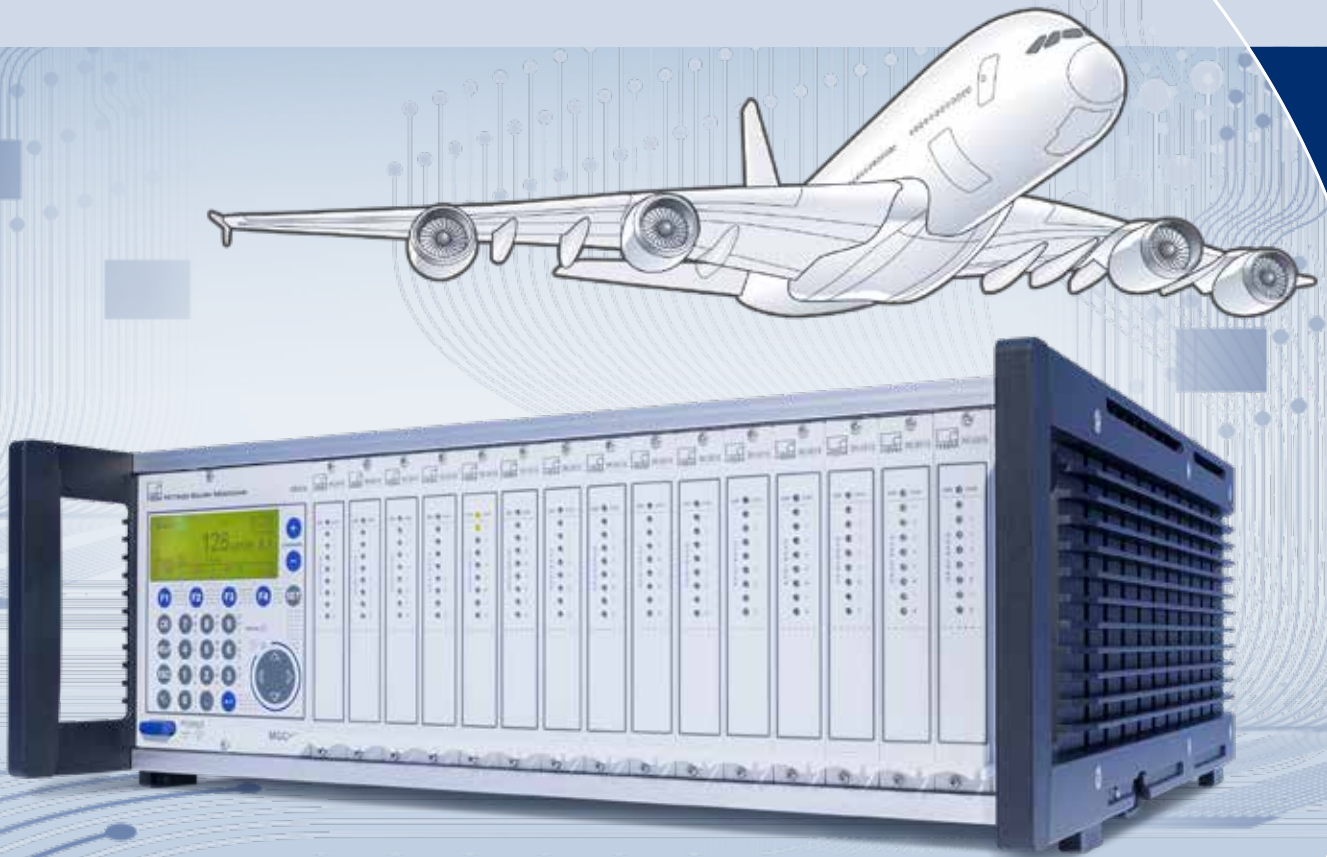


# MGCplus

The Number One Data Acquisition System



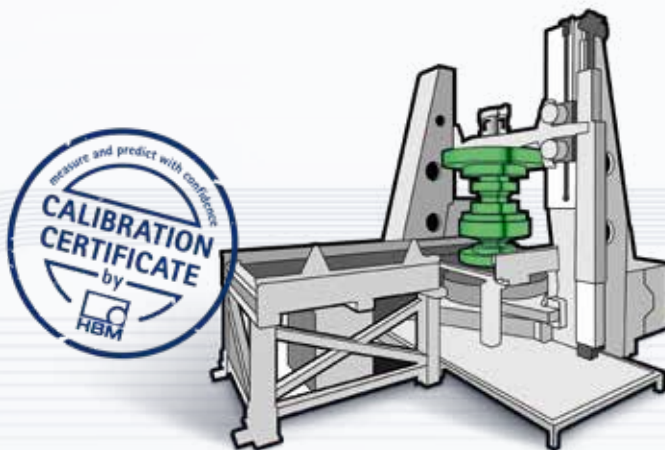
## MGCplus – Data acquisition for any number of channels

For calibration, material and fatigue tests: the MGCplus data acquisition (DAQ) system is used everywhere. It acquires strain, force, displacement, torque, voltage, current, temperature, and many other quantities. Due to its versatility, MGCplus has been one of the most popular data acquisition systems in the world – for over 25 years.

Proven compatibility not just within the MGCplus family, but along the entire measurement chain ensures high investment security.

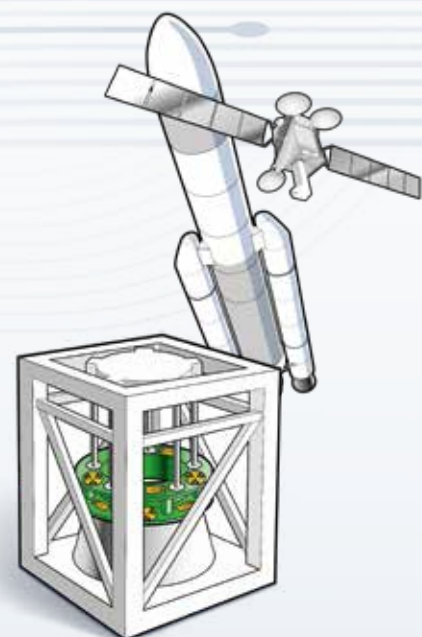
### For low channel counts ...

Does the precision of transducers need to be checked on site? Then MGCplus is the perfect choice. With an accuracy class of 25 ppm, the system offers the required precision. An extra bonus for easy handling: The integrated display shows the results straight away.



