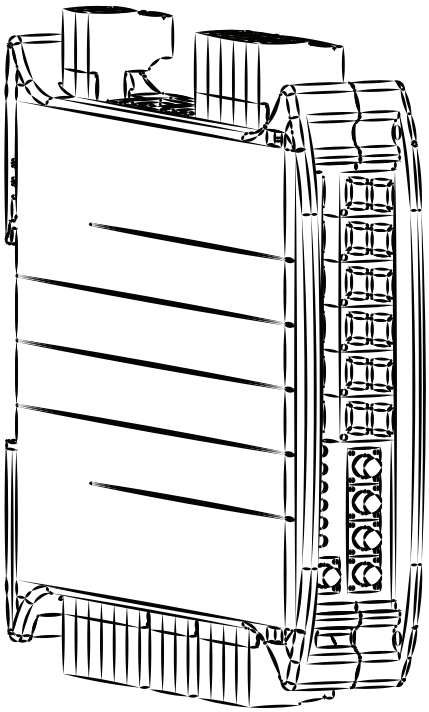
DINI ARGEO
Scales - Weighing systems

DGT1S / DGT1SAN

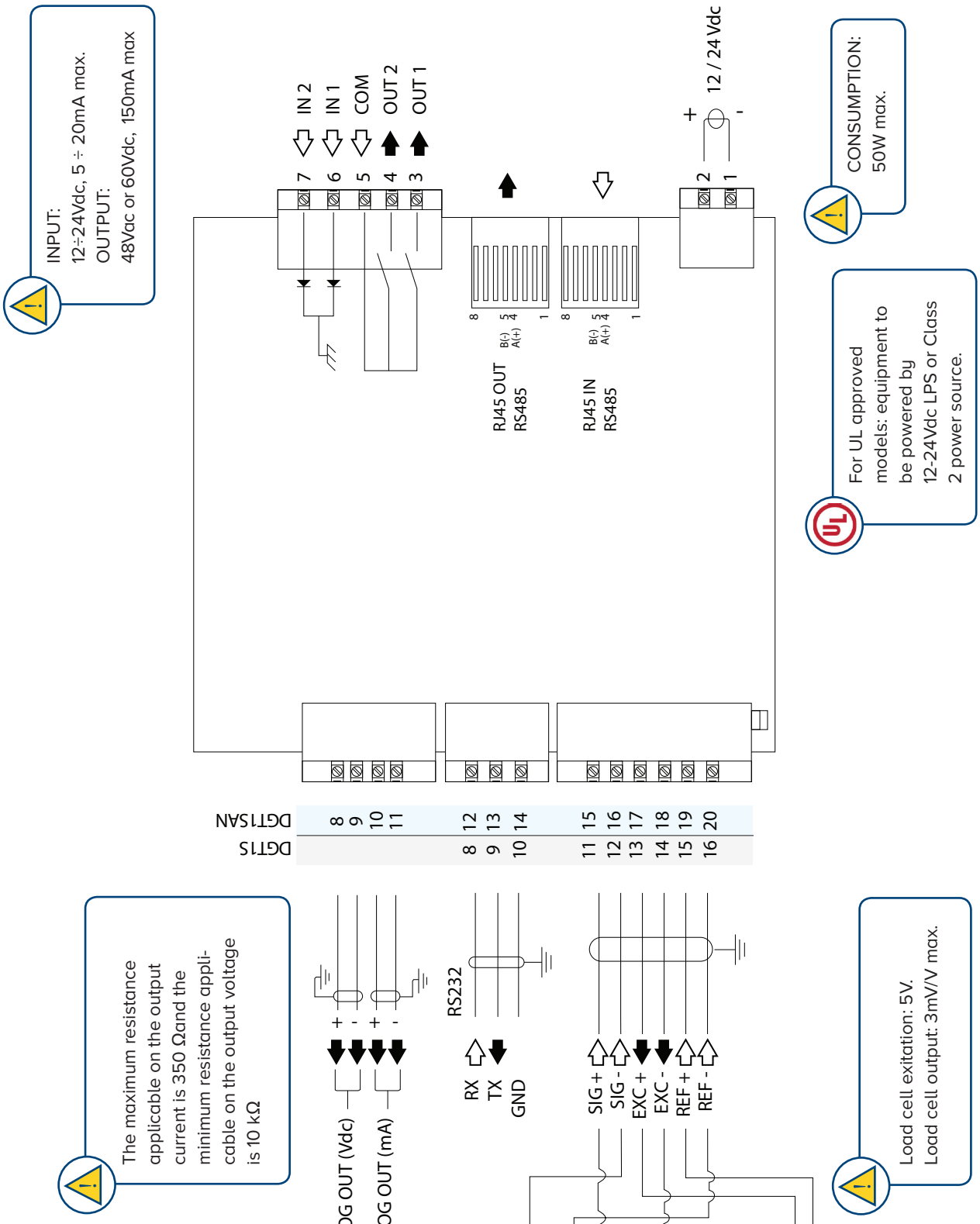
QUICK START GUIDE
for DGT1Sxx with firmware version from 08.00.00

