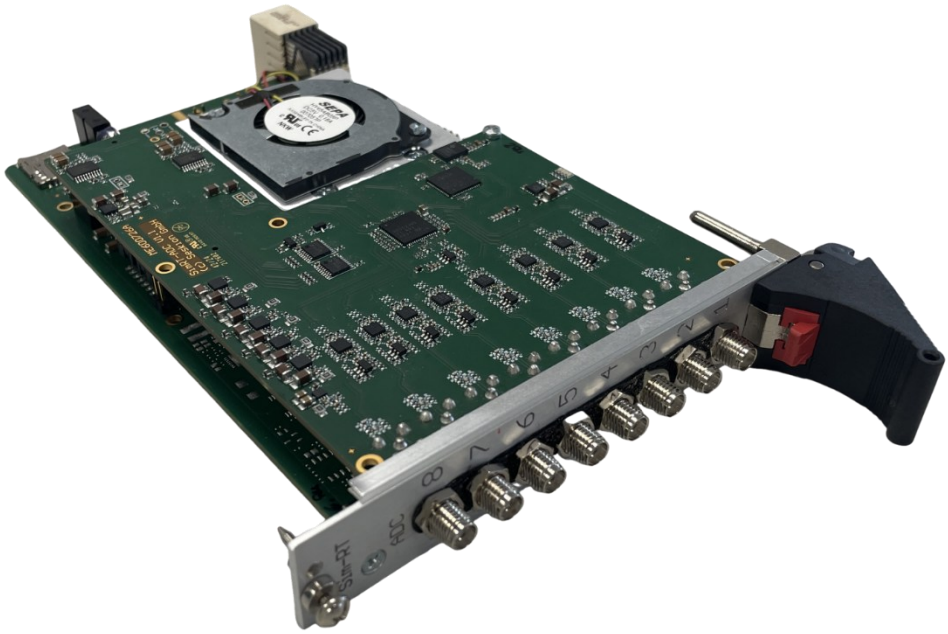
Simulyzer-RT ADC-Card



Hardware version	V1.0
Documentation version:	1.0
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	(1.1) 22.12.2025 – Technical Data + API documentation added
Order no.:	20.5006

Safety instructions

To avoid damages to persons and devices the following safety instructions have to be noticed!

- Only qualified personnel are allowed to handle this device!
- Before any handling within the device the current supply has to be switched off!
- During operation the device have to be positioned, that enough air condition is supplied and no small parts can get into the ventilation slots.
- In case of any trouble the system has to be switched de-energized!
- The declared environmental conditions and max. voltage ranges have to be observed!
- To warranty the device remove all dust and dirt in periodically intervals.
- Make sure that the ventilation slots are unobstructed!

Intended use:

The Simulyzer-RT ADC card is designed exclusively for measuring and analyzing voltages in a Simulyzer RT test system. The ADC card's range of tasks extends to analog recording within the test system (see Areas of Application).

- The device is only permitted to use for the intended use.
  Any other use results the deletion of the guarantee!

For questions and repair cases contact SesKion GmbH
Tel.: +49 (0)711/990 58 14
Fax: +49 (0)711/990 58 27
Email: info@seskion.de
Internet: www.seskion.de

