Utility Card Tests

This chapter describes tests for the optional Utility Card.

The Utility Card tests are numbered in the 8000s.

Programming Cards

Test 8001

Check Programming Cards

This tests the three plug-in card relays on the Utility Card and reports an error if any of the cards fails the test.

External device information in Diagnostics

Any external devices installed in the Utility Card will be detected and the information displayed in Diagnostics under **Config** > **Testhead Config** > **Actual Config**. For instance, the display show **Uti_001** if an external device is detected in slot 1 of the Utility Card.

The actual configuration is checked against the configuration specified in the official config file and any mismatch is indicated with an asterisk (*) in both the Actual Config and Official Config screens (**Config** > **Testhead Config** > **Actual Config** and **Official Config**).

Test 8101

Check Programming Card Relays

This tests the programming card relays on the Utility Card. There are nine pairs of relays in each programming card (Figure 8-1) and this test will report on any pairs that fail.

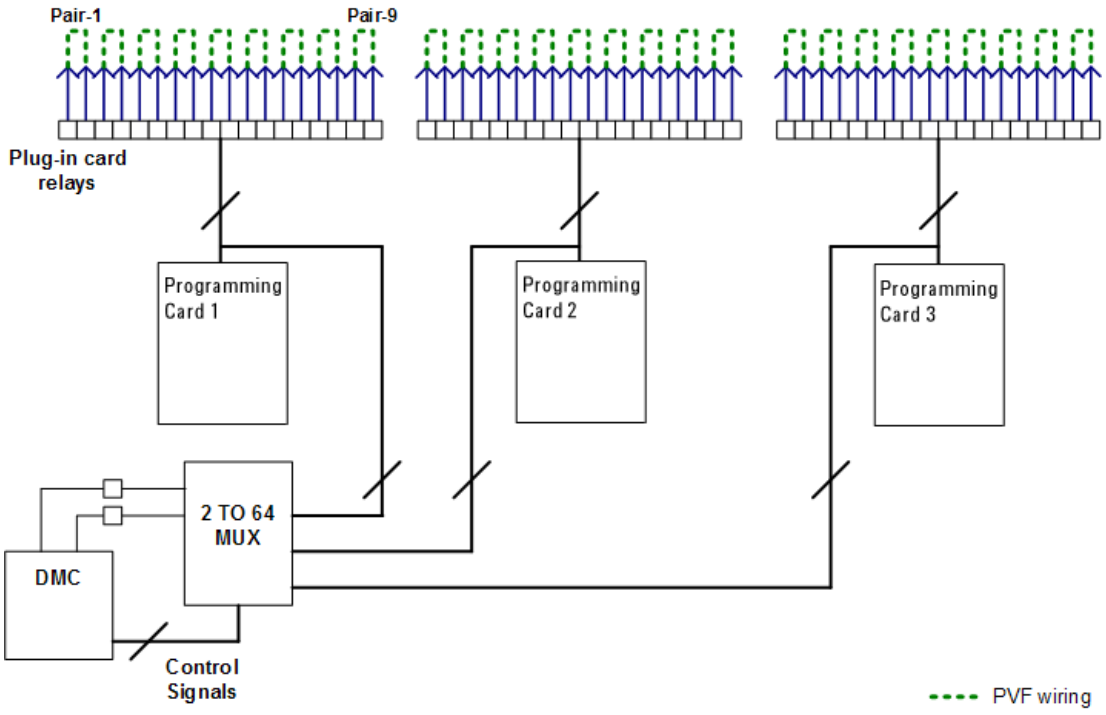
Table 8-1 Programming Card relay pairs

Relay Pairs	Relays	MINT Pins Conncected by PVF
Programming Card 1		
1	K1001, K1004	J2-41 to J2-42
2	K1007, K1010	J2-43 to J2-44
3	K1013, K1016	J2-45 to J2-46
4	K1002, K1005	J2-47 to J2-48
5	K1008, K1011	J2-49 to J2-50
6	K1014, K1017	J2-51 to J2-52

