

G4 Multi Channel Weighing Instrument

Program version 1.2.0.0



Operating instructions,
Quick installation
PM/DT/HE types

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Scale set-up values

PRECAUTIONS

READ this manual BEFORE operating or servicing this instrument.

FOLLOW these instructions carefully.

SAVE this manual for future reference.



WARNING

Only permit qualified personnel to install and service this instrument. Exercise care when making checks, tests and adjustments that must be made with power on. Failing to observe these precautions can result in bodily harm.

DO NOT allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this instrument.

Introduction

General

G4 is a high performance multi channel weighing instrument intended for industrial systems. Its basic function is to convert the signals from strain gauge transducers to useful weight information. Several types of communication interfaces are supported by G4, which makes it easy to integrate the instrument into industrial processes.

The front panel of G4, types PM/DT/HE, is flat, dustproof, and waterproof. It has a back lighted graphical colour LCD display with touch sensitive screen for weight information, set-up information and error messages.

It also has function keys and a numeric keypad for entry of digits.

The basic configuration of the instrument performs weighing and flow rate calculation. All functions are controlled by set-up parameters.

'Operating instructions, Quick installation' for G4, types PM/DT/HE, includes basic installation and set-up information, required for correct measuring with the instrument.

This description deals with the following points:

- Weighing with G4, types PM/DT/HE.
- Flow rate measurement.
- Quick installation.
- Data sheet calibration.
- Deadweight calibration in two points.

Additional installation and set-up of more instrument functions, not covered by this description, can also be performed, for example:

- Complete installation.
- Complete set-up.
- Setting of communication parameters.
- Table calibration.
- Level supervision.

For a complete instrument description, refer to:

**G4 Multi Channel Weighing Instrument
Technical Manual PM/DT/HE types**

Power supply

Power supply to the weight indicator should not be turned off during weekends and over-night. Continuous power supply to electronics and transducers prevents moisture condensation in the units.

Start-up

As soon as power is connected to the instrument, a start-up period begins.

The text 'Start up Please wait!' and a WAIT symbol (hour-glass) will be displayed after some seconds.

Then G4 automatically switches to normal measuring operation.

If the instrument is set for operator start-up, the text 'Press ENTER to start operation!' will be shown.

If a warm up time has been set, the text 'Warming up Please wait!' will be displayed before the instrument switches to measuring operation.

If any error is detected, the start-up stops and an error message will be displayed.

Maintenance

The G4 instrument needs no maintenance performed by the end-user. Any service or repair work must be performed by qualified personnel. Contact your supplier.

Cleaning

Before cleaning the G4, break the power connection to the instrument. Use a soft cloth to clean the exterior of the instrument. For cleaning the instrument front panel, a soft, damp, cloth may be used.

Safety information

Utilization.

Before connecting power to the instrument, check that all fixation screws at the modules are tightened so that the instruments functional grounding by the housing is maintained. The instrument may only be utilized for the measurement and control functions, described in the Technical Manual for G4 Multi Channel Weighing Instrument, PM/DT/HE types. It is especially important to adhere to the load limits of the input/output connectors. We accept no responsibility for any damage arising from improper operation. Any changes to the instrument, which causes any function changes, may only be carried out by the manufacturer, or after discussion with and permission by the manufacturer.

Meaning of symbols, used in this manual



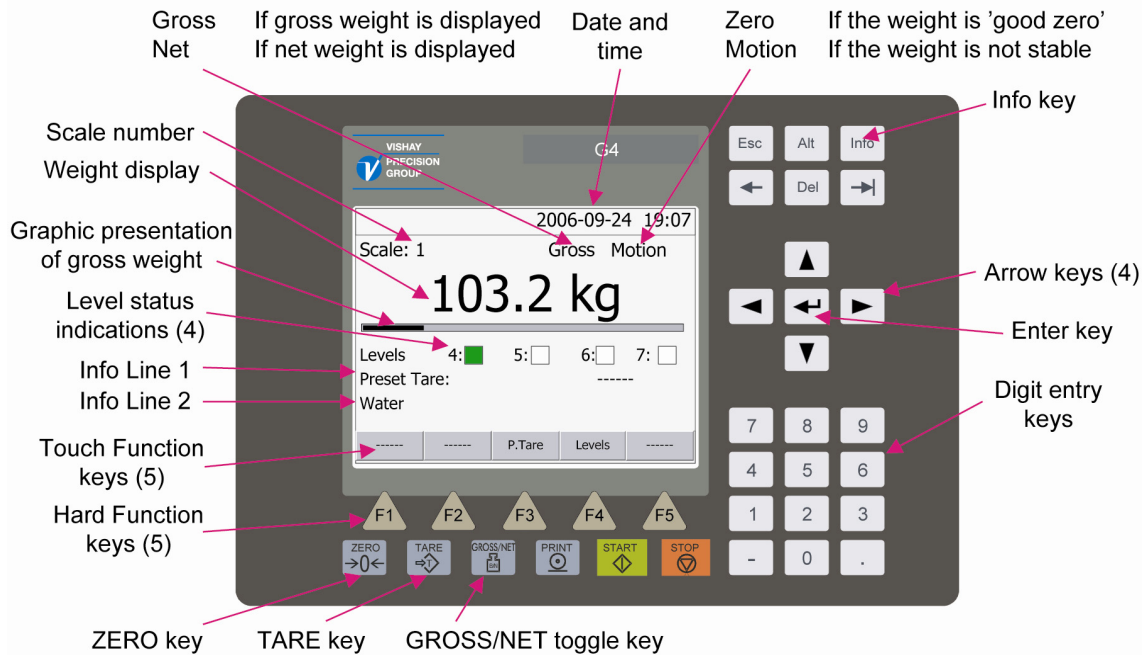
Direct current.



Alternating current.



Caution, risk of danger. Documentation needs to be consulted.



Front panel of instrument G4, types PM, DT, and HE.

Front panel

General

G4 has a flat, dustproof, and waterproof front panel with a back lighted and touch sensitive graphic colour LCD display and all necessary keys to perform weighing, batching, and set-up operations.

Display

G4 normally displays either gross weight or net weight digitally, and in some cases also gives a graphic representation of the gross weight.

Actual status information for the weight value and date and time will also be shown at the display.

The Level status (max 4 levels) for the scale and other configurable information may also be displayed in some cases.

If an error occurs this will be indicated by an error code at the display.

Info key


The Info key at the upper right corner of the panel is used to enter G4 menu system.

Function keys

Just below the display there are five function keys, marked F1 to F5.

Actual key functions, if any, are indicated at the lower line of the display.

To the right of the display, four arrow keys are provided. These keys control the position of the cursor, the indicated area at the display.




The Enter key () is situated between the arrow keys. It is used to accept the selection indicated by the cursor, to finish the entry of a value etc.

A set of keys for entry of digits is also provided.

Pressing function keys or the Enter key can be replaced by tapping at corresponding areas in the display.

Symbol keys

Six keys, marked with weighing symbols, are provided at the lower border of the panel. Three of them control the zero setting function, the tare function, and the gross/net function. The remaining three keys have no function in these instrument versions.

Key	Name	Function
	ZERO	Setting the gross weight value to zero (provided the value is in the zeroing range: -1 % to +3 % of the capacity) and setting the auto tare value to zero.
	TARE	Taring, i.e. entry of the gross weight as auto tare value and display of net weight zero. Depending on actual setting taring may be prevented if 'Motion' is displayed.
	GROSS/NET	Toggling between display of gross weight and net weight. Net weight can be displayed only if a tare value other than zero has been entered.

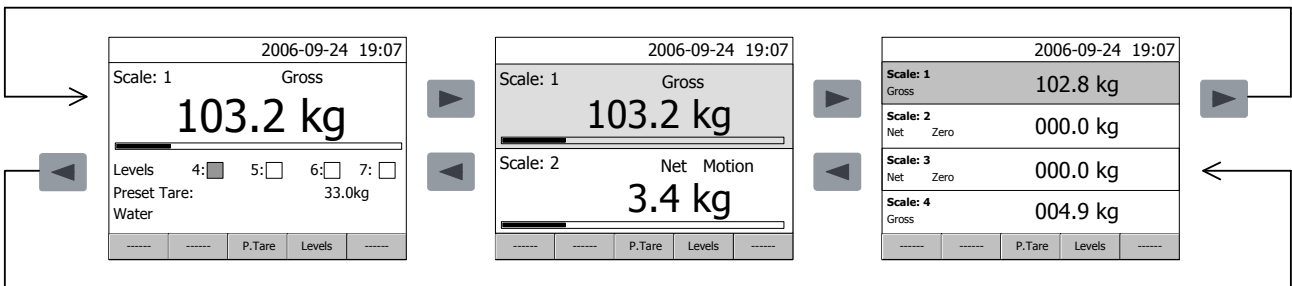
Display alternatives

It is possible to configure G4 to display one, two or four scales at a time, or a combination of the mentioned views. If a combination of views is used, the arrow keys 'right' and 'left' are used to select a display alternative. Only configured scales will be shown.

