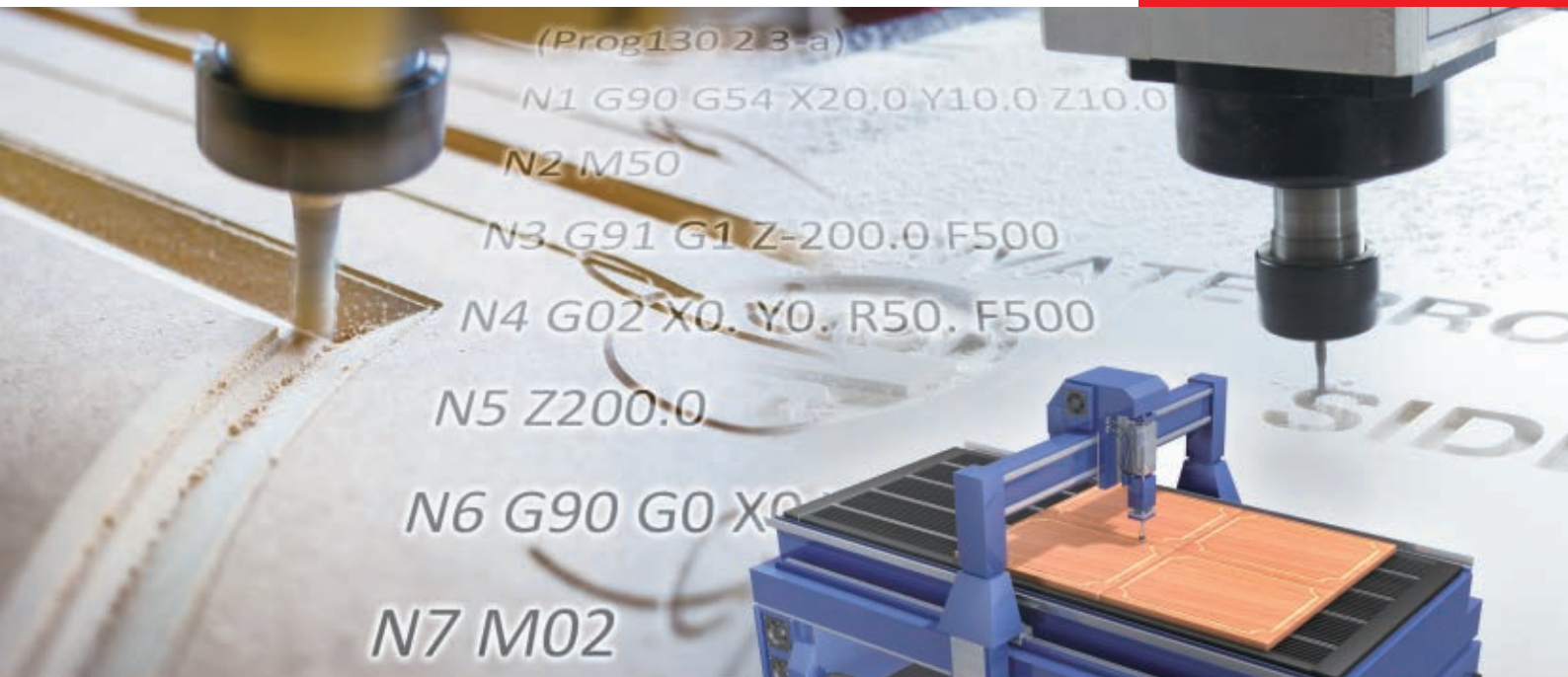# MITSUBISHI ELECTRIC SERVO SYSTEM
MELSEC iQ-R Series Motion Controller
G-code Control Add-on Library

January 2018

New Product Release
SV1801-2E

Easy Programming with G-code

G-code Control System Realized with General-purpose Servo

- G-code control is available for a system with MELSERVO-J4 series servo amplifiers.

- Various types of trajectory control are realized with extensive functions - tool radius compensation, normal line control, and automatic corner override, etc.

- Operators can edit and modify a G-code program on GOT on the spot.

- A combination of G-code control, synchronous control, and the Motion SFC program allows G-code control axes to operate synchronously with a production line.

