

Blue Fusion™

Web enabled automation controller

- Built-in web server
- Analog and digital I/O control
- Multi-axis motion control
- Connects easily to enterprise systems




**Control
Technology
Corporation**

5200 Series

Integrated Automation Control

For more than 25 years, CTC has pioneered the combination of advanced automation control capabilities into highly integrated, reliable and easy to use products. Webster's Dictionary defines fusion as "a merging of diverse, distinct, or separate elements into a unified whole" - and as you can see below, that's exactly what CTC's Blue Fusion controllers do! With a single compact controller you can handle I/O, Motion, User Interface, and Enterprise Connectivity requirements - with one unified programming language.

On the following pages you'll see how Blue Fusion controllers extend the fusion concept beyond the factory floor with CTC's web enabled automation technology. Now you can fuse IT (Information Technology) with IA (Industrial Automation). Supporting open communication standards like HTTP, SOAP and XML, Blue Fusion controllers connect your devices directly to the rest of the enterprise without expensive middleware.



User Interface

Operator-friendly graphical and text-based panels provide flexible configuration and intuitive operation.

Ethernet or
Serial Connection



Network Connection



Device Control

CTC controllers can interface to other devices via open networking standards such as Serial, Modbus, CAN, or Ethernet, further expanding your options for device integration.



I/O

CTC controllers support a wide range of digital and analog I/O, as well as specialty I/O like ultra high-speed registration latches, high-speed counters, and PID loops.

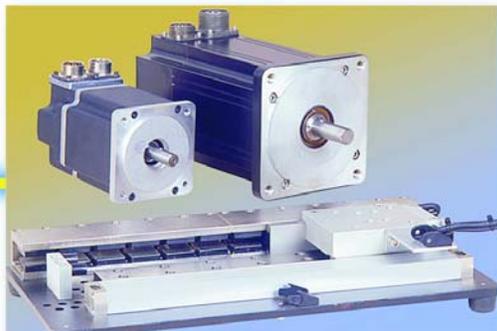
Welcome to the new era of Web Enabled Automation.

Ethernet Connection



Enterprise Connectivity

CTC controllers provide direct enterprise-to-device communication and control via both physical and wireless Ethernet connections. CTC's support for IT technologies such as XML and SOAP enable plant floor device data to be rapidly incorporated into the business information system network.



Motion Control

CTC automation controllers have been designed from the ground up to easily accommodate the data-intensive functions that motion control demands, making CTC controllers the ideal choice for high-performance servo or stepper applications.

Automation From an IT Perspective



Enterprise systems are highly dependent upon information exchange with real world devices such as PLCs, process instruments, quality devices and HMIs. Unfortunately most of these data exchanges are performed using semi-automatic or manual methods that are costly, slow and prone to errors. Blue Fusion controllers offer a way to eliminate this problem by providing real-time bi-directional information exchange with enterprise systems using standard IT methods like XML, SOAP, OPC, JDBC and SQL. Blue Fusion controllers translate real world sensor signals into IT friendly formatted information.

In addition to its direct enterprise connectivity capabilities, Blue Fusion controllers provide customers with several other efficient ways to exchange data between personnel and connected devices:

Built-in Web Server

- Use a standard browser to connect directly to Blue Fusion's web server
- Intuitive setup and diagnostic web pages
- Monitor and control connected devices via web pages
- Ideal for remote modification and troubleshooting
- Automatic discovery of all other Blue Fusion controllers on the network

