

This product is manufactured by Talon Instruments and exclusively distributed by Racal Instruments, Inc.

M-Module Dual Arbitrary Waveform Generator Model MA1801



- ◆ Register-Based for High Speed Operation
- ◆ Ping-Pong Memory Architecture Supports On-The-Fly Waveform Update
- ◆ 10Volts Peak to Peak Output into 50Ω (20Vpk-pk into high impedance)
- ◆ Modular Design Supports Low-Level Sparing for Better Maintainability
- ◆ Powerful Sequencer Supports Insert/Replace, Pseudo-Random Noise and Nested Looping and Branching
- ◆ Highest Density Dual Waveform Generator for VXI/PXI/Ethernet

Talon Instruments' Model MA1801 is a single width ANSI standard MA-Module that contains two 14-bit Arbitrary Waveform Generator (AWG) channels which can operate independently or in synchronization. The maximum sample rate is 125 MS/s. All waveforms can be sampled from data previously loaded into waveform memory or loaded and output on the fly.

Built-In Waveforms

Standard waveforms such as Sine, Square, Triangle, Ramp and Pulse are calculated and loaded into waveform memory automatically based on their specified parameters. Pseudo-random Noise (white, gaussian or pink) or a DC level can be generated for a defined or pseudo-random period using only one waveform memory

word. AM modulation inputs are also provided for each ARB channel.

Flexible Memory Buffers

A large 2-page waveform memory (512k samples/page) is provided so that multiple waveforms can be loaded into memory for fast test execution. Also, the contents of one page can be output while the other page is being loaded with fresh data allowing for real-time operation.

Powerful Sequencer

Powerful sequencing features allow waveform segments to be looped and output in any order. There are also provisions for jumping to different sequences based on a trigger input (with or without return). A sync bit can be placed anywhere in the waveform. Similarly, at any point during the output of a waveform, an alternate

waveform can replace the waveform being output for a defined number of samples.

Channel Synchronization

Both AWG channels may be operated independently or in synchronization. In addition, up to 4 MA1801s can be synchronized together using a synchronization cable accessory.

Ultra High Density/Modularity

The small size and high performance of the dual channel MA1801 make it ideal for use in high channel applications. The module can be used with a carrier in VXI (up to six per single slot), VME (drivers not supplied), PXI, cPCI or even Ethernet platforms. This reduces the size and cost of the system while improving system granularity and maintainability.

MA1801 SPECIFICATIONS

AMPLITUDE CHARACTERISTICS

Amplitude

200 mV – 20 Vpk-pk, output open circuit
100 mV – 10 Vpk-pk, into 50 Ω

Resolution

3.5 digits

Accuracy (at 1 kHz and specified output)

±1% of setting + 50 mV

DC Offset Range

0 to ±10 V

DC Offset Accuracy

1% + 50 mV

Low-Pass Filter

50 MHz, 7-pole, elliptic

Standby (Output disconnected)

Output On or Off

Output Protection

Short circuit

STANDARD WAVEFORMS

(Sine, Triangle, Square, Pulse, Ramp, Noise, DC.)

Frequency Resolution

4 digits

Accuracy

50 ppm (internal crystal)

Jitter

< 30 ps rms

Sine Function

Frequency Range

1 mHz to 25 MHz

Phase Range

0 - 360°

Distortion (1-10Vpk-pk)

< 100 kHz: < 0.1%

Harmonics

< 5 MHz: > 45 dBc

< 10 MHz: > 40 dBc

< 25 MHz: > 60 dBc (filter on)

Flatness

<10 MHz: 0.6 dB

SFDR (SCLK = 100 MHz)

< 1 MHz: > 50 dBc

Crosstalk (fc = 10 MHz)

-70 dB, typical

Triangle/Ramp/Pulse Function

Frequency Range

1 mHz to 10 MHz

Phase Range

0 - 360°

Square Wave Function

Frequency Range

1 mHz to 25 MHz

Duty Cycle Range

1% - 99%

Rise/Fall Time

7 ns

Noise and DC Functions

Types

White, quasi-gaussian or pink noise or DC

Generation

Real-time, pseudo-random

Period

Pre-defined (min and max samples specifiable) or pseudo-random

ARBITRARY WAVEFORMS

Waveform Memory

512k points in two pages

Memory Operation

One page can be outputting data while the other page is being re-loaded with new data.