ENGLISH



www.diniargeo.com

1. Electrical scheme

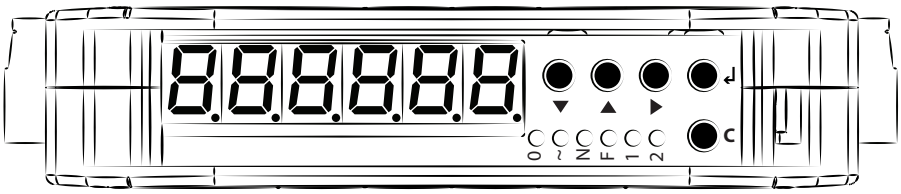


2. Check the firmware version

1. Reboot the weight transmitter: the xx.yy number shown is the firmware version. 08.00

This guide is only for DGT1Sxx with firmware version from 08.00.

3. Key function in setup mode



▼	Decreases digit / Scroll down
▲	Increases digit / Scroll up
▶	Enter the setup Selects digit to modify
↵	Enters a step / Confirms
C	Clears / Exits a step (no save)

4. Configuration menu

1. Reboot the weight transmitter

2. Press the ▶ key when display shows the 888888 message:

888888 ▶ d iU.dEC ▼ CAPAC — Scale configuration (see section 4)

CEL.CAP ▼ CEL.SEn ▼ dEAd.Ld — Theoretical calibration (see section 5)

0.CAL ib — Zeroing of the deal load (pre-tare zeroing)

ZEro — Zero adjustment (see section 6)

SPAn — Span adjustment (see section 7)

AdC.uU — Load cell diagnostic (see section 8)

An.out ↵ ModE ▼ Ao Min ▼ Ao ZEr ▼ Ao MAX — Calibration of analog output (see section 9)

inPutS ↵ inP. 01 ▼ inP. 02 — Digital input configuration (see section 10)

outPut ↵ out. 01 ▼ out. 02 — Digital output configuration (see section 11)

FLdbuS — Fieldbus configuration (see section 12)

485 ↵ SEt.Add ▼ bAud — RS485 port configuration (see section 13)

CLoCK — Date and time setting (with optional card only)

5. Maximum scale capacity and increment setting

888888 ▶ d iU.dEC — Set the decimal point position and the minimum scale increment*1
(0.001 - 0.002 - 0.005 - 0.01 - 0.02 - 0.05 - 0.1 - 0.2 - 0.5 - 1 - 2 - 5 - 10 - 20 - 50)
▼ CAPAC — Set the maximum scale capacity*2 *(max 999999)*

Examples:

For a 60000kg scale, with 2kg increment:
d iU.dEC = 2
CAPAC = 60000

For a 10000 g scale, with 0,1g increment:
d iU.dEC = 0.1
CAPAC = 10000.0

For a 3000kg scale, with 0,05kg increment:
d iU.dEC = 0.05
CAPAC = 3000.00

*1 *Increment = the amount that the scale will increment by as weight is added or removed.*
*2 *Maximum capacity = the maximum weight that can be measured using the scale you are creating.*

6. Theoretical calibration

888888 ▶ ...
▼ CEL.CAP — Set the total load cells capacity *(up to 999999)*
▼ CEL.SEn — Set the load cells mV/V average *(up to 99.99999)*
▼ dEAd.Ld — Dead load weight *(from -9999.9 to 99999.9)*

1. Set d iU.dEC and CAPAC (see section 4)

2. Set in CEL.CAP the total load cells capacity *(sum of the nominal load cell capacities)*

3. Set in CEL.SEn the load cell mV/V average value:

$$\frac{LC1\ mV/V + LC2\ mV/V + LC3\ mV/V + LC4\ mV/V}{4}$$

4. Enter in dEAd.Ld step. The display shows the theoretical dead load value. Modify the value and/or confirm with ↵.

5. Save calibration (Press **C** key many times until SAVEP message will appear, then press ↵ to confirm)

7. Zeroing of the dead load (pre-tare zeroing)

888888 ▶ ...
▼ 0.CAL ib — Zeroing of the deal load (pre-tare zeroing)

This functionality allows to zero the weigh of the scale structure (e.g.: empty silo, empty vessel, etc.) shifting the scale adjustment points.

8. Zero adjustment

888888 ▶ ...
▼ ZEro — Zero adjustment

1. Unload the scale

2. Enter the ZEro step to adjust the zero point

3. Save adjustment (Press **C** key many times until SAVEP message will appear, then press ↵ to confirm)

9. Span adjustment (with sample weight)

888888 ▶ ...

▼

SPAn Span adjustment

1. Load the scale with span weight

2. Enter the SPAn step, type the span weight value and press ↵ to adjust

3. Save adjustment (Press **C** key many times until SAVEP message will appear, then press ↵ to confirm)

10. Diagnostic of the load cell mV/V

888888 ▶ ...

