

Model 3296

Dataway Display Control w/Input Gate

INSTRUCTION MANUAL

February, 1987

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Schematic Drawing #022117-D-1570	Insert

Dataway Display Control w/Input Gate

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FEATURES

- Selective display based on specific Dataway command (NAF)
- Selective display only when a particular data bit is true or false
- Selective display of "Next" Dataway cycle
- Buffered "Gate" and strobe signals for oscilloscope triggering
- "Gate" and "Dataway Active" LEDs
- 16-bit manual input gate

APPLICATIONS

- Use with 3291 Dataway Display
- Locating faults in CAMAC systems
- Automatic computer-controlled diagnosis
- Software debugging
- Module checkout
- Event monitoring
- Data entry

GENERAL DESCRIPTION

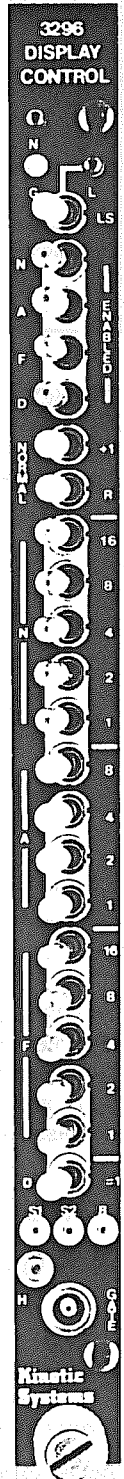
The Model 3296 control module is a single-width module arranged to enhance the use of the Model 3291 Dataway Display. The 3296 selectively controls (by switches on the 3296) the commands and associated data to be displayed by the 3291.

If a 3291 is in the "S1" mode, it will display all Dataway operations in the crate. The information is latched and updated during each Dataway cycle. When a typical system is in operation, a sequence of many commands is presented to the Dataway Display. It could be extremely useful to display only the command and data associated with one command, an F(1)·A(12) Read, for example. The 3296 provides this valuable tool. Its numerous additional features save many hours in software/hardware debugging.

The 3296 includes a 16-bit manual input gate for remote data entry (a 16-bit version of the 3461). A switch is also provided for setting LAM status. A LED indicates when a LAM request is present. The binary "N" pattern from the previous command can be read from the 3296 (if the N cable connection is implemented).

3291/3296 OPERATION

Operation	Description
Normal 3291	No control by the 3296; all switches off.
NAF Selection	Fourteen binary switches to select command(s) to be displayed.
Data Selection	One data bit is compared true or false; true with D=1 switch-selected.
Selection Enable	Four switches are labeled N, A, F, and D. When one is selected, it enables the associated binary selection switch. To display F(17)·A(1), the F and A switches are selected as well as binary F16, F1, and A1.
C/ + 1 Selection	Operated to the left, a normal compare results; operated to the right, the 3291 will display the next command after a compare. This feature is extremely useful.

