

Setting groups

Setting group is a technique to change a set of parameters of an IED at once. IEC 61850 offers services that allow to configure setting groups and change the actual setting group online. This article gives a short insight on those services and mainly tries to answer the following question:

1. What is the main principle
2. How do I know if this service is supported
3. What data can be retrieved online vs offline

But first!

The backbone for the services defined in the 7-2 is the data in the data model of the IED. That means services are restricted to data with specific functional constrained or specific structure. For setting group services that is data with the functional constraint `SG` or `SE`, respectively, and an object that is called 'SettingGroupControl'. This data must be defined into the data model by the vendor OR requested by the user of the IED during the specification phase!

What is the main principle

When talking about setting group services there are two things that the user want to do potentially.

1. Change the setting groups online. This can be done using two requests (client is sending to the server): `GetSGCBValues` and `SelectActiveSG`. Both those requests are basically write requests that operate on a specific structure in the server IED called setting group control.
2. Change the value in each setting group. For this to work there must be two sets of data defined in the server IED. One is the actual setting group (functional constrain `SG`) and other the so-called editable setting group (functional constrained `SE`). The overall procedure than is:
 - a. Set the editable setting group to the setting group that needs to be manipulated and by doing so expose its values to the data model
 - b. Change the values
 - c. Use `SelectActiveSG` to use the manipulated values.

How do I know if this service is supported

You can check the SCL (scl, icd file), if you want to know what of the above your IED is capable of doing.

1. For the first to be true the `SettingGroups` must be defined in the element `Services`. Also you can find a `SettingGroup` element in the data model. Often in the first logical device of the IED.
2. For the second to be true the IED element must in addition to that have a child element within the `SettingGroups` element called `SGEdit`. Also the data model has data attributes with the functional constrained `SE` defined.

What data can be retrieved online vs offline

You can get all parameters of all setting groups both online and offline.

Offline: Just parse the file for alle functional constraints `SG` or `SE`. Each leaf data attribute can have multiple `Val` children. They can be used to define different setting for different setting groups though the attribute `sGroup`.

Online: Not all parameters of all setting groups are exposed online at the same time. You can still get those by putting all setting groups as either active or edit setting groups and read those.