Table 8-1 Programming Card relay pairs

Relay Pairs	Relays	MINT Pins Conncected by PVF
7	K1003, K1006	J2-53 to J2-54
8	K1009, K1012	J2-55 to J2-56
9	K1015, K1018	J2-57 to J2-58
Programming Card 2		
1	K1101, K1104	J1-41 to J1-42
2	K1107, K1110	J1-43 to J1-44
3	K1113, K1116	J1-45 to J1-46
4	K1102, K1105	J1-47 to J1-48
5	K1108, K1111	J1-49 to J1-50
6	K1114, K1117	J1-51 to J1-52
7	K1103, K1106	J1-53 to J1-54
8	K1109, K1112	J1-55 to J1-56
9	K1115, K1118	J1-57 to J1-58
Programming Card 3		
1	K1201, K1204	J1-61 to J1-62
2	K1207, K1210	J1-63 to J1-64
3	K1213, K1216	J1-65 to J1-66
4	K1202, K1205	J1-67 to J1-68
5	K1208, K1211	J1-69 to J1-50
6	K1214, K1217	J1-71 to J1-72
7	K1203, K1206	J1-73 to J1-74
8	K1209, K1212	J1-75 to J1-76
9	K1215, K1218	J1-77 to J1-78

Figure 8-1 Test 8101 - relays tested



Balanced MUX and GP Relays

Test 8002

Check SUBMUX Relays for Balanced MUX and GP Relays

This test verifies that the K319 and K322 relays on the Utility Card can be closed and opened.

A measurement path is created on the Utility Card through the targeted relays and then through S bus and I bus on ASRU card. The cards are interfaced through X1 and X2 buses. On the ASRU card, K733 is closed to connect S bus to X1 bus, and K726 is closed to connect I bus to X2 bus. The source and detector on the ASRU card are set up to measure the resistance between the S and I buses. After closing the targeted relays, the test measures the resistance of this path for the closed relay test, expecting low impedance. Next, the targeted relays are opened one by one for the open relay test, which is expected to give a measurement of high impedance.

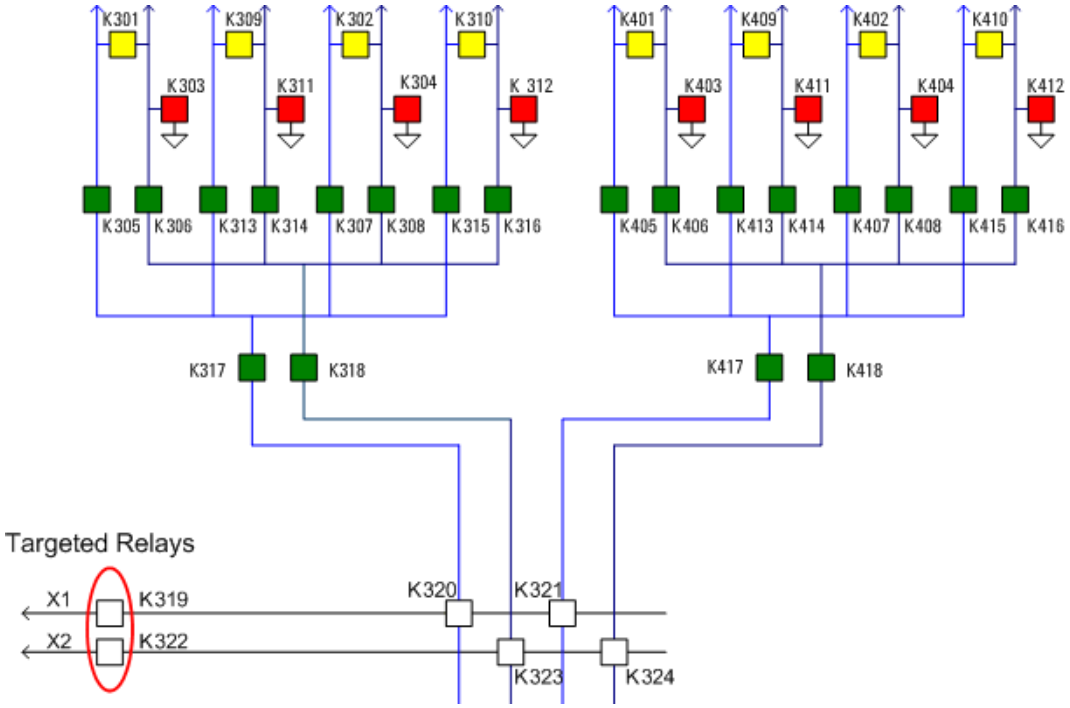
Subtests 1 and 2 verify that K319 and K322 can be opened.