E-mail Client

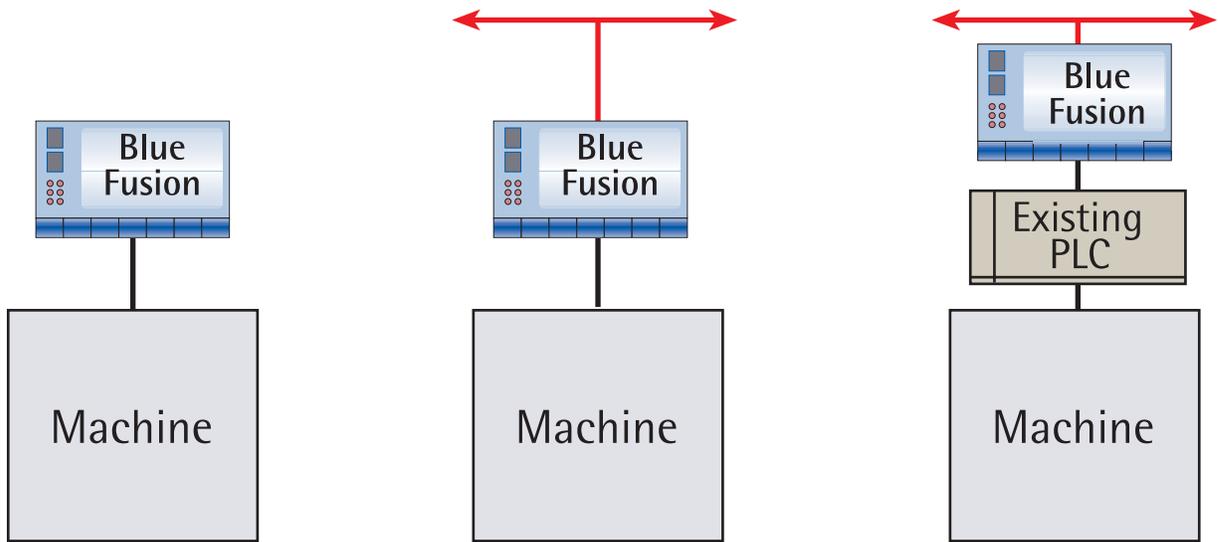
- Configure Blue Fusion to send automated e-mails
- Receives and responds to e-mail
- Embed live or historical data within e-mail text
- Schedule- or event-driven execution
- Easily send e-mail to multiple devices

Local data logging

- High speed data collection from any connected device
- Multiple non-volatile RAM and flash disk storage support for more than 2 million values
- Import data files directly into enterprise applications or spreadsheets

Flexible to Connect

Blue Fusion controllers can operate in either a stand-alone mode or a variety of networking configurations, providing a flexible migration path for future expansion and integration.



Stand-alone

Control all application I/O and motion functions as well as the user interface with a single Blue Fusion Controller.

Networked

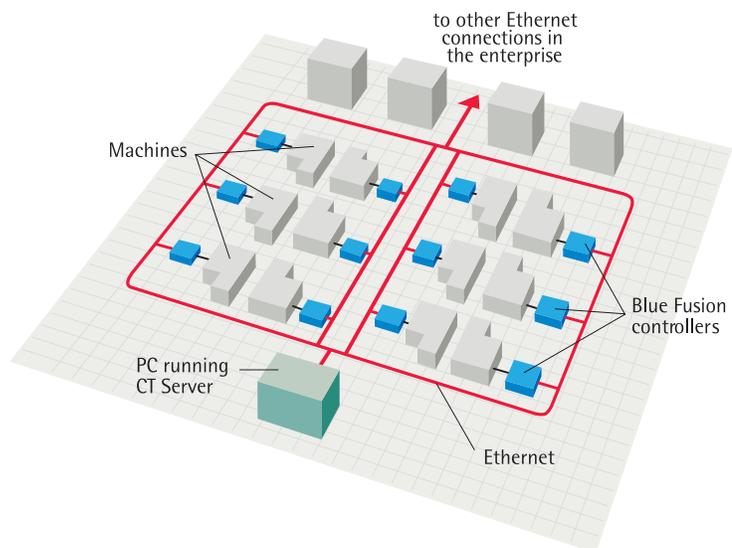
Easily connect multiple machines or machine sections to each other using standard Ethernet networks. Controllers can be monitored, controlled, configured or even reprogrammed over the Internet and/or Intranets.

