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Subject to technical change.

We assume no liability for typing errors.

Safety notes / Technical support

Notes

- Installation, maintenance and commissioning must be carried out only by qualified technical personnel.
- The product must be used only in the manner outlined in this instruction manual.

Special attention must be paid to warnings and notes as follows:



WARNING

Relates to a caution symbol on the product and means, that a failure to observe the necessary precautions can result in death, serious injury and/or considerable material damage.



WARNING




Relates to a caution symbol on the product and means, that a failure to observe the necessary precautions can result in death, serious injury and/or considerable material damage.

This symbol is used, when there is no corresponding caution symbol on the product.

CAUTION

A failure to observe the necessary precautions can result in considerable material damage.

Safety symbols

In manual and on product	Description
	CAUTION: refer to related documents (manual) for details.
	Earth (ground) Terminal
	Protective Conductor Terminal

Technical support

Please contact your local supplier (see www.uwt.de for address). Otherwise you can contact:

UWT GmbH
 Westendstr. 5
 87488 Betzigau
 Germany

Tel. 0049 (0)831 57123-0
 Fax. 0049 (0)831 76879
info@uwt.de
www.uwt.de

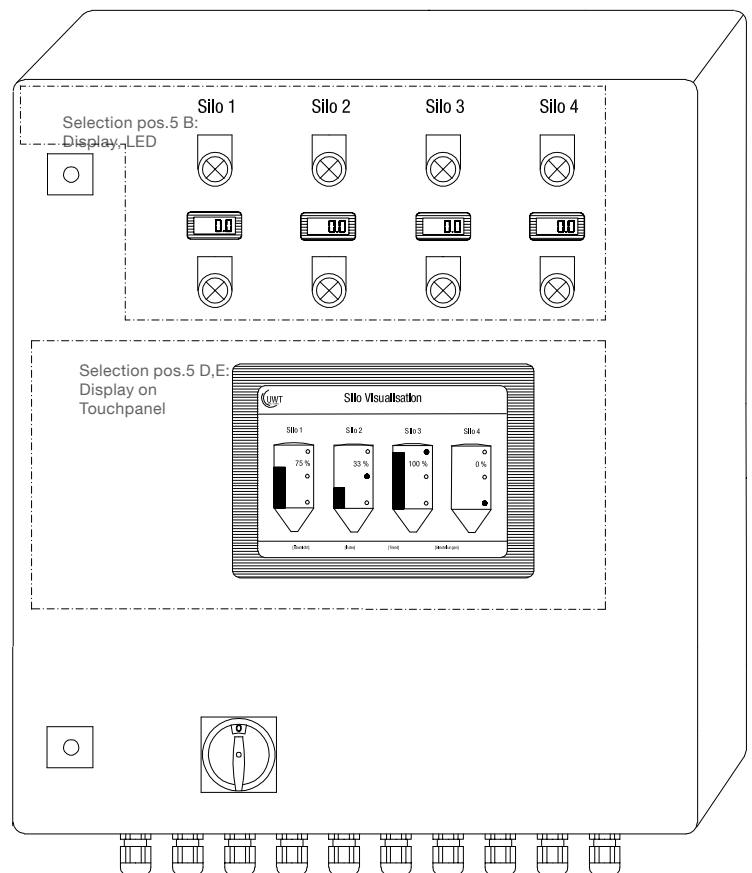
Overview

Features

- Fill level visualisation via HTTP-web server
- Visualisation via standard Internet browser software on all Ethernet PCs
- Password protected
- Worldwide remote enquiry of the level password protected - on request
- Software operation additional via a touch panel in the control cabinet or via fill level LEDs
- Data in percentage, height, volume or weight
- Trend display, data storage, export via .csv
- Evaluation of the analogue 4-20 mA signals of any sensors, as well as Modbus RTU of the UWT-systems
- Fill control via full alarm signals and shut off valves
- Separate truck module for safe and comfortable monitoring during silo filling

NT 3500 control cabinet

The heart of the NT 3500 is the web server module, which the visualisation software uses. All fill level control and display functions can be operated via the visualisation on a PC or a Touch panel with backlight and foil touch. An Ethernet interface ensures that the visualisation can be simultaneously operated from all PCs which are connected to the interface. Access is password protected. Additionally the control cabinet can be equipped with operating and display elements. Either the 10.4" or 15" touch panel or the digital level display with full and empty LEDs can be chosen. The electromechanical lead system can be started by the visualisation or by a push button. The flashing light with buzzer for alarm "silo full" can be mounted directly on the silo. The shut off valve can either be operated via a key switch on the truck module or mouse click on the PC and on the touch panel. The NT 3500 is a complete system which also provides the supply voltage for the sensors. The system is delivered with project specific electrical plans.

