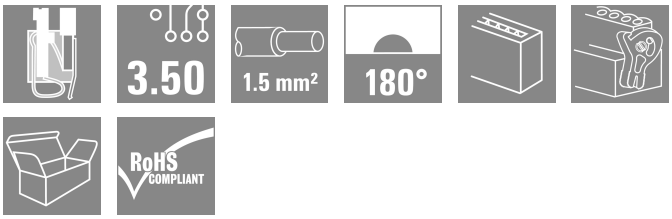
Data sheet

# BL-I/O 3.50/10/180LR NPN LED SN BK BX

**Weidmüller Interface GmbH & Co. KG**
Klingenbergstraße 26
D-32758 Detmold
Germany

www.weidmueller.com




Female plugs with spring connection (PUSH IN) as a plug-in connection level for decentralised I/O electronic components; used together with male headers in a 3.50-mm pitch.

## General ordering data

| | |
|---|---|
| Version | PCB plug-in connector, female plug, 3.50 mm, Number of poles: 10, 180°, PUSH IN with actuator, Clamping range, max. : 1.5 mm², Box |
| Order No. | 1531200000 |
| Type | BL-I/O 3.50/10/180LR NPN LED SN BK BX |
| GTIN (EAN) | 4050118335774 |
| Qty. | 20 items |
| Product data | IEC: 200 V / 2.2 A / 0.2 - 1.5 mm²<br>UL: 50 V / 5 A / AWG 24 - AWG 16 |
| Packaging | Box |

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## Technical data

### Approvals

| | |
|---|---|
| Approvals | |
| ROHS | Conform |
| UL File Number Search | UL Website |
| Certificate No. (UR) | E60693 |

### Dimensions and weights

| | | | |
|---|---|---|---|
| Depth | 29.1 mm | Depth (inches) | 1.1457 inch |
| Height | 14.5 mm | Height (inches) | 0.5709 inch |
| Width | 42.3 mm | Width (inches) | 1.6654 inch |
| Net weight | 6.18 g | | |

### Environmental Product Compliance

| | |
|---|---|
| RoHS Compliance Status | Compliant with exemption |
| RoHS Exemption (if applicable/known) | 7cl |
| REACH SVHC | No SVHC above 0.1 wt% |

### System Parameters

| | | | |
|---|---|---|---|
| Product family | OMNIMATE Signal - series BL/SL 3.50 | Type of connection | Field connection |
| Wire connection method | PUSH IN with actuator | Pitch in mm (P) | 3.50 mm |
| Pitch in inches (P) | 0.138 " | Conductor outlet direction | 180° |
| Number of poles | 10 | L1 in mm | 31.50 mm |
| L1 in inches | 1.240 " | Pin series quantity | 2 |
| Rated cross-section | 1 mm² | Touch-safe protection acc. to DIN VDE 57 106 | Safe from finger touch |
| Touch-safe protection acc. to DIN VDE 0470 | IP20 plugged/ IP10 unplugged | Volume resistance | ≤5 mΩ |
| Can be coded | Yes | Stripping length | 8 mm |
| Screwdriver blade | 0.4 x 2.5 | Screwdriver blade standard | DIN 5264 |
| Plugging cycles | 25 | Plugging force/pole, max. | 6 N |
| Pulling force/pole, max. | 6 N | | |

### Material data

| | | | |
|---|---|---|---|
| Insulating material | PBT | Colour | black |
| Colour chart (similar) | RAL 9011 | Insulating material group | IIIa |
| Comparative Tracking Index (CTI) | ≥ 200 | Moisture Level (MSL) | |
| UL 94 flammability rating | V-0 | Contact base material | Cu-alloy |
| Contact material | Cu-alloy | Contact surface | tinned |
| Storage temperature, min. | -40 °C | Storage temperature, max. | 70 °C |
| Operating temperature, min. | -50 °C | Operating temperature, max. | 75 °C |
| Temperature range, installation, min. | -30 °C | Temperature range, installation, max. | 75 °C |

### Conductors suitable for connection

| | |
|---|---|
| Clamping range, min. | 0.2 mm² |
| Clamping range, max. | 1.5 mm² |
| Wire connection cross section AWG, min. | AWG 24 |