Piggyback

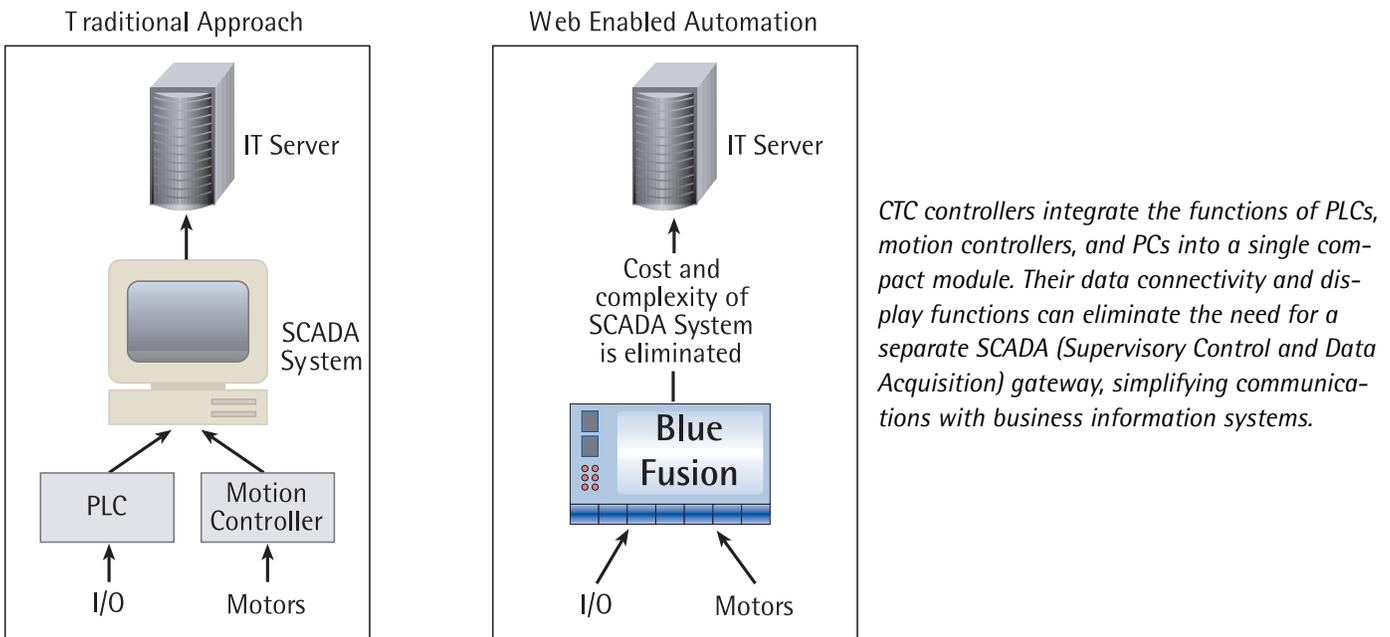
Upgrade existing control equipment by providing Internet/Intranet access to both the PLC and the process variables it controls. Easily add data collection without disrupting existing controls.

Distributed Scalable Control

Hundreds of controllers can be linked together and coordinated from a central point. By providing direct enterprise to device connectivity via standard IT networking technology, Blue Fusion controllers provide the information for increased operational efficiency in small, medium and large-scale implementations.

