

# OPERATION MANUAL

---

## DRS-HS SERIES

Digital Routing Switcher

---

DRS-21HS

DRS-22HS

DRS-41HS

DRS-42HS

---

1<sup>st</sup> Edition - Rev.1






# Precautions




---

## Important Safety Warnings




### [Power]

 Caution	Operate unit <b>only</b> on the specified supply voltage.
	Disconnect power cord by connector only. <b>Do not</b> pull on cable portion.
 Stop	<b>Do not</b> place or drop heavy or sharp-edged objects on power cord. A damaged cord can cause fire or electrical shock hazards. Regularly check power cord for excessive wear or damage to avoid possible fire / electrical hazards.


### [Grounding]

 Caution	<b>Ensure</b> unit is properly grounded at all times to prevent electrical shock hazard.
 Hazard	<b>Do not</b> ground the unit to gas lines, units, or fixtures of an explosive or dangerous nature.
 Caution	<b>Ensure</b> power cord is firmly plugged into AC outlet.




### [Operation]

 Hazard	<b>Do not</b> operate unit in hazardous or potentially explosive atmospheres. Doing so could result in fire, explosion, or other dangerous results.
 Hazard	<b>Do not</b> allow liquids, metal pieces, or other foreign materials to enter the unit. Doing so could result in fire, other hazards, or unit malfunction.
	If foreign material does enter the unit, turn power off and disconnect power cord <b>immediately</b> . Remove material and contact authorized service representative if damage has occurred.


### [Transportation]

 Caution	<b>Handle</b> with care to avoid shocks in transit. Shocks may cause malfunction. When you need to transport the unit, use the original packing materials or alternate adequate packing.
--	--


## [Circuitry Access]

 A black circle with a white lightning bolt and a plug symbol, with a diagonal slash through it.	<p><b>Do not</b> remove covers, panels, casing, or access circuitry with power applied to the unit! Turn power off and disconnect power cord prior to removal. Internal servicing / adjustment of unit should only be performed by qualified personnel.</p>
 A black circle with a white hand symbol, with a diagonal slash through it. Stop	<p><b>Do not</b> touch any parts / circuitry with a high heat factor. Capacitors can retain enough electric charge to cause mild to serious shock, even after power is disconnected. Capacitors associated with the power supply are especially hazardous. Avoid contact with any capacitors.</p>
 A black triangle with a white flame symbol inside. Hazard	<p>Unit <b>should not</b> be operated or stored with cover, panels, and / or casing removed. Operating unit with circuitry exposed could result in electric shock / fire hazards or unit malfunction.</p>


## [Potential Hazards]

 A black triangle with a white lightning bolt symbol inside. Caution	<p>If abnormal smells or noises are noticed coming from the unit, turn power off immediately and disconnect power cord to avoid potentially hazardous conditions. If problems similar to above occur, contact authorized service representative <b>before</b> attempting to again operate unit.</p>
---	---

## [Consumables]

 A black triangle with a white exclamation mark symbol inside. Caution	<p>The consumables used in unit must be replaced periodically. For further details on which parts are consumables and when they should be replaced, refer to the specifications at the end of the Operation Manual. Since the service life of the consumables varies greatly depending on the environment in which they are used, they should be replaced at an early date. For details on replacing the consumables, contact your dealer.</p>
---	--

## [Rubber Feet]

 A black circle with a white exclamation mark symbol inside. Caution	<p>If this product has come with rubber feet attached by screws, do not insert the screws again without rubber feet after removing the rubber feet and screws. It may cause damage to the internal circuits or components of the unit. To install the rubber feet again to the unit, do not use other than the supplied rubber feet and screws.</p>
---	---

# Upon Receipt

---

## Unpacking

---

The DRS-21/22/41/42 HS units and their accessories are fully inspected and adjusted prior to shipment. Operation can be performed immediately upon completing all required connections and operational settings.

Check your received items against the packing lists below.

ITEM	QTY	REMARKS
DRS-21 HS DRS-22 HS DRS-41 HS DRS-42 HS	1	
AC Cord	1	
Operation Manual	1	

### Option

ITEM	QTY	REMARKS
Rack mount bracket set (type 1)	1 set	For mounting single unit to an EIA 1RU rack space.
Rack mount bracket set (type 2)	1 set	For mounting two units to an EIA 1RU rack space.

## Check

---

Check to ensure no damage has occurred during shipment. If damage has occurred, or items are missing, inform your supplier immediately.

## Rack Mounting

---

The DRS-21/22/41/42HS can be either single unit or dual unit mounted to EIA standard rack units. Rack mounting requires purchase of one of the two available rack mount kits.

When single unit mounting the single mount kit with one extended rack ear must be used. When two units mounting the dual mount kit with standard size rack ears must be used. Consult your FOR-A supplier to order either of these options.

# Table of Contents

---

1. Prior to Starting.....	1
1-1. Welcome .....	1
1-2. Features .....	1
1-3. About This Manual.....	1
2. Panel Descriptions .....	2
2-1. Front Panel.....	2
2-2. Rear Panel .....	4
3. Connection .....	5
3-1. Basic Connection .....	5
4. Operation .....	6
4-1. Front Panel Switches and Buttons .....	6
4-2. Operation Procedures .....	7
4-2-1. OPERATE / LOCK.....	7
4-2-2. OUTPUT SELECT.....	7
4-2-3. INPUT SELECT.....	7
5. Internal Settings .....	8
5-1. GPI Setting.....	8
5-2. Serial Communication Settings .....	9
5-3. Other Settings .....	10
6. Remote Control .....	13
6-1. REMOTE Connector .....	13
6-2. GPI Internal Circuit Connection Example.....	15
6-3. Serial Communication Specification .....	16
6-3-1. RS-232C Interface.....	16
6-3-2. RS-422 Interface .....	17
6-3-3. Communication Parameters.....	17
6-4. Serial Control Commands .....	18
6-4-1. Crosspoint Switchover.....	18
6-4-2. Preset Crosspoint Switchover .....	19
6-4-3. Status Request Command .....	20
6-4-4. Reply Messages.....	21
6-4-5. Control Commands and ASCII Codes.....	23
7. If Problems Occur.....	25
8. Specifications and Dimensions.....	26
8-1. Unit Specifications .....	26

8-2. External Dimensions .....	27
8-2-1. DRS-21HS .....	27
8-2-2. DRS-22HS .....	27
8-2-3. DRS-41HS .....	28
8-2-4. DRS-42HS .....	28





# 1. Prior to Starting

---

## 1-1. Welcome

---

Congratulations! By purchasing DRS-21/22/41/42HS Digital Routing Switcher you have entered the world of FOR-A and its many innovative products. Thank you for your patronage and we hope you will turn to FOR-A products again and again to satisfy your video and audio needs. FOR-A provides a wide range of products, from basic support units to complex system controllers, which have been increasingly joined by products for computer video based systems. Whatever your needs, talk to your FOR-A representative. We will do our best to be of continuing service to you.

## 1-2. Features

---

The DRS-21HS (2x1), DRS-22HS (2x2), DRS-41HS (4x1), and DRS-42HS (4x2) are the low-cost, high-performance serial digital video routing switchers.

- HD video at bit-rates of 1.485Gbps or 1.485/1.001Gbps supported
- SD video at bit-rates from 143 Mbps to 270 Mbps supported
- DVB-ASI signal format supported
- Cable equalization function provided
- Re-clock function featured
- Allows crosspoint switchover from the front panel
- GPI control and tally output; RS-232C/422 communication control possible
- Blanking switch while receiving the reference signal is possible  
(The digital input signals must be synchronized with the input reference signal. The blanking switch is not available for DVB-ASI.)
- Compact design allows installation in limited space

## 1-3. About This Manual

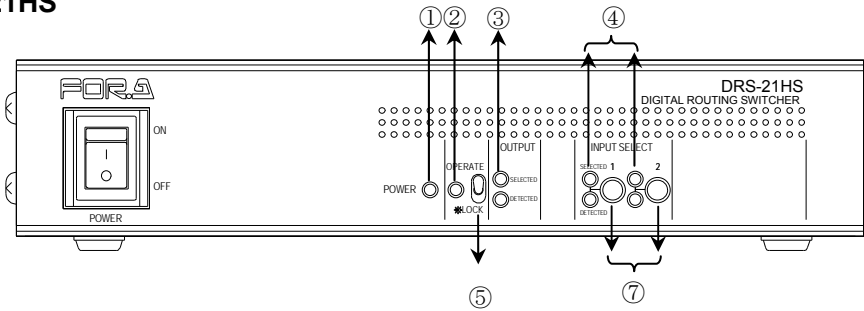
---

This manual is intended to help the user easily operate this product and make full use of its functions during operations. Before connecting or operating your unit, read this operation manual thoroughly to ensure you understand the product. After reading, it is important to keep this manual in a safe place and available for reference.

