DIGITAL PORT ROUTER-16

OPERATOR'S MANUAL

Overview

The DPR-16 is a Rs422 Duplex port router, which can operate as a stand-alone device, or as a slave to external SIGMA Electronics routers. In either case the DPR-16 will directly route 16 ports via its front control panel. If it is slaved to another router, it can also be set to parse routing commands generated from the external system and Re-Map them to the desired Port Configurations. The DPR-16 control panel has individual selection buttons for 16 Controller sources (top row) and 16 Controlled destinations (bottom row), and four Mode Selections: REC (record) and PLAY buttons on the left side, used for Macro operations, and GROUP and TAKE buttons on the right side, used for Port selections and Confirmations.

In addition to standard operation which DUPLEX links 1 of 16 ports (designated as a source) to 1 of the remaining 15 ports (designated as a primary destination), the DPR-16 can SIMPLEX link a source to any number of remaining destinations (designated as secondary destinations). This is most useful when multiple decks are being controlled simultaneously such as a gang record operation.

The DPR-16 can record and play user-defined button sequences named Macros. The macros are stored in flash memory. Macros are directly activated via the control panel, or triggered via external routing slave operations. Each Macro is identified via an S/D (SOURCE/DESTINATION) pair and is selected by pressing the corresponding source and destination buttons; i.e. Macro 1-2 corresponds to SOURCE 1 and DESTINATION 2. Since there are 16 source buttons and 16 destination buttons, there are 256 unique permutations.

Simple Operation

To select a source for routing, press any *SOURCE* button. The LED incorporated into the *SOURCE* button will begin flashing, indicating the start of a selection mode. If the incorrect source is selected simply reselect the desired source. A source can be canceled at any time by pressing the same *SOURCE* button again. Once a source is selected, a destination can be selected by pressing a *DESTINATION* button. Pressing the TAKE button completes the selection operation.

After a source is selected, and a destination is selected, the DESTINATION button's LED will light. At this time the PLAY, REC (record), and TAKE buttons' LEDs will begin to flash, indicating that any of those operations can be initiated. Pressing the DESTINATION button again will cancel the destination selection.

 A particular primary destination will also be cancelled if a different primary DESTINATION button is selected; there can only be one primary destination.

A source can be uni-directionally routed to more than one (secondary) destination, with bi-directionality reserved for a single (primary) destination. The GROUP button is used to enable the selection of secondary destinations. When the GROUP button is active, any destination selected is treated as a secondary destination. Secondary destinations are distinguished from a primary destination by their blinking button LEDs (the primary destination's LED is solid ON). To cancel the Group mode, press the GROUP button again or complete the selection with the TAKE button.

Pressing the TAKE button will complete the switch per the selected source and destinations. The SOURCE button's LED will stop blinking; all of the selected S/D buttons remain lit, indicating the current status.

Macros

You can easily record and play back up to 256 macros consisting of up to 61 button operations in each. Each macro is identified via a source-destination pair; i.e. Macro 10-3 corresponds to SOURCE (10) and DESTINATION (3). This is convenient when operation as a slave device to another SIGMA router and Re-Mapping is desired.

To 'Capture' a Macro, the REC (record) button is pressed after choosing a single S/D pair, prior to a TAKE button being pressed. The panel will enter the Macro Record mode, during which all-subsequent button presses will be saved to the macro identified by the particular S/D button pair selected. When starting the Record mode, all

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LEDs other than the REC button's LED will clear. The REC button's LED will remain lit until pressing the REC button again, which completes the Record mode operation.
 (Note: to clear a macro, simply press the REC button twice after selecting the S/D button pair that references the macro).

To 'Replay' a Macro, the PLAY button is selected after choosing a single S/D pair. The macro will play back all of the button presses that were recorded in the macro. At completion of the macro, the PLAY button's LED will clear. (This only works if a macro has been created for that pair)

If any other button other than a source and a primary destination is selected prior to selecting the REC or PLAY button, the Record and Play modes will be locked out until which time a new source is selected.

Macros can be write-protected by inserting a jumper at position J7, located on the main board.

