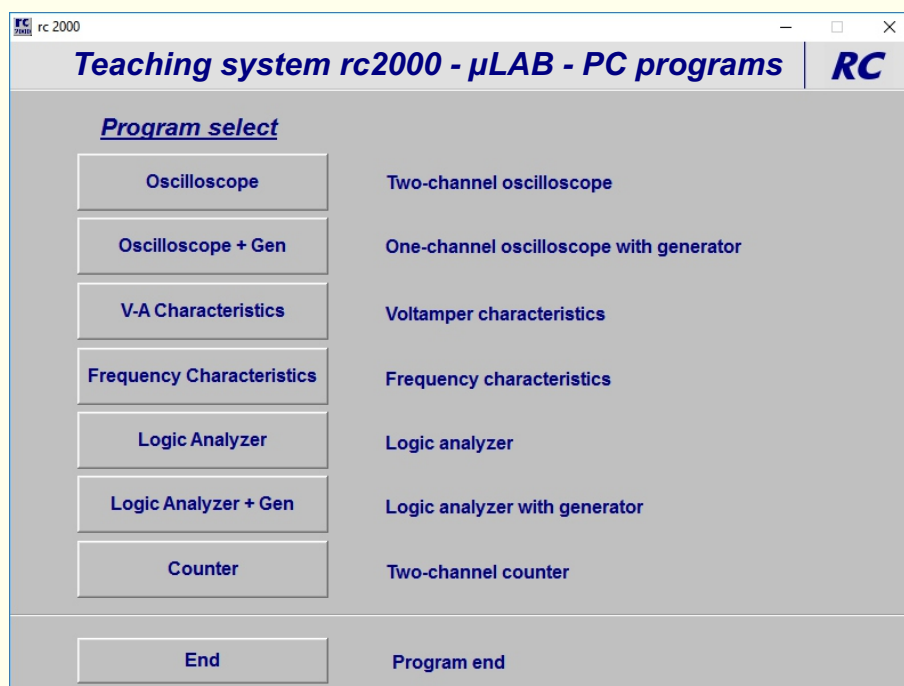


Teaching System rc2000 - μ LAB

Manual



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Measuring modes

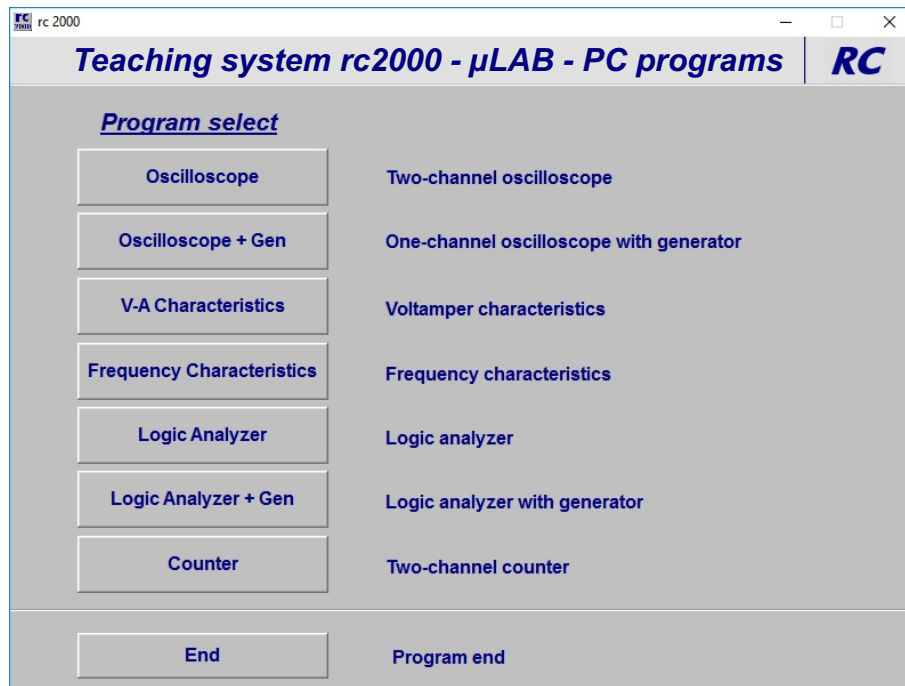


Fig. 1

- Oscilloscope
Two-channel differential voltage measurement
- Oscilloscope+Gen
Single-channel voltage generation and single-channel differential voltage measurementg
- V-A Charakteristics
Single-channel voltage generation (ramp) and two-channel differential measurement (voltage and current)
- Frequency Characteristics
Both characteristics are measured in the frequency range 10 Hz-10kHz
- Logic Analyzer
Eight-channel measurement of logical signals
- Logic Analyzer+Gen
Eight-channel generation of logical signals and simultaneous eight-channel measurement of logical signals
- Counter
Two-channel number measurements

