



## FLEX Indicator/ Controller



ETHERNET UDP

COMM.PORT.  
RS 232



COMM.PORT.  
RS 485 full duplex  
(RS 422)



# FLEX

Weigh Indicator/Controller type

## IMPORTANT SAFETY INFORMATION

*READ THIS PAGE FIRST!*

Penko Engineering manufactures and tests its products to meet all applicable national and international standards. It is vital that this instrument is correctly installed, used, and maintained to ensure it continues to operate to its optimum specification.

The following instructions must be adhered to and incorporated into your safety programme when installing, using, and maintaining Penko products. Failure to follow the recommended instructions can affect the system's safety and may increase the risk of serious personal injury, property damage, damage to this instrument and may invalidate the product's warranty.

- Read the instructions fully prior to installing, operating, or servicing the product. If this Instruction Manual is not the correct manual for the Penko product you are using, telephone 0031(0)318-525630 for a replacement copy. Keep this Instruction Manual in a safe place for future reference.
- If you do not fully understand these instructions, contact your Penko representative for clarification.
- Pay careful attention to all warnings, cautions, and instructions marked on and supplied with the product.
- Inform and educate your personnel about the correct installation, operation, and maintenance procedures for this product.
- Install your equipment as specified in the installation instructions of the appropriate Instruction Manual and as per applicable local and national codes. Connect all products to the proper electrical sources.
- To ensure correct performance, use qualified personnel to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified technicians use replacement parts specified by Penko. Unauthorized components and procedures can affect the product's performance and may affect the continued safe operation of your processes. The use of non-specified 'look-alike' substitution parts may result in the risk of fire, electrical hazards, or improper operation.
- Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.

## WARNING

### ***ELECTRICAL SHOCK HAZARD***

Installing cable connections and servicing this instrument require access to shock hazard level voltages which can cause death or serious injury.

Disconnect separate or external power sources to relay contacts before commencing any maintenance.

The electrical installation must be carried out in accordance with CE directions and/or any other applicable national or local codes.

Unused cable conduit entries must be securely sealed by non-flammable blanking plates or blind grommets to ensure complete enclosure integrity in compliance with personal safety and environmental protection requirements.

To ensure safety and correct performance this instrument must be connected to a properly grounded, three-wire power source.

Proper relay use and configuration is the responsibility of the user.

Do not operate this instrument without the front cover being secured. Refer any installation, operation or servicing issues to qualified personnel.



**WWW.PENKO.COM**

Penko is an ETC Company

e-mail: [info@penko.com](mailto:info@penko.com)

# Contents.

Indicator/Controller: **FLEX**

## Hardware:

Wiring connections: Loadcells, In/Outputs & Power supply	Page 1-1to 1-4
Wiring connections: Comports rs232 & rs422	Page 1-5
Wiring connections: Profibus, Ethernet & USB	Page 1-6
Dimensions	Page 1-7

## User interface:

Button explanation	Page 2-1
System setup	Page 2-2
Port setup	Page 2-3
Rs232/422 port	Page 2-3
Can1/Can2	Page 2-4
USB port	Page 2-5
Profibus setup	Page 2-5
Ethernet setup	Page 2-6
Indicator setup	Page 2-7
Indicator settings	Page 2-7 to 2-11
Filters	Page 2-12 to 2-13
Calibration	Page 2-14
Show	Page 2-14
Add/Replace	Page 2-15
Delete	Page 2-15
Transducers	Page 2-16
Geometric	Page 2-17
Indicator Recall	Page 2-18
Indicators	Page 2-19
Indicator setup (4 channel option board)	Page 2-20
Indicator settings (4 channel option board)	Page 2-20 to 2-24
Filters (4 channel option board)	Page 2-25 to 2-26
Calibration (4 channel option board)	Page 2-27
Show (4 channel option board)	Page 2-27
Add/Replace (4 channel option board)	Page 2-28
Delete (4 channel option board)	Page 2-28
Transducers (4 channel option board)	Page 2-29
Geometric (4 channel option board)	Page 2-30
Indicator Recall (4 channel option board)	Page 2-31
Indicators (4 channel option board)	Page 2-32
In/Output	Page 2-33
Inputs	Page 2-33
Outputs/Levels	Page 2-34 to 2-36
Passwords	Page 2-37
Screen setup	Page 2-38
Screens	Page 2-38 to 2-34
Backlight & buzzer	Page 2-45
Set clock	Page 2-46
Process setup	Page 2-46
Labels & links	Page 2-47 to 2-49
Printer	Page 2-50
System recall	Page 2-50
Status	Page 2-51
Scope	Page 2-52 to 2-54
Debug & Log	Page 2-55
Totals	Page 2-56
Info	Page 2-57

## Configuration Settings:

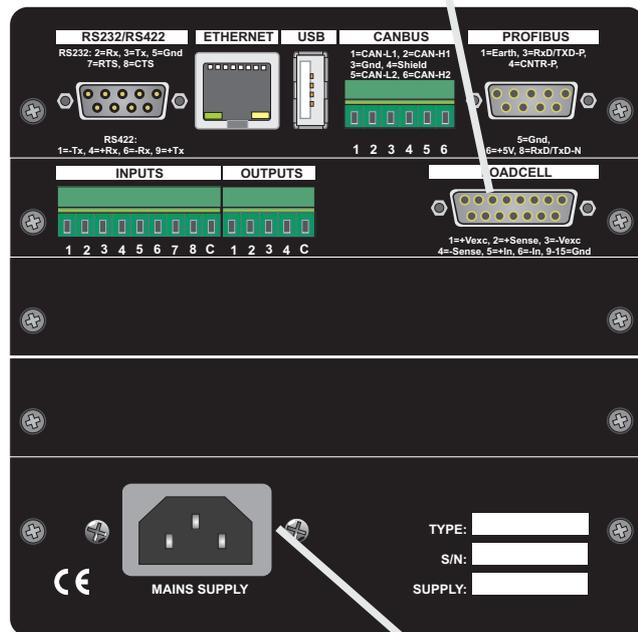
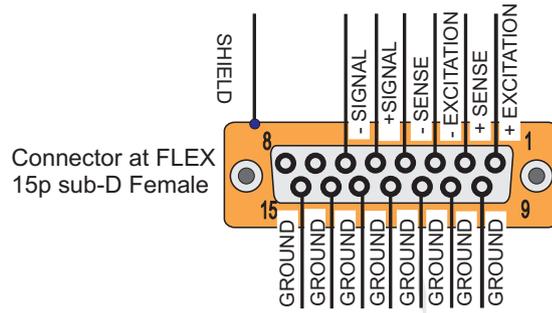
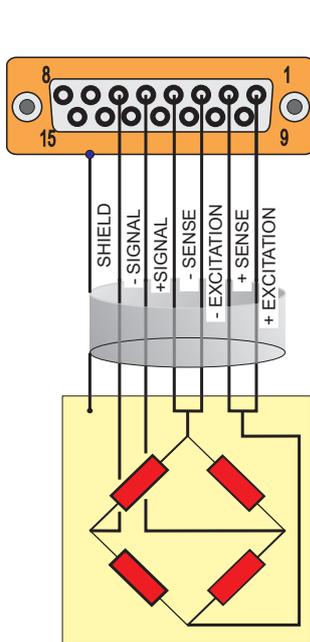
Default Indicator parameters	Page 3-1
Default filter parameters	Page 3-1
Default Port setup	Page 3-2
DefaultIn/Outputs	Page 3-3
Default Screen 1/screen 2 setup	Page 3-4
Default screen 3/screen 4 setup	Page 3-5
Default Button setup	Page 3-6
Default Ledbar setup	Page 3-6

## Appendix:

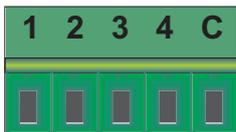
Appendix-A Error code explained	Page 4-1
Appendix-C Profibus description	Page 4-4

**WIRING CONNECTIONS:  
LOADCELL(S), IN/OUTPUTS & POWER SUPPLY**

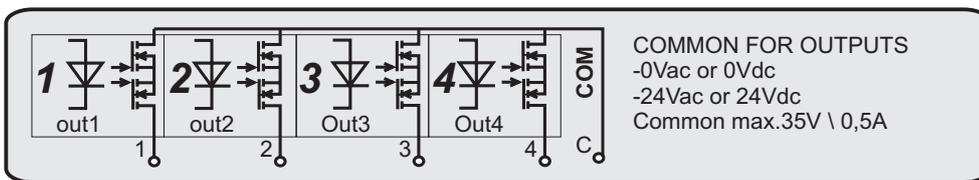
**Indicator/Controller: FLEX**



**Digital outputs 1-4**

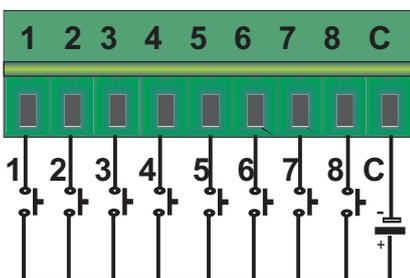


**AC POWER SUPPLY  
230Vac 50/60Hz**



**COMMON FOR OUTPUTS**  
-0Vac or 0Vdc  
-24Vac or 24Vdc  
Common max.35V \ 0,5A

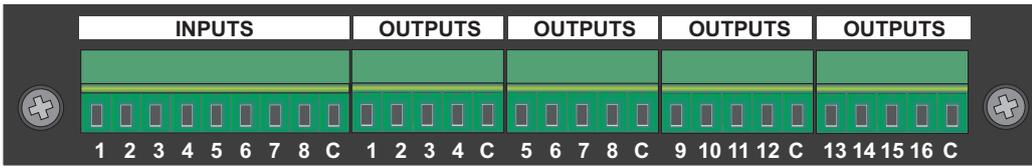
**Digital inputs 1-8**



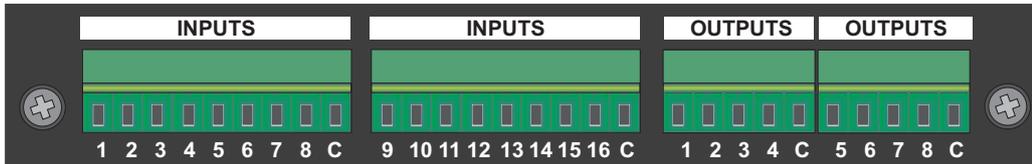
Input 1 normal or counter input.  
Before 2018: counter input <= 1kHz, on request 5kHz.  
Since 2018: counter input <= 5kHz @24Vdc with 50% duty cycle.



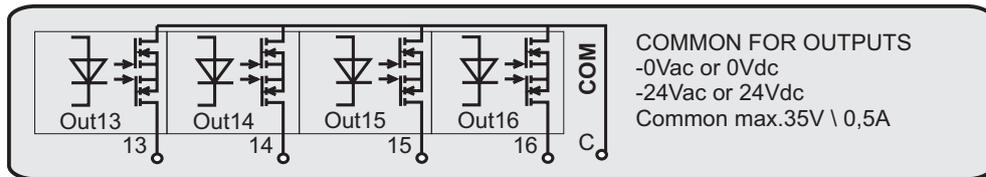
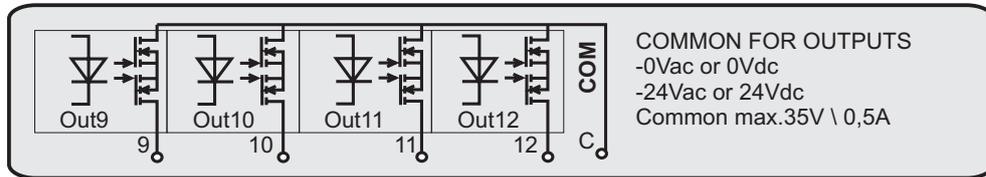
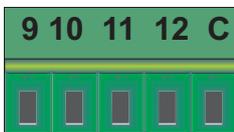
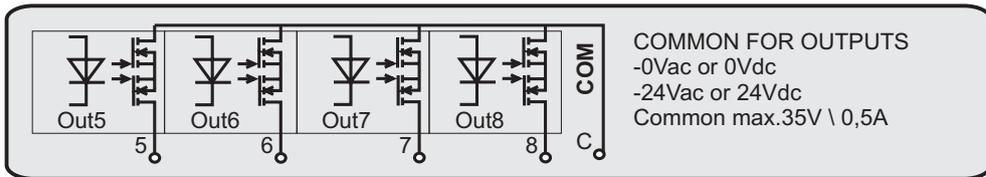
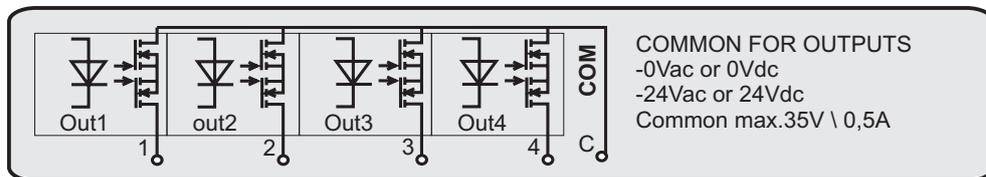
**Optional board 8in/16out**



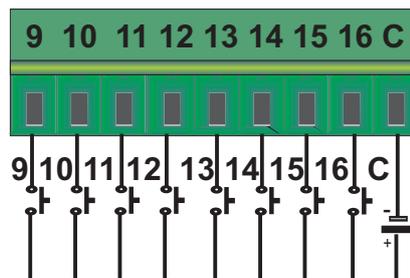
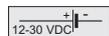
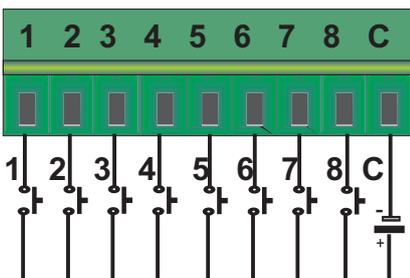
**Optional board 16in/8out**



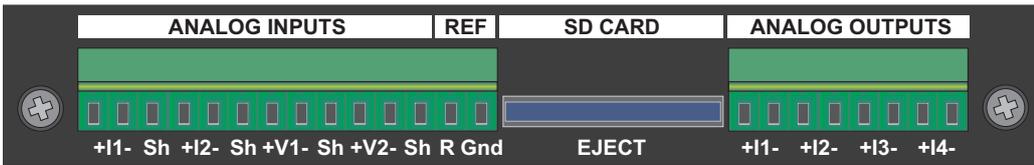
**Digital outputs 1-4, 5-8, 9-12, 13-16**



