



User Manual

Universal CMM Server

3/27/2018

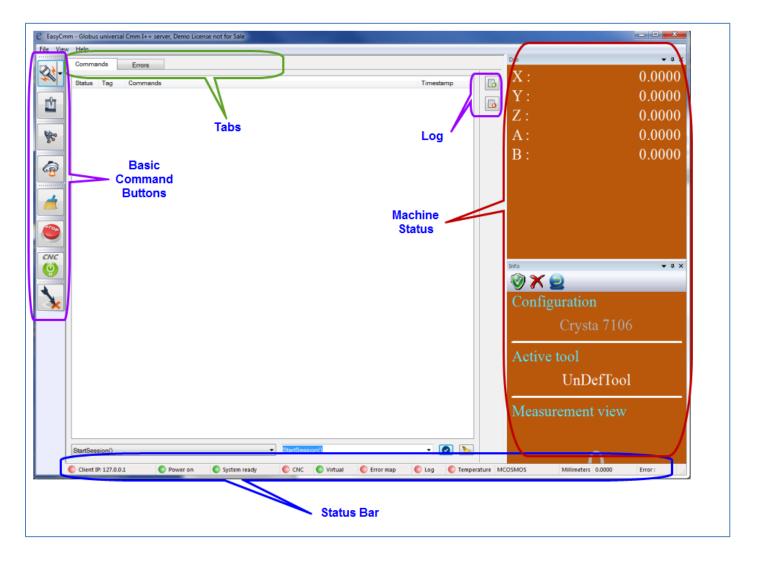
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 - 1.1.2 Errors tab
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1. GUI



1.1. Tabs

1.1.1. Commands tab

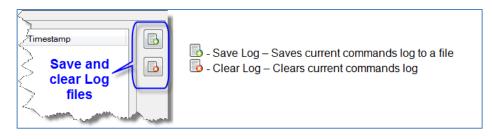
Status	Tag	Commands	Timestamp
<	00001	StartSession()	10/01/2016 - 14:21:14.035
>	00001	&	10/01/2016 - 14:21:14.038
>	00001	%	10/01/2016 - 14:21:16.264
<	00002	GetDMEVersion()	10/01/2016 - 14:21:16.270
>	00002	&	10/01/2016 - 14:21:16.279
>	00002	# DMEVersion("1.7")	10/01/2016 - 14:21:16.307
>	00002	%	10/01/2016 - 14:21:16.312
<	00003	GetMachineClass()	10/01/2016 - 14:21:16.322
>	00003	&	10/01/2016 - 14:21:16.326
>	00003	# GetMachineClass(CartCMM)	10/01/2016 - 14:21:16.340
>	00003	%	10/01/2016 - 14:21:16.343
<	00004	SetCoordSystem(MachineCsy)	10/01/2016 - 14:21:16.354
>	00004	&	10/01/2016 - 14:21:16.357
>	00004	%	10/01/2016 - 14:21:16.374

The Command tab shows the communication commands between the server (EasyCmm) and the client.

- Status :
- <-- Incoming command (Usually from client)
- --> Outgoing reply from server (&, #, %)
- Tag :
- o 00001 A command tag incoming from client
- E0001 An Error tag or An Event tag
- C0001 A command triggered by the server
- Commands :
 - o & Server receives the command
 - o # Server returns data (if necessary) to client
 - o % Server sends command complete
- Timestamp : Current date & time of the line
- ٠

	Marine Preserver		Ward and a second a
GoTo()			- • • • •
	Pre defined	Recently used I++ Commands	EasyCmm

 Pre-defined I++ commands – By selecting an I++ command, it will be shown in the recently used I++ command combo box. There, the user can type manually additional Parameter if the user clicks twice on the command row, the command is shown in recently used I++ commands combo box



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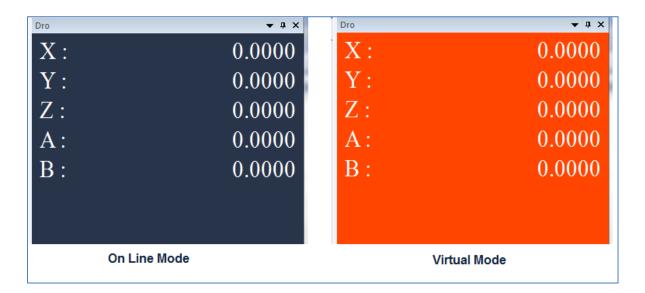
1.1.2.	Errors tab				
Tag Comma	nds	I++ Code	Severity	I++ Description	
0002 PtMeas()	14	1	No arguments provided.	

- \circ Tag I++ unique tag id.
- Commands I++ command
- I++ Code I++ predefined error code (as defined on DME specification).
- Severity Default error severity classification
 - 0: Info
 - 1: Warning, level 0 and 1 doesn't interfere with pending commands
 - 2: Error, client should be able to repair the error
 - 3: Error, user interaction necessary
 - 9: Fatal server error
 - Only errors with classification higher or equal 2 require ClearAllErrors().
- I++ Description I++ error description.

1.2. Panes

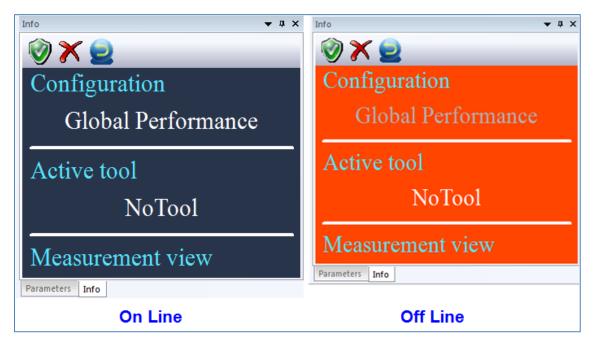
1.2.1. DRO pane

The DRO shows current X, Y, Z coordinates (and R if a rotary table is activated) and probe orientation (A, B angles).



