# THE JAPAN STEEL WORKS,LTD.
# J-EL3/ J-AD provider

## Version 1.0.2

## User's guide

## February 1, 2023

Remarks:
This document is translated into English by machine translation.

## 【 revision history 】

| Version | Date | Content |
|---|---|---|
| 1.0.1 | 2019-05-31 | First edition. |
| | 2019-10-23 | Errors in Figure 2-1 corrected |
| 1.0.2 | 2023-02-01 | Fixed a bug that the lock state is retained under certain conditions.<br>Fixed a bug that caused CAO to crash when it received more than expected.<br>Fixes a bug that malfunctions when an error packet is received.<br>Error data received.Check with the manufacturer. |
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## 【 hardware 】

| Model | Version | Notes |
|---|---|---|
| JSW J-AD series | - | |
| JSW J-E Ⅲ (J-EL Ⅲ) series | - | |
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## Contents

# 1. Introduction

This book is an user's guide of the ORiN provider of The Japan Steel Works (henceforth JSW) for electric injection molding made by company machine J-EL3 series and the J-AD series.

If this provider is used, measurements from electric injection molding machine J-EL3 series and the J-AD series can be acquired.

This book explains the function of this provider and the mounting method.

# 2. Outline of provider

## 2.1. Outline

The electric injection molding made by JSW company machine uses RS232C or the UDP communication and the provider acquires data. The file format of this provider is DLL(Dynamic Link Library), and the details :. Table2-1It is [natteimasu] in [noyou].

Table2-1JSW J-EL3AD provider

| | |
|---|---|
| File name | CaoProvJSWJ-EL3AD.dll |
| ProgID | CaoProv.JSW.J-EL3AD |
| Registry registration | regsvr32 CaoProvJSWJ-EL3AD.dll |
| Blotting out of registry registration | regsvr32 /u CaoProvJSWJ-EL3AD.dll |

Figure2-1[Ni] CaoProvController and the correspondence chart of the JSW electric injection molding machine are shown.

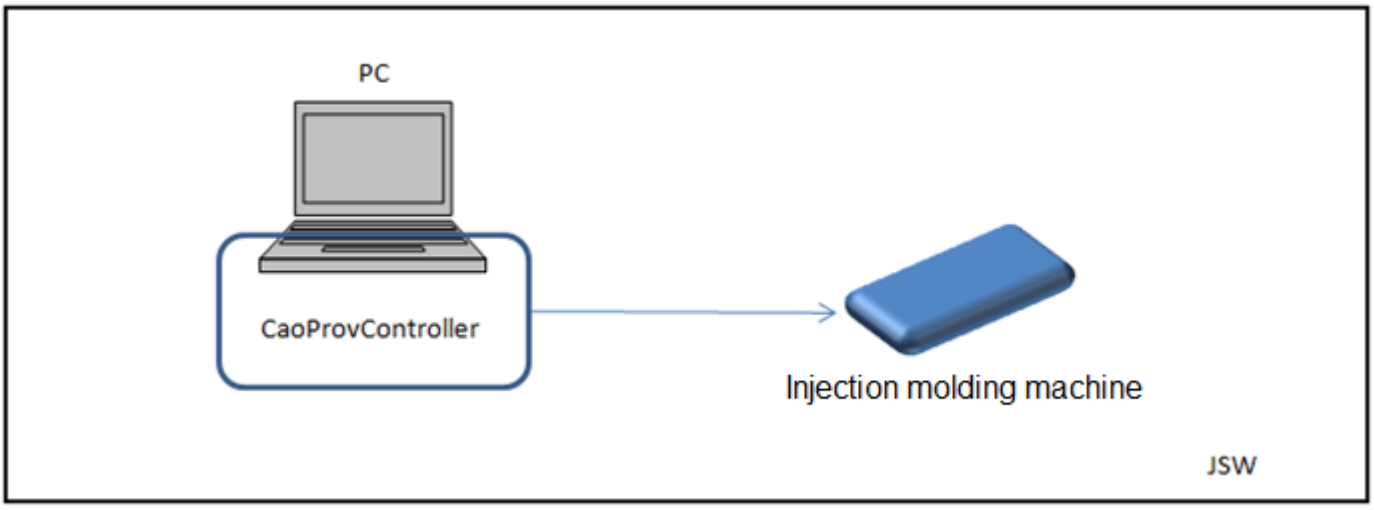


Figure2-1CaoProvController and correspondence chart of JSW electric injection molding machine

## 2.2. Method property

### 2.2.1. CaoWorkspace::AddController method

Specify a necessary option when you generate the Controller object by the above-mentioned communicate mode and each communicate mode.

