

# DIGSI-5-QN0025:

## DIGSI 5 QUICK NOTES Multi-ended Line Diff setup

This Quick Note covers the key steps in DIGSI 5 v9.00 to set up a three-end line differential scheme. From version 8.60 firmware onwards, the method of selecting three and multi-end line differential schemes changed from using a 'Significant Feature' in the order code to requiring 185 function points per line end being available for the third and each addition ended.

This introduces a new Function Group "Protection communication" of type "Advanced Protection Communications". Refer to Section 3.6 and 3.6.6 of the Manual<sup>[1]</sup>



#### [1]

Use manual 8.6 or higher. This document was written based on manual V8.80 "SIPROTEC 5 Distance Protection, Line Differential Protection, and Overcurrent Protection for 3-Pole Tripping 7SA82, 7SD82, 7SL82, 7SA84, 7SD84, 7SD86, 7SL86, 7SL86, 7SJ86."

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## 1. Set up the Project

Add a device to the project. We have shown a simple relay/scheme to show the key steps. In this case we used DIGSI V9.00, and a 7SL86 with firmware and communication protocols v8.83. Your configuration may need to be different.

We added the 7SL86 to the project using the "Hardware and protocols Editor", but device could have also been added using a short or long code. *To keep the Quick Guide simple, we used the Hardware editor to avoid the case of using a short/long code that included an older firmware/hardware specification that included a non-two-end Significant Feature specification.* 

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Step 1: Select device type								
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MEPE:					26	iecti	. •• 0-6	enu
Chan D. Caland de las annualis								
Step 2: Select device properties								
Voltage variant	DC 60 V to 250 V, AC 100 V to 230 V							
Significant feature:	Two-end protection							
Select function-point class:	Base + 300							
Integrated Ethernet interface (port J):	Only DIGSI 5 connection							
Step 3: Select application template								
Step 3: Select application template Application-template selection:	Standard User-defined							
Step 3: Select application template Application template selection:	Standard User-defined Application templates	Configuration	Status					
Step 3: Select application template Application-template selection:	Standard User-defined Application templates DDF/DIS RND overhead line. 1.5 CB	Configuration V08.83	Status					
Step 3: Select application template Application-template selection:	Standard User-defined Application templates DOPFIDE RND overhead line, 1.5 CB Basic	Configuration V08.83 V08.83	Status					
Step 3: Select application template Application-template selection:	Standard User-defined Application templates DIPFIDS MD overhead line, 1.5.CB Baic DIPFIDS whethead line, solid ground, next, p. DIPFIDS whethead line, solid ground nexts a point	Configuration V08.83 V08.83 V08.83 V07.54	Status					
Step 3: Select application template Application-template selection:	Standard User-defined Application templates DPF/05 M/D overhead line, 1.5 CB Eastic DPF/05 M/D overhead line, solid ground, neut, p. DPF/05 AVD overhead line, solid ground neutral point	Configuration V08.83 V08.83 V08.83 V07.54	Status					
Step 3: Select application template Application template selection:	Standard         User-defined           Application templates         DPF/DD MD overhead line, 15 C8           DPF/DD Staff Do overhead line, solid ground, neut, p.         DPF/DD Staff Overhead line, solid ground, neut, p.           DPF/DD Sverhead line, solid ground eneutral point         DPF/DD Sverhead line, solid ground eneutral point	Configuration V08.83 V08.83 V09.83 V07.54	Status					
Step 3: Select application template Application-template selection: Step 4: Select communication versions	Standard User-defined Application templates DIFFOIS MR0 overhead line. 1.5 CB Beic DIFFOIS MR0 overhead line. solid ground: next. p. DIFFOIS swethead line. solid grounded nextral point	Configuration V08.83 V08.83 V08.83 V07.54	Status					
Step 3: Select application template Application-template selection: Step 4: Select communication versions Communication configuration:	Standard User-defined Application templates DIPFIDIS MID overhead line, 1.5 CB Back DIPFIDIS MID overhead line, solid grounder neutral point DIPFIDIS overhead line, solid grounder neutral point	Configuration V08.83 V08.83 V08.83 V07.54	Status Status					
Step 3: Select application template Application-template selection: Step 4: Select communication versions Communication configuration:	Standard         User-defined           Application templates         DPP00 KM0 overhead line, 15 CB           Bait         DPP00 KM0 overhead line, solid ground neut, p.           DPP00 KM0 overhead line, solid ground neut, p.         DPP00 KM0 overhead line, solid ground neut, p.	Configuration V08.83 V08.83 V07.54	Status					
Step 3: Select application template Application-template selection: Step 4: Select communication versions Communication configuration: Open Hardware and protocols Editor after device creation	Standard         User-defined           Application templates         DPP/DB to R0 overhead line, 1.5.0.8           Bit         DPP/DB to R0 overhead line, solid ground next, p.           DPP/DB to R0 overhead line, solid ground next, p.         DPP/DB to R0 overhead line, solid ground next, p.           VM R0.5         VM R0.5	Configuration V08.83 V08.83 V08.83 V07.54	Status O O O O O O O O O O O O O O O O O O O					
Step 3: Select application template Application-template selection: Step 4: Select communication versions Communication configuration: Open Herdware and protocols Editor after device creation	Standard         User-defined           Application templates            DVP/DDS MD overhead line, 15 CB            Baic            DVP/DDS MD overhead line, solid ground.next.p.            DVP/DDS ND overhead line, solid ground next.rp            OVER ND	Configuration V08.83 V08.83 V07.54	Status .					



Add display, current terminals, and Optical serial interface in the device view.

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#### 2. Add Function Groups

Add Advanced Protection Communications Type 1



Add "87 Line diff. prot" (to Line 1 function group)



Synchronise the hardware (info.Inconsistencies)

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#### 3. Set up the Protection Data Interface

In the Hardware and Protocols area select "Device View" and double click on Protection Interface, to see its properties. Change Chanel 1 to "Adv. Prot.Intf".



In this example we are setting this relay to be a single end of a three-end scheme. If it was the 'mid' relay in a chain, or if 'ring' communications where to be setup, then Channel 2 would also have this protocol selected.

# 4. Add the additional line end

In the Device Combination area of the function group, two line-ends have defaulted. Click any of the "Add new stage" button to add a third line-end (e.g. add a Device 3).

DIGSI 5 V9.00 - C:\Users\warwick\Docum	entsMutom	ation\Example LDif V8.60\Example LDif	V8.60		
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T Single-line configuration					
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🔛 General		Add new stage	Delete stage		
Process monitor					
Fault locator					
🔛 Mes.v.fail.det		Device 2			
50/51 OC-3ph-A1					
SON/S1N OC-gnd-A1		91.3321.22712.101	Device index:	2	<b>1</b>
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🛃 Trigger routing		51.5521.22712.102	Address in Device combil.	102	
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Device combination					
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Display pages					

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A third line-end is now added (Device 3 below)

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Communication mapping						
<ul> <li>Settings</li> </ul>						
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Device combination		Add new stage	Delete støge			
Charts						
<ul> <li>Display pages</li> </ul>						
Safety and security						

Device information, Resource Consumption shows that 185 function-points are now being consumed



Settings/Device Settings, still shows device functionality to be "Two-end Protection", as significant features are not used in firmware 8.60 or higher

DIGSI 5 V9.00 - C:\Users\warwick\Doci	cuments/Automation/Example LDif V8.60/Example LDif V8.60	
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Information routing	Voltage variant: DC 60 V to 250 V. AC 100 V to 230 V =	
Communication mapping	Integrated Ethernet interface (port J): Only DIGS15 connection	
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