KUKA
TRAINING 2025

OFFERED BY JENDAMARK

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> COURSES OFFERED

Jendamark currently offers the following KUKA robot training courses at their training facility in Pretoria, South Africa:

Upgrade KRC4	2 Days	R10,090.20
Robot Operation Pro	4 Days	R20,180.50
Programming 1 KRC4	5 Days	R25,225.50
Programming 2 KRC4	5 Days	R25,225.50
Service Electrical KRC4	4 Days	R20,180.50
System Integration KRC4	5 Days	R25,225.50
Fieldbus Technology Profibus KRC4	2 Days	R10,090.20
Fieldbus Technology Profinet KRC4	2 Days	R10,090.20

» Minimum of 4 persons per course

» All prices are per person and exclude VAT

» Prices valid until 31 December 2025

» Payment terms: 100% payment required before course start date

» KRC4 Programming 1 course is a prerequisite for any other course

» Enquiries to be sent to: leatitia@jendamark.co.za

> Upgrade KRC4

Software version: KSS 8.x (KRC4)

TARGET GROUP

Operator, set-up man, robot programmer

STUDY OUTCOME

The goal of this seminar is to transfer the existing robot programming and/or operating skills of the participants into the KRC4 environment.

PRECONDITIONS

» Seminar: "Robot Operation" (KRC2) or

» Seminar: "Basic Robot Programming" (KRC2)
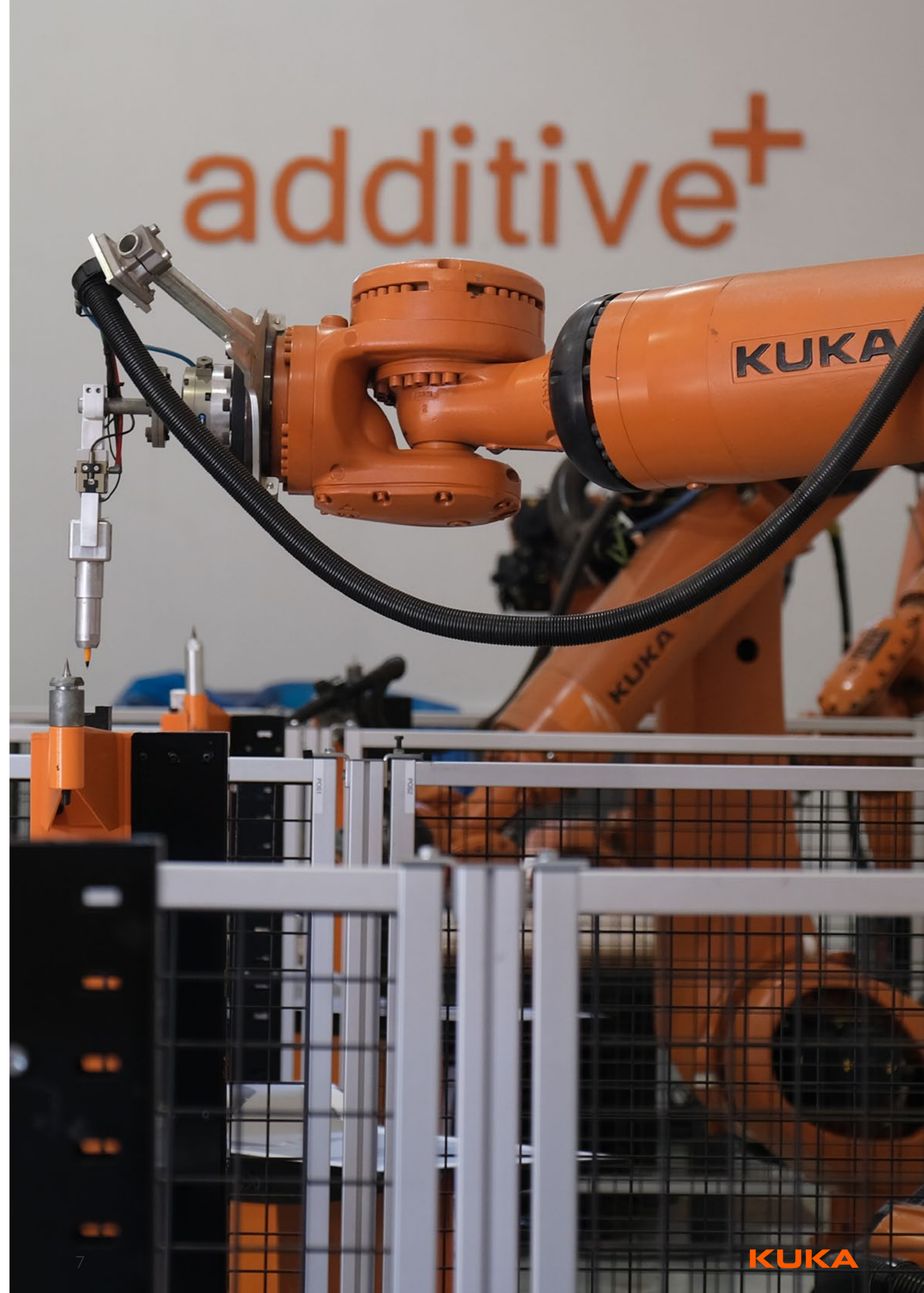
DURATION

