
GRID FEEDING MONITORING RELAYS

The bridge between green energy and the power grid

CM-UFD grid feeding monitoring relays
with ABB Ability™ EDCS connectivity



Renewable energy sources – a challenge for power grids

ABB provides reliable stability

Weather conditions can mean generators need to feed several gigawatts of renewable power into the public grid within a short time. These sudden power increases can exceed the grid's power control capabilities.

The rise of renewable energy sources

The rapid expansion of fluctuating renewable energy sources like wind turbines and solar power plants has had a dramatic effect on our power grid. Instead of a relatively small number of high capacity generating plants there are now thousands of small renewable power sources.

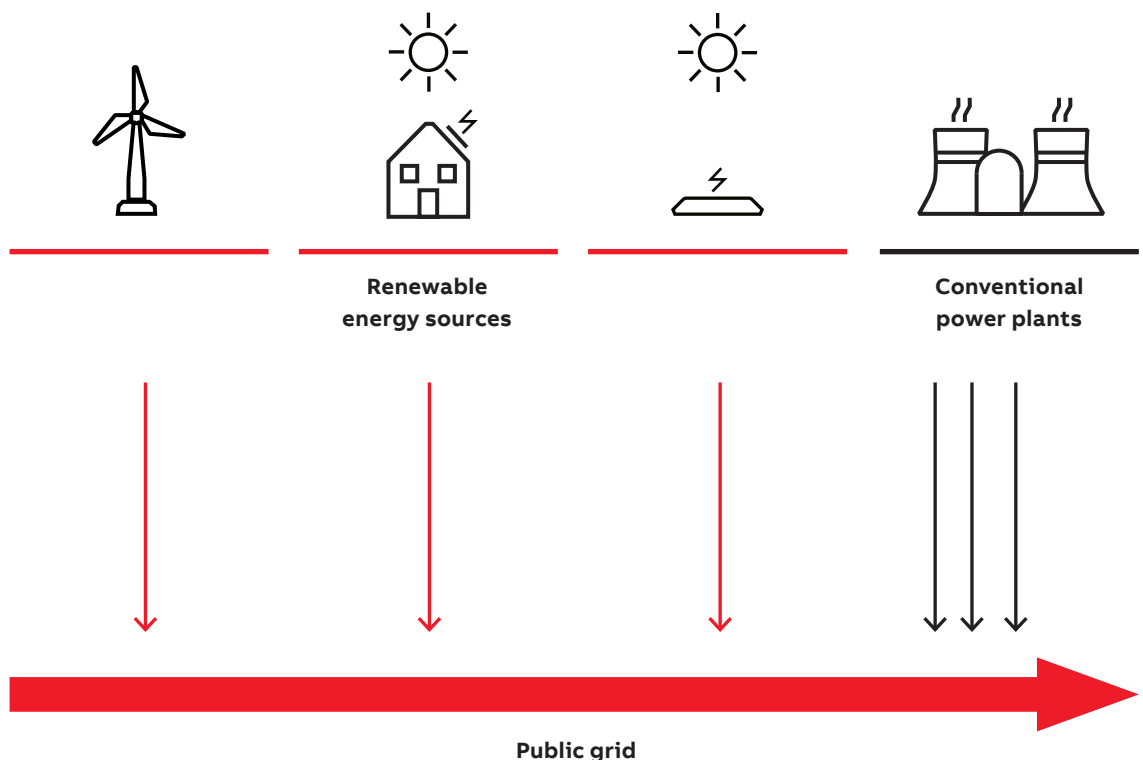
Depending on weather conditions, several gigawatts of renewable power might be fed into the public grid within a short time.

Influence of fluctuating energy input

A sudden power rise, for example on an especially windy day, might exceed the grid power control capabilities. To stabilize the grid, renewable power plants must be disconnected so that the energy generated and the energy consumed can be balanced.

If both are not in equilibrium, the frequency increases or decreases in the public network, increasing the risk of a blackout.

