YASKAWA Electric Corporation

Sigma-7 Series AC Servo Drive

Two-Axis SERVOPACKs with Built-in Controllers

Sigma-7C

Sample Project File Ver.1.01

VGA, WSVGA, WXGA Common Edition

Technical Guide

Revision History

Revision No.	Date	Descriptions
00	20/10/2017	New
01	01/07/2022	Support ST6000 series Update 5-2. Target HMI Devices

Table of Contents

For the details of settings, refer to YASKAWA Electric Corporation Sigma-7-Series AC Servo Drive Sigma-7C SERVOPACK Troubleshooting Manual and Sigma-7C SERVOPACK Product Manual.

* The material above and other materials for Sigma-7C can be downloaded from YASKAWA Electric's technical information site.

* The communication driver and the connected device data copy tool must be Sigma-7C compliant. Download and install them from our Web site before using this sample project file.

1. Overview

This sample project file is for connecting the GP4000 / SP5000 / ST6000 series and YASKAWA Electric Corporation Two-Axis SERVOPACKs with Built-in Controllers Sigma-7C. By using this project, you can troubleshoot the controller section and maintain the SERVOPACK from the display unit. The main functions of this sample project file are as follows.

Controller Section)

- Various registers required for troubleshooting can be monitored without using a dedicated tool.

- Details of the error generated in Sigma-7C Controller Section can be checked.

- Abnormality content is identified based on the LED and the alarm code displayed on the CPU, and troubleshooting and sections to be checked are displayed. Since the alarm code is converted into a message and the related items are displayed, the cause of the alarm can be quickly identified.

- Maintenance monitor settings of MPE720 is read, and power consumption and predicted life for each axis can be checked by using a bar graph. Power consumption can be displayed by means of a chart in any combination of axes.

Servo Section)

- Sigma-7 Series Display Edit Parameters.

- Sigma-7 Series Display Monitor (Operation, State, I/O, Alarm)

- Able to achieve trace function.

Common)

- Able to display QR code.

- Able to use in combination with sample of communication message type (for slave).

2. Notes

1. The intellectual property rights for the files provided by Schneider Electric Japan Holdings Ltd. belong to us.

2. Downloaded files and the data extracted from those files are no guarantees of our product specifications. Please be aware of this fact.

3. The liability for use of this service lies with the customer.

4. In any case, this is not intended as a warranty for any work for a system that makes use of the data on these screens.

5. For models that can operate in this sample project, please refer to the chapter

"5.2. Target HMI Devices" in this manual.

6. Any modifications made to this service by a customer are entirely at the responsibility of the customer.

7. Please be aware that we cannot respond to any inquiries for the purpose of modifying these data.

8. The content and information in the data on these screens and documentation are subject to change without prior notification.

3. Restrictions

  This screen data is taken from screenshots showing the representative features and functions of the GP4000 / SP5000 / ST6000 series.

  When using the sample project file, be sure to reference our product manual or the connection device manual, including the usage restrictions and safety precautions. In addition, please be aware that we are unable to accept responsibility for damage arising from reasons that cannot be attributable to us, loss of customer opportunity or profit arising from the malfunction of our product, damage arising from special circumstances regardless of whether or not we had foreknowledge of those circumstances, secondary damage, compensation for accidents, damage to our products, or other business-related guarantees.

4. How to use this project file

When using this project file (henceforth known as "the file"), be sure to confirm the following details:

1) When using the file as-is

  Confirm the communication settings.

  When using this file as-is, transfer it in GP-Pro EX to a display console with a touch panel.

  When connecting, refer to section "5. Device Configuration" of this Instructions for Use.

  For networking cables, refer to sections "5.5. Communication settings" of this Instructions for Use.

2) How to combine with other files

  In GP-Pro EX, select [Project] → [Utilities] → [Copy from Another Project].

  For further details, refer to GP-Pro EX Reference Manual.

  However, there are issues to be aware of, such as overlapping screen numbers, so also refer to sections 3) and later.

3) Screen numbers when combining

  There may be times when things get overwritten, such as when there are duplicate screen numbers.

  When combining the file with a file currently being created, be aware of the screen numbers.

  Refer to section "5.2. Screen transitions" for screen numbers that are being used by the file.

  When combining with 2), it is possible to designate a copy destination screen number before starting to copy. Before combining, be sure to either designate a screen number when copying, or change the screen number in advance.

  When changing a screen number, be sure to also change the screen number for the screen replacement switch.

  Be aware that if no changes are made to the screen replacement destination screen number, unexpected operations may occur.

4) Changing addresses

When changes are made to the address of a connection device that has been configured on the screen, it will not operate properly.

Do not make changes to these addresses.

5. Device Configuration

5-1. System Configuration

Sigma-7C SERVOPACK is connected to the HMI device by Ethernet.

Σ-7C can have a maximum 6 - axis configuration (internal 2 axes + 4 external axes via MECHATROLINK–III connection) and this sample project file can be used with the same configuration.
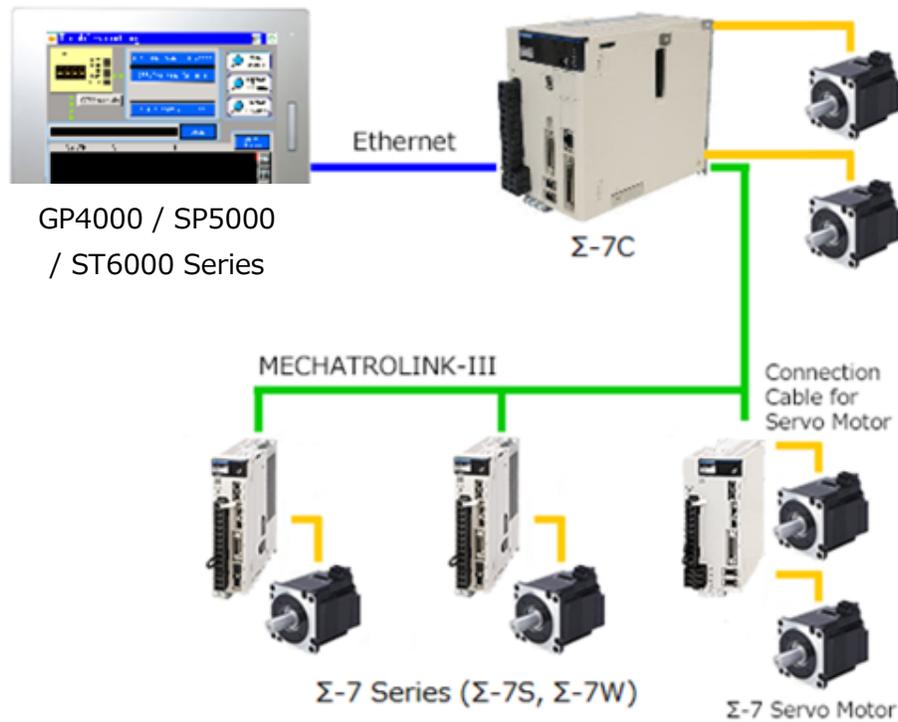
*The connection above is an example.

