COURSE OUTLINES

UK Robotic Training

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Scheduled

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UK R552 IRC5 Programming and Operation
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UK R565 MAG Process & ArcWare Programming
UK R5590 RobotStudio Online
UK R5591 RobotStudio Offline Programming stage 1
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UK R569 IRC5 SafeMove 1st Generation
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UK R752 OmniCore Programming and Operation

On Demand

UK R500 IRC5 YuMi Programming and Operation
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UK R752v OmniCore Programming and Operation

For availability and booking of Scheduled courses, please use the link below.

Scheduled Course Online Booking

For more information and booking On-Demand or Onsite courses, please email the training team using the link below.

Email UK Robotics Training
OUTLINE - ROBOTICS

IRC5 Operator
UK R551

Course Outline
Duration 2 days
Beneficial for robot operators and maintenance staff
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Not required

Subject areas:
Safety Instructions
Safe working practices
Emergency stops and recovery
Enabling device
Modes of operation and Safety interlocks
Brake release and Pinch points
Program reset and Collision awareness

System Description
Robot and external mechanical units
Control system, Operators panel and FlexPendant
Start-up and Shut-down procedures

Program Operation
Starting, stopping and stepwise program operation
Program Editor and Production windows
Teach, Test and Production operational modes
Override speeds
Continuous & Cycle running modes
Debug menu

Jogging the robot using the joystick
Joint axis and linear jogging
Tool Re-Orientation
Coordinate systems
Jog speed and incremental positioning

Event messages and logs
Error identification
Recovery

Modifying a Program
The program Editor
Move instructions (MoveJ, MoveL)
Modifying Positions

Continued:

Tool Center Points
Tool center point appreciation

Work object coordinates
Workobject appreciation

Using Inputs and Outputs
Operating the Input Output window
Set, Reset and WaitDI instructions

Program Structure appreciation
Routines and program flow
Debug menu and program reset
Modules
Backup and Restore

Objectives
On completion, participants will be able to perform:
Safe program operation
FlexPendant operation
System start-up, shut-down procedure, and error recovery
Jog the robot with the Joystick
Perform program reset
Modify program positions
Backup and Restore system information
Course Outline
Duration 4.5 days
Beneficial to programmers, operators, and maintenance staff
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Not required

Subject areas:
Safety instructions
Safe working practices
Emergency stops and recovery
Enabling device
Modes of operation and Safety interlocks
Brake release and Pinch points

System description
Robot and external mechanical units
Control system, Operators panel and FlexPendant
Start-up and Shut-down procedures

Program operation
Starting, stopping and stepwise program operation
The ‘Program editor’ and ‘Production’ windows
Manual and Automatic operation
Override speeds
Continuous & Cycle running modes
Debug menu and program reset and collision awareness

Jogging the robot using the joystick
Joint axis, Linear and Orientation Jogging
Coordinate systems
Jog speed and incremental positioning

Programming RAPID
The program Editor
Routines and program flow
Move instructions (MoveJ, MoveL and MoveC)
Editing Speed and Zone data
Modifying positions
Saving Programs

Event messages and logs
Error identification and Recovery

Tool center points and Work-object coordinate systems
TCP, tool center point, and work-object theory, and definition

Continued:
Logical instructions
Digital Inputs (WaitDI, WaitUntil)
Digital Outputs (Set, Reset, SetDO)
Waiting for time

Decision making instructions
Compact IF, IF Then...
While
Test

Working with numbers
Increment, Decrement, Clear
Assigning a value

FlexPendant messaging instructions
TPWrite, TPErase, TPShow, TPEndReadNum, TPEndReadFK

Evaluating cycle times
Clock data, clock instructions and clock reading function

Task memory structure
Program and System Modules
Backup and Restore

Objectives
On completion, participants will be able to perform:
Safe program operation
FlexPendant operation
System startup, shutdown, and error recovery
Jog the robot with the Joystick
RAPID programming, editing, testing, and reset
Appreciation of basic program structure and flow
Backup and Restore of system information

Objectives
On completion, participants will be able to perform:
Safe Operation of the YuMi® equipment
Calibrate YuMi arms and Grippers
Jog robot arms using Joystick
Create basic RAPID programs
Program MultiMove Instructions and data
Configure Cameras using RobotStudio’s Integrated Vision
Program RAPID code to move robot to a detected object
Program Gripper specific instructions
Measure a contact force using ABB TuneMaster software
Perform a backup of the IRC5 controller
OUTLINE - ROBOTICS

IRC5 YuMi Programming and Operation
UK R500

Course Outline
Duration 4 days
This training is targeted at Integrators / Programmers
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
UK R552 IRC5 Programming & Operation is recommended
but not required

Subject areas:

Safety
Performance levels
Safe working practices

Description and operation of the YuMi®
Product Introduction.
FlexPendant Navigation & Jogging the YuMi ®
Operate YuMi ® system in manual and automatic run mode.

RAPID programming
Create simple programs
Tool Centre Point definition
Work-object coordinate definition

MultiMove
MultiMove concepts
MultiMove Instructions and data

RobotStudio®
Use RobotStudio software to interface with the YuMi ®
Setup camera configuration
Use Integrated Vision inspection tools
Program using RAPID code snippets in RobotStudio’ s text editor

Calibration of the Arms and Hands of YuMi®
Understand how to properly calibrate the arms and the hands.

