ABB MEASUREMENT & ANALYTICS | DATA SHEET

Remote Modular Controller (RMC)

Integrated solutions based remote controller

Introduction

The RMC-100 controller design is based on our goal to improve modularity and scalability for our customers. The controller is DIN rail mounted, which allows more packaging options than our prior XSeries platforms.

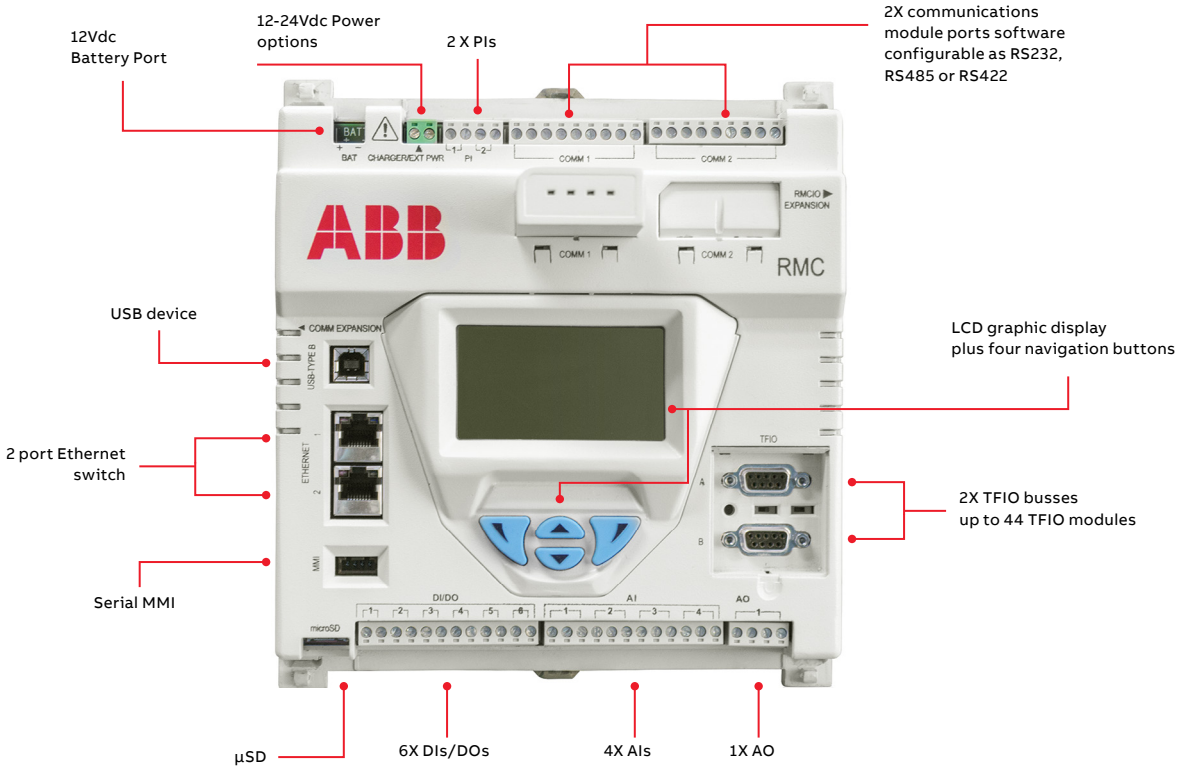
With these goals in mind, ABB has also designed a new "Total Package" solution, the XCORE, to house the RMC-100. The XCORE may be supplied as a standard enclosure with configurable options, or as a completely custom design that is built and assembled to individual customer requirements.

There is no other platform in the industry with such a dynamic range. A single RMC-100 is capable of managing liquids and gas measurement, automation, and asset data concentration in large production and transmission facilities, all the way down to an RTU for smaller systems. This eliminates the uncertainty in trying to choose a closed-ended model of a product family that will offer the adaptability needed to survive an ever-changing industry. The RMC-100's expandability and scalability will ensure it will remain an asset for many years into the future.

General features

The RMC-100 is a new class of controller with backward compatible functionality based on ABB Totalflow software, communications, and IO technologies. The RMC-100 is the first in a series of major upcoming steps into a next generation G5 platform. The existing end user knowledge base, work processes, and benefits that Totalflow customers trust are utilized within the G5 series.

