CKD

SCARA Robot

KSL3000 Additional Function Manual

INSTRUCTION MANUAL

SM-A20058-A

- Read this Instruction Manual before using the product.
- Read the safety notes carefully.
- Keep this Instruction Manual in a safe and convenient place for future reference.

CKD Corporation

This document explains additional functions of CKD Corporation industrial robot controller KSL3000.

Chapter 1

Explains NCBOY additional axis function.

Chapter 2

Explains the pulse output function.

Chapter 3

Explains the area output function.

The information contained in this manual is subject to change without notice.
The respective manuals of Safety, Operation, Robot Language, Interface, Installation and Transportation, Communication, User Parameters, and Alarms are available. Use this manual in combination with the other manuals as appropriate.

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Chapter 1
NCBOY Additional Axis Function

Cannot be used with SCARA system.

Chapter 2
Pulse Output Function

Not available with robot controller KSL3000.

Chapter 3
Area Output Function

This chapter explains the area output function.

3.1 Overview of the area output function

The area output function is a function for turning on or off a specified DOUT signal when the robot enters a specified area. It allows you to choose 64 combinations of a specified area and a specified DOUT signal.
The controller system versions in which this function is supported are as follows:
Main section: X8GCAS-13E or higher (SCARA)

3.2 Parameters

The setting parameters for the area output function are described in the “AREA.PAR” parameter file. The parameter format is as follows:

```
[A00] AREA OUTPUT SETTING PARAMETER
{Area output flag (0:Disable 1:Enable)}
{P1:+Direction position coordinate [mm]}
{P2:-Direction position coordinate [mm]}
{Dout number}
{Table No.1}
=    0           ①Area output function enabling/disabling setting
=    9999.9    9999.9    9999.9    0.0    0.0    0.0    0.0    0.0
=   -9999.9   -9999.9   -9999.9    0.0    0.0    0.0    0.0    0.0
                ②Cuboid areas P1 and P2
=    1           ③Output DOUT number and output logic
{Table No.2}
=    0
=    9999.9    9999.9    9999.9    0.0    0.0    0.0    0.0    0.0
=   -9999.9   -9999.9   -9999.9    0.0    0.0    0.0    0.0    0.0
=    2
{Table No.3}
=    0
=    9999.9    9999.9    9999.9    0.0    0.0    0.0    0.0    0.0
=   -9999.9   -9999.9   -9999.9    0.0    0.0    0.0    0.0    0.0
=    3

.
.
.

{Table No.64}
=    0
=    9999.9    9999.9    9999.9    0.0    0.0    0.0    0.0    0.0
=   -9999.9   -9999.9   -9999.9    0.0    0.0    0.0    0.0    0.0
=    64
```

① **Area output function enabling/disabling setting**

This parameter specifies whether to enable or disable the area output function.

0: Disables the function

1: Enables the function

Data type: Integer type

Data range: 0 or 1

Value example: 0

② **Cuboid areas P1 and P2**

These parameters specify an area for which a signal is output. When the robot enters the specified cuboid area, the specified DOUT signal is turned on or off.

* If the values of (plus position) and (minus position) are interchanged, this does not affect operation.

Setting: = (plus position x-coordinate), (plus position y-coordinate), (plus position z coordinate), (reserved), (reserved), (reserved), (reserved), (reserved)

