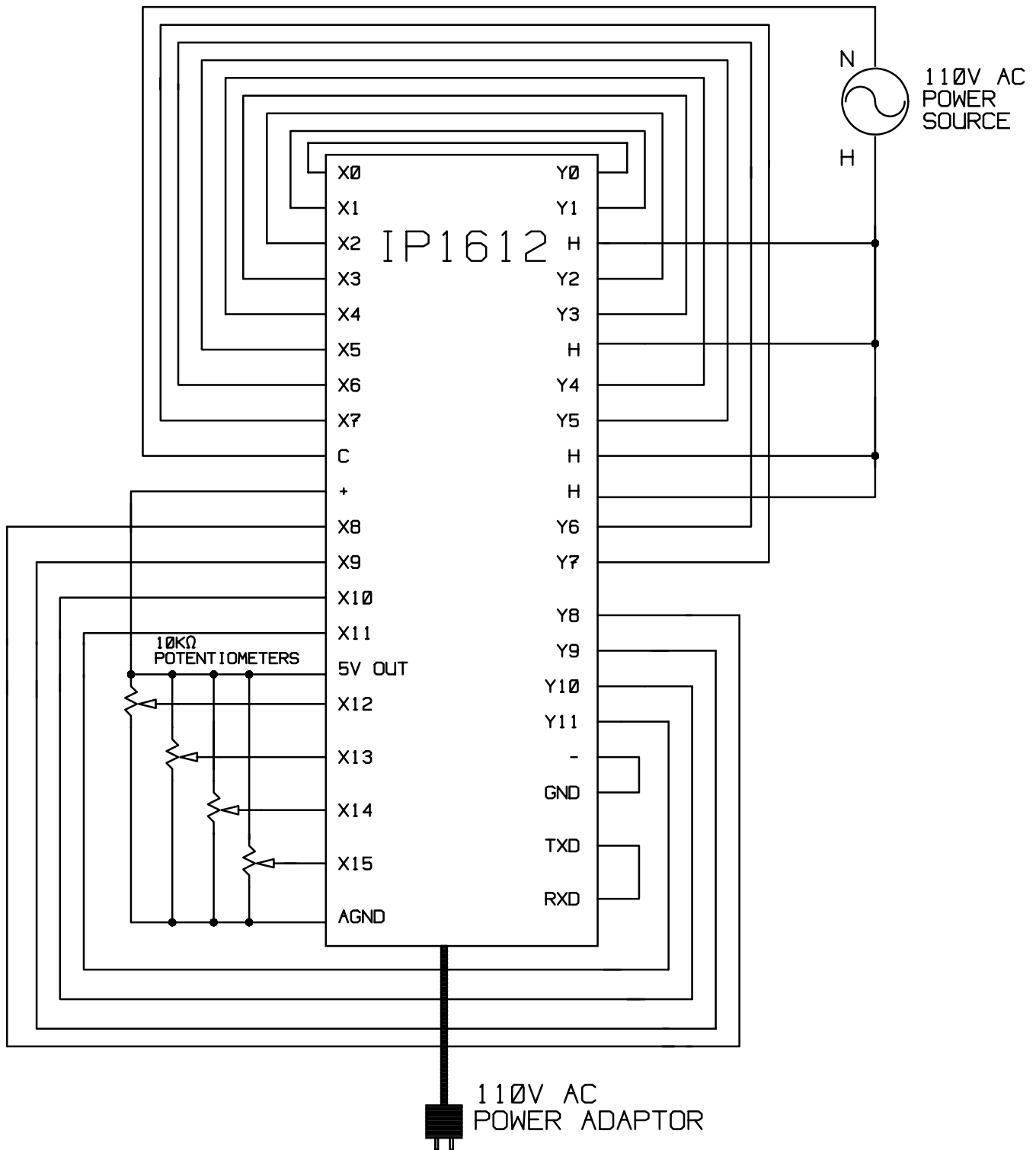


DIAGNOSING AND SERVICING

Each new IP1612 programmable controller from the factory comes preprogrammed with a self-diagnostic program in the EEPROM. Depending on whether you want to do a complete diagnosis or a partial one, you can wrap around the IP1612 as depicted in the following diagnostic wiring diagram,



To run the self diagnostics, just put the PLC in RUN mode and turn the power ON. (Remember that you should always check the wiring before you flip the power switch on.) Now check the following:

1. Y0 ... Y11 indicators will be turned on sequentially and cycled four times at the rate of one second per output and three seconds between sweeps. Check the indicator lights visually. If you suspect that an external output fails

even though its internal state indicator light is working, probe the output terminal screw with an oscilloscope or a voltmeter and see if the external signal flashes as the indicator light. If not, the external output driver is bad.

