ASTRO

Scan Converter

SC-2063A

Instruction Manual

Ver 1.02

Scan Converter

SC-2063A

取扱説明書

2009.6

Ver.1.02

アストロデザイン株式会社

Contents

Version Update History

Ver.	Date	Page	Section No.	Description
1.02	2009/7/7		v	Correct the accesorry
		17	7	Correct Chapter 7 Command specs
1.01	2008/4/14	2	1.3	Add limitation for 1.3 Spec
1.00	2008/4/1			First edition

BEFORE USING THIS SCAN CONVERTER

INTRODUCTION

Thank you very much for purchasing this model SC-2063A scan converter.

This manual contains details on the operation procedures for the SC-2063A can converter as well as the checkpoints and precautions to be observed when using the model. Since improper handling may result in malfunctioning, before using the SC-2063A please read through these instructions to ensure that you will operate the scan converter correctly.

After reading through the manual, keep it in a safe place for future reference.

SAFETY PRECAUTIONS

⚠WARNING

Concerning the scan converter

- **Do not subject the scan converter to impact or throw it around. This may cause the unit to malfunction, explode or generate abnormally high levels of heat, possibly resulting in a fire.**
- **Do not use this unit where there is a risk of ignition or explosions.**
- **Do not place the unit inside a microwave oven or other heating kitchen appliance or inside a pressure vessel. Doing so may heat up the unit to abnormally high levels, cause smoking, run the risk of the unit's catching fire and/or damage the circuit components.**
- **This unit contains some high-voltage parts. If you touch them, you may receive an electric shock and/or burn yourself so do not attempt to disassemble, repair or remodel the unit.**
- **If there is a thunderstorm while the unit is being used outdoors, immediately turn off its power, disconnect the power cable from the main unit, and move the unit to a safe place.**

Concerning the power cable

- **Always take hold of the molded part of the plug when disconnecting the power cable.**
- **Do not use force to bend the power cable or bundle it with other cables for use. This may cause a fire.**
- **Do not place heavy objects on top of the power cable. This may damage the cable, causing a fire or electrical shock.**

Concerning foreign matter

- **Do not spill liquids inside the unit or drop inflammable objects or metal parts into it. Operating the unit under these conditions may cause a fire, electric shocks and/or malfunctioning.**

⚠ CAUTION

Concerning the scan converter

- **When connecting to the SC-2063, use the FG cable provided to connect the frame ground (FG) terminal on the unit to the frame ground terminal on the unit connected to it. If these terminals are not connected to the same frame ground, both the SC-2063A and the equipment connected to the SC-2063A may fail.**
- **When disconnecting the SC-2063A from the unit which is connected to the SC-2063A, disconnect the connecting cables first, and then disconnect the FG cable.**
- **When the unit's power is to be turned ON or OFF, be absolutely sure to use the POWER switch on the front panel.**

Concerning impact

- **This is a precision instrument and, as such, subjecting it to impact may cause malfunctioning. Take special care when moving the unit.**
- **Do not drop the unit.**

Concerning installation

- **Install the unit in a stable location. Do not stand it on either of its side panels. Doing so may cause the unit's temperature to rise due to heat generation, possibly resulting in malfunctioning.**

When trouble or malfunctioning has occurred

- **In the unlikely event that trouble or malfunctioning should occur, disconnect the unit's power cable, and contact your dealer or an Astrodesign sales representative.**

What is packed with the unit

The unit comes with the following items.

Be absolutely sure to use only the genuine accessories which are supplied for this unit since the use of any non-designated items may cause malfunctioning.

❒ Standard accessories

- SC-2063A main unit
  - SC-2063A instruction manual in Japanese (what you are now reading): 1 copy
  - SC-2063A instruction manual in English (what you are now reading): 1 copy
  - SC-2063A command tool instruction manual in Japanese (what you are now reading): 1 copy
  - SC-2063A command tool instruction manual in English (what you are now reading): 1 copy
- Power cable: 1 pc (*1)

1 CONCERNING THE SC-2063A

1.1 Outline

The SC-2063A scan converter (hereafter, the “SC-2063A” or “the unit”) converts video input signals to timing signal which support PC monitors or to NTSC or PAL format signals.

