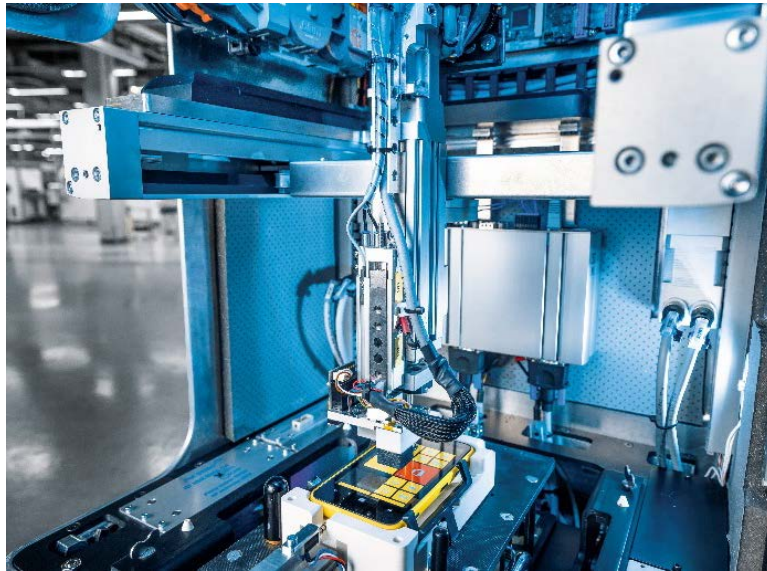# Automatic testing of touchscreens and keys on mobile devices

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Highlights

- Highly compact unit – installation space and working space are virtually identical

- Rapid and precise positioning
  - Maximum acceleration of 10 m/s2
  - Repetition accuracy ± 0.05 mm

- Complete handling solution (kinematics and controller) from a single source

Customer

PKC Electronics Oy (Finland)
Area of business: Turnkey solutions for testing and power management as well as designing and manufacturing electromechanics

Project

Test system for testing various functions on mobile devices, such as immersion and swiping tests, performance tests of keys and switches as well as audio and frequency tests.

Requirements

- Rapid and precise movement of the inspection unit to specific test areas
- Pressing keys and switches with a predefined force
- Precision tapping and swiping movements on touch displays with specific test parameters
- Monitoring the test process
- High flexibility:
  - Different test routines in one device
  - Rapid and simple adjustment of test procedures
  - Flexible system for testing different mobile devices
- Minimal space required

Solution

- A compact planar surface gantry EXCM-30 is used to move and position the test tools
- An electric mini slide EGSL positions the test adapter ("finger adapter") precisely in the Z direction to perform the tap and swipe tests
- Microphones and light cubes are moved in the Z direction with a pneumatic slide DGSL (which is mounted on the EGSL) and moved towards the test object