Arrow keys 'up' and 'down' are used to select one of the configured scales. When several scales are displayed, the selected scale is indicated yellow. The function keys will influence only the selected scale.

If display of only one scale is selected, detailed information of weight and other selected information can be presented.

If display of two or four scales is selected, the weight values will be shown, but less other information.

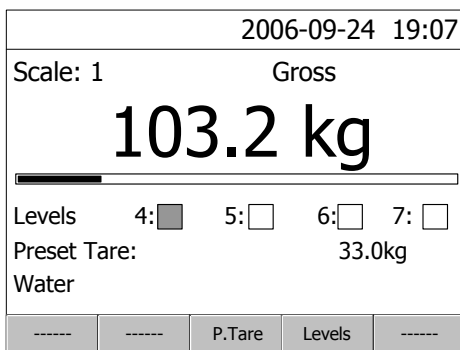


'Level status'

Status of the level supervision is presented in four boxes below the weight value presentation. The boxes have fixed positions. When a digit is shown at a box, the corresponding Level is in use. For each scale the four lowest level numbers that are in use will be shown. A Level box will be marked green when the level of the supervised weight signal is above the set value for that Level.

'Information lines'

By set-up parameters it is possible to configure the instrument to display selected information on two information lines below the Level status boxes.



Example:

Levels 4, 5, 6, and 7 are in use; the weight signal is above Level 4.

Preset Tare (33.0 kg for Scale 1) on Info line 1.

Scale Name (Water for Scale 1) on Info line 2.

Operation

Zero indication and zero adjustment

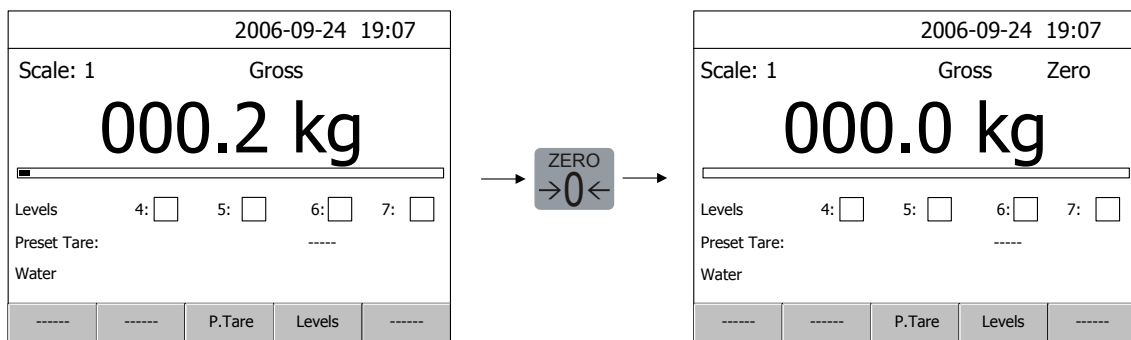
A basic zero setting of the gross weight for unloaded scale is performed at installation as a part of the calibration. When a 'good zero' is displayed, the text 'Zero' is shown to the right in the display.

Minor correction of the zero value may be needed and can rapidly be performed.

Zero adjustment

If, for unloaded scale, the text 'Zero' is not shown, but the gross weight is close to zero, a rapid zero adjustment can be performed.

The gross weight must be stable (text 'Motion' not shown) and the key ZERO must be enabled.



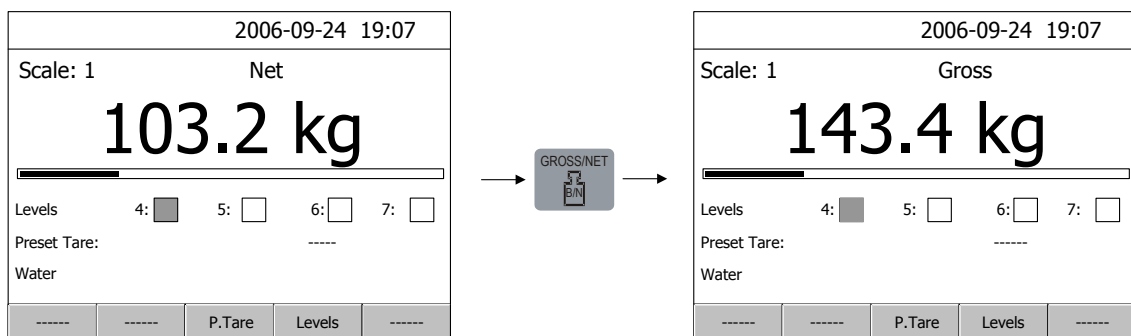
Zero adjustment can only be performed if the accumulated deviation from the basic zero setting in the last calibration is within -1 % to +3 % of the 'Capacity'. In other cases a new basic zero setting must be performed.

Gross weight

The gross weight is the total weight loaded on the scale after zero setting.

Gross weight is displayed when the text 'Gross' is shown in the display.

When net weight is displayed, the GROSS/NET key can be pressed to change to display of gross weight, provided that the GROSS/NET key is enabled.



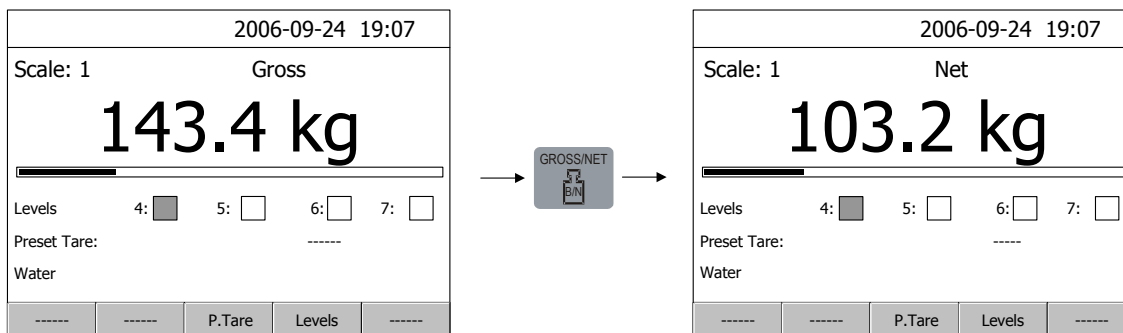
In some cases, gross weight is shown as a graphic bar at the display. Maximum length of the bar corresponds to 'Capacity' of the scale.

Net weight

The net weight is the difference between the gross weight and a tare value. If the tare value is zero, net weight can not be displayed.

Net weight is displayed when the text 'Net' is shown in the display.

When gross weight is displayed, the GROSS/NET key can be pressed to change to display of net weight, provided that the GROSS/NET key is enabled.



Taring

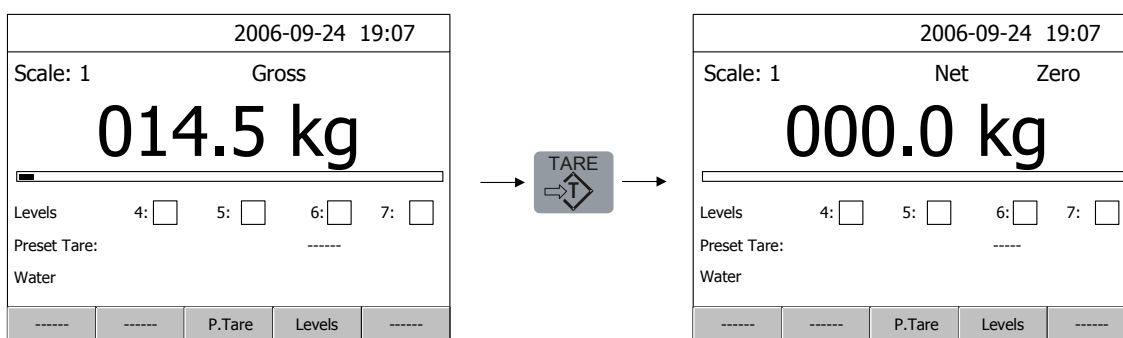
Taring means storing of a tare value for the scale. Net weight will be calculated as the difference between the gross weight and this tare value. If the tare value is zero, net weight will not be displayed.