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## Technical data

| | | | |
|---|---|---|---|
| Wire connection cross section AWG, max. | AWG 16 | | |
| Solid, min. H05(07) V-U | 0.2 mm² | | |
| Solid, max. H05(07) V-U | 1.5 mm² | | |
| Flexible, min. H05(07) V-K | 0.2 mm² | | |
| Flexible, max. H05(07) V-K | 1.5 mm² | | |
| w. plastic collar ferrule, DIN 46228 pt 4, min. | 0.2 mm² | | |
| w. plastic collar ferrule, DIN 46228 pt 4, max. | 0.75 mm² | | |
| w. wire end ferrule, DIN 46228 pt 1, min. | 0.2 mm² | | |
| w. wire end ferrule, DIN 46228 pt 1, max. | 1 mm² | | |
| Plug gauge in accordance with EN 60999 a x b; ø | 2.4 mm x 1.5 mm; 1.9mm | | |
| Clampable conductor | Cross-section for conductor connection | Type | fine-wired |
| | | nominal | 0.25 mm² |
| | wire end ferrule | Stripping length | nominal 10 mm |
| | | Recommended wire-end ferrule | H0,25/12 HBL |
| | Cross-section for conductor connection | Type | fine-wired |
| | | nominal | 0.34 mm² |
| | wire end ferrule | Stripping length | nominal 10 mm |
| | | Recommended wire-end ferrule | H0,34/12 TK |
| | Cross-section for conductor connection | Type | fine-wired |
| | | nominal | 0.5 mm² |
| | wire end ferrule | Stripping length | nominal 10 mm |
| | | Recommended wire-end ferrule | H0,5/14 OR |
| | Cross-section for conductor connection | Type | fine-wired |
| | | nominal | 0.75 mm² |
| | wire end ferrule | Stripping length | nominal 10 mm |
| | | Recommended wire-end ferrule | H0,75/14T HBL |
| Reference text | The outside diameter of the plastic collar should not be larger than the pitch (P), Length of ferrules is to be chosen depending on the product and the rated voltage. | | |

### Rated data acc. to IEC

| | | | |
|---|---|---|---|
| tested acc. to standard | IEC 60664-1, IEC 61984 | Rated current, min. number of poles (Tu=20°C) | 2.2 A |
| Rated current, max. number of poles (Tu=20°C) | 2 A | Rated current, min. number of poles (Tu=40°C) | 2.2 A |
| Rated current, max. number of poles (Tu=40°C) | 2 A | Rated voltage for surge voltage class / pollution degree II/2 | 200 V |
| Rated voltage for surge voltage class / pollution degree III/2 | 160 V | Rated voltage for surge voltage class / pollution degree III/3 | 50 V |
| Rated impulse voltage for surge voltage class/ pollution degree II/2 | 2500 V | Rated impulse voltage for surge voltage class/ pollution degree III/2 | 2.5 kV |
| Rated impulse voltage for surge voltage class/ contamination degree III/3 | 0.8 kV | Short-time withstand current resistance | 3 x 1s with 120 A |

### Rated data acc. to CSA

| | | | |
|---|---|---|---|
| Rated voltage (Use group B / CSA) | 50 V | Rated voltage (Use group D / CSA) | 50 V |
| Rated current (Use group B / CSA) | 5 A | Rated current (Use group D / CSA) | 5 A |
| Wire cross-section, AWG, min. | AWG 22 | Wire cross-section, AWG, max. | AWG 16 |

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## Technical data

### Rated data acc. to UL 1059

| | | | |
|---|---|---|---|
| Institute (UR) | UR | Certificate No. (UR) | E60693 |
| Rated voltage (Use group B / UL 1059) | 50 V | Rated voltage (Use group D / UL 1059) | 50 V |
| Rated current (Use group B / UL 1059) | 5 A | Rated current (Use group D / UL 1059) | 5 A |
| Wire cross-section, AWG, min. | AWG 24 | Wire cross-section, AWG, max. | AWG 16 |
| Reference to approval values | Specifications are maximum values, details - see approval certificate. | | |

### Packing

| | | | |
|---|---|---|---|
| Packaging | Box | VPE length | 142.00 mm |
| VPE width | 105.00 mm | VPE height | 40.00 mm |

