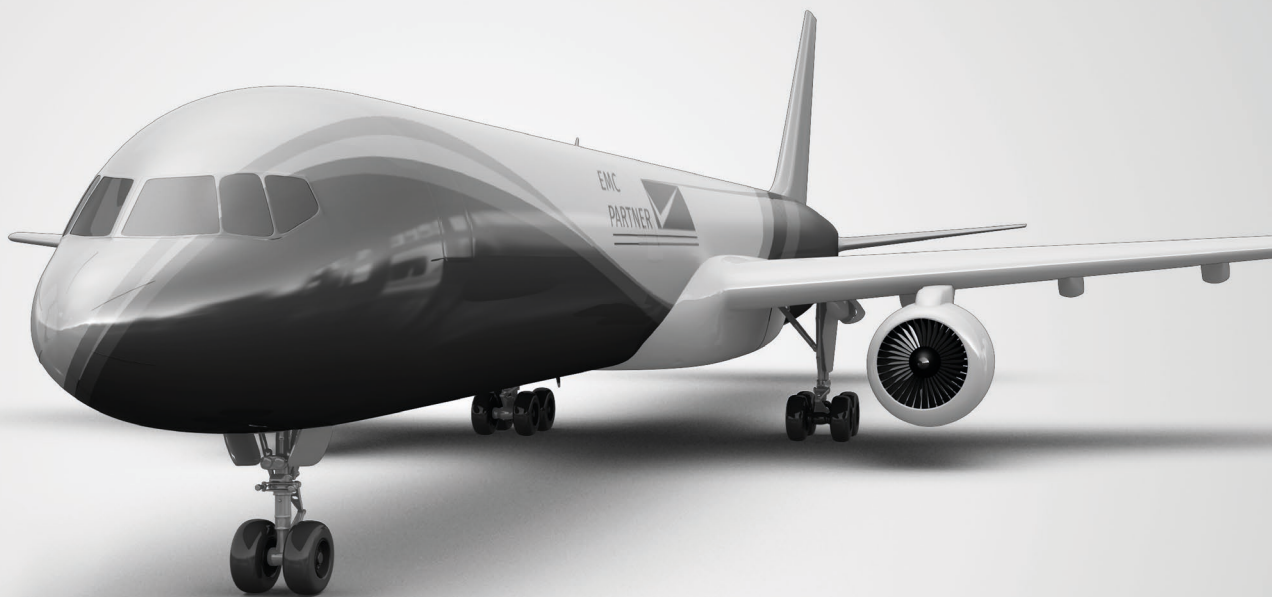


DO-160 & MIL-STD-461G

# Indirect Lightning Testing

## MIG series





This document has been optimized for electronic media



Smart navigation through technical specifications. Click the green links.



### Accredited Calibration

Quality at EMC PARTNER is based on an ISO 9001 management system. This is the foundation for an ISO 17025 accreditation verified by the Swiss Calibration Service (SCS). SCS No. 146 is the accreditation number of EMC PARTNER AG. Locally accredited but recognized worldwide through affiliation with the ILAC organisation



WHEN GETTING RESULTS MATTERS

## THERE IS STILL ONLY ONE CHOICE

Military and avionic testing is all about quality and reliability. The EMC PARTNER full scale lightning test system fulfils these requirements.

A flexible solution that includes:

- › MIL-STD-461G: CS117, internal & external equipment test levels
- › RTCA DO-160: SECTION 22, Level 1 to 5
- › EUROCAE ED-14: SECTION 22, Level 1 to 5
- › OEM proprietary requirements based on DO-160 SECTION 22

Providing world-class solutions to major aircraft OEMs and tier 1 suppliers for over 20 years.

# FULL SCALE SOLUTION

The first commercially available system to integrate all DO-160 waveforms.  
A system that has grown to meet new and evolving market requirements.



## WF2, 3 & 6 System

### MIG-OS-MB + MIG-OS-MB-EXT

- PIN Injection
- Single Stroke
- Multiple Stroke
- Multiple Burst

### CN-MIG-BT3 & CN-MIG-BT5

- Cable Bundle

## WF1, 4, 5A & 5B System

### MIG 0600 MS + MIG 0618SS

- PIN Injection
- Single Stroke
- Multiple Stroke

### CN-GI-CI & CN-GI-CI-V

- Cable Bundle
- Ground Injection

## Included Benefits

<b>Reliable</b>	keeps on going during long test phases
<b>Precise</b>	delivers the same pulse repeatedly
<b>Stable</b>	a tried and trusted solution used at over 100 locations worldwide
<b>Polarity</b>	change polarity by electronic switching
<b>Flexible</b>	meet many requirements through a big range of accessories
<b>Automated</b>	save and repeat test routines

# AVAILABLE CIRCUITS

Full scale indirect test system includes all waveforms for RTCA DO-160: Section 22 and MIL-STD-461G: CS117 testing. The basic system can be easily extended to meet OEM specific requirements.



## Waveform 1 (6.4/69 $\mu$ s)

MIL-STD-461 / CS117

### Current Impulse

- › Cable Bundle Single Stroke
- › Cable Bundle Multiple Stroke



## Waveform 2 (0.1 and 0.3/6.4 $\mu$ s)

RTCA DO-160 / S.22

### Voltage Impulse

- › Cable Bundle Single Stroke
- › Cable Bundle Multiple Stroke



## Waveform 3 (1MHz & 10MHz)

RTCA DO-160 / S.22

### Voltage & Current Impulse

- › PIN injection
- › Cable Bundle Single Stroke
- › Cable Bundle Multiple Stroke
- › Cable Bundle Multiple Burst



## Waveform 4 (6.4/69 $\mu$ s)

RTCA DO-160 / S.22

### Voltage Impulse

- › PIN Injection
- › Ground Injection Single Stroke
- › Ground Injection Multiple Stroke



## Waveform 5A (40/120 $\mu$ s)

RTCA DO-160 / S.22

### Current Impulse

- › PIN Injection
- › Cable Bundle Single Stroke
- › Cable Bundle Multiple Stroke



## Waveform 5B (50/500 $\mu$ s)

RTCA DO-160 / S.22

### Current Impulse

- › PIN Injection
- › Cable Bundle Single Stroke
- › Cable Bundle Multiple Stroke