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Sudden changes in weather conditions can affect the amount of power being fed into the grid



CM-UFD RANGE

Integrate green energy
into the power grid -
with ABB's smart and
easy-to-use CM-UFD range.



The solution for stable power grids

Controlled grid feeding with the CM-UFD range

ABB's grid feeding monitoring relays detect unusual events in the public power grid and automatically disconnect and reconnect the renewable power plant.

Application

ABB's CM-UFD range are multi-functional grid feeding monitoring relays, installed between the renewable energy system and the public grid. The innovative relays guarantee grid stability and prevent blackouts. If the public grid's voltage or frequency moves out of the permitted ranges, the device uses a decoupling unit (e.g. contactor or breaker Tmax XT) to separate the renewable energy system from the public grid. As soon as the grid is stable again, the system is automatically reconnected.

The CM-UFD range provides different monitoring functions in accordance with several local grid feeding standards to detect over-/undervoltage and over-/underfrequency.

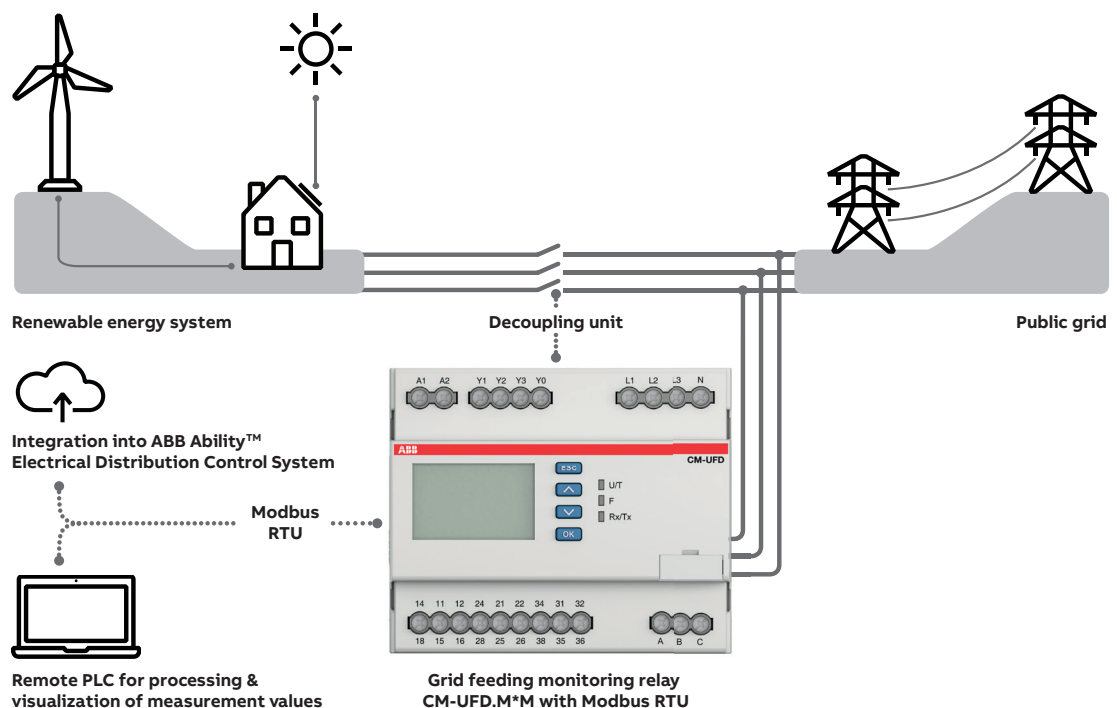
Functionality

The device measures the ten-minute average value, voltage increases and decreases as well as any changes in grid frequency. The rate of change of frequency (ROCOF) and vector shift monitoring to detect a loss of mains event can be easily configured.

