Electronic 4 Channel Spectral Sensor Multiplexer

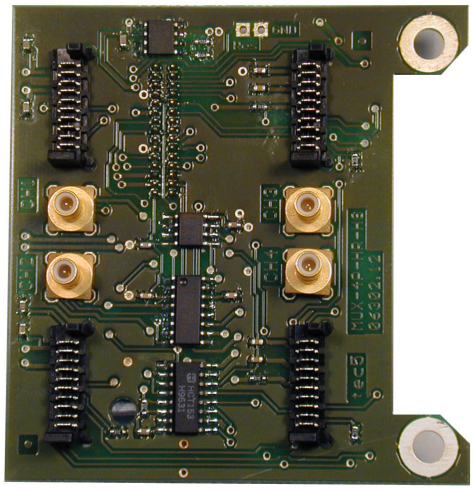
MUX-4P for FEE-HS

Product-ID: 06302.10
Document: ds_mux-4p_110e.doc

tec5 five
Technology for Spectroscopy

In der Au 27
61440 Oberursel / Germany

Phone: +49 (0) 6171 / 9758 – 0
Fax: +49 (0) 6171 / 9758 – 50
E-Mail: sales@tec5.com
Internet: www.tec5.com



Short Description

§ Passive input multiplexer for Front End Electronics FEE-HS
§ 4 sensor input channels
§ Mode ‘sequential’ : 1 of 4 channels
§ Mode ‘simultaneous’ : 2 of 4 (1&2,1&3,1&4)
§ Input from device: Spectral Sensor or Preamp.
§ Output to device: Front End Electronics
§ Typically mounted as sandwich board on FEE
§ PCB dimensions 66 mm x 67 mm

General

In conjunction with a Front End Electronics the Electronic Spectral Sensor Multiplexer allows to operate up to 4 identical sensor units (PDAs with Preamplifier Electronics or Spectral Sensors based on these arrays).

In the signal chain following the multiplexer, signals from all sensors pass identical circuitry for video data processing and analog-to-digital conversion, so that all measurement channels are influenced in an identical manner by potential inaccuracies of electronics.

The sensor interface corresponds to specification *‘Sensor_1A’*. The interconnection to each sensor module is done by a miniaturized coax line and a 10-pin flat ribbon cable.

Module Versions

MUX-4P is available only for the Front End Electronics module FEE-HS. The sensor interface complies to the *‚Sensor_1A‘* interface specification.

Operating Modes

In mode of operation ‘sequential’, the multiplexer acts like a static input switch for up to 4 Spectral Sensors attached. The size of a spectral data array is equal to the number of pixels of the active sensor.

In the operation mode ‘simultaneous‘, a combination of two sensors can be read out almost concurrently with the MUX-4P. To achieve this, the multiplexer interleaves the spectral data of the single sensors pixel by pixel. So, the scans are overlapping with a time shift of only one pixel readout clock (approx. 5 µs with FEE-HS). The selectable combinations are CH1&Ch2, Ch1&Ch3 and Ch1&Ch4. The size of a spectral data array is equal to the sum of the number of pixels of both active sensors.

The multiplexer operating mode (the active sensor or the combination) is selected by software and transferred to the MUX-4P via the Front End Electronics of the Operating Electronics.

Supported Sensors

The following compatible sensor modules are currently available:

- MMS - Spectral Sensors (not MMS-NIR)
- MCS - Spectral Sensors (equipped with Preamplifier Electronics type DZA-S3901-4)
- Preamplifier Electronics DZA-S3901-4

Additional Features

- Local non-volatile memory, 256 Bytes capacity
- Compatible to Front End Electronics equipped with the adapter unit ADAP_25X
- MUX-4P can be used together with the Spectral Sensor Controller Unit MOE-C161