Figure 5-1 System Configuration

5-1-1. 1:1 connection configuration

Between Display and MP series: Ethernet connection
Between MP series and Inverter series: MECHATROLINK connection
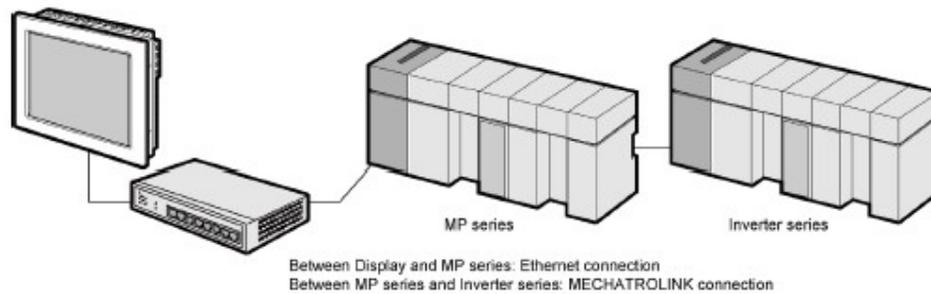
Figure 5-2 1:1connection

This sample project file is created for a 1:1 connection system. To use it in a 1:n connection system, you will need to modify the project.

Refer to *GP-Pro EX Device/PLC Connection Manual* for the details of connection.

5-2. Target HMI Devices

The following shows the display device types for use with this sample project file.

The module name below is the module selecting on GP-Pro-EX

The notation in table point the below project file.

VGA : connection_gp4501_v_YAS- Sigma7C_ml_Ver101.prx
WSVGA : connection_st6500_wsv_YAS-Sigma7C_ml_Ver101.prx
WXGA : connection_st6600_wx_YAS-Sigma7C_ml_Ver101.prx

Table 5-1 Target HMI Devices

Series	Unit / Display Module	Target project module			
		VGA	WSVGA	WXGA	Remark
GP4000 Series	GP-4104				
	GP-4105				
	GP-4106				
	GP-4107				
	GP-4114T				
	GP-4115T				
	GP-4116T				
	GP-4115T3				GP-Pro EX Over Ver.4.07.300
	GP-4201T				
	GP-4201TM (Modular Type)				
	GP-4201TW				
	GP-4203T				
	GP-4301T				
	GP-4301TM (Modular Type)				
	GP-4301TW				
	GP-4303T				
	GP-4311HT	OK*1			GP-Pro EX Over Ver.4.06.000
	GP-4401T	OK*1			
	GP-4401WW				
	GP-4501T (Analog Touch Panel)	OK			
	GP-4501T (Matrix Touch Panel)	OK*1			

	GP-4501TW				
	GP-4503T	OK*1			
	GP-4521T	OK *1			GP-Pro EX Over Ver.4.07.300
	GP-4601T (Analog Touch Panel)	OK *2			
	GP-4601T (Matrix Touch Panel)	OK *2			
	GP-4603T	OK *2			
	GP-4621T	OK *2			GP-Pro EX Over Ver.4.07.300
	GP-4G01 VGA (640*480)	OK *1			GP-Pro EX Over Ver.4.07.000
	GP-4G01 SVGA (800*600)	OK *2			GP-Pro EX Over Ver.4.07.000
	GP-4G01 WVGA (800*480)				GP-Pro EX Over Ver.4.07.000
	GP-4000M (Rear Modular Type)				
LT4000 Series	LT-4201TM (Modular Type DIO)				
	LT-4201TM (Modular Type Analog)				
	LT-4301TM (Modular Type DIO)				
	LT-4301TM (Modular Type Analog)				
	LT-4000M (Rear Module DIO)				
	LT-4000M (Rear Module Analog)				
SP5000 Power Box (SP-5B10)	SP-5500TP VGA (640*480)	OK *1			
	SP-5500TP SVGA (800*600)	OK *2			
	SP-5600TP VGA (640*480)	OK *1			
	SP-5600TP SVGA (800*600)	OK *2			

	SP-5600TP XGA (1024*768)				
	SP-5600TA XGA (1024*768)				GP-Pro EX Over Ver.4.08.200
	SP-5660TP VGA (640*480)	OK *1			
	SP-5660TP SVGA (800*600)	OK *2			
	SP-5660TP XGA (1024*768)				
	SP-5700TP VGA (640*480)	OK *1			
	SP-5700TP SVGA (800*600)	OK *2			
	SP-5700TP XGA (1024*768)				
	SP-5700WC FWXGA (1366*768)		OK *2	OK *2	GP-Pro EX Over Ver.4.07.300
	SP-5800WC FWXGA (1366*768)		OK *2	OK *2	GP-Pro EX Over Ver.4.07.300
	SP-5400WA WVGA (800*480)				
	SP-5500WA WXGA (1280*800)		OK *2	OK *1	
	SP-5600WA WXGA (1280*800)		OK *2	OK *1	
	DC Power Supply Adapter SVGA (800*600)	OK *2			GP-Pro EX Over Ver.4.08.000
	DC Power Supply Adapter XGA (1024*768)				GP-Pro EX Over Ver.4.08.000
SP5000 Open Box (SP-5B40, SP-5B41, SP-5B41*)	SP-5500TP SVGA (800*600)	OK *2			
	SP-5600TP SVGA (800*600)	OK *2			GP-Pro EX Over Ver.4.06.100
	SP-5600TP XGA (1024*768)				
	SP-5600TA XGA (1024*768)				GP-Pro EX Over Ver.4.08.200

	SP-5660TP SVGA (800*600)	OK *2			GP-Pro EX Over Ver.4.06.100
	SP-5660TP XGA (1024*768)				
	SP-5700TP SVGA (800*600)	OK *2			GP-Pro EX Over Ver.4.06.100
	SP-5700TP XGA (1024*768)				
	SP-5700WC FWXGA (1366*768)		OK *2	OK *2	GP-Pro EX Over Ver.4.07.300
	SP-5800WC FWXGA (1366*768)		OK *2	OK *2	GP-Pro EX Over Ver.4.07.300
	SP-5400WA WVGA (800*480)				
	SP-5500WA WXGA (1280*800)		OK *2	OK *1	
	SP-5600WA WXGA (1280*800)		OK *2	OK *1	
	DC Power Supply Adapter SVGA (800*600)	OK *2			GP-Pro EX Over Ver.4.06.300
	DC Power Supply Adapter Other Resolution				GP-Pro EX Over Ver.4.06.300
SP5000 Standard Box (SP-5B00)	SP-5500TP VGA (640*480)	OK *1			
	SP-5500TP SVGA (800*600)	OK *2			
	SP-5600TP VGA (640*480)	OK *1			
	SP-5600TP SVGA (800*600)	OK *2			
	SP-5600TP XGA (1024*768)				
	SP-5600TA XGA (1024*768)				GP-Pro EX Over Ver.4.08.200
	SP-5660TP VGA (640*480)	OK *1			
	SP-5660TP SVGA (800*600)	OK *2			

