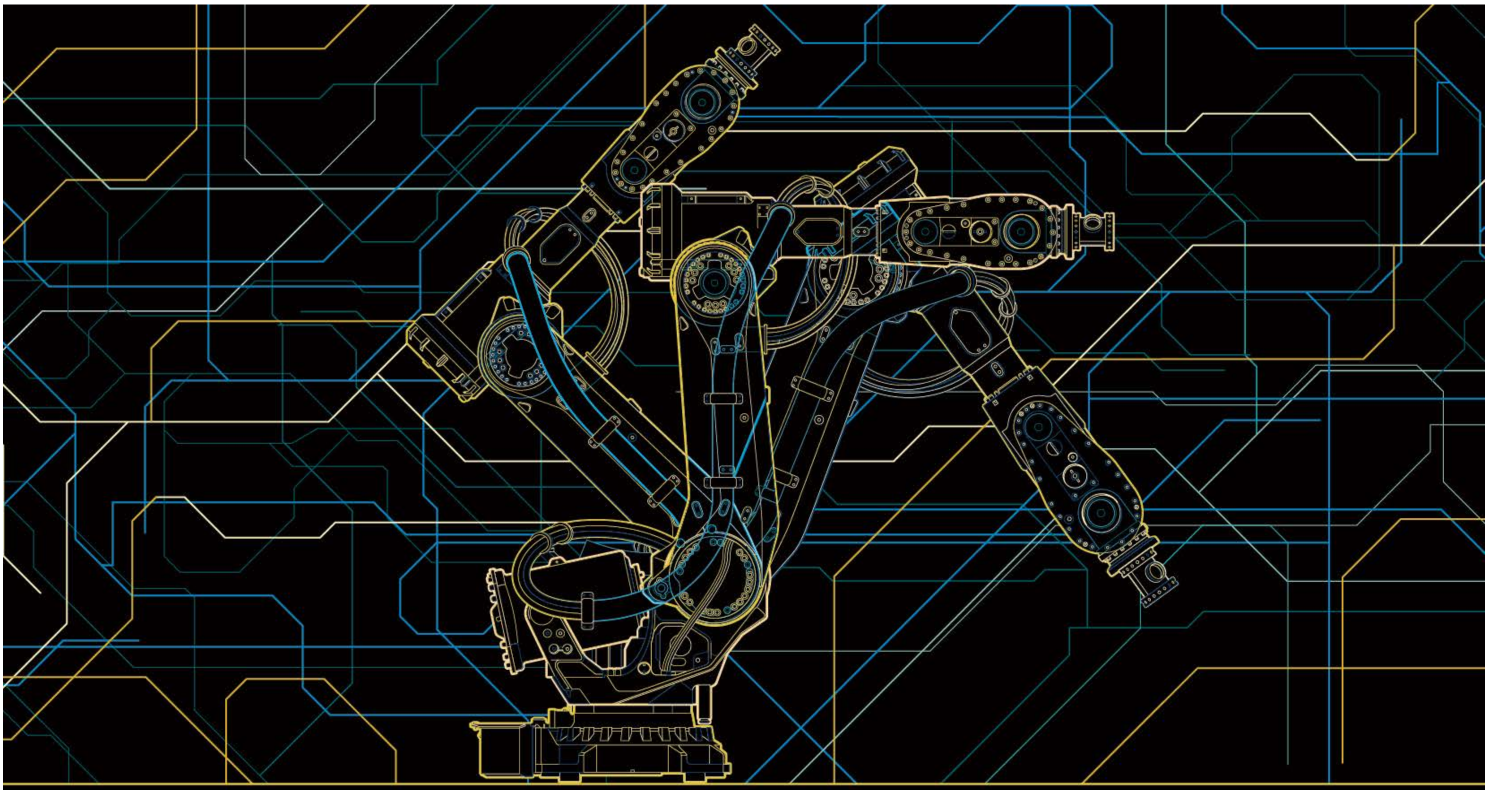


Application manual
Torch services

Power and productivity
for a better world™

Trace back information:
Workspace RW 6-0 version a3
Checked in 2014-11-11
Skribenta version 4.1.349

Application manual
Torch services

Document ID: 3HAC050981-001

Revision: -

The information in this manual is subject to change without notice and should not be construed as a commitment by ABB. ABB assumes no responsibility for any errors that may appear in this manual.

Except as may be expressly stated anywhere in this manual, nothing herein shall be construed as any kind of guarantee or warranty by ABB for losses, damages to persons or property, fitness for a specific purpose or the like.

In no event shall ABB be liable for incidental or consequential damages arising from use of this manual and products described herein.

Additional copies of this manual may be obtained from ABB.

The original language for this publication is English. Any other languages that are supplied have been translated from English.

ABB AB
Robotics Products
Se-721 68 Västerås
Sweden

Table of contents

This page is intentionally left blank

1 Overview

About this manual

This manual explains the basics of when and how to use the following Torch Service options:

- Product overview
- Operation overview
- Requirements overview
- Software set-up
- Software Reference, Instructions

Usage

This manual can be used either as a reference to find out if an option is the right choice for solving a problem, or as a description of how to use an option. Detailed information regarding syntax for RAPID routines, and similar, is not described here, but can be found in the respective reference manual.

Who should read this manual?

This manual is intended for:

- installation personnel
- robot programmers

Prerequisites

The reader should be familiar with:

- industrial robots and their terminology
- the RAPID programming language
- system parameters and how to configure them.

Reference documents

Reference	Document Id.
RAPID reference manual - RAPID Overview	3HAC 16580-1
RAPID reference manual - Instructions, functions, and data types	3HAC 16581-1
Operating manual - Getting started, IRC5 and RobotStudio	3HAC 021564-001
Operating manual - IRC5 with FlexPendant	3HAC16590-1
Technical reference manual - System parameters	3HAC 17076-1
Operating manual - RobotStudio	3HAC 032104-001
Application manual - GAP	3HAC 024844-001

This page is intentionally left blank

2 Introduction

2.1 Product overview

About Torch services

Torch Services is a set of functions for maintaining the welding gun of a MIG/MAG welding system.

