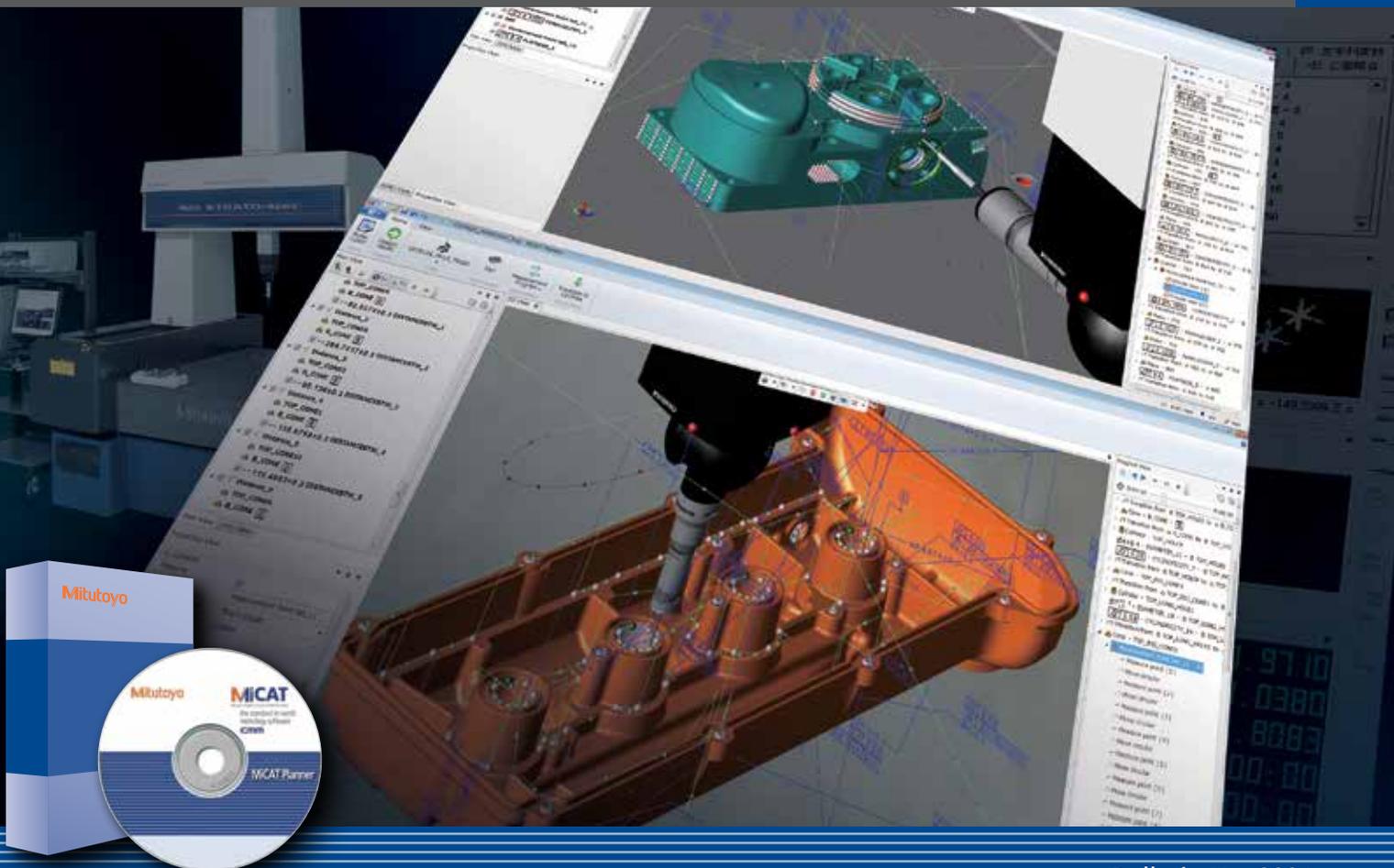


## MiCAT PLANNER

AUTOMATIC PART PROGRAM GENERATION

COORDINATE  
MEASURING MACHINES



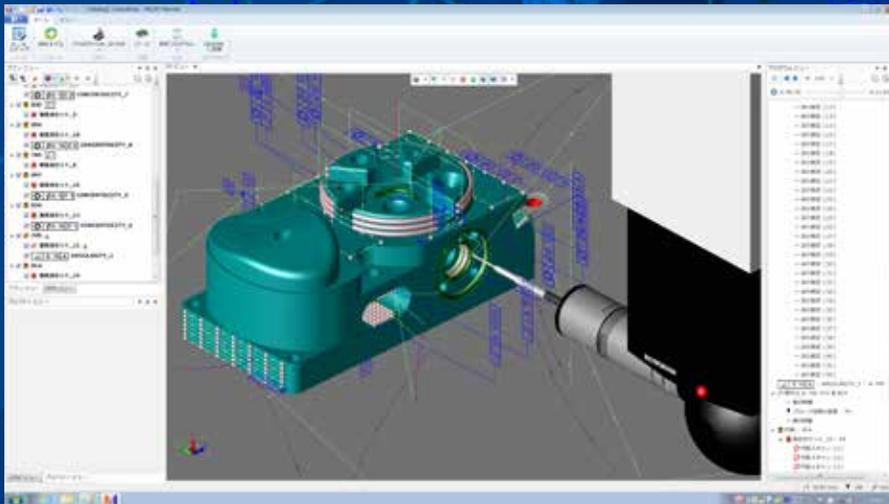
## Part programs – easy, fast, automatic and reliable.

Traditionally, creating part programs for coordinate measuring machines is a strategic and time-consuming task.

Problems with conventional CMM part programming:

- Higher production costs. Misinterpretation of design intent may result in incorrect results leading to possible scrap.
- Lost productivity. Complex parts require time consuming path optimization.
- Lost productivity and higher production costs. The work of multiple part programmers can cause measurement discrepancies requiring investigation or possible scrap.

**MiCAT Planner is the solution.**



Your manufacturing processes need the ability to quickly adapt to meet today's challenging demands:

- Shorter product life cycles require rapid change to design revisions and fast programming capability.
- Increasing machine up-time requires more efficient programs and reduced set-up time.

Mitutoyo's CMM programming software, MiCAT Planner, meets all of these demands.

