



RJG, INC.

eDART SYSTEM™



Can You...?

- Transfer a mold anywhere and duplicate the process quickly and easily
- Ship zero-defect parts to your customer without 100% visual inspection
- Provide complete process documentation for every part
- View the status of every machine in your plant, anytime and from anywhere
- Track your level of productivity in real-time

Successful companies mold efficiently and are more productive than their competition. With increasing demands for absolute quality, progressive molders use process control systems to stay ahead of the competition. The eDART System™ allows progressive molders to keep pace with the demand for more products at higher quality and lower cost. The ability to immediately recognize problems, respond to conditions, and make effective adjustments and decisions gives molders a competitive advantage. The use of RJG's eDART System can help you increase quality, productivity and profits.

RJG provides you with the knowledge and tools necessary to effectively control your process.

Knowledge

In all aspects of business, the availability of real-time information is the key to success. For injection molders, real-time processing knowledge is crucial. RJG knows that in the long run, knowledge is the only sustainable competitive advantage.

- View the status of every job in your plant in real-time
- Always know if your processes are functioning within set limits

Quality

Shipping only absolute quality parts to your customer is a key competitive advantage. Being able to minimize and contain suspect parts is essential to your business since shipping one bad part to a customer has the same effect as shipping a truckload.

- Reduce the cost of quality by automatically containing abnormal parts at the press
- Identify problem jobs and resolve root causes of reject parts
- Document how every part was made with thorough process data

Efficiency

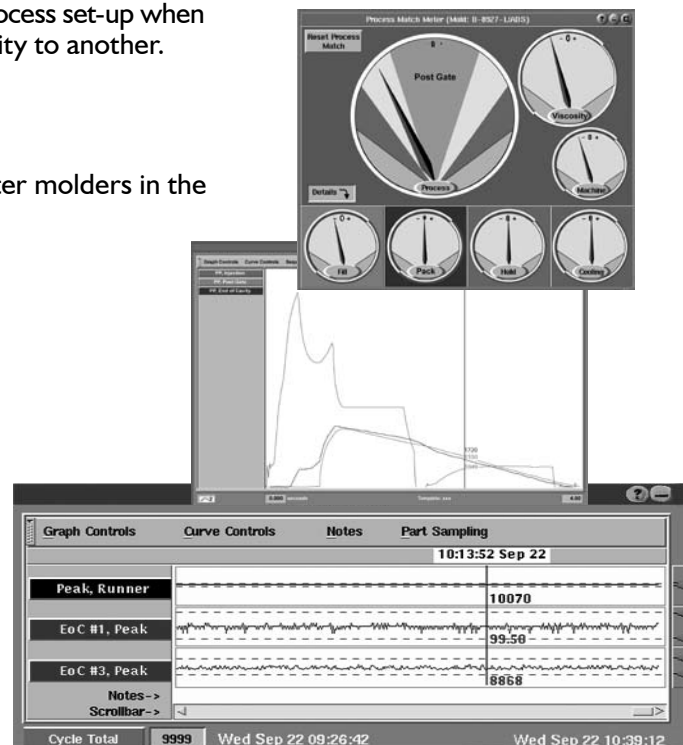
The eDART System allows you to view at a glance the status of every job in your plant in real-time, to immediately know if your processes are running within set limits. Process templates can be set to simplify process set-up when a job is moved from one machine to another, or one facility to another.

RJG Solutions

At RJG we want our customers to be the most sought after molders in the industry. We help you stay competitive by:

- Providing the most sophisticated process control solutions in the industry
- Helping you create an individualized strategy and customized implementation for your facility
- Helping your employees function as a team, allowing them to make informed decisions
- Providing software that is comprehensive, yet easy to understand and customizable for each job, mold and machine

