

# First Industrial Mini-size 90W PoE Injector and Fiber Converter

## DP101

### Industrial 1-port 90W PoE Fiber Media Converter

The DP101 is the first industrial grade fiber optic media converter featuring 90W PoE 802.3bt /PSE power feeding. The PoE is compliant with standard IEEE 802.3af / at / bt and non-standard PD with the innovative smart PoE detection algorithm. DP101 can automatically supply power through 2/4 pairs of wires or limit feeding power for non-standard PD, such as outdoor dome IP camera with internal heater.



### Features & Benefit

#### Ethernet Media Converter

- Converts Optical Signal and Ethernet Electrical Signal
- Supports IEEE 802.3 100Base-FX, 100Mbps Fast Ethernet Optical Fiber
- Supports IEEE 802.3 10/100Base-TX ,10/100Mbps Fast Ethernet

#### Link Loss Forwarding

- Bi-Directional Link Loss Forwarding for Real Time Far-End Link Fault Alert
- Bi-Directional Auto Recovery for Ethernet Optical Fiber and Ethernet RJ-45 Communication

#### Dual Forwarding Modes

##### Pure Converter:

- Low Packet Forwarding Latency – 1.6x10<sup>-6</sup> Sec

##### Ethernet Switch Store-and-Forward:

- TX 10/100Mbps Auto-Negotiation, Auto MDI/MDI-X
- IEEE 802.3x Flow-Control & Back-Pressure
- CRC Error Packet Filtering

#### Standard Compliance

- IEC 61000-6-2/ IEC 61000-6-4 Heavy Industrial EMC
- EN50121-4 Railway Track Side EMC
- High Level Electro Magnetic Susceptibility – Level 3

#### Easy System Configuration

- DIP-Switch Configuration: Forwarding Mode / TX Speed / Link Loss Forwarding /PoE Setting
- TX Forced 100Mbps Full-Duplex
- Switch Store and Forwarding Mode support TX Speed Auto Negotiation and Auto MDI-X

#### Smart PoE Capability

- Auto PD Type Recognize- Standard or Non-Standard
- Auto Apply Limited Power for Non-Standard PD
- Built-in Over-Current, Cable Short Protections for Non-Standard PD

#### Hardened System Design

- Survive Under -40 ~75°C Environment
- Wide Range Redundant Power Input
- Ingress Protection – IP40

#### Compact Size Design

- Cigarette Box Size- Minimal Space Requirement
- Easy Cable Reorganization

#### Special Vertical Market Application

- Factory Automation – Real Time Machine Communication
- Railway Track Side – PLC Communication
- Telecom Unattended Station – Ethernet / Fiber Conversion



## Interfaces

### System LED

- 1x Power
- 1x Mode
- 1x LLF
- 2x FX
  - 1x LNK
  - 1x FDX
- 1x PoE

### 100M FX SC (ST Connector by request)

| DIP NO. | ON                                   | OFF (Default)                             |  |
|---------|--------------------------------------|---|--|
| 1       | Set to Converter Mode                | Set to Store and Forwarding Mode          |  |
| 2       | Set RJ45 in 100Mbps Full Duplex Mode | Set RJ45 in 100Mbps Auto Negotiation Mode |  |
| 3       | Enable Link Loss Forwarding function | Disable Link Loss Forwarding function     |  |
| 4       | PoE Enable                           | PoE Disable                               |  |
| DIP5    | DIP6                                 | Power Budget For No-standard PD           | Power Budget For Standard PD             |
| OFF     | OFF                                  | Class 5: 45W                              | Auto Mode<br>Class 0-Class 8<br>Max: 90W |
| OFF     | ON                                   | Class 6: 60W                              |  |
| ON      | OFF                                  | Class 7: 75W                              |  |
| ON      | ON                                   | Class 8: 90W                              |  |