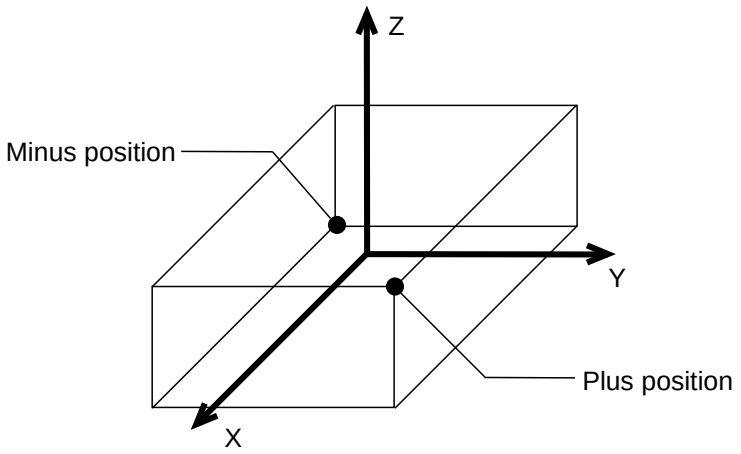
=(minus position x-coordinate), (minus position y-coordinate), (minus position z coordinate), (reserved), (reserved), (reserved), (reserved), (reserved)

Data type: Real number type

Data unit: mm

Data range: -9999.9 to 9999.9

Value example: 1.0



③ **Output DOUT number and output logic**

This parameter specifies the DOUT number for which a signal is output.
If the DOUT number is positive, the specified DOUT is turned on when the robot enters the specified area. Also, if the DOUT number is negative, the specified DOUT is turned off when the robot enters the specified area.

Data type: Integer type
Data range: 1 to 64, -1 to -64, 101 to 164, -101 to -164, 301 to 364, -301 to -364, 401 to 464, -401 to -464
Value example: 1

Note:

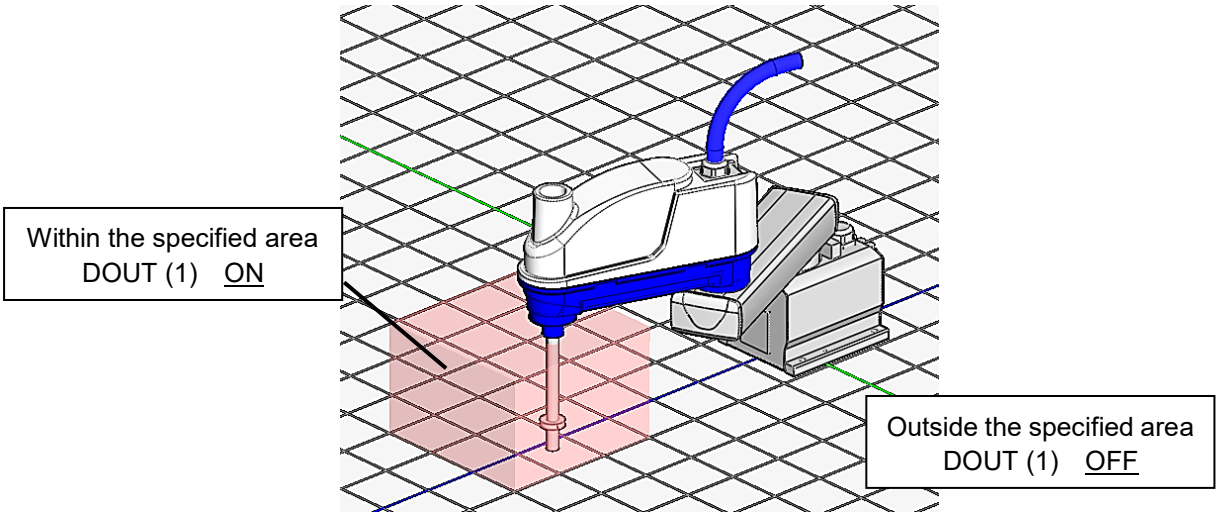
- If the same DOUT number is specified on more than one table, the output signal will be the logical OR of the DOUT output of each table. Details are provided in the next section.
- Note that a specified DOUT enabled by this function cannot be turned on or off by using the SCOL language or a teaching pendant.

