

DACS-G

PRODUCT

GUIDE



The purpose of this document is to depict the available DACS-G Checkweigher product range. The guide provides information on DACS-G models and configurable options, the guide will be updated periodically to reflect range development.

Following the initial product definition content a tutorial is provided, this provides an introduction to fundamental Checkweigher uses as well as more detail about the options depicted in the initial configuration tables.

The guide, which due to the anticipated update frequency is supplied in PDF format only, is provided as an **Ishida internal reference document only**.



DACS-G



Key features

- Compact and modular design
- Multi-range (DACS-G-S015, 600g or 1500g)
- 7" Colour LCD screen, touch key pad with command dial button
- 200 presets standard. Up to 500 as an optional upgrade
- Quick-release conveyors in a wide range of dimensions
- Smooth frame design for fast and easy cleaning
- Ishida-made, high-speed, high-sensitivity load cell
- Anti Floor Vibration (AFV) compensation cell
- Load cell - excessive load protection through Dislocating Force Limiter (DFL)

Connectivity

- Ethernet
- USB

Options

- Special reject systems
- Feedback control
- Metal detector
- Printer
- Reject confirmation

Reading the codes

How to read the name:

- The model name contains information about the machine specifications
- You can tell the maximum weight, conveyor width and length, type of in-feed conveyor, finish and display unit

DACS-G-S 015 - 24 - SS - I - S

Code	Max weight	Weigh Conveyor width	Weigh Conveyor length	Finish	In-feed conveyor	Display unit
015	1,500g	1 - 160 mm		SS - Stainless Steel	I - Infeed	S - Standard command dial
060	6,000g	2 - 240 mm	2 - 250 mm	WP - Water Proof	N - No Infeed	H - High grade colour touch screen
		3 - 320 mm	3 - 350 mm		CE - Ceia MD**	
		4 - 400 mm	4 - 450 mm		S - Safeline MD	
			5 - 550 mm			
			6 - 650 mm			

Checkweigher benefits applications

- Feedback to hand packers
- Feedback to a volumetric filler
- Feedback to an auger filler
- Feedback to the baking process

- 1 Screens
- 2 Data Storage
- 3 Printer
- 4 Metal detector
- 5 The reject system



DACS-G Command Dial



S Standard command dial

DACS-G CTS



H High grade colour touch screen (CTS) - this is the most advanced option

DACS-G-S015/S060

Model

Model(s)	Infeed (mm)	Weight (mm)	Reject (mm)	Model(s)	Infeed (mm)	Weight (mm)	Reject (mm)
DACS-G-S015-12*	450	250	550	DACS-G-S060-22*	450	250	550
DACS-G-S015-13*	350	350	550	DACS-G-S060-23*	350	350	550
DACS-G-S015-14*	350	450	550	DACS-G-S060-24*	350	450	550
DACS-G-S015-22*	450	250	550	DACS-G-S060-33*	450	350	550
DACS-G-S015-23*	350	350	550	DACS-G-S060-34*	450	450	750
DACS-G-S015-24*	350	450	550	DACS-G-S060-35*	450	550	750
DACS-G-S015-33*	350	350	750	DACS-G-S060-36*	550	650	750
DACS-G-S015-34*	350	450	750	DACS-G-S060-44*	545	445	845
DACS-G-S015-35*	450	550	750	DACS-G-S060-45*	445	545	845
				DACS-G-S060-46*	545	645	845

Specifications

Option	Rules/Comments			S015	S060
Languages	Up to 3 off			●	●
Manuals (Paper or CD)	Up to 3 off			●	●
Line Height	850mm	100 ±		●	●
Leg Extension Straight	950mm	100 ±		●	●
Leg Extension Flared	1100mm	100 ±		●	●
Environment	SS	Stainless Steel		●	●
	WP	Water Proof	*DACS G-S060 22/23/24 size not available	●	●
Direction of Travel	Left to right			●	●
	Right to left			●	●
Display	S	Standard Command Dial		●	●
	H	High Grade CTS	Caution - ensure required language is available	●	●
Approval	Non approved			●	●
	MID			●	●
Feet	Standard	Not bolt down		●	●
	Bolt Down			●	●
	Caster			●	●
Metal Detector Integration	None			●	●
	CEIA	THS/SL21E 3F	Aperature size to be confirmed, product dependent	●	●
	CEIA	THS/SLMS21	Aperature size to be confirmed, product dependent	●	●
	CEIA	THS/MS21	Aperature size to be confirmed, product dependent	●	●
	Safeline	Dual Frequency	Aperature size to be confirmed, product dependent	●	●
	Safeline	Signature	Aperature size to be confirmed, product dependent	●	●



Reject Options

Reject Method	Direction (Front or Rear)	Direction (Front or Rear inline)	Direction (Front and Rear)	Reject Bin	S015	S060
Standard Air	2 zone	3 zone	3 zone	Confirm quantity	●	●
HD Air	2 zone	3 zone	3 zone	Confirm quantity	●	●
Pneumatic Arm	2 zone	3 zone	3 zone	Confirm quantity	●	●
Reject Options	Rules					
Reservoir Kit	Included with HD Air; selectable with other options				●	●
Reject Confirmation	Only selectable with reject bin(s)				●	●
Bin Full	Only selectable with reject bin(s)				●	●
Bin Locked	Only selectable with reject bin(s)				●	●
Product Buildback Sensor	Only selectable with reject bin(s)				●	●