Available services

The available services consist of:

Automatic mechanical cleaning

Automatic mechanical cleaning of the contact tip and gas nozzle to remove welding spatter.

Automatic spraying

Automatic spraying of the contact tip and gas nozzle with a liquid weld spatter release agent.

Automatic cut-off of the welding wire.

Automatic cut-off of the welding wire.

2.2 Operation overview

RAPID Move instructions

Torch Services consist of a suite of RAPID Move instructions. The instructions are programmed in traditional RAPID programming manner. Each instruction moves the welding gun to the service location and starts the service equipment.

2.3 Requirements overview

System prerequisites

This Torch Services version is intended for use in arc welding systems incorporating IRB 1400, 2400, etc. robots.

BaseWare requirements:	5.06
Controller requirements:	IRC5

Torch services package

The Torch Services package includes software that is loaded into all arc welding motion tasks, when the Torch Services option is purchased. Process configuration parameters are used to connect real I/O signals and to modify the default settings.

User's qualifications

Any competent robot programmer (S4 RAPID language) may be self-taught to program and use Torch Services.

3 Installation

3.1 Software set-up

3.1.1 System parameters

Introduction

Torch Services I/O connections together with additional settings for torch services are configured in the process configuration database (PROC).

Actual I/O assignments to real I/O boards are not made by the Torch Services installation. These definitions must be added to the EIO configuration database by the user or system designer.

Default process configuration

Below is the default process configuration loaded by Torch Services. There is a separate configuration for each task.

```
PROC:CFG_1.0::
# TCMC proc.cfg file

#
TS_MECHCLEAN_PROP:
-name "TSMC_1" -ReamTime 3 -ClampOpen "diTS1_ClOp" \
-Start "doTS1_St" -AirBlast "doTS1_AiBl"

#
TS_SPRAY_PROP:
-name "TSSP_1" -SprayTime 2 -SprayOn "doTS1_SpOn"

#
TS_WIRECUT_PROP:
-name "TSWC_1" -ShearWidth 20 -ShearDirection 0 \
-Cut "doTS1_St" -CutterOpen "diTS1_ClOp"
```

To change settings

To change settings, RobotStudio is preferably used. It is also possible to load an altered proc.cfg, the "Add or Replace" feature must then be used to override the existing fields with the new settings.

Extend the ream time

For example, a user could extend the ream time by loading a file like this:

```
PROC:CFG_1.0:
# TCMC proc.cfg file

#
TS_MECHCLEAN_PROP:
-name "TSMC_1" -ReamTime 5 -ClampOpen "diTS1_ClOp" \
-Start "doTS1_St" -AirBlast "doTS1_AiBl"
```

Continues on next page

Note

That Torch Services does not install any I/O signals in the EIO configuration database. It provides only a mechanism to connect to existing signals in the system. If the robotic system is not a turn-key system, I/O signals will need to be installed in the system.

I/O configuration file

Below is an example of an I/O configuration file that could be used to load I/O signals for the default case:

```
EIO:CFG_1.0:5.0:
#
EIO_SIGNAL:
  -Name " diTS1_ClOp" -SignalType "DI" -Unit "Board_A"\
  -UnitMap 0
  -Name " doTS1_St" -SignalType "DO" -Unit "Board_A"\
  -UnitMap 0
  -Name " doTS1_AiBl" -SignalType "DO" -Unit "Board_A"\
  -UnitMap 1
  -Name " doTS1_SpOn " -SignalType "DO" -Unit "Board_A"\
  -UnitMap 2
```

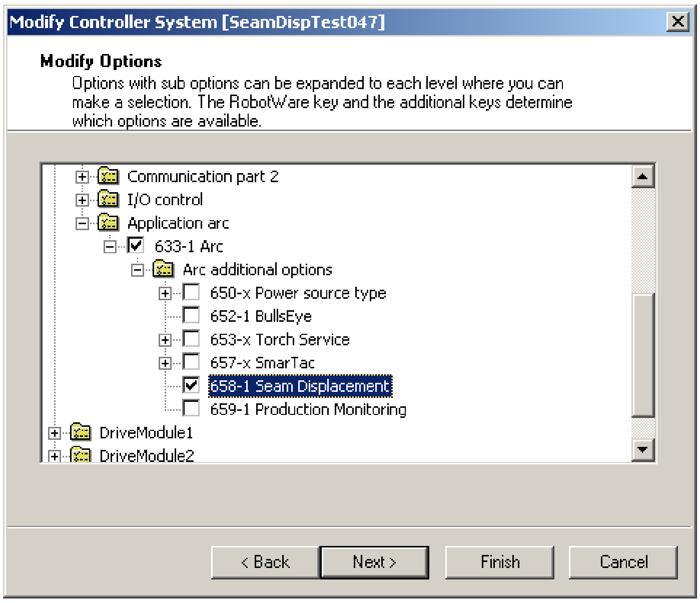
3.1.2 Loading software

Instruction

Software is loaded by purchasing the Torch Services BaseWare option.

Note

That the Torch Service is a separate Arc option.



Modify Controller System [SeamDispTest047]

Modify Options

Options with sub options can be expanded to each level where you can make a selection. The RobotWare key and the additional keys determine which options are available.

- Communication part 2
- I/O control
- Application arc
  - ☑ 633-1 Arc
    - Arc additional options
      - □ 650-x Power source type
      - □ 652-1 BullsEye
      - □ 653-x Torch Service
      - □ 657-x SmarTac
      - ☑ 658-1 Seam Displacement
      - □ 659-1 Production Monitoring
- DriveModule1
- DriveModule2

xx1400001926

Figure 3.1: Arc options, Torch Service selected

This page is intentionally left blank

4 Software Reference

4.1 MoveMechCleanL, Move linear mechanical clean

About MoveMechCleanL

`MoveMechCleanL` is an instruction used to ream the tool mechanically.

