KEITHLEY

Switch Matrix Configurations

4200-UL-LS-XX, 4200-UL-RS-XX, 4200-LC-LS-XX, and 4200-GP-RS-XX Packing List

PA-739 Rev. B / 3-01

A GREATER MEASURE OF CONFIDENCE

4200-UL-LS-XX

Depending on the particular model, this switch matrix configuration uses up to six Model 7174A matrix cards. By using 2-wire Local Sense and the row-column connection scheme, five instrument components of the Model 4200-SCS and a C-V meter can be connected to the matrix. With six matrix cards, 72 pins are available for DUT. Table 1 lists the equipment that is supplied with each of the six models.

4200-UL-RS-XX

Depending on the particular model, this switch matrix configuration uses two to six Model 7174A matrix cards. By using 4-wire Remote Sense and the Instrument Card connection scheme, four instrument components of the Model 4200-SCS, and a C-V meter can be connected to the instrument card of the matrix. With six matrix cards, 30 pin-pairs are available for DUT. Table 2 lists the equipment that is supplied with each of the five models.

4200-LC-LS-XX

Depending on the particular model, this switch matrix configuration uses up to six Model 7072 matrix cards. By using 2-wire Local Sense and the Row-Column connection scheme, five instrument components of the Model 4200-SCS and a C-V meter can be connected to the matrix. With six matrix cards, 72 pins are available for DUT. Table 3 lists the equipment that is supplied with each of the six models.

4200-GP-RS-XX

Depending on the particular model, this switch matrix configuration uses up to six Model 7071 matrix cards. The 4200-GP-RS-XX uses a unique 3-pole relay that gives it remote sense capability, even when connected in the Local Sense mode. By using the Local Sense and the Row-Column connection scheme settings, five instrument components of the Model 4200-SCS and a C-V meter can be connected to the matrix and used in a 4-wire measurement configuration. With six matrix cards, 72 pins are available for DUT. Table 4 lists the equipment that is supplied with each of the six models.

Documentation summary

This packing list provides documentation for all the available switch matrix configurations. You only need to address the information that applies to the model that you ordered. The information in this packing list is organized as follows:

- **Supplied equipment** — Describes the equipment that make up a switch matrix and provides tables that list the equipment that is supplied with each model.
- **Test systems for switch matrix configurations** — Describes and illustrates the four basic switch matrix systems.
- **Installation** — Summarizes how to install matrix cards in the mainframe, connect the GPIB port of the mainframe to the GPIB port of the Model 4200-SCS, and how to make signal connections to the matrix.
- **Mainframe power on** — Summarizes how to power on the switch mainframe.
- **Using *KCON* to add switch matrix to the system** — Provides the step-by-step procedure to add your switch matrix to the system.

> ***NOTE*** *For details on using a switch matrix, refer to the "Model 4200-SCS Reference Manual," Appendix B.*

Supplied equipment

Tables 1 through 4 list the supplied equipment for each switch matrix configuration. For example, if you ordered the 4200-UL-LS-72 (see last column of Table 1), check that you have received a 707A switch mainframe (with light pen), six 7074A switch cards, 72 triax cables, an IEEE-488 cable, and two triax-to-BNC adapters. The supplied equipment is summarized as follows:

Switch Mainframes — The Model 708A mainframe has one slot for one matrix card, while the Model 707A has six slots for up to six matrix cards. The supplied mainframe is equipped with a light pen that can be used to open and close switches.

Switch Cards — Each of the following matrix card types has eight rows and 12 columns:

- Model 7174A Low Current Matrix Card — Provides 2-pole switching with 10fA typical offset current. It is equipped with 3-lug triax connectors.
- Model 7072 Semiconductor Matrix Card — Provides two 2-pole low current paths (<1pA offset current), two 1-pole C-V paths for characterization (DC to 1MHz), and four 2-pole paths for general purpose switching. It is equipped with 3-lug triax connectors.
- Model 7071 General Purpose Matrix Card — Provides 3-pole switching with <100pA offset current. It is equipped with screw terminals and pin connectors.

Model 4200-TRX-3 Triax Cables — For the 7174A and 7072 switch cards, triax cables terminated with 3-slot triax connectors are supplied for connections to DUT. Each triax cable is three meters in length.

Model 7078-MTC-20 Cables — For each 7071 switch card, a 20-ft mass terminated cable terminated with 38-pin connectors is supplied for connections to DUT.

Model 7078-TRX-BNC Adapters — For the 7174A and 7072 switch cards, these 3-slot triax-to-BNC adapters allow an instrument equipped with BNC connectors (i.e., Model 590 CV Analyzer) to be connected to the switch card.

> ***NOTE*** *If any of the supplied equipment is missing or damaged, contact Keithley Instruments, or your Keithley representative, for instructions. Contact information is provided in the "Model 4200-SCS User's Manual."*

Table 1
Supplied equipment — 4200-UL-LS-XX

Supplied Equipment	4200-UL-LS-12	4200-UL-LS-24	4200-UL-LS-36	4200-UL-LS-48	4200-UL-LS-60	4200-UL-LS-72
708A Switch Mainframe	1	—	—	—	—	—
707A Switch Mainframe	—	1	1	1	1	1
7174A Switch Cards	1	2	3	4	5	6
4200-TRX-3 Cables	12	24	36	48	60	72
7007-1 IEEE-488 Cable	1	1	1	1	1	1
7078-TRX-BNC Adapters	2	2	2	2	2	2
7078-PEN Light Pen	1	1	1	1	1	1

Table 2
Supplied equipment — 4200-UL-RS-XX

Supplied Equipment	4200-UL-RS-6	4200-UL-RS-12	4200-UL-RS-18	4200-UL-RS-24	4200-UL-RS-30
707A Switch Mainframe	—	1	1	1	1
7174A Switch Cards	2	3	4	5	6
4200-TRX-3 Cables	12	24	36	48	60
7007-1 IEEE-488 Cable	1	1	1	1	1
7078-TRX-BNC Adapters	4	4	4	4	4
7078-PEN Light Pen	1	1	1	1	1

Table 3
Supplied equipment — 4200-LC-LS-XX

Supplied Equipment	4200-LC-LS-12	4200-LC-LS-24	4200-LC-LS-36	4200-LC-LS-48	4200-LC-LS-60	4200-LC-LS-72
708A Switch Mainframe	1	—	—	—	—	—
707A Switch Mainframe	—	1	1	1	1	1
7072 Switch Cards	1	2	3	4	5	6
4200-TRX-3 Cables	12	24	36	48	60	72
7007-1 IEEE-488 Cable	1	1	1	1	1	1
7078-TRX-BNC Adapters	2	2	2	2	2	2
7078-PEN Light Pen	1	1	1	1	1	1

Table 4
Supplied equipment — 4200-GP-RS-XX

Supplied Equipment	4200-GP-RS-12	4200-GP-RS-24	4200-GP-RS-36	4200-GP-RS-48	4200-GP-RS-60	4200-GP-RS-72
708A Switch Mainframe	1	—	—	—	—	—
707A Switch Mainframe	—	1	1	1	1	1
7071 Switch Cards	1	2	3	4	5	6
7078-MTC-20 Cables	1	2	3	4	5	6
7007-1 IEEE-488 Cable	1	1	1	1	1	1
7078-PEN Light Pen	1	1	1	1	1	1

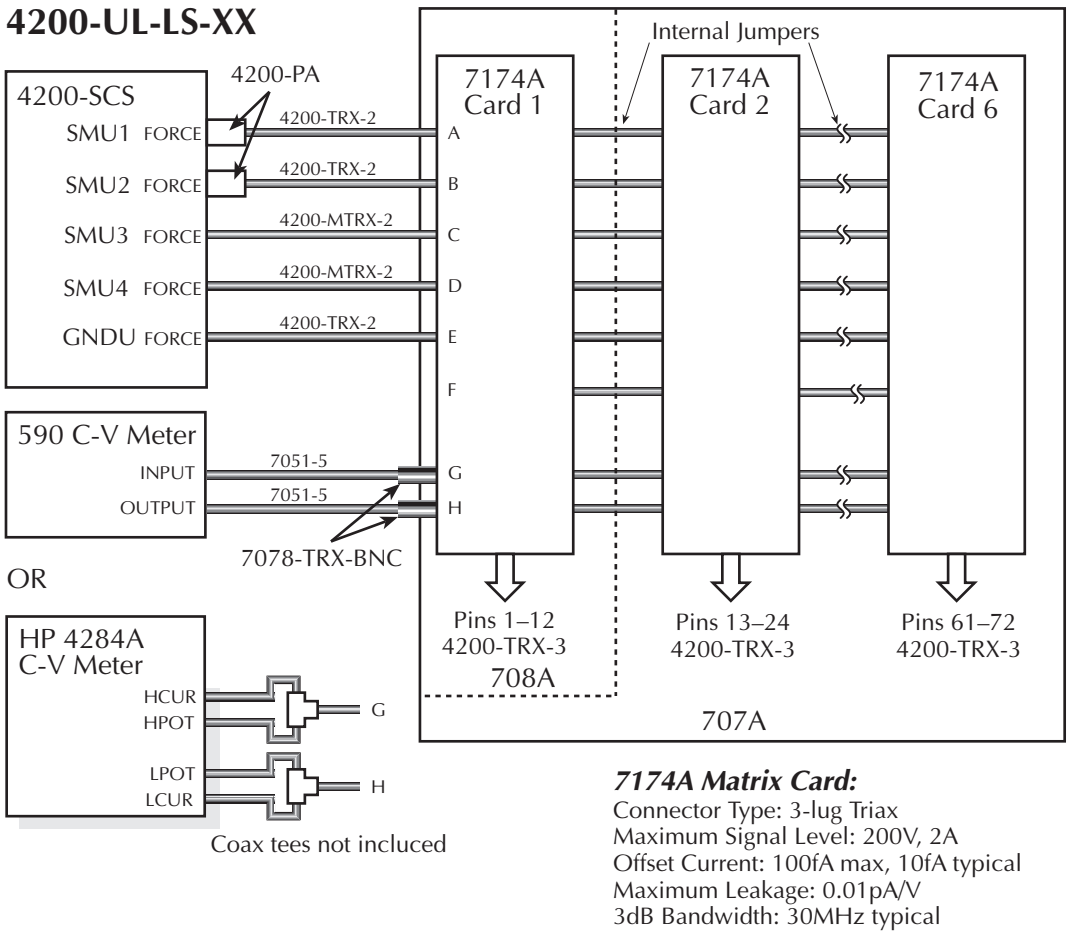
NOTE Configurations for Models 4200-UL-LS-12/707A, 4200-LC-LS-12/707A, and 4200-GP-RS-12/707A are not noted in the above configurations. These models imply that a Model 707A is used in place of a Model 708A in a single card system to allow for future expansion.