Continued:

Utilize YuMi® specific RAPID code
Gripper Instructions
Contact Linear

TuneMaster software
Measuring contact force during robot motion

Understanding YuMi® specific parameters.
Enabling collision error handling

Backup system information
Perform a Backup and Restore

Objectives
On completion, participants will be able to perform:

Safe Operation of the YuMi ® equipment
Calibrate YuMi arms and Grippers
Jog robot arms using Joystick and lead-through methods
Create basic RAPID programs
Program MultiMove Instructions and data
Configure Cameras using RobotStudio’ s Integrated Vision
Program RAPID code to move robot to a detected object
Program Gripper specific instructions
Measure a contact force using ABB TuneMaster software
Perform a backup of the IRC5 controller
OUTLINE - ROBOTICS
IRC5P Programming and Operation (Paint)
UK R345

Course Outline
Duration 5 days
Beneficial for robot operators, programmers and maintenance staff working with IRC5P (Paint) robots
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Knowledge of operating Windows PC beneficial

Subject areas:

Safety Instructions
Safe working practices for programming and operation
Operating controls and indicators on the robot controller

Jogging the robot using the joystick
Coordinate systems
Joint axis, linear jogging, and Tool Re-Orientation

Programming and Operation
Program Structure
Starting, stopping and stepwise program operation
Programming and editing using the TPU (Teach Pendant Unit)
Basic editing using RobotStudio, ShopFloor Editor and Robview5
Movement instructions
Input and output instructions
PaintWare instructions and data

Tool Centre Points
Tool center point definition

Work object coordinates
Workobject definition

 Conveyor Tracking (Optional)
Base-frame definition theory
RAPID Instructions for conveyor tracking

Objectives
On completion, participants will be able to perform:

Practice all areas of safety as they pertain to the robot
Identify and use the controls necessary for robot operation
Run robot system in manual or automatic modes
Interpret and respond to error codes
Basic programming and editing using the pendant
Operate RobotStudio, ShopFloor Editor and Robview5
Use input and output instructions within a basic program
Use movement instructions within a basic program
Add and use PaintWare functionality in a program
Teach object tracking for moving conveyor
OUTLINE - ROBOTICS

IRC5 Advanced Programming stage 1

Course Outline
Duration 4.5 days
Beneficial to Integrators, Programmers, Advanced Operators
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have attended the UKR552 IRC5 Programming & Operation Course or have an extensive working knowledge of the topics covered

Subject areas:

Safety
Complex Tool Center Points and Work-objects
Defining moving and stationary TCP
Definition of Work Objects and Mirroring
Optional Arguments
Review Move Instructions and their options
Task structure and Module Declarations
Attributes, Load and Unload during execution Local & Global data
World coordinate system and World zones
Definition of World co-ordinates and World zones
Working with Numbers
Assigning a value to data and Common Numeric Functions
Increment, Decrement and Clearing Values
Checking data or values using “IF” and “TEST”
Cycle Timing Instructions
Reset, Start, Stop and reading a clock used for timing
Configuration Instructions
Control robot axis configuration during Joint and Linear motion
Interpolation method through Singular Points
Positional Functions
Offset / Reltool and reading the current position
Searching Instructions
Routine Handling
Explanation and Uses of Backwards, Error, and Undo Handling
Position Displacement
Activating and deactivating program displacement
Activating program displacement by specifying a value

Continued:
Interrupts and Trap routines
Connecting a variable to a trap routine
Interrupt from a Digital /Analogue Input signals or Time
Activating and deactivating individual interrupts
Enabling all interrupts
Commonly used interrupt Instructions
Event Handling
Power on, Start, Restart, Stop, Qstop, Reset
Logical Instructions
Advanced I/O Instructions
Changing Analogue Output values / Group of Digital Output signals
Waiting and testing for Inputs
Configuration of Group/ Binary signals and Cross Connections
Fixed Position Events
Performance Instructions
Reducing acceleration and overriding or limiting program velocity
Defining and activating payload
Soft Servo and External Axes activation & deactivation
Creating Your Own Instructions and Functions
Routine declarations and parameters
Messaging Instructions and Functions
Objectives
On completion, participants will be able to:
Create and properly use complex tool center points
Define and use work object co-ordinate systems
Define and use world zones
Use numerical data instructions, perform String Manipulation
Use instructions for avoiding singularity areas
Use search, error handling and Program displacement
Use interrupt instructions and trap routines
Use event routines and backward handling
Use Error Handlers and Undo Handlers
Use communication instructions
Use advanced I/O instructions
Use instructions to enhance robot performance
Create basic ‘user’ instructions and functions
OUTLINE - ROBOTICS

IRC5 Advanced Programming stage 2
UK R557

Course Outline
Duration 4 days
Beneficial to Integrators and Programmers of IRC5 robots
Instructor led seminar with practical exercises
The language of the course is English

Prerequisites
Students must have attended the UKR556 IRC5 Advanced Programming stage1 course and have ongoing IRC5 experience

Subject areas:
Dot Notation
Accessing Data type parts
Checking robot at home
Creating Routines with arguments
Creating instructions with parameters
INOUT, Optional Arguments
Present() Function
Mutually Exclusive Arguments
Global and Local Routines and Data
PERS/VAR
“Present()” Versus “?”
Functions with Parameters
Variables inside Routines
Arrays
Creation, Manipulation, Printing, Resetting
In combination with routines and parameters
1, 2 and 3 dimensional arrays
Strings
String Concatenation, Manipulation and Functions
8 Bit Hexadecimal ASCII Codes
Serial Communication
Reading, Writing & Appending Files
COM Port Communication
File Handling
Copying, Renaming and Removing Files
Making, Removing and Opening Directories
Directory Listings
File Handling Functions

Continued:
Socket Messaging
Client and Server configuration
FTP Client, FTP Server, FTP Robot Client configuration
Mounting an FTP Network Drive
MultiTasking
General Description, Creating a parallel program
System parameter setting, Task Data
Synchronizing using a common variable, Interrupt, and dispatcher
Common data in several tasks
Teach pendant messages from parallel tasks
NFS Client
NFS Server and Robot Client Configuration
Mounting an NFS Network Drive

Objectives
On completion, participants will be able to perform:

Demonstrate the techniques of advanced programming
Use Dot notation
Create instructions and functions to suit any purpose
Create and manipulate Arrays
Manipulate Strings
Communicate using Serial Channels
Handle Files and Directories
Utilise MultiTasking to create and program Background tasks
Socket Messaging for Client and Server configurations
Configure the robot to communicate with an FTP Server
Configure the robot to communicate with an NFS Server
OUTLINE - ROBOTICS

