MID – Manufacturing Improvement Devices, Inc.

Changeover Tool (COT) - EXECUTIVE SUMMARY

PROBLEM STATEMENT:

In high-performance food production, changing product SKUs on multi-SKU machines presents a significant challenge. These machines, while versatile, are mechanically complex and require precise, multi-step manual adjustments for each SKU change. This process often becomes a bottleneck due to its complexity and the need for rapid execution, posing difficulties even for experienced operators and proving nearly insurmountable for novices. The predominant "trial and error" method leads to prolonged changeover times, disrupting the entire production line with frequent stops / starts. This inefficiency results in considerable waste and idle time for operators, ultimately leading to a below-standard Overall Equipment Effectiveness (OEE), which often falls significantly short of the global benchmark of over 85%.

SAVINGS POTENTIAL:

Comprehensive evaluations by two leading companies in the food and beverage industry have revealed substantial annual savings achievable through efficient and predictable size changeovers. These savings, estimated conservatively, are detailed as follows:

TABLE 1: SAVINGS POTENTIAL ITEMIZED

Reduced Changeover time	$	2 million
Quicker Ramp-up to full speed	$	3 million
Reduced Scrap	$	10 million
Reduced Training time	$	5 million
TOTAL SAVINGS	$	20 million*

*Note: These figures are based on the complete integration of the Changeover Tool (COT) across all manufacturing and packaging processes.

Key Insight: By optimizing changeover practices, companies stand to gain millions in savings annually, enhancing overall efficiency and profitability.

GUARANTEED DELIVERABLES OF THE COT:

- **Efficient Changeovers:** Achieve short, predictable changeover times, streamlining production processes
- **Zero Scrap Generation:** Perfect changeovers ensuring no material waste
- **Immediate Operational Readiness:** Eliminate ramp-up time / products meeting specifications on startup
- **Universal Usability:** Independent of operator experience, ensuring consistent performance
- **Streamlined Operator Training:** Simplified and efficient training processes for operators
- **Rapid Deployment:** Quick and easy implementation across production lines
- **Predictive Maintenance: P**redictive maintenance, enhancing machine longevity, reducing downtime
- **Cost-Effectiveness:** Significant savings in time and resources, offering a high return on investment.

ENHANCED OPERATIONAL FEATURES OF THE CHANGEOVER TOOL (COT):

- **Versatile Adjustment Guidance:** Capable of providing precise adjustment guidance for up to 250 machines, ensuring broad applicability across various equipment.
- **Unlimited SKU Support:** Designed to support a large array of unique products / SKUs
- **Intuitive Visual Guidance:** Features user-friendly visual instructions through either a built-in PC screen and/or a mobile tablet PC, enhancing ease of use during changeovers.
- **Comprehensive Progress Tracking:** Incorporates a fail-safe tracking system to ensure all changeover locations are accurately adjusted, eliminating the possibility of skipped or incorrect settings.
- **Detailed Time Tracking:** Monitors the time spent on adjustments at each location, providing valuable data on the overall duration of changeovers, aiding in efficiency analysis and improvement.

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UTILIZATION PROCEDURE:

The Changeover Tool (COT) utilizes a built-in Tablet PC (Figure 1, #1) pre-loaded with all SKU size data needed to guide an operator to perform precise machine size adjustments. The process begins by sliding the measurement sensor (Figure 1, #2) onto a magnetically-encoded "Location Aware Bracket" (Figure 2). The operator is then given numeric and visual adjustment guidance via the Tablet PC. Operators follow these step-by-step instructions at each bracket location, ensuring every adjustment is precise and correct. The procedure is complete when all designated changeover locations are successfully adjusted. Figure 3 (below) shows an