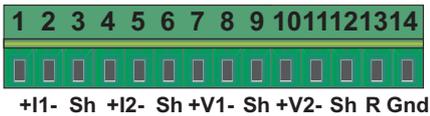
**Digital inputs 1-8, 9-16**



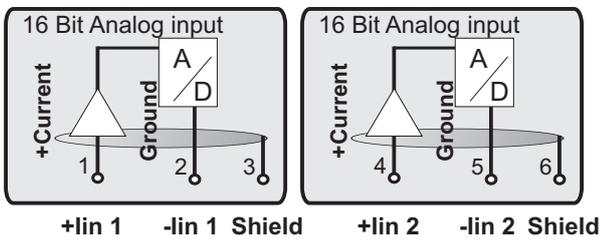
## Optional board analog in/out



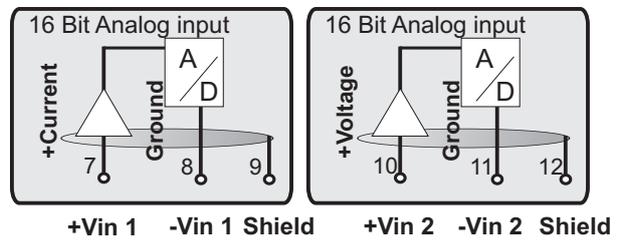
### Analog Inputs



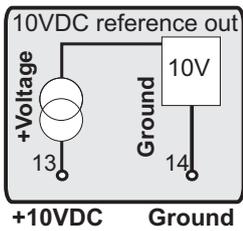
Current inputs, 0/4 - 20/24mA



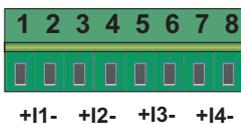
Voltage inputs, 0 - 10VDC



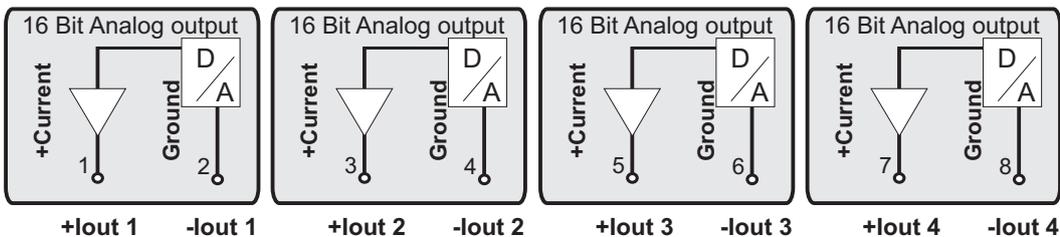
### Reference voltage



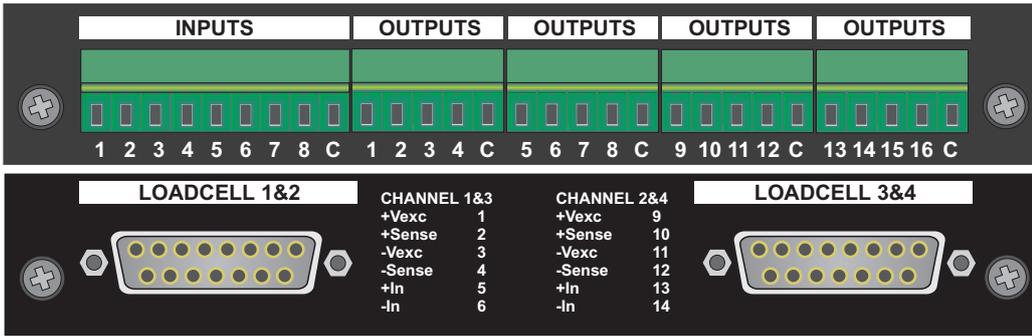
### Analog outputs (mA)



Current outputs, 0/4 - 20/24mA

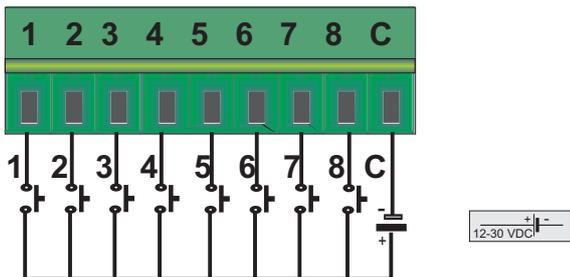


## Optional 4-channel weighing boards

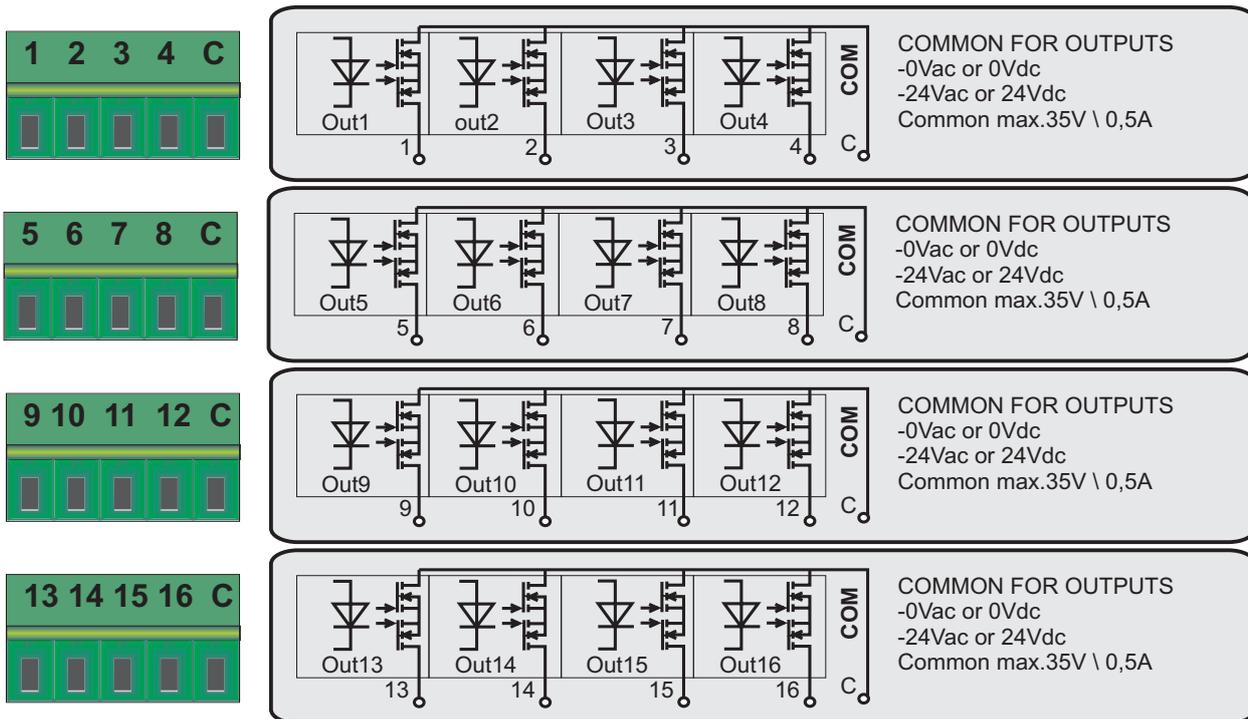


Loadcell cables need to be filtered with ferrite bead at begin and end of cable for NMI approval.

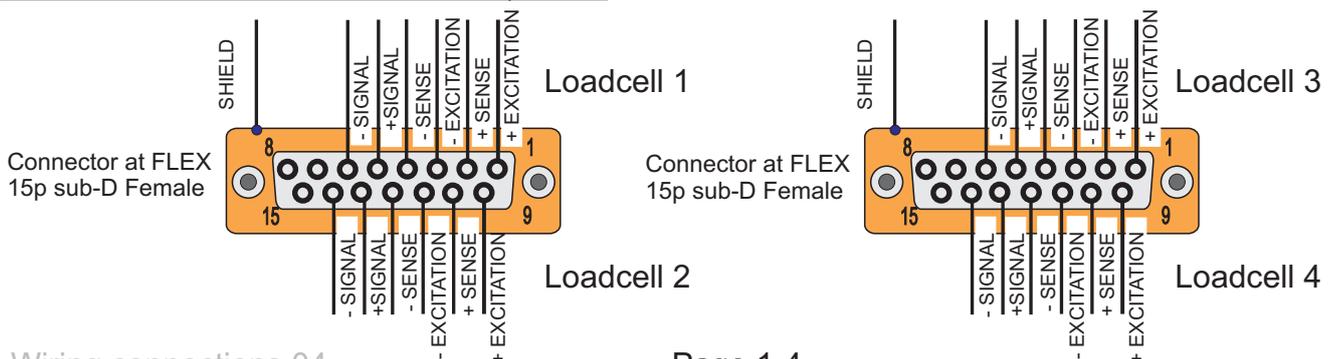
### Digital inputs 1-8

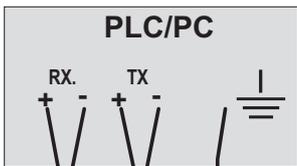
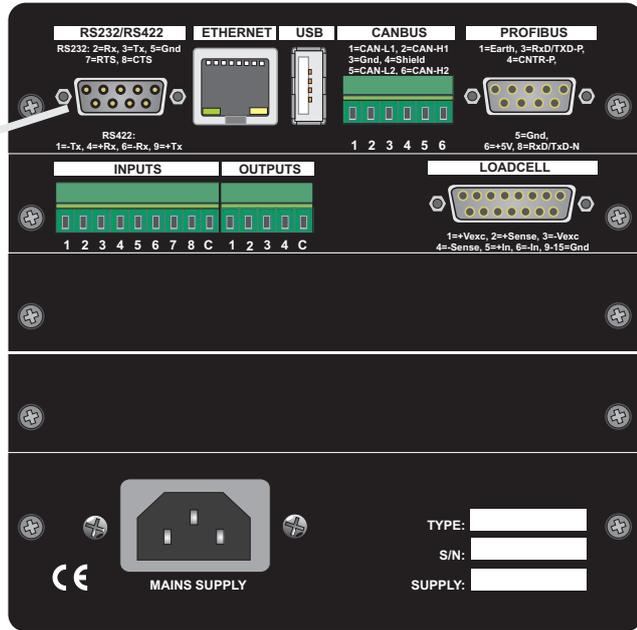
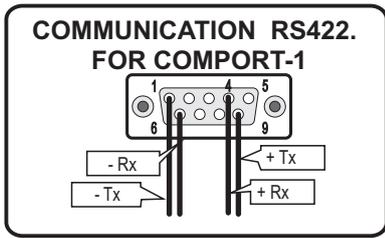


### Digital outputs 1-4, 5-8, 9-12, 13-16



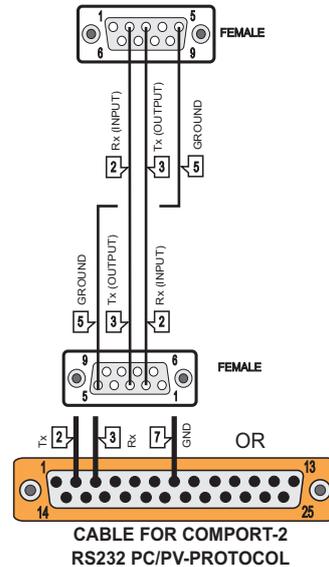
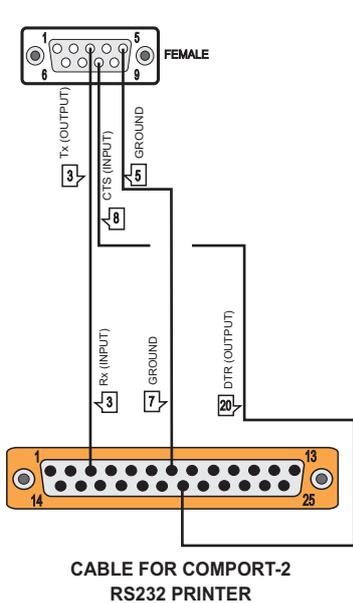
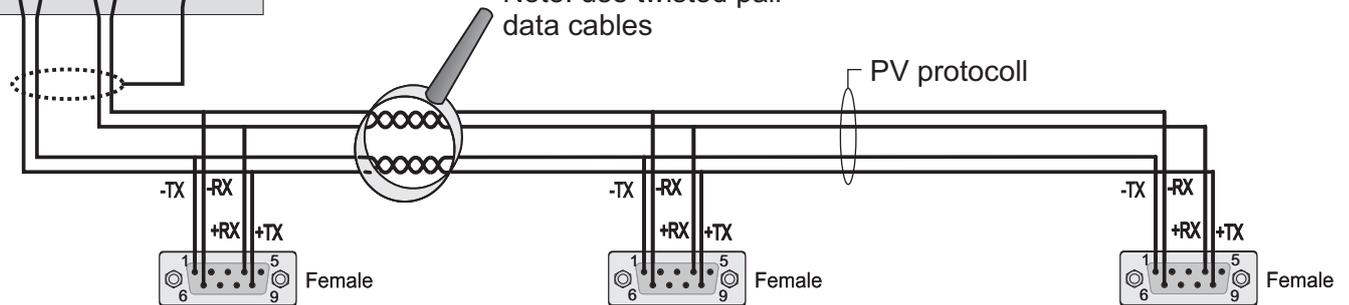
### Loadcell connection 1&2, 3&4





Rs422 PV protocol Example

Note: use twisted pair data cables

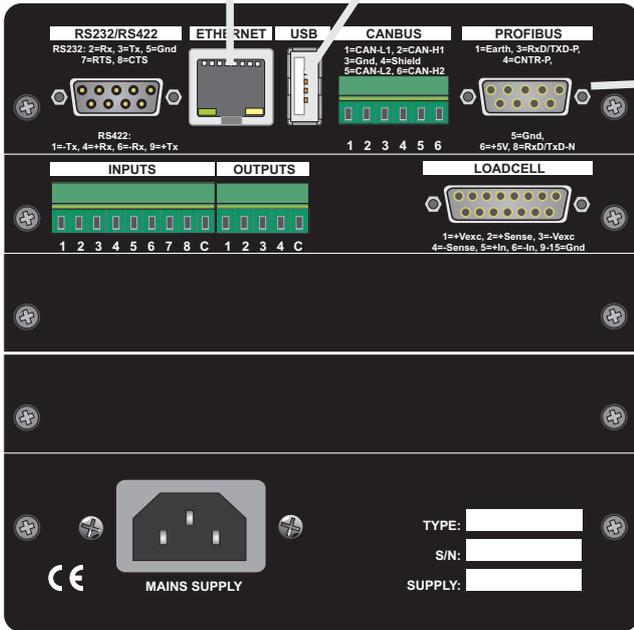
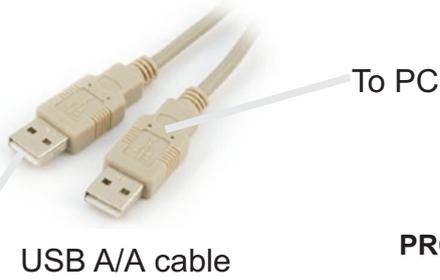


# WIRING CONNECTIONS: PROFIBUS, ETHERNET & USB

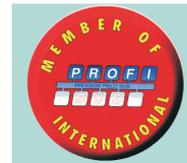
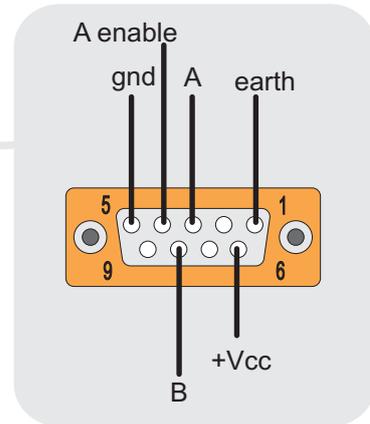
Indicator/Controller: **FLEX**

RJ-45 Ethernet connector

- 1 = td+
- 2 = td-
- 3 = rd+
- 4 = not used
- 5 = not used
- 6 = rd-
- 7 = not used
- 8 = not used