Figure 8-2 shows the relays under test.

Table 8-2 Test 8002 subtests

Subtest	Target Relay	Mode
0	K319 and K322	closed
1	K319	opened
2	K322	opened

Figure 8-2 Test 8002 - relays tested



Test 8003

Check SUBMUX Relays for Balanced MUX and GP Relays

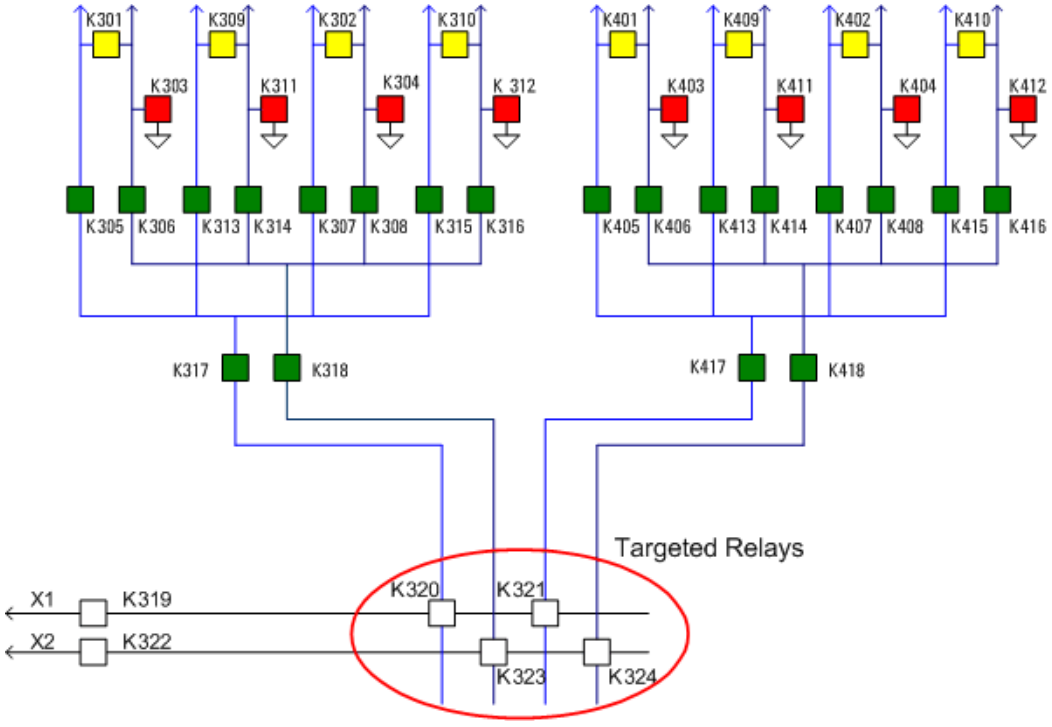
This test is similar to Test 8002. The setup for the ASRU card is same as in Test 8002. For the Utility Card, the Balanced MUX and GP relays are separated into two groups. The relays in each group are closed to test the targeted relays K320, K323 and K321, K324.

Figure 8-3 shows the relays under test.

Table 8-3 Test 8003 subtests

Subtest	Target Relay	Mode
0	K320 and K323	closed
1	K320	opened
2	K323	opened
3	K321 and K324	closed
4	K321	opened
5	K324	opened

