

## Digital Weighing Indicator

# WE2110





<b>Contents</b>	<b>Page</b>
<b>Safety instructions</b>	<b>4</b>
<b>1 Introduction</b>	<b>8</b>
<b>2 Verification and Sealing Marks</b>	<b>9</b>
<b>3 Mounting option cards ZCC and ZS</b>	<b>10</b>
<b>4 Installation</b>	<b>14</b>
4.1 Start-up of WE2110	14
4.2 First steps with WE2110	15
4.3 Starting the digital Setup	16
4.4 Notes on digital Setup	22
<b>5 Calibration of WE2110</b>	<b>25</b>
<b>6 Linearization</b>	<b>26</b>
<b>7 Calibration with mV/V</b>	<b>27</b>
<b>8 Limit values</b>	<b>28</b>
<b>9 WE2110-Panel Software</b>	<b>29</b>
<b>10 Totalizing</b>	<b>30</b>
<b>11 Peak storage, Freeze display, Live animal filter</b>	<b>31</b>
<b>12 Error messages</b>	<b>32</b>
<b>13 Specifications</b>	<b>34</b>

## Safety instructions

The product normally presents no dangers provided the instructions and notes for layout, installation, correct operation and maintenance are followed.

- The safety and accident prevention regulations applicable to the particular application must be observed.
- Installation, setting up and servicing may be carried out by qualified personnel only.
- All connections service and repair work which requires the unit to be opened may only be carried out by qualified electricians.
- It is absolutely essential before installing the unit to check whether it is designed for 110...240 V<sub>AC</sub> or 12...24 V<sub>DC</sub>. Connecting a 12...24 V<sub>DC</sub> model to 230 V<sub>AC</sub> will destroy the unit.
- If units are permanently connected a readily accessible 2-pole isolator must be provided.
- 12...24 V<sub>DC</sub> supply must be safely insulated of the extra low voltage from the power supply (EN 61010).
- The safety regulations of EN 61010 must be observed when connecting additional devices.
- The power supply must be switched off before the unit is opened.
- The change of the fuses is to be done by HBM only.
- The units are maintenance free.
- Screened cables must be used for all connecting cables to ensure the optimum EMC protection. The screen to be connected to the housing of the connectors in a flat way.

### **Appropriate use**

The WE2110 Digital Weighing-Indicator may be used for weighing measurement and directly related control and regulation tasks, only. Any other use is **not** appropriate.

To ensure safe operation, the Weighing-Indicator may only be used according to the specifications given in this manual.

When using the Weighing-Indicator, the legal and safety regulations for the respective application must also be observed. The same applies if accessories are used.

The Weighing-Indicator is no safety element in the sense of appropriate use. Prerequisites for correct and safe Weighing-Indicator operation are appropriate transportation, storage, installation and mounting, and careful operation.

### **General dangers in the case of non-observance of the safety instructions**

The Digital Weighing-Indicator complies with the state of the art and is operationally reliable. If the Weighing-Indicator is used and operated inappropriately by untrained personnel, residual dangers might develop.

Any person charged with Weighing-Indicator installation, operation, maintenance or repair must in any case have read and understood the operating manual and the notes on safety, in particular.

### **Residual dangers**

The Weighing-Indicator's scope of performance and supply covers a part of the weighing technology, only. The plant designer/constructor/operator must in addition design, realise and take responsibility for the weighing measurement-system's safety such that potential residual dangers are minimized. The respective regulations must in any case be observed. Residual dangers regarding the weighing technology must be specified explicitly.

In this manual, the below symbols are used to refer to residual dangers:

Symbol:  **DANGER**

*Meaning:* **Maximum danger level**

Warns of an **imminently** dangerous situation in which failure to comply with safety requirements **will result in** death or serious physical injury.

Symbol:  **WARNING**

*Meaning:* **Potentially dangerous situation**


Warns of a **potentially** dangerous situation in which failure to comply with safety requirements **can result in** death or serious physical injury.

Symbol:  **CAUTION**

*Meaning:* **Potentially dangerous situation**

Warns of a potentially dangerous situation in which failure to comply with safety requirements **could result in** damage to property or some form of physical injury.

Symbols for using advices and helpful information:

Symbol:  **NOTE**

Means that important information about the product or its handling is being given.

Symbol:  **CE mark**

The CE mark enables the manufacturer to guarantee that the product complies with the requirements of the relevant EC guidelines.

**Reconstruction and modifications**

HBM's express consent is required for modifications regarding the Weighing-Indicator's construction and safety. HBM does not take responsibility for damage resulting from unauthorized modifications.

**Qualified personnel**

The Weighing-Indicator may be used by qualified personnel, only; the technical data and the special safety regulations must in any case be observed. When using the Weighing-Indicator, the legal and safety regulations for the respective application must also be observed. The same applies if accessories are used. Qualified personnel means: personnel familiar with the installation, mounting, start-up and operation of the product, and trained according to their job.

## 1 Introduction

The HBM WE2110 is a precision digital indicator using the latest Sigma-Delta A/D converter to ensure extremely fast and accurate weight readings. This advanced technology allows the WE2110 to be configured for up to 100,000 divisions with up to 60 measurements per second. The WE2110 has extended sensitivity adjustment which can handle scales with outputs ranging from 0.2 to 3.0 mV/V for full range. It is approved for legal for trade scales up to 6000 divisions in single range mode, or 2 x 3000 divisions in dual interval/range operation.

The WE2110 can be fitted with one of the two optional accessory cards available:

- WE2110/ZCC Card with analog  $-10 \dots +10$  V or 4...20 mA-Output and 2 x Output and 1 x Input
- WE2110/ZS driver card, with four optical isolated open-collector driver transistors and four optical isolated Inputs.

Serial outputs are provided standard in the WE2110 to communicate with external computers, printers and remote displays. Two Serial outputs are available providing RS-232. One can be set up to a RS422/485 interface for bus systems .

### Operating Manual

This Operating manual contains all the information needed to set up and calibrate the WE2110. It can be used by those installers with some experience with digitally programmed indicators, or anyone who has used the WE2110 before. The manual makes use of simple flow charts where possible.

More detailed information on the operation of the WE2110 can be found in a separate description of commands (1-WE2110.DOC System CD)

### Cleaning

- Do not use any cleaning agent or solvent to clean the housing. Use only a quite dry cloth for cleaning.



## Scope of supply

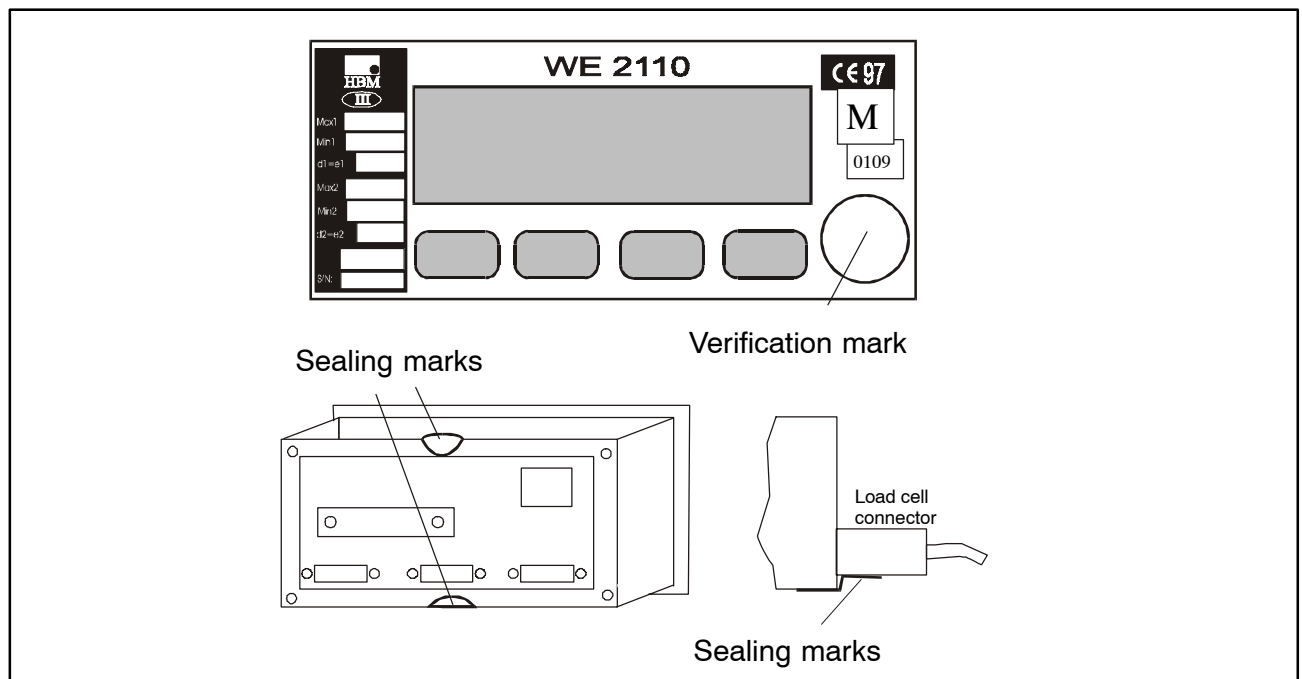
- Precision Weighing Indicator
- One connector DB9 (male) for load cell connection
- Two connectors DB9 (female) for interface connections
- Operating Manual
- Labels for the scales
- Connector plug DC for WE2110DC
- The mains connection comes with a power supply connection plug



