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SiRad Easy® r4
Boards & Accessories

Product Sheet

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1.1	-	-	-		1 of 7

Version Control

- 2 -

Version	Changed section	Description of change	Reason for change
1.0	all		Initial document
1.1	1, 2	Added boards and accessories	New and updated parts

Table of Contents

1   Parts List

This document lists *SiRad Easy® r4* platform boards and matching accessories. These accessories are not compatible with *SiRad MIMO r2, SiRad MIMO, SiRad Easy®* (non-r4 version), or *SiRad Simple®* unless noted. Please see Section 2 for hardware compatibility of *SiRad Easy® r4* boards and accessories.

1.1   SiRad Easy® r4 Boards

Platform Bundles	Order-No.	Description
SiRad Easy® r4 Starter Kit	000630	*SiRad Easy® r4* platform including *Base Board+* and *RFE_TRA_120_002+* board
SiRad Easy® r4 Eval Kit	000633	*SiRad Easy® r4* platform including *Base Board+, RFE_TRX_024_046+* board, *RFE_TRA_120_002+* board, and *Breakout Board+*
Single Boards	**Order-No.**	**Description**
Base Board+	000629	*SiRad Easy® r4* processing board including USB-Micro-B-Cable, platform essential
Breakout Board+	000620	Breakout and debugging board for *SiRad Easy® r4* platform (optional)
RFE_TRX_024_046+	000631	Exchangeable 24 GHz Radar Front End Board with our TRX_024_046 transceiver
RFE_TRX_120_001+	000627	Exchangeable 120 GHz Radar Front End Board with our TRX_120_001 transceiver, including a reflector and lens with 10 mm spacers
RFE_TRX_120_067+	000750	Exchangeable 120 GHz Radar Front End Board with our TRX_120_067 transceiver, including a reflector and lens with 10 mm spacers; *RFE_TRX_120_067+* is a replacement for our board *RFE_TRX_120_001+*
RFE_TRA_120_002+	000628	Exchangeable 120 GHz Radar Front End Board with our TRA_120_002 transceiver, including a reflector and two lenses
RFE_TRA_120_045+	000635	Exchangeable 120 GHz Radar Front End Board with our TRA_120_045 transceiver, including a reflector and two lenses
RFE_TRA_300_042+	000731	Exchangeable 300 GHz Radar Front End Board with our TRA_300_042[1] transceiver, including a lens with 15 mm spacers

1.2   Accessories for Power Supply and Data Connection

Accessories	Order-No.	Description
USB-Micro-B-Cable	3rd party vendor	Standard shielded USB cable of type A to micro-B for data transfer and power supply of the *Base Board+;* compatible part for *SiRad MIMO r2;* available from most distributors of electronic components like Farnell, Digi-Key, or Mouser
6-pin header bar for UART/TRIGGER I/O port	3rd party vendor	Standard 1.27 mm 6-pin header for the UART/TRIGGER port of the *Base Board+;* available, for example, from Mouser, Mfr.-No.: Harwin M50-3530642
6-pin and 30-pin header bars for signal I/O ports	3rd party vendor	Standard 2.54 mm 6-pin and 30-pin header bars for the signal I/O ports of the *Breakout Board+;* available from most distributors of electronic components
Signal I/O BTB connectors	3rd party vendor	0.5 mm high Berkstak connectors for data transfer between *Base Board+* and *Breakout Board+* or custom hardware; available, for example, from Farnell, Digi-Key, Mouser, TTI Inc, Mfr.-No.: - 10-pin Amphenol FCI Mezzanine 10132797-015100LF (Plug), - 10-pin Amphenol FCI Mezzanine 10132798-012100LF (Receptacle), - 20-pin Amphenol FCI Mezzanine 10132797-025100LF (Plug), - 20-pin Amphenol FCI Mezzanine 10132798-022100LF (Receptacle)

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[1] Datasheet available on request.

1.3   Accessories for Debugging and Firmware Update

Recommended Debugger	Order-No.	Description
STLINK-V3MINI	3rd party vendor	Hardware debugger/programmer for the microcontroller on the *Base Board+* using the DBG port of the *Base Board+* or DBG3 port of the *Breakout Board+;* compatible part for *SiRad MIMO r2;* available, for example, from Mouser or RS Components, Mfr.-No.: STLINK-V3MINI
Alternative Debuggers	**Order-No.**	**Description**
STLINK-V2 or NUCLEO-64	3rd party vendor	Alternative hardware debugger/programmer for the microcontroller on the *Base Board+* using the DBG1 or DBG2 port on the *Breakout Board+;* available, for example, from Mouser or RS Components; it needs either a jumper cable or tag connect cable (listed below) to connect to the *Breakout Board+*
Jumper cable	3rd party vendor	Standard 6-pin female-female wire for debugging/programming with the DBG2 port on the *Breakout Board+* when using the STLINK-V2 or NUCLEO-64 hardware debugger/programmer; available from most distributors of electronic components like Mouser or RS Components
Tag connect cable	3rd party vendor	Alternative 6-pin tag connect cable for debugging/programming with the DBG1 port on the *Breakout Board+* when using the STLINK-V2 or NUCLEO-64 hardware debugger/programmer; available from Tag-Connect

1.4   Lenses

The mentioned lenses are starting points to research optics for sensor development. Investigations should cover optimization of the used lens material, focusing/opening angle, and signal gain for the intended application or planned certification.

