Part 7
Simulation Software

- EDS-EDR5: EXCITING & DYNAMIC ROBOT CONTROL SIMULATION SOFTWARE
- ED-WINCAPS II: 4-AXIS RECTANGULAR COORDINATES ROBOT SOFTWARE
- EDS-SimPL: SIMULATION SOFTWARE PROGRAMMABLE LOGIC CONTROLLER
- EDS-ESS: ELECTRONIC SEQUENCE CONTROL SIMULATION SOFTWARE
- EDS-PHLeggo Plus: PNEUMATICS & HYDRAULICS SIMULATION SOFTWARE
EDRS is powerful simulation software that helps develop the intelligent robot and give the user training in convenient and speedy manner. Also, it comes with dynamic robot simulation based on three dimension and implements minute performance control of the robot through Kinetic Engine.

> FEATURES

- Simulation in various types of environment by configuring the robot and environment in three-dimension
- Configuration of the robot and environment by Robot Editor and Environment Editor
- Various sensors essential for the robot and environment can be mounted and monitored at the user’s choice
- 28 types of sensor for entering real life-like parameters and performing simulation
- Capable of exporting and loading the robot, object and environment which the user has drawn using 3D Max(OPTION)
- Possesses compiler itself and allows control of each robot sensor using C, C++ and Flow Chart Language; and perform build and debug
- Programming Library enables programming on Virtual C++(MFC) and Eclipse
- Vision Sensor for viewing an object at the robot’s point of view; and observation at the user’s and robot’s point of view in separate windows
- Realistic simulation using the Kinetic Engine for controlling the robot’s complex and minute performances
- Enhancement of educational effects with the Electronic Manual covering the robotics courses and over 20 types of flash animation for sensors and actuators
- Real-time upgrade of a latest version through the software’s Upgrade function on Internet
> SPECIFICATIONS

**ROBOT EDITOR:**
*Robot Design Tool using the Robot Library*

Based on the Library method, the Robot Editor enables the user to compose the robot easily and conveniently and reproduces various types of robot at the user’s choice.

1. **Robot Library:** This Library provides humanoid and other types of robot. The user can add his own library developed using Library Developing Tool
2. **Sensor Library:** Comes with 28 types of sensor. The sensors are mounted on the surface of the robot or inside the robot using the Sensor Arrangement Tool
3. **Library Preview:** Allows page preview of the robot and Sensor Library
4. **Object Attributes:** Checks attributes of the robot and sensor objects
5. **Sensor Arrangement Tool:** Capable of free rotation and position control at the time of arranging the sensors
6. **Configuration of Sensor Attributes:** Can change attributes suitable for the characteristics of each sensor

**STAGE EDITOR:**
*Environment Design Tool Using Environment Library*

Stage Editor is often called Environment Editor, and makes it convenient for the robot simulation environment composed by the Library method.

1. **Environmental Library:** This Library consists of basic environments and various elements. The user can register his own library additionally using Library Developing Tool
2. **Library Preview:** Allows page preview of Environment Library to be applied
3. **View of Environmental Attribute:** Shows the attributes for selected environment objects
4. **Free View / Front View / Plane View:** Configures three-dimensional environment using Free View, Front View and Plane View
5. **Environment Arrangement Tool:** Arranges each object to compose the environment in convenience using the Tool
6. **Environment Creation Tool:** It is a powerful environment setup tool to compose various types of floor, wall and door upon the user’s choice
7. **Environment Parameter Setup:** Configures environment parameters such as temperature, humidity and atmospheric pressure and simulate these assigned values
8. **Attribute Alteration Model:** Consists of human body detection, sound source, light source and heat source, and provides the attribute alteration model to give input for a specific sensor
EXCITING & DYNAMIC ROBOT CONTROL SIMULATION SOFTWARE

EDS-EDRS

PROGRAMMING LANGUAGE: Programming Tool for Controlling the Robot
- FL (Flowchart Language) makes it possible to control the robot’s sensors and actuators quite easily through the control blocks and status blocks.
- C/C++ Editor allows simulation through automatic engagement with simulator.
- Comes with API function to control the sensors and actuators.
- Provides Control Library and sample projects for other languages such as MFC, JAVA, and Python.