Upgrade Options

Machine Upgrade Options	Rules	S015	S060
Extended Infeed (excludes combination units)	Extended Infeed Conveyor at 50mm increments - original infeed length stated + up to 400mm maximum	●	●
Printer		●	●
Beacon		●	●
E Stop Facility		●	●
Belt Gap Transfer Plates	If selected, all conveyors	●	●
Infeed Guides	Infeed conveyor only, not full length of conveyor	●	●
Windshield Fixed Lockable Hatch	Included as standard when selecting reject confirmation. Material Polycarb only	●	●
Windshield Fixed Interlocked Hatch	Material Polycarb only	●	●
Undercover	Material Polycarb only	●	●
Reject Bin Over Cover	Included as standard with reject confirmation (all bins)	●	●
Communication Options (up 3 maximum per m/c)	Rules		
Host Interface	Ethernet / RS232 / RS422/485	●	●
Preset Communications	Ethernet / RS232 / RS422/485	●	●
Weight Data Output	Ethernet / RS232 / RS422/485	●	●
Serial Print	Ethernet / RS232 / RS422/485	●	●
IDCS II	Ethernet / RS232 / RS422/485	●	●
Modbus	Ethernet / RS232 / RS422/485	●	●
Software Options	Rules		
Reference Weight Renewal		●	●
Extended Presets	200 Standard, 500 Extended	●	●
Average Start		●	●
Proper Count Software (with Paddle)	Hardware included (paddle assembly)	●	●
Proper Count Software (without Paddle)	No hardware supplied	●	●
Feedback Control	Hardware included (additional module)	●	●
Pre-set Selection via Handheld Barcode	Excludes hardware (barcode scanner)	●	●
Random Checking Software	Not to be used in conjunction with any other communication or software option (including IDCS II)	●	●

DACS-G-S015-24 (SNACKS)

Model

Model(s)	Infeed (mm)	Weight (mm)	Reject (mm)
DACS-G-S015-24-SS-I-N-S	350	450	450
DACS-G-S015-24*	350	450	550

Specifications

Option	Configuration			DACS Snacks
Languages	Up to 3 off			●
Manuals (Paper or CD)	Up to 3 off			●
Line Height	850mm	100 ±		●
Leg Extension Straight	950mm	100 ±		N/A
Leg Extension Flared	1100mm	100 ±		N/A
Environment	SS	Stainless Steel		●
	WP	Water Proof		N/A
Direction of Travel	Left to right			●
	Right to left			●
Display	S	Standard Jog Dial		●
	H	High Grade CTS		●
Approval	Non approved			●
	MID			●
Feet	Standard	Not bolt down		●
	Bolt Down			●
	Caster			N/A



Reject Options

Reject Method	Direction (Front or Rear)	Direction (Front or Rear inline)	Direction (Front and Rear)	Reject Bin	DACS Snacks
Standard Air	2 Zone	3 Zone	3 Zone	Confirm Quantity	●
HD Air	2 Zone	3 Zone	3 Zone	Confirm Quantity	●
Pneumatic arm*	2 Zone	3 Zone	3 Zone	Confirm Quantity	N/A
Reject Options	Rules				
Reservoir Kit	Included with HD Air; selectable with other options				●
Reject Confirmation	Only selectable with reject bin(s)				●
Bin Full	Only selectable with reject bin(s)				●
Bin Locked	Only selectable with reject bin(s)				●
Product Buildback Sensor	Only selectable with reject bin(s)				●

* Only available on 550mm reject conveyor

Upgrade Options

Machine Upgrade Options	Rules	DACS Snacks
Extended Infeed (excludes combination units)	Extended Infeed Conveyor at 50mm increments - original infeed length stated + up to 400mm maximum	N/A
Printer		●
Beacon		●
E Stop Facility		●
Belt Gap Transfer Plates	If selected, all conveyors	●
Windshield Gravity Held	Included as standard with 015 model. Material Polycarb only	●
Windshield Fixed Lockable Hatch	Included as standard when selecting reject confirmation. Material Polycarb only	●
Windshield Fixed Interlocked Hatch	Material Polycarb only	●
Undercover	Material Polycarb only	●
Reject Bin Over Cover	Included as standard with reject confirmation (all bins)	●
Communication Options (up 3 maximum per m/c)	Rules	
Host Interface	Ethernet / RS232 / RS422/485	●
Preset Communications	Ethernet / RS232 / RS422/485	●
Weight Data Output	Ethernet / RS232 / RS422/485	●
Serial Print	Ethernet / RS232 / RS422/485	●
IDCS II	Ethernet / RS232 / RS422/485	●
Modbus	Ethernet / RS232 / RS422/485	●
Software Options	Rules	
Reference Weight Renewal		N/A
Extended Presets	200 Standard, 500 Extended	●
Average Start		●
Proper Count Software (with Paddle)	Hardware included (paddle assembly)	●
Proper Count Software (without Paddle)	No hardware supplied	●
Feedback Control	Hardware included (additional module)	●
Pre-set Selection via Handheld Barcode	Excludes hardware (barcode scanner)	●