Single Lenses	Order-No.	Description
SiRad Standard HE-PD Lens	000017	Our standard collecting lens with 10 mm spacers and screws for 120 GHz transceivers and 15 mm spacers for the TRA_300_042[1] transceiver; compatible part for *SiRad Easy® r4, SiRad Easy®* (non-r4 version), and *SiRad Simple®*
SiRad Compact Acryl Lens	3rd party vendor	Our acrylic collecting lens for TRA_120_002 and TRA_120_045 transceivers; fixation on top of the transceiver with glue; please write us to get in touch with a lens manufacturer/supplier
LEDiL Lens Series EMILY and LISA	-	Compatible TIR-lens series from LEDiL with different viewing angles (spot beam to wide beam); *RFE_TRA_120_002+* v1.2 has a matching footprint for the positioning pins of the EMILY and LISA lens series on the board; assembly with tape or glue; we recommend the lenses EMILY-RS, EMILY-SS, and LISA3-RS of the series
LEDiL Lens Series VERONICA	3rd party vendor	VERONICA is a compatible lens series from LEDiL with IP ratings up to IPX8; *RFE_TRA_120_002+* v1.2 has a matching footprint for the positioning pins of the VERONICA-SQ-MINI and VERONICA-SQ lens series on the board; assembly with tape; we recommend VERONICA-SQ-MINI-D and VERONICA-SQ-RS of the series
LEDiL Lens Series LAURA	3rd party vendor	Compatible lens series from LEDiL with different viewing angles (spot beam to wide beam); assembly with tape; we recommend LAURA-RS and LAURA-SS of the series
LEDiL Lens Series SURI	3rd party vendor	Small beam lens series from LEDiL; assembly with tape or screws

1.5   Reflectors

Reflectors	Order-No.	Description
Reflector CA10715 for *SiRad Easy® r4*	3rd party vendor	Spot beam reflector CA10715 from LEDiL for the RFE boards *RFE_TRX_120_001+*, *RFE_TRX_120_067+*, *RFE_TRA_120_002+*, *RFE_TRA_120_045+*; assembly with tape; no positioning pins; available, f.e., from Mouser, Mfr.-No.: CA10715_BOOM-S
Reflector_TRA_120_002	3rd party vendor	Compatible reflector from TE-Connectivity (discontinued); *RFE_TRA_120_002+* v1.0 and *RFE_TRA_120_002+* v1.1 have a matching footprint for the positioning pins of Reflector_TRA_120_002 on the board; Mfr.-No: 1-2154430-1
LEDiL Reflector Series BOOM	3rd party vendor	Reflector series from LEDiL with different viewing angles (spot beam to wide beam); assembly with tape but no positioning pins
LEDiL Reflector Series ELLA	3rd party vendor	Compact reflector series from LEDiL; assembly with tape; we recommend the lens ELLA-30-S of the series

1.6   Retro Target Reflector

While corner reflectors can be useful for development, we recommend big metal plates for precise verification measurements or certification preparation. Big metal plates do not cause target artifacts that can be induced by the nature of the pyramidal shape of corner reflectors, possibly leading to multiple targets at different distances or split target signals.

Retro Target Reflector	Order-No.	Description
TOPLICHT Retro / Triple Reflector	3rd party vendor	Foldable octahedral radar reflector (aluminum); available from TOPLICHT; the radar reflector is usable with *SiRad MIMO r2, SiRad MIMO, SiRad Easy®* (non-r4 version), and *SiRad Simple®;* Mfr.-No: 3042-030

2   Compatibility

The table below shows board and accessory compatibilities. An 'x' indicates that the parts are compatible and work together when connected, while '-' means that they are incompatible or do not work together.

Table 1   Compatibility of Accessory Parts

Hardware Compatibility	Breakout_Board v1.0	Breakout_Board v1.1	RFE_TRX_024_046 v1.1	RFE_TRX_024_046 v1.2	RFE_TRX_120_001 v1.0	RFE_TRX_120_001 v1.1	RFE_TRX_120_067 v1.0	RFE_TRA_120_002 v1.0	RFE_TRA_120_002 v1.1	RFE_TRA_120_002 v1.2	RFE_TRA_120_045 v1.0	RFE_TRA_300_042 v1.0
Base_Board v1.0	x	x	x	x	x	x	x	x	x	x	x	x
Base_Board v1.1	x	x	x	x	x	x	x	x	x	x	x	x
Base_Board v1.2	x	x	x	x	x	x	x	x	x	x	x^2	x^2
Base_Board v1.3	x	x	x	x	x	x	x	x	x	x	x	x
SiRad Standard HE-PD Lens	-	-	-	-	x	x	x	x	x	x	x	x^3
SiRad Compact Acryl Lens	-	-	-	-	-	-	-	x	x	x	x	-
Reflector CA10715	-	-	-	-	-	-	-	x	x	x	x	-
Reflector_TRA_120_002[4]	-	-	-	-	-	-	-	x	x	-	-	-
LEDiL Lens EMILY/LISA	-	-	-	-	-	-	-	x^5	x^5	x	-	-
LEDiL Lens VERONICA	-	-	-	-	-	-	-	x^5	x^5	x	-	-
LEDiL Lens LAURA	-	-	-	-	-	-	-	x	x	x	x	-

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[2] Mostly compatible - please get in touch with our Sales team.

[3] With 15 mm spacer only, see Section 1.4: Lenses.

[4] Discontinued by the manufacturer.

[5] Usable with mechanical changes applied to the lens (removing the positioning pins).

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