SIEMENS

SIWAREX U
Weighing Module for Level Measurement
Calibrating SIWAREX U with SIWATOOL U

Quick Guide

For modules with order number 7MH4950-1AA01 and 7MH4950-2AA01
(also valid for 7MH4601-1AA01 and 7MH4601-1BA01)

Contents

Introduction

SIWAREX U is a compact weighing module for measuring the level of silos and bunkers, monitoring crane loads, load measurement on conveyor belts etc.

Purpose of this document for functional safety

This programming manual contains important information that you will require to commission and use the device.

It is aimed at persons who install the device mechanically, connect it electrically, parameterize and commission it, as well as at service and maintenance engineers.

Notes on warranty

The contents of this programming manual shall not become part of or modify any prior or existing agreement, commitment or legal relationship. All obligations on the part of Siemens AG are contained in the respective sales contract, which also contains the complete and solely applicable warranty conditions. Any statements on the device versions described in the programming manual do not create new warranties or modify the existing warranty.

The content reflects the technical status at the time of printing. We reserve the right to make technical changes in the course of further development.

Validation of this document

This documentation is only valid in conjunction with the manual SIWAREX U. This manual is available on the Siemens homepage.

http://support.automation.siemens.com/WW/view/en/28392477

1.   Hardware Requirements

Following hardware parts and software are requested to integrate a scale in SIMATIC. 24V Power supply, S7-300 CPU or ET200M Station, memory card for CPU, SIWAREX U, front connector for SIWAREX U, SIWATOOL U software, RS232 cable, computer with Windows XP or higher and a calibration weight higher than 5% of the sum of the nominal value of all load cells.

24V Power Supply   S7-315 PLC   or   ET 200M   SIWAREX U
                                                                      7MH4950-1AA01
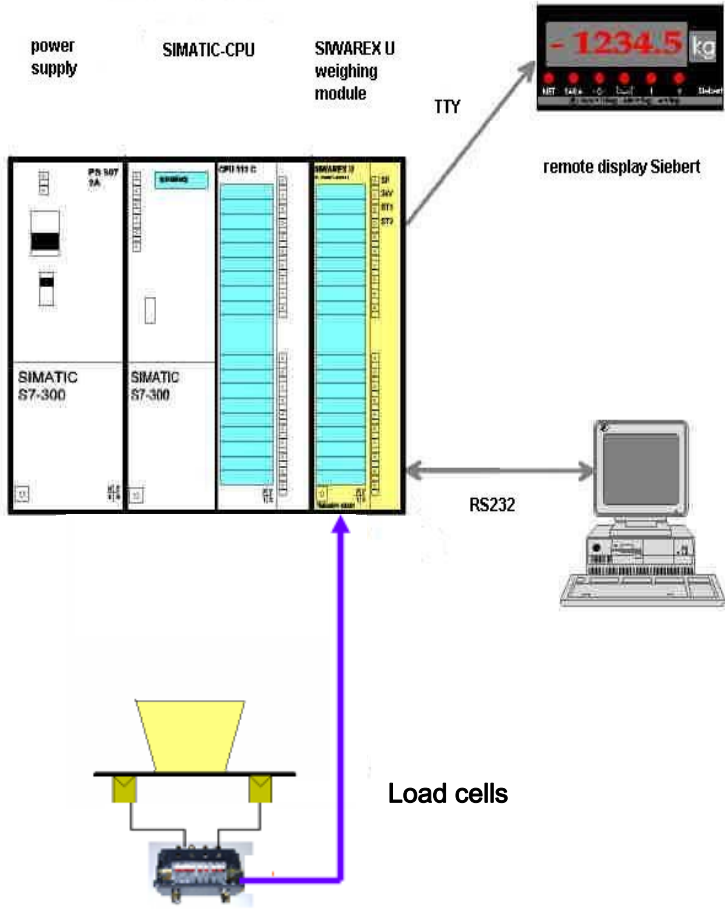

SIWATOOL RS232 Cable   Configuration Package for SIWAREX U
7MH4607-8CA   7MH4950-1AK01