	SP-5660TP XGA (1024*768)				
	SP-5700TP VGA (640*480)	OK *1			
	SP-5700TP SVGA (800*600)	OK *2			
	SP-5700TP XGA (1024*768)				
	SP-5700WC FWXGA (1366*768)		OK *2	OK *2	GP-Pro EX Over Ver.4.07.300
	SP-5800WC FWXGA (1366*768)		OK *2	OK *2	GP-Pro EX Over Ver.4.07.300
	SP-5400WA WVGA (800*480)				
	SP-5500WA WXGA (1280*800)		OK *2	OK *1	
	SP-5600WA WXGA (1280*800)		OK *2	OK *1	
	DC Power Supply Adapter SVGA (800*600)	OK *2			GP-Pro EX Over Ver.4.08.000
	DC Power Supply Adapter XGA (1024*768)				GP-Pro EX Over Ver.4.08.000
SP5000X eXtreme Box (SP-5B90)	SP-5490WA WVGA (800*480)				GP-Pro EX Over Ver.4.08.200
	SP-5690WA WXGA (1280*800)		OK *2	OK *1	GP-Pro EX Over Ver.4.08.200
	SP-5790WA FWXGA (1366*768)		OK *2	OK *2	GP-Pro EX Over Ver.4.08.200
ST6000 Series	ST-6200 WA				GP-Pro EX Ver.4.09.250 以上
	ST-6400 WA				GP-Pro EX Ver.4.09.250 以上
	ST-6500 WA		OK	OK *2	GP-Pro EX Ver.4.09.250 以上
	ST-6600 WA		OK *2	OK	GP-Pro EX Ver.4.09.250 以上
	ST-6700 WA		OK *2	OK *2	GP-Pro EX Ver.4.09.250 以上

STM6000 Series	STM-6200 WA		/ 35			GP-Pro EX Ver.4.09.350 以上
	STM-6400 WA					GP-Pro EX Ver.4.09.350 以上
	STM-6B00 　WQVGA (480*272)					GP-Pro EX Ver.4.09.350 以上
	STM-6B00 (WVGA) 　WVGA (800*480)					GP-Pro EX Ver.4.09.350 以上

*1. Usable by making changes to the display type in the project file. But change layout or connection
　　device settings if necessary.

*2. Usable by making changes to the display model and convert resolution in the project file.
　　But change layout or connection device settings if necessary.

* A SD card or USB stick has be available to support all functions.
　　When using an Open Box (SP-5B40, SP-5B41，SP-5B41*), SD card is required.

5-3. Software

Table 5-2 Software

No	Manufacturer	Product Name	Model	Comments
1	Schneider Electric Japan Holdings Ltd.	GP-Pro EX	PFXEXEDV40	MP Ethernet / MECHATROLINK Driver Ver.1.19.12 or later

These sample projects were created with the version of GP-Pro EX in the table below. Please update the version if it is less than the version created.

Please download the MP Ethernet/MECHATROLINK Driver (Ver.1.19.12) from our website.

Table 5-3 HMI Software version

No	Notation	HMI software version	Comments
1	VGA	GP-PRO EX Ver.4.09.120	*1
2	WSVGA	GP-PRO EX Ver.4.09.300	*1
3	WXGA	GP-PRO EX Ver.4.09.300	*1

*1: You can use the Version Reverter to version down the created software version of the project file to Ver. 4.06.300.

5-4. Connection Devices

The target devices to be connected with this sample project file are YASKAWA Electric Sigma-7C. For the details of the target types, refer to *GP-Pro EX Device/PLC Connection Manual*, as well as YASKAWA Electric's catalogs and manuals.

Table 5-4 Connection devices

No	Manufacturer	Product Name	Series	Model	Comments
1	YASKAWA Electric Corporation	Two-Axis SERVOPACKs with Built-in Controllers Sigma-7C	Sigma-7-Series SERVOPACKs	SGD7C-□□□ AMAA	

5-5. Communication Settings

5-5-1. GP-Pro EX communication settings

Configure the settings as necessary according to the devices and facilities.

Refer to *GP-Pro EX Device/PLC Connection Manual* for the details of communication settings.

For the setting example of Σ - 7 C + Σ - 7 S + Σ - 7 W configuration, refer to the following.

Figure 5-3 GP-Pro EX communication settings

Table 5-5 Key parameter settings

Parameter	Range	Initial value
Port No.	1024 - 65535	1024
Automatic	OFF - ON	ON
Timeout	1 - 127	3
Retry	0 - 255	2
Wait to	0 - 255	0

5-5-1-1. Indivisual Device Settings of Sigma-7C Control Section
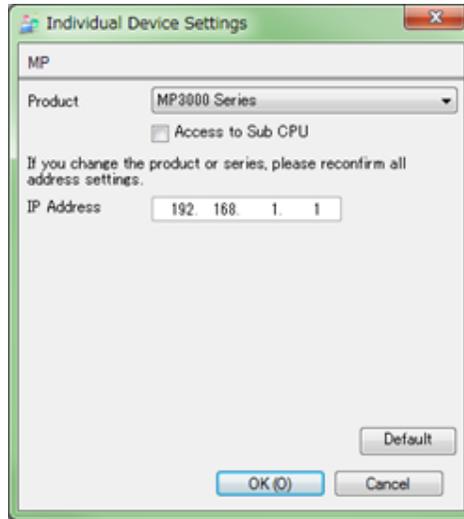

Figure 5-4 Individual Device Settings of Sigma-7C Control Section

Table 5-6 Setting Values of Sigma-7C Control Section

Item	Value
Device Name	MP
Product	MP3000 Series
Access to Sub CPU	None
IP Address	192.168.001.001

5-5-1-2. Indivisual Device Settings of Sigma-7C Servo Section
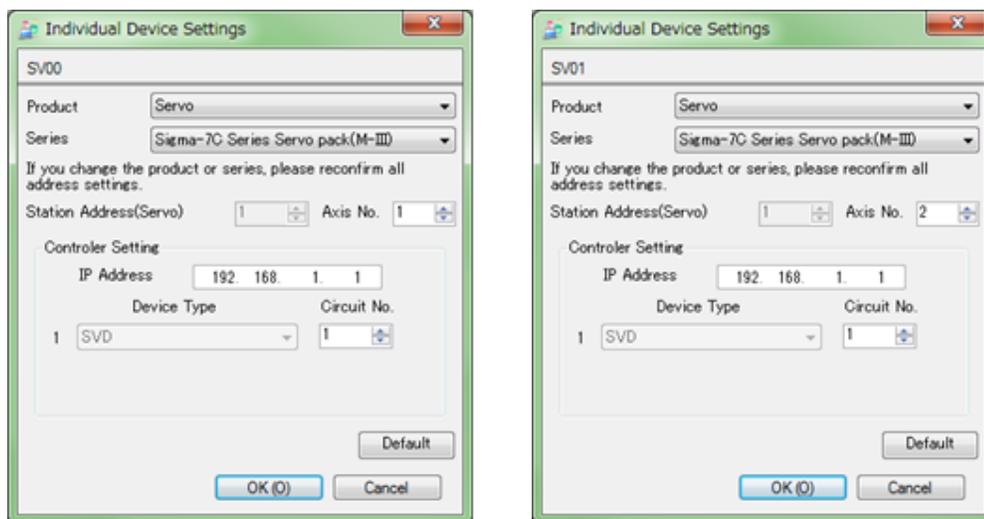

Figure 5-5 Individual Device Settings of Sigma-7C Servo Section

Table 5-7 Setting values of Sigma-7C Servo Section

Item	Axis 1 Setting	Axis2 Setting
Device Name	SV0	SV1
Product	Servo	Servo
Series	Sigma-7C Series SERVOPACK(M-III)	Sigma-7C Series SERVOPACK(M-III)
Station Address	1(fixed)	1(fixed)
Axis No.	1	2
IP Address	192.168.001.001	192.168.001.001
Device Type	SVD(Fixed)	SVD(Fixed)
Circuit No.	1	1
Device ID	1	2

*1 : Depending on the equipment to be used, should be set.