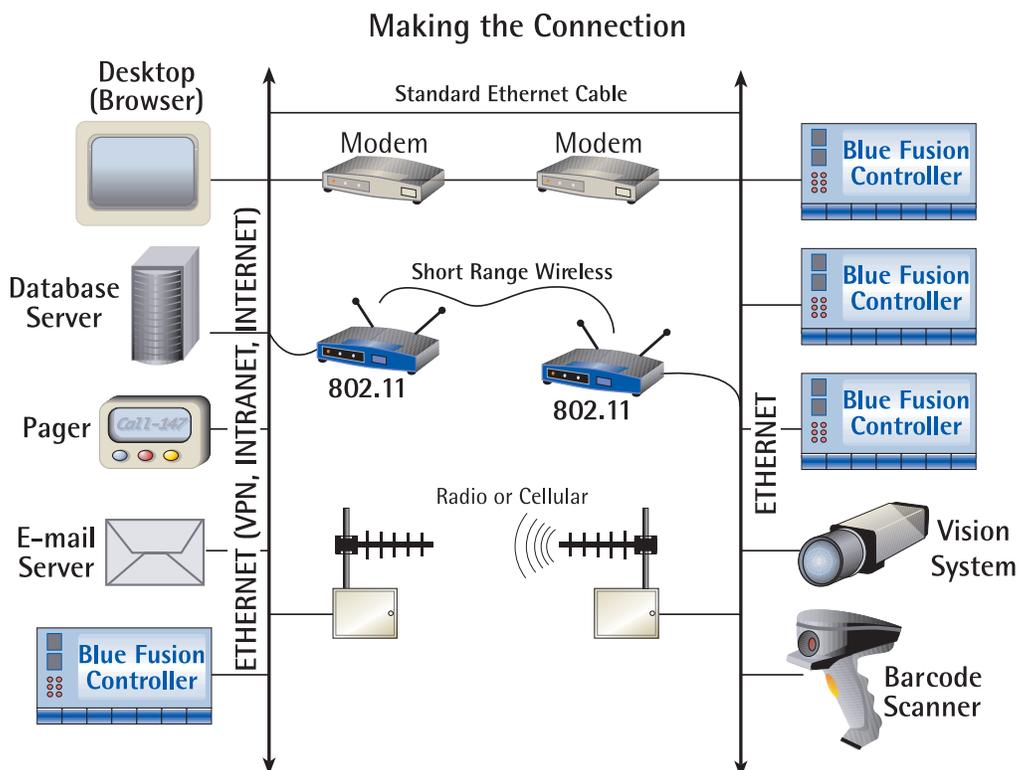


Web Enabled Automation: streamlined system integration



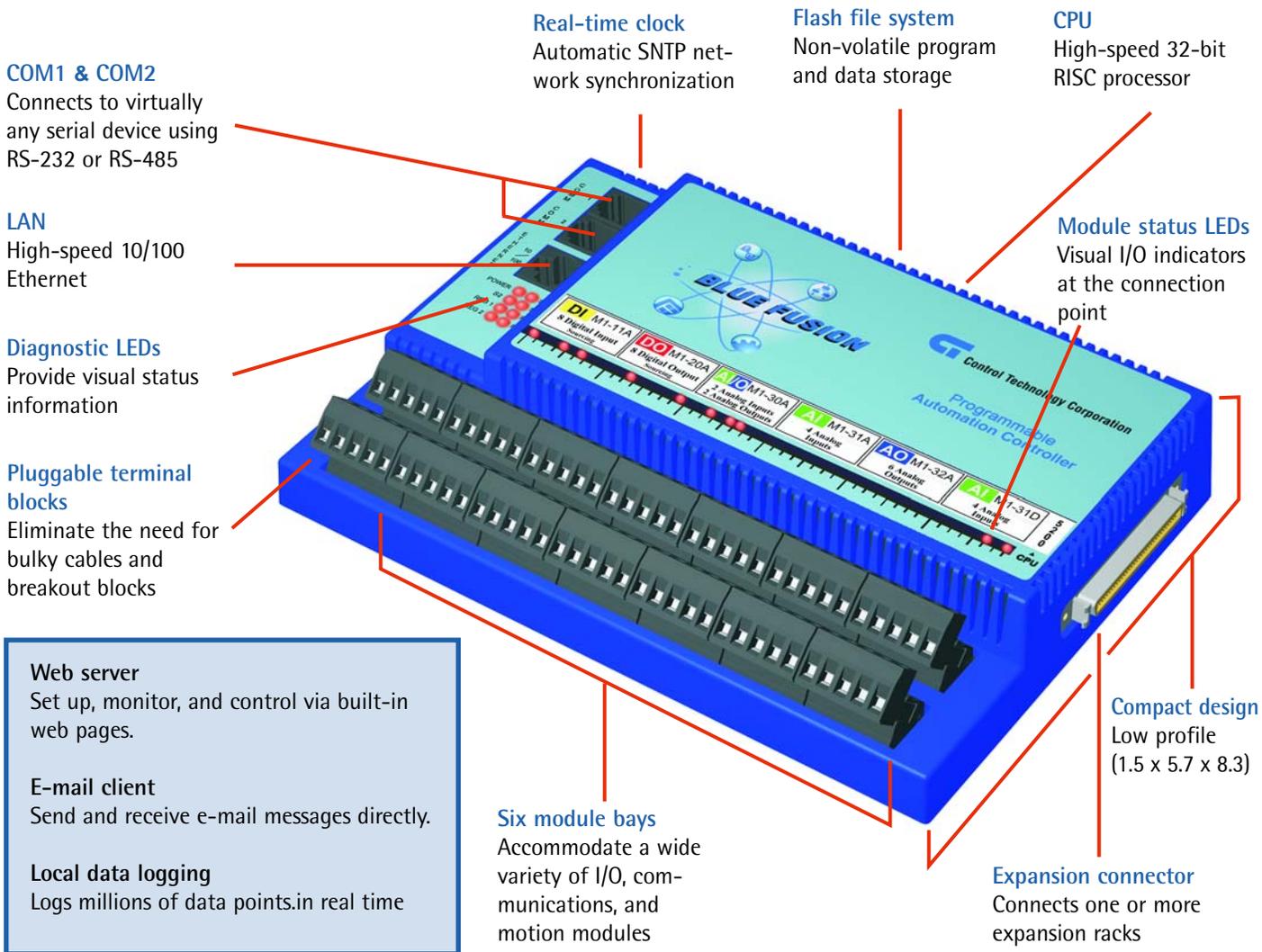
Making the Connection: multiple options for networking

