

Spring Automation Software



What we offer:

- ▶ Warehouse Control System
 - ▶ Statistics tracking
 - ▶ Waving
 - ▶ Picking
 - ▶ Destination Decisions
 - ▶ Data Collections and Analytics
 - ▶ Etc.
- ▶ HMI to WCS Integration
 - ▶ Graphical Representations
 - ▶ Data Charts and Stats
 - ▶ Clean User Interfaces

Divert	Full	Jam	Fault	Divert	Full	Jam	Fault	Divert	Full	Jam	Fault
1 SW1	0	0	0	16 L.114	0	0	0	31 L.129	0	0	0
2 VLF1	0	0	0	17 L.115	0	0	0	32 L.130	0	0	0
3 SM1	0	0	0	18 L.116	0	0	0	33 L.131	0	0	0
4 L.101	0	0	0	19 L.117	0	0	0	34 L.132	0	0	0
5 L.102	0	0	0	20 L.118	0	0	0	35 L.133	0	0	0
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

Time Stamp	Source	Type	Message
2019-06-06 12:49:01.913	Spring_Demo	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 12:49:01.807	Spring_Demo	SA_IPCConnect	Connected to IPC server at 192.168.32.20
2019-06-06 12:31:24.605	SA_IO_Data	SA_IPCConnect	Connected to IPC server at 192.168.32.20
2019-06-06 12:31:23.579	SA_IO_Data	SA_IPCWrite	Write error - (Ermo 104) Connection reset by peer
2019-06-06 11:50:12.631	SA_IO_Data	SA_IPCConnect	Connected to IPC server at 192.168.32.20
2019-06-06 11:50:11.118	SA_IO_Data	SA_IPCWrite	Write error - (Ermo 104) Connection reset by peer
2019-06-06 11:36:46.437	Spring_Demo	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:36:46.341	Spring_Demo	SA_IPCConnect	Connected to IPC server at 192.168.32.20
2019-06-06 11:34:01.231	Spring_Demo	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:34:01.123	Spring_Demo	SA_IPCConnect	Connected to IPC server at 192.168.32.20
2019-06-06 11:19:13.602	Spring_Demo	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:19:13.517	Spring_Demo	SA_IPCConnect	Connected to IPC server at 192.168.32.20
2019-06-06 11:17:59.832	Spring_Demo	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:17:59.532	Spring_Demo	SA_IPCConnect	Connected to IPC server at 192.168.32.20
2019-06-06 11:15:40.456	Spring_Demo	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:15:40.368	Spring_Demo	SA_IPCConnect	Connected to IPC server at 192.168.32.20
2019-06-06 11:12:44.845	Spring_Demo	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:12:44.752	Spring_Demo	SA_IPCConnect	Connected to IPC server at 192.168.32.20
2019-06-06 11:10:30.376	SA Alarms	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:10:27.660	SA_Demo_BC_Writer	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:10:27.610	SA_Scanners	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:10:27.609	SA_IO_Data	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:10:27.409	Spring_Demo	SA_PLCConnect	Connected to PLC at 192.168.32.28
2019-06-06 11:10:18.337	SA_Demo_BC_Writer	SA_PLCReadTag	ReadTag failed reading BarcodeFeedHandshake
2019-06-06 11:10:08.934	SA_Demo_BC_Writer	SA_PLCReadTag	ReadTag failed reading BarcodeFeedHandshake
2019-06-06 11:09:59.331	SA_Demo_BC_Writer	SA_PLCReadTag	ReadTag failed reading BarcodeFeedHandshake
2019-06-06 11:09:50.128	SA_Demo_BC_Writer	SA_PLCReadTag	ReadTag failed reading BarcodeFeedHandshake
2019-06-06 11:09:40.725	SA_Demo_BC_Writer	SA_PLCReadTag	ReadTag failed reading BarcodeFeedHandshake
2019-06-06 11:09:31.322	SA_Demo_BC_Writer	SA_PLCReadTag	ReadTag failed reading BarcodeFeedHandshake
2019-06-06 11:09:21.918	SA_Demo_BC_Writer	SA_PLCReadTag	ReadTag failed reading BarcodeFeedHandshake
2019-06-06 11:09:12.515	SA_Demo_BC_Writer	SA_PLCReadTag	ReadTag failed reading BarcodeFeedHandshake
2019-06-06 11:09:03.113	SA_Demo_BC_Writer	SA_PLCReadTag	ReadTag failed reading BarcodeFeedHandshake