EXCITING DYNAMIC SIMULATION: Robot & Environment Simulation Tool
- This simulator combines and simulates the robot and environment which was composed on the Robot Editor and Environment Editor.
- Checks the operation status of various sensors such as infrared and ultrasonic.
- Simultaneous simulation of multiple robots in the same environment.
- Checks the data of actuators and sensors through Report View.
- Execution of C/C++ and Flowchart Language in the types of Release and Debug.
- Can change the environment’s temperature, humidity and atmospheric pressure using Environment Variable Edit Windows during the course of simulation.

EDRS PACKAGE
- Program Installation CD : 1 ea
  » EDRS Program
  » Dynamic Element Generator Plug-in (Option)
  » Voiceware (Option)
- Key Lock : 1 ea
- Operation Manual : 1 ea
- Protective Hardcover Case : 1 ea

HARDWARE REQUIREMENT
- Operation System : Windows 2000/XP/Vista
- Minimum Specification
  » System CPU : Pentium4 2GHz or higher
  » RAM : over 512MB
  » Hard Disk : Min. 1GB hard disk space
- Recommended Specification
  » System CPU : Pentium4 3GHz or higher
  » RAM : Min. 1GB
  » Hard Disk : Min. 2GB hard disk space
• Simulation Software

4-AXIS RECTANGULAR COORDINATES ROBOT SOFTWARE

• Simulation of entire robot processes from the preview to actual setup
• Realistic simulation based on 3D graphics
• Library of various robots (Multi Joint, SCARA, Rectangular Coordinates)
• Software configurable in detail by the user’s objective
• Real time communications between PC and the robot

> EXPERIMENTS

- Communication Setup Dialog
- Communication Setup Window
- Controller Status Window
- File Edit Window
- File Manager Window
- Location Manager Window
- Robot Controller Communication Software

- Robot Parameters
- Program Run by the Internal Mode
- Robot Position Monitoring
- Robot System Command
- User I/O Monitor Dialog
- Network Management Software

> SPECIFICATIONS

- Program Manager
  » Reduces the amount of work load in programming
  » Loaded with a program bank useful for the line expansion
- I/O Manager
  » Real time I/O Monitor function
  » Time Chart Monitor function
- Arm Manager
  » Robot program simulation
  » Monitoring enabled in all angles by 3D view
  » Remote control function
  » Checks the range of a movement track
- Log Manager
  » Error Log: Records an error message and time of occurrence
  » Operation Log: Records an operation message on the Pendant
  » Control Log: Records a command value of each axis of the robot, an encoder value, a current value and a load rate
  » Remote control function
  » Checks the range of a Movement Track
  » Object creation function on the robot display
- Object creation function on the robot display
Simulation that links the PLC program written on a PLC Editor (GMWIN) with Virtual Plant (SimPL)

- PLC training given by software without any hardware
- Virtual experiments on program written on PLC Editor (GMWIN)
- Various virtual plants and 3,000 images

Control of Real Plant by loading the GMWIN-written PLC program to GLOFA

Synchronization of Real Plant and Virtual Plant

> SPECIFICATIONS

**EASY PLANT DESIGN**
- Elegant UI (User Interface) in Windows XP style
- Enriched library for 2D plant design
- Multi-Window enable editing with complex plants
- Convenience in designing similar plant by supporting the user library storage functions
- Offers functions for designing various types of plant for the User
- Offers function for setting up rapid completion of object
- Offers function of Coordinate Navigation, Grid View, Snap Setup, and Screen Magnification & Reduction

**ADDITIONAL FUNCTIONS FOR SIMULATION CONTROL**
- Script is used to control operation of the virtual plant
- Visual Basic Script is used so that the user can easily learn and write
- Basic applicable functions are provided for reading and writing tag values

