# PG INSPECTION
TECHNOLOGIES

PG1000 REACTION Software

Made in USA

The PG1000 REACTION software was developed by PG Inspection Technologies for the exclusive purpose of cutting tool inspections. The word **REACTION** is an acronym for **REA**ltime **C**utting **T**ool **I**nspect**ION.**

Our software digitally analyzes five million pixels, sorting over sixteen million colors at a rate of fifteen times per second to find patterns and shapes, overlooking the excessive glare from too much direct light, shadows, irregular or broken shapes. REACTION software does not electronically enhance, crop, or magnify tool images in any way. What you see is exactly what the camera captures. The GPU and CPU analyze the image to help you, the user, inspect your cutting tools. We did not use a CAD system as the backbone of our software. CAD systems, while great for drawing images and dimensioning them on paper, are incapable of doing complex custom image analysis. Instead, we wrote our own software to fill the needs of cutting tool inspection.

Common Geometries Measured by the PG1000 REACTION Software
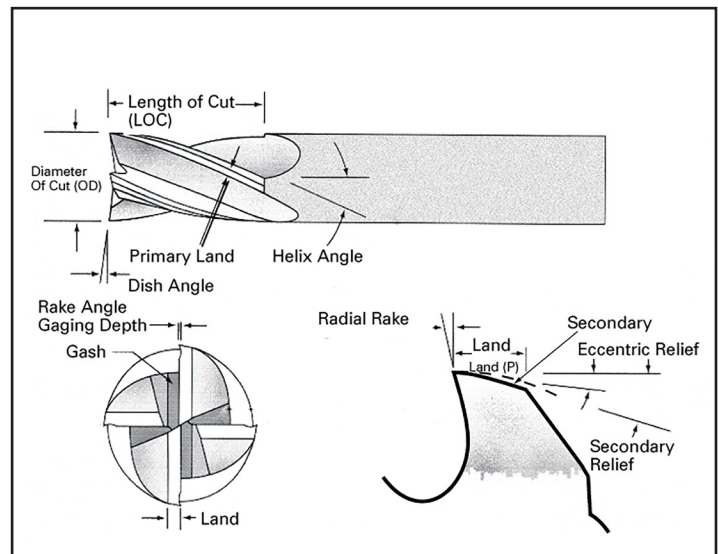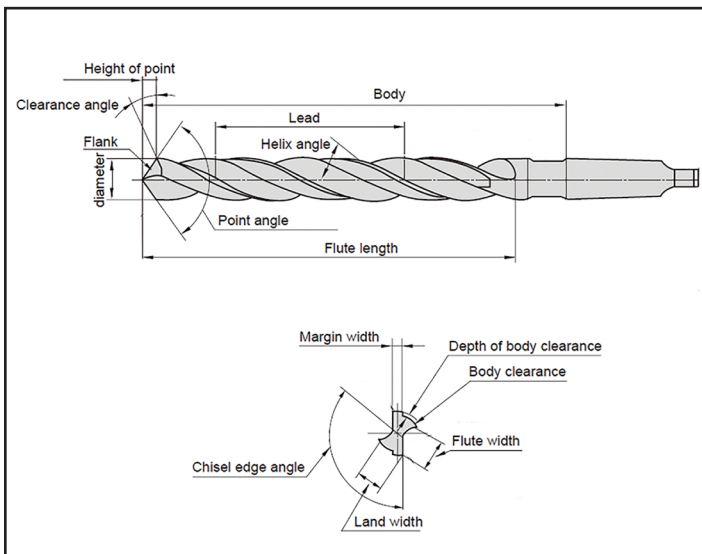
PG1000 Software History

Original software for first PG1000 developed. It did little more than put a magnified image on a small monitor.

CTM / Basic software v6/6.5. Could capture a magnified image and perform routine calculations.
Support ended in 2016.

REACTION software v7.0. Began to capture live images and offered more advanced calculations.
Support ended in 2019.

