MQCS – Modular Quality Control System

Martin Klinger

June 2020

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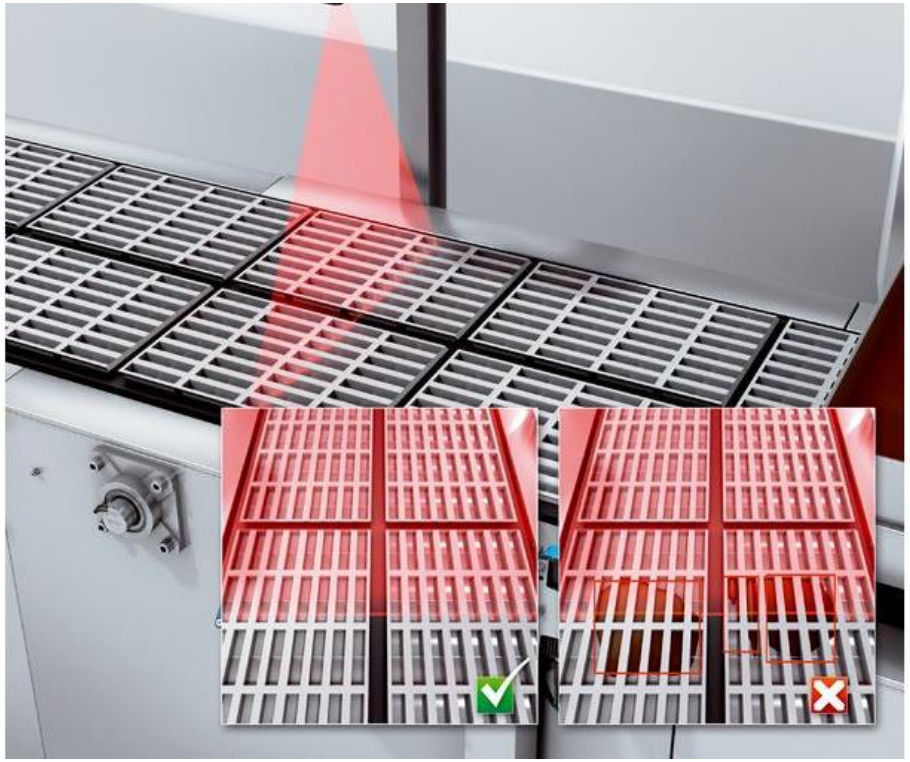
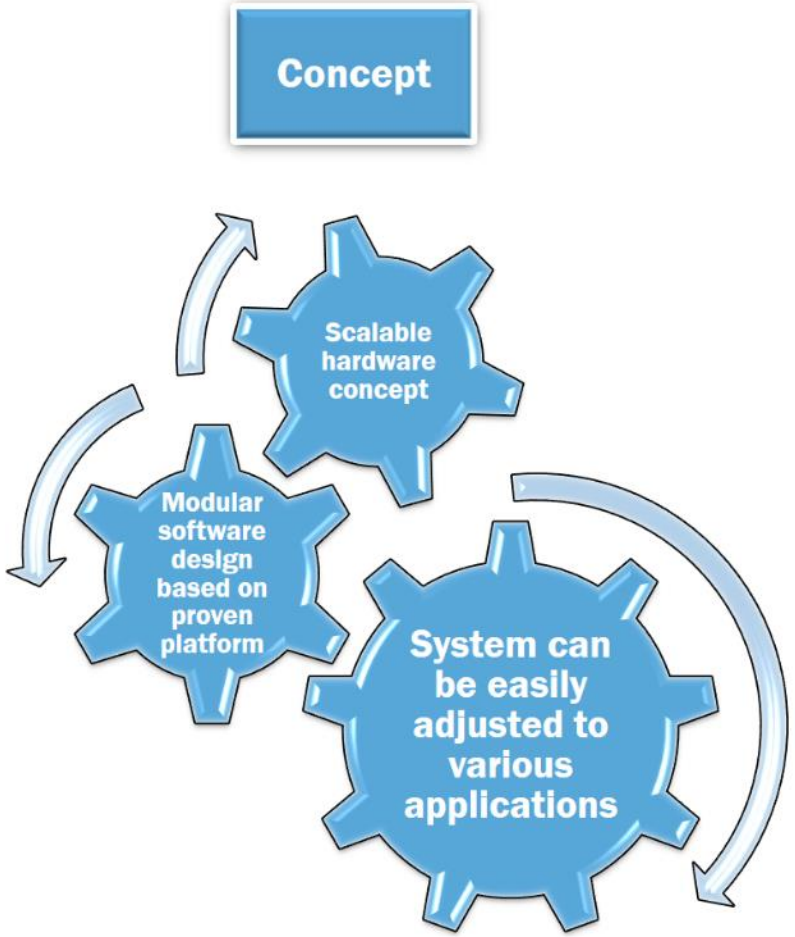


MQCS – Modular Quality Control System

MQCS - Concept



Objectives:

- Ability to generate application specific solutions in short with minimum effort
- Possibility to support complex applications (image processing 2D/3D)
- Use of already established hardware
- Continuing expansion of software library
- (re-)use of software by SSU and HQ
- Open for extension with further functions and sensors

Modular Quality Control System

Standardized hardware

SICK
Sensor Intelligence.

Element 1

Standard wired cabinet

(in 2 different versions)

including

- Touch screen panel
- Controller
- Network switch
- Necessary accessories

Modular Quality Control System

Standardized hardware

- **Certified hardware** (CE, EMC, …) according to SICK quality and manufacturing standards
- Using **SICK standard** components
- **Better pricing** due to centralized procurement
- Common service and **spare parts** support
- Hardware can be used by SSUs to **develop their own quality control solutions**
- Possibility of using **SICK software framework** or own software approach
- **Flexisoft module** for real-time processing of sensor outputs

Element 2

Modular software platform that runs on different controllers

- **TDC-E** for basic applications such as matching, counting and basic visualization
- **APU** for applications that require high performance processing power such as 3D inspections or image processing

Modular Quality Control System

Application modules

SICK
Sensor Intelligence.

