DATaRec® 4 - DISTRIBUTED TESTING SYSTEM

MEASURING TECHNOLOGY FOR DATA ACQUISITION AND RECORDING IN MOBILE AND STATIONARY APPLICATIONS

ZODIAC DATA SYSTEMS GmbH
AIRCRAFT SYSTEMS
Data Systems

ZODIAC AEROSPACE
YOUR INSPIRATION IS OUR BENCHMARK

LARGE INTERFACE PORTFOLIO
DATaRec® 4 systems offer a large interface portfolio ranging from digital to analog interfaces and covering video signals as well, enabling the customer to acquire and record highly synchronized data from various sources. This allows a seamless integration into existing test center equipment.

SOFTWARE INDEPENDENT DATA RECORDING
DATaRec® 4 is widely independent from selected analysis software and even offers the customer control possibilities by means of using an API.

With its high bandwidth, due to exceptionally high sampling rates, the DATaRec® 4 Series incorporates large-volume data recording. Data conversion in other formats is possible depending on used data acquisition software.

ENHANCE YOUR DATA QUALITY
The modularity of the DATaRec® 4 system, combined with an easy-to-use setup, effectively saves time in your test scenarios. The DATaRec® 4 incorporated and proven UDP streaming technique allows you to change operational test scenarios on-the-fly.

FAST AND FLEXIBLE
The easy adaptation of DATaRec® 4 system configurations effectively saves time in re-configuring the system for different test scenarios and thus enables you to cover various testing applications with one set of equipment.
FIT FOR THE FUTURE  
FIT FOR YOU

The distributability and large bandwidth available as well as the possibility to adjust the input range in accordance with the measurement task reduce the number of possible error sources. The modular architecture also allows a reduction of the signal cable length and the optimal adjustment of the used input range in accordance with the measurement task.

STAY UPDATED

High Speed controllers implemented within the DATaRec® 4 system ensure sufficiently high data rates to support existing and future requirements for the recording of analog and digital data. In terms of reliability and accuracy the DATaRec® 4 Series sets the benchmark to ensure a high data quality and thus enhance your results and lower the required number of measurements.

DATaRec® 4 customers will stay at the edge of technology as new features can seamlessly be incorporated in new firmware releases.

REAL-TIME ACCESS

DATaRec® 4 systems allow for changing operational test scenarios on the fly by offering standard communication interfaces such as Ethernet and USB to control and record data. The UDP stream and data storage technologies available enable the user to monitor online data being written on a storage medium inside the DATaRec® 4 Series.

You can connect the modules to any PC and you are independent from DAQ software due to a DATaRec® 4 recorder webserver running permanently on a Link module.

ONLY BY TESTING YOU CAN BE CERTAIN

REDUCTION OF ERROR SOURCES

The distributability and the large range of different sample frequencies reduce the number of possible error sources, this allows a reduction of the signal cable length and the optimal adjustment of the used input range in accordance with the measurement task.
DATaRec® 4 SYSTEM EXAMPLES

1. STAND ALONE
A one-module system linked directly via a USB to a PC.

2. COMPACT SYSTEM
Central measuring system with a maximum of 384 channels. Can operate without PC, via pre-programmed link module, in stand-alone mode or in logging mode.

3. DISTRIBUTED DATA ACQUISITION SYSTEM
Distributed data acquisition system with a cable length up to 100 meters and a maximum of 384 channels attached to one central link module.

4. MULTI-CHANNEL SYSTEM
Distributed measurement system with more than 700 channels based on up to 3 link modules.

DATaRec® 4 SCHEMATICS

Data streams supported
- Analog / ICP / IEPE
- Charge
- Strain gauge / Bridge
- Microphone
- AES / EBU
- CAN / FlexRay Buses / Peripherals
- Temperature
- Video
- Ethernet bus traffic
- Serial busses
- RPM
- Analog output
- Source output

USB 2.0, Link
Application 1
USB 2.0, IEEE 1394b, Ethernet
Application 2
USB 2.0, IEEE 1394b, Ethernet
Application 3
Storage module
Conditioning
Analysis
### Module Overview