1.2.2. Info pane

- Configuration Section
- \circ Active tool section
- o Measurement view section

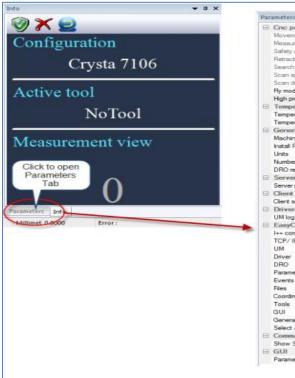


Info Icons



1.2.3. Parameters pane

View Help							
Panes 🕨	Dro pane						
Toolbars 🕨	Info pane						
	Parameters pane						
	Tools pane						
Tool properties pane							
Parameters	▼ # X 🗊						
Cnc parameters	50.0000						
Movement speed	50.0000						
Measurement speed	5.0000						
Safety distance	5.0000						
Retraction distance	5.0000						
Search distance	5.0000						
Scan speed	0.0000						
Scan deflection	0.0000						
V modern	and the second second second second						
STOC AND CONTRACTOR	JEANSH- MARCHART AND						
Commands Tab							
Show Scan Data On Comma	a True						
GUI							
Parameters docking mode	Dock to the right and hide						
Tool							
Calibration expiration days	0						
Kitha Calibrat							
	ion Days is set						
	st Calibration						
	his then the						
calibration wi	Il show in RED						



Parai	meters	* 9 >
	Coc parameters	
	Movement apeed	0.000000
1.1	Neasurement speed	0.000000
	Safety distance	0.000000
	Retraction distance	0.000000
	Search distance	0 000000
	Scan speed	0.000000
	Scan deflection	0.000000
	Ry mode	ON
	High precision	OFF
-	Temperature compensatio	
	Temperature compensation	OFF
	Temperature compensation	0.000000
	General	- (2011)
1	Machine configuration path	C:\Program Files\Globus\EasyC
	nstall Path	C:\Program Files\Globus\EasyC
1	Units	Milmeters
	Number of digits after point	4
	DRO refresh delay (ms)	500
3 1	Server	
	Server port	1294
3.4	Client	
0	Client software	Other
- 1	Drivers Log	
	UM log level	Level 0
	EasyCmm I++ GUI log leve	d
	++ commands	False
	TCP/IP	False
	ML	False
	Ditver	False
	DBO	False
	Parameters	False
	Events	False
	iles.	False
	Coordinates system	False
	Tools	False
	500	False
	Seneral	False
	Select Al	False
	Commands Tab	
	Show Scan Data On Comma	True
	GUI	1.004
	Parameters docking mode	Dock together with info pane

CNC parameters

The CNC parameters shows the active tool automatic modes basic activated parameter values that the controller uses when driving the machine on GOTO, PTMEAS or SCAN command.

- Move Speed Speed when the CMM moves between the measurement points.
- Measure Speed Speed when the CMM is moving to probe the part.
- Safety Distance The distance between the theoretical probe point on the surface of the piece and the point where the CMM changes from movement speed to measurement speed.
- Retract distance Defines the distance that the probe retracts from the workpiece after each probe hit.
- Search Distance The maximal distance the CMM will move in measurement speed in order to probe a point.
- Scan Speed Used when the CMM is scanning.
- Scan Deflection The measuring probe deflects when scanning a work piece during measurement. The deflection will not go beyond the limits of the defined value.
- Fly Mode On or Off. Machine parameter and not only for current active tool
- High Precision On or Off. Machine parameter and not only for current active tool

Temperature Compensation

- Switch on Temperature Compensation
- Set figure for the Coefficient of expansion



Server

The port used for I++ communication.

Client

Client section is used to define which I++ client is used. Some relevant parameters per each client can be defined.

Example: For MCosmos Only:-

Client					
Client software	MCOSMOS	-			
Tools map path			Tools Map Path:	C:\MCOSMOS35\Configuration\virtual\IppClient\	Browse
Update tools map	False				
[[Main] NoOfTrees: [Tree001] NoOfTools: 1=tool_1.	nat View Help =1 =3 5.A0.0-B0.0 5.A90.0-B0.0			Example	

General

- Machine Configuration path
- o Install path
- Units MM or Inch
- Number of digits after the point

o DRO Refresh delay (ms)

Machine Configuration Path

The path used for all configurations folders. When clicking the configuration button, the dialog will show all configurations under this path.

Install Path

The path used for all components database, i.e. heads, modules, probes, tool changers, etc.

Units

"Millimeters" or "Inches". – The unit type for all numeric values

Number of digits after the point

Number of decimal places, for all numeric values.

DRO Frequency

The value is sent to the controller when 'OnReportE' command is issued, sets the DRO time interval that the controller sends to the server and the server to the client.

Drivers Log

 UM Log Level – Universal machine (and drivers) log level. From Level 1 (the less detailed) to Level 4 (the most detailed).

EasyCMM I++ GUI log level

I++ GUI Log Level – The user can select any source to log out to the log file

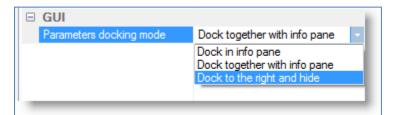
I++ commands	False
TCP/ IP	False
UM	False
Driver	False
DRO	False
Parameters	False
Events	False
Files	False
Coordinates system	False
Tools	False
GUI	False
General	False
Select All	False

Commands Tab

Show Scan Data on Comma – True or False

GUI

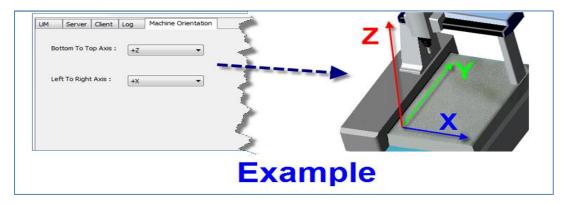
Parameters pane Docking Mode



Machine Orientation

In This section the user can define the machine orientation i.e. the coordinate system orientation representing the machine coordinate system.