### ... high channel counts ...

If parts and system components are exposed to major stress, thorough testing beforehand is essential. With MGCplus, up to 128 channels can be acquired in a single 19-inch housing. Numerous measurement channels, small footprint, everything synchronized.



## ... or very high channel counts

Ready for takeoff! But only if all safety requirements are met. Aircraft manufacturers fulfill these through extensive material and fatigue tests of all components, from the smallest part to the aircraft as a whole. When strain gauges and other sensors are deployed at all the construction's critical points, MGCplus can fully play to its strengths: thousands of synchronized measurement channels, intelligent data management and simple integration into control systems.



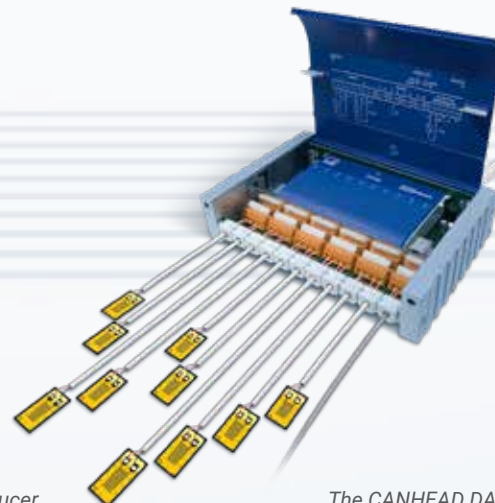
## Extremely flexible design

MGCplus adapts to every task. Do you want to increase your sampling rate and house the system in the control cabinet?

Are sampling rates of few hundred samples per second sufficient, and should the amplifiers be as close to the sensors as possible?



