VG-862

Instruction Manual

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Ver. 1.1

ASTRODESIGN, INC.

Contents

FOREWORD

Thank you for purchasing the model VG-862 video signal generator.
This manual provides details on how to operate the VG-862 and the precautions to be heeded when doing so. Since improper handling may lead to accidents, we recommend that you take the time to read through this manual without fail before attempting to operate the VG-862: the information provided will ensure that you will operate the VG-862 properly.
After reading through the manual, keep it in a safe place for future reference.

SAFETY PRECAUTIONS

⚠ WARNING

Concerning foreign matter

- Do not spill liquids onto the board or drop inflammable objects or metal parts onto it. Operating the generator under these conditions may cause a fire, electrical shock or malfunctioning.

⚠ CAUTION

Handling the board

- The driver supplied with this generator is for use only with operations performed in Windows 98.
- Handle this board carefully since it is composed of precision components.
- Do not allow the board to be thrown onto a carpet, plastic case or other such surface.
- Never touch the board's edge connector area.
- If the board is not going to be used for an extended period of time, place it inside the bag in which it came sealed and keep it in a safe place.
- No protection circuits are incorporated into the DVI outputs due to the constraints imposed by the circuit configuration. Before connecting or disconnecting a cable, be absolutely sure to turn off the power. (Otherwise, malfunctioning may result.)

Concerning impact

- This is a precision piece of equipment and, as such, subjecting it to impact may cause malfunctioning.
  Take special care when moving the generator.

When trouble or malfunctioning occurs

- In the unlikely event that trouble or malfunctioning should occur, first turn off the power, and then contact your dealer or an Astrodesign sales representative.

CHAPTER 1
GENERAL DESCRIPTION OF VG-862 HARDWARE

This chapter presents a general introduction to the hardware featured in the model VG-862 programmable video signal generator.

1.1 Introduction

VG-862 (PCI board type of signal generator designed specifically for digital output signals)

The model VG-862 is a PCI bus type of video signal generator which is designed to be used solely with digital output signals. Its horizontal frequency setting accuracy is defined in 2-dot increments, and its maximum dot clock output covers the 165 MHz range.
Using the accessory SP-8022 software program, the generator supports timing and pattern editing functions, pattern preparation functions offering a high degree of freedom and using the GUI, and natural image display functions.
This generator lives up to its reputation when it is incorporated in various inspection devices.

(Complies with PCI Bus Specification Revision 2.1)

* With Windows 98, more than one VG board (VG-860, VG-861 and/or VG-862) cannot be installed and used at the same time.

* With Windows 2000, both the VG-861 and VG-862 boards can be installed and used at the same time.

1.2 Features

◊ **Dot clock frequencies spanning a wide band**

The frequencies used by the dot clock output signals cover a wide range from5 MHz to 165 MHz, enabling the inspection of displays up to the UXGA class. The horizontal timing data can be set to an accuracy defined in 2-dot increments across the entire frequency spectrum.

◊ **Windows-compatible software program**

Using the SP-8022-2 software program, the VG-862 is capable of editing, registering and executing timing and pattern data. The pattern data editing functions enable the execution of pattern preparation functions which use the GUI and have a much greater degree of freedom than in the past, and they enable JPEG/BMP and other natural images (in full color) to be displayed.

◊ **Simple data control functions with a higher degree of freedom**

Timing data and pattern data can be organized separately in their own files. Control over this data can easily be exercised by such features as the list display, sort function and naming function.

◊ **Sample data**

Available as sample data are timing data, pattern data, palette set data, user character data and font data. These types of data can be combined as desired and the desired output signals delivered.

◊ **Hardware cursor function featured**

The hardware has been provided with a cursor function which is used for missing pixel inspections, etc.

CHAPTER 2
VG-862 BOARD SETTINGS

This chapter deals with the hardware settings of the VG-862 board, and describes aspects ranging from the personal computer environment and the installation method to startup.