For example, in the case above, the orientation when facing towards the front of the machine will look like this:



1.2.4. Tools Pane

EasyCmm - Globus universal Cmm I++ server, Demo License not for St										
File View	File View Help									
	Panes	•	Dro pane							
	Toolbars	۱.	Info pane							
	Status	Tag	Parameters pane	1						
	<	C00(Tools pane	2						
ĭ	>	C000	Tool properties pane	\geq						
	>	C006	10	/						
and the second s		C0002	Clear Million St.							

l Tools		•									
Name		I++ Nickname	A	В	Diameter	Max diff	Std dev	х	Y	z	Calibration date
- RefToo	pl										
	RefTool	RefTool			1.0000	0.0000		0.0000	0.0000	0.0000	
_ tool_1											
۸	tool_1.A0.0-B0.0	tool_1.A0.0-B0.0	0.0	0.0	1.0000	0.0000		0.0000	0.0000	0.0000	
▲	tool_1.A90.0-B-180.	.0 tool_1.A90.0-B-180.0	90.0	-180.0	1.0000	0.0000		0.0000	0.0000	0.0000	
۸	tool_1.A90.0-B-90.0	0 tool_1.A90.0-B-90.0	90.0	-90.0	1.0000	0.0000		0.0000	0.0000	0.0000	
▲	tool_1.A90.	Set tool	90.0	0.0	1.0000	0.0000		0.0000	0.0000	0.0000	
À	tool 1.A90.0	Change tool Set reference tool	90.0	90.0	1.0000	0.0000		0.0000	0.0000	0.0000	
	-	Rename tool nickname									
		Calibrate tool									
		Re-Calibrate tool Mark used tools	L								

Tools pane shows the active configuration tools. The orientations are grouped for each tool. The user can set his own Ref Tool.

Name	I++ Nickname	А	В	Diameter	Max diff	Std dev	х	Y	Z	Calibration date	*
RefTool	RefTool			1.0000	0.0000).0000).0000).0000		
- tool_1											E
sl_1.A0.0-Bi 🋕	ool_1.A0.0-B0.	0.0	0.0	1.0000	0.0000).0000).0000	0.0000		
🛕 1.A90.0-B-1	L_1.A90.0-B-18	90. 0	۱80.	1.0000	0.0000).0000).0000	0.0000		
🛕 _1.A90.0-B-	ol_1.A90.0-B-9(э 0. 0	90.0	1.0000	0.0000).0000).0000).0000		-

RefTool - Supports all standard tool properties. Is used by many servers, for basic geometric referencing of the tools to the machine.

F.I. defining position of qualification - artifact, multiple columns referencing.

- Name Tool's I++ name
- I++ Nickname Tools can be re-named (nickname).
- \circ A 'A' angle.
- \circ **B** 'B' angle
- Diameter The effective diameter of the probe. If two values are shown, the first represents the value for touch signal and the second represents the value for scanning.
- Max Diff the quality of the measurement or probe system
- Std. dev. a quality calculated to indicate the extent of deviation for a group as a whole.
- \circ X, Y, Z Offsets of orientation to the reference tool.
 - When scanning probes are calibrated the user receives two different probe diameters and form errors,
 - ① One for touch measurement and the other for scanning measurement.
 - The values of the scanning probe are always the lower ones. Only the offset of the touching measurement is used.
 - For the probe radius compensation of scanning commands, the diameter of the scanning probe is always used.
- Calibration Date Date & Time of the Tools last calibration.
- Tool Probe File Name (Only for PCDmis client) The PCDmis tool's file name. When PCDmis loads, it asks which tool is in use. The user must choose from the tools file names.

In case the user changes a tool on the I++ server and this tool file name is set, it notifies the PCDmis with this information, so when the PCDmis loads, it will show the last tool used (from Server) as a default.

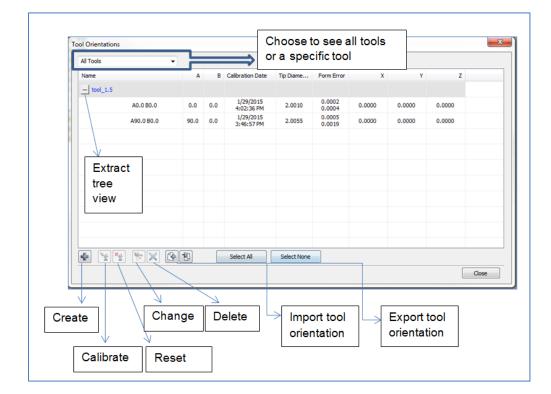
Set Tool – Sets the active tool.

- Change Tool Change the tool by Probe Changer or manually
- * Calibrate Tool Requalify Active Tool
- Marked used Probes (Only for PCDmis client) This button will mark all PCDmis part program used probes. It is simulating the mark used button of PCDmis as it is

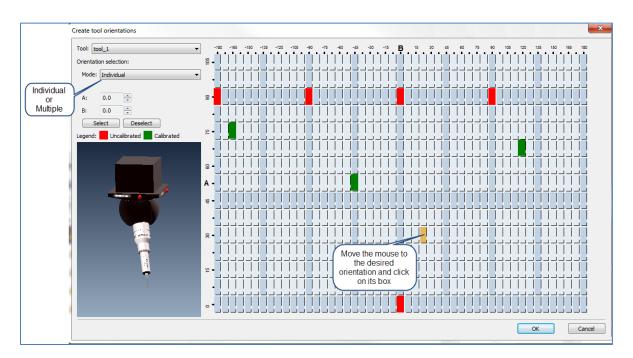
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disabled in case that PCDmis works as an I++ client. (User must set the communication path as shown in 2.3.1.2).

o Probe definitions



1.2.4.1. Create tool orientations



Calibrated orientation will be shown in green color.

Orientation selection

Individual - By selecting the desired orientation box or selecting manually angle 'A' & 'B'.

