

# Application Module

## Hardware expansion module for the imc CRONOS system family

Data Sheet Version 1.4

The purpose of the Application Module is to integrate "external channels" into an imc CRONOS *compact*, imc CRONOS *flexor* or imc BUSDAQ *flex* system. These channels, originating from "third-party" measurement devices or systems, are connected via standard hardware interfaces (Ethernet, RS-232, RS-485, RS-422).

Examples of such sources include:

- special complex sensors
- "third-party" measurement devices
- bus systems (e.g. Fieldbusses)

The standard interfaces supported include, in particular:

- Ethernet
- serial interfaces (RS-232, RS-485, RS-422)

The systems to be integrated are typically customized or application-dedicated devices from third-party manufacturers, and the integration is accomplished by means of a standard hardware module (APPMOD). On this module there is a dedicated processor for which a special application is programmed, and implemented either as a contracted service by the manufacturer, or by a qualified distribution partner or even by specially trained customers using development tools provided. With the help of standardized mechanisms, this customized hardware- and software expansion is flexibly supported by the standard device software (imc STUDIO) without the need for a special version or release of this device software.

The hardware of the module's all-purpose standard version supports both the Ethernet internet and an all-purpose serial COM-port. The associated driver chips and connectors (RJ45/DSUB-9) for both are provided. Concrete applications are typically programmed for exactly one of these two interfaces and not for independent operation of both at the same time (in the sense of multi-tasking). Such customized application-firmware is then loaded "dynamically" in the Application Module in conjunction with the standard device software (imc STUDIO). Since it is quite possible for multiple variants of such application firmware to be managed and utilized, this all-purpose module is capable of performing a wide variety of functions as well as operating varying interfaces, by loading the corresponding system configurations "sequentially".

The imc measurement device exchanges data via the following mechanisms:

- channels ("FIFO-channels")
- p.v. ("process vector")-variables
- display-variables

Similar to the field bus interfaces, the APPMOD module is a configuration option: Devices can only be equipped ex-factory at time of order. Exchanging or retrofitting the module to existing systems in the field and by the user is not supported.

**imc CRONOS *flex*- frame less expansion, flexible modularity**

An imc CRONOS *flex* system uses EtherCAT as an "internal" system bus for connecting various modules to the main base unit (CRFX-400 / CRFX-2000G). With the system bus, all imc CRONOS *flex* modules are guaranteed to be synchronized with each other. This allows various modules to be either connected in one central block or connected via standard network cable in a spatially distributed system.

A base unit can be configured with up to three Application modules ex factory.



imc CRONOS *flex* distributed system

**imc CRONOS *compact*- modular measurement system**

imc CRONOS *compact* is a modular and reconfigurable hardware a "rack"-based series of devices available in a variety of housing sizes and device frames. imc CRONOS *compact* (CRC) plug-in-modules can be inserted into the system (CRC-400 / CRC-2000G).

Once the modules are plugged into a portable or rack-based housing, they are electrically connected to the CRC-system and are supplied by the system with power. The data storage will be managed by the CRC-system.



imc CRONOS *compact* plug-in-modules

Rack-based modules ("-R") differ from the standard modules only in terms of the front panel's attachment mechanism.



imc CRONOS *compact* portable housing

**imc BUSDAQ *flex*- flexible and intelligent multi-bus data logger**

imc BUSDAQ *flex* system is a base unit with 2 CAN nodes and one or more extensions.