### Type tests

| | | | |
|---|---|---|---|
| Test: Durability of markings | Standard | draft DIN VDE 0627 section 6.2.2 / 09.91 | |
| | Test | mark of origin, type identification, pitch, type of material | |
| | Evaluation | available | |
| | Test | durability | |
| | Evaluation | passed | |
| Test: Clampable cross section | Standard | DIN EN 60999-1 section 7 and 9.1 / 12.00, DIN EN 60947-1 section 8.2.4.5.1 / 12.99 | |
| | Conductor type | Type of conductor and conductor cross-section | solid 0.2 mm² |
| | | Type of conductor and conductor cross-section | stranded 0.2 mm² |
| | | Type of conductor and conductor cross-section | solid 1.5 mm² |
| | | Type of conductor and conductor cross-section | stranded 1.5 mm² |
| | | Type of conductor and conductor cross-section | AWG 24/1 |
| | | Type of conductor and conductor cross-section | AWG 24/19 |
| | | Type of conductor and conductor cross-section | AWG 16/1 |
| | | Type of conductor and conductor cross-section | AWG 16/19 |
| | Evaluation | passed | |
| Test for damage to and accidental loosening of conductors | Standard | DIN EN 60999 section 8.4 / 04.94 | |
| | Requirement | 0.2 kg | |
| | Conductor type | Type of conductor and conductor cross-section | stranded 0.05 mm² |
| | Evaluation | passed | |
| | Requirement | 0.3 kg | |
| | Conductor type | Type of conductor and conductor cross-section | solid 0.5 mm² |

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## Technical data

| | | | |
|---|---|---|---|
| | | Type of conductor and conductor cross-section | AWG 24/1 |
| | | Type of conductor and conductor cross-section | AWG 24/19 |
| | Evaluation | passed | |
| | Requirement | 0.4 kg | |
| | Conductor type | Type of conductor and conductor cross-section | solid 1.5 mm² |
| | | Type of conductor and conductor cross-section | stranded 1.5 mm² |
| | | Type of conductor and conductor cross-section | AWG 16/1 |
| | | Type of conductor and conductor cross-section | AWG 16/19 |
| | Evaluation | passed | |
| Pull-out test | Standard | DIN EN 60999 section 8.5 / 04.94 | |
| | Requirement | ≥10 N | |
| | Conductor type | Type of conductor and conductor cross-section | AWG 24/1 |
| | | Type of conductor and conductor cross-section | AWG 24/19 |
| | Evaluation | passed | |
| | Requirement | ≥30 N | |
| | Conductor type | Type of conductor and conductor cross-section | H05V-U0.5 |
| | | Type of conductor and conductor cross-section | H05V-K0.5 |
| | Evaluation | passed | |
| | Requirement | ≥40 N | |
| | Conductor type | Type of conductor and conductor cross-section | H05V-U1.5 |
| | | Type of conductor and conductor cross-section | H05V-K1.5 |
| | Evaluation | passed | |

### Important note

| | |
|---|---|
| IPC conformity | Conformity: The products are developed, manufactured and delivered according international recognized standards and norms and comply with the assured properties in the data sheet resp. fulfill decorative properties in accordance with IPC-A-610 "Class 2". Further claims on the products can be evaluated on request. |
| Notes | • Rated data refer only to the component itself. Clearance and creepage distances to other components are to be designed in accordance with the relevant application standards.<br>• P on drawing = pitch<br>• Crimp form A for wire end ferrules with PZ 6/5 crimping tool are recommended for the largest cable sizes.<br>• Total load-carrying capacity of the potential bridges when feeding with 1.5 mm² is max. 17.5 A (so the capacity is 2.18 A for poles 2 through 9)<br>• Wire end ferrule without plastic collar to DIN 46228/1<br>• Wire end ferrule with plastic collar to DIN 46228/4<br>• Conductor < 0.2 mm² tinned<br>• Max. outer diameter of the conductor: 2.9 mm |

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## Technical data

- In accordance with IEC 61984, OMNIMATE-connectors are connectors without breaking capacity (COC). During designated use, connectors are not allowed to be engaged or disengaged when live or under load
- Long term storage of the product with average temperature of 50 °C and maximum humidity 70%, 36 months

### Classifications

| | | | |
|---|---|---|---|
| ETIM 8.0 | EC002638 | ETIM 9.0 | EC002638 |
| ETIM 10.0 | EC002638 | ECLASS 14.0 | 27-46-02-02 |
| ECLASS 15.0 | 27-46-02-02 | | |

