DIGITAL SPEED REFERENCE (DI-16G)
MODEL DS406

Before installing this option, a TECHNICALLY QUALIFIED INDIVIDUAL, who is familiar with this type of equipment and hazards involved, should READ this ENTIRE INSTRUCTION SHEET.

   IMPORTANT: This option may have been installed by the factory. However, certain steps can only be completed at the installation site. Therefore, review and then perform those steps which complete the installation process.

INTRODUCTION

When installed, this option allows the user to interface a 16-bit binary/4-digit BCD digital speed reference to the Drive. This reference can be binary, BCD(Hz) or BCD(%), with SIGN (+/-) and SET (READ) inputs. (Refer to the Drive technical manual description of system constant Sn-26.) NOTE: A 12-bit binary/4-digit BCD input can be used; this requires changing a switch setting on the option board.

CAUTION

   This option contains electroctatic sensitive devices. Personnel should be grounded before removing contents from the carton and installing into the equipment.

INSTALLATION

1.   Disconnect all electrical power to Drive.

2.   Remove Drive front cover. Check that "CHARGE" indicator lamp inside Drive is off.

3.   Verify voltage has been disconnected by using a voltmeter to check for voltage at incoming power terminals (L1, L2, L3).

WARNING

   Hazardous voltage can cause severe injury or death. Lock all power sources feeding Drive in "OFF" position.

4.   See Figure 1. Install the option on the Main Control Board, 1PCB, and ensure 2CN is properly connected. Make sure Electrostatic procedure is followed.

Figure 1.
Installation of
Digital Speed
Reference DI-16G
In GPD 503
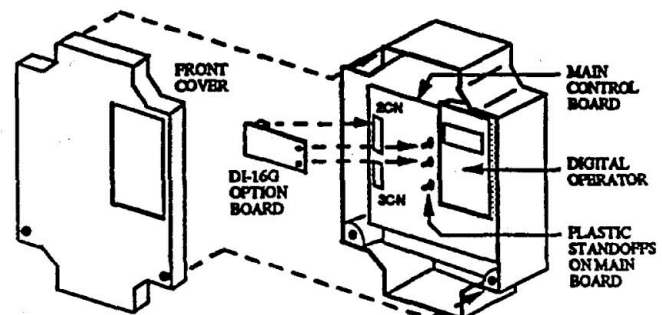
CHANGE RECORD					

DWG. NO. 02Y00025-0381
SHEET NO. 1 OF 5
EFF. 07/19/94   (m-df)

Table 1. DI-16G Specifications
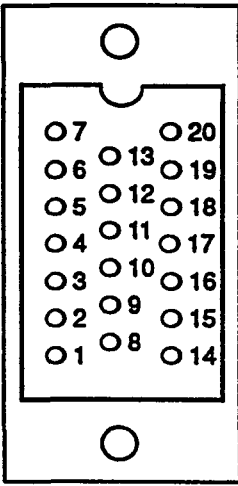
Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
High Level Voltage Input	V_{IH}	12.5		24.0	V	$R_L > 8.9\ K\Omega$
Low Level Voltage Input	V_{IL}	0		12.0	V	$R_L < 8.8\ K\Omega$
Logic Low Current			6.4	10	mA	

Separately supplied control voltage input: 24V (isolated)

5. Wiring. See Figure 2 for Digital Speed Reference (DI-16G) connections. Connect digital input signals to the option board via connector CC1. See Table 2 for connector pin functions.

Route wires from the Drive and connect to the peripheral device(s). Refer to "Electrical Installation" in the Drive technical manual for further information on use of shielded cable.

Table 2. Connector Pin Functions of DI-16G

Pin Layout of Connector CC1	Pin No.	Type of Input Signals — Binary Input	Type of Input Signals — BCD Input		Remarks
	1	2^0	1		— "On" when closed (shorted to 0V at CC1-19); "Off" when open.
	2	2^1	2		
	3	2^2	4	$\times 10^0$	
	4	2^3	8		
	5	2^4	1		— Binary / BCD selection and input unit is set by Drive constant Sn-26; see Table 3.
	6	2^5	2		
	7	2^6	4	$\times 10^1$	
	8	2^7	8		
	9	2^8	1		— If 12-bit binary / 3-digit BCD input is to be used, change the setting of switch S1 on the option board (see below), and DO NOT make connections to CC1-12 thru -16.
	10	2^9	2		
	11	2^{10}	4	$\times 10^2$	
	12	2^{11}	8		
	13	2^{12}	1		For 16-bit binary / 4-digit BCD input
	14	2^{13}	2		
	15	2^{14}	4	$\times 10^3$	* S1 "OPEN"
	15	2^{15}	8		
	17	SIGN (polarity) signal			For 12-bit binary / 3-digit BDC input
	18	SET (READ) signal			
	19	Frequency reference common (0V)			S1 "CLOSED"
	20	Shield sheath connection			
Separate Board Terminals	21	E			Ground
	22	+24V			Separately supplied 24V control voltage input
	23	0V			

(Pin Layout of Connector CC1, As Viewed From Wire Entry Side):
7 20
6 13 19
5 12 18
4 11 17
3 10 16
2 9 15
1 8 14

* Factory set position.

