ESTIC Corporation
Servo Nutrunner
Master Control Unit ENRZ-MU50

Technical Guide

Table of Contents

1. Overview

This file explains the sample project connection with the Servo Nutrunner Master Control Unit ENRZ-MU50 made by ESTIC Corporation.

The main features are as follows;

- Various MU50 information can be monitored without using specific PC software.
- The servo nut runner AU50 and servo press SPU50, which are connected to the MU50 can be operated from GP.
- Display Tightening Result/Pressing Result list and details
- Torque curve when tightening and Pressure curve when pressing can be displayed.
- The system setting and parameters can be changed for MU50、AU50、SPU50. The details of various parameters can also be displayed.
- The alarm detail can be displayed when occurring to help the primary response.

For more details, please see the ESTIC Corporation's "Servo Nutrunner Master Control Unit ENRZ-MU50"

* To obtain the above document, visit the ESTIC Corporation's website.

2. Notes

1. The intellectual property rights for the files provided by Digital Electronics Corporation 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. Any modifications made to this service by a customer are entirely at the responsibility of the customer.
6. Please be aware that we cannot respond to any inquiries for the purpose of modifying these data.
7. The content and information in the data on these screens and documentation are subject to change without prior notification.

3. Limitations

This screen data is taken from screenshots showing the representative features and functions of the GP 4000 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 "5System Configuration" of this Manual for Use. Refer to sections "5.5Communication Settings" for communication settings of this Manual for Use.

（2）Limitation

This sample project file is for various parameters edit and monitoring which have already been downloaded to MU50.
Connection configuration of the MU50, AU50, SPU50 cannot be changed. Newly-Configuration settings, tightening program and pressure channel also cannot be created.
For new creation, please use ESTIC Corporation's "Z50 system management".

（3）How to combine with other files

In GP-Pro EX, select [Project] → [Utilities] → [Copy from Another Project].
For further details, refer to "from Startup to Shutdown" in our reference manual.
However, there are issues to be aware of, such as overlapping screen numbers, so also refer to sections 4) and later.

（4）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 "6.2Screens List" for screen numbers that are being used by the file. When combining with (3), 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.

（5）Changing addresses

When changes are made to the address of a connection device that has been configured on the screen, it will seriously effect the operation.
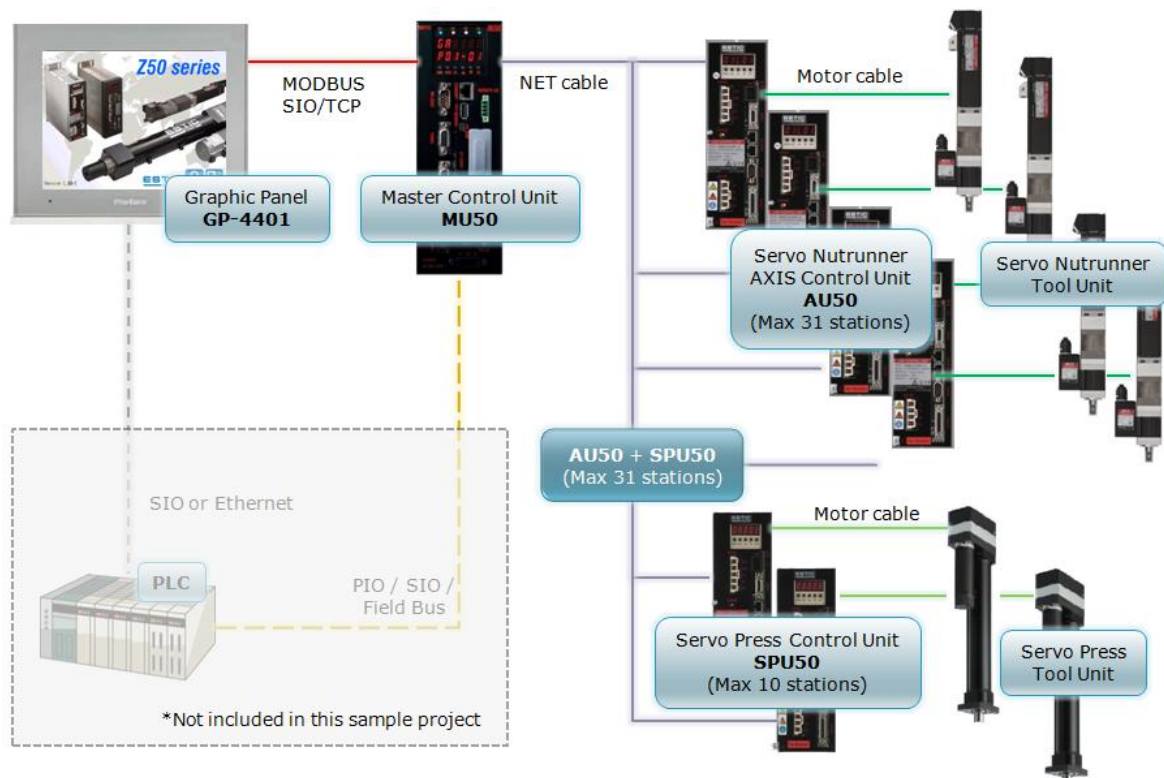Do not make changes to these addresses.