Retail Code of Practice - Standardisation Guide

Model

Model(s)	Infeed (mm)	Weight (mm)	Reject (mm)
DACS-G-S015-12*	450	250	550
DACS-G-S015-13*	350	350	550
DACS-G-S015-14*	350	450	550
DACS-G-S015-22*	450	250	550
DACS-G-S015-23*	350	350	550
DACS-G-S015-24*	350	450	550
DACS-G-S015-33*	350	350	750

Model(s)	Infeed (mm)	Weight (mm)	Reject (mm)
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DACS-G-S060-33*	350	350	750
DACS-G-S060-34*	350	450	750

Model(s)	Infeed (mm)	Weight (mm)	Reject (mm)
DACS-G-S060-35*	450	550	750
DACS-G-S060-36*	550	650	750
DACS-G-S060-44*	545	445	845
DACS-G-S060-45*	445	545	845
DACS-G-S060-46*	545	645	845

Specifications

Option	S015	S060
Reject Bin Lockable	●	●
Reject Bin Door Status	●	●
Reject Bin Full Status Monitoring	●	●
Fixed Tunnel Lockable Access	●	●
Fixed Tunnel Interlocked Access	● (optional)	● (optional)
Reject Confirmation	●	●
Product Detection Sensor	●	●
Reject Confirmation Sensor	●	●
Product Build Up Sensor	●	●
Audible/ Visual Reject Confirmation of Successful Reject	●	●
Enhanced Product Tracking	●	●
Metal Detector Fault	●	●
Reject System Failure (Metal) Low Air	●	●
Bin Lock Open Status	●	●

Checkweigher overview and benefits

- Automatically checks the weight of every pack
- Only correctly weighted packs continue down the line
- A small saving of a couple of grams per pack can add up to a lot of money



Used for both weighing and counting packs

WEIGHING

1

PRE-PACKING



2

PACKING



1

Pre-packing

Make sure the right amount of product is there before it is packed

2

Packing

Make sure the pack contains the correct amount of product once packed/sealed

COUNTING

3

MULTI-PACKING



3

Multi-packing

Make sure the right amount of each item is in the multi-pack

4

CARTONS & CASES



4

Cartons & cases

Make sure the correct number of items is in the carton or case

Core parts of the checkweigher



1 In-feed conveyor

- Helps stabilise the product as it moves to the weigh conveyor
- Regulates pack spacing

2 Weigh conveyor

- Weighing takes place on the weigh conveyor
- Disturbances impact the accuracy - a windshield may be used
- Accuracy influenced by the time that the product is on the weigh conveyor

3 Reject conveyor

- The reject conveyor belt has a special coating which makes it slippery - product moves smoothly as it leaves the checkweigher

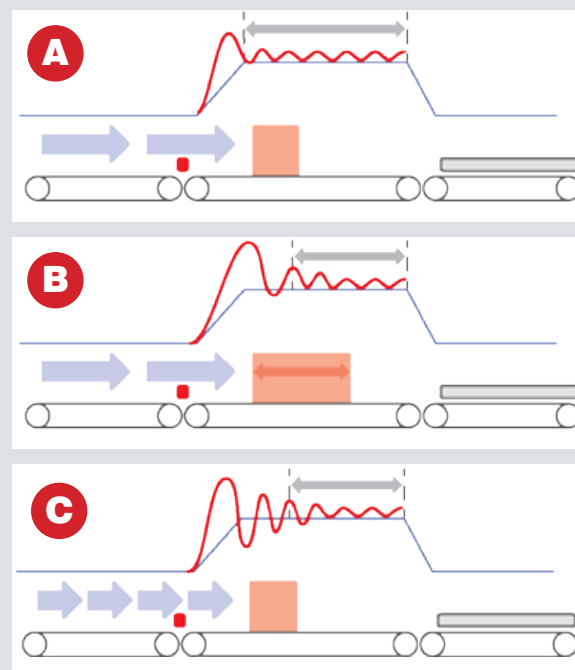
In-feed conveyor

A Optimal stable time

B As product length increases, stable time decreases.

The longer the product, the less space there is on the weigh conveyor relative to the product, so the slower the conveyor must move for the product to be stable long enough for an accurate reading from the weigh sensor