At default setting, taring can always be performed, provided the key TARE is enabled. But the scale can also be set to allow taring only at stable weight (when the text 'Motion' is not shown).

In G4 two tare values can be used: Auto tare and Preset tare.

Auto tare

By taring, the actual gross weight is stored as Auto tare value, and the scale will switch to display of net weight 'zero'.



Editing Preset tare

In this example Scale 1 is set for taring with 'Preset tare', and for displaying the value of the 'Preset Tare' at Info Line 1 (and Scale Name at Info Line 2). The example shows editing the Preset tare value, using the numeric keypad.

Press 'P.Tare'.

2006-09-24 19:07
Scale: 1 Gross
034.5 kg
Levels 4: 5: 6: 7:
Preset Tare: 0.00 kg
Water
----- P.Tare Levels -----

Press 'Edit' to edit the value.

If Operator Lock is activated, the Operator Code will be needed.

Preset tare, Scale 1
Preset Tare 1 0.0 kg
Edit Escape

The actual value of 'Preset tare' is displayed. Use the numeric keypad to write the new value.

Finish by 'Enter'.

Edit: Preset tare 1
Value: 33.0 kg
Maximum value: 999999 kg
Minimum value: 0 kg
Enter Escape

Menu 'Preset tare, Scale 1' will be shown with the new value.

Press 'Escape' to return to display of normal weighing operation.

Preset tare, Scale 1
Preset Tare 1 33.0 kg
Edit Escape

Level supervision

With G4 it is possible to supervise different weighing signals at defined levels. The instrument contains 32 supervising units, Level 1 to Level 32, which can be connected to the scales by the parameter set-up. For each scale up to 4 connected Levels are indicated at the display in normal operation. All Levels connected to a scale are shown if 'Levels' or function key F4 is pressed.

Edit Levels

The supervision levels are easily edited from the G4 front panel during normal operation.

In this example Scale 1 has five levels of supervision.

Level number 6 should be edited.

Press 'Levels'.

2006-09-24 19:07

Scale: 1 Gross

034.5 kg

Levels 4: 5: 6: 7:

Preset Tare: 33.0 kg

Water

----- P.Tare Levels -----

Select Level 6 by using arrow keys up and down to position the indicator. (Or tap at Level 6 to edit.)

Press 'Edit'.

If Operator Lock is activated, the Operator Code will be needed.

Levels, Scale 1

Level 4	20.0 kg
Level 5	40.0 kg
Level 6	55.0 kg
Level 7	85.0 kg
Level 9	120.0 kg

Edit Escape

The actual value of Level 6 is displayed. Use the numeric keypad to write the new value.

Finish by 'Enter'.

Edit: Level 6

Value: kg

Maximum value: 999999 kg

Minimum value: -999999 kg

Enter Escape

Menu 'Levels, Scale 1' will be shown with the new value for Level 6.

Press 'Escape' to return to display of normal weighing operation.

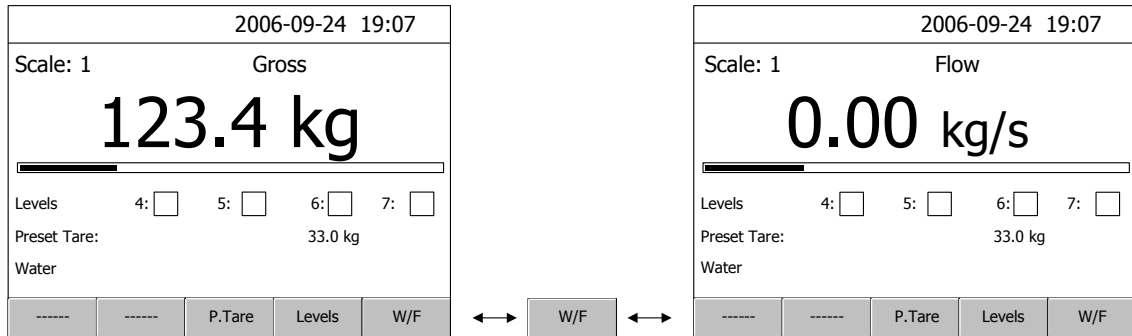
Levels, Scale 1

Level 4	20.0 kg
Level 5	40.0 kg
Level 6	60.0 kg
Level 7	85.0 kg
Level 9	120.0 kg

Edit Escape

Flow display

When option Flow display is activated for a scale, function key F5 will show the text 'W/F'. Pressing function key F5, or tapping at 'W/F', will switch the scale between display of weight value (indicated by 'Gross' or 'Net') and display of flow value (indicated by 'Flow').



Installation

Mechanical installation

The instrument G4 has a flat plastic front panel and can be ordered with three different housings: aluminium housing for panel mounting or stand-alone use, or stainless steel housing for stand-alone use in harsh environment. Instruments for panel mounting have an integrated gasket that gives sealed attachment to mounting panels. Stand-alone instruments have sealed housings.

Electrical installation

The field wiring of the instrument shall be suitable to the environment (e.g. chemically) in the end-user application.

Mains cables shall be separated and routed away from SELV or SELV-E field wiring.



For DT and HE instruments UL Listed and KAM cord type flexible cables shall be used. For cable diameters, see specification in the Technical Manual. These instruments have plugged cable entry holes. Replace a suitable number of plugs by the strain reliefs delivered with the instrument.

Field wiring installation shall comply with any national regulations, hereunder National Electrical Code (NEC) for US and/or Canadian Electrical Code for Canada.

- A switch or circuit-breaker shall be included in the building installation.
- The switch shall be in close proximity to the equipment and within easy reach of the operator
- The switch shall be marked as the disconnecting device for the equipment.
- The equipment switch or circuit-breaker employed as disconnecting device shall comply with relevant requirements of IEC 60947-1 and IEC 60947-3.

The power supply for the instruments can be made via an external dc supply unit or an internal ac/dc supply unit.

All electrical connections to G4, including connection to ground, are made via plug-in terminal blocks. Shielded cables are needed, except for the power input, and the cables should be routed so that electromagnetic interference from power cables is avoided.

WARNING

Make sure that the power to the instrument is turned off before:

- *any modules are removed from or inserted in the instrument.*
- *any connections are connected to or disconnected from the instrument.*

All modules should be regarded as ESD sensitive. Make sure that an ESD safe environment is maintained when inserting modules, removing modules and when handling modules separately from the instrument. Modules must be kept in metallised ESD bag when not mounted in the instrument.

DC SUPPLY 24 V ---



The output of the external dc supply must be rated 24 V --- , $\pm 15\%$ including fluctuations, min. 40 W. The supply must provide Double Insulation between Mains parts and 24 V SELV or SELV-E circuit, and a limited-energy circuit (max. available current 8 A). For the US market this energy limit can be achieved with an ANSI/UL 248-14 fuse rated 5 A. For other markets an IEC 60127 T type fuse rated 4 A may also be used.

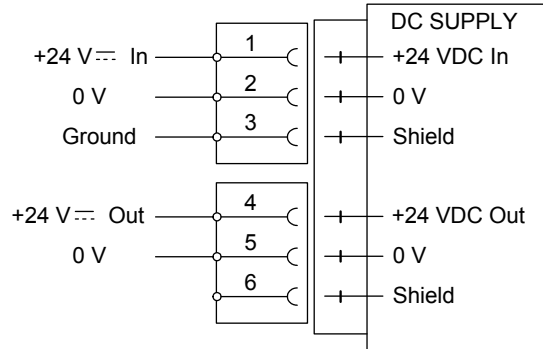
24 V --- In

Terminals 1, 2, and 3.

Connect power to terminal 1 (positive) and terminal 2 (0 V). To achieve functional grounding, terminal 3 should be connected to ground.

24 V --- Out

Terminals 4 (positive) and 5 can be used to supply max. 100 mA to logics, like outputs and inputs.



AC SUPPLY 110-240 V \sim



Mains supply cable shall be separated and routed away from SELV or SELV-E field wiring.

Remove power before removing the module from the instrument.

Make sure the fixation screws are well tightened during operation.

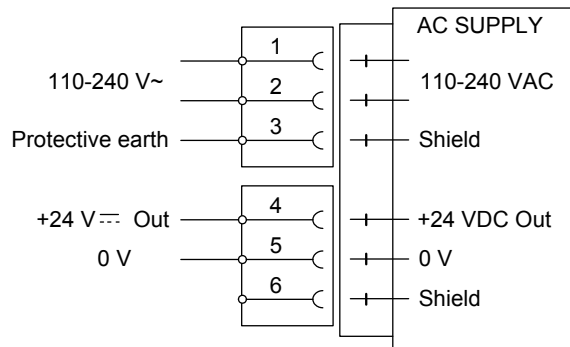
110-240 V \sim In

Terminals 1, 2, and 3.

