

# VFT Measuring System for GIS

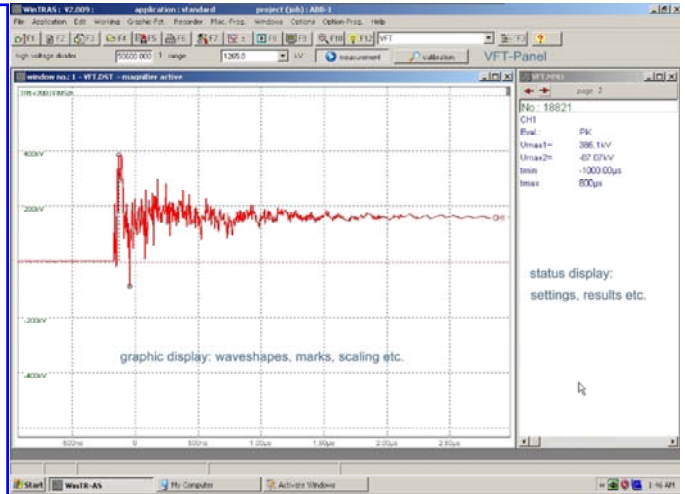
## Remote Control Digital Recorder TR-AS® RC

**DR. STRAUSS**

Impulse Measurement  
Calibration - Diagnosis  
[www.strauss-mess.de](http://www.strauss-mess.de)



Principle design for single channel version



**VFT-Measuring System TR-AS® RC for VFT**  
Digital Recorder with 200 MS/s sampling rate and 12 Bit resolution, remote controlled by external Laptop Computer

The VFT-Measuring System TR-AS® RC for VFT is special designed for high bandwidth and allows measurements of very fast transients (VFT) in a frequency range from power frequency up to 100 MHz directly with help of capacitive sensors, e.g. PD-sensors installed in Gas - Insulated Switchgear (GIS).

Additionally measurement of lightning and switching impulse voltages as also A.C. measurements on the finally installed GIS can be performed.

### Principle of measuring system

The measuring system consists of an electrical field sensor with capacitance C1, a directly coupled low voltage capacitor and a coaxial measuring line with capacitance C2 which forms together a capacitive voltage divider with a ratio of approximately C2:C1.

The measuring line is connected to the 250 V input of the digital recorder which includes an input divider with ratio 25:1.

The 10 V output of the divider is connected with a BNC-bridge to the 10 V input of the programmable measuring amplifier channel 1 of the digital recorder.

### Software Control

The VFT-Measuring System is remote controlled via the local area network (LAN) by an external Laptop Computer with special remote control software.

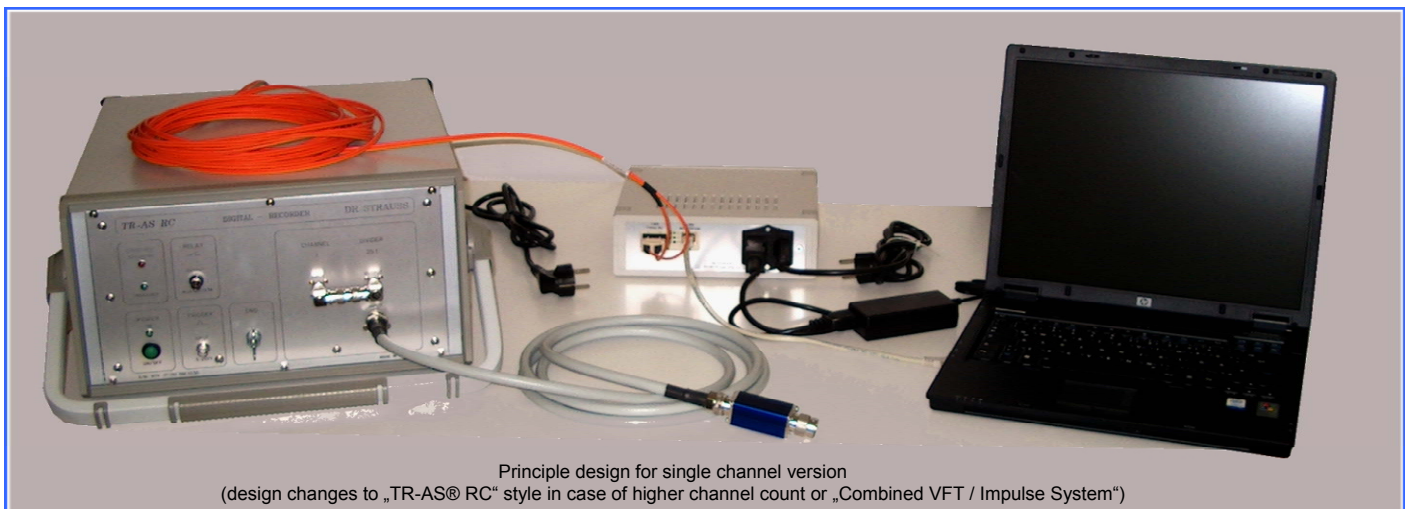
The VFT-Measuring System includes an Industry computer with harddisc and LAN-interface but without display and keyboard.

