

AVL AMPLIFIERS AND COMBUSTION MEASUREMENT SYSTEMS

FLEXIFEM KNOCK

PIEZO AMPLIFIER, KNOCK METER AND PEAK PRESSURE MONITOR



The FlexIFEM Knock is a compact and robust system combining a state-of-the-art charge amplifier and a digital processing unit for analysis of cylinder pressure signals, allowing stand-alone calculation of combustion characteristics without crank angle information.

In the FlexIFEM Knock package, the FlexIFEM dynamically delivers for each input channel the maximum knock peak within the last n combustion cycles, where n can be freely selected in the range [1...100], as well as the average knock peak over the last n combustion cycles.

With an optional firmware upgrade the FlexIFEM Knock furthermore features a reliable peak cylinder pressure monitoring function for use on R&D or endurance test beds, or for in-vehicle calibration. The FlexIFEM Knock device is operated in a stand-alone mode providing real-time processed results values on the integrated CAN bus interface or to the analog outputs.

FUNCTION SUMMARY

- State-of-the-art piezoelectric amplifier
- Peak cylinder pressure measurement and monitoring
- Dynamic knock peak calculation and output
- Upgradeability to FlexIFEM Indi
- Output channels for customized events and alarms
- CAN and DAC outputs for cyclic results (knock peaks, engine speed, p_{\max})



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Technical Data / Product Name	FLEXIFEM KNOCK
GENERAL	
Weight	1.6 kg
Dimensions WxHxD	86 x 112 x 270 mm
Power supply	9.5 V ... 36 V DC or 100 ... 240 V AC via included AC adapter
Power consumption	Operation: 10 W; Startup: 20 W
Temperature range	-10°C...+50°C (+15°F.....+120°F)
SID (Sensor IDentification)	Yes (optional for 1-channel version)
DISPLAY	
Resolution	120 x 80
Dimensions WxHxD	60 x 40 mm
INPUTS	
Analog channels (piezo/voltage)*	1 or 2
Charge input range**	0 ... 14,400 pC
Voltage input range	-10 ... +10 V
Sampling Rate per channel	1 MHz
ADC resolution	16 Bit
LVDS for crank angle signal	Optional (TI0601ADUP.01)
Digital inputs for injection/ignition timings	Optional (TI0601ADUP.01)
INTERFACES	
DAC outputs	2
DAC output range	-10 ... +10 V
Digital outputs	4
Relays	1
OHI (for Etas Inca)	Optional (TI0601ADUP.01)
Gigabit Ethernet to PC (IndiCom)	Optional (TI0601ADUP.01)
Test bed connection (RS232 or TCP/IP)	Optional (TI0601ADUP.01)
Real-time CAN	Yes

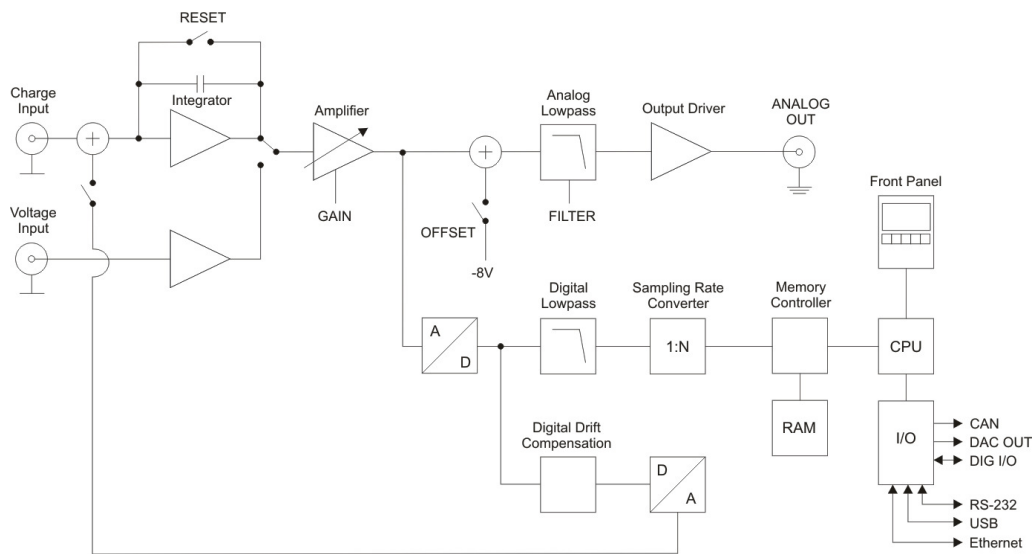
*: each input channel has an integrated charge amplifier, which can be by-passed

** : higher input range available on demand



FUNCTIONAL DESCRIPTION

The built-in analog-digital converter converts the analog signal at the integrated charge amplifier outlet into a digital data flow. A digital low pass filters high-frequency interferences from the signal whereby the signal-noise ratio is improved and anti-aliasing effects of the secondary sampling rate converter are avoided. The converter provides the data rate required for the several evaluation algorithms. The data are stored by a memory controller into a Random-access memory so that they can be accessed by the processor in any required order.