IRC5 MAG Process and ArcWare Programming
UK R565

Course Outline
Duration 2 days
Beneficial for robot operators, programmers, and maintenance staff
Instructor led seminar with practical exercises
The language of the course is English

Prerequisites
Students must have attended either the UK R551 IRC5 Operator or UK R552 IRC5 Programming and Operation

Subject areas:

Safety Instructions
Safe working practices when operating a welding robot

MAG welding process
Short circuit, spray, pulse, rapid arc and, CMT
Optimum weld settings
Synergic and non-synergic settings
Approach angles, Weld geometry.
Weld quality and fault recognition

ArcWare Programming and editing
Welding Instructions, ArcL and ArcC
Seam, Weld and Weave data

Tool Calibration
Tool data theory
TCP setup and quick-check using ABB Bullseye equipment
Operate Torch Service Centre, cleaning / wire cutting (if used)

Manual functions
Gas purge and wire feed
Process Blocking
Weld and weave tuning

External Axis
Base frame calibration
Programming Coordinated motion with robot and rotary positioner

Objectives
On completion, participants will be able to perform:

Setting up of weld equipment
Programming of weld instructions and parameters
Safe Operation of welding robot
Recognition and correction of weld defects
Bullseye and torch service operation
Calibrate external axis positioner
Program robot and positioner coordinated motion
OUTLINE - ROBOTICS

IRC5 Electrical Maintenance
UK R555

Course Outline
Duration 3 days
Beneficial for robot service engineers and electrical maintenance personnel
Instructor led seminar with practical exercises
The language of the course is English

Prerequisites
UK R551 IRC5 Operator or UK R552 IRC5 Programming & Operation
Delegates must be electrically competent

Subject areas:

Safety Instructions
- Electrical Safety
- Emergency stops
- Enabling device
- Modes of operation and Safety interlocks
- Brake release and Pinch points
- Program reset and Collision awareness

System Description
- Robot and external mechanical units
- Control system, Operators panel and FlexPendant
- Start up and Shut down procedures
- Backup and Restore system information

Event messages and logs
- Error identification
- Recovery

RobotStudio
- Connecting PC to online robot
- Building robot operating systems
- Starting the boot-server application
- Downloading operating system to robot controller
- Advanced restart options
- Setting up ‘User Authorisation System’

Continued:

Servo System
- Drive system components
- Fault finding on drives

Computer System
- Computer unit components
- Fault finding on computer

Safety chains
- Safety chain components
- Fault finding on safety run-chain

Calibration
- Robot calibration methods
- Measurement system
- Fault finding exercises

I/O system
- Configuring Input/Output parameters
- ABB DeviceNet cards and addressing
- Cross connections

Objectives
On completion, participants will be able to perform:

Trouble shooting
- Preventative maintenance procedures
- Restart Procedures
- RobotStudio Online connection
- Install RobotWare operating system
- Backup and Restore system information
OUTLINE - ROBOTICS

Fieldbus
UK R600

Course Outline
Duration 3 days
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have attended the UKR551 IRC5 Operator or
UK R552 Programming and Operation course

Subject areas:

Fieldbus Expressions
Master/Slave etc.

Computer Connections
LAN/WAN etc.
AnyBus Devices
PCIe Profibus/DeviceNet Cards

Signal Definitions

DeviceNet
DeviceNet components
Cable lengths/Baud Rates/Termination
Connection Types
ABB Standard Boards and configuration files
Configuring a WAGO DeviceNet Coupler
Configuring a DeviceNet AnyBus Adapter

EtherNet/IP
CIP Routing
Intended use of WAN and LAN ports
EtherNet/IP on different networks
Configuring an EtherNet/IP AnyBus Adapter
Configuring a WAGO EtherNet/IP Coupler
EDS Files
IRC5 new local I/O modules

Continued:

Profinet
Profinet Overview
RobotStudio IO Configurator
Configuring a Profinet AnyBus Adapter
Configuring a WAGO Profinet Coupler

ProfiBus
ProfiBus Cables/Connectors/Speeds/Termination
Softing Profibus Configurator
Configuring a Profibus AnyBus Adapter
Configuring a WAGO ProfiBus Coupler

Review and Summary

Objectives
On completion, participants will be able to perform:
Configuration of the ABB IRC5 officially supported Fieldbuses.
OUTLINE - ROBOTICS

OmniCore Single Arm YuMi Programming and Operation
UK R650

Course Outline
Duration 4 days
This training is targeted at Integrators / Programmers
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
UK R652 OmniCore Basic Programming & Operation is recommended but not required

Subject areas:
Safety
Performance levels
Safe working practices

Description and operation of the YuMi®
Product Introduction.
FlexPendant Navigation & Jogging the YuMi ®
Operate YuMi ® system in manual and automatic run mode.

RAPID programming
Create simple programs
Tool Centre Point definition
Workobject coordinate definition

RobotStudio®
Use RobotStudio software to interface with the YuMi ®
Setup camera configuration
Use Integrated Vision inspection tools
Program using RAPID code snippets in RobotStudio’ s text editor

Continued:
Calibration of the Arm and Hand of YuMi®
Understand how to properly calibrate the arms and the hands.

Utilize YuMi® specific RAPID code
Gripper Instructions
Contact Linear

TuneMaster software
Measuring contact force during robot motion

Understanding YuMi® specific parameters.
Enabling collision error handling

Backup system information
Perform a Backup and Restore

Objectives
On completion, participants will be able to perform:

Safe Operation of the YuMi ® equipment
Calibrate YuMi arm and Gripper
Jog robot arm using Joystick and lead-through methods
Create basic RAPID programs
Configure Cameras using RobotStudio’ s Integrated Vision
Program RAPID code to move robot to a detected object
Program Gripper specific instructions
Measure a contact force using ABB TuneMaster software
Perform a backup of the OmniCore controller
Course Outline
Duration 2 days
Beneficial to Maintenance Engineers and Programmers who require the fundamental knowledge of working with RobotStudio’s Online non-licensed features
Instructor led seminar with practical exercises.
The language of the course is English
This course does not include the following features:
SafeMove configuration, Integrated vision, conveyor tracking.

