Technical Information

SMARTDAC+
CX Replacement Guide
(Model and Suffix Code Replacement)

TI 04L51B01-32EN

Contents

YOKOGAWA

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Foreword

This manual describes replacing CX1000/CX2000 models and suffix codes of the DAQSTATION Control and Measurement Station with GX10/GX20 models and suffix codes (with PID control module and /PG option). For detailed specifications on these models, refer to the general specifications or user's manuals.

Note that the GX10/GX20 is not completely upwardly compatible with the CX1000/CX2000. This manual can help you select replacement models, but be aware that the models that you select may not offer all of the functionality of the ones that they replace.

Notice

- The contents of this manual are subject to change without notice as a result of continuing improvements to the instrument's performance and functions.
- Every effort has been made to ensure accuracy in the preparation of this manual. Should any errors or omissions come to your attention, however, please inform Yokogawa Electric's sales office or sales representative.
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1. Comparison of Specifications

Installation type	144 x 144 mm panel mount		288 x 288 mm panel mount	
Screen image				
Model	CX1000	GX10	CX2000	GX20
Display	5.5-inch LCD	5.7-inch LCD	10.4-inch LCD	12.1-inch LCD
Touch panel	None	Yes	None	Yes
Max. loops (main unit only)	2	6	6	16
Max. measurement inputs (main unit only)	6	20 (with 2 loops)	20	50 (with 6 loops)
Min. control interval	250ms	100ms	250ms	100ms
MIn. recording interval	1s	100ms	1s	100ms
Internal memory	1.2MB	500MB	1.2MB	500 MB or 1.2 GB
External storage media	FDD, CF, Zip, 2 GB max.	SD memory card, 32 GB max.	FDD, CF, Zip, 2 GB max.	SD memory card, 32 GB max.
Expansion unit (distributed installation)	None	Yes	None	Yes
Program patterns	4 or 30	99	4 or 30	99
PV inputs	16	32	16	32
Time events	16	32	16	32
Custom display support	No	Yes	No	Yes
Modular structure (maintenance)	No	Yes	No	Yes
Web-based operation and monitoring	Screen shots	Yes	Screen shots	Yes

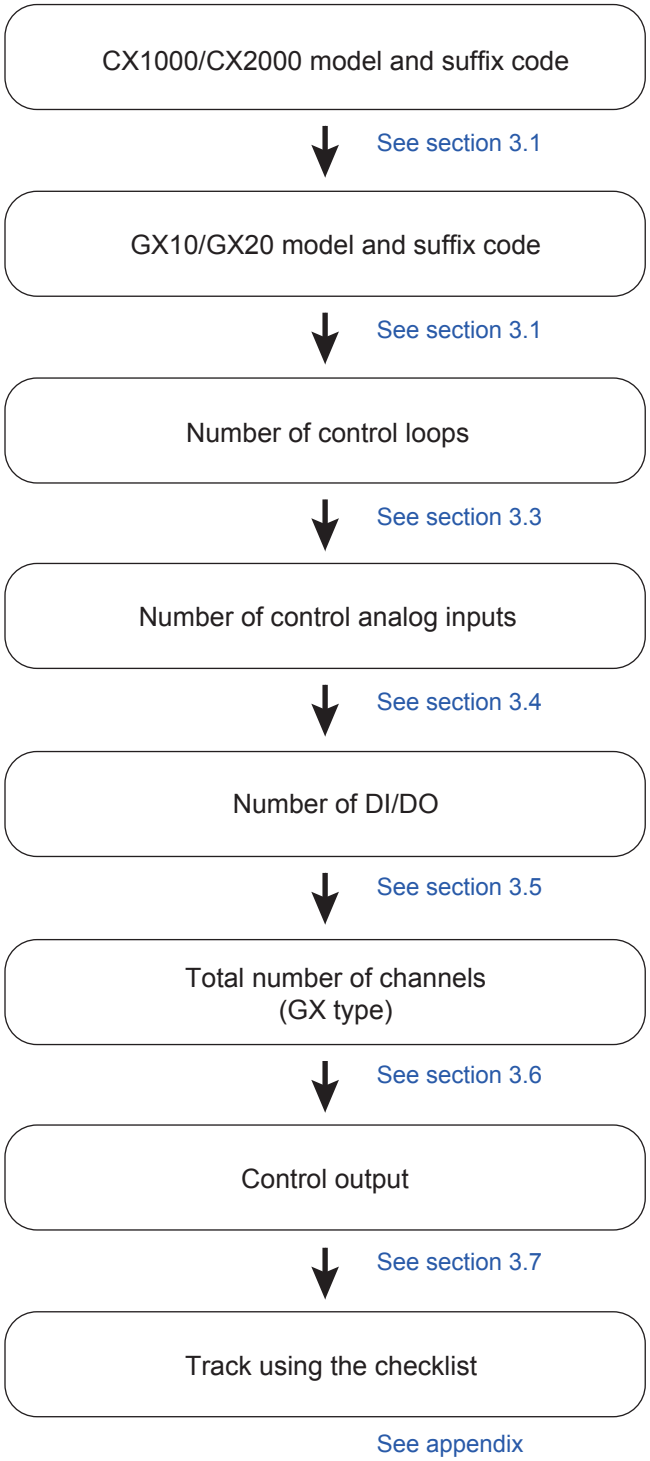
Replacement unit

Before		After
CX1000	→	GX10
CX2000	→	GX20

If you do not require the display functions you can replace it with the GM Data Acquisition System.

2. Outline of Checks

The following is an outline of things to check when replacing the CX1000/CX2000 model and suffix code with the GX10/GX20 model and suffix code.



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3. Specific Items to Check

3.1 Model and suffix code

CX1000

CX1000 model and suffix code	CX1000 specification		GX10 specification (option /BC as needed)
C X 1 x 0 x -x -x -x			
	-2: English	->	Select display language suffix code "E"
	-0: Ethernet only -1: Ethernet, RS-232C communication interface -2: Ethernet, RS-422A/485 communication interface	->	Ethernet comes standard, select option /C2 or /C3
	-1: 3.5 in. floppy disk drive -2: CompactFlash memory card -3: Zip disk	->	SD memory card comes standard
	0: Measurement channel 0ch 6: Measurement channels 6ch	->	Select needed units of the GX90XA See sections 3.2 and 3.4
	0: Embedded loop 0 loop 2: Embedded loops: 2 loops	->	Select needed units of the GX90UT See sections 3.2 and 3.3

Option code	CX1000 specification		GX10 specification (option /BC as needed)
/A6	Measurement alarm (6 DOs)	->	Select GX90WD or GX90YD See sections 3.2 and 3.5
/A6R	Measurement alarm with remote control (8 DIs, 6 DOs)	->	Select GX90WD See sections 3.2 and 3.5
/A4F	Measurement alarm (4 DOs, FAIL/end-of-memory output relays)	->	Select option /FL and the GX90WD or GX90YD See sections 3.2 and 3.5
/A4FR	Measurement alarm with remote control (8 DIs, 4 DOs, FAIL/end-of-memory output relays)	->	Select option /FL and the GX90WD See sections 3.2 and 3.5
/BT1	Batch header function	->	Standard function
/M1	Computation functions (including report functions)	->	Select option /MT Ooption /MC required to use communication channels
/N2	Three-wire isolated RTD (measurement channels) *1	->	Replace with GX90XA-04-H0 See section 3.2
/P1	24 V DC/AC power supply	->	Select option /P1
/PG1	Program control (4 program patterns)	->	Select option /PG
/PG2	Program control (30 program patterns)	->	Select option /PG

*1 Since no option corresponds to the 3-wire isolated RTD, replace with a GX90XA-04-H0 that uses individual A/D. There are 4 channels per module.

GX10

Model	Suffix Code		Optional code	Description
GX10				Paperless recorder (Panel mount type, Small display)
Type	-1			Standard (Max. measurement channels: 100 ch)
Display language		J		English, degF, DST (summer/winter time) *1
Optional features			/AH	Aerospace heat treatment
			/AS	Advanced security function (Part 11)
			/BC	Black cover
			/BT	Multi-batch function
			/C2	RS-232 *2
			/C3	RS-422/485 *2
			/CG	Custom display
			/E1	EtherNet/IP communication (PLC communication protocol) *3
			/E2	WT communication *4
			/E3	OPC-UA server
			/E4	SLMP communication (Mitsubishi PLC) *5
			/FL	Fail output, 1 point
			/LG	Log scale
			/MT	Mathematical function (with report function)
			/MC	Communication channel function *6
			/P1	24 V DC/AC power supply
			/PG	Program control function *7
			/UH	USB interface (Host 2 ports)

*1 The Display language is selectable from English, German, French, Russian, Korean, Chinese, Japanese. (As of Mar., 2013)
To confirm the current available languages, please visit the following website.
URL: http://www.yokogawa.com/ns/language/

*2 /C2 and /C3 cannot be specified together.