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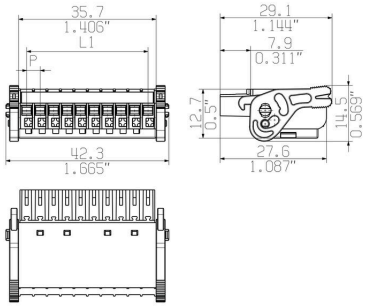
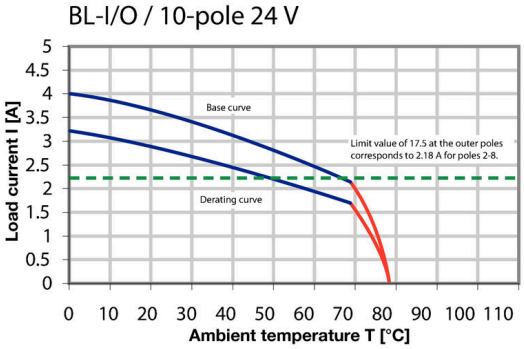
## Drawings

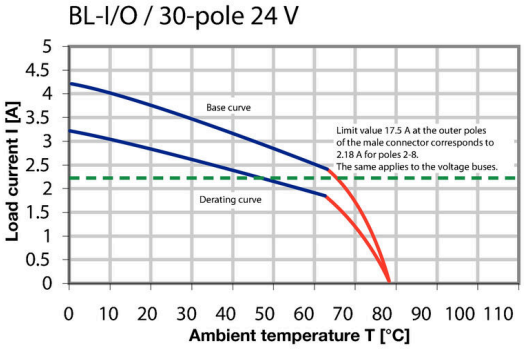
### Dimensional drawing



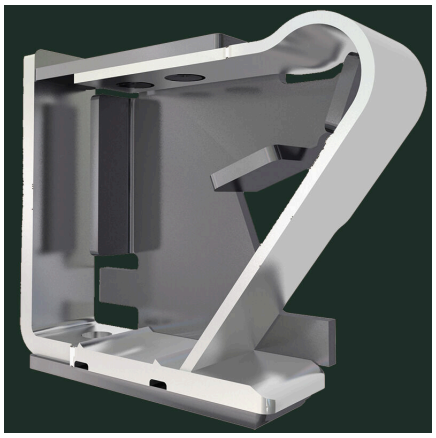

### Graph




### Graph

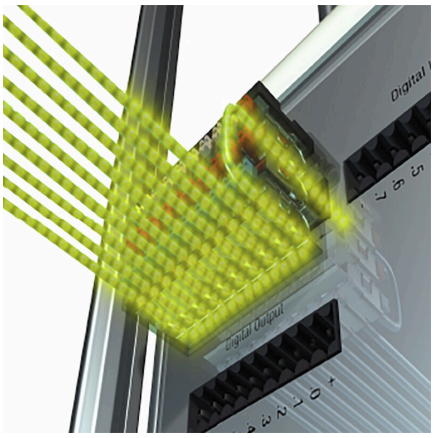



### Product benefits



Solid PUSH IN contactSafe and durable

### Product benefits



Multiplies the potentialLow wiring costs

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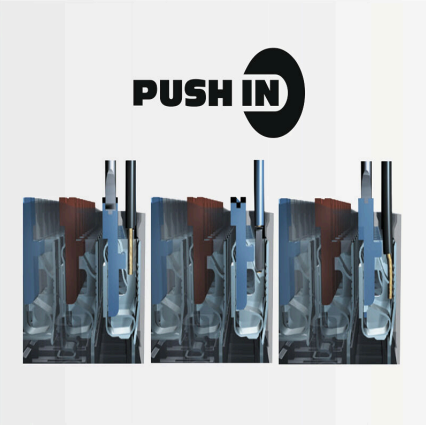
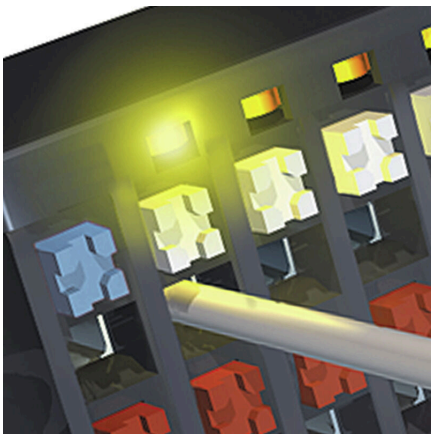
## Drawings

### Product benefits




PUSH IN - fast and secureInvented by Weidmüller

### Product benefits



Integrated electronicsFor more space on the circuit board

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## Accessories

### Coding elements

Only connects what is supposed to be connected: the right connection at the right place.
Coding elements and locking devices clearly assign connecting elements during the manufacturing process and operation
The coding elements and locking devices are inserted prior to assembly or during the cable assembly phase.
The Weidmüller alternative: configure online using the variant configurator to precode prior to delivery.
Incorrect assembly on the circuit board and incorrect plugging of connecting elements is no longer possible.
The advantage: no troubleshooting during manufacture and no operational errors by the user.