Figure 8-3 Test 8003 - relays tested



Test 8004

Check SUBMUX Relays for Balanced MUX and GP Relays

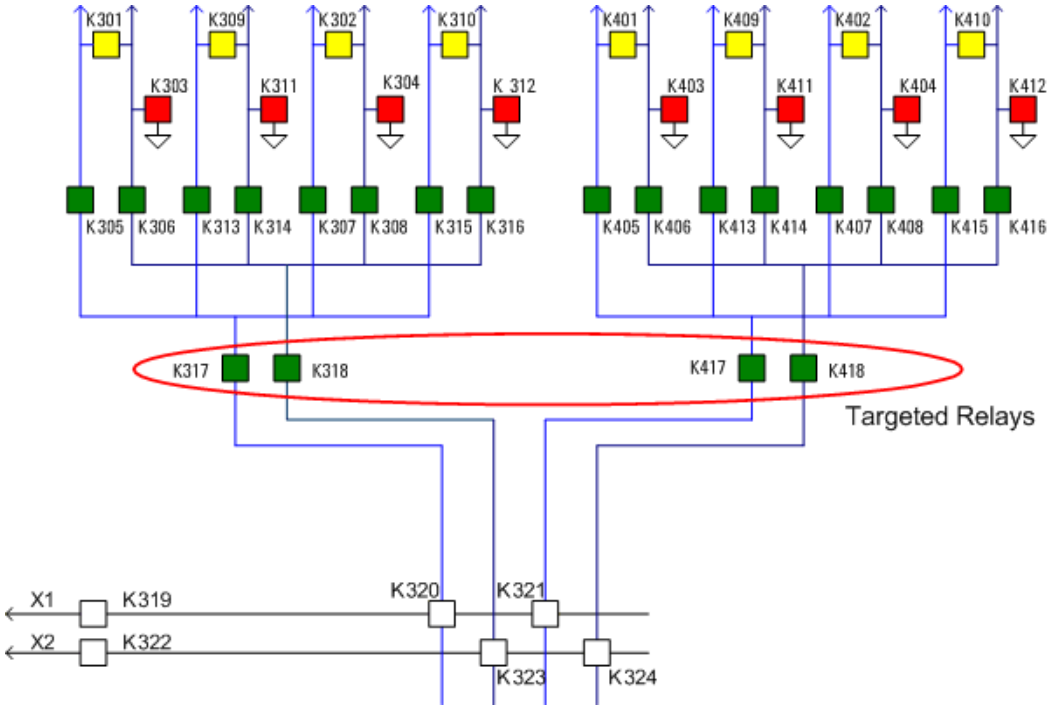
This test is similar to Test 8003. The setup for the ASRU card is same but the targeted relays on the Utility Card are K317, K318 and K417, K418.

Figure 8-4 shows the relays under test.

Table 8-4 Test 8004 subtests

Subtest	Target Relay	Mode
0	K317 and K318	closed
1	K317	opened
2	K318	opened
3	K417 and K418	closed
4	K417	opened
5	K418	opened

Figure 8-4 Test 8004 - relays tested



Test 8005

Check Balanced MUX and GP Relays

This test checks the Balanced MUX and General Purpose (GP) relays on the Utility Card. The setup for the ASRU card is the same as Test 8002. In the Utility Card, the targeted relays are tested in 8 groups. In each group, 1 closed relay test and 3 open relay tests are performed using the same resistance measurement method between S and I buses.

Figure 8-5 shows the relays under test.