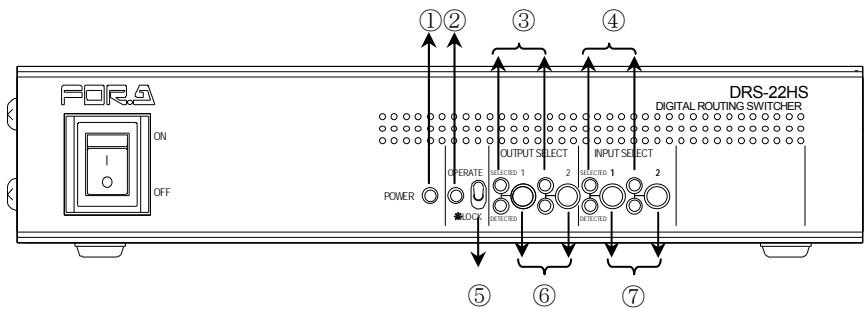
## 2. Panel Descriptions

### 2-1. Front Panel

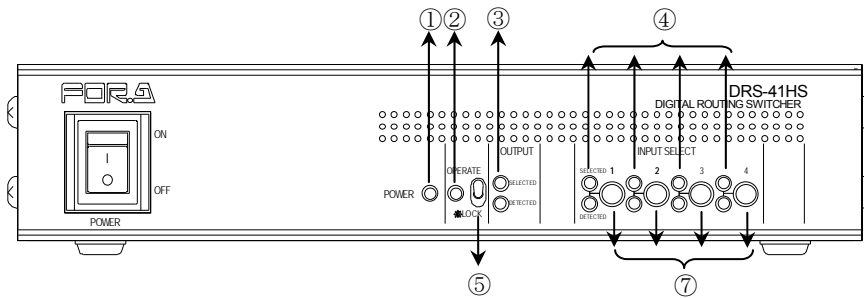
#### ◆ DRS-21HS



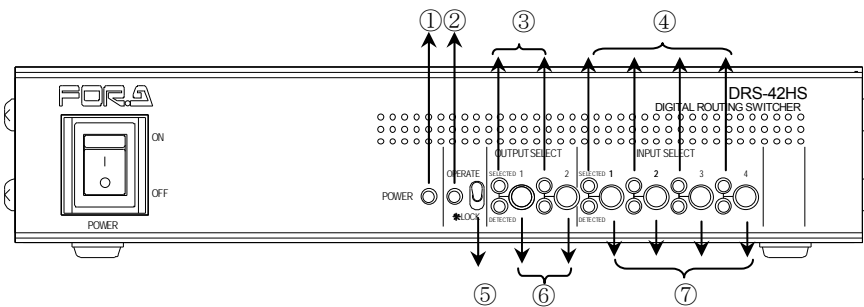
#### ◆ DRS-22HS



#### ◆ DRS-41HS



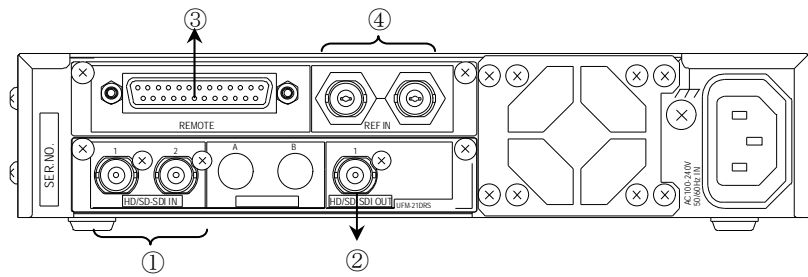
#### ◆ DRS-42HS



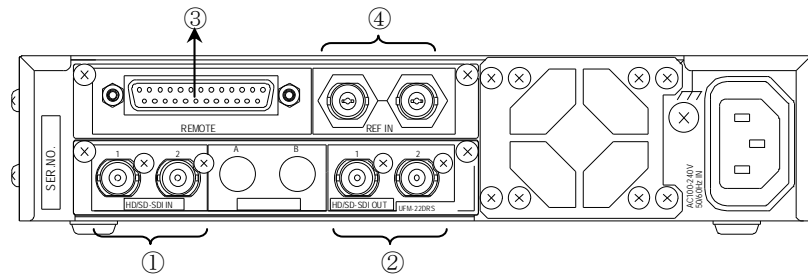
- ① POWER indicator  
The power indicator lights up green whenever the power is applied to the unit.
- ② LOCK/OPERATE indicator  
The indicator light up green when the lock function is turned on.
- ③ OUTPUT SELECT indicators 1-2  
SELECTED: The indicator lights up green when the output channel is selected.  
DETECTED: The indicator lights up green when the signal is detected.
- ④ INPUT SELECT indicators 1-4  
SELECTED: The indicator lights up green when the input channel is selected.  
DETECTED: The indicator lights up green when the signal is detected.
- ⑤ LOCK/OPERATE switch  
Locks the input selection. The lock setting is turned on when the switch is set to the bottom position and turned off when set to the up position. Locking the local front panel control or the GPI remote control can be selected using the internal dipswitch. See section 4-2-1. "OPERATE / LOCK."
- ⑥ OUTPUT SELECT buttons 1-2  
Used to select the output channel. Selectable regardless of the lock setting.
- ⑦ INPUT SELECT buttons 1-4  
Used to select the input channel.  
Disabled when the LOCK-LOCAL setting is turned on.

## 2-2. Rear Panel

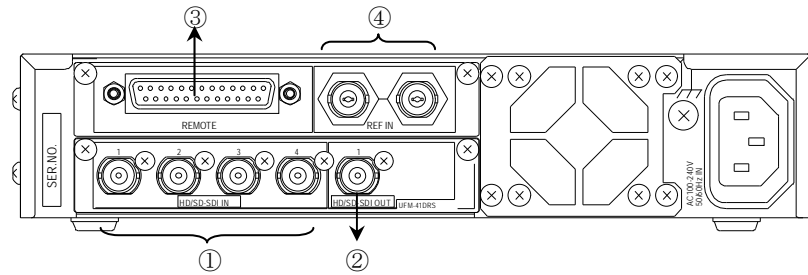
### ◆ DRS-21HS



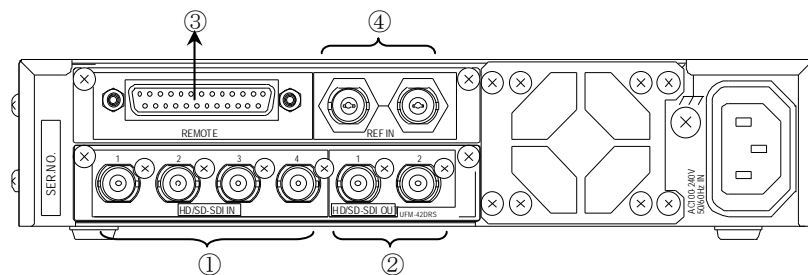
### ◆ DRS-22HS



### ◆ DRS-41HS



### ◆ DRS-42HS



#### ① IN PUT 1-4

Used for video input connections.

#### ② OUT PUT 1-2

Used for video output connections.


#### ③ REMOTE

Used for remote control. 25-pin D-sub connector, female. GPI I/O or RS-232C/RS-422 can be selected by setting the jumpers on the board.

