

# G4 PROGRAM DESCRIPTION

**Program: G4MI\_1.8.123.0**



Program for Waste Crane application

This description is valid for:

**G4 Multi Channel Weighing Instrument** with application program **1.8.123.0**

See also the following descriptions

**G4 Multi Channel Weighing Instrument** Program version 1.8.0.0

**Technical Manual PM/DT/HE** ([www.vishaypg.com/doc?35209](http://www.vishaypg.com/doc?35209))

**G4 Multi Channel Weighing Instrument** Program version 1.7.0.0

**Operating instructions, Quick installation PM/DT/HE** ([www.vishaypg.com/doc?35178](http://www.vishaypg.com/doc?35178))

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

### **Special Program options:**

To get the functionality described below the following program option has to be activated.

*13: Waste Crane Option:* Option for special functions

## **Function**

This program adds functionality for a crane loading waste into two boilers. Signal exchange is provided for communication with a crane PLC (digital signal exchange) and a SCADA system (Ethernet communication using ModbusTCP protocol).

## **Operation**

a). The operator of a crane lifts waste on the crane and drives the crane Grab over Hopper 1 (which feeds boiler 1).

A signal from the Crane PLC is fed to digital input Terminal 12 (IN2) of the DIO8 (denoting crane is feeding Boiler 1), or to digital input Terminal 13 (IN3) of the DIO8 (denoting crane is feeding Boiler 2).

b). The operator pushes a "Weigh" button on the arm of his control console. This weigh command feeds to the Crane PLC and the PLC generates a "weigh" command to the system. This command activates the digital input Terminal 17 (IN7) of the DIO8. The operator is locked out from moving the crane whilst this is happening.

c). The G4 waits for the weight to settle via the "in motion" and "in motion" window. The weight reading and status of the Scale are then stored in registers of the G4 along with the Boiler Identity (Boiler 1 or Boiler 2 depending on the digital inputs IN2 or IN3 as described above).

See Appendix 1 for possible register numbers

When the weight has been recorded a "Weigh complete" signal is fed back to the PLC via Terminal 1 (O1) of the DIO8. This signal is active during approx. 5 sec.

The PLC receives this command and allows the crane operator to move the Crane and pick up another load, which he feeds to either Hopper/ Boiler 1 or 2.

d). At the end of a shift the SCADA/DCS system can give a command to "Reset" the accumulated weights and the number of weighments via digital input terminal 14 (IN4) of the DIO8.

Note This command might also be generated as a software command from the SCADA system (see chapter about modbusTCP communication below).

G4 should handles the following two items as standard.

e). If the Crane tries to pick up a heavy load beyond the Crane Capacity , the G4 high relay trips and stops the lift occurring via the Crane PLC controls. This output is connected from the G4 HSWF2 digital output Terminal 1(O1). The operator can still lower the load.

f). If the crane grab is lowered into the waste too much the low (or slack rope) relay trips and stops further lowering.  
This signal will come from the G4 HSWF2 digital output terminal 2 (O2).

g). For normal operations a Load cell selector switch in the enclosure is in its normal operating position (“Main”) so there is no input on DIO8 Terminal 18 (IN8) and the G4 has Scale 1 selected (Displayed as ‘1: Main’).

Note.

If the Main /Aux switch is ever in the Aux position then a signal is connected to DIO Terminal 18 (IN8) and this selects scale 2 (shown on display as ‘2: Aux’). The Scale 2 HSWF module has the Characteristics of the other Crane (Crane 2) Load cell stored in it, (from information when Scale 1 of Crane 2 was set up).

The situation where Aux is selected should only ever happen for test/fault finding purposes where there may be a problem with the Crane load cell or its G4 display.

No weighing or logging of weights should occur in this situation.

The display should normally only show scale1/Main as its main display as under these conditions Scale 2 input is open circuit (which will show as an error if on display as well)

Outputs and inputs as described above

Module	Function	Description	Pin No	Remark
DIO8	Output O1	Weigh Complete	1	Active during approx. 5 sec. after ‘weigh’ command and stable weight and weight data saved.
DIO8	Common OCom	Common	9	
DIO8	Shield	Screen	10	

DIO8	Input I2	Boiler 1	12	If Boiler 1, active until ‘weigh complete’ received
DIO8	Input I3	Boiler 2	13	If Boiler 2, active until ‘weigh complete’ received
DIO8	Input I4	Reset Acc Weights	14	Positive flank detected as command.
DIO8	Input I7	Weigh	17	Positive flank detected as command.
DIO8	Input I8	Main/Aux Load cell	18	If active scale 2:Aux selected
DIO8	Input ICom	Common	19	
DIO8	Shield	Screen	20	
DIO8				

HSFW2	Output O1	Crane Overload High	1	Standard level supervision
HSFW2	Output O2	Crane Undload Low	2	Standard level supervision
HSFW2	Common OCom	Common	3	
HSFW2	Shield	Screen	4	

## Communication

When a 'weigh' command is received, the G4 waits for the weight to settle via the "Motion Check" and "Motion Detect Window" parameters for scale 1.

The weight and boiler data are then accumulated and stored in registers of the G4.

The saved weight and boiler data are then present for reading of a scada system until the next weighing when the old data is overwritten by the new data.

