Designation of digital Inputs/Outputs

Each of the digital inputs and outputs may be associated with any physical input or output of the transmitter.

Digital outputs

no.	Function
1	Weighing conveyor running
2	Upstream conveyor running
3	Automatic start
4	Sliding average alarm
5	General alarm
6	Ejector 1
7	Ejector 2
8	Ejector 3
9	Ejector 4
10	Ejector 5
11	Ejector 6
12	Ejector 7
14	Start Conveyor speed controller
15	Start upstream Conveyor speed controller
16	Start downstream conveyor speed controller
35	Weight in zone 1
36	Weight in zone 2
37	Weight in zone 3
38	Weight in zone 4
39	Weight in zone 5
40	Weight in zone 6
41	Weight in zone 7
42	Weight in zone 8

Digital Inputs

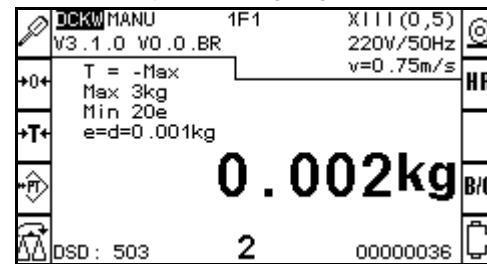| no.	Function
20	Start weighing detector
21	Throughput management detector
22	Start sorter
23	Saturation of downstream belt
25	Start weighing conveyor
26	Speed detector
27	Request product ejection
31	Restart sorter belt

Printing

Printing of each weighing and/or end of batch.
Output to printer or USB memory stick (virtual printer).

```
BATCH NUMBER: BATCH 123
ITEM CODE: 123ABC
BATCH START: 06/06/08 15:03:42
BATCH END: 06/06/08 16:45:02
MACHINE NUMBER: 1
CLASS RECORD CODE: 1
REF 1: ref 123
REF 2: ref 456
FREE INFO: free text
TOTA BATCH COUNTER: 54
DEF No.: 4
CLASS 1 COUNTER: 5
TOTAL WEIGHT CLASS 1: 499.92 g
CLASS 2 COUNTER: 5
TOTAL WEIGHT CLASS 2: 499.98 g
CLASS 3 COUNTER: 5
TOTAL WEIGHT CLASS 3: 199.86 g
CLASS 4 COUNTER: 5
TOTAL WEIGHT CLASS 4: 3426.68 g
CLASS 5 COUNTER: 5
TOTAL WEIGHT CLASS 5: 0 g
CLASS 6 COUNTER: 5
TOTAL WEIGHT CLASS 6: 0 g
CLASS 7 COUNTER: 5
TOTAL WEIGHT CLASS 7: 149.98 g
CLASS 8 COUNTER: 5
TOTAL WEIGHT CLASS 8 : 899.8 g
AVERAGE BATCH WEIGHT: 117.986 g
STANDARD BATCH DEVIATION : 23.9911 g
MAX BATCH WEIGHT: 150 g
MIN BATCH WEIGHT: 99.96 g
```
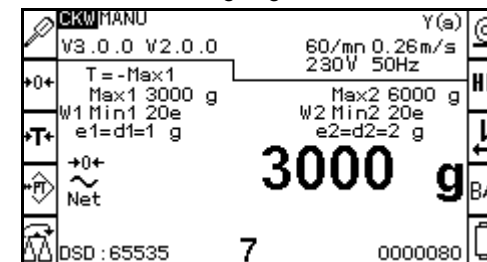
Example 1: End of batch printing

Weighing screens

DCKW mode: Dynamic weighing

```
DCKW MANU        1F1    XIII(0,5)
V3.1.0 V0.0.BR         220V/50Hz
T = -Max               v=0.75m/s
Max 3kg
Min 20e
e=d=0.001kg
                  0.002kg   B/G
DSD : 503    2        00000036
```

CKW mode: Static weighing

```
CKW MANU               Y(a)
V3.0.0 V2.0.0    60/mn 0.26m/s
T = -Max1             230V 50Hz
Max1 3000 g      Max2 6000 g
W1 Min1 20e      W2 Min2 20e
e1=d1=1 g        e2=d2=2 g
~ Net
                  3000   g   B/G
DSD :65535   7        0000080
```

- Data storage (DSD) :
  Max. number of records .... 48,000.
  Record contains: DSD no., gross weight, tare weight, net weight, predetermined tare, type of weight printed, type of weight transmitted by protocol, units, identification no.