Test systems for switch matrix configurations

Figures 1 through 4 show typical test systems for the four basic switch matrix configurations. Note that the triax cables that connect the Model 4200-SCS to the matrix card are supplied with the Model 4200-SCS. Also note that configurations using the Model 708A mainframe use only one matrix card.

4200-UL-LS-XX switch matrix configuration — The test system in Figure 1 uses local sensing. The two supplied triax-to-BNC connectors are used to connect a C-V meter to the switch matrix. The switch matrix columns (pins) are used for connecting to the probe station or test fixture.

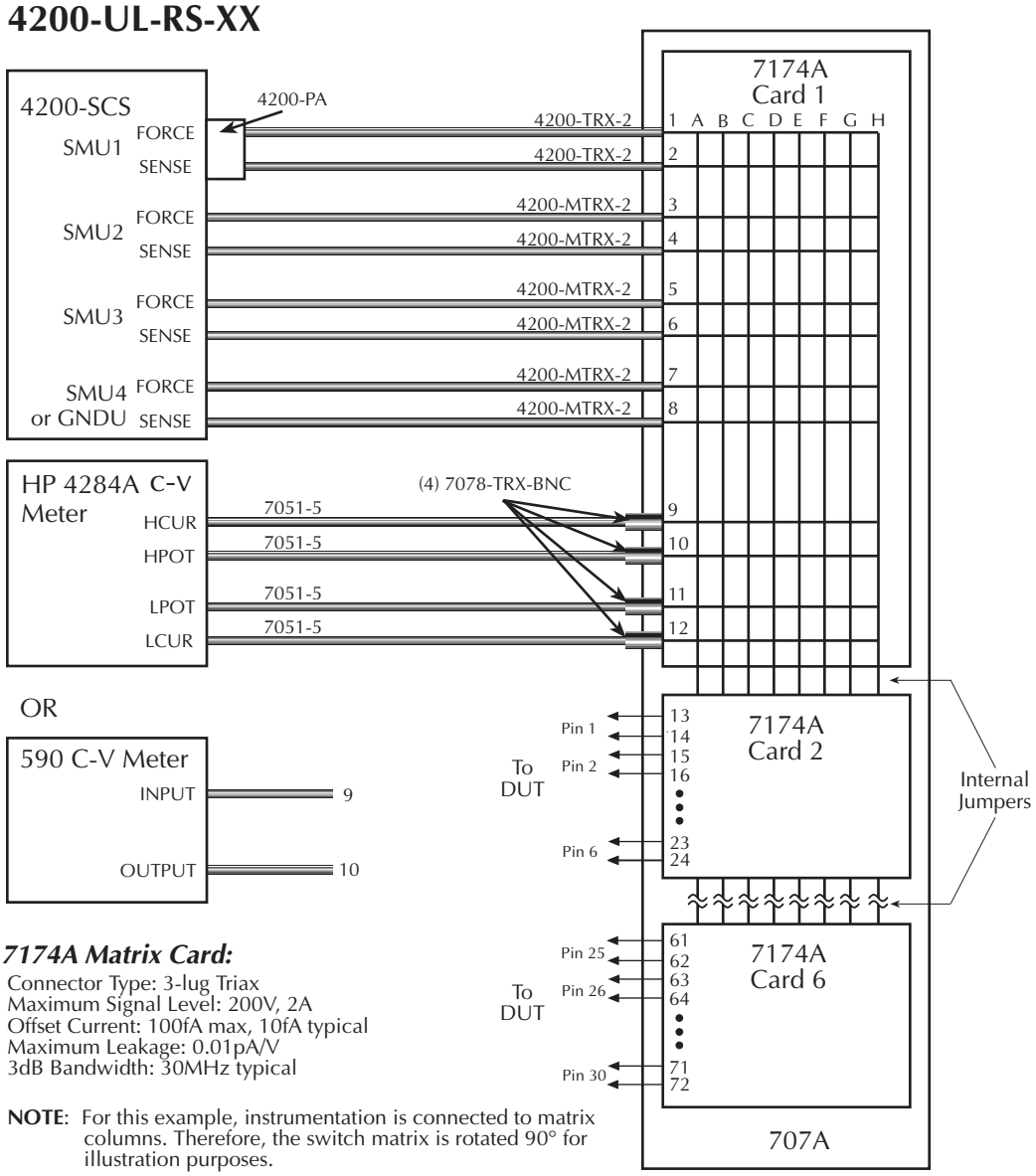
Figure 1
Test system for 4200-UL-LS-XX switch matrix configuration



7174A Matrix Card:
Connector Type: 3-lug Triax
Maximum Signal Level: 200V, 2A
Offset Current: 100fA max, 10fA typical
Maximum Leakage: 0.01pA/V
3dB Bandwidth: 30MHz typical

4200-UL-RS-XX switch matrix configuration — The test system in Figure 2 uses remote sensing. Since 12 individual paths are required for the instruments, they are connected to matrix columns instead of rows. The first matrix card in the system serves as the Instrument Card. The probe station (or test fixture) is connected to the columns of the other matrix cards. The four supplied triax-to-BNC connectors are used to connect the HP C-V meter to the switch matrix.

Figure 2
Test system for 4200-UL-RS-XX switch matrix configuration



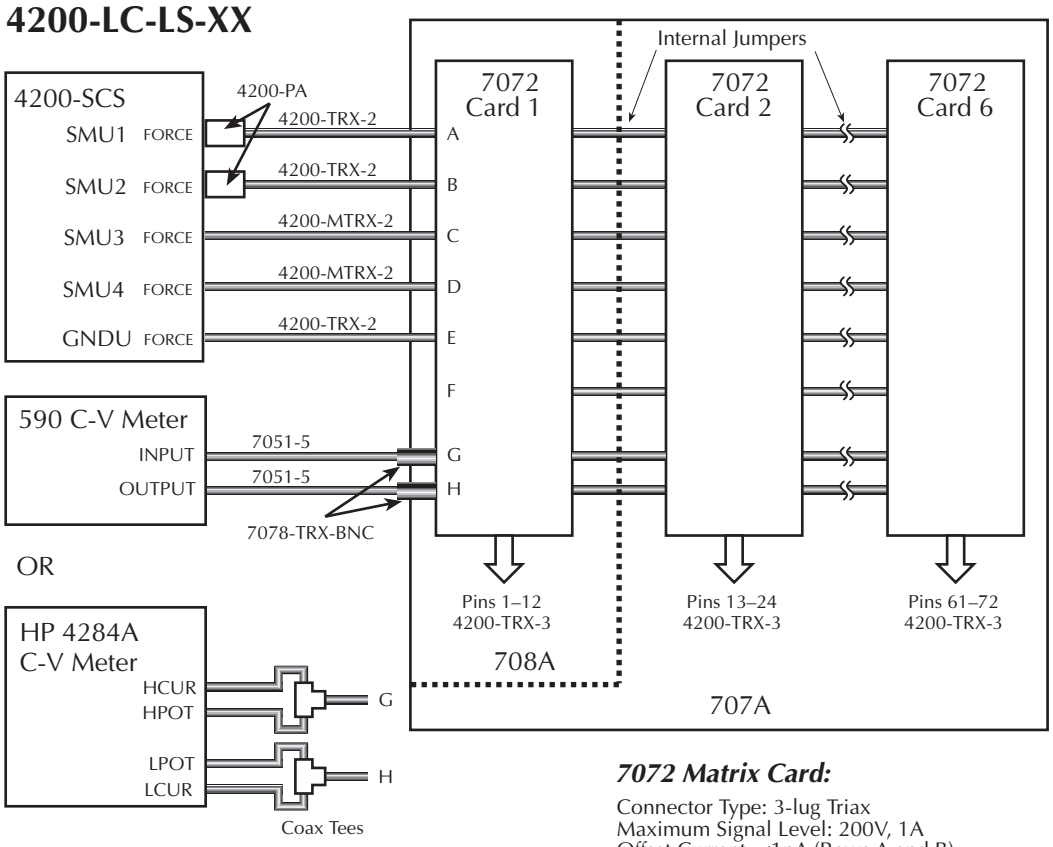
7174A Matrix Card:
Connector Type: 3-lug Triax
Maximum Signal Level: 200V, 2A
Offset Current: 100fA max, 10fA typical
Maximum Leakage: 0.01pA/V
3dB Bandwidth: 30MHz typical

NOTE: For this example, instrumentation is connected to matrix columns. Therefore, the switch matrix is rotated 90° for illustration purposes.

4200-LC-LS-XX switch matrix configuration — The test system in Figure 3 uses local sensing and Model 7072 switch cards. Rows A and B of the switch cards are the low current paths. Therefore, they are connected to the PreAmps of SMU1 and SMU2. Rows G and H of the switch cards are optimized for C-V measurements. Therefore, they are connected to a C-V meter.

The two supplied triax-to-BNC connectors are used to connect the C-V meter to the switch matrix. The switch matrix columns (pins) are used for connecting to the probe station or test fixture.

