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SCT-2200 Fieldbus Module

Profibus, PROFINET, EtherCAT, DeviceNet, CANopen, Ethernet/IP, Modbus TCP/IP

Technical Manual



RICE LAKE WEIGHING SYSTEMS

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1.0 Introduction

The SCT Fieldbus module gathers data from all connected SCT scale modules and translates information to the fieldbus network protocols as listed:

- CANopen
- EtherCAT®
- PROFINET®
- Ethernet/IP™
- DeviceNet®
- PROFIBUS®
- Modbus TCP/IP®

Manuals and additional resources are available from Rice Lake Weighing Systems at www.ricelake.com/manuals

Warranty information can be found on the website at www.ricelake.com/warranties

1.1 Safety

Safety Signal Definitions:

DANGER *Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.*

WARNING *Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.*

CAUTION *Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.*

IMPORTANT *Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.*

General Safety

Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.

WARNING

Failure to heed could result in serious injury or death.

Electric shock hazard!

The units have no power switch, to completely remove power from the units, disconnect the power source.

Always disconnect from main power before performing any work on the device.

Do not allow minors (children) or inexperienced persons to operate this unit.

Do not operate without all shields and guards in place.

Do not use for purposes other then weighing applications.

Do not place fingers into slots or possible pinch points.

Do not use this product if any of the components are cracked.

Do not make alterations or modifications to the unit.

Do not remove or obscure warning labels.

Do not use near water, avoid contact with excessive moisture.

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1.2 Technical Data

- Power supply: 12 to 24 VDC LPS or with Class 2 Power Supply
- Maximum current draw: 250 mA (with 12 VDC power supply)
- HUB configuration: check up to 16 weighing scales simultaneously
- RS-485 communication: opto isolated against electric or electrostatic discharges
- Addressing:

CANopen:	up to 127 different addresses (1 to 127)
EtherCAT:	automatic addressing (not settable)
PROFINET Ethernet/IP Modbus TCP/IP:	uses addressing through IPv4
DeviceNet:	up to 64 different addresses (from 0 to 63 through MAC address)
PROFIBUS:	up to 99 different addresses (from 0 to 98)

- Baud rate:

CANopen:	10 Kbit/s to 1 Mbit/s
EtherCAT:	9600 bit/s to 115200 bit/s
PROFINET Ethernet/IP Modbus TCP/IP:	depends on the network speed (up to 100 Mbit/s)
DeviceNet:	9600 bit/s to 115200 bit/s
PROFIBUS:	9600 bit/s to 12 Mbit/s

1.3 FCC Compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescites dans le Règlement sur le brouillage radioélectrique edicté par le ministère des Communications du Canada.

1.3.1 Radio certificate number:

Bluetooth:

- US: PVH0946
- Canada: 5325A-0946

WiFi:

- US: ZXVHLK-RM04

Note ***WiFi module not certified for use in Canada.***

2.0 Setup

Each SCT scale module comes with two parallel RS-485 ports with RJ45 connectors. The ports are used to connect the SCT scale modules with the corresponding port on the fieldbus module. SCT scale modules can be connected in line (up to 16 weighing scales) by connecting each SCT scale module to the next one and the first SCT scale module to the fieldbus module. This creates a network that can be managed by one or more PCs.

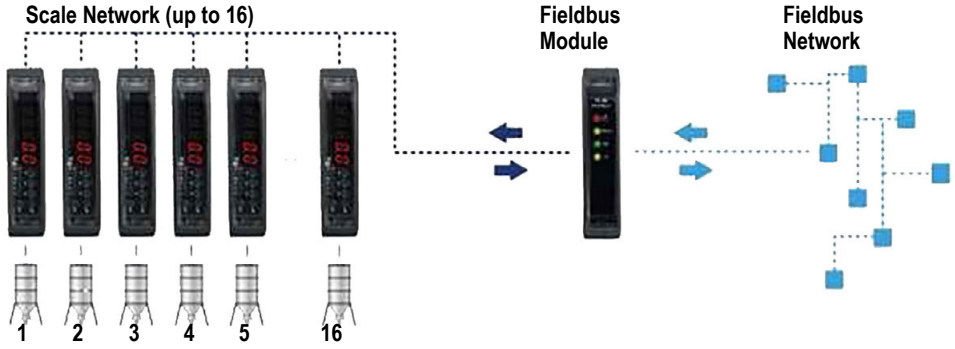


Figure 2-1. Scale Network Connection

The following table lists out required PC setup connections to a PC:

Device Protocol	Connector
CANopen	3 wires
EtherCAT	RJ45
PROFINET Ethernet/IP Modbus TCP/IP	RJ45
DeviceNet	5 wires (Two if there is a power supply
PROFIBUS	DB-9 female connector

Table 2-1. PC Connectors

2.1 Fieldbus Serial Communication Mode

2.1.1 Firmware Version 7.15 or earlier

To select the fieldbus communication protocol, follow the steps below:

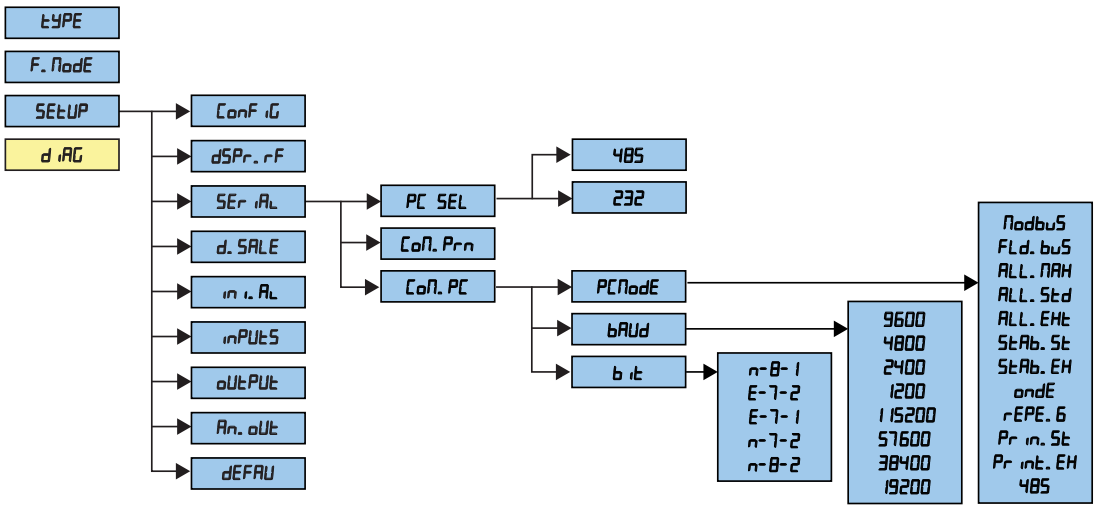


Figure 2-2. Serial Communication Menu

1. Reboot the SCT scale module.

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2. Press ▲ as the firmware version displays to enter Setup mode.
3. Navigate to display SEtuP. Press ↵.
4. Navigate to display SEr iALPress ↵.
5. Navigate to display Pc .SEL .Press ↵.
6. Navigate to display 485 .Press ↵.
7. Navigate to display CoM .PC. Press ↵. PCModE displays.
8. Press ↵.
9. Navigate to display FLdbuS.Press ↵.
10. Proceed to Section 2.1.3 on page 5

2.1.2 Firmware Version 8.04

The SCT scale module menu is used to configure the Fieldbus module.