Orientation selection:							
Mode:	Individual 🔻						
A: 0.0 B: 0.0 Select	Deselect						

Multiple – By selecting start angle, end angle and step angle.

Orientation selection:								
Mode:	M	Iultiple	•					
	Start	End	Increment					
A:	0.0	0.0	- 7.5					
В:	0.0	0.0	7.5					
S	elect	Deselect						

1.2.4.2. Calibrate tool orientations

There are two methods for calibration: Automatic and Manual

• Automatic calibration parameters

Tool: tool_1					
		•			
Method: Automatic		•			
Parameters					
Reference sphere has mo	ved				
Tactile scanning calibration					
Probing calibration		۲			
Number of executions:	1	•			
Point on top of sphere					
Number of circles:	1				
Number of points per circle:	4				
First circle:					
Angle from top (degrees)): 30	0.0000			
Last circle:					
Angle from top (degrees)): 90	0.0000			
Offset from equator:	0.	0000			
CNC		*			
Movement speed (mm/s):		100.0000			
Measurement speed (mm/s):		3.0000			
Tactile scanning speed (mm/s): 15.0000					
Approach distance:					
Uncalibrated tool orientation: 4.0000					
Calibrated tool orientatio	n:	2.0000			
Search distance: 5.0000					
Tool orientation change:					
Distance from reference sphere: 20.0000					
Reference sphere		۲			
Name: reference sp	phere	_1 •			
Diameter: 9.9998					
Stem diameter: 4.0000					
Calibra	ate	Cancel			

 Reference sphere has moved – To start calibrating the machine needs to know the masterball position.

If it is already predefined (by calibration that was done before or a 'Locate Sphere' routine), the user can uncheck this checkbox and the machine will move automatically above the center of the masterball.

- Tactile scanning calibration Check this option if a scanning probe is attached and you want to have the scanning routine while calibrating. In this case, calibration data for diameter, form and date will have two results, one is tactile result and the second is scanning result.
- Number of executions Set number of executions.
- Point on top of sphere Check this option if you want the machine to probe the first point on the center top of the sphere. Calibration is performed between the top of sphere and lower circle arc.

If this option is unchecked, calibration is performed in the last circle arc (If number of circles set to 1) or between the first circle angle and last circle angle (If number of circles set to at least 2).

- Number of circles Set the number of circles.
- Number of points per circle Set the number of points per circle.
- First circle Angle from top Set the angle from top of sphere for the first circle (will be enabled only in if at least 2 circles are set in 'Number of circle' field.

- Last circle Angle from top Set the angle from top of sphere for the last circle (usually performed on equator).
 - 'Z offset' is calculated automatically out of last circle angle. It is the distance (in mm) from the equator (It is usually used when probe diameter is small and there is a shank risk while calibrating).
- CNC parameters Set the speeds, approach and search distances for the calibration routine.
- Distance from reference sphere This distance is where the probe change will take place.
- Reference sphere Select the reference sphere for calibration routine.

Tool:	tool_1	l		
Method:	Manua	al		
Parame	ters			
Fixed	numbe	r of points:	5	
Max f	orm err	or:	0.0000	
Referen	ice spl	here		
Name:		reference	sphere_1	
Diameter	:	9.9998		
Stem diar	neter:	4 0000		

o Manual calibration parameters

- Fixed number of points Check this option if you want to enter a fixed number of points to take on the masterball. If it is checked, enter the number of points.
- Max form error Check this option if you want the calibration to be accepted if it does not exceed the form error value that you set.
- Reference sphere Select the reference sphere for calibration routine.

1.2.4.3. Reset calibration

Resets all actual calibration data (diameter, form error, date, offsets) of the selected tool.

1.2.4.4. Change tool

If no tool is set (after connect or after a collision), this button will set the selected tool. If there is an active tool set, this button will change to the selected tool.

1.2.4.5. Delete tool orientations

Delete the selected too

1.2.4.6. Marked used probes (for PcDmis)

PcDmis programs show the probes used in the specified program. It is possible to select and calibrate these probes only

1.2.5. Tool Properties Pane

Tool Properties pane shows the properties per each tool. The user can change (in some of the parameters) the minimum, maximum and actual value.

- If the "Max" Value of a form property is changed it will affect only the current tool orientation
- If the "default" value of a form property is changed it will affect ALL the tool orientations

Panes Dro pane Toolbars Info pane Status T Parameters pane C Tools pane C Tool spane C Tool spane				Timestamp 27/03/2018 - 07:47:35 377 27/03/2018 - 07:47:35 380 27/03/2018 - 07:47:35 461
Tool properties : tool_1.A90.0-B-180.0				
Property	Actual	Minimum	Maximum	Default
GoToPar.Speed	150.0000	2.0000	300.0000	150.0000
GoToPar.Speed GoToPar.BlendDistance	0.0000	0.0000	0.0000	0.0000
PtMeasPar.Speed	7.0000	2.0000	10.0000	7.0000
PtMeasPar.Approach	3.0000	0.0000	1000.0000	3.0000
PtMeasPar.Search	10.0000	0.0000	1000.0000	10.0000
PtMeasPar.Retract	3.0000	-1.0000	1000.0000	3.0000
RMSError	0.0000	0.0000	1.0000	0.0000
MinError	0.0000	-1.0000	0.0000	0.0000
MaxError	0.0000	-1.0000	0.0000	0.0000
Form	0.0000	0.0000	1.0000	0.0000
ED Dauble Click on a	🔒 1.0000	1.0000	10.0000	5.0000
LastCalibrated Double Click on a field to change	<u>_</u>	<u>_</u>	<u>_</u>	<u>_</u>
the value	American and and a	- And the second		and the second s

1.3. Toolbars

1.3.1. Device toolbar

- o "On Line" or "Virtual"
- Machine Configuration
- 📧 Open Tools pane
- I Laser Probe

1.3.2. Command toolbar

- Clear all errors button
- Stop Machine button
- Section CNC On\Off button

Take manual point (Virtual connection only)

• When this Button is pressed a window opens which allows the XYZ and IJK input for taking a point manually

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Take manual point
X: 0.0000 Y: 0.0000 Z: 0.0000 I: 0.0000 K: 1.0000 K: 1.0000 OK Cancel

1.4. Status bar

The Status bar shows in real time the relevant status of some important parameters.

