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High accuracy standard temperature controller

TK-XGT (RS485)

Technical Support Manual

TK Series

Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

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Preface

Thank you very much for selecting Autonics products.

Please familiarize yourself with the information contained in the **Safety Precautions** section before using this product.

This user manual contains information about the product and its proper use, and should be kept in a place where it will be easy to access.

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Technical Support Manual Guide

- Please familiarize yourself with the information in this manual before using the product.
- This manual provides detailed information on the product's features. It does not offer any guarantee concerning matters beyond the scope of this manual.
- This manual may not be edited or reproduced in either part or whole without permission.
- This manual is not provided as part of the product package. Please visit our home-page (www.autonics.com) to download a copy.
- The manual's content may vary depending on changes to the product's software and other unforeseen developments within Autonics, and is subject to change without prior notice. Upgrade notice is provided through our homepage.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our homepage.

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Technical Support Manual Symbols

Symbol	Description
Note	Supplementary information for a particular feature.
Warning	Failure to follow instructions can result in serious injury or death.
Caution	Failure to follow instructions can lead to a minor injury or product damage.
Ex.	An example of the concerned feature's use.
※1	Annotation mark.

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Safety Precautions

- Following these safety precautions will ensure the safe and proper use of the product and help prevent accidents, as well as minimizing possible hazards.
- Safety precautions are categorized as Warnings and Cautions, as defined below:

Warning	**Warning**	Failure to follow the instructions may lead to a serious injury or accident.
Caution	**Caution**	Failure to follow the instructions may lead to a minor injury or accident.

Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
  Failure to follow this instruction may result in personal injury, fire, or economic loss.
- The unit must be installed on a device panel before use.
  Failure to follow this instruction may result in electric shock.
- Do not connect, repair, or inspect the unit while connected to a power source.
  Failure to follow this instruction may result in electric shock.
- Check the input power specifications and terminal polarity for correct connecting the power source.
  Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit. Please contact us if necessary.
  Failure to follow this instruction may result in electric shock or fire.

Caution

- Do not use the unit outdoors.
  Failure to follow this instruction may result in shortening the life cycle of the unit, or electric shock.
- When connecting the power input and relay output cables, use AWG20 (0.5mm^2) cables.
  Failure to follow this instruction may result in fire due to contact failure.
- Use the unit within the rated specifications.
  Failure to follow this instruction may result in shortening the life cycle of the unit, or fire.
- Do not use loads beyond the rated switching capacity of the relay contact.
  Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.
- Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.
  Failure to follow this instruction may result in electric shock or fire.
- Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat, vibration, or impact may be present.
  Failure to follow this instruction may result in fire or explosion.
- Keep dust and wire residue from flowing into the unit.
  Failure to follow this instruction may result in fire or product damage.

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- Check the polarity of the measurement input contact before wiring the temperature sensor. Failure to follow this instruction may result in fire or explosion.
- For installing the unit with reinforced insulation, use the power supply unit which basic level is ensured.

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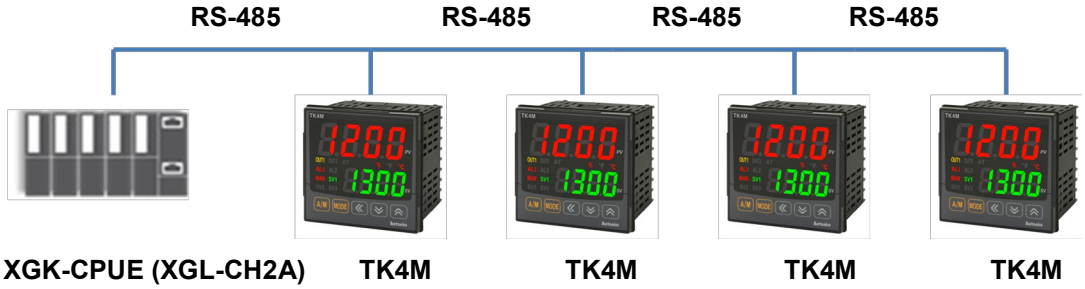
1 System

1.1 Version

Software	Version	Note
Operating system	Windows 7	—
XG 5000	V4.07	Release : 2016.03.29

1.2 Connections



1.3 Communication cable connection

TK	Cable	PLC (XGT – XGL-CH2A)
RS – 485 (-)		RX -
		RX +
RS – 485 (+)		TX -
		TX +

2 TK4M Communication Setting

2.1 TK4M Setting

1st Supply power to the TK unit. Press the MODE key to enter parameter setting group.