Advantages

- Highly accurate measurement and setting
- Modbus RTU communication interface and ABB Ability™ EDCS connectivity
- Functional safety - single fault tolerances
- Clear multiline, backlit LCD display
- Intuitive and user-friendly menu
- Event storage built-in
- Pre-settings meet several local standards
- Type-tested to a number of local grid feeding standards by TÜV Süd

Operating principle and impact of renewable energy sources on the power grid





Modbus RTU communication

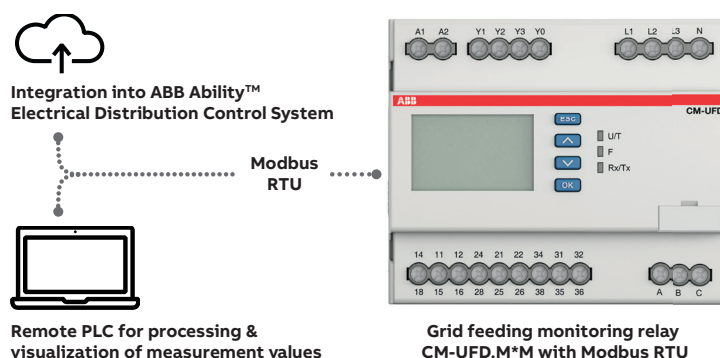
The CM-UFD.M*M range is equipped with an RS485 interface based on the Modbus RTU communication protocol. This communication interface makes it possible to:

- Visualize the process data
- Store process data
- Remotely trip the device

This enables owners of renewable energy resources to:

- Integrate the CM.UFD.M*M range into ABB Ability™ EDCS
- Perform remote monitoring via SCADA system
- Use the measured value from the grid for active power control and power factor correction
- Conduct remote maintenance and failure analysis

Modbus RTU communication



Pre-set devices

In accordance with a number of local standards, the CM-UFD relays can be used in all low voltage plants and in medium voltage plants.



Type-tested

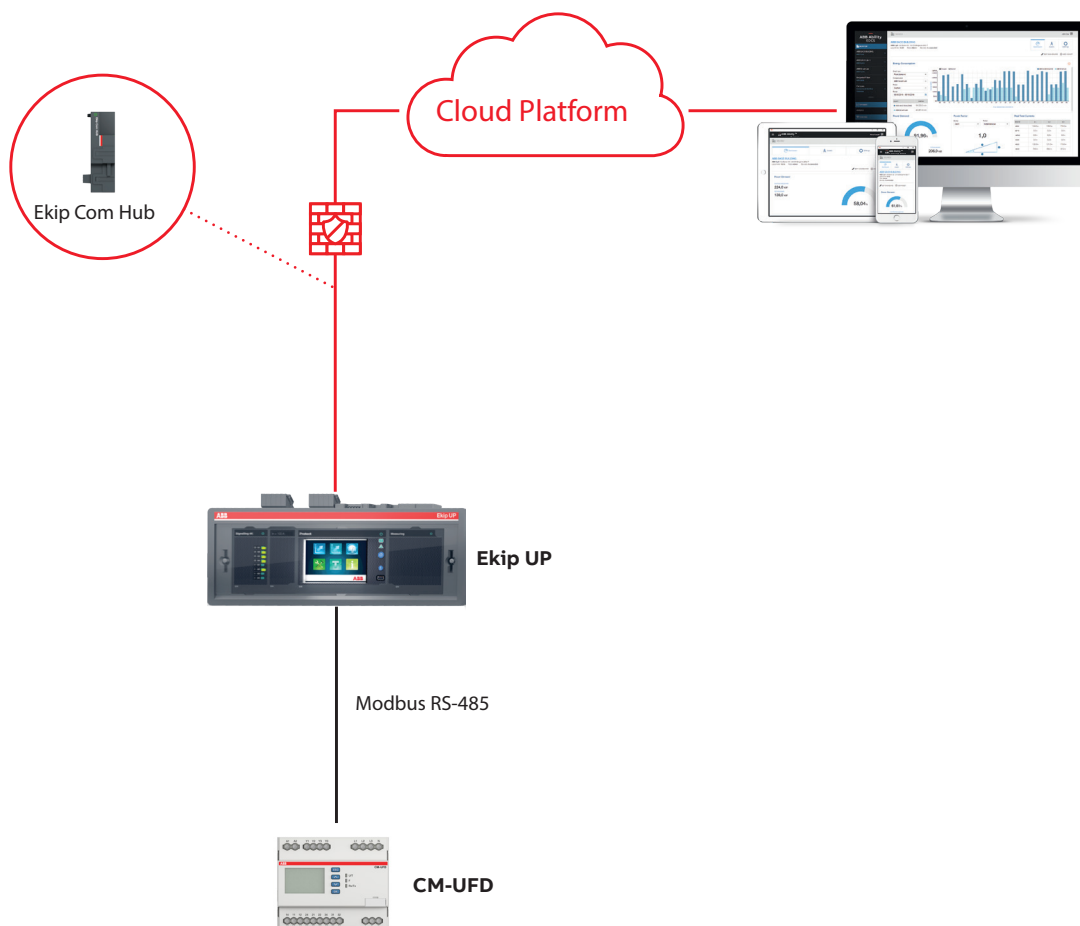
To ensure reliability and compliance the CM-UFD range is type-tested to local standards by the third party authority TÜV Süd.