REACTION software v8.0. Added Edge Detection and Scenes and Inspections features.

REACTION software v9.0. Includes new manual, calculation instructions, demo videos, improved user interface and customizable PDF report feature.

REACTION software v9.3. Edge detection algorithms significantly improved. Focus assistance features added. **Windows 10 required.**

| 1993-1996 | 1996-2012 | 2012-2016 | 2016-2020 | 2021-2022 | 2023 |

Reaction Software

Software version number

Gage model and serial number

Import and overlay DXF/DWG files

Archived inspection data / reports
Sort by name, type, date or time

Saved single inspection scene

Saved inspection
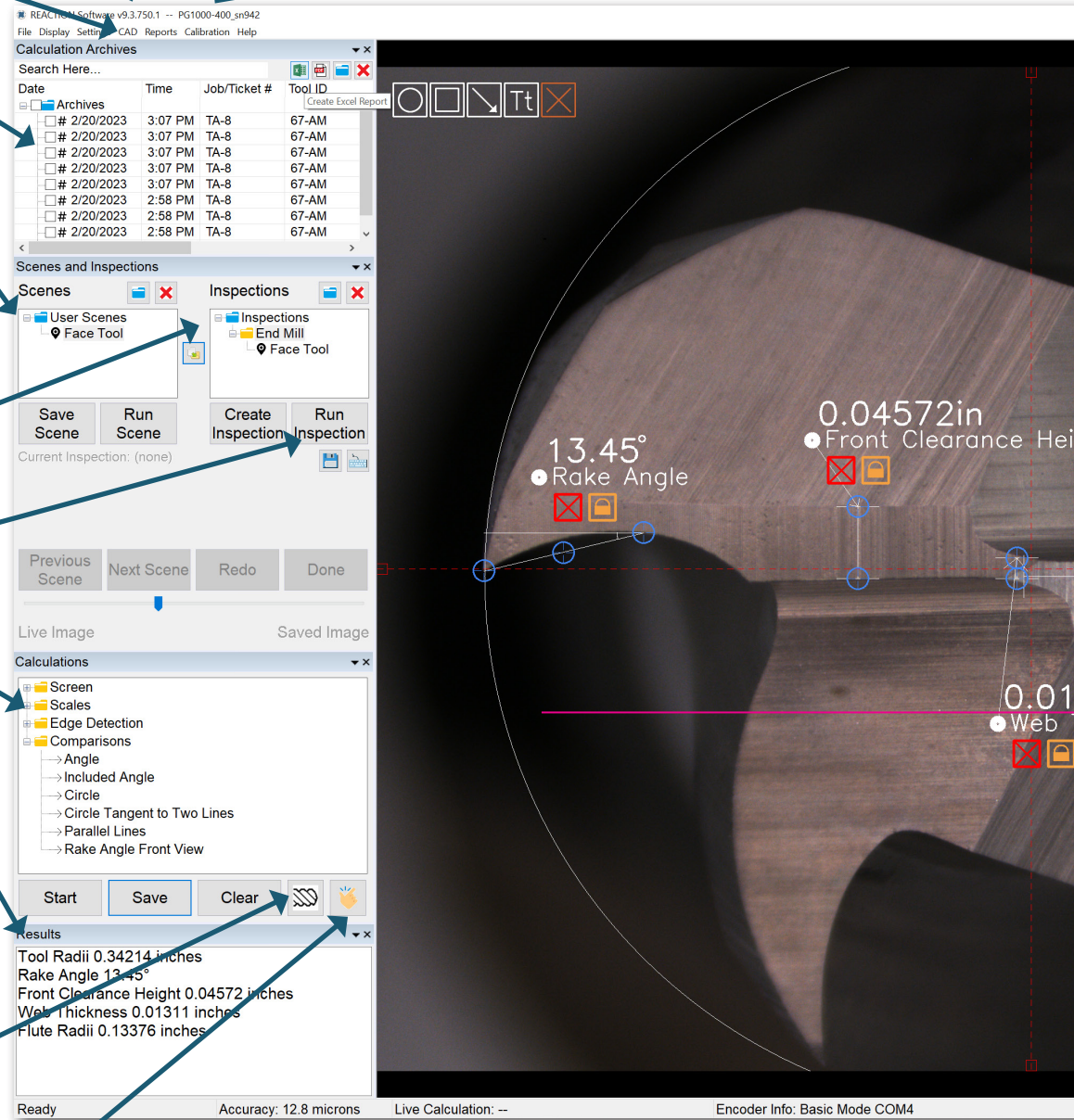Created by saving multiple Scenes

