DEFI-Module **DEFI**



GS Test Module for function tests of external defibrillators in accordance with IEC 60601-2-4

- ☑ graphical display of the discharge plot
- ☑ measuring of pulsed biphasic is possible
- ☑ ECG output over paddles or monitor
- ☑ output of several synchronization signals
- ☑ asynchron-, synchron- and AED testing
- ☑ stop clock function for charge and discharge times

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TÜVRheinland ZERTIFIZIERT
Management System ISO 9001:2015
www.tuv.com ID 0910095181

Technical Data

Measurement through:	50 Ohm	± 1 %
Measurement ranges:	± 700 V	
	± 4000 V	
	0 – 80 A	
	0 – 1000 J	± 1 J or ± 1 % of Value
resolution:	dt = 24 µs	
Synchronisation signal:	sinus, sinus square, triangle, rectangle, trapeze, ISO, ventricular fibrillation (VF), ventricular tachycardia (VT), mains frequency	
pulse with:	0 - 48 ms	± 0,1 ms or ± 2 % of Value
pulse delay:	0 - 100 ms	± 0,1 ms or ± 2 % of Value
at electrode sensor component:	2 mV	± 5 %
at ECG output:	1 - 5 mV	± 5 %
Time Measurement	1 – 1000 sek	± 1 %

Following accessories are included:

1 x GS paddle component with integrated 50 Ohm load resistor
1 x BNC cable

Description of functions:

The GS Test Module DEFI is designed for the functional testing of external defibrillators. The discharged defibrillator energy is measured through a 50 Ohm load resistor and the voltage plot can be displayed graphically. To determine the pulse delay time for ECG-synchronized defibrillation, the module generates a triangular signal with an adjustable amplitude and pulse duration at the ECG output and at the electrode sensor component. The GS Base Unit and the PC-Software are required for testing with this plug-in module.
When used together with the relevant test regulations, DEFI will automatically select the measured values to be tested. In the multimeter mode of operation, however, DEFI performs all measurements directly and displays the measured values.

Principle of testing for defibrillator energy and pulse duration:

The principle of measurement for determination of energy output by a defibrillator involves connecting the defibrillator outputs to a 50 Ohm load resistor and measuring the output current from the voltage drop through this resistor. The energy is calculated as the integral of V^2/50 Ohm under the pulse curve.

As soon as DEFI registers a defibrillator pulse, it samples the signal with a rate of 50 kHz and the PC-Software performs the required signal analysis. The pulse duration is T_P, defined as the time intervall between the 50 % points of the defibrillator voltage curve.

Pulse delay period - generation of ECG pulses:

In synchronous defibrillation, the defibrillator current pulse is triggered by the defibrillator shortly after detection of the R-wave of the ECG. The critical measured value for testing here is the pulse delay period, which is defined as the time difference between the maximum of the R-wave and the maximum value of the defibrillator pulse. As a part of the monitor-synchronous testing function, the system outputs triangular signals of adjustable amplitude and pulse duration at the ECG output of the Testing Module. These outputs are provided via ECG cables to the ECG monitor input of the defibrillator.

