

**SL-SMT 3.50/09/90LF 1.5SN BK BX****Weidmüller Interface GmbH & Co. KG**

Klingenbergstraße 26

D-32758 Detmold

Germany

[www.weidmueller.com](http://www.weidmueller.com)**Product image**

**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**

|              |   |
|--------------|---|
| Version      | PCB plug-in connector, male header, Solder flange, THT/THR solder connection, 3.50 mm, Number of poles: 9, 90°, Solder pin length (l): 1.5 mm, tinned, black, Box |
| Order No.    | <a href="#">1805010000</a>  |
| Type         | SL-SMT 3.50/09/90LF 1.5SN BK BX   |
| GTIN (EAN)   | 4032248268917   |
| Qty.         | 48 pc(s).   |
| Product data | IEC: 320 V / 15 A<br>UL: 300 V / 10 A   |
| Packaging    | Box   |

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## Technical data

## Dimensions and weights

|                          |            |                 |            |
|--------------------------|------------|-----------------|------------|
| Depth                    | 11.1 mm    | Depth (inches)  | 0.437 inch |
| Height                   | 9 mm       | Height (inches) | 0.354 inch |
| Height of lowest version | 7.5 mm     | Width           | 38.5 mm    |
| Width (inches)           | 1.516 inch | Net weight      | 3.84 g     |

## System specifications

|  |  |  |                              |
|--|--|--|------------------------------|
| Product family                               | OMNIMATE Signal - series BL/SL 3.50              | Type of connection                         | Board connection             |
| Mounting onto the PCB                        | THT/THR solder connection                        | Pitch in mm (P)                            | 3.5 mm                       |
| Pitch in inches (P)                          | 0.138 "  | Outgoing elbow                             | 90°                          |
| Number of poles                              | 9  | Number of solder pins per pole             | 1                            |
| Solder pin length (l)                        | 1.5 mm   | Solder pin length tolerance                | 0 / -0.3 mm                  |
| Solder pin dimensions                        | d = 1.2 mm, Octagonal                            | Solder pin dimensions = d tolerance        | 0 / -0.03 mm                 |
| Solder eyelet hole diameter (D)              | 1.4 mm   | Solder eyelet hole diameter tolerance (D)+ | 0.1 mm                       |
| Outside diameter of solder pad               | 2.3 mm   | Template aperture diameter                 | 2.1 mm                       |
| L1 in mm                                     | 28 mm  | L1 in inches                               | 1.102 "                      |
| Number of rows                               | 1  | Pin series quantity                        | 1                            |
| Touch-safe protection acc. to DIN VDE 57 106 | finger-safe plugged/ back-of-hand-safe unplugged | Touch-safe protection acc. to DIN VDE 0470 | IP20 plugged/ IP10 unplugged |
| Protection degree                            | IP10   | Volume resistance                          | ≤5 mΩ                        |
| Can be coded                                 | Yes  | Plugging cycles                            | 25                           |
| Plugging force/pole, max.                    | 6 N  | Pulling force/pole, max.                   | 6 N                          |

## Material data

|                                       |                           |                                       |                           |
|---------------------------------------|---------------------------|---------------------------------------|---------------------------|
| Insulating material                   | LCP GF                    | Colour                                | black                     |
| Colour chart (similar)                | RAL 9011                  | Insulating material group             | IIIa                      |
| Comparative Tracking Index (CTI)      | ≥ 175                     | Moisture Level (MSL)                  | 1                         |
| UL 94 flammability rating             | V-0                       | Contact material                      | Cu-alloy                  |
| Contact surface                       | tinned                    | Layer structure of solder connection  | 2...3 µm Ni / 5...7 µm Sn |
| Layer structure of plug contact       | 2...3 µm Ni / 5...7 µm Sn | Storage temperature, min.             | -40 °C                    |
| Storage temperature, max.             | 70 °C                     | Operating temperature, min.           | -50 °C                    |
| Operating temperature, max.           | 100 °C                    | Temperature range, installation, min. | -30 °C                    |
| Temperature range, installation, max. | 100 °C                    |                                       |                           |

## Rated data acc. to IEC

|   |                        |   |                   |
|---|------------------------|---|-------------------|
| tested acc. to standard   | IEC 60664-1, IEC 61984 | Rated current, min. number of poles (Tu=20°C)                         | 15 A              |
| Rated current, max. number of poles (Tu=20°C)                             | 12 A                   | Rated current, min. number of poles (Tu=40°C)                         | 13 A              |
| Rated current, max. number of poles (Tu=40°C)                             | 10 A                   | Rated voltage for surge voltage class / pollution degree II/2         | 320 V             |
| Rated voltage for surge voltage class / pollution degree III/2            | 160 V                  | Rated voltage for surge voltage class / pollution degree III/3        | 160 V             |
| Rated impulse voltage for surge voltage class/ pollution degree II/2      | 2.5 kV                 | 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 | 2.5 kV                 | Short-time withstand current resistance                               | 3 x 1s with 100 A |

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**Technical data****Rated data acc. to CSA**

Institute (CSA)



Certificate No. (CSA)

