

# Head-up Display End-of-Line Tester

5 stations for electrical and optical tests

## Introduction

The company was developing holographic technologies for augmented reality head-up displays (AR HUD). The first product was an automotive AR HUD delivering augmented reality imagery on multiple planes and at different distances onto the windscreen. The driver gets a clear view of the road ahead whilst key driver, safety and road information is displayed.

The Customer requested a test machine for Liquid Crystal on Silicon, a key component that forms part of holographic technologies within augmented reality head-up displays (AR HUD).

With unique optical cleanroom and design facilities and experience bringing similar products to market (e.g. vision cameras, lidar and tiny sensors), KT were able to provide an Automated Optical EOL production test system. Furthermore, KT was able to provide sample production to ramp volume as quickly as possible and to prove out test methods, operator loading and any product variation.

## Project Scope

### Challenges

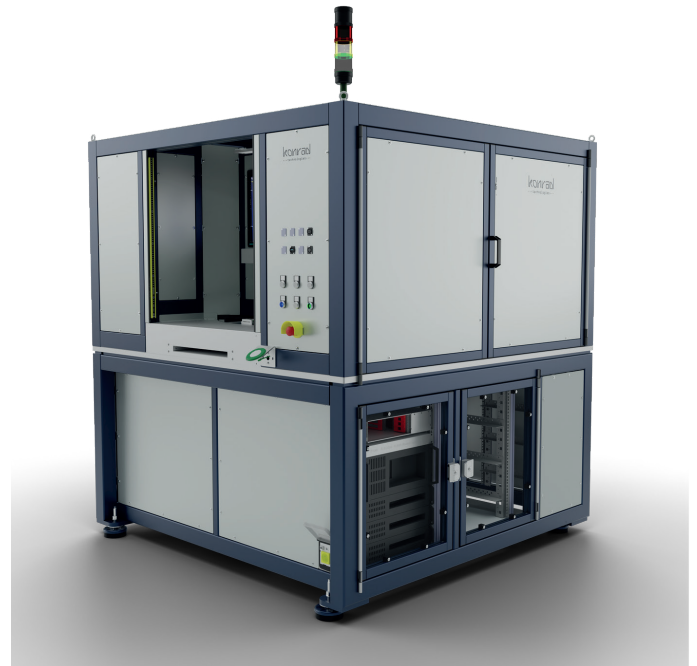
- A new state of the art heads up display was under development in cooperation with a large premium OEM based out of the United States. Due to pressing OEM timescales and the initial product launch, the test system and test software had to be agile to react to new product demands.

### Objectives

- Test quality and improved test methods were essential to take the lab development into an automated production environment. Test fixturing design was also key to cater for electrical and optical high speed digital interfacing.

## Solution

- The EOL machine integrated 5 stations combining electrical and optical test.
- Manual load and unload, optical testing, calibration, automation, software testing



- Optical calibration, automated device handling
- Optical tests, electrical functional test and EOL functional tests
- Accuracy of fixturing to provide accurate electrical contacting for the silicon whilst it moves between the automated test stations

## Customer Benefit

- Design for test and manufacture to bring a complex and challenging silicon device to market
- It was the customers first automated EOL machine to deliver a key component required for integration into the HUDs

## Our Know-how

- Domain expertise in optical development, software development and optical test and calibration
- Benchtop proof of concepts are essential to bridge manual lab test to high, automated volume. Sufficient time has to be allocated to allow for discovery and to prove out test methods at volume. Furthermore, to provide for incremental product samples through the product development whilst the EOL machine is being built.