### NOTE

**The main cable is not included in scope of supply!**

## 2 Verification and Sealing Marks

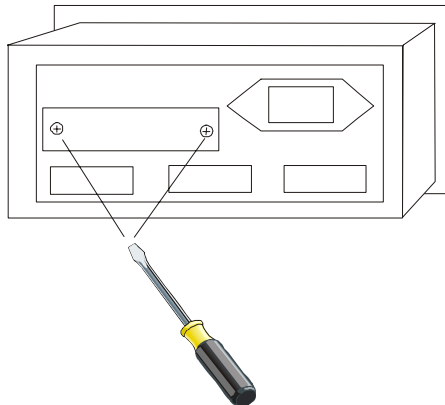


### 3 Mounting option cards ZCC and ZS

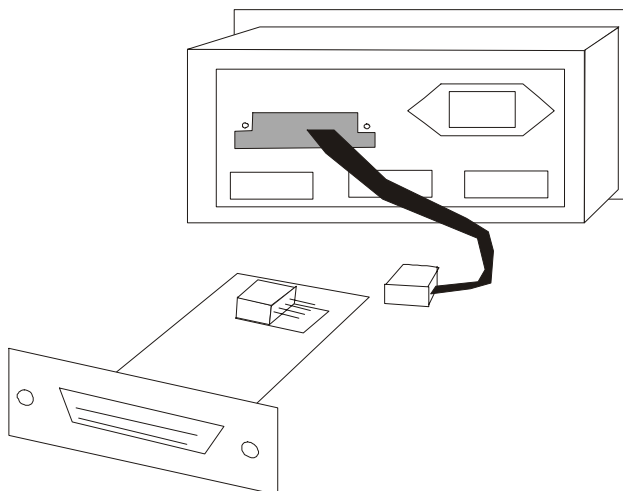


#### CAUTION

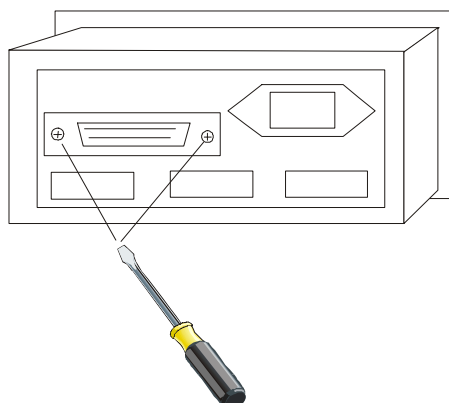
Before mounting, device must be switched-off or disconnected. Never change or assemble cards when unit is on power. The power supply board will be destroyed.



- Remove the rear sheet metal
- Keep the bolts!
- Take out the internal 4-wire cable connector