SC-2063A has DVI (Single / Dual) for input and DVI and composite for outputs.

1.2 Features

- **High-resolution inputs supported**

  1080p, UXGA and other high-resolution inputs are supported.

- **Composite outputs supported**

  Composite (NTSC and PAL) outputs are supported and able to converting 1080p, UXGA and other high-resolution inputs to Composite.

- **TBC function**

  Absorbs jitter in the vertical timing of input signals.

- **Zoom function**

  Able to zoom in to the input resolution and output it by selected format.

- **Picture cutting function**

  Able to cut the input signals and output it as selectedformat, it will be output without pixel conversion.

- **Frame rate conversion function**

  Convert the output frame rate to 60 Hz irrespective of input.

1.3 Restrictions imposed by the specifications

The SC-2063A has some specific restrictions on the timing signals that can be input. If these restrictions are exceeded, the video signals on the output screen may be disrupted.

- **Concerning the video input timing signal restriction values**

Dot clock frequency	25-162MHz (Single link) 50-324MHz (Dual link)
Horizontal frequency	17-125KHz
Minimum Horizontal blanking period	2dot (Single link) 4dot (Dual link)
Maximum Vertical frequency	1920 dot
Horizontal sync width	24-120Hz
Minimum horizontal front porch width	1 Line
Maximum vertical front porch width	1200dot
Maximum pixel of Disp area	2073600 dot (1920 X1080)

1.4 Main functions

- **Input system functions**

  TBC function: Able to output stable video signals even input signal is unstable (jitter within 1H in the vertical timing) among.

  DVI Dual link input: When unit receive the Dual link input it will automatically omit evenf rame.If the input format is not 1920X1080p@120, unit will omit the V frequency and output by 60Hz. If the input dot clock is over 162MHz, unit will omit the V frequency.

- **Scan conversion system functions**

  Zoom function: Able to zooms the video input signals automatically and output is as selected resolution.

  Frame rate conversion function: Convert the output frame rate to 60 Hz irrespective of input

  Picture cropping function: Able to cut the input signals and output it as selectedformat, it will be output without pixel conversion.

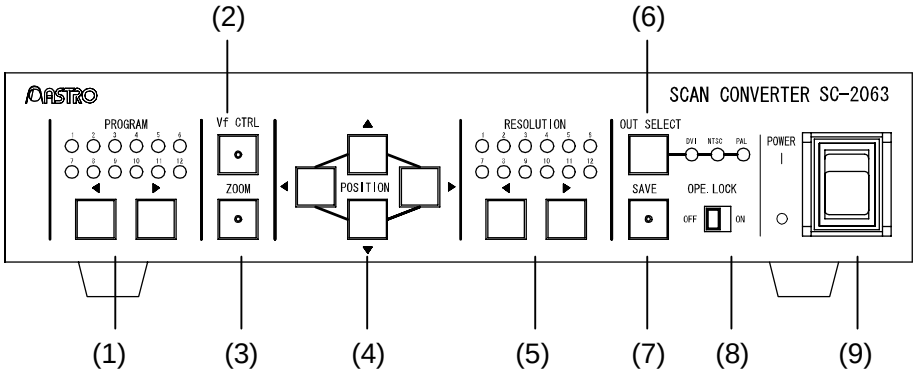
- **Control system functions**

  Setting storage function: Able to save the frequent use settings.

  Program copy function: Able to save program data by using commands with the RS-232C interface.

