

DIGSI 5 QUICK NOTES

DIGSI-5-QN0002: Changing the protection functions of a SIPROTEC 5 relay:

Instead of a pre-defined set of protection functions, SIPROTEC 5 relays have a flexible system of Function Points. Each relay is ordered with a Function Point Class. In the DIGSI 5 Library a large range of protection and control functions are available – each with an associated function point consumption. Functions can be selected from the library to allow a customised protection application. At a later stage, if the application changes, any unwanted functions can be replaced with new functions from the library (Figure 1).

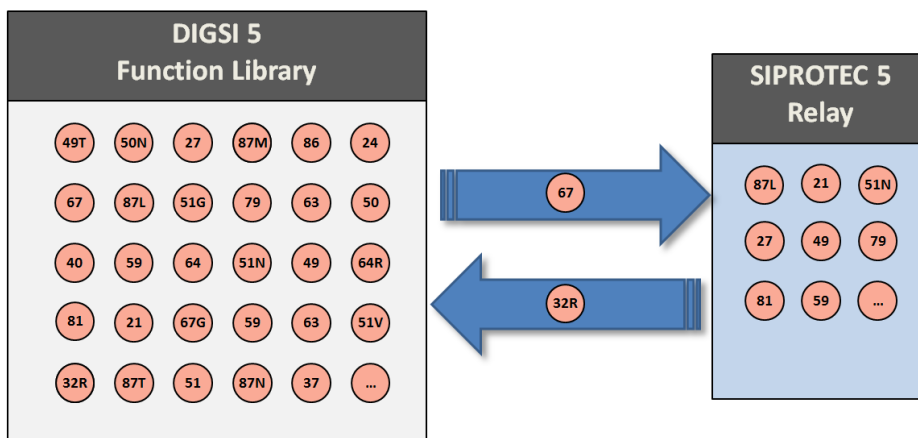


Figure 1. Transferring functions between the DIGSI 5 Library and a SIPROTEC 5 device.

At a later stage, if more function points are required for the application than were ordered in the device, additional points can be ordered and the additional license file applied via DIGSI 5 to the relay.

This document describes the use of the Single-Line Configuration view to select functions and transfer them to the device. An alternative method is to transfer the functions directly into the relay device in the Project Tree.

QUICK GUIDE TO: Adding functions to a relay

Within the Single-Line Configurator view, the function-groups and functions within each relay can be viewed by selecting the drop-down menu arrow for the device.

