

Weighing Controller A 810

Manual
Rev. 1.10-24



Thank You!

Thank you for purchase A.S.T. products!

SAFETY PRECAUTION

The integrated circuits used in this equipment are highly immune to noise and RFI when properly installed in the unit.

The terminal on the rear panel must be grounded directly, not with the AC ground.

Therefore, when shipping please always use original packing (conductive material) for shipping. Remove equipment from the shipping container and examine the external surfaces of the equipment for physical damage.

The A 810 should be positioned in a safe area with no combustible gas, the operating temperature is +14°F to 104°F (-10°C to +40°C), storage temperature -28°F to 185°F (-20°C to +85°C)

Confirm the AC voltage of all equipment before power-up. The A 810 can operate within a -15% to + 10% voltage variation.

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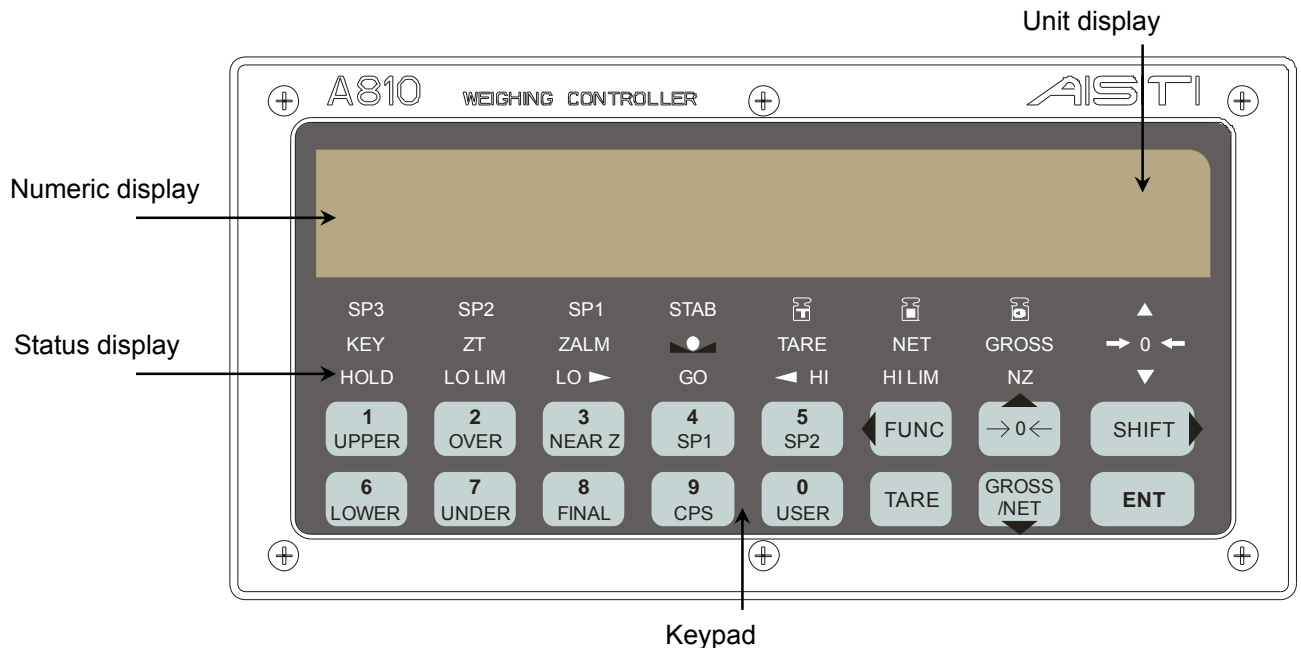
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0 History

- 1-10-24 (October 2011): additional description on page 11 "The contacts 2 / 3 and 1 / 6 in the cable connector must be bridged.
- 1.10-23 (Juni 2011): from Firmware V.35; Outputsignal „Sequence Activ“ (B21) new imported; user function „230“ as inputsignal for D18/D19 imported; graph in chapter 6.3 updated; in Sequence-Mode new delays imported („conf-Ti“, „SA-dlay“, „SP-dlay“); Discharge-Weighing/Loss-in-weight possible in Sequence-Mode.
- 1.10.22 (May 11): from Firmware V.34; signal output B21 used in sequence-mode; generation of Err109 due to missing confirmation signal at input pins D18 or D19 (with user function "230" associated); detailed description of signal input D18/19 at page 65; change of picture "PC-Interface" at page 88; new parameter "SPFix" in menu "DAC" for constant analog output at setpoints SP1, SP2 and CPS
- 1.10-21 (November 10): Interface: USB as option
- 1.10-20 (September 10): graphics of frontdesign and rear-panel changed due to constructive reasons
- 1.10-19 (January 10): due to change of processor, sample rate of 400/s is selectable (Firmware-Version V.32)
- 1.10-18 (June 09): due to Firmware-Update to V.31 default parameter dISP-R changed (faster display rate)
- 1.10-17 (June 09): due to Firmware-Update to V.30 parameter dISP-R added (display rate selectable)
- 1.10-16 (May 08): description Err 129 added
- 1.10-15 (March 08): refresh rate of I/O added
- 1.10-14 (January 08): additional operating functions added
- 1.10-13 (November 07): description of "dAC" changed

1. Description

1.1. Front Panel



The front panel contains a 7 digit numeric display, a two digit alphanumeric display, a multiple status display and 16 key membrane pad.

Legal-for-trade weighing parameter information is available in a separate window (Descriptive marking).

1.1.1. Numeric Display








The seven digit large size display allows showing a six digit weighing value and an additional plus / minus character. This display is used for weighing values like Gross, Net, Tare, accumulation values and setup values as well as Error messages.

1.1.2. Unit Display


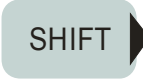
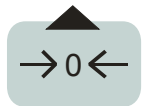











This two digit unit display is used for units in weighing mode and for alphanumeric information in setting mode.

1.1.3. Status display

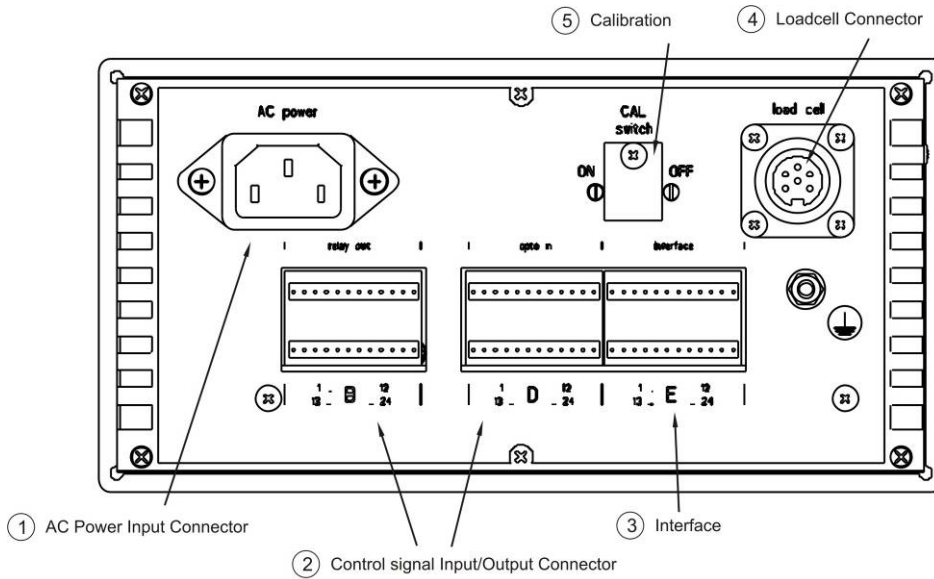
- SP3 : Turns on, if the weighing value has reached "FINAL" – "CPS" and the desired output signal at the rear panel is active on.
- SP2 : Turns on, if the weighing value has reached "FINAL" - "SetPoint2" and the desired output signal at the rear panel is active on.
- SP1 : Turns on, if the weighing value has reached "FINAL" - "SetPoint1" and the desired output signal at the rear panel is active on.
- KEY : Turns on, if the calibration lock is enabled.
- ZT : Turns on, if zero tracking is in operation.
- ZALM : Starts flashing if zero drift exceeds the Digital Zero limit.

	STAB	: Turns on, if weighing value is stable.
	TARE	: Turns on, if Tare weight is displayed. : "TARE" turns on, if Tare subtraction is active and Tare has a content.
	NET	: Turns on, if Net weight is displayed.
	GROSS	: Turns on, if Gross weight is displayed.
HI LIM	: Turns on, if upper limit has been reached and the desired output signal at the rear panel is active on.	
HI	: Turns on, if "weighing_value" > "FINAL" + "OVER".	
GO	: Turns on, if "FINAL" - "UNDER" ≤ "weighing_value" ≤ "FINAL" + "OVER".	
LO	: Turns on, if "weighing_value" < "FINAL" - "UNDER".	
LO LIM	: Turns on, if lower limit has been reached and the desired output signal at the rear panel is active on.	
HOLD	: Turns on, if weighing display is held.	
NZ	: Turns on, if "weighing_value" ≤ "Near_Zero".	
	: Turns on, if weighing value is at +1/4 scale division.	
	: Turns on, if weighing value is at centre zero.	
	: Turns on, if weighing value is at -1/4 scale division.	

1.1.4. Keypad

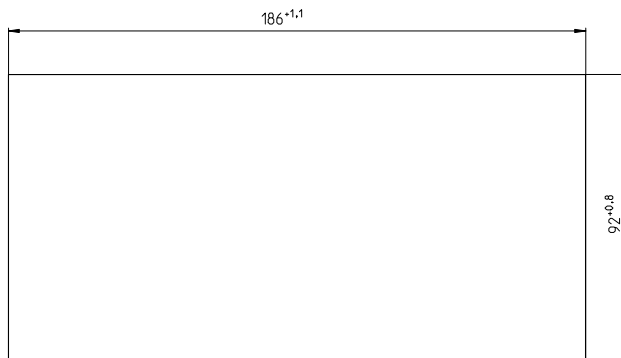
	Display in weighing mode	Display in setup mode
	Entry in setting modes according followed key inputs (see page 67)	Shifting active cursor position one position to the left
	Entry into code display modes according followed key inputs	Shifting active cursor position one position to the right
	if pressed the weighing value is zeroed, the Gross weight becomes Zero. Only available when "ZALM" is inactive.	→ one step up in navigation at the present level → incrementing the value of active (flashing) character position → toggle between on / off display
	if pressed the weighing value display toggled between Gross and Net   indicated by the NET or GROSS sign	→ one step down in navigation at the present level → decrementing the value of active (flashing) character position → toggle between on / off display
 (ESC)	if pressed the Tare weight will be subtract, Net weight becomes Zero and "TARE" -sign switches on; to clear Tare weight press  and then  . Signs  are illuminated. Press  for 2 sec and tare weight is cleared.	→ if pressed in setup mode the present action is terminated and the setting goes one level up; → in first setting level this key terminates the setup mode and returns the display to weighing mode
	Default: Print; User defined action selectable. (Refer to 3.1.15.1)	Confirms the present setting. Changed Parameter will be stored.
.....	direct display and setting of values of the presently selected code	

1.1.5. Rear Panel



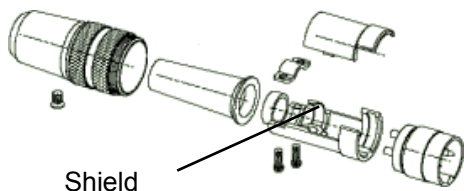
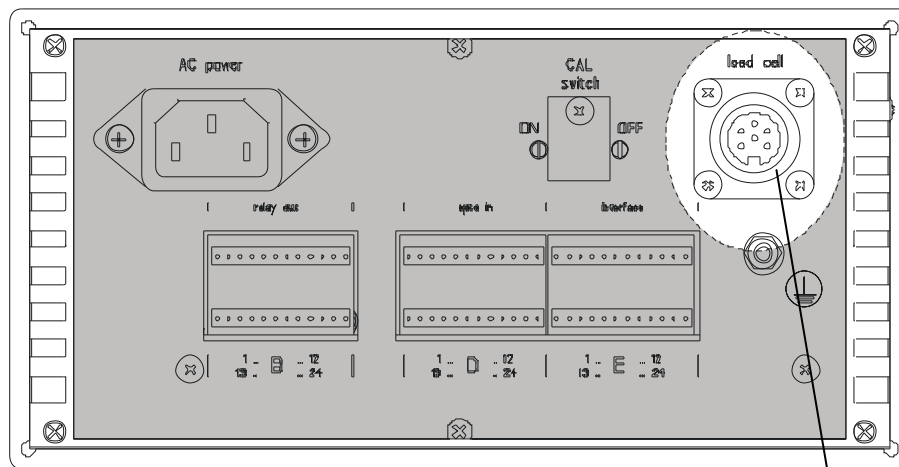
- ① AC Power Input Connector
 AC input is labeled with the standard AC voltage of the country in which the unit was purchased.
 Available voltage is: 115 or 230 V AC
 Confirm the correct voltage on your A810. AC frequency is 48 to 62 Hz and voltage supply -15 to +10%
- ② Control signal Input/ Output Connector
 Refer to Page 12 - PIN- Assignment of Control Signal Input / Output Connector
- ③ Interface
 Connector for RS232, TTY, RS485
- ④ Load cell connector
 Refer to Page 11 – Loadcell Connector
- ⑤ Calibration lock

1.2. Panel cut size

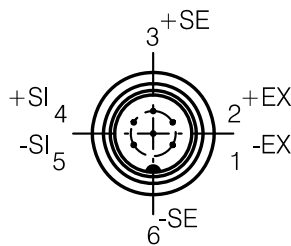


2. Connections

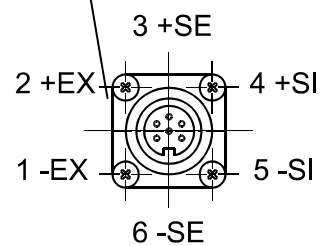
2.1. Loadcell Connector



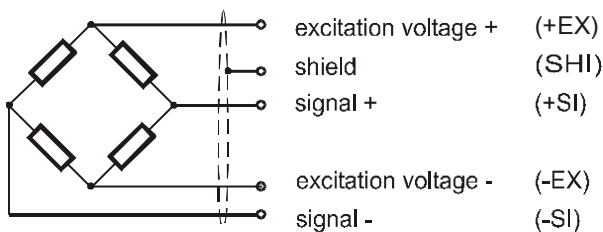
Shield



Frontview

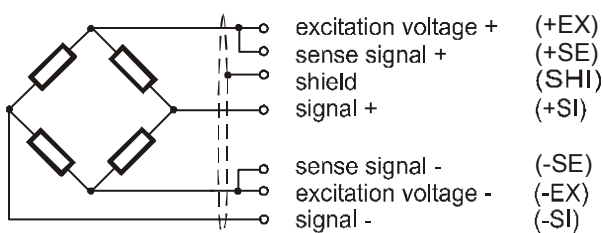


4 wire standard:

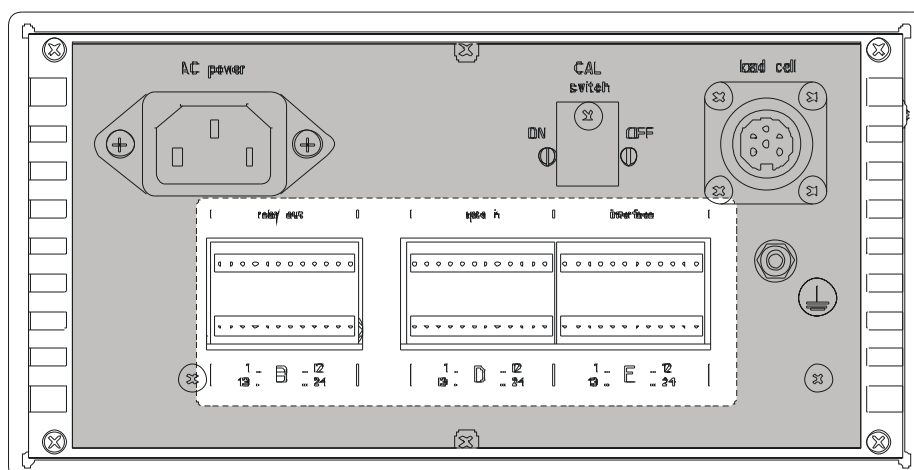


The contacts 2 / 3 and 1 / 6 in the cable connector must be bridged.

6 WIRE FOR REMOTE SENSING:



2.2. PIN- Assignment of Control Signal Input / Output Connector



Connector A: Power
 B: Control- Output- Signals
 D: Control- Input- Signals
 E: RS232, RS485, TTY- Interface, 4...20mA norm output

Connector B / Output-Signals		Connector D / Input-Signals	
PIN	Signal	PIN	Signal
B13	COM *2	D3	COM *2
B1	SP1	D4	G/N
B2	SP2	D5	D/Z ON
B3	SP3/ CPS	D6	Tare subtraction ON
B4	near zero	D7	Tare subtraction OFF
B14	COM *2	D12	COM *2
B5	under	D8	Hold or Judgment
B6	over	D9	Feed/ Discharge
B7	lower limit	D10	start *1
B8	upper limit	D11	stop *1
B15	COM *2	D24	COM *2
B9	stable	D16	start accumulation
B10	discharge	D17	clear accumulation sum
B11	go	D18	user defined function
B12	complete	D19	user defined function
B16	COM *2	D15	COM *2
B21	sequence active *1	D20	Code No. 8
B22	run	D21	Code No. 4
B23	sequence error	D22	Code No. 2
B24	weight error	D23	Code No. 1
B17	GND, extern I/O	D1	
B18	GND, extern I/O	D2	
B19	+24V, extern I/O	D13	
B20	+24V, extern I/O	D14	

*1 are effective in sequence mode
 *2 COM- terminals are not connected internally

Connector E	Description	Remarks
E1	RxD5+	TTY (Port 4)
E2	RxD5-	TTY (Port 4)
E3	TxD5+	TTY (Port 4)
E4	TxD5-	TTY (Port 4)
E5	GND	RS232
E6	GND	RS232
E7	TxD2	RS232 (Port 1)
E8	RxD2	RS232 (Port 1)
E9	R(A)	RS485 (Port0)
E10	R(B)	RS485 (Port0)
E11	D(Z)	RS485 (Port0)
E12	D(Y)	RS485 (Port0)
E13	GND_24	external ground optocoupler
E14	P24	external supply optocoupler
E15	U-OUT	DAC (0...10V)
E16	I-OUT	DAC (0...20mA)
E17	GND_24	DAC
E18	AUTO_SENSOR	
E19	RxD3	RS232 (Port 2)
E20	TxD3	RS232 (Port 2)
E21	R(A)	RS485 (Port0)
E22	R(B) - Rt	RS485 (Port0)
E23	D(Z)	RS485 (Port0)
E24	D(Y) - Rt	RS485 (Port0)

Please refer to section 4.6 “Examples of Communication Interfaces” at page 87 for a detailed description of interfaces.

Relay outputs (connector B) and Opto inputs (connector D) can either be with power (active) or neutral (passiv) depending on internal jumper position on mainboard. Both Input and Output connectors are separated into four groups. Each group contains four signals with dedicated COM. By setting each individual jumper's position to decide each group whether the I/O are with power or neutral.

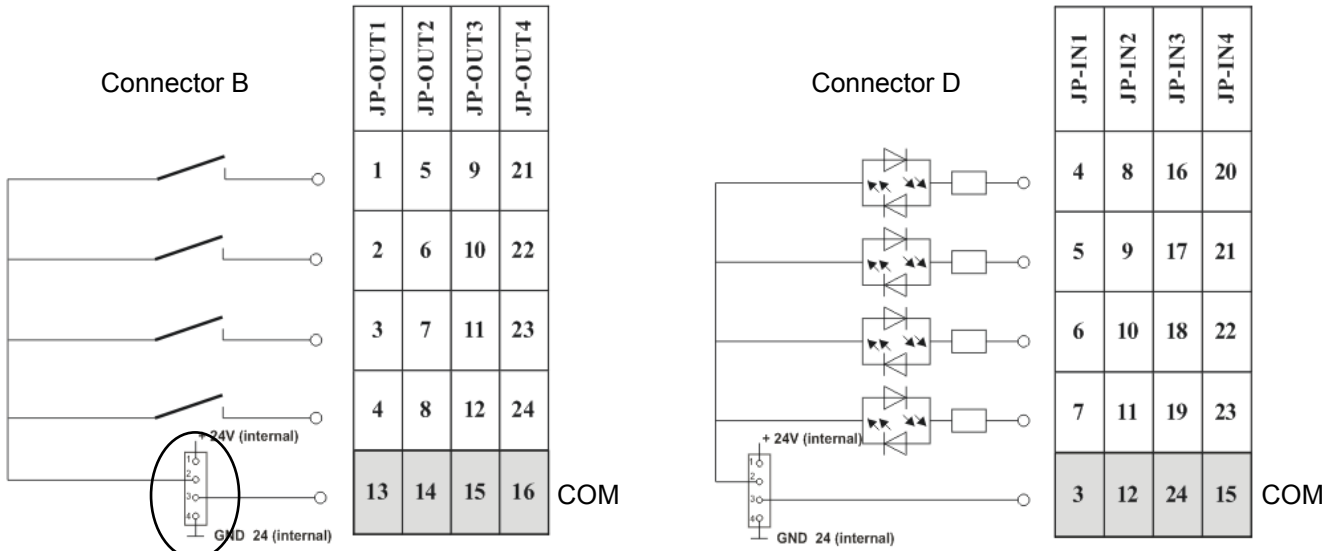


Fig. 1 Internal schematic of Relay Output (B) and Opto Input (D)

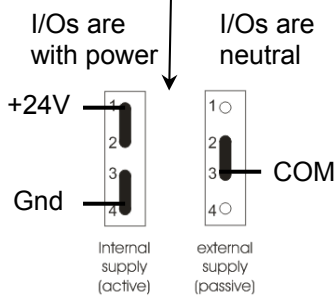


Fig. 2 Jumper setting

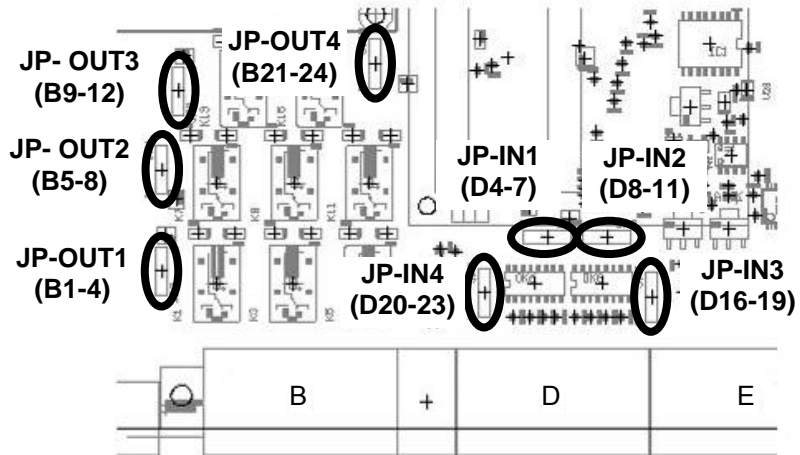
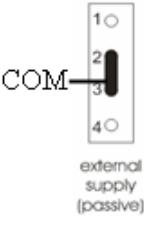





Fig. 3 Jumper positions on mainboard

Jumper-Positions:


Connector B / Output-Signals				Connector D / Input-Signals			
PIN	Signal	Polarity (JP-OUT1...4)		PIN	Signal	Polarity (JP-IN1...4)	
							
B13	COM	none *2	-	D3	COM	-	none *2
B1	SP1	none	+	D4	G/N	+	none
B2	SP2	none	+	D5	D/Z ON	+	none
B3	SP3/ CPS	none	+	D6	Tare subtraction ON	+	none
B4	near zero	none	+	D7	Tare subtraction OFF	+	none
B14	COM	none *2	-	D12	COM	-	none *2
B5	under	none	+	D8	Hold or Judgment	+	none
B6	over	none	+	D9	Feed/ Discharge	+	none
B7	lower limit	none	+	D10	start *1	+	none
B8	upper limit	none	+	D11	stop *1	+	none
B15	COM	none *2	-	D24	COM	-	none *2
B9	stable	none	+	D16	start accumulation	+	none
B10	discharge	none	+	D17	clear accumulation sum	+	none
B11	go	none	+	D18	user defined function	+	none
B12	complete	none	+	D19	user defined function	+	none
B16	COM	none *2	-	D15	COM	-	none *2
B21	Sequence active	None *1	+	D20	Code No. 8	+	none
B22	run	none	+	D21	Code No. 4	+	none
B23	sequence error	none	+	D22	Code No. 2	+	none
B24	weight error	none	+	D23	Code No. 1	+	none
B17	GND, extern I/O	-	-	D1	not used	none	none
B18	GND, extern I/O	-	-	D2	not used	none	none
B19	+24V, extern I/O	+	+	D13	not used	none	none
B20	+24V, extern I/O	+	+	D14	not used	none	none
		default				default	

*1 are effective in sequence mode

*2 COM- terminals are not connected internally

2.3. Control Input Signals

- **Gross / Net (G/N)** (pin D4)
(edge triggered)

Display value is switched between Gross and Net by pressing  key or by changing input D4.

When input signal is shorted to COM (OFF→ON) Net weight is displayed.

When input signal is opened to COM (ON→OFF) Gross weight is displayed.

Pressing dedicated key will always toggle between Net and Gross, independent of input signal.

- **Digital Zero (DZ)** (pin D5)
(edge triggered)


The Gross weight is set to zero by pressing  key or by shorten input D5 to COM (OFF→ON).



When "ZALM" is illuminated, Digital Zero Regulation Value is exceeded and no setting to zero can be done. Refer to 3.1.1.3 and 3.1.1.4 at page 25 for zero settings.



- **Tare subtraction (TARE)** (pin D6)
(edge triggered)

The Net weight is set to zero by pressing  key or by shorten input D6 to COM (OFF→ON).

Taring depends on its mode (3.1.1.10 at page 26) and its limit (3.1.1.9 at page 26).

- **Tare Reset** (TARE long press, when  is illuminated)
(pin D7)
(edge triggered)

The Net weight is brought to Gross weight by pressing  key and then  key.

After that  is illuminated. Reset Taring weight by pressing  for longer then 1s or by shorten input D7 to COM (OFF→ON).

- **Hold or Judgement** (pin D8)
(level triggered)

The weighing value is hold by shorten input D8 to COM (OFF→ON) and "HOLD" is illuminated. Over/Go/Under (3.1.7.4 at page 42) and Upper/Lower (3.1.7.5 at page 42) Limit have to be both set to "0".

At other settings the input switches to "Judgement".

Over/Go/Under comparison mode ("OUC-MD", 3.1.7.4 at page 42):

0: compare always

1: compare when judging input is ON

2: compare when complete output is ON

3: compare when complete output is ON

and weight will be hold during that time

Note: "Hold mode" is only available in Simple Comparison mode.

- **Feed/ Discharge** (pin D9)
(level triggered)

Feed or Discharge is accessed by shorten(Discharge) or open (Feed) input D9 to COM.
"Fd-Con" (3.1.6.2 in submenu "control" at page 39 has to be "2").

- 0: feeding
- 1: discharge
- 2: external control

During Discharge mode, "Upper/ Lower Limits" has to be compared with Gross weight ("ULL-CMD" 3.1.7.3 set to "0") and "Final/Over/Under" has to be compared with Net weight ("FOU-CMD" 3.1.7.2 set to "1").

Note: "Discharge mode" is only available in Simple Comparison mode.

- **Start** (pin D10)
(edge triggered)

During "Sequence mode" shorten input D10 to COM will start sequence cycle.

- **Stop** (pin D11)
(edge triggered, level triggered)

During "Sequence mode" shorten input D11 to COM will stop sequence cycle or clears sequence errors.

Refer to 6.6 "Sequence mode" at page 103 for more detail.

- **Start accumulation** (pin D16)
(edge triggered)

Accumulation is done when shorten input D16 to COM (OFF→ON) and at rising edge of "Complete output" signal. FOUC-MD (3.1.7.2 at page 41) has to be set to 0 (gross) or 1 (net).

"Func" + "3": shows sum of accumulated weight
"Func" + "4": shows counter of accumulated weight cycles

- **Clear accumulation** (pin D17)
(edge triggered)

Accumulation Counter and weight value is cleared when shorten input D17 to COM (OFF→ON) for more than 3 seconds. For confirmation "del Acc" will be displayed.

- **User Function I** (pin D18)
(edge triggered)

This user defined function is activated when shorten input D18 to COM (OFF→ON).
Refer to 3.1.16.1 at page 64.

- **User Function II** (pin D19)
(edge triggered)

This user defined function is activated when shorten input D19 to COM (OFF→ON).
Refer to 3.1.16.2 at page 64.

- **Code selection** (pins D20-23)
(level triggered)

This binary input select active codeset when inputs are shortened to COM. "External Code" (3.2.3.2 at page 67) has to be "ON".
Any selected codeset greater than 9 will generate "Err110".

D23 is low-bit and D20 is high-bit.

Example:

	binary presentation
Selection of codeset 5: shorten D23 to COM (code N°1);	1
open D22 to COM (code N°2);	0
shorten D21 to COM (code N°4);	1
open D20 to COM (code N°8);	0

2.4. Control Output Signals

- **Setpoint1 (SP1)** (Pin B1)
(low-activ)

Will set „ON“, if setpoint1 SP1 (3.2.3.2.7, p.69) of active codeset has been exceeded.

- **Setpoint 2 (SP2)** (Pin B2)
(low-activ)

Will set „ON“, when setpoint2 SP2 (3.2.3.2.5, p.68) of active codeset has been exceeded.

- **Setpoint3/ Compensationpoint (SP3/CPS)** (Pin B3)
(low-activ)

Will set „ON“, when setpoint3 SP3/CPS (3.2.3.2.3, p.68) of active codeset has been exceeded.

- **Near Zero (NZ)** (Pin B4)
(low-activ)

Will set „ON“, when actual weight has gone below Near Zero value (3.2.3.2.13, p.71) of active codeset.

- **Under (LO>)** (Pin B5)
(Low-aktiv)

Will set „ON“, when actual weight has gone below Final-UNDER value (3.2.3.2.10, p.70) of active codeset.

- **Over (<HI)** (Pin B6)
(low-activ)

Will set „ON“, when actual weight has exceeded Final+OVER value (3.2.3.2.9, p.70) of active codeset.

- **Lower Limit (LO LIM)** (Pin B7)
(low-activ)

Will set „ON“, when actual weight has gone below Lower Limit value (3.2.3.2.12, p.70) of active codeset.

- **Upper Limit (HI LIM)** (Pin B8)
(low-activ)

Will set „ON“, when actual weight has exceeded Upper Limit value (3.2.3.2.11, p.70) of active codeset.

- **Stable (STAB)** (Pin B9)
(low-activ)

Will set „ON“, when actual weight matches stable conditions.
Parameter that affect that condition are:

Stable number “StAN”,	3.1.1.11, p.27;
Stable range “StAR”,	3.1.1.12, p.27;
ADC sampling rate “SR”,	3.1.3.3, p.32;
Filter component “FC”,	3.1.3.1, p.32;
Threshold of filter jump “FT”,	3.1.3.2, p.32;

- **Discharge** (Pin B10)
(low-activ)

Will set „ON“, when “Complete”-signal is set in sequence-mode. Duration of that signal is set via Discharging time “dIS-TI” (p.46).

- **Go (GO)** (Pin B11)
(low-activ)

Will set „ON“, when actual weight is between threshold underweight UN (3.2.3.2.10, p.70) and overweight OV (3.2.3.2.9, p.70) of active codeset.

- **Complete** (Pin B12)
(low-activ)

Will set „ON“, when conditions under Complete signal output mode “CSO-MD” (3.1.6.3, p.39) are fulfilled. Duration of that signal is set via Complete output time “COTI” (p.43).

- **Sequence active** (Pin B21)
(low-active)

Will set “ON”, when “Start”-signal is activated. Will set “OFF”, when “Complete”-signal is finished or an error is reset.

- **Run** (Pin B22)
(low-activ)

Will set „ON“, when A810 is ready for operation.

- **Sequence error** (Pin B23)
(low-activ)

Will set „ON“, when an error during a weighing cycle has occurred. Observation via Near zero confirmation “NZC” (p.45) and Setpoint SP1 confirmation “SPC” (p.46) possible.

- **Weight error** (Pin B24)
(low-activ)

Will set „ON“, when an error of A810 or load cell has occurred. Refer to „Description of States of Error“ at page 112.

3. How to get started

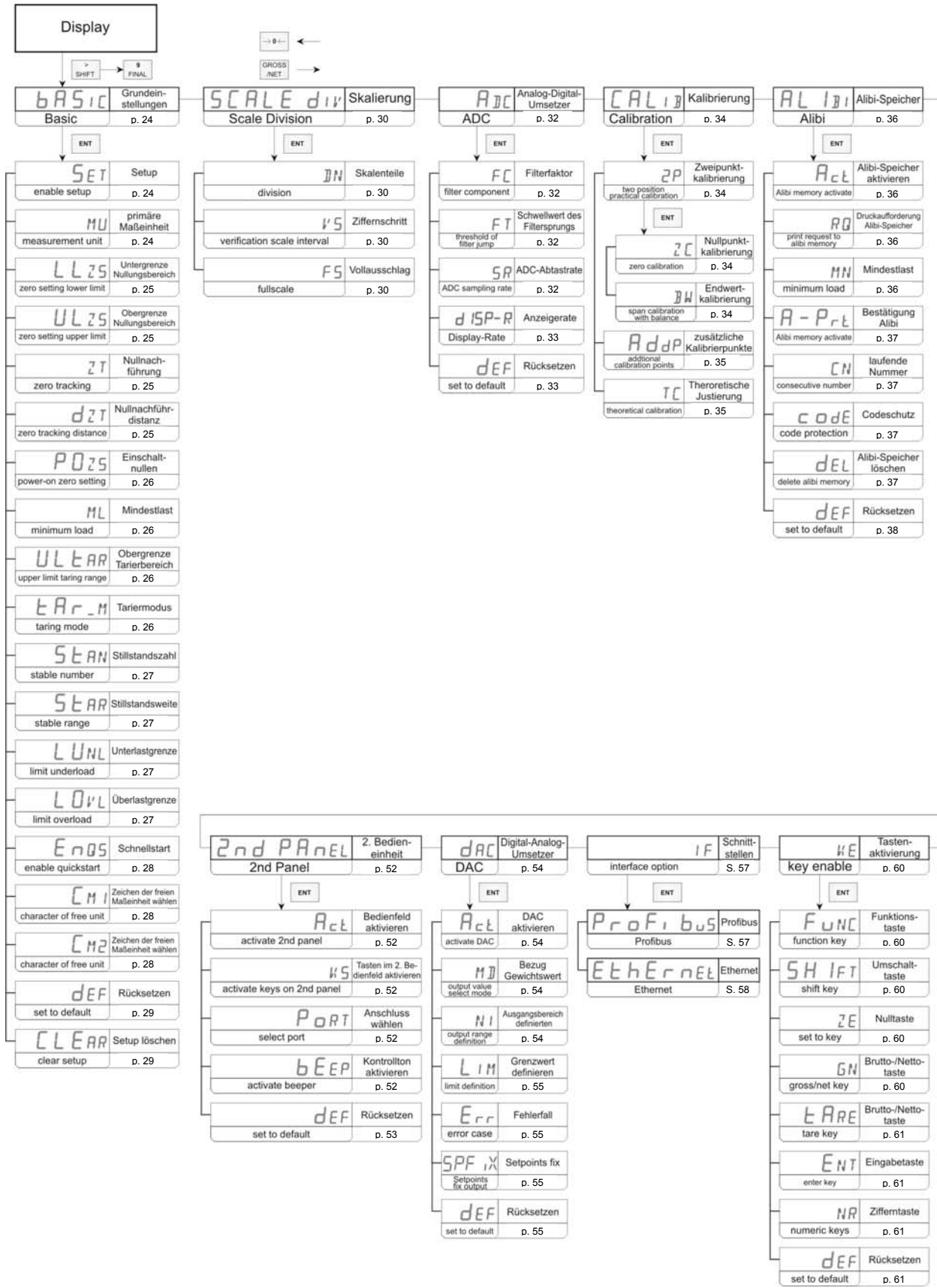
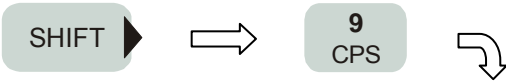
At delivery the A810 is preset on default parameters (comply with legal-for-trade) to operate as a simple scale provided the resolution is set and the calibration has been carried out.

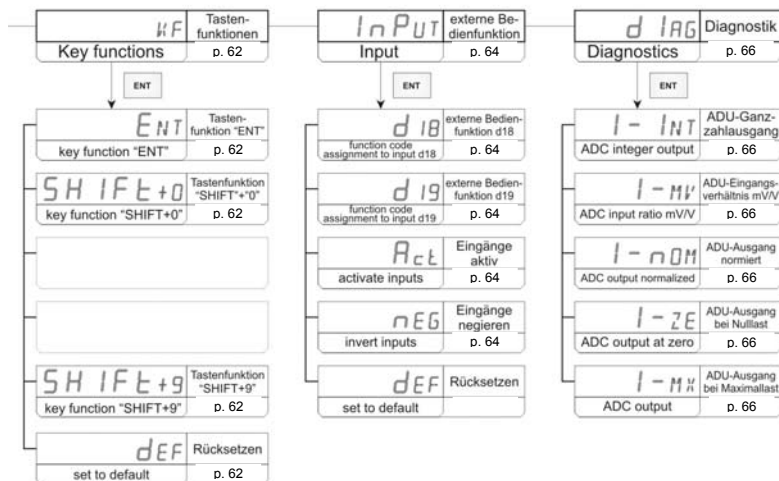
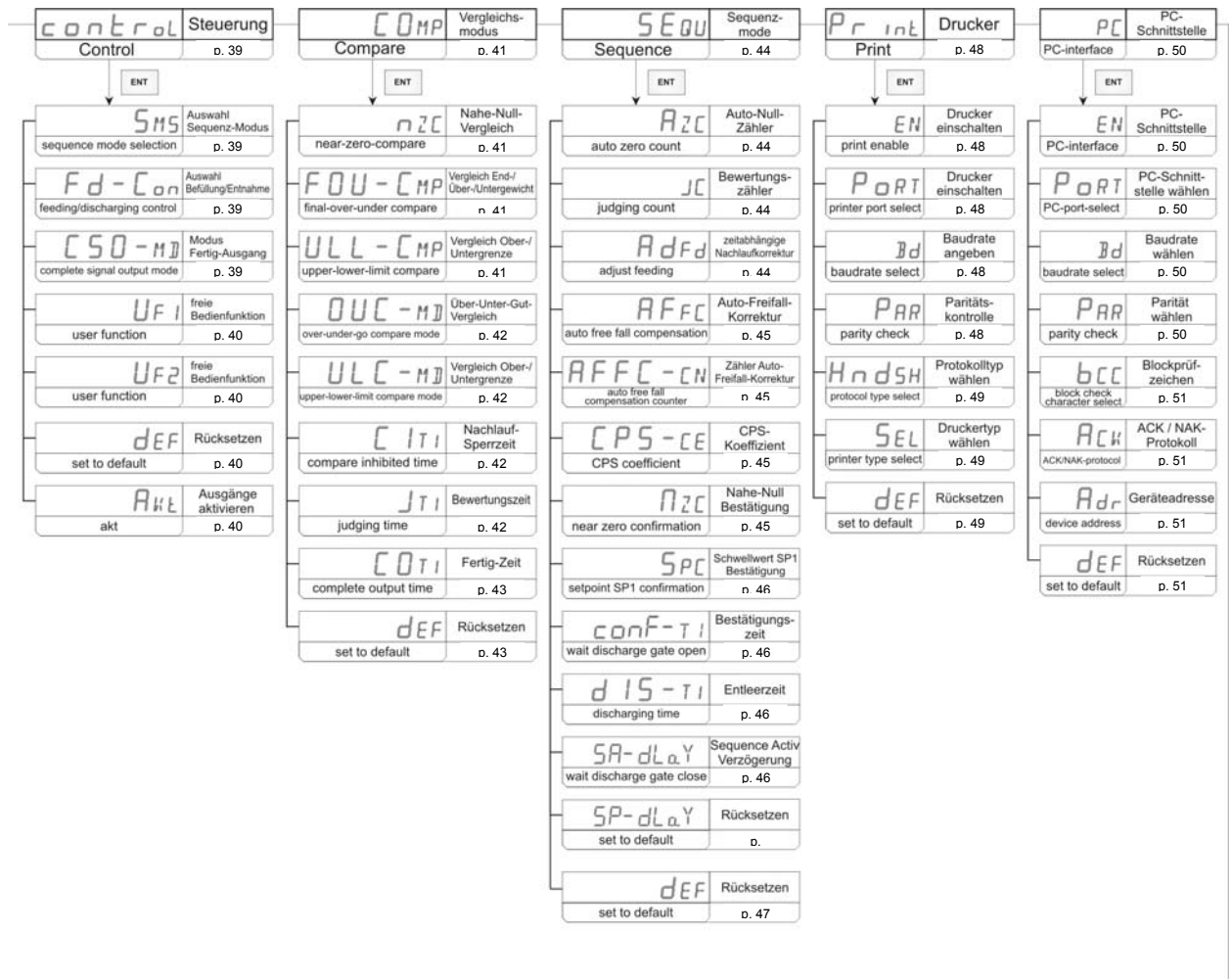
The following section explains how to setup the instrument according the required function by using the front panel keypad and display.