*3 If you want to write from a PLC to the GX via EtherNet/IP communication, a separate communication channel (/MC) is required.

*4 /MC option must be separately specified when the WT communication is selected.

*5 If you want the GX to load data from SLMP servers via SLMP communication, a separate communication channel (/MC) is required.

*6 If you want to load data from other devices into the GX using Modbus client, a communication channel (/MC) is required.

*7 A PID control module is required to use the program control function.

Replacement example

CX1206

Loops: 2

Analog inputs: 11 (5 control + 6 measurement)

Control outputs: 2 (relay, current, voltage pulse)

Contact inputs: 6

Contact outputs: 6 (2 relay, 4 transistor)

GX10+GX90UT+GX90XA

Loops: 2

Analog inputs: 12 (2 control + 10 measurement)

Control outputs: 2 (current, voltage pulse)

Contact inputs: 8

Contact outputs: 8 (8 transistor)

CX2000

CX2000 model and suffix code	CX2000 specification		GX20 specification (option /BC as needed)
C X 2 x x 0 -x -x -x			
	-2: English	->	Select display language suffix code "E"
	-0: Ethernet only -1: Ethernet, RS-232C communication interface -2: Ethernet, RS-422A/485 communication interface	->	Ethernet comes standard, select option /C2 or /C3
	-1: 3.5 in. floppy disk drive -2: CompactFlash memory card -3: Zip disk	->	SD memory card comes standard
	0: Measurement channel 0 ch 1: Measurement channels 10 ch 2: Measurement channels 20 ch	->	Select needed units of the GX90XA See sections 3.2 and 3.4
	0: Embedded loop 0 loop 2: Embedded loop 2 loops 4: Embedded loop 4 loops 6: Embedded loop: 6 loops	->	Select needed units of the GX90UT See sections 3.2 and 3.3

Option Code	CX2000 specification		GX20 specification (option /BC as needed)
/A6	Measurement alarm (6 DOs)	->	Select GX90WD or GX90YD See sections 3.2 and 3.5
/A6R	Measurement alarm with remote control (6 DOs, 8 DIs)	->	Select GX90WD See sections 3.2 and 3.5
/A4F	Measurement alarm (4 DOs, FAIL/end-of-memory output relays)	->	Select option /FL and the GX90WD or GX90YD See sections 3.2 and 3.5
/A4FR	Measurement alarm with remote control (4 DOs, 8 DIs, FAIL/end-of-memory output relays)	->	Select option /FL and the GX90WD See sections 3.2 and 3.5
/BT1	Batch header function	->	Standard function
/CST1	Control-purpose extension DIO interface (12 DIs, 12 DOs)	->	Select the GX90WD, GX90YD, or GX90XD depending on the number) See sections 3.2 and 3.5
/D5	VGA output	->	Select option /D5
/M1	Computation functions (including report functions)	->	Select option /MT Option /MC required to use communication channels
/N2	Three-wire isolated RTD (measurement channels) *1	->	Replace with GX90XA-04-H0 See section 3.2
/P1	24 V DC/AC power supply	->	Select option /P1
/TPS4	24 V DC transmitter power supply output *2	->	None
/PG1	Program control (4 program patterns)	->	Select option /PG
/PG2	Program control (30 program patterns)	->	Select option /PG

*1 Since no option corresponds to the three-wire isolated RTD, replace with a GX90XA-04-H0 that uses individual A/D. There are 4 channels per module.

*2 Since no option corresponds to option /TPS4, attach an external distributor or some other device.

GX20

Model	Suffix Code		Optional code	Description
GX20				Paperless recorder (Panel mount type, Large display)
Type	-1			Standard (Max. measurement channels: 100 ch)
	-2			Large memory (Max. measurement channels: 500 ch)
Display language		J		English, degF, DST (summer/winter time) *1
Optional features			/AH	Aerospace heat treatment
			/AS	Advanced security function (Part 11)
			/BC	Black cover
			/BT	Multi-batch function
			/C2	RS-232 *2
			/C3	RS-422/485 *2
			/CG	Custom display
			/D5	VGA output
			/E1	EtherNet/IP communication (PLC communication protocol) *3
			/E2	WT communication *4
			/E3	OPC-UA server
			/E4	SLMP communication (Mitsubishi PLC) *5
			/FL	Fail output, 1 point
			/LG	Log scale
			/MT	Mathematical function (with report function)
			/MC	Communication channel function *6
			/P1	24 V DC/AC power supply
			/PG	Program control function *7
			/UH	USB interface (Host 2 ports)

*1 The Display language is selectable from English, German, French, Russian, Korean, Chinese, Japanese. (As of Mar., 2013)
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*2 /C2 and /C3 cannot be specified together.

*3 If you want to write from a PLC to the GX via EtherNet/IP communication, a separate communication channel (/MC) is required.

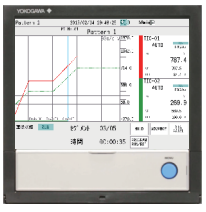
*4 /MC option must be separately specified when the WT communication is selected.

*5 If you want the GX to load data from SLMP servers via SLMP communication, a separate communication channel (/MC) is required.

*6 If you want to load data from other devices into the GX using Modbus client, a communication channel (/MC) is required.

*7 A PID control module is required to use the program control function.

Replacement example



CX2620
Loops: 6
Analog inputs: 30 (10 control + 20 measurement)
Control outputs: 6 (relay, current, voltage pulse)
Contact inputs: 18
Contact outputs: 18 (6 relay, 12 transistor)

GX20+GX90UT(x 3)+GX90XA(x 2)
Loops: 6
Analog inputs: 26 (6 control + 20 measurement)
Control outputs: 6 (current, voltage pulse)
Contact inputs: 24
Contact outputs: 24 (24 transistor)

3.2 SMARTDAC+ I/O modules

As the number of measurements (channels) differs by module type, confirm the number in the table below.

Analog input modules

Type	Channels	Scan interval (shortest)	Scanner	TC	RTD	DCV	DI	mA	Resistance	Feature
Universal (-U2)	10	100 ms	SSR	v	v	v	v			Universal
Low withstand voltage relay (-L1)	10	500 ms	SSR	v		v	v			Mid-price
Electromagnetic relay (-T1)	10	1 s	Relay	v		v	v			Noise-resistance
DC current input (-C1)	10	100 ms	SSR					v		mA only
High speed universal (-H0)	4	1 ms	-	v	v	v	v			High speed measurement
4-wire RTD/ resistance (-R1)	6	100 ms	SSR		v				v	4-wireRTD

v: Available

Other modules

Model	Name	Application	Channels
GX90YA	Analog output module	Current output	4
GX90XD	Digital input module	Remote control input or operation recording	16
GX90YD	Digital output module	Alarm output	6
GX90WD	Digital input/output module	Remote control input or operation recording/alarm output	DI: 8, DO: 6
GX90XP	Pulse input Module	Pulse signal data acquisition, integral count	10
GX90UT	PID control module	PID control (2 loop)	AI: 2, AO: 2, DI: 8, DO: 8, PV: 2, SP: 2, OUT: 2

3.3 Number of control loops

Select the number of GX90UT units needed according to the number of control loops. The GX90UT has 2 loops built in per module.

The number of loops differs depending on the control mode used.

- Single loop control: 1 loop on the CX is equivalent to 1 loop on the GX90UT.
- Cascade control and 2 loop switching: The GX90UT uses 1 module (2 loops). Confirm that there are enough loops.
- Loop control with PV switching: 1 loop on the CX is equivalent to 2 loops on the GX90UT.

Example: On the GX2620 when all six loops are single loop control

Control mode of CX		Loops used	GX90UT loops	Needed GX90UT units
Single loop contgrol	->	6	6	3 units
				Total 3 units

Example: On the GX2620 when 2 loops are cascade control and 4 loops are single loop control

Control mode of CX		Loops used	GX90UT loops	Needed GX90UT units
Single loop contgrol	->	4	4	2 units
Cascade control	->	2	4	2 units
				Total 4 units

Note 1: Since with there is no way to confirm how many GX90UT units are needed by the CX model alone, you must check the control mode being used. Also, when using remote input (RSP), either add 1 loop or use the input of a separate module.

Note 2: For loops set for analog retransmission, you must consider using a separate module or some other solution. If items other than PV and SP are set for retransmission, the MATH function /MT or GX90YA may be needed.

3.4 Number of control analog inputs

The number of control analog inputs on the CX1000/CX2000 may differ depending on the number of control loops and function settings (such as whether RSP is used). Check the number of control loops by the model, and also check the actual wiring to confirm the number of analog inputs. To check the wiring, see section 2.3 in the CX1000 or CX2000 user's manual.

The following table shows the number of control loops and analog inputs on the terminal name plate. Check the actual wiring to confirm whether they are being used.

