

DENSO ROBOT OWNER'S MANUAL (Additional information)

Modification of DeviceNet slave board for RC5 controller

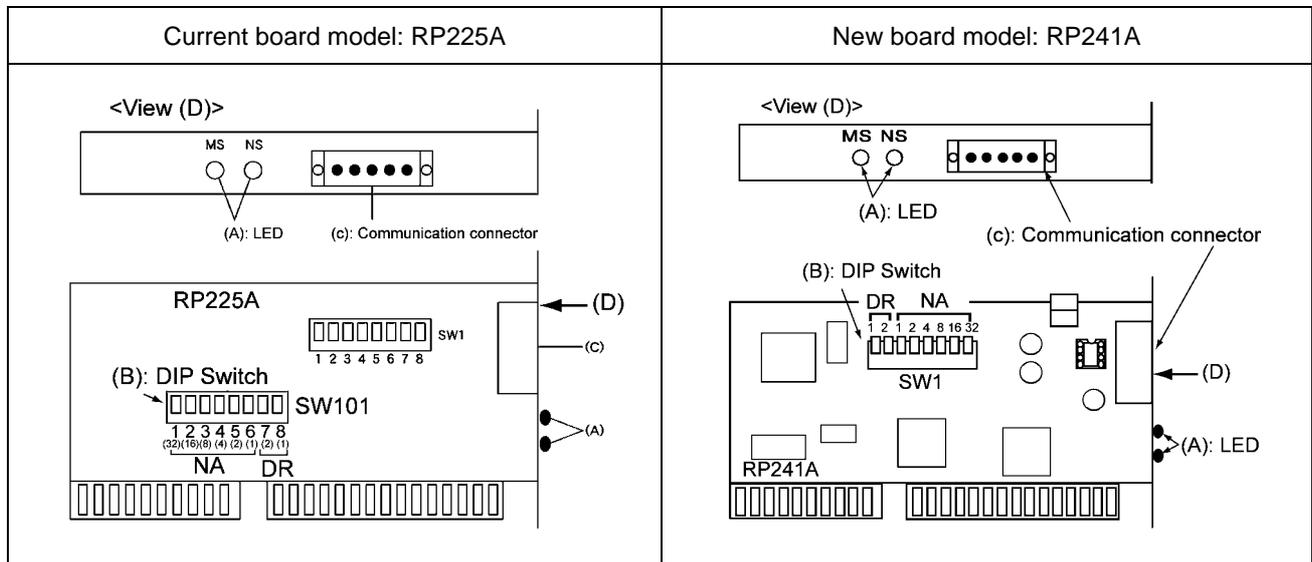
The DeviceNet slave board was modified to the same model board as the DeviceNet master board. The new board is compatible with current one except some settings. Refer to the following descriptions together with the " RC5 controller OPTIONS MANUAL, Chapter 8 DeviceNet Slave Board".

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1. Current and new board

The figure below shows the current and new DeviceNet board.



