

# Operating manual Getting started, IRC5 and RobotStudio

Power and productivity  
for a better world™



Trace back information:  
Workspace R16-1 version a6  
Checked in 2016-03-01  
Skribenta version 4.6.209

**Operating manual**  
**Getting started, IRC5 and RobotStudio**

**RobotWare 6.02**

**Document ID: 3HAC027097-001**

**Revision: N**

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.

This manual and parts thereof must not be reproduced or copied without ABB's written permission.

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.

© Copyright 2004-2016 ABB. All rights reserved.

ABB AB  
Robotics Products  
Se-721 68 Västerås  
Sweden

---

# Table of contents

Overview of this manual .....	7
Safety note .....	9
<b>1 Procedures</b> .....	<b>11</b>
1.1 Procedure for single robot systems .....	11
1.2 Procedure for MultiMove systems .....	13
1.3 Installation options and prerequisites .....	14
1.4 Connecting a PC to the controller .....	18
1.5 Creating a system using RobotStudio .....	22
1.6 Switching on the power .....	23
1.7 Loading calibration data .....	24
1.8 Updating revolution counters .....	25
1.9 Switching off the power .....	26
<b>2 General information</b> .....	<b>27</b>
2.1 What is a FlexPendant? .....	27
2.2 What is a T10? .....	33
2.3 What is RobotStudio? .....	35
2.4 What is RobotStudio Online? .....	36
2.5 What is RobotWare? .....	38
2.6 About the mediapool .....	39
2.7 When to use different jogging devices .....	40
2.8 Product documentation, IRC5 .....	43
<b>Index</b> .....	<b>45</b>

---

**This page is intentionally left blank**

# Overview of this manual

## About this manual

This manual is to be used when starting up the system for the very first time. It contains excerpts from other documents included in the robot system delivery.



### Note

This manual includes information for both RobotWare 5 and RobotWare 6.

## Usage

This manual contains instructions for starting up the IRC5 robot controller for the very first time after the physical installation has been completed.

## Who should read this manual?

This manual is intended for:

- Commissioning personnel

## Prerequisites

The reader should be familiar with:

- Mechanically installing the robot hardware.
- Be trained in robot operation.

The contents of the manual assumes all hardware (manipulator, controller and such) has been installed correctly and connected to each other.

## Organization of chapters

The manual is organized in the following chapters:

Chapter	Contents
1 Procedures	Procedures for setup and startup of the IRC5 robot system.
2 General	Descriptions of the parts in IRC5 robot system.

## References

Reference	Document ID
<i>Product manual - IRC5</i> IRC5 with main computer DSQC 639.	3HAC021313-001
<i>Product manual - IRC5</i> IRC5 with main computer DSQC1000.	3HAC047136-001
<i>Operating manual - IRC5 with FlexPendant</i>	3HAC050941-001
<i>Operating manual - RobotStudio</i>	3HAC032104-001
<i>Operating manual - Trouble shooting IRC5</i>	3HAC020738-001
<i>Technical reference manual - System parameters</i>	3HAC050948-001
<i>Application manual - MultiMove</i>	3HAC050961-001
<i>Operating manual - IRC5 with T10</i>	3HAC050943-001

Continues on next page

## Revisions

Revision	Description
-	Replaces manual with document id 3HAC 021564-001. Released with RobotWare 5.08.
A	Polish translation added.
B	RobotStudio Online is integrated in RobotStudio. Title adjusted.
C	Updated information on installing and licensing RobotStudio.
D	Updated the section <a href="#">Installation options and prerequisites on page 14</a> with the information on installing RobotStudio.
E	Released with RobotWare 5.13. Updated information in the section <a href="#">Installation options and prerequisites on page 14</a> Added steps on downloading a system to a controller. See <a href="#">How to create a system using RobotStudio on page 15</a> .
F	Released with RobotWare 5.13.02. Updated information about the RobotWare key delivery. See <a href="#">How to create a system using RobotStudio on page 15</a> .
G	Released with RobotWare 5.14. <ul style="list-style-type: none"> <li>• Added the procedure <a href="#">How to switch off power</a>. See <a href="#">How to switch off power on page 16</a>.</li> <li>• Removed references to RobotStudio trial period activation.</li> </ul>
H	Released with RobotWare 5.14.02. Added information on IRC5 Compact and Panel Mounted Controller. Updated the procedures <a href="#">How to switch on power on page 15</a> and <a href="#">How to switch off power on page 16</a> .
J	Released with RobotWare 5.15 Updated and reworked the sections relating to RobotStudio installation, licensing and activation, under <a href="#">Installation options and prerequisites on page 14</a> .
K	Released with RobotWare 5.60 <ul style="list-style-type: none"> <li>• Updated information on the new main computer DSQC1000. See <a href="#">Connecting a PC to the controller on page 18</a>.</li> <li>• Added a note on <i>MultiMove</i> being not supported in RW5.60. See <a href="#">Procedure for MultiMove systems on page 13</a>.</li> </ul>
L	Released with RobotWare 5.61 <ul style="list-style-type: none"> <li>• Updated information on limitations. See <a href="#">Connecting a PC to the controller on page 18</a>.</li> <li>• The option <i>MultiMove</i> is available in RobotWare 5.61.</li> <li>• Update the note on RW5.61 limitations in the section <a href="#">Installation options and prerequisites on page 14</a>.</li> </ul>
M	Released with RobotWare 6.0 <ul style="list-style-type: none"> <li>• Removed references to dual controller.</li> <li>• Added a new section on <a href="#">What is a T10? on page 33</a>.</li> <li>• Added a new section on RobotStudio Online Apps in <a href="#">General information on page 27</a> section.</li> </ul>
N	Released with RobotWare 6.03 Updated the chapter <a href="#">General information on page 27</a> . "SMB memory" is renamed "robot memory" and "cabinet memory" is renamed "controller memory".



## Safety note

---

### Overview

**Please note that there is no information regarding safety aspects in this manual!**

In an effort to keep this manual short, there is *no information* regarding:

- safe handling and operation of the equipment
- generic reference information
- detailed procedures

This information can be found in the *Product manuals* or the *Operating manuals* delivered with the robot system.

**This page is intentionally left blank**

# 1 Procedures

## 1.1 Procedure for single robot systems

### Overview

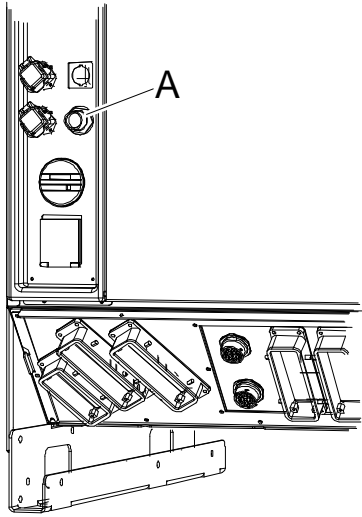

This instruction is valid for IRC5 single robot systems.