Element 3

Application modules to create new solutions

Basic modules

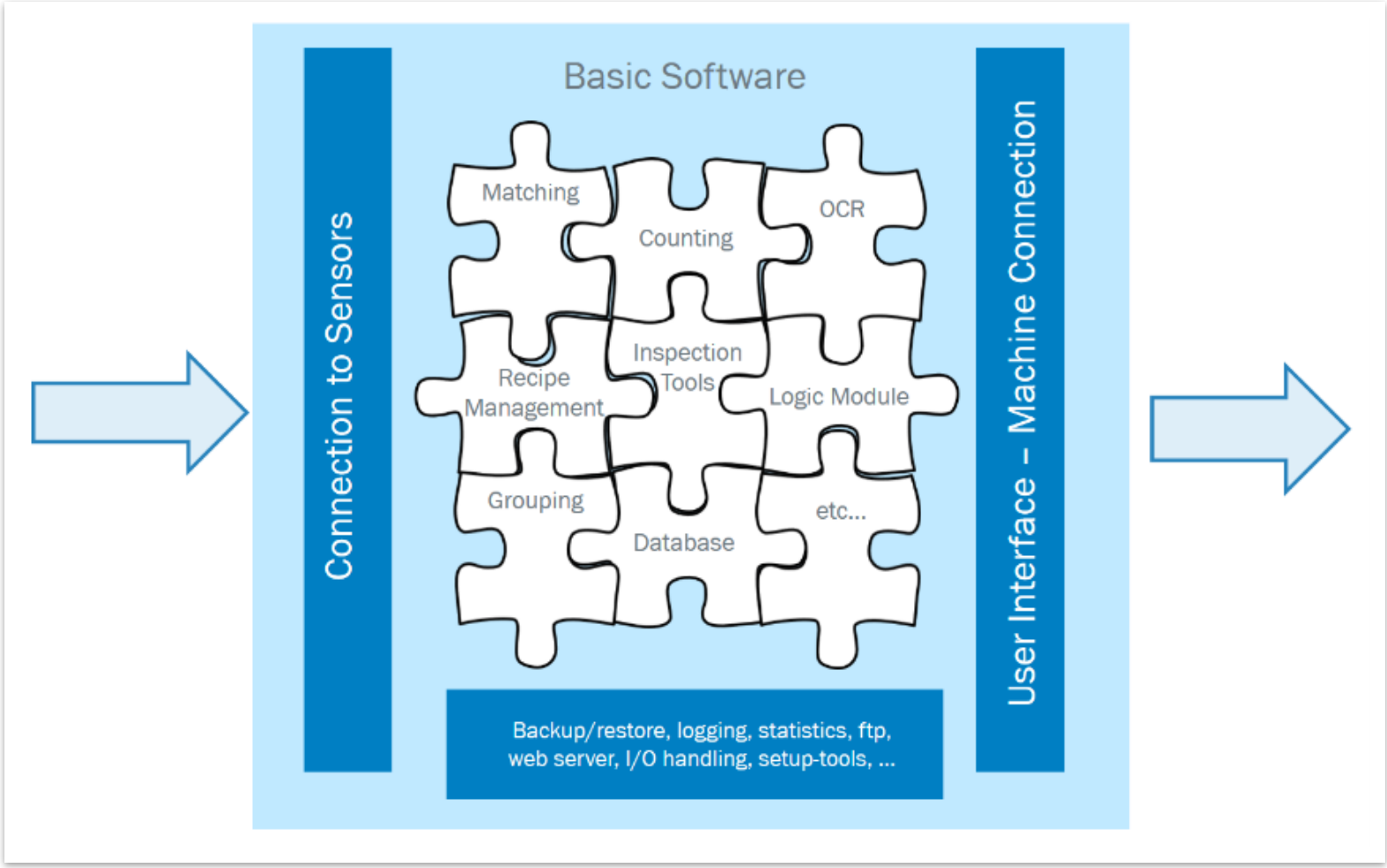
- User interface / web server
- User management
- Recipe management
- Sensor connection
- I/O handling
- Logging and data export
- Backup and restore
- Logical processing and grouping

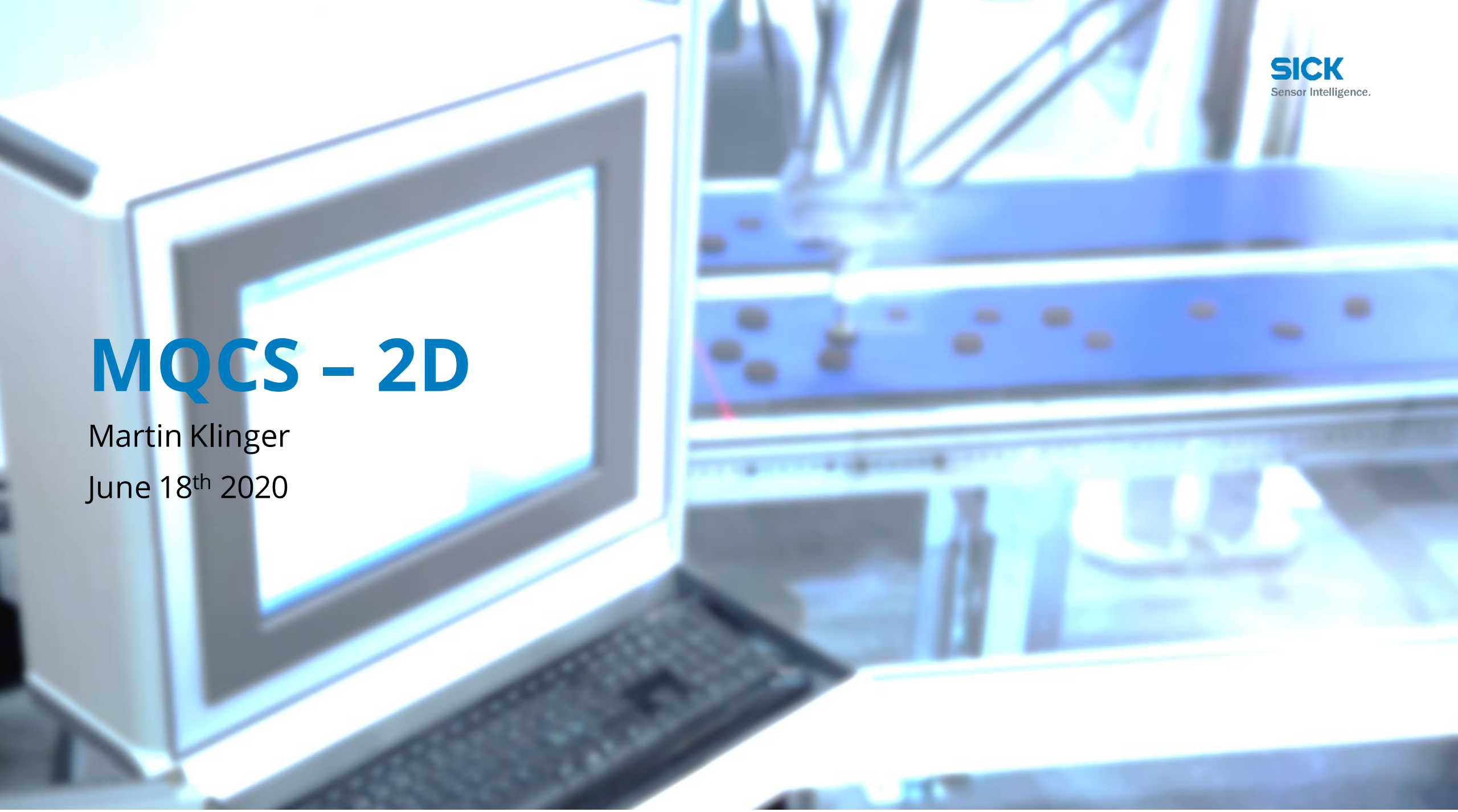
Application modules

- Code comparison / matching
- Counting and aggregation
- 3D object inspection (e.g. mold inspection)
- 3D object measurement

Modular Quality Control System

Software modules





MQCS – 2D

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June 18th 2020

Use cases MQCS-2D

MQCS 2D

System overview (example: code matching)

Cabinet with

- Integrated 12“ touch display
- Control unit w. software,
- PLC module
- Network switch
- Terminals for internal wiring

Ejector/Alarm signal

Packaging machine

Reading station 1 (leaflet, code128)

