

All our information and advice is compiled with the greatest possible care and in accordance with state of the art technology. However we are unable to assume any liability for the contents. – December GHH 20161

More information on the GroSens System can be found at www.grodan.com/grosens

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Installation Guide

HandHeld



GROSENS®
Makes precision irrigation possible

www.grodan.com/grosens

Precision Growing

With its focus on using the minimum input materials to generate the maximum output, Precision Growing is the most efficient and effective form of growing. It not only reduces growing costs but increases crop yield and quality. What's more, this form of growing actively contributes to sustainable horticulture.



The GroSens HandHeld package

GroSens Batteries

Extra set of batteries for Reader and Sensor

GroSens Sensor (Wireless)

The Sensor takes extremely precise measurements of the WC, the EC and the temperature

GroSens Cleaning Set

Cleaning set for disinfecting the sensor pins.

GroSens Reader

The reader allows you to see data from the GroSens sensor at a glance as you walk through the greenhouse.

GroSens Components

Extra-long antenna for optimal reception and USB cable for transferring measurement data to PC.



grodan[®]
GROSENS

How to get started with the GroSens HandHeld

- The GroSens HandHeld case includes a short description how to get started:
 - Download the User Manual HandHeld from the website: www.grodan.com/GroSens
 - Activate the Reader by following the instructions as shown on the inlay
 - Download software program via downloader program to be installed on your PC
- GroSens HandHeld is ready for use.

1 "Home page" - general functions

1

"Home page" -
general functions

2

Multi measurement function

3

Logging function

4

Downloader program

2 Multi measurement function

1

"Home page" -
general functions

2

Multi measurement function

3

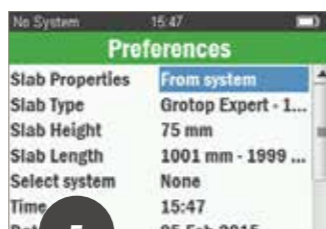
Logging function

4

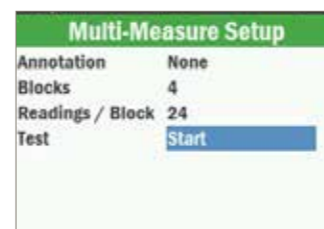
Downloader program

General functions

1. Single measurement +
functional check full
systems
2. Multi measurement
3. Logging function
4. Storage of files
5. Preferences
6. About
› version info



Create file



1. Annotation - name file
2. Select number of blocks
3. Select number of readings
4. Start



2 Multi measurement function

1

"Home page" -
general functions

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Downloader program

2 Multi measurement function

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Downloader program

Select sensor

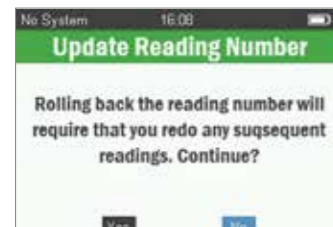


1. Activate Sensor



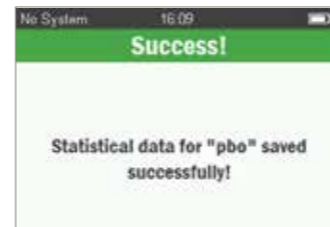
2. Select Sensor

Measurements



1. Start measurements
2. Correct measurements if needed

Save data - read averages



1. After last measurement -
store



Type	Annotation	Records
Multi	roe2	0
Multi	roe2	2
Multi	roe	5
Multi	sdg1901	24
Multi	sdg1901	0
Multi	sdg1901	0

Vital Dry - 1 year	
WVC [%V/V]	\bar{X} : 60.6 S: 18.2
EC [mS/cm]	\bar{X} : 4.34 S: 0.57
Temp [°C]	\bar{X} : 23.7 S: 0.2
Date	19-Jan-2015
Time	15:15
Block	1/4

2. Read out averages on
reader screen

3 Logging function

1

"Home page" -
general functions

2

Multi measurement function

3

Logging function

4

Downloader program



1. Select logging function
2. Select Sensor
3. Set logging parameters
4. Download and store
 › from Sensor to Reader

A screenshot of the 'View Summary Data' screen on the device. It shows a table with columns for 'Type', 'Annotation', and 'Records'.

Type	Annotation	Records
Multi		1
Log	NE140586smode	480
Log	NE140548kmode	480
Log	NE140586_st	453
Log	NE140548_st	452
Log	NE140548_cr2	119

Note: 5 days logging of data will take
about 6 minutes to download.