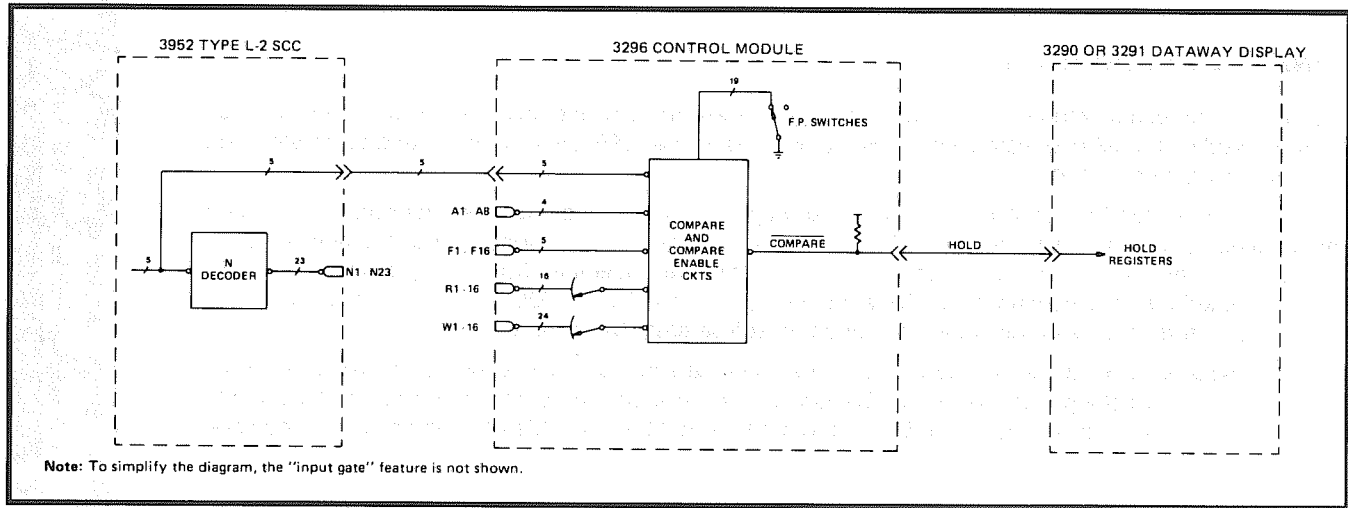


FUNCTION CODES

Command		Q	Action
F(0):A(0)	RD1	1	Reads state of lower 16 switches and clears the LAM status.
F(0):A(1)	RD1	1	Reads 'N' register. (Note 2.)
F(1):A(15)	RD2	1	Reads the module identifying number (3296=6340 ₈).
F(8):A(15)	TLM	LR	Tests whether the LAM request is present.
F(10):A(0)	CLM	1	Clears the LAM status.
F(24):A(0)	DIS	1	Disables the LAM request.
F(24):A(1)	DIS	1	Disables Dataway display control.
F(26):A(0)	ENB	1	Enables the LAM request.
F(26):A(1)	ENB	1	Enables Dataway display control.
F(27):A(0)	TST	LS	Tests whether the LAM status is set.
Z	CZ	0	Clears the LAM status, disables the LAM request, enables Dataway display control, and clears the N register.

Notes: 1. X=1 for all valid addressed commands.
 2. Indicates the binary N pattern associated with the previous command. The 3296 asserts HOLD to the 3291 during this command so that the previous data and command information is not lost in the 3291.

TYPICAL APPLICATION (includes N-line monitoring via SCC)



The 3296 contains binary selection switches for SLOT (N16, N8, N4, N2, N1), SUBADDRESS (A8, A4, A2, A1), and FUNCTION (F16, F8, F4, F2, F1) and one data bit (D=0/D=1). This module contains comparator ICs to compare the current command with that selected by the binary switches. When a comparison occurs, this control module allows the 3291 to display that command (and data, if applicable). Switches to disable the N, A, F, and D comparisons are provided. For example, if all comparisons are disabled except "F," then the selection of "F16" and "F1" would cause the 3291 to display all commands containing F(17).

POWER REQUIREMENTS

+6 volts — 320 mA

ORDERING INFORMATION

Weight: .70 kg. (1 lb. 8 oz.)

Model 3296-Z1A — Dataway Display Control with Input Gate

- Accessories** — Model 5860-G000 3291/3296 Patch Cord (included)
 Model 5930-Z1A Mating Connector
 Model 5844-Series Encoded "N" Cable (for use with the Auxiliary Controller Bus)
 Model 5860-B000 Encoded "N" Cable (for connection to the 3952)

OPERATION

Normal 3291 Operation

For normal 3291 operation (no control by the 3296), all 3296 switches should be in the LEFT position.

NAF Selection

Operate the binary N, A and F switches as appropriate to select the command(s) to be displayed. These switches represent a binary "1" when they are operated to the RIGHT. For example, N(18) is selected by having switches "N16" and "N2" operated to the RIGHT.

