



FRANKONIA

EMC Test-Systems GmbH

ECU-6G DATASHEET

EMC TEST AND CONTROL UNIT



Features:

- ✓ Radiated immunity tests according to IEC 61000-4-3, ISO 11452-2 and MIL-STD 461, RS10
- ✓ Conducted immunity test according to IEC/EN 61000-4-6, 10 kHz – 230 MHz
- ✓ BCI-testing according to ISO 11452-4 and MIL-STD 461, CS114
- ✓ Automatic switching between up to three external power amplifiers and connected coupling units / antennas
- ✓ Automatic switching between up to two EMI-receivers, spectrum analysers and three different antennas
- ✓ Easy integration into any control software by dll-driver
- ✓ Integrated interlock safety system

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DESCRIPTION

The ECU-6G is a central EMC test and control unit, which combines in just one compact box many major test components like signal generator, power meter, directional couplers and relay switching unit, which are needed for EMC tests. That reduces the cabling work and possible cabling mistakes to a minimum.

Furthermore, it includes general functions like EUT-monitoring and an interlock safety-system. With all the functions described above, the ECU-6G is a real all-rounder, which can be used for many different conducted and radiated immunity tests as well as control unit to switch between EMI-receiver and spectrum analyzer and different measuring antennas without time consuming cabling work.

It allows to control and to switch automatically between up to three external amplifiers, all connected to the ECU-6G and up to three different outputs for antennas or coupling devices (CDNs, EM-coupling clamp, BCI-clamps).

The integrated signal generator is available to cover the frequency range from 8 kHz to 6 GHz. Amplitude modulation is available with a modulation rate of 10 Hz to 20 kHz and a modulation depth of 0 % to 95 %.

Pulse modulation can be switched on with a repetition frequency of 0.1 Hz to 100 kHz and a duty cycle of 1 % - 99 %. In a word, it includes all requirements according to present EMC standards and it is best prepared for possible future changes.

TECHN. SPECIFICATIONS	SIGNAL GENERATOR
Output	50 Ω , SMA femal
Output (Relay 1:3)	3x SMA female
Frequency range	8 kHz – 6.2 GHz
Frequency resolution	0.001 Hz
Output level rang	-65dBm – +13 dBm
Output level accuracy	± 1 dBm
Accuracy (frequency)	± 0.5 ppm
Harmonics	< -30 dBc
Non harmonics	< - 60 dBc



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TECHN. SPECIFICATIONS	AMPLITUDE MODULATION	
Modulation rate	10 Hz to 20 kHz, resolution	
Modulation depth	0.1 Hz 0 to 95%, resolution 1%	
Modulation Accuracy	±5% (typ.)	
Modulation Distortion	±3% (typ.)	
Modulation waveforms	Sine, Triangle	
TECHN. SPECIFICATIONS	PULSE MODULATION	
On/Off ratio	70 dB	
Pulse Width	1µs to 10s	
External Modulation Connector	BNC female	
TECHN. SPECIFICATIONS	FREQUENCY MODULATION	
Deviation	0 Hz to 800 kHz	
Distortion	±1% (typ.)	
TECHN. SPECIFICATIONS	RF-POWER-METER	
Number of Channels	max. 7 1....6: SMA female	
Connectors	Ch 7:(RF-In): N female	
Frequency Range	LF-Module: 10 kHz to 500 MHz	RF-Module: 100 kHz to 6 GHz
Max. input power	27 dBm (500mW)	
Measuring Range	-60 ... +20 dBm (10kHz...4GHz)	-45 ... +20 dBm (4...6GHz)
Accuracy	±0.5 dB typical, ±1 dB maximum	
Resolution	0.1 dB	
VSWR	LF-Module: 10 kHz – 500 MHz	1:1.25
	RF-Module: 2 – 4 GHz	1:1.25
	4 – 6 GHz	1:1.35



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TECHN. SPECIFICATIONS	DIRECTIONAL COUPLER
	Coupling attenuation and frequency range depends on the installed type.
TECHN. SPECIFICATIONS	RF-RELAY SWITCHING UNIT
Max. power 8 kHz to 100 MHz	2000 W
Max. power 100 MHz to 600 MHz	1000 W
Max. power 600 MHz to 1 GHz	600 W
Max. power 1 to 3 GHz	400 W
Max. power 3 to 6 GHz	300 W
TECHN. SPECIFICATIONS	EUT-MONITOR INPUT
Input voltage (2x)	0 to 10 V
Resolution	2.5 mV
Input resistance	< 1k Ω
Connector	BNC female
TECHN. SPECIFICATIONS	EUT-FAILED INPUT
Connector	BNC female, optical decoupled
Signal	3.3/5V TTL/CMOS
Input Resistance	2.2 k Ω
TECHN. SPECIFICATIONS	INTERLOCK
Connector	BNC female
Closed with Connection	< 1k Ω
TECHN. SPECIFICATIONS	TEMPERATURE MEASUREMENT
Connector	SMB female
Temperature Sensor	PT1000
Measurement Range	5 ... 100°C



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TECHN. SPECIFICATIONS	USER PORT
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Connector	Sub-D 9 pol female
Output Type	4x Open Collector (optical decoupled)
Maximum Voltage/Current	50V / 50mA
Saturation Voltage	< 1V typical

TECHN. SPECIFICATIONS	REMOTE CONTROL
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Language	SCPI
USB	USB-B, Type: Emulated COM-Port
LAN	RJ45 (10/100 Mbit), Protocol: TCP/IP
GPIB / IEEE488	24 pol Centronics 3x USB-A for EUT-Monitoring or other Control Device

TECHN. SPECIFICATIONS	DISPLAY
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Type	OLED Yellow
Resolution	128x64 Points