If X0 ... X11 are connected to Y0 ... Y11 with power, you should also visually check the cycling of the external input indicator LED lights. Since each LED is an internal state indicator, it will tell you whether the input stage is good or not.

2. After one minute, the diagnostic program will send all combinations of 0's and 1's to Y0 ... Y11 rapidly while sensing the wrapped-around external inputs X0 ... X11. If an input is sensed to be bad, an error code will be seen on the display. If all inputs are sensed to be correct, the iteration count will be displayed.

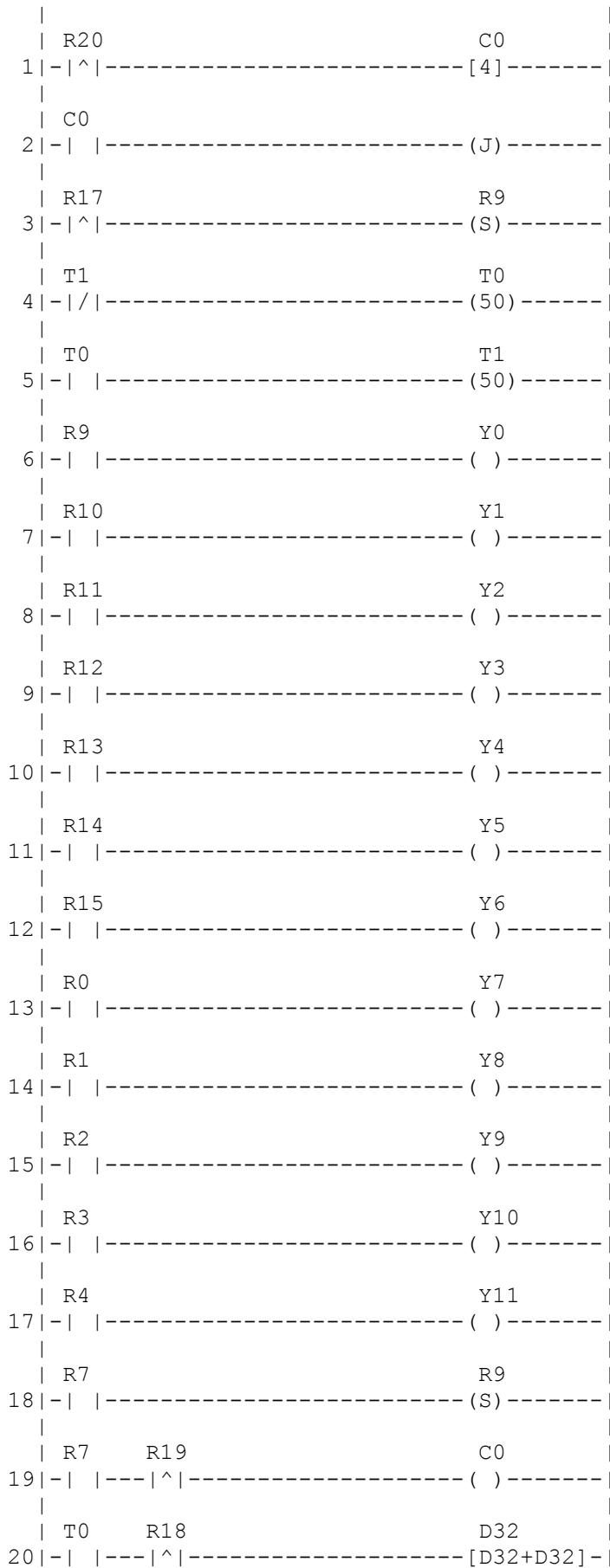
ERROR CODE	INDICATES	ERROR CODE	INDICATES
0001	Channel 0 stuck at 0	4094	Channel 0 stuck at 1
0002	Channel 1 stuck at 0	4093	Channel 1 stuck at 1
0004	Channel 2 stuck at 0	4091	Channel 2 stuck at 1
0008	Channel 3 stuck at 0	4087	Channel 3 stuck at 1
0016	Channel 4 stuck at 0	4079	Channel 4 stuck at 1
0032	Channel 5 stuck at 0	4063	Channel 5 stuck at 1
0064	Channel 6 stuck at 0	4031	Channel 6 stuck at 1
0128	Channel 7 stuck at 0	3967	Channel 7 stuck at 1
0256	Channel 8 stuck at 0	3839	Channel 8 stuck at 1
0512	Channel 9 stuck at 0	3583	Channel 9 stuck at 1
1024	Channel 10 stuck at 0	3071	Channel 10 stuck at 1
2048	Channel 11 stuck at 0	2047	Channel 11 stuck at 1

The occurrence of a code not listed above would mean a multiple-channel error. You can decipher the bad channel numbers by writing out the binary representation of the indicated error code. This most often occurs when there is a soft error, i.e., when it malfunctions temporarily, probably due to electrical noise.

