Dipl.-Ing. Kramert GmbH

Villigerstrasse 370
CH-5236 Remigen

Tel. 056 284 15 55
Fax 056 284 50 55

www.kramert.ch
E-mail kramert@kramert.ch

Ingenieurbüro für schnelle Elektronik
Engineering office for fast electronics

Instruction Manual

Encoder Counter Module

ECM-504 A

All technical data subject to change without notice.

31. March 2006

Description

The function of this module is to continuously read datas from 4 sensors. The sensor datas are stored in a dual ported memory. This memory is readable via VME-bus.
With each loop (read-out of all sensors) an 8 bit event counter is incremented. This event counter is placed on the MSByte of the 32 bit sensor data.

Memory 32 x 32 Bit.
For software compatibility of the ECM-504 VME module with the SSI-550 VME module, the memory space of both modules is exactly the same. The same EPICS software driver can be used to read both modules.

The VME-address range is selected by a 3x8 Bit-Dip switch (address selector, A31..A12). This address range is accessible via read and write commands (A32, D32; or A24, D32). The extended address range is selected via jumper switch. The occupied memory is always 128K.

An additional status register is implemented in the 504-A version. This register is used to

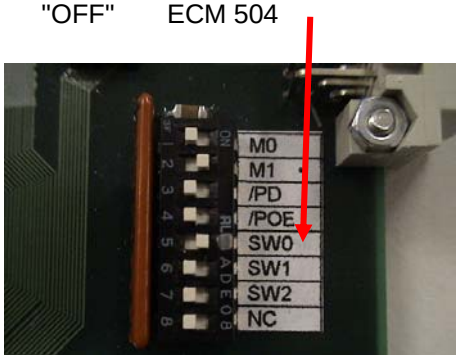
1. Enable the home-switch–counter-reset of each channel separately EN0..EN3.
2. Program the count direction of each counter separately VR0..VR3.
3. Shows the transition of each home switch by toggling the home flip-flops HFF0..HFF3, enabled by EN0..EN3.
4. Clear the encoder counter individually CLR0..CLR3

ENx is a signal which is a "wired or" connection to the S1 switches of the ECM-001 submodule dip-switches. VRx signal is "wired or" with S3. Either the dip-switch or the ENx -Bit can pull down the signal level. If you want to control the signals by the status-register bits, be sure that the dip switches S1x and S3x are open.
There is read and write access to the status register.

Backward compatibility:
There might be the case, that you want to switch the ECM 504-A module to a ECM 504 module. This can be done with one of the special function Dip-Switches.

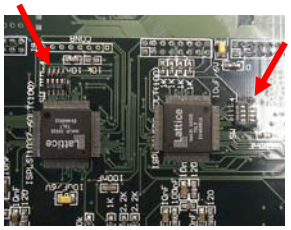
Special Function Dip-Switches

SW0	Function
"ON"	ECM 504-A
"OFF"	ECM 504



ECM-001 SUB-PRINT Dip Switch Settings

SMD-DIP-SWITCH:
Each Channel is controlled by a 4 bit dip-switch.
Function:
S1-ON Enable Z, Counter reset with Z reference mark; default: ON
S2-ON Invert Z polarity; default: OFF
S3-ON Changes counter direction (UP<->DOWN); default: ON
S4-XX Channel select; DON'T change this switch! This switch is locked. Hardware damage is possible.



VME Interface

Bit Assignment:

Sensor Register (0x00..0x7C)

Bit	Function
D23..D0	Sensor Data (24 Bit)
D31..D24	Event Counter

Status Register (0x80)

Bit	Function	Access
D0..D3	EN0..EN3	R/W
D4..D7	VR0..VR3	R/W
D8..D11	CLR0..CLR3	R/W
D12..D15	HFF0..HFF3	R
D12..D31	not used	R/W

