



- DL-1020
- DL-1021
- DL-1022
- DL-1023
- DL-1024
- DL-1025
- DL-1026
- DL-1027
- DL-1028
- DL-1038

PM1/2.5/10/CO/CO2/HCHO/TVOC/NH3/H2S/  
Temperature/Humidity/Dew Point Data Logger Module

### Features

- Able to record PM1/2.5/10, CO, CO2, HCHO, TVOC, NH3, H2S, Temperature, Humidity, and Dew Point Measurements
- Non-dispersive Infrared (NDIR) CO2 Sensor
- Electrochemical Sensor
- Up to 180,000 records with date and time stamps
- Web-based Configuration Interface
- Simple and Powerful Software Utility, iOS APP and Android App Included
- Supports the DCON, Modbus RTU/TCP, and MQTT Protocols
- Includes RS-485/Ethernet/PoE Communication Interfaces
- Relay Output for Audible/Visual Alarm or IAQ Device Control
- Includes redundant power inputs: PoE (IEEE 802.3af, Class 1) and DC input
- IP 43 Protection Approval



### Introduction

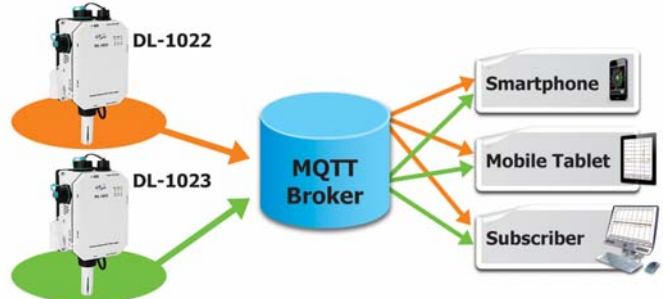
The DL-1000 is a series of particle and gas measurement module that can measure the concentration of aerosols in the air, such as: PM2.5, PM1, PM10 and the number of particles (0.3µm, 0.5µm, 1µm, 2.5µm, 5µm, 10µm). In addition, various fume concentrations related to human health can also be measured. For example: CO/CO2/HCHO/NH3/H2S/TVOC DL-1000 can record data and send alarm when concentration is too high. It can be used to record PM1/2.5/10, CO, CO2, HCHO, TVOC, NH3, H2S, Temperature, Humidity and Dew Point information, including date and time stamps, and are able to store up to 180,000 downloadable records. Real-time data can be accessed from the DL-1000 series Data Logger from anywhere and at any time using the free Windows software, the iOS App or the Android App, as long as they are connected to the same local network as the Data Logger. Support is provided for popular industrial protocols such as DCON, Modbus RTU, and Modbus TCP, as well as the emerging machine-to-machine (M2M)/IoT (Internet of Things) connectivity protocol-MQTT. The DL-1000 series Data Logger can be connected via widely used communication interfaces including RS-485, Ethernet and PoE, meaning that the device can be easily integrated into existing HMI or SCADA systems, and is easy to be maintained in a distributed control system. The DL-1000 series is designed for industrial applications in harsh environments that provides IP43 grade protection approval. The rugged RJ-45 ensures tight, robust connections, and guarantees reliable operation, even for applications that are subject to high vibration and shock.

#### Multi-platform Remote Access Software

Real-time data from the DL-300 Data Logger can be accessed from anywhere and at any time using the DL300 Utility, the iOS or Android App, or via a regular web browser, as long as they are connected to the same local network as the Data Logger.



#### Supports the MQTT Protocol for IoT Applications



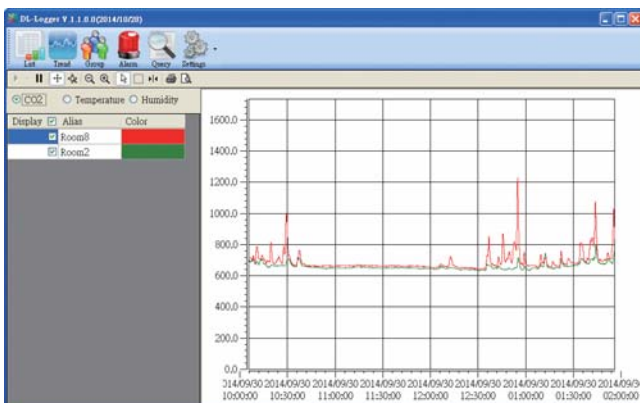
#### Replaceable Filter Patch (FLT-C001)

