

INSTRUCTION MANUAL

INTERFACE

MODEL IF O1-DPS

KIKUSUI ELECTRONICS CORPORATION

823650

# Power Requirements of this Product

Power requirements of this product have been changed and the relevant sections of the Operation Manual should be revised accordingly.

(Revision should be applied to items indicated by a check mark )

Input voltage

The input voltage of this product is \_\_\_\_\_ VAC,  
and the voltage range is \_\_\_\_\_ to \_\_\_\_\_ VAC. Use the product within this range only.

Input fuse

The rating of this product's input fuse is \_\_\_\_\_ A, \_\_\_\_\_ VAC, and \_\_\_\_\_.

### WARNING

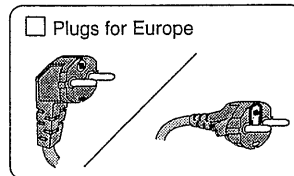
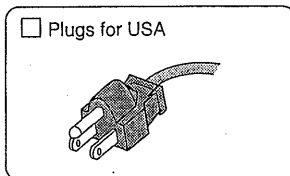
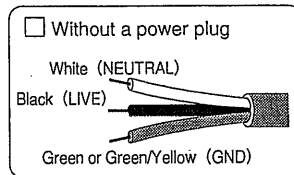
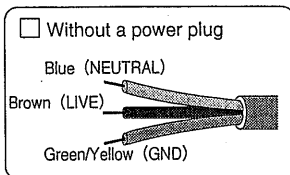
- To avoid electrical shock, always disconnect the AC power cable or turn off the switch on the switchboard before attempting to check or replace the fuse.
- Use a fuse element having a shape, rating, and characteristics suitable for this product. The use of a fuse with a different rating or one that short circuits the fuse holder may result in fire, electric shock, or irreparable damage.

AC power cable

The product is provided with AC power cables described below. If the cable has no power plug, attach a power plug or crimp-style terminals to the cable in accordance with the wire colors specified in the drawing.

### WARNING

- The attachment of a power plug or crimp-style terminals must be carried out by qualified personnel.



Provided by Kikusui agents  
Kikusui agents can provide you with suitable AC power cable.  
For further information, contact your Kikusui agent.

Another Cable \_\_\_\_\_

## 1. GENERAL

This interface is an "ASCII TO PARALLEL" converter which is used to control Kikusui Digital Programmable Power Supplies with GP-IB (HP-IB) Standard Interface Bus.

The control output is of a negative logic and consists of an address (binary 4 bits), range (binary 2 bits) standby (1 bit), sign (1 bit) and data (BCD 16 bits).

Programming requirements are reduced by the decimal-point detector circuit.

With this interface up to 15 units of DPS can be easily controlled.

## 2. SPECIFICATIONS

Instrument model No.: MODEL IF 01-DPS  
Instrument name: Interface  
Input control system: GP-IB (HP-IB) and  
8-bit parallel, character serial  
(HP 11202A I/O equivalent)  
Input logic level: TTL level  
Fan-in: 33 k $\Omega$  to 5 V, 6.8 k $\Omega$  to GND, and TTL 1

### Output

Data: Negative logic, POL 1 bit, data 16 bits BCD  
Strobe: Negative logic, 1 bit, approx. 20  $\mu$ sec  
Range: Negative logic, 4 bits, BIN  
Standby: 1 bit  
Address: Negative logic, 4 bits, BIN

Level: TTL

Fan-out: 20

Ready input: Positive logic, TTL level

Fan-in: 10 k $\Omega$  to 5 V, TTL1

Operating temperature range: 0 to 40 $^{\circ}$ C

Weight: Approx. 4.6 kg (10 lbs)

Power requirements: 100 V  $\pm$ 10%, 50/60 Hz AC, approx. 14 VA

Dimensions: 210 W  $\times$  90 H  $\times$  370 D mm  
(8.27 W  $\times$  3.54 H  $\times$  4.57 D in.)

(Maximum dimensions) 220 W  $\times$  100 H  $\times$  385 D mm  
(8.66 W  $\times$  3.94 H  $\times$  15.16 D in.)

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### 3. OPERATION METHOD

#### 3.1 Description of Front Panel (Figure 3-1)

- ① POWER: The main power switch of the instrument. When this switch is on, the power pilot light (LED) turns on to indicate that the instrument is operating.
- ② LISTENING: This light indicates that the instrument is in the LISTENER mode. This light turns on when in the address specification mode of GP-IB control operation.
- ③ ERROR: This light warns that invalid data has been entered (in which case the output strobe is inhibited). Since handshaking with the control circuit is interrupted, reset the bus line and enter valid data so that the light goes off.

