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RFL 9745 TELEPROTECTION CHANNNEL - VF OR DIGITAL

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PURPOSE AND SCOPE

This document details commissioning tests required on RFL 9745 Teleprotection channel equipment (both analogue and digital versions) prior to hand over of equipment to National Grid.

PART 1 – PROCEDURAL

1 RESPONSIBILITY

Those undertaking the commissioning of this equipment in accordance with the recognised commissioning procedure have responsibility for completing the commissioning of the equipment in accordance with this SCT.

All work should be carried out under National Grid Safety Rules.

Sections 5 and 6 of Appendix A of this SCT should only be completed under the supervision of a National Grid authorised (Advanced Commissioning) person who should ensure that tests can proceed without interference to other equipment or personnel.

2 FORMS AND RECORDS

SCT 43.01 Site Commissioning Record.

PART 2 - DEFINITIONS AND DOCUMENT HISTORY

3 DEFINITIONS

Not applicable.

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4 AMENDMENTS RECORD

Issue	Date	Summary of Changes / Reasons	Author(s)	Approved By (Inc. Job Title)
1	May 1997	New document	Alex Carter Technology and Science Division	John Downes Protection Control and Measurements Manager
2	August 1998	Revised for ISO 9002		Chris Parker Head of Protection and Control
3	April 2000	Modifications to reflect revised Guidance Notes	Pelquim Spahiu	David Humphreys Head of Protection and Control
4	December 2007	Reissued to include both VF and digital units	Alan Honeysett (RFL)/ Pradhip Kumar Asset Engineering	Zac Richardson Asset Engineering Manager
5	January 2009	Appendix A - Sections 1.2,1.5,1.9,1.10,1.11,3.2, 4.1,4.3, updated	Alan Honeysett (RFL)/ Pradhip Kumar Asset Engineering	Zac Richardson Asset Engineering Manager

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PART 3 - GUIDANCE NOTES AND APPENDICES

APPENDIX A – SITE COMMISSIONING RECORD

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RFL Communications plc
www.rflcomms.co.uk

Site Commissioning Record

RFL 9745 TELEPROTECTION CHANNEL (VF or Digital)

National Grid	
Site:	**Circuit:**
	Function* : ** Enter data as required (eg first intertrip /blocking /DAR signal etc)*
Voltage (kV) :	**VF or Digital:**

CONTRACT DETAILS

Customer	
Customer Reference / Order No.	
Site contact	
Telephone no.	
RFL Contract / Reference No.	
RFL Engineer	

COMPLETION / ACCEPTANCE DETAILS

RFL Engineer:		Sign	Name
Accepted on behalf of National Grid / Customer by:		Sign	Name
		Position	Company
Date:		Comments	

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IMPORTANT NOTES

Reference Documents

- RFL 9745 Manual dated 7 April 2008
- RFL Communications 9745 Application Note issue E2.05 Oct 2008

VF Narrowband and Wideband communications modules

- All 9745VF units up to early 2006 were fitted with narrowband communications modules. Units supplied after that date are fitted with wideband communication modules.
- Where wideband communication modules are fitted as replacement modules for narrowband, the system software must be upgraded to version 5.2 and certain parameters need to be modified (generally by loading the relevant wideband parameter file. Refer to Section 12.2 in Application Note.

CPU capacitors

- All recent CPU modules are fitted with capacitors to support the SOE log and date / time settings in the event of power outage. Before removing or working on CPU module, capacitors should be discharged by setting J2 (front RHS of module) to DISCH for 5 mins. Note that this will cause all SOE data and time to be lost.
- Many earlier CPU modules previously fitted with batteries are now fitted with BEM modules (battery elimination modules with capacitors) to support the SOE log and date / time settings in the event of power outage. Before removing or working on CPU module, capacitors should be discharged by setting J1 (front of BEM module) to DISCH for 5 mins. Note that this will cause all SOE data and time to be lost.

CPU

- CPU module ref. 107335-1 (2008 onwards) requires System Software 7.0. This software is not compatible with earlier CPU modules.

Working on the equipment

- Always disconnect from the power source before removing any modules, or working on the equipment.