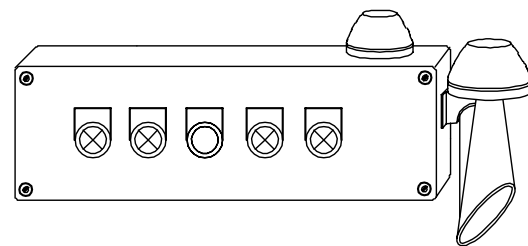


Truck module

- Use with one silo
- Mounting directly at the silo frame
- Display silo full/empty with LEDs
- Reset of alarm "silo full"
- Pinch valve control and status LED (optional)

Functionality:

The filling is enabled by an authorized user via key switch on the truck module or via mouse click on the PC or on the Touch panel. In case of a full silo the LED "silo full" and the flashing light with buzzer are switched on. The reset button is blinking during alarm. The pinch valve closes ca. 1 min after full detection. After reset of the alarm the reset button lights for ca. 5 min. When pressing the button again, the pinch valve opens once for ca. 3 min to enable the expulsion of the filling pipe. As long as a full silo is detected, the pinch valve can be opened again by the authorized user.



Example: Truck module with LEDs full/empty, key switch for control of the pinch valve, illuminated button for display and reset of alarm "silo full" and expulsion of the filling pipes, status LED for pinch valve

Technical Data / Electrical installation

Technical data

Dimensions	Depending on project
Mounting	Control cabinet Wall mounting Truck module Mounting on silo filler pipe
Material	Steel plate
Ingress protection	Control cabinet IP54 Truck module IP65
Ambient temperature	Control cabinet 0...+55°C Truck module IP65
Power supply	115V or 230V 50/60Hz
Power consumption	Depending on project

Technical data of the used Wago Controllers:

see www.wago.com, search for 750-881

Electrical installation



Safety Instructions

Handling	In case of improper handling or handling malpractice, the electric safety of the device cannot be guaranteed.
Installation regulations	The local regulations or VDE 0100 (Regulations of German Electrotechnical Engineers) must be observed.
RCCB protection	In case of a fault, the supply voltage must be automatically switched off by a RCCB protection switch to protect against indirect contact with dangerous voltages.
Wiring diagram	The electrical connections are made in accordance with the wiring diagram.
Supply voltage	Compare the supply voltage applied with the specifications given on the name plate before switching the device on.
Cable gland	Make sure that the screwed cable gland safely seals the cable and that it is tight (danger of water intrusion). Cable glands that are not used have to be sealed with a blanking element.
Field wiring cables	All field wirings must have insulation suitable for at least 250V AC. The temperature rating must be at least 80°C (176°F).
Installation in Hazardous Locations	The NT 3500 is not permitted for installation in Hazardous Areas. Observe the valid regulations for wiring in Hazardous Areas, if the NB 3000 is installed in Hazardous Areas.