A single robot system contains any of the following

- Single Cabinet Controller (controller with integrated control module and drive module)
- IRC5 Compact Controller
- Panel Mounted Controller

### How to get started

This procedure details how to get started with a single robot system.

	Action	Info/illustration
1	Mechanically install the robot and controller, and connect the electrical power and signal cables between them. Also connect the electrical power supply.	These procedures are detailed in the Product Manuals of robot and controller respectively.
2	Make sure all safety related connections are made correctly.	Refer to the work station wiring diagram.
3	Connect the FlexPendant to the controller.	 <p data-bbox="1070 1615 1177 1635">xx0500001854</p> <p data-bbox="1070 1653 1437 1704">A: FlexPendant connector, Single Cabinet Controller</p> <p data-bbox="1070 1727 1129 1783"> <b>Note</b></p> <p data-bbox="1070 1798 1437 1901">The FlexPendant connector may be placed in different positions on different controllers, but they look similar on all controllers.</p>

*Continues on next page*

# 1 Procedures

---

## 1.1 Procedure for single robot systems

*Continued*

	Action	Info/illustration
4	<p>If the robot system is delivered with fully functional system software installed, you can proceed as detailed in section <i>How to switch on power</i> in <a href="#">Installation options and prerequisites on page 14</a>.</p> <p>If no functional system software has been installed, please proceed as detailed in section <a href="#">Installation options and prerequisites on page 14</a>.</p>	

## 1.2 Procedure for MultiMove systems

### Overview



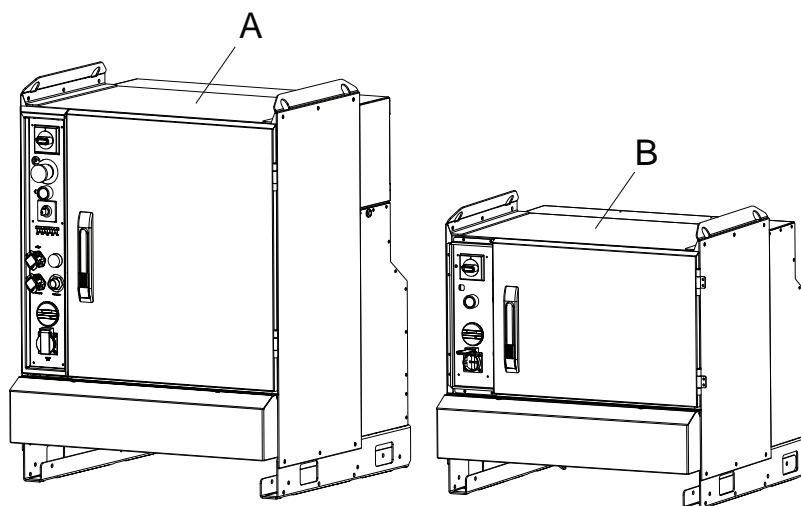
#### Note

The option MultiMove is not supported with RobotWare 5.60.  
The option *MultiMove* is available in RobotWare 5.15.xx/RobotWare 5.61.

This instruction is valid for IRC5 multi robot systems, that is, systems using the MultiMove option.

The ABB IRC5 controller has all components in one cabinet.

Additional drive modules can be connected to the controller. These are used in MultiMove applications where one controller is controlling up to four manipulators.



xx130000678

A	IRC5 controller
B	Additional drive module



#### Note

IRC5 Compact Controller does not support MultiMove.



#### Note

All multi robot systems are configured as single robot systems on delivery. In order to be fully functional as multi robot systems, these systems must be re-configured. How to perform this is detailed in *Application manual - MultiMove*.

# 1 Procedures

---

## 1.3 Installation options and prerequisites

### 1.3 Installation options and prerequisites

---

#### Prerequisites

You should have administrator privileges on the PC before installing RobotStudio.

---

#### Installation options for RobotStudio



#### Note

RobotStudio is available for a 30 day trial period. For more information about the activation procedure, see *Operating manual - RobotStudio*.

RobotStudio is categorized into the following two feature levels:

- **Basic** - Offers selected RobotStudio functionality to configure, program, and run a virtual controller. It also includes online features for programming, configuring, and monitoring a real controller connected over Ethernet.
- **Premium** - Offers full RobotStudio functionality for offline programming and simulation of multiple robots. The Premium level includes the features of the Basic level and requires activation.

In addition to the Premium functionality, there are add-ins like PowerPacs and options for CAD converters available.

- PowerPacs provides enhanced features for selected applications.
- Options for CAD converters allows import of different CAD formats.

RobotStudio offers the following installation options:

- **Minimal** - Installs only the features required to program, configure, and monitor a real controller connected over Ethernet.
- **Complete** - Installs all the features required to run the complete RobotStudio. If installed with this option, additional features of Basic and Premium functionality are available.
- **Custom** - Installs user-customized features. This option allows excluding unwanted robot libraries and CAD converters.



#### Note

RobotStudio 6.0 is installed for the Complete installation option on computers that have a 64-bit operating system. The 64-bit edition allows large CAD-models to be imported as it can address more memory than the 32-bit version.

However, the 64-bit edition has the following limitations:

- ScreenMaker, SafeMove Configurator, and EPS Wizard are not supported.
- Add-ins will be loaded from the following folder

```
C:\Program Files (x86)\ABB Industrial IT\Robotics  
IT\RobotStudio 6.0\Bin64\Addins
```

*Continues on next page*

### How to create a system using RobotStudio

If you have a single robot system, the RobotWare system is pre-installed on your IRC5 controller. However, if your system uses the option MultiMove, you must create a new system defining all robots in the system, see *Application manual - MultiMove*.

If you want to create or modify your RobotWare system, you need to use RobotStudio, see *Operating manual - RobotStudio* for details.



#### Note

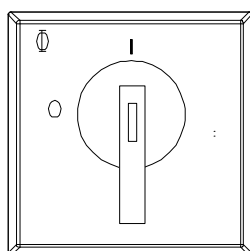
For RobotWare 6 you use the Installation Manager. For RobotWare 5 you use the System Builder. Both tools are available in RobotStudio.

### How to switch on power

The mains power switch is located on the front of the controller/module.

- For a Panel Mounted Controller, the placing of the switch can vary.

The following illustration shows the switch in power on state.



en0400000793



#### Note

The power switch can look different on a Panel Mounted Controller.

	Action	Information
1	Switch on the power to the Control Module.	If the system does not start up, or if the start window is not displayed, please proceed as detailed in <i>Operating manual - Trouble shooting IRC5</i> .
2	After switching the power on, proceed with loading calibration data.	See <a href="#">How to load calibration data on page 16</a> .

*Continues on next page*

# 1 Procedures

## 1.3 Installation options and prerequisites

*Continued*

### How to load calibration data


The calibration data is normally stored on the serial measurement board of each robot, regardless of whether the robot runs an absolute measurement system (*Absolute Accuracy* option is installed, *AbsAcc*) or not. This data is normally transferred automatically to the controller when the system is powered up, and in such cases no action is required by the operator.

