BTR CONTROLS

Dedicated Distributed Controller

Custom Integrated Controller and Operator Interface for OEM's

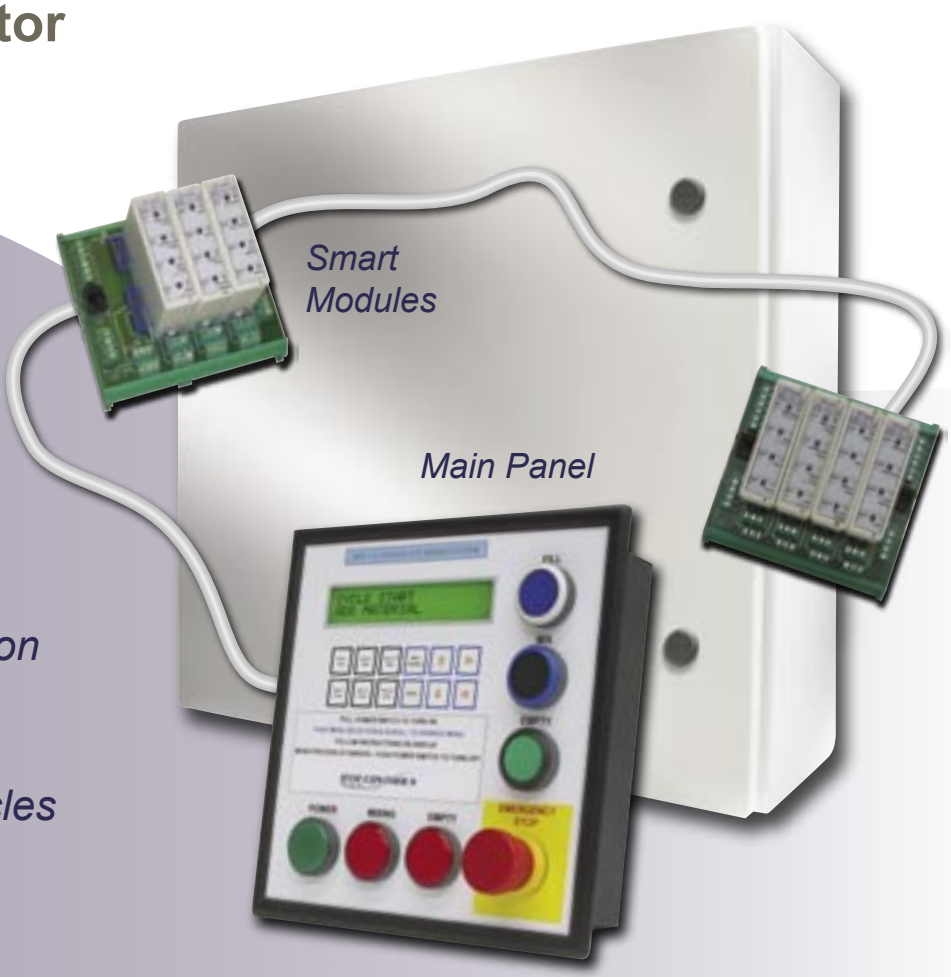
Simplify System Design

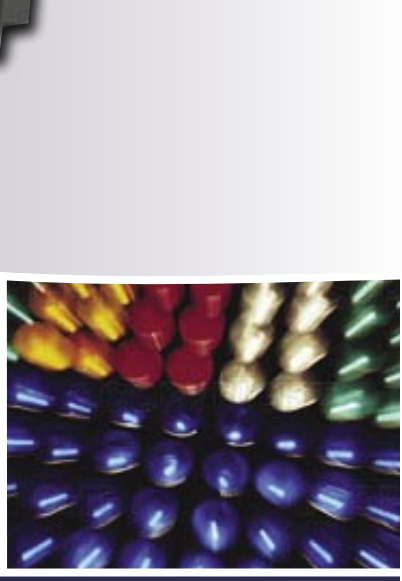
Lower Installed Costs

Enhance Equipment Features and Functions

Improve Customer Satisfaction

Proprietary Control Design with Longer Product Life Cycles





Machine *Material Handling* *Process* *Diagnostics*

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Uncomplicated Control

Complicated

Simplified

- *Eliminate Components*
- *Eliminate Complex Wiring*
- *Reduce Panel Size*
- *Enhance Funtionality*

A dedicated controller can be customized and optimized to meet your specific equipment and application requirements.