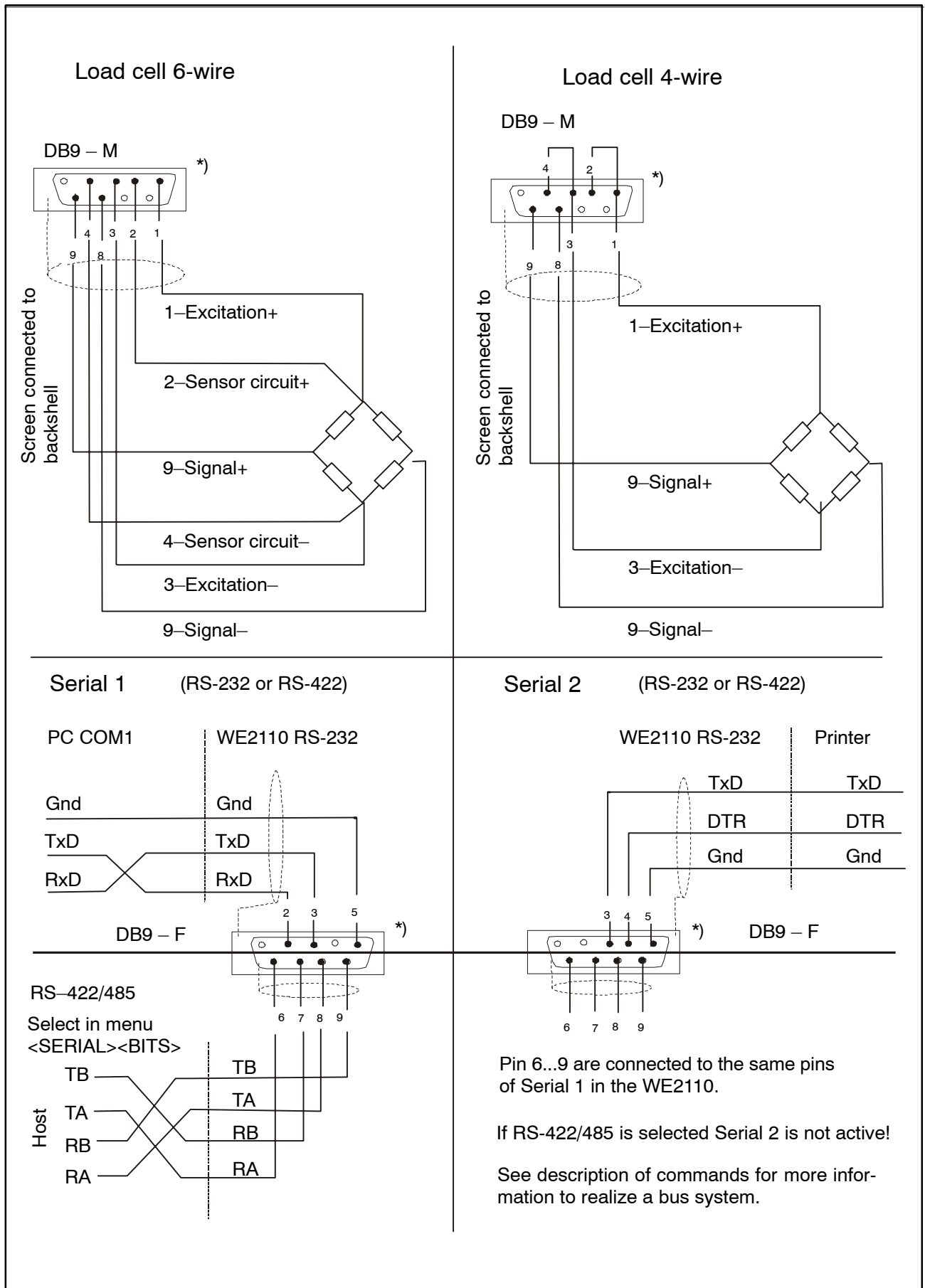


- Link cable connector to the card card ZCC or ZS
- Insert the card carefully



- Fix card with bolts
- Setup card by menu

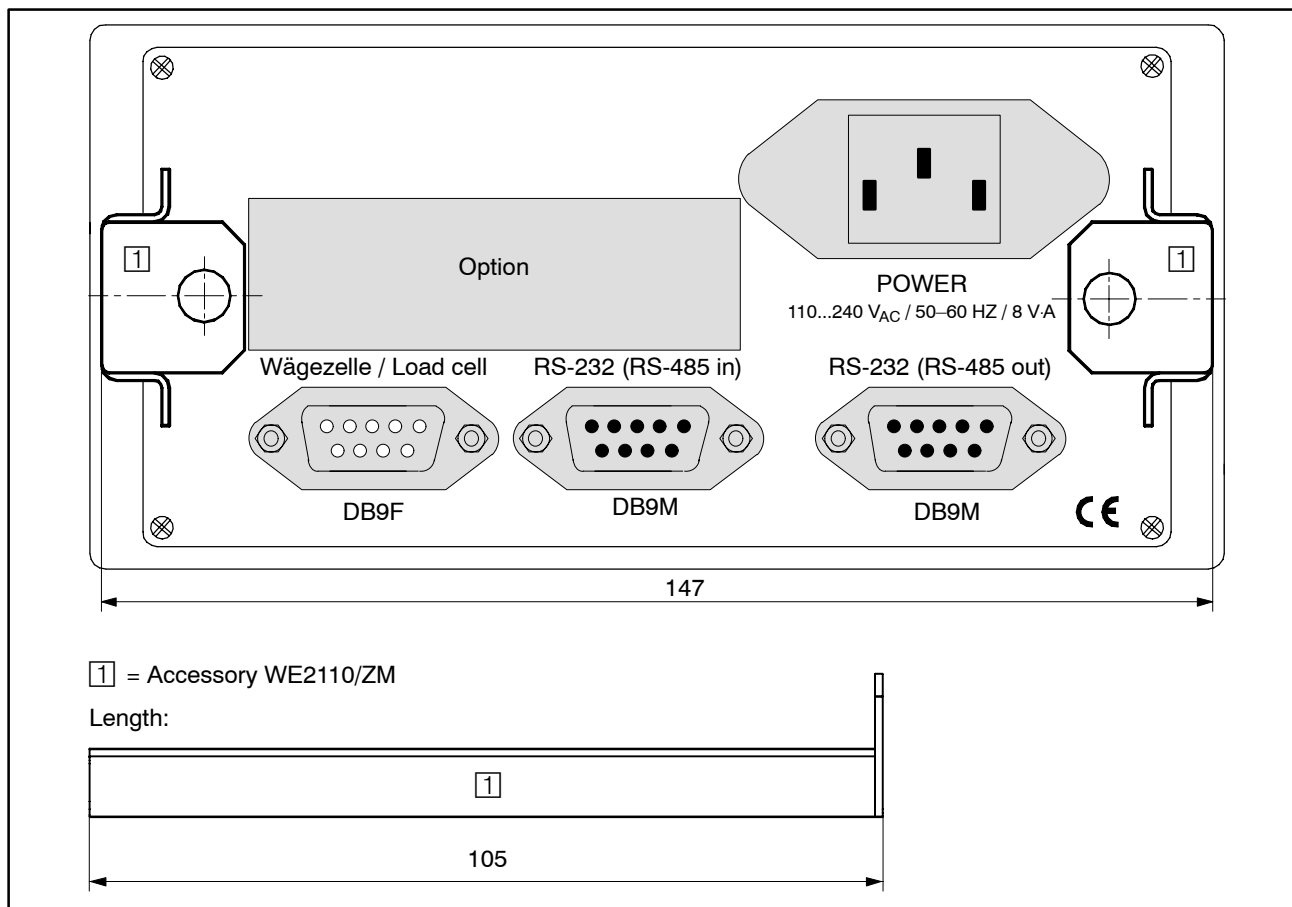
Connection diagrams



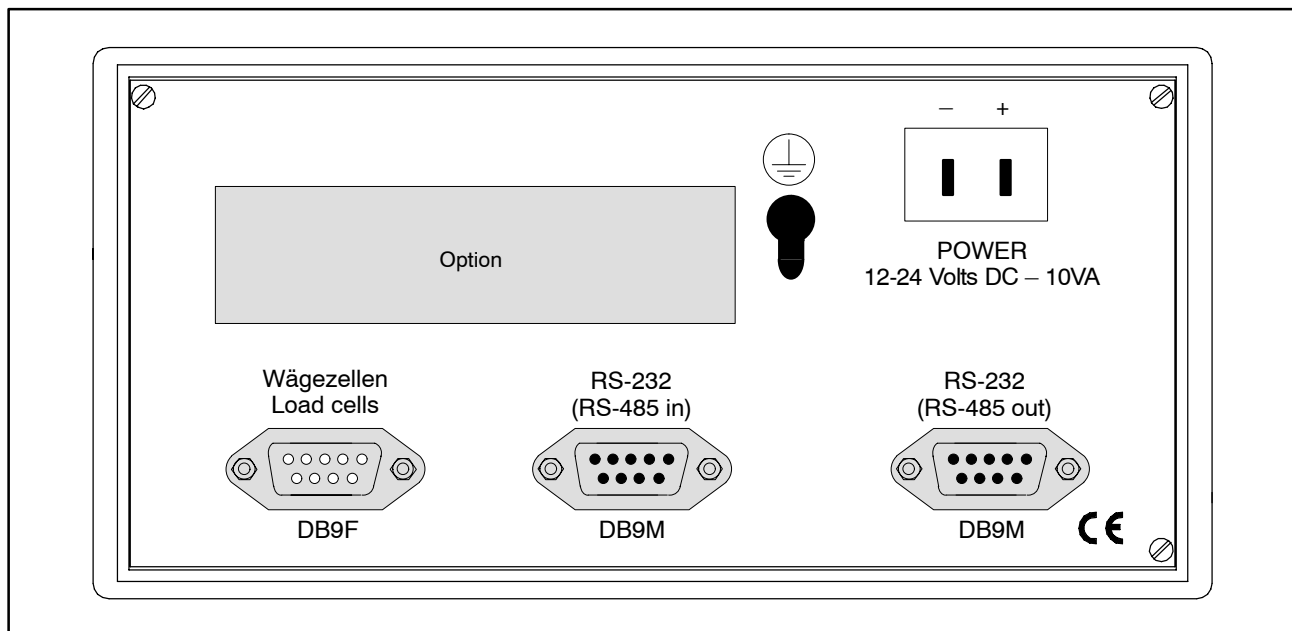
\*) View from the soldering side of the plugs included in the scope of supply

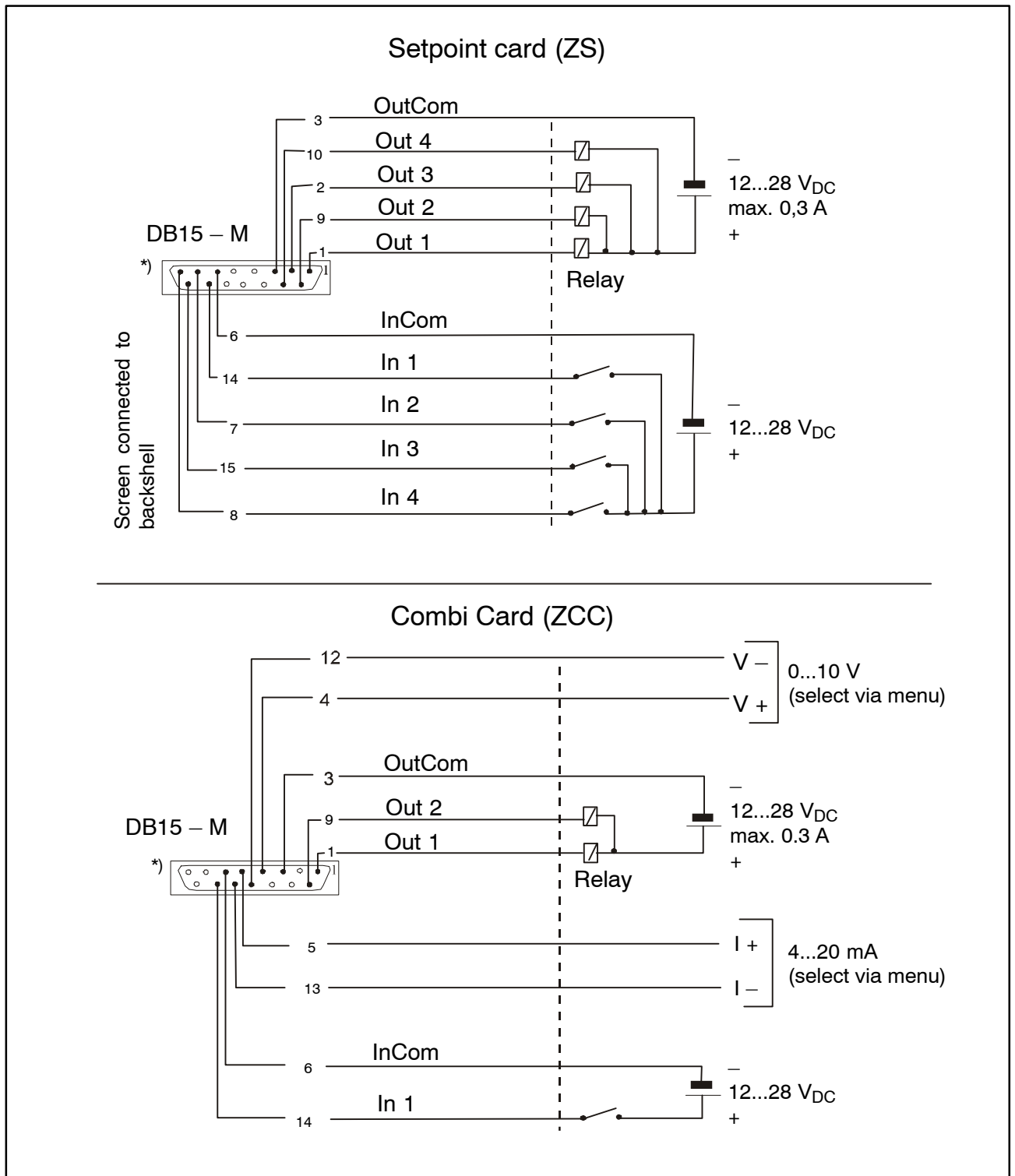
**Back side of the device WE210**

(Fig. with accessory Mounting kit for panel mounting WE2110/ZM)



**Back side of the device WE2010 DC**





\*) View from the soldering side of the plugs included in the scope of supply

## 4 Installation

### 4.1 Start-up of WE2110

The following steps must be followed to install the indicator:

1. First inspect the unit to ensure it is in good condition and all the required options are installed, and all the connectors required are available.
2. Use the connection diagrams (from page 11) to wire up the unit to the load cells, power and other external devices.
3. Follow the “Setting Up the WE2110” flowchart on the next page, to digitally set the unit (the section following the flow chart provides additional notes on the steps involved).
4. Refer to the calibration flowchart for the zero and span calibration steps and if necessary for the linearisation (see page 8).
5. The unit can then be sealed for security if necessary.

