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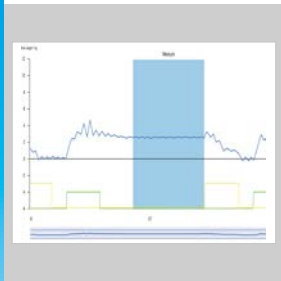
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Nonstop Automation Product and Package Weighing



Impressive Throughput

Incredibly fast 2-millisecond processing speed combined with in-motion weight filtering delivers outstanding results while increasing your machine's throughput. Innovative multi-item mode allows independent weighing of several small items on long conveyors.



Streamlined Commissioning

IND360's web-based graphical tool allows you to easily optimize photo-eye trigger points, adjust measuring times, and analyze vibration. An innovative web interface facilitates access for configuration, remote support, backup/restore and one click export of captured data to Microsoft Excel.



Flexible Integration

All of your static and automated weighing needs are covered by triggering automatic weight capture via a single photo eye, dual photo eyes, or your preferred automation interface. An extended memory option lets you maintain up to 8 million transactions for data analysis and fulfillment of legal requirements.



Built-In Checkweighing

The checkweighing mode offers configurable over- and under-tolerance limits. Attach your reject pushers or sorters directly to the digital outputs and fine-tune the trigger timing on the display or web interface. Because control is running on the IND360, your PLC's workload is reduced.



IND360dynamic Indicator High Throughput, Utmost Flexibility

IND360dynamic enables in-motion, high-speed weighing and connects to most PLCs in less than five minutes.

Features include:

- Web interface for configuration and monitoring
- Weighing trigger via light barrier(s) and PLC
- Legal for Trade OIML R51 approved for static and in-motion weighing
- Optional memory for 8 million entries including Alibi
- Standard Automation Interface SAI™ for acyclic and cyclic communication
- Smart5™ prioritized alarms
- Compliant PROFINET, Profibus DP, EtherNet/IP, EtherCAT, CC-Link IE Field Basic Networks
- Modbus RTU or Modbus TCP connectivity

METTLER TOLEDO

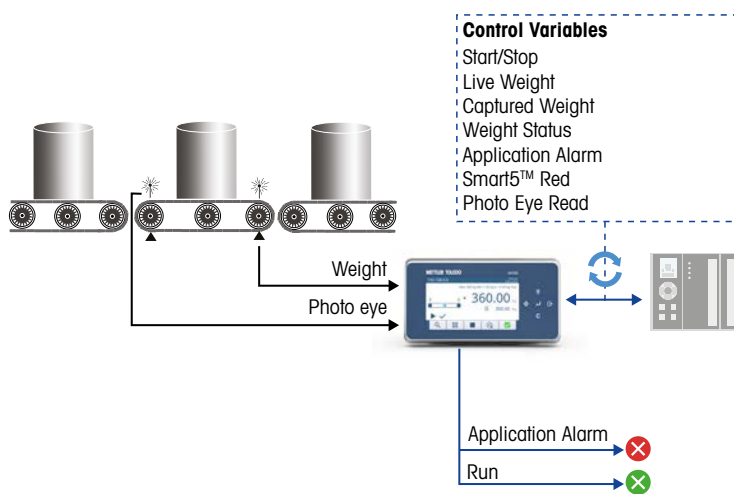
Designed for Distributed Control

IND360dynamic is the optimal fit for your automated weighing needs by delivering reliable weighing results and status information to your PLC/DCS. IND360 handles all weighing functionality including the management of photo eye inputs and outputs for rejection pushers. These onboard functions allow you to reduce cost and complexity, while taking the burden off your controller or PLC. The built-in memory stores the completed weighing operations for analysis and legal record keeping.