You define:

- *Operator and keypad types.*
- *Device functionality.*
- *Text messages and display requirements.*
- *Graphical overlay including operator, keypad and I/O legends.*
- *The number and type of Smart Modules—I/O, power supply, communication, special function and any proprietary custom option that may be required.*

The Custom Dedicated Philosophy

Today's business environment is more challenging than ever. To remain competitive, original equipment manufacturers must constantly reduce costs and enhance equipment performance with new features and functions.

On the surface, cost reductions have been achieved by utilizing standard "off-the-shelf" controls such as operator interfaces, programmable controllers and I/O. Programmable control devices are great for some applications—if you are constantly making changes in operation or design. There lies the dilemma—easy software changes for an OEM are also easy for their customer, and that opens the possibility for undocumented and unauthorized reprogramming without regard to product design criteria. Additionally, "off-the-shelf" products never seem to quite satisfy all of the equipment or application requirements. There are either more functions offered than necessary or not enough functions available, which ultimately forces a compromised design solution.

With a custom Dedicated Distributed Controller (DDC), the hardware is configured and a high level proprietary program is written, specifically for the machine or process. Predefined menu driven options are added for maximum versatility while variables are easily accessed through specifically defined keys on the keypad. Meaningful messages on the display simplify setup and maintenance. Limited use or new functions are simply implemented with plug-in Smart Modules. Custom graphics with operational information on both the main panel and Smart Modules complete the dedicated device. With the DDC, there is no need for a separate costly programming terminal.

The Main Panel layout can remain the same from product generation to generation, providing continuity of operation over many years of service. There is little need for a complicated electrical schematic or detailed instruction manual to operate or troubleshoot your product.

Custom Dedicated Distributed Controllers are best suited to satisfy cost reduction objectives while providing enhanced features and functions that exactly match the OEMs equipment and application requirements – without compromise.

For Bottom Line Results

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Lower Installed Costs.

- ***Reduced material costs*** — replace numerous electromechanical devices with multifunction smart electronic devices, use smaller enclosures, and replace terminal blocks and wires with pluggable connectors and pre-engineered interconnect cables.
- ***Reduced engineering costs*** — the Main Panel and Smart Modules are delivered pre-configured, there is no need to devote your resources to hardware layout and software development. The modular hardware design is easy to configure for your specific needs—simply "fill-out-a-form" to select components and define marking requirements. A single configuration can be multifunctional for use in a variety of applications.
- ***Reduced installation costs*** — plug-in Smart Modules and pluggable connectors eliminate multiple wire terminations, complicated interwiring between devices and resulting errors. Connectors are clearly marked and keyed for error free assembly and installation. DDC device hardware and software are pre-configured for your application, so there is no programming or setup required.

- ***Reduced maintenance costs*** — full text fault messages are provided on the display, no need to look-up and decipher cryptic codes. Smart Modules include both a programmable status LED and pushbutton for each channel.
- ***Future expandability*** — the modular design of the DDC enables additional hardware or network communications to be easily added. Applications can be predefined and future functionality can be planned for.
- ***Reduced inventory and simplified supplier relationships*** — by replacing individual devices with the multifunction integrated design of the DDC, inventory requirements and the number of SKUs for a given piece of equipment can be minimized. Less parts means fewer suppliers and simplified relationships, resulting in lower associated transaction costs. Simple bills of materials can also result in shorter equipment delivery lead times and lower equipment costs.