Two-channel oscilloscope

A) Block configuration

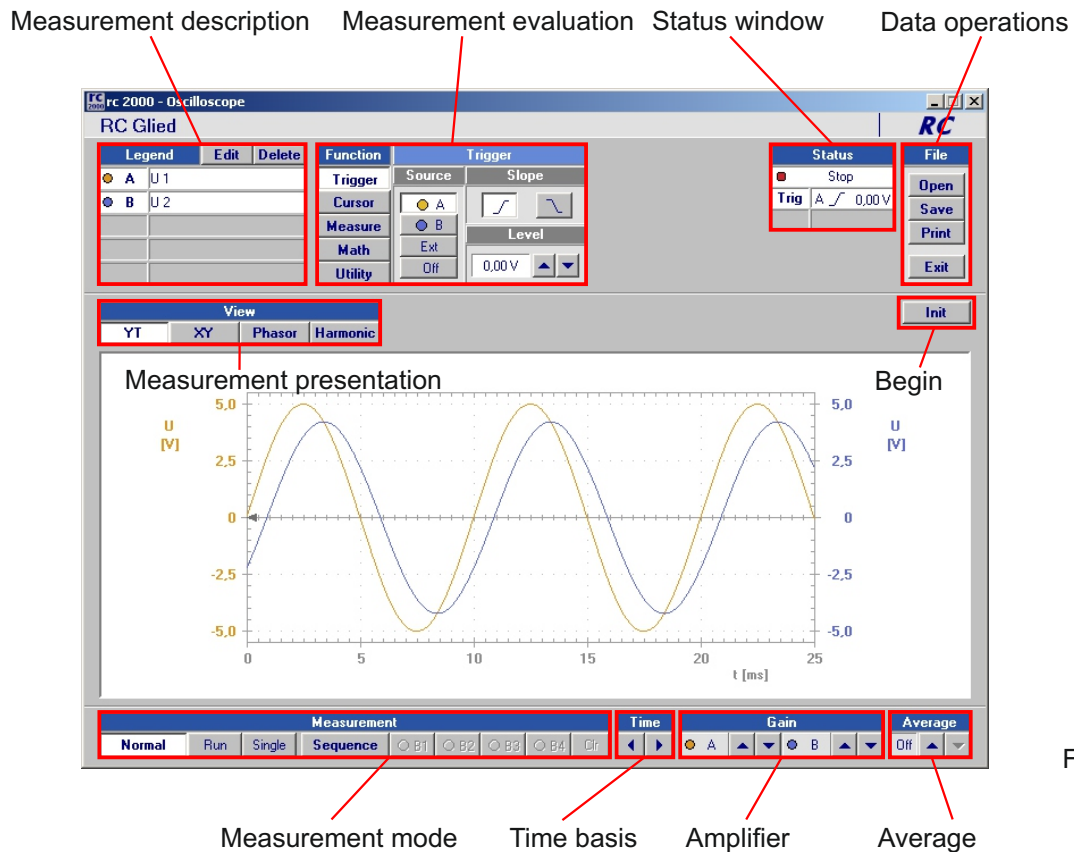


Fig. 2

Measurement mode

Normal	Run - continuous measuring cycles. Single - single start.
Sequence	Four measuring cycles in the same picture. Single measuring cycles are switched by the keys B1 to B4. Channel A (mostly input signal) serves as a comparison channel and must necessarily remain constant for all measurements

Measurement presentation

YT	Two-channel line diagram
XY	XY mode (Channel A - Axis X, Channel B - Axis Y) and line diagram
Phasor	Phasor diagram and line diagram
Harmonic	Harmonic chart (Amplitude und Phase) and line diagram

Measurement evaluation

Trigger	Trigger conditions for starting measuring cycle
Cursor	Data analysis with cursors
Measure	Automatic measurement Urms (effective value), Umean (linear middle value), Umax (maximum value), Umin (Minimum value) and frequency
Math	Mathematical operations (+, -, x, :) between measured curves

B) Measurement

• Exercise

Measure the input and output voltage of the RC element

• Schema

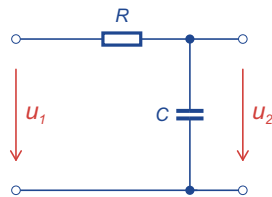


Fig. 3

• Measurement schema - symbolic

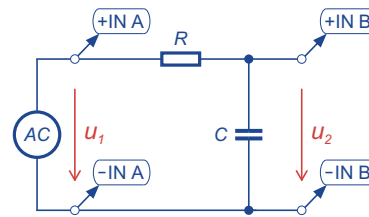
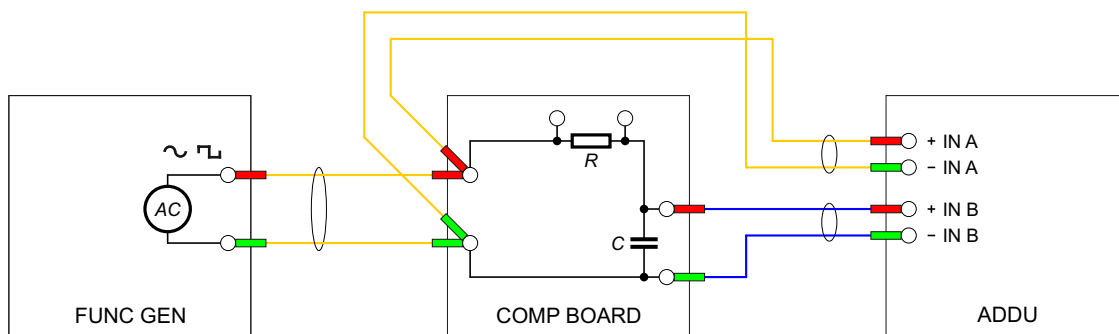


Fig. 4

• Measurement - real

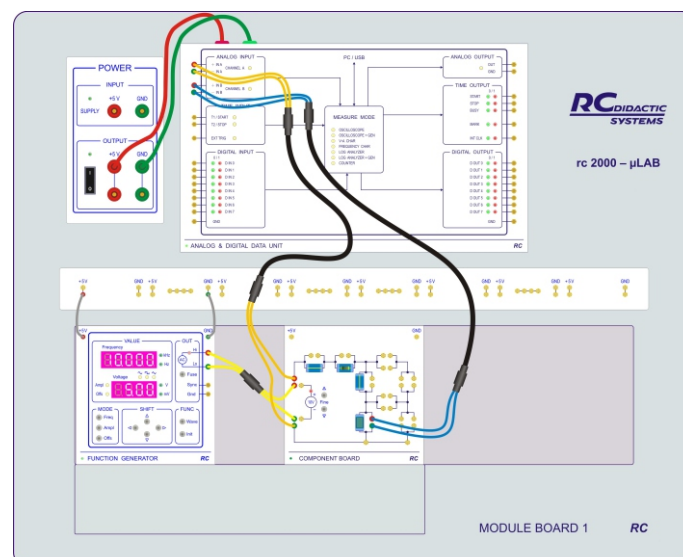


$U=5V\sin$ $f=100Hz$

$R=10k\Omega$ $C=100nF$

Fig. 5

• Real circuit



One-channel Oscilloscope & Analog-Generator

A) Block configuration

Measurement description Measurement evaluation + Editor Status window Data operations

