



Cat® PMC-R 2.0

ROOF SUPPORT CONTROL

FUNCTIONAL DESCRIPTION:

APPLICATION

The intrinsically safe Cat® PMC-R 2.0 control units are specifically designed to be used on shearer or plow faces to provide high levels of longwall automation.

Each roof support is equipped with one PMC-R 2.0 control unit and solenoid driver to operate the in-shield hydraulic functions and peripheral components, such as sensors for cylinder pressure and stroke length, shield inclination and personnel proximity detection.

The PMC-R 2.0 unit controls and displays all functions of a roof support and serves as the interface between operator and machine (HMI).

INTERACTIVITY

This interactive system allows users to execute single shield and automatic functions, as well as perform remote control operations from anywhere in the mine including the surface. To provide feedback for the operator on the longwall, important process values are continuously displayed on a full-color display.

HIGH-SPEED DATA TRANSMISSION

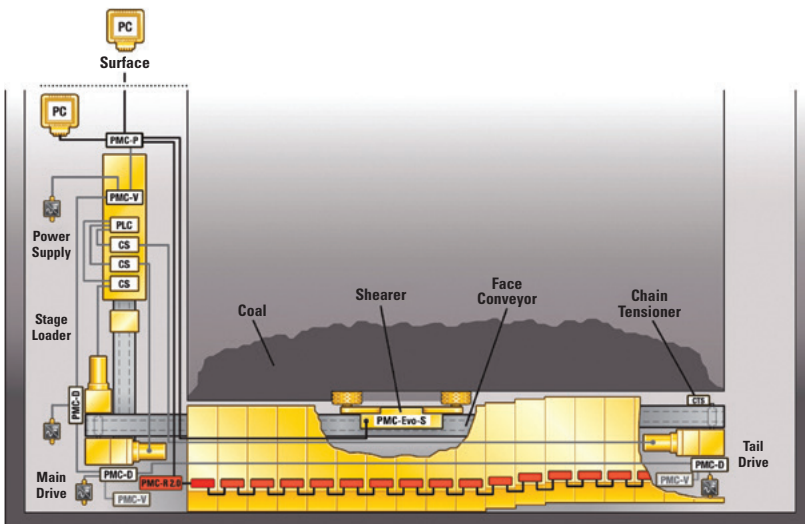
The PMC-R 2.0 control unit delivers fast 100M/Bit Ethernet communication, enabling real-time system feedback and data refresh rates for remote control operation.

The low latency connection also means process data values are updated much faster for higher resolution when data logging and reviewing historical trending. An enhanced user experience is provided when viewing Cat 3D VSoftware applications as the data is refreshed at a higher frequency resulting in a smoother and more accurate representation of the equipment underground.

ADVANCED FUNCTIONALITIES

The high bandwidth connection enhances machine-to-machine integration which provides for advanced automation functionality. More complex messages can be exchanged between the equipment, creating holistic integration and interoperability resulting in increased performance and reliability.

System Layout of PMC-R 2.0 System (Shearer Longwall)



PMC-R 2.0 Roof Support Control

Main Features

ENHANCED COMPUTING POWER

- Cat A6 family controller for enhanced communications and safety
- Advanced Processor with 260 MHz clock speed (9.5 × higher than predecessor)
- 8 MB internal Flash memory and 32 MB external Flash memory

EXPANDED COMMUNICATIONS CAPABILITIES

- High speed Ethernet backbone for enhanced remote functionalities with direct data response, for future-proofed automated face operations
- 100 Mbit/s Ethernet communication between each shield and the mine network
- Faster diagnosis through high-speed communication between PMC-R 2.0 controls and diagnostic applications
- Integrated wireless technology for enhanced connectivity options
- Integrated infrared receiver
- CAN interface for enhanced system expansion

OPERATOR CONVENIENCE AND SERVICEABILITY

- Improved graphical 66 mm (2.6 in) LCD display with 65 K color and 320 × 240 pixel
- Display area enlarged by 160% (50% more information at a glance) compared to predecessor
- Improved display concept: intuitive interaction, enhanced help functions and full text readout
- Multiple “hot-key” for direct menu and diagnostic access with operator feedback (sound, pressure point and activation LED)
- Multi-language support
- Easy, cost-effective in-service component repair for reduced cost of ownership
- 50% reduction in weight compared to model PMC-R

ROBUST DESIGN

- Robust and highly resistant metal housing with chrome plating
- IP65/68 rating
- Compatible with existing PMC-R style brass bar for ease of upgrade

ENHANCED SAFETY

- SIL 2 certified
- Separate emergency and local lock-out switch

FUTURE-PROOFED CONCEPT

- Design concept with CAN extension devices and Ethernet ports allows update of additional functionalities and features without a controller hardware upgrade, simply plug and play the new devices.