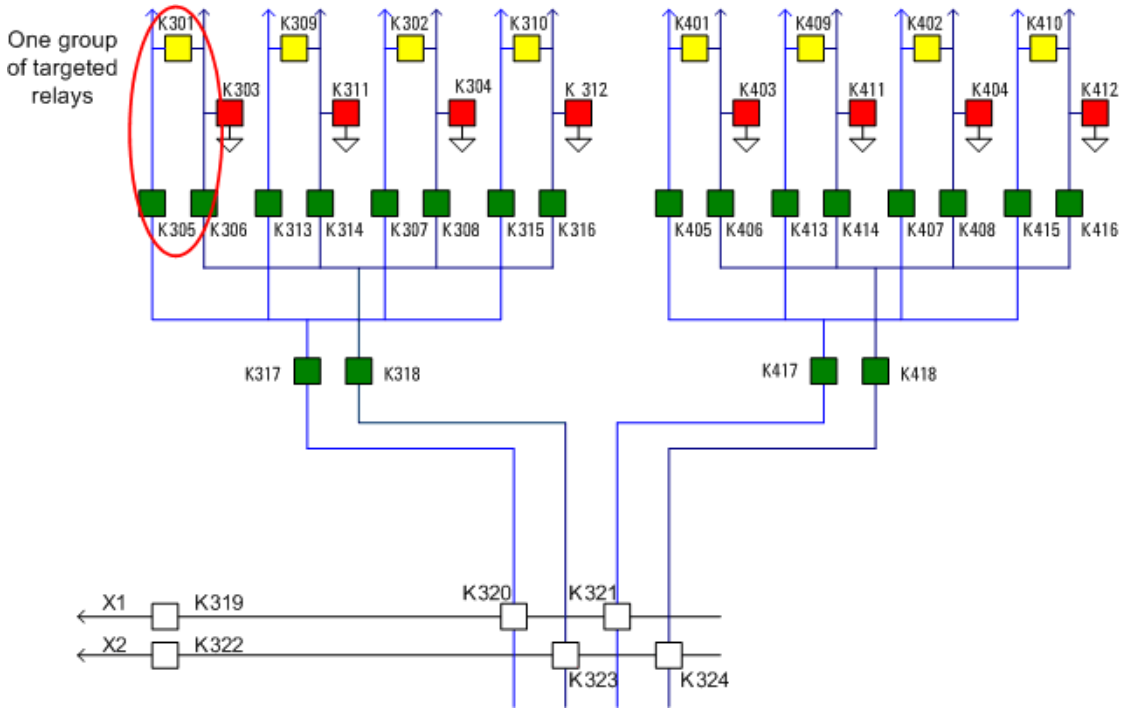
Table 8-5 Test 8005 subtests

Subtest	Target Relay	Mode
0	K305, K306, K301	closed
1	K305	opened
2	K306	opened
3	K301	opened
4	K313, K314, K309	closed
5	K313	opened
6	K314	opened
7	K309	opened
8	K307, K308, K302	closed
9	K307	opened
10	K308	opened
11	K302	opened
12	K315, K316, K310	closed
13	K315	opened
14	K316	opened
15	K310	opened
16	K405, K406, K401	closed
17	K405	opened
18	K406	opened
19	K401	opened
20	K413, K414, K409	closed
21	K413	opened

Table 8-5 Test 8005 subtests

Subtest	Target Relay	Mode
22	K414	opened
23	K409	opened
24	K407, K408, K402	closed
25	K407	opened
26	K408	opened
27	K402	opened
28	K415, K416, K410	closed
29	K415	opened
30	K416	opened
31	K410	opened

Figure 8-5 Test 8005 - relays tested



Test 8006

Check Ground Relays for Balanced Lines

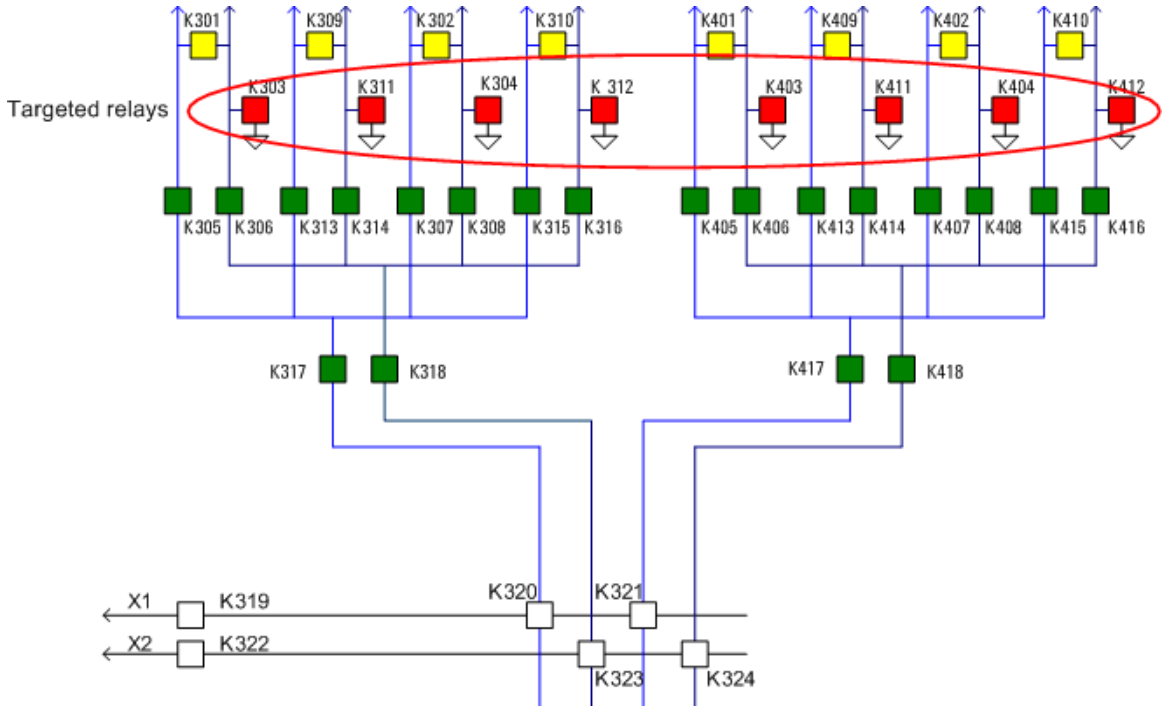
This test supplies 5 V to the measurement paths in Test 8005 and measures back with the detector on the ASRU card, targeting to test ground relays for the balanced lines. When the ground relay under test is closed, the path is expected to measure about 0 V while 5 V is expected for opened relay.

