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emhart glass

Technical News Bulletin

Steinhausen, February 2018

FlexIS 3 – New FlexIS Control System

- Uses the most state-of-the-art motion control technology
- New safe mode of operation called “Manual Mode”
- Uses the information of numerus sensor systems to calculate timing changes

Introduction

In 2003, the FlexIS control and timing system replaced the very successful T600 timing system. In the past 15 years over 1000 FlexIS systems have been installed. FlexIS has become the leading control system for glass forming machines. The full integration of servo technology is making the FlexIS control system the best available control for the full IS machine equipment from the feeder to the stacker.

Time has come to introduce the new **FlexIS 3** control system. FlexIS 3 is building on the enormous knowhow of FlexIS 1. FlexIS 3 however is not just a copy of FlexIS 1. FlexIS 3 uses the most state-of-the-art motion control technology and is the foundation for all future developments of Bucher Emhart Glass (BEG).
FlexIS 3 starts where FlexIS 1 ends. FlexIS 3 makes full use of the JX3-family from Jetter AG. The core of the new control system is the JetControl-365MC (JC-365MC). It's the most powerful controller of the JC-300 family. It offers the unrestricted use of the Motion Control technology for our Servo Axis.

FlexIS is not only the best timing system for the IS machine, FlexIS goes far beyond just being a "Timing System". Since over 10 years, Bucher Emhart Glass is doing research to improve the glass production process. This research has resulted in several Closed Loop products. FlexIS uses the information of numerus sensor systems to calculate timing changes, which in return stabilize the glass forming process.

It's needless to say that FlexIS 3 incorporates all of these developments done in the past years and is prepared for many more.

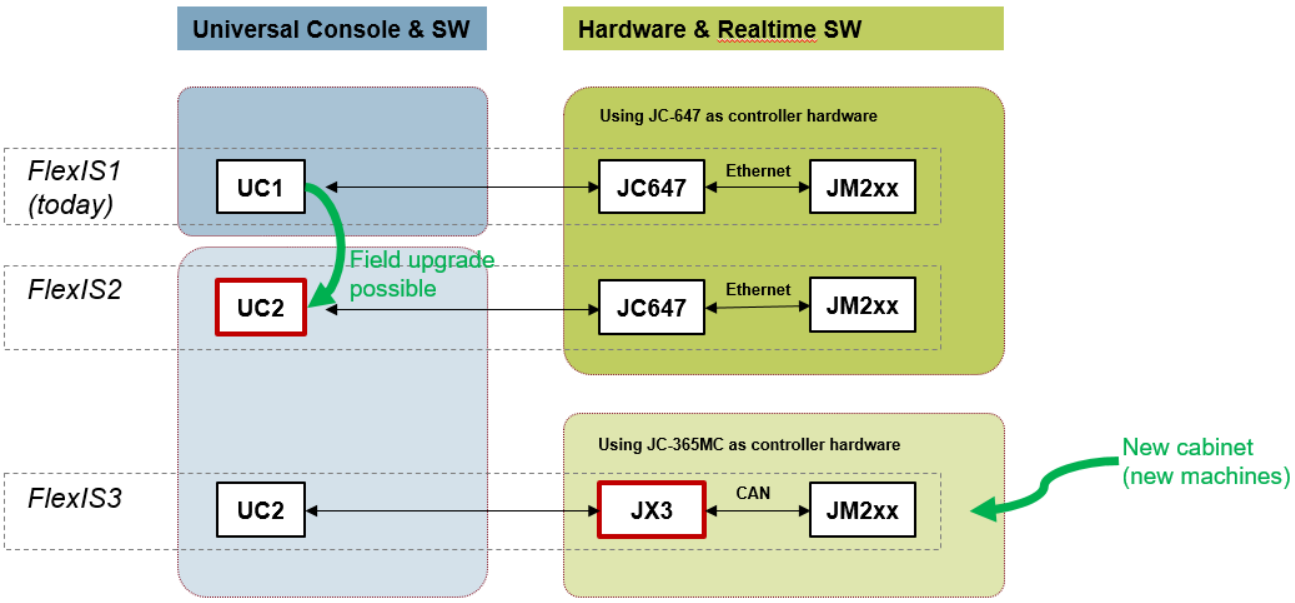
Another major topic in the glass industry is the increased demand for safe operation. Safety is one of the top priorities in the development program of Bucher Emhart Glass. For FlexIS 3 we have managed to develop a new safe mode of operation called "Manual Mode". This new Manual Mode gives the operator a SIMPLE and SAFE way to do a job change or to change mold equipment.

