

Abstract number: 17583

**SENS**  
**A Miniaturized High-g**  
**Sensing Data Recorder**

**TDW, Manuel Fritz**

July 7-9, 2015  
NDIA, 58<sup>TH</sup> Fuze Conference

**TDW**  
an MBDA company

- 1) MBDA Group Structure
- 2) SENS Data Recorder Characteristics
- 3) SENS Software Features
- 4) Test Results and Applications
- 5) SENS Advancement
- 6) Conclusions

**AIRBUS**  
GROUP

37,5 %  
↓

**BAE SYSTEMS**

37,5 %  
↓

 **FINMECCANICA**

25 %  
↓

**MBDA**

100 %  
↓

-  MBDA France
-  MBDA Italy
-  MBDA UK

100 %  
↓

 MBDA Germany

100 %  
↓

TDW GmbH

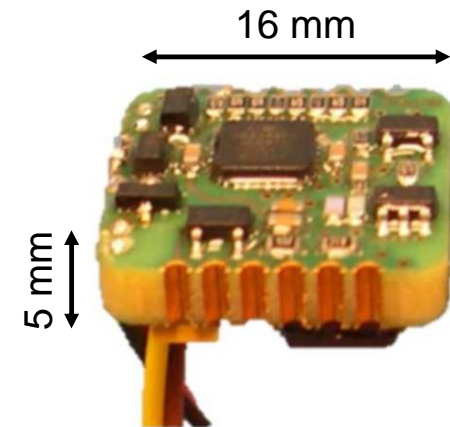
100 %  
↓

 MBDA Spain

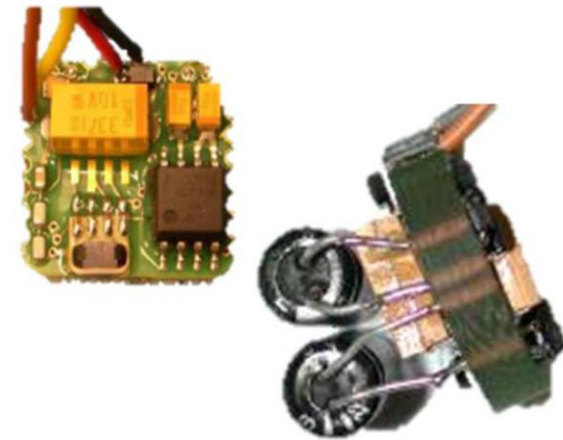
100 %  
↓

 MBDA USA

- SENS key features
  - Extremely miniaturized design
  - High-shock tested up to 25.000 g in > 30 test campaigns
  - Non-volatile memory
  - Integrated accelerometers
  - Easy and comfortable to use
  
- Ruggedized design based on
  - Small dimensions
  - Solid PCB
  - Robust joint between processor and PCB