1. Reboot the SCT scale module.
2. Press ▶ as the firmware version displays to access the quick setup menu:

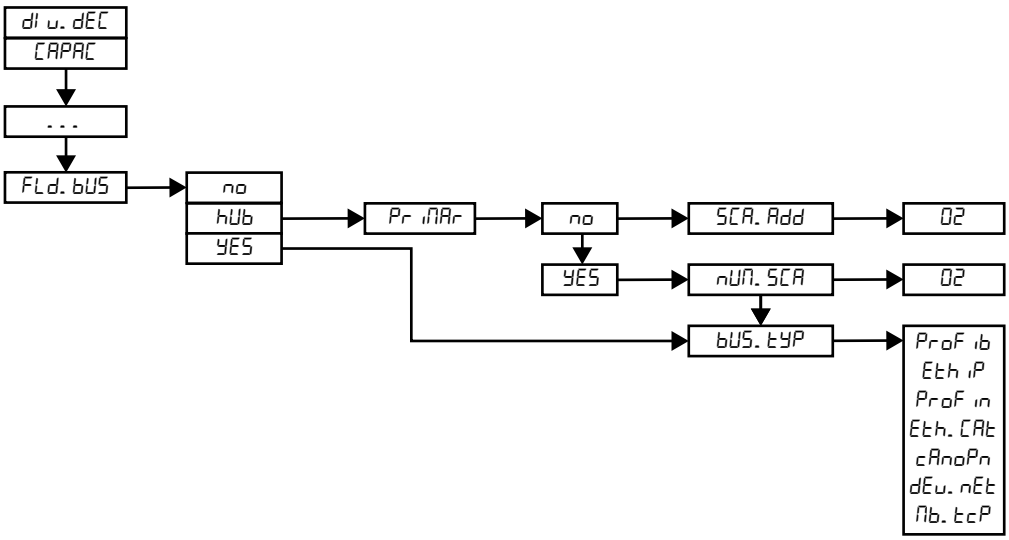


Figure 2-3. SCT-2200 Firmware Version 8.04 Quick Setup Menu

3. Press ▼ or ▲ until FLd .bu5 displays. Press ↵ to enter the menu.
   - Select no and Press ↵ to disable fieldbus module
   - Select hUb and Press ↵ to configure hub mode; Continue to Section 2.7 on page 15 to configure hub mode.
   - Select YES and Press ↵ to navigate bu5 .tYP without enabling hub mode.

Option	Description
no	No Fieldbus selected
hUb	Hub mode; menu prompts hub mode parameters
YES	One SCT module connected to Fieldbus; Fieldbus mode, but not hub mode

Table 2-2. Fieldbus menu options

2.1.3 SCT-2200 Fieldbus Hub Mode Configuration Settings

1. Navigate to FLdbuS.
   - For firmware version 7.15 or earlier, see Section 2.1.1 on page 3
   - For firmware version 8.04, see Section 2.1.2 on page 4
2. Select the type of fieldbus:
   - ProF ib - Profibus
   - Eth. iP - Ethernet/IP
   - ProF in - PROFINET
   - Eth .CAt - EtherCAT
   - CAnoPn - CANopen
   - dEU .nEt - DeviceNET
   - Mb .tcP - Modbus TCP/IP
3. Once the type of fieldbus is selected, enter the appropriate parameters (see Figure 2-4):
   - Profibus
     - nodE . id: sets the Profibus ID of the module
   - Ethernet/IP, PROFINET, Modbus TCP/IP:
     - Aut .cFG: auto IP configuration (no/yes)
     - iP .Add: sets the IP address
     - nEt .MSK: sets the net mask address
     - GAt .bAY: sets the default gateway

Note ***Set baud rate to 115200 for best performance***

   - CANopen:
     - nod .Add(1-127): sets the node address of the module
     - bAud .r: baud-rate, value: 1 MB, 800 kB, 500 kB, 250 kB, 125 kB, 100 kB, 50 kB, 20 kB, 10 kB
   - DeviceNET:
     - MAc . id (0-63): sets the MAC ID of the module
     - bAud .r: baud-rate, value: 500kB, 250kB, 125kB
4. Set the number of SCT scale modules (nuM .SCA) for the 485 sub-network managed by the primary hub device (1 to 16).
5. Set SCA .Add in secondary devices(visible if nuM .SCA is greater than 1): 485 address of the scale, if nuM .SCA is equal to 1 the 485 address is set equal to 1. See Section 2.7 on page 15 for hub mode parameters.

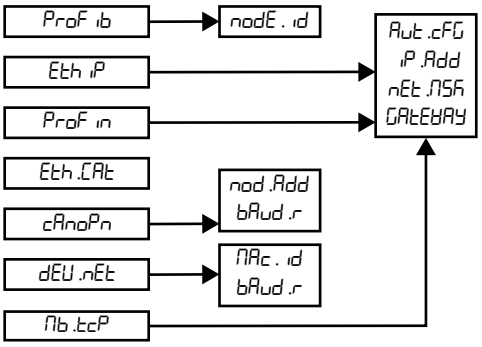


Figure 2-4. Filedbus Parameters

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2.2 Input and Output Data Areas

There are two data areas. An input area is read by the fieldbus module and the output area is written from the fieldbus module. All the numeric values have the big-endian format (the first byte is the most significant one).

2.2.1 Input Data Area

The input data area is read by the Fieldbus module and is made up of 16 registers, each of 2 bytes (32 bytes overall total).

SCT-2200			
Number Reg	**Input Registers**	**Bit**	**Number bytes**
0	Gross Weight Value	3	0
	Gross Weight Value	2	1
1	Gross Weight Value	1	2
	Gross Weight Value	0	3
2	Net Weight Value	3	4
	Net Weight Value	2	5
3	Net Weight Value	1	6
	Net Weight Value	0	7
4	Input Status Register	MSB	8
	Input Status Register	LSB	9
5	Command Status Register	MSB	10
	Command Status Register	LSB	11
6	Output Status Register	MSB	12
	Output Status Register	LSB	13
7	Last page number read or written	MSB	14
	Last page number read or written	LSB	15
8	1st set-up page word		16
			17
.....			
15	8th set-up page word		30
			31

Table 2-3. Input Data Area

GROSS WEIGHT and NET WEIGHT value format (0-3 registers) whole numbers value (no decimals).

Example:
if 3 decimals are set, the 3,000 value is read 3000
if 2 decimals are set, the 3,00 value is read 300

2.2.2 Input Register Status

Input register number 4 with two bytes is defined in Table 2-4.