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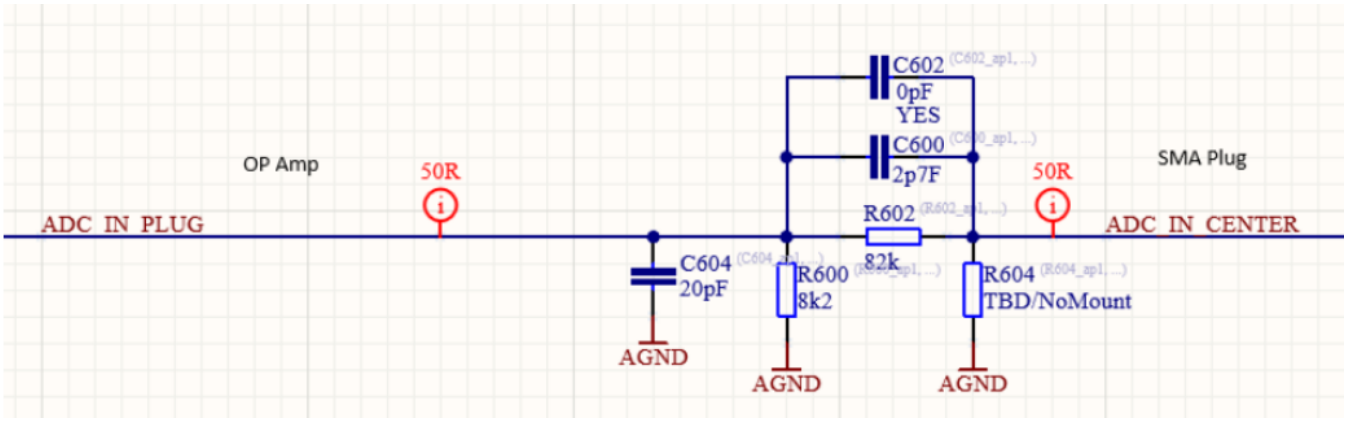
1. Technical Data

- Current consumption: 12V / 0,8 A (without external consumers)
- Operating temperature: 0°C … 40°C
- Rel. Humidity: Max. 85% not condensed
- Weight: 190g
- Dimensions: Single Eurocard, 4 U

Test conditions: Environmental temperature 20°C to 26°C						
Num	**Evaluation**	**Symbol**	**typ.**	**min.**	**max.**	**description**
1	Permitted voltage range	U_{supp}	12V	11.4V	12.6V	
2	Current consumption	I_{supp}	650mA	-	800mA	Without sensor supply

Input impedance

The input is designed for 100k input impedance.



Scaling max. sampling rate vs. transmitted channels

120 Msps is the maximum possible, which can be achieved on 8 channels. To optimize data transmission, you can adjust the *config.frameSampleCount* parameter.

Recording modes: continuous vs. triggered

Once data acquisition has started, data is streamed. This can be deactivated using *SRT_ADC_DataCaptureControl*. Trigger data is stored internally when the trigger occurs and is available via *SRT_ADC_GetAnalogTriggerData* and *SRT_ADC_ExtractTriggeredAnalogSignals* calls.

2. Configuration options – API documentation

ADC Konfiguration:

```
SRT_ADC_DeviceConfig_t config;
config.commonSampleRate = 120000.0;  // Samples Per Second
config.activeChannels = 1;           // 1-8 active Channels
config.frameSampleCount = 20000;     // number of samples in Frame
```

// Set configuration

```
SIMULYZER_API SRT_Status_t SRT_ADC_SetConfiguration(HANDLE hDevice, SRT_ADC_DeviceConfig_t *config);
```

// Enable/Disable streaming

```
SIMULYZER_API SRT_Status_t SRT_ADC_DataCaptureControl(HANDLE hDevice, int stop);
```

// Enable trigger

```
SIMULYZER_API SRT_Status_t SRT_ADC_EnableTrigger(HANDLE hDevice, uint8_t enable);
```

// Activate manual trigger

```
SIMULYZER_API SRT_Status_t SRT_ADC_SetManualTrigger(HANDLE hDevice);
```

// Reset previous trigger

```
SIMULYZER_API SRT_Status_t SRT_ADC_ResetTrigger(HANDLE hDevice);
```

// Set post trigger sample counts

```
SIMULYZER_API SRT_Status_t SRT_ADC_SetPostTriggerSampleCount(HANDLE hDevice, uint32_t sampleCount);
```

// Download triggered dataset

```
SIMULYZER_API SRT_Status_t SRT_ADC_GetAnalogTriggerData(HANDLE hDevice, uint32_t sampleCount);
```

// Extract signals from previous downloaded dataset

```
SIMULYZER_API SRT_Status_t SRT_ADC_ExtractTriggeredAnalogSignals(HANDLE hDevice, uint32_t sampleCount,
uint32_t channelMask, double* dataArray);
```