### DIP Switch

- 1x Forwarding Mode
- 1x RJ45 mode
- 1x LLF
- 1x PoE On/Off
- 2x PoE Budget

### 10/100M-TX

### Power Connector

- 1 x 3 pin terminal block

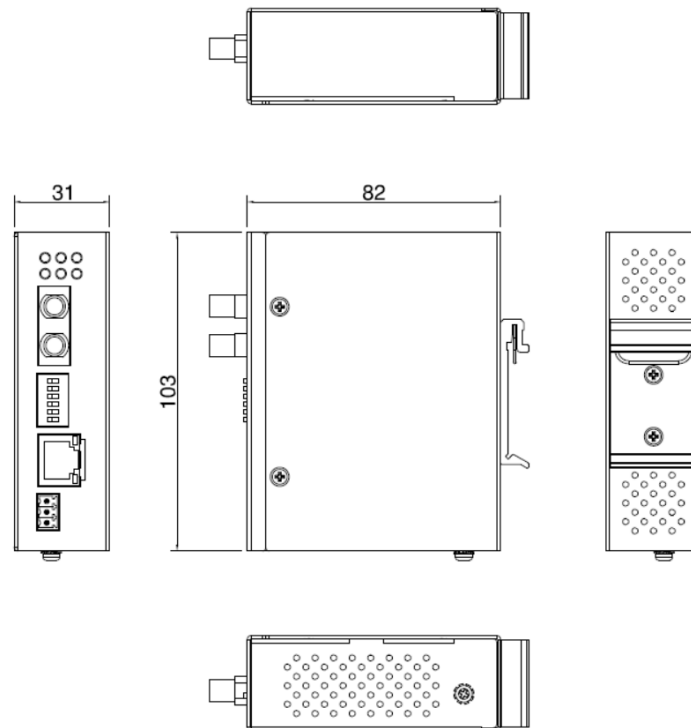


DIN Clip

Grounding Screw



## Dimensions



## Technology

|                 |  |
|-----------------|--|
| <b>Standard</b> | IEEE 802.3 10Base-T Ethernet                     |
|                 | IEEE 802.3u 100Base-TX/ 100Base-FX Fast Ethernet |
|                 | IEEE 802.3x Flow Control and back-pressure       |
|                 | IEEE 802.3af/at/bt Power Over Ethernet           |

## Performance

|                             |   |
|-----------------------------|---|
| <b>Forwarding Mode</b>      | Store and Forward with CRC Error Packet Check, and Pure Converter with low forwarding latency |
| <b>Packet Buffer Memory</b> | 128K bits   |
| <b>Transfer performance</b> | 10Base-T: 14,880pps, 100Base-TX/FX: 148,800pps  |