### 4.2 First steps with WE2110

- Connect the load cells and other devices
- Press the hidden setup key with a pencil
- Wait until BUILD is displayed
- Select the scale type <BUILD> <TYPE>  
(Items: SINGLE range, DUAL range, DUAL Interval, DIRECT mV/V)
- Enter decimal point <BUILD> <DP>
- Enter scale capacity 1 <BUILD> <CAP1>
- Enter verification interval e1 <BUILD> <E1>  
(Only valid: 1, 2, 5, 10, 20, 50, 100)
- Enter scale capacity 2 <BUILD> <CAP2>  
(if dual range/interval selected)
- Enter verification interval e2 <BUILD> <E2>  
(if dual range/interval selected)
- Select Additive Tare value <BUILD> <AD.TARE>
- Select unit <BUILD> <UNITS>
- Go to the CAL menu with the SELECT GROUP Key

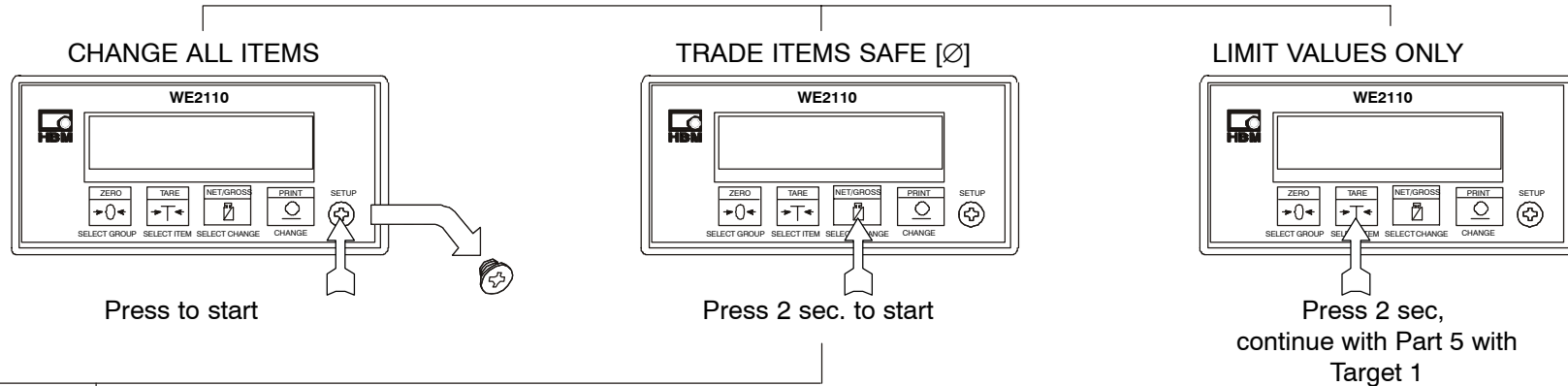
- Changing the default SYNC-Frequency of 50 Hz, has to be made before adjustment!
- Do a zero calibration <CAL> <ZERO>  
See page 28 for the flow chart. The process time is depending on the selected average filter setting. It takes approx. 15 sec at filter 10.
- Do a span calibration <CAL> <SPAN>  
See page 28 for the flow chart. The process time is depending on the selected average filter setting. It takes approx. 15 sec at filter 10.
- Select further settings in the OPTION menu
- Enter/select further settings

### 4.3 Starting the digital Setup

Digital setup and calibration is carried out entirely from the front panel using the secondary functions on the Control Buttons. There are two methods of entering the digital setup program. The first setup access method is by removing the security screw at the right of the keypad, and pressing the hidden button behind the screw. This setup program allows all steps to be accessed, including calibration. The second method involves pressing the Gross/Net button for at least 2 seconds. This also allows access to the setup, but all critical steps controlling the calibration and trade operation of the WE2110 cannot be accessed. This allows all other digital functions to be accessed without risk to the basic calibration. Once configured and calibrated, the WE2110 can be pass-code protected to prevent un-authorized tampering. If the scale has been previously pass-code protected, the correct code will need to be entered before setup can start.

# SETTING UP THE WE2110 – PART 1

## START THE SETUP PROGRAM



<p><b>build</b> BUILD</p> <p>↓</p> <p>↑</p>	<p><b>TYPE</b></p> <p>TYPE</p> <p><b>dp</b></p> <p>DEC.POINT</p> <p><b>LHP1</b></p> <p>CAPACITY 1</p> <p><b>E1</b></p> <p>E1</p> <p><b>CAP2</b></p> <p>CAPACITY 2</p> <p><b>E2</b></p> <p>E2</p> <p><b>AD.TARE</b></p> <p>AD.TARE</p> <p><b>UNITS</b></p> <p>UNITS</p>	<p>⊘</p> <p>⊘</p> <p>⊘</p> <p>⊘</p> <p>⊘</p> <p>⊘</p> <p>⊘</p> <p>⊘</p> <p>⊘</p>	<p>Set scale type</p> <p>Decimal point position</p> <p>Maximum capacity (single) Max1 capacity (dual)</p> <p>e1-verification interval</p> <p>Max2 capacity</p> <p>e1-verification interval</p> <p>Additiv tare limit</p> <p>Weighing units</p>	<p><b>Single</b> / Dual range / Dual interval / direct mV/V X.XXXXXX to XXXXXXX</p> <p>100 to 100000 (Weight)</p> <p>Number</p> <p>Max1 to 100000</p> <p>Number</p> <p>In weight units</p> <p>NONE / kg / g / t / lb</p>	<p></p> <p></p> <p>1, 2, 5, 10, 20, 50</p> <p>1, 2, 5, 10, 20, 50</p> <p></p> <p></p> <p>kg / g / t / lb</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p>
---	--	--	--	--	--	---



### SETTING UP THE WE2110 – PART 2

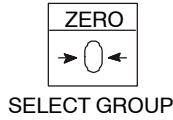
		TRADE SAFE			LIMITATION TO OIML R76	SEE NOTE
SELECT GROUP	SELECT ITEM		SELECT CHANGE	CHANGE		
		○	Overall scale use	TRADE or <b>INDUSTRIAL</b>	TRADE	9
		○	Reading average filter	1 (fast) to 200 (slow)		10
		○	ANTI-JITTER display filter	<b>OFF</b> / FINE / COARSE		11
		○	Motion detection rate	None / Number of Count-by per 0,5 or 1 sec.	All, but NONE	12
		○	Initial ZERO-setting	<b>ON</b> / <b>OFF</b>		13
		○	ZERO-tracking	None / Number of Count-by per 0,5 or 1 sec.	NONE / 0.5-0.1	14
		○	ZERO-setting range	± 100 %, ± 20 %, ± 2 %, -1 %, +3 %	01-03 / 02-02	15
		○	ZERO dead band	Set in weight units	<b>000000</b>	16
		○	Error 0040-00C0 deactivate	<b>ON</b> / <b>OFF</b>		17
		○	Ready for ZERO-calibration	Operates. 15 sec. or Input		18
		○	Ready for SPAN-calibration	Operates. 15 sec. or Input		19
		○	Clear linearisation point 1	Select point of operation L1 ... L5		20
		○	Clear linearisation point 1	Select point of operation L1 ... L5		21
		○	Restore factory calibration	Set for yes (Y) or no (N)		22

### SETTING UP THE WE2110 – PART 3

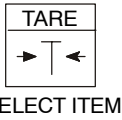
SEE NOTE

LIMITATION  
TO OIML R76

23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35



SELECT GROUP



SELECT ITEM

TRADE SAFE



SELECT CHANGE



CHANGE

SERIAL



SER 1  
SER 2  
ADDRESS  
AUT.OPT






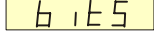
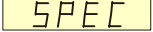
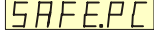

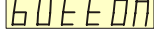

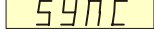
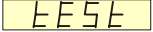

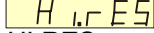
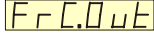
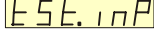
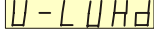
PRN.OPT

Serial Interface 1  
Serial Interface 2  
Network Address  
TYPE Type Auto-Output  
SOURCE Source for Output  
AUT.FMT Custom format  
ST CHR Start character  
END CHR 1 1. End character  
END CHR 2 2. End character

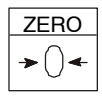
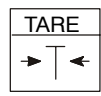
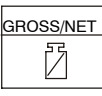
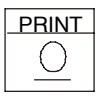
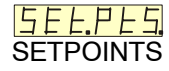
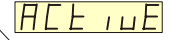
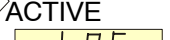
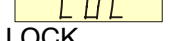
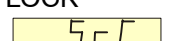
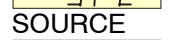
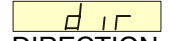

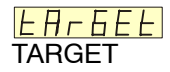
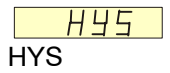
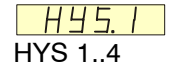
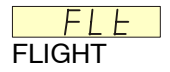
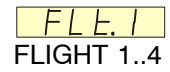
PRNT.TP Type of printout  
HEADER Edit header  
TIC.FMT Custom printout  
SPACE Position of printout

OFF /AUTO.LO / AUTO.HI / SINGLE / **NET**  
OFF /AUTO.LO / **PRINT** / SINGLE  
00 TO 31  
**AUTO.A** / AUTO.B / AUTO.C / AUTO.D / CUSTOM  
NET / TOTAL / **DISP** / GROSS  
ASCII CODE  
ASCII Code (**Default 02**)  
ASCII Code (**Default 03**)  
ASCII Code (**00**) = none  
**SING** / DOUB / TIC / A.SING / A.DOUB / A.TIC / TOTAL / A.TOTAL  
LINE.No.ASCII CODE  
ASCII CODE  
Columns, Rows



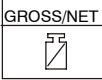

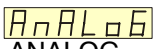
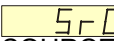
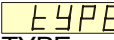
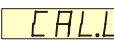
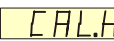
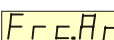


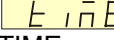

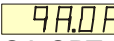
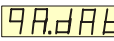
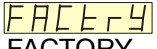

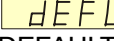
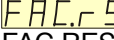
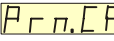
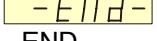
### SETTING UP THE WE2110 – PART 4

