



# TETRA Terminal Interoperability Certificate

28 August 2001

## Nokia Telecommunications

Manufacturer	Terminal Type	Software/Hardware Release No.
Nokia	THR420	SW: HY11.0390 HW: HRU 420-02

Telelaboratoriet has witnessed that the Nokia terminal is operating in accordance with

TETRA Interoperability Profile – (TIP) Ver 2.1.1, March 2000

for the following features.

Features:	Tested(Yes/No)
• PSTN interconnect	No
• Individual duplex call	Yes
• Individual simplex call (direct setup)	Yes
• Status messages	No
• Unannounced cell re-selection	Yes
• Announced type 3 cell re-selection	Yes
• Emergency call	No

The tests have been performed on a number of infrastructures. Details concerning the used infrastructures and the dates when the testing were performed can be found on page 2 of the certificate.

The test results for the tested features can be found in table 1 and table 2 of this certificate.

Authorised IOP test engineer

Telelaboratoriet(Tele Danmark)

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Telelaboratoriet(Tele Danmark) has made every effort to ensure that tests have been made correctly, and in accordance with TIP V2. Telelaboratoriet(Tele Danmark) has no liability for the test results, or towards the manufacturers.

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## Information about the equipment used for testing

### Testing during the January 2000 IOP test session:

The tests were performed using the following infrastructures:

Manufacturer	Infrastructure	Software/Hardware Release No.	Dates of testing
Motorola	Dimetra	2.3SER	25Jan2000
Nokia	Nokia	SW: 2.0 (DXT W1 1.28-8, TBS TBCPGMWC.PAC 2.6-0, TBBM TBBDSPWB.COM 2.19-0 HW: 2.0	24Jan2000
Marconi / OTE	Marconi / OTE	SCN: 5.3.1, BS: 1.1.3	25Jan2000
Simoco/Frequentis	SFT2000	4313 327 89013	27Jan2000

### Testing during the September 2000 IOP test session:

The tests were performed using the following infrastructures

Manufacturer	Infrastructure	Software/Hardware Release No.	Dates of testing
Motorola	Dimetra	SW: 3.0 with Ambassador switch: hardware BLN7022A39, software: q100, and Site controller: hardware 0.1.4, software: R070020	15-16Sep2000
Nokia	Nokia	SW: 2.1 (DXT W2 2.14-0, TBS TBCPGM 5.12-0, TBBMTCWB 2.8-0, TBBDSP 4.3). HW: 2.1	20-21Sep2000
Marconi / OTE	Marconi / OTE	SW :7.5.8.IOP HW: MPU 130-3432/01-05,	12-13Sep2000
Simoco/Frequentis	SFT2000	SW: 1.2 (Build 677)	18-19Sep2000

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## Additional information about the test performed

The tests were performed in the 380-400 MHz band.

## Test Results

The test results are shown in two tables. Table 1 is the test result as given in the TIPv2 SwMI certificates dated 06 June 2000. The information from the TIPv2 SwMI certificates dated 06 June 2000 are repeated here for informative purposes only.

### Table 1: Test results from the January 2000 IOP test session

Table 1 indicates the number of tests for each feature and the corresponding number of tests completed for each infrastructure.

For call setup, the two tests cover MS initiated setup and reception of a setup initiated from another station.

DTMF over-dial tests the transfer of DTMF digits from the terminal and the corresponding tone generation.

Setup queuing refers to the situation where the call is made on a busy site and the call is placed in a resource queue thus prolonging the setup phase. The call is subsequently completed when resources become available.

Status message testing includes transmission of uplink status and downlink acknowledgement status indicating success/failure of delivery.

The cell re-selection tests cover cell re-selection as well as call restoration for group call and simplex individual call.

### Table 2: Test results from the September 2000 IOP test session

Table two indicates whether or not tests addressing a specific requirement of the TIP specification have been performed, whether or the not the requirement is applicable for the combination of the SwMI and the terminal, and the result of the test if executed. Each entry of the table may take one of five values, -: No test performed, N/A: Not applicable, P: Pass, F: Fail or I: Inconclusive. No test performed is also assigned in case of no test case being available. In case of all entries of a row being N/A it should be assumed that the SwMI does not support this feature.

