000.0	1999.5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000	ok	SEND



Verify changes by clicking again on I11 “get switching output mode”

# Configuration Set NGM-HART

## 5.4.1 Threshold switching output

### BASIC CONFIGURATION

- Read out actual lower / upper threshold switching output, by clicking on I13 and I15.

Field G13/15 indicates the actual lower / upper switching threshold.

With the help of the thresholds, a hysteresis can be programmed to avoid output switching at turbulent levels. First, the upper threshold must be passed to activate the output then the lower threshold for deactivation of the output.

- Change actual lower / upper threshold in field G12 / G14 and click on I12 / I14 “set lower / upper threshold switching output mode”.

NGM Configuration Tool Customer (HART) V175 [Kompatibilitätsmodus] - Microsoft Excel									
Datei Start Einfügen Seitenlayout Formeln Daten Überprüfen Ansicht Entwicklertools									
A1	A	B	C	D	E	F	G	H	I
1									
2		step	command name	unit of variable	min. value	max. value	variable	status	send
3		1	get serial number	/	0	32bit	1000	ok	SEND
4		2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5		3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6		4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
7		5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
8		6	set response time	0.1s	2	100	2	ok	SEND
9		7	get response time	0.1s	2	100	2	ok	SEND
10		8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
11		9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
12		10	set lower threshold switching output	mm	0	L	600	ok	SEND
13		11	get lower threshold switching output	mm	0	L	600	ok	SEND
14		12	set upper threshold switching output	mm	0	L	600	ok	SEND
15		13	get upper threshold switching output	mm	0	L	600	ok	SEND
16		14	set upper dead band	mm	30	1400	61	ok	SEND
17		15	get upper dead band	mm	30	1400	61	ok	SEND
18		16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
19		17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
20		18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
21		19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
22		20	perform disturbance signal scan	/	/	/	/	ok	SEND
23		21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
24		22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
25		23	set probe length [L]	mm	0	20000	3000	ok	SEND
26		24	get probe length [L]	mm	0	20000	3000	ok	SEND
27		25	set delivery configuration	/	/	/	/	ok	SEND
28		26	reset to delivery configuration	/	/	/	/	ok	SEND
29		27	get level reading	mm	0	20000.0	1999.5	ok	SEND
30		28	get software revision	/	1	32bit	136	ok	SEND
31		29	get device status	/	/	/	011 0100 0000	ok	SEND
32		30	acquire signal data (approx. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
33		31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND
34				x2 [mm]	0	20000	4000		
35									
36							required user input		



Verify changes by clicking again on I13 / I15 “get lower / upper threshold switching output”

## 5.4.2 Upper Dead Band

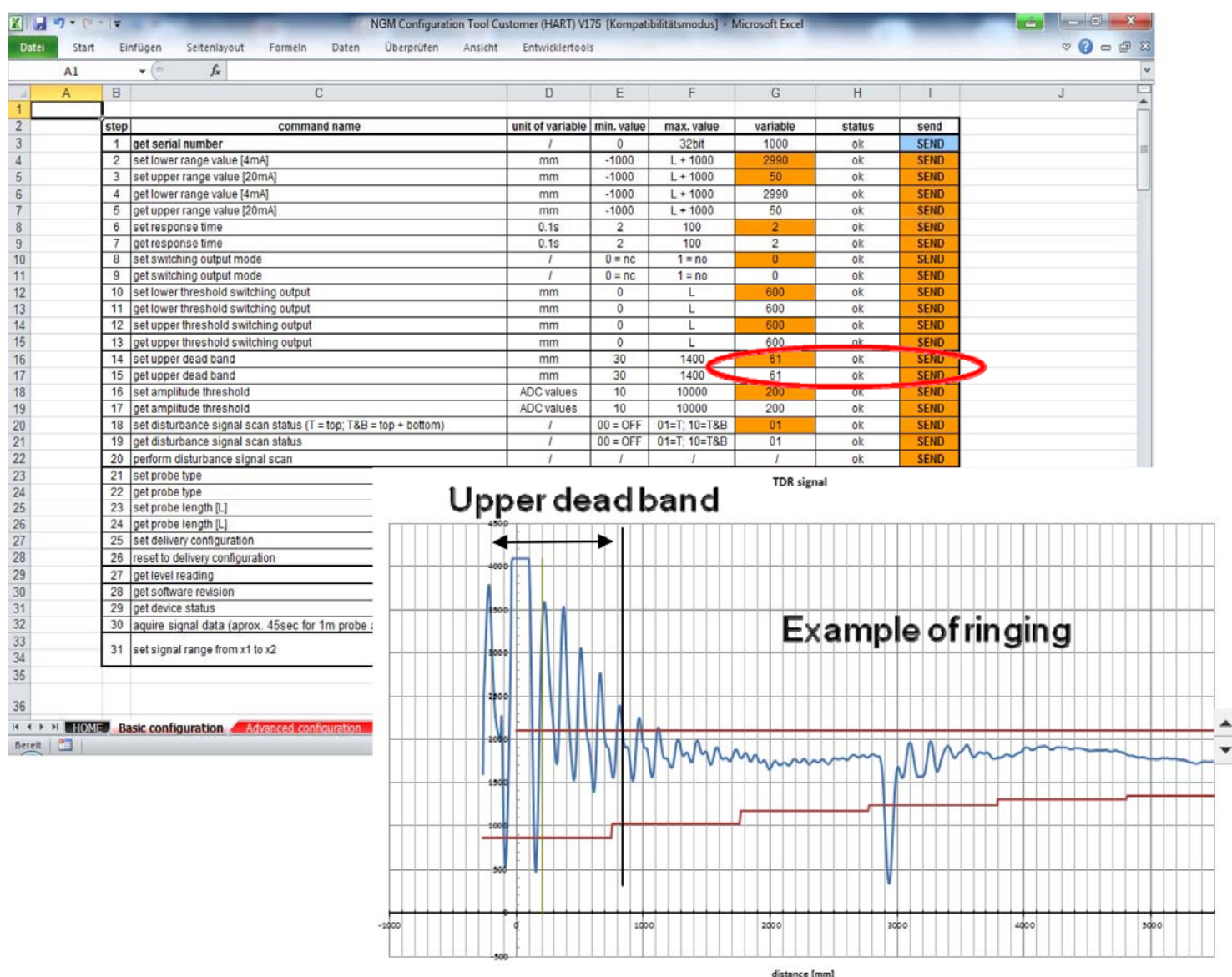
### BASIC CONFIGURATION

- Read out actual upper dead band, by clicking on I17.

Field G17 indicates the actual upper dead band.

With the upper dead band, noisy signals or ringing caused by the installation can be blocked. Increase the value for cutting signals left to the dead band, whose position is indicated by a green line. Any signal left to the green line will not be analyzed by the software. Entered values are in mm and are visible at the echo curve.

- Change actual upper dead band in field G16 and click on I16 “set upper dead band”.