As an option a sophisticated Windows® based setup program is available to make the adjustment easier and faster. Via PC-Programm all parameter can be saved for backup in a separate file, the print image is changable and A810 can send weighing- and status-strings to PC via commands (see separate information).

3.1. Parameter setup section

To enter into the parameter setup please press





3.1.1. Submenu “Basic”

This menu contains the basic adjustments affecting the ability of the scale to be approved for calibration. The adjustment might be carried out before calibration.

3.1.1.1. Enable Setup “Set”

Alternative decision to enable access to a reduced setup section via function call 108. When ON, only parameters that not affect legal-for-trade settings are available. When OFF function call has no affect.

default setting: off

Refer to 5.3 at page 93 for locked menus.

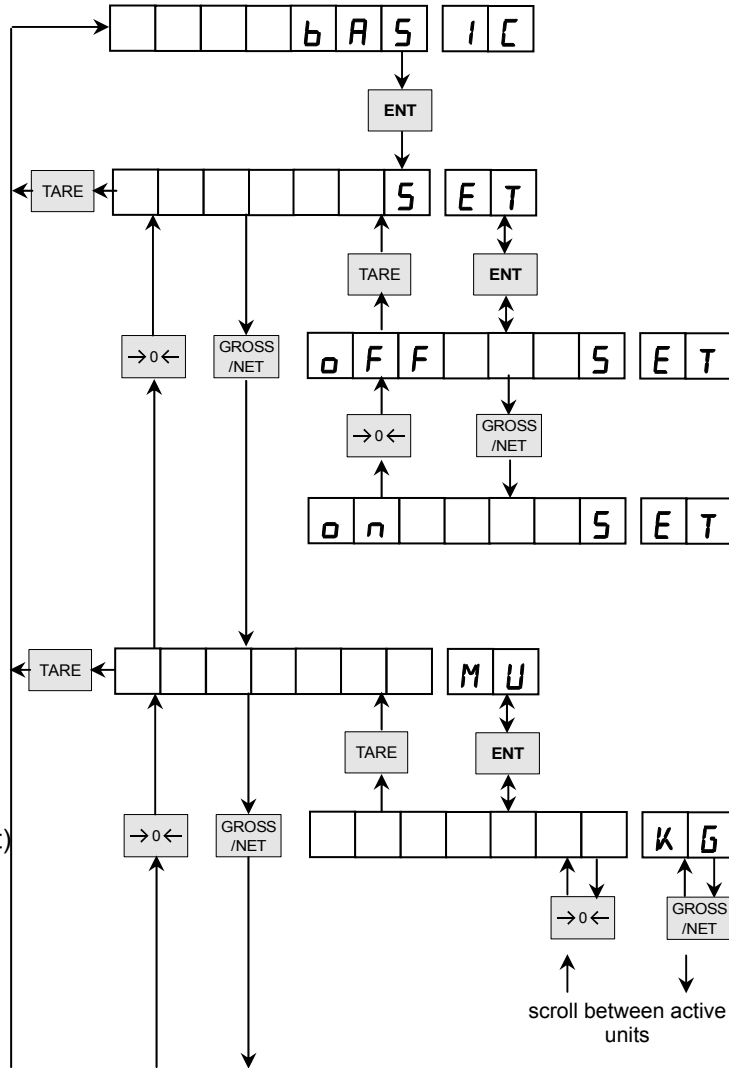
3.1.1.2. Select primary measurement unit “MU”

Select one of the units

KG, To, Gr, Lb, oz, N, KN and FU (free unit)

as primary unit. This unit is used for scale settings and calibration.

default setting: KG



The Weighing Controller A810 will be calibrated with this unit and after each restart this unit is shown.

Note: Free Unit “FU” is scaled and calibrated as “KG”. Setting appropriate chars for “FU” is done in “basic” menu 3.1.1.16 and 3.1.1.17 at page 28.

3.1.1.3. Range of zero setting lower limit "LLZS"

The lower limit of zero setting range can be adjusted between 0 ... -20% of full scale.

default setting: 1

3.1.1.4. Range of zero setting upper limit "ULZS"

The upper limit of zero setting range is adjustable between 0 ... 20% of FS and indicates in which range the zero setting function is operating.

default setting: 3

3.1.1.5. Zero tracking "ZT"

This toggle decision enables or disables the zero tracking option.

default setting: off

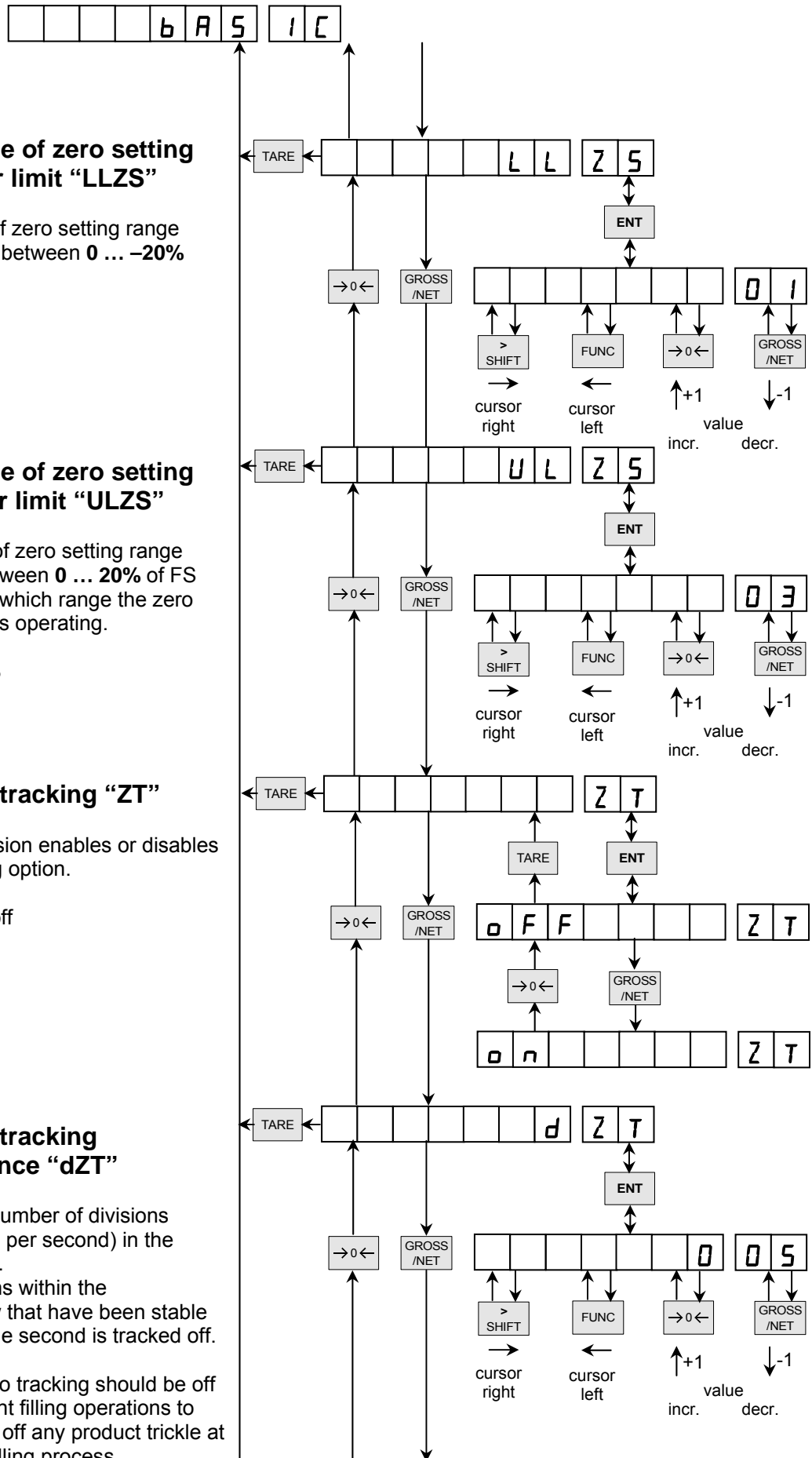
3.1.1.6. Zero tracking distance "dZT"

Set in terms of number of divisions (tenth of division per second) in the range of 0...100.

Weight deviations within the selected window that have been stable for more than one second is tracked off.

Please note: zero tracking should be off for most set point filling operations to prevent tracking off any product trickle at the start of the filling process.

default setting: 5 (0.5 divisions per second)



3.1.1.7. Power-on zero setting "POZS"

This toggle decision enables or disables the power-on zero setting option. Range is selected at 3.1.1.3 (Lower Limit) and 3.1.1.4 (Upper Limit) previous page.

default setting: off

3.1.1.8. Minimum Load "ML"

Set in terms of divisions in the range of 0 ... 250. This value indicates the trigger for the print out.

default setting: 20

→ If enabled and other settings are default printing is possible when weight >2kg is on load cell $(20(ML) \cdot 300kg(FS) = 2kg) / 3000(DN)$

3.1.1.9. Upper limit taring range "ULtAR"

Set in terms of percentage of full scale in the range of 0 ... 100%. It indicates the weight above zero up to which an enabled tare option is operating.

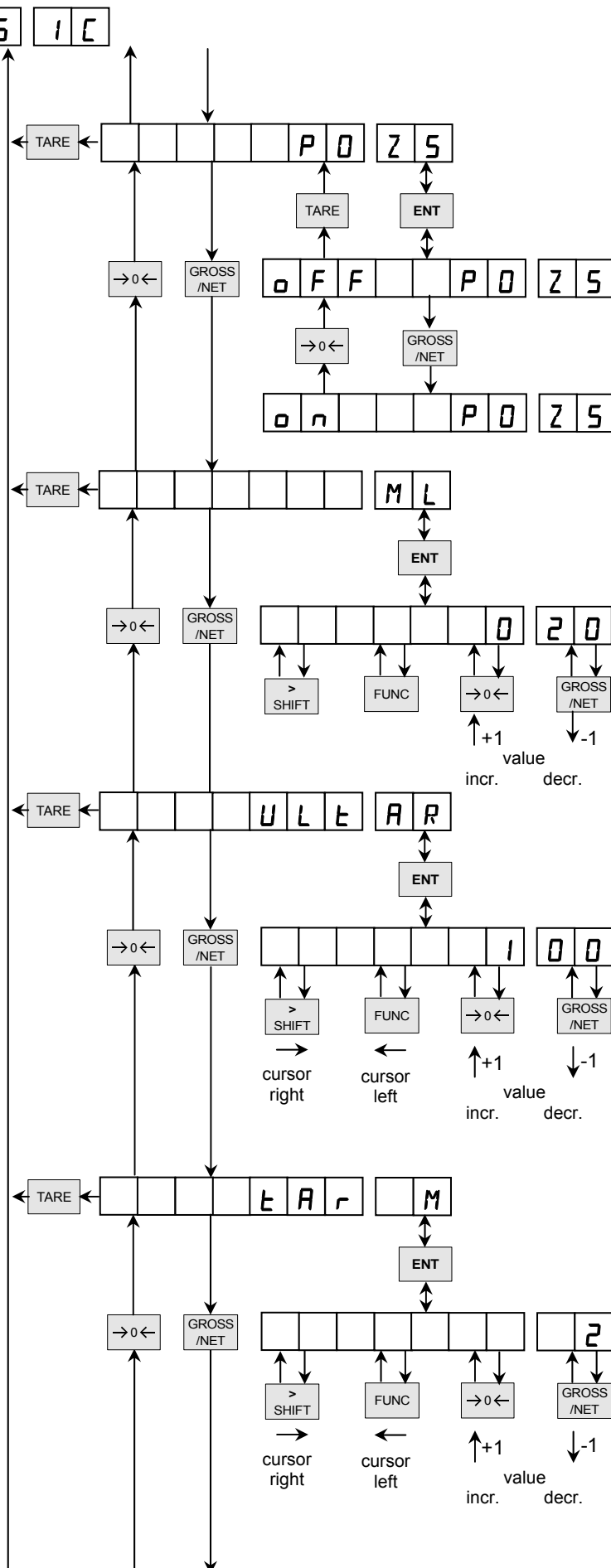
default setting: 100

3.1.1.10. Taring Mode "tAR_M"

This mode selection defines the action after the tare command. Set in terms of numbers in the range from 0, 1 or 2.

mode 0	tare always;
mode 1	tare only when stable;
mode 2	if stable → tare not stable → tare if stable is reached

default setting: 2



3.1.1.11. Stable number "StAN"

Set in terms of numbers in the range between values from 10 ... 250. This value defines the number of averaged ADC values taken into account for testing the stable condition. A higher number provides a safer stable condition but it also extends the minimum time necessary to recognize the stable condition after a load has been changed.

default setting: 50

3.1.1.12. Stable range "StAR"

Set in terms of tenth of a division in the range of 1 to 255. This value defines the range of tolerance a weighing sample has match in order to meet the stable condition. A higher value provides a safer and faster stable condition.

default setting: 10

3.1.1.13. Limit underload "LUNL"

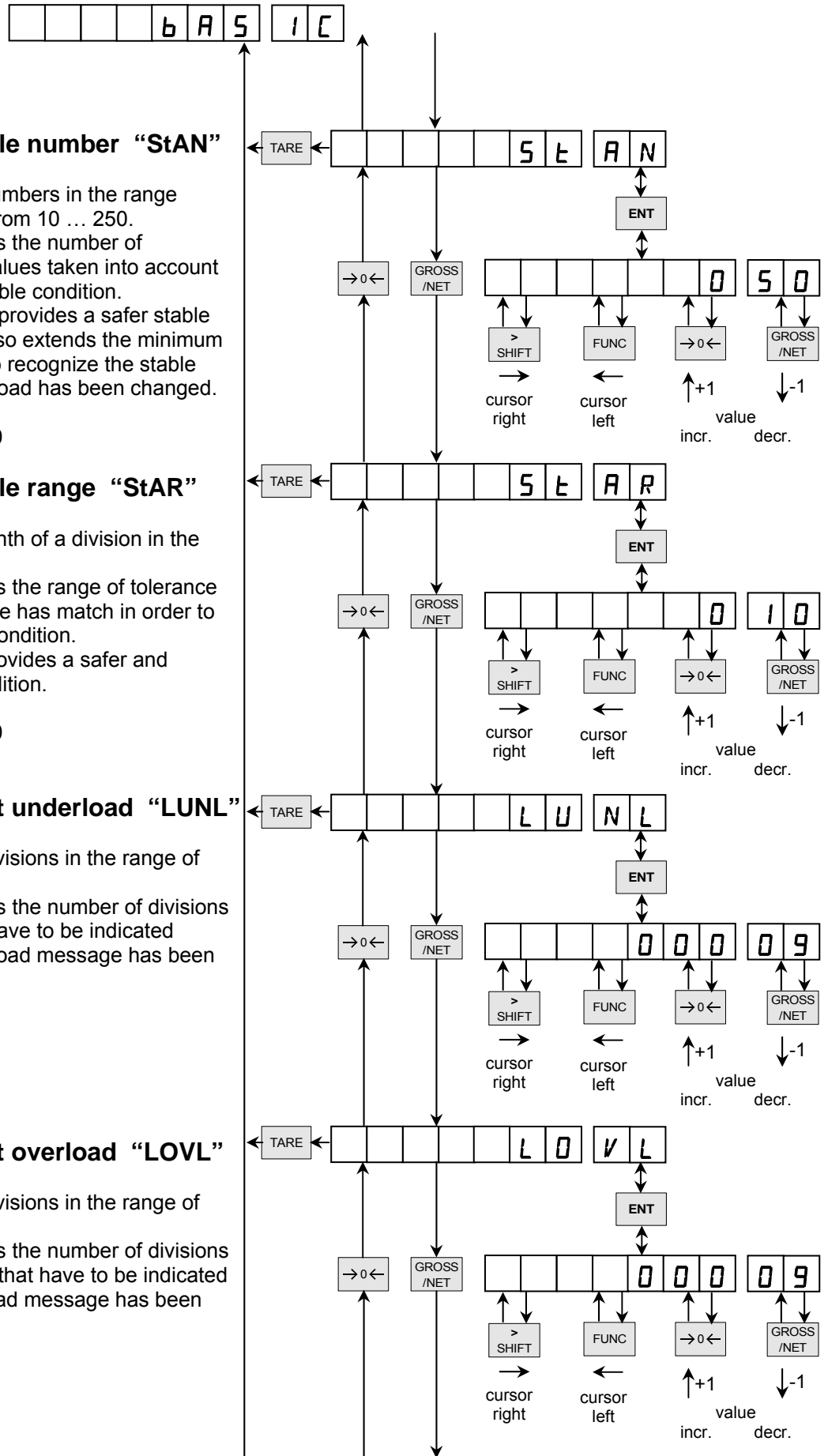
Set in terms of divisions in the range of 0 to 1000. This value defines the number of divisions below zero that have to be indicated before the underload message has been generated.

default setting: 9

3.1.1.14. Limit overload "LOVL"

Set in terms of divisions in the range of 0 to 1000. This value defines the number of divisions above FS (max.) that have to be indicated before the overload message has been generated.

default setting: 9



**3.1.1.15. Enable quickstart
“EnQS”**

This toggled decision defines whether the Power-on self test of the display is a full version (OFF) or just limited to a short segment test (ON).

default setting: off

**3.1.1.16. Select character of
free unit “CM1”**

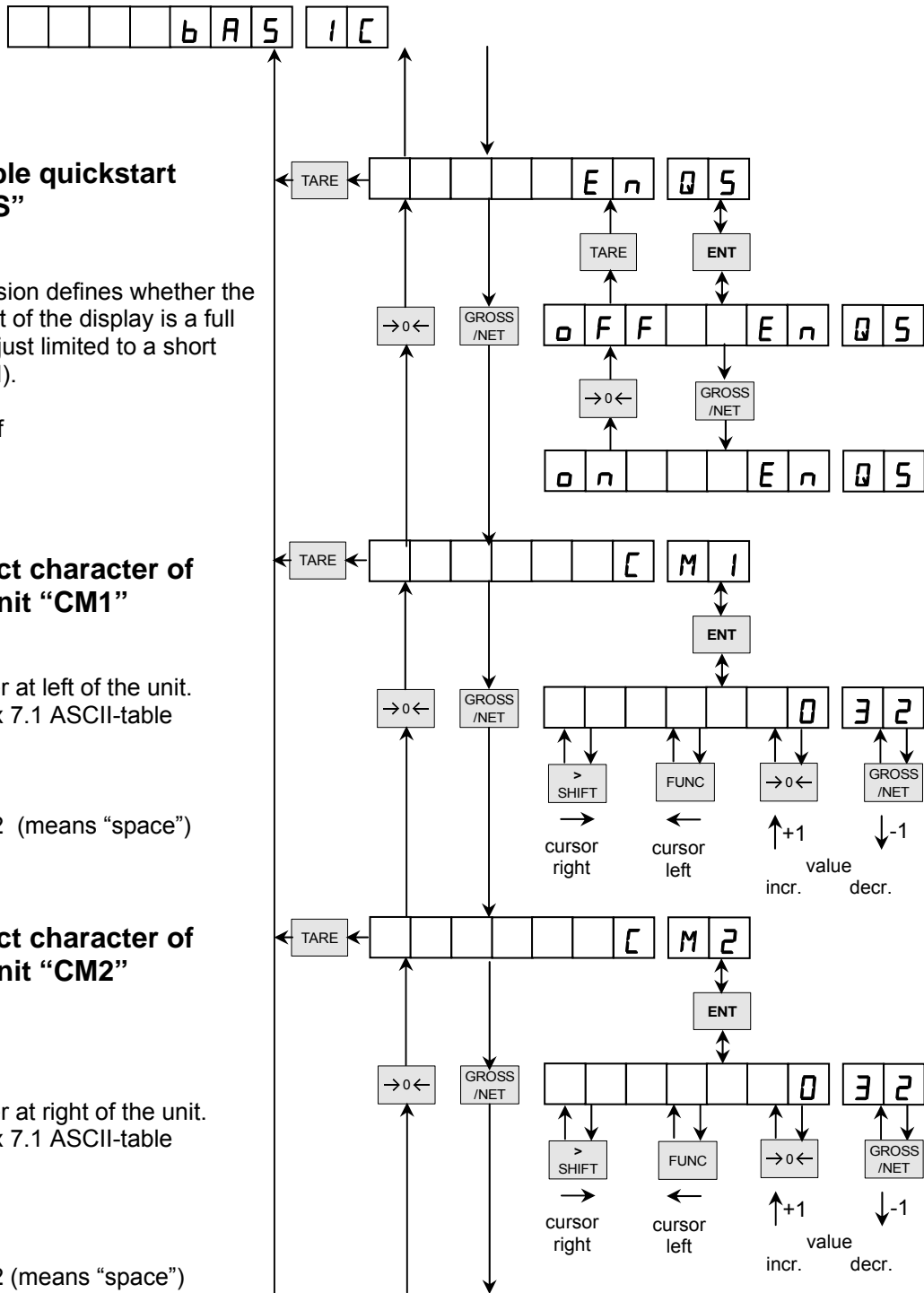
Sets the character at left of the unit. Refer to appendix 7.1 ASCII-table at page 108.

default setting: 32 (means “space”)

**3.1.1.17. Select character of
free unit “CM2”**

Sets the character at right of the unit. Refer to appendix 7.1 ASCII-table at page 108.

default setting: 32 (means “space”)



Example:

Desired measurement unit is “kp”.

- enable free unit “FU” by setting it “ON” (3.1.1.2) then
- left character is “k” → in submenu “CU1” select “107” and press key “ENT” then
- right character is “p” → in submenu “CU2” select “112” and press key “ENT”



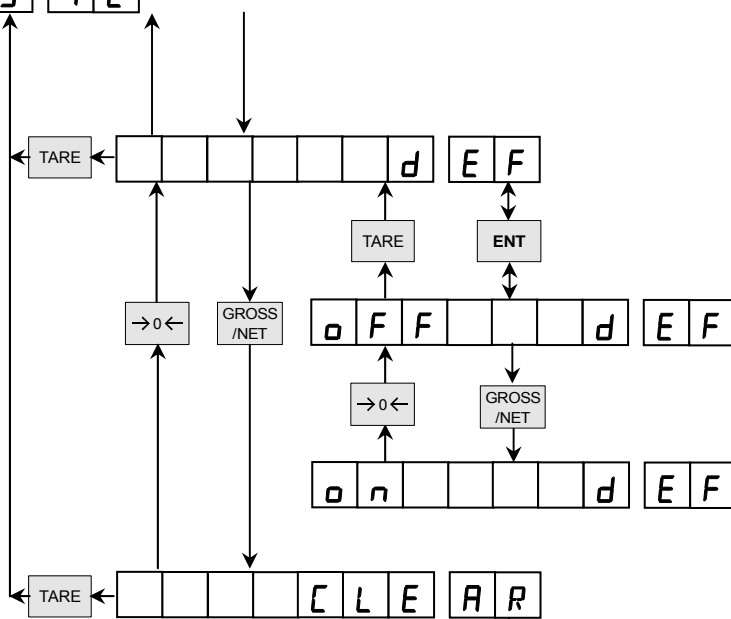
Refer to 7.1 ASCII-Table at page 108 for assigning numbers to characters.

b A S I C

3.1.1.18. Set to default “dEF”

Toggled decision to set all parameters of the “BASIC” sub menu to the default values when ON.

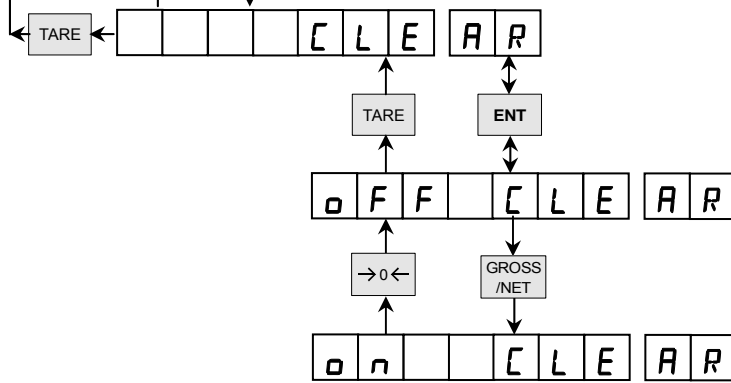
default setting: off



3.1.1.19. Clear Setup “CLEAR”

Toggled decision to set all parameters of the **whole** Setup menu to the default values when ON.

default setting: off



Note: When clearing Setup-Parameter even calibration is lost. For backup reasons use Windows® - Program before clearing.

3.1.2. Submenu “Scale division”

This menu is used to setup parameters for the selected unit “MU” 3.1.1.2 at page 24. Each used unit needs to be defined, the full scale interval (Dn) and the verification scale interval (VS). See 6.1”Calibration procedure” at page 94 for more detail.

3.1.2.1. Parameter for unit “MU”

3.1.2.1.1. Divisions “DN”

Confirming this menu by pressing **ENT** the operator reach the section of preset values like 100, 200, 300, 500, ... 30000.

If the preset value 0 is selected by pressing **ENT** an input box will be opened to enter a free FS-value in range between 100 ... 100000.

Pressing **ENT** continues the input and returns one level up.

default setting: 3000

3.1.2.1.2. Verification scale interval “VS”

Confirming this menu by pressing **ENT** the operator reaches the section of preset division size values like 0,0001 ... 100. This division size indicates the count-by value and decimal point.

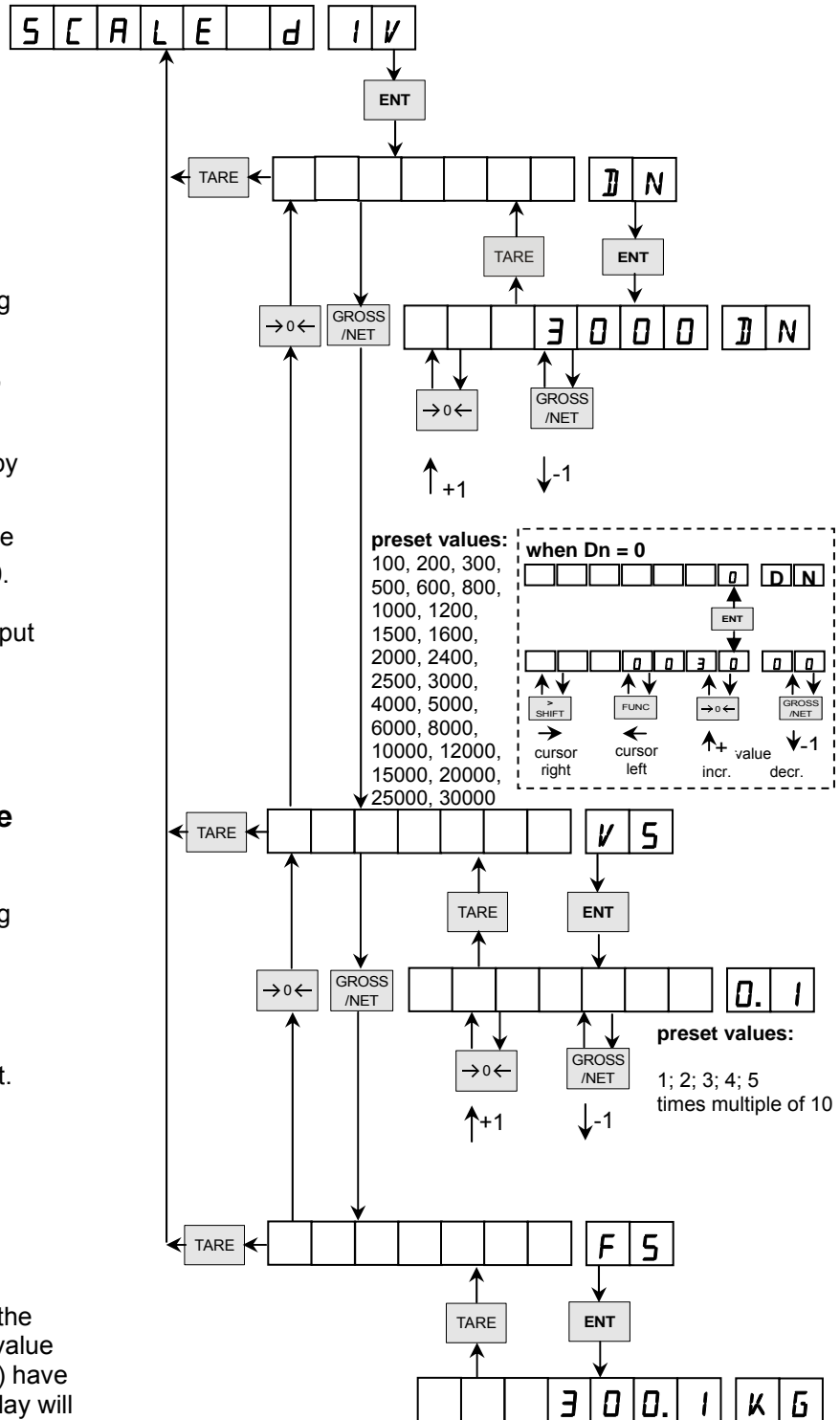
default setting: 0,1

Note: 1VS = 1e (OIML)

3.1.2.1.3. Fullscale “FS”

This option is used for checking the value for full scale (FS) and the value for verification scale interval (VS) have been entered correctly. The display will read out **fullscale + 1 VS**.

In case of default settings the display will show “300,1kg”



Examples:

I.)

Desired:	Fullscale	100kg
	Resolution	0.01kg

Menu

- Stability settings are done according to operators environment.
- set "MU" to "kg" 3.1.1.2
- "Dn" = $100\text{kg} / 0.01\text{kg} = 10000$
- set "Dn" to 10000 → A810 is legal-for-trade 3.1.2.1.1
- set "VS" = 0.01 3.1.2.1.2
- for confirmation of correctly set parameters: "FS" shows 100.01kg 3.1.2.1.3

II.)

Desired:	Fullscale	30t
	Resolution	0.002t

Menu

- Stability settings are done according to operators environment.
- set "MU" to "t" 3.1.1.2
- "Dn" = $30\text{t} / 0.002\text{t} = 15000$
- set "Dn" to 15000 → A810 is not legal-for-trade 3.1.2.1.1
- set "VS" = 0.002 3.1.2.1.2
- for confirmation of correctly set parameters: "FS" shows 30.002t 3.1.2.1.3

3.1.3. Submenu “ADC”

This menu is used to select the ADC and filter characteristics of the data acquisition. Analogue parameters like gain and offset are preset during the production test procedure and need no further adjustment.

3.1.3.1. Filter component “FC”

Set in terms of number between 10 to 250 this value defines the number of samples from the ADC to be used for the continuously moving averaging filter in connection with the ADC sampling rate. Lower value provides faster stable.

default setting: 50

3.1.3.2. Threshold of filter jump “FT”

Set in an range between 50 to 1000000 This value represents the ADC integer value when the sliding filter is stopped and restarted to trace any load change directly.

This value should be slide above the Maximum of interference caused by vibrations. Higher value provides faster stable.

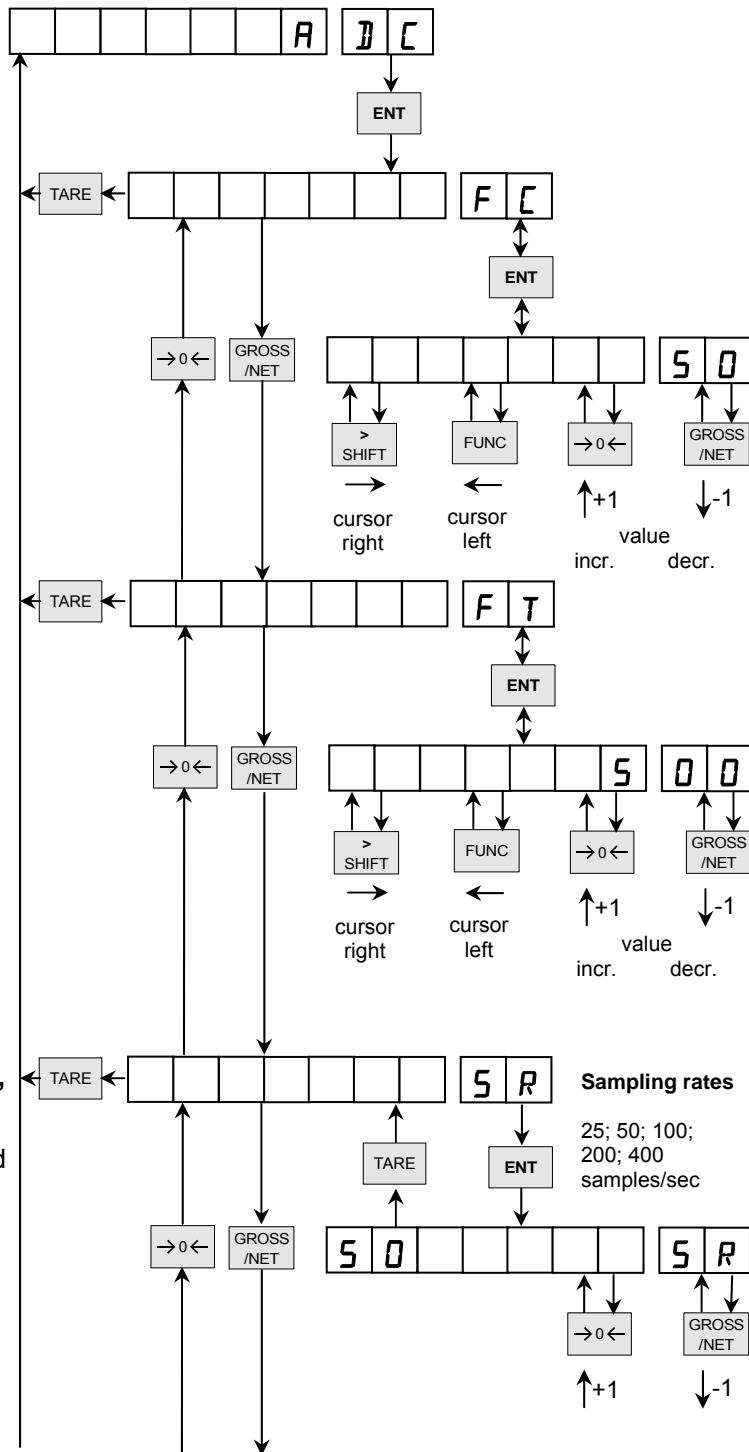
default setting: 500

3.1.3.3. ADC sampling rate “SR”

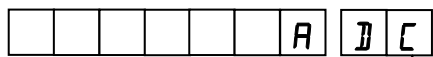
Set in terms of preset values for standard sampling rate and corresponds to the number of samples per second achieved by the ADC.

In connection to the filter settings the system can be adjusted to the application. Higher value is faster.

default setting: 50 samples / sec



Note: When SR = 100, “StAN” (3.1.1.11) is set automatically to 100 when “StAN” is greater than 100.
 When SR = 200, “StAN” (3.1.1.11) is set automatically to 10 when “StAN” is greater than 10.
 When SR = 400, “StAN” (3.1.1.11) is set automatically to 2 when “StAN” is greater than 2.



3.1.3.4. Display Frequency

This option regulates refreshing rate of display. Value * 10ms = frequency.

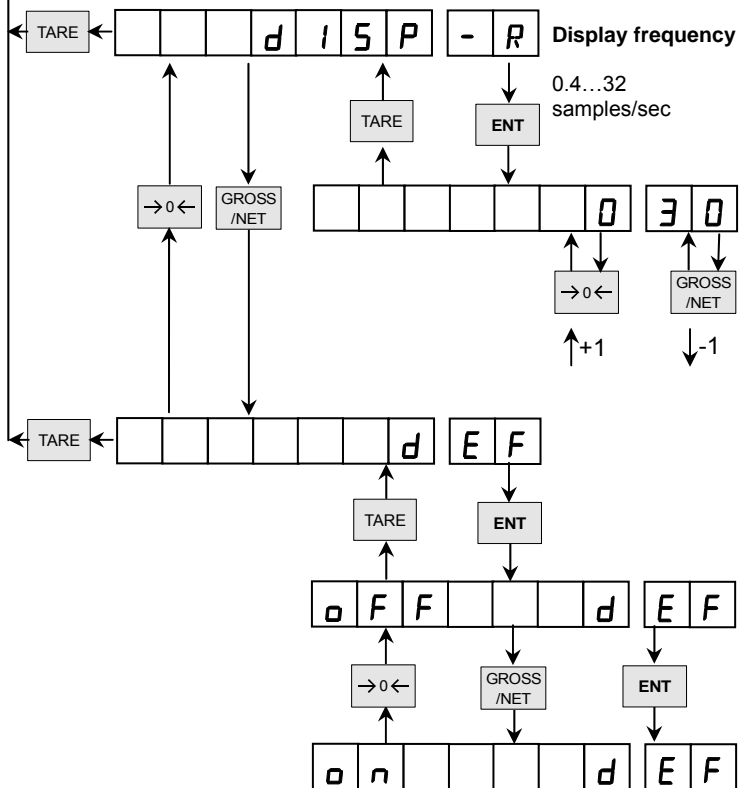
Lower value means faster display frequency.

default setting: 030 (3Hz)

3.1.3.5. Set to default "def"

This is an option to reset all parameter of the "ADC" sub menu to default values when ON.

Warning: Calibration is lost!



3.1.4. Submenu “Calibration”

This menu allows the operator to perform either a practical or a theoretical calibration. During the practical calibration a desired load has to be applied a zero / full scale span calibration by using of at least two points. Additional entered points will increase the accuracy.

The theoretical calibration allows to enter the known input voltage ratios but it will not reach the accuracy of a practical calibration due to tolerances of electronic components.

3.1.4.1. Two position practical calibration “2P”

The two position calibration allows the zero of the scale and some other value at almost any position of its characteristics, assumed that the complete system is linear.

3.1.4.1.1. Zero calibration “ZC”

This zero calibration is always the first step to determine the calibration data. After pressing **ENT** the information come up to remove any load. An additional pressing **ENT** starts the zero average. After counting from 0...100 it returns to the ZC-menu.