Adjustment weight
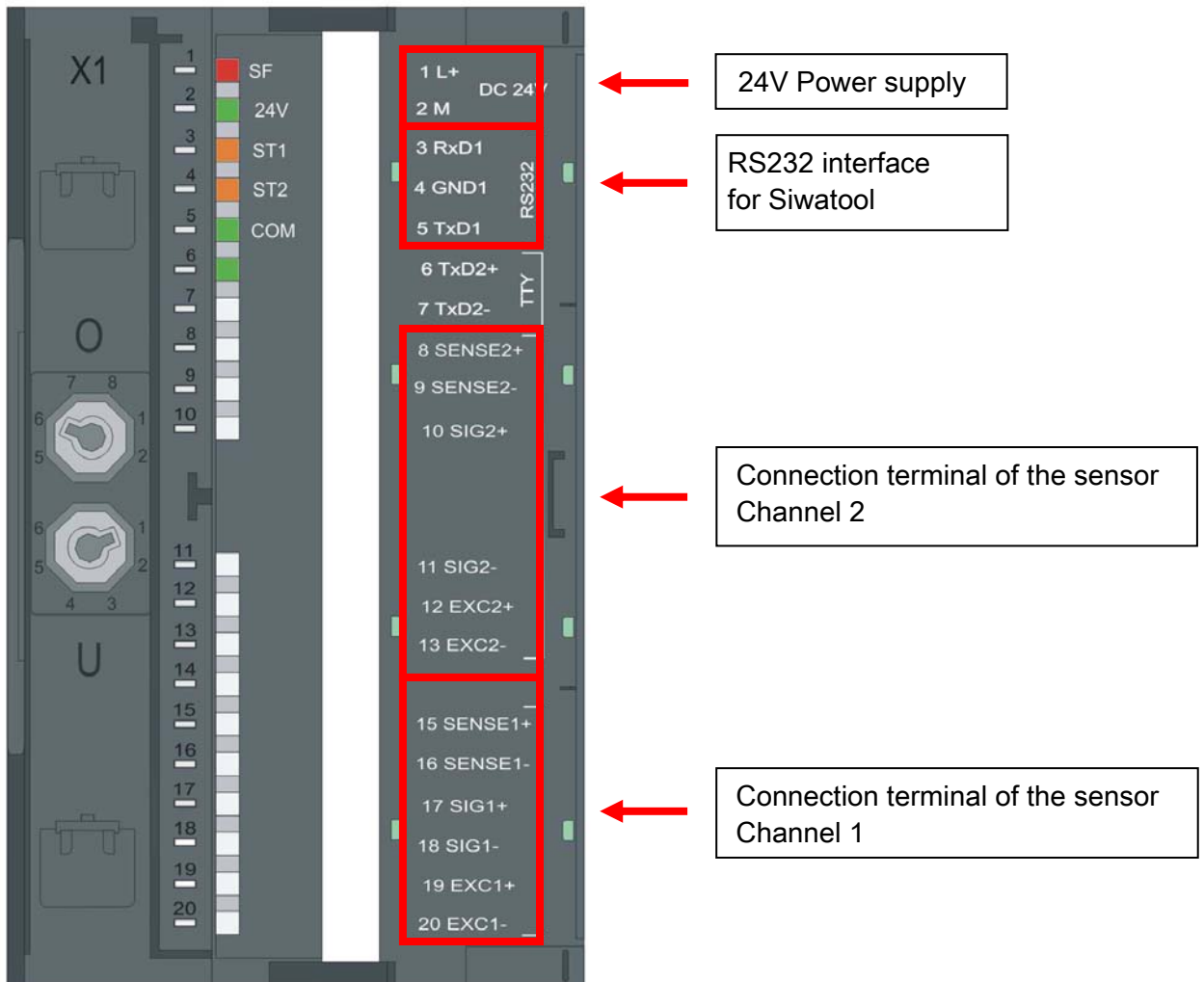(> 5% of the sum of the nominal value
  of all load cells)

Scale

System Configuration

power supply

SIMATIC-CPU

SIWAREX U weighing module

TTY

remote display Siebert

RS232

Load cells

2. Siwarex U connections

←	24V Power supply
←	RS232 interface for Siwatool
←	Connection terminal of the sensor Channel 2
←	Connection terminal of the sensor Channel 1

Diagram labels:

X1

SF
24V
ST1
ST2
COM

1 L+   DC 24V
2 M
3 RxD1
4 GND1   RS232
5 TxD1
6 TxD2+   TTY
7 TxD2-
8 SENSE2+
9 SENSE2-
10 SIG2+
11 SIG2-
12 EXC2+
13 EXC2-
15 SENSE1+
16 SENSE1-
17 SIG1+
18 SIG1-
19 EXC1+
20 EXC1-

Connection of load cells channel 1

Terminal	Signal Name	Comment
15	SENSE1+	Sensor line +
16	SENSE1-	Sensor line –
17	SIG1+	Measurement line +
18	SIG1-	Measurement line –
19	EXC1+	Load cell supply +
20	EXC1-	Load cell supply –

Connection of load cells channel 2

Terminal	Signal Name	Comment
8	SENSE2+	Sensor line +
9	SENSE2-	Sensor line –
10	SIG2+	Measurement line +
11	SIG2-	Measurement line –
12	EXC2+	Load cell supply +
13	EXC2-	Load cell supply –

Connection of the PC for SIWATOOL U

Connection in terminal block	Signal	Comment
3	RXD1	When using 7MH4 607-8CA connecting lead: Cable identifier "RxD"
4	GND1	When using 7MH4 607-8CA connecting lead: Cable identifier "GND"
5	TXD1	When using 7MH4 607-8CA connecting lead: Cable identifier "TxD"