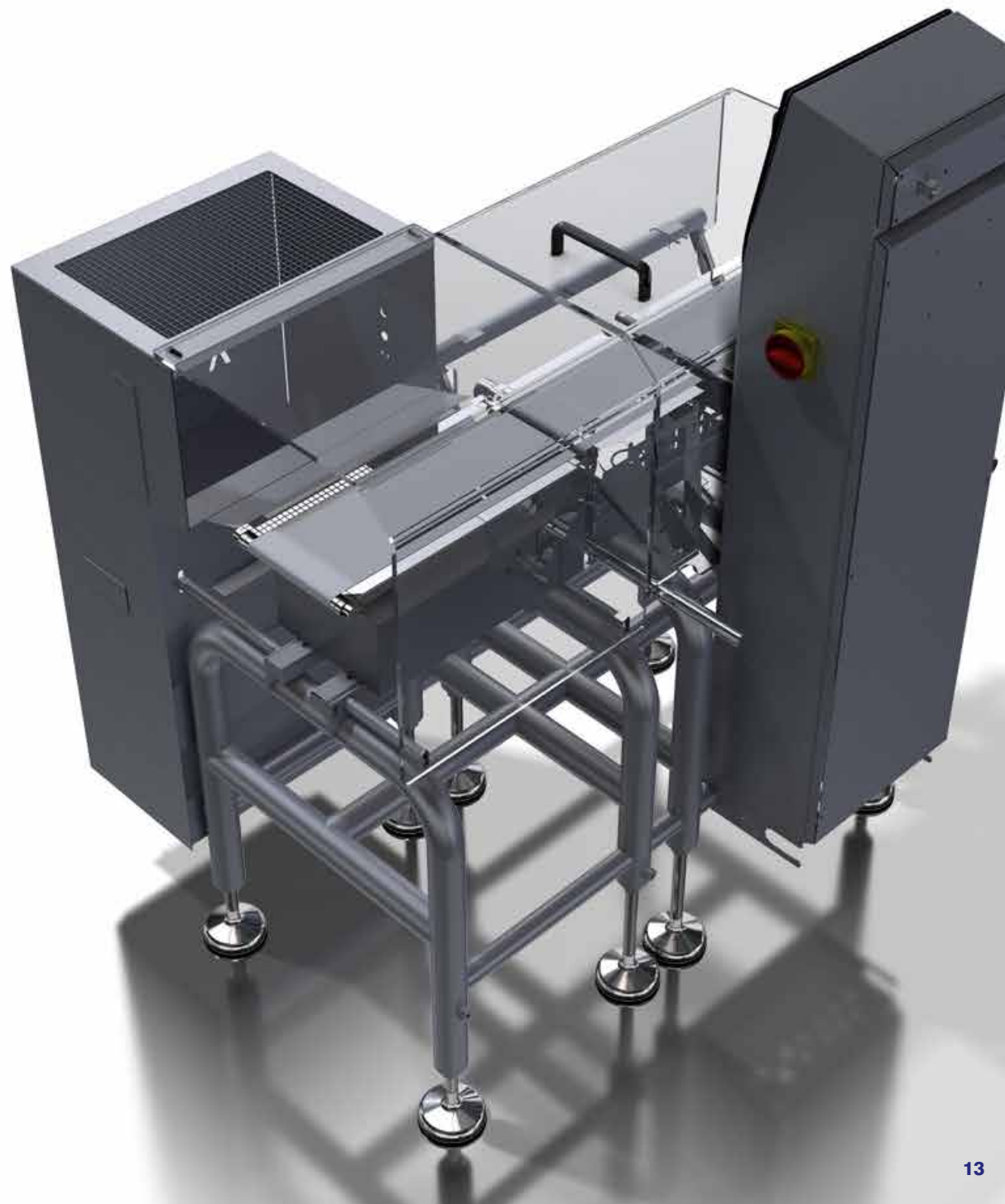
C As line speed increases, stable time decreases



Reject system

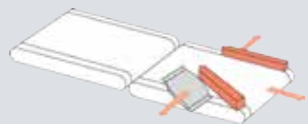
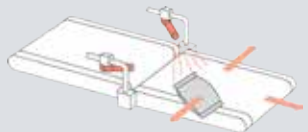
The difference between two and three zone reject systems:

- Two Zone - sends both under- and overweight packs into the same zone. This configuration is known as Two Zone as product can either continue in line if correctly weighted (First Zone) or be rejected off the line into the bin (Second Zone).
- Three Zone - separates underweight and overweight packs. Three Zone is similar to Two Zone except there are two reject zones.

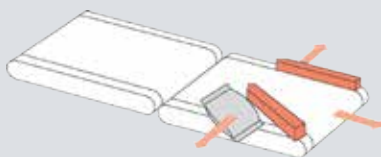


The reject system

Use these technical specifications to help guide your choice

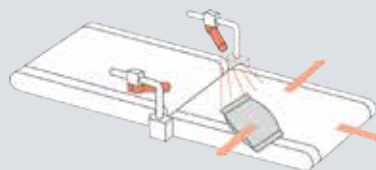
Rejection system		Speed	Drive	Zones	Product	Weight	Limitation
Arm		120-130 packs per minute	Pneumatic	2 or 3	Solid or bags	Machine Limit - product dependent	Not suitable for thin packs or small bags which can get caught in the gap between arm and belt
Airjet		200 packs per minute	Pneumatic	2 or 3	Solid or bags	Machine Limit - product dependent	Needs to push all the way to remove product

Arm rejector



- Used for packs that are between the machine limits
- Sorts products into separate under and overweight bins
- It is best used for thick solid products which do not get damaged very easily
- Suggested use on bags of crisps, open trays of meat and cereal boxes

Air jet rejector



- The most common option
- Uses an air jet to blow rejected products off the line.
- Suitable for separating lightweight products on a high-speed line, and is a double reject system
- Suggested use on bags of crisps, yoghurt pots and cereal boxes

Reject modes

The DACS can be operated in four reject modes:

- **Normal**

This mode does not involve the requirements of the “Three packers Rules”.*

- **T1-T2 Control - Mode**

This mode fulfills rules #2 and #3 of the “Three Packers Rules”.* This is:

- The actual quantity *may* be less, on the average than the marked quantity.
- No more than 2.5% (1 in 40) of the packages shall be Non-Standard (less than the normal weight).
- No packages shall be inadequate (less than the Apostolate Tolerance Limit).

