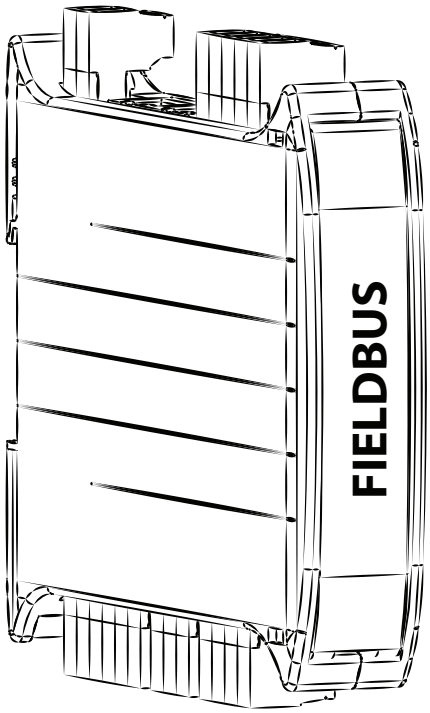
DINI ARGEO
Scales - Weighing systems

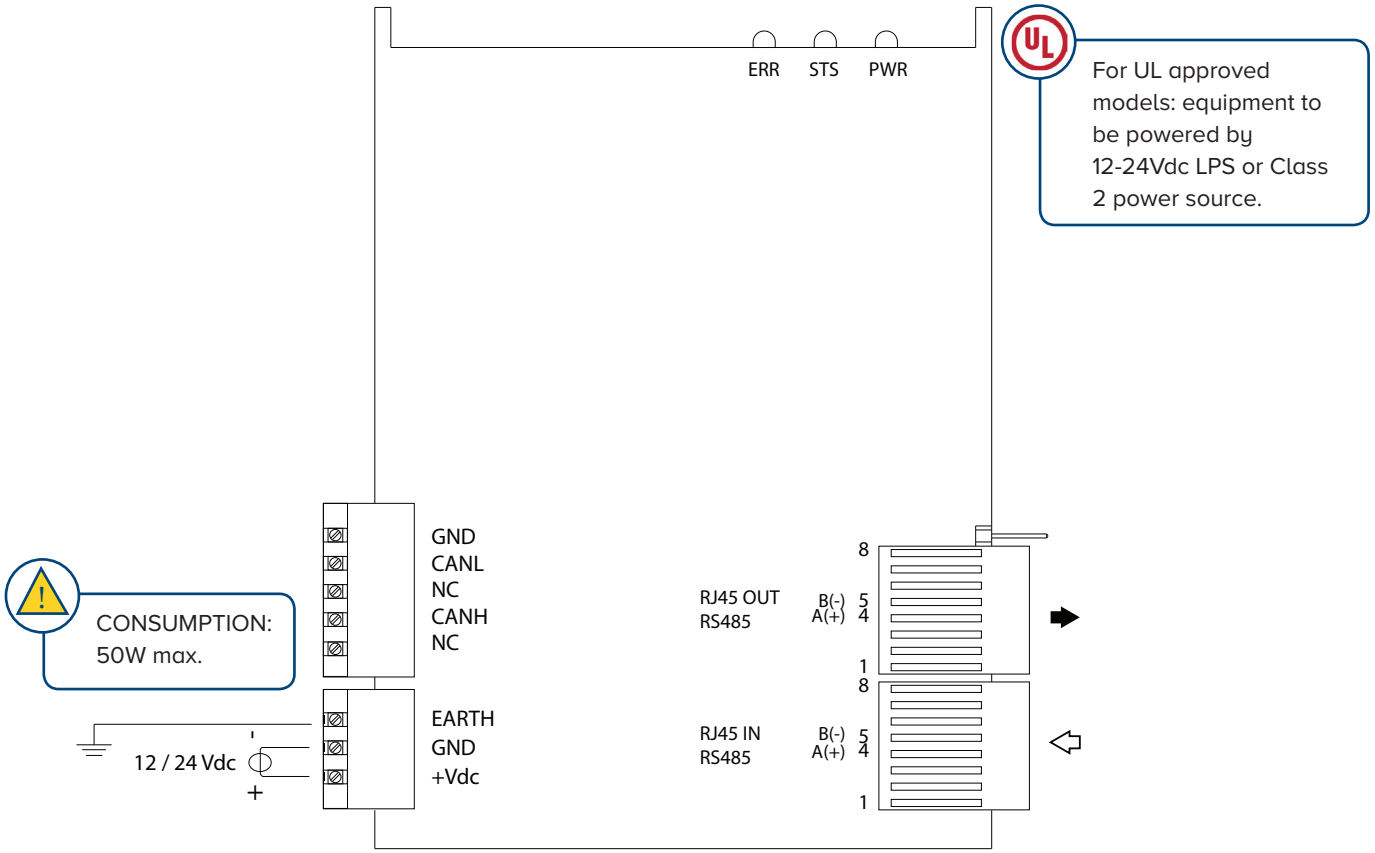
CANOPEN1S

QUICK START GUIDE
for DGT1Sxx with firmware version from 08.00.00

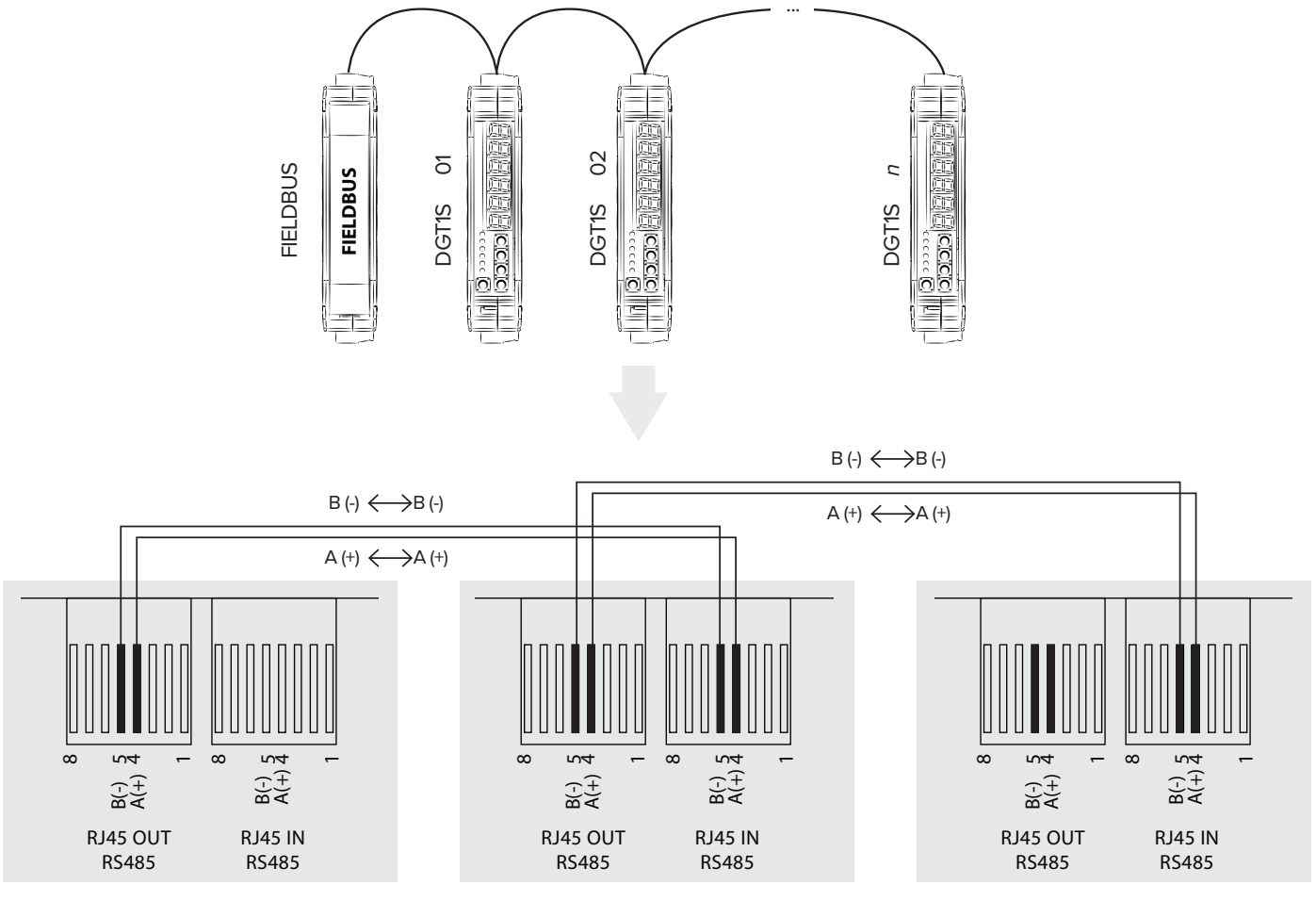
ENGLISH



1. Electrical scheme

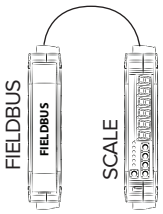


2. Canopen module connection to DGT1Sxx transmitter (through RS485 RJ45 port)

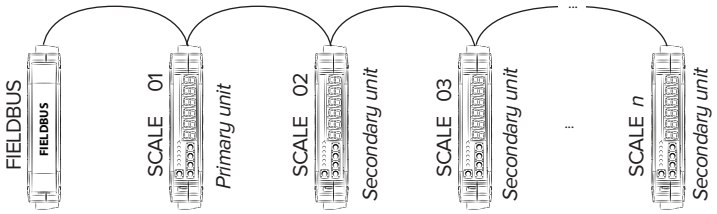