Run repeat full tool inspections

Software calculations available to
choose from (50+)

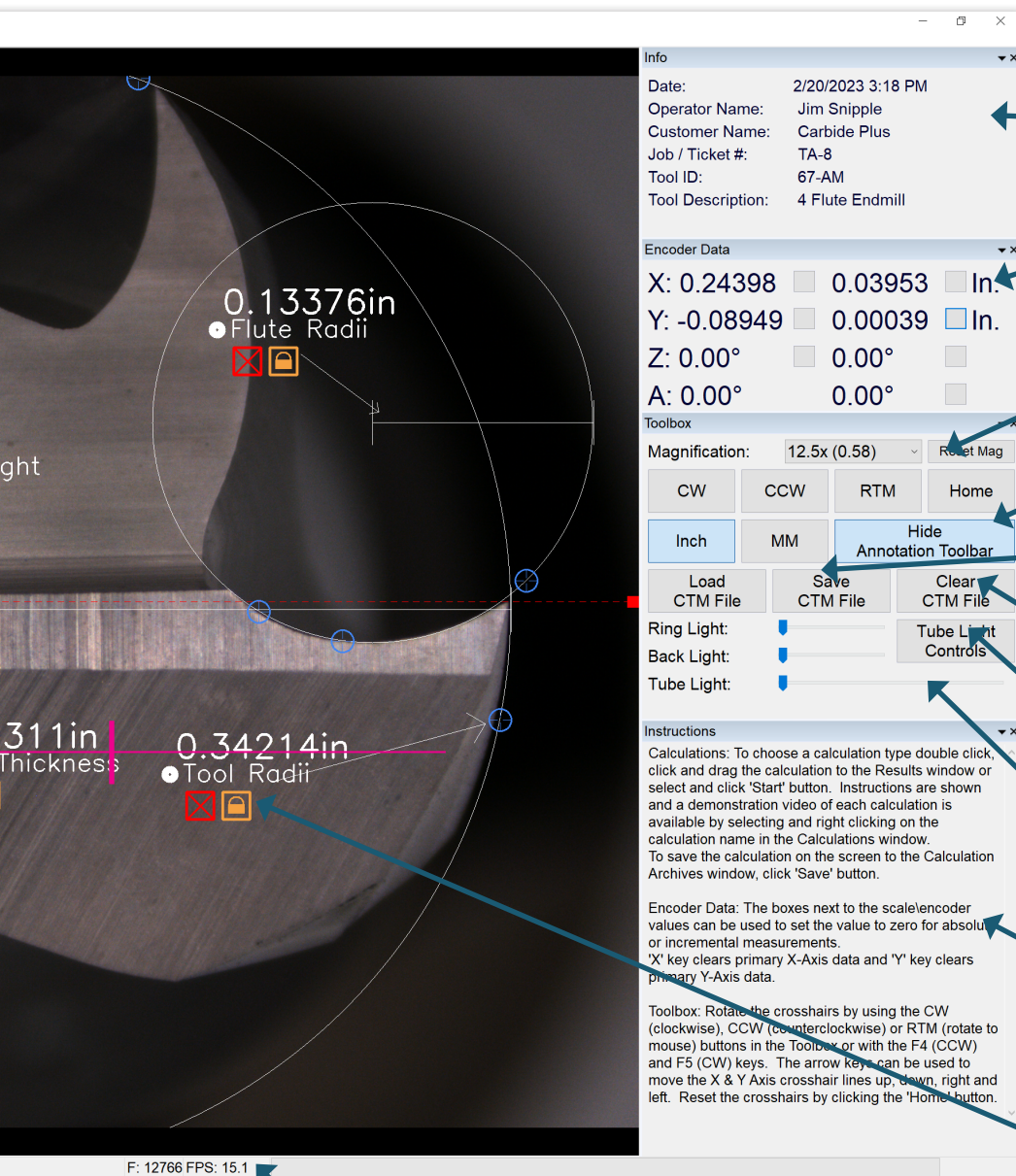Save results to calculation archives

Contour Edges assists with focus setting.
See what edge detection sees.

Snap Points to Edges automatically locates
edges when using screen calculations.

shown at 3840 x 2160 resolution

PG1000 accuracy
*(determined by pixel size and
magnification settings)*

REACTION Software v9.3.750.1 -- PG1000-400_sn942

File Display Settings CAD Reports Calibration Help

Calculation Archives

Search Here…

Create Excel Report

Date	Time	Job/Ticket #	Tool ID
Archives			
# 2/20/2023	3:07 PM	TA-8	67-AM
# 2/20/2023	3:07 PM	TA-8	67-AM
# 2/20/2023	3:07 PM	TA-8	67-AM
# 2/20/2023	3:07 PM	TA-8	67-AM
# 2/20/2023	3:07 PM	TA-8	67-AM
# 2/20/2023	2:58 PM	TA-8	67-AM
# 2/20/2023	2:58 PM	TA-8	67-AM
# 2/20/2023	2:58 PM	TA-8	67-AM

Scenes and Inspections

Scenes

User Scenes
   Face Tool

Inspections

Inspections
   End Mill
      Face Tool

| Save Scene | Run Scene | | Create Inspection | Run Inspection |

Current Inspection: (none)

| Previous Scene | Next Scene | Redo | Done |

Live Image   Saved Image

Calculations

- Screen
- Scales
- Edge Detection
- Comparisons
  - Angle
  - Included Angle
  - Circle
  - Circle Tangent to Two Lines