Verify that the correct SMB data has been loaded into the system as detailed below. In a MultiMove system, this procedure must be repeated for each robot.

	Action
1	On the FlexPendant, tap the <b>ABB</b> menu, then tap <b>Calibration</b> and select a mechanical unit.
2	Tap <b>Robot Memory</b> and then tap <b>Show status</b> . The data is displayed with status on the controller and robot memory.
3	If <b>Valid</b> is displayed under the headings <b>Controller Memory</b> and <b>Robot Memory</b> , calibration data is correct. If not, the data (on the robot or in the controller) must be replaced with the correct one as detailed below: <ul style="list-style-type: none"><li>• If, for instance, the SMB board has been replaced, transfer data from controller to robot memory. If the controller has been replaced, transfer transfer data from the robot to the controller memory.</li><li>• Transfer data by tapping <b>Robot Memory</b>, <b>Update</b>, and then selecting which data to update.</li></ul>
4	After loading calibration data, proceed with updating the revolution counters. See <a href="#">How to update revolution counters on page 16</a> .

### How to update revolution counters

In a MultiMove system, this procedure must be repeated for each robot.

	Action	Information
1	Manually jog the robot to a position close to the calibration position.	The calibration position of each axis is indicated by the calibration marks.
2	After positioning all axes within the scale indicated by the calibration marks, store the revolution counter settings. On the FlexPendant, tap the <b>ABB</b> menu, then tap <b>Calibration</b> . Select the mechanical unit to be calibrated. Tap <b>Update revolution counters</b> and follow the instructions provided.	 <b>CAUTION</b> If a revolution counter is incorrectly updated, it will cause incorrect robot positioning, which in turn may cause damage or injury! Verify the calibration position very carefully after each update.

### How to switch off power

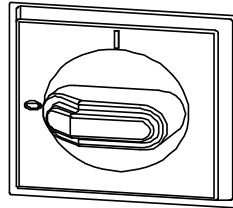
The mains power switch is located on the front of the controller/module.

- For a Panel Mounted Controller, the placing of the switch can vary.

*Continues on next page*



The following illustration shows the switch in power off state.



en1000001317

	Action	Information
1	Switch off the power to the control module.	The system will now shut down, which will take a couple of minutes.

# 1 Procedures

---

## 1.4 Connecting a PC to the controller

### 1.4 Connecting a PC to the controller

---

#### General

In general there are two ways of physically connecting a PC to the controller, to the service port or to the factory network port.

#### The service port

The service port is intended for service engineers and programmers connecting directly to the controller with a PC.

The service port is configured with a fixed IP-address, which is the same for all controllers and cannot be changed, and has a DHCP server that automatically assigns an IP-address to the connected PC.

#### The factory network port



#### Note

The factory network port is referred as LAN port for DSQC 639 and WAN port for DSQC1000.

The factory network port is intended for connecting the controller to a network.

The network settings can be configured with any IP-address, typically provided by the network administrator.

---

#### Limitations



#### Note

The maximum number of connected network clients using Robot Communication Runtime (RobAPI) is:

- WAN: 3 (LAN for DSQC 639)
- Service: 1
- FlexPendant: 1

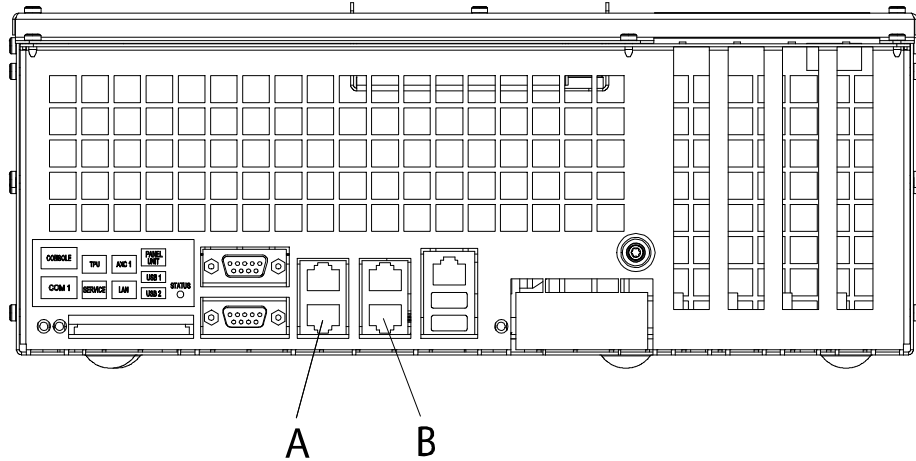
The maximum number of applications using RobAPI running on the same PC connected to one controller has no built-in maximum. However, UAS limits the number of logged-on users to 50.

The maximum number of concurrently connected FTP clients is 20.

*Continues on next page*

### Ports on the computer unit DSQC 639

The illustration below shows the two main ports on the computer unit DSQC 639, the service port and the LAN port.



connecti

A	Service port on the computer unit (connected to the service port on the controller front through a cable).
B	LAN port on the computer unit (connects to factory network).



#### Note

The LAN port is the only public network interface to the controller, typically connected to the factory network with a public IP-address provided by the network administrator.

*Continues on next page*

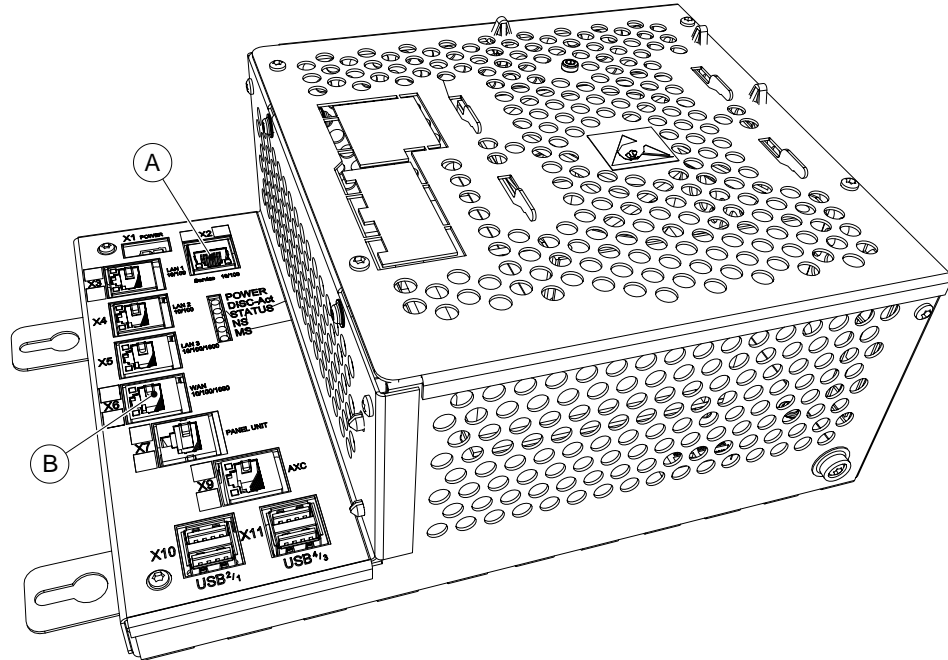
# 1 Procedures

## 1.4 Connecting a PC to the controller

Continued

### Ports on the computer unit DSQC1000

The illustration below shows the two main ports on the computer unit DSQC1000, the service port and the WAN port.



xx1300000609

A	Service port on the computer unit (connected to the service port on the controller front through a cable).
B	WAN port on the computer unit (connects to factory network).