Generally, the PM2.5 measuring sensor on the market is usually installed in outdoor applications. Because the outdoor air is quite dusty, the measuring channel of PM2.5 sensor is easily clogged by aerosol, resulting in continued alarms for the heavy concentration. Due to the error data from the clogged sensor, this module is returned to the factory for repair. Downtime during the repair period often causes significant cost and losses. In order to solve this problem, ICP DAS design the CL-200 series and DL-1000 series with replaceable patch, FLT-C001, which makes it easy for users to replace them without uninstall the devices. Cost of repair and time can be reduced by this innovated mechanical design.



#### Simple and powerful utility

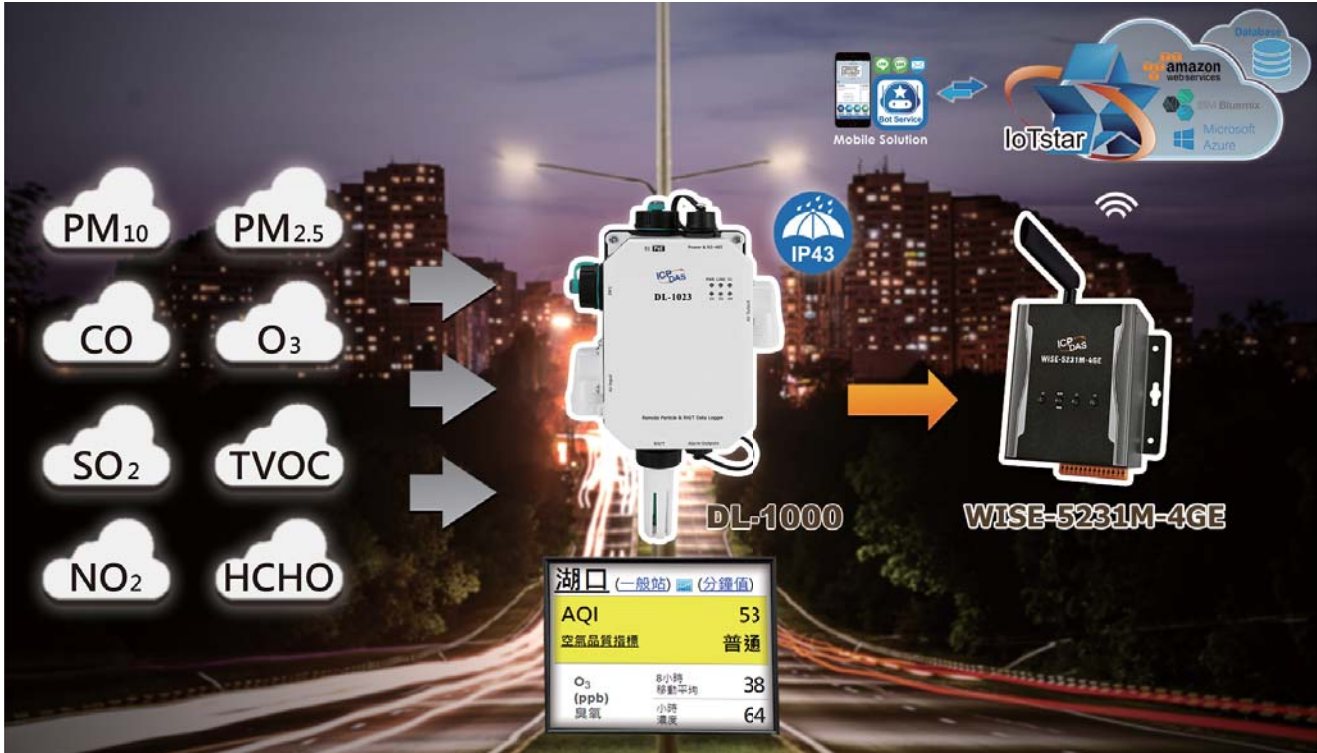
The DL300 Utility can be used to configure the modules, monitor real-time data, group DL-1000 modules so that the status of distribution groups can be viewed and managed. The utility also allows the log data to be downloaded and exported to a .CSV file that can then be imported into any industry-standard software or spread sheet for analysis.



