



# TTC-eDAQ 8102

## Global Hot Runner Control Solutions

Gammaflux TTC Controller  
featuring PRIAMUS Fill &  
Cool System



**Gammaflux<sup>®</sup>**



# Gammaflux and PRIAMUS

## Introducing a New System for Superior Balanced Filling in All Hot Runner Molds

Good process control starts with an excellent hot runner temperature controller like the Gammaflux TTC. Gammaflux has partnered with PRIAMUS in taking the next giant step with the TTC-eDAQ 8102. The TTC-eDAQ 8102 integrates the PRIAMUS Fill & Cool system with the Gammaflux TTC. The result is a packaged solution to handle viscosity changes and minimize part variations.

### Enhanced Part Quality

Part quality is affected by viscosity changes. When cavities do not fill at the same time, variance in dimensions and weights can be expected. When all parts are filled at the same time, dramatic improvements are seen in dimensions and repeatability. The TTC-eDAQ 8102 adjusts for changes in viscosity by balancing the fill times of the cavities.

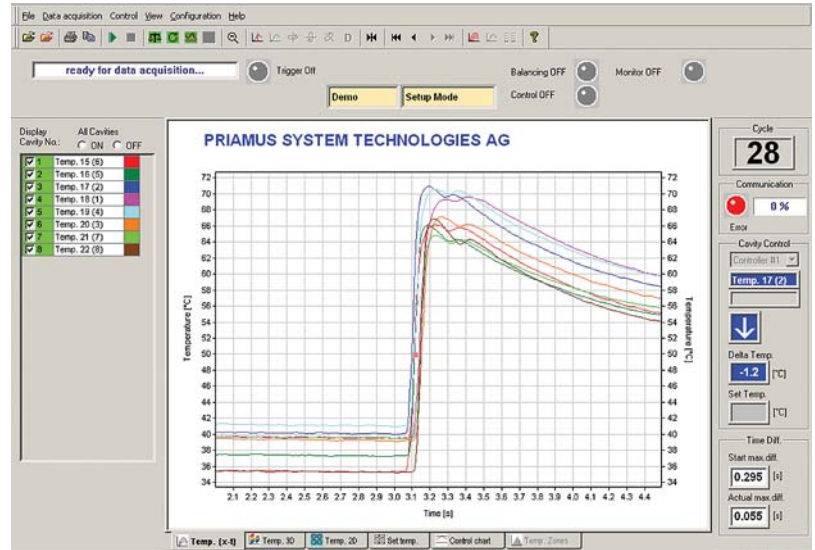
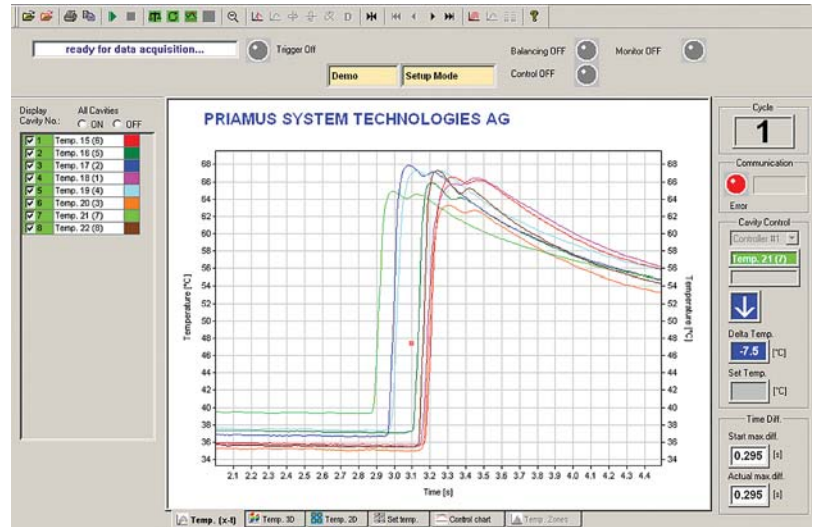
Molded part simulation packages can show what may happen under an ideal or static set of conditions. Any change in day-to-day conditions can have a significant impact on part quality. Even tools that are well designed for balanced melt flow can show significant variation in the fill times from cavity to cavity. The TTC-eDAQ 8102 can improve the performance of both new tools and existing tools.

### Cavity Temperature Sensors

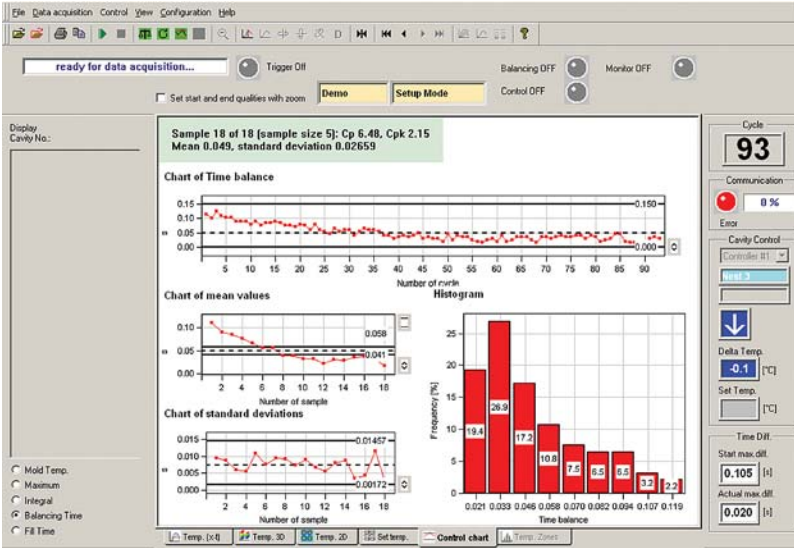
The PRIAMUS cavity thermocouples detect when the melt flows reach the sensors. By displaying the temperature curve of each cavity, the fill times can be observed. Variations in the timing of the cavity temperature curves indicate that the cavities are not filling at the same time.

