

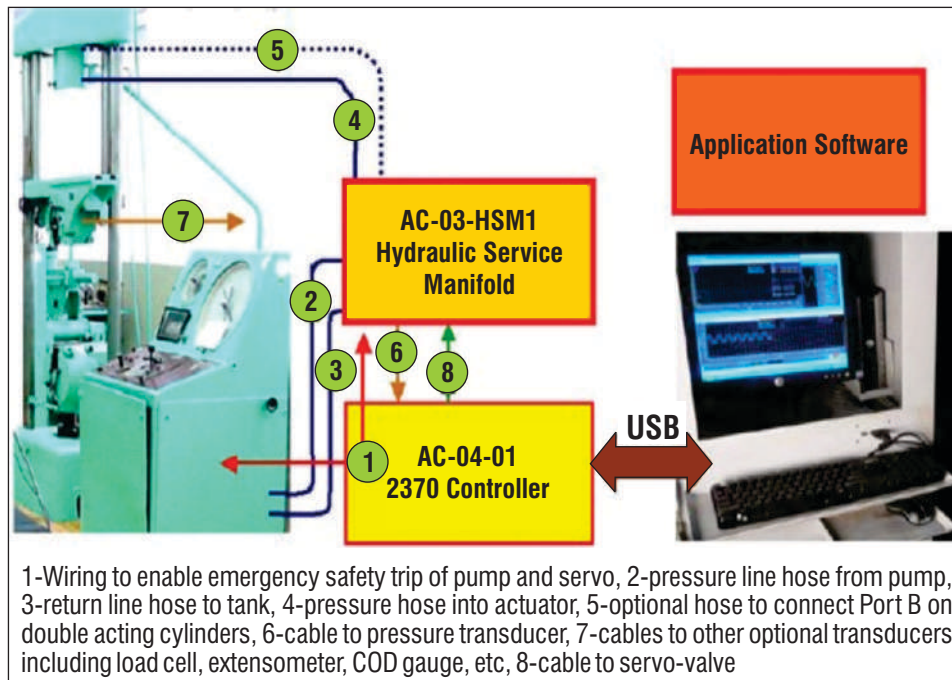


Upgrades and Retrofits

Several hundred test systems worldwide have been converted into state-of-the-art digitally controlled units through retrofits and upgrades from BISS. These include practically every make including Zwick, Shimadzu, Shenck, MTS and Instron that now enjoy a new lease of life and deliver the same performance and precision as a new system. Factory trained engineers assess specific requirements and perform the retrofit using components from the wide choice of controllers, software, grips, fixtures and sensors from BISS.

Need for Retrofit or Upgrade

- Hydraulics and mechanical parts in good condition, electronics and controls dysfunctional, unsupported or obsolete
- Requirement of test automation
- Old or inoperative transducers and/or grips and fixtures
- Ageing electromechanical drives as in static test systems
- Operators comfortable with old system and would prefer retrofit to replacement

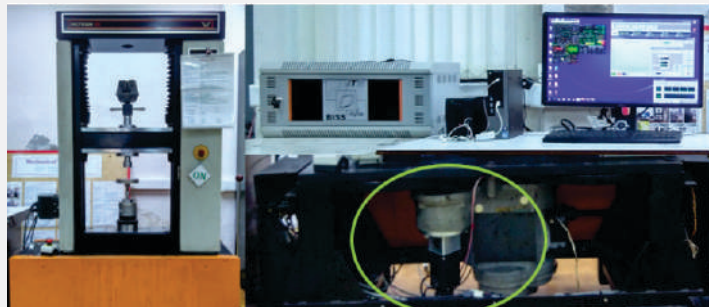
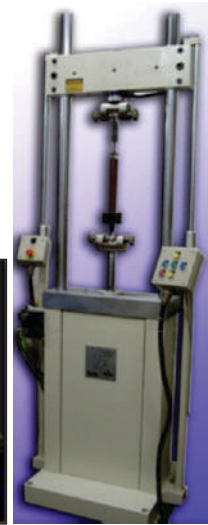
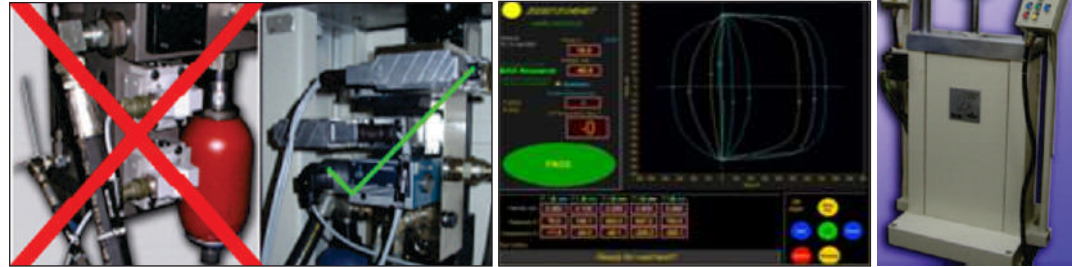