MELSEC iQ-R series

SSCNETIII/H
SERVO SYSTEM CONTROLLER NETWORK

Features

● G-code control is available by additionally installing the G-code control add-on library (additional charge).
● G-code programs can be edited on GOT and transmitted between GOT and a Motion CPU.
● Up to 16 axes can perform G-code control (Simultaneous interpolation: Up to 4 axes)
● It is possible to switch between control by a servo program and by a G-code program.
● G-code control can be combined with other functions in Motion CPU such as Motion SFC program and synchronous control.
● A G-code program, which is in text format, can be edited with a generic editor.
● FTP transfer function allows transmission of data via a CC-Link IE embedded Ethernet interface module.

System Configuration

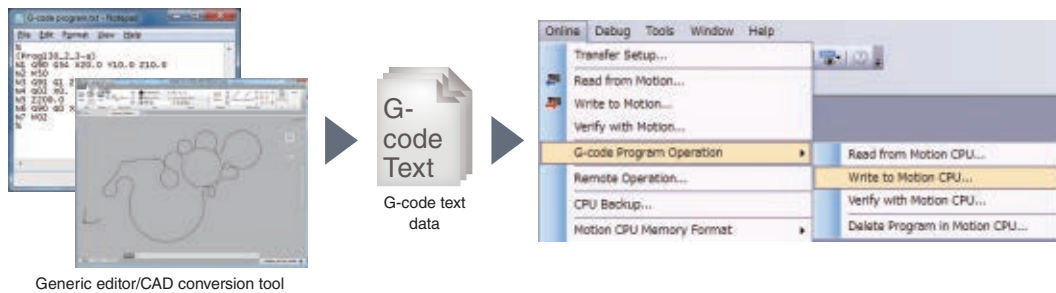(Note-1): USB memory can be connected only to GOT2000.
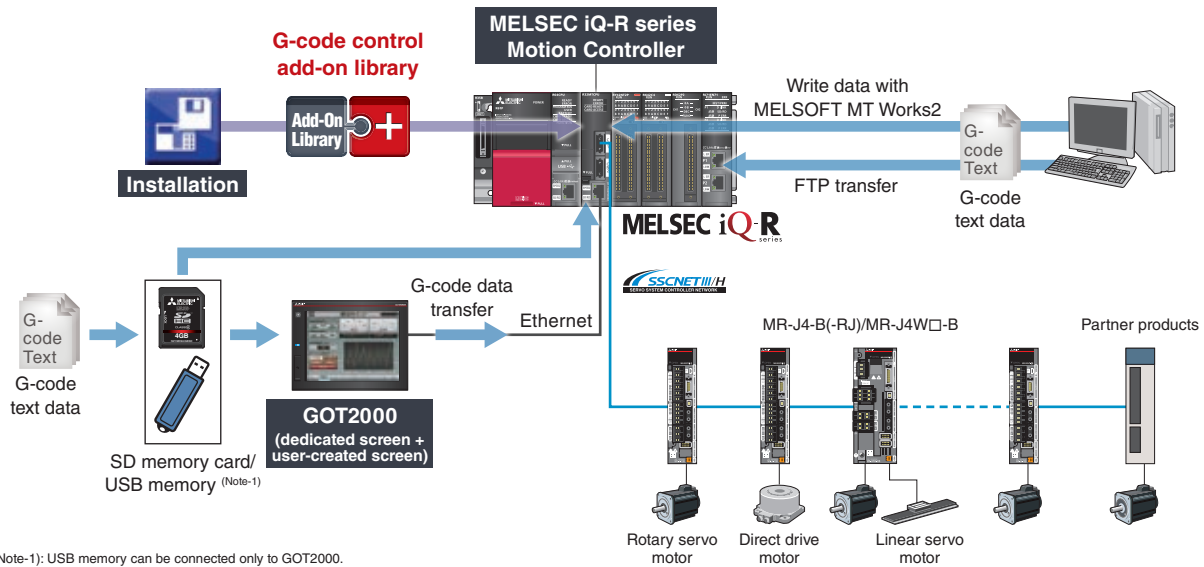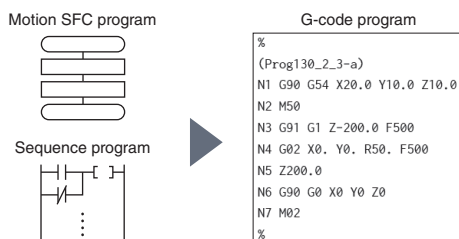
G-code Program