Enhanced Equipment Features and Functions.

Main Panel and Smart Module designs include on-board, flash programmed microprocessors making these devices readily upgradeable as application changes dictate. Possibilities are endless and only limited by your imagination. Provide your customers with increased value by offering advanced features and functions for little or no added cost compared to last generation products. Take advantage of these smart devices to:

- ***Automate processes that were manual in the past.***
- ***Enhance safety to better protect personnel and equipment.***
- ***Provide expanded application information and equipment diagnostics.***
- ***Increase productivity and eliminate process faults.***
- ***Improve equipment quality and performance.***
- ***and more....***

Proprietary Control Design.

Don't be subjected to the feature and function constraints and product life cycles of "off-the-shelf" HMI's, PLC's or I/O offered by major suppliers. The DDC is your proprietary control—designed and configured for your special needs. You decide what functions and parameters are required. Make the DDC an integral element of your equipment's life cycle and migration plan—don't let it be dictated by your supplier.

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DDC Modular Design Platform with Innova

Main Display Panel

- Rugged 22mm operators including illuminated or standard pushbuttons and selector switches, key switches, pilot lights and audible alarms for reliable, repeated, regular operations and general status indication.

♦ *Up to six operators per panel to provide multiple control and status functions.*

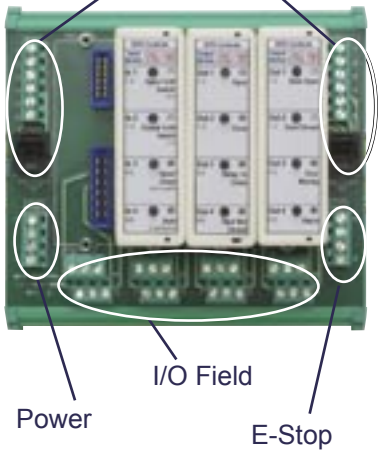
♦ *Contact blocks are installed on printed circuit boards for reliable operation and "error-proof" assembly.*

♦ *Operator types and legends are customer defined.*

- An additional 22mm Emergency Stop operator is hard-wired to the power supply for immediate shutdown in emergency situations.
  - ♦ *Dedicated terminal blocks for easy Emergency Stop control wiring.*
- Two-line, 20 character backlit LCD or graphics capable vacuum fluorescent display to show operating information, system configuration or fault indication for easy troubleshooting - even in poorly lit areas.
- Up to a 12 position keypad enables easy system interrogation, fault diagnosis, system configuration, limited operation and more.
  - ♦ *Keypad style, legends and functions are customer defined.*
- NEMA 4X, IP65 ingress protection to withstand the demands of indoor industrial and outdoor application environments.
- Includes C programmable microprocessor with flash memory for total system control and monitoring of Smart Modules.
- Overlay with customer defined legends and graphics for a common look and feel with machinery and equipment in which it is installed.
- Optional run/program switch on rear panel to enable commissioning.
- USB port for program revisions.
- Modbus communication to Smart Modules.
  - ♦ *RJ45 connector.*
  - ♦ *Optional six pole terminal block for hard-wiring.*

Smart Module Motherboard

- Standard 35mm DIN rail mounting for fast and secure installation.
- Connects to the main display panel or between motherboards with a single RJ45 plug-in cable, no tools required for installation.
  - ♦ *Two RJ45 connectors are standard.*
  - ♦ *Two optional six pole terminal blocks for hard-wiring.*
- Six pole fixed terminal block for each plug-in Smart Module. Modules can be installed or removed without disturbing control wiring.
- Up to four plug-in Smart Modules can be installed on each motherboard.
  - ♦ *Eight position motherboard is optional.*