Reading station 2 (folding box, PharmaCode)

*Optional: Common trigger light switch for both reading stations

**Optional: 2nd trigger light switch for seperate triggering

Cable for light switch (Trigger)

Power 24V DC

Ethernet

17 p. Cable: Power, Dig. Output (Mismatch), Dig. Input (Trigger)

*if no trigger signal from packaging machine is available

**if seperate triggering is necessary

MQCS
FEATURES

Display of sensor data via HMI with touch display

Scalable standard hardware

Modular software platform with basic functions

Recipe management

Application modules for specific quality control tasks

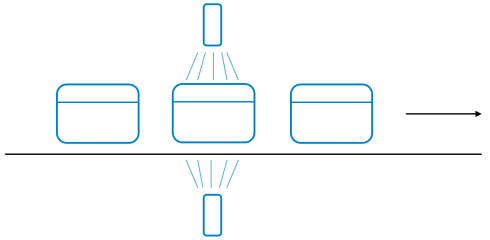
Data export via configurable ftp connection

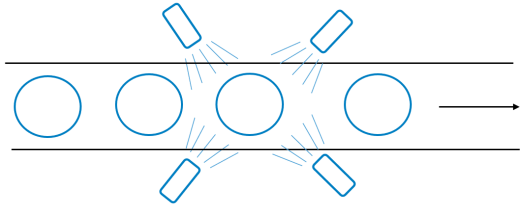
MQCS 2D

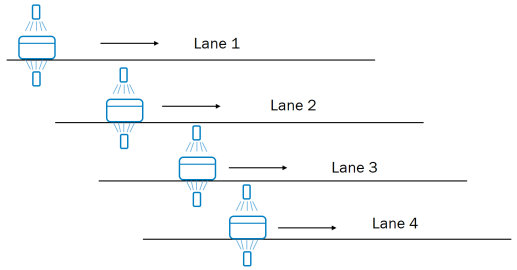
Predefined application scenarios

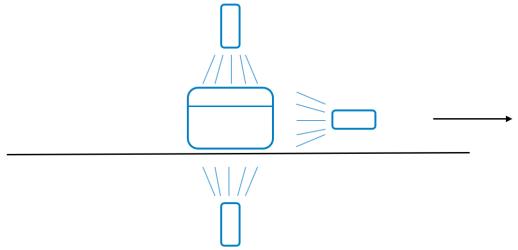
Predefined standard application scenarios with one system

1. Code matching with 2 sensors (up to 8)
2. Counting with 2 sensors
3. Code matching for round objects with 4 sensors + 1 sensor for lid check
4. Code matching with 4 lanes in parallel, with 2 sensors each
5. Counting with up to 4 sensors for round objects
6. Counting on 4 parallel lanes with 2 sensors each









MQCS 2D

Application scenarios

The standard configrations are provided with the system

Commissioning process:

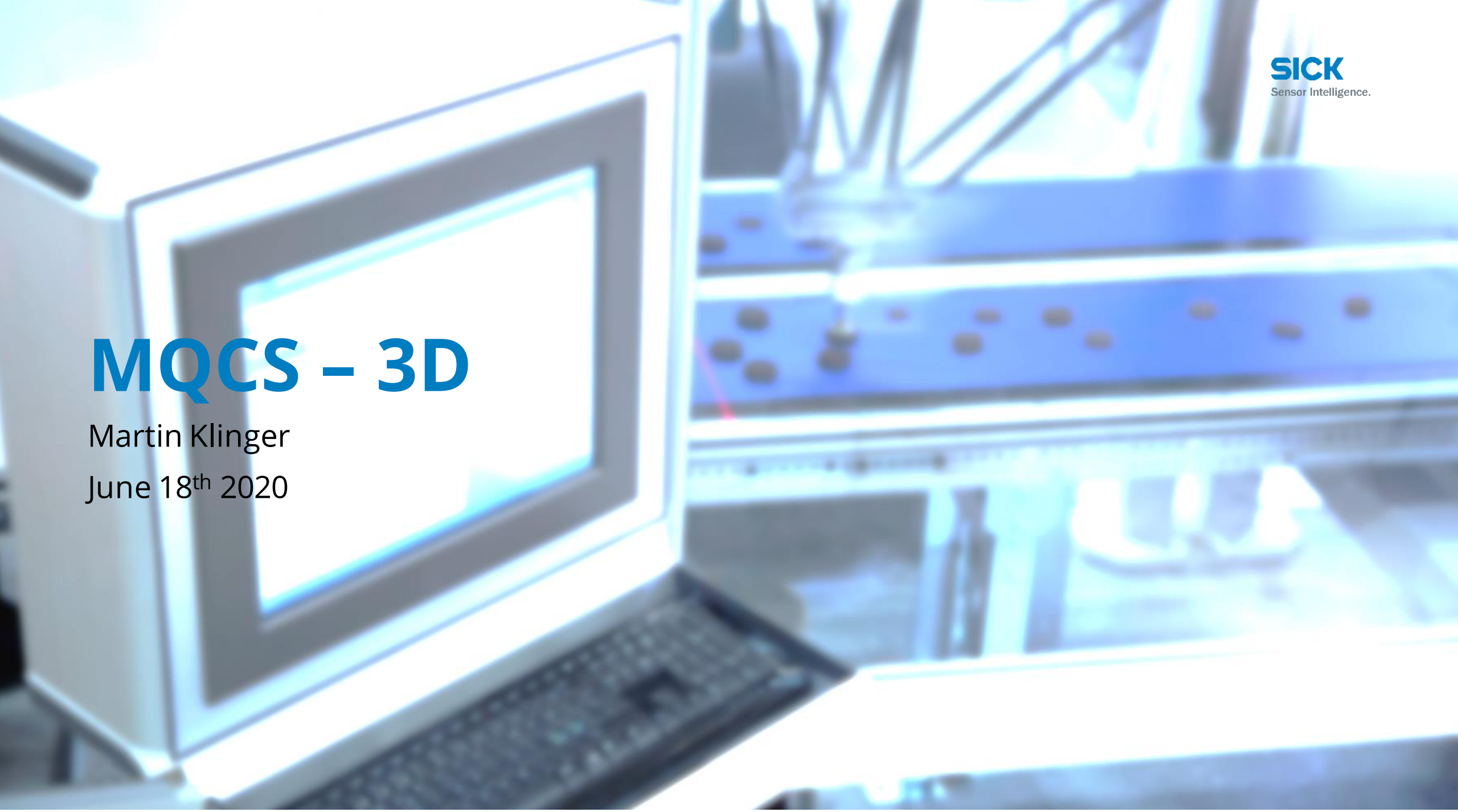
- Install the system at the customer site
- Power up the unit
- Select the application scenario and load the configuration
- Configure the sensors (IP-address)
- If real time processing is required, the Flexisoft modules needs to be configured using Flexisoft designer

- Ready

Further application scenarios can be configured by application engineering using TEMS manager

MQCS
BENEFITS

- **Quality assurance** by multifunctional check of objects
- **Individual application** thanks to modular soft- and hardware concept
- Fast and easy product change thanks to **recipe management**
- **Fast and easy integration** into existing plants
- **Easy access and visualization** of system data
- **No expert know how necessary** to operate the system