CX1000

Loops	Control analog inputs (PV or RSP)
2 loops (CX120x)	5

CX2000

Loops	Control analog inputs (PV or RSP)
2 loops (CX22x0)	5
4 loops (CX24x0)	10
6 loops (CX26x0)	10

3.5 Number of DI/DO

As the number of DIs and DOs differs according to the number of loops on the main unit and the option, confirm the number in the table below. (The table does not include options such as analog I/O and communication).

CX1000/CX2000

Main unit, option	No. of DI	No. of DO	
		Relay	Transistor
Per 2 loops built into the main unit (check by model) *	6	2	4
Option /A6	-	6	-
Option /A6R	8	6	-
Option /A4F	-	6	-
Option /A4FR	8	6	-
Option /CST1	12	-	12

* 1 terminal block has 6 contact inputs, 2 relay contact outputs, and 4 transistor output terminals.

GX10/GX20

Main unit, module	No. of DI	No. of DO	
		Relay	Transistor
Per 1 GX90UT	8	-	8
GX90WD	8	6	-
GX90XD	16	-	-
GX90YD	-	6	-
Option /FL	-	1	-

Ex. 1: CX2420-3-0-1/A4FR

CX2420

Main unit, option	No. of DI	No. of DO	
		Relay	Transistor
Per 4 loops built into the main unit	12	4	8
Option /A4FR	8	6	-
Total	20	18	

↓

GX20

Main unit, module	No. of DI	No. of DO	
		Relay	Transistor
Per 2 GX90UT	16	-	16
GX90WD	8	6	-
Option /FL	-	1	-
Total	24	23	

Ex. 2: CX2620-3-0-1/CST1

CX2620

Main unit, option	No. of DI	No. of DO	
		Relay*	Transistor
Per 6 loops built into the main unit	18	6	12
Option /CST1	12	12	-
Total	30	30	

↓

GX20

Main unit, module	No. of DI	No. of DO	
		Relay*	Transistor
Per 3 GX90UT	24	-	24
GX90WD	8	6	-
Total	32	30	

* Output from some relays will be transistor output.

3.6 Total number of channels (GX type)

After selecting the replacement GX model, you must decide on the GX type (100 ch standard or 500 ch large capacity). This type depends on the number of I/O module channels installed in the GX.

Ex. 1

Total number of channels with 1 analog input module (GX90XA-10-U2) and 1 PID control module (GX90UT).

GX90XA-10-U2: 10 channels, GX90UT: 26 channels

Total channels: 36 --> Standard or large capacity type

Ex. 2

Total number of channels with 2 analog input modules (GX90XA-10-U2), 1 digital input module (GX90XD), and 3 PID control modules (GX90UT).

GX90XA-10-U2 (x2): 20 channels, GX90XD (x1): 16 channels, GX90UT (x3): 78 channels

Total channels: 114 --> Large capacity type

Note)

- If the number of I/O module channels installed in the GX exceeds 100, you must select the large capacity type.
- The number of channels per GX90UT module is fixed at 26.

3.7 Control output

The CX1000/CX2000 has universal output of relay, voltage pulse, and current. The GX90UT has universal output of voltage pulse and current. If you were using relay output, external circuits may be required.

3.8 Operation screens

In cases such as when only internal loops are assigned to control loops, there will be screens that cannot display certain items in the same way as the CX . Consider the Custom Display option as needed.

Operation Display	CX	GX	Notes
Control group display (Controller style)	v	v	Select 2, 4, 6, or 8 divisions. You cannot assign measurement channels, DI/DO status display, or external loops.
Control group display (Faceplate style)	v	v	
Control group display (Hybrid style)	v	N/A	
Tuning display	v	v	
Control overview display	v	v	
DI/DO status display	v	N/A	
Control operation summary display	v	v	
Control alarm summary display	N/A	v	The GX summary screen differs in terms of measurement and control alarms.
Control event summary display	v	N/A	On the GX, integrated with the control event summary.
Internal switch status display	v	v	On the GX, this is the internal switch/relay status screen.
Program control display	v	v	
Custom display	NA	v	

v: Available
N/A: Not available

3.9 Precautions

Item	Precaution
FAIL output	The Fail output option (/FL) is required on the GX/GP/GM to set the control alarm to FAIL output.
Logic operation, PV/SP computation	These are standard functions on the GX, but the MATH /MT option is required on the GX/GP/GM.
Hybrid display	You can customize the screen with the Custom Display function.
DIO operation monitoring function	The GX does not have this function.
Communication commands	Since the communication commands are different, refer to the user's manual or communication manual for details. Not all commands have equivalents on the GX.
Temperature controller communication	The GX does not have temperature controller communication. Only a Modbus connection can display an external instrument on a custom display.
Ladder communication	The GX does not have ladder communication.
Program settings	Program settings on the GX do not include ramp settings. You must calculate it in the time settings prior to input.
Simultaneous execution of multiple program patterns	On the CX, you can run multiple program patterns at the same time as long as loops do not overlap. On the GX/GP/GM, you can only run 1 program pattern at a time.

Appendix Replacement Checklist

Please check the items below. Items with a check mark are relevant to the replacement, so please refer to the pages indicated.

Control loops

↓ Check (if relevant)			Refer to
□	1-1	Analog inputs other than PV in the control loops	Page 15
□	1-2	Control output is relay output	Page 17
□	1-3	Using PV and SP math	Page 18

Display operation related

↓ Check (if relevant)			Refer to
□	2-1	Items other than internal loops (such as external loops, measurement channels, or DIO) are assigned to a control group	Page 20
□	2-2	Tuning screen is customized (items added or deleted)	Page 21
□	2-3	Key lock is set	Page 23

Logic operation and Fail output function

↓ Check (if relevant)			Refer to
□	3-1	Using logic operation	Page 25
□	3-2	Using Fail output	Page 26

Program control

↓ Check (if relevant)			Refer to
□	4-1	Sometimes running multiple program patterns simultaneously	Page 27
□	4-2	Creating program patterns with the Ramp method	Page 28

Communication related

↓ Check (if relevant)			Refer to
□	5-1	Serial communications included	Page 29

1-1 Analog inputs other than PV in the control loops

Check the following items.

Using RSP	→	Secure an analog input channel that carries out RSP input.
Control mode is Cascade or 2 input switching	→	For Cascade and 2 input switching, the GX90UT uses 1 module (2 loops). Check whether there are enough loops.
Neither	→	May be using PV math. See section 1-3.

If wired to the terminal, check the settings by completing the steps below. If each loop has 2 or more inputs, it may be using RSP input, cascade control, 2 input switching control, or PV math.

• **6 loops**

PV, PV1, PV2: PV input, (RSP): RSP input
(not used during program control), □: unused terminal

LOOP4		LOOP6	LOOP3		LOOP2		LOOP5	LOOP1		
2	1	1	2	1	2	1	1	2	1	[Control mode setting]
(RSP)	PV	PV	(RSP)	PV	(RSP)	PV	PV	(RSP)	PV	← During single-loop control
□	PV	□	(RSP)	PV	□	PV	□	(RSP)	PV	← During cascade control
PV2	PV1	□	PV2	PV1	PV2	PV1	□	PV2	PV1	← During loop control with PV switching

• **4 loops**

PV, PV1, PV2: PV input, (RSP): RSP input
(not used during program control), □: unused terminal

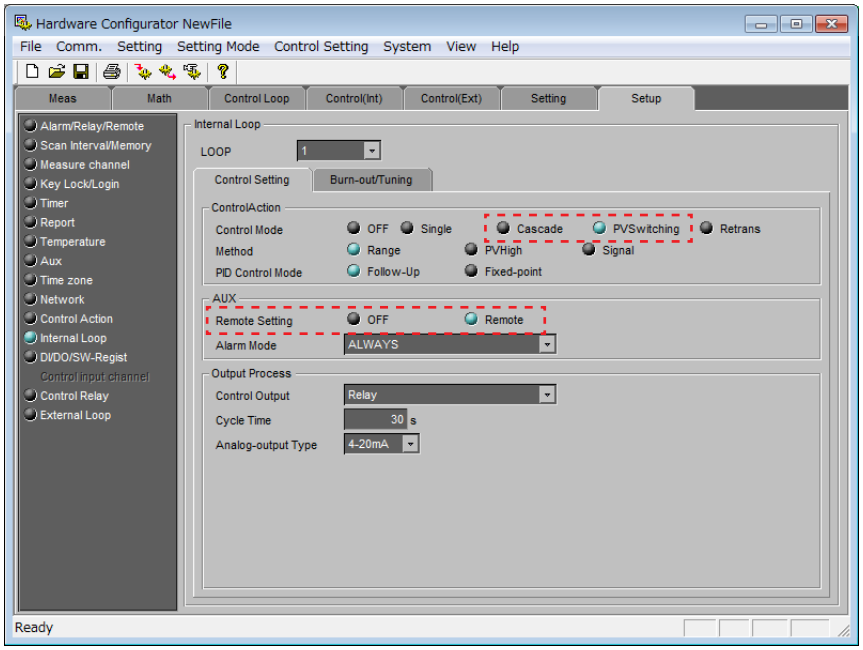
LOOP4		LOOP3			LOOP2		LOOP1			
2	1	3	2	1	2	1	3	2	1	[Control mode setting]
(RSP)	PV	□	(RSP)	PV	(RSP)	PV	□	(RSP)	PV	← During single-loop control
□	PV	□	(RSP)	PV	□	PV	□	(RSP)	PV	← During cascade control
PV2	PV1	(RSP)	PV2	PV1	PV2	PV1	(RSP)	PV2	PV1	← During loop control with PV switching