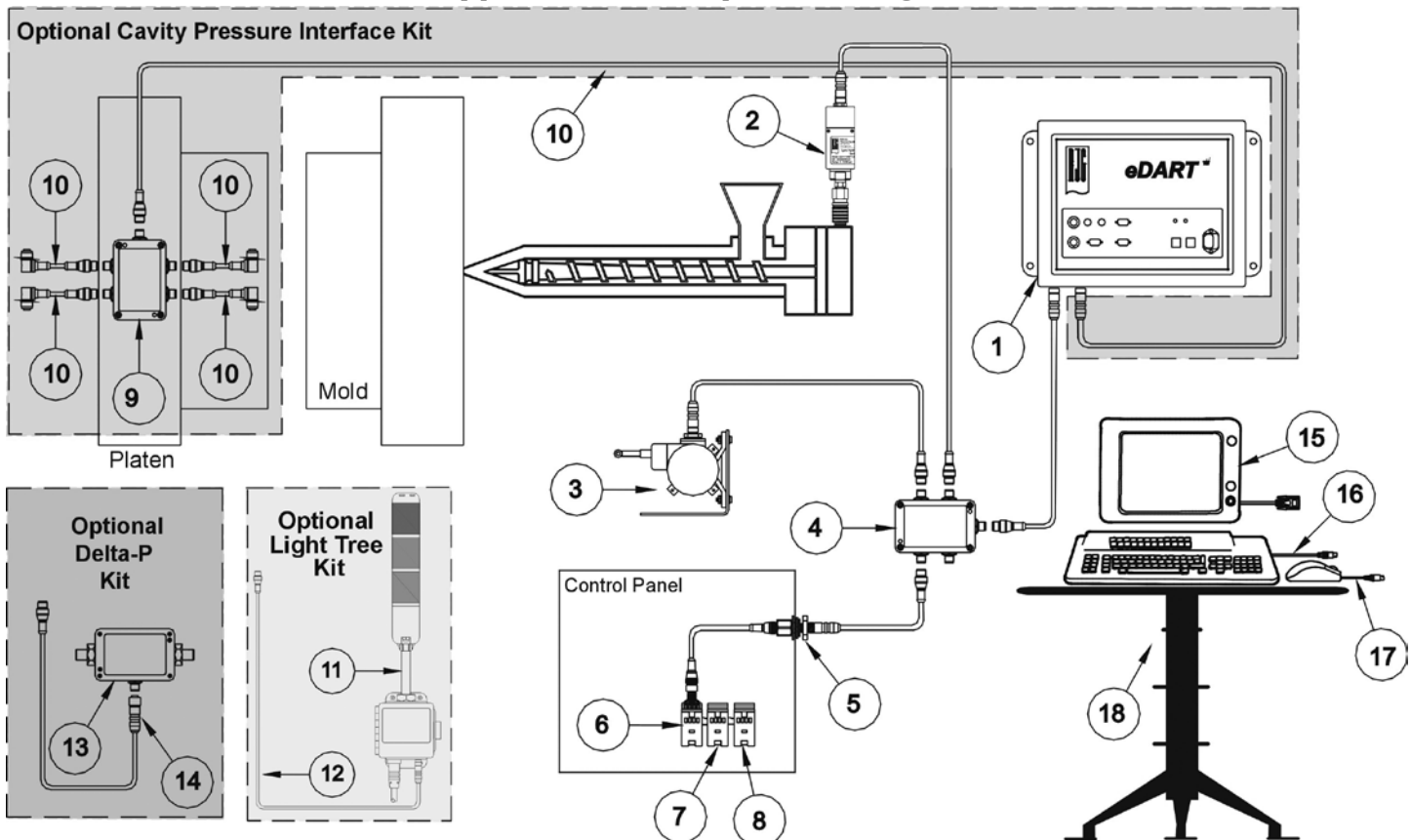
RJG's eDART System doesn't just monitor your process; it lets you become an active part of the process!



The eDART retains process and setup data for every mold run on a designated machine. Sensor configurations, process templates, alarm settings, and other setup information is automatically stored and can be easily shared with other eDARTs through a distributed network architecture. This unique ability to “share” information between eDARTs makes them interchangeable.

