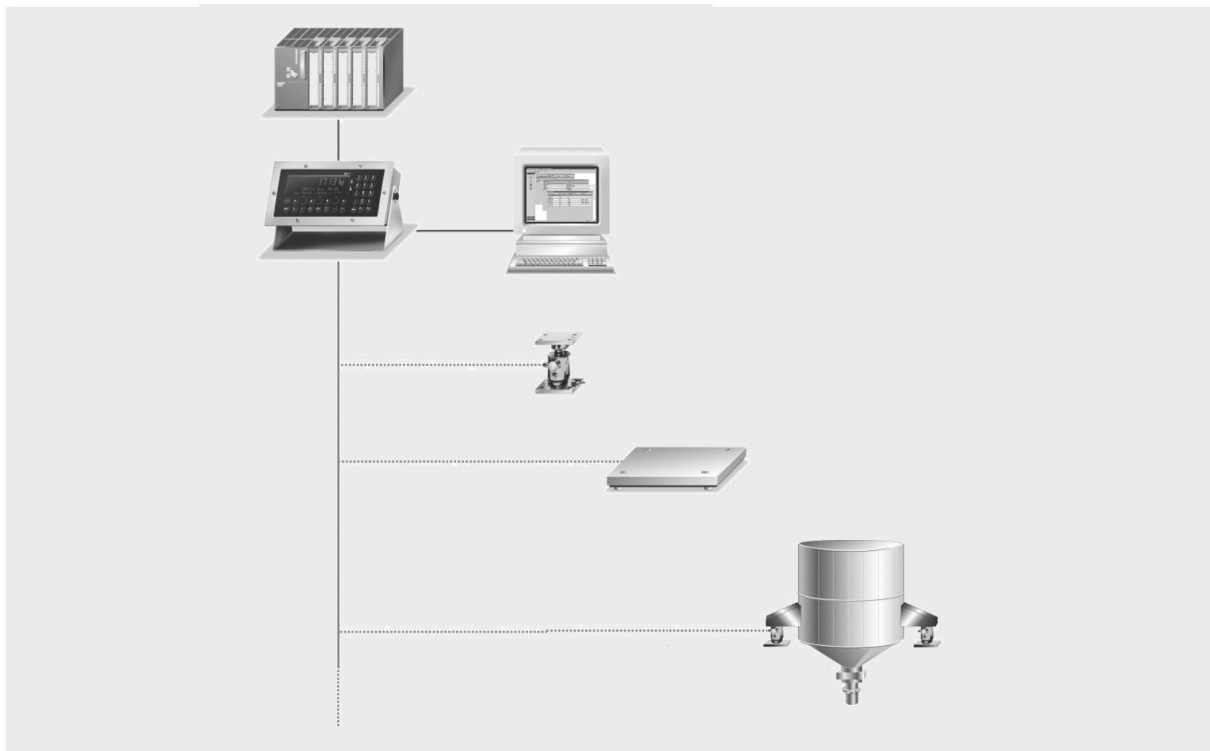




sartorius
mechatronics

X4, X5, X6 - Application PRO Controller

Operating Manual



Operating Manual
for PR 5510/00

9499 050 61503
Release 2.12.03

Edition 3

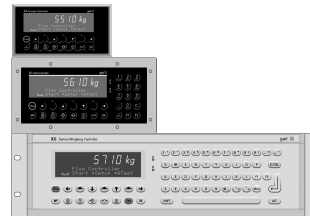
24.01.2008

for PR 5610/00

Release 2.12.03

for PR 5710/00

Release 2.12.03



Please note

Any information in this document is subject to change without notice and does not represent a commitment on the part of Sartorius. This product should be operated only by trained and qualified personnel. In correspondence concerning this product the type, name and release number as well as all license numbers in relation to the product have to be quoted.

Important

This product is partly copyrighted. It may not be modified or copied and may not be used without purchasing or written authority from the copyright owner (Sartorius). By using this product, you agree to be bound by the terms stated herein.

Bitte beachten

Alle Angaben in diesem Dokument sind unverbindlich für Sartorius und stehen unter Änderungsvorbehalt. Die Bedienung des Produktes darf nur von geschultem, fach- und sachkundigem Personal durchgeführt werden. Bei Schriftwechsel über dieses Produkt bitte Typ, Bezeichnung und Versionsnummer sowie alle mit dem Produkt in Zusammenhang stehenden Lizenznummern angeben.

Wichtig

Dieses Produkt ist in Teilen urheberrechtlich geschützt. Es darf nicht verändert oder kopiert und ohne Erwerb oder schriftliche Einwilligung des unheberrechtlichen Eigentümers (Sartorius) nicht benutzt werden. Durch die Benutzung dieses Produktes werden obige Bestimmungen von Ihnen anerkannt.

Contents

| | | |
|-----------|--|-----------|
| 1. | INTRODUCTION | 7 |
| 1.1. | GENERAL | 7 |
| 1.1.1. | Other manuals | 7 |
| 1.1.2. | Delivery condition | 7 |
| 1.1.3. | PRO-Controller | 7 |
| 2. | OPERATOR INTERFACE | 9 |
| 2.1. | DISPLAY | 9 |
| 2.2. | KEYPAD | 10 |
| 2.3. | ENTRY OF ALPHANUMERIC CHARACTERS | 11 |
| 2.4. | OPERATING CONCEPT | 12 |
| 2.4.1. | Operation via softkeys | 12 |
| 2.4.2. | Selection via the scroll keys | 12 |
| 2.4.3. | Selection via the MORE key | 13 |
| 2.5. | INPUT OVER EXTERNAL PC-KEYBOARD | 14 |
| 3. | MAIN MENU | 15 |
| 3.1. | SWITCHING ON THE PRO-CONTROLLER | 15 |
| 4. | SETUP | 16 |
| 4.1. | SETUP-MENU | 16 |
| 4.2. | CONFIGURATION MENU FOR THE PRO-CONTROLLER | 17 |
| 4.2.1. | Config menu tree | 17 |
| 4.2.2. | Changing the configuration | 17 |
| 4.2.2.1. | Digital input configuration | 18 |
| 4.2.2.2. | Input configuration of the analog card | 19 |
| 4.2.2.3. | Digital output configuration | 19 |
| 4.2.2.4. | Output configuration of the BCD card | 21 |
| 4.2.2.5. | Output configuration of the analog card | 22 |
| 4.2.2.6. | Selection of the external alibi memory function | 23 |
| 4.2.2.7. | Selecting the number of print-out copies | 23 |
| 4.2.2.8. | Setting the sequence number | 23 |
| 4.2.2.9. | Identification name of the terminal | 23 |
| 4.2.2.10. | Entry of limit values | 24 |
| 4.2.2.11. | Factory settings | 25 |
| 4.2.3. | Input of predefined texts | 25 |
| 4.2.3.1. | Entry of a new text | 26 |
| 4.2.3.2. | Editing a text | 27 |
| 4.2.3.3. | Deleting a text | 27 |
| 4.2.4. | Print-out of configuration data | 28 |
| 4.2.5. | Leaving the configuration | 30 |
| 5. | MAIN PROGRAMM | 31 |

| | | |
|---------|--|----|
| 5.1. | "START" PROGRAM | 31 |
| 5.2. | TERMINAL FUNCTION | 32 |
| 5.2.1. | Control | 32 |
| 5.2.2. | Predefined functions..... | 33 |
| 5.2.3. | Predefined functions with predefined texts | 36 |
| 6. | ALIBI MEMORY | 37 |
| 6.1. | GENERAL | 37 |
| 6.2. | INTERNAL ALIBI MEMORY..... | 37 |
| 6.2.1. | Configuring the alibi memory..... | 37 |
| 6.2.2. | Show contents of the memory | 38 |
| 6.2.3. | Searching for date and time..... | 38 |
| 6.2.4. | Searching for a sequence number | 39 |
| 6.2.5. | Printing a range..... | 39 |
| 6.2.6. | Weight print-out..... | 40 |
| 6.2.7. | Data in the alibi memory..... | 40 |
| 6.2.8. | Size of the alibi memory..... | 40 |
| 6.2.9. | Time behaviour of the alibi memory..... | 41 |
| 6.3. | EXTERNAL ALIBI MEMORY | 41 |
| 7. | PRINT-OUTS..... | 42 |
| 7.1. | STARTING A PRINT-OUT | 42 |
| 7.1.1. | Start with "Print"-Key..... | 42 |
| 7.1.2. | Start with digital input | 42 |
| 7.1.3. | Start print-out via communication | 43 |
| 7.1.4. | Start with EWCOM WA-command..... | 43 |
| 7.2. | NICE LABEL EXPRESS | 44 |
| 7.3. | PREDEFINED REPORT | 45 |
| 8. | SPM | 46 |
| 8.1. | SPM-LAYOUT | 46 |
| 8.2. | FESTTARA VIA SPM..... | 49 |
| 9. | PR 1613 COMMANDS..... | 50 |
| 9.1.1. | Commands for indicator function:..... | 50 |
| 9.1.2. | Errors | 50 |
| 10. | FIELDBUS..... | 51 |
| 10.1. | CONFIGURATION | 51 |
| 10.2. | APPLICATION PROTOCOL..... | 51 |
| 10.2.1. | Write window..... | 51 |
| 10.2.2. | Read window | 52 |
| 10.3. | DATA FORMATS | 52 |

| | | |
|-------|--|----|
| 10.4. | WRITE DATA..... | 53 |
| 10.5. | READ DATA | 55 |
| 11. | ANALOG TEST | 58 |
| 12. | ERROR MESSAGES | 59 |
| 12.1. | ERROR MESSAGES ON THE WEIGHT DISPLAY | 59 |
| 12.2. | ERROR MESSAGES ON THE TEXT DISPLAY | 59 |
| 13. | INDEX..... | 61 |

1. Introduction

1.1. General

1.1.1. Other manuals

This operating manual describes the operation of PRO-X5 and the important differences for PRO-X4 and PRO-X6. For general adjustment and installation please refer to the installation manuals for the instruments PR 5510 for PRO-X4, PR 5610 for PRO-X5 and PR 5710 for PRO-X6.

1.1.2. Delivery condition

The standard PRO-Controller contains neither hardware options nor licences.

1.1.3. PRO-Controller

The PRO-Controllers are indicators with all functions of a weighing platform. Weight values can be printed out and stored in an internal alibi memory. The data in this ring memory can be examined and printed. In addition an external alibi memory can be connected. Via communication weight values and signals of the PRO-Controllers can be bidirectionally transmitted.

Furthermore the PRO-Controllers can be used as powerful remote terminals. Messages from a communication master can be displayed, operator dialogues, text or value editing are possible.

A PC can communicate with a PRO-Controller via DDE or OPC via serial link or ethernet. A SPM can communicate with a PRO-Controller via fieldbus (Profibus, Interbus-S, Devicenet).

To the PRO-Controllers PRO-X5 and PRO-X6 a second weighing point can be connected.

Function survey:

- tare function
- input of predefined texts for the terminal function
- internal and external alibi memory
- weight print-out via configurable report
- remote operator dialogue controllable via PR1713 display and keyboard
- configurable digital and analog inputs and outputs with optional cards

Optional components survey:

- digital inputs and outputs
- serial interfaces
- analog output
- fieldbus on slot 4 (no 2nd analog output card and no Ethernet)
- Ethernet on slot 4 (no 2nd analog output card and no fieldbus)
- licence for PR 1791/13 DDE server communication
- licence for PR 1792 OPC server communication
- alibi licence for the internal alibi memory: PR 8901/81, memory extension required for PRO-X5 and PRO-X6
- external alibi memory via serial line
- EWCOM licence for additional commands: PR 1713/31 for PRO-X5 and PRO-X6
- external terminal PR 5610/05 for second operator station for PRO-X5 and PRO-X6
- external weighing point 'B' via DIOS master or XBPI for PRO-X5 and PRO-X6

List of the optional installable modules for the PRO-Controllers PRO-X4, PRO-X5 and PRO-X6. Max. 3 modules can be installed. For detailed information refer to the corresponding installation manual.

| For PRO-X5 and PRO-X6 | | Slot 1 | Slot 2 | Slot 3 | Slot 4 |
|-----------------------|--|--------|--------|--------|--------|
| PR 1713/04 | Serial I/O RS485/422 + RS232 | • | • | • | |
| PR 1713/06 | Analog out | • x1 | • x1 | • x1 | |
| PR 1713/07 | 1 analog out / 4 analog in | • x1 | • x1 | • x1 | |
| PR 1713/08 | BCD out / 24 out, 1 in, only PRO-X5 | • x2 | • x3 | ★ | |
| PR 1713/12 | Digital I/O 4/4 opto | ★ | • | • | |
| PR 1713/13 | DIOS master | • | | | |
| PR 1713/14 | Ethernet interface | | | | • x1 |
| PR 1713/15 | Digital I/O 4/4 relay | ★ | • | • | |
| PR 1713/17 | Digital I/O 6/8 | ★ | • | • | |
| PR 1721/11 | Profibus interface, for PRO-X6 PR 1721/21 | | | | • x1 |
| PR 1721/12 | Interbus interface, for PRO-X6 PR 1721/22 | | | | • x1 |
| PR 1721/14 | Devicenet interface, for PRO-X6 PR 1721/24 | | | | • x1 |

| | |
|------|--|
| • | = Can be fitted additionally |
| • x1 | = Note restrictions due to high current consumption! |
| • x2 | = Can be fitted additionally, but the top terminal strip is covered by slot 2. |
| • x3 | = Can be fitted additionally, but the top terminal strip is covered by slot 3. |
| ★ | = Preferred position (digital I/O is initialized, BCD card does not cover any connections) |