Figure 3
Test system for 4200-UL-RS-XX switch matrix configuration



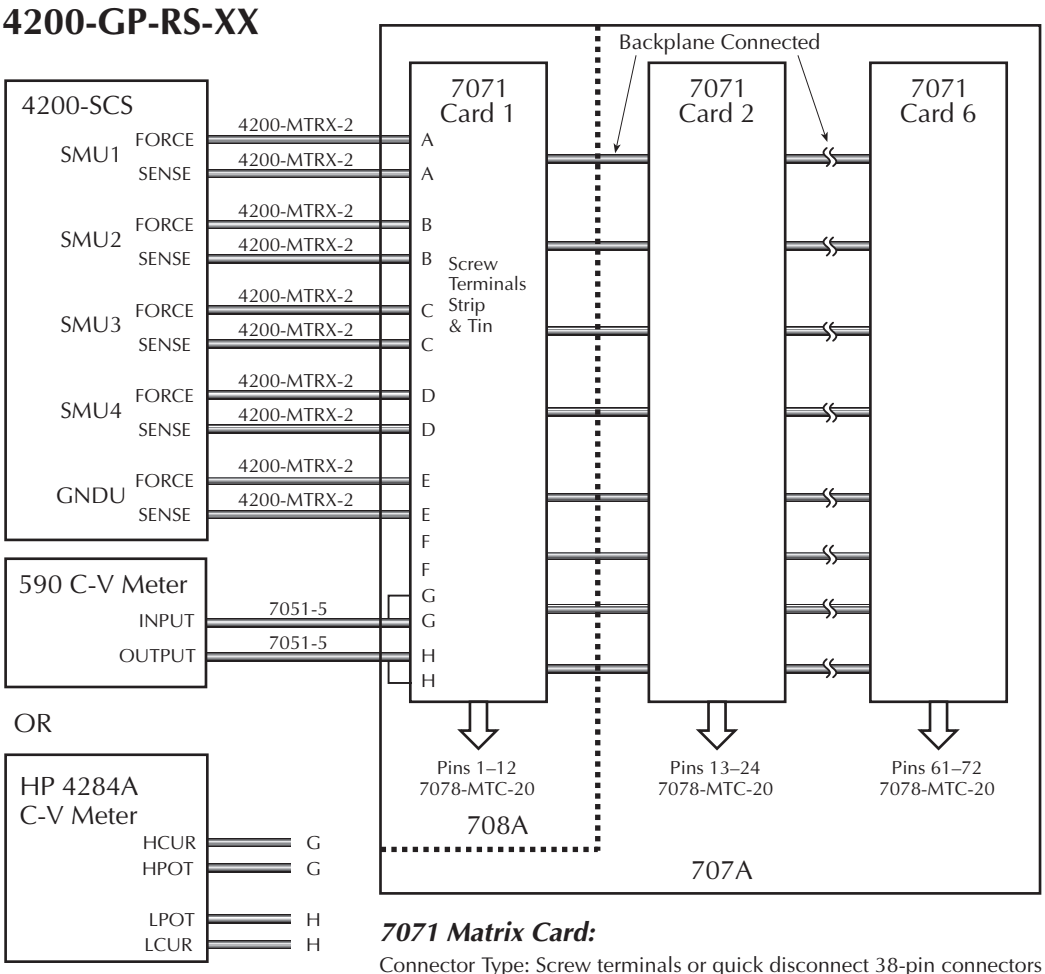
7072 Matrix Card:

Connector Type: 3-lug Triax
Maximum Signal Level: 200V, 1A
Offset Current: <1pA (Rows A and B)
Maximum Leakage: 0.01pA/V
3dB Bandwidth: 5MHz (CV Channels)

4200-GP-RS-XX switch matrix configuration — The test system in Figure 4 uses remote sensing for the Model 4200-SCS and the HP C-V meter. The 7071 switch card has screw terminals for row connections. Therefore, instruments are hard-wired to the matrix card. Since the 7071 uses a 3-pole relay, each terminal pair of the Model 4200-SCS and the HP C-V meter shares the same path (row) of the switch card.

The Model 590 C-V meter uses 2-wire local sensing. Therefore, a separate path (row) is used for the INPUT and the OUTPUT. It is best to connect the FORCE and SENSE of Row G together. Likewise, connect Row H FORCE and SENSE together. The supplied mass terminated cable(s) are used to connect matrix columns (pins) to the DUT.

Figure 4
Test system for 4200-GP-RS-XX switch matrix configuration



7071 Matrix Card:

Connector Type: Screw terminals or quick disconnect 38-pin connectors
Maximum Signal Level: 200V, 1A
Offset Current: <100pA
Maximum Leakage: 100pA/V
3dB Bandwidth: 5MHz typical

Installation

WARNING **The information in this section is intended for qualified service personnel only. Do not perform these procedures unless you are qualified to do so. Some of these procedures may expose you to hazardous voltages that could cause personal injury or death. Use caution when working with hazardous voltages.**

To prevent electric shock, the switch mainframe and Model 4200-SCS must be turned off and their line power cords disconnected. Also ensure that no power is being supplied from other equipment to the switches.

Installing matrix cards in mainframe

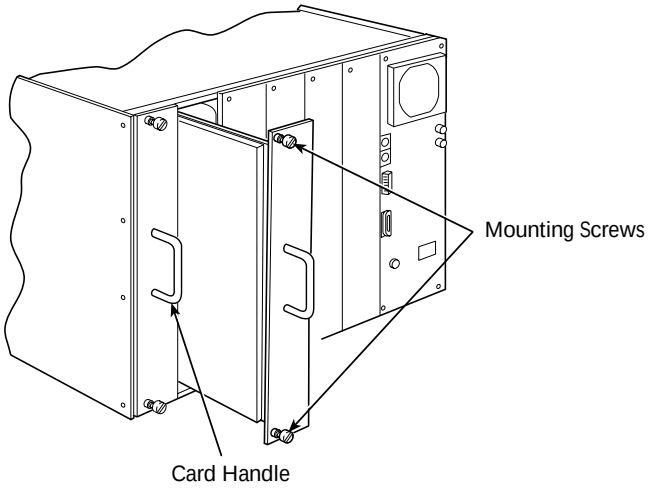
NOTE *Input connections to the Model 7071 matrix card are typically made to the screw terminal strip on the PC board of the card. These connections must be made before installing the card in the mainframe. See "Connections to Model 4200-SCS and DUT" to connect instrumentation to the Model 7071 matrix card.*

WARNING **The mounting screws must be secured to ensure a proper chassis ground connection between the card and the mainframe. Failure to properly secure this ground connection may result in personal injury or death due to electric shock.**

Use Figure 5 as a guide to install the matrix card(s) in the mainframe as follows:

1. Remove the slot cover from the desired slot(s).
2. Line up the card with the card guides in the slot.
3. Slide the card into the mainframe until it is fully seated in the backplane connectors.
4. Finger-tighten the spring-loaded mounting screws at the back of the card to lock it in place.

Figure 5
Installing a matrix card



Matrix expansion

When using the Model 707A mainframe, the rows of installed matrix cards must be connected to create a single matrix. Each switch card is an 8 (rows) x 12 (columns) matrix. With matrix rows connected, a two-card system results in an 8 x 24 matrix. Each additional daisy-chained card in the system adds 12 columns to the matrix.

4200-UL-LS-XX and 4200-UL-RS-XX

Model 7174A matrix cards — Supplied coaxial jumpers are used to connect the eight rows of the matrix cards installed in the mainframe. To install the jumpers, refer to the "Model 7174A Instruction Manual."

4200-LC-LS-XX

Model 7072 matrix cards — Rows C through F of the installed cards are automatically connected through the backplane of the mainframe. Supplied jumpers are used to connect Rows A, B, G and H. To install the jumpers, refer to the "Model 7072 Instruction Manual."

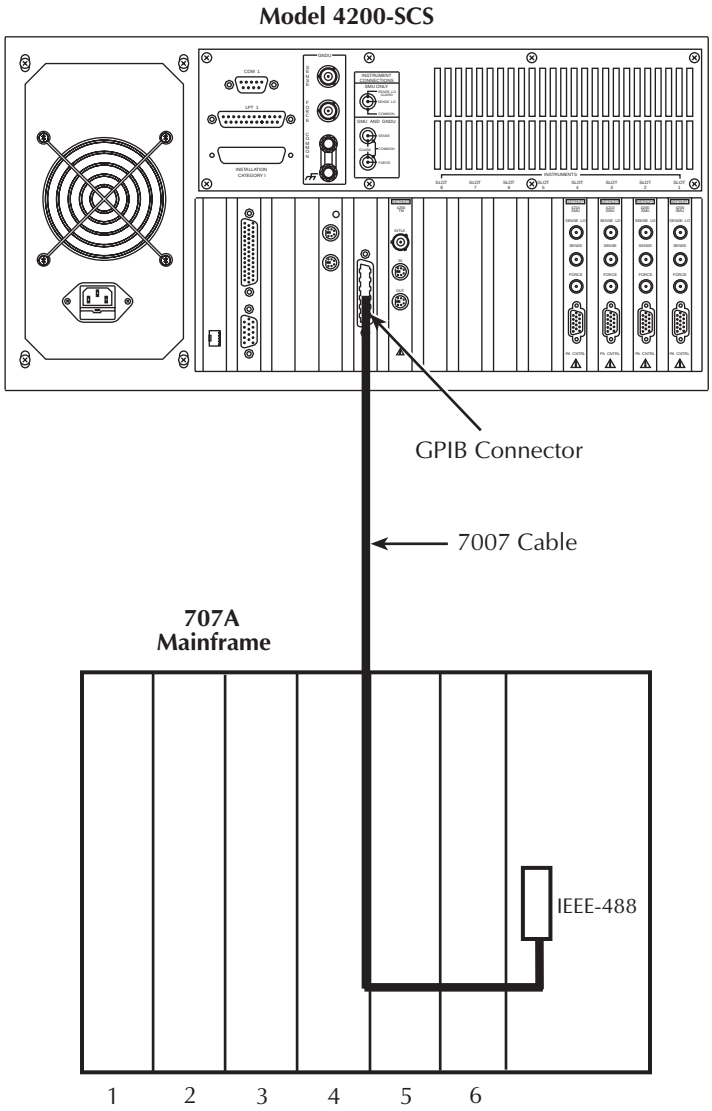
4200-GP-RS-XX

Model 7071 matrix card — The matrix rows of the installed cards are automatically connected through the backplane of the mainframe. No additional connections are required.

System connections

Connect the GPIB port of the Model 4200-SCS to the GPIB port of the Model 707A using a Model 7007-1 or 7007-2 cable as shown in Figure 6.

Figure 6
GPIB connections



Connections to Model 4200-SCS and DUT

The triax cables supplied with the Model 4200-SCS are used to connect the SMUs and GNDU to the switch matrix. The cables supplied with the switch matrix configuration are used to make connections to DUT.

NOTE *For details on connecting the switch matrix to a probe station, see "Model 4200-SCS Reference Manual," Appendices G, H, and I.*

Signal connections for 4200-UL-LS-XX, 4200-UL-RS-XX, and 4200-LC-LS-XX

NOTE *For details on connections, refer to the "Model 7174A or 7072 Instruction Manual."*

Input connections — Model 7174A and 7072 matrix cards are equipped with 3-lug triax connectors. As shown in Figures 1, 2, and 3, use the triax cables supplied with the Model 4200-SCS to connect it to the first card in the switch matrix. For instruments that use BNC connectors (i.e., Model 590) use the supplied triax-to-BNC adapters to make the input connections.

DUT connections — Model 4200-TRX-3 triax cables are provided for connections to DUT. Figures 7 and 8 show how to make typical connections to a DUT installed in a test fixture that is equipped with 3-lug triax connectors. For direct connections to the DUT, you can cut off one of the triax connectors on each triax cable. The center conductor of the cable is HI (H), the inner shield is Guard (G) and the outer shield is Common (C).