Fibre optic interfaces

- The 9745 may be equipped with digital communications interface modules that have fibre optic emitters, which use invisible laser light. If the fibre is disconnected or broken the radiation may be exposed and may cause permanent damage to eyesight or blindness. NEVER look directly into the light beam, and be careful not to shine the light against any reflective surface.

Key Data Table

- RFL Communications plc manages a database of RFL equipment on behalf of National Grid.
- On completion of setting up this equipment, ensure the Key Data Table at the end of this document is filled out and e-mailed / faxed to RFL Communications plc using the e-mail address / fax no. detailed on that page.
- Battery condition (if fitted) must be detailed on the Key Data Table.

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1. Pre Power-up Checks

1.1 Equipment Details				
Manufacturer			RFL Communications plc	
Equipment			9745 Teleprotection Channel	
Equipment Serial No.				
Chassis Order Code (PN No.)				
Equipment Type (✓)	VF		Logic Scheme	
	Digital		Parameter File	

1.2 Modules fitted			Enter Rev. No.; ✓ if fitted
Power Supply Modules	Voltage Range		Fitted ✓/X
Power Supply 1 Left hand slot (Note: 38 – 150V is standard)	19 – 36V		
	38 – 150V		
	170 – 300V		
Power Supply 2 Right hand slot (Note: 38 – 150V is standard)	19 – 36V		
	38 – 150V		
	170 – 300V		
Communications Module	Part No.	Rev.	Fitted ✓/X
Wideband Audio	105920 - 1		
Narrowband Audio	105040 - 20		
Digital	105060 - 2		
Digital Interface module Part No./Type			
CPU Module	Part No.	Rev.	Fitted ✓/X
CPU with Capacitor backed RAM	107335 - 1		
	107330 - 1		
	107330 - 20		
CPU with Battery backed RAM 1 ***It is recommended these be upgraded with BEM or current CPU with capacitor backed RAM*** If battery fitted, check if newer than 2 years old	105025 - 20		
		BEM fitted	
		Battery fitted	
	Battery newer than 2 years ✓/X		
Driver Module	Part No.	Rev.	Fitted ✓/X
Driver	105030 - 1		

I/O Modules	Module type		Fitted ✓/X
I/O module A (top)	Solid State module	105005-1	
	Relay module (o/p1=SS)	105010-1	
I/O module B (bottom)	Solid State module	105005-1	
	Relay module (o/p1=SS)	105010-1	

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1.3 Communication Details	✓as appropriate & add details in RH column	
VF Single 4 – wire (e.g. direct pilot, C&W, BT)		
VF Dual 4 – wire (e.g. direct pilot, C&W, BT)		
Digital – electrical (e.g. X21, C&W, BT, G703 etc)		
Digital – fibre C37.94 (with FSU or other interface)		
Digital – direct fibre (SM, MM, approx distance)		

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1.4 I/O Modules – Jumpers	Remove module to visually check jumper settings (or if no voltage present, test resistance as note)			
	Confirm Input voltage jumper settings. Circle as set			
Top module 'A'	J1	J2	J3	J4
	48 / 125	48 / 125	48 / 125	48 / 125
Bottom module 'B'	J1	J2	J3	J4
	48 / 125	48 / 125	48 / 125	48 / 125

Note: I/O module input links can be checked without removing the module by measuring the input resistance – 37 kΩ indicates 125V and 17 kΩ indicates 48V. Indicate if jumper settings were visually checked, or measured	Measured	
	Visual	

1.5 Audio Comms. Module – Jumpers (VF units) Strike through table if not applicable	Remove fixing screws at rear to remove module. Confirm Jumper settings against comms configuration that is deployed (✓)

- If Narrowband Audio comms module fitted, verify jumper settings

	JMP1	J9	J10	J11	J12	✓
Single 4 wire	A	A	A	A	B	
Dual 4 wire	A	B	B	B	B	

- If Wideband Audio comms module fitted, verify jumper settings

	JMP1	J1	J2	J3	J5	J10	J11	J12	J13	J14	J15	J16	✓
Single 4W	A	50	50	A	4W	A	4W	Run	IN	IN	IN	IN	
Dual 4W	A	50	50	B	4W	B	4W	Run	IN	IN	IN	IN	

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