Examples of Typical LOCAL Operations

1) To Connect Ports 1 and 2 together press:

> **<SOURCE 1>, <DESTINATION 2>, <TAKE>**

2) To Connect Ports 1 and 2 together, while additionally 'Ganging' Port 1 to Port 3 and 4, press:

> **<SOURCE 1>, <DESTINATION 2>, <GROUP>, <DESTINATION 3>, <DESTINATION 4>, <TAKE>**

3) To create a macro assigned to I/O pair 5-5 (Source 5 – Destination 5), with the same operation as example #2 press:

> **<SOURCE 5>, <DESTINATION 5>, <REC>**   (this starts the Macro 5-5 rec process)

 Then press all keys you want recorded; when finished press:

> **<SOURCE 1>, <DESTINATION 2>, <GROUP>, <DESTINATION 3>, <DESTINATION 4>, <TAKE>**

 Then complete the rec 5-5 process.

> **<REC>**

3) To play back a macro assigned to I/O pair 5-5, press:

> **<SOURCE 5>, <DESTINATION 5>, <PLAY>**

SLAVE OPERATION

If the DPR-16 is slaved to any external SIGMA routers, it will accept switching commands corresponding to the jumper-defined level and act on them. These external commands typically request routing of a single source to a single destination. However, if a macro is defined for a given S/D pair, the external switch command will trigger the macro in lieu of simply switching the pair. The macro is substituted for the simple switch, thereby generating a series of user-recorded button presses. If there is no defined macro, the direct switch is executed, by translating it into the corresponding SOURCE and DESTINATION buttons, and the TAKE button.

When the DPR-16 executes an external switch (directly or macro-trigger) all current operations of the local control panel are cancelled. The PLAY button is lit for the duration of the external switch.

Status

To obtain the status of any source/destination, press one of the DESTINATION buttons when the panel is not in Preset mode (no SOURCE button is blinking). If that destination has a defined source, the SOURCE button will light, the button for any primary destination belonging to that source will light, and the buttons for any secondary destinations belonging to that source will blink. To cancel the status, press an unassigned DESTINATION button, or press a SOURCE button twice (the first press will put the panel into Preset mode, and the second press will clear the panel).

Panel Lock/Unlock

Pressing the GROUP and TAKE buttons simultaneously can lock out the panel's source and control buttons. The S/D button-LEDs will temporarily light in a staggered pattern. Destination buttons can still be selected to indicate status. To unlock the panel, press the GROUP and TAKE buttons simultaneously a second time. The S/D buttons will flash for approximately ½ second and the panel will unlock.

Installation and Engineering Information

There are four jumpers on the main board of the DPR-16 which are used to set configuration. One pair of jumpers is used to select one out of four levels. The two other jumpers provide the ability to write-protect the flash memory, and to write-protect user-defined macros. These are normally Engineering functions and do not require any operator selection.

AUTOMATIC PORT CONFIGURATION

In the normal signal connections of a RS422 system, there is a device designated as a 'CONTROLLER' and a second device designated as a 'CONTROLLED' unit. Typically, an edit system is a controller and a tape deck as a controlled type device. The signal pins assigned to the two devices are not identically wired so that they may be plugged together with a standard 'straight-thru' cable. The DPR-16 utilizes the source and destination selection as an indicator of how a port is to be configured. When any of the ports is picked as a SOURCE, the wiring of that port is automatically configured to be a CONTROLLED type, which is compatible with an external controller such as the editor. When a port is selected as a DESTINATION, it automatically is configured as a CONTROLLER type suitable to plug directly into the device to be controlled. A RED / GREEN LED located adjacent to each DB9 on the rear is used to indicate the signal direction of the port. Green indicates that the port is in Controlled configuration and RED indicates that it is a CONTROLLER type.

Cabling

Rs422 is a DUPLEX form of communication between two or more devices. That means that for every data path to a device, there is a return data path. For this to operate correctly, there is a distinction between the Controller device and the controlled device pin-outs on the DB9 connectors. Some equipment can automatically change its' 'flavor' as required but that is the exception. Therefore, it is important to recognize what type of device is being connected to properly configure the hardware ports. The SIGMA DPR-16 determines this choice of configuration by the SOURCE – DESTINATION method of identification. Any port selected as a SOURCE is configured as a 'controlled' port. Any port designated as a 'destination' is configured as a 'controller' port. No port can be both configurations at the same time.

 All ports are balance differential pairs, terminated by 120 ohms.