 SELECT GROUP	 SELECT ITEM	TRADE SAFE	 SELECT CHANGE	 CHANGE	LIMITATION TO OIML R76	SEE NOTE
	 BAUD  BITS		Baud Rate	300 to 19200		36
			Interface Protocol	see manual ( <b>Default = n81-2-</b> )		37
 SPECIAL	 SAFE.PC  FULL.PC  BUTTON  INP.FN  SYNC	<input type="checkbox"/>	Set safety passcode	0 TO 999999 (0 = none)		38
			Set full passcode	0 TO 999999 (0 = none)		39
		<input type="checkbox"/>	Button locks (or instant)	<b>Y = active</b> / n = locked / l = instant	Y / n	40
			Input functions	- / 0 / t / G / P / b / L / S / C / u / 1 / 2 / H / E		41
		<input type="checkbox"/>	A/D synchronization	15 to 60 Hz		42
 TEST	 SCALE  HI.RES  FORCE OUT  TEST INPUT  O-LOAD		mV/V Test display for 5 sec.			43
			x10 resolution display	ON / <b>OFF</b> / 5 sec. in Safe-Setup		44
			Limit values test mode	<b>OFF</b> / ON1 / ON2 / ON3 / ON4		45
			Input test mode	<b>(-)</b> = <b>OFF</b> / (1) = ON		46
			Show number of overloads	Delete counter in Safe-Setup		47

### SETTING UP THE WE2110 – PART 5

 SELECT GROUP	 SELECT ITEM	TRADE SAFE	 SELECT CHANGE	 CHANGE	LIMITATION TO OIML R76	SEE NOTE
	     		<p>Activate Limit values</p> <p>Lock Limit values changes</p> <p>Limit value data source</p> <p>Switching direction</p> <p>Active relay logic of Limit values</p> <p>Alarm beep options</p>	<p>- / A / M / 0 / E / N</p> <p>(L) = lock out changes / (-) = free</p> <p>(G) = GROSS / (n) = NET</p> <p>(O) = OVER / (U) = UNDER</p> <p>(L) = LOW / (H) = HIGH</p> <p>(-) = off / (S) = tone / (d) = double tone / (c) = continuous tone / (f) = display flash</p>		<p>48</p> <p>49</p> <p>50</p> <p>51</p> <p>52</p> <p>53</p>
		<p>PRETARGET</p> <p>Target of Limit values 1..4</p> <p>TARGET 1..4</p>	<p>Set in weight units</p>		<p>54</p> <p>55</p>	
		<p>Hysteresis value 1..4</p> <p>HYS 1..4</p>	<p>Set in weight units</p>		<p>56</p>	
		<p>IResidual flow value 1..4</p> <p>FLIGHT 1..4</p>	<p>Set in weight units</p>			

**SETTING UP THE WE2110 – PART 6**

 SELECT GROUP	 SELECT ITEM	EICHRELEV.	 SELECT CHANGE	 CHANGE	LIMITATION TO OIML R76	SEE NOTE
 ANALOG	 SOURCE  TYPE  CAL.LOW  CAL.HI  FRC.ANL		Source for analog output  Type of analog output  Fine calibration low – UP/DN  Fine calibration high – UP/DN  Force analog output	<b>DISP</b> / GROSS / NET  VOLT / <b>CUR</b> / ABS.CUR  Change value  Change value  LO / HI		57  58  59  60  61
 CLOCK  	 TIME  DATE  QA.OPT  QA.DATE	<input type="checkbox"/>  <input type="checkbox"/>	Set the time  Set the date  Set the QA-mode  Set the QA date	00 . HH . MM (24-Hours Format)  DD . MM . YY (00 for 2000)  ON / <b>OFF</b>  DD . MM / Press TARE / YYYY		62  63  64  65
 FACTORY  to BUILD 	 DEFAULT  FAC.RESET  PRN.CFG	<input type="checkbox"/> <input type="checkbox"/>	Restore factory settings  Factory access only  Printout hole settings	N / Y  Continue Y/n		66  67  68
 -END-			Leave with SETUP (alternative: press TARE for 2 sec.)			69

## 4.4 Notes on digital Setup

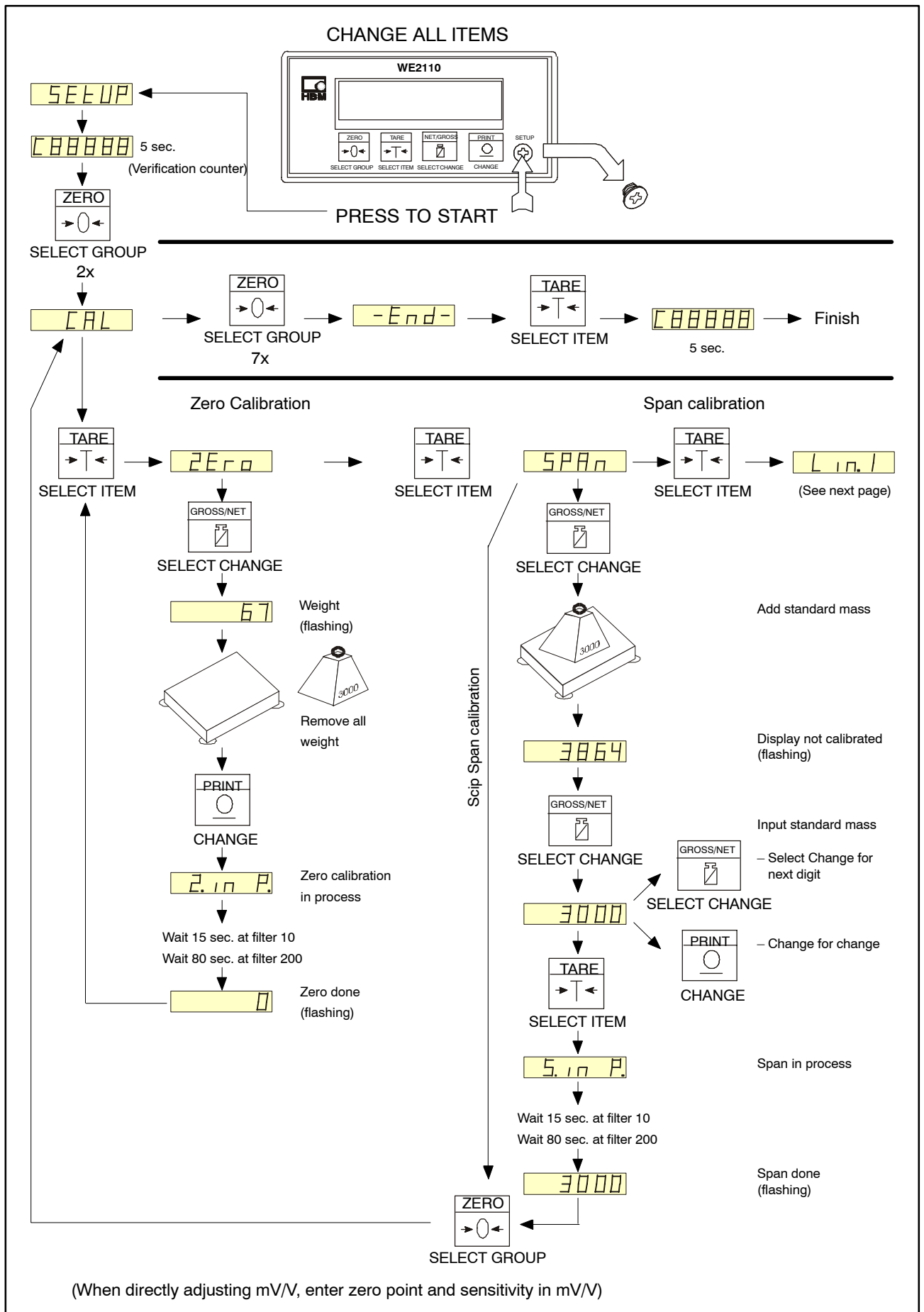
1	"Single" = single range, "Dual l" = dual interval, "Dual r" = dual range and "Direct" = direct mV/V calibration without weights.
2	Sets the decimal position before weight range input.
3	Enter the full scale weight (Max) for single interval, or (Max1) for dual interval/range. Use units of displayed weight (not divisions).
4	Enter the verification interval (e) for single interval, or (e1) for dual interval/range. Use units of displayed weight.
5	Enter (Max2) for dual interval/range.
6	Enter e2 for dual interval/range.
7	Additive Tare limit in weight. Up to this weight the WE2110 operates as a additive Taring system. ! The max. load of the scale (e.g. CAP1) is exceeded by that value !
8	The weight unit set here will be used for the display and any printer output.
9	Trade use has some limitations. See description of commands for that.
10	This is the number of readings that will be averaged for display.
11	Anti-jitter prevents minor display instability with small average filter settings (see 10).
12	Motion detection rate is set in the number of e1 per 0.5 second or per second.
13	Enables the initial zero setting at power-on. The fixed setting range is -5% ... +15%.
14	Zero Tracking rate is set in the number of e1 per 0.5 second or per second.
15	This sets the range of operation of the ZERO setting.
16	The band around zero is defined. This is used by the zero track function and the printout.
17	Deactivate the error message E0040...E00C0. Useful for EX-I applications.
18/19	See page 28 for separate chart for Zero and Span Calibration. Some digital settings can effect calibration, always complete digital Setup before calibrating. Enter zero and span in mV/V with direct-mV/V-calibration.
20/21	Linearity Routine. See diagram page 29 (not possible with mV/V adjustment).
22	Cancels existing calibration and restores original factory default calibration.
23	The Serial 1 output can be set to OFF, Auto.Lo (approx. 10/sec), Auto.Hi (ca. 50/sec), Single transmit by remote key, or Network.
24	The Serial 2 output can be set for OFF, Auto.Lo (approx. 10/sec), Single transmit, or Printer driving.
25	The network address can be set from 00 to 31.
26	Type of automatic output can be set. Auto.A is the standard HBM format, Auto.B, Auto.C or Auto.D are extended with units fields etc. See the description of commands for more information about automatic output formats.

