

DL-1000-WF Series

PM1/2.5/10/CO/CO_2/HCHO/TVOC/NH_3/H_2S/O_2/Pressure/
Temperature/Humidity/Dew Point Data Logger Module (Asia Only)

Features

- Able to record PM1/2.5/10, CO, CO_2, HCHO, TVOC, NH_3, H_2S, O_2, Pressure,Temperature, Humidity, and Dew Point Measurements
- Non-dispersive Infrared (NDIR) CO_2 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)/Wi-Fi 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

RoHS

Introduction

The DL-1000-WF 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/CO_2/HCHO/NH_3/H_2S/TVOC. DL-1000-WF can record data and send alarm when concentration is too high. It can be used to record PM1/2.5/10, CO, CO_2, HCHO, TVOC, NH_3, H_2S, O_2, Pressure, temperature, humidity and dew point information, including date and time stamps, and are able to storeup to 180,000 downloadable records. Real-time data can be accessed from the DL-1000 series Data Logger from anywhereand 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. It provides 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-WF series Data Logger can be connected via widely used communication interfaces including RS-485, Ethernet and 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-WF series is designed for industrial applications in harsh environments that provides IP43 protection rating. The rugged RJ-45 ensures tight, robust connections, and guarantees reliable operation, even for applications that are subject to high vibration and shock.

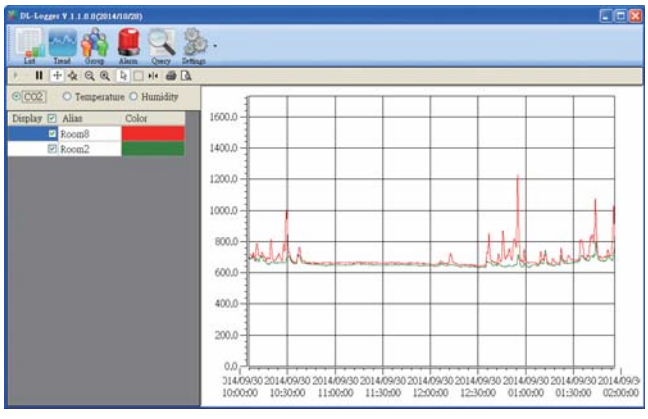
Multi-platform Remote Access Software

Real-time data from the DL-300 Data Logger can be accessed from anywhere and at any time using the DL-300 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.



Simple and powerful utility

The DL-300 Utility can be used to configure the modules, monitor real-time data, group DL-1000-WF 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, and then it can be imported into any industry-standard software or spread sheet for analysis.

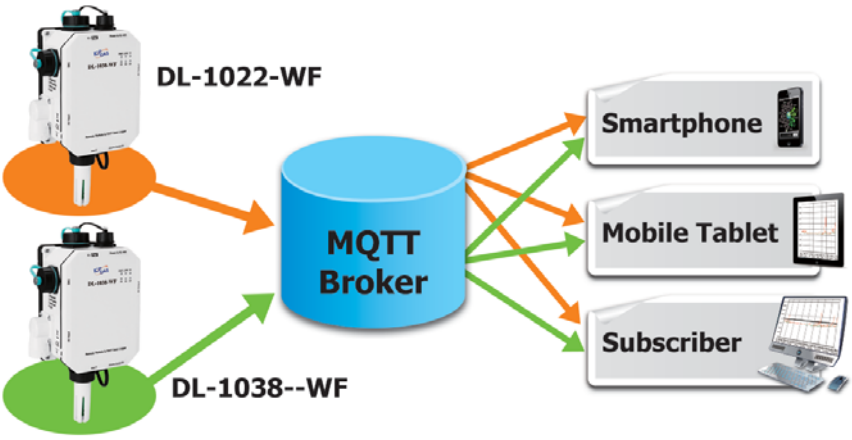


Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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 costs and losses. In order to solve this problem, ICP DAS designs the CL-200 series and DL-1000 series with replaceable patches, FLT-C001, which makes it easy for users to replace them without uninstall the devices. The cost of repair and time can be reduced by this innovated mechanical design.