Connectivity to ABB Ability™ EDCS

Parametrize with Ekip Connect and access data no matter where you are

The cloud-based service Ability™ EDCS enables customers to monitor the condition of CM-UFD.M*M in real-time and access the diagnostics remotely. This functionality is very important when operating in the field for critical power.

Example architecture



The grid feeding monitoring relays can be connected to the cloud directly by using Ekip Com Hub module. Another option is to connect via Modbus RTU when there is some other device equipped with the Ekip Com Hub like the Emax 2 air-circuit breaker.

In addition to the Ekip Connect 3 software, the following hardware is required:

- Ekip UP (min. firmware 2.23)
- Ekip Com Hub (min. firmware 1.18)
- Ekip Com Modbus RTU (min. firmware 2.28)
- Ekip Supply
- Ekip T&P cable
- CM-UFD.M*M (min. firmware 1.0.1)

ABB ABILITY™ EDCS

Monitor your renewable energy plant remotely with ABB's smart ABB Ability™ EDCS cloud platform.



Power islanding detection

Protect your workers with loss of mains detection

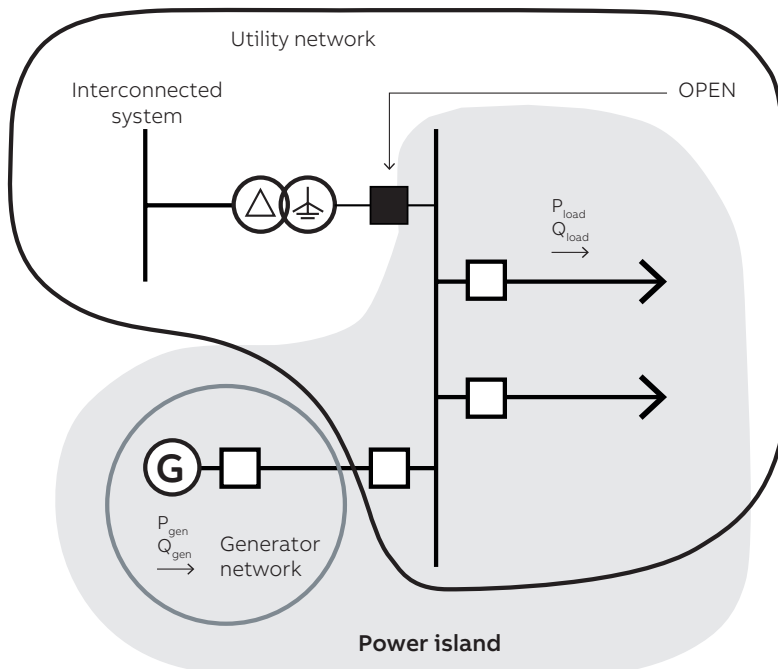
An additional phenomenon that can be detected by the CM-UFD range is Islanding, or loss of mains power.