The specification of AddController is shown as follows.

Format

```
AddController
(
        "< controller name >"          // Controller name (arbitrariness)
         "CaoProv.JSW.J-EL3AD" ,       // Provider name (fixation)
        "< machine name >"                    //   Provider   execution
machine name (unused)
        "< option >"           // Optional character string
```

The character string specified for an optional character string is shown as follows.

Table2-2Optional character string of CaoWorkspace::AddController

| Option | Indispensability | Explanation | Range of value | Default value |
|---|---|---|---|---|
| CONN = <optional connection > | - | Specify parameter in communication tools. It is necessary to specify parameters according to the communicate mode used. Refer to 2.2.1.1 about the specification method. | ----- | ----- |
| TIMEOUT=< Response standby time > | -- | Specify the response standby time (ms). | 0 - 65535 | 1000 |

Usage example

1. When the device to be acquired is serial communications

   CONN=COM:2, TIMEOUT=1000

2. When the device to be acquired is Ethernet

   CONN=Eth:192.168.0.1, TIMEOUT=1000

#### 2.2.1.1. Conn is optional.

Connected parameter character string of optional Conn is shown as follows. It is shown to omit it here in the brace) and the underlined part under the explanation of each parameter shows the default value when the option is not specified respectively.

**The RS232C under line shows the default value.**

"Conn=COM:<COM Port>[:<BaudRate>[:<Parity>:<DataBits>:<StopBits>[:Flow]]]"

| | | |
|---|---|---|
| <COM Port> | : | COM port number. '1' -COM1, '2' - COM2, ... |
| <BautRate> | : | Transmission rate. 4800, 9600, 19200, 38400, 57600, 115200 |
| <Parity> | : | Parity. 'N'-NONE, 'E'-EVEN, 'O'-ODD |
| <DataBits> | : | Number of data bits. '7'-7bit, '8'-8bit |
| <StopBits> | : | Number of stop bits. '1'-1bit, '2'-2bit |
| <Flow> | : | Flow control. '0' - None, '1' - Xon/Xoff, and '2'-hardware control<br>It is possible to specify it by taking OR. |

**The line shows the default value in case of Ethernet.**

"Conn=Eth:<IP>[:<Port>[:<Local IP>:<Local Port>]]"

| | | |
|---|---|---|
| <IP> | : | Connection destination Internet Protocol address. |
| <Port> | : | Connection destination port. (5555) |
| <Local IP> | : | Local Internet Protocol address. |
| <Loacal Port> | : | Local port. |

### 2.2.2. CaoController::AddVariable method

Generate the CaoVariable object from CaoController. To the variable identifierTable2-3It drinks and only the variable name can be used.

The specification of AddVariable is shown as follows.

Format

```
AddVariable
(
        "< variable identifier >"       // Variable identifier
         "",                            // Optional character string
)
```

### 2.2.3. CaoController::get_VariableNames method

Table2-3Drink and acquire the variable name list.

### 2.2.4. CaoVariable::get_Value method

Acquire data from the device according to the specified variable identifier.

Please refer to 2.3 for details.

## 2.3. Variable list

Table2-3 describes the list of system variables that can be used in the control class. Only the value acquisition operation is executable by all variables.

Table2-3Controller class variable list

| Variable identifier | Data type | Explanation |
|---|---|---|
| @MAKER_NAME | VT_BSTR | Acquire the manufacturer name. "JSW" is always acquired. |
| @VERSION | VT_BSTR | The version character string of the provider is acquired in the form of "*. *. *". |
| Measurements data | VT_ARRAY \| VT_BSTR<br>or<br>VT_ARRAY \| VT_VARIANT | Acquire the measuring data corresponding to the specified block number. The variable identifier can be freely specified. Please refer to Table2-4 for the option that can be specified. |

### 2.3.1. Measurements data

It is a user variable to acquire the measurements data. An arbitrary character string can be specified for the variable identifier. However, it is not recognized as a system variable, and do not specify @ when you specify @ for the heading character.

Option

Table2-5 Optional specification

| Optional name | Type | Explanation |
|---|---|---|
| BLOCKNO | VT_UI1 | Specify the block number to be acquired. This option cannot be omitted, and specify it. |
| ALLSHOT | VT_BOOL | Specify whether to acquire all the shot data.<br>All shots that the equipment maintains settle when TRUE is specified and it is acquired. When FALSE is specified, only the latest shot is acquired.<br>FALSE: Only the latest shot (default)<br>TRUE: All shots that can be acquired from equipment |

Data type

As for the measurements data, the data type is different according to the optional ALLSHOT specification.