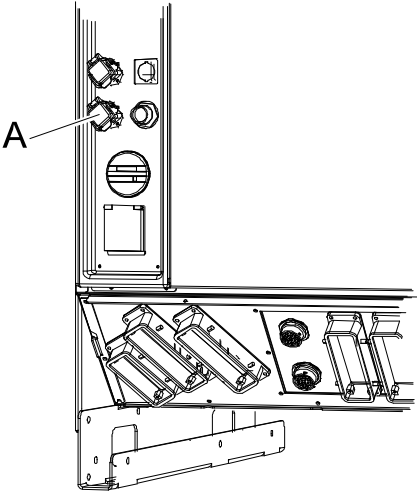
#### Note

The WAN port is the only public network interface to the controller, typically connected to the factory network with a public IP-address provided by the network administrator.

LAN1, LAN2, and LAN3 can only be configured as private networks to the IRC5 controller.

Continues on next page

### Connecting a PC to the controller

	Action	Note
1	<p>Make sure that the network setting on the PC to be connected is correct.</p> <p><b>When connecting to the service port:</b></p> <ul style="list-style-type: none"> <li>The PC must be set to "Obtain an IP address automatically" or set as described in <b>Service PC Information</b> in the <b>Boot Application</b> on the FlexPendant.</li> </ul> <p><b>When connecting to the factory network port:</b></p> <ul style="list-style-type: none"> <li>The network settings for the PC depend on the network configuration setup by the network administrator.</li> </ul>	<p>Refer to the system documentation for your PC, depending on the operative system you are running.</p>
2	<p>Connect a network cable to the network port of your PC.</p>	
3	<p><b>When connecting to the service port:</b></p> <ul style="list-style-type: none"> <li>Connect the network cable to the service port on the controller, or to the service port on the computer unit.</li> </ul> <p><b>When connecting to the factory network port:</b></p> <ul style="list-style-type: none"> <li>Connect the network cable to the factory network port on the computer unit.</li> </ul>	 <p>The diagram shows the rear panel of the controller. A label 'A' with a line pointing to a specific port is located on the left side of the panel. Below the main panel, there is a detailed view of the factory network ports, which are RJ45 ports. The text 'connectb' is visible at the bottom left of the diagram area.</p> <p><b>A Service port on the controller</b></p>

# 1 Procedures

---

## 1.5 Creating a system using RobotStudio

### 1.5 Creating a system using RobotStudio

---

#### How to create a system

If you want to create or modify your RobotWare system, you need to use RobotStudio, see *Operating manual - RobotStudio* for details.



#### Note

For RobotWare 6 you use the **Installation Manager**. For RobotWare 5 you use the **System Builder**. Both tools are available in RobotStudio.

---

#### How to create a MultiMove system

If your system uses the option MultiMove, you must create a new system defining all robots in the system.

For MultiMove systems, more information is also described in *Application manual - MultiMove*.

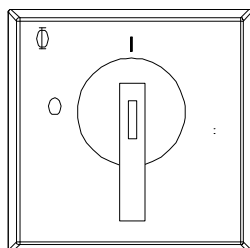
## 1.6 Switching on the power

### How to switch on power

The mains power switch is located on the front of the controller/module.

- For a Panel Mounted Controller, the placing of the switch can vary.

The following illustration shows the switch in power on state.



en040000793



#### Note

The power switch can look different on a Panel Mounted Controller.

	Action	Information
1	Switch on the power to the Control Module.	If the system does not start up, or if the start window is not displayed, please proceed as detailed in <i>Operating manual - Trouble shooting IRC5</i> .
2	After switching the power on, proceed with loading calibration data.	See <a href="#">How to load calibration data on page 16</a> .

# 1 Procedures

---

## 1.7 Loading calibration data

### 1.7 Loading calibration data

---

#### How to load calibration data

The calibration data is normally stored on the serial measurement board of each robot, regardless of whether the robot runs an absolute measurement system (*Absolute Accuracy* option is installed, *AbsAcc*) or not. This data is normally transferred automatically to the controller when the system is powered up, and in such cases no action is required by the operator.

Verify that the correct SMB data has been loaded into the system as detailed below. In a MultiMove system, this procedure must be repeated for each robot.


	Action
1	On the FlexPendant, tap the <b>ABB</b> menu, then tap <b>Calibration</b> and select a mechanical unit.
2	Tap <b>Robot Memory</b> and then tap <b>Show Status</b> . The data is displayed with status on the controller and robot memory.
3	If <b>Valid</b> is displayed under the headings <b>Controller Memory</b> and <b>Robot Memory</b> , calibration data is correct. If not, the data (on the robot or in the controller) must be replaced with the correct one as detailed below: <ul style="list-style-type: none"><li>• If, for instance, the SMB board has been replaced, transfer data from controller to robot memory. If the controller has been replaced, transfer data from the robot to the controller memory.</li><li>• Transfer data by tapping <b>Robot Memory</b>, <b>Update</b>, and then selecting which data to update.</li></ul>
4	After loading calibration data, proceed with updating the revolution counters. See <a href="#">How to update revolution counters on page 16</a> .



## 1.8 Updating revolution counters

### How to update revolution counters

In a MultiMove system, this procedure must be repeated for each robot.

	Action	Information
1	Manually jog the robot to a position close to the calibration position.	The calibration position of each axis is indicated by the calibration marks.
2	After positioning all axes within the scale indicated by the calibration marks, store the revolution counter settings. On the FlexPendant, tap the <b>ABB</b> menu, then tap <b>Calibration</b> . Select the mechanical unit to be calibrated. Tap <b>Update revolution counters</b> and follow the instructions provided.	 <b>CAUTION</b> If a revolution counter is incorrectly updated, it will cause incorrect robot positioning, which in turn may cause damage or injury! Verify the calibration position very carefully after each update.

# 1 Procedures

---

## 1.9 Switching off the power

### 1.9 Switching off the power

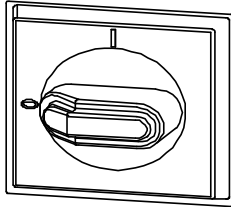
---

#### How to switch off power

The mains power switch is located on the front of the controller/module.