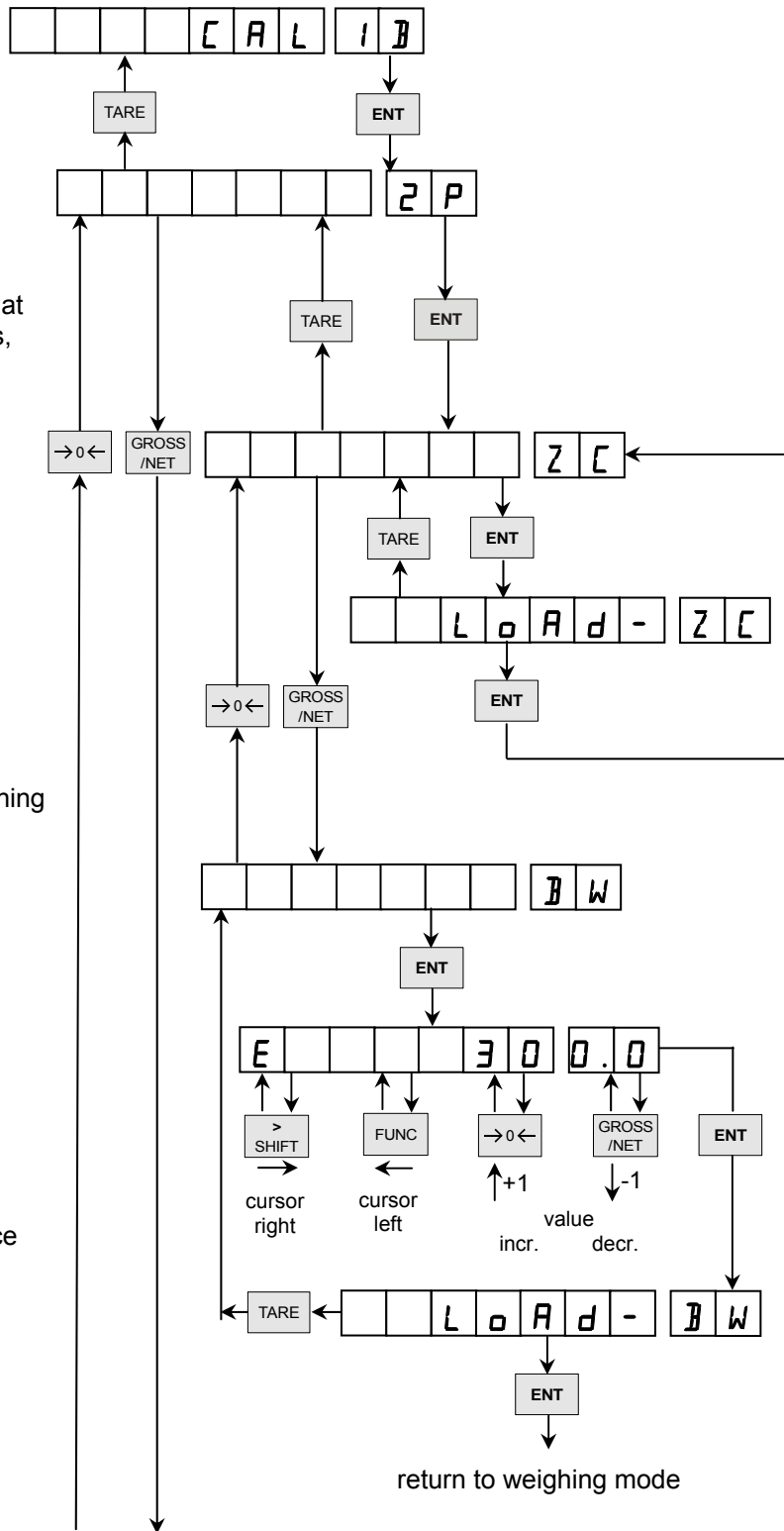
Do only Zero calibration will move weighing function parallel to previous one.

3.1.4.1.2. Span calibration with balance “BW”

After confirmation an input window is opened to enter the balance weight according the selected scale division. Shown balance weight is Fullscale. After pressing **ENT** the operator will be informed to place the real balance test weight on scale. Establish span by pressing **ENT**. After taking 100 samples of that test weighing the calibration has been saved.

Notice: If you reach the editing field by error and would like to abort:

- enter any value
- press **ENT**
- press **TARE**

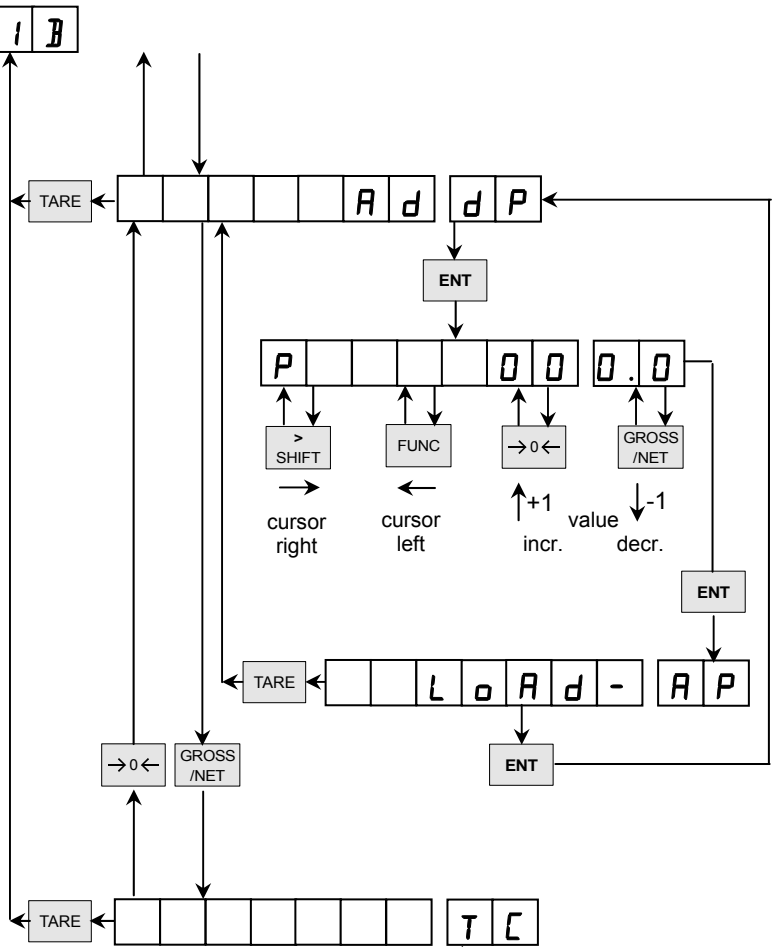


3.1.4.2. Additional calibration points "AddP"

To reduce the influence of any non linearity of the load cell arrangement additional calibration points might be entered by applying additional test weights. The procedure is similar to the previous ones.

Notice: If you reach the editing field by error and would like to abort:

- enter any value
- press **ENT**
- press **TARE**

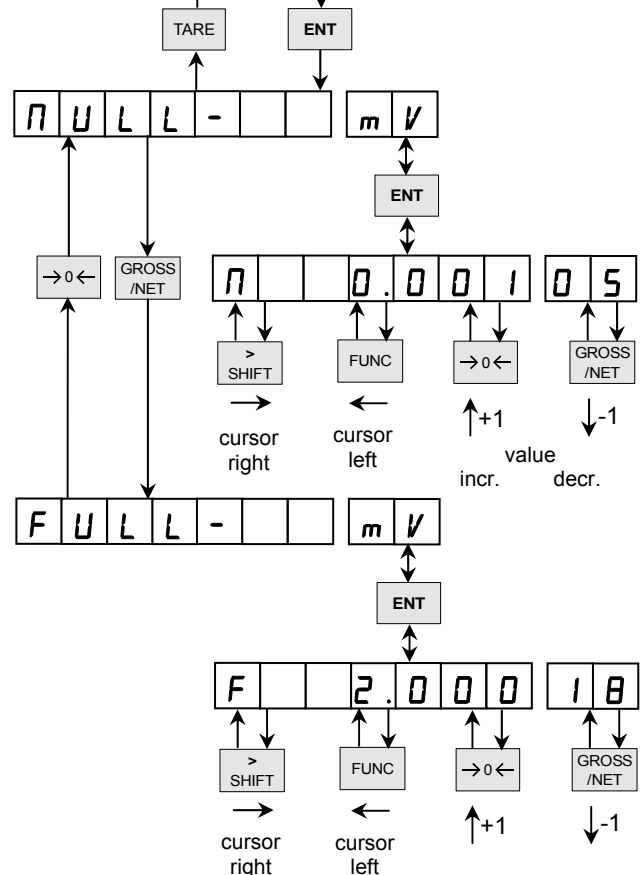


3.1.4.3. Theroretical calibration "TC"

After pressing **ENT** an entry window for the input voltage ratio corresponding to the zero position will be active. The shown value is the old calibrated / edited one. Next step is to enter the input voltage ratio corresponding to the full scale value. The shown value is the old calibrated / edited one.

When your loadcell provide a negative voltage ratio at Zero, press "TARE" to change sign.

Do only Zero calibration will move weighing function parallel to previous one.



3.1.5. Submenu “Alibi”

This submenu defines the settings for internal legal-for-trade memory. This memory is used for proof of weighing. It is written to, when operator “prints” to this memory. The string is as follows:

<Consecutive Number><Date><Time><1><Gross><Tare><Net><Productcode><0>

3.1.5.1. Alibi memory activate “Act”

This parameter activates the alibi as ringmemory.

- OFF: not active
- ON: active

default setting: off

Notice: Reading out a full memory takes app. 30 minutes.
Print to Alibi memory is done via function call “16” (7.2 at page 109).

3.1.5.2. Print request to Alibi memory “RQ”

This parameter defines under which condition the print to Alibi memory is done.

- 0: print at keypress; scale has to be in stable condition otherwise keypress is ignored
- 1: same as 0 but Gross weight has to be at Zero before print to Alibi memory is done.
- 2: print at keypress; print to Alibi memory is done, when scale is stable. Keypress is saved until print to Alibi memory is done.

default setting: 2

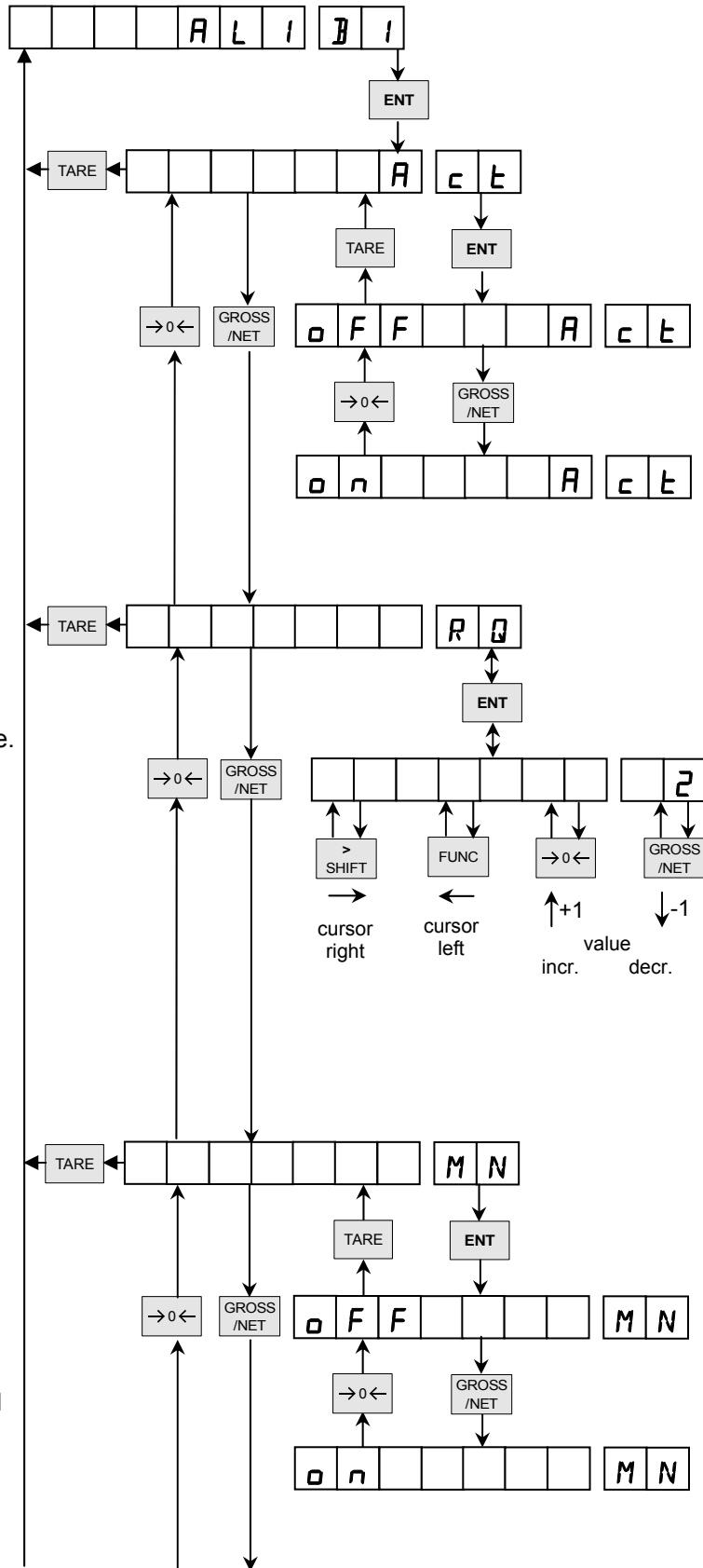
3.1.5.3. Minimum Load “MN”

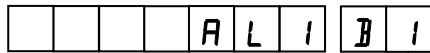
This parameter defines wether a print to Alibi memory is done, when actual weight is greater than Minimal Load “ML”.

- ON: print to Alibi memory when actual weight is greater then Minimum Load
- OFF: print always to Alibi memory

default setting: on

Refer to 3.1.1.8 “ML” at page 26.

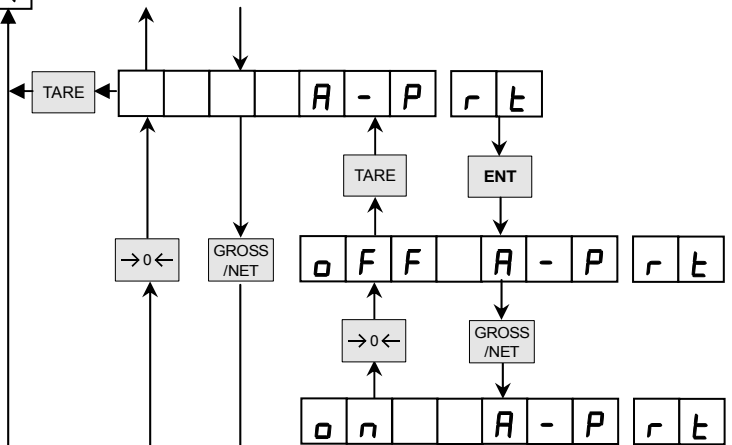




3.1.5.4. Alibi confirmation "A-Prt"

This parameter defines whether the print to Alibi memory is confirmed on display with "A-Prt" for 3s when done.

default setting: on

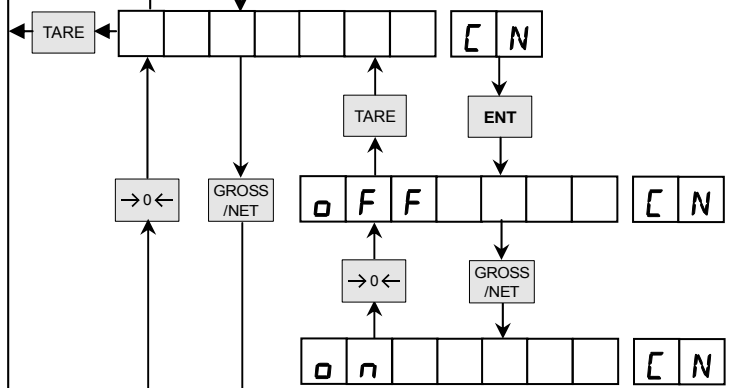


3.1.5.5. Consecutive Number "CN"

This parameter defines whether the Consecutive number is incremented every time a print to Alibi memory is done.

default setting: on

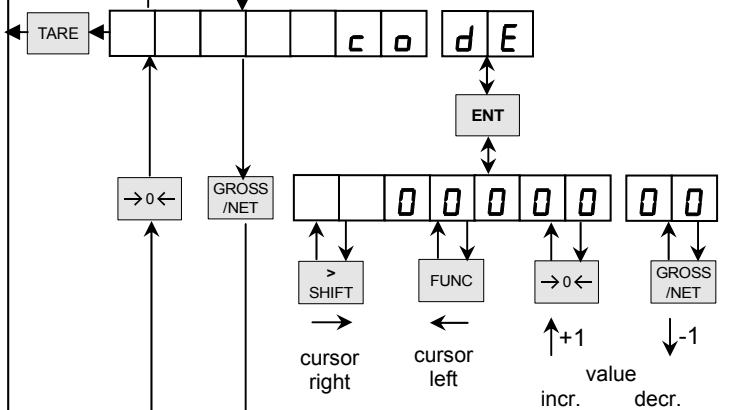
Note: This parameter has to be OFF when a physical printer is used. The Consecutive number is incremented each time any printout is initiated.



3.1.5.6. Code protection "code"

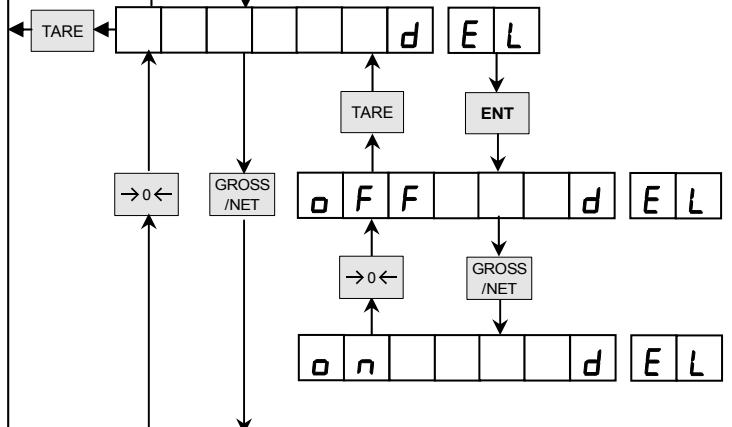
This parameter protects Alibi memory from deleting by any unauthorised user when calling function 21. Refer to 7.2 at page 109.

default setting: 0 (no protection)



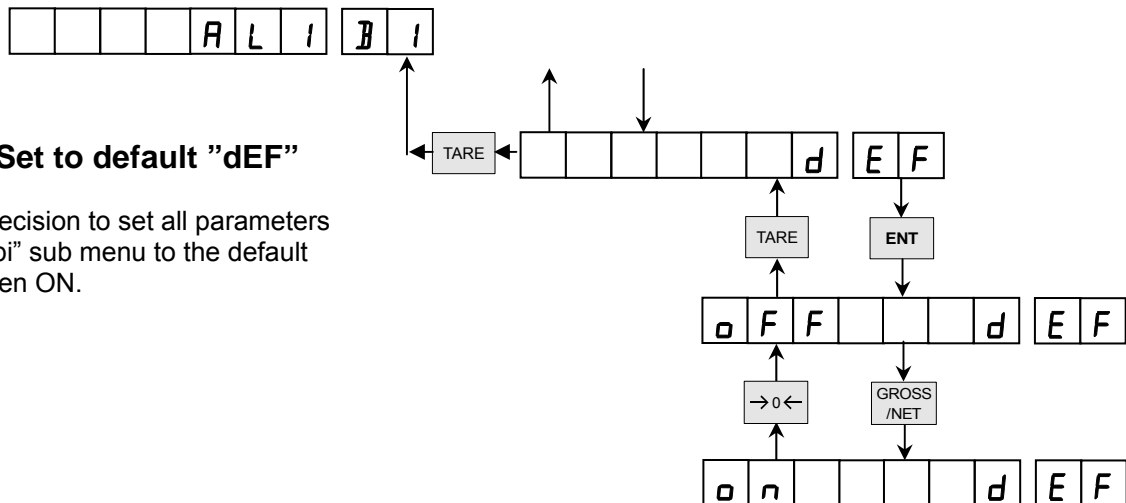
3.1.5.7. Delete Alibi memory "dEL"

This parameter deletes the whole Alibi memory when ON is confirmed.



3.1.5.8. Set to default "dEF"

Toggled decision to set all parameters of the "Alibi" sub menu to the default values when ON.



3.1.6. Submenu “Control”

This submenu defines the settings whether the A810 is working in “Comparison Mode” and “Sequence Mode” and certain in- and outputs.

3.1.6.1. Sequence mode selection “SMS”

This toggled decision defines whether the device is used in sequence mode or in comparison mode.

off: comparison mode

on: sequence mode

default setting: off

3.1.6.2. Feeding / Discharging control “Fd-Con”

This defines how the device is working regarding Feeding / Discharging application. It is only available in comparison mode.

0: feeding

1: discharge

2: external control

default setting: 0

3.1.6.3. Complete signal output mode “CSO-MD”

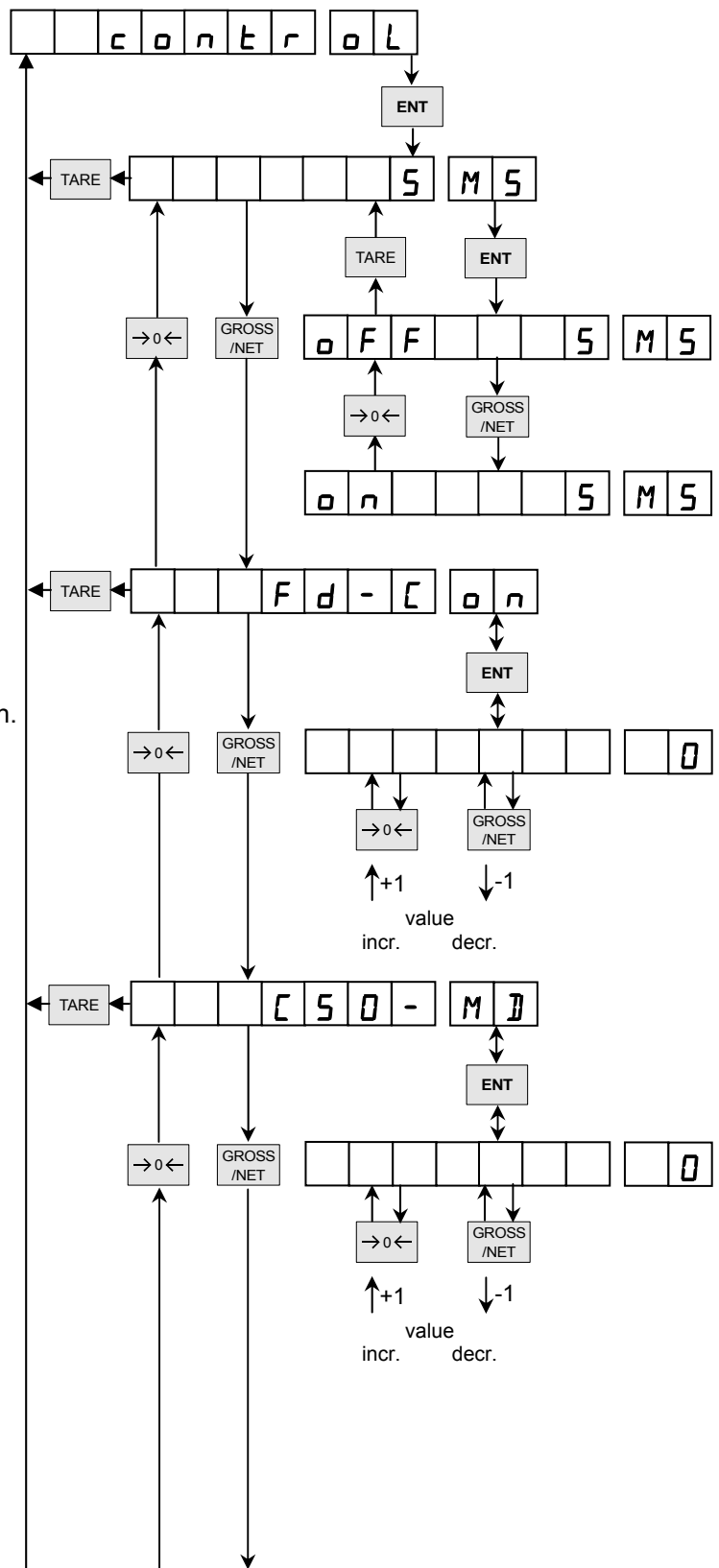
This selection defines when the “complete” signal is active at pin B12. The duration of “complete output signal” depends on “complete output time” 3.1.7.8 “COTI” at page 43.

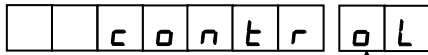
0: judging time is expired

1: after stable condition is set and judging time is expired

2: after CPS is set, stable is set or judging time is expired

default setting: 0

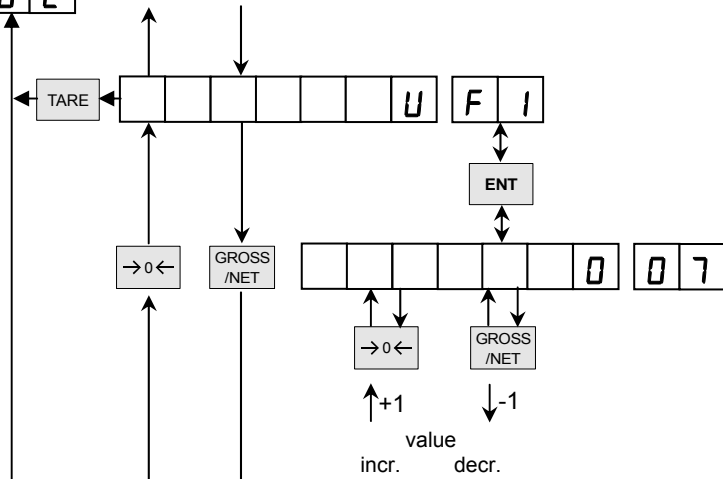




3.1.6.4. User function “UF1”

This function is activated once when complete signal is ON at the beginning of “Complete Output Time”.
Refer to 7.2
“Survey of Operating Functions” at page 109.

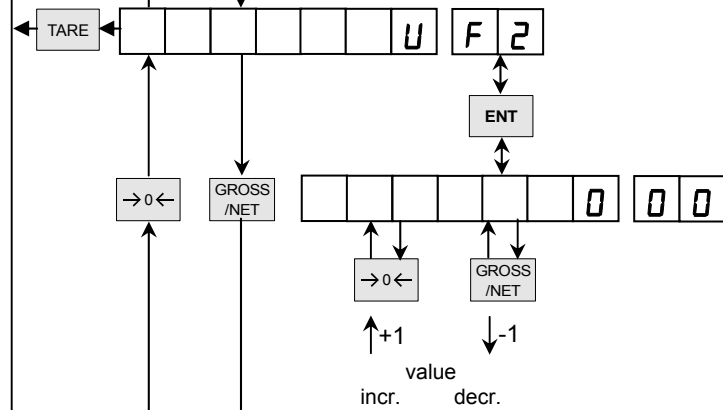
default setting: 7 (print)



3.1.6.5. User function “UF2”

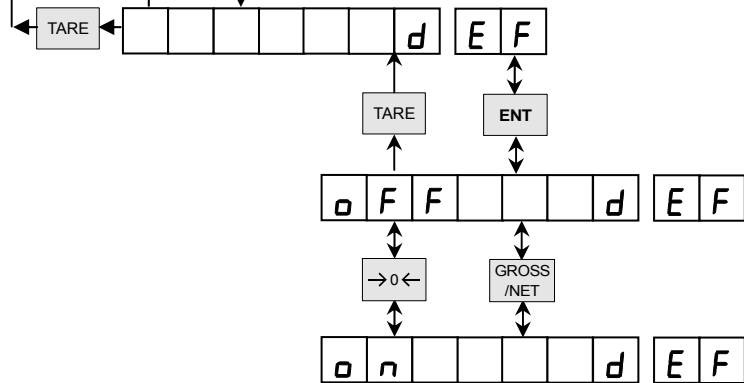
This function is activated once when complete signal is ON at the end of “Complete Output Time”.
Refer to 7.2 .
“Survey of Operating Functions” at page 109.

default setting: 0



3.1.6.6. Set to default “dEF”

Toggle decision to set all parameters of the “control” sub menu to the default values when ON.



3.1.7. Submenu comparison mode "COMP"

All settings in this submenu are for the basic behaviour in "Comparison Mode" and "Sequence Mode".

3.1.7.1. Near-Zero-Compare "nZC"

This selection defines whether Gross or Net will be used to carry out the Near-Zero-Compare mode.

- 0: compare with gross weight
- 1: compare with net weight
- 2: comparison off

default setting: 0

3.1.7.2. Final-Over-Under-Compare "FOU-CMP"

This selection is to define whether Gross or Net is taken into account regarding Final-Over-Under-Compare mode. This setting is used for setpoints SP1, SP2 and SP3/CPS as well.

- 0: compare with gross weight
- 1: compare with net weight
- 2: comparison off

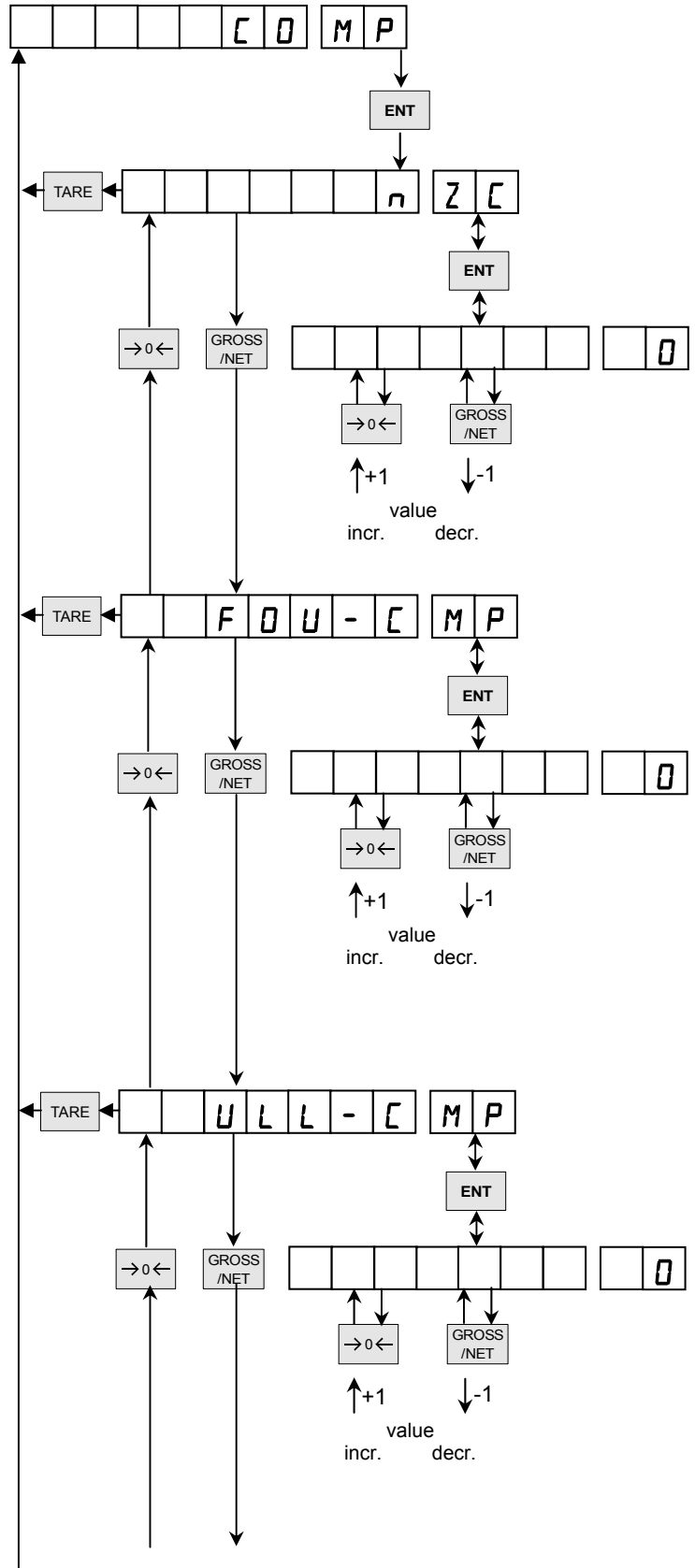
default setting: 0

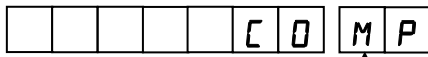
3.1.7.3. Upper-Lower-Limit-Compare "ULL-CMP"

This selection is to define whether Gross or Net is taken into account regarding Upper-Lower-Limit-Compare mode.

- 0: compare with gross weight
- 1: compare with net weight
- 2: comparison off

default setting: 0



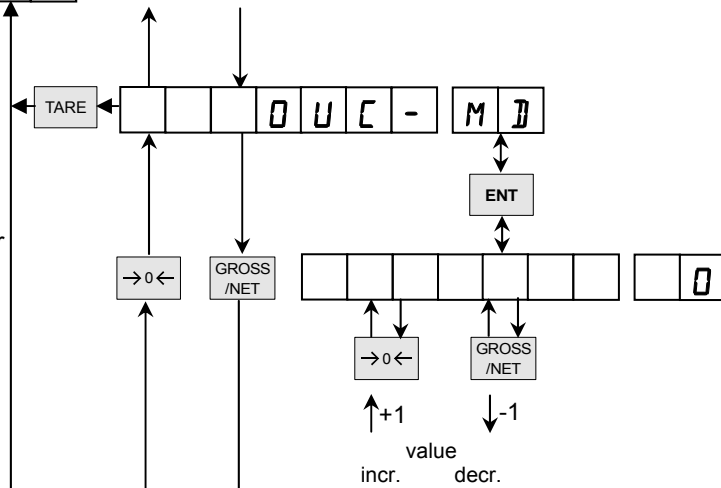


3.1.7.4. Over-under-go-compare mode "OUC-MD"

This selection defines when Over and Under signal is taken into account.

- 0: compare always
- 1: compare when judging input is ON
- 2: compare when complete output is ON
- 3: compare when complete output is ON and weight will be hold during that time

default setting: 0

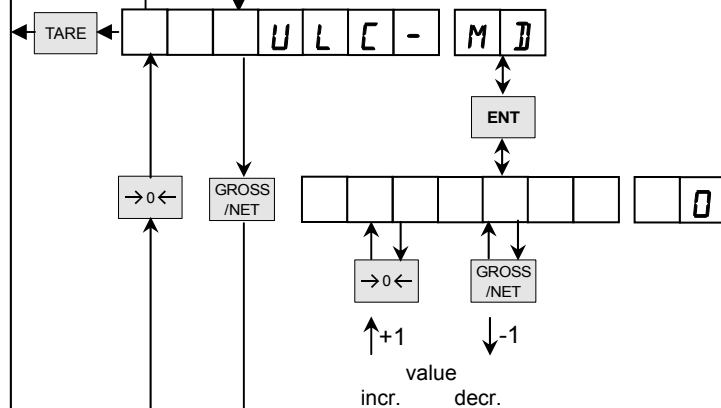


3.1.7.5. Upper-lower-limit-compare mode "ULC-MD"

This selection defines when Upper- and Lower limit signal is taken into account.

- 0: compare always
- 1: compare when judging input is ON

default setting: 0

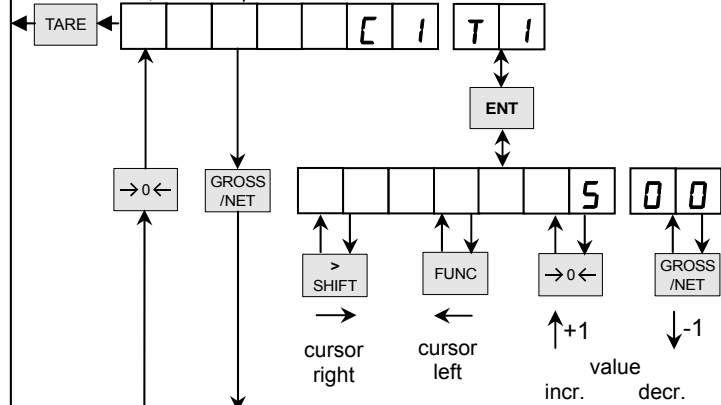


3.1.7.6. Compare inhibited time "CITI"

This timer defines duration between 50...999ms after SP1, SP2 or CPS setpoint is reached.

No comparison is done during that time.

default setting: 500ms



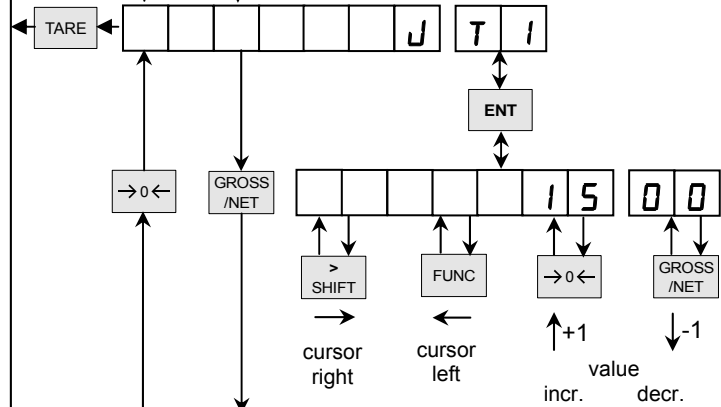
3.1.7.7. Judging time "JTI"

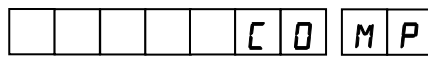
This timer defines duration between 0...9999ms after SP3/CPS compensation setpoint is reached.

After judging timer is expired the complete output timer can start.

default setting: 1500

Note: When "JTI" is set to 0, no judgement is done. Refer to example 6.7 at page 105.

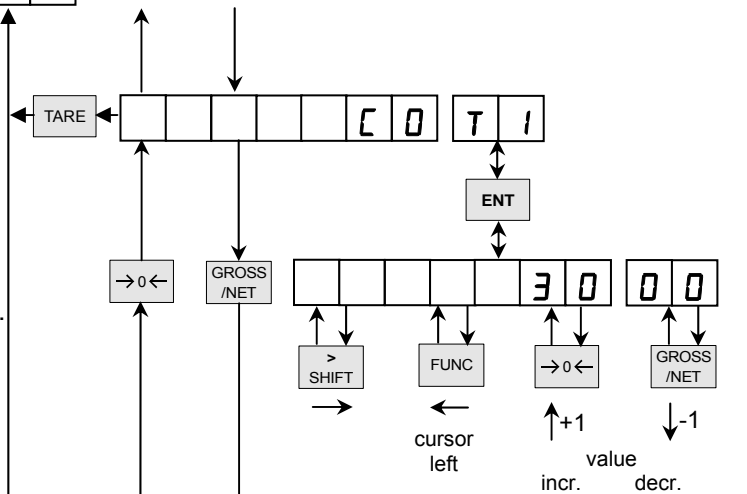




3.1.7.8. Complete output time "COTI"

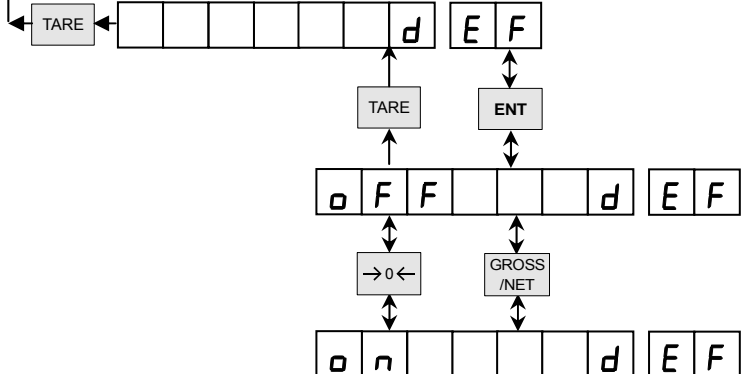
This timer defines duration between 50...9999ms of how long the complete output pin is ON. This setting is according to 3.1.6.3 "CSO-MD" at page 39.

default setting: 3000



3.1.7.9. Set to default "dEF"

Toggled decision to set all parameters of the "compare" sub menu to the default values when ON.



3.1.8. Submenu "SEQU"

In this submenu additional settings for "sequence mode" can be set.

3.1.8.1. Auto Zero Count "AZC"

The A810 will do an "Auto zero" for that number of starts.



- 0 → "Auto zero" is disabled
- 1 → do an "Auto zero" every start
- 2 → do an "Auto zero" every 2nd start

default: 0

3.1.8.2. Judging count "JC"

The A810 will do a "Judging" for that number of completed cycles.