Data Selection

The read/write data selection can operate on any single bit. A COMPARE occurs when that bit is true if the Data (D) switch is operated to the right (=1) or when that bit is false if the Data switch is operated to the left. This can be useful for system or module tests that write or read odd bits (1, 3, 5, etc.) followed by even bits (2, 4, 6, etc.). By operating the Data switch, either the even or the odd data commands can be viewed.

If it is desirable to view a command ONLY when a particular bit (such as a status bit) is true or false, a switch is provided on the 3296 PC board to cause a compare on any one read or write bit from 1 to 24. A 5-bit rocker switch is provided on the PC board. When the binary selection is made, that read or write bit will be compared. See the "PCB Option Selection Diagram".

Selection Enable/Disable

There are four switches labeled "N", "A", "F" and "D". When all of these switches are operated to the left, the 3291 operates normally (as it would if it were not connected to the 3296). When any of these switches are operated to the right, they enable the associated binary selection switches. For example, to display F(17)*A(1), the "F" and "A" switches are operated to the right (enabled) AND the appropriate binary switches (F16, F1 and A1) are also operated to the right. This command is displayed regardless of the slot (N) or data (D).

C/+1 Switch

When this switch is operated to the left, a normal compare results. When it is operated to the right (+1), the 3291 will display the command following the last compare. For example, an F(16)*A(0) command is followed by the F(0)*A(0) command. The binary selection is made to compare on the F(16)*A(0) command. The F(0)*A(0) command is displayed. This feature can be extremely useful in determining if a computer program is producing CAMAC commands in the proper order.

Other 3291 Modes

When used with the Model 3296, the 3291 will normally be in the "S1" mode. However, if it is in the "N'S1" mode, the display is updated ONLY on a compare from the 3296 AND the 3291 being addressed. If it is in the "Q-S1" mode, the display is updated on a compare AND a Dataway operation with Q=1.

Model 3296

LED's

- G LED (Yellow) This LED provides a one-shot extended indication that there is currently a Gate signal present. (The current Dataway operation produces a valid COMPARE with the selection made on the 3296.)
- N LED (Red) This LED provides a one-shot extended indication that the 3296 is being addressed.
- L LED (Red) This LED indicates that a LAM request is present. (LAM status set and enabled.)

FRONT PANEL CONNECTORS

- S1 A test point with a buffered Dataway S1 signal (low true).
- S2 A test point with a buffered Dataway S2 signal (low true).
- B A test point with a buffered Dataway Busy signal (low true).
- G An RA00250 LEMO connector with a gate signal (low true). This signal is true during a Dataway cycle in which the command (and slot, if applicable) COMPARES with that selected on the 3296. This signal starts approximately 200 ns after the Dataway cycle starts and ends approximately 200 ns after the Dataway cycle ends. The delay prevents false operation from transients. This signal is very useful for triggering an oscilloscope on selected Dataway cycles. The mating connector is for F00250 LEMO. A strap option for "S1 enable" is also provided on the PCB.
- H Alternate connection for rear "hold" patch cord.

REAR PANEL CONNECTORS

- "D" Connector This 9-pin connector (DE9P) contains signals for using the binary N's from a Type L SCC (or any other low true signals) to provide selective display.
- Red Jack This pin jack (for 0.080 inch pin) provides for "HOLDING" the data in the 3291 and updating only on a compare from the 3296.

Model 3296

USE AS A MANUAL INPUT GATE

The lower 16 switches can be used to provide remote data entry. These switches can be read by a F(0)*A(0) command to the 3296. The gate is limited to 16 bits because of space limitations. Operate the switches to the right for data = 1.

The momentary LAM status (LS) switch can be used to signal the computer that a data word has been entered. The normal LAM enable and LAM test commands are included. See the FUNCTION CODE chart for details.

