Parameterisation manual

MicroWave level measurement MWF

Adaption of parameters with the MWF2-KIT

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Parameterisation manual

HART modem with mA-display
1. Preparation

Requirements: MOLLET MWF2-KIT, a Laptop or PC with Microsoft Windows 7, 8, 10 and Excel.

The MOLLET MWF2-KIT consists of:

- 1 MWF-HART-D2 modem with mA-display (see first page)
- 1 measuring wire A with blank end of the wire
- 1 measuring wire B with crocodile clip
- 1 USB cable
- 1 USB stick with MWF Parameterisation-Tool based on Excel.
1.1 Connection to the MWF electronic

There are two possibilities to connect the MWF-HART-D2 modem with the MWF electronic:

1.1.1 Connection direct to the device:

1. Separate the MWF electronic temporary from the power supply.
2. Open the lid of the MWF housing.
3. Loosen the wire from the terminal „+“ of the 4-20 mA signal output.
4. Connect the blank end of the measuring wire A to the empty „+“ terminal of the 4-20 mA signal output.
5. Connect the loosened wire with crocodile clip of the measuring wire B.
6. Put both plugs of the measuring wires A and B into the sockets A and B at the front end of the MWF-HART-D2 modem.
7. Connect the MWF electronic to the power supply again and wait approx. 10 seconds until the electronic is ready for operation.

1.1.2 Connection to measuring value display or control device:

1. Separate the MWF electronic temporary from the power supply.
2. Loosen the wire from the signal input „+“ of the measuring value display or control device.
3. Connect the blank end of the measuring wire A to the empty „+“ terminal of the measuring value display or control device.
4. Connect the loosened wire with the crocodile clip of the measuring wire B.
5. Put both plugs of the measuring wires A and B into the sockets A and B at the front end of the MWF-HART-D2 modem.
6. Connect the MWF electronic to the power supply again and wait approx. 10 seconds until the electronic is ready for operation.

1.2 Laptop/PC connection and installation

1. Copy the MWF Parameterisation-Tool from the USB stick to the Laptop/PC.
2. Start the program and open register HOME.
3. Connect the MWF-HART-D2 modem and the Laptop/PC with the USB cable.
4. Open the Device Manager in the Windows Control Panel of the Laptop/PC. In the list with connections a HART modem is indicated.
5. Enter the number of the COM Port, that is mentioned behind the name of the HART modem (e.g. 4) into the spreadsheet of the MWF Parameterisation-Tool and confirm the input with ENTER.
6. Change into the register Basic configuration and click in line 1 on CONNECT. After a few seconds the serial number of the connected device is shown in field variable and in field status is shown „ok“. That means the connection between Laptop/PC and MWF device is correctly established.
   If the serial number is not indicated and in field status is not „ok“ shown, please check the establishment of the connections and the determining and input of the COM Port number.
7. Close the Device Manager.
2. Parameterisation of the MWF electronic

2.1 General information

1. The MWF has been completely parametrised corresponding to your requirements ex works. If the adaption of parameters is required, you should change only these parameters.
2. You find a sheet with all factory settings for the measuring parameters in the appendix of the supplied operation manual of the MWF.
3. All necessary changes can be executed in the register Basic configuration.
4. In order to change the value of a parameter, please insert the requested value in the orange colored field in the column variable. With a click on SEND this value will be sent to the MWF electronic. After a short time „OK“ is shown in the field status. The new value has been stored in the MWF electronic. (The previous value has been overwitten)
5. In order to secure your changes please store the Excel-file on the connected PC. With it the changed parameters can be checked again at any time or the Excel-file can be sent to MOLLET for support.
6. During the process of parameterisation you can use the display on the MWF-HART-D2 modem for monitoring the current output (4 – 20 mA). This is done by pressing the red button for switching on the display. After that you can read the actual measured value (filling level).

2.2 Parameterisation

Line 2 to 5 Setting of measuring range [M]

This is where the lower and upper measuring limits are parameterised. The values correspond to the length at the probe in mm, measured from the reference point [R].

1. Insert in line 2 the value for the lower measuring limit [uMG] 4 mA.
2. Insert in line 3 the value for the upper measuring limit [oMG] 20 mA.

Line 6 and 7 No input

These values are for factory setting only. Please don’t do any changes!

Line 8 to 13 Setting of switching output

This is where the switching output is parameterised. The switch-on and switch-off points of the switching output can be set at different positions within the measuring range [M] (switching hysteresis) by setting different values for lower and upper switch points. By using the same value for lower and upper switch points the least switching hysteresis is 3mm of the probe length.

1. Insert in line 8 the function of the switching output. The factory setting NC can be change to NO by setting the value „1“.
2. Insert in line 10 the value of the lower point of the switching output [uSA] and in line 12 the value of the upper point of the switching output [oSA]. The values correspond to the length at the probe in mm, measured from the reference point [R].
Line 14 and 15  Setting of upper dead band [TB]
Dependent on the installation situation of the MWF signal disturbances could occur in the upper area of the measuring probe (e.g. caused by a narrow nozzles). In order to suppress these disturbances, an upper dead band can be determined. Within the entered length, starting from the reference point [R], the measuring probe detects no signal.

1. Read in line 5 the value for the upper measuring limit \([\text{OMG}]\) 20 mA.
2. Insert in line 14 the requested value for the upper dead band \([\text{TB}]\). This has to be less than the value for the upper measuring limit from line 5 but more than the length of the nozzle.

Line 16 and 17  Adjustment of the sensitivity
Depending on bulk solids characteristics the sensitivity of the MWF has potentially to be adjusted. This can be done by changing the so-called amplitude threshold.