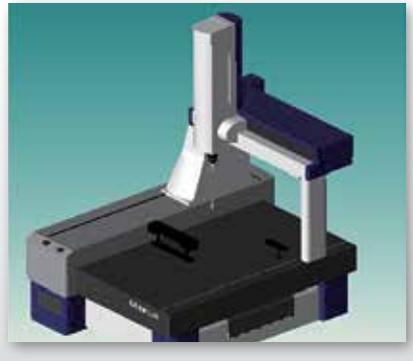
**MiCAT Planner software by Mitutoyo generates CMM part programs with unprecedented efficiency.**

MiCAT Planner drastically reduces programming efforts in developing part programs for coordinate measuring machines. The software's automatic measuring program generator saves time while reducing costs.

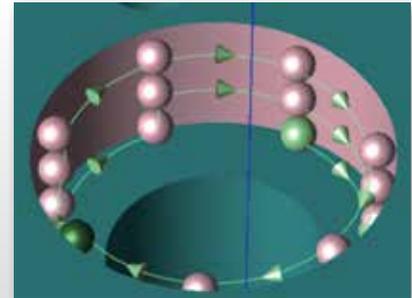
**Features:**

- MiCAT Planner identifies Geometric Dimensioning and Tolerancing (GD&T) from 3D models when included in the Product and Manufacturing Information (PMI), defines the measurement plan and automatically creates a measurement program.
- MiCAT Planner's integrated path and probe optimization function automatically selects the shortest measurement path with the fewest probe changes to measure the part in the least amount of time.
- MiCAT Planner's Rules Editor establishes consistent measurement guidelines to eliminate the variations that may occur between multiple CMM programmers.

DME: Virtual model of the CMM includes all probe configurations.



User-defined rules determine the measurement strategy automatically for each feature.



PMI: CAD file containing GD&T information.