Two days

CONTENT

1. Safety when working with KUKA robots in a KUKA college
2. Overview hard- and software structure KRC4
3. Smart Pad control elements
4. GUI differences KSS 4.x, 5.x – KSS 8.x
5. Hand-jogging the robot
6. Starting and executing robot programs manually and in automatic mode
7. Reading structured programs and program flowcharts
8. Introduction into the KRL-editor integrated in Work Visual
9. Working with program files
10. Mastering using EMD
11. Linking new programs with the cell. src

END OF SEMINAR

» The course ends with an assessment test

» A certificate is issued upon successful completion of the course

› Robot Operation Pro KRC4

Software version: KSS 8.x (KRC4)

TARGET GROUP

This course is aimed at students with no knowledge of industrial robots or students who have experience on other robot types but who have not worked on the KUKA KRC4.

STUDY OUTCOME

The goal of the seminar is to acquire basic skills required to operate a KUKA robot system.

PRECONDITIONS

» Basic computer skills

DURATION

Four days

CONTENT

1. Description of a KUKA robot

1.1. Introduction to robotics

1.2. Manipulator

1.3. KRC4 robot controller

1.4. The KUKA Smart PAD

1.5. Robot programming

1.6. Robot safety

1.7. Coordinate systems in conjunction with robots

2. Moving the robot

2.1. Reading and interpreting robot controller messages

2.2. Selecting and setting the operating mode

2.3. Moving individual robot axes

2.4. Moving the robot in the world coordinate system

2.5. Moving the robot in the tool coordinate system

2.6. Moving the robot in the base coordinate system

2.7. Displaying the current robot position

2.8. Jogging with a fixed tool

2.9. Tracking program modifications and changes of state by means of the logbook

3. Start-up

3.1. Mastering principle

4. Executing robot programs

4.1. Performing an initialisation run

4.2. Selecting and starting robot programs

4.3. Preparation for program start from PLC

4.4. Program start from PLC

5. Modifying programmed motions

5.1. Creating new motion commands

5.2. Modifying motion commands

6. Working with program files

6.1. Creating program modules

6.2. Editing program modules

6.3. Archiving and restoring robot programs

7. Creating and modifying programmed motions

7.1. Creating cycle-time optimised motion (axis motion)

7.2. Creating CP motion

7.3. Motion programming with external TCP

8. Logic function in robot programs

8.1. Displaying robot states

8.2. Introduction to logic programming

8.3. Displaying and modifying values

9. Using technology packages

9.1. Gripper operation with KUKA.GripperTech

9.2. Gripper programming with KUKA.GripperTech

END OF SEMINAR

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KUKA

› Programming 1 KRC4

Software version: KSS 5.x (KRC2)

TARGET GROUP

Course aimed at students with no knowledge of industrial robots or students who have experience on other robot types but who have not worked on the KUKA KRC2.

