MITSUBISHI ELECTRIC
Mitsubishi Programmable Logic Controller

CC-*Link*

CC-Link Ver. 2 Compatible Master/Local Module
QJ61BT11N

CC-Link Ver. 2 Compatible Analog Module
AJ65VBTCU-68ADVN
AJ65VBTCU-68ADIN
AJ65VBTCU-68DAVN

High-performance Model QCPU

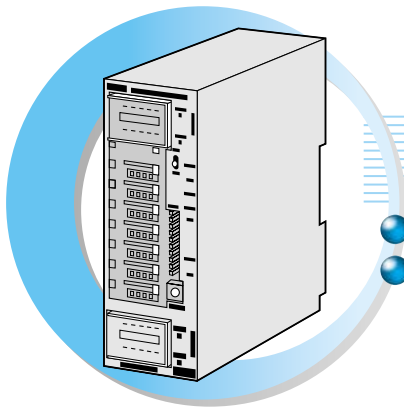| Q02CPU	Q12HCPU
Q02HCPU	Q25HCPU
Q06HCPU	

Providing more functions and better performance.

CC-*Link* **V2**

- Up to **8** times more controllable points compared to previous CC-Link.
- Switching between **8**-point and **16**-point mode for the remote **I/O** station frees up unused **I/O** points.

Approx. eight times as many control points.

◄·········· CC-*Link* **V2**

◄·········· CC-*Link*

CC-Link Ver. 2 Compatible Analog Module

- Compatible with existing CC-Link ver.1 network systems.
- Analog module only occupies **1** station on the network, therefore the number of channels can be increased on the CC-Link ver.2 network. (only applicable to CC-Link ver.2 networks)

High-performance Model **QCPU**

- This model has more functions and instructions.
  - ■ This model is compatible with **CC-Link Ver. 2**.
  - ■ Imperfect derivative instruction is added to the **PID** control instructions.
  - ■ Online change for **SFC** program file is available.

MELSEC **Q** series
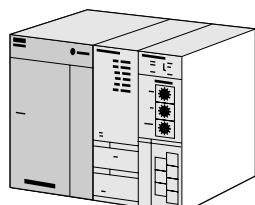
ISO 14001
JACO
UKAS ENVIRONMENTAL MANAGEMENT
051

BVQi
ISO 9001
UKAS QUALITY MANAGEMENT
008

Features

■ Master module for Q Series
QJ61BT11N

■ Analog Module
AJ65VBTCU-68ADVN / AJ65VBTCU-68ADIN
AJ65VBTCU-68DAVN

GX Developer

The **CC-Link V2** logo is on the compatible products.
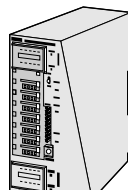
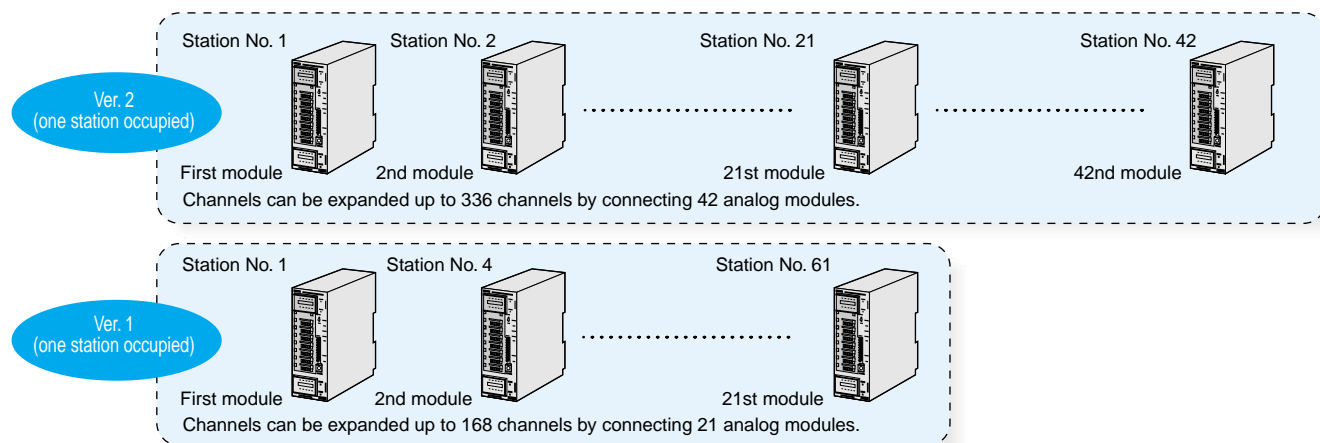■ GX Developer
Version 8.03D and higher product
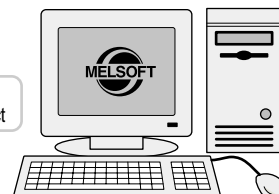
(1) The control data increase by 8-times, while maintaining compatibility with the conventional product.