Verify changes by clicking again on I17 “get upper dead band”



# Configuration Set NGM-HART

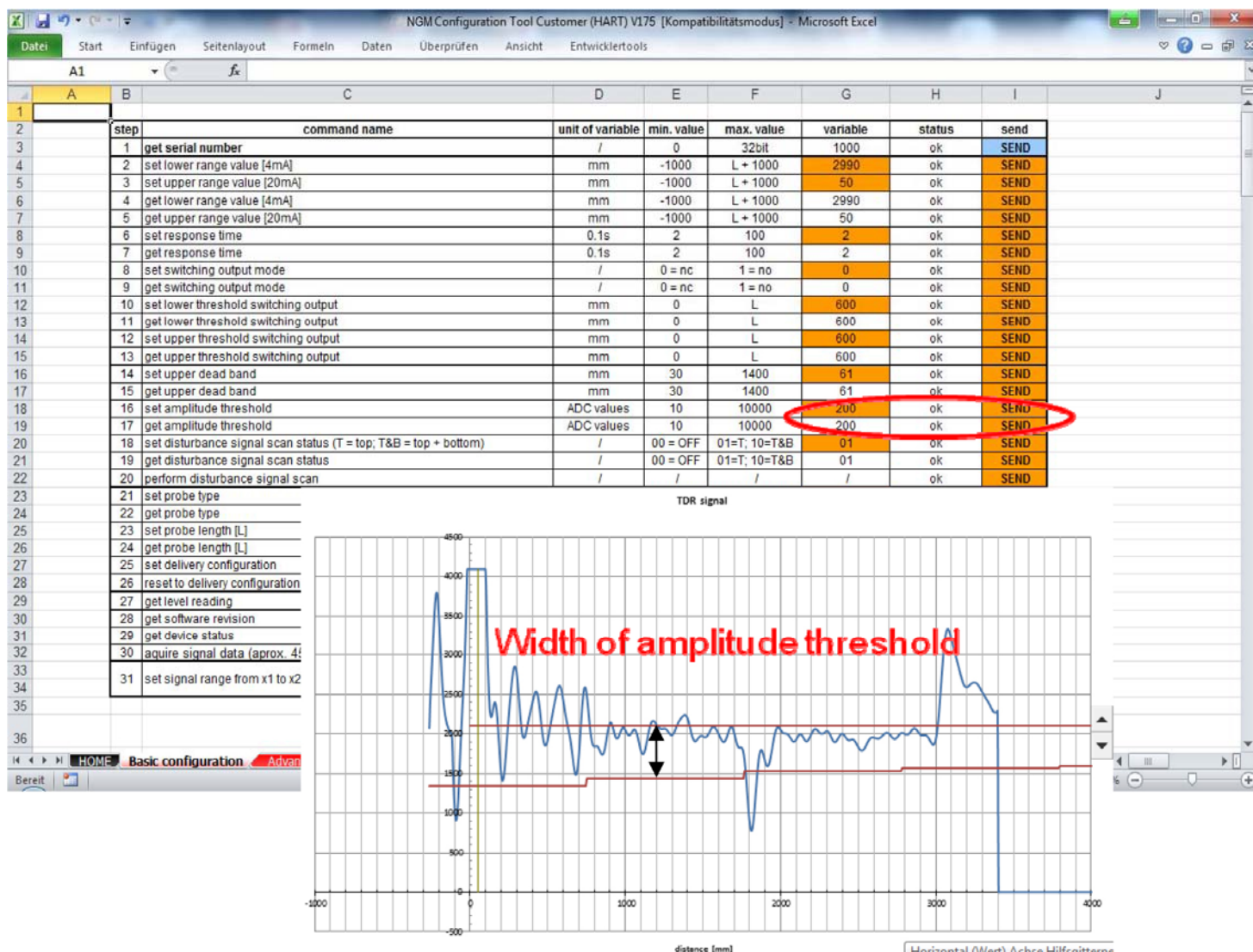
## 5.4.2 Amplitude threshold

### BASIC CONFIGURATION

- Read out actual amplitude threshold, by clicking on I19

Field G19 indicates the actual amplitude threshold. Dynamic noise or ringing can be blocked if it is within the amplitude threshold band. The level reflection should be always 1/3 bigger than the width of the amplitude threshold band.

- Change actual amplitude threshold in field G18 and click on I18 “set amplitude threshold”.



Verify changes by clicking again on I19 “get amplitude threshold”



## 5.4.3 Disturbance Signal Scan Status

### BASIC CONFIGURATION

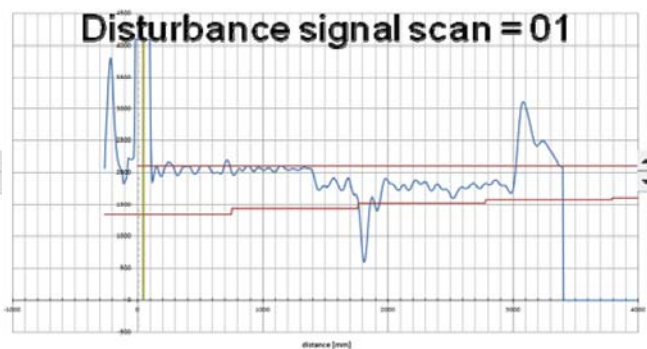
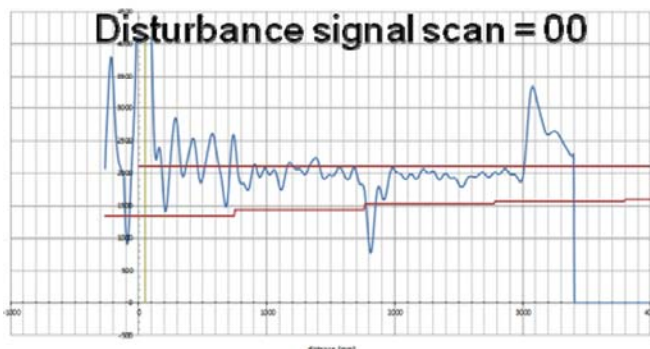
- Read out actual disturbance signal scan status by clicking on I21

Field G21 indicates the actual disturbance scan signal status.

- 00=off, raw echo curve
- 01=disturbance signal active on top
- 10=disturbance signal active on top and bottom

- Change actual disturbance signal scan status in field G20 and click on I20 “set disturbance signal scan status”
- Once changing it to “10” or “01” a disturbance signal scan must be performed with I22.

step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000.0	1999.5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm] x2 [mm]	-1000.0 0	20000 20000	-1000 4000	ok	SEND



Verify changes by clicking again on I21 “get disturbance signal scan status”

# Configuration Set NGM-HART

## 5.4.4 Probe Type

### BASIC CONFIGURATION

- Read out actual probe type status, by clicking on I24.

Field G24 indicates the actual probe type status.

- 0= coaxial probe
- 1= single probe rod or rope

Thresholds are adapted automatically by changing this parameter.

- Change actual probe type in field G23 and click on I23 “set probe type”.

step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000.0	1999.5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000		



Verify changes by clicking again on I24 “get probe type”

## 5.4.5 Probe Length

### BASIC CONFIGURATION

- Read out actual probe length, by clicking on I26.

Field G26 indicates the actual probe length in mm.

- Change actual probe length in field G25 and click on I25 “set probe length”.

NGM Configuration Tool Customer (HART) V175 [Kompatibilitätsmodus] - Microsoft Excel									
Datei Start Einfügen Seitenlayout Formeln Daten Überprüfen Ansicht Entwicklertools									
A	B	C	D	E	F	G	H	I	J
1									
2	step	command name	unit of variable	min. value	max. value	variable	status	send	
3	1	get serial number	/	0	32bit	1000	ok	SEND	
4	2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND	
5	3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND	
6	4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND	
7	5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND	
8	6	set response time	0.1s	2	100	2	ok	SEND	
9	7	get response time	0.1s	2	100	2	ok	SEND	
10	8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND	
11	9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND	
12	10	set lower threshold switching output	mm	0	L	600	ok	SEND	
13	11	get lower threshold switching output	mm	0	L	600	ok	SEND	
14	12	set upper threshold switching output	mm	0	L	600	ok	SEND	
15	13	get upper threshold switching output	mm	0	L	600	ok	SEND	
16	14	set upper dead band	mm	30	1400	61	ok	SEND	
17	15	get upper dead band	mm	30	1400	61	ok	SEND	
18	16	set amplitude threshold	ADC values	10	10000	200	ok	SEND	
19	17	get amplitude threshold	ADC values	10	10000	200	ok	SEND	
20	18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND	
21	19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND	
22	20	perform disturbance signal scan	/	/	/	/	ok	SEND	
23	21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND	
24	22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND	
25	23	set probe length [L]	mm	0	20000	3000	ok	SEND	
26	24	get probe length [L]	mm	0	20000	3000	ok	SEND	
27	25	set delivery configuration	/	/	/	/	ok	SEND	
28	26	reset to delivery configuration	/	/	/	/	ok	SEND	
29	27	get level reading	mm	0	20000.0	1999.5	ok	SEND	
30	28	get software revision	/	1	32bit	136	ok	SEND	
31	29	get device status	/	/	/	011 0100 0000	ok	SEND	
32	30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND	
33	31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND	
34			x2 [mm]	0	20000	4000	ok	SEND	
35									
36									



