

Digital Impulse Voltage Measuring Systems

TR-AS® 60-10-12 / 100-10-12 / 200-12-14 / 400-12

Remote Control Digital Recorder TR-AS® RC

DR. STRAUSS

Impulse Measurement
Calibration - Diagnosis
www.strauss-mess.de

The TR-AS® RC digital recorders are designed for recording task only. The WinTR-AS® software installed on an external control computer overtakes all control functions of the test procedure via the LAN with:

Setting and arming the TR-AS® RC, transfer of the raw data after recording, evaluation and display of shapes, saving the records in the database, generating the test record and printing to any network printer.



TR-AS® RC with 1 to 4 measuring channels located closed to the test field

Control Computer - Laptop PC inside the control room

TR-AS® RC Remote Control Housing

for connection via LAN (green) to the host computer (PC or Laptop)

Measuring rack mount with 1 to 4 channels with brackets for building into any 19" measuring rack or for using on the desk

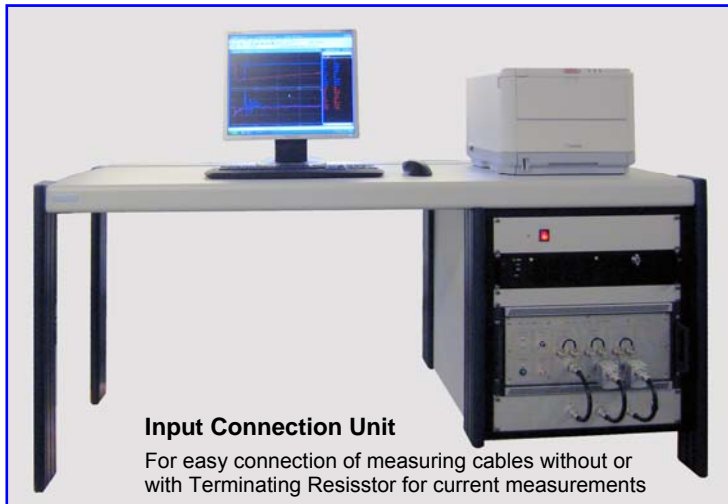
Direct input 100 mV to 10 V

Measuring Input 12 V to 2000 V

suitable for i.v. tests and calibrations in the test field and on-site

Dimensions: appr. 50x55x20 cm (WxDxH)

Weight: approx. 16 kg



Input Connection Unit

For easy connection of measuring cables without or with Terminating Resistor for current measurements

Working Desk with Measuring Rack MIRA 12

for installation of 19" measuring rack mount, for reducing of electromagnetic interferences into the necessary connection cables and disturbances caused hereby, with complete assembly of the offered components, with additional mains filter, approx. dimensions: Table 160 x 80 x 75 cm, MIRA 55 x 60 x 70 cm (W x D x H)

Industrial PC Control Computer

19" TFT display, Color Laserprinter, Keyboard and Mouse, connected to the TR-AS® digital recorder via fibre-optic LAN

TR-AS® RC Remote Control Housing

Measuring rack mount with 1 to 4 channels with brackets for building into any 19" measuring rack or for using on the desk

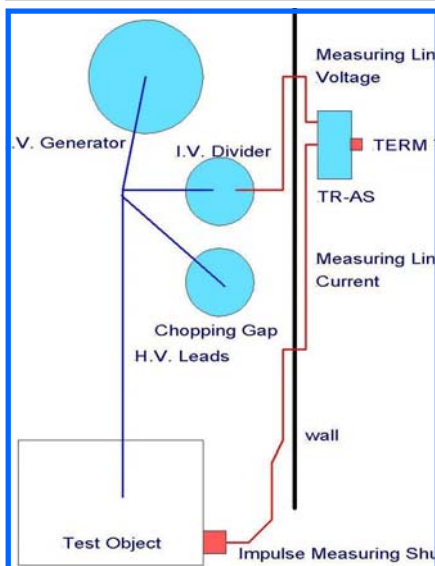
Direct input 100 mV to 10 V

Measuring Input 12 V to 2000 V

for connection via LAN to the host computer (PC or Laptop)

This new designed measuring technique of network controlled digital recorders gives the possibility for applications where measuring channels are distributed in large test fields, in control rooms on-site or anywhere around the world via Internet.

The following example show how to reduce earthing problems in a very large transformer testfield



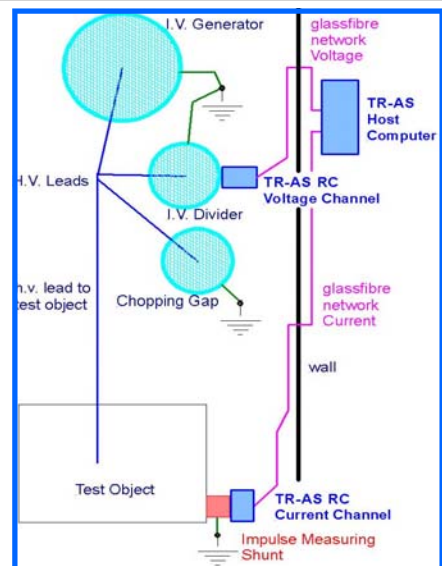
The left picture shows the typical arrangement of the voltage and current measuring circuit with a measuring system TR-AS® or TR-AS® RC for voltage and current with the known

Earthing Problem:

I.V. Generator, chopping gap and i.v. divider have with respect to the Test Object a different ground potential. During the impulse test ground currents are flowing over the coaxial shield of the measuring lines which cause distortions in voltage and current lapse.

