

KiDAU Advanced

On-board data acquisition unit

Type K3880C...

The KiDAU Advanced Type K3880C... is a modular designed on-board adapter for the nxt32 data acquisition module Type K3870B. It consists of three mechanically independent modules.

- Sensor Distribution (SD) Panel
- nxt32 data acquisition module Type K3870
- KiDAU Advanced casing

The KiDAU Advanced is characterized by excellent technical features:

- CrashLink interface
- 32 analoge/16 digitale channels
- In-dummy interfaces
- High bridge excitation and constant current mode
- Extended Li-ion battery technology for up to 20 minutes
- Direct recording in flash memory
- CAN bus logger
- Compatible with CrashDesigner
- Complies with SAE J211 and ISO 6487

Description

A KiDAU Advanced System has 32 analog and 16 digital inputs. The application of different connectors as well as pin assignments for the 32 analog inputs will be mapped by means of different SD-panels.

Each analog channel comprises a programmable input amplifier, bridge excitation circuit, low pass filter and 16 Bits A/D converter. The amplifier precision is typically better than 0.1% and the input impedance above 10 MΩ. The gain values can be programmed from 0.5 ... 10 000. An internal reference voltage is used for precise control of the amplifier setting, which is achieved via software loop.

The bridge excitation voltage is programmable separately for each channel. Bridge completion for half bridges can be switched internally. All current sensors may be supplied, a short circuit limitation is provided. In contrast to former designs, the input low-pass filter is designed only as an adaptive antialiasing filter. All necessary filtering according to SAE filter classes has to be done in the evaluation and analysis software or the CrashDesigner.



Each channel of the KiDAU Advanced has a dedicated separate A/D converter with a 16 Bits resolution. Thus all channels are sampled simultaneously, ensuring that no time lack occurs between different channels. The maximum sampling rate is 100 kHz for the KiDAU Advanced. Each channel of the KiDAU Advanced has a dedicated D/A converter of its own for compensation of the offset voltage. Neither potentiometers nor trimmers nor mechanical switches are used inside the device. All adjustments are implemented by software, automatically or by command. The 16 digital inputs are galvanically isolated in two groups by 8 inputs.

Technical data

Input voltage, relating to – EXC	V	–5 ... 18
Programmable gain		0.5 ... 10 000
Gain accuracy		
at gain 0.5 ... 999	%	<0.2
at gain 1 000 ... 10 000	%	<0.4
Max. signal	V	±5.0
Linearity	%	<0.01
Bridge excitation, regulated on each channel	V	0 ... 18
Bridge excitation accuracy at load 250 Ω and excitation 0 ... 10V	Max	–0.15% –3mV ... +0.05% +3mV
Constant current excitation	mA	1 ... 20
Programmable half bridge completion		yes
Maximum rated output, overall consumption restrained	mA	60
Filter		adaptive anti-aliasing
A/D converter resolution	Bit	24
Oversampling (6.4 MHz @ 100 kHz)		64x

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Technical data - continuation

Data resolution	Bits	16
Sampling rate, max.	kHz	100
Programmable offset compensation		yes
Signal bandwidth, max.	kHz	40
Sense line available ¹⁾		yes
Shunt check		2 quadrant internal resistor
Recommended external shunt resistance	kΩ	>9.5
Sensor ID verification		Dallas ¹⁾ Endevco ¹⁾
Digital inputs		16
Memory Speicher		non-volatile flash
Recording time (32 ch @ 20 kHz), flex. memory	s	529
Trigger		double trigger 1 x analog trigger start stop
Supply voltage	V	20 ... 60
Shock	g	500 g for 1 ms
Operating temperature range	°C	0 ... 40
Storage temperature range		
long term	°C	-25 ... 20
short term (<1 week)	°C	-25 ... 50
Humidity, max. (non-cond.)	%	80
Communication		100BaseTX
Ethernet	MBit/s	100/10
Battery (time for typical usage)		Li-ion (20 min.)
Interfaces		CrashLink USB, CAN
Remarks		CAN logger built in
Weight	kg	2.2 ²⁾
Dimension (LxWxBxH)	mm	231x64x90 ²⁾

¹⁾ Depending on Pinout

²⁾ With SD Panel Lemo 1B.307

Application

The KiDAU Advanced Type K3880C... is a very reliable data acquisition system designed for daily crash testing under harsh conditions.

