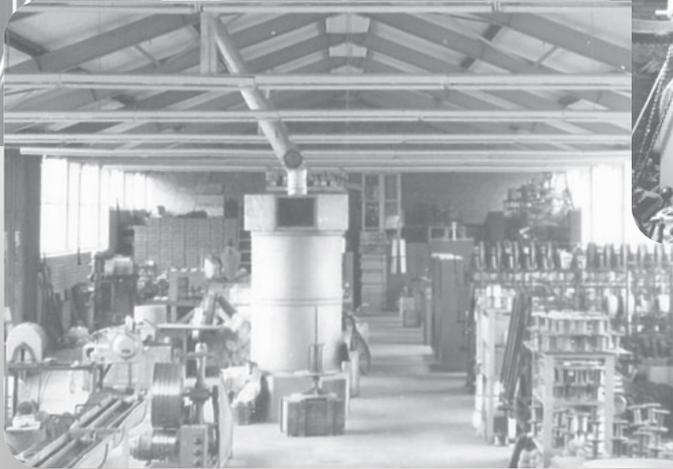


USB 2.0 / 3.0

Cables



SAB Bus



TRADITIONAL
FAMILY BUSINESS

SINCE 1947

USB 2.0 / 3.0 Cables

Content

Who we are	4
Our cables at a glance	5
Our cable harnessing at a glance	6
USB 3.0 cables		
■ USB 3.0 S	 USB 3.0 cable with UL recognition, continuously flexible, suitable for cable tracks	7
■ USB 3.0 RT	 USB 3.0 cable with UL recognition, continuously flexible, suitable for robots	7
■ USB 3.0 M	 USB 3.0 cable especially for the application in medical technology, flexible	8
USB 2.0 cables		
■ USB 2.0	 flexible USB 2.0 cable	9
■ USB 2.0 UL	 flexible USB 2.0 cable with UL recognition	9
■ USB 2.0 FRNC	 halogen-free flexible USB 2.0 cable	9
■ USB 2.0 S	 USB 2.0 cable, continuously flexible, suitable for cable tracks	10
■ USB 2.0 S UL/CSA	 USB 2.0 cable with UL recognition, CSA approval, continuously flexible, suitable for cable tracks	10
■ USB 2.0 RT UL/CSA	 USB 2.0 cable with UL recognition, CSA approval, continuously flexible, suitable for robots	10
■ SABIX® USB 2.0 R flex	 halogen-free continuously flexible SABIX® USB 2.0 Rail cable, tested acc. to EN 45545-2	11

Application range USB 2.0 and USB 3.0 cables

The SAB robot cables USB 2.0 and USB 3.0 was developed for high frequency data transmission in industry.

In the industry intelligent image processing systems are very important. They are the key to more efficiency, precision and productivity with the installation and treatment by robots for the most different applications. Whether for the identification of parts and components, for visual inspection, welded seam control or for the collection of bar codes or type tests; whe-

rever a quick and reliable collection and transmission of data from the camera to the industrial PC are absolutely important.

Our highly flexible robot cables USB 2.0 and USB 3.0 was especially developed for this application. It guarantees excellent transmission characteristics as it is demanded for intelligent image processing under extreme industrial application conditions.



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Family business in the third generation

75 years of experience in cable and wire manufacturing as well as in temperature measurement technology turned a one-man business into a company with more than 550 employees. We prove our strength every year with more than 1500 special products according to customers' requirements. Each product is a new challenge for our creative technical team. We at **SAB** see ourselves as a manufacturer and a service provider – in the sense of true partnership and the greatest possible customer orientation.

Today, the quality of our products is known and appreciated in more than 100 countries around the world. In all product ranges, we are certified according to DIN EN ISO 9001. Furthermore, we have implemented an environmental management system for our company according to DIN EN ISO 14001, an occupational health and safety management system according to NLF/ILO-OSH and DIN ISO 45001, and an energy management system according to DIN EN ISO 50001.