▼

AdC.mUU It allows to verify signal of the load cell. It should be included into the range 0 to 3 mV/V. Signal have to be stable and it have to increase by increasing the weight on the scale.

11. Analog output adjustment

888888 ▶ ...

▼

An.out ↵ modE ↵ Ao G Analog output proportional to gross weight

▼

Ao n Analog output proportional to net weight

Ao Min Analog output value when the weight is in underload or overload

▼

Ao ZEr

▼

Ao MAX Analog output value when the weight is equal to the full scale capacity

11.1 Adjustment procedure

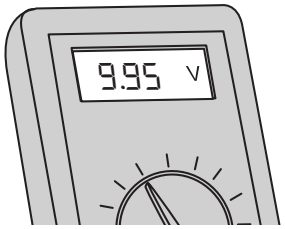
1. Connect a multimeter to pin 8 (+) and 9 (-) for the voltage analog output or 10 (+) and 11 (-) for the current analog output.

2. Follow the procedure:

A. Enter the parameter you want to adjust (Ao MAX, Ao ZE, Ao Min) and set a rough value:

Voltage output	Current output
62650 = ~ 10V	58600 = ~ 20mA
12000 = ~ 0V	12700 = ~ 4mA
0 = ~ -2V	0 = ~ 0mA

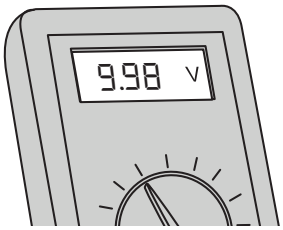
B. Press ↵ to update the analog output value



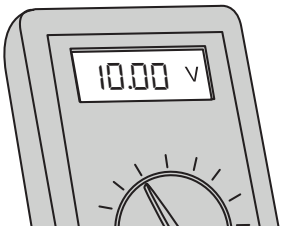
C. Increase or reduce the value to optimize the analog output value

