D-Link | D-ECS cloud

Reliable End-to-End Connectivity for

EV Charging

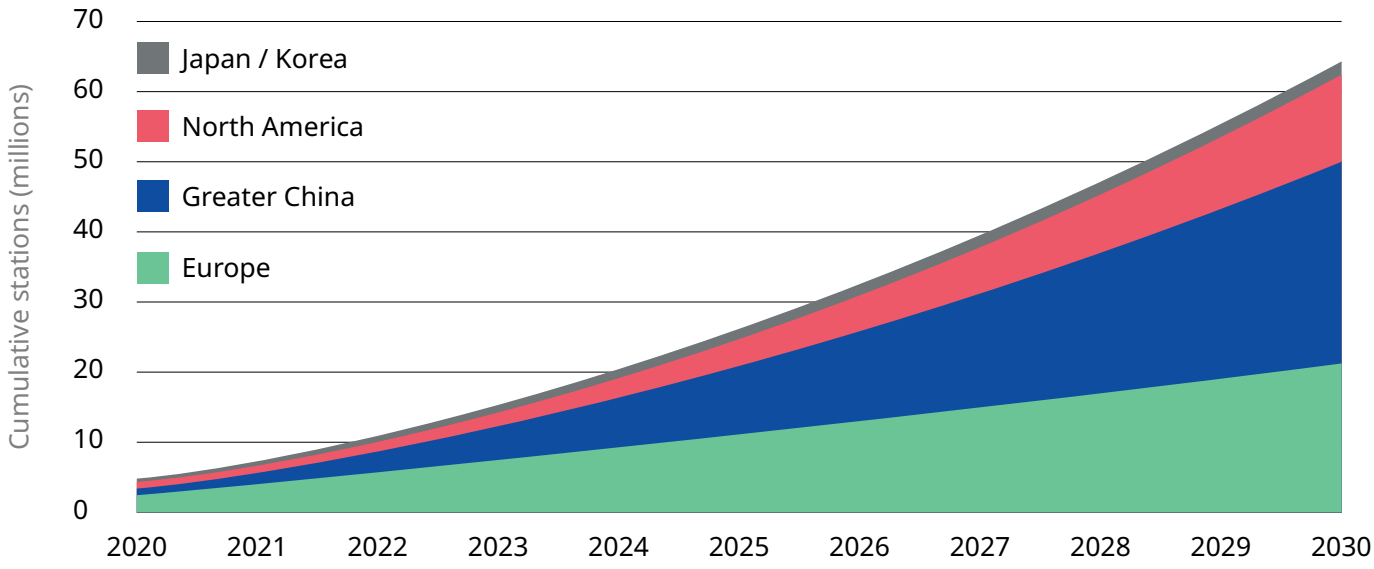
Introduction

Electric vehicles (EV) are a major global effort to decarbonize the transport sector. Global EV sales are increasing, and more charging stations, or electric vehicle supply equipment (EVSE), will be required to replenish depleted batteries. As the number of EVSEs grow, a major challenge facing charging station operators is remote systems management. In this guide, we will outline the basic network needs for remote EV charging station management, as well as explore possible options to add value, improve customer experience, and enhance manageability through cellular IoT connectivity.

EV Charging Station Growth

While charging preferences may vary for EV owners across different regions, the global number of charging stations is expected to grow at a significant pace in the next decade. According to a recent forecast by IHS Markit1 ,deployment of EV charging stations is expected to grow at a global rate of 31% CAGR to more than 66 million units by 2030.

[1] IHS Markit: 2022 EV Charging Infrastructure Forecast Report Link: https://www.spglobal.com/mobility/en/Info/0121/ev-charging-infrastructure-forecast.html



Source: IHS Markit

EV Charger Installation Types

EV Charging Wall Box

- Wall Mount
- Lower Power Output
- Home/ Building/ Parking Lot

EV Charging Pile

- Stand
- High Power Output
- Roadside/ ParkingLot/ Rest Stop

EV Charging Station

- Stand
- High Power Output
- Roadside/ ParkingLot/ Rest Stop

Why network is critical to the operation of EV charging.