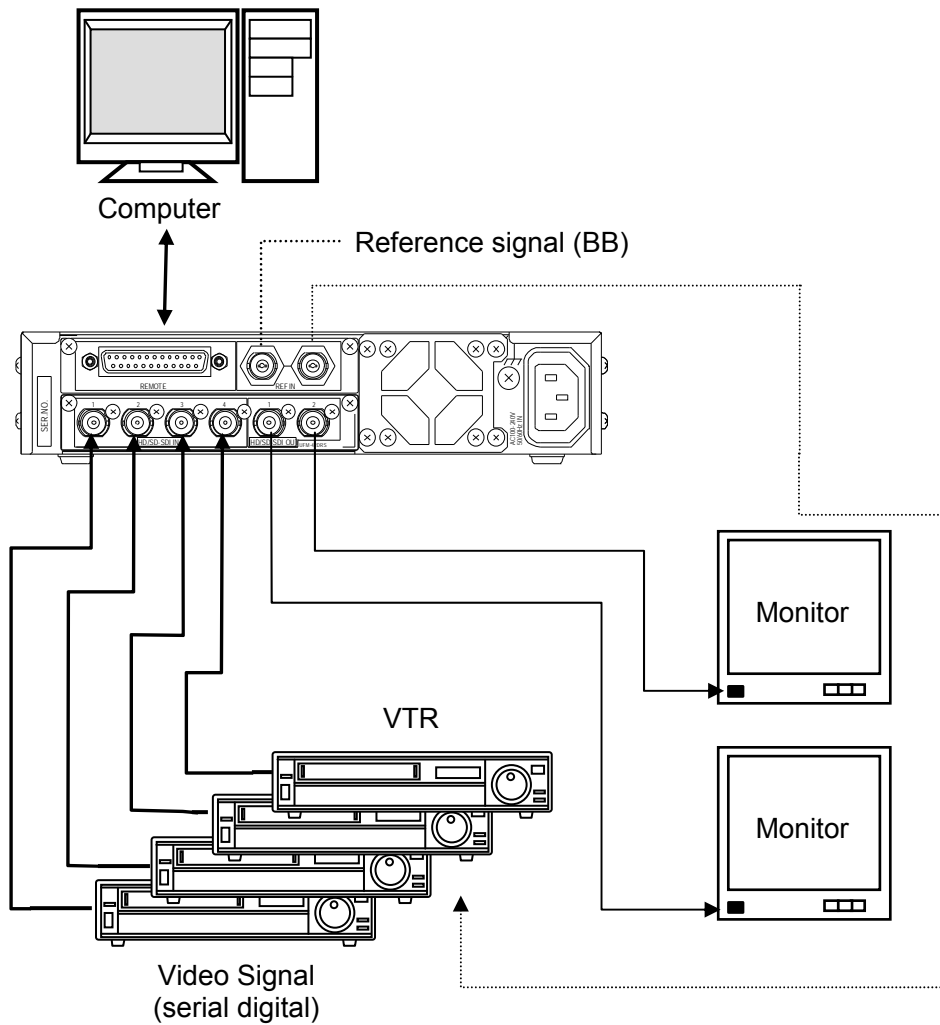
#### ④ REF IN

Used for external black burst (NTSC, PAL) input connection. If no loopthru connection is made, the second connector must be 75Ω terminated.

### 3. Connection

 <p><b>CAUTION</b></p>	Turn off all devices before making the connections.
---	---

#### 3-1. Basic Connection

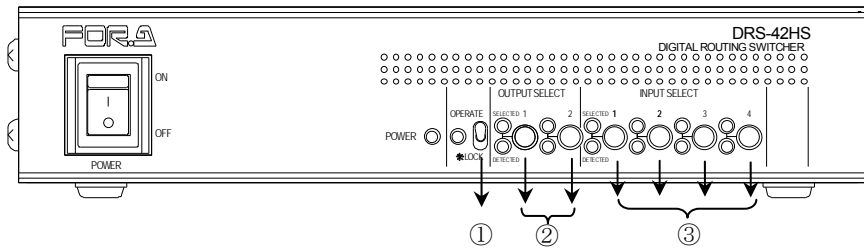


## 4. Operation

### 4-1. Front Panel Switches and Buttons

Crosspoints are switched using the switches and buttons on the front panel of the DRS-21/22/41/42HS.

#### ◆ DRS-42HS




Switches and Buttons	Factory Default	Refer to
① OPERATE / LOCK	OPERATE	4-2-1
② OUTPUT SELECT 1-2	-	4-2-2
③ INPUT SELECT 1-4	*	4-2-3

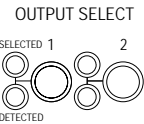
\*INPUT 1 is selected for all outputs at the factory.

## 4-2. Operation Procedures

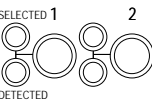
### 4-2-1. OPERATE / LOCK

Switch	Description		
 <p>OPERATE</p> <p>*LOCK</p>	<p>Turns on and off the lock setting.</p> <p>Up position (OPERATE): The lock setting is turned off.</p> <p>Down position (LOCK): The lock setting is turned on.</p> <p>The indicator lights up green when the lock setting is turned on.</p> <p>LOCK-LOCAL and LOCK-REMOTE are available.</p>		
	<table border="1"> <tr> <td> <p><b>LOCK-LOCAL</b></p> <p>Disables the local front panel control. The GPI input is possible.</p> </td> <td> <p><b>LOCK-REMOTE</b></p> <p>Disables the GPI input. The local front panel control is possible.</p> </td> </tr> </table>	<p><b>LOCK-LOCAL</b></p> <p>Disables the local front panel control. The GPI input is possible.</p>	<p><b>LOCK-REMOTE</b></p> <p>Disables the GPI input. The local front panel control is possible.</p>
	<p><b>LOCK-LOCAL</b></p> <p>Disables the local front panel control. The GPI input is possible.</p>	<p><b>LOCK-REMOTE</b></p> <p>Disables the GPI input. The local front panel control is possible.</p>	
<p>LOCK-LOCAL or LOCK-REMOTE can be selected with the internal dipswitch. The default setting is <b>LOCK-LOCAL</b>. See section 5-3 "Other Settings - LOCK SETTING."</p>			

### 4-2-2. OUTPUT SELECT

Buttons	Description
 <p>OUTPUT SELECT</p> <p>SELECTED 1      2</p> <p>DETECTED</p>	<p>Selects an output channel of which the input signal is switched.</p> <p>SELECTED: The indicator lights up green when the output channel is selected.</p> <p>DETECTED: The indicator lights up green when the signal is detected.</p> <p>The OUTPUT SELECT buttons are selectable although the lock setting is turned on. (The input signal is not switched.)</p> <p>*The buttons are not provided on the DRS-21HS and DRS-41HS. Only indicators are installed on these models.</p>

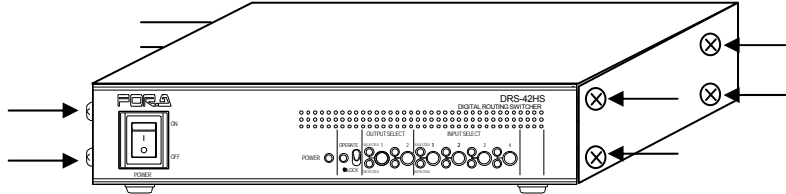
### 4-2-3. INPUT SELECT

Buttons	Description
 <p>INPUT SELECT</p> <p>SELECTED 1      2</p> <p>DETECTED</p>	<p>Switches the input signal routed to the output channel selected with OUTPUT SELECT.</p> <p>SELECTED: The indicator lights up green when the input channel is selected.</p> <p>DETECTED: The indicator lights up green when the signal is detected.</p> <p>The INPUT SELECT buttons are disabled when the LOCK-LOCAL is turned on. (LOCK-REMOTE does not disable the INPUT SELECT buttons.)</p>

# 5. Internal Settings

## ◆ Removing Top Cover

To change the internal settings, first remove the four screws from each side of the unit and then remove the top cover.



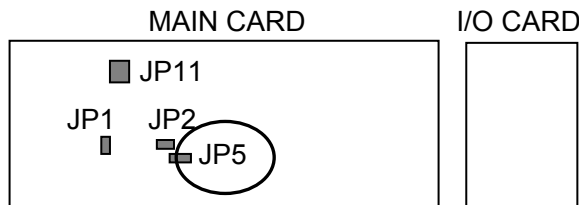
<b>CAUTION</b>
<p>Do not access internal cards or make connections with unit power ON. Always power OFF all connected units / disconnect power cords prior to accessing interior.</p> <p>Further note that adjustments and maintenance should be performed by qualified technical personnel familiar with FOR-A equipment.</p>

## 5-1. GPI Setting

To use GPI, set the jumpers on the MAIN CARD as follows.

### ◆ Jumper Setting

Use the jumper on the MAIN CARD of the DRS-21/22/41/42HS to set the DC voltage for GPI input. Setting JP5 to “+5V” uses internal +5V and setting to “EXT\_V” uses external voltage (DC voltage input of the REMOTE connector) for GPI input.

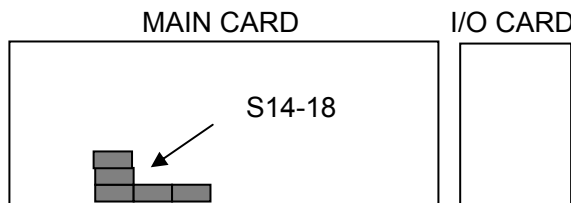


### Other jumper settings

JP1	Open. Used for maintenance. Do not change this setting.
JP2	Open. Used for maintenance. Do not change this setting.
JP11	1-2 short. Used for maintenance. Do not change this setting.

### ◆ Slide Switch Setting

Set all slide switches S14 through S18 on the MAIN CARD to “GPI”.



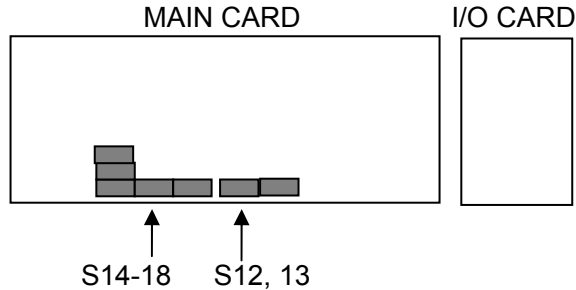


## 5-2. Serial Communication Settings

To use serial communication, set the switches on the MAIN CARD as follows.

### ◆ Slide Switch Setting

Set slide switches S12 through S18 on the MAIN CARD as below.