The movement to reach the cleaning station is performed linearly

Example

```
MoveMechCleanL rtApp, rtMechClean, v200, fine, tWeldGun;
```

The tool centre point (TCP) of the tool, `tWeldGun`, is moved along a linear path to the position, `rtApp`, with speed data v200 and zone data fine. At `rtApp` the TCP is moved along a linear path to the position `rtMechClean`. At `rtMechClean` the mechanical clean equipment is started. After the ream operation the TCP is moved back linearly to position `rtApp`.

Arguments

```
MoveMechCleanL ApproachPoint CleanPoint Speed Zone Tool [\WObj]
     [\TLoad]
```

`ApproachPoint`

Data type: `robtarget`

The approach point of the robot and external axes directly above the clean station. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

`CleanPoint`

Data type: `robtarget`

The destination point of the robot and external axes. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

`Speed`

Data type: `speeddata`

The speed data that applies to movements. Speed data defines the velocity for the tool centre point, the tool reorientation and external axes.

`Zone`

Data type: `zonedata`

Zone data for the movement. Zone data describes the size of the generated corner path.

`Tool`

Data type: `tooldata`

The tool in use when the robot moves. The tool centre point is the point moved to the specified destination position.

`[\WObj]`

Data type: `wobjdata`

Continues on next page

The work object (coordinate system) to which the robot position in the instruction is related.

This argument can be omitted, and if it is, the position is related to the world coordinate system. If, on the other hand, a stationary tool or coordinated external axes are used, this argument must be specified in order to perform a linear movement relative to the work object.

`[\TLoad]`

Data type: `loaddata`

The `\TLoad` argument describes the total load used in the movement. The total load is the tool load together with the payload that the tool is carrying. If the `\TLoad` argument is used, then the loaddata in the current tooldata is not considered.

If the `\TLoad` argument is set to `load0`, then the `\TLoad` argument is not considered and the loaddata in the current `tooldata` is used instead. For a complete description of the `TLoad` argument, see MoveL - Moves the robot linearly.

Program execution

Automatic /Continuous Mode

When executed, the robot makes a linear movement to the approach position, `ApproachPoint`. Then, the robot makes a linear movement to the clean position, `CleanPoint` with fixed low speed. At the clean position the mechanical cleaner is started. The cleaner will run the timed specified in the system configuration. When the clean operation is done, the robot will move back to the approach position with fixed low speed.

Forward Step

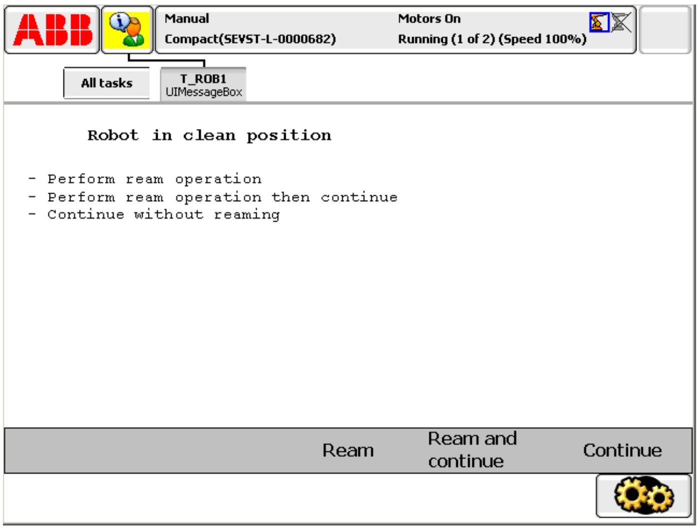
When executed, the robot makes a linear movement to the approach position, `ApproachPoint`.

Then, the robot makes a linear movement to the clean position, `CleanPoint` with fixed low speed.

Continues on next page

User dialog

At the clean position a user dialog will show, see Figure 4.1.



```
      Robot in clean position

 - Perform ream operation
 - Perform ream operation then continue
 - Continue without reaming
```

xx1400001927

Figure 4.1: User dialogue shown at the clean position

Choices

The available choices are:

Choice	Description
Ream	The reamer will run for one cycle and thereafter the user dialog is shown again.
Ream and Continue	The reamer will run for one cycle thereafter the robot will move back to the approach position with fixed low speed.
Continue	The robot will move back to the approach position with fixed low speed.

Examples

```
MoveMechCleanL rtApp, rtMC, vMax, fine, tWeldGun \WObj:=fixture;
```

The TCP of the tool, `tWeldGun`, is moved linearly to the position, `rtApp`. This position is specified in the object coordinate system for fixture.

At `rtApp` the TCP is moved along a linear path to the position `rtMC`. This position is also specified in the object coordinate system for fixture. At `rtMC` the mechanical clean equipment is started. After the ream operation the TCP is moved back linearly to position `rtApp`.

Syntax

MoveMechCleanL

```
[ ApproachPoint ':=' ] < expression (IN) of robtarget > ','
[ CleanPoint ':=' ] < expression (IN) of robtarget > ','
[ Speed ':=' ] < expression (IN) of speeddata > ','
[ Zone ':=' ] < expression (IN) of zonedata > ','
[ Tool ':=' ] < persistent (PERS) of tooldata >
[ '\' WObj ':=' < persistent (PERS) of wobjdata > ]
```

Continues on next page

```
[ '\' TLoad':=' ] < persistent (PERS) of loaddata > ] ';'
```

Related information

	Described in:
MoveMechCleanJ	Torch Services Software Reference
MoveSprayL	Torch Services Software Reference
MoveSprayJ	Torch Services Software Reference
MoveWireCutL	Torch Services Software Reference
MoveWireCutJ	Torch Services Software Reference
MoveL	Technical reference manual - RAPID Instructions, functions and data types - MoveL
Definition of loaddata	Technical reference manual - RAPID Instructions, functions and data types - loaddata

4.2 MoveMechCleanJ, Move joint mechanical clean

About MoveMechCleanJ

`MoveMechCleanJ` is an instruction used to ream the tool mechanically. The movement to reach the cleaning station does not have to be in a straight line.

