

# KLARI-FOUR 1000V



HV-U - PROBE



HV-I - PROBE

## THE REQUIREMENTS

- Safe measurement at high voltage potentials up to 1 kV.
- Dynamic current and voltage measurement for automotive hybrid or electrical power train with CAN data output.
- Two measuring channels, usable for current or voltage measurement.
- Easy use of the measurement technology for various applications.

## FIELDS OF APPLICATION

Use in laboratories and automotive:

- Measuring current and voltage in DC circuits.
- Measuring current and voltage in AC circuits, also with RMS value calculation.

## THE CONCEPT

- KLARI-FOUR<sub>1000V</sub> is galvanically isolated up to 1000 V DC between measuring circuit and data output and between the four measuring channels.
- Each measuring channel is equipped with an ASIC and a dsPIC. Each ASIC has 5 measuring ranges and autorange function.

## THE DESIGN

- 3 HE 19" compact measurement module in Europe format, 100 x 160 mm. For electrical isolation each measuring channel plus ASIC and  $\mu$ C is complete solitary gouted. The data output is transmitted via isolated CAN - optocoupler.
- Optimal adaption to the measuring task by a number of pluggable PROBES for current, voltage and temperature measurements with automatic PROBE-identification.
- Manifold configuration possibilities via PC. The corresponding configuration can be stored in the measuring module.

## YOUR BENEFIT

- Safe measurement based on 1 kV isolation.
- Variable measuring periods via 4 CAN-channels with max. 8000 frames/channel/sec.
- Safe measurement based on 1 kV isolation.
- Investment protection by easy adaption of the measuring technology to different measuring tasks.
- Precise and reproducible measured values in every measuring range by +/-15 bit resolution.
- Correct measurement results by automatic PROBE-identification with calibration value transmission.
- Easy implementation of CAN data export in common CAN loggers and analysis tools via supplied CAN data base.

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## SPECIFICATIONS

<b>Input / characteristics</b>	<ul style="list-style-type: none"> <li>• 4 galvanically isolated measuring channels, each with one <math>\mu\text{C}</math> and ASIC each channel can be connected to a current-, voltage or temperature PROBE</li> <li>• measurement range depends on PROBE-type. See table.</li> </ul>
<b>Resolution</b>	<ul style="list-style-type: none"> <li>• +/-15 bit/range</li> <li>• 5 internal gains, automatic gain selection</li> </ul>
<b>Accuracy</b>	<ul style="list-style-type: none"> <li>• +/-1% of actual value, <math>\pm 3</math> bit each gain in temperature range from - 40 ...+ 85°C</li> </ul>
<b>Sample rate</b>	<ul style="list-style-type: none"> <li>• max 8.000 samples per second each channel</li> <li>• continuous measurement including averaging and effective value calculation</li> </ul>
<b>Additional functions</b>	<ul style="list-style-type: none"> <li>• selection of data output via CAN and/or USB</li> <li>• CAN settings configurable (baudrate, Id ...)</li> <li>• integrated CAN termination configurable</li> <li>• automatic PROBE-type identification</li> <li>• PROBE calibration value elaborated</li> </ul>
<b>Outputs</b>	<ul style="list-style-type: none"> <li>• 1 CAN for each channel</li> <li>• opto isolated High-Speed-CAN up to 1Mbaud</li> <li>• USB 2.0 interface</li> </ul>
<b>Time basis</b>	<ul style="list-style-type: none"> <li>• ~30 <math>\mu\text{s}</math> resolution</li> </ul>
<b>Casing (LxWxH)</b>	<ul style="list-style-type: none"> <li>• Europe format, 100 x 160 x 60 mm</li> </ul>
<b>Power supply</b>	<ul style="list-style-type: none"> <li>• 6...50 V DC</li> </ul>
<b>Current consumption</b>	<ul style="list-style-type: none"> <li>• approx. 750 mA at 12 V DC</li> </ul>
<b>Configuration</b>	<ul style="list-style-type: none"> <li>• using PC via USB or CAN interface. Configuration may be managed and stored in the device</li> </ul>
<b>Operating modes</b>	<ul style="list-style-type: none"> <li>• Multichannel Mode:             <ul style="list-style-type: none"> <li>- Autorange function for all channels over all measuring ranges</li> <li>- individual sampling time for each channel</li> <li>- averaging or effective value calculation for each channel to reduce data output rate</li> </ul> </li> </ul>
<b>Temperature range</b>	<ul style="list-style-type: none"> <li>• -40...+85°C for measurement module</li> <li>• -40...+130°C for the shunt</li> </ul>
<b>Isolation voltage</b>	<ul style="list-style-type: none"> <li>• 1000 V DC</li> </ul>
<b>Protection class</b>	<ul style="list-style-type: none"> <li>• IP40</li> </ul>