1. Insert in line 16 a new value. Change the value in steps by 10 until you get a stable signal. The lower the value for the amplitude threshold, the higher the sensitivity.

Examples for wrong adjusted sensitivity:
- In case of an instable measuring value the MWF is too sensitive and the amplitude threshold has to be increased.
- In case of no signal in a filled-up silo the MWF is too insensitive and the amplitude threshold has to be decreased.

Line 18 and 19  Setting of noise filter
The noise filter suppresses external disturbances, e.g. caused by large electric motors. By activating the function „noise filter“, the function “disturbance signal suppression” (line 20) is deactivated at the same time.

1. Insert in line 18 the value „1“ for activating the function „noise filter“.

Line 20 and 22  Setting of disturbance signal suppression
Installations (e.g. strut, ladder or measuring devices that cause an echo) near the probe could disturb the measurement and deliver false signals that not correlate with the filling level. The disturbance signal suppression serves to detect, buffer and eliminate these disturbance signals.

Attention!!! In order to perform a disturbance signal, scan the MWF must be mounted at the final position prior to this and no bulk material / liquids may reside in the scan area (5,500 mm from top).

1. Insert in line 20 the value „.01“ for activating the disturbance signal suppression. The disturbance signal suppression has to be activated before a disturbance signal scan and elimination can be done.

Start the disturbance signal scan with a click on START in line 22 und wait for the indication „ok“ in the field status.
This can last up to one minute.

2. Insert in line 20 the value „.00“ for deactivating the disturbance signal suppression.
Line 23 and 24  No input
Type of probe has to be „1“: Please don´t do any changes!

Line 25 and 26  Adjustment of probe length [L]
If the probe has been shortened or another probe with a different rope length has been mounted, the probe length [L] has to be adjusted.

1. Insert in line 25 the value of the probe length [L] in mm, measured from the reference point [R].

Attention!!!  After shortening the probe, it could be necessary to adapt the value for the lower measuring limit in line 2 as well.

Line 27  Reset to MOLLET factory settings
Click on START in line 27 and the MWF will be reset to MOLLET factory settings. All individual parameter settings will be overwritten with the primary MOLLET factory settings.

Line 28  Measuring of filling level
Click on START in line 28 and the actual filling level will be scanned. The scanned value corresponds to the length at the probe in mm, measured from the reference point [R].

Line 31 and 32  Recording of signal image

1. Insert in line 32, in the lower, orange colored field the value of the probe length [L] in mm + 1000 mm rounded up to x000 and click on ADJUST. Example: probe length 8600 mm, please insert value 10000.

2. Click on START in line 31 and the recording of the signal image will be started. The duration of the recording is dependent on the probe length and can last up to 4 minutes.

3. Recording of signal image is finished as soon as „ok“ is permanent shown in the field status. Now the signal image can be viewed in the register Signal.
3. **Reading of parameter settings from the MWF electronic**

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td><strong>Basic configuration</strong>&lt;br&gt;Read out lower measuring limit [uMG] 4 mA</td>
<td>Click READ</td>
</tr>
<tr>
<td>5</td>
<td>Read out upper measuring limit [oMG] 20 mA</td>
<td>Click READ</td>
</tr>
<tr>
<td>9</td>
<td>Read out function of the switching output NC/NO</td>
<td>Click READ</td>
</tr>
<tr>
<td>11</td>
<td>Read out lower point of the switching output [uSA]</td>
<td>Click READ</td>
</tr>
<tr>
<td>13</td>
<td>Read out upper point of the switching output [oSA]</td>
<td>Click READ</td>
</tr>
<tr>
<td>15</td>
<td>Read out upper dead band [TB]</td>
<td>Click READ</td>
</tr>
<tr>
<td>17</td>
<td>Read out amplitude threshold (sensitivity)</td>
<td>Click READ</td>
</tr>
<tr>
<td>19</td>
<td>Read out noise filter switched ON or OFF</td>
<td>Click READ</td>
</tr>
<tr>
<td>21</td>
<td>Read out disturbance signal suppression switched ON or OFF</td>
<td>Click READ</td>
</tr>
<tr>
<td>26</td>
<td>Read out probe length [L]</td>
<td>Click READ</td>
</tr>
<tr>
<td>27</td>
<td><strong>Reset to MOLLET factory settings</strong></td>
<td>Click START</td>
</tr>
<tr>
<td>29</td>
<td>Read out software version</td>
<td>Click READ</td>
</tr>
<tr>
<td>30</td>
<td>Read out device status (only for internal use)</td>
<td>Click READ</td>
</tr>
</tbody>
</table>
4. Signal images

Examples of signal images useful for comparison with recorded signal images from you.

4.1 Signal image of an empty silo.

Wave runs through without any significant signal up to the tensioning weight.

4.2 Signal image of a partly filled silo.

Microwave reaches at approx. 4400mm the surface of the bulk goods and generate a significant signal.
4.3 Signal image with weak signal without indication of filling level.

A weak signal is indicated at approx. 1850mm, but no filling level is indicated or the filling level indication varies.

There are two potential reasons for such a situation:

Reason 1: The signal is generated by a disturbing installation in an empty silo.
Action: Step back to register Basic configuration and follow the instructions in chapter “Line 20 and 22 – Setting of disturbance signal suppression”.

Reason 2: The signal is generated by the bulk solids surface, but the value for the parameter amplitude threshold is too high.
Action: Step back to register Basic configuration and follow the instructions in chapter “Line 16 and 17 - Adjustment of the sensitivity”.

INFO: Der neue Parameter Wert wird auf der Skala der y-Achse dargestellt.