EXPERIMENTAL SETUP SPECIFICATIONS:

Crash sled: (Figure 1)
- Two 6 meter guidance bars
- 1700 kg concrete block on roller support
- Launched by pneumatic cylinder with electronically controlled release valve (0-100 bar)
- Collides with deformable steel crumble component similar to deceleration of a small car in a full scale crash test

Continuous Restraint Control System: (Figure 2)
- Regular seatbelt
- 30 kg torso mass restraint by seatbelt
- Semi-active actuator (Figure 3). Semi-active meaning that the actuator can only control the release of the seatbelt, it cannot retract it.

Data acquisition
- 2 acceleration sensors on torso
- 1 acceleration sensors on cart
- Hydraulic pressure sensor
- Current measurement of the amplifier output
- Current measurement of output reference signal

Power supply
- Two 1500W DC power supplies (Delta Elektronika SM52V-30A) Currently only one is installed. Combined supply can deliver 104 V at 30 A.

Amplifier
- Elmo Motion Controller 20/100. Required for combined supply, yet currently not working
- Elmo Motion Controller 25/60. Compatible with single power supply, currently operational

Software & Hardware
The data acquisition is processed by a 1dSpace real time I/O system which is connected to an external processor. This external processor is again connected to a PC. A Matlab/Simulink package is used to develop a model which is transcribed into C-code and built in the external processor. The data is retrieved by the Controldesk software package and Matlab is used to produce figures and analyze data.
FIGURES:

Figure 1: Crash sled setup

Figure 2: Constraint Control System setup
Figure 3: Semi-active hydraulic actuator