

Changeover Tool

(COT4-device)

- **What is Manufacturing Improvement Devices, Inc.**
- **Justification of the need**
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- **How can we work together**



MID – Manufacturing Improvement Devices, Inc.

www.ooeincrease.com

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**What is
Manufacturing Improvement Devices, Inc.**

Information about Manufacturing Improvement Devices

❖ Profile:

- Small, family-owned business
- Headquartered in W. Lafayette, Indiana, USA
- Founded in 2008
- Number of employees: 20

❖ Business model:

- *Mission:* Increase efficiency of industrial workers by providing innovative tools
- *Focus:* Invent, develop and commercialize unique Hi Tech tools and solutions
- *Skills:* EE, ME, Applied physics, CAD, Software, PCB design, Manufacturing
- *Sales:* MID directly, or regional sales representatives
- *Agility:* Less than 2 months from initial contact to being operational
- *Management:* Super-lean structure

❖ Operation:

- *Internal R&D:* Design an optimal concept, develop and demonstrate a prototype
- *Production:* Organize production & assembly of components and subsystems
- *Testing:* Rigorous testing of each device before shipment
- *Training:* By MID directly, or by qualified sales representatives
- *Servicing:* End-user's self-support or advanced replacement
- *Support:* Lifetime free software updates

Key Customers

- 5 CPG companies (Kellogg, Post, Quaker Oats, General Mills, ConAgra)

The Kellogg's logo is written in a red, cursive script font.

- 1 industrial company (GE – Oil & Gas in UK and Brazil)



Justification of the need

Common sources of “Changeover Pain”



Why are changeovers challenging? Is there a solution?

Hard facts:

- Key reasons why size changeovers are difficult and unpredictable:
 1. **Significant number** of changeover adjustments on the machine
 2. **Multiple settings** for different products (at each changeover location)
 3. **Working under time-pressure** to restore line operation
- Kaizen training - waste elimination cannot address production issues with a huge financial impact:
 - Creation of unnecessary **scrap** caused by machine “tweaking” after changeover
 - Manufacturing **product of inferior quality** during ramp-up period - may lead to potential recalls
- Until recently, “On-machine changeover training” was the only way to gain changeover experience
- Changeover “learning curve” of a new machine operator is typically much longer than expected

Ideal changeover solution:

Fool Proof Device that provides
interactive step-by-step operator guidance

Financial consequences – and big saving opportunity

Traditionally, producers settle for & accept costly changeovers

- Changeovers are complex and require **skillful and experienced operators**
- Any changeover increases the risk of **making out-of-spec products**
- Changeover time is **highly unpredictable** (idle equipment reduces productivity)
- **Scrap is created** during machine fine-tuning (“Tweaking”)

\$\$\$ opportunity is BIG:

Potential savings in millions of \$/year

	Reduced Change-over time (\$MM)	Faster Ramp-up to full speed (\$MM)	Reduced Scrap (\$MM)	Reduced Training time (\$MM)	TOTAL savings (\$MM)
Major US Food Company	2	3	10	5	20

Assessment conducted at the major US food company

“Ideal changeover solution” should be

- **Short and predictable** changeovers
- **NO ramp-up time** (product within spec. right from the start)
- **NO scrap** caused by changeover
- **NO dependency on operator’s experience**
- **Short operator training** (and no refresher-training)
- **Quick deployment**
- **Affordable / Cost-effective** solution

Bottom line:

Companies can **save millions every year** by better changeover practices

**How MID's solution
revolutionizes Changeovers**

MID tool for GUIDED changeovers

Delivers BIG savings (outcome of 5-year deployment at major US food manufacturer)

Changeover ISSUES:

COT4-device

Turn-key SOLUTION

“Old school” Changeover issues:

- Unnecessary Scrap
- Out-of-spec products
- Degraded OEE of entire line
- Difficult start-ups (tweaking)
- Unpredictable line downtime
- One machine at the time
- Dependence on operator skills
- Increased inventories
- Outside storage costs



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“MID approach” DELIVERS:

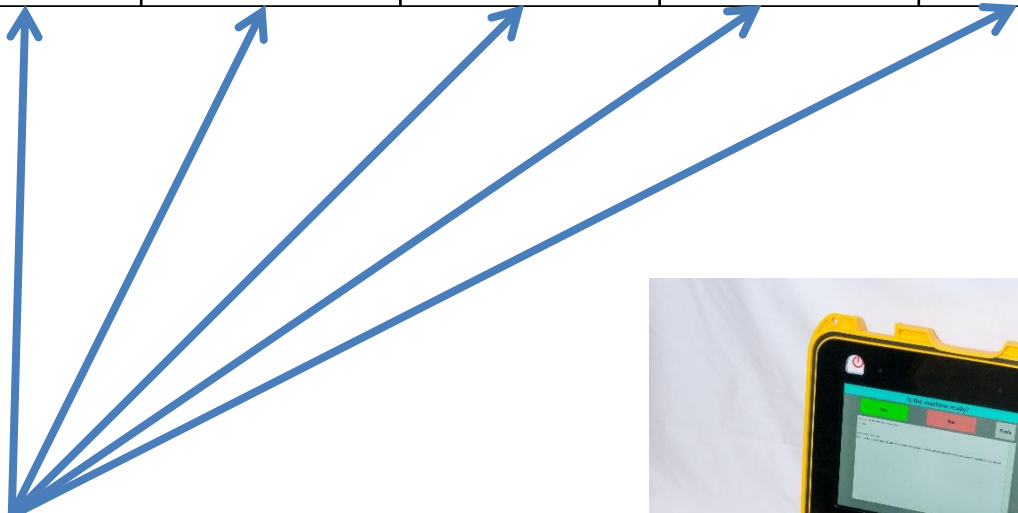
- No Scrap
- No Out-of-spec products
- No Ramp-up time (no tweaking)
- High confidence in line re-starts
- Very predictable line downtime
- Multiple lines changeover
- Line OEE is visibly improved
- No operator’s skills needed
- 10 min operator training

Capability: COT4-device can serve 5 different machines

Machine 1	Machine 2	Machine 3	Machine 4	Machine 5
Up to 50 adjustments (Brackets 1-50)	Up to 50 adjustments (Brackets 51-100)	Up to 50 adjustments (Brackets 101-150)	Up to 50 adjustments (Brackets 151-200)	Up to 50 adjustments (Brackets 201-250)



COT-Sensor (wireless)



COT4- Controller (wireless, battery operated)

One COT-sensor and up to 250 coded Brackets

COT-Sensor (placed at each installed bracket)