• **Ver. 2.** mode
By double, quadruple or octuple expanded cyclic setting, up to RX, RY (81092 points each), and RWw, RWr (2048 words each) is available.

• Additional mode
The Ver. 2 compatible remote station can join an existing system with minimum modification of sequence program.

• **Ver. 1.** mode
This mode is fully compatible with conventional products and allows reusing the existing with no revision.

Combination of QJ61BT11N compatible CPU and GX Developer

	Compatible CPU	Compatible GX Developer
Ver. 2. mode	• High-performance Model QCPU (Including pre-upgraded CPU) • Basic model QCPU • Process CPU	• Version 8.03D and above
Ver. 1 mode		No limits
Additional mode	• High-performance Model QCPU (Only upgraded product)	• Version 8.03D and above

(2) The analog module occupies only one station, thereby greatly increasing the number of modules that can connect to one system.
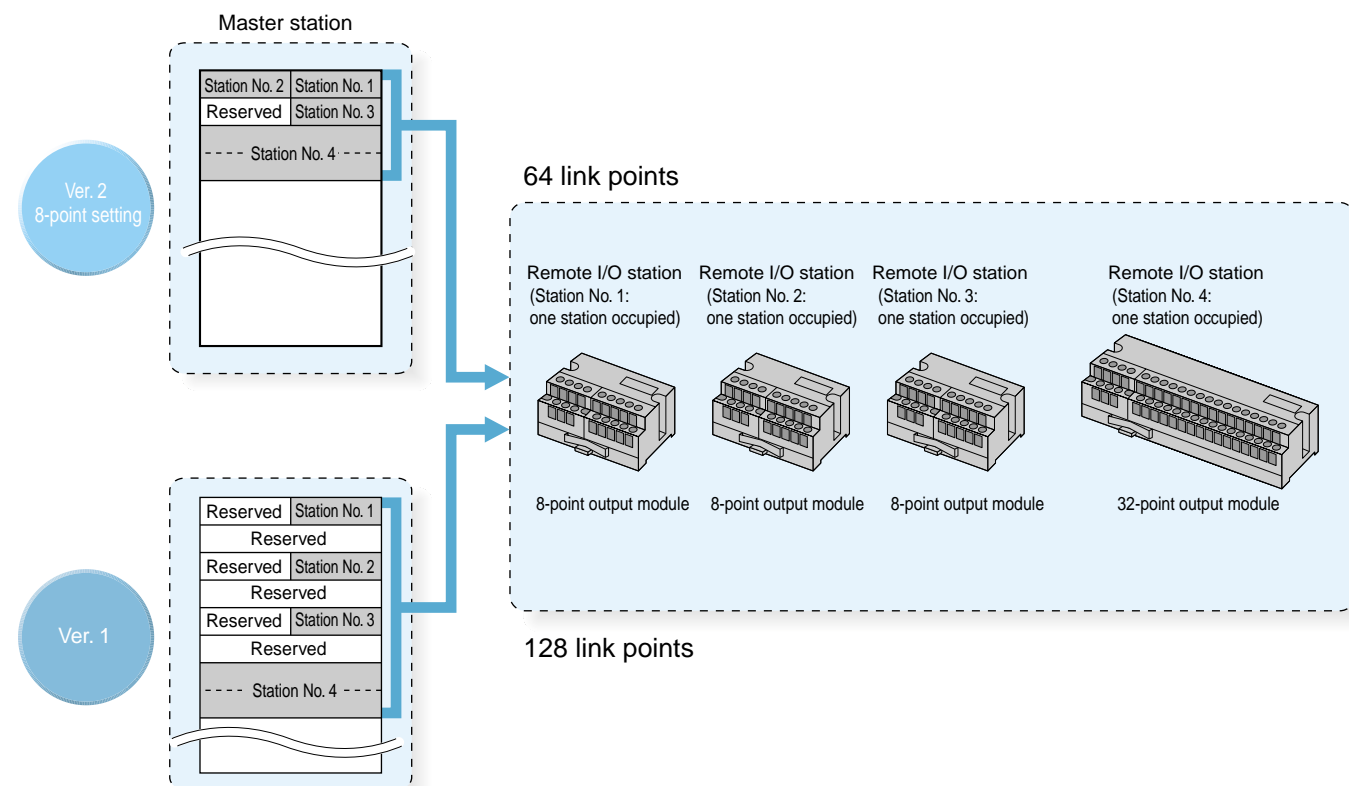
Ver. 2
(one station occupied)

