MPM

Electronic Assembly Equipment ITW EAE

OpenApps framework (v2.3) for the Benchmark™ User Interface on MPM Printers

The following is a complete list of the interfaces provided via the OpenApps framework (v2.3) for the Benchmark User Interface on MPM Printers. The first set of interfaces are those initiated by Benchmark as part of its operations. These interfaces provide OpenApps data and notification of events performed by the printer. The second set of interfaces are commands and data requests which can be submitted to Benchmark for its use/operation/feedback.

Benchmark Initiated Commands to convey information

Alarm Interface
(PICliAlarmInterface)

AlarmChange
Called when the state of an alarm changes (i.e. cleared by operator)

AlarmSysStateChange
Called when the state of the alarm system changes.

AlarmTriggered
Called whenever an alarm is triggered

Align Interface
(PlCliAlignInterface)

CorrectionReceived
Indicates that a print offset correction has been received by the SPI interface or the OpenApps interface(OAI)

PostAlignData
Posts the alignment data to OpenApps.

PostFidFoundData
Posts the board and stencil fiducial found data

PostRegistrationVerificationData
Posts the registration verification data to OpenApps

Board Interface
(PICliBoardInterface)

BoardAccepted
Indicates that a board which failed inspection has been accepted by the operator.

BoardBarcodeNotification
Outputs the barcode scanned at various sources.

BoardClamped

Board in the processing segment of the machine has just been clamped.

BoardPrinted

The identified board has been printed.

BoardProcgStarted

Board has entered into the processing segment of the machine, processing has started on identified board.

BoardProcgCompleted

Processing has completed on identified board.

BoardRejected

Indicates that a board which failed inspection or was kneaded has been rejected by the operator.

BoardUnclamped

Board in the processing segment of the machine has just been un-clamped.

ClearQueue

Informs OpenApps that any data pertaining to boards already processed by Benchmark should be considered invalid and no longer be used. Called in certain reset situations.

PostPanelData

Outputs the panel data.

PostPasteHeightData

Outputs the paste-height-monitor data.

Configuration Interface
(PICliConfigInterface)

ConveyorDirectionChanged

Indicates that the user has changed the conveyor direction.

PumpBladeTypeChanged

Indicates that the user has switched from blades to pump or pump to blades.

Connection Interface
(PICliConnectInterface)

Disconnect

Terminates a connection between Benchmark and OpenApps.

GetNotificationList

Returns the list of events that OpenApps wants to be notified about

GetVersionInfo

Returns the software version of OpenApps as a Unicode string

Ping

Called to test that the connection to OpenApps is working

Conveyor Interface
(PICliConveyorInterface)

BoardArrivedSeg

	Called when a board arrives on a conveyor segment.
	BoardDepartedSeg
	Called when a board leaves a conveyor segment.
	ConvSysStateChange
	Called when the conveyor system changes state.
	DownstreamReady
	Informs OpenApps of the downstream SMEMA device's readiness to receive a board.
	SettingConveyorWidth
	Called when the conveyor(s) resize to a new board width or when they home.
	UpstreamReady
	Informs OpenApps that a board is available upstream of the printer (according to the SMEMA interface)
Environment Interface (PICliEnviromentInterface)	
	PostECUData
	posts the environmental information to OpenApps. (temperature (deg C) & humidity)
Inspection Interface (PICliInspectionInterface)	
	PostBoardInspectionData
	posts the board inspection data to OpenApps.
	PostStencilInspData
	Posts the stencil inspection data to OpenApps.
Login Interface (PICliLoginInterface)	
	OperatorChangeWithGroups
	Called by Benchmark when the logged in operator has changed.
	ValidateOperator
	If OpenApps has registered for operator validation, Benchmark will call this method to validate the operator whenever one logs in.
MessageInterface (PICliMessageInterface)	
	PostMessage
	Sends a message from Benchmark to OpenApps.
ProgramInterface (PICliProgramInterface)	
	AssemblyPartNumberSet
	Indicates that the assembly part number has been set.
	ProcProgramEvent
	Indicates that the indicated process program action has occurred. Possible Actions are: selected, de-selected, modified

ProcProgramParamChanged
Indicates that the specified parameter value has been modified.