  - Parallel Lines
  - Rake Angle Front View

| Start | Save | Clear | | |

Results

Tool Radii 0.34214 inches
Rake Angle 13.45°
Front Clearance Height 0.04572 inches
Web Thickness 0.01311 inches
Flute Radii 0.13376 inches

Ready   Accuracy: 12.8 microns   Live Calculation: --   Encoder Info: Basic Mode COM4

13.45°
Rake Angle

0.04572in
Front Clearance Hei

0.01
Web

Info

Date:	2/20/2023 3:18 PM
Operator Name:	Jim Snipple
Customer Name:	Carbide Plus
Job / Ticket #:	TA-8
Tool ID:	67-AM
Tool Description:	4 Flute Endmill

Encoder Data

X: 0.24398	☐	0.03953	☐	In.
Y: -0.08949	☐	0.00039	☑	In.
Z: 0.00°	☐	0.00°	☐	
A: 0.00°	☐	0.00°	☐	

Toolbox

Magnification: 12.5x (0.58) ▾   Reset Mag

CW	CCW	RTM	Home
Inch	MM	Hide Annotation Toolbar	

Load CTM File	Save CTM File	Clear CTM File

Ring Light:
Back Light: Tube Light Controls
Tube Light:

Instructions

Calculations: To choose a calculation type double click, click and drag the calculation to the Results window or select and click 'Start' button. Instructions are shown and a demonstration video of each calculation is available by selecting and right clicking on the calculation name in the Calculations window.
To save the calculation on the screen to the Calculation Archives window, click 'Save' button.