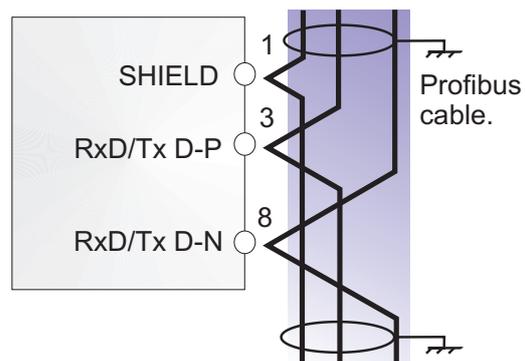


## PROFIBUS PORT CONNECTIONS

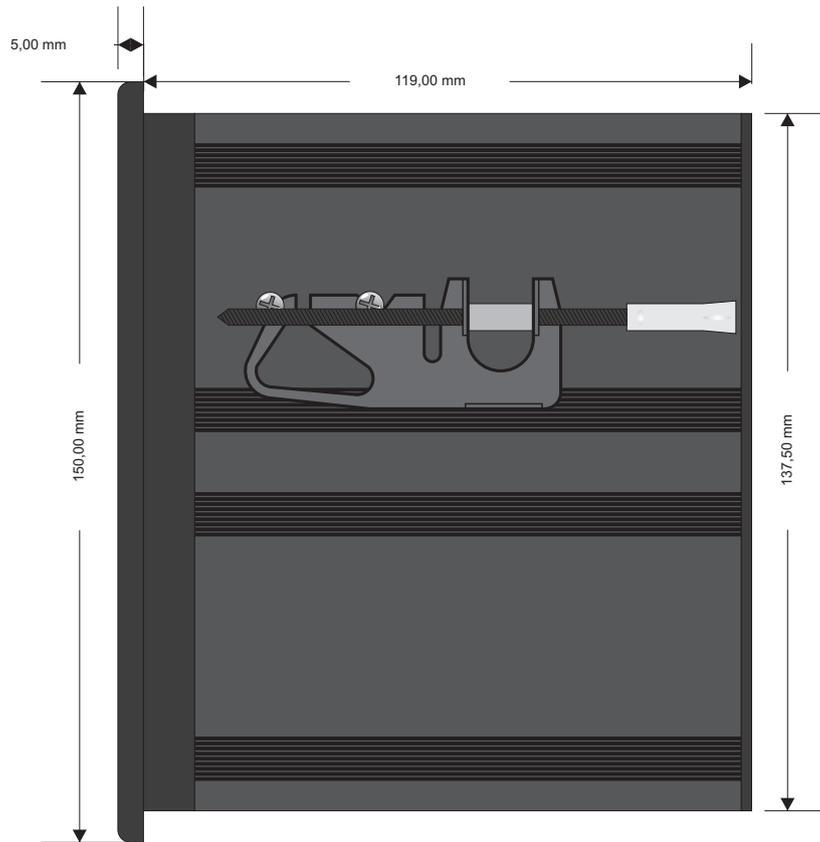


### PROFIBUS connector wiring:

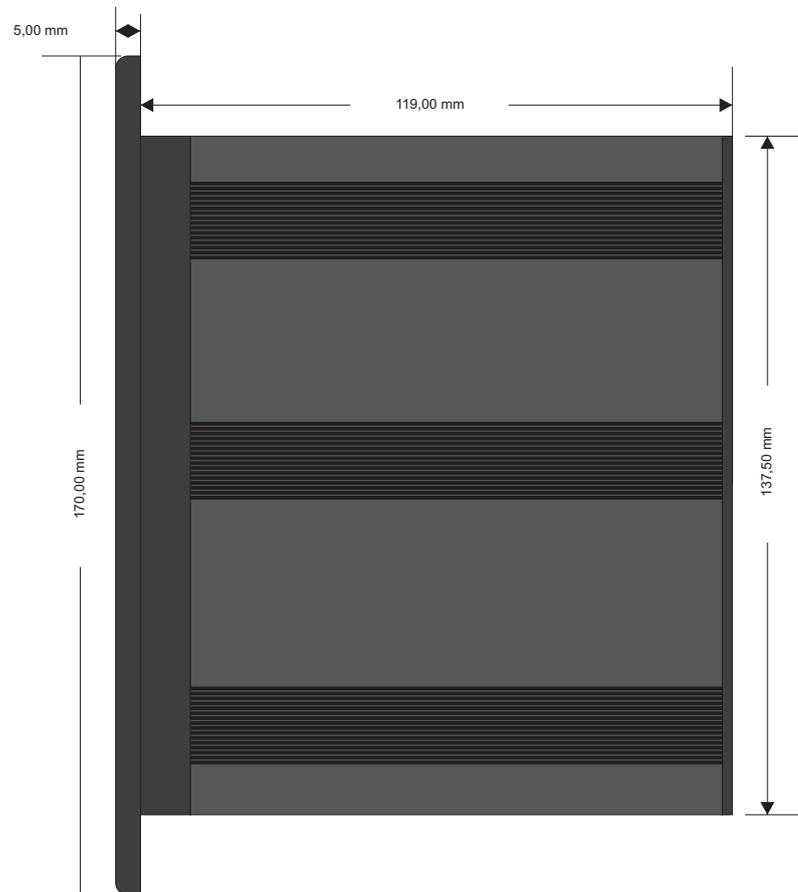
PIN No:	SYMBOL:	NAME:	NAME:
1:		SHIELD	SHIELD Protective Ground
2:		RP	Reversed for Power
3:	B/B	Rxd/TxD-P	Receive/Transmit-date-P
4:		CNTR-P	Control-P
5:	C/C:	DGND	Data Ground
6:		VP	Voltage plus
7:		RP	Reserved for Power
8:	A/A	RxD/TxD-N	Receive/Transmit-Data-N
9:		CNTR-N	Control-N



Side view



Top view



**Button explanation:**

The Penko Flex has different function keys.

Menu buttons:

Buttons to enter a menu are recognizable on there pictogram with text.

Examples:



Edit buttons:

Buttons to edit a parameter can be a -, + or edit button.

With the “-” button the parameter field will scroll down. 

With the “+” button the parameter field will scroll up. 

With the edit button a keyboard will be opened to edit the selected parameter. 

Alphanumeric keyboard:

Numeric keyboard:



Leave menu buttons:

With the “cancel” button its possible to leave a menu without saving the changed parameters.

With the “OK” button its possible to leave a menu nd save the changed parameters.

With the “Next>>” button its possible to go to the next parameters of the selected menu.

With the “<<Prev” button its possible to go to the previous parameters of the selected menu.



ON/OFF buttons.

Some function can be enabled or disabled, the buttons are recognizable on the red cross or green vink.



**System setup:**

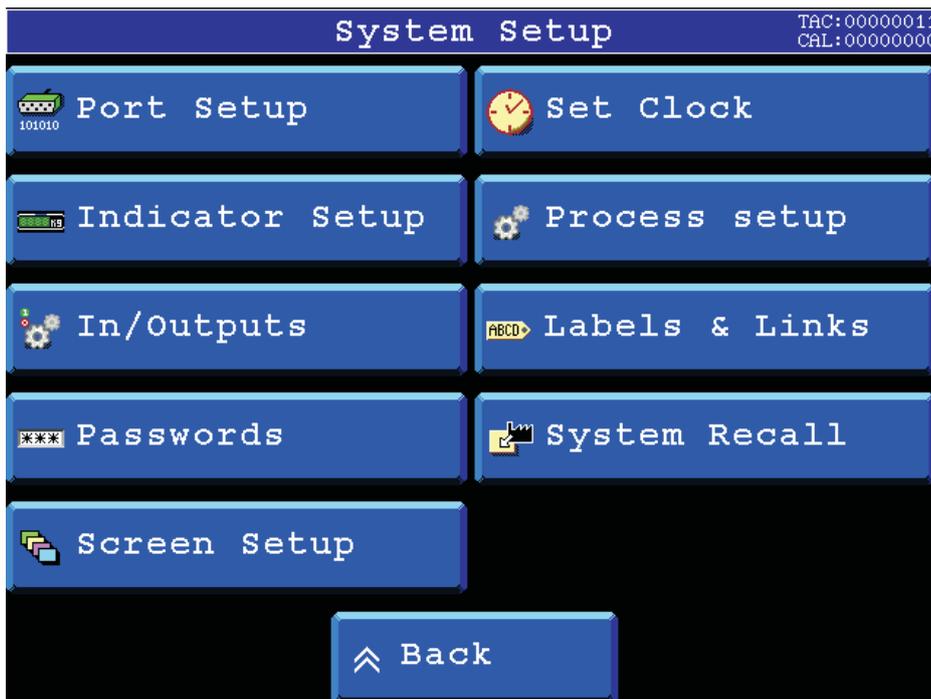
In this menu its possible to setup all settings for the flex and the needed program and recipe.

To go to this menu, select "System setup" from the Main menu.



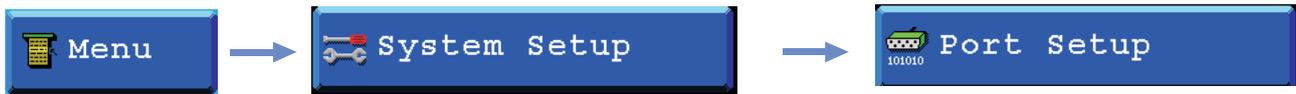
Different options are:

- Port Setup
- Indicator Setup
- In/Outputs
- Passwords
- Screen Setup
- Set Clock
- Process setup
- labels and links
- System Recall



**Port setup:**

In the port setup it's possible to set up all communication ports and protocols. To go to the port setup press the "Port Setup" button from the System setup.



RS 232 port:



In this menu all settings for the RS 232 comport can be set. For settings, see below.

RS 422 port:



In this menu all settings for the RS 422 comport can be set.

For settings, see below.

Protocol:

In this field, several communication protocols can be selected.

Different protocols are: None, Printer, ASCII, TP Slave, TP Master, NPV Slave, NPV Master, INDICATOR, HL Viewteq and HL PLC, Modbus RTU, Modbus ASCII and Baknet.



Address:

To identify the device in a configuration with multiple devices an address has to be selected. (Not for all protocols)



Baudrate:

Select a speed for the protocol (Not for all protocols)



Parity:

Select a parity for the protocol (Not for all protocols)



Stopbits:

Select the number of needed stopbits for the protocol (Not for all protocols)



CAN 1/CAN 2 port:



In this menu, all settings for the CAN comport can be set.

Protocol:

In this field, several communication protocols can be selected.

Different protocols are: None or Buslink



Baudrate:

Select a speed for the protocol



Buslink Address:

Up to 8 Flexes can communicate with each other, sharing inputs, outputs, markers and indicators.

In this parameter its possible to set the Buslink Address.



Buslink Subaddress:

When using a subaddress, up to 40 flexes can communicate with eachother.

In this parameter its possible to set the Buslink subaddress.



USB port:



In this menu all settings for the USB comport can be set.

Protocol:

When the USB port is switched to device mode the Flex acts as an external serial port. The USB device supports the following protocols:

- Twophase
- ASCII
- Printer

The first time the flex is connected to the PC, windows will ask for a driver. Then select the file Flexusb.inf to start the installation. This file is installed as part of th PI package.

USB Host

When the USB port is switched to host mode, a USB stick formatted with FAT16 or FAT filesystem can be used to load and store data on the stick.

When no printer port is selected, print commands will be stored as a text file on the usb stick with the name PRINTER.TXT.

Reading and writing registers, indicators and recipes to the USB stick can be done using the PLC program commands FILEREAD and FILEWRITE.



USB buslink active:

Tells if the USB buslink is active or the status of the USB Host.



The USB Port settings screen can show the following messages:

YES - USB device port is connected

NO - USB is disconnected

Ready - USB stick is connected and ready

Busy - USB stick is connected but busy

USB overcurrent - too much current draw from USB port

USB device unknown - device connected to the USB host port is not recognised.

Currently only FAT or FAT16 formatted USB sticks are supported.

File not found - Flex attempted to open a file that is not on the USB stick

Invalid FAT Format - Currently only FAT or FAT16 formatted USB sticks are supported.

Reformat the stick with FAT filesystem

File error - File access failed

Disconnect USB - When the Flex switches from device to host, a connected PC must be disconnected first.

Profibus setup:



In this menu all settings for the Profibus comport can be set.

Channel:

To identify the device in the used configuration, a Channel has to be selected.



Format:

The profibus value can be shown as Integer (direct value without decimal point) or as Floating point (real value with decimal point).



Ethernet setup:

In this menu all settings for the Ethernet comport can be set.

IP Number:

Edit the ethernet IP number.

Subnet Mask:

Edit the ethernet Subnet mask

Gateway:

Edit the ethernet Gateway.

Speed:

The speed of the ethernet communication can be set at: 10 Mbps, 100Mbps or automatic detection.

Name:

In the "name" its possible to give the Flex a unique name within the ethernet communication.

DCHP:

With the DHCP its possible to let the network generate an IP address for the Flex. When its disabled the flex will work with a fixed IP address. When its enabled the flex will request an IP address from the network.

Port:

In the Port" the port number for the communication can be set.

Buslink Address:

Up to 8 Flexes can communicate with each other, sharing inputs, outputs, markers and indicators.

With this parameter its possible to set the Buslink Address.

Buslink subaddr:

When using a subaddress, up to 40 flexes can communicate with eachother.

With this parameter its possible to set the Buslink subaddress.



## Indicator setup

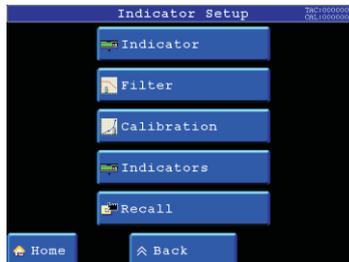
In the indicator setup it's possible to set all indicator parameters to make sure the indicator will act properly.

To reach this Setup see below



The different options are:

- Indicator
- Filter
- Calibration
- Indicators
- Recall



### Indicator:

To change the different settings, select "indicator" from the indicator setup



Before its possible to enter this menu, the indicator will ask for the "TAC" code. This "TAC" code is shown in the upper right corner.



### Indicator name:

With an indicator name, the indicator will be unique within the application. So it's easy to recognize it in the process and/or in the factory.

For example:  
Silo 1, Scale, etc.

The indicator name can have a maximum of 16 characters.

To change the indicator name, press the "EDIT" button behind the name and change it.



### Unit label:

The unit label defines the unit of measurement. The unit label is the value of a quantity, chosen by convention as a reference for measuring quantities of the same kind.

For example:  
,- t (ton) kg (kilo gram), g (gram), but can also be L (liter), lbs (pounds), etc.

The unit label can have a maximum of 4 characters.



Formatting:

Formatting defines the way that the weigher value will be shown.  
To change the formats of the indicator, press the “Formatting” button.



Step size:

The step size defines the scaled parts of the weight value.  
Example: Weigher value is 2003 kg

Step size	Display value
1	2003 kg
2	2004 kg
5	2005 kg
10	2000 kg

The display value will be round off to the nearest value with a valid step size.

Step size can be set at 1, 2, 5, 10, 20, 50, 100, 200.



Decimal point:

The Decimal point defines the point position of the weight value.  
Example: value 2006 kg with a decimal point position of “2” will be shown as 20.06 kg

Decimal point position can be set from NONE to 0,00000.