CTC controllers enable you to transfer data via any of several widely available standard Ethernet implementations: physical connections, modem, and radio or cellular wireless.



Blue Fusion Automation Controllers

Integrating digital and analog I/O, motion control, user interface, and enterprise connectivity



5200 Networking Specifications

Ethernet Communications

- 10/100 baseT Ethernet full duplex with DMA and flow control
- Supports wired and wireless networking
- UDP, TCP/IP, HTTP
- ARP, ICMP
- Modbus master/slave (RTU)
- FTP file server
- Telnet server
- HTTP server
- Raw socket support
- SNTP time synchronization
- DHCP support

Web Server

- Monitor and control devices via standard browser
- Built-in web pages allow controller to be fully configured and monitored with only a standard web browser
- Supports standard HTTP and XML interface

5200 Controller Specifications

To insure a consistent high level of performance, the 5200 controllers support a unique multiprocessor and multitasking architecture.

Multitasking

Each controller can operate 84 simultaneous tasks. This multitasking approach greatly simplifies application programming by eliminating the complexity of "big loop" programming and the delays of PLC ladder scanning approaches.

Multi-processors

In addition to the main CPU, most 5200 modules feature additional on-board processors. These additional processors automatically offload the main CPU and assure maximum performance as modules are added.

System Resources

- Industrial real-time deterministic OS
- Real-time clock
- Internal temperature sensor

User Memory

- Flash file system: 1 MB
- Non-volatile RAM drive: 1.5 MB
- Expandable with optional memory cards to more than 32 MB

Active Program Resources

- 4,500 non-volatile registers
- 32,768-element data table
- 84 simultaneous tasks

Encoder and High Speed Counters (optional)

- Quadrature encoder input (6 MHz)
- Dual high speed counters (6 MHz)

Analog I/O (max 48 channels)*

- Voltage, current and thermocouple
- PID loop control

Digital I/O (max 48 channels)*

- Hardware counters 10 kHz/channel
- Supports 16 PLS outputs. Actuation rate < 1 msec
- Optional quadrature encoder input with 32-bit counter and 2 high-speed (1 microsecond response) registration inputs

Motion Control (6 axes per controller)*

- Stepper
 - Velocity range: 0 - 1M steps/sec
 - Accuracy: ± 1 step
- Servo
 - Position loop rate: 500 μ sec/axis
 - Velocity range: 0 - 6M counts/sec
 - Accuracy: ± 1 count

Serial Communications

- Two serial COM ports (115 Kbaud)
- RS-232 (standard)
- RS-485 (optional)
- Supports wired and wireless networking
- Modbus master/slave (ASCII or RTU)

HMI Integration

- Fully integrated Ethernet support for CTC's iPanel™ touchscreens
- Serial support for other touchscreens

Data logging

- Local data logging to internal non-volatile RAM disk
- Automatic integration with CTC's CTLog software
- Standard memory stores 384,000 values; expandable to 3 million values

Environmental

- Operating temperature: -0 - 55°C
- Storage temperature: -40 - 85°C
- Relative humidity: 5 - 95% non-condensing

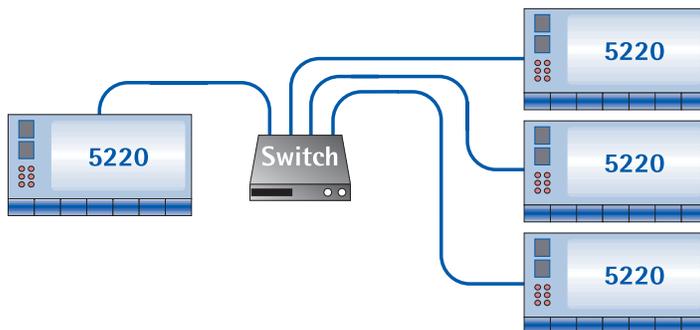
*Maximums are per controller or rack unit and are not necessarily mutually inclusive.