- For a Panel Mounted Controller, the placing of the switch can vary.

The following illustration shows the switch in power off state.



en1000001317

	Action	Information
1	Switch off the power to the control module.	The system will now shut down, which will take a couple of minutes.

## 2 General information

### 2.1 What is a FlexPendant?

---

#### Introduction to the FlexPendant

The FlexPendant is a hand held operator unit used to perform many of the tasks involved when operating a robot system: running programs, jogging the manipulator, modifying robot programs, and so on.

The FlexPendant is designed for continuous operation in harsh industrial environment. Its touch screen is easy to clean and resistant to water, oil and accidental welding splashes.

---

#### Complete computer and part of IRC5

The FlexPendant consists of both hardware and software and is a complete computer in itself. It is a part of IRC5, connected to the controller by an integrated cable and connector. The hot plug button option, however, makes it possible to disconnect the FlexPendant in automatic mode and continue running without it.

*Continues on next page*

## 2 General information

### 2.1 What is a FlexPendant?

*Continued*

#### Main parts

These are the main parts of the FlexPendant.



xx1400001636

A	Connector
B	Touch screen
C	Emergency stop button
D	Joystick
E	USB port
F	Enabling device
G	Stylus pen
H	Reset button

#### Joystick

Use the joystick to move the manipulator. This is called jogging the robot. There are several settings for how the joystick will move the manipulator.

*Continues on next page*

#### USB port

Connect a USB memory to the USB port to read or save files. The USB memory is displayed as drive */USB:Removable* in dialogs and FlexPendant Explorer.



#### Note

Close the protective cap on the USB port when not used.

#### Stylus pen

The stylus pen included with the FlexPendant is located on the back. Pull the small handle to release the pen.

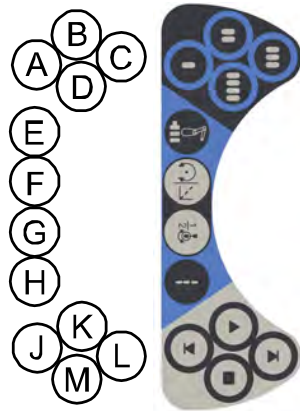
Use the stylus pen to tap on the touch screen when using the FlexPendant. Do not use screw drivers or other sharp objects.

#### Reset button

The reset button resets the FlexPendant, not the system on the controller.

#### Hard buttons

There are dedicated hardware buttons on the FlexPendant. You can assign your own functions to four of the buttons.



xx0900000023

A - D	Programmable keys, 1 - 4. How to define their respective function is detailed in section Programmable keys, in <i>Operating manual - IRC5 with FlexPendant</i> .
E	Select mechanical unit.
F	Toggle motion mode, reorient or linear.
G	Toggle motion mode, axis 1-3 or axis 4-6.
H	Toggle increments.
J	<b>Step BACKWARD</b> button. Executes one instruction backward as button is pressed.
K	<b>START</b> button. Starts program execution.
L	<b>Step FORWARD</b> button. Executes one instruction forward as button is pressed.
M	<b>STOP</b> button. Stops program execution.

*Continues on next page*

## 2 General information

---

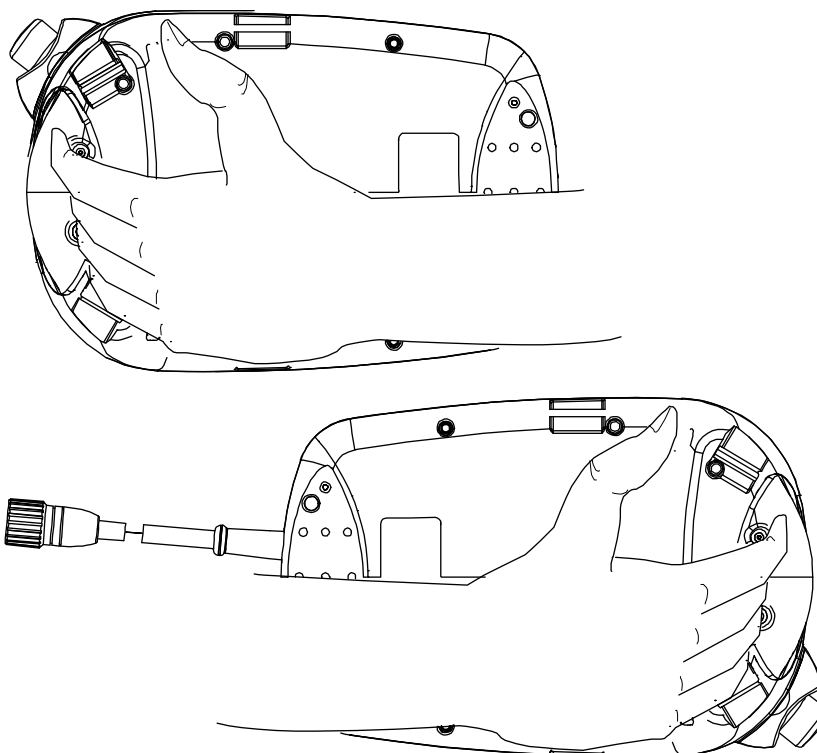
### 2.1 What is a FlexPendant?

*Continued*

---

#### How to hold the FlexPendant

The FlexPendant is typically operated while being held in the hand. A right-handed person uses his left hand to support the device while the other hand performs operations on the touch screen. A left-hander, however, can easily rotate the display through 180 degrees and use his right hand to support the device. For more information about adapting the FlexPendant to left-handedness, see *Operating manual - IRC5 with FlexPendant*.

