

Training Schedule 2009



With the right training you can do (almost) anything.

Hardware /// Software /// Service Training /// Maintenance & Repair /// Beginners & Specialists ///

Calendar 2009

Date		Days	Training course
January	26 – 27	2	Single Axis Motion Controller MR-MQ100
	28	1	System Q Process CPU
February	04	1	Mitsubishi Network / CC-Link IE
· · · · ·	05	1	Mitsubishi Network / CC-Link
	17 – 18	2	Frequency Inverter (Basic course + A700 practices)
	17	1	MES Interface
	18	1	eMES Interface
	26	1	System Q Redundant CPU
March	03 – 04	2	Ethernet
	05 - 06	2	Robot (Basic Course)
	09	1	FX Positioning
	24	1	System Q Safety
	25 – 26	2	Robot (Advanced Course)
April	01	1	Modbus TCP / Modbus serial
	27	1	Update HMI E1000
	28	1	Update HMI GOT1000
	29 – 30	2	GX Works 2
May	05 - 06	2	MELSERVO
may	12 - 13	2	Basic LVS
	12 13	1	C Controller (Basic course)
	18 – 19	2	Robot (MELEA Works, MELEA Vision)
	26 - 28	- 3	Motion Controller
lune	00	1	CANopen
Julie	16 - 17	י כ	PROFIBILIS DP V/0/V1/V/2 Master
	30	2	Single Avis Motion Controller MR-MO100
lub.	01	1	Single Axis Motion Controller MR MQ100
July	07 09	ו ר	Single Axis Motion Controller MR-MQ100
	07 - 08	2	New compact drives inverter + Networks
August			
September	07 – 09	3	iQ Platform / iQ Works
	14 – 15	2	Robot (Basic Course)
	21 – 22	2	Basic LVS
	22	1	MES Interface
	23	1	eivies interface
	29	1	
October	20 – 21	2	MELSERVO
	27 – 28	2	Frequency Inverter (Advanced Workshop)
	27	1	Mitsubishi Network / CC-Link IE
	28	1	Mitsubishi Network / CC-Link
	29 – 30	2	Ethernet
November	02	1	System Q Safety
	09	1	FX Positioning
	10	1	C Controller (Basic course)
	11	1	System Q Process CPU
	16 – 17	2	Robot (Advanced Course)
	16	1	Update HMI E1000
	17	1	Update HMI GO11000
December	01 – 03	3	Motion Controller
	10 – 11	2	GX Works 2

Programmable Logical Controller / Software

System Q Process CPU

Devices and Software: QnPH CPU

PX Developer GX Developer **GX IEC Developer**

Prereauisites: Basic Mitsubishi PLC knowledge

Course Target: You learn about the structure and functionality of Process PLCs. You will be able to program simple and complex PID loops.

Contents:

- Setup of the Multi Process System Description of hardware QnPH CPU
- (Programming software PX Devel-
- oper) Standard functions: Standard PID instruction Process PID instruction
- Auto tuning of PID
- Diagnosis Program development
- Practical examples

QnPRH hardware

QnPRH parameter

QnPRH software

Local I/O rack

- Different areas of application **Duration:**
- 1 day

Contents:

Networks

Duration:

1 day

System Q Redundant CPU

Devices and Software: OnPH CPU GX IEC Developer GX Developer PX Developer

Prerequisites: MELSEC PLC basic programming knowledge using GX IEC Developer and System Q

Course Target: You learn about the hardware and the application possibilities of the System Q Redundant CPU. Ability to self-program the first projects.

System Q Safety

Devices and Software: OS CPU

GX Developer

Prerequisites: Basic knowledge of Mitsubishi PLC programming

Course Target:

After the training you will be able to program the basic functions and carry out simple projects.

Contents:

- Basics of Safety PLC
- Hardware
- QS CPU CC Link Safety
- Designing and programming Safety Applications
- Diagnostic program/debugging **Duration:** 1 day

iQ Platform / iQ Works

Devices and Software: iQ Platform

iQ Works

Prerequisites: Basic training on A/Q logic control

Course Target:

You are able to install and operate the iQ platform in co-operation with other course members.

- - **Contents: Overview iQ Platform**
 - **Overview iQ Works**
 - High speed PLC CPU
 - High speed Motion CPU High speed Robot CPU
 - High speed CNC CPU
 - HMI GOT1000
 - Data Exchange between PLCs, Motion, Robot, CNC, HMI
 - Diagnostic program/debugging **Duration:**

3 davs

GX Works 2

Devices and Software: GX Works 2

Prerequisites:

Basic knowledge of the Mitsubishi System Q GX(IEC) Developer

Course Target:

You learn the new features of GX Works 2 and how to use the new software.