（6）Alarm Setting when combining

Alarm function is used in this sample project file.
Please be aware that it might be overwritten if the alarm is set in the file currently being created. Make sure not to overlap the setting.

5. System Configuration

5.1. System Configuration

* Power specifications for the GP Series will differ depending on the model
For more details, please refer to the catalog or hardware manual.

5.2. Display with Touch Panel

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

Device	Target Project Device	Target Device
GP-3***	GP-3***	
GP-4***	GP-41**	
	GP-42**	
	GP-43**	
	GP-4401T(Analog)	usable without change
	GP-4501T(Analog)	OK
	GP-46**	
ST	ST-32**	
LT	LT-3***	
	LT-4***	

Item marked with "OK" is usable by making changes to the device type without Convert Resolution.
*The switch operation may not correctly be operated in the Matrix type model.

5.3. Connection Devices

No	Manufacturer	Name	Series	Note
1	ESTIC Corporation	Master Control Unit ENRZ-MU50	Z50	Depending on combination

5.4. Software

No	Manufacturer	Product name	Model No.	Note
1	Digital Electronics Corporation	GP-Pro EX	PFXEXEDV**	
2	ESTIC Corporation	Z50System management		

5.5. Communication Settings

5.5.1.Pro-EX Communication Settings

Driver: "General MODBUS TCP Master"

Depending on your environment

Set "200"

Set "High word first(H/L)"

Setting list	Value	Notes
IP Address	any value	Depending on your network environment
Port No.	502	initial value
Unit ID	200	Change from the initial value (MU50 specific ID)
Double Word word order	High word first(H/L)	Change from the initial value

Driver: "General MODBUS SIO Master"

Setting list	Value	Notes
Slave Address	any value	Depending on your network environment
Double Word word order	High word first(H/L)	Change from the initial value

Change the setting to "125" the Boundary of Bit Device [0], [1] in the [Function Code and Max Query].

Settings		Value	Notes
000001	Boundary	125	Change from the initial value
100001	Boundary	125	Change from the initial value

5.5.2. Setting for GP

MU50 is constantly monitoring GP whether they communicate with each other or not. Please set as follows; ([Display Unit]-[System Area]-[Watchdog Settings])
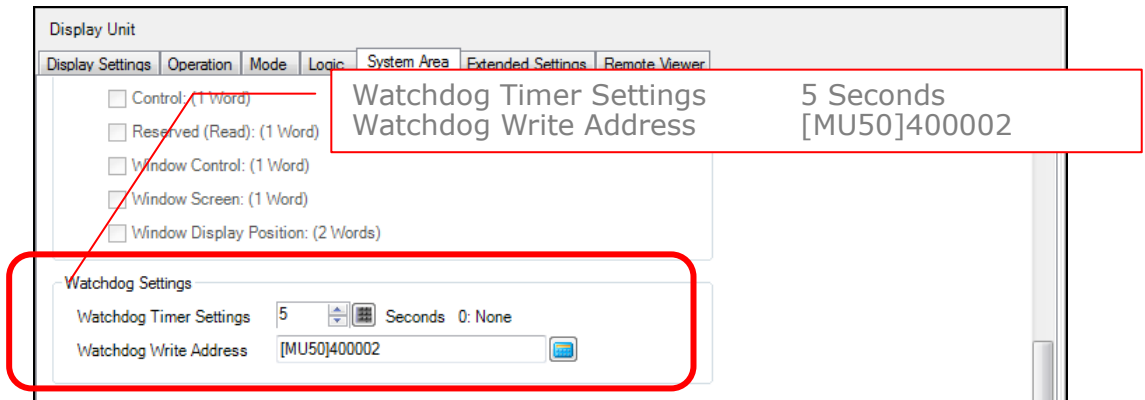
5.6. MU50 connection setting