• **2 loops**

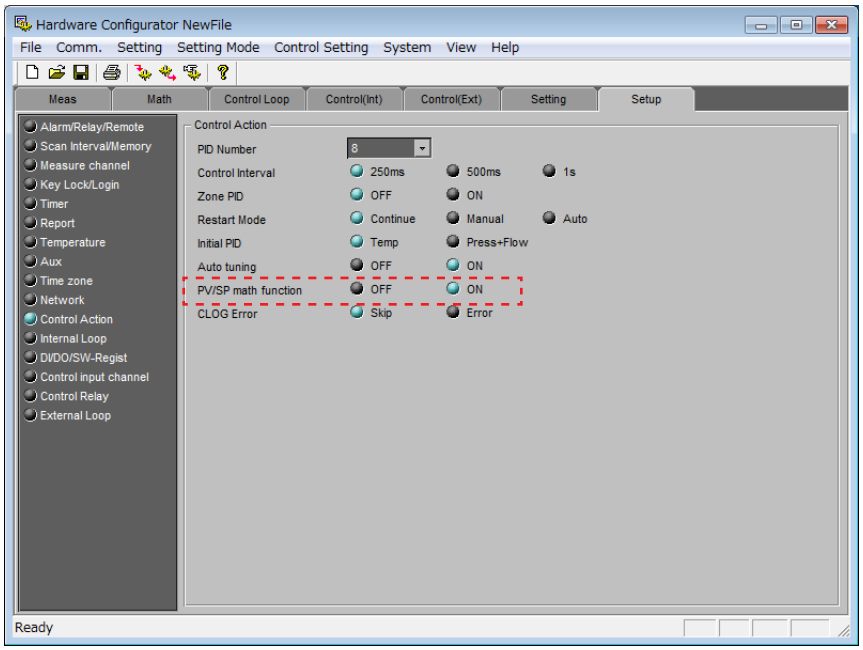
PV, PV1, PV2: PV input, (RSP): RSP input
(not used during program control), □: unused terminal

					LOOP2		LOOP1			
					2	1	3	2	1	[Control mode setting]
□	□	□	□	□	(RSP)	PV	□	(RSP)	PV	← During single-loop control
□	□	□	□	□	□	PV	□	(RSP)	PV	← During cascade control
□	□	□	□	□	PV2	PV1	(RSP)	PV2	PV1	← During loop control with PV switching

Open the setting file in Hardware Configurator and check the following items.



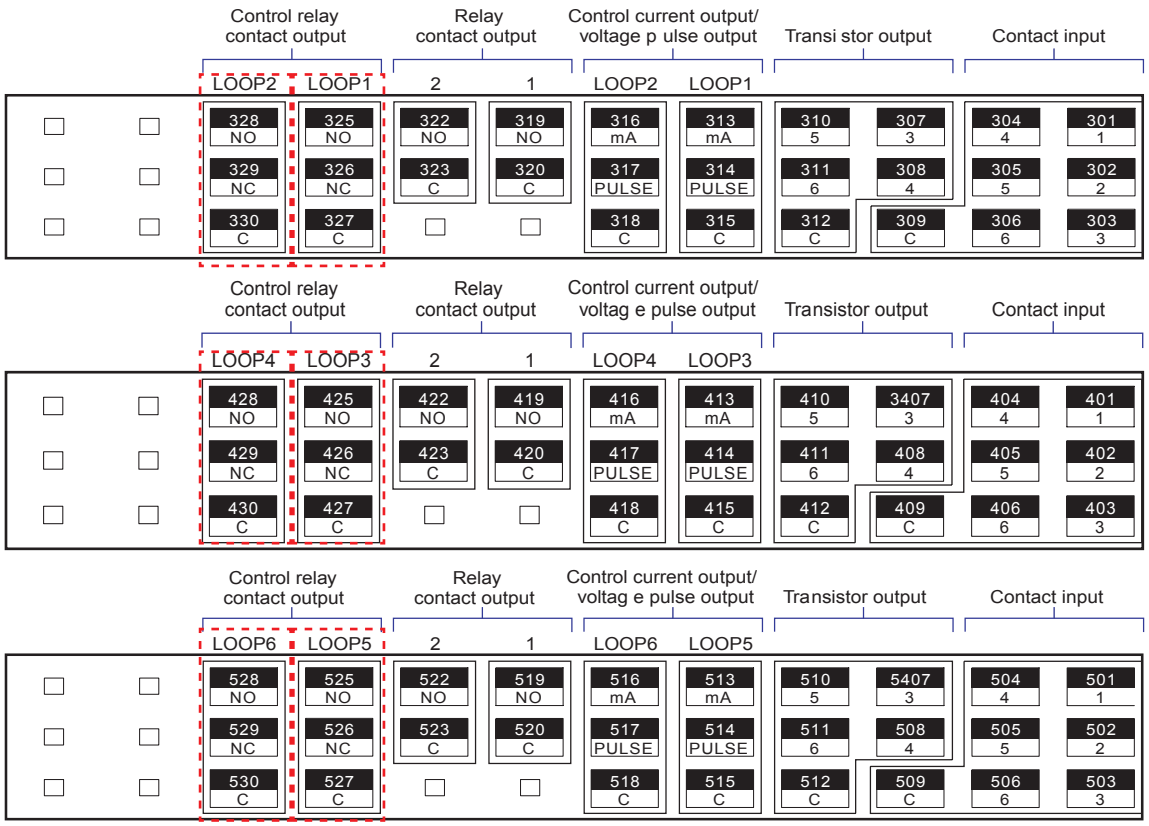
Also, check the following items to check whether PV math is being used.



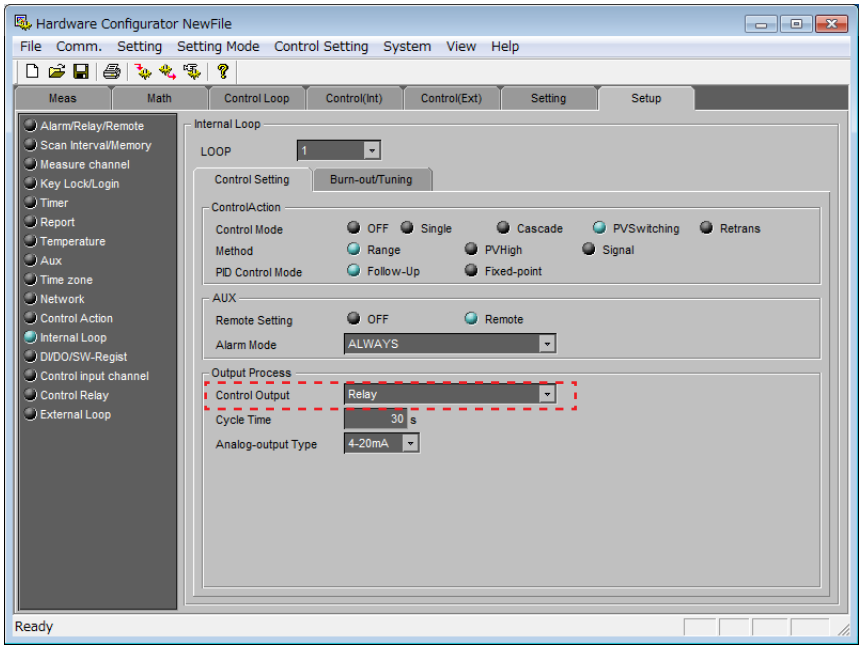
1-2 Control output is relay output

The GX90UT has no relay output, but it does have voltage pulse output for relay/SSR activation so you should attach an external relay/SSR.

Check the wiring against a drawing or other information. The terminals inside the dotted red frame are relay output terminals. If wired to these, you must set the PID module's control output to voltage pulse and activate an external relay.



Open the setting file in Hardware Configurator and check the following item.

