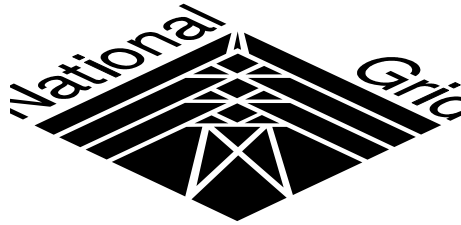


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Schedule of Site
Commissioning Tests
SCT 20.8.2
Issue 2
August 1998

**LFCB 102/103 Digital
Current Differential
Relay and MITZ-01
Interface Units**

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Registered Office
National Grid House
Kirby Corner Road
Coventry
CV4 8JY

Registered in
England and Wales
No. 2366977

Published by:

The National Grid Company plc
Kelvin Avenue
Leatherhead
Surrey KT22 7ST

THE NATIONAL GRID COMPANY plc

SCHEDULE OF SITE COMMISSIONING TESTS

**SCT 20.8.2 LFCB 102/103 DIGITAL CURRENT DIFFERENTIAL RELAY
AND MITZ-01 INTERFACE UNITS**

Station:

Circuit:

Manufacturer's Contract No:

Contractor's Signature:

NGC Contract No:

Accepted by:
(Engineer's Signature)

Contractor:

Date:

.....

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LFCB 102/103 DIGITAL CURRENT DIFFERENTIAL RELAY AND MITZ-01 INTERFACE UNITS

1 GENERAL DATA

1.1 LFCB Relay

Manufacturer: GEC ALSTHOM Measurements

Type	
Serial No	
Case Identification Code	
Firmware Reference	
Module Identification Codes:	Module 1
	2
	3
	4
	5
	6
	Front Panel
Relay Power Supply: $V_{x(1)}$	Vd.c.
Opto-isolator Supply: $V_{x(2)}$	Vd.c.
Rated Current: I_n	A

1.2 MITZ-01 Interface Unit

Serial No	Channel 1	Channel 2

D.C. Supply Rating: V_x

		Vd.c.
--	--	-------

1.3 Circuit Configuration

Two ended or three ended

--

2 INSPECTION OF EQUIPMENT

2.1 LFCB 102/103

CAUTION: The equipment contains components that are sensitive to electrostatic voltage discharge. To avoid damage handle modules by the metal side plates and frame, avoid contact with electrical components or connections and use electrostatic precautions.

2.1.1	With the Auxiliary supplies disconnected, carefully examine the relay for any signs of damage. Check, from the front nameplate, the relay model number and rating details are correct.	
2.1.2	Check that the module references are correct and that the modules are in the correct positions. (Refer to the Service Manual Hardware description).	
2.1.3	Examine module PCB link positions and check that they are correct. Reposition links if required (refer to relay setting sheet).	

2.2 MITZ

2.2.1	With the aux D.C. supplies disconnected examine case and internals for damage.	
2.2.2	Check that the case and module serial numbers are identical and that Model number and ratings are correct.	

3 CALIBRATED TEST EQUIPMENT

(i) Record of Calibrated Test Equipment used during Commissioning

	Manufacturer and Type	Serial No	Date Last Calibrated	Date Next Calibration Due
Insulation Resistance Tester				
Voltmeter or Multimeter				
Ammeter or Multimeter				
Timer				
Others (state function)				

4 WIRING & FIBRE OPTIC CONNECTIONS

4.1 Inspection

Inter relay and cubicle wiring checked to

	NGC No	Manufacturers No
Circuit Diagram No		
Wiring Diagram No		

4.2 Insulation Resistance

CAUTION: Use an electronic or brushless tester of 500 Vd.c. Accessible terminals of the same circuit should be connected together.

LFCB Circuit Relay Terminals	IR (M Ohms) to Earth	LFCB Circuit Relay Terminals	IR (M Ohms) to Earth
A1/A2 A3/A4 A5/A6 A7/A8 A9/A10 A11/A12 A21/A22 A23/A24 A25/A26 F1/F3/F5 F2/F4/F6 F7/F8 F9/F11 F10/F12 F13/F15 F14/F16 F17/F19 F18/F20 F21/F23 F22/F24 F25/F27 F26/F28		G2/G4/G6 G1/G3/G5 G7/G8 G9/G11 G10/G12 G13/G15 G14/G16 G17/G19 G18/G20 G21/G23 G22/G24 G25/G27 G26/G28 H3/H4 H5/H6 H13/H14	
MITZ Interface - Channel 1		MITZ Interface - Channel 2	
Terminals	IR (M Ohms) to Earth	Terminals	IR (M Ohms) to Earth
3/4 7/8 25/26		3/4 7/8 25/26	

4.3 Fibre Optic Cross Site Link

This is to have been installed and tested before the following commissioning tests on the LFCB relay can be carried out. Check that the relevant SCT has been completed.

- 4.3.1 Check that optical cables are correctly terminated at LFCB relay and MITZ interface, by reference to ruggedised pigtail identifying numbers.

4.4 Interface CT Continuity Check

Withdraw Analogue Input Module by 1 cm (disconnect Ribbon cable if necessary). Check that there is a short circuit between the following relay case terminals via the MMLG test block.