Connect power to terminal 1 and 2. To achieve functional grounding, terminal 3 should be connected to protective earth.

24 V --- Out

Terminals 4 (positive) and 5 can be used to supply max. 100 mA to logics, like outputs and inputs.



CPU unit

External computing devices connected to the CPU communication interfaces of the instrument have to comply with the standard, UL 60950.

The internal battery in the CPU module is to be used only in the equipment where servicing of the battery circuit and replacement of the lithium battery will be done by a trained technician.



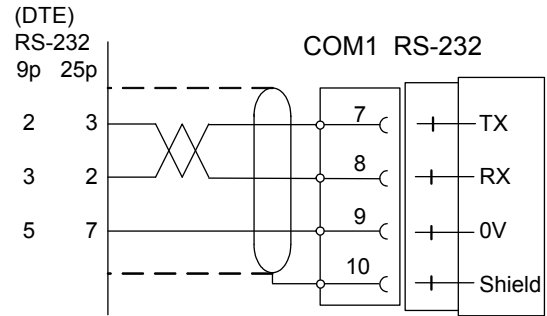
COM1

RS-232 Serial communication.
This is a SELV/SELV-E circuit.

COM 1 can be used for serial communication with computer/PLC (Modbus RTU).

Point to point communication, only one G4 unit connected to the computer/PLC.

Connections are made to terminals 7 to 9. Shielded cable must be used. Connect the shield to terminal 10.



COM2

RS-485 Serial communication for 2-wire or 4-wire with common 0 V.
This is a SELV/SELV-E circuit.

Communication port COM2 can be used for serial communication with computer/PLC (Modbus RTU).

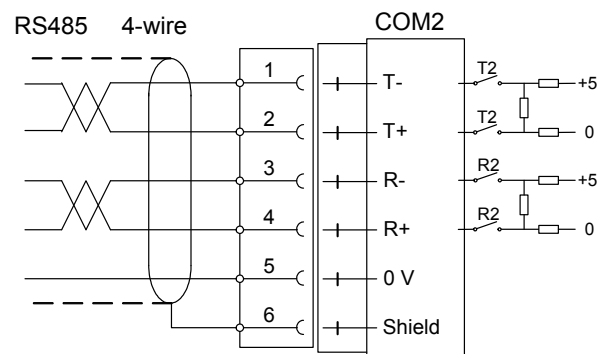
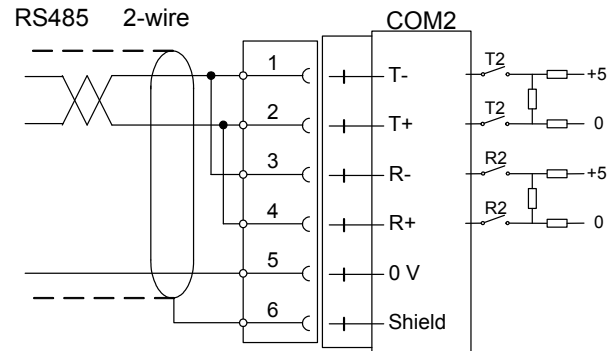
Connections are made to terminals 1 to 5. Shielded cable must be used. Connect the shield to terminal 6.

The communication line must be terminated at both ends.

If G4 is connected at the end of the communication line, the switches T2 and R2 must be set according to the table below.

2-wire termination:
Both T2 switches ON,
both R2 switches OFF.

4-wire termination:
Both T2 switches ON
both R2 switches ON.



WF IN, WF IN2 and HS WF2



The voltage levels on connectors of I/O modules shall not exceed hazardous voltage levels of 30 Vrms, 42.4 Vpeak or 60 Vdc under normal conditions. In wet locations these voltage levels shall not exceed 16 Vrms, 22.6 Vpeak or 35 Vdc.

Transducer inputs

Terminals 17 – 23 (channel 1), 10 – 16 (channel 2). See next page.
Transducer connection should be handled with great care to achieve good measuring data. Transducer integrated cables may not be shortened.

NOTE!

Transducer cables must be routed at least 200 mm away from 230/380 V, 50/60 Hz power cables. By cables with other frequencies or high power, an even wider distance is preferable.

4-wire connection should be used if the transducer integrated cable is long enough to be connected directly to a transducer input. At 4-wire connection, some terminals must be interconnected as shown in the figure on next page.

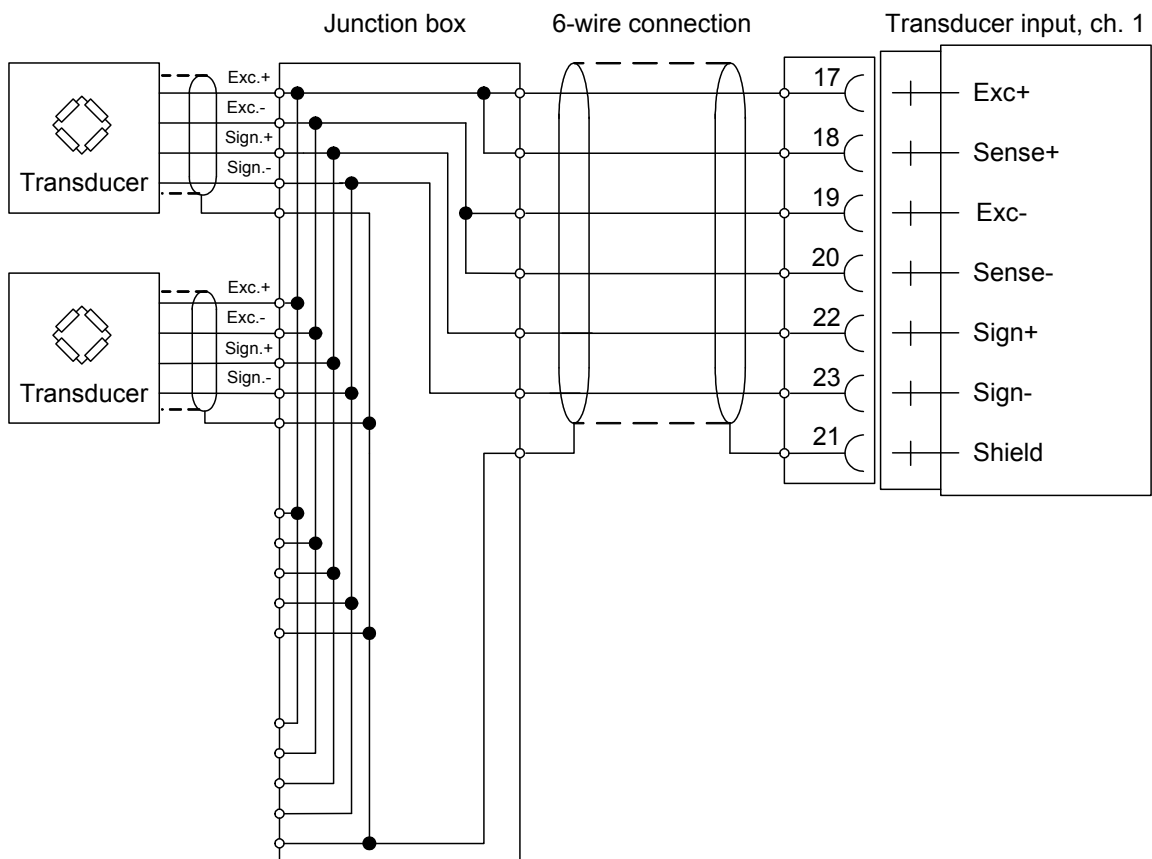
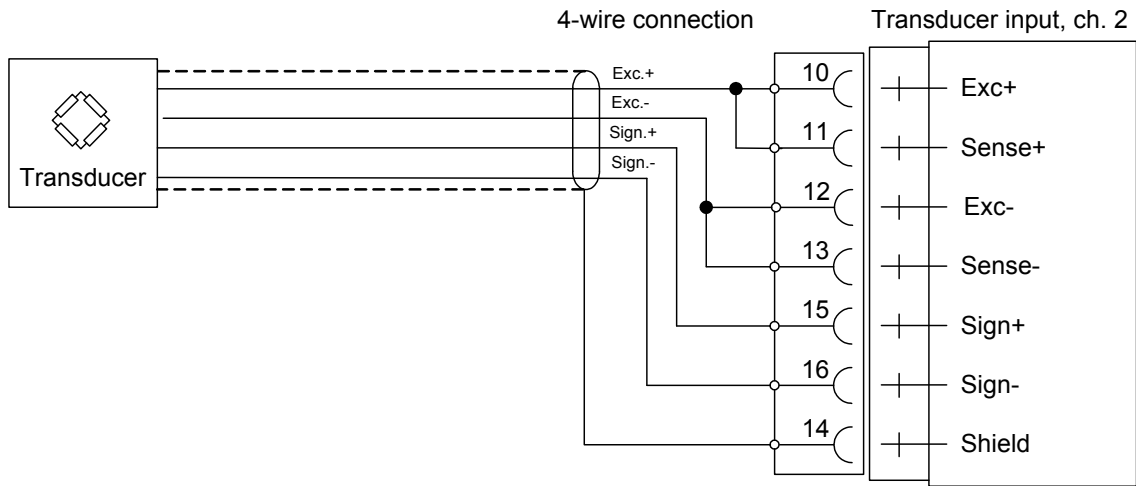
6-wire connection should be used if the integrated cable must be lengthened or if several transducers should be connected to one transducer input.