- **Average Control Mode**

Satisfies rules #1 and #3 of the Three Packers’ Rules.* That is:

- The actual quantity may not be less, on the average than the marked quantity.
- Non-standard packages *may* exceed 2.5% (1 in 40)
- No packages shall be inadequate

- **Average T1-T2 Control Mode**

Satisfies rules all of the Tree Packer’s rules.* That is:

- The actual quantity may not be less, on average than the marked quantity.
- No more than 2.5% (1 in 40) of the packages shall be non-standard.
- No package shall be inadequate

In average T1-T2 control the checkweigher will automatically adjust its lower limit to comply with average weight e-prepackage and the 3 packers rules:

- Packs that are less than the nominal weight, but still within the TNE**
- Packs that are less than the TNE** and are non-standard
- Packs that have less than twice the TNE** and are inadequate

We use the terms T1 and T2:

- T1 is the nominal weight minus the TNE** - packs in this zone are non-standard
- T2 is the nominal weight minus twice the TNE** - packs in this zone are inadequate

Non-approved machine

System Configuration	
Reject Mode	15/FEB/2012 10:17
0	Normal
1	T1 - T2 Control
2	Average Control
3	Average T1 - T2 Control

M.I.D approved machine

System Configuration	
Reject Mode	22/MAR/2012 15:42
0	Normal
1	Average T1 - T2 Control

* Three Packer’s Rules

1. The actual contents of the packages shall not be less, on average, than the nominal quantity.
2. Not more than 2.5% (1 in 40) of the packages may be non-standard, i.e., have negative errors larger than the TNE** specified for the nominal quantity.
3. No package may be inadequate, i.e., have a negative error large than twice the specified TNE**.

**TNE = Tolerable Negative Error

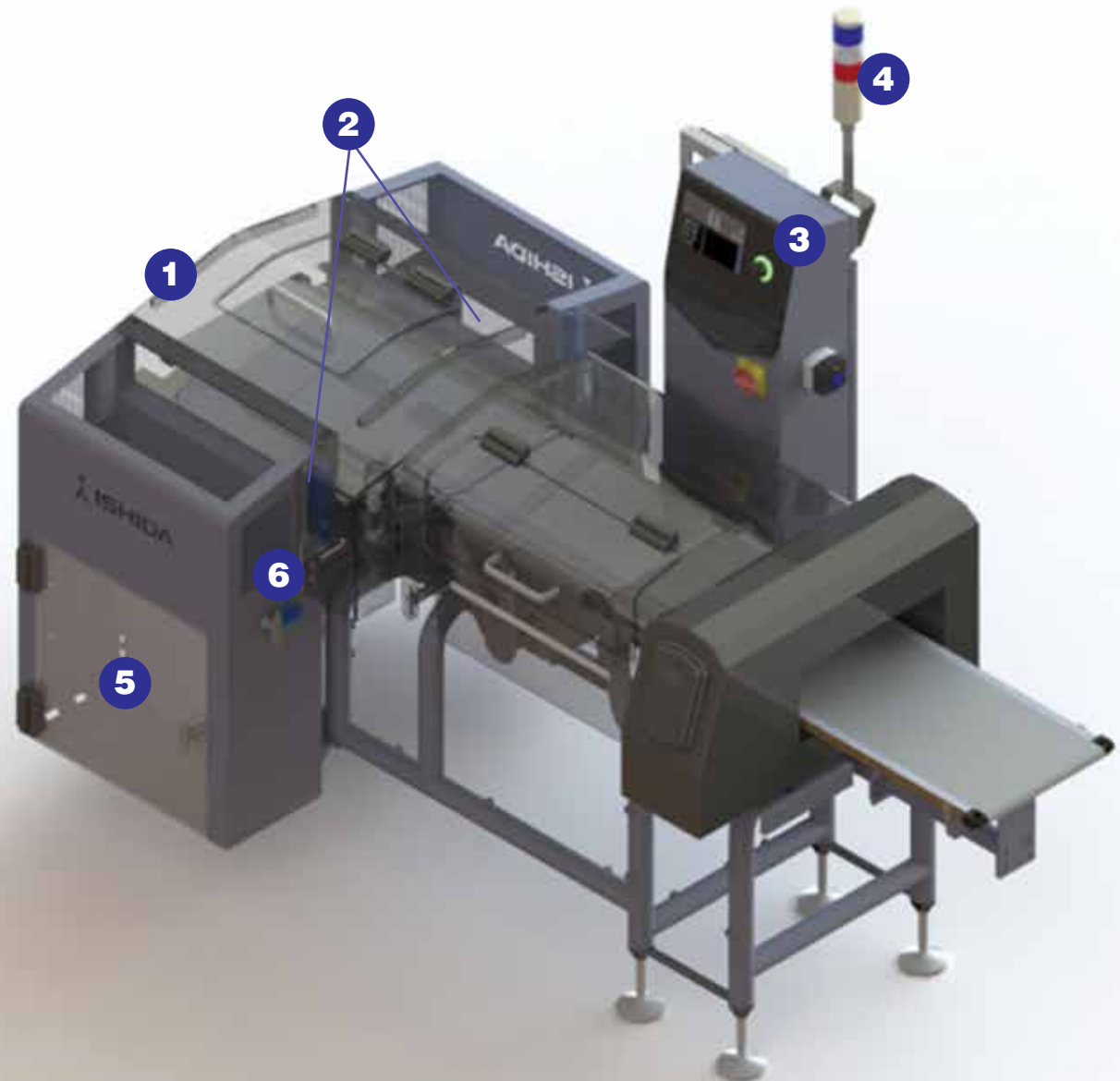
T1 and T2 ranges for a 400g pack		
Nominal weight	400g	The average of all packs must not be less than 400g
TNE**	12g	
T1 (Nominal weight - TNE**)	388g	1 in 40 may weigh between 388g and 376g
T1 (Nominal weight - 2 x TNE**)	376g	No pack may weigh less than 376g

