PCM 4200
Process Control Module

The D/3® Process Control Module (PCM) is a real-time, microprocessor based computer that provides distributed automation and control capabilities for continuous and batch process plant operations. The PCM 4200 is formfactor compatible with earlier cabinets and provides an upgrade path for PCM I, PCM II, PCM III, and PCM 2000 micros.

Each PCM can connect to a variety of I/O and field devices using numerous available protocols. The PCM 4200 can be used for applications ranging from less than a hundred to several thousand I/O points. There is no need to upgrade controllers for increased functionality. Just install the license you need.

The PCM provides autonomous control over a portion of the process plant after the PCM's databases and programs are downloaded over the network. The PCM performs all continuous, sequential, nd batch control functions and communicates with other D/3 nodes to support alarm, trending, and display functionality.

Benefits
Ease of Use
The PCM 4200 is easy to use. Turn it on and the PCM will perform its internal diagnostics and issue a request to be loaded from D/3 Manager. D/3 Manager™ is then used to load the databases and Sequence and Batch Language (SABL®) programs to the PCM. D/3 Manager makes it easy for an operator to completely reload a PCM after an outage.

Flexible
The PCM 4200 rack mount chassis can house a single PCM with an 8-slot backplane, two independent PCM 4200s or a pair of redundant PCM 4200s. And, these PCMs can perform all the functions of any previous D/3 PCM, faster.

Powerful
The PCM 4200 is more powerful and provides all the features and functions of earlier PCMs at a lower price. The PCM 4200 can communicate at 100Mbit/s, and scan I/O at 250msecs. It speeds through SABL programs and with its increased memory, more SABL programs and FlexBatch® phases can reside in the PCM. The heart of the PCM 4200 is a high-end, single board, embedded Intel® Atom™ dual-core processor with a PCI Local Bus architecture. This single board computer is specifically designed for complex automation applications.

The processor ships with 2 GB of RAM and utilizes the Intel ICH8M chipset. The PCM 4200 incorporates a 1 GB disk on a chip that is used to boot the PCM when it is first powered on. The PCM 4200 is available in several license configurations including 250, 500, 1000, 1500, and max tags. Licenses can be easily upgraded as your application grows by simply adding a license file to your D/3 System.

Features
Continuous Control Capabilities
Continuous control is executed in the PCM. The continuous control capabilities require no programming by the user. Instead, database function blocks are defined and then chained through easy to use utilities to create loops. The D/3 uses Master Devices to simplify the development and maintenance of simple to complex logic used for the control of valves, pumps, motors and other devices. The user graphically creates a Master Device that defines the device logic. Then, for each instance of a device, for example, a motor, the user only inputs the items that are different, such as the I/O terminations. A change to the Master Device logic will change every device using that logic. Master Devices provide an incredible engineering savings over ladder logic and other PLC configuration software.

Sequence and Batch Capability
The PCM 4200 executes the D/3 Sequence and Batch Language. SABL is a very powerful and versatile structured text programming language specific to process control. It is used to develop sophisticated interlocks, batch sequencing, FlexBatch phases, and even enhances the interface with operators. The PCM 4200 can store hundreds of SABL programs in its memory.

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PCM 4200 Specifications

Power Requirements	90V – 135VAC; 180V – 264VAC, 47 – 63 Hz
Input current	6A @ 115VAC; 3A @ 230VAC
Fuse protection	8A 250V
Environmental Specifications	
Operating Temperature	0ºC – 50ºC (32ºF -122ºF)
Storage Temperature	0ºC – 70ºC
Relative Humidity	< 95%, non-condensing
Memory	2 GB
Dimensions, PCM 4200 19" rack mount chassis, overall	
Height	24.5"
Width	19.0"
Depth	14.0"
Network communications, Ethernet	2, individually selectable as 10Base-T half duplex or 100Base-TX full duplex

Redundancy

Redundancy for PCM 4200 is automatic with the addition of the redundant hardware and license and the enabling of that PCM in the configuration utility. This means you can easily add a redundant PCM to the rack mount chassis while the primary is online. All the same databases and control programs run in both PCMs with no special programming required. The controllers communicate information required for staying in lock step with each other over a dedicated high speed Ethernet connection between the redundant PCMs.

Chassis

The PCM 4200 rack mount chassis can contain 2 independent PCM 4200s or a redundant pair of PCM 4200s each with 8-slot backplanes with room for up to 5 I/O communication cards. Each PCM is electrically isolated and protected and cooled by four separate fans. This allows one controller to be powered down and serviced while the other is powered up. In the unlikely event of a PCM failure, just slide out the card cage with the backplane and replace the failed component. Your MTTR in the field is mere minutes. The size of the PCM 4200 chassis with its front-only access allows it to be rack mounted into many existing 19-inch cabinets. It has been designed to fit in most PCM I, PCM II, PCM III, and PCM 2000 cabinets.

Superior I/O Support

NovaTech 8000 Series I/O includes a full range of remote I/O modules with a -40ºC to +70ºC temperature range and ISA's stringent G3 corrosion resistance. HART® information passes through the modules without additional field wiring and intrinsically safe modules are available for hazardous locations. In addition to the redundant Ethernet communication modules, NovaTech 8000 I/O is available in a 1 to 6 I/O module redundant configuration. D/3 also directly supports I/O families from Schneider and Siemens and a wide variety of I/O protocols including Modbus/TCP, EtherNet/IP, Foundation Fieldbus, and DF-1.

Intelligent Utility Assembly

The PCM 4200 Intelligent Utility Assembly is used to monitor the health of the PCM and to switch control to the backup PCM in case of a failure. Unlike other designs, the PCM 4200 Intelligent Utility Assembly is not a single point of failure. In a redundant configuration, if a failure were to occur on one Utility Assembly, a bumpless transfer would occur resulting in the backup PCM taking control. The failed PCM can then be slid out and components replaced while the backup PCM is online. The Intelligent Utility Assembly uses a powerful micro controller to implement many of the functions performed by discrete components in earlier designs. This provides greater reliability while executing more sophisticated watchdog and failover logic.

Micro Select Assembly

The Micro Select Assembly in the PCM 4200 chassis contains minimal hardware components—a selector switch and associated LEDs used to indicate the position of the selector switch and the selected PCM. The assembly is used to manually switch control from one PCM to the other or provide automatic failover in the unlikely event of a PCM failure. If the Micro Select Switch should fail, control is maintained with the selected PCM and the assembly can be replaced with both PCMs operational.

Ethernet

Peer to peer communications between PCMs and between Display Control Modules speeds across the high-speed Ethernet. Two 10Base-T/100Base-TX Ethernet ports are provided on the main CPU board. These two Ethernet ports can be used to provide redundant communication with all D/3 nodes. A third Ethernet port is available on a daughter board for a 100Mbit/s communication link (R-link) connecting redundant PCM 4200 controllers.

Power Supplies

The PCM 4200 contains up to two 300W hot-swap redundant AC power supply modules for each PCM. Two power supplies provide load sharing and redundancy.
• MTBF of 100,000 hours
• Over voltage protection
• Thermal protection
Contact the factory for optional 48VDC power supplies. An optional uninterruptible power supply (UPS) is also available for the PCM that permits it to continue to function in the event of short power losses.

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