



ND600 Serial Input/Output Interface

Description

The ND600 Serial Input/Output Interface permits serial input/output data transfer between the ND600 System and any one of the following input/output peripheral devices: Teletype Model 33ASR Automatic Send/Receive Set (strapped for 20 mA, full duplex operation), Texas Instruments Model 743 or 733 Terminal Printer, or Digital Equipment Corporation Model LA36 Writer. It also permits serial output of all status page information and any of the various tables and reports generated by the optional ND600 Firmware Packages. The interface also serves as a serial data communicator/controller interface to permit data, control and status transfer between ND600 Systems or between the ND600 System and another system. Input/output transfer rates are selectable from 50 to 9600 baud (depending upon device) via EIA RS-232-C Data Terminal Transmit/Receive Type D discipline. Each serial transfer is in standard 8-level, 10 or 11-unit serial time code format (one start bit, an 8-bit ASCII character, and one or two stop bits).

Data input can be from the Teletype keyboard and/or paper tape punch, the terminal printer keyboard and/or magnetic tape cassette (733 ASR), or the DEC writer keyboard. Data output is to the Teletype printer with or without punching paper tape, the terminal printer and/or magnetic tape cassette (733 ASR), or the DEC writer.

Transfer of each data channel requires eight characters with each character encoded in the standard 8-level, 10 or 11-unit serial time code. The first six characters contain BCD coded ASCII numbers, the seventh character contains a space, and the eighth, a delete or rubout character. Every tenth space and delete or rubout are replaced by carriage return and line feed.

All interface circuitry for any one of these input/output peripheral devices is contained on a half-width printed circuit board which plugs into any of the eight available half-size board connector slots in the front board housing of the ND600 Electronics Enclosure.

The basic ND600 System contains the firmware required for supporting any one of the serial input/output devices. If more than one serial input/output interface and peripheral device is ordered with the system, or if the serial input/output interface is to be used as a serial data communicator/controller channel, one additional firmware pair is required which must be installed on the Firmware Option board (70-2434).

Technical Specifications

Input/Output Code: 8-bit BCD coded ASCII in a standard 8-level, 10-unit (11-unit for Teletype) serial time code format (one start bit, an 8-bit ASCII character, one or two stop bits) via EIA RS-232-C Data Terminal Transmit/Receive Type D discipline.

Input/Output Rates: Teletype—110 baud. Terminal Printer/Keyboard—300 baud. Magnetic Tape Cassette (733ASR)—300 baud. DEC Writer—300 baud. Serial Data Communicator/Controller—Selectable from 50 to 2400 baud.

Readout Data Format: Eight characters per channel—Six BCD coded digits of data, one space character, and one rubout (delete for Teletype) character; every tenth space and rubout are replaced by carriage return and line feed. Carriage return and line feed also follow the last channel readout. Printout of non-significant zeroes is suppressed (i.e., replaced by space).

Identification of Channels Containing over One Million Counts: The character "M" is encoded in the first data digit and the remainder of the count over one million in the next five digits.

Readout Format for All Channels in the Current Display Group: Consists of the current elapsed acquisition live time, carriage return/line feed, first channel address, carriage return/line feed, first channel content and the content of each channel and the address of every 100th channel within the current display group. A carriage return/line feed occurs after output of the content of each channel whose address ends in nine and after output of every 100th channel address. Channel addresses are preceded by the character "@" to distinguish them from channel contents.

Readout Format for Channels in Marker Defined or Intensified Regions: Consists of the current elapsed acquisition live time, carriage return/line feed, start channel address, carriage return/line feed, start channel content, the content of each channel and the address of every 100th channel up to the stop channel, stop channel address, and carriage return/line feed for the marker defined or each intensified region within the current display group. A carriage return/line feed occurs after output of the content of each channel whose address ends in nine and after output of every 100th channel address. Channel addresses are preceded by the character "@" to distinguish them from channel contents.