WorkOrderNumberSet
Indicates that the work order number has been set.

State Interface (PICliStateInterface)

ChangeoverStarted
Indicates that the machine has started change-over in preparation for running a process program.

ChangeoverEnded
Indicates that the machine has finished the change-over process, or it has been cancelled.

ChangePasteStarted
Indicates that the user has selected the Change Paste wizard.

ChangePasteComplete
Indicates that the user has completed the Change Paste wizard.

DiagnosticsModeStarted
Indicates that the user is controlling the machine in diagnostics mode.

DiagnosticsModeEnded
Indicates that the user is done controlling the machine in diagnostics mode.

DispenseStarted
Indicates that the system has started a dispense using the paste dispenser option.

DispenseComplete
Indicates that the dispense has completed.

KneadNotification
Indicates that a knead operation is being performed on the current board

MachineStateChange
Indicates that the state of the machine has changed.

ManualAddPasteStarted
Indicates that the user has selected the Add Paste wizard.

ManualAddPasteComplete
Indicates that the Add Paste wizard has completed

ManualStencilCleanStarted
Indicates that the user is manually cleaning the stencil.

ManualStencilCleanComplete
Indicates that the user has completed manually cleaning the stencil.

PrintStrokeStarted
Indicates that the print stroke has started

PrintStrokeEnded
Indicates that the print stroke has ended

ProcessModeChange
Indicates that the process mode of the machine has changed.

SnapoffStarted
Indicates the snapoff of the worknest from the stencil has started

StencilInserted
Indicates that the user has inserted the stencil (could be part of stencil change).

StencilRemoved
Indicates that the user has removed the stencil (could be part of stencil change).

WipeRequested
Indicates that a wipe has been requested by the SPI interface, the Open App interface(OAI) or the Operator

WipeStarted
Indicates that a wipe has started

WipeStartedWithData
Indicates that a wipe has started and what wipe values are being used

WipeComplete
Indicates that the wipe has completed.

Trace Interface
(PICliTraceInterface)

SetSystemBarcodes
Indicates the barcodes for various items in the printer. Includes Stencil, Paste, Front and Rear Blades, Pump and Workholder barcodes.

Values Interface
(PICliValuesInterface)

PublishValue
Sends updated published value to plugins.

OpenApps initiated commands to request information or to have Benchmark perform an operation

PISerAlarmInterface

GetAlarmSysState
Returns the current alarm system state of the machine.

PostAlarm
Called by OpenApps to create an alarm.

Align Interface
(PISerAlignInterface)

SetBoardXYTData
Sets the X, Y and Theta error for the specified board. Used to close the loop from the downstream inspection device.

Board Interface
(PISerBoardInterface)

GetBatchCount
Gets the current batch count for the current run.

GetBoardBarcode
Returns the barcode for the specified board.

GetNextBoardId
Retrieves the board id that will be assigned to the next board that enters the system.

GetPanelData
Returns the panel data for the specified board.

SetBatchCount
Sets the current batch count for the current run.

SetBatchLimit
Sets the batch limit for the current run.

SetBoardBarcode
Sets the barcode for the specified board.

SetIgnoreBoard
Tells the printer that the board should not be processed by Benchmark but instead by another downstream machine. This function should be used when two or more machines are operating in tandem.

SetPanelData
Sets the panel data for the specified board.

Configuration Interface
(PISerConfigInterface)

GetConveyorDirection
Returns the current conveyor direction.

GetNumConvSegs
Returns the number of conveyor segments in the processing lane of the machine

GetPumpBladeType
Returns the current pump/blade setting.

GetTime
Returns the current system time for the workstation on which Benchmark is running.

SetTime
Sets the current system time for the workstation on which Benchmark is running.