The KiDAU Advanced can store data for a 100 s cycle at a sampling rate of 100 kHz which allows the user to start recording data before the vehicle or sled is actually started. This ensures that the measuring system works correctly and prevents data loss. The trigger point is registered and recorded as in previous systems. Once a valid trigger point is stored in the KiDAU Advanced data memory, the user can only select the actual measured data for transfer to a PC, and it is no longer necessary to read out the complete system memory. The KiDAU Advanced is designed with a trigger input and output for synchronization with other units. The first analog channel, two digital channels and a remote signal (software trigger) can be selected for triggering.

The trigger threshold and trigger criterion can be freely selected for the first analog channel. Batteries are no longer needed to retain the data because flash-EEPROMs are used for the memory. The data remain available for many years! The KiDAU Advanced system uses an internal Li-ion battery designed to run the complete system, including all connected sensors, for up to 20 minutes. External power supply using trailing cables is of course still possible. The size of the memory available in the KiDAU Advanced demands fast interfaces for data transfer. The standard interface for data transfer is 100BaseTx Ethernet with TCP/IP protocol. This interface supports high transfer rates and ensures perfect operation even when long umbilical cables are used. Both commands and data are transferred via this interface.

The KiDAU Advanced offers also a CAN bus recorder for one CAN channel and timestamps relative to T0 impact. CAN data with bus speeds of up to 500 kBit/sec is stored in flash memory alongside analog data. Therefore, the recording time is identical to analog recording. Because of its ability to connect an nxt dummy with up to 60 channels and the seamless integration of functionality in the CrashDesigner, the KiDAU Advanced is the perfect choice for on-board data acquisition.

Ordering key

Type K3880C

SD panel

None	0
Lemo 1B.307 or compatible	1
Tajimi 3RT01	2
Amphenol/Souriau PT02	3

Pin assignment

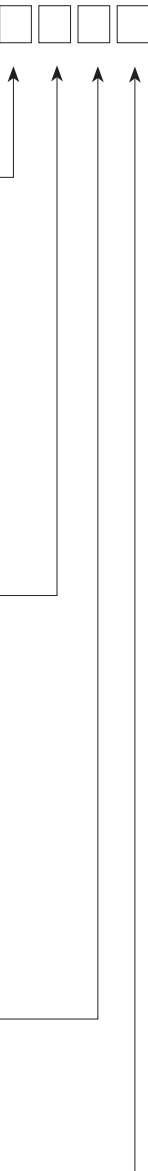
MD01 ¹⁾	M1
MD02 ¹⁾	M2
MD03 ¹⁾	M3
MD04 ¹⁾	M4
MD05 ¹⁾	M5
MD06 ¹⁾	M6
MD07 ¹⁾	M7
MD08 ¹⁾	M8
MD09 ¹⁾	M9
MTE1 ¹⁾	T0
MTE2 ¹⁾	T1
MTE4 ¹⁾	T4
MTE5 ¹⁾	T5
MTE6 ¹⁾	T6
F 01 ¹⁾	T8
F 02 ¹⁾	T9
MU ¹⁾	A2
MF ¹⁾	A3
AA	AA
Tajimi 3RT01 ²⁾	SC
Amphenol/Souriau PT02 ³⁾	S3

nxt32 module

Without	O
With	D

Number of channels

8 channels	08
16 channels	16
24 channels	24
32 channels	32



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¹⁾ Only in conjunction with Lemo 1B.307 connector
²⁾ Only in conjunction with Tajimi 3RT01 connector
³⁾ Only in conjunction with Amphenol PT02 connector