5.6.1. Connecting diagram
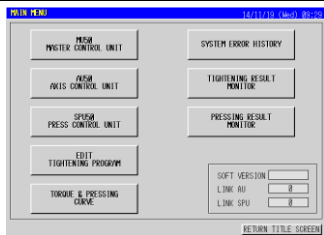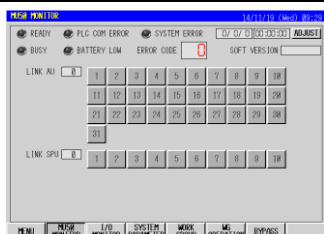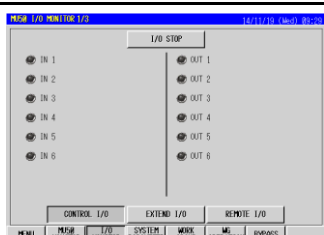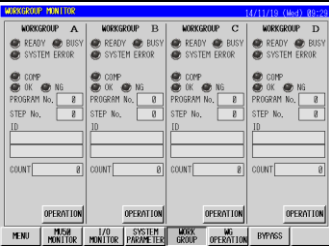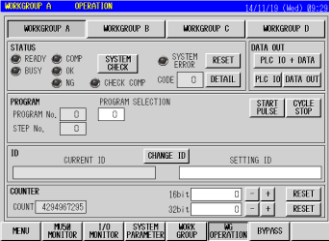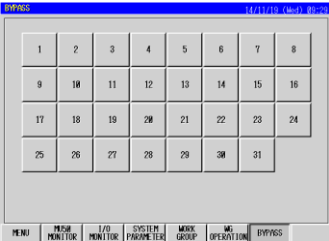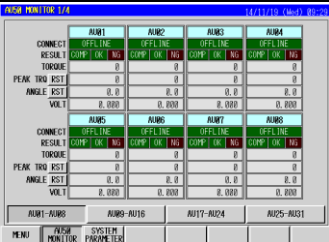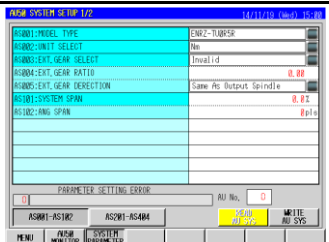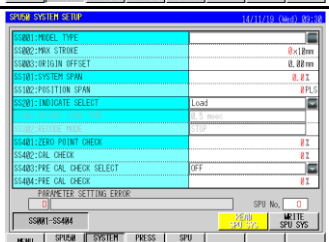
However, it is possible to connect multiple units with MU50. Please note that the indirect function is not used in this sample project file. If connecting with multiple units, peripheral connection settings and screen edits are required.
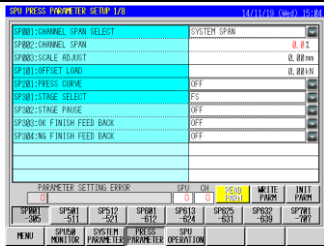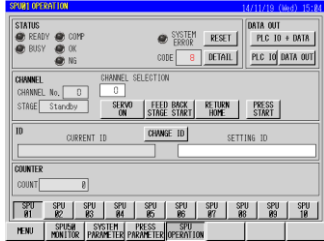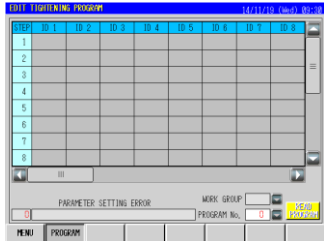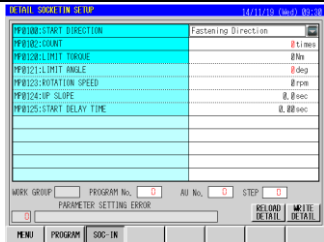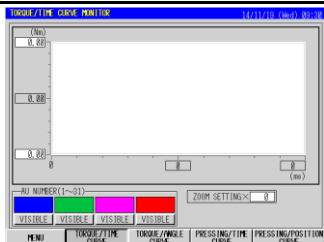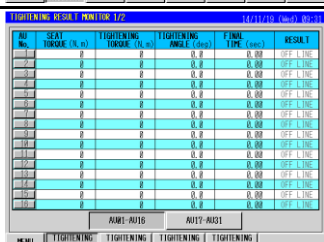
6. Screen Structure
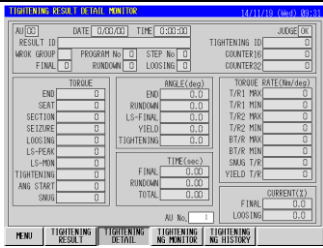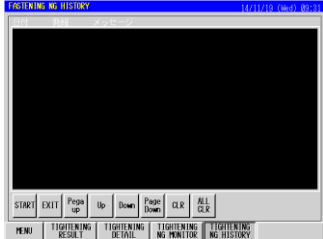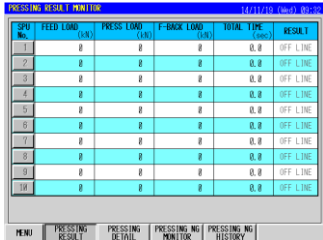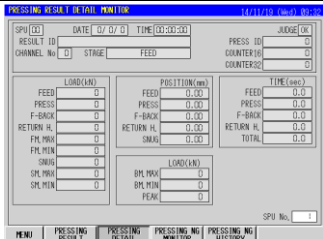
6.1. Screen types

The sample project file offers the following screens. There are some screens that are composed of more than one screen.

