

SMART

EcoStruxure™ Power Commission

Optimize circuit breaker testing to improve safety and uptime

se.com

Life Is On

Schneider
Electric

Table of contents

Most LV circuit breakers
are rarely tested

1

Why and when LV circuit
breakers need testing

2

Introducing Ecostruxure
Power Commission

3

Take a closer look

4

Opportunities for
maintenance service
contracts

5

Additional resources

6

Most LV circuit breakers are rarely tested. You can help.

Most LV circuit breakers are rarely tested. You can help



Why and when LV circuit breakers need testing



Introducing Ecostruxure Power Commission



Take a closer look



Opportunities for maintenance service contracts



Additional resources



Most LV circuit breakers are rarely tested. You can help.

Every day, circuit breakers protect people, property, buildings, and electrical systems from risks of overloads, short circuits, electric shock, and fire. Your customers also depend on circuit breakers to contain a fault, helping to limit its impact to preserve power to the rest of the facility.

Modern low-voltage (LV) circuit breakers offer protection and coordination features to help ensure reliable service.

While it is recognized that they must be properly and regularly maintained, they should also have their settings checked – during installation and periodically afterward – to ensure the proper configuration and operation during its entire lifecycle.

Electrical design institutes define each circuit breaker’s optimal configuration. **Panel builders, installers, and service technicians** validate the proper configuration.

Unfortunately, circuit breaker checks are often not done – putting safety and power availability at risk.

Contractors, design institutes, and panel builders all have a role to play in helping improve this situation.

This creates an opportunity for Schneider Electric partners to offer new services and build new business.



of Schneider Electric LV power circuit breakers tested during their entire lifecycle.



This eGuide will explain:

- ✓ **Why test circuit breakers** during initial configuration and periodically during the electrical installation lifecycle.
- ✓ **EcoStruxure™ Power Commissioning** – a powerful, laptop-based app for simplifying testing and reporting.
- ✓ **Recommended procedures** for settings check and performance testing.
- ✓ How to easily procure your **subscription to EcoStruxure Power Commissioning** software.
- ✓ **New service opportunities** with your customers.
- ✓ **How to enlarge your business** with Services opportunities



Why and when LV circuit breakers need testing.

Most LV circuit breakers are rarely tested. You can help
..

Why and when LV circuit breakers need testing
.....

Introducing Ecostruxure Power Commission
.....

Take a closer look
.....

Opportunities for maintenance service contracts
....

Additional resources
...



Why and when LV circuit breakers need testing

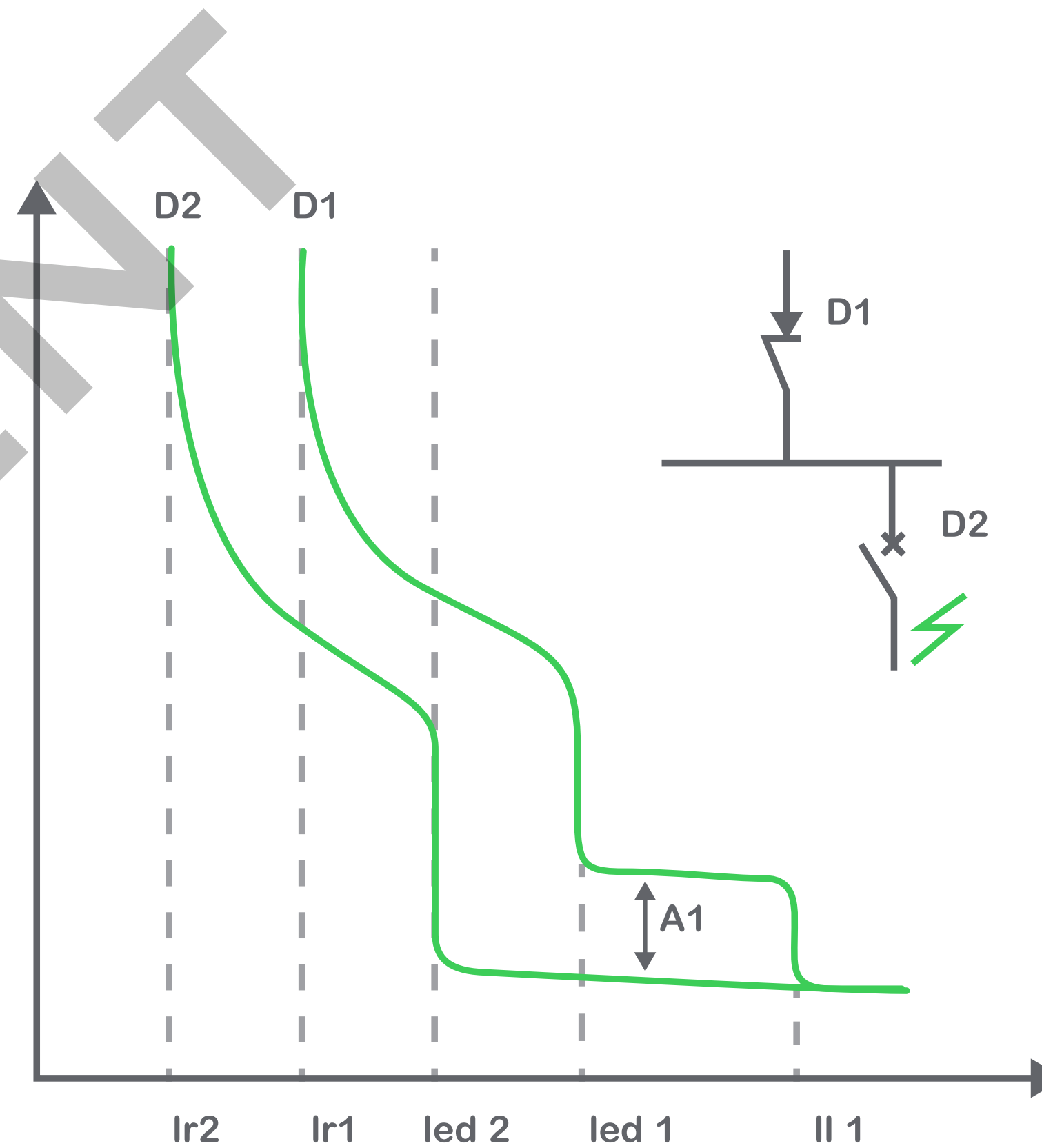
LV circuit breakers include molded case circuit breakers (MCCBs) and air circuit breakers (ACBs).

For LV applications above 100 A in main switchboards, the smart electronic trip units of these breakers integrate protection for many fault conditions, such as current overload, short circuit, and earth fault.

Configuring LV circuit breakers to work together can minimize electrical fault impacts while preserving supply continuity for the rest of a facility. Accomplish this by choosing from two types of coordinated protection:

1. Selectivity (including selective zone interlocking)
2. Cascading

However, both protections need to have settings calculated and configured to match the characteristics of the protected circuits.



Typical time versus current trip curves for D1 & D2 circuit breakers



When and how are circuit breaker settings defined?

During the electrical system design phase, each circuit breaker’s setting is specified for a new facility, upgrade, or expansion. An engineer typically uses an advanced software design tool (e.g., [ETAP®](#) or [Caneco ONE](#)) to calculate optimal settings to meet two critical objectives:

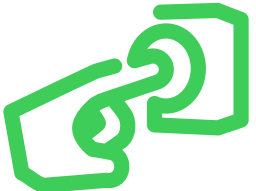
- 1. **Safety** – The circuit breaker’s ability to reliably disconnect in the case of overcurrent or earth fault. Proper functioning relies on consistency between circuit breaker setting, tripping curves, and power system characteristics (e.g., rated power of sources, impedances, length, and cross-section of cables).
- 2. **Continuity of supply** – One way to solve the safety requirement is to have a very sensitive circuit breaker with a low threshold and time delay. However, this can create unwanted tripping or selectivity, forcing settings to maximum values, potentially impairing safety. Choose a setting that carefully balances safety and supply continuity.

Why check LV circuit breaker settings?

To optimize safety and reliability, it is essential during the design phase that the circuit breaker settings specified apply to each circuit breaker during the initial electrical installation and then maintained to ensure optimized performance during the installation’s entire operational lifecycle.

Part 6 of the [IEC 60364-6](#), standard for LV installations – and multiple local regulations such as BS7671 and NFC15100 – requires checking overcurrent protective devices tripping values **during installation and operation**.

Schneider Electric estimates that at least **1/3** of adjustable circuit breakers remain with factory settings.