Blue Fusion System Expansion

CTC offers two system expansion options: expansion racks and distributed virtual I/O. Expansion racks offer the highest performance, while distributed virtual I/O allows multiple controllers to be distributed anywhere over the network.

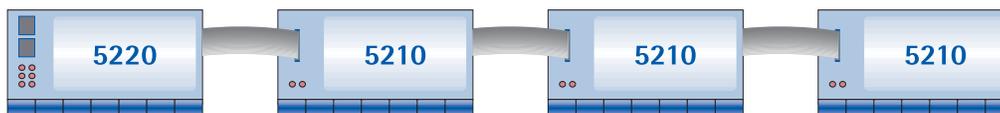
Distributed Virtual I/O (DVIO)

If the application requires I/O and motion to be distributed through the application, DVIO is a good solution. With DVIO, up to four Blue Fusion controllers can be connected via a switch isolated Ethernet network. *Note that minor networking delays must be taken into consideration when designing a DVIO system.*



Expansion Racks

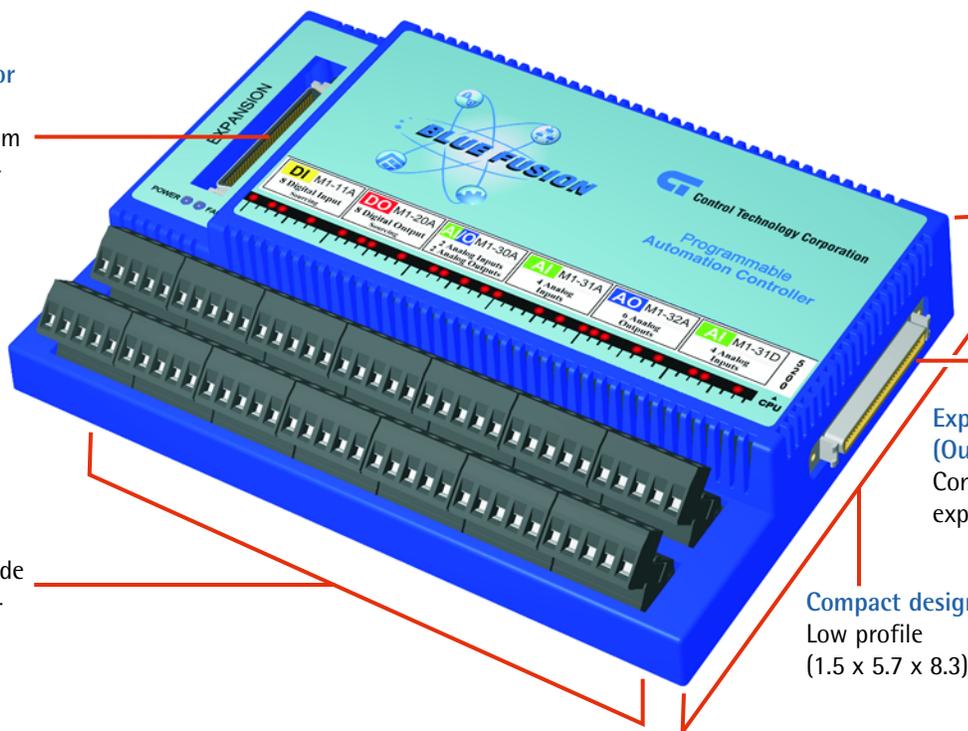
Blue Fusion expansion racks provide full speed access to all I/O and motion modules in the system. Up to three expansion racks may be added to each CPU allowing for up to 192 I/O points and up to 6 axes (12 with M2 modules) of motion control.



