



ECM2

PROCESS CONTROL PLATFORM FOR STAND-ALONE MASTER CONTROL AND FULL PROGRAMMABILITY

The ECM2 control platform is ideal for high-density commercial and industrial applications and for remote monitoring applications with high I/O point counts. The ECM2 can be implemented as a complete control platform for a single location or tool or for a complete manufacturing line. With the ability to handle detailed execution tasks through various commonly used programming languages as well as to run certified programmable safety interlocks, the unit can be used to manage all required tool control needs.

Based on case studies, the compact footprint of the ECM2 can typically save users 15-40% on their automation and control costs versus other solutions. In addition to lowering automation and control costs, the ECM2 has been shown to reduce energy consumption by 17% compared to comparable Programmable Logic Controllers (PLC) based control architectures.

Features & Benefits

- Full programmability, simple to program & faster time to market
- Compact, high density design reduces the number of controllers required, saving cost and tool real estate
- Adjust and reuse interlocking schemes on the fly, saving engineering time and costs
- Data monitoring & control interfaces utilize Modbus/TCP, DeviceNet™, EtherCAT®, or web browser for migration and flexibility
- Stand-alone real-time master controller, simple to support
- Designed with analog, digital, temperature, serial, and safety I/O connectivity in a single controller for flexibility and ease of use
- Energy efficient, found to be 17% more efficient than similar PLC type solutions

Programmability

The ECM2 provides various programmability options and can utilize other commonly used programming applications, virtually eliminating the need to learn and support new programming languages & applications.

In addition to the below applications, the ECM2 supports on-board analytical packages such as Statistical Process Control (SPC), advanced Multivariate SPC, advanced temperature control, etc.

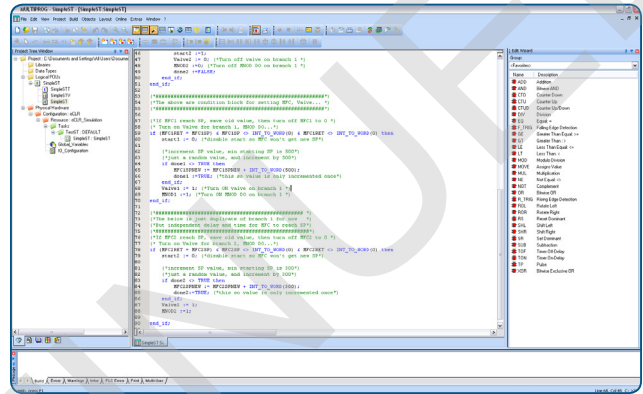


Programming Applications

- IEC61131-3 Functionality:
 - Ladder Diagrams
 - Function Block Diagrams
 - Structured Text
 - Instruction List
 - Sequential Function Chart
- Performance
 - 1000 64-bit floating point divides in ~180usec.
- Development Platform
 - Multiprog Express/Pro
- Ability to export Matlab/Simulink, Visual Studio, etc.
- Support PLCOpen Structure Text in XML format for portability between PLC
- Programmability via direct C++ on WinCE board
- Supports exporting of Matlab/Simulink code
- Supports exporting of Visual Studio applications

Programmable Interlocks

- SIL3 (IEC61508) certification achieved Q3, 2009
- Estimated typical savings per tool change: (2-3 iterations)
 - \$20-40k USD
 - 4-12 weeks reduced time-to-market
- Logic implementation via:
 - Truth table
 - Visim MS-Visio based downloadable CSV file (over Webpage)



User friendly IEC61131-3 programming environment, with international language support

Specifications

Physical			
Dimensions	2U(h) x 13"(w) x 10"(d)		
Ethernet Connector	100 BaseT auto-switched		
RS-232 Connector	TXD, RXD; DB9 connector		
Material Chassis	Plate/chromate		
Material Front	Paint black		
Clearance	Side and back only		
Cooling	Internal Fan		
Environmental			
Operating Temperature	0 to +45°C		
Storage	-40 to +85°C		
Humidity	5 to 95% non-condensing		
Altitude	Up to 2000 meters		
MTBF Minimum	10 years @ 80% confidence level (100K Hours @ 80% confidence level)		
Communication Protocol			
Protocols Supported	Master	Slave	Specifications, Slave Only
Modbus/TCP	Coming soon	Coming soon	Modbus/TCP Server/Slave Identical Register Set as Modbus RTU Slave Compatible with 10/100 BT Ethernet Interface Modbus Functions Supported: 1,2,3,4,5,6,15,16, 22, 23, 43
DeviceNet™	Yes	Coming soon	Type II Slave Device. Support Explicit and Poll I/O Messaging of pre-defined Master/Slave Connection set. Support up to 15ms scan rate with max IO configuration
EtherCAT®	Coming soon	Yes	EtherCAT Slave: CANopen over EtherCAT (CoE), PDO Mapping Support EtherCAT Device Description File (XML) Two Dedicated EtherCAT Ports. Support up to 1ms deterministic response time for real-time control
Ethernet®/TCP	N/A	N/A	Configuring, Diagnostics and Monitoring (Web Browser based) 10/100 BT Ethernet Interface
Profibus®	Coming soon	Coming soon	Profibus DP Supports data rates up to 12Mb/s
Power Input			
Main Power Supply Power Consumption	18VDC – 30VDC Typical – 1.2Amp Max – 10Amp		Internally limited
Power Supply Analog Power Consumption	±15V @ ±1% Max – 6.7Amp		Internally limited

Specifications (cont.)