3. Establish the communication to the Siwarex U module

Start the Siwatool U software into Windows:
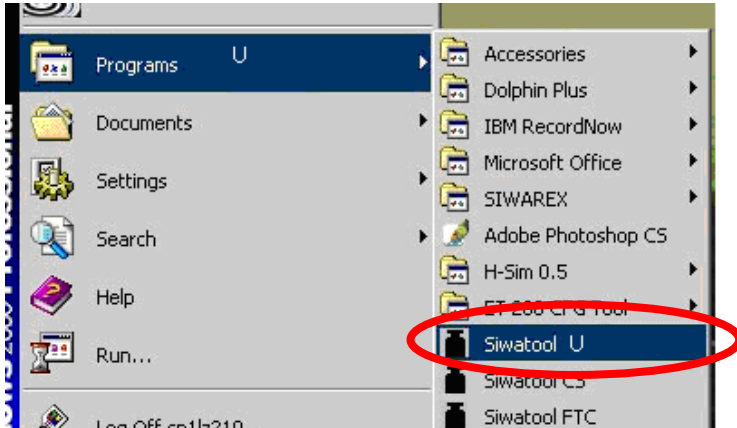
For establishing the communication between the Siwarex U module and the Siwatool software, click the button **Online**:
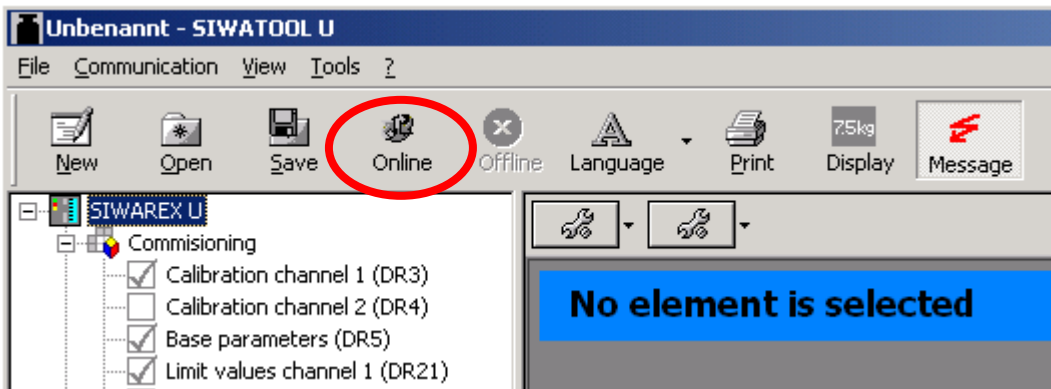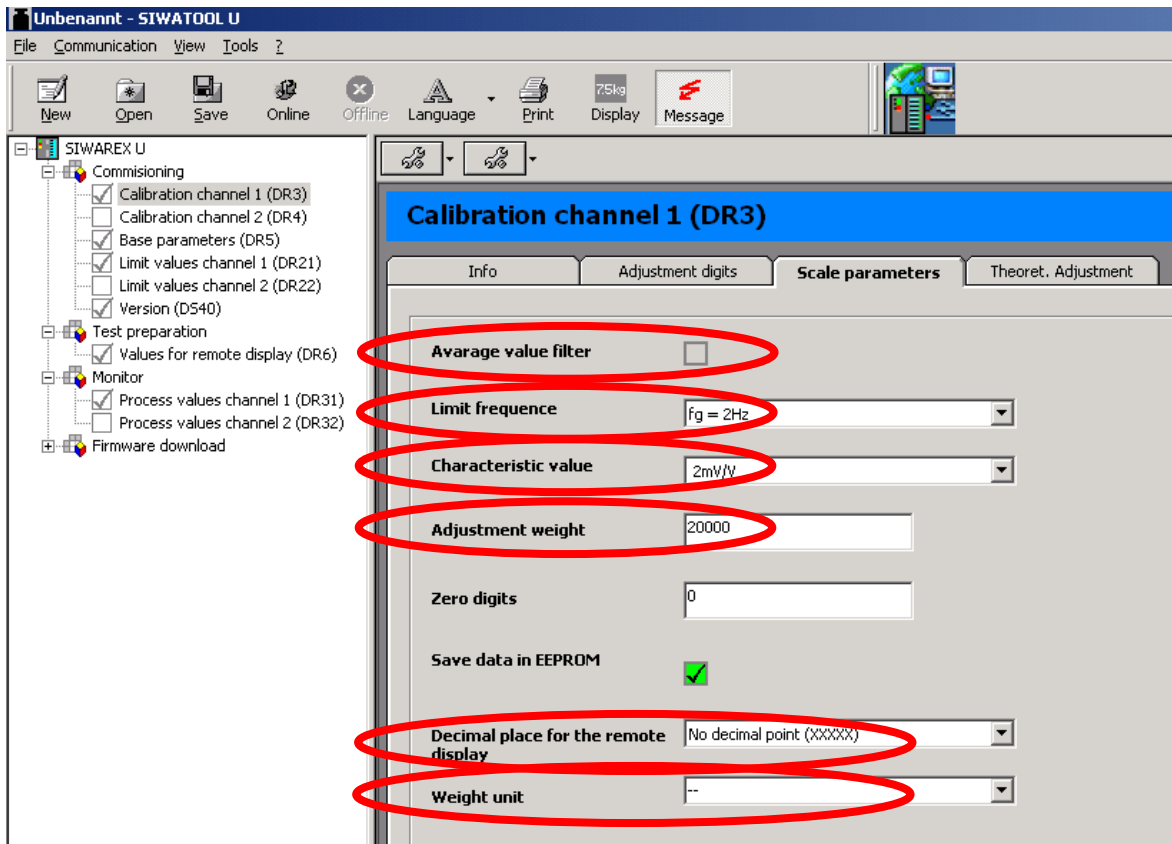
4. Adjustment with an adjustment weight

4.1 Set the SIWATOOL parameters

When the communication is established check the following parameter-settings:

Adjustment weight:
Enter the value of the adjustment weight.
The adjustment weight is an integer-value (up to 32767).