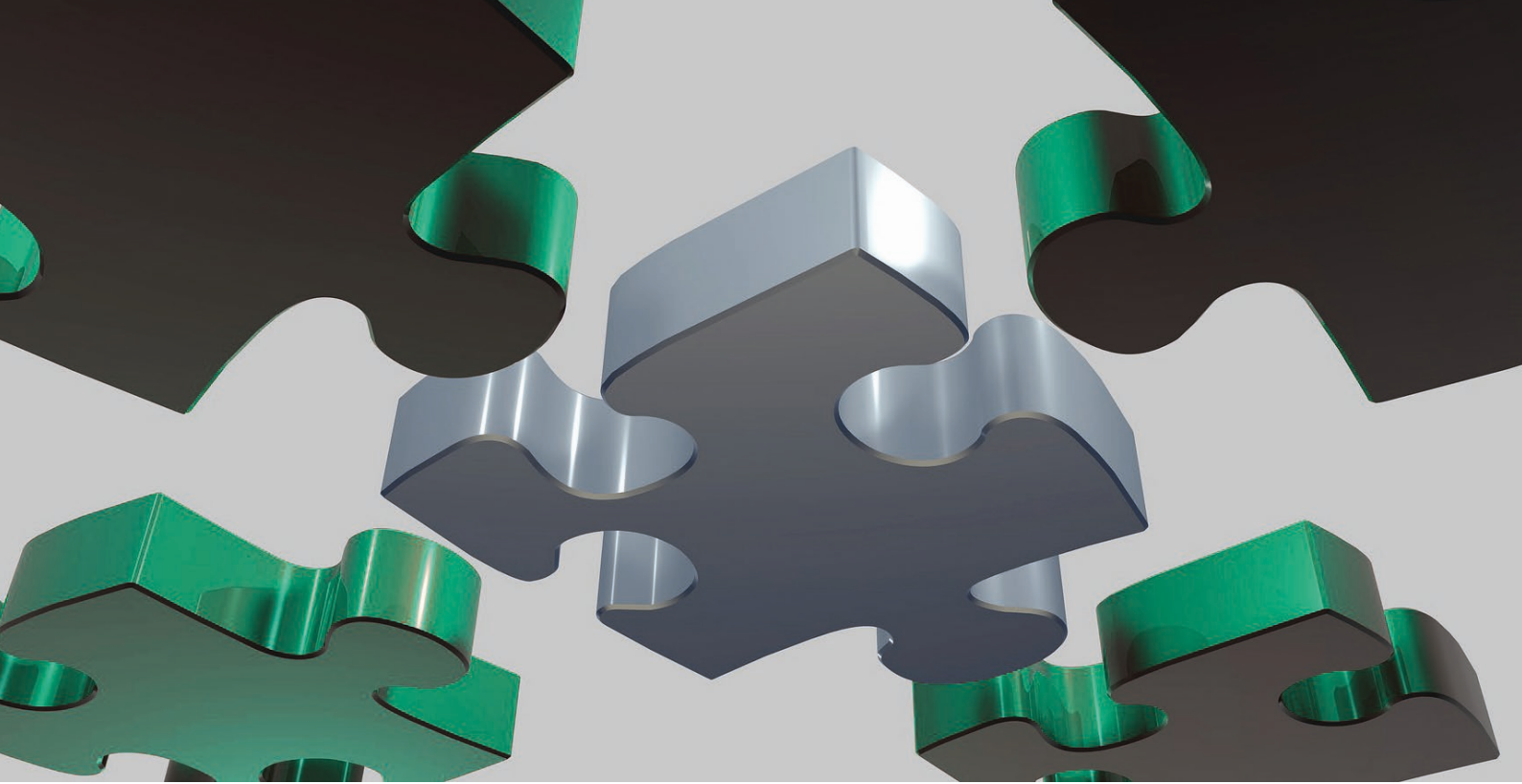


## Waveform 6 (0.25/4 $\mu$ s)

RTCA DO-160 / S.22

### Current Impulse

- › Cable Bundle Multiple Burst



## UNIQUE FEATURES

Tried and trusted technology developed in partnership with industry. Latest generation, solid state, precise technology.

### Easy upgrade



Add functionality without system downtime.

### Synchronization



PIN injection pulses synchronized to AC power

### Special couplers



Customized for specific tests for other avionic applications.

### Customizable patterns



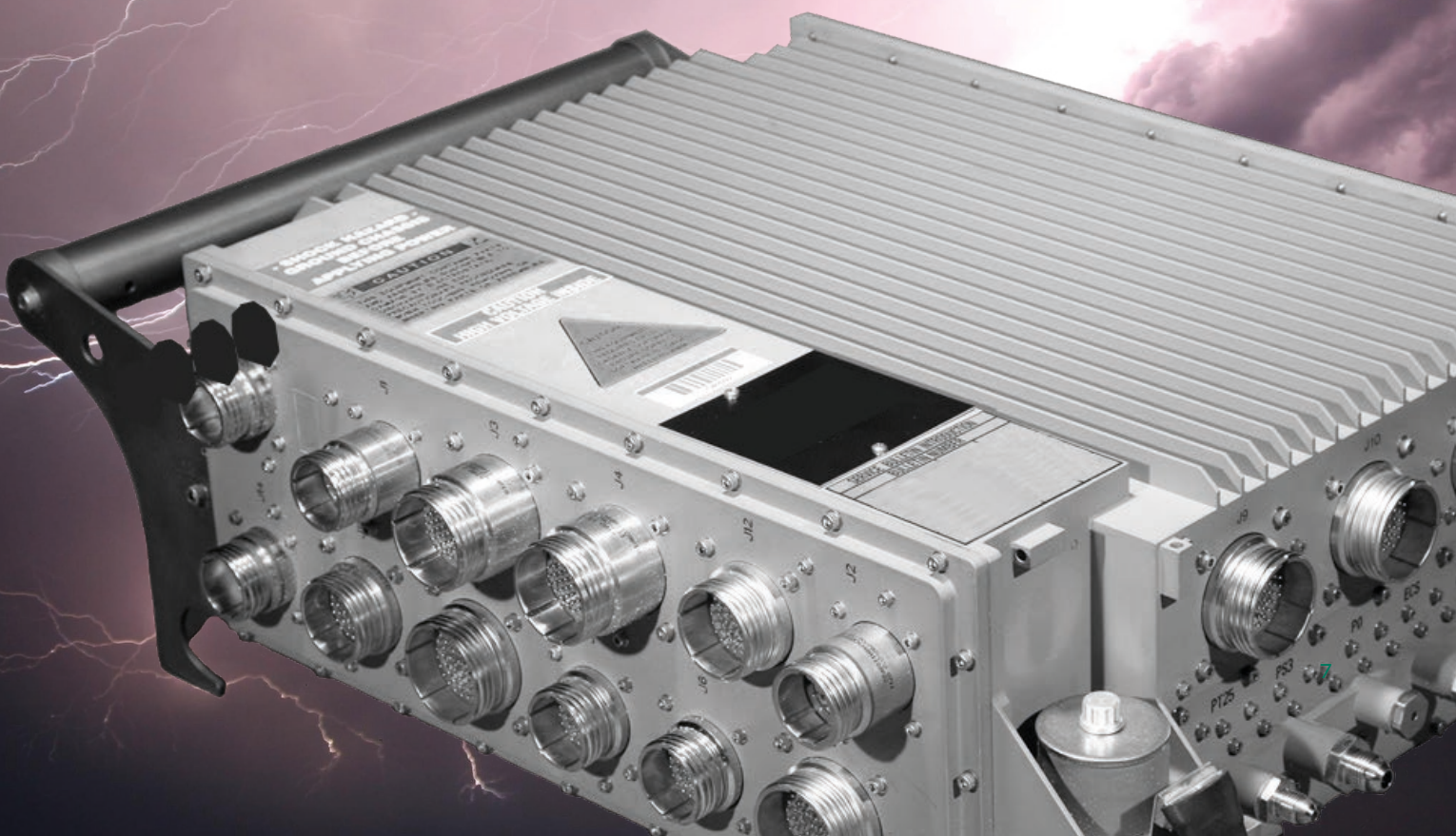
Multiple Stroke & Burst patterns freely programmable in the generator or using the pattern upload software.