27	Source for automatic output can be selected.		
28	Custom Auto format. See the description of commands for more information about automatic output formats.		
29	Allows the output string START character to be defined (normally 02).		
30	Allows the output string first END character to be defined (normally 03).		
31	Allows the output string second END character to be defined (00 = none).		
32	Type of printer output can be set. Print outs can be done in single line, double line, total, or printed ticket. "A" or Automatic printing is identical to manual printing, but occurs on stable weight.		
33	A custom printer header can be set up for up to 2 lines of 20 characters. Each character is displayed as L.CH.CCC where L = line number (1-2), CH = character number (01 to 20) and CCC is the character code (in decimal ASCII).		
34	A custom format for the printout can be entered. Max. 50 characters are allowed. Format NNN.CCC, where NNN = number of the character, CCC = ASCII code. For more information refer to the description of commands.		
35	Positioning of the printout. First parameter for the horizontal position, second parameter for the vertical position.		
36	The baud rate controls both serial 1 and serial 2 outputs. Different baud rates for each interface are not possible		
37	Controls the data flow. Each character set as shown on the table below. N, O, E parity is set for none, Odd or Even 8, 7 The number of data bits 1, 2 The number of stop bits t, – enable or disable RS485 termination resistors, on (+) or off (–) 2, 4 2 = RS232; 4 = RS485 d, – enable or disable DTR handshake for printer		
38	The Safety pass-code controls access to the SAVE Setup using the "Select Change" key. (If "000000" is set, no password is needed).		
39	The Full pass-code controls access to the FULL Setup (hidden screw) using the SETUP key and controls settings through the interface. "000000" means no protection.		
40	Individual keys can be enabled (Y), disabled (N) or set for instant operation (I) without a delay for No Motion.		
41	Input function are selected. Card ZS provides 4 inputs, card ZCC one.		
	0 = ZERO Key P = PRINT Key S = Show Total 1 = Single Transmit to Serial 1	t = TARE Key b = Blank Display C = Clear Total 2 = Single Transmit to Serial 2	G = GROSS Key L = Lock WE2110 U = Undo addition H = Hold Display E = Peak F = Live animal display
42	The speed of the A/D converter can be set to synchronize with the primary frequency of scale vibration for extremely high noise rejection. As a standard the mains frequency is convenient. <b>Warning – this setting effects calibration of the WE2110!</b>		
43	Allows the special mV/V display test mode to be selected for scale base testing for 5 seconds.		
44	Allows the special high resolution (x10) display mode to be selected for scale base testing.		

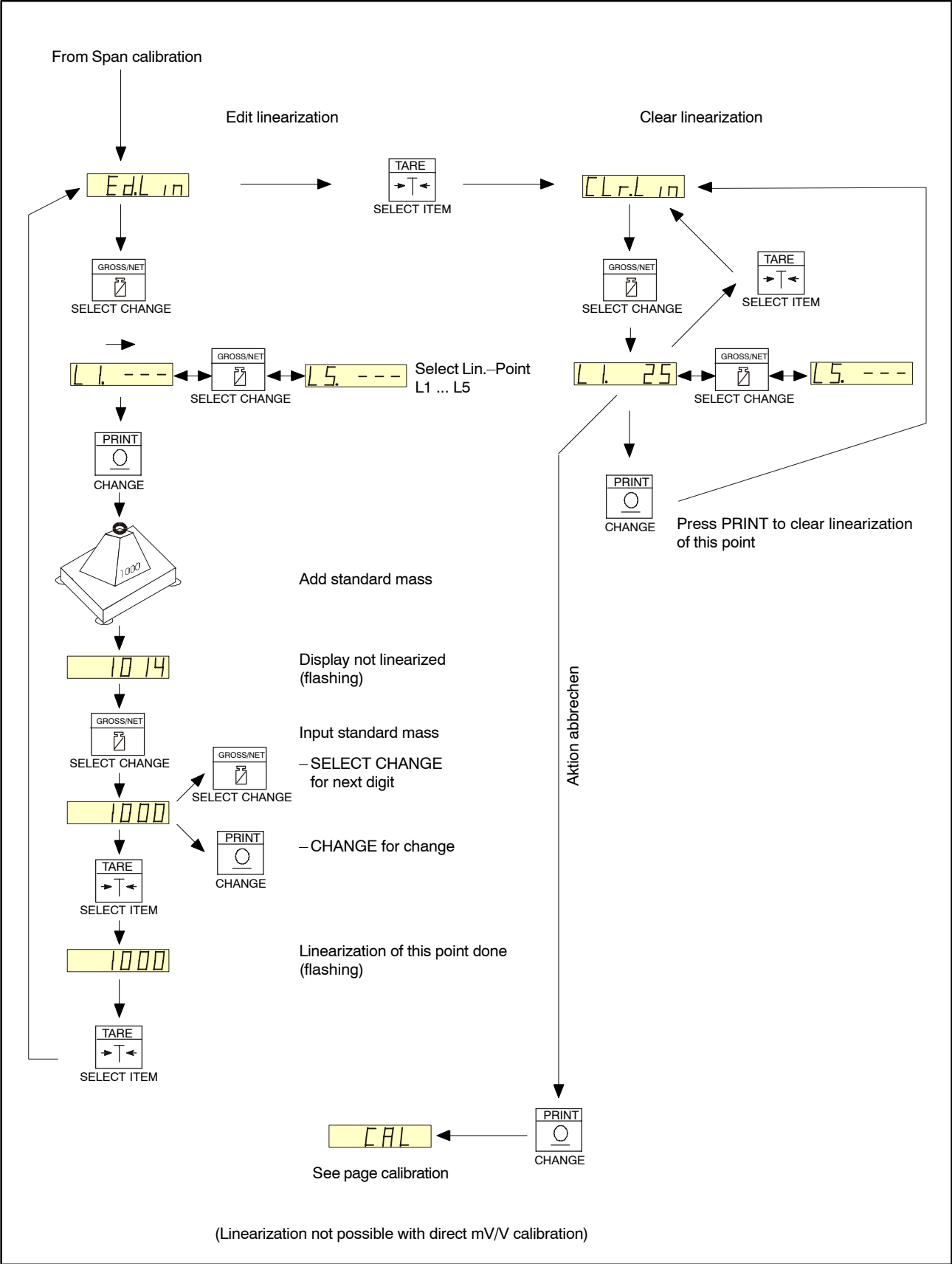
<b>45</b>	Allows the outputs to be forced ON one at a time.	
<b>46</b>	Shows a test display for the remote inputs with O = off and 1,2,3,4 = on.	
<b>47</b>	Shows the number of overloads (>130%) of the scale. In safe setup the counter can be set to zero.	
<b>48</b>	Allows individual setpoints to be enabled. Card ZS provides 4 outputs, card ZCC two.	
	A = Active Limit Switch E = Error Indication N = Net Indication	M = Motion Indication 0 = Zero Indication
<b>49</b>	Stops the operator changing the Limit Switches using the (TARE) button long press.	
<b>50</b>	Limit Switches can be set to trigger from Gross or Net weights.	
<b>51</b>	Sets the Residual flow and hysteresis for tripping on Increasing or Decreasing weight for Limit Switches.	
<b>52</b>	Sets the sense of the output drivers for positive or negative logic	
<b>53</b>	Setpoint alarm sounds may be set to OFF, Single, Dual, Continuous or display flashing (f) is set.	
<b>54</b>	The TARGET for output 1..4 can be entered in displayed weight units.	
<b>55</b>	The HYSTERESIS for output 1..4 can be entered in displayed weight units	
<b>56</b>	The (optional) RESIDUAL FLOW for output 1..4 can be entered in displayed weight units.	
<b>57</b>	Source for analogue output.	
<b>58</b>	Select VOLT for -10 ... 10 V output, CUR for 4 ... 20 mA, ABS.CUR for absolute 4 ... 20 mA e.g. for loss in weight systems	
<b>59</b>	Fine calibration of the low level – either 0 Volt or 4 mA	
<b>60</b>	Fine calibration of the high level – either 10 Volt or 20 mA	
<b>61</b>	Allows the analogue output card to be tested by forcing the output either low or high.	
<b>62</b>	The time is set similar to a normal digital clock (using 24 hour format).	
<b>63</b>	The date is set using European format.	
<b>64</b>	Activate the QA-feature. From the entered date the WE2110 will ask for maintenance .	
<b>65</b>	The date for maintenance.	
<b>66</b>	This step will delete ALL digital setup (but not calibration !) and return the WE2110 to the original factory defaults.	
<b>67</b>	Factory setting only.	
<b>68</b>	Print out the WE2110 setup.	
<b>69</b>	The exit point from digital setup. Press "Select Item" button to exit. Press "Select Group" button to continue setup.	