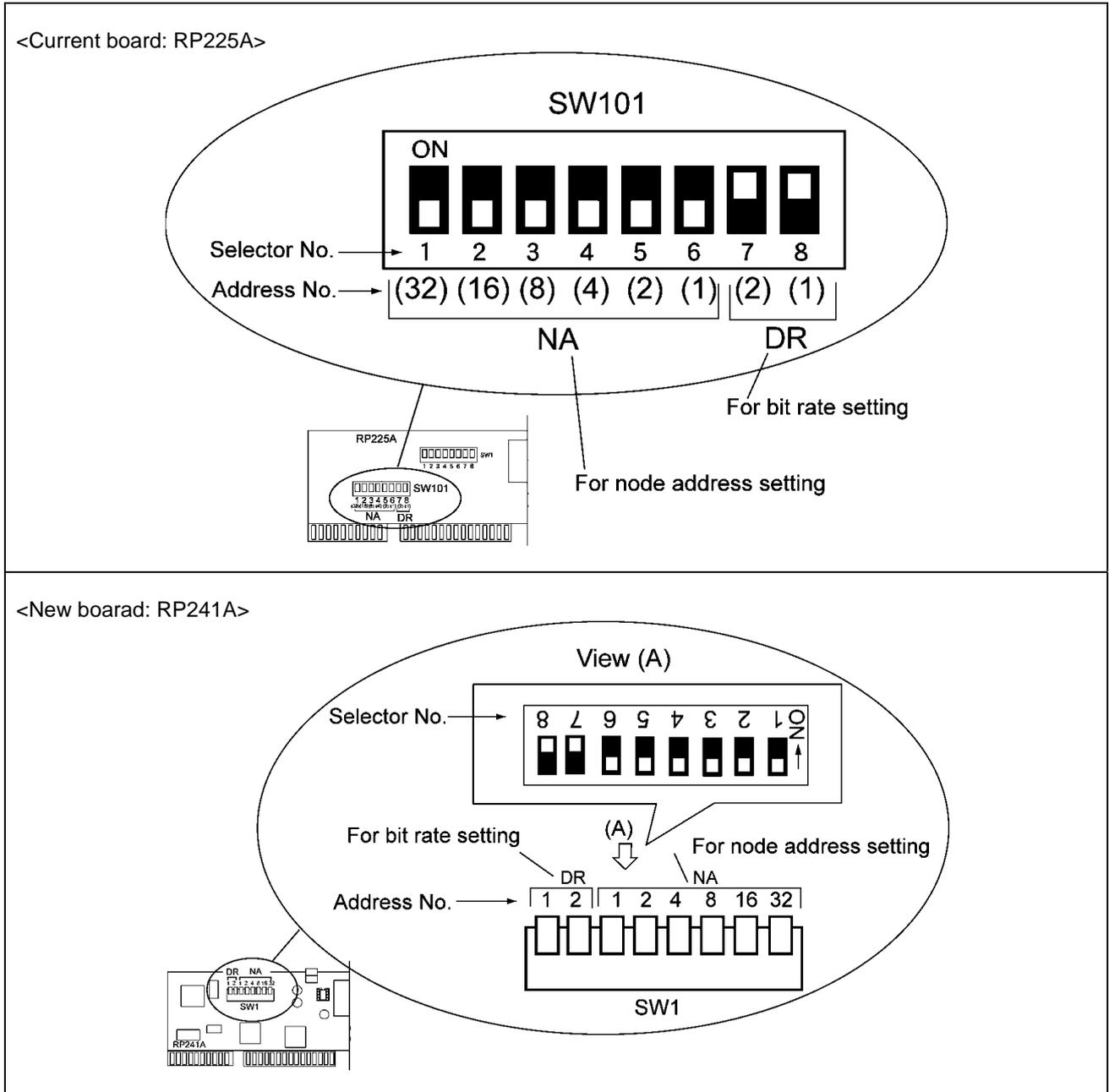
Current board (RP225A) and new board (RP241A)

DeviceNet Slave board for RC5 controller

2. DIP switch setting (RP225A: SW101 / RP241A: SW1)

Use the DIP switch for setting the node address and bit rate as shown in the figure below.

NOTE: Always turn off the controller power (including the network power) before setting the DIP switch.



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Setting the node address

Set the node address of the robot controller using selectors 1 through 6 of the DIP switch, referring to the table below. You may freely set any of 0 through 63 to a node address unless the address is double-assigned on the same network including the master and slaves. Double assignment will cause an address double-assignment error, disabling the network.