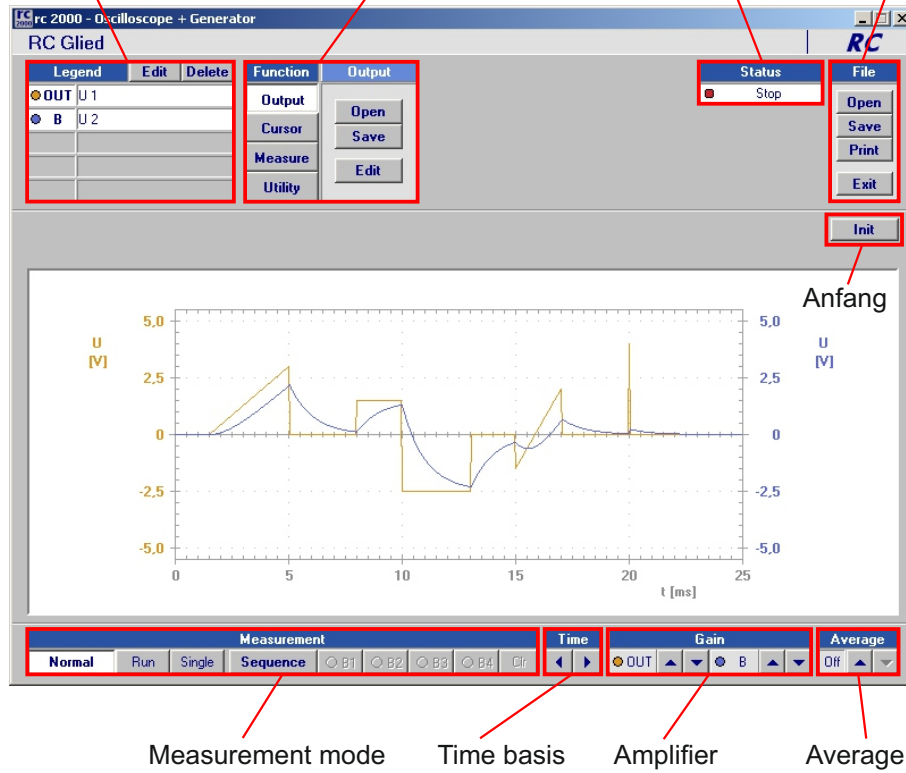


Fig. 6

B) Measurement

• Exercise

Measure the input and output voltage of the RC element

• Schema

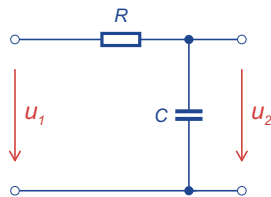


Fig. 7

• Measurement schema - symbolic

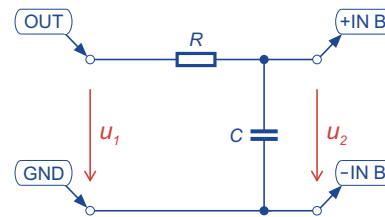
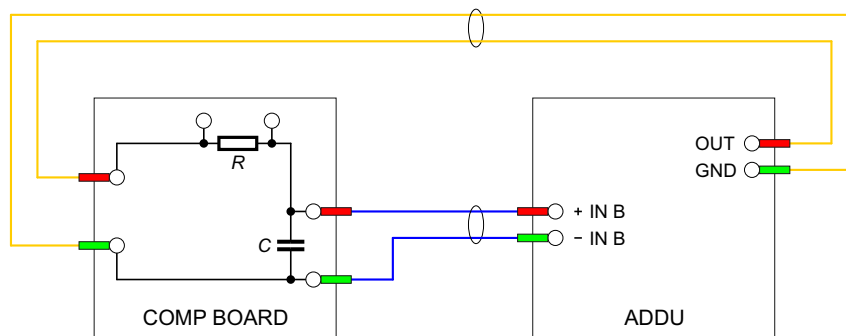