And also for the future, our slogan is: **"WE GO FORWARD!"**

FOUNDED:	1947 by Peter Bröckskes sen. an independent, medium-sized company.
CEO:	Peter Bröckskes and Sabine Bröckskes-Wetten
PLANT/LOCATION:	In Viersen (Lower Rhine) 110.000 m ² company site. Own manufacturing from copper conductor to outer sheath. VDE approved burnchamber and laboratory within the company.
EMPLOYEES/WORKERS:	approx. 430 at the plant in Viersen, 550 worldwide
YEARLY SALES:	over 134 Mio. € worldwide
PRODUCTS:	Special Cables Measurement Technology Cable Harnessing
CERTIFICATES AND APPROVALS:	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;">  </div> <div style="flex: 2;"> <p>Quality management system acc. to DIN EN ISO 9001 for every manufacturing field</p> <p>Environmental management system acc. to DIN EN ISO 14001</p> <p>Occupational health and safety management acc. to NLF/ILO-OSH and DIN ISO 45001</p> <p>Energy management system acc. to DIN EN ISO 50001</p> </div> </div>

USB 2.0 / 3.0 Cables

Who we are - a survey

WE DEVELOP AND PRODUCE **CABLES AND WIRES**
AS WELL AS **SPECIAL SOLUTIONS**
PARTICULARLY ACCORDING TO YOUR REQUIREMENTS AND APPLICATIONS.

Conductor Materials

- Bare copper
- Tinned copper
- Silver plated copper
- Nickel plated copper
- Nickel
- Nickel pure
- Compensating cable alloys

Conductor Sizes

- 0,14 mm² - 300 mm²
- variety of stranding styles

Insulation and Jacketing Materials

- PVC (varietals)
- Polyethylene
- Polypropylene
- TPE
- Fibreglass
- Besilen®/Silicone
- Pi foil
- FEP, ETFE, PFA, PTFE
- SABIX® zero halogen
- Polyurethane

Conductor Count Ranges

- unshielded - up to 125 conductors
- shielded - up to 100 conductors

Temperature Ranges (based on material)

- Thermoplastic Elastomers -50°C up to +145°C
- Besilen®/Silicone -40°C up to +220°C
- FEP, ETFE, PFA, PTFE -90°C up to +260°C
- Halogen-free -50°C up to +220°C
- Fibreglass up to +600°C

Shielding and Braiding Materials

- Bare copper
- Tinned copper
- Galvanized steel
- Stainless steel
- Aluminium foil
- Fibreglass
- Aramid

Approvals

- UL, CSA, CE, EAC, VDE, HAR, IEC, EN, ISO, DNV-GL, LR, ABS, RINA, RMRS, BSI



USB 2.0 / 3.0 Cables

Who we are - a survey

WE SUPPLY **HARNESSED CABLES AND WIRES**

FROM A SINGLE SOURCE.

- helix cables
- harnessed cables acc. to customers' specification
- cable harnesses
- harnessed motor and transmission cables for Siemens and Indramat drives
- harnessed track cable
- various combinations of connector types and terminals
- many application of various materials and sheath materials
- complete solutions
- high quality standard by continuous quality control

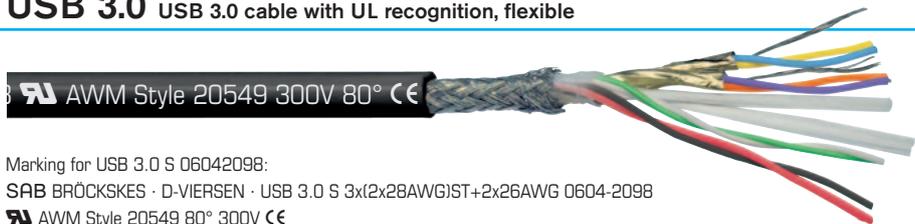


USB 3.0 Cables

USB 3.0 S USB 3.0 cable with UL recognition, continuously flexible, suitable for cable tracks

USB 3.0 RT USB 3.0 cable with UL recognition, continuously flexible, suitable for robots

USB 3.0 USB 3.0 cable with UL recognition, flexible



Marking for USB 3.0 S 06042098:

SAB BRÜCKSKES · D-VIERSEN · USB 3.0 S 3x(2x28AWG)ST+2x26AWG 0604-2098

AWM Style 20549 80° 300V CE

Construction:	USB 3.0 S <i>suitable for cable tracks</i>	USB 3.0 RT <i>suitable for robots</i>
Dimension:	3 x (2 x 28 AWG)ST + 2 x 26 AWG	3 x (2 x 28 AWG)ST + 2 x 26 AWG, 3 x (2 x 26 AWG)ST + 2 x 24 AWG
Conductor:	silver-plated strands and tinned copper strands	
Insulation:	special polymer	
Colour code:	yellow, blue + orange, violet (USB 3.0), green, white (USB 2.0), red, black (power supply)	
Stranding:	twisted pairs and datapairs screened, all elements together	
Wrapping:	non-woven tape	netting tape + non-woven tape
Screen:	tinned copper braiding	
Wrapping:	non-woven tape	
Sheath material:	PUR	
Sheath colour:	black (RAL 9005)	

Technical data:	USB 3.0 S <i>suitable for cable tracks</i>	USB 3.0 RT <i>suitable for robots</i>
Item number:	0604-2098	0604-3098, 0604-3096
Peak operating voltage:	max. 350 V	
Voltage UL:	300 V	
Testing voltage		
core/core:	2000 V	
core/screen:	2000 V	
Min. bending radius		
fixed laying:	5 x d	5 x d
flexible application:	10 x d	10 x d
continuously flexible:	12 x d	15 x d
Torsion angle:	---	up to ±360°/m
Temperature range VDE	UL: up to +80 °C	
fixed laying:	-50/+90 °C	
flexible application:	-40/+90 °C	
Fire performance:	flame retardant and self-extinguishing acc. to IEC 60332-1-2 + EN 60332-1-2	
Oil resistance:	very good, TMPU acc. to EN 50363-10-2	
UL Style:	20549	
Absence of harmful substances:	acc. to RoHS directive of the European Union	

item no.	type	dimension	outer-ø approx. mm	copper figure kg/km	cable weight ≈ kg/km	ohmic resistance at 20°C max.Ω/km		
						28 AWG	26 AWG	24 AWG
06042098	USB 3.0 S	3 x (2 x 28 AWG)ST + 2 x 26 AWG	6,1	26,5	45	223	140	—
06043098	USB 3.0 RT	3 x (2 x 28 AWG)ST + 2 x 26 AWG	6,4	28,1	50	223	140	—
06043096	USB 3.0 RT	3 x (2 x 26 AWG)ST + 2 x 24 AWG	8,0	38,9	73	—	130	83,3
06030078	USB 3.0	2 x (2 x 28 AWG)ST + 2 x 28 AWG + 2 x 26 AWG	6,1	25,5	48	223	140	—

Other dimensions and colours are possible on request.



For transmission lengths more than 3 m, please contact us!

Also possible as harnessed cable with USB type A and USB type B plug!



USB 3.0 Cables

USB 3.0 M

USB 3.0 cable for the application in medical technology, flexible



Marking for USB 3.0 M 06061018:

SAB BRÜCKSKES · D-VIERSEN · USB 3.0 M 2x(2x28AWG)ST+2x28AWG+2x26AWG 0606-1018 CE

Construction:

Conductor:	28 AWG: silver-plated strands, fine wires 26 AWG: tinned copper strands, fine wires
Insulation:	FEP
Colour code:	28 AWG: yellow, blue + orange, violet (USB 3.0), green, white (USB 2.0), 26 AWG: red, black (power supply)
Stranding:	USB 3.0 twisted and screened pairs, USB 2.0 twisted pairs, all elements together
Drain wire:	bare copper strands, fine wires
Screen:	alu foil
Stranding:	all USB 3.0 elements together
Wrapping:	foil
Screen:	tinned copper braiding
Sheath material:	SABmed S
Sheath colour:	grey (RAL 7000)

Technical data:

Peak operating voltage:	max. 50 V
Testing voltage:	core/core 600 V core/screen 600 V
Min. bending radius	
fixed laying:	5 x d
flexible application:	10 x d
Temperature range	
fixed laying:	-40/+180 °C
flexible application:	-25/+180 °C
Impedance of data pairs:	nom. 90Ω
Absence of harmful substances:	acc. to RoHS directive of the European Union