MultiRange/Interval:

In the multirange/intervall the indicator can be set to change its stepsize when the weigher signal reaches a certain value.



Range:

This is the number of divisions when the indicator has to display with the next step size.  
Auto ranging is disabled when range size is set to 0.



Step:

The biggest allowed step size must be set in the step field.



Example: The normal step size is per 1, Range =100 and Step=50.

<u>Indicator display</u>	<u>Step size per</u>
0-100	1
100-200	2
200-500	5
500-1000	10
1000-2000	20
2000-5000+	50

The maximum preset tare only works, and this is also the biggest value, to the first level of the autorange when the indicator is set to certified. In this example the preset tare is valid to 100.

#### Mode:

The multi interval function has 2 modes, “Multi range” en “Multi interval”.

With “Multi range” the highest shown stepsize will be reseted after the signal has been lower or equal to “0”.

With “Multi interval” the highest shown stepsize will be resetted after the signal reaches the privious range.



#### Operation Mode:

This parameter defines the operation mode of the unit.

The operation mode can be set at “industrial” or Certified mode.

In industrial mode its always possible to change the indicator parameters and calibration settings.

In certified Mode the unit will be sealed by marks and also the weighing parameters will be blocked to satisfy to the calibration laws.

*A weighing unit must be certified when its used for measuring for trade aims.*



**Note:** If certified mode is selected, the zero band = 4% (+2 and -2%)  
Also zero suppressing is disabled.

Max load:

To prevent overload by the user, the FLEX will not show any weight above this value.

*In certified mode the max load is not allowed to be more than the maximum load + 9 scale parts.*

Stable condition:

The Flex will give a signal when the weigher value is stable within certain values.

The stable function can be set with 2 parameters:

- **Range** (in the selected weigher unit)
- **Time** (milliseconds).

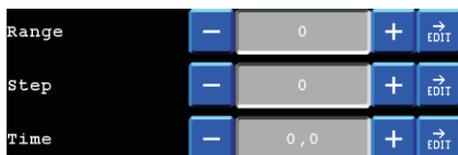
The indicator will give the stable signal when it's within the **range** for the set **time**

Zero tracking:

Zero tracking is able to tune the zero point back to zero when the scale becomes dirty.

The zero tracking can be set with 3 parameters:

- Range**, the maximum offset to tune back to zero.
- Step**, the step size that will be tuned every **time** when the offset is within the Maximum **range**.
- Time**, the time that the signal has to be within the range to tune 1 step back to zero.



**Sample rate:**

The sample rate defines the refreshment speed of the weighing signal.

For example:

If a weighing unit is filling bottles of milk with 1600 gram and the Sample rate is set to 1600 samples/sec the unit is able to fill this bottle in 1 second and see every gram of it, so a accuracy of +/- 1 gram has become possible.

If the same unit is set to a sample rate of 800 samples/sec the unit is still able to fill the bottle in 1 second but it now will see only the halve of the grams, so now a accuracy of +/- 2 gram has become possible.

To get the same accuracy with 800 sample/sec as with 1600 samples/sec the machine should be set to fill the bottles within 2 seconds.

Sample rate can be set at 10, 20, 25, 50, 100, 200, 400, 800 or 1600 samples/sec.



**Note:** The accuracy of a weigher is always depending on the chosen load cells and the mechanical construction.

**Certified text:**

Certified text is only used when the weigher is certified and sealed by an authorized person.

The text will be shown in the weigher screens and will show information about; Serial number, number of calibration certificates, the minimum allowed weight value and the maximum allowed weight value.

This text can only be changed by an authorized person.

**Class:**

The class is only used when the weigher is certified and sealed by an authorized person and depends on the used load cells and the construction.

The class will be shown in the weigher screens.

The class can only be changed by an authorized person.



**Filter:**

Filters are used because in an industrial environment there are always vibrations.

- From machines in the building
- Motors on the weighing device
  - Mixers
  - vibrators
  - screws
  - Etc.
- From the buildings itself.

The purpose of a filter is to get the most steady and reliable weighing signal possible.



Before its possible to enter this menu, the indicator will ask for the “TAC” code. This “TAC” code is shown in the right upper corner.



**Note:** be aware that filters are not a miracle. Good mechanics are very important

Overall:



The overall filter effects the signal which is used in the device.

The overall filter can be set at 0, -6db, -12db, -18db, -24db, -30,db, -36db -42 db and -50 db, where 0 means no effect and -50 is the strongest damping.

The sample rate has effect on the filter strength.  
For fast dosing switch off this filter and use the Digital filter.

To prevent a loss of information or accuracy, don't set the overall filter higher than 24dB.  
When no accuracy is needed, a higher filter setting is allowed to enable extreme filtering.



Digital:



This filter is better known as bessell filter. This filter only works with some sample rates.

The Digital filter can be set at None, Dynamic application and static application.

The Cutoff frequency can be set at 1,0Hz, 1,4Hz, 2,5Hz, 5,0Hz and 10Hz.



Display:

The display filter will damp the weigher signal to the display to get a calm display view.

Filter range:

The filter range is the band where the filter is active.

Display filter:

The display Filter is the strength of the filter.

The display filter can be set at 0, -6db, -12db, -18db, -24db, -30,db, -36db -42 db and -50 db, where 0 means no effect and -50 is the strongest damping.

Display Rate:

The display rate is the refreshment speed of the display.

The display rate can be set at 1, 2, 3, 5, 10 or 25 updates/sec.

Display suppress:

Within this band the indicator will show 0.

When the indicator is certified, this parameter will be disabled.



## Calibration:

Before an indicator can be used, the ADC (Analog Digital Converter) needs to be calibrated. On this way it knows where to start and where to end. The ADC converts the analog output from the load cells to a digital signal, this signal is used for all different calculations and to make it ready for readable information on the display.

To change and check the calibration, select “Calibration” from the indicator setup



Before its possible to enter this menu, the indicator will ask for the “CAL” code. This “CAL” code is shown in the right upper corner.



## Show:

In the calibration show its possible to see and check all calibration information. To show this information, press the “ Show” button.



## TAC:

TAC means “ traceable access code”, every time the calibration is changed this number will increase with 1. When an indicator gets certified this number will be written on the device and is used by the controlling agency to see if the calibration isn’t changed after sealing. So if an indicator is certified its not allowed to change the calibration by an non authorised person.



## Points:

This field shows the amount of existing calibration points. Its possible to have more then 2 calibration points. This is mostly used if the weigher signal in not linear.



## Sample:

Sample shows the direct value of the ADC (analog digital converter). 0 = minimum, 1000000 = maximum.



## Weight:

This field shows the actual weigher value.



## Weight x 10:

This field shows the actual weigher value + an extra digit, so this weigher value is 10 times more accurate then the normal value. This value is needed when the indicator gets certified.

## Example:

The normal weigher value is 10,00 kg  
The weigher value x 10 could be 10,002, 10,001, 10,000, 9,999 or 9,998 kg.



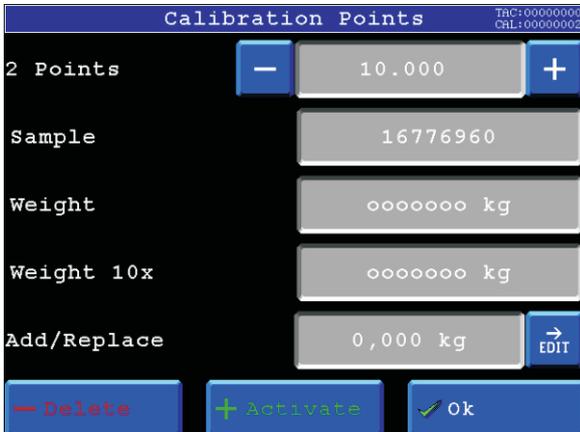
Press the “OK “ button to leave this menu,.

**Points:**

To add or replace new calibration points, press the “Add/Replace” button.



The first 4 fields will show the Weigher status (for explanation, see paragraph “show”)



Add/Replace:

If the indicator must be calibrated for the first time, its needed to delete the old calibration points first. To delete the points, press the “Delete” button.



When all points are deleted, first calibrate the Dead load (0).

Make sure the scale is completely empty and type 0 in the “Add/Replace” field by pressing the “Edit” button.

To save the zero point press the “+ Activate” button.

The Dead load is calibrated now and in the weight and weight x 10 field will appear the actual value.



To make sure the indicator works all right, its needed to calibrate the “Gain” weight. The Gain is the reference of the indicator to make the weigher signal a straight line.

To calibrate the gain weight put a reference weight on the scale.

It doesn't matter what mass it is if only its completely known what the exact weight is.

Press the “Edit” button to type the exact reference weight in the “Add/Replace” field.

To save the reference weight, press the “+ activate” button.

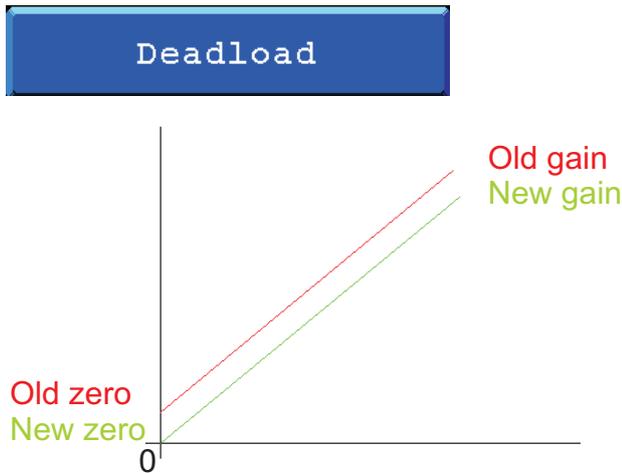
The reference weight is calibrated now and in the weight and weight x 10 field will appear the actual reference weight.



If more points are needed or need to be added later, repeat the gain calibration with an other reference weight.

**Deadload:**

The deadload is used to pull the whole weighing line back to zero.  
The zero point could be different because of some modification on the scale, or dirt.



Its also possible to change the line position if there is weight on the scale.  
To do so, edit the actual weight value to the new known value.



To save the new dead load, press the “Activate” button.

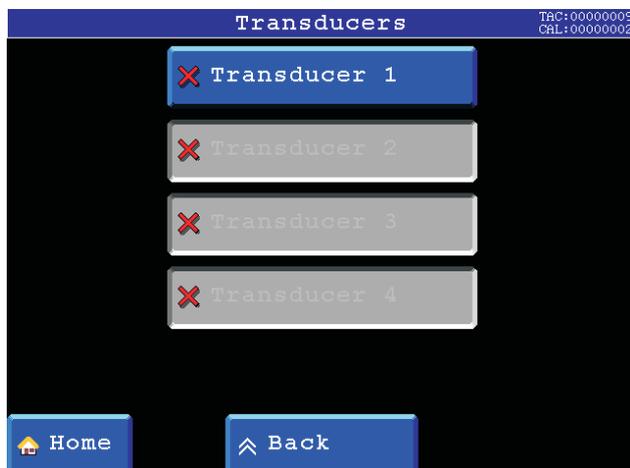
**Transducers:**

In this menu its possible to make a calibration with the information provided with new loadcells. So its not needed to calibrate the weiger with real weights.



When this function is used, normal calibration is disabled.

Its possible to set up a maximum of load cells.To setup the used load cells choose Transducer 1, 2, 3 or 4.



Output:

The Output value will be provided by the supplier of the loadcells.



Output 2,02300 mV/V EDIT

Zero Balance:

The Zero Balance value will be provided by the supplier of the loadcells.



Zero Balance 0,00000 mV/V EDIT

Type:

In this field the type of the loadcells can be edited.



Type loadcell EDIT

Max Load:

The Max load value will be provided by the supplier of the loadcells.



Max Load 100,000 EDIT

Geometric:

After Calibrating with the "Transducer" menu the geometric location and hight of the place where the loadcells are fabricated and the recent location must be filled in.



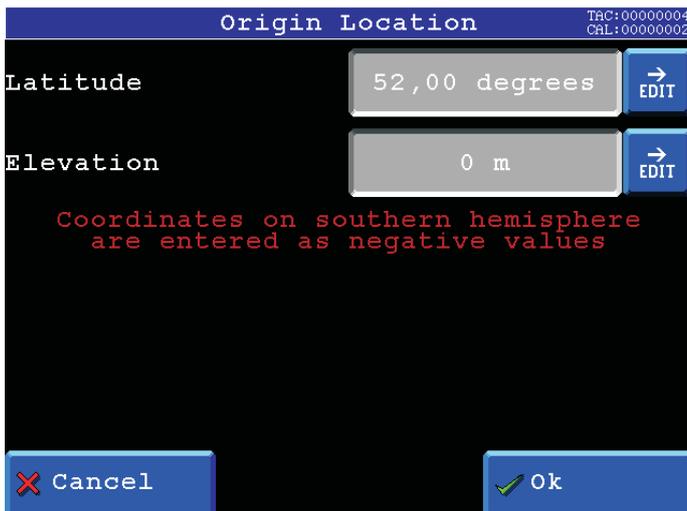
Geometric

Origin:

In the "origin" menu, the latitude and Elevation of the place of fabrication of the loadcells can be edited.



Origin



Origin Location TAC:00000004  
CAL:00000002

Latitude 52,00 degrees EDIT

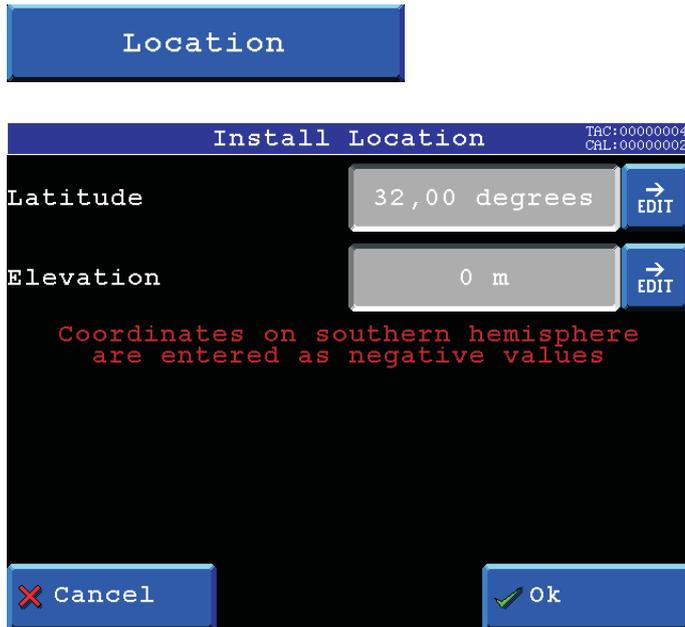
Elevation 0 m EDIT

Coordinates on southern hemisphere  
are entered as negative values

Cancel Ok

Location:

In the "location" menu, the latitude and Elevation of the place of installation can be edited.



Recall:

To set all indicator parameters back to factory settings, select "Recall" from the indicator menu.



Before its possible to enter this menu, the indicator will ask for the "TAC" code. This "TAC" code is shown in the right upper corner.



Press the "OK" button to set the indicator parameters back to factory settings.  
Press the "Cancel" button to leave without setting the parameters back to factory settings.