Example:
increase Ao MAX from 62650 to 62750

D. Press ↵ to update the analog output value

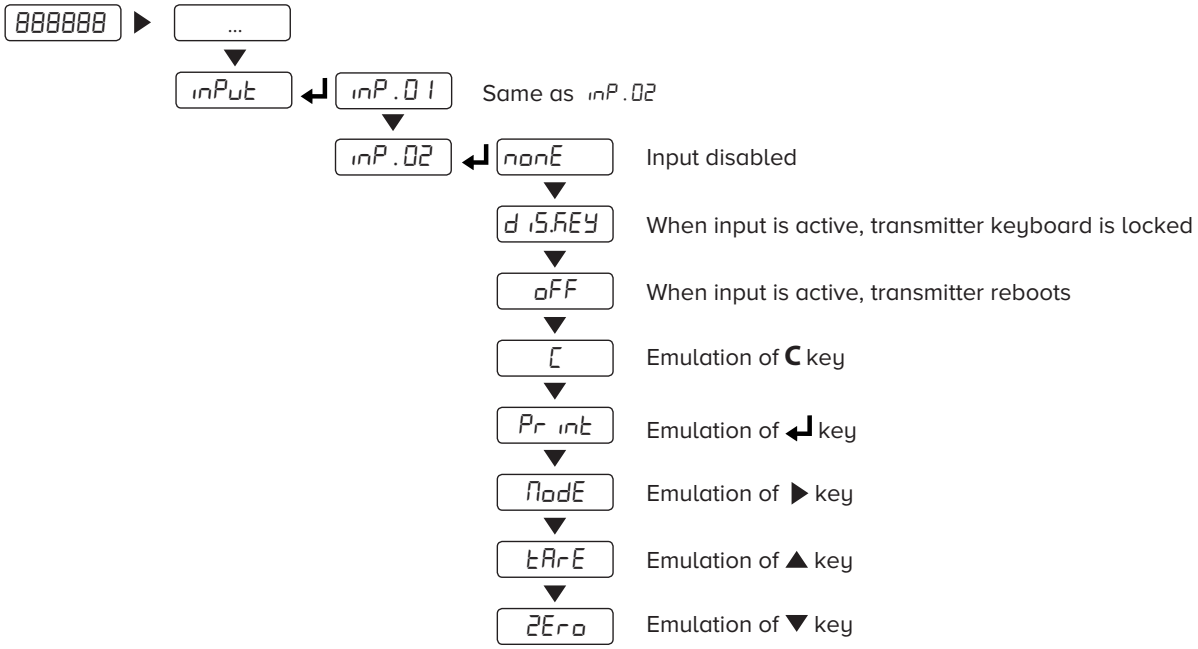


E. Repeat the operation from point “D” until you obtain the correct value, then press ↵ to store

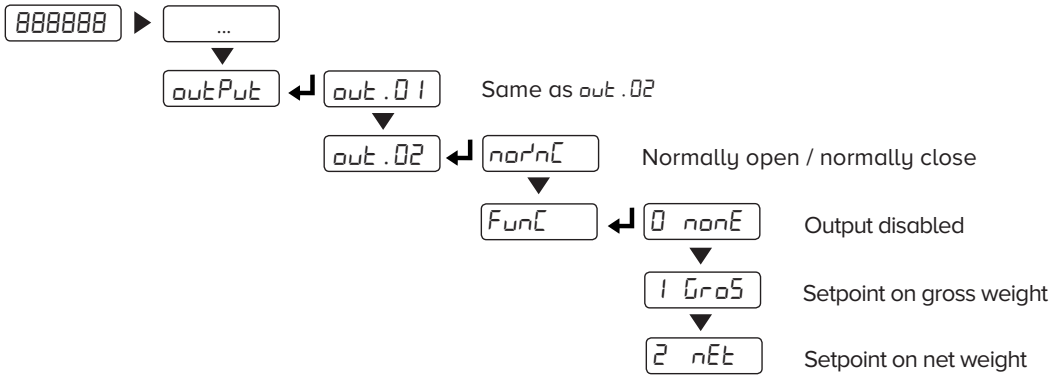


F. Save setting (Press **C** key many times until SAVEP message will appear, then press ↵ to confirm)

12. Input setting



13. Output setting



13.1 How to program setpoints

1. In weighing mode, press ↵ for 3 second

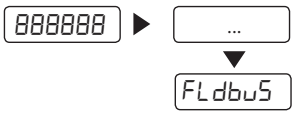
2. Select the setpoint to modify:

- 5.1 on ↵ Set the output 1 setpoint value
- 5.2 on ↵ Set the output 2 setpoint value

3. Press **C** key to store and exit the menu

Please refer to the complete technical manual for more information

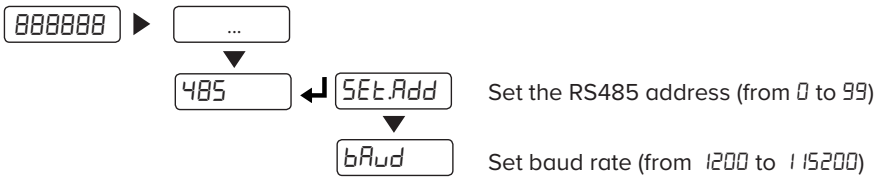
14. Fieldbus setting



Please refer to the fieldbus quick start guide for configuration

15. RS485 port setting

Take note: standard configuration protocol is Modbus RTU.



16. RS232 port for service configuration

RS232 port can be used for programming service only.
This port is active only in configuration menu and it is standard configured as 9600 baud, n-8-1.
Configuration can be made by using the PC utility “DiniTools”.

17. Programming errors

MESSAGE	DESCRIPTION	SOLUTION
PrEC.	Calibration error	First calibrate the zero point, then proceed with the next points.
Err.Pnt	Calibration error	Check the connection of the load cell. Check that the cell signal is stable, valid and greater than that of the previously acquired point.
Er 11	Calibration error	Increase the calibration weight.
Er 12	Calibration error	Check that the signal coming from the cell increases upon the increasing of the weight loaded on the scale. When acquiring the calibration points, use the increasing calibration weights.
Er 37	Calibration error	Repeat the calibration, checking that the capacity and division have been correctly set.
Er 39	Instrument not configured	Transmitter needs to be configurated.
C.Er.36	Calibration error	Check that the signal coming from the load cell is not negative.
C.Er.37	Calibration error	Check that the signal coming from the load cell is not negative.
Err.Not	Weight unstable	Check in AdC.nUU parameter that the signal is stable. If the connection of the cells is with 4 wires, check that the sense jumpers are inserted.

