Mitsubishi Electric
Factory Automation Division

ACADEMY PROJECT

Training Catalogue
NOVEMBER 2024 – JANUARY 2025

Automating the World

Content

VALUE
CAREER
QUALITY
EDUCATION
DEVELOPMENT
COMPETENCE
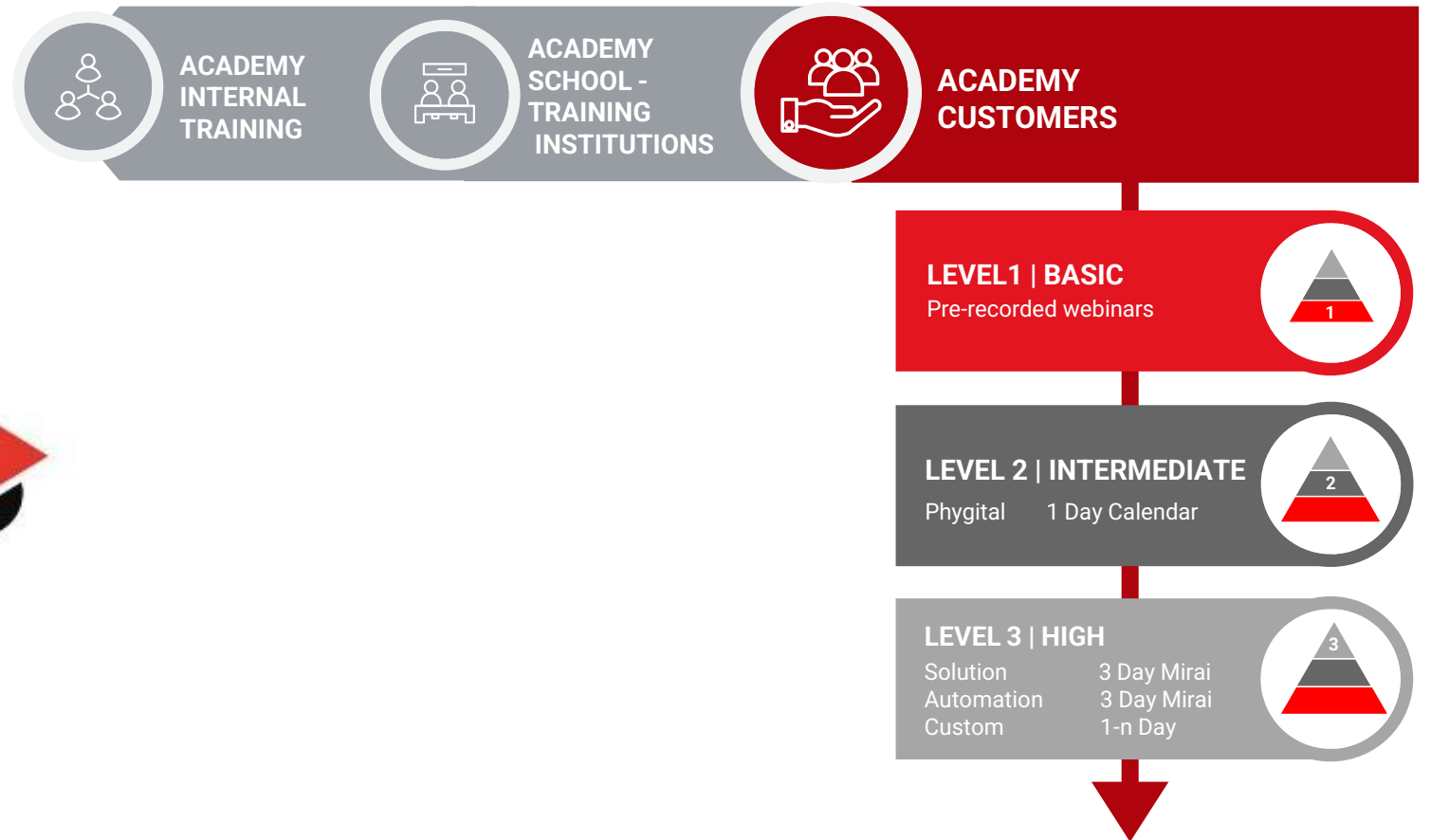LOYALTY

The Project AcadeMy

Mitsubishi Electric strongly believes that training is the best way to spread out automation culture and meet market needs. This is why we created the AcadeMy programme, a system of training courses held both in its offices in Vimercate, Rome, Turin, Padua, and its support offices in Prato and Bologna.

