

JAKA	Manual	Release note for JSI V1.6.33	Doc Level	4
		DOC Version 1.1	Language	EN

JAKA Robotics

Just Always Keep Amazing

Release Note for JSI

Controlled state: _____

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Department : JSI Project Team

JSI Version : V1.6.33

Editor:	Reviewer:	Approver:
Yunfeng Zhu	Shirong Lu	Weil Shao
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1.0	202403020	---	Initial release	Shirong Lu
1.1	20240417	---	Updated to match jsi-1.6.33	Wei Shao

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1. Release Information

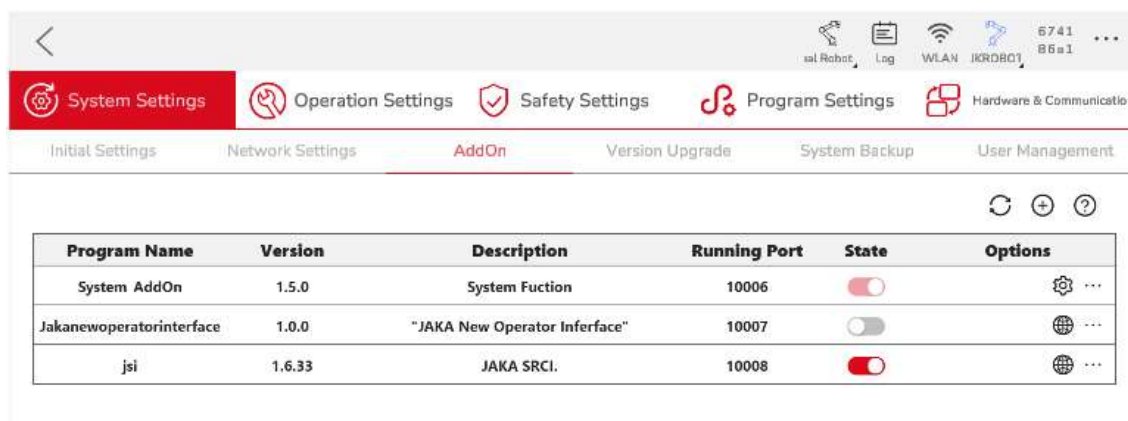
1.1. Release time

19-Apr-2024

1.2. Release Version

1.6.33

Jsi version can be check from JAKAZu APP->Setting->system Settings->AddOn page.



1.3. Addon Package name

jsi_1.6.33_JKZUC_171.36RC.tar.gz

1.4. Scope of JSI V1.6

JSI V1.6 is an official release of SRCI Interpreter with most functions and parameters defined in SRCI protocol.

JSI V1.6 is implemented following SRCI protocol version V1.4;

2. Version compatibility

Recommend using the following version set for SRCI application.

JSI Addon Version	JAKA Controller Version	JAKA Zu App	GSDML file
1.6.33	1.7.1_36_rc	1.7.1_37 and above	GSDML-V2.41-JAKA-JAKARobot- 20231017.xml

Note:

1. JAKA Zu APP is only needed to setup and Check JSI functionality.

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3. Version History

V1.6.33

Release date: 2024-04-19

First official release with most functions defined in SRCI core profile but ReturnToPrimary.
Passed the latest PI SRCI Test Set V2.2.

V1.6.30

Release date: 2024-03-01

Initial release with some common used functions

4. Supported functions and parameters

4.1. Overview of Supported functions

Not all the functions supported by JSI are listed bellow. Some basic functions are needed to support user functions in profile Core, but are not intended to be called directly by user. These kind of basic functions are not listed here.

Some functions are partial supported, and the illustrations of which are listed separately in Chapter functions Descriptions.