WCS Explained

- ▶ Software that sits in the middle that bridges lower-level controls (PLCs) and upper-level software (WMS)
- ▶ Often referred to as "Middleware"
- ▶ Handles solution logic that is data intensive
- ▶ Executes "heavier" logic that cannot be handled by a PLC's capabilities
- ▶ Facilitates logic that cannot be reasonably or cost-effectively done in the WMS
- ▶ Much cheaper option than customization in SAP or Manhattan style offerings

Available Services



Sorting



Routing



Picking



Accumulation and Release



Labeling

P&A
Inkjet



Inventory

Relieving
Replenishment

Communication Protocols

- ▶ WMS communication
 - ▶ Oracle
 - ▶ FTP
 - ▶ CIFS
 - ▶ Web service requests

Behind the Scenes

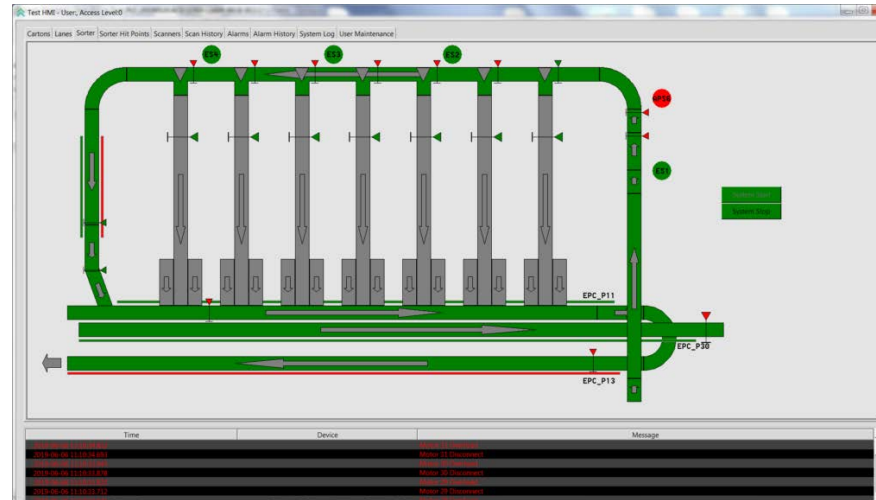
▶ The **FRAMEWORK!**

- ▶ Common foundation upon which all services and our HMI is built
- ▶ The framework provides PLC, OPC UA, database and WMS connectivity
- ▶ The framework provides TCP and UDP client and server capability along with data events for connectivity to devices such as label printers, scanners, etc
- ▶ The framework provides timed events
- ▶ Services are built on the framework depending on project requirements.
- ▶ Services are purpose specific, modular, and limited in functionality. This creates a system that is easier to develop, cheaper to deploy, and quicker to troubleshoot

Integrated Into Framework Event System	Event Handling	Spring IPC	
		Periodic	
		TCP/IP Client	ZPL Client
		TCP/IP Server	
		UDP Server	
		Serial Ports	Serial Scanners
	PLCs	Rockwell EIP	
	Supported Databases	MySQL	
		Oracle	
		SQLite	
Supported	UDP Client		
	FTP Client		
	SFTP Client		
	SFTP Server		
	Modbus		
	OPC-UA		

How is it Built?

- ▶ HMI Based Interface
 - ▶ Ignition
 - ▶ Python/tkinter
- ▶ Service Based Processing



Sort	Alarming
WMS communication (send/rec)	Database
Routing	Scheduler
Inventory	Labeling
Divert confirmation	IPC

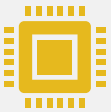
Spring Software - A Custom Approach



In our experience no two customers have the same requirements, no two systems are going to sort by the same rules, and no two systems have the same WMS requirements



Offerings for “canned” sortation logic, picking logic or other WCS functionality can be clunky, expensive and still in need of customization for a user



Spring Software is adapted to your needs for a cost-competitive but feature packed experience