RACAL INSTRUMENTS™ 3171

- **80 MS/s, 22 V_{pk-pk} Arbitrary Waveforms With Isolated Output**
- **Built-in Waveforms: Triangle, Sine, Square, Ramp, Pulse, Arbitrary and DC**
- **128 k-points Waveform Memory**
- **Dual 50 MHz, 22 V_{pk-pk} Pulse Generator**
- **Trigger Delays Up to 1 Second With 2 ns Resolution**
- **External 400 kHz Amplitude Modulation**

80 MS/s Waveform and Dual Output Pulse Generator

Racal Instruments™ 3171 80 MS/s Isolated Waveform Generator and Dual 50 MHz Pulse Generator combines multi-instrument density and high-frequency performance in a single-slot, C-sized VXIbus format. Isolated waveform output in the range of 100 mHz to 40 MHz with 12-bit vertical resolution and pulse output to 50 MHz makes the 3171 a powerful solution to a variety of test stimulus requirements.

Multi-Instrument Functionality
The 3171 is a synergistic combination of an Arbitrary Waveform Generator and Dual Pulse Generator. The 3171 is really three independent instruments in one module that may be used simultaneously for three separate purposes, or together, to create complex pulse or trigger sequences. System density is maximized when compared to GPIB or single-function VXIbus module formats. The Option 01T interface controls the 1260-39, using both register-based and message-based operation. Refer to the applicable Option 01T data sheet for specifications and product features such as include, exclude, and scan lists, relay coil-current monitoring, and user-defined path names and reset states.

Isolation From Ground
The Arbitrary Waveform Generator (Arb) output provides 250 volts of isolation from VXIbus ground. This feature helps eliminate system ground loops and protects the VXIbus from damage from external hazardous voltages that may be connected to the instrument's interface connector.

Built-In Digital Word Generator
The 3171's Arb output is available as both an analog signal (up to 22 V_{pk-pk} into 50 Ω) or as a 12-bit digital word with TTL levels which can source or sink 15 mA. This powerful feature may be used as 12 independent TTL pulse outputs or as a 12-bit digital pattern generator.

External Amplitude Modulation
The Arb output of the 3171 may be controlled in amplitude by an external DC signal up to ±10 Volts or modulated in amplitude by an external AC signal up to 400 kHz. This feature allows for real-time control of the Arb output for control system applications and AM signal generation for telecom applications.

Dual Pulse Generator
The two pulse generator outputs of the 3171 are available with programmable rise and fall times ranging from 3 ns to 150 ns. Pulse Generator #1 (PG1) has the additional ability of independently programmable rise and fall times from 150 ns to 1 second. Pulse width and delay parameters are programmable on both pulse generators from 120 ns to 1 second with 2 ns resolution.

Flexible Triggering
3171 output channels may be synchronized to each other or to other 3171 modules within the same VXIbus mainframe using triggers. Waveform may be output continuously, one or more cycles per trigger or under the control of a gate signal. A sync and cursor output signal exist to synchronize the Arb with other instruments.

EADS NORTH AMERICA DEFENSE

3171 PRODUCT SPECIFICATIONS

AMPLITUDE CHARACTERISTICS

Amplitude
5 mV-22 V_{pk-pk}, into 50 Ω

Resolution
12 bits (5 mV)

Accuracy
±0.5% of set or ±15 mV

DC Offset Range
0-±11 V

DC Offset Resolution
12 bits

DC Offset Accuracy
±0.5% of set or ±15 mV

Isolation (Arb)
250 Volts

Output Impedance (selectable)
<2 Ω, 50 Ω or 93 Ω

Low-Pass Filters (Arb)
2 MHz, 2.2 MHz and 22 MHz

Standby
Output On or Off

Output Protection
Current Limit (400 mA)

AMPLITUDE MODULATION

Modulation Bandwidth
0-400 kHz

Modulation Amplitude Range
-10 Volts to +10 Volts

AM Input Impedance
10 kΩ

STANDARD WAVEFORMS (ARB)

(Sine, Triangle, Square, Pulse, Ramp, Pulsed DC, DC, Arbitrary)

Frequency Resolution
4 digits

Accuracy
±.01% of set

Stability
100 ppm

Frequency Ranges
Sine, Triangle, Square: 1 mHz-10 MHz
Ramp: 1 mHz-1 MHz
Pulsed DC: 1 mHz-40 MHz
Arbitrary Waveform (Sample Rate): 150 mHz-80 MHz

ARBITRARY WAVEFORMS (ARB)

Waveform Memory
128 k Points

Vertical Resolution
12 bits

Waveform Size Range
1 to 128 k Points

DIGITAL PATTERN GENERATOR (ARB)