## Interface

| <b>Ethernet Port</b>     | <p><b>DP101-M-SC/DP101-S-SC:</b><br/>1 x 10/100Base-TX RJ45, Auto Negotiation,Auto MDI/MDI-X<br/>1 x 100BaseFX (Duplex SC Connector, Multi/Single Mode)</p> <p><b>DP101-M-ST/DP101-S-ST:</b><br/>1 x 10/100Base-TX RJ45, Auto Negotiation,Auto MDI/MDI-X<br/>1 x 100BaseFX (Duplex ST Connector, Multi/Single Mode)</p> <p><b>DP101-WDM13-SC / DP101-WDM15-SC</b><br/>1 x 10/100Base-TX RJ45, Auto Negotiation,Auto MDI/MDI-X<br/>1 x 100BaseFX (Simplex SC Connector, Single Mode)</p>  |   |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
|--------------------------|--|---|---|-------------|-------|-----------|---|-------|-----------|---|-------|-----------|---|-------|-----------|------------------------------------|-------|-------|--|-----------------------------------|-----|-----|--------------|---|-----|----|--------------|----|-----|--------------|----|----|--------------|
| <b>System LED</b>        | <p>1 x Power: Green On<br/>1 x Mode:Converter mode (Green On), Store and Forward mode (Green Off)<br/>1 x LLF: LLF Happens (Red On)<br/>1 x PoE: Green On (PoE Active)</p>   |   |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| <b>Ethernet Port LED</b> | Link (Green On), Activity (Green Blinking), Full Duplex (Amber on), Half Duplex & Collision (Amber Blinking), Half Duplex (Amber Off)  |   |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| <b>Fiber Port LED</b>    | LNK: Link (Green On), Activity (Green Blinking)<br>FDX: Full Duplex (Amber on)   |   |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| <b>DIP Switch</b>        | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #0056b3; color: white;"> <th>DIP No.#</th> <th>Status</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>DIP 1</td> <td>On<br/>Off</td> <td>Converter Mode<br/>Store &amp; Forward Switch Mode (Default)</td> </tr> <tr> <td>DIP 2</td> <td>On<br/>Off</td> <td>RJ45 100Mbps Full Duplex Mode<br/>RJ45 Auto-Negotiation(Default)</td> </tr> <tr> <td>DIP 3</td> <td>On<br/>Off</td> <td>Enable Link Loss Forwarding function<br/>Disable Link Loss Forwarding function (Default)</td> </tr> <tr> <td>DIP 4</td> <td>On<br/>Off</td> <td>PoE Enable<br/>PoE Disable(Default)</td> </tr> </tbody> </table><br><table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #0056b3; color: white;"> <th>DIP 5</th> <th>DIP 6</th> <th>Forced Power Feeding Level<br/>Only for Non-standard PD</th> <th>Power Feeding For Standard PoE PD</th> </tr> </thead> <tbody> <tr> <td>Off</td> <td>Off</td> <td>Class 5: 45W</td> <td rowspan="4" style="text-align: center;">Auto Detection by PoE Standard<br/>Class 0~Class 8<br/>Max: 90W</td> </tr> <tr> <td>Off</td> <td>On</td> <td>Class 6: 60W</td> </tr> <tr> <td>On</td> <td>Off</td> <td>Class 7: 75W</td> </tr> <tr> <td>On</td> <td>On</td> <td>Class 8: 90W</td> </tr> </tbody> </table> <p><b>Note: To protect normal devices, the DIP5/DIP6 Forced Power feeding level setting is ONLY valid when DIP 4 PoE is switched ON and non-standard PD device is connected.</b></p> | DIP No.#  | Status  | Description | DIP 1 | On<br>Off | Converter Mode<br>Store & Forward Switch Mode (Default) | DIP 2 | On<br>Off | RJ45 100Mbps Full Duplex Mode<br>RJ45 Auto-Negotiation(Default) | DIP 3 | On<br>Off | Enable Link Loss Forwarding function<br>Disable Link Loss Forwarding function (Default) | DIP 4 | On<br>Off | PoE Enable<br>PoE Disable(Default) | DIP 5 | DIP 6 | Forced Power Feeding Level<br>Only for Non-standard PD | Power Feeding For Standard PoE PD | Off | Off | Class 5: 45W | Auto Detection by PoE Standard<br>Class 0~Class 8<br>Max: 90W | Off | On | Class 6: 60W | On | Off | Class 7: 75W | On | On | Class 8: 90W |
| DIP No.#                 | Status   | Description   |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| DIP 1                    | On<br>Off  | Converter Mode<br>Store & Forward Switch Mode (Default)                                 |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| DIP 2                    | On<br>Off  | RJ45 100Mbps Full Duplex Mode<br>RJ45 Auto-Negotiation(Default)                         |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| DIP 3                    | On<br>Off  | Enable Link Loss Forwarding function<br>Disable Link Loss Forwarding function (Default) |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| DIP 4                    | On<br>Off  | PoE Enable<br>PoE Disable(Default)  |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| DIP 5                    | DIP 6  | Forced Power Feeding Level<br>Only for Non-standard PD                                  | Power Feeding For Standard PoE PD                             |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| Off                      | Off  | Class 5: 45W  | Auto Detection by PoE Standard<br>Class 0~Class 8<br>Max: 90W |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| Off                      | On   | Class 6: 60W  |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| On                       | Off  | Class 7: 75W  |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| On                       | On   | Class 8: 90W  |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |
| <b>Power input</b>       | <p>3-Pin Removable Terminal Connector with Power Redundancy, Polarity Reverse Protection</p> <ul style="list-style-type: none"> <li>V1+ , V2+ : Redundant Power Input ( V+ )</li> <li>V- (COM): Common Power-GND (V-) for V1 and V2</li> </ul>   |   |   |             |       |           |   |       |           |   |       |           |   |       |           |                                    |       |       |  |                                   |     |     |              |   |     |    |              |    |     |              |    |    |              |