Client IP: 1	127.0.0.1	Power on	System ready	CNC	Virtual 🚺 Fly	Crror map	Cog	C Temperature	Client software	Millimet 0.0000	Error :
				6.4							
0			address o					client s	ottware.		
0	Powe	er On – S	Shows con	nectivity	with the	e control	er.				
	0	On (G	reen) – Se	rver is c	onnected	d to the	contro	oller.			
	0	Off (Re	ed) – Serve	er is disc	connecte	ed from t	he co	ntroller.			
0	Syste	m Read	y – Shows	the stat	tus of the	e server	while	executi	ng comr	nands.	
	0	Green	light – Ser	ver is re	ady for I	next ope	ration).			
	0	Red lig	<mark>ht – Serve</mark>	er is bus	y with ur	ncomple	te con	nmand (a comm	and didn't	
		come	to its end a	ind no 'c	omplete	' reply w	as iss	sued).			
0	CNC	- Show	s whether	the cont	roller is i	n CNC (auton	natic) m	ode or N	lanual mo	de.
	0	Green	light – CN	C (autor	natic) m	ode.					
	0	Red lig	<mark>jht</mark> – Manu	al mode							
0	Virtua	al – Shov	ws whethe	r the cor	ntroller is	s in Virtu	al mo	de or no	ot.		
	0	Green	light – Virt	ual mod	e.						
	0	Red lig	<mark>ht –</mark> Onlin	e mode							
0	Error	Map – S	Shows if ar	n error m	nap is ac	tivated a	and th	e contro	oller uses	s this map	while

- Error Map Shows if an error map is activated and the controller uses this map while sending the coordinates.
 - Green light Error map is used.
 - Red light Error map is not used.
- Log Shows if an Log File is activated
 - Green light Log Activated.
 - Red light Log inactive
- Temperature Shows if Temperature compensation is active on the machine
 - Green light Temperature compensation Activated.
 - Red light Temperature compensation inactive
- o Client Software-
- o Millimeters or Imperial
 - Shows if program is working in MM or Inches
- Error Shows the last error description.

2. Machine configuration

In this dialog the user can create, duplicate, delete and edit a CMM configuration.

Properties - CNC CMM Configuration: Crysta7106		e & Head name	Create, Duplicate, Delete
Machine: Mibutoyo Crysta-Apex S / PH1/ Reference spheres Tools Tool changers Name reference sphere 1 reference sphere 2 reference sphere 3	Diameter Stem Diameter 9.9998 4.0000 24.9902 10.0000 14.9405 8.0000	Edit Machine	Edit machine configuration
			Machine configuration components
		<u>с.</u>	⊖ Open GL part
Create Duplicate	Edit Delete	OK Cancel Apply	

2.1. Configuration operation

The Configuration section shows the active configuration name.

User can choose to connect online or offline (virtual mode).



User can change, create, delete and edit any configuration.

User can change, create, delete and edit any configuration items & settings.

2.1.1. Create configuration

nfiguration: conf1				Create Edit Machine
Leference spheres Tools Too	l changers Tool change	r ports Rotary ta	ble	
Name		Diameter	Stem Diameter	
+ » /×				

To create new configuration, click on the create/duplicate/delete option box.

The dialog will reopen and the server will be disconnected (if connected).

The user can name the configuration in the configuration text box.

The new configuration will be activated.

2.1.2. Create Duplicate Configuration

To create a duplicate configuration, choose this option from the create/duplicate/delete combo box.

The current configuration will be duplicated to a new one with a different name.

The new configuration will be activated.

2.1.3. Delete Configuration

To delete a configuration, choose this option from the create/duplicate/delete combo box.

The current configuration will be deleted and the next configuration, if exists, will be activated. If no configuration exists, a new one will be created.

2.1.4. Change Configuration

To Change the active configuration (machine), choose a different one from the configuration combo box.

The dialog will reopen and the selected configuration will be activated.

2.2. Edit Machine

To edit the selected configuration press the 'Edit Machine' button

2.2.1. Machine components tab

Set the components of the selected configuration.

Components	Properties Volumetric compensation	_	
Model:	Mitutoyo Crysta-Apex S		→ Machine Model
Controller			
Model:	Mitutoyo UC400		Controller Model
Connection:	▼ Settings	Ĵ.	
Part temperat	ure sensor number: 9		Controller connection
			type to computer
Probe head			(serial, tcp/ip etc)
Model:	PH10MQ	ъL	
Connection:	Serial Settings	۲ III	Probe Head
Orientation:	Serial V		
			Probe Head
Direction at			connection type to
Direction at	A90.0 B90.0: +X 🔻		computer (serial, tcp/ip
JogBox			etc)
Connection:	TCP/IP Settings	i	Head direction at A0.0
			> Head direction at A90.0
			logRov connection
			 JogBox connection type to computer
			- type to computer

Machines with temperature compensation have sensors that sample the temperature. These sensors are indexed.

Part temperature sensor number - The sensor that samples the part temperature.

2.2.2. Machine Properties tab

Set size and basic default speeds of the machine.