**SIMULATION FUNCTIONS**
- Operates in connection with GMWIN Simulator
- Ladder diagram simulation written on GMWIN
- Basic attribute editing functions for simulation
- Help Menu for setup methods per attribute
- Run, Stop, Pause and Sound Effect
- Each point of contact of virtual PLC described in Motion Step Diagram
- Various types of job sheet
- Various experiment tasks
WIRING EXPERIMENT
• Step-by-step navigation instruction and voice instruction for wiring methods
• Electrical wiring practices through wiring experiment functions that are same as real-life wiring experiment (COM, Power, I/O, etc) for power supply, PLC equipment, I/O elements
• Virtual Plant can move by PLC ladder located on the wiring experiment windows after all electrical wiring is completed
• Can move back to the previous step during the course of experiment on each step

REAL PLC OPERATION MONITORING
• Communication though RS 232C Loader Port without separate modules
• Convenient monitoring for GLOFA PLC with Virtual Plant
• Capable of monitoring the contact and motion step diagram

SIMPL PACKAGE
• Program Installation CD : 1ea
  » SimPL Program
  » GMWIN
  » Acrobat Reader
• Keylock : 1ea
• User Manual : 1ea
• Hard Cover Case : 1ea

HARDWARE REQUIREMENT
• Operation Manual : 1ea
• Protective Hardcover Case : 1ea
• Operation System : Windows 95/98/NT4.0/2000/XP
• Minimum Specifications
  » System CPU : Pentium-II 300MHz or higher
  » RAM : Over 128MB
  » Hard Disk : Min. 200Mbyte free space
• Recommended Specifications
  » System CPU : Pentium-II 700MHz or higher
  » RAM : Over 256MB
  » Hard Disk : Min. 1G byte free space
• Simulation Software

**ELECTRONIC SEQUENCE CONTROL SIMULATION SOFTWARE**

- Programming on the circuit diagrams and simulation for electric sequence symbol
- Generation of parts list on programmed electric sequence circuit diagrams
- Automatic real wiring elements placement by parts list and programmed replacement
- Conversion of programmed electric sequence circuit diagram into a file retrievable on AutoCAD
- Virtual Experiments of PLC program configured on GMWIN without extra jobs
- Animated operation for electric sequence elements
- Electronic manuals covering abundant examples of electric sequence and control theory

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> **SPECIFICATIONS**

**PROGRAMMING ELECTRIC SEQUENCE CIRCUIT DIAGRAM**

- Programming circuit diagram by electric sequence symbol
- Element Library designated for easy circuit configuration
- Elements of single-phase, three-phase, direct-current and alternating current
- Multi view and project methods

**CIRCUIT PROGRAMMING BASED ON REAL IMAGES**

- Circuit programming using real image
- Virtual wiring exercise
- Element Library type for easy circuit configuration
- Circuit configuration interlocking with pneumatic/hydraulic symbol circuit diagrams
- Various types of electrical sequence’s real image elements
PARTS LIST AND COMPONENTS CIRCUIT
- Easy creation of the parts list for the programmed circuits
- Configuration of placement circuit on parts list elements

SIMULATION ON ELECTRIC SEQUENCE CIRCUITS
- Detects the operation status of electric circuit elements by change in color
- Setup current in use, maximum current, maximum voltage
- Detection of overcurrent/overvoltage
- Sound alarm and screen warning message against short circuits
- Elements of current meter and volt meter
- Sound by elements operation

SIMULATION ON REAL CIRCUITS
- Detection on operation status of electric circuit elements by change in color
- Setup current in use, maximum current, maximum voltage
- View of real image circuit and inner circuit
- Sound for each element’s operation

PLC INTERFACE
- Interlocking operation with GMWIN Simulator
- Programming on the electric sequence circuit by PLC with PLC elements programming sequence on the circuit
OTHER FUNCTIONS

- Descriptions of electric sequence elements
- Descriptions of circuit diagrams in DXF file
- Flash video file on the electric sequence elements