3. Canopen function mode: SINGLE SCALE or HUB MODE

Function 1: Single scale mode



Function 2: Hub mode



Single scale mode configuration

	Scale
hub	no
nod.Add	001
bAud.r	1 Mb

Hub mode configuration

Primary	Scale 01
hub	YES
Pr iNAr	YES
nod.Add	001
bAud.r	1 Mb

Secondary	Scale 02	Scale 03	Scale *n*
hub	YES	YES	YES
Pr iNAr	no	no	no
SCA.Add	2	3	n

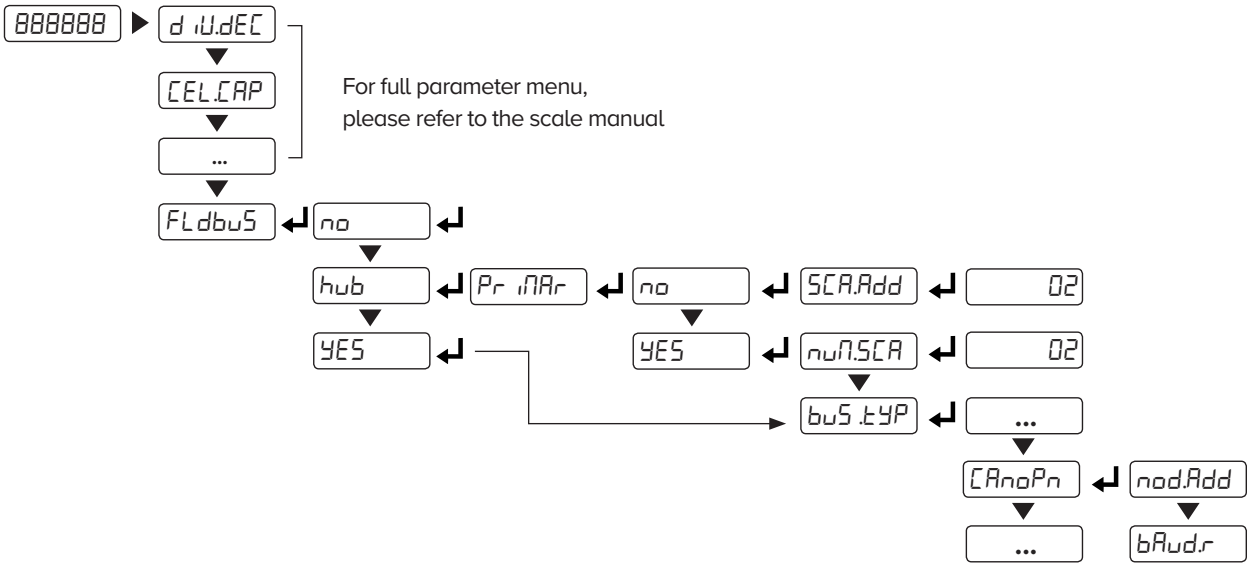
In hub mode, primary unit (scale 01) needs the configuration of all the parameters, secondary units need the configuration of a few parameters only

4. Canopen configuration (trough weight transmitter menu)

Configuration has to be made by the weight transmitter setup:

1. Reboot the weight transmitter

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



5. Canopen parameters description

hub Enable the HUB mode.

