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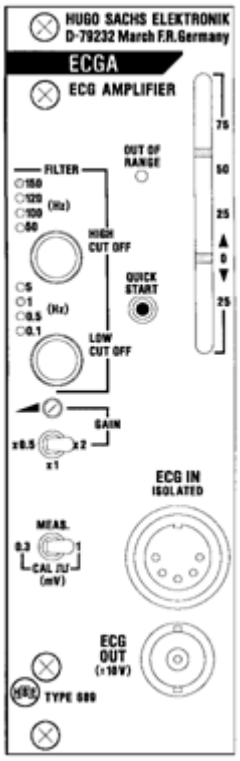
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Bioelectric Signal Amplifier modules

ECGA



ElectroCardioGram Amplifier Module type 689

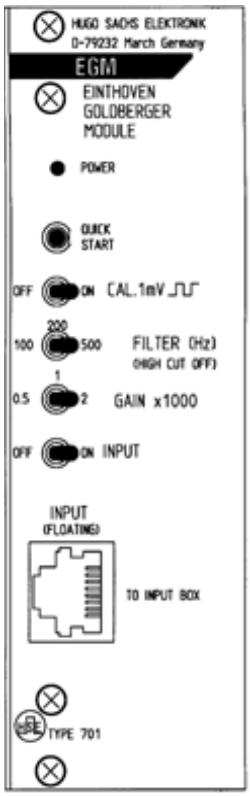
This module is especially designed to amplify ECG signals. A floating input circuit is used to avoid hum and grounding problems. A bargraph display is integrated in the module to visualise the ECG signal. The filters are designed for heart rates up to 1000 beats per minute. The analog ECG signal is available at a BNC connector on the front panel and also internally on the PLUGSYS system bus. Both outputs can be used for recording on a chart recorder or for data acquisition. A square-wave signal generator with amplitudes of 0.3mV and 1 mV is incorporated for calibration.

Description

Input	floating differential input, isolated barrier internally clamped to 300V, with protection against static discharges and 10 kHz input filter for h.f. suppression
Input connector	5-pin Binder socket with screw lock. The pin connections correspond to those of the standard 3-pin ECG input cable
Input impedance	10 000 MOhm
Common mode rejection	106 dB
Filters	Low-pass filter (HIGH CUT OFF) 150Hz, 120Hz, 100Hz, 50Hz High-pass filter (LOW CUT OFF) 5Hz, 1 Hz, 0.5Hz, 0.1 Hz
Filter indication	by green LEDs on the front panel
Gain	“GAIN” trimmer set to maximum in position x0.5 5000 in position x1 10000 in position x2 20000 “GAIN” trimmer set to minimum in position x0.5 1000 in position x1 2000

	in position x2 4000
Display	Bargraph 0.75 V/LED
Output	BNC connector on the front panel (±10 V), the output voltage is also available on the PLUGSYS bus
Calibration	square-wave signal generator with amplitudes of 0.3 mV and 1 mV
Recorder output	The internal output is connected to the bus system via jumpers. The ECG signal is connected to the recorder via a Recorder Output Module ROM. It is also possible to connect a recorder directly to the BNC connector “ECG OUT” at the front panel
Quick start	for rapid discharge of the coupling capacitors by pressing the QUICK START key
Power supply	5 V/600 mA, through connector from PLUGSYS bus system
Dimensions	module for PLUGSYS system, width 8E (40.5 mm), height 3U (128.7 mm), depth Europe size (220 mm)
Connector	DIN 41612, 96-pin VG
Weight	400 g

EGM



Einthoven Goldberger Module type 701

The EGM module Type 701 is used for capturing and amplifying ECG signals after Einthoven and Goldberger. It is connected to 4 electrodes. This module has isolated input amplifiers in order to avoid hum interference. In this way the inputs are isolated electrically from the output circuits and from the housing. The 6 output voltages of the different leads can be switched through jumpers to the PLUGSYS system bus. From the system bus they can be picked off by a ROM module (Recorder Output Module, e.g. ROM-DL) for direct recording or for data acquisition by computer.

Inputs leads:	Output signals: Bipolar Einthoven extremity leads:	Output signals: Unipolar Goldberger extremity leads:
RA right arm LA left arm LF left foot RF right foot (reference)	I LA(+) - RA(-) II LF(+) - RA(-) III LF(+) - LA(-)	aVR RA(+) - (LA+LF)/2(-) aVL LA(+) - (RA+LF)/2(-) aVF LF(+) - (RA+LF)/2(-)

In addition the CTP (Central Terminal Point) signal is available at the multi-pin socket. This signal is required when using the Wilson Lead Amplifier (WLA) PLUGSYS module Type 702. It is used as reference for the Wilson unipolar chest leads (V1 - V6).