During the construction and operation of buildings, many LV circuit breakers do not have optimized configuration settings due to:

- **Outdated design calculations** – Initial design calculations were computed without the necessary information and/or are not current according to the actual installation. For example, it is typical that load lists evolve, cables types and lengths may change, or the circuit breakers offer more setting capability than initially calculated.
- **Lack of responsibility** – No one thinks it is their responsibility to configure the circuit breakers.
- **Human error** – Settings are manual, and checking is visual, increasing the chance of human error.
- **Modified settings during operation** – Settings are sometimes adjusted to solve an issue quickly but then not returned to their optimal settings during facility operation.

What are the risks if circuit breaker settings are not configured?

Circuit breakers that remain non-configured in factory settings may pass a building inspection but create installation risks of:

1. Non-conformity to standards
2. Non-selectivity or unexpected circuit breaker tripping
3. Undocumented test results and maintenance records tracked from installation through the life of the electrical installation

Inspecting settings validates the configuration. Testing operation validates the performance.

Checking circuit breaker settings during facility construction and periodically while in operation will help avoid installation risks by ensuring:

- Conformity of the built installation with the calculations defined during design
- Compliance with IEC and local standards



Additionally, periodic circuit breaker performance testing is part of its preventive maintenance to help:

- Validate the circuit breaker conditions, mainly the core protection functions.
- Identify earlier indications of potential operational issues. Circuit breakers may be inactive for months or even years before a fault occurs – this will give you time to fix the issue before it can cause a problem.

An opportunity for new preventive maintenance services



Poorly maintained switchgear is

62%

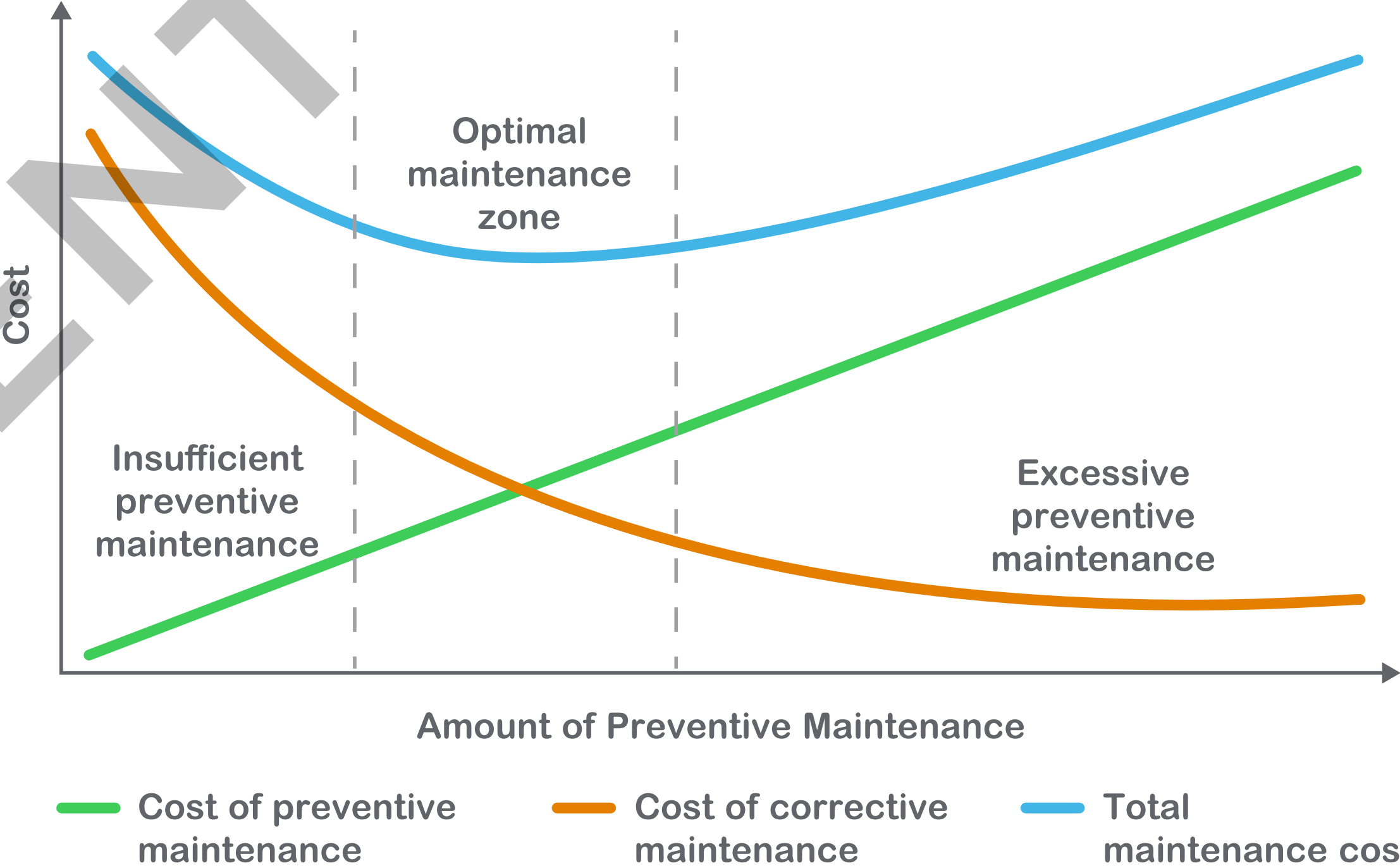
more likely to fail than systems with a proper maintenance program.
[Source: IEEE 483](#)






25%

of building fires are electrical in origin.
[Source: European Fire Academy](#)

Total maintenance cost




Regularly scheduled electrical equipment maintenance:

-  Can help prevent electrical fire risks in deteriorating electrical installations.
-  If performed every 2-3 years, it can optimize the total cost of ownership for an electrical installation¹.
-  Should include testing circuit breakers for proper open/close operations and protection settings.

Schneider Electric [MasterPact™ MTZ](#) ACBs and [ComPacT](#) MCCB products with MicroLogic trip units are sold worldwide into greenfield projects and many millions in operation in existing facilities. Schneider Electric estimates that the end user tests only 15 to 20% of these products during its entire lifecycle.

This creates a unique opportunity for Schneider Electric partners to add or extend services by including circuit breaker testing services as part of maintenance contracts.

However, most of today’s mandatory circuit breaker checking is performed only visually. This poses a risk of human error with poor traceability and time-consuming operational testing.



Schneider Electric’s EcoStruxure Power Commission is an all-in-one software solution that offers a simpler, more efficient, and reliable solution to support setting inspections and operational testing.

¹, [“IEEE Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems”, IEEE 493-2007](#)

Introducing EcoStruxure Power Commission

Most LV circuit breakers are rarely tested. You can help



Why and when LV circuit breakers need testing



Introducing Ecostruxure Power Commission



Take a closer look



Opportunities for maintenance service contracts



Additional resources



Discover EcoStruxure Power Commission – simple and reliable circuit breaker testing and reporting

As an electrical services provider, your time is money. To help deliver exceptional services to your customers, you need tools and solutions that:



Simplify your work



Saves Time



Avoids errors and rework

[EcoStruxure Power Commission](#) solution, formerly known as EcoReach™, is an upgraded intelligent digital testing tool that automates setting, commissioning, testing, and reporting.

It is compatible with Schneider Electric:



Air and molded case circuit breakers equipped with MicroLogic electronic trip unit (e.g., MasterPacT, ComPacT, PowerPacT)



Power and energy meters (e.g., PowerLogic)



Communication gateways (e.g., EcoStruxure Panel Server)

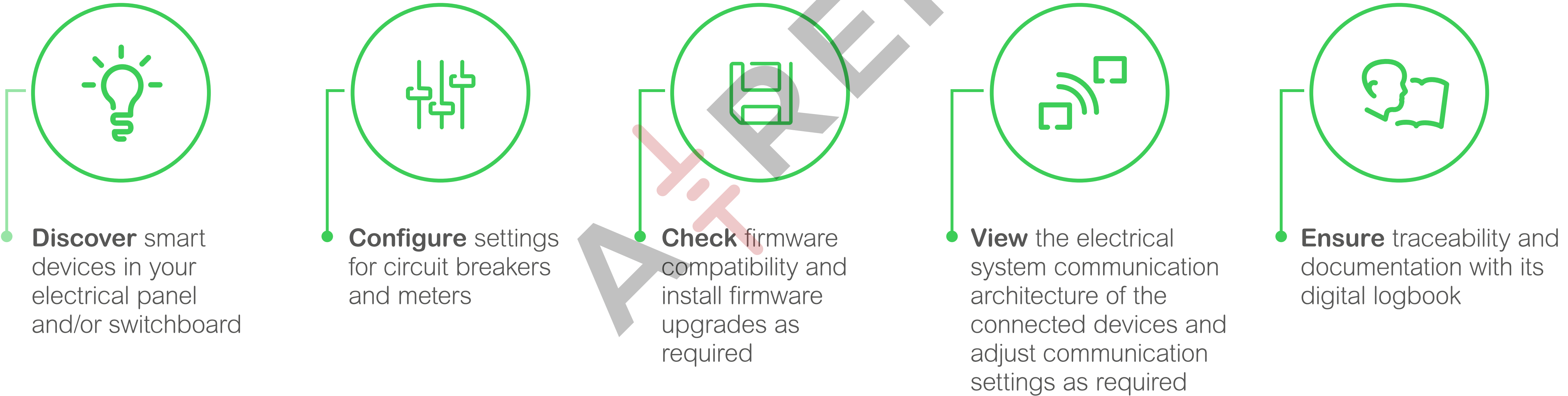
The solution's basic level is available for **free** with additional, advanced features accessed through a **subscription**.