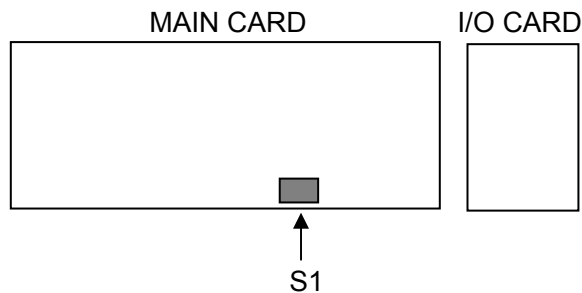
#### RS-232C

Set S12 and S13 to "232".  
Set all switches S14 through S18 to "COM".

#### RS-422

Set S12 and S13 to "422".  
Set all switches S14 through S18 to "COM".

### ◆ Dipswitch Setting (Bit Rate Setting)



#### S1-1, S1-2

Pin No.	Item	Setting								Factory Default
		OFF				ON				
1	BIT RATE SETTING	OFF	9,600	ON	19,200	OFF	38,400	ON	4,800	OFF
2		OFF		OFF		ON		ON		OFF

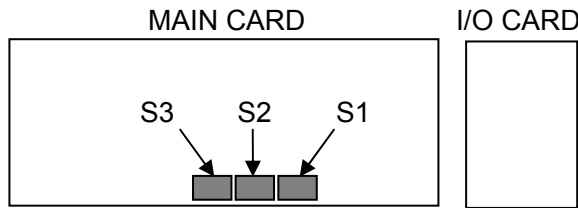
#### BIT RATE SETTING (S1-1, S1-2)

Selects the bit rate for the serial communication.

The available settings are "9,600 [bps]", "19,200 [bps]", "38,400 [bps]", and "4,800 [bps]".

## 5-3. Other Settings

Set dipswitches S1, S2, and S3 on the MAIN CARD as below.



### S1

Pin No.	Item	Setting								Factory Default
		OFF				ON				
3	SWITCH TIMING	OFF	First/second field	OFF	First field	ON	Second field	ON	-	OFF
4		OFF		ON		OFF		ON		OFF
5, 6, 7	-	-				-				OFF
8	LOCK SETTING	LOCK-LOCAL				LOCK-REMOTE				OFF

\*Do not change the settings of pins other than Pin 3, 4, and 8.

#### ◆ SWITCH TIMING (S1-3, 4)

Selects the crosspoints of which field are switched against the external reference signal. The available settings are "First and second fields", "First field", and "Second field". The table below shows the available settings for each input signal format.

External Reference Signal	Video Signal	S1-3, 4 Setting	Video Signal	S1-3, 4 Setting
525/60	525/60, 1080/59.94i	First and second fields, First field, Second field,	720/59.94p, 1080/59.94p	First field
625/50	625/50, 1080/50i	First and second fields, First field, Second field,	720/50p, 1080/50p	First field

\*Do not set both Pin 3 and 4 to ON.

#### ◆ LOCK SETTING (S1-8)

Selects the type of the OPERATE/LOCK switch setting. The available options are LOCK-LOCAL and LOCK-REMOTE.

### S2

Pin No.	Item	Setting		Factory Default
		OFF	ON	
1, 2	-	-	-	OFF
3	INITIAL SETTING	NORMAL	INITIAL	OFF
4, 5, 6	-	-	-	OFF
7	DVB-ASI MODE	DVB-ASI	177M	OFF
8	-	-	-	ON

Do not change the settings of pins other than Pin 3, and 7.

◆ **INITIAL SETTING (S2-3)**

If set to ON, initializes the crosspoint settings at power on.  
(INPUT1 will be selected for all outputs.)

◆ **DVB-ASI MODE (S2-7)**

Set to OFF if using the DVB-ASI signal. Set to ON if using the signal at 177 Mbps. (DVB-ASI and 177Mbps cannot be used at the same time. The re-clock function is not available for the DVB-AVI signal.)

**S3**

Pin No.	Item	Setting			Factory Default
		OFF	ON		
1	H COUNT NUM	000: 0	011: 3	110: 6	OFF (000)
2		001: 1	100: 4	111: 7	
3		010: 2	101: 5		
4	H COUNT DIR	COUNT DOWN	COUNT UP		OFF
5	V COUNT NUM	000: 0	011: 3	110: 6	OFF (000)
6		001: 1	100: 4	111: 7	
7		010: 2	101: 5		
8	V COUNT DIR	COUNT DOWN	COUNT UP		OFF

◆ **H COUNT NUM (S3-1,2,3)**

If set to 000, the crosspoint switching timing is delayed by the amount described in the next page. By setting to 001 to 111 (binary numbers), the switching timing can be adjusted in the range from  $\pm 1$  to  $\pm 7$  counts. (1 count is approximately 4.2us.)

◆ **H COUNT DIR (S3-4)**

If set to OFF, the switching timing is advanced by the amount set in H COUNT NUM.  
If set to ON, the switching timing is delayed by the amount set in H COUNT NUM.

◆ **V COUNT NUM (S3-5,6,7)**

If set to 000, the crosspoint switching timing is delayed by the amount described in the next page. By setting to 001 to 111, the switching timing can be adjusted in the range from  $\pm 1$  to  $\pm 7$ H.

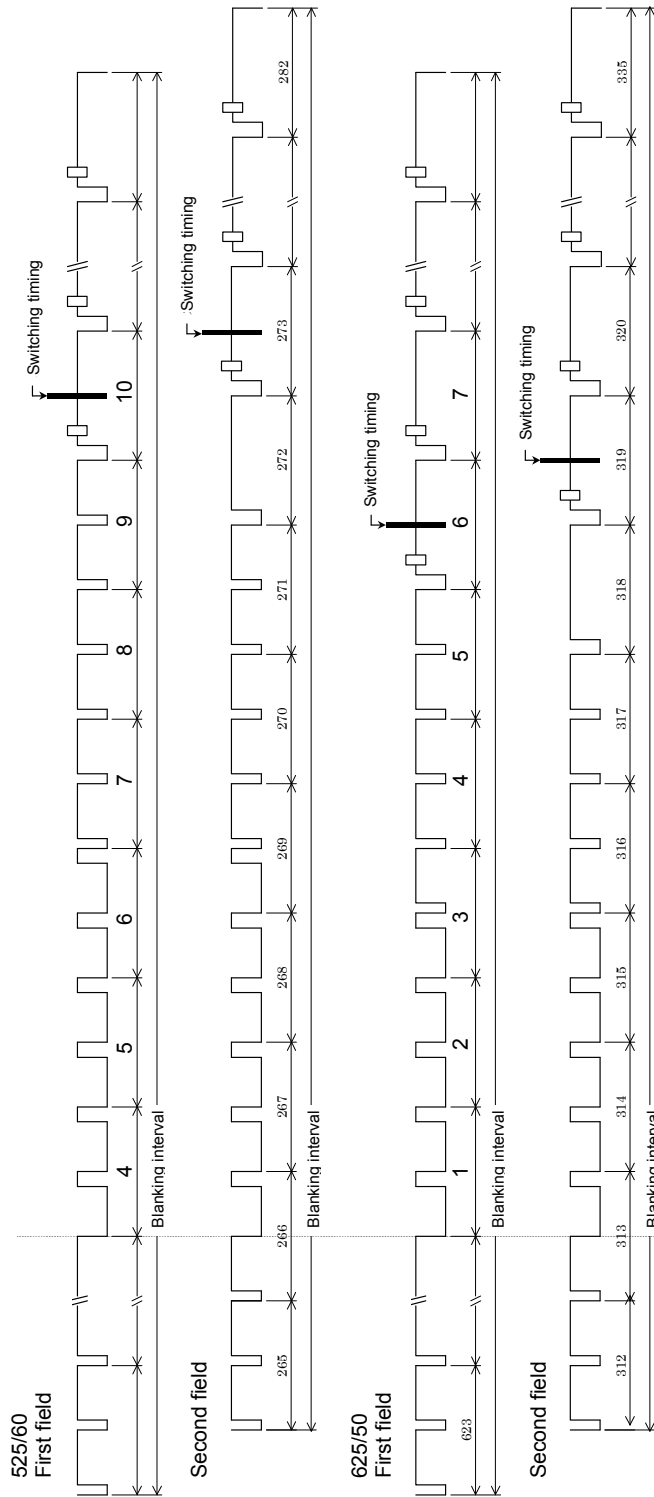
◆ **V COUNT DIR (S3-8)**

If set to OFF, the switching timing is advanced by the amount set in V COUNT NUM.  
If set to ON, the switching timing is delayed by the amount set in V COUNT NUM.

**IMPORTANT**

Each input signal must be synchronized with the reference input signal.

## Reference crosspoint switching timing



### IMPORTANT

To perform the blanking switch with the switching timing described above, all input signals must be synchronized. The crosspoint is switched based on the external reference signal even the signals have different clock rates.