# 5 Calibration of WE2110

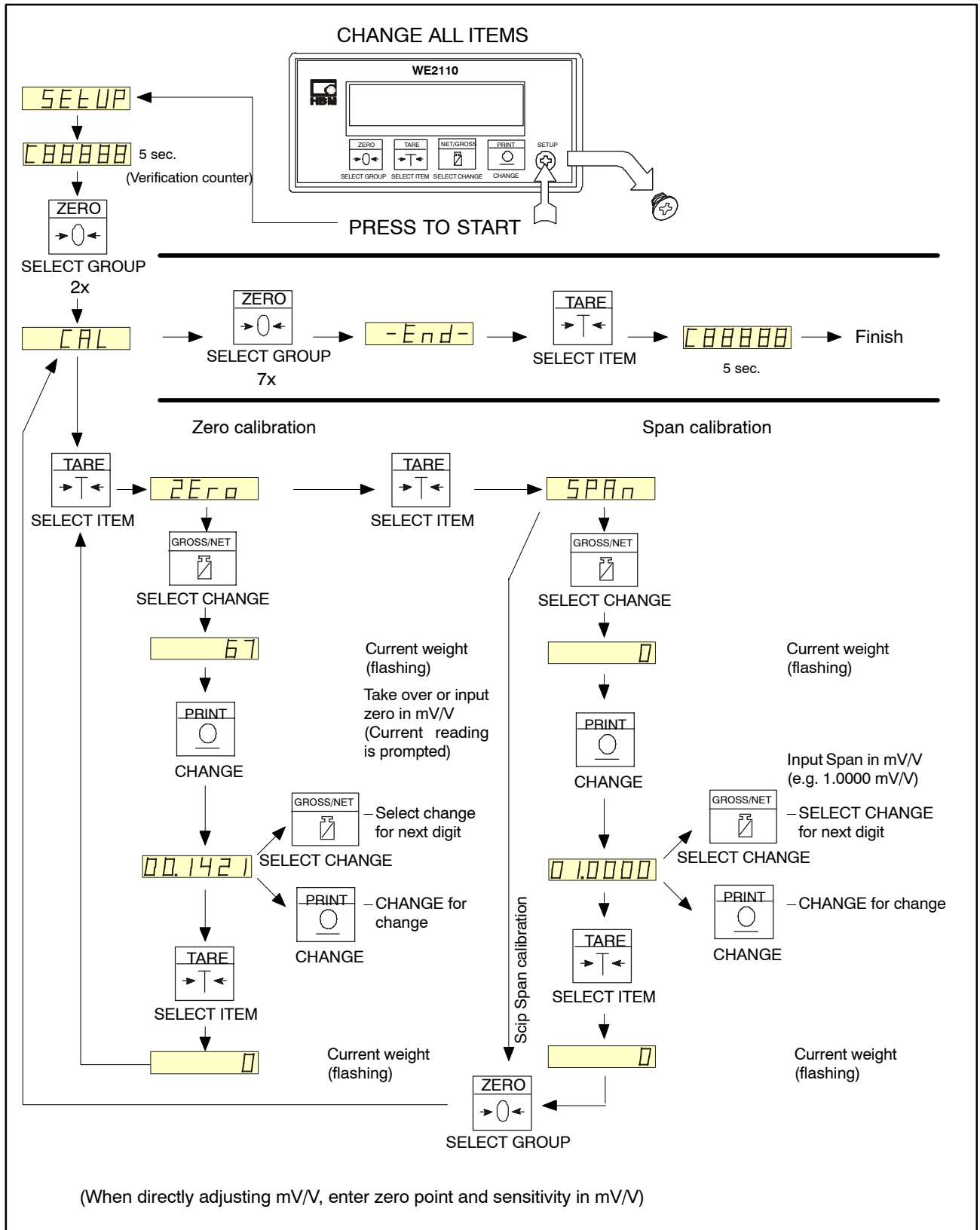


# 6 Linearization



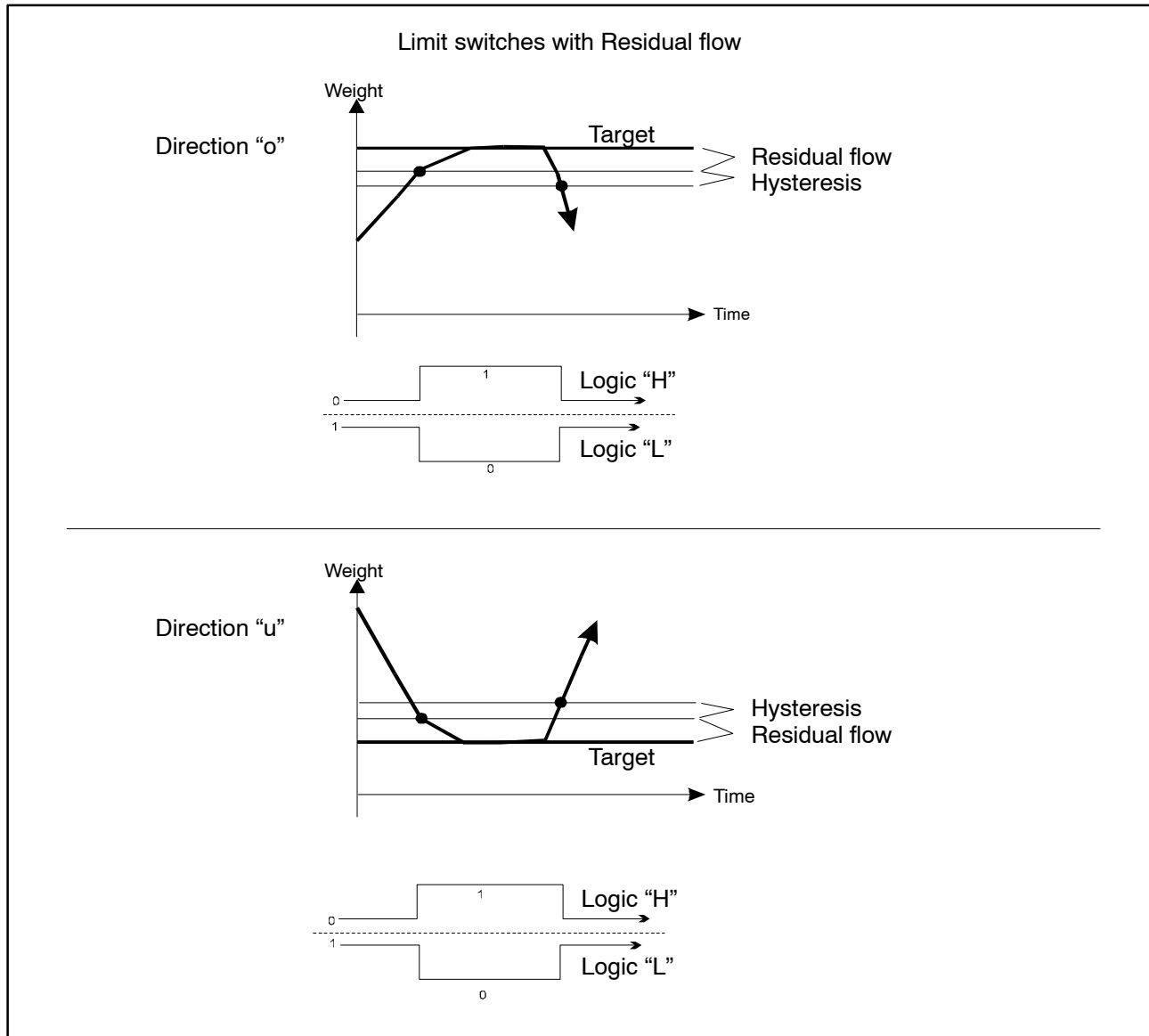
# 7 Calibration with mV/V

Scale type "DIRECT" within the BUILD menu has to be selected!



## 8 Limit switches

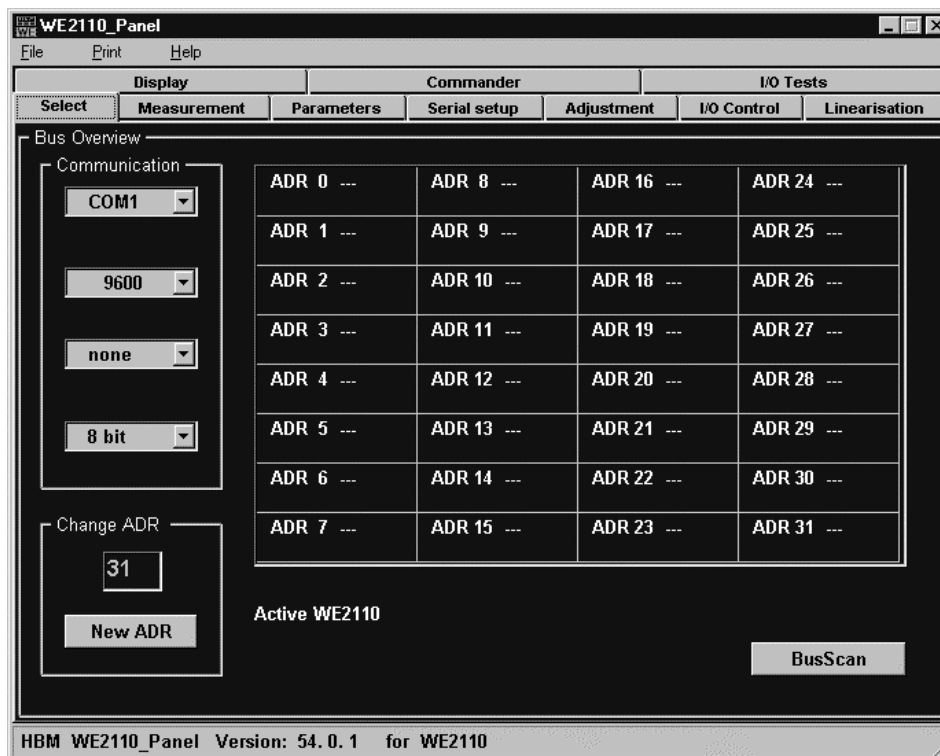
If the optional setpoints have been used, the setpoint target values can be accessed by pressing the TARE button for 2 seconds.



