

# Training



# Training

## Training for customer courses

### Version 1.

© 11/2022

All Rights Reserved

Publishing date 20/11/2022

### Organizer:

Sumitomo (SHI) Demag Plastics Machinery GmbH

Altdorfer Straße 15 • D-90571 Schwaig.

Phone 0911 / 5061-0

Internet: [www.sumitomo-shi-demag.eu](http://www.sumitomo-shi-demag.eu)

**Hint:** The data contained in this document may be altered without prior notice.

**Reservation:** Courses that do not reach the minimum number of participants can be cancelled at short notice by the organizer. Program changes reserved.

# CONTENTS

<b>1</b>	<b>Machine operation .....</b>	<b>5</b>
1.1	Operating NC5 .....	5
1.2	Operating EI-Exis SP .....	6
1.3	Operating IntElect NC5 .....	7
1.4	Flexible sequences NC5 .....	8
1.5	Operating NC5 multi machines .....	9
1.6	Operating LSR .....	10
1.7	Operating Mucell .....	11
<b>2</b>	<b>Application Training .....</b>	<b>12</b>
2.1	Machine operator .....	12
2.2	Tool setting on injection moulding machines - Module I .....	13
2.3	Set up of injection moulding machines - Module II .....	14
2.4	Process Technology - Optimization – Module I .....	15
2.5	Process Technology - Sampling – Module II .....	16
2.6	Process Technology - LSR .....	17
2.7	Process Technology - Mucell .....	18
<b>3</b>	<b>Machine Technics .....</b>	<b>19</b>
3.1	Machine technic - Systec / EIExis SP .....	19
3.2	Machine technic – IntElect 2 .....	20
3.3	Machine technic – IntElect smart .....	21
<b>4</b>	<b>Robotic .....</b>	<b>22</b>
4.1	SDR-Series - Module I .....	22
4.2	SDR-Series - Module II .....	23
4.3	SDR-Series - Module III .....	24
4.4	SAM-C Series - Module I .....	25
4.5	SAM C Series - Module II.....	26
<b>5</b>	<b>Registration.....</b>	<b>27</b>
5.1	Contact Team Training.....	27
5.2	Training appointments.....	27



## 1 Machine operation

### 1.1 Operating NC5 plus

This training covers topics of operation and functions on NC5 machines.

#### Subjects:

- Operating philosophy NC5 plus
- Set up the clamping unit
- Programming the machine and mould sequences and mould safety
- Set up the injection unit
- Set up process parameters, Injection profiles
- Process monitoring and documentation
- Practice at the machine

#### Profile:

<b>Aim:</b>	Getting familiar with the operating philosophy of NC5 plus, set up the machine
<b>Target group:</b>	Setup staff, shift leader, production leader
<b>Duration:</b>	2 days
<b>Participants:</b>	max. 6
<b>Background:</b>	basic knowledge of injection moulding, experience with NC controlled machines
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	BT

## 1.2 Operating EI-Exis SP

This training covers how to use the special functions of packaging applications on EI-Exis SP machines.

### Subjects:

- Set up the clamping unit
- Programming the machine and mould sequences and mould safety
- Set up parallel functions for mould, ejector, cores and injection
- Set up process parameters
- Usage of MWE
- Practice at the machine or NC5 panels

### Profile:

<b>Aim:</b>	Getting familiar with the operating of NC5 and packaging application
<b>Target group:</b>	Setup staff, shift leader, production leader
<b>Duration:</b>	1 day
<b>Participants:</b>	max. 6
<b>Background:</b>	Seminar "Operating NC5 plus"
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	BEL

## 1.3 Operating IntElect NC5 plus

This training covers how to use the special functions of IntElect machines with NC5 controller.