Example

```
MoveMechCleanJ rtApp, rtMechClean, v200, fine, tWeldGun;
```

The tool centre point (TCP) of the tool, `tWeldGun`, is moved to the position, `rtApp`, with speed data v200 and zone data fine. At `rtApp` the TCP is moved along a linear path to the position `rtMechClean`. At `rtMechClean` the mechanical clean equipment is started. After the ream operation the TCP is moved back linearly to position `rtApp`.

Arguments

```
MoveMechCleanJ ApproachPoint CleanPoint Speed Zone Tool [\WObj]
     [\TLoad]
```

`ApproachPoint`

Data type: `robtarget`

The approach point of the robot and external axes directly above the spray station. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

`CleanPoint`

Data type: `robtarget`

The destination point of the robot and external axes. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

`Speed`

Data type: `speeddata`

The speed data that applies to movements. Speed data defines the velocity for the tool centre point, the tool reorientation and external axes.

`Zone`

Data type: `zonedata`

Zone data for the movement. Zone data describes the size of the generated corner path.

`Tool`

Data type: `tooldata`

The tool in use when the robot moves. The tool centre point is the point moved to the specified destination position.

`[\WObj]`

Data type: `wobjdata`

The work object (coordinate system) to which the robot position in the instruction is related.

Continues on next page

This argument can be omitted, and if it is, the position is related to the world coordinate system. If, on the other hand, a stationary tool or coordinated external axes are used, this argument must be specified in order to perform a linear movement relative to the work object.

`[\TLoad]`

Data type: `loaddata`

The `\TLoad` argument describes the total load used in the movement. The total load is the tool load together with the payload that the tool is carrying. If the `\TLoad` argument is used, then the loaddata in the current tooldata is not considered.

If the `\TLoad` argument is set to `load0`, then the `\TLoad` argument is not considered and the loaddata in the current `tooldata` is used instead. For a complete description of the `TLoad` argument, see MoveL - Moves the robot linearly.

Program execution

Automatic /Continuous Mode

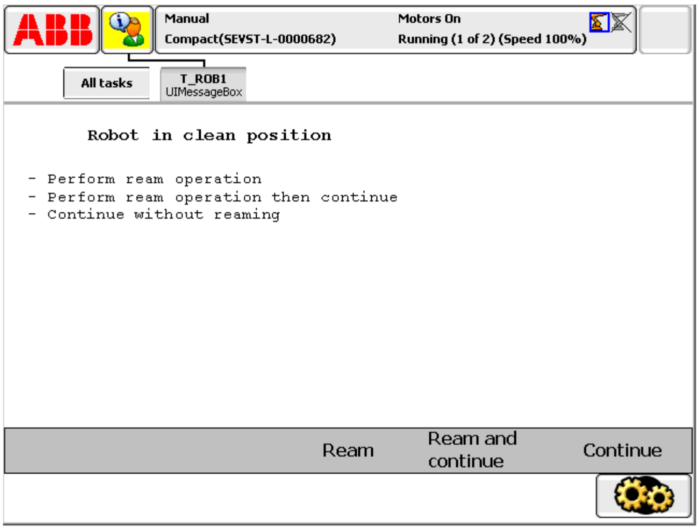
When executed, the robot makes a linear movement to the approach position, `ApproachPoint`. Then, the robot makes a linear movement to the clean position, `CleanPoint` with fixed low speed. At the clean position the cleaner is started. The cleaner will run the timed specified in the system configuration. When the clean operation is done, the robot will move back to the approach position with fixed low speed.

Forward Step

When executed, the robot makes a linear movement to the approach position, `ApproachPoint`. Then, the robot makes a linear movement to the clean position, `CleanPoint` with fixed low speed.

User dialog

At the clean position a user dialog will show, see Figure 4.2.



```
Robot in clean position

- Perform ream operation
- Perform ream operation then continue
- Continue without reaming
```

xx1400001927

Figure 4.2: User dialogue shown at the clean position

Continues on next page

Choices

The available choices are:

Choice	Description
Ream	The reamer will run for one cycle and thereafter the user dialog is shown again.
Ream and Continue	The reamer will run for one cycle thereafter the robot will move back to the approach position with fixed low speed.
Continue	The robot will move back to the approach position with fixed low speed.

Examples

```
MoveMechCleanJ rtApp, rtMC, vMax, fine, tWeldGun \WObj:=fixture;
```

The TCP of the tool, `tWeldGun`, is moved linearly to the position, `rtApp`. This position is specified in the object coordinate system for fixture.

At `rtApp` the TCP is moved along a linear path to the position `rtSP`. This position is also specified in the object coordinate system for fixture. At `rtSP` the mechanical clean equipment is started. After the ream operation the TCP is moved back linearly to position `rtApp`.

Syntax

MoveMechCleanJ

```
[ ApproachPoint ':=' ] < expression (IN) of robtarget > ','
[ CleanPoint ':=' ] < expression (IN) of robtarget > ','
[ Speed ':=' ] < expression (IN) of speeddata > ','
[ Zone ':=' ] < expression (IN) of zonedata > ','
[ Tool ':=' ] < persistent (PERS) of tooldata >
[ '\' WObj ':=' < persistent (PERS) of wobjdata > ]
[ '\' TLoad':=' ] < persistent (PERS) of loaddata > ] ';'
```

Related information

	Described in:
MoveMechCleanL	Torch Services Software Reference
MoveSprayL	Torch Services Software Reference
MoveSprayJ	Torch Services Software Reference
MoveWireCutL	Torch Services Software Reference
MoveWireCutJ	Torch Services Software Reference
MoveL	Technical reference manual - RAPID Instructions, functions and data types - MoveL
Definition of loaddata	Technical reference manual - RAPID Instructions, functions and data types - loaddata

4.3 MoveSprayL, Move linear spray

About MoveSprayL

MoveSprayL is an instruction used to move the weld gun to a station for automatic spraying of the contact tip and gas nozzle with a liquid weld spatter release agent. The movement to reach the cleaning station is performed linearly.

Example

```
MoveSprayL rtApp, rtSpray, v200, fine, tWeldGun;
```

The tool centre point (TCP) of the tool, tWeldGun, is moved along a linear path to the position, rtApp, with speed data v200 and zone data fine. At rtApp the TCP is moved along a linear path to the position rtSpray. At rtSpray the sprayer is started. After the spray operation the **TCP** is moved back linearly to position rtApp.