Fig. 8

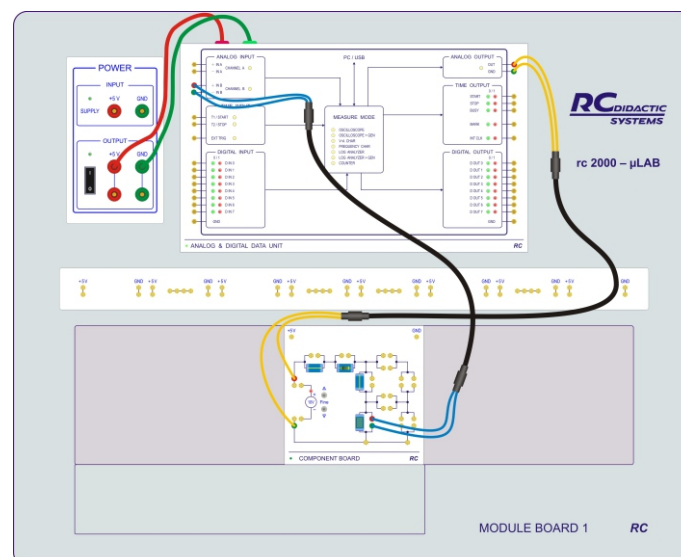
• Measurement - real



$R=10K\Omega$ $C=100nF$

Fig. 9

• Real circuit



V-A Characteristics

A) Block configuration

Measurement description Measurement evaluation Ausgangsrampe Data operations

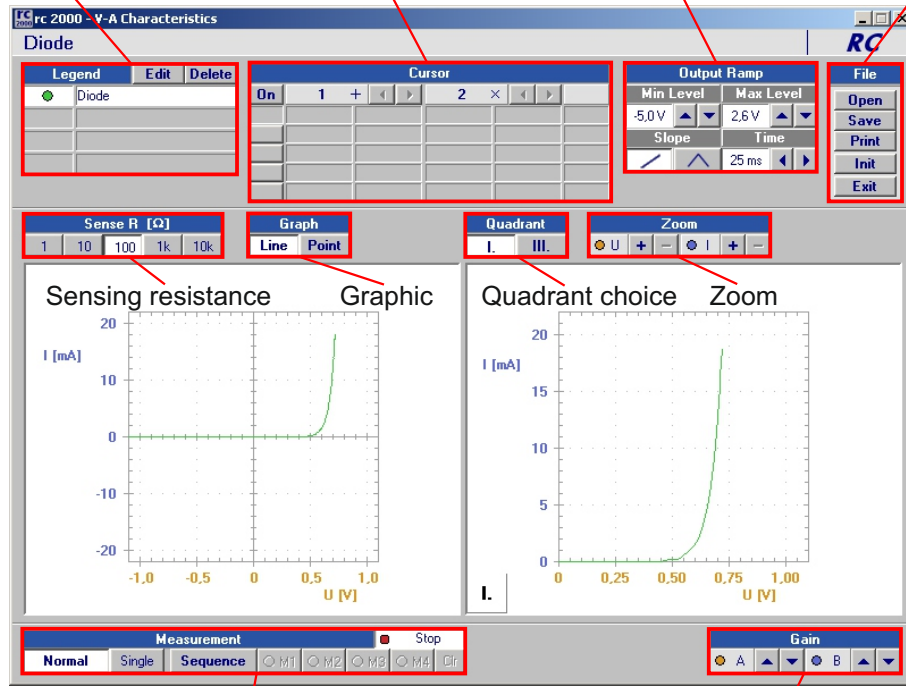


Fig. 10

Measurement mode + Status window

Amplifier (I Fig.)

B) Measurement

• Exercise

Measure the V-A characteristics of the Si diode

• Schema

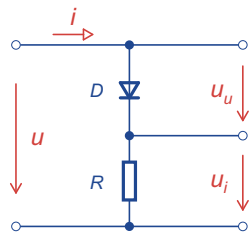


Fig. 11

• Schema - symbolic

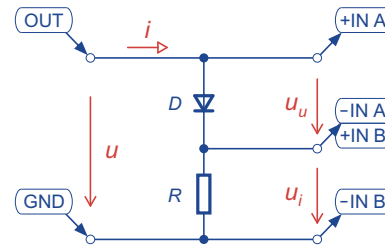
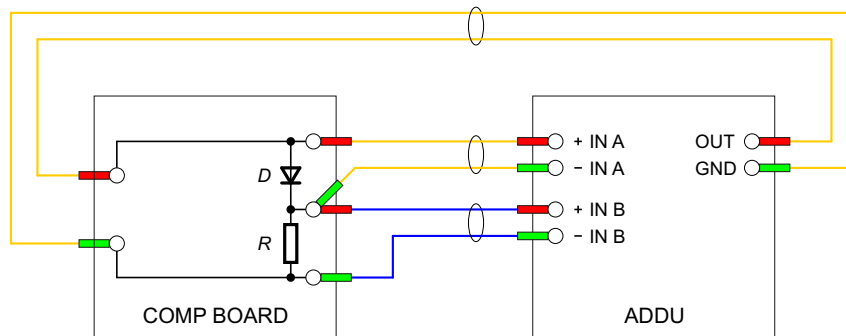