NOTE *If using the Keithley Model 8006 Component Test Fixture, refer to the "Model 4200-SCS User's Manual," Section 2, for details on connections.*

Figure 7
Typical DUT connections for the 4200-UL-LS-XX and 4200-LC-LS-XX

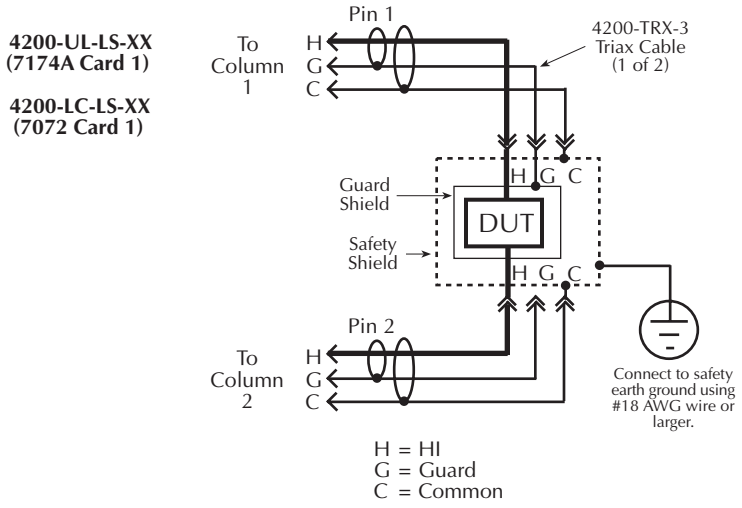
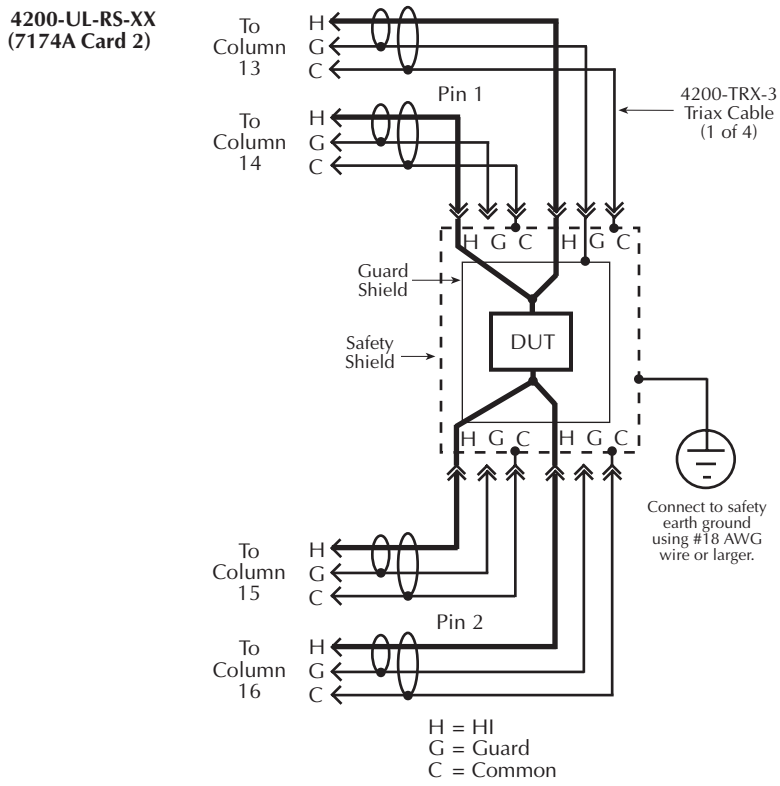


Figure 8
Typical DUT connections for the 4200-UL-RS-XX



4200-GP-RS-XX signal connections

NOTE *For details on connections, refer to the "Model 7071 Instruction Manual."*

Input connections — The Model 7071 matrix card has a screw terminal strip that can be used to connect instrumentation to matrix rows. The terminal strip is located on the PC board of the card. Therefore, input cables must be connected to the matrix card before it is installed in the mainframe.

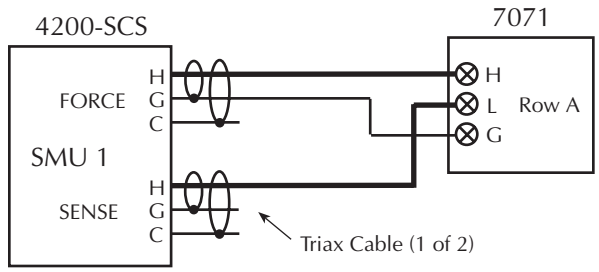
As shown in Figure 4, use the triax cables supplied with the Model 4200-SCS to connect the SMUs and GNDU to the first card in the switch matrix. Cut off one of the triax connectors on each triax cable, and connect the wires directly to the screw terminal strip on the matrix card. The center conductor of a triax cable is HI (H), the inner shield is Guard (G) and the outer shield is Common (C). Figure 9A shows how to connect SMU1 to Row A of the switch matrix. The other SMUs and GNDU are connected in a similar manner.

WARNING **The Guard (G) terminal of SMUs are at the same potential as the HI (H) terminal. Therefore, if a hazardous voltage is on the HI terminal, it is also on the Guard terminal. Make sure unconnected Guard conductors are insulated to prevent electric shock.**

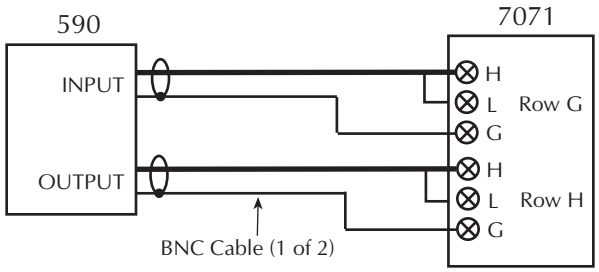
For instruments that are equipped with BNC connectors use BNC cables that are unterminated at one end. The center conductor of each cable is signal high. Figures 9A and 9B show how to connect the Models 590 and HP4284A to the 7071 matrix card.

Figure 9
Input connections for 4200-GP-RS-XX

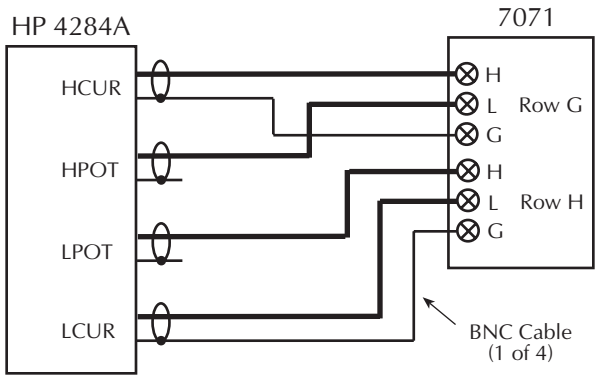
4200-GP-RS-XX



A. 4200-SCS connections to 7071



B. 590 connections to 7071

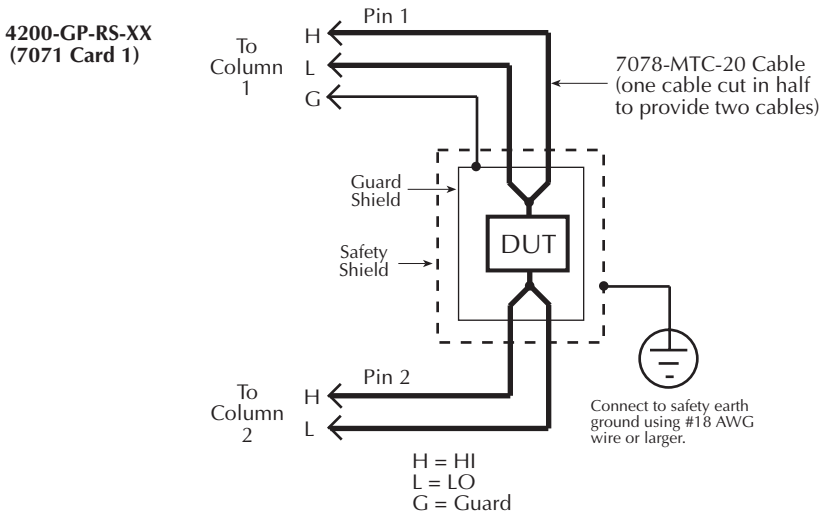


C. HP 4284A connections to 7071

DUT connections — Model 7078-MTC-20 cable is used to make connections to DUT. One 7008-MTC-20 is supplied with each 7071 matrix card. Cutting this cable in half provides two modified cables that allow direct connection to DUT. Each cable accommodates 12 columns.

Figure 10 shows how to make typical connections to a DUT. Terminal identification for the mass terminated cables is provided in the "Model 7071 Instruction Manual."

Figure 10
Typical DUT connections for the 4200-GP-RS-XX



Mainframe power-on

The detailed power-on procedure for the switch mainframe is located in the Model 708A or 707A Instruction Manual. After setting the power line voltage using the line voltage switch on the rear panel and connecting the power cord, turn on the mainframe by pushing in the POWER switch. During the power-on sequence, the GPIB (IEEE) address is displayed briefly.

Using *KCON* to add switch matrix to the system

NOTE *The following procedure assumes that the Model 4200-SCS is powered on with KITE open. See "Details to power-on the Model 4200-SCS" in the Model 708A or 707A Instruction Manual.*

In order for the Model 4200-SCS to control a switch matrix, the switch matrix must be added to the test system. The switch matrix is added using the KCON (Keithley CONfiguration utility).

The switch matrix can be used with a test fixture to test discrete DUT, or with a probe station to test a wafer. The test fixture or probe station is also added to the system configuration using KCON.

Step 1. Close *KITE* and open *KCON*

Close *KITE* by clicking the close button (**X**) at the top right-hand corner of the *KITE* window. If you have made changes, you will be prompted to save them. On the windows desktop, double-click the ***KCON*** icon to open *KCON*.

Step 2. Add test fixture or probe station

NOTE *Using a switch matrix requires a test fixture or probe station in the system configuration. However, both cannot be in the system configuration together. See "Removing test fixture or probe station from the system" at the end of this procedure.*

Add a test fixture

Perform the following steps to add a test fixture to the system configuration:

1. As shown in Figure 11, select **Test Fixture** from the **Tools** menu.
2. From the **Model** drop-down menu in the **Test Fixture Properties** window (Figure 12), select a test fixture. The three test fixture options from the menu include:
   - **Generic Test Fixture** — For this test fixture, specify the **Number of Pins** in the test system (12, 24, 36, 48, 60, or 72). Figure 12 shows the pin number settings for all the switch matrix configurations.
   - **Keithley Model 8006** — For this test fixture, the number of pins will be fixed at 12. Figure 12A lists the switch matrix configurations that use 12 pins.
   - **Keithley Model 8007** — For this test fixture, the number of pins will be fixed at 72. Figure 12F lists the switch matrix configurations that use 72 pins.