Prerequisites
Students must have experience with Microsoft Windows and completion of an ABB robot programming course

Subject areas:

RobotStudio Online Overview
Introduction to RobotStudio’s non-licensed features
Downloading and Installing RobotStudio & RobotWare
Exploring RobotStudio tabs, ribbons, and browsers
Licensing options

Connecting RobotStudio to robot controller
Methods of connection
Write access
Authenticate, managing users and grants

Controller Tools
Methods of restarting the controller
Backup and Restore
Event messages
File Transfer
FlexPendant viewer
Online Monitor

Operating Inputs / Outputs
View status and changing output value
Simulating signals

Continued:

Configuration
Robot Parameters
Adding and editing Input and Output signals
Upgrading robot operating system software

Rapid Editor
Text editing
Comparing files
Using Rapid reference help files

Test and Debugging
Methods of program execution
Using Breakpoints

Path data & Path editor
Viewing path data and adjusting values
Graphically viewing path and adjusting values

Virtual Robot
Build a station with virtual controller
Virtual FlexPendant
Basic simulation tools

Objectives
On completion, participants will be able to perform:

Download RobotWare software onto PC
Connection of RobotStudio to Robot controller
Installation of robot operating system
Create User Authorisation
Backup and restore system information
Basic Rapid editing
Creation of virtual robot from real robot backup
RobotStudio Offline Programming
Stage 1
UK R5591

Course Outline
Duration 4.5 days
Beneficial to Programmers / integrators who require the fundamental knowledge of working with RobotStudio. Instructor led seminar with practical exercises.

The language of the course is English

Prerequisites
Students must have experience with Microsoft Windows and completion of UK R552 IRC5 Programming and Operation course

Subject areas:

RobotStudio Basics
Configure user Library and Geometry galleries
Help menu, Exploring Views, Tabs, Ribbons
Navigating the graphics window; pan, zoom and rotate
Selection levels and snap modes
Methods of creating a new station
Importing robots, attaching tools and moving CAD files
Creating a workobject coordinate system
Programming Motions and setting axis configuration
Setup and Run a Simulation
Saving a robot program
Modifying geometries Local Origin
Creating a Tool with TCP from geometry
Moving Robots Task Frame (Robot World Coordinate)

Zone Data Visualization
Turning on visual zones and automatic reduction of zones
Setting up Asymmetrical zones

Graphical Programming
Creating Paths automatically from Curves and Edges
Target manipulation and setting axis configurations
Collision detections and evaluating reach

Signal Analyzer
Signal setup and analyzing
Performance tuning and data export

Continued:

Modelling
Creating mechanisms
Mirroring part geometries, Mirror paths

Programming and Simulating IO signals
Setup a simulation from a robot backup
Working with Smart Components and the RAPID editor
Adding Action Instructions (Logic)
Station Logic setup
Configure simulation settings

Transfer
Open and edit program modules
Restoring a Backup file, Comparing and transferring data

External Axes
Setting up a Track simulation
Setting up a Positioner simulation

Sales tools
Enhancing a station’s graphic appearance
Adding and moving to graphical viewpoints
Managing simulation events
Recording a movie
Record simulation to Station Viewer.exe file
Exporting views as 2D drawing

Objectives
On completion, participants will be able to perform:

Create a RobotStudio Station
Perform offline programming
Optimize Zone data
Create a Simulation
Analyze signals
Basic modelling
Transfer RAPID code to robot
Program External axis
Course Outline
Duration 4 days
Beneficial to Programmers / Integrators who require further knowledge of working with RobotStudio.
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Completion of UK R5591 RobotStudio Offline Programming stage 1 course

Revision of RobotStudio stage 1
Setting up and track simulation

Event Manager
Adding Events: I/O Connections, I/O signals changed
Simulation events

Smart components
Create smart components In-feeder, vacuum gripper, out-pallet
Complete a simulation using smart components

MultiMove
Concepts
Building a MultiMove station
Programming MultiMove using Wizard
Changing the MultiMove motion behavior

Mechanisms
Create a gripper tool mechanism
Turn gripper mechanism into a Smart component
Use gripper in a station
Create a complex external axis mechanism

Continued:
Conveyor Tracking
Conveyor setup
Programming the robot to track parts moving along the conveyor
Running the simulation
Change conveyor speed and the start window
Adding a second robot to the station

ScreenMaker
Prepare the station
Open and configure a new ScreenMaker project
Design and test the main screen Production tab
Design and test the main screen Service tab
Design and configure a gripper screen
Design and configure a conveyor screen

Layout Tools
Configure and export 2D drawings from station views

Physics
Flexible cables and hoses
Changing the Physics behavior of station geometries
Create a joint mechanism
Setup a simulation combining physics cables with physics joints
Gravity and Friction

Course Objectives
On completion, participants will be able to:
Use simulation events
Create smart components
Program a MultiMove simulation
Create complex mechanisms
Setup and program conveyor tracking
Create FlexPendant custom screens using ScreenMaker
Export 2D drawings from the station
Use physics within simulations
Course Outline
Duration 2 days
Beneficial to Programmers / integrators who require the fundamental knowledge of working with RobotStudio ArcWeld PowerPac 1.
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have experience with Microsoft Windows and prior completion of a RobotStudio course

Subject areas:

Learning the Basics of the ArcWeld PowerPac
PowerPac Interface

Working with basic AWPP functions
Create a New Station and System
Creating a New Part Program
Data Manager and Templates
Programming Welds
Simulating Open Paths
Adding Additional Welds and Air Moves
Adding Service Procedures
Creating the Robot Program
Test Running the Program with Production Screen

Advanced Features
Working with multiple robots and positioners
Creating the System and Station
Importing a Process Template
Programming Welds in Multiple Tasks
Manipulating Process Paths
Removing and Adding Process to a Path

Objectives
On completion, participants will be able to perform:
Create Virtual System and RobotStudio station
Create new part programs using ‘Production Manager’
Program weld paths using the ArcWeld PowerPac 1
Simulate graphical paths and synchronize to RAPID code
Program Multiple robots with positioner
OUTLINE - ROBOTICS

IRC5 SafeMove 1st Generation
UK R569

Course Outline
Duration 2 days
Beneficial to integrators, programmers and maintenance staff
Instructor-led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have attended the UK R552 IRC5 Programming and
Operation Course or have an extensive working knowledge of the
topics covered.
Attendance of the IRC5 Advanced Stage 1 course is advantageous.