Verify changes by clicking again on I26 “get probe length”



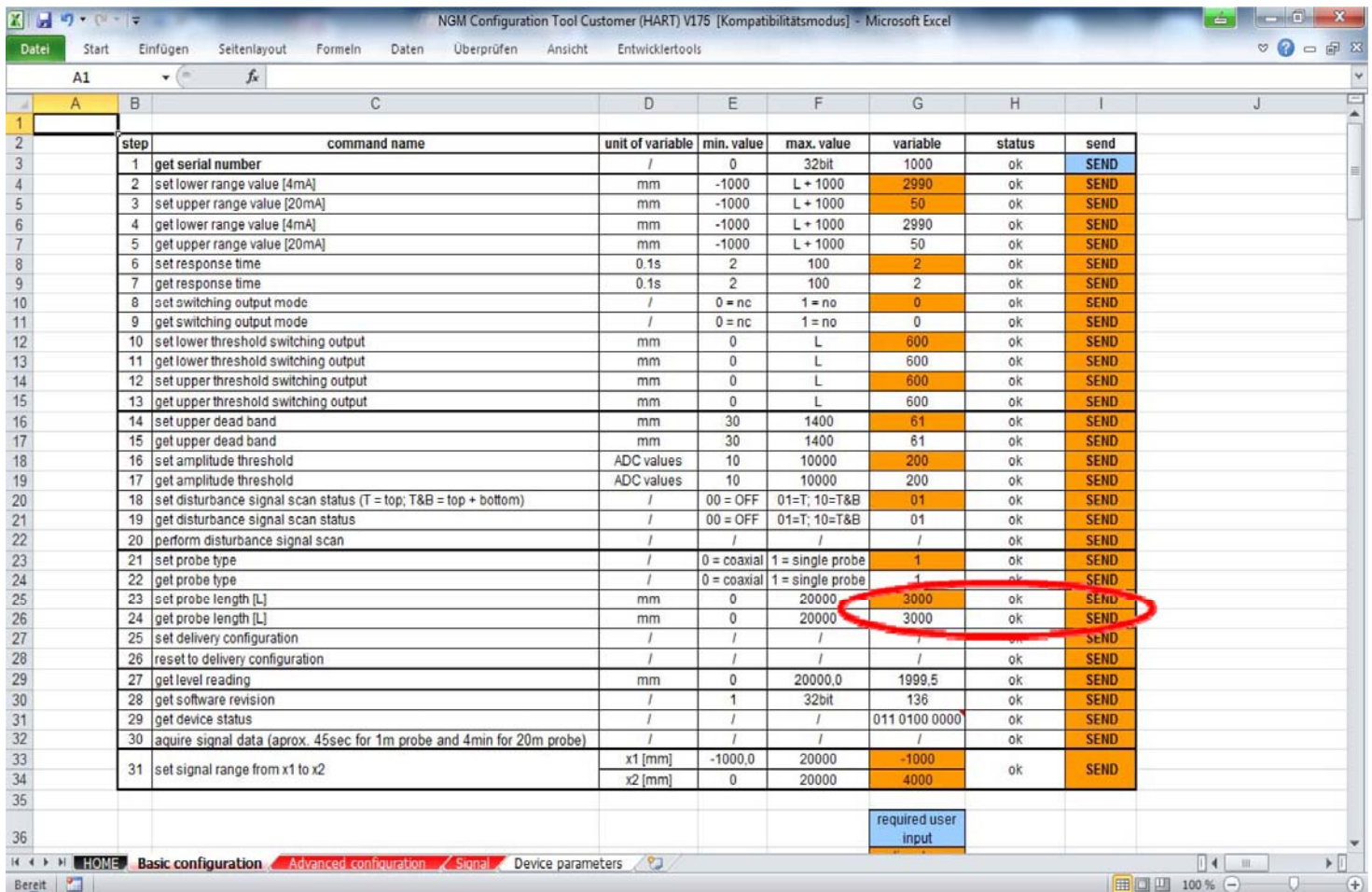
# Configuration Set NGM-HART

## 5.4.6 Set Delivery Configuration

### BASIC CONFIGURATION

- Set actual parameters as delivery configuration by clicking on I27

Former delivery configuration parameters will be overwritten!  
No reset to factory conditions is possible anymore.



step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01 = T; 10 = T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01 = T; 10 = T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000,0	1999,5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000,0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000	ok	SEND



UNDO NOT POSSIBLE!

## 5.4.7 Reset to Delivery Configuration

### BASIC CONFIGURATION

Reset unit back to delivery configuration, by clicking on I28.

4...20mA, response time, switching mode and thresholds, upper dead band, amplitude threshold, disturbance scan, probe type, and probe length will be set back to delivery configuration.

step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000.0	1999.5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000	ok	SEND



UNDO NOT POSSIBLE!

# Configuration Set NGM-HART

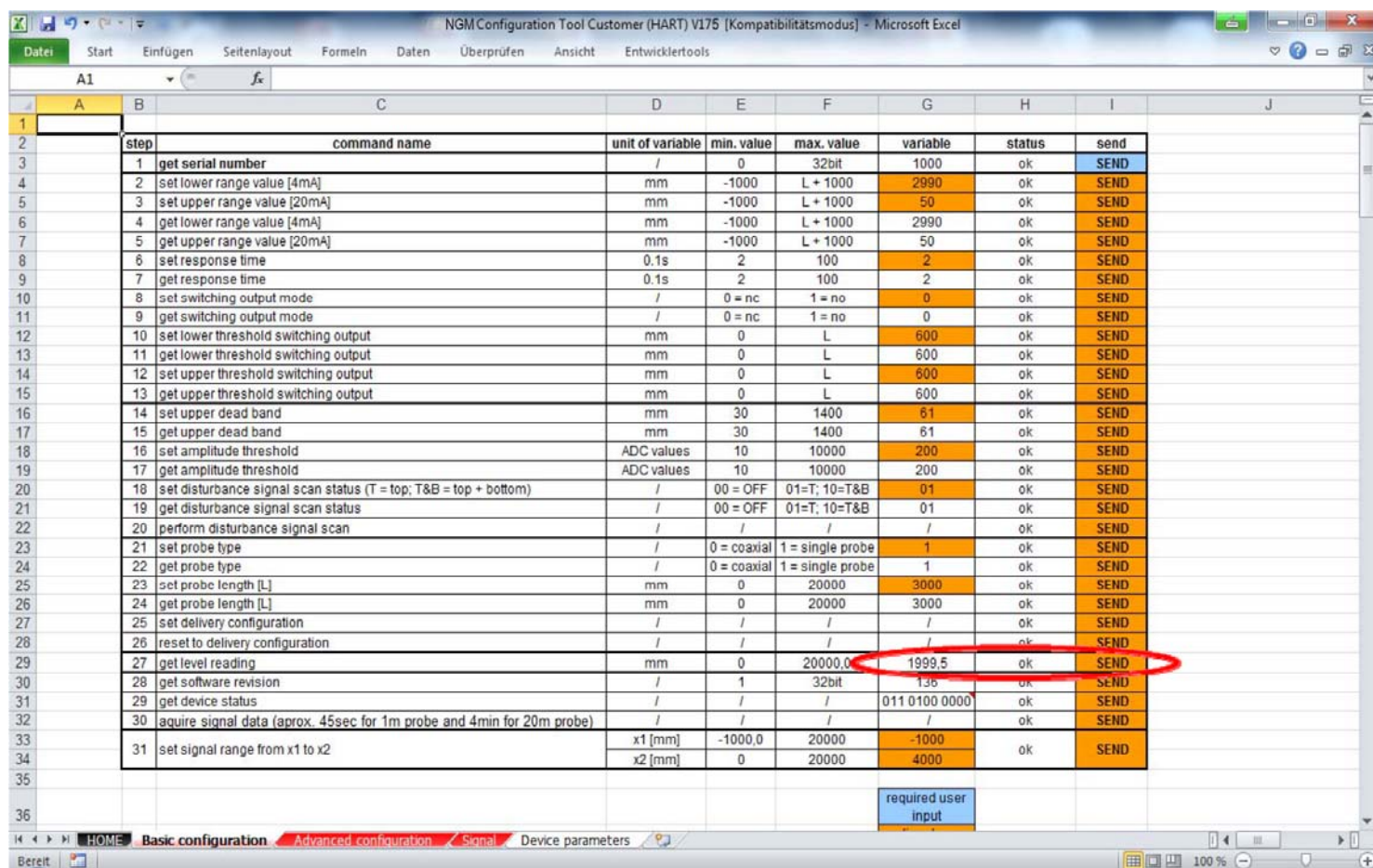
## 5.4.8 Level Reading

### BASIC CONFIGURATION

- Get actual level reading, by clicking on I29.