Figure 11
Tools menu to add test fixture

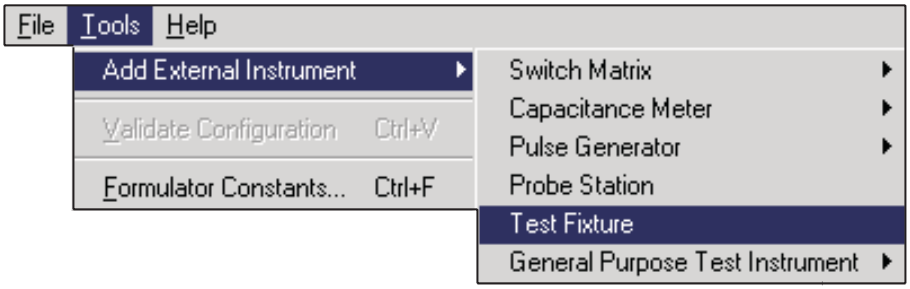
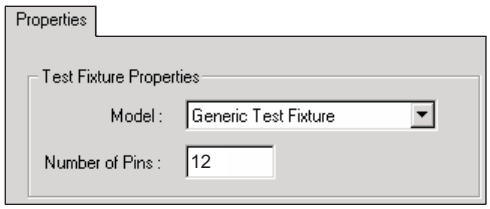
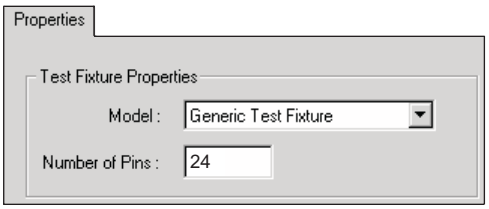


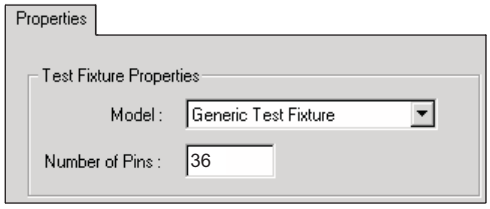
Figure 12
Test fixture properties



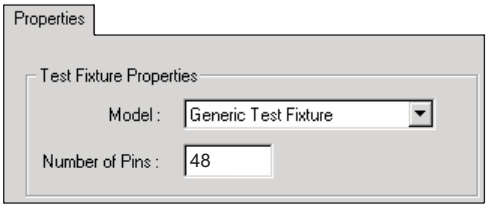
A. 4200-UL-LS-12
4200-UL-RS-6
4200-LC-LS-12
4200-GP-RS-12



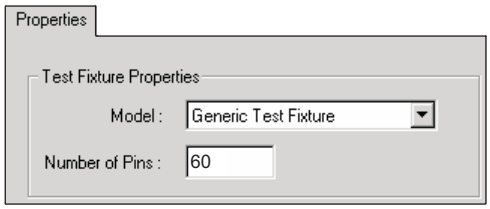
B. 4200-UL-LS-24
4200-UL-RS-12
4200-LC-LS-24
4200-GP-RS-24



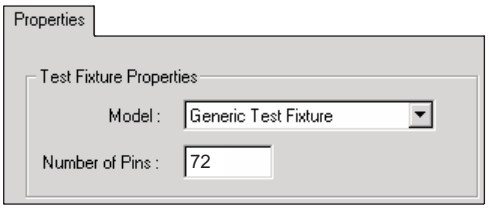
C. 4200-UL-LS-36
4200-UL-RS-18
4200-LC-LS-36
4200-GP-RS-36



D. 4200-UL-LS-48
4200-UL-RS-24
4200-LC-LS-48
4200-GP-RS-48



E. 4200-UL-LS-60
4200-UL-RS-30
4200-LC-LS-60
4200-GP-RS-60



F. 4200-UL-LS-72
4200-LC-LS-72
4200-GP-RS-72

Add a probe station

Perform the following steps to add a probe station to the system configuration:

1. As shown in Figure 13, add the **Probe Station** using the **Tools** menu.
2. From the **Model** drop-down menu in the Prober **Properties** window (Figure 14), select a probe station. Supported probe stations include the following:
   - Fake Prober
   - Manual Prober
   - Micromanipulator 8860 Prober
   - Karl-Suss PA200 Prober

   NOTE *Contact Keithley for the most up-to-date list of supported probers. If using an unsupported prober, you will have to create a user library and module to control it.*

3. Using Figure 14 as a guide, specify the **Number of Pins / Positioners** for your switch matrix configuration (12, 24, 36, 48, 60, or 72).

Figure 13
Tools Menu to add a probe station

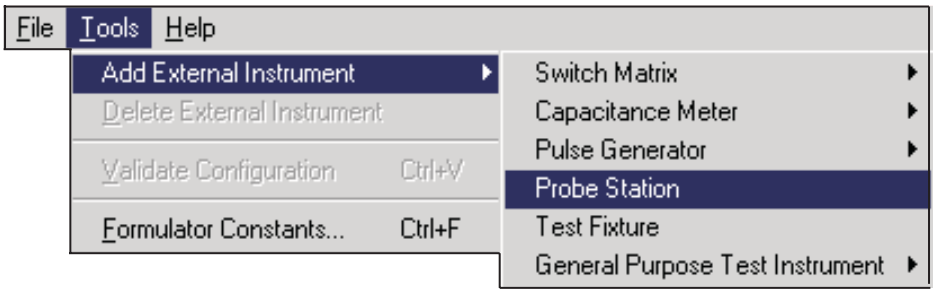
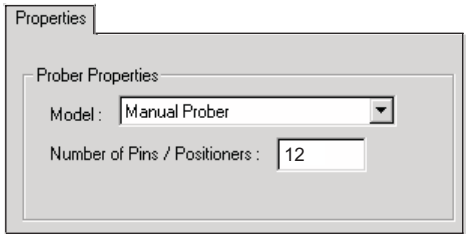
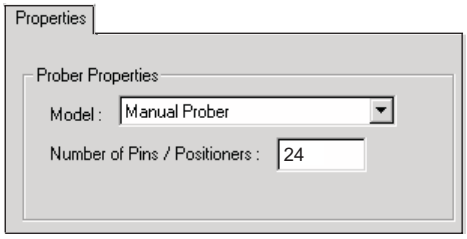


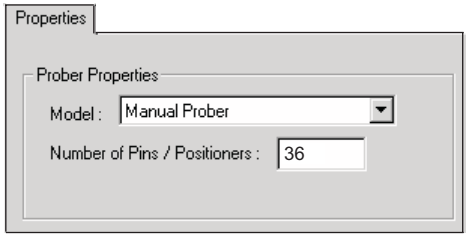
Figure 14
Prober properties



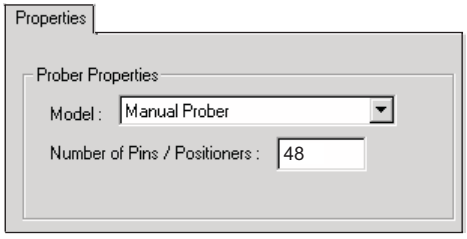
A. *4200-UL-LS-12*
4200-UL-RS-6
4200-LC-LS-12
4200-GP-RS-12



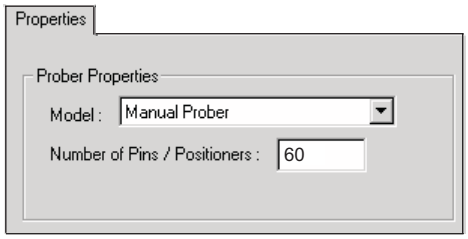
B. *4200-UL-LS-24*
4200-UL-RS-12
4200-LC-LS-24
4200-GP-RS-24



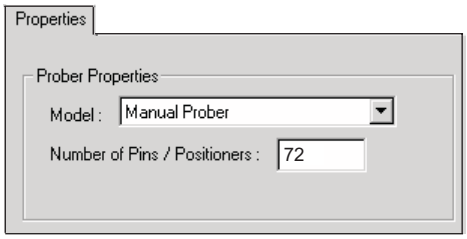
C. *4200-UL-LS-36*
4200-UL-RS-18
4200-LC-LS-36
4200-GP-RS-36



D. *4200-UL-LS-48*
4200-UL-RS-24
4200-LC-LS-48
4200-GP-RS-48



E. *4200-UL-LS-60*
4200-UL-RS-30
4200-LC-LS-60
4200-GP-RS-60

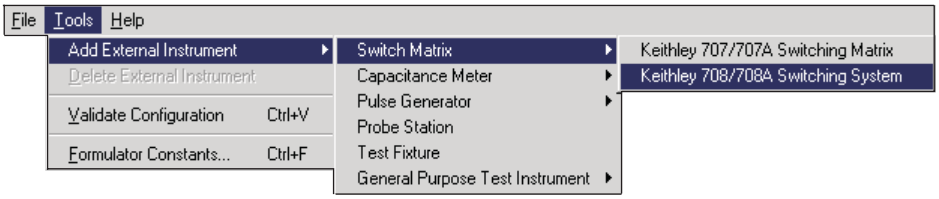


F. *4200-UL-LS-72*
4200-LC-LS-72
4200-GP-RS-72

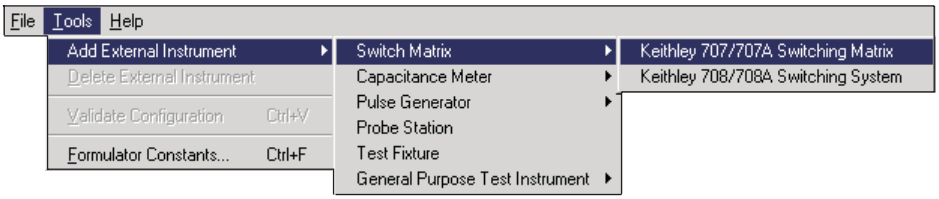
Step 3. Add switch mainframe

Add the switch mainframe (Model 708A or 707A) to the system using the **Tools** menu as shown in Figure 15. The switch system **Properties** tab will then be displayed.

Figure 15
Add 708A or 707A to test system



A. Add 708A switch mainframe



B. Add 707A switch mainframe

Step 4. Set switch system properties

Switch system properties are set from the **Properties** tab. Figures 16 through 19 show the **Properties** tab for the various switch matrix configurations.

GPIB address

The **Properties** windows in Figures 16 through 19 show the GPIB address of the Model 708A set to 19 and the GPIB address of the Model 707A set to 18. These are the factory set address values for the mainframes.