## Applications

### Intelligent Street Lighting in Smart City

In smart city applications, smart street lights integrate various communication technologies and are no longer illumination only. The high-density construction of streetlights have become one of the most important sources of government collecting road information in recent years. DL-1000 series products, with standard industrial communication protocol Modbus RTU/TCP, can integrate with smart streetlights to achieve outdoor air quality monitoring such as: O<sub>3</sub>, CO, CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>2</sub>, TVOC, HCHO, and Particle Matter 1/2.5/10. Due to these aerosol could accumulate around the sensor and would cause error record after using for a period, DL-1000 support replaceable dust filter patch to easily change the patches inside the filter hood rather than uninstall the device.



### Outdoor Mobile Air Quality Detection Application

In developed countries, the Air Quality detection, statistics and evaluation is the most for improvement. In a vast area, it can only rely on the vehicle moving to record status of air quality, and to offline extract these and send back sorting out.

ICP DAS DL-1000 series can integrate with our 3G/ 4G controllers to transmit data back to control center wirelessly.



### Factory Gas Detection Application

In some factories, H<sub>2</sub>S is one of the harmful gases. Due to the colorless and odorless are two characteristics quite hard to find or feel it, sometimes the workers inside the factory get injured inevitably. Joint liability from the injury brings the company a massive fines.

DL-1026 H<sub>2</sub>S detector module can put in the spot. It equip with standard industrial protocols and with high flexible to integrate information from devices and transmit back to control center. When the concentration of gas is too high, DL-1026 can also send alarm signals to inform relative person to evacuate people there.



# DL-10



#### Particle Matter Sensor

- 1 : PM2.5
- 2 : PM2.5/1/10 + Particle
- 3 : PM2.5/1/10 + Particle + CO+CO2
- 5 : O2

PM Size :  
0.3µm, 0.5µm,  
1µm, 2.5µm,  
5µm, 10µm



#### Types of Gas Sensor

- 0 : -
- 1 : CO
- 2 : CO2
- 3 : CO+CO2
- 4 : HCHO + TVOC
- 5 : NH3
- 6 : N2S
- 7 : HCHO
- 8 : TVOC



#### Communication

- : Ethernet/PoE
- : Wi-Fi

DL-10xx Series		Type of Sensor									Communication
		Particle		Gas Sensor							
Basic Type	Wi-Fi	PM1/PM2.5/PM10/Particle	O2	CO	CO2	HCHO	NH3	H2S	TVOC	T & RH	
DL-1020	DL-1020-WF	Yes	-	-	-	-	-	-	-	Yes	Basic type: RS-485 + Ethernet/PoE  WF type: Wi-Fi + RS-485 + Ethernet/PoE
DL-1021	DL-1021-WF	Yes	-	Yes	-	-	-	-	-	Yes	
DL-1022	DL-1022-WF	Yes	-	-	Yes	-	-	-	-	Yes	
DL-1023	DL-1023-WF	Yes	-	Yes	Yes	-	-	-	-	Yes	
DL-1024	DL-1024-WF	Yes	-	-	-	Yes	-	-	Yes	Yes	
DL-1025	DL-1025-WF	Yes	-	-	-	-	Yes	-	-	Yes	
DL-1026	DL-1026-WF	Yes	-	-	-	-	-	Yes	-	Yes	
DL-1027	DL-1027-WF	Yes	-	-	-	Yes	-	-	-	Yes	
DL-1028	DL-1028-WF	Yes	-	-	-	-	-	-	Yes	Yes	
DL-1034	DL-1034-WF	Yes	-	Yes	Yes	Yes	-	-	Yes	Yes	
DL-1037	DL-1037-WF	Yes	-	Yes	Yes	Yes	-	-	-	Yes	
DL-1038	DL-1038-WF	Yes	-	Yes	Yes	-	-	-	Yes	Yes	



