

2<sup>nd</sup> World Congress on

# Automation and Robotics

June 13-15, 2016 Philadelphia, USA

## CyberFLEX – Robot based product flexible cyber physical EOL test systems

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Cyber physical product flexible EOL test systems are useful for testing cockpit components like climate controllers, navigations systems, multifunction panels, and displays that are able to cover all OEM (Porsche, Mercedes Benz, BMW, AUDI, Toyota, GM) requirements in the areas AOI (Luminance, Colour, Shape Matching, Pattern Matching, Black Mura, etc.), Force Feedback, Force Sense, Keyhaptics, Acoustics, Rotary Haptics, Electrical Measurements, Communication (CAN, LIN, FlexRAY, Most, K-Line, Automotive Ethernet) with autocalibration functionality. The SYSTEC calibration standards are unique worldwide and enable customers to minimize downtimes dramatically. The systems comply with Industrie 4.0 challenges and uses servo drives (or robots) to be able to make measurements in different angles (AOI, haptics, etc.). SYSTEC leverages NI's excellent platforms like LabVIEW, LabVIEW RT, and LabVIEW FPGA to implement a new distributed architecture (framework) to build a backbone for all EOL solutions (Teststands, Roundtable Solutions, Inline Systems, etc.). IMAQ Vision is the basis for AOI implementations, where some parts of the code run on CUDA architectures. Hardware core components include PXI chassis and different plug in boards including like DIO, DAQ, modular instruments, etc. Force feedback and acoustic measurements are based on CompactDAQ technology. Mitsubishi robots and motion systems are building the backbone of the product flexible EOL systems. The roundtables are controlled with customer specific Zync powered sbRIO hardware. The whole implementations are completely 64 bit applications using Microsofts Windows 10 operating system (Linux RT in the embedded area).

### Biography

Herbert Pichlik studied Hard and Software Engineering (Dipl.-Ing.) at the University of Applied Sciences in Nuremberg where he is Lecturer since 1997 (best rating from students in Bavaria). He started his professional career in 1985 when he joined Philips Kommunikations Industrie AG (PKI) as a Software and Hardware Development Engineer. After a short period at LGA, and 10 years as Quality Manager at Quelle AG, he joined SYSTEC GmbH in 2000 as CTO. He has written and co-authored several books and dozens of papers and articles. He holds several patents in the field of analog and digital integrated circuit technologies and is an internationally awarded keynote speaker.

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