- Change Speed Override
- Enable Robot
- Group Continue
- Group Interrupt
- Group Jog
- Group Reset Group Stop
- Move Axes Absolute
- Move Direct Absolute
- Move Linear Absolute
- Read Actual Position

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- Read Tool Data
- Read Frame Data
- Read Load Data
- Read Robot Default Dynamics
- Read Robot Reference Dynamics
- Read Robot SW Limits
- Write Tool Data
- Write Frame Data
- Write Load Data
- Write Robot Default Dynamics
- Write Robot Reference Dynamics

4.2. Standardized Supported Functions and Parameters

PI robotics working group has defined a standard template to communicate Supported functions and parameters, the latest template version is V1.7 for now. Please refer to attached excel file for detailed supported functions and parameters.



JSI 1.6.33
SupportedFunction

4.3. Limitations

Please read through these limitations before using SRCI commands:

For now, the Operation Mode settings cannot be changed. SRCI would be in Operation Mode=4 (external automation) by default when run.

When using PLC to control the robot, it would only report motion-related errors. When such error occurs, please refer to the Robot_UserData->SystemLog of the TIA software in PLC for detailed information.

- **Unsupported functions:**
 - ⊗ ***SYNC. Information from the robot and PLC would not be automatically synchronized, thus the user needs to synchronize them using a read/write function.***
 - ⊗ ***ReturnToPrimary***
 - ⊗

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LogLevel

- ⊗ ***StepMode in EnableRobot***
- ⊗ ***Part of UserData function: DelayTime, InterpreterCycleTime, Accelerating, ConstantVelocity, IsBlending***

4.4. Risks

Please read through these risks before using SRCI to control JAKA cobot:

- When using Move Direct Absolute and Move Linear Absolute, please be careful with the ConfigMode settings in PLC. The mechanical constructions between industrial robot and cobot are different, therefore the definition of Shoulder, Elbow and Wrist may vary from the real situation. If you cannot be sure of the moving trajectory of robot after setting ConfigMode, please set as the following content before using:
 - ⊗ ConfigMode.Shoulder=1 ("*No change*")
 - ⊗ ConfigMode.Elbow=1 ("*No change*")
 - ⊗ ConfigMode.Wrist=1 ("*No change*")
- Please make sure the overall speed and command speed are in a safe and acceptable range before executing any commands.
- Using SRCI AddOn with the App simultaneously will violate the requirements of "single point control", which may lead to unexpected risks (such as unexpected robot movements or error information loss). Therefore, the SRCI AddOn and the App should not be used at the same time.
- The version of controller and SRCI AddOn must be strictly matched, otherwise there might be unexpected risks.

4.5. Function Descriptions

The following functions are partial supported in current release of JSI.

Note:

√: **Supported as SRCI required.**

×: **Not supported.**

!: **Supported with conditions.**

4.5.1. Change Speed Override

Change Speed Override may affect all move command except Group Jog and Free Drive. Can be set during a movement.

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Automatically set to 5% of its speed after RI initialization.

Inputs

Parameter	Data Type	Unit	M/O	Note
Override	REAL	[%]	M	√

4.5.2. Enable Robot

JAKA allows to Power On/Off and Enable/Disable the robot separately. Power On the robot before Enable; Disable the robot before Power Off. Enable the robot means the robot is ready to receive commands.

Only support Operation Mode=4 (External Automation)

In normal conditions, the Enable Robot command takes only 5s to take effect.

But in conditions like when the robot is in an emergency stop state, 5s might prolong to 20s. This is because Power On the robot is the prerequisite of Enable the robot. In normal conditions, Power On was completed by AddOn, so the user can directly Enable the robot to control. But in conditions of emergency stop, the AddOn still runs when the robot is powered off, so it won't re-power on the robot. That's why when the Enable command is send again, the robot would first power on itself (15s), then execute the Enable command (5s).

Inputs

Parameter	Data Type	Unit	M/O	Note
HoldToRun	BOOL	-	M	√
StepMode	USINT	-	M	! Only support0
ManualStep	BOOL	-	O	×

Outputs

Parameter	Data Type	Unit	M/O	Note
Enabled	BOOL	-	M	√

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4.5.3. Group Continue

This function can continue executing an "interrupted" move command.