Retail Code of Practice System

- | | |
|--------------------------------------|--------------------------------------|
| 1 Product build-up sensor | 4 Configurable lamp indicator |
| 2 Reject confirmation sensors | 5 Bin door status sensor |
| 3 Error reset/sensor test | 6 Bin full sensor |

Highlights of features

- Reject Confirmation System
- Lockable Reject / Bin full System
- Air Pressure System
- Metal Detector Failure
- Build Back Sensor / Reject Check Sensor
- Automatic Reject System
- Tunnel Guard / Windshield
- Pack Tracking
- Fail Safe Sensors
- Functional testing can be achieved
- Error Reset Switch
- Beacon Lamp Indicator



Retail Code of Practice

Retail Channel	Marks & Spencer	Tesco	Sainsbury's	Morrisons	Reject Confirmation - DACS-W-N	Reject Confirmation - DACS-G
Automatic Reject System	●		●	●	●	●
Lockable	●		●		●	●
Bin Full Status	●	●	●	●	●	●
Tunnel Guard (Fixed)	●		●	●	●	●
Locked Hatch	●			●	●	●
Interlocked Hatch	● (optional)			● (optional)	●	●
Reject Confirmation	●	●	●	●	●	●
Photogating Sensor	●		●	●	●	●
Metal Detector Fault	●	●	●	●	●	●
Reject Failure (Metal) Low Air	●	●	●	●	●	●
Product Build Back	●	●			●	●
Bin Lock/ Open Status	●	●	●		●	●
Reject Check Sensor	●	●			●	●
Audible/ Visual Confirmation of successful reject			●	●	●	●

Options and optional extras

Working with data

- The checkweigher will gather data, which can be used in various ways
- We need to know how the checkweigher will integrate into the packaging line/network as this affects both the hardware connections we provide and the software we pre-load

Hardware connections: connecting to other machines

The checkweigher can either have a Serial or Ethernet connection.



Serial connection. Can be used to communicate data with cable lengths of up to 30 meters.



Ethernet connection (recommended). The most robust data transfer protocol, cable lengths of up to 100m can be used.



Barcode readers

- In some applications there is a requirement for the checkweigher to weigh packs or multipacks coming from different lines.

A barcode reader can be used to read the product barcode and automatically select the associated checkweigher preset with the appropriate reference weight. This mode of operation cannot be used in MID applications.

Checking your options match

- **Host interface:** sends data via Ishida's custom protocol. A custom interface and application needs to be written. You can read and write machine data and access statistics, batch reports and preset information.
- **Preset communication:** used to keep compatible machines (like a CCW) synchronised to the DACS by changing both presets when only one is adjusted. This is particularly useful when machines are not in the same part of the building.
- **Weigh data output:** sends a special command string which contains the weigh result. This is useful when you just want simple information about the weight.
- **External print:** displays the same data that is going to the printer, in real time.
- **Modbus:** sends data over Ethernet. Custom software needs to be developed and can give access to all the data on the checkweigher, including start and stop, error message and batch reports.

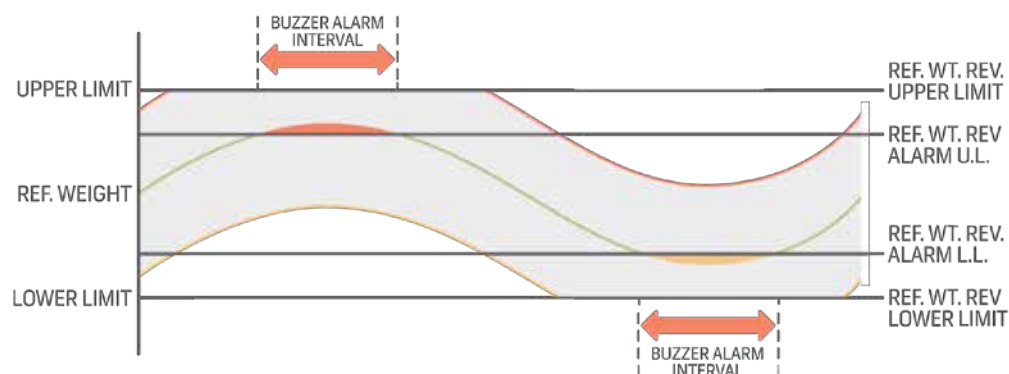
Not all hardware and protocols work together. Use this table to check that it all makes sense.

	Host interface	Preset communication	Weigh data output	External Print	Modbus
Serial	●	●	●	●	
Ethernet	●	●	●	●	●
Needs custom software	●		●	●	●

Working with data

Reference weight renewal

This is used for counting items in a bag or pack, for products where the weight of a batch can vary, but the number of items in a bag needs to remain constant. If the batch is heavier or lighter than normal, the reference weight is automatically adjusted so that the count remains correct.