Max coordinate: 100.0000 600.0000 1000.0000 Size (mm): 500.0000 600.0000 1000.0000 Home position (quill) x: 0.000 1000.0000 y: 500.0000 500.0000 1000.0000 y: 500.0000 500.0000 1000.0000 z: 900.0000 500.0000 1000.0000 Speeds Default Max Movement (mm/s): 100.0000 300.0000	Working volume							
Max coordinate: 100.0000 600.0000 1000.0000 Size (mm): 500.0000 600.0000 1000.0000 Home position (quill) x: 0.000 1000.0000 y: 500.0000 1000.0000 1000.0000 y: 500.0000 100.0000 300.0000 Approach (mm/s): 2.0000 10.0000 10.0000 Tactile scanning (mm/s): 8.0000 20.0000 10.0000	_	X axis		Y axis	Z axis			
Size (mm): 500.0000 600.0000 1000.0000 Home position (quill) x: 0.000 y: 500.0000 y: 500.0000 Speeds Movement (mm/s): Default Max 100.0000 300.0000 Approach (mm/s): 2.0000 10.0000 Tactile scanning (mm/s): 8.0000 20.0000	Min coordinate:	-400.0000	0	.0000	0.0000			
Home position (quill) x: 0.000 y: 500.0000 y: 900.0000 Speeds Default Movement (mm/s): 100.0000 Approach (mm/s): 2.0000 Tactile scanning (mm/s): 8.0000	Max coordinate: 100.0000 600.0000 1000.0000							
x: 0.000 y: 500.0000 z: 900.0000 Speeds Movement (mm/s): Default Max 100.0000 300.0000 Approach (mm/s): 2.0000 10.0000 Tactile scanning (mm/s): 8.0000 20.0000	Size (mm): 500.0000 600.0000 1000.0000							
y: 500.0000 y: 900.0000 Speeds Movement (mm/s): Default Max Movement (mm/s): 100.0000 Approach (mm/s): 2.0000 Tactile scanning (mm/s): 8.0000 Control Control C	Home position (quil	I)						
Default Max Speeds Default Max Movement (mm/s): 100.0000 300.0000 Approach (mm/s): 2.0000 10.0000 Tactile scanning (mm/s): 8.0000 20.0000	x: 0.000							
Speeds Default Max Movement (mm/s): 100.0000 300.0000 Approach (mm/s): 2.0000 10.0000 Tactile scanning (mm/s): 8.0000 20.0000	y: 500.0000	the second se						
Default Max Movement (mm/s): 100.0000 300.0000 Approach (mm/s): 2.0000 10.0000 Tactile scanning (mm/s): 8.0000 20.0000								
Movement (mm/s): 100.0000 300.0000 Approach (mm/s): 2.0000 10.0000 Tactile scanning (mm/s): 8.0000 20.0000	z: 900.0000							
Approach (mm/s): 2.0000 10.0000 Tactile scanning (mm/s): 8.0000 20.0000								
Tactile scanning (mm/s): 8.0000 20.0000	z: 900.0000 Speeds		efault		Max			
	Speeds			300.				
Read from Controller	Speeds Movement (mm/s):	100	.0000		0000			
	Speeds Movement (mm/s): Approach (mm/s):	100	.0000	10.	0000			
	Speeds Movement (mm/s): Approach (mm/s):	100	.0000	10. 20.	0000			

Working Volume:

Min Coordinate – Minimum coordinate value of each axis.

Max Coordinate – Maximum coordinate value of each axis.

Size – Absolute working volume size.

Home Position – Coordinate system of the "software" home position (as opposed to initialization home position).

 Read coordinates from machine – Reads the current X, Y, Z position from machine and fill in the fields, respectively.

Movement Speed – Set default and maximum speed used when the CMM moves between the measurement points.

Approach Speed – Set default and maximum speed used when the CMM is moving to probe the part (also known as measurement speed).

Tactile Scanning Speed – Set default and maximum speed used when the CMM is scanning.

Read From Controller – The server will try to read as much as possible the above parameters and set them automatically as defined in the controller. (Not supported by all controllers).

2.2.3. Machine Volumetric Compensation tab

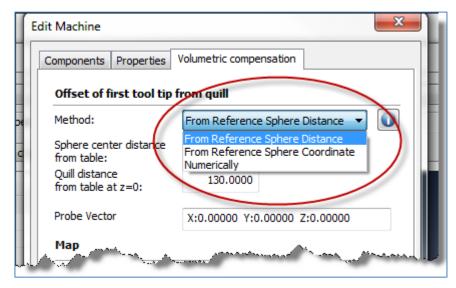
In order to execute compensation at the actual measurement place, the server must know the offset from Z-spindle to stylus tip. This value is known as Probe Vector.

dit Machin	e	23
Componer	nts Properties	/olumetric compensation
Offset	of first tool tip f	rom quill
Method	:	From Reference Sphere Distance 🔻 🚺
Sphere (from tab	center distance ble:	130.0000
Quill dist from tab	tance ble at z=0:	130.0000
Probe V	ector	X:0.00000 Y:0.00000 Z:0.00000
Мар		
Map :	Undefined	Import
		OK Cancel

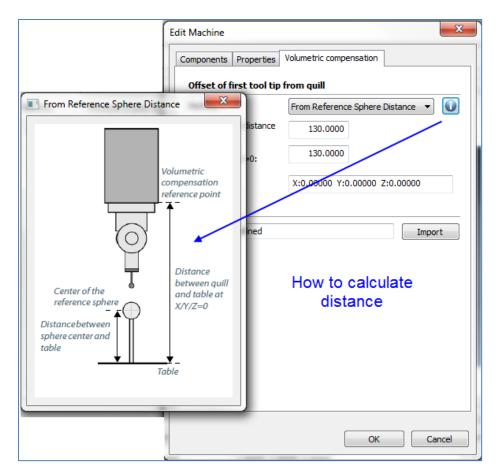
- Also in the "Machine Properties.Ini" File
 - \circ Estop = 0 // for older controllers
 - Estop = 1 // for newer controllers

There are three methods to define the offset of first tool tip from quill:

These can be accessed from the Drop-Down box on the "Volumetric Compensation tab.