200039-1176845

Rated voltage (Use group B / CSA) 300 V

Rated voltage (Use group D / CSA) 300 V

Rated current (Use group B / CSA) 10 A

Rated current (Use group D / CSA) 10 A

Reference to approval values  
Specifications are maximum values, details - see approval certificate.**Rated data acc. to UL 1059**

Institute (UR)



Certificate No. (UR)

E60693

Rated voltage (Use group B / UL 1059) 300 V

Rated voltage (Use group D / UL 1059) 300 V

Rated current (Use group B / UL 1059) 10 A

Rated current (Use group D / UL 1059) 10 A

Reference to approval values  
Specifications are maximum values, details - see approval certificate.**Packing**

|           |        |            |        |
|-----------|--------|------------|--------|
| Packaging | Box    | VPE length | 341 mm |
| VPE width | 134 mm | VPE height | 21 mm  |

**Classifications**

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| ETIM 6.0    | EC002637    | ETIM 7.0    | EC002637    |
| ETIM 8.0    | EC002637    | ETIM 9.0    | EC002637    |
| ECLASS 9.0  | 27-44-04-02 | ECLASS 9.1  | 27-44-04-02 |
| ECLASS 10.0 | 27-44-04-02 | ECLASS 11.0 | 27-46-02-01 |
| ECLASS 12.0 | 27-46-02-01 | ECLASS 13.0 | 27-46-02-01 |

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## Technical data

## 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          | <ul style="list-style-type: none"> <li>• Gold-plated contact surfaces on request</li> <li>• Rated current related to rated cross-section &amp; min. No. of poles.</li> <li>• Diameter of solder eyelet <math>D = 1.4 + 0.1 \text{ mm}</math></li> <li>• Solder eyelet diameter <math>D = 1.5 + 0.1 \text{ mm}</math>, from 9 poles</li> <li>• P on drawing = pitch</li> <li>• 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.</li> <li>• 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</li> <li>• Long term storage of the product with average temperature of 50 °C and maximum humidity 70%, 36 months</li> </ul> |

## Approvals

Approvals



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

## Downloads

|   |   |
|---|---|
| Approval/Certificate/Document of Conformity | <a href="#">Declaration of the Manufacturer</a>   |
| Engineering Data                            | <a href="#">CAD data – STEP</a>   |
| Product Change Notification                 | <a href="#">PCN_2015_208_PL30X_SC-SMT_SL_SMT_3.xx_5.xx_neue_Tapeverpackung_Step_4_DE</a><br><a href="#">PCN_2015_208_PL30X_SC-SMT_SL_SMT_3.xx_5.xx_new_Tape_Packaging_Step_4_EN</a>   |
| Catalogues                                  | <a href="#">Catalogues in PDF-format</a>  |
| Brochures                                   | <a href="#">FL DRIVES EN</a><br><a href="#">MB SMT EN</a><br><a href="#">FL DRIVES DE</a><br><a href="#">MB DEVICE MANUF. EN</a><br><a href="#">FL BUILDING SAFETY EN</a><br><a href="#">FL APPL LED LIGHTING EN</a><br><a href="#">FL INDUSTR.CONTROLS EN</a><br><a href="#">FL MACHINE SAFETY EN</a><br><a href="#">FL HEATING ELECTR EN</a><br><a href="#">FL APPL INVERTER EN</a><br><a href="#">FL_BASE_STATION_EN</a><br><a href="#">FL ELEVATOR EN</a><br><a href="#">FL POWER SUPPLY EN</a><br><a href="#">FL 72H SAMPLE SER EN</a><br><a href="#">PO OMNIMATE EN</a><br><a href="#">PO OMNIMATE EN</a> |
| White paper surface mount technology        | <a href="#">Download Whitepaper</a>   |

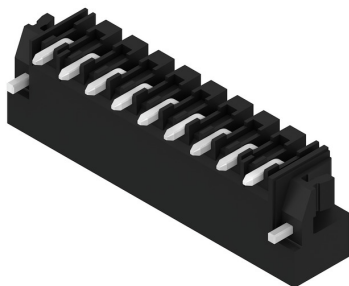
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**Drawings****Product image****Dimensional drawing**

$L1 = 28.00 \text{ mm}$  |  $P = 3.50 \text{ mm}$

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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  | Product data | Packaging |
|------------|----------------------------|--|--------------|-----------|
| Order No.  | <a href="#">1693430000</a> | PCB plug-in connector, Accessories, Coding element, orange, Number |              | Box       |
| GTIN (EAN) | 4008190867447              | of poles: 1  |              |           |
| Qty.       | 100 pc(s).                 |  |              |           |
| Type       | BL SL 3.5 KO SW            | Version  | Product data | Packaging |
| Order No.  | <a href="#">1610100000</a> | PCB plug-in connector, Accessories, Coding element, black, Number  |              | Box       |
| GTIN (EAN) | 4008190187637              | of poles: 1  |              |           |
| Qty.       | 100 pc(s).                 |  |              |           |

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## Accessories

## LED Light guides

**Effective: the link between LED and front panel.**

Floodlight indicators allow users to monitor the switching states without requiring a special design: optical plastic directs the light from standard LEDs around a bend into the connectors or through the front plate.