# OEM SPECIFIC & SPECIAL APPLICATIONS

Many years working with the avionics industry has taught us one thing. Flexibility is the key to success. EMC PARTNER's ability to extend and customize the standard system is legendary.

Some OEMs require testing with fixed impedance waveforms, even for cable bundle. The EMC PARTNER system is flexible enough to offer this capability with external couplers.

Special application requests are nothing new to EMC PARTNER. One example is the solution for large diameter cables that can only pass once through a coupler. Applicable for voltage and current waveforms, this unique set of couplers can be used for waveforms 1, 4, 5A and 5B.



# Other systems for indirect lightning

- DO 160 SECTION 22 LEVEL 3
- MIL-STD-461 CS117 INTERNAL EQUIPMENT TEST LEVELS
- COMPACT SOLUTION
- BUILT ON EXPERIENCE

[WWW.EMC-PARTNER.COM/AVI](http://WWW.EMC-PARTNER.COM/AVI)



# Technical Specifications

# DO-160 G SECTION 22 AND MIL-STD-461 G CS117 CONFIGURABLE TEST SYSTEM FOR ALL TEST LEVELS

Test equipment	DO-160G Section 22	MIL-STD-461G CS117	Airbus, Boeing, other
<b>Generators*</b>			
MIG0600MS	✓	✓	✓
MIG0618SS	✓		✓
MIG-OS-MB	✓	✓	✓
<b>Accessories</b>			
MIG-OS-MB-EXT	✓	✓	✓
NW-WF2-FS	✓	✓	✓
NW-WF2-SS	✓	✓	✓
NW-WF3-1M-FS	✓	✓	✓
NW-WF3-1M-SS	✓	✓	✓
NW-WF3-10M-FS	✓	✓	✓
NW-WF3-10M-SS	✓	✓	✓
NW-WF6H-MB	✓	✓	✓
Custom plugins, NWs			available, send inquiry
LISN-5U-32	✓	✓	✓
SHUNT0E1	✓	✓	✓
V-PROBE-PHV	✓	✓	✓
V-PROBE-SI	✓	✓	✓
I-PROBE-MB-P1	✓	✓	✓
I-PROBE-MS	✓	✓	✓
NW-MS-LEVEL1	✓	optional	✓
SYNC-ADAPTER	✓		✓
CN-MIG-TT	✓		✓
AC-DC-DECOUPLER2	✓		✓
AC-DC-DEC Level 4&5	✓		✓
CDN-BDBC	✓		✓
RACK-36HE-MB	✓	✓	✓
<b>Coupling devices</b>			
CN-MIG-BT3	✓	✓	✓
CN-MIG-BT5	✓	✓	✓
CN-GI-CI	✓	✓	✓
CN-GI-CI-V	recommended	✓	✓
CN-CI-I1	optional	optional	optional
CN-CI-V1	optional	optional	optional
CN-WF5A1500	optional	optional	optional
CN-WF5A2000	optional	optional	optional
<b>Software</b> one TEMA license per generator required			
TEMA	✓	✓	✓
TEMA EXT-MEASURE	✓	✓	✓
OPTICAL LINK	✓	✓	✓

\* Generators require couplers and accessories as indicated, in order to meet the requirements.

# GENERATORS LEVEL 5 AND HIGHER

## 1. MIG0600MS

### MIG0600MS circuit: WF1 cable induction

Standards	DO-160G S22, MIL-STD-461G CS117, other
Coupling mode	Cable Induction (CI)
Current waveform WF1	6.4 $\mu\text{s} \pm 20\%$ / 69 $\mu\text{s} \pm 20\%$
Test level	specified at coupler output
Test level single stroke	20 A – 1800 A (up to 3200 A can be applied)
Test level multiple stroke	40 A – 1800 A (first stroke) 20 A – 900 A (subsequent stroke)
Requires	CN-GI-CI

### MIG0600MS circuit: WF4, pin injection

Standards	DO-160G S22, other
Coupling mode	pin injection / direct application
Output impedance	5 $\Omega$
Voltage, current WF4	6.4 $\mu\text{s} \pm 20\%$ / 69 $\mu\text{s} \pm 20\%$
Test level	specified at application point
Test level single stroke	70 V – 1700 V
Synchronization	automatic on power peak (SYNC-ADAPTER)

### MIG0600MS circuit: WF4 cable induction

Standards	DO-160G S22, MIL-STD-461G CS117, other
Coupling mode	Cable Induction (CI)
Voltage waveform WF4	6.4 $\mu\text{s} \pm 20\%$ / 69 $\mu\text{s} \pm 20\%$
Test level	specified at coupler output
Test level single stroke	25 V – 1600 V
Test level multiple stroke	25 V – 750 V (first stroke) 12.5 V – 190 V (subsequent stroke)
Requires	CN-GI-CI-V

### MIG0600MS circuit: WF4 ground injection

Standards	DO-160G S22, other
Coupling mode	Ground Injection (GI)
Voltage waveform WF4	6.4 $\mu\text{s} \pm 20\%$ / 69 $\mu\text{s} \pm 20\%$
Test level	specified at application point
Test level single stroke	25 V – 1700 V
Test level multiple stroke	25 V – 800 V (first stroke) 12.5 V – 400 V (subsequent stroke)
EUT max. power	230 V / 32 A @ 50/60 Hz
Requires	CN-GI-CI-V

### MIG0600MS circuit: WF5A, pin injection

Standards	DO-160G S22, other
Coupling mode	pin injection / direct application
Output impedance	1 $\Omega$
Voltage, current WF5A	40 $\mu\text{s} \pm 20\%$ / 120 $\mu\text{s} \pm 20\%$
Test level	specified at application point
Test level single stroke	50 V – 1600 V ( 50 A – 1600 A)
Synchronization	automatic on power peak

### MIG0600MS circuit: WF5A cable induction

Standards	DO-160G S22, MIL-STD-461G CS117, other
Coupling mode	Cable Induction (CI)
Current waveform WF5A	40 $\mu\text{s} \pm 20\%$ / 120 $\mu\text{s} \pm 20\%$
Test level	specified at coupler output
Test level single stroke	60 A – 5000 A
Test level multiple stroke	60 A – 2000 A (first stroke) 30 A – 1000 A (subsequent stroke)
Requires	CN-GI-CI