Fuse Status Detection and Power Measurements		
Fuse Detection	4 Fuses: 1. 24V_PWR_1 3. 24V_PWR_3 2. 24V_PWR_2 4. 24V_FUSED	Can be expanded to up to 48 by different distribution board design. Fuses are reported as pass or fail to the application software.
Fuse Detection Thresholds	17V for the 24V powers 12.5V for 15V powers	
Power Measurements	1. 24V_Main 2. +15V 3. -15V	High and low limits for each power are configurable via application software. Power measurements are reported to the application software and compared against the predefined limits.
Power Measurements Resolution	10 bits	
Programmable Interlock		
Certification	SIL3	Redundant PLD design, Implement 1 out of 2 programmable logic architecture
Inputs	64 + 1 (for watchdog function)	Active high or low contact inputs, jumper selectable in groups of 12
Output Relays	33 dry contact type N.O.	32 are monitored
Output Current Standard Output High Power	2A 16A	Software monitored
Mode of Operation	Run / Prog	Run- normal operation mode. Prog - Load the Interlock Logic and Access special FPGA registers for debug
Classic Interlock		
Relays		Total input and output relays. Based on customer schematic. High power NO relay for WD functionality
Logic	Hardwired on PCB	
Digital Input		
Number of Inputs	210	Shared with outputs, each functions as I/O
Sink Input Current Input Low Voltage Range(ON) Input High Voltage Range(OFF)	Max -2.2mA at $V_{in}=0V$ Min 0V to Max 9.2V Min 9.9V to Max 24V	
Source Input Current Input High Voltage Range(ON) Input Low Voltage Range(OFF)	Max 2.35mA at $V_{in}=24V$ Min 12.5V to Max 24V Min 0V to Max 11.7V	
Debounce Filter	0 msec to 999 msec	1 msec resolution
Isolation	2.5KVrms	
DI Refresh Rate	1msec	
Digital Output		
Number of Outputs	210	Shared with inputs, each functions as I/O
Output Type	Open collector	Pull up value – 10K
Output Drive Current	200 mA per output, maximum 750 mA per 6 outputs	Sinked/sourced from 24VDC
Sink Output High Voltage Output Low Voltage	Min 23.7V @ 0.16mA Max 0.3V @ 200mA	Pull up value -10K
Source Output High Voltage Output Low Voltage	Min 23.7V @ 200mA Max 0V @ 0μA	Pull down value -10K
Isolation	2.5KVrms	
Max Update Rate	1msec	
EMC Protections	± 2kv (Immunity to EFT/Burst)	
Over Current Protection Each Channel Total	~1.5A ~10A	DO driver internal current limit. Current limit circuit
Polarity	Sink / Source, Hardware selectable per 16 IOs for DIO 0-185, per 2 IOs for DIO186-207, per 1 IO for DIO208, 209.	
Logic	Hardwired on PCB	

Specifications (cont.)

Analog Input		
Number of Inputs Single Ended Differential	64 32	
Resolution 0-5V ±5V 0-10V ±10V	16 Bit 16 Bit 16 Bit 16 Bit	
Accuracy Single Ended 0-5V ±5V 0-10V ±10V Differential 0-5V ±5V 0-10V ±10V	0.1 % Full Scale (5V) 0.05 % Full Scale (10V) 0.1 % Full Scale (10V) 0.05 % Full Scale (20V) 0.1 % Full Scale (5V) 0.05 % Full Scale (10V) 0.1 % Full Scale (10V) 0.05 % Full Scale (20V)	For 0.05% calibration is needed For 0.05% calibration is needed For 0.05% calibration is needed For 0.05% calibration is needed
Input Latency Total	<200µSec	
Input DC Resistance	0.4MΩ (Differential) 0.2MΩ (Single ended)	Pull Down Res
-3db Filter Frequency	0.76kHz	Calculated as $f = 1/2\pi RC$
EMC Protections	Clamping diodes to ± 15V	
Isolation	No Isolation	Same net, different planes for Analog and Digital part
Analog Output		
Number of Outputs Differential	16	
Resolution Range ±10V	16 Bit	
Accuracy Range ±10V	0.03 % (3mv) FS (10V) (required 0.1%)	
Output Drive Current	10mA per output, (Capacitive load max 1nF)	
Output Latency Total	<100µsec	
EMC Protection	± 2kv (Immunity to EFT/Burst)	
Isolation	No Isolation	

Ordering Information

Ordering Code for Base Unit: AS00680G-08

Contact MKS to determine your needs for your personalized product configuration.



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