Description of input-output

Each of the logical inputs/outputs can be associated with any of the physical inputs/outputs of a transmitter, the terminal or an offset input/output unit (e.g. WAGO).

▼ I/O associated with scales

Outputs	Inputs
Empty scale	Suspension
Scale error	Continuity
Manual mode	Discharge authorisation
Out of tolerance	Validation of manual dosing

▼ Global I/O

Outputs	Inputs
Cycle in progress	Start cycle
	Abandon cycle
	Stop manufacturing run

▼ I/O associated with actuators

These inputs/outputs are associated with the actuators triggering the transfer of the products. Their number depends on:

- configuration,
- the number of products used for manufacturing.

I/O for each of the actuators:

Outputs	Inputs
Circuit selection (Enables the positioning of a handling circuit before dosing.)	Start authorisation (Can be used to wait for external authorisation before starting product dosing.)
High flow rate	
Low flow rate	
Flow rate error	

User data

File / Reference	Capacity	Code	Label	Level
Products	100	12 c. alpha	20 c. alpha	Supervisor
Silos	100	3 figures	20 c. alpha	Supervisor
Actuators	255			Engineer
Formula headers	100	12 c. alpha	20 c. alpha	Supervisor
Formula details	2000			Supervisor
References 1 to 4		16 c. alpha		Operator
Results	1000			Operator

▼ Results file

This file contains the results of all of the weighing operations performed for the various manufacturing runs. It may be exported in CSV format for future use with Excel or any software accepting this format.

Parameters	Format – Value	Comments
Date	DD/MM/YYYY	
Time	hh:mm	
Sequence	0 to 65535	Sequence number of an operation in the manufacturing cycle.
Run no.	10 figures	Counter incremented for each new manufacturing run.
Formula code	12 characters	Code of the formula executed.
Formula name	20 characters	Name of the formula executed.
Reference 1 to 4	16 characters	Reference entered in the keyboard at the start of the manufacturing run.
Scale no.	1 or 2	
DSD Nº	0 to 65535	
Product code	12 characters	Code for the product dosed.
Product name	20 characters	Name of the product dosed.
Silo code	0 to 255	Code of the silo containing the product dosed during the operation.
Silo name	20 characters	Name of the silo containing the product dosed during the operation.
Batch no.	20 characters	Batch number of the product dosed.
Loading	A=Auto / M=Manual	Loading mode for the operation.
Target weight	0 to 999999999999 g, kg or t	Set point weight (target).
Dosed weight	0 to 999999999999 g, kg or t	Weight actually achieved (Dosed).
Difference	0 to 999999999999 g, kg or t	Difference: Weight achieved - Set point weight.
Result	1 character	+: Out of tolerance (excess) / -: Out of tolerance (through lack of product).

Your Authorized Distributor

Non contractual illustrations. Precia-Molen reserves the right to alter the characteristics of the equipment described in this brochure at any time.

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I 410 MDU
Multiple Dosing Unit

PRECIA MOLEN™ WORLDWIDE WEIGHING

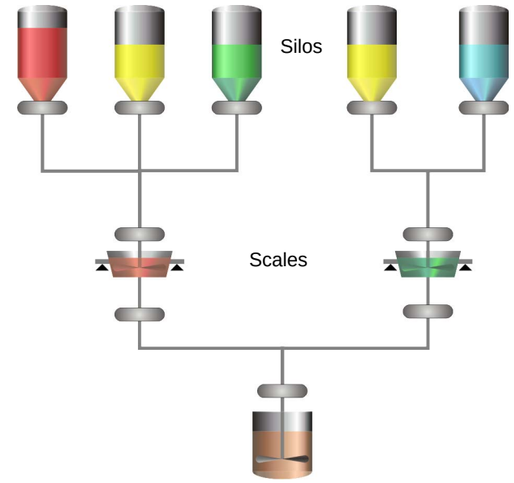
Application

I 410 MDU software is suitable for most manufacturing processes for a finished or semi-finished product comprising different components in the proportions defined in a formula.

This software can process the automatic creation of each of the doses with weight-based checks and stock management, providing complete manufacturing traceability.

The I 410 MDU software system can be used in many sectors such as:

- Agri food
- Pharmaceuticals and cosmetics
- The chemical industry, etc.



Standard MDU installation

Functions

▼ Management of 1 to 2 weighing bins.

▼ Identification of batches of primary matter and finished products.

▼ Description of formulas per type of operation:

- Automatic dosing:
  Creation of the dose via actuator control;
- Manual dosing:
  Manual creation of the dose by the operator; visual monitoring via a bargraph;
- Timeout:
  Suspension of the cycle depending on programmed times and actuator control (e.g.: stirring cycle);
- Discharge:
  Possibility for intermediate and/or global cycle-end drainage (batch).