5210 Expansion Rack

Expansion connector (In)
Connects to upstream controller or expansion block

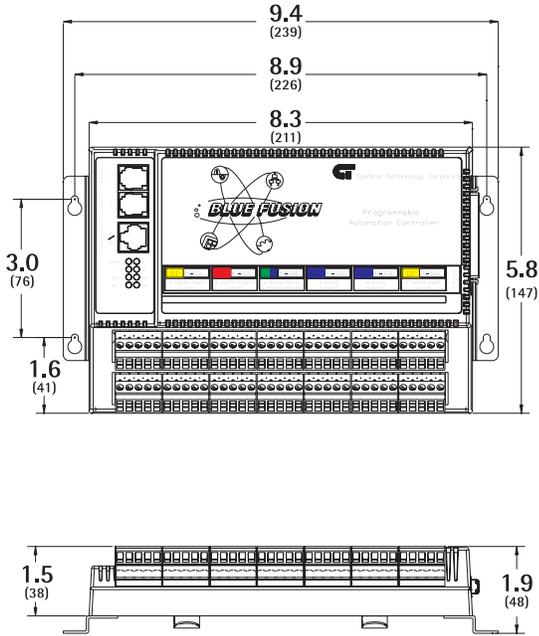
Six module bays
Accommodate a wide variety of I/O, communications, and motion modules



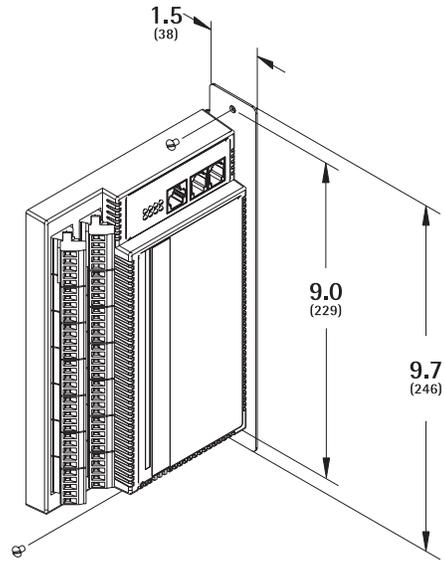
Expansion connector (Out)
Connects to additional expansion racks

Compact design
Low profile
(1.5 x 5.7 x 8.3)

Dimensions



SHOWN WITH OPTIONAL FLUSH MOUNTING BRACKET (80-5180)
 Dimensions are in inches (mm). DIN rail clips are standard.



SHOWN WITH OPTIONAL RIGHT-ANGLE MOUNTING BRACKET (80-5181)

5200 Controller Part Numbers

The part number for your controller is determined by the controller's configuration.

Part No. XX nnnn = P H C M cc

For Blue Fusion controllers (CPU), XXnnnn = BC5220, while for Blue Fusion expansion racks, XXnnnn = BX5210. Other variables in the part number are defined as follows:

	P		H		C		M		cc
	power		high speed I/O and encoder		communications		user memory		custom code
CPU	18 - 32 V	0	none	0	RS-232	1	1.5 MB NVRAM 1 MB Flash	0	00
Options	10 - 32 V	1	differential ²	1	RS-485	2	3.5 MB NVRAM 5 MB Flash	1	
			single ended ³	2	RS-232 Plus ⁴	3	3.5 MB NVRAM 9 MB Flash	2	
					RS-485 Plus ⁴	4	5.5 MB NVRAM 17 MB Flash	3	
Rack	18 - 32 V	0	none	0	none	0	base memory	0	00
Options	10 - 32 V	1							

Notes

1. Grey shaded rows in the above table represent the default configuration.
2. Adds differential encoder input and two high speed 24V (<1μsec) registration sourcing inputs.
3. Adds single ended encoder input and two high speed 24V (<1μsec) registration sourcing inputs or 4 general purpose inputs.
4. Adds high speed bus for new M2 I/O, communications and motion modules.



Capture and Control

Real-time automation control and data acquisition

Web-Enabled Automation Controllers

Analog and Digital I/O Modules

Motion Control

Quickstep™ State-Logic Control Software



Visualize

Visualization and graphical control of your process

Touchpanels

Text Displays

CT HMI™ - Interactive graphics for panels and the web



Manage and inform

Web-based integration of devices and the enterprise

CTServer™ - Information server and SQL database

CT Log™ - High speed data historian

CT EASY™ - Powerful Event and Action System

CT OPC™ - Universal OPC device interface

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Corporate Headquarters

25 South Street
Hopkinton, MA 01748
508.435.9595
888.818.2600
Fax: 508.435.2373
www.ctc-control.com

Midwest Office

12308 North Corporate Pkwy.
Mequon, WI 53092
262.243.9595
Fax: 262.243.9521

West Coast Office

4401 Sierra Morena Ave.
Carlsbad, CA 92008
760.434.7234
Fax: 760.730.9212