STUDY OUTCOME

The goal of the seminar is to acquire basic skills required for programming a KUKA robot system.

PRECONDITIONS

» Basic computer skills

DURATION

Five days

CONTENT

» Points 1 – 9 of Robot Operation Pro KRC4 (see pages 8 – 9), plus

1. Safety when working with KUKA robots

   1.1. Recognising and avoiding hazards when operating KUKA robots

   1.2. Overview of safety facilities when operating KUKA robots

2. Advanced knowledge of the structure of a robot system

3. Executing robot programs manually, in automatic mode and via an external controller

   3.1. Selecting and setting the correct operating mode

   3.2. Performing an initialisation run

   3.3. Selecting, starting and executing robot programs

   3.4. Executing a program start via a PLC

4. Human-machine communication

   4.1. Displaying and configuring the logbook

   4.2. Displaying robot states (signals, timers, cyclical flags, counters)

   4.3. Reading and interpreting robot controller messages

   4.4. Displaying the current robot position

5. Using technology packages (KUKA.GripperTech)

   5.1. Gripper operation and programming gripper commands with KUKA inline forms

   5.2. Configuration for simple programming of gripper commands

6. Working with program files

   6.1. Creating user-defined program modules

   6.2. Integrating newly created programs into the (configured) PLC interface on the robot side

   6.3. Creating, deleting, renaming, duplicating robot programs and files of various types

   6.4. Archiving and restoring robot programs

7. Displaying and adapting saved values (variables)

   7.1. Successful programming with KRL (KUKA Robot Language)

   7.2. Reading structured programs and program charts and creating simple program flowcharts

   7.3. Structuring and streamlining robot programs by implementing global sub-programs

   7.4. Linking robot programs

8. Modifying existing or creating new programmed motions with KUKA macros

   8.1. Moving the robot manually

   8.2. Creating and modifying programmed motions with the aid of KUKA inline forms

   8.3. Programming and applying logical functions in motion program

   8.4. Programming wait functions with the aid of KUKA inline forms

   8.5. Programming simple switching functions with the aid of KUKA inline forms

   8.6. Programming path-related switching functions with the aid of KUKA inline forms

9. Performing commissioning tasks on the robot

   9.1. Mastering the robot

   9.2. Setting up a tool: measuring the geometry and assigning the load data

   9.3. Entering supplementary load data for the robot

   9.4. Setting up, calibrating and offsetting a work piece base

   9.5. Calibrating a fixed tool / robot-guided work piece

END OF SEMINAR

» The course ends with an assessment test

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KUKA

› Programming 2 KRC4

Software version: KSS 8.x (KRC4)

TARGET GROUP

Programmers, service technicians

STUDY OUTCOME

The aim of the seminar is to build on the basic skills taught previously and to learn the basics of the KUKA high-level programming language, KRL, and apply it in structured robot programs.

PRECONDITIONS

» Seminar: "Robot Programming 1"

DURATION

Five days

CONTENT

1. Successful programming with KRL (KUKA Robot Language) and Work Visual
2. Workflow of a programming project for robot programs
3. Creating program flowcharts for robot programs
4. Structuring and streamlining robot programs with KRL
5. Programming with conditional statements and branches
6. Programming with loops and jumps
7. Linking robot programs with parameter transfer
8. Working with variables
9. Correct use of various variable types
10. Declaring, initialising and manipulating simple data types
11. Declaring, initialising and manipulating arrays
12. Defining, declaring, initialising and manipulating enumeration data
13. Defining, declaring, initialising and manipulating composite data types (structures)
14. Human-machine communication
15. Programming with important system variables
16. Creating and modifying programmed motions in KRL
17. Calculating and manipulating robot positions
18. Programming relative motions
19. Programming logical functions in KRL
20. Programming wait functions
21. Programming simple switching functions
22. Programming path-related switching functions (e.g. for adhesive application, welding)