MQCS – 3D

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Use cases MQCS-3D

MQCS - 3D

Software overview: MQCS framework

The MQCS framework is available for Linux and Windows:

- MQCS – 2D => Linux (TDC-E)
- MQCS – 3D => Windows 10 (APU)

MQCS Viewer

› Provides user interface for operation

MQCS Recorder

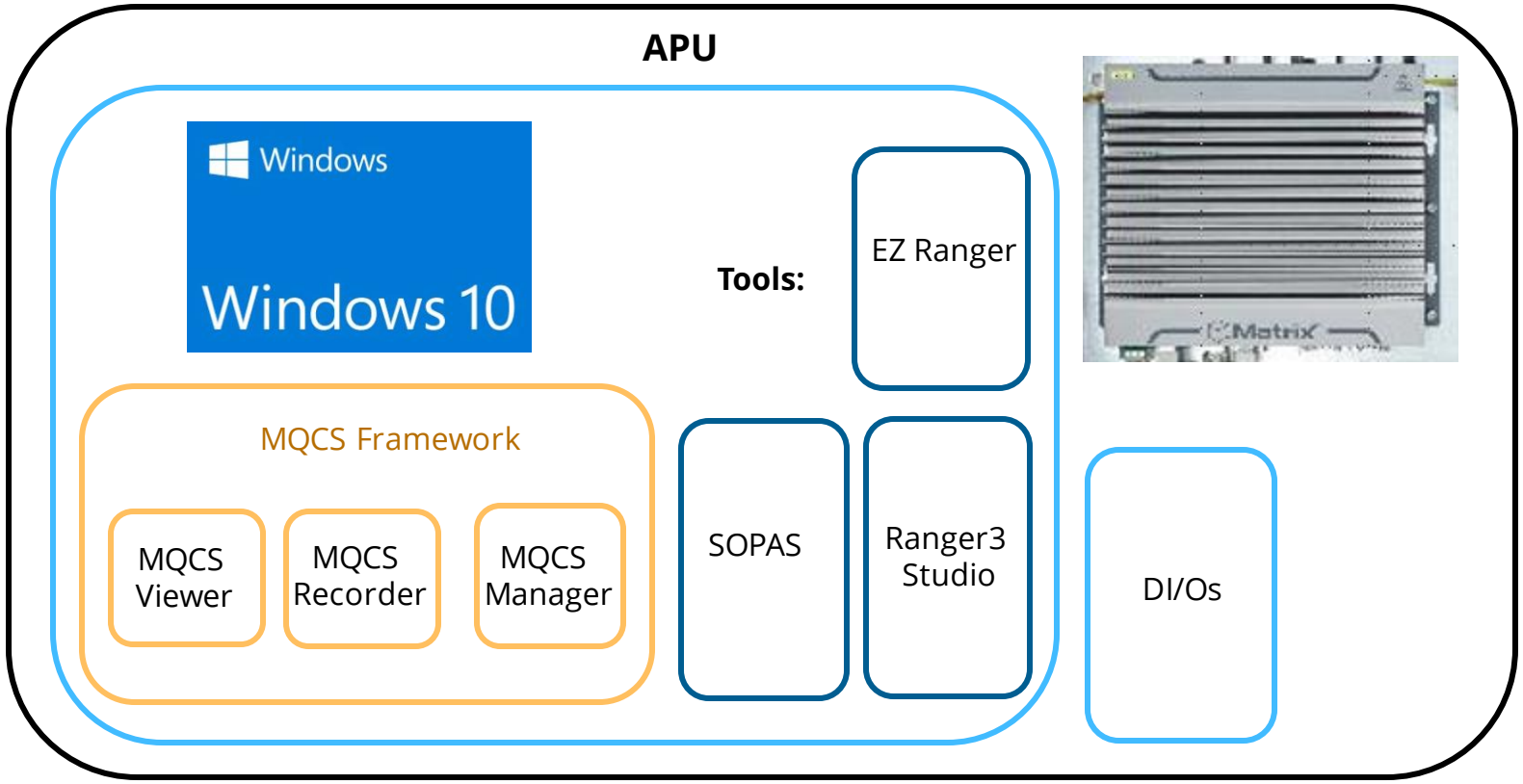
› Provides software modules

MQCS Manager

› Enter system settings

› Manage software modules

› Manage sensors



MQCS - 3D

HW: Components for 3D inspections

Essential components:

Camera

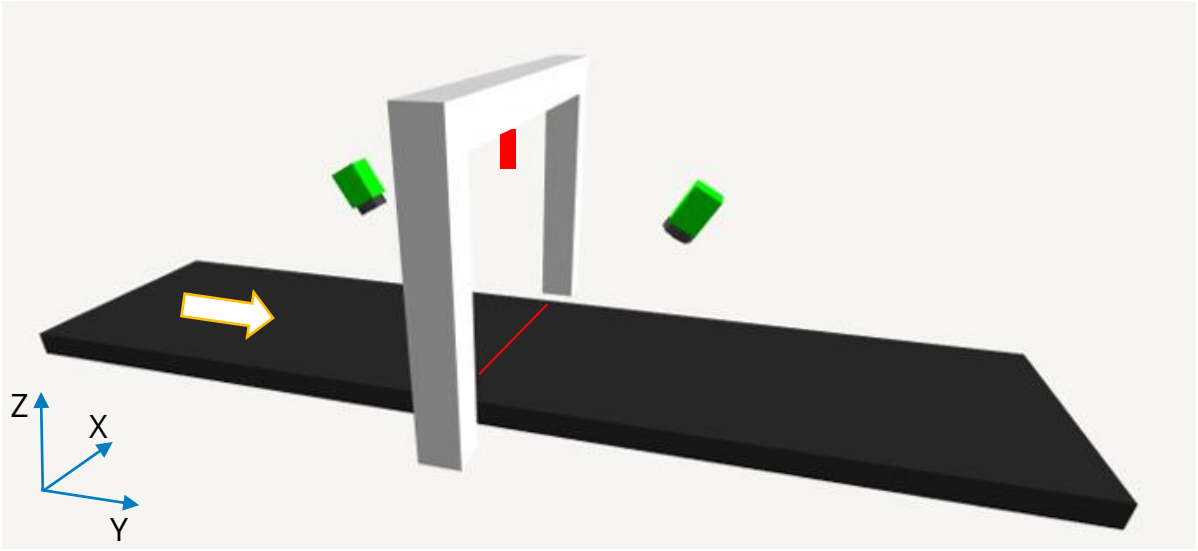
Laser

APU + SW

Encoder

Modular design

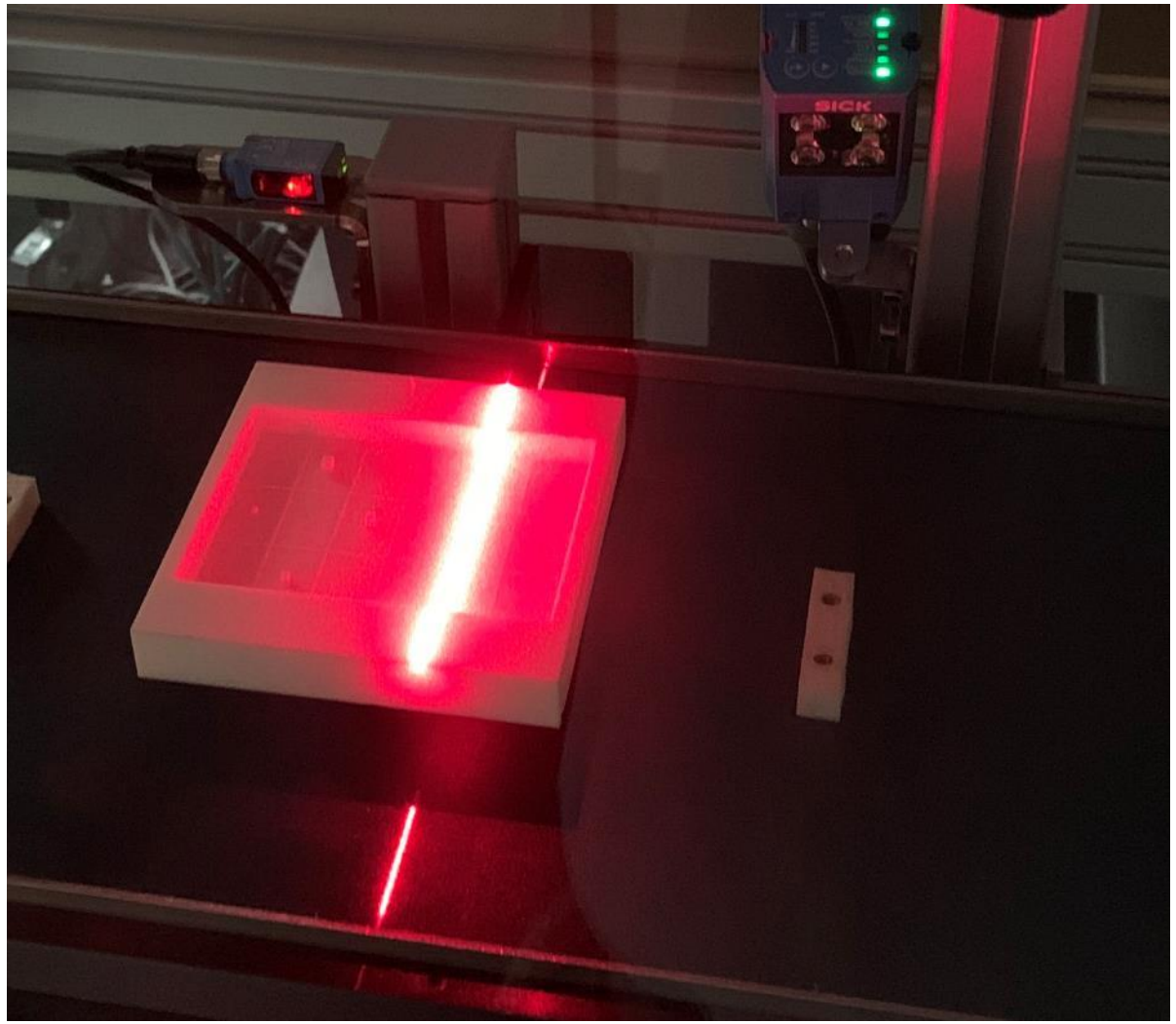
- Support for systems with multiple sensors
- Sensor packages to be added to the basic system as needed



MQCS – 3D

Features

- **Contactless check of molds for candy or chocolate production**
- **Inspection independent from color of molds and product**
- **Mold and product can have the same color**
- **Inspection of individual cavities**
- **Higher accuracy**
- **Easy to use user interface**
- **Fast and easy tech-in of new molds, independent from number of cavities**
- **Recipe management**
- **Scalable system with 1 … 4 sensors**



MQCS – 3D

Benefits

Contactless inspection – no risk that product is contaminated

Contacting solutions need cleaning and certification according to IFS – Food (International featured standard)

Easy operation thanks to easy tech-in procedure and recipe management

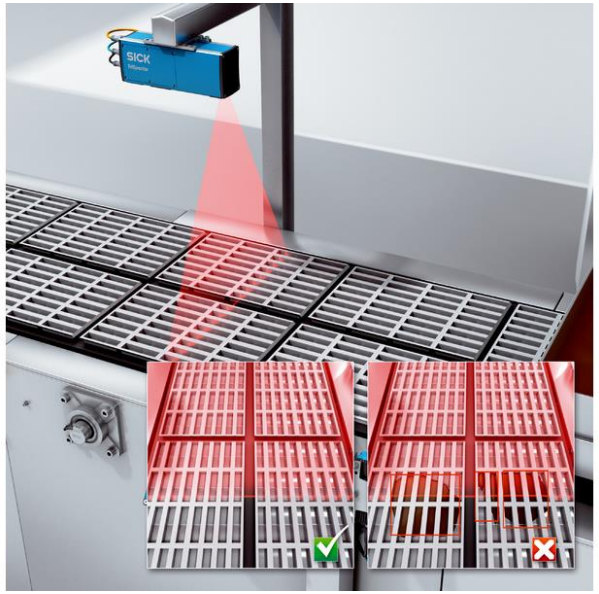
Fast and easy product changeover

Complete solution – easy to integrate into existing equipment

Statistics and error images - maximum process transparency

MQCS - 3D

Possible applications*

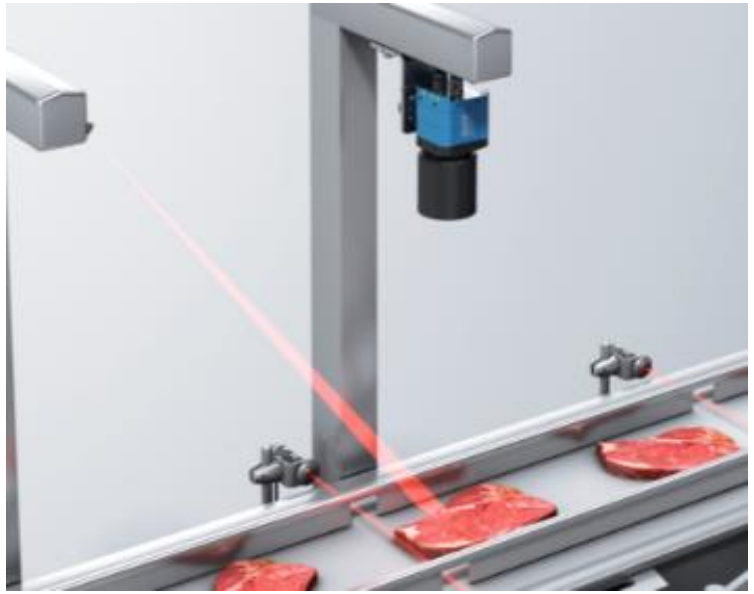


Mold inspection

Inspect molds for residues, contamination or defects than can cause quality issues in the production process

Object inspection

The MQCS measures and inspects objects for abnormalities, like residues, contamination or defects that can cause quality issues in the production process



3D object measurement

measurement tool for all kinds of objects – the 3D image can be used to calculate dimensions, volume or weight

*for more details refer to BU65 use cases

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Sensor Intelligence.

Questions ?

Thank you for your attention!