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Application

The I 400 CKW software fulfils most industry requirements for discontinuous dynamic weighing.

- In motion weighing
- Checking production tolerance
- Weight classification
- Checking order compliance
- Checking prepacked goods
- etc...

Weighings can be obtained either dynamically or statically.

Functions

- Management of 1 to 8 weight classes that can be associated with 7 ejection systems.
- Determination of threshold values in 6 modes:
  - legislation of prepacked goods
  - relative,
  - relative sliding,
  - absolute,
  - percentage,
  - sliding percentage.
- Batch identification with two associated reference files and one free text field.
- Control of the weighing conveyor and an upstream spacing conveyor and downstream ejector conveyor (options).
- Batch statistics: histograms by class, average, standard deviation, etc...
- Results can be printed.
- Record of weighings which can be transferred onto a USB memory stick.
- Full control of the process by averages via a MODBUS serial link or CAN Open fieldbus, Profibus DP, Device Net, TCP/MODBUS.
- Several operating modes:
  - acquisition of weight in motion (catch weigher),
  - stop product for addition or removal,
  - sorter/calibrator with ejection, etc.

Operator interface

NET: 500.0 g
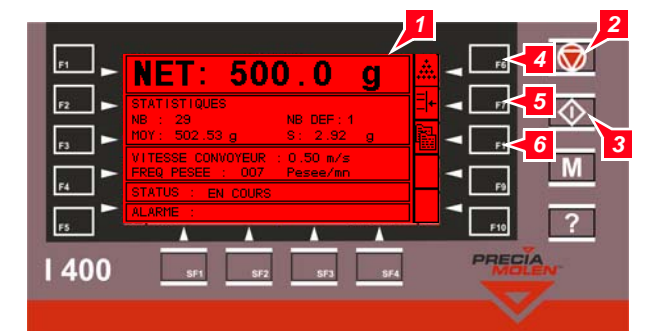
1. Main application display :
   - Display package weight,
   - Statistics (number of packages weighed, average, standard deviation),
   - Conveyor speed; weighing frequency,
   - Status of the machine (stopped, running, fault, etc.),
   - Alarm,
   - Fault number.
2. Conveyor stop
3. Conveyor start,
4. F6: access batch screen.
5. F7: access statistics screen.
6. F8: access file screen.

Function keys F1 to F10 and SF1 to SF4 are structured at several levels. They can have different functions depending on the context.

Configuration

The various operating parameters of the I400 system, which are configurable are organised in 7 files and four levels of operation, password protected:

- Installer:
  - Metrological adjustment and Input/Output configuration.
- Supervisor:
  - Setting up the peripherals.
- Operator:
  - Definition of dosage set points and access to results.
- User:
  - Limited rights to start batches.

This segmenting of parameters makes the I 400 system modular and easily integrated into the majority of industrial processes. The functioning of the application is therefore more secure as it denies access to unauthorised operators.

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Batch identification

Batch set up screen

1. Set up/start a batch by entering the various batch data:
   • Batch no. (12 char. alphanum.),
   • Item code,
   • class code,
   • reference 1 (code 12 char. alpha., name 20 char. alpha.),
   • reference 2 (code 12 char. alpha., name 20 char. alpha.),
   • free info (12 char. alphanum.),
2. Stop current batch.
3. Print batch (if printer option fitted).
4. Weighing conveyor status (stop, or current).
5. Message display (fault, alarm, etc.).
6. Return to "Operation monitoring" screen
7. Access " Statistics and distribution" screen.