The WinTRAS-Software for control and measurement is installed on the harddisc of the VFT-Measuring System and can be transparently operated with help of the remote control software on the Laptop Computer.



### Basic Connections

- Gas - Insulated Switchgear GIS Flange with PD-sensor inbuilt with N-Connector
- Low-voltage capacitor
- Measuring cable to TR-AS® RC
- Short-Circuit-Connector on chain



Principle design for single channel version  
(design changes to „TR-AS® RC“ style in case of higher channel count or „Combined VFT / Impulse System“)

### Components of the (pure) VFT-Measuring System TR-AS® RC:

- Low Voltage Capacitor (blue) with N-Connectors
- Coaxial Connection cable with N-connectors (grey)
- Digital Recorder TR-AS® RC with power cord (left side)
- Glassfiber-Connection Cable (orange)

- Connection Box with power cord (in the middle)
- LAN-connection cable to PC (0.5 m length)
- Laptop Computer (PC) with power supply (black) and special short power cord (0.3 m length)

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<b>Technical Data</b>	
<b>Low-Voltage Capacitor</b>	N-Connectors
Rated Voltage	250 V (option for additional 2000V input => "Combined VFT/Impulse System")
<b>Measuring Cable</b>	Tri-axial 75 Ohm with N-Connectors, 10 m length (other length optional)
<b>Rated Capacitance C2</b>	<b>13 000 pF ± 15%</b> (other C2 available on request)
<b>Digital Recorder</b>	<b>TR-AS® 200 - 12</b>
Rated resolution of output data (Bit / %)	12 / 0.025
Sampling rate selectable	2.5 kHz-200 MS/s
Sampling interval uncertainty	0.2 ns
Non-linearity of Quarz Time Base	0.01%
Record Length	256K Data (1024K Data optional)
<b>Input Stage</b>	
No. Measuring Channels	1 - 4 (max.2 channels if "Combined VFT/Impulse System")
Measuring input, single ended	250 V input divider 25:1, N-connector (option additional 2000V input divider 200:1)
Measuring range	5 V - 250 V (option additional 40 - 2000 V for "Combined VFT/Impulse System")
Input impedance	20 MOhm / 5 pF (option 1MOhm / 33 pF for additional 2000 V input)
Input test voltage 0.1/2000 us	±350 V
Measuring input, single ended	10 V input, BNC-connector
Input impedance	1 MOhm / 33 pF
Measuring frequency range for VFT	10 Hz - 100 MHz
Input Setting Sequence	Factor 1.2
automatically controlled	16 Stages
<b>Impulse scale factor</b>	
constancy 0,1 µs to >> 1 s	1%
long term stability (one year)	0.5%
<b>Limits on overall errors</b>	<b>according to all applicable Standards (IEC 61083, IEC 60060, IEEE 1122, IEEE 4, ... )</b>
<b>Calibration Interval</b>	<b>every 2 to 4 years</b> recommended
<b>Control Computer</b>	Industrial type, Dual-Core CPU ≥ 1.6 GHz
RAM	≥ 2 GByte
Harddisk	≥ 160 GByte
Netconnection	100 M glassfibre SC
<b>Desktop-Housing</b>	
Dimensions: (BxDxH)	approx. 50x55x20 cm)
Weight:	approx. 16 kg
<b>Connection box (on available for single channel device)</b>	For connection of TR-AS® RC and external Laptop PC with following components
Media Converter	TP – fibre-optic SC, 100MBit, with power supply
Power connections	To mains and Laptop PC
<b>Power Requirements</b>	
Voltage	115 –230 V
Frequency	50-60 Hz
Power	200 VA
<b>Environmental:</b>	
Ambient Temp	+5...+40°C
Humidity	10...90%, non condensating
<b>Laptop PC</b>	
Specification	External
Specification	According to separate Operation Manuals
Technical data and design subject to change without notice. Alternative design on request.	