### MIG0600MS circuit: WF5A ground injection

Standards	DO-160G S22, other
Coupling mode	Ground Injection (GI)
Current waveform WF5A	40 $\mu\text{s} \pm 20\%$ / 120 $\mu\text{s} \pm 20\%$
Test level	specified at application point
Test level single stroke	60 A – 5000 A
Test level multiple stroke	60 A – 2000 A (first stroke) 30 A – 1000 A (subsequent stroke)
EUT max. power	230 V / 32 A @ 50/60 Hz
Requires	CN-GI-CI

### MIG0600MS circuit: WF5B, pin injection

Standards	DO-160G S22, other
Coupling mode	pin injection / direct application
Output impedance	1 $\Omega$
Voltage, current WF5B	50 $\mu\text{s} \pm 20\%$ / 500 $\mu\text{s} \pm 20\%$
Test level	specified at application point
Test level single stroke	50 V – 500 V ( 50 A – 500 A)
Synchronization	automatic on power peak

### MIG0600MS circuit: WF5B cable induction

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Coupling mode</b>	Cable Induction (CI)
<b>Current waveform WF5B</b>	50 $\mu$ s $\pm$ 20 % / 500 $\mu$ s $\pm$ 20 %
<b>Test level</b>	specified at coupler output
<b>Test level single stroke</b>	75 A – 2000 A (up to 5000 A can be applied)
<b>Test level multiple stroke</b>	30 A – 1800 A (first stroke) 30 A – 1000 A (subsequent stroke)
<b>Requires</b>	CN-GI-CI

### MIG0600MS circuit: WF5B ground injection

<b>Standards</b>	DO-160G S22, other
<b>Coupling mode</b>	Ground Injection (GI)
<b>Current waveform WF5B</b>	50 $\mu$ s $\pm$ 20 % / 500 $\mu$ s $\pm$ 20 %
<b>Test level</b>	specified at application point
<b>Test level single stroke</b>	75 A – 2000 A (up to 5000 A can be applied)
<b>Test level multiple stroke</b>	30 A – 1800 A (first stroke) 30 A – 1000 A (subsequent stroke)
<b>EUT max. power</b>	230 V / 32 A @ 50/60 Hz
<b>Requires</b>	CN-GI-CI

### MIG0600MS control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Pulse voltage monitor BNC</b>	10 V = 1600 V, accuracy $\pm$ 3% (only PIN)
<b>Surge current monitor BNC</b>	10 V = 1600 A, accuracy $\pm$ 3% (only PIN)
<b>Surge voltage on display</b>	75 – 1600 V, accuracy $\pm$ 3% (only PIN)
<b>Surge current on display</b>	25 – 1600 A, accuracy $\pm$ 3%, (only PIN)
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Power synchro. on/off PIN</b>	0 – 360°, 1° step
<b>Impulse polarity</b>	positive, negative, alternating (electronic switch)
<b>Impulse repetition s. stroke</b>	WF1/WF4: 20 s, WF5A: 20 s, WF5B: 40 s
<b>Patterns</b>	DO-160, user programmable
<b>Spacing multiple stroke</b>	10 ms – 500 ms
<b>Max. number of pulses</b>	25 every 20 s
<b>Impulse counter</b>	programmable up to 29'999
<b>Programmable ramps</b>	current or voltage, depending on waveform
<b>Emergency stop</b>	Emergency Stop button, BNC input, interlock
<b>Internal memory</b>	up to 15 tests can be saved and recalled

## MIG0600MS supply, weight, dimensions, climatic conditions

Operating voltage	115 / 230 V (50/60 Hz) ± 10%
Power consumption	ON < 400 VA, standby < 10 VA
Weight	295 kg
W x d x h	60 x 65 x 184 cm
Version	19" rack, 36 UH with wheels, easy to move

Temperature range	10 – 35 °C
Humidity	< 80 % non-condensing
Air pressure	86 – 106 kPa

### Included articles

Power cord	with country plug
User manual	with conformity declaration
Calibration certificate	factory calibration

## MIG0600MS optional accessories

LISN	LISN-5U-32
Adapters	NW-MS-LEVEL1, SYNC-ADAPTER
Voltage probe	V-PROBE-SI
Current probe	I-PROBE-MS
Coupling devices (CI)	CN-GI-CI, CN-GI-CI-V, other
Software	TEMA, for latest Windows, <a href="#">OPTICAL LINK</a> <a href="#">TEMA-EXT-MEASURE</a> , for DSO control
Alternative model 0600SS	price optimised single stroke model available

## 2. MIG0618SS

### MIG0618SS circuit: WF1 cable induction

Standards	DO-160G S22, other
Coupling mode	Cable Induction (CI)
Current waveform WF1	6.4 µs ± 20 % / 69 µs ± 20 %
Test level	specified at coupler output
Test level single stroke	250 A – 3500 A
Requires	CN-GI-CI

### MIG0618SS circuit: WF4, pin injection

Standards	DO-160G S22, other
Coupling mode	pin injection / direct application
Output impedance	5 Ω
Voltage, current WF4	6.4 µs ± 20 % / 69 µs ± 20 %

<b>Test level</b>	specified at application point
<b>Test level single stroke</b>	125 V – 3400 V
<b>Synchronization</b>	automatic on power peak

#### **MIG0618SS circuit: WF4 ground injection**

<b>Standards</b>	DO-160G S22, other
<b>Coupling mode</b>	Ground Injection (GI)
<b>Voltage waveform WF4</b>	6.4 $\mu$ s $\pm$ 20 % / 69 $\mu$ s $\pm$ 20 %
<b>Test level</b>	specified at application point
<b>Test level single stroke</b>	125 V – 3400 V
<b>EUT max. power</b>	230 V / 32 A @ 50/60 Hz
<b>Requires</b>	CN-GI-CI-V

#### **MIG0618SS circuit: WF5A, pin injection**

<b>Standards</b>	DO-160G S22, other
<b>Coupling mode</b>	pin injection / direct application
<b>Output impedance</b>	1 $\Omega$
<b>Voltage, current WF5A</b>	40 $\mu$ s $\pm$ 20 % / 120 $\mu$ s $\pm$ 20 %
<b>Test level</b>	specified at application point
<b>Test level single stroke</b>	125 V – 3200 V
<b>Synchronization</b>	automatic on power peak

#### **MIG0618SS circuit: WF5A cable induction**

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Coupling mode</b>	Cable Induction (CI)
<b>Current waveform WF5A</b>	40 $\mu$ s $\pm$ 20 % / 120 $\mu$ s $\pm$ 20 %
<b>Test level</b>	specified at coupler output
<b>Test level single stroke</b>	400 A – 6000 A (up to 10000 A can be applied)
<b>Requires</b>	CN-GI-CI

