

Icam Post BTC Course

SYNOPSIS

This training is purposely formatted to be delivered live by an instructor via Team, over a period of 4 days, in 8-hour sessions. The typical schedule is Monday to Thursday between 9:30 AM and 5:30 PM Central time for customers in all North American time zones.

The course subjects are divided into 18 training modules, each comprised of three sequential activities:

- *Lecture*: the instructor delivers a live presentation of the topics covered in the module and uses the Icam Post software to show examples of related applications.
- *Tasks*: the trainees are given a certain amount of time to complete one or more exercises following step-by-step guidelines provided in the training manual.
- *Review*: the instructor reviews the correct exercise results and, if time permits, discusses what the trainees experienced during the tasks.

One week before the class, participants will receive an email containing instructions on how to download, install and activate the Icam Post software. The email includes contact information for an Icam Support technician, should assistance be required during installation. This email also provides installation download links to the training material.

Prior to the class, each trainee must have had the current version of the Icam Post software installed and the Icam Post license configured on their workstations. They must have also downloaded the training material zip file and extracted its contents (i.e. a folder named "BTC_Training") on their desktop.

The "BTC_Training" folder includes the following subfolders:

- *"Documents"*: contains this document, along with the training agenda and the class preparation instructions in PDF format;
- *"Manual"*: contains the training manual in PDF format;
- *"Student"*: contains the material used for exercises ("start" post-processors and test CL files from various CAM systems).



PRICING:

**\$4,000 per attendee /
4-day course**

All training courses are held online.



CLASS TIME:

Monday to Thursday,
9:30 AM - 5:30 PM
(Central Time) each day



Cancellation Policy:

**48 Hours before
scheduled training**

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MODULE 1

INTRODUCTION TO ICAM POST AND BASIC POST-PROCESSOR CONFIGURATION

This module explains the concept of post-processing and outlines the typical input and output data format specifications. It also introduces QUEST, Icam Post's development module, and summarizes the basic steps required for configuring a new post-processor.

MODULE 2

EXECUTING A POST-PROCESSOR

This module explains the post-processor naming conventions and introduces GENER, Icam Post's post runtime module, so trainees can start running post-processors right away.

MODULE 3

ICAM POST DATABASE MANAGEMENT

This module explains the file formats used to store Icam Post post-processors and outlines the various database management options available.

MODULE 4

CONFIGURING A POST-PROCESSOR (THE *GENERAL DESCRIPTION* CHAPTER)

From this point on, the course outlines the typical steps that must be followed when configuring a post-processor. This module explains the options available in the first chapter of the Questionnaire, *General Description*, where the post-processor upfront information is configured. This chapter has five sections:

- The *General Information* section determines the post-processor name, machine type, kinematics configuration, units and positioning methods. This section is comprised of four tabs or sub-sections: "General", "Machine axes", "Identification" and "Other".
- The *Display Format* section is concerned with the operator listing file created by GENER while post-processing. This section offers two tabs: "General" and "Summaries".
- The *Registers* section determines the format of the word addresses supported by the control. This section should be answered early on, since many questions derive their default answers based on the availability and format of specific word addresses. This section has no additional tabs.
- The *G/M Code Assignments* section defines the G and M code word addresses. This section has no tabs.
- The *Output Format* section determines some important information about the format of the NC program that will be created by GENER. This section is comprised of three tabs: "General", "Program ID" and "Message Display".

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MODULE 5

SETTING THE POST FOR A SPECIFIC MACHINE [THE *MACHINE DESCRIPTION* CHAPTER]

So far, the settings in the previous chapter have configured a *generic* post-processor. Next, users must define the physical components of the machine, such as axes and travel limits, and configure home, head and tool change positions and specifics. They must also set up machine-specific data such as the maximum number of tools, maximum RPM and feed rate types and limits. All these settings are included in the *Machine Description* chapter of the Questionnaire, which is comprised of the following sections:

- The *Linear Axes* section defines the particulars about each of the machine's linear axes (e.g. positive direction, velocities and physical travel limits).
- On those machines that support them, a *Rotary Axes* section defines the particulars about rotary table and/or head axes. For milling posts where no rotary axes were defined in the preceding section, the Rotary Axes section will not be available. For mill-turn posts, the name of this section will be C-Axis
- The *Home Position* and *Reference Point* section defines information about the primary home point and how G0HOME and FROM post-processor commands should be processed.
- The *Feedrate* section defines how interpolation velocity is controlled.
- The *Tool Change* section defines the capabilities of the tool change device.
- The *Spindle* section defines the spindle capabilities.