Screen Title	Screen Image	Function(s)
Top		- Top Screen - Language Switch Button
Security		- Parameter Security setting. - operation Security setting.
Main Menu		- Menu button to switch to each screen - Checks MU50 software version and number of connections AU50/SPU50
MU50 Monitor		- Checks the MU50 status - Sets the internal MU50 system calendar
MU50 I/O Monitor		- Monitors MU50 I/O, EXTEND I/O, REMOTE I/O status - Forces output by pressing the I/O STOP button
MU50 System Parameter		- Monitoring and editing of MU50 system parameters

Screen Title	Screen Image	Function(s)
MU50 Work Group Monitor		- Monitors the work group status - Switches to workgroup operation screen via operation button
MU50 Work Group Operation		- Monitors and operates the work groups A to D from GP.
MU50 BYPASS		- Displays AU50 in the axis which is connected to the MU50 (BYPASS).
AU50 Monitor		- Monitors AU50 status
AU50 System Parameter		- Monitoring and editing of AU50 system parameters
SPU50 Monitor		- Monitors SPU50 status
SPU50 System Parameter		- Monitoring and editing of SPU50 system parameters

Screen Title	Screen Image	Function(s)
SPU50 Press Parameter		- Monitoring and editing of SPU50 press parameters
SPU50 Operation		- Monitors and operates each SPU50 axis from GP
Edit Tightening Program		- Selects workgroup/ program No. and specifies the tightening program - Switches to the edit tightening program screen
Detail Socket-in Setup		- Editing of parameter for Socket-in, DETAIL RUNDOWN SETUP, DETAIL TIGHTENING HEADER SETUP, DETAIL TIGHTENING SETUP and DETAIL CONTROL SETUP
Torque/Time Curve		- Displays AU50 torque curve and SPU50 pressing curve
NG History		- Displays system NG history
Tightening Result Monitor		- Displays AU50 tightening result

Screen Title	Screen Image	Function(s)
Tightening Result Detail Monitor		- Displays AU50 tightening result detail with specified AU No.
Tightening Result NG monitor		- Displays Tightening Result NG monitor
Tightening Result NG history		- Displays Tightening Result NG history
Pressing Result Monitor		- Displays SPU50 pressing result
Pressing Result Detail Monitor		- Displays SPU50 pressing result detail with specified SPU No.
Pressing Result NG monitor		- Displays Pressing Result NG monitor
Pressing Result NG history		- Displays Pressing Result NG history

6.2. Screens List

No.	Title	Function(s)
B8600	Top	welcome screen
B8601	Main Menu	Menu screen
B8602	Security	Security screen
B8610	MU50 Monitor	MU50 monitor screen
B8611	I/O Monitor 1/3	I/O monitor screen
B8612	I/O Monitor 2/3	EXTEND I/O monitor screen
B8613	I/O Monitor 3/3	REMOTE I/O monitor screen
B8615	MU50SYS PARAM 1/4	MU50 system parameter edit screen
B8616	MU50SYS PARAM 2/4	
B8617	MU50SYS PARAM 3/4	
B8618	MU50SYS PARAM 4/4	
B8620	WG A-D Monitor	Work group A to D monitor screen
B8630	WG_A Monitor	Work group A monitor/operation screen
B8631	WG_B Monitor	Work group B monitor/operation screen
B8632	WG_C Monitor	Work group C monitor/operation screen
B8633	WG_D Monitor	Work group D monitor/operation screen
B8635	MU50 BYPASS	AU50 BYPASS setting screen
B8640	AU50 Monitor 1/4	AU50 monitor screen
B8641	AU50 Monitor 2/4	
B8642	AU50 Monitor 3/4	
B8643	AU50 Monitor 4/4	
B8660	AU50 SYS PARAM 1/2	AU50 system parameter edit screen
B8661	AU50 SYS PARAM 2/2	
B8700	SPU50 Monitor 1/2	SPU50 monitor screen
B8701	SPU50 Monitor 2/2	
B8710	SPU50 SYS PARAM	SPU50 system parameter edit screen

B8720	SPU50 PRESS PARAM 1/8	
B8721	SPU50 PRESS PARAM 2/8	
B8722	SPU50 PRESS PARAM 3/8	
B8723	SPU50 PRESS PARAM 4/8	
B8724	SPU50 PRESS PARAM 5/8	
B8725	SPU50 PRESS PARAM 6/8	
B8725	SPU50 PRESS PARAM 7/8	
B8727	SPU50 PRESS PARAM 8/8	
B8730	SPU01 Operation	SPU50 press parameter edit screen
B8731	SPU02 Operation	
B8732	SPU03 Operation	
B8733	SPU04 Operation	
B8734	SPU05 Operation	
B8735	SPU06 Operation	
B8736	SPU07 Operation	
B8737	SPU08 Operation	
B8738	SPU09 Operation	
B8739	SPU10 Operation	
B8740	LAST RESULT PRESS Monitor	Pressing result monitor screen
B8741	LAST RESULT Detail	Pressing result detail monitor screen
B8742	LAST RESULT HISTORY	Pressing result history screen
B8800	LAST RESULT Monitor 1/2	Tightening result monitor screen
B8801	LAST RESULT Monitor 2/2	
B8810	LAST RESULT Detail	Tightening result detail monitor screen
B8815	LAST RESULT HISTORY	Tightening result history screen
B8819	JOB PROGRAM Edit(work)	Edit tightening program screen (Work)
B8820	JOB PROGRAM Edit	Edit tightening program screen
B8821	SOCKET IN PARAM	Edit tightening program screen - socket-in