Arguments

```
MoveMechCleanL ApproachPoint CleanPoint Speed Zone Tool [\WObj]
     [\TLoad]
```

ApproachPoint

Data type: robtarget

The approach point of the robot and external axes directly above the clean station. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

SprayPoint

Data type: robtarget

The destination point of the robot and external axes. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

Speed

Data type: speeddata

The speed data that applies to movements. Speed data defines the velocity for the tool centre point, the tool reorientation and external axes.

Zone

Data type: zonedata

Zone data for the movement. Zone data describes the size of the generated corner path.

Tool

Data type: tooldata

The tool in use when the robot moves. The tool centre point is the point moved to the specified destination position.

[\WObj]

Data type: wobjdata

The work object (coordinate system) to which the robot position in the instruction is related.

Continues on next page

This argument can be omitted, and if it is, the position is related to the world coordinate system. If, on the other hand, a stationary tool or coordinated external axes are used, this argument must be specified in order to perform a linear movement relative to the work object.

`[\TLoad]`

Data type: `loaddata`

The `\TLoad` argument describes the total load used in the movement. The total load is the tool load together with the payload that the tool is carrying. If the `\TLoad` argument is used, then the loaddata in the current tooldata is not considered.

If the `\TLoad` argument is set to `load0`, then the `\TLoad` argument is not considered and the loaddata in the current `tooldata` is used instead. For a complete description of the `TLoad` argument, see MoveL - Moves the robot linearly.

Program execution

Automatic /Continuous Mode

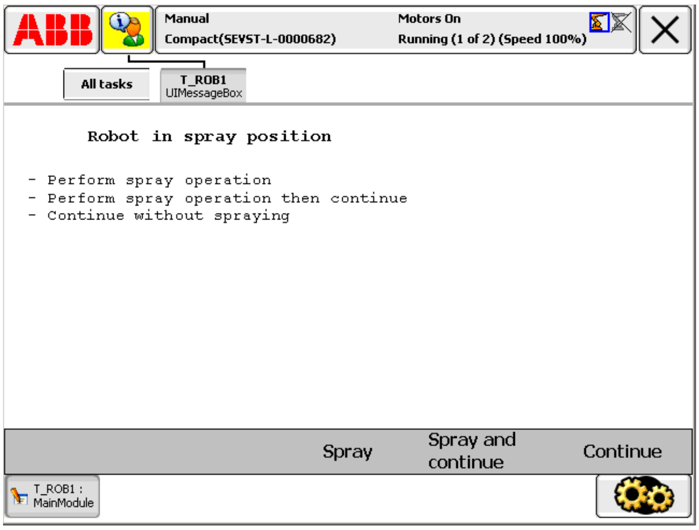
When executed, the robot makes a linear movement to the approach position, `ApproachPoint`. Then, the robot makes a linear movement to the spray position, `SprayPoint` with fixed low speed. At the spray position the sprayer is started. The sprayer will run the timed specified in the system configuration. When the spray operation is done, the robot will move back to the approach position with fixed low speed.

Forward Step

When executed, the robot makes a linear movement to the approach position, `ApproachPoint`. Then, the robot makes a linear movement to the spray position, `SprayPoint` with fixed low speed.

User dialog

At the spray position a user dialog will show, see Figure 4.3.



```
    Robot in spray position

- Perform spray operation
- Perform spray operation then continue
- Continue without spraying
```

xx1400001928

Figure 4.3: User dialogue shown at the spray position

Continues on next page

Choices

The available choices are:

Choice	Description
Spray	The sprayer will run for one cycle and thereafter the user dialog is shown again.
Spray and Continue	The sprayer will run for one cycle thereafter the robot will move back to the approach position with fixed low speed.
Continue	The robot will move back to the approach position with fixed low speed.

Examples

```
MoveSprayL rtApp, rtSP, vMax, fine, tWeldGun \WObj:=fixture;
```

The TCP of the tool, `tWeldGun`, is moved linearly to the position, `rtApp`. This position is specified in the object coordinate system for fixture.

At `rtApp` the TCP is moved along a linear path to the position `rtSP`. This position is also specified in the object coordinate system for fixture. At `rtSP` the spray equipment is started.

After the spray operation the TCP is moved back linearly to position rtApp.

Syntax

MoveSprayL

```
[ ApproachPoint ':=' ] < expression (IN) of robtarget > ','
[ SprayPoint ':=' ] < expression (IN) of robtarget > ','
[ Speed ':=' ] < expression (IN) of speeddata > ','
[ Zone ':=' ] < expression (IN) of zonedata > ','
[ Tool ':=' ] < persistent (PERS) of tooldata >
[ '\' WObj ':=' < persistent (PERS) of wobjdata > ]
[ '\' TLoad':=' ] < persistent (PERS) of loaddata > ] ';'
```

Related information

	Described in:
MoveMechCleanL	Torch Services Software Reference
MoveMechCleanJ	Torch Services Software Reference
MoveSprayJ	Torch Services Software Reference
MoveWireCutL	Torch Services Software Reference
MoveWireCutJ	Torch Services Software Reference
MoveL	Technical reference manual - RAPID Instructions, functions and data types - MoveL
Definition of loaddata	Technical reference manual - RAPID Instructions, functions and data types - loaddata

4.4 MoveSprayJ, Move spray

About MoveSprayJ

`MoveSprayJ` is an instruction used to move the weld gun to a station for automatic spraying of the contact tip and gas nozzle with a liquid weld spatter release agent. The movement to reach the spray station does not have to be in a straight line.

Example

```
MoveSprayJ rtApp, rtSpray, v200, fine, tWeldGun;
```

The tool centre point (TCP) of the tool, `tWeldGun`, is moved to the position, `rtApp`, with speed data v200 and zone data fine. At `rtApp` the TCP is moved along a linear path to the position `rtSpray`. At `rtSpray` the sprayer is started. After the spray operation the TCP is moved back linearly to position `rtApp`.

