



Machine Vision & High-Flex Camera Cables

High-Flex USB Cable for Machine Vision

90 Ω twinax SDP + UTP + low-drop power High-Flex USB 3.2 / USB3 Vision drag-chain camera



USB3 Vision · 5 / 10 Gbps

90 $\Omega \pm 7 \Omega$ Twinax SDP

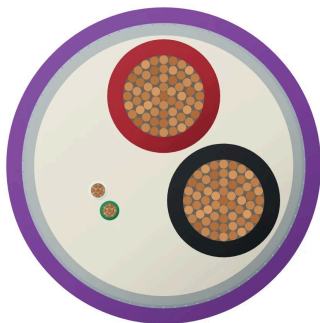
$\geq 5\text{M}-10\text{M}$ Drag-Chain Cycles

Application

High-Flex USB Cable for Machine Vision is a continuous-flex 90 $\Omega \pm 7 \Omega$ hybrid data-and-power cable engineered for AIA USB3 Vision (5 Gbps / 10 Gbps) and USB 2.0 industrial cameras, combining two individually foil-and-drain-shielded 90 Ω SuperSpeed twinax

Typical uses: Automated Optical Inspection (AOI), Semiconductor & PCB pick-and-place, 3D robotic bin-picking & guidance, Pharmaceutical packaging vision

Construction



Cross-section, not to scale

1	19-strand tinned/silvered Cu signal &	USB 3.2 / USB3 Vision
2	Foamed polyolefin (O2YS) dielectric	USB 3.2 spec
3	Individual twinax screens (SDP)	USB 3.2 SDP
4	Overall EMC copper braid	AIA USB3 Vision
5	Outer sheath (PUR TPU)	UL AWM 20233 / 21198

Technical data

Typical values

Differential impedance Z0	90 Ω ± 7 Ω (SuperSpeed SDP & USB 2.0 D+/D-)	Intra-pair delay skew (SDP)	≤ 15 ps/m
Mutual capacitance (SDP)	≈ 42 pF/m	Velocity of propagation (VoP)	78 % (0.78 c)
Attenuation (0.625 / 1.25 / 2.5 GHz)	24.0 / 35.0 / 52.0 dB/100m (AWG 24 SDP)	Power conductor DC resistance	≤ 55 Ω/km (AWG 20) · ≤ 88 Ω/km (AWG 22)
Operating temp. (drag-chain / fixed)	-30 °C to +80 °C	Voltage rating (UL AWM)	30 V / 80 °C (UL Style 20276 / 20233)
Min. bending radius (fixed / chain)	5 × D fixed · 7.5 × D drag-chain	Drag-chain cycle life	≥ 5,000,000 to 10,000,000 cycles
Halogen-free & cleanroom suitability	IEC 60754-1/2 · low-abrasion PUR outer jacket	Oil & flame resistance	EN 60811-404 · UL VW-1 / FT1
Standards	AIA USB3 Vision · USB 3.2 Gen 1 (5 Gbps)		

Sizes

4 standard constructions

Tick the sizes you need and send this page to info@tebaoflex.com or WhatsApp +86 185 9591 3361.

Order designation	Configuration	Conductor size	Outer Ø ≈ mm	Copper kg/km	Weight ≈ kg/km	Min. bend R fixed mm
Standard High-Flex USB Cable for Machine Vision configurations 4 sizes						
☐ USB 2.0 High-Flex Vision (1×2×AWG28 + 2×AWG20)	1×2×AWG28 + 2×AWG20 (USB 2.0)	AWG 28 / 20	5.0	21	36	25
☐ USB3 Vision Compact Chain (2×2×AWG28 + 1×2×AWG28 + 2×AWG24)	2×2×28 + 1×2×28 + 2×24	AWG 28 / 24	5.6	26	44	28
☐ USB3 Vision Standard Chain (2×2×AWG26 + 1×2×AWG28 + 2×AWG22)	2×2×26 + 1×2×28 + 2×22	AWG 26 / 22	6.2	33	54	31
☐ USB3 Vision Long-Reach Chain (2×2×AWG24 + 1×2×AWG26 + 2×AWG20)	2×2×24 + 1×2×26 + 2×20	AWG 24 / 20	7.3	45	72	36

– Outer diameters and weights are nominal factory values subject to ±5 % manufacturing tolerance per USB3 Vision / USB 3.2 Gen 1 & Gen 2 / USB 2.0 High-Flex.

Impedance, capacitance & attenuation

4 sizes

Configuration	Impedance Z0	Max. DC R @ 20 °C Ω/km	Mutual C pF/m ≈	VoP %	Attenuation @ 20 °C dB/100m	Dielectric test V
1×2×AWG28 + 2×AWG20 (USB 2.0)	90 Ω	55.0	44.0	75	9.5 @ 100 · 21.0 @ 400 MHz	750
2×2×28 + 1×2×28 + 2×24	90 Ω	140.0	43.0	78	34.0 @ 0.625 · 49.0 @ 1.25 · 72.0 @ 2.5 GHz	750
2×2×26 + 1×2×28 + 2×22	90 Ω	88.0	42.0	78	28.5 @ 0.625 · 41.0 @ 1.25 · 60.0 @ 2.5 GHz	750
2×2×24 + 1×2×26 + 2×20	90 Ω	55.0	42.0	78	24.0 @ 0.625 · 35.0 @ 1.25 · 52.0 @ 2.5 GHz	750

– Transmission values (characteristic impedance Z0, mutual capacitance, VoP, and attenuation) are measured at +20 °C per USB3 Vision / USB 3.2 Gen 1 & Gen 2 / USB 2.0 High-Flex.

Standards and approvals

- ✓ AIA USB3 Vision
- ✓ USB 3.2 Gen 1 / Gen 2
- ✓ UL AWM 20276 / 20233

Certifications



Management systems: ISO 9001, ISO 14001, ISO 45001

Request a quotation

Send the size, length and destination. An application engineer replies within 2 business hours.

WhatsApp / phone

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Email

info@tebaoflex.com

Web

tebaoflex.com/cables/high-flex-usb-cable-for-machine-vision



Typical values for this cable type, based on USB3 Vision / USB 3.2 Gen 1 & Gen 2 / USB 2.0 High-Flex. Values for your order are confirmed in the quotation. Subject to change without notice. Jiangsu Tebaoflex Special Cable Co., Ltd., Taicang, Jiangsu, China.