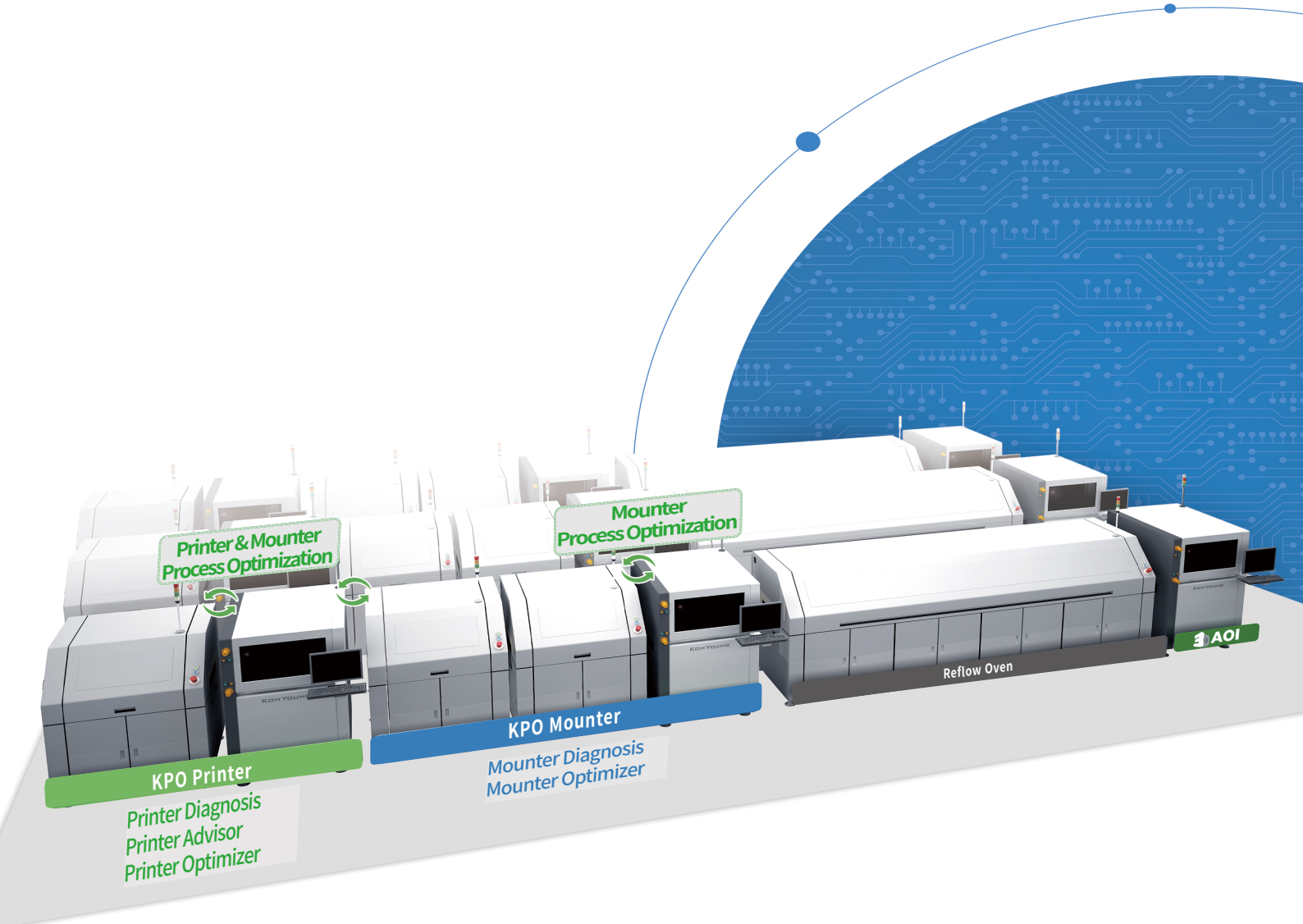
KOH YOUNG TECHNOLOGY
INTELLIGENT INSPECTION

True 3D Smart Factory Solutions,
Powered by AI

Koh Young Process Optimizer (KPO)

The Industry's First AI-powered Process Optimization Solution

Based on Koh Young's accurate 3D measurement data and its proprietary deep learning technology, Koh Young Process Optimizer (KPO) enables printing & mounting process optimization in real-time.



Koh Young Process Optimizer (KPO)

AI-Powered Real-time Process Optimization Solution

With the industrial revolution, Smart Factory solutions are demanded by the SMT industry because they result in a more efficient and agile system, less production downtime, and a greater ability to predict and adjust to changes in an assembly line.
Furthermore, the increasing demand for reduced size and higher performance electronics devices makes defect-free production difficult as the form factor gets smaller.