### Subjects:

- Set up the clamping unit
- Programming the machine and mould sequences and mould safety
- Set up clamp force stages
- Set up parallel functions for mould, ejector, cores and injection
- Set up “active lock”
- Set up “active flow balance”
- Usage of MWE
- Practice at the machine or NC5 panels

### Profile:

<b>Aim:</b>	Getting familiar with the operating of NC5 and packaging application
<b>Target group:</b>	Setup staff, shift leader, production leader
<b>Duration:</b>	1 day
<b>Participants:</b>	max. 6
<b>Background:</b>	Seminar “Operating NC5 plus”
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	BI

## 1.4 Flexible sequences NC5 plus

This training covers programming of basic and flexible sequences for mould and injection.

### Subjects:

- Set up the clamping unit
- Programming the machine and mould sequences and mould safety
- Set up parallel functions for mould, ejector, cores and injection
- Set up process parameters
- Usage of MWE
- Practice at the machine or NC5 panels

### Profile:

<b>Aim:</b>	Getting familiar with the operating of all electric NC5 machines
<b>Target group:</b>	Setup staff, shift leader, production leader
<b>Duration:</b>	1 day
<b>Participants:</b>	max. 6
<b>Background:</b>	Seminar "Operating NC5 plus"
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	BA



## 1.5 Operating NC5 plus multi machines

This training covers programming and practice with more component machines.

### Subjects:

- Set up the clamping unit
- Programming basic mould sequences
- Set up parallel functions for mould, ejector, cores and injection
- Set up turn table
- Practice at the machine or NC5 panels

### Profile:

<b>Aim:</b>	Getting familiar with the operating of NC5 multi machines
<b>Target group:</b>	Setup staff, shift leader, production leader
<b>Duration:</b>	1 day
<b>Participants:</b>	max. 6
<b>Background:</b>	Seminar "Operating NC5 plus"
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	BML

## 1.6 Operating LSR

This seminar is an extension of the seminar "Operation NC5 plus" for safe operation and use the "LSR" screens.

### Subjects:

- Operating philosophy sequence programming
- Settings for the shut-off nozzle
- Settings for the brush unit
- Set up the injection unit
- Programming in- and outputs
- Programming of the tool functions evacuation and ventilation
- Practice at the NC5 demo Controller

### Profile:

<b>Aim:</b>	Getting familiar with the operating of the LSR screens
<b>Target group:</b>	Setup staff, shift leader, production leader
<b>Duration:</b>	1 day
<b>Participants:</b>	max. 6
<b>Background:</b>	Seminar "Operating NC5 plus"
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	BS

## 1.7 Operating Mucell

This seminar is an extension of the seminar "Operation NC5" for safe operation and use the "Mucell screens.

### Subjects:

- Operating philosophy sequence programming
- Settings for the shut-off nozzle
- Set up the injection unit
- Programming of mold functions
- Programming of the "Mucell" screens
- Practice at the NC5 demo Controller

### Profile:

<b>Aim:</b>	Getting familiar with the operating of the "Mucell" screens
<b>Target group:</b>	Setup staff, shift leader, production leader
<b>Duration:</b>	1 day
<b>Participants:</b>	max. 6
<b>Background:</b>	Seminar "Operating NC5 plus"
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	BC

## 2 Application Training

### 2.1 Machine operator

This seminar deals with the handling of injection molding machines that are in production. The participant learns the process sequence and structure and function of the production facilities. He recognizes and evaluates the causes of malfunctions and can safely bring the machine and robot back into production.

#### Subjects:

- Structure of the injection molding machine
- Cycle sequence
- Security-related elements
- Alarm messages and alarm reactions
- Stopping and starting the machine
- Basic position of the robot
- Safety and dangers when handling injection molding machines
- Practical training at the machine

#### Profile:

<b>Aim:</b>	Safe handling of Sumitomo (SHI) Demag injection molding machines in production
<b>Target group:</b>	Production staff
<b>Duration:</b>	2 days
<b>Participants:</b>	max. 6
<b>Background:</b>	No previous knowledge required
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	MF

## 2.2 Tool setting on injection moulding machines - Module I

Introduction to injection molding technology in theory and practice. In intensive, practical training, the participant learns how to set up an injection molding tool and the necessary inputs for the clamping unit in the NC5 plus machine control.