5-5-1-3. Individual Device Settings of Σ-7S, Σ-7W
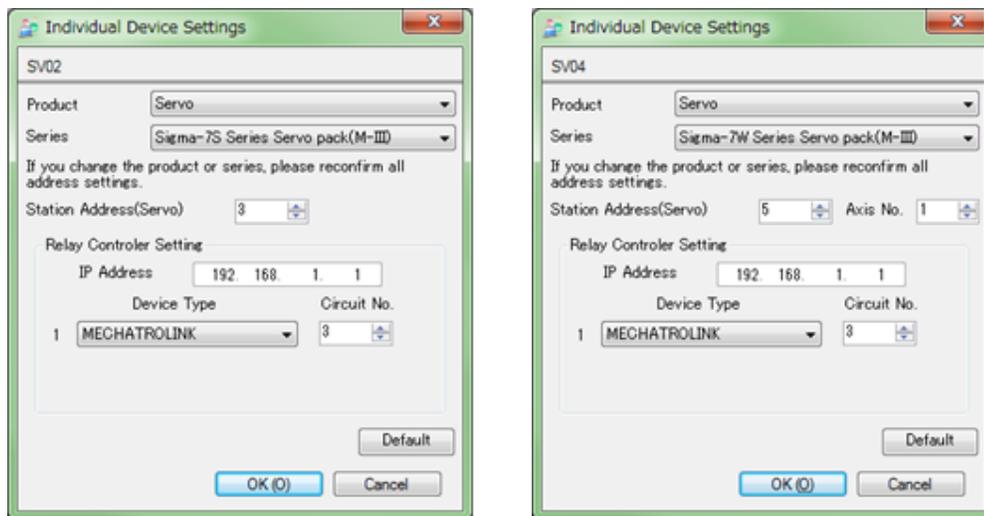
Figure 5-6 Indivisual Device Settings of Σ-7S, Σ-7W

Table 5-8 Setting values of Σ-7S, Σ-7W

Item	MECHATROLINK-Ⅲ Axis 1	MECHATROLINK-Ⅲ Axis 2	MECHATROLINK-Ⅲ Axis 3	MECHATROLINK-Ⅲ Axis 4
Device Name	SV02	SV03	SV04	SV05
Product	サーボ	サーボ	サーボ	サーボ
Series	Sigma-7S Series SERVOPACK(M-III)	Sigma-7S Series SERVOPACK(M-III)	Sigma-7W Series SERVOPACK(M-III)	Sigma-7W Series SERVOPACK(M-III)
Station Address	3	4	5	5
Axis No.	—	—	1	2
IP Address	192.168.001.001	192.168.001.001	192.168.001.001	192.168.001.001

Device Type	MECHATROLINK	MECHATROLINK	MECHATROLINK	MECHATROLINK
Circuit No.	3	3	3	3
Device ID	3	4	5	6

*1 : Depending on the equipment to be used, should be set.

5-5-1-4. Individual Device Settings of Σ-7S, Σ-7W

Table 5-9 Setting Value of Indirect Device

Item	SERVOPACK Σ-7C	SERVOPACK Σ-7S	SERVOPACK Σ-7W
Indirect Device Name	Indirect8	Indirect1	Indirect7
Series	Σ-7C-Series SERVOPACK(M-III)	Σ-7S-Series SERVOPACK(M-III)	Σ-7W-Series SERVOPACK(M-III)
Device ID Address	[#INTERNAL]USR28070	[#INTERNAL]USR28000	[#INTERNAL]USR28060
Initial ID *1	1	3	5

*1 : If you do not connect Σ - 7S or Σ - 7W, please set the unused Device ID to initial ID.

5-5-2. Sigma-7C settings

Communication settings with the touch panel display are performed with the Yaskawa Electric Support Tool. Refer to YASKAWA Electric's manual for the details.

5-6. Notes for using the Open Box (SP-5B40 / SP-5B41 / SP-5B41*)

·An appropriate performance may not be attained due to loads of the program executed at the same time.

Customers are requested to perform sufficient operation check in the usage environments in customer's responsibility.

·In "Display Unit - WinGP Settings" in the GP-Pro EX, Please refer to the "Historical Data Retentive Settings-Save in" to "SRAM". "Display Settings" is set as required.

·"Storage" in the setting screen, Please set to "SD".

· If the write filter settings are enabled, disable them before transferring the project file. SP5000-specific functions such as "launcher" and "Write Filter", please refer to the "SP5000 series Open Box Reference Manual "

6. Screen Structure

6-1. Screen transitions diagram

【Top】

Axis settings, QR code

【Axis settings】　　【Select QR code】　　　　【Sigma-7 Series】

Maintenance monitor

【Maintenance monitor】　【Chart settings】　　　　　【Axis settings】

【Bar graph】　　　　　　　　　　【Chart】
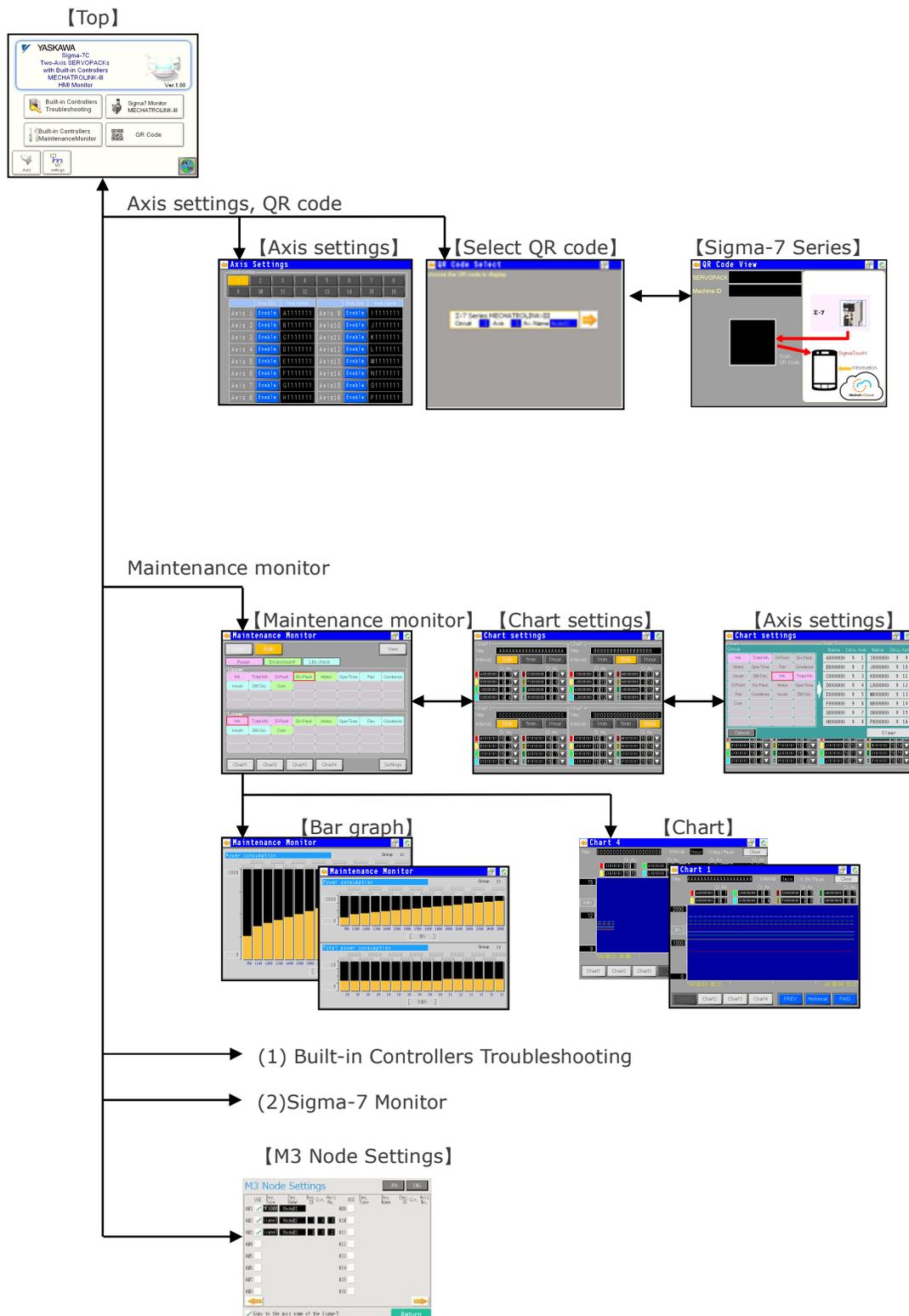
(1) Built-in Controllers Troubleshooting