Connect the transducer directly to MGCplus



The CANHEAD DAQ system combined with MGCplus

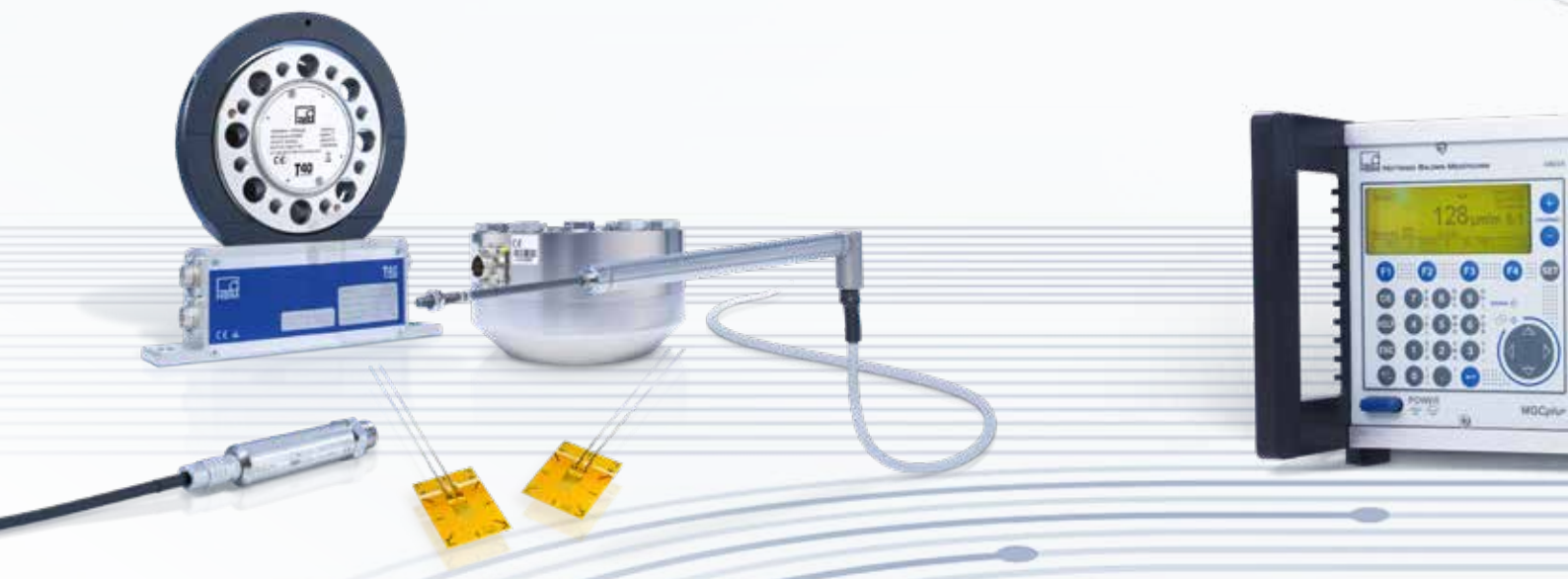
catman Enterprise - HBM's software for applications with high channel counts - and HBM's service result in a worldwide unique complete solution, which upon request can be installed and put into operation on site.



## A flexible system for low to medium channel counts ...

Sensors and transducers

MGCplus



### Reliability:

For strain, force, torque, displacement, and pressure: HBM offers precise sensors and transducers which, when combined with MGCplus, form a precise and reliable measurement chain. MGCplus can also acquire further quantities such as temperature, acceleration, voltage and current.

### Flexibility:

The centralized and modular MGCplus system concept allows impressive flexibility: speed, transducer type, precision, and number of channels can all be adjusted. In just a few steps, MGCplus can be adapted to the requirements of the measurement task.

## catman Easy/AP



### User-friendly operation:

The system is set up quickly and reliably thanks to TEDS (Transducer Electronic Data Sheet). Time-consuming, error-prone manual sensor parameterization is now a thing of the past.