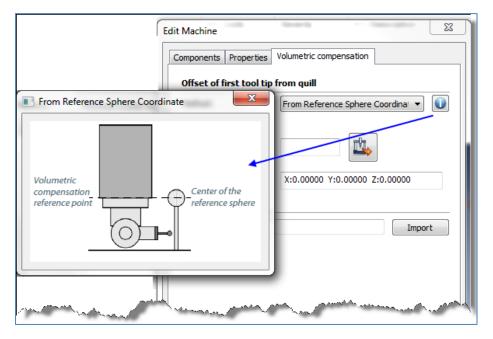
• From Reference Sphere Distance



Sphere center distance from table – Defined from the table to the center of the masterball.

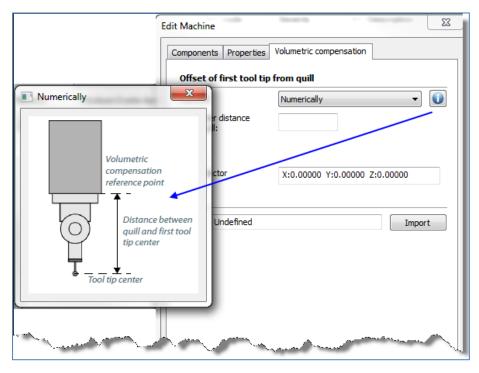
Quill distance from table at z=0 - To set this distance, you must move the Z-spindle to Z = 0. Normally, you have to remove your probe system to determine this distance.

• From Reference Sphere Coordinates



Set the 'Z' coordinate of the reference sphere center.

o Numerically



- Tip center distance from quill Set the stylus tip center distance from quill.
- o Error Map

User can import the error map file of a machine.

omponents Properties	Volumetric compensation
Offset of first tool tip	from quill
Method:	From Reference Sphere Distance 🔻 🚺
Sphere center distance from table:	130.0000
Quill distance from table at z=0:	130.0000
Probe Vector	X:0.00000 Y:0.00000 Z:0.00000
Мар	
Map: Undefined	Import
	have a second the second s
and a product	

2.2.4. Machine other parameters tab (DEA Controllers only)

Edit Machine	Edit Machine
Components Properties Volumetric compensation Other parameters	Components Properties Volumetric compensation Other parameters
Model: DEA Global Silver Advantage	Analog scan
Controller	Probe lower force: 0.0250
Model: Hexagon DC240C/DC800	Probe upper force : 0.0750
Connection: TCP/IP	Probe max force : 0.1500
Part temperature sensor number: 1	Probe return speed : 2.0000
Probe head	
Model: PH10MQ -	
Connection: Machine Controller Settings	
	Land and a start of the start o
Orientation:	
Direction at A0.0 B0.0:	Additional settings for Dea
Direction at A90.0 B90.0: +X •	Controllers
For Dea Controllers an additional	
TAB appears	
OK Cancel	

2.3. Machine configuration tabs

2.3.1. Reference Spheres tab

achine:		/sta-Apex / PH10					Edit Machine
leference sph	eres Tools	Tool changers	Tool chang	er ports R	otary table		
Name				Diamete	r Stem Diameter		
A reference	sphere_1			9,9998	4.0000	Stem Diameter	Diameter
						Diamotor	
	Edit						
	1	De	elete			ž x	
÷ 🔖	\mathbb{P}						
1 1							
		Locate				OK Ca	ncel Apply

Create – Create a new sphere.

Create Reference	e Sphere
Name: refere	rence sphere_2 Change name if required
Diameter:	
Stem:	Add Sphere Diameter
Diameter:	
Orientation:	Add Stem
i: 0	0.0000 Diameter
j: O	0.0000
k: 1	1.0000
	Add I,J,K Relative to Machine Co-ordinate System
	OK Cancel

Create duplicate – Create a duplication of selected sphere and rename it.

- Delete Delete selected sphere configuration.
- Locate Add location of sphere on CMM

Note: If the Reference Sphere has not been located a Yellow triangular warning sign



will appear at the start of the "Name" of the Sphere

Name	Diameter	Stem Diameter	
Reference sphere_1	9.9998	4.0000	
The reference sphere has not been located			•

Edit – Edit configuration of selected sphere

(Edit Reference	Sphere				x
	Name: re	ference sphere 1				
	Diameter: 9.9	9998				
	Stem:					
1	Diameter:	4.0000				
1	Orientation	n:				
1	i:	0.0000				
	j:	0.0000				
	k:	1.0000				
				z		
				sites ×		
					ОК	Cancel

Orientation – Sphere orientation while calibrating.

2.3.2. Tools tab

Name	Stylus Length	Tip Diameter	
tool_1.5	20.0000		
reate Create duplicate	Edit	Delete	

Create - Create a new tool.

NE 047-7022 047-7090 M8 D13 CF EXT L100 M8 D13 CF EXT L200 M8 D13 CF EXT L50	Length 14.9500 22.9500 100.0 200.0	Tip Dia		PAA1			
047-7090 M8 D13 CF EXT L100 M8 D13 CF EXT L200	22.9500 100.0						
M8 D13 CF EXT L100 M8 D13 CF EXT L200	22.9500 100.0						
M8 D 13 CF EXT L 200							
	200.0						
M8 D 13 CF EXT L 50						RINDA	ANC 🔺 🕺
	50.0000		Ξ				and the second sec
1	50.0000						
2	100.0						
3	200.0						
4	299.9						
ASTAR-mp	14.0000						
ASTAR-p EF	26.3000						
ASTAR-p LF	26.3000			Swivel length:	69.0000		Riennaw
ASTAR-p MF	26.3000			Stylus length:	0.0000		
ASTAR-p SF	26.3000						
ASTAR-m	41 0000		Ŧ	Tip diameter:	0.0000		
	2 3 4 ASTAR-mp ASTAR-p EF ASTAR-p LF ASTAR-p MF ASTAR-p SF ASTAR-p SF	3 200.0 4 299.9 ASTAR-mp 14.0000 ASTAR-p EF 26.3000 ASTAR-p LF 26.3000 ASTAR-p MF 26.3000 ASTAR-p SF 26.3000	3 200.0 4 299.9 ASTAR-mp 14.0000 ASTAR-p EF 26.3000 ASTAR-p LF 26.3000 ASTAR-p MF 26.3000 ASTAR-p SF 26.3000	3 200.0 4 299.9 ASTAR-mp 14.0000 ASTAR-p EF 26.3000 ASTAR-p LF 26.3000 ASTAR-p MF 26.3000 ASTAR-p SF 26.3000	3 200.0 4 299.9 ASTAR-mp 14.0000 ASTAR-p EF 26.3000 ASTAR-p LF 26.3000 ASTAR-p MF 26.3000 ASTAR-p SF 26.3000	3 200.0 4 299.9 ASTAR-mp 14.0000 ASTAR-p EF 26.3000 ASTAR-p LF 26.3000 ASTAR-p MF 26.3000 ASTAR-p SF 26.3000	3 200.0 4 299.9 ASTAR-mp 14.0000 ASTAR-p EF 26.3000 ASTAR-p LF 26.3000 ASTAR-p MF 26.3000 ASTAR-p SF 26.3000