Connection Interface
(PISerConnectInterface)

Connect
Establishes the connection between an OpenApps (client) and Benchmark (server). Validates the legitimacy of OpenApps, and gives

	Benchmark the information it needs to establish its connection back to the Plugin. **Disconnect** Terminates a connection between an OpenApps and Benchmark. **GetMachineInfo** Returns the machine identifier as a Unicode string. The machine identifier is the machine serial number. Also returns the machine type. **GetVersionInfo** Returns the software version of Benchmark as a Unicode string, and the interface schema. **Ping** Called to test that the connection to Benchmark is working.
Conveyor Interface (PISerConveyorInterface)	**EnableDownstreamUnload** Enables/disables unloading from the machine. **EnableUpstreamLoad** Enables/disables loading into the machine. **GetConveyorWidth** Retrieves the current actual conveyor width. **GetConvSysState** returns the state of the selected segment of the conveyor. **GetDownstreamReady** Retrieves the current downstream device ready state. **GetUpstreamReady** Retrieves the current upstream device ready state. **IsBoardOnSeg** Indicates if a board is on conveyor segment and returns its board id.
Inspection Interface (PISerInspectionInterface)	**Force100percentInspection** Triggers the software to inspect all taught devices on the next board. This will have the same effect as pressing the inspect now on the production screen. If the system is not in production it no action shall be taken.
Login Interface (PISerLoginInterface)	**GetOperatorAndGroups** Returns the name of the logged in operator. If an operator is not currently logged in, returns an empty string. Also returns a list of the groups to which the operator is a member.
Message Interface (PISerMessageInterface)	**PostMessage**

Called by OpenApps to send a message to Benchmark.

Program Interface
(PISerProgramInterface)

GetAssemblyPartNumber
Retrieves the current assembly part number.

GetBoardSeparationValues
Retrieve current values related to separation distance & speed (each defined by a base + offset)

GetLoadedProcProgramName
Returns the name of the currently loaded process program

GetProcProgram
Serializes the requested process program to a temporary XML file on the local machine, and returns the name of this temporary file.

GetProcProgramDir
Returns the name of the process program directory

GetSqueegeeValues
Retrieve current values related to squeegee force & speed

GetWorkOrderNumber
Retrieve the current work order number.

LoadProcProgram
Loads the specified process program.

SetBoardSeparationOffsets
Set the active board separation offset values

SetSqueegeeOffsets
Set the active squeegee offset values

State Interface
(PISerStateInterface)

GetProcessMode
Returns the current process mode of the machine.

GetState
Returns the current state of the machine.

PauseProduction
Pauses production. This will have the same effect as pressing the pause button on the production screen.

ReadInput
Reads the state of an electrical input.

StopProduction
Stops production. This will have the same effect as pressing the stop button on the production screen.

TriggerAutoAddPaste
Triggers an automatic add paste. This will have the same effect as pressing the automatic add paste button on the production screen.

TriggerManualAddPaste
Triggers a manual add paste. This will have the same effect as pressing the manual add paste button on the production screen

TriggerManualCleanStencil
Triggers a manual clean. This will have the same effect as pressing the manual clean button on the production screen.

TriggerManualInspection
Triggers a manual inspection. This will have the same effect as pressing the manual inspect button on the production screen.

TriggerWipe
Triggers a wipe. This will have the same effect as pressing the wipe now button on the production screen.

Trace Interface
(PISerTraceInterface)

GetSystemBarcodes
Allows OpenApps to set barcodes for various items within the machine.

SetSystemBarcodes
Allows OpenApps to set barcodes for various items within the machine.

Values Interface
(PISerValuesInterface)

EnumerateDataObjectValues
Called by OpenApps to retrieve a list of all the available data object values.

GetDataObjectValue
Called by OpenApps to retrieve the most recent data object value.

EnumerateValues
Called by OpenApps retrieve a list of all the available published values.

GetValue
Called by OpenApps to retrieve the most recent value of a particular published value.