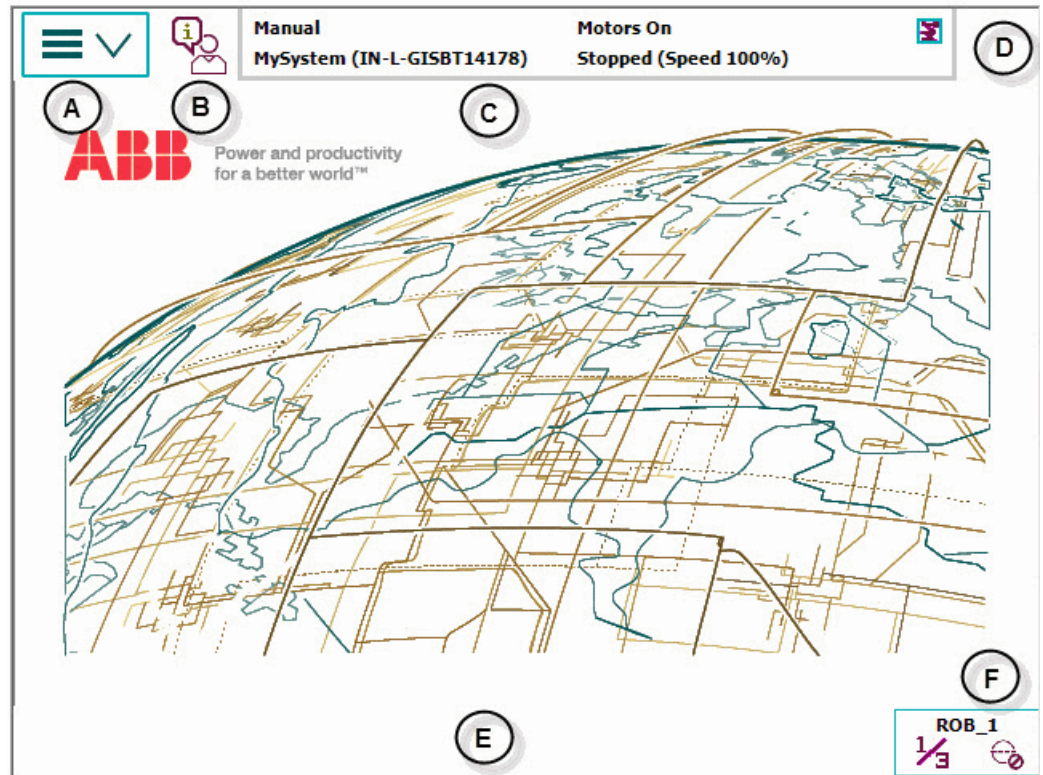


en0400000913

*Continues on next page*

#### Touch screen elements

The illustration shows important elements of the FlexPendant touch screen.



xx1400001446

A	ABB menu
B	Operator window
C	Status bar
D	Close button
E	Task bar
F	Quickset menu

#### ABB menu

The following items can be selected from the ABB menu:

- HotEdit
- Inputs and Outputs
- Jogging
- **Production Window**
- **Program Editor**
- **Program Data**
- **Backup and Restore**
- Calibration
- **Control Panel**
- **Event Log**

*Continues on next page*

## 2 General information

---

### 2.1 What is a FlexPendant?

*Continued*

- **FlexPendant Explorer**
- **System Info**
- etc.

This is further described in section *The ABB Menu in Operating manual - IRC5 with FlexPendant*.

#### Operator window

The operator window displays messages from robot programs. This usually happens when the program needs some kind of operator response in order to continue. This is described in section *Operator window in Operating manual - IRC5 with FlexPendant*.

#### Status bar

The status bar displays important information about system status, such as operating mode, motors on/off, program state and so on. This is described in section *Status bar in Operating manual - IRC5 with FlexPendant*.

#### Close button

Tapping the close button closes the presently active view or application.

#### Task bar

You can open several views from the ABB menu, but only work with one at a time. The task bar displays all open views and is used to switch between these.

#### Quickset menu

The quickset menu provides settings for jogging and program execution. This is described in section *The Quickset menu in Operating manual - IRC5 with FlexPendant*.

---

### Operated in twenty languages

As the name suggests, the FlexPendant is designed with flexibility and adaptation to end-users' specific needs in mind. Currently, it can be operated in twenty different languages, including Asian character-based languages such as Chinese and Japanese.

Switching from one of the installed languages to another is easy. For more information about changing language, see *Operating manual - IRC5 with FlexPendant*.



## 2.2 What is a T10?

### Introduction

The T10 is a jogging device used to jog manipulators and mechanical units in an intuitive way by pointing the device in the direction of movement.

When using a FlexPendant for jogging, a predefined coordinate system is selected, such as world coordinates or tool coordinates, and the manipulator moves in the desired direction along the selected coordinate system.

Using the T10 for jogging is quite similar, but instead of selecting a coordinate system, the direction is shown in space with the device itself. For example when jogging vertically the T10 is held in vertical direction, when jogging horizontally the T10 is held in horizontal direction, etc. This is achieved thanks to the built in inertial measurement unit, consisting of accelerometers and gyroscopes, which measure the motion of the device in space.

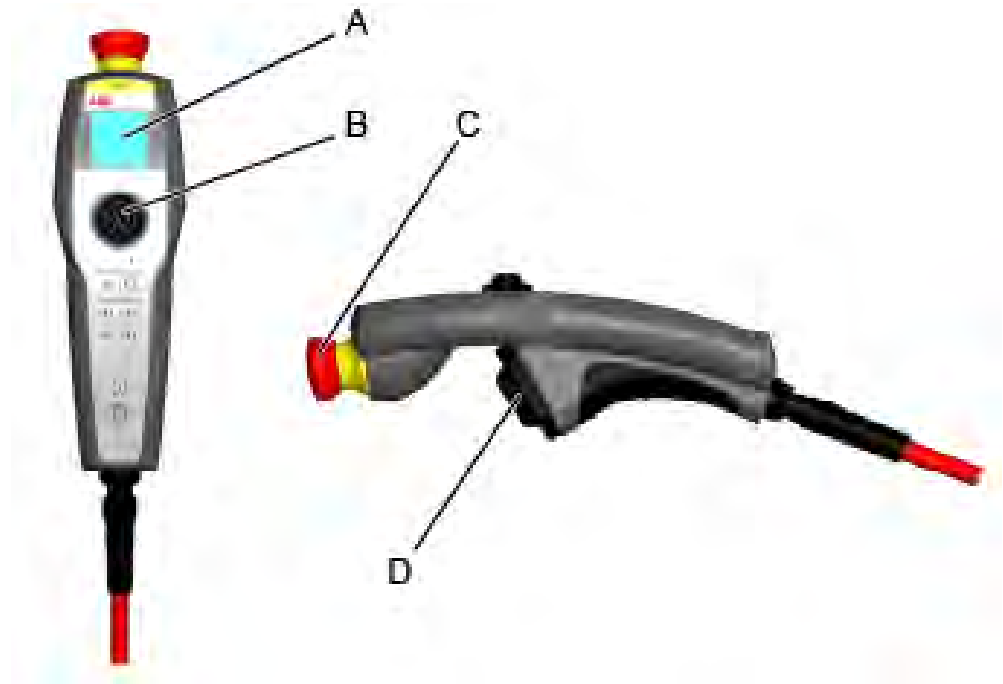
The joystick is used for adjusting the jog speed and the positive or negative direction. The forward and backward movement of the joystick corresponds directly to the movement of the manipulator, which is the most intuitive way. The left and right movement of the joystick is used for reorientation.

For more information about the T10, see *Operating manual - IRC5 with T10*.

### Prerequisites

The RobotWare option *976-1 T10 Support* is necessary to run the T10 with the IRC5 robot controller.

### Overview



xx1400002068

*Continues on next page*

## 2 General information

---

### 2.2 What is a T10?

*Continued*

	Description
A	Display
B	Joystick
C	Emergency stop button
D	Enabling device

## 2.3 What is RobotStudio?

---

### Overview

RobotStudio is an engineering tool for configuration and programming of ABB robots, both real robots on the shop floor and virtual robots in a PC. To achieve true offline programming, RobotStudio utilizes ABB VirtualRobot™ Technology. RobotStudio has adopted the Microsoft Office Fluent User Interface. The Office Fluent UI is also used in Microsoft Office. As in Office, the features of RobotStudio are designed in a workflow-oriented way.