2nd Enter PAr 4 and set the communication settings as below.

Parameter	Display	Setting	Note
Communication address	AdrS	01	User setting
Communication speed	bPS	384	User setting
Communication parity bit	PrtY	nonE	Fixed
Communication stop bit	StP	2	Fixed
Communication response waiting time	rSYt	20	User setting
Communication write	ConY	En.A	Fixed

* Hold the MODE key over 3 sec while in setting mode to return to RUN mode.
* Hold the MODE key for 1.5 sec while in setting mode to move to other parameter group.
* Press the MODE key after the setting and it is saved.
* If there is no additional key operation within 30 sec after entering into setting mode, it will be automatically returned to RUN mode and previous set value will be remained.
* Check that RS485 communication models are only available communication.

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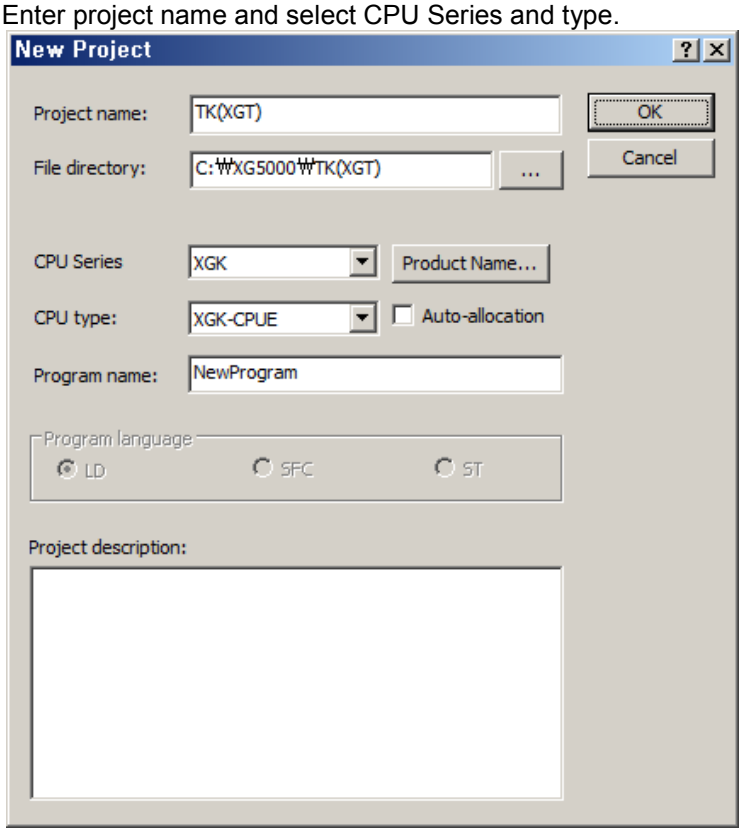
2.2 XG5000 Setting

1st Run XG5000, and select [Project] – [New Project] on menu.
Enter project name and select CPU Series and type.