The **AcadeMy** is based on 7 principles such as Trust, Quality, Technology, Training, Ethics, Skills and Growth and provides both standard and customized training courses addressed to a wide audience, ranging from high school or university students, System Integrators, OEMs and End Users.
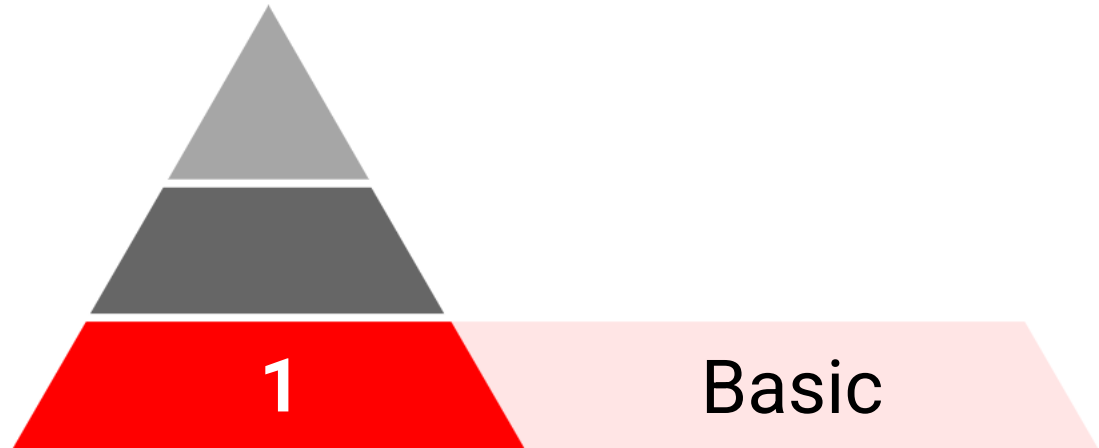
Structure

MITSUBISHI ELECTRIC
Changes for the Better

ACADEMY INTERNAL TRAINING

ACADEMY SCHOOL - TRAINING INSTITUTIONS

ACADEMY CUSTOMERS

LEVEL1 | BASIC
Pre-recorded webinars

1

LEVEL 2 | INTERMEDIATE
Phygital   1 Day Calendar

2

LEVEL 3 | HIGH
Solution   3 Day Mirai
Automation   3 Day Mirai
Custom   1-n Day

3

AcadeMy

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LEVEL 1 | Basic
Trainings on demand **FREE OF CHARGE**

The first of the AcadeMy's three levels provides **FREE OF CHARGE basic product trainings, Q&As, and video tutorials** on specific functions addressed to anyone who wishes to acquire new skills or improve their knowledge.

The trainings consist of free pre-recorded video tutorials ranging **from 2 minutes to 3 hours** and can be enjoyed independently via PC or Smartphone.

List of available trainings
Trainings on demand **FREE OF CHARGE**

Click HERE to access all trainings

| PLC | HMI | INVERTER | ROBOT | SCADA |

COMPACT PLC iQ-F

- Basic training | Compact PLC iQ-F
- Q&A PLC - FX5 - Firmware Update
- Q&A PLC - Program Download From SD Card

MODULAR PLC iQ-R

- Basic training | Modular PLC iQ-R - Part 1
- Basic training | Modular PLC iQ-R - Part 2
- Basic training | Modular PLC iQ-R - Part 3

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Level 2 | Intermediate
Phygital Trainings, 1 Day, Calendar

The second of the AcadeMy's three levels provides **one-day in-person** or web-based training on all Mitsubishi Electric products, solutions and applications. It is addressed to **technicians who wish to acquire skills supported by a trainer** and obtain a final certificate of participation.

Courses last a full day, from 9.30 a.m. to about 5 p.m.

Training features

- Final test with **certificate of attendance** useful for training credits or training funding
- iQWorks licence included on first enrollment
- Supply of PDF documents and training exercises
- The teacher will use the DEMO kits for practical testing of various exercises
- Participants will be invited to use programmes in simulation, also via streaming
- **Basic product knowledge is recommended by participating to On Demand Webinars (level 1)**

Inverter Applications
SAP Code 272521

2

Topics covered:

▶ Introduction to Mitsubishi Electric Inverters
▶ CC-Link IE Field Basic network configuration:
  ○ Data exchange between an FX5U PLC and a FR-E800 Inverter
  ○ Communication Diagnostics
▶ CC-Link IE TSN network configuration:
  ○ Data exchange between a TSN master FX5-CCLGN-MS and an Inverter FR-E800
  ○ Communication Diagnostics
▶ Inverter Management via HMI
  ○ Communication Configuration
  ○ Device List
  ○ GOT Drive: Using the Template

Software installation required: FR Configurator2   GX Works3   GT Designer3

Compact PLC iQ-F Applications
SAP Code 333515

2

Topics covered:

▸ Introduction of iQ-F Series Compact PLCs
▸ CC-Link IE Field Basic network configuration:
  o Data exchange between an FX5U and an MR-JE-C Servo Drive
  o Communication Diagnostics
▸ Simple PLC Communication Configuration
  o Communication Diagnostics
▸ Modbus TCP: Configuration of data exchange between two FX5U PLCs
  o Communication Diagnostics
▸ Configuration of the FX5-OPC module in communication with a client
  o Testing with OPC UA Client free «UaExpert»

The next level of industry

MELSEC iQ-F series

Software installation required: MR Configurator2   GX Works3   GT Designer3   UaExpert

Simple Motion iQ-F Applications
Codice SAP 272520

2

Topics covered:

▸ Board Presentation of FX5-40SSC-G Motion, CC-Link IE TSN Network and MR-J5-G Servo Drive
▸ Settings and Creation of CC-Link IE TSN Network with MR-J5-G Servo Drive
▸ Motion functions FX5-40SSC-G (ADVANCED speed operation, Mark detection, Positioning table)
▸ FX5-40SSC-G Template usage examples (Jog, Home, Positioning, Interpolation)
▸ Virtual axes (Real and CGA) , External encoders
▸ Synchronous Control, Clutch, Electronic Cam.
▸ Axis timing management (Initial analisys axis phase, Run time control change phase request)
▸ Axis tuning with application examples on demo
▸ Electronic cam profile design
▸ MR-J5-G fully closed loop system: load-side feedback encoder connection
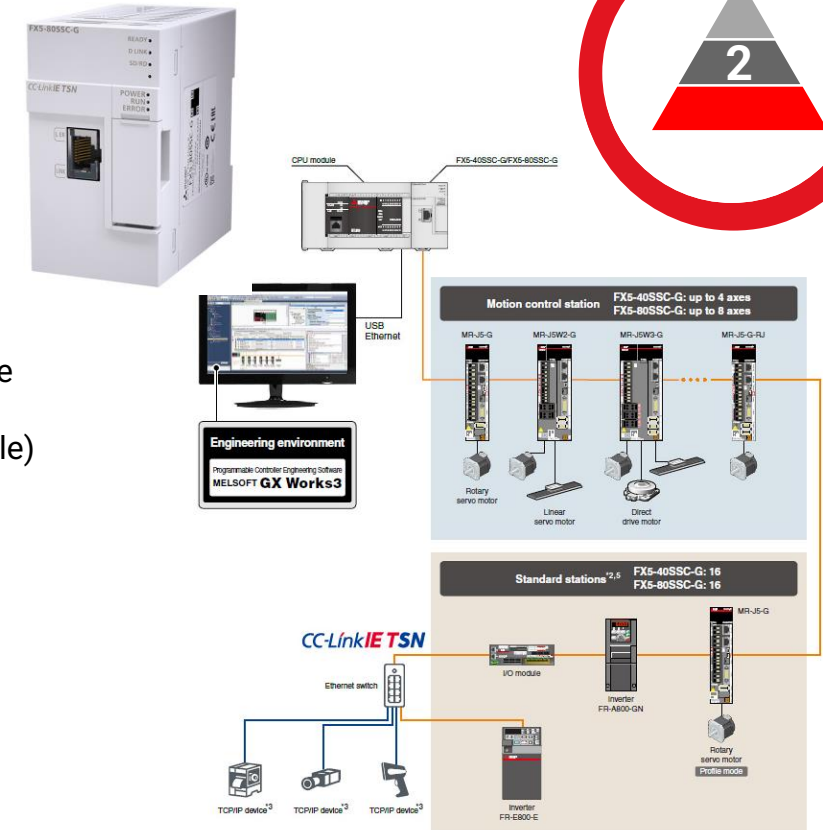
Software installation required: MR Configurator2 GX Works3 GT Designer3

HMI - GOT Applications
SAP Code 272515

Topics covered:

▶ Real-time simulation of HMI base template with PLC
▶ Programming and use of the Data Logging function
▶ Design and use of recipes
▶ Using MES Interface on GOT panel
  ○ DB Connection Service Tool installation and configuration guide
  ○ SQL Server Management Studio installation guide
  ○ SQL database configuration, creation, management, backup and restore
▶ Control via GOT2000 of FR-E800 inverters in Modbus TCP

GOT2000
Graphic Operation Terminal

GOTSIMPLE
Graphic Operation Terminal

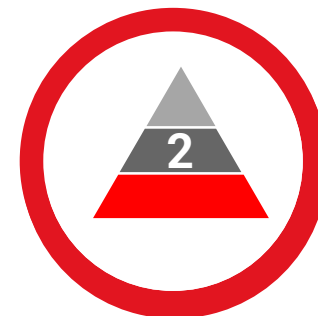Software installation required: GT Designer3 | FR Configurator2 | GX Works3

Simple Motion iQ-R & Safety Applications
SAP Code 333518

Topics covered:

▸ RD78G Motion Module Presentation, CC-Link IE TSN Network and MR-J5-G Servo Drive
▸ Settings and Creation of CC-Link IE TSN Network with MR-J5-G Servo Drive
▸ RD78G Motion Functions (ADVANCED speed operation, Mark detection, etc.)
▸ RD78G Template usage examples (Jog, Home, Positioning, Interpolation)
▸ Virtual axes (Real and CGA) , External encoders
▸ Synchronous Control, Clutch, Electronic Cam.
▸ Axis Tuning
▸ Introduction and settings safety PLC and safety remote I/O on CC-Link IE TSN network
▸ Integrated MR-J5-G safety functions on CC-Link IE TSN bus (STO, SLS, SS1, SS2, SOS etc.)
▸ FB safety use for MR-J5-G management
▸ Application example of safety network use on CC-Link IE TSN bus with demo
▸ Introduction and use Servo Drive MR-J5-G on CC-Link IE TSN network in I/O mode (Profile Mode)
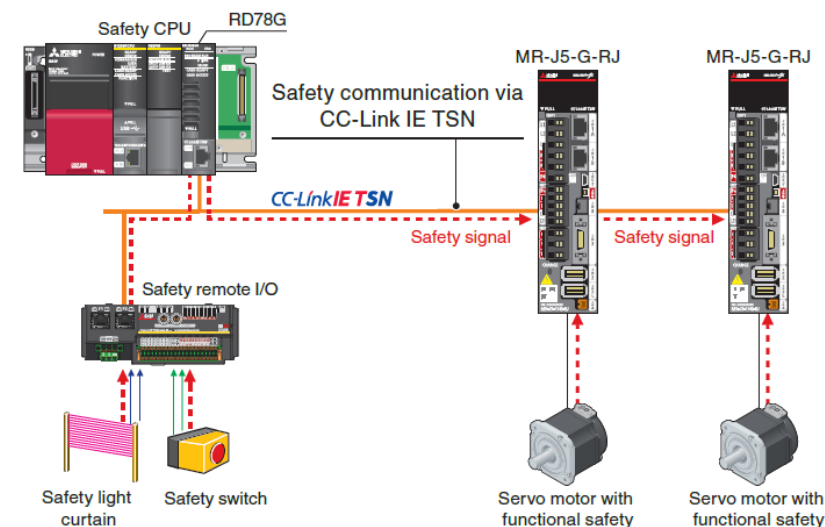
Software installation required: GX Works3 | GT Designer3 | MR Configurator2

PLC - iQ-R Application
SAP Code 333516

2

Topics covered:

- ▶ Presentation of the iQ-R modular platform
- ▶ Simple CPU Communication: data exchange with iQ-F
- ▶ Modbus TCP
  - o Simple CPU Communication (master)
  - o Slave configuration
  - o Function Block Library (master and slave)
- ▶ CC-Link IE TSN
  - o Network and architecture description
  - o Network configuration and communication tests
- ▶ Safety
  - o CPU Configuration
  - o I/O Configuration Safety CC-Link IE TSN
  - o Configuration Safety CC-Link IE TSN with Inverter

Software installation required: GX Works3   GT Designer3

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Robot Applications
SAP Code 272519

Topics covered:

- ▶ Industrial and Collaborative Robot lineup presentation
- ▶ Parameterization and Networking CC-Link IE Field Basic with IQ-F and HMI
- ▶ Using T/B and JOINT, XYZ, TOOL movements
- ▶ Programming basics
- ▶ Programming software and cables
- ▶ Creating a new project with the RT ToolBox3 programming suite
- ▶ Basic movement instructions
- ▶ Pick & Place program example
- ▶ Use of some advanced instructions (PLT, CNT)
- ▶ Control via template from HMI
- ▶ Using the SPLINE function
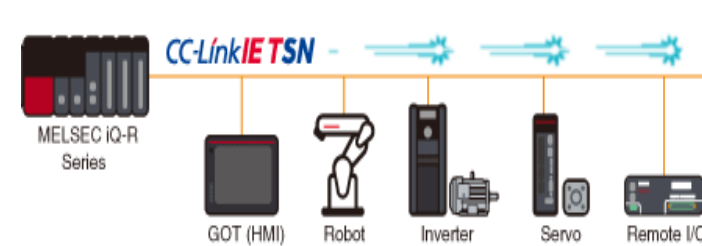
Software installation required: RT ToolBox3   GT Designer3   GX Works3

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Training Calendar
Trimester **NOVEMBER** - **JANUARY**