Contents:

- What's new? PLC Support
- Programming languages:
- MELSEC languages & editors IEC languages & editors PLC Parameter
- Diagnostics
- **Duration:**
- 2 davs

MES Interface

Devices and Software: QJ71MES96, System Q

GX IEC Developer GX Developer MX MES Interface, MS Access, Oracle XE or SQL Server Express as

example for a data base **Prereauisites:**

Basic training on A/Q logic control

Course Target:

You are able to set up and operate the MES module in combination with a database (MS Access, Oracle XE or SQL Server Express).

MX MES InterfaceIT module, System Q

MES features Hardware

Contents:

Software

What is MES?

Practical examples with QJ71MES96 or GT15-MES

Duration:

1 day

C Controller (Basic course)

Devices and Software:

System Q Rack (1 Q-CPU, 1 C Controller, analogue and digital I/O module) GX (IEC) Developer, Tornado, C Controller configuration software

Prerequisites:

Basic knowledge of Mitsubishi PLC programming, knowledge of multiple CPU systems, basic knowledge of C or C++

Course Target:

After the training you will be able to program the basic functions and carry out simple projects.

- Contents:
- Description of the hardware Q06CCPU-V-01
- Setup of the C Controller
- Short introduction to VX Works Necessary C basics (and repetition,
- if necessary) Programming software Tornado
- Sample programs of the basic functions

Duration:

1 day

MX MFS InterfaceIT Workbench. Oracle XE or SQL Server Express as example for a data base **Prerequisites:**

Devices and Software:

GX IEC Developer

GX Developer

Basic training on A/Q logic control

Course Target: You are able to set up and operate the eMFS module in combination with a database (Oracle XE or SQL Server Express).

Hardware Software

Contents:

What is MES? **MES** features

Practical examples with MX MES InterfaceIT module

Differences between Mitsubishi

MES modules and eMES module

1 dav

Duration:

eMES Interface

LVS / Inverter

Assembly / Modification of ACB/MCCB

Devices: ACB:

AE-SW 1600 3PD/O with accessories MCCB:

NF1000-1600 with accessories

Prerequisites:

- Basic knowledge of electrical engineering and experience in designing power supplies.
- This training is addressed to clients with basic experience in MITSUBISHI LVS products range.

Course Target:

After the training the participants are able to select, assemble and test the right products for a power supply system

- **Contents MCCB:**
- Assembly/Test of AL/AX Assembly/Test of MDS
- Assembly/Test of SHT/UVT

Contents ACB:

- Assembly/Test of Draw-Out mechanism
- Assembly/Test of AX contact block Assembly/Test of MD
- Assembly/Test of UVT options
- Assembly/Test of CC/SHT
- Assembly/Test of CT's
- Assembly/Adjustment/Test of ETR
- Assembly/Test of EX1, DP and VT
- Assembly/Test of BIF-CC and **BIF-CON**
- Current Flow Simulation/Character-
- istic Test with Y2000 Tester Inspection/Maintenance handling **Duration:**
- 1 day

Frequency Inverter (Basic course + A700 practices)

Devices and Software: FR-F700

FR-A700 **FR-Configurator**

Prerequisites:

Basic knowledge of electrical engi-neering, GX-Developer recommended, but not required.

Course Target:

Devices:

FR-D700 FR-E700

FR-F700

FR-A700

FR-A701

inverter

Brake units

FR-Configurator

Prerequisites:

Regenerative units

Structure and function of Mitsubishi frequency inverters. Selection of the right inverter, including peripheral devices for drive applications. Handling of more complex drive applications like torque and positioning. Use of the FR-A700's built-in PLC. Provide advice on EMC and harmonic compatibility. Setup the drive by using FR-Configurator software.

Contents:

- Basic knowledge about drive technology like EMC, harmonics and regenerative energy.
- Theoretical and practical exercises with FR-A700

Duration: 2 davs

Basic LVS

Devices and Software: Open Air Circuit-Breakers and Add-Ons Compact Circuit-Breakers and Add-Ons

Power Contactors and Add-Ons

Prerequisites:

Basic knowledge of electrical engineering and experience in designing of power supplies. This training is addressed to clients

with basic experience in LVS products.

Course Target:

After the training the participants are able to select the right product in order to install it into the system.

FX Positioning

Devices and Software:

FX3U GX IEC Developer, GX Developer FX Configurator FP

Prerequisites:

Basic training on FX/A/Q logic control

Course Target: You are able to install and perform positioning control between FX and Servo Drives

- **Contents:** General introduction to LVS technology

- Product range
- **Duration**:

Contents:

outputs

- Basics
- Application fields

- 1 1/2 days

- Selection

Course Target: Increased knowledge of EMC harmonics phenomena. Ability to handle more complex applications.