18. Modbus protocol - holding registers (read/write area)

<table>
<tr><th>Data</th><th>Reg. Nr.</th><th>Byte</th><th>DESCRIPTION</th><th>EXAMPLE</th></tr>
<tr><td>Command</td><td>40001</td><td>1 (MSB)
2 (LSB)</td><td>Set the command to send to the weight transmitter:
<table>
<tr><th>1(MSB)</th><th>2(LSB)</th><th></th></tr>
<tr><td>00 Hex</td><td>00 Hex</td><td>No command</td></tr>
<tr><td>00 Hex</td><td>01 Hex</td><td>Scale zeroing</td></tr>
<tr><td>00 Hex</td><td>02 Hex</td><td>Tare</td></tr>
<tr><td>00 Hex</td><td>03 Hex</td><td>Preset Tare</td></tr>
<tr><td>00 Hex</td><td>19 Hex</td><td>Digital output setting</td></tr>
<tr><td>00 Hex</td><td>1F Hex</td><td>Store weigh in Alibi Memory</td></tr>
<tr><td>00 Hex</td><td>22 Hex</td><td>Reboot the weight transmitter</td></tr>
</table></td><td>For setting a preset tare of 1000 kg:
<table>
<tr><td>40001</td><td>1(MSB)</td><td>00 Hex</td></tr>
<tr><td></td><td>2(LSB)</td><td>03 Hex</td></tr>
<tr><td>40002</td><td>1(MSB)</td><td>00 Hex</td></tr>
<tr><td></td><td>2</td><td>00 Hex</td></tr>
<tr><td>40003</td><td>3</td><td>03 Hex</td></tr>
<tr><td></td><td>4(LSB)</td><td>E8 Hex</td></tr>
</table>
Take note:
to repeat the last command one shoult firt set the command register 40001 at the “No command” value (0000 Hex) and then repeat the command.</td></tr>
<tr><td>Command Parameter</td><td>40002
40003</td><td>1 (MSB)
2
3
4 (LSB)</td><td>Set the command parameter</td><td></td></tr>
<tr><td>Gross Weight Value</td><td>40101
40102</td><td>1 (MSB)
2
3
4 (LSB)</td><td>Gross weight value expressed with no decimal point (absolute value).
Example:
- the value 5,042 is read as 5042;
- the value 2,51 is read as 251.</td><td>
<table>
<tr><th></th><th></th><th colspan="4">Gross weight value examples</th></tr>
<tr><th></th><th></th><th>1000</th><th>6000</th><th>15000</th><th>350000</th></tr>
<tr><td>40101</td><td>1(MSB)</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td></tr>
<tr><td></td><td>2</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>05 Hex</td></tr>
<tr><td>40102</td><td>3</td><td>03 Hex</td><td>17 Hex</td><td>3A Hex</td><td>57 Hex</td></tr>
<tr><td></td><td>4(LSB)</td><td>E8 Hex</td><td>70 Hex</td><td>98 Hex</td><td>30 Hex</td></tr>
</table></td></tr>
<tr><td>Net Weight Value</td><td>40103
40104</td><td>1 (MSB)
2
3
4 (LSB)</td><td>Net weight value expressed with no decimal point (absolute value).
Example:
- the value 5,042 is read as 5042;
- the value 2,51 is read as 251.</td><td>
<table>
<tr><th></th><th></th><th colspan="4">Net weight value examples</th></tr>
<tr><th></th><th></th><th>1000</th><th>6000</th><th>15000</th><th>350000</th></tr>
<tr><td>40103</td><td>1(MSB)</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td></tr>
<tr><td></td><td>2</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>05 Hex</td></tr>
<tr><td>40104</td><td>3</td><td>03 Hex</td><td>17 Hex</td><td>3A Hex</td><td>57 Hex</td></tr>
<tr><td></td><td>4(LSB)</td><td>E8 Hex</td><td>70 Hex</td><td>98 Hex</td><td>30 Hex</td></tr>
</table></td></tr>
<tr><td>Tare Weight Value</td><td>40105
40106</td><td>1 (MSB)
2
3
4 (LSB)</td><td>Tare weight value expressed with no decimal point.
Example:
- the value 5,042 is read as 5042;
- the value 2,51 is read as 251.</td><td>
<table>
<tr><th></th><th></th><th colspan="4">Tare weight value examples</th></tr>
<tr><th></th><th></th><th>1000</th><th>6000</th><th>15000</th><th>350000</th></tr>
<tr><td>40105</td><td>1(MSB)</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td></tr>
<tr><td></td><td>2</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>05 Hex</td></tr>
<tr><td>40106</td><td>3</td><td>03 Hex</td><td>17 Hex</td><td>3A Hex</td><td>57 Hex</td></tr>
<tr><td></td><td>4(LSB)</td><td>E8 Hex</td><td>70 Hex</td><td>98 Hex</td><td>30 Hex</td></tr>
</table></td></tr>
<tr><td rowspan="2">Weight Status / Digital Input Status</td><td rowspan="2">40107</td><td>1 (MSB)</td><td>Bit 7(msb) No function
Bit 6 No function
Bit 5 No function
Bit 4 No function
Bit 3 No function
Bit 2 No function
Bit 1 Status of input n.2 (0= OFF; 1 = ON)
Bit 0 (lsb) Status of input n.1 (0= OFF; 1 = ON)</td><td>
<table>
<tr><th></th><th></th><th colspan="4">Input status</th></tr>
<tr><th></th><th></th><th>IN1 = OFF
IN2 = OFF</th><th>IN1 = ON
IN2 = OFF</th><th>IN1 = OFF
IN2 = ON</th><th>IN1 = ON
IN2 = ON</th></tr>
<tr><td>40107</td><td>1(MSB)</td><td>00 Hex</td><td>01 Hex</td><td>02 Hex</td><td>03 Hex</td></tr>
<tr><td></td><td>2(LSB)</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
</table></td></tr>
<tr><td>2 (LSB)</td><td>Bit 7(msb) 1 = Scale unloaded (gross weight = 0)
Bit 6 Tare PT (1= PT tare is active)
Bit 5 Tare (1 = Tare is active).
Bit 4 Overload condition (0= No; 1 = Overload)
Bit 3 Underload condition (0= No ; 1 = Underload)
Bit 2 Weight Stability (0= Unstable ; 1= Stable)
Bit 1 Gross Weight Polarity (0= “+” ; 1 = “-”)
Bit 0 (lsb) Net Weight Polarity (0= “+” ; 1 = “-”)</td><td>If BYTE 2 (LSB) of Reg. Nr. 30005 = 45 HEX:
<table>
<tr><th>Bit 7</th><th>Bit 6</th><th>Bit 5</th><th>Bit 4</th><th>Bit 3</th><th>Bit 2</th><th>Bit 1</th><th>Bit 0</th></tr>
<tr><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
</table>
Bit 0 = Net weight is negative
Bit 1 = Gross weight is positive
Bit 2 = Weight is stable
Bit 5/6 = A Preset Tare is in memory</td></tr>
</table>