Bit	Description	Bit Meaning	
LSB		**0**	**1**
0	Weight Polarity	+	--
1	Weight Stability	NO	YES
2	Under load Condition	NO	YES
3	Overload Condition	NO	YES
4	Gross weight zone	Out of Zone 0	In Zone 0
5-7	Not used	--	--
MSB			
8-15	Not used	--	--

Table 2-4. Input Status Register

2.2.3 Command Status

Input register number 5 is defined below:

High Byte → ***Last command received***

Low Byte:

low nibble → ***Counting of processed commands***

high nibble → ***Result of last command received***

In which ***Result of last command received*** can take on the following values:

OK = 0 – Correct command and carried out

ExceptionCommandWrong = 1 – wrong command

ExceptionCommandData = 2 – wrong data in the command

ExceptionCommandNotAllowed = 3 – not allowed command

ExceptionNoCommand = 4 – nonexistent command

2.2.4 Output Status Register

Output register number 6 is defined in Table 2-5:

Bit	Description	Bit Meaning	
LSB		**0**	**1**
0	Relay 1	Not Enabled	Enabled
1	Relay 2	Not Enabled	Enabled
2	Relay 3	Not Enabled	Enabled
3	Relay 4	Not Enabled	Enabled
4	Relay 5	Not Enabled	Enabled
5	Relay 6	Not Enabled	Enabled
6-7	Not used		
MSB			
8-15	Not used		

Table 2-5. Output Status Register

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2.3 Output Data

The output data area is written by the fieldbus module (is therefore read by the scale module) and is made up of 16 registers, each of 2 bytes (32 bytes total).

Number Byte	Modbus Address	Output Registers	Byte
0	40001	Command Register	MSB
1		Command Register	LSB
2	40002	Parameter 1	3
3		Parameter 1	2
4	40003	Parameter 1	1
5		Parameter 1	0
6	40004	Parameter 2	3
7		Parameter 2	2
8	40005	Parameter 2	1
9		Parameter 2	0
10	40006	*Not used*	--
11		*Not used*	--
12	40007	*Not used*	--
13		*Not used*	--
14	40008	*Not used*	--
15		*Not used*	--
16	40009	1st set-up page word	--
17			--
.....			
30	40016	8th set-up page word	--
31			--

Table 2-6. Output Data

2.3.1 Command Register

Output register 0 is the Command Register. It consists of two bytes and can take on the values, which correspond to the implimented commands described in Table 2-7 on page 9.

Implimenting a Command

A command is implimented when the contents of the Command Register varies from the contents of the last Command Register (therefore in order to repeat the last command, first set the Command Register to the ***NO COMMAND*** value and then to the ***COMMAND*** value).

The only exceptions are the ***READ_SETUP, WRITE_SETUP*** and ***CHANGE_PAGE*** commands, which are run if there is a change to Parameter 1 (page number to be read/written). Therefore:

To read various setup pages, set the ***READ_SETUP*** command. Enter the number of the first page to be read in Parameter 1, then change each instance of Parameter 1 to the new page number to be read.

To write various pages, set the ***WRITE_SETUP*** command. Enter the number of the first page to be written in Parameter 1. Enter the output data to be written in registers 8-15. The ***WRITE_SETUP*** command will implement each time the data of registers 8-15 or the page number in Parameter 1 has been changed.

Implemented Command	Command Register Value	Description
NO_COMMAND	0 (0000 Hex)	No command
ZERO_REQUEST	1 (0001 Hex)	Zero scale execution (*)
TARE_REQUEST	2 (0002 Hex)	Automatic tare execution (*)
TAREMAN_REQUEST	3 (0003 Hex)	Manual tare execution (*) (the value will be entered in Parameter 1 (2))
NET_SWITCH_REQUEST	4 (0004 Hex)	Display switch on the net weight **
GROSS_SWITCH_REQUEST	5 (0005 Hex)	Display switch on the gross weight **
CHANNEL_1_REQUEST	6 (0006 Hex)	Switching on Channel 1
CHANNEL_2_REQUEST	7 (0007 Hex)	Switching on Channel 2
CHANNEL_3_REQUEST	8 (0008 Hex)	Switching on Channel 3
CHANNEL_4_REQUEST	9 (0009 Hex)	Switching on Channel 4
WRITE_SETPOINT_1	10 (000A Hex)	Setpoint 1 (ON value in Param. 1; OFF value in Param. 2) See Section 2.3.2 on page 10
WRITE_SETPOINT_2	11 (000B Hex)	Setpoint 2 writing (ON value in Param. 1; OFF value in Param. 2) See Section 2.3.2 on page 10
WRITE_SETPOINT_3	12 (000A Hex)	Setpoint 3 writing (ON value in Param. 1; OFF value in Param. 2) See Section 2.3.2 on page 10
WRITE_SETPOINT_4	13 (000B Hex)	Setpoint 4 writing (ON value in Param. 1; OFF value in Param. 2) See Section 2.3.2 on page 10
WRITE_SETPOINT_5	14 (000A Hex)	Setpoint 5 writing (ON value in Param. 1; OFF value in Param. 2) See Section 2.3.2 on page 10
WRITE_SETPOINT_6	15 (000B Hex)	Setpoint 6 writing (ON value in Param. 1; OFF value in Param. 2) See Section 2.3.2 on page 10
SET_OUTPUT	25 (0019 Hex)	Setting the RELAY (4) See Section 2.3.3 on page 10
READ_SETUP	26 (001A Hex)	Setup page reading; See Section 2.4 on page 11
WRITE_SETUP	27 (001B Hex)	Setup page writing; See Section 2.4 on page 11
WRITE_FLASH	28 (001C Hex)	Saving the set-up in flash;
CHANGE_PAGE	29 (001D Hex)	Alibi page (5)
READ_ALIBI	30 (001E Hex)	Weigh reading on alibi (6); Section 2.3.5 on page 11
WRITE_ALIBI	31 (001F Hex)	Storage of weigh on alibi (5)
HOLD_PEAK_WEIGHT	32 (0020 Hex)	Block the weight on the display
UNLOCK_WEIGHT	33 (0021 Hex)	Allow unlock of weight on display after second ***Peak Hold Weight*** to see the effective weight
RESTART_INSTRUMENT	34 (0022 Hex)	Restart the instrument
READ_CALIBRATION	35 (0023 Hex)	Read data of calibration; See Section 2.5 on page 12
WRITE_CALIBRATION	36 (0024 hex)	Write data of calibration; See Section 2.5 on page 12
POINT_ACQUISITION	37 (0025 hex)	Acquisition calibration point
ABORT_CALIBRATION	38 (0026 Hex)	Cancellation procedure calibration
KEYBOARD_ENABLE	40 (0028 Hex)	Block keyboard (parameter 1 = 0) o unlock keyboard (parameter 1 = 1)
NUMBER_OF_PIECES	41 (0029 Hex)	Write number of pieces with parameter 1 that correspond with the number of pieces
APW_INPUT	42 (002° Hex)	Input during the state of insertion in APW from keyboard
APW_SET	43 (002B Hex)	Set the average piece weight; and the value is in parameter 1
SET_ZERO_TIMEOUT	44 (002C Hex)	Set the max time of execution of the zero function (parameter 1 = new value in seconds, max number of seconds is 127)
** Active functions only in NTGS mode (net/gross switch)		