■Editing a program

A G-code program is created in text format with a generic editor/CAD conversion tool.
Read and write the G-code program from/to a Motion controller by G-code program operations with MELSOFT MT Works2.
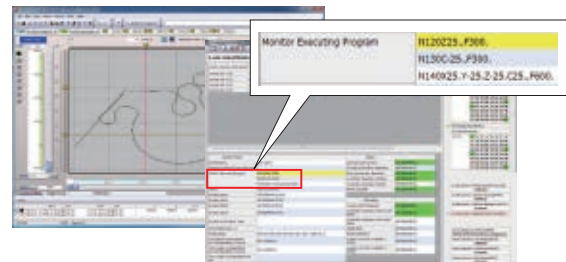

Generic editor/CAD conversion tool

■Starting a program

Start a program by using a G-code control device from Motion SFC program or a sequence program.

Motion SFC program   G-code program

```
%
(Prog130_2_3-a)
N1 G90 G54 X20.0 Y10.0 Z10.0
N2 M50
N3 G91 G1 Z-200.0 F500
N4 G02 X0. Y0. R50. F500
N5 Z200.0
N6 G90 G0 X0 Y0 Z0
N7 M02
%
```

■Debug

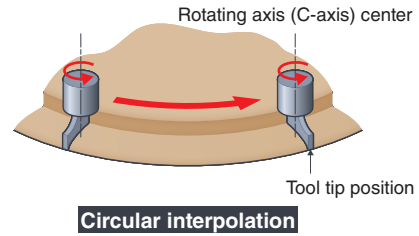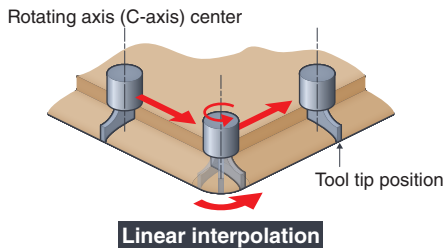[2-dimensional data in digital oscilloscope]

[G-code control monitor]

Functions

### Normal line control

Controls the rotation of a rotating axis (C-axis) so that the tool is always in the normal direction.

Rotating axis (C-axis) center

Tool tip position

Linear interpolation

Rotating axis (C-axis) center

Tool tip position

Circular interpolation

Automatic corner override

Reduces the load on the tool during inside corner cutting by automatic deceleration.

Automatic deceleration of the feed speed

Program path
Work surface
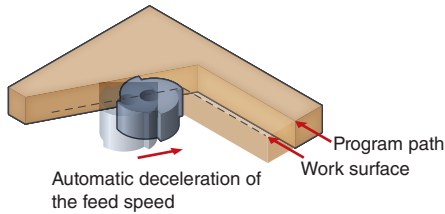
Tool radius compensation

Compensates the path only for an amount of the tool radius.
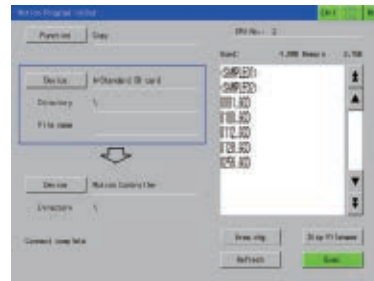
Right compensation

Left compensation
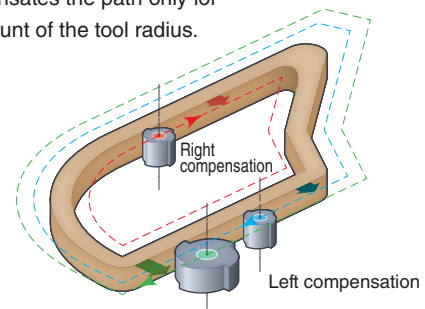
Editing G-code Programs on GOT2000

G-code programs can be edited and read from/written to a Motion controller with GOT2000.
The on-site operation without a personal computer helps to boost productivity.

[Editing Motion programs]
G-code programs from a Motion controller are displayed as a list and edited on GOT.

[Input/output of Motion programs]
G-code programs can be transmitted between GOT and Motion controllers, and the data originally saved in the controller can also be deleted on GOT.

Combination of G-code Control and Synchronous Control

Operation combining trajectory control by G-code and synchronous control is possible.

[Example of synchronous operation between G-code control axes and conveyor axis]
The machine can draw trajectory on a workpiece using G-code control without stopping the conveyor line.