#### **MIG0618SS circuit: WF5A ground injection**

<b>Standards</b>	DO-160G S22, other
<b>Coupling mode</b>	Ground Injection (GI)
<b>Current waveform WF5A</b>	40 $\mu$ s $\pm$ 20 % / 120 $\mu$ s $\pm$ 20 %
<b>Test level</b>	specified at application point
<b>Test level single stroke</b>	400 A – 6000 A
<b>EUT max. power</b>	230 V / 32 A @ 50/60 Hz
<b>Requires</b>	CN-GI-CI

### MIG0618SS control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Pulse voltage monitor BNC</b>	10 V = 6000 V, accuracy $\pm 3\%$ (only PIN)
<b>Surge current monitor BNC</b>	10 V = 6000 A, accuracy $\pm 3\%$ (only PIN)
<b>Surge voltage on display</b>	75 – 6000 V, accuracy $\pm 3\%$ (only PIN)
<b>Surge current on display</b>	25 – 6000 A, accuracy $\pm 3\%$ , (only PIN)
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Power synchro. on/off PIN</b>	0 – 360°, 1° step
<b>Impulse polarity</b>	positive, negative, alternating (electronic switch)
<b>Impulse repetition s. stroke</b>	starting with 4 s
<b>Impulse counter</b>	programmable up to 29'999
<b>Programmable ramps</b>	current or voltage, depending on waveform
<b>Emergency stop</b>	Emergency Stop button, BNC input, interlock
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG0618SS supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm 10\%$
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	170 kg
<b>W x d x h</b>	60 x 65 x 123 cm
<b>Version</b>	19" rack, 18 UH with wheels, easy to move
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG0618SS optional accessories

<b>LISN</b>	LISN-5U-32
<b>Adapters</b>	NW-MS-LEVEL1, SYNC-ADAPTER
<b>Voltage probe</b>	V-PROBE-SI
<b>Current probe</b>	I-PROBE-MS
<b>Coupling devices (CI)</b>	CN-GI-CI, CN-GI-CI-V, other
<b>Software</b>	TEMA, for latest Windows, OPTICAL LINK TEMA-EXT-MEASURE, for DSO control

### 3. MIG-OS-MB

#### MIG-OS-MB circuit: WF2 cable induction

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Coupling mode</b>	Cable Induction (CI)
<b>Voltage waveform WF2</b>	rise time: < 100 ns ( or/and < 340 ns) pulse duration: 6.4 $\mu$ s $\pm$ 20 %
<b>Test level</b>	specified at coupler output
<b>Test level single stroke</b>	40 V – 1700 V
<b>Test level multiple stroke</b>	25 V – 1600 V (first stroke) 12.5 V – 800 V (subsequent stroke)
<b>Requires</b>	CN-MIG-BT3

#### MIG-OS-MB circuit: WF3, 1 MHz, pin injection

<b>Standards</b>	DO-160G S22, other
<b>Coupling mode</b>	pin injection / direct application
<b>Output impedance</b>	25 $\Omega$
<b>Voltage, current WF3</b>	frequency: 1 MHz $\pm$ 20 % damping: 25 – 75 % (1st to 5th peak)
<b>Test level</b>	specified at application point
<b>Test level single stroke</b>	80 V – 600 V
<b>Synchronization</b>	0 – 360°, step 1°
<b>EUT max. power</b>	230 V / 400 Hz, 115 V / 800 Hz

#### MIG-OS-MB circuit: WF3, 1 MHz, cable induction

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Coupling mode</b>	Cable Induction (CI)
<b>Voltage, current WF3</b>	frequency: 1 MHz $\pm$ 20 % damping: 25 – 75 % (1st to 5th peak)
<b>Test level</b>	specified at coupler output
<b>Test level single stroke</b>	80 V – 1500 V
<b>Test level multiple stroke</b>	80 V – 600 V (first stroke) 80 V – 600 V (subsequent stroke)
<b>Test level multiple burst</b>	60 V – 900 V
<b>Requires</b>	CN-MIG-BT5

### MIG-OS-MB circuit: WF3, 10 MHz, cable induction

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Coupling mode</b>	Cable Induction (CI)
<b>Voltage, current WF3</b>	frequency: 10 MHz $\pm$ 20 % damping: 25 – 75 % (1st to 5th peak)
<b>Test level</b>	specified at coupler output
<b>Test level single stroke</b>	80 V – 1500 V
<b>Test level multiple stroke</b>	80 V – 1500 V (first stroke) 80 V – 1500 V (subsequent stroke), adjustable
<b>Test level multiple burst</b>	50 V – 1920 V
<b>Synchronization</b>	0 – 360°, step 1°
<b>Requires</b>	CN-MIG-BT5

### MIG-OS-MB control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Pulse voltage monitor BNC</b>	10 V = 6000 V, accuracy $\pm$ 3% (only PIN)
<b>Surge current monitor BNC</b>	10 V = 6000 A, accuracy $\pm$ 3% (only PIN)
<b>Surge voltage on display</b>	75 – 6000 V, accuracy $\pm$ 3% (only PIN)
<b>Surge current on display</b>	25 – 6000 A, accuracy $\pm$ 3%, (only PIN)
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Power synchro. on/off PIN</b>	0 – 360°, 1° step
<b>Impulse polarity</b>	positive, negative, alternating (electronic switch)
<b>Impulse repetition s. stroke</b>	starting with 0.1 s
<b>Impulse counter</b>	programmable up to 29'999
<b>Programmable ramps</b>	current or voltage, depending on waveform
<b>Emergency stop</b>	Emergency Stop button, BNC input, interlock
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG-OS-MB supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 or 230 V (50/60 Hz) ± 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	40 kg
<b>W x d x h</b>	45 x 57 x 37 cm
<b>Version</b>	19" unit, 8 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG-OS-MB optional accessories

<b>Plugins for higher test levels</b>	MIG-OS-MB-EXT, NW-WF2-FS, NW-WF2-SS, NW-WF3-1M-FS, NW-WF3-1M-SS, NW-WF3-10M-FS, NW-WF3-10M-SS, NW-WF6H-MB, custom plugins
<b>LISN</b>	LISN-5U-32
<b>Adapters / decouplers</b>	CN-MIG-TT, AC-DC-DECOUPLER2, AC-DC-DECOUPLER 4&5, CN-BDBC
<b>Voltage probe</b>	V-PROBE-PHV
<b>Current probe</b>	I-PROBE-MB-P1
<b>Coupling devices (CI)</b>	CN-MIG-BT3, CN-MIG-BT5
<b>Software</b>	TEMA, for latest Windows, OPTICAL LINK TEMA-EXT-MEASURE, for DSO control