▼ Actuator control via internal, offset or virtual physical input/output (reading/writing of bits in a table shared by the field bus).

▼ Complete control of the dosing process with inputs/outputs, MODBUS protocol and ProfibusDP field bus, Profinet, DeviceNet, Ethernet TCP/MODBUS or Ethernet/IP.

▼ Independent configuration of operations for each of the scales, organised into several files and with four levels of operation (Installer, Supervisor, Operator, User), password protected.

▼ Safeguard/restoration of parameters and transfer of results by USB stick.

Minimum configuration

- I 410 terminal.
- An external weight transmitter or measurement card integrated in the terminal.
- Logical inputs/outputs, depending on the number of products to be automatically dosed.

Operator interface

The MDU application may manage up to two scales. In this case, the operator screen is divided into two parts enabling global supervision of the installation.

1. Scale supervision 1.
2. Scale supervision 2.
3. **F6**: Access to configuration options (or validation of weighing in manual loading<Exposant>*).
4. **F9**: Cycle-end stop (or access to the manufacturing start screen*).
5. **F10**: Access to additional information.
6. Abandon of the cycle.
7. Start of the cycle.
8. Access to the metrologic screen.
9. Change of user level.
10. Accept key.

** During an operating phase not shown here.*

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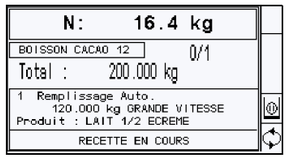
Formulas and types of operations

Manufacturing cycles are described in formulas using different types of operations.

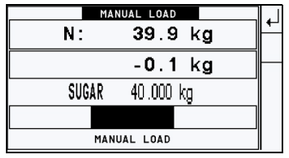
For dosing operations, quantities may be expressed in weight or as a percentage.

- Automatic dosing



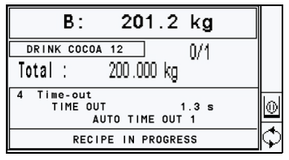
The product is automatically transferred from the storage silo to the unloading hopper.
Either the hopper is weighed in filling mode or the storage silo is weighed directly in dosing mode.
Products are transferred via actuator control, e.g. using valves, pumps, screws, etc.

- Manual dosing



The transfer is completed manually by the operator.
A bargraph enables the easy calculation of the set point weight via visual checks.

- Timeout



The manufacturing cycle is suspended for a configurable period.
Actuators may be controlled during timeout.
This enables mixing or stirring cycles to be created, for example.

- Specific operation

The cycle is suspended while awaiting external authorisation input.
From authorisation, an actuator is controlled until an external input changes status at the end of the operation.

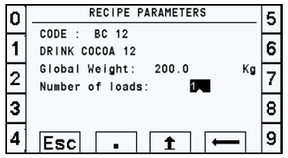
- Discharge

The drainage actuator control can be used to empty the weigh hopper up to the minimum configurable weight threshold.
It is possible to empty the weigh hopper several times during the manufacturing cycle.

- Assignation

If two scales are used, assignation can be used to synchronise manufacturing cycles.
This generally ensures that manufacturing is completed by both scales before discharge into a mixer.

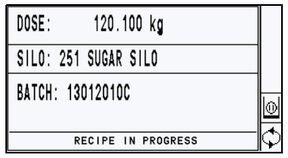
Starting manufacturing



In addition to selecting the formula, manufacturing can be started by indicating, as preferred:

- the total weight to be manufactured; the system will calculate the number of loads required;
- the total weight to be manufactured and the number of loads required; the system will calculate the optimal value of loads;
- the number of loads required.

Traceability



Complete traceability of the batches manufactured.
In automatic mode, a batch number is assigned to each product silo.
With manual dosing, the operator introduces the batch number for the product using the terminal or a bar code reader.

Printing

A global summary or details of weighing can be printed at the end of the manufacturing run.

A global summary may also be requested at the end of each load.

Examples:

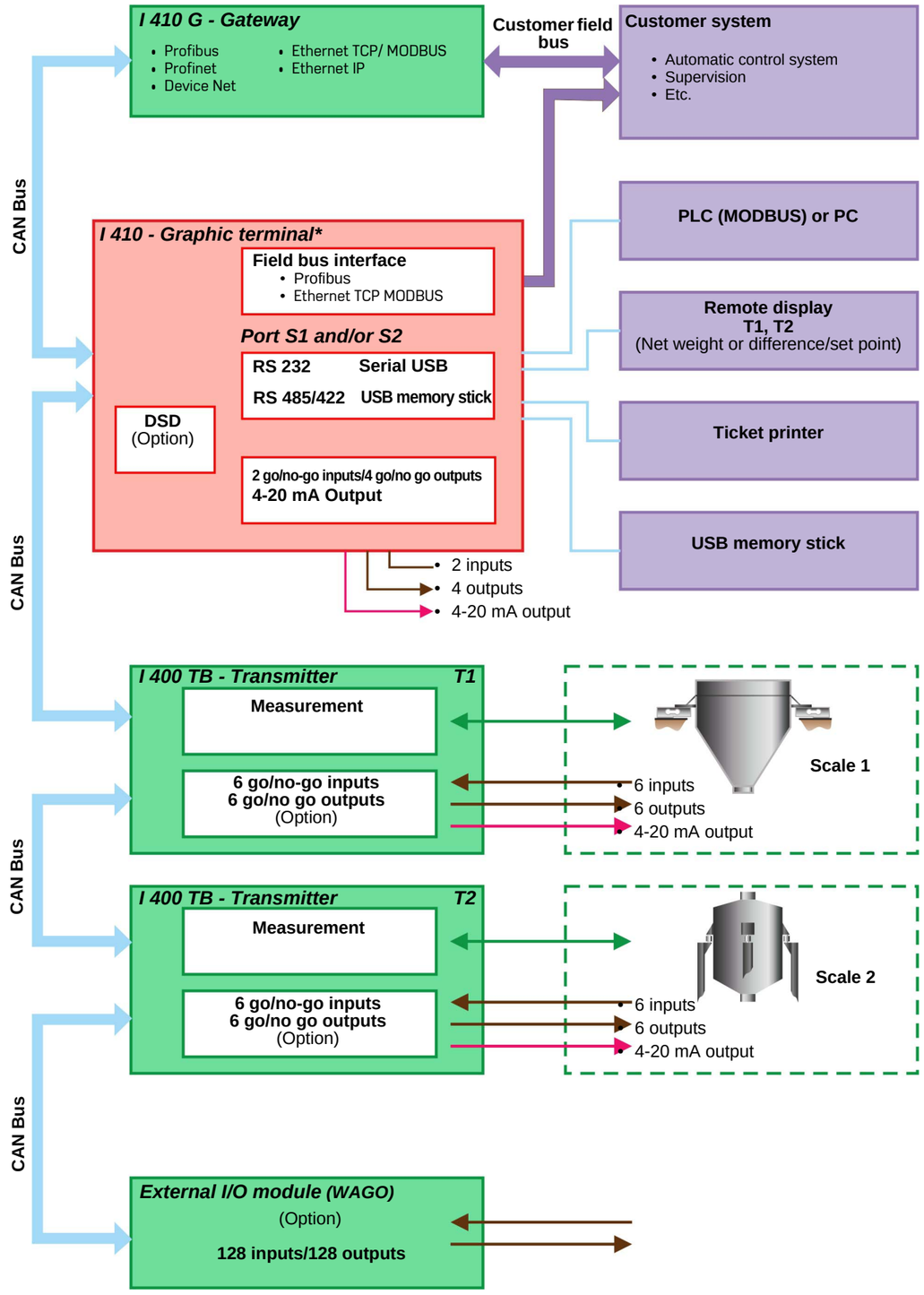
- global summary without weighing details

```
PRECIA
WORLDWIDE WEIGHING
07001 PRIVAS

START RECIPE:        22/03/14   09:41
END RECIPE:          22/03/14   09:44

BC 12   DRINK COCOA 12

MANUFACTURE  : WRAPPED PALLETS
QUALITY  : EXTRA
NOTE  : NTR

      TOTAL RECIPE:       516.700 kg
```

- global summary with weighing details

```
PRECIA
WORLDWIDE WEIGHING
07001 PRIVAS

START RECIPE:        22/03/14   09:44

BC 12   DRINK COCOA 12

MANUFATURE   : WRAPPED PALLETS
QUALITY  : EXTRA
NOTE  : NTR

-------------------------------------------
SCALE: 1   LOAD No: 1      Time: 09:45
PRODUCT: SEMI SKIMMED MILK
Batch No: 15012010A
          Target:   45.000 kg
          Dose :    45.100 kg
          Diff.i+    0.100 kg
-------------------------------------------
SCALE: 1   LOAD No: 1      Time: 09:46
PRODUCT: COCOA
No Lot : 13012010C
          Target:   15.000 kg
          Dose :    29.400 kg
          Diff.i+   14.400 kg
-------------------------------------------
SCALE: 1   LOAD No: 1      Time: 09:47
PRODUCT: SUGAR
          Target:   15.000 kg
          Dose :    15.400 kg
          Diff.i+    0.400 kg
-------------------------------------------
        TOTAL LOAD:       89.900 kg
-------------------------------------------
```

Block diagram



It is possible to include one or two internal weighing channels in the graphic terminal.