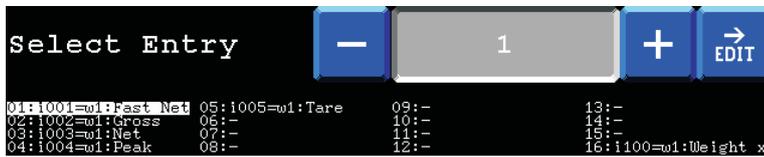
**Indicators:**

This is the place to give a function to the internal indicators.



Select Entry:

In this field its possible to select the line to edit below in the screen.



Local Weigher:

Here you select the physical weigher that the created indicator is based on.



Mode:

Here set the function you want to give to the created indicator.



Options are:

- Weight: (filtered net weigher value that can react on multirange/interval)
- Fast Gross: (unfiltered gross weigher value)
- Fast Net: (unfiltered net weigher value)
- Gross: (filtered gross weigher value)
- Net: (filtered net weigher value)
- Tare: (tare value)
- Peak: (highest reached weigher value can be reset by button peak reset)
- Valley: (lowest reached weigher value can be reset by button valley reset)
- Weight x 10 : (filtered net weigher value shown with extra decimal that can react on multirange/interval)
- Gross x 10: (filtered gross weigher value shown with extra decimal)
- Net x 10: (filtered net weigher value shown with extra decimal)
- Fast gross x 10: (unfiltered gross weigher value shown with extra decimal)
- Fast Net x 10: (unfiltered net weigher value shown with extra decimal)
- Tare x 10: (tare value shown with extra decimal)
- Peak x 10: (highest reached weigher value shown with extra decimal can be reset by button peak reset)
- Valley x 10: (lowest reached weigher value shown with extra decimal can be reset by button valley reset)
- Sample: (direct value got from the loadcell(s))

**Make sure each indicator is only used once!!!**

## Indicator setup 4-channel weigher

In the indicator setup its possible to set all indicator parameters to make sure the indicator will act properly.

To reach this Setup see below



The different options are:

- Weigher 1
- Weigher 2
- Weigher 3
- Weigher 4
- Indicators
- Info



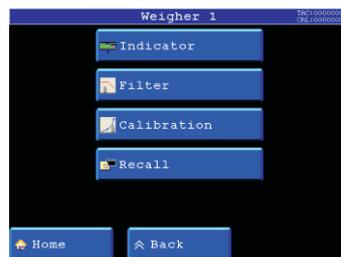
### Weigher 1 (2,3 and 4):

To make the different settings, select “Weigher 1” from the indicator setup



The different options are:

- Indicator
- Filter
- Calibration
- Recall



Before its possible to enter this menu, the indicator will ask for the “TAC” code. This “TAC” code is shown in the right upper corner.



### Indicator name:

With an indicator name the indicator will be unique within the application. So it's easy to recognize it in the process and/or in the factory.

For example:  
Silo 1, Scale, etc.

The indicator name can have a maximum of 16 characters.

To change the indicator name, press the “EDIT” button behind the name and change it.



Unit label:

The unit label defines the unit of measurement.

The unit label is the value of a quantity, chosen by convention as a reference for measuring quantities of the same kind.

For example:

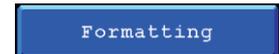
, - t (ton) kg (kilo gram), g (gram), but can also be L (liter), lbs (pounds), etc.

The unit label can have a maximum of 4 characters.

Formatting:

Formatting defines the way that the weigher value will be shown.

To change the formats of the indicator, press the “Formatting” button.

Step size:

The step size defines the scaled parts of the weight value.

Example: Weigher value is 2003 kg

Step size	Display value
1	2003 kg
2	2004 kg
5	2005 kg
10	2000 kg

The display value will be round off to the nearest value with a valid step size.

Step size can be set at 1, 2, 5, 10, 20, 50, 100, 200.

Decimal point:

The Decimal point defines the point position of the weight value.

Example: value 2006 kg with a decimal point position of “2” will be shown as 20.06 kg

Decimal point position can be set from NONE to 0,00000.

MultiRange/Interval:

In the multirange/intervall the indicator can be set to change its stepsize when the weigher signal reaches a certain value.

MultiRange/Interval

Range:

This is the number of divisions when the indicator has to display with the next step size.

Auto ranging is disabled when range size is set to 0.

Step:

The biggest allowed step size must be set in the step field.



Example: The normal step size is per 1, Range =100 and Step=50.

<u>Indicator display</u>	<u>Step size per</u>
0-100	1
100-200	2
200-500	5
500-1000	10
1000-2000	20
2000-5000+	50

The maximum preset tare only works, and this is also the biggest value, to the first level of the autorange when the indicator is set to certified. In this example the preset tare is valid to 100.

#### Mode:

The multi interval function has 2 modes, “Multi range” en “Multi interval”.

With “Multi range” the highest shown stepsize will be reseted after the signal has been lower or equal to “0”.

With “Multi interval” the highest shown stepsize will be resetted after the signal reaches the privious range.



#### Operation Mode:

This parameter defines the operation mode of the unit.

The operation mode can be set at “industrial” or Certified mode.

In industrial mode its always possible to change the indicator parameters and calibration settings.

In certified Mode the unit will be sealed by marks and also the weighing parameters will be blocked to satisfy to the calibration laws.

*A weighing unit must be certified when its used for measuring for trade aims.*



**Note:** If certified mode is selected, the zero band = 4% (+2 and -2%)  
Also zero suppressing is disabled.

Max load:

To prevent overload by the user, the FLEX will not show any weight above this value.

*In certified mode the max load is not allowed to be more than the maximum load + 9 scale parts.*

Stable condition:

The Flex will give a signal when the weigher value is stable within certain values.

The stable function can be set with 2 parameters:

- **Time** (milliseconds).
- **Range** (in the selected weigher unit)

The indicator will give the stable signal when it's within the **range** for the set **time**

Zero tracking:

Zero tracking is able to tune the zero point back to zero when the scale becomes dirty.

The zero tracking can be set with 3 parameters:

- **Time**, the time that the signal has to be within the range to tune 1 step back to zero.
- **Range**, the maximum offset to tune back to zero.
- **Step**, the step size that will be tuned every **time** when the offset is within the Maximum **range**.



**Sample rate:**

The sample rate defines the refreshment speed of the weighing signal.

For example:

If a weighing unit is filling bottles of milk with 1600 gram and the Sample rate is set to 1600 samples/sec the unit is able to fill this bottle in 1 second and see every gram of it, so a accuracy of +/- 1 gram has become possible.

If the same unit is set to a sample rate of 800 samples/sec the unit is still able to fill the bottle in 1 second but it now will see only the halve of the grams, so now a accuracy of +/- 2 gram has become possible.

To get the same accuracy with 800 sample/sec as with 1600 samples/sec the machine should be set to fill the bottles within 2 seconds.

Sample rate can be set at 10, 20, 25, 50, 100, 200, 400, 800 or 1600 samples/sec.



**Note:** The accuracy of a weigher is always depending on the chosen load cells and the mechanical construction.

**Certified text: (this is device dependent, not weigher dependent)**

Certified text is only used when the weigher is certified and sealed by an authorized person.

The text will be shown in the weigher screens and will show information about; Serial number, number of calibration certificates, the minimum allowed weight value and the maximum allowed weight value.

This text can only be changed by an authorized person.

**Class:**

The class is only used when the weigher is certified and sealed by an authorized person and depends on the used load cells and the construction.

The class will be shown in the weigher screens.

The class can only be changed by an authorized person.



**Filter:**

Filters are used because in an industrial environment there are always vibrations.

- From machines in the building
- Motors on the weighing device
  - Mixers
  - vibrators
  - screws
  - Etc.
- From the buildings itself.

The purpose of a filter is to get the most possible steady and reliable weighing signal.



Before its possible to enter this menu, the indicator will ask for the “TAC” code. This “TAC” code is shown in the right upper corner.



**Note:** be aware that filters are not a miracle. Good mechanics are very important

Overall:



The overall filter effects the signal which is used in the device. The overall filter can be set at 0, -6db, -12db, -18db, -24db, -30,db, -36db -42 db and -50 db, where 0 means no effect and -50 is the strongest damping.

The sample rate has effect on the filter strength. For fast dosing switch off this filter and use the Digital filter.



Digital:



This filter is better known as bessel filter. This filter only works with some sample rates. The Digital filter can be set at None, Dynamic application and static application. The Cutoff frequency can be set at 1,0Hz, 1,4Hz, 2,5Hz, 5,0Hz and 10Hz.



Display:



The display filter will damp the weigher signal to the display to get a calm display view.

Filter range:

The filter range is the band where the filter is active.



Display filter:

The display Filter is the strength of the filter.

The display filter can be set at 0, -6db, -12db, -18db, -24db, -30,db, -36db -42 db and -50 db, where 0 means no effect and -50 is the strongest damping.



Display Rate:

The display rate is the refreshment speed of the display.

The display rate can be set at 1, 2, 3, 5, 10 or 25 updates/sec.



Display suppress:

Within this band the indicator will show 0.

When the indicator is certified, this parameter will be disabled.

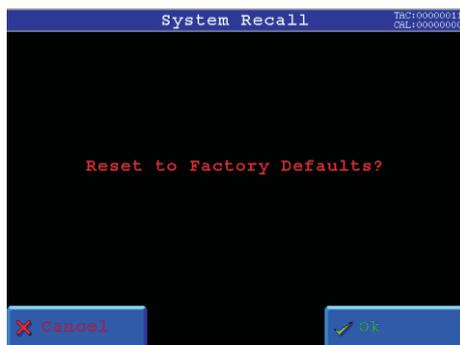


**Recall:**

To set all indicator parameters back to factory settings, select “Recall” from the indicator menu.



Press the “OK” button to set the indicator parameters back to factory settings.  
Press the “Cancel” button to leave without setting the parameters back to factory settings.



**Calibration:**

Before an indicator can be used, the ADC (Analog Digital Converter) needs to be calibrated. On this way it knows where to start and where to end. The ADC converts the analog output from the load cells to a digital signal, this signal is used for all different calculations and to make it ready for readable information on the display.

To change and check the calibration, select “Calibration” from the indicator setup



Before its possible to enter this menu, the indicator will ask for the “CAL” code. This “CAL” code is shown in the right upper corner.



**Show:**

In the calibration show its possible to see and check all calibration information. To show this information, press the “ Show” button.



**TAC:**

TAC means “ traceable access code”, every time the calibration is changed this number will increase with 1. When an indicator gets certified this number will be written on the device and is used by the controlling agency to see if the calibration isn’t changed after sealing. So if an indicator is certified its not allowed to change the calibration by an non authorised person.



**Points:**

This field shows the amount of existing calibration points. Its possible to have more then 2 calibration points. This is mostly used if the weigher signal in not linear.



**Sample:**

Sample shows the direct value of the ADC (analog digital converter). 0 = minimum, 1000000 = maximum.



**Weight:**

This field shows the actual weigher value.



**Weight x 10:**

This field shows the actual weigher value + an extra digit, so this weigher value is 10 times more accurate then the normal value. This value is needed when the indicator gets certified.

**Example:**

The normal weigher value is 10,00 kg  
The weigher value x 10 could be 10,002, 10,001, 10,000, 9,999 or 9,998 kg.



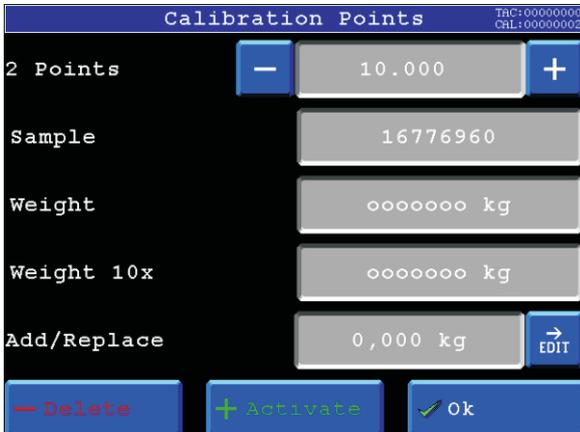
Press the “OK “ button to leave this menu,.

**Points:**

To add or replace new calibration points, press the “Add/Replace” button.



The first 4 fields will show the Weigher status (for explanation, see paragraph “show”)



Add/Replace:

If the indicator must be calibrated for the first time, its needed to delete the old calibration points first. To delete the points, press the “Delete” button.



When all points are deleted, first calibrate the Dead load (0).

Make sure the scale is completely empty and type 0 in the “Add/Replace” field by pressing the “Edit” button.

To save the zero point press the “+ Activate” button.

The Dead load is calibrated now and in the weight and weight x 10 field will appear the actual value.



To make sure the indicator works all right, its needed to calibrate the “Gain” weight. The Gain is the reference of the indicator to make the weigher signal a straight line.

To calibrate the gain weight put a reference weight on the scale.

It doesn't matter what mass it is if only its completely known what the exact weight is.

Press the “Edit” button to type the exact reference weight in the “Add/Replace” field.

To save the reference weight, press the “+ activate” button”.

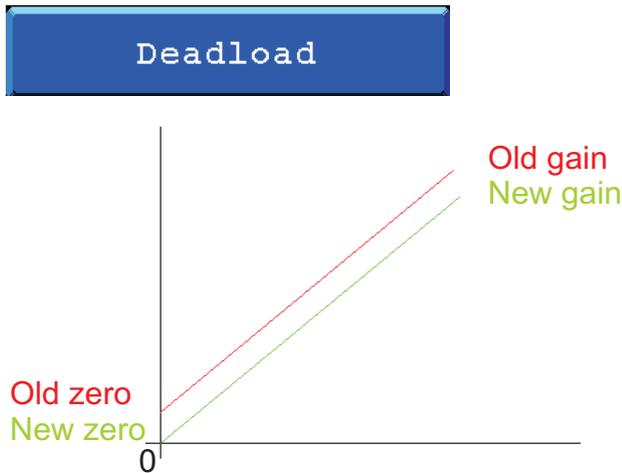
The reference weight is calibrated now and in the weight and weight x 10 field will appear the actual reference weight.



If more points are needed or need to be added later, repeat the gain calibration with an other reference weight.

**Deadload:**

The deadload is used to pull the whole weighing line back to zero. The zero point could be different because of some modification on the scale, or dirt.



Its also possible to change the line position if there is weight on the scale. To do so, edit the actual weight value to the new known value.



To save the new dead load, press the “Activate” button.

**Transducers:**

In this menu its possible to make a calibration with the information provided with new loadcells. So its not needed to calibrate the weiger with real weights.



When this function is used, normal calibration is disabled.

Its possible to set up a maximum of load cells.To setup the used load cells choose Transducer 1, 2, 3 or 4.



Output:

The Output value will be provided by the supplier of the loadcells.



Output 2,02300 mV/V EDIT

Zero Balance:

The Zero Balance value will be provided by the supplier of the loadcells.



Zero Balance 0,00000 mV/V EDIT

Type:

In this field the type of the loadcells can be edited.



Type loadcell EDIT

Max Load:

The Max load value will be provided by the supplier of the loadcells.