Node Address Setting by the DIP Switch

| DIP switch Selector No. (Values in Parentheses show Address No.) | | | | | | Node address | DIP switch Selector No. (Values in Parentheses show Address No.) | | | | | | Node address |
|---|-----------|----------|----------|----------|----------|-----------------|---|-----------|----------|----------|----------|----------|-----------------|
| 1 (32) | 2 (16) | 3 (8) | 4 (4) | 5 (2) | 6 (1) | | 1 (32) | 2 (16) | 3 (8) | 4 (4) | 5 (2) | 6 (1) | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 33 |
| 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 34 |
| 0 | 0 | 0 | 0 | 1 | 1 | 3 | 1 | 0 | 0 | 0 | 1 | 1 | 35 |
| 0 | 0 | 0 | 1 | 0 | 0 | 4 | 1 | 0 | 0 | 1 | 0 | 0 | 36 |
| 0 | 0 | 0 | 1 | 0 | 1 | 5 | 1 | 0 | 0 | 1 | 0 | 1 | 37 |
| 0 | 0 | 0 | 1 | 1 | 0 | 6 | 1 | 0 | 0 | 1 | 1 | 0 | 38 |
| 0 | 0 | 0 | 1 | 1 | 1 | 7 | 1 | 0 | 0 | 1 | 1 | 1 | 39 |
| 0 | 0 | 1 | 0 | 0 | 0 | 8 | 1 | 0 | 1 | 0 | 0 | 0 | 40 |
| 0 | 0 | 1 | 0 | 0 | 1 | 9 | 1 | 0 | 1 | 0 | 0 | 1 | 41 |
| 0 | 0 | 1 | 0 | 1 | 0 | 10 | 1 | 0 | 1 | 0 | 1 | 0 | 42 |
| 0 | 0 | 1 | 0 | 1 | 1 | 11 | 1 | 0 | 1 | 0 | 1 | 1 | 43 |
| 0 | 0 | 1 | 1 | 0 | 0 | 12 | 1 | 0 | 1 | 1 | 0 | 0 | 44 |
| 0 | 0 | 1 | 1 | 0 | 1 | 13 | 1 | 0 | 1 | 1 | 0 | 1 | 45 |
| 0 | 0 | 1 | 1 | 1 | 0 | 14 | 1 | 0 | 1 | 1 | 1 | 0 | 46 |
| 0 | 0 | 1 | 1 | 1 | 1 | 15 | 1 | 0 | 1 | 1 | 1 | 1 | 47 |
| 0 | 1 | 0 | 0 | 0 | 0 | 16 | 1 | 1 | 0 | 0 | 0 | 0 | 48 |
| 0 | 1 | 0 | 0 | 0 | 1 | 17 | 1 | 1 | 0 | 0 | 0 | 1 | 49 |
| 0 | 1 | 0 | 0 | 1 | 0 | 18 | 1 | 1 | 0 | 0 | 1 | 0 | 50 |
| 0 | 1 | 0 | 0 | 1 | 1 | 19 | 1 | 1 | 0 | 0 | 1 | 1 | 51 |
| 0 | 1 | 0 | 1 | 0 | 0 | 20 | 1 | 1 | 0 | 1 | 0 | 0 | 52 |
| 0 | 1 | 0 | 1 | 0 | 1 | 21 | 1 | 1 | 0 | 1 | 0 | 1 | 53 |
| 0 | 1 | 0 | 1 | 1 | 0 | 22 | 1 | 1 | 0 | 1 | 1 | 0 | 54 |
| 0 | 1 | 0 | 1 | 1 | 1 | 23 | 1 | 1 | 0 | 1 | 1 | 1 | 55 |
| 0 | 1 | 1 | 0 | 0 | 0 | 24 | 1 | 1 | 1 | 0 | 0 | 0 | 56 |
| 0 | 1 | 1 | 0 | 0 | 1 | 25 | 1 | 1 | 1 | 0 | 0 | 1 | 57 |
| 0 | 1 | 1 | 0 | 1 | 0 | 26 | 1 | 1 | 1 | 0 | 1 | 0 | 58 |
| 0 | 1 | 1 | 0 | 1 | 1 | 27 | 1 | 1 | 1 | 0 | 1 | 1 | 59 |
| 0 | 1 | 1 | 1 | 0 | 0 | 28 | 1 | 1 | 1 | 1 | 0 | 0 | 60 |
| 0 | 1 | 1 | 1 | 0 | 1 | 29 | 1 | 1 | 1 | 1 | 0 | 1 | 61 |
| 0 | 1 | 1 | 1 | 1 | 0 | 30 | 1 | 1 | 1 | 1 | 1 | 0 | 62 |
| 0 | 1 | 1 | 1 | 1 | 1 | 31 | 1 | 1 | 1 | 1 | 1 | 1 | 63 |

Note: Selector OFF and ON are expressed by 0 and 1, respectively.
Before shipment from the factory, the node address is set to 1 by default.