The channel 1 cable shield must be connected to terminal 21 and the channel 2 cable shield must be connected to terminal 14.

In WF IN and WF IN2 the shield terminals are internally connected to the G4 housing, which is internally connected to earth via the power supply connector terminal 3 (Shield). The shield shall not be connected at any other point.

In HS WF2 the transducer input channels are separately insulated by operational insulation and the shields can be connected to the most convenient ground/earth point. This can be the junction box when using multiple transducers or at the barrier ground when using Ex zener barriers.

In the junction box SL-4 from Nobel Weighing Systems, see figure, all necessary terminals are provided.



A transducer may be connected directly to terminals at the transducer input.

For several transducers or long distances,
a junction box and lengthening cable is needed.

For a HS WF2 channel, the shield can be connected to
ground/earth at any point.

Basic set-up

General

All operating functions in G4 are controlled by parameters, stored in the instrument memory. The actual setting of the parameter values can be edited during normal weighing operation, using the touch display and the keys on the front panel.

WARNING. *Changes done during editing of set-up parameters will affect the behaviour of the instrument immediately. The user must take all necessary precautions to prevent any undesired effects in process monitored or controlled by the G4 instrument or a connected control system.*

It is strongly recommended to activate the set-up lock in the instrument to prevent any unauthorized changes of set-up parameters.

This section proposes a number of parameters to set, that will rapidly give the instrument a useful presentation mode and basic measuring properties. It contains setting of, for example, the measurement unit and resolution for the weight value, and also some parameter settings for data sheet calibration and deadweight calibration in two points.

If you are dealing with an already working instrument we recommend that you perform a backup of the set-up parameters before you make any changes to the instrument.

When the set-up is finished, all parameter values should be noted (see appendix 1 and 2), or backed up in a file. Backup to an USB memory (or internal file) can be done from menu 'Maintenance', sub menu 'Create Backup'.

Appendix 1 and 2 to this manual contains suitable forms to fill in for the instrument hardware configuration and for the set-up parameters, covered by this manual.

Hardware configuration

The instruments G4, types PM/DT/HE, have room for one fieldbus module and six other modules. The configuration of installed modules, used measuring channels, and scale numbers is made in set-up parameter menu 'Hardware Config.'.

At delivery of an instrument, the hardware configuration normally corresponds to the set-up. If any mismatch between installed modules and hardware configuration occurs, an error message will be shown at instrument start-up.

Consult 'G4 Multi Channel Weighing Instrument Technical Manual PM/DT/HE types' if you need to change the hardware configuration.

Security lock

With an instrument G4 it is possible to perform set-up operations during normal operation, which may influence for example the performance of a scale. To prevent these dangers, the instrument is equipped with security locks at two levels that can be activated to protect from unauthorized access to editing of parameters and values. Four-digit codes for the locks can be defined by the customer.

By default setting the code for both locks is: 1 9 3 7 .

Common parameters

G4 has a number of parameters that are common for the whole instrument. They are found in menu 'General', a sub menu to 'Set-up parameters'.

Press the key marked 'Info' at the upper right corner of the instrument panel.

In the 'Main Menu', use the arrow keys 'up' or 'down' to position the indicator on line 'Parameter Set-up'.

Press 'Enter' to open 'Parameter Set-up'.

In menu 'Parameter set-up' position the indicator on line 'General'.

Press 'Enter' to open 'General'.

In menu 'General', position the indicator on the parameter to edit. Some basic parameters are explained below.

Press 'Enter' to open the editing menu. The Set-up Code or the Operator Code may be needed.

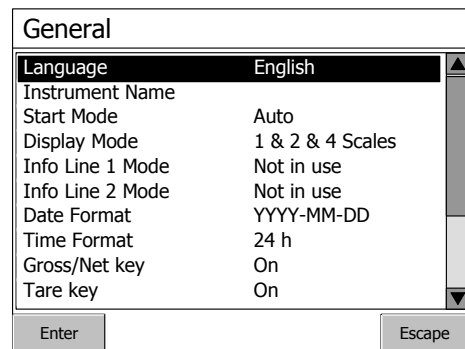
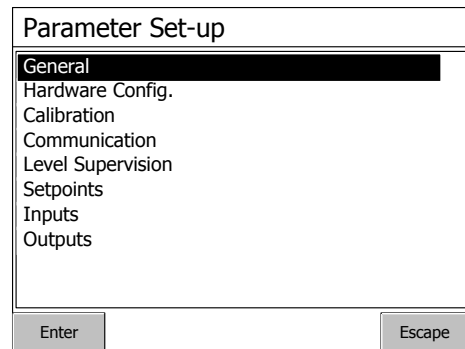
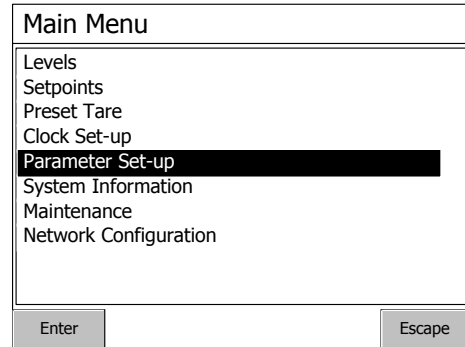
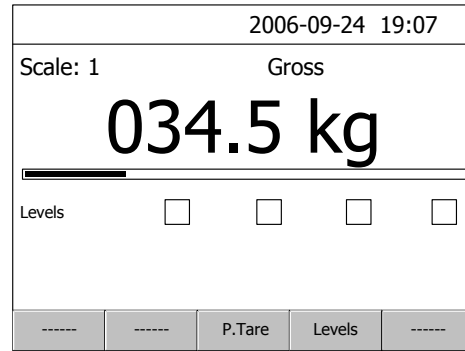
Language

'Language' was selected in menu 'General'.

Use the arrow keys to position the indicator on the desired language.

The selected language will be used for all displayed text at the screen, and for all parameter names.

Finish by 'Enter', and menu 'General' will appear again.



Date Format

'Date Format' was selected in menu 'General'.

Use the arrow keys to position the indicator on the desired date format.

Y = year, M = month, D = day.

Finish by 'Enter', and menu 'General' will appear again.

Time Format

'Time Format' was selected in menu 'General'.

Use the arrow keys to position the indicator on the desired time format.

Finish by 'Enter', and menu 'General' will appear again.

Set-up Lock

For security reasons, we recommend setting of this parameter to 'On'.

'Set-up Lock' was selected in menu 'General'.

Use the arrow keys to select 'Off' or 'On' for the Set-up Lock. If the lock is set to 'On', a 'Set-up Code' will be needed to perform editing of set-up parameters, and a parameter for the 'Set-up Code' will be available. See below.

Finish by 'Enter', and menu 'General' will appear again.

Set-up Code

As the above parameter 'Set-up Lock' was set to 'On', this parameter appeared in the list of parameters in menu 'General'.

'Set-up Code' was selected in menu 'General'.

Use the numeric keypad to edit the default code value '1 9 3 7' to another four-digit value.

Finish by 'Enter', and menu 'General' will appear again.

In menu 'General', press 'Escape' twice to return to the 'Main Menu'.

See next page to perform Clock Set-up for the instrument.

Clock set-up

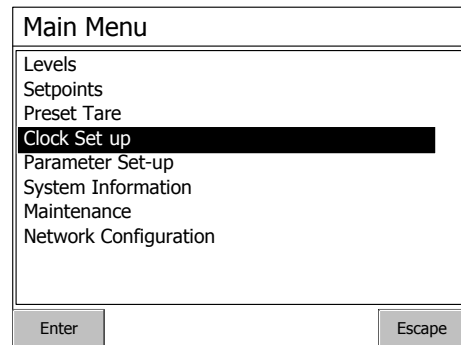
Date/time information is always presented at the G4 weight display. Setting of correct date and time is performed in 'Clock Set-up', a sub menu to the 'Main Menu'.

