



Company Profile
IBS Test Systems

Introduction

IBS Test Systems develops, constructs and oversees gearbox test benches for well-known test bench and gearbox manufacturers.

We deliver following test bench components:

- Gearbox shifting robots for position/force controlled engaging and testing of transmissions
- Flexible test bench controller (real-time capable with high frequent data acquisition & actuator control) and programmer system with graphical user interface
- Mobile test benches for function testing of double clutch transmissions DCT
- Haptic and mechanical device testing with position/force controlled industrial robots (available 2011)

We offer following services:

- Conception of test strategies and implementation
- Electro mechanical design and manufacturing, measurement and drive instrumentation
- Conception/realization of high-end real-time test bench control systems
- Software development and system integration
- Setting-up operation and long-term maintenance

Company

Since 1992 IBS Test Systems develops test bench control and real-time control systems for force/position controlled robot and special kinematics.

The control systems were originally engineered in cooperation with the Fraunhofer-Institut for Production Systems and Design Technology (IPK Berlin) and have been consistently further developed to the following features for a flexible test bench control FPS:

- Programmer system: test step administration, online-display of test results, preparation and interpretation of test reports
- Integration of test bench components in customer IT-structure
- Interface to Profibus DP, driveline bus SERCOS, CAN, RS232, TCP/IP
- Force/position control for gearbox shifting robots
- Speed/torque control for E-machinery (tensioning/ loading of drivelines)

- Real-time task level (loop time, parametrizable min. 500us) for data acquisition, generation of stimulus trajectory, control loops for testee state variables

Since 2006 we perform mechanical and electro mechanical design and manufacturing in order to implement quickly and cost-efficiently customized adjustments of our test bench components.

By use of our flexible test bench control FPS we realize the following different test bench projects in short time:

- Control systems for end-of-line test benches, endurance test and quality measuring for manual control gears and double clutch gears
- Gearbox shifting robot with force control for gearing and testing of automobile manual control gears
- Haptic and mechanical device testing with force/position controlled industrial robots (available 2011)

History

Our aim – at that time such as today - is ambitious: We want to react quickly and reliable to the innovations of our customers which lead to increasing requirements for gear test technique.

The following overview shows an extract of the projects realized by IBS Test Systems.

2010	Gateway between manufacturing control systems and guidance systems, electro mechanical design & manufacturing, computer engineering, identification systems and software development
2009	Control and measurement system for acceptance test bench for three types of double clutch transmissions
2008	Mobile test bench for double clutch transmissions, electro mechanical design, manufacturing and control system development
2008	Contact pattern test bench for double clutch gears, electro mechanical design, manufacturing and control system development
2007/2008	Conception of test bench control for three end-of-line test benches for double clutch transmissions, development and realization of direct activation of hydraulic valves, shift rod position control, hardware development of sensor signal conditioning components, data reduction and appraisal of quality features
2007	Development of test bench control systems for drag torque testing and dynamic turn-checking backlash measurement of double clutch transmissions
2007	Development of test bench control systems for force/position controlled actuation of manual control

	gears for testing neutral and gear position sensors
2006	Concept development and prototypical realization of a test bench for frequency converter and pump control with MATLAB / dSPACE
2004	Multiaxis control system for a medical training machine for gait rehabilitation. SW-development with real-time operating system RTLinux and C/C++. Interpolation of periodical shaft angel gradients refer to Fourier Analysis and Approximation
2003	Quality measurement test bench for 6-gear transmission with high type variance; automatic measurement of relevant mechanical parameter of gearshift and driveline. Realization of a multiaxis robot control system with force, impedance and position control
2003	Control development for endurance test for 6-gear transmission with high type variance
2002	Control development for end-of-line test bench for automatically shifted 6-gear transmission (ASG)
1998	Gearbox test bench for force/position controlled scanning of boundary contour, development of control software with real-time operating system VxWorks
1994	Automation of laboratory for space with force/position controlled robots for the European project LORA
1992	Automation of installation processes with force/position controlled robots for the European project SEMOS

Customer Benefit

We work closely and trustfully together with our customers - from the preparation of requirement specifications to conception of test strategies and setting-up operation. Prior to the start of our manufactures we discuss the mechanics and design of control cabinet on the basis of 3D-CAD-modells, the test strategy on the basis of flow charts.

Due to the fact that the testees are often still in stage of development we consider future variants and changes at the projection of our test bench components. We take excellent quality and delivery on time for granted.

Services

- Conception of test strategies
- Mechanical and electro mechanical design and manufacturing
- Measurement instrumentation, development of electronic component assembly for sensor signal conditioning
- Software development and system integration
- Integration in existent test benches and setting-up operation
- Long-term maintenance, enhancements and delivery of spare parts

Products

- Gearbox shifting robot GSR
- Mobile measurement and shifting equipment for double clutch transmissions
- Flexible test bench control system (real-time capable with high frequent data acquisition & actuator control) and programmer system with graphical user interface
- Haptic and mechanical device testing with force/position controlled industrial robots (available 2011)
- Analysis system for transmission error of multi-stage spur and bevel gears (in development)

Technologies

We use the following technologies for our test bench projects:

- Servo drives with SERCOS-interface (BoschRexroth) or Profibus (Siemens) with high resolution Sine-Cosine-angle transmitters
- Siemens industry-PCs
- Real-time operating systems VxWorks 5.5, VxWorks 6.6, Xenomai, RTAI (periodic tasks with min. 100us cycle time)
- User interfaces with Application Framework Qt for Windows/Linux, Matlab
- Force measurement instrumentation HBM, pressure measurement instrumentation Keller

Partners

We realize our ambitious projects in cooperation with our reliable partners,

- Fraunhofer Institute for Production Systems and Design Technology IPK, Berlin
- KUKA Systems GmbH, Bremen
- USK Karl Utz Sondermaschinen GmbH, Limbach-Oberfrohna

Contact

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