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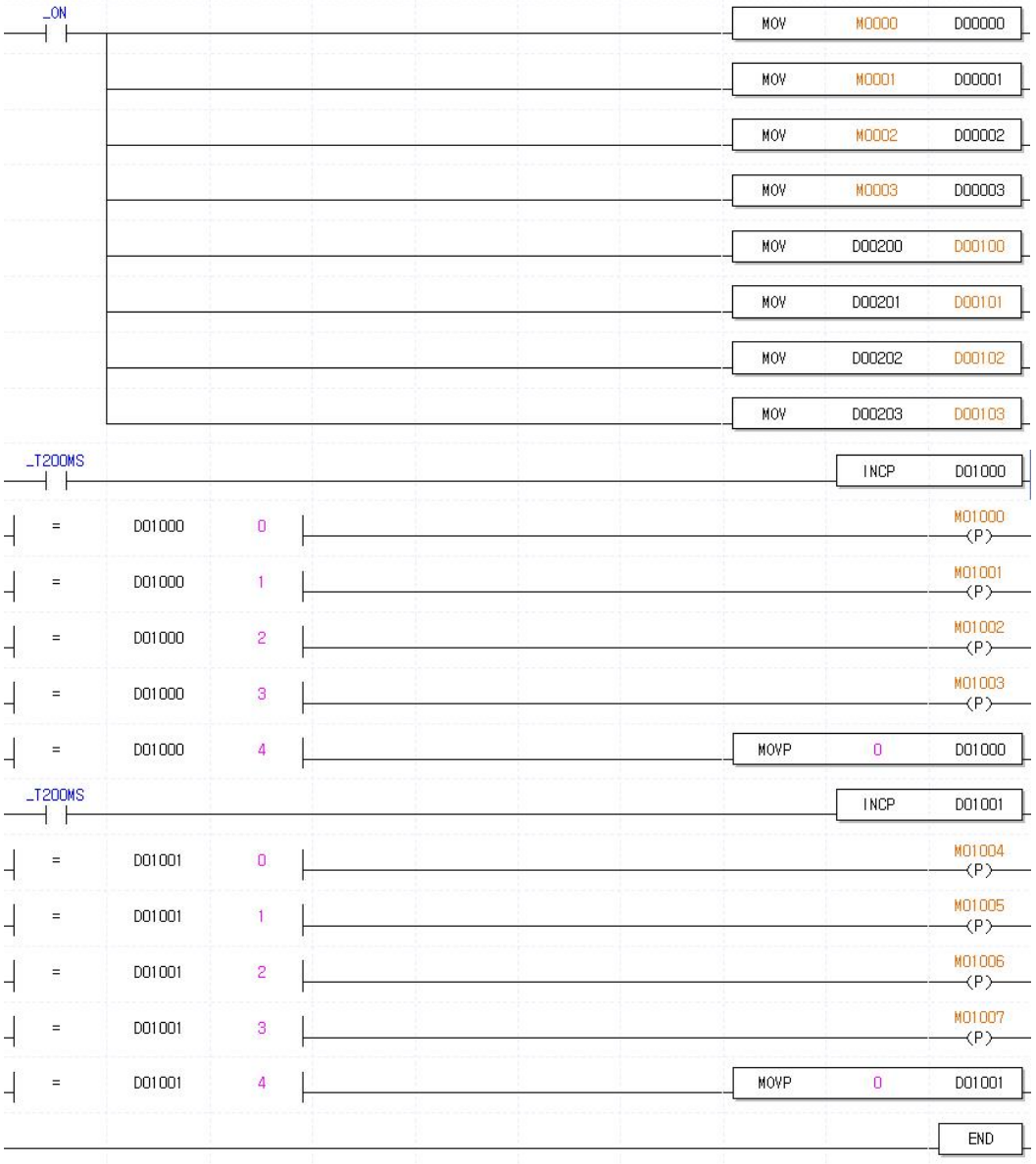
2nd After executing, enter the below contents at XG5000.

* This communication program is only for test. Before using it at field, review and test the program fully.



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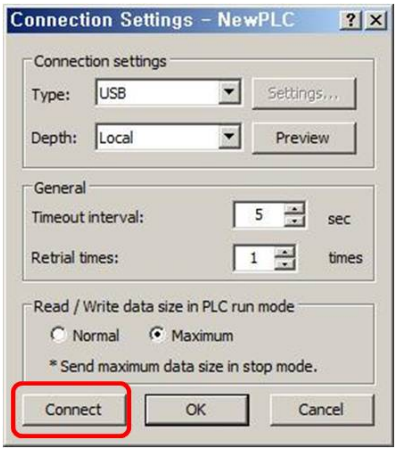
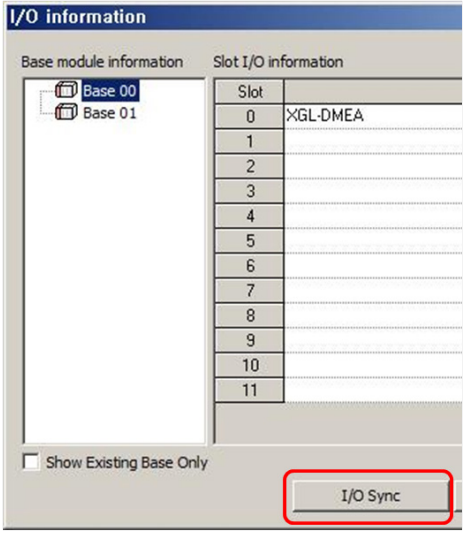
3rd Select [Online] – [Connection Settings] to select connection method. This test is connected via USB. After completing connection, select [Online] – [Mode Switch] – [Stop].