Pr iNAr In HUB mode, it identifies the "primary scale" of the network, on which all Canopen parameters are set.
Take note: if FLdbuS = "YES" or "hub", RS485 baud rate is automatically set to 115200 and scale address = 01.

nod.Add Set the node address of the module.

bAud.r Select the baud rate from 10 Kb/s to 1 Mb/s.

6. Canopen Input data area (for data reading) - SINGLE SCALE mode

<table>
<tr><th>Data</th><th>Byte</th><th>DESCRIPTION</th><th>EXAMPLE</th></tr>
<tr><td rowspan="4">Gross weight</td><td>1 (MSB)</td><td rowspan="4">Bytes 1, 2, 3 and 4 contain the Gross Weight value</td><td rowspan="4"><table><tr><th></th><th colspan="4">Gross weight value examples</th></tr><tr><th></th><th>1000</th><th>6000</th><th>15000</th><th>350000</th></tr><tr><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>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>3</td></tr>
<tr><td>4 (LSB)</td></tr>
<tr><td rowspan="4">Net weight</td><td>5 (MSB)</td><td rowspan="4">Bytes 5, 6, 7 and 8 contain the Net Weight value</td><td rowspan="4"><table><tr><th></th><th colspan="4">Net weight value examples</th></tr><tr><th></th><th>1000</th><th>6000</th><th>15000</th><th>350000</th></tr><tr><td>5(MSB)</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td></tr><tr><td>6</td><td>00 Hex</td><td>00 Hex</td><td>00 Hex</td><td>05 Hex</td></tr><tr><td>7</td><td>03 Hex</td><td>17 Hex</td><td>3A Hex</td><td>57 Hex</td></tr><tr><td>8(LSB)</td><td>E8 Hex</td><td>70 Hex</td><td>98 Hex</td><td>30 Hex</td></tr></table></td></tr>
<tr><td>6</td></tr>
<tr><td>7</td></tr>
<tr><td>8 (LSB)</td></tr>
<tr><td rowspan="2">Input Status</td><td>9 (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 rowspan="2"><table><tr><th></th><th colspan="4">Input status</th></tr><tr><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>9(MSB)</td><td>00 Hex</td><td>01 Hex</td><td>02 Hex</td><td>03 Hex</td></tr><tr><td>10(LSB)</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table></td></tr>
<tr><td>10 (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 10 (LSB) = 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>-</td><td>11 (MSB)</td><td colspan="2">Last received command</td><td>See table in reg. nr. 40001 of the holding registers table</td></tr>
<tr><td>Command Status Register</td><td>12 (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 commands
Bit 2 Counting of processed commands
Bit 1 Counting of processed commands
Bit 0 (lsb) Counting of processed commands</td><td>Bit 0 to Bit 3 are used as a counter of received commands, 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>-</td><td>13 (MSB)</td><td colspan="2">No Function</td><td rowspan="2"><table><tr><th></th><th colspan="4">Output status</th></tr><tr><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>13(MSB)</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>14(LSB)</td><td>00 Hex</td><td>01 Hex</td><td>02 Hex</td><td>03 Hex</td></tr></table></td></tr>
<tr><td>Output status register</td><td>14 (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>
<tr><td rowspan="3">-</td><td>15</td><td rowspan="3">-</td><td rowspan="3">-</td></tr>
<tr><td>...</td></tr>
<tr><td>32</td></tr>
</table>