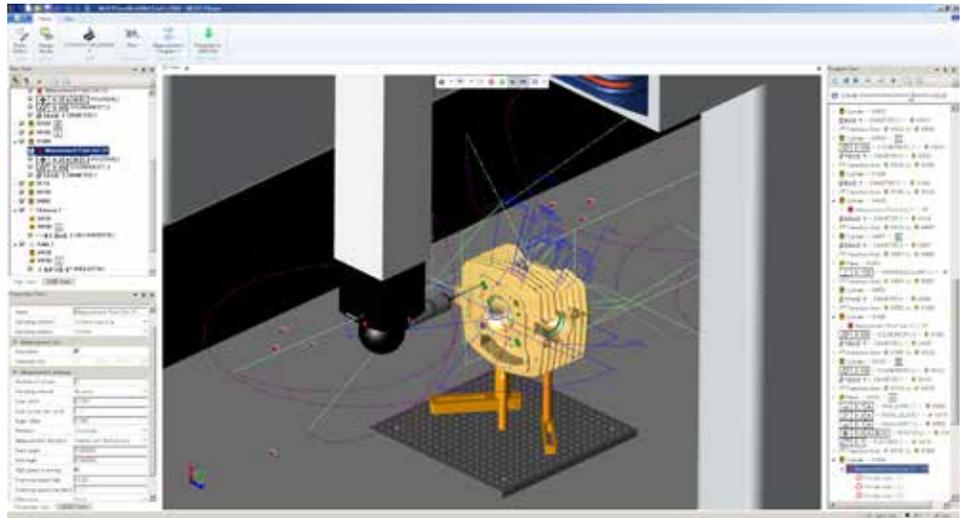


**Instant and automatic generation of measurement programs.**



# Who can benefit from MiCAT Planner?

The Mitutoyo MiCAT Planner boasts amazing performance, speed and usability. So, the short answer is everyone can benefit from MiCAT Planner.



**We only work on short or midsize runs. Is it really useful?**

✓ Yes, MiCAT Planner will dramatically reduce your programming time.

**I only inspect outsourced parts and never evaluate the same characteristics. Is MiCAT Planner appropriate in this case?**

✓ Yes, MiCAT Planner will assist you in easily creating part programs that include different features and characteristics.

**Our production is quite stable on long runs. We rarely need to create programs for new components on our CMM. Are you sure MiCAT Planner can help?**

- ✓ Yes, MiCAT Planner ensures that all part programs are:
- Safe. Continuous collision detection and avoidance ensures operator safety and equipment integrity caused by costly probe collisions.
  - Consistent. Rules Editor maintains uniform measurement guidelines for all components being inspected on the CMM.
  - Optimization. Part measurement path is minimized to reduce inspection time and increase throughput.

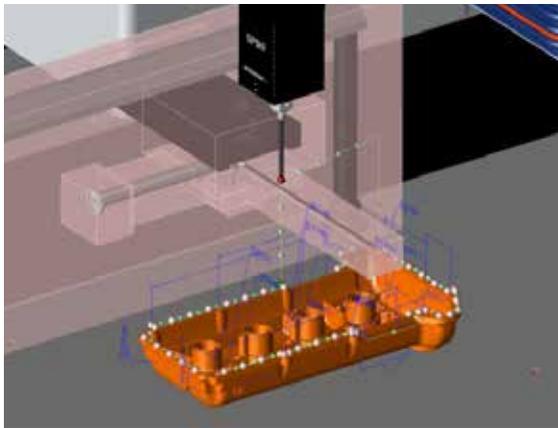
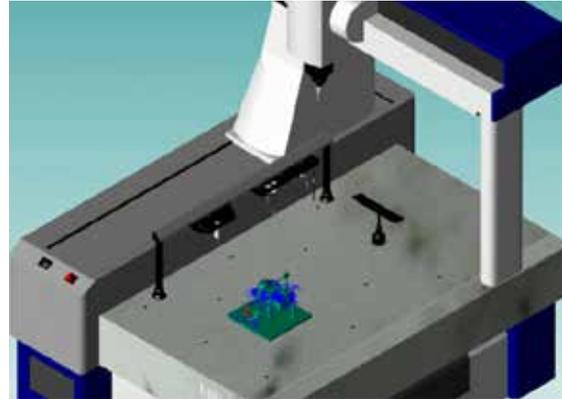
**We have many CMM programmers, why do we need MiCAT Planner?**

✓ MiCAT Planner's Rules Editor will ensure a higher level of quality in measurement programs so you can trust the program will always be developed using the same measuring practices, regardless of personal programming styles.