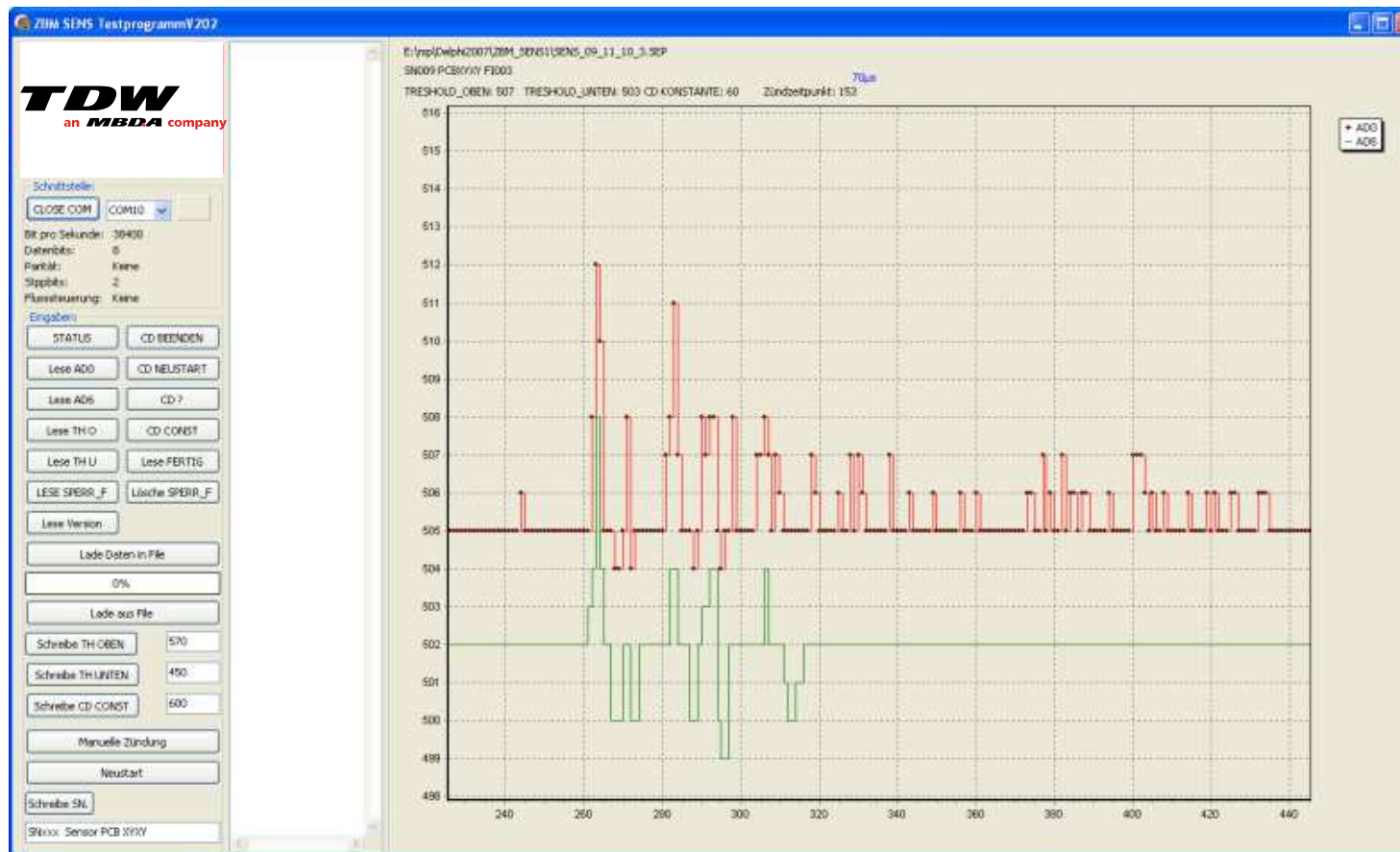


- Number of channels: up to 5 (analogue or digital)
- Resolution per channel: up to 10 Bit
- Storage volume: 512 kByte
- Pre-trigger storage: up to 256 samples
- Duration of recording:
  - 40 ms (w/o external capacitors)
  - Up to 5 sec. (with additional autarky ultracapacitors)
- Operation modes: master/slave
  - To be triggered internal or external



- Accelerometers:
  - Piezo-resistive, e.g. by PCB
  - Different types available
  - Filter parameters adaptable for different ranges
  - Measurement range up to 60.000 g
- Memory / Processor
  - Sample rate: up to 10  $\mu$ s (1 channel) or 140  $\mu$ s (5 channels)
- Programming interface: RS232

- **SENS software allows:**
  - Input of positive and negative trigger points
  - Input of inactive time
  - Surveillance of operation status
  - Automatic interlock in order to avoid unintended overwriting of the memory
  - Monitoring of all test signals
  - Survey of firmware, serial numbers of electronic devices and of the sensors
  - Manuel sequence control for tests in laboratory
  - Graphic illustration of measured data
  - Storage of all measured data as a text file
  - Import options into other applications, e.g. EXCEL
  - Flexible adaptation to test specific requirements







## Test Results and Applications



SENS in shell  
- before test



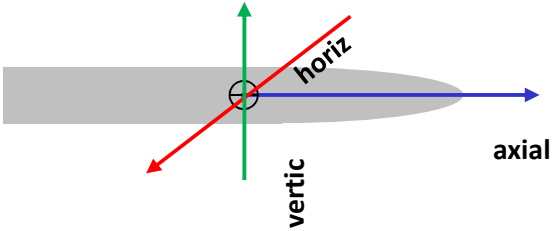
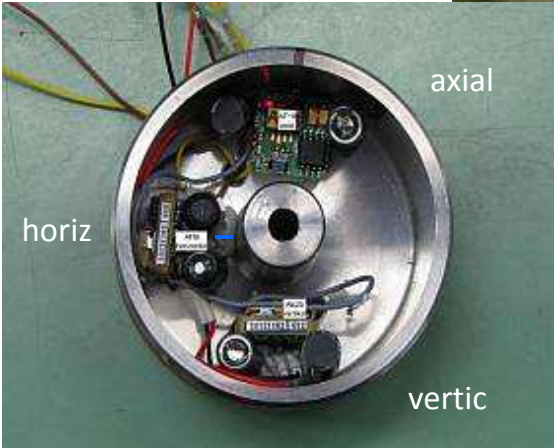
SENS in shell  
- after test