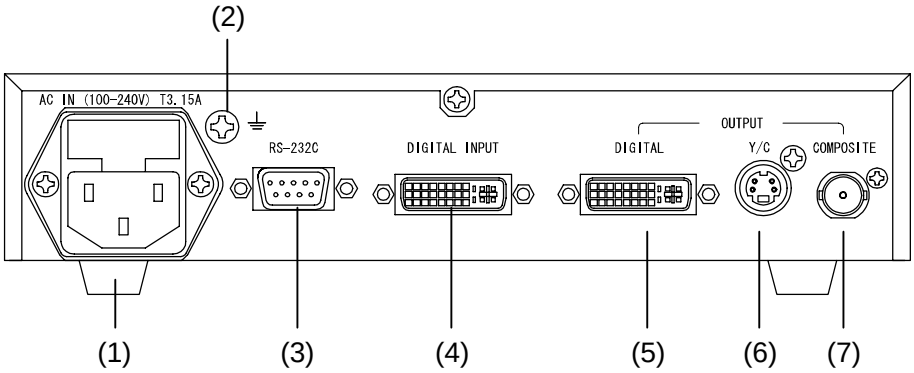
1.5 PARTS AND THEIR FUNCTIONS

1.5.1 SC-2063A front panel view and parts



(1)	[PROGRAM] key & LED	Read out the saved settings.
(2)	[Vf CONT] key & LED	Fix the output vertical timing to 60 Hz. LED lighted: 60 Hz LED off: Input timing
(3)	[ZOOM] key & LED	Zooming the input images to the output resolution. LED lighted: Zooming LED off: Picture cutting
(4)	[POSITION] key	Adjusting the picture cutting position when zooming is OFF. Able to move fast when keep on pressing
(5)	[RESOLUTION] key & LED	Setting for the output timing.
(6)	[OUT SELECT] key &LED	For selecting the output signals. DVI: The signals are output from the DVI connector. NTSC: NTSC signals are output from the Y/C and COMPOSITE connectors. PAL: PAL signals are output from the Y/C and COMPOSITE connectors.
(7)	[SAVE] key & LED	For saving the data which has been set.
(8)	[OPE LOCK] key & LED	For canceling the input of all the keys except for the power switch.
(9)	[POWER] key	Power switch

1.5.2 SC-2063 rear panel view and parts

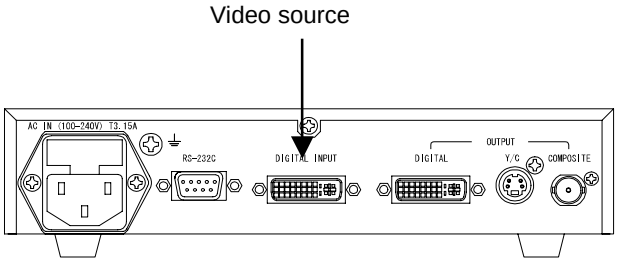


(1)	AC power socket	Connect the power cable here. Voltages from 100 to 120V and from 200 to 240V are supported.
(2)	Frame ground (FG) terminal	Connect this to the FG terminal on the unit connected to the VG-849C.
(3)	RS-232C connector (9 pins, male)	Use this connector to connect the unit to a personal computer using an RS-232C cable.
(4)	DVI digital serial input connector	Input the DVI Single Link / Dual Link signals to this connector (HDCP not supported).
(5)	DVI digital serial output connector	Output the DVI Single Link signals from this connector (HDCP not supported).
(6)	Y/C output connector	This is the NTSC or PAL Y/C video output connector.
(7)	COMPOSITE output connector	This is the NTSC or PAL COMPOSITE video output connector.

2 INSTALLATION AND CONNECTIONS

2.1 Connecting the video input signals

Connect the DVI (digital, Single Link) cable to the DIGITAL INPUT connector.

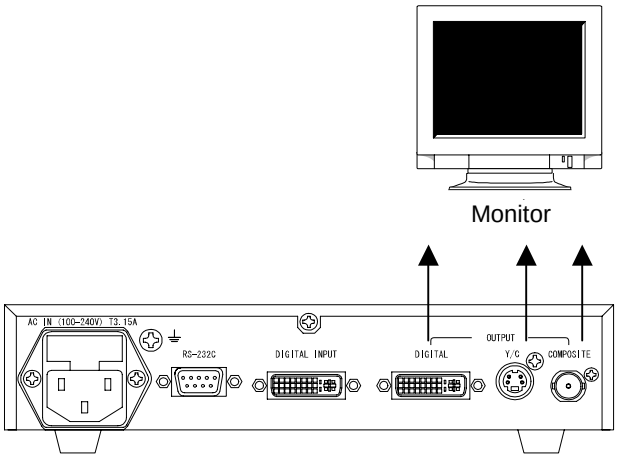


2.2 Connecting the display unit

Connect the DVI (digital, Single Link / Dual Link) cable to the DIGITAL (OUTPUT) connector.