# Automatic testing of touchscreens and keys on mobile devices
Automation concept

Communication by Festo CVElib

Ethernet

Switch
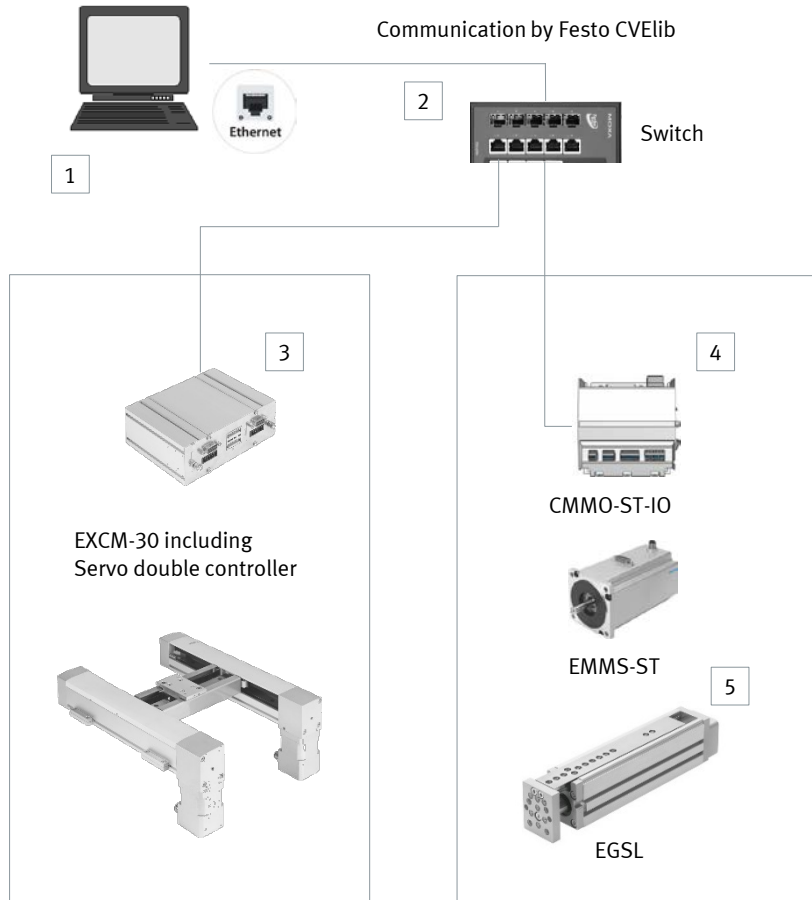
1 PC control

2 Ethernet hub

3 XY movement with compact planar surface gantry EXCM
with integrated drive and controller package

4 Controller CMMO-ST with integrated force and torque monitoring
→ Controlled pressing force with a force limiter
→ Gentle contact with the surface – no damage

5 Z movement with electric mini slide EGSL
+ stepper motor EMMS-ST

EXCM-30 including
Servo double controller

CMMO-ST-IO

EMMS-ST

EGSL

Automatic testing of touchscreens and keys on mobile devices
Components in detail

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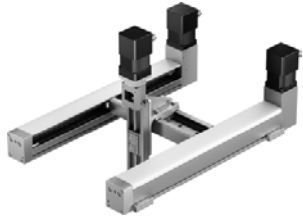
Compact planar surface gantry EXCM-30

- Stroke length, X-axis: 100 ... 700 mm
- Stroke length, Y-axis: 110, 160, 210, 260, 360
- Rated load for maximum dynamic response: 3 kg
- Maximum acceleration: 10 m/s²
- Maximum speed: 0.5 m/s
- Stroke scalable in the X- and Y-axes
- Flexible motor mounting upwards or downwards
- Standardised Festo plug & work solution with functional drive-controller package
- Closed-loop servo operation

Electric mini slide EGSL

- Sizes: 35, 45, 55, 75
- Stroke length: 50 ... 300 mm
- Force: 75 ... 450 N
- Maximum performance in a compact space
- Precision, load capacity and dynamic response
- Particularly suitable for vertical applications such as pressing or joining
- Safe against falling parts thanks to cover with magnetic sensors
- Efficient solution - outstanding value for money

Stepper motors EMMS-ST

- Holding torques: 0.3 ... 6.5 Nm
- Voltage: 48 V DC
- Nominal current: 8 A
- Step angle: 1.8 ±5%
- With a long service life and a full range of positioning functions
- With optional brake
- Improved and optimised connection technology
- Two-phase hybrid stepper motor with a high torque and a high degree of protection

Controller CMMO-ST

- Voltage: 24 V DC
- Nominal current: 5 A
- Micro step: 12,800 steps/revolution
- Closed-loop servo controller for stepper motors
- Closed-loop servo system
  - Maximum operational reliability
  - Use of the maximum motor characteristic curve
- Supports safety function STO
- Easy activation via:
  - I/O interface
  - IO-Link or I-Port
  - Modbus TCP
- Parameterisation possible via:
  - FCT (Festo Configuration Tool)
  - Ethernet interface with Integrated web server