2.1 Personal computers compatible with VG-862 board

The VG-862 board is operable with most computers that use the PCI (Peripheral Component Interconnect) bus, a worldwide standard.

Note: Depending on the configuration of the personal computer system, the VG-862 board may not operate properly if there are not enough resources and the generator is contending with other boards.

Note: Personal computer compatibility is being updated all the time. Direct any inquiries to the Astrodesign's sales division.

2.2 Installation method

In order for the VG-862 board to operate properly, ensure that it is used within the conditions set forth in the table below. Since the VG-862 PCI board is installed in the personal computer for use, every effort should be made to ensure that the operating environment and ratings of the computer are satisfied.

1. In order to protect the performance of the VG-862 board's video signals from interference, avoid inserting the VG-862 board into a slot next to a board which generates a significant level of noise.

2. Before removing the computer's cover, make absolutely sure that its power has been turned off. Follow the instructions given in the computer's manual and proceed.

3. In order to avoid interference with other boards, insert the VG-862 board into a slot which is as far away as possible from those boards. Remove the computer's blind cover and store it where it will not be lost.

4. When inserting the board, push it straight in perpendicularly to the PCI backplane without bending it in any way. Screw down the VG-862 board's metal fitting to anchor it securely.

5. Follow the instructions given in the computer's manual, and attach the computer's cover.

6. After having installed the computer, securely connect the video output cable of the monitor which is to be tested to the D-Sub connector on the VG-862 board's metal fitting, and secure the screws at the two ends to ensure the cable will not be disconnected.

Note: When the VG-862 board is installed, the system settings must not be changed by any individual who is not technically qualified in and thoroughly familiar with computer systems. Otherwise the system may fail to start up.
Before proceeding with the installation, ensure that all the software files (on the hard disk,etc.)are backed up.
Astrodesign will not be liable for any trouble even if it is caused by the VG-862 board.

2.3 Turning the computer's power ON and OFF

Before turning on the computer's power check again the connections between the VG-862 and monitor which is to be tested. Connect the AC power cables of the monitor and computer to 3-pin grounded power outlets.

Turn on the power in the following order:

1. First, turn on the computer's power.
2. Then turn on the monitor's power.

Note: Although the situation differs from one computer to the next, the resource data cannot be used if there is any contention for it. Make inquiries with the manufacturer of your computer. Alternatively, remove the PCI board which is in contention with the VG-862.

Note: After the power has been turned on, nothing is displayed on the monitor which has been connected to the VG-862. Install the SP-8022 application software program that accompanies the VG-862 generator, and then proceed to create or execute the timing, pattern, palette set and other data.

Turn off the power by following the turn-on sequence in reverse.

Note: The system settings must not be changed by any individual who is not technically qualified in and thoroughly familiar with computer systems. Otherwise the system may fail to start up. Astrodesign will not be liable in the event that the software program needs to be re-installed, data on the hard disk has been destroyed and or any other types of trouble have occurred.
Be absolutely sure to make backups of the software program before initiating any changes.

CHAPTER 3
GENERAL DESCRIPTION OF SP-8022-2 SOFTWARE PROGRAM

This chapter presents an overview of the SP-8022-2 application software program that accompanies the VG-862 generator, and it describes its installation.

3.1 Overview

The SP-8022-2 software program enables the VG-862 generator to be controlled from Windows 98/2000. By way of incorporating the easy-to-operate features of Windows thanks to the GUI (Graphical User Interface), it enables timing, pattern, action and other data to be edited and executed with ease.
Edited data can be saved in the computer and controlled altogether as sequence files.

The following functions can be implemented using SP-8022:

- Editing, control and execution of timing data
- Editing and execution of pattern data (graphic pattern, optional pattern and BMP pattern data)
- Editing and execution of palette set data
- Setting and execution of action data

In order to implement these functions, the driver operates in cooperation with the software program.

Driver

In the process of its initialization which is executed from the operating system, the driver searches the PCI board and captures data. Upon completion of its initialization, it supports such functions as providing PCI data and transferring data in response to requests from the library.