If a card is inserted in slot 4, no 2nd analog output card is allowed in slot 1, 2 or 3.

| For PRO-X4 | | Slot 1 | Slot 2 | Slot 3 | Slot 4 |
|------------|------------------------------|--------|--------|--------|--------|
| PR 5510/04 | Serial I/O RS485/422 + RS232 | • | • | | |
| PR 5510/06 | Analog out | | | • x1 | |
| PR 5510/07 | 1 Analog out / 4 analog in | • x1 | • x1 | | |
| PR 5510/08 | BCD out / 24 out, 1 in, CC | • | • | | |
| PR 5510/09 | BCD out / 24 out, 1 in, CE | • | • | | |
| PR 5510/12 | Digital I/O 6/12 opto | • | • | | |
| PR 5510/13 | DIOS master | • | | | |
| PR 5510/14 | Ethernet interface | | | | • x1 |
| PR 5510/31 | Profibus interface | | | | • x1 |
| PR 5510/32 | Interbus interface | | | | • x1 |
| PR 5510/34 | Devicenet interface | | | | • x1 |
| PR 5510/35 | CC-Link | | | | • x1 |

| | |
|------|--|
| • | = Can be fitted additionally |
| • x1 | = Note restrictions due to high current consumption! |
| ★ | = Preferred position (digital I/O is initialized, BCD card does not cover any connections) |

If a card is inserted in slot 4, no 2nd analog output card is allowed in slot 1 or 2.

2. Operator Interface

2.1. Display






A 7-digit weight value with decimal point can be displayed on the **weight indicator**. The weight unit can be as tons, kilograms, grams or lbs. In addition to the numeric output value, two text lines can be displayed. The remaining display symbols are shown in the following table.




| Status display | Description |
|----------------------|--|
| B G | Gross weight display Gross weight = net weight + tare weight (B is only active in NTEP mode) |
| NET | Net weight display |
| T | The stored tare or initial weight is displayed. |







| Status display | Description |
|----------------|---------------------------------------|
| | The weight value is within +/- 1/4 d. |
| | Weight standstill |
| | Not used with PRO-Controllers |
| | Not used with PRO-Controllers |







2.2. Keypad


The symbols on the front panel keys and their signification are:



| Indicator keys | Description |
|---|--|
|  | While pressing this key, the gross weight is displayed (<i>B – gross weight</i>). |
|  | While pressing this key, the tare weight is displayed. |
|  | Set/reset tare The actual gross value is stored in the tare memory, provided that: <ul style="list-style-type: none"> - weight standstill - indicator not in error status |

| Indicator keys | Description |
|---|---|
|  | Print-out |
|  | Key for switch-over between weighing point A, B and C=A+B, (not valid for PRO- Controllers) |
|  | Set gross weight to zero, provided that: <ul style="list-style-type: none"> - weight standstill - weight within zero set range - not tared |

| Menu keys | Description |
|---|--|
|  | Exit from the actual menu and continue operation at the next higher level. |
|  | Softkey: select function |
|  | Scroll down through menu functions |
|  | Scroll up through menu functions |
|  | Display of further menu functions, which are indicated by the double arrow  . |

| Edit keys | Description |
|---|--|
|  | Move cursor left during editing and selection of values, if  is displayed. |
|  | Move cursor right during editing and selection of values, if  is displayed. |
|  | Enter / execute / confirm |
|  | Backspace / delete |

| Function keys | Description |
|---|-------------------------------|
|  | Not used with PRO-Controllers |
| | |

| Function keys | Description |
|---|--|
|  | Programmable function key, not used with PRO-Controllers |
|  | Programmable function key, not used with PRO-Controllers |

2.3. Entry of alphanumeric characters



In the alphanumeric input mode, a blinking cursor is displayed in the input field. Access to this mode is by pressing an alphanumeric key. For PRO-X4 please refer to the chapter More-key.

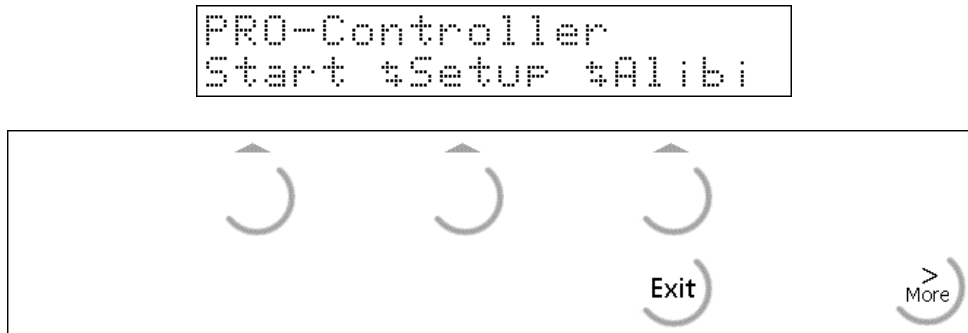
| | |
|--|---|
| | <p>Several functions are allocated to each alphanumeric key. By pressing a key once, the first character, e.g. 'A', is displayed in the cursor position. After pressing the same key a second time, 'B' is displayed in the cursor position, and after pressing a third time, 'C' is displayed, etc. After the last possible function, the first one is displayed again.</p> <p>The entry of a character is completed by pressing another character key, or key arrow right .</p> <p>Press key arrow left to return to the previous character. By pressing the delete key , the character is deleted from the display.</p> <p>If only numeric values must be entered for an entry, letters are not enabled. Therefore, the entry of values such as 555 is possible by pressing the key three times without the arrow key.</p> <p>Due to the double function of the keys for PRO-X4 numbers and characters are indicated at the lower right edge of the keys.</p> |
|--|---|

| Key | Key | Character | Remark |
|-----------|-----------|------------------------------|---|
| X5 | X4 | For PRO-X4 only via More key | |
| | | # " () = \$? ! % 1 | Comma, decimal point or colon can be entered using the dot key . Values with polarity sign are also entered by pressing the dot key , once for minus and twice for plus. Every entry is completed by pressing key . Input of a space is possible using key . |
| | | ABCabc2 | |
| | | DEFdef3 | |
| | | GHIghi4 | |
| | | JKLjkl5 | |
| | | MNOmno6 | |
| | | PQRSpqrs7 | |
| | | TUVtuv8 | |
| | | WXYZwxyz9 | |
| | | - + * / ; ; _ ' & , < > | |
| | | ÄÖÜäöüßø | |



2.4. Operating concept


2.4.1. Operation via softkeys

The operation of the PRO-Controllers is menu-guided. For this purpose, the controllers are provided with a softkey functionality: The three softkeys with the upward arrow  below the display have the function described in the lower text line. For PRO-X6 the softkeys look like this .

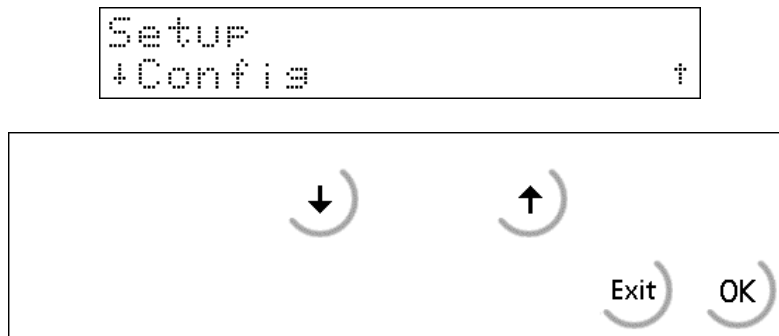




Selection of the menu is made by pressing the corresponding softkey .


If more than three functions can be selected, the double arrow  indicates that further functions can be displayed and called up by pressing key .




Key  can be used to leave a menu. After pressing this key, the operation is continued at the next higher level.

2.4.2. Selection via the scroll keys














Key arrow down  permits scrolling forwards through the menu, key arrow up  permits scrolling backwards through the menu.





Key  can be used to leave the menu and to continue operation at the next higher level.



Key  permits selection of the menu item displayed between  .

2.4.3. Selection via the MORE key

If the display line for the softkey functions shows the double arrow  further functions can be displayed and called up by pressing key . Divergent from PRO-X5 is this key  on PRO-X4 located at the lower left corner. On PRO-X6 this key  is located at the lower right corner of the alpha keyboard.

Furthermore is the function of the key  different for the entry of texts to PRO-X4. After selection of [New] and the entry of a new text number the cursor does not flash! The key  has to be pressed, until the corresponding LED is lit  , and the cursor flashes. Now a new text can be entered. If the key  is pressed once more the LED is switched off and the text can be corrected or edited character by character with the keys  and  . The text entry is terminated with the key  .

After pressing the key [Edit] the last edited text appears. With the keys  and  all stored texts can be scrolled, and selected with key  . As described above they can be edited or corrected via key  .

After pressing the keys  and  a known text number can be entered. The text can also be edited or corrected as described above.

2.5. Input over external PC-keyboard

The Batch Controller have an alphanumeric key field and a connection for a PC keyboard with DIN-Plug (on the rear side of housing). Thus the operation of the Batch Controller can be made also by an external PC keyboard. Both functions are equivalent and are alternatively applicable.

| | | | | | | | | | | | | |
|----------|--|--|--|--|--|--|--|--|--|--|--|--|
| Keyboard | | | | | | | | | | | | |
| Keypad | | | | | | | | | | | | |

| | | | | | |
|----------|--|--|--|--|--|
| Keyboard | | | | | |
| Keypad | | | | | |


In the delivering condition the external keyboard is adjusted as an US keyboard. If a German keyboard will be used, you have to change the character set with [Strg][F2] into German. With [Strg][F1] you can return again to the delivering condition (US).
The LEDs from the PC keyboard will be not triggered.

For detail informations please refer to the Installation Manual.

3. Main menu

As soon as the unit is ready for operation after switch-on, the functions of the main menu can be selected.

```
PRO-Controller
Start $Setup $Alibi
```

The menu items can be selected by pressing the relevant softkey .




| Softkey | Function |
|---------|---|
| [Start] | Terminal functions |
| [Setup] | Configuration, calibration, determination of the serial ports, initial data |
| [Alibi] | Configuration and alibi memory read-out. |

3.1. Switching on the PRO-Controller

After supply voltage switch-on, the name Pro-Controller appears on the alphanumeric display. Now the main menu is activated.

Installing optional cards or changing optional cards to another slot must be done before the entry of data, as this operation requires a [Cold] start with the loss of all entered RAM data.

There are three possibilities to reach the boot menu:

1. Menu [Setup]->[Reboot], [Warm] start possible
2. Press key , when switching on the instrument
2. Press keys  and , ([Setup]->[Software Parameter]->[Reset on stop+exit] = 1 or 5 s.), whereby [Warm] start is not possible.



Please note, that you may only do a [Cold] start when this is necessary (e.g. after installation of a new optional card), because all data which were not stored in EPROM or EAROM are lost !!

For further details, see the relevant chapter in the installation manual.

4. Setup

4.1. Setup-Menu


The [Setup] menu is described in the installation manual.

To prevent the access to the Setup menu by unauthorized persons, the access to this menu can be disabled by means of a key switch.



Please, note that you must not change the calibration data after material entry. Changing e.g. the weight unit from kg into lb must be subsequently followed by a cold start. Hereby, all RAM data (database tables, etc.) are lost.

```
Calibration changed
Make cold start!
```

This message is displayed when changing the calibration data subsequently. Now, you have to continue with .