Outstanding features:



- biocompatible sheath material
- biological harmlessness
acc. to EN ISO 10993-1,
cytotoxicity acc. to EN ISO 10993-5
- high temperature resistant
- high notch and tear resistance
- very good flexibility
- surface not adhesive

item no.	type	dimension	outer-ø approx. mm	copper figure kg/km	cable weight ≈ kg/km	ohmic resistance at 20°C max.Ω/km 28 AWG 26 AWG	
06061018	USB 3.0 M	2 x (2 x 28 AWG)ST + 2 x 28 AWG + 2 x 26 AWG	5,6	25,4	48	223	140

Other dimensions and colours are possible on request.



For transmission lengths more than 3 m, please contact us!

Also possible as harnessed cable with USB type A and USB type B plug!



USB 2.0 Cables

USB 2.0 flexible USB 2.0 cable

USB 2.0 UL flexible USB 2.0 cable with UL recognition

USB 2.0 FRNC halogen-free flexible USB 2.0 cable



0,5mm² 0601-0222 AWM Style 2655 80°C 300V



Marking for USB 2.0 UL 06010222:

SAB BRÖCKSKES · D-VIERSEN · USB 2.0 Leitung · (2x0,22mm²)ST+2x0,5mm² 0601-0222 AWM Style 2655 80°C 300V



Construction:	USB 2.0 <i>flexible</i>	USB 2.0 UL <i>flexible</i>	USB 2.0 FRNC <i>flexible</i>
Dimension:		(2 x 0,22 mm ²) ST + 2 x 0,5 mm ²	
Conductor:		bare copper strands (0,50 mm ²), silver-plated strands (0,22 mm ²)	
Insulation:		SABIX®	
Colour code:		black, red (0,50 mm ²), white, green (0,22 mm ²)	
Stranding:		2 x 0,22 mm ² wrapped with alu foil, together with 0,5 mm ²	
Wrapping:		non-woven tape	
Screen:		tinned copper braiding	
Sheath material:		PVC	SABIX®
Sheath colour:		black (RAL 9005)	

Technical data:	USB 2.0 <i>flexible</i>	USB 2.0 UL <i>flexible</i>	USB 2.0 FRNC <i>flexible</i>
Item number:	0601-0122	0601-0222	0601-9001
Peak operating voltage:		max. 350 V	
Voltage UL:	---	300 V	---
Testing voltage			
core/core:	600 V	2000 V	1500 V
core/screen:	600 V	2000 V	1200 V
Min. bending radius		5 x d	
fixed laying:		10 x d	
flexible application:			
Temperature range VDE		UL: up to +80 °C	
fixed laying:	-30/+70 °C	-30/+70 °C	
flexible application:	-5/+70 °C	-5/+70 °C	
Halogen-free:		---	acc. to IEC 60754-1 + VDE 0482-754-1
Fire performance:		---	flame retardant and self-extinguishing acc. to IEC 60332-1-2 + VDE 0482-332-1-2
Oil resistance:		acc. to internal standard	
UL Style:	---	2655	---
Absence of harmful substances:		acc. to RoHS directive of the European Union	

item no.	type	dimension	outer-ø approx. mm	copper figure kg/km	cable weight ≈ kg/km
06010122	USB 2.0	(2 x 0,22 mm ²)ST + 2 x 0,50 mm ²	6,8	34,0	60
06010222	USB 2.0 UL	(2 x 0,22 mm ²)ST + 2 x 0,50 mm ²	7,0	34,0	64
06019001	USB 2.0 FRNC	(2 x 0,22 mm ²)ST + 2 x 0,50 mm ²	6,8	34,0	62

Other dimensions and colours are possible on request.

Also possible
as harnessed cable
with USB type A and
USB type B plug!