In-Motion Catchweighing System Configuration Options

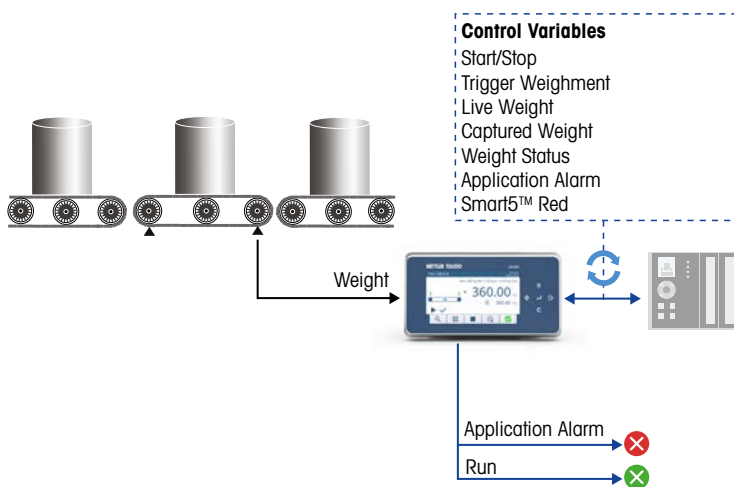
The objective is to determine the in-motion weight and immediately transfer the result to a higher-level system for further processing.

Example 1: Photo Eyes Trigger Weighing Operation



The two photo eyes that trigger the weighing operation are directly connected to the input of IND360. This method provides the best reaction time, least jitter and saves I/O space on the PLC. The live weight and photo eye status are continuously transmitted to the PLC. The resulting captured weight and status information are sent to the PLC once a weighing transaction is completed.

Example 2: PLC Triggers Weighing Operation

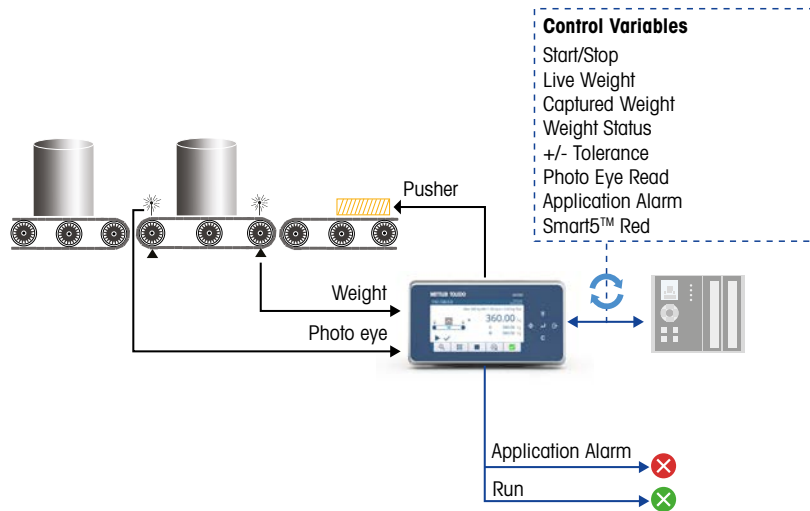


The PLC sends a command to trigger the weight capture in a similar way as if there were photo eyes installed. This operating mode avoids the need for photo eyes, which simplifies hygienic design but requires that the PLC knows the position of the item. The live weight is continuously transmitted to the PLC, and the resulting captured weight and status information are sent to the PLC once the weighment is completed.