Free basic-level access for settings check, setup, and commissioning

EcoStruxure Power Commission is a browser-based software app. The free level is available for download by any contracting or panel building firm.

The app is simple to use and ideal for setting up testing and commissioning purposes to:



Subscription-based additional features for advanced capabilities

With IoT-enabled advancements, the new features of EcoStruxure Power Commission are available with an annual subscription.*

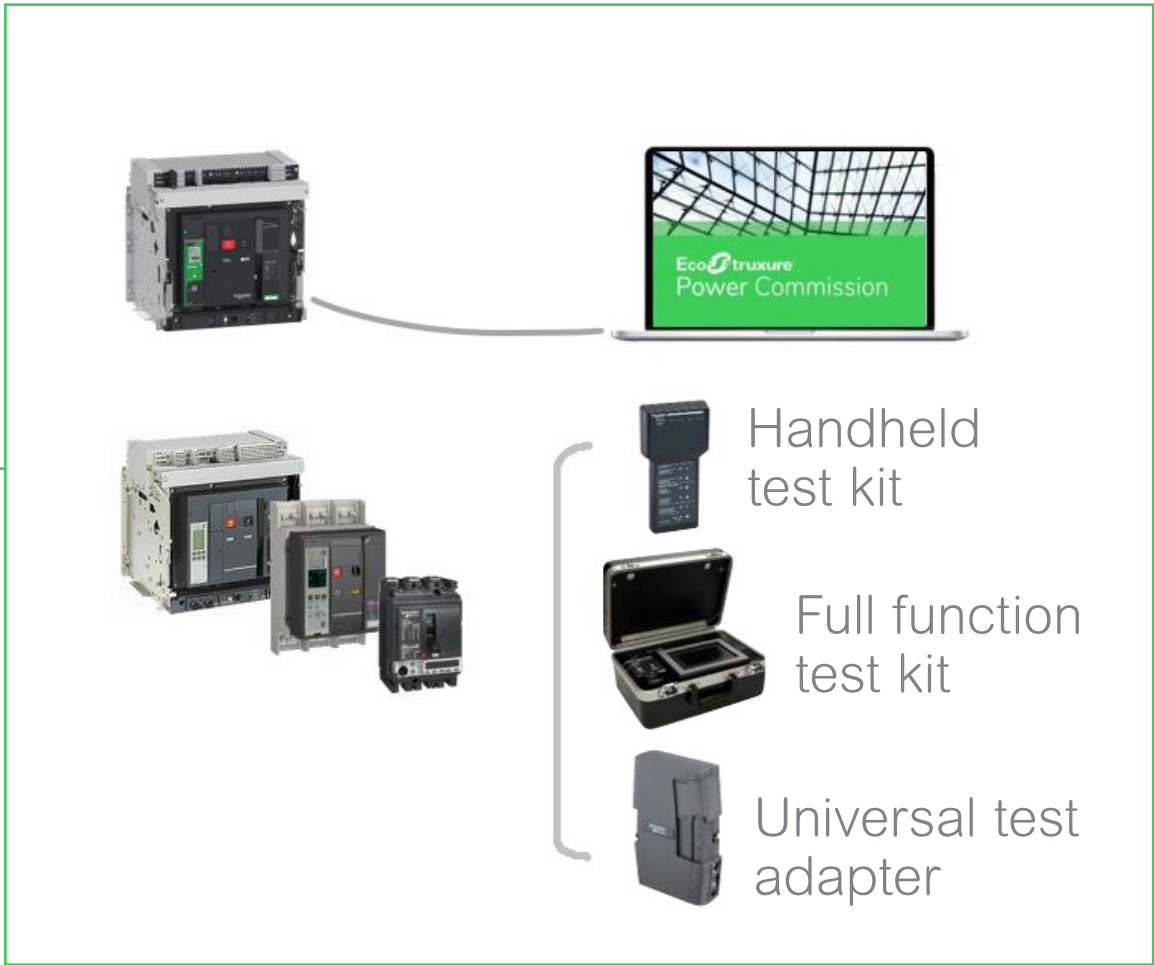
These advanced capabilities are also simpler to use through a direct laptop connection to any Schneider Electric MasterPacT, ComPacT, or PowerPacT:

- **Multiple test instruments** are no longer needed (e.g., handheld, full function, universal adaptor).
- **Connect to any ACB or MCCB** equipped with a MicroLogic control unit using only a USB cable or a single **Service Interface**.*

As a more compact and lightweight solution, this improved mobility makes it easier to visit any customer site for circuit breaker initial validation testing before installation or for periodic testing during facility operations.

*Connect with a USB cable for testing MasterPact MTZ; or with single Service Interface for testing any other ACB and MCCB ranges.

Before



Now



* Available for Schneider Electric Certified Services Partners.

EcoStruxure Power Commission’s advanced features unify support for a wide range of procedures into a single solution.

You can validate circuit breakers settings to confirm compliance with those optimized and specified by the design engineer and execute operational tests, including:

1. **Routine checks** (e.g., open/close/tripped status, racked in/out position)
2. **Secondary injection testing** (e.g., automatic trip curve test)
3. **Preparation for primary injection testing** (if required)
4. **Zone selective interlocking testing** (verify communication and wiring)

*NOTE: Some advanced features are available only to Schneider Electric Certified Services Partners.

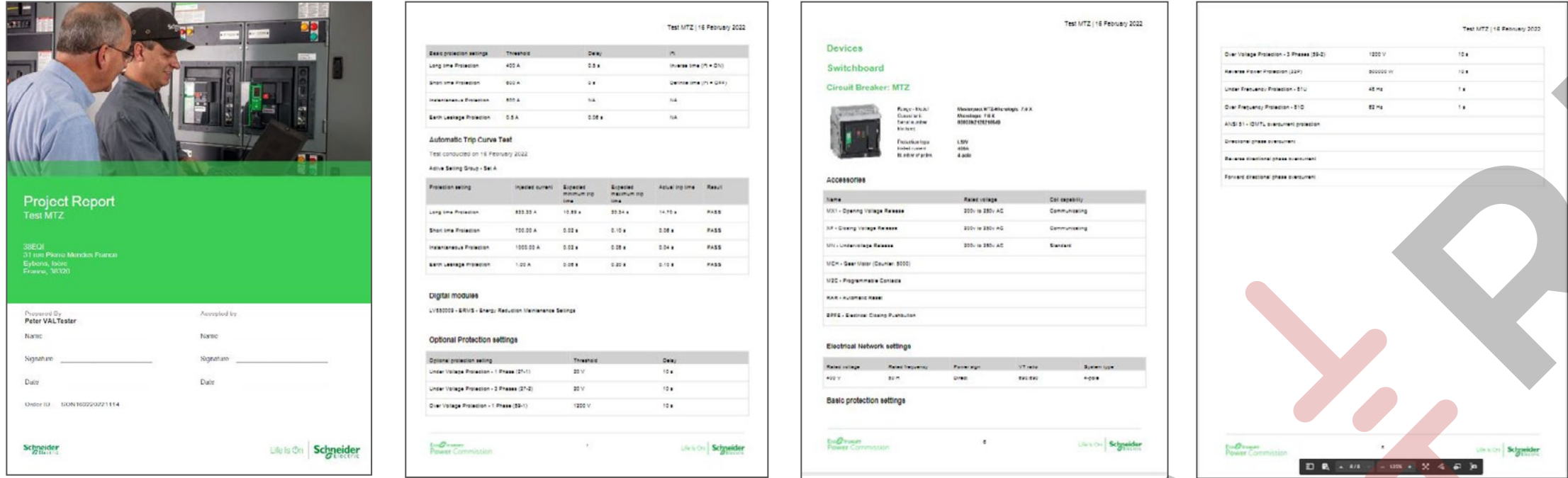
Types of breaker tests	Explanation	Schneider Electric
Routine checks	Verify basic functioning Open / Close Tripped status Verify racked in / out position communication is happening properly	Use EcoStruxure Power Commission - Device check up <ul style="list-style-type: none"> • At start up • To perform yearly when in operation
Secondary injection test	Check the healthiness of the electronic protection relay of a breaker. The test equipment will automatically generate the required currents for below types of trip (LSIG) and verify whether breaker trips correctly within its calculated time.	Use EcoStruxure Power Commission - Advanced circuit breaker testing / Automatic trip curve test <ul style="list-style-type: none"> • At startup • To perform every 2-3 years when in operation
Primary injection test	Involves injecting the actual current required to operate a protective device power through the circuit breaker. The process can be extremely arduous, it is only conducted by specialists and, in specific cases, primary injection testing may not be required through life. The feature inhibits ground fault protection and disables thermal memory calculations to prepare for effective primary injection testing.	Use EcoStruxure Power Commission - Advanced circuit breaker testing / Prepare Primary injection test
Zone selective interlocking (ZSI) test	ZSI is a system used to enhance the selective coordination level of electrical distribution systems. It allows an upstream breaker to trip instantaneously on a fault in its zone while maintaining coordination with downstream breakers. It verifies all control units communicate with each other and the wiring between breakers is done properly.	Use EcoStruxure Power Commission - Advanced circuit breaker testing*