Application software (SP-8022-2)

This is a GUI-based editing and execution software program.
It controls the VG-862 board, and it edits and executes the data.

3.2 Operating environment

Processor	: Pentium 133 MHz or higher recommended
Memory	: 32 MB or more recommended
Free space on hard disk	: At least 32 MB
Display resolution	: 800 x 600 recommended

Operating system

Windows 98, Japanese/English version
Windows2000 Japanese/English version

BIOS

PCI BIOS ver.2.1 or higher

3.3 Supply format

Installation disk

SP-8022-2 installation CD x 1

3.4 Software installation (Windows 98)

This section explains how to install the files for running the SP-8022-2 program in Windows 98/2000.
The explanation involves the disk mentioned below.

Windows 98/2000 SP-8022-2 installation disks: CD x 1

3.4.1 Installing the driver

First, install the driver.

(1) When installing VG-862 for the very first time

l) After Windows 98 has started up, the system recognizes the VG-862, and the add new hardware dialog box appears. Select the driver provided by hardware manufacturer option, and press [OK].

2) The "Install from floppy disk" dialog box is now opened. Insert the SP-8022-2 installation disk into the CD disk drive, set CD disk drive \SP8022 as the "Copy source of the files to be copied," and press [OK].

3) Upon completion of the installation, the dialog box for verifying system restart appears. Select [Yes], and restart the system.

(2) When replacing the VG-862 driver

1) Select Settings from Start, and then select Control Panel. From Control Panel, select System. Now select Device Manager on the System Properties screen.

2) A device identified by "VG-862" will be present in the system devices item. Select this, and press the Properties button. Select driver in VG-862 properties, and press the Change driver button.

3) Select other divices in Select hardware type, and press [OK].

4) Press the Use disk button on the Select devices dialog box.

5) Insert the installation disk into the CD disk drive, enter the CD disk drive name as the "Copy source of the files to be copied," and press [OK].

6) Select the relevant model of the VG-862 as Model, and press [OK].

7) Installation now commences. You may be asked again for the whereabouts of"VVG86.inf" in which case you should enter the name of the CD disk drive.

8) Restart the system. The driver installation is now complete.

* Operation may not proceed normally in the event of contending interrupts. In a case like this, set a sufficient interrupt space.

3.4.2 Installing the SP-8022-2

l) Next, install the SP-8022-2 application software program. Insert the SP-8022-2 installation disk into the CD disk drive, and proceed with the following Windows settings: Start → Settings → Control Panel → Add/Remove Programs → Install. The installer now operates, and setup commences.
(Alternatively, execute the \SP8022\SETUP.EXE file on the CD disk drive.)

2) First, the Welcome dialog box appears.
Now follow the instructions which appear in the dialog boxes to proceed with the installation.

3) Upon completion of the installation, restart the system. The SP_8022.bat file is run only once, and the attributes of the files in the SampleData directory are changed to read-only.

4) This now completes the installation. Access and read the GUIde Help by selecting Start in Windows → Programs → SP-8022-2. Similarly, start Sequence Editor by seiecting Start → Programs → SP-8022-2.

3.4.3 How to uninstall the program

From Start in Windows 98, select Settings → Control Panel → Add/Remove Programs → SP-8022. Delete SP-8022-2.
If the program is to be re-installed, first delete the file and registry settings by uninstalling the program. If any of the previous files still remain, Windows may not operate properly.

The data files in the Sample Data directory are read-only files and so will not be deleted by uninstallation. Delete these files separately. Since the drivers will not be deleted by uninstallation either, they should also be deleted separately.

3.4.4 Concerning directory files

The table below lists the directories created by installation.