If a section of the network is separated by energy utilities (e.g. for maintenance) it may be unintentionally supplied with power by the generating plant contained therein. Within this power island there is no possibility to control consumed and generated power, thus frequency and voltage might vary significantly.

Under- and over frequency monitoring might not be sufficient to detect this inconsistency of voltage and frequency which can damage electrical devices. Islanding can also be dangerous to utility workers who may not realize that a circuit is still powered. It may also prevent automatic reconnection of devices.

ABB's grid feeding monitoring relay prevents this by shutting down the generator when it is decoupled from the public grid.

Power islanding



Easy installation and maintenance

Operate the device remotely and monitor your renewable energy plant



The CM-UFD's display, communication interface, pre-setting and Modbus RTU reduce installation and configuration times by up to 60%.

CM-UFD with Modbus RTU



Services and training

Cut installation time by up to 60%

There's no need to learn every possible adjustment and its effects on your system – ABB's trained staff supports your business and answers your technical questions promptly.



Easy-to-install

Commission & configure up to 60% faster

Simple instructions, presets for local grid feeding standards, and ABB's intuitive menu structure make installation quicker. Commissioning and troubleshooting errors are prevented.



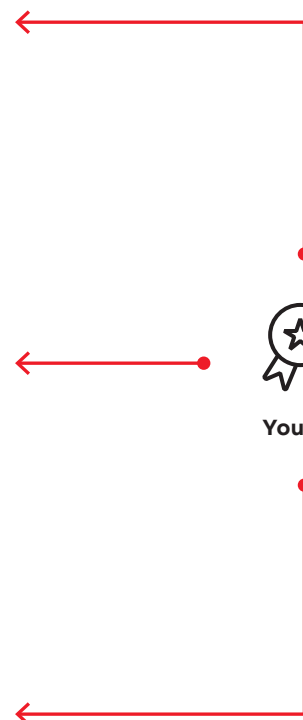
Optimum interface

Reduce downtime by up to 70%

Operate the device via LCD display or remotely with the Modbus RTU. Users are informed immediately in case of an event in the public grid. Redundant microcontrollers ensure reliable measuring values and tripping.