Arguments

```
MoveSprayJ ApproachPoint SprayPoint Speed Zone Tool [\WObj] [\TLoad]
```

`ApproachPoint`

Data type: `robtarget`

The approach point of the robot and external axes directly above the clean station. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

`SprayPoint`

Data type: `robtarget`

The destination point of the robot and external axes. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

`Speed`

Data type: `speeddata`

The speed data that applies to movements. Speed data defines the velocity for the tool centre point, the tool reorientation and external axes.

`Zone`

Data type: `zonedata`

Zone data for the movement. Zone data describes the size of the generated corner path.

`Tool`

Data type: `tooldata`

The tool in use when the robot moves. The tool centre point is the point moved to the specified destination position.

`[\WObj]`

Data type: `wobjdata`

The work object (coordinate system) to which the robot position in the instruction is related.

Continues on next page

This argument can be omitted, and if it is, the position is related to the world coordinate system. If, on the other hand, a stationary tool or coordinated external axes are used, this argument must be specified in order to perform a linear movement relative to the work object.

`[\TLoad]`

Data type: `loaddata`

The `\TLoad` argument describes the total load used in the movement. The total load is the tool load together with the payload that the tool is carrying. If the `\TLoad` argument is used, then the loaddata in the current tooldata is not considered.

If the `\TLoad` argument is set to `load0`, then the `\TLoad` argument is not considered and the loaddata in the current `tooldata` is used instead. For a complete description of the `TLoad` argument, see MoveL - Moves the robot linearly.

Program execution

Automatic /Continuous Mode

When executed, the robot makes a linear movement to the approach position, `ApproachPoint`. Then, the robot makes a linear movement to the spray position, `SprayPoint` with fixed low speed. At the spray position the mechanical sprayer is started. The sprayer will run the timed specified in the system configuration. When the spray operation is done, the robot will move back to the approach position with fixed low speed.

Forward Step

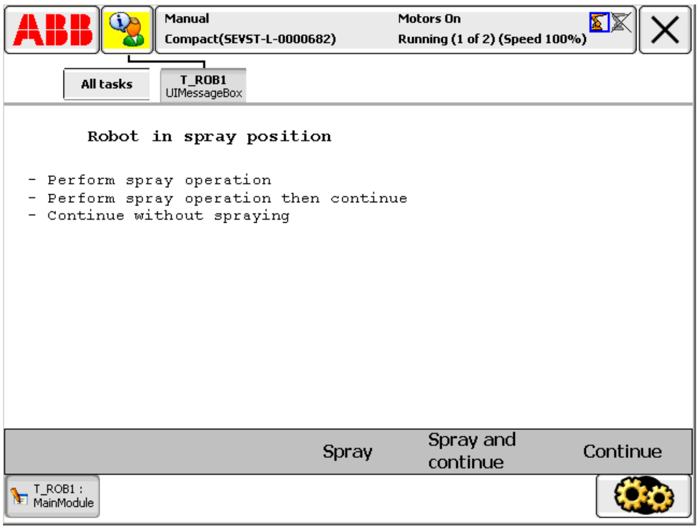
When executed, the robot makes a linear movement to the approach position, `ApproachPoint`.

Then, the robot makes a linear movement to the spray position, `SprayPoint` with fixed low speed.

Continues on next page

User dialog

At the spray position a user dialog will show, see Figure 4.4.



```
Robot in spray position

- Perform spray operation
- Perform spray operation then continue
- Continue without spraying
```

xx1400001928

Figure 4.4: User dialogue shown at the spray position

Choices

The available choices are:

Choice	Description
Spray	The sprayer will run for one cycle and thereafter the user dialog is shown again.
Spray and Continue	The sprayer will run for one cycle thereafter the robot will move back to the approach position with fixed low speed.
Continue	The robot will move back to the approach position with fixed low speed.

Examples

```
MoveSprayJ rtApp, rtSP, vMax, fine, tWeldGun \WObj:=fixture;
```

The TCP of the tool, `tWeldGun`, is moved to the position, `rtApp`. This position is specified in the object coordinate system for fixture.

At `rtApp` the TCP is moved along a linear path to the position `rtSP`. This position is also specified in the object coordinate system for fixture. At `rtSP` the spray equipment is started. After the spray operation the TCP is moved back linearly to position `rtApp`.

Syntax

MoveSprayJ

```
[ ApproachPoint ':=' ] < expression (IN) of robtarget > ','
[ SprayPoint ':=' ] < expression (IN) of robtarget > ','
[ Speed ':=' ] < expression (IN) of speeddata > ','
[ Zone ':=' ] < expression (IN) of zonedata > ','
[ Tool ':=' ] < persistent (PERS) of tooldata >
[ '\' WObj ':=' < persistent (PERS) of wobjdata > ]
```

Continues on next page

```
[ '\' TLoad':=' ] < persistent (PERS) of loaddata > ] ';'
```

Related information

	Described in:
MoveMechCleanL	Torch Services Software Reference
MoveMechCleanJ	Torch Services Software Reference
MoveSprayL	Torch Services Software Reference
MoveWireCutL	Torch Services Software Reference
MoveWireCutJ	Torch Services Software Reference
MoveL	Technical reference manual - RAPID Instructions, functions and data types - MoveL
Definition of loaddata	Technical reference manual - RAPID Instructions, functions and data types - loaddata

4.5 MoveWireCutL, Move linear wire cut

About MoveWireCutL

MoveWireCutL is an instruction used to move the weld gun to a station for automatic cut-off of the welding wire. The movement to reach the cut station is performed linearly.

Example

```
MoveWireCutL rtApp, rtCut, v200, fine, tWeldGun;
```

The tool centre point (TCP) of the tool, `tWeldGun`, is moved along a linear path to the position, `rtApp`, with speed data v200 and zone data fine. At `rtApp` the TCP is moved along a linear path to the position `rtCut`. At `rtCut` the wire is cut off.

After the cut operation the TCP is moved back linearly to position `rtApp`.