3.3 Usage Example

This section gives an example where AREA.PAR is written as follows:

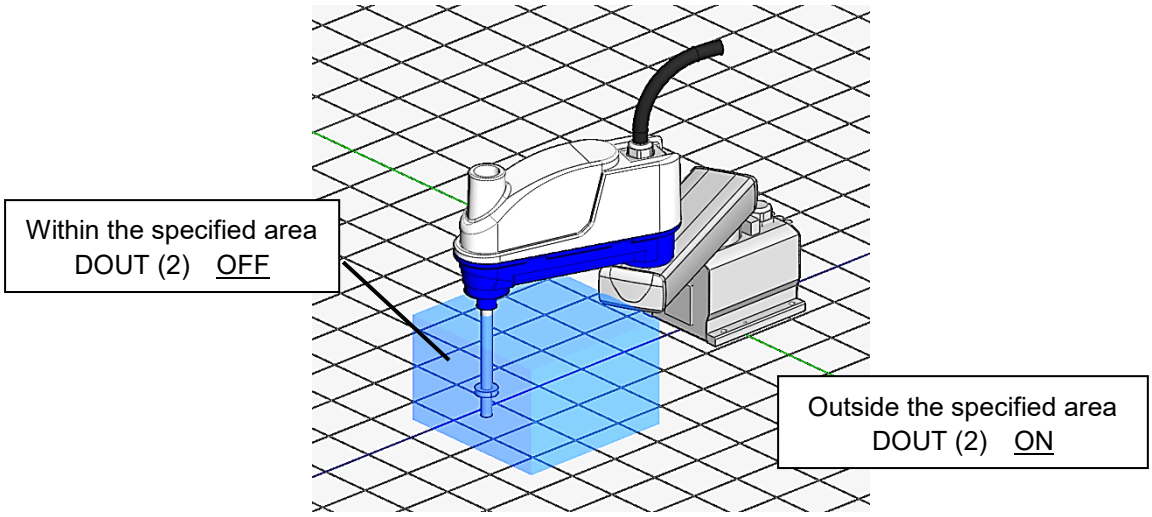
```
[A00] AREA OUTPUT SETTING PARAMETER
{Area output flag (0:Disable 1:Enable)}
{P1:+Direction position coordinate [mm]}
{P2:-Direction position coordinate [mm]}
{Dout number}
{Table No.1}
=    1
=    700.0    100.0    200.0    0.0    0.0    0.0    0.0    0.0
=    400.0   -200.0      0.0    0.0    0.0    0.0    0.0    0.0
=    1

{Table No.2}
=    1
=    650.0    250.0    200.0    0.0    0.0    0.0    0.0    0.0
=    350.0    -50.0      0.0    0.0    0.0    0.0    0.0    0.0
=    -2
.
.
.
```

The area specified in Table No.1 is as shown in the figure below.



If the current position of the robot is within the specified area, DOUT (1) is turned on; otherwise, DOUT (1) is turned off.

The area specified in Table No.2 is as shown in the figure below.



If the current position of the robot is within the specified area, DOUT (2) is turned off; otherwise, DOUT (2) is turned on.

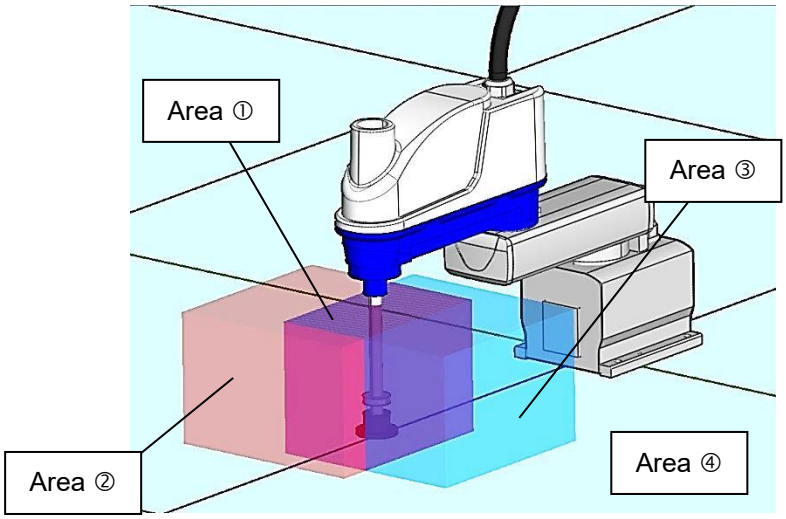
3.3.1 Case where the same DOUT number is used on more than one table

If this area output function is used to specify the same DOUT number on more than one table, the output signal will be the logical OR of the DOUT output of each table. In other words, if output ON and OFF instructions are given at the same time, the ON instruction will be given priority.