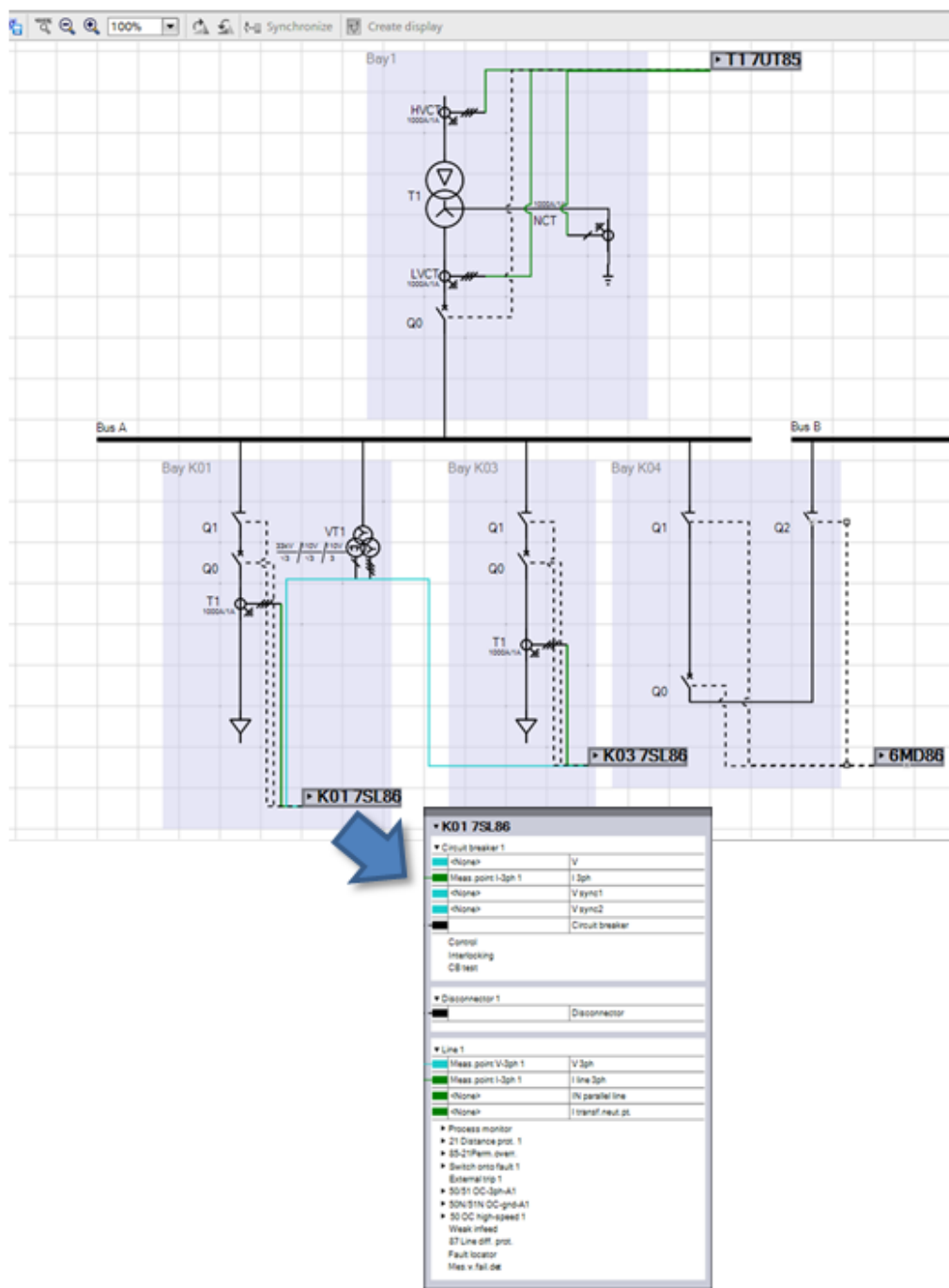


Figure 2. Single Line Configurator view. To see details of a SIPROTEC device select its drop-down arrow.

The available functions for each device type can be seen by navigating the DIGSI 5 Global Libraries. To add a function to a relay, select the function in the library and drag to the device (Figure 3).