## ACCESSORIES

### MIG-OS-MB-EXT

<b>Application</b>	extends MIG-OS-MB to L5+ test levels requires necessary plugin(s) for each WF
<b>Test level WF2</b>	extended up to
<b>Test level WF3 1 MHz</b>	extended up to
<b>Test level WF3 10 MHz</b>	extended up to
<b>Test level WF6</b>	5 A – 160 A (multiple burst)
<b>Weight</b>	18 kg (empty)
<b>Dimensions</b>	19" unit, 4 UH
<b>Supply</b>	normal mains 230 V or 115 V, fused
<b>For generator</b>	MIG-OS-MB
<b>Requires</b>	plugins for necessary waveforms: NW-WF2-FS, NW-WF2-SS, NW-WF3-1M-FS, NW-WF3-1M-SS, NW-WF3-10M-FS, NW-WF3-10M-SS, NW-WF6H-MB, custom plugins
<b>Requires</b>	<a href="#">RACK-36HE-MB</a>

### NW-WF2-FS

<b>Application</b>	WF2 First Stroke (FS) plugin, extends MIG-OS-MB to L5+
<b>Test level WF2 first stroke</b>	extended up to 4500 V
<b>Weight</b>	3 kg
<b>Dimensions</b>	17 x 22 x 18 cm
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Requires</b>	<a href="#">MIG-OS-MB-EXT</a>

### NW-WF2-SS

<b>Application</b>	WF2 Subsequent Stroke (FS) plugin, extends MIG-OS-MB to L5+
<b>Test level WF2 sub. stroke</b>	extended up to 1100 V
<b>Weight</b>	2 kg
<b>Dimensions</b>	17 x 22 x 18 cm
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Requires</b>	<a href="#">MIG-OS-MB-EXT</a> , <a href="#">NW-WF2-FS</a>

### NW-WF3-1M-FS

<b>Application</b>	WF3 1 MHz First Stroke (FS) plugin, extends MIG-OS-MB to L5+
<b>Test level WF3 first stroke</b>	extended up to 5000 V (1 MHz)
<b>Weight</b>	2 kg
<b>Dimensions</b>	17 x 22 x 18 cm
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Requires</b>	<a href="#">MIG-OS-MB-EXT</a>

### NW-WF3-1M-SS

<b>Application</b>	WF3 1 MHz Subsequent Stroke (FS) plugin, extends MIG-OS-MB to L5+
<b>Test level WF3 sub. stroke</b>	extended up to 2250 V (1 MHz)
<b>Weight</b>	2 kg
<b>Dimensions</b>	17 x 22 x 18 cm
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Requires</b>	<a href="#">MIG-OS-MB-EXT</a> , <a href="#">NW-WF3-1M-FS</a>

### NW-WF3-10M-FS

<b>Application</b>	WF3 1 MHz First Stroke (FS) plugin, extends MIG-OS-MB to L5+
<b>Test level WF3 first stroke</b>	extended up to max. 3400 V (10 MHz)
<b>Weight</b>	2 kg
<b>Dimensions</b>	17 x 22 x 18 cm
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Requires</b>	<a href="#">MIG-OS-MB-EXT</a>

### NW-WF3-10M-SS

<b>Application</b>	WF3 10 MHz Subsequent Stroke(FS) plugin, extends MIG-OS-MB to L5+
<b>Test level WF3 sub. stroke</b>	extended up to max. 1900 V (10 MHz)
<b>Weight</b>	2 kg
<b>Dimensions</b>	17 x 22 x 18 cm
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Requires</b>	<a href="#">MIG-OS-MB-EXT</a> , <a href="#">NW-WF3-10M-FS</a>

### NW-WF6H-MB

<b>Application</b>	WF6 multiple burst (MB) plugin, extends MIG-OS-MB with WF6 capability
<b>Test level WF6 MB</b>	5 A – 180 A
<b>Weight</b>	2.2 kg
<b>Dimensions</b>	17 x 22 x 18 cm
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Requires</b>	<a href="#">MIG-OS-MB-EXT</a>

## CUSTOM PLUGIN

<b>Application</b>	different plugins available on request extends MIG-OS-MB with more capabilities
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Requires</b>	<a href="#">MIG-OS-MB-EXT</a>
<b>Contact</b>	<a href="mailto:sales@emc-partner.ch">sales@emc-partner.ch</a>

## LISN-5U-32

<b>Standard(s)</b>	DO-160G S22, MIL-STD-461G CS117, ED-14G S22
<b>Application</b>	Line Impedance Stabilization Network (5 $\mu$ H)
<b>Inductance</b>	5 $\mu$ H per line (for both AC and DC lines)
<b>Capacitance</b>	10 $\mu$ F/line included, 2 x ( $\geq$ 28 mF) included LISN is calibrated with capacitors connected
<b>Number of lines</b>	4 AC lines (L1 L2, L3, N), 2 DC lines (+ / -)
<b>AC voltage max.</b>	L-L: 420 V @50/60 Hz, L-PE: 240 V @50/60 Hz L-L: 420 V @ 800 Hz, L-PE: 240 V @ 800 Hz
<b>AC current max.</b>	32 A
<b>DC voltage max.</b>	50 V
<b>DC current max.</b>	32 A
<b>Weight</b>	16 kg
<b>W x d x h</b>	45 x 60 x 19 cm
<b>Construction type</b>	19" unit, 4 UH
<b>For generator(s)</b>	<a href="#">AVI-LV5-CB</a> , other (AVI-LV3)

## EXT-LISN-DC-270

<b>Standard(s)</b>	DO-160G S22, MIL-STD-461G CS117, ED-14G S22
<b>Application</b>	extends LISN-5U-32 capability up to 270 V DC
<b>Capacitance</b>	2 lines, $\geq$ 28 mF each
<b>Weight</b>	23 kg
<b>W x d x h</b>	45 x 60 x 19 cm
<b>Construction type</b>	19" unit, 4 UH
<b>Special characteristics</b>	built-in safety features

## SHUNT0E1

<b>Application</b>	calibration of WF2, WF3 short circuit current
<b>Impedance</b>	0.1 $\Omega \pm 2 \%$
<b>Weight</b>	0.15 kg
<b>Dimensions</b>	12 x 2.5 x 2.5 cm
<b>Requires</b>	<a href="#">MIG-OS-MB</a> , <a href="#">CN-MIG-BT3</a> or <a href="#">CN-MIG-BT5</a>

### V-PROBE-PHV

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Type of probe</b>	common mode / passive
<b>Input voltage</b>	max. 1 kV r.m.s., max. 4 kV impulse
<b>Bandwidth (-3 dB)</b>	250 MHz
<b>Usable rise time</b>	1.4 ns
<b>Accuracy</b>	± 2 %
<b>Attenuation ratio</b>	100:1
<b>Input impedance</b>	50 MΩ    7.5 pF
<b>Compensation range</b>	10 – 50 pF
<b>DSO input selection</b>	1 MΩ
<b>Weight</b>	0.5 kg
<b>Dimensions</b>	24 x 28 x 9 cm (packed)
<b>Included</b>	carrying case