Station No. 1   Station No. 2   Station No. 21   Station No. 42

First module   2nd module   21st module   42nd module

Channels can be expanded up to 336 channels by connecting 42 analog modules.

Ver. 1
(one station occupied)

Station No. 1   Station No. 4   Station No. 61

First module   2nd module   21st module

Channels can be expanded up to 168 channels by connecting 21 analog modules.

Maximum number of connected units

	Number of connected analog modules	Number of connected remote I/O stations
Ver. 2	42 modules	2 stations One analog module can be replaced with three stations.
	33 modules or less	Total of 64 stations including analog modules
Ver. 1	21 modules	1 station One analog module can be replaced with three stations.

* The maximum number of connected modules will differ according to the number of connected intelligent device stations (including local stations) and remote device stations.

(3) The number of points occupied by one station can be selected to free-up unused I/O points.

- The remote I/O station 8-point or 16-point settings. (Ver. 2 mode)
  The number of occupied remote I/O station points can be selected from 8 points or 16 points from the GX Developer parameters.
  The devices can be used efficiently by freeing up unused I/O points.
- Use the conventional remote I/O module.
  Conventional remote I/O modules (CC-Link ver.1 type) are compatible with CC-Link ver.2.

Example: Using three 8-point output modules and one 32-point output module

Master station

Station No. 2	Station No. 1
Reserved	Station No. 3
Station No. 4	

Ver. 2
8-point setting

64 link points

Remote I/O station
(Station No. 1:
one station occupied)

Remote I/O station
(Station No. 2:
one station occupied)

Remote I/O station
(Station No. 3:
one station occupied)

Remote I/O station
(Station No. 4:
one station occupied)

8-point output module

8-point output module

8-point output module

32-point output module

Reserved	Station No. 1
Reserved	
Reserved	Station No. 2
Reserved	
Reserved	Station No. 3
Reserved	
Station No. 4	

Ver. 1

128 link points

CC-Link Ver.2 compatible Analog modules

Features

● Analog to Digital Converter module
AJ65VBTCU-68ADVN / AJ65VBTCU-68ADIN
● Digital to Analog Converter module
AJ65VBTCU-68DAVN

(1) The functions and specifications are compatible with Ver. 2.
Conventionally, three stations were occupied to use eight channels. With the CC-Link Ver. 2 mode, eight channels can be used with one station. This makes it possible to connect up to 42 modules per master, therefore dramatically increasing the number of channels in each system.

(2) Complete compatibility with conventional product
Just by setting the rotary switch, these modules work as CC-Link ver.1 compatible ones.
The parameter setting or sequence program does not need to be changed.

Performance specifications

(1) Analog to Digital Converter module

Item		AJ65VBTCU-68ADVN	AJ65VBTCU-68ADIN
Protection degree		IP1XB	
Analog input	Voltage	-10 to +10VDC (input resistance 1MΩ)	———
	Current	———	0 to 20mADC (input resistance 250Ω)
Digital output		16-bit signed binary (-4096 to +4095)	16-bit signed binary (-96 to +4095)

I/O characteristics, maximum resolution, accuracy (accuracy relative to maximum value of digital output value)					
	Analog input range	Digital output	**Accuracy** Ambient temperature 0 to 55℃	Ambient temperature 28 ± 55℃	Max. resolution
AJ65VBTCU-68ADVN (Voltage)	-10 to +10V	-4000 to +4000	±0.3% (±12 digit*)	±0.2% (±8 digit*)	2.5mV
	User range setting 1 (-10 to +10V)				
	0 to 5V	0 to +4000			1.25mV
	1 to 5V				1.0mV
	User range setting 2 (0 to 5V)				
AJ65VBTCU-68ADIN (Current)	0 to 20mA	0 to +4000			5μA
	4 to 20mA				4μA
	User range setting (0 to 20mA)				5μA

*:digit indicates digital value.