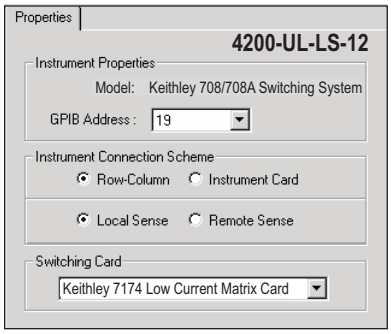
The address value in the **Properties** tab area must match the actual GPIB address setting of the mainframe. The GPIB (IEEE) address of the mainframe is displayed briefly during its power on sequence. In the **Properties** tab area, the address value can be changed from the drop-down menu for the **GPIB Address**. To change the address on the 707A/708A Mainframe, see the "707A/708A Instruction Manual."

4200-UL-LS-XX switch system properties

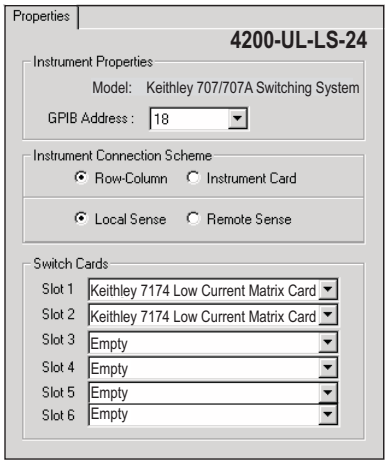
In Figure 16, use the appropriate **Properties** tab as a guide to set the properties. Under **Instrument Connection Scheme**, select **Row-Column** and **Local Sense**. From the drop-down windows for the **Switch Cards**, select **Keithley 7174 Low Current Matrix Card** for the indicated slot(s).

NOTE *If one or more slots are set for a matrix card other than the Model 7174A, then all slots must first be set to **Empty** before they can be set to **Keithley 7174 Low Current Matrix Card**.*

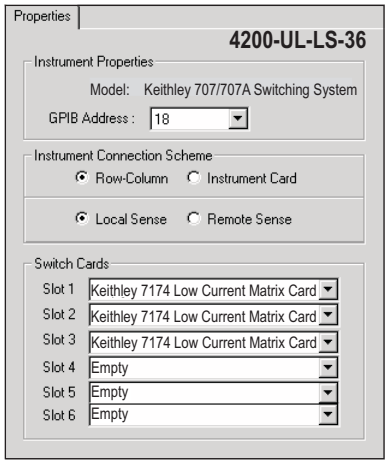
Figure 16
Switch system settings for 4200-UL-LS-XX



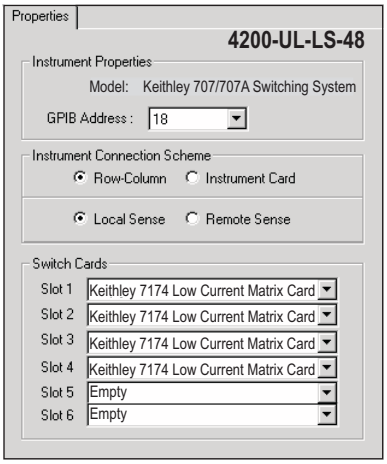
A. 4200-UL-LS-12



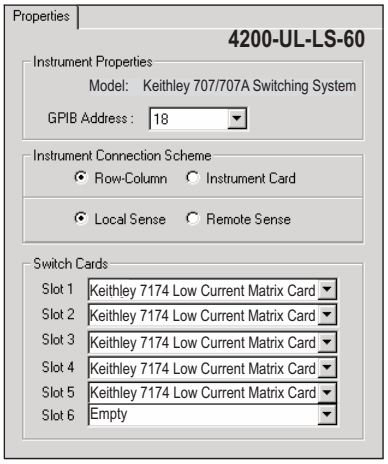
B. 4200-UL-LS-24



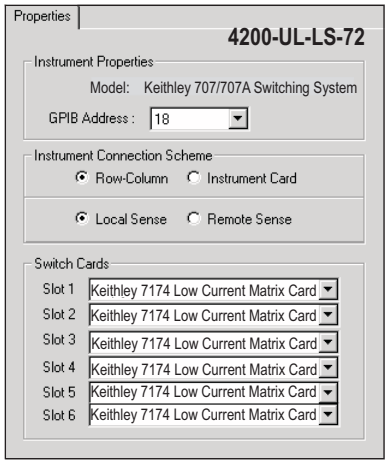
C. 4200-UL-LS-36



D. 4200-UL-LS-48



E. 4200-UL-LS-60



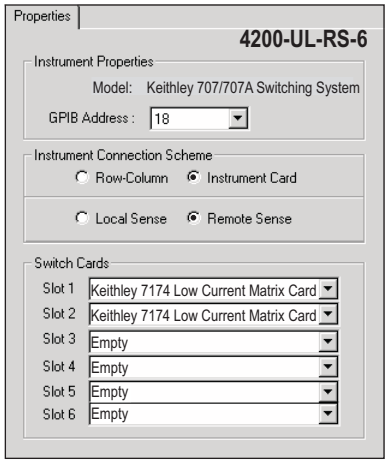
F. 4200-UL-LS-72

4200-UL-RS-XX switch system properties

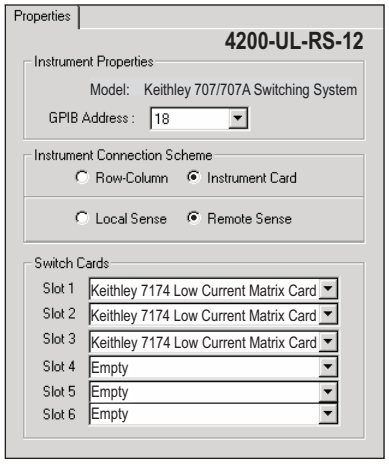
In Figure 17, use the appropriate **Properties** tab as a guide to set the properties. Under **Instrument Connection Scheme**, select **Instrument Card** and **Remote Sense**. From the drop-down windows for the **Switch Cards**, select **Keithley 7174 Low Current Matrix Card** for the indicated slots.

NOTE *If one or more slots are set for a matrix card other than the Model 7174A, then all slots must first be set to **Empty** before they can be set to **Keithley 7174 Low Current Matrix Card**.*

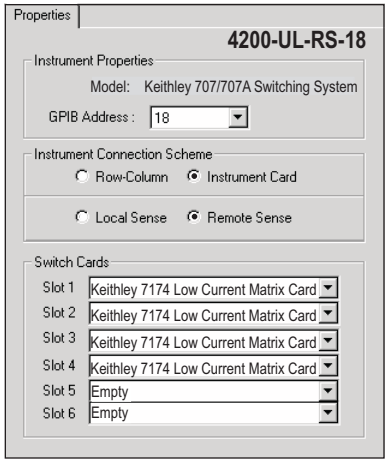
Figure 17
Switch system settings for 4200-UL-RS-XX



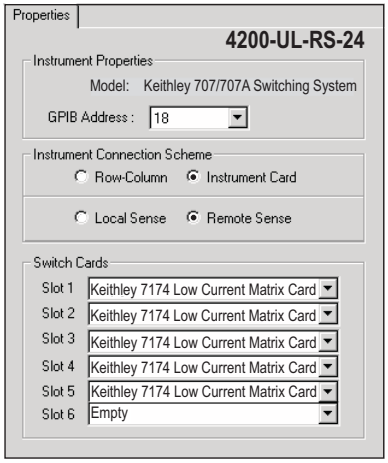
A. 4200-UL-RS-6



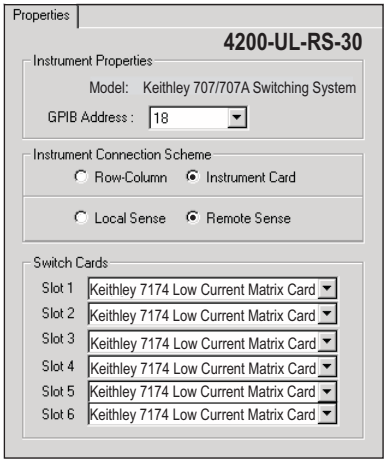
B. 4200-UL-RS-12



C. 4200-UL-RS-18



D. 4200-UL-RS-24



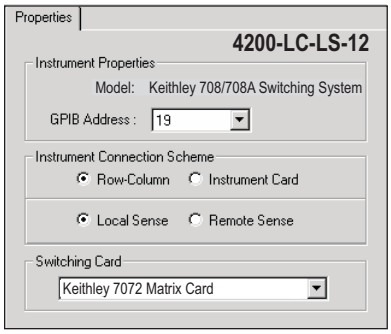
E. 4200-UL-RS-30

4200-LC-LS-XX switch system properties

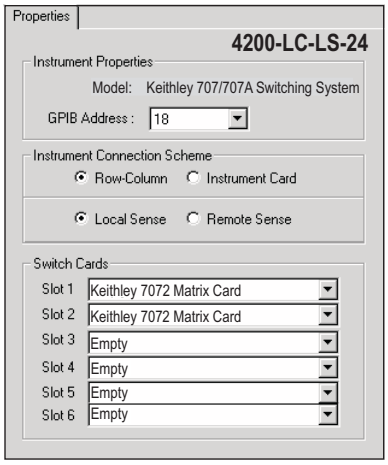
In Figure 18, use the appropriate **Properties** tab as a guide to set the properties. Under **Instrument Connection Scheme**, select **Row-Column** and **Local Sense**. From the drop-down windows for the **Switch Cards**, select **Keithley 7072 Matrix Card** for the indicated slot(s).