In-Motion Checkweighing System Configuration Options

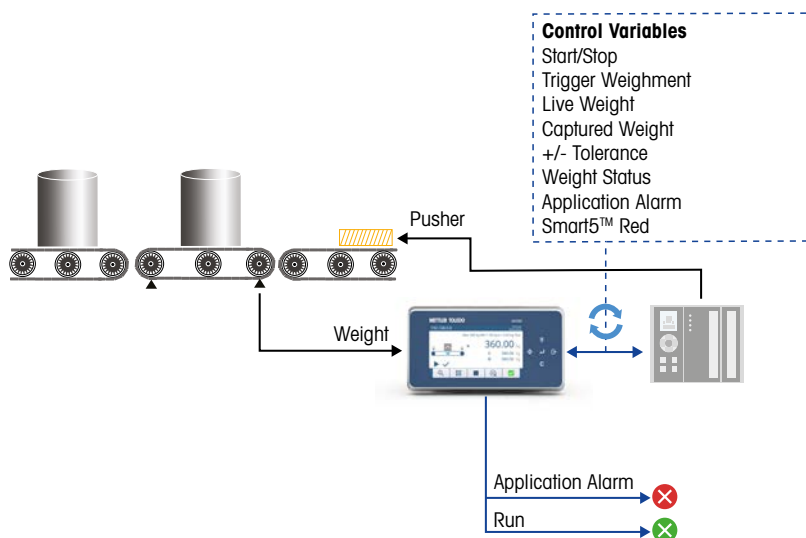
In contrast to catchweighing, checkweighing mode performs a tolerance check against two lower and two upper limits.

Example 3: Photo Eyes and Pusher Controlled by IND360



Two photo eyes that trigger the weighing operation and the reject pushers are directly connected to the inputs and outputs of IND360. This method provides the best reaction time, least jitter, and saves I/O space on the PLC. Live weight and photo eye status are continuously transmitted to the PLC. On completion of a weight capture, the resulting captured weight, tolerance, and status information are available to the PLC.

Example 4: Weight Trigger and Reject Pusher Controlled by PLC



The PLC sends a command to trigger the weight capture. The IND360 monitors the weight tolerance and signals the PLC when the item must be rejected via a discrete signal or via Boolean value transmitted to the PLC. Each weight transaction includes measurement value, tolerances, and checkweighing data in addition to live weight data that can be read at any time.

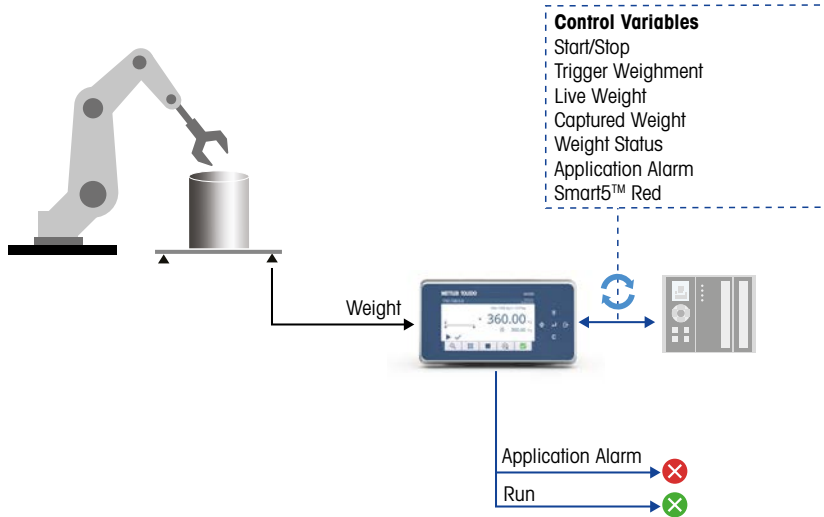
This operating mode facilitates operation without photo eyes for simplification of hygienic design. Both the weight trigger and the pusher control require that the PLC can determine the position of the item.