4.5.4. Group Interrupt

This function interrupts all active commands and stops all joints. Yet the planned trajectory will remain, which could be resumed by Group Continue.

JAKA supports jogging when Group Interrupt , and sequence 2 may use automatically. GroupStop has higher priority than Group Interrupt , which would end Group Interrupt when called.

4.5.5. Group Jog

Group Jog includes: Jog Frame, Jog Tool and Jog Axes. JAKA supports them all.

4.5.6. Group Reset

It deletes all messages read by Read Messages, including errors and warnings. The main scenarios:

1. Controller error, like p-stop (protective-stop)
2. The AddOn's SRCI malfunctions

4.5.7. Group Stop

Clear the move commands for the current active sequence and empty the move command cache.

4.5.8. Move Axes Absolute

This function commands a movement of the robot without a defined path.

Inputs

Parameter	Data Type	Unit	M/O	Note
Joint Position	Robot Joint Position	-	M	! not support external axis
Velocity Rate	REAL	[%]	M	√

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Acceleration Rate	REAL	[%]	M	√
Deceleration Rate	REAL	[%]	O	×
Jerk Rate	REAL	[%]	O	×

Parameter	Data Type	Unit	M/O	Note
Tool No	USINT	-	M	Support 0-15, default 0:flange
Aborting Mode	USINT	-	M	√
Blending Mode	USINT	-	M	! refer to blending section
Blending Parameter	ARRAY[0..1] of REAL	-	M	√

4.5.9. Move Direct Absolute

This function calculates the fastest path to the target position (joint position) based on the provided Cartesian coordinates, with the target position calculated according to the ConfigMode's ConfigParameters.

Inputs

Parameter	Data Type	Unit	M/O	Note
Position	Robot Cartesian Position	-	M	! not support external axis
Velocity Rate	REAL	[%]	M	√
Acceleration Rate	REAL	[%]	M	√

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Deceleration Rate	REAL	[%]	O	×
Jerk Rate	REAL	-	O	×
Tool No	USINT	-	M	support 0-15, default 0: flange, -1: current
Frame No	USINT	-	M	support 0-15, default 0: World, -1: current

Parameter	Data Type	Unit	M/O	Note
Aborting Mode	USINT	-	M	√
Blending Mode	USINT	-	M	! refer to blending sectoin
ConfigMode	ConfigParameters	-	M	! refer to mechanical constraction sectoin
Turn Mode	USINT	-	M	! Only support 2

4.5.10. Move Linear Absolute

This function commands an interpolated linear movement on the robot arm from the actual position of the TCP to an absolute cartesian position in the specified coordinate system.

Inputs

Parameter	Data Type	Unit	M/O	Note
Position	Robot Cartesian Position	-	M	! Not support external axis
Velocity Rate	REAL	[%]	M	√
Acceleration Rate	REAL	[%]	M	√

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Deceleration Rate	REAL	[%]	O	×
Jerk Rate	REAL	-	O	×
Tool No	USINT	-	M	Support 0-15, default 0: flange
Frame No	USINT	-	M	Support 0-15, default 0: world
Aborting Mode	USINT	-	M	√
Blending Mode	USINT	-	M	!

Parameter	Data Type	Unit	M/O	Note
ConfigMode	ConfigParameters	-	M	! Refer to mechanical construction section
TurnMode	USINT	-	M	! Only support 2

4.5.11. Read Actual Position

This function reads the current position of the TCP relative to the currently used coordinate system.

Inputs

Parameter	Data Type	Unit	M/O	Note
Tool No	INT	-	M	! support 0-15, -1: current
Frame No	INT	-	M	! support 0-15, -1: current

Outputs

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Parameter	Data Type	Unit	M/O	Note
Position	Robot Position	-	M	√

4.5.12. Read Frame Data

The function reads the user-defined coordinate system settings based on the Frame Number.