MODULE 6

SETTING THE POST FOR A SPECIFIC CONTROL [THE *CONTROL DESCRIPTION* CHAPTER]

Once the machine specifics are configured, the next step is to set up options specific to the numeric control. This module presents the next chapter of the Questionnaire, *Control Description*, which handles various interpolation types and motion-related advanced features:

- The *Coordinate System* section defines the plane selection codes and allows the definition of origin translation and rotation, scaling and mirroring capabilities.
- The *Linear Interpolation*, *Rapid Positioning* and *Circular and Helical Interpolation* sections define the particulars of these three main interpolation types.
- The *Tool and Fixture Compensation* section defines tool length, tool radius, 3D tool and fixture (work) compensation capabilities and codes.
- The *Advanced 5D Machining* section defines linearization, path planning, Rotary Turn-Around (RTA), Rotary Tool-tip Control Programming (RTCP) and Cartesian-to-Polar (C2P) features available for machines with contouring rotary axes.
- The optional *Spline Interpolation* and *High Speed Machining* sections require a special license to configure these advanced CNC options.

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MODULE 7

SETTING THE POST FOR A SPECIFIC CONTROL, CONT'D [THE *AUTOMATIC CANNED CYCLES* CHAPTER]

This module continues the definition of control-specific options by setting up the canned cycles available on the CNC, such as drilling or threading cycles (for lathes and millturns). These settings are included in the *Automated Canned Cycles* chapter.

MODULE 8

CONFIGURING OTHER MACHINE OPTIONS [THE *OPTIONAL POST-PROCESSOR WORDS* CHAPTER]

This module deals with various additional options of the machine or control which are not handled in the previous chapters. The sections available here are organized by their related post-processor command or major word (e.g. AIR, BREAK, CALSUB, CLAMP, COOLNT, DELAY, END, INSERT, LOCATE, MCHTOL, OPSKIP, OPSTOP, PPRINT, RAPID, RETRCT, REWIND, SEQNO, STOP, TMARK, TRANS, etc.).

MODULE 9

POST-PROCESSOR DEVELOPMENT TOOLS [FINDER, DIFFS, WORDS MANAGER, WIZARD, CONFIG]

This module presents various utilities available in QUEST which can be used to facilitate post-processor development.

MODULE 10

INTRODUCTION TO POST-PROCESSOR CUSTOMIZATION [RMD TOOLS]

This module introduces the *Startup* and *Shutdown Procedures* used for customizing post-processors and exemplifies the *Rapid Macro Development* tools, which are predefined actions that can be assembled in order to create a macro without writing any macro code.

MODULE 11

ICAM POST MACRO LANGUAGE: FUNDAMENTALS [DATA TYPES, VARIABLES, OPERATORS, FUNCTIONS]

This module presents the fundamentals of the Icam Post proprietary macro language, such as supported data types, user-defined and system variables, macro operators and functions.

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MODULE 12

ICAM POST MACRO LANGUAGE: MACRO FLOW CONTROL (IF, CASE, DO, WHILE, REPEAT, EXIT)

This module outlines the proprietary macro flow control techniques such as branching and looping.

MODULE 13

THE ICAM POST MACRO LANGUAGE: OUTPUT STRING FORMATTING

This module deals with the unique syntax used in the Icam Post macro language for formatting strings where various data types are transferred into text generated by the post-processor.

MODULE 14

STARTUP / SHUTDOWN MACROS \$P ARGUMENTS

This module explores in detail the *Startup* and *Shutdown Procedures* briefly introduced in Module 10. These procedures can “capture” specific events such as the program start and end, tool changes, motions, output tape blocks, etc., allowing them to be customized if desired. The module lists the specific information available in each particular procedure and outlines some best practices that can optimize the macro process.

MODULE 15

USER-DEFINED SYNTAX MACROS

This module deals with post-processing events that may require to be customized, but cannot be “captured” using Startup and Shutdown procedures. It details the techniques used to trigger macros and exemplifies best practices that optimize the process.

MODULE 16

PPFUN COMMANDS

This module is dedicated to *Post-Processor Functions*, special commands used to access internal GENER functions. It details their specifics and exemplifies their usage.

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MODULE 17

FILE INPUT | OUTPUT SPECIFICATIONS AND THE DIALOG EDITOR

This module outlines the syntax used in the Icam Post macro language for reading from and writing to external text files.

MODULE 18

LOOKAHEAD TECHNIQUES

This module is an introduction to some of the techniques available in Icam Post macros to search ahead during the process for information related to upcoming data. It discusses methods for scanning the CL file in search for particular records programmed ahead of the current location. It also outlines the \$FINFO and \$FCLINFO functions, which can be used at the beginning of an operation to obtain a wide variety of information about the upcoming operation (e.g. start and end positions, feeds and speeds, tool compensations, as well as flags indicating positioning and interpolation modes encountered, etc.).



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