**Regardless of the measuring tasks, MiCAT Planner adds an abundance of benefits to your CAD-based programming.**

# Graphical CMM Configuration

MiCAT Planner utilizes the CMM configuration's created with System Manager in the CMM MCOSMOS software. All racks and probes of the machine are graphically represented for the rack type and location on the CMM.



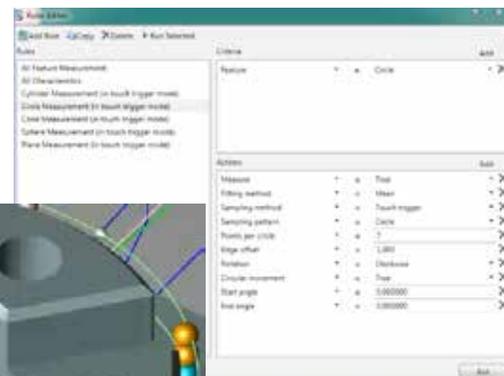
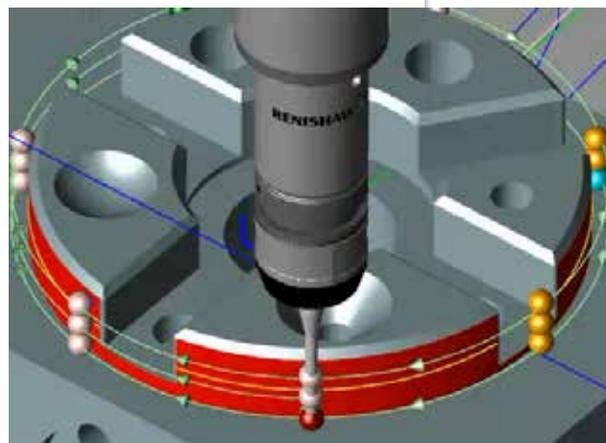
MiCAT Planner selects the most suitable probe configuration and measurement strategy for each feature implementing the best practices defined by User settings in the Rules Editor.

This virtual reality allows automatic avoidance of each rack zone. Even long styli can be avoided when positioned in the rack or encroaching in the measuring volume.

# Measurement Strategy

One of the main benefits of MiCAT Planner is the compliance to measuring rules that can be set as needed.

Depending on the feature type, size or other criteria, you decide the number of measuring points, their distribution, and speed for touch-trigger or scanning probes.

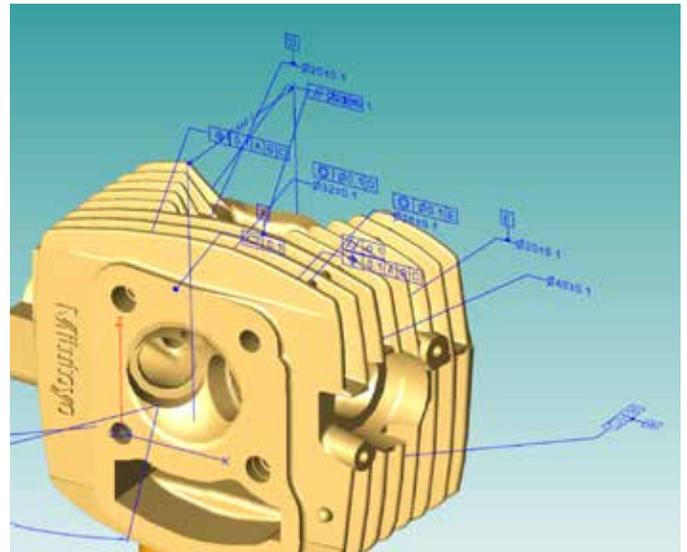


Several sets of rules can be applied simultaneously according to manufacturing or customer requirements.