### Intuitive software:

HBM's catman Easy/AP software is the perfect tool for displaying, saving and analyzing measured data. Alternatively, MGCplus can be integrated into any operating system and into your own programs in no time. The HBM Common API for .NET programs and a LabVIEW™ driver are some of the tools available for this purpose.



... and for very high channel counts



## Strain gauges:

HBM is your reliable partner for strain gauges and offers both standard models and customized versions for special requirements.

## MGCplus for stability:

Integrated automatic calibration (AutoCal) ensures the system is exceptionally stable, even during long-lasting tests.

**Get started right away – with HBM's service:**  
Upon request, our experienced engineers put together an individual and turnkey solution.



### MGCplus for reliability:

The communication processor features a circular buffer to ensure no important measured values are lost.

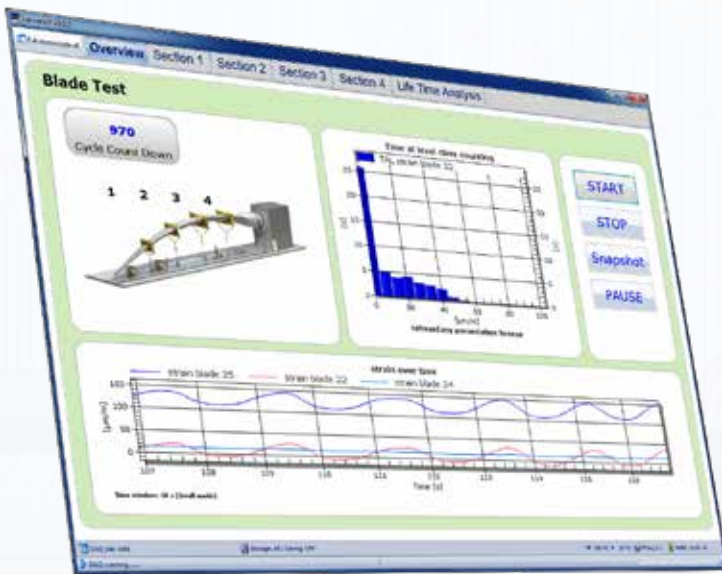
### catman Enterprise:

The catman Enterprise data acquisition software is the first choice for measurement projects with up to 20,000 channels, and is therefore perfect for use in the aerospace industry. The entire project team can access the data – worldwide and live.



# Successfully manage measurement projects with **catman Easy/AP**

For measurement projects with up to 1,000 channels, catman Easy/AP covers all stages of the job: from setting the measurement channels and displaying values through intelligent storage to analysis and reporting. It couldn't be any faster or more intuitive.



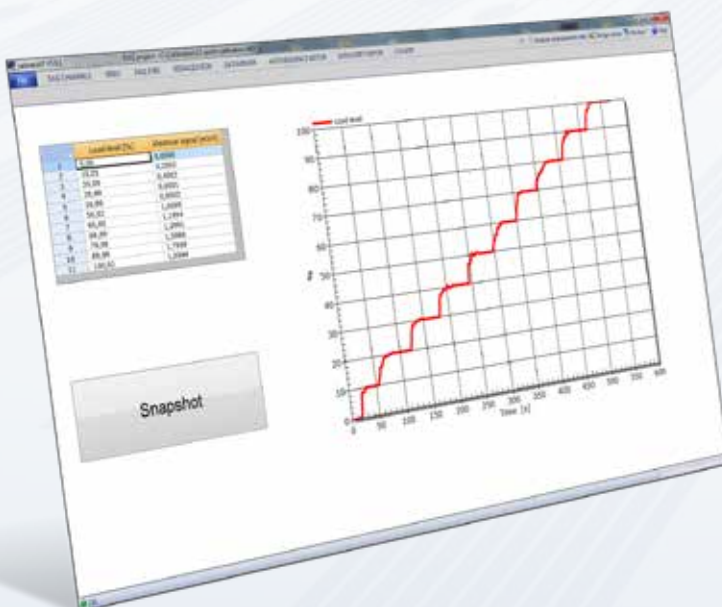
## Connect and set up

- Plug & play integration of measuring devices
- Channel configuration via TEDS and sensor database
- Calculation channels and intelligent triggers
- Automated actions such as e-mail, push notifications or FTP server uploads
- Automation of measurement tasks by VBA scripting and auto sequences