For example:

a) For a 20 kg scale you may use a resolution of 1 g:
   - the parameter "Adjustment weight" is set into gram (e.g. "20000").
   - the parameter "Decimal place for the remote display" is set to
     "No decimal point (XXXXX)".
   - the parameter "Weight unit" is set to " g".

b) For a 40 kg scale you may use a resolution of 10 g:
   - the parameter "Adjustment weight" is set into gram x10 (e.g. "4000").
   - the parameter "Decimal place for the remote display" is set to
     "2 decimal points (XXX.XX)".
   - the parameter "Weight unit" is set to " kg".

The decimal point is not part of the integer-value and is only used for the Siwatool-display (and a remote display, if available).
That means the decimal point have to determine, so that the displayed weight value (weight value = integer-value) will not increase the value of 32767.
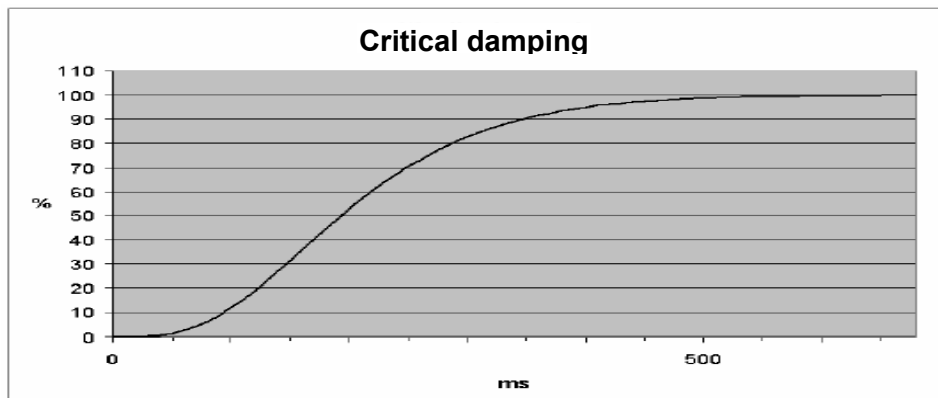
Characteristic value:
Characteristic value of the load cell.
The specification of the characteristic value can be read into the techincal data sheet of the load cell.

Limit frequence:
If this parameter is set to 5 Hz, the scale will respond quickly to a weight change; if it is set to 0.05 Hz, the scale will "move slowly".

Step response of the limit frequence of 2 Hz:

Average value filter:
The average value filter ensures a stable weight value and prevents interference.
The weight is measured according to the average value of n weight values.
32 weight values will be used for calculating the average value. The earliest value is discarded every 20 milliseconds and the latest value will be added for the calculation.

After setting the parameters, click **Send** to send the changed parameters to the Siwarex U module:
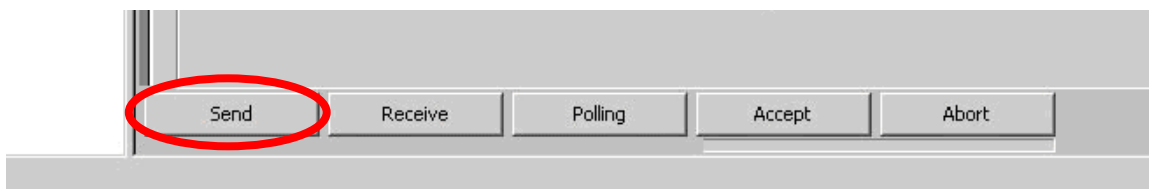
Use the same procedure to parameterize the second channel with DR4.

4.2 Adjustment procedure

Ensure that the scale is empty (not loaded) and execute the command **Channel 1: Adjustment zero valid (1)**.
The Siwarex U module shows now the weight value "0".

