

**OPERATION REFERENCE INFORMATION**

**GenRad 1658 Digibridge®**

**1. GENERAL INFORMATION**

Refer to instruction manual for details of specification, installation, operation, and service.

**MEASUREMENT RANGES**

Parameter; Frequency	Minimum (Reduced Acc)	Basic Ranges, Full Accuracy	Maximum (Reduced Acc)
R; 120 Hz*	0.0001 Ω	2 Ω to 2 MΩ	99.999 MΩ
R; 1 kHz	0.0001 Ω	2 Ω to 2 MΩ	9.9999 MΩ
Q (with R)	.0001	-----	9.999
L; 1 kHz	.00001 mH	0.2 mH to 200 H	999.99 H
L; 120 Hz*	0.0001 mH	2 mH to 2000 H	9999.9 H
Q (with L)	00.01	-----	999.9
C; 1 kHz	.00001 nF	0.2 nF to 200 μF	999.99 μF
C; 120 Hz*	0.0001 nF	2 nF to 2000 μF	99999 μF
D (with C)	.0001	-----	9.999

\*120 Hz or 100 Hz, depending on model.

**2. EXTENDER CABLE**

Available from GenRad (P/N 1657-9600).

**COLOR CODE OF EXTENDER CABLE**

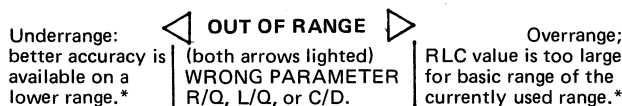
Colors	Signal	DUT	Digibridge
Red	I+	"High" end	Signal source (hi)
Red and white	P+	"High" end	Potential sense (hi)
Black	I-	"Low" end	Current sense (lo)
Black and white	P-	"Low" end	Potential sense (lo)
Black and green	GND	Shield only	Guard

**3. EXT BIAS SWITCH**

Keep this switch OFF (regardless of whether any bias source is connected) for all measurements except when applying dc bias to capacitors. (Refer to manual, para 3.7.)

**4. OPERATION**

- Select VALUE mode with [DISPLAY] key.
- Select measurement conditions with keys at right. Repeat keying advances selection as indicated nearby.
- With [HOLD RANGE] key, select autorange (no indication) or RANGE HELD (indicator on panel).
- Select parameter with R/Q, L/Q, or C/D key; note confirmation by type of unit, on panel. (Repeat keying has no effect except in entry mode; see para 6.)
- Refer to manual for details of test fixture connections. Keep EXT BIAS switch generally OFF (see above).
- Use START button for AVERAGE or SINGLE MEASURE MODE.
- Read RLC and DQ displays. Observe range lights:



\*Select autorange (avoid RANGE HELD) to obtain best available accuracy and minimize the number of under- and over-range measurements.

- If limits have been entered and enabled (para 6), observe GO/NO-GO lights.
- If limits have been entered and enabled (para 6), to see display of bin number instead of measured values, use [DISPLAY] key to select BIN No. and remeasure the DUT.

**5. INTERFACE OPTION, USE OF IEEE-488 BUS**

Set the TALK switch (rear panel) as follows:  
**TALK ONLY** — whenever bus is not in use and while communicating only with "listen-only" devices.  
**TALK/LISTEN** — to enable use in a system with a controller device, e.g., calculator. Refer to table below for device-dependent messages to control Digibridge.

**PROGRAMMING COMMANDS**

Command	Code	Command	Code	Command	Code
Display		Measure mode		Data output**	
Entry*	D0	Single	L0	None	X0
Bin	D1	Average	L1	Bin number	X1
Value	D2	Continuous	L2	DQ	X2
Measurement rate		Parameter		DQ, bin no.	X3
Fast	S0	L/Q	M0	RLC	X4
Medium	S1	C/D	M1	RLC, bin no.	X5
Slow	S2	R/Q	M2	RLC, DQ	X6
Equivalent circuit		Range control		RLC, DQ, bin	X7
Parallel	C0	Hold range	R0	Initiation	
Series	C1	Hold rng 1	R1	Start***	G0
Frequency		Hold rng 2	R2	Manual start	
120 Hz (100)	F0	Hold rng 3	R3	Enable switch	E0
1 kHz	F1	Autorange	R4	Disable sw	E1

\* Enables entry of bin limits, which must be entered via keyboard.  
 \*\* Must be specified before initiation of measurement.  
 \*\*\* An alternative command is given in manual.

**6. ENTRY MODE**

Entry-mode keys (left rear block of 16 keys) are effective only when selected DISPLAY mode is ENTRY.

LIMIT ENTRY PROCEDURE	DISPLAY
With [FREQUENCY] select: With [DISPLAY] select: Use [R/Q] [L/Q] or [C/D] to select units by repeat keying (X) [=] [BIN No.] [0] (X is the desired DQ limit)* (Y) [=] [NOM VALUE] (Y = number; above units)* (S) [%] [=] [BIN No.] (Z) (for symmetrical limit pair) (S is number up to 100.00)* (Z is 1, 2, 3, ... 8). (H) [%] [-] (L) [%] [=] [BIN No.] (Z) (for unsymmetrical limit pair) (H is number up to 10000)* (L is number up to 100.00)* To change nom val, reenter.** To change bin limits, reenter. To close a bin, use zero for S. To see, press [NOM VALUE] To see, key in [BIN No.] (Z) Inhibit: [0] [=] [NOM VALUE] Enable: (Y) [=] [NOM VALUE]	120 Hz (100 Hz) or 1 kHz. ENTER LIMITS. MΩ, kΩ, Ω, H, mH, nF, or μF. (X) in DQ display area; max 4 digits and dec pt. (Y) in RLC display area; max 5 digits and dec pt. Upper limit in RLC area, lower limit in DQ area, (values, not percents).  Upper limit in RLC area, lower limit in DQ area, (values, not percents.)  (Y) in RLC display area. Both limit values. Identical limit values. (Y) in RLC display area. Limit values (as above). 0 in RLC display area. (Y) in RLC display area.

BIN No.	GENERAL ASSIGNMENT
Bin 0	DQ failure
Bin 1	RLC pass, tightest tolerance
Bin 2	RLC pass, next looser tolerance
—	(progressively looser tolerances)
Bin 8	RLC pass, last available bin
Bin 9	RLC fail (default bin)

\*Use numerical and decimal-point keys in sequence to enter number; max of 5 digits and decimal pt valid, even if display is limited to 4.  
 \*\*New nominal value does not affect bins already set up.

To resume operation using limits entered as above, press [DISPLAY] key (see para 4); do not change frequency.