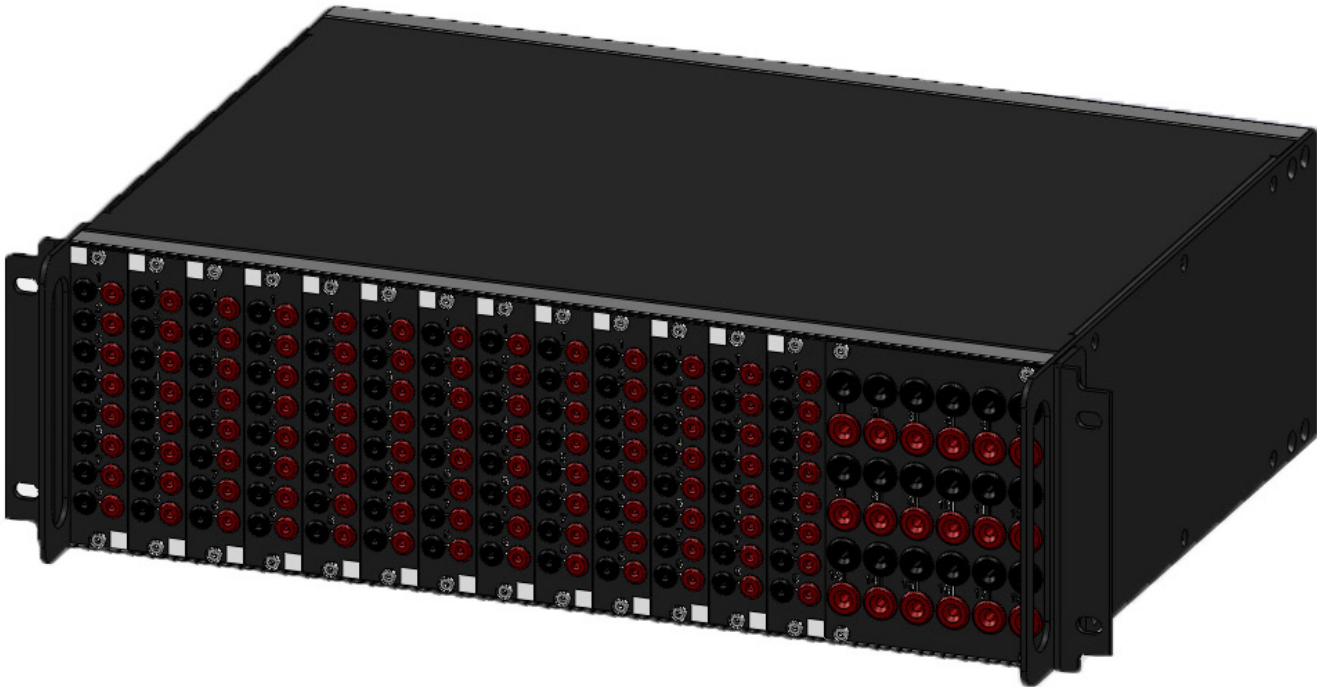

Break-Out Box
User Manual

www.opal-rt.com

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BREAK-OUT BOX

INTRODUCTION

The Opal-RT break-out box lets you quickly and easily test electronic equipment. Using the OP8xxx breakout box, you manually generate circuit faults (open circuit and short circuit) using jumpers to either break contact or connect a circuit. can analyze and test electronic equipment by specifically testing each component and its connection.