Directory name	Directory name	Directory name	
Designated directory (default: SP-8022-2)	SampleData (all the files under this directory have read-only properties)		Data files
			Sample.seq
		Action	Sample file
		FontSet	Sample file
		PalSet	Sample file
		Pattern	Sample file
		Timing	Sample file
		UserChar	Sample file
		Trash	None (creation of directory only)
	Temp		None (creation of directory only)
	EXE		Execution file
			ActEdit.exe
			CharEdit.exe
			FontEdit.exe
			GpcEdit.exe
			OptEdit.exe
			PalEdit.exe
			SeqEdit.exe
			SeqExec.exe
			TimEdit.exe
			VbmCvt.exe
			ActFile.dll
			CharFile.dll
			CMDDLL.dll
			CVSBMP.dll
			FontFile.dll
			GpcFile.dll
			GpcOpnSav.dll
			GUICmn.dll
			LimitDll.dll
			OptPtnFile.dll
			PalFile.dll
			RegDll.dll
			SeqFile.dll
			TimFile.dll
			TransDll.dll
			SP_VG.msg
			SPErr.msg
			VGErr.msg
			bcbsmp35.bpl
			vcl35.bpl
			vclx35.bpl
			borlndmm.dll
			cp3240mt.dll
			ImgCom3.dll
			imged32.dll
			ImgEtc3.dll
			ImgFile3.dll

Designated directory (default: SP-8022-2)	OptDoc	ImgTiff3.dll
		Optional pattern creation file
	Help	OPT_make.txt
		Help file
		ActEdit.hlp
		CharEdit.hlp
		FontEdit.hlp
		GpcEdit.hlp
		GUIde.hlp
		Make_opt.hlp
		OptEdit.hlp
		PalEdit.hlp
		SeqEdit.hlp
		SeqExec.hlp
		TimEdit.hlp
		VbmCvt.hlp
		Vgerrmsg.hlp
		ActEdit.CNT
		CharEdit.CNT
		FontEdit.CNT
		GpcEdit.CNT
		GUIde.CNT
		Make_opt.CNT
		OptEdit.CNT
		PalEdit.CNT
		SeqEdit.CNT
		SeqExec.CNT
		TimEdit.CNT
		VbmCvt.CNT

File which is copied into the [Windows]-[System] directory by the driver installation:
VVG86.VXD

File which is copied into the [Windows]-[Inf] directory by the driver installation:
VVG862.INF

3.4.5 Description of directories

EXE directory
The SP-8022-2 execution files are to be found here.

SampleData directory
The data files used by the data editing programs are to be found here.

OptDoc directory
The text which explains how to create optional patterns is to be found here.

Help directory
The help files are to be found here.

3.4.6 Concerning the use of the Registry

Registry items are added by the Windows 98 driver installation program. They are registered in the Registry as follows.

HKEY_CURRENT_USER
\Software\Astrodesign\SP8022\

To uninstall the program, delete all the data following \SP8022.

3.4.7 Description of installation disk

The files listed below are to be found on the installation disk.
SP-8022-2 installation disk

INST32I.EX
_ISDEL.EXE
_SETUP.1
_SETUP.DLL
_SETUP.LIB
AUTORUN.INF
DISK1.ID
SETUP.EXE
SETUP.INI
SETUP.INS
SETUP.ISS
SETUP.PKG
VVG86.VXD
VVG862.INF

CHAPTER 4
APPENDIX

4.1 Specifications

Item	Specification
TMDS dot clock frequency	25 to 165 MHz
LVDS dot clock frequency	20 to 85 MHz
Horizontal frequency setting accuracy	2-dot increments across entire frequency range
Horizontal frequency, number of horizontal dots	10 to 300 kHz, max. 4096 dots
Vertical frequency, number of vertical scanning lines	15.6 to 200 Hz, max. 4096 lines
Video memory	2K x 2K x 24 bits (bitmap)
Number of colors generated simultaneously	16.77 million colors
Output control	ON/OFF: R, G, B Polarity reversal, ON/OFF
Scanning	Non-interlaced, interlace & sync, interlace & video