Afterwards, place the adjustment weight on the scale and execute the command **Channel 1: Adjustment weight valid (2)**. With executing of this command, the adjustment line is detected of the scale.
The Siwarex U module shows now the adjustment weight.
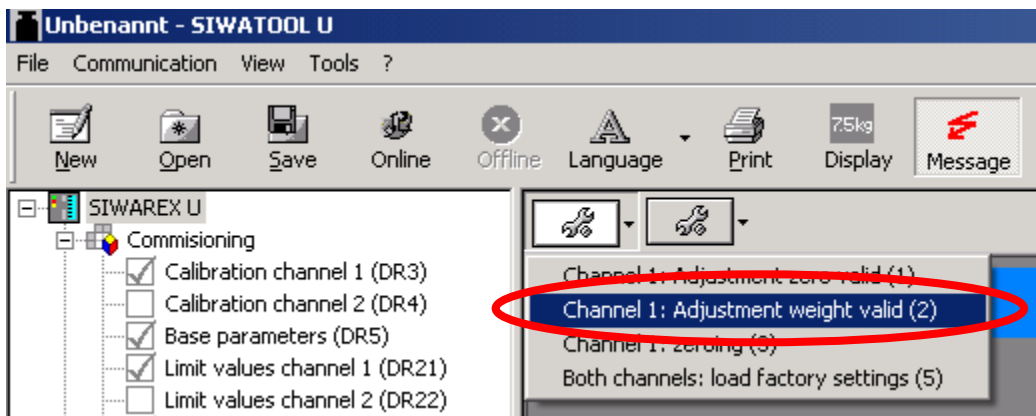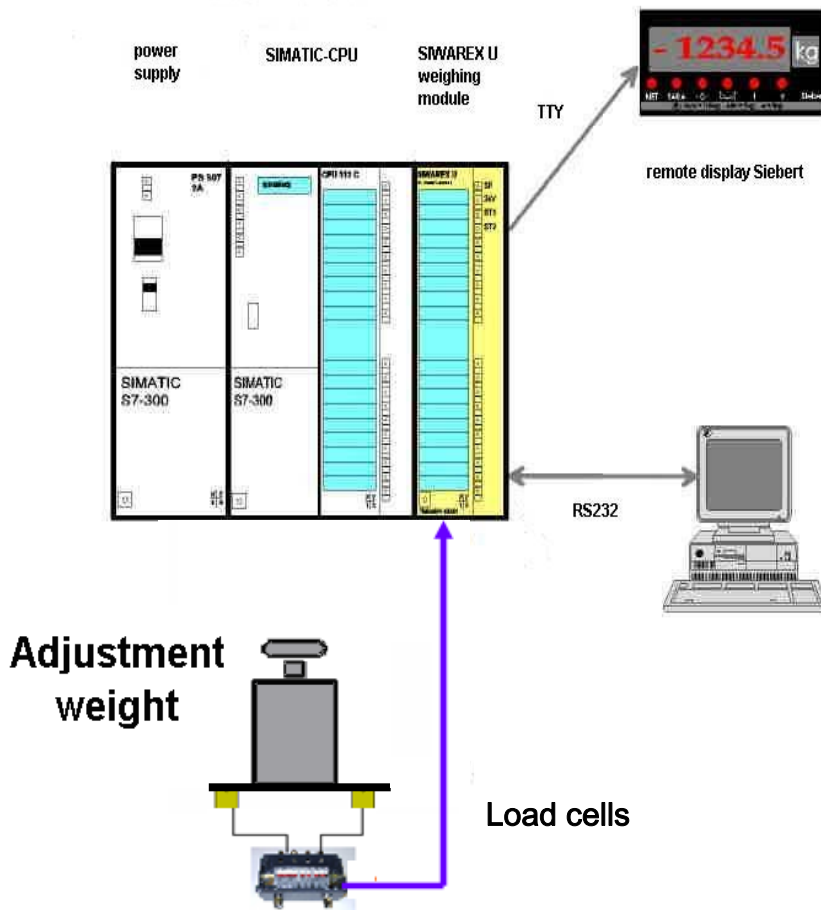
The adjustment is completed now.

5. Adjustment without an adjustment weight (theoretical adjustment)

If the adjustment is not possible by using adjustment weights, the scale can also be adjusted without adjustment weights, if the mechanical structure of the scale is correct.

If the measuring logs are available, these logs can be used for the theoretical adjustment. If the measuring logs aren't available, the default-values of the load cells can be used of the technical data sheet.
The execution of the theoretical adjustment is handled with the help of the SIWATOOL U software.
First, the "Characteristic value" (e.g. "2 mV/V") must be defined in the DR3, index card: "Scale parameters":
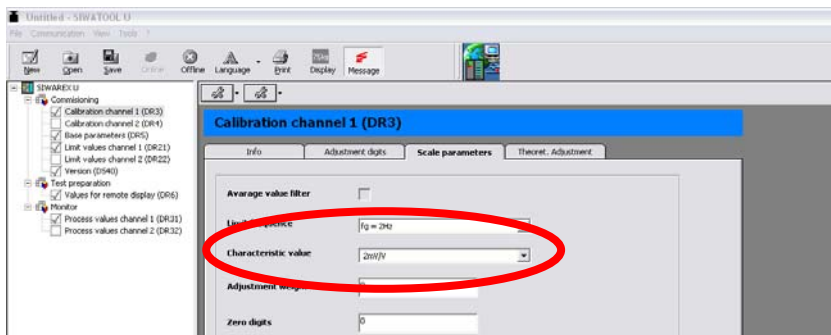
Then, switch to the "Theoret. Adjustment" index card.
To execute the theoretical adjustment, the rated load for all load cells is defined first,
e.g. 3 load cells with 1,000 kg each result in a rated load of 3,000 kg.
(See also step "1." in the picture below)