Setting of date and time doesn't interrupt normal weighing operation.

(To open 'Main Menu' from normal weight display, press the key marked 'Info' at the upper right corner of the instrument front panel.)


In the 'Main Menu', use arrow keys 'up' or 'down' to position the indicator on line 'Clock Set-up'.

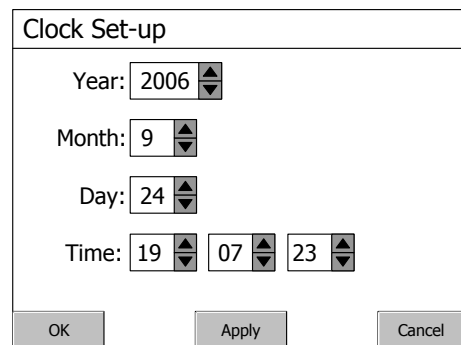
Press 'Enter' to open 'Clock Set-up'.



A flashing cursor line appears at 'Year'.

Use arrow keys to edit the value in the selected field.

Use the Tab-key () to move it from field to field.



Press 'OK' to accept the new values and return to the 'Main Menu'.

Press 'Apply' to accept the new values and stay in the 'Clock Set-up' menu.

Press 'Cancel' to reject the new settings and return to the 'Main Menu'.

Scale calibration

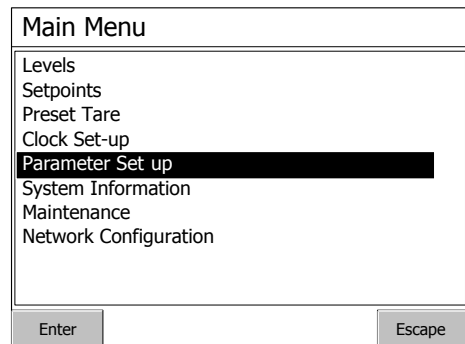
All calibration set-up parameters are set individually for each scale. The scale number is used to distinguish similar parameters in different scales. The following example shows a set-up sequence for Scale 1, so all parameter names will begin with 1: .

Individual parameters for the scales are found in menu 'Calibration', a sub menu to 'Parameter Set-up'.

('Parameter Set-up' is a sub menu to the 'Main Menu'. To open 'Main Menu' from normal weight display, press the key marked 'Info' at the upper right corner of the instrument front panel.)

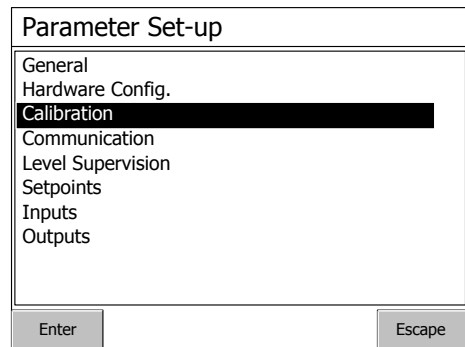
In the 'Main Menu', use the arrow keys 'up' or 'down' to position the indicator on line 'Parameter Set-up'.

Press 'Enter'.



In menu 'Parameter Set-up', use the arrow keys to position the indicator on line 'Calibration'.

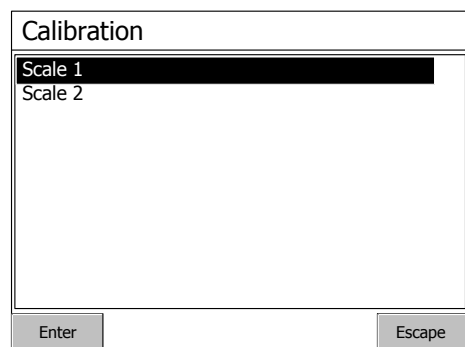
Press 'Enter' to open 'Calibration'.



Menu 'Calibration' displays the scales that are in use.

Use arrow keys to position the indicator on the desired Scale number, in this example Scale 1.

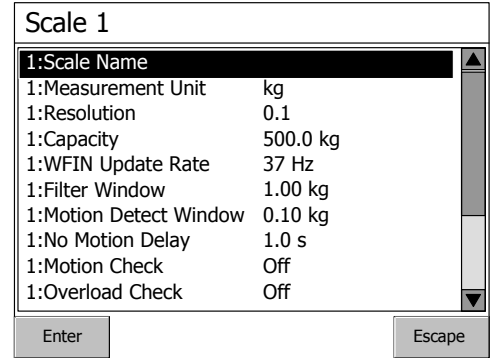
Press 'Enter' to open 'Scale 1'.



In menu 'Scale 1', arrow keys can be used to scroll the list of parameters, and to select a parameter name by positioning the indicator on the corresponding line. Some basic parameters are explained below.

Press 'Enter' to edit the value of a selected parameter.

The Operator Code or the Set-up Code may be needed to continue.



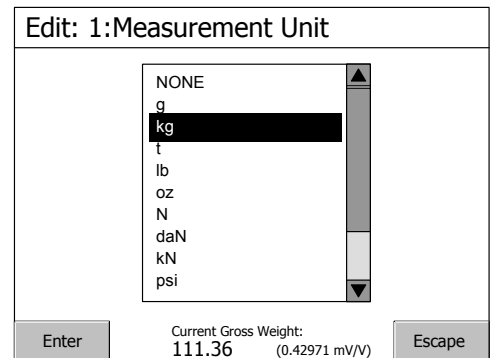
1:Measurement Unit

This parameter defines the measurement unit that will be used for the measured value and for related set-up parameters.

Use the arrow keys to position the indicator on the desired unit.

Press 'Enter' to accept.

Menu 'Scale 1' will appear again.



1:Resolution

This parameter defines the smallest change in measured value that will be shown, and the decimal point position for the scale.

0.1 means the scale will display 0.0 – 0.1 – 0.2 – 0.3 etc.

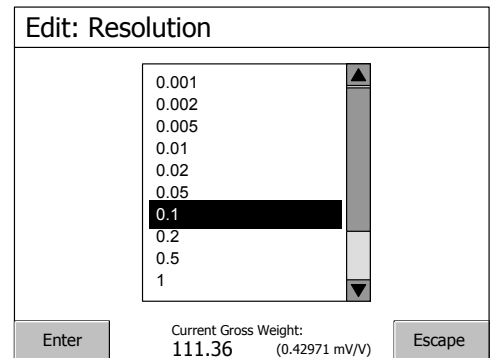
0.2 means the scale will display 0.0 – 0.2 – 0.4 – 0.6 etc.

0.5 means the scale will display 0.0 – 0.5 – 1.0 – 1.5 etc.

Use the arrow keys to position the indicator on the desired resolution.

Press 'Enter' to accept.

Menu 'Scale 1' will appear again.



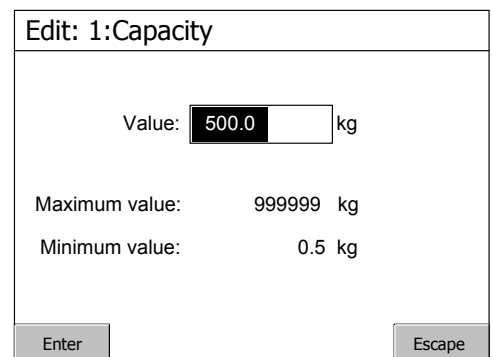
1:Capacity

This parameter defines the nominal range for the scale. The value of 'Capacity' is shown with measurement unit and decimal point position according to the settings above.

Use the numerical keypad to write the desired value of capacity for the scale.

Press 'Enter' to accept.

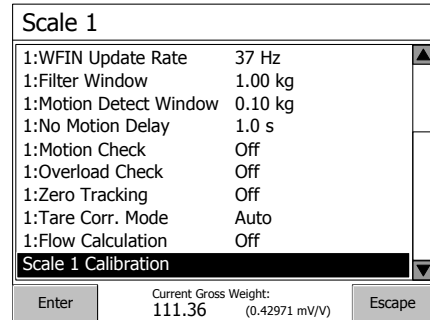
Menu 'Scale 1' will appear again.



The last line in menu 'Scale 1' gives access to menu 'Scale 1 Calibration', where calibration type can be selected.

