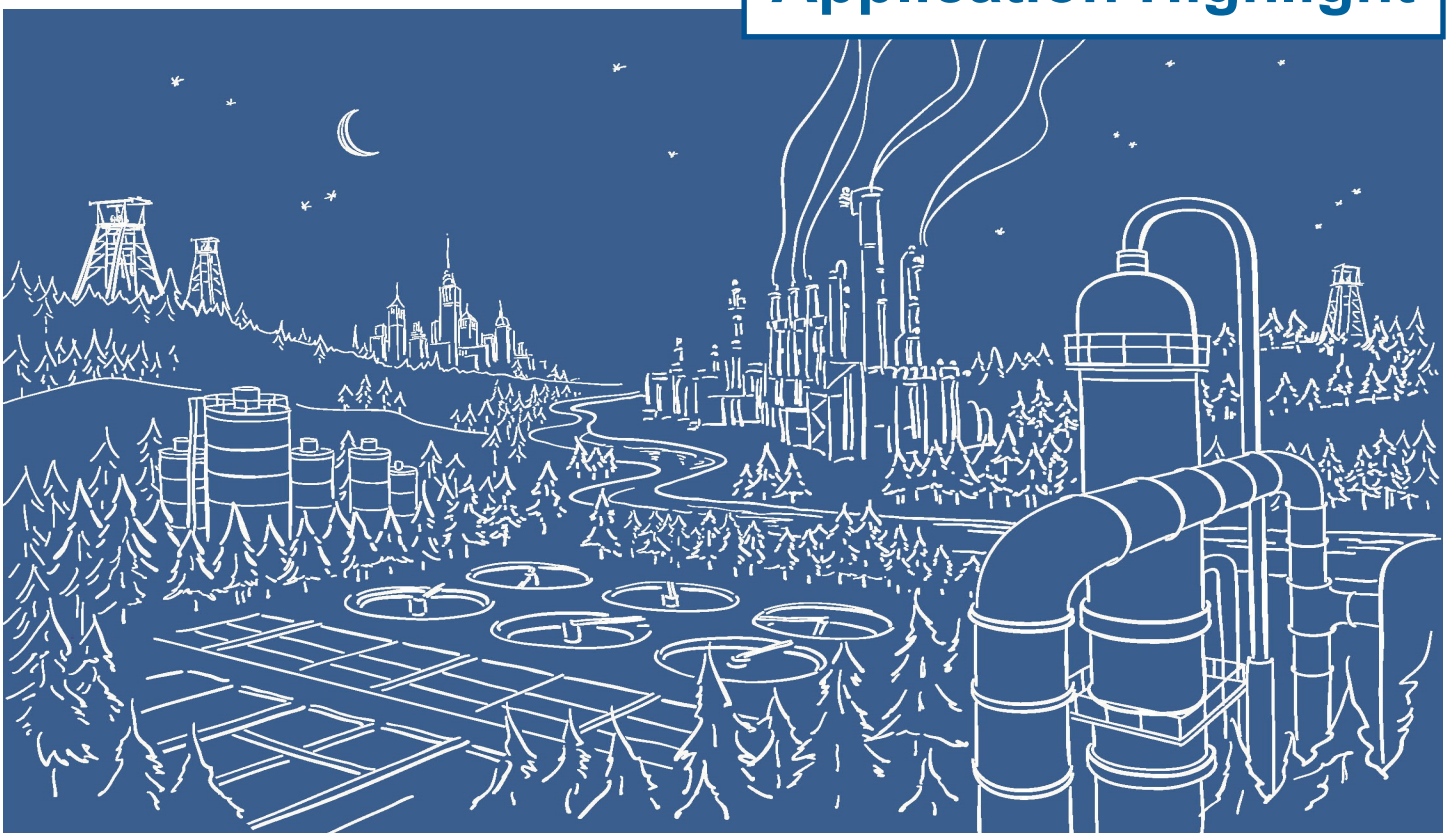
Application Highlight



2500 Series®
Janus Programmable Automation Controller

Manufacturer uses Janus Processor to modernize legacy TI 530T controller operating a DESMA rubber injection molding machine

Summary

In a recently completed application, a CTI customer used the control and communications capabilities of the new Janus Processor to modernize a legacy controller on a DESMA rubber injection molding machine. The old TISoft program was converted to Janus Workbench, with significant simplification done because of the power of the Janus instruction set.