Connection settings	Settings
Type	USB
Depth	Local



4th At [Online] – [Diagnose] – [I/O Information] , click 'I/O Sync'. After I/O synchronize, the settings are set as using module settings.



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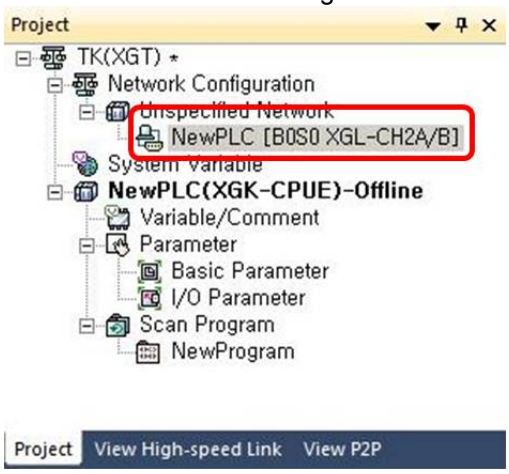
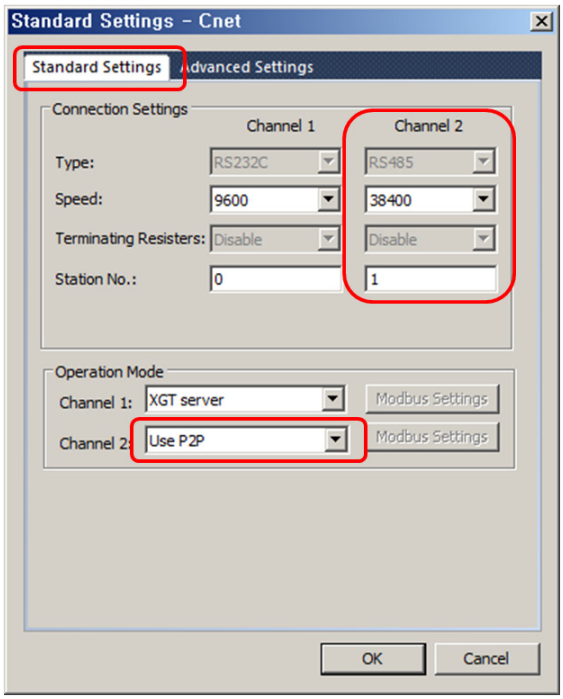
5th After I/O synchronize, you can check the added communication module below standard network. Double-click the right communication module.



6th [Standard Settings-Cnet] dialog box appears. At standard settings, set as below.

Item		Setting	Note
Standard Settings Channel 2	Communication type	RS-485	Fixed
	Communication speed	38400	User setting
	Terminating resisters	Disable	User setting
	Station No.	1	User setting
Operation mode	Channel 2	Use P2P	



