Wizard Easy Programming

Quickstart Guide

The ABB Wizard Easy Programming Tool is a block-based programming interface for collaborative robots made by the ABB robot manufacturer. The language is available on the FlexPendant of the robot and has multiple categories of blocks for use. The categories are briefly described below. Words surrounded by brackets below represent variables in the programming environment.

- **Message:** Blocks under the Message category are used to receive user input through the graphical user interface and to print messages on the teaching pendant. The input received can be either numerical (the number is inserted in a text field and saved as a numeric variable) or categorical (the category is selected through button interactions and saved as a numeric variable).

    - There are four blocks available under the message category: “Clear operator messages on FlexPendant”, “Show <message> on FlexPendant”, “Ask <question> with <answer options>. Save this answer in <numeric variable>”, and “Ask <question> with a numeric answer. Save the answer in <numeric variable>”.

- **Move:** Blocks under the Move category are used to move the robot. The robot can be moved by joint or in a straight line. Every movement block receives a tool, speed, and position as input.

    - There are two blocks available under the move category: “Move <tool> <speed> to <somewhere>”, and “Move <tool> <speed> in a straight line to <somewhere>”.

- **Stop & Wait:** Blocks under the Stop & Wait category are used to make the program execution stop or wait for a defined period.

    - There are three blocks available under the stop & wait category: “Wait <number>
    - seconds”, “Stop” and “Wait until the robot has reached a stopping point”.

- **Procedures:** Blocks under the Procedures category are used to define and call custom functions made by the developer in their program solution.

    - There is only one default block available in the Procedures category: “Call <procedure>”. However, there is also an “Add Procedure” button inside this category for developers to define new procedures
    - Three customized procedures are also available to open, close, and restart the gripper, named respectively as OpenGripper, CloseGripper, and StartGripper.

The StartGripper procedure is used to activate the gripper before the program execution.

- **Loops:** Blocks under the Loops category define loops in the program execution.
    - There are two blocks available under the Loops category: “Repeat <number> times” and “Repeat <while or until> <condition>”.
- **Signals:** Blocks under the Signals category are used to set, send, and read digital and analogic inputs and outputs. Participants in this experiment should not use blocks under the signals category.
- **Logic:** Blocks under the Logic category are used to define the logic of the program execution.
    - There are four blocks available in the Logic category: “If <condition> do”, “If <condition> do, else”, “<variable> <operand> <variable>”, and “error <error variable> occurs”.
- **Variable:** Blocks under the Variable category define variables in the program solution. There are three different types of variables available for use under this category: number, boolean, and string. Each variable can used in a “Set <variable> to” block to update its value or be used as a variable value block.

Besides the block categories, there is also a **Data** button on the top-right corner of the programming language that developers can use to open an interface where they can set, update, and delete the variables and robot positions defined in their program solution.

Next to the Data button, there is also a **Help** button where developers can access technical information about the blocks and the programming language.

On the top center of the programming environment, there is an **Apply** button that developers should use to save their changes every time they make an update in their program solution.

A **File** button is also available to open other program files. A window containing the messages written by message blocks can be found through a **Messages** button on the top left corner of the programming environment. Next to the Messages button, there is also an **Event Log** button where the logs of the robot and the programming language are reported by the operating system.

To run and stop the program execution, there are hard buttons available on the FlexPendant, including but not limited to buttons to start and stop the program, and buttons to move to the next instruction or return to the previous instruction.