Connect the S-connector cable to the Y/C connector.

Connect the BNC cable to the COMPOSITE connector.



3 OUTPUT SETTINGS

3.1 Setting the output timing signals

The video signals are output at one of the resolutions listed below by selecting the RESOLUTION key.

LED	Resolution (horizontal x vertical)
1	1920×1080
2	1280×720
3	720×480
4	720×576
5	1366×768
6	1024×768
7	1024×720
8	1920×1200
9	1600×1200
10	1280×1024
11	800×600
12	640×480
Off	Input resolution

3.2 Setting the zoom

Press the ZOOM key. When its LED is lighted, zooming is performed with the input signals set to the output resolution.

When the ZOOM key LED is off, the input images are set to the output resolution, cropped and output with no changes in the image quality. The position of the picture can be moved using the POSITION key.

3.3 Setting to fix the vertical frequency

Press the Vf CTRL key. When its LED is lighted, the output frequency is fixed at 60 Hz.

The output frequency while the Vf CTRL key LED is off becomes the same as the vertical frequency of the input signals. However, the input and output cannot be synchronized since the TBC function is working.

3.4 Output settings

The output connectors and signals can be switched by making the selection using the OUT SELECT key.

LED	DVI output	Y/C output	COMPOSITE output	
DVI	○	×	×	Only digital (Single Link) signals are output.
NTSC	×	○	○	NTSC timing signals are output.
PAL	×	○	○	PAL timing signals are output.

4 HOW TO SAVE THE SETTINGS

The statuses established by the keys can be saved as programs. A total of 12 programs can be saved.

Setting procedure

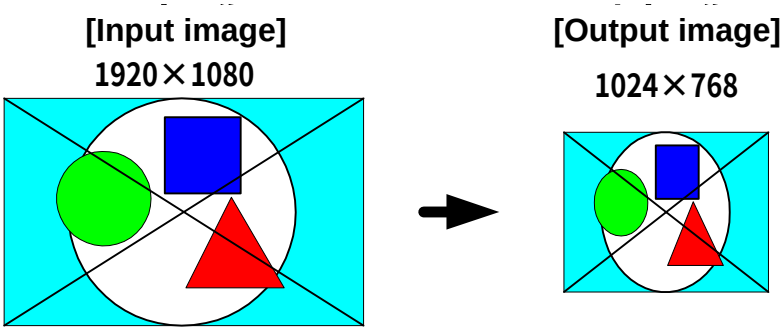
1. Select the number of the program in which the statuses are to be saved.
2. Press the Vf CTRL, ZOOM, POSITION, RESOLUTION and OUT SELECT keys to perform the corresponding settings.
3. Hold down the SAVE key.
4. All the LEDs of the selected POSITION, RESOLUTION and OUT SELECT keys go off. Continue to hold down the SAVE key until the LEDs come back on.

The status saving is completed as soon as the LEDs come back on.

5 OPERATION (operation examples for reference)

5.1 Zoom function

This function displays 1080p DVI input signals on the monitor with an XGA (1024 x 768) resolution. Its setting is saved in program No.5.



1. Keep pressing the PROGRAM key until the No.5 LED lights.

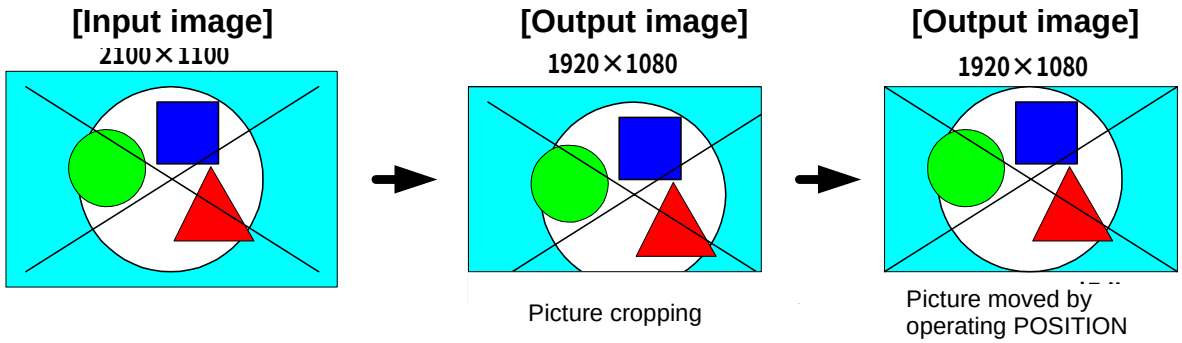
   (To save the settings, select the number of the program in which the settings are to be saved using the PROGRAM key.)