The Setup-Menu is structured as indicated:

Setup





| Configuration | Follows in this chapter |
|----------------------|----------------------------|
| - Weighingpoint(s) | In the installation manual |
| - Set Clock | In the installation manual |
| - Serial Ports | In the installation manual |
| - Software Parameter | In the installation manual |
| - Show Boardnumber | In the installation manual |
| - Licence Setup | In the installation manual |
| - Print Setupdata | In the installation manual |
| - Print last fault | In the installation manual |
| - Refresh Display | In the installation manual |
| - I/O Slots | In the installation manual |
| - Show Version | In the installation manual |
| - Enable download | In the installation manual |
| - Reboot | In the installation manual |

4.2. Configuration menu for the PRO-Controller

This menu is used for entry of the specific configuration data. The configuration data are stored in the RAM and saved in the EAROM

Press  to select [Setup] .

```
PRO-Controller
Start $Setup $Alibi
```

Select [Config] with / and confirm with . Leave the setup menu with .

```
Setup
↓Config †
```

With [Change], the configuration parameters can be changed. With [Text], predefined texts can be entered. Press [Print] to print out the configuration parameters via the printer interface.

```
Configuration
Change# Text # Print
```

By activating the "key switch locking 2", access to the configuration can be prevented. A warning message is displayed during two seconds.

```
Setup locked
```

Unless the system clock is running (time not set), an error message is displayed. The running system clock is an indispensable prerequisite for the alibi memory! The configuration is finished. At PRO-X4 the clock runs automatically after power-on.

```
Clock not set
```

4.2.1. Config menu tree

Config

- Input config
- Output config.
- Ext. Alibi memory
- Reportcopies
- Sequencenumber
- Terminal name

- WP. A Limit 1 on
- WP. A Limit 1 off
- WP. A Limit 2 on
- WP. A Limit 2 off
- WP. B Limit 1 on
- WP. B Limit 1 off
- WP. B Limit 2 on
- WP. B Limit 2 off

Configuration for PRO-Controllers

- Input configuration
- Output configuration
- serial line for external Alibi memory
- Number of report copies
- set sequencenumber
- Name of terminal for printout

- Limit value
- Limit value
- Limit value
- Limit value
- Limit value, only for PRO-X5 and PRO-X6
- Limit value, only for PRO-X5 and PRO-X6
- Limit value, only for PRO-X5 and PRO-X6
- Limit value, only for PRO-X5 and PRO-X6

4.2.2. Changing the configuration

Press [Change] to change the configuration parameters.

```
Configuration
Change# Text # Print
```


4.2.2.1. Digital input configuration


For slot 1 to 3, digital I/Os are configurable.

Input functions


- None: No input function
- Tare A: Set tare of weighing point A
- Reset tare A: Reset tare of weighing point A
- Set zero A: Set weighing point A to zero
- Tare B: Set tare of weighing point B
- Reset tare B: Reset tare of weighing point B
- Set zero B: Set weighing point B to zero
- Start print-out: Generate new data, write to alibi memory, print
- Repeat print-out: Print the old data again
- Protection 1: Key switch locking1: don't leave the terminal mode.
- Protection 2: Key switch locking2: don't make an access to 'Setup'.
- Hold slot 1: Hold output value for slot 1
- Hold slot 2: Hold output value for slot 2
- Hold slot 3: Hold output value for slot 3


An input can be allocated to an individual function. Generally, more than one input can be allocated to an input function. In this case, the input with the higher card number and / or input number overrules. FALSE is assigned to non-allocated input functions. The card type and the available I/Os are detected automatically. Functions for a 2nd WP can be selected, but they don't have a function without a 2nd WP.

Select [Input config.] with .

A configurable card with digital inputs fitted in this position is displayed by "I/O". Select the card position and press .

Unless a card with digital inputs is fitted in this position, [no input] is displayed. The card is not selectable for an input configuration.

Select the function for this input. Make further allocations using the cursor keys.  finishes the input configuration for this card position.

Configure further cards as described above.  finishes the input configuration.

```
+Input config.      ↑
```

```
Input config.
↑Slot 1      ↑      I/O
```

```
Input config.
↑Slot 1      ↑ no input
```

```
Slot 1 Input      ↑ 1↑
$Tare A           $
```

```
Input config.
↑Slot 1      ↑      I/O
```

Plug-in cards for PRO-X5 and PRO-X6

PR 1713/08 digital I/O type: 1 input

PR 1713/12 digital I/O type: 4 inputs

PR 1713/15 relay I/O type: 4 inputs

PR 1713/17 digital I/O type: 6 inputs

Plug-in cards for PRO-X4

PR 5510/08 digital I/O type: 1 input

PR 5510/09 digital I/O type: 1 input

PR 5510/12 digital I/O type: 6 inputs

4.2.2.2. Input configuration of the analog card

With an analog input card no values need to be configured. The four analog values of the card with the lowest slot number are copied into word addresses *anain1*, *anain2*, *anain3* and *anain4* automatically. Moreover, the first analog input value *anain1* is copied into DWORD address *user_wp* for possible use as a USER weighing point.

4.2.2.3. Digital output configuration

A function can be allocated to the individual inputs and outputs. The card type and the available I/Os are detected automatically.


Output functions

- None: No output function
- Limit 1 A: Limit 1 output of weighing point A
- Limit 2 A: Limit 2 output of weighing point A
- Standstill A: Standstill of weighing point A
- 1/4 d zero A: 1/4 d zero of weighing point A
- tared A: Weighing point A is tared
- Weight valid A: Weight display without error
- Weight faulty A: Scale not ready, inverse of Weight valid' (< min. minus or > overload) A
- Limit 1 B: Limit 1 output of weighing point B
- Limit 2 B: Limit 2 output of weighing point B
- Standstill B: Standstill of weighing point B
- 1/4 d zero B: 1/4 d zero of weighing point B
- B tared: Weighing point B is tared
- Weight valid B: Weight display without error
- Weight faulty B: Scale not ready, inverse of Weight valid' (< min. minus or > overload) B
- Output 1...8: Can be written freely via communication

The functions of weighing point "B" are active only, provided that the weighing point exists. If the DIOS card is fitted, its fieldbus module type configuration is fixed. It serves only for connection of an external weighing point. The output function can be allocated in the framework of a software project.

Select parameter [Output config.] with .


```
+Output config.  ↑
```

A configurable card with digital outputs fitted in this position is displayed by "I/O". Select the card position and press .

```
Output config.
+Slot 1  ↑  I/O
```

Unless a card with digital outputs is fitted in this position, [no output] is displayed. The card is not selectable for an output configuration.

```
Output config.
+Slot 1  ↑  no output
```

Select the function for this output. Make further allocations with the cursor keys. Configure further cards as described above.  finishes the inputs for this card.

```
Slot 1 Output  ↑  1↑
$Tared A  ↓
```

 finishes the output configuration.

```
+Output config.  ↑
```

Plug-in cards for PRO-X5 and PRO-X6.

PR1713/08 Digital I/O Type: 24 Ausgänge
 PR1713/12 Digital I/O Type: 4 Ausgänge
 PR1713/15 Relais I/O Type: 4 Ausgänge
 PR1713/17 Digital I/O Type: 8 Ausgänge

Plug-in cards for PRO-X4.

PR5510/08 Digital I/O Type: 24 Ausgänge
 PR5510/09 Digital I/O Type: 24 Ausgänge
 PR5510/12 Digital I/O Type: 12 Ausgänge

4.2.2.4. Output configuration of the BCD card

The BCD card can be fitted on every slot, preferably on slot 3 for mechanical reasons. The mechanical restrictions for inserting adjacent cards are described in the Installation Manual. Switch-over from BCD to digital outputs deletes all output functions for this slot.

The PR 1713/08 card is configurable as

1) digital output card with 24 outputs and one input. Configurable as a digital I/O card.

2) BCD output of the scale for

- gross weight,
- net weight,
- tare or
- following the display.

5 decades are displayed. On scales with more than 5 digits, only the first 5 digits are displayed. All data refer to the weighing point selected in parameter " Source of data".

Data output:

- Bit 0 to 19: 5-digit weight value
- Bit 20: negative
- Bit 21: standstill
- Bit 22: value valid
- Bit 23: tared

3) BCD output is from the SPM, DWORD address MD 42. The 5 least significant decades are output.

Select the slot on which the BCD card is fitted, and press



```
Output confis.
+Slot 3      +      I/O
```

The mode selected last is displayed (digital or BCD).

Select mode "Digital" and press . Continue operation as with normal digital I/Os (see above)

```
+Mode of output      +
$      BCD          $
```

or

select mode "BCD" and press

Selection must be from

- WP-A
- WP-B, only for PRO-X5 and PRO-X6
- external from SPM *bcdout*

```
+Source of data      +
$      WP-A         $
```

If a weighing point was selected (WP-A, WP-B), the weight mode can be selected:

- gross weight
- net weight
- tare
- following the display

```
+BCD value          +
$      Gross       $
```

If the external data source was selected (external from SPM *bcdout*) no further parameters need to be configured.

Press to finish the configuration of this slot.

```
Output confis.
+Slot 3      +      I/O
```

4.2.2.5. Output configuration of the analog card

Optionally, the analog output can be fitted on slot 1, 2 or 3. Selection is always between weighing data and values from the SPM. Dependent of data source, further parameters are configurable.

Select the slot on which the analog card is fitted.

```
Output config.
+Slot 3 + Analog
```

Select parameter [Source of data]:

A weighing point A
 B weighing point B, only for PRO-X5 and PRO-X6
 External value specified via SPM address *anaout* (DWORD).¹

```
+Source of data +
$ UP-A $
```

Only WP: Select the value from

gross weight always gross weight
 Net / gross in tared condition -> net weight, in non-tared condition -> gross weight
 Net / 0mA in tared condition-> net weight, in non-tared condition -> 0mA
 Net / 4mA in tared condition -> net weight, in non-tared condition -> 4 mA
 Net / 20mA in tared condition-> net weight, in non-tared condition-> 20mA

```
+Analog value +
$ Gross $
```

Select parameter [Analog range]

The following options can be selected using the scroll keys:

4..20mA 0 to FSD for output 4 to 20 mA
 0..20mA 0 to FSD for output 0 to 20 mA

```
+Analog range +
$ 4..20 mA $
```

Only WP: Select parameter [If ADC error]

The following options can be selected using the scroll keys:

0mA analog error results in output 0mA
 4mA analog error results in output 4mA
 20mA analog error results in output 20mA
 hold the last value remains unchanged

```
+If ADC error +
$ 0 mA $
```

Only WP: Select parameter [If below zero]

The following options can be selected using the scroll keys:

0mA below zero results in output 0mA
 4mA below zero results in output 4mA
 20mA below zero results in output 20mA
 hold the last value remains unchanged

```
+If below zero +
$ 0 mA $
```

Only WP: Select parameter [If above FSD]

The following options can be selected using the scroll keys:

0mA above FSD results in output 0mA
 4mA above FSD results in output 4mA
 20mA above FSD results in output 20mA
 hold the last value remains unchanged

```
+If above FSD +
$ 0 mA $
```

 finishes the slot configuration.

¹ Scaling: output current = *anaout** 1 µA (across 0 and 20 mA)

4.2.2.6. Selection of the external alibi memory function

In this application, an external alibi memory can be configured. The external alibi memory is connected to a serial interface and will be written with a data set. This external alibi memory could be a printer or data storage unit with Flash card (z.B. Omniscale).

This functionality is independent of the internal alibi memory. (See chapter 6).

Select one of the following interfaces:

- off (no external alibi memory)
- Built in
- Slot1 RS485
- Slot1 RS232
- Slot2 RS485
- Slot2 RS232
- Slot3 RS485, only for PRO-X5 and PRO-X6
- Slot3 RS232, only for PRO-X5 and PRO-X6

```

+Ext. alibi memory +
      $      off      $
  
```

4.2.2.7. Selecting the number of print-out copies

Select parameter [Report copies]. The number of copies can be entered directly (1 ... 99). Value 0 suppresses the output, but makes the data available for the print repeat function (for digital input, fieldbus or communication). (See chapter 7)

```

+Report copies      +
                          3
  
```

4.2.2.8. Setting the sequence number

Although the sequence number is entered during configuration, it is not stored in EAROM. Therefore, start is with 1 after a cold start.

Select parameter "Sequence number" from the main menu of configuration. Enter the new number. The number is limited to 1 to 99999999.