3. Then you can tweak the trim pot or turn any potentiometer connected to X12 ... X15 to see a reading 0 to 1023 on the green LED display. Whichever input that has been changed most recently will be shown. If you do not care for analog input testing, just connect either the 5V OUT or AGND to one of these four inputs to see if the display shows 1020 to 1023 and 0 to 3 respectively. Do not worry about the last two bits because the A/D converters may not be absolutely accurate and the wire contacts may not be perfectly resistance-free.
4. If anything looks suspicious, disconnect all the power supplies, check your wiring again, reconnect and repeat the above steps.

IP1612 Diagnostic Program

IP1612 RELAY LADDER LOGIC



21	-----	(JE)	-----		
	C0				
22	- /	-----	(J)-----		
	R27		C3		
23	- ^	-----	[2]-----		
	T3		T2		
24	- /	-----	(2)-----		
	T2		T3		
25	-	-----	(12)-----		
	T2		T6		
26	-	-----	(8)-----		
	C2	R24	T6	R26	
27	- /	--- / ---		-----	(S)-----
	T2	R26	R25		C5
28	-	--- / ---	^	-----	[C5+1]-----
	T2				C6
29	-	-----	-----	-----	[4097-C5]-----
	T2	C6			R28
30	-	---	-----	-----	(S)-----
	C1	T2			C1
31	-	---	-----	-----	[4095]-----
					R24
32					(S)-----
	T2				C3
33	-	-----	-----	-----	()-----
	C3				R24
34	-	-----	-----	-----	(R)-----
	T2		R26		C1
35	-	-----	/	-----	()-----
	R21	R28	T2		D34
36	- /	--- / ---		-----	[C1]-----
	R21	R28	T2		D34
37	-	--- / ---		-----	[4095-C1]-----
	R37				R5
38	-	-----	-----	-----	()-----
	R38				R6
39	-	-----	-----	-----	()-----
	R39				R7
40	-	-----	-----	-----	()-----
	R41				Y0
41	-	-----	-----	-----	()-----
	R42				Y1
42	-	-----	-----	-----	()-----

43	R43	Y2
	-	- - - - - () - - - - -
44	R44	Y3
	-	- - - - - () - - - - -
45	R45	Y4
	-	- - - - - () - - - - -
46	R46	Y5
	-	- - - - - () - - - - -
47	R47	Y6
	-	- - - - - () - - - - -
48	R32	Y7
	-	- - - - - () - - - - -
49	R33	Y8
	-	- - - - - () - - - - -
50	R34	Y9
	-	- - - - - () - - - - -
51	R35	Y10
	-	- - - - - () - - - - -
52	R36	Y11
	-	- - - - - () - - - - -
53	X0	R9
	-	- - - - - () - - - - -
54	X1	R10
	-	- - - - - () - - - - -
55	X2	R11
	-	- - - - - () - - - - -
56	X3	R12
	-	- - - - - () - - - - -
57	X4	R13
	-	- - - - - () - - - - -
58	X5	R14
	-	- - - - - () - - - - -
59	X6	R15
	-	- - - - - () - - - - -
60	X7	R0
	-	- - - - - () - - - - -
61	X8	R1
	-	- - - - - () - - - - -
62	X9	R2
	-	- - - - - () - - - - -
63	X10	R3
	-	- - - - - () - - - - -
64	X11	R4
	-	- - - - - () - - - - -

65	T6	C2	[D32-D34]
66	C2	R21	(S)
67	C3 R21	R8	(S)
68	R26 R28 R8		[4095-D34]
69	R26 R28 R8		[D34]
70	R28	C12	[A12]
71		C13	[A13]
72		C14	[A14]
73		C15	[A15]
74		C20	[C12-C16+3]
75	R31	R22	()
76		C20	[6-C20]
77	R31	R22	(S)
78	R22 R28		[C12]
79	R22	C16	[C12]
80		C20	[C13-C17+3]
81	R31	R22	()
82		C20	[6-C20]
83	R31	R22	(S)
84	R22 R28		[C13]
85	R22	C17	[C13]
86		C20	[C14-C18+3]

87	R31	R22
		()
88		C20
		[6-C20]
89	R31	R22
		(S)
90	R22 R28	
		[C14]
91	R22	C18
		[C14]
92		C20
		[C15-C19+3]
93	R31	R22
		()
94		C20
		[6-C20]
95	R31	R22
		(S)
96	R22 R28	
		[C15]
97	R22	C19
		[C15]
98		(JE)
99		(E)
100		