- 0 → "Judging" is disabled
- 1 → do a "Judging" every finished cycle
- 2 → do a "Judging" every 2nd finished cycle

default setting: 0

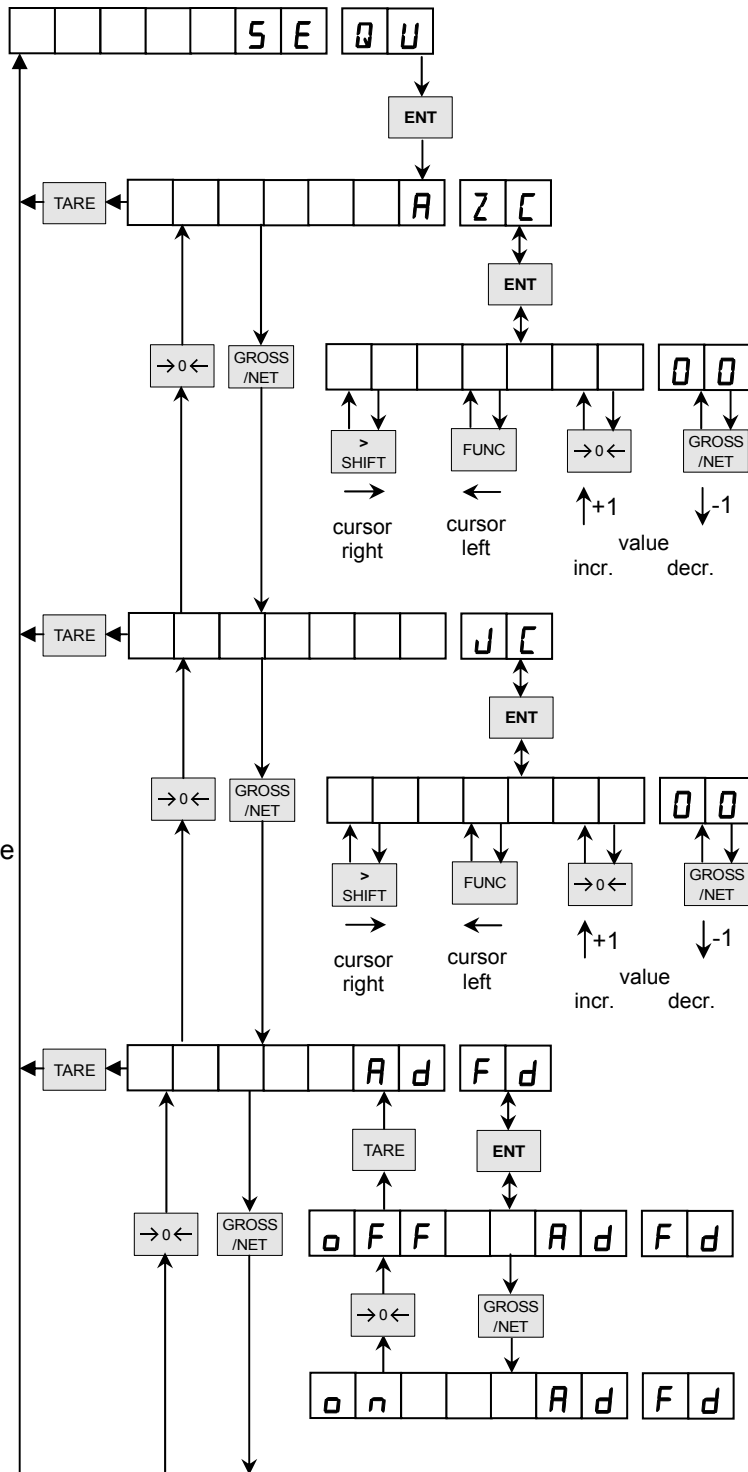
3.1.8.3. Adjust feeding "AdFd"

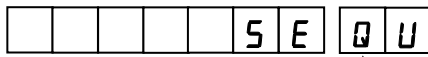
Toggle decision to set "Adjust feeding" ON or OFF.

When ON this parameter will reset CPS once when CPS is already set and stretches cycle for a certain time. Refer to 3.2.3.2.15 "CFT" at page 71 for timing.

default setting: off

Refer to 6.8 at page 106 for more details.



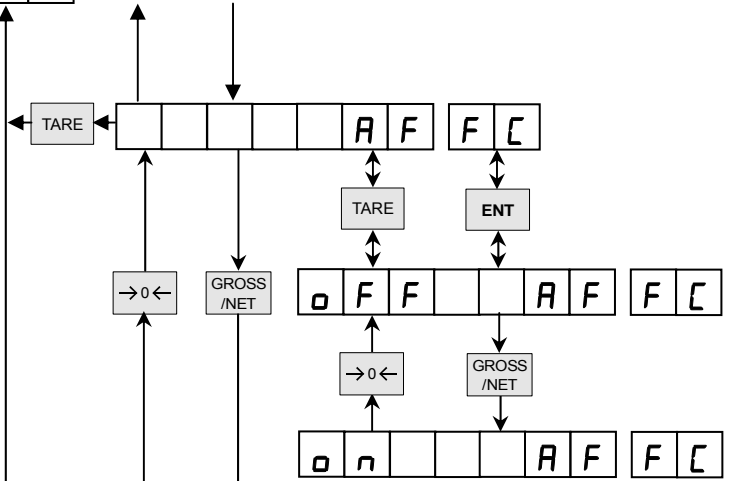


3.1.8.4. Auto free fall compensation "AFFC"

Toggle decision to set "Auto free fall compensation" ON or OFF.

default setting: off

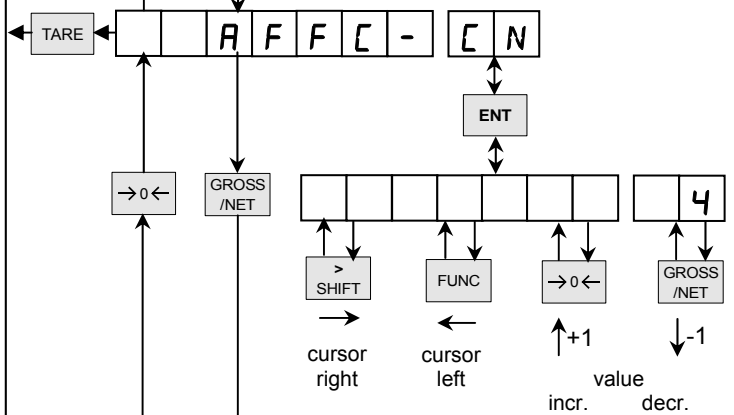
Refer to application note 6.9 at page 107.



3.1.8.5. Auto free fall compensation counter "AFFC-CN"

Set in terms of numbers between 0...9 of completed weighing cycles to take into account for compensation.

default setting: 4

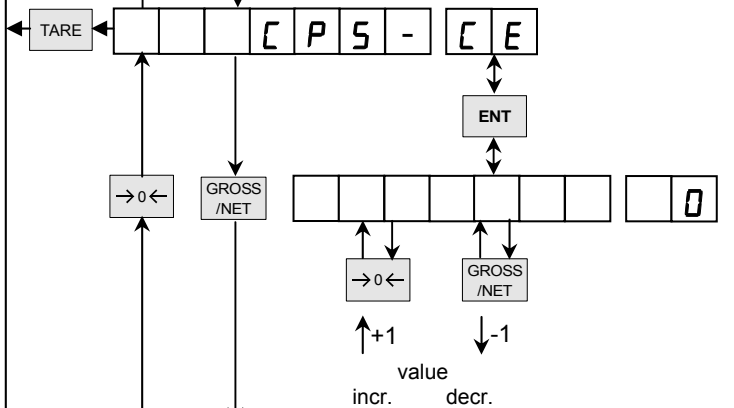


3.1.8.6. CPS coefficient "CPS-CE"

Set in terms of numbers between 0...3 of weighing.

- 0: 0.25
- 1: 0.5
- 2: 0.75
- 3: 1

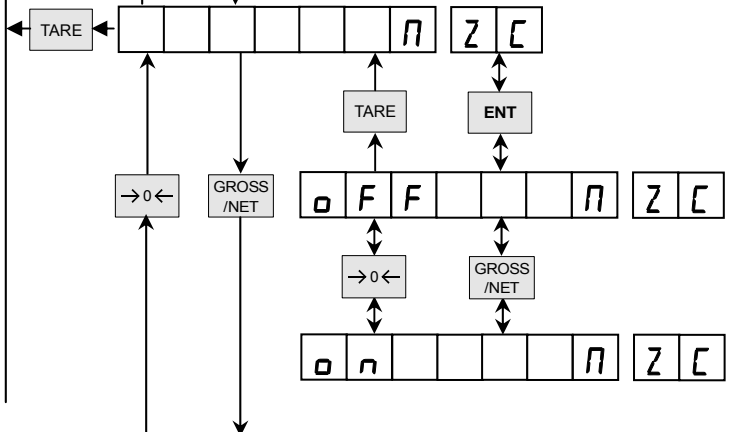
default setting: 0

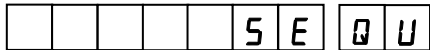


3.1.8.7. Near zero confirmation "NZC"

Toggle decision to ensure a "near zero" condition during starting a cycle. When no "near zero" condition is detected "Err 104" is shown.

default setting: off

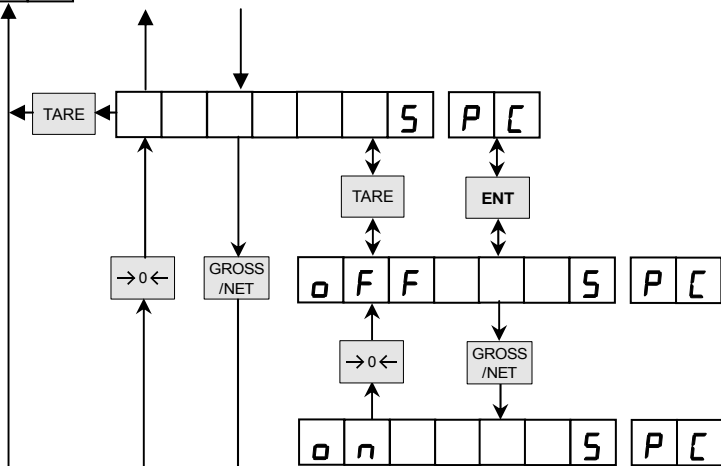




3.1.8.8. Setpoint SP1 confirmation "SPC"

Toggle decision to ensure a weight below SP1 during starting a cycle. When weight is higher SP1 "Err 105" is shown.

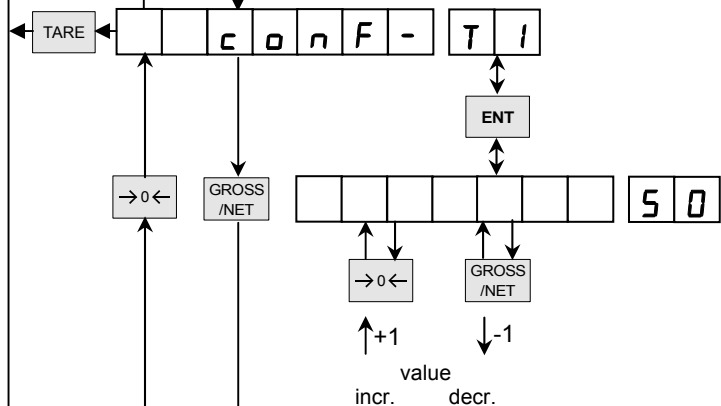
default setting: off



3.1.8.9. Confirmation time "conf-TI"

Set in terms of numbers between 50...9999ms. During that time in sequence mode a signal has to be on input D18 or D19 (with user function "230" p.109 associated) otherwise a weighing cycle is aborted with "Err109".

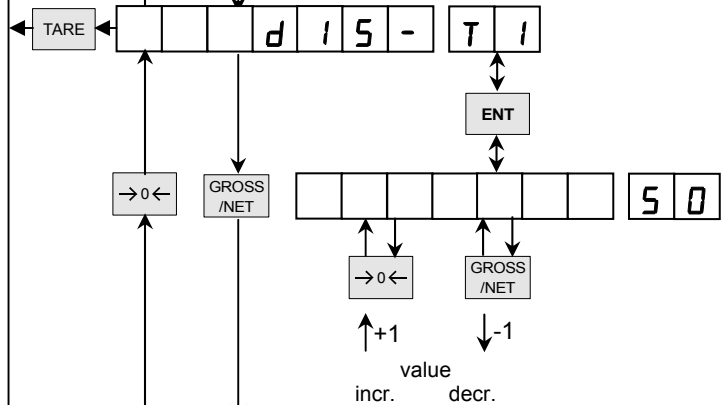
default setting: 0



3.1.8.10. Discharging time "dis-TI"

Set in terms of numbers between 50...9999ms. After the "Complete Signal" turns ON, the "Discharge" Signal (B10) turns ON for that time.

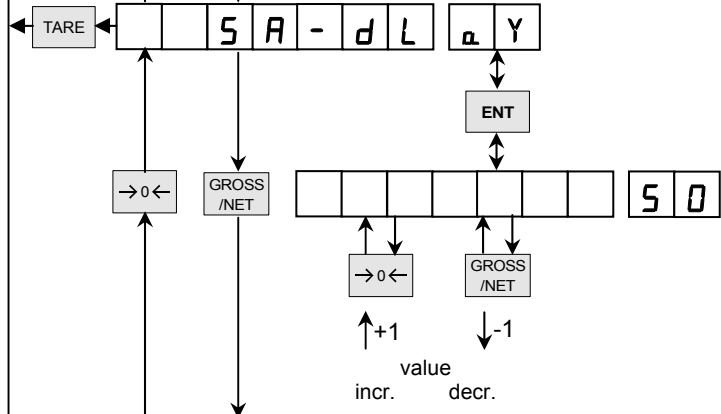
default setting: 3000



3.1.8.11. Sequence active delay "SA-dlay"

Set in terms of numbers between 50...9999ms. After "Start"-Signal (D10) turns on, output signal "sequence active" (B21) is delayed by that time till it turns on.

default setting: 50

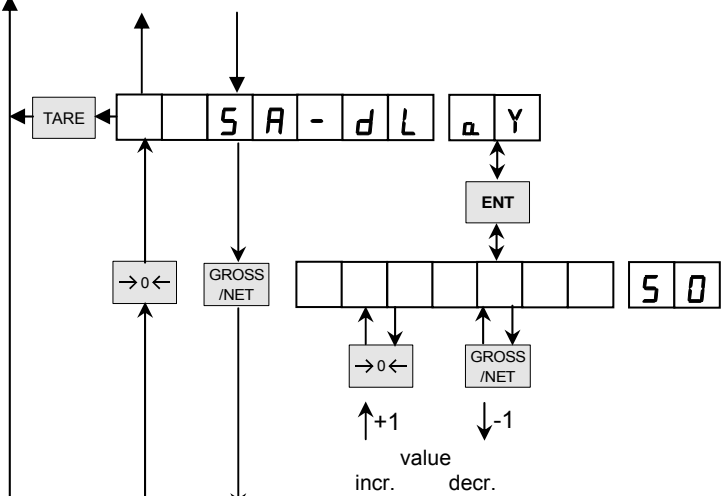




3.1.8.12. Setpoints delay "SP-dlay"

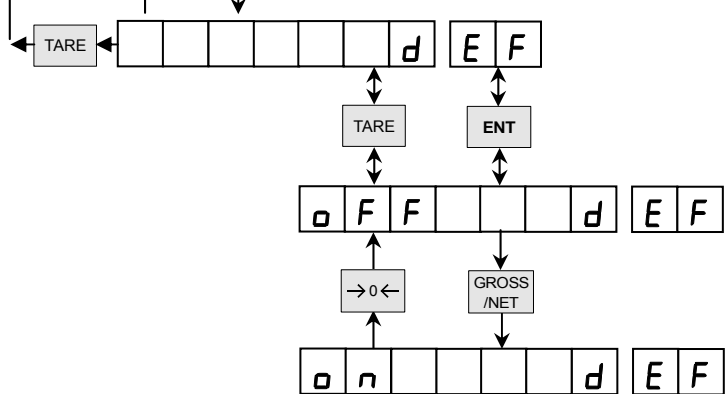
Set in terms of numbers between 50...9999ms.
 After "Sequence activ"-Signal (B21) turns on, output signals "SP1", "SP2" and "CPS" are delayed by that time till they turn on.

default setting: 50



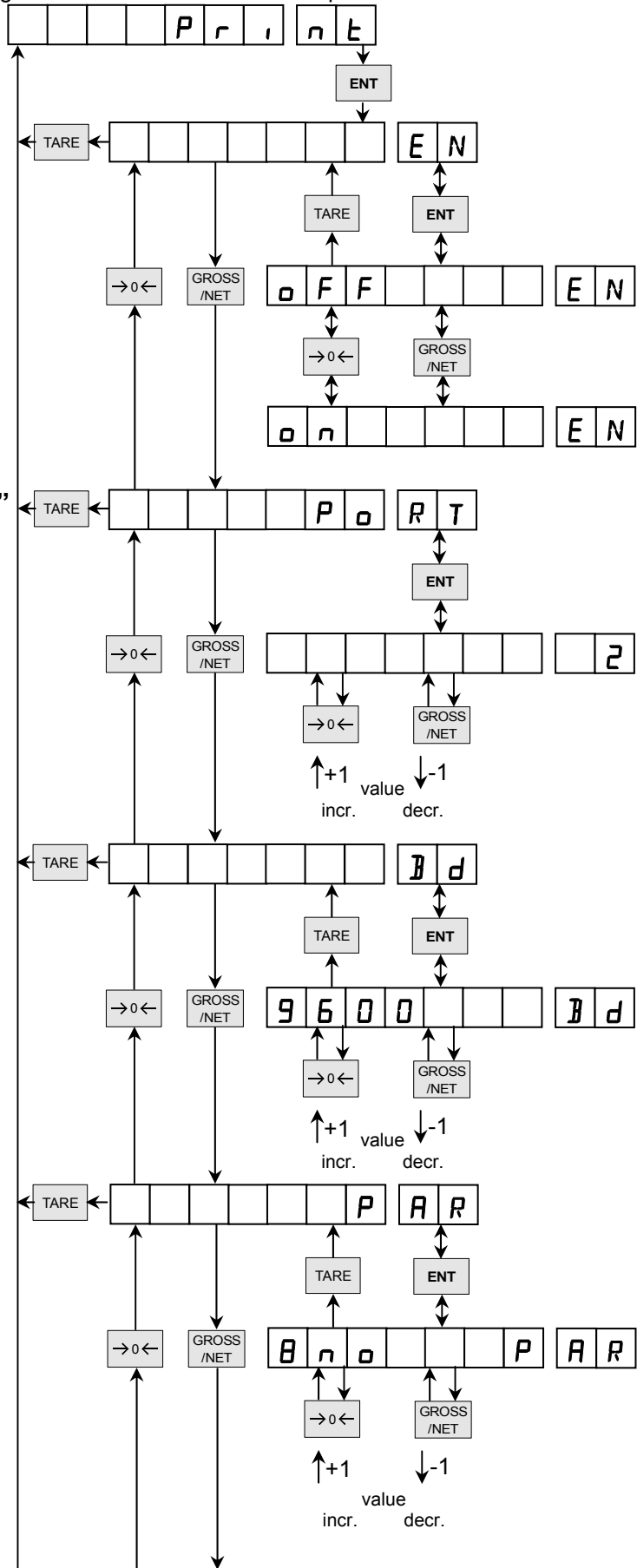
3.1.8.13. Set to default "dEF"

Toggle decision to set all parameters of the "sequence" sub menu to the default values when ON.



3.1.9. Submenu "Print"

This menu defines the major parameter to get a direct communication to a printer.



3.1.9.1. Printer enable "EN"

This toggled decision defines whether the printer port is enabled for further use.

default setting: on

3.1.9.2. Printer port select "PoRT"

Set in terms of numbers to defines the physical address of the communication port at A810 to the printer.

default setting: 2 (Pins E19, 20)

Refer to 2.2 at page 12.

3.1.9.3. Baudrate select "Bd"

Set the desired baud rate for the communication port of A810 to the printer in the range of 1200 ... 76800 baud.

default setting: 9600

3.1.9.4. Parity check "PAR"

Select the number of data bits for transmission and the type of parity.

default setting: 8no

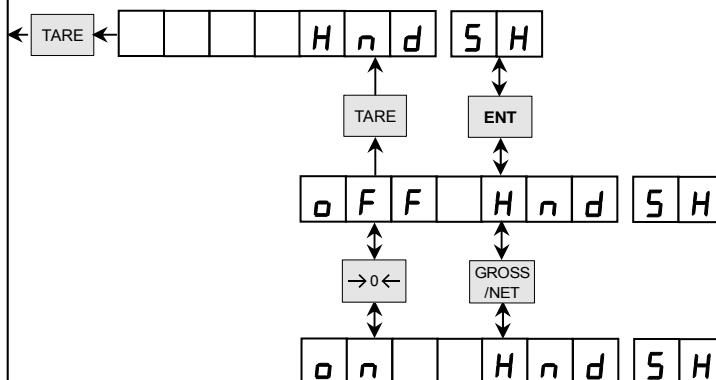
8no	8 databits, no parity, 1stopbit
8EvE	8 databits, even parity, 1stopbit
8odd	8 databits, odd parity, 1stopbit
7EvE	7 databits, even parity, 1stopbit
7odd	7 databits, odd parity, 1stopbit

Print

3.1.9.5. Protocol typ select "HndSH"

This toggled decision defines whether a software Xon / Xoff in enabled.

default setting: on



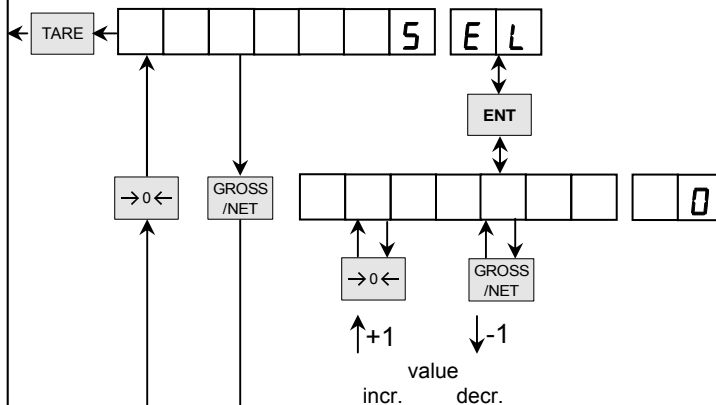
3.1.9.6. Printer type select "SEL"

Set in terms of numbers this parameter defines the type of serial printer. In default setup a standard CR/LF handling is set.

default setting: 0

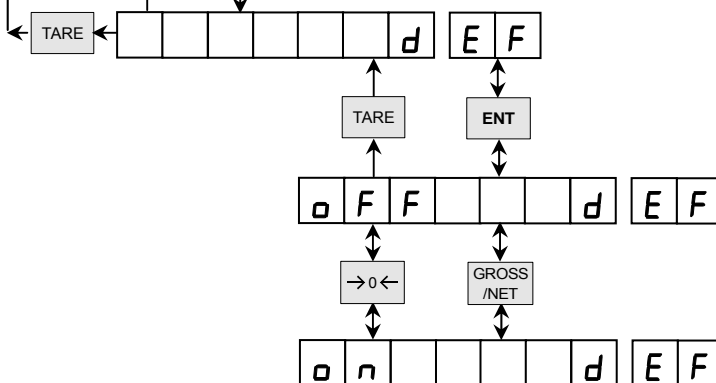
numeric	printer type
0	CR / LF
1	TM295
2	Epson LX- / FX
3	Star
4	DPN-245
5	GFM 21-TE
6	OmniScale

Note: If you do not find your printer, please do not hesitate to contact our service.



3.1.9.7. Set to default "dEF"

Toggled decision to set all parameters of the "Print" sub menu to the default values when ON.



3.1.10. Submenu PC-Interface “PC”

This menu defines all parameters required for communication between A810 and a PC.

3.1.10.1. PC-Interface “EN”

This toggled decision defines whether the PC-port is enabled.

default setting: on

3.1.10.2. PC-Port-select “PoRT”

Set in terms of numbers to define the address of the communication port for PC link.

default setting: 1 (Pin E7, 8)

Refer to 2.2 at page 12.

3.1.10.3. Baudrate select “Bd”

Set the desired baud rate for the communication port between 1200 ... 78600 baud.

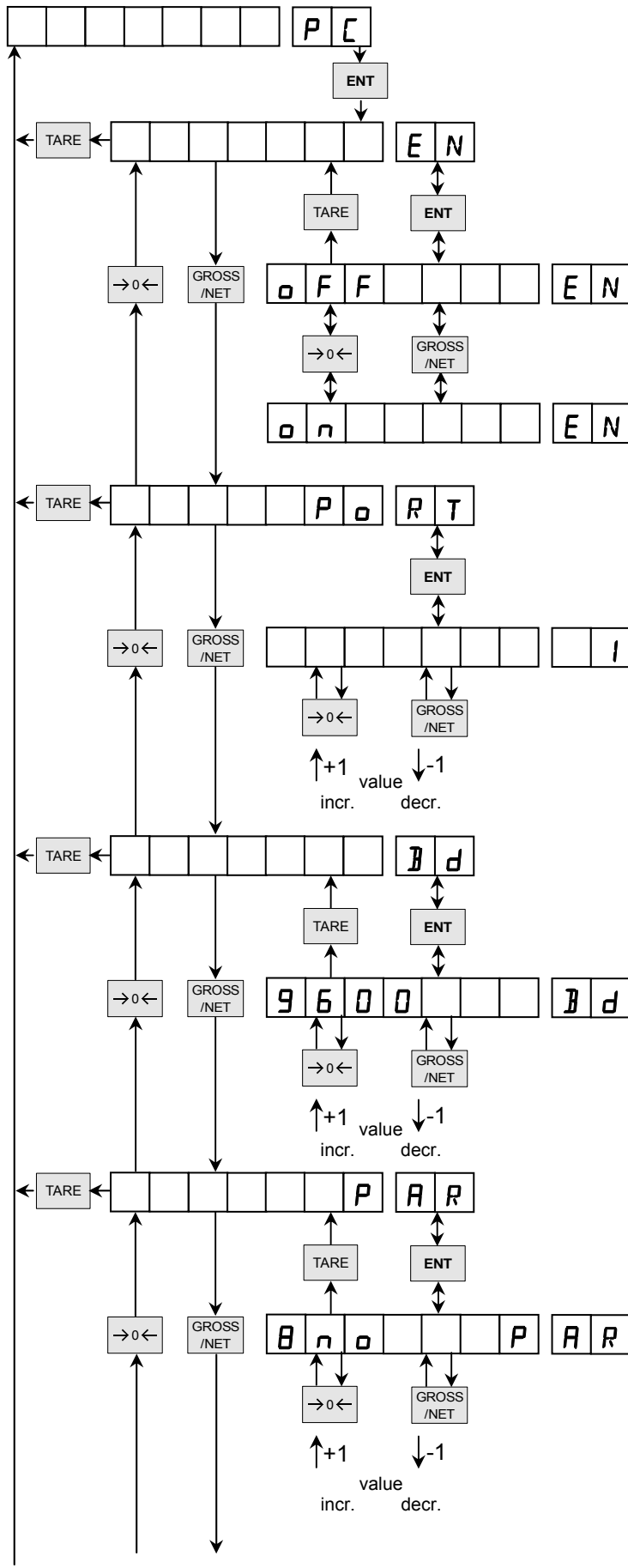
default setting: 9600

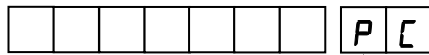
3.1.10.4. Parity select “PAR”

Select number of data bits of transmission and the type of parity.

default setting: 8no

8no	8 databits, no parity, 1stopbit
8EvE	8 databits, even parity, 1stopbit
8odd	8 databits, odd parity, 1stopbit
7EvE	7 databits, even parity, 1stopbit
7odd	7 databits, odd parity, 1stopbit





3.1.10.5. Block check character select "bCC"

This toggled decision defines whether the data transmission includes block check character.

default setting: off

3.1.10.6. ACK / NAK-Protocol "ACK"

Set in the range between 0 and 2. This selection defines the data acknowledge handling.

default setting: 0

- 0: ACK/NAK
- 1: none
- 2: ACK / NAK covered by STX ... ETX

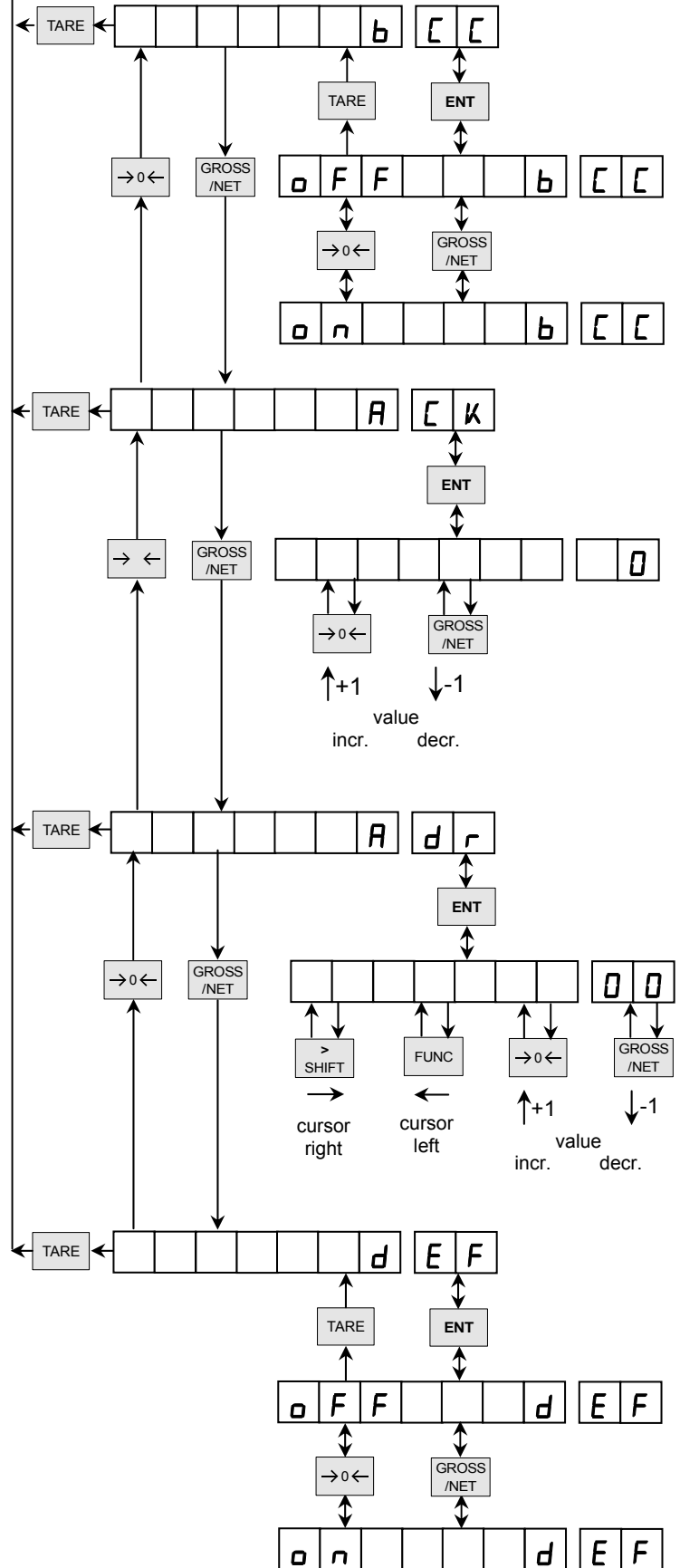
3.1.10.7. Device address "Adr"

Set in the range between 0 to 16. This parameter defines the address that is used for communication via this port in any bus environment.

default setting: 0

3.1.10.8. Set to default "dEF"

Toggled decision to set all parameters of the "PC" sub menu to the default values when ON.



3.1.11. Submenu “2nd Panel”

The following menu is used for a 2nd display as remote control that is mounted in distance from A810. For example A810 is mounted in rough and hot environment and can be operated from a control center via the 2nd panel.

3.1.11.1. Activate 2nd Panel “Act”

Toggle decision whether 2nd control panel activated or not.

default setting: off

3.1.11.2. Activate keys on 2nd panel “KS

This function activates keys on 2nd panel. In default the 2nd panel works only as remote display and keypresses are ignored by A810.

default: off

3.1.11.3. Select “Port”

This function dedicates a port at the I/O-interface to the 2nd panel.

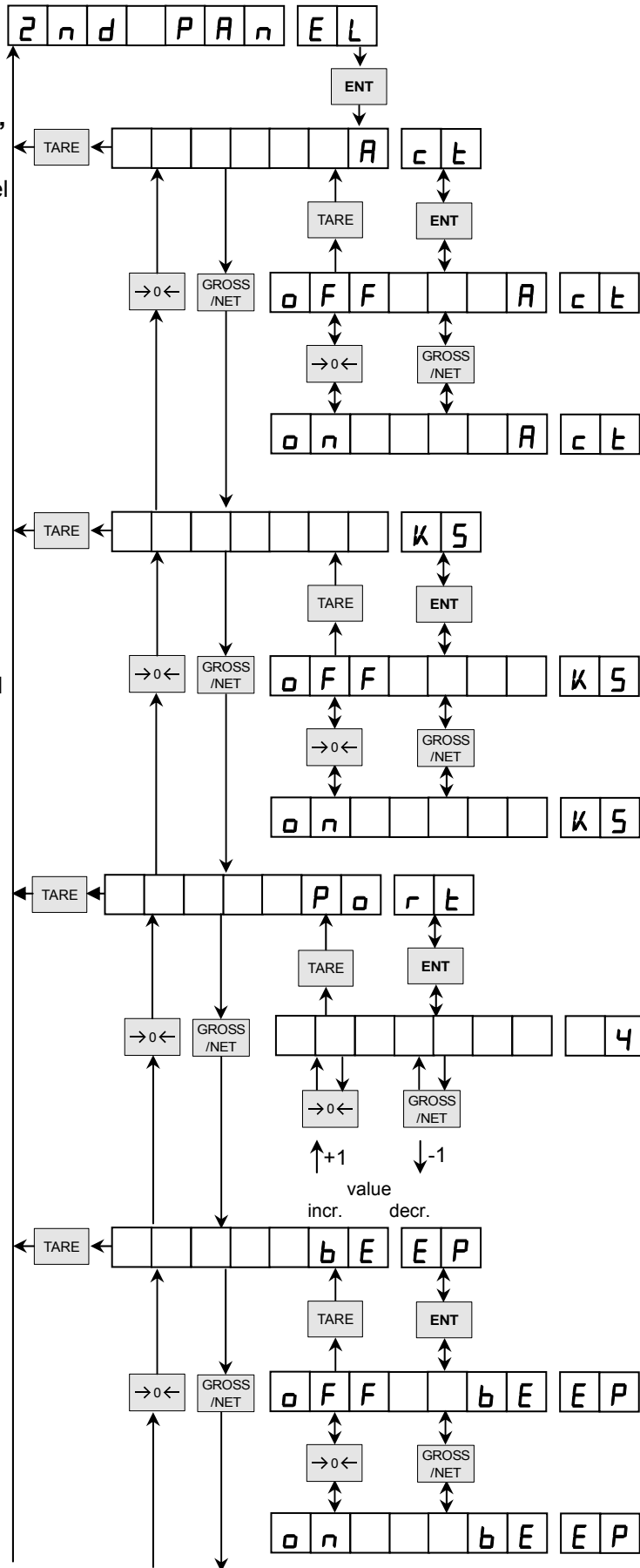
default: 4

Note: Port 3 is reserved for optional Ethernet or Profibus-DP.

3.1.11.4. Activate beeper “bEEP”

This toggled decision activates internal buzzer. During any keypress the buzzer will beep for 150ms.

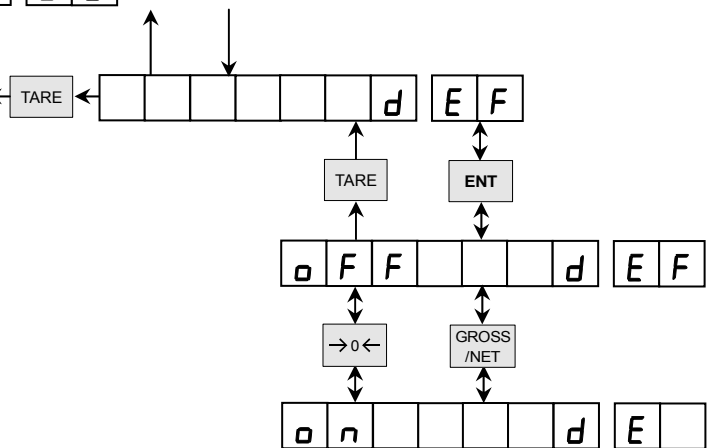
default: off



2 n d P A n E L

3.1.11.5. Set to default "dEF"

Toggled decision to set all parameters of the "2nd Panel" sub menu to the default values when ON.



3.1.12. Submenu “dAC”

This submenu defines the function of the onboard digital to analogue converter for an norm standard output of 4...20mA resp. 0...10V.

3.1.12.1. Activate DAC “Act”

This toggled decision defines whether the output to the DA conversion is enabled.

default setting: off

3.1.12.2. Output value select mode “MD”

Set in the range between 0 and 2. This selection defines whether the Gross, Net or Tare value should be converted on that output.

- mode 0: output is Gross
- mode 1: output is Net
- mode 2: output is Tare

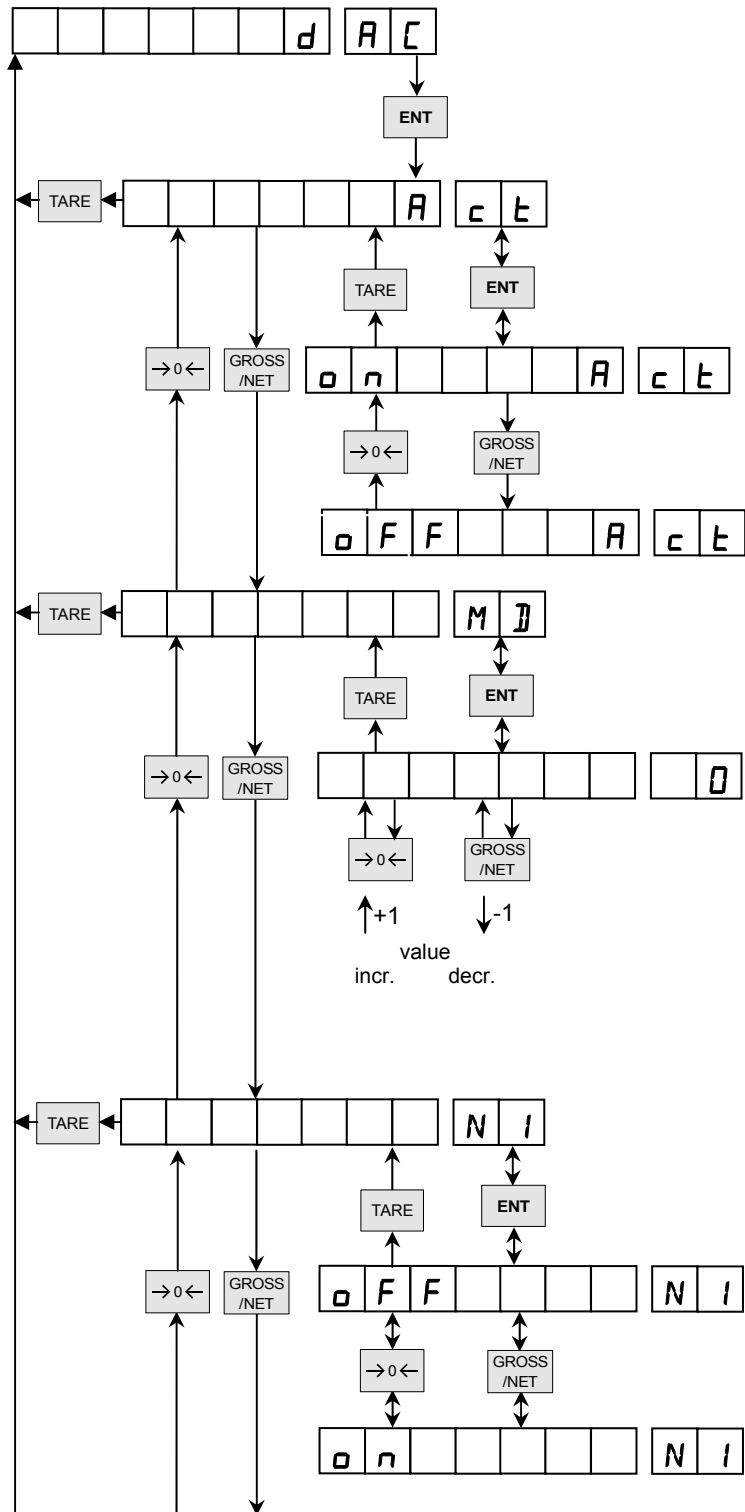
default setting: 0

3.1.12.3. Output range definition “NI”

This toggled decision defines whether the output range is standard

- on: 4 ... 20mA
- off: 0 ... 20mA.

default setting: on



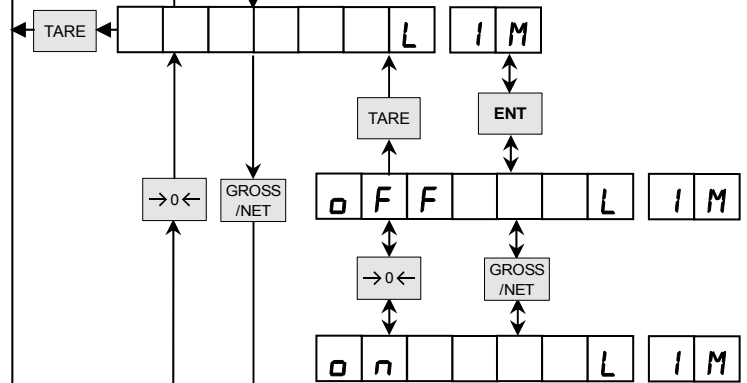


3.1.12.4. Limit definition “LIM”

This selection is required to define whether the output range (defined at 3.1.12.3 “NI”) should be related to

on: 0...100% fullscale
 off: UNDER to OVERLOAD – Limits (refer to “LUNL” and “LOVL” at page 27)

default setting: on

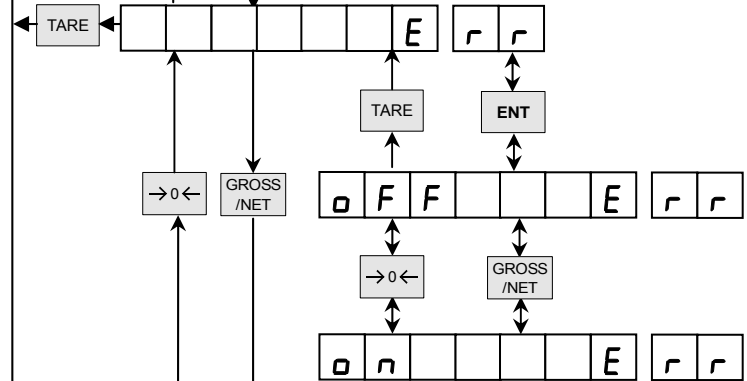


3.1.12.5. Error case “Err”

This toggle decision defines whether in case of OVERLOAD the output is set to

on: output like at Zero weight
 off: output like at MAX weight

default setting: off

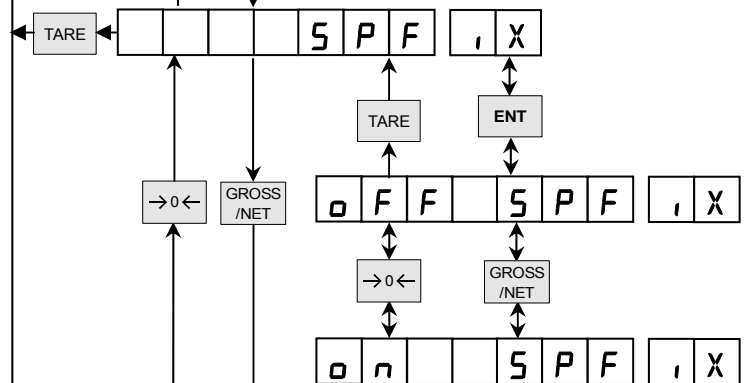


3.1.12.6. constant analog output “SPFix”

This selection defines whether the analog signal is continuously output accordant to weight or is fixed output accordant to setpoints (SP1, SP2, CPS) to control external electronics. (3.1.12.6 at page 68)

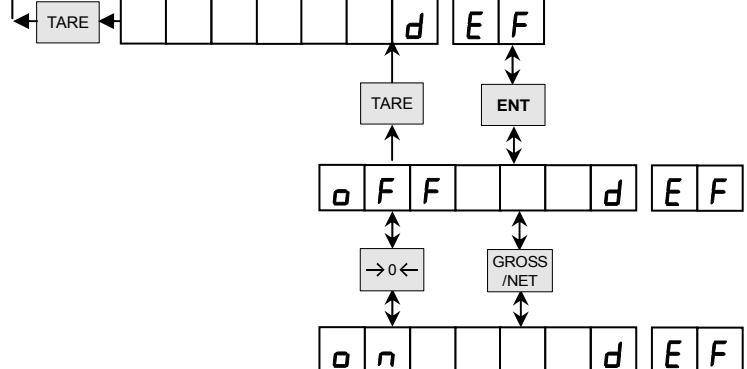
on: fixed output accordant to setpoints
 off: output proportional weight

default setting: off



3.1.12.7. Set to default “dEF”

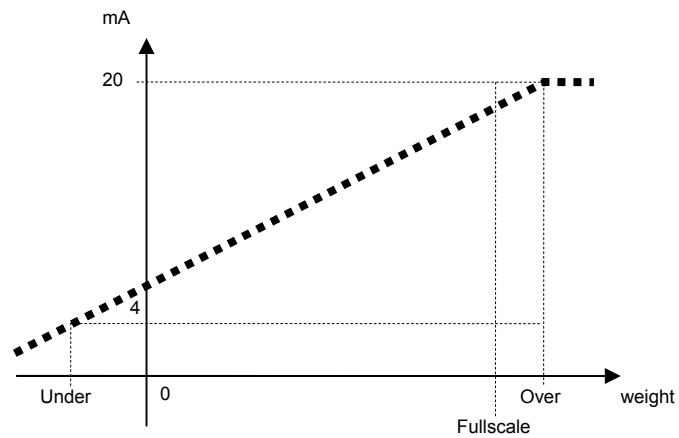
Toggled decision to set all parameters of the “DAC” sub menu to the default values when ON.