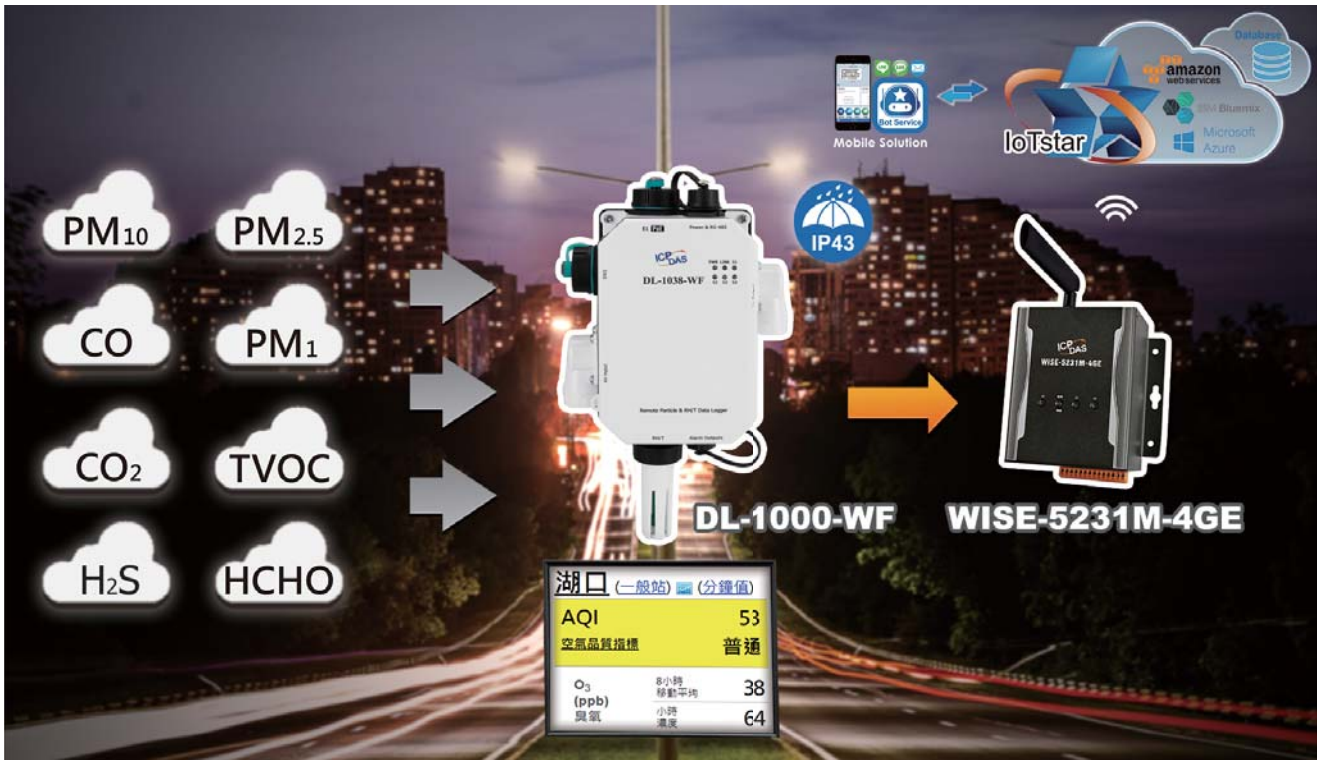
Supports the MQTT Protocol for IoT Applications





Applications

DL-1000-WF series products, with standard industrial communication protocol Modbus RTU/TCP, can integrate with smart city to achieve outdoor air quality monitoring such as CO, CO_2, H_2S, TVOC, HCHO, and Particle Matter 1/2.5/10. Since these aerosol could accumulate around the sensor and would cause error record after using for a period of time, DL-1000-WF supports replaceable dust filter patches to easily change the patches inside the filter hood rather than uninstall the device.



Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Outdoor Mobile Air Quality Detection Application

In developed countries, the air quality detection, statistics and evaluation is in urgent need for improvement. In a vast area, it can only rely on the vehicle to move to record status of air quality in the area, and to extract the off-line data and send it back. ICP DAS's DL-1000-WF series can integrate with our 3G/ 4G controllers to transmit data back to the control center wirelessly.



Factory Gas Detection Application

In some factories, H_2S is one of the harmful gases. Since the colorless and odorless are two characteristics quite hard to find or feel, sometimes the workers inside the factory get injured inevitably. Joint liability from the injury brings the company massive fines.

DL-1026-WF H_2S detector module can be put on the spot. It is equipped with standard industrial protocols and with high flexibility to integrate information from devices and transmit it back to the control center. When the concentration of gas is too high, DL-1026-WF can also send alarm signals to inform relative personnel to evacuate people there.



Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

DL-10 X X X - X

Pressure Sensor

0 : -
1 : Pressure

Particle Matter Sensor

1 : PM2.5
2 : PM2.5/1/10+Particle
3 : PM2.5/1/10+Particle +CO+CO_2
5 : O_2

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

Types of Gas Sensor

0 : -
1 : CO
2 : CO_2
3 : CO+CO_2
4 : HCHO + TVOC
5 : NH_3
6 : H_2S
7 : HCHO
8 : TVOC

Communication

☐ : Ethernet/PoE
WF : Wi-Fi

DL-10xx Series		Type of Sensor										Communication
		Particle		Gas Sensor								
Basic Type	Wi-Fi	PM1/PM2.5/ PM10/Particle	O_2	CO	CO_2	HCHO	NH_3	H_2S	TVOC	T & RH	Pressure	
DL-1020	DL-1020-WF	√	-	-	-	-	-	-	-	√	-	Basic type: RS-485 + Ethernet/PoE WF type: Wi-Fi + RS-485 + Ethernet/PoE
DL-1021	DL-1021-WF			√	-	-	-	-	-			
DL-1022	DL-1022-WF			-	√	-	-	-	-			
DL-1023	DL-1023-WF			√	√	-	-	-	-			
DL-1024	DL-1024-WF			-	-	√	-	-	√			
DL-1025	DL-1025-WF			-	-	-	√	-	-			
DL-1026	DL-1026-WF			-	-	-	-	√	-			
DL-1027	DL-1027-WF			-	-	√	-	-	-			
DL-1028	DL-1028-WF			-	-	-	-	-	√			
DL-1034	DL-1034-WF			√	√	√	-	-	√			
DL-1035	DL-1035-WF			√	√	-	√		-			
DL-1036	DL-1036-WF			√	√	-	-	√	-			
DL-1037	DL-1037-WF			√	√	√	-	-	-			
DL-1038	DL-1038-WF			√	√	-	-	-	√			
DL-1050	DL-1050-WF	-	√	-	-	-	-	-	-			
DL-1051	DL-1051-WF			√	-	-	-	-	-			
DL-1052	DL-1052-WF			-	√	-	-	-	-			
DL-1053	DL-1053-WF			√	√	-	-	-	-			
DL-1054	DL-1054-WF			-	-	√	-	-	√			
DL-1055	DL-1055-WF			-	-	-	√	-	-			
DL-1056	DL-1056-WF			-	-	-	-	√	-			
DL-1057	DL-1057-WF			-	-	√	-	-	-			
DL-1058	DL-1058-WF			-	-	-	-	-	√			