APPLICATION RANGE

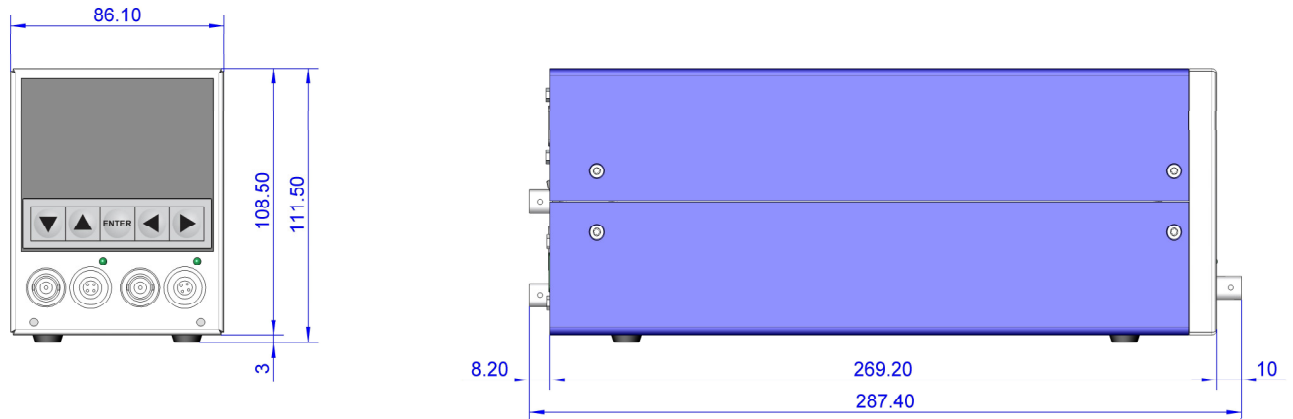
The flexibility and robustness of the FlexIFEM Knock allow its usage through the entire engine development process. This stand-alone device can thus be used as a simple charge amplifier on test bed or in vehicle, as a knock and/or peak pressure monitoring device for endurance purpose, or as a precise knock and/or p_{max} meter delivering accurate values for e.g. function development or calibration activities.

YOUR BENEFITS AT A GLANCE

- Easy handling and installation thanks to integrated piezoelectric amplifiers and to stand-alone, time-based mode
- Flexible integration in any test environment thanks to real-time CAN, digital and analog outputs
- Quick combustion understanding and trouble-shooting thanks to integrated display
- Customizable software package and easy upgradeability



DIMENSIONS



COMPATIBILITY AND UPGRADE

- Full upgrade path to FlexIFEM Indi and operation with IndiCom

SCOPE OF SUPPLY

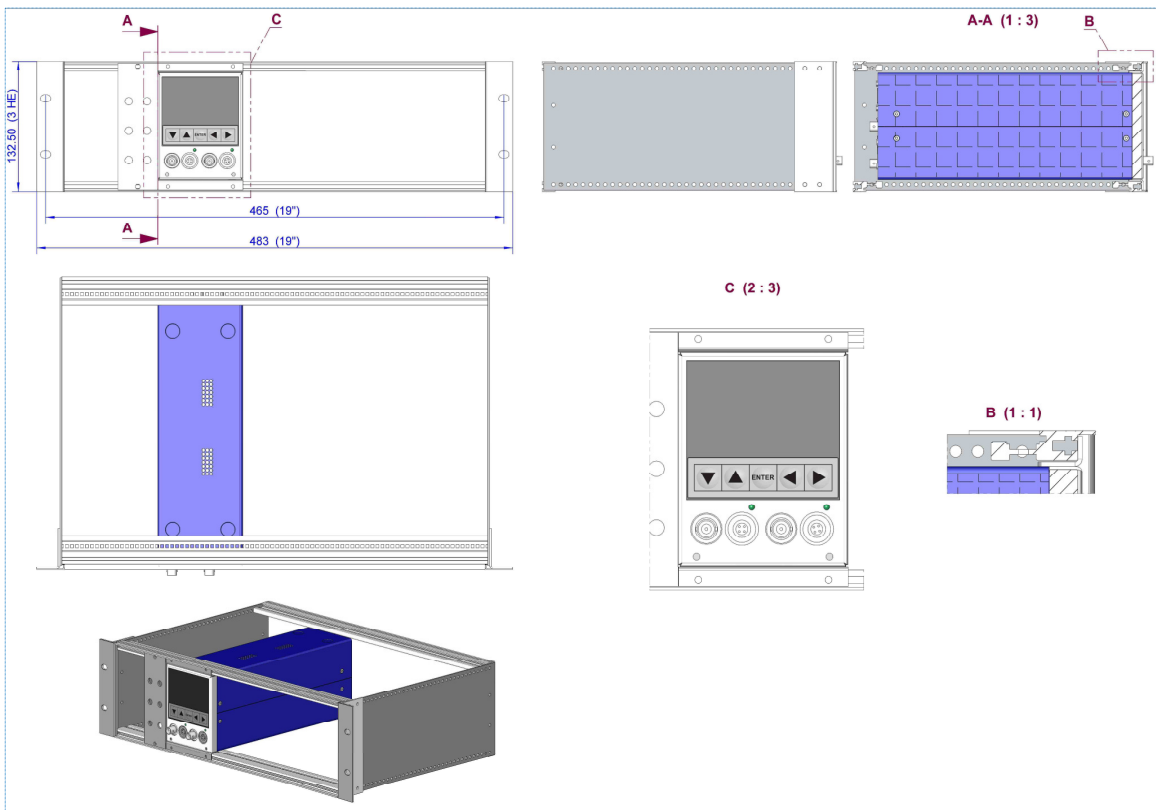
- 1x FlexIFEM Knock 601
- 1x patch cable, length 3 m
- 1x external power supply
- 1x connecting cable for power supply
- 1x or 2x analog-in adaptor cable(s) (4-pin Fischer to BNC)
- 1x or 2x ferrite clamp(s)
- 1x set user manuals, English
- 1x set data carrier