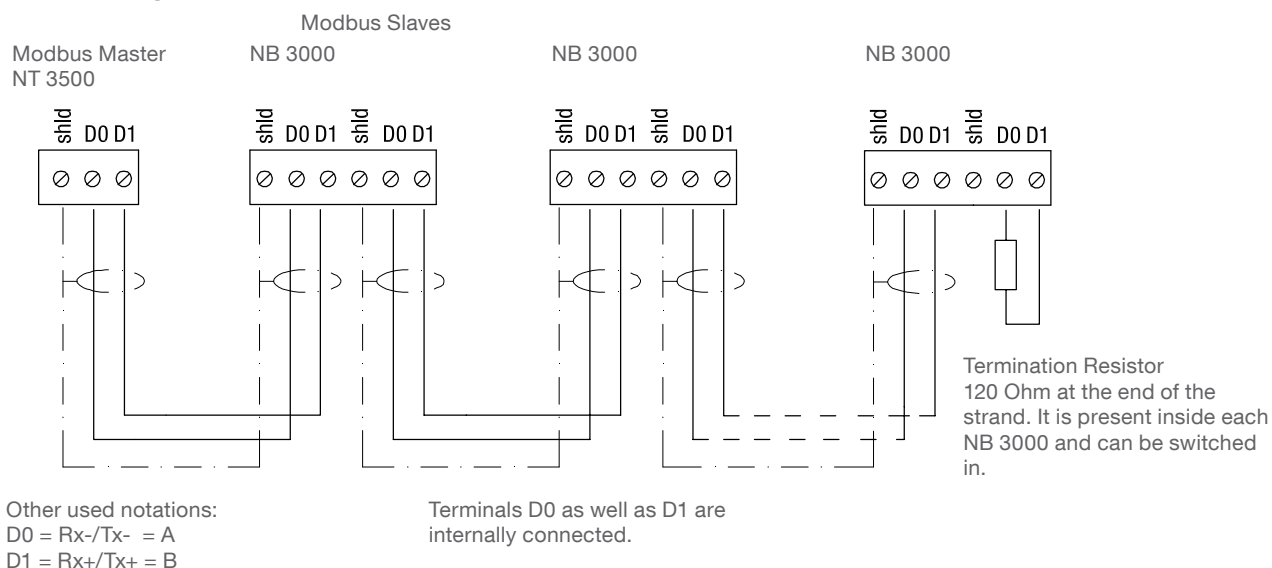
Wiring diagram

The NT 3500 will be delivered with detail wiring diagram depending on the project.

Electrical installation

Modbus network

General wiring of a Modbus network



Cable recommendations for Modbus network

Shielded cable

Functionality up to 50m

Manufacturer: Lapp, Type UNITRONIC LiYCY 2x0.34, Art.no: 0034502

Twisted pair cable

Functionality up to 1000m

Manufacturer: Lapp, Type UNITRONIC BUS CAN 1x2x0.34, Art.no: 2170263

UV-protection hose with threaded hose coupling M20x1,5

UV protection for Modbus cable

Manufacturer: Flexa, Type Rohrflex PA6, Art.no: 0233.202.012 and Type RQG1-M, Art.no: 5020.055.018

ATEX-protection hose with threaded hose coupling M20x1,5

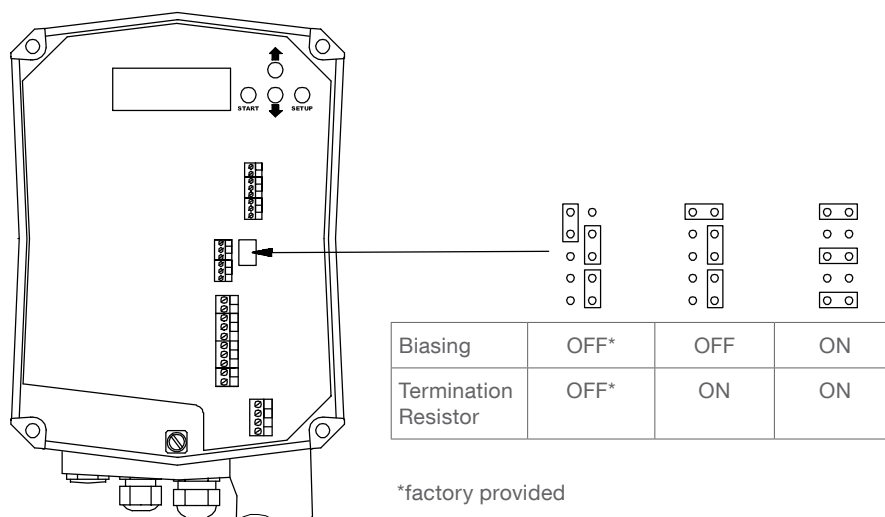
For installation of Modbus cable in ATEX Zone 21

Manufacturer: PMA, Type ESX, Art.no: ESXT-12B.50 and Type END, Art.no: BEND-M202GT

NB 3000

Setting Modbus: Biasing and Termination Resistor

Termination Resistor and Biasing needs to be switched ON at the end of the Modbus strand.



Commissioning

1. Web server configuration

CAUTION: The configuration should be done by the network administrator only.

The web server is preset to the IP address 192.168.10.70. It must be changed to a company's own IP address as follows:

- Use a PC, which is connected via Ethernet to the Web server. Set in the system control the TCP / IP to address 192.168.10.xx, whereas xx can be any two digit number (the access to the Web server requires the number 192.168.10., the last two digits are not relevant).
- An up to date version of Internet browser and Java must be installed.
- Open the Internet browser and type the IP address 192.168.10.70 of the web server in the command bar. The overview page "Home" of the visualisation opens (see page 7).
- Click the "User" button and set the User Level to 5. The "Config" button will appear in the menu bar.
- Click on this button. The configuration page of the web server will open (see page 9).
- Enter your IP address, sub net mask and gateway, the current date and time
- Then reset to your TCP / IP address in the system control of your PC.