## 6. Remote Control

The DRS-21/22/41/42HS can be remotely controlled using the REMOTE connector. GPI I/O or serial communication (RS232C or RS-422) can be selected. See section 5. "Internal Settings" for details.

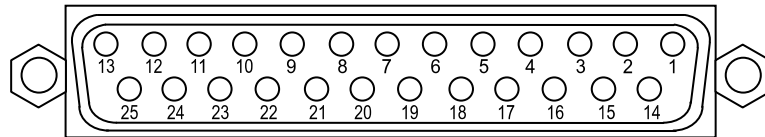
### 6-1. REMOTE Connector

#### ◆ Specifications

Connector	(Receptacle on the rear of the unit)	Socket contact, 25pin D-sub female
	(Plug)	Pin contact, 25pin D-sub male
The maximum voltage rating on GPI	30VDC	
The maximum current rating on GPI	Pins for signals (pin 1-8, pin 14-21): 40mA, Pin for voltage (pin 9, pin 22): 00mA	

\*Connector uses inch type lock screws.

#### ◆ REMOTE connector



#### (1) GPI I/O

Pin No.	REMOTE	Pin No.	REMOTE
1	Selects IN1 for OUT1	14	Outputs the tally signal when IN1 is selected for OUT1.
2	Selects IN2 for OUT1	15	Outputs the tally signal when IN2 is selected for OUT1.
3	Selects IN3 for OUT1	16	Outputs the tally signal when IN3 is selected for OUT1.
4	Selects IN4 for OUT1	17	Outputs the tally signal when IN4 is selected for OUT1.
5	Selects IN1 for OUT2	18	Outputs the tally signal when IN1 is selected for OUT2.
6	Selects IN2 for OUT2	19	Outputs the tally signal when IN2 is selected for OUT2.
7	Selects IN3 for OUT2	20	Outputs the tally signal when IN3 is selected for OUT2.
8	Selects IN4 for OUT2	21	Outputs the tally signal when IN4 is selected for OUT2.
9	+5V DC output	22	DC voltage input for GPI input
10	Ground terminal	23	Ground terminal
11	Open	24	Open
12	Open	25	Open
13	Open		

**(2) Serial Communication (RS-232C)**

Pin No.	REMOTE	Pin No.	REMOTE
1	FG: Ground terminal	14	Open
2	RXD: Receive data	15	Open
3	TXD: Transmit data	16	Open
4	Internally connected to pin 5.	17	Open
5	Internally connected to pin 4.	18	Open
6	Internally connected to pin 20.	19	Open
7	SG: Ground terminal	20	Internally connected to pin 6.
8	Open	21	Open
9	Open	22	Open
10	FG: Ground terminal	23	FG: Ground terminal
11	Open	24	Open
12	Open	25	Open
13	Open		

**(3) Serial Communication (RS-422)**

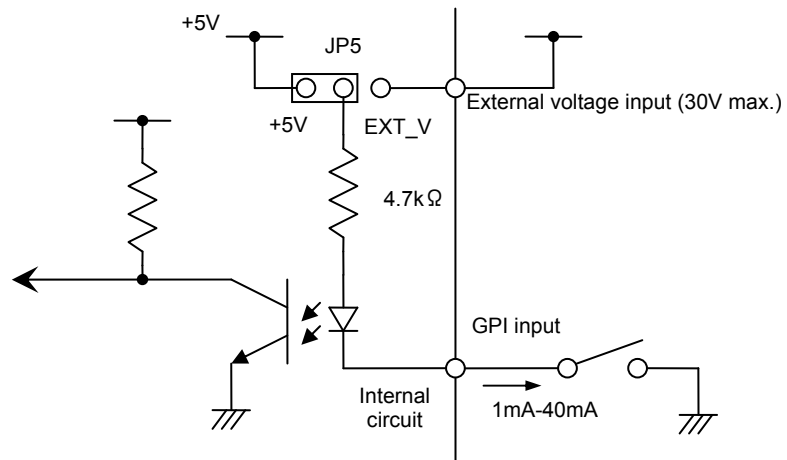
Pin No.	REMOTE	Pin No.	REMOTE
1	FG: Ground terminal	14	Open
2	RB+: Receive data +	15	Open
3	TA-: Transmit data -	16	Open
4	TB+: Transmit data +	17	Open
5	RA-: Receive data -	18	Open
6	SG: Ground terminal	19	Open
7	SG: Ground terminal	20	SG: Ground terminal
8	SG: Ground terminal	21	Open
9	Open	22	Open
10	FG: Ground terminal	23	FG: Ground terminal
11	Open	24	Open
12	Open	25	Open
13	Open		

**IMPORTANT**

The voltage and current should not exceed the maximum rating voltage and current. Also the amount of electric current must be appropriate for the electric wire.

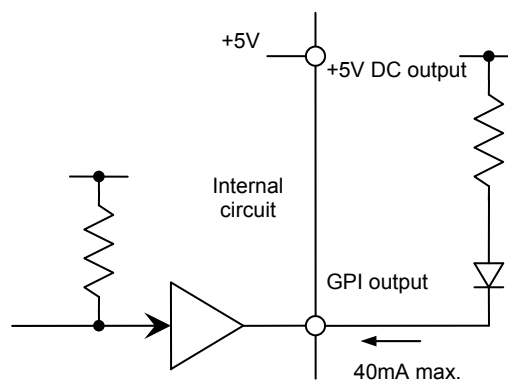
## 6-2. GPI Internal Circuit Connection Example

### ◆ GPI Input Circuit



\*The input signal pulse width should be 50ms or more.

### ◆ GPI Output Circuit



## 6-3. Serial Communication Specification

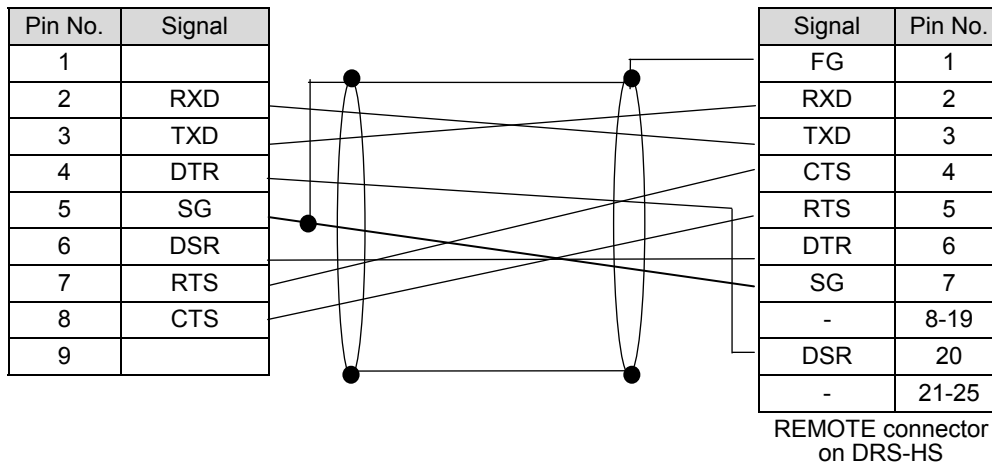
### 6-3-1. RS-232C Interface

REMOTE connector pin assignment for RS-232C interface is as shown below.

Pin No.	Signal	Pin No.	Signal
1	Frame ground FG	14	-
2	Receive data RXD	15	-
3	Transmit data TXD	16	-
4	Clear to send CTS	17	-
5	Request to send RTS *	18	-
6	(Connected to pin 20)	19	-
7	Signal ground SG	20	(Connected to pin 6)
8	-	21	-
9	-	22	-
10	-	23	-
11	-	24	-
12	-	25	-
13	-		

\* If power is applied, the signal input to CTS is output from RTS.

An example of computer cable connection for control via RS-232C interface is shown below. Note example is based on the use of a PC-AT type (IBM / IBM clone) computer. Cable wiring connections may differ for other computer models.



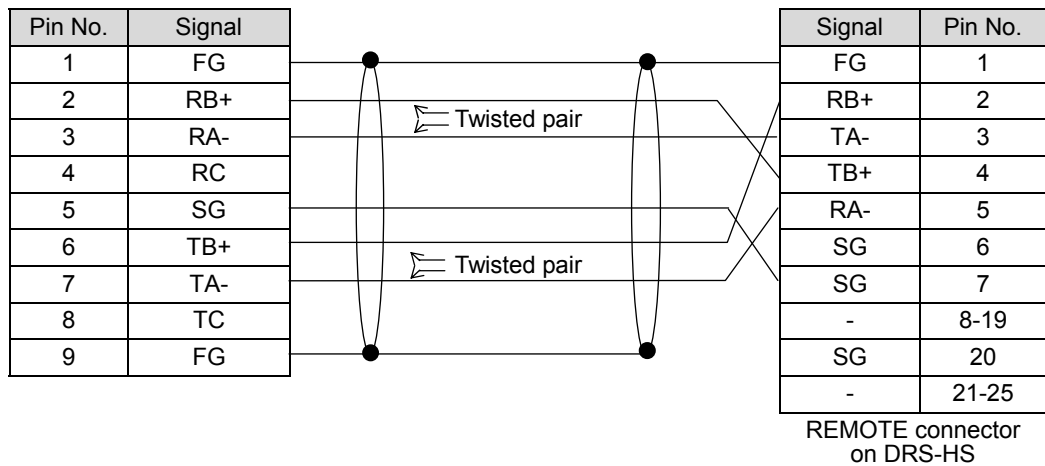


## 6-3-2. RS-422 Interface

REMOTE connector pin assignment for RS-422 interface is as shown below.