OPTIONS / EXTENSIONS

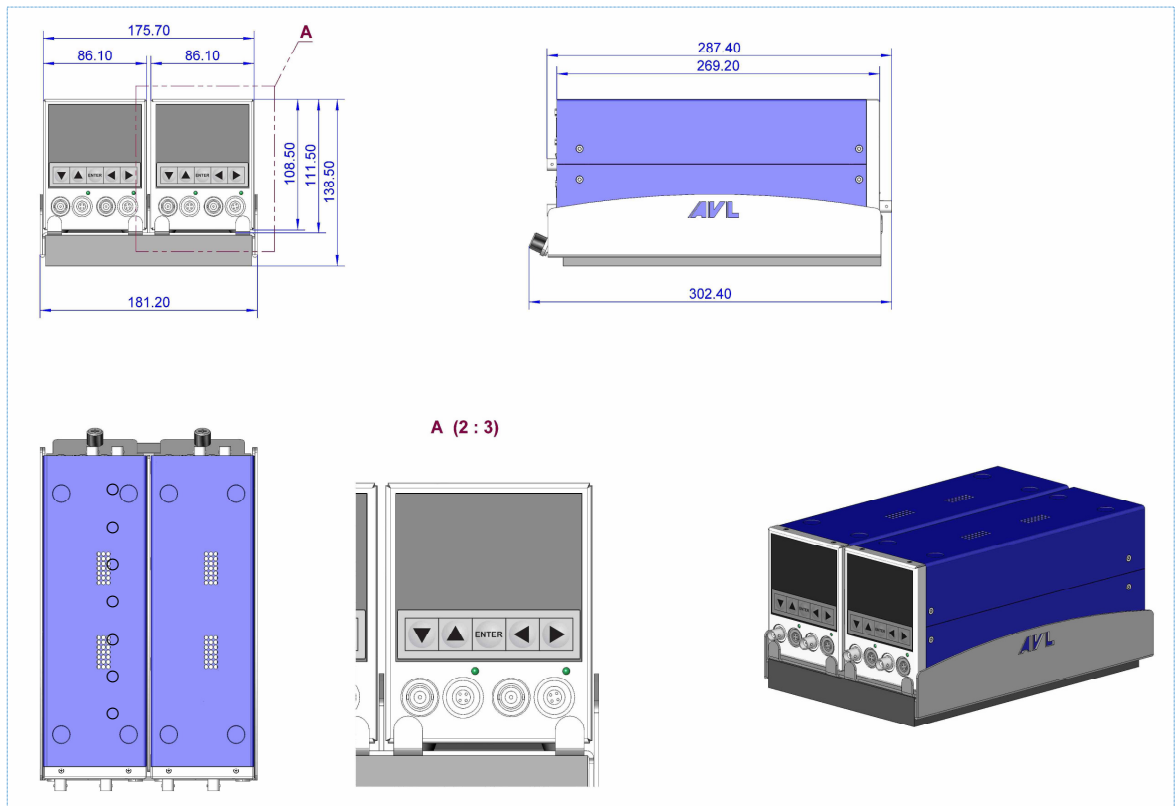
- SOFTWARE EXTENSIONS
 - **TI01PMAx.01**: p_{max} Upgrade
 - **TI0601ADUP.01**: Upgrade to FlexIFEM Indi

- ACCESSORIES
 - **TI02RACKA.01**: Mounting rack for up to 4 FlexIFEM (requires mounting kit TI02RMAB.01 – 1 kit per device)





- **T102MT2A.02:** Mounting tray for 2 FlexIFEM



- **T102MT4A.02:** Mounting tray for 4 FlexIFEM