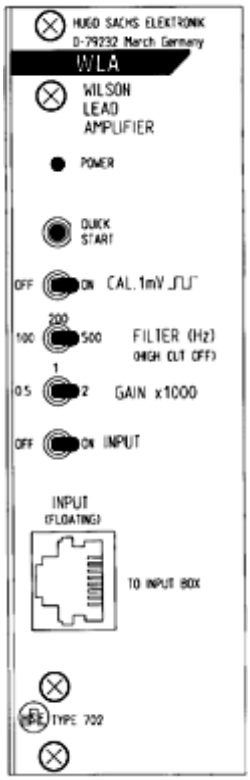
Description

ECG leads	bipolar extremity leads I, II and III after Einthoven as well as unipolar extremity leads aVR, aVL and aVF after Goldberger
ECG input	the 4-way inputs cable must be connected as follows: RA (right arm), LA (left arm), LF (left foot), RF (right foot)
Input circuit	isolated input circuit (floating input), isolating voltage 200 V DC max.
Input impedance	10 MOhm
Filter	low-pass filter 100 Hz, 200 Hz and 500 Hz high-pass filter 0.1 Hz, fixed
Gain	setting x0.5: 500 setting x1: 1000 setting x2: 2000
Calibration	square-wave signal 1 mV 2 Hz (120/min). The calibration signal is activated with a switch.
Recorder outputs	the outputs of the 6 ECG leads are linked by jumpers to the PLUGSYS bus system. The link to the recorder is provided by a Recorder Output Module (ROM) installed in the PLUGSYS system.
Supply	5 V 1.2 mA from the PLUGSYS system bus
Dimensions	module for the PLUGSYS housing, width: 8 E (40.8 mm), height: 3 U (128.7 mm) , depth: Eurocard (220 mm)
Connector	96-pin VG connector to DIN 41612, 8-pin RJ-45
Weight	430 g
Input cable	(order separately) 4-way ECG input cable with needles, or 4-way ECG input cable with banana plugs, or input box with 4 + 6 inputs for the simultaneous use of WLA module Type 702 for 6 unipolar Wilson chest leads (V1 - V6)

WLA

Wilson Lead Amplifier Module type 702

The WLA module Type 702 is used for capturing and amplifying unipolar ECG chest lead potentials after Wilson. Up to 6 chest electrodes (V1 to V6) can be connected.
IMPORTANT: correct recording of the Wilson unipolar chest electrode potentials requires the central reference signal (Central Terminal Point, CTP) which is formed from the bipolar extremity leads after Einthoven. Using the WLA therefore requires the EGM module Type 701 which provides the CTP signal. The necessary link between the two modules is provided by the input box.
The WLA module has isolated input amplifiers in order to avoid hum interference. In this way the inputs are isolated electrically from the output circuits and from the housing.
The 6 output voltages of the different chest leads can be switched through jumpers to the PLUGSYS system bus. From the system bus they can be picked off by a ROM module (Recorder Output Module, e.g. ROM-DL) for direct recording or for data acquisition by computer.
A square-wave calibration generator with a 1 mV amplitude is incorporated for calibrating the amplitudes.
Input leads: V1, V2, V3, V4, V5, V6 and CTP
CTP = Central Terminal Point = reference signal (additional output on the EGM module Type 701)



Description

ECG leads	6 unipolar chest leads after Wilson; V1 to V6
Input circuit	isolated input circuit (floating input), isolating voltage 200 V DC max.
Input impedance	10 MOhm
Filter	low-pass filter: 100 Hz, 200 Hz and 500 Hz high-pass filter: 0.1 Hz, fixed
Gain	setting x0.5: 500 setting x1: 1000 setting x2: 2000
Calibration	square-wave signal 1 mV 2 Hz (120/min). The calibration signal is activated with a switch.
Recording outputs	the output signals of the 6 ECG leads are linked by jumpers to the PLUGSYS bus system. The link to the recorder is provided by a Recorder Output Module (ROM) installed in the PLUGSYS system.
Supply	5 V 1.2 mA from the PLUGSYS system bus
Dimensions	module for the PLUGSYS housing, width: 8 E (40.8 mm), height: 3 U (128.7 mm), depth: Eurocard (220 mm)
Connector	96-pin VG connector to DIN 41612
Weight	430 g

Input box	(order separately) input box with 4 + 6 inputs for simultaneous use of the WLA module Type 702 and an EGM module Type 701 for 4 bipolar Einthoven extremity leads (I, II, III) and Goldberger unipolar extremity leads (aVR, aVL, aVF) with the necessary internal link for the CTP.

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