Pin No.	Signal	Pin No.	Signal
1	Frame ground FG	14	-
2	Receive data + RB+	15	-
3	Transmit data - TA-	16	-
4	Transmit data + TB+	17	-
5	Receive data - RA-	18	-
6	Signal ground SG	19	-
7	Signal ground SG	20	Signal ground SG
8	-	21	-
9	-	22	-
10	-	23	-
11	-	24	-
12	-	25	-
13	-	26	-

An example of computer cable connection for control via RS-422 interface is shown below. Refer to RS-422 interface board manual for pin assignments.



## 6-3-3. Communication Parameters

When controlling the units via the serial communication interface (RS-232C/RS-422), set the communication parameters of the computer as shown below.

Baud rate	9,600 (factory default), 19,200, 38,400, 4,800 [bps] See section 5-2. "Serial Communication Settings" for details.
Data bits	8 [bit]
Stop bits	1 [bit]
Parity	None
Flow control	None
Synchronization	Start-stop (asynchronous)

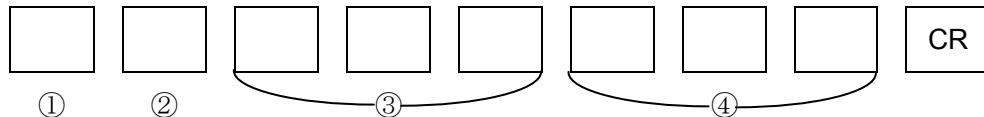
## 6-4. Serial Control Commands

The commands listed below are used when the RS-232C or RS-422 protocol is employed. All commands are transmitted in ASCII code (in hexadecimal).

**IMPORTANT**

All commands must be entered in upper case.

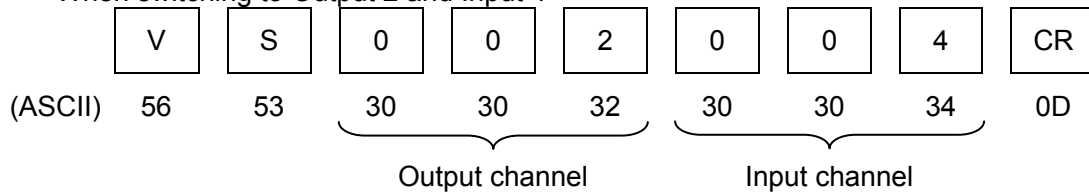
### 6-4-1. Crosspoint Switchover



- ① Channel type code  
V: Video signal (level 1)                      ASCII 56
- ② Control code  
S: Switchover                                      ASCII 53
- ③ Output channel  
Enter the output channel using 3 digits.
- ④ Input channel  
Enter the input channel using 3 digits.

**Example**

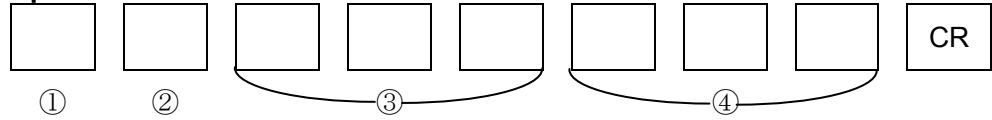
- When switching to Output 2 and Input 4



## 6-4-2. Preset Crosspoint Switchover

Crosspoint preset commands are temporarily stored until execution command is received. Temporarily stored crosspoints are switched simultaneously only after execution command is received.

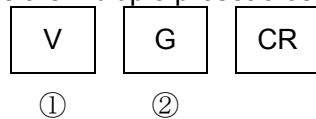
### (A) Crosspoint Preset Command



- ① Channel type code  
V: Video signal (level 1)                      ASCII 56
- ② Control code  
P: Presets the crosspoint                      ASCII 50
- ③ Output channel  
Enter the output channel using 3 digits.
- ④ Input channel  
Enter the input channel using 3 digits.

### (B) Preset Crosspoint Switchover Command (Execution Command)

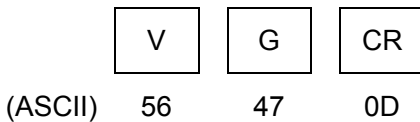
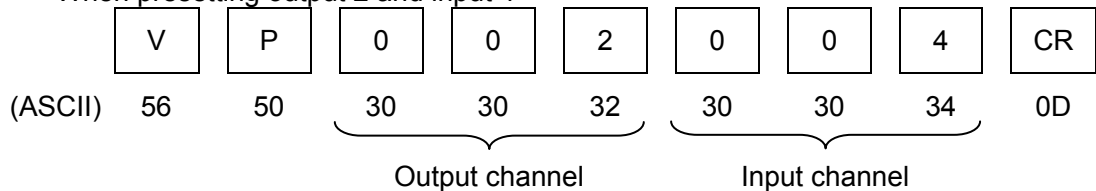
Switches the multiple preset crosspoints at once.



- ① Channel type code  
V: Video signal (level 1)                      ASCII 56
- ② Control code  
G: Switches the preset crosspoints at once    ASCII 47

### Example

- When presetting output 2 and input 4





## 6-4-4. Reply Messages

---

### (A) Normal receive

- When a crosspoint switchover command is received, a reply message is sent as below.

O	K	CR	LF
---	---	----	----

(ASCII) 4F 4B 0D 0A

- When a preset crosspoint switchover command is received, a reply message is sent as below.

S	E	T	CR	LF
---	---	---	----	----

(ASCII) 53 45 54 0D 0A

- When a status request for a specific output channel is received, a reply message is sent as below.

S	SPACE	0	0	4	CR	LF
---	-------	---	---	---	----	----

(ASCII) 53 20 30 30 34 0D 0A

In the example above, IN4 is selected for the specified output channel.

**(B) Error Receive**

If an error occurred when a command is received, one of the following error messages is sent.

- Command error (If received command has undefined format.)

E	SPACE	C	O	M	D	CR	LF
---	-------	---	---	---	---	----	----

(ASCII) 45 20 43 4F 4D 44 0D 0A

- Overrun error

E	SPACE	O	V	R	N	CR	LF
---	-------	---	---	---	---	----	----

(ASCII) 45 20 4F 56 52 4E 0D 0A

- Framing error

E	SPACE	F	R	M	E	CR	LF
---	-------	---	---	---	---	----	----

(ASCII) 45 20 46 52 4D 45 0D 0A

- Data error

(1) If 000 or 003 or higher is entered for the output channel of a crosspoint switchover command **or** if 000 or 005 or higher is entered for input channel of a crosspoint switchover command.

E	SPACE	S	D	A	T	A	CR	LF
---	-------	---	---	---	---	---	----	----

(ASCII) 45 20 53 44 41 54 41 0D 0A

(2) If 000 or 003 or higher is entered for the output channel of a crosspoint preset command **or** if 000 or 005 or higher is entered for the input channel of a crosspoint preset command.

E	SPACE	P	D	A	T	A	CR	LF
---	-------	---	---	---	---	---	----	----

(ASCII) 45 20 50 44 41 54 41 0D 0A

## 6-4-5. Control Commands and ASCII Codes

---

### ◆ Crosspoint Switchover Command

Command	ASCII Code	
V	56	Selects the channel type
S	53	Crosspoint switchover command
*	30	Output channel number (3 digits) 001-002
*	30	
*	31-32	
*	30	Input channel number (3 digits) 001-004
*	30	
*	31-34	
CR	0D	End of command

### ◆ Crosspoint Preset Command

Command	ASCII Code	
V	56	Selects the channel type
P	53	Crosspoint preset command
*	30	Output channel number (3 digits) 001-002
*	30	
*	31-32	
*	30	Input channel number (3 digits) 001-004
*	30	
*	31-34	
CR	0D	End of command

### ◆ Preset Crosspoint Switchover Command

Command	ASCII Code	
V	56	Selects the channel type
G	47	Preset crosspoint switchover command
CR	0D	End of command

### ◆ Status Request Command

Command	ASCII Code	
V	56	Selects the channel type
R	52	Status request command
*	30	Output channel number (3 digits) 001-002
*	30	
*	31-32	
CR	0D	End of command

◆ Reply message from DRS-21HS, DRS-22HS, DRS-41HS, or DRS-42HS when command is processed without any error:

Command	ASCII Code	
O K CR LF	4F 4B 0D 0A	Output when crosspoint switchover command is normally received.
S SPACE * * * CR LF	53 20 30 30 31-34 0D 0A	Output when status request is received. (*** is 001-004)
S E T CR LF	53 45 54 0D 0A	Output when crosspoint preset command is normally received.