4.2 Restrictions

Item	Minimum value	Maximum value
Setting accuracy	2 dots	
Horizontal frequency	10 kHz	300 kHz
Vertical frequency	15.6 Hz	200 Hz
H_TOTAL	68	4096 dots
H_SYNC	2 dots	
H_BP	0dot	
H_DISP	26	2048 dots
H_FP	0 dots	
H_BLANK	42 dots	
H D	2 dots (HS output switching)	
V_TOTAL	4	4096
V_SYNC	1	
V_BP	0	
V_DISP	1	2048
V_FP	0	
PANELLINK	25MHz	165 MHz
LVDS	20MHz	85 MHz

Notes: Due to the chip specifications, the TMDS signals will not be output correctly when BP and FP are zero.
Since there is no character plane, the background and window scrolling cannot be combined. Vertical scrolling during interlacing is performed in 2-dot increments.

4.3 Ratings

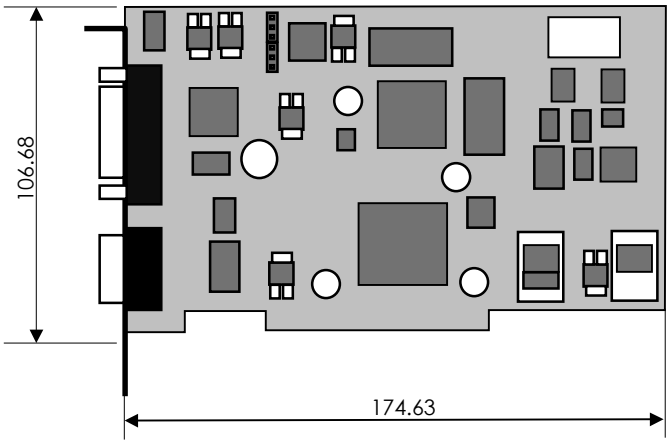
Slot	PCI 9054 (PLX)
Shape	106.68 mm x 174.63 mm (short-size PCI, excluding protrusions)
Weight	Approx. 0.3kg
Ambient operating temperature	5 to 40°C
Storage temperature	-10 to 60°C
Humidity	30 to 85% RH (no condensation)
Power consumption	15W max.

4.4 Accessories

Instruction manual	1 copy
SP-8022-2 (editing software program and drivers for Windows)	1 set

4.5 Outline drawing

Unit: mm



4.6 Connector pin layouts

4.6.1 Digital output connector

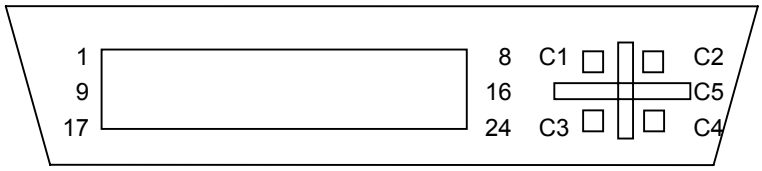
1) Connector: DVI-D

2) Pin layout

Connector pin no.	Input/output signal
1	TMDS DATA2-
2	TMDS DATA2+
3	TMDS DATA2/4 G
4	TMDS DATA4-
5	TMDS DATA24+
6	DDC CLK
7	DDC DATA
8	NC
9	TMDS DATA1
10	TMDS DATA1+
11	TMDS DATA1/3 G
12	TMDS DATA3-
13	TMDS DATA3+
14	+5V
15	GND
16	SENSE
17	TMDS DATA0-
18	TMDS DATA0+
19	TMDS DATA0/5 G
20	TMDS DATA5-
21	TMDS DATA5+
22	TMDS CLK G
23	TMDS CLK+
24	TMDS CLK-

Layout

Pin layout as seen from panel



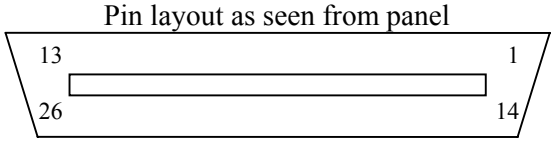
4.6.2 Digital output connector

1) Connector: 3M MDR 10226-1210-VE with 26 pins (compatible with FPD LINK(TM) and FLAT LINK(TM))