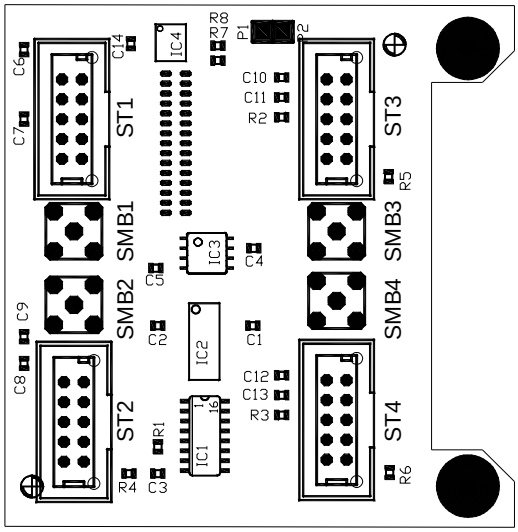
Power consumption:

- +5V_analog / -5V_analog: current of sensors only
- V_{CC}(+5V_digital): typical < 5mA
- +12V_analog: typical < 5mA
- -12V_analog: typical < 5mA

Environmental conditions:

- Temperature range, operating: 0 °C ... 60 °C
- Temperature range, storage: -40 °C ... +70 °C
- Humidity (@25°C, non condensing): 10 % ... 90 %

Design



Interfaces

Sensor interface:
Channel 1: SMB1 and ST1
Channel 2: SMB2 and ST2
Channel 3: SMB3 and ST3
Channel 4: SMB4 and ST4

Connector type:
SMB1 to SMB4: SMB flange socket
ST1 to ST4: MICS 10
'Sensor_1A' compatible

ST1: Channel 1 ... ST4: Channel 4

STx Pin or SMB	Input / Output	Description
1	Input	Not connected (ADC trigger signal (**))
2	Output (*)	Sensor StartScan
3	Output (*)	Ground (Sensor Clock 2 (**))
4	Output (*)	Sensor Clock 1
5	Output (*)	Ground (Integrator reset (**))
6	Input	Sensor EndofScan
7	---	Digital Ground
8	Output (Supply from FEE)	-5V power supply for sensor
9	---	Digital Ground
10	Output (Supply from FEE)	+5V power supply for sensor
SMB	---	Analog Ground
SMB	Input	Sensor Video signal (center contact)

(*): Original FEE signal
(**): Used for former HR version only

Front End Electronics interface:
Connector type:
ST5 (right column) / ST6 (left column): Header connector 2*15 (pattern 1.27mm), pin contacts on solder side

ST5 Pin	Description
1	Output, secondary channel, trigger signal ADC
2	Input, secondary channel, DZA integrator reset
3	Input, secondary channel, start of scan signal
4	Output, secondary channel, end of scan signal
5	Input, secondary channel, clock 1
6	Input, secondary channel, clock 2
7	Output, main channel, trigger signal ADC
8	Input, main channel, DZA integrator reset
9	Input, main channel, start of scan signal
10	Output, main channel, end of scan signal
11	Input, main channel, clock 1
12	Input, main channel, clock 2
13	Digital Ground
14	Output Analog Video
15	Analog Ground

ST6 Pin	Description
1	Reserve 2, linked to pin P1
2	Open (not used)
3	Digital Ground, linked to pin P2
4	Digital Ground
5	+12V_analog supply voltage input
6	VCC (+5V_digital) supply voltage input
7	Input multiplexer select control line 0
8	Input multiplexer select control line 1
9	Input multiplexer select control line 2 (not used)
10	Identification MUX type
11	I2C Bus line, clock signal
12	I2C Bus line, data signal
13	-5V_analog supply voltage input for sensors
14	+5V_analog supply voltage input for sensors
15	-12V_analog supply voltage input

Remark: Signal assignment of the Front End Electronics to multiplexer connector varies for different multiplexer types. Assignment is switched by the Front End Electronics depending on the multiplexers identification information.

User Information

General

The information in this data sheet has been checked carefully. However, no responsibility is assumed for inaccuracies. tec5 reserves the right to make changes to any portion of this document without notice.
Each product is tested carefully before being shipped. If, however, problems should occur while initial operation or during later operation, please first check your specific settings and correct installation (connectors).

Warranty

The warranty period for this product is 12 months. The warranty begins on the day of delivery. Within the warranty period, tec5 will repair free of charge any faulty functioning of the product resulting from faulty design or defective material. All other claims are excluded, in particular consequential damage.

Handling

The electronics is partly constructed in CMOS technology and is thus sensitive against electrostatic discharge. Take appropriate precautions whenever handling the component. Please switch off the power before connecting or disconnecting the product.