Table 1

Automated reporting simplifies sharing with all the stakeholders

You can also quickly and automatically generate a testing project report to share with all stakeholders to provide them peace of mind that circuit breakers are correctly configured and performing safely and reliably. Save this report as part of each circuit breaker’s documentation.

EcoStruxure Power Commission captures circuit breaker settings to quickly export to the digital logbook via the [EcoStruxure Facility Expert](#) app. Sharing and documenting settings helps you save time while enabling consistency and traceability.



Customized advanced maintenance reports for Schneider Electric Certified Services Partners include additional checks and tests needed during maintenance activity.



The power of the digital twin

In the future, Schneider Electric envisions digital design tools like [ETAP](#) or [Caneco BT](#) software to offer seamless connectivity between the digital twin and EcoStruxure Power Commission. For greater time savings, this will enable:

- Direct upload of specified settings for each circuit breaker in the electrical system.
- Simple steps for circuit breaker settings checks and operational testing

Per IEC 60364-6, and associated local regulations, perform setting inspections and operational tests multiple times over a circuit breaker's lifecycle. **This is an opportunity to offer these tests as value-added services to your customers.**

[EcoStruxure Power Commission](#) supports these requirements using a single, integrated solution. Refer to **Table 1** for detailed information about the circuit breaker tests supported and recommended testing schedules.



Take a closer look

Most LV circuit breakers are rarely tested. You can help



Why and when LV circuit breakers need testing



Introducing Ecostruxure Power Commission



Take a closer look



Opportunities for maintenance service contracts



Additional resources



Take a closer look – Test and log at the initial installation stage

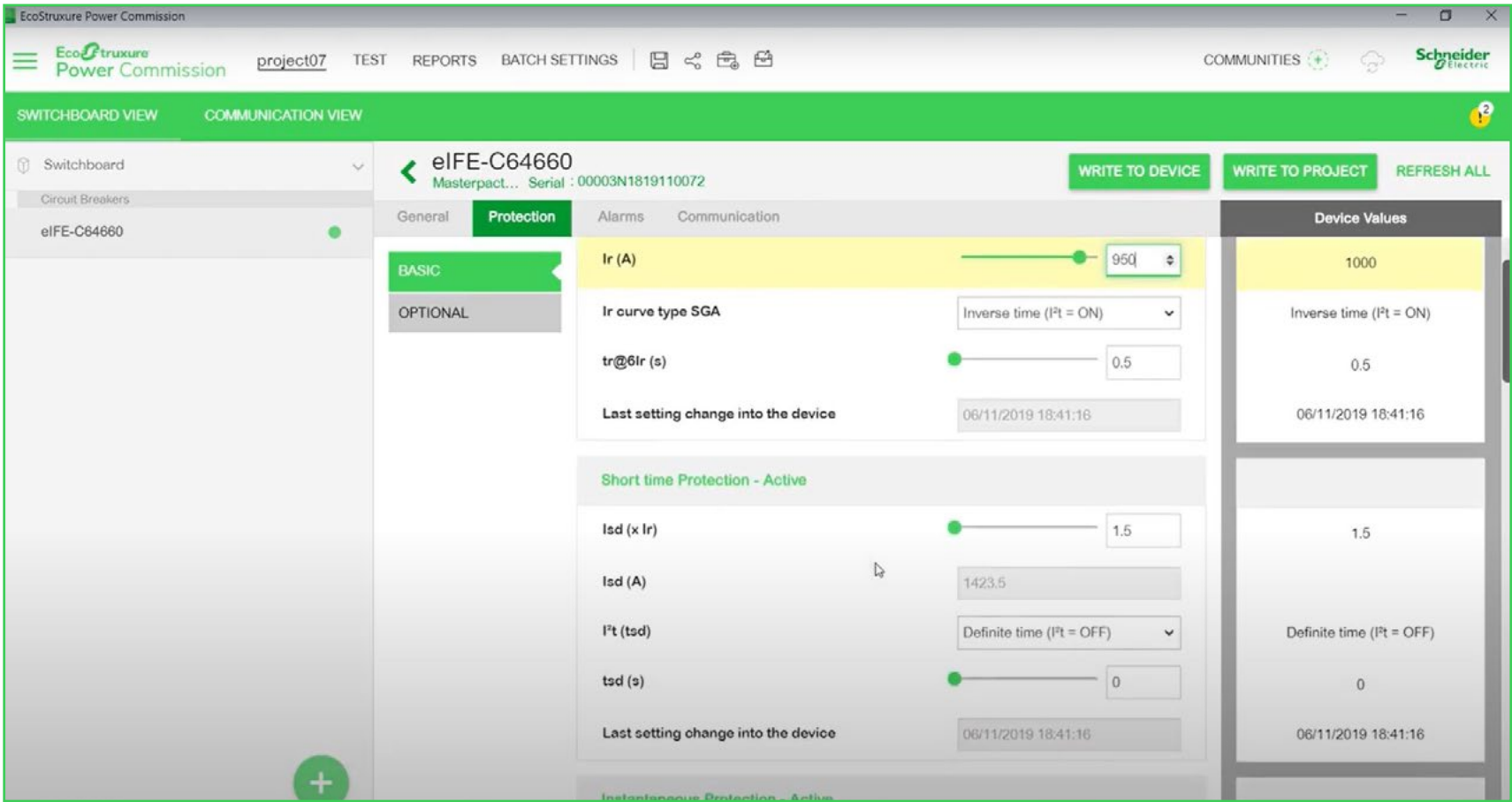
A panel builder or electrical contractor should verify adjustable circuit breaker settings prescribed for all new electrical installations at the factory acceptance test (FAT) or site acceptance test (SAT) stage. Settings check* and operational testing should be performed before powering the site. The following steps should be followed.

1. Connect the laptop running EcoStruxure Power Commission to the breaker. Then add the device to your EcoStruxure Power Commission project. If it is a MasterPact MTZ, use a basic mini USB cable. For any MasterPact NT, MasterPact NW, ComPact, PowerPact series breakers, use the Service Interface, **see Figure 1.**

2. Perform settings check to validate that each is consistent with those specified at the design stage for that circuit breaker.



Figure 1 A. Direct connection with MasterPact MTZ only
B. Connection through Service Interface for ComPact / PowerPact equipped with MicroLogic control unit, MasterPact NT/NW



*Setting checks can be performed by panel builders or contractors using EcoStruxure Power Commission. However, some advanced testing features are available only to Schneider Electric Certified Services partners with appropriate training.



Take a closer look –

Test and log at the initial installation stage

3. **Perform operational tests**, including simple trip test, secondary injection test, and primary injection test, if requested. EcoStruxure Power Commission offers a range of trip curve testing, including short-time, long-time, instantaneous, and ground fault tests. For each test, the application provides step-by-step instructions to the technician to make testing efficient.