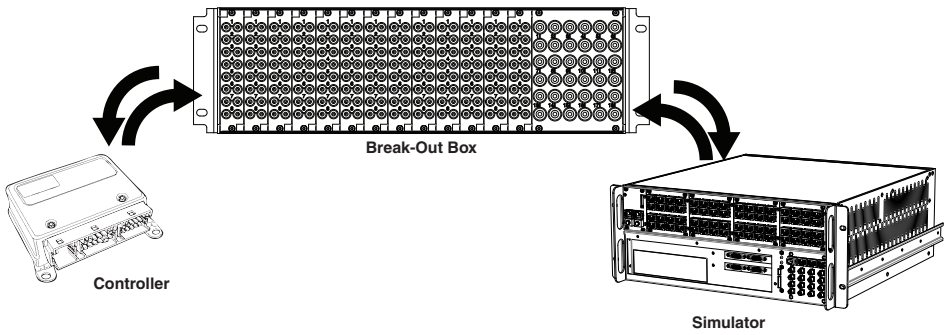


Figure 1: Break-out box use illustration

By installing the break-out box as a link between the unti under test (ECU, motor controller, etc.) and the simulator, you can insert a fault at any point in the test to assess how the unit reacts to the fault.

Features

- Up to 104 low current circuits (1, 3, 5, 8 amp)
- Separate plug in modules (Group of 8)
- Up to 18 high current circuits(10, 15, 20 amp)

PIN ASSSIGNMENTS

Front Low Current Connector Diagram

Each pair of jacks connects from a channel on the unit under test to a channel on the simulator.

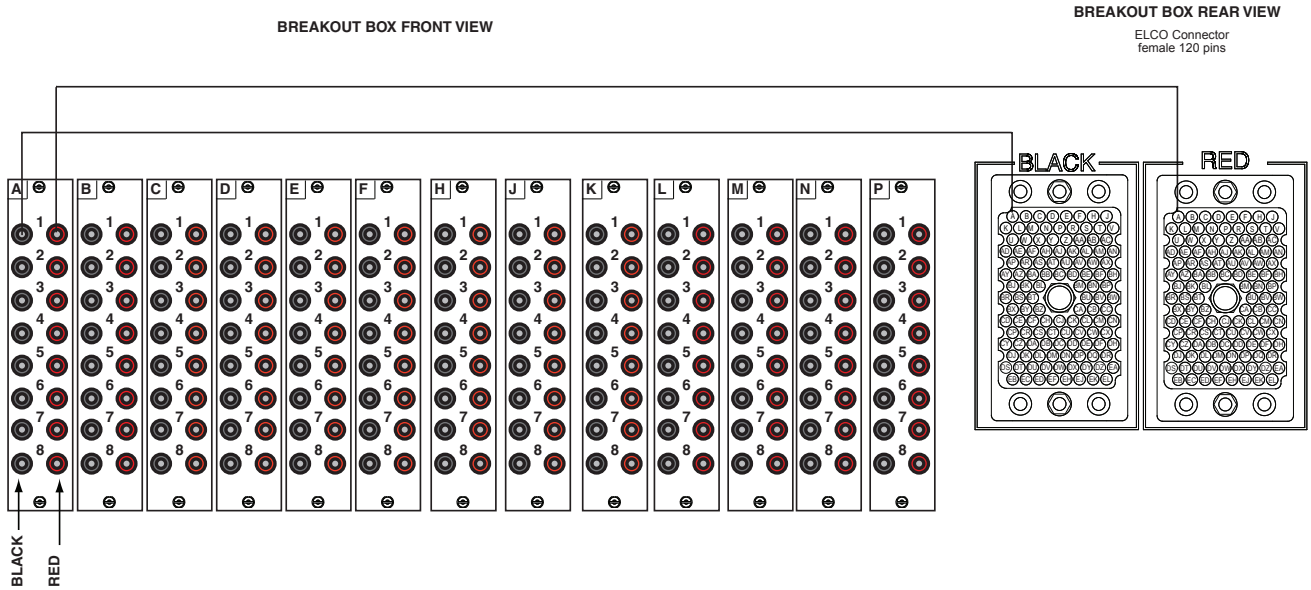
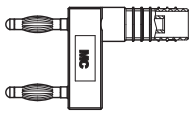


Figure 2: Front banana jacks path to ELCO connector

Faults are manually created by inserting a jumper into the desired channel jacks. The jumper used for the break-out box are supplied.



