

RobotWare

Industrial Robot Controller Software

IRC5



Sharpen your robots' performance

RobotWare is a family of controller software designed to make you more productive and lower your cost of owning and operating a robot. The heart of this powerful and configurable software is ABB's robot language, RAPID, a highly flexible programming tool and one of the most powerful software languages in the robot industry. This 'shop floor' language is included in every ABB control system and gets you on speaking terms with your robot. RobotWare has a range of additional functions and process specific applications, which add up to a complete controller-based software concept.

RobotWare ensures optimal process performance through ABB's advanced motion technology that has the most accurate path holding on the market.

ABB also offers unique personnel safety and error recovery features. With RobotWare, you will be able to effectively program your robot systems to do exactly what you want.

Key benefits

- High adaptability to your specific needs
- Short cycle times and high accuracy
- Superior reliability and safety
- Extensive communication capability for integration and control
- Built in process control functionality

Basic Functionality

Programming language

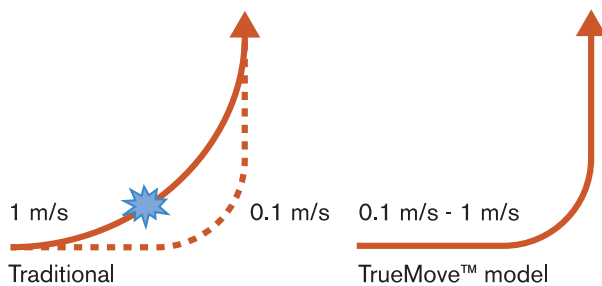
RAPID is a flexible, high-level programming language delivered with all ABB robot systems. Its basics are easy to use, while deeper layers allow you to create highly sophisticated solutions.

ABB Motion Technology

Motion control is the key to the robot's performance in the area of path accuracy, speed, cycle time, programmability and synchronization with external devices. By improving these parameters, users improve quality, productivity and reliability. The path accuracy of TrueMove, together with the short cycle time of QuickMove, is the cornerstone of these user benefits.

TrueMove™

TrueMove ensures that the motion path followed by the robot is the same as the programmed path – regardless of the robot speed.



QuickMove™

QuickMove is a unique self-optimizing motion control feature. It keeps cycle times at a minimum by ensuring maximum acceleration at every moment. Tests have shown that ABB robots can reach more than 25 % shorter cycle times than competitors.

Additional axes

Up to 36 axes can be run from the control system. The robot main axes can be coordinated with external mechanical structures such as work-piece positioners and track-motion devices or gantries. The kinematic representation of external structures makes programming easier and quicker.

Soft Servo

In applications where materials or tools cannot be precisely positioned, the robot can be set to a Soft Servo mode. This means that the robot acts like a mechanical spring when encountering resistance from the environment.



Security and safety

IRC5 complies with all safety regulations by providing redundant safety circuits, a three position enabling device and safe monitoring of reduced speed mode etc.

The safety is further enhanced by internal supervision on several levels which makes it possible to detect exceptional conditions at an early stage.

Error handling

Errors on your production line should not necessarily mean a standstill. In such an event, you would want to get your robot back into production with as little operator intervention as possible. Using pre-defined operator dialogues, you can give the operator specific options of how the error should be handled. This exception handling is ensured through customized error handlers that can be set up to take a certain action depending on error type.

If the power supply is cut off during operation, the robot will be able to restart at the exact same position and system status as before the power failure.

I/O-System

In addition to a number of discrete I/O, IRC5 can be equipped with one or multiple fieldbus channels (Devicenet, Profibus, Interbus etc.).

The I/O-system is easy to configure with your own naming of the I/O-signals and has a broad range of different features that can be configured the way you like them.

User Authorization System

IRC5 includes an advanced user authorization system (UAS). It includes administration of users and access rights connected to user names and passwords. The same user can have different access rights for different parts of the robot system. UAS helps users to get an easy-to-use interface, with access to relevant information. UAS improves quality of your systems by letting only authorized personnel access sensitive data.

System Property Browser

Is a browser for all properties of your system. Which cards are included with which software revision? What is the temperature in the controller? System Property Browser has the answers.

RobotWare Options

Advanced Shape Tuning is used to optimize your robot for cutting advanced shapes at low speed (10-100 mm/s).

Absolute Accuracy makes your robot an ideal robot and identical to any other Absolute Accurate robot. Perfect for off-line programming and fast replacements of robots. The option includes a Birth Certificate, which guarantees the accuracy of the robot. For more information, see separate data sheet.

MOTION COORDINATION

MultiMove Coordinated gives you the possibility to run several robots from the same controller cabinet. The motion of the robots can be either coordinated to a common work object or independent of each other.

MultiMove Independent gives you the possibility to run several robots from the same controller cabinet. The motion of the robots is independent of each other.

Multiple Axis Positioner is used to make multiple axis devices (positioners etc.) move totally coordinated with the robot.

