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# Data recorder

**Type DTI375.TH**

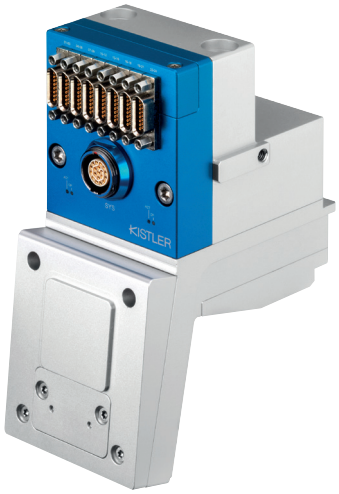
## In-dummy data recording module

The data recorder Type DTI375.TH records digitized measuring values during a crash test in the Thor (TH) dummy which are provided decentralized and sensor close by the so-called DiMod (digitalizing module) via bus line during crash tests and stores them in a central memory. Data transmission from the data recorder to the outside and the communication to and from the data recorder is done via a single interface cable. This system cable provides a default 48 V (36 ... 60 V) supply voltage, a 100 Base-T Ethernet connection and an RS-485 bus each for the trigger impuls (T-zero and Start Recording) as well as the 1 kHz synchronisation signal.

- Available with 8x3 ports for connecting up to 288 measuring channels
- Each port is armed with an RS-485 bus connection for feeding the connected sensors and recording the measuring signals
- Central memory with capacity of more than 200 s measuring data recording at 20 kHz sampling rate
- A non-volatile flash memory is used for the measurement data storage
- External data transmission and communication via Ethernet connection with 100 Mbit/s

### Description

On the part of the DTI technology (Digital Transducer Interface), the data recorder is the core element for recording in-dummy measuring values. Depending on the instrumentation of the Thor (TH) dummy, the data recorder can be used for recording measuring values of up to 288 DiMod channels. In addition, a signal interface module with 24 DTI ports is used with the DTI375.TH version of the data recorder. Each port can be connected via DTI bus with up to 12 DiMod channels.For current supply on the connected DTI bus, each DTI port has its own short-circuitproof control unit which sets the output voltage to 5.6 V and supplies a maximum of 500 mA, overall current is restrained by the UPS power supply. The data recorder can supply a total of approximately 10 A. On the DTI bus cable remain 0.5 V voltage reserve with the voltage set to 5.6 V which is sufficient at full load for a cable length of 5 m – standard wire diameter assumed, e.g. AWG26. In addition, each DTI port has its own RS-485 driver and receiver for data transmission on the bus.




### Technical data

**Data recorder**

| | | |
|---|---|---|
| DTI ports | | 24 |
| Measuring channels | | 288 |
| Recording time | s | >200 |
| Trigger | | T-zero<br>Start Recording (SR) |
| Max. trigger input voltage (with respect to GND) | V | –8 ... 13 |
| Synchronization input frequency | Hz | 1 000 |
| Communication | | |
| RS-485 | Mbit/s | 6 |
| Ethernet | Mbit/s | 100 |
| Memory (flash) | GByte | 4 |
| Supply voltage | V | 36 ... 60 |
| Weight | grams | 714 |
| Dimensions (LxWxH) | mm | 97x63x134 |
| Operating temperature range | °C | 5 ... 40 |
| Operating temperature range for charging batteries | °C | 5 ... 35 |
| Storage temperature range | | |
| Long term | °C | –20 ... 25 |
| Short term (<1 week) | °C | –20 ... 50 |
| Humidity, max. (non-cond.) | % | 80 |
| Shock resistance, peak; half-sine wave for 6 ms in all axes | g | 100 |

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## Technical data (continuation)

**UPS Power supply (integrated)**

| | | |
|---|---|---|
| Power consumption (max.) | W | 70 |
| Buffer time | min | >5 |
| Rechargeable battery | | |
| Type | | Lithium-Polymer |
| Voltage | V | 7.4 |
| Capacity | mAh | 1 100 |
| Power (nom., max.) | W | 60 |

## Description (continuation)

In order to ensure uninterruptible measuring and recording even when the main current supply fails, each data recorder is equipped with a backup power supply (UPS). The UPS power supplies are buffered with Lithium-Polymer accumulators and the accumulator hardware is protected among others against overvoltage and low voltage. Charging of the accumulators is done voltage and current controlled and all components are monitored and controlled by the I2C bus of the data recorder's processor. All relevant operating data like charge balance and accumulator capacity can be retrieved

Accumulator mode is only activated during the measuring by switching on a switching regulator which supplies 5.7 V activated by a FET controller, as soon as the input voltage of the UPS power supply input is below 36 V. Switching back in normal operation with nominal 48 V supply can only be activated by the data recorder under control of the processor. All relevant operating data like charge balance and accumulator capacity can be retrieved. This prevents disturbances because of disturbed inputs during measuring.

## Application

The data recorder Type DTI375.TH is designed for direct assembling in the Thor-M (TH) dummy and is centrally as well as symetrically installed into the dummy together with the UPS power supply. It records measuring data during the crash test and stores the peripheral processed and digitized data in a flash memory provided for that purpose. The sensor close digitization modules are connected via bus wires with the central built-in data recorder. The Thor (TH) specific bus concept has the advantage that only a minimum wiring in the dummy is required. It is a four-wire bus, with two lines for the power supply of the sensors, and two lines for the data transmission with 6 Mbit/s in differential RS-485 format. Readout of the data is done after the crash test on an appropriate Ethernet connection.

When installing the data recorder and the UPS power supply in the dummy in a suitable place, it must be ensured that neither the mechanical nor the dynamic properties of the dummy are impaired. For this, a very high level of integration and a very small and lightweight design of the devices is desirable. The UPS power supply as well as the data processing electronics were designed in such a way that they are optimally adapted to the conditions in the Thor (TH) dummy. It has proved advantageous to accommodate the functional groups used in an angled housing, which can then be centrally inserted in the dummy.

The combination of plug-in connectors and cable outlets on the devices is designed to ensure easy assembly and interchangeability.

| **Included accessories** | **Type No.** |
|---|---|
| • System cable for data recorder and UPS power supply | on request |

**Optional accessories**

- None

| **Ordering code** | **Type DTI375.TH** |
|---|---|

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