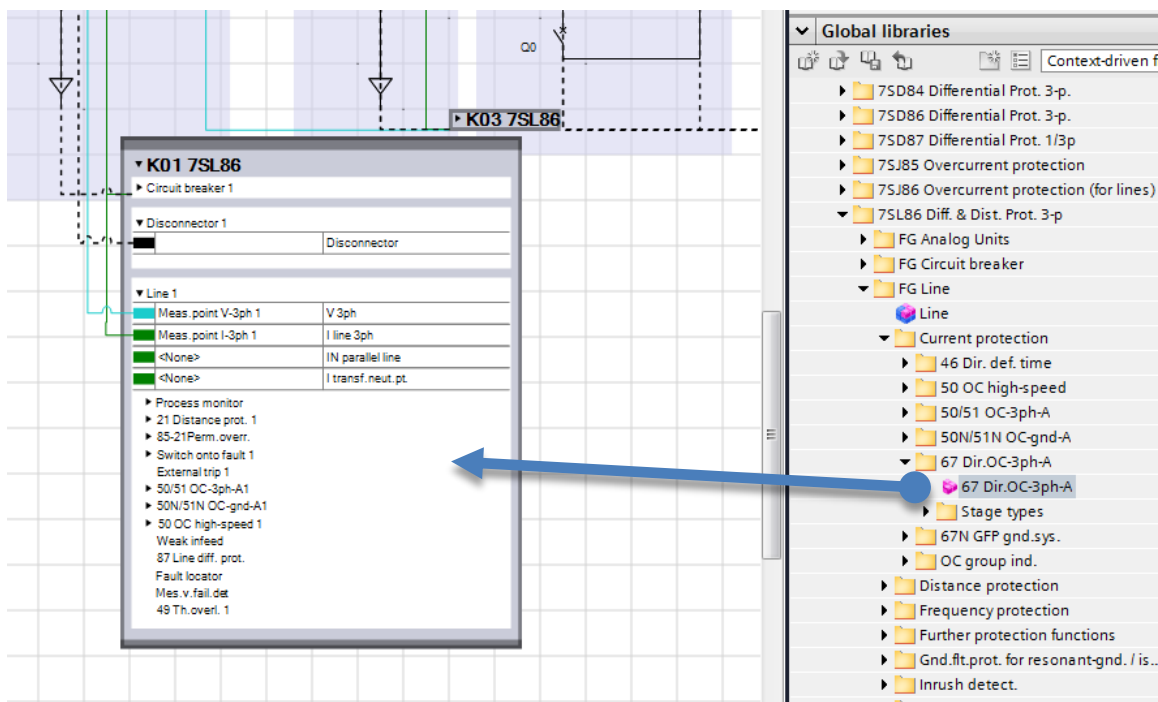


Figure 3. To add the 67 Dir. OC function, select it from the Global Library and drop into the device.

Double-clicking a function navigates to the setting page. Extra setting stages can be added here and the results seen graphically by selecting Diagram view.

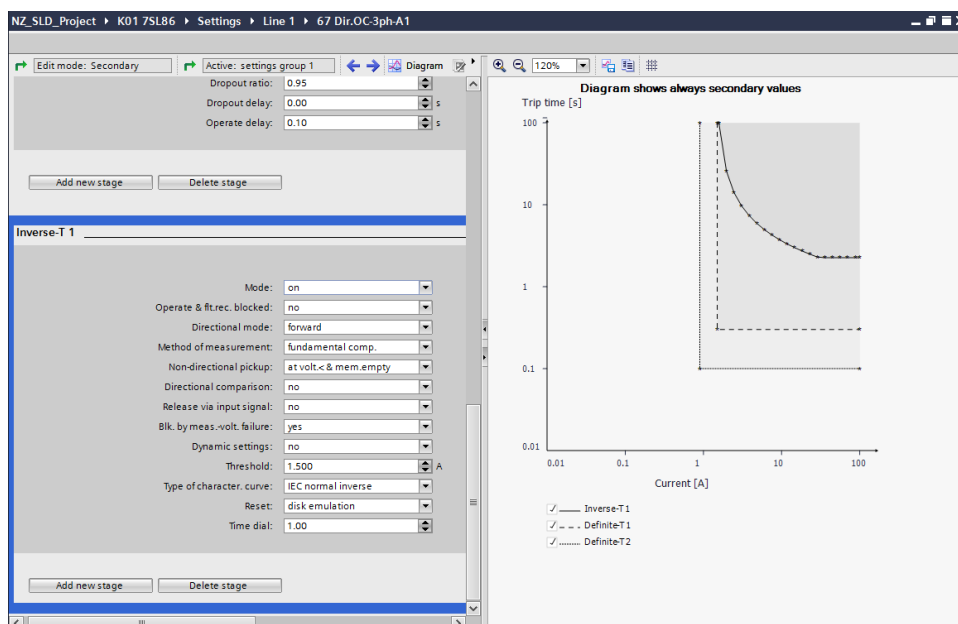


Figure 4. DIGSI 5 Settings editor showing the overcurrent settings in Diagram view.

The routing of each protection element to circuit breaker trip functions is configured in the Circuit Breaker Interaction settings tab. This is useful in applications such as a transformer where the desired circuit breaker tripping can be function-specific.