- Industrialized PC based system configured for mission-critical, real-time analysis, containment and control
- Monitor, keyboard and mouse inputs
- An average of 700 samples per second acquisition rate
- 10/100MB ethernet capability
- Remote access for viewing and customer support
- True real-time graphical display
- Connect up to 48 I/O Points
- Integrated battery UPS
- Runs stand-alone or networked
- CE Certified

Typical eDART System Diagram



Hardware Required:

- 1 eDART Process Controller
- 2 Hydraulic Pressure Sensor (Hydraulic Machine)
- 3 Stroke/Velocity Sensor
- 4 4-1 Junction Box
- 5 Lynx Single Feed Through
- 6 Sequence Module
- 7 Dual Relay Module
- 8 Analog Input Module

Optional Cavity Pressure Interface Kit:

- 9 Junction Box
- 10 Lynx Cable

Optional Light Tree Kit:

- 11 Light Tree
- 12 Lynx Cable

Optional Delta-P Kit:

- 13 Delta-P Module
- 14 Lynx Cable

Optional Components:

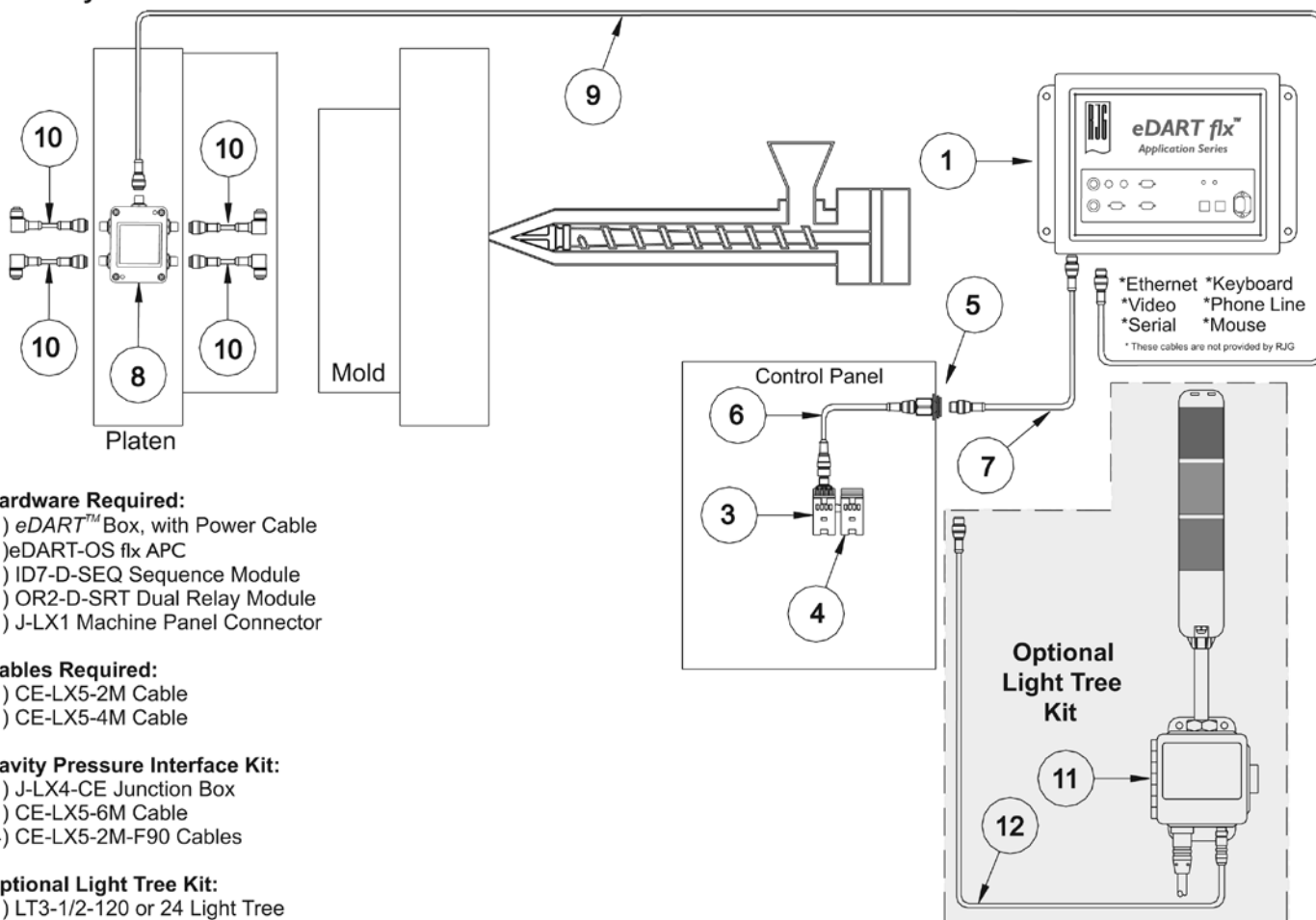
- 15 Monitor
- 16 Keyboard
- 17 Mouse
- 18 eDART Stand