Basic knowledge about frequency

Contents:

- Basic knowledge of drive technoloav like EMC, harmonics and regenerative
 - energy.
- Practical exercises on our inverter test bench

Duration:

2 days

Frequency Inverter (Advanced Workshop)

New compact drives Inverter + Networks

Devices and Software:

FR-D700 FR-E700

FR-Configurator SW3

Prerequisites: Basic knowledge of electrical engineering.

Course Target:

New features of D700 & E700.

- Provide advice on EMC and hamonic requirements.
- Choosing the right inverter and setup with FR-Configurator SW3 software.
- First day: Basic knowledge about inverter
- serial communication using Mitsubishi inverter protocol Second day: Introduction of communication
- option cards like CC-Link, CANopen and Profibus.

- **Contents:** Basic knowledge about drive tech-
- nology like EMC, harmonics and regenerative
- energy
 - Frequency inverters product overview
 - What's new in D700 & E700
 - RS485 communication (Mitsubishi protocol) / Communication option cards

Duration: 2 davs



SSCNET / FX Configurator FP

Direct positioning via on board puls

Overview FX Positioning

Networks / HMI

PROFIBUS DP V0/V1/V2 Master

Devices and Software:

System Q FX3U **GX IEC Developer GX** Developer GX Configurator DP

Prerequisites: Basic training on A/Q logic control

Course Target: You are able to install and operate networks in co-operation with other course members. In addition, you know how to handle the diagnostic program for locating bugs.

Ethernet

Devices and Software:

System Q, FX series **GX IEC Developer** GX Developer FX Configurator EN

Prerequisites:

Basic training on A/Q/FX logic control **Course Target:**

You are able to install and operate networks between PCs and PLCs. In addition, you get an inroduction to telecontrol with MELSEC PLC.

Modbus TCP / Modbus serial

Devices and Software: System Q, FX series

GX IEC Developer GX Developer MB Configurator

Prerequisites: Basic training on A/Q/FX logic control

Course Target:

You are able to install and operate networks between PCs and PLCs. In addition, you get an inroduction to telecontrol with MELSEC PLC

Update HMI E1000

Devices and Software:

E1000-series Terminals Different types of PLCs GX (IEC) Developer, E Designer 7.50

Prerequisites:

Programming of MELSEC PLCs with GX (IEC) Developer

Course Target:

High-Level functions; extend standard user knowledge

- **Contents:** System Q, FX3U Profibusmaster (new functions)
- Mode types
- Networks functions Networks start-up
- Diagnostic
- Program/debugging
- FDT/DTM (concept)

Communication basics

Duration: 2 days

Contents:

Duration:

Contents:

Duration:

Contents:

welcome!

Duration:

1 dav

1 dav

Interface types:

Modbus TCP/IP

- Modbus serial

Function blocks

2 days

Interface types

FX series

Protocol types

Module overview

- System Q series

Communication between PLCs

Communication PC <=> PLC

Communication basics

Presentation of new hardware

Special wishes of participants are

New features of the latest

E-Designer release

CANopen

Devices and Software:

FX series **GX IEC Developer**

GX Developer

Prerequisites:

Basic training on System Q/FX logic control

Course Target:

You are able to install and operate networks in co-operation with other course members. In addition, you know how to handle the diagnostic program for locating bugs.

Contents:

- **Overview CANopen networks**
- Networks functions
- **Technical differences**
- Commissioning of the network Diagnostic program/debugging
- **Duration:**

2 davs

Mitsubishi Network / CC-Link

Devices and Software: System Q, FX series

Basic training on A/Q/FX logic control

You are able to install and operate

course members. In addition, you

program for locating bugs.

networks in co-operation with other

know how to handle the diagnostic

GX IEC Developer

GX Developer

Prerequisites:

Course Target:

- **Contents:** Overview Mitsubishi networks
 - CC-Link functions
 - Master-Slave
 - Master-Local
 - Standby Master
 - Dedicated instruction Networks functions
 - Networks start-up
 - Horizontal and vertical communication
 - Diagnostic program/debugging

Overview Mitsubishi networks

Horizontal and vertical communi-

Diagnostic program/debugging

- PLC-PLC communication

Dedicated instruction

CC-Link IE functions:

Networks functions

Networks start-up

 Function blocks **Duration:**

1 dav

Contents:

cation

Duration:

1 day

Mitsubishi Network / CC-Link IE

Devices and Software:

System Q **GX IEC Developer GX** Developer

Prerequisites:

Basic training on A/Q logic control

Course Target: You are able to install and operate networks in co-operation with other course members. In addition, you know how to handle the diagnostic program for locating bugs.

Update HMI GOT1000

Different types of PLCs GX (IEC) Developer

Prereauisites:

Course Target:

High-Level functions; extend standard user knowledge

- Presentation of new hardware
- Special wishes of participants are

Duration:

GOT1000-series Terminals

Devices and Software:

GT Works 2

Programming of MELSEC PLCs with GX (IEC) Developer

Contents:

- New features of the latest GT Works2 release
- welcome!