FlexIS Versions

The FlexIS control system consist of three major components:
User Console (UC)
Controller
Servo Drives

FlexIS 3 replaces the UC as well as the realtime controller.

The UC is the interface of the control system for the machine operator. To be able to offer some of the latest development to existing FlexIS 1 customers, BEG makes the new User Consol UC2 available as an upgrade package for FlexIS 1. The FlexIS 1 with UC2 is named FlexIS 2.



Obsolescence of FlexIS 1

This Technical New Bulletin, announces the End Of Life of the FlexIS 1 control system. The FlexIS 1 will be fully replaced by the even more powerful and flexible FlexIS 3. BEG will continue to supply spare parts for FlexIS 1 until at least end of 2028.
The obsolete part is the JC-647, which is the main controller for FlexIS 1.
Among others, following parts will become obsolete by end of February 2018:

601-20011	Section Controller without FPS
601-20012	Section Controller with FPS
601-20013	Machine Controller
601-20067	Ware Handling Controller

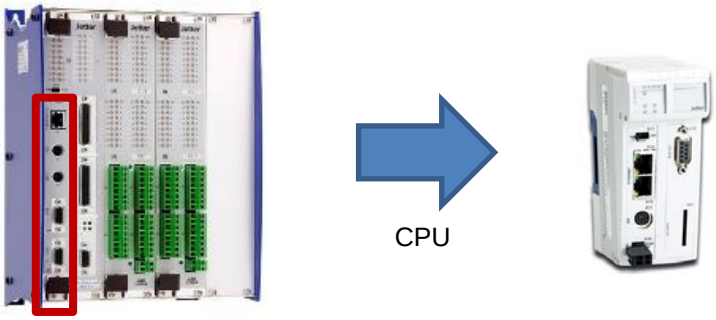
Note: The JetMove JM-215B and JM-204 are not obsolete. These are also being used in the FlexIS 3 control system.

Details of FlexIS 3

Hardware change

The most significant change is the introduction of the JetControl JC-365MC. It replaces the obsolete JC-647. With FlexIS 3 the same type of controller is used for the Machine Controller, for every Section Controller and for the Ware Handling Controller.

The JC-365MC is programmed with the new programming language STX and contains the Motion Control capabilities.

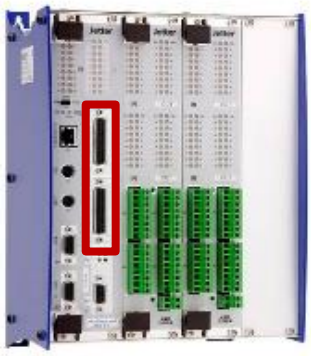


The JC-647 was a compact all-in-one controller with input/output-cards incorporated in the same housing. The JX3-family allows a much more flexible configuration of input- and output modules and allows simple and powerful expansions in the future.

The digital inputs and outputs, which were part of the JC-647 controller housing are replaced by individual JX3-DI16 input and JX3-DO16 output modules. Every module has 16 digital inputs or 16 digital outputs.

Digital
I / O

The JX3-AO4 analog output modules replace the analog output modules, which were an option on the JC-647 and offered up to 8 analog outputs for FPS. With FlexIS 3 every JX-AO4 offers 4 channels. It's however possible to use multiple modules on one controller.

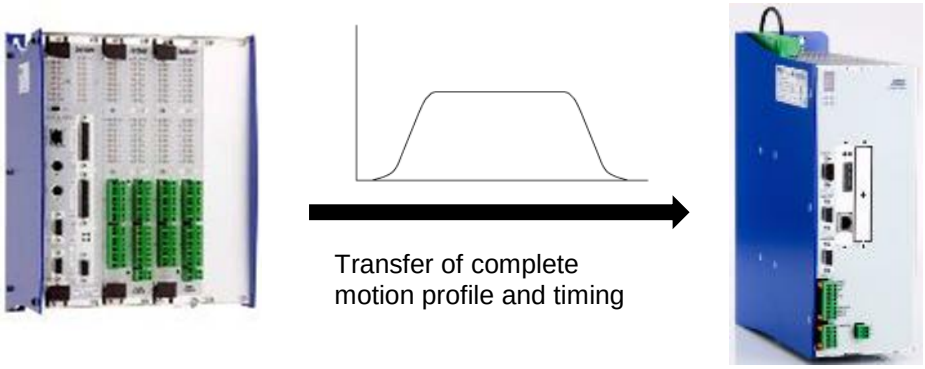


Analog
outputs

Software

The FlexIS 3 software is a complete new real time software. It uses the Motion Control technology to move the servo axis. This new technology allows the FlexIS 3 to run smoother and more flexible motion profiles. This makes the full servo machine even more powerful.