Maximum conversion speed	1ms/1 channel
Absolute maximum input	±15V / ±30mA
Analog input points	8 channels/1 module
CC-Link station type	Remote device station
Number of occupied stations	Ver. 2 mode 1 station (expanded word (RWr/RWw) 16 words each RX/RY 32 points Ver. 1 mode 3 stations (RWr/RWw) 12 words each RX/RY 32 points
Communication cable	Ver. 1.10 compatible CC-Link dedicated cable: FANC-110SBH, CS-110, FA-CBL200PSBH
Dielectric withstand voltage	Between power supply/communication system batch and analog input batch: 500VAC, 1 minute
Insulation method	Across communication system terminals and all analog input terminals: Photocoupler isolated Across power supply system terminals and all analog input terminals: Photocoupler isolated Across channels: Non-isolated
Noise durability	By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency
External connections	One-touch connector for communication [Transmission circuit] (5pins pressure welding type, the plug for the connector is sold separately.) One-touch connector for power supply and FG [Unit power supply and FG] (5 pins pressure welding type, the plug for the connector are sold separately.) One-touch connector for analog I/O (4pins pressure welding type, the plug for the connector is sold separately.) <Sold separately> Online connector for communication: A6CON-LJ5P Online connector for power supply: A6CON-PWJ5P

Applicable wire size	One-touch connector for communication	Communication line: Ver. 1.10 compatible CC-Link dedicated cable 0.5mm² (AWG20) [ø2.2 to 3.0] shielded wire 0.5 mm² (AWG20)
	One-touch connector for power supply/FG	0.66 to 0.98mm² (AWG18) [ø2.2 to 3.0] Wire diameter 0.08 mm² or more
	One-touch connector for analog I/O	ø1.0 to 1.4 (A6CON-P214), ø1.4 to 2.0 (A6CON-P220) [Applicable cable: 0.14 to 0.2 mm²] ø1.0 to 1.4 (A6CON-P514), ø1.4 to 2.0 (A6CON-P520) [Applicable cable: 0.3 to 0.5 mm²]

Applicable DIN rail	TH35-7.5Fe, TH35-7.5A1 (conforming to JIS C 2812)
	CC-Link connector type metal installation fitting: A6PLT-J65V1
External power supply	24VDC (20.4VDC to 26.4VDC, ripple factor within 5%)
	Inrush current: 4.2A, within 1.2ms or less
	Current consumption 0.10A
Weight	0.17kg
External dimensions (mm)	115 x 41 x 67

(1) Digital to Analog Converter module

Item	AJ65VBTCU-68DAVN
Protection degree	IP1XB
Digital output	16-bit signed binary (-4096 to +4095)
Analog output	-10 to +10VDC (input resistance 2kΩ to 1MΩ)

I/O characteristics, maximum resolution, accuracy (accuracy relative to maximum value of digital output value)		Digital output	Analog input range	Accuracy		Max. resolution
				Ambient temperature 0 to 55℃	Ambient temperature 28 ± 55℃	
	Voltage	-4000 to +4000	-10 to +10V	±0.3% (±30 mV)	±0.2% (±20mV)	2.5mV
			User range setting 1 (-10 to +10V)			
		0 to +4000	0 to 5V	±0.3% (±15 mV)	±0.2% (±10 mV)	1.25mV
			1 to 5V			1.0mV
			User range setting 2 (0 to 5V)			1.25mV