USB 2.0 Cables

- USB 2.0 S** USB 2.0 cable, continuously flexible, suitable for cable tracks
- USB 2.0 S UL/CSA** USB 2.0 cable with UL recognition, CSA approval, continuously flexible, suitable for cable tracks
- USB 2.0 RT UL/CSA** USB 2.0 cable with UL recognition, CSA approval, continuously flexible, suitable for robots



21198 80°C 300V CSA AWM I/II A/B 80°C 300V FT2 CE 



Marking for USB 2.0 S UL/CSA 06011122:

SAB BRÜCKSKES · D-VIERSEN · USB 2.0 Leitung · (2x0,22mm²)ST+2x0,5mm² 0601-1122  AWM Style 21198 80°C 300V CSA AWM I/II A/B 80°C 300V FT2 CE

Construction:	 		
	USB 2.0 S <i>suitable for cable tracks</i>	USB 2.0 S UL/CSA <i>suitable for cable tracks</i>	USB 2.0 RT UL/CSA <i>suitable for robots</i>
Dimension:		(2 x 0,22 mm ²) ST + 2 x 0,5 mm ²	
Conductor:		bare copper strands (0,50 mm ²), silver-plated strands (0,22 mm ²)	
Insulation:		SABIX®	
Colour code:		black, red (0,50 mm ²), white, green (0,22 mm ²)	
Stranding:		2 x 0,22 mm ² wrapped with alu foil, together with 0,5 mm ²	
Wrapping:		non-woven tape	PTFE foil
Screen:		tinned copper braiding	wrapping with tinned copper round wires
Wrapping:		non-woven tape	
Sheath material:		PUR	
Sheath colour:		black (RAL 9005)	

Technical data:	 		
	USB 2.0 S <i>suitable for cable tracks</i>	USB 2.0 S UL/CSA <i>suitable for cable tracks</i>	USB 2.0 RT UL/CSA <i>suitable for robots</i>
Item number:	0601-1022	0601-1122	0601-2022
Peak operating voltage:		max. 350 V	
Voltage UL/CSA:	---	300 V	
Testing voltage			
core/core:	600 V	2000 V	
core/screen:	600 V	2000 V	
Min. bending radius			
fixed laying:		5 x d	5 x d
flexible application:		6 x d	7,5 x d
continuously flexible:		7,5 x d	10 x d
Torsion angle:		---	up to ±180°/m
Temperature range VDE			UL/CSA: up to +80 °C
fixed laying:	-50/+90 °C	-50/+90 °C	
flexible application:	-40/+90 °C	-40/+90 °C	
Halogen-free:	acc. to IEC 60754-1 + VDE 0482-754-1		---
Oil resistance:	TMPU EN 50363-10-2 + VDE 0207-363-10-2		
UL Style:	---	21198	
Absence of harmful substances:	acc. to RoHS directive of the European Union		

item no.	type	dimension	outer-ø approx. mm	copper figure kg/km	cable weight ≈ kg/km
06011022	USB 2.0 S	(2 x 0,22 mm ²)ST + 2 x 0,50 mm ²	7,0	34,1	59
06011122	USB 2.0 S UL/CSA	(2 x 0,22 mm ²)ST + 2 x 0,50 mm ²	7,2	34,1	66
06012022	USB 2.0 RT UL/CSA	(2 x 0,22 mm ²)ST + 2 x 0,50 mm ²	7,0	34,3	64

Other dimensions and colours are possible on request.

Also possible as harnessed cable with USB type A and USB type B plug!

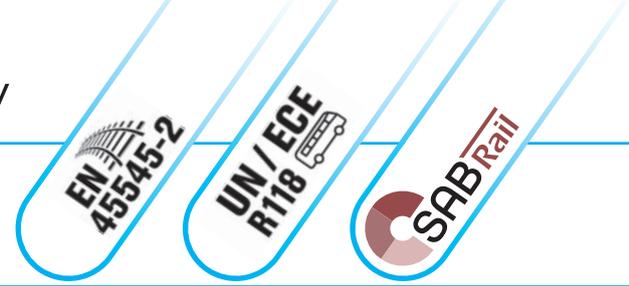


CABLE ASSEMBLY POSSIBLE

Cables for Railway Technology

SABIX® USB 2.0 R flex

halogen-free continuously flexible SABIX® USB 2.0 Rail cable



D-VIERSEN · SABIX USB 2.0 R flex 4x28AWG 0601-9013



Marking for SABIX® USB 2.0 R flex 06019013:
SAB BRÜCKSKES · D-VIERSEN · SABIX USB 2.0 R flex 4x28AWG 0601-9013

