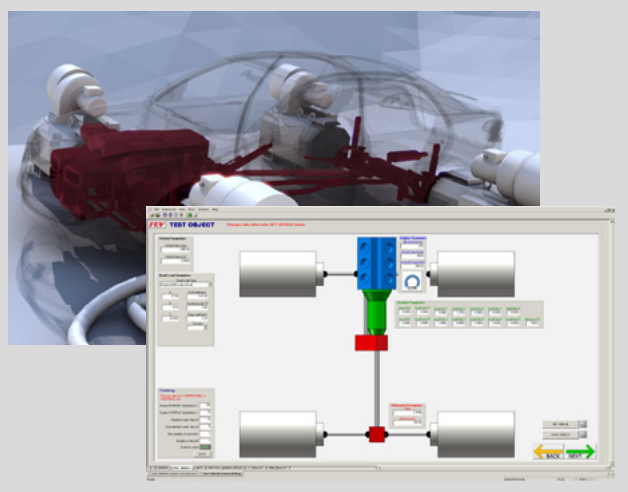
TOM X -
Controller System

CONTROL

» FEV'S INTELLIGENT MULTIPURPOSE CONTROLLER SYSTEM COVERING ALL TYPES OF TEST BENCH SETUPS



Controlling the dynamometer and supervising the test object are essential tasks in the field of testing and development of engines, gear boxes and powertrains as well as their components.

TOM X is a universal controller unit that can handle all types of loading units and test objects as well as be seamlessly integrated into any testing environment. All established control modes are available and can be switched bumpless during operation. TOM X can be operated either remotely via the automation system, locally or optionally via an external control panel.

It offers integrated basic monitoring of the tested object, where, in case of a limit violation, the TOM X responds in a way to secure the test object by bringing it into a stable operating condition. The TOM X is modularly extendable and compiled real-time models can be integrated easily.

Offering real-time networking of component test benches, engines and transmissions can be connected in one virtual overall system.

Your Benefits

- Usage of fast real-time bus systems
- High-speed performance in real-time allows integrated execution of MATLAB/Simulink models
- Test control with high dynamic speed and torque control
- Secure operation via the integrated multi-layered test object monitoring
- Integrated limit observation with selectable error reaction
- Bumpless transfer between control modes
- Easy online tuning
- Pre-defined test object configurations can be stored locally or be loaded via network
- Modular framework allows tailor-made configurations
- Pre-integrated selection of standard devices and actuators
- Integrated Restbussimulation Devices
- Easy integration of new test bench devices and actuators
- High dynamic simulations
- Highly flexible dyno assignment functionality for multi-machine control
- Easily extendable by different hardware interfaces

TOM X/Software & Testing Solutions/E//2017

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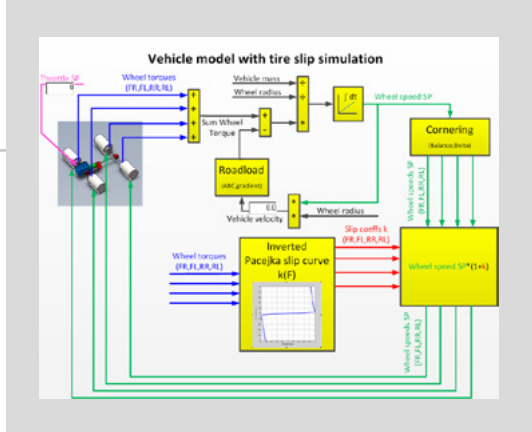
TOM X - Controller System

Control Modes

Mode	Throttle Actuator	Loading Unit
0: idle	Controllers deactivated	Controllers deactivated
1: α / n	Position-Control	Speed-Control
2: α / M	Position-Control	Torque-Control (Load-Cell / Torque Flange)
3: n / M	Speed-Control	Torque-Control (Load-Cell / Torque Flange)
4: M / n	Torque-Control (Load-Cell / Torque Flange)	Speed-Control
5 I 6: X / n I X / M	Free definable values operation mode	
7: α / RLS (v) 8: v / RLS (v)	Manual modification of throttle and clutch; automatic test definitions Manual modification of velocity; execution of emission cycles	
9: n / n	Speed-Control	Speed-Control
10: Track Recording	Position-Controlled Recorded from the track	Speed-Control Recorded from the track

Technical Data

Computer Types	a) 19" 4HU PC I Windows 7 / RTX b) IPC-based system for high dynamic applications	Control Rates	a) 1 – 4 kHz b) up to 10 kHz
Accuracy:	Torque measurement: ± 0.2 % FS Speed measurement: ± 0.5 rpm		
In- / Outputs	AI, AO, DI, DO, FI, CAN for CANopen and/or CANraw (up to 4x), EtherCAT (up to 4x)		
Interfaces	Common IO (Free configurable 10 x DIN , 9 DOUT) Speed Dyno (1x FI, 1x DIN and for detecting rotation direction) Engine Interface Box (5x DOUT, 2x DIN) ICE Speed Safety SPS for the interaction to facility infrastructure (TGA)		Emergency Stop / Battery Safety (1x relay gate input, 2x DOUT, 1x DIN) Up to 2x VGA Pendant
ECU Interface	ASAM-MCD3 (ASAP3) series or TCP/IP, KWP 2000, SAE J1939		
Other interfaces	Ethernet, serial different protocols e.g. AK, ASAM-ACI, FEV CAS, TCP/IP, DI, DO, FI, AI + AO via CAN or EtherCAT		
Functions	Manual and remote operation Operation modes 0-10 Modular safety concept ➔ 24 V safety circuit, WatchDog monitoring Real-time limit observation Limit Monitoring Data and event processing Live data and status visualization Data acquisition and logging Post mortem function: max. 100 channels		Device control and coordination Clutch handling Start-Stop Handling MATLAB/Simulink tool chain xCU Integration
Simulations	Accelerator-pedal simulation FEV FPS Driver- and Vehicle-Simulation FEV SIM Zero-inertia simulation Starter simulation Engine and dynamometer simulation High dynamic simulations, such as: - Engine Torque Pulse Simulation incl. CAM and FFT - Inertia Simulation - Wheel slip via Pacejka model		



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