Using the SC6540 Modular Scanning Matrix
A Reference Guide

Introduction

Using an Associated Research SC6540 Modular Scanning Matrix can help to simplify your safety testing routine and allow you to test more efficiently. The SC6540's modular design makes it a powerful tool for use in a wide variety of applications including multi-point Hipot, Ground Continuity, Ground Bond, and Insulation Resistance tests. However, due to the multiple models offered it is imperative that each Scanner be configured and addressed correctly in order to ensure a properly functioning test system. In this paper we will discuss the various models of the SC6540 Scanning Matrix and offer tips to help make setting up your test system quick and easy.

Scanner Configurations

The SC6540 is available in 2 basic configurations according to how it sends and/or receives data: a Main, and a Secondary. A Main Scanner can only be controlled remotely via a PC. A Secondary Scanner can be controlled locally by an Associated Research electrical safety testing instrument or by a Main Scanner.

Main: a Main Scanner communicates directly with a PC via an RS-232 or GPIB interface. This model receives control information from a PC and can also deliver instructions to up to 4 additional Secondary Scanners. A Main Scanner can be distinguished by its *power module* located on the upper left side of the rear panel (see Figure 1.0).

Figure 1.0: Main Scanner Rear Panel

Secondary: a Secondary Scanner *only* receives data. The data that the Secondary receives can come from a Main Scanner (remote control) or directly from an Associated Research, Inc. instrument (local control). A Secondary Scanner can be distinguished by its input control bus located on the upper left side of the rear panel (see Figure 2.0).

Figure 2.0: Secondary Scanner Rear Panel

Scanner Modules

All SC6540 Scanners are capable of supporting up to 2 Modules. Each Module consists of either 8 HV (high voltage) ports or 8 GB (ground bond) ports. Module A refers to a row of 8 ports of the Scanner and Module B refers to a row of 8 ports of the Scanner (see Figure 3.0).

Figure 3.0: Modules A and B

Scanner Models

There are 5 different Scanner models available, each varying by Module number and type. See the table below:

Model	Configuration
HH	16 Port HV
HG	8 Port HV, 8 Port GB
HN	8 Port HV
GG	16 Port GB
GN	8 Port GB

Table 1.0: Scanner Model and Port Configuration

If a Scanner only has 8 ports (HN, GN), these ports will always be located in Module A.

Selecting the Correct SC6540 Scanner

1.) Determine the control configuration needed: Main or Secondary.
2.) Determine the number and type of ports needed.
3.) Select the appropriate model according to the above table.

Using a Local Secondary Scanner with an Associated Research, Inc. Instrument

An SC6540 Scanner may be used with the our OMNIA® II Series, HypotULTRA Series and HypotMAX models 7700/7704 in a Secondary configuration. This means that the test instrument has direct (local) control over the Scanner.

A Secondary Scanner mates with an Associated Research instrument by means of its input control bus. See the table below for Scanner and instrument compatibility:

	U3 w/ Int. Scanner	U3 w/o Int. Scanner	8104 w/ Int. Scanner	8104 w/o Int. Scanner	8106	7700	7704
HH	x	x	x	x	x	x	x
HN	1	1	1	2	2	2	2
HG	x	x	1	1	1	x	2
GG	x	x	x	x	x	x	x
GN	x	x	1	2	2	x	2

Table 2.0: Local Scanner and Instrument Compatibility Chart

Using a Main Scanner with an Associated Research Instrument

Up to 12 SC6540 Scanners may be used with an Associated Research instrument and a PC in a Main configuration. This means that the Scanners are controlled remotely by the PC using compatible software and either an RS-232 or GPIB communications interface.

RS-232 Addressing Considerations

When using a Main Scanner with an RS-232 interface there is no need to set a hardware address as it receives information directly from a COM (communications) port.

GPIB Addressing Considerations

When using a Main Scanner with a GPIB interface it must addressed properly so that the PC can access each port correctly. This is especially important in applications where multiple Main Scanners are being used.

The GPIB address may be set using the 8-pin DIP switch located on the rear panel of the Scanner. Pins 1-5 are used to set the Main Scanner GPIB address. Pins 6-8 are not used. The DIP switches must be flipped up for an ON condition and down for an OFF condition.

Note: This is opposite to what the ON position indicates on the actual DIP switch itself.

The GPIB address of the Scanner may be set according to the sum of the total binary code set on the DIP switch.

GPIB Address Bit Values
PIN 1 = 1
PIN 2 = 2
PIN 3 = 4
PIN 4 = 8
PIN 5 = 16

Note: The GPIB address of the Scanner must be set before power is applied.

Note: A default address of 9 is set upon shipment from the factory.

Using a Remote Secondary Scanner with a Main Scanner

Up to 4 Secondary Scanners may be controlled remotely by a Main Scanner making for a total of 80 ports controlled by a single Main.

Virtual Addresses

Each Module in a series of Scanners must be addressed properly so that the PC can control all the ports correctly. This type of address is known as a *virtual address*. Scanners must be virtually addressed regardless of the communications interface used.

The Main Scanner

A Main Scanner automatically assigns a virtual address to its own Modules based on the type. GB and HV Modules are addressed independently of each other so the Main Scanner assigns a virtual address of 0 to a GB Module and a virtual address of 0 to a HV Module. If both Modules are the same type the Main Scanner automatically assigns a virtual address of 0 to Module A and 1 to Module B.

The Secondary Scanners

Secondary Scanners must be virtually addressed according to Module by setting the 8-pin DIP switch located on the back panel. Pins 1-4 address the ports of Module A. Pins 5-8 address the ports of Module B. The DIP switches must be flipped up for an ON condition and down for an OFF condition.

The virtual address of the Secondary Scanner may be set according to the sum of the total binary code set on the DIP switch.

Virtual Address Bit Values	
PIN 1 = 1	PIN 5 = 1
PIN 2 = 2	PIN 6 = 2
PIN 3 = 4	PIN 7 = 4
PIN 4 = 8	PIN 8 = 8

Note: This is opposite to what the ON position indicates on the actual DIP switch itself.

The following table shows the virtual addressing scheme for a Main Scanner with 4 accompanying Secondary Scanners:

Scanner Type	Position	Circuit Address	Channels
Main	A	Automatically assigned 0	1-8
Main	B	Automatically assigned 1	9-16
Secondary 1	A	2	17-24
Secondary 1	B	3	25-32
Secondary 2	A	4	33-40
Secondary 2	B	5	41-48
Secondary 3	A	6	49-56
Secondary 3	B	7	57-64
Secondary 4	A	8	65-72
Secondary 4	B	9	73-80

Table 3.0: Address Scheme for Main Scanner with Four Accompanying Secondary Scanners

Addressing a System with Multiple GB and HV Modules

Virtual addresses must be incremented separately according to the type of ports present in each Module (HV or GB). Each GB Module can be addressed starting from 0 and each HV Module can be addressed starting from 0.

Example: A system requiring both 40 High Current and 40 High Voltage test points can be set up in of the following configuration:

Scanner Type	Position	Circuit Address	Channels
Main HC	A	Automatically assigned 0	1-8
Main HV	B	Automatically assigned 0	1-8
Secondary 1 HC	A	1	9-16
Secondary 1 HV	B	1	9-16
Secondary 2 HC	A	2	17-24
Secondary 2 HV	B	2	17-24
Secondary 3 HC	A	3	25-32
Secondary 3 HV	B	3	25-32
Secondary 4 HC	A	4	33-40
Secondary 4 HV	B	4	33-40

Table 4.0: Addressing Scheme for Example