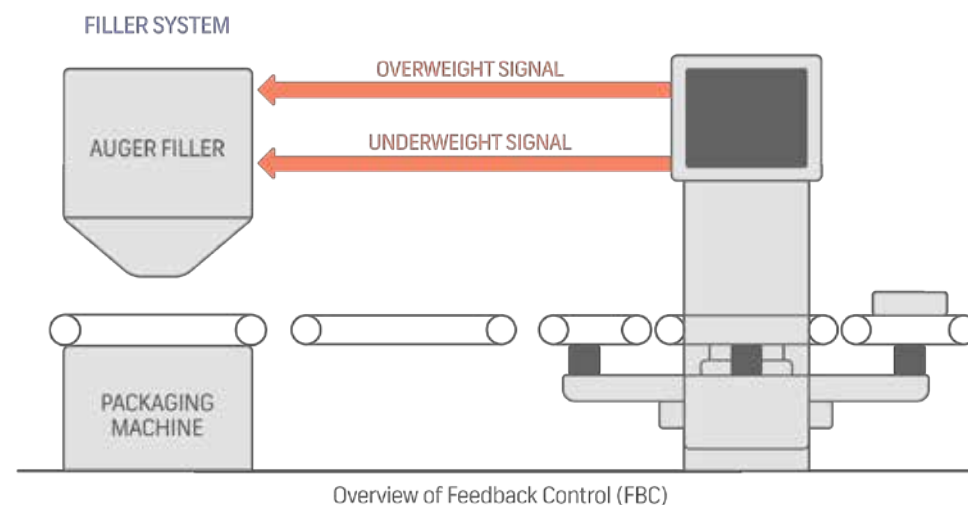
Proper count software

This is used to count the number of proper packs. When the set amount is reached it will give an output to indicate the count is reached or perform an action. This could include sounding an alarm, or moving a diverting arm.



Feedback control

- The checkweigher can control other devices via pulse relays in the line
- Sends messages to packing machines to adjust amount of product going into a pack
- Can be linked to one or two machines
- Most common with filling machines like coffee



Our system may not be compatible with all fillers, therefore always send technical details on how our system works with the quote

What is IDCS?

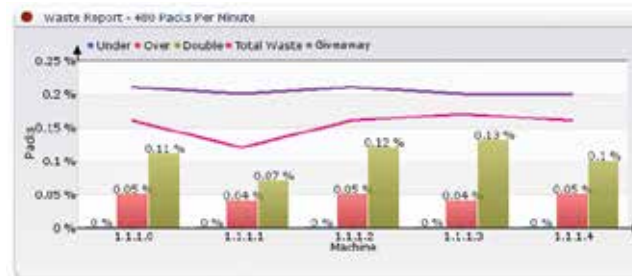
The Ishida Data Capture System (IDCSII) is a **Management Information System** that constantly monitors line performance through interrogation of the Checkweigher to identify and record many parameters including individual pack weight (every pack), number of packs passing down the line and availability of the machine.

Ishida Data Capture System (IDCSII)

This recorded data can then be presented to factory management staff (or indeed line operators) such that line effectiveness can be reported in real time. The IDCS system incorporates a level of reporting flexibility within the software so that customers can selectively configure the system to meet their individual reporting requirements. Additionally the **Overall Equipment Effectiveness (OEE)** can be calculated and reported against predefined user limits.

To enable a Checkweigher to be fully compatible with the IDCS system an interface module needs to be installed on the machine. This interface modules collects and records the data from the machine before transmission to the hosting server where the various reports are configured and the encrypted pack data stored.

A key feature of this interface module is the fact that it acts as a data buffer between the machine and the server, if for any reason the server goes down or is unavailable the pack data is stored within the interface module until such time as communication with the server is re-established and data can be transferred, this buffer ensures data integrity (i.e. removes the opportunity for any pack data to be lost).