Static Weighing

System Configuration Options

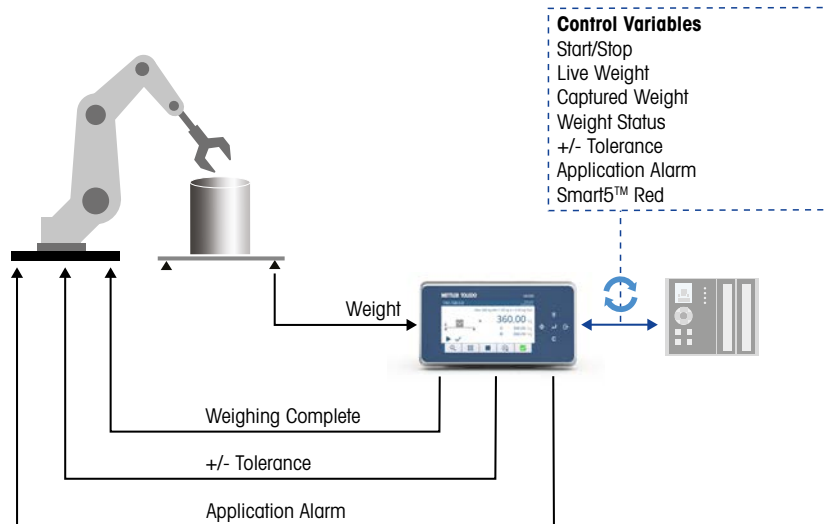
In static weighing, the weight is captured once the weight signal reaches stability.

Example 5: PLC-Triggered Catchweighing



The PLC sends a command to trigger the weight capture as soon as the item has been placed. The resulting captured weight and status information are available on the PLC network once the weighment is completed.