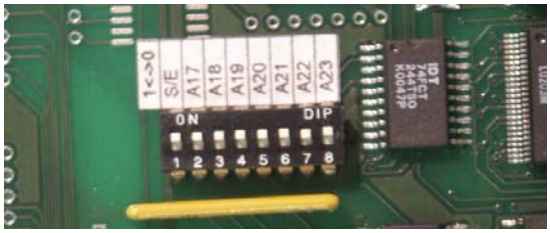
Base Address Settings

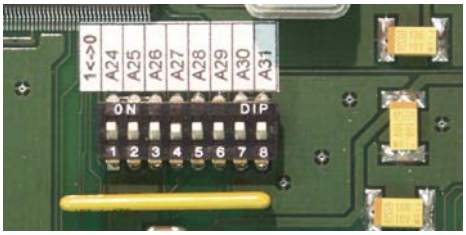
Base address + offset:	
0x00	Sensor 1
0x04	Sensor 2
0x08	Sensor 3
0x0C	Sensor 4
…	
0x80	Status register

The address range is selected by two 8 Bit-Dip switches (address selector, A31..A17). This address range is accessible via read commands (A32D32 or A24D32).

The RAM of the ECM-504 is located between baseaddress+0x00.. 0x0C, 0x80 (4Byte width).
The base address can be mapped with the Dip Switches to 128K boarders within the VME address space.

Access via A24D32 Standard
A32D32 Extended





This Standard/Extended address range switch is marked on the print with „S/E“. Standard address range (A24) is selected with the switch in the Down-position. The extended address selector switch (A31..A24) is then disabled.

Base address	A31 ... A24	A23	A22	A21	A20	A19	A18	A17		A24/A32 Switch
with the STA/EXT-Switch = 1: STANDARD										
0x000000	x	0	0	0	0	0	0	0		**1**
0x020000	x	0	0	0	0	0	0	**1**		**1**
0x040000	x	0	0	0	0	0	**1**	0		**1**
0x060000	x	0	0	0	0	0	**1**	**1**		**1**
with the STA/EXT-Switch = 0: EXTENDED										
0x00000000	0	0	0	0	0	0	0	0		**0**
0x00020000	0	0	0	0	0	0	0	**1**		**0**
0x00040000	0	0	0	0	0	0	**1**	0		**0**

a.s.o.

Address Modifier:

	Addressing Space	AM-Codes
STA	STANDARD A2..A23	3D, 39
EXT	EXTENDED A2..A31	0D, 09

Temperature Range: Ventilated VME-Crate is required.
Power Requirements: approx. 1 A at +5V
Physical: Single width VME module.

Front Panel Connectors

Encoder IN CH-0	9-pol. D-SUB female RS422 Encoder input, impedance 120 Ohm
RESET	Push-Button,CH-0 Chip Reset
AUX-IN	Clear CH0 Counter TTL Schmitt Trigger LEMO Input, impedance 1kOhm pullup, low active
CH 0,1 LED	Shows LSB of the 24-bit encoder counters
Encoder IN CH-1	9-pol. D-SUB female RS422 Encoder input, impedance 120 Ohm
RESET	Push-Button,CH-1 Chip Reset
AUX-IN	Clear CH1 Counter TTL Schmitt Trigger LEMO Input, impedance 1kOhm pullup, low active
Encoder IN CH-2	9-pol. D-SUB female RS422 Encoder input, impedance 120 Ohm
RESET	Push-Button,CH-2 Chip Reset
AUX-IN	Clear CH2 Counter TTL Schmitt Trigger LEMO Input, impedance 1kOhm pullup, low active
CH 2,3 LED	Shows LSB of the 24-bit encoder counters
Encoder IN CH-3	9-pol. D-SUB female RS422 Encoder input, impedance 120 Ohm
RESET	Push-Button,CH-3 Chip Reset
AUX-IN	Clear CH3 Counter TTL Schmitt Trigger LEMO Input, impedance 1kOhm pullup, low active

Pin Assignment 9-pol. D-SUB Connector			
Pin	**Function**	**Pin**	**Function**
1	GND	6	A-
2	A+	7	Z-
3	Z+	8	B-
4	B+	9	GND
5	+5V DC		