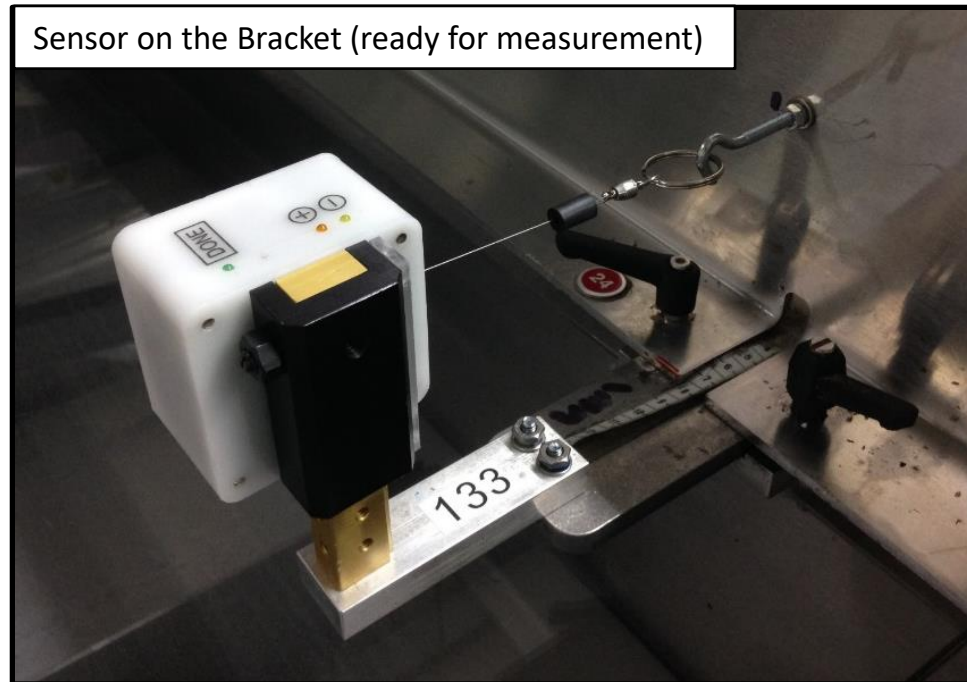


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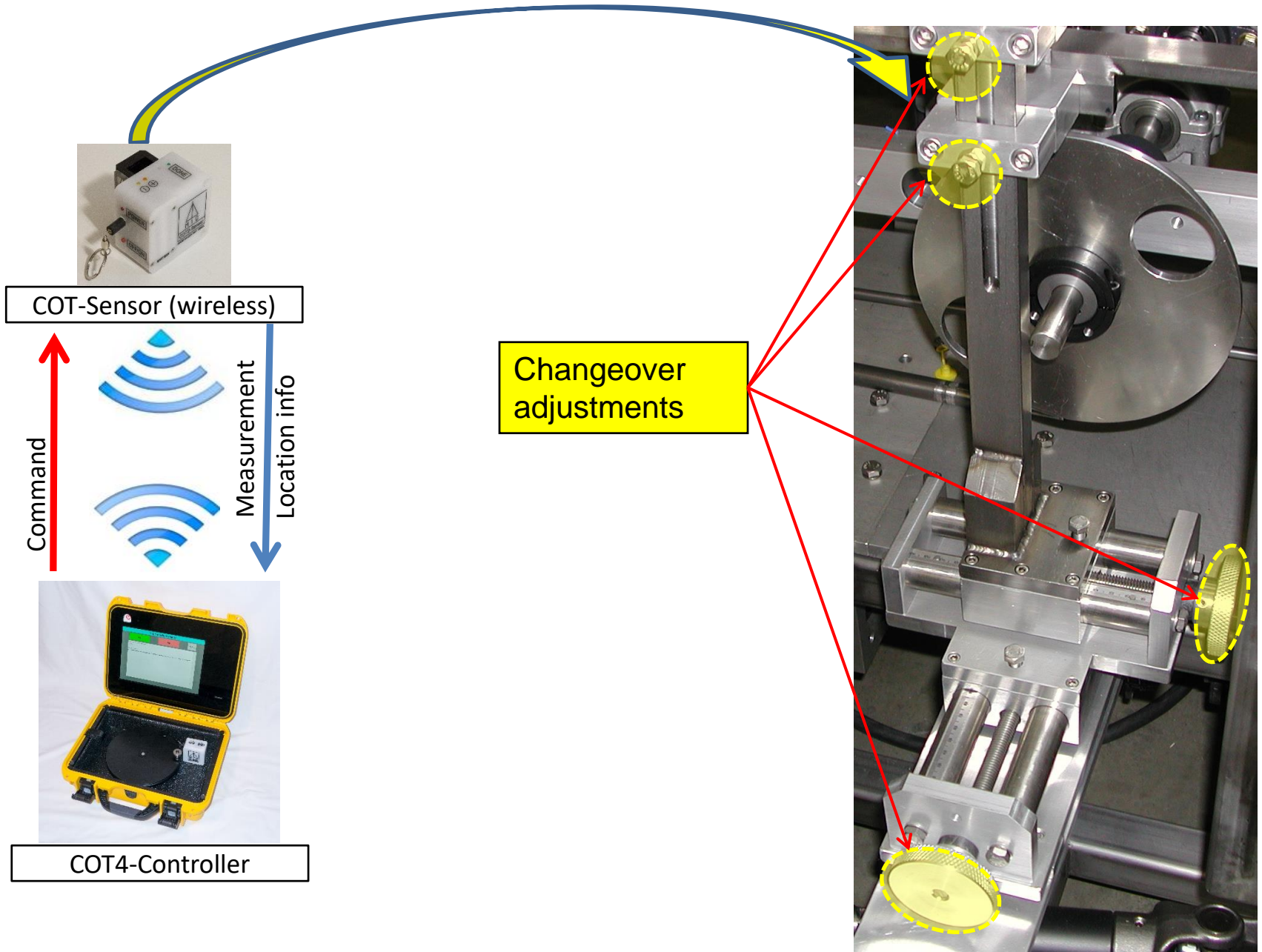
Brackets (permanently installed on a machine)



Sensor on the Bracket (ready for measurement)



Location-aware wireless distance measurement



Position & distance update (every second)