- DIN Rail mount enclosure
- Class 1, Div 2 area classification
- Operating temperature -40 °C to 70 °C
- 300MHz or 720MHz options available at purchase
- Floating point co-processor
- Extensive serial port extensibility via factory certified Ethernet-to-serial converters
- On-board 12Vdc lead acid battery charger controller compatible with solar panel inputs
- 9-30Vdc external power capability
- Dual software images (active/standby)
- Backward compatible implementation of G4 software application suite
- Backward compatible support for Modbus and Totalflow native protocols
- Forward compatible support for next gen IO modules and communications expansion options



General specifications

Specification item		Description
Operating voltage range		12 - 24 Vdc (+/- 20% variation, acceptable input range 9 – 30 Vdc)
Nominal power		1.5 watts (5A maximum with external options)
Dimensions	Width Height Depth Installed depth	7.56 inches (19.20 cm) 8.31 inches (21.11 cm) 1.72 inches (4.37 cm) On DIN rail: 1.79 inches (4.55 cm)
Input / Output		6 DI/DO, 2 PI , 4 AI, and 1 AO
Maximum battery capacity		30 Ah
Mounting		DIN rail mounts on a wall or enclosure that meet the environmental ratings for the environment of the location.
Operating temperature		-40 °C to 70 °C (-40 °F to 158 °F) (-40 °C to 60 °C (-40 °F to 140 °F) with battery connected) Storage temperature of -40 °C to 85 °C (-400 °F to 185 °F) or greater TFIO of -40 °C to 70 °C (-40 °F to +158 °F)
Electromagnetic compatibility		Emissions (Other): FCC CFR 47, Part 15, Subpart B, Class A (FCC Emissions) IECS-03, Issue 4, CAN/CSA-CEI/IEC CISPR 11 Class A (Canada ITE Emissions) AS/NZS CISPR 11, Class A (Australia/New Zealand)
EMC Directive 2004/108/EC		**Emission EN 61326-1: Radiated and conducted Class A** Immunity EN 61326-1 to: EN 61000-4-2, ESD, 8 kV Air, 4 kV Contact EN 61000-4-3, RFI, 10 V/m EN 61000-4-4, EFT, 1 kV to AC, 0.5 kV to DC & Signals EN 61000-4-5, Surge, 2 kV CM, 1 kV DC & Signals EN 61000-4-6, Conducted, 0.15-80 MHZ, 3 Vrms EN 61000-4-8, Magnetic Fields, 3 A/m 50/60 Hz
Hazardous location certification (North America)		According to standards for the assurance of fundamental safety requirements in the United States of America: • UL No 61010-1: “Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements” • ANSI/ISA 12.12.01: “Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations” • ANSI/UL 60079-0: “Explosive Atmospheres – Part 0: Equipment – General Requirements” • ANSI/UL 60079-15: “Explosive Atmospheres – Part 15: Equipment protection by type of protection ‘n’” • UL No 50E: “Enclosures for Electrical Equipment, Environmental Considerations” According to CSA standards for the assurance of fundamental safety requirements in Canada • C22.2 No 61010-1:12: “Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements” • C22.2 No 0-10: “General Requirements” • C22.2 No 213-M1987: “Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations Industrial Products” • C22.2 No 60079-0:11: “Explosive Atmospheres – Part 0: Equipment – General Requirements” • C22.2 No 60079-15:12: “Explosive Atmospheres – Part 15: Construction, test and marking of type of protection ‘n’ electrical apparatus” • C22.2 No 94-2: “Enclosures for Electrical Equipment, Environmental Considerations” • C22.2 No 60529:05: “Degrees of protection provided by enclosures (IP Code)”

Processor and memory features

The RMC board integrates a processor that is available in two speeds: 300 MHZ in the standard controller or purchase upgrade of 720 MHZ with 256 MB mDDR M SRAM, 32 M Flash and 256 bytes of serial E2PROM. Table 6 provides the memory components of the electronic board.