(2)Sigma-7 Monitor

【M3 Node Settings】

(1) Built-in Controllers Troubleshooting

【Troubleshooting】 ←→ 【Alarm detail】

【CPU Error Status】 ←→ 【I/O Error】 ←→ 【I/O error detail】

【Operation error】 ←→ 【Operation error detail】

【32-bit Error Code】

【program execution state】 ←→ 【Operation status】

【Axis status】 ←→ 【Error list】 ←→ 【Error detail】

【Sigma-7Monitor】 ←→ 【Trace Menu】 【Sigma-7Alarm】

(2)Sigma-7 Series monitor
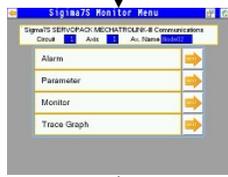
【Alarm Monitor】
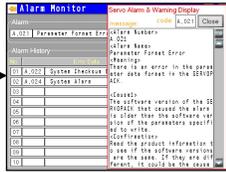
【Parameter Menu】

【Pn0xxx-PnAxxx】
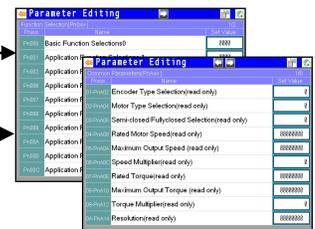
【Monitor Menu】

【State】 【Operation】 【I/O】

【Trace Menu】
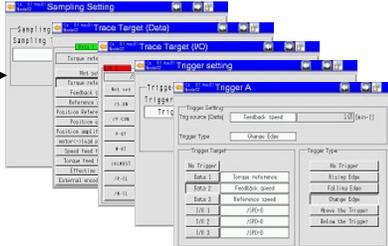
【Setup Wizard】 【Chart】
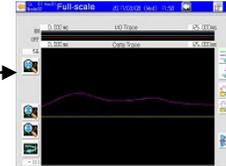
6-2. List of Screens

6-2-1. List of base screens

Table 6-1 List of base screens

Screen number	Screen title	Function
B4100	Trace Menu	Sigma-7S Trace
B4101	Sampling Setting	Sigma-7S Trace
B4102	Trace Target(Data)	Sigma-7S Trace
B4103	Trace Target(I/O)1	Sigma-7S Trace
B4104	Trace Target(I/O)2	Sigma-7S Trace
B4105	Trace Target(I/O)3	Sigma-7S Trace
B4106	Trigger Setting	Sigma-7S Trace
B4017	Trigger A	Sigma-7S Trace
B4108	Trigger B	Sigma-7S Trace
B4120	Trace Setting	Sigma-7S Trace
B4121	Sampling Setting	Sigma-7S Trace
B4122	Trace Target Setting(Data)	Sigma-7S Trace
B4123	Trace Target Setting(I/O)1	Sigma-7S Trace
B4124	Trace Target Setting(I/O)2	Sigma-7S Trace
B4125	Trace Target Setting(I/O)3	Sigma-7S Trace
B4126	Trigger Setting	Sigma-7S Trace
B4127	Trigger A Setting	Sigma-7S Trace
B4128	Trigger B Setting	Sigma-7S Trace
B4191	Sampling Setting(Original)	Sigma-7S Trace
B4192	Trace Data Setting(Original)	Sigma-7S Trace
B4193	I/O 1 Setting(Original)	Sigma-7S Trace
B4194	I/O 2 Setting(Original)	Sigma-7S Trace
B4195	I/O 3 Setting(Original)	Sigma-7S Trace
B4196	Trigger Setting(Original)	Sigma-7S Trace
B4197	Trigger A Setting(Original)	Sigma-7S Trace
B4198	Trigger B Setting(Original)	Sigma-7S Trace
B4310	Graph Menu	Trace common
B4311	Graph Window-Switch Setting	Trace common

Screen number	Screen title	Function
B4312	CSV Data Save	Trace common
B4321	ALL Graph	Trace common
B4322	All Graph Cull	Trace common
B4323	Data Graph	Trace common
B4324	Data Graph Cull	Trace common
B4325	Graph legend	Trace common
B4326	Graph legend Cull	Trace common
B4327	Graph 3ch	Trace common
B4328	Graph 3ch Cull	Trace common
B4331	Zoom Graph	Trace common
B4341	All Graph	Trace common
B4342	All Graph Cull	Trace common
B4348	All Graph(Original)	Trace common
B4349	All Graph Cull(Original)	Trace common
B4400	Trace Menu	Sigma-7W Trace
B4401	Sampling Setting	Sigma-7W Trace
B4402	Trace Target(Data)	Sigma-7W Trace
B4403	Trace Target(I/O)1	Sigma-7W Trace
B4404	Trace Target(I/O)2	Sigma-7W Trace
B4405	Trace Target(I/O)3	Sigma-7W Trace
B4406	Trigger Setting	Sigma-7W Trace
B4407	Trigger A	Sigma-7W Trace
B4408	Trigger B	Sigma-7W Trace
B4420	Trace Setting	Sigma-7W Trace
B4421	Sampling Setting	Sigma-7W Trace
B4422	Trace Target Setting(Data)	Sigma-7W Trace
B4423	Trace Target Setting(I/O)1	Sigma-7W Trace
B4424	Trace Target Setting(I/O)2	Sigma-7W Trace
B4425	Trace Target Setting(I/O)3	Sigma-7W Trace
B4426	Trigger Setting	Sigma-7W Trace
B4427	Trigger A Setting	Sigma-7W Trace
B4428	Trigger B Setting	Sigma-7W Trace
B4491	Sampling Setting(Original)	Sigma-7W Trace
B4492	Trace Data Setting(Original)	Sigma-7W Trace
B4493	I/O 1 Setting(Original)	Sigma-7W Trace