## 9 WE2110-Panel Software

The optional WE2110-Panel Software from HBM allows the operation of all functions and settings through a PC. A standard setup can be stored and used for other units as well. Additionally an integrated commander enables direct access to the WE2110 by the command set.

This software can be ordered together with the description of commands with order no. 1-WE2110/DOC.



## 10 Totalizing

The WE2110 can add single weight and store the sum in an internal storage. The following steps are needed for that:

- Select printer type TOTAL or A.TOTAL
- If SERIAL 2 is set to PRINT then the output goes to the printer as well. If set to OFF the output goes only to the display.
- Pressing the PRINT–Key forces the WE2110 to add the current weight to the sum. The W2110 displays (COUNT) (000004) – no of items is four, followed by (TOTAL) (003456) – sum is 3456.
- Pressing the PRINT–Key for 2 seconds does not add, but displays the no of items and sum again, print out this information if selected and deletes the sum.
- Using external keys in connection with the optional setpoints the following extended functions can be realized:
  - Display the sum w/o deleting it
  - Display sum and delete – as 2 seconds PRINT–Key
  - Undo last print

## 11 Peak Value Storage, Freeze Display, Live Animal Filter

Using external keys in connection with the optional setpoints the following extended functions can be realized. These functions are only possible in the INDUSTRIAL mode:

### Peak value storage:

- Press once: peak value is displayed – unit flashes
- Press again: back to normal display
- 2 seconds press sets the storage to zero

### Freeze of the display:

- Press once: display is on hold – unit flashes
- Press again: back to normal display

### Live Animal Filter:

- Short press shows “\_\_\_\_\_”. After that freezed value is shown–unit flashes
- Long press ( $\approx$  2 sec.) returns to normal display

## 12 Error messages

### Weighing errors

(U ----)	The weight is below the minimum allowable weight reading
(O ----)	The weight is above full range
(ZERO) (ERROR)	The weight reading is beyond the limit set for Zero operation
(STABLE) (ERROR)	Scale motion has prevented a Zero, Tare or Print operation from occurring on command.
(PRINT) (ERROR)	A printer problem has prevented the printout from being completed. (No power, no paper, cable fault)
(CAL) (DUE)	Maintenance is due ! Call your scale supplier
(PRINT)	WE2110 is currently printing
(SAVING)	WE2110 is currently writing to the EEPROM

### Setup errors

(RES) (LO)	The scale build is configured for less than 100 verification intervals
(RES) (HIGH)	The scale build is configured for more than 100,000 verification intervals
(CHEC) (TRADE)	At least one parameter is not acc. to EN45501 requirements. Check the trade relevant items. This is only displayed in trade mode when leaving setup. Error numbers:
<b>! Note: This error is not displayed if parameters are set via the interface !</b>	<ul style="list-style-type: none"> <li>1 = Verification interval e1 or e2 &gt; 50</li> <li>2 = Graduations &gt; 6000d</li> <li>3 = No weighing unit selected</li> <li>4 = Motion set to NONE</li> <li>5 = Zero tracking not OFF or 0.5d/s</li> <li>6 = Zero setting range not 2% or -1% +3%</li> <li>7 = Zero dead band not set to 000000</li> <li>8 = Buttons set for immediate operation</li> <li>9 = Type set to direct mV/V calibration</li> </ul>

### Calibration errors

(ZERO) (HIGH)	The load cell output is beyond allowable zero calibration range.
(ZERO) (LO)	The load cell output is below allowable zero calibration range.
(SPAN) (LO)	The load cell signal range (span) is too small for these settings.
(SPAN) (HI)	The load cell signal range (span) is too large for these settings.
(NO) (ZERO)	A new WE2110 must be zero calibrated before span calibration.



## Diagnostic Errors

<b>(E 0001)</b>	The power supply voltage is too low. (check supply)
<b>(E 0002)</b>	The power supply voltage is too high. (check scale / cables)
<b>(E 0004)</b>	The load cell excitation voltage is too low. (check scale)
<b>(E 0008)</b>	The load cell excitation voltage is too high. (check scale)
<b>(E 0010)</b>	The temperature is outside of allowable limits. (check location)
<b>(E 0020)</b>	Count-by setting is too high or low for the set scale capacity
<b>(E 0040)</b>	Excitation sense lines 1-2 are not connected. The error message can be deactivated with <OPTION><SENS.CH><OFF>.
<b>(E 0080)</b>	Excitation sense lines 3-4 are not connected. The error message can be deactivated with <OPTION><SENS.CH><OFF>.
<b>(E 00C0)</b>	Excitation sense lines 1-2 <b>and</b> 3-4 are not connected. The error message can be deactivated with <OPTION><SENS.CH><OFF>.
<b>(E 0100)</b>	The digital setup information has been lost. (restore setup)
<b>(E 0200)</b>	The calibration information has been lost. – (re-calibrate)
<b>(E 0300)</b>	All setup information has been lost – (enter setup and calibrate)
<b>(E 0400)</b>	The HBM factory configuration information has been lost. (service)
<b>(E 0800)</b>	The EEPROM memory storage chip has failed (service)
<b>(E 2000)</b>	Real time clock problem (service)
<b>(E 8000)</b>	The EPROM memory storage chip has failed (service)

The "E" type error messages are additive. For example if a condition is detected where the power supply voltage is low, resulting in a reduction of excitation voltage, the resulting Error messages will be E0005 (0001 + 0004).

## 13 Specifications

Type		WE2110
<b>Accuracy class</b>		6000 d acc. to EN 45501
<b>Number of verification intervals acc. to OIML R76</b>		6000 d ; 2 x 3000 d
<b>Input sensitivity</b>	$\mu\text{V/e}$	Multi-range / Multi-interval $\geq 0.2 (\geq 1.0 \text{ OIML R76})$
<b>Measuring range</b>	$\text{mV/V}$	0 ... 3.5
<b>Input zero range</b>	$\text{mV/V}$	$\pm 2$
<b>Weight units</b>		g, kg, t, lb
<b>Max. number of load cells</b>		8 x 350 $\Omega$
<b>Load cell excitation</b>	$V_{\text{DC}}$	8 (short circuit proof)
<b>Load cell connection</b>		6- / 4-wire
<b>Load cell cable length</b>	$\text{m/mm}^2$	< 580
<b>Linearization</b>		5 intermediate points
<b>Measuring range (without filter)</b>	Hz	60
<b>Filter low pass (digital)</b>		1/1 ... 1/200 moving average
<b>Zero track window</b>	d/sec	0 ... 32 (adjustable)
<b>Motion detection window</b>	d/sec	0 ... 32 (adjustable)
<b>Interface 1</b>		full duplex RS-232, RS-485 (4-wire)
<b>Interface 2</b>		RS-232 for printers, remote displays
<b>Cable lengths</b>		$\leq 25$
	RS-232	
	RS-485	$\leq 500$
<b>Baud-Rate, adjustable</b>	m baud	300 ... 19200
<b>Power supply</b>	$V_{\text{AC}}$	110 ... 240, 48 ... 60 Hz
<b>DC-Version (Type WE2110DC)</b>	$V_{\text{DC}}$	12 ... 24 nom., 10 ... 30 max.
<b>Power consumption</b>	VA	10
<b>Nominal (rated) temp. range</b>	$^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ]	- 10 ... + 40 [+ 14...+ 104]
<b>Operation temp. range</b>	$^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ]	- 10 ... + 60 [+ 14...+ 140]
<b>Storage temp. range</b>	$^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ]	- 30 ... + 60 [- 22... +140]
<b>Display</b>		6 Digit LED, green
<b>Digit height</b>	mm	14
<b>Status symbols</b>		Zero, gross, net, motion, units (g, kg, lb, t), setpoints
<b>Keys</b>		Foil keys with tactile and audible feedback
<b>Dimensions w/o connectors (l x w x h)</b>	mm	150 x 115 x 72
<b>Front panel</b>	mm	144 x 72
<b>Front panel cut-out (DIN 43700)</b>	mm	138 x 68
<b>Weight approx.</b>	kg	1
<b>Protection class acc. to IEC529</b>		IP 40
<b>Protection class of front only acc. to IEC529</b>		IP 65
<b>Housing material</b>		Aluminum, painted

<b>Combi-Card WE2110/ZCC (optional)</b>		
<b>Analogue outputs</b>		4 ... 20 mA or -10 ... +10 V, optically isolated
<b>Perm. load resistance -10...+10 V</b>	$\Omega$	>2000
<b>Perm. load resistance 4...20 mA</b>	$\Omega$	<500
<b>Resolution</b>	bit	16
<b>Fine adjustment via menu</b>		Voltage output or current loop
<b>Inputs/outputs (limit values)</b>		1 x input and 2 x output, optically isolated
<b>Setpoint-Card WE2110/ZS (optional)</b>		
<b>Optional digital Inputs / Out- puts</b>		4 x input and 4 x output, optically isolated
<b>Reference value outputs</b>		gross, net, zero, motion, error
<b>Functions for input</b>		keys, blank, lock, total, peak, hold
<b>Voltage range inputs / out- puts (external)</b>	$V_{DC}$	12 ... 28
<b>Duration of short circuit out- puts</b>		no limits
<b>Max. voltage / Max. current</b>	$V_{DC}/$ mA	50 / 300