The "Zero offset in uV/V" (unit = µV/V), and the "Characteristic value" (unit = mV/V) is then
entered for each individual load cell.
(See also step "2." and "3." in the picture below)

These values are taken from the respective load cell measuring log.
If the measuring logs aren't available, the default-values can be used,
e.g. "Zero offset in uV/V" = "0" and "Characteristic value" = "2.0":
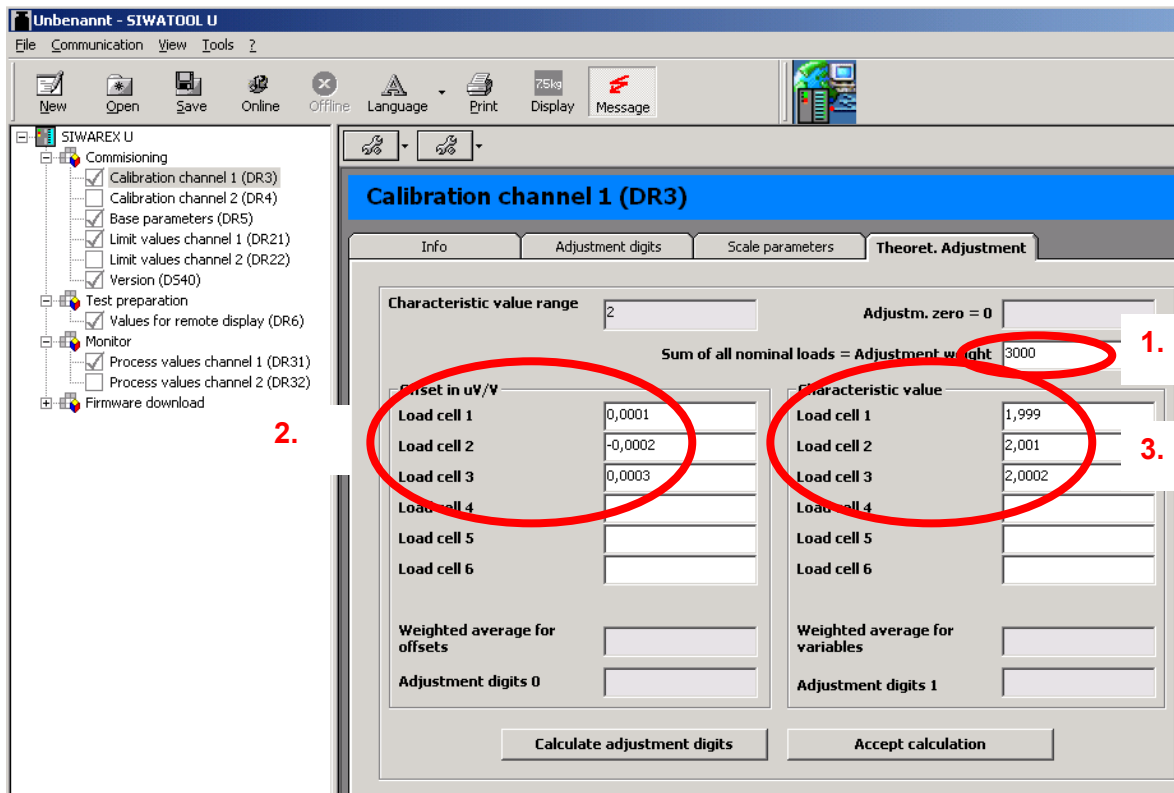
After entering the data for each load cell, the adjustment digits are calculated and the result is displayed by actuating the button "Calculate adjustment digits".
Then, the calculated adjustment digits can be integrated into the DR3 by actuating the button "Accept calculation":
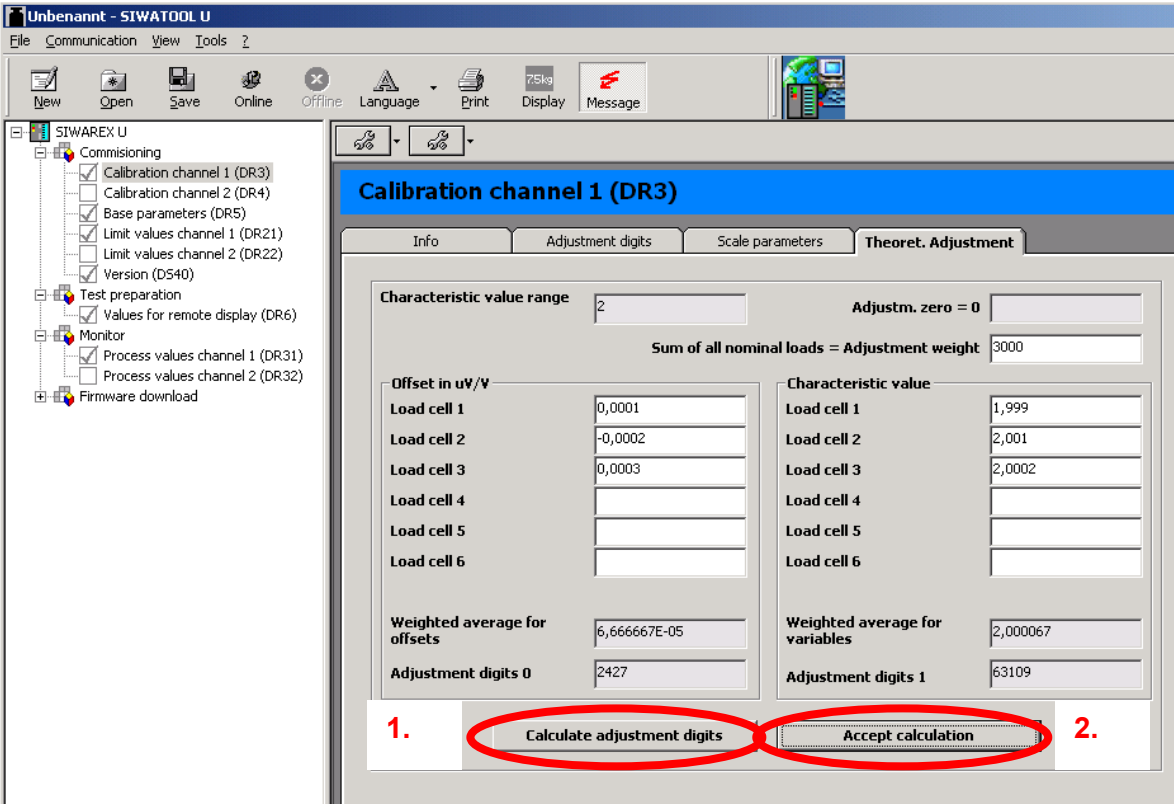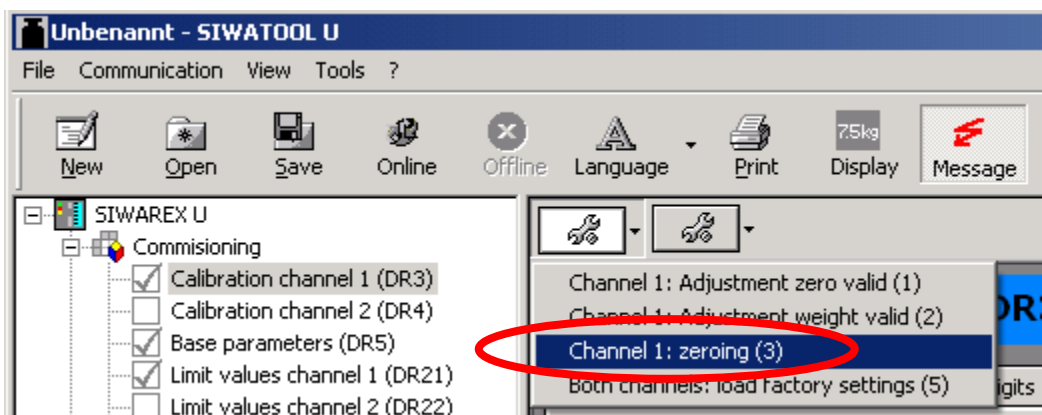