Smarter charging

Connectivity lets charging stations operate more dynamically, perhaps by flexibly favoring off-peak hours to reduce the cost of “topping up” and lower the total cost-of-use for EVs.

Increased resilience

Charging millions of EVs places a load on the grid, and unmanaged charging — such as when everyone gets home from work and plugs in their car — can cause problems. Connected charging stations can collaborate to smooth out the load, prevent problems, and keep energy costs low.

Added value

From checking an app to see whether a local charging station is free, to getting a push notification when your car is charged, smart EV infrastructure improves the EV owner’s experience and ultimately helps boost EV uptake.

Easier maintenance

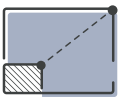
EV stations are sophisticated tools, and it’s possible to run diagnostics and even conduct maintenance or repairs remotely, using software tools to identify and fix problems — and that means fewer expensive field trips by maintenance workers, and more uptime for charging stations.

EV Station Network Challenges

In addition to ensuring that charging stations are utilized, profitable, and offer a pleasant charging experience to customers, operators can also encounter hurdles in deploying, operating, maintaining, and monitoring a fast-growing network of charging stations.

Continuous Operation

Downtime at charging stations must be minimized to maximize profits. Ensuring uninterrupted network uptime is only possible with reliable connectivity and effective status monitoring, such as redundant connectivity and remote monitoring.



Scalability

The ability to quickly deploy networks at charging stations to meet rising demand is paramount for success, and time is money. Wired network connections may not be readily available in rural areas and waiting for local ISPs to install wired connections can be very time-consuming or too costly to install.

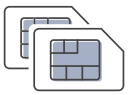
Flexibility

When business grows at each charging site, so may on-site services and network connection requirements, such as upgrades for Wi-Fi hotspots, waiting lounge entertainment options, and surveillance systems.

Security

Charging points are termed Electric Vehicle Supply Equipment (EVSE) and provide the electrical equipment needed to deliver safe charging. A public EVSE must also include a secure payment mechanism. Infrastructure of this kind requires security to ensure customer data is protected from hackers.

D-Link Connectivity Features

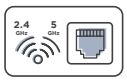


Multi-SIM Design

Zero downtime with multi-SIM design

Secure VPN Connection

Integrated VPN Client and Server support for secure connectivity



Redundant WAN Connectivity

4G/5G and Ethernet dual-WAN for load balance or failover purpose

WiFi Connectivity

WiFi connection for multiple wireless clients

Remote Management

Network management platform for massive IoT implementation

Industrial Grade Design

Zinc-plated steel casing for extra protection

Application Scenario — Charging Point

Typically a single Wall mount or pile type of EVSE was installed. The common scenarios are, residential, gas station or roadside.

Modbus Support

Key Benefits

- 4G LTE WAN connectivity
- RS-232/485 interface
- DI/DO for local sensor activity or actuator control
- Supports Modbus protocol