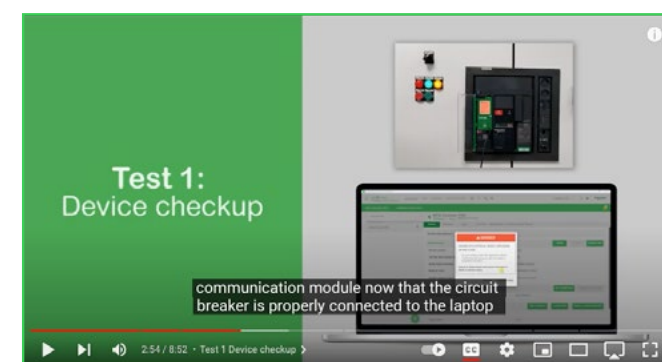
4. **Enable EcoStruxure Power Commission to capture all settings and test results in its database** to create a 'baseline' for configurations, ensure traceability, and confirm all details for the associated switchboard. Configuration details and test results are easily shared with the EcoStruxure Facility Expert digital logbook, used by the contractor and the facility operations team.

5. **Record test results** to save behind the QR code associated with the circuit breaker. Any mobile device equipped with EcoStruxure Facility Expert can be used to scan the QR code label on the circuit breaker to retrieve the complete device test history.

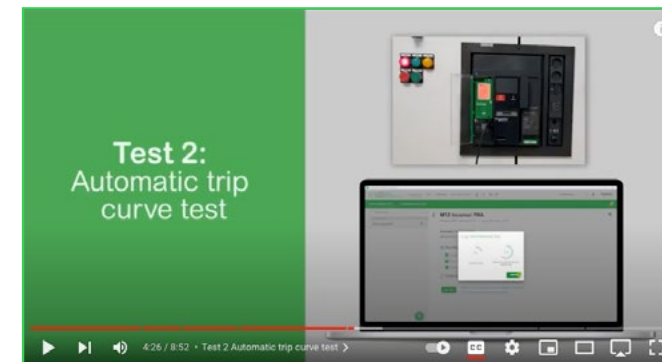
6. **Use EcoStruxure Power Commission to generate an automated test report** by either the panel builder or contractor performing the settings check and operational tests. Before starting the installation, this should be delivered to the design institute and the building owner to confirm the breaker has the correct settings and that operational tests were performed.

7. **Share report and data** to EcoStruxre Facility Expert.

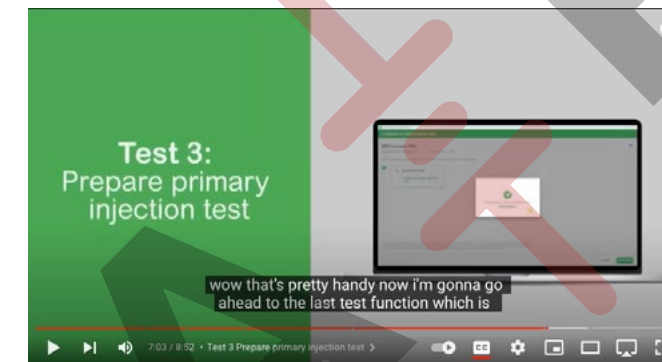
▶ Watch Videos



Device checkups



Automatic trip curve test



Prepare primary injection test

Take a closer look – Periodic testing during operation

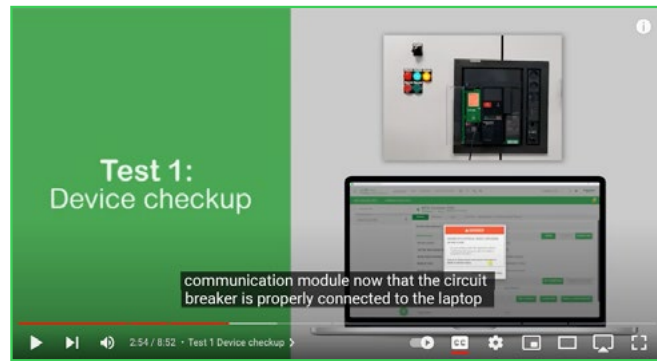
The contracted electrical service – for example, an EcoXpert Power Services partner – should be responsible for this stage of checking settings and testing performance.

The **IEC 60364-6** standard specifies that the testing period is dependent on the installation, equipment, and type of operation.

For example, for ComPacT NSX Schneider Electric recommends to perform preventive maintenance and to test the tripping time every two years with the following steps*:

1. Scan the QR code on the circuit breaker to confirm the correct breaker is being tested and quickly retrieve the digital log detailing the settings and previous test results for that breaker.
2. The EcoStruxure Power Commission** should be used to check that all settings are consistent with the original design specification, including protected circuit characteristics and selectivity objectives.
3. Perform a series of tests to validate the proper operational condition, including routine checks and testing of the circuit breaker's ability to detect an overcurrent and trip (including the mechanical part).
4. Generate report in EcoStruxure Power Commission to deliver to your customer.

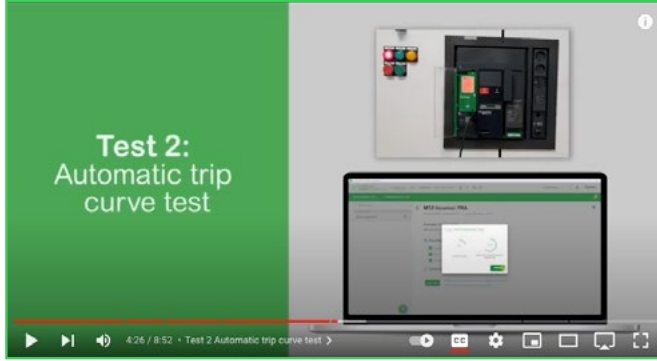
▶ **Watch Videos**



Test 1:
Device checkup

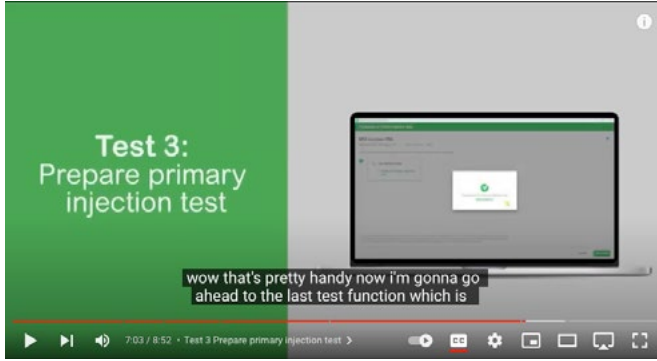
communication module now that the circuit breaker is properly connected to the laptop

Device checkups



Test 2:
Automatic trip curve test

Automatic trip curve test



Test 3:
Prepare primary injection test

wow that's pretty handy now I'm gonna go ahead to the last test function which is