With add-ins, RobotStudio can be extended and customized to suit your specific needs. Add-ins are developed using the RobotStudio SDK. With the SDK, it is also possible to develop custom SmartComponents which exceed the functionality provided by RobotStudio's base components.

For more information, see *Operating manual - RobotStudio*.

---

### RobotStudio for real controllers

RobotStudio allows, for example, the following operations when connected to a real controller:

- Installing and modifying systems on RobotWare 6 controllers, using the **Installation Manager**.
- Text-based programming and editing, using the **RAPID Editor**.
- File manager for the controller.
- Administrating the User Authorization System.
- Configuring system parameters.

## 2 General information

### 2.4 What is RobotStudio Online?

### 2.4 What is RobotStudio Online?

#### Introduction to RobotStudio Online

RobotStudio Online is a suite of **Windows Store** applications intended to run on **Windows 10** tablets. It provides functionality for shop floor commissioning of robot systems.



#### Note

Some of the functionality requires use of a safety device such as the T10 jogging device or the JSHD4 three position safety device. For more information on T10, see *Operating manual - IRC5 with T10*.



You can run these apps on a tablet that communicates with the robot controller wirelessly. To enable certain functionality, such as entering manual mode and enabling power to the mechanical unit motors, you need a safety device that is connected to the robot using the same plug that alternatively is used to connect the FlexPendant.

The following RobotStudio Online Apps are available in the Microsoft [Windows Store](#):



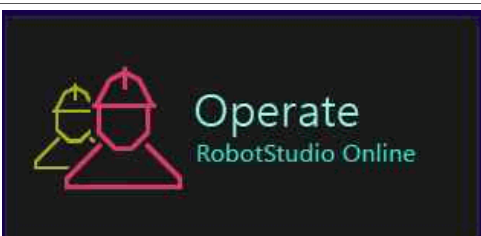
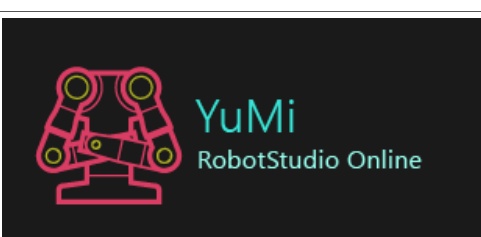


#### Note

You must have **Windows 8.1** to run these Apps.

RobotStudio Online Apps	Description
 xx1400002047	<b>Manage</b> is a tool to manage IRC5 controllers on a network.
 xx1400002049	<b>Calibrate</b> is a tool for calibration and definition of frames with IRC5 controllers.

*Continues on next page*

RobotStudio Online Apps	Description
 <p>xx1400002048</p>	<p><b>Jog</b> is a tool for manual positioning (moving or jogging) with IRC5 controllers.</p>
 <p>xx1400002050</p>	<p><b>Tune</b> is a tool for shop floor editing of RAPID programs with IRC5 controllers.</p>
 <p>xx1400002511</p>	<p><b>Operate</b> is a tool used in production to view the program code.</p>
 <p>xx1500000832</p>	<p><b>YuMi</b> is a tool for programming of the new dual arm and collaborative robot YuMi, IRB 14000, from ABB.</p> <p>It will help the users to get a fast introduction to robot programming using lead-thru and graphical programming.</p>

## 2 General information

---

### 2.5 What is RobotWare?

### 2.5 What is RobotWare?

---

#### Concept



#### Note

RoboWare concept provided here applies to RobotWare 5. For RobotWare 6 details, see *Operating manual - RobotStudio*.

RobotWare is a generic term for all software to be installed in the robot system designed to operate the robot.

RobotWare is installed and stored in the mediapool (Mediapool) folder on a PC/server. The mediapool is described in section [About the mediapool on page 39](#).

RobotWare is delivered on a DVD and this contains software for all available models, options and such.

However, the RobotWare license keys, required to access the software, are delivered as character strings printed on a piece of paper delivered with the controller cabinet. There is one key for the control module, and one key for each drive module.

When adding functionality at a later date, a new controller license key is required to access the functions. The key is available from your local ABB representative.

## 2.6 About the mediapool

---

### Overview

The mediapool is a folder on your PC that contains the RobotWare software. It is from the mediapool that you select programs and options when building systems.



#### Note

Mediapool is valid only for RobotWare 5.

---

### The default mediapool

If RobotWare is installed with default settings on the PC, the default media pool is located in the folder *C:\Program Files\ABB Industrial IT\Robotics IT\Mediapool*.

---

### Customized mediapools

You can create customized mediapools by creating new folders to which you copy RobotWare files from existing mediapools. You can also update or modify a mediapool by importing new parts of RobotWare using the *Import Option* tool in RobotStudio.

In RobotStudio, you then choose which mediapool to use when creating new systems.

## 2 General information

---

### 2.7 When to use different jogging devices

### 2.7 When to use different jogging devices

---

#### Overview

For operating and managing the robot, you can use any of the following:

- FlexPendant: Optimized for handling robot motions and ordinary operation
- RobotStudio: Optimized for configuration, programming and other tasks not related to the daily operation.
- T10: Intended for jogging the robots in an intuitive way by selecting desired directions of movement.
- RobotStudio Online Apps : Optimized for jogging, managing, working with the frames, calibration methods and RAPID programs available in the robot controller.

---

#### Start, restart and shut down the controller

To...	Use...
Start the controller	The power switch on the controller's front panel.
Restart the controller	The FlexPendant, RobotStudio, RobotStudio Online Apps or the power switch on the controller's front panel.
Shut down the controller	The power switch on the controller's front panel or the FlexPendant, tap <b>Restart</b> , then <b>Advanced</b> .
Shut down the main computer	The FlexPendant.

---

#### Run and control robot programs

To...	Use...
Jog a robot	The FlexPendant or T10 .
Start or stop a robot program	The FlexPendant, RobotStudio or RobotStudio Online Apps.
Start and stop background tasks	The FlexPendant, RobotStudio or RobotStudio Online Apps.

---

#### Communicate with the controller

To...	Use...
Acknowledge events	The FlexPendant or RobotStudio Online Apps.
View and save the controller's event logs	RobotStudio, FlexPendant or the RobotStudio Online Apps.
Back up the controller's software to files on the PC or a server	RobotStudio, FlexPendant or the RobotStudio Online Apps.
Back up the controller's software to files on the controller	The FlexPendant or RobotStudio Online Apps.
Transfer files between the controller and network drives	RobotStudio, FlexPendant or the RobotStudio Online Apps.