CAUTION

Keep digital signal (i.e. control circuit) wiring separate from main circuit input/output wiring.

CAUTION

To prevent erroneous operation caused by noise interference, use shielded cable for digital signal wiring, and limit distance to 10m (33 feet) or less.

IMPORTANT: The DI-16G input circuits can receive output of relay contacts or transistor (open collector).

    – Use relays with highly reliable contacts (for very small current) with a capacity of 30VDC or more and rated current of 100mA or higher.

    – Use transistor (open collector) with rated voltage of 35VDC or more and rated current of 30mA or higher.
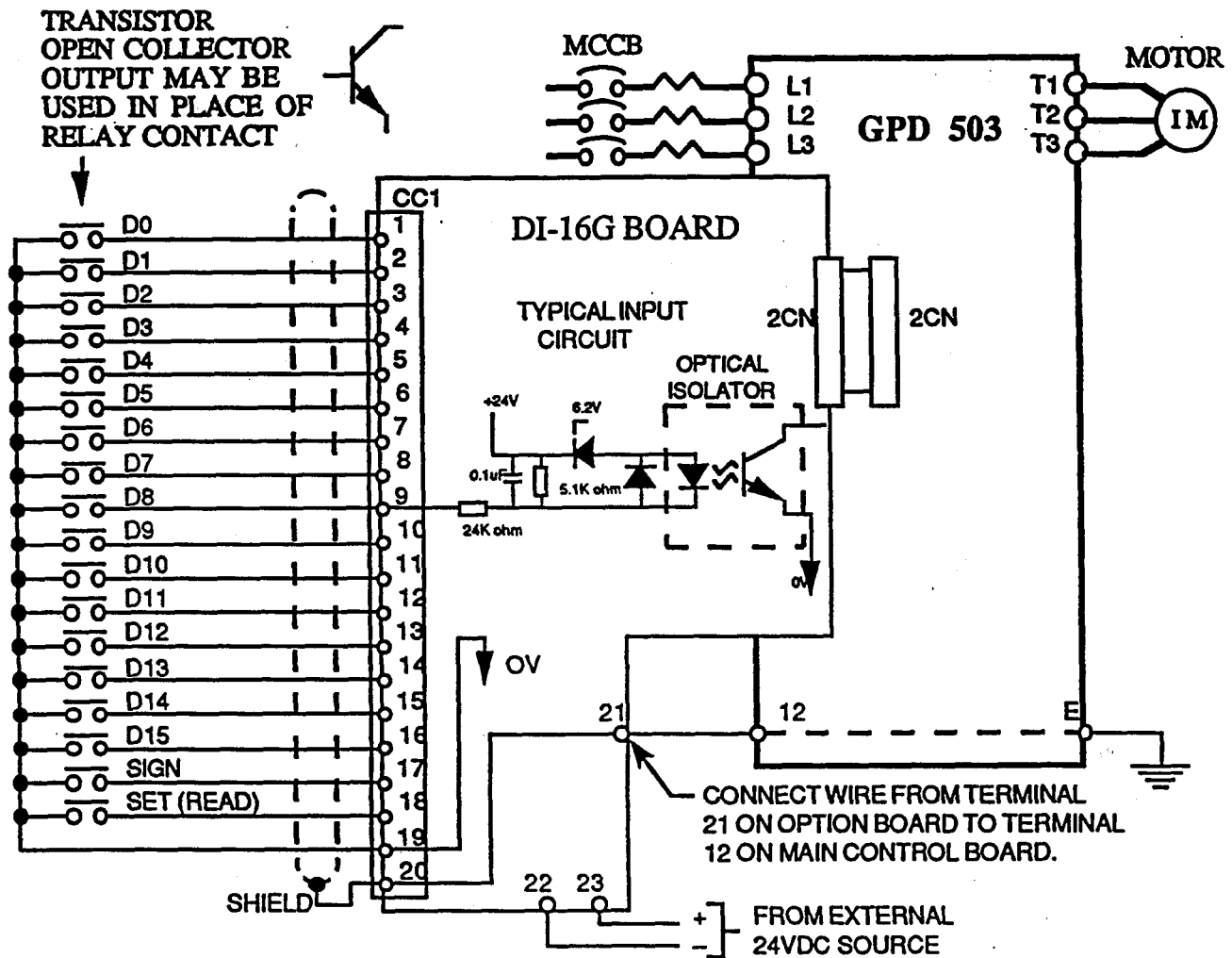