If you do not measure the current output in series with a Multimeter, it is recommended to read out the level 3 – 5 times to recognize potential current fluctuations.

If a fluctuating current can be observed, the amplitude threshold or dead band needs to be adjusted.



step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000.0	1999.5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000	ok	SEND



## 5.4.9 Software Revision

### BASIC CONFIGURATION

- Get actual software revision, by clicking on I30.

You can get the actual softwaretool on our homepage <https://www.kobold.com/>

step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000.0	1999.5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000	ok	SEND

# Configuration Set NGM-HART

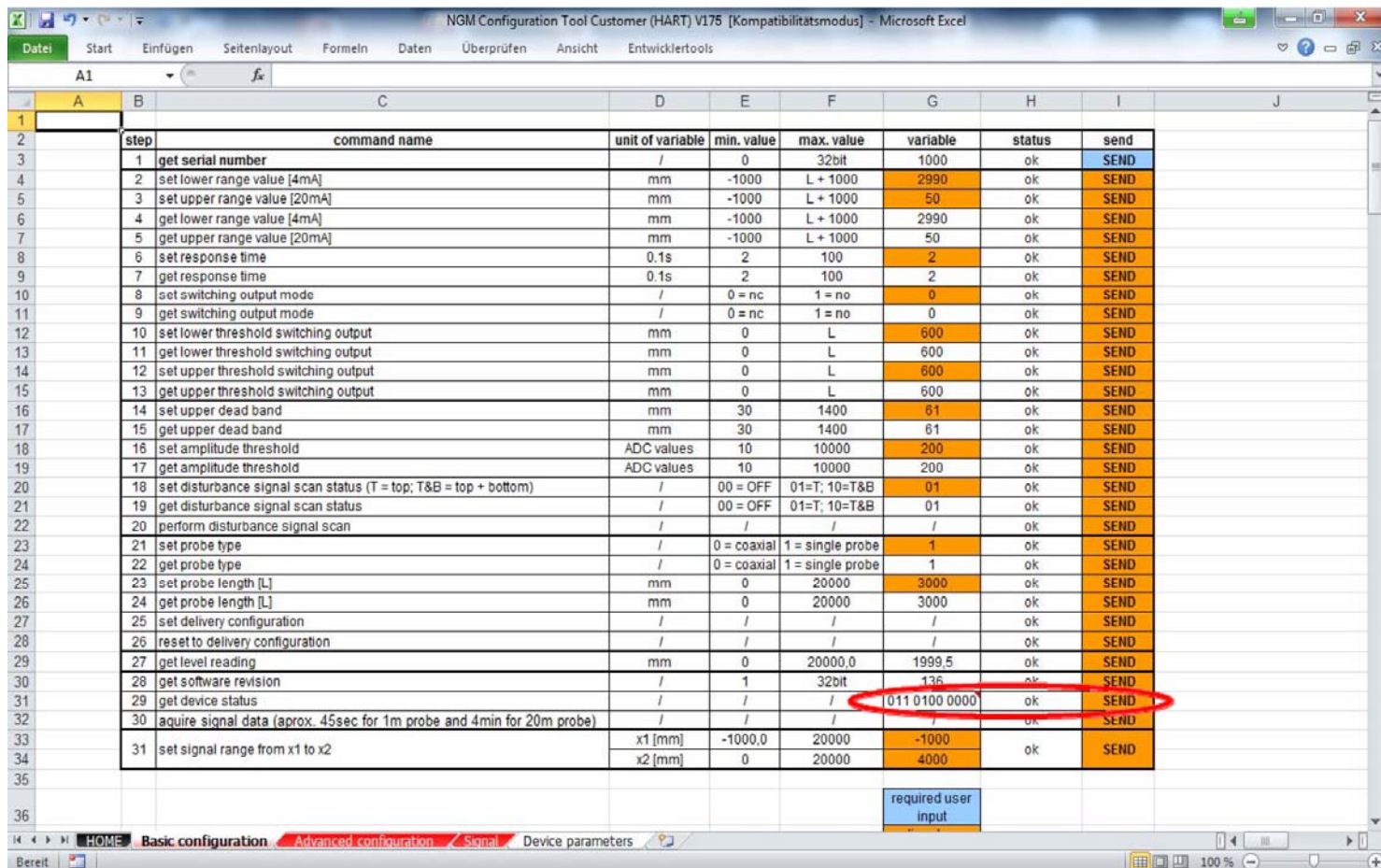
## 5.4.10 Device Status

### BASIC CONFIGURATION

- Get actual device status, by clicking on I31.

Important probe status information can be communicated.

Click on the small red upper right corner for more details.



step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000.0	1999.5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000	ok	SEND

required user input



## 5.4.11 Signal Data – Echo Curve

### BASIC CONFIGURATION

- Acquire actual signal data or also called echo curve by clicking on I32

Once the OK status in field H32 does not disappear anymore, the echo curve can be visualized by clicking on worksheet SIGNAL.

Reading out the echo curve from the electronics can take several seconds, as all data must be communicated via the serial HART® protocol to the PC.

step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01=T; 10=T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000,0	1999,5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000,0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000	ok	SEND