Arguments

```
MoveWireCutL ApproachPoint CutPoint Speed Zone Tool [\WObj] [\TLoad]
```

`ApproachPoint`

Data type: `robtarget`

The approach point of the robot and external axes directly above the spray station. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

`CutPoint`

Data type: `robtarget`

The destination point of the robot and external axes. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

`Speed`

Data type: `speeddata`

The speed data that applies to movements. Speed data defines the velocity for the tool centre point, the tool reorientation and external axes.

`Zone`

Data type: `zonedata`

Zone data for the movement. Zone data describes the size of the generated corner path.

`Tool`

Data type: `tooldata`

The tool in use when the robot moves. The tool centre point is the point moved to the specified destination position.

`[\WObj]`

Data type: `wobjdata`

The work object (coordinate system) to which the robot position in the instruction is related.

Continues on next page

This argument can be omitted, and if it is, the position is related to the world coordinate system. If, on the other hand, a stationary tool or coordinated external axes are used, this argument must be specified in order to perform a linear movement relative to the work object.

`[\TLoad]`

Data type: `loaddata`

The `\TLoad` argument describes the total load used in the movement. The total load is the tool load together with the payload that the tool is carrying. If the `\TLoad` argument is used, then the loaddata in the current tooldata is not considered.

If the `\TLoad` argument is set to `load0`, then the `\TLoad` argument is not considered and the loaddata in the current `tooldata` is used instead. For a complete description of the `TLoad` argument, see MoveL - Moves the robot linearly.

Program execution

Automatic /Continuous Mode

When executed, the robot makes a movement to the approach position, `ApproachPoint`. Then, the cutter opens and the robot makes a linear movement to the cut position, `CutPoint` with fixed low speed.

Note

Note that if the configuration parameters `ShearWidth` and `ShearDirection` is used the cut position will be slightly different each time to minimize the shear wear. At the cut position the cutter is closed and opened. When the cut operation is done, the robot will move back to the approach position with fixed low speed.

Forward Step

When executed, the robot makes a movement to the approach position, `ApproachPoint`. Then, the robot makes a linear movement to the cut position, `CutPoint` with fixed low speed.

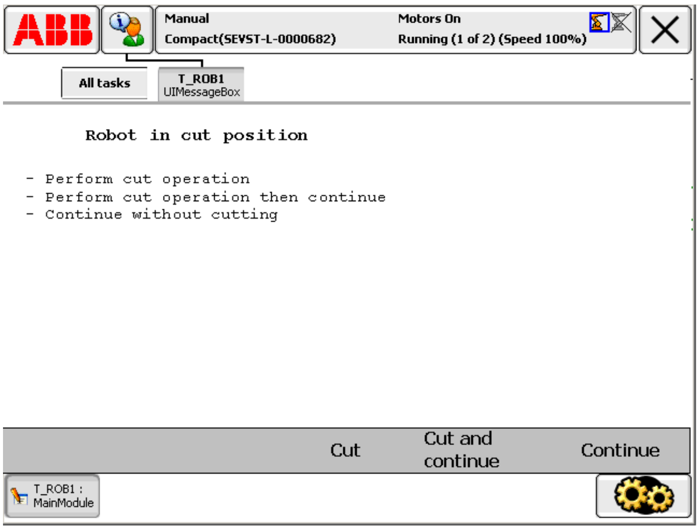
Note

Note that if the configuration parameters `ShearWidth` and `ShearDirection` is used the cut position will be slightly different each time to minimize the shear wear.

Continues on next page

User dialog

At the cut position a user dialog will show, see Figure 4.5.



```
Robot in cut position

- Perform cut operation
- Perform cut operation then continue
- Continue without cutting
```

xx1400001929

Figure 4.5: User dialogue shown at the cut position

Choices

The available choices are:

Choice	Description
Cut	The cutter will close and open, thereafter the user dialog is shown again.
Cut and Continue	The cutter will close and open thereafter the robot will move back to the approach position with fixed low speed.
Continue	The robot will move back to the approach position with fixed low speed.

Examples

```
MoveWireCutJ rtApp, rtCut, vMax, fine, tWeldGun \WObj:=fixture;
```

The TCP of the tool, `tWeldGun`, is moved to the position, `rtApp`. This position is specified in the object coordinate system for fixture.

At `rtApp` the cutter opens and the TCP is moved along a linear path to the position `rtCut`. This position is also specified in the object coordinate system for fixture. At `rtCut` the cutter closes and opens. After the cut operation the TCP is moved back linearly to position `rtApp`.

Syntax

MoveWireCutL

```
[ ApproachPoint ':=' ] < expression (IN) of robtarget > ','
[ CutPoint ':=' ] < expression (IN) of robtarget > ','
[ Speed ':=' ] < expression (IN) of speeddata > ','
[ Zone ':=' ] < expression (IN) of zonedata > ','
[ Tool ':=' ] < persistent (PERS) of tooldata >
[ '\' WObj ':=' < persistent (PERS) of wobjdata >
[ '\' TLoad':=' ] < persistent (PERS) of loaddata > ] ';'
```

Continues on next page

Related information

	Described in:
MoveMechCleanL	Torch Services Software Reference
MoveMechCleanJ	Torch Services Software Reference
MoveSprayL	Torch Services Software Reference
MoveSprayJ	Torch Services Software Reference
MoveWireCutJ	Torch Services Software Reference
MoveL	Technical reference manual - RAPID Instructions, functions and data types - MoveL
Definition of loaddata	Technical reference manual - RAPID Instructions, functions and data types - loaddata

4.6 MoveWireCutJ, Move wire cut

About MoveWireCutJ

MoveWireCutJ is an instruction used to move the weld gun to a station for automatic cut-off of the welding wire. The movement to reach the cut station does not have to be in a straight line.

Example

```
MoveWireCutJ rtApp, rtCut, v200, fine, tWeldGun;
```

The tool centre point (TCP) of the tool, tWeldGun, is moved to the position, rtApp, with speed data v200 and zone data fine. At rtApp the TCP is moved along a linear path to the position rtCut. At rtCut the wire is cut off.

After the cut operation the TCP is moved back linearly to position rtApp.