Martin Klinger

Martin.klinger@sick.de

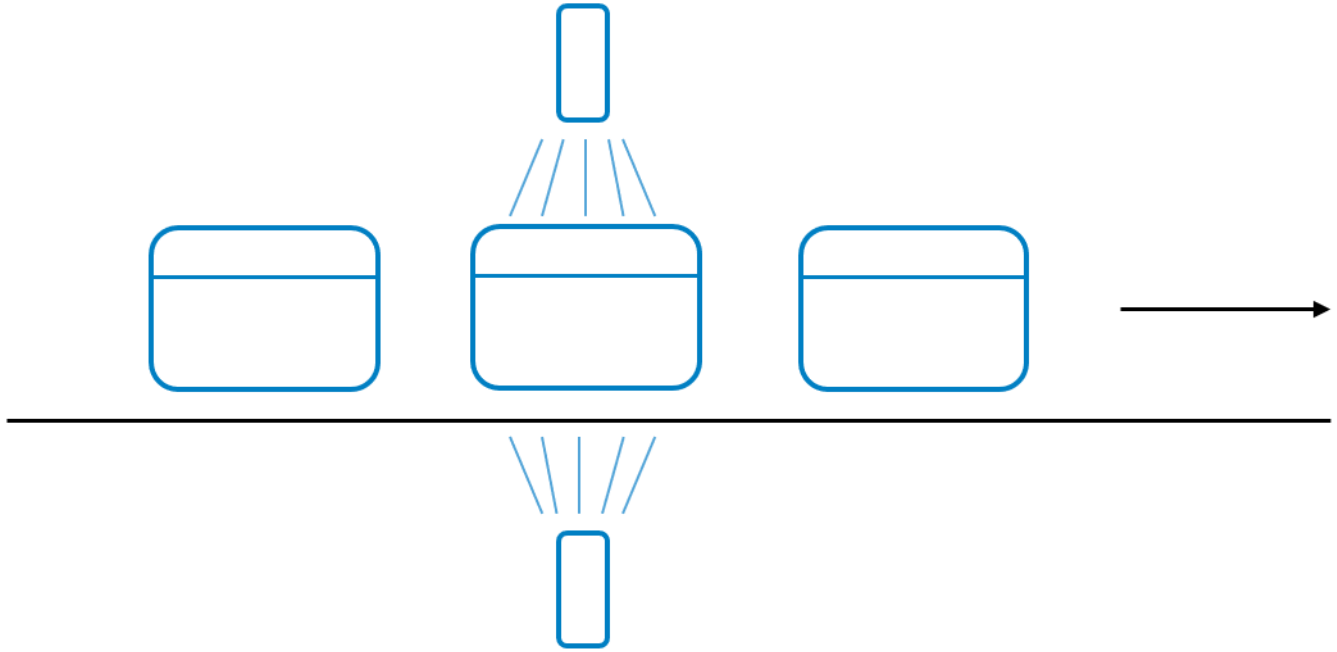
www.sick.de

Backup Material

MQCS 2D

Predefined application scenarios

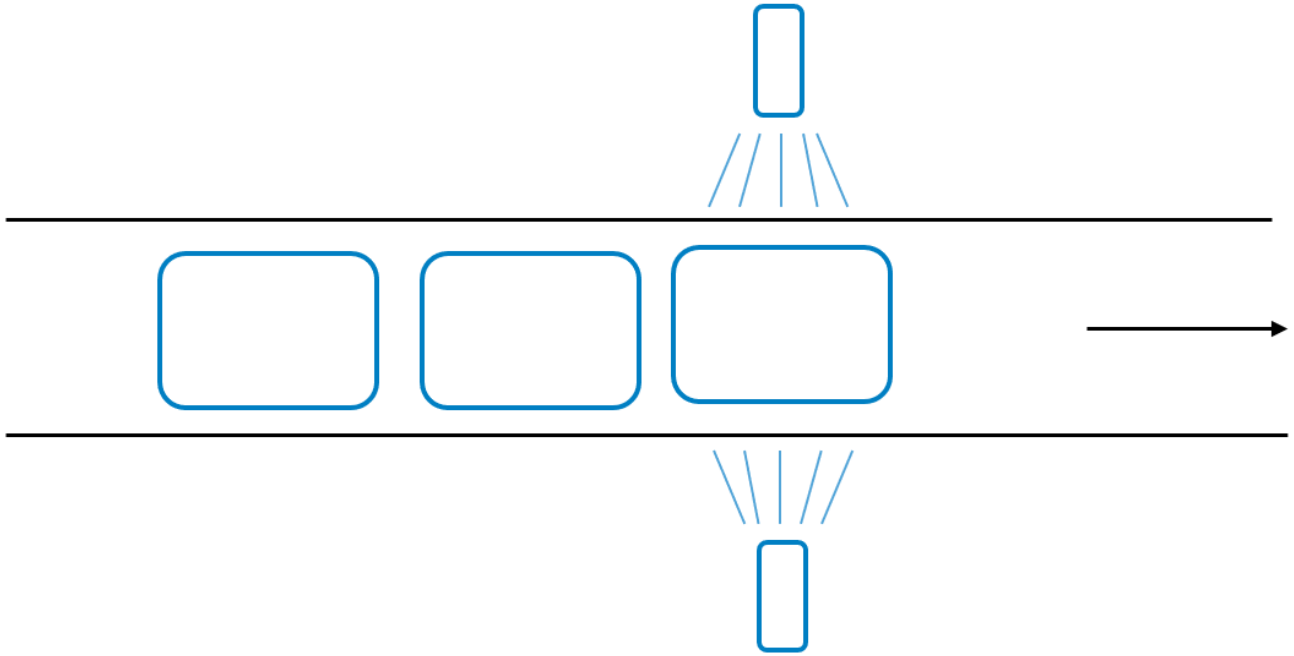
Code matching with 2 sensors – e.g. check lid and tub