User data

File characteristics

File	Capacity	Code	Name	Access level
Items	100	13c. alpha.	20c. alpha.	Operator
Classes	50	13c. alpha.	20c. alpha.	Supervisor
Ejector	7	1 to 7	-	Supervisor
Reference 1	100	12c. alpha.	20c. alpha.	Operator
Reference 2	100	12c. alpha.	20c. alpha.	Operator
Results	400	-	-	User

Ejector file

Parameters	Format – value	Comment
Ejector distance	in mm	Between the weighing detector and the ejection axis
Ejector cmd time	in ms	Definition of reaction time

Items file

Parameters	Format – value	Comment
Code	13 c. Alpha.	-
Label	20 c. Alpha.	-
Nominal weight	in kg	-
Tare	in kg	-
Price	in €/kg (UK market is £ possible?)	(0: no price calculation)
Class record code	0..50	(0: no link with the class file)

Class file

This file is used to manage up to 8 weight zones by class with the ability to choose different ways of calculating the thresholds :

• *Prepacked:* automatically calculated according to the nominal weight and legislation for prepacked goods.
• *Relative*: with respect to the nominal weight (signed values).
• *Relative sliding:* according to the average sliding weight.
• *Absolute*: direct comparison with the net weight.
• *Percentage*: with respect to the nominal weight (signed values in %).
• *Sliding percentage*: with respect to the sliding average (values in signed %).

For each zone, choice of method:
• None,
• Ejector from 1 to 7 (selective sorting),
• Stop ejection,
• Stop adjustment, (to re-adjust the weight of the package).

Result file

Parameter	Format
Batch code	12c. alpha.
Item code	13c. alpha.
Date batch start	dd/mm/yy
Time batch start	hh/mm/ss
Date batch end	dd/mm/yy
Time batch end	hh/mm/ss
Machine no.	2 c. num
Class code	2 c. num
Reference code 1	12c. alpha.
Reference code 2	12c. alpha.
Items weighed counter	6 c. num
Zone 1 items counter	6 c. num
Total weight zone 1	7 c. num. including decimal point

Items and total weight counter zone, same for zones 2 to 8

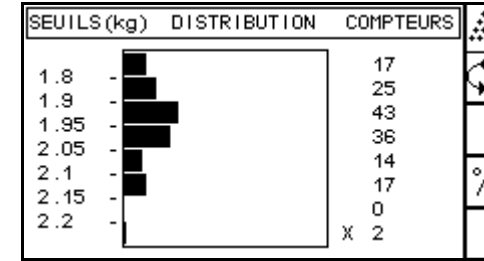|	
Average weight of batch	5 (weight)
Standard deviation of batch	5 (weight)
Minimum package weight for batch	5 (weight)
Maximum package weight for batch	5 (weight)
Unit	2 c. alpha (g or kg)

◼ Distribution screen:
• Recall threshold,
• Histogram of weighings,
• Counters by class.

◼ Batch Statistics screen:
• Totals by zone,
• Batch average
• Standard deviation,
• Batch minimum package weight,
• Batch maximum package weight,
• Total number of weighings taken into account for the statistics,
• Total number of packages weighed.

Application block diagram

CAN Bus

I 400 G – Coupler

Field BUS
• Profibus
• DeviceNET
• TCP/MODBUS Ethernet

I 400 – Weighing terminal

S1 and/or S2
● RS 232 ● Serial USB
● RS 485/422 ○ USB memory stick

DSD Option

S1 to S6
● TOR Inputs/outputs

2 TOR inputs
4 TOR outputs

Automatic control system (MODBUS)

Printer P 250, P 360

USB memory stick

CAN Bus

Weighing belt

I 400 - Transmitter

T1

Weighing

Input/Output Card

1 TOR input (Start weighing detector)
5 TOR inputs (downstream belt, upstream belt detectors, etc.)
6 TOR outputs (belt cmd., ejector cmd., fault, etc.)