NOTE *If one or more slots are set for a matrix card other than the Model 7072, then all slots must first be set to **Empty** before they can be set to **Keithley 7072 Matrix Card**.*

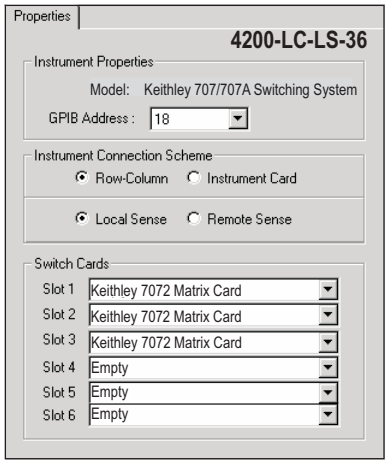
Figure 18
Switch system settings for 4200-LC-LS-XX



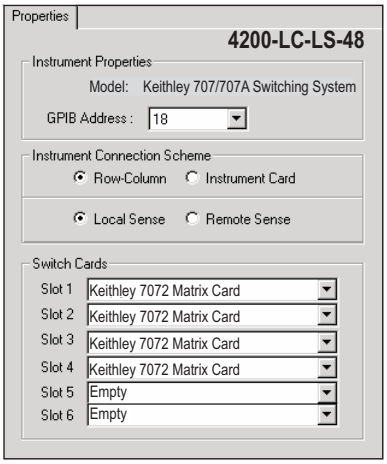
A. 4200-LC-LS-12



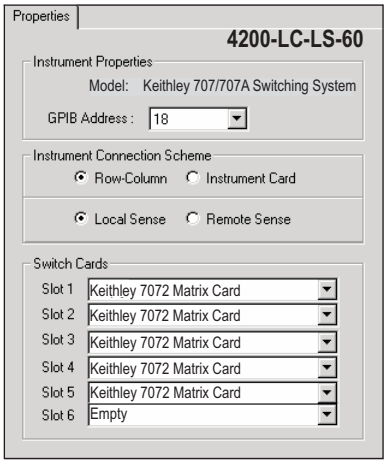
B. 4200-LC-LS-24



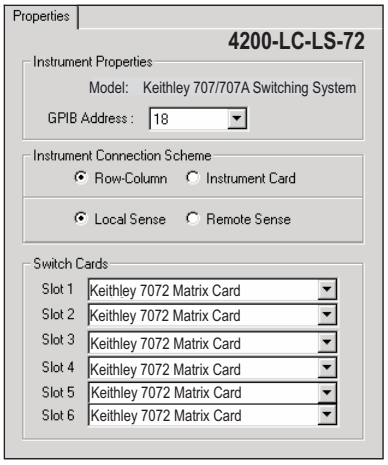
C. 4200-LC-LS-36



D. 4200-LC-LS-48



E. 4200-LC-LS-60



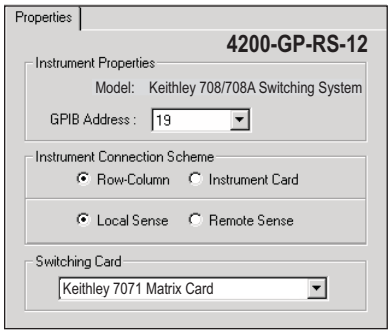
F. 4200-LC-LS-72

4200-GP-RS-XX switch system properties

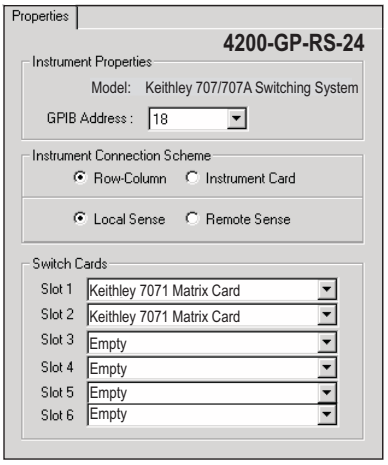
In Figure 19, use the appropriate **Properties** tab as a guide to set the properties. Under **Instrument Connection Scheme**, select **Row-Column** and **Local Sense**. From the drop-down windows for the **Switch Cards**, select **Keithley 7071 Matrix Card** for the indicated slot(s).

NOTE *If one or more slots are set for a matrix card other than the Model 7071, then all slots must first be set to **Empty** before they can be set to **Keithley 7071 Matrix Card**.*

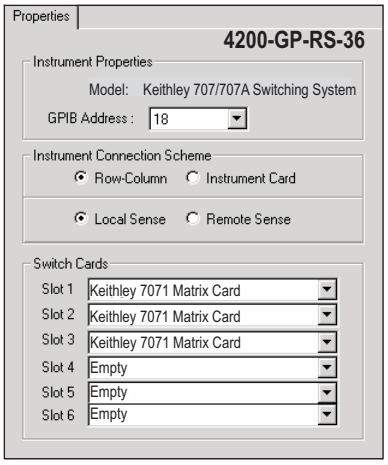
Figure 19
Switch system settings for 4200-GP-RS-XX



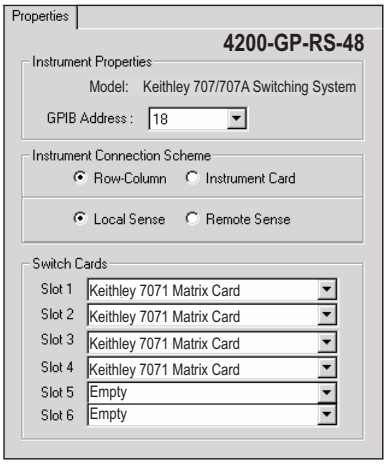
A. 4200-GP-RS-12



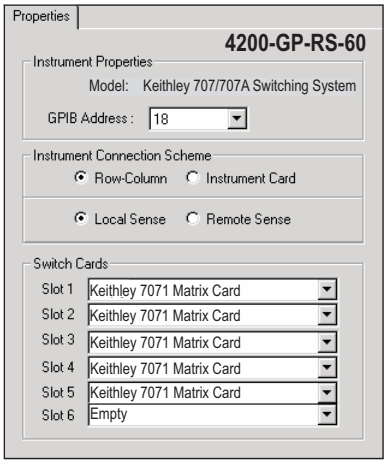
B. 4200-GP-RS-24



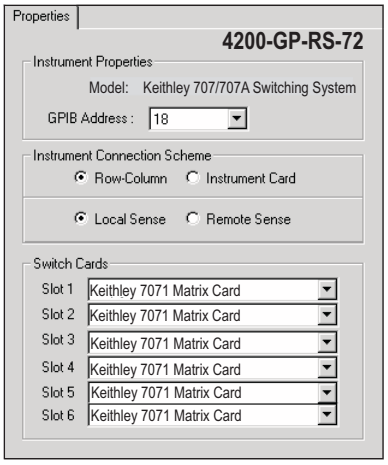
C. 4200-GP-RS-36



D. 4200-GP-RS-48



E. 4200-GP-RS-60



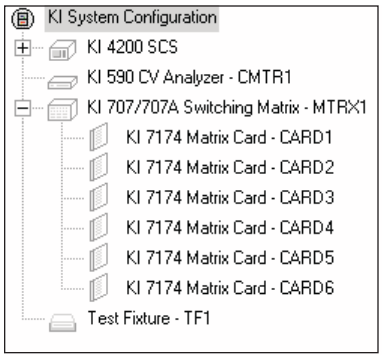
F. 4200-GP-RS-72

Step 5. Set matrix card properties

The navigator for the system configuration is provided on the left side of the *KCON* window. Figure 20 shows an example of the System Configuration Navigator. When a test fixture, switch mainframe, and matrix cards are added to the system, they appear in the navigator. The navigator in Figure 20 shows a switch system that uses six Model 7174A matrix cards.

The properties for each matrix card in the switch system must be set. A card properties tab is opened by clicking the card entry in the navigator. For example, clicking **KI 7174 Matrix Card - CARD 1** in Figure 20 opens the **Properties** tab for that card.

Figure 20
System Configuration Navigator (example)



Card properties for 4200-UL-LS-XX, 4200-LC-LS-XX, and 4200-GP-RS-XX

Figure 21 shows the card properties for these switch matrix configurations. Set up each card in the system as shown in the illustration.

Each row and column has a drop-down menu to set the card properties. The rows are used for instrument assignments. Figure 21 shows Row G (**CMTR1 Input**) and Row H (**CMTR1 Output**) being used by the Model 590 CV Analyzer. If the Model 590 has not been added to the system, the **CMTR1 Input** and **CMTR1 Output** settings will not be available. The "4200-SCS Reference Manual," Appendix C, explains how to add the Model 590 to the system. If not using Rows G and H, set them to **NC** (no connection).

The columns are used for DUT pin assignments. Any available DUT pin may be assigned to any column. DUT pins may only be assigned once. The total number of DUT pins is set in the test fixture or prober setup panel. The example in Figure 21 shows Card 1 Columns to DUT pins 1 through 12, Card 2 Columns to DUT pins 13 through 24, and so on.

4200-UL-RS-XX card properties

Figure 22 shows the card properties for these switch matrix configurations. Set up each card in the system as shown in the illustration.

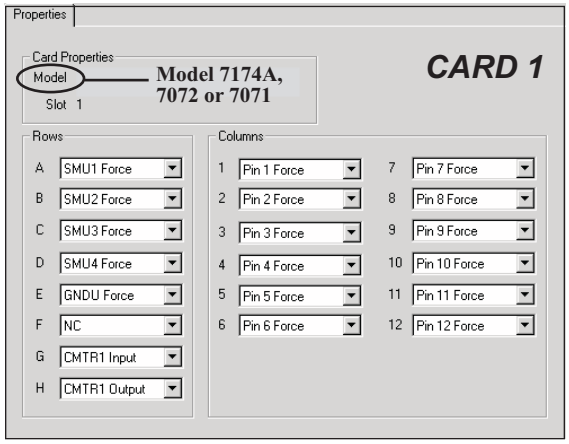
> ***NOTE*** *When the instrument connection scheme is set to Remote Sense, a pair of terminals is required for each instrument and each DUT pin. This is why Figure 22 displays every other pin as a Sense Lead.*

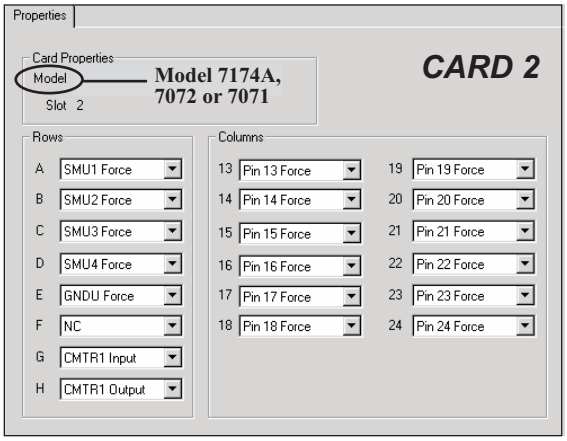
Each column has a drop-down menu to set the card properties. CARD 1 is used for instrument assignments. Figure 22 shows Column 9 (**CMTR1 HCUR**) and Column 11 (**CMTR1 LCUR**) being used by the HP Model 4284A LCR Meter. If the Model 4284A has not been added to the system, the **CMTR1 HCUR** and **CMTR1 LCUR** settings will not be available. The "4200-SCS Reference Manual," Appendix D, explains how to add the Model 4284A to the system. If not using Columns 9 and 11, set them to **NC** (no connection).