The sequence number is incremented with each print-out (See chapter 7).

```

Sequence number
                12324
  
```

4.2.2.9. Identification name of the terminal

Select parameter "Scale identifier" from the main menu of configuration. Enter the identification name. This name is printed on the print-out.

```

+Scale identifier +
Station 1
  
```

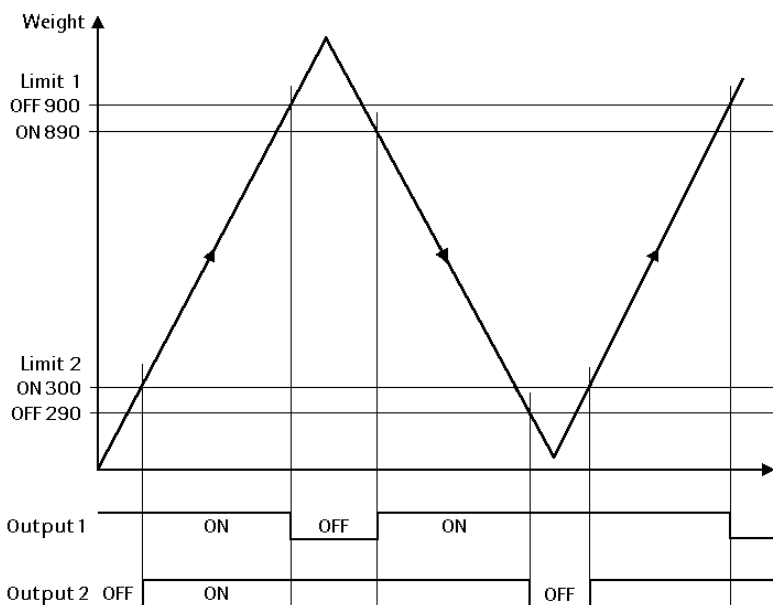
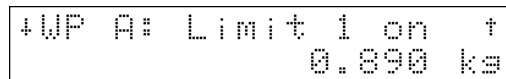
4.2.2.10. Entry of limit values

For each weighing point, two limit values can be entered. The result of limit value comparison can be used e.g. as digital output. The limit values are stored as a sequence of digits (as on the weight display). When changing the scale of the relevant WP, the weight value might be changed. After changing the scale, checking the limit values is indispensable. Each limit value comprises two parameters: switch-on point and switch-off point, in order to define a hysteresis. All limit values are entered according to the same procedure. The limit values for WP-A are:

- "WP-A: limit 1 on"
- "WP-A: limit 1 off"
- "WP-A: limit 2 on"
- "WP-A: limit 2 off"

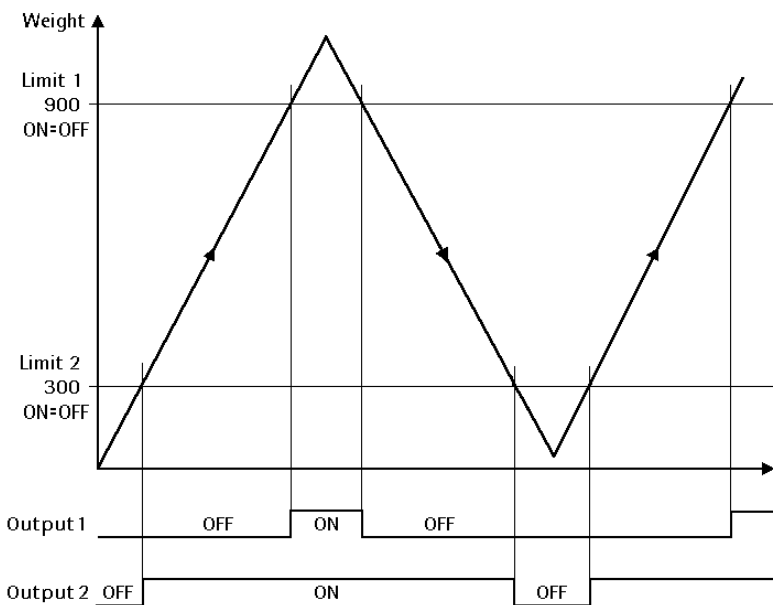
With a second weighing point, 4 further values must be configured (not applicable for PRO-X4).

Select the limit value to be configured using the cursor keys and enter the required value.



Example:

The output signal of limit contact 1 switches OFF above 900 kg, limit contact 2 switches OFF below 290 kg. The two limit contacts have a hysteresis of 10 kg. With power failure (both limit contacts OFF), the contacts indicate underfill and overfill simultaneously.



If the limit values for ON and OFF are equal, the limit contact switches ON, when the weight exceeds the value, and off, when the weight is below the value.

4.2.2.11. Factory settings

Inputs

only slot 1

| Input number | Function |
|--------------|--|
| 1 | Set tare WP-A |
| 2 | Reset tare WP-A |
| 3 | Set WP-A to zero |
| 4 | Protect 1, disable exit from the application |

Outputs

only slot 1

| Output number | Function |
|---------------|------------------------------|
| 1 | WP-A is tared |
| 2 | Standstill of WP-A |
| 3 | Limit value 1 of WP-A is set |
| 4 | Limit value 2 of WP-A is set |
| 5 | WP-A is zero |
| 6 | Weight of WP-A is valid |

Parameters

| Parameter | Value |
|---------------------|---------------------------------------|
| Ext. Alibi Memory | off |
| Print-out copies | 1 |
| Sequence number | 1 |
| Scale name | empty |
| Limit values | 0 in the format of the relevant scale |
| Analog output | Gross weight of WP-A |
| Analog range | 4..20mA |
| Analog error 1 ADC | 0=0mA |
| Analog error 2 <0 | 0=0mA |
| Analog error 3 >FSD | 0=0mA |

4.2.3. Input of predefined texts

These texts can be displayed via communication. The advantage is that they are already provided in the instrument and need not be transmitted. See chapter 5.2 .

The texts are stored in a database. A text is identified by the text for line 1 and a unique number within 1 ... 999. The text for line 2 is free. The two texts always have a maximum length of precisely 20 characters.

Press [Text] to enter predefined texts.

```
Configuration
Change# Text # Print
```


With [New], [Edit] and [Del]ete, the text database can be edited.

```
Text
New # Edit # Del
```


4.2.3.1. Entry of a new text

Press [New].


```
Text
New   #   Edit #   Del
```

Enter a number within 1 and 999 and press . The predefined text is addressed with this number via communication.

```
Number of text      0
```

Enter the text for line 1 and press . This text is also used for identification of the database entry, i.e. it must not be empty.







```
+Text line 1      †
                  Abort? †
```

Enter the text for line 2 and press . The text must be exactly like it should be shown later. When using the text with a function using softkeys the typical symbols are inserted on the display (by replacing the character in the text). This text may also remain empty and can contain the text of a dimension for numeric entries.

```
+Text line 2      †
  Yes                No
```

In the terminal mode, the two text entries would result in the following display.


```
                  Abort?
  Yes                No
```

For PRO-X4 the key  has to be pressed, until the corresponding LED is lit , and the cursor flashes. Now a new text can be entered. If the key  is pressed once more the LED is switched off and the text can be corrected or edited character by character with the keys  and . The text entry is terminated with the key .


4.2.3.2. Editing a text

Press [Edit].


```
Text
New      # Edit # Del
```

Select text and press .


```
+Warning#          †
                                     1
```





This text is also the content of the first line and can be edited. Text line editing is similar to the entry. Press .



```
+Text line 1      †
Warning#
```

Edit the text of line 2 and press .

```
Line 2#
   Yes                                     No
```

Leave the edit mode with .


After pressing the key [Edit] the last edited text appears. With the keys  and  all stored textes can be scrolled, and selected with key . As described above they can be edited or corrected via key .

After pressing the keys  and  a known text number can be entered. The text can also be edited or corrected as described above.

4.2.3.3. Deleting a text

The operator has to press [Delete].

```
Text
New      # Edit # Del
```

Select the text and press .

```
+Warning#          †
                                     1
```

Press [Yes] to delete the text.

```
Delete text
   Yes #           # No
```

Leave the delete mode with .

The procedure for deleting a text is the same as for editing a text, but instead of pressing the key [Edit] the key [Delete] has to be pressed.

4.2.4. Print-out of configuration data

When printing the first line, a check if printing was possible is done. In case of printer failure during printing, a time-out of 2 sec. is started for each print line. The print-out cannot be changed by 'Nice Label Express'.

From the configuration main menu

```
Configuration  
Change# Text # Print
```

Press key [Print].

All data and predefined texts are printed out.

```
Printing ...
```

Unless printing is possible, display during 2 sec:

```
Could not print
```

Print-out example:

```
Configuration data PRO-Controller - Rel 2.00
Datum: 2003.03.28 12:48
-----
```

Input configuration

```
Slot 1:          Digital input
  Input 1:       Tare A
  Input 2:       Reset tare A
  Input 3:       Set zero A
  Input 4:       Protection 1
  Input 5:       None
  Input 6:       None
Slot 2:          No function
Slot 3:          No function
```

Output configuration

```
Slot 1:          Digital output
  Output 1:      Standstill A
  Output 2:      1/4 d zero A
  Output 3:      Tared A
  Output 4:      Weight valid A
  Output 5:      Limit 1 A
  Output 6:      Limit 2 A
  Output 7:      None
  Output 8:      None
Slot 2:          No function
Slot 3:          Analog output
  Source of data: WP-A
  Analog range:  4..20mA
  Analog value:  Gross
  ADU error:     0mA
  Below zero:    4mA
  Above FSD:     20mA
```

```
Ext.Alibi memory: off
Report copies:    1
Sequence number:  20
Scale identifier: Filling station
```


Limits

```
1 on  for WP-A:  1.000 kg
1 off for WP-A:  0.900 kg
2 on  for WP-A:  4.500 kg
2 off for WP-A:  4.600 kg
1 on  for WP-B:  0.0 kg
1 off for WP-B:  0.0 kg
2 on  for WP-B:  0.0 kg
2 off for WP-B:  0.0 kg
```

```
Text #   Line 1                               Line 2
-----
   1     Warning:                            Mixer is not running
   2     Setpoint:
  21     Take a sample                        OK
  47     Product code:
```

4.2.5. Leaving the configuration

From the configuration main menu,

press key .


When selecting the parameters,

press .

If parameters were changed, the following menu is displayed:


[Yes] The modified parameters are taken over and stored in EAROM.

[No] All changes are cancelled.

 Editing can be continued.

```
Store data ?
Yes # # No
```

5. Main Programm

Only when the main program is busy, terminal functions and starting print-outs by external control signal are possible. Key  starts a print-out with entry into the alibi memory, even, if the main program is not running. Accesses via SPM or fieldbus to the main program functions (report printing, terminal) are handled at intervals of 50 ms.

5.1. "Start" program


Selecting the main program from the initial condition:


Press key [Start]


```
PRO-Controller
Start $Setup $Alibi
```

The application is now in the terminal mode. Via fieldbus or communication, free, independent inscription into the two display lines is possible via fieldbus or communication. Key pressing operations can also be read out (see "Terminal functions").

(The 2 text lines are deleted.)

A Weight print-out with entry into the internal and/or external alibi memory can be activated by pressing the print-key .

Via key , this mode can be left again, after a prompt was replied with [Yes].

When input function *protection1* is active (logical TRUE) (e.g. key switch),  is ignored.

The operator presses [Yes]. Now, the program is in the initial condition again.


```
Terminate program
Yes # No # Alibi
```

```
PRO-Controller
Start $Setup $Alibi
```

With [Alibi] the search and display function of the internal alibi memory can be called up. See 'Alibi memory'.

5.2. Terminal function

In the terminal function of a PRO-Controller the text display may be remote controlled by communication. Keys pressed by the operator can be read. To simplify the remote control, texts, numbers and weight values can be edited locally at a PRO-Controller. Only the edited value has to be read back. All texts can also be stored locally in the PRO-Controller and can be addressed by a textnumber.

The terminal function can always be cancelled by pressing key . A prompt is displayed.

5.2.1. Control

Terminal functions are controlled via two variables: "termfun" and "termstat". These variables can be read and written via DDE/OPC or Fieldbus connection. (See chapter 8 SPM and 10 Fieldbus)

termfun Determines the function to be executed (write MD 48 or fieldbus function 121)

- 0 No function
- 1... Execute function (see below)
- 1 Cancel function, corresponds to key Exit

termstat Returns the execution status: (read MD 49 or fieldbus function 121)

- 0 Terminal IDLE
- 1, ... Function finished (see below)
- 1 Terminal busy
- 2 General error
- 3 Unknown text number (database)

The functions get their input texts in line1 (upper display line) and line2 (lower display line) from the variables *dsp1* or *dsp2*.

When adding text number $N * 256$ to the function number (in "termfun"), *dsp1* and *dsp2* from the pre-defined text table are used.

General procedure between the communication master (PC or fieldbus-master) and the communication slave (PRO-Controller):

| Master | PRO-Controller |
|--|--|
| | After initialization, the variables <i>termfun</i> and <i>termstat</i> are 0. PRO-Controller is ready to execute a function. |
| Master writes text into variable <i>dsp1</i> and <i>dsp2</i> . | - no effect- |
| Master writes a function number e.g. 2 into <i>termfun</i> master waits for the status variable <i>termstat</i> > 0 | PRO-Controller sets the status <i>termstat</i> to -1 (busy) The pre defined function 2 is executed: PRO-Controller displays text of <i>dsp1</i> into line1 PRO-Controller displays text of <i>dsp2</i> into line2 and allows the operator to edit <i>dsp2</i> . |
| | The operator presses OK and ends the editing. |
| | PRO-Controller writes into <i>dsp2</i> with input PRO-Controller sets <i>termstat</i> to 1 (OK). PRO-Controller waits, that <i>termfun</i> will be reset to 0. As long as <i>termstat</i> was not set to 0, '!..' is displayed. |
| Master reads <i>termstat</i> <> 0. Master reads input text from <i>dsp2</i> . | - no effect- |
| Master writes function 0 into <i>termfun</i> and ends the dialog. | PRO-Controller sets <i>termstat</i> to 0 (Idle) and is ready again to expect a new function. The 2-line text display is empty again. |

5.2.2. Predefined functions

In addition to the simple terminal function, local value or text entry or output of messages via predefined functions at the instrument are possible.

This is controlled by parameter "Function type" on *termfun*.

Display function:

termfun = 1 → The text in line 1 and line 2 is updated permanently. Thereby the memory of *dsp1* is copied to line 1 and the memory of *dsp2* is copied to line 2. The function can be finished via *termfun* = -1 or key 'Exit'.