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Setting the bit rate

To match the bit rate of the robot controller with that of the network, use selectors 7 and 8 of the DIP switch, referring to the table below:

Bit Rate Setting By DIP Switch

| Selectors on the DIP switch | | Bit rate |
|-----------------------------|---------------------------|----------|
| Selector 7 (Address 2) | Selector 8 (Address 1) | |
| 0 | 0 | 125 kbps |
| 0 | 1 | 250 kbps |
| 1 | 0 | 500 kbps |
| 1 | 1 | 500 kbps |

Note 1: Selector OFF and ON are expressed by 0 and 1, respectively. (Before shipment from the factory, both of these selectors are set to 0 (=500 kbps) by default.)

Note 2: On the same network, set the same bit rate to all nodes (master and slaves). Otherwise, slaves whose bit rate is different from that of the master cannot communicate only, but also they may cause a communications error between correctly set nodes.

3. Added specification to DeviceNet communication specifications

Adds the internal power consumption for the RP241A to the specifications.

| Item | | Specifications |
|----------------------------|--------|---------------------------------------|
| Internal power consumption | RP225A | Communication power source: 30mA max. |
| | RP241A | Communication power source: 70mA max. |

4. Added Error Code

Adds the descriptions to the "error 1201" and "error 1213".

| Error code | What has happened: | What to do: | LEDs | |
|------------|---|--|--|--|
| | | | MS | NS |
| 1201 | Preparing for communications (link not established) <ul style="list-style-type: none"> The DeviceNet module is working normally, but has not established link with the master device. The DeviceNet module is working normally and has established explicit link with the master device, but not established an I/O link. | Establish the link from the master device. |  G |  G or  G |
| 1213 | The network is broken or "bus off." <ul style="list-style-type: none"> The DeviceNet cable is broken or not connected. The network power is not supplied. | (1) Check whether the DeviceNet cable is connected with the robot controller. (2) If this error occurs after you change the DIP switch setting, check whether the bit rate setting made with the DIP switch matches the network's bit rate. |  G |  G or  |

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5. RC5 EDS File (\$ DeviceNet Manager Generated Electronic Data Sheet)

The EDS file below is applied to the RP225A and RP241A board.

[File]

```
DescText= "RC5 EDS File";
CreateDate= 11-14-1997;
CreateTime= 15:00:00;
ModDate= 05-26-2005;
ModTime= 01:28:10;
Revision= 1.3;
```

[Device]

```
VendCode      = 171;          $ Vendor Code
ProdType      = 12;          $ Product Type
ProdCode      = 1;           $ Product Code
MajRev       = 1;           $ Major Rev
MinRev       = 3;           $ Minor Rev
VendName     = "Denso Corporation";
ProdTypeStr  = "Communication Adapter";
ProdName     = "RC5";
```

[IO_Info]

```
Default      = 0X0001;      $ Poll Only
PollInfo     = 0X0001,      $ Poll Only
              1,            $ Default Input = Input1
              1;            $ Default Output = Output1
```

\$Input Connections

```
Input1      =
              7,            $ From 7 to 32 Bytes, Variability
              0,            $ All bits are significant
              0x0001,       $ Poll Only Connection
              "Data",       $ Name
              6,            $ Path Length
              "20 07 24 02 30 04", $ Register Object Instance 2 Attribute 4
              "Robot Output Data"; $ Help
```

\$Output Connections

```
Output1     =
              8,            $ From 8 to 32 Bytes, Variability
              0,            $ All bits are significant
              0x0001,       $ Poll Only Connection
              "Data",       $ Name
              6,            $ Path Length
              "20 07 24 01 30 04", $ Register Object Instance 1 Attribute 4
              "Robot Input Data"; $ Help
```