

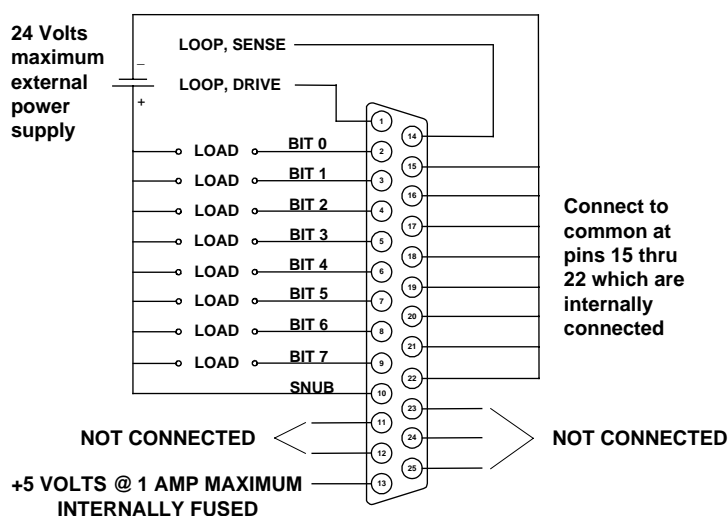
# Control Port Reference

## Description

Each Dynalab Circuit Analyzer is equipped with a Control Port providing the user with the ability to operate a variety of external devices from within a Sequence. The Control Port effectively consists of 8 switches, called **bits**, that can be controlled by a set of Sequence Commands. The bits are numbered 0 through 7.

## Control Port Specification

The following diagram shows the pinout of the Control Port and gives some specifications for select the devices to be controlled.



Maximum single bit port current: 0.5 amps  
Maximum total bit port current: 2.0 amps

Care should be taken to insure that the maximum current per bit and total for the device does not exceed, .5 and 2 Amps, respectively. Excessive current may damage the U114 component on the main processor board.

The external device being activated (load) must be located between the power supply's positive side and the Analyzer's parallel port. A snub circuit as shown absorbs the energy created when a relay or solenoid is de-energized.

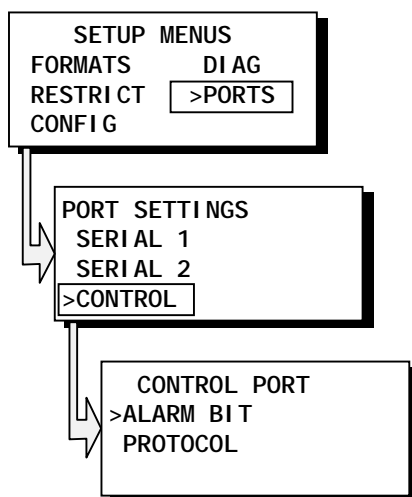
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## Hardware Configuration

This section covers some settings in the Analyzer firmware that effect the operation of the Control Port. These settings may be adjusted by choosing the appropriate options from the Analyzer's Setup Menus.

### Setup Menus

Enter the **Setup Menus** by depressing the **STOP** button while switching on the power to the Analyzer. Step through the menus as shown in the diagram below.



### Alarm Bit Settings

The **Alarm Bit** setting determines what Control Port bit is activated if the Analyzer enters the Alarm Mode.

BIT ACTIVATED DURING  
ALARM: 1

### Control Port Protocol

The Control Port **Protocol** setting establishes the communication protocol for the different Dynalab accessories that are serially controlled by this port. The **SPI** setting is the default and controls Dynalab Accessories 212-2005, 212-2006 and 212-2011. The **XBIT** setting controls the LED Driver Board, 7500020, and the obsolete PDC Board.

SERIAL PROTOCOL  
✓SPI  
XBIT

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## **Sequence Commands Used with the Control Port**

The commands listed below are the core Sequence commands used to program Control Port events.

### **BSET – turn on specified Control Port switch**

### **BCLR – turn off specified Control Port switch**

BSET and BCLR are the most commonly used Control Port commands. See the Sequence Snippet below for detailed syntax.

#### **Sequence Snippet**

Line No.	Command	Parameter	Description
4	BSET	0	Switch Control Port Bit 0 On
5	DELAY	1	Wait for 1 second before continue
6	BCLR	0	Switch Control Port Bit 0 Off

### **SET – turn on all Control Port switches**

The SET command can be used to turn on ALL bits simultaneously. For example, if we were only using five bits and wanted them all switched on at the same time, you could use the SET command. Please note however that even the bits not being used would also be turned on.

### **CLEAR – turn off ALL Control Port switches**

The CLEAR command functions as a kind of reset for the Control Port. CLEAR can be used any time you want to turn off all bits.

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## **PSET – Activates Control Port bits based on 8-bit binary number**

Converts decimal value specified to 8-bit binary equivalent and activates Control Port bits with respect to the binary value. See the table below.

Decimal Value	Bit Activated
0	none
1	0
2	1
3	0, 1
4	2
5	0, 2
8	3
13	0, 2, 3
16	4
32	5
64	6
128	7
231	0, 1, 2, 5, 6, 7

### **Parameter**

Any integer from 0 to 255

### **Sequence Snippet**

Line No.	Command	Parameter	Description
4	PSET	231	Switch Control Port Bit 0, 1, 2, 5, 6, 7 On
5	DELAY	1	Wait for 1 second before continue
6	CLEAR		Switch ALL Control Port Bits Off

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## Sequence Sample

This sequence starts in the ASSEMBLE Mode (continuous short scan typically used during installation of wires onto the test fixture to check for misplaced wires). After all wires have been installed, the operator will depress the **START** button to continue through the Sequence. After reading the input from the **START** button, the Analyzer will move to line 2 and perform the complete TEST of the specified Netlist.

If no errors were logged (by depressing the **START** button when the Analyzer is stopped on an error), the Analyzer would activate the Control Port bit to release the fixture lock and display a “no errors” report.

If errors were logged and error summary report would be displayed, and the harness would not be released.

The table below shows what this Sequence should look like.

Line No.	Command	Parameter	Description
1	ASSEMBLE	[NETLIST]	Continuous Short scan during assembly
2	TEST	[NETLIST]	Complete Netlist scan
3	BER	8	On error, go to line 8
4	BSET	0	Switch Control Port Bit 0 On
5	DELAY	1	Wait for 1 second before continue
6	BCLR	0	Switch Control Port Bit 0 Off
7	SOUND	0	Play “twirl” sound if no errors are found
8	REPORT		Display error report
9	KWAIT		Wait for START button to be pressed
10	REPEAT		Clear ALL error counter, reset ALL Control Port Bits, and repeat from line 1