The Gammaflux TTC-eDAQ 8102 automatically adjusts the timing of the filling of each cavity by changing the cavity temperature set points in the Gammaflux TTC. This causes the cavities to fill as close to the same time as possible. PRIAMUS' speed of sensors and electronics coupled with the accuracy of Gammaflux temperature controllers combine to provide dramatic improvement in part quality and consistency.

### Automatic Fill Time Optimization



*In the example shown above, an eight cavity tool starts out with a fill time variance of .295 seconds. After 28 cycles, the fill time variance is reduced to .055 seconds.*



Control charts and histograms are included for displaying mold temperatures and fill time data. Mean values and standard deviation charts are provided. Once the process is thermally balanced, the capability of the process can be automatically calculated. Alarm functions are also provided for display and external alarm requirements.

## Automatic Switchover From Pack To Hold

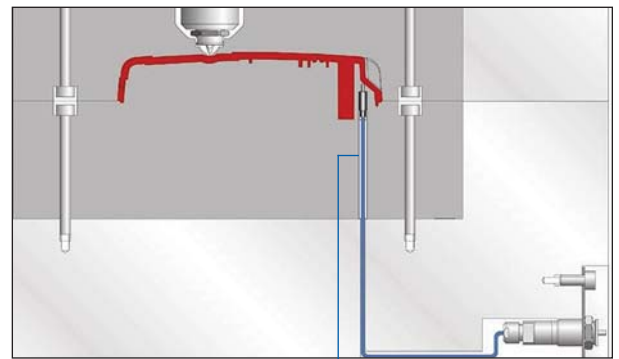
The controller can provide the switchover signal during the cycle to the machine controller to switch from pack to hold. The switchover point is determined by the cavity temperature data. Delay timers are provided to fine tune the process. The switchover signal also has applications in core pulling sequences, gas assist applications and sequential valve gate control.

## Cavity Pressure Measurement

Cavity pressure sensors typically need to be mounted near the gate of a cavity. They do not accurately indicate the location of the melt flow. Cavity pressure sensors are useful in monitoring peak pressures and in process monitoring. The TTC-eDAQ 8102 connects directly to cavity pressure sensors in addition to cavity temperature sensors.

Using the PRIAMUS PRIASED™ feature, PRIAMUS cavity pressures can be used with the TTC-eDAQ 8102 without having to set sensitivity settings. The sensitivity of the sensor is embedded in the sensor and read automatically by the controller.

With the PRIAMUS PRIASAFE™ feature, PRIAMUS pressure sensor mountings avoid side loading which can lead to false pressure readings. Typically, the use of one cavity pressure sensor per tool is recommended.



Standard installation:  
Distance sleeve

Exception (e.g. when installed in a slide):  
Mounting nut

The PRLAMUS cavity thermocouples are normally mounted near the end of each cavity. When the melt flow reaches the thermocouple in a cavity the temperature rapidly increases indicating that the cavity is volumetrically filled. The TTC-eDAQ 8102 records the data from all the thermocouples and adjusts for any differences in the fill times of the cavities.



## Additional Hot Runner Applications

The TTC-eDAQ 8102 can be specified as a sequential valve gate controller. Multiple thermocouple sensors in a cavity can detect the exact position of the melt as it moves through the cavity. As each cavity thermocouple detects the melt flow, the next gate can be opened. In this fashion, the weld line of the part can be moved.

Additional applications for the TTC-eDAQ 8102 include cluster (hot-to-cold) molds and family molds. With family molds, a reference fill time is determined for each cavity. The controller will maintain this reference fill time by changing the temperature set points for each cavity.

Type N (nickel) thermocouples are used to avoid corrosion or oxidation. These sensors are calibrated for an exceptionally fast response time. Sensors are available as small as .6mm in diameter and can be machined to fit the contour of each cavity.

## Mold Temperature Adjustment

The TTC-eDAQ 8102 also includes the PRIAMUS Cool package. This enables the mold cavity temperatures (the temperatures when the cavities are empty, between shots) to be balanced manually or automatically to minimize shrinkage variations during the cooling phase. This is done by adjusting the set points of the cooling water controllers.

## Summary

The TTC-eDAQ 8102 controller provides the excellent hot runner temperature control of the Gammaflux TTC using the thermocouples and heaters normally mounted in the tool. The integrated PRIAMUS Fill & Cool package adjusts the cavity set points in the TTC to balance the fill times of the tool and the mold temperatures using cavity temperature sensors. The results include:

- Improved and repeatable part dimensions
- Consistent part weights
- Adjustment to viscosity changes
- Detection of melt flow location

*PRIAMUS cavity temperature and pressure sensors are used to monitor melt flow and cavity pressures. Depending upon the application, temperature sensors are installed in every cavity (multi cavity and family molds) or in different locations in the same cavity (sequential applications).*



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