Circuit breaker 1	
Protection group	Trip
(All)	(All)
49 Th.overl. 1	X
▶ 21 Distance prot. 1	X
▶ 85-21 Perm. overr.	X
▶ Switch onto fault 1	X
▶ External trip 1	X
▶ 50/51 OC-3ph-A1	X
▶ 50N/51N OC-gnd...	X
▶ 50 OC high-speed 1	X
▶ 87 Line diff. prot.	X
▼ 67 Dir.OC-3ph-A1	X
Definite-T 1	X
Definite-T 2	X
Inverse-T 1	X

Figure 5. Circuit Breaker Interaction view showing the tripping configuration of each protection function.

QUICK GUIDE TO: Monitoring function points used

The current Function Point consumption can be viewed in the Device Information View.

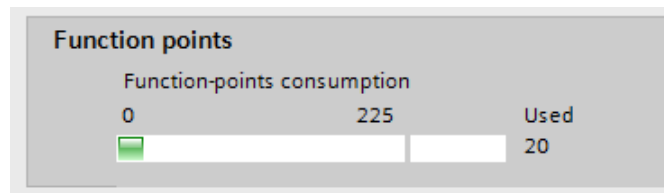


Figure 6. Function point consumption monitor. Example showing 225 available in the relay, with 20 used.

Any unwanted functions can be deleted from the device by the right-click context menu. Any associated function points are automatically released by DIGSI.

Alternatively, to plan an application in advance without the use of DIGSI 5, the SIPROTEC 5 Online Configurator can be used to indicate the number of functions points required.

SIPROTEC 5 Open Configuration

Device

- > Base functionality
- > Modules
- > Communication
- > Housing
- > Sales options
- > Manufact. properties

Determine the function-points class:
Select one of the application templates and change the displayed functional scope if required:

DIFF/DIS Basic

Functional scope	ANSI	Function	Abbr.	Always included	Add selected Qty: x	Value	=	Result Points	Qty.
21/21N		Distance protection	Z<	1x	<input type="text" value="0"/>	95	=		1x
87L		Line differential protection for 2 line ends	ΔI	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
87L		Line differential protection for 3 to 6 line ends (dependent on Significant properties)	ΔI	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
25		Synchrocheck, synchronizing function	Sync		<input type="text" value="0"/>	60	=		
27		Undervoltage protection, 3-phase	V<		<input type="text" value="0"/>	5	=		
27		Undervoltage protection, positive-sequence system	V1<		<input type="text" value="0"/>	5	=		
27		Undervoltage protection, 3-phase, universal, Vx	Vx<		<input type="text" value="0"/>	5	=		
32, 37		Power protection active/reactive power	P<, Q<		<input type="text" value="0"/>	10	=		
38		Temperature Supervision		<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
46		Negative sequence overcurrent protection	I2>		<input type="text" value="0"/>	15	=		

Sum: 0
Function-points class: 0

Apply Cancel

Figure 7. SIPROTEC 5 Online configurator, indicates the points required for available functions.

QUICK GUIDE TO: Upgrading Function Points (Adding points to the relay)

The Function Point Class of a relay device can be upgraded at any stage via a ‘Device-functionality upgrade’ file. This is the process of “adding more licenced points” to the relay. The upgrade is ordered from HV Power and the resulting file is applied via the DIGSI 5 ‘Upgrade Device Functionality’ function from the Project Tree.

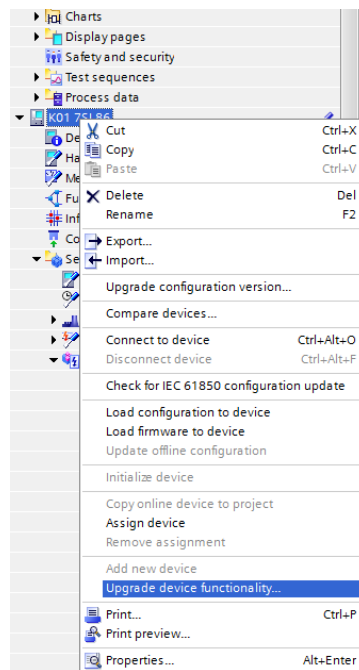


Figure 8. Upgrading the function points of a device.