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

System Specifications

Power	Powered from Terminal Block		+8 to +48 VDC
	Powered from PoE		IEEE 802.3af, Class 1 (48 V)
	Power Consumption	PoE	3.6 W MAX
		Non-PoE	3.4 W MAX
System	Alarm		PM1/PM2.5/PM10/O_2/CO/CO_2/HCHO/TVOC/NH_3/H_2S/RH/Temperature
	Real Time Clock		Yes
	Data Logger		Yes, up to 180,000 records
	Relay Output		PhotoMos Relay × 4, 100 VDC @ 1 A
LED Indicators	PWR		Green for normal operation
	Link		Green for the Ethernet-linked
	S1 ~ S4		Red for an alarm condition
Environment	Operating Temperature		-20 to +50°C
	Storage Temperature		-30 to +75°C
	Humidity		10 to 90% RH, Non-condensing
	Protection Rating		IP43
Communication	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, Wi-Fi) and MQTT (Ethernet)
	Dual Watchdog		Yes, Module (2.3 sec), Communication (Programmable)
Wi-Fi Interface	Antenna		Antenna = 1 dBi (PCB Antenna)
	Output Power		18 dBm @ 1 DSSS, 14.5 dBm @ 54 OFDM
	Receive Sensitivity		-95.7 dBm @ 1 DSSS, -74.0 dBm @ 54 OFDM
	Standard Supported		IEEE 802.11 b/g/n
	Mode		Infrastructure & Limited AP
	Encryption		WEP, WPA and WPA2
	Transmission Range		50 meters (LOS)
Mechanical	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
PM1/PM2.5/ PM10/Particle (Note1)	0 to 1,000 µg/m3 (Laser Type)	1µg/m3	± 10% of FSR.	1 seconds	20 seconds	5 years
CO	0 to 1000 ppm (Electrochemical)	1 ppm	±5% of measured value	30 seconds	60 seconds	5 years
CO_2	0 ~ 9999 ppm (NDIR)	1 ppm	±30 ppm ±3% of measured value	120 seconds	300 seconds	15 years
HCHO	0 ppb to 2000 ppb (Electrochemical)	1 ppb	0 ~ 300ppb : ±30ppb > 300ppb : ±10%	≤60 seconds	180 seconds	3 years
TVOC	0 ppb to 60000 ppb (MEMS Metal Oxide)	1 ppb	±15%	60 seconds	180 seconds	5 years
NH_3	0 to 100 ppm (Electrochemical)	1 ppm	±5% of measured value	< 40 seconds	60 seconds	2 years
H_2S	0 to 100 ppm (Electrochemical)	1 ppm	±5% of measured value	< 30 seconds	60 seconds	2 years
O_2	0 ~ 25% (Luminescence for O2 sensor)	0.01%	±2%	< 30 seconds (typical)	120 seconds	5 years