Note that an associated 3291 will indicate the input bits selected when the 3296 read occurs ONLY if the four ENABLE switches (N,A,F,D) are to the LEFT (not enabled). The 3296 read will be correct, however, regardless of NAFD ENABLE selection.

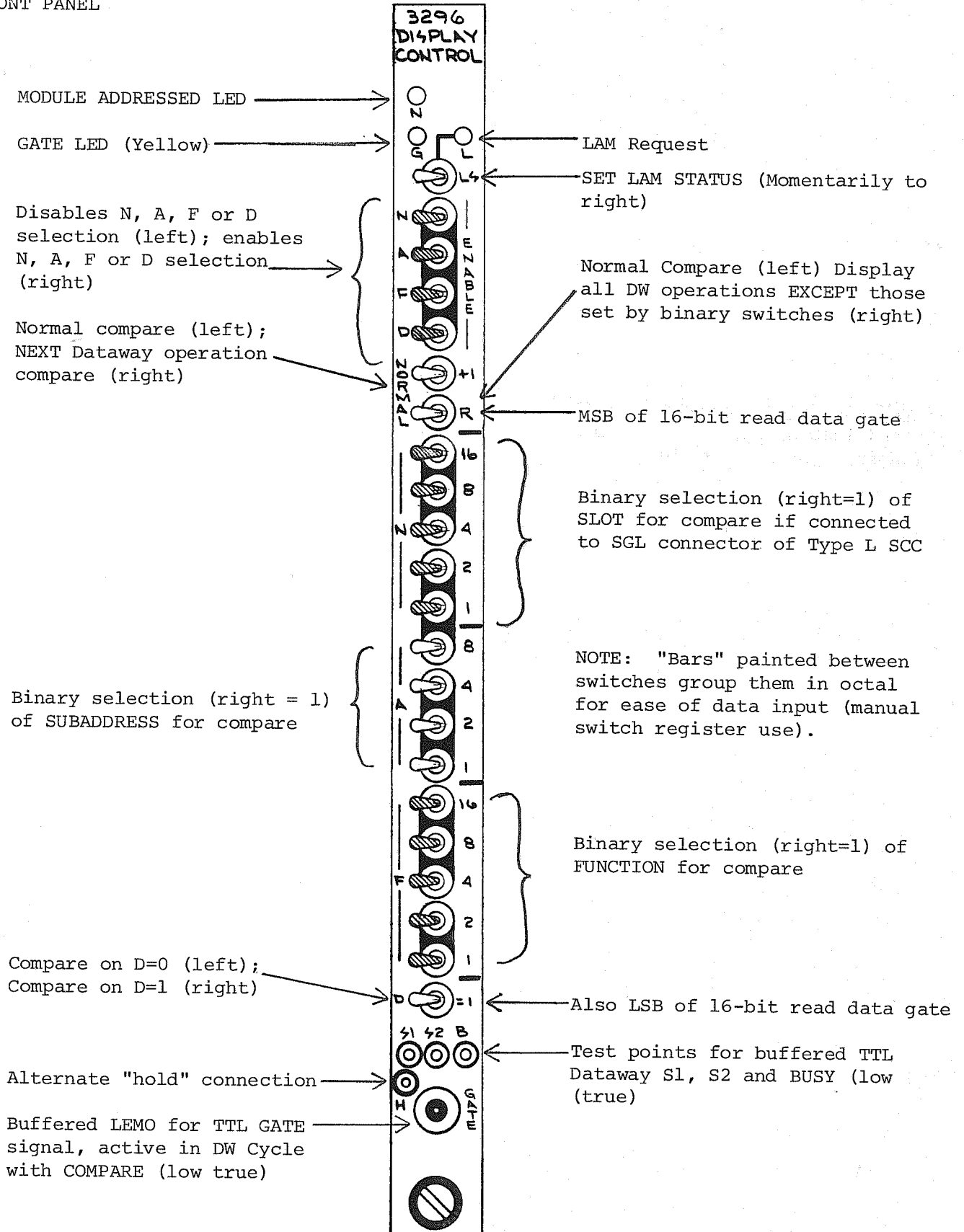
AUTOMATIC COMPUTER DIAGNOSIS

The 3291 and 3296 provide a unique combination for automatic diagnosis of system operation. The 3291 can be used to test all data bits by writing and reading each bit and command bits (A's, F's, etc.), by performing these commands to a vacant slot, and then reading the 3291 command register.