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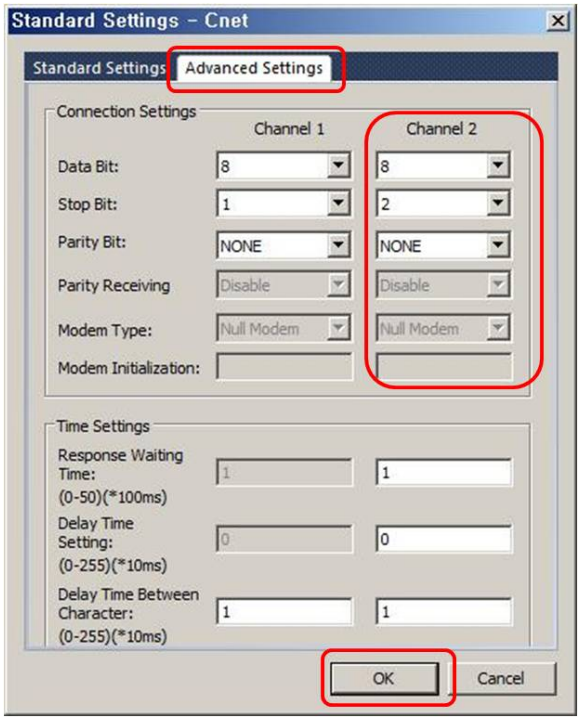
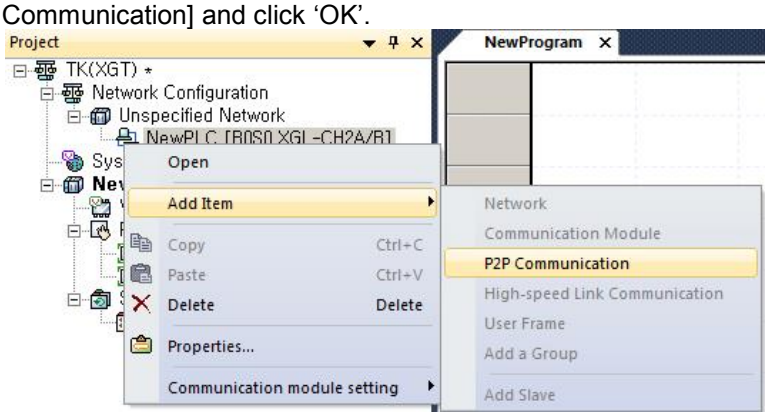
7th At advanced settings, set as below.

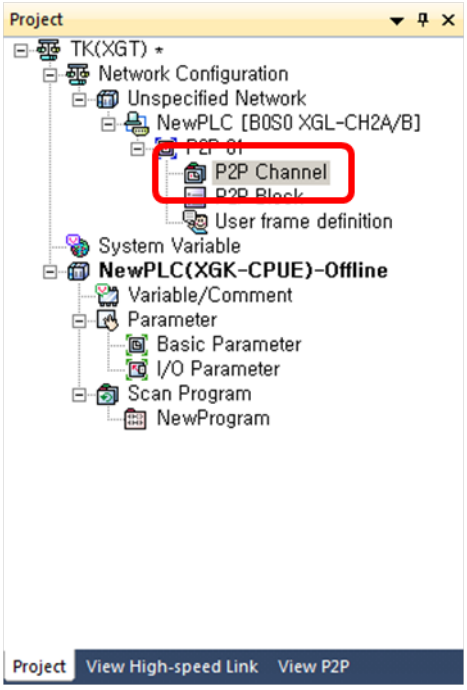
Item		Channel 2
Advanced settings	Data bit	8
	Stop bit	2
	Parity bit	NONE

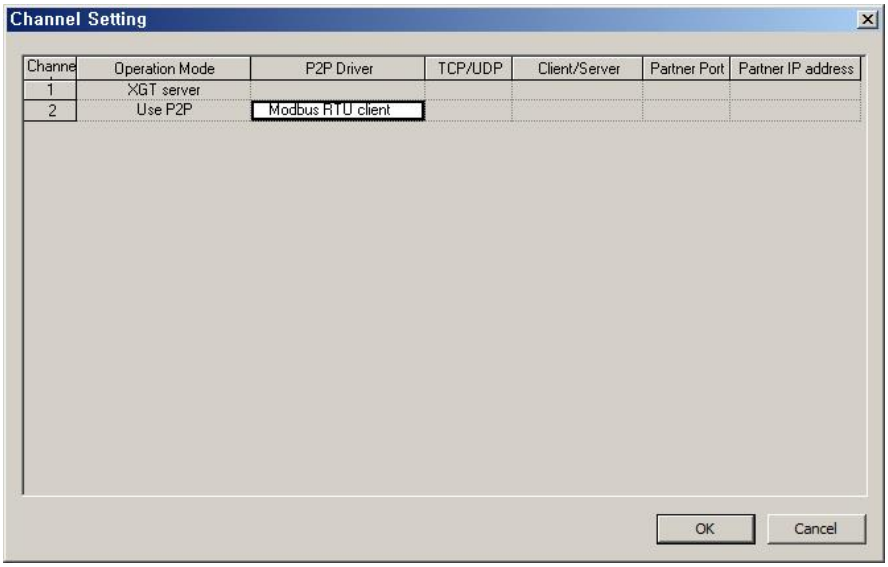


8th At Project window, select the communication module and [Add Item] – [P2P Communication] and click 'OK'.