Fig. 12

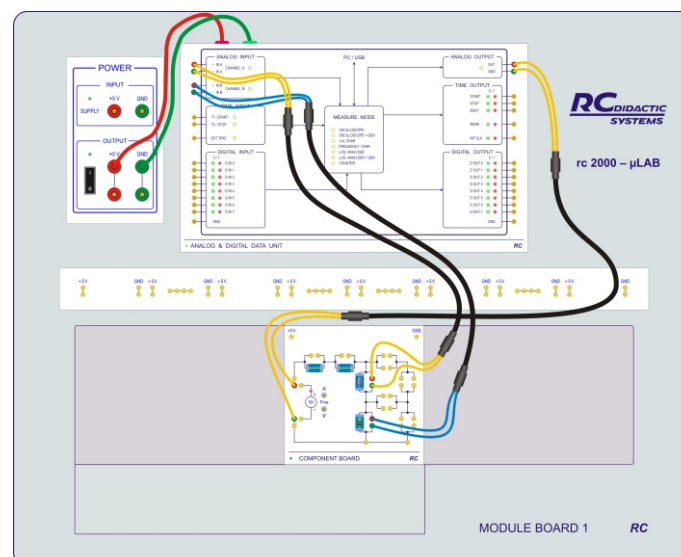
• Measurement - real



R=100Ω D=1N4001

Fig. 13

• Real circuit



Frequency Characteristics

A) Block configuration

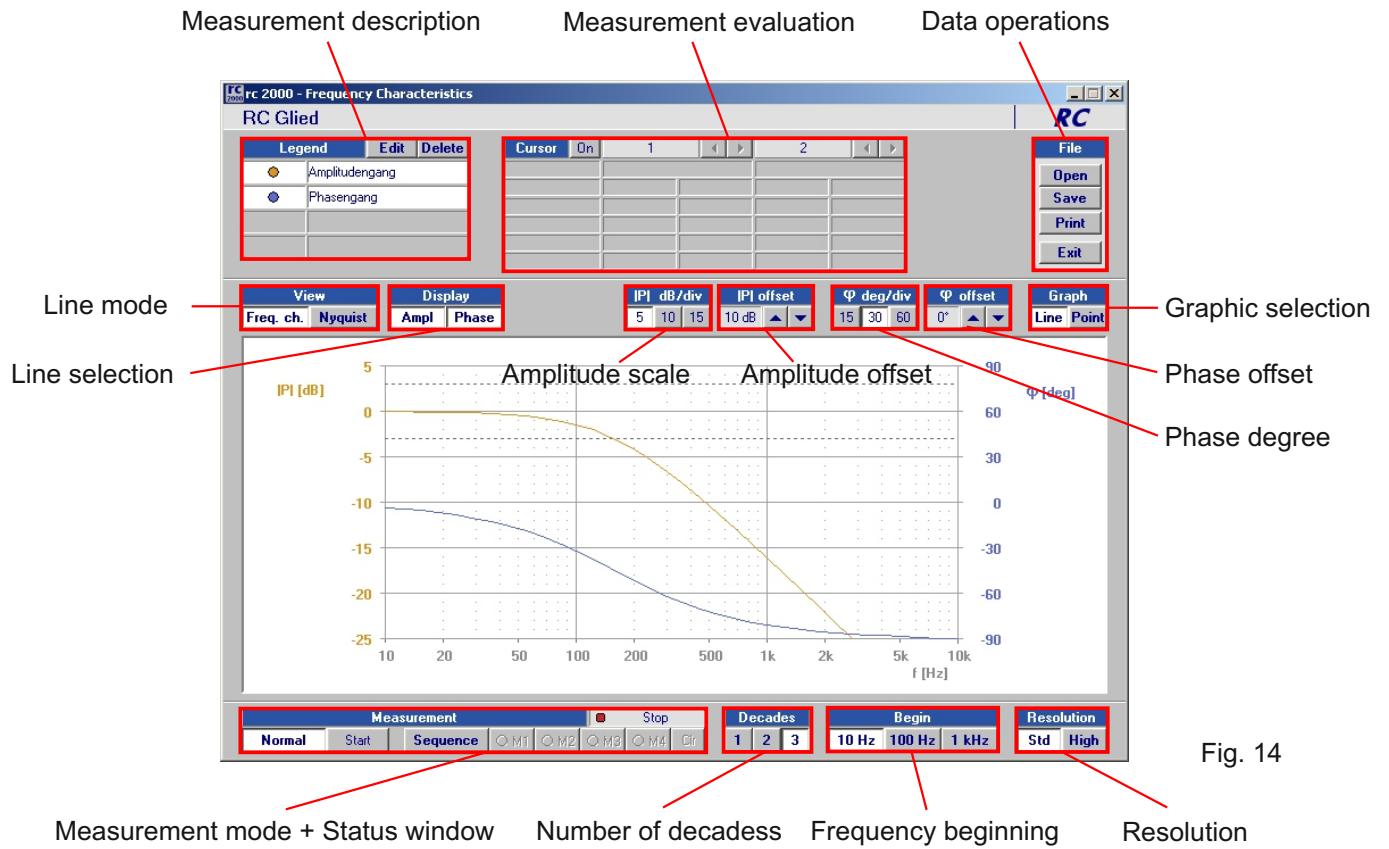


Fig. 14

B) Measurement

• Exercise

Measure the frequency characteristics of the RC element

• Schema

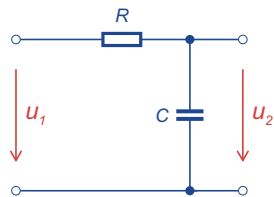


Fig. 15

• Schema - symbolic

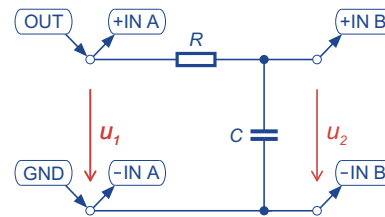
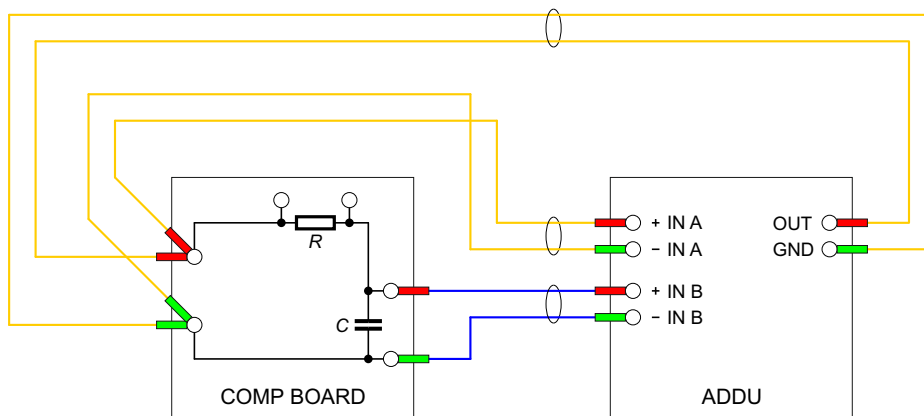