Table 2-7. Command Register

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2.3.2 Value format of Parameter 1 and Parameter 2:

→ *For the MANUAL TARE (only Param1):*

→ *For SETPOINTS 1 and 2:*

Whole numbers (no decimals)

Example:
If 3 decimals are set, in order to enter the value 3,000 → enter 3000
If 2 decimals are set, in order to enter the value 3,00 → enter 300

2.3.3 Setting of the Relays

The status of the relays is settable using Parameter 1:

Parameter 1:

bit 0 → RELAY 1 in which bit 0 = 1 → RELAY 1 CLOSED; bit 0 = 0 → RELAY 1 OPEN

bit 1 → RELAY 2 in which bit 1 = 1 → RELAY 2 CLOSED; bit 1 = 0 → RELAY 2 OPEN

Value format of Parameter 1 and Parameter 2 for the RELAYS:

→ Bit configuration

When the setpoint is assigned to a relay, the command is ignored.

The writing of the setpoint values does not cause the automatic save to flash, but are set temporarily. In order to save these in flash, execute the ***WRITE_FLASH*** command.

2.3.4 Alibi Page

To go to the ALIBI page and set the value 1000 in Parameter 1.

With the writing command, fill the page with the values described in Table 2-8 then transmit the writing command.

Format of the Parameter 1 value:

Whole numbers (no decimals):

Input Data Area (Number Byte)	Modbus Address	Description	Byte
16	40009	Stored gross weight value (byte 3)	3
17		Stored gross weight value (byte 2)	2
18	40010	Stored gross weight value (byte 1)	1
19		Stored gross weight value (byte 0)	0
20	40011	Stored tare weight value (byte 3)	3
21		Stored tare weight value (byte 2)	2
22	40012	Stored tare weight value (byte 1)	1
23		Stored tare weight value (byte 0)	0
24	40013	ID: Weigh number	3
25		ID: Weigh number	2
26	40014	ID: Weigh number	1
27		ID: Weigh number	0
28	40015	Alibi status register	MSB
29		Alibi status register	LSB
30	40016	Not used	--
31		Not used	--

Table 2-8. Alibi Page (16 bytes)

Format Alibi Status Register Value

Two bytes are defined in Table 2-9:

Bit	Description
7-10	Number of rewritings (0 to 255)
10-8	Number of scale (1 to 4)
11	Type of tare; bit 11 = 1 manual tare; bit 1 = 0 null or semiautomatic tare
12-15	Not Used

Table 2-9. Alibi Status Register Value

2.3.5 Weigh Reading on Alibi

To read a weight stored in Alibi, set the rewriting number in Parameter 1 and the weight number (ID) in Parameter 2. The command automatically executes the change on the Alibi page. Format of the Parameter 1 and Parameter 2 values with whole numbers (no decimals).

2.4 Setup Area

The setup area is the one stored in flash (1024 bytes) and is made up of 64 pages (0-63). For an approved instrument, it is not possible to write the metric parameters which are between page 0 and the first half of page 38. It is possible to write only the data between the second half of page 38 and page 63. By writing one of the pages between 0 and 37 when the instrument is approved, the result of the command is ***ExceptionCommandNotAllowed***, by writing in the other one, the result is ***CommandOk***. Page 38 is not copied completely, only the second half.

Area Setup – Pages 5, 6, 14 and 15

Input/Output Data Area (Number Byte)	Modbus Address	Description	
--		Page 5	Page 6
16	40009		*Not Used*
17			Range 1 Channel 1 Division (LSB)
18	40010		Range 1 Channel 1 Division (MSB)
19			Range 2 Channel 1 Division (LSB)
20	40011		Range 2 Channel 1 Division (MSB)
21		Range 1 Channel 1 (LSB)	*Not Used*
22	40012	Range 1 Channel 1	*Not Used*
23		Range 1 Channel 1	Channel 1 Decimals
24	40013	Range 1 Channel 1 (MSB)	Channel 1 Unit of Measure *
25		Range 2 Channel 1 (LSB)	
26	40014	Range 2 Channel 1	
27		Range 2 Channel 1	
28	40015	Range 2 Channel 1 (MSB)	
29		*Not Used*	
30	40016	*Not Used*	
31		*Not Used*	

Table 2-10. Area Setup (16 bytes) Pages 5 and 6

***** Meaning of the numeric value in the Unit of Measure field.

0 → Grams; 1 → Kilograms; 2 → Tons; 3 → Pounds

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2.5 Calibration Sequence

The following tables contain read/write metrological calibration data:.

Input Data Area (Number Byte)	Modbus Address	Description	Byte
16	40009	Unit Of Measure	1
17		Unit Of Measure	0
18	40010	1st Range Division	1
19		1st Range Division	0
20	40011	2nd Range Division	1
21		2nd Range Division	0
22	40012	Decimal	1
23		Decimal	0
24	40013	1st Range Capacity	3
25		1st Range Capacity	2
26	40014	1st Range Capacity	1
27		1st Range Capacity	0
28	40015	2nd Range Capacity	
29		2nd Range Capacity	
30	40016	2nd Range Capacity	
31		2nd Range Capacity	

Table 2-11. Metrological Data, Page 5000 (16 byte)

Input Data Area (Number Byte)	Modbus Address	Description	Byte
16	40009	Calibration Point	1
17		Calibration Point	0
18	40010	1st Calibration Weight (MSB)	
19		1st Calibration Weight	
20	40011	1st Calibration Weight	
21		1st Calibration Weight (LSB)	
22	40012	2nd Calibration Weight (MSB)	
23		2nd Calibration Weight	
24	40013	2nd Calibration Weight	
25		2nd Calibration Weight (LSB)	
26	40014	3rd Calibration Weight (MSB)	
27		3rd Calibration Weight	
28	40015	3rd Calibration Weight	
29		3rd Calibration Weight (LSB)	
30	40016	Calibration Status	1
31		Calibration Status	0

Table 2-12. Page Content Weight Of Calibration, Page 5001 (16 byte)

Value	Denomination	Description
0	CALIBRATION_NOT_STARTED	Calibration not is in execution
1	CALIBRATION_ACQUISTION_UNDERWAY	Acquisition point calibration in progress
2	CALIBRATION_ACQUISTION_OK	Point calibration successfully acquired
3	CALIBRATION_ACQUISTION_ERROR	Error acquisition point calibration
4	CALIBRATION_OK	Calibration OK
5	CALIBRATION_ERROR	Error in Calibration