#### General ordering data

| | | |
|---|---|---|
| Type | BL SL 3.5 KO OR | Version |
| Order No. | 1693430000 | PCB plug-in connector, Accessories, Coding element, orange, Number |
| GTIN (EAN) | 4008190867447 | of poles: 1 |
| Qty. | 100 ST | |
| Type | BL SL 3.5 KO SW | Version |
| Order No. | 1610100000 | PCB plug-in connector, Accessories, Coding element, black, Number |
| GTIN (EAN) | 4008190187637 | of poles: 1 |
| Qty. | 100 ST | |

### Slotted screwdriver

Slotted screwdriver with rounded blade SD DIN 5265, ISO 2380/2, output to DIN 5264, ISO 2380/1.
ChromTop tip, SoftFinish grip

#### General ordering data

| | | |
|---|---|---|
| Type | SDS 0.4X2.5X75 | Version |
| Order No. | 9009030000 | Screwdriver, Screwdriver |
| GTIN (EAN) | 4032248266944 | |
| Qty. | 1 ST | |
| Type | SDIS 0.4X2.5X75 | Version |
| Order No. | 9008370000 | Screwdriver, Screwdriver |
| GTIN (EAN) | 4032248056330 | |
| Qty. | 1 ST | |

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## Accessories

### Crimping tools

Crimping tools for wire end ferrules, with and without plastic collars
- Ratchet guarantees precise crimping
- Release option in the event of incorrect operation

### General ordering data

| | | |
|---|---|---|
| Type | PZ 1.5 | Version |
| Order No. | 9005990000 | Pressing tool, Crimping tool for wire-end ferrules, 0.14mm², 1.5mm², |
| GTIN (EAN) | 4008190085964 | Trapezoidal crimp |
| Qty. | 1 ST | |
| Type | PZ 6/5 | Version |
| Order No. | 9011460000 | Pressing tool, Crimping tool for wire-end ferrules, 0.25mm², 6mm², |
| GTIN (EAN) | 4008190165352 | Trapezoidal indentation crimp |
| Qty. | 1 ST | |

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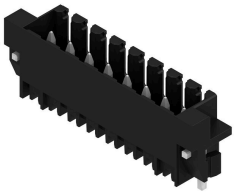
## Counterpart

### SL-SMT 3.5/180RF

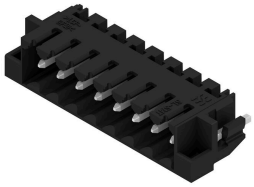


High-temperature-resistant male header, 3.50 mm pitch.
- Plugging direction parallel (90°), straight 180° or angled (135°) to PCB
- Housing variants: closed side (G), screw flange (F), solder flange (LF) or snap-on solder flange (RF)
- Optimised for the SMT process
- Pin length 3.2 mm universal for all soldering methods
- Pin length 1.5 mm optimised for reflow soldering methods
- Packed either in a box (BX) or tape-on-reel (RL)
- Male header can be coded

#### General ordering data

| | | |
|---|---|---|
| Type | SL-SMT 3.50/10/180RF 1.... | Version |
| Order No. | 1291390000 | PCB plug-in connector, male header, Clip-on flange, THT/THR solder |
| GTIN (EAN) | 4050118085266 | connection, 3.50 mm, Number of poles: 10, 180°, Solder pin length |
| Qty. | 50 ST | (l): 1.5 mm, tinned, black, Box |

### SL-SMT 3.5/90RF



High-temperature-resistant male header, 3.50 mm pitch.
- Plugging direction parallel (90°), straight 180° or angled (135°) to PCB
- Housing variants: closed side (G), screw flange (F), solder flange (LF) or snap-on solder flange (RF)
- Optimised for the SMT process
- Pin length 3.2 mm universal for all soldering methods
- Pin length 1.5 mm optimised for reflow soldering methods
- Packed either in a box (BX) or tape-on-reel (RL)
- Male header can be coded

#### General ordering data

| | | |
|---|---|---|
| Type | SL-SMT 3.50/10/90RF 1.5... | Version |
| Order No. | 1060780000 | PCB plug-in connector, male header, Clip-on flange, THT/THR solder |
| GTIN (EAN) | 4032248810246 | connection, 3.50 mm, Number of poles: 10, 90°, Solder pin length (l): |
| Qty. | 50 ST | 1.5 mm, tinned, black, Box |