Prepare primary injection test

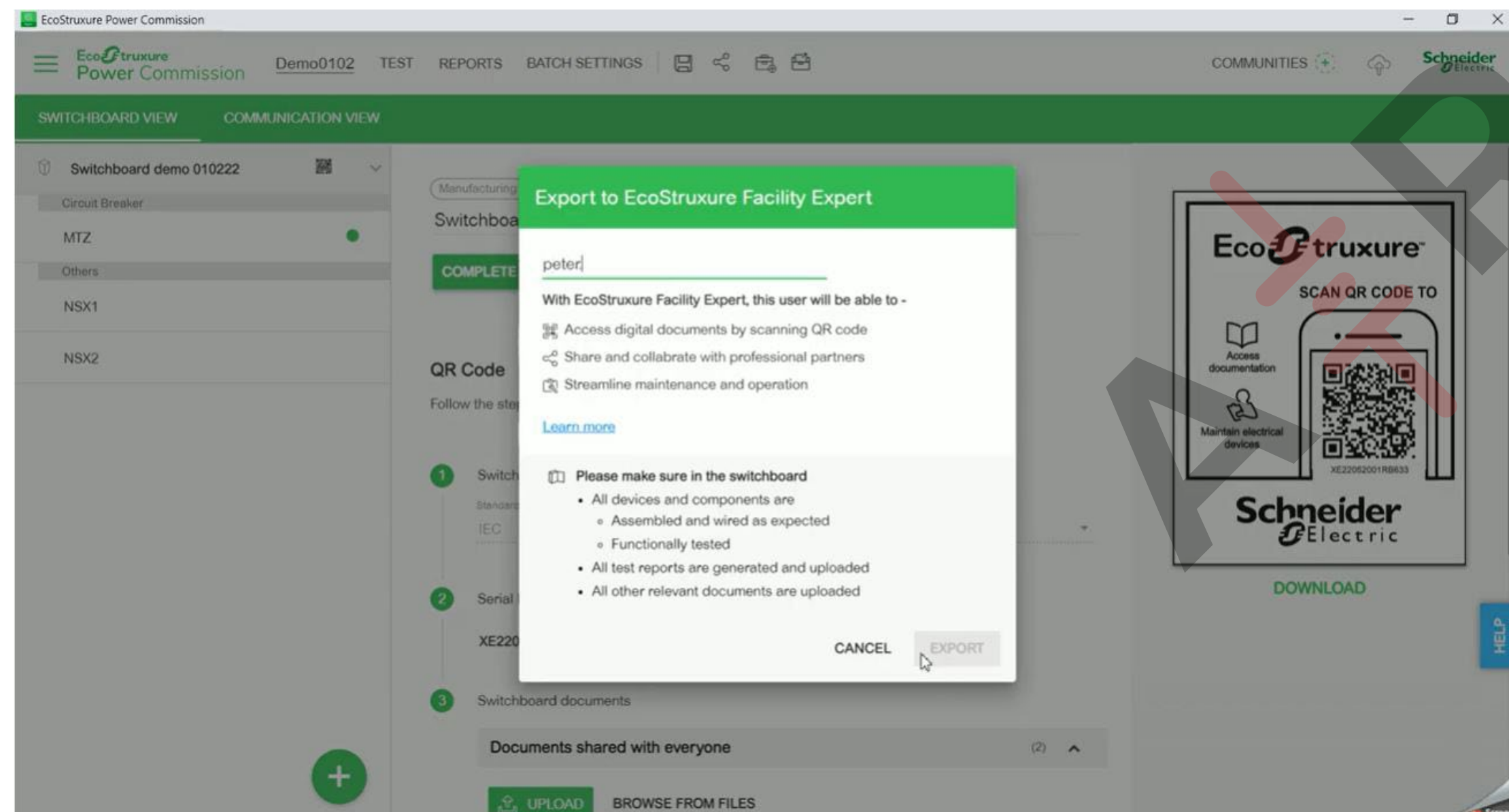
*This testing is part of a complete certified maintenance that includes necessary checks and verifications to ensure a proper maintenance.

**EcoStruxure Power Commission can perform a complete secondary injection test, but it can also help with a primary injection test (the preparation part), and ZSI tests. It is a multi-purpose tool that makes testing easier while reducing human error risks.



Take a closer look – Periodic testing during operation

- 5. Share settings and test results via the EcoStruxure Facility Expert digital logbook to create a continuous testing record. The record will always be mobile-accessible by scanning the QR code.
- 6. Share periodic test report with the facility operations team.



Take a closer look –

Simple steps to procuring EcoStruxure Power Commission’s advanced features

Getting on board with the advanced version is easy and requires only two steps to complete your solution.

1. Procure the Service Interface*
2. Subscribe to the advanced testing feature

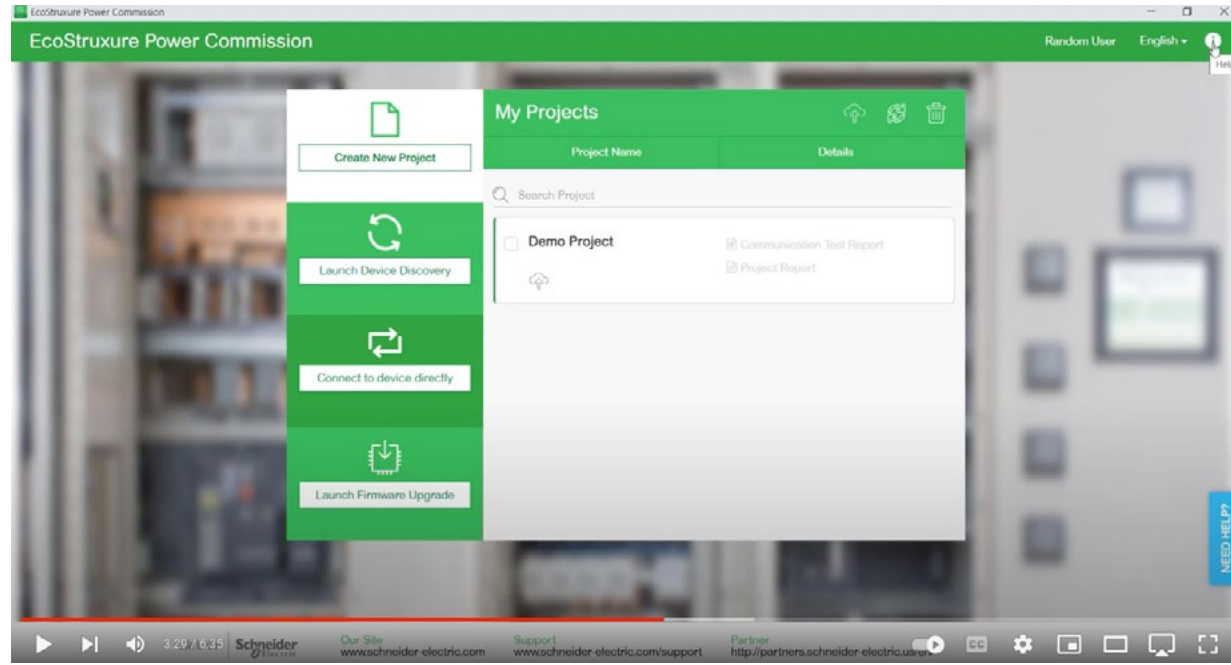
[Visit the order page](#)

Choose one of three optional ways to order both products:

1. Access the Exchange portal directly and order your license.
2. Access the Exchange website from EcoStruxure Power Commission software if you have previously installed the free trial period on your laptop.
3. Connect to the MicroLogic trip unit of a MasterPact MTZ, then click on the ‘Purchase and Activate’ option in EcoStruxure Power Commission, select Purchase and follow the link.

*Some advanced features are available only to Schneider Electric Certified Services partners.

[▶ Watch Video](#)



Watch this video to learn more about **EcoStruxure Power Commission** in-app purchase and activation



Take a closer look –

Simple steps to procuring EcoStruxure Power Commission

Place your order

Once at Exchange, log in with your mySE credentials, select the ‘Circuit Breaker Advanced Testing’ license option, which includes:

- Automatic trip curve test
- Ground fault inhibit
- Zone Selective Interlocking

Place your order, indicate your voucher code if any, and choose payment method.

Activate EcoStruxure Power Commission on your computer

After your order is processed, you will receive an email with an activation code. Follow these steps to activate your license.

1. Copy activation code
2. Launch EcoStruxure Power Commission, then select ‘Purchase and Activate’
3. Choose the subscription type you purchased and click on ‘View Details’
4. Click ‘Activate Here,’ paste your activation code, and click Continue

Procure a Service Interface*

EcoXpert partners* can acquire a compatible Services Interface by contacting their local Schneider Electric representative.

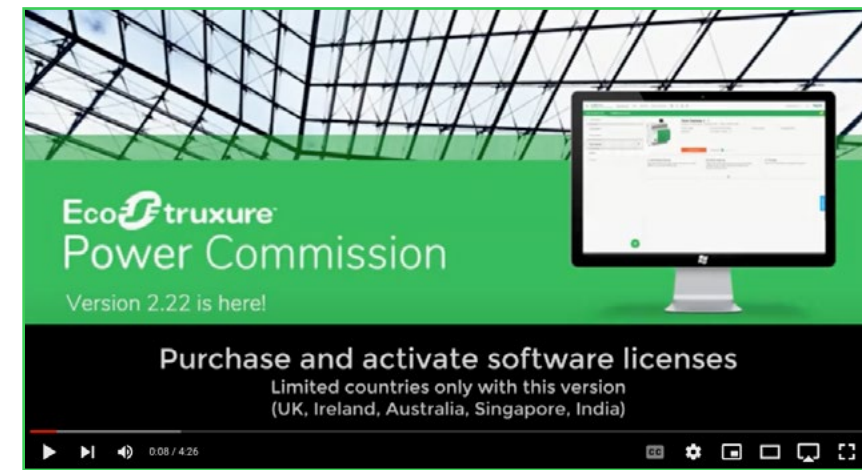
That’s it. You are now a licensed EcoStruxure Power Commission user, ready to build new business opportunities.

*NOTE: Some advanced features are available only to Schneider Electric Certified Services partners.