Arguments

```
MoveMechCleanL ApproachPoint CleanPoint Speed Zone Tool [\WObj]
     [\TLoad]
```

ApproachPoint

Data type: robtarget

The approach point of the robot and external axes directly above the spray station. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

CutPoint

Data type: robtarget

The destination point of the robot and external axes. It is defined as a named position or stored directly in the instruction (marked with an * in the instruction).

Speed

Data type: speeddata

The speed data that applies to movements. Speed data defines the velocity for the tool centre point, the tool reorientation and external axes.

Zone

Data type: zonedata

Zone data for the movement. Zone data describes the size of the generated corner path.

Tool

Data type: tooldata

The tool in use when the robot moves. The tool centre point is the point moved to the specified destination position.

[\WObj]

Data type: wobjdata

The work object (coordinate system) to which the robot position in the instruction is related.

Continues on next page

This argument can be omitted, and if it is, the position is related to the world coordinate system. If, on the other hand, a stationary tool or coordinated external axes are used, this argument must be specified in order to perform a linear movement relative to the work object.

`[\TLoad]`

Data type: `loaddata`

The `\TLoad` argument describes the total load used in the movement. The total load is the tool load together with the payload that the tool is carrying. If the `\TLoad` argument is used, then the loaddata in the current tooldata is not considered.

If the `\TLoad` argument is set to `load0`, then the `\TLoad` argument is not considered and the loaddata in the current `tooldata` is used instead. For a complete description of the `TLoad` argument, see MoveL - Moves the robot linearly.

Program execution

Automatic /Continuous Mode

When executed, the robot makes a movement to the approach position, `ApproachPoint`. Then, the cutter opens and the robot makes a linear movement to the cut position, `CutPoint` with fixed low speed.

Note

Note that if the configuration parameters `ShearWidth` and `ShearDirection` is used the cut position will be slightly different each time to minimize the shear wear. At the cut position the cutter is closed and opened. When the cut operation is done, the robot will move back to the approach position with fixed low speed.

Forward Step

When executed, the robot makes a movement to the approach position, `ApproachPoint`. Then, the robot makes a linear movement to the cut position, `CutPoint` with fixed low speed.

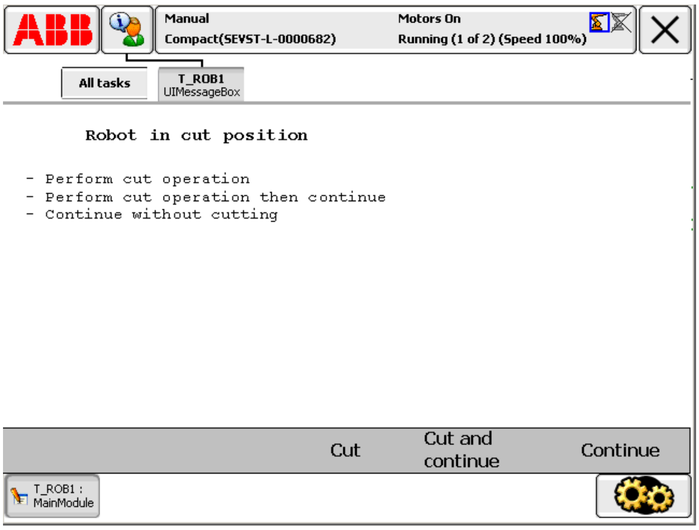
Note

Note that if the configuration parameters `ShearWidth` and `ShearDirection` is used the cut position will be slightly different each time to minimize the shear wear.

Continues on next page

User dialog

At the cut position a user dialog will show, see Figure 4.6.



```
Robot in cut position

- Perform cut operation
- Perform cut operation then continue
- Continue without cutting
```

xx1400001929

Figure 4.6: User dialogue shown at the cut position

Choices

The available choices are:

Choice	Description
Cut	The cutter will close and open, thereafter the user dialog is shown again.
Cut and Continue	The cutter will close and open thereafter the robot will move back to the approach position with fixed low speed.
Continue	The robot will move back to the approach position with fixed low speed.

Examples

```
MoveWireCutJ rtApp, rtCut, vMax, fine, tWeldGun \WObj:=fixture;
```

The TCP of the tool, `tWeldGun`, is moved to the position, `rtApp`. This position is specified in the object coordinate system for fixture.

At `rtApp` the cutter opens and the TCP is moved along a linear path to the position `rtCut`. This position is also specified in the object coordinate system for fixture. At `rtCut` the cutter closes and opens. After the cut operation the TCP is moved back linearly to position `rtApp`.

Syntax

MoveWireCutJ

```
[ ApproachPoint ':=' ] < expression (IN) of robtarget > ','
[ CutPoint ':=' ] < expression (IN) of robtarget > ','
[ Speed ':=' ] < expression (IN) of speeddata > ','
[ Zone ':=' ] < expression (IN) of zonedata > ','
[ Tool ':=' ] < persistent (PERS) of tooldata >
[ '\' WObj ':=' < persistent (PERS) of wobjdata > ]
[ '\' TLoad':=' ] < persistent (PERS) of loaddata > ] ';'
```

Continues on next page

Related information

	Described in:
MoveMechCleanL	Torch Services Software Reference
MoveMechCleanJ	Torch Services Software Reference
MoveSprayL	Torch Services Software Reference
MoveSprayJ	Torch Services Software Reference
MoveWireCutL	Torch Services Software Reference
MoveL	Technical reference manual - RAPID Instructions, functions and data types - MoveL
Definition of loaddata	Technical reference manual - RAPID Instructions, functions and data types - loaddata

Contact us

ABB AB
Discrete Automation and Motion
Robotics
S-721 68 VÄSTERÅS, Sweden
Telephone +46 (0) 21 344 400

ABB AS, Robotics
Discrete Automation and Motion
Nordlysvegen 7, N-4340 BRYNE, Norway
Box 265, N-4349 BRYNE, Norway
Telephone: +47 51489000

ABB Engineering (Shanghai) Ltd.
5 Lane 369, ChuangYe Road
KangQiao Town, PuDong District
SHANGHAI 201319, China
Telephone: +86 21 6105 6666

www.abb.com/robotics

Power and productivity
for a better world™