2. Perform the basic settings of the connected sensors

With the following settings, the connected sensors are addressed via the visualisation and give a real measurement result. For this settings the above mentioned synoptical table is helpful:

- Enter in page "Settings" (see page 11), the data under "Hardware", "Signal Input" and, if full detectors are connected, "Full Level Indicator".
- Enter in page "Volume Calculation" (see page 13) the data under "Signal Input", "Silo Profile" and "Silo Data".

3. Perform further user settings

Enter the required user specific settings according to the "Visualisation - Operation" from page 7 onwards.

Visualisation - Operation

Start of the Visualisation

By entering the IP address in the browser (according to the web server configuration) the visualisation starts.
On the first call Java is started. If the progress bar does not move further, please restart your browser and the visualisation.



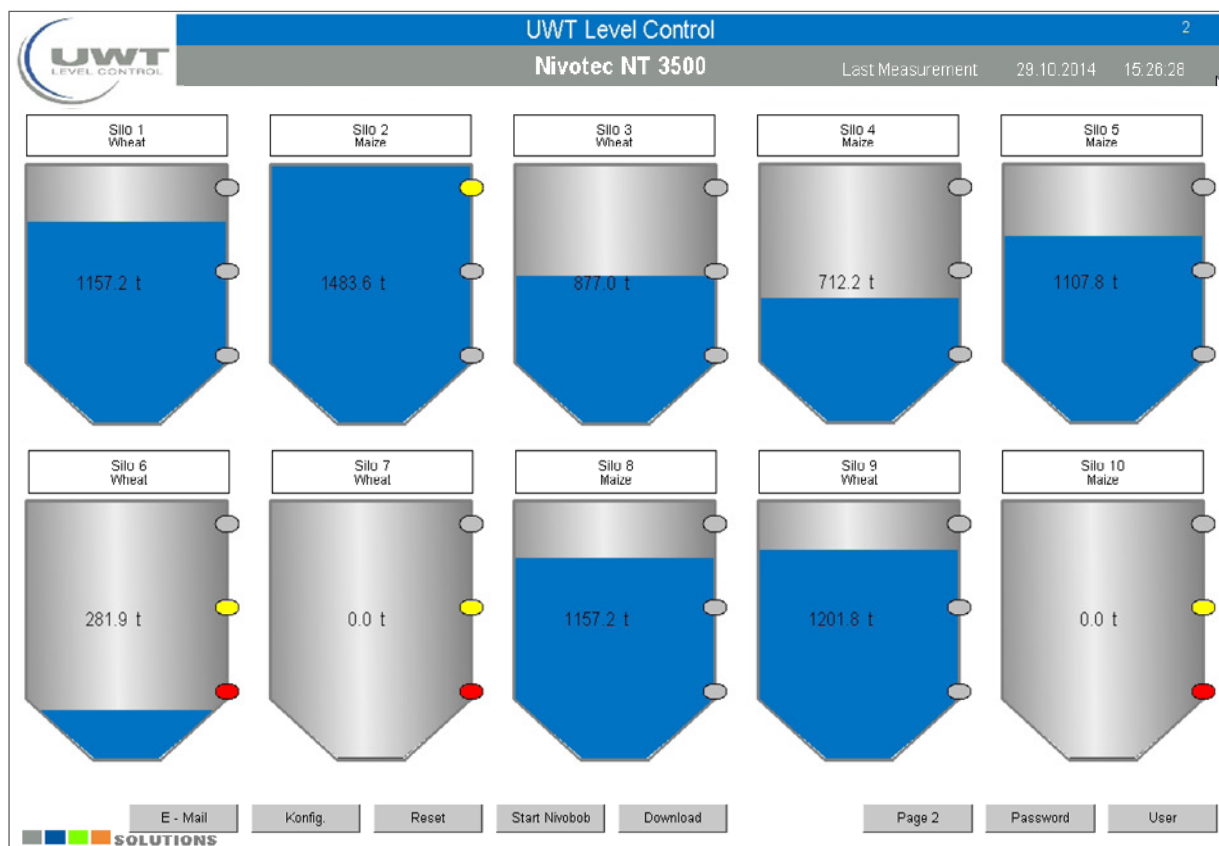
After successful start the overview page "Home" appears.

Overview page (Home)

Display of level, level switches, information regarding silo and error messages

User Level 0 or higher

The selected number of silos (see page "Config") is presented. If more than 10 silos are defined, a button appears for progression to the next page.



Note: If a distorted image on the PC is present, it should not be viewed in full screen mode, thus the window can be drawn in an undistorted view.

Visualisation - Operation

The following selections appear depending on the setted User Level:

Silo Single View (click on a silo)

The single view for the respective silo will open (see page 10).

E-Mail

Sends an E-mail if a level switch is activated or if an error message of the NB 3000 is present.