In the event that replacements are needed, we recommend using the original part (SKS2-12L/1SA/N, 12mm jumper, 2mm), or an equivalent.

Rear High Current Connector Diagram

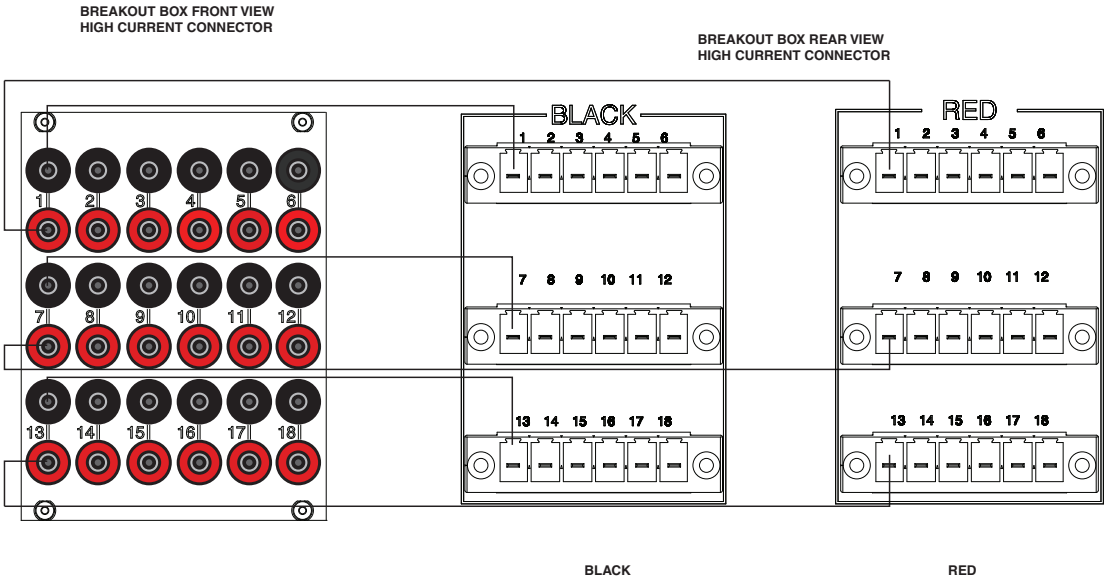


Figure 3: High current banana jack path to Phoenix connector

Low Current Connector Pin Assignments

The following table lists the signals available on the front, low current connector and on the system's two rear ELCO connectors.

Red (left) breakout pin	Red (right) ELCO connector	Black (right) breakout pin	Black (left) ELCO connector	Signal Name / Channel (space reserved for user notes)
A1	A	A1	A	
A2	B	A2	B	
A3	C	A3	C	
A4	D	A4	D	
A5	E	A5	E	
A6	F	A6	F	
A7	H	A7	H	
A8	J	A8	J	
B1	K	B1	K	
B2	L	B2	L	
B3	M	B3	M	
B4	N	B4	N	
B5	P	B5	P	
B6	R	B6	R	
B7	S	B7	S	
B8	T	B8	T	
C1	U	C1	U	
C2	V	C2	V	
C3	W	C3	W	
C4	X	C4	X	
C5	Y	C5	Y	
C6	Z	C6	Z	
C7	AA	C7	AA	
C8	AB	C8	AB	
D1	AC	D1	AC	
D2	AD	D2	AD	
D3	AE	D3	AE	
D4	AF	D4	AF	
D5	AH	D5	AH	
D6	AJ	D6	AJ	
D7	AK	D7	AK	
D8	AL	D8	AL	
E1	AM	E1	AM	
E2	AN	E2	AN	
E3	AP	E3	AP	
E4	AR	E4	AR	
E5	AS	E5	AS	
E6	AT	E6	AT	
E7	AU	E7	AU	
E8	AV	E8	AV	
F1	AW	F1	AW	
F2	AX	F2	AX	
F3	AY	F3	AY	
F4	AZ	F4	AZ	
F5	BA	F5	BA	
F6	BB	F6	BB	
F7	BC	F7	BC	
F8	BD	F8	BD	
H1	BE	H1	BE	
H2	BF	H2	BF	
H3	BH	H3	BH	