Max Load 100,000 EDIT

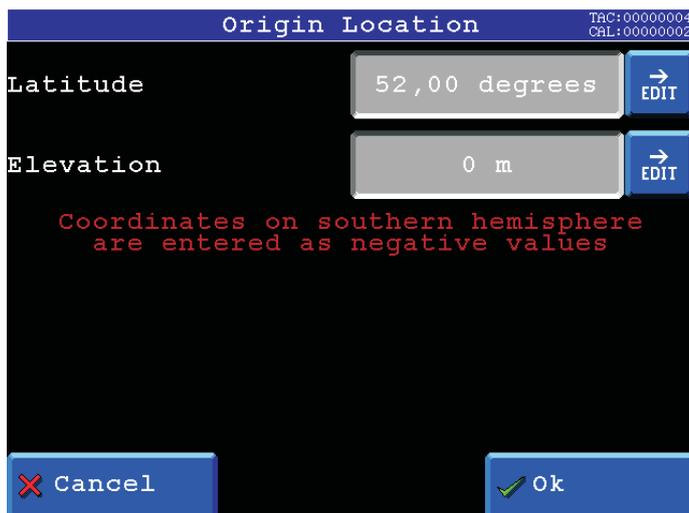
Geometric:

After Calibrating with the “Transducer” menu the geometric location and hight of the place where the loadcells are fabricated and the recent location must be filled in.



Origin:

In the” origin” menu, the latitude and Elevation of the place of fabrication of the loadcells can be edited.



Origin Location TAC:00000004  
CAL:00000002

Latitude 52,00 degrees EDIT

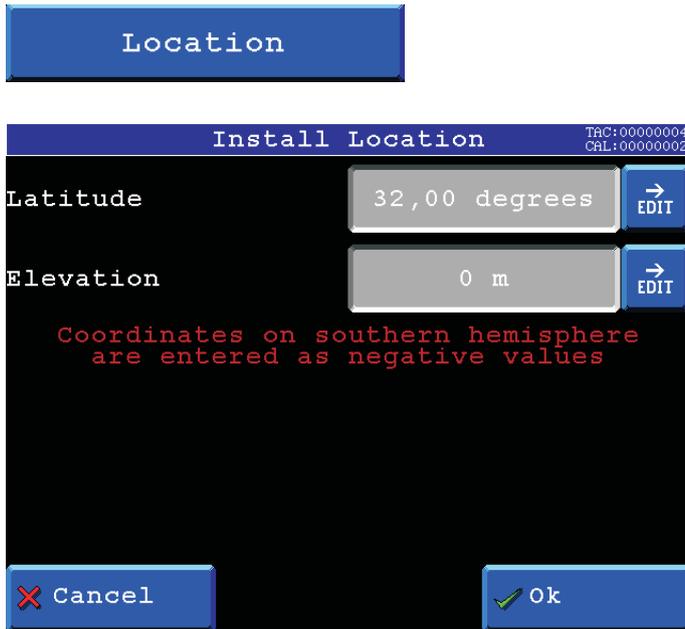
Elevation 0 m EDIT

Coordinates on southern hemisphere  
are entered as negative values

Cancel Ok

Location:

In the "location" menu, the latitude and Elevation of the place of installation can be edited.



Recall:

To set all indicator parameters back to factory settings, select "Recall" from the indicator menu.



Press the "OK" button to set the indicator parameters back to factory settings.  
Press the "Cancel" button to leave without setting the parameters back to factory settings.



**Indicators:**

This is the place to give a function to the internal indicators.



Select Entry:

In this field its possible to select the line to edit below in the screen.



Local Weigher:

Here you select the physical weigher that the created indicator is based on.



Mode:

Here set the function you want to give to the created indicator.



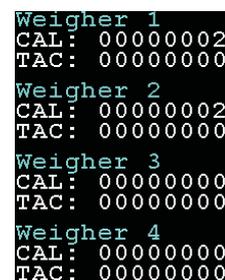
Options are:

- Weight: (filtered net weigher value that can react on multirange/interval)
- Fast Gross: (unfiltered gross weigher value)
- Fast Net: (unfiltered net weigher value)
- Gross: (filtered gross weigher value)
- Net: (filtered net weigher value)
- Tare: (tare value)
- Peak: (highest reached weigher value can be reset by button peak reset)
- Valley: (lowest reached weigher value can be reset by button valley reset)
- Weight x 10 : (filtered net weigher value shown with extra decimal that can react on multirange/interval)
- Gross x 10: (filtered gross weigher value shown with extra decimal)
- Net x 10: (filtered net weigher value shown with extra decimal)
- Fast gross x 10: (unfiltered gross weigher value shown with extra decimal)
- Fast Net x 10: (unfiltered net weigher value shown with extra decimal)
- Tare x 10: (tare value shown with extra decimal)
- Peak x 10: (highest reached weigher value shown with extra decimal can be reset by button peak reset)
- Valley x 10: (lowest reached weigher value shown with extra decimal can be reset by button valley reset)
- Sample: (direct value got from the loadcell(s))

**Make sure each indicator is only used once!!!**

**Info:**

Here the CAL and TAC code will be shown per weigher..



**In/Outputs:**

In this menu its possible to setup the Inputs, Outputs and analog inputs and ouputs for the different processes.

To go to this menu, select “In/Outputs” from the System setup.



Different options are:

- Inputs
- Outputs/Levels

**Inputs:**



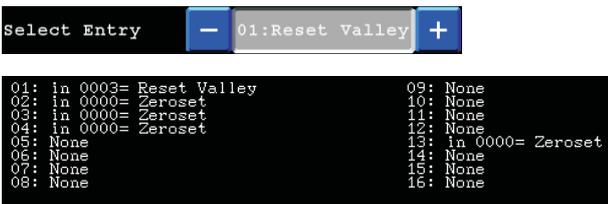
All inputs can be configured as different functions.

Different functiions are:

- None (not used)
- Zeroset
- Zeroreset
- Tareset
- Tarereset
- Print
- Reset peak
- Reset Valley
- Next screen
- Screen lock
- Start (Starts the program sequence)
- Stop (Stops the program sequence)
- Wait (Pauses the program sequence)

**Select Entry:**

In this field its possible to select the line to edit below in the screen.



**Select Entry:**

In this field its possible to select the function to link to the selected line.



**Input:**

In this field its possible to select the input to link to the selected line.



**Indicator: (only on 4-channel Flex weigher)**

In this field its possible to select the Indicator to link the weigher based function to.



***For Flex Indicator only!!!***

Outputs/Levels:

To setup the outputs, press the “Outputs/levels” button.



Outputs/Level 1-8:

Here you can select the function of outputs 1-8.



Mode:

In this field its possible to select weigher mode that the output has to switch on. Different modes are:

- Fast Gross kg (unfiltered gross weigher value)
- Fast Net kg (unfiltered net weigher value)
- Gross kg (filtered gross weigher value)
- Net kg (filtered net weigher value)
- Tare kg (tare value)
- Peak kg (highest reached weigher value can be reset by button peak reset)
- Valley kg (lowest reached weigher value can be reset by button valley reset)



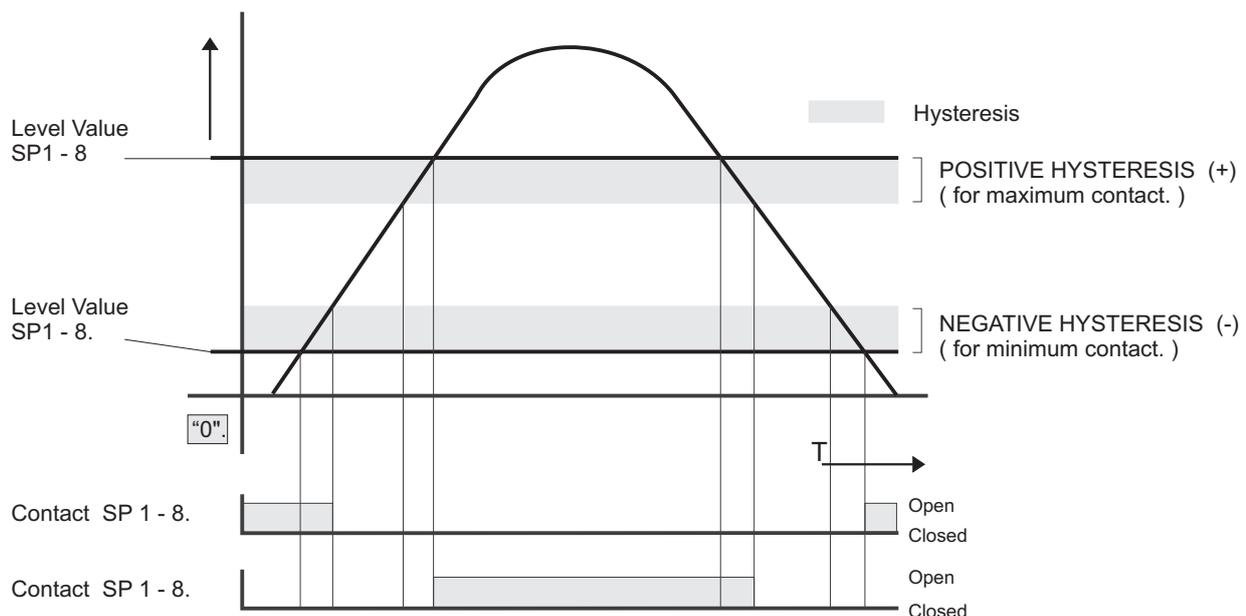
Level:

In this field you can set the level at which the output will switch on.



Hysteresis:

In this field you can set the hysteresis for the outputs. (see diagram below)



ADC setup:

To setup the analog inputs, press the “ADC setup” button.



At first select the number of the slot and the channel to edit.



ExternalRegisters:

In this field its possible to choose the external register wich must be coupled to the analog input.



Mode:

In this field its possible to select the used input signal.  
Different modes are:

Port 1 and 2:

- RAW (input value from 0 to 24 mA will be calculated from 0 to 65000 parts)
- 0 - 24 mA (input value 0 to 24 mA will be calculated from 0 to 100,00%)
- 0 - 20 mA (input value 0 to 20 mA will be calculated from 0 to 100,00%)
- 4 - 20 mA (input value 4 to 20 mA will be calculated from 0 to 100,00%)
- 4 - 24 mA (input value 4 to 24 mA will be calculated from 0 to 100,00%)

Port 3 and 4:

- RAW (input value from 0 to 10 V will be calculated from 0 to 65000 parts)
- 0 - 10 V (input value 0 to 10 V will be calculated from 0 to 100,00%)



DAC setup:

To setup the analog outputs, press the “DAC setup” button.



At first select the number of the slot and the channel to edit.



ExternalRegisters:

In this field its possible to choose the external register wich must be coupled to the analog input.



**Mode:**

In this field its possible to select the needed output signal.

Different modes are:

- RAW (register value from 0 to 6500 will be calculated from 0 to 65000 parts)
- 0 - 24 mA (input value 0 to 24 mA will be calculated from 0 to 100,00%)
- 0 - 20 mA (input value 0 to 20 mA will be calculated from 0 to 100,00%)
- 4 - 20 mA (input value 4 to 20 mA will be calculated from 0 to 100,00%)
- 4 - 24 mA (input value 4 to 24 mA will be calculated from 0 to 100,00%)



**Passwords:**

In this menu it is possible to setup passwords to block access to certain parts of the menu.

To go to this menu, select “Passwords” from the System setup menu.

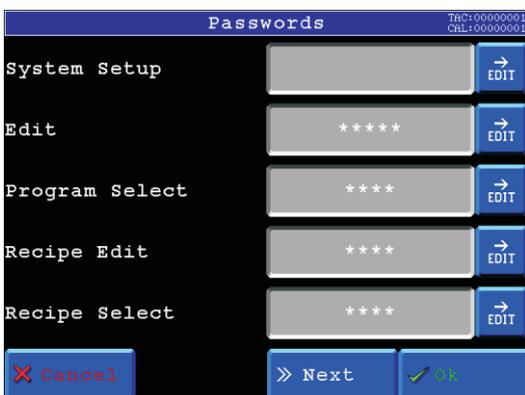


You are asked for a password. This is default turned off so you can just press “OK”. If there is a password set up fill it in here, and press “OK”



Now you can change (setup) passwords for the following menu options.

- System Setup (This blocks all menu options)
- Edit (This makes the menu read-only)
- Program Select (This blocks the option to select a different program)
- Recipe Edit (This blocks the option to change recipe parameters)
- Recipe Select (This blocks the option to select an other recipe)
- Set Time/Date (This blocks the option to change the time and date)



When changing a password you are asked to fill in a new password twice.

If the two passwords you filled in are not identical, the password will not be changed and you can try again.

**Screen setup:**

In this menu its possible to setup the four Main screens, operator buttons, screen colours and calibrate the touchscreen..

To go to this menu, select “Screen setup” from the System setup menu.



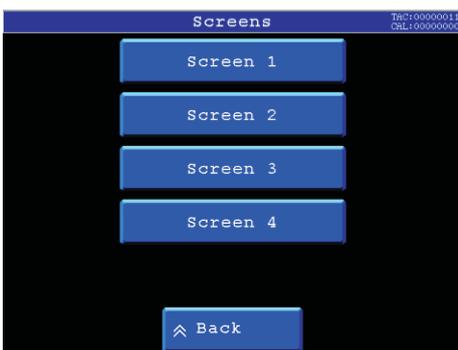
Different options are:

- Screens
- Buttons
- Colours
- Led Bar
- Calibrate screen
- Backlight&Buzzer
- Company Name

Screens:

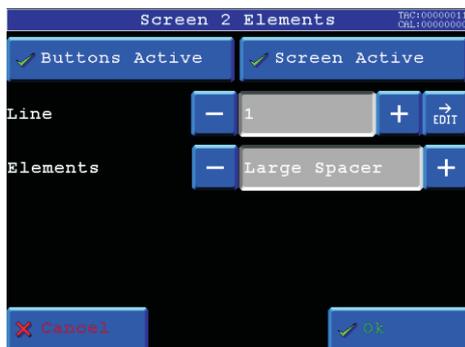


In this menu the four main screens can be set.



Screen 1-4:

To edit a screen, select a screen.



Buttons active:



Enabled

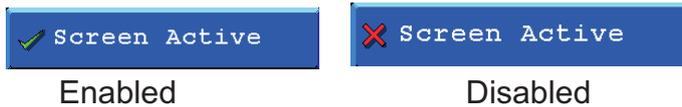


Disabled

With this option its possible to enable or disable the menu/screen buttons in the selected screen.

In screen 1 the buttons are always active.

Screen active:



With this option its possible to enable or disable the selected screen.  
Screen 1 is always active.

Line:

Each screen can display up to 7 different elements.  
The real available lines are depending on the size of the used elements.

Different elements are:

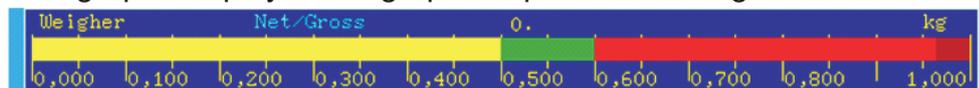
- Off: No element selected for this line.
- Small spacer: An empty line of 5 pixels.
- Large spacer: An empty line of 50 pixels.
- Large indicator: An indicator with big display which can show, Nett/tarre, gross, filtered nett, filtered gross, peak, valley and tare.



- Small indicator: An indicator with small display witch can be linked to, Nett/tarre, gross, filtered nett, filtered gross, peak, valley and tare.



- Bargraph: Displays a bargraph coupled to the weigher.



- Buttons: Displays the weigher buttons.



- I/O status: Displays the 4 outputs/levels.

Buttons:

In this menu you can enable/disable buttons that are shown on the main screens.