Construction:

Conductor:	bare copper strands, fine wires
Insulation:	SABIX®
Colour code:	white, green, red, black
Screen:	alu foil and tinned copper braiding, Drain AWG 30 of tinned copper under the braid
Sheath material:	SABIX®
Sheath colour:	black (RAL 9005)

Technical data:

Peak operating voltage:	max. 30 V
Testing voltage:	core/core 600 V core/screen 600 V
Min. bending radius	
fixed laying:	5 x d
flexible application:	10 x d
Temperature range	
fixed laying:	-50/+90 °C
flexible application:	-50/+90 °C
Halogen-free:	acc. to EN 50306-1 + EN 50264-1 are fulfilled. Development of HCl is < 0,5% acc. to IEC 60754-1. pH-value is > 4,3 acc. to IEC 60754-2. Conductivity is < 10,0 µS/mm acc. to IEC 60754-2. Fluoric content < 0,1% acc. to IEC 60684-2.
Fire performance:	No flame propagation acc. to IEC 60332-3-24 + VDE 0482-332-3-24 resp. IEC 60332-3-25 + VDE 0482-332-3-25 and EN 50305 + VDE 0260-305 section 9.1.2. Flame retardant and self-extinguishing acc. to IEC 60332-1-2 + VDE 0482-332-1-2. Flame retardant acc. to ISO 6722 (UN/ECE R118)
Toxicity:	acc. to EN 50305 + VDE 0260-305
Smoke density:	acc. to IEC 61034 + VDE 0482-1034
Oil and fuel resistance:	acc. to EN 50264-1 + VDE 0260-264-1
Absence of harmful substances:	acc. to RoHS directive of the European Union

Outstanding features:



- halogen-free
- continuously flexible
- no flame propagation
- flame retardant and self-extinguishing
- good oil and fuel resistance
- fulfils fire protection requirements R15 (EL1A) and R16 (EL1B) acc. to EN 45545-2 for hazard levels HL1-3
- flame retardant acc. to UN/ECE R118

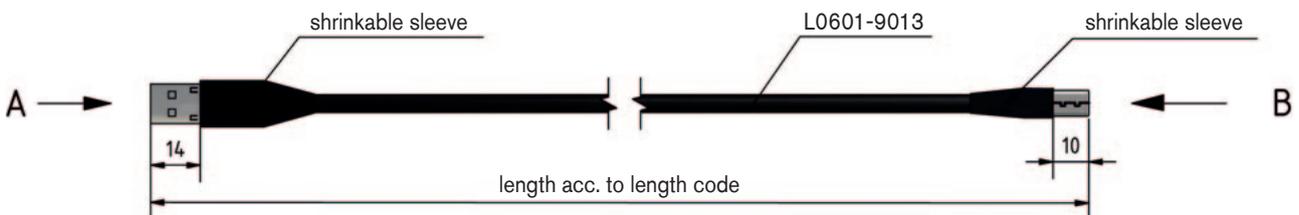
Art.-Nr.	type	dimension	outer-ø approx. mm	copper figure kg/km	cable weight ≈kg/km	ohmic resistance at 20°C max. Ω/km
06019013	SABIX® USB 2.0 R flex	4 x 28/7 AWG	5,2	14,3	41	223,8

Other dimensions and colours are possible on request.

Also possible as harnessed cable with USB type A and USB type B plug!



USB 2.0 cable with USB type A and USB type B plug



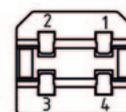
view A (2:1)



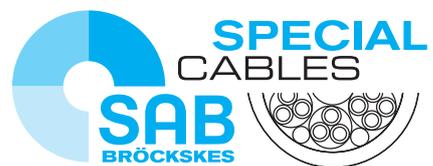
Pin configuration

USB A	colour code	USB B
1	red	1
2	white	2
3	green	3
4	black	4
housing	screen	housing

view B (3:1)



view soldering side



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