The test results have been derived from examining the behaviour of a live system. The verdicts indicated are based on the log evaluation of the information exchange between the SwMI and the terminals indicated in table 2. The verdicts reflect the fact that at the time of the IOP testing is was/was not possible to demonstrate a behaviour that was in accordance with the related requirement.

**Table 1: Test performed during the January 2000 IOP test session**

Nokia THR420 Terminal <sup>1</sup>	# of tests <sup>2</sup>	Marconi/OTE	Motorola Dimetra	Nokia	Simoco/ Frequentis SFT2000
<b>PSTN interconnect</b>					
setup	0	0	0	0	0
clearing	0	0	0	0	0
DTMF over-dial	0	0	0	0	0
setup queuing	0	0	0	0	0
<b>Status messages</b>	0	0	0	0	0
<b>Individual call (duplex)</b>					
setup (on/off hook) (in coming/out going)	0	0	0	0	0
Modification to simplex	0	0	0	0	0
clearing	0	0	0	0	0
<b>Individual call (simplex)</b>					
setup (direct)	0	0	0	0	0
setup queuing	0	0	0	0	0
<b>Emergency group call</b>					
setup	0	0	0	0	0
clearing	0	0	0	0	0
speech item request	0	0	0	0	0
<b>Emergency Individual call</b>					
setup	0	0	0	0	0
clearing	0	0	0	0	0
speech item request	0	0	0	0	0
<b>Cell re-selection</b>					
unannounced	0	0	0	0	0
announced type 3	0	0	0	0	0

<sup>1</sup> The THR420 was not used for testing during the January 2000 IOP test session.

<sup>2</sup> This column indicates the total number of different test that has been executed for the terminal. Each of the subsequent columns indicates the number of different tests, which have been executed using a specific combination of MS and SwMI. The number of tests in each column may be less than the total number of available test cases due to some test cases not being relevant for a given combination of MS and SwMI.

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**Table 2: Test performed during the September 2000 test session**

Abbreviations:

- : Not performed.
- N/A: Not applicable
- P: Pass
- F: Fail
- I: Inconclusive

Nokia THR420 Terminal	Marconi/OTE	Motorola Dimetra	Nokia	Simoco/ Frequentis SFT2000
<b>6 Registration</b>				
6.1 ITSI attach	P	P	P	P
6.2 ITSI attach including group attachment	N/A	N/A	N/A	N/A
6.3 Roaming location updating	P	P	P	P
6.4 De-registration	-	-	-	-
<b>7 Individual call</b>				
7.1 Call setup	P	P	P	P
7.1 Call setup(Queuing)	-	-	P	P
7.1.1 Hook signalling (simplex)	P	-	P	P
7.1.1 Hook signalling (Duplex)	-	N/A	-	-
7.1.2 Direct through-connect (Simplex)	P	-	-	P
7.1.2 Direct through-connect (Duplex)	-	N/A	-	N/A
7.1.3 Call setup Modifications				
7.1.3 (Duplex to Semi duplex)	-	N/A	-	N/A
7.1.3.2 Setup Modifications by called Party				
7.1.3.2.1 Direct to hook	-	(P) <sup>1</sup>	-	N/A
7.2 Transmission control				
7.2.1 End of transmission	P	P	P	P
7.2.2 Request to transmit	P	P	P	P
7.2.3 Request for speech item	P	F <sup>2</sup>	N/A	p
7.3 Call maintenance	-	-	-	-
7.4 Call disconnection	-	-	-	-
7.5 Emergency individual call	-	-	-	N/A
7.5.1 Emergency speech item request	-	-	-	N/A
7.5.2 Emergency individual call modification	-	-	N/A	N/A
<b>8 Group management</b>				
8.4 MS Attachment of the selected group	-	P	-	P
8.4 MS Attachment of the selected group (Rejection)	-	-	-	-
8.4 MS Attachment of the Null group	-	-	-	-
8.4 MS Change of the selected group	-	-	-	-
8.5 Multiple group attachment	-	-	-	-
8.6 MS initiated detachment	-	-	-	-
8.7 SwMI initiated group attachment detachment				
8.7.1 SwMI initiated detachment	N/A	N/A	-	N/A
8.7.2 SwMI initiated attachment	N/A	N/A	-	N/A
8.7.3 SwMI initiated group reporting	N/A	N/A	-	N/A
8.7.4 SwMI initiated registration with group report request	N/A	N/A	-	N/A