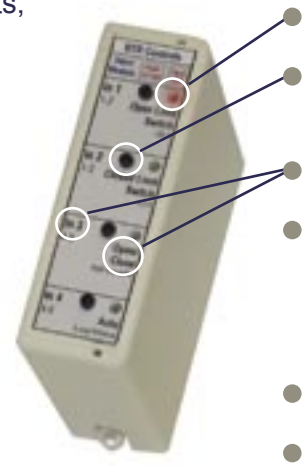
- Motherboards can be daisy chained or installed remotely.
- Four pole fixed terminal block for input voltage and pass-through voltage.
- Four pole fixed terminal block for two Emergency Stop connections (both directly break incoming power).
- Internal Modbus communication.

ative Features for Maximum Satisfaction

Smart Modules

A wide variety of Smart Modules are available for interfacing with drives, sensors, actuators, and solenoids for maximum application flexibility.

- Power supply with 2 inputs/2 outputs, 4 inputs or 4 outputs.
- 4 input module - AC/DC.
- 4 output module.
  - ~ transistor (open collector NPN)
  - ~ triac
  - ~ relay
- Special function modules.
  - ~ *Analog input*
  - ~ *Analog output*
  - ~ *Thermocouple*
  - ~ *Incremental encoder input*
- Communication modules for integration in enterprise-wide manufacturing, process and facility systems.



- Custom modules for customer defined functions and proprietary options.
- Integral microprocessor for custom programming and local functions.
- Programmable LEDs for status indication.
- Programmable pushbuttons to test I/O circuit functionality.
- Customer defined legends and markings.
- Plug-in modules install securely to the motherboard with two screws for reliable performance in high vibration and shock applications.
- DIP switch to select Smart Module address.
- Modbus internal communication.
- Noise protection.

Intuitive Diagnostics Simplify Troubleshooting

The Main Panel and Smart Modules provide intuitive visual indication and multi-lingual text diagnostics to simplify and speed troubleshooting. Indicator legends and text displays are customer defined to satisfy individual specific equipment and application requirements.

LCD or Vacuum Fluorescent Display (VFD)

2 line, 20 character display enables full text messages to be displayed. There is no need for cryptic codes or abbreviations that need to be deciphered or interpreted. Optional VFD available with graphic capability.

Audible Alarms

Sirens and buzzers provide warnings or system fault indication.

22mm Pilot Lights or Illuminated Operators

Pilot light and operator colors are selected along with custom legends to indicate equipment status and faults.

Smart Module LEDs and Legends

Smart Modules include programmable LEDs for each input or output channel to indicate status. Each circuit is identified with customer defined legends.

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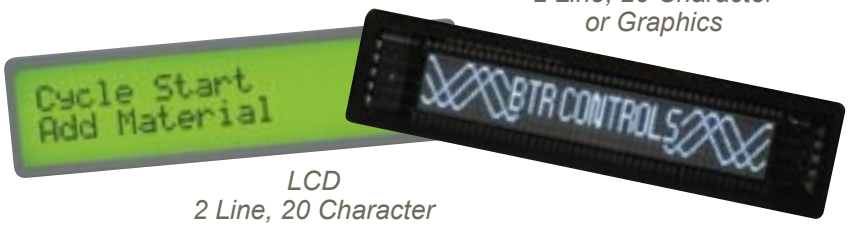
Custom Hardware and Software Design

Custom Hardware Specification
4 Simple Steps

1. Select the display type.



Vacuum Flourscent
1 Line, 10 Character
2 Line, 20 Character
or Graphics

LCD
2 Line, 20 Character

2. Select the required types of operators, trim ring colors, position on panel and labels.

Pushbutton

Pilot Light

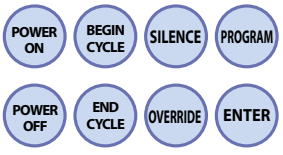
Multi-position Switch or Key

Audible Alarm

Trim Ring Color

Emergency Stop

3. Select the required keypad, number of keys, position and labels.



Custom Software Specification

BTR CONTROLS will work hand-in-hand with you to develop a comprehensive software specification including: input and output configurations, display messages, status/fault indication and network communication requirements. Once the software specification is finalized, BTR CONTROLS can write the necessary code for your review and final approval or alternatively, you can develop your own code.