** Please refer to the complete manual for the full list of available data*

7. Canopen Input data area (for data reading) - HUB mode

<table>
<tr><th>DATA*</th><th>⚖ 1</th><th>⚖ 2</th><th>⚖ 3</th><th>⚖ 4</th><th>⚖ ...</th><th>⚖ 16</th><th>DESCRIPTION / EXAMPLE</th></tr>
<tr><td>In/Out status</td><td>1</td><td>9</td><td>17</td><td>25</td><td>...</td><td>121</td><td>
<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>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
</table>
Bit 7 Scale present bit (Fixed value = 1)
Bit 6/5 Progressive command loop counter;
Values: 0 (00), 1 (01), 2 (10), 3 (11).
Bit 4 Last command result (0 = OK; 1 = ERROR)
Bit 3 Status of output n.2 (0 = OFF; 1 = ON)
Bit 2 Status of output n.1 (0 = OFF; 1 = ON)
Bit 1 Status of input n.2 (0= OFF; 1 = ON)
Bit 0 Status of input n.1 (0= OFF; 1 = ON)
EXAMPLE:
If Byte 1 = 13 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>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td></tr>
</table>
Bit 0 = Input 1 is ON
Bit 2 = Output 1 is ON
Bit 3 = Output 2 is ON
</td></tr>
<tr><td rowspan="3">Gross weight</td><td>2 (MSB)</td><td>10 (MSB)</td><td>18 (MSB)</td><td>26 (MSB)</td><td>...</td><td>122 (MSB)</td><td rowspan="3">For each scale there are three bytes containing the Gross Weight value
<table>
<tr><th>⚖ 1</th><th>3000 kg</th></tr>
<tr><td>2(MSB)</td><td>00 Hex</td></tr>
<tr><td>3</td><td>0B Hex</td></tr>
<tr><td>4(LSB)</td><td>B8 Hex</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>11</td><td>19</td><td>27</td><td>...</td><td>123</td></tr>
<tr><td>4 (LSB)</td><td>12 (LSB)</td><td>20 (LSB)</td><td>28 (LSB)</td><td>...</td><td>124 (LSB)</td></tr>
<tr><td>Scale status</td><td>5</td><td>13</td><td>21</td><td>29</td><td>...</td><td>125</td><td>
<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>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
</table>
Bit 7 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 Net Weight Polarity (0= “+” ; 1 = “-”)
EXAMPLE:
If BYTE 5 = 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="3">Net Weight</td><td>6 (MSB)</td><td>14 (MSB)</td><td>22 (MSB)</td><td>30 (MSB)</td><td>...</td><td>126 (MSB)</td><td rowspan="3">For each scale there are three bytes contain the Net Weight value
<table>
<tr><th>⚖ 3</th><th>1000 kg</th></tr>
<tr><td>22(MSB)</td><td>00 Hex</td></tr>
<tr><td>23</td><td>03 Hex</td></tr>
<tr><td>24(LSB)</td><td>E8 Hex</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>15</td><td>23</td><td>31</td><td>...</td><td>127</td></tr>
<tr><td>8 (LSB)</td><td>16 (LSB)</td><td>24 (LSB)</td><td>32 (LSB)</td><td>...</td><td>128 (LSB)</td></tr>
</table>

8. Canopen output data area (for sending commands)

<table>
<tr><th>Command</th><th>Byte</th><th>Description</th><th>Example</th></tr>
<tr><td>Transmitter ID</td><td>1</td><td>It allows to select the transmitter which receives the command:

<table><tr><th>Transmitter</th><th>Value</th></tr><tr><td>Transmitter 01</td><td>01 Hex</td></tr><tr><td>Transmitter 02</td><td>02 Hex</td></tr><tr><td>Transmitter 03</td><td>03 Hex</td></tr><tr><td>...</td><td>... Hex</td></tr><tr><td>Transmitter 16</td><td>10 Hex</td></tr></table>
Take note:
transmitter ID has to be set for each command.</td><td>For zeroing the weight of transmitter number 4:

<table><tr><th>Byte</th><th>Value</th></tr><tr><td>1</td><td>04 Hex</td></tr><tr><td>2</td><td>01 Hex</td></tr></table></td></tr>
<tr><td>Command</td><td>2</td><td>Main available commands:

<table><tr><th>Value</th><th>Command</th></tr><tr><td>00 Hex</td><td>No command</td></tr><tr><td>01 Hex</td><td>Scale zeroing</td></tr><tr><td>02 Hex</td><td>Tare</td></tr><tr><td>03 Hex</td><td>Preset Tare</td></tr><tr><td>0A Hex</td><td>Setpoint 1 setting</td></tr><tr><td>0B Hex</td><td>Setpoint 2 setting</td></tr><tr><td>19 Hex</td><td>Digital output setting</td></tr><tr><td>22 Hex</td><td>Reboot the weight transmitter</td></tr><tr><td>23 Hex</td><td>Read the calibration data</td></tr><tr><td>24 Hex</td><td>Write the calibration data</td></tr><tr><td>25 Hex</td><td>Calibration point acquisition</td></tr><tr><td>26 Hex</td><td>Abort the calibration procedure</td></tr><tr><td>28 Hex</td><td>Lock keyboard (parameter 1 = 0);
Unlock keyboard (parameter 1 = 1)</td></tr></table>
Take note:
to repeat the last command one shoult firt set the command at the “No command” value (0000 Hex) and then repeat the command.

Please refer to the complete manual for more information.</td><td>EXAMPLE 1
For setting a preset tare of 1000 kg, one should:

1. Set the transmitter address in byte 1
2. Set the command in byte 2
3. Set the tare value in parameter 1 (byte 3, 4, 5, 6)

<table><tr><th>Byte</th><th>Value</th></tr><tr><td>1</td><td>01 Hex</td></tr><tr><td>2</td><td>03 Hex</td></tr><tr><td>3(MSB)</td><td>00 Hex</td></tr><tr><td>4</td><td>00 Hex</td></tr><tr><td>5</td><td>03 Hex</td></tr><tr><td>6(LSB)</td><td>E8 Hex</td></tr></table>
EXAMPLE 2
For setting the setpoint n. 1 of the scale n. 2, one should:

1. Set the transmitter address in byte 1
2. Set the command in byte 2
3. Set the setpoint value in parameter 1 (byte 3, 4, 5, 6)

<table><tr><th>Byte</th><th>Value</th></tr><tr><td>1</td><td>01 Hex</td></tr><tr><td>2</td><td>03 Hex</td></tr><tr><td>3(MSB)</td><td>00 Hex</td></tr><tr><td>4</td><td>00 Hex</td></tr><tr><td>5</td><td>03 Hex</td></tr><tr><td>6(LSB)</td><td>E8 Hex</td></tr></table></td></tr>
<tr><td rowspan="4">Parameter 1</td><td>3(MSB)</td><td rowspan="4">First parameter of the command.
Parameter is always expressed in absolute mode (no decimals, no sign).</td><td rowspan="5"></td></tr>
<tr><td>4</td></tr>
<tr><td>5</td></tr>
<tr><td>6(LSB)</td></tr>
<tr><td rowspan="4">Parameter 2</td><td>7(MSB)</td><td rowspan="4">Second parameter of the command.
Parameter is always expressed in absolute mode (no decimals, no sign).</td></tr>
<tr><td>8</td></tr>
<tr><td>9</td></tr>
<tr><td>10(LSB)</td></tr>
<tr><td rowspan="3">-</td><td>11</td><td rowspan="3">-</td><td rowspan="3">-</td></tr>
<tr><td>...</td></tr>
<tr><td>32</td></tr>
</table>

** Please refer to the complete manual for the full list of available data*

9. Calibration procedure

DESCRIPTION

1. Send command 23 Hex to the transmitter you want to adjust (transmitter ID has to be specified in byte 1)

Byte	Value	Description
1	03 Hex	Transmitter n. 3
2	23 Hex	Command

2. Select the 5001 page for calibration using the CHANGE PAGE command (1D Hex)

Byte	Value	Description
1	03 Hex	Transmitter n. 3
2	1D Hex	Change page
$3_{(MSB)}$	00 Hex	5001 (1389 Hex)
4	00 Hex	
5	13 Hex	
$6_{(LSB)}$	89 Hex	

3. Set the span adjustment weight on page 5001, from byte 19 to 22 (if different from the one used during the last calibration)

	Weight value examples			
	1000	6000	15000	350000
$19_{(MSB)}$	00 Hex	00 Hex	00 Hex	00 Hex
20	00 Hex	00 Hex	00 Hex	05 Hex
21	03 Hex	17 Hex	3A Hex	57 Hex
$22_{(LSB)}$	E8 Hex	70 Hex	98 Hex	30 Hex

4. Send “WRITE CALIBRATION” command (24 Hex), with:
parameter 1 = 5001 (1389 Hex).

See example of point 2., but byte 2=24 Hex (Write Calibration).

