struck innovative systeme

MTCA.4/MTCA Electronics

2/4 Channel 2.5 GSPS 14-bit Digitizer AMC SIS8160 Dual FMC Carrier/SFMC01 Combination (Kintex Ultrascale based)

new

SIS8160 FMC Carrier Functionality
- 4-lane PCI Express Gen3 Connectivity
- Xilinx XCKU40- or XCKU060-1FFVA1156C Kintex Ultrascale FPGA
- Dual Boot
- Front Panel MMCX Clock Input
- Front Panel MMCX Digital In-/Output (HW Configuration)
- Point to Point Links
- 4 MLVDS µTCA Ports (AMC Ports 17-20) → 8 MLVDS lines
- 2 HPC FMC Sites
- Variable FMC V_{ADJ} (1,0V - 1,8V)
- Low Jitter Clock Generation and Management
- 2 x 2 GByte DDR4 Memory with two Memory Controllers
- White Rabbit Option (over FMC 2)
- Stand Alone Operation Option
- MMC1.0 under DESY LV91

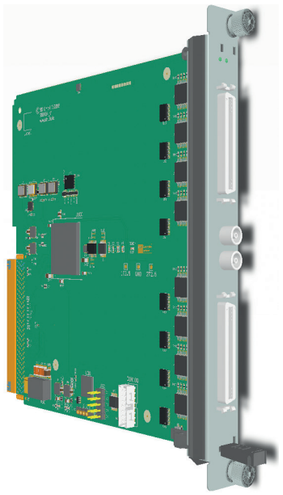
SFMC01 Functionality
- 2 Channels 2.5 GSPS 14-bit
- AC (Balun) or DC Coupled
- Up to 5 GHz AC Analog BW

Possible next JESD Digitizer FMCs
- 4 Channel GSPS 16-bit
- 8 Channel 500 MSPS 14-bit
- Project Driven ...

SIS8160 w. SFMC01

Product Announcement
SIS8164 64 Channel Digital I/O AMC (Artix-7 based)

Functionality
- Single-lane PCI Express Gen2 Connectivity
- Xilinx XC7A15T-2FGG484C Artix-7 FPGA
- 2 x 32 Channels/Bits on 3M 10250-55H3PC Connectors
- Cable Present Detection Option with Front Panel LED
- LVTTL with TTL Tolerance
- Input/Output Enable in 8 Channel Groups
- One LEMO LVTTL Control Input with TTL Tolerance
- One LEMO LVTTL Control Output
- Flexible Interrupt Generation (Control Input, Input Status Change,...)
- Gigabit Link Port implemenation (AMC Port 0, AMC.2 type E1)
- 4 MLVDS µTCA Ports (AMC Ports 17-20) → 8 MLVDS lines
- MMC1.0 under DESY LV91



SIS8864 preview

Struck Innovative Systeme GmbH
Harksheider Str. 102A, 22399 Hamburg, Germany
email: info@struck.de web: www.struck.de
phone: ++49 40 60 87 305 0

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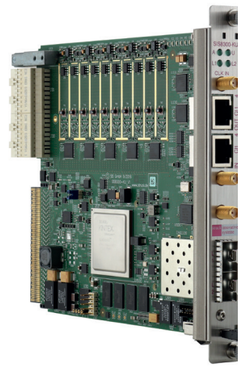
QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001

2018 marks our 20th year in business. We would like to take this opportunity to thank you for your patronage.
Feel free to inquire about customized versions of standard products or full custom designs in case our off-the-shelf product offerings do not meet the requirements of your application.

Kintex Ultrascale based
SIS8300-KU 10 channel 16-bit 125 MS/s MTCA.4 Digitizer

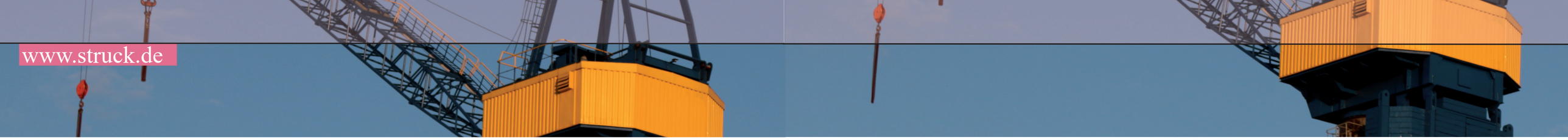
The SIS8300-x digitizer board family is in use for LLRF, BPM and controls applications in several accelerators. The new SIS8300-KU is targeted at users who would like to develop or customize firmware with the Xilinx Vivado toolchain. The higher MGT speeds of the Ultrascale family result in performance improvements on the PCI Express and link side.