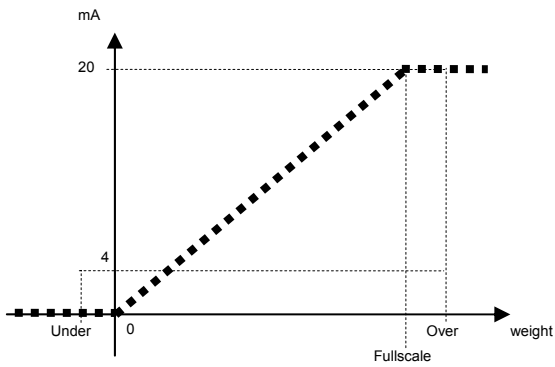
Examples:



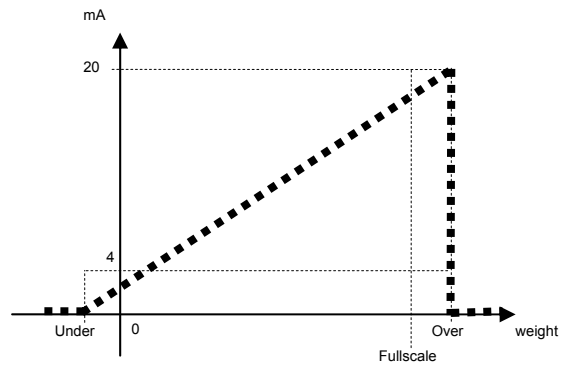
Settings: NI = on;
LIM = off;
Err = off;



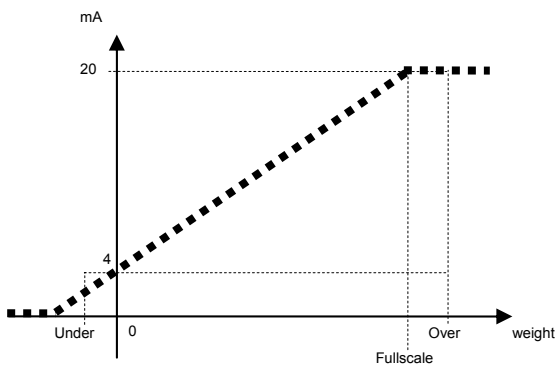
NI = off;
LIM = on;
Err = off;



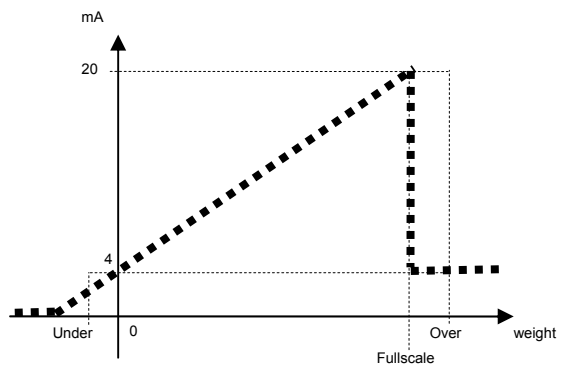
NI = off;
LIM = off;
Err = on;



default setting
NI = on;
LIM = on;
Err = off;



NI = on;
LIM = on;
Err = on;



3.1.13. Submenu Interface option "IF"

This submenu defines the required information for Profibus DP or TCP/IP – interface if equipped.

3.1.13.1. Submenu "Profibus"

Settings for Profibus selectable.

3.1.13.1.1. Profibus activate "Act"

This toggled decision defines whether the Profibus functionality is enabled.

default setting: off

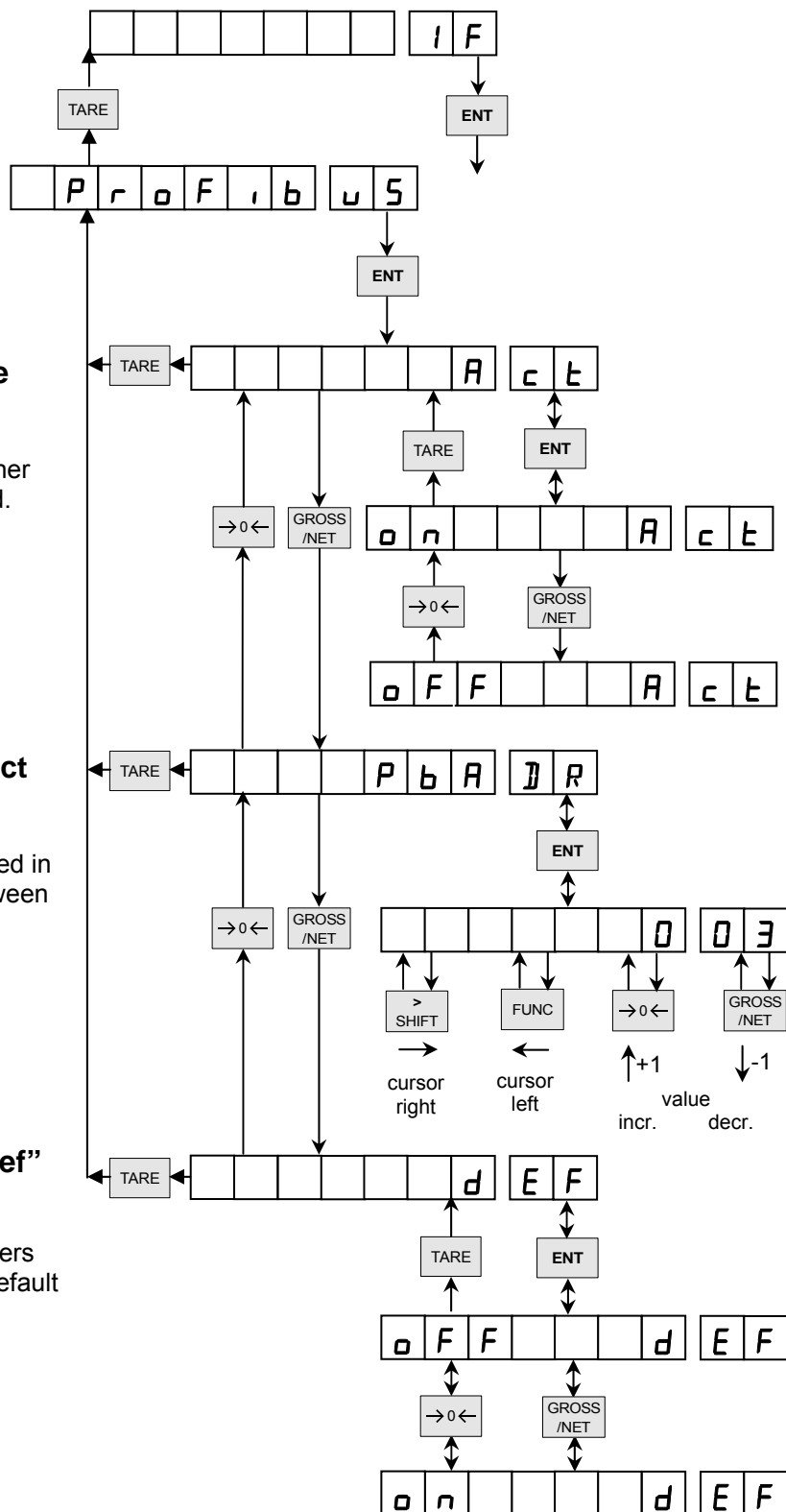
3.1.13.1.2. PB-address select "Pb-ADR"

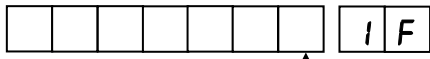
This parameter defines address used in Profibus-environment in range between 1...125.

default setting: 3

3.1.13.1.3. Set to default "def"

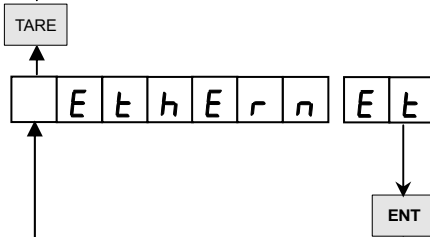
Toggled decision to set all parameters of the "Profibus" sub menu to the default values when ON.





3.1.13.2. Submenu “Ethernet“

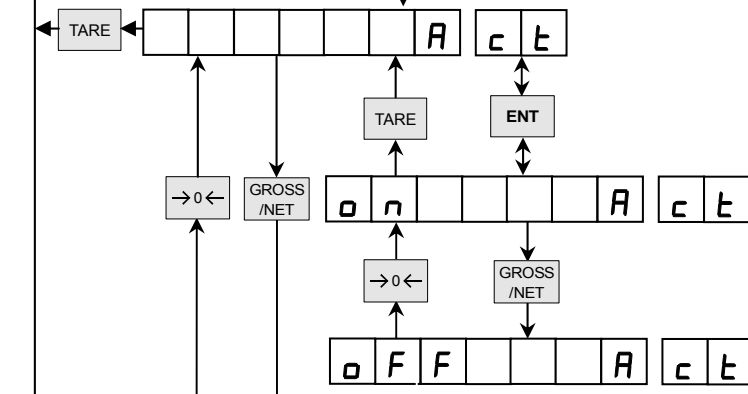
In this menu all Ethernet relevant addresses and masks are selectable.



3.1.13.2.1. Ethernet activate “Act“

This toggled decision defines whether the Ethernet functionality is enabled.

default setting: off

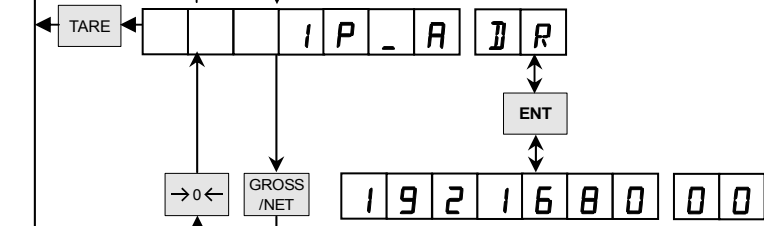


3.1.13.2.2. TCP/IP-address “IP_ADR“

This parameter defines address used in Ethernet-environment in range between 1...254.254.254.254

default setting: 192.168.000.001

Notice: Content of display will be left shifted to show whole data.



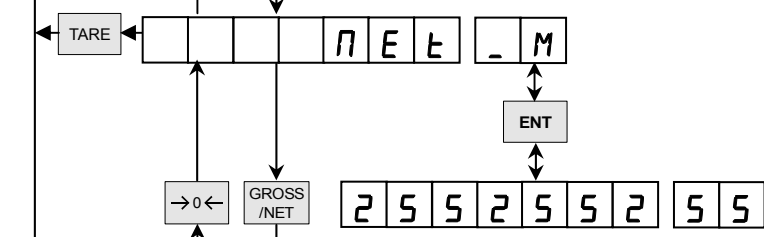
via direct numerical input

3.1.13.2.3. Subnetmask “Net_M“

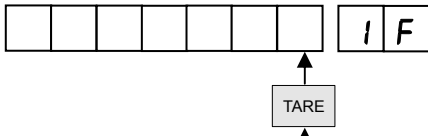
Selection of subnetmask of A810 in range between 1...255.255.255.255

default setting: 255.255.255.000

Notice: Content of display will be left shifted to show whole data.



via direct numerical input

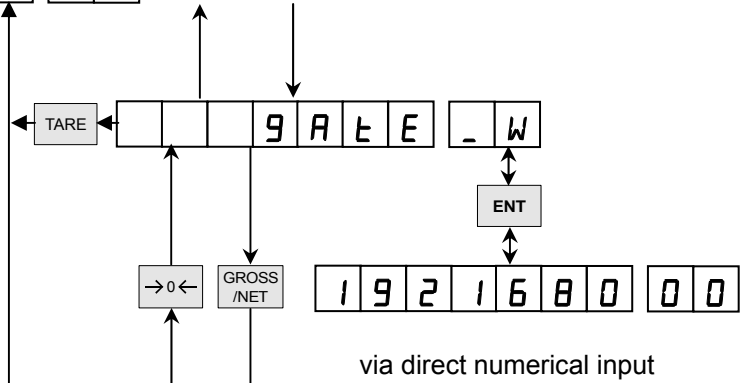


3.1.13.2.4. Gateway "Gate_W"

Selection of gateway-address of A810 in range of 1...255.255.255.255

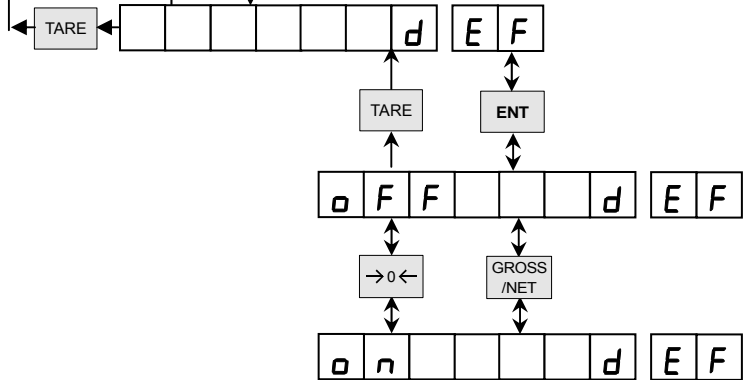
default setting: 192.168.000.254

Notice: Content of display will be left shifted to show whole data.



3.1.13.2.5. Set to default "def"

Toggle decision to set all parameters of the "Ethernet" sub menu to the default values when ON.



3.1.14. Submenu Key enable “KE”

This menu defines which keys are enables or disabled during weighing mode.

3.1.14.1. Function – Key “Func”

This toggled decision defines whether the **FUNC** -Key is enabled in weighing mode.

default setting: on



You will not be able to have access to predefined functions when OFF!

3.1.14.2. Shift – Key “SHIFT”

This toggled decision defines whether the **SHIFT** -Key is enabled in weighing mode.

default setting: on

3.1.14.3. Set – Zero – Key “ZE”

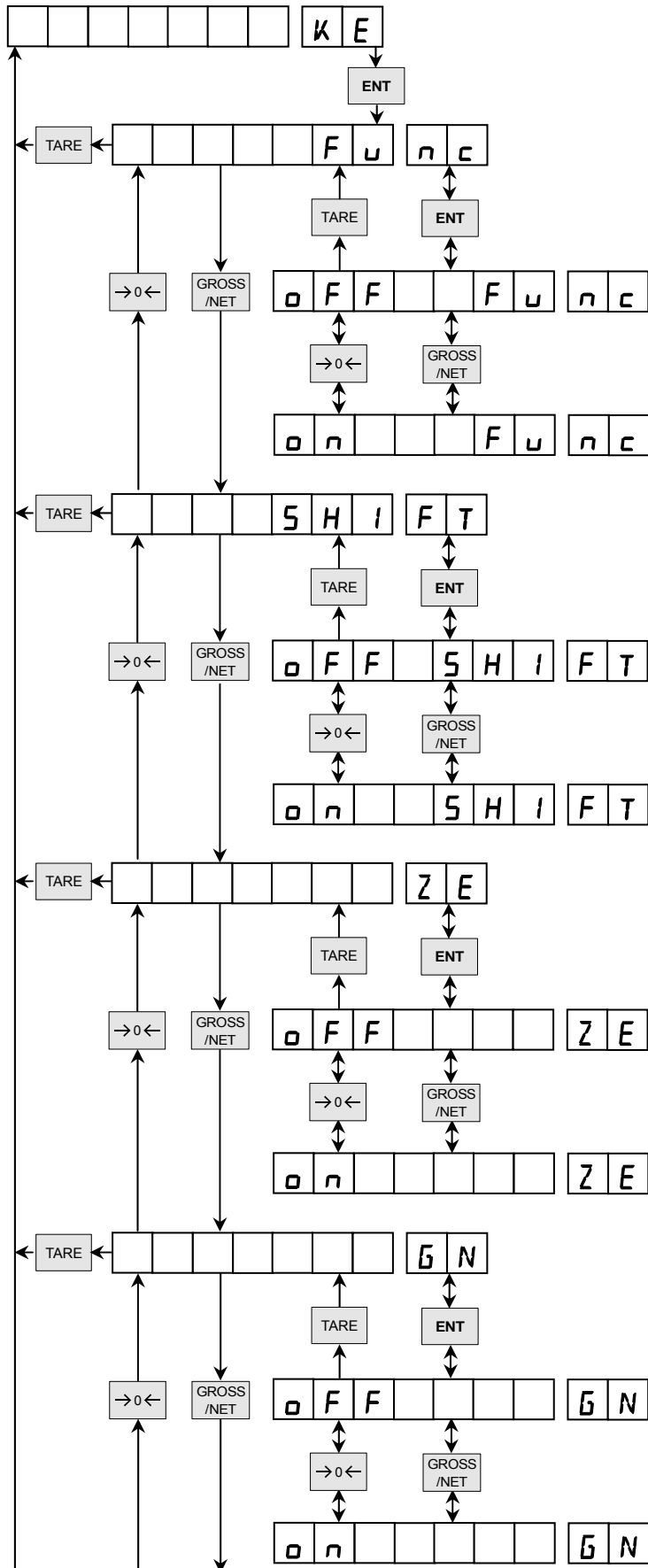
This toggled decision defines whether the **→0←** -Key is enabled in weighing mode.

default setting: on

3.1.14.4. Gross / Net – Key “GN”

This toggled decision defines whether the **GROSS / NET** -Key is enabled in weighing mode.

default setting: on



3.1.14.5. Tare – Key “TA”

This toggled decision defines whether the **TARE** -Key is enabled in weighing mode.

default setting: on

3.1.14.6. Enter – Key “ENT”

This toggled decision defines whether the **ENT** -Key is enabled in weighing mode.

default setting: on

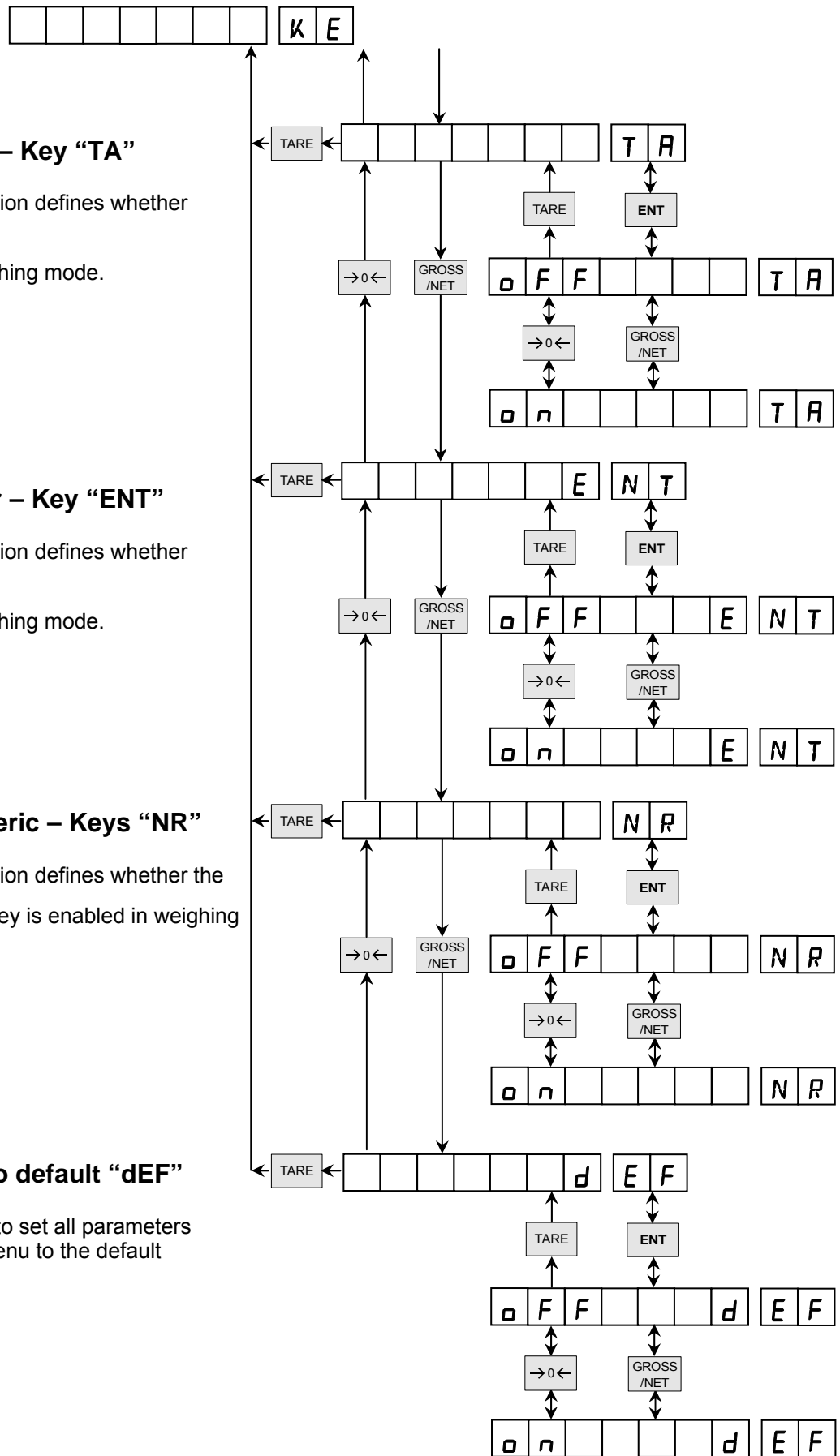
3.1.14.7. Numeric – Keys “NR”

This toggled decision defines whether the **1 UPPER ... 9 CPS** -Key is enabled in weighing mode.

default setting: on

3.1.14.8. Set to default “dEF”

Toggled decision to set all parameters of the “KE” sub menu to the default values when ON.



3.1.15. Submenu key functions “KF”

This menu defines the assignment of functions to key combinations. These settings are used for combining keys with any user defined action. Refer to appendix 7.2 “Survey of Operating Functions” at page 109.

3.1.15.1. Key Function “ENT”

This input defines the kind of function (N°-nnn) which will be executed after pressing

ENT in weighing mode.

default setting: 7 (print)

3.1.15.2. Key Function “Shift+0”

This input defines the kind of function (N°-nnn) which will be executed after pressing

> SHIFT + 0 USER in weighing mode.

default setting: 78 (Preset Tara)

All numerics between 0 to 9 can be aligned to a deposit function call.

3.1.15.3. Key Function “Shift+9”

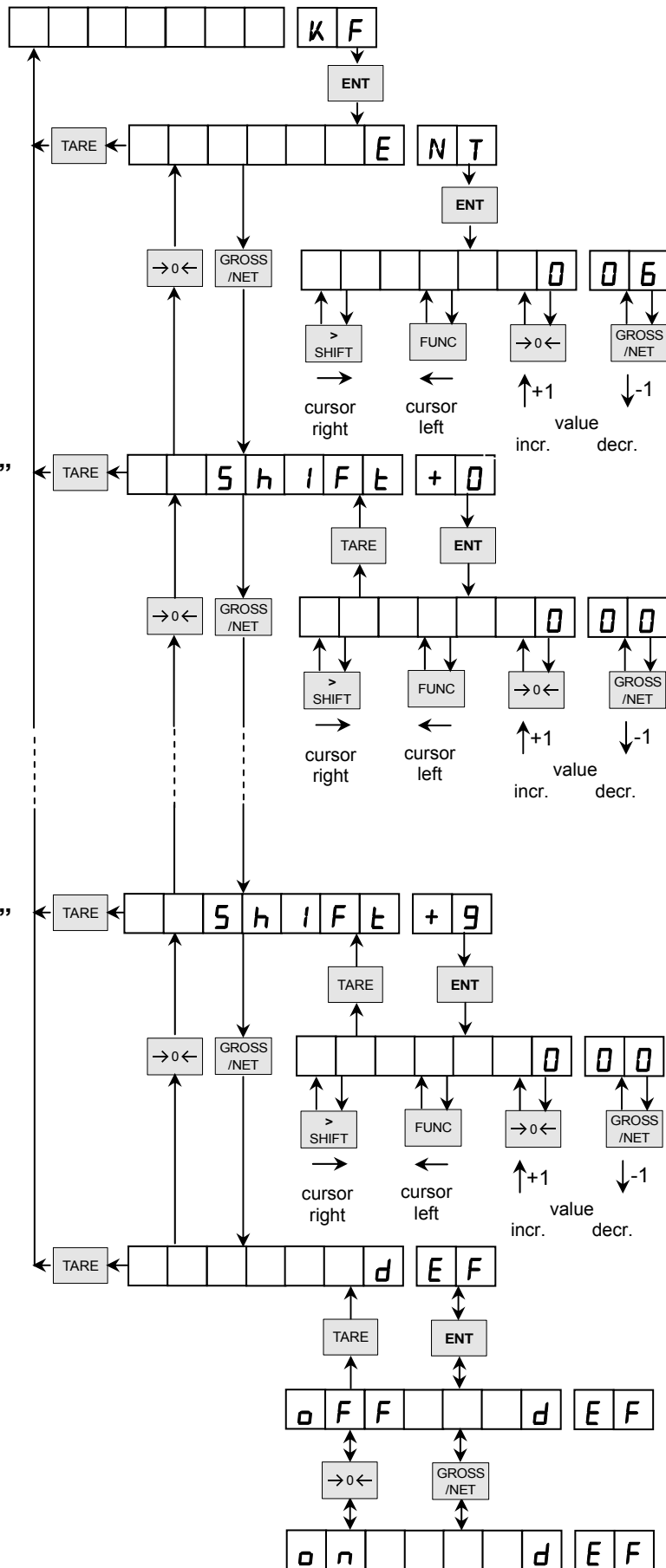
This input defines the kind of function (N°-nnn) which will be executed after pressing

> SHIFT + 9 CPS in weighing mode.

default setting: 0

3.1.15.4. Set to default “dEF”

Toggled decision to set all parameters of the “KF” sub menu to the default values when ON.



	Function (Refer to 7.2 at page 109)	Description
Default settings for "Shift" +	0: 78	edit Preset Tara weight
	1: 92	show date for 5 seconds
	2: 91	show time for 5 seconds
	3: 95	show input ratio [mV/V]
	4:	
	5:	
	6: 4	show Tara weight
	7: 186	clear Tara weight (set Net to Gross)
	8:	
	9:	

3.1.16. Submenu "Input"

The following menu defines the setup of the available inputs D°18 and 19. The instrument allows to run a function by activating an control input. Refer to appendix 7.2 "Survey of Operating Functions" at page 109.

3.1.16.1. Function code assignment to input D° 18

This input menu defines the function executed by activating the input D° 18.

default setting: 000 (no action)

3.1.16.2. Function code assignment to input D° 19

This input menu defines the function executed by activating the input D° 19.

default setting: 000 (no action)

3.1.16.3. Activate inputs "Act"

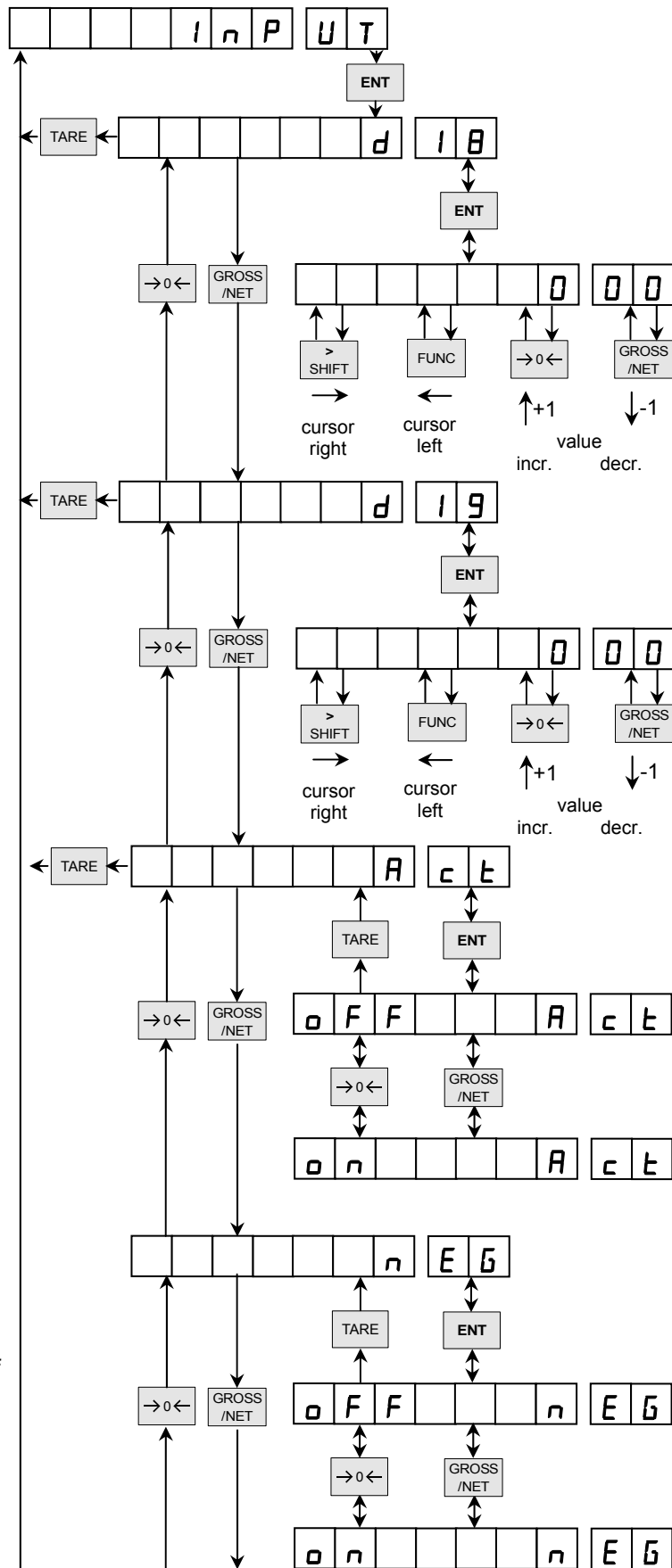
Toggled decision whether D18 and D19 are activated.

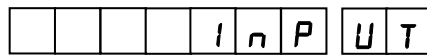
default setting: off

3.1.16.4. Invert inputs "neg"

Toggled decision whether input signals of D18 and D19 are inverted.

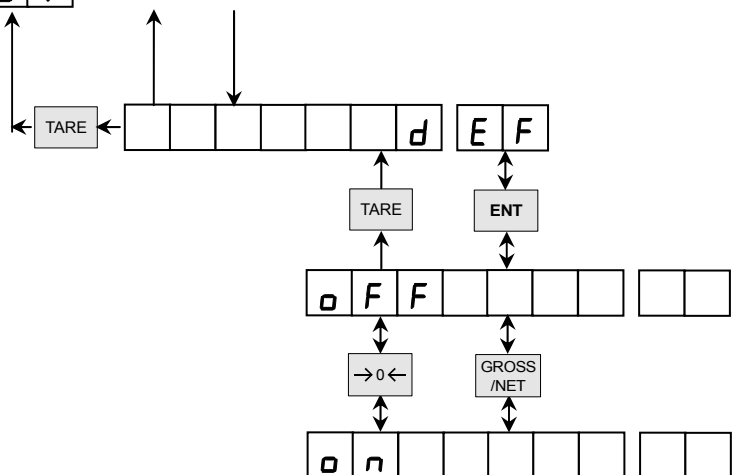
default setting: off





3.1.16.5. Set to default “dEF”

Toggle decision to set all parameters of the “Input” sub menu to the default values when ON.



Input signal D18 dominates D19.

When D18 keeps “Low” (“Neg” = OFF) then D19 will be ignored.

When D19 keeps “Low” (“Neg” = OFF) then with falling edge of D18 user function of D18 will be executed and with re-set (rising edge) of D18 user function of D19 will be executed.

Thus a single user function can be executed by falling and rising edge of a input D18, when both signal have the same user function associated.

3.1.17. Submenu “Diagnostics”

This function is required to carry out a basic test of the load cell, the instrument and their interconnections.

3.1.17.1. ADC – Integer output “I - INT”

This function shows the direct output value of the 24-Bit-ADC. To read this integer value in the range of 0 ... 4194303 is the basic requirement to be ready for calibration.

0 = 0 mV/V
2000000 = 2 mV/V

3.1.17.2. ADC – input ratio mv/V “I - MV”

This output is a floating-point result of the current input voltage ratio in mV/V checking the load cell arrangement.

3.1.17.3. ADC – output normalized “I - nOM”

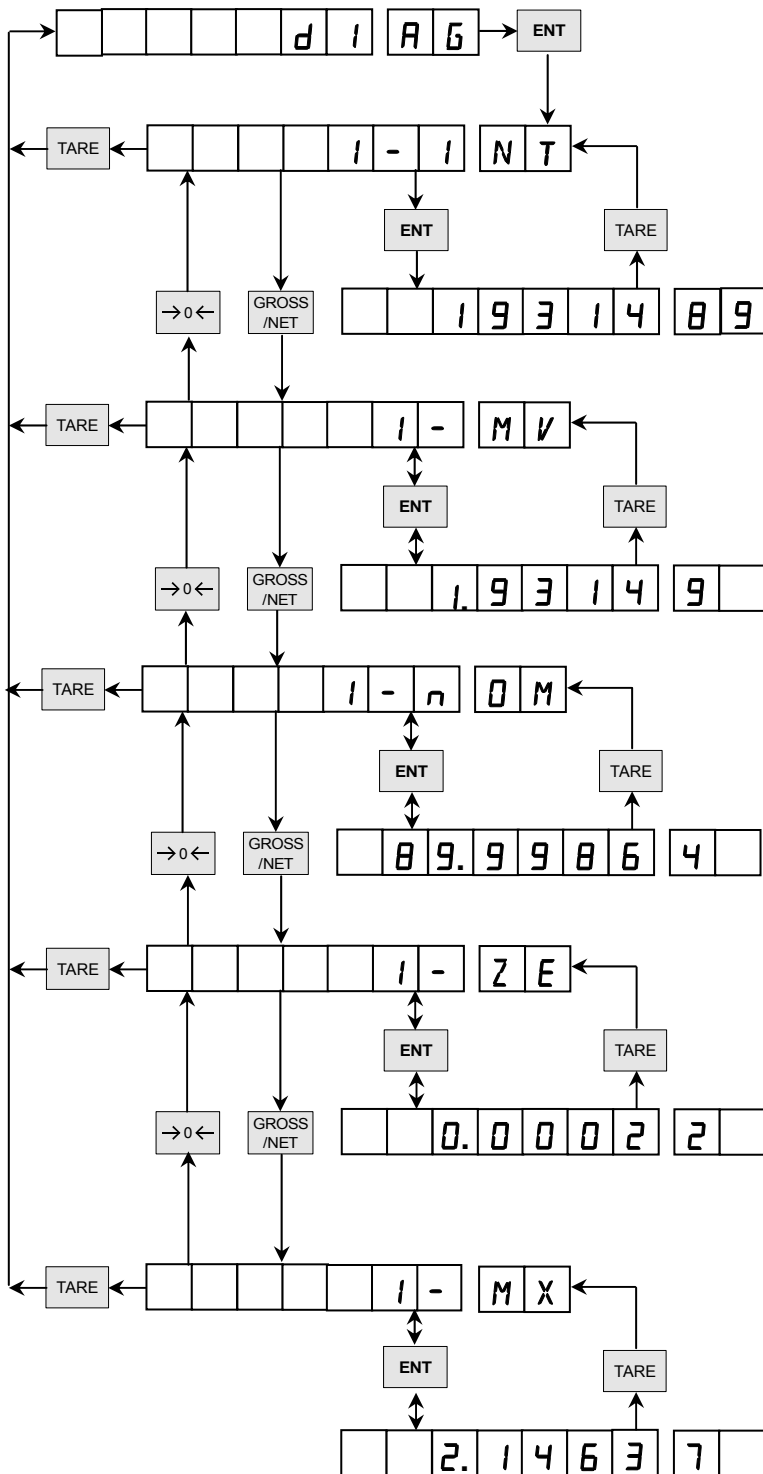
This function can only be used after calibration has been carried out. It shows the current weight on the load cell as percentage of max value.

3.1.17.4. ADC – output at zero “I - ZE”

This function can only be used after calibration has been carried out. It gives the input voltage ratio in mV/V at calibrated zero. It is recommended to note it down for further use.

3.1.17.5. ADC – output “I - MX”

This function can only be used after calibration has been carried out. It gives the input voltage ratio in mV/V at calibrated max value.