Course	November	December	January	SAP Code
INVERTER Applications - **ITA** iQ-F IEF Basic - iQ-F IEF TSN - Control from HMI	11/11/2024 27/11/2024	02/12/2024	13/01/2025 28/01/2025	272251
INVERTER Applications - **ENG** iQ-F IEF Basic - iQ-F IEF TSN - Control from HMI	On request	On request	On request	272251
Compact PLC - iQ-F Applications - **ITA** iQ-F IEF Basic with Servo - Simple PLC communication - Modbus TCP between 2 PLCs - OPC UA	12/11/2024 28/11/2024	03/12/2024	14/01/2025 29/01/2025	333515
Compact PLC - iQ-F Applications - **ENG** iQ-F IEF Basic with Servo - Simple PLC Communication - Modbus TCP between 2 PLCs - OPC UA	On request	On request	On request	333515
Simple Motion iQ-F Applications - **ITA** Servo & Tuning - iQ-F SSCNET III o TSN	13/11/2024 29/11/2024	04/12/2024	15/01/2025 30/01/2025	272520
Simple Motion iQ-F Applications - **ENG** Servo & Tuning - iQ-F SSCNET III o TSN	On request	On request	On request	272520

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Training Calendar
Trimester NOVEMBER - JANUARY

Course	November	December	January	SAP Code
HMI-GOT Applications - ITA Simulation with PLC - Data Logging - Recipes - MES - Modbus TCP with Inverter	15/11/2024	11/12/2024	27/01/2025	272515
HMI-GOT Applications - ENG Simulation with PLC - Data Logging - Recipes - MES - Modbus TCP with Inverter	On request	On request	On request	272515
Simple Motion iQ-R & Safety Applications - ITA Motion J5 -Tuning - Safety Motion - Safety I/O - Safety Inverter	14/11/2024	05/12/2024	31/01/2025	333518
Simple Motion iQ-R & Safety Applications - ENG Motion J5 -Tuning - Safety Motion - Safety I/O - Safety Inverter	On request	On request	On request	333518
PLC - iQ-R Applications - ITA Safety - Simple PLC con iQ-F - Modbus TCP - Data exchange between CPUs	25/11/2024	12/12/2024	16/01/2025	333516
PLC - iQ-R Applications - ENG Safety - Simple PLC con iQ-F - Modbus TCP - Data exchange between CPUs	On request	On request	On request	333516
Robot Applications - ITA IEF Basic con IQF - Control from HMI - Spline	26/11/2024	06/12/2024	17/01/2025	272519
Robot Applications - ENG IEF Basic con IQF - Control from HMI - Spline	On request	On request	On request	272519

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Training Summary

Corso	SAP Code
INVERTER Applications iQ-F IEF Basic - iQ-F IEF TSN - Control from HMI	272251
Compact PLC - iQ-F Applications iQ-F IEF Basic with Servo - Simple PLC communication - Modbus TCP between 2 PLCs - OPC UA	333515
Simple Motion iQ-F Applications Servo & Tuning - iQ-F SSCNET III o TSN	272520
HMI-GOT Applications Simulation with PLC - Data Logging - Recipes - MES - Modbus TCP with Inverter	272515
Simple Motion iQ-R & Safety Applications Motion J5 -Tuning - Safety Motion - Safety I/O - Safety Inverter	333518
PLC - iQ-R Applications Safety - Simple PLC con iQ-F - Modbus TCP - Data exchange between CPUs	333516
Robot Applications IEF Basic con IQF - Control from HMI - Spline	272519

LEVEL 3
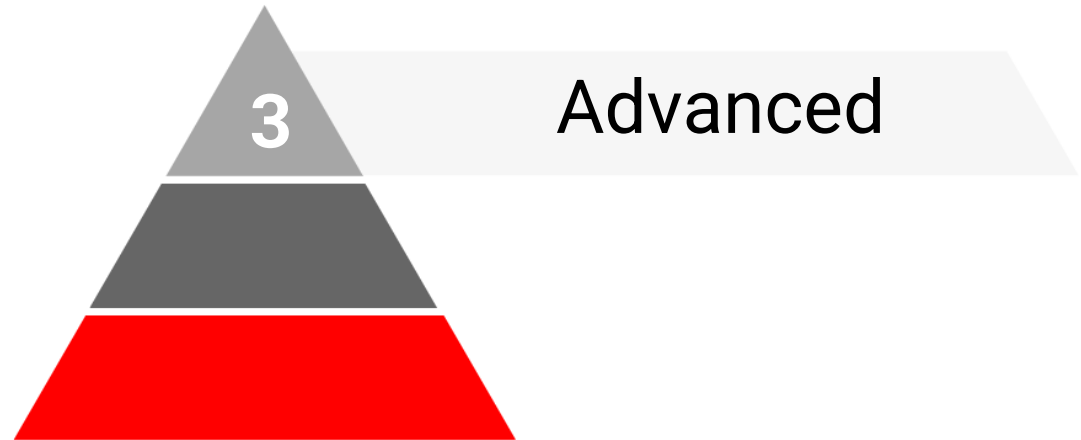
3 Advanced

- Solution - Automation - Custom

Level 3 | Advanced
Trainings Solution - Automation - Custom

The last of the three AcadeMy levels provides advanced multi-day in-presence training packages on Mitsubishi Electric solutions or applications and is addressed to technicians and maintenance engineers who wish to acquire multiple skills supported by an in-presence trainer and a final certificate of attendance.