The DR3 is then sent to the weight module with the new adjustment data with the button "Send":
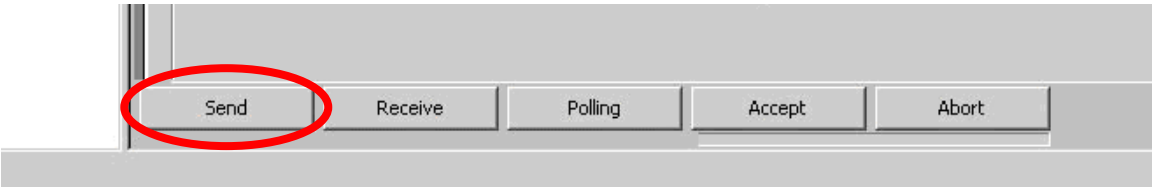
After sending the DR3, the command **Channel 1: zeroing (3)** has to be executed, when the scale is empty.

The theoretical adjustment is now finished.

After a theoretical adjustment you can check the correct work of the scale by using a check weight. Whether the shown weight value is different from the check weight you can adjust both numbers by manual parameter input in the field **"Adjustment digits 1"**. Following DR3 must be forwarded to the SIWAREX U module by **double click "Send"**.
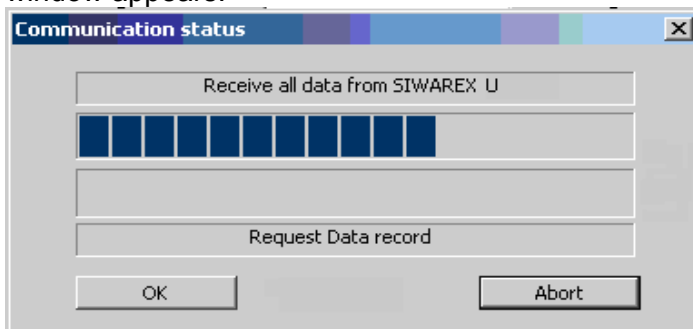