Screen number	Screen title	Function
B4494	I/O 2 Setting(Original)	Sigma-7W Trace
B4495	I/O 3 Setting(Original)	Sigma-7W Trace
B4496	Trigger Setting(Original)	Sigma-7W Trace
B4497	Trigger A Setting(Original)	Sigma-7W Trace
B4498	Trigger B Setting(Original)	Sigma-7W Trace
B4700	Trace Menu	Sigma-7C Trace
B4701	Sampling Setting	Sigma-7C Trace
B4702	Trace Target(Data)	Sigma-7C Trace
B4703	Trace Target(I/O)1	Sigma-7C Trace
B4704	Trace Target(I/O)2	Sigma-7C Trace
B4705	Trace Target(I/O)3	Sigma-7C Trace
B4706	Trigger Setting	Sigma-7C Trace
B4707	Trigger A	Sigma-7C Trace
B4708	Trigger B	Sigma-7C Trace
B4720	Trace Setting	Sigma-7C Trace
B4721	Sampling Setting	Sigma-7C Trace
B4722	Trace Target Setting(Data)	Sigma-7C Trace
B4723	Trace Target Setting(I/O)1	Sigma-7C Trace
B4724	Trace Target Setting(I/O)2	Sigma-7C Trace
B4725	Trace Target Setting(I/O)3	Sigma-7C Trace
B4726	Trigger Setting	Sigma-7C Trace
B4727	Trigger A Setting	Sigma-7C Trace
B4728	Trigger B Setting	Sigma-7C Trace
B4791	Sampling Setting(Original)	Sigma-7C Trace
B4792	Trace Data Setting(Original)	Sigma-7C Trace
B4793	I/O 1 Setting(Original)	Sigma-7C Trace
B4794	I/O 2 Setting(Original)	Sigma-7C Trace
B4795	I/O 3 Setting(Original)	Sigma-7C Trace
B4796	Trigger Setting(Original)	Sigma-7C Trace
B4797	Trigger A Setting(Original)	Sigma-7C Trace
B4798	Trigger B Setting(Original)	Sigma-7C Trace
B8198	Circuit/Axis	Sigma-7S
B8199	Initial	Initial Screen
B8200	Menu	Menu Screen

Screen number	Screen title	Function
B8201	QR Code View	Not use
B8202	System Settings	Not use
B8203	QR Code select	Sigma-7 Series Common
B8204	Sigma7 Monitor Select	Sigma-7 Series Common
B8210	Troubleshooting start	Sigma-7C Control Section
B8211	Troubleshooting start button	Sigma-7C Control Section
B8212	CPU status	Sigma-7C Control Section
B8218	Axis setting original	Not use
B8219	Axis setting	Sigma-7 Series Common
B8220	MP-CPU Module	Not use
B8230	Battery Replacement	Not use
B8240	32-bit Error Code(SW050)	Sigma-7C Control Section
B8241	32-bit Error Code(SW050)	Not use
B8250	CPU Error status(SW041)	Sigma-7C Control Section
B8260	User Operation Error	Sigma-7C Control Section
B8270	User Operation Error Status	Sigma-7C Control Section
B8280	I/O Error (CPU 1/2)	Sigma-7C Control Section
B8281	I/O Error (Rack 2,3,4)	Not use
B8282	I/O Error (Rack 1,5,6,7)	Not use
B8283	I/O Error (Rack 2,3,4)	Not use
B8284	I/O Error (Rack 1,5,6,7)	Not use
B8285	B8281,B8282　Call	Not use
B8286	B8283,B8284　Call	Not use
B8287	I/O Error (CPU 2/2)	Sigma-7C Control Section
B8288	I/O Error (Rack 1)	Sigma-7C Control Section
B8289	I/O Error (Rack 1)	Sigma-7C Control Section
B8290	Maintenance menu	Sigma-7C Control Section
B8291	Bar Graph Full	Sigma-7C Control Section
B8292	Bar Graph Half	Sigma-7C Control Section
B8293	Chart Axis Settings	Sigma-7C Control Section
B8294	Chart1	Sigma-7C Control Section
B8295	Chart2	Sigma-7C Control Section
B8296	Chart3	Sigma-7C Control Section
B8297	Chart4	Sigma-7C Control Section
B8300	A101　Error　status	Sigma-7C Control Section
B8301	A101　Rack　status　2-4	Not use

Screen number	Screen title	Function
B8302	A101 Rack status 1,5-7	Not use
B8303	B8301,B8301 Call	Not use
B8307	A101 Error status 2/2	Sigma-7C Control Section
B8309	A101 Rack status 1	Sigma-7C Control Section
B8310	MP-Diagnostic Slotmodule	Not use
B8311	MP-Diagnostic Slotmodule	Not use
B8312	MP-Diagnostic Slotmodule	Not use
B8315	MP-Diagnostic Slotmodule	Not use
B8320	Diagnostic of program execution	Sigma-7C Control Section
B8321	Confirmation the operation sta	Sigma-7C Control Section
B8330	Confirm the axis Status1-8	Sigma-7C Control Section
B8331	Confirm the Axis Status9-16	Not use
B8350	Motion Error TS	Sigma-7C Control Section
B8351	Axis Error	Sigma-7C Control Section
B8360	Alarm History:Servo Alarm	Not use
B8361	Alarm History:SVB,SVC ALRM	Not use
B8362	Alarm History:CPU Alarm	Not use
B8363	Alarm History:Option Module	Not use
B8370	I/O Error Status	Not use
B8380	I/O Error Status MP3000	Sigma-7C Control Section
B8381	Rack select 2-4	Not use
B8382	Rack select 1_5-7	Not use
B8385 -B8398	Rack Status Detail	Sigma-7C Control Section
B8400 -B8418	ILxx04(Alarm)	Sigma-7C Control Section
B8450 -B8468	ILxx02(Warnning)	Sigma-7C Control Section
B8498	Alarm Window Back	Sigma-7C Control Section
B8499	Function Window	Sigma-7C Control Section
B8500 -B8508	Screen for Monitor Display	Sigma-7S
B8510	Screen for Alarm Display	Sigma-7S
B8530 -B8538	Screen for Monitor Display	Sigma-7W
B8540	Screen for Alarm Display	Sigma-7W

Screen number	Screen title	Function
B8560 -B8568	Screen for Monitor Display	Sigma-7C
B8570	Screen for Alarm Display	Sigma-7C
B8600 -B8696	Screen for Parameter Display	Sigma-7S
B8700 -B8796	Screen for Parameter Display	Sigma-7W
B8800 -B8896	Screen for Parameter Display	Sigma-7C
B8900	QR Code View	Sigma-7S
B8901	QR Code View	Sigma-7W
B8902	QR Code View	Sigma-7C
B9800 -B9805	M3 Node Settings	M3 Node Settings
B9901 ～B9999	Trend Screen for Sigma7 Trace	Trace common