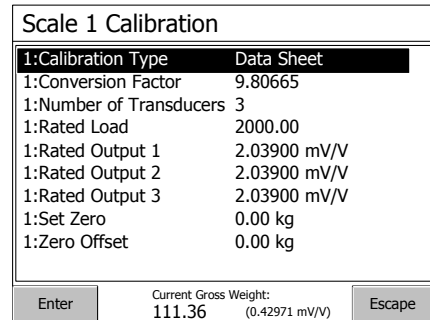
Use the arrow keys to position the indicator on line 'Scale 1 Calibration'.

Press 'Enter'.



Menu 'Scale 1 Calibration' shows the current type of calibration for scale 1, and the parameter values of that calibration.

To perform a new calibration, use arrow keys to position the indicator on line '1:Calibration Type'. Press 'Enter'.



1:Calibration Type

This parameter defines the type of calibration to perform for the scale.

Three calibration types are available.

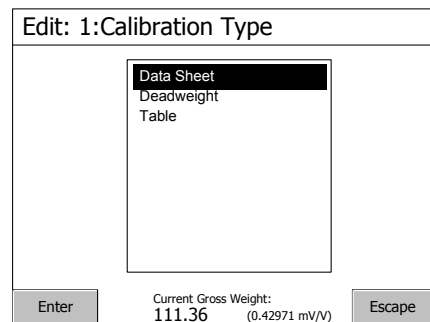
'Data Sheet' calibration for fast calibration when transducer data is available and the installation is free from mechanical disturbances.

'Deadweight' calibration, the most accurate calibration type, where known weights are used to give well defined load on the scale.

'Table' calibration for entry of recorded values from a previous calibration.

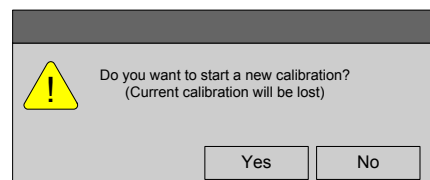
Use arrow keys to indicate the desired type of calibration.

Press 'Enter'.



A question will be displayed.

To start the calibration, tap at 'Yes'.



Performing a data sheet calibration is described on pages 24 - 26.

Performing a deadweight calibration is described on pages 27 - 29.

Data sheet calibration

This calibration method can be used when data sheets for the transducers are available and no external forces influence the weighing installation.

If fixed supports are included, the load must be evenly distributed on all supports.

Data sheet calibration can be performed without any transducers connected, but the transducers must be connected as the zero setting is performed.

A data sheet calibration for a scale should start with the scale parameters, described on page 22.

This example shows a Data Sheet calibration for Scale 1.

When data sheet calibration has been selected and you have accepted to start a new calibration, menu 'Scale 1 Calibration' will be displayed again.

Use arrow keys 'up' and 'down' to select a parameter to edit, then press 'Enter' to accept.

All parameters are explained below.

Scale 1 Calibration	
1:Calibration Type	Data Sheet
1:Conversion Factor	9.80665
1:Number of Transducers	3
1:Rated Load	2000.00
1:Rated Output 1	2.03900 mV/V
1:Rated Output 2	2.03900 mV/V
1:Rated Output 3	2.03900 mV/V
1:Set Zero	0.00 kg
1:Zero Offset	0.00 kg

Enter Current Gross Weight: 111.36 (0.42971 mV/V) Escape

1:Conversion Factor

This parameter defines the relationship between a weight value expressed in transducer data sheet unit and the same weight value expressed in measurement unit. The default value, 9.80665, can be used when transducers in N (Newton) are used for weighing in kg.

Use the numeric keypad to write a new value for '1:Conversion Factor'.

Press 'Enter' to accept.

Menu 'Scale 1 Calibration' will appear again.

Edit: 1:Conversion Factor	
Value:	<input type="text" value="9.80665"/>
Maximum value:	100
Minimum value:	0.01

Enter Current Gross Weight: 111.36 (0.42971 mV/V) Escape

1:Number of Transducers

This parameter value should be set to the number of support points for the load, including all transducers and fixed support points. The number will affect the number of lines '1:Rated Output'.

Use the numeric keypad to write a new value for '1:Number of Transducers'.

Press 'Enter' to accept.

Menu 'Scale 1 Calibration' will appear again.

Edit: 1:Number of Transducers	
Value:	<input type="text" value="3"/>
Maximum value:	4
Minimum value:	1

Enter Current Gross Weight: 111.36 (0.42971 mV/V) Escape

1:Rated Load

Rated load for the transducer is a value, given in the data sheet. All the transducers in the scale must have the same impedance and rated load. The rated load value, expressed in the unit of the data sheet, should be entered for this parameter.

Use the numeric keypad to write a new value for '1:Rated Load'. Press 'Enter' to accept.

Menu 'Scale 1 Calibration' will appear again.

Edit: 1:Rated Load	
Value:	<input type="text" value="2000.00"/>
Maximum value:	999999
Minimum value:	1
Enter	Current Gross Weight: 111.36 (0.42971 mV/V) Escape

1:Rated Output 1, 2, etc

The number of lines '1:Rated Output ...' corresponds to '1:Number of Transducers' above. These parameter values should be set to the output signal values for the transducers, given in the data sheets. For a fixed support point the value of the rated output should be set to 0.00000 mV/V.

Use the numeric keypad to write a new value for '1:Rated Output 1'. Press 'Enter' to accept.

Menu 'Scale 1 Calibration' will appear again and the rated output value for all transducers and fixed support points can be entered in the same way.

Edit: 1:Rated Output 1	
Value:	<input type="text" value="2.03900"/> mV/V
Maximum value:	9.99999 mV/V
Minimum value:	0 mV/V
Enter	Current Gross Weight: 111.36 (0.42971 mV/V) Escape

1:Set Zero

This parameter is used to make the scale display gross weight zero when it is unloaded. Make sure the scale is completely unloaded before this setting is performed.

The current gross weight is indicated in the display.

The value '0.00 kg' is proposed for '1:Set Zero'.

Press 'Enter' to accept 0.00 kg.

Edit: 1:Set Zero	
Value:	<input type="text" value="0.00"/> kg
Maximum value:	999999 kg
Minimum value:	-999999 kg
Enter	Current Gross Weight: 111.36 (0.42971 mV/V) Escape

Menu 'Scale 1 Calibration' will be displayed with the 'Current gross weight' changed to the new value of '1:Set Zero' ('zero' in this example). The value of '1:Zero Offset' has changed correspondingly.

1:Zero Offset

This parameter shows the offset value needed to make the scale display the gross weight 'zero' for unloaded scale.

The value of '1:Zero Offset' should not be edited.

Scale 1 Calibration	
1:Calibration Type	Data Sheet
1:Conversion Factor	9.80665
1:Number of Transducers	3
1:Rated Load	2000.00
1:Rated Output 1	2.03900 mV/V
1:Rated Output 2	2.03900 mV/V
1:Rated Output 3	2.03900 mV/V
1:Set Zero	0.00 kg
1:Zero Offset	111.36 kg
Enter	Current Gross Weight: 000.00 (0.42971 mV/V) Escape

Exit calibration

To exit from calibration, press 'Escape' twice.

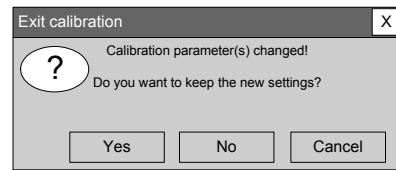
A question will be displayed.

Answer **Yes** to keep the new settings in the instrument memory,
answer **No** to exit calibration without saving (all changes will be rejected).

In both cases the instrument switches to sub menu 'Calibration'.

Answer **Cancel** to continue the calibration for Scale 1.

Now it is possible to perform calibration of any remaining scales, or to return to normal weight display by pressing 'Escape' several times.



Deadweight calibration

This is the most accurate calibration method. It requires that known weights to at least two-thirds of the scale capacity are available.

A deadweight calibration of a scale should start with the scale parameters, described on page 22.

An asterisk (*) will be shown at the calibration parameters that have not yet been stored.

This example shows a two-point Deadweight calibration for Scale 1.

When deadweight calibration has been selected and you have accepted to start a new calibration, menu 'Scale 1 Calibration' will be displayed again.

Use arrow keys 'up' or 'down' to select a parameter to edit, then press 'Enter' to accept.

All parameters are explained below.

Scale 1 Calibration	
1:Calibration Type	Deadweight
1:No of Calibration points	2
1:Value Cal. P1*	0.0 kg
1:Value Cal. P2*	500.0 kg
1:Transd. Signal P1	0.00000 mV/V
1:Transd. Signal P2	1.66631 mV/V
1:Set Zero	0.00 kg
1:Zero Offset	0.00 kg

Enter Current Gross Weight: 111.36 (0.42971 mV/V) Escape

1:No of Calibration Points

This parameter defines the number of calibration points. Up to six points can be selected, parameters for load value and transducer signal will be displayed for the selected number of points.