The pin assignments for a 9-pin cable are as follows:

Pin	Master	Slave
1	Ground	Ground
2	Rcv A	Xmit A
3	Xmit B	Rcv B
4	Xmit Common	Rcv Common
5	Spare	Spare
6	Rcv Common	Xmit Common
7	Rcv B	Xmit B
8	Xmit A	Rcv A
9	Ground	Ground

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PIN   CONTROLLING DEVICE      CONTROLLED DEVICE
 1    Frame Ground            Frame Ground
 2    Receive A               Transmit A
 3    Transmit B              Receive B
 4    Transmit Common         Receive Common
 5    Spare                   Spare
 6    Receive Common          Transmit Common
 7    Receive B               Transmit B
 8    Transmit A              Receive A
 9    Frame Ground            Frame Ground
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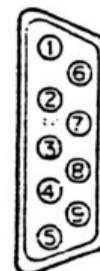
(OUTSIDE VIEW)

A and B are defined as follows.

$A < B \longrightarrow$ "1" (MARK)
$A > B \longrightarrow$ "0" (SPACE)
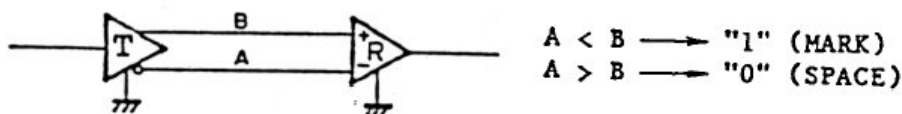
Slave Mode

External routing commands generated by SIGMA routers are targeted for one of four levels. If the DPR-16 is connected to any external SIGMA router, it must be configured to parse the desired control level. The active level is determined by setting two jumpers located on the main board, labeled J6 A and B. The unit is shipped with a default setting of Level 4 (both jumpers engaged). Level 1 is selected by removing both jumpers. Level 2 is selected by inserting a jumper at location J6-A only. Level 3 is selected by inserting a jumper at location J6-B only. Any external routing commands targeted for a level other than the one referenced by the jumper settings will be ignored. These jumper settings have no effect on local control of the DPR-16

Power-up

When the DPR-16 powers up, one source and one destination button LED will light for a period of about ½ second, and will represent the version number of the installed software. The router will then fetch its last state from flash memory and restore it.

Flash Write-Protection

The internal flash memory is write-protected via a jumper at position WP. This selection will also write-protect the macros; jumper J7 becomes superfluous.

Cold-Boot

To cold boot the DPR-16, toggle the REC and TAKE buttons three times simultaneously. All of the ports will be set as sources, and any defined macros will be cleared. While the macros are cleared from flash, the TAKE button will blink and all other operations will be locked out. However, if the flash is copy-protected via jumper WP, the macros will remain unchanged. If the macros are copy-protected via jumper J7, the REC button will rapidly flash instead of the TAKE button, to indicate that the macros remain unchanged.

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POWER SUPPLY SPECIFICATIONS;

AC INPUT	Auto Ranging	90 to 132v	180 to 264v
Power Efficiency	Power Supply Rating	82%	
INPUT Frequency	Power Supply Rating	47 – 63 Hz	

EMC AND SAFETY SPECIFICATIONS
CE Mark	Complies with the LVD
EMC	EN55022-B, CISPR22-B, FCC Part 15 Class B, EN50082-1
Agency Approvals	VDE, UL, c-UL
Safety Standards	IEC950, EN60950, UL1950, CSA,
	C22.2 No. 950 Class 1 SELV
Safety File numbers	VDE: 18934-3336
	UL: E150565

ENVIRONMENTAL SPECIFICATIONS
Operating Temperature	No Derating	0 to 50C
	Linear derate to 50%	51 to 70C
Storage Temperature		-40 to 85C
Cooling		Convection
Relative Humidity	Non-Condensing	95% max
MTBF	MIL-HDBK-217F	>200,000 hrs

Rs422 PORT SPECIFICATIONS

One 9-pin female 'D' type connector per port.

Data Rate > 110 to 250kbaud rate DUPLEX

16 full-duplex differential bus ports with auto configuration

120-ohm characteristic impedance across each Differential signal pair

LED Indicator of port configuration

MECHANICAL Specifications

Housed in a 1 RU by 7 in deep all metal enclosure including Local control mounted on front of unit.

Power Consumption: Less than 12 W power consumption.

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