4. Define Overlay Graphic.

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Designed for the Most Demanding Applications

General

Ingress Protection: NEMA 4X, IP65

Operating Temperature: 0 … 60°C (32 … 140°F)

Shock: 50g, 11ms amplitude, half-sinusoidal

Vibration: 5g @ 10 … 500 Hz logarithmic

Source Voltage: 24 Volt DC - Power Supply Module or separate source

DDC Main CPU

Flash Memory	16K bytes standard, 32K bytes optional
SRAM	1K byte standard, 2K bytes optional
EEPROM	512 bytes standard, 1024 bytes optional
Program	C, Assembly, BASIC

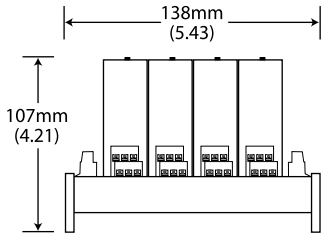
Smart Modules

Power Supply	Input Voltage: 20 ~ 30 VAC
AC/DC Input	Input Voltage: 12 ~ 30 VAC or VDC (optional 115 VAC) Input Current: 12mA @ 24 VAC or VDC
Transistor Output	Output Voltage: 40 VDC maximum Output Current: 200 mA maximum
Triac Output	Output Voltage: 24 ~ 120 VAC Output Current: 750 mA maximum
Relay Output	Output Voltage: 12 ~ 120 VAC, 24 ~ 110 VDC Output Current: 5A resistive (p.f. 1.0) maximum Output Power: 1/4HP @ 120 VAC

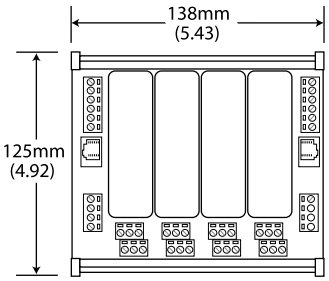
Dimensions

Motherboard with Smart Modules

side view

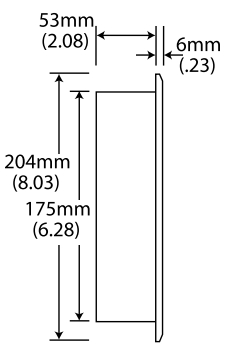


top view

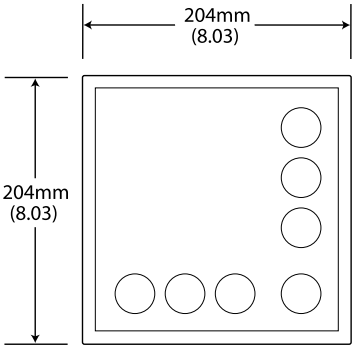


Main Panel

side view



top view



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BTR CONTROLS

Our new, fully equipped 15,000 square foot facility is strategically located in the northwest suburbs of Chicago.

Our Vision is to provide a new level of service, product design, manufacturing capability and expertise to the OEM market. We believe that using custom designed controls from BTR will help enhance your product and improve overall profits. Don't be subjected to limited product life cycles and losing control over the design process by using "off-the-shelf" products.

Our Philosophy is to become a strategic partner with our customers. We take the time and make the effort to be your partner by immersing ourselves in your business to understand your exact requirements. Your success and profitability becomes our main concern. We are here to serve you with creative design, extensive industrial control experience and the right attitude.

Electronic Control Design

There is a major difference between text book electronic design and real-world application. We provide our years of experience to insure products are capable of withstanding the demands of actual field operation and installation. From single board computers for embedded control to complete turnkey dedicated control systems, we offer the latest in industrial design and manufacturing technology.

Electrical Assembly Services

In addition to our electronic control design, development and manufacturing capabilities, we also offer electrical assembly services specializing in large quantity control panel production. We are a CUL listed facility.

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