#### 3.2 Description of Rear Panel (Figure 3-2)

- ④ AC cord: AC power cord of the instrument
- ⑤ Fuse: Fuse of the AC power line
- ⑥ INPUT connectors
  - 1. GP-IB: 24-pin connector for control with GP-IB
  - 2. Connector for control via HP 11202A I/O Interface card
- ⑦ OUTPUT connector: 50-pin connector to be connected to DPS units via cables

⑧ ADDRESS (DIP switches):

Display OPEN: 0

|   | 1       | 2  | 3  | 4  | 5  | 6            | 7     | 8   |
|---|---------|----|----|----|----|--------------|-------|-----|
| 1 | ADDRESS |    |    |    |    | LISTEN ONLY  | I/O   | NOP |
| 1 | A1      | A2 | A3 | A4 | A5 | ADDRESS-ABLE | GP-IB |     |

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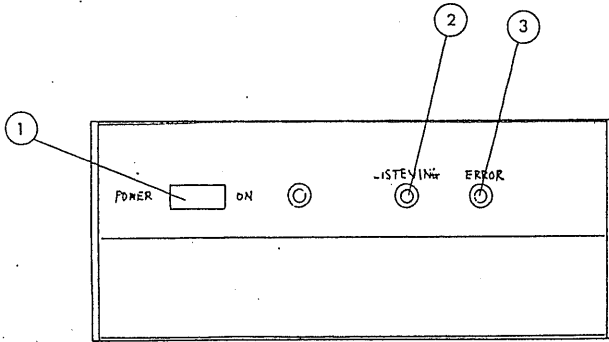


Figure 3-1. Front panel

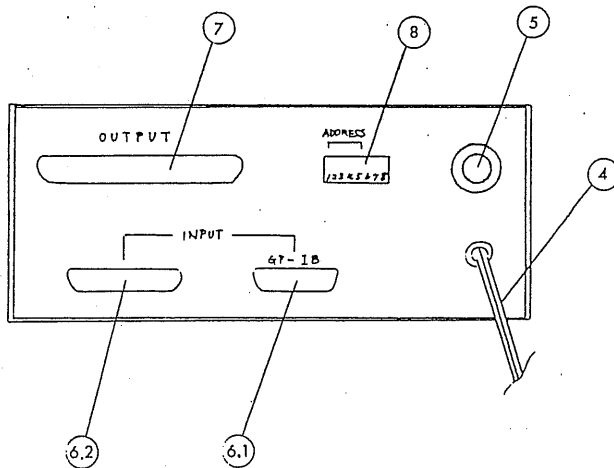


Figure 3-2. Rear panel

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### 3.3 Layout of Control Connector Pins

|         |    |    |        |
|---------|----|----|--------|
| SIG.GND | 24 | 12 | GND    |
| GND     | 23 | 11 | ATEN   |
| GND     | 22 | 10 |        |
| GND     | 21 | 9  | IFC    |
| GND     | 20 | 8  | NDAC   |
| GND     | 19 | 7  | NRFD   |
| GND     | 18 | 6  | DAV    |
|         | 17 | 5  |        |
| DI/O 8  | 16 | 4  | DI/O 4 |
| DI/O 7  | 15 | 3  | DI/O 3 |
| DI/O 6  | 14 | 2  | DI/O 2 |
| DI/O 5  | 13 | 1  | DI/O 1 |

GP-IB Input Connector

|                                     |    |    |     |
|-------------------------------------|----|----|-----|
| GND                                 | 36 | 18 | GND |
| GND                                 | 35 | 17 | GND |
| 0 $\phi$                            | 34 | 16 |     |
| 0 <sub>1</sub>                      | 33 | 15 |     |
| 0 <sub>2</sub>                      | 32 | 14 |     |
| 0 <sub>3</sub>                      | 31 | 13 |     |
| 0 <sub>4</sub>                      | 30 | 12 |     |
| 0 <sub>5</sub>                      | 29 | 11 |     |
| 0 <sub>6</sub>                      | 28 | 10 |     |
| 0 <sub>7</sub>                      | 27 | 9  |     |
| $\overline{\text{STP}}$             | 26 | 8  |     |
| $\overline{\text{CTL}}$             | 25 | 7  |     |
| I/O                                 | 24 | 6  |     |
|                                     | 23 | 5  |     |
|                                     | 22 | 4  |     |
| $\overline{\text{FLG}}$             | 21 | 3  |     |
| $\overline{\text{ECH}}(\text{GND})$ | 20 | 2  |     |
|                                     | 19 | 1  |     |