PERIPHERAL EQUIPMENT

- New isolation coupler with/without power supply connection
- CAN based code plug
- Solenoid driver board – with multiple connections for enhanced roof support automation
- Solenoid driver, reed rod and pressure sensor can be used from previous PMC-R version
- Personal Proximity Detection (PPD) system
- Infrared transmitter and sensors for shearer position tracking
- LED warning light
- Ethernet media convertor for diverse data communication with mine wide fibre and copper networks
- Shield height measurement system

GLOBAL CERTIFICATION

- Europe: ATEX
- United States: MSHA
- Russia: GOST
- Australia: IECEx, ANZEx
- China: MA
- Additional certifications on project demand

CPU/Processor Data

Parameter	CPU Data
CPU	Cat A6 family
Clock Frequency	Up to 260 MHz
Cores	3 core
Memory	8 MB internal FLASH ROM 32 MB external FLASH ROM

Electrical Data

Parameter	Typical Value	Maximum Ratings
Supply Voltage	12V DC	9V–13.2V
Power Supply Current	Not applicable	8.1 A (MSHA); 2.5 A (RoW)
Power Consumption	170mA/@12V	230mA/@12V

Environmental Data

Parameter	Symbol	Typical Value	Maximum Ratings
Operating Temperature	T _{amb}	20° C (68° F)	–20° C→+40° C (–4° F→+104° F)
Storage Temperature	T.	20° C (68° F)	–20° C→+60° C (–4° F→+140° F)

Connector

Type	Symbol	Amount	Maximum Ratings
SKK 24 mini	X1-X6	6	8 A
SKK 24 mini	Y1-Y6	6	8 A

Optical Devices

Type		Amount	Maximum Ratings
LCD Display	Shield information	1	66 mm (2.6 in) – 320 × 240 pixel – color 64 K in use
Infra-Red LED	Shearer position detection	1	IRDA Standard receiver
LED indication 1	Status HMI	3	On/Off/Blinking – 1 × red, 2 × green
LED indication 2	Wireless Status*	2	On/Off/Blinking – 1 × green, 1 × yellow
LED indication 3	Big Jumbo LED	3	On/Off/Blinking – 1 × red, 1 × green, 1 × yellow
LED indication 4	Key Status	31	On/Off/Blinking – green

Acoustic Devices

Type	Amount	Maximum Ratings
Beeper	1	>= 90 dB

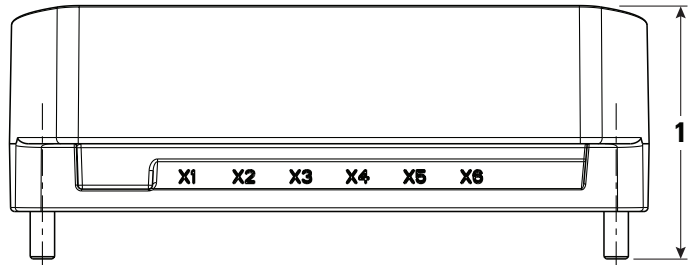
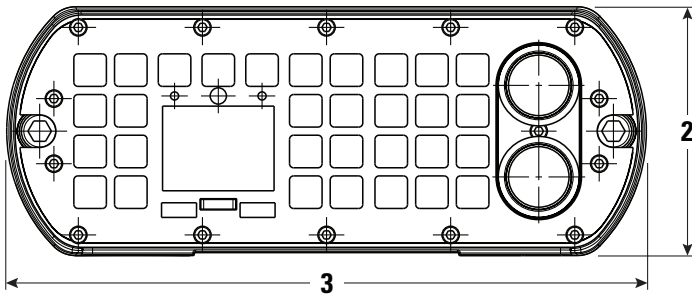
*Radio approval pending.

PMC-R 2.0 Roof Support Control

Dimensions

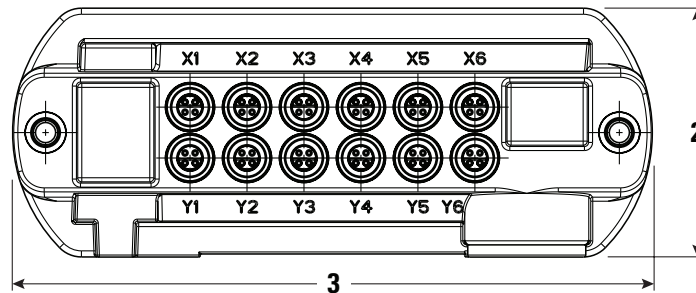
All dimensions are approximate.

Front and Side View



1 Width	124 mm	4.88 in
2 Height	122 mm	4.80 in
3 Length	314 mm	12.36 in

Rear View



2 Height	122 mm	4.80 in
3 Length	314 mm	12.36 in

SKK Connector fits to existing Cat brass bar.

For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at www.cat.com

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