MQCS 2D

Predefined application scenarios

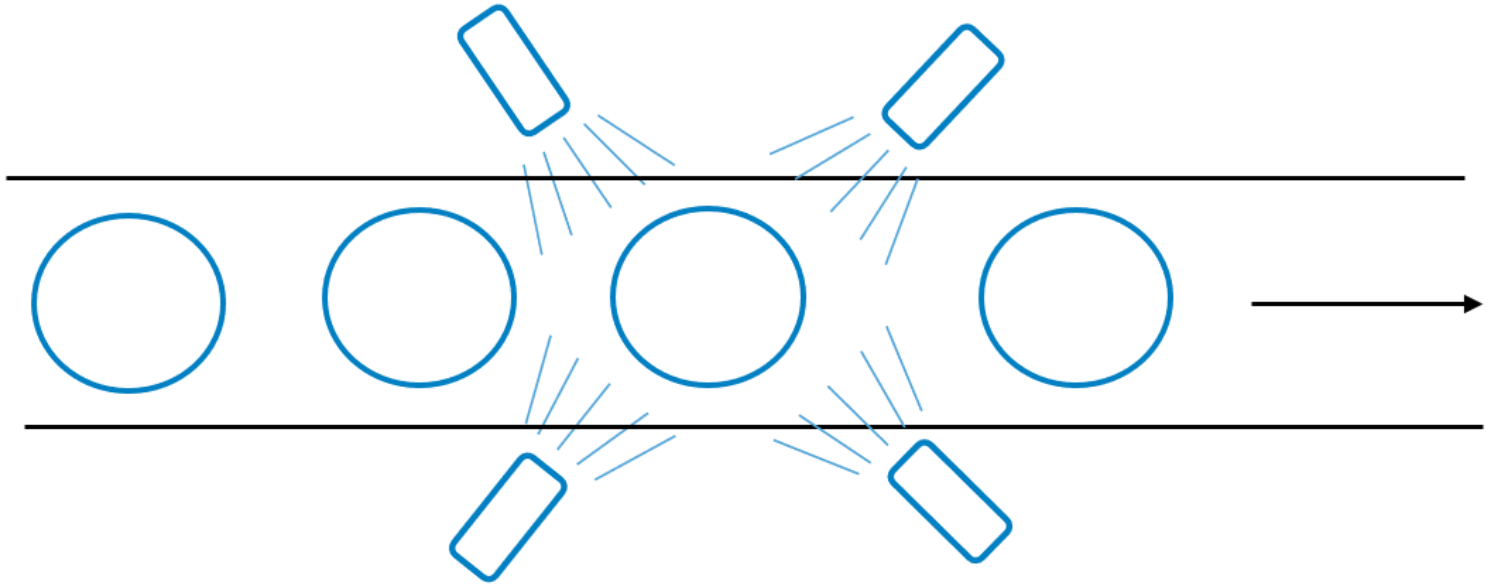
Counting with 2 sensors



MQCS 2D

Predefined application scenarios

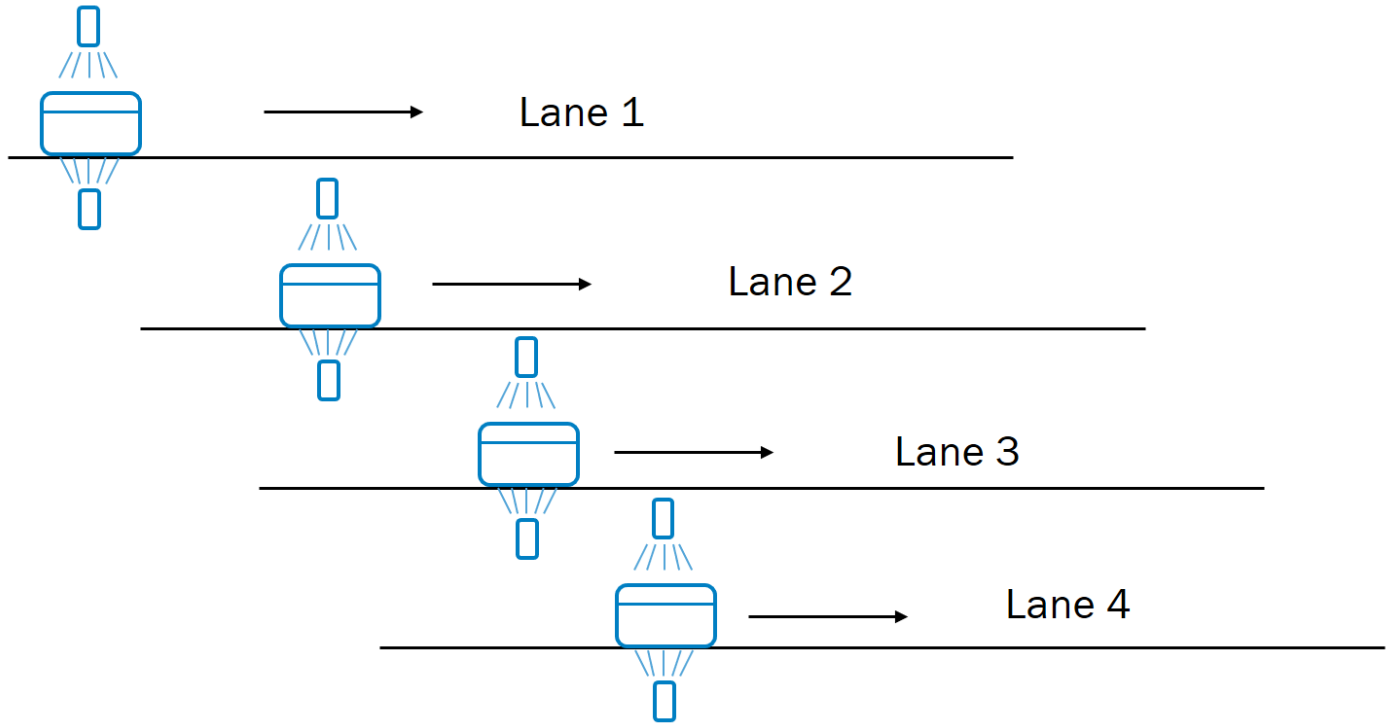
Code matching for round objects with 4 sensors + 1 sensor for lid check



MQCS 2D

Predefined application scenarios

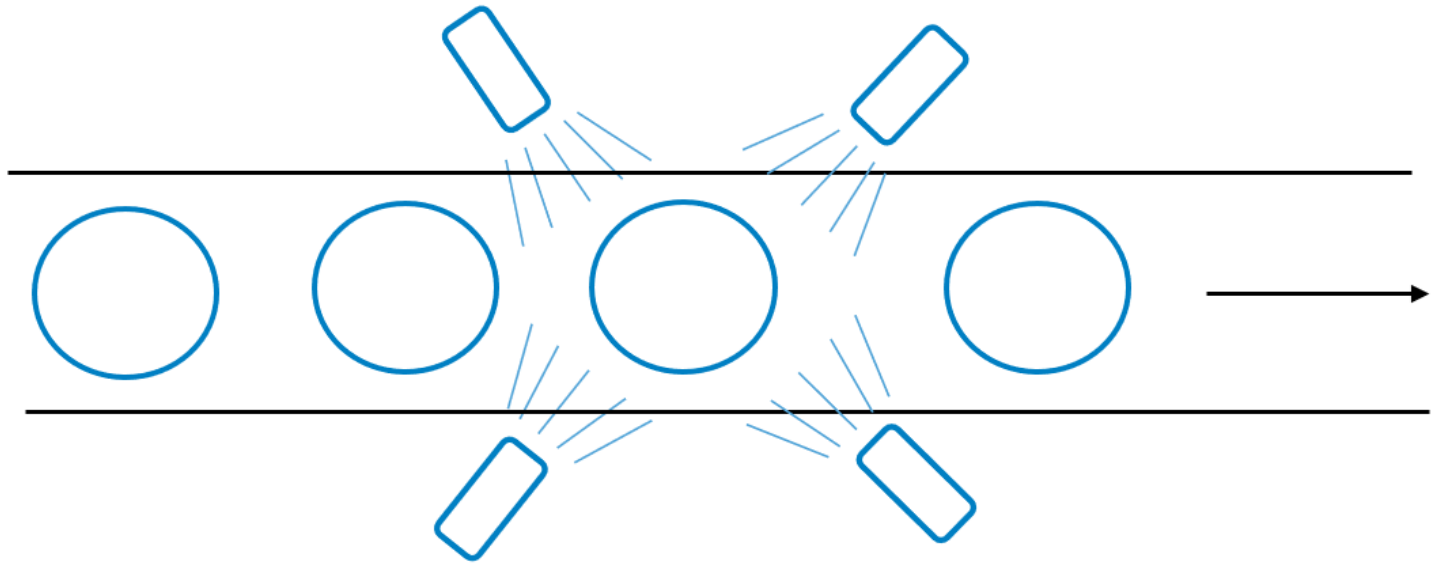
Code matching with lands in parallel, with 2 sensors each