Config

See page 9.

Reset

Reset of the full signal (buzzer) and of error messages.

Start Nivobob

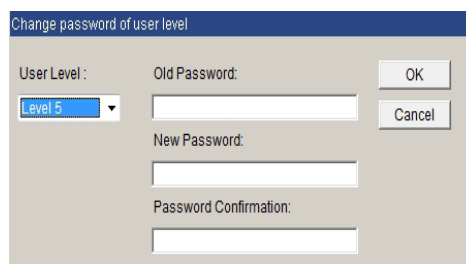
Starts the measurement of all connected Nivobobs. If more than 10 silos are defined, the measurements of the silos not displayed on the screen are started as well. As long as the measurement is running, a green arrow appears in each silo.

Download

Issue of trend data for all silos in .csv format. The level values are stated in the unit as defined under "Volume Calculation" (see page 13).

Password

Used for password assignment. Each User Level can change its own password. The higher level can change the password of the lower levels. No password is presetted apart from Level 7.



Change password of user level

User Level: Level 5 Old Password: OK Cancel

New Password:

Password Confirmation:

User

Selecting the User Level with different permissions:

Level 0

- Overview page (Home)

Level 1

Similar to Level 0, additional:

- Silo Single View
- Start Nivobob
- View of Event List
- Reset of the full signal (buzzer) and of error messages
- Download of trend data

Level 2

Similar to Level 1, additional:

- Page "Settings"
- Page "Volume calculation"

Level 3+4

BLocked

Level 5

Similar to Level 2, additional:

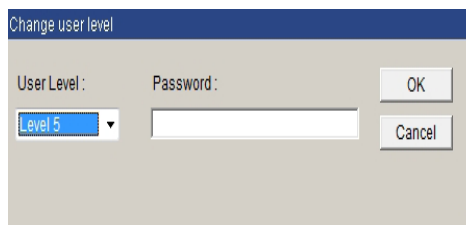
- Page "Setup Nivobob"
- Page "Config"
- Page "E-Mail"

Level 6

BLocked

Level 7

UWT Service-Level



Change user level

User Level: Level 5 Password: OK Cancel

Visualisation - Operation

Page "Config"

Setting of date, time, software language, country-specific units, number of displayed silos as well as network settings

User Level 5 or higher



Config. Controller

Nivotec NT 3500

Date - Time	
Time	18:16:42
Date	29.10.2014
New Time	00:00:00
New Date	01.01.1970
Set	

Settings	
Motor	Foot
Tonnen	US Tonnen
Deutsch	Englisch

Network				
IP Address	192.168.10.72			
Sub Net Mask	255.255.255.0			
Gateway	192.168.10.20			
New IP Address	0	0	0	0
New Sub Net Mask	0	0	0	0
New Gateway	0	0	0	0
Set				

Number of Silos	
10	



Visualisation - Operation

Page "Silo Single View"

View of details and settings of the sensors for a silo.
Open/close the pinch valve.

