

**SOLDER
JUMPER
CHARTS**

TIME C H A R T				
	SB8	SB7	SB6	SB5
1	◆			
2		◆		
3	◆	◆		
4			◆	
5	◆		◆	
6		◆	◆	
7	◆	◆	◆	
8				◆
9	◆			◆
A		◆		◆
B	◆	◆		◆
C			◆	◆
D	◆		◆	◆
E		◆	◆	◆
F	◆	◆	◆	◆
Ø				

G A I N C H A R T				
	SB4	SB3	SB2	SB1
1	◆			
2		◆		
3	◆	◆		
4			◆	
5	◆		◆	
6		◆	◆	
7	◆	◆	◆	
8				◆
9	◆			◆
A		◆		◆
B	◆	◆		◆
C			◆	◆
D	◆		◆	◆
E		◆	◆	◆
F	◆	◆	◆	◆
Ø				

KEY
◆ = Short □ = Open

Specifications

Type Calculation: Digital
 Resolution: 1.5% to 8% (Dependent on time BASE selection)
 Sample Time Base: 0.125 sec to 114 sec/sample selectable

For general specifications, see the Series 8000 manual that came with this unit.

Setup Procedure

- I. Disassemble the Series 8000 unit as described on page 6 of the main manual.
- II. Remove the input board and Rate of Change Function Board.
- III. Set up the boards as described below.
- IV. Calibrate as described in the main manual. Note that the function board must be in place for the unit to be operational (*do not attempt to calibrate without it*).
- V. Reassemble the unit as described in the main manual, pages 4 to 6.

Setup Instructions

The Rate of Change Function Board was configured to your exact requirements by your distributor. Should you wish to change the input requirements to the board, follow the instructions below. These instructions provide the user with information necessary to select new rate of change.

The rate of change is figured as a percentage of full-scale input change per second to give a full-scale output from the Series 8000. The selected rate of change is always converted bi-directionally for positive and negative rates of change. A zero rate of change is represented as a mid-scale output on the Series 8000.

1. To configure the Rate of Change Function Board, the maximum rate of change in percent of full-scale input/second must be known for the application requirements.

RATE OF CHANGE CALIBRATION CHART

GAIN CHART POSITION		2	3	4	5	6	7	8	9	A	B	C	D	E	F	+F	
TIME CHART POSITION	SAMPLE TIME IN SECONDS	VOLTS	0.125	0.08335	0.0625	0.05	0.04166	0.035715	0.031258	0.02778	0.025	0.022725	0.02084	0.01925	0.017855	0.01667	0.01555
0	0.125	1	0.6668	0.5	0.4	0.33328	0.28572	0.250064	0.22224	0.2	0.1818	0.16672	0.154	0.14284	0.13336	0.1244	
1	0.139	0.899280	0.599640	0.449640	0.359712	0.299712	0.256942	0.224877	0.199856	0.179856	0.163489	0.149928	0.138489	0.128453	0.119928	0.111870	
2	0.167	0.748502	0.499101	0.374251	0.299401	0.249461	0.213862	0.187173	0.166347	0.149700	0.136077	0.124790	0.115269	0.106916	0.099820	0.093113	
3	0.222	0.563063	0.375450	0.281531	0.225225	0.187657	0.160878	0.140801	0.125135	0.112612	0.102364	0.093873	0.086711	0.080427	0.075090	0.070045	
4	0.333	0.375375	0.250300	0.187687	0.150150	0.125105	0.107252	0.093867	0.083423	0.075075	0.068243	0.062582	0.057807	0.053618	0.050060	0.046696	
5	0.555	0.225225	0.150180	0.112612	0.090090	0.075063	0.064351	0.056320	0.050054	0.045045	0.040945	0.037549	0.034684	0.032171	0.030036	0.028018	
6	1	0.125	0.08335	0.0625	0.05	0.04166	0.035715	0.031258	0.02778	0.025	0.022725	0.02084	0.01925	0.017855	0.01667	0.01555	
7	1.889	0.066172	0.044123	0.033086	0.026469	0.022053	0.018906	0.016547	0.014706	0.013234	0.012030	0.011032	0.010190	0.009452	0.008824	0.008231	
8	3.667	0.034087	0.022729	0.017043	0.013635	0.011360	0.009739	0.008524	0.007575	0.006817	0.006197	0.005683	0.005249	0.004869	0.004545	0.004240	
9	7.222	0.017308	0.011541	0.008654	0.006923	0.005768	0.004945	0.004328	0.003846	0.003461	0.003146	0.002885	0.002665	0.002472	0.002308	0.002153	
A	14.333	0.008721	0.005815	0.004360	0.003488	0.002906	0.002491	0.002180	0.001938	0.001744	0.001585	0.001453	0.001343	0.001245	0.001163	0.001084	
B	28.556	0.004377	0.002918	0.002188	0.001750	0.001458	0.001250	0.001094	0.000972	0.000875	0.000795	0.000729	0.000674	0.000625	0.000583	0.000544	
C	57	0.002192	0.001462	0.001096	0.000877	0.000730	0.000626	0.000548	0.000487	0.000438	0.000398	0.000365	0.000337	0.000313	0.000292	0.000272	
D	113.9	0.001097	0.000731	0.000548	0.000438	0.000365	0.000313	0.000274	0.000243	0.000219	0.000199	0.000182	0.000169	0.000156	0.000146	0.000136	
	COUNTS RESOLUTION	205	136	102	82	67	59	51	45	41	37	34	32	29	27	25	
		1.5%	2%	2.4%	3%	3.4%	3.9%	4.4%	4.9%	5.4%	5.9%	6.3%	6.9%	7.3%	8%	8%	

Example: The input board range is 0 to 1VDC and the maximum rate of change is 100mV/60 seconds.

The range is 100mV/1V=0.1.

The rate is 0.1/60 seconds=0.001667/second.

- Refer to the *Rate of Change Calibration Chart*. Look in the main body of the data to find the number closest to the calculated value and record the next highest value. In some cases two numbers may seem appropriate; if so, use the number with the smallest sample time. Since the example value is 0.001667, the next highest value is 0.001744.
- Once the closest number is located, note the hexadecimal value in the Gain Position and Sample Time Positions headings. The hexadecimal value for Gain Position and Sample Time Positions is A, A.
- Refer to the *Solder Jumper Chart* to determine which solder jumpers need to be opened or closed. In this example solder jumpers SB1, SB3, SB5 and SB7 need to be closed.

Calibration

Recalibration is required any time the range setting or input type is changed.

- Install CAL#1 jumper (E2-E3) and calibrate unit as if the Rate of Change Function Board was not installed. Note: Jumpering E2-E3 bypasses the function board.
- Install ROC jumper (E1-E2) and CAL#2 jumper (E5-E6).
- Set input to minimum and adjust MID (R-22) for mid-scale output.
- Use the following formula to calculate the input needed for adjusting the span for full-scale output:

$$(\text{Percent/Second}) * (\text{Sample Time}) = \text{Percent of Input}$$

$$\text{Percent of Input} * \text{Full-Scale Input} = \text{Calibration Input}$$

Example: Percent/Second = 0.001667 and Sample Time from the Calibration chart was 14.333 seconds.

$$0.001667 * 14.333 = 0.02389$$

$$0.02389 * 1V (\text{Full-Scale}) = 0.02389V$$

- Set input to Full-Scale Calibration input, calculated in Step 4, and adjust SPAN (R-19) for full-scale output.
- Install ROC jumper (E4-E5).
- Set input to mid-scale and adjust MID (R-22) for mid-scale output.
- The calibration process is complete.