23. Path-related calling of sub-programs in the program sequence
24. Linking robot programs
25. Using global and local subprograms
26. Program links with parameter transfer
27. Programming project: cycle time optimisation using the example of a palletising application
28. Robot and PLC
29. Reconfiguring the interface of the robot to the PLC
30. Reaction to state changes during program execution (interrupts)
31. Programming interrupt routines
32. Collision avoidance
33. Programming motions taking collision detection into account
34. Limiting motions – configuring workspaces and limiting motion ranges
35. Programming user- and application-specific messages
36. Successful programming with KRL (KUKA Robot Language) and Work Visual
37. Selecting and using system algorithms of the KUKA System Software
38. Using logical functions in programs
39. Coupling CP motions with analog signals
40. Programming control commands (Submit interpreter)

END OF SEMINAR

» The course ends with an assessment test
» A certificate is issued upon successful completion of the course

› Service Electrical KRC4

Software version: KSS 8.x (KRC4)
Controller type: KRC4

TARGET GROUP

Robot service technicians

STUDY OUTCOME

The participants in this seminar are trained in the fundamentals of proper fault diagnosis and troubleshooting for the electrical equipment of the robot system KRC4 including the necessary network basics for re-commissioning a KRC4 system after repair work.

PRECONDITIONS

» Electric specialist

» Seminar: "Robot Operation PRO" or "Robot Programming 1"

DURATION

Four days

CONTENT

1. Safety when working with KUKA training robots

2. Recognising and avoiding hazards when handling electrical components of the KRC4

3. Avoiding hazards when handling ESD components of the KRC4

4. Basic knowledge of the structure of a KRC4 controller

5. Technical data and control concept

6. Cooling and energy saving

7. Basic knowledge of the structure of a KRC4 control computer

8. Exchanging the control PC properly

9. Exchanging the individual PC components

10. Overview of the bus systems of the KRC4 controller

11. Exchanging drive components on the KUKA Controller Bus

12. Interfacing capability of the KRC4 controller using the KUKA Extension Bus and the KUKA Line Interface

13. Troubleshooting by evaluating the display on the Controller System Panel

14. Basic knowledge of networks

15. Familiarisation with various network components

16. Selecting and assigning IP addresses and subnet masks

17. Configuring the KUKA Line Interface

18. Establishing a remote desktop connection to the KRC4 controller

19. Basic principles of Ethernet-based field buses of the KRC4

20. Familiarisation with passive components of the KRC4

21. Exchanging passive components of the KRC4

22. Safety concept of the KRC4

23. Safety by means of Profisafe or the Safety Interface Board

24. Overview of the functionality and interface of the KUKA Safe Operation option software concept and data handling

25. Installing software by means of KRC System Recovery

26. Data archiving by means of images

27. Diagnostic options and troubleshooting directly at the controller

28. Reading block diagrams, wiring diagrams and circuit diagrams

29. Practical troubleshooting using circuit diagrams

30. Work Visual, Controller System Panel, KRC Diag and diagnostic monitor

31. Trace function for troubleshooting

32. Configuring, recording and analysing traces

33. Maintenance table and maintenance intervals

34. Practical performance of maintenance on the controller

35. Overview of Work Visual and its potential use for diagnosis

36. Downloading and comparing projects, transferring them to the controller

37. Performing diagnosis using Work Visual

38. Recording a trace using Work Visual

39. Preview of other potential applications of Work Visual

END OF SEMINAR

» The course ends with an assessment test

» A certificate is issued upon successful completion of the course

› System Integration KRC4

Software version: KSS 8.x (KRC4)
Controller type: KSS 8.x (KRC4)

TARGET GROUP

System integrators, commissioning engineers

STUDY OUTCOME

System integrators who have ample experience with the integration of robot systems shall be enabled to transfer their knowledge within a short time into the KRC4 environment with the focus on commissioning KRC4 systems. The topics covered on the first seminar day enable system integrators who have good skills in commissioning robots and fieldbus systems.

