

PROGRAM DESCRIPTION

G4

Program: G4MI_1.2.113.4

This description is valid for:

G4 Weighing Instrument with application program **1.2.113.4**

See also the following descriptions

G4 Weighing Instrument, Program version 1.2.0.0

Technical Manual PM/DT/HE (www.vishaypg.com/doc?35160)

G4 Weighing Instrument, Program version 1.2.0.0

Operating instructions, Quick installation PM/DT/HE (www.vishaypg.com/doc?35196)

or

G4 Weighing Instrument Program version 1.2.0.0

Technical Manual RM (www.vishaypg.com/doc?35131)

G4 Weighing Instrument Program version 1.2.0.0

Operating instructions, Quick installation RM (www.vishaypg.com/doc?35134)

If these descriptions in any case are contradictory, this description is valid.

Function

This special program has functions for summing 2-8 weighing channels.

General

Added functions in this program is

- Connect each load cell to a separate weighing channel in the G4. The sum of the load cells is displayed in the 'Sum' window. The number of load cells that should be summed (1-8) is set in a set-up.
- Supervise the load on each separate load cell, the load on sum, the load on each side (meaning that half of the summed load cells belong to the 'left side' and the other half belongs to the 'right side') and the difference in load between the sides, with any of the 32 possible level functions.
- Set a delay on any of the level functions between 0 - 10000 ms to allow for temporary dynamic overloads.
- Allow for any channel to 'simulate' the weight from another channel (use for temporary disconnection of a channel, and still have a reasonably correct sum).
- Communicate the four calculated values (sum of all load cells, left side, right side, and difference between left and right side) via serial communication (modbus rtu) or output them on any of the four analog outputs.
- If channel name is entered (set-up), this name is displayed in the channel displays instead of only channel number (scale number)
- Instrument name (set-up) is used as the name for the window where the sum is displayed.
- Flow rate calculated on the sum value can be displayed, communicated or output on an analog output. This function uses all flow parameters normally used by scale 1. The total flow value is also using scale 1 display area.
- Pressing the PRINT button in 'Sum' window causes a printout.

Operation

The G4 will start up showing the 'Sum' window (or 'Oven' window if instrument name is set to 'Oven' as in picture below), where the sum of configured no. of channels is displayed, with both gross and net value. Here we also show indicators for up to eight level functions, indicating the level number, and the status for the levels.

Main window

Oven	2007-07-17 19:07			
Gross	102.8 kg			
Net	Zero	000.0 kg		
Levels	1: <input checked="" type="checkbox"/>	2: <input checked="" type="checkbox"/>	3: <input type="checkbox"/>	4: <input type="checkbox"/>
Levels	21: <input checked="" type="checkbox"/>	22: <input type="checkbox"/>	23: <input type="checkbox"/>	32: <input type="checkbox"/>
-----	-----	-----	Levels	Chan.1-8

For both weights, there are also indicators for 'motion' and 'good zero'.

Pressing the 'TARE' button in this window causes a tare command to all channels used in the sum. If all channels were able to perform a tare, the result of the command is indicated in the net value that should change to zero.

Pressing the 'ZERO' button in this window causes a zero command to all channels used for the main hoist. If all channels were able to zero (the gross weight) this is indicated in the gross value that should change to zero.

By pressing the soft key 'Levels' (F4) a window opens where all the configured levels for the 'sum of channels' are shown.

By pressing the soft key 'Chan.1-8' (F5) a window opens where all the separate channels are shown in the same way as in a normal weight indicator. Here all channels that are used for sum is shown, as well as other configured channels. In the opened window there is a soft key 'Oven' (F1) (or 'SUM' if no instrument name is entered) that return the display to the 'Oven' window.

For RM version of G4 the gross and net weight of the 'sumt' can be displayed by selecting scale 9 (in the same way as for channels 1-8).

Calibration

The channels used for the 'Sum' (1-X) should be set up equally with regards to the common parameters (unit, resolution, update rate, filter parameters, motion parameters...), when the 'Sum' values (total sum, sum of left, sum of right and difference left - right) are calculated from the weights from the separate channels.

Each channel in the 'sum' should then be calibrated using the '**Data sheet**' calibration method (recommended for most applications where the 'Load value' can be calculated, see below), or by the '**dead weight**' calibration method.

When each channel is calibrated and zero is set, the calibration for the 'sum' can be adjusted if necessary in two points setting the correction parameters for the 'sum' (see below).