### V-PROBE-SI

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Type of probe</b>	differential (can measure CM as well)
<b>Input voltage</b>	max. 7 kV DC + peak, max. 2.5 kV r.m.s.
<b>Bandwidth</b>	DC – 70 MHz (-3 dB)
<b>Accuracy</b>	± 2 %
<b>Input impedance</b>	10 MΩ    10 pF
<b>Attenuation ratio</b>	1:100 or 1:1000
<b>Power supply</b>	4 x AA batteries and/or mains adapter
<b>Weight</b>	1.5 kg (packed)
<b>Dimensions</b>	29 x 34 x 8 cm (packed)
<b>Included</b>	carrying case, mains adapter, AA batteries

### I-PROBE-MB-P1

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Application</b>	measurement of SC current / clamp on probe
<b>Output impedance</b>	50 Ω (BNC connector)
<b>Input current</b>	max. 100 A r.m.s., max. 5 kA impulse
<b>Waveforms</b>	WF2, WF3 (1&10 MHz), WF6, other
<b>Bandwidth (-3 dB)</b>	5 Hz – 15 MHz
<b>Sensitivity</b>	0.1 V/A into 1 MΩ
<b>Accuracy</b>	+ 1 / - 0 %
<b>Current time product</b>	0.5 As
<b>I/f</b>	3.5 A/Hz
<b>Usable rise time</b>	25 ns
<b>DSO input selection</b>	1 MΩ
<b>Weight</b>	1.68 kg
<b>Dimensions</b>	12 x 13 x 4 cm (inner diameter 5 cm)
<b>Included</b>	carrying case

### I-PROBE-MS

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Application</b>	measurement of SC current / clamp on probe
<b>Output impedance</b>	50 $\Omega$ (BNC connector)
<b>Input current</b>	max. 12 kA impulse
<b>Waveforms</b>	WF1, WF4 (SC), WF5A, WF5B, other
<b>Bandwidth (-3 dB)</b>	1 Hz – 16 MHz
<b>Sensitivity</b>	0.5 mV/A into 1 M $\Omega$
<b>Accuracy</b>	$\pm$ 1 %
<b>Current time product</b>	0.5 As
<b>I/f</b>	3.5 A/Hz
<b>Usable rise time</b>	25 ns
<b>DSO input selection</b>	1 M $\Omega$
<b>Weight</b>	1.5 kg
<b>Dimensions</b>	28 x 24 x 9 cm packed (inner diameter 9 cm)
<b>For generators</b>	<a href="#">MIG0600MS</a> , <a href="#">MIG0618SS</a>
<b>Included</b>	carrying case, 4 x 1.5 V AA batteries

### NW-MS-LEVEL1

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Application</b>	allows lower test levels to be applied to EUT
<b>Lowest test level WF4 PIN</b>	50 V ensured
<b>Lowest test level WF5A PIN</b>	50 V ensured
<b>Lowest test level WF5B PIN</b>	50 V ensured
<b>Can be used also for</b>	WF1, WF4, WF5A, WF5B cable bundle tests
<b>Weight</b>	2 kg
<b>Dimensions</b>	8 x 24 x 9 cm
<b>For generator</b>	<a href="#">MIG0600MS</a>

### SYNC-ADAPTER

<b>Standards</b>	DO-160G S22, other
<b>Application</b>	allows sync. on EUT power, PIN injection
<b>For generator</b>	<a href="#">MIG0600MS</a>

### CN-MIG-TT

<b>Standards</b>	DO-160G S22 (pin injection), other
<b>Application</b>	Test tip for PIN injection

### AC-DC-DECOUPLER2

<b>Standards</b>	DO-160G S22 (pin injection), other
<b>Application</b>	decoupling network for powered pins
<b>Test level WF2 max.</b>	3200 V
<b>Test level WF3 max.</b>	4000 V
<b>EUT supply voltage max.</b>	230 V (50 – 400 Hz), 115 V (800 Hz), 230 V DC
<b>Weight</b>	0.2 kg
<b>Dimensions</b>	2.5 x 12.5 x 2.5 cm
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Remark</b>	for higher test levels use

### AC-DC-DEC 4&5

<b>Standards</b>	DO-160G S22 (pin injection), other
<b>Application</b>	decoupling network for powered pins
<b>Test level WF2 max.</b>	3200 V
<b>Test level WF3 max.</b>	6000 V
<b>EUT supply voltage max.</b>	230 V (50 – 400 Hz), 115 V (800 Hz), 230 V DC
<b>Weight</b>	0.2 kg
<b>Dimensions</b>	2.5 x 16 x 2.5 cm
<b>For generator</b>	<a href="#">MIG-OS-MB-EXT</a> and <a href="#">WF2, WF3 plugins</a>
<b>Remark</b>	recommended for levels 4 and 5

### CDN-BDBC

<b>Standards</b>	DO-160G S22 (pin injection), other
<b>Application</b>	blocking devices and bypass circuitry for pin inj.
<b>For waveforms</b>	WF4 (WF1), WF5A up to 1600 V / 3200 A
<b>Weight</b>	0.3 kg (packed)
<b>Dimensions</b>	14 x 17 x 5 cm (packed)
<b>Delivery contains</b>	two bypass/blocking devices
<b>For generators</b>	<a href="#">MIG0600MS</a> , <a href="#">MIG0618SS (pin injection)</a>

### RACK-36HE-MB

<b>Application</b>	optional rack with wheels for <a href="#">MIG-OS-MB</a> , <a href="#">MIG-OS-MB-EXT</a> and <a href="#">storage for 6 plugins</a>
<b>Weight</b>	142 kg (includes generator, extension, plugins)
<b>Dimensions</b>	60 x 65 x 180 cm (19" rack / 36 UH)

# COUPLING DEVICES

## CN-MIG-BT3

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Application</b>	injection probe for cable bundle tests
	WF2 levels 1 - 5
	WF3 levels 4-5
	WF 6 levels 1 - 5
<b>Aperture</b>	7.7 x 7.7 cm
<b>Dimensions</b>	21 x 45 x 19 cm
<b>Weight</b>	34 kg
<b>For generator</b>	MIG-OS-MB with extension and plugins
<b>Included</b>	calibration loop, HV connection cable
<b>Requires</b>	<a href="#">SHUNTOE1</a> for short circuit calibration

## CN-MIG-BT5

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Application</b>	injection probe for WF3 levels 1-3
<b>Aperture</b>	8 x 7 cm
<b>Dimensions</b>	22 x 22 x 20 cm
<b>Weight</b>	13 kg
<b>For generator</b>	<a href="#">MIG-OS-MB</a>
<b>Included</b>	calibration loop, HV connection cable
<b>Requires</b>	SHUNTOE1 for short circuit calibration

## CN-GI-CI

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Application</b>	injection probe for: WF1, WF5A, WF5B in cable induction mode, WF4, WF5A, WF5B in ground injection mode
<b>Test levels</b>	1 – 5 for mentioned waveforms
<b>EUT supply</b>	230 V / 32 A 50/60 Hz, 10 A 400/800 Hz
<b>Aperture</b>	4 x 4 cm
<b>EUT cable turns</b>	one complete turn is enough
<b>Dimensions</b>	45 x 60 x 27 cm
<b>Weight</b>	53 kg
<b>For generators</b>	<a href="#">MIG0600MS</a> , <a href="#">MIG0618SS</a>
<b>Included</b>	connection cables