Figure 2. Interconnection for Digital Speed Reference (DI-16G) Circuit

6. Adjustments. There are no other adjustments to be made on the Digital Speed Reference option except S1 (see Table 2); however, the Drive will have to be reprogrammed for the input requirement of the digital reference. See Figure 3, and refer to the Technical Manual description of system constant Sn-26, and Multi-function Input (Sn-15 thru Sn-18 data 02).

IMPORTANT: For the Digital Speed Reference circuit to function properly, system constant Sn-04 must be set to XXX0 and Sn-08 must be set to XXX0 (input to DI-16G replaces auto speed reference signal).

IMPORTANT: With the DI-16G option in place in a GPD 503, control constant Cn-20 MUST BE SET to 0 or 1 for proper frequency reference display on the Digital Operator.

Table 3. Sn-26 — Setting Unit and Range For GPD 503

Setting Value	Setting Unit		Setting Range [1]	
			S1 Closed (16-bit / 4-digit)	S1 Open (12-bit / 3-digit)
* 0000	BCD [2]	1%	0 — 109 %	0 — 109 %
0001	BCD	0.1%	0.0 — 109.0 %	0.0 — 109.0 %
0010	BCD	0.01%	0.00 — 109.00 %	0.00 — 15.99 %
0011	BCD	1Hz	0 — 400 Hz	0 — 400 Hz
0100	BCD	0.1Hz	0.0 — 400.0 Hz	0.0 — 159.9 Hz
0101	BCD	0.01Hz	0.00 — 159.99 Hz	0.00 — 15.99 Hz
0111 1000	Binary [3]	30000/100%	0.00 — 109% / 0 — 32700	0.00 — 100% / 0 — 4095

* Factory setting.

[1] Setting ranges shown are based on a maximum frequency (Cn-20) setting of 400 Hz and upper limit of frequency reference of 109%.

[2] In all BCD inputs, the highest digit can have a value from 0 to F; other digits can only have a value from 0 to 9.

[3] The difference between settings 0111 and 1000 is in how the reference is displayed on the Digital Operator:
   Setting value 0111 – Binary references are displayed as (%) values.
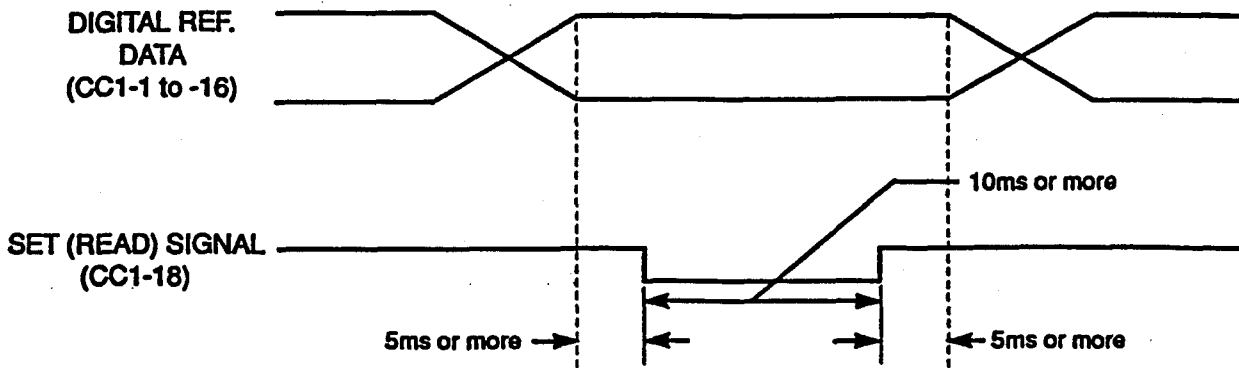   Setting value 1000 – Binary inputs are displayed as the converted decimal value.

Figure 3. Timing of Reference Input

7. Reinstall and secure Drive cover.

8. Place this instruction sheet with the Drive technical manual.

THIS COMPLETES INSTALLATION OF THIS OPTION.