When you specify TRUE for ALLSHOT

| Data type | Explanation |
|---|---|

| Data type | | | Explanation |
|---|---|---|---|
| VT_ARRAY \| VY_VARIANT | | | Array that maintains data for all shots. |
| i | VT_ARRAY \| VT_BSTR | | Array that maintains data for one shot |
| | 0 | VT_BSTR | The 0th data |
| | 1 | VT_BSTR | The first data |
| | : | | |
| | N | VT_BSTR | Data of N turn eyes |

When you specify or FALSE that doesn't specify ALLSHOT

| Data type | | | Explanation |
|---|---|---|---|
| i | VT_ARRAY \| VT_BSTR | | Array that maintains data of the latest shot |
| | 0 | VT_BSTR | The 0th data |
| | 1 | VT_BSTR | The first data |
| | : | | |
| | N | VT_BSTR | Data of N turn eyes |

## 2.4. It is an example of data every the block.

The example of the data at every the block is described.

The data enumerated here becomes the example of the reference to the end. Note it so that the output item of each equipment used is different.

Table2-6 Acquisition data of No.70 (whole series commonness)

| No | Data is detailed. | Unit |
|---|---|---|
| 1 | Alarm | — |
| 2 | It is producing. | |
| 3 | It is arranging. | |
| 4 | It is stopping. | |
| 5 | It is stopping. | |

Table2-7 Acquisition data of No.41 (whole series commonness)

| No | Data is detailed. | Unit |
|---|---|---|
| 1 | Shot number | — |
| 2 | Time of cycle | sec |
| 3 | Shooting time | sec |
| 4 | Turn-over time | sec |
| 5 | Shooting beginning position | mm |

| No | Data is detailed. | Unit |
|---|---|---|
| 6 | Tamotsu pressure change position | mm |
| 7 | Tamotsu pressure completion position | mm |
| 8 | Residual quantity | mm |
| 9 | Injection pressure (MAX) | MPa |
| 10 | Tamotsu pressure change pressure | MPa |
| 11 | Back pressure (MAX) | MPa |
| 12 | Pressure in metal mold (option) | MPa |
| 13 | Time when measuring it (HHMMSS) | (second of season) |
| 14 | Date when measuring it (YYMMDD) | (date) |

Table2-8 No.50 (J-E Ⅲ (J-EL Ⅲ) series)

| No | Data is detailed. | Unit |
|---|---|---|
| 1 | Shot number | — |
| 2 | NH temperature | ℃ |
| 3 | H1 temperature | ℃ |
| 4 | H2 temperature | ℃ |
| 5 | H3 temperature | ℃ |
| 6 | H4 temperature | ℃ |
| 7 | 1 in temperature of metal mold (movability) | ℃ |
| 8 | 2 in temperature of metal mold (fixation) | ℃ |
| 9 | Temperature of operation oil | ℃ |
| 10 | LNH temperature | ℃ |
| 11 | Temperature under hopper | ℃ |
| 12 | HV temperature | ℃ |
| 13 | One in preliminary temperature | ℃ |
| 14 | Two in preliminary temperature | ℃ |
| 15 | Three in preliminary temperature | ℃ |
| 16 | Four in preliminary temperature | ℃ |
| 17 | Five in preliminary temperature | ℃ |
| 18 | Six in preliminary temperature | ℃ |
| 19 | Seven in preliminary temperature | ℃ |
| 20 | Eight in preliminary temperature | ℃ |
| 21 | Nine in preliminary temperature | ℃ |
| 22 | Ten in preliminary temperature | ℃ |

Table2-9No.50 (J-AD series)

| No | Data is detailed. | Unit |
|---|---|---|
| 1 | Shot number | — |
| 2 | Measurement completion position | mm |
| 3 | Measurement torque | % |
| 4 | Dwell pressure application switch speed | mm/s |
| 5 | Between type [hiratoki] | sec |
| 6 | Type [hei] time | sec |
| 7 | Reserve 1 | — |
| 8 | Reserve 2 | — |
| 9 | Reserve 3 | — |
| 10 | Reserve 4 | — |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | | |
| 17 | | |
| 18 | | |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |

Table2-10No.51(Only the J-AD series :).