Example:

```
dsp1 = "Process working      "
dsp2 = "Please wait...       "
```

| | Display text |
|--------------------|-----------------------------------|
| <i>termfun</i> = 1 | Process workins Please wait... |

Input functions:

The text of memory *dsp1* is displayed in the upper display line.

During numerical inputs the text of *dsp2* is displayed behind the number as unit. Leading and trailing spaces are cut.

- termfun* = 2 → input of text, *dsp2* is displayed in line 2 and may be edited by the operator
- termfun* = 3 → input of a number with datatype integer. The value of the variable *editint* may be edited in line 2.
- termfun* = 4 → input of a number with datatype REAL. The value of the variable *editreal* may be edited in line 2.
- termfun* = 5 → input of a weight value. The variable *editwgtA* is edited in the weight format of weighing point "A" in line 2.
- termfun* = 6 → input of a weight value. The variable *editwgtB* is edited in the weight format of weighing point "B" in line 2.

Return value of the input function in *termstat* after pressing OK or Exit:

OK = 1 value was stored

Exit = 2 value was not stored

Example:

dsp1 = "Enter number....."

dsp2 = "pcs "

editint = 500

| | Display text |
|--------------------|--------------------------|
| <i>termfun</i> = 3 | Enter number 520_ pcs |

Message function:

The text of the variable *dsp1* is displayed in line1 of the display. The predefined texts of the 2nd line can be translated using *Translatelt*.

The message function expects an answer from the operator by pressing a softkey, [OK] or [Exit]. The answer is shown in the return value *termstat* after pressing a softkey:

OK = 1, Exit = 2, softkey1 = 3, softkey2 = 4, softkey3 = 5

| | Display text of the second line |
|---------------------|---|
| <i>termfun</i> = 10 | # OK # |
| <i>termfun</i> = 11 | # OK #Cancel |
| <i>termfun</i> = 12 | Abort #Retry #Ignore |
| <i>termfun</i> = 13 | Yes # # No |
| <i>termfun</i> = 14 | Yes # No #Cancel |
| <i>termfun</i> = 15 | Retry # #Cancel |
| <i>termfun</i> = 16 | Text in line 2 is taken from variable <i>dsp2</i> |

5.2.3. Predefined functions with predefined texts

With the predefined functions of the previous chapter, the texts for line 1 in *dsp1* and for line 2 in *dsp2* must be transmitted via communication. Alternative, predefined texts could be stored in the database of the PRO controller and must not be transmitted via communication. All texts in the database have a text number: 1...999, which addresses the both display texts. Via communication only a combination of this number and the function number is send.

When adding text number $N * 256$ to the function number (in "termfun"), *dsp1* and *dsp2* from the table of predefined texts are used.

Example:

Functions-type 1 (The text in line 1 and line 2 is updated permanently) and text 2 (from the predefined texts of the database)

termfun = Functions-type + Text-number * 256

termfun = 1 + 2 * 256

termfun = 513

Example during the configuration of the predefined texts.

Configuration parameter

Number of text in the database

Text for line 1:

Text for line 2:

Display during configuration

| | |
|----------------|---|
| Number of text | 2 |
|----------------|---|

| | |
|--------------|---|
| +Text line 1 | † |
| Abort? | |

| | |
|--------------|----|
| +Text line 2 | † |
| Yes | No |

Display during operation with *termfun*=513

| | Display text |
|----------------------|------------------|
| <i>termfun</i> = 513 | Abort? Yes No |

6. Alibi Memory

6.1. General

The alibi memory is used for W & M storage of weight data. It is indispensable, unless W & M tickets with copies are printed out. In this case, it must store the weight data for the required period of time. This is in the user's responsibility. The alibi memory must be configured according to the requirements. For use of the internal alibi memory for PRO-X5 and PRO-X6 the memory extension PR1713/05 and the licence PR8901/81 is needed. PRO-X4 has a built-in alibi memory of 1 MB.

Viewing the alibi memory is possible also after pressing [Exit] -> [Alibi] in the terminal mode. Printing is on the printer interface. Configurable under [Setup] -> [Serial Ports] -> [Printer device at].

An external alibi memory could be configured independent from the internal alibi memory. For that, an external memory could be connected, e.g. a Flash-card memory from Omniscale.

6.2. Internal alibi memory



6.2.1. Configuring the alibi memory

Configuring the memory is done during commissioning. Therefore the CAL switch has to be open. With the CAL switch closed, it can neither be deleted nor changed in its size subsequently. A cold start, or reconfiguration deletes the memory and its configuration. A data set has 64 bytes.

The memory requirement due to the application (all databases) must be taken into account by the user himself.

Press key [Alibi].

```
PRO-Controller
Start $Setup $Alibi
```

Provided that the number of entries is already configured, the number is displayed and can be changed and stored by pressing key . The database is created. Changing, even with the same number of entries, destroys the current database.  can be pressed to return. An automatic return to the start menu is made.


```
Number of entries:
                  1000
```

6.2.2. Show contents of the memory

Making an access to the alibi memory is like configuring, but the CAL switch must be closed.


6.2.3. Searching for date and time



Searching for date and time is started by pressing [Date].

Optionally, key  can be pressed to return to the alibi memory menu.

With [Date], the date of the last entry is displayed.



```
Search for
Date #Range # Seq
```

Another date can be entered with .



The time of the last entry for the selected date is displayed. Press / to display further times of weighing operations for this date.

```
Date#
2002-04-11
```

```
Date#
2002-04-12
```

Press  to display the data of the selected entry with sequence number, weighing point and weight mode. The weight value appears on the weight display. To print-out the selected data press .


```
2002-04-12 Time#
+11:41:42.00 †
```

Press / to display further entries for this date. The type of weight can be "Gross", "Net", "Tare" or "Calcul" for calculated weight, e.g. a sum.



```
2002-04-12 11:41.02
+#41 A-Gross†
```



```
2002-04-12 11:48:26
+#11 A-Gross†
```

6.2.4. Searching for a sequence number


Searching for a sequence number is started by pressing [Seq]. Optionally, key  can be pressed to return to the alibi memory menu.

The number of the last weighing sequence is displayed. A different sequence number can be entered.

Press  to display the data of the selected entry with sequence number, weighing point and weight mode. The weight value appears on the weight display. To print-out the selected data press .

Press / to display further entries with the same sequence number.

The type of weight can be "Gross", "Net", "Tare" or "Calcul" for calculated weight, e.g. a sum.

Return to the sequence number entry by pressing key .

```
Search for
Date #Range # Seq
```

```
Sequence number
12
```

```
Sequence number
11
```

```
2002-04-12 11:46:13
+ #11 A-Gross†
```


```
2002-04-12 11:48:26
+ #11 A-Gross†
```



```
Sequence number
11
```

6.2.5. Printing a range



Select [Range] to choose the range entry for the weighing data print-out.

The date of the first entry in the alibi memory is displayed.

Another date can be entered by pressing key .

The time of the first entry for the selected date is displayed. Press / to display further entries for this date.

Unless an entry for the selected date exists, an error message is displayed during 3 s. Subsequently, the date entry must be repeated.

Press key  to select the start of the list. The date of the last entry is displayed. Another date can be entered and stored by pressing key . Unless an entry for the selected date exists, an error message is displayed during 3 s. Subsequently, this date entry must be repeated.



```
Search for
Date #Range # Seq
```


```
First date:
2002-04-12
```

```
2002-04-12 Time:
+ 11:41:42.00 †
```

```
No matching entry !
```

```
Last date:
2002-04-16
```

Keys / can be pressed to display all entries for the defined period.

Press  to select the end of the list and to activate the print-out. All weighing data for the defined period with date, time, sequence number, weight mode, weighing point and weight are printed out.

```
2002-04-12 Time:
+11:41:42.00      †
```

```
Printing . . .
```

6.2.6. Weight print-out

The serial interface for the print-out could be set at the configuration parameter [Setup] -> [Serial Ports] -> [Printer device at]. The print-out is one line per measured value, independent of whether a single measured value or a range is printed. The printer needs no W&M approval.

```
2001-01-31 17:51:21 #12345678 Gross A <123.45 kg>
```

The date format is YYYY.MM.DD. Unless the weight is gross, net, tare or calculated, '???' instead of the type is printed. With faulty CRC, '-----' instead of the weight is printed.

6.2.7. Data in the alibi memory

- Weight value contains the weight, the weight type and the weighing point identification (WEIGHT)
- Date and time (DT)
- Operation number within 1 and 999999 (DINT).
- Modified CRC-16 (WORD). The type of modification is not stated. I.e., stored data cannot be changed also by application programming. Records with faulty CRC check get a sequence of minus signs instead of the weight.

The data are stored in a ring memory. After the memory is full, more new data shift the oldest data out of the memory.

6.2.8. Size of the alibi memory

Activating the internal alibi memory requires for PRO-X5 and PRO-X6 the memory extension PR 1713/05. PRO-X4 has already a alibi memory of 1 MB installed.

For the application program, 100 kbytes are reserved for the dynamic memory, e.g. databases. Depend-ent of the firmware version, approx. 200 kbytes are occupied by system and application.

When creating the database, the entry is limited to the actual conditions due to already used memory space, i.e. the actual memory extension and the memory requirement of the firmware are taken into account.

For operation, a separate main program which can be called up at the uppermost operating level of the PRO-Controllers is used. The program comprises the following functions:

- Configuration, when the CAL switch is open.
- Search and print-out of data sets, when the CAL switch is closed.

6.2.9. Time behaviour of the alibi memory

As the database can contain several thousand entries, execution times in the range of seconds must be expected with accesses. The time requirement for execution of a database operation increases with the number of possible entries. Therefore, the configuration should provide only the indispensable number of entries. During searching in the database, 3 dots are indicated in the upper left corner of the two-line display.

6.3. External alibi memory

During configuration, the external alibi memory can be switched off or allocated to one of the serial interfaces. The interface must be configured dependent of connected instrument. The dataset is not configurable. This functionality is independent of the internal alibi memory.

For the external alibi memory, a separate interface must be specified during configuration.

Print-out format:

```
2002-10-30-11:06:59 #27          Gross  A    <00.277 kg>
```

Unless the interface is available, a message "Cannot print / alibi" is output during 3 sec.

7. Print-Outs

7.1. Starting a print-out

For activating a print-out, the application must be in the main program!

The serial interface for the print-out could be set at the configuration parameter [Setup] -> [Serial Ports] -> [Printer device at].

If a print-out is started, a new data set with weight, sequence number, date and time is generated. These data are provided for DDE/OPC-communication in the variables *seq_alibi*, *wgt_alibi*, *date_alibi*, *time_alibi*, *wp_alibi* and *typ_alibi*. See chapter 8 SPM.

For fieldbus these data are stored in the read address 160 to 164. See chapter 10 Fieldbus.

The process can be started by the following signals:


1. The "Print" key on the instrument front panel
2. Digital input prints the configured number of copies with new data.
3. The fieldbus function prints according to *repofun*.
4. EWCOM (m command) or Modbus prints according to *repofun*.
5. EWCOM WA command starts 1 print-out
6. DDE / OPC signal according to *repofun*.

If an internal alibi memory is activated, the data set is written into the alibi memory.

If an external alibi memory is activated, the data set is printed to the serial interface.

If "Error ..." is displayed on the scale, if the gross weight is negative or $< 50d$ (defined in the weighing point configuration) printing is not possible. "Cannot Print / Alibi" is displayed and *repostat* = -1 is set.

7.1.1. Start with "Print"-Key

The  key on the instrument front panel prints the configured number of copies with new data. The key functions also when the main program is not busy. To allow a print-out, the configuration parameter 'Report copies' has to set to 1 or greater.

7.1.2. Start with digital input

In the configuration of the digital inputs, two functions are possible:

1. "Start printout" A new data set is generated, printed and stored into the alibi memory.
2. "Repeat printout" The old data set is printed again.

7.1.3. Start print-out via communication

Print-out is controlled via 2 variables. These variables could be accessed by DDE / OPC, Fieldbus, EWCOM (m-commands) or Modbus.

repofun indicates the number of print-outs
 0 = no function
 1 ... = number of copies ²
 257, ... = repeat last print-out *repofun* – 256 times
 -1 = cancel function

repostat returns the execution status
 0 = print function is idle
 1 ... = number of still unfinished print-outs
 -1 = an error occurred

Procedure:

| Master | Slave |
|------------------------------------|--|
| | After initialization <i>repofun</i> = 0 and <i>repostat</i> = 0 |
| Master writes <i>repofun</i> >= 1. | PRO-Controller sets <i>repostat</i> = <i>repofun</i> and starts the print-out. |
| | PRO-Controller decrements <i>repostat</i> as soon as a print-out was finished. |
| | After the last print-out <i>repostat</i> = 0, <i>repofun</i> is set to 0. The print-out is finished. |

These datas are provided for DDE/OPC-communication in the variables *seq_alibi*, *wgt_alibi*, *date_alibi*, *time_alibi*, *wp_alibi* and *typ_alibi*. See chapter 8 SPM.