Functionality
- 4-lane PCI Express Gen3 Connectivity
- 10 Channels 125 MS/s 16-bit (or 250 MS/s 14-bit) ADC
- 10 MS/s to 125 MS/s Per Channel Sampling Speed
- AC or DC Input Stage
- Internal, Front Panel, RTM and Backplane Clock Sources
- Two 16-bit 250 MS/s DACs for Fast Feedback Implementation
- High Precision Clock Distribution Circuitry
- Programmable Delay of Dual Channel Digitizer Groups
- Multi Gigabit Link Port Implementation to Backplane
- Twin SFP+ Card Cage for High Speed System Interconnects
- White Rabbit Clock Option for SFP+ Ports
- Two RJ45 Connectors (One Clock + 3 Data or 4 Data In/Out)
- Xilinx XCKU040-1FFVA1156C Kintex Ultrascale FPGA



SIS8300-KU
MTCA.4
Digitizer

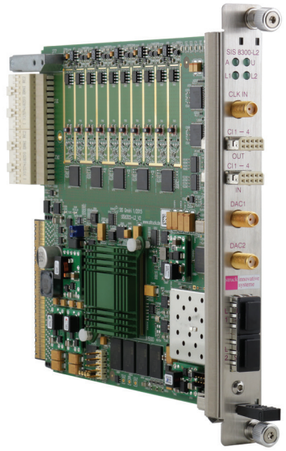
- 2 GByte DDR4 Memory (flexible partitioning scheme)
- Dual boot
- MMC1.0 under DESY license LV91
- In Field Firmware Upgrade Support
- Zone 3 class A1.0, A1.0C or A1.1CO Compatible



SIS8300-L2 10 channel 16-bit 125 MS/s MTCA.4 Digitizer

The SIS8300-L2 is the working horse of the European XFEL. It allows for flexible configuration of the Zone 3 and the analog performance was further enhanced for LLRF operation im combination with the DWC8300 Downconverter RTM.

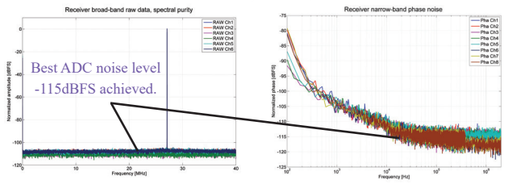
Functionality
- MTCA.4
- 4-lane PCI Express connectivity
- 10 channels 125 MS/s 16-bit ADC
- 10 MS/s to 125 MS/s per channel sampling speed
- Xilinx XC6VLX130T-2FFG1156C Virtex-6 FPGA
- Dual boot
- 2 GByte DDR3 memory
- AC or DC input stage
- ADC inputs through Rear Transition Module (RTM)
- internal, front panel, RTM and backplane clock sources
- Two 16-bit DACs for fast feedback implementation
- Front panel or Zone 3 DAC routing
- FPGA, RTM_CLK4, DIV0 and DIV1 DAC clock sources
- High precision clock distribution circuitry
- Programmable delay of dual channel digitizer groups
- Gigabit link port implementation to backplane
- 6.5 GBit/s on point to point links
- Extended MGT clocking scheme
- Twin SFP card cage for high speed system interconnects
- Front panel grounding block
- MMC 1.0 under DESY license LV91
- Zone 3 class A1.1 compatible (A1.0C and A1.1CO optional)

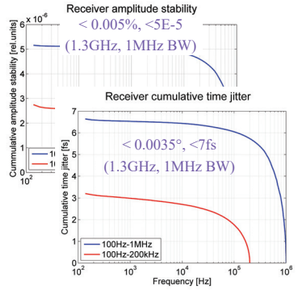


SIS8300-L2 MTCA.4 Digitizer

Model	FPGA Family	Channels/Sampling Speed/Resolution
SIS8300 V2	Virtex 5	10 x 125 MS/s 16-bit
SIS8300 V2	Virtex 5	8 x 250 MS/s 14-bit
SIS8325	Virtex 6	10 x 250 MS/s 16-bit
Related MTCA.4 Digitizer Boards		

SIS8300-L2/DWC8300 Data
(courtesy DESY)





DWC8300 RTM

DWC8300 MTCA.4 Downconverter RTM

The DWC8300 is a MTCA.4 downconverter RTM. It was developed at DESY for LLRF applications under the designation DRTM-DWC10 and is built by Struck under license of DESY.