M2M IIoT RTU / DOM-311-TSO

- 3G/LTE CAT4
- 1 x SIM, 1 xFE, 2 x RS232/485
- 3 x DI, 2 x DO
- DC 9-36V TB

LTE Connectivity with Failover

Key Benefits

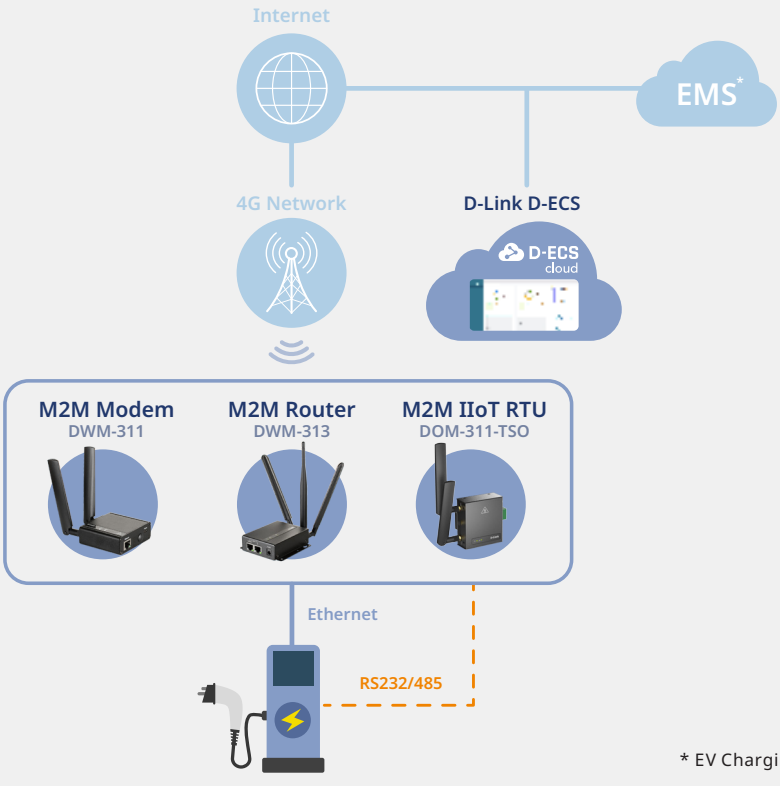
- Dual 4G LTE WAN connectivity (one for failover)
- Remote monitoring/configuration via D-ECS
- Secure connectivity
- Cost-saving deployment
- Faster time to market

M2M Router / DWM-313

- 3G/LTE CAT4
- 2 x SIM, 2 x FE
- N150 WiFi
- DC Jack 5-18V

M2M Modem / DWM-311

- 3G/LTE CAT4
- 1 x SIM, 1 x GE
- 5V/2A via Micro USB



* EV Charging Management System

Application Scenario — Charging Station

Typically two or more EVSE installed.
The common scenarios are, parking space,
MDU or shopping mall.

Key Benefits

- Fixed network WAN connectivity and failover
- Remote monitoring/configuration via D-ECS
- IP surveillance

M2M PoE Modem / DWM-314-GP

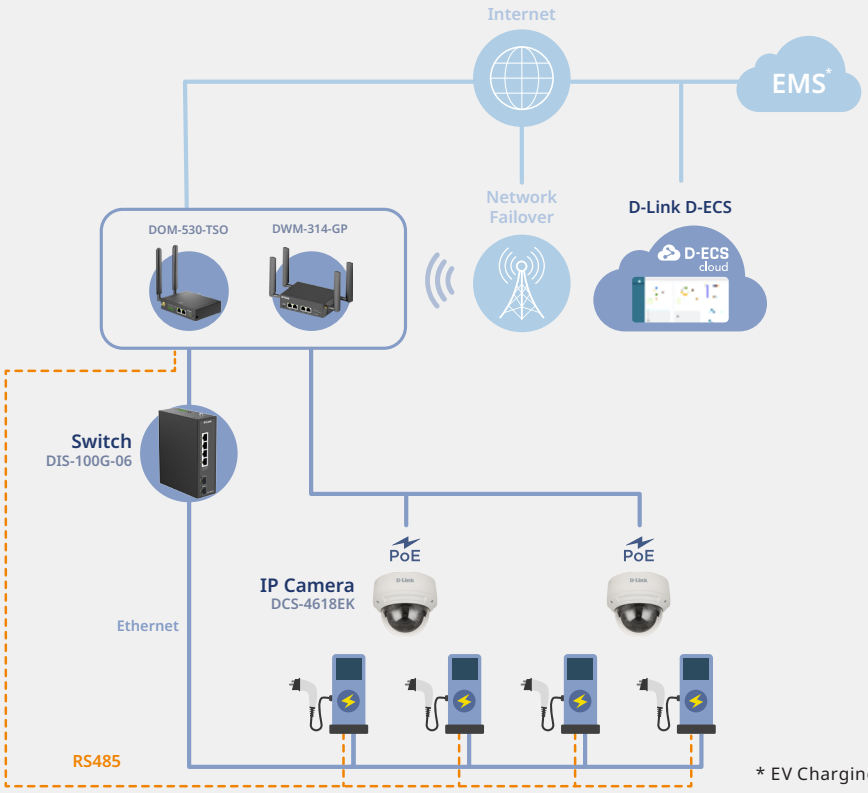
- 5G NR (FR1)
- 2 x SIM
- 2 x Gb Ethernet
- 2 x Gb 802.3at PoE
- DC 50~57V 2-Pin TB