Table 2-13. Calibration Input from Scale Indicator - Bytes 30-31 from Table 2-12

Input Data Area (Number Byte)	Modbus Address	Description
16	40009	Zero calibration ADC value (MSB)
17		Zero calibration ADC value
18	40010	Zero calibration ADC value
19		Zero calibration ADC value (LSB)
20	40011	1st calibration point ADC value (MSB)
21		1st calibration point ADC value
22	40012	1st calibration point ADC value
23		1st calibration point ADC value (LSB)
24	40013	2nd calibration point ADC value (MSB)
25		2nd calibration point ADC value
26	40014	2nd calibration point ADC value
27		2nd calibration point ADC value (LSB)
28	40015	3rd calibration point ADC value (MSB)
29		3rd calibration point ADC value
30	40016	3rd calibration point ADC value
31		3rd calibration point ADC value (LSB)

Table 2-14. Calibration Point, Page 5002 (16 byte)

Number	Command	Note
35 (0023 Hex)	READ_CALIBRATION	Copy of calibration data of the channel equal to parameter 1 into temporary area (accessible via the pages 5000 to 5002)
36 (0024 Hex)	WRITE_CALIBRATION	Parameter 1 = 0 store of temporary data into calibration data (non-volatile memory) Parameter 1 = 5000 copy data output area values (byres 16 to 31)Into the temporary calibration area related to metrologic values Parameter 1 = 5001 copy data output area values (byres 16 to 31)Into the temporary calibration area related to calibration weights values Parameter 1 = 5002 copy data output area values (bytes 16 to 31) into the temporary calibration area related to calibration ADC values
37 (0025 Hex)	POINT_ACQUISITION	Parameter 1 is the point to acquire
38 (0026 Hex)	ABORT_CALIBRATION	Abort the calibration under way

Table 2-15. Calibration Commands

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2.5.1 Calibration Sequence

1. Set parameter 1 to the channel to calibrate.
2. Select ***READ_CALIBRATION***.
3. Insert the metrologic value on Page 5000 shown in Table 2-11 on page 12.
4. Select ***WRITE_CALIBRATION***. Parameter 1 can be equal to 5000, if changing divisions and capacity.
5. Set up calibration point on Page 5001, byte 16-17 show in Table 2-12 on page 12..
6. Set up the calibration weight value on page 5001. Calibration weight values on Page 5001 go from bytes 18-29.
7. Set parameter 1 to 5001 and select ***WRITE_CALIBRATION***.
8. If doing a theoretical calibration, insert the ADC values on Page 5002.
9. Set parameter 1 to 5002 and select ***WRITE_CALIBRATION***
   or
   set page 5001 to read the log calibration status (byte 30-31). Unload the platform. Set parameter 1 to 0 and select ***POINT_ACQUISITION***. ***CALIBRATION_ACQUISTION_OK displays.***
   If ***CALIBRATION_ACQUISTION_ERROR*** displays, repeat Step 9.
10. Load the platform with the first calibration weight.
11. Select ***POINT_ACQUISITION*** with parameter equal to 1. ***CALIBRATION_ACQUISTION_OK displays.***
    If ***CALIBRATION_ACQUISTION_ERROR*** displays, repeat Step 10**.**
12. Repeat Step 10 to calibrate multiple points (if any).
13. Select ***WRITE_CALIBRATION*** with parameter 1 equal to zero to store calibration. ***CALIBRATION_OK*** displays.
    If ***CALIBRATION_ERROR*** displays, repeat from Step 1**.**

2.6 Browser Calibration

PC browser weigh monitoring and calibration can be used to monitor weights, perform calibration or set setpoints. It can be used with multi-scales connected in hub mode or with a single scale. Browser weigh monitoring and calibration is only available on the Profinet, Ethernet/IP, and Modbus TCP/IP modules. The PC must be on the same network as the device.

Note

Calibration can take place while the SCT-2200 is in weigh mode

When Calibrating the scale on a multi-scale setup, the weight values returned to the PLC will be interrupted while calibration is performed

2.6.1 Calibrating Scale from Web Browser

1. Open a web browser in the PC.
2. Type the IP address of the scale module to be calibrated into the address field of the browser and press enter.
3. Enter Password: 41042
4. Press Enter. Weigh monitoring and calibration displays.

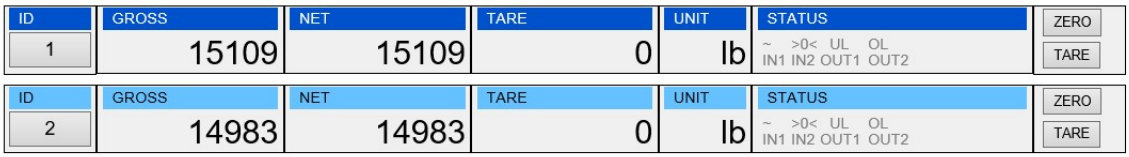


Figure 2-5. Weigh Monitoring

5. Select the ***ID number*** of scale to be calibrated.
6. Enter all calibration parameters in the ***Parameters*** dialog box.
7. Select the number of calibration points to be used in the ***Cal. Points*** dialog box.

8. Clear the weight from the scale.
9. Click ***Zero***.
10. Enter the weight value in the ***Point 1*** weight field.
11. Place weight on the scale and click ***Point 1***.
12. Repeat steps 8-11 for each calibration point.
13. Click ***Write Parameters*** to perform calibration.

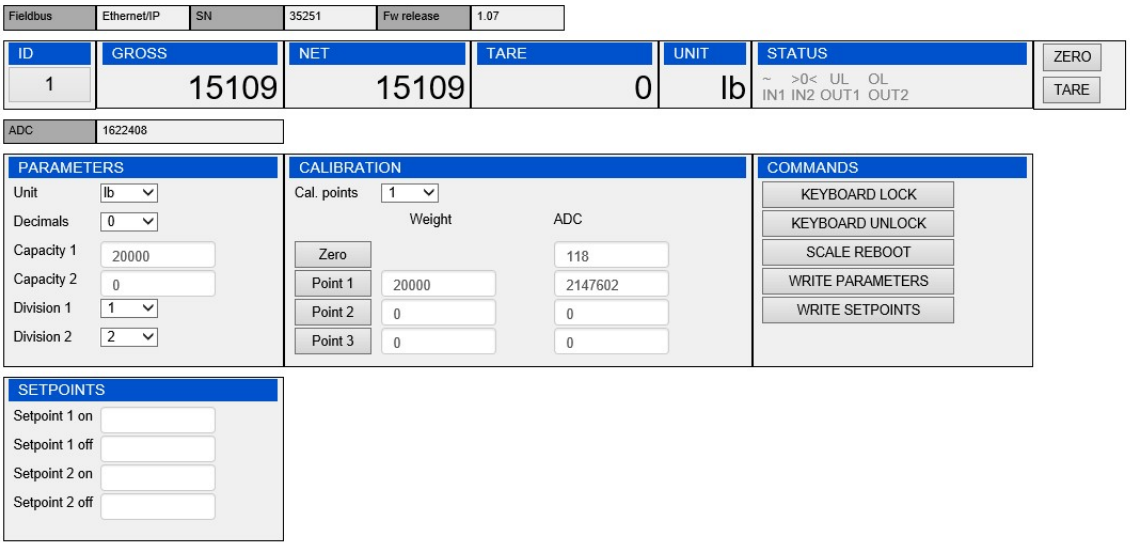


Figure 2-6. Calibration Dialog Box

2.7 Hub Mode

2.7.1 Module Connection to SCT-2200 Transmitters

Use the RJ45 and RS-485 directional ports to connect the Fieldbus Module to one or more SCT-2200 scale modules (up to 16).