5. Zero capture: unload the scale and write the “ACQUISITION POINT” command (25 Hex), with parameter 1 = “0”.

Byte	Value	Description
1	03 Hex	Transmitter n. 3
2	25 Hex	Acquisition point
$3_{(MSB)}$	00 Hex	Zero point acquisition
4	00 Hex	
5	00 Hex	
$6_{(LSB)}$	00 Hex	

6. Read the calibration status into page 5001 (byte 30, 31)

If acquisition is OK, then proceed with step 7; otherwise check the load cell mV/V (they have to be stable) and repeat point 5.

$30_{(MSB)}$	$31_{(LSB)}$	
00 Hex	00 Hex	Calibration not started
00 Hex	01 Hex	Acquisition underway
00 Hex	02 Hex	Acquisition OK
00 Hex	03 Hex	Acquisition error
00 Hex	04 Hex	Calibration OK
00 Hex	05 Hex	Calibration error

7. Span capture: load the scale with span weight and write the “ACQUISITION POINT” command (25 Hex), with parameter 1 = “1”.

If acquisition is OK (see step 6), then proceed with step 8; otherwise check the load cell mV/V (they have to be stable and greater then zero point) and repeat point 7.

Byte	Value	Description
1	03 Hex	Transmitter n. 3
2	25 Hex	Acquisition point
$3_{(MSB)}$	00 Hex	Span acquisition
4	00 Hex	
5	00 Hex	
$6_{(LSB)}$	01 Hex	

8. Store calibration using the “WRITE CALIBRATION” command (24 Hex), with parameter 1 = “0”

Byte	Value	Description
1	03 Hex	Transmitter n. 3
2	24 Hex	Write calibration
$3_{(MSB)}$	00 Hex	Store calibration
4	00 Hex	
5	00 Hex	
$6_{(LSB)}$	00 Hex	

10. Canopen messages

Message	Meaning
FbuS_Er	No connection received from module Hub after 30 second since system start
F.r.HH.yy	Firmware version of the module hub
F_b_Conn	Start the communication between hub module and scale
F_b_oK	Communication on fieldbus network configurated and running
F_b_Err+code	Error state, see table error codes
F.buS.in	Fieldbus initialization

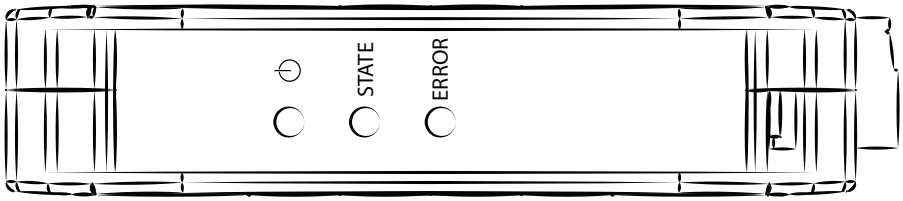
Table error code:

Code	Meaning
1000	Fatal error in hub module
1001	Inconsistency between protocol type selected and the one managed by the Hub module, e.g. Hub type Canopen module with Profinet protocol selected on DGT1
1-18	Other fatal error in Hub module
000001 and the following	Unrecoverable error module Hub

Some error of network:

Code	Meaning
000140	General network error
000141	Connection closed
000142	Time-out connection
000143	Isolated network
000144	Duplicated node
000145	Network cable disconnected

11. Annunciators



	When it flickers: fieldbus module initialization. When turned on: fieldbus module is ready.
STATE	This LED indicates the RS485 communication state between fieldbus module and weight transmitter: When turned on: initialization of the communication. When it flickers: fieldbus module is correctly comunicating. When it flickers slowly: fieldbus module is tring to communicate with the weight transmitter (no communication).
ERROR	When turned off: communication OK. When turned on or it flickers: no communication with the fieldbus master; check the cable connection, protocol and the PLC configuration.

i All leds turn on during the fieldbus module start-up, allowing you to check their correct functioning.

Notes

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Scales - Weighing systems

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TECH_MAN_ENG_CANOPEN_QSG
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