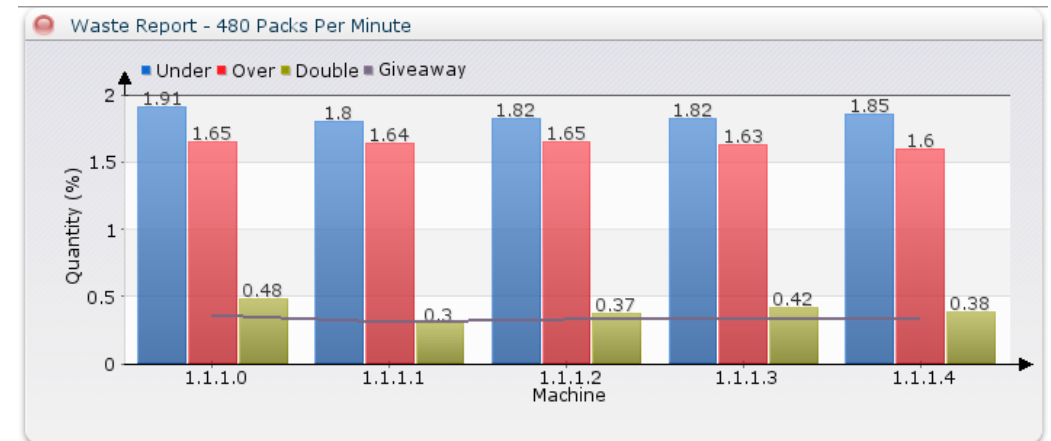
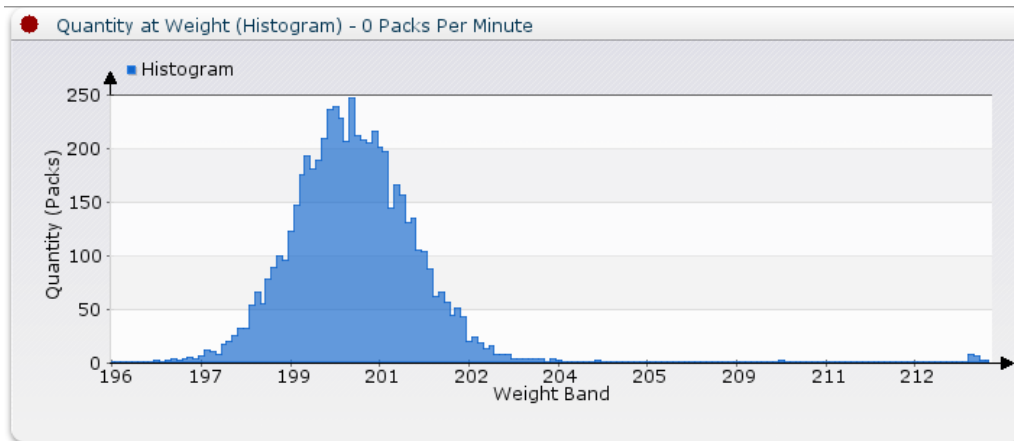
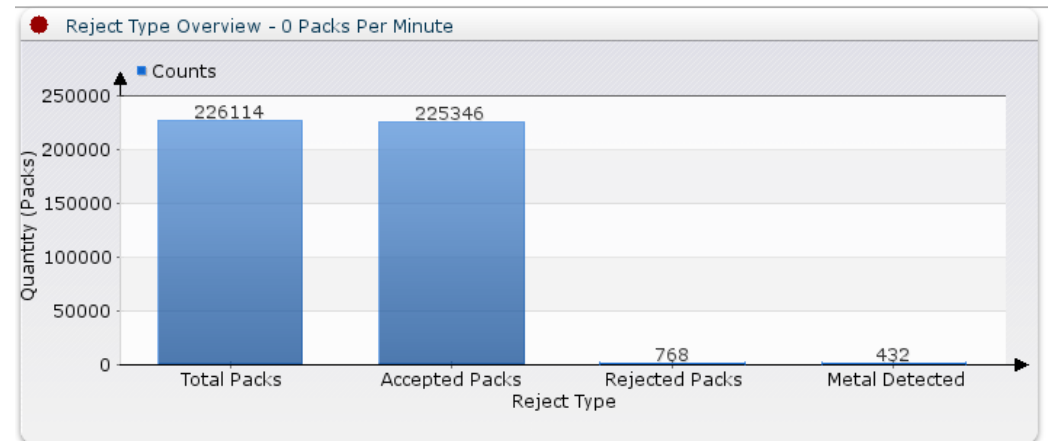
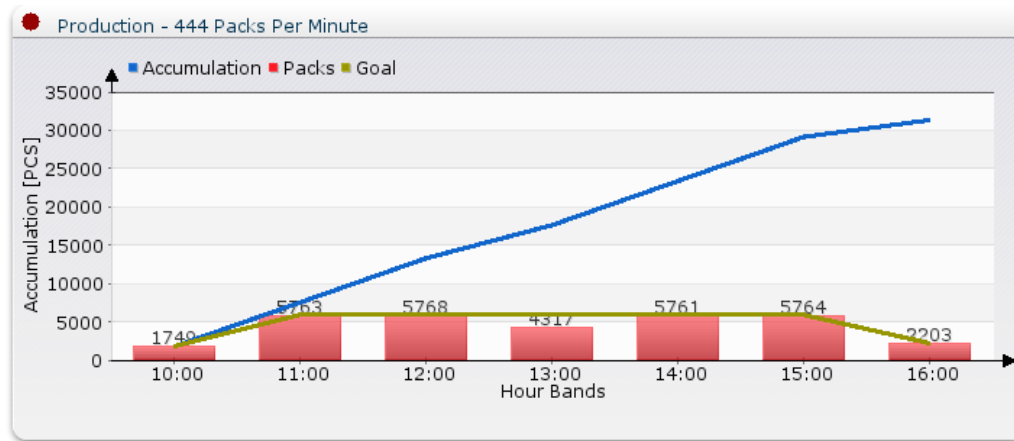
Average Overview - 26 October 2012, 4:13 pm

Machine Name	Product Name	Reference Weight (g)	Average Weight	Lowest Weight	Highest Weight
1.1.1.0	Test	200.00	199.07	198.30	211.80
1.1.1.1	Test	200.00	199.99	199.70	204.40
1.1.1.2	Test	200.00	199.99	199.70	205.90
1.1.1.3	Test	200.00	199.95	199.30	210.00
1.1.1.4	Test	200.00	199.98	199.20	212.00
1.1.1.2	Test	200.00	200.01	199.40	212.00



Ishida Data Capture System (IDCS)

Custom-built software





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