9th Double-click ‘P2P Channel’ and select ‘Modbus RTU client’ of ‘Use P2P’. Click ‘OK’.





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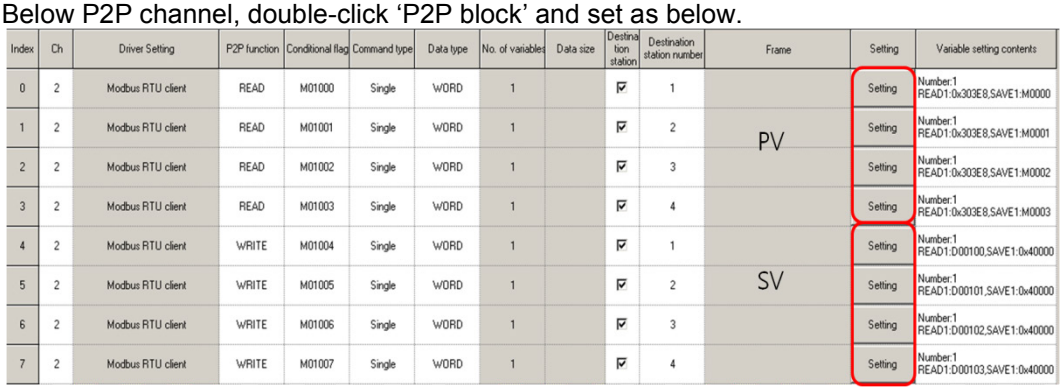
10th Below P2P channel, double-click ‘P2P block’ and set as below.



CH	P2P function	Conditional flag	Command type	Data type	Destination station number
2	READ (PV)	M1000 to M1003	1. Single	WORD	Enter destination station (1 to 4).
2	WRITE (SV)	M1004 to M1007	1. Single	WORD	Enter destination station (1 to 4).

* Refer to the below table for variable setting for PV and SV.
  Click ‘Setting’ to set variable.

* Modbus Mapping Table

Address	Type		Setting range	Factory default
301001 (03E8)	PV	Present value	1999 to 9999	-
400001 (0000)	SV	Setting value	Within L-Sv to H-Sv range	0

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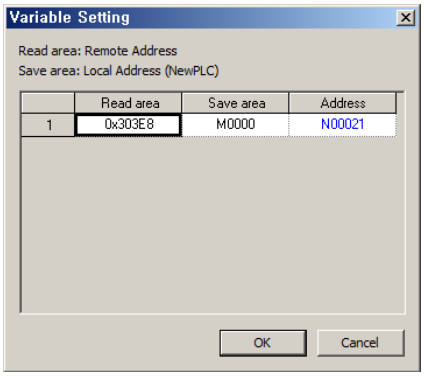
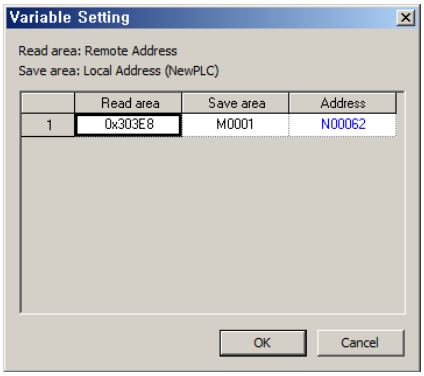
11th Variable settings