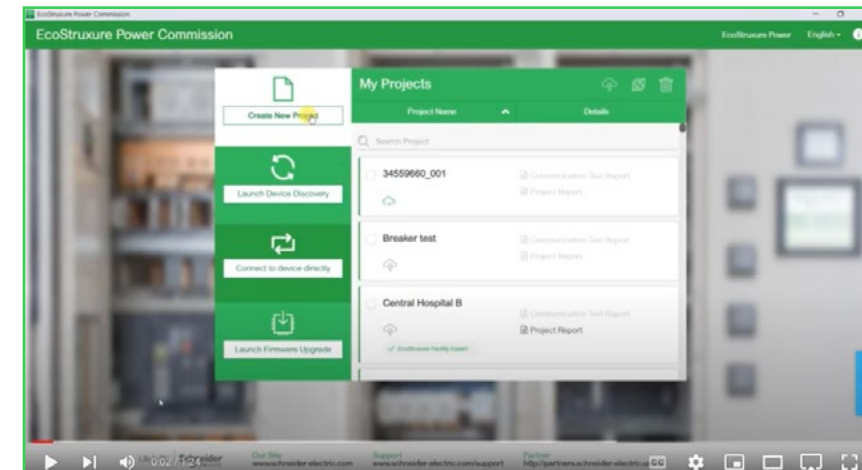


Take a closer look –

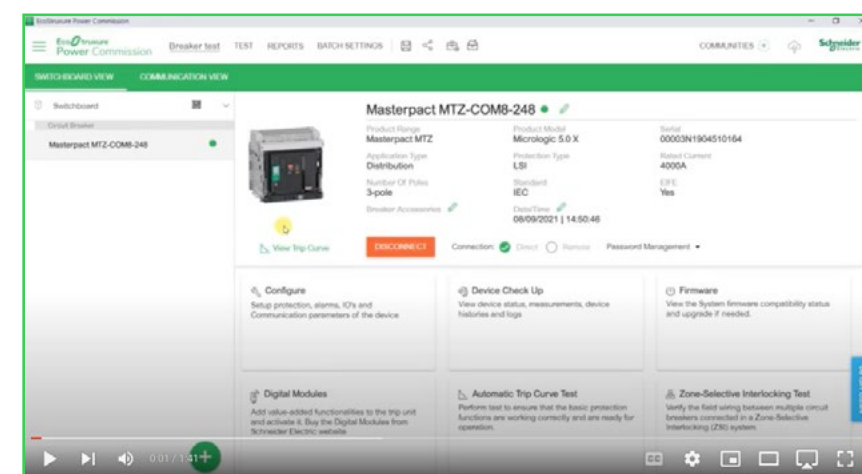
▶ Watch the videos



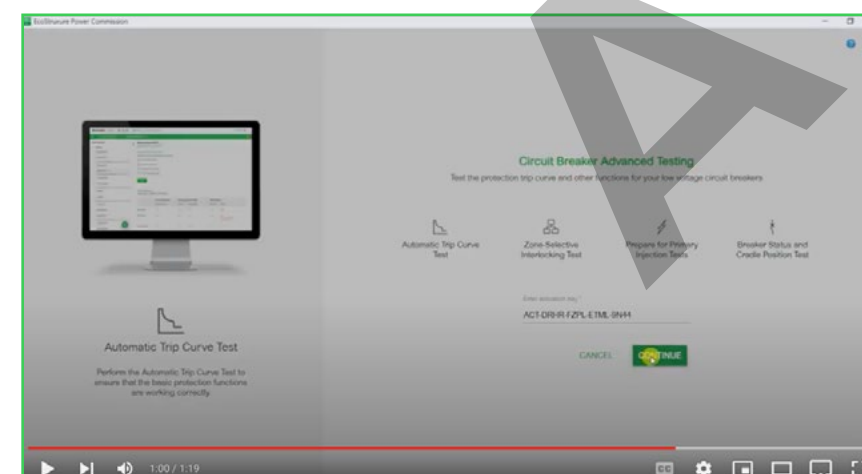
How to purchase and activate EcoStruxure Power Commission subscription



Connect to device



Purchase subscription



Activate subscription



Most LV circuit breakers are rarely tested. You can help

Why and when LV circuit breakers need testing

Introducing Ecostruxure Power Commission

Take a closer look

Opportunities for maintenance service contracts

Additional resources



Opportunities for value-added maintenance service contracts

Most LV circuit breakers are rarely tested. You can help



Why and when LV circuit breakers need testing



Introducing Ecostruxure Power Commission



Take a closer look



Opportunities for maintenance service contracts



Additional resources



Opportunities for value-added maintenance service contracts

Schneider Electric designs digital offers to unlock incremental business value for our partners – including EcoXpert partners – so that you can grow with us in the digital age.

Schneider Electric enables you to become a services partner and benefit from complete technical training to perform maintenance, replace spare parts, and modernize installations.

Subscribe to EcoStruxure Power Commission advanced features for service partners to benefit from a full package that support your efforts to sell and deliver your own preventive and corrective maintenance services.

In addition, you are equipped to upskill your team to complement services you already provide or to start your new business in Services.



Effective Maintenance Strategy for Electrical Installations
A guide for electrical designers

To help set your strategy for a complete preventive maintenance program, download the eGuide



Schneider Electric’s recommended sales and service approach

- **Push the prescription of circuit breaker tests** to cover the entire electrical installation lifecycle.
- **Promote the value of settings checks and operational testing** to your customers. Help them understand how this will improve the safety and reliability of their electrical installations and, in turn, boost power availability, uptime, and productivity.
- **Fully monetize your installation and commissioning** services, offering additional testing before start-up.
- **Increase your business with Services** leveraging technical training and EcoStruxure Power commission advanced features

This approach will keep you connected to your customers, which may reveal further service opportunities. It will also maximize customer satisfaction by helping your customers ensure their electrical installations operate as safely and reliably as possible.

EcoXpert partner program

Schneider Electric offers you the opportunity to develop your skills to sell value-added services:

- Familiarize yourself with Schneider Electric’s digital offers to improve your efficiency and join their esteemed network of certified professionals
- Learn how to connect sites and expand your contract offering when you become a certified EcoXpert
- Develop your analysis skills further to enhance your level of energy services and advise your customers; climb the ladder of success and reach higher levels of certification



[Visit EcoXpert partner page to learn more.](#)

A new revenue stream for UK EcoXpert

A leading UK EcoXpert partner uses EcoStruxure Power Commission testing during installation and commissioning stages to generate an additional successful – and growing – revenue stream.

Beyond charging for circuit breaker testing services, the timesaving, auto-generated test reports are sold as a separate line item.

Clients use QR codes to access up-to-date breaker testing and configuration data immediately.

Testing records deliver a deeper level of circuit breakers knowledge to the EcoXpert and the customer, which opens the door to offering added value services contract. This is just one of many potential opportunities enabled by a closer connection with the customer.