## System Specifications

<b>Power</b>	Powered from Terminal Block	+12 to +48 VDC	
	Powered from PoE	IEEE 802.3af, Class 1 (48 V)	
	Power Consumption	PoE	3.5 W MAX
		Non-PoE	3.3 W MAX
<b>System</b>	Alarm	PM1/PM2.5/PM10/O2/CO/CO2/HCHO/TVOC/NH3/H2S/RH/Temperature	
	Real Time Clock	Yes	
	Data Logger	Yes, up to 180,000 records	
	Relay Output	PhotoMos Relay × 4, 100 VDC @ 1 A	
<b>LED Indicators</b>	PWR	Green for normal operation	
	Link	Green for the Ethernet-linked	
	S1 ~ S4	Red for an alarm condition	
<b>Environment</b>	Operating Temperature	-20 to +50°C	
	Storage Temperature	-30 to +75°C	
	Humidity	10 to 90% RH, Non-condensing	
	Protection Class	IP43	
<b>Communication</b>	RS-485 Port	Baud Rate = 1200 ~ 115200 bps	
	Ethernet Port	10/100 Base-TX, 8-Pin RJ-45 x1(Auto-negotiating, Auto-MDI/MDIX, LED indicators)	
	Security	IP filter (whitelist) and Password (web)	
	Protocol	Modbus/RTU(RS-485), Modbus TCP(Ethernet) and MQTT(Ethernet)	
	Dual Watchdog	Yes, Module (2.3 sec), Communication (Programmable)	
<b>Mechanical</b>	Installation	DIN-Rail or Wall Mounting	
	Dimensions (W x L x H)	130 mm x 211 mm x 70 mm	