MQCS 2D

Predefined application scenarios

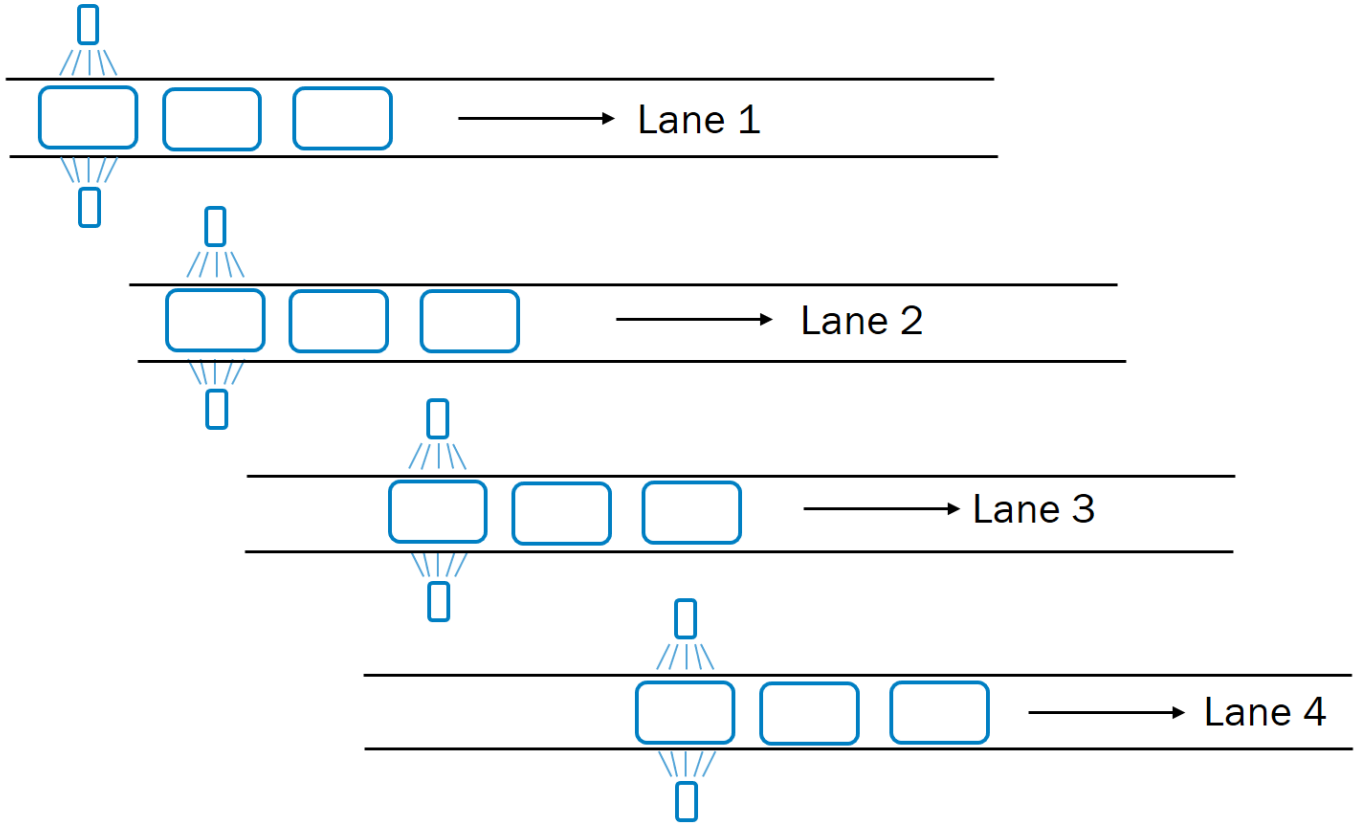
Counting with up to 4 sensors for round objects



MQCS 2D

Predefined application scenarios

Counting with 4 lanes in parallel, with 2 sensors each



MQCS 2D

Predefined application scenarios

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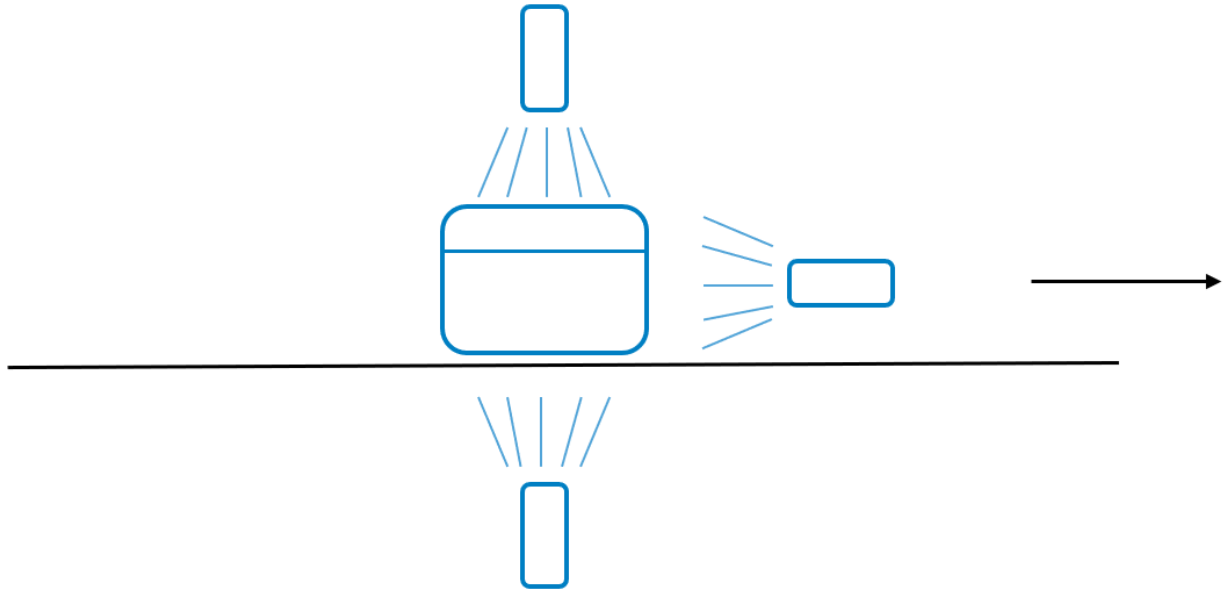
Matching / counting

- 2 sensors verify correct packaging
- 1 sensor captures serial number to track produced objects



MQCS – 3D

Target customers

The solution is used in production lines that use mold for food production

- Chocolate production
- Candy production

End customers (e.g. Ferrero, Ritter-Sport, Mondelez, Nestle, …)

OEMs that produce machines for candy and chocolate production (e.g. Bühler, Winkler&Dünnebier, …)

Further applications: baking processes also be used to check cake pans