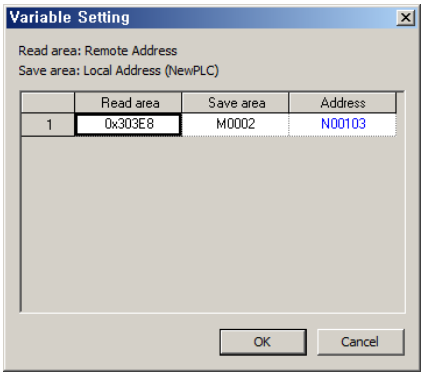
* PV setting

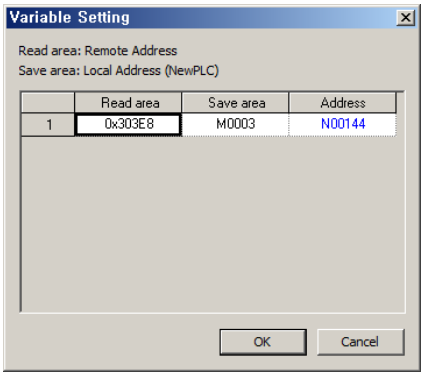
Station	Read area (setting)	Save area (setting)	Address (fixed)
Station 1	0x303E8	M0000	N00021
Station 2	0x303E8	M0001	N00062
Station 3	0x303E8	M0002	N00103
Station 4	0x303E8	M0003	N00144

Address	Type	Note
301001 (03E8)	PV	Present value









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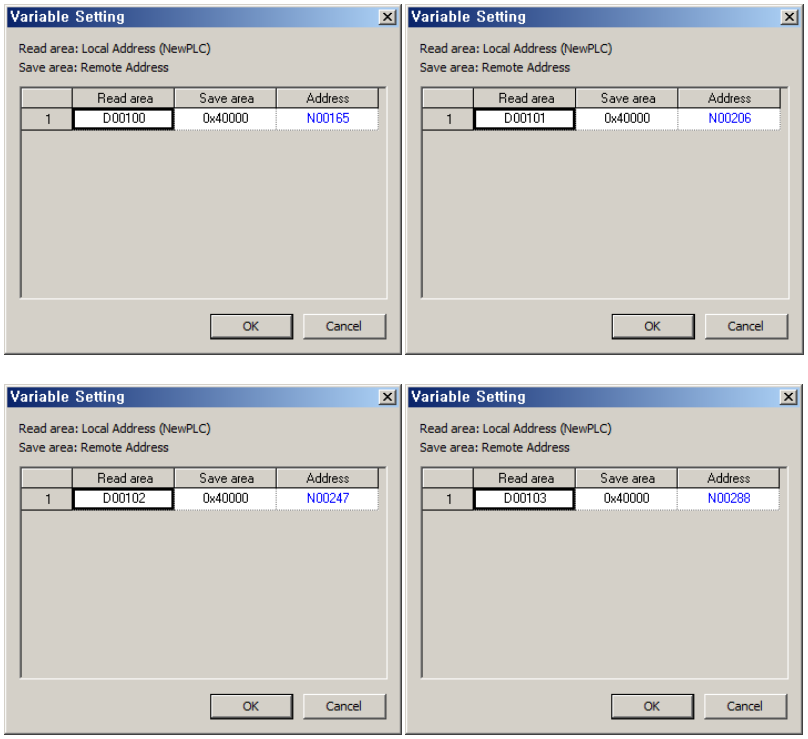
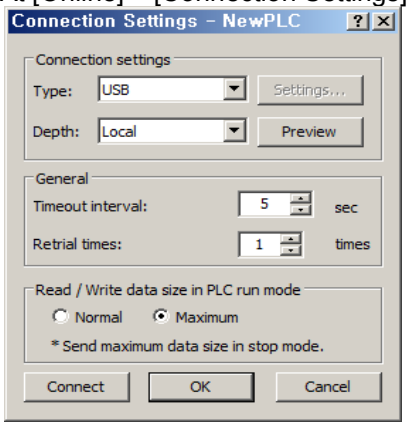
* SV setting

Station	Read area (setting)	Save area (setting)	Address (fixed)
Station 1	D00100	0x40000	N00165
Station 2	D00101	0x40000	N00206
Station 3	D00102	0x40000	N00247
Station 4	D00103	0x40000	N00288