<table>
<thead>
<tr>
<th>Module</th>
<th>Channels</th>
<th>Coupling</th>
<th>Connector</th>
<th>Sampling rate (S/s)</th>
<th>Bandwidth (Hz)</th>
<th>THD (at 2 Vpeak)</th>
<th>SFDR (at 2 Vpeak)</th>
<th>Resolution (bit)</th>
<th>Phase accuracy (at 20 kHz BW)</th>
<th>Filter</th>
<th>Galvanic Isolation</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIM282</td>
<td>10 IN / 2 OUT*</td>
<td>AC / DC / ICP and DC</td>
<td>BNC</td>
<td>1k - 1M</td>
<td>400k - 1M</td>
<td>&lt; -90 dB</td>
<td>&gt; 95 dB</td>
<td>16 / 32</td>
<td>&lt; 0.2°</td>
<td>optional: LP 500 Hz, 1 kHz, 5 kHz or 10 kHz</td>
<td>Digital / analog layer</td>
<td>TEDS, 10 channels additional as RPM usable, optional 2 CAN / FlexRay</td>
</tr>
<tr>
<td>DIC24</td>
<td>24 IN</td>
<td>AC / ICP or DC</td>
<td>D-Sub (50)</td>
<td>100 - 50k</td>
<td>20k - 20k</td>
<td>&lt; -108 dB</td>
<td>&gt; 124 dB</td>
<td>16 / 32</td>
<td>&lt; 0.2°</td>
<td>none</td>
<td>Digital / analog layer</td>
<td>TEDS, 1 channel usable as RPM, includes BNC adapter cable ship</td>
</tr>
<tr>
<td>DIC24 Plus</td>
<td>18 / 6 IN</td>
<td>AC / ICP / AC / DC / ICP</td>
<td>D-Sub (25) / BNC</td>
<td>100 - 50k</td>
<td>20k - 20k</td>
<td>-107 dB</td>
<td>&gt; 108 dB</td>
<td>16 / 32</td>
<td>&lt; 0.2°</td>
<td>HP 22 Hz, LP 500 Hz, 1 kHz or 4 kHz</td>
<td>Digital / analog layer</td>
<td>TEDS, 2 channel usable as RPM, includes BNC adapter cable ship</td>
</tr>
<tr>
<td>SGU9</td>
<td>9 IN</td>
<td>DC</td>
<td>LEMO</td>
<td>196 - 25k</td>
<td>10k</td>
<td>N/A</td>
<td>&gt; 128 dB</td>
<td>16 / 32</td>
<td>&lt; 0.2°</td>
<td>digital linear phase FIR</td>
<td>Digital / analog layer</td>
<td>TEDS, 2 channel usable as RPM, includes BNC adapter cable ship</td>
</tr>
<tr>
<td>DIC6B / DIC6L</td>
<td>6 IN (single ended) / (differential)*</td>
<td>AC / DC / ICP</td>
<td>BNC / LEMO</td>
<td>100 - 200k</td>
<td>80k</td>
<td>&lt; -104 dB</td>
<td>&gt; 92 dB</td>
<td>16 / 32</td>
<td>&lt; 0.2°</td>
<td>optional: HP 22 Hz, LP 500 Hz, 1 kHz or 4 kHz</td>
<td>Digital / analog layer</td>
<td>Full, Half bridges (Quarter bridges possible), Error detection</td>
</tr>
<tr>
<td>DEBU</td>
<td>4 IN</td>
<td>AC / ICP</td>
<td>LEMO</td>
<td>500 - 200k</td>
<td>80k</td>
<td>&lt; -93 dB</td>
<td>&gt; 102 dB</td>
<td>16 / 32</td>
<td>&lt; 0.2°</td>
<td>HP 22 Hz</td>
<td>Digital / analog layer</td>
<td>TEDS, 2 channels usable as RPM, includes BNC adapter cable ship</td>
</tr>
<tr>
<td>MIC6</td>
<td>6 IN</td>
<td>AC / ICP</td>
<td>LEMO</td>
<td>500 - 200k</td>
<td>80k</td>
<td>&lt; -90 dB</td>
<td>&gt; 90 dB at 1 nC</td>
<td>16 / 32</td>
<td>&lt; 0.2°</td>
<td>optional: LP 500 Hz, 1 kHz, 2 kHz or 5 kHz</td>
<td>Digital / analog layer</td>
<td>TEDS, 2 channels usable as RPM, includes BNC adapter cable ship</td>
</tr>
<tr>
<td>CHG6F</td>
<td>6 OUT</td>
<td>1013 q Input impedance</td>
<td>Micro Dot</td>
<td>100 - 200k</td>
<td>80k</td>
<td>&lt; -104 dB</td>
<td>&gt; 100 dB</td>
<td>16 / 32</td>
<td>&lt; 0.2°</td>
<td>none</td>
<td>Digital / analog layer</td>
<td>TEDS, 1 channel usable as RPM</td>
</tr>
<tr>
<td>OUT6</td>
<td>2 IN / 2 OUT</td>
<td>AC / DC</td>
<td>BNC</td>
<td>100 - 200k</td>
<td>80k</td>
<td>&lt; -95 dB at 5 nC</td>
<td>&gt; 100 dB</td>
<td>8 / 16</td>
<td>&lt; 0.2°</td>
<td>none</td>
<td>Digital / analog layer</td>
<td>OUT replay</td>
</tr>
<tr>
<td>ANH100 / ANH101</td>
<td>2 IN / 2 OUT</td>
<td>AC / DC</td>
<td>BNC</td>
<td>100 - 200k</td>
<td>80k</td>
<td>&gt; -100 dB</td>
<td>&gt; 100 dB</td>
<td>8 / 16</td>
<td>&lt; 0.2°</td>
<td>none</td>
<td>Digital / analog layer</td>
<td>low bandwidth and high bandwidth modes, OUT sampling rate as IN</td>
</tr>
</tbody>
</table>