2) Pin layout

Connector pin no.	LVDS 8-bit transmitter output signal
1	GND
14	TxOUT/RxIN0-
2	TxOUT/RxIN0G
15	TxOUT/RxIN0+
3	NC
16	GND
4	TxOUT/RxIN1-
17	TxOUT/RxIN1G
5	TxOUT/RxIN1+
18	DDCSDA
6	TxOUT/RxIN2-
19	TxOUT/RxIN2G
7	TxOUT/RxIN2+
20	NC
8	NC
21	NC
9	DDCSCL
22	TxCLKOUT/RxCLKIN-
10	TxCLKOUT/RxCLKING
23	TxCLKOUT/RxCLKIN+
11	+5V
24	+5V
12	TxOUT/RxIN3-
25	TxOUT/RxIN3G
13	TxOUT/RxIN3+
26	GND

Pin layout as seen from panel



Note: Clock delays cannot be set at the LVDS outputs.
***** When signals are input to a 6-bit LVDS device, operation is enabled by connecting the TxOUT0, TxOUT1, TxOUT2 and TxCLKOUT differential pair lines.

4.7 LVDS device pin compatibility table

LVDS device: Thine (or National Semiconductor, Texas Instruments)
Transmitter: THC63LVDM83A

Input pin		LVDS 8-bit signal
THINE	NS	1CH
T(R)A0	TxIN/RxOUT 0	RA2
TA1	TxIN/RxOUT 1	RA3
TA2	TxIN/RxOUT 2	RA4
TA3	TxIN/RxOUT 3	RA5
TA4	TxIN/RxOUT 4	RA6
TA5	TxIN/RxOUT 6	RA 7 (MSB)
TA6	TxIN/RxOUT 7	GA2
TB0	TxIN/RxOUT 8	GA3
TB1	TxIN/RxOUT 9	GA4
TB2	TxIN/RxOUT 12	GA5
TB3	TxIN/RxOUT 13	GA6
TB4	TxIN/RxOUT 14	GA 7 (MSB)
TB5	TxIN/RxOUT 15	BA2
TB6	TxIN/RxOUT 18	BA3
TC0	TxIN/RxOUT 19	BA4
TC1	TxIN/RxOUT 20	BA5
TC2	TxIN/RxOUT 21	BA6
TC3	TxIN/RxOUT 22	BA 7 (MSB)
TC4	TxIN/RxOUT 24	HS
TC5	TxIN/RxOUT 25	VS
TC6	TxIN/RxOUT 26	DISP
TD0	TxIN/RxOUT 27	RA0 (LSB)
TD1	TxIN/RxOUT 5	RA1
TD2	TxIN/RxOUT 10	RA 0 (LSB)
TD3	TxIN/RxOUT 11	GA1
TD4	TxIN/RxOUT 16	BA1 (LSB)
TD5	TxIN/RxOUT 17	BA1
TD6	TxIN/RxOUT 23	SW0

* This bitmap is based on the DISM1.0 bitmap.
* Bear in mind that the names given to the least and most significant bits of R, G and B differ from one device manufacturer to another.
* This pin layout is compatible with the devices made by Thine, National Semiconductor and Texas Instruments.

4.8 Tables of error codes

4.8.1 Error messages that may be displayed by the SP-8022

The various error messages which may be displayed by the SP-8022 are listed below.