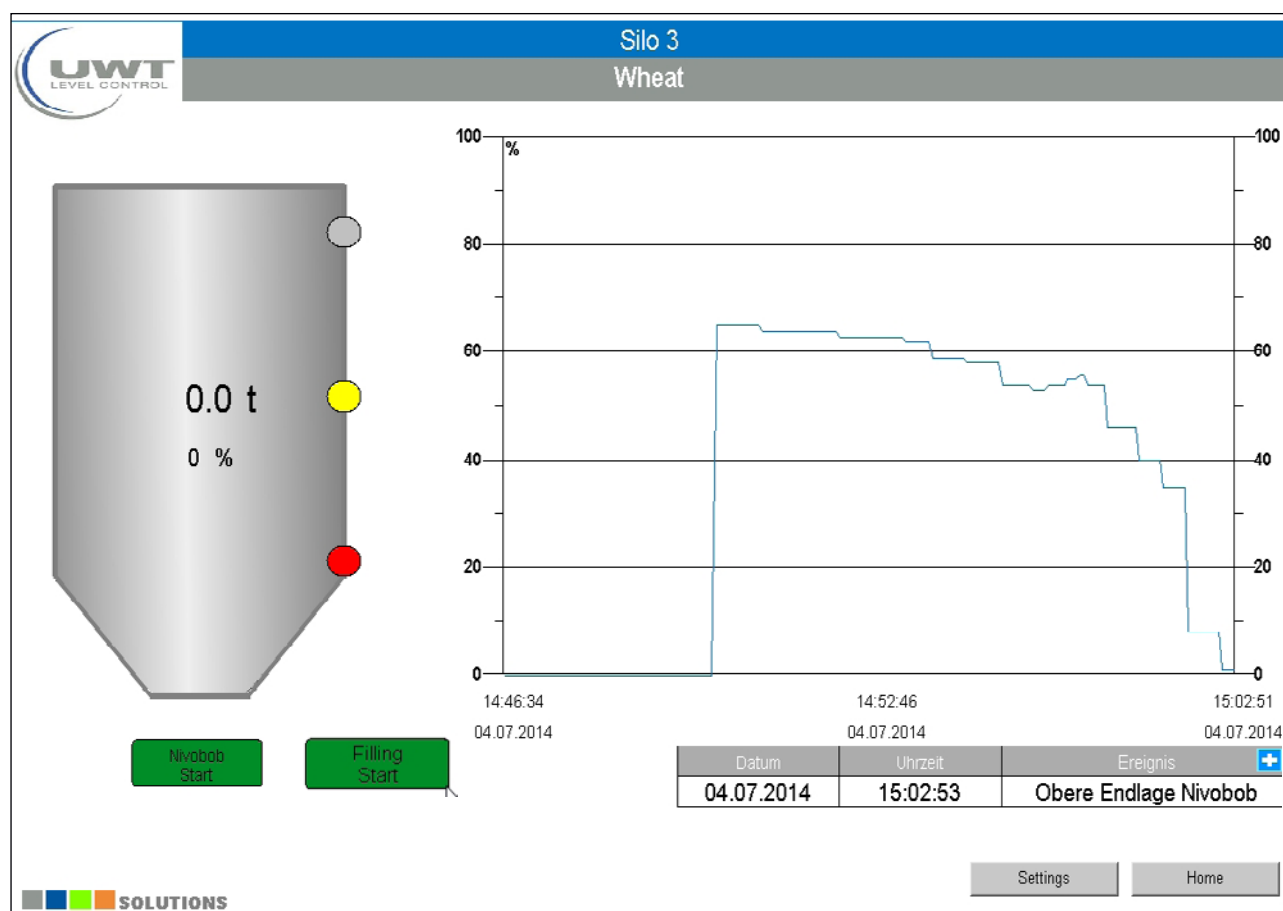
User Level 1 or higher

Clicking on a silo in the Overview page (Home) opens the Silo Single View.

The level is displayed in the unit as defined under "Volume Calculation" (see page 13), in addition as a percentage.
The colored points display the full, demand and empty detection.

The trend stores a total of 200 data points per silo. The oldest point is deleted when a new value is stored.

Events are displayed in a table. The selection "+" opens the list of the last 17 events.



Nivobob Start

Starts the measurement of the Nivobob for this silo. During the measurement, the button appears gray. When the measurement is completed, the color changes back to green.

The button appears only if on page "Settings" under "Hardware" the selection "Nivobob" has taken place.

Filling Start / Stop

Control of the pinch valve.

The control of the valve during the filling of the silo is done in combination with the Truck module (see description on page 3).

Via the visualisation software the valve can be opened and closed independently by pressing the button "Filling Start/Stop".

The button appears only if on page "Settings" the selection "Pinch valve - Yes" is done.

Settings

Leads to the page "Volume Calculation" of this silo (see page 11).

Visualisation - Operation

Page "Settings"

Detail settings for the respective measurement point

User Level 2 or higher

The page opens with click on "Settings" in the page "Silo Single View".

View with selection "Hardware - Nivobob":

Settings Silo 1
Maize

Silo Data	Signal Input	Trend	
Name	Silo 1	Trend Intervall	00:01:00
Content	Maize		
Art. Nr.			
		Enable Nivobob	
		<div style="display: flex; justify-content: space-around;"> Yes No </div>	
Hardware		Automatic Power Measurement Start	
LR 560		<div style="display: flex; justify-content: space-around;"> Yes No </div>	
Nivobob			
Volume Calculation		Measure Interval	
		<div style="display: flex; justify-content: space-around;"> Yes No </div>	
Setup Nivobob		Intervall Time	
		00:00:00	
		Start Time	
		00:00:00	
		Pinch Valve	
		<div style="display: flex; justify-content: space-around;"> Yes No </div>	

View with selection "Hardware - LR560":

Settings Silo 1
Maize

Silo Data	Signal Input	Trend	
Name	Silo 1	Trend Intervall	00:01:00
Content	Maize		
Art. Nr.			
Hardware		Automatic Power Measurement Start	
LR 560		<div style="display: flex; justify-content: space-around;"> Yes No </div>	
Nivobob			
Volume Calculation		Measure Interval	
		<div style="display: flex; justify-content: space-around;"> Yes No </div>	
		Intervall Time	
		00:00:00	
		Start Time	
		00:00:00	
		Pinch Valve	
		<div style="display: flex; justify-content: space-around;"> Yes No </div>	

Visualisation - Operation

Silo Data

The silo shown can be labeled with any text for silo name, content and article number.