With **FlexIS 1** the complete motion cam was sent to the drive and based on this cam the drive ran this cam more or less autonomously.

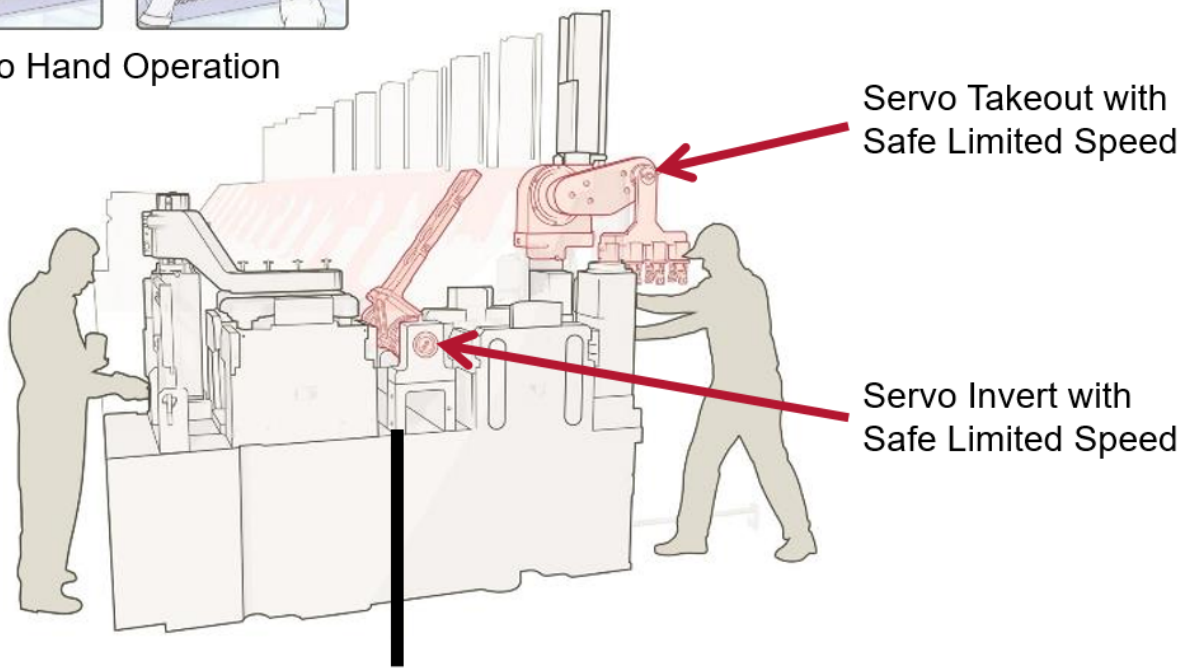


With **FlexIS 3** the controller uses the Motion Control technology and transfers the set point every 2-4 ms.

Manual Mode – SIMPLE and SAFE

With FlexIS 3 BEG introduces a new option. This option offers an operation mode, which makes the manual interaction with the machine simpler while maintaining the same safety category as Maintenance Stop (MS).

Two Hand Operation



Safe Separation of Blank and Blow Side Operation

The new and safe Manual Mode introduces a safe Two Hand Operation for all Servo Mechanisms but also for the pneumatically moving mechanisms. A key element of the Manual Mode is the safe separation of the Blank and Blow side operation, which makes it possible to work safely inside the section on one side of the machine while the other side remains energized.
This new safety concept is only possible by using the latest servo technology. The Servo Electric Invert (SEI) and the Servo Electric Takeout (SETO) are speed supervised (SLS = Safe Limited Speed) during Manual Mode.

UC2

Together with the FlexIS 3 Bucher Emhart Glass is also introducing a new User Interface.
The UC2 (User Console 2) is the foundation for any future development. Especially for the Bucher Emhart Glass End To End development.

For details on the new UC2 see TNB 266

Summary

FlexIS 1 will be obsolete by end of February 2018. Bucher Emhart Glass is however committed to continue to supply spare parts until end of 2028.

Bucher Emhart Glass is proud to announce the release of FlexIS 3 together with UC2. This new control system builds on decades of glass production know how and is the foundation for all future Bucher Emhart Glass controls developments.

FlexIS 3 is already running under glass on multiple machines since 2016. We are very confident that FlexIS 3 will replace the obsolete FlexIS 1 control system rapidly and smoothly.