Please note: This course is specially tailored to the needs of experienced robot system integrators and definitely not suitable for beginners in the robot business. In this case we suggest choosing our subject-specific courses. Please do not hesitate to contact us if unsure which course to choose.

PRECONDITIONS

» Experience in commissioning and configuration of robot systems

» Experience in commissioning of Profibus

» Recommended: Seminar "Basic Robot Programming" (KRC2)

» Recommended: Seminar "Advanced Robot Programming"

» Recommended: Seminar "FBT Profibus"

» Recommended: Seminar "Safety-Start-up KUKA Safe Operation2.x"

Please note: Taking part in this course without previous knowledge in "Safety-Start-up KUKA Safe Operation 2.x" is possible. In this case, the achieved level of knowledge will be sufficient for start-up and configuration of "KUKA Safe Range Monitoring" but not for "KUKA Safe Operation 3.x"

DURATION

Five days

CONTENT

1. Introduction into the operation of a KRC4 system, mastering and tool calibration
2. Overview: Hard- and software KRC4
3. Basic network skills for KRC4
4. Overview: Interface structure KRC4
5. Differences KUKA Smart Pad and KUKA KCP
6. KR C System Recovery
7. Differences KUKA Safe Operation 2.x and 3.x
8. Configuration KUKA Safe Range Monitoring
9. Commissioning PROFINET using KUKA Work Visual
10. KUKA Work Visual for commissioning purposes: Profibus Master via Gateway

END OF SEMINAR

» The course ends with an assessment test

» A certificate is issued upon successful completion of the course

› Fieldbus Technology Profibus KRC4

Software version: KSS 8.x (KRC4)

TARGET GROUP

Robot service technician, start-up engineer, project engineer

STUDY OUTCOME

PROFIBUS configuration at the KRC4, embedding Profibus via Ethercat gateway

PRECONDITIONS

» Seminar: Robot Programming 1 KSS 8.x

DURATION

Two days

CONTENT

1. Familiarisation with the field bus system PROFIBUS
2. Principle of operation PROFIBUS
3. PROFIBUS devices
4. PROFIUBS cabling
5. Configuration of the KUKA Line Interface
6. Configuration
7. Diagnosis
8. Working with Work Visual
9. Loading and installing of projects from and to the KRC4
10. Comparing of different projects
11. Integration of device description files in Work Visual
12. Configuring the KRC4 as PROFIBUS (EtherCat Gateway) Master
13. Introducing the PROFIBUS interfaces
14. Physical configuration in Work Visual
15. Logical mapping of I/Os
16. Assigning long texts
17. Coupling and decoupling of PROFIBUS slaves
18. Configuring the KRC4 as PROFIBUS slave (EtherCat Gateway)
19. Physical configuration in Work Visual
20. Logical mapping of I/Os
21. Diagnosis
     21.1. over the Smart Pad HMI
     21.2. over Work Visual
     21.3. over Webbrowser

END OF SEMINAR

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› Fieldbus Technology Profinet KRC4

Software version: KSS 8.x (KRC4)

TARGET GROUP

Robot service technicians, start-up engineers, project engineers

STUDY OUTCOME

PROFINET configuration at a robot system

PRECONDITIONS

» Seminar: "Programming 1"x

DURATION

Two days

CONTENT

1. How PROFINET works
2. Structure of a PROFINET-system
3. PROFINET components
4. PROFINET and the KRC-system
5. Operation of Work Visual for the configuration of the fieldbus
6. Generate a PROFINET configuration with Work Visual
7. Transfer a PROFINET configuration with Work Visual
8. Coupling of PROFINET modules
9. Diagnosis and error tracking

END OF SEMINAR

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