Maximum conversion speed	1ms/1 channel
Output shortcircuit protection	Provided
Absolute maximum input	±12V
Analog input points	8 channels/1 module
CC-Link station type	Remote device station
Number of occupied stations	Ver. 2 mode 1 station (expanded word (RWr/RWw) 16 words each RX/RY 32 points) Ver. 1 mode 3 stations (RWr/RWw) 12 words each RX/RY 32 points
Communication cable	Ver. 1.10 compatible CC-Link dedicated cable: FANC-110SBH, CS-110, FA-CBL200PSBH
Dielectric withstand voltage	Between power supply/communication system batch and analog input batch: 500VAC, 1 minute
Insulation method	Across communication system terminals and all analog input terminals: Photocoupler isolated Across power supply system terminals and all analog input terminals: Photocoupler isolated Across channels: Non-isolated
Noise durability	By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency
External connections	One-touch connector for communication [Transmission circuit] (5 pins pressure welding type, the plug for the connector is sold separately.) One-touch connector for power supply and FG [Unit power supply and FG] (5 pins pressure welding type, the plug for the connector are sold separately.) One-touch connector for analog I/O (4pins pressure welding type, the plug for the connector is sold separately.) <Sold separately> Online connector for communication: A6CON-LJ5P Online connector for power supply: A6CON-PWJ5P

Applicable wire size	One-touch connector for communication	Communication line: Ver. 1.10 compatible CC-Link dedicated cable 0.5mm² (AWG20) [ø2.2 to 3.0] shielded wire 0.5 mm² (AWG20)
	One-touch connector for power supply/FG	0.66 to 0.98mm² (AWG18) [ø2.2 to 3.0] Wire diameter 0.08 mm² or more
	One-touch connector for analog I/O	ø1.0 to 1.4 (A6CON-P214), ø1.4 to 2.0 (A6CON-P220) [Applicable cable: 0.14 to 0.2 mm²] ø1.0 to 1.4 (A6CON-P514), ø1.4 to 2.0 (A6CON-P520) [Applicable cable: 0.3 to 0.5 mm²]

Applicable DIN rail	TH35-7.5Fe, TH35-7.5A1 (conforming to JIS C 2812)
	CC-Link connector type metal installation fitting: A6PLT-J65V1
External power supply	24VDC (20.4VDC to 26.4VDC, ripple factor within 5%)
	Inrush current: 4.2A, within 1.2ms
	Current consumption 0.15A
Weight	0.16kg
External dimensions (mm)	115 x 41 x 67

CC-Link Ver. 2 specification

Item		Specification			
Maximum number of link points		Remote input/output (RX, RY): 8192 points each, Remote register (RWw): 2048 points each, Remote register (RWr): 2048 points each			
Expanded cyclic setting		Single	Double	Quadruple	Octuple
Number of link points per station	Remote input/output (RX, RY) Remote register (RWw) Remote register (RWr)	32 points each 4 words 4 words	32 points each 8 words 8 words	64 points each 16 words 16 words	128 points each 32 words 32 words
Number of link points per number of occupied station					
1 station occupied	Remote input/output (RX, RY) Remote register (RWw) Remote register (RWr)	32 points each 4 words 4 words	32 points each 8 words 8 words	64 points each 16 words 16 words	128 points each 32 words 32 words
2 station occupied	Remote input/output (RX, RY) Remote register (RWw) Remote register (RWr)	64 points each 8 words 8 words	96 points each 16 words 16 words	192 points each 32 words 32 words	384 points each 64 words 64 words
3 station occupied	Remote input/output (RX, RY) Remote register (RWw) Remote register (RWr)	96 points each 12 words 12 words	160 points each 24 words 24 words	320 points each 48 words 48 words	640 points each 96 words 96 words
4 station occupied	Remote input/output (RX, RY) Remote register (RWw) Remote register (RWr)	128 points each 16 words 16 words	224 points each 32 words 32 words	448 points each 64 words 64 words	896 points each 128 words 128 words

Item		Specification
Maximum number of link points		Remote input/output (RX, RY): 2048 points each Remote register (RWw): 256 words Remote register (RWr): 256 words
Number of link points per station		Remote input/output (RX, RY): 32 points each Remote register (RWw): 4 words Remote register (RWr): 4 words
Number of link points per number of occupied station	1 station occupied	Remote input/output (RX, RY): 32 points each Remote register (RWw): 4 words Remote register (RWr): 4 words
	2 stations occupied	Remote input/output (RX, RY): 64 points each Remote register (RWw): 8 words Remote register (RWr): 8 words
	3 stations occupied	Remote input/output (RX, RY): 96 points each Remote register (RWw): 12 words Remote register (RWr): 12 words
	4 stations occupied	Remote input/output (RX, RY): 128 points each Remote register (RWw): 16 words Remote register (RWr): 16 words

Ever-advancing high-performance model **QCPU**

Features

(1) The **CC-Link Ver. 2** additional mode is supported.