B8830	RUNDOWN PARAM 1/5	Edit tightening program screen – Temporary tightening
B8831	RUNDOWN PARAM 2/5	
B8832	RUNDOWN PARAM 3/5	
B8833	RUNDOWN PARAM 4/5	
B8834	RUNDOWN PARAM 5/5	
B8840	TIGHTENING 1/6	Edit tightening program screen – Final tightening
B8841	TIGHTENING 2/6	
B8842	TIGHTENING 3/6	
B8843	TIGHTENING 4/6	
B8844	TIGHTENING 5/6	
B8845	TIGHTENING 6/6	
B8850	LOOSING 1/6	Edit tightening program screen - Loosening
B8851	LOOSING 2/6	
B8852	LOOSING 3/6	
B8853	LOOSING 4/6	
B8854	LOOSING 5/6	
B8855	LOOSING 6/6	
B8860	CONTROL	Edit tightening program screen - Control
B8890	Graph 1/4	Torque/Time curve screen
B8891	Graph 2/4	Torque/Angle curve screen
B8892	Graph 3/4	Pressing/Time curve screen
B8893	Graph 4/4	Pressing/Position curve screen
B8900	System Error History	Error screen - System error history
B8901	NG History	Error screen – NG history
B8910	Fastening NG Monitor	Error screen – NG history
B8911	Pressing NG Monitor	Error screen – NG history
B8912	Fastening NG Monitor	Error screen – NG history
B8913	Pressing NG Monitor	Error screen – NG history

W0004	Parameter details description	Parameter details description windows
W0005	Error details description	Error details description windows
W0098	Security	Security Select windows
W0100	DATA&TIME ADJUST	MU50 internal calendar setting windows
W0101	MS0101	MU50 system parameter edit windows
W0201	MS0201	
W0202	MS0202	
W0203	MS0203	
W0204	MS0204	
W0205	MS0205	
W0301	MS0301	
W0302	MS0302	
W0303	MS0303	
W0304	MS0304	
W0305	MS0305	
W0501	MP501	
W0502	MP502	
W0601	MS0601	
W0602	MS0602	
W0611	MS0611	
W0702	MS0702	
W0703	MS0703	
W0704	MS0704	
W0705	MS0705	
W0706	MS0706	
W0712	MS0712	
W0713	MS0713	
W0714	MS0714	

W0715	MS0715	
W0716	MS0716	
W1001	AS001	AU50 system parameter edit windows
W1002	AS002	
W1003	AS003	
W1005	AS005	
W1010	AS201	
W1011	AS301	
W1012	AS302	
W1013	AS303	
W1020	SP001	SPU50 press parameter edit windows
W1021	SP201	
W1022	SP301	
W1023	SP302	
W1024	SP304	
W1025	SP305	
W1026	SP512	
W1027	SP601	
W1028	SP611	
W1029	SP613	
W1030	SP617	
W1031	SP625	
W1032	SP632	
W1033	SP636	
W1034	SP707	
W1040	SS001	SPU50 system parameter edit windows
W1041	SS201	
W1042	SS301	

W1043	SS302	
W1044	SS403	
W1050	MP0403-B8860	Tightening program edit windows
W1051	MP0400	
W1052	MP0401	
W1053	MP0402	
W1054	MP0403	
W1055	MP0406	
W1056	MP0409	
W1057	MP0411	
W1058	MP0412	
W1059	MP0424	
W1060	MP0430	
W1090	MP200	
W1091	MP203	
W1092	MP204	
W1093	MP205	
W1094	MP208	
W1095	MP211	
W1096	MP213	
W1097	MP214	
W1098	MP229	
W1099	MP235	
W1100	MP238	
W1101	MP242	
W1110	MP300	
W1111	MP302	
W1112	MP303	

W1113	MP304	
W1114	MP305	
W1115	MP308	
W1116	MP311	
W1117	MP313	
W1118	MP314	
W1119	MP331	
W1120	MP334	
W1121	MP338	
W1120	MP334	
W1121	MP338	
W1122	MP346	
W1123	MP351	
W1124	MP355	
W1200	AU No. search	AU No. search windows
W1210	WG Select	Work group select windows
W1211	PG No. Select 1/2	Tightening program No. select windows
W1212	PG No. Select 2/2	
W1220	CH No. Select 1/2	Pressing channel No select windows
W1221	CH No. Select 2/2	
W1230	SPU No. Search	SPU No. search windows
W1300	MP0100	Tightening program edit windows
W1301	MP0200	
W1303	MP2003	
W1304	MP0204	
W1305	MP0205	
W1400	MU SYS PARAM WRITE	MU50 system parameter write confirmation windows
W1401	AU SYS PARAM WRITE	AU50 system parameter write confirmation windows