The source and detector of the ASRU card are connected to the I bus via a current limiting resistor by closing the interconnect relays K830, K808 and K812. The I bus is then connected to X1 and X2 buses. Each ground relay for the balanced lines in the measurement paths is closed and a 0 V measurement is expected at the detector. Next, the targeted ground relay is opened and a 5 V measurement is expected.

Table 8-6 Test 8006 subtests

Subtest	Target Relay	Mode
0	K303	closed
1	K303	opened
2	K311	closed
3	K311	opened
4	K304	closed
5	K304	opened
6	K312	closed
7	K312	opened
8	K403	closed
9	K403	opened
10	K411	closed
11	K411	opened
12	K404	closed
13	K404	opened
14	K312	closed
15	K312	opened

Figure 8-6 Test 8006 - relays tested



Muxed Power Supply Relays

Test 8007

Check SUBMUX Relays for Channel-7 Muxed PS Relays

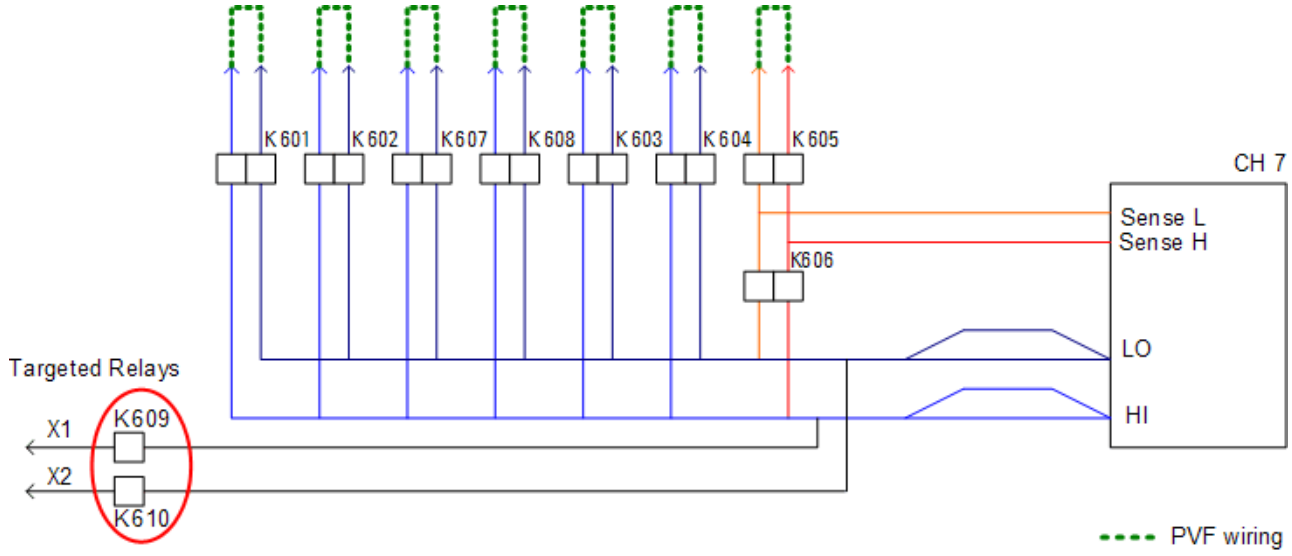
This test verifies that the K609 and K610 relays can be closed and opened. It is similar to Test 8002, measuring the resistance of the path on the Utility Card through the targeted relays. Subtest 0 checks that both relays can be closed. Subtests 1 and 2 verify that K609 and K610 can be opened.