3.2. Combination of “Func” and any numeric key

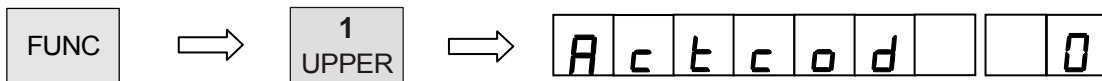
To call one of the following functions press “FUNC” key and after that please press any numeric key. These functions are dedicated to numeric keys and can not be edited by user. To switch back to weighing mode press “TARE” key.

3.2.1. Reduced setup (0)

Function Call 108: Any parameters that are accessible due to legal-for-trade conditions can be changed. The “Reduced setup” structure is similar to “setup mode” (refer to 5.3 at page 93).

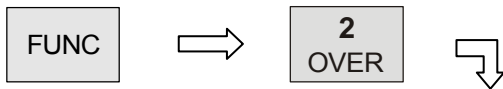
3.2.2. Show actual code (1)

Function Call 190: This function shows the actual codeset. Refer to 3.2.3.2 for editing parameters of codeset and what parameters belong to a single codeset.



3.2.3. Activate code / edit codesets (2)

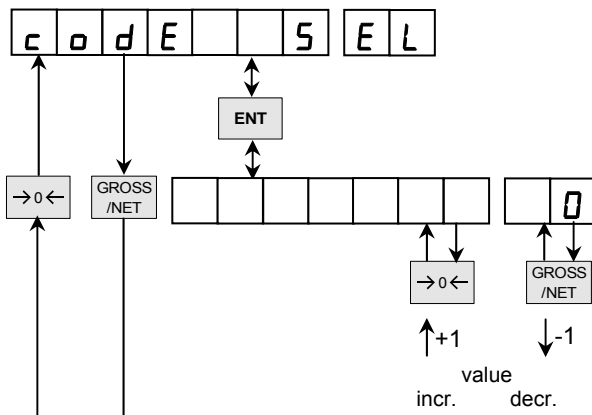
Function Call 191: This function allows the operator to select (3.2.3.1) the active one of ten codesets. Selection of active codeset is done via external input or internal selection (3.2.3.2).



3.2.3.1. Code selection

This menu defines the code N° used in operation, as long the code source is not switched to external.
10 different code blocks might be selected (0 ...9)

default setting: 0

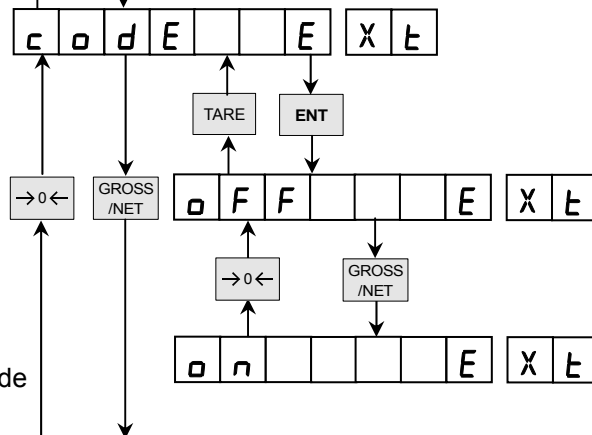


3.2.3.2. Code source select

This selection defines whether the code block N° is used in selected operation by external inputs or internal select (see above).

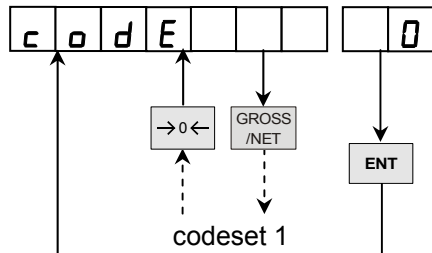
default setting: off

Note: Selection of a codeset greater 9 will generate “Err110”. In case of error active code is set to 9.



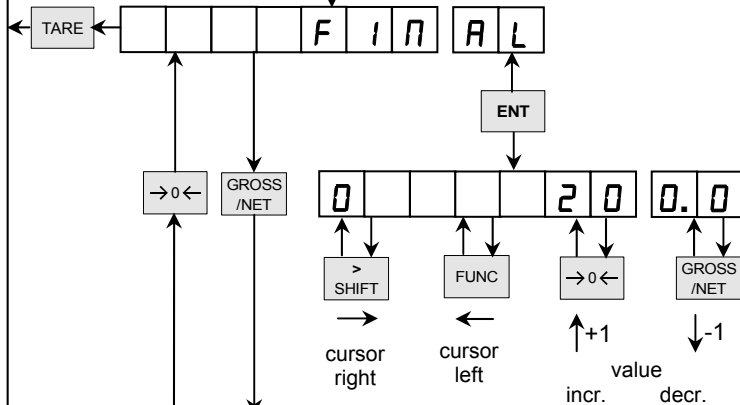
3.2.3.2.1. Parameter set of code N° 0

After confirming this by pressing **ENT** the following parameter can be set.



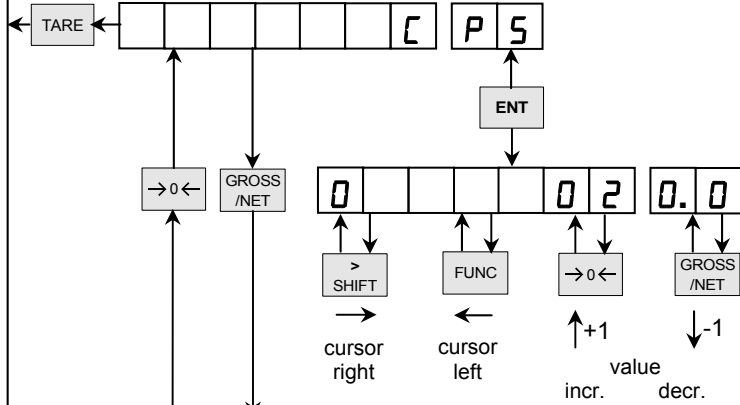
3.2.3.2.2. Parameter "FINAL" of code N° 0

This parameter defines the final weight that have to be reached. After this weight is reached the sequence is completed. "0" at left side indicates codeset.



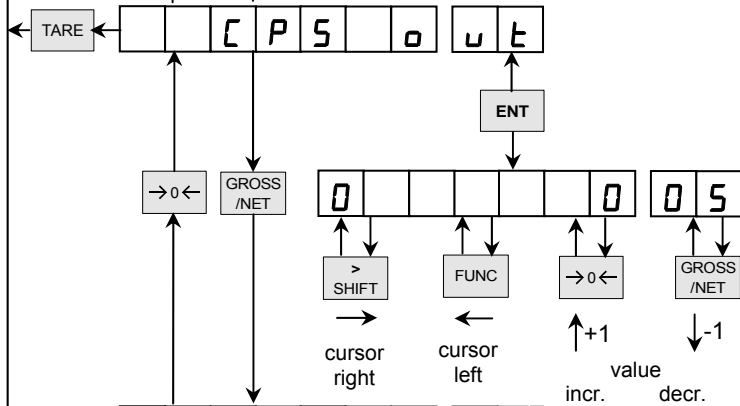
3.2.3.2.3. Parameter "Compensation" of code N° 0

This parameter is a "compensation set point" (CPS). It refers to "Final" value and "set point 3" (SP3) is set when actual weight > Final – CPS. "0" at left side indicates codeset.



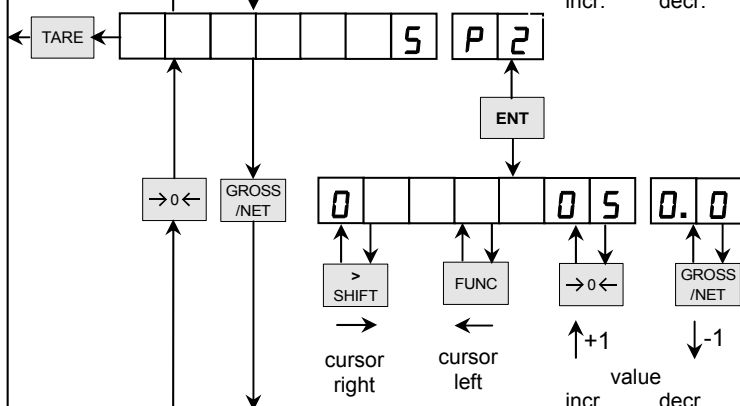
3.2.3.2.4. Constant analog output "CPS out"

This parameter is only available when Parameter "SPFix" (3.1.12.6) is "ON". This parameter equates an analog output between 0% (0V / 0mA) and 100% (10V / 20mA) at setpoint "CPS".



3.2.3.2.5. Parameter "Set Point 2" of code N° 0

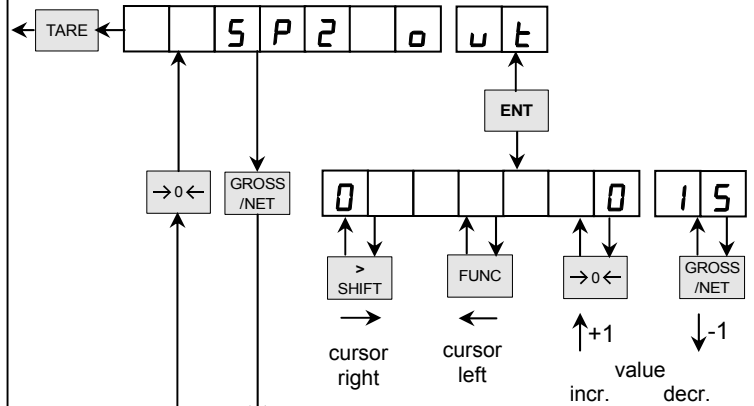
This parameter defines when SP2 is set ON. It refers to "Final" value and SP2 is set when actual weight > Final – SP2. "0" at left side indicates codeset.



c o d E

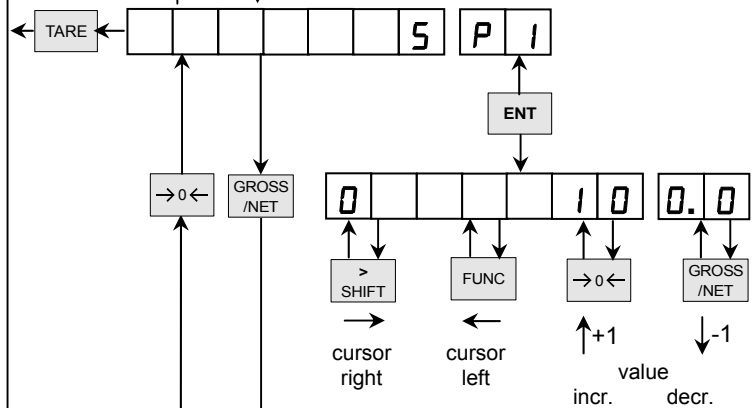
3.2.3.2.6. Constant analog output "SP2 out"

This parameter is only available when Parameter "SPFix" (3.1.12.6) is "ON". This parameter equates an analog output between 0% (0V / 0mA) and 100% (10V / 20mA) at setpoint SP2.



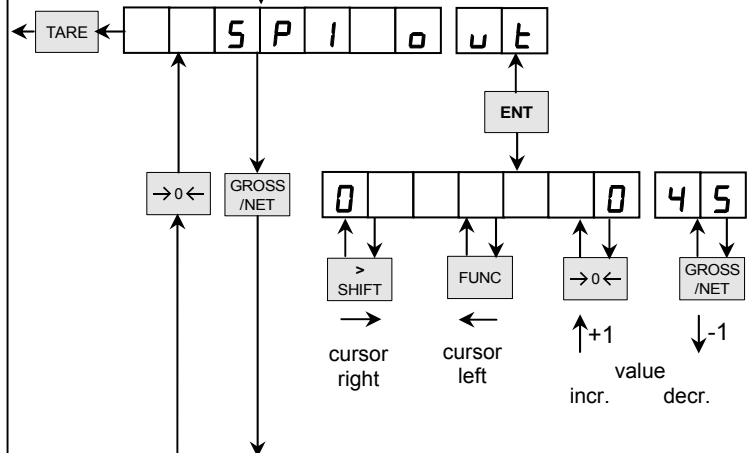
3.2.3.2.7. Parameter "Set Point 1" of code N° 0

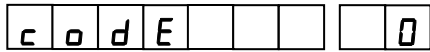
This parameter defines when SP1 is set ON. It refers to "Final" value and SP1 is set when actual weight > Final - SP1. "0" at left side indicates codeset.



3.2.3.2.8. Constant analog output "SP1 out"

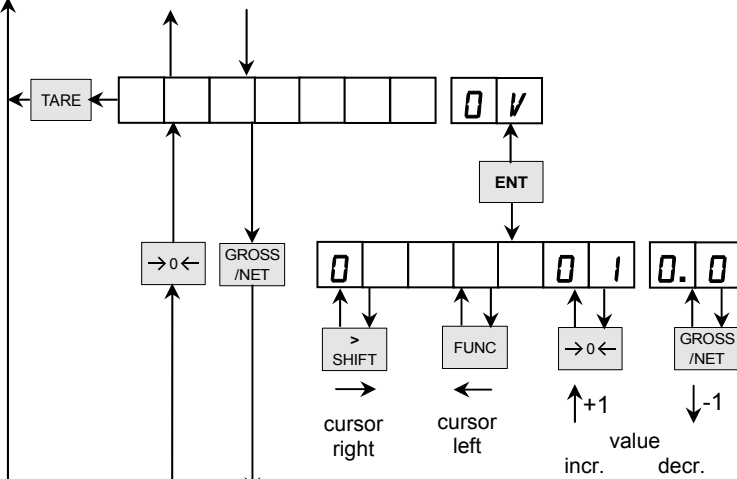
This parameter is only available when Parameter "SPFix" (3.1.12.6) is "ON". This parameter equates an analog output between 0% (0V / 0mA) and 100% (10V / 20mA) at setpoint SP1.





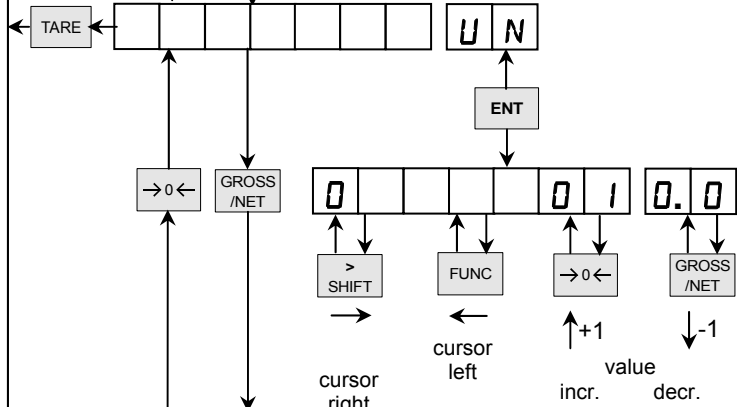
**3.2.3.2.9. Parameter
“Over” of code
N° 0**

This parameter defines when OVER is set ON. It refers to “Final” value and OVER is set when actual weight > Final + OVER. “0” at left side indicates codeset.



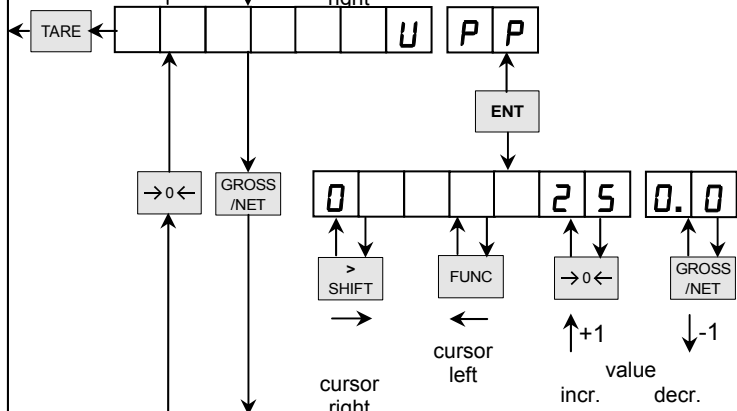
**3.2.3.2.10. Parameter
“Under” of code
N° 0**

This parameter defines when UNDER is set ON. It refers to “Final” value and UNDER is set when actual weight > Final - UNDER. “0” at left side indicates codeset.



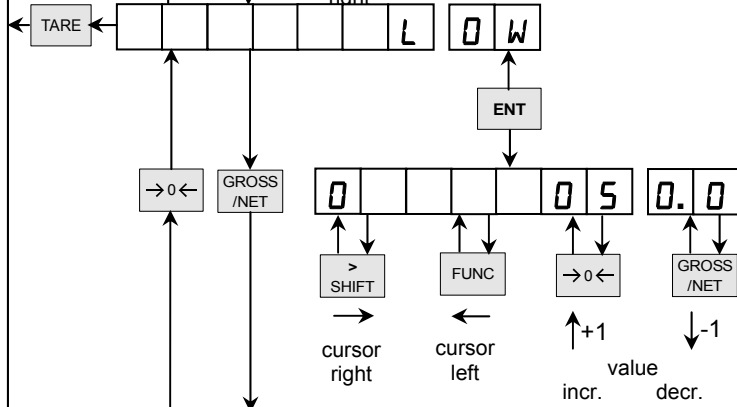
**3.2.3.2.11. Parameter
“Upper” of code
N° 0**

This parameter defines UPPER LIMIT. It refers to zero and UPPER LIMIT is set ON when actual weight > UPPER LIMIT. “0” at left side indicates codeset.



**3.2.3.2.12. Parameter
“Lower” of code
N° 0**

This parameter defines LOWER LIMIT. It refers to zero and LOWER LIMIT is set ON when actual weight < LOWER LIMIT. “0” at left side indicates codeset.



**3.2.3.2.13. Parameter
“Near Zero” of
code N° 0**

This parameter defines NEAR ZERO.
NEAR ZERO is set ON when
actual weight < NEAR ZERO.
“0” at left side indicates codeset.

**3.2.3.2.14. Parameter
“AFFL” of code
N° 0**

This parameter defines AUTO FREE
FALL LIMIT.
AFFC (3.1.8.4 page 45) has to be ON.
When absolute difference between
actual weight - FINAL < AFFL then
will that value be taken into account
for calculate a new CPS.
“0” at left side indicates codeset.
AFFL set to 0 deactivates this parameter.

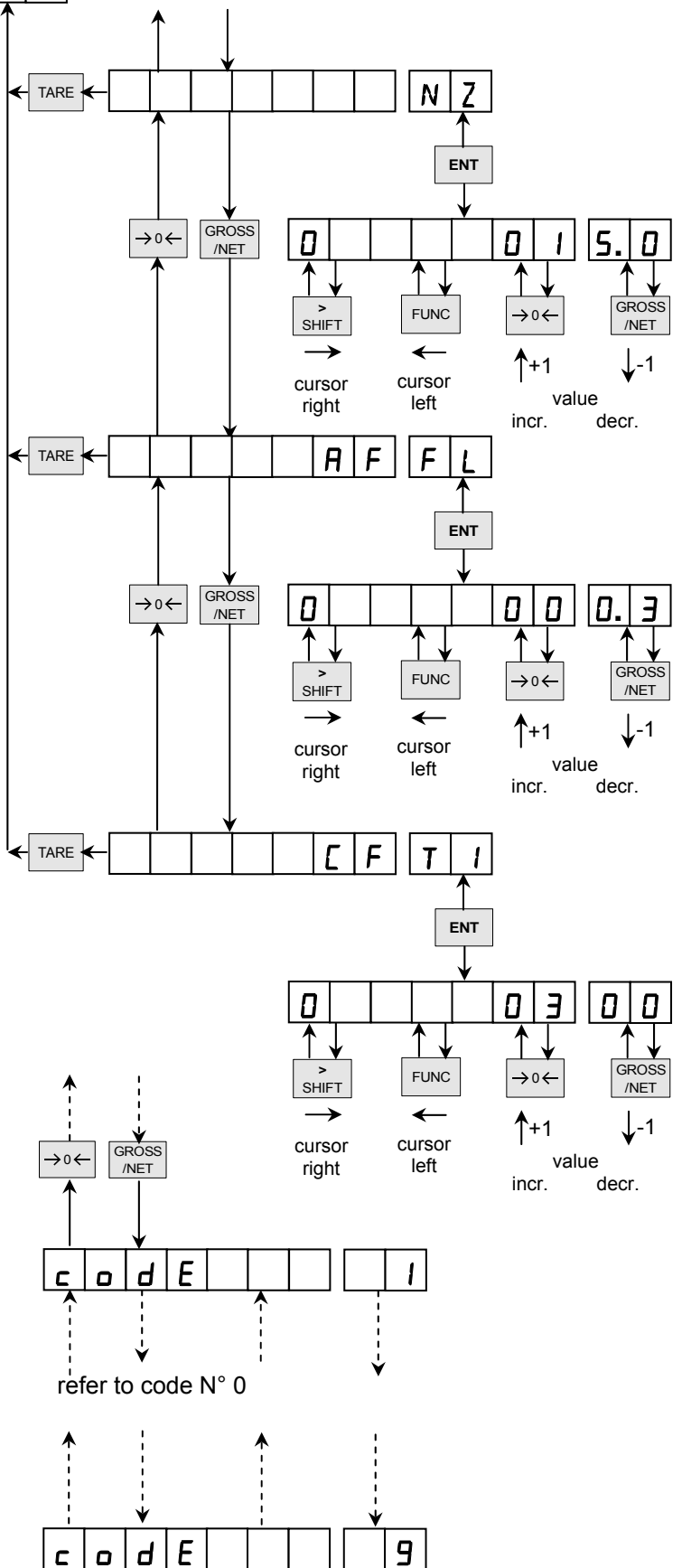
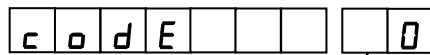
**3.2.3.2.15. Parameter
“CFTI” of code
N° 0**

This parameter defines
COMPENSATION FEEDING TIME in
range between 50...3000ms.
AdFd (3.1.8.3 at page 44) has to be ON.
After CPS was set it is reset for that time
and set again automatically.
“0” at left side indicates codeset.

**3.2.3.3. Parameter set of code
N° 1**

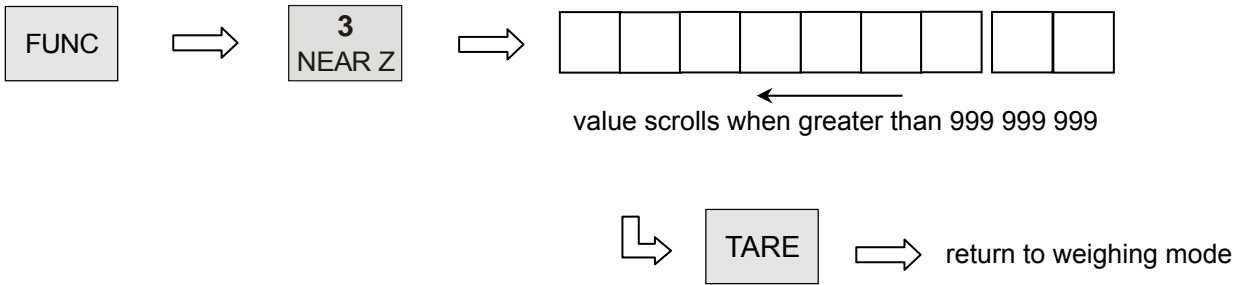
·
·
·

**3.2.3.4. Parameter set of code
N° 9**



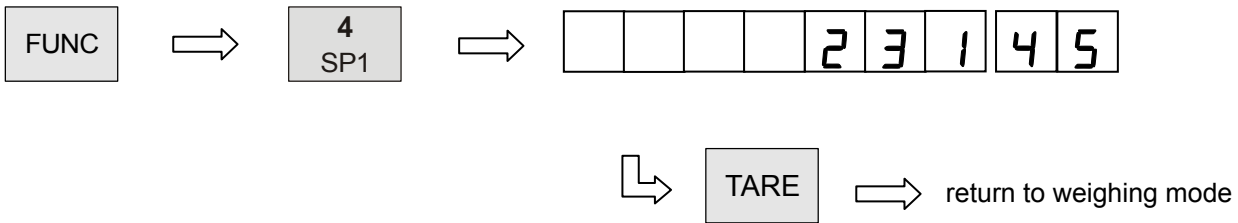
3.2.4. Show accumulation total sum (3)

Function Call 196: According present selected code. Parameter "FOU-CMD" (3.1.7.2 at page 41) defines whether Net or Gross weight is accumulated. Scrolling is done when accumulation sum is greater than 999.999.999. Maximum total sum can be up to 4.294.967.295, where decimal point is irrelevant. At highest resolution of 100.000 more than 42 thousand weighing cycles can be accumulated. If the maximum total sum is exceeded, "Err 120" is generated.



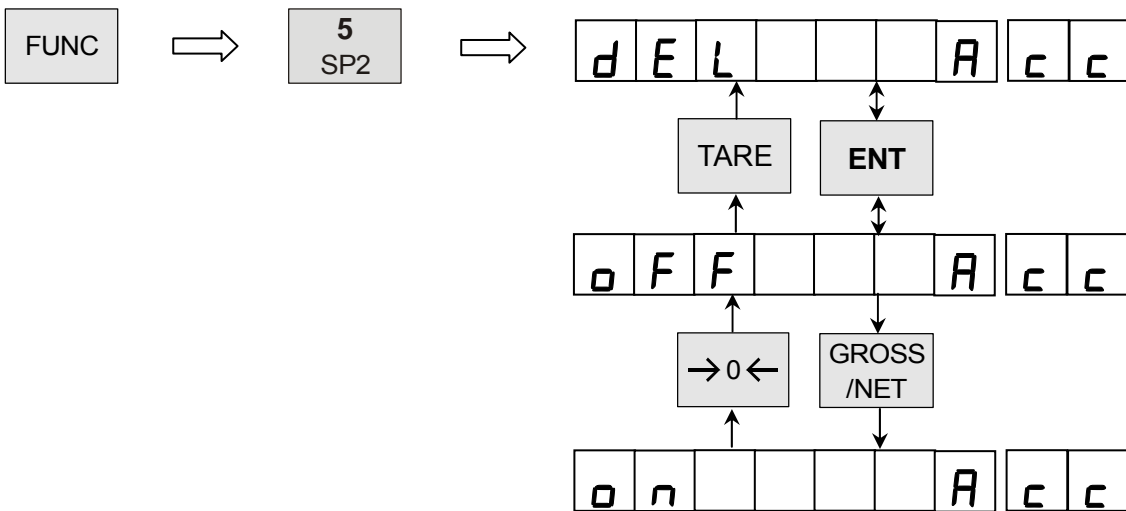
3.2.5. Show accumulation count (4)

Function Call 194: According present selected code.



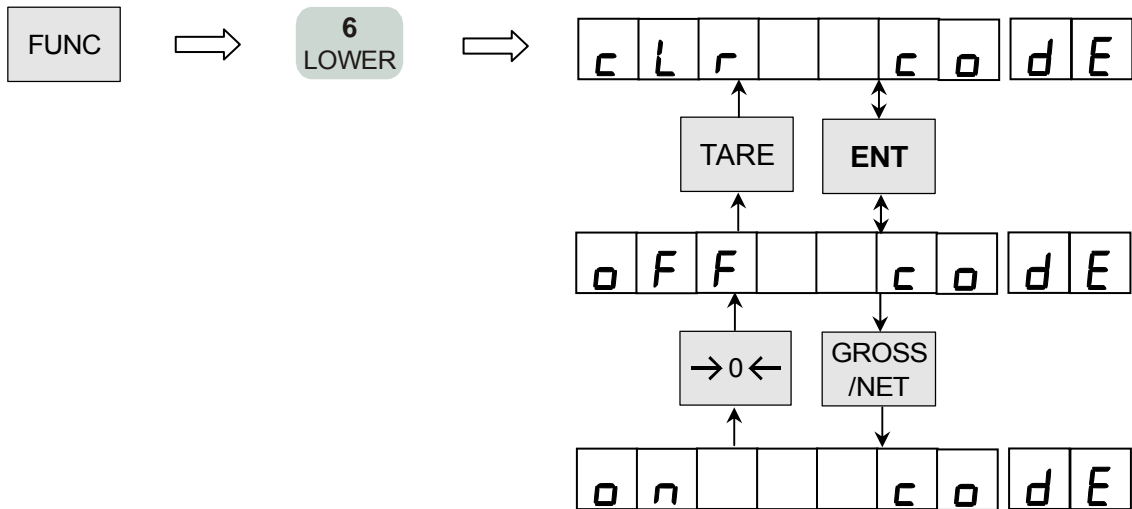
3.2.6. Clear active accumulated sum (5)

Function Call 192: According present selected code, this function clears total sum and counter.



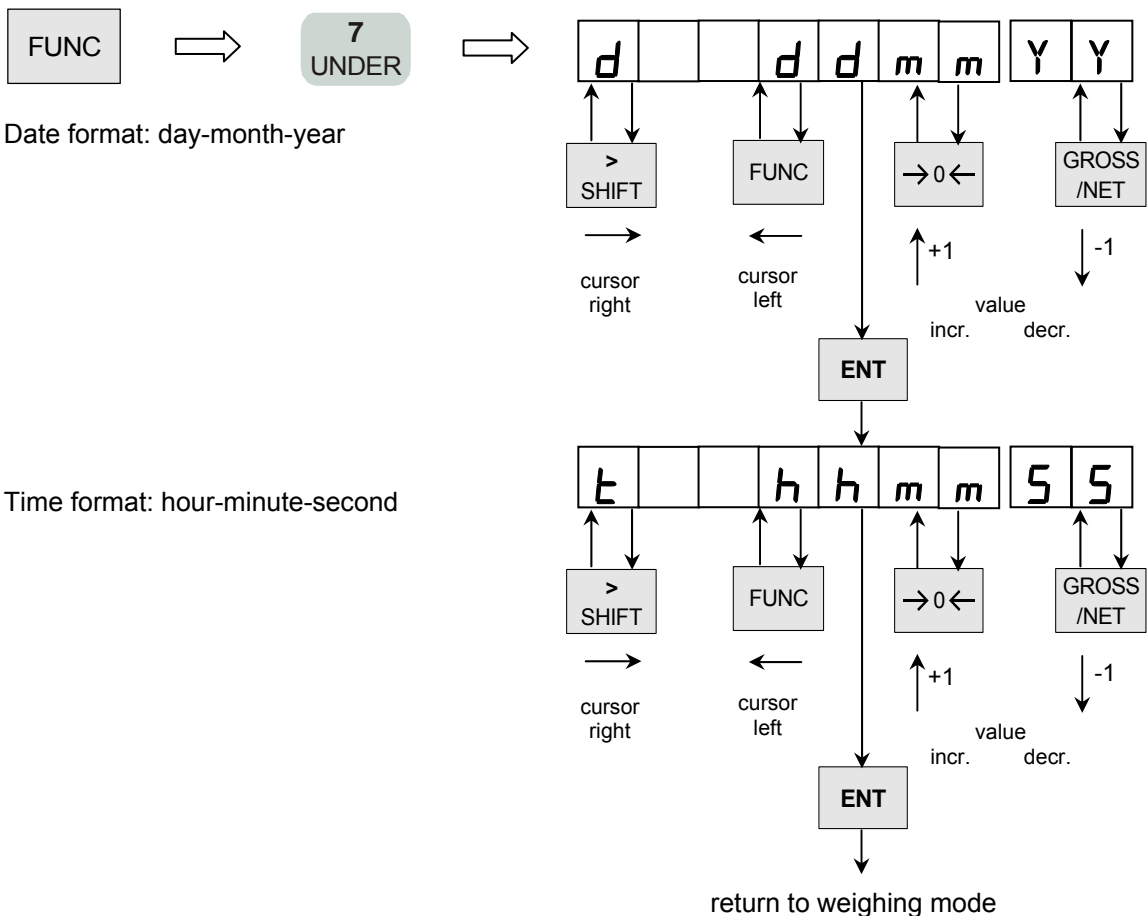
3.2.7. Clear all codesets (6)

Function Call 195: Clear all ten codesets and accumulative memories.



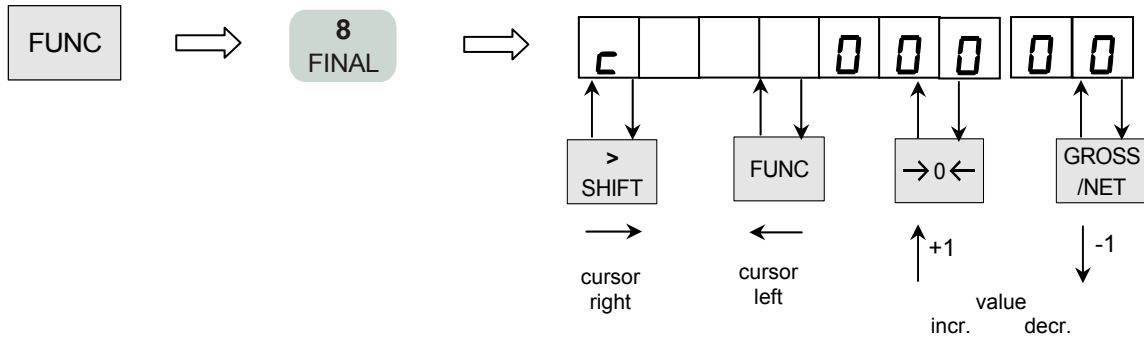
3.2.8. Set date and time (7)

Function Call 44: This function allows the operator to set date and time.



3.2.9. Edit Consecutive number (8)

Function Call 45: This function allows the operator to enter a consecutive number. This number can be shown on the printout and is incremented every time a printout is initiated.



3.2.10. Show higher resolution (9)

Function Call 94: This function shows the operator a ten times better resolution for 5 seconds.

4. Serial Interfaces

4.1. Modes of Operation of the Serial Interfaces

Each of five serial interfaces of an A810 terminal is suited for the asynchronous exchange of data in full duplex mode.

4.2. Exchange of a Character

4.2.1. Data Exchange Parameters

The following data exchange parameters are available and have to be set in line with the characteristics of the peripheral device:

Baud rate, Bit/s: 1200, 2400, 4800, 9600, 14400, 19200, 38400, 76800
Data bits, parity: 8Bit, none / 8Bit, even / 8Bit, odd / 7Bit, even / 7Bit, odd
Stop bits: 1

4.2.2. Character Coding

The 7-bit or 8-bit ASCII code is used for the coding of characters depending on the characteristics of the peripheral device and the mode of data safeguarding. Please pay attention to the following constraints:
The 8-bit code has to be selected when a printer with an 8-bit character set (IBM 2) is used and the 8-bit characters are exploited in full (umlauts, graphics characters). Data safeguarding by means of block check sum requires the 7-bit code but this will be the exception since generally the demands of calibration approval cannot be met when further processing the data by PC. When the 8-bit code shall be used, set data exchange to 8 bit when commissioning the terminal. Data exchange between a A810 terminal and an IBM compatible PC requires the 7-bit code (with/without parity bit) or the 8-bit code without parity bit to be used since the UART modules of a PC can transfer a data frame of no more than 10 bits (including start and stop bit).

Recommendation: Always set to 8 bit, no parity unless there are compelling reasons to select some other mode.

4.2.3. Electrical Implementation of the Serial Interfaces

Table 1 shows the assignment of the physical interfaces to a number of standards. Though any physical interface can be connected to any logical device, there is a standard assignment identical with the default configuration when the instrument is supplied.

	Interface 0	Interface 1	Interface 2	Interface 3	Interface 4
physical interface standard	RS422 / RS485	RS232	RS232	Profibus /Ethernet	TTY
preferred assignment to logical device	measuring BUS	PC	printer 1	SPS/ PC	

Table 1

4.2.4. Physical Protocol (Handshake)

The physical protocol is for avoiding the loss of data. Each receiving device allows the transmission of characters only when it is able to receive them. When A810 receives a signal 'disable transmission', its transmitter channel will just complete the character currently transmitted. The receiver channel is able to receive another 20 characters after the 'disable transmission' signal has been transmitted to a peripheral device before any loss of data will occur. Each serial interface may operate either without handshake or observing the software protocol. When the software protocol is used, transmission is enabled by the transmitter receiving the XON character (DC1, code 11h) and transmission is disabled by the XOFF character (DC3, code 13h).

4.2.5. Logical Devices

During commissioning, each logical device is allocated a serial interface. Logical devices are printer, remote display unit, PC / SPC, second operating unit and measuring BUS. If there are two logical printers, so two printers can in fact be connected to one terminal.

4.3. Printers

The type A810 terminal is able to communicate with different printers. The type of printer has to be set during commissioning. Traffic between a terminal and a printer depends on the selected mode. This applies to the transmission of certain print commands (Escape sequences). The following printers are supported by a A810 terminal and can be set during commissioning:

- CR/LF printer
Any printer can be used as a CR/LF printer provided it can process a 7-bit or 8-bit code and control characters Carriage Return (CR, code 0Dh) and Line Feed (LF, code 0Ah). The terminal will not transmit any Escape sequence to a CR/LF printer. Thus no part of the text can be highlighted.
- TM295
The A810 supports the following specific control characters: Line Feed forward/backward, Form Feed forward/backward, Capital Letters on/off, Switch to German Character Set, Lift Pinch Roller.
- Epson printers of series LX, FX, LQ
The following Standard Escape Sequences are supported which are suitable for other software compatible printers, too: Carriage Return, Line Feed, Form Feed, Wide Font on/off, Bold Font on/off, Narrow Font on/off, Italics on/off, Underline on/off.
- STAR printer SP212, SP312, SP349
The following control characters are supported: Carriage Return, Line Feed, Wide Font on/off, Set to German Character Set, Cut Paper.

Please note that the standard program does not support any teleprinter since there is no reason for a terminal with EU approval to be connected to a teleprinter.

4.4. Remote Display Units

4.4.1. A810 Remote Display Units

Any system compatible remote control and display unit of the A810 will not be used as logical device 'Remote display unit' but instead as logical device 'Second operating unit'. This simplifies the configuration of the interface and enables more functions to be used, e.g. for the commissioning program.

4.4.2. Foreign Remote Display Units

Any A810 terminal can in principle be adapted by the manufacturer to any remote display unit and its protocol. This will be done on customer's demand. Altogether up to 8 different data exchange protocols can be declared and selected by the commissioning program. The remote display can read out either gross, net or tare weight or the value currently on display.

4.5. PC / SPC

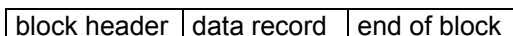
Linking an A810 terminal to the serial interface of a computer or a stored-program control unit allows weighing data to be used in data processing or process control. In this case the computer or the control unit is commonly the active party that triggers certain reactions of the terminal by means of a set of declared commands. The default setting of an A810 terminal is such that it will transmit data only in case of error when no request is received.

4.5.1. Acknowledgement Protocol

By issuing an acknowledgement protocol the terminal reports back to the computer whether it has understood a transmitted command. The default setting when a terminal is supplied is such that each command is acknowledged after 25 ms at the latest by character Acknowledge (ACK, code 06h) when it is valid or character Negative Acknowledge (NAK, code 15h) when the command cannot be executed. Please note that the transmission of character ACK does not prove the meaning of the transmitted data to be correct. The acknowledgement protocol can be changed during in the commissioning program. The same applies to the run time (command 'PROTOK').

4.5.2. Structure of a Data Frame

Data frames have identical structures in either direction. Each of them contains the following components:



The default setting when a terminal is supplied is character STX (code 02h) for the block header and character ETX (code 03h) for the end-of-block code. This declaration can be changed in the commissioning program and during traffic (command 'LINES'). The data record contains the information to be transferred. It consists of a command transmitted to A810 and a data record returned in response. The characters belonging to a data block shall be transmitted to the terminal within one second, otherwise the terminal will regard the transmission as finished, reply by transmitting NAK and ignore the block.

4.5.3. Remote Control Commands

Each of the remote control command starts with a command number (see Table 3). Depending on the type of command, more parameters may follow. For those commands that request a terminal to transmit a data record, the structure of the returned data record will be explained when describing the command. A A810 is able to receive several commands directly following one another and to execute them subsequently. The order of the responses need not necessarily coincide with the order of the commands since the response may depend on certain conditions such as dwell.

In the following passage all numbers used in a command are represented as hexadecimal numbers or ASCII characters. The examples contain only the data records. The block headers and end-of-block codes have to be added in accordance with the block structure used.