# Configuration Set NGM-HART

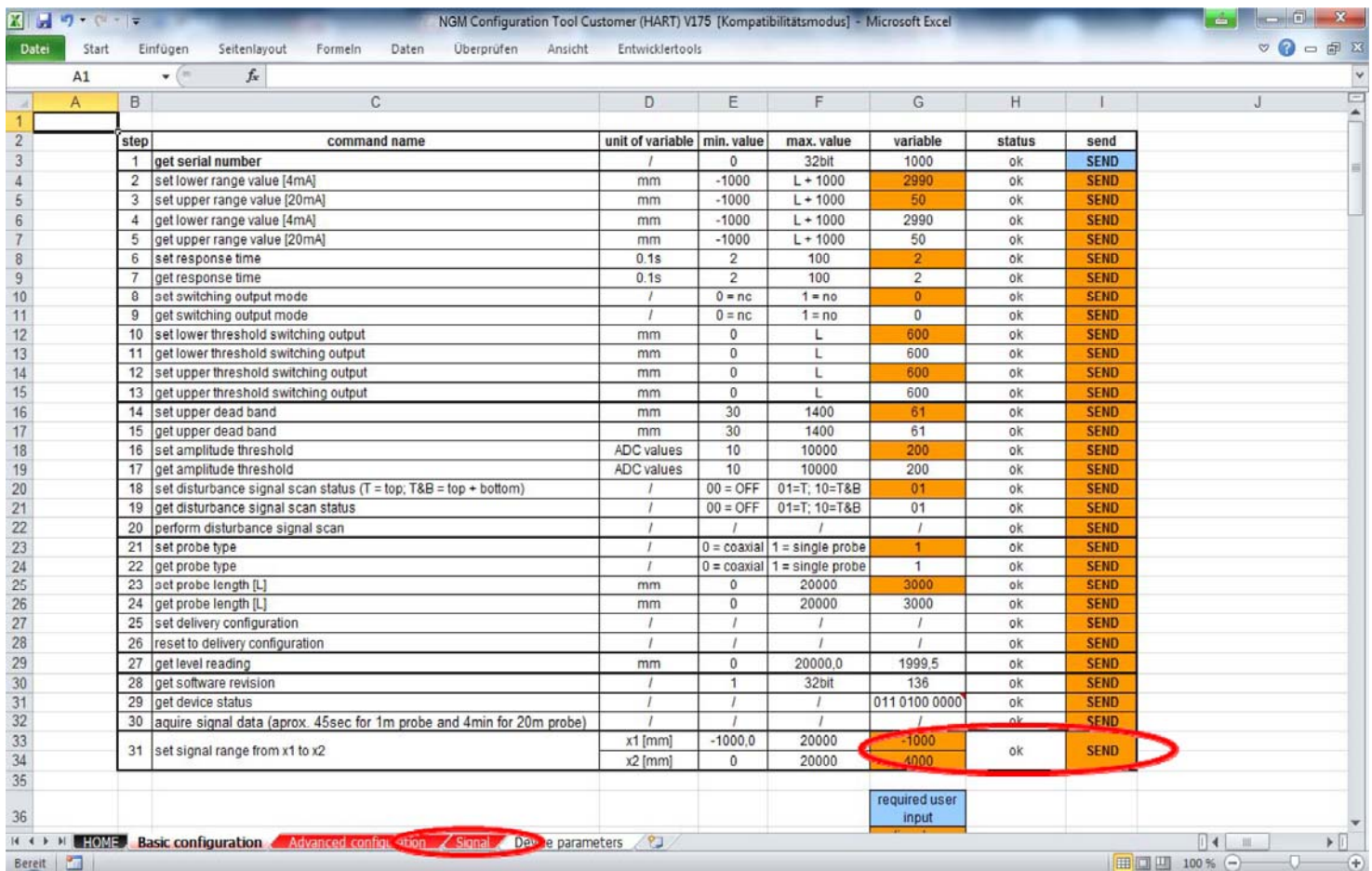
## 5.4.12 Signal Range

### BASIC CONFIGURATION

- Set signal range, by entering values in field G33/34 and clicking on I33/34

Depending on the probe length, the range within the echo curve in worksheet SIGNAL can be adapted.

A negative X1 range of -1000 is always recommended and standard. With this the microwave generation and coupling can be verified.



step	command name	unit of variable	min. value	max. value	variable	status	send
1	get serial number	/	0	32bit	1000	ok	SEND
2	set lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
3	set upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
4	get lower range value [4mA]	mm	-1000	L + 1000	2990	ok	SEND
5	get upper range value [20mA]	mm	-1000	L + 1000	50	ok	SEND
6	set response time	0.1s	2	100	2	ok	SEND
7	get response time	0.1s	2	100	2	ok	SEND
8	set switching output mode	/	0 = nc	1 = no	0	ok	SEND
9	get switching output mode	/	0 = nc	1 = no	0	ok	SEND
10	set lower threshold switching output	mm	0	L	600	ok	SEND
11	get lower threshold switching output	mm	0	L	600	ok	SEND
12	set upper threshold switching output	mm	0	L	600	ok	SEND
13	get upper threshold switching output	mm	0	L	600	ok	SEND
14	set upper dead band	mm	30	1400	61	ok	SEND
15	get upper dead band	mm	30	1400	61	ok	SEND
16	set amplitude threshold	ADC values	10	10000	200	ok	SEND
17	get amplitude threshold	ADC values	10	10000	200	ok	SEND
18	set disturbance signal scan status (T = top; T&B = top + bottom)	/	00 = OFF	01 = T; 10 = T&B	01	ok	SEND
19	get disturbance signal scan status	/	00 = OFF	01 = T; 10 = T&B	01	ok	SEND
20	perform disturbance signal scan	/	/	/	/	ok	SEND
21	set probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
22	get probe type	/	0 = coaxial	1 = single probe	1	ok	SEND
23	set probe length [L]	mm	0	20000	3000	ok	SEND
24	get probe length [L]	mm	0	20000	3000	ok	SEND
25	set delivery configuration	/	/	/	/	ok	SEND
26	reset to delivery configuration	/	/	/	/	ok	SEND
27	get level reading	mm	0	20000.0	1999.5	ok	SEND
28	get software revision	/	1	32bit	136	ok	SEND
29	get device status	/	/	/	011 0100 0000	ok	SEND
30	acquire signal data (aprox. 45sec for 1m probe and 4min for 20m probe)	/	/	/	/	ok	SEND
31	set signal range from x1 to x2	x1 [mm]	-1000.0	20000	-1000	ok	SEND
		x2 [mm]	0	20000	4000		

required user input

## 5.4.13 Signal

### SIGNAL

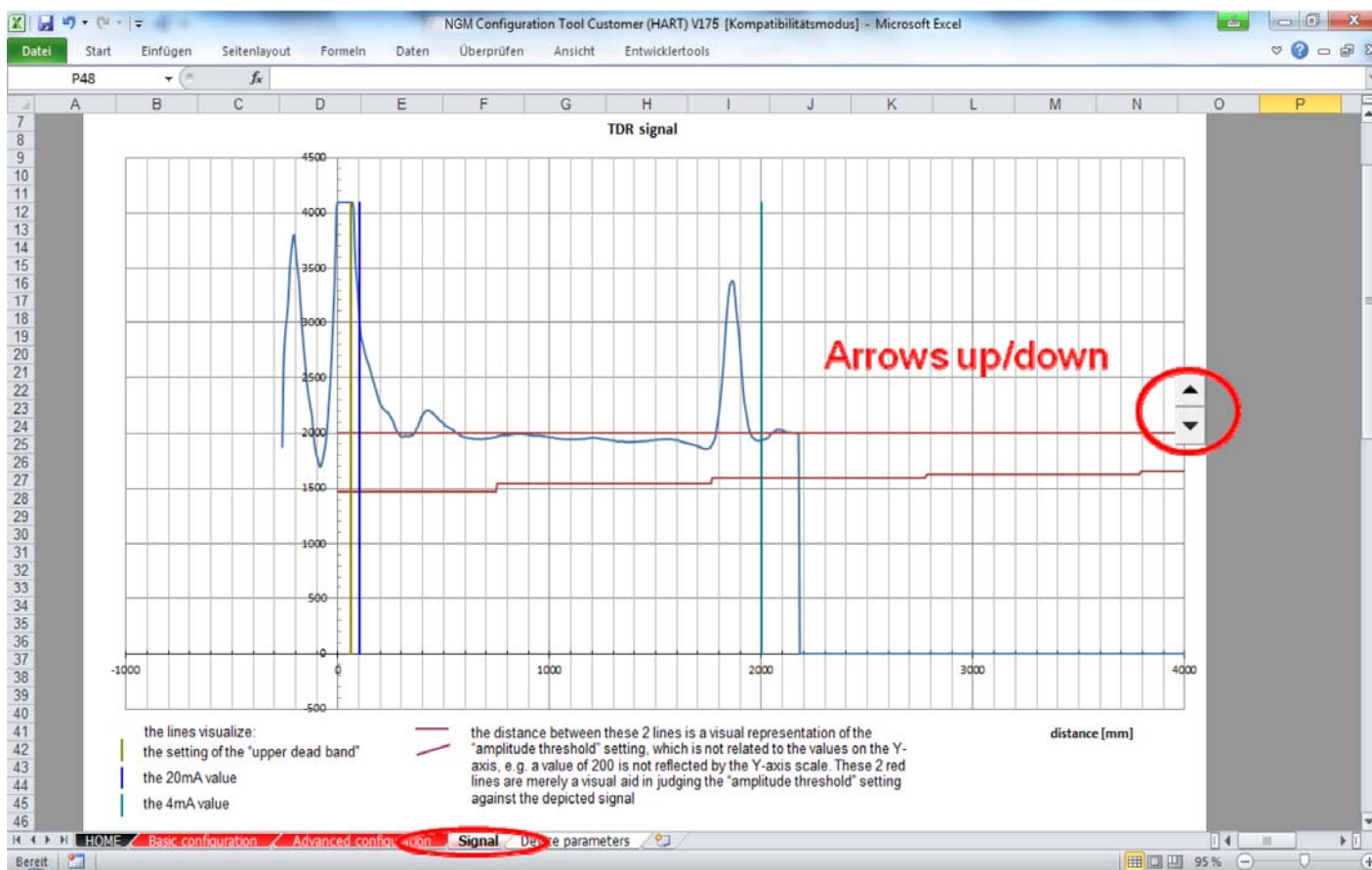
- Visualization of the actual echo curve, where the level calculation is based on.
- The NGM gets 70 echo curves every second for calculating the level.