**Additional functions GIM282**

**IN:** +/- 50V input range, autoranging, IN overvoltage protection, ICP cable check

**OUT** = **GEN:** 2 ch. Signal generation, Record (E to E), safety output shutdown, Internal memory of 256 MB

* on settings
**Module Overview**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Can4f</th>
<th>Eth100</th>
<th>Mrg100</th>
<th>Asm100</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bus</strong></td>
<td>4 CAN IN / OUT 2 FlexRay IN</td>
<td>2 Ethernet</td>
<td>8 PCM</td>
<td>8 Serial</td>
</tr>
<tr>
<td><strong>Signal Rate</strong></td>
<td>1 / 10 Mbit / s</td>
<td>1000 Mbit / s</td>
<td>30 Mbit / s (NRZ) 10 Mbit / s (BiPhase)</td>
<td>2 Mbit / s</td>
</tr>
<tr>
<td><strong>Connector</strong></td>
<td>D-Sub (9)</td>
<td>D-Sub (9)</td>
<td>HD D-Sub (14)</td>
<td>HD D-Sub (44)</td>
</tr>
<tr>
<td><strong>Galvanic Isolation</strong></td>
<td>via octocoupler</td>
<td>Between channels, power input, digital / analog layer</td>
<td>Digital / analog layer</td>
<td></td>
</tr>
<tr>
<td><strong>Functions</strong></td>
<td>Record, playback (CAN), polling (CAN)</td>
<td>10 / 100 / 1000 Mbit / s Ethernet bus</td>
<td>NRZ-L, -M, -S, BiPhase-L, -M, -S, signal level: RS422</td>
<td>RS422 / RS485 and RS232, selectable</td>
</tr>
</tbody>
</table>

**Link Modules**

- **Lmf2e/lmf4f** (Link Module for connecting 2/4 Subsystems)
- **Lmf1g** (Link Module for connecting 2 Subsystems (Link Chains) with LMF-Sync Interface and extended bit rate (1 Gbit))

**Storage Modules**

- **Smm** (Flash-Based Solid State Storage Module, 64/128/256 GB)
- **Dsr** (Storage receiver for DSMI (Data Storage Media))

**Power Modules**

- **Pwdsd** (Power Module with DC Input, typ. 50W Output Power)
- **Pwh9a** (Power Module with DC Input, typ. 92W Output Power)
- **Pwaca** (Power Module with DC Input, typ. 150W Output Power)

**Utility Module**

- **Picosc1** (Standard PC with Windows embedded Standard 7 operating system)

**Accessories**

- **Active Housing For Datarec® 4 Systems**
  - For easy transport, safe installation and cooling of Datarec® 4 systems. Can be fixed safely with standard car seat belts.
- **Module Spacer**
  - For a better cooling of modules through enhanced air circulation between grouped Datarec® 4 modules.
- **Link Repeater Optical**
  - For expanding the distance between modules up to 500 meters (with fibre optical cables).
- **Battery Pack Datarec® 4**
  - A mobile power supply for Datarec® 4 modules with a capacity of 95Wh.
- **Seatbelt Fixture For Datarec® 4**
  - For easy and safe transport of Datarec® 4 systems in a car. Can be fixed safely with standard car seat belts.
- **Gss102 Module Extender**
  - A 19” Rack housing for Datarec® 4 System modules. It has an integrated power supply and fans for cooling the installed modules. The 19” brackets can be mounted on the front and on the rear side of the GSS102 module extender.
- **Lind Car Adapter Pack**
  - For power supply of a Datarec® 4 module from a car accessory power socket.
- **Link Repeater Optical**
  - For expanding the distance between modules up to 500 meters (with fibre optical cables).
- **Special Adapter Cables**
  - • DIC24 adapter cables • DIC24+ adapter cables • DIC24 Breakout Box • Channel fuse
Zodiac Data Systems customers are technology leaders in design and production of state-of-the-art aerospace, defence, automotive and industry products. Their challenges in testing and prototyping require exceptional quality and individual adaptation of applied measurement systems.

Our mission at Zodiac Data Systems is to support our customers with long-standing knowledge and a wide range of expertise to conquer their unique testing requirements utilizing the highest quality of products and services the industry has to offer.