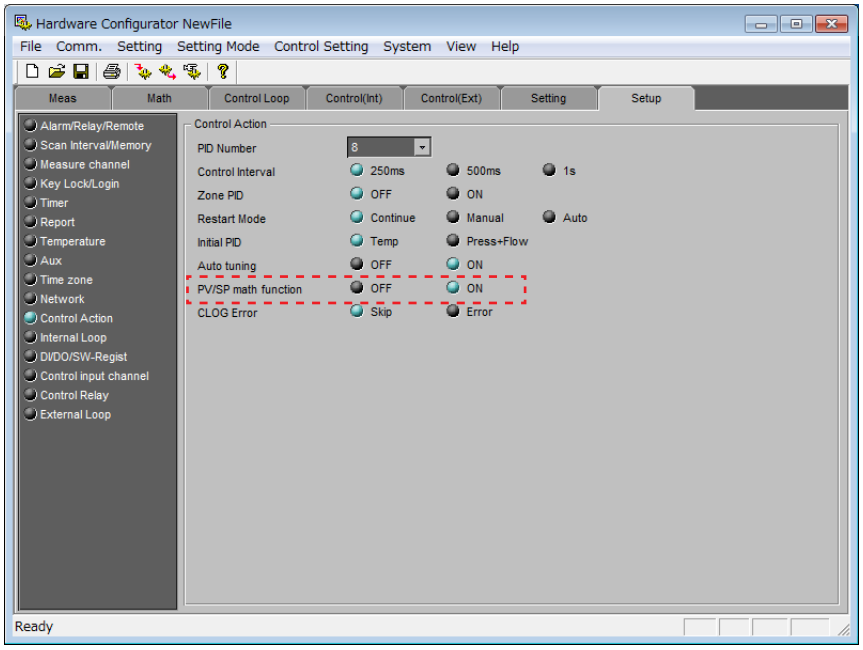


1-3 Using PV and SP math

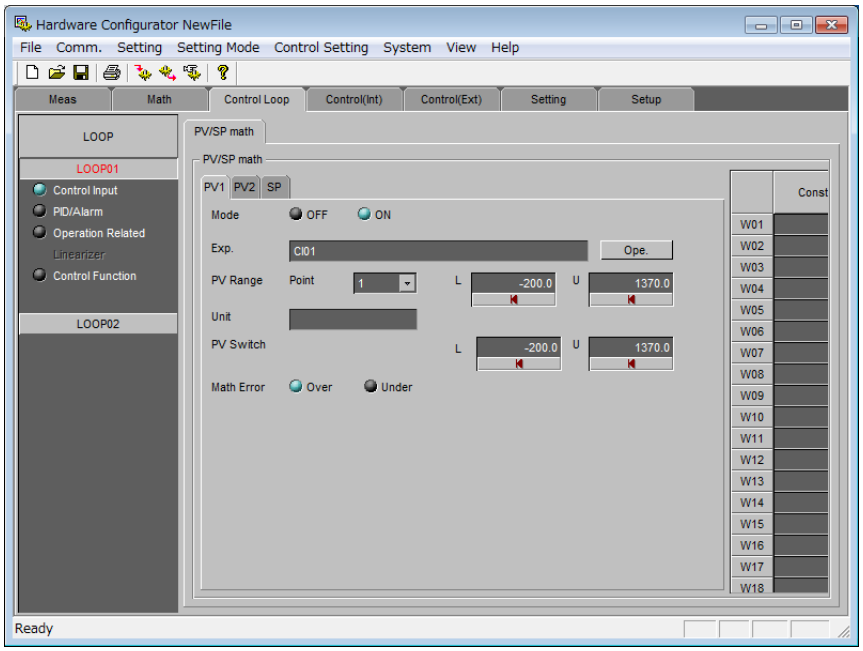
PV and SP math are standard functions on the CX (no MATH option needed). On the GX, you can add the MATH option and then assign the calculated value to PV or SP.

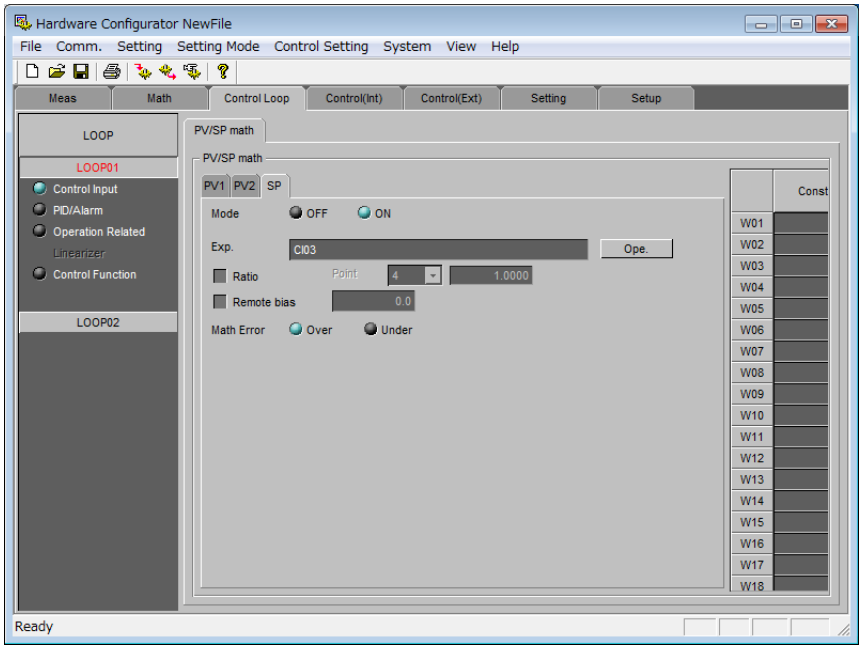
Open the settings file in Hardware Configurator and check the items below. If PV/SP math is ON, the MATH option (/MT) is required on the GX.

- Specify a MATH channel for PV math --> EXPV function ON + EXPV type
- Specify a MATH channel for SP math --> RSP function ON + RSP type



Check the parameters of PV and SP math as follows.

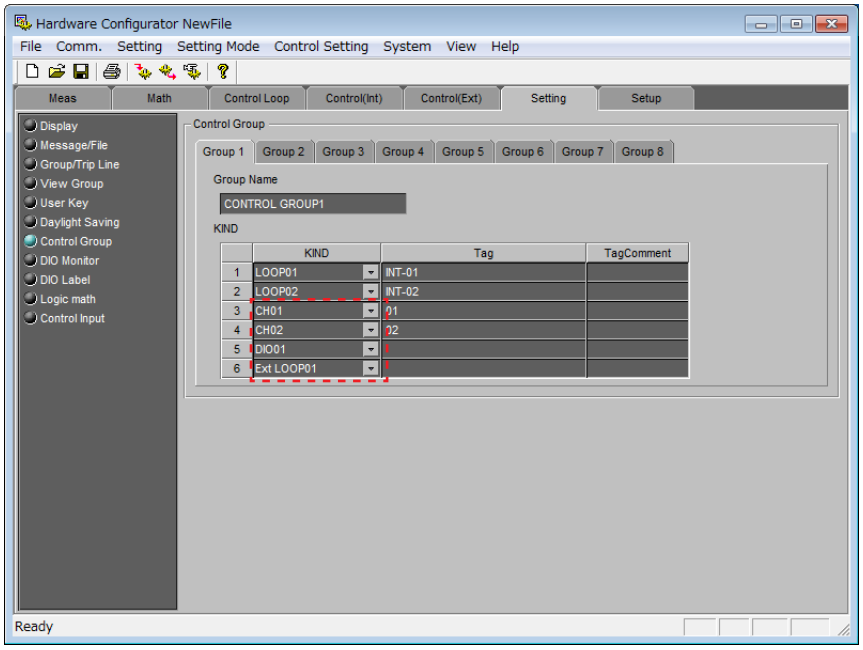



Hardware Configurator NewFile
File Comm. Setting Setting Mode Control Setting System View Help
Meas Math Control Loop Control(Int) Control(Ext) Setting Setup
LOOP
LOOP01
Control Input
PID/Alarm
Operation Related
Linearizer
Control Function
LOOP02
PV/SP math
PV/SP math
PV1 PV2 SP
Mode OFF ON
Exp. CI03 Ope.
Ratio Point 4 1.0000
Remote bias 0.0
Math Error Over Under
Const
W01 W02 W03 W04 W05 W06 W07 W08 W09 W10 W11 W12 W13 W14 W15 W16 W17 W18
Ready

2-1 Items other than internal loops (such as external loops, measurement channels, or DIO) are assigned to a control group