The most important parameters (4...20mA; dead band and amplitude threshold) are visualized.

With the arrows up/down, the amplitude threshold can be positioned properly on the average zero line of the echo curve as a means to evaluate the correct value.

– x-axis: length in mm

y-axis : voltage according to factory-specific scales





# Configuration Set NGM-HART

## 5.4.14 More Parameters...

### ADVANCED CONFIGURATION

- Parameters within the worksheet ADVANCED CONFIGURATION are only recommended to change by experts.

step	command name	unit of variable	min. value	max. value	variable	status	send	remarks	DIP function
1	GET_SERIAL_NUMBER	/	0	32bit	1000	ok	SEND	in case other commands do not reply	
2	SET_LOWER_CURRENT_CALIB	0.001mA	4000	8000	6000	ok	SEND	analog current output	
3	SET_UPPER_CURRENT_CALIB	0.001mA	16000	20000	18000	ok	SEND	analog current output	
4	GET_LOWER_CURRENT_CALIB	0.001mA	4000	8000	6000	ok	SEND	analog current output	
5	GET_UPPER_CURRENT_CALIB	0.001mA	16000	20000	18000	ok	SEND	analog current output	
6	GO_LOWER_CALIBRATION_POINT	/	/	/	/	ok	SEND	analog current output	
7	GO_UPPER_CALIBRATION_POINT	/	/	/	/	ok	SEND	analog current output	
8	SET_4MA_LEVEL (lower range value [4mA])	mm	-1000	L + 1000	2990	ok	SEND	analog current output	0001 001 1
9	SET_20MA_LEVEL (upper range value [20mA])	mm	-1000	L + 1000	50	ok	SEND	analog current output	0010 001 1
10	GET_4MA_LEVEL (lower range value [4mA])	mm	-1000	L + 1000	2990	ok	SEND	analog current output	
11	GET_20MA_LEVEL (upper range value [20mA])	mm	-1000	L + 1000	50	ok	SEND	analog current output	
12	SET_LOWPASS_TIME (response time)	0.1s	2	100	2	ok	SEND	analog current output	01xx 001 1
13	GET_LOWPASS_TIME (response time)	0.1s	2	100	2	ok	SEND	analog current output	
14	DS_SET_CURRENT	0.001mA	0	20000	20000	ok	SEND	analog current output	
15	SET_SWITCH_MODE (switching output mode)	/	0 = nc	1 = no	0	ok	SEND	switching output	010x 010 1
16	GET_SWITCH_MODE (switching output mode)	/	0 = nc	1 = no	0	ok	SEND	switching output	
17	SET_SWITCH_THRESHOLD (lower threshold switching output)	mm	0	L	600	ok	SEND	switching output	0010 010 1
18	GET_SWITCH_THRESHOLD (lower threshold switching output)	mm	0	L	600	ok	SEND	switching output	
19	SET_SWITCH_DEACTIVATION_LEVEL (upper threshold switching output)	mm	0	L	600	ok	SEND	switching output	0011 010 1
20	GET_SWITCH_DEACTIVATION_LEVEL (upper threshold switching output)	mm	0	L	600	ok	SEND	switching output	
21	DS_SET_SWITCH	/	0	1	1	ok	SEND	switching output	
22	DS_RELEASE_OUTPUT	/	/	/	/	ok	SEND	both outputs	
23	SET_MEASUREMENT_PULSE_START (upper dead band)	index	50	300	70	ok	SEND	application	01xx 011 1
24	GET_MEASUREMENT_PULSE_START (upper dead band)	index	50	300	70	ok	SEND	application	
25	SET_AMPLITUDE_FACTOR (amplitude threshold)	ADC values	10	10000	200	ok	SEND	application	10xx 011 1
26	GET_AMPLITUDE_FACTOR (amplitude threshold)	ADC values	10	10000	200	ok	SEND	application	
27	MEASURE_EMPTY_SCAN (perform disturbance signal scan)	/	/	/	/	ok	SEND	application	0001 011 1
28	SET_TL_LINE_SLOPE_COAX	m/s	2000	10000	2609	ok	SEND	calibration	
29	GET_TL_LINE_SLOPE_COAX	m/s	2000	10000	2609	ok	SEND	calibration	
30	SET_TL_LINE_OFFSET_COAX	mm	-1000.0	1000.0	-390.0	ok	SEND	calibration	
31	GET_TL_LINE_OFFSET_COAX	mm	-1000.0	1000.0	-390.0	ok	SEND	calibration	
32	SET_TL_LINE_SLOPE_MONO	m/s	2000	10000	2620	ok	SEND	calibration	
33	GET_TL_LINE_SLOPE_MONO	m/s	2000	10000	2620	ok	SEND	calibration	
34	SET_TL_LINE_OFFSET_MONO	mm	-1000.0	1000.0	-359.5	ok	SEND	calibration	
35	GET_TL_LINE_OFFSET_MONO	mm	-1000.0	1000.0	-359.5	ok	SEND	calibration	
36	SET_PROBE_END_OFFSET_COAX	1/1000 index	-5000	5000	0	ok	SEND	calibration	
37	GET_PROBE_END_OFFSET_COAX	1/1000 index	-5000	5000	0	ok	SEND	calibration	
38	SET_PROBE_END_OFFSET_MONO	1/1000 index	-5000	5000	0	ok	SEND	calibration	
39	GET_PROBE_END_OFFSET_MONO	1/1000 index	-5000	5000	0	ok	SEND	calibration	