The trainings last for three full days, from 9.30 a.m. to about 5 p.m.

Training features

▶ iQWorks licence included at first registration (excluding package maintenance)
▶ Provision of PDF documents and course exercises
▶ The lecturer will use the DEMO kits for practical testing of various exercises
▶ Participants, also in streaming, will be invited to use programs in simulation
▶ **Basic product knowledge is recommended by participating to On Demand Webinars (level 1 Basic)**

Package SOLUTION - Digital SCADA
SAP Code 694474

Day 1	Day 2	Day 3

▸ Introduction to SCADA Genesis64
▸ Managing a new project
▸ Connection configuration:
▸ Mitsubishi PLC, OPC Classic, OPC UA, MQTT
▸ User interface development and runtime configuration
▸ GraphWorX64 graphics
▸ Visualize and manipulate data
 	
▸ Practical exercises
	▸ Alarms Display and acknowledgement
	▸ Real-time and historical trend visualization
	▸ Organize your systems, buildings and processes in an asset-based hierarchy
	▸ Implement Global/Local Aliasing to reduce development time
	
	▸ Practical exercises
		▸ Hyper Historian :
		   ○ Logging on files
		   ○ Logging on Microsoft SQL
		▸ HyperAlarm/AlarmWorX
		   ○ Logging on Microsoft SQL
		   ○ Advanced Features
		▸ Users and system security
		
		▸ Practical exercises

Software installation required: **GENESIS64**™ GX Works3

Package SOLUTION - Robot

SAP Code 694475

Day 1	Day 2	Day 3

▸ Industrial and Collaborative Robots Lineup
▸ Using the «3D Monitor»
  o Creating the virtual island
  o Importing CAD files: island, tool, workpiece
▸ Choice of robot
  o Criteria and methods
  o Project development and simulation
  o Checking cycle time, axis load, inertia
▸ Operating modes:
  o Control from RT ToolBox3, Teaching-Box, digital IO board, fieldbus
 	
▸ Practical exercises
	▸ Safety applications: Industrial, Cooperative, Collaborative robots
	▸ Advanced safety features with MelfaSafePlus
	▸ Data exchange in CC-LINK IE Field Basic with iQF - iQR
	▸ Control by GOT2000:
	  o Template usage and customisation
	▸ Advanced Features:
	  o Compliance control and torque limitation
	  o Methods of anti-collision
	  o SPLINE with fixed and dynamic points
	▸ Practical exercises
		▸ Use of FB from Mitsubishi PLC for robot control
		▸ Additional axes management
		▸ Communication socket (ASCII Data Link) for data exchange with vision systems and PCs
		▸ Conveyor Tracking: configuration and application examples
		▸ MELFA Smart Plus introduction: predictive maintenance, tracking with additional axes, 2D calibration
		
		▸ Practical exercises

Software installation required: RT ToolBox3   GT Designer3   GX Works3

Package SOLUTION - CPU Motion

SAP Code 694476

Day 1	Day 2	Day 3
▶ Presentation Motion CPU iQ-R SSC-Net in Fiber Optic and Servo Drive MR-J4-B ▶ Multi CPU system (HS communication) ▶ Motion CPU (Servo Program , Mark detection, Limit Output data, SFC program, etc.) functions ▶ Examples of use Motion Template (Jog, Home, Positioning, Interpolation, CP Start operation, etc) ▶ MR-J4 fully closed loop system: connection second load side feedback encoder ▶ Practical exercises	▶ Synchronous Control, Clutch, Electronic Cam ▶ Virtual axis management (Real and CGA), external encoders ▶ Initial analisys axis phase (Run time control change phase request) ▶ Application example synchronous control with 3-axis demo ▶ Design of electronic cam profiles in «Coordinate Mode» ▶ Practical exercises	▶ Sizing and Tuning of axes ▶ Practical examples of sizing ▶ Examples of tuning with demo ▶ Practical exercises

Software installation required: MR Configurator2   GT Designer3   GX Works3   MT Developer2   Drive Sizing software **Motorizer**