Switch / DIS-100G-06

- 4 x GE ports + 2 x SFP port Unmanaged Industrial Switch
- DIN-Rail
- Wide operating temperature (-40 °C to 75 °C)

M2M IIoT Gateway / DOM-530-TSO

- 3G/LTE Cat.4
- 2 x SIM
- 2 x Gb Ethernet
- 2 x RS232/485
- 1 x DI, 1 x DO
- DC 9~36V 2-Pin TB



* EV Charging Management System

Application Scenario — Charging Pool

Typically five or more EVSE installed. The common scenarios are, parking lot, logistic center ,transportation center.

Key Benefits

- Fixed network WAN connectivity and failover
- Remote monitoring/configuration via D-ECS
- IP surveillance

DWM-550-G

- 5G NR (FR1)
- 2 x SIM
- 4 x Gb Ethernet
- Wi-Fi AX1800
- DC 9~36V 3-Pin TB

DOM-550-GSO

- 5G NR (FR1)
- 2 x SIM
- 3 x Gb Ethernet
- Wi-Fi AC1200
- 1 x RS232/485
- 2 x AI/DI/DO
- DC 9~36V 2-Pin TB

Switch / DIS-100G-10

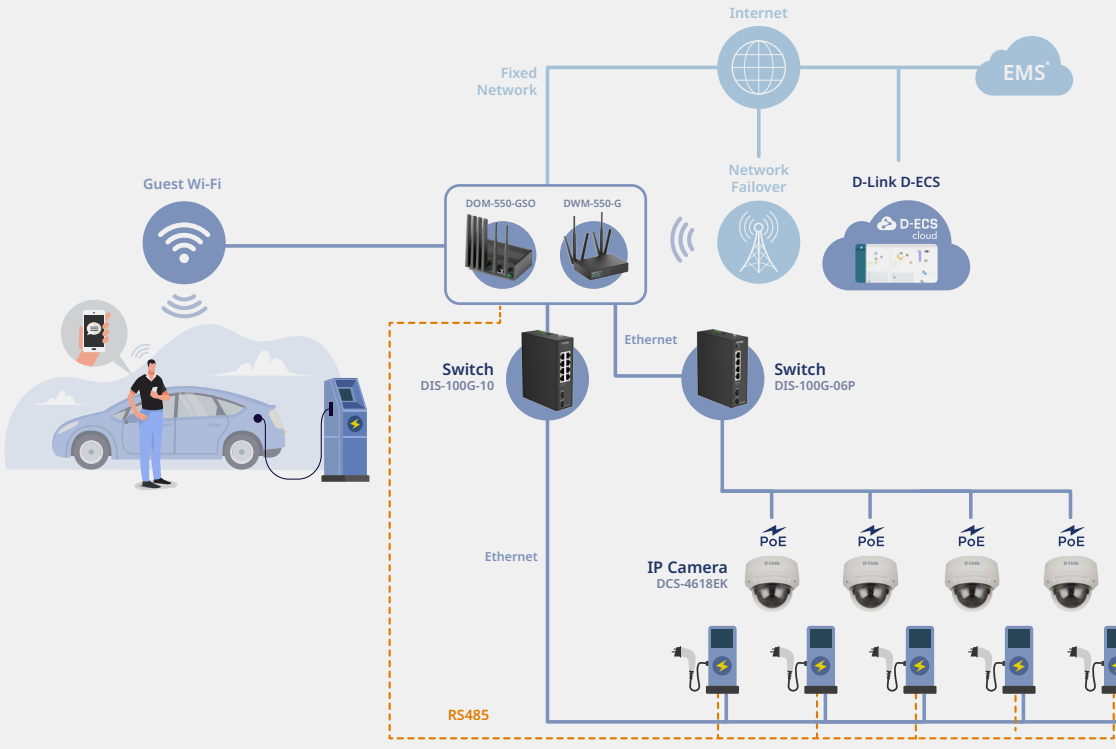
- 8 x GE ports + 2 x SFP ports Unmanaged Industrial Switch
- DIN-Rail
- Wide operating temperature (-40 °C to 75 °C)

