OSAI OPEN*control* CNC - 2019 Training Courses

Course code	C01
Title	OPEN*control* HW Configuration and SW Installation
Main topic	HW/SW
Subject	HW Configuration and SW Installation
Level	1
Knowledge required (suggested)	Basic CNC knowledge and remote devices on bus
Course duration (days) -standard-	2
Course duration (days) -scheduled-	1
Agenda	OPEN*control* HW models and devices Boards and fieldbuses. ODM system configurator. EtherCAT ET9000 configurator. CANopen SYCON configurator. SW installation - BIOS - Operating System - CNC SW - PC applications Backup and restore modes
Material required (customer)	Laptop - Windows 10 O.S.

OSAI OPEN*control* CNC - 2019 Training Courses

Course code	C02
Title	End User HMI
Main topic	SW
Subject	WinNBI End user applications
Level	1
Knowledge required (suggested)	Basic CNC knowledge
Course duration (days) -standard-	1
Course duration (days) -scheduled-	1
Agenda	BootController ProcessController (Standard HMI screens) - HMI screens components - Machine setup - Origin preset - Program management - Searching memory - Multi Block Retrace System History FileBrowser- File management - Drag&Drop - Logic drives configuration - Local files (PC/CNC) Table Editor Machine Plot IsoView User data area Backup and from Security
Material required (customer)	Laptop - Windows 10 O.S.

OSAI OPEN*control* CNC - 2019 Training Courses

Course code	C03
Title	Screen customization
Main topic	SW
Subject	WinNBI ProcessController/Layout Builder
Level	1
Knowledge required (suggested)	Basic CNC knowledge
Course duration (days) -standard-	1
Course duration (days) -scheduled-	1
Agenda	ProcessController and LayoutBuilder - general functions (Run-Time and Design Time) Creating and enabling a HMI screen - default and dedicated lists - HMI screen selection modes - multi cnc HMI screen Graphics operations - copy/paste, move, drag, stretch etc. - layer definition Properties - fonts, dimensions etc. Predefined graphic objects - detail analysis Customized graphic objects (buttons, images etc.) - detail analysis - PLC interaction Utility - HMI screen translation - variable list - local variables and dedicated DLL (mention)
Material required (customer)	Laptop - Windows 10 O.S.

OSAI OPEN*control* CNC - 2019 Training Courses

Course code	C04
Title	PLC programming
Main topic	SW
Subject	Machine Logic programming
Level	2
Knowledge required (suggested)	Basic CNC knowledge
Course duration (days) -standard-	2
Course duration (days) -scheduled-	1
Agenda	4Control development Tool Machine logic structure - PLC - Data area - Time task - Event task - Consent task - Priority, scheduling etc. - Calls to function (mode) Data area details - System and Process data area - Interpolators and axis data area - Global and local data area - Tables - Input, Output an in memory variables Console and Part Program consent task details Axes motion management from PLC Functions and Function Blocks - Communication with processes (Channels) library - Axes movement from PLC library - General functions library - Axes management library - CANopen management library - XML files management library - TCP/IP from logic communication library - Serial management library Searching memory management and Multi Block Retrace
Material required (customer)	Laptop - Windows 10 O.S.

OSAI OPEN*control* CNC - 2019 Training Courses

Course code	**C07**
Title	**PLC application**
Main topic	SW
Subject	Use and customization of standard OSAI Machine Logic
Level	2
Knowledge required (suggested)	Basic CNC knowledge Participation in C04 course
Course duration (days) -standard-	1
Course duration (days) -scheduled-	1
Agenda	Installation AAMP configuration analysis Logic configuration Pre-assigned I/Os management Overview pre-defined logic functions - Enabling and Axes reference - Process and Axes status information - Spindle - Emergencies - Hold/Feedhold - Console - CANopen device - Modbus device - Pneumatic devices (clamps, part locking, references magazines etc.) - Tool change - M codes - Joystick/Handwheel for manual movement - PLC messages Customization of pre-defined functions Dedicated HMI Macro customization (part program) - Tool Change - Tool Preset - Probing - Axis homing
Material required (customer)	Laptop - Windows 10 O.S.

OSAI OPEN*control* CNC - 2019 Training Courses

Course code	C05
Title	ISO programming base
Main topic	SW
Subject	Basic ISO programming course 2D½ machining
Level	2
Knowledge required (suggested)	CNC basic knowledge
Course duration (days) -standard-	1
Course duration (days) -scheduled-	1
Agenda	Programming with OPEN*control* system - IProgram files - ISO program components - Block types - Programmable functions - G codes - ISO program execution and synchronization - Change of the execution sequence Axes programming - Axes movements - Origins and control of coordinates and trajectory - Change of the axis reference system - Overtravel and protected areas Tools and offsets programming Tool radius compensation Spindle programming M auxiliary functions Parametric programming Canned cycles Probing cycles Communications management Technological variables, Tables
Material required (customer)	Laptop - Windows 10 O.S.

OSAI OPEN*control* CNC - 2019 Training Courses

Course code	**C06**
Title	**Advanced ISO programming**
Main topic	SW
Subject	ISO programming advanced course 3D machining
Level	3
Knowledge required (suggested)	ISO CNC programming
Standard course duration (days)	1
Course duration (days) -scheduled-	1
Agenda	Programming with OPEN*control* system High speed programming (SPLINES) - Points programming and profile features - Curve change management - Angles management - Splines control commands - Spline kinematics transformation Virtualizations - Polar coordinates programming - Cylindrical coordinates programming - Non-orthogonal axes programming 3D Transformations - Rotation of the Cartesian coordinates - Tool Center Point (TCP) Tool direction/offset vectors programming - Kinematics identification - Tool Center Point for machines with Prismatic head - Tool Center Point of the tool-length only - Tool Center Point for general machines - UPR and tool offsets Paramacros Multi-process management (multi-channel) - Functional notes on process synchronization - Process control commands - Notes on "acquiring/releasing axes" functions Programming of axes movement Filters Notes on XML programming Volumetric Compensation management
Material required (customer)	Laptop - Windows 10 O.S.