2. Set the zoom function to ON (LED lighted).
3. Keep pressing the RESOLUTION key until the No.6 LED lights.
4. If the image cannot now be displayed on the monitor, set the Vf CTRL key to ON (LED lighted), and set the output frame rate to 60 Hz.
5. Hold down the SAVE key to save the settings. Continue to hold down the SAVE key until the LEDs of all the PROGRAM, RESOLUTION and OUT SELECT keys go off and then come back on.

Note: If the settings do not need to be saved, steps 1 and 5 above may be skipped.

5.2 Picture cropping function

If the input resolution is greater than the output resolution (input resolution > output resolution), this function crops the picture without zooming, and displays it. Given as an example of the setting procedure below is a case where the output resolution was set to 1080p. This setting is saved in program No.8.



1. Keep pressing the PROGRAM key until the No.8 LED lights.

   (To save the settings, select the number of the program in which the settings are to be saved using the PROGRAM key.)

   Set the zoom function to OFF (LED off).

2. Keep pressing the RESOLUTION key until the No.1 LED lights.
3. If the image cannot now be displayed on the monitor, set Vf CTRL to ON (LED lighted), and set the output frame rate to 60 Hz.
4. Hold down the SAVE key to save the settings. Continue to hold down the SAVE key until the LEDs of all the POSITION, RESOLUTION and OUT SELECT keys go off and then come back on.

Note: If the settings do not need to be saved, steps 1 and 4 above need not be taken.

6 MAIN SPECIFICATIONS

6.1 Input signal specifications

Dot clock frequency	DVI	Single Link: 25 to 162 MHz, serial output (Panel Link) Dual Link 20 to 324MHz
Horizontal frequency		25 to 125 KHz
Number of vertical scanning lines		24 to 120 Hz
Horizontal sync period		2 dots or more (4dot at Dual Link Mode)
Vertical sync period		1 line or more
Horizontal display period		Less than 1920 dots (even number of dots only)
Vertical display period		Less than 1200 lines
Maximum number of pixels		2073600dot(1920×1080)
HDCP		Not supported

6.2 Output signal specifications

Dot clock frequency	DVI	Single Link: 25 to 162 MHz, serial output (Panel Link)
	Y/C	NTSC, PAL
	COMPOSITE	NTSC, PAL
Horizontal frequency		25 to 125KHz
Number of vertical scanning lines		24 to 120Hz
Horizontal sync period		2 dots or more
Vertical sync period		1 line or more
Horizontal display period		Less than 1920 dots (even number of dots only)
Vertical display period		Less than 1200 lines
Maximum number of pixels		23034000dot(1920×1200)
HDCP		Not supported

6.3 General specifications

Supply voltage	AC100 to 120V, AC200 to 240V
Power line frequency	50Hz/60Hz
Power consumption	30W
Dimensions	210 (W) × 44 (H) × 350 (D) mm (excluding protrusions)
Weight	Approx. 2.5 kg
Operating temperature	5 to 40°C
Storage temperature	-10 to 60°C
Operating humidity	30 to 85%RH (no condensation)