Inputs

Parameter	Data Type	Unit	M/O	Note
Frame No	INT	-	M	! support 0-15, -1: current

4.5.13. Read Load Data

The function reads the payload data based on Load No.

Inputs

Parameter	Data Type	Unit	M/O	Note
LoadNo	INT	-	M	! Support 1-15, -1: current

Outputs

Parameter	Data Type	Unit	M/O	Note
Load Data	Load Data	-	M	! Support X, Y, Z and Mass

4.5.14. Read Robot Default Dynamics

The function reads the default values of the robot dynamics.

Outputs

Return to Default Dynamics, the structure is as follows:

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Parameter	Data Type	Unit	M/O	Note
Velocity Rate	REAL	[%]	M	√
Acceleration Rate	REAL	[%]	M	√
Deceleration Rate	REAL	[%]	O	×, Return -1
Jerk Rate	REAL	[%]	O	×, Return -1

4.5.15. ReadRobotReferenceDynamics

The function reads the references values of the robot dynamics.

Outputs

Return to Default Dynamics, the structure is as follows:

Parameter	Data Type	Unit	M/O	Note
Velocity Reference	REAL	[mm/s]	M	√
Acceleration Reference	REAL	[mm/s2]	M	√
Deceleration Reference	REAL	[mm/s2]	O	×
Jerk Reference	REAL	[mm/s3]	O	×

4.5.16. Read Robot SW Limits

The function reads the positive and negative soft limits of the robot.

Outputs

Return to Default Dynamics, the structure is as follows:

Parameter	Data Type	Unit	M/O	Note
-----------	-----------	------	-----	------

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J1LowerLimit, J1UpperLimit ~ J6LowerLimit, J6UpperLimit	REAL	[mm/s]	M	√
E1LowerLimit, E1UpperLimit ~ E6LowerLimit, E6UpperLimit	REAL	[mm/s]	M	×

4.5.17. Read Tool Data

The function reads the configuration of the tool coordinate system based on Tool No.

Inputs

Parameter	Data Type	Unit	M/O	Note
Tool No	USINT	-	M	! Only support 1~15

Outputs

Parameter	Data Type	Unit	M/O	Note
Tool Data	Tool Data	-	M	√

4.5.18. Write Frame Data

This function writes the data of the user coordinate system based on Frame No.

Inputs

Parameter	Data Type	Unit	M/O	Note
FrameNo	USINT	-	M	! Only support 1~15
Frame Data	Frame Data	-	M	√

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Reference Frame should not be an user coordinate system which has already used reference Frame (not 0).

4.5.19. Write Load Data

This function writes the payload data based on Load No.

Inputs

Parameter	Data Type	Unit	M/O	Note
LoadNo	USINT	-	M	! Only support 1~15
Load Data	Load Data	-	M	! Only support X, Y, Z and Mass

4.5.20. Write Robot Default Dynamics

The function writes default values of the robot dynamics.

Inputs

Parameter	Data Type	Unit	M/O	Note
Velocity Rate	REAL	[%]	M	√
Acceleration Rate	REAL	[%]	M	√
Deceleration Rate	REAL	[%]	O	×
Jerk Rate	REAL	[%]	O	×

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4.5.21. Write Robot Reference Dynamics

Inputs

The function writes reference values of the robot dynamics.

Parameter	Data Type	Unit	M/O	Note
Velocity Rate	REAL	[%]	M	√
Acceleration Rate	REAL	[%]	M	√
Deceleration Rate	REAL	[%]	O	×
Jerk Rate	REAL	[%]	O	×

4.5.22. Write Tool Data

This function writes the data of the user coordinate system based on Tool No.

Inputs

Parameter	Data Type	Unit	M/O	Note
Tool No	USINT	-	M	! Only support 1~15
Tool Data	Tool Data	-	M	√