Application Content – Machine Builder Libraries

Reduce Time to Design, Develop and Deliver

Overview

Machine Builder Libraries help design machines faster, delivering specific functionality and best-in-class performance in a modular approach.

Machine Builder Libraries are available in Studio 5000® Application Code Manager as a Rockwell Automation Library.

Studio 5000 Application Code Manager allows the creation and management of your own library objects for reuse on other projects.

The use of Machine Builder Libraries as components of your own libraries facilitates the management of the lifecycle of your application code.

Studio 5000 **Application Code Manager:**

- Easily create and configure objects using re-usable libraries of code
- Helps improve design consistency, reduce engineering costs and achieve faster commissioning

Machine Builder Libraries are:

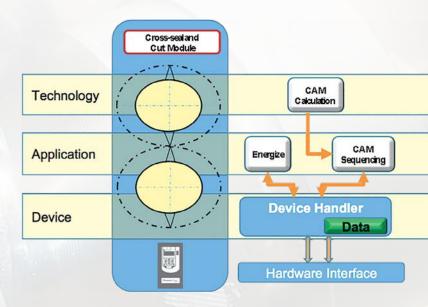
- Life-cycle managed
- Tested and documented
- Best-in-class for performance
- Application-centric
- · Flexible, granular and modular
- Easy to integrate

Machine Builder Libraries Granularity

Machine Builder Libraries are designed in a modular way to maximize granularity and flexibility. Machine Builder Libraries utilize standardized interfaces to assure interoperability with each other. They are also made to be embedded into your existing Logix Application and work with your existing code where possible.

Benefit from Machine Builder Libraries Architecture Example

User selects applicable blocks from the library to assist the creation of a specific application module. For example, user needs to build a "Cross-seal and cut" application module.



The composition of a function using smaller and relevant blocks allows the creation of greater variability of functions.





Machine Builder Libraries Architecture

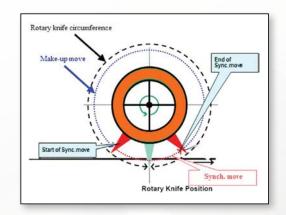
Reduce Time to Design, Develop and Deliver

Select library objects from Machine Builder Libraries that helps build the desired application module. As an example, use Machine Builder Libraries to accelerate the development of a "Cross-seal and cut section" application module.

Technology

Rotary Knife Cam Calculation

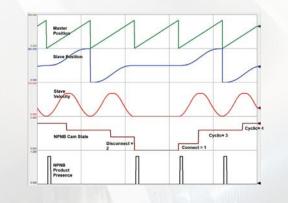
- Calculate cam profile
- Connect (accel)
- Disconnect (decel)
- Cyclic (continuous)
- Configure profile
- Maximum smoothness
- Minimum peak velocity
- Sync compensation
 - Linear
 - Arcsine





No Product No Bag

- Cam management
 - Connect when product available
 - Disconnect when product not available
 - Adjust phase
 - Switch from cyclic 1 to cyclic 2



No Product N raM_Opr_NoProductNoBa		
No Product No Bag raM Opr NoProductNoBa Wrk. NPNB Ref_AxisPth_M	Sts_MtdID Sts_CamState	1009- 3- (Sts_EN)- (Sts_ER)- (Sts_ER)- (Sts_Connect)- (Sts_Disconnect)- (Sts_Cyclic2)-

Device

Device Handler

- Kinetix[®] and Powerflex axes handler – Enhanced diagnostics (multiple languages)
 - Manual axis operation
 - Path recovery
 - Axis virtualization = test your code as a virtual machine
 - Standard interface for application code
 - Several methods available

8	Running		Progra	m	Vint
	Physical 11.2 Position 13.0 Velocity	12:30:24 12:30:21 12:30:21 12:30:21 12:30:21 12:30:21 12:30:21 12:30:21 12:30:20	.713327 .712705 .712437 .712453 .712453 .712533 .712381	DC Bus Start Inhib Ready for Faulted Energized Reference StandStill NoMotion Recoverab On Path	Command Motion (R d
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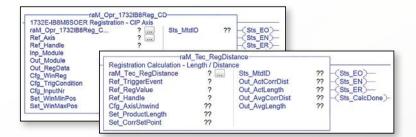
	Rotary Knife Cam Calculation			
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Rotary Knife Cam Calculati				
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	/rk CamConnect		8	-(Sts_ER)-
Out CamCyclic	Wrk_CamCyclic			-(Sts_DN)-
Out CamDisconnect Wrk		1		
Out CamDwell	Wrk_CamDwell			
Cfg ArcSinComp	0.			
Cfg CompMode	1.			
Cfg KnifeReversal	0-			
Set_CutAngle	30.0+			
Set_KnivesNumb	2.			
Set_KnifeRadius	50.0-			
Set_ProductLength	300.0+			
Set_KnifeStartDist	90.0+			
Set_FilmStartDist	150.0-		L	
Set_KnifeStopDist	90.0*			
Set FilmStopDist	150.0-			

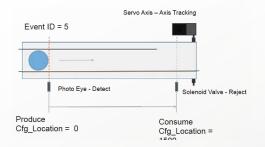


Machine Builder Libraries Portfolio Examples

Registration Instruction

- Arm/re-arm in one instruction
- Hardware registration drive and 1732 SOE modules
- Software registration capture position of another axis
- Look for the sensor in a specific position window
- Support for CIP, virtual and consumed axes
- Calculate correction distance, length and averages





Position Tracking

- Produce an event into a position tracking queue
- Consume an event from a position tracking queue
- Tracking gueue consists of ID, position, product presence and user-defined data

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Machine Performance Tracking

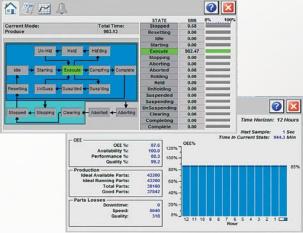
- RAPID equipment interface Add-On Instructions (AOI) data structure
- View current machine mode and state
- Track cumulative mode/state times
- Track Overall Equipment Effectiveness (OEE) and production data over 1-, 5- and 12-hour time

Benefits of Machine Builder Libraries:

- Faster design cycles
- Use the Device Handler in Virtual Mode and virtualize your complete machine application code
- No need to wait for hardware availability to test the code
- Reduced engineering cost
- Use Device Handler queue of events to troubleshoot your application code
- Reduced execution risk
- Create and manage your reusable modular code based on application specific, tested and documented libraries
- Increased machine value
- Build a machine event list aggregating events from different devices

For More Information

Contact the Machine Builder Libraries team at oemlibraries@ra.rockwell.com. Now available for download on the Compatibility & Downloads web page at rockwellautomation.com. Click here to download.



OEE	
OE	E %.
Availabilit	1 16
Performance	1
Qualit	1 %:
Production	
Ideal Available Pa	rts
Ideal Running Pa	rts
Total Pa	rts
Good Pa	rts
Parts Losses	
Downti	ne:
Spe	ed:

Managed machine life cycle

- Easier hardware upgrade due to device handler standard interface
- Separation of application code and hardware management
- Benefit from futures updates of Machine **Builder Libraries**
- Easier machine functionalities upgrade by updating Machine Builder Libraries



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