Retrofit over Replacement

- Retrofit cost typically less than 30% of replacement cost
- Quality of test result is primarily affected by quality of measurement. By merely replacing control system, the quality of test can be vastly improved. BISS controllers offer the highest degree of precision available in digital measurement – 24 bits
- Test automation with appropriate software permits reproducible test results in accordance with prevailing test standards
- Internet-of-Things (IOT) - enabled solution permits extension of Tech Support and Lab Resource Management capability to ageing systems

BISS Solution to Life Extension with Improved Functionality

- Entire control console is replaced with a state-of-the-art digital control system and required application software
- Delicate aging dual-stage servo-valve is replaced with state-of-the-art, contamination insensitive direct drive servo-valve
- First retrofit performed 25 years ago on a 20 - year old 500 kN MTS system continues to serve IISc. Picture shows high speed MTS test system retrofitted for Delphi Automotive Systems (USA) in 2003



BISS Retrofits work for electromechanical (EM) systems too

- Ageing Instron EM test system at IIT-Kanpur retrofitted with state-of-the-art BISS controls as well as drive continues to serve the Materials Research Laboratory

MTS Structural Test Rig Retrofitted with BISS Controls

- This test rig in a Malaysian university was retrofitted with BISS controls
- The BISS supply provided for integration of test control with measurements from up to 24 strain and displacement channels
- The BISS solution permits synchronized test control with multi-channel data acquisition



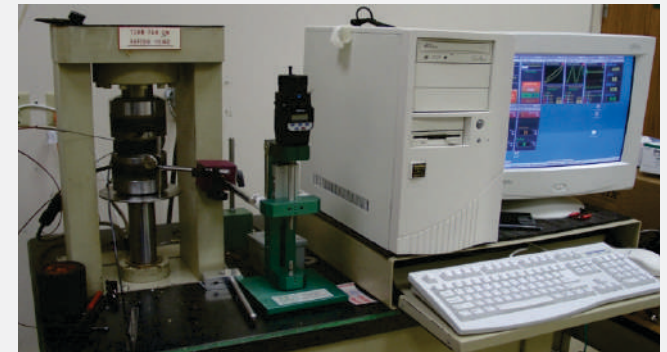


Retrofit of Triaxial Wheel Test Rig at Accuride Inc (USA)

- Retrofit performed in 2000 provides for triaxial loading of automotive wheels with simultaneous data acquisition from 78 strain gauges in fully automated mode. It is used by Accuride to validate the design of wheels for high performance tractor-trailers

Custom Test Rig Upgrade at Premix (Cleveland) 2001

- The system is used to develop heat and flow process parameters for induction molding of thermoplastics
- BISS controls powered by customized software allow automated characterization of hardening process of resins used in injection molding
- Test control is multi-channel as temperature, mean force as well as displacement amplitude and frequency need to be controlled while tracking kinetics of hardening



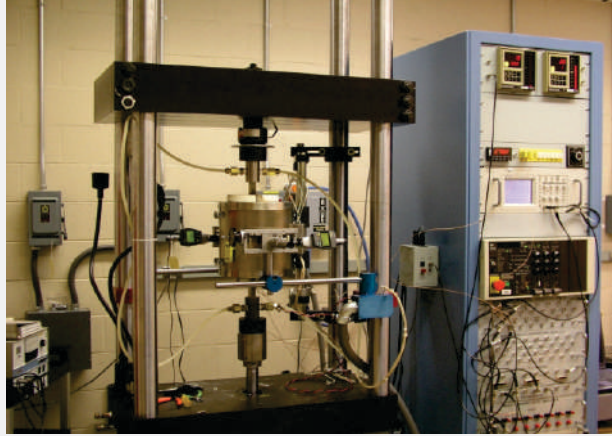
Modernization of high performance systems