## Visualize and save

- Various visualization objects to suit the individual measurement task
- Up to four video signals can be integrated
- Numerous storage and export formats



## Analyze and report

- Comparison of measured data, computation and analysis of signals and data
- Extensive reporting – straight from the software or in Microsoft Word® and Excel®



# Thousands of measurement channels at a glance with **catman Enterprise**

Developed for high channel counts and large data volumes. With catman Enterprise, thousands of channels virtually configure themselves with the help of the self-explanatory Excel® import. The convenient setup and execution of a measurement make even the largest jobs child's play.



## Keep track

- Hardware overview in a matrix
- Offline channel parameterization in tabular form, as in Excel®
- Easily import configurations and calculations
- Logical grouping of channels (e.g. right wing, left wing)
- One-click function test for all strain gauge channels

Channel Name	Parameter 1	Parameter 2	Parameter 3	Parameter 4	Status
Strain 1	1000	1000	1000	1000	OK
Strain 2	1000	1000	1000	1000	OK
Strain 3	1000	1000	1000	1000	OK
Strain 4	1000	1000	1000	1000	OK
Strain 5	1000	1000	1000	1000	OK
Strain 6	1000	1000	1000	1000	OK
Strain 7	1000	1000	1000	1000	OK
Strain 8	1000	1000	1000	1000	OK
Strain 9	1000	1000	1000	1000	OK
Strain 10	1000	1000	1000	1000	OK



## Visualize

- Individual visualization options
- For special requirements: Prediction lines, color-coded load levels, limit monitoring



## Get more

- Server-client architecture
- Special triggers, e.g. snapshot or fast sampling rate
- Automated measurement tasks with VBA script

## Acquire data directly at the measuring point

Optionally, MGCplus can be expanded by the CANHEAD amplifier system. CANHEAD can be installed directly at the measuring points to reduce wiring effort – and offers an excellent price-to-performance ratio.

**Care-free measurement guaranteed:**  
The carrier-frequency technology effectively suppresses electromagnetic interference.



CANHEAD is integrated seamlessly into the measurement system via the AP74/ML74B communication boards of MGCplus. The amplifier acquires the data from static and quasistatic measurements, and is excellently suited for long-term monitoring, fatigue and structural tests.

As data are acquired close to the measuring points, much less wiring is required: material and installation costs are reduced.





CANHEAD is modular and consists of two parts: the base module, and the amplifier module plugged into it. The amplifier module is the same for all base modules. It can be easily removed for calibration or measurement at a different location. Extremely user-friendly: in true daisy chain style, just a single cable is used for both power and data.

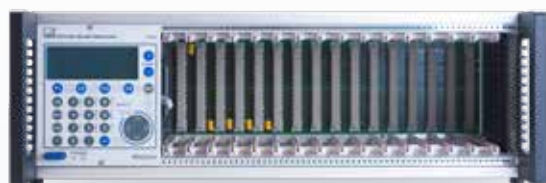


## MGCplus system design

MGCplus is modular, thus it offers maximum flexibility.  
In just a few easy steps, MGCplus can be adapted to the specific task.  
Every system consists of the following components:

### Desktop housing

With 2, 6 or 16 slots\*



### ... or rack frame

For the cabinet, with 16 slots\*



### Measuring amplifier

With 1, 4 or 8 channels



### Special modules

For special measurement tasks



### Communication processor

Gateway to the PC, for parameterization and with the option of autonomous data storage