Add Part – Add the selected part to assembled tool.

Remove Last Part – Remove the last part from assembled tool.

Edit – Edit tool configuration

rt to add:		Definition:	
Name	Length Tip Di	a ■ SP25M ■ SM25-1 ■ SH25-1 ■ M3-M2 EXT L5 SS ↑ M2-M2 EXT L20 D3 SS ↑ A-5000-3603 Swivel length: 156.0500 Stylus length: 20.0000	NUME Num Later
		Tip diameter: 2.0000	· · · · · ·

2.3.3. Tool Changers tab

Name	Туре	
▲ tool changer_1	FCR25-L6	
		Provestinger
Warning :		
Tool changer		
Not calibrated		
Not calibrated		_
		2 x
		_
Create Locate	Edit Delete	
		_]

- Edit Edit a selected tool changer
- Definition

Set the tool changer model, number of ports and orientation on the machine

Edit Tool Changer	×
Name: tool changer_1	
Definition Configuration	
Model: FCR25-L6	
Number of ports: 6	
Left-to-right direction: +X	
Up direction: +Z -	_ 11
ALWEIMON	
Z OK Cance	

ame:	tool changer_	1		
Definitio	n Configuratio	n		
App x: y: z:	roach position (100.0000 200.0000 300.0000	iquil)		Read actual machine position and send to approach
A: B:	ange angles: 0.0	3		position coordinates
	proach:	150.0000		
Doc	king:	50.0000		
Cou	upling:	15.0000]	
Docking	distance:	15.0000		

Configuration

Approach Position – An intermediate position for the probe before entering the tool changer.

Tool Change Angles – Tool orientation angles 'A' and 'B' when entering the ports.

Tool Change Speeds:

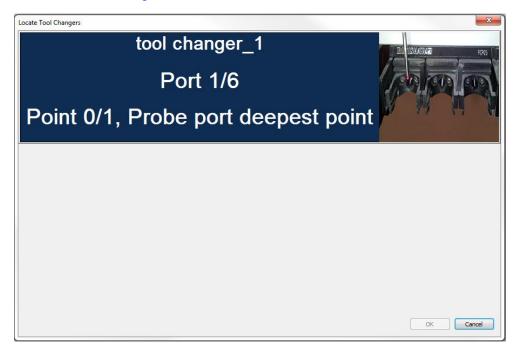
Approach – Speed while moving around the tool changer with a tool attached.

Docking – Docking speed (in and out from a port).

Coupling – Used while moving when no tool attached (after undocking and before docking).

Docking distance – A distance from a port, which sets the limit between, approach speed and docking speed.

Locate Tool Changer



To calibrate a tool changer, please follow instructions on Locate Tool Changer dialog.

2.3.4. Tool Changer Ports tab

Properties -	CNC	CMM								
onfiguration:	Crysta	a7106							•	Create
Machine: Mitutoyo Crysta-Apex S / P				10MQ					Edit Machine	
Reference sph	neres	Tools 1	Tool changers	Tool changer ports	Rotary table					
Port		Part	Т	pols						
tool char	nger_1									
1		SH25-1	1 to	ol_1.5						
2										
3										
5										
6										
								ОК	Cano	el Apply

2.3.5. Rotary Table tab

Properties - C	NC CMM									
Configuration:	Crysta7106							•	Create 🔶	
Machine:										
Reference sphere	res Tools Tool	changers Tool	changer ports Rot	tary table						
Rotary table										
Model:	GOM		•							
Connection:	Serial	•	Settings							
Type:	Indexing	•								
Positive angl	e direction:	Clockwise	•							
	ed (degrees/s):	100.0								
Center and orier	ntation									
x:	i:									
y:	j: k:									
Z:	Ni									
0	→ Loca	te (calibr	ate)							
							ОК	Cancel	Apply	

Model – Set the model of the rotary table.

Connection – Set the connection type to the computer (i.e. serial, tcpip etc..)

Type – Set the rotary table type (i.e. Indexing or Continuous).

Indexing – Rotary table has fixed number of angles (rotation positions) and each angle should be calibrated to be used.

Continuous – User can rotate to any angle (rotation position). In this case calibration will take place just once.

Positive angle direction – Set the direction (clockwise / counter clockwise) for positive angle.

Rotation Speed – Set the rotation speed (degrees/second).

Center and orientation – Shows the rotary table center and orientation on the machine.

Locate – To calibrate the selected Rotary table please follow the instruction from the dialogs.

3. Prepare Client Software as an I++ Client

See attached documentations:

- I. MCOSMOS setup for I++.doc
- II. PC-DMIS as I++ Client_V1.3.pdf

4. EasyCmm shortcuts:

- Ctrl + L Opens EasyCmm server log folder.
- Ctrl + D Opens EasyCmm drivers log folder.
- Ctrl + P Opens probe definition dialog.