6-2-2. List of window screens

Table 6-2 List of window screens

Screen number	Screen title
W1101-W1217	Window Screen for Sigma-7 Trace
W1500-W1516	Window Screen for Sigma-7C Control Alarm Status
W1517-W1519	Window Screen for Sigma-7C Control Alarm Status (Not use)
W1520-W1533	Window Screen for Sigma-7C Control I/O Status
W1540	Sigma-7C Control Manual Alarm
W1541	Sigma-7C Control Alarm Rack
W1542	Sigma-7C Control Circuit Change
W1543	Sigma-7C Control Circuit select of alarm
W1544	Sigma-7C Control Check of alarm
W1545	Sigma-7 Series Circuit Select
W1546	Sigma-7 Series Axis Select
W1560	Sigma-7 Series Alarm Window
W1600	QR Error Window
W1601	Sigma-7C Control Maintenance Graph 2
W1701-W1707	Sigma-7C Control Full Screen Bar Graph
W1721-W1727	Sigma-7C Control Half Screen Bar Graph(Upper)
W1741-W1747	Sigma-7C Control Half Screen Bar Graph(Lower)
W1790	Sigma-7C Control Chart Item Select
W1793	Sigma-7C Control Rack Select
W1924	Restart
W1925	Current Program Number
W1926	Motion Program Alarm
W1927	Language Change Window
W1932-W1960	M3 Node Settings Window

6-3. M3 Node Settings

When using MECHATROLINK-lll message communication devices, multiple devices are connected to Sigma-7C made by YASKAWA Electric Corporation and on an HMI unit, information is obtained and data are written via the Sigma-7C Control Section. It's necessary to know IDs for switching nodes and axis positions in advance because multiple nodes are switched and monitored.
To use the sample project file, be sure to correctly configure the settings described in this chapter.

6-3-1. Base screen list

Table 6-3 Base screen list

Base No.	Title	Descriptions
B9800	Node settings init Initial screen	Configure initial settings of M3 devices. It's a start screen of the sample project file.
B9801 -B9805	Node settings	Registration screen of M3 devices This sample project will not run if the screen settings are not correctly configured. The setting contents are stored.

6-3-2. Window screen list

Table 6-4 Window screen list

| Window No.	Title	Descriptions
W1950	Node Type	Select M3 devices. MP3000/Sigma-7/K1G/AZ/LC2/STYVS1/LC2A
W1951 -W1958	―	Displays setting errors of the M3 Node settings screen.

6-3-3. Operation
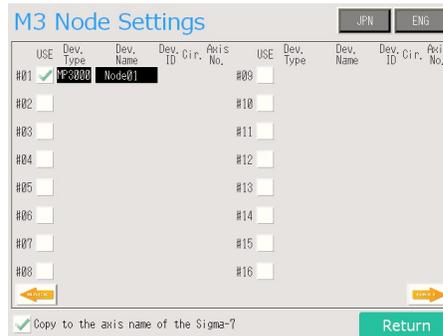
Figure 6-1 Default
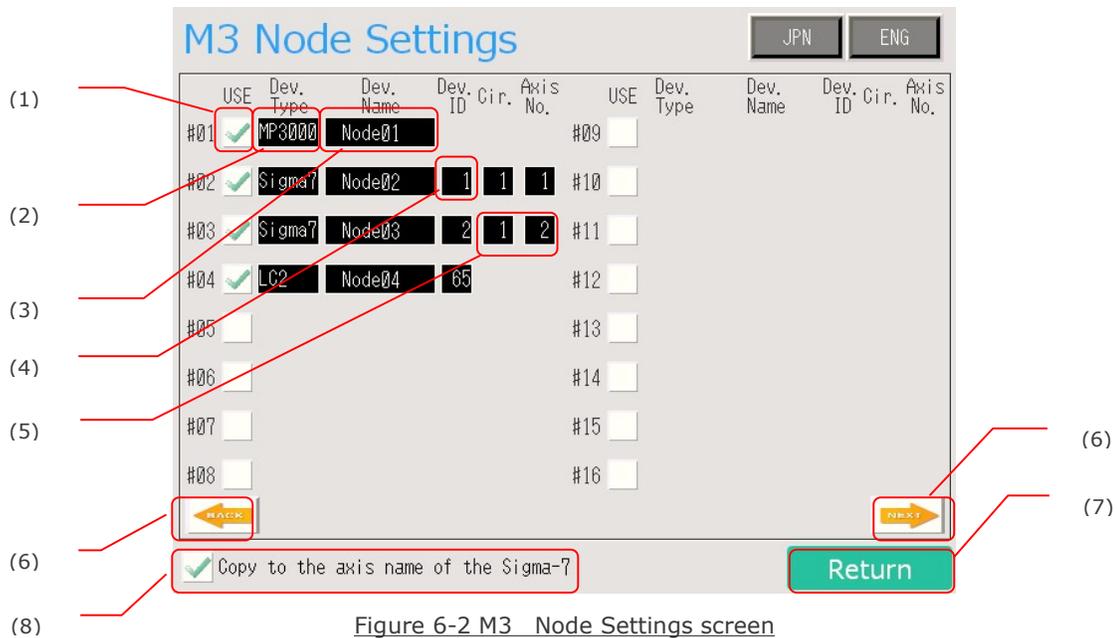
Figure 6-2 M3 Node Settings screen

Table 6-5 Details of functions

№	Name	Details of functions
(1)	USE	Check a box on the left of a node to be used.
(2)	Connection device	Select a device to be connected. MP3000/Sigma-7S/ Sigma-7W/ Sigma-7C /K1G/AZ/LC2/STYVS1/LC2A (Note) To specify the controller part of Sigma-7C, select MP3000.
(3)	Device name	Specify a name that is displayed on the node select window. It does not have to be the same name as that of GP-Pro EX Device/PLC settings.
(4)	Device ID	Enter the device ID number specified in the GP-Pro EX Device/PLC settings. Not necessary for MP3000.

(5)	Circuit/Axis No.	Specify a circuit number and an axis number of Sigma-7.
(6)	Change pages	Specify 16 nodes per page. Up to 64 can be specified.
(7)	Return	Return to the user's screen. Move to the screen assigned in the _Node_Set_Return_Screen variable. On the Return-to screen, enter the current screen number in the _Node_Set_Return_Screen variable.
(8)	Copy Axis Name	If checked,copy to the axis name of the Sigma-7.