The 3296 contains a "binary N" register so that the "N" information can be tested (up to the decoder in the SCC). This register is strobed at S2 of every Dataway cycle and read at F(0)*A(1) in the 3296. The 3291 is "held" (not updated) during this read so that previous data and command information is not destroyed and the 3291 can then be read.

To prevent the compare-enable switches from interfering with an automatic diagnosis, these switches will cause selective control of the 3291 only if enabled from the Dataway. Control enabled is the initialized state. The computer can disable prior to the test, then re-enable. IF THE COMPUTER HAS DISABLED CONTROL AND FAILED TO RE-ENABLE, THIS CAN BE DONE FROM THE MODULE BY TOGGLING THE NORMAL/+1 SWITCH.

FRONT PANEL

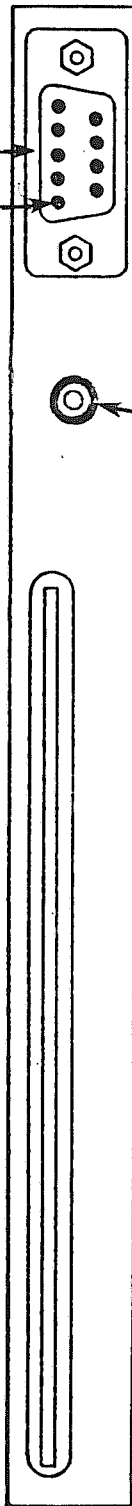


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REAR PANEL

3296

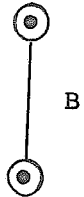
DE9P connector
Pin 1



Jack for HOLD to 3291
(Red pin jack for 0.080" pin)

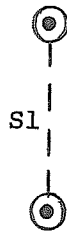
<u>Description</u>	3296 DE9P Conn.	3952 2DB52P Conn.
Ground	1	--
N16	2	51
N8	3	49
N4	4	47
N2	5	45
N1	6	43
N/C	7	--
CLEAR	8	--
HOLD	9	--

PCB OPTION SELECTION DIAGRAM



Normal strap location
for GATE signal on FP

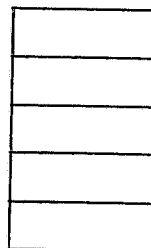
Alternate strap location
if Dataway noise causes
false FP GATE signal.
This does NOT affect internal
3291 control. It makes GATE true
only during S1.



Read/Write Bit Selection Table
('1' indicates switch 'ON'.)

Bit	S5	S4	S3	S2	S1
1	0	0	0	0	0
2	0	0	0	0	1
3	0	0	0	1	0
4	0	0	0	1	1
5	0	0	1	0	0
6	0	0	1	0	1
7	0	0	1	1	0
8	0	0	1	1	1
9	0	1	0	0	0
10	0	1	0	0	1
11	0	1	0	1	0
12	0	1	0	1	1
13	0	1	1	0	0
14	0	1	1	0	1
15	0	1	1	1	0
16	0	1	1	1	1
17	1	0	0	0	0
18	1	0	0	0	1
19	1	0	0	1	0
20	1	0	0	1	1
21	1	0	1	0	0
22	1	0	1	0	1
23	1	0	1	1	0
24	1	0	1	1	1

Read/Write Bit Selection



5
4 BIT 'ON'
3 this side
2 toward PCB.
1