
Smart Substation Control and Protection SSC600/SSC600 SW

Frequently asked questions (FAQ)

This document lists some of the most frequently asked questions related to centralized protection and control with SSC600 and SSC600 SW.

- Q1. Is centralized protection with SSC600/SSC600 SW less expensive than conventional protection and control relays?**
The initial acquisition price for a greenfield installation is within the same price range as conventional protection and control relays. Taking into account redundant protection, new functionalities, and lifecycle costs, SSC600 is less expensive. The total cost of ownership is estimated to be 15% less for SSC600, compared to a similar system with conventional protection and control relays. Centralized protection and control is an investment for the future.
- Q2. Is the engineering of SSC600 more complex compared to a conventional protection and control relay?**
Engineering SSC600 requires less effort compared to separately engineering 30 interconnected bay devices. Powerful templating functionalities in PCM600 allows for fast engineering of the complete SSC600 centralized protection system.
- Q3. We have just started using IEC 61850 and centralized protection and control is too much for us. What is your recommendation?**
Switching to a centralized protection and control approach often means a learning curve at the beginning, but the benefits will pay off in the long run. ABB also offers a full range of conventional protection and control relays to choose from, if making the switch to a centralized approach is not yet feasible.
- Q4. What if the SSC600 device breaks? Will I lose protection of the whole substation?**
SSC600 is a robust industrial device with redundant power supply and no moving parts. SSC600 has the same lifecycle policies as our protection relays. There are multiple different redundancy solutions available, such as duplicating SSC600 units or including backup protection in the merging units.
- Q5. How does SSC600 compare to other centralized protection and control solutions?**
SSC600 is based on international standards, which means different parts of the system are interchangeable. The protection functionality, product quality, testing, and processes according to the highest standards. Full lifecycle management is guaranteed by ABB.

- Q6. Is SSC600 protection slower due to the process bus communication?**
SSC600 protection is as fast as conventional relay protection, thanks to the powerful central unit. Also process bus communication doesn't add any significant delays. For details on protection function performance, please refer to the SSC600 Technical Manual, which includes the performance of the whole centralized protection and control (CPC) system calculated from the analog measurement from the merging unit (MU), all the way to the binary output operation after the protection decision is made in SSC600. The SSC600 Technical Manual can be found in the [Technical Documentation Portal](#) of ABB Relays-Online.
- Q7. SMU615 does not have enough I/Os for my application. What is your recommendation?** Inputs and outputs can be extended with RIO600 or with REX615 relays. For highly I/O intensive applications, ABB recommends REX640.
- Q8. Our operating personnel does not know how to use such a complex system.**
After commissioning, when SSC600 is fully operational, the usage is in large part the same as with any other protection device. Operation via SSC600 should be easier than before, because of the full visibility of the whole substation from one location.
- Q9. Does SSC600 work with any protection relay or just the SMU615 merging unit?**
SSC600 is based on international standards, such as IEC 61850. Any protection relay that is capable of sending measurements according to IEC 61850 9-2LE or IEC 61869-9, and receiving control commands via IEC 61850 GOOSE (Generic Object Oriented Substation Event) messaging, is suitable as merging unit.
- Q10. How is the SSC600 system tested?**
Commissioning and testing before energizing the substation is done as with conventional relays. The secondary injection is just done to the merging units. There are also digital testing devices, which can inject digitized measurements, if needed. Periodical testing can also be done as before, as long as it has been prepared in the SSC600 application during the engineering phase.
- Q11. Where in the switchgear do I install SSC600?**
SSC600 fulfills the same environmental standards as ABB's protection relays – which means it can be installed in the low-voltage compartment. However, as SSC600 is for the whole substation, it often makes sense to install the device in a separate rack, for example together with the gateway and Ethernet switches.
- Q12. Can SSC600 handle multiple small substations?**
In many cases, yes. The distance between the protected objects and the SSC600 device is not decisive. However, if the distance between SSC600 and the merging unit is long, it must be secured that the communication channel is good enough for sampled value streams.
- Q13. Can you connect SSC600 directly to the SCADA (supervisory control and data acquisition) system?**
SSC600 supports IEC 61850 MMS, IEC 60870-5-104 and DNP3. If the SCADA system supports these protocols, SSC600 can be directly connected to it just as any other protection relay.
- Q14. What kind of equipment is needed to build a working centralized protection system?**
Technologies used in centralized protection and control system needs to have the needed performance to enable real-time functionality. This means that the Ethernet switches and time synchronization devices need to be capable to operate with the needed performance. These requirements are the same as in any process bus application when using sampled values. Guidance documentation for equipment selection can be found in the [Knowledge warehouse](#) of ABB Relays-Online.

Q15. What is the difference between SS600 and SSC600 SW?

SSC600 is turnkey centralized protection and control product, which is delivered as a tested, complete product, including device and embedded software. SSC600 SW is a virtualized protection and control product, which is delivered as a pure software package, without any hardware. Functionalities, features and performance (including protection) are the same in both SSC600 and SSC600 SW.

Q16. What kind of software is needed to take SSC600 SW into use?

SSC600 SW is delivered as a Virtual Machine. It can be used in either VMWare ESXi or KVM. The SSC600 Installation Manual provides the guidelines on how to configure a virtualization environment to enable the real-time functionality of SSC600 SW. The SSC600 Installation Manual can be found in the [Technical Documentation Portal](#) of ABB Relays-Online.

Q17. What kind of computer do I need to run SSC600 SW?

SSC600 SW needs appropriate computing resources to enable real-time protection and control functionality. Minimum requirements for the computer, and some example configurations, are documented in the SSC600 Engineering Manual, which can be found in the [Technical Documentation Portal](#) of ABB Relays-Online.