W1402	SPU SYS PARAM WRITE	SPU50 system parameter write confirmation windows
W1403	PRESS PARAM WRITE	SPU50 pressing parameter write confirmation windows
W1404	PRG PARAM WRITE	MU50 tightening program write confirmation windows
W1405	PARAMETER READ Wait	PARAMETER READ Wait windows
W1500	WORK GROUP select Ch1	Torque curve screen – work group select windows
W1501	WORK GROUP select Ch2	
W1502	WORK GROUP select Ch3	
W1503	WORK GROUP select Ch4	
W1511	AU No. WG_A select Ch1	Torque curve screen -WG_A-AU No. select windows
W1512	AU No. WG_A select Ch2	
W1513	AU No. WG_A select Ch3	
W1514	AU No. WG_A select Ch4	
W1515	AU No. WG_B select Ch1	Torque curve screen-WG_B-AU No. select windows
W1516	AU No. WG_B select Ch2	
W1517	AU No. WG_B select Ch3	
W1518	AU No. WG_B select Ch4	
W1519	AU No. WG_C select Ch1	Torque curve screen -WG_C-AU No. select windows
W1520	AU No. WG_C select Ch2	
W1521	AU No. WG_C select Ch3	
W1522	AU No. WG_C select Ch4	
W1523	AU No. WG_D select Ch1	Torque curve screen -WG_D-AU No. select windows
W1524	AU No. WG_D select Ch2	
W1525	AU No. WG_D select Ch3	
W1526	AU No. WG_D select Ch4	
W1551	SPU No. select Ch1	Pressing curve screen-SPU No. select windows
W1552	SPU No. select Ch2	
W1553	SPU No. select Ch3	
W1554	SPU No. select Ch4	

| W1600 | Language switchable | Language switchable windows (ENG/JPN) |

6.3. Screen transition

Top Screen

Security Screen

Menu

MU50 Monitor

I/O Monitor

MU50 System Parameter

Workgroup

WG Operation

BYPASS

AU50 Monitor

AU50 System Parameter

SPU50 Monitor

SPU50 System Parameter

Press Parameter

SPU50 Operation

Job Program

Socket in

Rundown

Tightening

Loosing

Control

Torque/Time Curve

Torque/Angle Curve

Pressing/Time Curve

Pressing/Position Curve

System Error History

Tightening Result

Tightening Detail

Tightening History

NG History

Pressing Result

Pressing Detail

Pressing History

NG History

## 6.4. Language switch

This sample project file supports multi-languages (Japanese/English). Press and hold "JPN/ENG" switch for a few seconds to change to the required language.

Press "JPN/ENG" switch for a few seconds to change the language.

6.5. Menu switch at the bottom of the screen

Menu switches are located at the bottom of each screen.
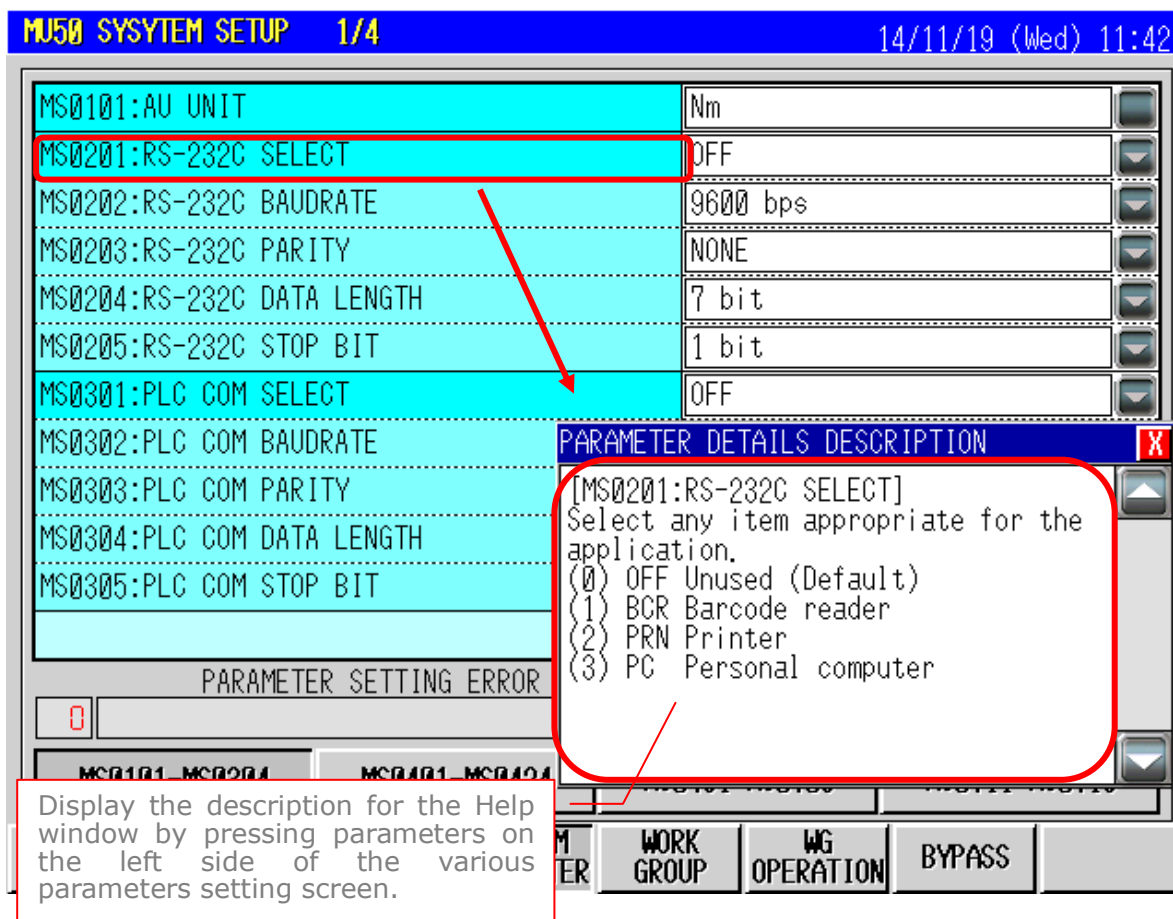Press "MENU" to return to the "MAIN MENU" screen.
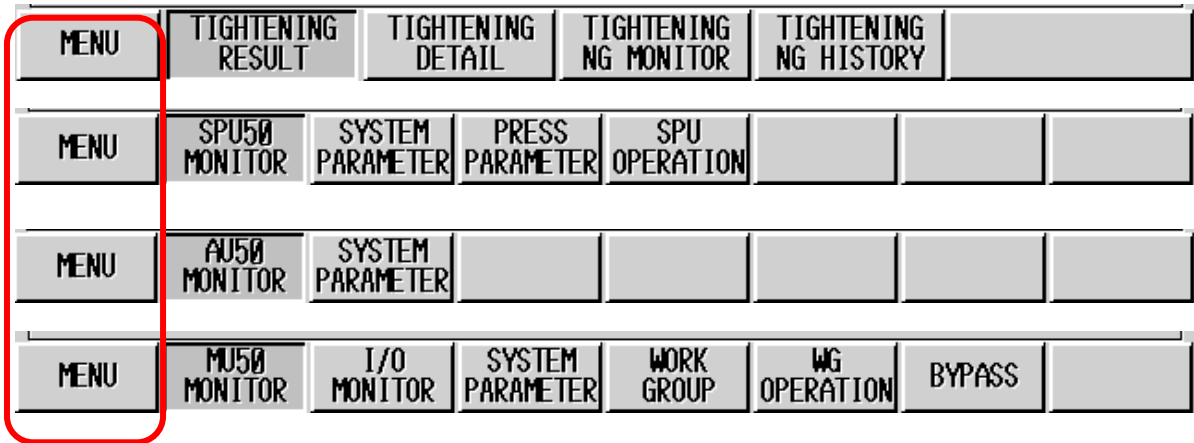
6.6. Parameter