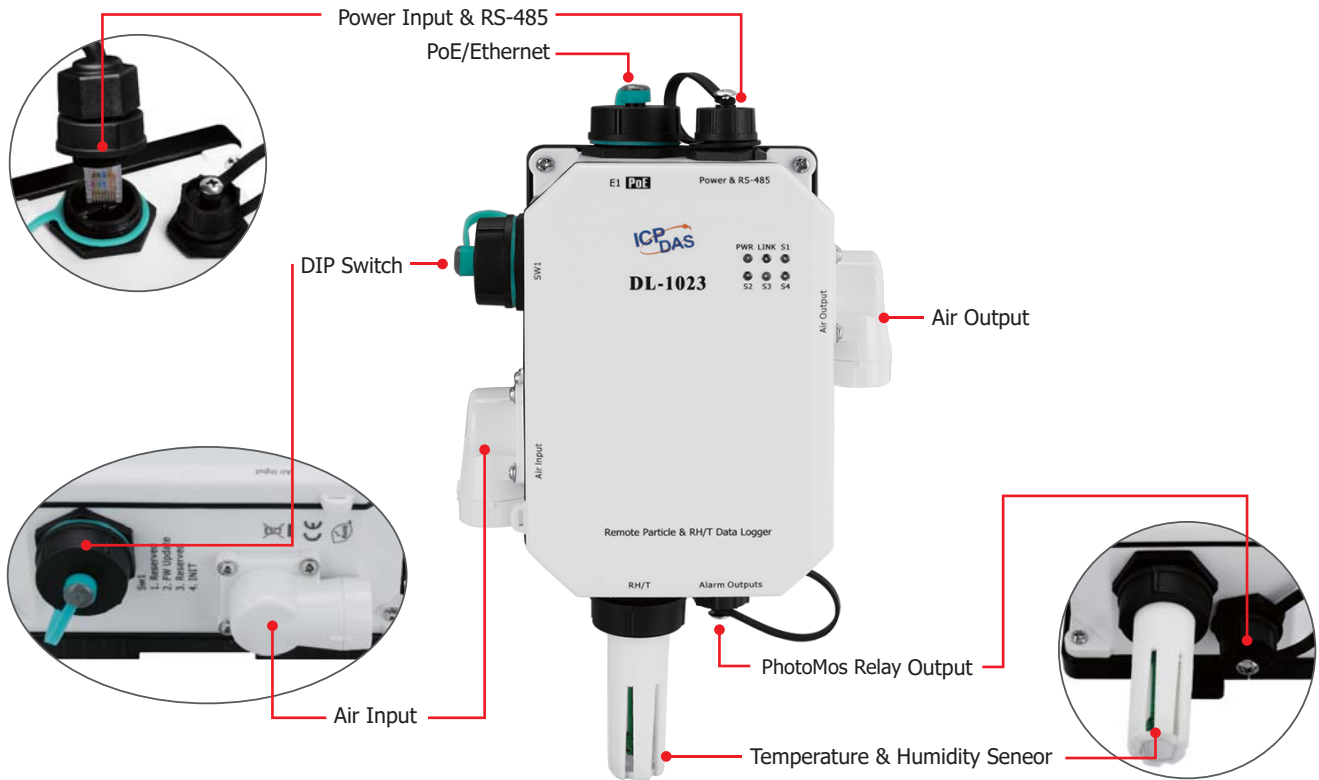
## I/O Specifications

Type of Sensor	Range	Resolution	Accuracy	Response Time	Warm-up Time	Life Time
<b>PM1/PM2.5/PM10 /Particle (Note1)</b>	0 to 1,000µg/m3 ( Laser Type)	1µg/m3	± 10% of FSR.	1 seconds	20 seconds	5 years
<b>CO</b>	0 to 1000 ppm (Electrochemical)	1 ppm	±5% of measured value	30 seconds	60 seconds	5 years
<b>CO2</b>	0 ~ 9999 ppm (NDIR)	1 ppm	±30 ppm ±3% of measured value	120 seconds	300 seconds	15 years
<b>HCHO</b>	0 ppb to 2000 ppb (Electrochemical)	1 ppb	0 ~ 300ppb : ±30ppb > 300ppb : ±10%	≤60 seconds	180 seconds	3 years
<b>TVOC</b>	0 ppb to 60000 ppb (MEMS Metal Oxide)	1 ppb	±15%	60 seconds	180 seconds	5 years
<b>NH3</b>	0 to 100 ppm (Electrochemical)	1 ppm	±5% of measured value	< 40 seconds	60 seconds	2 years
<b>H2S</b>	0 to 100 ppm (Electrochemical)	1 ppm	±5% of measured value	< 30 seconds	60 seconds	2 years
<b>Temperature</b>	-20 to +50°C	0.1°C	±0.6°C	-	-	10 years
<b>Relative Humidity</b>	0 to 100% RH, Non-condensing	0.1% RH, Non-condensing	±5% RH, Non-condensing	-	-	10 years
<b>Dew Point</b>	Calculated using temperature and relative humidity	0.1°C	-	-	-	10 years

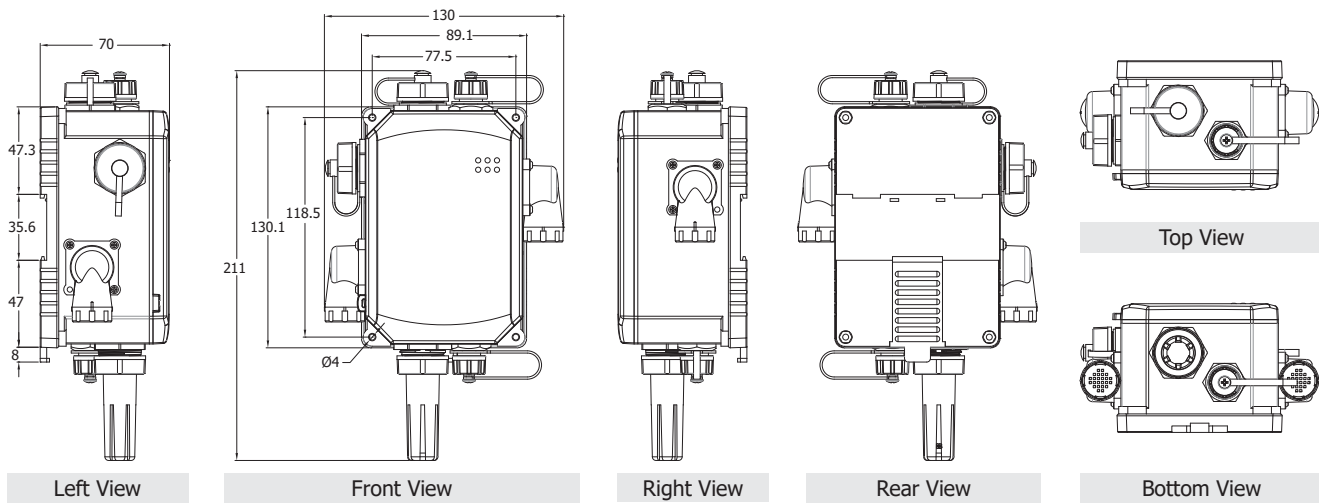
**Note1:** 5 years, the filter patch (FLT-C001) by replaceable