Functionality
- MTCA.4 RTM implementation
- 10 Channels
- 8 Channel FBM multi coax. connector (CH1 to CH8)
- CH0 and CH9 SMA
- 700 MHz - 4 GHz (350 - 500 MHz LF version)
- Various intermediate frequencies
- Switchable front end attenuators
- LO clock from front panel or RF backplane
- LO power level monitor
- Digitizer clock input (5 - 130 MHz) from front panel or RF backplane
- I^2C support
- Zone 3 class A1.1 compatible

Production under DESY license LV 63

DS8VM1 Direct Sampling/Vectormodulator RTM

The DS8VM1 Downconverter/Vectormodulator RTM was developed at DESY for lower frequency single cavity LLRF applications under the designation DRTM-DS8VM1.

DS8VM1 RTM

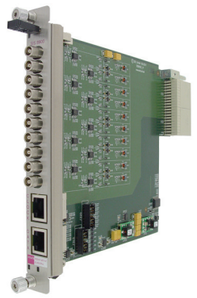
Functionality
- MTCA.4 RTM
- 8 Channels DC or AC on FBM multi coax. connector
- DC - 400 MHz or 5 MHz – 700 MHz
- 2 Channels DC on MMCX connectors
- Switchable front end attenuators
- VM output 50MHz - 1 GHz
- Switchable output attenuator
- REF power level monitor
- Digitizer clock input (10 - 700 MHz) from front panel or RF backplane
- MMCX clock, interlock and sync. reset input
- On board clock generation/distribution
- I^2C support
- Zone 3 class A1.1 compatible

Production under DESY license LV 74

SIS8900 MTCA.4 Single Ended Input RTM

The SIS8900 RTM is used to feed single ended -50 Ω terminated- signals to the SIS8300 digitizer. Access to RTM _CLK0, RTM_CLK1 and RTM_CLK2 and a couple of digital I/O lines is implemented in addition.

Functionality
- MTCA.4 RTM
- 8-Bit I/O expander for I^2C-bus
- 10 LEMO 00 connectors (FBM option)
- 50 Ohm input impedance
- -1 V,...,+1 V default input range
- AC OR DC input configuration
- RJ45 jack for RTM clocks
- RJ45 jack for Digital I/O
- +5V, 250 mA power option for RJ45 jacks
- Two metric on board pin headers for 6 LVDS input/output signals each
- Zone 3 class A1.1 compatible

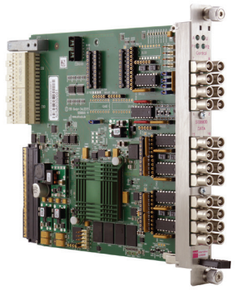


SIS8900 RTM

SIS8800 MTCA.4 Scaler/Digital I/O

The SIS8800 is the MTCA.4 follow up to our SIS3820 VME multi purpose scaler. It can be used standalone or in combination with the SIS8980 discriminator RTM or custom digital I/O RTMs.

Functionality
- MTCA.4
- 4-lane PCI Express connectivity
- Xilinx XC6VLX130T-2FFG1156C Virtex-6 FPGA
- Dual boot
- 2 GByte DDR3 memory
- 16 front inputs NIM or TTL/LEMO, TTL,ECL or LVDS/flat cable
- 4 control in-/4 control front outputs
- 42 LVDS I/Os to Zone 3
- two MGTs to Zone 3
- MMC 1.0 under DESY license LV91
- Zone 3 class D1.1 compatible



SIS8800
MTCA.4
Scaler

DWC8VM1 Downconverter/ Vectormodular RTM

The DWC8VM1 Downconverter/Vectormodulator RTM was developed at DESY for single cavity LLRF applications under the designation DRTM-DWC8VM1.

Functionality
- MTCA.4 RTM
- 8 Channels Downconverter on FBM multi coax. connector
- 2 Channels DC on MMCX connectors
- 500 MHz - 4 GHz (HF Version 5.7 GHz)
- Various intermediate frequencies
- Switchable front end attenuators
- VM output 50 MHz - 6 GHz
- Switchable output attenuator
- LO clock from front panel or RFBP
- LO and REF power level monitor
- Digitizer clock input (5 - 130 MHz) from front panel or RF backplane
- MMCX clock and interlock input
- I^2C support
- Zone 3 class A1.1 compatible

DWC8VM1 RTM

Production under DESY license LV 71

Model	f_{min} in MHz	f_{max} in MHz
DWC8VM1LF	350	500
DWC8VM1	500	3500
DWC8VM1HF	3500	6000
DWC8VM1 Overview Table		