Depending on the housing variant, a basic unit with up to five application modules can be configured.



imc BUSDAQ *flex*-4 with one extension

**Overview of available varieties**

Order code		article number
• CRFX/APPMOD-NET-COM	1x Ethernet or 1x serial interface for the CRFX base unit	1190190
• CRFX/APPMOD-NET-COM-ET	version in extended temperature range	1191104
• CRC/APPMOD-NET-COM	1x Ethernet or 1x serial interface for CRC	1170242
• CRC/APPMOD-NET-COM-ET	version in extended temperature range	1171XXX
• CRC/APPMOD-NET-COM-R	1x Ethernet or 1x serial interface for CRC-RACK	1170162
• CRC/APPMOD-NET-COM-R-ET	version in extended temperature range	1171XXX
• BUSFX/APPMOD-NET-COM	1x Ethernet or 1x serial interface for BUSDAQ <i>flex</i>	1240017

## Technical Specs - imc APPMOD

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Embedded Processor		
Parameter	Value	Remarks
Embedded processor	Freescale Power PC MPC5200B Core CLK 384 MHz	
RAM	64 MB 48 MB	total memory available for the application
Flash	16 MB	only for the operation system
Operating system	Linux	

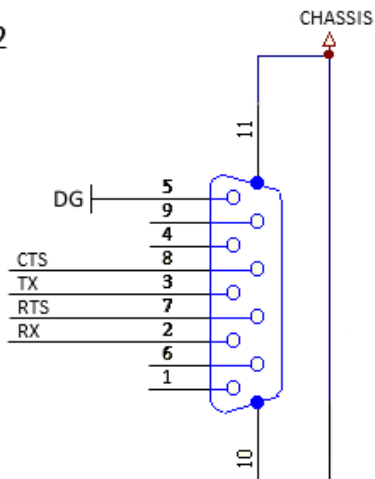
General		
Parameter	Value	Remarks
Interfaces	1x Ethernet interface and 1x serial interface  3.5 mm cinch	Specific applications can each use exactly one of the two interfaces. Simultaneous use of both interfaces requires a system with two interfaces.  service-jack (RS232, 115 kBaud, Tx, Rx, GND) console for development, debugging
Module width	requires 1 slot	fixed installation, ex factory
Modularity	order option	upon request
Max. amount of interfaces in one system	3 8 1 2 3 5	totally in one CRFX base unit totally in one CRC system totally in one BUSFX-4 system totally in one BUSFX-6 system totally in one BUSFX-8 system totally in one BUSFX-12 system

Ethernet Variant		
Parameter	Value	Remarks
Terminals / Nodes	1	
Terminal connectors	1x RJ45	
Topology	bus	
Transfer protocol	TCP / IP	IEEE Norm 802.3
Transfer medium	Ethernet	
Data flow direction	sending/receiving	
Baud rate	100 MBit 10 MBit	100BaseT (Half- and Full-duplex) 10BaseT (Half- and Full-duplex) Auto-sensing
Isolation strength	60 V	to system ground (CHASSIS)

Serial interface variant		
Parameter	Value	Remarks
Terminals / Nodes	1	
Terminal connectors	1x DSUB-9	
Baud rate	300, 1200, 2400, 4800, 9600, <del>14400</del> , 19200, <del>28800</del> , 38400, 57600, 115200, 230400	special bit-rates: 14400 and 28800
Isolation	galvanically isolated	to system ground (CHASSIS)
Isolation strength	60 V	nominal working voltage
Operation modes	RS 232 RS 485 / RS 422	flexibly configurable: multi-protocol transceiver
RS232 mode		
Parameter	Value	Remarks
Topology	point-to-point	
Transfer protocol	RS232	
Signal type	Tx, Rx, GND CTS, RTS	Basis signals Handshake, flow control
Data flow direction	sending/receiving	
Byte format	7 or 8 data bits, 1 or 2 stop bits, none/odd/even parity	
Flow control	XON/XOFF, RTS/CTS	
RS485/422 mode		
Parameter	Value	Remarks
Topology	Bus	
Transfer protocol	RS485	compatible to RS422
Operating mode	Half- and Full-duplex	activated via software
Signal type	2x Tx, 2x Rx, GND	basis signals, differential
Data flow direction	sending/receiving	
Termination	120	activated via software

Pinning RS232

RS232



PIN	Signal	
1	n.c.	
2	RX	
3	TX	
4	n.c.	
5	DG	Digital Ground
6	n.c.	
7	RTS	
8	CTS	
9	n.c.	