Manual parameter input

Double click
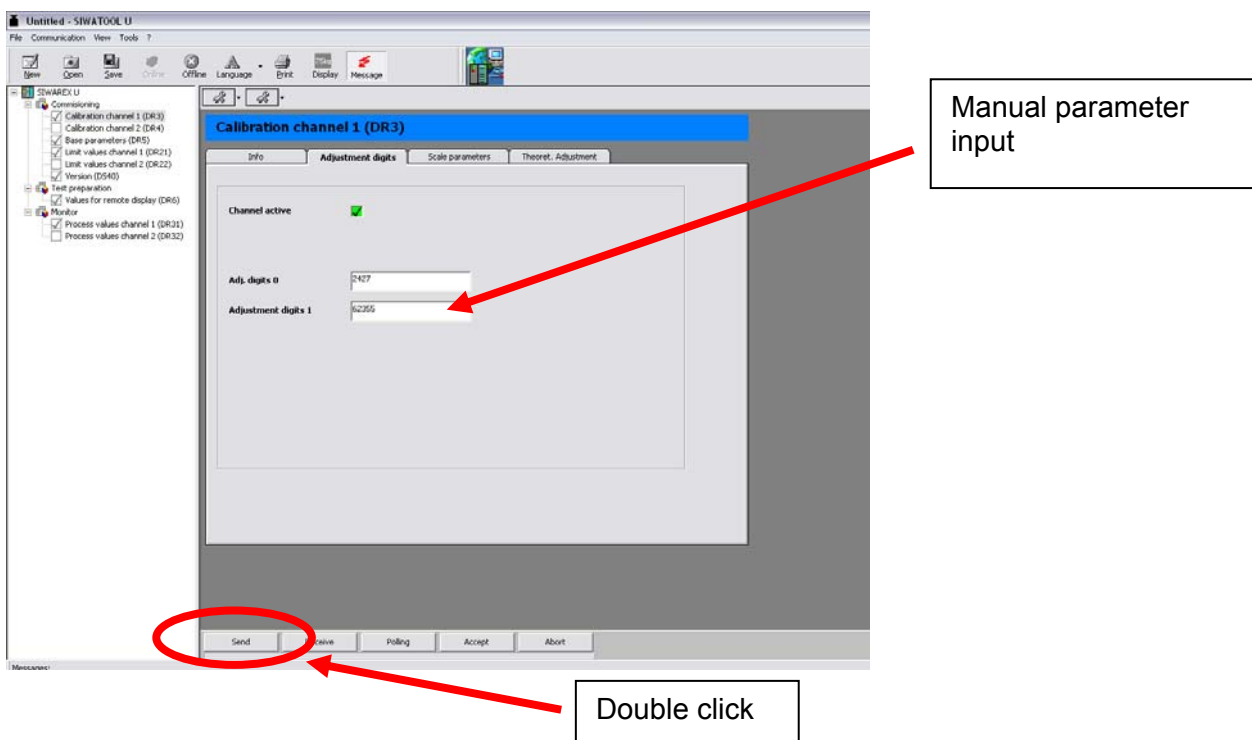
6. Create a Siwatool backup file

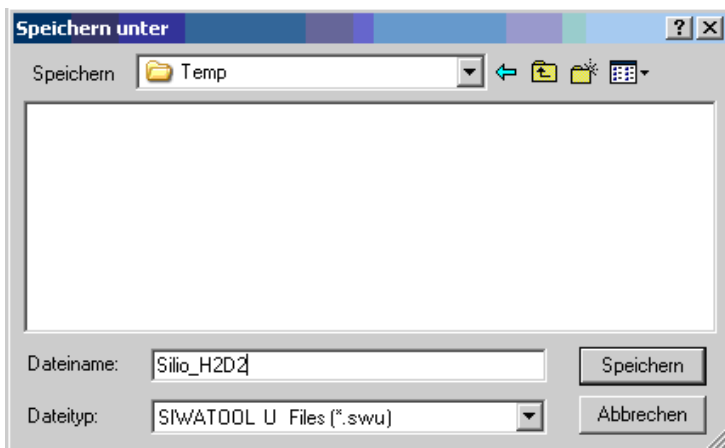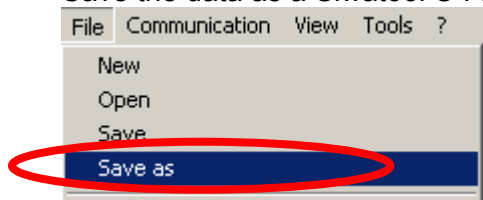Eventually you may save all parameter settings of the Siwarex U module into a file

Receive all data from the Siwarex U module to the Siwatool software:
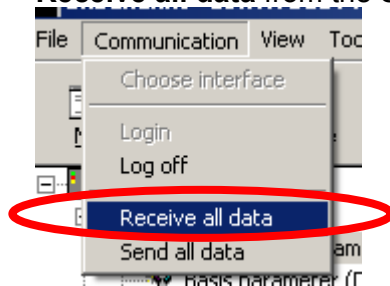
During the transmission from the Siwarex U module to the PC, the following message-window appears:

Save the data as a Siwatool U File:

If you have any issues or suggestions regarding the related products or documents, please feel free to contact:

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