For fieldbus these datas are stored in the read address 160 to 164. See chapter 10 Fieldbus.

7.1.4. Start with EWCOM WA-command

With the communication command "WA" a print out is started with (gross weight with non-tared / net weight with tared), read sequence number and date-time. According to the configuration, writing is done in the internal and/or external alibi memory and/or a print-out is started.

See chapter 9 PC connection.

² Multiple print-out is only purposeful with NLE, if the print-out is delivered at the end. With a single print-out, the datasets are separated by 2 empty lines.

7.2. Nice Label Express

Reports can be printed directly or via NLE. The name of the NLE file is "WGT.LBL". Unless a layout generated by NLE exists, printing is done directly with a fixed format.

Print out activation can be started via "Print", digital input, EW communication or DDE/OPC. The logic printer interface is used.

For creating a self-defined report, program Nice Label Express is required. With these reports, all variable contents (e.g. weights) and fixed texts (e.g. "sequence number") are included into the report by variables. I.e. the user can create his language adaptations with TranslateIt also for NLE. In these cases, calling up "Nice Label Express" is not necessary. For "Nice Label Express", a fixed structure of variables is made available from the application.

| Variable for NLE | Type | Internal name | Description |
|---|--------|------------------|--|
| datetime | STR20 | <i>dt_alibi</i> | Date |
| onlytime | STR20 | <i>dt_alibi</i> | Time |
| seqnum | UDINT | <i>seq_alibi</i> | Sequence number |
| wp_id | STR2 | <i>wp_alibi</i> | Weighing point "A", "B" |
| gross | WEIGHT | <i>wgt_gross</i> | Gross weight |
| net | WEIGHT | <i>wgt_net</i> | Net weight |
| tare | WEIGHT | <i>wgt_tare</i> | Tare weight |
| actual | WEIGHT | <i>wgt_alibi</i> | With tared: net weight, otherwise gross weight |
| mode | STR20 | <i>typ_alibi</i> | Text <i>tgross</i> or <i>tnet</i> , according to <i>actual</i> |
| scale | STR20 | | Instrument identification name |
| text1 | STR20 | <i>text1</i> | Free text via communication or terminal function |
| text2 | STR20 | <i>text2</i> | Free text via communication or terminal function |
| text3 | STR20 | <i>text3</i> | Free text via communication or terminal function |
| editstr | STR20 | <i>dsp2</i> | Text to be edited via communication or terminal function |
| editint | DINT; | <i>editint</i> | Number to be edited via communication or terminal function |
| editreal | REAL | <i>editreal</i> | Number to be edited via communication or terminal function |
| editwgt | WEIGHT | editwgt | Weight to be edited via communication or terminal function |
| num1 | DINT | <i>num1</i> | Free number to be set via communication |
| num2 | DINT | <i>num2</i> | Free number to be set via communication |
| num3 | DINT | <i>num3</i> | Free number to be set via communication |
| Texts which must be translated using TranslateIt : | | | |
| tscal | STR20 | | Scale: |
| thead | STR20 | | Weight printout: |
| tseq | STR20 | | Sequence: |
| tdate | STR20 | | Date: |
| ttime | STR20 | | Time: |
| tgross | STR20 | | Gross: |
| tnet | STR20 | | Net: |
| ttare | STR20 | | Tare: |

7.3. Predefined report

Unless an NLE layout was defined, a simple weight report is printed out.

```
Scale:      Filling station
Sequence:   27
Date:       30.10.2002
Time:       11:06:59
Gross:      A    <00.277 kg>
Net:        A    <00.277 kg>
Tare:       A    <00.000 kg>
>
```

8. SPM

8.1. SPM-Layout

Direct access to the SPM is possible via DDE, OPC, EWCOM, DUST or ModBus. Areas

- MB 0 ... MB 127
- MB 707 ... MB 1023

are occupied by firmware functions.

Weights are always REAL in 'kg' or 'lb', dependent of scale configuration. Exception: weights from the **firmware** (DINT).

| Address | MSBit in MX | Format | Name | Description |
|---------|-------------|------------|-----------------|--|
| MX 139 | 139 | BOOL | | Set WP-A to zero |
| MX 140 | 140 | BOOL | | Set tare WP-A |
| MX 141 | 141 | BOOL | | Reset tare WP-A |
| MX 155 | 155 | BOOL | | Set WP-B to zero |
| MX 156 | 156 | BOOL | | Set tare WP-B |
| MX 157 | 157 | BOOL | | Reset tare WP-B |
| MX 430 | 430 | BOOL | <i>protect2</i> | Key switch for disabling 'Setup', copy of the relevant digital input |
| | | | | |
| MX 568 | 568 | BOOL | | WP-A in standstill |
| MX 569 | 569 | BOOL | | WP-A within 1/4 d |
| MX 574 | 574 | BOOL | | WP-A tared |
| MX 632 | 632 | BOOL | | WP-B in standstill, only PRO-X5 and PRO-X6 |
| MX 633 | 633 | BOOL | | WP-B within 1/4 d, only PRO-X5 and PRO-X6 |
| MX 638 | 638 | BOOL | | WP-B tared, only PRO-X5 and PRO-X6 |
| | | | | |
| MD 32 | 1024 | Array BOOL | | Slot 1 digital outputs |
| MD 33 | 1056 | Array BOOL | | Slot 2 digital outputs |
| MD 34 | 1088 | Array BOOL | | Slot 3 digital outputs |
| MD 35 | 1120 | Array BOOL | | Slot 1 digital inputs |
| MD 36 | 1152 | Array BOOL | | Slot 2 digital inputs |
| MD 37 | 1184 | Array BOOL | | Slot 3 digital inputs |
| MB 152 | 1216 | BYTE | | Outputs 1 to 8 to be set directly via communication |
| MX 1216 | 1216 | BOOL | | Bit 1 (union) |
| MX 1217 | 1217 | BOOL | | Bit 2 |
| MX 1218 | 1218 | BOOL | | Bit 3 |
| MX 1219 | 1219 | BOOL | | Bit 4 |
| MX 1220 | 1220 | BOOL | | Bit 5 |
| MX 1221 | 1221 | BOOL | | Bit 6 |
| MX 1222 | 1222 | BOOL | | Bit 7 |
| MX 1223 | 1223 | BOOL | | Bit 8 |
| MX 1248 | 1248 | BOOL | run | Program START busy |
| MW 80 | 1280 | UINT | anain1 | Analog input 1 of the 1st analog input card |
| MW 81 | 1296 | UINT | anain2 | Analog input 2 |
| MW 82 | 1312 | UINT | anain3 | Analog input 3 |
| MW 83 | 1328 | UINT | anain4 | Analog input 4 |
| MW 85 | 1344 | UINT | anaout | Analog output of the 1st analog output card |
| MD 42 | 1344 | UDINT | bcdout | BCD output |
| MX 1376 | 1376 | BOOL | | Hold output value Slot 1 |

| | | | | |
|---------|------|-------|-------------|--|
| MX 1377 | 1377 | BOOL | | Hold output value Slot 2 |
| MX 1378 | 1377 | BOOL | | Hold output value Slot 3 |
| MX 1384 | 1384 | BOOL | | WP-A limit 1 |
| MX 1385 | 1385 | BOOL | | WP-A limit 2 |
| MX 1386 | 1386 | BOOL | | WP-B limit 1, only PRO-X5 and PRO-X6 |
| MX 1387 | 1387 | BOOL | | WP-B limit 2, only PRO-X5 and PRO-X6 |
| MX 1388 | 1388 | BOOL | | WP-A data are valid |
| MX 1389 | 1389 | BOOL | | WP-A scale not ready |
| MX 1390 | 1390 | BOOL | | WP-B data are valid, only PRO-X5 and PRO-X6 |
| MX 1391 | 1391 | BOOL | | WP-B scale not ready, only PRO-X5 and PRO-X6 |
| MX 1392 | 1392 | BOOL | | WP-A tared with fixed tare value from MD 104 at increasing flank |
| MX 1393 | 1393 | BOOL | | WP-B tared with fixed tare value from MD 105 at increasing flank, only PRO-X5 and PRO-X6 |
| MB 176 | 1408 | SINT | dimA | WP-A dimension (g, kg, t, lb) ³ |
| MB 177 | 1416 | SINT | expA | WP-A exponent ⁴ |
| MB 178 | 1424 | SINT | dimB | WP-B dimension (g, kg, t, lb), only PRO-X5 and PRO-X6 |
| MB 179 | 1432 | SINT | expB | WP-B exponent, only PRO-X5 and PRO-X6 |
| MD 46 | 1472 | DINT | | Counts for user WP, copy of the 1st analog input |
| MD 48 | 1536 | DINT | termfun | Dialogue: function code ⁵ |
| MD 49 | 1568 | DINT | termstat | Dialogue: status |
| MB 203 | 1624 | STR20 | dsp1 | Dialog: display line 1, length |
| MB 203 | 1624 | USINT | | Length (union) |
| MD 51 | 1632 | DINT | | Characters 1 ... 4 (union) |
| MD 52 | 1664 | DINT | | Characters 5 ... 8 |
| MD 53 | 1696 | DINT | | Characters 9 ... 12 |
| MD 54 | 1728 | DINT | | Characters 13 ... 16 |
| MD 55 | 1760 | DINT | | Characters 17 ... 20 |
| MB 227 | 1816 | STR20 | dsp2 | Dialogue: display line 2 and string input, length |
| MB 227 | 1816 | USINT | | Length (union) |
| MD 57 | 1824 | DINT | | Characters 1 ... 4 |
| MD 58 | 1856 | DINT | | Characters 5 ... 8 |
| MD 59 | 1888 | DINT | | Characters 9 ... 12 |
| MD 60 | 1920 | DINT | | Characters 13 ... 16 |
| MD 61 | 1952 | DINT | | Characters 17 ... 20 |
| MD 62 | 1984 | DINT | editint | Dialogue: numeric input |
| MD 63 | 2016 | REAL | editreal | Dialogue: last numeric input |
| MD 64 | 2048 | REAL | editweightA | Dialogue: weight input format WP-A |
| MD 65 | 2080 | REAL | editweightB | Dialogue: weight input format WP-B, only PRO-X5 and PRO-X6 |
| MD 66 | 2112 | DINT | repofun | Print-out: function n new data, print n times, enter ALIBI n + 256 old data, print n times, 0 done -1 error |
| MD 67 | 2144 | DINT | repostat | Print-out: status |

³ Dimension: 0: no, 1: mg, 2: g, 3: kg, 4: t, 5: lb, 6: l, 7: sec, 8...16: userdefined.

⁴ Weight = 'readout' * 10^{expA}. 'readout' is a weight value in DINT-format = number representation as display.

⁵ For all texts: Only characters for text allowed which may be represented by the display or printable. No cursor control or line deleting characters allowed. The length of text is set automatically to 20 characters before output.

| | | | | |
|---------|------|-------|--------------------|---|
| | | | | > 0 copies still to be printed 0 done -1 error |
| MD 68 | 2176 | DINT | <i>seq_alibi</i> | Print-out: sequence number |
| MD 69 | 2208 | REAL | <i>wgt_alibi</i> | Print-out: weight in WP-A format |
| MD 70 | 2240 | DINT | <i>date_alibi</i> | Print-out: date, format: BCD – YYYYMMDD (union) |
| MD 71 | 2272 | DINT | <i>time_alibi</i> | Print-out: time, format: BCD – HHMMSSCC |
| MB 288 | 2304 | USINT | <i>wp_alibi</i> | Print-out: weighing point 'A' or 'B' -> 1 or 2 |
| MB 289 | 2312 | USINT | <i>typ_alibi</i> | Print-out: weight type 0 gross weight 1 net weight |
| MX 2320 | 2320 | BOOL | <i>tared_alibi</i> | Print-out: tared |
| MB 291 | 2328 | STR20 | <i>text1</i> | Print-out: text 1 |
| MB 291 | 2328 | USINT | | Length (union) |
| MD 73 | 2336 | DINT | | Characters 1 ... 4 |
| MD 74 | 2368 | DINT | | Characters 5 ... 8 |
| MD 75 | 2400 | DINT | | Characters 9 ... 12 |
| MD 76 | 2432 | DINT | | Characters 13 ... 16 |
| MD 77 | 2464 | DINT | | Characters 17 ... 20 |
| MB 315 | 2520 | STR20 | <i>text2</i> | Print-out: text 2 |
| MB 315 | 2520 | USINT | | Length (union) |
| MD 79 | 2528 | DINT | | Characters 1 ... 4 |
| MD 80 | 2560 | DINT | | Characters 5 ... 8 |
| MD 81 | 2592 | DINT | | Characters 9 ... 12 |
| MD 82 | 2624 | DINT | | Characters 13 ... 16 |
| MD 83 | 2656 | DINT | | Characters 17 ... 20 |
| MB 339 | 2712 | STR20 | <i>text3</i> | Print-out: text 3, length |
| MB 339 | 2712 | USINT | | Length (union) |
| MD 85 | 2720 | DINT | | Characters 1 ... 4 |
| MD 86 | 2752 | DINT | | Characters 5 ... 8 |
| MD 87 | 2784 | DINT | | Characters 9 ... 12 |
| MD 88 | 2816 | DINT | | Characters 13 ... 16 |
| MD 89 | 2848 | DINT | | Characters 17 ... 20 |
| MD 96 | 3072 | REAL | | Limit 1 WP-A on in the format of WP |
| MD 97 | 3104 | REAL | | Limit 1 WP-A off in the format of WP |
| MD 98 | 3136 | REAL | | Limit 2 WP-A on in the format of WP |
| MD 99 | 3168 | REAL | | Limit 2 WP-A off in the format of WP |
| MD 100 | 3200 | REAL | | Limit 1 WP-B on in the format of WP |
| MD 101 | 3232 | REAL | | Limit 1 WP-B off in the format of WP |
| MD 102 | 3264 | REAL | | Limit 2 WP-B on in the format of WP |
| MD 103 | 3296 | REAL | | Limit 2 WP-B off in the format of WP |
| MD 104 | 3328 | REAL | | Fixtare in the format of WP-A→MX 1392 |
| MD 105 | 3360 | REAL | | Fixtare in the format of WP-B→MX 1393, only for PRO-X5 and PRO-X6 |
| MD 110 | 3520 | DINT | | Used internally |
| MD 111 | 3552 | DINT | | Used internally |