◆ Reply message sent from DRS-21HS, DRS-22HS, DRS-41HS, or DRS-42HS when error occurs:

Command	ASCII Code	
E SPACE C O M D CR LF	45 20 43 4F 4D 44 0D 0A	Output when command format error occurs.
E SPACE O V R N CR LF	45 20 4F 56 52 4E 0D 0A	Output when overrun error occurs.
E SPACE F R M E CR LF	45 20 46 52 4D 45 0D 0A	Output when framing error occurs.
E SPACE S D A T A CR LF	45 20 53 44 41 54 41 0D 0A	Output when channel number in the crosspoint switchover command is wrong.
E SPACE P D A T A CR LF	45 20 50 44 41 54 41 0D 0A	Output when channel number in the crosspoint preset command is wrong.



## 7. If Problems Occur

If any of the following problems occur during operation of your unit, proceed as indicated below to see if problem can be corrected before assuming a unit malfunction has occurred.

Problem	Check	Action
Unable to output video signals	POWER indicator	Verify that the power is ON and the power cord is securely connected.
	INPUT indicator	Verify INPUT connectors have cables physically connected and are inputting signals to the router.
		Verify the cable length.
		Verify the format of input signal is HD SDI 1.485Gbps or 1.485/1.001Gbps, SD SDI 143Mbps-270Mbps, or DVB-ASI.
	Crosspoint settings	Verify the crosspoint settings are made properly.
Unable to control using RS-232C/RS-422	Communication parameter settings	Verify the communication parameter settings at the computer are made properly. See section 6-3-3. ".Communication Parameters"
	Control cable	Verify cable is the proper type for connection and pin assignments are correct.
	RS-232C/RS-422 setting	Verify the RS-232C/RS-422 setting is made properly. See section 5-2. "Serial Communication Settings."
Unable to control using GPI	Cable connection	Verify the cable is securely connected.
	LOCK/OPERATE switch LOCK SETTING	Verify GPI is not locked. Check the LOCK-OPERATE switch and LOCK SETTING. See section 5-3. "Other Settings."
	GPI setting	Verify the GPI setting is made properly. See section 5-1. "GPI Setting."
Unable to output tally signals	Cable connection	Verify the cable is properly connected.
	GPI setting	Verify the GPI setting is made properly. See section 5-1. "GPI Setting."

## 8. Specifications and Dimensions

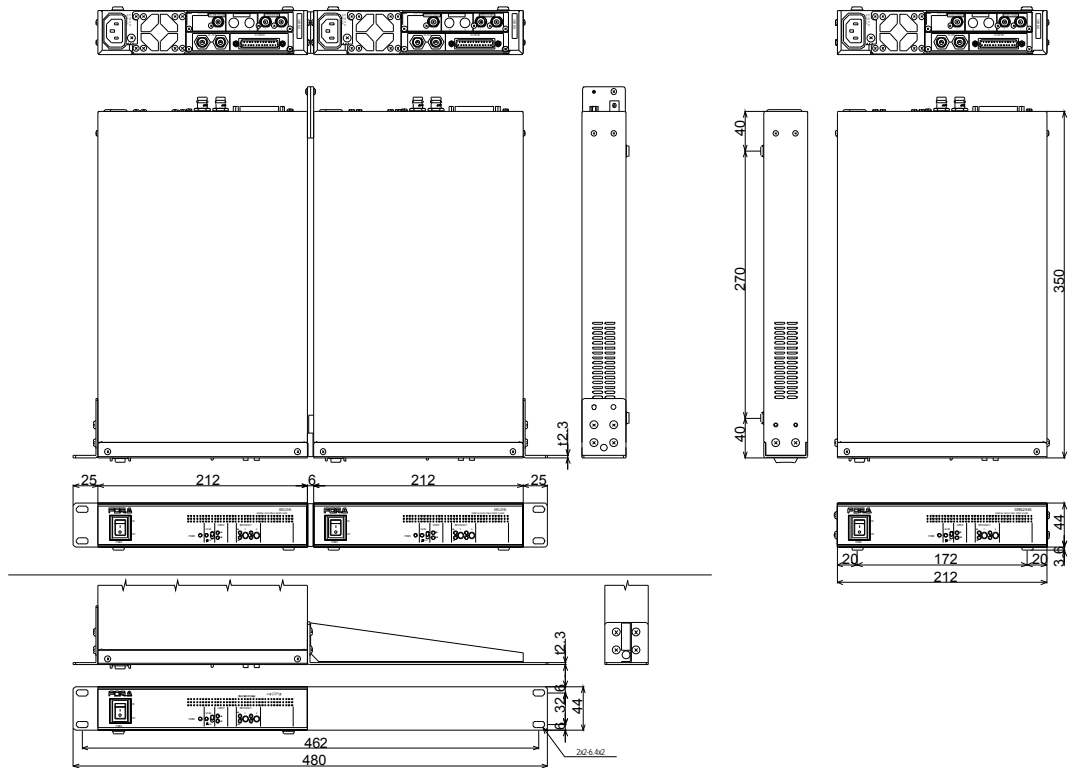
### 8-1. Unit Specifications

	DRS-21HS	DRS-22HS	DRS-41HS	DRS-42HS
Number of Inputs and Outputs	2 inputs x 1 output	2 inputs x 2 outputs	4 inputs x 1 output	4 inputs x 2 outputs
Digital Input	SD-SDI: 143Mbps-270Mbps or HD-SDI: 1.485Gbps or 1.485/1.001Gbps or DVB-ASI 75Ω BNC			
Cable Compensation	SD-SDI: 200m max. (5C-2V) HD-SDI: 100m max. (5C-FB)			
Digital Output	SD-SDI: 143Mbps to 270Mbps or HD-SDI: 1.485Gbps or 1.485/1.001Gbps or DVB-ASI (depending on the input signal) 75Ω BNC			
Ref Input	BB NTSC: 0.429Vp-p PAL: 0.450Vp-p 75Ω BNC x 1, loop-through (Terminate with 75Ω terminator, if unused.)			
Power	100VAC to 240VAC ± 10%, 50/60Hz			
Power Consumption	20VA (12W) at 100V to 120VAC 26VA (13W) at 220V to 240VAC			
Temperature	10°C to 40°C			
Humidity	30% to 90% (no condensation)			
Dimensions	212 (W) x 44 (H) x 350 (D) mm			
Weight	2kg			
Remote Control	REMOTE 25-pin D-sub (female) x 1 GPI/O, RS-232C or RS-422 control (internally selectable)			
Consumables	Cooling fan:P-1362 (Recommended replacement period: every 2 years) Power: JBW12-2R5 (Recommended replacement period: every 5 years)			

## 8-2. External Dimensions

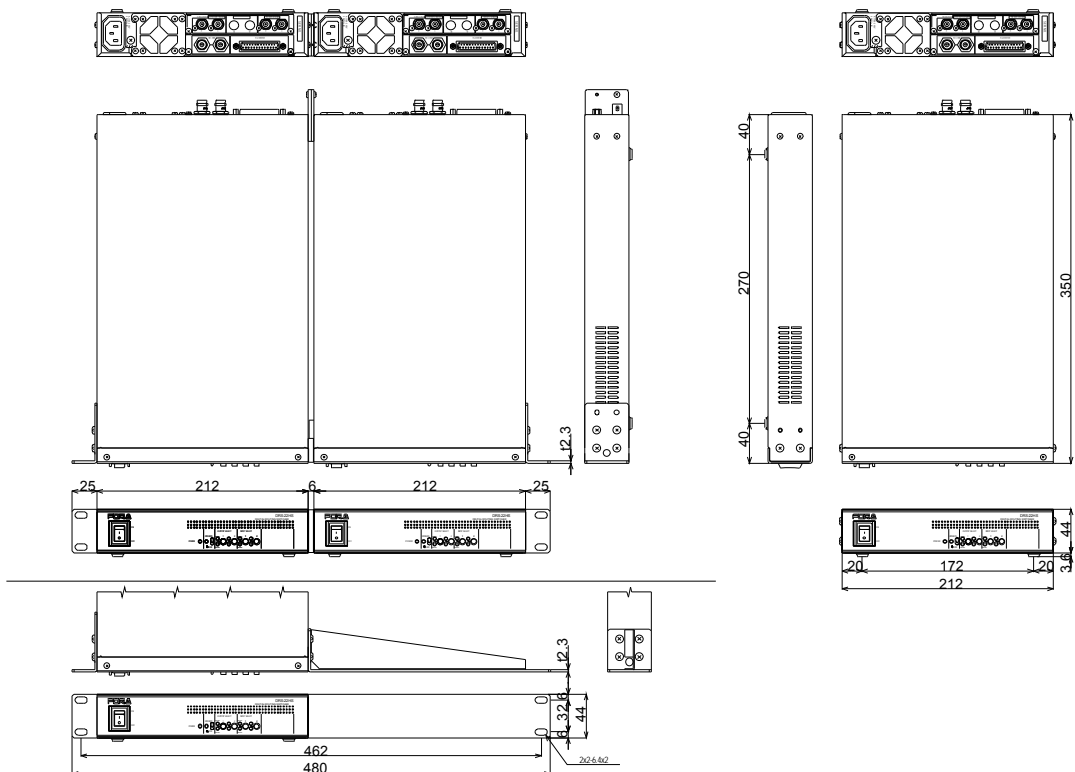
### 8-2-1. DRS-21HS

(All dimensions in mm)