Your benefits



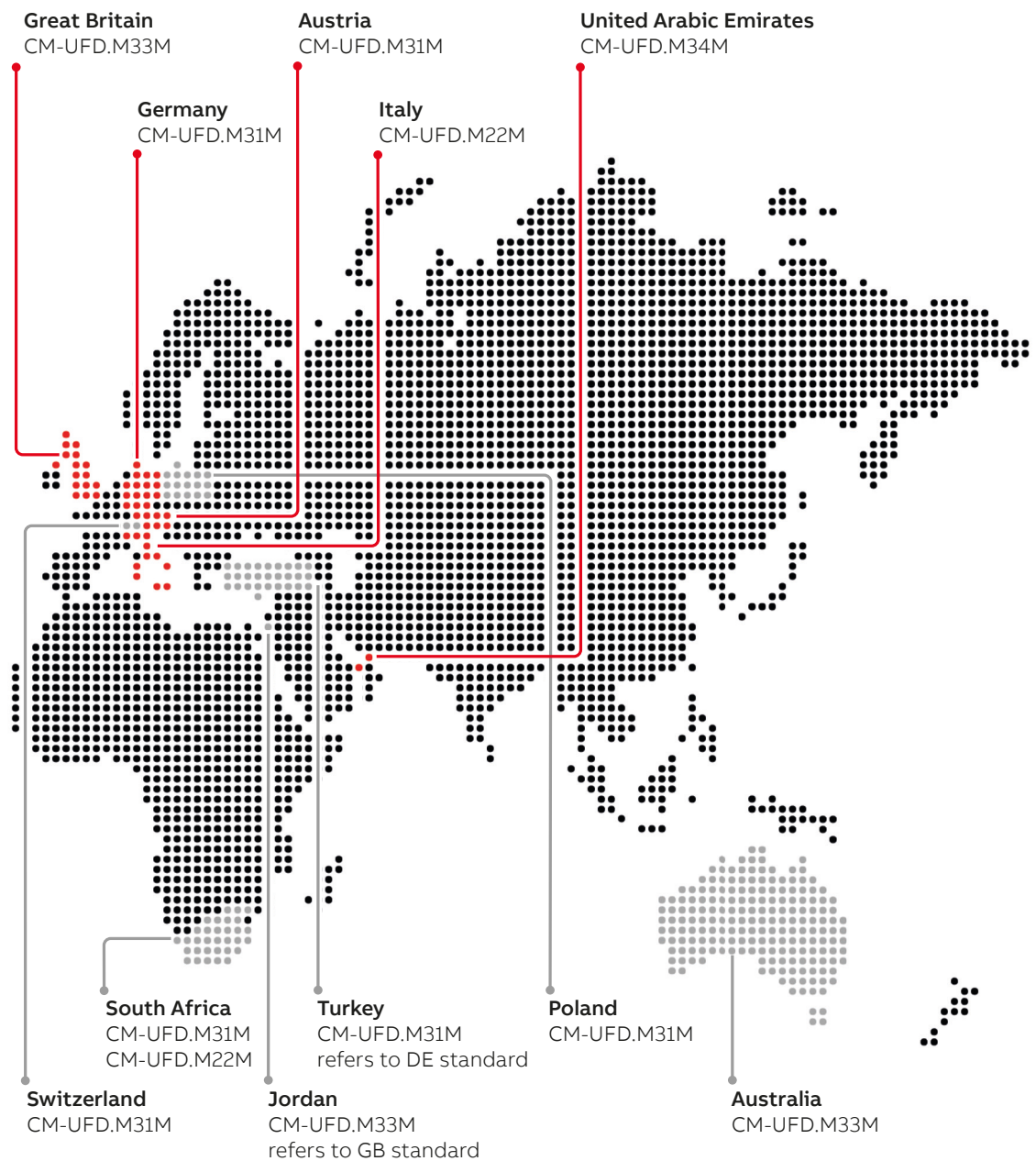
Global availability and pre-set standards

Easy installation and handling -
wherever you are in the world

A reliable solution that takes country-specific requirements into account: the CM-UFD range is already pre-set to local requirements, making installation quick and simple. Additionally, the devices can also be set manually with the display and used all over the world.

Countries with a dedicated local standard (in red)

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Areas of application
and the country
specific requirements



Countries referring to an existing local standard or using a product with reference to another dedicated standard (in grey)

CM-UFD.M*M range

Ordering information



The CM-UFD.M*M monitoring relays monitors voltage and frequency in single- and three-phase networks. In conjunction with inverters with integrated island network detection, this corresponds to the conditions for grid and system protection according to several local standards.

Type	Rated control supply voltage	Measuring range	Order code
CM-UFD.M22M	24-240 V AC/DC	L-L: 0-540 V AC / L-N: 0-312 V AC	1SVR560731R3700
CM-UFD.M31M	24-240 V AC/DC	L-L: 0-540 V AC / L-N: 0-312 V AC	1SVR560731R3701
CM-UFD.M33M	24-240 V AC/DC	L-L: 0-540 V AC / L-N: 0-312 V AC	1SVR560731R3702
CM-UFD.M34M	24-240 V AC/DC	L-L: 0-540 V AC / L-N: 0-312 V AC	1SVR560731R3703



Access technical data sheets, product data and manuals at abb.com/lowvoltage or via the QR code.

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You can find the address of your
local sales organisation on the
ABB home page



abb.com/lowvoltage

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