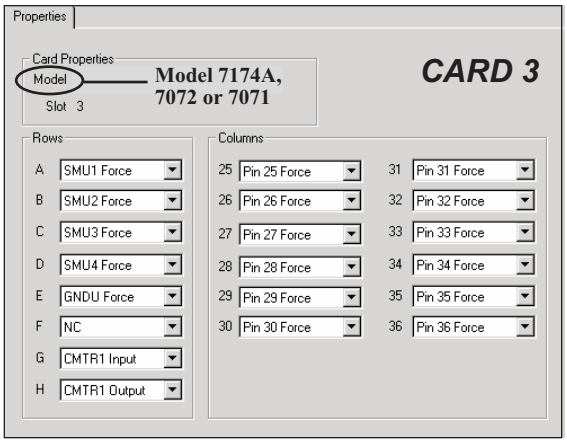
The Columns of the other cards are used for DUT pin-pair assignments. As shown, set CARD 2 Columns to DUT pins 1 through 6, CARD 3 Columns to DUT pins 7 through 12, and so on.

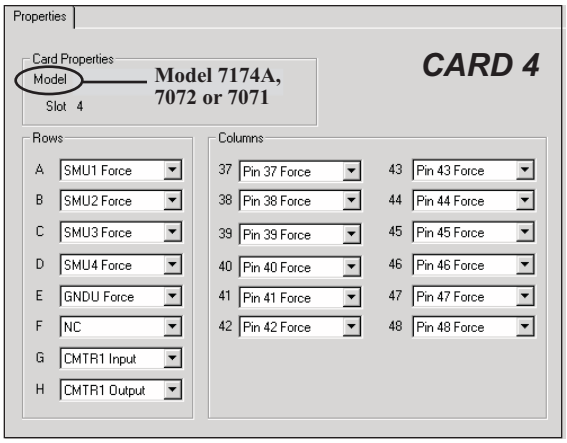
Figure 21
Card properties: 4200-UL-LS-XX, 4200-LC-LS-XX, and 4200-GP-RS-XX

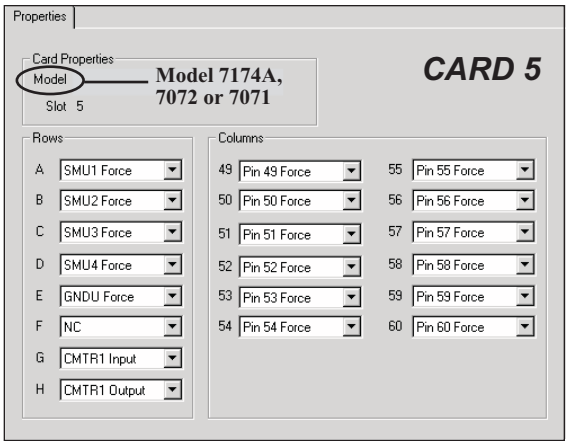
4200-UL-LS-XX (7174A Matrix Cards)
4200-LC-LS-XX (7072 Matrix Cards)
4200-GP-RS-XX (7071 Matrix Cards)











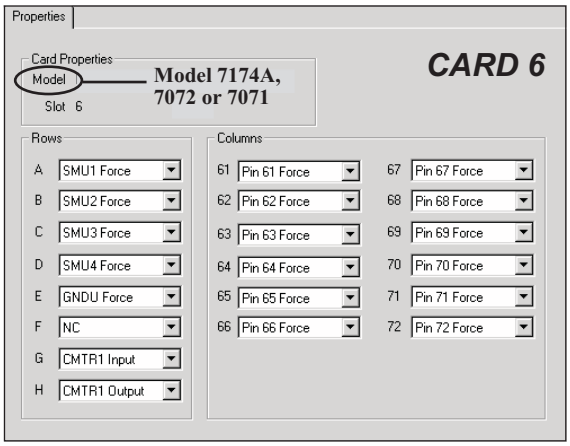
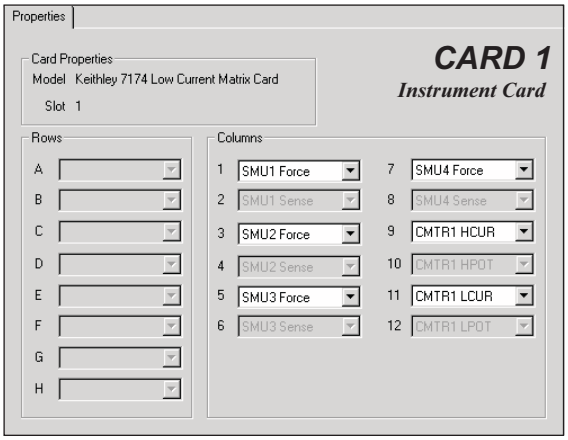
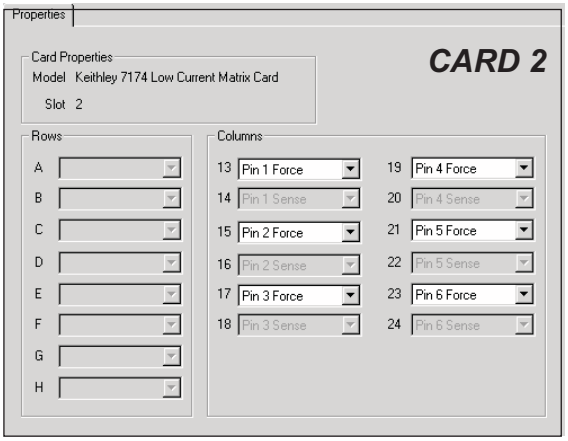
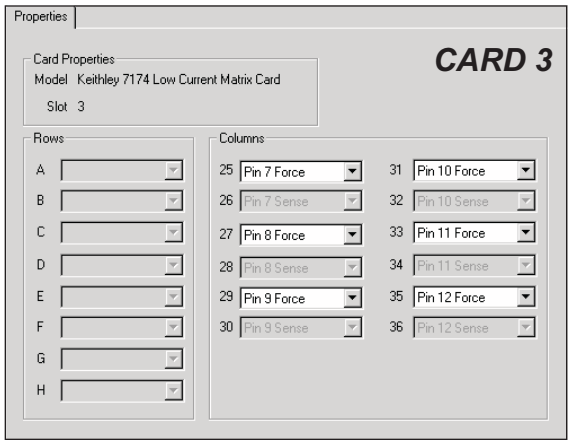


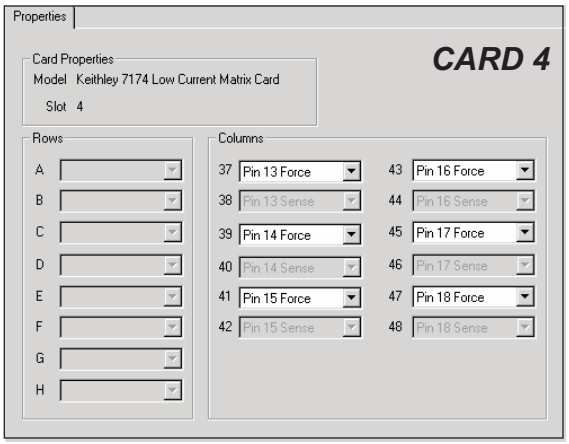
Figure 22
Card properties: 4200-UL-RS-XX

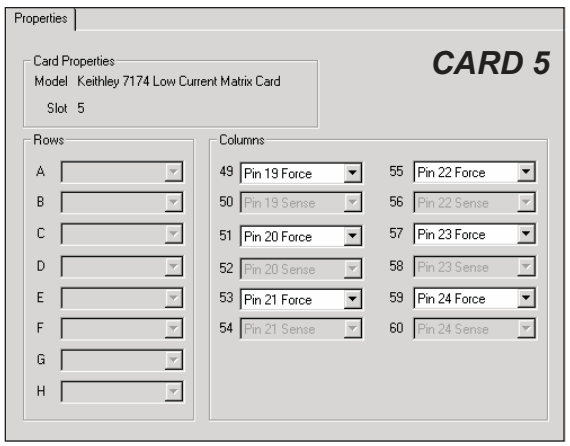
4200-UL-RS-XX (7174A Matrix Cards)

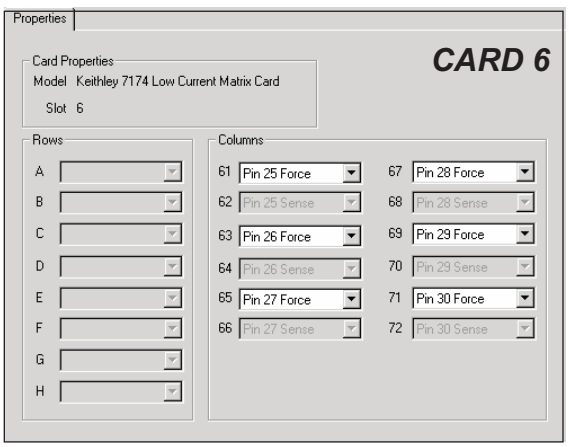








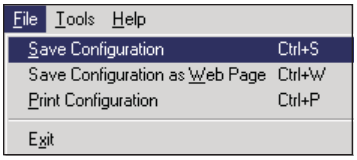




Step 6. Save configuration

The *KCON* configuration is saved from the **File** menu. As shown in Figure 23, click **Save Configuration**.

Figure 23
Save KCON system configuration



Step 7. Close *KCON* and open *KITE*

KCON can be closed from the **File** menu by clicking **Exit**. It can also be closed by clicking the close button (**X**) at the top right-hand corner of the *KCON* window.

On the windows desktop, double-click the ***KITE*** icon to open *KITE*.

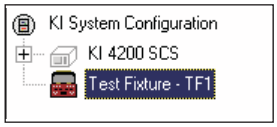
Deleting test fixture or probe station from the system

A test fixture and a probe station cannot be in the test system at the same time. If a test fixture is in the system, it will have to be removed if you want to add a probe station. Conversely, if a probe station is in the system, it will have to be removed if you want to add a test fixture.

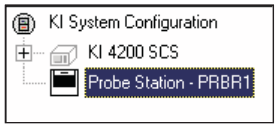
If a test fixture or probe station is in the system, it will be displayed in the System Configuration Navigator provided on the left side of the *KCON* window. To delete an instrument, click Test Fixture - TF1 or Probe Station PRBR1 to select it, and then select Delete External Instrument in the Tools menu. This procedure is illustrated in Figure 24.

Figure 24
Removing a test fixture or probe station from the system configuration

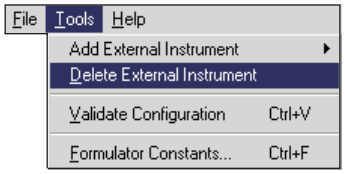
1. Select Instrument



OR



2. Delete Instrument



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