Additional resources

Most LV circuit breakers are rarely tested. You can help



Why and when LV circuit breakers need testing



Introducing Ecostruxure Power Commission



Take a closer look



Opportunities for maintenance service contracts

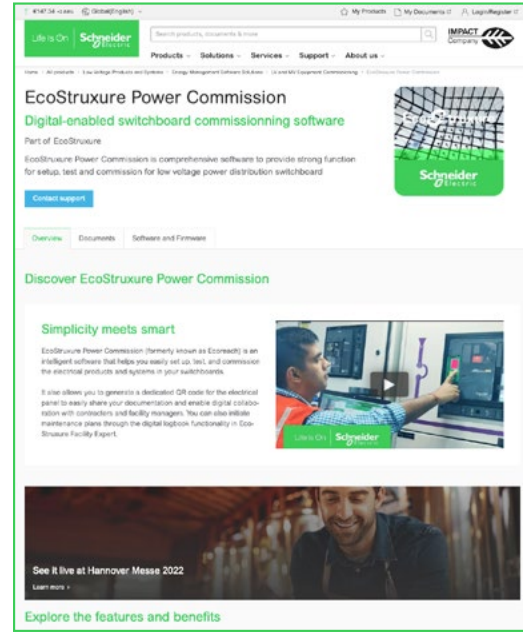


Additional resources

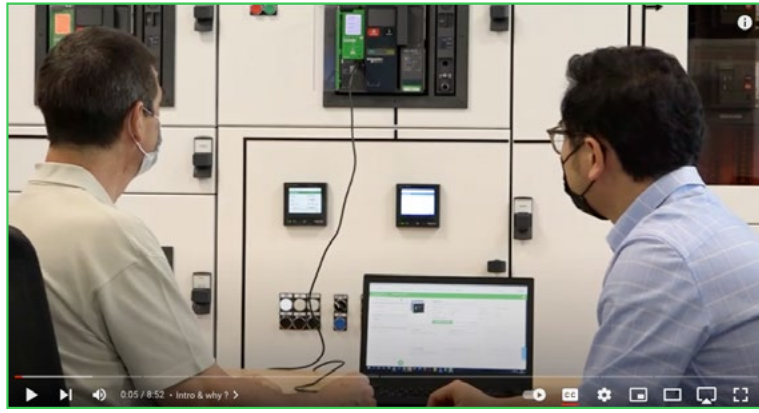


Additional resources

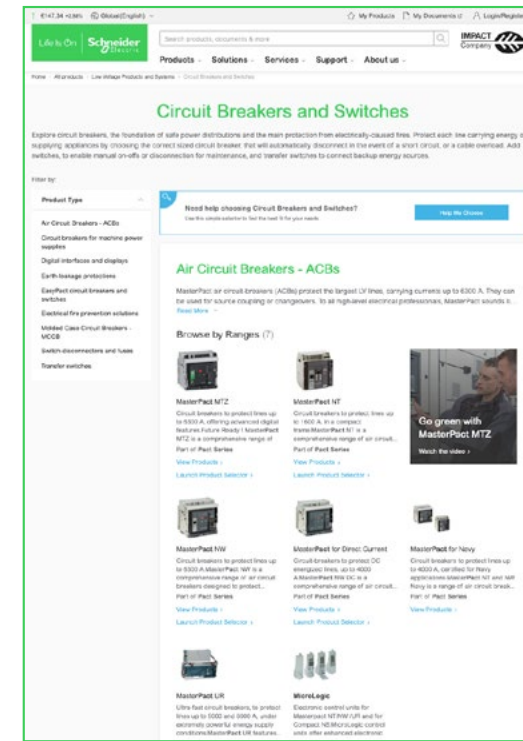
EcoStruxure Power Commission



Offer page

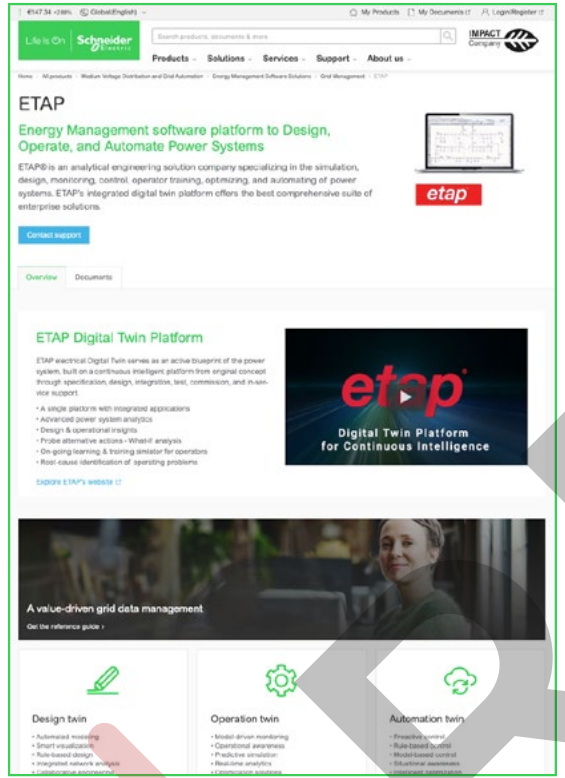


Video: Test circuit breakers using EcoStruxure Power Commission - Episode1



Low-voltage circuit breakers offer page

Electrical design tools



ETAP

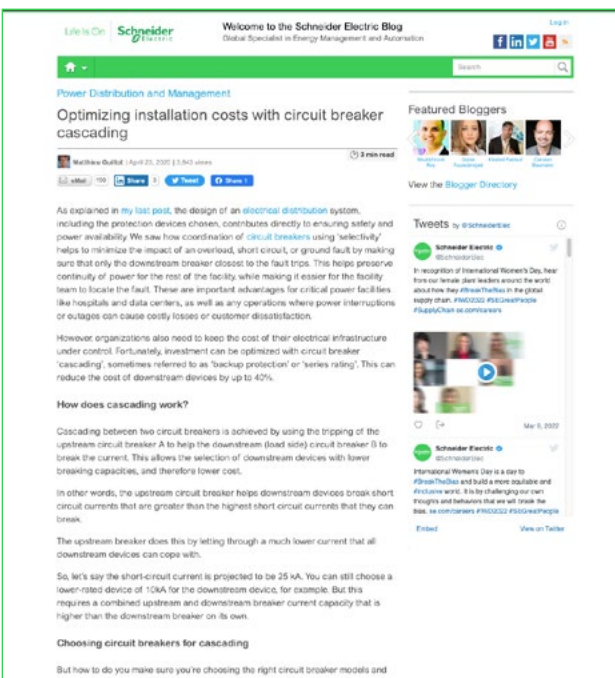


Caneco ONE

Circuit breaker coordination



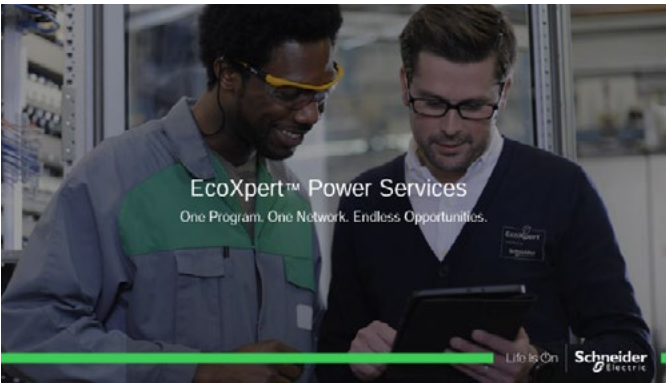
Blog: Circuit breaker selectivity for power availability



Blog: Optimizing installation costs with circuit breaker cascading



EcoXpert



EcoXpert Power Services

Most LV circuit breakers are rarely tested. You can help

Why and when LV circuit breakers need testing

Introducing Ecostruxure Power Commission

Take a closer look

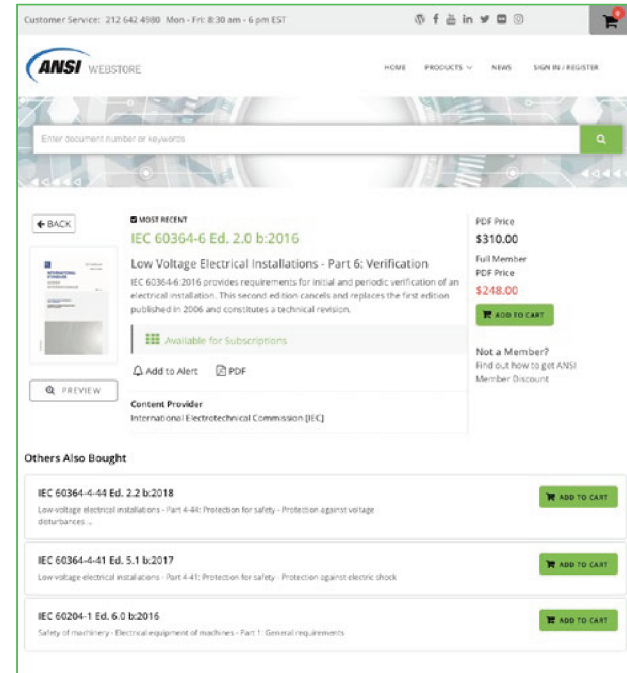
Opportunities for maintenance service contracts

Additional resources



Additional resources

Electrical standards relevant to circuit breaker testing



[IEC 60364-6 Ed. 2.0 b:2016 - Low Voltage Electrical Installations - Part 6: Verification](#)

Country-based standards influenced by IEC 60364-6 that require confirmation of correct rating, setting, and performance of protective devices:

Country	Local standard / regulations
France	NFC 15-100
Germany	VDE0100
Italy	CEI EN 64-8 (CEI: Comitato Elettrotecnico Italiano)
Spain	REBT
Great Britain	BS 7671
Russian Federation	ROCT 50571.X
Morocco / Algeria / Tunisia	NF C15100
India	National Building Code of India: Part 8 -Section 2
Australia	ASNZS3000-2007+A2
Singapore	CP 5 Code of practice for electrical installation
Philippines	Philippine Electrical Code
Malaysia	MS1936:2016 (MS IEC 60364) MS1979:2015
Area Hong Kong and Macao	COP EWR 2015
US	NFPA70 "NEC"
Canada	CE Code CSA C22.1

Most LV circuit breakers are rarely tested. You can help



Why and when LV circuit breakers need testing



Introducing Ecostruxure Power Commission



Take a closer look



Opportunities for maintenance service contracts



Additional resources