If any load cell or channel used in the 'sum' detects an error, the weight values (gross and net) in the 'Sum' window will be replaced with an error text 'Error', unless the parameter 'Replacement channel' is set to a valid channel (see below).

Data sheet calibration of the 'Sum' channels

Every channel used by the 'Sum' should normally be calibrated using the '**data sheet**' method. See the G4 standard manuals on how this is done.

If each separate load cell in the 'Sum' is connected to an own channel in G4, then some values has to be calculated, and the value for 'Rated load' be adjusted according to the formule below, in order to have a correct data sheet calibration.

The values that has to be calibrated is as follows:

Display value: How much of the total load that should be displayed by the separate load cell/channel.

Load value: How much of the total load that acts on the separate load cell.

When these values are calculated, the value for 'Rated load' that is entered in the data sheet calibration, should be adjusted as follows

$$\text{Rated load} = \text{Display value} / \text{Load value} * \text{load cell capacity}$$

In the parameter 'Rated output 1' the value for rated output in the data sheet for the load cell should be entered.

Dead weight calibration of the Sum

In some cases a dead weight calibration is preferred instead of data sheet calibration. That is for example if the 'Load value' is not possible to calculate.

If the 'Sum' has more than one load cell, each connected to its own channel in G4, a dead weight calibration of each channel can be done applying a known weight so that the load is spread equally over all load cells. Then do a dead weight calibration on each channel in two points by lifting the known weight in a similar way for the separate channels.

Adjusting the calibration for the 'Sum'

When each channel is calibrated and zero is set, the calibration for the 'Sum' can be adjusted in two points. See the parameters for the 'Summing parameters' (menu 'Calibration' below).

Replacement channel function

If a load cell or channel used in the sum value detects an error, the weight values (gross and net) in the 'Sum' (Oven) window will be replaced with an error text 'Error'. In this case the erroneous channel can simulate (use) the weight from another channel, by settin the set-up parameter 'Replacement channel' to another valid channel (see below). This will be indicated in the display with the text 'WARNING, load cell simulated'.

Flow measurement

Setting up the flow parameter for flow measurement on the 'Sum' value is done by setting the flow parameters for scale 1. The flow value is displayed in the scale 1 display area, and to output the flow value for the 'Sum' on an analog output, select the flow value for scale 1 to the analog output.

Print function

Pressing the PRINT button in 'Sum' window causes a printout of all scales that are summed (1-8), gross (G) and net (N), date and time and sum of net weight to one (or both) serial ports that is configured for printer output (Std Serial).

Example, Summed scales = 4.

```
'-----'  
' 2011-05-17 09:16'  
' 1:  N  060.1 kg G  132.3 kg'  
' 2:  N  067.8 kg G  145.7 kg'  
' 3:  N  029.9 kg G  067.1 kg'  
' 4:  N  039.0 kg G  133.9 kg'  
'  
  Total: N  196.8 kg'
```

If the summed weight is unstable, the instrument will wait for stable weight before printing.

Parameter 'Motion check' has no effect.

During printing and while waiting for stable weight a status indicator in the display flashes with 'Printing' or alternates between 'Printing' / 'Unstable'.

Printout can also be activated by activating a digital input (configured as 'print' input) or by sending a print command (command '9') to the command register via serial communication.

Parameters

The menu system is reached with the 'Info' button when the indicator displays the separate channels (not possible in the 'Sum' window).

From 'Sum' window, press key 'Chan.1-8' and then key 'Info' (or key F11 on a connected USB keyboard).

Added or changed menus and parameters.

Menu 'Communication/Serial Com./COMX:Mode

This menu has been extended with a new choice 'Std Serial' to be able to send data to a connected printer.

Menu 'Inputs/Inputs Slot X/Input XX Use

This menu has been extended with a new choice 'Print' in order to be used as an external print command.

Menu 'Calibration'

This menu has been extended with a new sub menu 'Summing parameters'

This sub menu consists of five new parameters.

No of load cells in Sum

Range: 0 – 8 <2>	Defines the number of channels that should be used for the Sum. Channels that are used starts with channel no. 1 up to the channel set in this parameter. When this is an even number, the first half of the channels are considered to be the 'left side' and the other half to be the 'right side'.
------------------------	--

The following four set-up parameters, makes it possible to adjust the calibration for the sum value. This is done by entering weight values in two different points.