4.5.3.1. Keyboard Commands

KEYS_ON	Command No 20h	Parameters: none
	The entire keyboard of a terminal is re-enabled (made active) after the command KEYS_OFF. This applies also to a second operating unit possibly connected. This is the on-condition.	
KEYS_OFF	Command No 21h	Parameters: none
	The entire keyboard of a terminal is disabled (made inactive). This applies also to a second operating unit possibly connected but not to a key function activated via parallel interface.	
KEYFUNCT	Command No 24h	Parameters: key code
	This command contains the code of a key (see Table 4) as its parameter. It has the same effect as pressing the respective key on the keyboard. This command can be used to remote-control a function of the terminal that can be triggered by a single keystroke. Input operations consisting of key sequences (e.g. input of a coefficient) cannot be implemented this way, there are other commands for this purpose.	
	Example: '\$ A'	trigger print function
S_KEYON	Command No 35h	Parameters: none
	After this command has been received, any keystroke at the terminal is transmitted in a keycode data record till command S_KEYOFF will shut down this mode.	
	Returned data record: * identifier 'C' for keycode * code keycode according to Table 4	
	Example: 'C B'	key 'Set to zero' has been pressed
S_KEYOFF	Command No 36h	Parameters: none
	The mode of operation triggered by S_KEYON is shut down.	
S_INPUT	Command No 37h	Parameters: range of values
	The terminal is switched to mode Input of numbers.	
	Parameters: * identifier 'K' for answer code * character is indicated by 1 st digit from the left * identifier 'M' for minimum of input number range * number ASCII string (integer) * identifier 'X' for maximum of input number range * number ASCII string (integer) * identifier 'P' for decimal point (number of trailing digits) * number ASCII character {'0' to '4'}	
	The identifier and the decimal point indicated by the display unit of the terminal are just for the operator's information, they have no effect whatsoever on the value of the entered number. The display will furthermore indicate '0' for the last digit which will be shifted when a numeral is entered. Press 'TARE' to correct a digit and press 'ENT' to conclude the input. When the number entered is outside the preset range of numbers, the input	

routine cannot be left but is repeated. After a valid number has been entered, the terminal will respond and return to the display of weight.

Example: '7KLM20X100P1' Identifier 'L', Min 2.0, Max 10.0

Returned data record:

* identifier W for input of number
 * number ASCII string (integer)

Example: command from PC/SPS '7KLM20X100P1'
 the display reads out: L .0
 input of 7 5 'Ret' L 7.5
 response by A810 'W75'

4.5.3.2. Commands for Weighing Operations

S_D_STI Command No 25h Parameters: none

The weight value indicated by the display (gross, net or tare) is transmitted one single time as soon as the display is updated after the dwell condition has been met.

Returned data record:

* status byte condition of load cell, bit code see Table 2
 * LA number '1' to '9', 'A' to 'G', 'V' load cell 1 to 16 or compound
 * identifier 'B','N','T' gross, net, or tare weight
 * measured value number on display represented as ASCII string
 * unit of measurement unit represented as ASCII string

Example: 'Q1B5.234kg' load cell 1, gross 5.234kg, dwell, value <>0 in display range above minimum load, tare memory empty, value in partial range

Bit No	0		1	
Bit 0	moving		at dwell	
	00	01	10	11
Bit 1,2	display range	overload	underload	off limit
Bit 3	gross <> 0		gross in exactly-zero range	
Bit 4	less than minimum load		minimum load exceeded	
Bit 5	current tare memory empty		current tare memory occupied	
Bit 6	not within partial range		within partial range	
Bit 7	always		off limit	

Table 2

S_D_NSTI Command No 26h Parameters: none

The weight value indicated by the display (gross, net or tare) is transmitted one single time as soon as the display is updated without the need for the dwell condition to be complied with. The returned data record is the same as for command S_D_STI.

S_D_CONT Command No 27h Parameters: none

The weight value is transmitted each time the display is updated till continuous transmission is concluded by command S_D_CEND. The returned data record is the same as for command S_D_STI.

S_D_CEND Command No 28h Parameters: none

The continuous transmission of the data on display as started by S_D_CONT is shut down.

S_ALL Command No 29h Parameters: none
The weighing data gross, net and tare weights as well as status are transmitted.

Returned data record:

* Status byte condition of load cell, see Table 2

* LA number '1' to '9', 'A' to 'G', 'V' load cell 1 to 16 or compound
* identifier 'B' gross weight
* measured value ASCII string of gross value
* unit of measurement ASCII string of unit
* identifier 'N' net weight
* measured value ASCII string of net weight
* unit of measurement ASCII string of unit
* identifier 'T' tare weight
* measured value ASCII string of tare weight
* unit of measurement ASCII string of unit

Example: 'P2B24.50kgN22.35kgT2.15kg'

ZOOM Command No 2Ah Parameter: range of zoom

This parameter may be '0' or '1'. Parameter '0' has the effect that each weight transmitted by the terminal has the same resolutions as the value on display (default condition). Parameter '1' increases the resolution of the transferred data records 10 times. The command will not be executed when the data transfer mode approved for calibration has been declared during commissioning.

SET_TARA Command No 2Bh Parameter: tare weight

The parameter to be transferred as an ASCII string is the value of the tare weight to be set and its unit is the basic unit of the terminal. Subsequently the terminal will switch to the display of net weight and the LED of sign 'TARE' will be active. Please note that the weight is represented in the unit of measurement currently enabled. When you run a terminal with several units of measurement, check the unit of measurement currently used by beforehand reading out a weight value.

Example: '+10.35' set tare memory to 10,35

E_PARAM Command No 2Ch Parameters: scale parameters

Parameters filter coefficient, zero tracing, and dwell range are transmitted to the terminal. Always follow this order and do not omit any parameter. You are allowed, however, to omit a parameter not followed by another one. The command will not be executed when the data transfer mode approved for calibration has been declared during commissioning.

Parameter:

* identifier 'I' for filter coefficient
* number ASCII character of filter coefficient/10
* identifier 'Z' for zero tracing facility
* numeral '0' for inactive / '1' for active
* identifier 'S' for dwell range of scale
* number ASCII sequence of 1/10 divisions

Example: 'I8Z0S20' filter 80, no zero tracing, dwell range 2

S_PARAM Command No 2Dh Parameters: none

Parameters resolution, count-by step, filter coefficient, and status of the zero-tracing facility of the current channel are transmitted. The dwell range is transmitted as well except for the compound channel.

When a scale has a partial weighing range (multi-range scale), the resolution and count-by step of the partial weighing range are also included in the data record.

Returned data record (scale without partial weighing range):

* identifier 'A' for resolution of the scale, unit divisions
* number ASCII string of number of divisions
* identifier 'P' for step, count-by step of the scale
* number ASCII sequence of step, unit 1/10000 of currently used unit
* identifier 'I' for filter coefficient
* numeral ASCII character of filter coefficient/10
* identifier 'Z' for zero tracing facility
* numeral '0' for inactive / '1' for active
* identifier 'S' for dwell range of scale
* number ASCII string of 1/10 divisions
* identifier 'F' irrelevant for A810, is transmitted for reason
* numeral '0' of compatibility with previous controller

Example: 'A2500P20I9Z1S10F0' 2500 divisions, count-by step 0.002*unit of measurement, filter 90, zero tracing facility active, dwell range 1d

Returned data record (multi-range scale):

* identifier 'A' for resolution of the scale, unit divisions
* number ASCII string of number of divisions
* identifier 'P' for step, count-by step of the scale
* number ASCII string of step, unit 1/10 gram
* identifier 'a' for resolution of the scale (partial weighing range), unit divisions
* number ASCII string of number of divisions
* identifier 'p' for step, count-by step of the scale (partial weighing range)
* number ASCII string of step, unit 1/10 gram
* identifier 'I' for filter coefficient
* numeral ASCII character of filter coefficient/10
* identifier 'Z' for zero tracing facility
* numeral '0' for inactive / '1' for active
* identifier 'S' for dwell range of scale
* number ASCII string of 1/10 divisions
* identifier 'F' irrelevant for A810, is transmitted for reason
* numeral '0' of compatibility with previous controller

Example: 'A2500P200a3000p20I9Z1S10F0'
2500 divisions, count-by step 0.02*unit of measurement, 3000 divisions in partial weighing range, count-by step 0.002*unit in partial range, filter 90, zero tracing facility active, dwell range 1d

E_ME Command No 45h Parameter: number of unit of measurement

This is to set the unit of measurement by transmitting its number as a parameter. When doing so, the numbers '0' to '6' stand for the units of measurement kg, t, g, lb, oz, N, and KN. The command is executed only when the selected unit of measurement has been declared during set-up.

Example: 'E1' The scale is switched to unit t.

4.5.3.3. Commands for Printer Output

E_TIME	Command No 2Eh	Parameter: time
	This parameter is made up of time in the format HH:MM:SS for setting the real-time clock.	
Example:	'17:39:05'	time: 17h 39min 5sec
E_DATE	Command No 2Fh	Parameter: date
	This parameter is made of date in the format YY.MM.DD for setting the real-time clock.	
Example:	'02.01.98'	Date: Jan 2 nd , 1998
E_BEIW	Command No 30h	Parameter: coefficient
	This parameter is made up of up to 14 ASCII characters acting as place holders of the current coefficient in a print image.	
Example:	'0Batch 00130A1'	coefficient: batch 00130A1
E_LFDNR	Command No 31h	Parameter: serial number
	This parameter is made up of up to 8 ASCII characters representing a number between 0 and 10000000. This number will be used as serial number as from the next printing operation provided it does not fall outside the range of serial numbers declared during setup.	
Example:	'1123'	set serial number to 123
S_LFDNR	Command No 32h	Parameters: none
	An ASCII string is transmitted representing the serial number to be used for the next printout.	
	Returned data record:	
	* identifier	'c' for serial / consecutive number
	* number	ASCII string of number
Example:	'c456'	use serial number 456
E_DBILD	Command No 33h	Parameter: print image
	Command E_DBILD requires 8 bit data exchange. This command is for uploading a user-specific print image to the RAM of the terminal or for disabling a print image, respectively. Add the print-image identifier 'U' after the Command No if you want to upload a print image. After that you may add up to 1000 characters which will form the print image. In doing so you may use any printable ASCII code as well as the codes of place holders and control functions. For the syntax for drawing up a print image please refer to chapter 'Commissioning, Scaling', paragraph 'Structure of a Print Image'. There you will find the tables containing the declared codes. Transmit this command without any parameter if you want to disable a print image. The following printout will then be based on the ROM-resident print image.	

Example: 33h 55h ;command number, identifier print image
 FFh 90h ;carriage return
 FFh 91h FFh 91h ;2 times line feed
 FFh 93h ;wide font on
 54h 65h 73h 74h ;'Test'
 FFh 94h ;wide font off
 FFh 90h FFh 91h ;carriage return, line feed
 FFh B0h ;fixed text 'gross'
 FFh 80h 0Ch ;gross weight, 12 digits
 FFh F0h ;end

DR_PCON Command No 3Bh Parameters: none

This command has the effect that any character transmitted to the printer is concurrently transmitted to the PC interface. For this you have to declare a printer as a logical device during setup.

Returned data record:

- * identifier 'DRU' for printer data record
- * string of ASCII and control characters according to print image and declared type of printer (example applies to CR/LF printer)

Example: 'DRU' 0Dh 0Ah 0Ah 'Test' 0Dh 0Ah 'gross' 5.375kg'

DR_PCOFF Command No 3Ch Parameters: none

The mode of operation set by means of DR_PCON is shut down.

E_DBOFFS Command No 42h Parameters: offset values

This command allows to change the displacement of the print image to the right and to the bottom and the following space lines as declared during Set-up.

Parameters:

- * identifier 'l' for space lines in front of the print image
- * number between 0 and 99, number of space lines in front of print image
- * identifier 'c' for spaces in front of each line
- * number between 0 and 99, number of spaces in front of each line
- * identifier 'f' for space lines behind the print image
- * number between 0 and 99, number of space lines behind print image

Example: 'l5c12f2' 5 space lines in front of print image, 12 spaces
 in front of each line, 2 space lines after print
 image

PRINT Command No 43h Parameters: printdata

This command is for direct printing to logical printer 1. Printdata can contain printable characters as well as ESC-sequencities. A binary zero is interpreted as end of datastream. Length of printdata is restricted to 1000 characters.

Example: 'CA810' Text 'A810' will be printed directly.

E_PCODE Command 52h Parameters: product-code

This command is for setting the product-code (0...255) of A810. These codes are printed to alibi-memory or physical printer.

Example: 'R100' Setting product-code to 100.

S_PCODE Command 53h Parameters: none

This command reads out product-code.

Example received data: 'C100'

4.5.3.4. Commands for Data Protocol

PROTOK Command No 38h Parameters: Acknowledge protocol

This command is for matching the acknowledge protocol with the requirements of the other station. The relevant setup parameter will be overwritten. The command is followed by an ASCII character selecting the protocol. The following modes can be set:

'0' standard protocol, acknowledge characters ACK and NAK are transmitted according to DIN 66019.
'1' A810 will not transmit ACK and NAK.
'2' A810 will transmit ACK and NAK enclosed in a block frame made up of STX and ETX.

The command takes effect immediately, so command PROTOK is acknowledged already by the newly set protocol. If needed at all, this command should always open the exchange of data.

ADDRESS Command No 39h Parameter: device address

The interconnection of several terminals in a TTY ring or on an RS485 BUS requires that exactly one device is addressed at any time. Immediately after power-on the device having the address '0' is active. Command ADDRESS is for selecting the device the address of which is the parameter transmitted whereas all the other devices in the ring are disabled.

Example: '95' enable device with address 5

LINES Command No 3Ah Parameter: block structure

The command LINES determines the structure of a data block by defining its header and end. The relevant parameters in the Set-up will be overwritten. This parameter can be used to match the data protocol of the terminal with the conventions of the program running on the computer. The following modes can be set:

Parameter	block header	end of block
'0'	STX	ETX
'1'	STX	CR ETX
'2'	STX	LF ETX
'3'	STX	CR LF ETX
'4'		
'5'		CR
'6'		LF
'7'		CR LF

When a protocol approved for calibration is used, only parameters '0' to '3' are permitted since the protocol requires characters STX and ETX.

4.5.3.5. Miscellaneous Command

TERMINAL Command No 34h Parameters: none

Command TERMINAL can be used for running an A810 terminal as a second operating unit for the input and output of characters in connection with a PC or an SPC, respectively. If data exchange approved for calibration has been set during setup, the terminal will not execute this command. After command TERMINAL has been transferred all characters contained in a data block are read out by the display of the A810 as far as the display is able to do so. Vice versa the A810 transmits each character entered directly by keyboard to the PC/SPC. The Terminal-mode of operation is shut down by transferring the end-of-block character (ETX) to the terminal.

S_CONFIG Command No 41h Parameters: none

After receiving this command, the terminal returns a string of characters containing the program version number, the date of release, and a few code bytes identifying the translation mode of the program. The length of the transmitted data block is variable.

Returned data record:

* program release No 81.xx
* identifier '/'
* program release date dd.mm.yy
* configuration byte 1
* configuration byte 2

Meaning of configuration byte 1

Bit0:	0=special software	1=standard program
Bit1:	0=function keyboard only	1=additional keyboard
Bit2:	always 1	
Bit3:	always 1	
Bit4:	0=	1=compound scale
Bit5:	0=	1=scale with partial range
Bit6:	always 1	

Meaning of configuration byte 2

Bit0:	0=	1=analog interface active
Bit1:	always 1	
Bit2:	always 1	
Bit3:	always 1	
Bit4:	always 0	
Bit5:	always 1	
Bit6:	0=	1=parallel interface active

Example: '10.01/02.09.06O/' standard program 810.01 dated Sept. 2nd, 06, 1-channel A810 with additional keyboard and analog interface

CALL_FU Command No 47h Parameters: # of operating function, keycode

This command is to call an operating function directly. Additional keycodes can be added as well.

Example: 'G*311206K' call function 42 ('*' - set date), enter 31.12.06 and confirm with key ENT ('K')

E_DAC0 Command No 4Eh Parameters: voltage

This command is to set DA-converter to a voltage level.
Parameter 0 is equal to a voltage of 0V resp. a current of 0mA and the maximum of 4095 (FFFh) is equal to a voltage of 10V resp. a current of 20mA.

Example: 'N2048' output of 5V resp. 10mA at DA-converter

4.5.4. Behaviour in case of trouble

In normal conditions the terminal transmits data on request whereas in case of trouble an error message resulting in the shut-down of the scale program is transmitted compulsorily at the time when it is read out by the display. Acknowledge the error message either by pressing key 'Test' or by transmitting key code 'C' via PC interface.

Error data record:

* identifier 'F' for error
* number ASCII string (max. 2 digits)

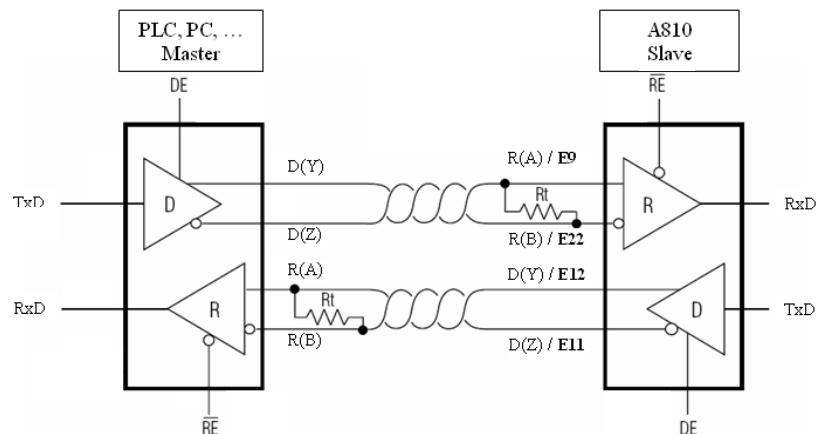
Example: 'F13' Breakdown of positive supply voltage ADC 1

4.6. Examples of Communication Interfaces

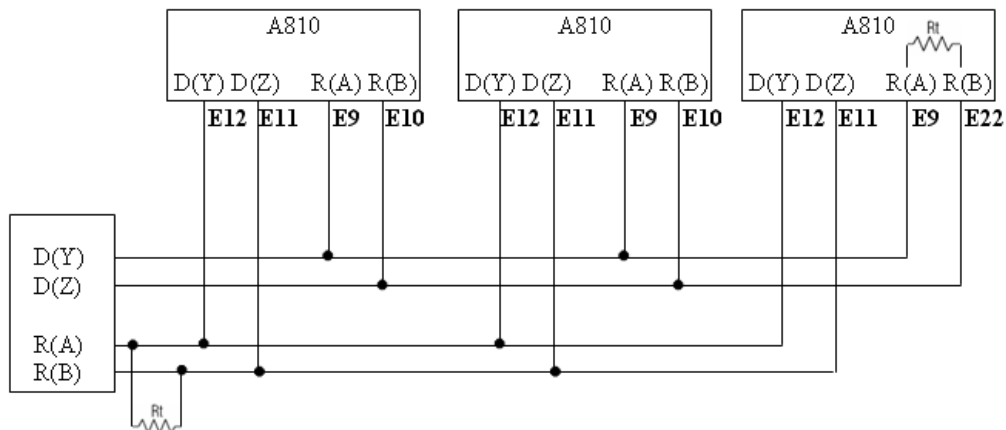
4.6.1. RS-485 Interface

Note: Connection "D(Y)" has the same term as Tx+, D(A), SD(A);
 Connection "D(Z)" has the same term as Tx-, D(B), SD(B);
 Connection "R(A)" has the same term as Rx+, RD(A);
 Connection "R(B)" has the same term as Rx-, RD(B);

- Direct connection



- Multipoint connection



- How to communicate

1. Set the Address ID for each A810
2. Change PC-port of A810 to "0" (Submenu PC-Interface "PC" at page 50)
3. Send ADDRESS command from host → activated A810 will respond with ACK (0x06)
4. One A810 specified by host is open for communication
5. Format of communication commands are set up in Submenu PC-Interface "PC" at page 50
6. Communication is opened to specified A810 until ADDRESS command to another A810 is sent

- Setting the Address ID

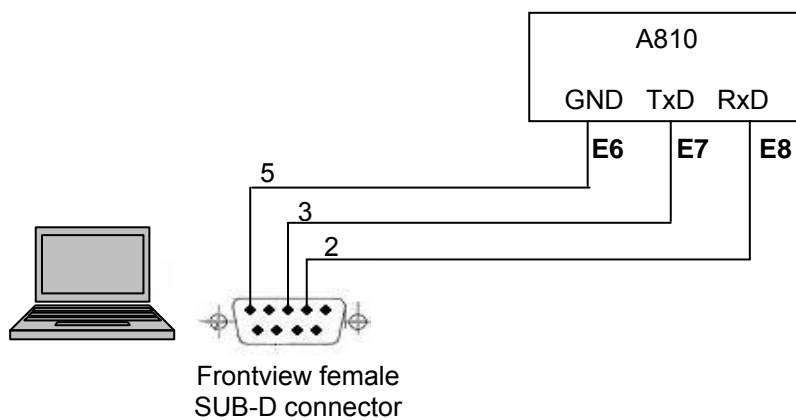
Menu "PC" → submenu Device address "Adr" at page 51.

- ADDRESS command

0x02 0x39 **0x35** 0x03 (hexadecimal)
<STX>**95**<ETX> (String)

open communication to A810 with address "5"

4.6.2. RS-232 Interface



4.7. Tables of serial interfaces

4.7.1. Commands of the PC Interface

Name	Code decimal	Code hexa	Function	page
KEYS_ON	32	20	A810 keyboard on	78
KEYS_OFF	33	21	A810 keyboard off	78
KEYFUNCT	36	24	release A810 key function	78
S_D_STI	37	25	transmit display content after dwell	79
S_D_NSTI	38	26	transmit display content even when not at dwell	79
S_D_CONT	39	27	continuous transmission of display content on	79
S_D_CEND	40	28	continuous transmission of display content off	79
S_ALL	41	29	transmit gross, net, and tare	80
ZOOM	42	2A	zoom for exchange of data on/off	80
SET_TARA	43	2B	set tare memory	80
E_PARAM	44	2C	receive filter coefficient, zero tracing, dwell range	80
S_PARAM	45	2D	transmit resolution, count-by step, filter coefficient, zero tracing, dwell range	81
E_TIME	46	2E	receive time	82
E_DATE	47	2F	receive date	82
E_BEIW	48	30	receive coefficient	82
E_LFDNR	49	31	receive serial number	82
S_LFDNR	50	32	transmit serial number	82
E_DBILD	51	33	receive print image	82
TERMINAL	52	34	Terminal-mode of operation on	85
S_KEYON	53	35	transmit key code on	78
S_KEYOFF	54	36	transmit key code off	78
S_INPUT	55	37	transmit input of numbers	78
PROTOK	56	38	set protocol	84
ADDRESS	57	39	address A810 in TTY-Ring / RS485-BUS	84
LINES	58	3A	define line structure	84
DR_PCON	59	3B	print output by PC on	83
DR_PCOFF	60	3C	print output by PC off	83
S_CONFIG	65	41	transmit configuration of device	85
E_DBOFFS	66	42	receive print image offset values	83
PRINT	67	43	direct print	83
E_ME	69	45	set unit of measurement	81
CALL_FU	71	47	call a operating function	85
E_DAC0	78	4E	set 12-Bit value at DA-converter	86
E_PCODE	82	52	set product code	84
S_PCODE	83	53	receive product code	84

Table 3

4.7.2. Code-Table A810 Keyboard

Key name	Key code		Comment
	normal	to scroll	
SET TO ZERO	'B'	'b'	key 'Set to zero'
TARE	'G'	'g'	key 'TARE'
FUNC	'H'	'h'	key 'FUNC'
SHIFT	'I'	'i'	key 'SHIFT'
ENT	'K'	'k'	key 'ENT'
GROSS/NET	'S'	's'	key 'Gross/NET'
SHIFT + TARE	'T'	't'	keys 'SHIFT' + 'TARE'
0	'0'	'0'	figure 0
1	'1'	'1'	figure 1
2	'2'	'2'	figure 2
3	'3'	'3'	figure 3
4	'4'	'4'	figure 4
5	'5'	'5'	figure 5
6	'6'	'6'	figure 6
7	'7'	'7'	figure 7
8	'8'	'8'	figure 8
9	'9'	'9'	figure 9
SET TO ZERO + 1	'@'		keys '→0←' + '1'

Table 4

The codes of column "to scroll" are generated repeatedly by the keyboard when a key is pressed permanently.

5. Specifications

General:

Power supply	115 / 230 V AC 48 to 62 Hz -15% to +10 %
power consumption	approx. 15 VA
operating temperature	-10 to +40°C (14°F to 104°F)
storage temperature	-20°C to +85°C (-28,4°F to 185°F)
humidity	< 85 % RH (non condensing)
dimensions (W x H x D)	200 x 104 x 193,4mm (7.87 x 4.09 x 7.61inch)
panel cut out (W x H)	186 +1,1/-0 x 90,7 +0,8/-0mm (7.32 +0.04/-0.0 x 3.57 +0.03/-0inch)
weight	1.7 kg (3.75lb)

Analogue parameter:

Measuring principle	Measuring amplifier: integrating converter; ratio metric to Load Cell supply
load cell excitation	DC 5V
load cell current	max. 100mA Load impedance: Min. 57Ω (e.g. 6 load cells with 350 Ω each) Max. 2000Ω
load cell wiring	4 wire standard 6 wire for remote sensing
span adjustment range	0,5mV/V to 5mV/V
input sensitivity	0,5 μV / count
conversion resolution	20 Bit effective, 24 Bit internal
conversion rate	40ms (25Sps) ... 2,5ms (400Sps) selectable
non – linearity	± 0,0015% FS
noise	< 0,1 μVp-p RTI
stability	offset drift ± 0,005 μV/°C
display resolution	legal for trade: 10 000 non legal for trade: 100 000

Display:

display type	LED, green, 20,7 mm 7 digits numeric 2 digits alphanumeric
weighing value	6 digits, plus / minus sign
decimal point	configurable
scale capacity	6 digits (up to 999999)
status display	LED illuminated status pattern
refresh rate	selectable between 32...0.4Hz (depends also on conversion rate)

Configuration

setting mode	via keyboard operation or host computer via RS232 (standard), USB2.0 (option), TCP/IP (option)
memory	default value setup from flash ROM

External I/O – Signals:

input number	16 Input's
input assignment	flexible via setup gross/net, digital zero ON, tare subtraction ON, tare subtraction OFF, hold/judgment, feed/discharge, start, stop
output type	relay output, max. 1A, external voltage max. 42V DC
output number	16 Output's
output assignment	fixed
24V for external usage	max. 100mA
refresh rate	40ms (25Sps) ... 2,5ms (400Sps) selectable with conversion rate

5.1. Interface

Interfaces

Standard:

- 1 - RS232C computer interface
type: asynchronous,
baud rate selectable
distance approx. 15m
- 2 - RS232C printer interface
type: asynchronous,
baud rate selectable
distance approx. 15m
- 3 – RS485 bus interface
type: asynchronous, multipoint
baud rate selectable
distance approx. 1000m
- 4 – TTY remote display interface
type: asynchronous,
baud rate and protocol selectable
distance approx. 1000m

D/A converter interface:

- current output: 4...20mA
- conversion speed: 40 times/sec
- resolution: 12 bit
- over range: FS ±10%

optional:

USB 2.0

TCP/IP 10MHz

Profibus DP

BCD parallel

to be connected via option slot or additional rear connector

5.2. Features / Basic functions

Theoretical Calibration

In addition to the capability of adjusting the A810 by using calibrating weight a theoretical calibration via the characteristic value and rated load of the load cells is also possible.

Auto free fall compensation

The automatic free fall compensation (AFFC) provides closer tolerance and better accuracy in batching application.

Selfcheck and Watchdog

To insure function and reliability of the complete system well proofed self check procedures and a watchdog function are provided.

Accumulation Function

The A810 accumulation function continuously updates the material throughput and monitors the total sum and the counts for each code group separately.

Feeding-/ Discharging weighing

The A810 allows an accurate feeding or discharging process controlled by a set of weighing control parameters.

For comparison there are the simple comparison and the sequence mode selectable.

5.3. Calibration Lock

Menu	Description	accessible via reduced setup	Increment ID-Number	Remarks to increment ID-Number
'dIAG'	diagnostics	yes	no	
'basic'	basics for weighing	no	yes	
'Scale div'	scale division	no	yes	
'ADC'	parameters of A/D-converter	no	yes	
'CALIB'	calibration	no	yes	
'ALIBI'	legal-for-trade memory	no	yes	
'Control'	processing mode	yes	no	
'COMP'	comparison mode	yes	no	
'SEQU'	sequence mode	yes	no	
'Print'	parameters for printer	yes	no	
'PC'	parameters for PC	yes	no	
'dAC'	parameters for D/A-converter	yes	no	
'IF'	address of ProfibusDP or Ethernet	yes	no	
'KE'	enable keys	yes	no	
'KF'	parameters of Operating Function	no	no	
'InPut'	parameters for input section	yes	no	

6. Application notes

6.1. Calibration procedure

- 1: Release Calibration Lock (CAL Switch = ON) at rear panel of A810.
- 2: Select primary measurement unit "MU" 3.1.1.2.
 - The calibration is done with this unit.
 - This unit is shown on display after each restart of A810.
- 3: Select stability settings 3.1.3
 - Adjust ADC settings depending on your environment
 - Adjust filter settings so that sign "STABLE" is illuminated ("StAN" 3.1.1.11 and "StAR" 3.1.1.12 at page 27) during weighing.

- 4: Do scaling 3.1.2

Notice: Fullscale (FS) = Divisions (Dn) * Verified Scale Interval (VS)

Scaling is done for selected measurement unit "MU" (kg, To, Gr, Lb, oz, N, kN or FU).
(Scaling and calibrating of Free Unit "FU" overwrites "KG"-calibration and scaling.)

To ensure that your device is legal-for-trade set division "Dn" (3.1.2.1.1) lower or equal 10000.

- Division (Dn)

Select desired scale intervals over fullscale range between 10 and 100000 at point 3.1.2.1.1

- Verified scale interval (VS)

Select lowest interval of the scale at point 3.1.2.1.2. This is the finest resolution.

- Fullscale (FS)

The shown value at point 3.1.2.1.3 is the result of division "Dn" times Verified Scale Interval "VS" plus one "VS". The operator can see the Fullscale and its resolution at a glance.

- 5: Calibration 3.1.4

- unload the loadcell and do a Zero Calibration
 - put testweight on loadcell and register this weight to A810
- Note:** This weight should be more than 20% of Fullscale for accuracy!
- In case of a non-linear loadcell the operator can set up to six additional calibration points for adjustment.

- 6: Close calibration lock (CAL Switch = OFF) and restart the system.

Example:

Desired: Fullscale 100kg
 Resolution 0.01kg

Menu

- Stability settings are done according to operators environment.
- set "MU" to "kg" 3.1.1.2
- "Dn" = $100\text{kg} / 0.01\text{kg} = 10000$
- set "Dn" to 10000 → A810 is legal-for-trade 3.1.2.1.1
- set "VS" = 0.01 3.1.2.1.2
- for confirmation of correctly set parameters: "FS" shows 100.01kg 3.1.2.1.3

Additional settings:

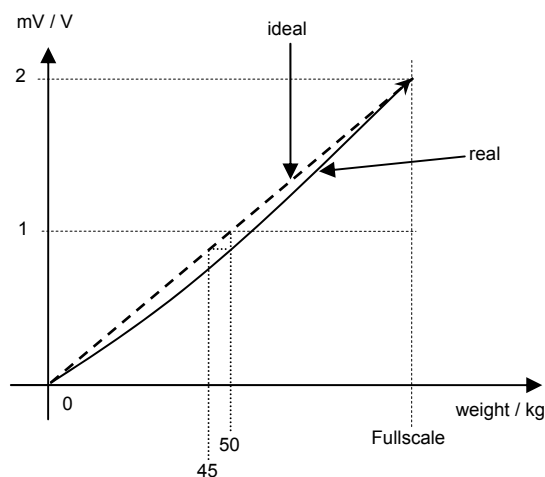
When operator wants to switch between measurement units in weighing mode these units have to be scaled as well. Be aware that both Fullscale values have to have the same weight. 3.1.2

- unload loadcell and do a Zero Calibration 3.1.4.1.1
- put testweight of more than 20kg (>20% of FS) on and enter this weight to A810 3.1.4.1.2
- do calibration 3.1.4.1.2

Additional settings:

When the loadcell is non-linear, the operator can set additional calibration points. 3.1.4.2

In that example the testweight is 50kg. A810 would show approx. 45kg.
 To adjust this loadcell error, put testweight on and enter 50.00kg in menu "AddP".
 Now A810 shows correct weight.



- close Calibration Lock (CAL Switch = OFF) and restart A810.

6.2. Theoretical calibration

Theoretical calibration is used for calibration without balance weight. It is possible to enter a known input ratio of a load cell to A810. This procedure is not as accurate as calibration with balance weight because tolerances of components influence the result.

When operator knows the input ratio of a load cell and wants to replace the weighing controller, he should have marked out these values before. These values could be for example:

0.00239mV/V at Zero point and
2.15267mV/V at nominal load.

(from 3.1.17.4 at page 66)
(from 3.1.17.5 at page 66)

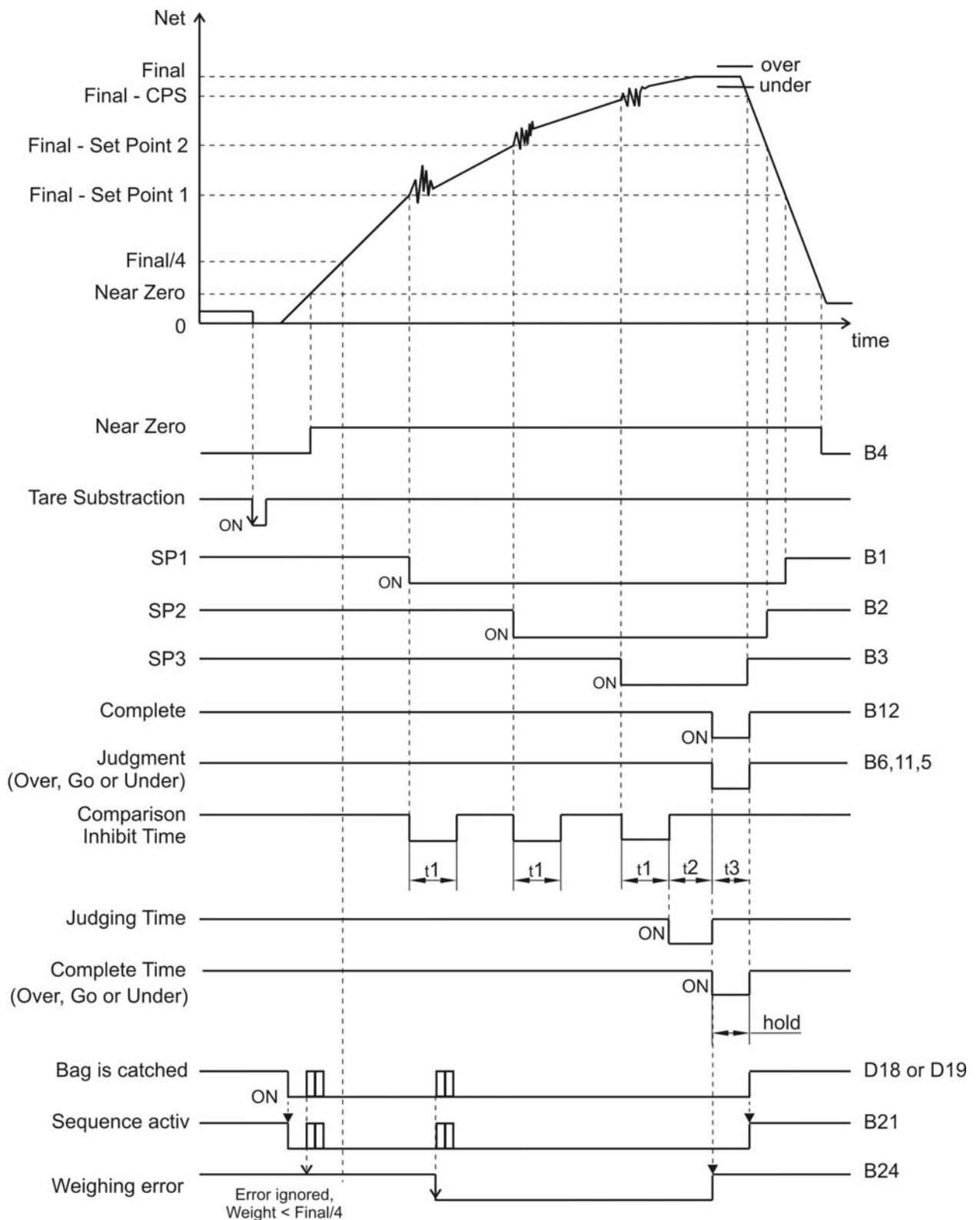
After replacing the weighing controller, these two input ratios are entered to A810. At first the known input ratio at Zero point of load cell is entered at point 3.1.4.3. After that the known input ratio at Fullscale of load cell is entered. A810 is now calibrated at these two points.

When you do only a theoretical calibration at Zero point, weighing function is moved parallel to previous weighing function.

When you are using A810 and load-cell out of the box and you want to do theoretical calibration, the procedure is as follows:

- enter "0.00000" at Zero point (3.1.4.3 at page 35)
- enter mV/V-ratio delivered with your load-cell at nominal load
- return to weighing mode and A810 shows value different from zero
- enter setup mode again
- do zero with unloaded cell (submenu "Calibration" 3.1.5.1.1 at page 34)
- return back to weighing mode and A810 shows zero.

6.3. Simple Comparison Mode – Feeding Weighing e.g. 1



Settings for this example:

Simple Comparison Mode is activated setting parameter “**SMS**” in submenu “control” (3.1.6 at page 39) **OFF**.

Feeding is activated setting parameter “**Fd-Con**” in submenu “control” (3.1.6 at page 39) to “**0**”.

The weighing value compared at Near Zero (“**NZ**”) can be Gross or Net, selected at 3.1.7.1 at page 41. In this case parameter is set to “**1**”: compare with net weight”.

The weighing value compared with Final, Over and Under (“**FOU-CMD**”) can be Gross or Net, selected at 3.1.7.2 at page 41.

In this case parameter is set to “**1**”: compare with net weight”.

In Simple Comparison Mode the Over, Go and Under comparison is done due to the settings of “**OUC-MD**” in menu 3.1.7.4 at page 42.

In this case parameter is set to “**2**”: compare when complete output is ON”.

When set this parameter to 3, A810 will not change any outputs, weighing value or indicators during “Complete Output Time”.

The “Complete Output” signal is ON due to the setting of “**CSO-MD**” in menu 3.1.6.3 at page 39.

In this case parameter is set to “**0**”: judging time is expired”.

Conditions:

- When weighing value \leq set value of Near Zero, the Near Zero output turns on.
- When weighing value \geq Final – Set Point1, the SP1 output signal turns off.
- When weighing value \geq Final – Set Point2, the SP2 output signal turns off.
- When weighing value \geq Final – CPS, the CPS output signal turns off.
- When weighing value \leq Final – Under, the Under output signal turns on when complete signal is active.
- When weighing value \geq Final + Over, the Over output signal turns on when complete signal is active.
- When Final – Under \leq weighing value \leq Final + Over, the Go output signal turns on when complete signal is active.