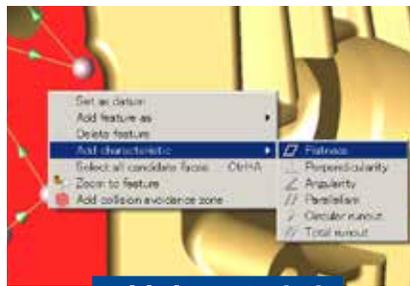
# CAD Data Information: Automatic or Manual

After importing the CAD model, either all required features and GD&T are with the PMI data (Product Manufacturing Information), or can be manually input if the information is incomplete or not included.

After a CAD model is loaded that includes PMI data, all required features and characteristics to be evaluated are instantly displayed and available, and a part program is automatically generated.

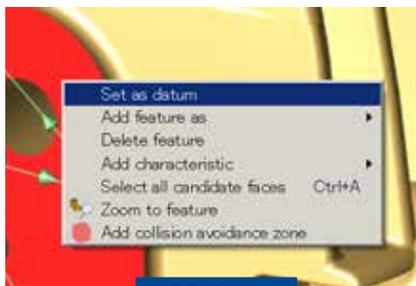


**Add feature**

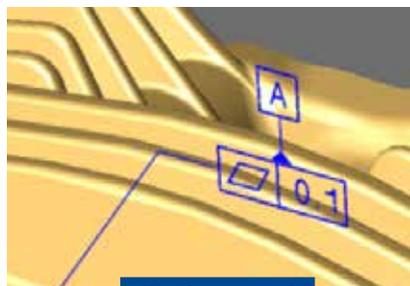


**Add characteristic**

If the CAD model lacks features, characteristics or tolerances, manual inputs are easy and quick thanks to MiCAT Planner's GD&T Wizard.



**Add datum**



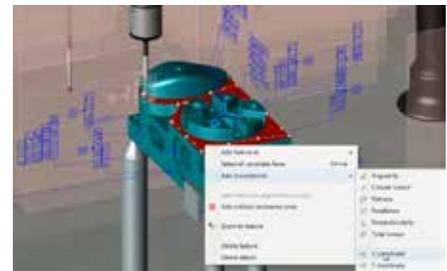
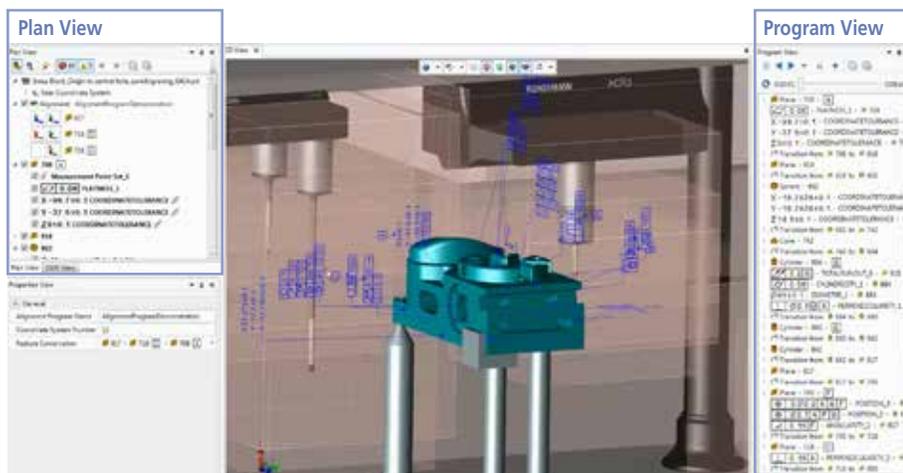
**Display result**



# Automatic Part Program Generation

After all features and characteristics to be evaluated are validated and approved, a part program is automatically generated.

The Plan View (left) shows the outline of the measurement plan, where as the Program View (right) shows the measurement path and probing details. Both the Plan and Program views are synchronized with the 3D view (center). When you select a feature or characteristic in any of the three views, MiCAT Planner indicates the selected item in the other views.