Digital Output Status	40108	1 (MSB)	No Function	
		2 (LSB)	Bit 7 (msb) No function ... ... Bit 2 No function Bit 1 Digital output 2 status (0 = OFF; 1 = ON) Bit 0 (lsb) Digital output 1 status (0 = OFF; 1 = ON)	
Setpoint 1	40133	1 (MSB)	Set the activation threshold for digital output 1	
		2		
	40134	3		
		4 (LSB)		
Setpoint 2	40135	1 (MSB)	Set the activation threshold for digital output 2	
		2		
	40136	3		
		4 (LSB)		

		Output status			
		O1 = OFF O2 = OFF	O1 = ON O2 = OFF	O1 = OFF O2 = ON	O1 = ON O2 = ON
40108	1 (MSB)	-	-	-	-
	2 (LSB)	00 Hex	01 Hex	02 Hex	03 Hex

		Setpoint weight value examples			
		1000	6000	15000	350000
40133	1 (MSB)	00 Hex	00 Hex	00 Hex	00 Hex
	2	00 Hex	00 Hex	00 Hex	05 Hex
40134	3	03 Hex	17 Hex	3A Hex	57 Hex
	4 (LSB)	E8 Hex	70 Hex	98 Hex	30 Hex

		Setpoint weight value examples			
		1000	6000	15000	350000
40135	1 (MSB)	00 Hex	00 Hex	00 Hex	00 Hex
	2	00 Hex	00 Hex	00 Hex	05 Hex
40136	3	03 Hex	17 Hex	3A Hex	57 Hex
	4 (LSB)	E8 Hex	70 Hex	98 Hex	30 Hex

18.1 Communication examples

SCALE ZEROING COMMAND

Query:	Slave address	Active function	Register address	Register value	Error check
Hexadecimal Coded	01	06	0000	0001	480A
Binary Coded	00000001	00000110	0000000000000000	0000000000000001	0100100000001010

If the command will be correctly executed, the answer will be exactly the query string.

AUTOMATIC TARE COMMAND

Query:	Slave address	Active function	Register address	Register value	Error check
Hexadecimal Coded	01	06	0000	0002	080B
Binary Coded	00000001	00000110	0000000000000000	0000000000000010	0000100000001011

If the command will be correctly executed, the answer will be exactly the query string.

NET WEIGHT READING

Query:	Slave address	Active function	Address 1st register	Number of registers	Error check
Hexadecimal Coded	01	04	0002	0002	D00B
Binary Coded	00000001	00000100	0000000000000010	0000000000000010	1101000000001011

Response *(e.g. 500kg)*:	Slave address	Active function	Nr. bytes	Value 1st register	Value 2nd register	Error check
Hexadecimal Coded	01	04	04	0000	01F4	FB93
Binary Coded	00000001	00000100	00000100	0000000000000000	0000000111110100	1111101110010011

19. Modbus protocol - Input registers (read area)

<table>
<tr><th>Data</th><th>Reg. Nr.</th><th>Byte</th><th>DESCRIPTION</th><th>EXAMPLE</th></tr>
<tr><td rowspan="4">Gross Weight</td><td rowspan="2">30001</td><td>1 (MSB)</td><td rowspan="4">Gross weight value is expressed with no decimal point (absolute value).
Example:
- the value 3,055 is read as 3055;
- the value 3,01 is read as 301.</td><td rowspan="4"><table><tr><th colspan="2"></th><th colspan="4">Gross weight value examples</th></tr><tr><th colspan="2"></th><th>1000</th><th>6000</th><th>15000</th><th>350000</th></tr><tr><td rowspan="2">30001</td><td>1(MSB)</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td></tr><tr><td>2</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>05 Hex</td></tr><tr><td rowspan="2">30002</td><td>3</td><td>03 Hex</td><td>17 Hex</td><td>3A Hex</td><td>57 Hex</td></tr><tr><td>4(LSB)</td><td>E8 Hex</td><td>70 Hex</td><td>98 Hex</td><td>30 Hex</td></tr></table></td></tr>
<tr><td>2</td></tr>
<tr><td rowspan="2">30002</td><td>3</td></tr>
<tr><td>4 (LSB)</td></tr>
<tr><td rowspan="4">Net Weight</td><td rowspan="2">30003</td><td>1 (MSB)</td><td rowspan="4">Net weight value expressed with no decimal point (absolute value)