The eDART *flx* is for molders looking for an affordable system tailored specifically for automated abnormal part containment. In conjunction with the use of cavity pressure sensors, it can detect part abnormalities such as short shots, flash, sinks/voids, dimensional variations, warp and more, before the mold even opens. eDART *flx* provides a simple to use, fail-safe solution for sorting parts.

The eDART *flx* offers many of the features of RJG's original eDART, such as: automatic sensor recognition and scaling, network-ability, auto-zeroing of cavity pressure sensors, automatic job selection and simple, robust hook-ups (no mix-up of inputs or complicated cabling). However, the eDART *flx* has been tailored specifically for automated part containment. Many of the advanced features of the original eDART aren't needed, which makes the eDART *flx* simpler to use and considerably more affordable. However if you should decide later that you want more advanced features, the eDART *flx* is fully upgradable.

Typical eDART *flx* System Diagram

Cavity Pressure Interface Kit



Lynx devices feed data to the eDART through digital communication, allowing for easy 'connect and go' usability. Job setup information only needs to be input the first time a sensor is connected, dramatically reducing setup times. The system recognizes the digital ID of the Lynx sensors and automatically calls up the job associated with that sensor. Lynx devices carry critical calibration information and self-checking diagnostics capabilities. Some of the common devices are listed below.

Sequence Input Module: Once wired to the molding machine, this module provides the system with machine timing sequences including injection forward, screw run, mold closed, first stage and mold open.



Dual Relay Output Module: For machines and automation equipment that accept digital signals, this device provides a normally open or normally closed contact for process control or 3-way part sorting.

Analog Input Module: Analog sensors or equipment can be integrated with the eDART System. Mainly for electric machines, this module accepts a 0-10V DC signal from these devices and communicates it to the eDART.

Lynx Surface Mount Modules: The Analog Input Module interfaces with temperature, dew point, pressure and other remote sensors. The Dual Relay Output Module supplies signals to part diverters, valve gate controllers, machine input cards and other applications.



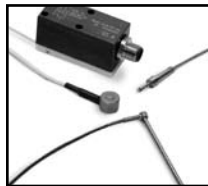
Position/Velocity Sensor: Tracking injection velocity, shot volume, cushion, and plasticizing rates is as simple as connecting a stroke/velocity sensor. The stroke/velocity sensor is available in various cable lengths for use on varying machine sizes.

Lynx Hydraulic Sensor: The eDART calculates injection pressure and plots it along with other profiles. These curves provide many machine and process variables, displaying hydraulic consistency and repeatability over time.



Lynx Nozzle Pressure Sensor: Particularly useful on electric presses, this sensor provides an easy way to directly measure pressure (up to 30,000 psi) in the nozzle during injection.

Lynx Delta Pressure Sensor: This machine or mold mount differential pressure sensor measures the difference in coolant pressure between the mold inlet and outlet, providing information about the cooling capability and consistency supplied to the molded part.



Lynx Cavity Pressure Sensors: Implementing cavity pressure has never been simpler than with digital cavity pressure sensors. The eDART automatically recognizes the sensor and identifies them with the mold being run.

Lynx Quad Temperature Module: This module takes up to four thermocouple inputs for use with the RJG eDART System. Various connector configurations are available.