TECHN. SPECIFICATIONS	GENERAL DATA
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Operating Temperature	5 ... 40 °C
Dimensions (WxHxD) in mm	449 x 177 x 580
Weight	18 kg
Power Input	100..240 VAC, 50/60 Hz, 130VA



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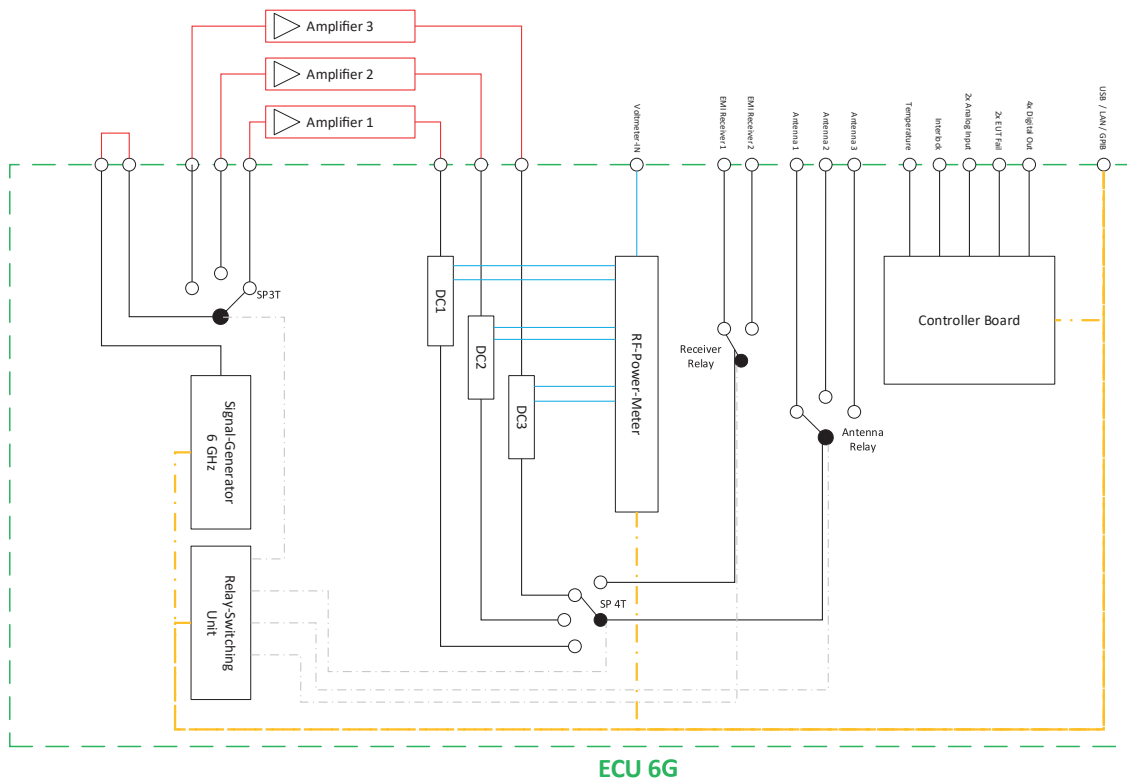
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FRANKONIA
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BLOCK DIAGRAMM



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TECHN. SPECIFICATIONS	USER PORT
-----------------------	-----------

Connector	Sub-D 9 pol female
Output Type	4x Open Collector (optical decoupled)
Maximum Voltage/Current	50V / 50mA
Saturation Voltage	< 1V typical

TECHN. SPECIFICATIONS	REMOTE CONTROL
-----------------------	----------------

Language	SCPI
USB	USB-B, Type: Emulated COM-Port
LAN	RJ45 (10/100 Mbit), Protocol: TCP/IP
GPIB / IEEE488	24 pol Centronics 3x USB-A for EUT-Monitoring or other Control Device

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PART NUMBER

PART NO.	PART	DESCRIPTION	BUILD IN
300001	ECU-6	Compact EMC-Conotrol-Unit, 9kHz – 6GHz	
301001	ECU-PM1	2-channel powermeter, 10kHz – 500MHz	✓
301002	ECU-PM2	2-channel powermeter, 100kHz – 6GHz	✓
301003	ECU-PM1A	1-channel powermeter, RF-voltage	✓
301004	ECU-REC	Option: Switching of 2 EMI receivers	✓
301005	ECU-OUT2	Option: 2 switchable antenna outputs	✓
301006	ECU-OUT3	Option: 3 switchable antenna outputs	✓
301007	ECU-120dBm	Option: Signal output from -120dBm	✓
301009	ECU-PH	Option: Input for phase modulation	✓
301010	ECU-DC1B	Directional Coupler, 10kHz-400MHz, 30dB, 100W	✓
301011	ECU-DC1C	Directional Coupler, 10kHz-400MHz, 40dB, 500W	✓
301012	ECU-DC2	Directional Coupler, 80MHz-1GHz, 50dB, 1000W	✓
301013	ECU-DC9	Directional Coupler, 1GHz-6GHz, 40dB, 500W	✓

SAMPLE CONFIGURATION FOR A SYSTEM FROM 80MHZ TO 6GHZ:

PART NO.	PART	DESCRIPTION	QTY.	INFORMATION
300001	ECU-6	Compact EMC-Conotrol-Unit, 9kHz – 6GHz	01	Basic device
301002	ECU-PM2	2-channel powermeter, 100kHz – 6GHz	02	1 powermeter from 80MHz to 1GHz 1 powermeter from 1GHz to 6GHz
301012	ECU-DC2	Directional Coupler, 80MHz-1GHz, 50dB, 1000W	01	DC for 80MHz to 1GHz
301013	ECU-DC9	Directional Coupler, 1GHz-6GHz, 40dB, 500W	01	DC for 1GHz to 6GHz



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