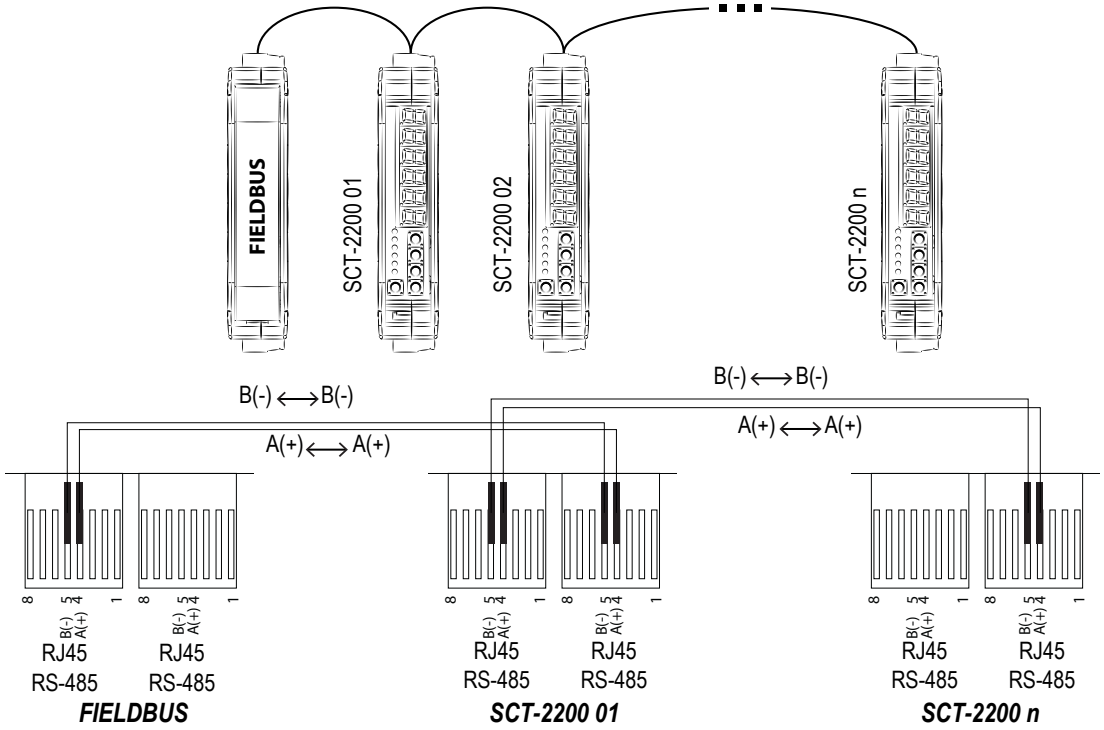


Figure 2-7. Module Connections in Hub Mode

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2.7.2 Firmware Version 7.15 or older

485 Network

The following paths can be followed from the setup menu in the scale module to access hub mode setup parameters;

Step setup	Value
SEtUP → SEri AL → PC SEL	485
SEtUP → SEri AL → COM. PC → PCMOdE	FLd. bUS
→ bUS. tYP	ProF ib : Profibus Eth. IP : Ethernet/IP ProF in : PROFINET Eth. CAt : EtherCAT CAnoPn : CANopen dEu. nEt : DeviceNet Mb. tcP : Modbus TCP/IP
Other parameters depending on the protocol selected	
SEtUP → SEri AL → COM. PC → PCMOdE → nUM. SCA	Number of scale modules on the 485 network
SEtUP → SEri AL → COM. PC → PCMOdE → SCA. Add	Address 485 of the scale module (enter parameter from 1 with consecutive values)
SEtUP → SEri AL → COM. PC → bAUd	115200

Table 2-16. Scale Module Settings for Hub Mode

Available parameters are dependent on the selected protocol.

PROFINET – the name of the node to be used in PROFINET project associated with the primary node of the network is given by Dini- <IP4>, where IP4 is the last byte of the IP address entered in the configuration of SCT, even if the self-configuration of the IP address is used.

Example: IP = 192.168.1.10, the node name is Dini-010.

Verify 485 network

1. From the configuration menu of the primary SCT scale module select d iAG→5 .5CAn. The scale will execute a continuous cycle to check if the scales on the network work.
   - Value 1 means that the selected scale is on-line.
   - Value 0 means that the selected scale is off-line.
2. Using arrow keys the instrument enters in the manual scan.
3. Press the C key to exit. At connection 485 network displays briefly, followed by Pb .COnn. When the Profibus master connects, the yellow led of the module turns on.

2.7.3 Firmware Version 8.0 or newer

Enter the Quick Setup Menu and select Fieldbus hub mode. See Section 2.1.2 on page 4. Enter the following configuration settings for each scale. In hub mode, all of the parameters must be configured for the primary unit (scale 01). Secondary units need only a few parameters.

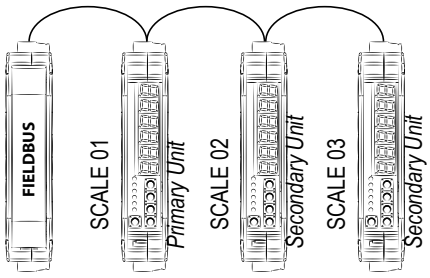


Figure 2-8. Configuration of Hub Mode

Profibus Hub Mode Configuration

Primary	Scale 1
HUb	YES
Pr iMAr	YES
nodE. Ed	00
nUM. SCA	3

Secondary	Scale 02	Scale 03
HUb	YES	YES
Pr iMAr	no	no
ScA. Add	2	3

Table 2-17. Profibus Configuration

PROFINET, EthernetIP, and Modbus TCP/IP Hub Mode Configuration

Primary	Scale 1
HUb	YES
Pr iMAr	YES
AUto. CFG	00
iP. Add	000. 000. 000. 000
nodE. Ed	000. 000. 000. 000
nUM. SCA	3

Secondary	Scale 02	Scale 03
HUb	YES	YES
Pr iMAr	no	no
ScA. Add	2	3

Table 2-18. PROFINET/EthernetIP Configuration

EtherCAT Hub Mode Configuration

Primary	Scale 1
HUb	YES
Pr iMAr	YES
nUM. SCA	3

Secondary	Scale 02	Scale 03
HUb	YES	YES
Pr iMAr	no	no
ScA. Add	2	3

Table 2-19. EtherCAT Configuration

DeviceNet Hub Mode Configuration

Primary	Scale 1
HUb	YES
Pr iMAr	YES
nod. Add	00
bAUd. r	500 Kb
nUM. SCA	3

Secondary	Scale 02	Scale 03
HUb	YES	YES
Pr iMAr	no	no
ScA. Add	2	3

Table 2-20. DeviceNet Configuration

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CANopen Hub Mode Configuration

Primary	Scale 1
HUb	YES
Pr iMAr	YES
nod. Add	001
bAUd. r	1Mb
nUM. SCA	3

Secondary	Scale 02	Scale 03
HUb	YES	YES
Pr iMAr	no	no
ScA. Add	2	3

Table 2-21. CANopen Configuration

2.8 Output Data

The output data area is composed of 32 bytes and is shown in Table 2-22.