Subject areas

Overview
SafeMove 1st generation Hardware
General functions
Category 1 and 0 Safety Stops

Active Functions
Safe Stand Still
Safe Axis Speed
Safe Axis Range
Safe Tool Speed
Safe Tool Zone
Support Functions

Passive Functions
Monitor Axis Range
Monitor Stand Still
Monitor Tool Zone

Support Functions
Cyclic Brake check
Safe Brake Ramp

Synchronization
Synchronization Switch (Single & Dual Channel)
Software Synchronization
PreWarning

Continued:

EIO Configuration
Virtual Board
Cross Connections
Antivalent & Equivalent Signals

RobotStudio
UAS Configuration
EIO Configuration
Safety Configuration
Tool Zone Visualizer Add-in

Objectives
On completion, participants will be able to perform:
SafeMove Install and Configuration
Synchronization
Recovery from Safety Violations
OUTLINE - ROBOTICS
IRC5 SafeMove 2
UK R5692

Course Outline
Duration 3 days
Beneficial to Integrators, Programmers, and maintenance staff
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have attended the UK R552 IRC5 Programming
and Operation Course or have an extensive working knowledge of
the topics covered.
Attendance of the IRC5 Advanced Stage 1 course is advantageous.

Subject areas:
Overview
Hardware
Safety IO Setup
Function Mapping
Pre and Post Logic
Stop Configurations
General Output
Keyless Option
Checksums

Safety Functions
Managing Safety Configurations
Tool and Arm Configurations
Safe Zones
Safety Functions
Safe Ranges
Track Configuration
Contact Application

Continued:
Support Functions
Cyclic Brake check
Safe Brake Ramp

Safety Violation
Violation Recovery

Synchronization
Synchronization Switch
Software Synchronization
Pre-warning Signal

RobotStudio
UAS Configuration
EIO Configuration
SafeMove Visualizer
IO Configurator

Objectives
On completion, participants will be able to perform:

SafeMove Installation and Configuration
Synchronization
Recovery from Safety Violations
OUTLINE - ROBOTICS

IRC5 EPS Electronic Position Switches
UK R568

Course Outline
Duration 1 days
Beneficial to Integrators, Programmers and maintenance staff
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have attended the UK R552 IRC5 Programming and Operation Course or have an extensive working knowledge of the topics covered.
Attendance of the IRC5 Advanced Stage 1 course is advantageous.

Subject areas

Overview
Hardware
General functions

Passive Functions
Monitor Axis Range

Support Functions
Cyclic Brake check
Safe Brake Ramp

Synchronization
Synchronization Switch (Single & Dual Channel)
Software Synchronization
PreWarning

EIO Configuration
Virtual Board
Cross Connections

RobotStudio
UAS Configuration
EIO Configuration
Safety Configuration

Objectives
On completion, participants will be able to perform:
EPS Installation and Configuration
Synchronization
OUTLINE - ROBOTICS

OmniCore Programming and Operation
UK R752

Course Outline
Duration 4.5 days
Beneficial to programmers, operators, and maintenance staff
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Basic PC knowledge and a technical background

Course Goal
The participant after completion should be able to create, test and optimize a simple, structured pick and place and path following applications.

Student profile
This course is the first step to become a robot programmer and for personnel with a need to modify existing programs

Subject areas:
Health & Safety
Introduction to OmniCore and ABB robots
Jogging the robot with the joystick
Basic Move-instructions
Program structure (Datatypes, Instructions, Routines, Modules)
Revolution counters
Tool center point definition
Work-objects coordinate definition
Saving data (Program, Backup, Diagnostics)
Create a Virtual Controller
RobotStudio RAPID editor
I/O- instructions
Most common instructions and program logic
Most common functions
Configuring FlexPendant Dashboards

Course objectives
Upon completion of this course, the student will:

Have a basic knowledge about the mechanics of ABB robots
Be able to jog the robot both linear, reoriented and axis-by-axis
Be able to structure a program using routines and modules
Understand the difference between Task and Program
Be able to program basic movements
Be able to update the revolution counters
Be able to create and define tooldata
Be able to create and define wobjdata
Be able to save programs and backup the system
Be able to create a virtual copy of a real controller
Be able to use RobotStudio for editing the robot program both online and offline
OUTLINE - ROBOTICS

Mechanical Maintenance
UK R755

Course Outline
Duration 3-5 days depending on mechanical unit
Please enquire for availability of specific robot types
Beneficial for staff responsible for robot maintenance
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have attended the UKR551 IRC5 Operator or
UK R552 Programming and Operation course

Subject areas:

Safety Instructions
Emergency stops
Safety & Overview
Introduction
Documentation
Mechanical manipulator overview
Safety
Special tools

Strip Down and Re-assemble
Motor removal and replacement
Complete wrist change
Upper arm removal and complete strip down
Lower arm removal
Cable harness removal

Maintenance
Preventative maintenance schedule & routines
Lubrication requirements
Practical exercises in maintenance & faultfinding

Service
Review of programming techniques
Possible failure points
Re-calibration procedures

Objectives
On completion, participants will be able to perform:

Understand Mechanical repair and component replacement
Understanding of internal robot workings
Preventative maintenance procedures