Vertical Resolution

14 bits

Minimum Segment Size

2 points

SEQUENCED WAVEFORMS

Sequencer Step Limits

512

Segment Loops

1 to 64k or continuous

SWEEP WAVEFORMS

Sweep Range

100 mHz to 25 MHz

Waveforms

Sine, square, triangle

Spacing

Linear, logarithmic

Direction

Up or down

Sweep Duration

0.01 to 1000 s

SAMPLING CLOCK

Internal Source Range

1 Hz to 125 MHz

External Source Range

Up to 125 MHz

External Source Characteristics

Range: 50mVpk-pk to ±10 V

Threshold: ±9.75 V, programmable

REFERENCE CLOCK

Internal Reference

10 MHz ± 50 ppm

External Reference

Connector: Front Panel MCX

Impedance: 50 Ω

Range: 50mV pk-pk to ±5 V

Threshold: ±4.75 V, programmable

TRIGGERING

CHARACTERISTICS

Sources

External (2): 50mV pk-pk to ±5 V

Input Impedance: 10 kΩ ±5%

Level (Programmable): ±9.75 V

Resolution: 5 mV

Accuracy: 100 mV

M-Module Triggers: TRIGA, TRIGB

Other Sources: Markers, Ext. Master

Maximum Trigger Frequency

DC to 20 MHz

Trigger Slope

Positive or negative

Trigger Delay

0 to 64k points (sample clocks)

System Delay (trig/gate input to waveform output)

20 ns + 7 Sample Clocks

Sync Output

Front Panel: TTL

M-Module Triggers: TRIGA, TRIGB

Sync Source: Sequence start, sequence

step start, each loop of sequence step,

counted sequence step, offset 0-2M points

Sync Width: 1-4097 points, programmable

Marker Output

Front Panel: TTL

M-Module Triggers: TRIGA, TRIGB

Marker Sources (2): HI or LOW on a

segment, portion of a segment, or on

individual memory words within a segment

FRONT PANEL I/O

(accessed with MCX connectors)

Inputs

Trigger/Gate (2/chan): Zin = 10 kΩ, ±9.75 V

External Sample Clock: 50 Ω, ±9.75 V

External Reference: 10MHz, 50 Ω, ±5 V

AM (2): MCX, 10 kΩ, 2V_{pk-pk} for 90% depth

Outputs

Waveform (2): Zout = 50 Ω

Marker/Sync (2/chan): 74LVC244 (LVTTTL)

MA-MODULE INTERFACE DATA

(Single-wide MA-Module, ANSI/VITA Std. 12-1996 Compliant)

Drivers (VXI, PXI and Ethernet Support)

LabVIEW, LabWindows/CVI, VXIplug&play

(WIN95/WINNT Frameworks)

Master/Slave Connector

Allows synchronization of 2-4 MA1801s

Cooling (10°C Rise)

3.0 l/s @ 0.5mm H₂O

Peak Current & Power Consumption

	+12	+5	-12
I _{Peak} (A)	0.2	1.2	0.3

Total Power: 12 Watts

ENVIRONMENTAL

Temperature

Operating: 0°C-50°C

Storage: -40°C-70°C

Humidity (non-condensing)

5 to 95%

Weight

4 oz. (0.11 kg)

MTBF (ground benign)

50,000 hours

EMC (Council Directive 89/336/EEC)

Emission: EN61326-1: 1997+ A1:1998,

Class B

Immunity: EN61326-1:1997+ A1:1998,

Table 1

Safety (Low Voltage Directive 73/23/EEC)

BS EN61010-1:1993/A2 1995

ORDERING INFORMATION

Model	Description	Part Number
MA1801	Dual Arbitrary Waveform Generator	MA1801

 The CE Mark indicates that the product has completed and passed rigorous testing in the area of RF Emissions, Immunity to Electromagnetic Disturbances and complies with European electrical safety standards.



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The Racal Instruments and Talon Instruments policy is one of continuous development and consequently the equipment may vary in detail from the description and specification in this publication.