Conveyor Tracking coordinates the robot motion with a work object on a conveyor line.

Sensor Synchronization adjusts the robot speed to an external moving device (e.g. a press or a conveyor) with the help of a sensor. The option can also be used for synchronizing two robots with each other. This option simplifies programming and improves productivity of any loading /unloading applications.

MOTION EVENTS

World Zones makes it possible to define zones of cubical-, cylindrical- or spherical shapes, as well as zones in an axis joint range. The zones can be used to stop the robot from entering a zone, either permanently or only when another robot is working in the zone. Another typical use is to check if the robot is in a 'home' position.

Fixed Position Events is used to issue events depending on the current robot position. They can be used to control or check the status of peripheral equipment. Events might be of the type: Change/Check the value of an I/O signal or make a procedure call.

MOTION FUNCTIONS

Independent Axis makes an additional axis (linear or rotating) run independently of the other axes in the robot system. The option includes the Axis reset function, which resets the axis counter to zero or any other, given number. The option is useful for repeating manoeuvres, where mechanical reset of the axis (turning back the axis) would mean loss of cycle time in the process.

Path Recovery stores all system data, when an interrupt occurs (fault message or other) and restores them after necessary actions have been taken. Useful for service interrupts.

Path Offset gives you the possibility to track the programmed robot path at a given offset distance. The robot can alternate following the path and making an offset, depending on inputs from an AI/DI or serial channel.

MOTION SUPERVISION

Collision Detection protects your equipment and robot from severe damage. Collision Detection stops the robot if the motion torque values are exceeded.

COMMUNICATION

FTP/NFS client makes it possible to read information on a remote hard disk directly from the controller.

PC Interface provides the communication interface between the robot and a network PC. This is useful if you want to:

- Use an OPC Server interface for SCADA integration (delivered with the RobotWare CD)
- Use RobotStudio^{Online} to interact with the controller over a network connectivity.

Note: For local connection over the service channel, PC Interface is not required.

- Communicate with other ABB Industrial Robot Software

FlexPendant Interface is the option that makes it possible to run your own application on the FlexPendant, e.g. an operator panel. Applications are developed in Microsofts VisualStudio.net.

Fieldbus Command Interface is a communication protocol, used for communication with DeviceNet modules, e.g. for changing configuration.

File and Serial Channel Handling includes instructions for communication via serial channels. This can be used to continuously store data (program output) on a disk or to use a bar code reader as input to the robot.

I/O CONTROL

Logical Cross Connections gives you the possibility to define logical connections between multiple inputs and outputs, thus offering simple PLC functionality.

Analog Signal Interrupt is used to supervise equipment and make the robot react on its status. E.g. supervise a door opener or a temperature sensor.

Multitasking lets you run up to 14 RAPID programs, in parallel. Use them for supervision of external equipment, operator dialogue or advanced calculations. Background programs start automatically when the power is turned on and they continue to run, even if the main program is stopped.

Continuous Application Platform is used for designing continuous path process applications, such as arc welding applications. By using CAP, the development work is much faster and results in robust high performance applications.

Discrete Application Platform is used for designing discrete point process applications, such as spot welding applications. By using DAP, the development work is much faster and results in robust high performance applications.

Advanced RAPID is the toolbox for the expert RAPID programmer. Includes a manual for the kernel of the RAPID language and a number of advanced functions on a bit level.

Sensor Interface is an interface with a driver for serial communication (RTP1 & LTAPP). This makes it easy to exchange data, with user set names for offset values, gap between sheets and timestamps etc.

SERVO MOTOR CONTROL

Servo Tool Control is a general and flexible software platform for controlling an integrated servo tool (e.g. a spot welding gun) from the robot controller.

Servo Tool Change enables on-line change of tools (e.g. spot welding guns). The robot keeps track of the design data of up to 8 different tools (reach, weld force, type of servo motor).

Electronically Linked Motors makes the robot control master/slave motor configurations. Can be used to replace mechanical driving shafts in gantries or positioners. Up to 11 motors can be controlled.

DIAGNOSTIC TOOLS

Service Information System predicts service stops for large robots. Includes operating time, calendar time and advanced algorithms for calculation of gearbox services. Alarms on the FlexPendant and in WebWare.

APPLICATION OPTIONS

RobotWare-Arc makes your robot optimized for arc welding. The positioning of the robot and the process control and monitoring are handled in one and the same instruction as well as process equipment supervision, error recovery, etc.

RobotWare-Spot includes routines for gun pre-closing, simulation possibilities, reverse execution with gun control and supervision of weld equipment, error recovery, etc. The RobotWare-Spot family includes options for multiple guns and servo guns.

RobotWare-Dispense helps you handle on/off guns as well as proportional guns. Can handle up to 5 guns simultaneously in wet or dry mode and possibilities to restart an interrupted dispensing sequence.