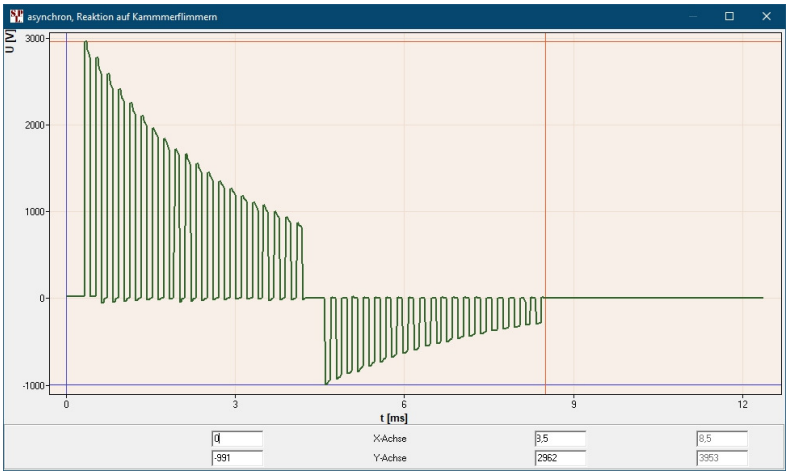
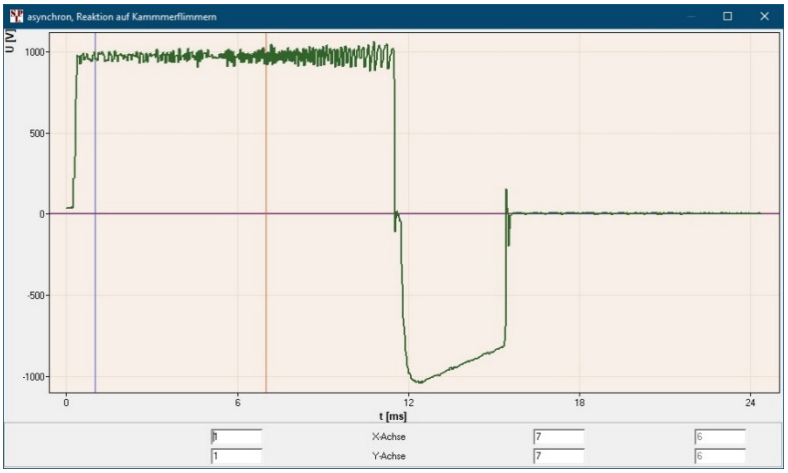
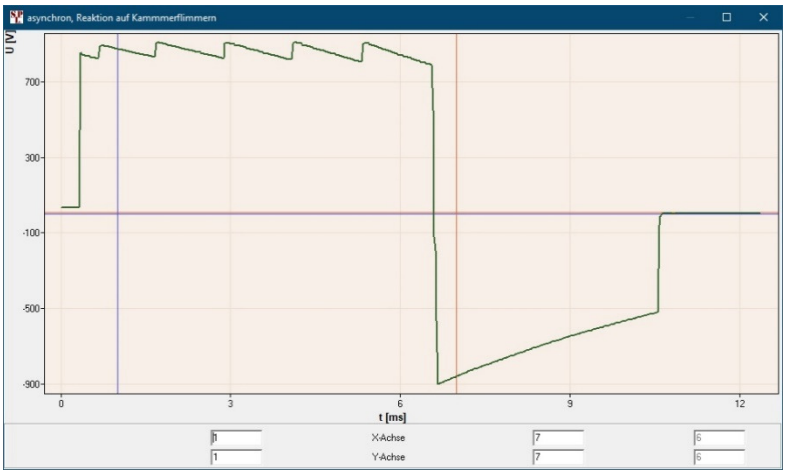
During the paddle-synchronous testing function, the system injects triangular signals with an amplitude of 2 mV and an adjustable pulse duration into the electrode sensor component. These signals may be detected there via the defibrillator electrodes.

(The specified measuring accuracy refers to the measuring element. Technical modifications and errors reserved. 10/2026)

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	discharge plot of Schiller FRED, measured with ACTIMED
	discharge plot of PRIMEDIC HeartSave AED-M, measured with ACTIMED
	discharge plot of ZOLL M, measured with ACTIMED

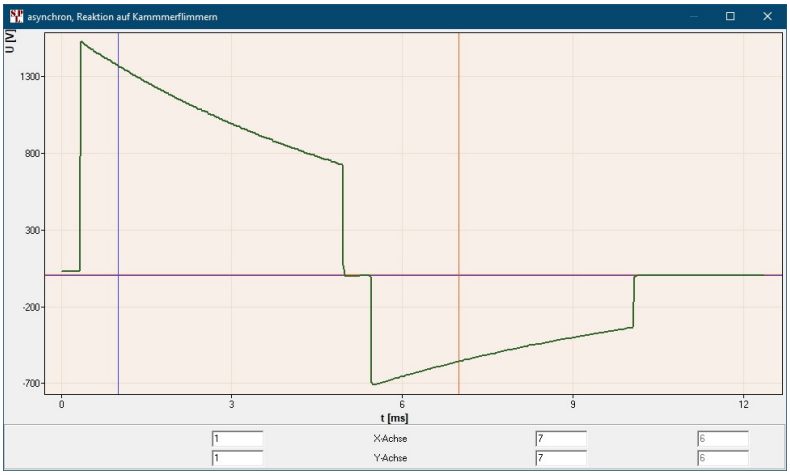
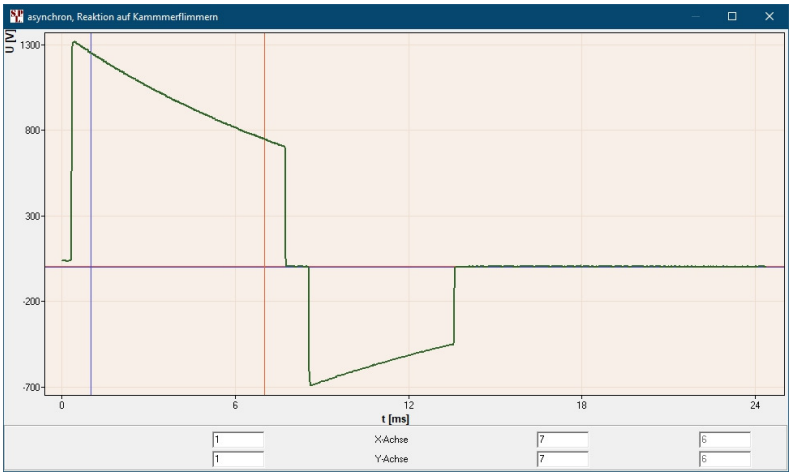
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	discharge plot of Philips, measured with ACTIMED
	discharge plot of LIFEPAK 12, measured with ACTIMED

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