*Continues on next page*



#### Program a robot

To...	Use...
Create or edit robot programs in a flexible way. This is suitable for complex programs with a lot of logic, I/O signals or action instructions	RobotStudio to create the program's structure and most of the source code and the FlexPendant to store robot positions and make final adjustments to the program. When programming, RobotStudio provides the following advantages: <ul style="list-style-type: none"> <li>• A text editor optimized for RAPID code, with auto-text and tool-tip information about instructions and parameters.</li> <li>• Program check with program error marking.</li> <li>• Close access to configuration and I/O editing.</li> </ul>
Create or edit a robot program in a supportive way. This is suitable for programs that mostly consist of move instructions	The FlexPendant. When programming, the FlexPendant provides the following advantages: <ul style="list-style-type: none"> <li>• Instruction pick lists</li> <li>• Program check and debug while writing</li> <li>• Possibility to create robot positions while programming</li> </ul>
Add or edit robot positions	The FlexPendant or T10 with a combination of suitable RobotStudio Online Apps.
Modify robot positions	The FlexPendant or T10 with a combination of suitable RobotStudio Online Apps.

#### Configure the robot's system parameters

To...	Use...
Edit the system parameters of the running system	RobotStudio, FlexPendant or the RobotStudio Online Apps.
Save the robot's system parameters as configuration files	RobotStudio, FlexPendant or the RobotStudio Online Apps.
Load system parameters from configuration files to the running system	RobotStudio, FlexPendant or the RobotStudio Online Apps.
Load calibration data	RobotStudio, FlexPendant or the RobotStudio Online Apps.

#### Create, modify and install systems

To...	Use...
Create or modify a system	RobotStudio together with RobotWare and a valid RobotWare Key for systems based on RobotWare 5. RobotStudio together with RobotWare and license file for systems based on RobotWare 6.
Install a system on a controller	RobotStudio
Install a system on a controller from a USB memory	The FlexPendant.

#### Calibration

To...	Use...
Calibrate base frame etc.	The FlexPendant or the RobotStudio Online Apps.

*Continues on next page*

## 2 General information

---

### 2.7 When to use different jogging devices

*Continued*

To...	Use...
Calibrate tools, work objects etc.	The FlexPendant or the RobotStudio Online Apps.

---

#### Related information

The table below specifies which manuals to read, when performing the various tasks referred to:

Recommended use...	for details, see manual...	Document number
FlexPendant	<i>Operating manual - IRC5 with Flex-Pendant</i>	<i>3HAC050941-001</i>
RobotStudio	<i>Operating manual - RobotStudio</i>	<i>3HAC032104-001</i>
T10	<i>Operating manual - IRC5 with T10</i>	<i>3HAC050943-001</i>

---

## 2.8 Product documentation, IRC5

---

### Categories for user documentation from ABB Robotics

The user documentation from ABB Robotics is divided into a number of categories. This listing is based on the type of information in the documents, regardless of whether the products are standard or optional.

All documents listed can be ordered from ABB on a DVD. The documents listed are valid for IRC5 robot systems.

---

### Product manuals

Manipulators, controllers, DressPack/SpotPack, and most other hardware is delivered with a **Product manual** that generally contains:

- Safety information.
- Installation and commissioning (descriptions of mechanical installation or electrical connections).
- Maintenance (descriptions of all required preventive maintenance procedures including intervals and expected life time of parts).
- Repair (descriptions of all recommended repair procedures including spare parts).
- Calibration.
- Decommissioning.
- Reference information (safety standards, unit conversions, screw joints, lists of tools).
- Spare parts list with exploded views (or references to separate spare parts lists).
- Circuit diagrams (or references to circuit diagrams).

---

### Technical reference manuals

The technical reference manuals describe reference information for robotics products.

- *Technical reference manual - Lubrication in gearboxes*: Description of types and volumes of lubrication for the manipulator gearboxes.
- *Technical reference manual - RAPID overview*: An overview of the RAPID programming language.
- *Technical reference manual - RAPID Instructions, Functions and Data types*: Description and syntax for all RAPID instructions, functions, and data types.
- *Technical reference manual - RAPID kernel*: A formal description of the RAPID programming language.
- *Technical reference manual - System parameters*: Description of system parameters and configuration workflows.

*Continues on next page*

## 2 General information

---

### 2.8 Product documentation, IRC5

*Continued*

---

#### Application manuals

Specific applications (for example software or hardware options) are described in **Application manuals**. An application manual can describe one or several applications.

An application manual generally contains information about:

- The purpose of the application (what it does and when it is useful).
- What is included (for example cables, I/O boards, RAPID instructions, system parameters, DVD with PC software).
- How to install included or required hardware.
- How to use the application.
- Examples of how to use the application.

---

#### Operating manuals

The operating manuals describe hands-on handling of the products. The manuals are aimed at those having first-hand operational contact with the product, that is production cell operators, programmers, and trouble shooters.

The group of manuals includes (among others):

- *Operating manual - Emergency safety information*
- *Operating manual - General safety information*
- *Operating manual - Getting started, IRC5 and RobotStudio*
- *Operating manual - Introduction to RAPID*
- *Operating manual - IRC5 with FlexPendant*
- *Operating manual - RobotStudio*
- *Operating manual - Trouble shooting IRC5, for the controller and manipulator.*

# Index

## A

ABB menu, 31

## B

backward button, 29

## C

calibration, 41  
calibration data, 16, 24  
close button, 31  
connector, 28  
controller license key, 38  
control tools, overview, 40

## D

display, 34

## E

emergency stop button, 34  
FlexPendant, 28  
enabling device, 28, 34

## F

FlexPendant  
hardware buttons, 29  
how to hold, 30  
left-hander, 30  
main parts, 28  
overview, 27  
screen, 31  
forward button, 29

## H

Hard buttons, 29  
hold-to-run button, 28

## J

joystick, 28, 34  
using, 28

## M

Media Pool, about, 39  
MultiMove system, 16, 25

## O

operator window, 31

## P

program a robot, 41  
program execution start button, 29

## Q

quickset menu, 31

## R

reset button  
location, 28  
using, 29  
RobotStudio  
overview, 35  
RobotStudio Oline Apps, 36  
Calibrate, 36  
Jog, 37  
Manage, 36  
Operate, 37  
Tune, 37  
YuMi, 37  
RobotWare  
overview, 38  
RobotWare, about the media pool, 39  
RobotWare option, 33  
run button, 29

## S

start button, 29  
status bar, 31  
step  
backward, 29  
forward, 29  
stop button, 29  
stylus pen  
location, 28  
using, 29  
system parameters, 41

## T

task bar, 31  
toggle buttons, 29  
tool, overview control tools, 40  
touch screen, 27, 31

## U

USB port  
FlexPendant, 28





# 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.**

No. 4528 Kangxin Highway  
PuDong District  
SHANGHAI 201319, China  
Telephone: +86 21 6105 6666

[www.abb.com/robotics](http://www.abb.com/robotics)