Sensor Adapters: These sensor adapters accept inputs from any standard piezoelectric and strain gauge sensors, scales the input signal from the sensor and sends a digital cavity pressure signal to the eDART controller.

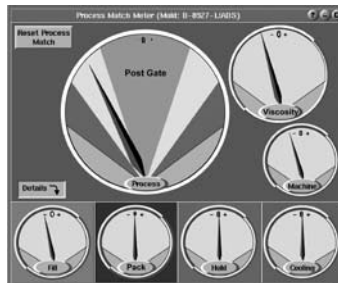


Mold ID Sensor: If a mold does not have Lynx cavity pressure sensors installed, the Mold Identifier enables the eDART System to identify and ensure that the right mold is in place before a job runs.

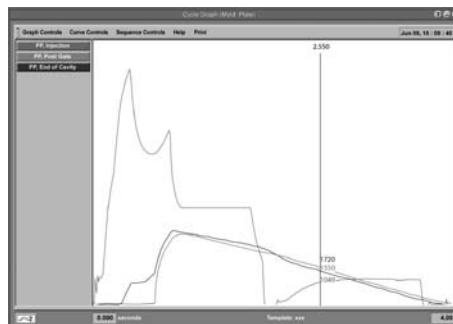
The flexibility of the eDART System™ is demonstrated in the eDART software. It is designed to ensure quality parts shot after shot by allowing the user to see and adjust process conditions in real-time and provides password protected areas to limit access to vital settings. With its layered, modular technology the eDART System can be customized for every company, facility and machine. While many tools are available, the most common are described below.

Process Analysis and Control Software

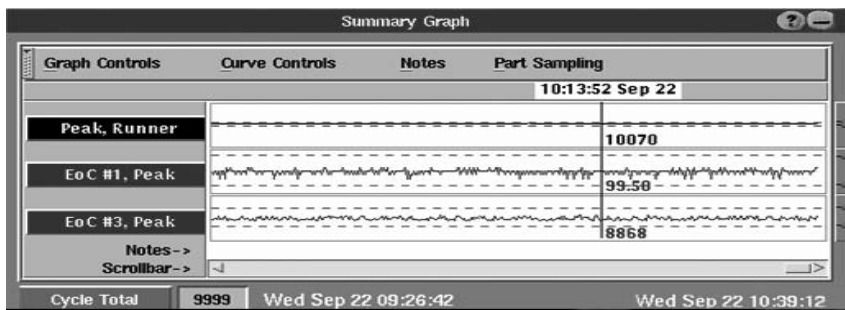
The Process Analysis portion of the eDART software provides tools that help the user view the process in real-time, analyze the information and determine what actions need to be taken.



Process Match Meter – Designed for practical use on the shop floor, the Process Match Meter has easy-to-read gauges that clearly indicate whether or not the process is stable.



Cycle Values, Graphs and Templates – Once an optimal process is achieved, the data collected can be used to create a template of the process parameters. Matching this template ensures consistent part production. Real-time analysis for both process and machine allows users to view the current injection pressure, machine variation, injection volume, variations in material viscosity, and much more.



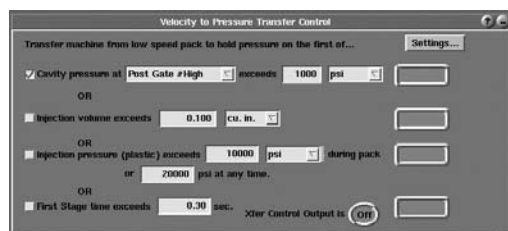
Summary Graph and Statistics – At a glance, see how well the process stays within set limits. User selected variables are plotted and statistical calculations made for analyzing process capability and consistency to provide a representation of process capability over time.