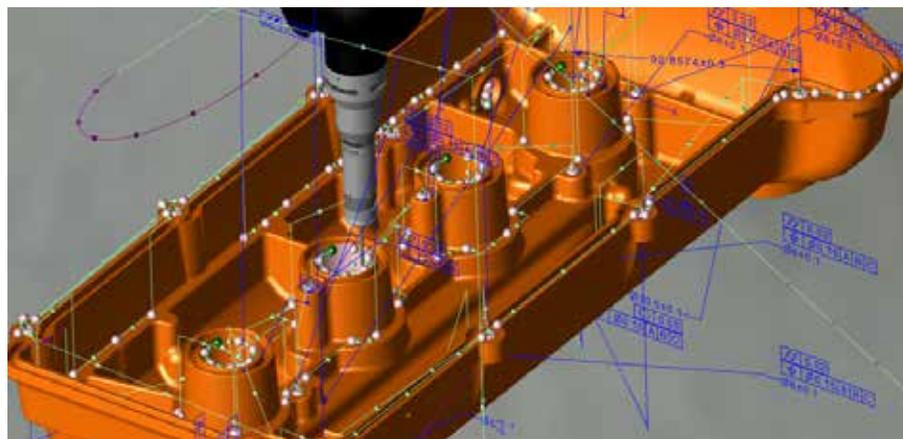
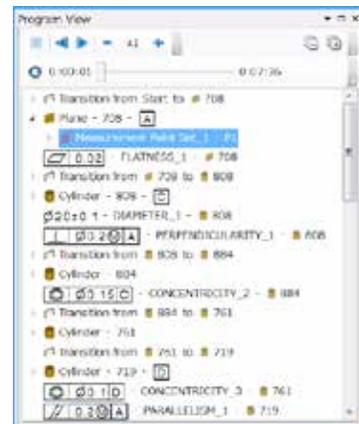


If required, a missing feature (not identified on the CAD model) or a missing characteristic to be evaluated can be manually added from the 3D view.

# Safe GD&T Interpretation

CAD-designed components are more and more defined by form and position symbols according to international standards.

However, depending on the individual programmer skill level, it may lead to different or inconsistent interpretation in the measurement strategy.



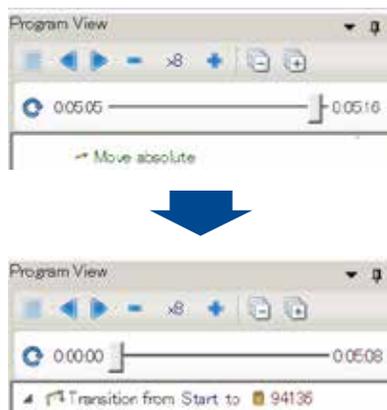
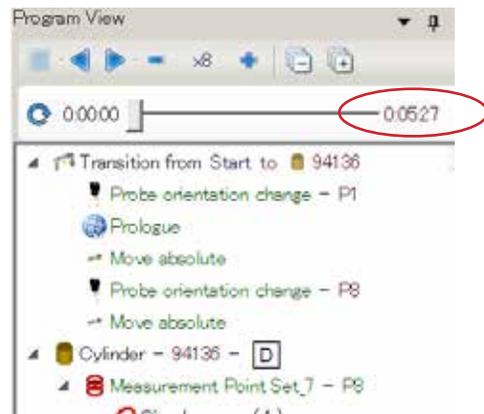
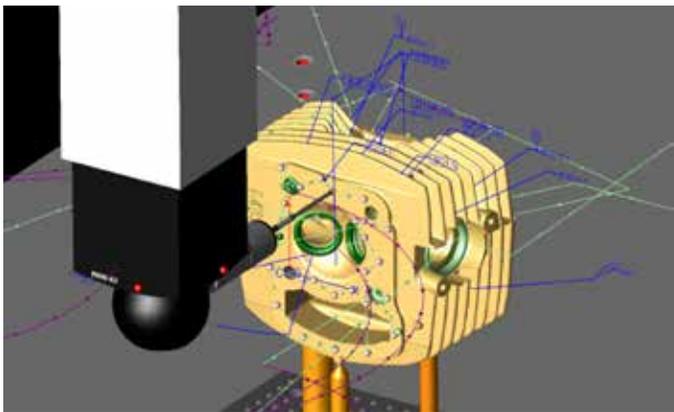
MiCAT Planner prevents risk of misinterpretation: each GD&T symbol, tolerance and datum is automatically understood and converted in the corresponding required measurement points. In the program view, all GD&T are shown in regards to the feature to be measured for calculating the result.