Because Janus Processors support the CAMP communications protocol, no changes were required for the Maple Systems HMI.

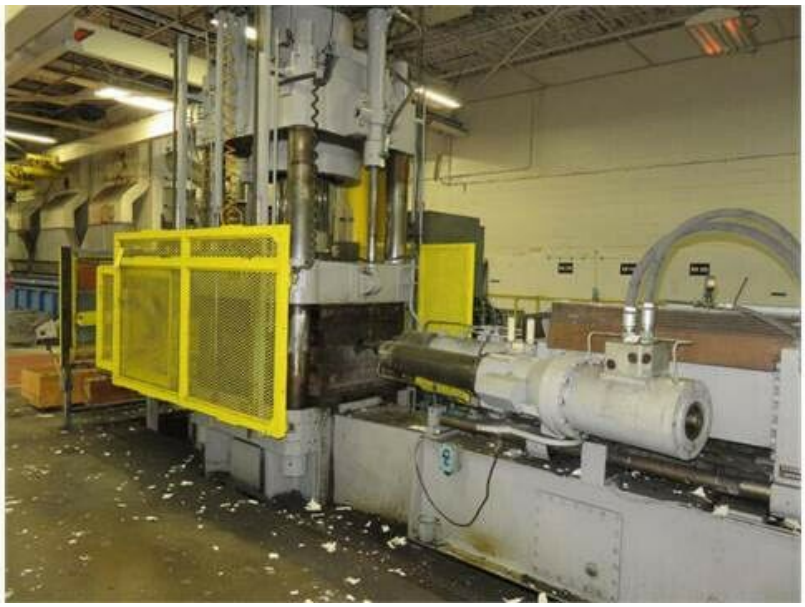
The DESMA rubber molding press at Griffith Rubber (Garrett IN) was installed decades ago using a TI530T controller with a BASIC module driving a Nematron HMI device and a single rack of Series 500 I/O. Several years ago, the 530T controller was converted to a CTI 2500-C100 using a 2500-RADP adapter to plug into the old Series 500 base. The HMI was replaced with a new unit from Maple Systems which communicated over Ethernet using the CTI CAMP protocol. The 530T program pre-dated Special Functions so all math operations were done using RLL integer math. In addition, hardware and software changes over time resulted in a program that was not completely documented.

CTI Distributor Encore Systems performed the conversion of the old TISoft program to Janus Workbench, which was done line-by-line. Some old 530 instructions did not convert directly (e.g. Move From Table) so the functionality had to be reproduced. The IEC61131 instruction set of Janus is very rich so this was not a difficult task. Additionally, many pages of

Integer math needed in the 530T to accomplish analog scaling were replaced efficiently with the built-in Scaling instruction in Workbench.

Janus variable tags were generated manually, using a rules-based approach by including the old TISoft variable followed by a new descriptive name, e.g. C1_Machine_Function_Equals_Zero. Next time a program is converted the Tags will be generated using Excel to speed up / automate the process.

Another learning step was with regard to the HMI. In the 530T, operators enter some variables in Signed Integer to indicate Timer values. With Janus these needed to be converted to Time variables. A simple Structured Text (ST) program was written to accomplish this task. Another ST program was written to move (and return) these HMI variables to the internal SD card so they would not be lost during a program download. No changes were required to the configuration of the Maple Systems HMI.



Two things were very clear by the time this conversion was successfully completed:

(1) Conversion is much easier with a clearly documented program, and

(2) A fundamental understanding of the process being automated is required.

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