7. System settings and Global script

7-1. Screen Capture/Memory card settings

This sample project file has the following system settings for screen capture and data saving to SD card. When using an HMI that does not support SD cards, change the data storage destination to USB storage.
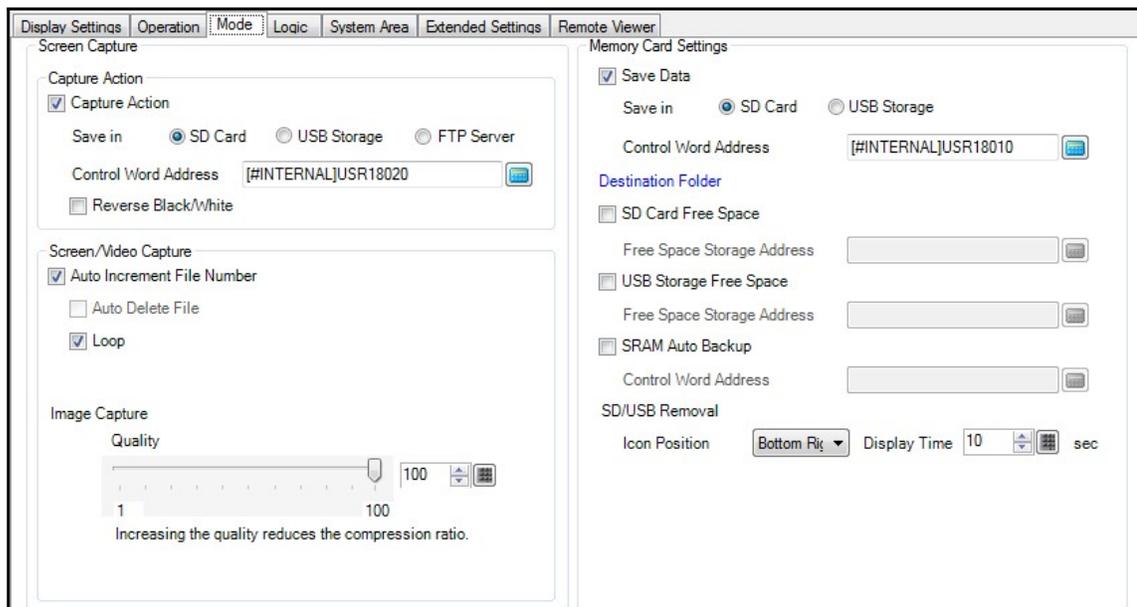

Figure 7-1   Main body settings/operation settings

Table 7-1 Capture settings

Capture action	Save in	Control address	Reverse black/white
Yes	SD Card	[#INTERNAL] USR18020	---

Table 7-2 Screen/video capture settings

Auto increment file number	Auto delete file	Loop	Image capture
Yes	---	Yes	100

Table 7-3 Memory card settings

Save data	Save in	Control address
Yes	SD Card	[#INTERNAL]USR18010

7-2. Alarm settings

In this sample program, it does not use the alarm block.

Settings are made to other blocks, but not used. (Old version specifications in which an alarm is recognized in a GP unit.)

Delete other blocks, if unnecessary.

Figure 7-2 Alarm settings

7-3. Sampling settings

Sampling groups are registered in the sample project for chart display.

Figure 7-3 Sampling settings

Table 7-4 Sampling settings

Group	Comment	Occurrences	Words	Bit	Sampling Address
1	Chart1	864	8	32	USR29500-USR29515
2	Chart2	864	8	32	USR29516-USR29531
3	Chart3	864	8	32	USR29532-USR29547
4	Chart4	864	8	32	USR29548-USR29563

Group	Trigger Bit	Data clear Bit	ACK Bit
1	_Sampling_Trigger[0].X[0]	_Sampling_Clear[0].X[0]	_Sampling_Ack[0].X[0]
2	_Sampling_Trigger[1].X[0]	_Sampling_Clear[1].X[0]	_Sampling_Ack[1].X[0]
3	_Sampling_Trigger[2].X[0]	_Sampling_Clear[2].X[0]	_Sampling_Ack[2].X[0]
4	_Sampling_Trigger[3].X[0]	_Sampling_Clear[3].X[0]	_Sampling_Ack[3].X[0]

7-4. Global script

Data for charts is collected with Global Script in this sample project.

Table 7-5 Global script

ID	Comment	Trigger	Description
1	Sampling start	1 sec. each	Operated only at the time of "00" sec., and turned ON the Sampling trigger bit according to the collection cycle for each chart group. 1 min: Turned ON the trigger every minute. 5 min: Turned ON the trigger when 0, 5, 15… 55 minutes have passed. 1 hour: Turned ON the trigger at every "00" minute.
2	Sampling Ack	Always In operation	Turns OFF the trigger bit when "Sampling Ack Bit" is turned ON.

8. Address Map

Table 8-1 USR Devices

Address	Module	Description
USR00100-USR6623	Trace	Trace Data
USR07100-USR10611	Trace	Trace Data Cull
USR11000-USR17523	Trace	Summing up Trace Data/ Summing up Trace Data Cull
USR18000~USR18900	Sigma/Trace	Trace Work Area
USR18010~USR18011	Common	Memory device control address
USR18020~USR18022	Common	Screen capture control address
USR24000	SIGMA-7 CONTROL	CPU type
USR24003~USR24006	〃	Window control address
USR24007	〃	DWG type
USR24008	〃	Operation error counter

Address	Module	Description
USR24009	〃	Operation error code
USR24010	〃	Operation error message text number
USR24011	〃	Operation error DWG number
USR24012	〃	Operation error not use
USR24013	〃	Operation error not use
USR24014	〃	Operation error DWG step number
USR24015	〃	Operation error DWG number of calling program
USR24016	〃	Operation error not use
USR24017	〃	Operation error not use
USR24018	〃	Operation error DWG step number of calling program
USR24019	〃	32bit error
USR24020~USR24023	〃	Window control address
USR24025~USR24028	〃	Window control address
USR24029	〃	Error code
USR24030	〃	IFA/IFC sub slot number
USR24031	〃	IFA/IFC error code
USR24032	〃	IFA/IFC read/write bit
USR24033	〃	IFA/IFC Read transmission status
USR24034	〃	IFA/IFC Write transmission status
USR24035	〃	SVB/SVC sub slot number
USR24036	〃	SVB/SVC error code
USR24037	〃	SVB/SVC ST#1-ST#15 error status
USR24038	〃	SVB/SVC ST#16-ST#30 error status
USR24039	〃	IO/MPUIF sub slot number
USR24052~USR16086	〃	rack1-4·slot1-9 module information
USR24090	〃	top address of selected module error status
USR24091	〃	Top address of selected module information
USR24092	〃	Cursor slot number
USR24093	〃	Cursor Rack number
USR24094	〃	Cursor offset X
USR24095	〃	Cursor offset Y
USR24096	〃	Offset Address
USR24097	〃	Module ST1 information
USR24098	〃	Module ST2 information
USR24110	〃	Circuit No.
USR24111	〃	Axis No.

Address	Module	Description
USR24112	〃	Parts offset address
USR24115	〃	ILxx02 information
USR24117	〃	ILxx04 information
USR24119	〃	IWxx2D information
USR24200～USR24779	〃	Option module information
USR24810～USR24814	〃	Option module alarm information
USR25000	〃	Axis alarm
USR25010	〃	Module alarm
USR25020	〃	Program alarm
USR27000～USR28079	〃	Alarm history buffer
USR28000～USR28255	〃	Rack1,5-7 Alarm buffer
USR29000～USR29099	〃	QR making memory
USR29100～USR29299	〃	Maintenance setting buffer
USR29300～USR29399	〃	Group information buffer
USR29480～USR29485	〃	Time data (Global script)
USR29500～USR29563	〃	Sampling data for Chart (Global script)
USR29610～USR29642	〃	System status
USR29700～USR29732	〃	Module information
USR29800	〃	SERVO Device ID Address