6.6.1. Parameter input help function

Set various parameters of MU50, AU50, SPU50.
Offer "Help display function" that allows you to check the meaning of each parameter, setting range and initial value.

MU50 SYSYTEM SETUP 1/4	14/11/19 (Wed) 11:42
MS0101:AU UNIT	Nm
MS0201:RS-232C SELECT	OFF
MS0202:RS-232C BAUDRATE	9600 bps
MS0203:RS-232C PARITY	NONE
MS0204:RS-232C DATA LENGTH	7 bit
MS0205:RS-232C STOP BIT	1 bit
MS0301:PLC COM SELECT	OFF
MS0302:PLC COM BAUDRATE	
MS0303:PLC COM PARITY	
MS0304:PLC COM DATA LENGTH	
MS0305:PLC COM STOP BIT	

PARAMETER DETAILS DESCRIPTION

[MS0201:RS-232C SELECT]
Select any item appropriate for the application.
(0) OFF Unused (Default)
(1) BCR Barcode reader
(2) PRN Printer
(3) PC Personal computer

PARAMETER SETTING ERROR

0

MC0101_MC0204   MC0401_MC0404

Display the description for the Help window by pressing parameters on the left side of the various parameters setting screen.

WORK GROUP   WG OPERATION   BYPASS

6.6.2. Notes when inputting parameters

When switching to edit various parameters screen, confirm read target of unit and No. first and press the "READ" switch to read the parameter.

SPU PRESS PARAMETER SETUP 1/8	14/11/19 (Wed) 11:42

SP001:CHANNEL SPAN SELECT	SYSTEM SPAN
SP002:CHANNEL SPAN	0.0%
SP003:SCALE ADJUST	0.00mm
SP101:OFFSET LOAD	0.00kN
SP201:PRESS CURVE	OFF
SP301:	
SP302:	
SP303:	
SP304:NG FINISH FEED BACK	OFF

> Confirm read target of equipment (AU No., SPU No.) and data (tightening program No., pressing channel No.)o. and press "READ".

PARAMETER SETTING ERROR   0

SPU	CH	READ PARM	WRITE PARM	INIT PARM
0	0			

SP001 -305	SP501 -511	SP512 -521	SP601 -612	SP613 -624	SP625 -631	SP632 -639	SP701 -707

MENU	SPU50 MONITOR	SYSTEM PARAMETER	PRESS PARAMETER	SPU OPERATION			

6.7. I/O STOP

Press "I/O STOP" switch to check wiring.
Even when the input signal is ON, MU50 is not operating during "I/O STOP" when pressed.
In order to lighten up the lamp on the screen, the input signal connection can be checked.
In addition, forced output can be performed by pressing the "OUT" lamp.
Output signal wiring can be checked by monitoring a destination PLC.