Example 6: Self-Contained Checkweighing

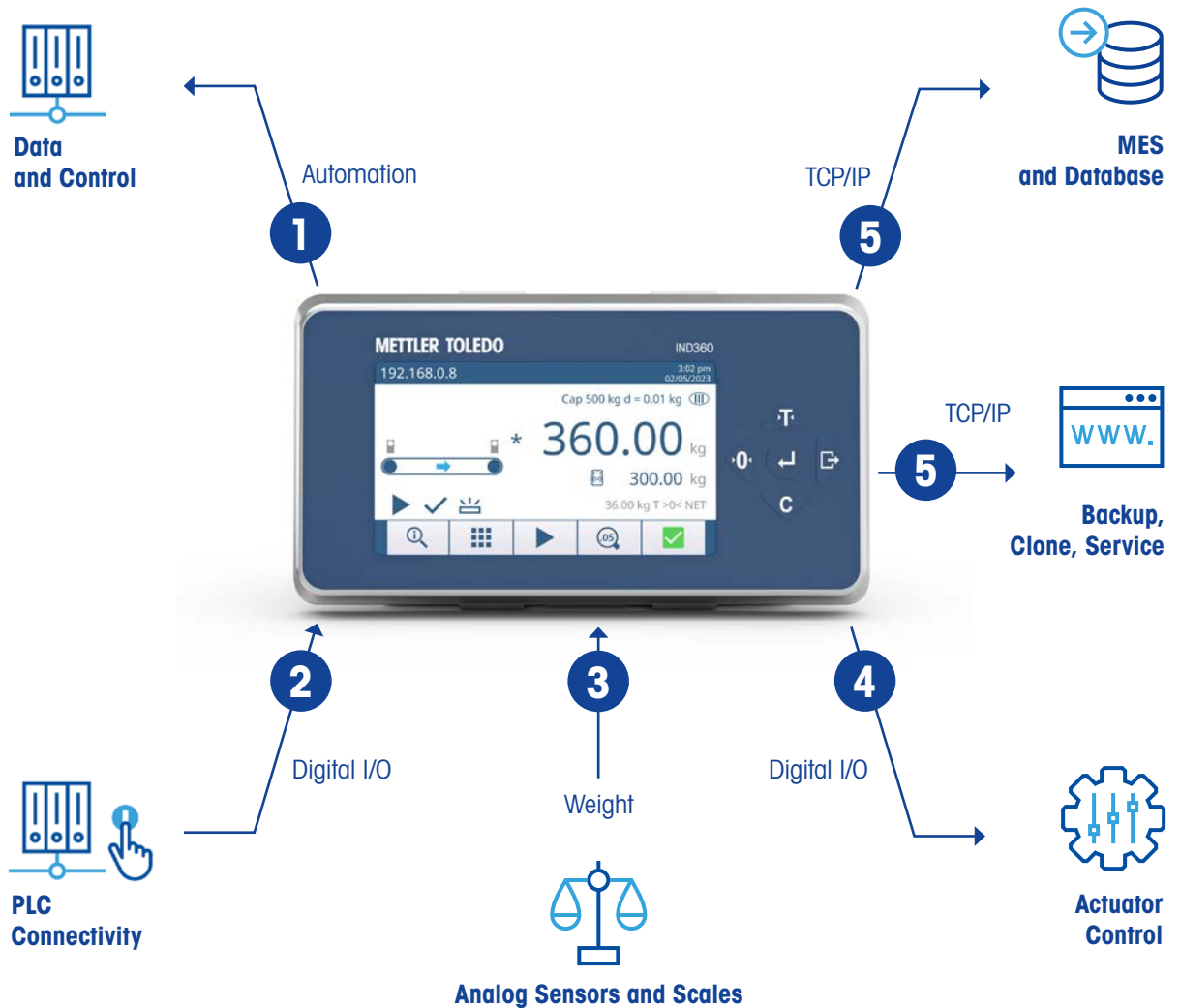


This setup demonstrates a self-contained, weight-based sorting machine. Higher-level systems such as PLCs or PCs read the result from the IND360.

A robot or other mechanical conveying system places an item on the scale triggering a weighing operation through the photo eye. Once the weighment is completed, the result is transmitted to the robot using IND360's digital outputs.

IND360dynamic Connectivity

IND360 offers you a broad set of connectivity options for seamless integration into your PLC or PC-based system.



1 Connect IND360 to your automation interface to read the captured weight data and all related status information. Leverage the comprehensive PLC command set to configure IND360 through the PLC.

2 Attach photo eyes directly to IND360 to optimize reaction time, save IO space on your PLC, and reduce wiring complexity.

3 Select from a broad portfolio of analog (strain gauge) load cells and weigh modules for optimal integration and weighing results.

4 For checkweighing connect reject devices directly to IND360 for more precise timing control.

5 The service port provides an Ethernet TCP/IP connection to IT systems and enables access to the web interface for monitoring, configuration, backup, restore, and many other unique functions.

Powerful Control Variables on your PLC

IND360 offers more than 250 control variables to your automation network giving you the power to control, monitor, and maximize the performance of your weighing system. Below is a subset of readily available data points. For the full set of data points, please refer to IND360dynamic application manual and the IND360 PLC programming manual.

	Category	Data Point
State Machine	Control Commands	Start, Stop
	Error Handling	Application alarm bits (invalid parameters, blocked photo eye, re-zero overdue) Smart5™ alarms (red, orange, yellow, blue, green)
Weight Readings	Result	Live weight, Captured weight, +/- tolerances
	Error	Gap too small, Item too long, Item too light, Item too heavy, Incorrect photo eye trigger sequence, Stability timeout (static mode)
	Read Record	Read past weighing result from internal memory
Application Configuration	System Settings	Work Mode (In-Motion catchweighing/checkweighing, static catchweighing/checkweighing) Photo Eye Operating Mode (single/dual photo eye, triggered by digital input or automation interface) Conveyor (belt speed, belt length)
	Measuring Setup	In-Motion: Photo eye offsets, Stabilization and measurement timing Static: Weight capture offset, Stability criteria
	Correction Factors	Up to 5 correction factors to adjust for wind effects when object is in motion
	Re-Zero	Periodic, automatic re-zeroing of scale Dedicated re-zero photo eye Re-zero signal through digital input or automation interface
Digital I/O	Input Assignment	Assign function to each digital input
	Output Assignment	Assign function to each digital output

IND360dynamic

Technical Features

For full device specifications, approvals, and additional drawings, please refer to the IND360base datasheet.