### Subjects:

- Basic understanding of injection moulding
- Structure of injection moulding machines
- Structured set up process
- Setting up the injection moulding tool
- Operating of the NC5 plus controller
- Safety and risks when setting up the machine
- Final test
- Practice at the machine

### Profile:

<b>Aim:</b>	Independent tool setup and operation of a Sumitomo (SHI) Demag injection molding machine
<b>Target group:</b>	Setup staff
<b>Duration:</b>	3 days
<b>Participants:</b>	max. 6
<b>Background:</b>	technical understanding
<b>Equipment:</b>	safety shoes, workwear
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	E1

## 2.3 Set up of injection moulding machines - Module II

Deepening knowledge of injection molding technology in theory and practice. In intensive, practical training, the participant learns how to prepare the production chain, set up, evaluate and adjust the injection molding process. He evaluates the quality requirements and creates the documentation of the set processes using the corresponding image pages of the NC5 plus machine control.

### Subjects:

- Structure of the injection moulding machine
- Structure of thermoplastic resin
- Mold technology
- Preparation of the process
- Operating of the NC5 plus controller
- Basic setting of the injection molding process
- Set up the injection unit
- Start up the machine
- Final test
- Practice at the machine

### Profile:

<b>Aim:</b>	Independent start up and operation of a Sumitomo (SHI) Demag injection molding machine
<b>Target group:</b>	Setup staff
<b>Duration:</b>	3 days
<b>Participants:</b>	max. 6
<b>Background:</b>	Seminar "Tool setting on injection moulding machines - Module 1"
<b>Equipment:</b>	safety shoes, workwear
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	E2

## 2.4 Process Technology - Optimization – Module I

The focus of this seminar is the recognition of relationship between the injection molding parameters, as well as faults on injection molded parts and their causes.

### Subjects:

- Behavior of thermoplastic plastic melts
- Hot runner technology
- Basic setting of the process parameters
- Influence of the parameters on the part quality
- Optimizing the cycle time
- Operation of the necessary screen pages NC5
- Analysis of energy consumption
- Practical exercises on the machine
- Final test

### Profile:

<b>Aim:</b>	Recognizing defects on injection molded parts and developing solutions in stable processes by using the functions of the NC5 controller
<b>Target group:</b>	Process technician, shift leader, production leader
<b>Duration:</b>	3 days
<b>Participants:</b>	max. 6
<b>Background:</b>	Seminar “Set up of injection moulding machines - Module 2”
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	P1

## 2.5 Process Technology - Sampling – Module II

The participant learns the structured approach to tool sampling and calculates the design of the machine. With the help of the process curves, the set process is analyzed, evaluated and improved.

### Subjects:

- Structured tool sampling
- Creation of checklists
- Calculation of the machine design
- Calculation of an injection molded part
- Operation of the necessary screen pages NC5
- Analysis with process curves
- Practical exercises on the machine
- Final test

### Profile:

<b>Aim:</b>	Safe and systematic approach to the sampling of new processes.
<b>Target group:</b>	Process technician, shift leader, production leader
<b>Duration:</b>	3 days
<b>Participants:</b>	max. 6
<b>Background:</b>	Seminar "Process Technology - Optimization – Module 1"
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	P2



## 2.6 Process Technology - LSR

Introduction to the process engineering for processing liquid silicone rubbers

### Subjects:

- Properties and processing of the silicone
- Process conditions
- Tool technology
- Machine technology
- Mixing and dosing the components
- Practical training on the machine

### Profile:

<b>Aim:</b>	Safe handling of the LSR process engineering
<b>Target group:</b>	Process technician, shift leader, production leader
<b>Duration:</b>	2 days
<b>Participants:</b>	max. 6
<b>Background:</b>	Good knowledge of the injection molding process and experience with NC5-controlled injection molding machines
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	PS

## 2.7 Process Technology - Mucell

Introduction to the process engineering of Mucell applications

### Subjects:

- Properties and processing of foames
- Process conditions
- Tool technology
- Machine technology
- Mixing and dosing the components
- Practical training on the machine

### Profile:

<b>Aim:</b>	Safe handling of the Mucell process engineering
<b>Target group:</b>	Process technician, shift leader, production leader
<b>Duration:</b>	2 days
<b>Participants:</b>	max. 6
<b>Background:</b>	Good knowledge of the injection molding process and experience with NC5-controlled injection molding machines
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	PC

## 3 Machine Technics

### 3.1 Machine technic - Systec / EIExis SP

This seminar provides knowledge of the technology of the hydraulic and hybrid injection molding machines Systec and EIExis SP and their maintenance.