These challenges and requirements from SMT manufacturers motivated Koh Young to develop a real-time Koh Young Process Optimizer, which exploits Artificial Intelligence (AI) to control and optimize printing and mounting operations based on Koh Young's accurate 3D measurements data and error detection from SPI and AOI machines.

KPO Printer

KPO Printer is an AI-based automatic printing process optimizer. This solution applies machine learning algorithms to real-time print process data and delivers the optimum printing parameters. KPO Printer allows customers to monitor print quality and optimize parameters in real-time to guarantee the best print quality without any intervention by an operator or process expert.

- **Printer Diagnosis**

  PDM detects different defects related to printer setup by studying the patterns of solder paste depositions on the PCB through multiple anomaly detection algorithms. This module ensures a correct printer setup and highlights special cause variations in the process.

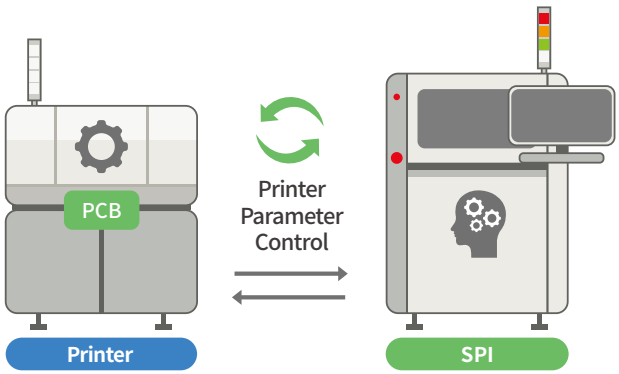
- **Printer Advisor**

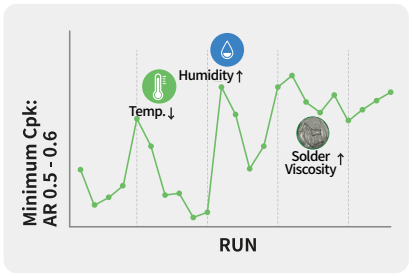
  PAM is developed to recommend the optimal printing parameters including printing speed, pressure, and separation speed. With SPI-to-printer communication, PAM automatically performs DOEs designed to perform a detailed SPI result analysis using advanced diagnostic algorithms and then recommends the ideal print parameters. This helps avoid the trial-and-error experimental runs to set up the printing parameters, especially for New Product Introductory (NPI).

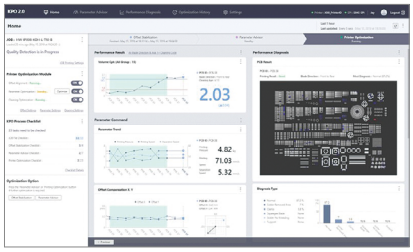
- **Printer Optimizer**

  Printing quality is changeable during production because of environmental changes or other printing conditions. POM is developed to maintain or even improve the printing quality by monitoring production data in real time and adjusting the printing parameters in a fully-automated manner.

General Concept of KPO Printer Solution & GUI Example







KPO Mounter

Based on Koh Young's accurate True 3D measurement data and its proprietary deep learning technology, KPO Mounter enables real-time mounting process optimization. With seamless communication between the mounter and a pre-reflow AOI, the software analyzes defects, provides real-time feedback, identifies the root causes, and provides actionable information – all based on Koh Young's proprietary AI engine.

Mounter Diagnosis

Mounter Diagnosis detects and identifies root causes of the mounter offsets induced from different mounter units such as the head, holder, nozzle, feeder, reel, and components. Furthermore, Mounter Diagnosis specifically diagnoses and troubleshoots the issues with studying offset patterns and suggests troubleshooting procedures based on maintenance manual and tips from the mounter experts.

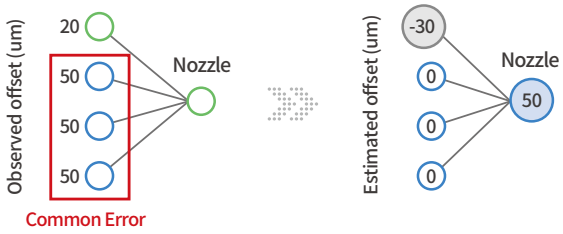
Mounter Optimizer

Mounter Optimizer collects and analyzes corresponding Pre-AOI measurement data to identify the root causes of the mounter offsets defects in real-time. Based on the AI-based KPO Engine, Mounter Optimizer feedbacks to mounters for the optimal placement positions of the components in real-time through offset shift commands. Koh Young is currently working with industry-leading mounter companies to actualize this module.

