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Instruction Manual

Encoder Counter Module

ECM-504/B/F 5VS BISS-C

All technical data subject to change without notice.

April 2022

Description

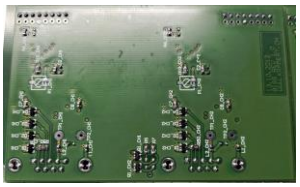
The function of this module is to continuously read data from 4 BISS-C absolute encoders like Renishaw RL32BAS001C05A. The controller reads a programmable number of data bits from all 4 encoders one by one. The MA clock frequency is 250 kHz. The readout of one encoder takes approx. 150 µs . The Serial Encoder data length is programmable from 1 to 32 bits. The Encoder data format can be Binary or Gray code and is programmable. The programmed data length and data format is valid for **all** four sensors.

The ECM-504/B/F module is based on the SSI-550 module and may run with the same epics software driver.

Submodule Description

Encoder-IO :

Submodules communicate with two absolute encoders each. The encoders are supplied from this modules. Each encoder supply is generated from its own DC/DC converter. Suppy voltage could be set up to 5.5 V to compensate voltage drop of the cable. Default suppy voltage is set to 5.1V.



BISS-504 D-Sub Connector:

Connector:		
D-Sub 9-pol.	**Signal**	**Function**
4,5	5V	Power
8,9	0V	
2	BISS, MA +	Serial Communications
3	BISS, MA -	
6	BISS, SLO +	
7	BISS, SLO -	
1	Inner	Shield
Case	Outer	

CH0..CH3 LED Shows the least significant bit of the encoder

Encoder supply 5V / 200 mA max

Encoder connector cable examples:

Cable connection for Encoder type: Renishaw RL32BAS001C05A, BISS

Connector:			
Color	**D-Sub 9-pol**	**Signal**	**Function**
Brown	4,5	5 V	Power
White	8,9	0 V	
Green			
Violet	2	MA+	Serial Communications
Yellow	3	MA-	
Grey	6	SLO+	
Pink	7	SLO-	
Inner shield	1	Inner	Shield
Outer shield	Case	Outer	

Important:

- Please recheck all encoder connections, pins and colors with your latest encoder datasheet
- Do not connect the encoder with the ECM-504/B/F board under power.

VME Interface

Bit Assignment:

Sensor Register (0x00..0x10)

Bit	Function
D0..D31	Sensor Data

Control Register (0x80)

Bit	Function	Access	Default Value
D4..D0	Data Length [SSI]	R/W	0x17 (=24 bit)
D5	Data Format [SSI]	R/W	0x0 (=Binary)
D15..D6	not used	R/W	
D31..D16	Module ID	R	0x505F

Data Length

D4..D0	Data Length [SSI Bits]
0x0	1
...	..
0x1F	32

Data Format

D5	Data Format [SSI]
0	Binary
1	Gray

Module ID: 0x505F
This sixteen bit module identification number is read only. It is used for automatic epics driver detection.

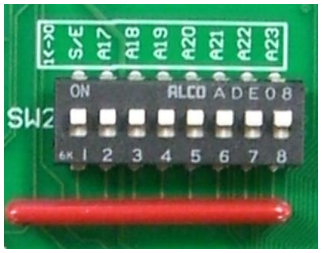
Base Address Settings

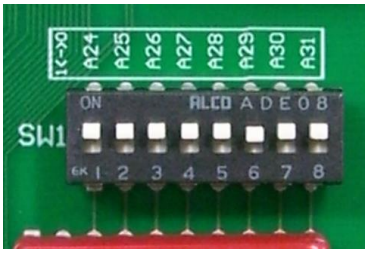
Base address + offset:	
0x00	Sensor 0
0x04	Sensor 1
0x08	Sensor 2
0x0C	Sensor 3
0x10	Sensor 4
0x14..0x7F	Not used
0x80	Control Register

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

The RAM of the ECM-504/B/F is located between base address + 0x00..0x13, 0x80..0x83.
The base address can be mapped with the dip switches to 128kByte boarders within the VME address space.

Access via A24D32 Standard
A32D32 Extended





Example: DIP-SW Address above is : 0x00000000, Extended Mode

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 OFF 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

Boot and Option Switches:

BOOT-SW: M0, M1, /PD, /POE, PROG:
This is the default position. These switches define the bootmode of the module and **must** stay at their default positions.

OPTION-SW: SW0, SW1, SW2:
Reserved for options

Temperature Range: Ventilated VME-Crate is required
Power Requirements: max. 2 A at +5V

Physical: Single width VME module

Datasheet Revision History:

April 2022	First published

FPGA Revision History:

REV 1, 3.11.2012, Checksum 1EE62DD	