The right picture show the suggested arrangement with the **solved earthing problems** using two separate remote controlled TR-AS® RC digital recorder for voltage and current measurement.

Both digital recorders are controlled from the control computer with installed WinTR-AS® software which joins the records of voltage and current to one common record.



Technical Data of Digital Recorder

TR-AS® 60-8-10-12 / 100-8-10-12 / 200-12-14 / 400-12

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Digital Recorder	100 -8 ¹⁾	100 -10 ¹⁾	100/200 -12	400 -12 ³⁾	200 -14
Rated resolution of output data (Bit / %)	8 / 0.4	10 / 0.1	12 / 0.025	12 / 0.025	14 / 0.006
Static integral non-linearity (%)	0.5	0.25	0.2	0.2	0.1
Static differential non-linearity	0.8	0.6	0.3	0.3	0.3
Dynamic differential non-linearity	0.8	0.8	0.8	0.8	0.8 ²⁾
Sampling rate selectable	2.5 kHz - 25 / 60 / 100 / 200 MS/s ¹⁾			2.5 kHz-400 MS/s	2.5 kHz-200 MS/s
Sampling interval uncertainty	0.1 ns				
Non-linearity of Quarz Time Base	0.01%				
Record Length (standard/optional)	262144 / 512K / 1M				
No. of Timebase	2 to 8 selectable				
Timebase Recording Mode	A-B-C...H-Sequence				

Input Stage	values in brackets on request (reference systems)
No. Measuring Channels	1 .. 4
Measuring input, single ended	N-type / LEMO optional
Measuring range for impulse	12 - 2000 V
Bandwidth analogue (-3dB)	DC - 50 MHz (70 MHz)
Risetime	7 ns (5 ns)
Input test voltage 0.1/2000 us	± 3.5 kV
Input impedance	1 MOhm / 30 pF
Direct measuring input	65 mV - 10 V, BNC
Bandwidth analogue (-3dB)	DC - 70 MHz
Risetime	5 ns
Input impedance	1 MOhm / 30 pF
Input Settings	Factor 1.2
automatically controled	23 Stages
Internal Noise Level	< 0.1%
Interferences	< 0.1%
Record Interval	
at sampling rate 200 MS/s	1.25 / 2.5 / 5 ms
at sampling rate 100 MS/s	2.5 / 5 / 10 ms
at sampling rate 5 MS/s	52 / 104 / 209 ms
Trigger	
channels single, OR-connected	yes
internal level	pos. and neg. level
internal dynamic (deviation)	pos. and neg. dU/dt
external	5 - 200 V, BNC
Selftest and Calibration check	memory, scale factor and risetime
Limits on overall errors	according to all applicable Standards (IEC 61083, IEC 60, IEEE 1122, IEEE 4, ...)
Impulse scale factor	
constancy in time interval 0.25-1.0 µs and 0.42 µs upto >20 ms	≤ 1%
uncertainty	< 0.5%
lightning and switching i.v., full and standard chopped, impulse current	
peak value	1% (0.7% optional)
time parameter	2%
front chopped voltage 1.2/50 µs	
peak value, Tc=0.5µs	1.5% (1% optional)
time-to-chopping, Tc=0.5µs	3% (2% optional)
Evaluation	WinTRAS - Software
shape, accuracy:	according to IEC-61083-2
automatic meancurve calculation	ON/OFF selectable
manual evaluation	ON/OFF selectable
Calibration Interval	every 2 to 4 years recommended

- 1) 100 MS/s systems available also with 60 and 25 MS/s max. sampling rate
2) referenced to 12 Bit (according to IEC 1083-1)
3) 400 MS/s with terminated input only

Control and Evaluating System

Personal Computer state of the art, Dual-Core CPU with ≥ 2GHz, ≥ 2GB RAM, Harddisk ≥ 250 GByte, Diskdrive 3,5", DVD-RW, color laserprinter, fibre-optic LAN adapter / RJ45 LAN connection and external fibre-optic media converter...
Power: Voltage 230 V +10%/-20%, (optional 100/115 V), Frequency 50-60 Hz, Power 400 VA
Environmental: Ambient Temp +5...+40°C, Humidity 0...90%, non condensating
Technical data and design subject to change without notice.
Alternative design on request.

Application

Approved and reference measuring systems in high-voltage and high-power tests
precise steep impulse measurement
simultan multichannel systems
dynamic tests
fourier-analyses
quality control ..

DKD-Calibration

The measuring systems can be calibrated in our DKD Calibration Laboratory accredited by the PTB. The Calibration Laboratory issues DKD-Calibration Certificates which documents the traceability to National Standards.

Type Test Report TR-AS® 100-10

Since 01.08.1993 a complete type test report according to IEC 61083-1 is available for the digital impulse voltage measuring system TR-AS® 100-10 which is designed as an approved, reference or reference standard measuring system.

Type Test Report TR-AS® 200-14

The new family with TR-AS® 100-12 to TR-AS® 200-14 consequently continue developed show improved performance. The excellent overall performance makes them the most sophisticated system today available for comparative measurements during transformer tests.