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

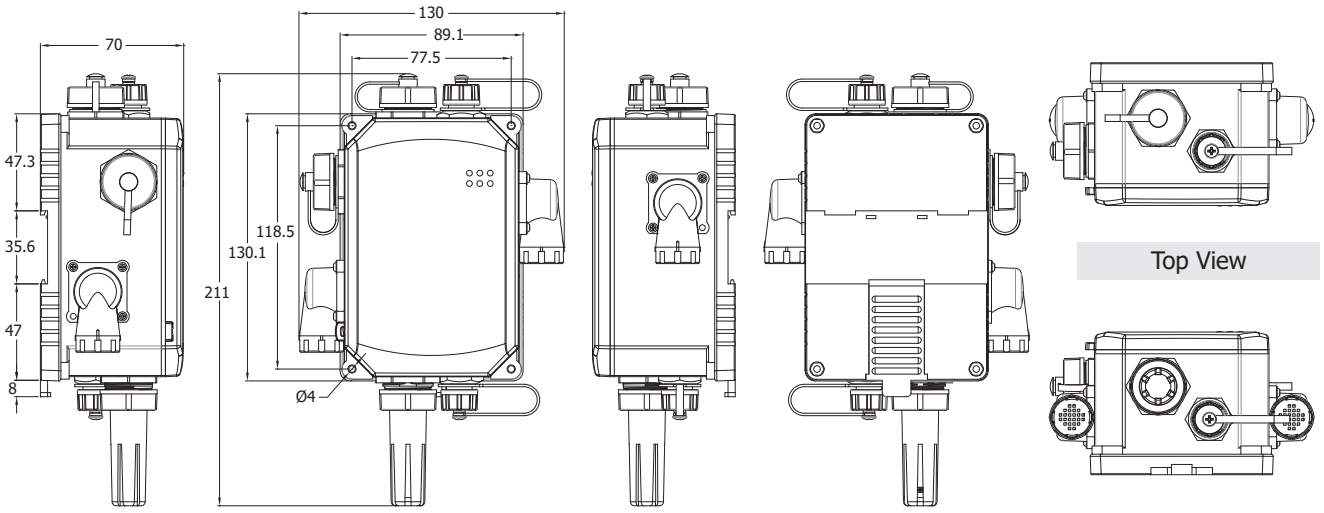
I/O Specifications

Type of Sensor	Range	Resolution	Accuracy	Response Time	Warm-up Time	Life Time
Temperature	-20 to +50°C	0.1°C	±0.6°C	-	-	10 years
Relative Humidity	0 to 100% RH, Non-condensing	0.1% RH, Non-condensing	±5% RH, Non-condensing	-	-	10 years
Dew Point	Calculated using temperature and relative humidity	0.1°C	-	-	-	10 years
Pressure	300 ~ 1200 hPa	0.1 hPa	1 hPa	-	-	-

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

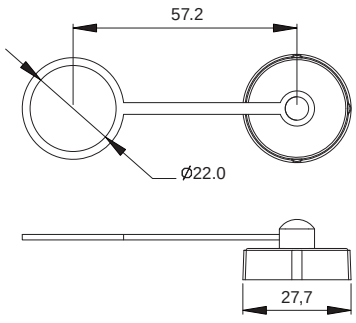
Particle	
Sizes	0.3μm, 0.5μm,,1μm, 2.5μm,,5μm, 10μm

Dimensions (Units: mm)



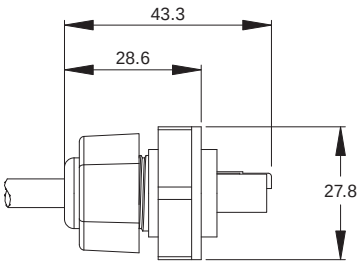
Left View | Front View | Right View | Rear View | Top View | Bottom View