## 5.4.15 Signal Discussion 1

### Empty Coaxial Probe

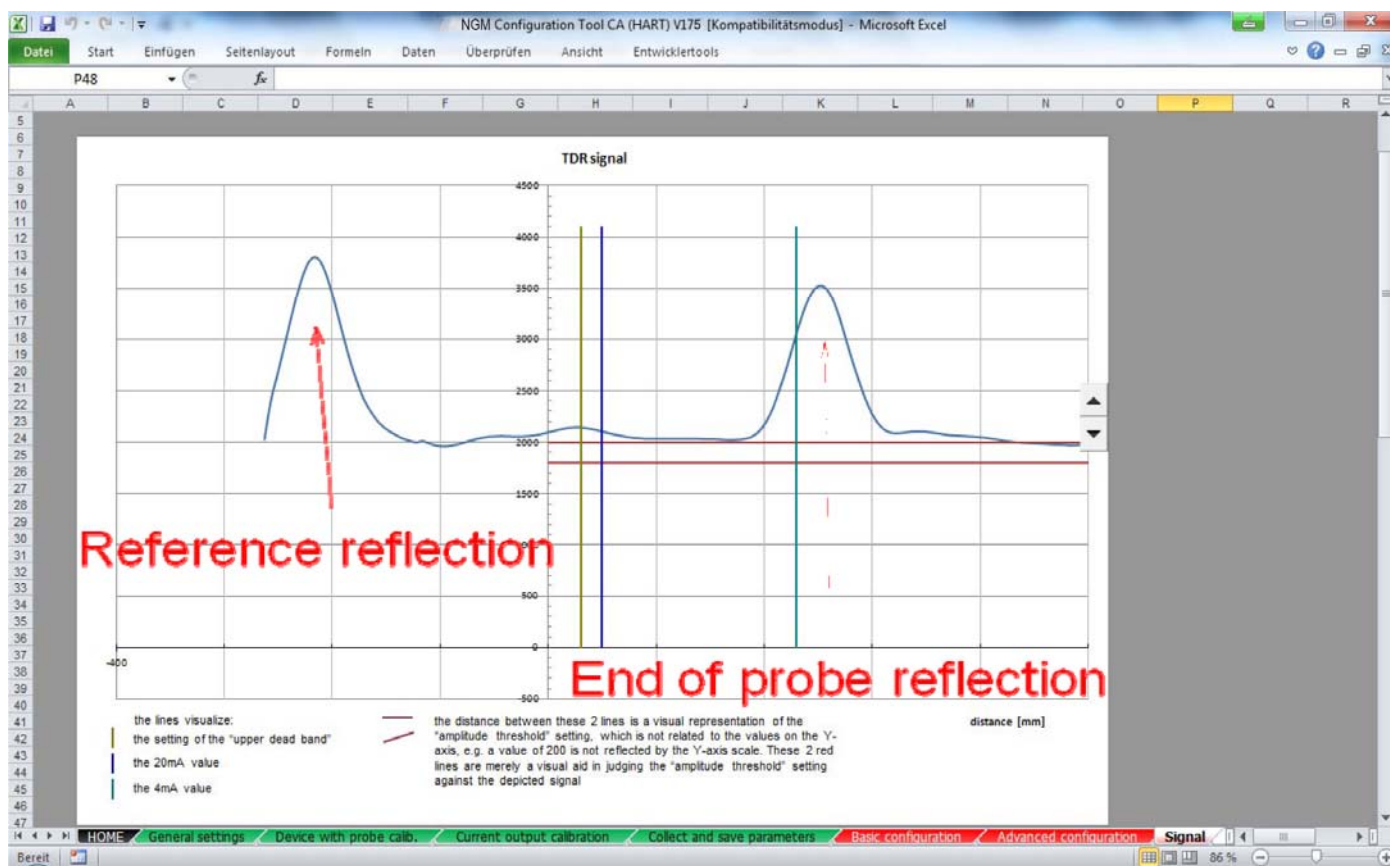
- Nice reference reflection at the beginning
- Perfect coupling into the coaxial probe
- Positive end of probe reflection which corresponds to the physical end of probe

Dead band parameter at 30 mm.

20 mA parameter at 50 mm.

4 mA parameter at 230 mm.

Amplitude threshold at 1000.



# Configuration Set NGM-HART

## 5.4.16 Signal Discussion 2

### Level Coaxial Probe

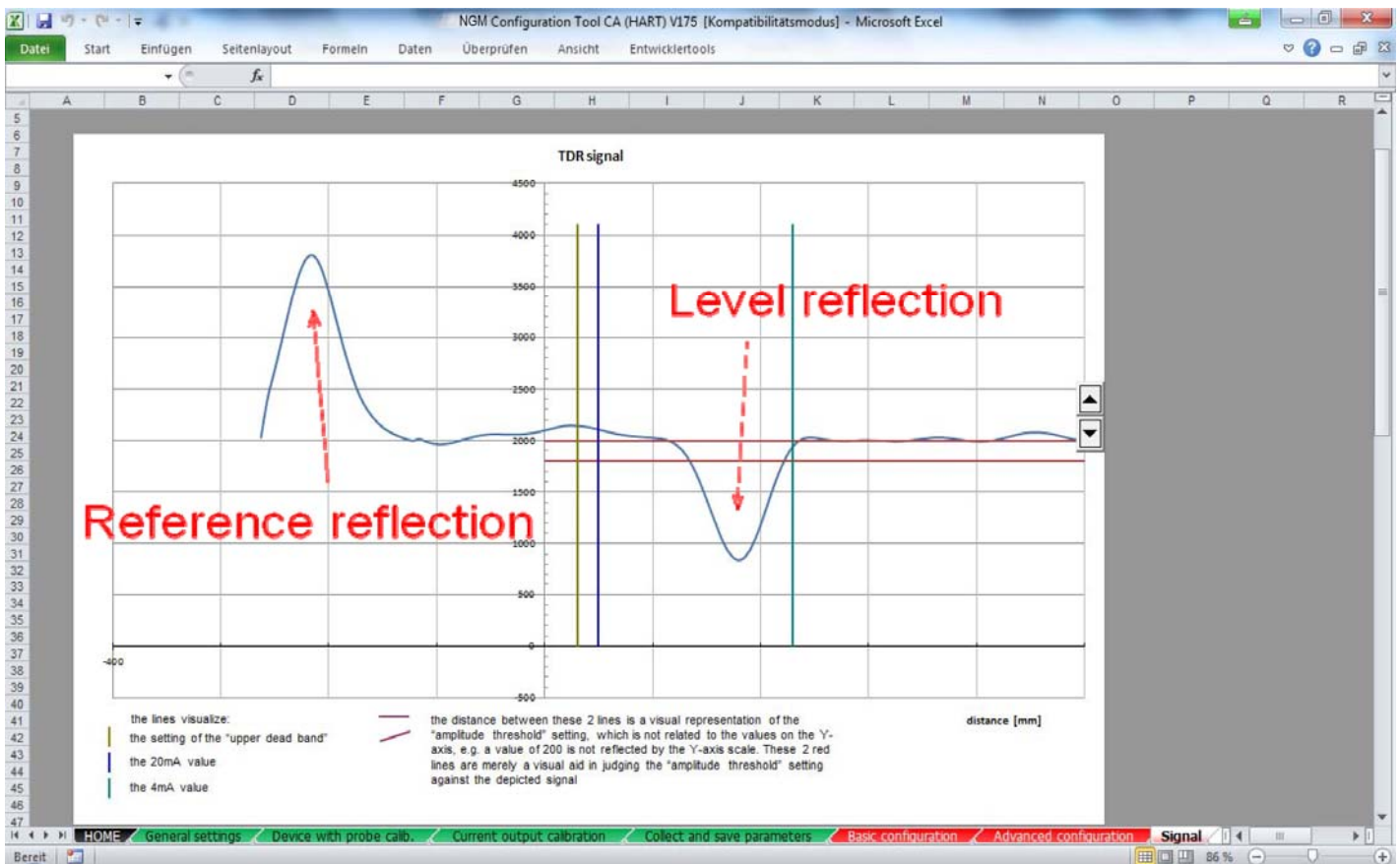
- Stable reference reflection at the beginning
- Negative level reflection at 168mm
- No end of probe reflection as energy is completely reflected at water surface

Dead band parameter at 30 mm.

20 mA parameter at 50 mm.

4 mA parameter at 230 mm.

Amplitude threshold at 1000.