# Cycle-Time Optimization

When programming manually, the programmer creates a measurement path following the required features for calculating the expected results.

Frequently, this results in unnecessary CMM movements and inefficient probing paths. Consequently, this results in longer inspection times that slow throughput and increase cost.

First, MiCAT Planner generates the probing path according to the measurement plan, and then optimizes it according to best strategy, avoiding wasted probe changes and/or movements.



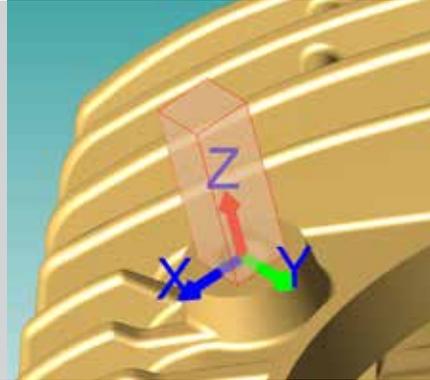
MiCAT Planner automatically estimates the measuring cycle time according to the actual CMM configuration and settings. For example, the required time for exchanging a probe in the rack, or the specified scanning speed in your measurement rules, are considered for this time estimation. Immediately after the cycle optimization is executed, the new estimated cycle time is displayed.

... and much more.

### Avoidance Zone

Several avoidance zones can be created to simulate the presence of any obstacle such as a clamp, a bracket or a column simulating a fixture.

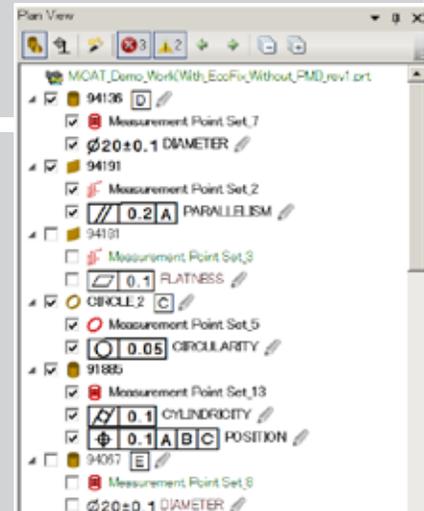
MiCAT Planner will automatically calculate probing points and paths to avoid these areas, providing a collision-free part program.



### Individual Measurement Control

Any feature within the CAD model can be included or excluded from the Rules Editor, allowing for exceptions to define the measurement strategy when required by production or manufacturing requirements.

MiCAT Planner will consider this as an exception for a given feature, but will continue applying existing rules to all other features of this type.



### Flexible Measurement Selection

While MiCAT Planner always selects the maximum number of features available to measure, the user can include or exclude features by checking / unchecking the corresponding boxes. Drag-and-drop functionality is also available for defining the measurement sequence.



### Edit Part Program

A part program generated by MiCAT Planner can be managed and edited using the MCOSMOS Editor.\*

\* Requires MiCAT Planner RUN OPTION authorization.

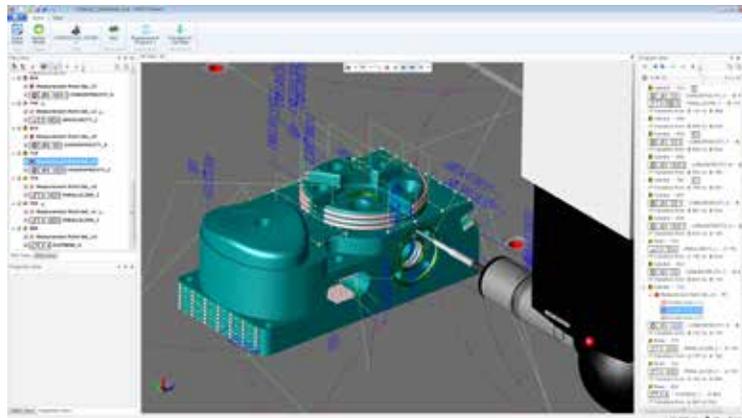
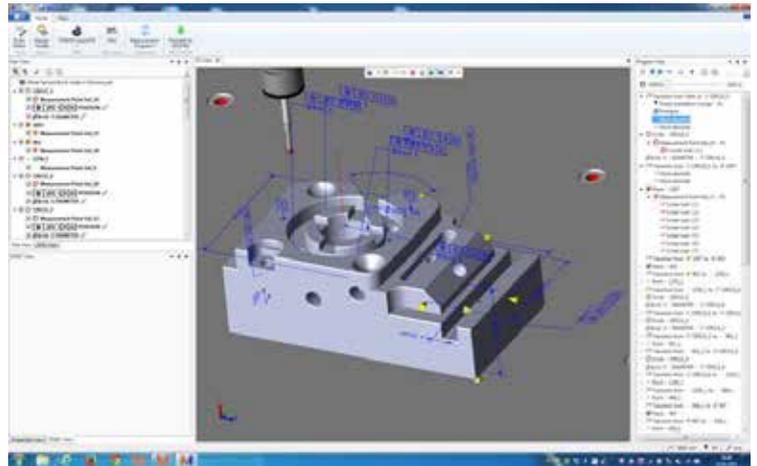
# Return On Investment