| | | | | |
|--------|------|------|--|--|
| MD 112 | 3584 | REAL | | Fullscale value WP-A |
| MD 113 | 3616 | REAL | | Gross weight WP-A ⁶ |
| MD 114 | 3648 | REAL | | Net weight WP-A |
| MD 115 | 3680 | REAL | | Tara WP-A |
| MD 116 | 3712 | REAL | | Fullscale value WP-B, only PRO-X5 and PRO-X6 |
| MD 117 | 3744 | REAL | | Gross weight WP-B, only PRO-X5 and PRO-X6 |
| MD 118 | 3776 | REAL | | Net weight WP-B, only PRO-X5 and PRO-X6 |
| MD 119 | 3808 | REAL | | Tare WP-B, only PRO-X5 and PRO-X6 |

8.2. Festtara via SPM

Per SPM kann die Waage mit einem festen Wert tariert werden.

| | |
|---|---|
| Via Kommunikation wird der Festtara Speicher (MR 104 bzw MR 105) mit dem gewünschten Wert beschrieben. Der Wert darf FSD nicht überschreiten. | |
| Via Kommunikation wird mit der ansteigenden Flanke des Steuerbits (MX 1392 bzw MX 1393) der Wert übernommen und damit tariert. | Der PRO-Controller tariert mit dem Wert im Festtara Speicher. Es darf bereits tariert sein. Es wird nicht tariert, wenn der Wert ungültig ist. Es wird in dem Fall aber auch nicht enttariert, falls bereits tariert wurde. |
| Das Steuerbit wird via Kommunikation zurückgesetzt. | |

⁶ Weights are in 'kg' or 'lb'. On error the value is 0.0, e.g. on net if not tared.

9. PR 1613 Commands

This function requires license PR1713/31. Requests via the serial interface are handled at intervals of 100 ms.

Note: If necessary, further commands can be added in a software project.

9.1.1. Commands for indicator function:

| Command | Reply | Description |
|------------|---|---|
| WGA WGB | QGA wwwwwemz QGB wwwwwemz | Read gross weight |
| WNA WNB | QNA wwwwwemz QNB wwwwwemz | Read net weight |
| WTA WTB | QTA wwwwwemz QTB wwwwwemz | Read tare weight |
| WA | QA wwwwwwe sssssssss YYMMDDhhmmss | Start alibi printing (gross weight with non-tared / net weight with tared), read sequence number and date-time. According to the configuration, writing is done in the internal and/or external alibi memory and/or a print-out is started. |
| WZA WZB | Q | Set zero |
| WSA WSB | Q | Set tare |
| WFA WFB | Q | Reset tare |

wwwwwwe weight, description with PR16xx. With scales with 6 digits, 'E10000' is replied.
 m '1' with scale standstill
 z '1' = tared, '4' = 1/4 d, '5' = tared and 1/4 d
 ssssssssss sequence number, e.g. 0000000013
 YYMMDDhhmmss date and time

Note:

To use the function 'WA', the main program has to run (Alibi memory must have access to the display!). The reply telegram is send, when the Alibi entry is made and printed. This will take with the intern Alibi memory a minimum of 3 sec. After 20 sec the error message 'E70000' is send (timeout).

9.1.2. Errors

| Error | Description |
|--------|--|
| E20000 | Unknown command |
| E10000 | General error |
| E1xxxx | Error in the analog section |
| E50000 | Analog test is active |
| E60000 | Invalid weighing point |
| E70000 | Required function is still active or not available |

10. Fieldbus

A PRO-Controller can be used as fieldbus slave for Profibus, Interbus-S or DeviceNet by inserting a fieldbus interface card into slot 4. I.e. one or several PRO-Controllers can be connected to a communication master (e.g. Siemens S7 Profibus). Data on the fieldbus are handled at intervals of 20 ms. Weights are always REAL in 'kg' or 'lb', dependent of scale configuration.

10.1. Configuration

Configuration parameters in menu section [Setup]-[Fieldbus]:

[Protocol] The protocol, e.g. Profibus-DP, can be selected.
 [Scale Interface] For using the fieldbus interface as described here, parameter [Scale Interface] must be set to 'enabled'.

10.2. Application protocol

The interface operates with a 2 * 8 byte write window and a 2 * 8 byte read window. The windows are allocated to the weighing points. The field exchanges its data cyclically from each slave. This means: in each cycle, 8 bytes are written and 8 bytes are read, also with unchanged data contents. Via window 2 (allocated to WP-B), the firmware functions and WP-specific functions are available. The functions related to the instrument are handled via window 1 (allocated to WP-A).

The application protocol described in this chapter is independent of the selected fieldbus and shown from the fieldbus master's view.

10.2.1. Write window

In this window, data are transmitted from the master to the slave (PRO-Controller).

The first four bytes are used for writing a data value.

| | |
|--------|------------------------|
| Byte 0 | Write data: MSB |
| Byte 1 | " |
| Byte 2 | " |
| Byte 3 | Write data: LSB |
| Byte 4 | Read data type request |
| Byte 5 | Write data type |
| Byte 6 | Direct control bits |
| Byte 7 | Direct control bits |

The type of these data is written in byte 5.

The bits in bytes 6 and 7 are independent of the write value data type in direct access.

Procedure for writing a parameter:

Wait, until *write_handshake* = 0 in the read window (PR1713 is ready to receive new data)

Write value into bytes 0 to 3

Write data type into byte 5 (*write data type request*)

Wait, until *write_handshake* = 1 (PRO-Controller confirms data reception) write 0 into byte 5 (*write data type request*) -> *write_handshake* is set to 0.

10.2.2. Read window

In this window, data are transmitted from the slave (PRO-Controller) to the master.

The first four bytes are used for reading a data value.

The type of these data is given in byte 4. The data type corresponds to the request in the write data window.

Bytes 6 and 7 contain status bits independent of the read value data types.

| | |
|--------|--|
| Byte 0 | Read data: MSB |
| Byte 1 | " |
| Byte 2 | " |
| Byte 3 | Read data: LSB |
| Byte 4 | Echo of read data type request |
| Byte 5 | General system bits: Writehandshake power_fail analog error ... |
| Byte 6 | Status bits |
| Byte 7 | Status bits |

For reading status bits and writing direct control bits, a procedure is not required. General system bits and status bits are always present and need not be requested. The direct control bits are also available continuously.

Procedure for reading a parameter:

1. Write the type of data / parameters into byte 4 of the write window (e.g. net weight) as *read data type request*.
2. Wait until, in the 4th byte of the read window, the echo of *read data type request* is equal to the *read data type* of the 4th byte in the write window.
3. Now, the value is available in bytes 0 to 3.

10.3. Data formats

Write the **DINT** value *editint* 4660 (1234 hex)

Write window: byte number value 132 (84 hex)

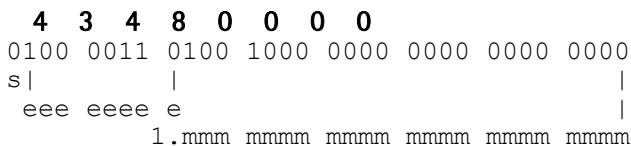
| | | | | | | | |
|----|----|----|----|---|----|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 00 | 00 | 12 | 34 | | 84 | | |

The **REAL** format according to IEEE 754 ; IEC 60559

REAL : 32 bit = 1 bit sign, 8 bit exponent bias 127, 23 bit mantissa

Example:

200 = 43 48 00 00



Sign = 0
Exponent = 10000110 = 134 - bias 127 = 7

MANTISSA = 1.100 1000 0000 0000 0000 0000 = 1,5625 * 2⁷ = 200

STRING is always 20 characters long and is transmitted in portions of 5 * 4 characters.

10.4. Write data

All write values are addressed by *write_data_type_request*. The WP-typical data are accessible via various write windows. The data which are independent of the WP can be reached via the write window of WP-A or WP-B.

| Value in byte 5 <i>Write data type request</i> | | Write data in byte 0...3 (parameters) for functions independent of WP-A |
|---|--------------------|---|
| Dec | Name | |
| 24 | | Limit1_on value [REAL] WP-A |
| 25 | | Limit1_off value [REAL] WP-A |
| 26 | | Limit2_on value [REAL] WP-A |
| 27 | | Limit2_off value [REAL] WP-A |
| 31 | | Fixtare [REAL] WP-A |
| 112 | | Set WP-A to zero no write data required |
| 113 | | Set tare WP-A no write data are required |
| 114 | | Reset tare WP-A no write data required |
| 115 | | Activate test WP-A no write data required |
| 116 | | Reset test WP-A no write data required |
| 121 | <i>termfun</i> | Dialogue: function code |
| 122 | <i>dsp1</i> | Line 1 for display; [characters 1...4] ⁷ |
| 123 | | Line 1 for display; [characters 5...8] |
| 124 | | Line 1 for display; [characters 9...12] |
| 125 | | Line 1 for display; [characters 13...16] |
| 126 | | Line 1 for display; [characters 17...20] |
| 127 | <i>dsp2</i> | Line 2 for display; [characters 1...4] |
| 128 | | Line 2 for display; [characters 5...8] |
| 129 | | Line 2 for display; [characters 9...12] |
| 130 | | Line 2 for display; [characters 13...16] |
| 131 | | Line 2 for display; [characters 17...20] |
| 132 | <i>editint</i> | Dialogue: numeric input |
| 133 | <i>editreal</i> | Dialogue: numeric input |
| 134 | <i>editweightA</i> | Dialogue:weight input in the WP-A format |
| 141 | <i>repofun</i> | Report: start print-out |
| 142 | <i>text1</i> | Text1; [characters 1...4] |
| 143 | | Text1; [characters 5...8] |
| 144 | | Text1; [characters 9...12] |
| 145 | | Text1; [characters 13...16] |
| 146 | | Text1; [characters 17...20] |
| 147 | <i>text2</i> | Text2; [characters 1...4] |
| 148 | | Text2; [characters 5...8] |
| 149 | | Text2; [characters 9...12] |
| 150 | | Text2; [characters 13...16] |
| 151 | | Text2; [characters 17...20] |
| 152 | <i>text3</i> | Text3; [characters 1...4] |
| 153 | | Text3; [characters 5...8] |
| 154 | | Text3; [characters 9...12] |
| 155 | | Text3; [characters 13...16] |
| 156 | | Text3; [characters 17...20] |

⁷ Valid for all texts: Bevor the funktion, which uses the texts, is activated, all 5 parts have to be send (5 * 4 character)

| | | |
|-----|-------------|-------------------------------------|
| 157 | <i>num1</i> | Report: free number for print-out |
| 158 | <i>num2</i> | Report: free number for print-out |
| 159 | <i>num3</i> | Report: free number for print-out |
| 180 | | Analog output value [DINT] |
| 184 | | Output signals bits 1...8 [=1 byte] |

| Value in byte 5 <i>Write data type request</i> | | Write data in bytes 0...3 (parameters) for WP-B |
|---|--------------------|--|
| Dec | Name | |
| 24 | | Limit1_on value [DINT] WP-B |
| 25 | | Limit1_off value [DINT] WP-B |
| 26 | | Limit2_on value [DINT] WP-B |
| 27 | | Limit2_off value [DINT] WP-B |
| 31 | | Fixtare [DINT] WP-B |
| 112 | | Set WP-B to zero, no write data required, only PRO-X5 and PRO-X6 |
| 113 | | Set tare WP-B, no write data required, only PRO-X5 and PRO-X6 |
| 114 | | Reset tare WP-B, no write data required, only PRO-X5 and PRO-X6 |
| 115 | | Activate test WP-B, no write data required, only PRO-X5 and PRO-X6 |
| 116 | | Reset test WP-B, no write data required, only PRO-X5 and PRO-X6 |
| 134 | <i>editweightB</i> | Dialogue weight input in WP-B format, only PRO-X5 and PRO-X6 |

Direct control bits (write bits for the fieldbus master, separate windows for WP-A and WP-B):

| | bit 7 | bit 6 | bit 5 | bit 4 | bit 3 | bit 2 | bit 1 | bit 0 |
|---------------|----------------|--------------|-----------------|----------|---------|------------|----------|----------|
| Byte 6 | | | | | | | | |
| Byte 7 | use as fixtare | set fix-tare | reset powerfail | test off | test on | reset tare | set tare | set zero |

Note: The addresses shown with gray background and the control bits are handled by the firmware section of the interface. All control bits react only on a 0 -> 1 transition. To detect a transition, the status must be present during at least 40 ms. Weights from this area are in READOUT format, **not** REAL !