	Parameter	Description
Application	Operating modes	In-Motion checkweighing/catchweighing with multi-object processing (supports up to 3 items on the conveyor simultaneously) Static checkweighing/catchweighing
	Weight Trigger	Digital input: front photo eye, rear photo eye, dual photo eye, capture weight signal (static mode) Automation network: virtual photo eye trigger
	State Machine	States: Run, Stop Control commands: Run, Stop (control by automation network, I/O or HMI)
	Measurement (in-motion)	Measuring time: configurable measuring time. Flexible measuring time using front or dual photo eye mode. Photo eye timing: configurable photo eye offsets, settling time (front photo eye) to eliminate initial weight readings and pre-trigger exclude time (rear photo eye) to eliminate exit weight readings for higher accuracy. Max object void: configurable function for objects that cause momentary photo eye release because of empty spaces in their geometry. Compensation factors: adjust for deviation of static vs. in-motion weight Static mode: configurable weight capture offset, minimum trigger time, trigger debounce time, stability timeout
	Measurement (static)	Configurable weight capture offset, minimum trigger time, trigger debounce time, stability timeout
	Re-Zero	Periodic, automatic re-zeroing of scale Dedicated re-zero photo eye Re-zero signal through digital input or automation interface
	Classification	Two lower and two upper tolerance limits
	Legal for Trade Approval	Automatic Weighing Instrument (AWI) according to OIML R51 (MID, 2014/32/EU) for automatic catchweighers Non-Automatic Weighing Instrument (NAWI) according to OIML R76 (2006), EN45501:2015, WELMEC 2.1 Issue 4
Alibi memory (Data Record)	Up to 100,000 entries (standard configuration), up to 8,000,000 entries (extended memory option) Access through web interface (.csv), automation interface or IND360 display	
Measuring	Supported scale types	Analog (A/D 960 Hz, 480 Hz to Automation network)
	Digital filtering	In-Motion mode: specific purpose-built algorithm Static mode: configurable environment and limit frequency removing mechanical and environmental noise; Adjustable through the automation interface
PLC connectivity	Automation Interfaces	PROFINET, Profibus DP, EtherNet/IP, EtherCAT, CCLink IE Field Basic, Modbus RTU, Modbus TCP
	Certification	PNO (Siemens), ODVA (Rockwell and others), ETG (EtherCAT), CLPA (CC-Link IE Field Basic)
	Data exchange	Cyclic: 480 Hz bidirectional read/write data exchange via process image 16 bytes (SAI 2 block), or 64 bytes (SAI 8 block) Acyclic: dynamic data size
	Condition monitoring	Heartbeat 1 Hz, Smart5™ alarms (NAMUR NE107)
	Selectable data	Up to 7 high-speed weight values (32-bit float), with condition monitoring Device and application configuration (read/write) Device and application status information (read)
	Device description files	GSD and GSDML (for Profibus DP and PROFINET) EDS (for EtherNet/IP) Rockwell AOP integrated into Studio 5000 ESI (for EtherCAT) CSP+ (for CC-Link IE Field Basic)
	Command set	METTLER TOLEDO Standard Automation Interface (SAI) for dynamic applications
	Sample code	Fully functional sample project for: Siemens TIA Portal (≥ V14 SP1) Rockwell Studio 5000 (≥ V24)
Digital I/O	Input signals	Up to 5 configurable inputs Functionality: Run/Stop, Front photo eye, Rear photo eye, Re-zero, Reverse, Capture weight
	Output Signals	Functionality: Run, Ready, Smart5 red, Smart5 orange, Application alarm, Scale loaded, Re-zero timeout, Weighing completed, Weighing failed, In tolerance, -Tolerance limit 2, -Tolerance limit 1, +Tolerance limit 1, +Tolerance limit 2, Upper limit, Remote Adjustable signal delay and impulse length (if applicable)
	Voltage	Logical high voltage: 10 ... 30 VDC Logical low voltage: 0 ... 5 VDC