G-code control axes
X-Y-Z axes

Conveyor axis

Synchronous operation

Z-axis

Y-axis

X-axis

Conveyor axis
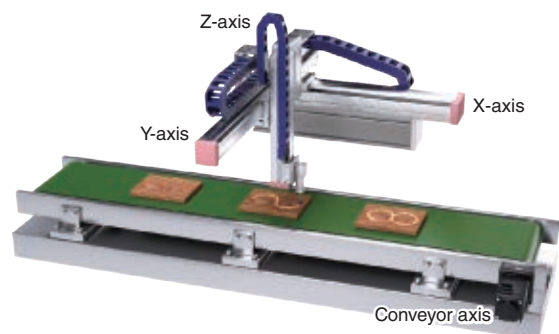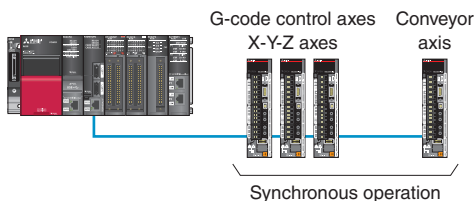
Conversion from CAD Data into G-code Available in the future

CAD data in DXF format is converted into a G-code program, and then the program is exported as G-code text data.
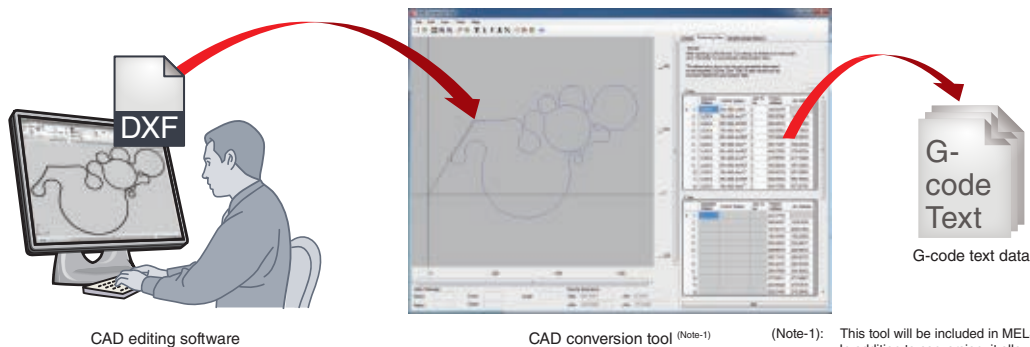
CAD editing software

CAD conversion tool (Note-1)

G-code text data

(Note-1): This tool will be included in MELSOFT MT Works2. In addition to conversion, it allows you to change the order of drawing. In order to edit the CAD data, CAD editing software is required.

Functions list

Name	G-code
Positioning	G00
Linear interpolation	G01
Circular interpolation	G02, G03
Dwell	G04
Exact stop check	G09, G61
Polar coordinate interpolation	G12.1, G13.1
Plane selection	G17, G18, G19
Tool radius compensation	G38, G39, G40, G41, G42
Normal line control	G40.1, G41.1, G42.1
Tool length compensation	G43, G44, G49
Local coordinate system setting	G52

Name	G-code
Basic machine coordinate system selection	G53
Work coordinate system selection	G54, G55, G56, G57, G58, G59
High-accuracy control	G61.1
Automatic corner override	G62
Cutting mode	G64
Program coordinate rotation	G68, G69
Absolute value command	G90
Incremental value command	G91
Override	Specified with device
FIN signal wait function	G-code control device
Single block	G-code control device

Software list

Product name	Model			Contents
	R64MTCPU	R32MTCPU	R16MTCPU	
Operating system software add-on library (G-code control add-on library)	SW10DND-GCD01			Number of licenses: 1
	SW10DND-GCD05			Number of licenses: 5
	SW10DND-GCD10			Number of licenses: 10
	SW10DND-GCD20			Number of licenses: 20
	SW10DND-GCD50			Number of licenses: 50

(Note): When requesting more than 50 licenses, contact your local sales office.

[G-code Control Add-on Library Packing List]
- DVD-ROM (Add-on library, manual PDF)
- USB key (for license activation)
- Before Using the Product
- License Certificate
- END-USER SOFTWARE LICENSE AGREEMENT

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⚠ SAFETY WARNING
To ensure proper use of the products listed in this document, please be sure to read the instruction manual prior to use.

New publication, effective January 2018.
Specifications are subject to change without notice.