| No | Data is detailed. | Unit |
|---|---|---|
| 1 | Shot number | — |
| 2 | NH3/HV temperature | ℃ |
| 3 | NH2 temperature | ℃ |
| 4 | NH1 temperature | ℃ |
| 5 | H6 temperature | ℃ |
| 6 | H5 temperature | ℃ |
| 7 | H4 temperature | ℃ |
| 8 | H3 temperature | ℃ |
| 9 | H2 temperature | ℃ |

| No | Data is detailed. | Unit |
|---|---|---|
| 10 | H1 temperature | ℃ |
| 11 | Temperature under hopper | ℃ |
| 12 | 1 in temperature of metal mold (movability) | ℃ |
| 13 | 2 in temperature of metal mold (fixation) | ℃ |
| 14 | Temperature of operation oil | ℃ |
| 15 | One in preliminary temperature | ℃ |
| 16 | Two in preliminary temperature | ℃ |
| 17 | Three in preliminary temperature | ℃ |
| 18 | Four in preliminary temperature | ℃ |
| 19 | Five in preliminary temperature | ℃ |
| 20 | Six in preliminary temperature | ℃ |
| 21 | Seven in preliminary temperature | ℃ |
| 22 | Eight in preliminary temperature | ℃ |
| 23 | Nine in preliminary temperature | ℃ |
| 24 | Ten in preliminary temperature | ℃ |
| 25 | 11 in preliminary temperature | ℃ |
| 26 | 12 in preliminary temperature | ℃ |
| 27 | Reserve 4 | ℃ |

## 2.5. Error code

In this provider, the following original error codes in which the mask is done with 0x8011**** exist. (Table2-11 Reference)

About a common error of ORiN2, Refer to the chapter of the error code of "ORiN2 SDK User's guide".

Table2-11 Original error code table

| Error number | Explanation |
|---|---|
| 0x80110001 | It is not specified that indispensability is optional. Specify that indispensability is optional. |
| 0x80110002 | The communication type of the uncorrespondence was specified. COM/ ETH/ Specify UDP. |
| 0x80110004 | The sequence number of the received data is different. Confirm it to the manufacturer. |
| 0x80110005 | It is different from the block number that the received block number demanded. Confirm it to the manufacturer. |
| 0x80110006 | It is a checksum error. Confirm the communication situation. |
| 0x80110008 | The difference is seen between the number of data described in receive data and the data actually received. Confirm it to the manufacturer. |
| 0x80110009 | Online with the machine was not able to be confirmed. Confirm be correct to wiring. |

| | |
|---|---|
| | whether there is a power supply of the machineSpecify a big value by optional Timouet of AddController when this error happens frequently correctly though it is wired. |
| 0x8011000A | The confirmation of the protocol version was not able to be taken. There is a possibility that the machine side doesn't correspond to the protocol. Specify a big value by optional Timouet of AddController when this error happens frequently though it corresponds to the protocol. |
| 0x8011000B | A normal response was not able to be received from the machine side though data was demanded. Specify a big value by optional Timouet of AddController when this error happens frequently. |
| 0x8011000C | The block data was not able to be received. Specify a big value by optional Timouet of AddController when this error happens frequently. |
| 0x8011000D | It failed in the data conversion of the sequence number among the received data. There is a possibility of the protocol that doesn't correspond. |
| 0x8011000E | It failed in the data conversion of checksum among the received data. There is a possibility of the protocol that doesn't correspond. |
| 0x8011000F | There is a possibility of the protocol that doesn't correspond fail in the data conversion of the number of data among the received data. |
| 0x80110010 | It failed in the data conversion of the block number among the received data. There is a possibility of the protocol that doesn't correspond. |
| 0x80110011 | It is other receive data error. |
| 0x80110012 | It was not possible to control it exclusively in the time that had been specified with TIMEOUT. There is a possibility of the trouble of the program. |
| 0x80110013 | Error data received.Check with the manufacturer. |

# 3. Sample program

The value of variable identifier block number 50 is acquired from the device, and an easy sample is shown as follows.

Precondition:
・The device used is assumed to be JSW J-EL Ⅲ series.
・The COM port used is assumed to be one.

**List 3-1 Sample.frm**

```
Dim eng As CaoEngine
Dim ctrl As CaoController
Dim var As CaoVariable
Private Sub Form_Load()
        Set eng = New CaoEngine
        Controller object ..'.. making
        Set ctrl = eng.Workspaces(0).AddController("", _
 "CaoProv.JSW.J-EL3AD", _
 "", _
 "CONN=COM:1")
        Controller variable object ..'.. making
        Set var = ctrl.AddVariable("BLOCK50", "BLOCKNO=50")
End Sub

..'.. acquisition of value
Private Sub Command1_Click()
        ..'.. acquisition of control variable value
        Dim vars As Variant
        vars = var.Value
        For i = 0 To UBound(vars)
                Sheet1.Cells(i + 1, 1) = vars(i)
        Next i
  End Sub
```