SENS recovered



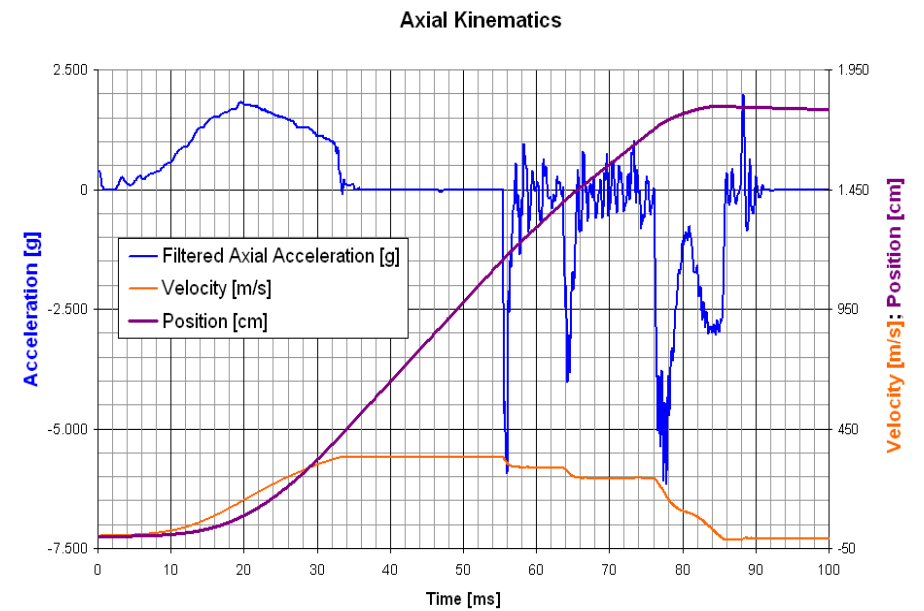
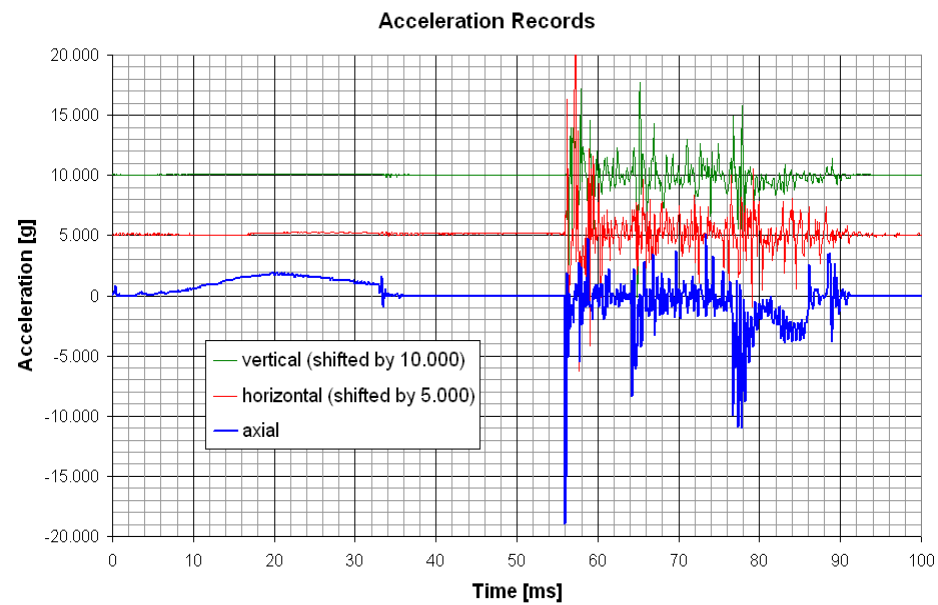
*Test Results and Applications*



unclassified



## Test Results and Applications





- Next generation SENS will feature:
  - Resolution up to 12 Bit
  - Higher sample rates
  - Extended recording time

- SENS...
- is intensively used and tested in projects of TDW
- proved to be reliable
- is considered as important tool for testing penetrators etc.
- can be procured at TDW

## TDW Gesellschaft für verteidigungs- technische Wirksysteme mbH

Postfach 1340  
D-86523 Schrobenhausen  
Germany

Tel.: +49 (0) 82 52 99 86 15  
Fax: +49 (0) 82 52 99 61 20

[manuel.fritz@mbda-systems.de](mailto:manuel.fritz@mbda-systems.de)