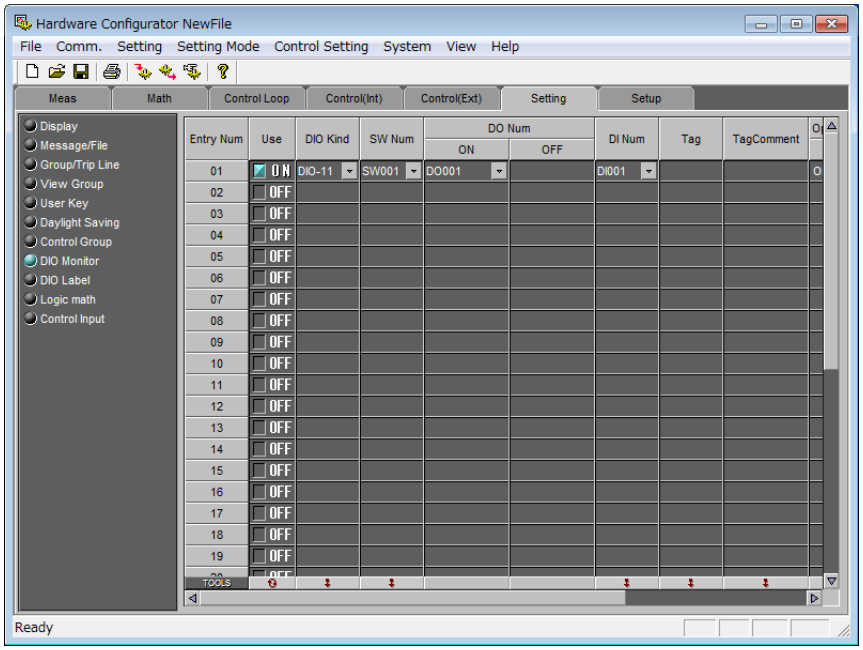
On the CX you can assign such things as measurement channels, DI/DO, and external loops to something other than internal loops, but on the GX you can only assign things to internal loops. If you need a display similar to the CX, consider using a custom display.

Open the settings file in Hardware Configurator and check the items below. Since only internal loops can be assigned to GX control groups, settings like the ones below cannot be used. If you want to display measurement channels and external loops on the same screen, consider a multi-screen (GX20 only) or the Custom Display function (/CG).



Also, if DIO is assigned, you may be using the DIO operation monitoring function.

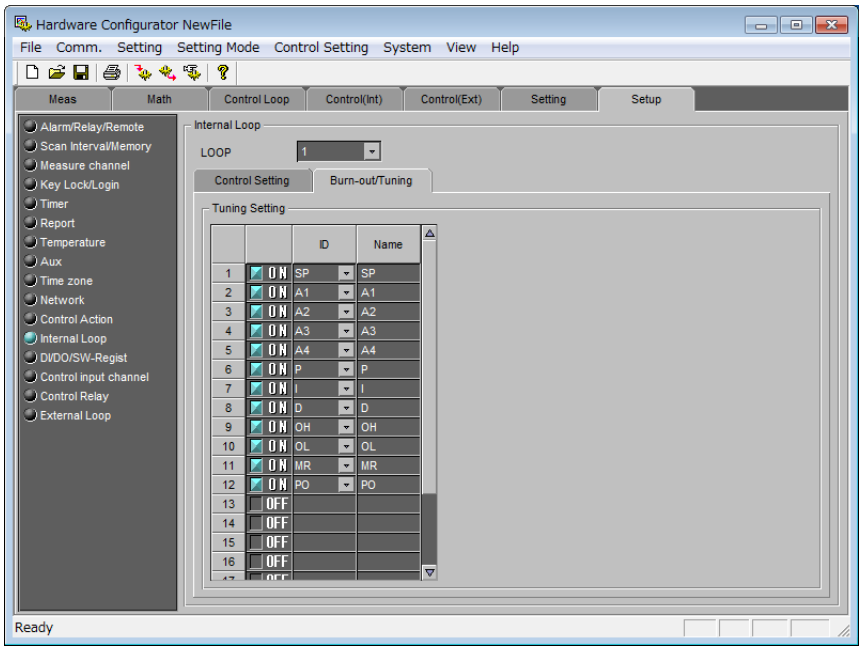
This function is not supported on the GX.



2-2 Tuning screen customized (items added or deleted)

On the CX you could customize the tuning screen (by showing/hiding items, changing item names, etc.). The GX screens are fixed, so consider using a custom display as needed.

Open the settings file in Hardware Configurator and check the items below. With the CX you can change tuning items with settings, but on the GX you cannot add items or change item names.