Alarm Settings (Mold: C960)

Cycle Value	Status	Value	Qty	Sort	Ind	Type	Direction	Level	Units
Sequence Time, Cycle Time	Suspect	8.005	5-1366		<input checked="" type="checkbox"/>	Warn	Above	0.001	sec.
Sequence Time, Cycle Time		8.005	61-402		<input checked="" type="checkbox"/>	Warn	Below	7.999	sec.
ST, Injection Forward		4.000	64		<input checked="" type="checkbox"/>	Reject	Above	4.012	sec.
ST, Injection Forward		4.000	64		<input checked="" type="checkbox"/>	Reject	Below	3.989	sec.
Peak, Post Gate #1	Reject	3941	32		<input checked="" type="checkbox"/>	Reject	Above	3500	psi
Peak, Post Gate #1		3941	0		<input checked="" type="checkbox"/>	Reject	Below	1000	psi
Cycle Integral, Post Gate #1	Reject	11820	19		<input checked="" type="checkbox"/>	Reject	Above	11000	psi-s
Cycle Integral, Post Gate #1		11820	0		<input checked="" type="checkbox"/>	Reject	Below	0000	psi-s

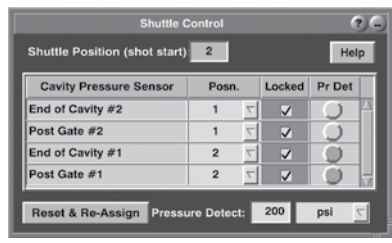
Buttons: Add Alarms (Reject), Add Warnings (Suspect), Remove Alarm(s) & Warning(s), << Collapse, Settings...

Alarm Settings – For automated part containment, molders can set alarm levels around specific summary values. Based on these alarm settings, the part diverter control relays a good/bad signal to a robot, diverter or conveyor.

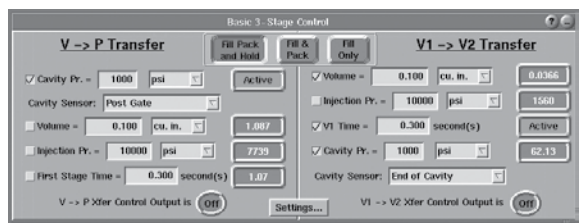


V → P Transfer Control – This process allows implementation of DECOUPLED MOLDING™ techniques by transferring the machine from velocity to pressure control on cavity pressure, hydraulic pressure, position or time.

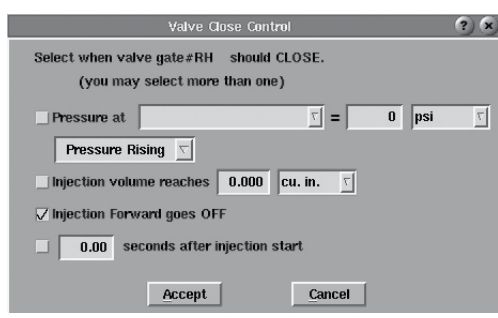
The optional software tools for expanded process analysis and control are more examples of the flexibility and depth that is possible with the eDART System. To anticipate the needs of progressive molders, RJG has developed the following software tools to meet the demands and advances in molding technology:



Shuttle Control – Be able to differentiate between positions as well as collect and organize data on the current mold half in certain shuttle or rotary molding applications. This software also allows the user to have unique cavity pressure control setpoints for each mold base.



Basic 3-Stage Control – With a relatively simple upgrade, the capability of older machines can be significantly improved. The addition of a load compensation valve enables older relief-valve machines to do 2 or 3-Stage DECOUPLED MOLDINGSM where fill, pack and hold are repeated shot after shot.



Valve Gate Sequencing – Valve gate sequencing allows precise, individual control of flow fronts in the cavity. This precise control maximizes uptime, process capability, and performance. This is especially true on large machines with complex processes using hot runner valve gates.

- Types of Valve Gate applications include:
- Independent Valve Gate Control
 - Sequential Valve Gate Control
 - Alternate Cavity Valve Gate Control

“I knew we had made the correct decision when, after installation, our first eDART SystemTM paid for itself within two months. H & H has been able to reduce scrap, lower cycle times, decrease machine time, and monitor machine capabilities, along with developing templates to insure part quality.

I feel any molding shop without this technology in 3 to 5 years will be out of date, and struggling to play catch-up to those who have it.”