Value in point 1 (normally 0)

Range: -999999 999999 <0>	Defines the actual load that is on the summed channels.
------------------------------------	--

Read value in point 1

Range: -999999 999999 <0>	Defines the read value of the load that is on the summed channels. This parameter is automatically set by the system, when the value in the previous parameter 'Value in point 1' is entered (by pressing the enter key) It may be changed manually.
------------------------------------	---

Value in point 2

Range: -999999 999999 <20>	Defines the actual load that is on the summed channels in the second point.
-------------------------------------	--

Read value in point 2

Range: -999999 999999 <20>	Defines the read value of the load that is on the summed channels in the second point. This parameter is automatically set by the system, when the value in the previous parameter 'Value in point 2' is entered (by pressing the enter key) It may be changed manually.
-------------------------------------	--

The configured channels (Scale 1 to Scale 8) in the menu 'Calibration' has been extended with one more parameter each.

Replacement channel

Choices: Not in use 1 2 3 4 5 6 7 8 <Not in use>	Defines if the channel should use the weight of another channel. Normally this parameter should be set in 'Not in use'. It can be used if e.g. a load cell used in the summed value is broken and must temporary be removed. This channel can then use the weight value from another channel by setting this parameter to the channel that should be used. If these channels normally had the same load, the operation can continue until the load cell is replaced. The use of this is clearly indicated in the 'Sum' (Oven) window, with the message 'WARNING, load cell simulated'
--	--

For the separate channels (Scale 1 to Scale 8) in the menu 'Calibration', the parameter 'Overload' has been removed (this parameter is not relevant in summing applications, when overload levels are instead controlled with the level function, see 'Level supervision').

For scale 1 in the menu 'Calibration' the parameter 'Auto Derivation Time' has been removed, when the system cannot calculate the best derivation time for the flow of the 'Sum'. The derivation time has to be set manually in the parameter 'Derivation Time'.

Menu 'Level supervision'

The sub menus ('Level 1' to 'Level 32') has been extended with a new parameter

Level 'X' Delay

Range: 0 – 10000 ms <0>	Defines the delay in ms before the level is activated when the weight has gone above the set level value. Allows for temporary dynamic overloads.
-------------------------------	---

The sub menus ('Level 1' to 'Level 32') have a parameter 'Level'X' Scale' that has been extended with four new choices.

Level 'X' Scale

Choices: Not in use 1 2 3 4 5 6 7 8 Sum of chan. Left side Right side Left - Right <1>	Four new chooses: Sum of chan.: The level is compared with the summed weight value. Left side: The level is compared with the left side weight value. Right side: The level is compared with the right side weight value. Left – Right: The level is compared with the difference between the left side and the right side.
--	---

Menu 'Analog outputs'

The sub menus ('Analog Outputs') have a parameter 'AOUT 'X' Scale' that has been extended with four new choices.

AOUT 'X' Scale

Choices: Not in use 1 2 3 4 5 6 7 8 Sum of chan. Left side Right side Left - Right <1>	Four new choices: Sum of chan.: The analog output uses the summed weight value. Left side: The analog output uses the left side weight value. Right side: The analog output uses the right side weight value. Left – Right: analog output uses the difference between the left side and the right side.
--	---

New Modbus registers

Data type: Integer	Data type: float (2 reg./value)	Explanation	R/W
41800 (1 reg)	45800	Summed value: Error	R
41801 (1 reg)	45802	Summed value: Status	R
41802 (3 reg)	45804	Summed value: Gross weight	R
41805 (3 reg)	45806	Summed value: Net weight	R
41808 (1 reg)	45808	Left side: Error	R
41809 (1 reg)	45810	Left side: Status	R
41810 (3 reg)	45812	Left side: Gross weight	R
41813 (3 reg)	45814	Left side: Net weight	R
41816 (1 reg)	45816	Right side: Error	R
41817 (1 reg)	45818	Right side: Status	R
41818 (3 reg)	45820	Right side: Gross weight	R
41821 (3 reg)	45822	Right side: Net weight	R
41824 (1 reg)	45824	Left side - Right side: Error	R
41825 (1 reg)	45826	Left side - Right side: Status	R
41826 (3 reg)	45828	Left side - Right side: Gross weight	R
41829 (3 reg)	45830	Left side - Right side: Net weight	R

Document no. 35014
PG4MI_1_2_113_4_E1R1
© Vishay Nobel AB, 2011-10-20
Subject to changes without notice, set forth at www.vishaypg.com/doc?63999.

Vishay Nobel AB

Box 423, SE-691 27 Karlskoga, Sweden
Phone +46 586 63000 · Fax +46 586 63099
pw.eur@vishaypg.com
www.weighingsolutions.com