Figure 8-7 shows the relays under test.

Table 8-7 Test 8007 subtests

Subtest	Target Relay	Mode
0	K609 and K610	closed
1	K609	opened
2	K610	opened

Figure 8-7 Test 8007 - relays tested



Test 8008

Check SUBMUX Relays for Channel-8 Muxed PS Relays

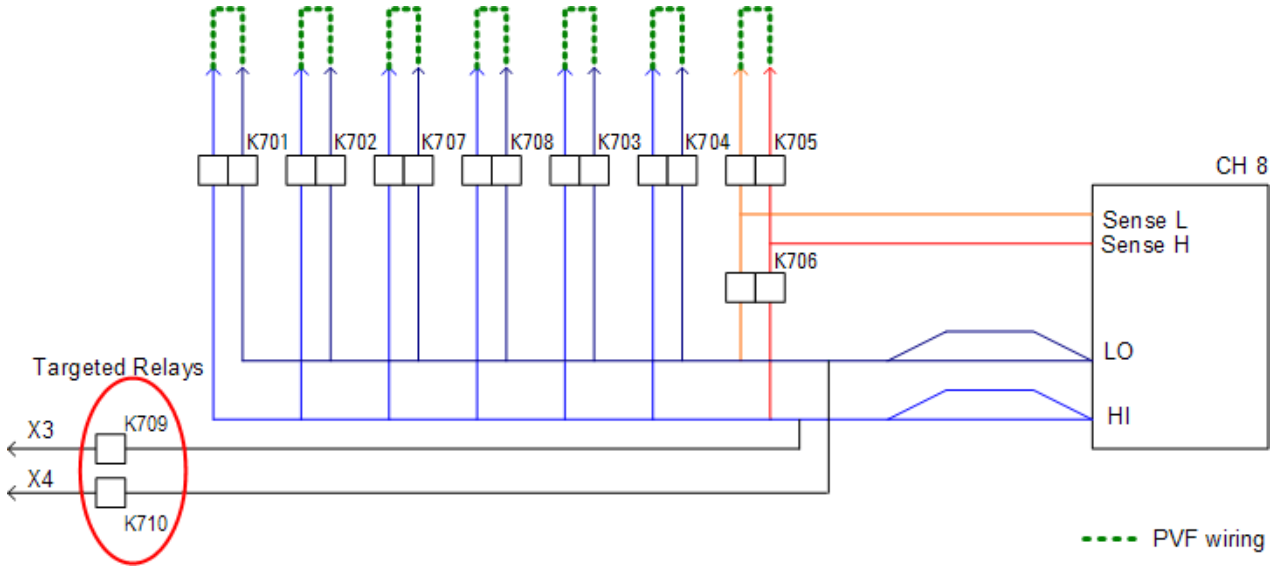
This test verifies that both the K709 and K710 relays can be closed and opened. It is similar to test 8007 but the measurement path is made through the X3 and X4 buses instead of the X1 and X2 buses.

Figure 8-8 shows the relays under test.