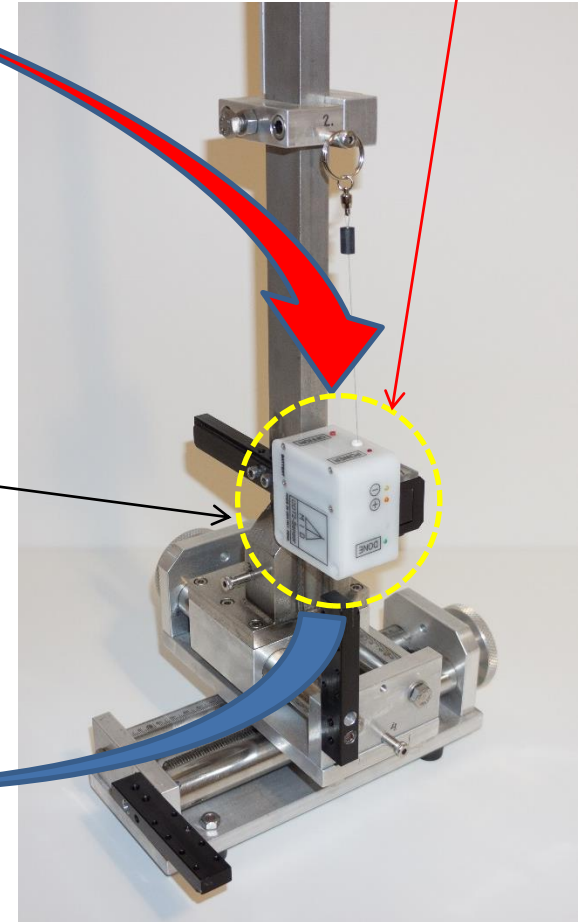
COT4-Controller



Wireless streaming: CONTROLLER to SENSOR

- Updates COT-sensor LED indicators (every second)
- Remotely shuts OFF COT-sensor due to inactivity

COT-Sensor



Distance: up to 50m (150Ft)

Wireless streaming: SENSOR to CONTROLLER

- Controls adjustment sequence (RANDOM or STRICT)
- Updates Sensor's Location reading (every second)
- Updates Sensor's Distance reading (every second)

Detailed Technical summary

Technical summary

- **Any new or old machine can use COT4-device**
- **COT4-device deployment does not affect OEM warranty or operational safety of the machine**
- **COT4-device serves up to 5 different machines** (up to 50 locations per machine – total 250 locations)
- **COT4-device supports up to 50 different products (SKU's) per machine**
- **COT4-device supports two different adjustment sequences:**
 1. **RANDOM** (example of adjustment sequence: 1, 13, 8, 2, 4, ...)
 2. **STRICT ascending sequence** (example of adjustment sequence: 1, 2, 3, 4, 5, ...)
- **Visual GUIDANCE** (operator typically finishes adjustment at one location in less than 3 minutes)
- **Hands-free operation** (operator can use both hands for changeover adjustments)
- **Training is very short** (10 minutes – even for a novice)
- **No computer (or any other particular skill) is necessary** to operate COT4-device
- **Interactive HELP function** (PowerPoint, PDF and video-clips related to each changeover location)

Technical summary – cont.

- **No adjustment location can be missed or skipped** (COT4-device displays progress of adjustments)
- **No misplacement or location misreading errors** (changeover location is automatically recognized)
- **Adjustment procedure could be interrupted at any point** (as long COT4-controller is powered)
- **Location-aware brackets are made of anodized Aluminum or Stainless steel** (wash-down capable)
- **Distance between COT-sensor and COT4-controller can be up to 50m (150ft)**
- **COT4-controller can withstand strong mechanical shocks and vibration** (no moving parts)
- **Changeover data safety** is very high (any successful changeover is backed-up on the SD card)
- **Interchangeability of COT-sensors** is fully supported (5min)
- **One-time installation of location-aware brackets** requires 8 to 24 hours of machine downtime

How We can work together

Suggested Next steps

- ❖ MID offers a free DEMO at customer location (prove simplicity of COT4-device)
- ❖ MID offers 1 month free consignment of COT4-device. Customer has no obligation to purchase COT-device if equipment fails to deliver promised functionality (“Letter of intent” defines details).
- ❖ Consignment offer includes detailed assessment of the machine to be enabled for COT4-device (in-depth discussion with line managers and machine operators)
- ❖ Consignment offer includes MID guidance to optimally install Location-aware brackets
- ❖ Consignment offer includes 1-day on-site/ on-machine training
- ❖ Consignment offer includes 24/7 support during entire consignment period