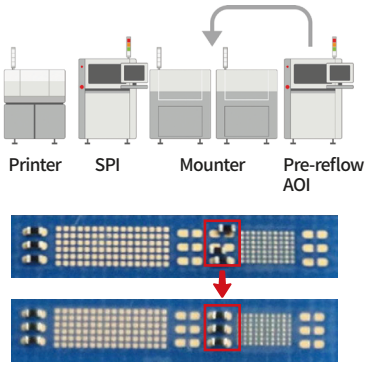
General Concept of KPO Mounter Solution

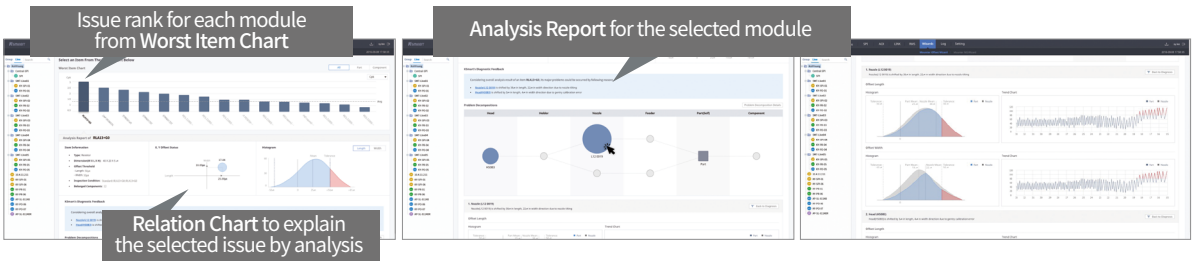
Mounter Diagnosis

Offset Defect Root Cause Identification through Collected Data Analysis

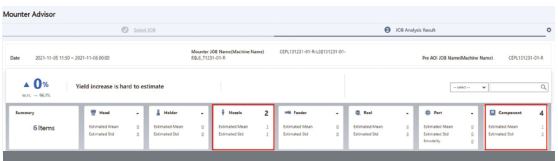


Mounter Optimizer (Feedback)

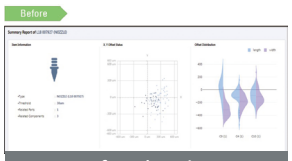




Nozzle Issue Improvement by Mounter Diagnosis



Nozzle issue identified through Mounter Advisor



Before changing the nozzle speed

Component offset and distribution improved after changing the nozzle speed

KPO Printer Installation Guide

Printer Requirements

MPM (PAM/PDM 1.4 version)

MPM Momentum Printer: Benchmark 4.7.1 version or higher
(Edison Printer are not supported)

OA, License, KPO Interface (P/N 1024283)

DEK, KPO Interface (P/N 1024284)

DEK (PAM/PDM 1.4 version)

Printer Platform: Horizon & NeoHorizon
(New DEK TQ Printer is not supported)

DEK Software version: RTX 1590 (9.20.1590.18)

OS: WES7

PC System: Q35 or H81

EKRA (In development)

Serio series Printer (All older model are not supported)

SJ INNOTECH (In field testing)

Printers with the last 4 digits of the serial number greater than 1331

FUJI (ITest in plan)

GPX-C

Other Printers: Panasonic, ESE (Pending, to be updated)

Pump head (Enclosed Flow, ProFlow) are not supported

Koh Young SPI Requirements

Hardware	C-Platform SPI: aSPIre 3, KY8030-2, KY8030-3 after 2013. 9. 1	
	aSPIre 2 after 2014. 1. 1	
	KPO 1.4: Single or Dual Lane SPI	
	KPO Printer 2.0: Single Lane SPI	
	SPI-PC upgrade may be required based on the date of release	
	K-BOX is independent from the SPI as it runs its own Linux OS	
Software	SPI GUI	Minimum: 4.10.0.2_H26 (or higher)
		Recommended: 4.10.1.2_20037M (or higher)
	WinMCS	Minimum: 770.3.1.7
		Recommended: 800.0.12.000 (or higher)
	KSMART Base: 1.1.171.4_KYSTD (or higher)	
	Supported OS: Windows 7 or Windows 10 (No plan to support XP)	

KPO Mounter (Diagnosis) Installation Guide

Mounter Requirements

FUJI

NXT (version 8.9 or higher), AIMEX (version 4.9 or higher)

Host Interface Profiler option license required

Hanhwa

T-M2M(AC) AOI Interface (version 2.2 or higher)

ASM

OIB SDK (version 5.3 or higher)

Koh Young Pre-AOI Requirements

Hardware	Pre-AOI installation : Any version
	KPO Mounter 1.1, 2.0: Single or Dual Lane AOI - KPO Mounter 1.1: Support Advisor - KPO Mounter 2.0: Support Advisor, Feedback
	K-Tower Installation: Data Anaylsis and Server for storage - K-Tower Enterprise : Max. 10 Line support - K-Tower Advanced : Max. 5 Line support
Software	AOI GUI version: 2.7.4.1 (or higher)
	BRM version: 2.5.14.0 (or higher)

The above specifications are subject to change without notice.

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