## Optical Fiber

|                                | Distance | FP Laser Wavelength    | TX Range     | RX (Max)    | Link budget |
|--------------------------------|----------|------------------------|--------------|-------------|-------------|
| <b>Single-Mode</b>             | 30KM     | 1310nm                 | -8 ~ -3 dBm  | -32 ~ -3dBm | 24dB        |
| <b>Multi-Mode</b>              | 2KM      | 1310nm                 | -20 ~ -12dBm | -30 ~ -3dBm | 10dB        |
| <b>Single-Mode WDM13-SC-20</b> | 20KM     | TX:1310nm<br>RX:1550nm | -15~ -3dBm   | -32 ~ -3dBm | 17dB        |
| <b>Single-Mode WDM15-SC-20</b> | 20KM     | TX:1550nm<br>RX:1310nm | -15~ -3dBm   | -32 ~ -3dBm | 17dB        |

| Power Requirement                |  |
|----------------------------------|--|
| Input Voltage                    | 54VDC (46~57VDC : IEEE 802.3af, 50~57VDC : IEEE 802.3at, 53~57VDC : IEEE 802.3bt)  |
| Reverse Polarity Protect         | Yes  |
| Input Current                    | 0.04A @54V full traffic without PD loading   |
| Power Consumption                | Max. 2.18W@54VDC full traffic without PD loading, suggest to reserve 15% tolerance   |
| PoE                              |  |
| Power forwarding mode            | IEEE 802.3af/at Alternative A<br>IEEE 802.3bt draft: 4 pairs cable   |
| PoE Power Budget                 | System: Max.90W@75°C<br>Per Port: Max. 90W   |
| Powered Device Type              | IEEE 802.3af/at/bt<br>Non-standard PD device, forced power supply  |
| Mechanical                       |  |
| Installation                     | DIN Rail   |
| Enclosure Material               | Steel Metal  |
| Dimension                        | 103mm (H) x 31mm (W) x 82mm (D) / without DIN Rail Clip  |
| Ingress Protection               | IP40   |
| Weight                           | 315g without package   |
| Environmental                    |  |
| Operating Temperature & Humidity | -40°C~75°C, 0%~95% Non-Condensing (I-Grade)  |
| Storage Temperature              | -40°C~80°C   |
| MTBF                             | >200,000 hours   |
| Hi-Pot Insulation                | AC1.0KV for Power/Ethernet port to Chassis Ground  |
| Warranty                         | 5 years  |
| Standard                         |  |
| EMC                              | IEC/ EN61000-6-2, IEC/EN61000-6-4  |
| EMI                              | CISPR 22, FCC part 15B Class A   |
| EMS                              | IEC61000-4-2 ESD<br>EN61000-4-3 RS<br>EN61000-4-4 EFT<br>EN61000-4-5 Surge<br>EN61000-4-6 CS<br>EN61000-4-8 Magnetic Field |
| Railway                          | EN50121-4  |

## Ordering Information

| Model Name         | Description   |
|--------------------|---|
| DP101-M-SC-2       | Industrial 1-port Fast Ethernet PoE to Fiber Media Converter, multi-mode, 2km/ SC, PSE/ 802.3bt               |
| DP101-M-ST-2*      | Industrial 1-port Fast Ethernet PoE to Fiber Media Converter, multi-mode, 2km/ ST, PSE/ 802.3bt               |
| DP101-S-SC-30      | Industrial 1-port Fast Ethernet PoE to Fiber Media Converter, single-mode, 30km/ SC, PSE/ 802.3bt             |
| DP101-S-ST-30*     | Industrial 1-port Fast Ethernet PoE to Fiber Media Converter, single-mode, 30km/ ST, PSE/ 802.3bt             |
| DP101-WDM13-SC-20* | Industrial 1-port Fast Ethernet PoE to Fiber Media Converter, single-mode, 20km/TX1310nm,WDM/SC, PSE/802.3bt  |
| DP101-WDM15-SC-20* | Industrial 1-port Fast Ethernet PoE to Fiber Media Converter, single-mode, 20km/TX1550nm, WDM/SC, PSE/802.3bt |
| Package List       |   |
|                    | 1 x Product Unit  |
|                    | 1 x 3-pin Removable Terminal Connector  |
|                    | 1 x Attached Din Clip   |
|                    | 1 x Quick Installation Guide  |

\*Customized Order