

Manual MCS-64 Profibus

Appendix:

4.13 Loss in Weight Commands

4.13 Loss in Weight Commands – PL1 to PL5, LC, LI, GF, GR, GM, SL

Remark: These commands are only available in **firmware version 88.185**.

Note: All setups should be stored with the **SL** command before power off.

The mass flow control / status commands are used to control the mass flow measurement functions.

LC Mass flow control

[**get: cmd41, index 1, value xxx**]
[**set: cmd41, index 129, value xxx**]

The lower bits (0...3) are set by the PLC to indicate a 'Start/Stop' signal outputs 0 ... 3.

Bit 4 is set by the PLC to indicate a 'Start/Stop' signal.

Bit 5 is set by the PLC to indicate 'Flow Frozen', for example whilst the shaking process is carried out.

Request / Setting

Master (PC / PLC) sends	Device responds	Result
LC	C:016	Active bit 4 (decimal 16)
LC_48	OK	Set bit 4+bit 5 (dec. 16 + 32 = 48)

LI Mass flow status

[**get: cmd41, index 2, value xxx**]

The lower bits (0...3) shows the actual status of digital inputs 0 ...3.

Bit 4 shows status of "start/stop" signals.

Bit 5 shows status of 'flow frozen' signal, for example while the silo is being refilled.

Bit 6 shows the 'flow' status [OK = 'high', not OK = 'low'].

Request

Master (PC / PLC) sends	Device responds	Result
LI	I:048	Active bit 4+bit 5 (decimal 48)

GF Mass flow

[**get: cmd41, index 3, value xxx**]

Get the actual mass flow rate in the chosen scale (kg per second for example).

Request

Master (PC / PLC) sends	Device responds	Result
GF	F:+00.000	Get actual mass flow

[Once the LIW sequence has started, the mass flow value is constantly available @ Net weight index/subindex]

GR Mass flow trend

[get: cmd41, index 4, value xxx]

Get the actual mass flow trend (= total mass divided by total time).

Request

Master (PC / PLC) sends	Device responds	Result
GF	F:+00.000	Get actual mass flow

GM Total mass

[get: cmd41, index 5, value xxx]

Get the total mass in the chosen scale (g, kg or t).

Request

Master (PC / PLC) sends	Device responds	Result
GM	L:+00.000	Get actual total mass

The mass flow parameters can be read or set by the following commands.

PLn Read/modify loss in weight parameters

Issuing the PL command with one parameter (PLn) will return the value of the n'th parameter in the format **Pn:+00500**. Issuing the PL command with two parameters (PLn x) will change the n'th parameter to the value x.

Note: In this version of software all the parameters will be set to zero by the factory default (FD) command.

Available parameters:

“_” means Space button on keyboard

PL1 Position the decimal point for LIW scaling

[get: cmd42, index 1, value xxx]
[set: cmd42, index 129, value xxx]

Request / Setting

Master (PC / PLC) sends	Device responds	Result
PL1	P1:+00001	Decimal point in position 100.0
PL1_2	OK	Set decimal point in pos. 10.00

Range: 0 .. 5

PL2 Select LIW rate (weight unit / time unit)

[get: cmd42, index 2, value xxx]
[set: cmd42, index 130, value xxx]

Request / Setting

Master (PC / PLC) sends	Device responds	Result
PL2	P2:+00005	Active scale is 1000kg/hour
PL2_2	OK	Set scale to kg/hour

The following rates units are available:

0 : kg / sec
 1 : kg / min
 2 : kg / h
 3 : 1000 kg / sec or 1 t / sec
 4 : 1000 kg / min or 1 t / min
 5 : 1000 kg / h or 1 t / h
 6 : 1000 t / sec
 7 : 1000 t / min
 8 : 1000 t / h

PL3 Delta time

[get: cmd42, index 3, value xxx]
[set: cmd42, index 131, value xxx]

The Delta time has to be defined in increments where 1 increment equals 10 milliseconds.
 The delta time is the time base for calculating the mass flow. Range: 1 ... 262143.
 Remark: A long delta time leads to greater accuracy but with a slower update rate. A short delta time leads to the opposite.

Request / Setting

Master (PC / PLC) sends	Device responds	Result
PL3	P3:+01000	Active delta time is 10000 msec or 10 sec
PL3_02000	OK	Set delta time to 20 sec

[Once the LIW sequence has started, the mass flow value is constantly available @ Net weight index/subindex]

PL4 Delta weight

[get: cmd42, index 4, value xxx]
[set: cmd42, index 132, value xxx]

If during the delta time the 'process delta weight' exceeds the delta weight set, the LDM 88.1 firmware will automatically select the appropriate delta time to be used in the mass flow calculation. The delta time setup will not be changed or stored. Range: 0 .. 131071 d.

If the delta time exceeds the value set in PL3 or the delta weight exceeds the value set in PL4, a new measurement is made and the mass flow is update.

Request / Setting

Master (PC / PLC) sends	Device responds	Result
PL4	P4:+99999	Active delta weight is 99999
PL4_1000	OK	Set delta weight to 1000 d

PL5 Delay Time for mass flow calculation

[get: cmd42, index 5, value xxx]
 [set: cmd42, index 133, value xxx]

The delay time starts at the end of a refill period or shaking process. The delay time has to be set in increments where 1 increment is equal to 10 milliseconds. Range: 0 ... 262143.

Request / Setting

Master (PC / PLC) sends	Device responds	Result
PL5	P5:+00300	Active delay time 300 msec
PL5_200	OK	Set delay time to 2000 msec

SL Save the loss in weight setup parameters

[set: cmd28, index __, value \$10]

With this command the 'Dosing Parameters' settings will be saved in the EEPROM.

Request / Setting

Master (PC / PLC) sends	Device responds	Result
SD	OK	Dosing parameters saved
SD	ERR	Error

4.13.1 Loss in weight process

The LIW process is controlled by the loss in weight commands. All other standard commands are also available.

Once the loss in weight parameters have been loaded into the LDM 88.1, the filling process will begin when the 'Start' signal from the CAN gateway appears on bit 4.

Note: The 'gross weight' field always contains the actual gross value. However, the 'net weight' field only shows the 'net weight' if the 'Loss-In-Weight' calculation is NOT running. If the 'Loss-In-Weight' calculation is running, the 'net weight' field will then shows the flow rate.

Whilst the dosing/filling process is running, the value of the actual mass flow, mass flow trend and total mass are continuously available.

When the silo is more or less empty, a refill will be required. During the refill procedure, the mass flow value will automatically be 'frozen' by the LDM 88.1 firmware. When the end of refill is detected, the mass flow delay time will begin. At the end of the mass flow delay time the actual values will be updated. The same procedure happens during a shaker process.

The mass flow control bits are set by the PLC. Only during refill mode will the LDM automatically set bit 5.

The mass flow status is shown as the status of digital the inputs.

Remark: The setup of the filter mode FM, the filter frequency FL and the update rate UR all influence the mass flow values.