<b>Particle</b>	
<b>Sizes</b>	0.3µm, 0.5µm,,1µm, 2.5µm,,5µm, 10µm

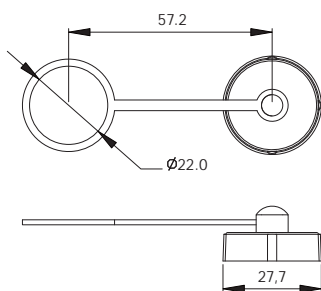
## Appearance



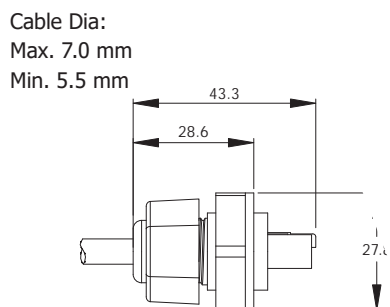
## Dimensions (Units: mm)



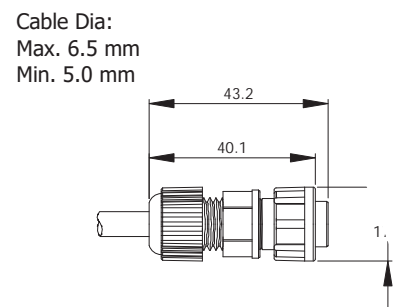
### IP65 Ethernet Cap with Tether



### IP65 Ethernet Plug







### IP65 PWR Plug



## Ordering Information

<b>DL-1020 CR</b>	Remote PM1/2.5/10/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)
<b>DL-1021 CR</b>	Remote PM1/2.5/10/CO/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)
<b>DL-1022 CR</b>	Remote PM1/2.5/10/CO2/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)
<b>DL-1023 CR</b>	Remote PM1/2.5/10/CO/CO2/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)
<b>DL-1024 CR</b>	Remote PM1/2.5/10/HCHO/TVOC/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)
<b>DL-1025 CR</b>	Remote PM1/2.5/10/NH3/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)
<b>DL-1026 CR</b>	Remote PM1/2.5/10/H2S/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)
<b>DL-1027 CR</b>	Remote PM1/2.5/10/HCHO/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)
<b>DL-1028 CR</b>	Remote PM1/2.5/10/TVOC/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)
<b>DL-1038 CR</b>	Remote PM1/2.5/10/CO/CO2/TVOC/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485 and PoE (RoHS)

## Accessories

Mode Name	NS-205-IP67	NS-205PSE-IP67	NS-208PSE-IP67	NS-208-IP67
Picture				
PoE	-	802.3af x 4	802.3af x 8	-
Input Voltage Range	+10 VDC ~ +30 VDC (1 kV Isolated)	+46 VDC ~ +53 VDC		+12 VDC ~ +53 VDC
Installation	Wall Mounting	Wall Mounting	Wall Mounting	
Dimensions (W x L x H)(Unit: mm)	85 x 76 x 137	85 x 76 x 137	190 x 155 x 104	

MDR-60-48	48 V/1.25 A, 60 W Power Supply with DIN-Rail Mounting
DIN-KA52F-48	48 V/0.52 A, 25 W Power Supply with DIN-Rail Mounting
DR-120-48	48 V/2.5 A, 120 W Power Supply with DIN-Rail Mounting

<p>IP67 RJ-45 Plug</p>  <p>4SASO-001</p>	<p>IP67 Power Plug</p>  <p>4SIO1K0000013</p>	<p>Cap with Tether</p>  <p>4SASO-0004</p>
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