Fig. 16

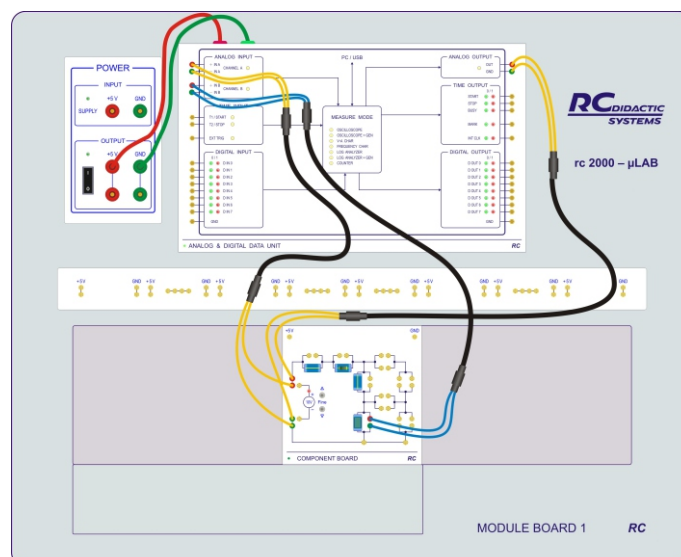
• Measurement - real



$R=10k\Omega$ $C=100nF$

Fig. 17

• Real Circuit



Logic Analyzer

A) Block configuration

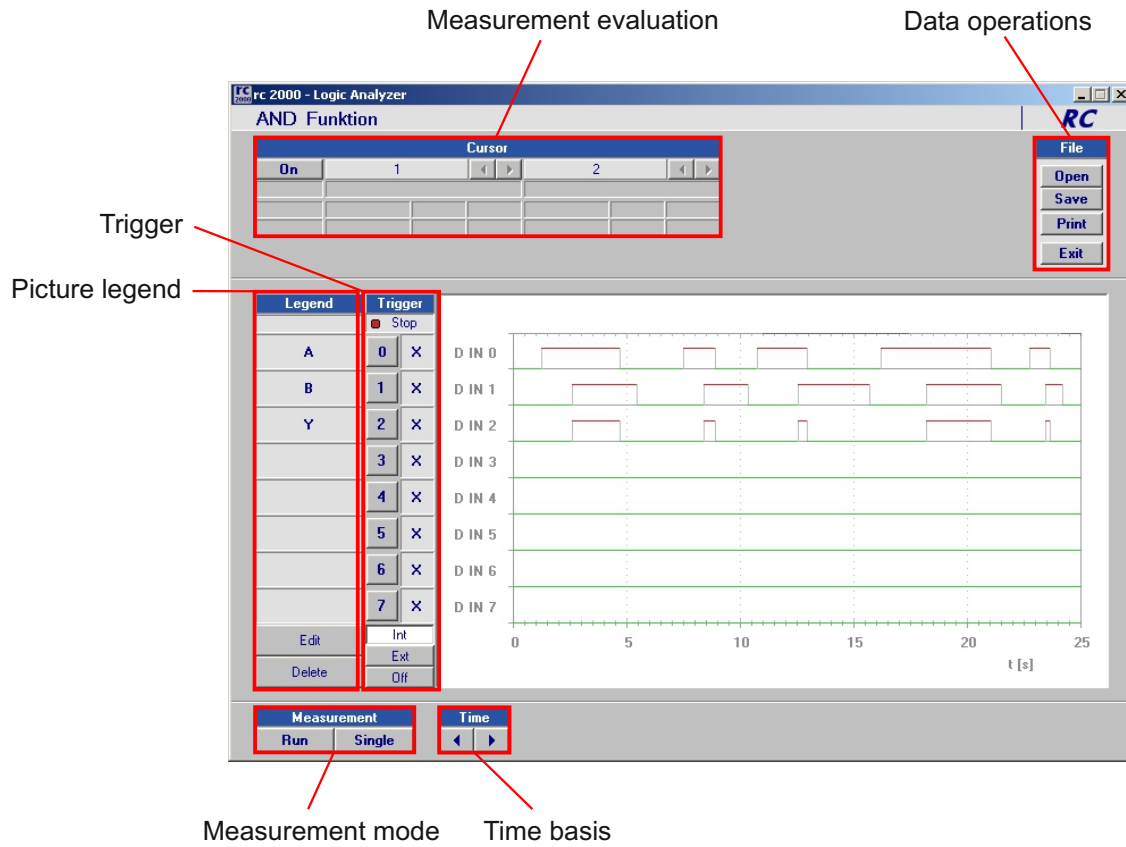


Fig. 18

B) Measurement

- **Exercise**

Check logical function AND (manual data entry)

- **Schema**

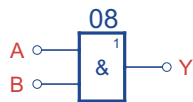


Fig. 19

- **Measurement - real**

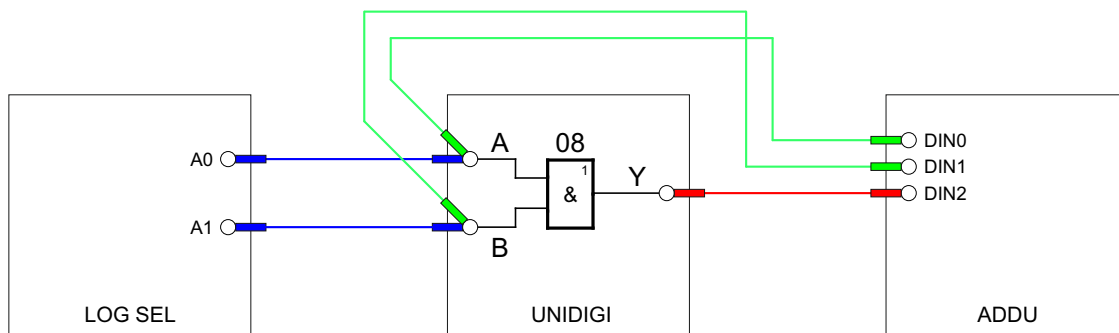
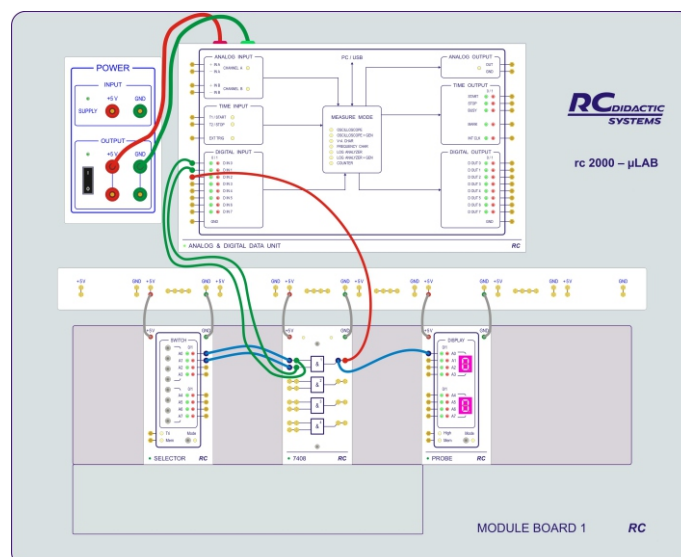


