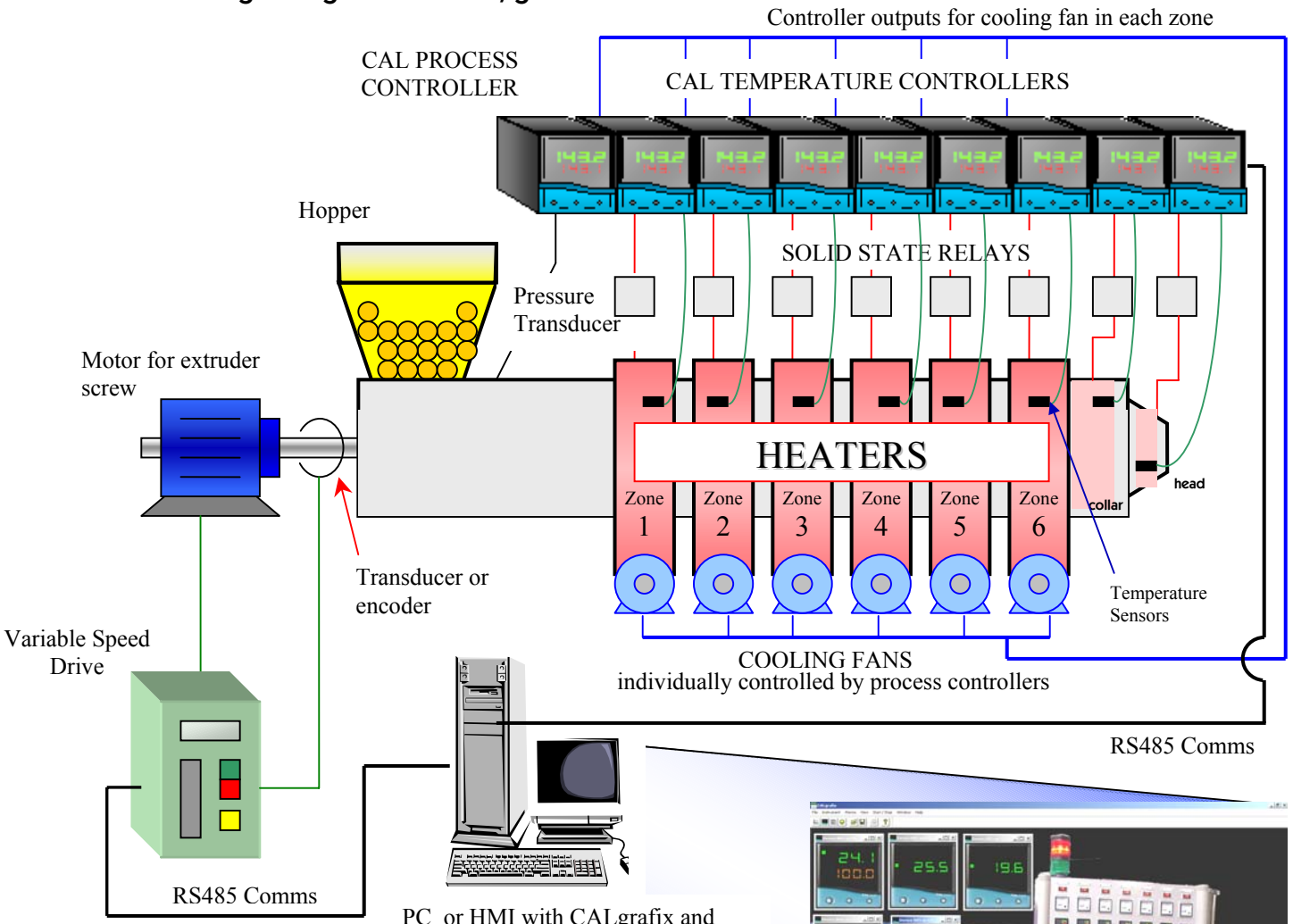
Using CALgrafix on Plastic Extruders

CAL Controls

Application

Plastics Extruders have a number of temperature zones (six plus collar and head in the example shown) that are critical to ensure the end product is produced at the right quality as quickly as possible. Each of the temperature controllers shown below control the temperature at each zone as the extrusion is being formed. The controllers apply heat or cooling as required so that set-point temperature can be reached then maintained. The extruder screw speed is controlled by a variable speed drive; an encoder or transducer provides feedback so that constant speed is achieved. A pressure transducer can also provide indication to when a blockage exists due to hardened polymer, hence avoiding damage to the screw, gearbox and motor.

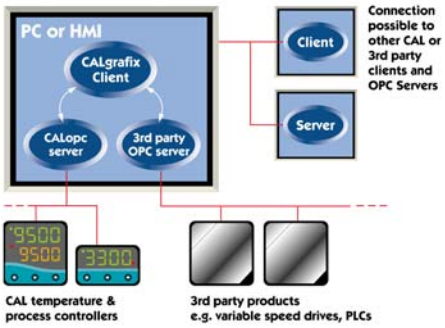


Each of the processes detailed above are all working in isolation to each other. By using CALgrafix all the main components can be networked hence creating a system that can be monitored centrally.

Benefits of using CALgrafix

- **REDUCED SET UP TIME**
- **PROCESS DATA FOR QUALITY MONITORING**
- **ALARM NOTIFICATION**
- **INTEGRATION TO OTHER PLANT**

Settings for polymer temperature in each zone and pressure within the extruder can all be controlled from a PC, this provides time saving on commissioning, changing to different materials or extruding other products.



CALgrafix is an OPC (OLE for process control) based software product, which is an open standard for networking process control products. This means ,third party hardware (in this case, a variable speed drive) that has an OPC server can be networked with CAL controllers to create an integrated system.

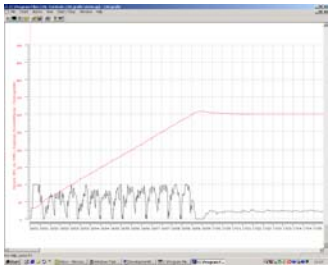
Other OPC clients such as SCADA providing plant-wide monitoring can access devices via the OPC servers, in addition to CALgrafix

An application note on OPC is available on request.

Providing data for quality control purposes can also be achieved with CALgrafix. Charting functions allow plotting of process values over a specified timescale. This data can also be exported to other applications such as Excel™.

Alarm Notification

Data Chart



Visual and audible alarms notification can be set, to assist in reducing response time to alarms. Alarms can be set for all measured and set parameters. During an alarm condition display priority is given to alarm notification window and an audible alarm signal can be set.

Notes

Exothermic reaction – Often with extruders, temperature build up is a problem due to continued pressure and operation in certain zones along the barrel. This high temperature is often higher than set-point such that cooling becomes essential. CAL's controllers have heat-cool strategy that makes fine tuning much easier.

Speed Monitoring - Closed-loop control of the screw speed is normally controlled by the variable speed drive. It is possible to monitor, chart and record screw speed and also monitor current. CALgrafix can do this via MODBUS RTU, OPC V2 Server (from the variable speed drive supplier) or analogue signals fed into a CAL 9500P controller.

For further information on CALgrafix in relation to your application, contact our sales office below.

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