I/O Interface Input Connector

|  |    |    |                 |
|--|----|----|-----------------|
| GND  | 50 | 25 | GND             |
| SET  | 49 | 24 |                 |
| READY  | 48 | 23 |                 |
| ERROR  | 47 | 22 |                 |
| POLARITY   | 46 | 21 |                 |
| ADDRESS $\left\{ \begin{matrix} 2^3 \\ 2^2 \end{matrix} \right.$   | 45 | 20 | $2^1$ } ADDRESS |
|  | 44 | 19 | $2^0$ }         |
|  | 43 | 18 | $2^1$ } RANGE   |
|  | 42 | 17 | $2^0$ }         |
| MSD $\left\{ \begin{matrix} 8 \\ 4 \\ 2 \\ 1 \end{matrix} \right.$ | 41 | 16 |                 |
|  | 40 | 15 |                 |
|  | 39 | 14 |                 |
|  | 38 | 13 |                 |
| 8<br>4<br>2<br>1   | 37 | 12 |                 |
|  | 36 | 11 |                 |
|  | 35 | 10 |                 |
|  | 34 | 9  |                 |
| 8<br>4<br>2<br>1   | 33 | 8  | STANDBY         |
|  | 32 | 7  |                 |
|  | 31 | 6  |                 |
|  | 30 | 5  |                 |
| LSD $\left\{ \begin{matrix} 8 \\ 4 \\ 2 \\ 1 \end{matrix} \right.$ | 29 | 4  |                 |
|  | 28 | 3  |                 |
|  | 27 | 2  |                 |
|  | 26 | 1  | STROBE          |

Output Connector

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### 3.4 Write Procedure

Four types of specifications can be given for Digital Programmable Power Supplies with the following formats:

- (a) To specify address: "A"  CR·LF

Write character A, address specification, and CR·LF.

- (b) To specify range: "R"  CR·LF

Write character R, range specification, and CR·LF. When the range specification number is followed by a character (non-numeric) other than R, characters CR·LF may be omitted.

Examples: "R" 1 "A" 1 CR·LF

"R" 1 "D" 1 CR·LF

"R" 1 "S" 1 "D" 1 CR·LF

- (c) To specify data: "D"  CR·LF

Write character D, data specification, and CR·LF.

- (d) To specify standby status: "S"  CR·LF

Write character "S", standby status, and CR·LF. (0 to effect the standby status; 1 to release from standby status)

When the status symbol number is followed by a character (non-numeric) other than "S", CR·LF may be omitted.

Examples: "S" 1 "D" 1 CR·LF

"S" 1 "R" 1 "D" 1 CR·LF

- o Specifications may be either with numeric or non-numeric characters.
- o If 0 is specified for the address, all DPS units are controlled.
- o The range specification is executed when the next data is written.
- o Be sure to use the fixed-point representation system.

Symbols and ranges

|                        | V type                    | C type                     |
|------------------------|---------------------------|----------------------------|
| 0: MSD within range is | 0.1 - less than<br>1 V    |                            |
| 1: MSD within range is | 1 - less than 10 V        | 1 - less than 10 mA        |
| 2: MSD within range is | 10 - less than<br>100 V   | 10 - less than<br>100 mA   |
| 3: MSD within range is | 100 - less than<br>1000 V | 100 - less than<br>1000 mA |

Note that some models may not follow the above relationships.

Data

Data can be specified with four digits. However, it is limited with respect to the range to be used.

|  |        |
|--|--------|
| R0: Below decimal point                  | ×.0000 |
| 1: One digit before the decimal point    | ×0.000 |
| 2: Two digits before the decimal point   | ×00.00 |
| 3: Three digits before the decimal point | ×000.0 |

Error is caused when this  
column has become effective.

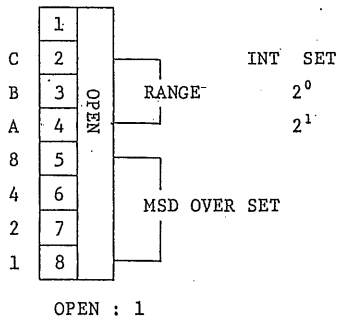
It is not always necessary to specify five columns including a decimal point.

Examples: 10.00 + 10  
00.01 + 0.01 or .01

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### 3.5 Fixed-range Operation and MSD Overinput Protection

- o An internal DIP switch is provided for range setting selection between INT and FXT. The instrument is delivered to the customer with this switch set in the EXT mode. To operate the instrument in the INT mode, set the switch for the INT mode and select a range with a binary code.
- o The MSD OVER SET provision is incorporated to guard against overoutput which could be caused by an erroneous setting. This provision monitors the most-significant column and, when this column has become the same or higher than the set value, the state is judged to be erroneous and no strobe signal is generated.



### 3.6 Indication of Error Lamp

The error lamp turns on when any one of the following abnormal conditions has occurred.

- (1) The MSD OVER SET circuit has tripped.
- (2) The column or columns higher than the decimal point have exceeded the specified value.
- (3) The error flag (for data disparity or over-data) has been posted on the DPS side.