Switch / DIS-100G-06P

- 4 x GE PoE (30W) ports + 2 x SFP port Unmanaged Industrial Switch
- DIN-Rail
- Wide operating temperature (-40 °C to 75 °C)
- PoE budget: 120W

IP Camera (Outdoor) / DCS-4618EK

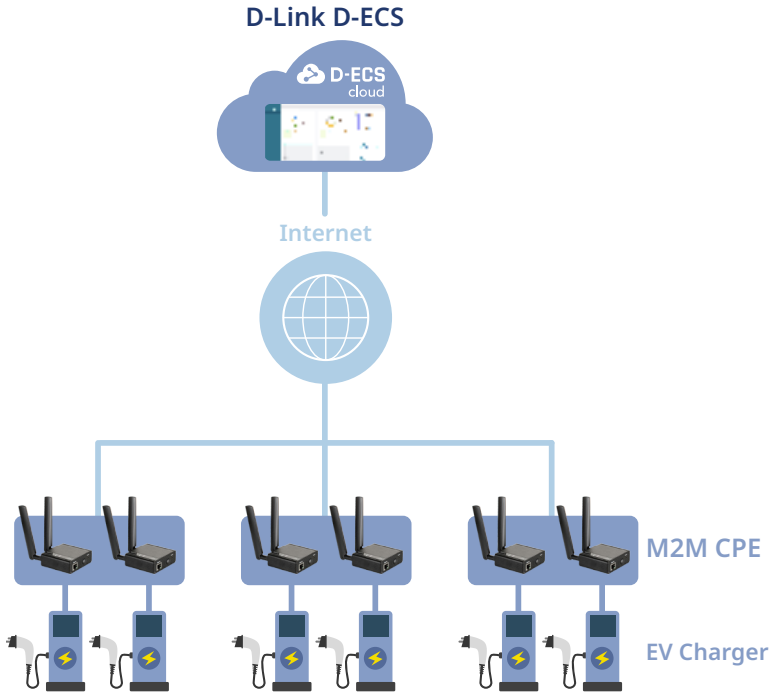
- Resolution up to 3840 x 2160 at 30 FPS
- H.265 codec support
- Motorized varifocal 2.7 - 13.5 mm lens
- 30 m range IR LED illuminator
- PoE (Power over Ethernet)
- IP66 compliant housing
- ONVIF Profile S compliant



* EV Charging Management System

D-Link D-ECS Cloud Management Solution

D-ECS is a professional-grade 4G/5G cellular M2M CPE device management platform that is easy to use and provides comprehensive management data at a glance from a centralized location to manage remote EVSE networks. Perfect for EV charging stations with minimal IT personnel by enabling plug-and-connect deployments with simple and scalable setup requirements.



End-to-End Solution

- Minimal need for in-house IT skills
- Easy network management outsourcing
- Enhance business value and operational flexibility
- D-ECS only support M2M CPE Devices

D-ECS Core Features

Enhanced Functionalities to Give Your Business a Competitive Advantage

Easy Deployment

Organization Managemant for Role-based administration

Geo-location Using Google Maps

Traffic Report for Data Analysis

Google and Microsoft 2FA to Log in

Status Monitoring and Alerts

Schedules Task (reboot, rest, config, FW)

SSL/ TLS Encryption for Data Security

Your Reliable EV Station Connectivity Partner

Cellular IoT technology brings reliable and secure high-speed connectivity without the need for high-cost groundwork and installation. IoT connectivity enables remote diagnostics, maintenance, and monitoring to reduce the need for on-site personnel.
D-Link's end-to-end EV station connectivity solutions help to streamline operation, maintenance, and monitoring of EV charging stations to decrease annual cost of ownership and provide valuable data to help improve future deployments and develop new station services.

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For more information on how D-Link can help you connect your EV charging stations, please visit www.Dlink.com or contact your local D-Link sales representative.