PC ENVIRONMENT FOR ESS

- OS : Windows 2000/XP
- Minimum Requirement
  » CPU : Pentium- III 700 or higher
  » RAM : min. 256MB
  » Hard Disk : Min. 1GB free Space
- Recommended Specifications
  » CPU : Pentium- III 1GB or higher
  » RAM : Above 512MB
  » Hard Disk : min. 2GB free Space

ACCESSORIES

- Program Installation CD : 1ea
  » ESS Program
  » GMWIN 4.04 Version
- Key Lock : 1ea
- User Manual : 1ea
- Hard Cover Case : 1ea
Simulation Software

PNEUMATICS & HYDRAULICS SIMULATION SOFTWARE

- Programming and simulation of pneumatic, hydraulic and electrical control symbol circuits
- Creation of a parts list on programmed pneumatic and hydraulic circuit diagrams
- Virtual experiments on programs written on GMWIN
- Conversion of pneumatic/hydraulic diagrams into a file retrievable on AUTOCAD
- Animated operations for pneumatic and hydraulic elements
- Simple and convenient interface for beginners

> SPECIFICATIONS

PROGRAMMING OF PNEUMATIC AND HYDRAULIC SYMBOL CIRCUIT DIAGRAMS

- Element library type designated for easy circuit configuration
- Configuration of circuits interlocking with the real image pneumatic/hydraulic circuit diagrams
- Multi view and project methods
- Drag-and-drop method for quick design

CIRCUIT PROGRAMMING BASED ON REAL IMAGES

- Realistic circuit programming using real images of pneumatic and hydraulic parts
- Virtual wiring exercises
- Element library type designated for easy circuit configuration
- Configuration of circuits by interlocking with pneumatic/hydraulic symbol circuit diagrams
- Various types of pneumatics, hydraulics, electrical real image elements
**SIMULATION**
- Detects the operation status of pneumatic and hydraulic symbols and components by the change in color
- Digital elements included for simulation with pneumatic and hydraulic circuits
- Detects a circuit’s fault by slow operation and phase-by-phase operation
- Sound function for operation of elements
- Can change a parameter for pneumatic and hydraulic components during the process of simulation
- Motion step diagram for checking the status of various components simultaneously

**PLC**
- Interlocking operation with GMWIN Simulator
- Circuits using PLC through PLC elements

**DISPLACEMENT DIAGRAM**
- Programming of displacement diagrams by simulation
- Can select analog or digital
- Time and graph colors are selectable
- Can print displacement diagrams
- Run/Pause/Stop functions

**8051 SIMULATION**
- 8051 Microprocessor simulation in liaison with pneumatic and hydraulic circuits and electrical circuits
- C Compiler and Programming Editor
- Debug/Release mode for simulation

**DIO(DIGITAL INPUT/OUTPUT) HARDWARE INTERFACE**
- Simple hardware connection using USB
- Input : 6 Points, Output : 6 Points
- Motion control in liaison with electrical circuits and pneumatic and hydraulic circuits

※DIO Hardware Module(Option)
SIMPLE AND CONVENIENT INTERFACE
- Simple and convenient interface for nonprofessionals
- Powerful user interface for the user’s convenience
- Luxurious MS Office 2003 themes
- Convenient style docking
- Page Select through convenient MDI - TabView

PLENTIFUL TEACHING MATERIALS
- Theory (electronic manual) and practice (job sheets)
- Flash animation over 100 subjects in liaison with real equipment
- 2.5D flash animation for pneumatic and hydraulic elements

ENVIRONMENT FOR PHLEGO PLUS
- OS: Windows 98/2000/XP
- Minimum Requirement
  » CPU: Pentium IV 1GB or higher
  » RAM: Above 512MB
  » Hard Disk: min. 1GB free Space
- Recommended Specifications
  » CPU: Pentium IV 2GB or higher
  » RAM: Above 512MB
  » Hard Disk: Min. 2GB free Space