- Use as fixtare set the fixtare value with the current weight
- Set fixtare tare the scale with the fixtare value
- Reset power fail reset power fail flag
- Test off de-activate analog test
- Test on activate the analog test
- Reset tare the scale tare is reset
- Set tare the scale tare is set
- Set zero set the scale to zero, when the weight is within the zero set range

10.5. Read data

All read values are addressed by *read data type request*. The data typical for the WP are accessible via various read windows. The data independent of the Wp can be reached via the read window of WP-A or WP-B.

| Value in byte 4 <i>Read data type request</i> | | Read data in bytes 0...3 (parameters) for WP-A and WP-independent functions |
|--|--------------------|---|
| Dec | Name | |
| 4 | | Exponent/unit/stepwidth WP-A |
| 8 | | Gross weight [DINT] WP-A |
| 9 | | Net weight [DINT] WP-A |
| 10 | | Tare [DINT] WP-A |
| 12 | | Gross weight x100 WP-A |
| 14 | | Fullscale value [DINT] WP-A |
| 23 | | Fullscale value [REAL] WP-A |
| 24 | | Limit1_on value [REAL] WP-A |
| 25 | | Limit1_off value [REAL] WP-A |
| 26 | | Limit2_on value [REAL] WP-A |
| 27 | | Limit2_off value [REAL] WP-A |
| 28 | | Gross weight [REAL] WP-A |
| 29 | | Net weight [REAL] WP-A |
| 30 | | Tare [REAL] WP-A |
| 31 | | Fixtare [REAL] WP-A |
| 121 | <i>termstat</i> | Dialogue: status of dialogue [DINT] |
| 122 | <i>dsp1</i> | Line 1 for display; [characters 1...4] |
| 123 | | Line 1 for display; [characters 5...8] |
| 124 | | Line 1 for display; [characters 9...12] |
| 125 | | Line 1 for display; [characters 13...16] |
| 126 | | Line 1 for display; [characters 17...20] |
| 127 | <i>dsp2</i> | Line 2 for display; [characters 1...4] |
| 128 | | Line 2 for display; [characters 5...8] |
| 129 | | Line 2 for display; [characters 9...12] |
| 130 | | Line 2 for display; [characters 13...16] |
| 131 | | Line 2 for display; [characters 17...20] |
| 132 | <i>editint</i> | Dialogue: numeric input |
| 133 | <i>editreal</i> | Dialogue: numeric input |
| 134 | <i>editweightA</i> | Dialogue: weight input in WP-A format |
| 141 | <i>repostat</i> | Report: print-out status |
| 142 | <i>text1</i> | Text1; [characters 1...4] |
| 143 | | Text1; [characters 5...8] |
| 144 | | Text1; [characters 9...12] |
| 145 | | Text1; [characters 13...16] |
| 146 | | Text1; [characters 17...20] |
| 147 | <i>text2</i> | Text2; [characters 1...4] |
| 148 | | Text2; [characters 5...8] |
| 149 | | Text2; [characters 9...12] |
| 150 | | Text2; [characters 13...16] |
| 151 | | Text2; [characters 17...20] |
| 152 | <i>text3</i> | Text3; [characters 1...4] |
| 153 | | Text3; [characters 5...8] |
| 154 | | Text3; [characters 9...12] |
| 155 | | Text3; [characters 13...16] |
| 156 | | Text3; [characters 17...20] |
| 157 | <i>num1</i> | Report: free number for print-out |

| | | |
|-----|---------------|---|
| 158 | <i>num2</i> | Report: free number for print-out |
| 159 | <i>num3</i> | Report: free number for print-out |
| 160 | | Report: sequence number |
| 161 | | Report: date |
| 162 | | Report: time |
| 163 | | Report: weight |
| 164 | | Report: type + WP ⁸ |
| 180 | <i>anain1</i> | Analog input value 1 |
| 181 | <i>anain2</i> | Analog input value 2 |
| 182 | <i>anain3</i> | Analog input value 3 |
| 183 | <i>anain4</i> | Analog input value 4 |
| 184 | | Input values of slots 1, 2 and 3 (3 * 8 bits) |

| Value in byte 4 <i>Read data type request</i> | | Read data in byte 0...3 (parameters) for WP-B |
|--|-------------|---|
| Dec | Name | All following read data only for PRO-X5 and PRO-X6 |
| 4 | | Exponent/unit/stepwidth WP-B |
| 8 | | Gross weight [DINT] WP-B |
| 9 | | Net weight [DINT] WP-B |
| 10 | | Tare [DINT] WP-B |
| 12 | | Gross weight x100 WP-B |
| 14 | | Fullscale value [DINT] WP-B |
| 23 | | Fullscale value [REAL] WP-B |
| 24 | | Limit1_on value [REAL] WP-B |
| 25 | | Limit1_off value [REAL] WP-B |
| 26 | | Limit2_on value [REAL] WP-B |
| 27 | | Limit2_off value [REAL] WP-B |
| 28 | | Gross weight [REAL] WP-B |
| 29 | | Net weight [REAL] WP-B |
| 30 | | Tare [REAL] WP-B |
| 31 | | Fixtare [REAL] WP-B |
| 134 | editweightB | Dialogue: weight input in WP-A format |

Direct control bits (for reading by the fieldbus master, separate windows for WP-A and WP-B)

| | bit 7 | bit 6 | bit 5 | bit 4 | bit 3 | bit 2 | bit 1 | bit 0 |
|--------|--------------------|------------|-----------------------|------------------|------------|----------------|--------------------|------------------------------|
| Byte 5 | write hand-shake | power fail | | | | | limit 1 | limit 2 |
| Byte 6 | parameter error | | | | | tare active | calibration active | test active |
| Byte 7 | out-of-calibration | standstill | within zero set range | zero within 1/4d | below zero | above overload | above FSD | error number in gross weight |

⁸ Value = *typ_alibi* * 256 + *wp_alibi*

Note: The addresses and control bits shown with gray background are handled by the firmware section of the interface.

| | |
|------------------------------|--|
| write handshake | 0 = PR1713 is ready to receive new data |
| power fail | scale has a voltage sag (signal must be reset for deleting it) |
| tare active | scale is tared |
| calibration active | scale is calibrated |
| test active | scale is in test mode |
| out-of-calibration | scale is between FSD and overload; also when weight < 0 (dim bit) when W&M mode is active |
| standstill | scale is in standstill |
| within zero set range | scale is within zero set range |
| zero within 1/4d | scale is zero (+/-weight < 1/4d) |
| below zero | scale is below zero |
| above overload | scale load exceeds the overload range |
| above FSD | scale is above fullscale value (maximum scale range e.g. 5000 kg), but still no overload. |
| error number in gross weight | scale is in error condition e.g. 'Err 3'. An error number instead of a weight is on the display and in the gross weight. |
| parameter error | after each write operation, the parameter is checked for validity. Unless it is valid, the bit is set and the parameter is ignored. The bit remains set till the next write operation. |

11. Analog Test

During instrument calibration, a test value is calculated and stored in EARAM automatically. This value is scaled to FSD (e.g. 5000).

Select the analog test from the initial condition.



```
PRO-Controller
Start $Setup $Alibi
```

Select the second menu level and press key "Test":

```
PRO-Controller
Test $      $
```

When activating the analog test, the measuring signal is separated from the load cell. Dependent of calibration, the value is displayed either as current test value or as difference between the initially stored test value and the current test value (e.g. 0000).

```
Analog test active
# Stop #
```

Press key  "Stop" or  "Exit" to finish the analog test.

Unless the active weighing point can be switched to the analog test mode, the following message is displayed during 3 sec.:

```
Analog test failed
```

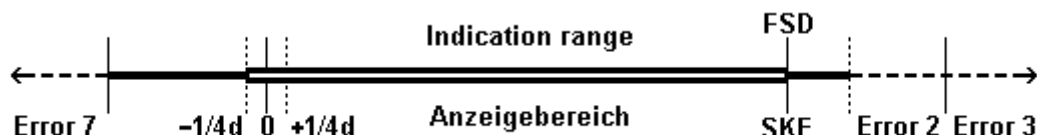
12. Error Messages

12.1. Error messages on the weight display

The error statuses of the analog section are output on the weight display. Display is coded as 'Error X'.



| Error messages on the weight display | |
|--------------------------------------|--|
| Error 1 | internal arithmetic overflow (faulty calibration values) |
| Error 2 | input voltage is above FSD + overload |
| Error 3 | input voltage is above the permissible range of 36 mV. However, an error in the analog section, a defective load cell, or a cable break are also possible. |
| Error 4 | weight value exceeds display digits |
| Error 5 | weight is not available, e.g. weighing point is busy |
| Error 7 | input voltage is negative or incorrect load cell connection |
| Error 8 | ADC error, e.g. internal ADC defective or overloaded |
| Error 9 | no communication with weighing point |
| Error 11 | weight is not available |
| Error 15 | serial number check failed |



12.2. Error messages on the text display

The PRO-Controllers generate the following error messages.

| Display | Description |
|---------------------|--|
| DBase error | Opening a table, or writing into a database table was not possible. The table is reserved to another program, or does not exist. |
| Mat. table is empty | No data were found in the table. |
| Name already exists | Input of new data into the table under an already existing name is not possible. All table entries must have different names. |
| Analog test failed | The analog test cannot be activated. The weighing point is not free, or in error status. |

13. Index

A

| | |
|--------------------|----|
| Alibi memory..... | 37 |
| analog input..... | 19 |
| Analog out..... | 8 |
| analog output..... | 22 |
| analog test..... | 58 |

B

| | |
|--------------|----|
| BCD..... | 21 |
| BCD out..... | 8 |

C

| | |
|-----------------------------|----|
| configuration..... | 17 |
| configuration printout..... | 28 |

D

| | |
|---------------------|----|
| DDE..... | 46 |
| DDE / OPC..... | 42 |
| digital input..... | 18 |
| digital output..... | 19 |
| DUST..... | 46 |

E

| | |
|----------------------------|------------|
| EAROM..... | 15, 17, 30 |
| Error messages..... | 59 |
| Ethernet..... | 8 |
| EW Com..... | 46 |
| EW-Com..... | 42, 43 |
| external alibi memory..... | 23, 41 |

F

| | |
|-----------------------|-------|
| factory settings..... | 25 |
| Fieldbus..... | 8, 51 |

G

| | |
|-------------------|---|
| gross weight..... | 9 |
|-------------------|---|

I

| | |
|--------------------------|-------|
| identification name..... | 23 |
| Interbus-S..... | 8, 51 |

L

| | |
|-------------------|----|
| limit values..... | 24 |
|-------------------|----|

M

| | |
|-------------------------|----|
| Main menu..... | 15 |
| main program..... | 31 |
| messages functions..... | 35 |
| ModBus..... | 46 |
| more key..... | 13 |

N

| | |
|-------------------------|----|
| net weight..... | 9 |
| Nice Lable Express..... | 44 |

O

| | |
|----------------|----|
| OPC..... | 46 |
| operation..... | 12 |

P

| | |
|---------------------------|--------|
| power on..... | 15 |
| PR1713/08..... | 19, 20 |
| PR1713/12..... | 19 |
| PR1713/12..... | 20 |
| PR1713/15..... | 19 |
| PR1713/15..... | 20 |
| PR1713/17..... | 19 |
| PR1721..... | 51 |
| predefined functions..... | 33 |
| predefined texts..... | 25 |
| Profibus..... | 8, 51 |

S

| | |
|------------------|----|
| scroll keys..... | 12 |
|------------------|----|

| | |
|--------------------------|----|
| sequence number | 23 |
| serial I/O..... | 8 |
| Setup | 16 |
| softkeys..... | 12 |
| SPM layout | 46 |
| standstill..... | 9 |
| Starting print-out | 42 |

T

| | |
|-----------|----|
| tare..... | 10 |
|-----------|----|

| | |
|---|----|
| tared | 9 |
| terminal function | 32 |
| Time behaviour of the alibi memory..... | 41 |

Z

| | |
|------------|---|
| zero | 9 |
|------------|---|

Sartorius Mechatronics T&H GmbH
Meiendorfer Straße 205
22145 Hamburg, Germany
Tel +49.40.67960.303
Fax: +49.40.67960.383
www.sartorius-mechatronics.com