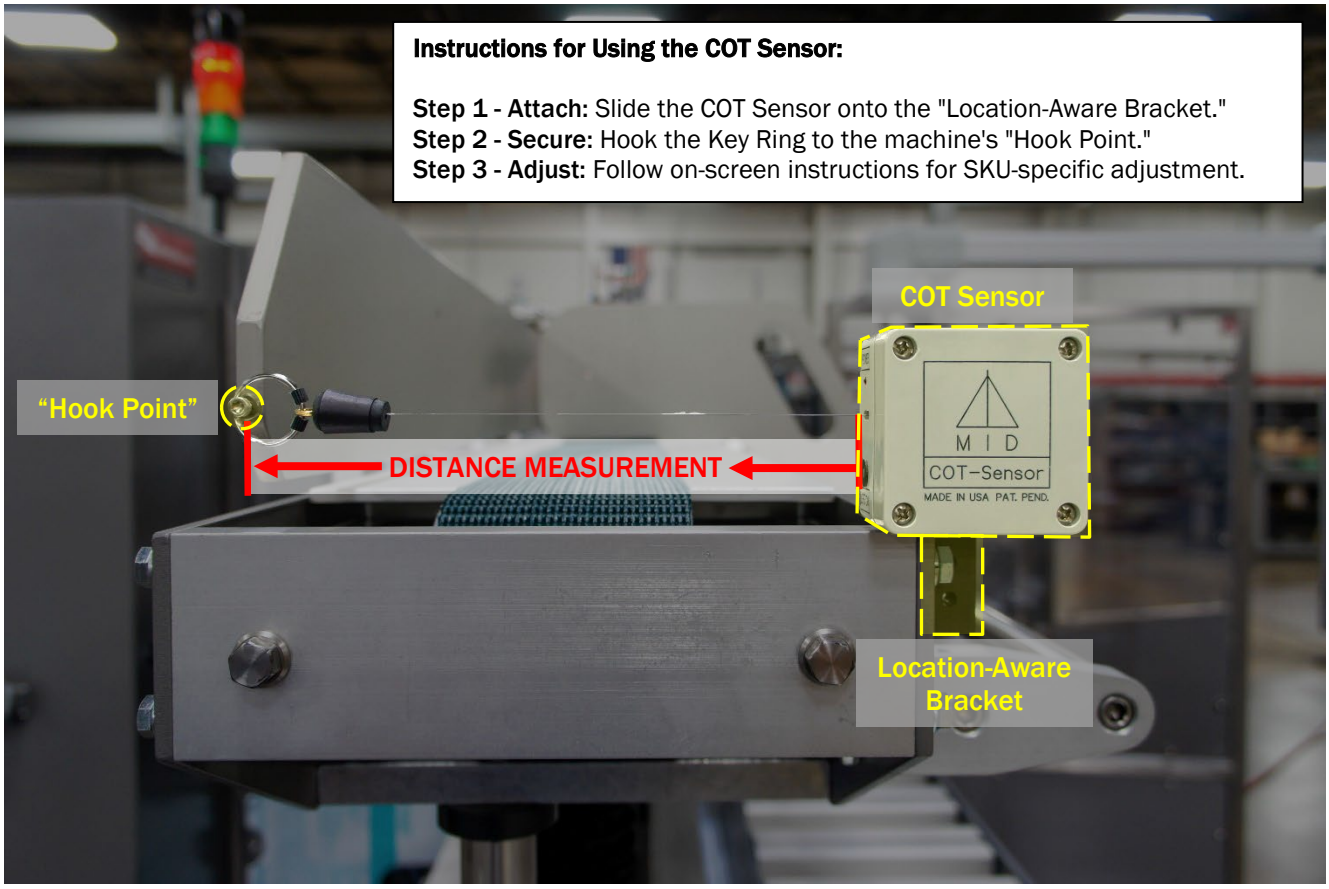

Figure 1 - *COT wireless sensor positioned on a Location-Aware Bracket performing measurement*

Enhanced Mobility with Handheld Terminal PC:

The Changeover Tool (COT) now integrates a handheld wireless terminal PC, enhancing operational flexibility. This device allows operators to conduct machine changeover adjustments directly, without relying on the primary built-in Tablet PC. Upon positioning the COT sensor on a Location-Aware Bracket, the handheld terminal immediately displays essential information and resources:

- Bracket-specific data: Number, current and target measurement values (Figure 4)
- Visual aids: Bracket location photos, and helpful documents (Figure 5, 6)
- Instructional support: Access to step-by-step guidance videos (Figure 7)

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CHANGEOVER TOOL COMPONENTS:

Figure 2 - Changeover Tool (COT) Component Overview

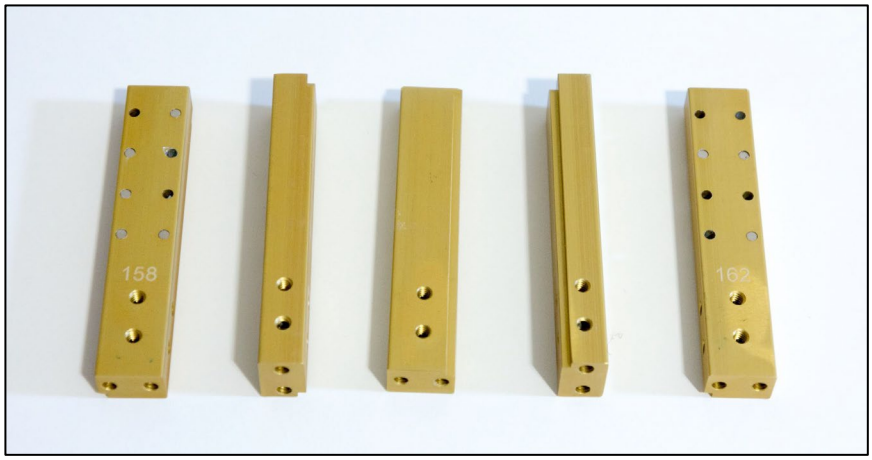

Figure 3 - Location-Aware Brackets

CHANGEOVER TOOL COMPONENTS - Continued:

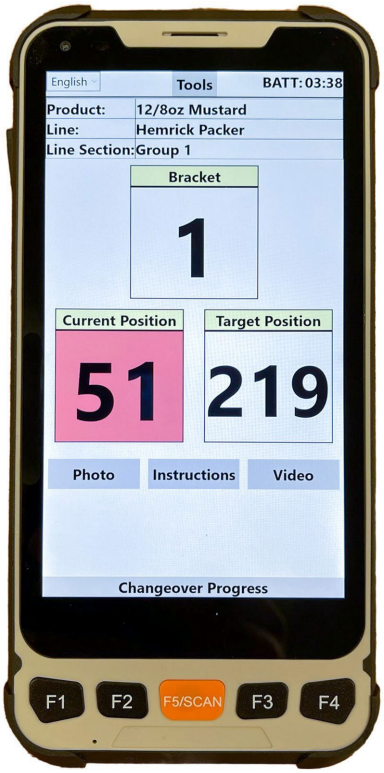

Figure 4 – Main Handheld Terminal Screen

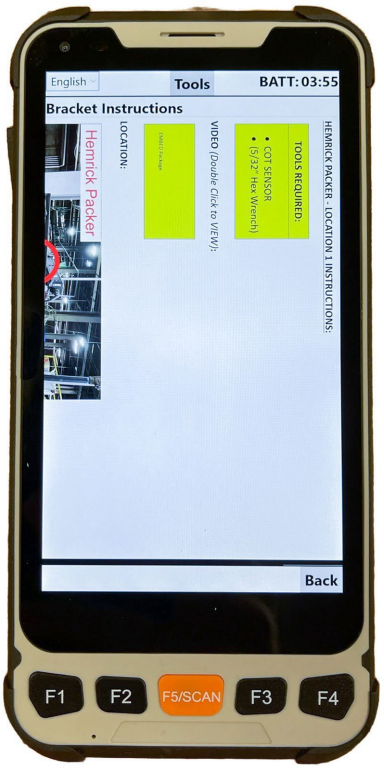

Figure 5 – Bracket Help Document (landscape view)

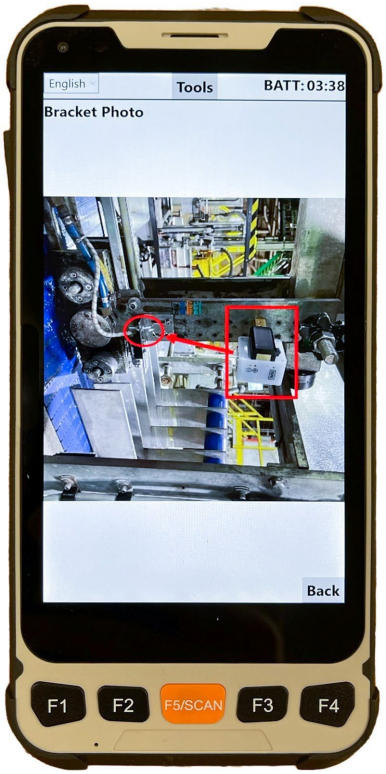

Figure 6 – Bracket Help Photo (landscape view)

Figure 7 - Bracket Help Video (landscape view)