Using MiCAT Planner means saving programming time, and time is money. But how much saving can you expect? Two different scenarios display your savings potential.

## CAD model without PMI Data

- Number of measured features = 17
- Number of evaluated characteristics = 22
- Programming time with MCOSMOS = 51 minutes
- Programming time with MiCAT Planner = 23 minutes

Time saving = 28 minutes  
 → 55%



## CAD model with PMI Data

A CAD file with PMI that contains GD&T does not proportionally increase program generation time because of the number of features and characteristics.

In this example:

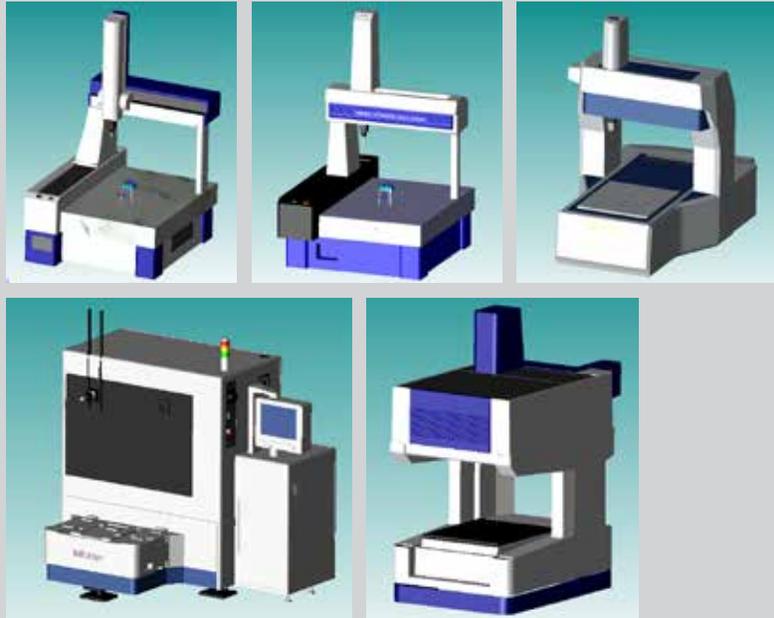
- with MCOSMOS = 43 minutes
- with MiCAT Planner = 3 minutes

Time saving = 40 minutes  
 → 93%

# Supported Hardware

## Mitutoyo CMMs

- CRYSTA series
- STRATO series
- LEGEX series
- MACH-3A
- MACH-V



### Probe system

#### Touch-trigger probes

- TP200/TP20/TP2
- TP7M

#### Contact scanning probes

- MPP310/MPP100
- SP25M
- SP600M/SP600Q
- SP80

#### Probe head

- PH10M/PH10MQ/PH10T
- PH6M

## Auto-change racks

- ACR3 (4 ports/8 ports)
- FCR25
- MCR20
- SCR200
- SCR600
- SCR6
- SCP80





## Whatever your challenges are, Mitutoyo supports you from start to finish.

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed up by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.



Find additional product literature and our product catalog

[www.mitutoyo.com](http://www.mitutoyo.com)

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