Table 8-8 Test 8008 subtests

Subtest	Target Relay	Mode
0	K709 and K710	closed
1	K709	opened
2	K710	opened

Figure 8-8 Test 8008 - relays tested



Other Tests

Test 8040

Muxed Power Supplies Connected to Utility Card & Relays

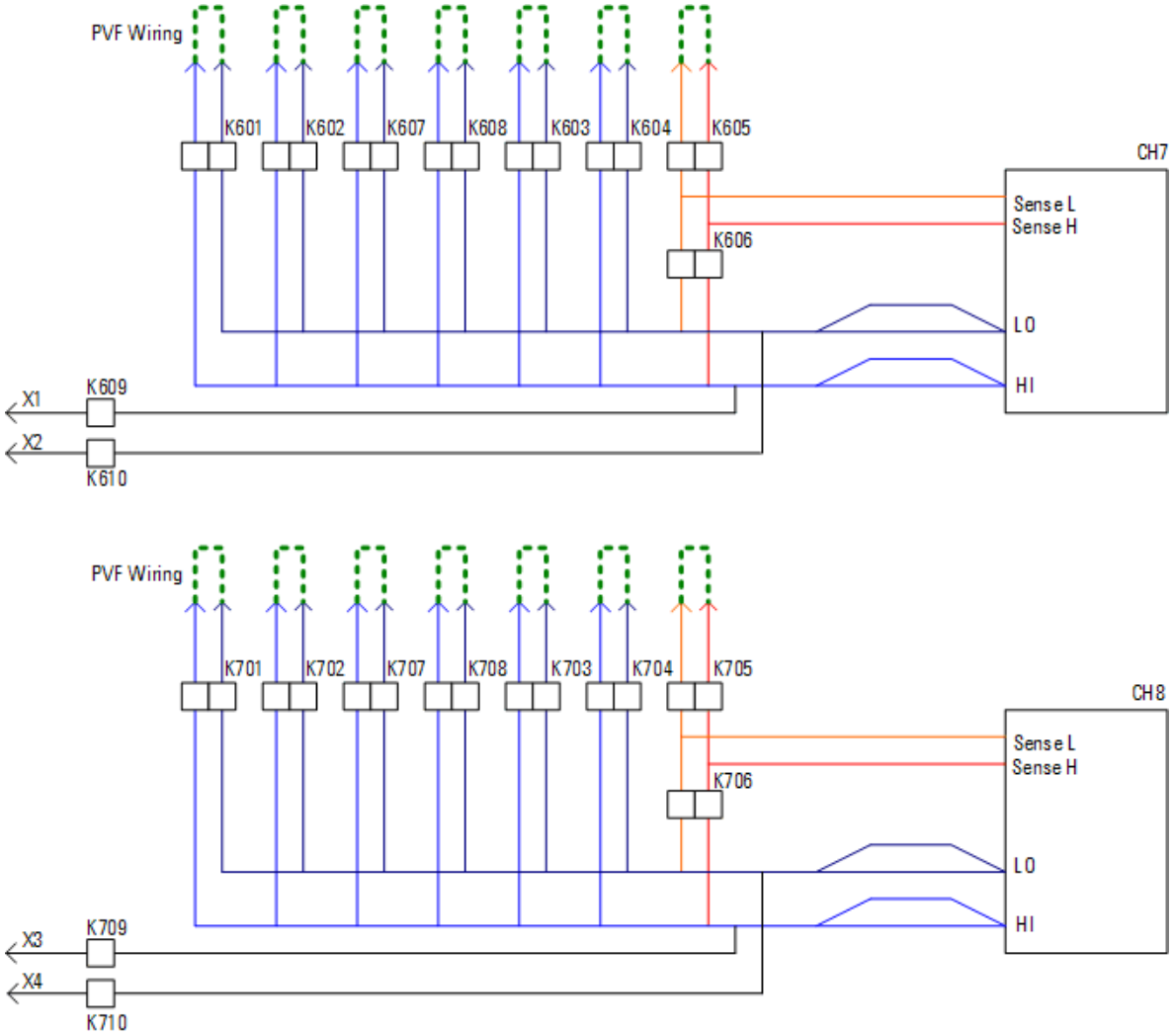
This tests muxed power supplies connected to the Utility Card and muxed power supply relays. It verifies that the power supplies are connected as specified in the system configuration. All the data for channels 7 and 8 can be found in the power supplies data array in the system config file for each module.

First the test queries channels 7 and 8 to see if the proper power supply type is connected. Once it is verified, the muxed power supply is programmed to output 5 V into the Utility Card; this is then checked with the ASRU card to ensure the connectivity and voltage accuracy. Each of the muxed power supply relay pairs under test is closed to trigger the current limit at alternate subtests to check that they can be closed or opened.

Muxed power supplies information in Diagnostics

When muxed power supply channel 7 and channel 8 are specified in the config file for the Utility Card, the information is displayed in Diagnostics under **Config** > **System Config**.

Figure 8-9 Test 8040 – Muxed power supplies and relays



Test 8042

Test Ethernet Port of Utility Card

This test checks the Ethernet port by reading the MAC address written to ROM while the command mode is switched to Ethernet token access command from the backplane. This test can be run only from **Test Number Entry**.