Timers:

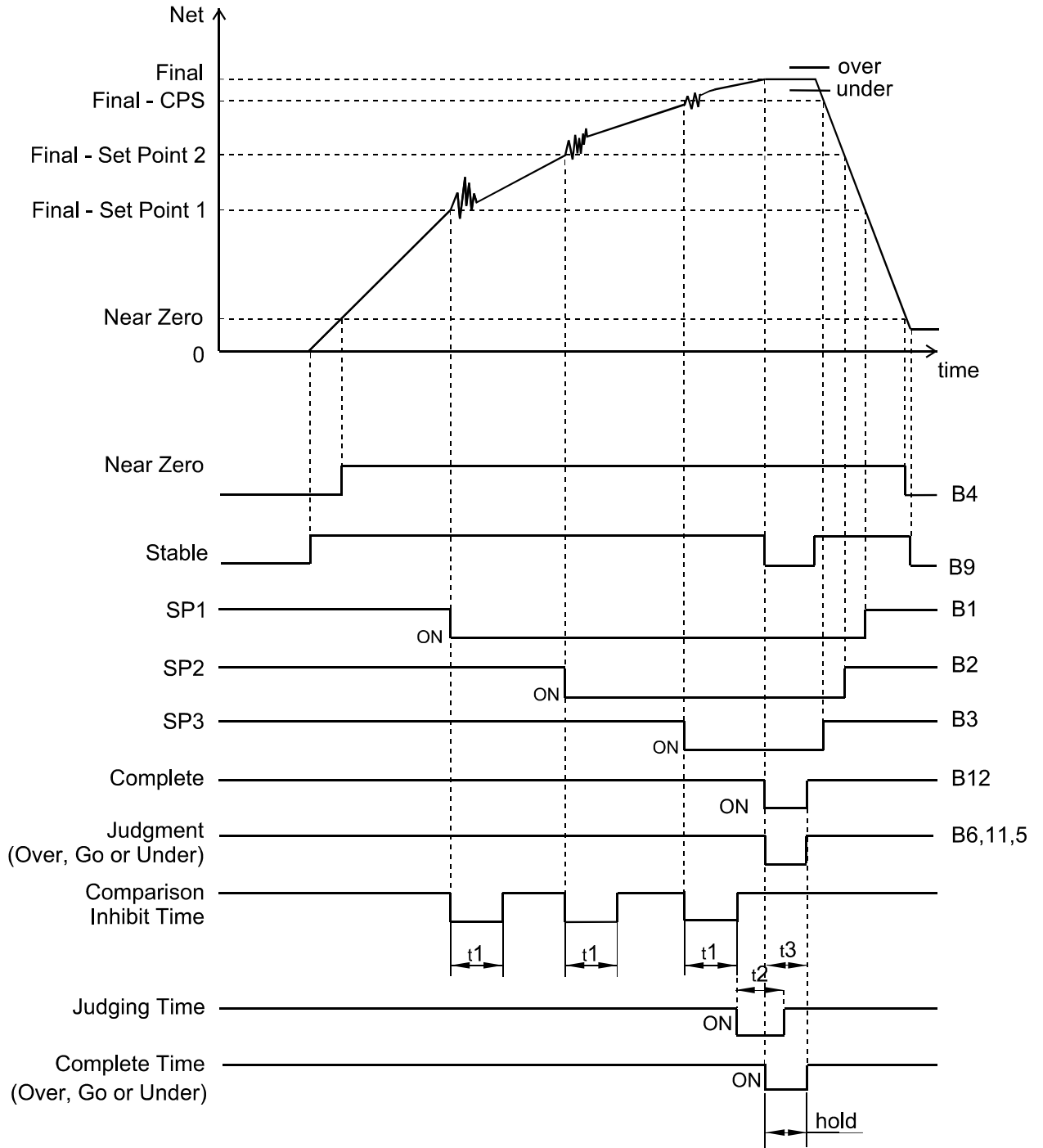
t1: Comparison inhibited Time “CITI” – set in 3.1.7.6 at page 42

t2: Judging Time “JTI” – set in 3.1.7.7 at page 42

t3: Complete Output Time “COTI” – set in 3.1.7.8 at page 43

A full “Simple Comparison Mode” is restarted after weighing value fell below of $\frac{1}{4}$ of Fullscale. Otherwise the “Complete Output” signal is not activated.

6.4. Simple Comparison Mode – Feeding Weighing e.g. 2



Settings for this example:

Simple Comparison Mode is activated setting parameter “**SMS**” in submenu “control” (3.1.6 at page 39) **OFF**.

Feeding is activated setting parameter “**Fd-Con**” in submenu “control” (3.1.6 at page 39) to “**0**”.

The weighing value compared at Near Zero (“**NZ**”) can be Gross or Net, selected at 3.1.7.1 at page 41. In this case parameter is set to “**1**”: compare with net weight”.

The weighing value compared with Final, Over and Under (“**FOU-CMD**”) can be Gross or Net, selected at 3.1.7.2 at page 41.

In this case parameter is set to “**1**”: compare with net weight”.

In Simple Comparison Mode the Over, Go and Under comparison is done due to the settings of “**OUC-MD**” in menu 3.1.7.4 at page 42.

In this case parameter is set to “**2**”: compare when complete output is ON”.

When set this parameter to 3, A810 will not change any outputs, weighing value or indicators during “Complete Output Time”.

The “Complete Output” signal is ON due to the setting of “**CSO-MD**” in menu 3.1.6.3 at page 39.

In this case parameter is set to “**0**”: judging time is expired”.

Conditions:

- When weighing value \leq set value of Near Zero, the Near Zero output turns on.
- When weighing value \geq Final – Set Point1, the SP1 output signal turns off.
- When weighing value \geq Final – Set Point2, the SP2 output signal turns off.
- When weighing value \geq Final – CPS, the CPS output signal turns off.
- When weighing value \leq Final – Under, the Under output signal turns on when complete signal is active.
- When weighing value \geq Final + Over, the Over output signal turns on when complete signal is active.
- When Final – Under \leq weighing value \leq Final + Over, the Go output signal turns on when complete signal is active.

Timers:

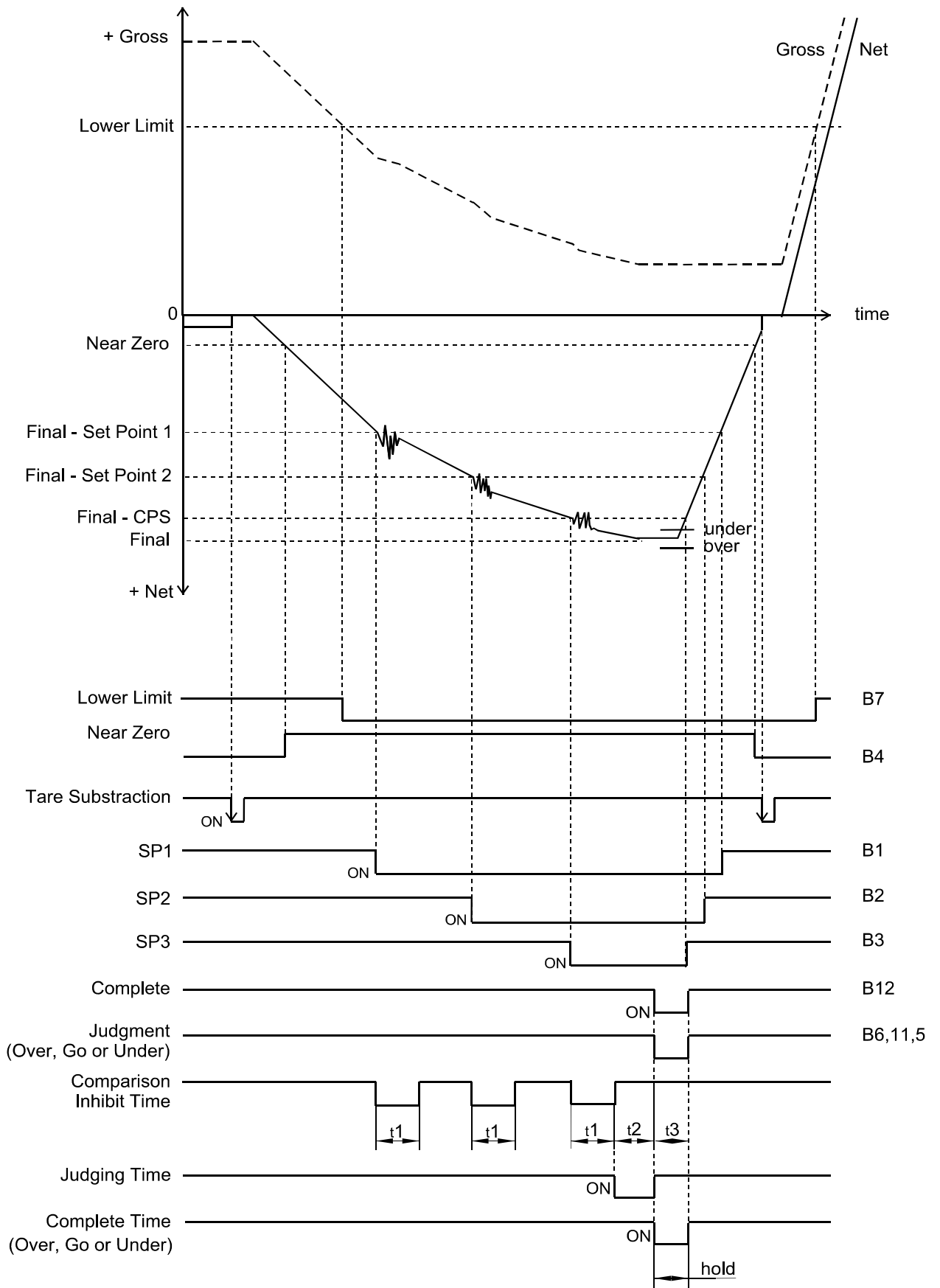
t1: Comparison inhibited Time “CITI” – set in 3.1.7.6 at page 42

t2: Judging Time “JTI” – set in 3.1.7.7 at page 42

t3: Complete Output Time “COTI” – set in 3.1.7.8 at page 43

A full “Simple Comparison Mode” is restarted after weighing value fell below of $\frac{1}{4}$ of Fullscale. Otherwise the “Complete Output” signal is not activated.

6.5. Simple Comparison Mode – Discharging Weighing



Settings for this example:

Simple Comparison Mode is activated setting parameter “**SMS**” in submenu “control” (3.1.6 at page 39) **OFF**.

Discharging is activated setting parameter “**Fd-Con**” in submenu “control” (3.1.6 at page 39) to “**1**”.

Upper and Lower Limit has to be compared with Gross weight. Parameter “**ULL-CMD**” in submenu “COMP” (3.1.7 at page 41) is set to “**0**”.

The weighing value compared at Near Zero (“**NZ**”) can be Gross or Net, selected at 3.1.7.1 at page 41. In this case parameter is set to “**1**”: compare with net weight”.

The weighing value compared with Final, Over and Under (“**FOU-CMD**”) can be Gross or Net, selected at 3.1.7.2 at page 41.

In this case parameter is set to “**1**”: compare with net weight”.

In Simple Comparison Mode the Over, Go and Under comparison is done due to the settings of “**OUC-MD**” in menu 3.1.7.4 at page 42.

In this case parameter is set to “**2**”: compare when complete output is ON”.

When set this parameter to 3, A810 will not change any outputs, weighing value or indicators during “Complete Output Time”.

The “Complete Output” signal is ON due to the setting of “**CSO-MD**” in menu 3.1.6.3 at page 39 after the Stable condition is detected.

In this case parameter is set to “**2**”: after CPS is set, stable is set or judging time is expired”.

Conditions:

- When weighing value \leq set value of Near Zero, the Near Zero output turns on.
- When weighing value \geq Final – Set Point1, the SP1 output signal turns off.
- When weighing value \geq Final – Set Point2, the SP2 output signal turns off.
- When weighing value \geq Final – CPS, the CPS output signal turns off.
- When weighing value \leq Final – Under, the Under output signal turns on when complete signal is active.
- When weighing value \geq Final + Over, the Over output signal turns on when complete signal is active.
- When Final – Under \leq weighing value \leq Final + Over, the Go output signal turns on when complete signal is active.

Timers:

t1: Comparison inhibited Time “CITI” – set in 3.1.7.6 at page 42

t2: Judging Time “JTI” – set in 3.1.7.7 at page 42

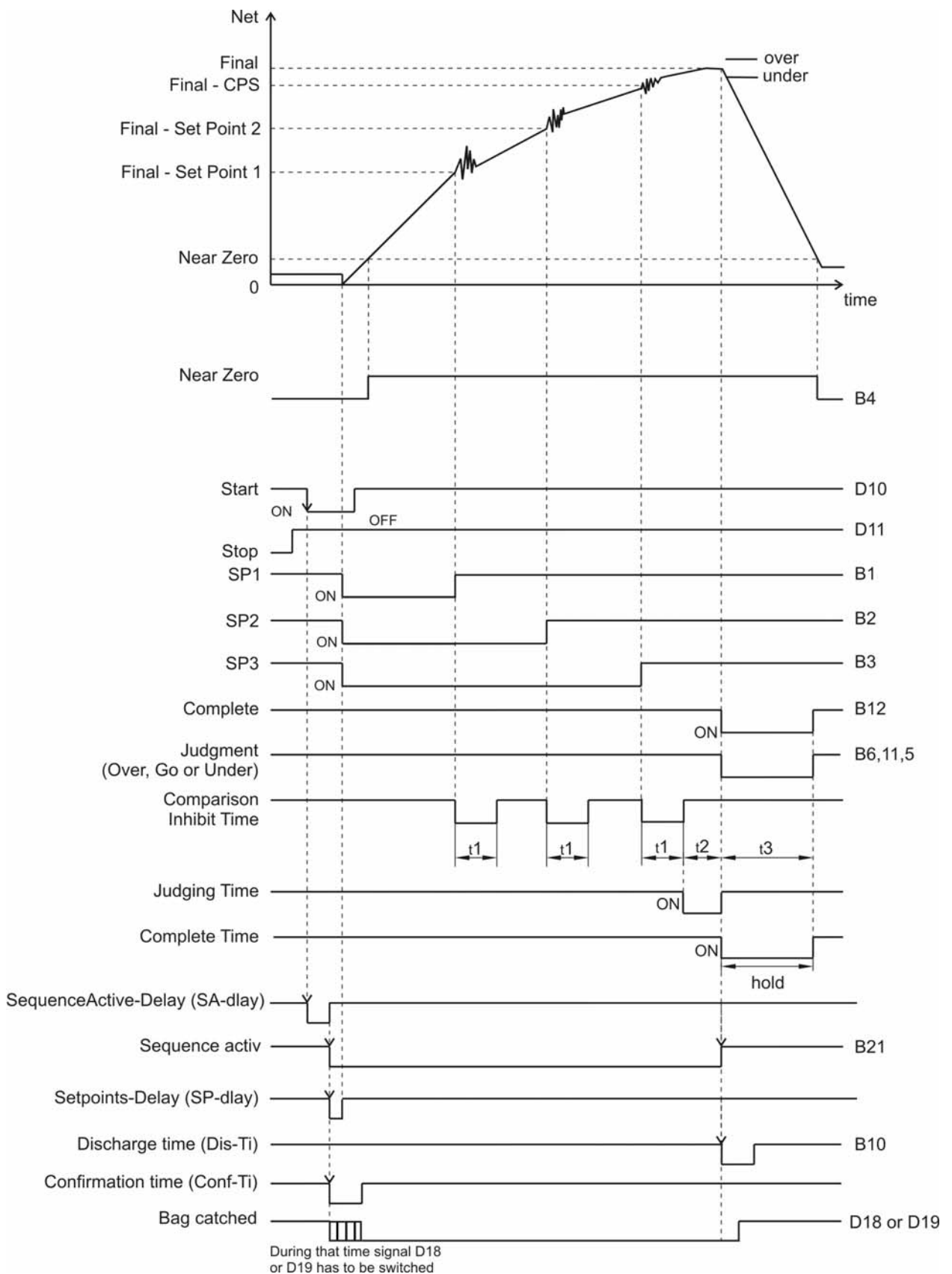
t3: Complete Output Time “COTI” – set in 3.1.7.8 at page 43

A full “Simple Comparison Mode” is restarted after weighing value felt below of $\frac{1}{4}$ of Fullscale. Otherwise the “Complete Output” signal is not activated.

Main differences between “Feeding Weighing” and “Discharging Weighing”:

- “Fd-Con” is set to “1”
- “ULL-CMD” has to be “0”
- “FOU-CMD” has to be “1”

6.6. Sequence Mode



Sequence Mode is activated setting parameter “**SMS**” in submenu “control” 3.1.6.1 at page 39 to **ON**.

Weighing sequence starts at the rising edge of Start signal; SP1, SP2, SP3 turn on.

In Sequence Mode the Over, Go and Under comparison is always done when the “**Complete output**” is **ON** and Judging Count “**JC**” 3.1.8.2 at page 44 is not set to “**0**”.

The weighing value compared with Final, Over and Under (“**FOU-CMD**”) can be Gross or Net, selected at 3.1.7.2 at page 41.

In this case parameter is set to “**1**”: compare with net weight”. In this case, Net weight is set to zero at “start”.

When setting “**FOU-CMD**” to “**0**”: compare with gross weight”, then gross weight is set to zero at “start”.

Setting of parameter “**OUC-MD**” in menu 3.1.7.4 at page 42 has no affect! Internal treatment is like set to “**3**”.

The weighing value compared at Near Zero (“**NZ**”) can be Gross or Net, selected at 3.1.7.1 at page 41. In this case parameter is set to “**1**”: compare with net weight”.

Conditions:

- When weighing value \leq set value of Near Zero, the Near Zero output turns on.
- When weighing value \geq Final – Set Point1, the SP1 output signal turns off.
- When weighing value \geq Final – Set Point2, the SP2 output signal turns off.
- When weighing value \geq Final – CPS, the CPS output signal turns off.
- When weighing value \leq Final – Under, the Under output signal turns on.
- When weighing value \geq Final + Over, the Over output signal turns on.
- When Final – Under \leq weighing value \leq Final + Over, the Go output signal turns on.

Timers:

t1: Comparison Inhibited Time “**CIT1**” – set in 3.1.7.6 at page 42

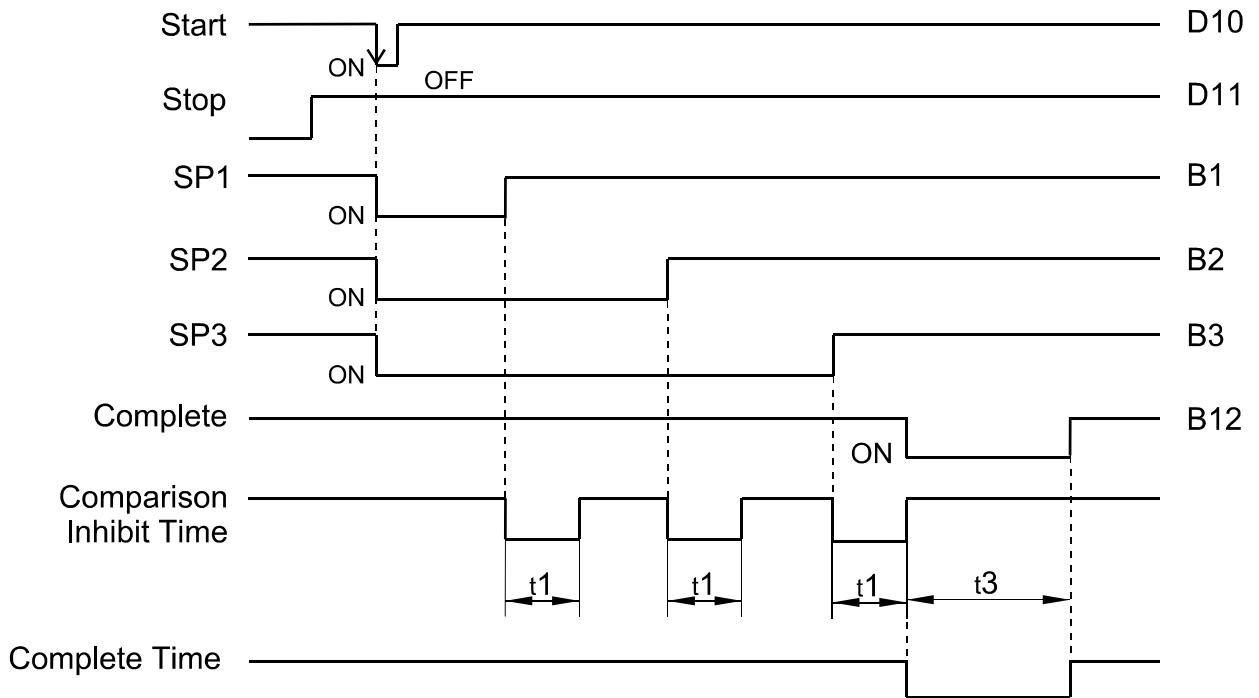
t2: Judging Time “**JTI**” – set in 3.1.7.7 at page 42

t3: Complete Output Time – set in 3.1.7.8 at page 43

“Sequence Active” - delay “**SA-dlay**” set in 3.1.8.11 at page 46

Setpoints delay - delay “**SP-dlay**” set in 3.1.8.12 at page 47

6.7. Sequence Mode without Judgement



Entering a Judging Count of **0** in "**JC**" (3.1.8.2 in submenu "**SEQU**" at page 44) disables Over, Under and Go comparison during Complete Output Time "**CTI**".

When SP3/CPS turns OFF, Complete signal turns ON immediately.

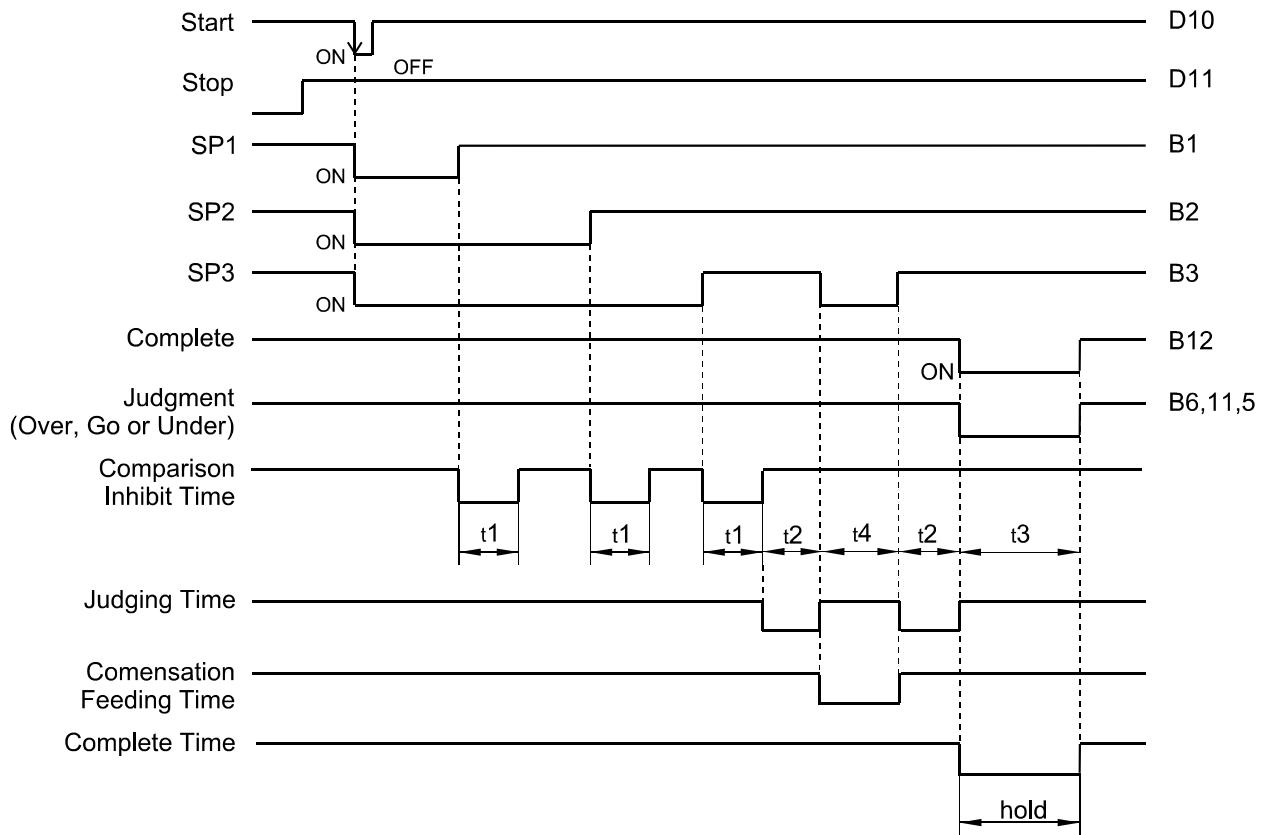
Timers:

t_1 : Comparison Inhibited Time "**CITI**" – set in 3.1.7.6 at page 42

t_3 : Complete Output Time – set in 3.1.7.8 at page 43

In this example Judging Timer "**JTI**" set in 3.1.7.7 at page 42 is set to **zero**.

6.8. Sequence Mode with Adjust Feeding



Enable Adjust Feeding in “**AdFd**” (3.1.8.3 in submenu “SEQU”).

In Sequence Mode the Over / Under comparison is done when the Complete output is ON.

Timer “CFT” re-opens SP3 for a certain time to adjust final weight.

Timers:

t_1 : Comparison Inhibited Time “CITI” – set in 3.1.7.6 at page 42

t_2 : Judging Time “JTI” – set in 3.1.7.7 at page 42

t_3 : Complete Output Time “COTI” – set in 3.1.7.8 at page 43

t_4 : Compensation Feeding Time “CFT” – set in 3.2.3.2.15 at page 71

6.9. Auto Free Fall Compensation

Auto Free Fall Compensation adjust the amount of feeded ingredient in "Sequence Mode" to automatically reduce weighing errors, reaching Final weight as close as possible.

For that procedure

- AFFC-CN completed cycles are recorded
- differences (error) between actual weight and Final weight is calculated each time
- average the errors after AFFC-CN cycles
- this average is multiplied by CPS-CE for weighting
- result is added to CPS value.



Example:

AFFC (3.1.8.4 page 45)	:	ON	
Average count of AFFC (AFFC-CN 3.1.8.5 page 45)	:	4	
CPS coefficient (CPS-CE 3.1.8.6 page 45)	:	2 (0: ¼; 1: ½; 2: ¾; 3: 1)	
Final (3.2.3.2.2 page 68)	:	250.0kg	(code specific)
Auto Free Fall Limit (AFFL 3.2.3.2.14 page 71)	:	1.0kg	(code specific)

Times	Actual weighing value	Error	Average count of AFFC	CPS
0 (power on)				
1	250.6	0.6	1	10.0
2	250.7	0.7	2	10.0
3	250.6	0.6	3	10.0
4	250.5	<u>0.5</u>	4 → 0	10.0
		2.4 / 4 = 0.6		
		0.6 X ¾ = 0.45		new CPS: 10.45
5	250.1	0.1	1	10.45
6	250.2	0.2	2	10.45
7	251.4	(1.4)	3	10.45
8	249.9	-0.1	3	10.45
9	250.0	<u>0.0</u>	4 → 0	10.45
		0.2 / 4 = 0.05		
		0.05 X ¾ = 0.0375		new CPS: 10.4875
10	250.0	0	1	10.4875
11	249.9	-0.1	2	10.4875
12	250.0	0	3	10.4875
13	251.7	(1.7)	4	10.4875
14	250.0	<u>0</u>	4	10.4875
		-0.1 / 4 = -0.025		
		-0.025 X ¾ = -0.01875		new CPS: 10.46875

Note: The CPS is internally compared with highest precision but it is only shown in precision of scaling.

7. Appendix

7.1. ASCII-table

Dez	Hex	Char	Dez	Hex	Char	Dez	Hex	Char
32	0x20		64	0x40	@	96	0x60	`
33	0x21	!	65	0x41	A	97	0x61	a
34	0x22	"	66	0x42	B	98	0x62	b
35	0x23	#	67	0x43	C	99	0x63	c
36	0x24	\$	68	0x44	D	100	0x64	d
37	0x25	%	69	0x45	E	101	0x65	e
38	0x26	&	70	0x46	F	102	0x66	f
39	0x27	'	71	0x47	G	103	0x67	g
40	0x28	(	72	0x48	H	104	0x68	h
41	0x29	)	73	0x49	I	105	0x69	i
42	0x2A	*	74	0x4A	J	106	0x6A	j
43	0x2B	+	75	0x4B	K	107	0x6B	k
44	0x2C	,	76	0x4C	L	108	0x6C	l
45	0x2D	-	77	0x4D	M	109	0x6D	m
46	0x2E	.	78	0x4E	N	110	0x6E	n
47	0x2F	/	79	0x4F	O	111	0x6F	o
48	0x30	0	80	0x50	P	112	0x70	p
49	0x31	1	81	0x51	Q	113	0x71	q
50	0x32	2	82	0x52	R	114	0x72	r
51	0x33	3	83	0x53	S	115	0x73	s
52	0x34	4	84	0x54	T	116	0x74	t
53	0x35	5	85	0x55	U	117	0x75	u
54	0x36	6	86	0x56	V	118	0x76	v
55	0x37	7	87	0x57	W	119	0x77	w
56	0x38	8	88	0x58	X	120	0x78	x
57	0x39	9	89	0x59	Y	121	0x79	y
58	0x3A	:	90	0x5A	Z	122	0x7A	z
59	0x3B	;	91	0x5B	[	123	0x7B	{
60	0x3C	<	92	0x5C	\	124	0x7C	|
61	0x3D	=	93	0x5D	]	125	0x7D	}
62	0x3E	>	94	0x5E	^	126	0x7E	~
63	0x3F	?	95	0x5F	_			

7.2. Survey of Operating Functions

The operating functions listed here can be called by certain keys (submenu "KF" at page 62) or key sequences provided that the respective settings have been made during Setup. To enter numerical code of a function call directly, please press $\rightarrow 0 \leftarrow$ (1st) and $\boxed{\text{TARE}}$ (2nd) together.

Anyway only a subset of all possible operating functions can be exploited in a terminal .

Operating function	Numerical code
SET TO ZERO	1
GROSS	2
NET	3
TARE	4
TARING	5
printer 1, standard print	6
printer 1, print single line	7
printer 1, print single item	8
printer 1, print subtotal	9
printer 1, print total sum	10
print into Legal-for-Trade memory	16
output Legal-for-Trade memory to printer	17
output of single data records from Legal-for-Trade memory	18
output of one data record from Legal-for-Trade memory	19
display capacity utilization of Legal-for-Trade memory	20
erase Legal-for-Trade memory	21
set print to German	22
set print to English	23
set print to French	24
set print to Polish	25
set print to Czech	26
toggle language between German and English	27
toggle language between German and French	28
toggle language between German and Polish	29
toggle language between German and Czech	30
set the date of the real-time clock	42
set the time of the real-time clock	43
set the date and time of the real-time clock	44
enter Consecutive number	45
set unit to kilogram	61
set unit to ton	62
set unit to gram	63
set unit to pound	64
set unit to ounce	65
set unit to Newton	66
set unit to Kilonewton	67
-- reserved for any other unit of measurement --	68
switch to next unit of measurement	69
set tare memory 1 in current channel	70
set tare memory 2 in current channel	71
set current tare memory in current channel	78
enter number of current tare memory first time	79
display time	91
display date	92

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set to increased display resolution till acknowledgment	93
set to increased display resolution for 5 sec	94
display input voltage, mV/V	95
display input voltage of calibrated zero, mV/V	96
display input voltage of calibrated max, mV/V	97
display input voltage of 1 e, μ V/V	98
display internal resolution between zero and max	99
CALL REDUCED SETUP	108
PRINT SETUP DATA	109
PRINT ALIBI MEMORY OF CURRENT DAY	115
SET PRODUCT-CODE TO 00	116
SET PRODUCT-CODE TO 01	117
SET PRODUCT-CODE TO 02	118
SET PRODUCT-CODE TO 03	119
SET PRODUCT-CODE TO 04	120
SET PRODUCT-CODE TO 05	121
SET PRODUCT-CODE TO 06	122
SET PRODUCT-CODE TO 07	123
SET PRODUCT-CODE TO 08	124
SET PRODUCT-CODE TO 09	125
SET PRODUCT-CODE TO 10	126
SET PRODUCT-CODE TO 11	127
SET PRODUCT-CODE TO 12	128
SET PRODUCT-CODE TO 13	129
SET PRODUCT-CODE TO 14	130
SET PRODUCT-CODE TO 15	131
SET PRODUCT-CODE TO 16	132
SET PRODUCT-CODE TO 17	133
SET PRODUCT-CODE TO 18	134
SET PRODUCT-CODE TO 19	135
SET PRODUCT-CODE TO 20	136
SET PRODUCT-CODE TO 21	137
SET PRODUCT-CODE TO 22	138
SET PRODUCT-CODE TO 23	139
SET PRODUCT-CODE TO 24	140
SET PRODUCT-CODE TO 25	141
SET PRODUCT-CODE TO 26	142
SET PRODUCT-CODE TO 27	143
SET PRODUCT-CODE TO 28	144
SET PRODUCT-CODE TO 29	145
SET PRODUCT-CODE TO 30	146
SET PRODUCT-CODE TO 31	147
ENTER PRODUCT-CODE	148
SET TARE MEMORY 1 AS ACTIVE TARE MEMORY	153
SET TARE MEMORY 2 AS ACTIVE TARE MEMORY	154
SHOW CURRENT CONSECUTIVE NUMBER	179
SHOW CHECKSUM ACCORDING TO PTB-FORM NR. D09-03.11	180
BARCODEREADER	184
TOGGLE GROSS / NET	185
TARE RESET	186
SHOW CURRENT CODESET	190
CALL MENU CODE PARAMETER	191
CLEAR ACCUMULATION MEMORY	192

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SHOW ACCUMULATION COUNT	194
CLEAR ALL PARAMETER OF ALL CODESETS	195
SHOW ACCUMULATION TOTAL SUM	196
EDIT "UPPER LIMIT" OF CURRENT CODESET	201
EDIT "OVER" OF CURRENT CODESET	202
EDIT "NEAR ZERO" OF CURRENT CODESET	203
EDIT "SP1" OF CURRENT CODESET	204
EDIT "SP2" OF CURRENT CODESET	205
EDIT "CPS" OF CURRENT CODESET	206
EDIT "LOWER LIMIT" OF CURRENT CODESET	207
EDIT "UNDER" OF CURRENT CODESET	208
EDIT "FINAL" OF CURRENT CODESET	209
PUT CURRENT VALUE TO DIFFERNCE-STATISTIC	220
SHOW AVERAGE VALUE OF DIFFERNCE-STATISTIC IN INCREASED RESOLUTION; A810 CONTINUES WORKING IN BACKGROUND	221
SHOW SUM OF DIFFERENCES	222
SHOW MAX OF DIFFERENCES	223
SHOW MIN OF DIFFERENCES	224
SHOW ACCUMULATION COUNTER; A810 CONTINUES WORKING IN BACKGROUND	225
DURING SEQUENCE-MODE SIGNAL FOR CONFIRMATION HAS TO BE PRESENT, OTHERWISE INTERRUPTION OF CYCLE WITH "ERR109"	230

Chart 1, Survey of Operating Functions

7.3. Description of States of Error

When an error occurs, the terminal reads out an error message in place of weight. Apart from underload and overload, every error message has to be acknowledged by pressing key 'Set to zero'. Depending on the type of error, the terminal will either restart or continue its operation. Trace the cause of the error and eliminate it whenever it occurs one more time. 7.3 shows all possible error messages as well as possible sources of error.

Error Message	Error	Cause
uuuuuu	underload (compound scale: possibly followed by number of channel with underload)	load carrier is lifted, load cell(s) defective, faulty measuring cable
nnnnnn	overload (compound scale: possibly followed by number of channel with overload)	excessive load, load cell(s) defective, faulty measuring cable
Err 0	error RAM test	terminal defective
Err 1	error proof sum ROM section	terminal defective
Err 2	error proof sum Flash ROM	terminal defective
Err 3	write error Flash	terminal defective
Err 4	data error real-time clock	terminal defective
Err 5	no active Setup found	terminal defective
Err 6	more than one active Setups	terminal defective
Err 10	AD converter 1, time-out in calibration cycle	terminal defective
Err 11	AD converter 1, time-out in conversion cycle	terminal defective
Err 12	AD converter 1, overflow buffer of measured data	terminal defective
Err 13	AD converter 1, positive load cell voltage supply missing	interruption or short circuit of power supply circuit
Err 14	AD converter 1, negative load cell voltage supply missing	interruption or short circuit of power supply circuit
Err 15	AD converter 1, input signal below input signal range	defective load carrier, erroneous connection of measuring cables, erroneous ADC setting
Err 16	AD converter 1, input signal in excess of input signal range	defective load carrier, erroneous connection of measuring cables, erroneous ADC setting
Err 20	AD converter 2, time-out in calibration cycle	terminal defective
Err 21	AD converter 2, time-out in conversion cycle	terminal defective
Err 22	AD converter 2, overflow buffer of measured data	terminal defective
Err 23	AD converter 2, positive load cell voltage supply missing	interruption or short circuit of power supply circuit
Err 24	AD converter 2, negative load cell voltage supply missing	interruption or short circuit of power supply circuit
Err 25	AD converter 2, input signal below input signal range	defective load carrier, erroneous connection of measuring cables, erroneous ADC setting
Err 26	AD converter 2, input signal in excess of input signal range	defective load carrier, erroneous connection of measuring cables, erroneous ADC setting

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Err 30	interface 0 (RS422/RS485) overflow transmitter buffer	distant station prohibits transmission or defective terminal
Err 31	interface 0 (RS422/RS485) overflow receiver buffer	distant station transmits too many data, XON/XOFF protocol not operational
Err 32	interface 0 (RS422/RS485) interruption receiving line	interruption or short circuit of receiving line
Err 33	interface 0 (RS422/RS485) overflow receiver register	defective terminal
Err 34	interface 0 (RS422/RS485) troubled reception	interfering signal on receiving line
Err 35	interface 0 (RS422/RS485) bad frame	transmitter uses different number of data or stop bits, bad Baud rate
Err 36	interface 0 (RS422/RS485) bad parity	transmitter uses different number of data or stop bits, bad Baud rate, bad transmission
Err 40	interface 1 (RS232) overflow transmitter buffer	distant station prohibits transmission or defective terminal
Err 41	interface 1 (RS232) overflow receiver buffer	distant station transmits too many data, XON/XOFF protocol not operational
Err 45	interface 1 (RS232) bad frame	transmitter uses different number of data or stop bits, bad Baud rate
Err 46	interface 1 (RS232) bad parity	transmitter uses different number of data or stop bits, bad Baud rate, bad transmission
Err 50	interface 2 (RS232) overflow transmitter buffer	distant station prohibits transmission or defective terminal
Err 51	interface 2 (RS232) overflow receiver buffer	distant station transmits too many data, XON/XOFF protocol not operational
Err 55	interface 2 (RS232) bad frame	transmitter uses different number of data or stop bits, bad Baud rate
Err 56	interface 2 (RS232) bad parity	transmitter uses different number of data or stop bits, bad Baud rate
Err 60	interface 3 (RS232) overflow transmitter buffer	distant station prohibits transmission or defective terminal
Err 61	interface 3 (RS232) overflow receiver buffer	distant station transmits too many data, XON/XOFF protocol not operational
Err 65	interface 3 (RS232) bad frame	transmitter uses different number of data or stop bits, bad Baud rate
Err 66	interface 3 (RS232) bad parity	transmitter uses different number of data or stop bits, bad Baud rate, bad transmission
Err 70	interface 4 (TTY) overflow transmitter buffer	distant station prohibits transmission or defective terminal
Err 71	interface 4 (TTY) overflow receiver buffer	distant station transmits too many data, XON/XOFF protocol not operational
Err 75	interface 4 (TTY) bad frame	transmitter uses different number of data or stop bits, bad Baud rate
Err 76	interface 4 (TTY) bad parity	transmitter uses different number of data or stop bits, bad Baud rate, bad transmission
Err 80	interface 5 (RS232 internally) overflow transmitter buffer	distant station prohibits transmission or defective terminal
Err 81	interface 5 (RS232 internally) overflow receiver buffer	distant station transmits too many data, XON/XOFF protocol not operational
Err 85	interface 5 (RS232 internally) bad frame	transmitter uses different number of data or stop bits, bad Baud rate
Err 86	interface 5 (RS232 internally) bad parity	transmitter uses different number of data or stop bits, bad Baud rate, bad transmission

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Err 90	error block check sum	bad block check sum of transmission of calibrated data from PC
Err 91	error block check sum in memory approved for calibration	defective terminal
Err 92	memory approved for calibration 95 % capacity utilization	warning, memory approved for calibration nearly full
Err 93	memory approved for calibration overflow	memory approved for calibration cannot accept any more data
Err 99	invalid combination of functions	violation of commissioning rules
Err 101	Sequence error	when start signal is on, the Stop signal turns on
Err 102	Sequence error	during weighing cycle, the Stop signal turns on
Err 103	Zero Alert	turns on, when Zero Range is exceeded (3.1.1.3 and 3.1.1.4 at page 25)
Err 104	Sequence error	Start signal turns on when Near Zero (3.2.3.2.13 at page 71) is exceeded (signal is OFF) and Near Zero Confirmation is ON (3.1.8.7 at page 45)
Err 105	Sequence error	Start signal turns on when SP1 is exceeded and SP1 Confirmation is ON (3.1.8.8 at page 46)
Err 109	Sequence error	During sequence cycle input D18 or D19 (with associated user function number "230" (s. at page)) is interrupted; downtime 3.1.8.9 at page 46 is too short
Err 110	external codeset selection	selected external codeset is greater than 9
Err 120	accumulation sum overflow	accumulation exceeds maximum value of 4.294.967.295
Err 129	unstable signal during calibration	Reduce vibration or set "STAN" 3.1.1.11 and "STAR" 3.1.1.12 at page 27 to higher values
Err 196	no positive acknowledgement from Profibus-module	no module integrated; reset A810
Err 197	no answer from Profibus-module	no module integrated; reset A810
Err 198	wrong PC-port is set for Profibus	set PC-port to "3"

Chart 2, States of Error