Digital Word Width
12 bits

Level
TTL

Current (Source and Sink)
±15 mA

PULSE WAVEFORMS

(PG1 & PG2)

Frequency Resolution
4 digits

Accuracy
±0.01% of set

Stability
100 ppm

Frequency Range
0.5 Hz-50 MHz

Pulse Width Range
10 ns-1 s

Pulse Width Resolution
2 ns or 0.01% of set (whichever is greater)

Pulse Width Accuracy
±5 ns or ±0.01% of set (whichever is greater)

Rise & Fall Times
PG1 & PG2: 3 ns-150 ns (rise=fall
PG1: 150 ns-800 µs (4 ranges, rise and fall are independent)

Pulse Delay Range
120 ns to 1 s from input trigger

Pulse Delay Resolution
2 ns or 0.01% of set (which ever is greater)

Pulse Delay Accuracy
±5 ns or ±0.1% of set (which ever is greater)

SAMPLING CLOCK

Reference
VXIbus CLK10

External Reference Level
TTL

External Clock (Arb)
Up to 40 MHz

External Clock Level
TTL

OPERATING MODES

(Normal, Triggered, Delay Triggered, Burst, Gated)

Normal Mode
Continuous output of a waveform.

Triggered Mode
One waveform cycle is output.

Delayed Trigger Mode
Delays from trigger by 120 ns to 1 second.

Burst Mode
A waveform is repeated from 1 to 64 k times.

Gated Mode
Generator is enabled when an external gate signal is active. The first gated output cycle is synchronous with the active slope of the gate signal. The last output cycle is always completed.

Amplitude Modulation
Output of the Arb may be amplitude modulated by an external analog signal up to ±10 Volts and with a bandwidth of up to 400 kHz.

TRIGGERING CHARACTERISTICS

Sources
External: TTL input
VXI Backplane: TTLTrg0-7

Trigger Slope
Positive or Negative

Trigger Delay
PG: 120 ns to 1 s
Arb: 170 ns to 1 s

Sync Output (Arb)
Last Point (Standard and Arbitrary Waveforms),
Any Point (Arbitrary Waveforms)

Cursor Output (Arb)
Any point (Digital Patterns only)

FRONT PANEL I/O

Inputs
Trig/Gate(Arb): TTL,
0-40 MHz, 250 V isolated
Clock(Arb): TTL, 40 MHz max, 250 V Isolated
Trig (PG1 & PG2): TTL
Gate (PG1 & PG2): TTL

Outputs
Waveform (Arb): Z_{out} = 2 Ω, 50 Ω or 93 Ω, 250 V Isolated
Cursor/Sync (Arb): TTL, ±15 mA,250 V Isolated
Digital Word (Arb): TTL, ±15 mA, 250 V Isolated
Waveform (PG1 & PG2): Z_{out} = 2 Ω,50 Ω or 93 Ω
Clock (PG1 & PG2): TTL into 50 Ω

3171 ORDERING INFORMATION

VXIBUS INTERFACE DATA

(Single-slot, message-based, VXIbus 1.4)

Software

SCPI, IEEE 488.2, LabVIEW, LabWindows/CVI, VXI plug&play WIN Framework

Backplane Signal Support

TTLTrg0-7: Trigger Input, Sync Output

Built-In Test (BIT)

Power On BIT: <5 seconds

BIT SCPI Command: 95% fault detection, <30 seconds

Auto-Calibration

(after 15 minute power-on)
Stored in Non-Volatile Memory, <3 seconds

Status Lights

Red: Power-On Self-Test Failure

Green: Arb Output On/Off

Green: PG2 Output On/Off

Green: PG1 Output On/Off

Peak Current & Power Consumption

	+24	+12	+5	-2	-5.2	-12	-24
I_{Pm} (A)	.45	.55	2.5	.03	.4	.55	.45
I_{Dm} (mA)	.94	.22	1.0	.63	.81	.46	.80

ENVIRONMENTAL

Temperature

Operating: 0-50º C

Storage: -40º C-+70º C

Altitude

Operating: 10,000 ft.

Storage: 15,000 ft.

Weight

3.5 lb. (1.6 kg)

EMC (Council Directive 89/336/EEC)

EN55011, Group 1, Class A

EN50082-1, IEC 801-2,3,4

Safety

EN 61010-1, IEC1010-1, UL3111-1, CSA 22.2 #1010

(Specifications applicable after a 30 minute warm-up period and with the output terminated with a 50 Ω load.)

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.

ORDERING INFORMATION

MODEL/DESCRIPTION	PART NUMBER
Racal Instruments 3171, 0MS/s Waveform and Dual Output Pulse Generator	407533

EADS North America Defense Test and Services
1.800.722.2528/1.949.859.8999 sales@eads-nadefense.com