(4) Thermal down has occurred on the DPS side.

The errors of (1) and (2) occur in the interface. When an error of this type has occurred, no strobe signal is generated.

The error of (3) occurs on the DPS side.

The error states of (1) through (3) can be corrected by entering correct data. The state of (4) is corrected when the DPS has cooled off.

### 3.7 Example of Control Procedure with DPS

(1) Connect the interface to the DPS at the rear, using the cable with 50-pin connectors.

(2) Connect the interface to the controller, using the GP-IB cable with 24-pin connectors.

(3) Select a device code (address) and a mode at the rear of the interface.

- o Device code: Consists of five bits and is specified from the controller side.

- o Set the instrument in the ADDRESSABLE mode so that it can operate on the bus line.

- o Set the instrument in the GP-IB mode.

(4) Set an address code at the rear of the DPS.

(5) Connect the power cord to an AC line outlet.

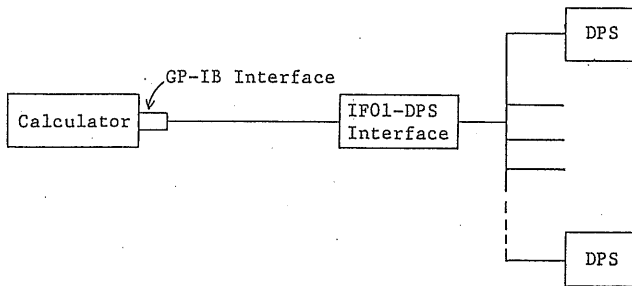
(6) Connect the DPS output to the load.

- (7) Turn on the POWER switch.

When the power is turned on, all registers are cleared. DPS series instruments which have the SET function are in the standby state, which is released when data is initially written into the DPS.

- (8) The instrument is now operated by the controller.

### 3.8 Operation in Conjunction with Calculator



Examples of programming (assuming device code to be 1)

- (1) To specify a particular value to particular DPS  
1.23 V Address 1

#### (a) HP 9825A

```
0: wrt 701, "A1"  
1: wrt 701, "R1D+1.23"  
2: wrt 701, "S1"  
3: end
```

#### (b) HP 9830A

```
10: CMD "?U1"  
20: WRITE (13,*) "A1"  
30: WRITE (13,*) "R1D+1.23"  
40: WRITE (13,*) "S1"  
50: END
```

(c) TEK 4051

```
10: PRINT @1: "A1"  
20: PRINT @1: "R1D+1.23"  
30: PRINT @1: "S1"  
40: END
```

(d) COMMODORE PET

```
10: OPEN 1, 5  
20: PRINT #1, "A1"  
30: PRINT #1, "R1D+1.23"  
40: PRINT #1, "S1"  
50: END
```

(2) When address data is entered each time

Assuming that the range is fixed at 2 and the standby state has been released.

(a) HP 9825A

```
0: ent "address input", A  
1: ent "data input", D  
2: wrt 701, "A" a  
3: wrt 701, "R2"  
4: wrt 701, "D" D  
5: gto 0
```

(b) HP 9830A

```
10: DISP "ADDRESS INPUT"  
20: INPUT A  
30: DISP "DATA INPUT"  
40: INPUT D  
50: CMD "?U1"  
60: WRITE (13, *) "A" A  
70: WRITE (13, *) "R2"  
80: WRITE (13, *) "D" D  
90: GOTO 10
```

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(c) COMMODORE PET

```
10: OPEN 1, 5
20: PRINT "ADDRESS INPUT"
30: INPUT A
40: PRINT "DATA INPUT"
50: INPUT D
60: PRINT #1, "A" A
70: PRINT #1, "R2"
80: PRINT #1, "D" D
90: GOTO 20
```

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Remarks: Setting data for range of DPS

|        |             |       |    |
|--------|-------------|-------|----|
| DPS V  | 4-0.02      |       | R1 |
| DPS V  | 10-0.05     |       | R1 |
| DPS V  | 20-1        | 2V    | R1 |
|        |             | 20V   | R2 |
| DPS V  | 40-1        |       | R2 |
| DPS V  | 50-0.5/50-3 | 5V    | R1 |
|        |             | 50V   | R2 |
|        |             |       |    |
| DPS VE | 10-2        |       | R2 |
| DPS VE | 20-1        |       | R2 |
| DPS VE | 40-0.5/40-5 |       | R2 |
| DPS VE | 80-2.5      |       | R2 |
| DPS VE | 100-0.2     |       | R3 |
|        |             |       |    |
| DPS C  | 20-1        | 100mA | R2 |
|        |             | 1 A   | R3 |
| DPS C  | 50-0.5      | 50mA  | R2 |
|        |             | 500mA | R3 |

CF01-DPS

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