Hardware

Indication of the sensor used. For other 4-20mA sensors than LR560 the selection "LR560" must be used.

Signal Input

- If a Nivobob is connected (with selections "Hardware - Nivobob") :

Selection of the signal output, which is used with the connected Nivobob.

With selection "Modbus" the Modbus address, which is present on the Nivobob, must be entered.
 The Modbus address of the Nivobob is setted in the Nivobob communication menu (see manual Nivobob). It is reasonable to use the address 1 for the first device, then ascending to 2, 3, etc. Optional (with selection code 33) the Nivobob devices are delivered with already preset address.

Setting "Modem" is used if a GSM module for remote maintenance is installed at the silos.

- If LR 560 (or another 4-20mA sensor) is connected (with selection "Hardware - LR560"):

Setting "Analogue 4-20mA" is setted as standard.

Setting "Modbus" and "Pulse" is not active.

Setting "Modem" is used if a GSM module for remote maintenance is installed at the silos.

Level Indicator

- If level indicators are connected, the setting is done as follows:

Setting "Digital input", if the level indicator is connected directly to the control cabinet (via I/O module).

Setting "Modbus", if the level indicator is connected to the Nivobob and thus is read by the Modbus connection of the Nivobob (only possible for full detector).

- With setting "Value" no level indicators are connected. The message for full and demand is activated, when the entered value (in percent) is exceeded by the material level. The message for empty is activated, when the material level is below the entered value (in percent).

Trend

The trend stores the level values according to the setted interval (hours : minutes : seconds).

A total of 200 data points per silo are stored. The oldest point is deleted when a new value is stored.

Enable Nivobob

Measurement start can be blocked by setting to "No", e.g. while a silo is beeing filled.

Automatic Power Measurement Start

After power up or after power failure of the web server, the Nivobob will start automatically if "Yes" is selected. The level measurement is then immediately updated (the Nivobob gives no actual signal output until a new measurement is started).

Measure Interval

Activation of automatic measurement start of Nivobobs, if setted to "Yes". The start takes place automatically, the first time at the setted start time (time of day), then regularly repeated with the setted interval (hours : minutes : seconds).

Pinch Valve

With use of a pinch valve the selection must be set to "Yes". Explanation of the pinch valve functionality see page 10.

Volume Calculation

see page 13

Setup Nivobob

see page 14

Visualisation - Operation

Page "Volume Calculation"

Settings for volume related measurement display and setting of the silo dimensions

User Level 2 or higher

The page opens with click on "Volume Calculation" in the page "Settings".

Volume Calculation Silo 1
Maize

Signal Input	
Linear	Volume

Silo Profile	
Cylindrical	Rectangular

Silo Data	
H (m)	15.4
K (m)	3.2
L (m)	1.2
D1 (m)	3.5
D2 (m)	0.5

Unit	
Meter (m)	
Cubicmeter (m³)	
Ton (t)	
Kilogram (kg)	
L iter (l)	
Percent (%)	

Volume	
Max. Volume	117.71
Density g/l	650

Calculated	
Max. Value	Current Value
76.51 t	0.00 t

Signal input

Selection "Linear", if the level signal output of the connected sensor is linear (relation between the signal output and the level in the silo). Thus the volume-based calculation is performed not in the sensor, but in the visualisation.

Selection "Volume", if the level signal output of the connected sensor is volume based (relation between the signal output and the level in the silo). Thus the volume-based calculation is performed in the sensor and not in the visualisation.

Silo Profile and Silo Data

With the setted data the software calculates the max. volume and (with selection "Signal input - Linear") the volume based display.

For the correct measurement display the connected sensors must be set as follows:

• Nivobob NB 3000:

- Value "Cone Height"
 - with selection "Signal input - Linear": must be set to 0
 - with selection "Signal input - Volume": must correspond to the value K given above
- Value "Silo Height" must correspond to the value H given above
- Value "Air Dist" must correspond to the value L given above
(H and L are related to the lower edge of the sensor-weight)

• 4-20mA sensors

- 4mA must correspond to the value 0% given above
- 20mA must correspond to the value 100% given above
(H and L are related to the fixing flange if using LR 560)

Unit

The selected unit is used in the visualisation.

Volume

Display of the max. volume (in cubic meters) and input of bulk density to calculate the weight.