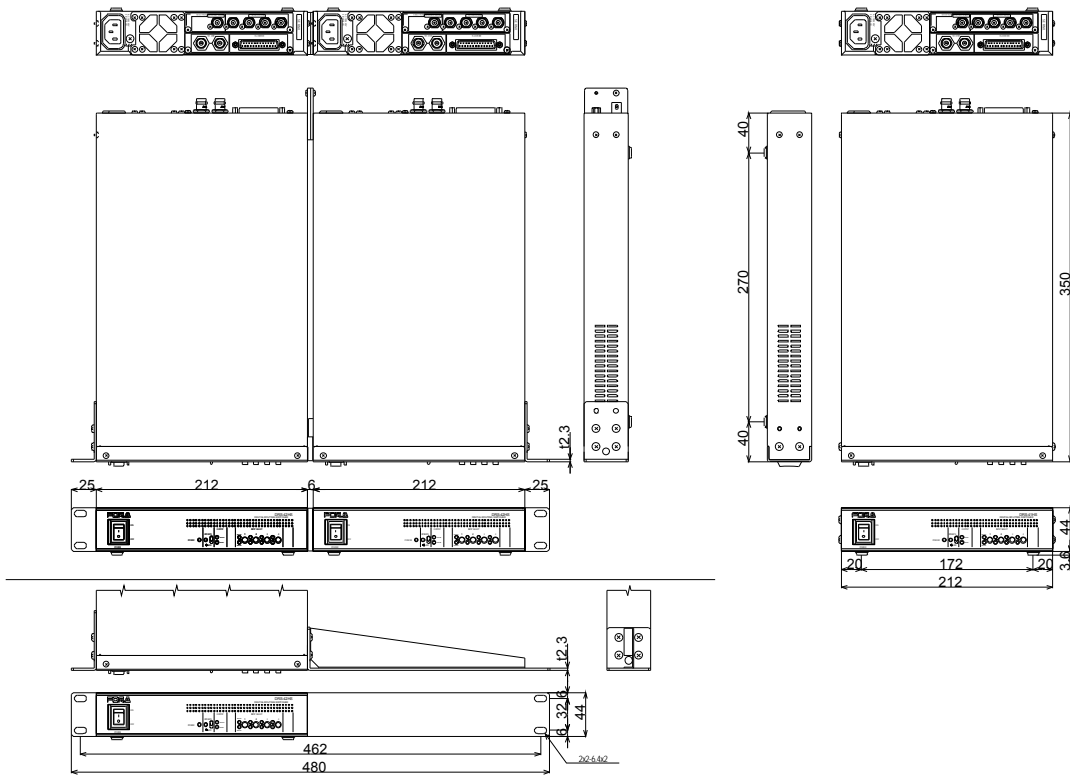
### 8-2-2. DRS-22HS

(All dimensions in mm)



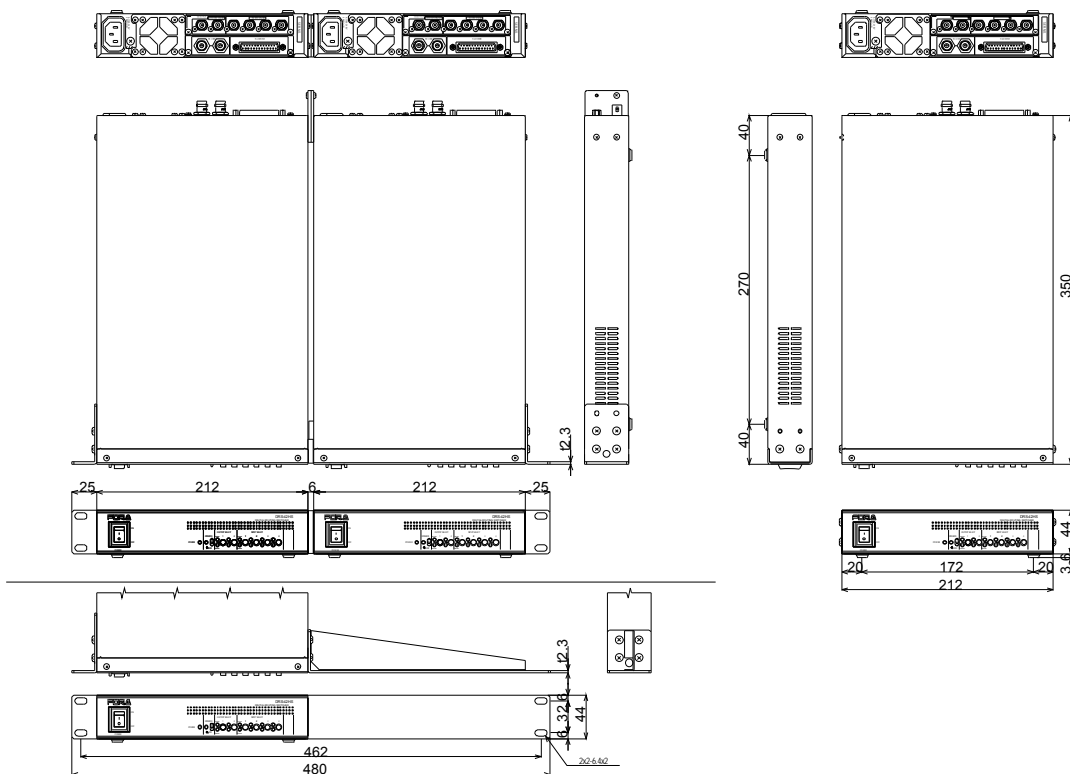
### 8-2-3. DRS-41HS

(All dimensions in mm)



### 8-2-4. DRS-42HS

(All dimensions in mm)



## **Warning**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.



**FOR-A COMPANY LIMITED**

Head Office 3-8-1 Ebisu, Shibuya-ku, Tokyo 150-0013, Japan  
Overseas Division Phone: +81(0)3-3446-3936, Fax: +81(0)3-3446-1470  
Japan Branch Offices Osaka/Okinawa/Fukuoka/Hiroshima/Nagoya/Sendai/Sapporo  
R&D/Production Sakura Center/Sapporo Center

**FOR-A America Corporate Office**

11155 Knott Ave., Suite G&H, Cypress, CA 90630, USA  
Phone: +1-714-894-3311 Fax: +1-714-894-5399

**FOR-A America East Coast Office**

2 Executive Drive, Suite 670, Fort Lee Executive Park, Fort Lee, NJ 07024, USA  
Phone: +1-201-944-1120 Fax : +1-201-944-1132

**FOR-A America Distribution & Service Center**

2400 N.E. Waldo Road, Gainesville, FL 32609, USA  
Phone: +1-352-371-1505 Fax: +1-352-378-5320

**FOR-A Corporation of Canada**

346A Queen Street West, Toronto, Ontario M5V 2A2, Canada  
Phone: +1-416-977-0343 Fax: +1-416-977-0657

**FOR-A Latin America & the Caribbean**

5200 Blue Lagoon Drive, Suite 760, Miami, FL 33126, USA  
Phone: +1-305-931-1700 Fax: +1-305-264-7890

**FOR-A UK Limited**

UNIT C71, Barwell Business Park, Leatherhead Road, Chessington Surrey, KT9 2NY, UK  
Phone: +44(0)20-8391-7979 Fax: +44(0)20-8391-7978

**FOR-A Italia S.r.l.**

Via Volturmo 37, 20047 Brugherio MB, Italy  
Phone: +39-039-881-086/103 Fax: +39-039-878-140

**FOR-A Corporation of Korea**

801 Dangsang Bldg., 53-1 Dangsang-Dong, Youngdeungpo-Gu, Seoul 150-800, Korea  
Phone: +82(0)2-2637-0761 Fax: +82(0)2-2637-0760

**FOR-A China Limited**

708B Huateng Bldg., No. 302, 3 District, Jinsong, Chaoyang, Beijing 100021, China  
Phone: +86(0)10-8721-6023 Fax: +86(0)10-8721-6033

\*The contents of this manual are subject to change without notice.