The fibre-optic elements are simply clipped behind the relevant 90° bend male connectors (90° outlet direction). Versions with different incoming light beam heights achieve maximum light efficiency for LEDs with different designs or heights.

The advantages compared to conventional solutions:

- No additional LED circuit board required behind the front panel
- No "long-legged" LEDs with separate mounting required
- Bent fibre-optic cable line for maximum light efficiency
- Uncomplicated front plate bore holes due to circular shape of outgoing light beam
- Easy to maintain correct clearance and creepage distance
- Can be partitioned for smaller pole numbers

The result: simplified manufacturing process, reduced costs and simplified design

## General ordering data

| Type       | SL 3.5 FLA 4.0/1.75/8      | Version   | Product data | Packaging |
|------------|----------------------------|---|--------------|-----------|
| Order No.  | <a href="#">1597650000</a> | PCB plug-in connector, Accessories, Flood-light display, Transparent, |              | Box       |
| GTIN (EAN) | 4008190027773              | Number of poles: 1  |              |           |
| Qty.       | 50 pc(s).                  |   |              |           |
| Type       | SL 3.5 FLA 2.3/8           | Version   | Product data | Packaging |
| Order No.  | <a href="#">1597520000</a> | PCB plug-in connector, Accessories, Flood-light display, Transparent, |              | Box       |
| GTIN (EAN) | 4008190120566              | Number of poles: 1  |              |           |
| Qty.       | 50 pc(s).                  |   |              |           |
| Type       | SL 3.5 FLA 4.0/8           | Version   | Product data | Packaging |
| Order No.  | <a href="#">1597530000</a> | PCB plug-in connector, Accessories, Flood-light display, Transparent, |              | Box       |
| GTIN (EAN) | 4008190075699              | Number of poles: 1  |              |           |
| Qty.       | 50 pc(s).                  |   |              |           |
| Type       | SL 3.5 FLA 1.5/1.75/8      | Version   | Product data | Packaging |
| Order No.  | <a href="#">1597630000</a> | PCB plug-in connector, Accessories, Flood-light display, Transparent, |              | Box       |
| GTIN (EAN) | 4008190148386              | Number of poles: 1  |              |           |
| Qty.       | 50 pc(s).                  |   |              |           |
| Type       | SL 3.5 FLA 2.3/1.75/8      | Version   | Product data | Packaging |
| Order No.  | <a href="#">1597640000</a> | PCB plug-in connector, Accessories, Flood-light display, Transparent, |              | Box       |
| GTIN (EAN) | 4008190011321              | Number of poles: 1  |              |           |
| Qty.       | 25 pc(s).                  |   |              |           |
| Type       | SL 3.5 FLA 1.5/8           | Version   | Product data | Packaging |
| Order No.  | <a href="#">1597510000</a> | PCB plug-in connector, Accessories, Flood-light display, Transparent, |              | Box       |
| GTIN (EAN) | 4008190127541              | Number of poles: 1  |              |           |
| Qty.       | 50 pc(s).                  |   |              |           |

## Recommended wave soldering profiles

**Weidmüller Interface GmbH & Co. KG**  
Klingenbergstraße 16  
D-32758 Detmold  
Germany  
Fon: +49 5231 14-0  
Fax: +49 5231 14-292083  
[www.weidmueller.com](http://www.weidmueller.com)

### Single Wave:



### Double Wave:



### Wave soldering profiles

Wired connection elements should be processed in accordance with the DIN EN 61760-1 standard. We have included two recommendations for practical wave soldering profiles, with which Weidmüller PCB terminals and connectors are qualified.

When choosing a suitable profile for your application, the following factors also need to be considered:

- PCB thickness
- Proportion of Cu in the layers
- Single/double-sided assembly
- Product range
- Heating and cooling rates

The single and double wave profiles each indicate the recommended operating range, including the maximum soldering temperature of 260 °C. In practice, the maximum soldering temperature is quite often well below the above maximum profile.

We reserve the right to make technical changes.



## Recommended reflow soldering profile

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Fon: +49 5231 14-0

Fax: +49 5231 14-292083

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## Reflow soldering profile

The perfect soldering profile for SMT Surface Mount Technology is one the most exiting question in SMT production. But there are more than one correct answer: The diagram of temperature-on-time is related to processing features of solder paste and to maximum load of components.

We have to consider the following parameters:

- Time for pre heating
- Maximum temperature
- Time above melting point
- Time for cooling
- Maximum heating rate
- Maximum cooling rate

We recommend a typical solder profile with associated process limits. With preheating components and board are prepared smoothly for the solder phase. Heating rate is typically  $\leq +3\text{K/s}$ . In parallel the solder paste is 'activated'. The time above melting point of 217°C the paste gets liquid and components and boards begin to connect. The maximum temperature of 245°C to 254°C should stay between 10 and 40 seconds. In the cooling phase at  $\geq -6\text{K/s}$  solder is cured. Board and components cool down while avoiding cold cracks.