Address	Type	Note
400001 (0000)	SV	Setting value

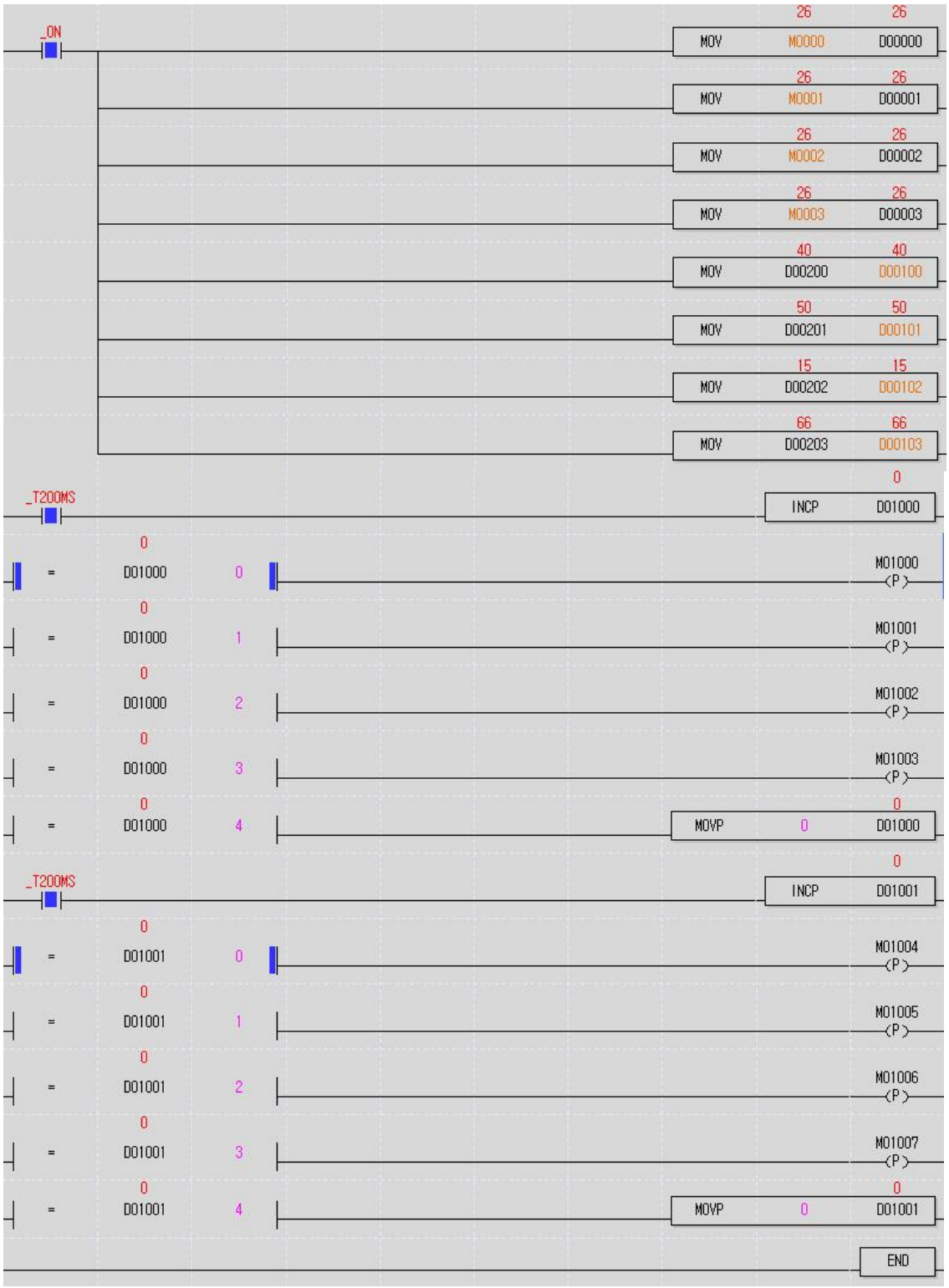


12th At [Online] – [Connection Settings], select connection method between PC and PLC.



13th Select [Online] – [Write] to execute download.

3 Operation Check



D00000 to D00003 are present temperature values of station 1 to 4.
D00100 to D00103 are setting values of station 1 to 4.
You can change setting values to select D100 to 103.

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