The main board includes:

Component	Description
Flash	A 32-bit flash is used for flash device software image, configuration and measurement data in the AM3356.
RAM	A low power DDR memory (LPDDR) (2 Gb) is used for RAM storage on the processor.
Clocks	A high accuracy/stability TCXO 32.768k Oscillator is specified to ensure accurate clocks / RTC for the AM335x for measurements (+/-5 ppm accuracy, 5ppm drift over time) A standard 50 ppm Oscillator at 25 MHZ is used.
LCD Interface	Parallel 128 x 64 Graphic LCD with backlight
Directional button Interface	Dedicated 4 button interface: up, down, left, and right
Core processor	Cortex A8 processor / 256 MByte mDDR
Memory	128 Mbyte mDDR 1Gb EMMC Flash for application data and configuration files permanently storage 256 byte E2PROM to storage factory supplied registry (MAC address, etc.)
Operating speed	300 MHZ or 720 MHZ option at purchase time
Communication ports	2 software configurable RS232/RS485/RS422 pluggable serial ports with 2 communication modules 1 USB 2.0 device interface 2-port onboard 10/100 Mbps Ethernet switch 1 MMI port backward compatible with G4 MMI port
Digital input/output	6 open/drain outputs; each pin is configurable as input or output
Analog inputs	4 single-ended channels, 0-10 Vdc or 0-20mA loop
Analog output	1 four-wire analog output, 0-10V/4-20mA (non-isolated, 4-20mA)
Analog to digital resolution	24-bit maximum resolution (0.00038% FS) 24-bit nominal resolution (0.0015% FS)
Pulse inputs	2 Dedicated Pulse Inputs with configurable de-bounce (with no de-bounce 0 to 20 KHz; with de-bounce 0 to 550 Hz)
I/O scan rate	Configurable up to 4 times per second
I/O expansion interfaces	2 independent TFIO module buses 1 RMCIO Expansion interface (Available for future use) 1 Type-A USB COM expansion (Available for future use)
Power	12 Vdc d Lead Acid (SLA) battery input 9 – 30 Vdc External power source (no battery)
Charger	Solar: 12Vdc solar charger controller; solar panel maximum 30 watts (60 ˚C) External: Maximum 26Ah SLA battery when using integrated charger controller
Security switch	On/Off supported in combination with two configurable security code levels. Security switch functionality is backward compatible with G4 XSeries
Time-based stability	± 7.5 ppm (parts per million)

Communication ports

Ports configuration for local communication support either local access from a host system or connection to external devices or peripherals.

Ports configured for remote communication connect the RMC to a communication network and allow remote access or management over that network.

The RMC has six onboard communication ports:

Port name	Use
COMM 1 and COMM 2	Remote communication configurable for either RS232, RS485 or RS422
MMI	Local communication
ETHERNET 1	Local communications (high-speed TCP/IP-based local operator interface) Remote communication using TCP/IP connections over a network (Management port) 100 Mpbs or 10 Mpbs Full duplex
ETHERNET 2	Daisy chain other Totaflow equipment or connect Ethernet-to-serial devices 100 Mpbs or 10 Mpbs Full duplex
USB 2.0 (full speed and high-speed mode)	Local communication (high-speed serial local operator interface)
COMM EXPANSION (future use)	Provide interface functionality to a variety of expansion interfaces such as COMM modules, USB Host and Ethernet

On-board IO

Analog input features)

Electrical specification (each point)	Value
AI Mode	Voltage / Current
AI Input Voltage	0 – 30 Vdc
AI Input Current	0 – 20 mA
AI Input Impedance (voltage mode)	90kΩ typical
AI Input Impedance (current mode)	255Ω typical
AI Current Source Max	25mAdc max
AI Resolution	24-bit
AI Input Protection	32 Vdc typical

Analog output features

Electrical specification (each point)	Value
AO Input Voltage	0 – 30 Vdc
AO Output Current	0 – 24 mA
AO Sink to Source Resistance	154 Ω
AO Voltage Sourcing	V input to RMC – 0.6 V typical
AO Current Sourcing	0-24 mAdc
AO Output Resolution	16 Bit Resolution DAC Output
AO Output Protection	32 Vdc typical

Pulse input features

Electrical specification (each point)	Value
PI Open Circuit Voc	5 Vdc
PI Pull up Resistance	10kΩ
PI Input Capacitance in Low Pass Filter Mode	0.1µF
PI Input Frequency Range with De-bounce Enabled	0-550 Hz
PI Input Frequency Range with De-bounce Disabled	0-20 kHz

Digital input and output

Electrical specification (each point)	Value
DI/DO Voltage	0 – 30 Vdc
DI V low threshold	0.8 Vdc default, configurable (0-30 Vdc)
DI V high threshold	2.4 Vdc default, configurable (0-30 Vdc)
DI V pullup	3.4 Vdc +/- 0.3 Vdc
DI Iminsink	0.2mA
DI/DO Rinput	75kΩ nominal
DI/DO leakage	450uA typical
DI/DO Vtvs	32Vdc typical
DO Type	FET Open Drain (OD)

Software modularity

The software design represents significant modularization through use of object oriented design principles. This allows a flexible and stable real time environment. Totalflow supplied objects (applications) can be enabled in our factory or by the user, one or more times on the same device.