6.4 RS-232C port

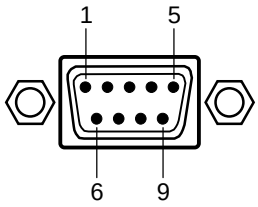


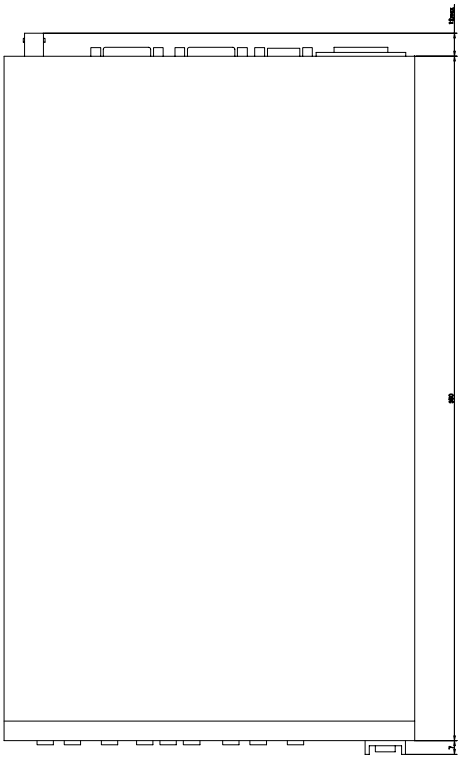
Fig. 11-3-10 Pin layout

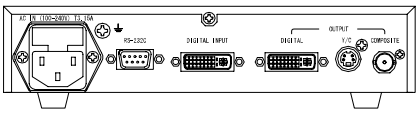
D-sub 9 pins, male

Table 11-3-7 Pin numbers

Pin No.	I/O	Signal
1	-	NC
2	O	TXD Transmit data
3	I	RXD Receive data
4	-	Short-circuited with pin 6
5	-	FG Frame ground
6	-	Short-circuited with pin 4
7	I	CTS Clear to send
8	O	RTS Request to send
9	-	NC

6.5 Exterior





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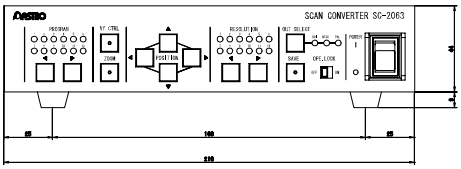
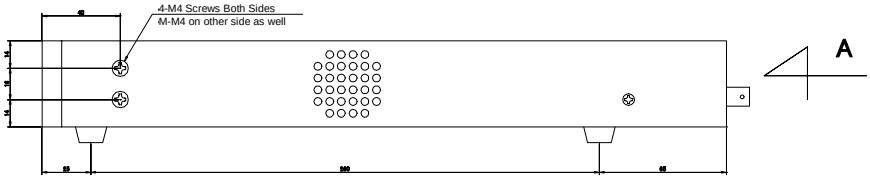




7 COPYTOOL

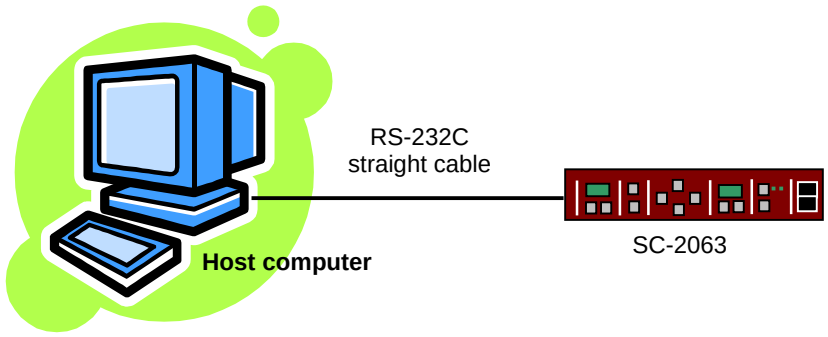
7.1 Outline

This software program is used to copy the data inside the SC-2063A into a personal computer.

7.2 Operating environment and connection method

Hardware	IBM PC AT or compatible machine (CPU Pentium 90 MHz or faster)
Operating system	Microsoft Windows 2000 or Windows XP
Display	640 x 480 dots or more, capable of displaying 256 or more colors
Transmission port	RS-232C（COM1-COM99）

Connections



Communication specifications

Transfer rate	38,400 bps
Communication system	Full duplex communication
Start bit	1 bit
Data length	8 bits
Stop bit	1 bit
Parity check	None
Flow control	None

7.3 Command specification

1. Command start

   ENQ (05H) must be sent to the SC-2063A at the start of a command.