Review and Summary
OUTLINE - ROBOTICS

PickMaster 3
UK R756

Course Outline
Duration 4 days
Beneficial to Programmers / integrators who need to configure PickMaster 3 software
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Prior attendance of UKR552 IRC5 Programming and Operation and an operational knowledge of Microsoft windows is required, attendance of UKR556 IRC5 Advanced Programming Stage 1 will be beneficial

Subject areas:

Safety Instructions
Safe working practices
Emergency stops and recovery
Enabling device
Modes of operation
Program reset

System Description
Robot and external mechanical units
Control system, Operators panel and FlexPendant
Startup and Shutdown procedures
PickMaster 3

Installation and Commissioning
Camera Set-up & Calibration
Conveyor Tracking
Conveyor Base-frame Set-up
Fixed Index Work Area Set-up
Vision Set-up
Defining new products
How to set up ATC and Load Balance project

Objectives
On completion, participants will be able to perform:

Safe robot operation
Set-up a System
Build a Line and Project with PickMaster
Configure products with PickMaster
Test & Tune for running a product
Course Outline
Duration 5 days
Beneficial for robot operators and maintenance staff
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Not required

Subject areas:

Safety Instructions
Safe working practices
Emergency stops and recovery
Enabling device
Modes of operation and Safety interlocks
Brake release and Pinch points
Program reset and Collision awareness

System Description
Robot and external mechanical units
Control system, Operators panel and FlexPendant
Startup and Shutdown procedures

Program Operation
Starting, stopping and stepwise program operation
The program Editor and Production windows
Teach, Test and Production operational modes
Override speeds
Continuous & Cycle running modes
Debug menu

Jogging the robot using the joystick
Joint axis and linear jogging
Tool Re-Orientatio
Coordinate systems
Jog speed and incremental positioning

Event messages and logs
Error identification
Recovery

Continued:

Modifying a Program
The program Editor
Move instructions (MoveJ, MoveL)
Modifying Positions

Tool Centre Points
Tool center point Definition

Work object coordinates
Workobject Definition

Using Inputs and Outputs
Operating the Input Output window
Set, Reset and WaitDI Instructions

Program Structure appreciation
Routines and program flow
Debug menu and program reset
Modules, Backup and Restore

FlexVision
‘Teachin’ Details

Objectives
On completion, participants will be able to perform:

Safe program operation
FlexPendant operation
System startup, shutdown and error recovery
Jog the robot with the Joystick
Perform program reset
Modify program positions
Backup and Restore system information
Teachin Details
Course Outline
Duration 2 days
Beneficial for robot operators and maintenance staff
Instructor led online seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have experience using Microsoft Windows.
Each Student will require a computer with Internet connection.
Headset with microphone and webcam is preferable
RobotStudio installed preferably with premium or trial license.
RobotWare 6 will also need to be installed.
RobotStudio download link

Subject areas:

Safety Instructions
Safe working practices
Emergency stops and recovery
Enabling device
Modes of operation and Safety interlocks
Brake release and Pinch points
Program reset and Collision awareness

System Description
Robot and external mechanical units
Control system, Operators panel and FlexPendant
Start-up and Shut-down procedures

Program Operation
Starting, stopping and stepwise program operation
Program Editor and Production windows
Teach, Test and Production operational modes
Override speeds
Continuous & Cycle running modes
Debug menu

Jogging the robot using the joystick
Joint axis and linear jogging
Tool Re-Orientatation
Coordinate systems
Jog speed and incremental positioning

Continued:

Event messages and logs
Error identification
Recovery

Modifying a Program
The program Editor
Move instructions (MoveJ, MoveL)
Modifying Positions

Tool Center Points
Tool center point appreciation

Work object coordinates
Workobject appreciation

Using Inputs and Outputs
Operating the Input Output window
Set, Reset and WaitDI Instructions

Program Structure appreciation
Routines and program flow
Debug menu and program reset
Modules
Backup and Restore

Objectives
On completion, participants will be able to perform:
Safe program operation
FlexPendant operation
System start-up, shut-down procedure, and error recovery
Jog the robot with the Joystick
Perform program reset
Modify program positions
Backup and Restore system information
OUTLINE - ROBOTICS

IRC5 Programming and Operation
UK R552v (Virtual class)

Course Outline
Duration 4 days
Beneficial to programmers, operators, and maintenance staff
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have experience using Microsoft Windows.
Each Student will require a computer with Internet connection.
Headset with microphone and webcam is preferable
RobotStudio installed preferably with premium or trial license.
RobotWare 6 will also need to be installed.
RobotStudio download link

Subject areas:

Safety instructions
Safe working practices
Emergency stops and recovery
Enabling device
Modes of operation and Safety interlocks
Brake release and Pinch points

System description
Robot and external mechanical units
Control system, Operators panel and FlexPendant
Start-up and Shut-down procedures

Program operation
Starting, stopping and stepwise program operation
The ‘Program editor’ and ‘Production’ windows
Manual and Automatic operation
Override speeds
Continuous & Cycle running modes
Debug menu and program reset and collision awareness

Jogging the robot using the joystick
Joint axis, linear and orientation jogging
Coordinate systems, Jog speed and incremental positioning

Event messages and logs
Error identification and Recovery

Continued:

Programming RAPID
The program Editor
Routines and program flow
Move instructions (MoveJ, MoveL and MoveC)
Editing Speed and Zone data
Modifying positions
Saving Programs

Tool center points and Work-object coordinate systems
TCP, tool center point, and work-object theory, and definition

Logical instructions
Digital Inputs (WaitDI, WaitUntil)
Digital Outputs (Set, Reset, SetDO)
Waiting for time

Decision making instructions
Compact IF, IF Then...
While
Test

Working with numbers
Increment, Decrement, Clear
Assigning a value

FlexPendant messaging instructions
TPWrite, TPErase, TPShow, TPReadNum, TPReadFK

Evaluating cycle times
Clock data, clock instructions and clock reading function

Task memory structure
Program and System Modules, Backup and Restore

Objectives
On completion, participants will be able to perform:

Safe program operation
FlexPendant operation
System startup, shutdown, and error recovery
Jog the robot with the Joystick
RAPID programming, editing, testing, and reset
Appreciation of basic program structure and flow
Backup and Restore of system information
OUTLINE - ROBOTICS

IRC5 Advanced Programming stage 1
UK R556v (Virtual class)

Course Outline
Duration 4.5 days
Beneficial to Integrators, Programmers, Advanced Operators
Instructor led online seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have attended the UK R552 IRC5 Programming and
Operation course or have an extensive working knowledge of the
topics covered. Each Student will require a computer with Internet
connection. Headset with microphone and have experience using
Microsoft Windows.
RobotStudio with RobotWare 6 will need to be installed and either
a premium or trial license active. RobotStudio download link

Subject areas:

Safety
Complex Tool Center Points and Work-objects
Defining moving and stationary TCP, Work Objects and Mirroring

Optional Arguments
Review Move Instructions and their options

Task structure and Module Declarations
Attributes, Load and Unload during execution Local & Global data

World coordinate system and World zones
Definition of World co-ordinates and World zones

Working with Numbers
Assigning a value to data and Common Numeric Functions
Checking data or values using “IF” and “TEST”

Cycle Timing Instructions

Configuration Instructions
Control robot axis configuration during Joint and Linear motion
Interpolation method through Singular Points

Positional Functions
Searching Instructions
Routine Handling
Explanation and Uses of Backwards, Error, and Undo Handling

Position Displacement
Methods of activating and deactivating program displacement

Continued:

Interrupts and Trap routines
Connecting a variable to a trap routine
Interrupt from a Digital /Analogue Input signals or Time
Activating and deactivating individual interrupts
Enabling all interrupts, Commonly used interrupt Instructions

Event Handling
Power on, Start, Restart, Stop, Qstop, Reset

Logical Instructions

Advanced I/O Instructions
Changing Analogue Output values / Group of Digital Output signals
Waiting and testing for Inputs
Configuration of Group/Binary signals and Cross Connections

Fixed Position Events

Performance Instructions
Reducing acceleration and overriding or limiting program
velocity
Defining and activating payload
Soft Servo and External Axes activation & deactivation

Creating Your Own Instructions and Functions
Routine declarations and parameters

Messaging Instructions and Functions

Objectives
On completion, participants will be able to:
Create and properly use complex tool center points
Define and use work object co-ordinate systems
Define and use world zones
Use numerical data instructions, perform String Manipulation
Use instructions for avoiding singularity areas
Use search, error handling and Program displacement
Use interrupt instructions and trap routines
Use event routines and backward handling
Use Error Handlers and Undo Handlers
Use communication instructions
Use advanced I/O instructions
Use instructions to enhance robot performance
Create basic ‘user’ instructions and functions
OUTLINE - ROBOTICS

RobotStudio Offline Programming
Stage 1
UK R5591v (Virtual Class)

Course Outline
Duration 4.5 days
Beneficial to Programmers / integrators who require the fundamental knowledge of working with RobotStudio. Instructor led seminar with practical exercises. The language of the course is English

Prerequisites
Students must have experience with Microsoft Windows and completion of UK R552 IRC5 Programming and Operation course. Each Student will require a computer with Internet connection. Headset with microphone
RobotStudio 2022.x installed with premium, educational, or trial license.
RobotWare 6.15 and 7.8 or newer will also need to be installed. [RobotStudio download link]

Subject areas:

RobotStudio Basics
Configure user Library and Geometry galleries
Help menu, Exploring Views, Tabs, Ribbons
Navigating the graphics window; pan, zoom and rotate
Selection levels and snap modes
Methods of creating a new station
Importing robots, attaching tools and moving CAD files
Creating a workobject coordinate system
Programming Motions and setting axis configuration
Setup and Run a Simulation
Saving a robot program
Modifying geometries Local Origin
Creating a Tool with TCP from geometry
Moving Robots Task Frame (Robot World Coordinate)

Zone Data Visualization
Turning on visual zones and automatic reduction of zones
Setting up Asymmetrical zones

Graphical Programming
Creating Paths automatically from Curves and Edges
Target manipulation and setting axis configurations
Collision detections and evaluating reach

Continued:
Signal Analyzer
Signal setup and analyzing
Performance tuning and data export

Modelling
Creating mechanisms
Mirroring part geometries, Mirror paths

Programming and Simulating IO signals
Setup a simulation from a robot backup
Working with Smart Components and the RAPID editor
Adding Action Instructions (Logic)
Station Logic setup
Configure simulation settings

Transfer
Open and edit program modules
Restoring a Backup file, Comparing and transferring data

External Axes
Setting up a Track simulation
Setting up a Positioner simulation

Sales tools
Enhancing a station’s graphic appearance
Adding and moving to graphical viewpoints
Managing simulation events
Recording a movie
Record simulation to Station Viewer.exe file
Exporting views as 2D drawing

Objectives
On completion, participants will be able to perform:

Create a RobotStudio Station
Perform offline programming
Optimize Zone data
Create a Simulation
Analyze signals
Basic modelling
Transfer RAPID code to robot
Program External axis
Course Outline
Duration 4 days
Beneficial to Programmers / Integrators who require further knowledge of working with RobotStudio. Instructor led online seminar with practical exercises. The language of the course is English

Prerequisites
Completion of UK R5591 RobotStudio Offline Programming stage 1 course
Students must have experience using Microsoft Windows. Each Student will require a computer with Internet connection. Headset with microphone
RobotStudio 2022.x installed with premium or trial license. RobotWare 6.15 and 7.8 or newer will also need to be installed.
RobotStudio download link

Subject areas:
Revision of RobotStudio stage 1
Setting up and track simulation
Event Manager
Adding Events: I/O Connections, I/O signals changed
Simulation events
Smart components
Create smart components In-feeder, vacuum gripper, out-pallet
Complete a simulation using smart components