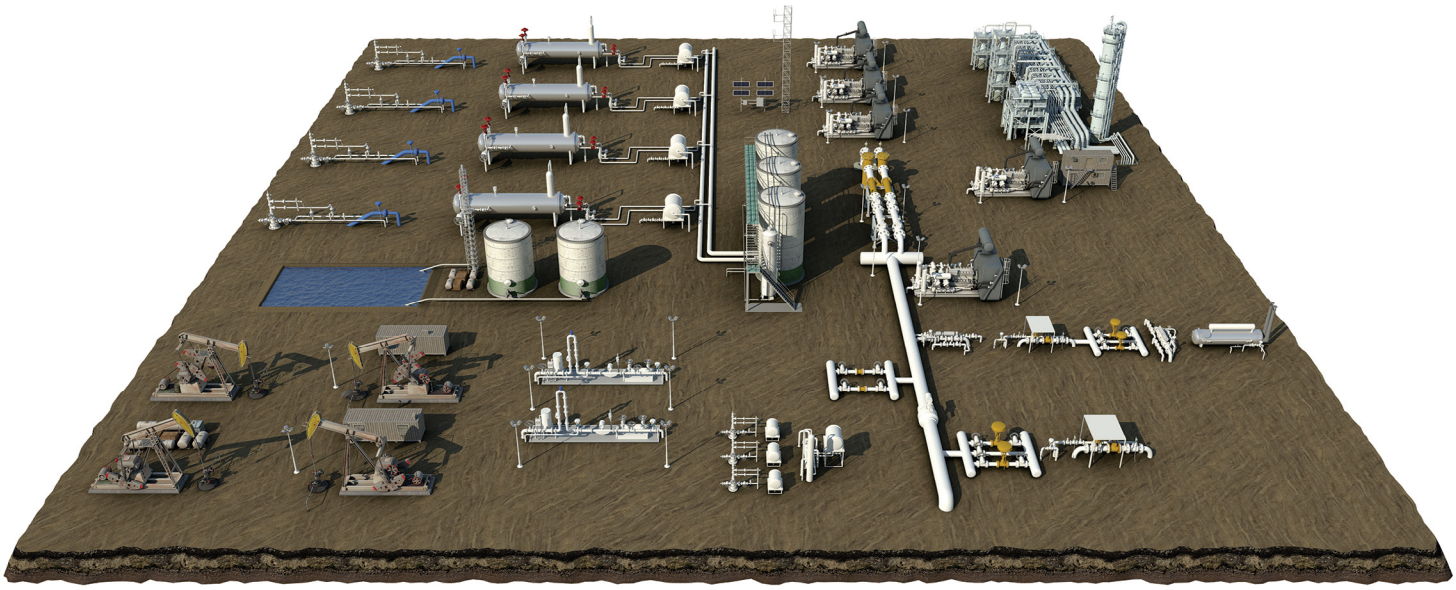
Supported software applications continually grow. A sample of standard applications include:

- AGA3 orifice meter run
- ISO 5167 orifice meter run
- VCone meter run
- AGA7 meter run (rotary/turbine/ultrasonic)
- Coriolis gas application
- Liquid measurement (Linear): Oil, light hydrocarbon, or water
- Real-time Data logger (trending)
- RAMS (Alarming, Exception Reporting)
- Operators (simple custom math / logic)
- Selectable Units (user selectable engineering units)
- Tank level application
- Therms master application (host polling for gas quality)
- Therms slave application (slave receiving gas quality)
- NGC Client (Ethernet connection to NGC for gas quality)
- XMV (MODBUS multivariable) Interface (for Multiple DP meter runs)
- Multiple protocols (Totalflow native low power, Modbus slave (binary/ASCII), Modbus master (binary/ASCII), Enron Modbus, LevelMaster, ABB 266 XMV Multivariable)

IO expansion

TFIO modules

The RMC provides added hardware functionality by allowing the addition of modular I/O as needed with two independent TFIO interfaces, TFIO A and TFIO B. Each TFIO interface supports up to 22 TFIO modules (44 total), meaning you can support more applications across the entire well pad.



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