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## Measuring ranges:

Examples for measuring ranges and measurement value resolutions								
Range/ Gain	200 V PROBE		1000 V PROBE		1 mΩ PROBE		200 μΩ PROBE	
	Measuring range	Resolution/bit	Measuring range	Resolution/bit	Measuring range	Resolution/bit	Measuring range	Resolution/bit
1	+/-200 V	16,344 mV	+/-1000 V	120 mV	+720 A -300 A	24 mA	+3600 A -1500 A	120mA
6	+/-80 V	2,724 mV	+/-600 V	20 mV	+/-120 A	4 mA	+/-600 A	20mA
24	+/-20,43 V	681 μV	+/-150 V	5 mV	+/-30 A	1 mA	+/-150 A	5mA
50	+/-10,215 V	340,5 μV	+/-75 V	2,5 mV	+/-15 A	500 μA	+/-75 A	2,5mA
100	+/-5,1075 V	170,25 μV	+/-37,5 V	1,25 mV	+/-7,5 A	250 μA	+/-37,5 A	1,25mA

The measuring inputs are galvanically isolated from each other and from the electronic measuring equipment.  
 All interfaces and the power supply are galvanically isolated.  
 Measurements are possible in plus and minus path.

## STANDARD SCOPE OF DELIVERY

- KLARI-FOUR 1000V measuring module, isolation tested, PROBE inputs are calibrated in KLARIC company.
- order number: IMMCM-ZU007-0001
- **Please order KLARI-PROBES separately!**
- PC software for the configuration via CAN or USB-2.0-interface
- CAN data base and documentation on CD-ROM
- We will give you reliable and competent support if you have any questions or need support.

**Please order KLARI-PROBES separately !**

On demand we offer manufacturers calibration with certificate.



## 19" Table housing Euro format 3HE

42 TE,

62 TE,

84 TE wide

70..230V AC Power supply

CAN connection unit for

1 x 5 CAN 40 mm width

2 x 5 CAN 80 mm width

## KLARI-PROBES, 1000 V

Standard measuring adapters for currents and voltages

(Selection. For further types see data sheet "KLARI-PROBES<sub>1000V</sub>")

- **HV-LI current-PROBES**, isolation 1 kV,  
100 mOhm, PBV, measuring range 0...-3 A/+7,2 A,  
resolution 2,5 µA/bit\*, permanent current ca. 6,5 A\*\*  
IMFIP-45A02-0SHV - 3 m  
  
50 mOhm PBV, measuring range 0...-6 A/+14,42 A  
resolution 5µA/bit\*, permanent current ca. 7,5 A\*\*  
IMFIP-A5A02-0SHV - 3 m  
  
10 mOhm, PBV, measuring range 0...-30 A/+72 A  
resolution 25 µA/bit\*, permanent current ca. 23 A\*\*  
IMFIP-C5A02-0SHV - 3 m
- **HV-I current-PROBES**, isolation 1 kV,  
2 mOhm, BF-1, measuring range 0...-150 A/+360 A  
resolution 125 µA/bit, permanent current ca. 60 A\*\*,  
MFIP-H4802-0SHV - 3 m  
  
1 mOhm, BF-1, measuring range 0..-300/+720 A  
resolution. 250 µA/bit\*, permanent current ca. 80 A\*\*  
IMFIP-M4802-0SHV - 3 m  
  
0,2mOhm, BF-2, measuring range 0..-1500/+3600 A,  
resolution 1,25 mA/bit\*, permanent current ca. 180 A\*\*  
IMFIP-R2602-0SHV - 3 m  
  
0,1mOhm, BF-2, measuring range 0..-3000/+7200 A,  
resolution 2,5 mA/bit\*, permanent current ca. 400 A\*\*  
IMFIP-U2602-0SHV - 3 m

\* indicated for the lowest measuring range

\*\*depending on the type of connection !



# ACCESSORIES

- **HV-U voltage-PROBES**, isolation 1 kV

Range  $\pm 1000$  V,  
resolution 1,25mV/bit\*

IMFVP-00007-0SHV	-	1 m
IMFVP-00009-0SHV	-	3 m

Range  $\pm 200$  V,  
resolution 170 $\mu$ V/bit\*

IMFVP-00007-NSHV	-	1 m
IMFVP-00009-NSHV	-	3 m

\* indicated for the lowest measuring range  
See separate catalogue excerpts or data sheets.

## Individual measuring adapters

- Measurement-adapters with original automobile plug connectors. They are placed directly into the measuring circuit.
- Application of battery-interruptor for current measurement via "Service Plug".

For further types see data sheet "KLARI-PROBES<sub>1000V</sub>".

We are pleased to quote individual solutions.