Encoder Data: The boxes next to the scale\encoder values can be used to set the value to zero for absolute or incremental measurements.
'X' key clears primary X-Axis data and 'Y' key clears primary Y-Axis data.

Toolbox: Rotate the crosshairs by using the CW (clockwise), CCW (counterclockwise) or RTM (rotate to mouse) buttons in the Toolbox or with the F4 (CCW) and F5 (CW) keys. The arrow keys can be used to move the X & Y Axis crosshair lines up, down, right and left. Reset the crosshairs by clicking the 'Home' button.

F: 12766 FPS: 15.1

Callouts:

Job data
(shown on reports)

Encoder Data outputs
X Axis = Horizontal
Y Axis = Vertical
Z Axis = Crosshair rotation
A Axis = Base block/Tool Rotation*
PG1000-400 only

Microscope magnification setting
PG1000-400 = auto synchronize
PG1000-200 = manual adjust

Crosshair / Z Axis control

Inch/MM selection

Show / Hide annotation tool bar

Load / Save / Clear CTM image file

Light controls for ring light, backlight and illumination tube optional accessories

Instructions

Delete, lock / unlock calculations
When locked inspection moves
with scale movement

Camera frame rate

Focus pulse count
PG1000-400 only

PG INSPECTION
T E C H N O L O G I E S

For more information visit: **www.pg1000.com**

REACTION Software Features

Info:

Displays the date and time, as well as job information that will print on the PDF reports generated from the Calculation Archives window.

Encoder Data:

Displays absolute and incremental positions of the X, Y and Z Axis movements.

For PG1000-400 models the software also displays the position of the A Axis (base block/tool position).

Toolbox:

Controls the most frequently used inspection functions on the desktop. Control the crosshairs via the clockwise (CW), counterclockwise (CCW) and rotate to mouse (RTM) buttons. Home button resets the crosshair location.

Instructions:

Text instructions for each calculation are shown in the lower right corner of the program. By right clicking on the calculation name a demonstration video for each calculation is also available.

Calculations:

First choose a calculation method to make your inspection and then choose the calculation.
- **Screen:** use your mouse to pick points on the image and complete calculations.
- **Scales:** use the X and Y Axis handwheels to choose points and complete calculations.
- **Edge Detection:** draw boxes around the area of interest and the software will automatically make the desired calculations.
- **Comparisons:** create different shapes and angles to use as overlays on your tool image.

Results:

These are the chosen calculations currently displayed on the tool image.

Scenes and Inspections:

Used to create macros for repeat tool inspections.

A Scene is a saved calculation for a single tool image. In addition to the calculation data, an image overlay is also created and saved as part of the Scene. An Inspection is a collection of multiple Scenes saved together as a complete tool Inspection.

When using Scenes and Inspections the software will guide the user through the tool setup process for each Scene.

For the PG1000-400, the software will display an overlay image for tool alignment and then direct the operator to properly setup the correct magnification, A Axis (base block/tool position) and focus parameters.

For the PG1000-200, the software will display an overlay image for tool alignment but will only ask the user to verify the magnification setting.

For both the PG1000-200 and 400 the lighting settings can also be saved and recalled to ensure consistent lighting settings for consistent tool measurements between operators and inspections.

Calculation Archives:
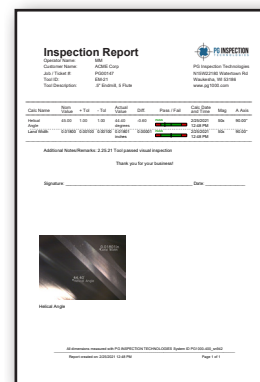
Save your measurements and create custom PDF tool inspection reports with or without tool images.

Feedback

REACTION software was developed with a significant amount of input from our customers. We appreciate our customers opinions and we will continue to enhance our software based on requests and feedback from our customers. Please contact us with any requests or comments regarding our software.

PG INSPECTION TECHNOLOGIES

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