Red (left) breakout pin	Red (right) ELCO connector	Black (right) breakout pin	Black (left) ELCO connector	Signal Name / Channel (space reserved for user notes)
H4	BJ	H4	BJ	
H5	BK	H5	BK	
H6	BL	H6	BL	
H7	BM	H7	BM	
H8	BN	H8	BN	
J1	BP	J1	BP	
J2	BR	J2	BR	
J3	BS	J3	BS	
J4	BT	J4	BT	
J5	BU	J5	BU	
J6	BV	J6	BV	
J7	BW	J7	BW	
J8	BX	J8	BX	
K1	BY	K1	BY	
K2	BZ	K2	BZ	
K3	CA	K3	CA	
K4	CB	K4	CB	
K5	CC	K5	CC	
K6	CD	K6	CD	
K7	CE	K7	CE	
K8	CF	K8	CF	
L1	CH	L1	CH	
L2	CJ	L2	CJ	
L3	CK	L3	CK	
L4	CL	L4	CL	
L5	CM	L5	CM	
L6	CN	L6	CN	
L7	CP	L7	CP	
L8	CR	L8	CR	
M1	CS	M1	CS	
M2	CT	M2	CT	
M3	CU	M3	CU	
M4	CV	M4	CV	
M5	CW	M5	CW	
M6	CX	M6	CX	
M7	CY	M7	CY	
M8	CZ	M8	CZ	
N1	DA	N1	DA	
N2	DB	N2	DB	
N3	DC	N3	DC	
N4	DD	N4	DD	
N5	DE	N5	DE	
N6	DF	N6	DF	
N7	DH	N7	DH	
N8	DJ	N8	DJ	
P1	DK	P1	DK	
P2	DL	P2	DL	
P3	DM	P3	DM	
P4	DN	P4	DN	
P5	DP	P5	DP	
P6	DR	P6	DR	
P7	DS	P7	DS	
P8	DT	P8	DT	

Table 1: Low current connector pin assignments

High Current Connector Pin Assignments

The following table lists the signals available on the front, low current connector and on the system's two rear ELCO connectors.

Red (left) breakout pin	Red (right) Pheonix connector	Black (right) breakout pin	Black (left) Pheonix connector	Signal Name / Channel (space reserved for user notes)
1	Top	1	Top	
2	Top	2	Top	
3	Top	3	Top	
4	Top	4	Top	
5	Top	5	Top	
6	Top	6	Top	
7	Middle	7	Middle	
8	Middle	8	Middle	
9	Middle	9	Middle	
10	Middle	10	Middle	
11	Middle	11	Middle	
12	Middle	12	Middle	
13	Bottom	13	Bottom	
14	Bottom	14	Bottom	
15	Bottom	15	Bottom	
16	Bottom	16	Bottom	
17	Bottom	17	Bottom	
18	Bottom	18	Bottom	

Table 2: High current connector pin assignments

SPECIFICATIONS

Product name	**Break-Out Box**
Part number	OP8xxx
Number of channels	Low current: 104 channels, 1A, 3A, 5A (or 8A TBD) High current: 18 channels, : 10A, 15A, (or 20A TBD)
Voltage range	0-30 Vdc
Form factor	3 U
Dimensions	13.33 x 48.26 x 30.8cm HxWxD (5.25” x 19” x 12.125”)
I/O connector	Low current: Elco 120 pin, SEB2-R 2 mm banana jack with 12 mm jumper High current: Phoenix connector, SEB4-R 4mm banana jack with 19 mm jumper
Operating temperature	10 to 40 ºC (50 to 104ºF)
Storage temperature	-55 to 85ºC (-67 to 185ºF)
Relative humidity	10 to 90%, non condensing
Maximum altitude	2,000 m (6562 ft.)

CONTACT

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