Package SOLUTION - Packaging
SAP Code 694477

Day 1	Day 2	Day 3
Introduction to the process of a «flowpack» horizontal packaging machine	**Mitsubishi Electric proposal**	▸ Use of Robots for packaging applications
▸ Product phase, brand detection, cam crimping machine (rotary / linear / long D welding profile)	▸ Cam profile of a rotating crimper	▸ Communication socket (ASCII Data Link) for data exchange with vision systems
▸ No products No Bag, No Gap No Seal	▸ Return to axis phase after opening of the protections (Initial analisys axis phase)	▸ Conveyor Tracking: configuration and application examples of a Scara Robot on a horizontal packaging machine
▸ Thermoregulation	▸ Mark detection and phase change management (Run time control change phase request)	
▸ Motorizer: Sizing Rotary crimper motor (example Mechanics our demo)	▸ Verification of operation in simulation	
	▸ Change cam profile on the fly (Run time control change phase request)	
	▸ Flight release and docking for NPNB and NGNS functions	
▸ Practical exercises	▸ Practical exercises	▸ Practical exercises

Software installation required: | MR Configurator2 | GT Designer3 | GX Works3 | RT ToolBox3 | Drive Sizing software **Motorizer**

Package SOLUTION - Life Science
SAP Code 694478

Day 1	Day 2	Day 3
▸ Introduction to Scara and Anthropomorphic Robots in the «Life Science» market ▸ Use of the "3D Monitor" ▸ Virtual island Creation ▸ CAD file import: island, tool, workpiece ▸ Choice of robot ▸ Criteria and modalities ▸ Project development and simulation ▸ Check cycle time, axle load, inertia ▸ Practical exercises	▸ Communication socket (ASCII Data Link) for data exchange with vision systems ▸ Conveyor Tracking: configuration and application examples of a Scara or Anthropomorphic Robot ▸ CC-LINK IE TSN network management ▸ Management of Profinet networks ▸ Modbus TCP network management ▸ Practical exercises	▸ Interface with the database: o Using MES modules on iQR o Using MES modules on GOT2000 o OPC UA iQF module configuration o OPC UA iQR module configuration o The MX-OPC UA Client software ▸ Practical exercises

Software installation required: MR Configurator2 | GT Designer3 | GX Works3 | RT ToolBox3

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Package SOLUTION - Process

SAP Code 694479

3

Day 1	Day 2	Day 3
► iQ-R modular PLC introduction ► Process CPUs ► CPU and network device redundancy (CC-Link IE Field): configuration ► PID functions integrated in the process CPU, process FB ► Practical exercises	► Introduction to the GENESIS64 Scada for process applications ► Redundancy configuration in SCADA (server/client) ► Practical exercises	► Complete PLC-SCADA configuration and testing of a redundant system ► Practical exercises

Software installation required: MR Configurator2   GT Designer3   GX Works3   RT ToolBox3

Package AUTOMATION - Beginner
SAP Code 690002

The course is designed for newly hired technicians who have minimal skills in industrial automation

Day 1	Day 2	Day 3
▶ Compact PLC basic course ▶ GOT2000 series HMI introduction ▶ PLC simulator / HMI introduction ▶ Practical exercises	▶ See course «Simple Motion iQ-F Applications» cod. 272520 **Click HERE to view the dedicated slide** ▶ Practical exercises	▶ Inverter applications introduction ▶ Robot Applications introduction ▶ Practical exercises

Software installation required: | MR Configurator2 | GT Designer3 | GX Works3 | RT ToolBox3 |

Package AUTOMATION - Expert
SAP Code 690003

The course is designed for technicians who have industrial automation skills but do not know Mitsubishi Electric products

Day 1	Day 2	Day 3
▸ See course «Compact PLC iQF Applications» cod. 333515	▸ See course «Simple Motion iQ-F Applications» cod. 272520	▸ See course «Robot Applications» cod. 272519
Click HERE to view the dedicated slide	**Click HERE to view the dedicated slide**	**Click HERE to view the dedicated slide**
▸ Practical exercises	▸ Practical exercises	▸ Practical exercises

Software installation required: | MR Configurator2 | GT Designer3 | GX Works3 | RT ToolBox3 |

Package CUSTOM
SAP Code 690004

Course	Durations	Conditions	Date
Package CUSTOM	>=3 day	Phygital	On request

Note Package Custom:

▶ It is possible to compose the days on topics defined in level 2 or 3 courses (Solution or Automation).

▶ Any requests on customer specific arguments (e.g. specifications) will be considered with dedicated configurations and offers for a minimum package of 3 days.