MU50 I/O MONITOR 2/3			14/11/19 (Wed) 11:43
	I/O STOP		
EXTEND IN01	EXTEND IN09	EXTEND OUT01	EXTEND OUT09
EXTEND IN02	EXTEND IN10	EXTEND OUT02	EXTEND OUT10
EXTEND IN03	EXTEND IN11	EXTEND OUT03	EXTEND OUT11
EXTEND IN04	EXTEND IN12	EXTEND OUT04	EXTEND OUT12
EXTEND IN05	EXTEND IN13	EXTEND OUT05	EXTEND OUT13
EXTEND IN06	EXTEND IN14	EXTEND OUT06	EXTEND OUT14
EXTEND IN07	EXTEND IN15	EXTEND OUT07	EXTEND OUT15
EXTEND IN08	EXTEND IN16	EXTEND OUT08	EXTEND OUT16
CONTROL I/O	EXTEND I/O	REMOTE I/O	
MENU	MU50 MONITOR	I/O MONITOR	SYSTEM PARAMETER	WORK GROUP	WG OPERATION	BYPASS	

6.8. System Error History

Regarding system error, error details, the causes and treatment methods can be displayed from the history list screen, thus reduction of recovery time can be achieved when errors occur.

Touching the error item you want to check error details, the causes and treatment methods can be displayed.
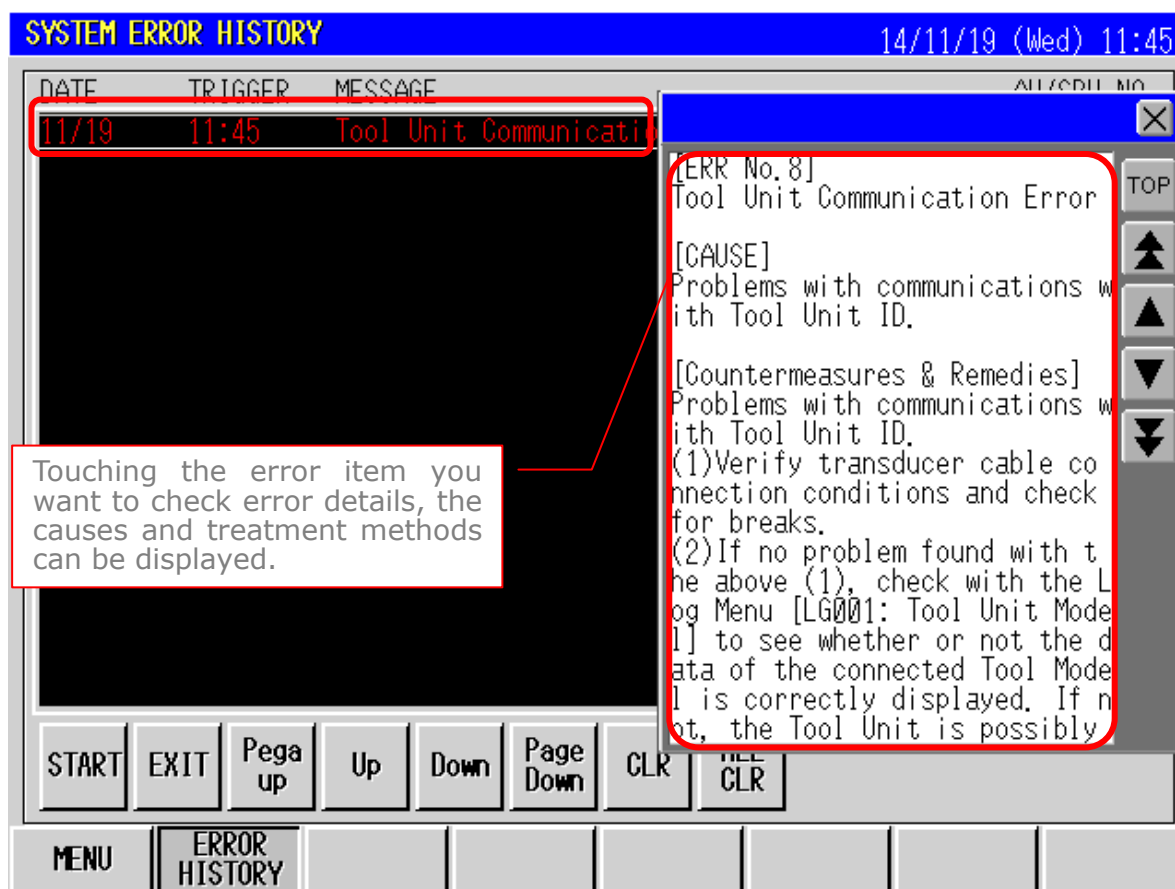
7. Related documents

ENRZ-MU50 Manual

ENRZ-AU50 Manual

ENRZ-SPU50 Manual

MU50Touch Panel Specification.pdf

Please ask ESTIC Corporation if you require the documents above.