Byte	Modbus Address	Data
1	40001	Scale Command register (MSB) → to which scale send the command (7F Broadcast)
2		Scale Command register (LSB) → command
3	40002-40016	
…		
32		

Table 2-22. Output Data Area

The Command Register structure:

- MSB: sends data to scale ID number on the 485 network (1 → scale 1, 2 → scale 2, …)
- LSB: command

The Fieldbus module sends all information in the output data area as it was received to the specified scale module with the command register MSB byte equal to zero.

Commands with MSB greater than 0x6F will be managed by the hub module.

Command (Hex)	Description
F000	Fill in the Input Data Area with scale data system (Table 2-29 on page 23)
F001	Fill in the Input Data Area with the data received from the scale 1
F002	Fill in the Input Data Area with the data received from the scale 2
…	…
F010	Fill Input Data Area with scale 16 data
F100	Fill Input Data Area with status data of the system
F200	Scan of the 485 network. Useful if some scales are not connected and checks which scales are online.
F300	Rereading network settings from the scale 1 and scanning network.
7Fxx	Enter the Output data area in the broadcast, in all scales of the subsystem 485 (with Modbus address zero)

Table 2-23. Commands

Commands in broadcast, do not provide feedback from the scale, they are actually carried out by all the scales. To ensure that they execute, control the outcome of the controls and counter scales.

2.8.1 Output Data (for sending commands)

<table>
<tr><th>Command</th><th>Byte</th><th>Modbus Address</th><th>Description</th><th>Example</th></tr>
<tr><td>Transmitter ID</td><td>1</td><td rowspan="2">40001</td><td>Select the transmitter to receive 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>
NOTE: Transmitter ID must be set for each command.</td><td>To zero 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>
NOTE: To repeat the last command, set the command to “No command” value (0000 Hex) then repeat the command.

Please refer to the SCT-2200 technical manual (PN 183522) for more information.</td><td>EXAMPLE 1
For setting a preset tare of 1000 kg:

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 to 1000 kg:

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>02 Hex</td></tr><tr><td>2</td><td>0A 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="2">Parameter 1</td><td>3(MSB)</td><td rowspan="2">40002</td><td rowspan="2">First parameter of the command.
Parameter is always expressed in absolute mode (no decimals, no sign).</td><td rowspan="2"></td></tr>
<tr><td>4</td></tr>
<tr><td rowspan="2">Parameter 2</td><td>5</td><td rowspan="2">40003</td><td rowspan="2"></td></tr>
<tr><td>6(LSB)</td></tr>
<tr><td rowspan="2">-</td><td>7(MSB)</td><td rowspan="2">40004</td><td rowspan="2">Second parameter of the command.
Parameter is always expressed in absolute mode (no decimals, no sign).</td><td rowspan="2"></td></tr>
<tr><td>8</td></tr>
<tr><td rowspan="2">-</td><td>9</td><td rowspan="2">40005</td><td rowspan="2"></td></tr>
<tr><td>10(LSB)</td></tr>
<tr><td rowspan="3">-</td><td>11</td><td rowspan="3">40006-40016</td><td rowspan="3">-</td><td rowspan="3">-</td></tr>
<tr><td>...</td></tr>
<tr><td>32</td></tr>
</table>

Table 2-24. Output Data (for sending commands)

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2.9 Input Data

The Input Data area can be filled with different pages.

Page	Profibus Command (HEX) to Change Page
Network data page	F000
Scale 1 data	F001
...	…
Scale 16 data	F010
Network status	F100

Table 2-25. Input Data Area

2.9.1 Input Data (for data reading) - Single Scale Mode

<table>
<tr><th>Data</th><th>Byte</th><th></th><th>DESCRIPTION</th><th>EXAMPLE</th></tr>
<tr><td rowspan="4">Gross weight</td><td>1(MSB)</td><td rowspan="2">40001</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><td rowspan="2">40002</td></tr>
<tr><td>4(LSB)</td></tr>
<tr><td rowspan="4">Net weight</td><td>5(MSB)</td><td rowspan="2">40003</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><td rowspan="2">40004</td></tr>
<tr><td>8(LSB)</td></tr>
<tr><td rowspan="2">Input Status</td><td>9(MSB)</td><td rowspan="2">40005</td><td>Bit 7(LSB) 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 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 rowspan="3">40006</td><td>Last received command</td><td></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 to count received commands, from 0 (0000) to 15 (1111).
Bit 4 to Bit 7 are used to indicate the result 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>Non-existent command</td></tr></table></td></tr>
<tr><td>-</td><td>13(MSB)</td><td rowspan="3">40007</td><td>No Function</td><td rowspan="3"><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>-</td><td>15
...
32</td><td>40008-
40016</td><td>-</td><td>-</td></tr>
</table>

Table 2-26. Input Data (for data reading) - Single Scale Mode

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2.9.2 Input Data (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 [40001] [Modbus Address in Square Brackets]</td><td>9 [40005]</td><td>17 [40009]</td><td>25 [40013]</td><td>...</td><td>121 [40021]</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) [40001]</td><td>10(MSB) [40005]</td><td>18(MSB) [40009]</td><td>26(MSB) [40013]</td><td>...</td><td>122(MSB) [40021]</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 [40002]</td><td>11 [40006]</td><td>19 [40010]</td><td>27 [40014]</td><td>...</td><td>123 [40022]</td></tr>
<tr><td>4(LSB) [40002]</td><td>12(LSB) [40006]</td><td>20(LSB) [40010]</td><td>28(LSB) [40014]</td><td>...</td><td>124(LSB) [40022]</td></tr>
<tr><td>Scale status</td><td>5 [40003]</td><td>13 [40007]</td><td>21 [40011]</td><td>29 [40015]</td><td>...</td><td>125 [40023]</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) [40003]</td><td>14(MSB) [40007]</td><td>22(MSB) [40011]</td><td>30(MSB) [40015]</td><td>...</td><td>126(MSB) [40023]</td><td rowspan="3">For each scale there are three bytes containing 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 [40004]</td><td>15 [40008]</td><td>23 [40012]</td><td>31 [40016]</td><td>...</td><td>127 [40024]</td></tr>
<tr><td>8(LSB) [40004]</td><td>16(LSB) [40008]</td><td>24(LSB) [40012]</td><td>32(LSB) [40016]</td><td>...</td><td>128(LSB) [40024]</td></tr>
</table>

Table 2-27. Input Data (for data reading) - Hub Mode

2.10 Network Page Data

The data bytes in Table 2-28 are used to populate the byte structure of Table 2-29.