**New:**  
With PTPv2-synchronization



### Modules

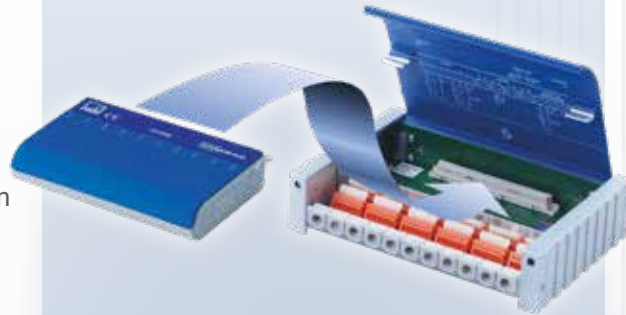
For communication with CANHEAD



With optional extension



CANHEAD is compact and distributable and consists of the following:



### Base modules

With 10 channels for voltage and SG bridges



### Amplifier module

With 10 channels



### Connection boards

With 1, 4 or 8 inputs










### Connection boards

For special modules



















## Specifications

												
		Excitation	Accuracy class	Max. sampling rate per channel	No. of channels	Voltage	Current	SG full bridge	SG half bridge	SG quarter bridge	Inductive full bridge	Inductive half bridge
Single-channel modules	ML01B		0.03	19.2 kS/s	1	AP01i AP03i	AP01i AP03i					
	ML10B	DC	0.03	19.2 kS/s	1			AP01i AP03i AP14	AP01i AP03i AP14	AP14		
	ML30B	CF (600 Hz)	0.03	19.2 kS/s	1			AP01i AP03i AP14	AP14	AP14		
	ML38B	CF (225 Hz)	0.0025	19.2 kS/s	1			AP01i AP03i				
	ML55B	CF (4.8 kHz)	0.03	19.2 kS/s	1			AP01i AP03i AP14	AP01i AP03i AP14		AP01i AP03i	AP01i AP03i
	ML60B		0.01	19.2 kS/s	1							
Multi-channel modules	ML801B	DC	0.05 <sup>1)</sup>	2.4 kS/s <sup>2)</sup>	8	AP402i <sup>3)</sup> AP801 AP801S6 AP836i	AP402i <sup>3)</sup>	AP810i AP815i	AP810i AP815i	AP814Bi AP815i		
	ML455	CF (4.8 kHz)	0.05	4.8 kS/s	4			AP455i AP455iS6	AP455i AP455iS6		AP455i AP455iS6	AP455i AP455iS6
	ML460		0.01 <sup>4)</sup>	4.8 kS/s	4							
Special modules	ML71B											
	ML74B											
	ML77B											
	ML78B											
CANHEAD	CA1030	CF (600 Hz)	0.1	300 S/s	10	CB1010		CB1010	CB1010			
		CF (600 Hz)	0.1	300 S/s	10					CB1014 CB1015 CB1016		

1) 0.1 with AP402i, AP814Bi, AP815i, AP836i; 1 with AP418i  
 2) In 8-channel mode, 4.8 kS/s in 4-channel mode, 9.6 kS/s in 2-channel mode  
 3) 4 channels per connection board; two connection boards can be used with one ML801B  
 4) 0.05 for PWM



Connectable transducer types and suitable combinations of MGCplus amplifier modules and connection boards as well as CANHEAD modules

															
LVDT	Potentiometer	Current-fed piezo-electric transducer	Piezoresistive transducer	Thermocouple	Resistance thermometer	Ohmic resistor	Torque	Speed	Pulse counting	CANHEAD	Digital input	Digital output	Analog output	CAN bus	PROFIBUS
	AP01i AP03i		AP01i AP03i										AP01i AP03i		
													AP01i AP03i AP14		
													AP01i AP03i AP14		
													AP01i AP03i		
													AP01i AP03i AP14		
							AP17	AP01i AP03i AP17	AP01i AP03i AP17				AP01i AP03i AP17		
AP455i AP455iS6	AP836i	AP418i <sup>3)</sup>		AP809	AP835	AP835									
							AP460i	AP460i	AP460i						
													AP71	AP71	
										AP74					
															AP77
											AP75	AP75	AP75 AP78		

[www.hbm.com](http://www.hbm.com)

**HBM Test and Measurement**

Tel. +49 6151 803-0

Fax +49 6151 803-9100

[info@hbm.com](mailto:info@hbm.com)

measure and predict with confidence