#### Subjects:

- Operation of the NC5 control
- Hydraulic, mechanical and electrical structure of the injection molding machines
- Reading of hydraulic and circuit diagrams
- Electrical control of hydraulic components
- Interaction of mechanics, hydraulics and control
- Calibration of pumps
- Troubleshooting
- Creation and processing of maintenance tasks in the NC5 control
- Wear detection
- Performing maintenance
- Practical training

#### Profile:

<b>Aim:</b>	Safe handling of injection molding machines of the Systec and EIExis SP series, independent error analysis, troubleshooting and maintenance
<b>Target group:</b>	Maintenance staff
<b>Duration:</b>	4 days
<b>Participants:</b>	max. 6 participants
<b>Background:</b>	basic technical knowledge hydraulic, mechanic, electric
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	MT-SE

## 3.2 Machine technic – IntElect 2

This seminar provides knowledge of the technology of the fully electric IntElect 2 injection molding machine and its maintenance.

### Subjects:

- Operation of the NC5 control, Use of specific image pages
- How the control system works
- Frequency-controlled drives interaction of mechanics,
- Drives and controls
- Series-specific features
- Handling of the electrical plan and use of the service pages of the NC5
- Operator terminals for troubleshooting and disposal
- Creating and editing Maintenance tasks in the NC5 control
- Wear detection
- Performing maintenance
- Practical training

### Profile:

<b>Aim:</b>	Safe handling of the IntElect 2 injection molding machine, independent error analysis, troubleshooting and maintenance
<b>Target group:</b>	Maintenance staff
<b>Duration:</b>	4 days
<b>Participants:</b>	max. 6 participants
<b>Background:</b>	Basic knowledge of electrical engineering and the mechanical functions of an injection molding machine
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	MT-IZ

### 3.3 Machine technic – IntElect smart

This seminar provides knowledge of the technology of the fully electric IntElect smart injection molding machine and its maintenance.

#### Subjects:

- Operation of the NC5 control, Use of specific image pages
- How the control system works
- Frequency-controlled drives interaction of mechanics,
- Drives and controls
- Series-specific features
- Handling of the electrical plan and use of the service pages of the NC5
- Operator terminals for troubleshooting and disposal
- Creating and editing Maintenance tasks in the NC5 control
- Wear detection
- Performing maintenance
- Practical training

#### Profile:

<b>Aim:</b>	Safe handling of the IntElect smart injection molding machine, independent error analysis, troubleshooting and maintenance
<b>Target group:</b>	Maintenance staff
<b>Duration:</b>	4 days
<b>Participants:</b>	max. 6 participants
<b>Background:</b>	Basic knowledge of electrical engineering and the mechanical functions of an injection molding machine
<b>Equipment:</b>	safety shoes, workwear
<b>Location:</b>	Schwaig, on customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	MT-IS

## 4 Robotic

### 4.1 SDR-Series - Module I

This training conveys the basics of commissioning and “simple pick & place” CNC robots SDR Visual-2.

#### Subjects:

- Operation of the Robot Terminal
- Robot functions on the IMM-Terminal
- Start up machine / robot
- Data exchange Robot ↔ Machine
- “simple pick&place” application
- Practical training on the robot with IMM-simulation

#### Profile:

<b>Objective:</b>	Operation of the robot system Creation of a teach program with “simple pick&place”
<b>Target group:</b>	Operators and tool setters
<b>Duration:</b>	2 days
<b>Participations:</b>	max. 4 participants
<b>Background:</b>	For beginners – knowledge of the basic functions of a robot would be helpful
<b>Equipment:</b>	safety shoes, work wear
<b>Location:</b>	Schwaig, at customer site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	HSB

## 4.2 SDR-Series - Module II

This training conveys the more sophisticated programming techniques for CNC Series SDR robots.