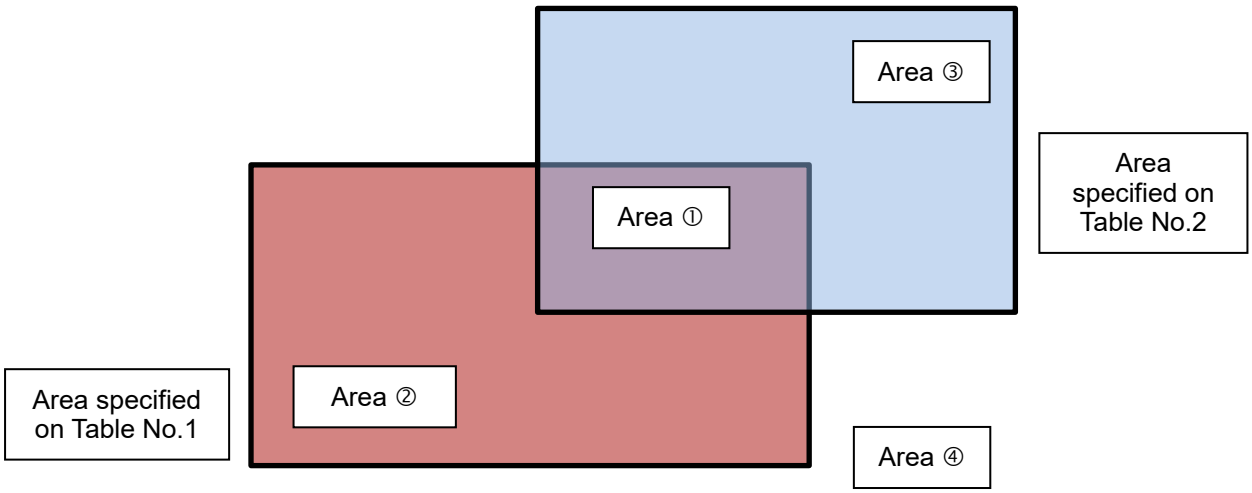
Here is an example where AREA.PAR is written as follows:

```
[A00] AREA OUTPUT SETTING PARAMETER
{Area output flag (0:Disable 1:Enable)}
{P1:+Direction position coordinate [mm]}
{P2:-Direction position coordinate [mm]}
{Dout number}
{Table No.1}
=    1
=    700.0    100.0    200.0    0.0    0.0    0.0    0.0    0.0
=    400.0   -200.0      0.0    0.0    0.0    0.0    0.0    0.0
=    1

{Table No.2}
=    1
=    650.0    250.0    200.0    0.0    0.0    0.0    0.0    0.0
=    350.0    -50.0      0.0    0.0    0.0    0.0    0.0    0.0
=    -1
.
.
.
```

The specified areas are as shown below.



Also, the areas are divided into the following four areas depending on the combination of the setting values of each table.



ON/OFF of DOUT (1) in each area is as follows:

Area ①: Table No.1 is ON, Table No.2 is OFF, and DOUT (1) is ON.
Area ②: Table No.1 is ON, Table No.2 is ON, and DOUT (1) is ON.
Area ③: Table No.1 is OFF, Table No.2 is OFF, and DOUT (1) is OFF.
Area ④: Table No.1 is OFF, Table No.2 is ON, and DOUT (1) is ON.