Readout Format for Intensified Region Totals:

Consists of the current elapsed acquisition live time, carriage return/line feed, start channel address, the total number of counts in the region (two 6-digit words containing the six most and six least significant digits, respectively), stop channel address and carriage return/line feed for each intensified region within the current display group. Channel addresses are preceded by the character "@" to distinguish them from region totals.

Communicator Input/Output Code: Standard 10 or 11-unit serial time code (one start bit, an 8-bit word and one or two stop bits) via EIA RS-232-C Data Terminal Transmit/Receive Type D discipline.

Communicator Data Format: Four six-bit binary bytes per channel with each byte transferred in the

serial time code as the six least significant bits of the 8-bit word. Bit 8 of the 8-bit word is always logic 1 during transfer of the least significant binary byte.

Communicator Control Word Format: Bits 1 through 7 of the 8-bit control word are encoded to command data acquisition, data input/output, status input/output, any other keyboard command, keyboard enable/disable or display on/off. Bit 8 of the 8 bit control word is always logic 0 during transfer of a control word.

Power Requirements: +5 Vdc @ 0.5A. +12 Vdc @ 50 mA. -12 Vdc @ 25 mA.

Dimensions: Standard half-size board (8.5-in. l. x 5.2-in. w.)

Part Number: 70-2437.

Sample Data Printout

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2660
00
0 26653 42030 25149 12613 10827 11058 13823 18116 20803
19352 15044 12830 11902 13393 18815 26647 28280 21992 16003
13378 12467 12072 12280 13209 13777 15217 16187 16248 16444
16462 16417 15819 15281 14313 13538 12631 11718 11288 10996
10658 10247 10054 9728 9526 9698 9488 9419 9064 9129
9138 9133 9047 8972 9068 9100 9104 9100 9125 9240
9225 9497 9120 9200 9026 9004 8648 8257 7569 7079
6584 6024 5670 5532 5124 4965 4872 4552 4561 4406
4406 4230 4134 4135 4146 4216 4005 4161 4436 4786
5474 6716 8230 11066 14331 17952 21184 24241 25316 25586
0100
23394 20320 16761 13337 10360 7899 6325 5151 4497 4323
4051 3967 3955 3990 3853 3870 3921 4091 4009 4240
4194 4200 4428 4344 4402 4457 4513 4503 4489 4602
4587 4687 4653 4531 4494 4443 4402 4339 4194 4018
3864 3771 3504 3335 3349 3180 3187 3100 3032 2898
2899 2823 2906 2780 2730 2720 2609 2582 2570 2512
2404 2321 2459 2352 2445 2584 3025 3336 3735 4321
4919 5425 5973 6402 6392 6482 6110 5739 5067 4525
3879 3210 2622 2199 1732 1588 1474 1335 1466 1680
1809 2204 2723 3057 3564 4049 4473 4732 4760 4821
0200
4626 4493 4081 3558 3077 2651 2250 1755 1481 1107
919 706 554 464 400 331 258 264 183 183
146 172 160 134 129 129 133 123 123 126
124 135 146 105 115 130 122 110 102 126
119 122 119 114 129 114 112 89 102 89
98 101 100 91 100 77

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Sample Region Printout

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2660
0159
2512
2404 2321 2459 2352 2445 2584 3025 3336 3735 4321
4919 5425 5973 6402 6392 6482 6110 5739 5067 4525
3879 3210 2622 2199 1732 1588 1474 1335 1466 1680
1809 2204 2723 3057 3564 4049 4473 4732 4760 4821
0200
4626 4493 4081 3558 3077 2651 2250 1755 1481 1107
919 706 554 464 400 331 258 264 183 183
146 172 160 134 129 129 133 123 123 126
124 135 146 105 115 130 122 110 102 126
119 122 119 114 129 114 112 89 102 89
98 101 100 91 100 77

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Sample Totalization Printout

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2660
013 0 158410 021
035 0 283902 0111
0163 0 92474 0185
0187 0 72795 0215

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Specifications subject to change
Printed in U.S.A. 10/77 PS 1030 2.5

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