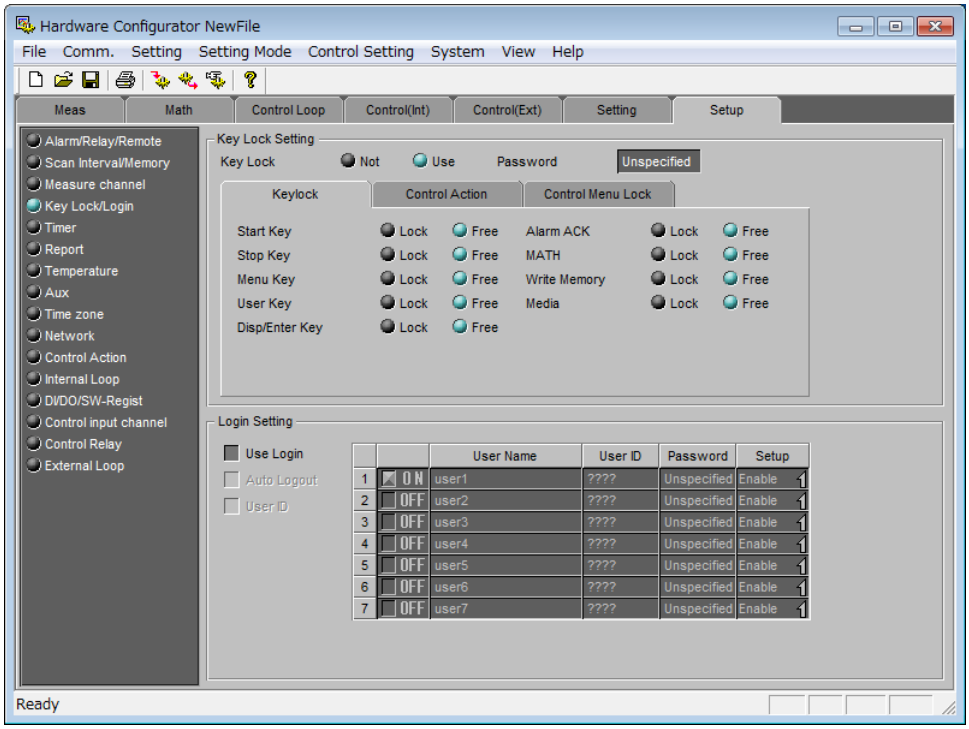


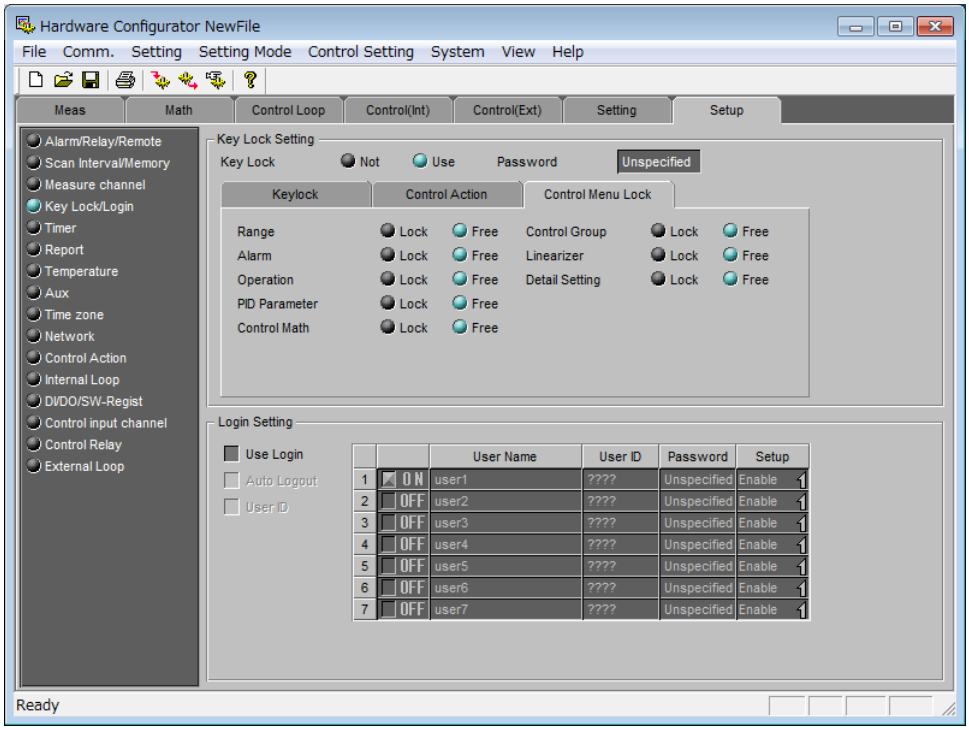
GX tuning screen

2-3 Key lock is set

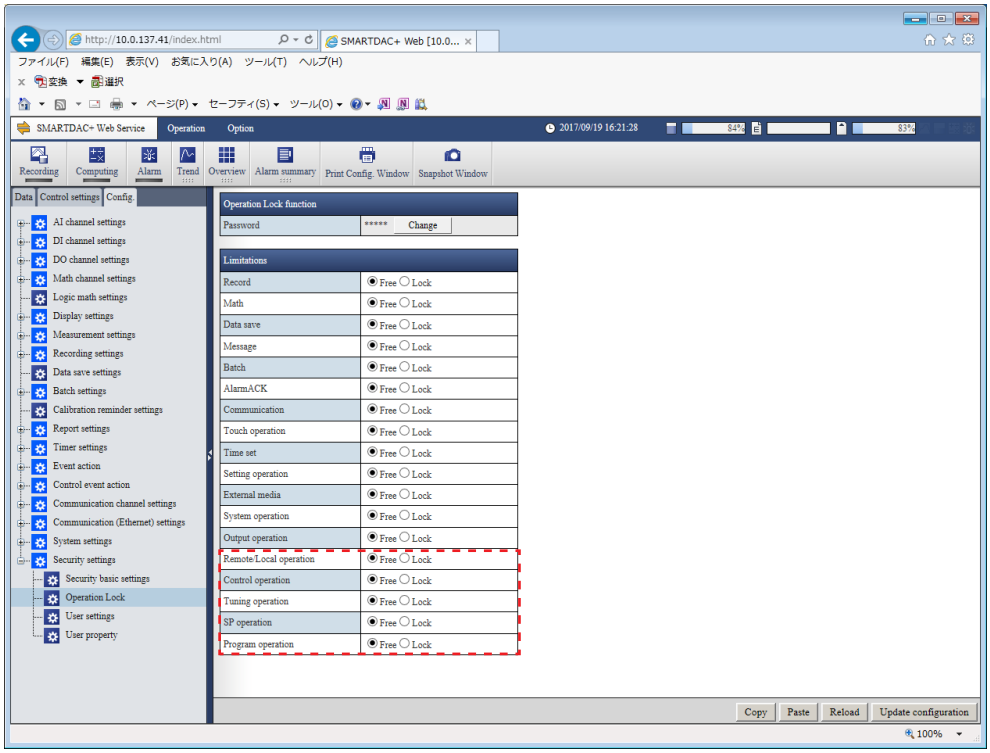
On the CX, you could select detailed lock settings on individual items, but these detailed settings are not available on the GX.

Open the settings file in Hardware Configurator and check the items below. On the CX, you could set the key lock on individual items as follows, but on the GX you can only key lock multiple items at once.





GX key lock (operation lock) settings



Restrictions for each item are as follows.

Remote/Local operation

Restricts remote/Local operation.

Control operation

Restricts AUTO/MAN/Cascade control, RUN/STOP control, and control output value control.

Tuning operation

Restricts auto-tuning operation and turning operation from the operation screen.

Turning configuration is possible from the setting screen.

SP operation

Restricts SP operation from the operation screen.

SP configuration is possible from the setting screen.

Setting the SPs in the SP group of the tuning screen is possible.

Program operation

Restricts PROG/RESET operation, advance operation, and changing of the TSP, SP, or segment remaining time in hold mode.

Tuning operation

Setting operations from autotuning operation and the tuning screen are restricted.

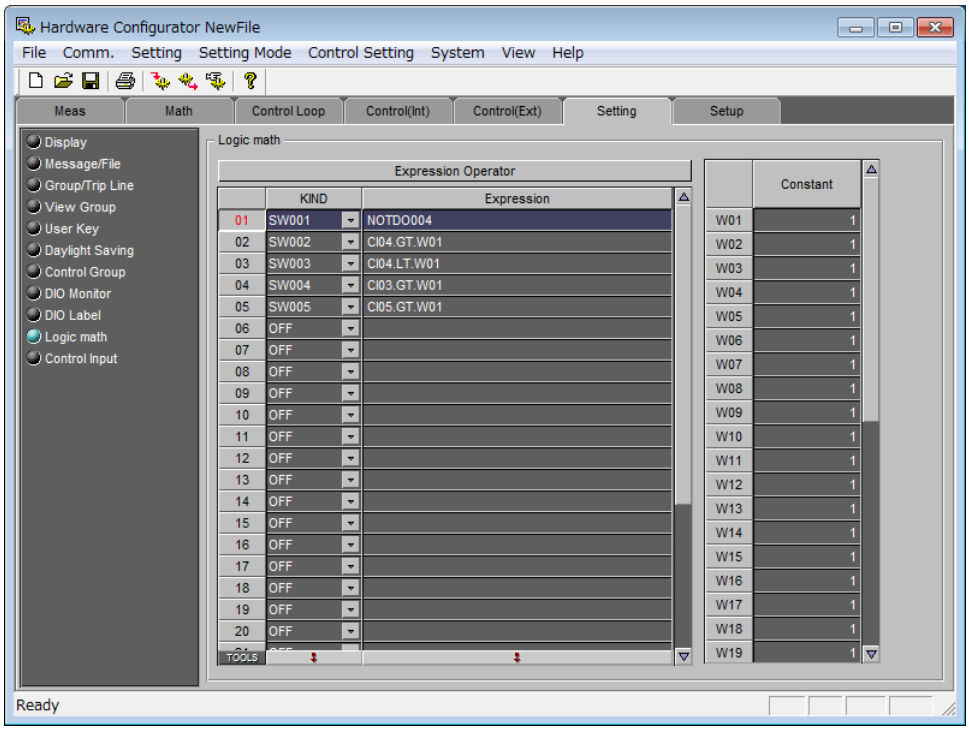
* You can enter settings from the setting screen.

3-1 Using logic operation

Logic operation is a standard function on the CX (no MATH option needed). Since the GX requires the MATH option, please add /MT.

Open the settings file in Hardware Configurator and check the items below. If using this function, the MATH option (/MT) is required on the GX.

* Note that you can sometimes substitute logic with a functionally equivalent event action or control event action.



Setting method on the GX

Logic operation constant --> MATH channel setting --> Variable calculation constant

Logic operation --> Logic operation setting

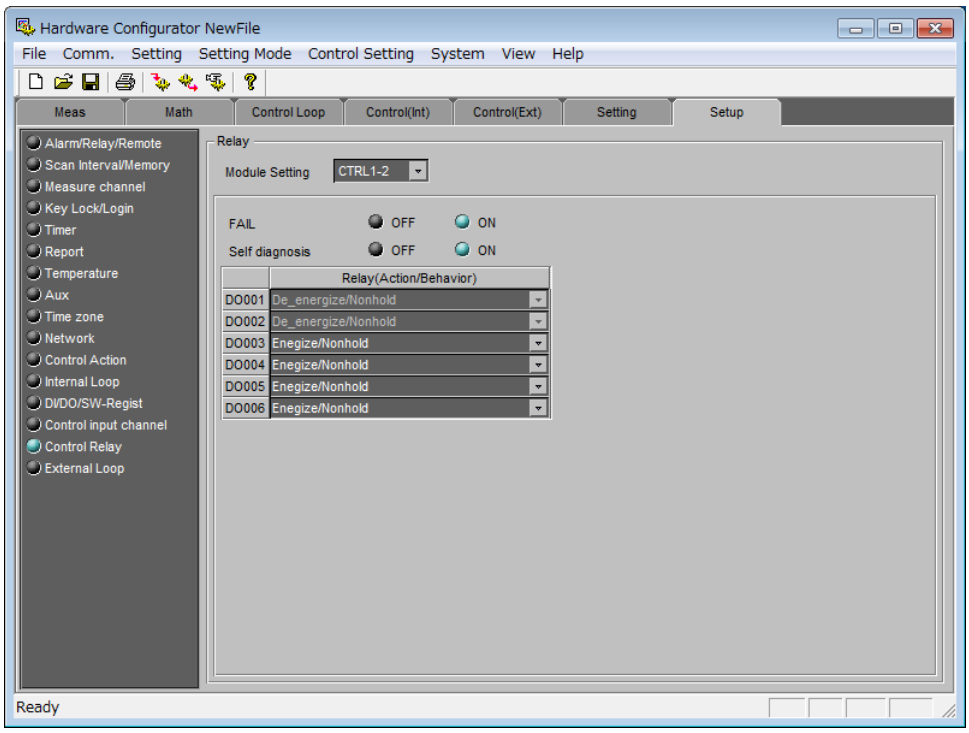
* The selectable output destination will be a manual type internal switch or DO terminal.

3-2 Using Fail output

On the CX, you can configure FAIL output from a DO associated with an internal loop. Since the GX requires the FAIL output option, please add /FL.

If using FAIL and diagnostic output, the GX will require Fail output (/FL).

* The GX can output either FAIL only or instrument information only. If using both FAIL and diagnostics, you must use the GX event action function to output instrument information to a DO terminal (requires the GX90YD or GX90WD).
* The GM does not have an /FL option, but you need the GX90YD or GX90WD.