Enable/disable:

By pressing the buttons, the button will be enabled/disabled.



Enabled



Disabled

Colours:

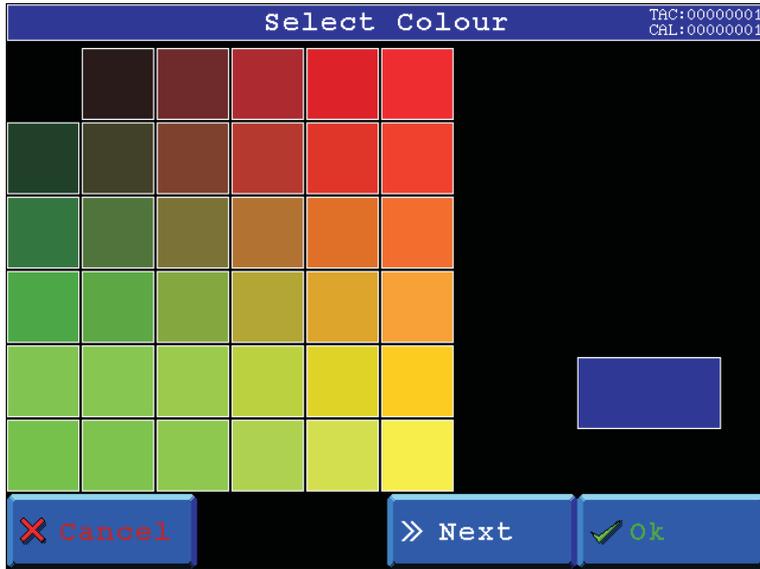
In this menu it's possible to setup the colours of your Flex. this way it is possible to customize it to your own style.

Different options are:

- Header Background
- Header Frame
- Header Text
- Screens Background
- Element Background
- Element Frame
- Element Text
- Element Labels
- Menu Background
- Menu Text
- Disabled Rtext
- Element Readout
- Button Face
- Recall Defaults

Select colour

By pressing one of the buttons you can change the colour of that part of the flex screen. The colour that is shown on the right site is the colour that you selected.



Header Background:



Here you can change the colour of the background of the header.



Header Frame:



Here you can change the colour of the frame around the header and the TAC and CAL code.



Header Text:



Here you can change the colour of the text that is in the header. (in this example "Colours")



Header Text:



Here you can change the colour of the background of the standard Flex screens. (not the custom screens)

Element Background:



Element Background

Here you can change the colour of the background of the standard elements on the standard Flex screens. The elements that are affected are:

- Large Indicator
- Small Indicator
- Bargraph
- History View
- Process Data

Element Frame:



Element Frame

Here you can change the colour of the frame around the standard elements on the standard Flex screens. The elements that are affected are:

- Large Indicator
- Small Indicator
- Bargraph
- History View
- Process Data

Element Text:



Element Text

Here you can change the colour of the text of the standard elements on the standard Flex screens. The elements that are affected are:

- Large Indicator
- Small Indicator
- Bargraph
- History View
- Process Data

Element Labels:



Element Labels

Here you can change the colour of the labels that are used in the standard elements on the standard Flex screens. The elements that are affected are:

- Large Indicator
- Small Indicator
- Bargraph
- History View
- Process Data

Menu Background:



Menu Background

Here you can change the colour of the background in the menu.

Menu Text:



Menu Text

Here you can change the colour of the text on the menu buttons.

Disabled Text:



Here you can change the colour of text of units that are disabled in the menu

Element Readout:



Here you can change the colour of the readout text of the standard elements on the standard Flex screens. The elements that are affected are:

- Large Indicator
- Small Indicator
- Process Data

Button Face:



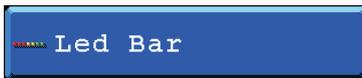
Here you can change the colour buttons in the menu and in the standard flex screens

Recall Defaults:



Here you can reset all colours to the factory default settings.

Led Bar:



In this menu you can setup the Bargraph and the history view that you can place on your screen.

Bar Style:



Here you can select what kind of led bar you want. You can choose from:

- Bar
- Dot
- Bar Peak
- Dot Peak
- Bar Reversed
- Dot Reversed

Bar Levels:



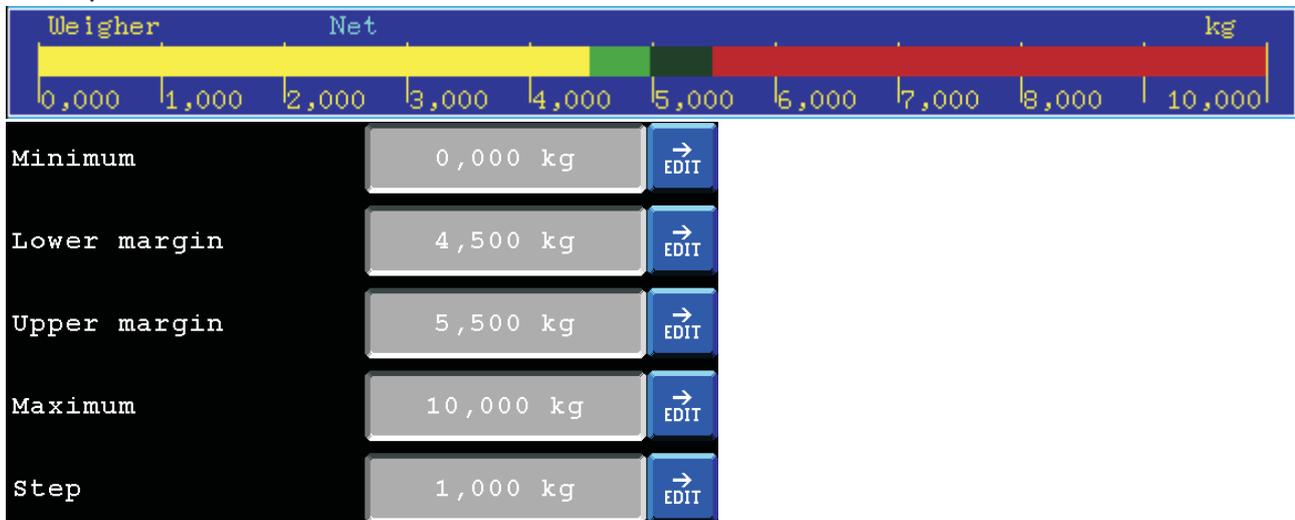
Here you can select what kind of led bar you want. You can choose from:

- Normal
- CheckWeigher

Set Levels:

Here you can setup the levels for the led bar. These are also the settings for the history view.

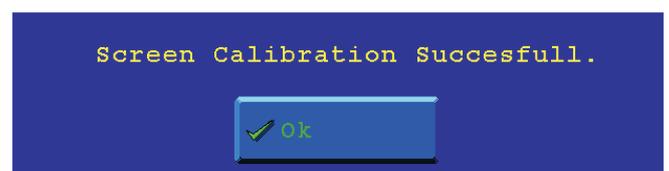
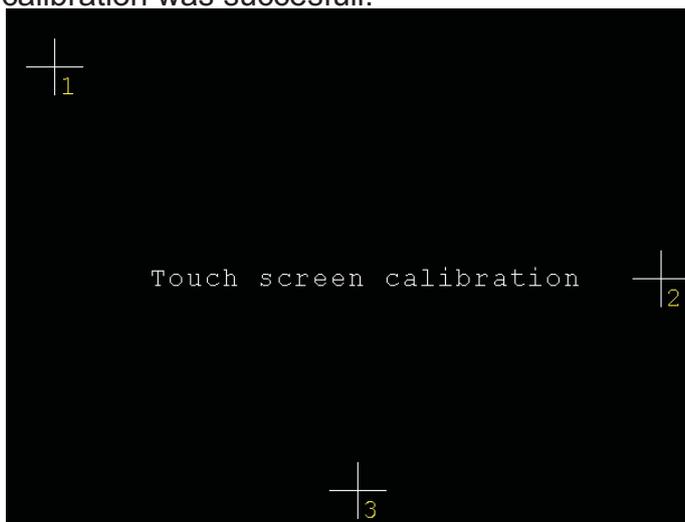
Example:

Marker Trigger:

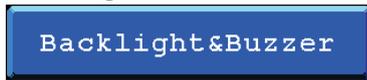
Here you can setup the marker that triggers the drawing of a new bar in the history view. everytime the marker is turned on or off a new bar appears.

Calibrate Screen:

Here you can calibrate the touchscreen. press 1,2,3 in the right sequence in the middle of the cross to calibrate. When this is done correctly a popup screen will appear showing that the calibration was successful.



**Backlight&Buzzer:**



Here you can setup the backlight, the buzzer and the visualization update speed.

**Level:**

Here you can change the brightness of the Flex screen.  
0=dark 255=bright



**Key Beep:**

Here you can enable/disable the key beep of the Flex.  
When this is enabled every time you hit a button the flex gives a beep.



Key beep enabled

key beep disabled

**Visualization priority:**

Here you can setup the update speed of the visualization screens.  
0=the program has higher priority as the visualization this makes the program little faster.  
1=the program has the same priority as the visualization  
2= the program has lower priority as the visualization, this will make the program a little slower.



**Company Name:**



Here you can setup your company information.  
The information you can add is:

- Name
- Street
- City
- Telephone
- Fax
- Web address

This will appear in Info in the menu.



**Set clock:**

In this menu it's possible to setup the internal time and date.

Time:

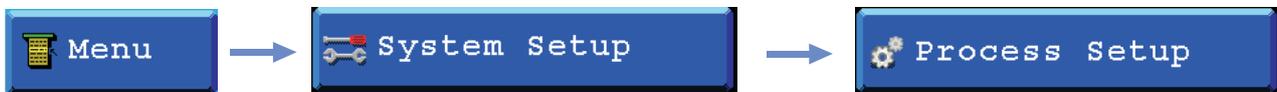
Setup the internal time.

Date:

Setup the internal date.

**Process Setup:**

In this menu it is possible to setup the number of programs and recipes that are enabled. And set up the E-mark marker and Extended register.

Programs:

Setup the number of programs that is enabled.

Recipes:

Setup the number of Recipes that is enabled.

Marker:

Setup the start marker for the E-Mark. This and following 15 markers will be used for the Emark.

Extendend Register:

Setup the start Extended register for the E-Mark. This and following 4 Extended resgisters will be used for the Emark. .



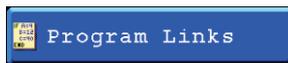
**Labels & Links:**

In this menu its possible to setup names for programs, recipes and indicators.



The different options are:

- Program Links
- Recipe Links
- Indicator Links
- Labels

Program Links:

Here you can setup a name for the programs of the Flex.

Program Number:

Select the number of the program you want to change.

Name Link:

Select the number of the label you want to use for this program name.

Name:

Here you can change the text of the label that will be used as a name for this program number.

Recipe Links:

Here you can setup a name for the recipes of the Flex.

Recipe Number:

Select the number of the recipe you want to change.

Name Link:

Select the number of the Label you want to use for this recipe name.

Name:

Here you can change the text of the label that will be used as a name for this recipe number.



Indicator Links:



Here you can setup a name for the internal indicators of the Flex.

Indicator Number:

Select the number of the indicator you want to change.



Name Link:

Select the number of the Label you want to use for this indicator name.



Name:

Here you can change the text of the label that will be used for this indicator.



Unit link:

Select the number of the Label you want to use for showing the indicators unit.



Unit:

Here you can change the text of the label that will be used for this indicators unit.(kg, lbs, pcs, etc.).



Labels:



Here you can change (setup) texts for labels.

Label:

Select the number of the Label you want to change.



Name:

Here you can change the text of the label.



**Printer:**

To setup the printer settings, select “printer” from the System setup.



Setup:

In this menu the printer properties can be set.



Printer layout:

In the printer layout the way results are printed can be set.

Different layouts are:

- None (no printer ticket)
- Ticket (Results are printed under each other)
- Line (results are printed after each other).



Columns: Set the length of the printer ticket.



Rows:

Set the number of empty lines after printing.



Margin:

Set the number of empty spaces before printing.



Printer newline:

Set the end of line sequence selection.

Different settings are:

- None
- CR
- LF
- CR+LF
- CR+00
- Zebra ZPL II

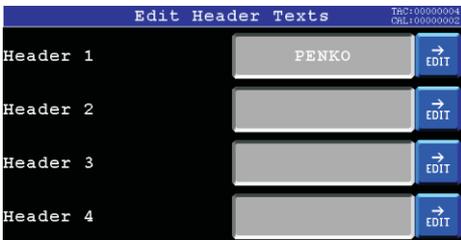


**Header:**

In this menu its possible to edit the haeder names.  
Up to 4 headers can be set.

**Header 1-4:**

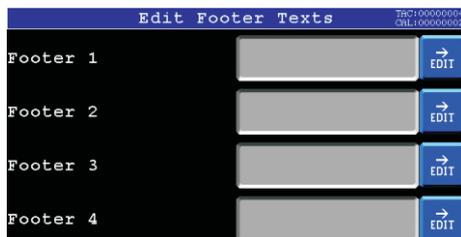
Edit the names of the 4 headers.

**Footer:**

In this menu its possible to edit the footer names.  
Up to 4 footers can be set.

**Footer 1-4:**

Edit the names of the 4 footers.

**System Recall:**

To set all settings back to factory settings, select "System Recall" from the System setup.

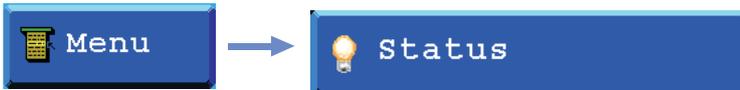


Press the "OK" button to set all settings back to factory settings.  
Press the "Cancel" button to leave without setting back to factory settings.



**Status:**

Its possible to show the status of the inputs, outputs and indicator scope..  
To go to this menu, press the “status”button from the main menu..



Slots, I/O + markers, Indicators, Ext.Registers, Scope, Debug and Log

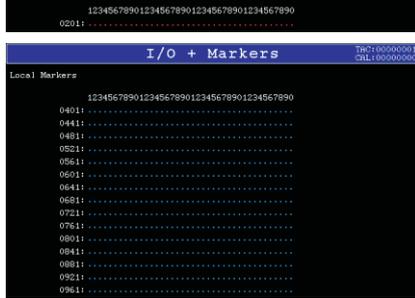
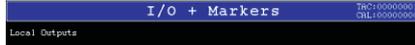
Slots:

In this screen all available boards are shown.



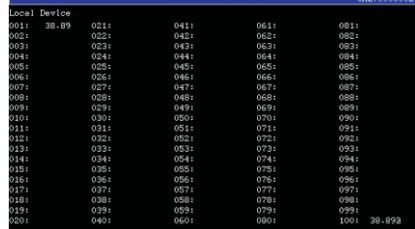
I/O + Markers:

In this screen the status of all in-, outputs and markers can be shown.



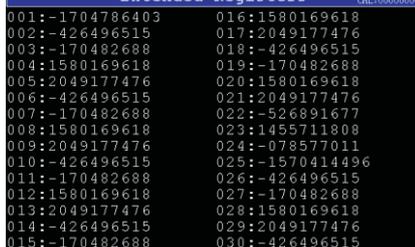
Indicators:

In this screen the available indicators can be shown.