Calculated values

Display of the calculated maximum content (according to the entered Silo Profile and Data) and the actual content. Both values are shown in the above selected unit.

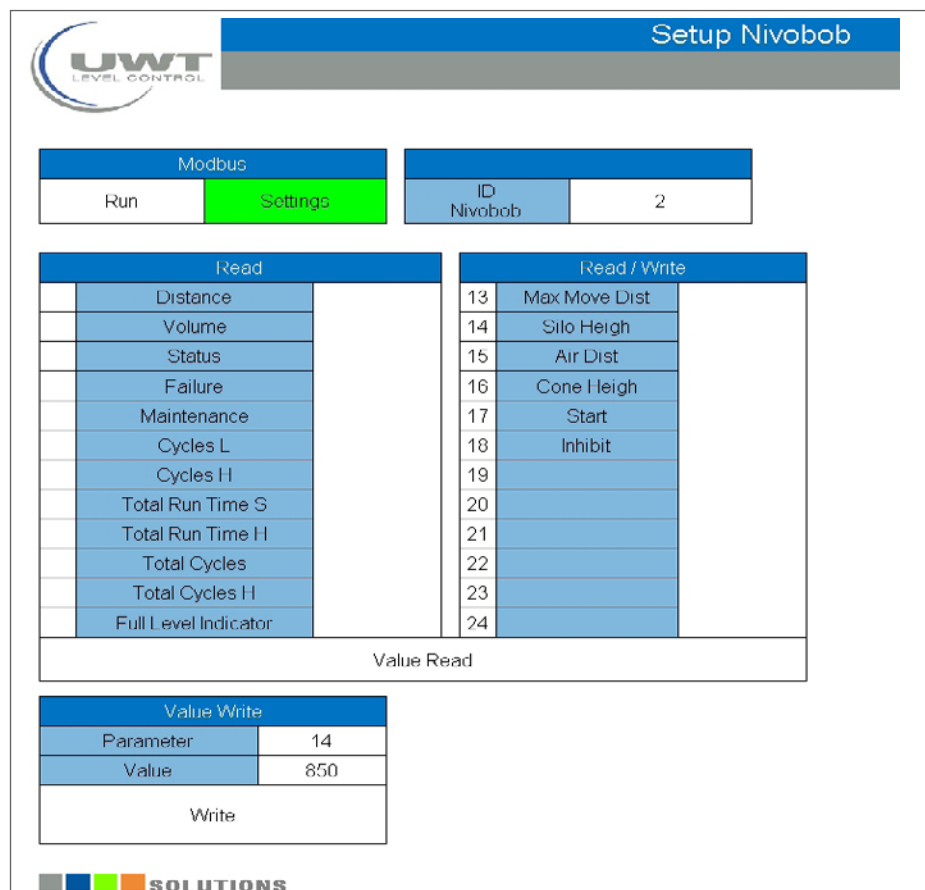
Visualisation - Operation

Page "Setup Nivobob"

Parameterization and reading diagnostic data from the Nivobob

User Level 5 or higher

The page opens with click on "Setup Nivobob" in the page "Settings", if the selection "Signal input - Modbus" is set.



Modbus	
Run	Settings

ID	Nivobob
2	

Read	
Distance	
Volume	
Status	
Failure	
Maintenance	
Cycles L	
Cycles H	
Total Run Time S	
Total Run Time H	
Total Cycles	
Total Cycles H	
Full Level Indicator	

Read / Write	
13	Max Move Dist
14	Silo Heigh
15	Air Dist
16	Cone Heigh
17	Start
18	Inhibit
19	
20	
21	
22	
23	
24	

Value Read

Value Write	
Parameter	14
Value	850
Write	

SOLUTIONS

Modbus

Activation of parameter setting and value reading with click on "Settings". A list with parameters of Nivobob NB 3000 appears. For details of the displayed parameters, see manual of the NB 3000.

Selecting "Run" will close again.

ID Nivobob

Enter the ID number (Modbus address) of the Nivobob which is related to this silo.

Read and Read/Write

The parameters which are read only, or which are read and write, are displayed. Update the values by clicking the "Value Read" button. After a few seconds, the values are shown. The values 13-16 are always displayed and written in millimeters.

Value write

Enter the number (13-18) of the value, which shall be written, in the "Parameter" box. This value is transferred to the Nivobob by clicking the "Write" button

With parameter 17 "Start" set to 1 the Nivobob can be started. Set back to 0 afterwards.

With parameter 18 "Inhibit" set to 1 a running measurement of the Nivobob is stopped. Set back to 0 afterwards.