- These two ageing high performance systems in a Russian laboratory were supplied during Soviet times
- Their retrofit demanded adaptation of BISS controls to high flow three stage servovalves
- BISS firmware includes code for total digital control of three-stage servovalves using proprietary 'loop-in-loop' algorithm
- The systems were tuned from Bangalore remotely, using IOT technology



ROSATOM





Upgrade of High Performance MTS System at AFRL (USA)

- US Air Force Research Laboratory (AFRL) provided material support for the development in 2002 of new generation BISS controller built around high performance Digital Signal Processors (DSP).
- The target was to retrofit the MTS system with a high performance controls to permit sustained fatigue cycling with high precision at up to 200 Hz
- The technology was applied to research on fatigue thresholds

Multitude of Test Systems Retrofitted with BISS Controls across Malaysia

- Petronas University, Uniten and other reputed universities in Malaysia chose to extend the life of ageing test systems with BISS retrofits
- Each system was carefully assessed to determine the minimum degree of retrofit required to ensure extended high quality service



100kN UTM – Zwick Roell

High Speed Dartec

100kN UTM – Instron



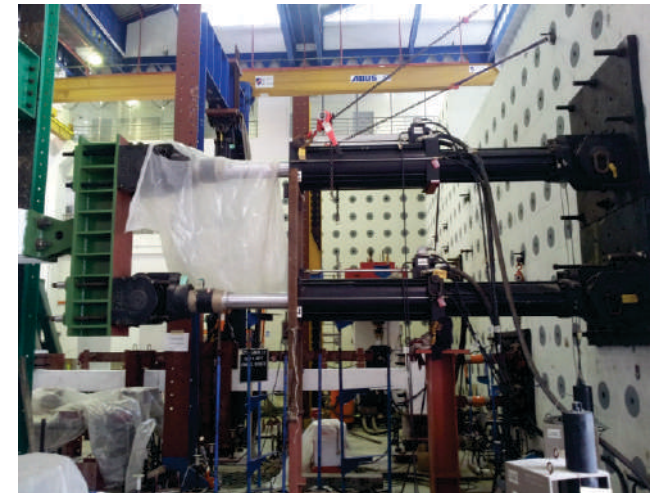


Incorporation of Multi-Station Capability in Retrofits

- The Instron and Dartec test systems at Cosmic Labs (Bangalore) are controlled by a single BISS 2370 controller
- A new BISS hydraulic powerpack was integrated with the test systems
- The modernized systems serve a variety of fatigue and fracture applications in services rendered by Cosmic Labs

Upgrade of MTS High Performance Multi-Actuator Structural Test Rig with BISS Controls

- This 3-stage MTS servo-valve was brought under total digital control
- BISS 2370 controller is used for synchronous control of four high performance actuators



The Retrofit / Upgrade Process

- Before taking up the project, experts inspect the existing facility to evaluate general condition of individual components
- Along with customer, a list of target parts for replacement/repair is prepared along with potential additions if required to upgrade or adapt test system to new requirements
- Techno-commercial offer is prepared based on actual assessed requirement
- The retrofit work is performed by specialists with the highest degree of expertise and experience gathered over 30 years
- The quality of retrofit is backed up with Warranty and offer to assume responsibility for the subsequent maintenance of the entire facility
- After sales support is backed up by state-of-the-art Iota technology

Performance & cost implications

- The load frame, actuator and hydraulics typically outlast controls several times over. A retrofit is often a guarantee of reduced life cycle cost for a test system
- Experience shows that replacing conventional 2-stage valves with direct drive equivalents can improve performance and at the same time render the system less sensitive to contamination that often affects ageing systems
- Replacement of obsolete LVDT sensors with state-of-the-art digital encoders delivers 0.1 micron resolution on stroke measurement to render superior quality and reproducibility of measurement even on ageing servo-actuators
- Replacement of ageing analog electronics with state-of-the-art digital control and suite of application software permits higher productivity through automated testing in strict compliance with prevailing standards
- A retrofit lending a new lease of life to a test system typically costs a fraction of its new price. The retrofit can be backed up with acceptance of responsibility for maintenance and calibration of the 'old system made new'. BISS supports a vast variety of test systems worldwide.



Contact

Australia : +61 397203477
Japan : +81 448538520
Korea : +82 25522311
Malaysia : +60 377701319
Singapore : +65 67743188
Taiwan : +886 35722155
Thailand : +66 25138751



ITW India Private Limited (BISS Division)
No. 497E, 14th Phase. Peenya Industrial Area,
Bangalore - 560058, India
Email - sales@biss.in
Tel: +91 80 283 60184 Fax: +91 80 283 60047