### Registers that are relevant for the above described sequence.

Register number Integers	Number of Registers.	Explanation	R/W
40030	1	Command error	R
40031	1	Instrument state	R
40032	1	Instrument error	R
40033	1	Instrument status	R
40146	1	Saved Scale 1: Error code+	R
40147	1	Saved Scale 1: Status +	R
40151	3	Saved Scale 1: Net weight+	R
40161	1	Load Dropped to Boiler 1 or Boiler 2 ++	R
40162	1	Increment/No of loads dropped to Boiler 1 *	R
40163	1	Increment/No of loads dropped to Boiler 2 *	R
42000	1	Command register	R/W
42250	3	Boiler 1 Accumulated Weight Low *	R/W
42253	3	Boiler 1 Accumulated Weight High *	R/W
42256	3	Boiler2 Accumulated Weight Low *	R/W
42259	3	Boiler2 Accumulated Weight High *	R/W

The registers 40030 – 40033 shows the current values when read.

+ Status of the weighing system when the "Weigh Complete" signal is generated and weight is stable.

\* These will be reset to zero when the SCADA system sends '5' to the Command register.

### Complete list of new Modbus registers

See also standard manual for all standard modbus registers

Data type: Integer	Data type: float (2 reg./value)	Explanation	R/W
40146 (1 reg)	44134	Saved Scale 1: Error code	R
40147 (1 reg)	44136	Saved Scale 1: Status	R
40148 (3 reg)	44138	Saved Scale 1: Gross weight	R
40151 (3 reg)	44140	Saved Scale 1: Net weight	R
40154 (3 reg)	44142	Saved Scale 1: Flow rate	R
40157 (3 reg)	44144	Saved Scale 1: Input signal (mV/V)	R
40161 (1 reg)	45800	Load Dropped to Boiler 1 or Boiler 2 ++	R
40162 (1 reg)	45802	Increment/No of loads dropped to Boiler 1	R
40163 (1 reg)	45804	Increment/No of loads dropped to Boiler 2	R

### Status register 40161 (integer) or 45800 (float)

Bits set to 1 in this register have the following meaning:

Bit no	Function	Comment
0	Load Dropped to Boiler 1	Load Dropped to Boiler 1
1	Load Dropped to Boiler 2	Load Dropped to Boiler 2
2-15	Not used	

**Note: If this register (bits) is read as float value, see description in standard manual of Data representation.**

### Command register

The command register has been extended with a new command that can be used to reset all accumulated weights and counters for Boiler 1 and Boiler 2. See also standard manual for a description of the command register.

Cmd	Action activated in instrument	Description
5	Reset acc.weight and counters for boiler 1 and 2	Reset the accumulated weights and counters for boiler 1 and boiler 2

# Parameters

The menu system is reached with the 'Info' button on the G4 front panel (or key F11 on a connected usb keyboard). This will open the menu system. Select menu '**Parameter Set-up**' to enter the menus for set-up parameters.

Note that if the login system has been activated the first time trying to enter / change a parameter a pop-up message window will ask for a login code. The standard code for G4 to enter here (if not changed) is '1937'

## Added or changed parameters.

### Menu 'General'

Following parameters in this menu has new default values:

Display Mode	New default value:	1 Scale
--------------	--------------------	---------

If 'Info Line 1 Mode' is set to 'Acc.Weight' it will display the accumulated weight for Boiler 1.  
If 'Info Line 2 Mode' is set to 'Acc.Weight' it will display the accumulated weight for Boiler 2.

### Menu 'Hardware Config'

Following parameters in this menu has new default values:

Slot 1 Module Type	New default value:	HSWF2
Slot 2 Module Type		DIO8

### Menu 'Calibration'

Following parameters in this menu has new default values:

1: Scale Name	New default value:	Main
1: Motion Check	-"	On
2: Scale Name		Aux

### Menu 'Communication'

Following parameters in this menu has new default values:

Modbus TCP Slave	New default value:	On
------------------	--------------------	----

### Menu 'Inputs'

Under 'Slot 2' inputs 22, 23, 24, 27, and 28 are removed from choices. These inputs are dedicated in the software for special use.

### Menu 'Outputs'

Under 'Slot 2' output 21 is removed from choices. This output is dedicated in the software for special use.

### Menu 'Program options'

This menu shows all available program options for this special program. In this program the option for Waste Crane functions '13: Waste Crane Option' has been added.

Program options must be activated with an option code to be functional. The option code can be purchased from your instrument supplier.

### 13: Waste Crane Option

< - >	<p>The option code necessary to activate the 'Waste Crane' functionalities.</p> <p>The code always consists of 10 digits and is related to the CPU module serial number and the application program number.</p> <p>To temporarily use the option, enter the string 'Demo' (irrespective of upper/lower case). This will allow to use the option for 14 days e.g. for try out. Enter a '-' to turn off the program option. The demo program option can be used for several short periods but after a total use of 14 days it will be permanently turned off until a valid code is entered.</p>
-------	---

Document no. 35024  
PG4MI\_1\_8\_123\_0\_E1R1  
© Vishay Nobel AB, 2011-10-20  
*Subject to changes without notice, set forth at [www.vishaypg.com/doc?63999](http://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](mailto:pw.eur@vishaypg.com)  
[www.weighingsolutions.com](http://www.weighingsolutions.com)