IP65 Ethernet Cap with Tether



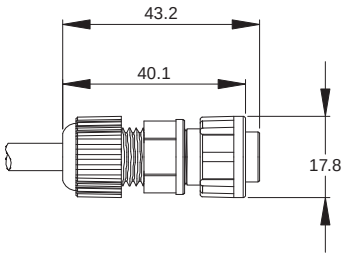
IP65 Ethernet Plug

Cable Dia:
Max. 7.0 mm
Min. 5.5 mm



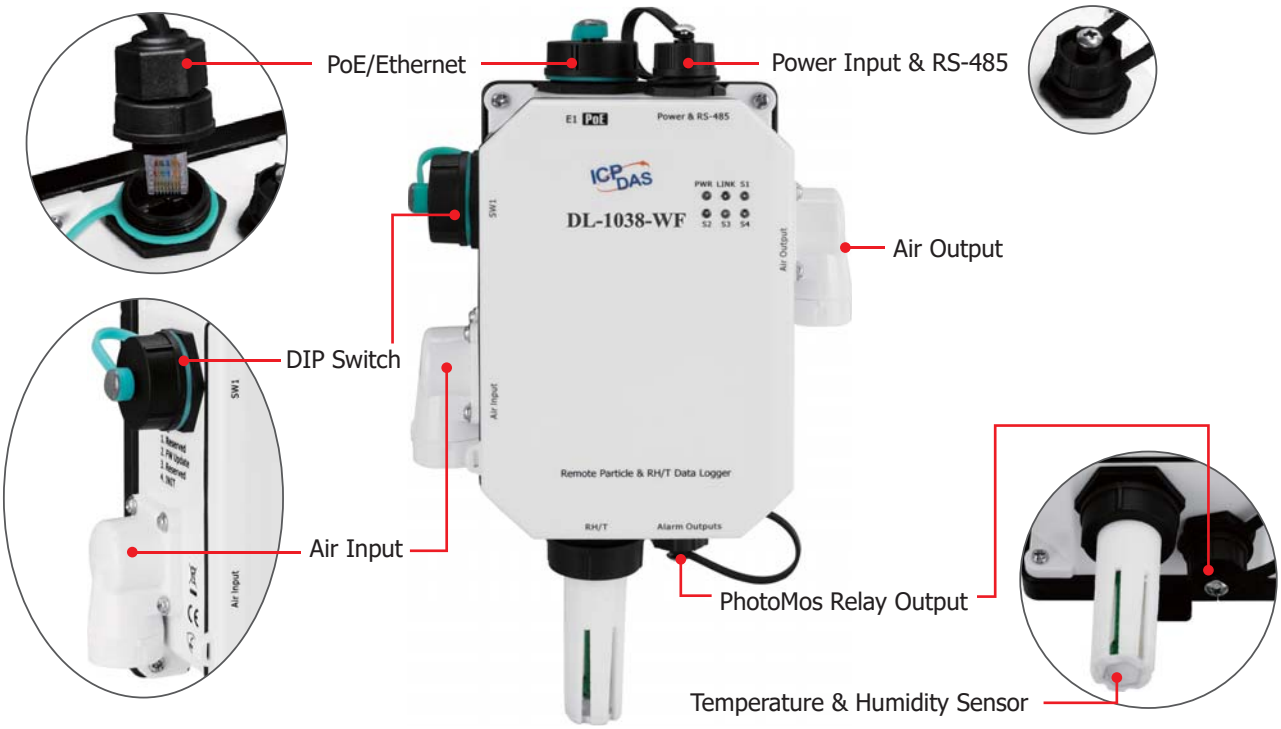
IP65 PWR Plug

Cable Dia:
Max. 6.5 mm
Min. 5.0 mm



Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Appearance



Accessories

Mode Name	NS-205-IP67	NS-208PSE-IP67	NS-208-IP67
Picture			
PoE	–	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	
Dimensions (Unit: mm)	85 x 76 x 137 (W x L x H)	190 x 155 x 104 (W x L x H)	

FLT-C001	Replaceable Filter Patch (Circle) (1 Pack 4 Patches) (RoHS) Size: (OD :16, ID:12)mm

IP67 RJ-45 Plug	IP67 Waterproof Cable, 1M	Cap with Tether	Replaceable Filter Patch
			
4SASO-0001	**CA-05BFFM-LL7A01**	**4SASO-0004**	**FLT-C001**

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Ordering Information

DL-1020-WF CR	Remote PM1/2.5/10/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1021-WF CR	Remote PM1/2.5/10/CO/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/ Wi-Fi and PoE (RoHS) (Asia Only)
DL-1022-WF CR	Remote PM1/2.5/10/CO_2/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/ Wi-Fi and PoE (RoHS) (Asia Only)
DL-1023-WF CR	Remote PM1/2.5/10/CO/CO_2/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/ Wi-Fi and PoE (RoHS) (Asia Only)
DL-1024-WF CR	Remote PM1/2.5/10/HCHO/TVOC/Temperature/Humidity/Dew Point Data Logger with Ethernet/ RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1025-WF CR	Remote PM1/2.5/10/NH_3/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/ Wi-Fi and PoE (RoHS) (Asia Only)
DL-1026-WF CR	Remote PM1/2.5/10/H_2S/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/ Wi-Fi and PoE (RoHS) (Asia Only)
DL-1027-WF CR	Remote PM1/2.5/10/HCHO/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/ Wi-Fi and PoE (RoHS) (Asia Only)
DL-1028-WF CR	Remote PM1/2.5/10/TVOC/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/ Wi-Fi and PoE (RoHS) (Asia Only)
DL-1038-WF CR	O_2/CO/CO_2/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1050-WF CR	Remote O_2/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1051-WF CR	Remote O_2/CO/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1052-WF CR	Remote O_2/CO_2/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1053-WF CR	Remote O_2/CO/CO_2/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1054-WF CR	Remote O_2/HCHO/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1055-WF CR	Remote O_2/NH_3/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1056-WF CR	Remote O_2/H_2S/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1057-WF CR	Remote O_2//HCHO/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)
DL-1058-WF CR	Remote O_2/TVOC/Temperature/Humidity/Dew Point Data Logger with Ethernet/RS-485/Wi-Fi and PoE (RoHS) (Asia Only)

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000