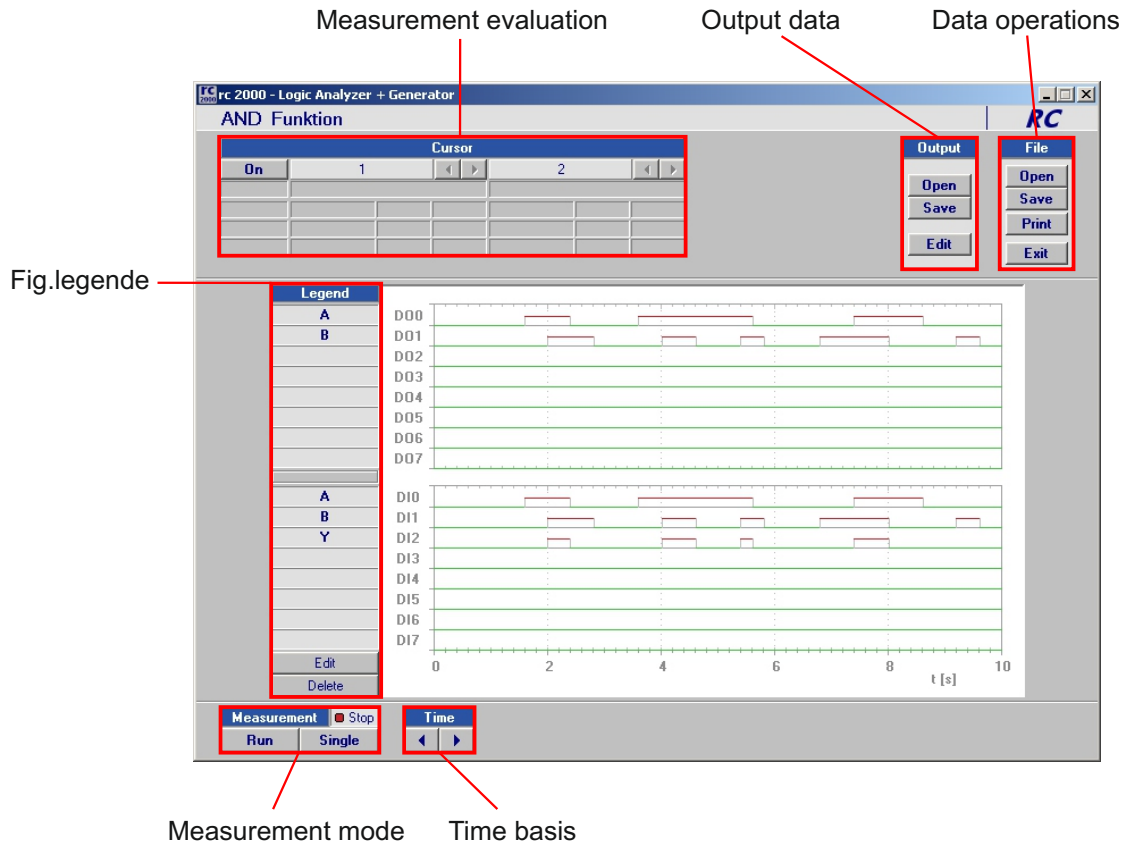
Fig. 20

- **Real Circuit**



Logic Analyzer & Logic Generator

A) Block configuration



B) Measurement

- **Exercise**

Check logical function AND (automatic data entry)

- **Schema**

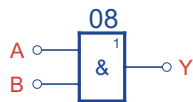
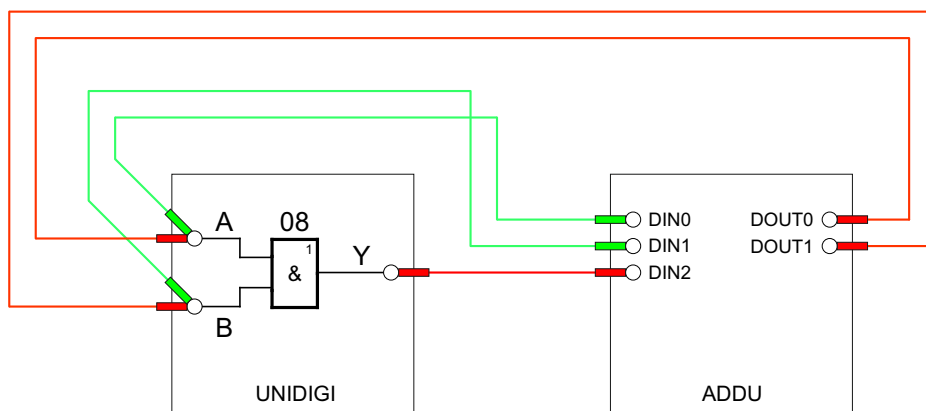