Error message	Code (H)	Description
Parameter Error	0101	Parameter error
DotClock Range Error	0110	Dotclock in the horizontal timing data is outside the specified range.
Hfrontp Range Error	0111	The front porch in the horizontal timing data is outside the specified range.
HD(start+Width)Range Error	0112	HD in the horizontal timing data is outside the specified range.
Hperiod Range Error	0113	Hperiod in the horizontal timing data is outside the specified range.
Hdisp Range Error	0114	Hdisp in the horizontal timing data is outside the specified range.
Hsync Range Error	0115	Hsync in the horizontal timing data is outside the specified range.
Hbackp Range Error	0116	Hbackp in the horizontal timing data is outside the specified range.
Hblanking Range Error	0117	The blanking period in the horizontal timing data is outside the specified range.
Hfreq Range Error	0118	The horizontal frequency in the horizontal timing data is outside the specified range.
Other H-Timing Data Error	0119	Other error in the horizontal timing data.
Vtotal Range Error	0120	Vtotal in the vertical timing data is outside the specified range.
Vdisp Range Error	0121	Vdisp in the vertical timing data is outside the specified range.
Vsync Range Error	0122	Vsync in the vertical timing data is outside the specified range.
Vbackp Range Error	0123	Vbackp in the vertical timing data is outside the specified range
Vfrontp Range Error	0124	The front porch in the vertical timing data is outside the specified range.
Vblanking Range Error	0125	The blanking period in the vertical timing data is outside the specified range.
Vfreq Range Error	0126	The vertical frequency in the vertical timing data is outside the specified range.
VD(Start+Width) Range Error	0127	VD in the vertical timing data is outside the specified range.
Veqpfp Range Error	0128	EQPfp in the vertical timing data is outside the specified range.
Veqpbp Range Error	0129	EQPbp in the vertical timing data is outside the specified range.
Other V-Timing Data Error	012A	Other error in the vertical timing data.
Timing Data Disable	0130	Timing data disable error.
Pattern Data Disable	0131	Pattern data disable error.
FlashMemory write Error	0140	Flash memory card writing error.
User Character Code Error	0141	User character code is outside the specified range.
User Character Size Error	0142	User character size is outside the specified range.
Timing NO Error	0143	Timing number is outside the specified range.
Palette NO Error	0144	Palette number is outside the specified ranae.
FontSet NO Error	0145	Font number is outside the specified range.
FontSet FAT Error	0146	Font data call error.
FontSet Data Not Regist	0147	Font data error.
Pattern NO Error	0148	Pattern is not registered.
Pattern Data Size Over	0149	Pattern data size is outside the specififed range.
Pattern Data Not Regist	014A	Pattern data error.
Pattern FAT Error	014B	Pattern data call error.
Pattern Data Size Over	014C	Pattern data size outside specified range error.
Flash Firm Disable	0150	Flash card disable error.
Flash Firm Write Error	0151	Flash card writing error.
Write Flash while Firm Working	0152	Flash card writing error.
Communication TimeOut	01F0	Communication timeout error.

Undefined Command	01F1	Undefined command error.
V-Sync Timeout	01F2	V-sync timeout error.

4.8.2 Error messages that may be displayed when optional patterns are created

The various error messages which may be displayed when optional patterns are created are listed below.

Error message	Code (H)	Description
Program not Exist	0201	Program has not been loaded.
Variables Stack Error	0202	Variable stack error. (Overflow or underflow) An overflow may occur when the number of hierarchical levels increases for the functions that have declared many variables.
Register Stack Error	0203	Register stack error. (Overflow or underflow) An overflow may occur when the calculation formula is too complex.
Call Stack Error	0204	Function call stack error. (Overflow or underflow) An overflow occurs when the number of function call hierarchical levels exceeds 64.
Illegal Instruction Code	0205	An attempt was made to execute an illegal command. The compiled program may have been destroyed.
Divide by Zero	0206	Division by zero was executed.
Math Error	0207	Mathematical error
Unfinished Error	0214	The program was terminated part of the way through. This may occur if the parentheses ( ) are not paired up properly
Program Size too Big	0215	The program size is too big.
Variables Area Overflow	0216	The variable area has overflowed.
Illegal Character	0217	An illegal character has appeared.
Numeral Buffer Overflow	0218	A character string expressing a number is too long
String Buffer Overflow	0219	The character string has more than the maximum 255 characters.
malloc Fail	021A	Insufficient memory
No Semicolon	021B	The statement does not end with a semicolon.
Variable Not Defined	021C	An undefined variable was used.
Illegal Expression	021D	The type of expression is not correct.
Illegal Expression for Real	021E	The type of expression using real numbers is not correct. This occurs when a bit inversion operation is perforrned for a real number.
Unbalanced Parenthesis ( )	021F	The parentheses ( ) are not paired up properly.
Unbalanced Bracket [ ]	0220	The brackets [] are not paired up properly.
Symbol Solve Error	0221	The correspondence between the symbol (variable name or function name) definition and reference is illegal.
Multiple Symbol Definition	0222	The same symbol has been defined more than once.
‘main ( )’ Definition Error	0223	“main” function definition error.
‘goto’ Statement Error	0224	“goto” statement error.
‘return’ Statement Error	0225	“return” statement error.
Return Type Error	0226	The type of function return value is illegal.
‘if’ Statement Error	0227	“if” statement error.
‘while’ Statement Error	0228	“while” statement error.
‘do’ Statement Error	0229	“do” statement error.
‘for’ Statement Error	022A	“for” statement error.
‘switch’ Statement Error	022B	“switch” statement error.
‘case’ Statement Error	022C	“case” statement error.
Too Many ‘case’ Statement	022D	Too many “case” statements have been used. Up to 127 “case” statements can be used per “switch”.
‘default’ Statement Error	022E	“default” statement error.
break’ Statement Error	022F	“break” statement error.