In this example a two-point calibration is described.

Use the numeric keypad to write '2' for '1:No of Calibration Points'.

Press 'Enter' to accept.

Menu 'Scale 1 Calibration' will appear again.

Edit: 1:No of Calibration points	
Value:	<input type="text" value="2"/>
Maximum value:	6
Minimum value:	2

Enter Current Gross Weight: 111.36 (0.42971 mV/V) Escape

1:Value Cal. P1

This parameter defines the load for the lowest calibration point. Normally the scale should be unloaded and the parameter value set to 0 (zero). This weight value and the corresponding transducer signal value are automatically stored for the scale. The current gross weight is indicated at the bottom line in the display.

If necessary, use the numeric keypad to write a new value for '1:Value Cal. P1'.

Press 'Enter' to accept.

Menu 'Scale 1 Calibration' will appear again.

Edit: 1:Value Cal. P1*	
Value:	<input type="text" value="0.0"/> kg
Maximum value:	999999 kg
Minimum value:	-999999 kg

Enter Current Gross Weight: 111.36 (0.42971 mV/V) Escape

1:Value Cal. P2

This parameter, in a two point calibration, defines the load for the highest calibration point. Normally the scale should be loaded to at least two-thirds of the scale capacity.

This weight value and the corresponding transducer signal value are automatically stored for the scale. The current gross weight is indicated at the bottom line in the display.

Use the numeric keypad to write the actual load on the scale for '1:Value Cal. P2'.

Press 'Enter' to accept.

Menu 'Scale 1 Calibration' will appear again.

Edit: 1:Value Cal. P2*	
Value:	<input type="text" value="100.0"/> kg
Maximum value:	999999 kg
Minimum value:	-999999 kg
Enter	Current Gross Weight: 098.29 (0.67298 mV/V)
	Escape

1:Transd. Signal P1 and 1:Transd. Signal P2

These parameters are only shown and cannot be edited.

1:Set Zero

This parameter is used to make the scale display gross weight zero when it is unloaded. Make sure the scale is completely unloaded before this setting is performed.

The current gross weight is indicated in the display.

The value '0.00 kg' is proposed for '1:Set Zero'.

Press 'Enter' to accept 0.00 kg.

Edit: 1:Set Zero	
Value:	<input type="text" value="0.00"/> kg
Maximum value:	999999 kg
Minimum value:	-999999 kg
Enter	Current Gross Weight: -000.38 (0.42965 mV/V)
	Escape

Menu 'Scale 1 Calibration' will be displayed with the 'Current gross weight' changed to the new value of '1:Set Zero'.

The value of '1:Zero Offset' has changed correspondingly.

1:Zero Offset

This parameter shows the offset value needed to make the scale display the gross weight 'zero' for unloaded scale.

The value of '1:Zero Offset' should not be edited.

Scale 1 Calibration	
1:Calibration Type	Deadweight
1:No of Calibration points	2
1:Value Cal. P1	0.0 kg
1:Value Cal. P2	500.0 kg
1:Transd. Signal P1	0.42971 mV/V
1:Transd. Signal P2	0.67298 mV/V
1:Set Zero	0.00 kg
1:Zero Offset	-0.38 kg
Enter	Current Gross Weight: 000.00 (0.42965 mV/V)
	Escape

Exit calibration

To exit from calibration, press 'Escape' twice.

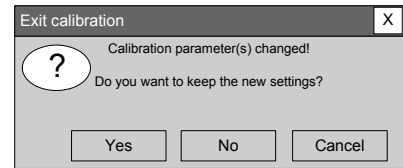
A question will be displayed.

Answer Yes to keep the new settings in the instrument memory,
answer No to exit calibration without saving (all changes will be rejected).

In both cases the instrument switches to sub menu 'Calibration'.

Answer Cancel to continue the calibration for Scale 1.

Now it is possible to perform calibration of any remaining scales, or to return to normal weight display by pressing 'Escape' several times.



Zeroing of gross weight

When the scale installation is calibrated, a zeroing is performed in order to get the gross weight zero when the scale is unloaded. If mechanical equipment is added later, this will affect the weight display for the scale, and a new zeroing of the gross weight becomes necessary.

NOTE! The scale must be unloaded when zeroing is performed.

Access 'Set Zero' for any calibration type.

Navigate to menu 'Calibration' and select the desired scale, in this example 'Scale 1'. The sequence is described on page 21.

In menu 'Scale 1', use arrow key 'down' to position the indicator at the bottom line: 'Scale 1 Calibration'.

Press 'Enter'.

Scale 1		
1:WFIN Update Rate	37 Hz	
1:Filter Window	1.00 kg	
1:Motion Detect Window	0.10 kg	
1:No Motion Delay	1.0 s	
1:Motion Check	Off	
1:Overload Check	Off	
1:Zero Tracking	Off	
1:Tare Corr. Mode	Auto	
1:Flow Calculation	Off	
Scale 1 Calibration		
Enter	Current Gross Weight: 111.36 (0.42971 mV/V)	Escape

In menu 'Scale 1 Calibration', use arrow key 'down' to position the indicator at line '1:Set Zero'.

Press 'Enter'.

The Set-up Code or the Operator Code may be needed.

Scale 1 Calibration		
1:Calibration Type	Deadweight	
1:No of Calibration points	2	
1:Value Cal. P1	0.0 kg	
1:Value Cal. P2	500.0 kg	
1:Transd. Signal P1	0.38793 mV/V	
1:Transd. Signal P2	1.66631 mV/V	
1:Set Zero	0.00 kg	
1:Zero Offset	0.00 kg	
Enter	Current Gross Weight: 111.36 (0.42971 mV/V)	Escape

Menu 'Edit: 1:Set Zero' is displayed, and the current gross weight is indicated on the bottom line in the screen.

The value '0.00 kg' is proposed for '1:Set Zero'.

Press 'Enter' to accept 0.00 kg.

Edit: 1:Set Zero		
Value:	<input type="text" value="0.00"/> kg	
Maximum value:	999999 kg	
Minimum value:	-999999 kg	
Enter	Current Gross Weight: 111.36 (0.42971 mV/V)	Escape

Menu 'Scale 1 Calibration' will be displayed with the 'Current gross weight' changed to the new value of '1:Set Zero'.

The value of '1:Zero Offset' has changed correspondingly.

Press 'Escape' to exit from calibration, like described for 'Deadweight' calibration on page 29.

Scale 1 Calibration		
1:Calibration Type	Deadweight	
1:No of Calibration points	2	
1:Value Cal. P1	0.0 kg	
1:Value Cal. P2	500.0 kg	
1:Transd. Signal P1	0.38793 mV/V	
1:Transd. Signal P2	1.66631 mV/V	
1:Set Zero	0.00 kg	
1:Zero Offset	111.36 kg	
Enter	Current Gross Weight: 000.00 (0.42971 mV/V)	Escape

Common set-up values

Note: Only the set-up parameters covered in this manual are listed.

Location/Notes:

Software version: Serial number:

Date:

Hardware position	Module	Serial no.	Notes
Slot 1
Slot 2
Slot 3
Slot 4
Slot 5
Slot 6
Fieldbus module (at the CPU-unit)

Parameter name	Default value	Set-up value
Language	English	.....
Date Format	YYYY-MM-DD	.....
Time Format	24 h	.....
Set-up Lock	Off	.....
Set-up Code	1 9 3 7	.....

Scale set-up values

Note: Only the set-up parameters covered in this manual are listed.

Locations/Notes:

.....

Module: Ser. no.: Slot no.:

Channel number:

Scale number:

<u>Parameter name:</u>	<u>Default values</u>	.....	.....
X:Measurement Unit	kg	.....	.....
X:Resolution	0.1	.....	.....
X:Capacity	500.0	.....	.....
X:Calibration Type	Data sheet	.....	.....
X:Conversion Factor	9.80665	.....	.....
X:Number of Transd.	3	.....	.....
X:Rated Load	2000.0	.....	.....
X:Rated Output 1	2.03900	.....	.....
X:Rated Output 2	2.03900	.....	.....
X:Rated Output 3	2.03900	.....	.....
X:Rated Output 4	2.03900	.....	.....
X:No of Calibration Points	2	.....	.....
X:Value Cal. P1	0.0	.....	.....
X:Value Cal. P2	500.0	.....	.....
X:Transd. Signal P1	0.00000	.....	.....
X:Transd. Signal P2	1.66631
X:Zero Offset	0.00

Document no. 35196
Article no. 600 856 R1c
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