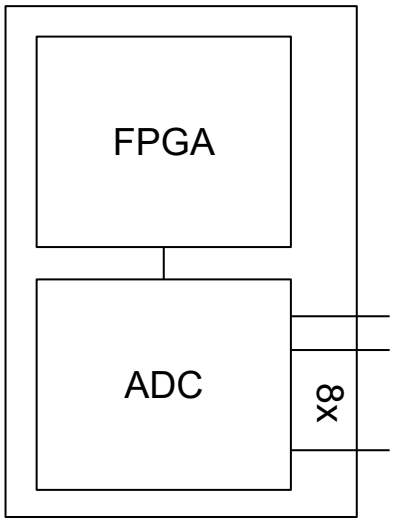
// Trigger callback

```
SIMULYZER_API SRT_Status_t SRT_ADC_SetTriggerCallback(HANDLE hDevice, void* ctx,
SRT_ADC_AnalogTriggerCallback_t triggerCallback);
```

// Configure trigger

```
SIMULYZER_API SRT_Status_t SRT_ADC_SetAnalogTriggerConfig(HANDLE hDevice, uint8_t channel, double triggerLevel,
SRT_TriggerSlopeEnum_t triggerSlope);
```

3. Block Diagram



4. Connectors:

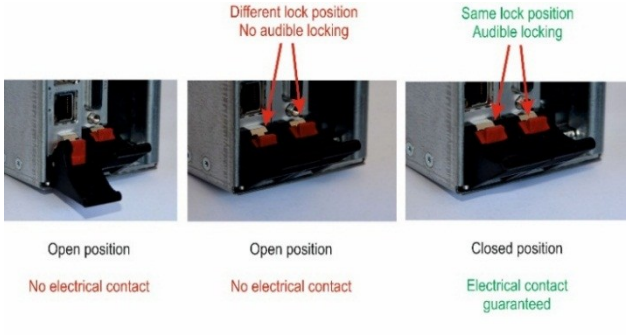
- For SPI, FAST-SO
- Connectors to bus: 1 PCIe Lane to CPU-1
  Power supply I2C
  Parallel to all cards for synchronization
- Connectors frontside: SMA female coaxial connector

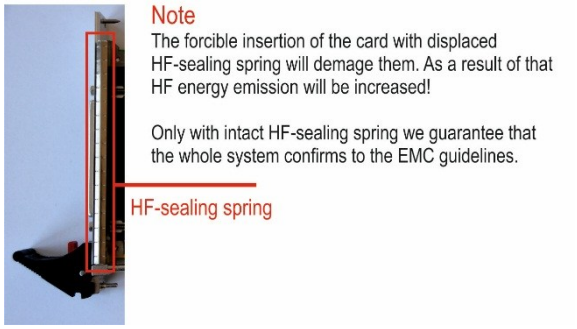
5. Interfaces and FPGA:

- Xilinx® Zynq® UltraScale+ MPSoC Module ARM® dual-/quad-core Cortex™-A53 (64 bit, up to 1500 MHz)
- 8 x SMA female coaxial connector Voltage range -10V … +10V (16bit with 120 Msps)

6. Handling Card/Chassis

Pay attention that the ejection lever of the plug-in card is arrested correctly.
Only the correct position guarantees a justly connection of the bus system and the power supply!





7. Measurement Accuracy

7.1. Time base

Test conditions: Environmental temperature 20°C to 26°C						
Num	**Evaluation**	**Symbol**	**Type**	**Max**	**Unit**	**Comment**
1	Accuracy time base	$\Delta f/f$	±30	±50	ppm	-
2	Aging of time base	$\Delta f/f_A$	±5		ppm/year	-
3	Temperature drift of time base	$\Delta f/f_T$	±0.3	±0.7	ppm/°C	-

7.2. Measurement of the supply voltage

Test conditions: Environmental temperature 20°C to 26°C						
Num	**Evaluation**	**Symbol**	**Type**	**Max**	**Unit**	**Comment**
4	Accuracy of the measured voltage	U_{mea}	±0.1	±0.1	% of scfin. 20V	Range -10V … 10V
5	Aging of the measured voltage	$U_{A\text{-}mea}$		±0.1	%/year	Range -10V … 10V
6	Resolution of the measured voltages		16		Bit	0.. 65535
			0.335698		mV/LSB	