### Subjects:

- Operation of the teach box
- Program structure
- Creating a teach program with placing program
- Free programming
- Practical training on the robot with IMM-simulation

### Profile:

<b>Objective:</b>	Operation of the robot system Creation of a free teach program
<b>Target group:</b>	Tool setter
<b>Duration:</b>	3 days
<b>Participations:</b>	max. 4 participants
<b>Background:</b>	The participants should have attended the training 'SDR Series – Module 1'
<b>Equipment:</b>	safety shoes, work wear
<b>Location:</b>	Schwaig, at customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	HSG

### 4.3 SDR-Series - Module III

In this course, building on the topics of Module 2, the extended programming options of the SDR-CNC control of 3 to 5-axis robotic devices are explained and implemented in practice. The area of application ranges from simple removal programs to the implementation of complex manufacturing tasks.

#### Subjects:

- Structure and structuring options for Teach programs
- Creation of the program sequence with the Text editor
- Programming of branches as well Part and sub-programs
- Programming a filing scheme
- Integration of peripheral components in the Program Sequence
- Optimization of the cycle time
- Configuration of the cycle options
- Practical training on the robotic device with

#### Profile:

<b>Objective:</b>	Independent creation of complex teaching programs; Optimization of program processes
<b>Target group:</b>	Tool setter
<b>Duration:</b>	2 days
<b>Participations:</b>	max. 4 participants
<b>Background:</b>	The participants should have attended the training 'SDR Series – Module 2'
<b>Equipment:</b>	safety shoes, work wear
<b>Location:</b>	Schwaig, at customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	HSA



## 4.4 SAM-C Series - Module I

This training conveys the basics of commissioning and “simple pick & place” CNC robots SAM C robots.

### Subjects:

- Operation of the Robot Terminal
- Robot functions on the IMM-Terminal
- Start up machine / robot
- Data exchange Robot ↔ Machine
- “simple pick&place” application
- Practical training on the robot with IMM-simulation

### Profile:

<b>Objective:</b>	Operation of the robot system Creation of a teach program with “simple pick&place”
<b>Target group:</b>	Operators and tool setters
<b>Duration:</b>	2 days
<b>Participations:</b>	max. 4 participants
<b>Background:</b>	For beginners – knowledge of the basic functions of a robot would be helpful
<b>Equipment:</b>	safety shoes, work wear
<b>Location:</b>	Schwaig, at customer site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	SAC-B

## 4.5 SAM C Series - Module II

This training conveys the more sophisticated programming techniques for CNC Series SAM C robots.

### Subjects:

- Operation of the teach box
- Program structure
- Creating a teach program with placing program
- Free programming
- Practical training on the robot with IMM-simulation

### Profile:

<b>Objective:</b>	Operation of the robot system Creation of a free teach program
<b>Target group:</b>	Tool setter
<b>Duration:</b>	3 days
<b>Participations:</b>	max. 4 participants
<b>Background:</b>	The participants should have attended the training 'SAM C-Series – Module 1'
<b>Equipment:</b>	safety shoes, work wear
<b>Location:</b>	Schwaig, at customers site
<b>Language:</b>	English, if the course is to be held in another language, please contact <a href="mailto:sdg.training@shi-g.com">sdg.training@shi-g.com</a>
<b>Course title:</b>	SAC-G

## 5 Registration

### 5.1 Contact Team Training

**Sumitomo (SHI) Demag Plastics Machinery GmbH**  
Altdorfer Str. 15  
90571 Schwaig

**Karola Schmid**

Email: [sdg.training@shi-g.com](mailto:sdg.training@shi-g.com)

Telefon: +49 (911) 5061-444

Fax: +49 (911) 5061-96444

### 5.2 Training appointments

All Trainings on request. Please contact Karola Schmid.