Example:
- the value 5,042 is read as 5042
- the value 2,51 is read as 251</td><td rowspan="4"><table><tr><th colspan="2"></th><th colspan="4">Net weight value examples</th></tr><tr><th colspan="2"></th><th>1000</th><th>6000</th><th>15000</th><th>350000</th></tr><tr><td rowspan="2">40103</td><td>1(MSB)</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td></tr><tr><td>2</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>05 Hex</td></tr><tr><td rowspan="2">40104</td><td>3</td><td>03 Hex</td><td>17 Hex</td><td>3A Hex</td><td>57 Hex</td></tr><tr><td>4(LSB)</td><td>E8 Hex</td><td>70 Hex</td><td>98 Hex</td><td>30 Hex</td></tr></table></td></tr>
<tr><td>2</td></tr>
<tr><td rowspan="2">30004</td><td>3</td></tr>
<tr><td>4 (LSB)</td></tr>
<tr><td rowspan="2">Weight Status / Digital Input Status</td><td rowspan="2">30005</td><td>1 (MSB)</td><td>Bit 7(msb) No function
Bit 6 No function
Bit 5 No function
Bit 4 No function
Bit 3 No function
Bit 2 No function
Bit 1 Status of input n.2 (0= OFF; 1 = ON)
Bit 0 (lsb) Status of input n.1 (0= OFF; 1 = ON)</td><td><table><tr><th colspan="2"></th><th colspan="4">Input status examples</th></tr><tr><th colspan="2"></th><th>IN1 = OFF
IN2 = OFF</th><th>IN1 = ON
IN2 = OFF</th><th>IN1 = OFF
IN2 = ON</th><th>IN1 = ON
IN2 = ON</th></tr><tr><td rowspan="2">30005</td><td>1(MSB)</td><td>00 Hex</td><td>01 Hex</td><td>02 Hex</td><td>03 Hex</td></tr><tr><td>2(LSB)</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table></td></tr>
<tr><td>2 (LSB)</td><td>Bit 7(msb) 1 = Scale unloaded (gross weight = 0)
Bit 6 Tare PT (1= PT tare is active)
Bit 5 Tare (1 = Tare is active)
Bit 4 Overload condition (0= No; 1 = Overload)
Bit 3 Underload condition (0= No ; 1 = Underload)
Bit 2 Weight Stability (0= Unstable ; 1= Stable)
Bit 1 Gross Weight Polarity (0= “+” ; 1 = “-”)
Bit 0 (lsb) Net Weight Polarity (0= “+” ; 1 = “-”)</td><td>If BYTE 2 (LSB) of Reg. Nr. 30005 = 45 HEX:<table><tr><th>Bit 7</th><th>Bit 6</th><th>Bit 5</th><th>Bit 4</th><th>Bit 3</th><th>Bit 2</th><th>Bit 1</th><th>Bit 0</th></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr></table>Bit 0 = Net weight is negative
Bit 1 = Gross weight is positive
Bit 2 = Weight is stable
Bit 5/6 = A Preset Tare is in memory</td></tr>
<tr><td rowspan="2">Command Status Register</td><td rowspan="2">30006</td><td>1 (MSB)</td><td>Last received command</td><td>See table in reg. nr. 40001 of the holding registers table</td></tr>
<tr><td>2 (LSB)</td><td>Bit 7(msb) Last command result
Bit 6 Last command result
Bit 5 Last command result
Bit 4 Last command result
Bit 3 Counting of processed command
Bit 2 Counting of processed command
Bit 1 Counting of processed command
Bit 0 (lsb) Counting of processed command</td><td>Bit 0 to Bit 3 are used as a counter of received command, from 0 (0000) to 15 (1111).
Bit 4 to Bit 7 are used to indicate the resul of the last received command:<table><tr><th>Bit 7</th><th>Bit 6</th><th>Bit 5</th><th>Bit 4</th><th>Result</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>Command OK</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>Incorrect command</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>Incorrect command data</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>Command not allowed</td></tr><tr><td>0</td><td>1</td><td>0</td><td>0</td><td>Inexistent command</td></tr></table></td></tr>
<tr><td rowspan="2">Output Status Register</td><td rowspan="2">30007</td><td>1 (MSB)</td><td>No Function</td><td rowspan="2"><table><tr><th colspan="2"></th><th colspan="4">Output status</th></tr><tr><th colspan="2"></th><th>O1 = OFF
O2 = OFF</th><th>O1 = ON
O2 = OFF</th><th>O1 = OFF
O2 = ON</th><th>O1 = ON
O2 = ON</th></tr><tr><td rowspan="2">30006</td><td>1(MSB)</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>2(LSB)</td><td>00 Hex</td><td>01 Hex</td><td>02 Hex</td><td>03 Hex</td></tr></table></td></tr>
<tr><td>2 (LSB)</td><td>Bit 7(msb) No function
... ...
Bit 2 No function
Bit 1 Digital output 2 status (0 = OFF; 1 = ON)
Bit 0(lsb) Digital output 1 status (0 = OFF; 1 = ON)</td></tr>
</table>