   The SC-2063A will not accept any commands until it receives ENQ.

   ENQ need be sent only once, but no problems are posed if it is sent more than once.

2. Setting the program data

   Set the program data.

STX		0x02	
CMD1		0x20	
CMD2		0x4E	
Program number	2	bytes	“01 to 12”
“.”	1	byte	0x2C
Vf_Cont	1	byte	“0 to 1” ‘0’：OFF ‘1’：ON
“.”	1	byte	0x2C
Zoom	1	byte	“0 to 1” ‘0’：OFF ‘1’：ON
“.”	1	byte	0x2C
Position (X coordinate)	4	byte	“0000 to 9999”
“.”	1	byte	0x2C
Position (Y coordinate)	4	bytes	“0000 to 9999”
“.”	1	byte	0x2C
Resolution	2	bytes	“00 to 12” ‘0’：All LEDs off.
“.”	1	byte	0x2C
OUT SEL	1	byte	“0 to 2” ‘0’：DVI ‘1’：NTSC ‘2’：PAL
“.”	1	byte	0x2C
Spare	6	bytes	
“.”	1	byte	0x2C
(Special order identification)	1	byte	“0,A to Z” ‘0’: Standard ‘A to Z’: Special order identification
(Firmware Version)	2	bytes	“00 to 99”
ETX		0x03	
BCC		Check sum	

Returned values from SC-2063A

ACK: Normal termination

NAK: Command communication error

PARM_ERR: Parameter error

3. Capturing the program data

STX		0x02	
CMD1		0x30	
CMD2		0x4E	
Program number	2	bytes	“01 to 12”
PARM		Change specified	2 bytes
ETX		0x03	
BCC		Check sum	

Returned values from SC-2063A

Normal:

STX		0x02		
TRDT		0x10		
Program number	2	bytes		“01 to 12”
“.”	1	byte		0x2C
Vf_Cont	1	byte		“0 to 1” ‘0’：OFF ‘1’：ON
“.”	1	byte	0x2C	
Zoom	1	byte		“0 to 1” ‘0’：OFF ‘1’：ON
“.”	1	byte		0x2C
Position (X coordinate)	4	bytes		“0000 to 9999”
“.”	1	byte		0x2C
Position (Y coordinate)	4	bytes		“0000 to 9999”
“.”	1	byte		0x2C
Resolution	2	bytes		“00 to 12” ‘0’：All LEDs off.
“.”	1	byte		0x2C
OUT SEL	1	byte		“0 to 2” ‘0’：DVI ‘1’：NTSC ‘2’：PAL
“.”	1	byte		0x2C
Spare	6	bytes		
“.”	1	byte		0x2C
Special order identification	1	byte		“0,A to Z” ‘0’: Standard ‘A to Z’: Special order identification
Firmware Version	2	bytes		“00 to 99”

NAK: Command communication error

4. Setting the program number

Set the program number.

STX		0x02	
CMD1		0x20	
CMD2		0x50	
Program number	2	bytes	“01 to 12”
ETX		0x03	
BCC		Check sum	

Returned values from SC-2063A

ACK: Nommand communication error

PARM_rmal termination

NAK: CoERR: Parameter error

5. Capturing the program number

Capture the program number which has been selected.

STX	0x02
CMD1	0x30
CMD2	0x50
ETX	0x03
BCC	Check sum

Returned values from SC-2063

Normal:

STX		0x02	
TRDT		0x10	
Program number	2	bytes	“01 to 12”
ETX		0x03	
BCC		Check sum	

NAK: Command communication error

SC-2063A Instruction Manual

NOTICE

- An incorrectly collated manual or a manual with missing pages will be replaced.
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- The contents of this manual are subject to change without prior notice due to improvements.
- The manufacturer will not be liable for any effects caused by incorrect operation.
- All inquiries concerning this product should be addressed to your dealer or to the manufacturer at the contact numbers given below.
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T0163

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