## 5.4.17 Signal Discussion 3

### Empty Rod Probe

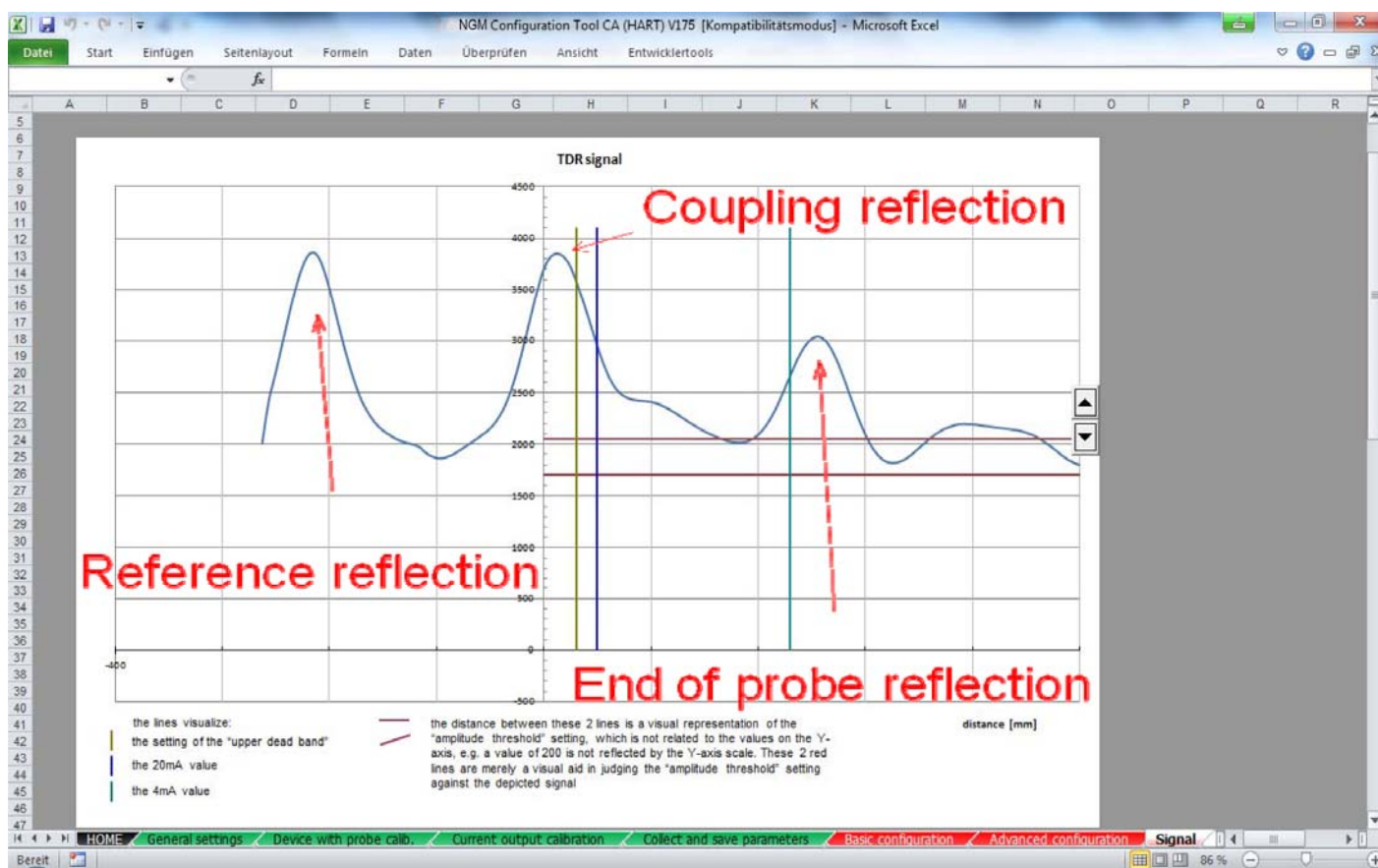
- Nice reference reflection at the beginning
- Strong positive impulse at the transition of coupling to the single rod
- Reflection can change with mounting conditions.
- Positive end of probe reflection which corresponds to the physical end of probe

Dead band parameter at 30mm.

20 mA parameter at 50 mm.

4 mA parameter at 230 mm.

Amplitude threshold at 1000.





# Configuration Set NGM-HART

## 5.4.18 Signal Discussion 4

### Level Rod Probe

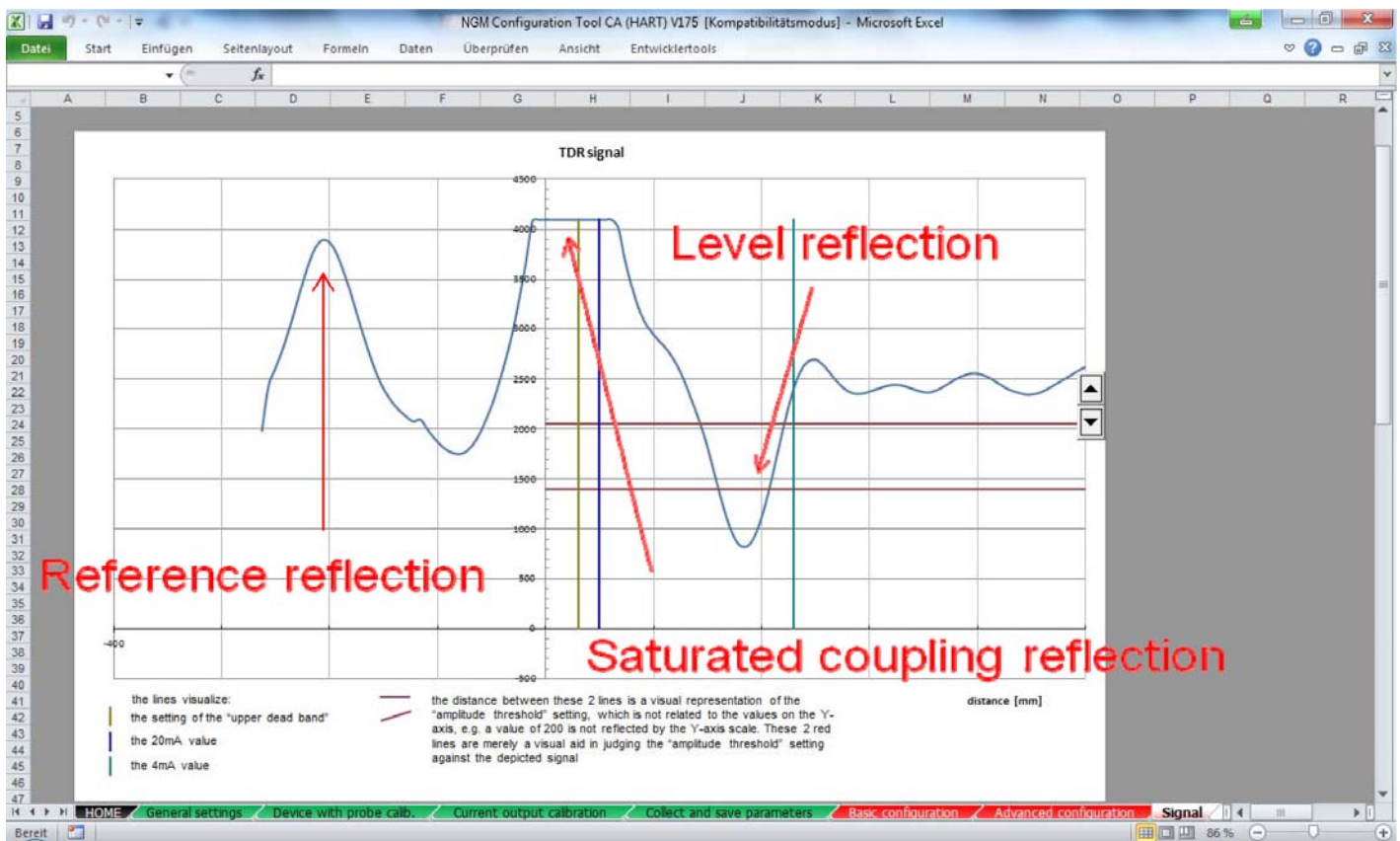
- Stable reference reflection at the beginning
- Negative level reflection at 168mm
- No end of probe reflection as energy is completely reflected at water surface
- Positive coupling reflection in saturation as amplification factor increased

Dead band parameter at 30 mm.

20 mA parameter at 50 mm.

4 mA parameter at 230 mm.

Amplitude threshold at 1000.





### 6. Technical Data

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Operating temperature	-25 °C... +55 °C
Enclosure	Polystyrene
Connection to PC	USB 1.1 "B" connector
Cable to PC	USB "A-B" 1.8 m
Connection to HART field	KLEPS 2
Spiral cable length	0.6 m (1.1 m)
Ingress protection	IP 20
Electrical protection	Class III
Weight	0.1 kg

#### STORAGE CONDITIONS

Ambient temperature: -25... +55 °C

Relative humidity: max. 98%

## 7. Disposal

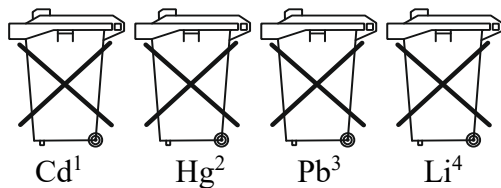
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### **Note!**

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

### **Batteries**

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

### **Electrical and electronic equipment**