Ryan Wodrich
 Process Engineer
 H & H Engineered Molded Products, Co.

“RJG’s Systematic Molding training and their eDART System software are powerful tools that can achieve Zero defect molding. Used together they allowed us to reduce PPM from over 1500 two years ago to -0- (yes, truly ZERO) on 27 molding machines - producing difficult automotive electrical connectors.”

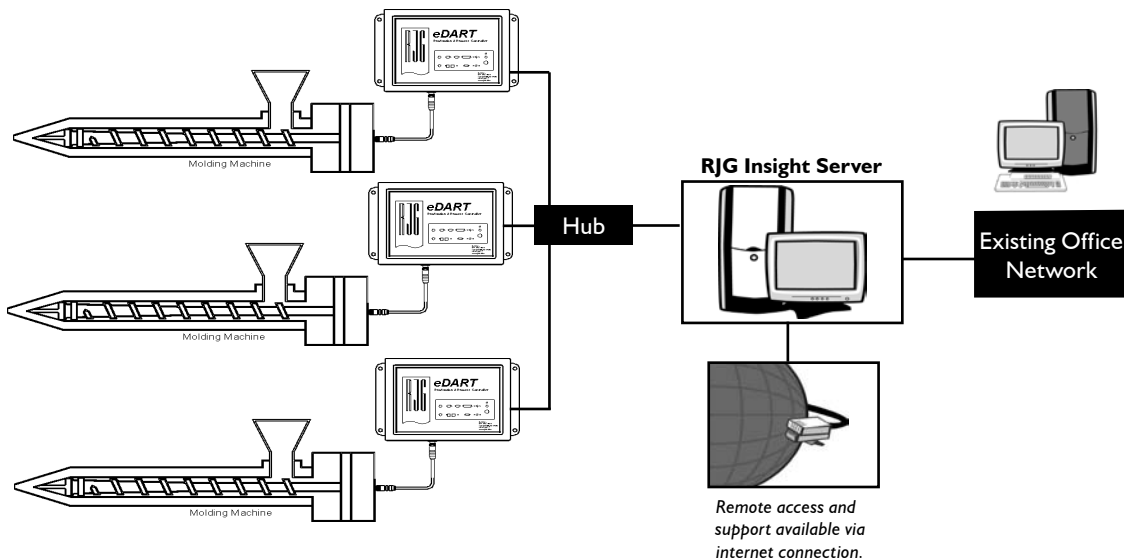
Chuck Malo
 Principle Engineer - Plastics Processing
 FCI Automotive North America



RJG Insight Server

Users can access RJG systems without the worries of additional network load, unwanted broadcasts, or uncontrolled traffic by adding the RJG Insight Server to the system. The server is designed to separate the network traffic of the eDART System™ from your existing office network, by acting as a bridge between the two networks. For ease of operation and security of data, the addition of the server not only eliminates network traffic jams, but provides constant backup, data storage and secure customer support access.

The Insight System®, RJG's process control system, consists of hardware and software that keeps you informed on what's going on in your plant and the ability to make strategic changes to your processes to improve efficiencies. The key to efficient molding is the ability to immediately recognize problems, respond to conditions, and make effective changes as soon as they occur. Insight Software programs allow you to do just that.



Intouch Production Monitoring

RJG, Inc. has formed a partnership with Intouch to provide both process control and production monitoring on a single core engine. This partnership provides a real-time production monitoring, scheduling, and reporting system that easily integrates with RJG's eDART System™. The Intouch system is able to retrieve data from the Insight database for use in generating real-time reports and schedules. The Intouch system is an easy to use, understandable monitoring package that can be as flexible in its capability as a customer needs it to be, with capacity customized to meet the requirements of individual customers. The Intouch system greatly enhances visibility and control in your manufacturing operation, providing up to the minute status information for every job on the factory floor. Real-time job information and machine status can be viewed at the machine or across a computer network. Reporting can be done by shift, day, week, month, job, machine or tool. By providing these tools on a web based platform, users are able to view the status of their jobs from anywhere through the use of a web browser.