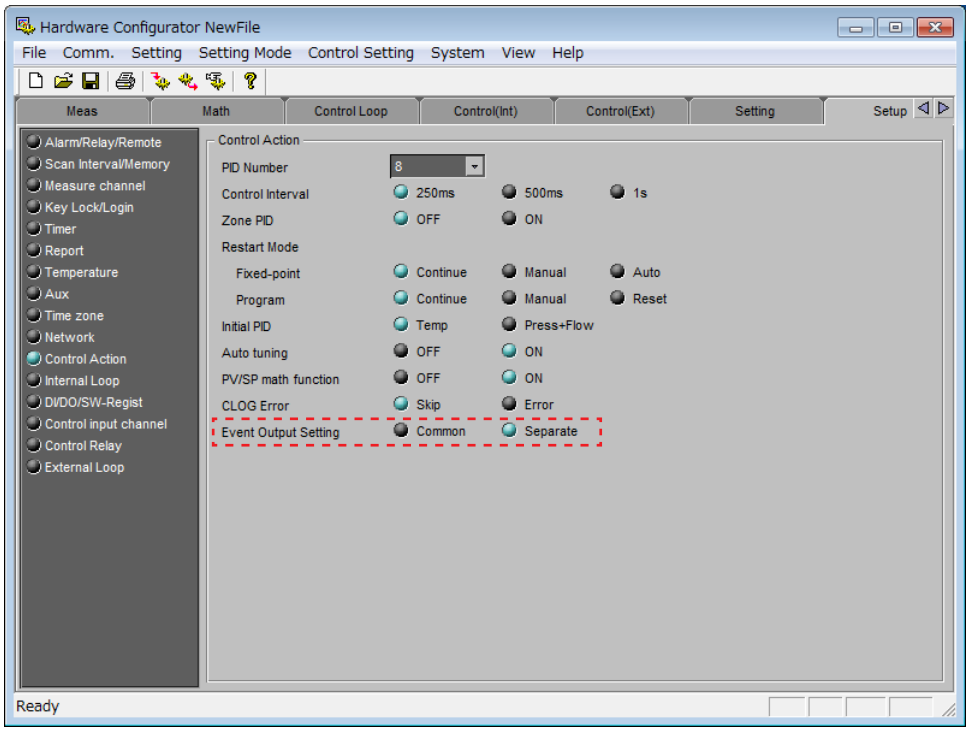


4-1 Sometimes running multiple program patterns simultaneously

On the CX, you could run multiple program patterns simultaneously as long as loop numbers written to program patterns did not overlap. On the GX, you cannot run multiple program patterns simultaneously.

If one CX is controlling 2 devices, consider replacing with one GX for each device.

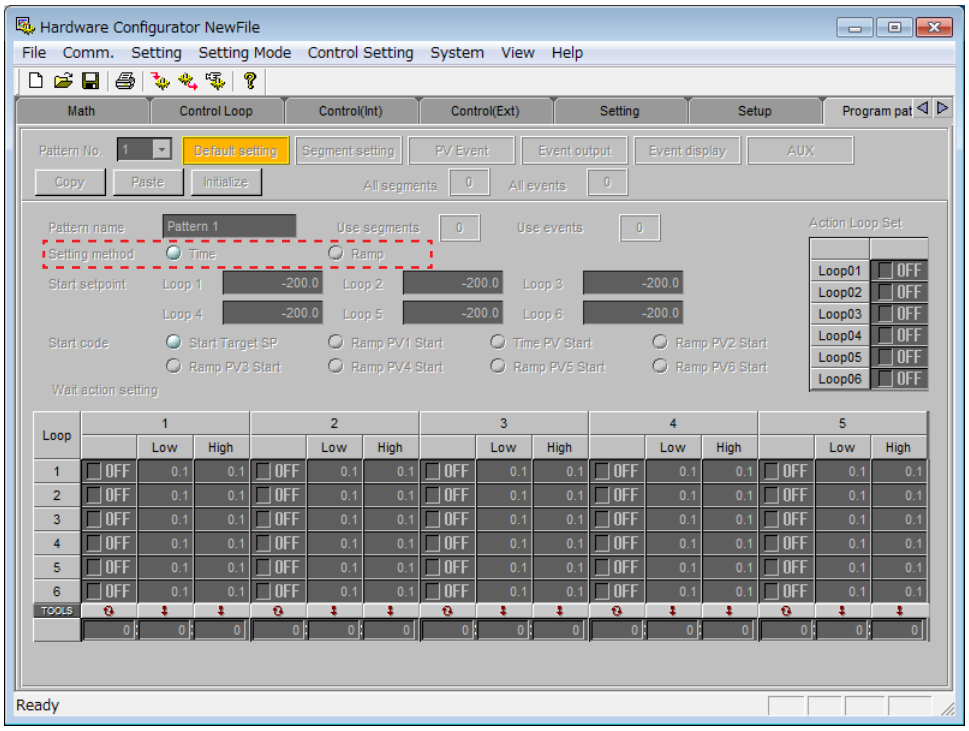
There is no way to check for simultaneously running program patterns from settings, so you will have to check it manually. However, if the following is set, multiple program patterns are probably being run.



4-2 Creating program patterns with the Ramp method

On the CX there were two methods for setting the segment time (the Time and Ramp methods). Be aware that only the Time method is available on the GX.

Open the settings file in Hardware Configurator and check the items below. Since the Ramp setting is not available on the GX, use the Time setting.



5-1 Serial communications included

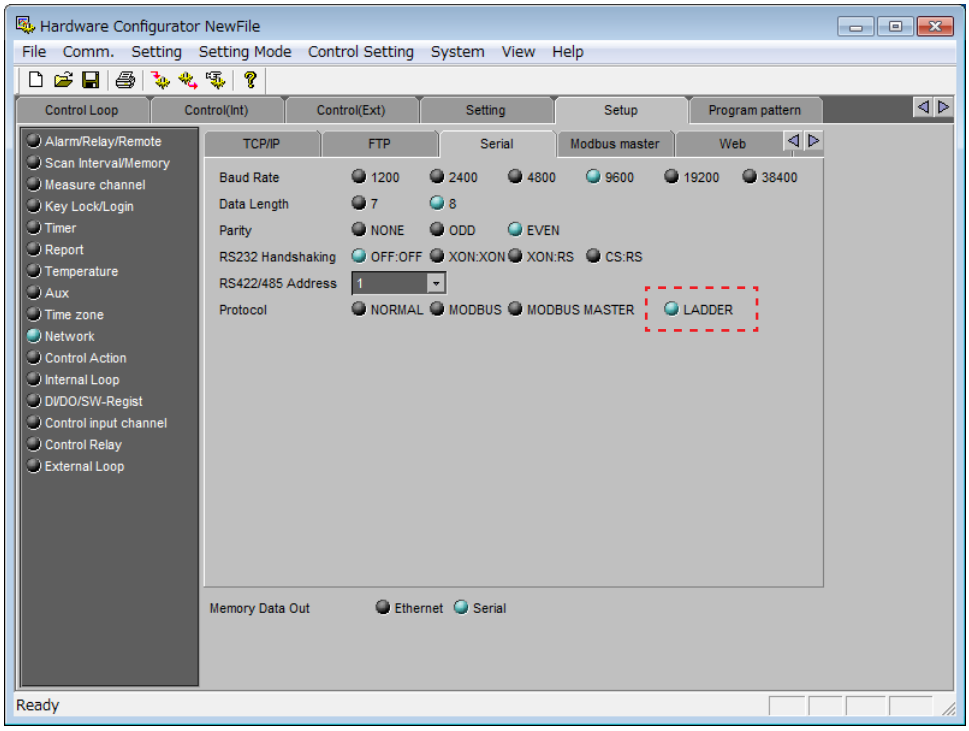
Various protocols that the CX supports are not supported on the GX. For the use of serial communications, see 3.1, "Model and suffix code."

If a GREEN series instrument is connected:

It may be connected with temperature controller communication. The GX does not support temperature controller communication. By using an external controller part on a custom display (/CG), you can monitor and operate a Modbus connected controller (/C3 or /C2, /MC).

If a PLC is connected:

It may be connected with ladder communications. Open the settings file in Hardware Configurator and check whether ladder communication is being used. The GX does not support Ladder communication. Use other protocols to handle Modbus connections (/C2 or /C3), SLMP communication (/E4), and other types of communication. Note that since the executable items are different than those of the CX, refer to the user's manual or communication manual for details.



An outline of communications is as follows. See the user's manual or communication manual for details.

Command communication:

Read/write, operation, parameter changes, and other actions on the various types of channels (some items such as program pattern creation may be unavailable).

Modbus communication:

Read/write, operation, some parameter changes, and other actions on the various types of channels. See the user's manual or communication manual for details.

Ex.) RUN/STOP and write SP are available. You cannot write an alarm value.

SLMP communication: writing to various types of channels only

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