20. Modbus protocol - Calibration sequence

<table>
<tr><th>DESCRIPTION</th><th>EXAMPLE</th></tr>
<tr><td>1. Send command 0023 Hex</td><td>
<table>
<tr><td rowspan="2">40001</td><td>1(MSB)</td><td>00 Hex</td></tr>
<tr><td>2(LSB)</td><td>23 Hex</td></tr>
</table>
</td></tr>
<tr><td>2. Set the span adjustment weight in registers 40902 and 40903 (if different from the one used during the last calibration)</td><td>
<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="4">Weight value examples</th></tr>
<tr><th>1000</th><th>6000</th><th>15000</th><th>350000</th></tr>
<tr><td rowspan="2">40902</td><td>1(MSB)</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td></tr>
<tr><td>2</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>05 Hex</td></tr>
<tr><td rowspan="2">40903</td><td>3</td><td>03 Hex</td><td>17 Hex</td><td>3A Hex</td><td>57 Hex</td></tr>
<tr><td>4(LSB)</td><td>E8 Hex</td><td>70 Hex</td><td>98 Hex</td><td>30 Hex</td></tr>
</table>
</td></tr>
<tr><td>3. Zero capture: unload the scale and write the “ACQUISITION POINT” command (0025 Hex) into the command register (40001)
Set parameter “0” into parameter register (40002 / 40003)</td><td>
<table>
<tr><td rowspan="2">40001</td><td>1(MSB)</td><td>00 Hex</td></tr>
<tr><td>2(LSB)</td><td>25 Hex</td></tr>
<tr><td rowspan="2">40002</td><td>1(MSB)</td><td>00 Hex</td></tr>
<tr><td>2</td><td>00 Hex</td></tr>
<tr><td rowspan="2">40003</td><td>3</td><td>00 Hex</td></tr>
<tr><td>4(LSB)</td><td>00 Hex</td></tr>
</table>
</td></tr>
<tr><td>4. Read the calibration status into input register (30116)</td><td>
<table>
<tr><th colspan="2">30116</th><th></th></tr>
<tr><td>1(MSB)</td><td>2(LSB)</td><td></td></tr>
<tr><td>00 Hex</td><td>00 Hex</td><td>Calibration not started</td></tr>
<tr><td>00 Hex</td><td>01 Hex</td><td>Acquisition underway</td></tr>
<tr><td>00 Hex</td><td>02 Hex</td><td>Acquisition OK</td></tr>
<tr><td>00 Hex</td><td>03 Hex</td><td>Acquisition error</td></tr>
<tr><td>00 Hex</td><td>04 Hex</td><td>Calibration OK</td></tr>
<tr><td>00 Hex</td><td>05 Hex</td><td>Calibration error</td></tr>
</table>
</td></tr>
<tr><td colspan="2">5. If acquisition is OK proceed with step 6. Otherwise check the load cell mV: they have to be stable.</td></tr>
<tr><td>6. Span capture: load the scale with span weight and write the acquisition command (0025 Hex) into the command register (40001)
Set parameter “1” into parameter register (40002 / 40003)</td><td>
<table>
<tr><td rowspan="2">40001</td><td>1(MSB)</td><td>00 Hex</td></tr>
<tr><td>2(LSB)</td><td>25 Hex</td></tr>
<tr><td rowspan="2">40002</td><td>1(MSB)</td><td>00 Hex</td></tr>
<tr><td>2</td><td>00 Hex</td></tr>
<tr><td rowspan="2">40003</td><td>3</td><td>00 Hex</td></tr>
<tr><td>4(LSB)</td><td>01 Hex</td></tr>
</table>
</td></tr>
<tr><td colspan="2">7. Read the calibration status into input register (see point 3)</td></tr>
<tr><td colspan="2">8. If acquisition is OK proceed with step 9. Otherwise check the load cell mV: they have to be stable and greater then zero point.</td></tr>
<tr><td>9. Store calibration using the write calibration command (0024 Hex)</td><td>
<table>
<tr><td rowspan="2">40001</td><td>1(MSB)</td><td>00 Hex</td></tr>
<tr><td>2(LSB)</td><td>24 Hex</td></tr>
</table>
</td></tr>
<tr><td>10. Wait for calibration OK status in register 30116</td><td>
<table>
<tr><th colspan="2">30116</th><th></th></tr>
<tr><td>1(MSB)</td><td>2(LSB)</td><td></td></tr>
<tr><td>00 Hex</td><td>04 Hex</td><td>Calibration OK</td></tr>
</table>
</td></tr>
<tr><td colspan="2">NOTES:
• While write calibration command is in progress, some Modbus reading timeout may happen because of the saving procedure
• To abort the calibration underway use 0026 Hex command in register 40001</td></tr>
</table>

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TECH_MAN_ENG_DGT1S_QSG
Rev. 25.09.2018