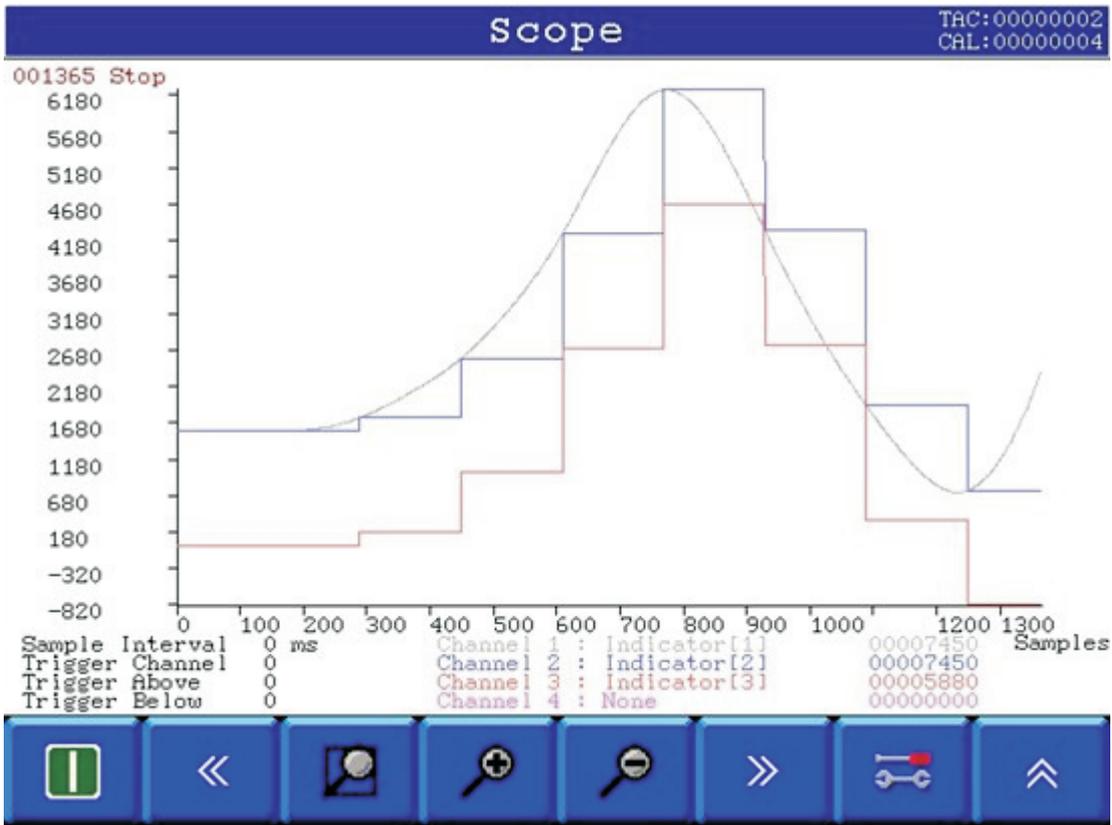
Extended Registers:

In this screen the available extended registers can be shown.



Scope:

In this screen the indicator signal can be shown as scope.



In this example the sample rate is set to the maximum of 1600 samples/sec by setting the interval to 0ms. Under system setup->Indicator setup-> indicators the different indicators have been setup:

- 1: Fast Gross Weigher 1
- 2: Gross Weigher 1. This setting follows the selected display speed.
- 3: Weight Weigher 1. This setting also follows the selected display speed multirange settings and net/tare selection.

The resulting waveform clearly shows the difference between Gross and Fast gross for measuring a fast signal.



Starts measuring or arms the trigger. When triggering is selected, the signal must be within the selected levels before the data is stored. While armed or measuring, this button becomes a stop button to interrupt the current measurement



Scroll buttons are used to scroll the waveform half a screen forward or backward when zoomed in on a waveform. When the entire waveform is displayed these buttons have no function.



Zoom all. This button sets the scale factors to fit the entire waveform on the screen. The highest and lowest values are used to select the units. entering the scope function or program one of the inputs to start the program.



Zoom buttons are used to zoom in or out on the waveform. Only the X-axis is zoomed. To change the Y-axis, the settings menu can be used.



The settings menu contains all scope settings.



The Back button stops the scope function and returns to the FLEX menu. To ensure maximum performance of the FLEX, the scope can't capture data when outside the scope menus.

To capture measurements while a program is running you can start the program before entering the scope function or program one of the inputs to start the program.

### Scope settings

For each of the four channels the source signal can be selected:

Type	Number	Function
Register	1-10	Contains PLC program results
Extended register	1-900	Contains PLC program or visualization results
Indicator	1-100	Contains weigher data or measured values from external devices
Input	1-200	Inputs – to ensure levels are visible on screen the values are 100 for 'off' and 300 for 'on'
Output	201-400	Outputs – to ensure levels are visible on screen the values are 100 for 'off' and 300 for 'on'
Markers	401-1000	Outputs – to ensure levels are visible on screen the values are 100 for 'off' and 300 for 'on'

### Timebase and trigger settings

This menu is used to select the measurement speed and levels at which to start measuring data.

#### Sample interval

This sets the interval at which measurements are taken in ms. 1ms gives 1000 measurements per second. Setting this to 1000 will give one measurement per second. Selecting 0 ms gives the highest measuring speed of 1600 samples/sec.



#### Trigger channel

This selects the channel to use to trigger or start measuring. By setting the levels accordingly measurements can start on for instance the weight rising above a selected value or an input detecting a product.



**Trigger above**

Selects the value above which the scope will start measuring data.

**Trigger below**

Selects the value below which the scope will start measuring data.

**Scale**

This menu sets the waveform zoom and display settings.

**X maximum**

Sets the lowest value to display on the horizontal axis. This value is changed by the Zoom and scroll buttons.

**X minimum**

Sets the lowest value to display on the horizontal axis. This value is changed by the Zoom and scroll buttons.

**Y maximum**

Sets the highest value to display on the vertical axis. This value is changed by the 'zoom all' button.

**Y minimum**

Sets the lowest value to display on the vertical axis. This value is changed by the 'zoom all' button.

**X axis**

Select sample number or milliseconds to use as unit or a channel number to use for the horizontal axis.

**Show grid**

Select this to draw a grid over the scope screen.



**Debug:**

In this screen the cycle time can be shown.

```
Cycle Time: 683us
```

**Log:**

In this screen the cycle program can be shown. this can be used by Penko for troubleshooting.

```
MicroSDrive LOG screen In0:00000001
Out:00000000
Booting...Indicator/Flex
Serial flash address:
Error: FLASH address:100000, chip id 0xFF!
Serial number: 1000000000
Penko Engineering (c) 2010
Serial number: 1000000000
Version 1.1.0.0.0.1
HMID 00000002, SMID 00000001
FlashFile Init, Initializing file system...
FlashFile fat_create, total files in use 0
File system started in ima.
Setting vnc_serial to: 0
Slot 2(24), card 24
no user visualisation
Loading vram...
gl_init setting SCR_MHINI
setting resource_text:OK.
touchscreen init
Touchscreen default calibration loaded
init:layinfo.size = 1024
load:layinfo.size = 1024
started in 5.774 seconds.
```

**Totals:**

Here the Totals created on the program can be printed and reset.



The different options are:

- Weigher 1
- Weigher 2
- Weigher 3
- Weigher 4



The different Totals for each weigher are:

- Subtotal
- Total
- Day total
- Batch Total

Subtotal:

Here the Subtotal of the program will be shown you can print this from here directly.

Total:

Here the Total of the program will be shown you can print this from here directly.

Day total:

Here the Day total of the program will be shown you can print this from here directly.

Batch total:

Here the Batch total of the program will be shown you can print this from here directly.

Clear selected:

When a total is selected and you press this button the total will be reset to 0.

Print:

When a total is selected and you press this button the total will be printed.

**Info:**

Here you find all the hardware and software versions that are installed, the license for this Flex 2100 and the certified information.



The information find here is:

- Hardware version (this is the version of circuitboards of the Flex)
- Bootloader version (this is the Bootloader software version)
- FPGA Videochip version (this is the videochip software version)
- Version (this is the Firmware version)
- HWID (This is the hardware ID number)
- SFID (this is the software ID number)
- Serial Number (this is the serial number of the Flex)
- MAC Address (this is the MAC address of the Ethernet chip)
- Software update trace counter (this is the number of time a new firmware is updated to the Flex).
- User program CRC (this is the checksum on the program)

License:

Here you can see what kind of license the Flex has and here you can also change the license.

Certified:

Here you can see the certification information for when the Flex is used as a certified weigher.

4-channel (only when a 4-channel weigher card is installed):

Here you can see the software versions of the 4-channel processor board.

**Configuration Settings:**

**Indicator parameters:**

Description	Default	Custom setting
<i>Indicator</i>		
Indicator name:		_____
Unit label:		_____
Operation Mode:		_____
Max Load:		_____
Sample Rate:		_____
Certified Text:		_____
Class:		_____
<i>Formatting</i>		
Step:		_____
Decimal point:		_____
<i>Multi Range/interval</i>		
Range:		_____
Max Step:		_____
Mode:		_____
<i>Stable Conditions</i>		
Range:		_____
Time:		_____
<i>Zero Tracking</i>		
Range:		_____
Step:		_____
Time:		_____

**Filter parameters:**

Description	Default	Custom setting
<i>Overall</i>		
Overall Filter:	0db	_____
<i>Digital</i>		
Digital Filter:	0	_____
Cutoff frequency:	0	_____
<i>Display</i>		
Filter Range:	4	_____
Display Filter:	1	_____
Display Rate:	3	_____
Display Suppress:	2	_____

**Port Setup:**

Description	Default	Custom setting
<u>Rs232 port</u>		
Protocol:		_____
Address:		_____
Baudrate:		_____
Parity:		_____
Stopbits:		_____
<u>Rs422 port</u>		
Protocol:		_____
Address:		_____
Baudrate:		_____
Parity:		_____
Stopbits:		_____
<u>CAN1 Port</u>		
Protocoll:		_____
Address:		_____
Baudrate:		_____
<u>CAN2 Port</u>		
Protocoll:		_____
Address:		_____
Baudrate:		_____
<u>USB Port</u>		
Protocoll:		_____
USB Link Active:		_____
<u>Profibus Setup</u>		
Channel:		_____
Format:		_____
<u>Ethernet setup</u>		
IP Number:		_____
Subnet Mask:		_____
Gateway:		_____
Speed:		_____
Name:		_____
DHCP:		_____
UDP Port:		_____
Buslink Address:		_____
Buslink Subaddress:		_____

**In/Outputs:**

Description	Default	Custom setting
<u>Inputs</u>		
Line 1:		_____
Function (line 1):		_____
Input (line 1):		_____
Line 2:		_____
Function (line 2):		_____
Input (line 2):		_____
Line 3:		_____
Function (line 3):		_____
Input (line 3):		_____
Line 4:		_____
Function (line 4):		_____
Input (line 4):		_____
Line 5:		_____
Function (line 5):		_____
Input (line 5):		_____
Line 6:		_____
Function (line 6):		_____
Input (line 6):		_____
Line 7:		_____
Function (line 7):		_____
Input (line 7):		_____
Line 8:		_____
Function (line 8):		_____
Input (line 8):		_____

Outputs/Levels

Output 1 Mode:		_____
Output 1 Level:		_____
Output 1 hysteresis:		_____
Output 2 Mode:		_____
Output 2 Level:		_____
Output 2 hysteresis:		_____
Output 3 Mode:		_____
Output 3 Level:		_____
Output 3 hysteresis:		_____
Output 4 Mode:		_____
Output 4 Level:		_____
Output 4 hysteresis:		_____

**Passwords:**

Description	Default	Custom setting
System Setup:		_____
Edit:		_____
Set Clock/Date:		_____

**Screen 1 Setup:**

Description	Default	Custom setting
Buttons active:		_____
Screen active:		_____
<u>Line 1</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 2</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 3</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 4</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 5</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 6</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 7</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____

**Screen 2 Setup:**

Description	Default	Custom setting
Buttons active:		_____
Screen active:		_____
<u>Line 1</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 2</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 3</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 4</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 5</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 6</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 7</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____



**Screen 3 Setup:**

Description	Default	Custom setting
Buttons active:		_____
Screen active:		_____
<u>Line 1</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 2</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 3</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 4</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 5</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 6</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 7</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____

**Screen 4 Setup:**

Description	Default	Custom setting
Buttons active:		_____
Screen active:		_____
<u>Line 1</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 2</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 3</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 4</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 5</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 6</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____
<u>Line 7</u>		
Elements:		_____
(Par 1) _____:		_____
(Par 2) _____:		_____

**Button Setup:**

Description	Default	Custom setting
Zero:		_____
Tareset:		_____
Peak Reset:		_____
Start:		_____
Recipe:		_____
Tare:		_____
Print:		_____
Valley Reset:		_____
Stop:		_____

**Ledbar Setup:**

Description	Default	Custom setting
Bar Style:		_____
Bar Levels:		_____
Minimum:		_____
Maximum:		_____
Lower margin:		_____
Upper margin:		_____
Step:		_____



- 2001 - Parameter error
- 2005 - Input value is not valid
- 2101 - Weigher not stable
- 2102 - Parameter exceeds maxload
- 2103 - Parameter below zero
- 2104 - Not in zero range
- 2105 - Arithmetic overflow occurred
- 2106 - A/D reads all 1's
- 2107 - A/D reads all 0's
- 2108 - Gain ref.< Zero ref.
- 2109 - Gain > 0.999984741211
- 2110 - Save error
- 2111 - Flash ROM exhausted
- 2112 - Error on header creation
- 2113 - Error on data write
- 2114 - Header validation failed
- 2115 - De-active old data fail
  
- 2601 - No program available
- 2603 - No recipes available
- 2116 - Load errors
- 2117 - Item not found in store
- 2118 - Error in stored data
- 2119 - Bad calibration
- 2120 - Action not enabled

Weigher error code:

<b>CCCCCCC</b>	NO PROPER CALIBRATION AVAILABLE. (No calibration points available).
<b>uuuuuuuu</b>	UNDERFLOW. (A/D reads al 0's, check loadcell)
<b>ooooooo</b>	OVERFLOW. (A/D reads al 1's, check loadcell )
<b>=====</b>	DISPLAY OVERFLOW. (Exceed maximum display value) (IND-1)

---

## Appendix-C: Profibus Protocol description. Indicator/Controller: FLEX

Module = "weight" 0x28, 0x1E

```
; gross 32 bits inputs
; net 32 bits inputs
; tare 32 bits inputs
; status 16 bits inputs
; cmd 8 bits inputs
; level1 32 bits outputs
; level2 32 bits outputs
; cmd 8 bits outputs
;
; cmd bit definition:
; 1 = zero reset command
; 2 = zero set command
; 3 = tare off
; 4 = tare on
; 5 = free
; 6 = free
; 7 = free
; 8 = free
;
; status bit definition:
; 1 = hardware overload detected
; 2 = overload detected
; 3 = stable signal
; 4 = in stable range
; 5 = zero corrected
; 6 = center of zero
; 7 = in zero range
; 8 = zero tracking possible
; 9 = tare active
; 10 = preset tare active
; 11 = new sample available
; 12 = calibration invalid
; 13 = calibration enabled
; 14 = user certified operation
; 15 = level 1 active
; 16 = level 2 active
EndModule
```