1 dav

Robots / Motion / Servo

Robot (Basic Course)

Devices and Software: RV-, RP- or RH- Robots, PC, RT ToolBox2, Ethernet Components

Prerequisites: Basic knowledge required

Course Target: You learn about the general use of Mitsubishi robots.

Contents:

- Overview of various robot systems
- Robot systems parts/options Introduction RV-, RH- and RP-series
- Connecting a robot system
- Calibration methods
- Programming Melfa Basic V
- Ethernet communication
 - Debugging Programming, editing of programs
- Multitasking -
- Compliance control
- Open discussion about existing / future applications or problems

Duration:

2 davs

Motion Controller

Devices and Software:

Motion Controller, MT Developer, Melsec System Q (GX-IEC Developer)

Prereauisites: Basic knowledge of Mitsubishi PLC Programming

Course Target:

Basic part:

You learn about the structure and functionality of the Mitsubishi Motion Controller. You are able to create positioning programs including interpolation of servo axes.

Advanced part:

MELSERVO

AC Servo Motor

MR-Configurato

Prerequisites:

Course Target:

FX3U, FX3N-20SSC-H

Devices and Software:

MR-J3-A, MR-J3-B, MR-J3-T

You are able to develop complete positioning programs including synchronisation of several serve axes and creating electrical CAM curves.

Basic knowledge of drive engineering

and FX-PLC programming required

You learn about the structure and function of the MR-J3 series. You are

able to start-up the MR-J3 and to do

You learn about positioning with

the debugging by yourself.

FX3U and FX3U-20SSC-H

Contents:

- **Basic part:** Product overview
- Hardware and configuration
- Programming software
- **Operating systems** Basic functions:
- Parameter
- Real mode
- Test mode
- Diagnosis
- Program development practical examples Advanced part:
- Virtual mode CAM curves
- **Duration:**

3 days

Robot (Advanced Course)

Devices and Software:

RV-, RP- or RH-Series Robot Systems, RT ToolBox2, MR-J3-, PLC-, PC-Connection, Conveyor Belt, Vision System

Prereauisites:

Robot basic training RV-/RP-/RH-series **Course Target:**

You are able to solve complex application tasks with the help of Mitsubishi robots and further Mitsubishi industrial components

Notice:

Basic training is mandatory !

Contents:

- Melfa Basic V programming Software Packages, MELFA Vision, MELFA Works
- Multitasking
- Compliance control User defined origin setting
- Collision detection
- Multi axes control
- Communication
- System tuning
- Conveyor tracking (optional)
- **Duration:**

2 days

Robot (MELFA Works, MELFA Vision)

Devices and Software:

RV-, RP- or RH-Series Robot Systems PC, RTToolbox2, MELFA Works, MELFA Vision COGNEX Vision System

Prerequisites:

Robot basic training RV- / RP- / RH- series

Course Target:

You are able to create simple projects with MELFA Works, simulate the projects and transfer them to the real robot. With MELFA Vision you connect the vision system and create vision programs.

Notice:

Basic training is mandatory !

Contents:

- MELFA Works Project creation
- Solid Works Basics
- **MELFA Works Simulation** MELFA Works with a real robot
- **MELCalib**
- MELFA Vision Projects
- Connecting a Vision System
- Conveyor tracking with Vision System

Duration:

2 days

Devices and Software: MR-MQ100, MT Developer2-MQ

Prerequisites: Basic knowledge of MELSERVO products

Course Target:

You will learn about the structure and functionality of the Single Axis Motion Controller.

At the end you will be able to create positioning programs including encoder following with electrical CAM curves. We will show you how to realize applications like rotary cutter, flying saw and labeling with the new MR-MQ100. systems Features of MR-J3 servo drives Wiring

Contents:

- Parameter
- Machine Analyzer, Vibration Supression Control

General features of AC servo

- Servo sizing Functions of FX3U and FX3U-20SSC-H
- Start-up procedure
- Practical exercises
- **Duration:** 2 days
- **Single Axis Motion Controller MR-MQ100**

Contents:

- Product overview
- Hardware and configuration . Programming software

Program development - practical

examples with mark detection and

- Operating systems
- **Basic functions:** - Parameter Real mode

Virtual mode

encoder following

Test mode

- Diagnosis

Duration:

2 days

Training Registration

Fax to: +49 (0) 2102 486-7170

(Just copy this form, fill it out and return by fax!)

Attn. Ms. U. Zinapold

I / we hereby register for the following course:

Course:	Phone:				
	E-mail:				
Course location:	Dates from: to:				
Participants:					
Surname:	First name:				
Surname:	First name:				
Surname:	First name:				
Company:	Industry:				
Address:					
Citer					
Спу:					
Please reserve single room(s)/ double room(s) for me / us					
from to	ights				

Date

Stamp, Signature