## CN-GI-CI-V

<b>Standards</b>	MIL-STD-461G CS117, DO-160G S22, other
<b>Application</b>	injection probe for WF4, WF5A (voltage) in

	cable induction mode
<b>Test level WF4</b>	50 – 1600 V
<b>EUT supply</b>	230 V / 32 A 50/60 Hz, 10 A 400/800 Hz
<b>Aperture</b>	6 x 12 cm
<b>Dimensions</b>	53 x 65 x 50 cm
<b>Weight</b>	190 kg
<b>For generators</b>	<a href="#">MIG0600MS</a> , <a href="#">MIG0618SS</a>
<b>Included</b>	connection cables

### CN-CI-I1

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Application</b>	large aperture coupler for WF1, WF5A, WF5B, cable induction mode (current waveforms)
<b>Test levels</b>	ask for details
<b>EUT supply</b>	230 V / 32 A 50/60 Hz, 10 A 400/800 Hz
<b>Aperture</b>	6 x 15 cm
<b>EUT cable turns</b>	cable straight through coupler
<b>Dimensions</b>	45 x 60 x 38 cm
<b>Weight</b>	160 kg
<b>For generators</b>	<a href="#">MIG0600MS</a>
<b>Included</b>	connection cables

### CN-CI-V1

<b>Standards</b>	DO-160G S22, MIL-STD-461G CS117, other
<b>Application</b>	large aperture coupler for WF4, WF5A, WF5B, cable induction mode (voltage waveforms)
<b>Test levels</b>	ask for details
<b>EUT supply</b>	230 V / 32 A 50/60 Hz, 10 A 400/800 Hz
<b>Aperture</b>	6 x 15 cm
<b>EUT cable turns</b>	cable straight through coupler
<b>Dimensions</b>	51 x 95 x 36 cm
<b>Weight</b>	292 kg
<b>For generators</b>	<a href="#">MIG0600MS</a>
<b>Included</b>	connection cables

### CN-WF5A1500

<b>Standards</b>	Airbus ABD0100.1.2 G, Boeing
<b>Application</b>	coupler for WF5A with 1 Ω impedance
<b>Output impedance</b>	1 Ω
<b>Test level WF5A (CI)</b>	up to 1500 V / 1500 A
<b>EUT supply</b>	230 V / 32 A 50/60 Hz, 10 A 400/800 Hz
<b>Aperture</b>	6 x 15 cm
<b>Dimensions</b>	65 x 130 x 110 cm
<b>Weight</b>	525 kg including hydraulic positioning cart
<b>For generators</b>	<a href="#">MIG0600MS</a>

<b>Included</b>	connection cables, hydraulic cart, control box
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### CN-WF5A2000

<b>Standards</b>	Airbus ABD0100.1.2 G, Boeing
<b>Application</b>	coupler for WF5A with 1 Ω impedance
<b>Output impedance</b>	1 Ω
<b>Test level WF5A (CI)</b>	up to 2000 V / 2000 A
<b>EUT supply</b>	230 V / 32 A 50/60 Hz, 10 A 400/800 Hz
<b>Aperture</b>	6 x 15 cm
<b>Dimensions</b>	65 x 130 x 110 cm
<b>Weight</b>	645 kg including hydraulic positioning cart
<b>For generators</b>	<a href="#">MIG0600MS</a>
<b>Included</b>	connection cables, hydraulic cart, control box

## SOFTWARE

### TEMA

<b>Suitable for generators</b>	MIG0600MS, MIG0618SS, MIG-OS-MB
<b>Includes</b>	remote control of generator, automatic test report, sequence mode
<b>Separate license</b>	DSO control requires TEMA EXT-MEASURE
<b>Operating system required</b>	Windows, latest
<b>Communication port</b>	USB
<b>Updates</b>	lifetime updates at no additional cost
<b>Latest version</b>	available on EMC PARTNER website
<b>Optional</b>	20m OPTICAL-LINK fibre for remote control



EMC PARTNER

# PRODUCT APPLICATION RANGE

## CONSUMER & INDUSTRIAL ELECTRONICS

Transient Test Systems for conducted EMC tests on electronic equipment. ESD, EFT, surge, ring wave, DOW, dips, magnetic field, common and differential mode. Compliant to IEC, EN and ANSI standards.



## AEROSPACE ELECTRONICS

Impulse generators and couplers for avionic applications. Single stroke, multiple stroke and multiple burst according to RTCA / DO-160, EUROCAE / ED-14 and aircraft manufacturer standards.



## Component TestING

Voltage and current Impulse generators for design and production testing of varistors, gas discharge tubes, surge protective devices, X / Y capacitors and specialist impulse generators for semiconductor tests.



## DEFENCE ELECTRONICS

Complete test solutions for MIL-STD-461 requirements CS06, CS106, CS115, CS116, CS117 and CS118.



## TELECOM & data line testing

Voltage and current impulse generators, CDNs, power contact, power induction equipment for exchange and customer equipment according to ITU, IEC, EN and ETSI requirements.



## ENERGY & UTILITY EQUIPMENT

High current CDNs combined with transient test equipment fulfil requirements to test renewable and classical energy distribution network and monitoring equipment.



## CUSTOMER ServiceS

Customer support throughout an equipment's lifetime is central to the EMC PARTNER AG philosophy. Directly from our ISO accredited facility in Switzerland or through our network of services centres, we provide support wherever you



# Specific EMC test requirements ?

Search & find your required test equipment by application, standard or test type

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For further information please do not hesitate to contact your local EMC PARTNER AG representative.  
Visit our website for more information and contact details.

# [www.emc-partner.com](http://www.emc-partner.com)

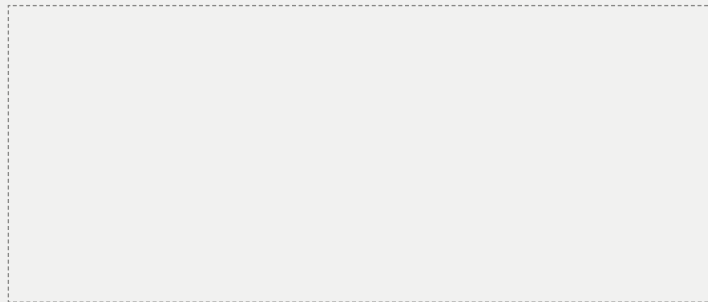


## Swiss Headquarters

EMC PARTNER AG  
Baselstrasse 160  
CH - 4242 Laufen

Phone +41 61 775 20 30  
Fax +41 61 775 20 59  
Email [sales@emc-partner.ch](mailto:sales@emc-partner.ch)  
Web [www.emc-partner.com](http://www.emc-partner.com)

## Your local representative



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