Relay Case	MMLG Block		
A21-A22	2-8		Ohm
A23-A24	4-8		Ohm
A25-A26	6-8		Ohm

Replace Analogue Input Module and reconnect Ribbon cable.

5 SINGLE-ENDED UNIT TESTS (PRELIMINARY - NO SECONDARY INJECTION)

Tests on other components of the circuit, such as CTs, alarm scheme, in/out switching are to be complete before the circuit can be considered commissioned.

NB: These tests assume the use of multiplexed communications links with MITZ interfaces. For testing schemes with dedicated fibre optic links refer to Appendix B.

- 5.1 In the communications room at the communications channel link blocks, insert the 'U' links into the test position.

Channel 1	Channel 2

Connect the D.C. aux supplies to the MITZ interface unit and switch on. Check that the green LED on the front panel of the MITZ interface is on.

Channel 1	Channel 2

- 5.2 At the LFCB relay, with aux supplies off, check that Power Supply Fail alarm contact H5-H6 and the Relay Inoperative contact G3-G5 are made.

- 5.3 Connect the aux D.C. supply to relay and switch on. Check that the Power Supply Fail alarm contact H5-H6 opens immediately.

- 5.4 Check that the Relay Inoperative alarm contact G3-G5 opens after about 12 sec.

- 5.5 On power up, the relay performs diagnostic checks. During these checks the front panel LCD should rapidly display a series of messages.

- 5.6 Check that these tests are complete after about 12 sec, when the LCD displays either 'date and time not set' or '***ALARMS***'.

- 5.7 Clear all alarm messages and set date and time (refer to Service Manual).

NB: It will only be possible to reset the communication fail alarm, if the relay's universal address is selected. This will normally be the case as the relay is supplied with this address setting as default.

- 5.8 By operating the keypad on the front panel (refer to the Service Manual), display and note the Manufacturer's Software reference.

- (i) Main Processor

- (ii) Communication Processor

5.9 Settings

Apply the required settings (refer to the relay setting sheet).

5.9.1 Display and Record Settings:

Threshold Level: IS_1		pu
% Bias: k_1		%
Threshold Level: IS_2		pu
% Bias: k_2		%
Permissive Intertrip Time: PIT		msec
Comm Channel Delay Tolerance		micro sec
Comm Channel Fail Alarm Time		sec
*Relay Address		
Serial Port Baud Rate		baud
Serial Port Bit Framing Format		databits
		parity
Serial Port Bit Framing Format		stopbits
Time Synchronising Period		min
Remote Access Level for Serial Port		
Block Auto-Reclose Mode		
Tripping Mode		
Configuration		

* When the correct individual address is set, the respective communication fail alarm(s) will occur because of the loopback condition.

5.9.2 Use the keypad to set 'LOOPBACK TEST ADDRESS ON' and reset the communication channel alarm(s). Check that the green healthy LED flashes slowly and that 'CURRENT DIFFERENTIAL' normally displayed at the default level is replaced by 'LOOPBACK TEST ADDRESS ON'.

5.10 Checking Test Options

Use the keypad to select the test options (refer to Service Manual).

5.10.1 Use the keypad to carry out the Lamp Test: Check that the Alarm LEDs turn on and relay Healthy LED turns off.

5.10.2 Use the keypad to select STATUS INPUT TEST.

Using a smoothed D.C. supply equal to $V_{x(2)}$, apply voltage to the below mentioned terminals and check the displayed messages agree with the table below.

Terminal +ve -ve	Displayed Message Opto-input State	Also Check That	Check Operation
No Voltage Connected	0 0 0 0 0 0		
A1-A2	1 0 0 0 0 0	Out of Service Lamp Lights	
A3-A4	0 1 0 0 0 0		
A5-A6	0 0 1 0 0 0		
A7-A8	0 0 0 1 0 0	Intertrip Contacts F9-F11. F10-F12. G9-F11. G10-G12. Close	
A9-A10	0 0 0 0 1 0		
A11-A12	0 0 0 0 0 1		

5.10.3 Use the keypad to Select CONTACT TEST.

Ensure that the relay contacts are isolated from the tripping, control and alarm schemes. Connect a D.C. supply equal to $V_{x(2)}$ to terminals A1-A2 to switch the relay out of service.

Using the keypad check that the output contacts operate in accordance with the table below.

Output Contact to be Tested	Check Contact Closed	Check Operation
Relay INOP	G3-G5	
PROT OP A	F1-F3	
PROT OP B	F2-F4	
PROT OP C	F7-F8	
Trip A	G17-G19. G18-G20. F17-F19. F18-F20	
Trip B	G21-G23. G22-G24. F21-F23. F22-F24	
Trip C	G25-G27. G26-G28. F25-F27. F26-F28	
Any Trip	F13-F15. F14-F16	
Intertrip	G9-G1. G10-G12. F9-F11. F10-F12	
Block A/R	G13-G15. G14-G16	
Comm Supervision	G7-G8	
Scheme INOP	G2-G4	

REMOVE $V_{x(2)}$ from A1-A2

5.11 Intertrip Check

5.11.1 Connect an aux D.C. supply $V_{(x2)}$ as in Figure 4. Check that on closing switch SW1 the intertrip contacts (F9-F11) operate in an average of 30 msec and remains operated until SW1 is opened.

msec