Byte	Data
1	Input/output status
2	Gross weight (B2)
3	Gross weight (B1)
4	Gross weight (B0)
5	Scale status
6	Net weight (B2)
7	Net weight (B1)
8	Net weight (B0)

Table 2-28. Data for First Scale - Pattern Will Continue for Other Scales

Byte	Data
1	Scale 1 data (byte 1)
2	Scale 1 data (byte 2)
3	Scale 1 data (byte 3)
4	Scale 1 data (byte 4)
5	Scale 1 data (byte 5)
6	Scale 1 data (byte 6)
7	Scale 1 data (byte 7)
8	Scale 1 data (byte 8)
9	Scale 2 data (byte 1)

Byte	Data
10	Scale 2 data (byte 2)
11	Scale 2 data (byte 3)
12	Scale 2 data (byte 4)
13	Scale 2 data (byte 5)
14	Scale 2 data (byte 6)
15	Scale 2 data (byte 7)
16	Scale 2 data (byte 8)
…	…
121	Scale 16 data (byte 1)

Byte	Data
122	Scale 16 data (byte 2)
123	Scale 16 data (byte 3)
124	Scale 16 data (byte 4)
125	Scale 16 data (byte 5)
126	Scale 16 data (byte 6)
127	Scale 16 data (byte 7)
128	Scale 16 data (byte 8)

Table 2-29. Network Page Data

Bit	Data
0	Input 1 status
1	Input 2 status
2	Output 1 status
3	Output 2 status
4	Last command result (0: ok, 1: error)
6-5	Command counter (modulo 4)
7	Always 1 (scale present bit)

Table 2-30. Input/Output Status

Bit	Data
0	Net weight polarity
1	Gross weight polarity
2	Weight stability
3	Underload condition
4	Overload condition
5	Entered tare condition
6	Manual tare condition
7	Gross zero zone

Table 2-31. Scale Status

Note ***SCALE 1…N PAGE DATA- Data are the same of the 1 to 1 function mode.***

Byte	Data
1	Number of the scales of the system
2	Scale 1 state
3	Scale 2 state
…	…
17	Scale 16 state
…	0
128	0

Table 2-32. Network Status Page

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Value	Meaning
0	Scale not part of the network
1	Scale on-line
2	Scale off-line

Table 2-33. Scale State

To put a scale back online after it goes offline:

- Restart the scale module
- Execute by the execute the command 0xF200
- Execute by the execute the command 0xF300, after this command the module reads from scale 1, the network configuration, and sets as Input Data Area the Network Data page

Table 2-34 indicates the frequency, in seconds, to update data in the input to each scale. This is the speed of the network when the specified number of scales is connected to the network.

Baud rate	Scale 1	Scale 2	Scale 4	Scale 8	Scale 16
115200	54	27	13.6	6.8	3.6
57600	42	21.2	10.6	5.8	3
38400	40.8	20.4	10.2	5.2	2.6
19200	33	16.6	8.4	4.2	2.2
9600	20.4	10.2	5.2	2.6	1.4

Table 2-34. Scales Scan Rate

2.11 Profibus File

Device name – DINIPB

Manufacturer ID – 0DE1

GSD Module: IN/OUT: 128 Byte (64 word) – 128 input bytes + 128 output bytes

2.12 EDS Ethernet/IP File

Device name – DINI NIC 52-RE/EIS

Manufacturer ID – 283

Product ID – 0x10D

Module Name	Number	Description
Input (T→O)	1	128 byte input area module
Output (O→T)	1	128 byte output area module
T = target O = originator		

Table 2-35. EDS Modules

Use the parameters in Figure 2-9 to setup a generic Ethernet module.

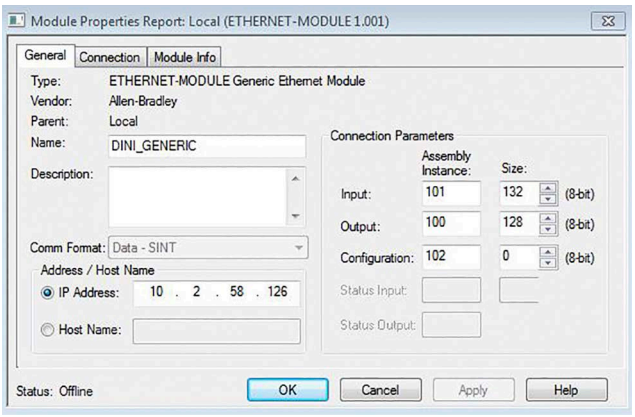


Figure 2-9. Generic Ethernet Module Setup

2.13 GSDML PROFINET File

Device name – DINI-xxx

Manufacturer ID – 011E

Product ID – 010A

Module Name	Number	Description
64 byte input	2	64 byte module for the input area
64 byte output	2	64 byte module for the output area

Table 2-36. GSDML Modules

2.14 ESI EtherCAT File

Device name – DINI NIC 52-RE/ECS

Manufacturer ID – 0xE0000044

Product ID – 0x0000000B

Module Name	Number	Description
Input	1	200 byte module for the input area
Output	1	200 byte module for the output area

Table 2-37. ESI Modules

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2.15 EDS CANopen File

Device name – DINI NIC 52-COS

Manufacturer ID – 0x00000044

Product ID – 1541540

Module Name	Number	Description
Input	64	8 bytes modules for the input area (TXPDU); min. 4 TXPDU (32 byte)
Output	64	8 bytes module for the output area (RXPDU); min. 4 RXPDU (32 byte)

Table 2-38. EDS Modules

2.16 EDS DeviceNet File

Device name – DINI Slim-DeviceNet NIC 52-DNS

Manufacturer ID – 283

Product ID – 35

Module Name	Number	Description
Input (Production)	1	128 byte module for the input area
Output (Consumption)	1	32 byte module for the output area

Table 2-39. EDS Modules

3.0 Troubleshooting

Upon start up, the SCT scale module displays the firmware version of the Hub in the form F. r. HH. YY (HH. YY is the release). The first transmission to the SCT scale module by the Fieldbus module displays F. b. COnn. When communication between the module Hub and Fieldbus network is operational, Fb. OH displays.

If there is an error, F. b. Err and the error code found in Table 3-2 or Table 3-3 alternate on the display. If there is no communication between the module and the SCT scale module hub, F. bUS. Er flashes on the display.

Message	Description
F. r. HH. YY	Firmware version of the module hub
F. b. COnn	Start the communication between hub module and scale
F. b. OH	Communication on Fieldbus network configured and running
F. b. Err + codE	Error state, see Table 3-2
F. bUS. Er	No connection received from module Hub for 30 seconds after system start

Table 3-1. SCT Scale Module Messages

Code	Description
1000	Fatal error in Hub module
1001	Inconsistency between protocol type selected and the one managed by the hub module *Example: Hub type DeviceNet module with PROFINET protocol selected on SCT*
1-18	Other fatal error in Hub module
000001	Unrecoverable error module Hub, see Table 3-3

Table 3-2. Error Code

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

Table 3-3. Network Errors

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