Training Summary

Corso	SAP Code
Package SOLUTION - Digital SCADA	694474
Package SOLUTION - Robot	694475
Package SOLUTION - CPU Motion	694476
Package SOLUTION - Packaging	694477
Package SOLUTION - Life Science	694478
Package SOLUTION - Process	694479
Package AUTOMATION - Beginner	690002
Package AUTOMATION - Expert	690003
Package CUSTOM	690004

Contacts

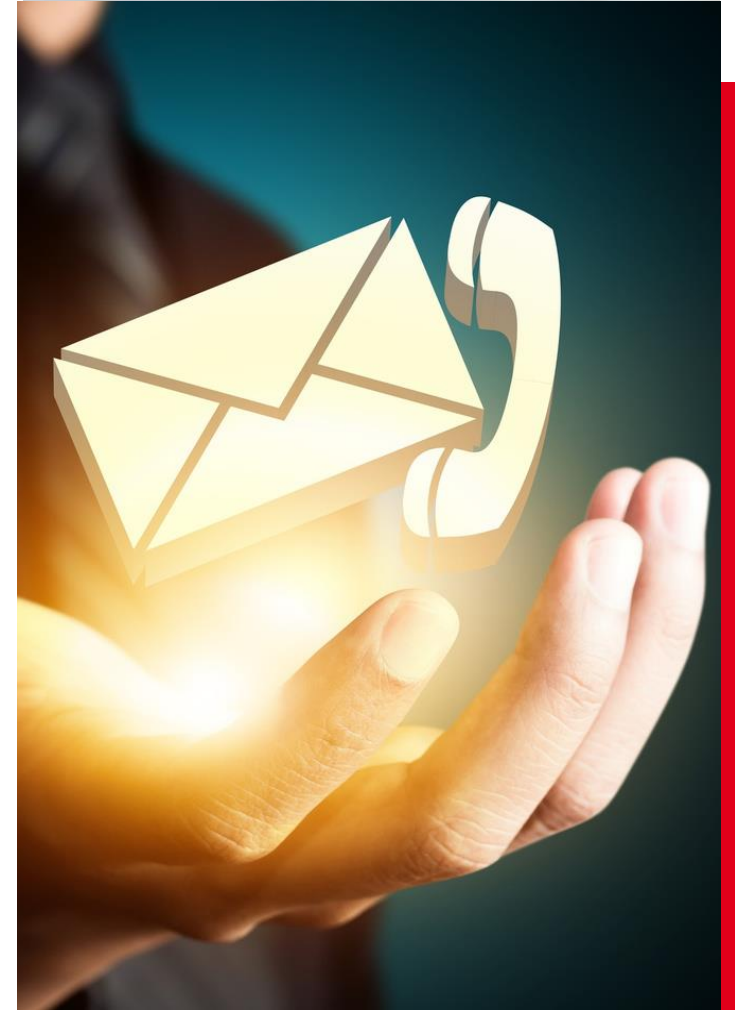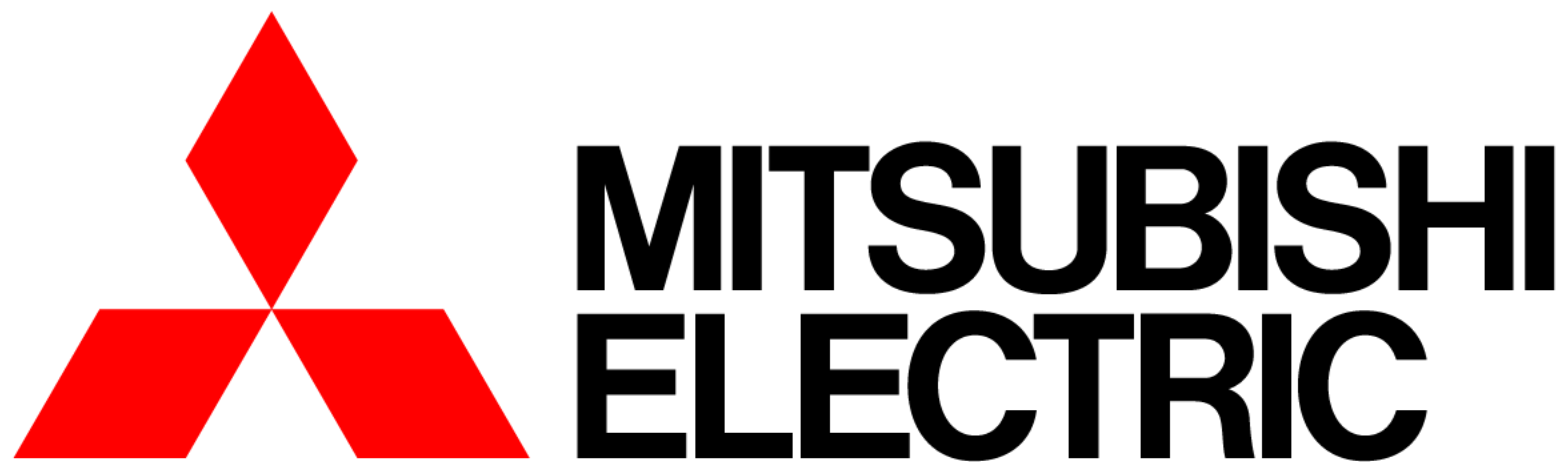Need more details about our training?
Contact us:

 traning.ida@it.mee.com

 www.mitsubishielectric.com/fa

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