4 Downloader program

1

"Home page" -
general functions

2

Multi measurement function

3

Logging function

4

Downloader program

Download of files

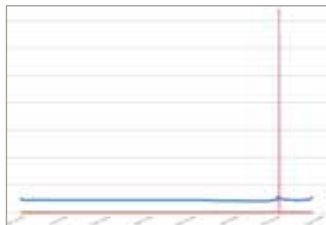


1. Connect Reader to
 computer
2. Select download
3. Select where to save
 your computer



Results in Excel

1. Multi measurement file



ID	Date/Time	WC	EC	Temp	Block	Average	St. Dev.	Min.	Max	
24	15-Jan-15 15:15	63.1%	3.42	23.6	Block 1	N Volumetric Water Content	62.6%	6.0%	52.9%	68.4%
25	15-Jan-15 15:17	69.4%	3.51	23.7	Block 1	Electrical Conductivity	4.94	0.80	3.42	5.38
26	15-Jan-15 15:18	63.9%	4.42	23.7	Block 1	Temperature	23.7	0.0	23.6	23.7
27	15-Jan-15 15:19	63.3%	3.95	23.7	Block 1					
28	15-Jan-15 15:20	52.9%	5.38	23.7	Block 1					
29	15-Jan-15 15:20	52.9%	5.38	23.7	Block 1					
30	15-Jan-15 15:22	67.3%	4.58	23.6	Block 2	N Volumetric Water Content	62.1%	6.4%	53.8%	72.1%
31	15-Jan-15 15:23	55.4%	3.95	23.8	Block 2	Electrical Conductivity	4.16	0.56	3.14	4.94
32	15-Jan-15 15:25	60.4%	4.29	23.8	Block 2	Temperature	23.8	0.1	23.5	23.8
33	15-Jan-15 15:26	53.8%	3.14	23.7	Block 2					
34	15-Jan-15 15:26	72.1%	4.94	23.8	Block 2					
35	15-Jan-15 15:27	63.6%	4.06	23.8	Block 2					
36	15-Jan-15 15:28	57.4%	3.98	23.8	Block 3	N Volumetric Water Content	48.7%	13.8%	28.9%	61.0%
37	15-Jan-15 15:28	61.9%	4.70	23.8	Block 3	Electrical Conductivity	4.51	0.62	3.98	5.09
38	15-Jan-15 15:29	45.3%	4.75	23.7	Block 3	Temperature	23.7	0.1	23.6	23.8
39	15-Jan-15 15:29	39.7%	4.76	23.7	Block 3					

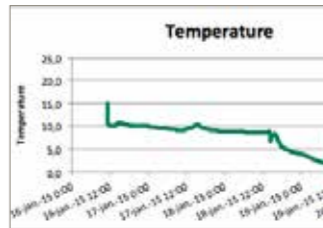
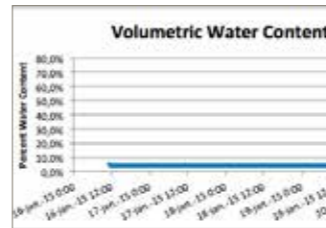
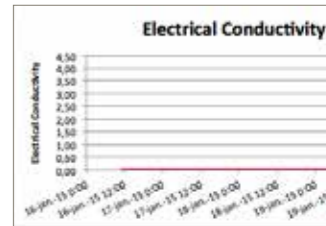
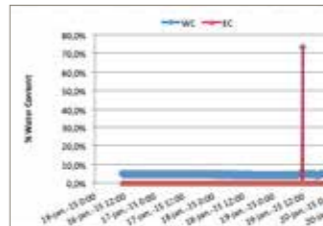
Sensor Information	
Serial Number	NE130329
Firmware Version	200
Battery	86%
Reader Information	
Serial Number	
Firmware Version	GR 2.03.124
Hardware Version	0
Battery	93%

ID	Date/Time	WC	EC	Temp
0	16-Jan-15 11:09	5.3%	0.00	15.0
1	16-Jan-15 11:12	4.6%	0.00	12.3
2	16-Jan-15 11:15	4.6%	0.00	11.2
3	16-Jan-15 11:18	4.6%	0.00	10.9
4	16-Jan-15 11:21	4.6%	0.00	10.7
5	16-Jan-15 11:24	4.6%	0.00	10.6
6	16-Jan-15 11:27	4.6%	0.00	10.5
7	16-Jan-15 11:30	4.6%	0.00	10.5
8	16-Jan-15 11:33	4.6%	0.00	10.4
9	16-Jan-15 11:36	4.6%	0.00	10.4
10	16-Jan-15 11:39	4.6%	0.00	10.3
11	16-Jan-15 11:42	4.6%	0.00	10.3
12	16-Jan-15 11:45	4.6%	0.00	10.2

Block	Average	St. Dev.	Min.	Max.
Block 2	62.1%	6.4%	53.8%	72.1%
Block 3	48.7%	13.8%	28.9%	61.0%
Block 4	55.1%	5.7%	49.2%	62.7%
Test Summary				
Start Time	15 Jan 2015 15:09			
Stop Time	19 Jan 2015 15:29			
Records	24			
Slab Type	CONCRETE MASTER 1 YEAR			
Slab Height	75 mm			
Slab Length	1001 mm TC 1999 mm			
Interval	30s			
ID	0			

2. Logging file

NE130329		
Measurement	Min	Max
% Water Content	4.1%	72.4%
Electrical Conductivity	0.00	4.18
Temperature	1.9	23.1
Test Summary		
Start Time	15 Jan 2015 15:09	
Stop Time	19 Jan 2015 20:57	
Records	1637	
Slab Type	CONCRETE MASTER 1 YEAR	
Slab Height	75 mm	
Slab Length	1001 mm TC 1999 mm	
Interval	30s	
ID	0	



Update soft & hardware



1. Update Sensor firmware
 - › Sensor type
2. Update Reader firmware
3. Update Reader software

Trouble shooting – Attention points

- Sensors have to be updated to FW version 2.0 or higher
 - Sensors that have a lower FW version than 2 cannot be used for multi measurements or logging
 - You can also update Sensor manually with the Downloader program (see sheet 5)
 - connect the Reader to the computer
 - go to actions › update Sensor firmware › click on it › push test button on the Sensor
 - when the Sensor is updated, you have to set the Sensor mode click on actions › set Sensor mode choose "system mode" for growers with full systems, choose "kitt mode" for HandHeld systems.

- If growers don't have excel on their computer, they cannot read the excel files the downloader creates. You can download the "excel reader program" on the Microsoft page to read out the excel files.

Reader Problems: several items indicate when a reader is blocked in functioning:

- Red light on the sensor and I cannot take a new measurement
- No measurements on the reader but "---"
- In multi measurements I have to push the test button to get a new reading

This means that the function of measurement is interrupted.

If you have to restart the Reader:

- push and hold the "on-button" until the screen turns grey/black
 - › the Reader will restart and should function optimally again.