MultiMove
Concepts
Building a MultiMove station
Programming MultiMove using Wizard
Changing the MultiMove motion behavior

Mechanisms
Create a gripper tool mechanism
Turn gripper mechanism into a Smart component
Use gripper in a station
Create a complex external axis mechanism

Continued:
Conveyor Tracking
Conveyor setup
Programming the robot to track parts moving along the conveyor
Running the simulation
Change conveyor speed and the start window
Adding a second robot to the station

ScreenMaker
Prepare the station
Open and configure a new ScreenMaker project
Design and test the main screen Production tab
Design and test the main screen Service tab
Design and configure a gripper screen

Layout Tools
Configure and export 2D drawings from station views

Physics
Flexible cables and hoses
Changing the Physics behavior of station geometries
Create a joint mechanism
Setup a simulation combining physics cables with physics joints
Gravity and Friction

Course Objectives
On completion, participants will be able to:
Use simulation events
Create smart components
Program a MultiMove simulation
Create complex mechanisms
Setup and program conveyor tracking
Create FlexPendant custom screens using ScreenMaker
Export 2D drawings from the station
Use physics within simulations
OUTLINE - ROBOTICS

IRC5 SafeMove 2
UK R5692v (Virtual class)

Course Outline
Duration 3 days
Beneficial to Integrators, Programmers, and maintenance staff
Instructor led online seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have attended the UK R552 IRC5 Programming and
Operation Course or have an extensive working knowledge of the
topics covered. Attendance of the IRC5 Advanced Stage 1 course is
advantageous.
Each Student will require a computer with Internet connection.
Headset with microphone and have experience using Microsoft
Windows.
RobotStudio with RobotWare 6 will need to be installed and either
a premium or trial license active.
RobotStudio download link

Subject areas:
Overview
Hardware
Safety IO Setup
Function Mapping
Pre and Post Logic
Stop Configurations
General Output
Keyless Option
Checksums
Safety Functions
Managing Safety Configurations
Tool and Arm Configurations
Safe Zones
Safety Functions
Safe Ranges
Track Configuration
Contact Application
Support Functions
Cyclic Brake check
Safe Brake Ramp

Continued:
Safety Violation
Violation Recovery
Synchronization
Synchronization Switch
Software Synchronization
Pre-warning Signal

RobotStudio
UAS Configuration
EIO Configuration
SafeMove Visualizer
IO Configurator

Objectives
On completion, participants will be able to perform:
SafeMove Installation and Configuration
Synchronization
Recovery from Safety Violations
OUTLINE - ROBOTICS

IRC5 Operator with FlexLoader Vision
UK R5512v (Virtual class)

Course Outline
Duration 5 days
Beneficial for robot operators and maintenance staff
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have experience using Microsoft Windows.
Each Student will require a computer with Internet connection.
Headset with microphone
RobotStudio 2022.x installed with premium or trial license.
RobotWare 6 will also need to be installed.
RobotStudio download link

Subject areas:

Safety Instructions
Safe working practices
Emergency stops and recovery
Enabling device
Modes of operation and Safety interlocks
Brake release and Pinch points
Program reset and Collision awareness

System Description
Robot and external mechanical units
Control system, Operators panel and FlexPendant
Startup and Shutdown procedures

Program Operation
Starting, stopping and stepwise program operation
The program Editor and Production windows
Teach, Test and Production operational modes
Override speeds
Continuous & Cycle running modes
Debug menu

Jogging the robot using the joystick
Joint axis and linear jogging
Tool Re-Orientations
Coordinate systems
Jog speed and incremental positioning

Continued:

Event messages and logs
Error identification
Recovery

Modifying a Program
The program Editor
Move instructions (MoveJ, MoveL)
Modifying Positions

Tool Centre Points
Tool center point Definition

Work object coordinates
Workobject Definition

Using Inputs and Outputs
Operating the Input Output window
Set, Reset and WaitDI Instructions

Program Structure appreciation
Routines and program flow
Debug menu and program reset
Modules, Backup and Restore

FlexVision
‘Teachin’ Details

Objectives
On completion, participants will be able to perform:

Safe program operation
FlexPendant operation
System startup, shutdown and error recovery
Jog the robot with the Joystick
Perform program reset
Modify program positions
Backup and Restore system information
Teachin Details
Course Outline
Duration 4.5 days
Beneficial to programmers, operators, and maintenance staff
Instructor led seminar with practical exercises.
The language of the course is English

Prerequisites
Students must have experience using Microsoft Windows.
Each Student will require a computer with Internet connection. Headset with microphone
RobotStudio 2022.x installed and preferably with premium or trial license.
RobotWare 7.8 or newer and OmniCore FlexPendant application will also need to be installed.
RobotStudio download link

Course Goal
The participant after completion should be able to create, test and optimize a simple path following applications.

Student profile
This course is the first step to become a robot programmer and for personnel with a need to modify existing programs

Subject areas:
Health & Safety
Introduction to OmniCore and ABB robots
Jogging the robot with the joystick
Basic Move-instructions
Program structure (Datatypes, Instructions, Routines, Modules)
Revolution counters
Tool center point definition
Work-objects coordinate definition
Saving data (Program, Backup, Diagnostics)
Create a Virtual Controller
RobotStudio RAPID editor
I/O- instructions
Most common instructions and program logic
Most common functions
Configuring FlexPendant Dashboards

Course objectives
Upon completion of this course, the student will:

Have a basic knowledge about the mechanics of ABB robots
Be able to jog the robot both linear, reoriented and axis-by-axis
Be able to structure a program using routines and modules
Understand the difference between Task and Program
Be able to program basic movements
Be able to update the revolution counters
Be able to create and define tooldata
Be able to create and define wobjdata
Be able to save programs and backup the system
Be able to create a virtual copy of a real controller
Be able to use RobotStudio for editing the robot program both online and offline