The additional mode with increased functions is supported with the **CC-Link Ver. 2** compatible master/local module **QJ61BT11N**.

(2) Imperfect derivative **PID** control instructions have been added.

The conventional **PID** control instruction (**PIDCONT** instruction) was capable only of perfect derivative operations, but now imperfect derivative operations are available with the newly added S.PIDCONT instructions. The target level can be reached more smoothly using the **PID** operations which are not easily affected by higher harmonic noise.

(3) Online change for **SFC** program files is available.

Until now, only Online change for ladder programs was available. With this high-performance model, the online change for SFC program files can now be done.

CPU   **SFC** program file

Write during **RUN**
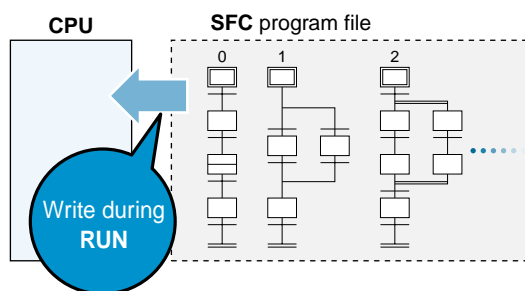
(4) High speed processing of floating point comparison instructions.

The time for processing the floating point comparison instructions has been increased by six-times from the conventional 40μs for one instruction to 6.4μs for one instruction. The time required to scan a program containing many floating point comparison instructions can be shortened.

| | E > | E12, 34 | DO | |

Instruction processing time 40μS → 6.4μS
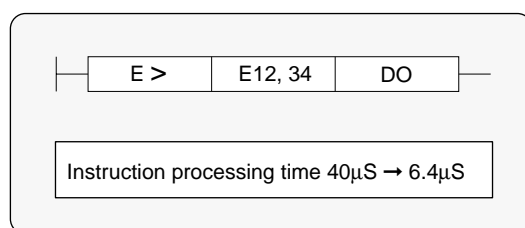
List of additional functions

Details of upgraded high-performance module QCPU		Compatible GX Developer (* 2)
Additional function	Serial No. (* 1)	
• SFC program batch write during RUN • Change of file memory capacity	04122 or higher	Version 8 or above
• CC-Link Ver. 2 additional mode compatible (* 3) • Imperfect derivative PID operation function	05032 or higher	Version 8.03D or above
• Faster floating point comparison instruction.		————————

*1. Serial No. for the compatible high-performance model QCPU.
*2. GX Developer version with which additional functions can be set and programmed.
*3. Combinations with CC-Link Ver. 2 compatible master module QJ61BT11N are possible.

Manuals

Manual name	Manual shipping style	B/SH No.	Type code
High Performance model QCPU (Q mode) User's Manual (Hardware Design, maintenance and Inspection)	Sold separately	SH-080037-G	13JL97
QCPU (Q mode) User's Manual (Hardware)	Enclosed with Q3 B base	IB-0800061-L	13JL96
QCPU (Q mode) / QnACPU Programming Manual (Common Instructions)	Sold separately	SH-080039-G	13JF58
QCPU (Q mode) / QnACPU Programming Manual (SFC)	Sold separately	SH-080041-D	13JF60
QCPU (Q mode) / QnACPU Programming Manual (PID Control Instructions)	Sold separately	SH-080040-E	13JF59
CC-Link System Master/Local Module Users Manual (Hardware) QJ61BT11N	Enclosed with the product	IB-0800250-A	13JP16
CC-Link System Master/Local Module Users Manual QJ61BT11N	Sold separately	SH-080394E-A	13JR64
Analog - Digital Converter Module type AJ65VBTCU-68ADVN/ADIN User's Manual	Sold separately	SH-080401E-A	13JR65
Digital - Analog Converter Module type AJ65VBTCU-68DAVN User's Manual	Sold separately	SH-0800402E-A	13JR66
GX Developer Version 8 Operating Manual	Sold separately	SH-080373E-A	13JU41
GX Developer Version 8 Operating Manual (SFC)	Sold separately	SH-080374E-A	13JU42

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