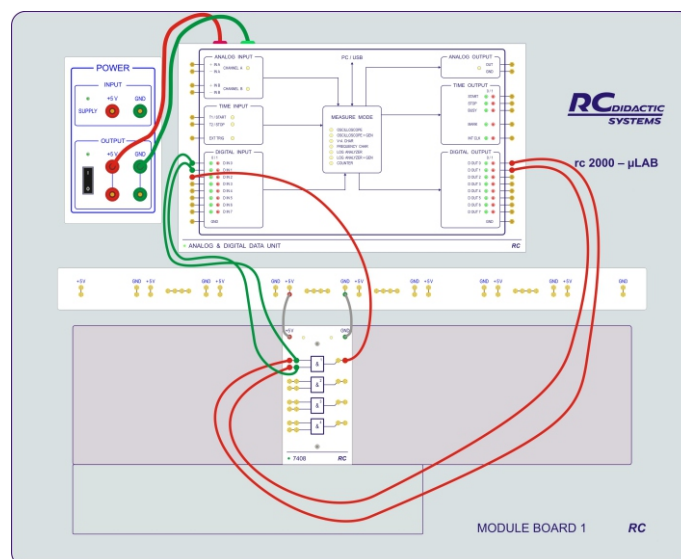
Fig. 22

- **Measurement - real**



- **Real Circuit**

Fig. 23



Two-channel Counter

A) Block configuration

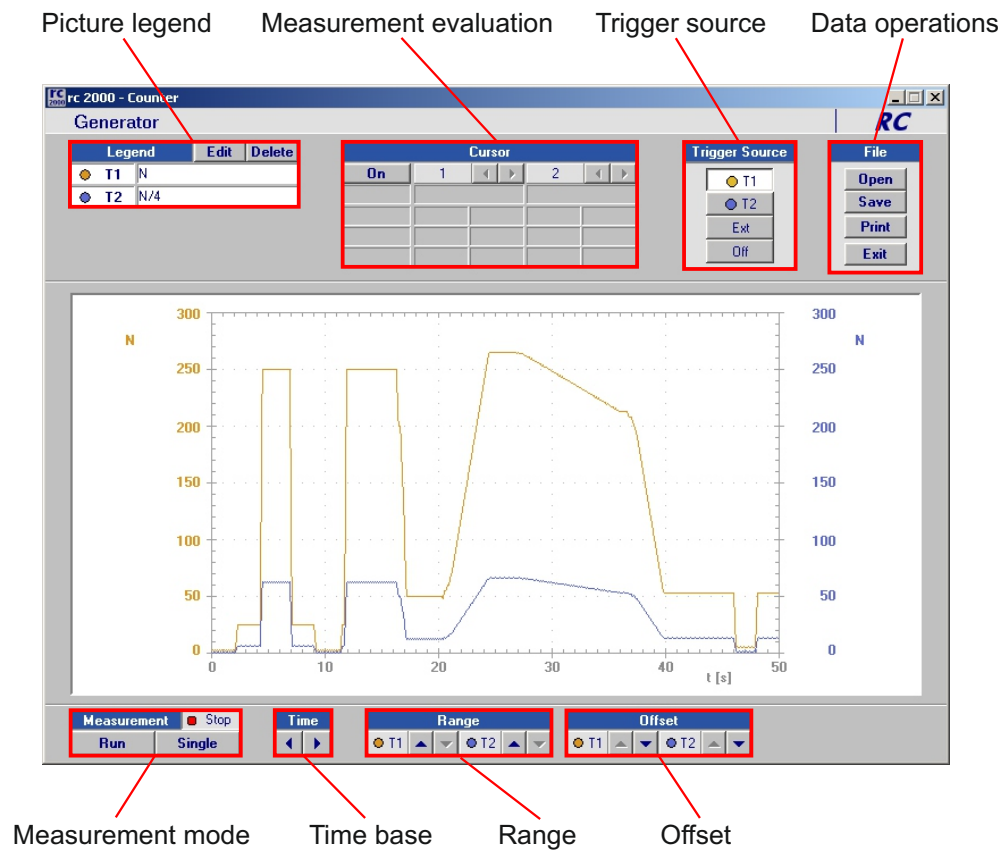


Fig. 24

B) Measurement

• Exercise

Measure two different frequencies with dual channel counter

• Schema

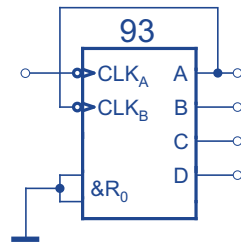


Fig. 25

• Measurement - real

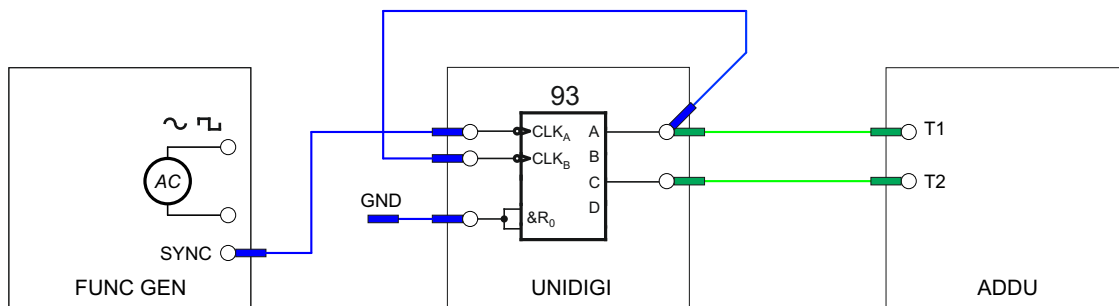


Fig. 26

• Real Circuit