'continue' Statement Error	0230	"continue" statement error.
Argument Type Error	0231	Illegal type of function argument.
Number of Argument Error	0232	Illegal number of function arguments.
Function Call Error	0233	Illegal function call.

Error message	Code (H)	Description
Function Declare Error	0234	Illegal function declaration.
Variable Declare Error	0235	Illegal variable declaration.
Argument Declare Error	0236	Illegal function argument declaration.
Variable Initialize Error	0237	Illegal variable initialization.
Array Declare Error	0238	Illegal array variable declaration.
Mode Error (Write or Not)	0264	Illegal object control mode.
Code Poke Offset Error	0265	Error in offset during code writing.
Parser Error	0266	Parsing status error.
Expression Error	0267	Numerical expression analysis status error.
Build-In Function Error	0268	Built-in function error.
User Function Error	0269	User-defined function error.
Internal Label Error	0270	Label control error in parsing.

4.8.3 Error messages that may be displayed from the driver

The various error messages which may be displayed from the driver are listed below.

Error message	Code (H)	Description
Driver: Command Execution Timeout.	0840	Driver: Command execution timeout
Driver: :Command Parameter Error.	0841	Driver: Parameter error.
Driver: :Control Port Not Ready	0842	Driver: Data cannot be written into control port.
Driver: :Data Port Write Timeout.	0850	Timeout for writing data into data port.
Driver: :Data Port Read Timeout.	0851	Timeout for reading data from data port.
Driver: :DMA Timeout	0860	DMA execution timeout.
Driver: :DMA Illegal Page	0861	DMA memory error.
Driver: :DMA Linear Lock	0862	DMA memory lock error.
Driver: :DMA Copy Page Table	0863	DMA memory page processing error.
Driver: :DMA Setup	0864	DMA setup error.
Driver: :DMA Start Ready	0865	DMA start error.
Driver: :DMA Start Complete	0866	DMA start completion error.
Driver: :DMA Trans Complete	0867	DMA transfer completion error.
Driver: :Wait Interrupt Timeout	0870	DMA transfer completion wait error.
Driver: :Parameter Error	087D	Parameter error.
Driver: :Device IO Control Error	087E	Driver call error.
Driver: :Device Open Error	087F	Driver open error.

4.8.4 Error messages that are displayed when created optional patterns are executed

The error messages that may be displayed when created optional patterns are are listed below.

Error message	Code (H)	Description
Option Pattern not exists	0081	User-created optional pattern does not exist.
Variables stack error	0082	Variable stack error.
Register stack error	0083	Register stack error.
Call stack error	0084	Function stack error.
Illegal instruction	0085	Illegal instruction code.
Divide by Zero	0086	Division by zero was executed.
Math error	0087	Error in floating decimal point calculation.