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Nokia THR420 Terminal	Marconi/OTE	Motorola Dimetra	Nokia	Simoco/ Frequentis SFT2000
<b>9 Group call</b>				
9.1 Call setup	P	P	P	P
9.1 Call setup (Queuing)	-	-	-	-
9.1.1 Call setup modifications	-	-	-	N/A
9.2.1 End of transmission	P	P	P	P
9.2.2 Request to transmit	P	P	P	P
9.2.3 Request for speech item	P	F <sup>2</sup>	N/A	P
9.3 Call disconnection	P	P	P	P
9.4 Late entry	-	-	-	-
9.5 Emergency group call .	-	-	-	N/A
9.5 Emergency group call(Setup to busy group)	-	-	-	N/A
9.5.1 Emergency speech item request	-	-	-	N/A
9.5.2 Emergency group call modification	-	-	-	N/A
<b>10 Cell re-selection</b>				
10.1 Undeclared cell re-selection	-	-	P	P
10.2.1 Unannounced cell re-selection with call restoration				
10.2.1 (Group call)	-	-	-	P
10.2.1 (Queuing, group call)	-	-	-	N/A
10.2.1 (individual call)	N/A	-	-	-
10.2.1 (Queuing, individual call)	N/A	N/A	-	N/A
10.2.2 Announced cell re-selection without Preferred Neighbour Selected with call restoration				
10.2.2 (Group call)	-	-	-	P
10.2.2 (Queuing, group call)	F <sup>5</sup>	I <sup>3</sup>	N/A	N/A
10.2.2 (Pre-emption, group call)	-	I <sup>3</sup>	N/A	N/A
10.2.2 (individual call, traffic)	-	-	-	P
10.2.2 (individual call, inactivity)	-	(P) <sup>4</sup>	-	-
10.2.2 (Queuing, individual call, traffic)	F <sup>6</sup>	-	-	N/A
10.2.2 (Queuing, individual call, inactivity)	-	-	-	N/A
<b>11 Short data service</b>				
11.1 Status messages (to dispatcher)	-	-	-	-
11.1 Status messages (Text messaging)	-	-	-	-
<b>12 Telephone call</b>				
12.1 Gateway Addresses	-	-	-	-
12.2 Call Set-up	-	-	-	-
12.2.1 MS Originated, Late Through-Connect	-	-	-	N/A
12.2.2 MS Originated, Early Through-Connect	-	-	-	-
12.2.3 MS Originated, Call Queued	-	-	-	N/A
12.2.4 MS Terminated	-	-	-	-
12.3 Call Maintenance	-	-	-	-
12.4 DTMF Over-dial	-	-	-	N/A
12.5 Disconnect Causes	-	-	-	-
12.6 Emergency telephone call	-	-	-	N/A

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**Comments:**

- 1) 'Call Status' element is missing in D-CALL PROCEEDING. Incorrect value of the of the transmission grant element in the D-SETUP PDU.
- 2) The MS is unable to get the speech Item, unable to pre-empt the ongoing call.
- 3) There is a mismatch between SwMI log and MS log which makes it impossible to assign a verdict.
- 4) The verdict is based on observations made during the test session since sufficient logging is missing to make a more dedicated evaluation of the behaviour
- 5) Problems with evaluate signalling due to log file from SwMI being incomplete, reestablishment of audio following registration on new cell requires pressing PTT again.
- 6) Signalling is OK, however reestablishment of audio following registration on new cell requires pressing PTT again.

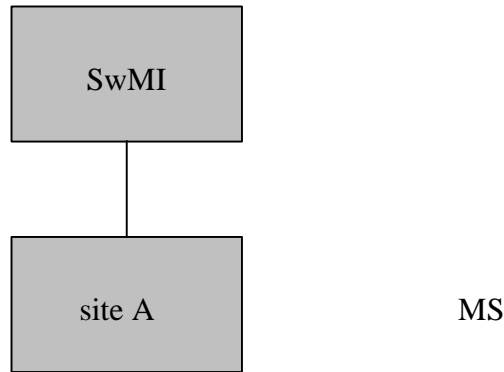
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Certificate Date: 28 August 2001  
Issued to: Nokia for terminal: THR420

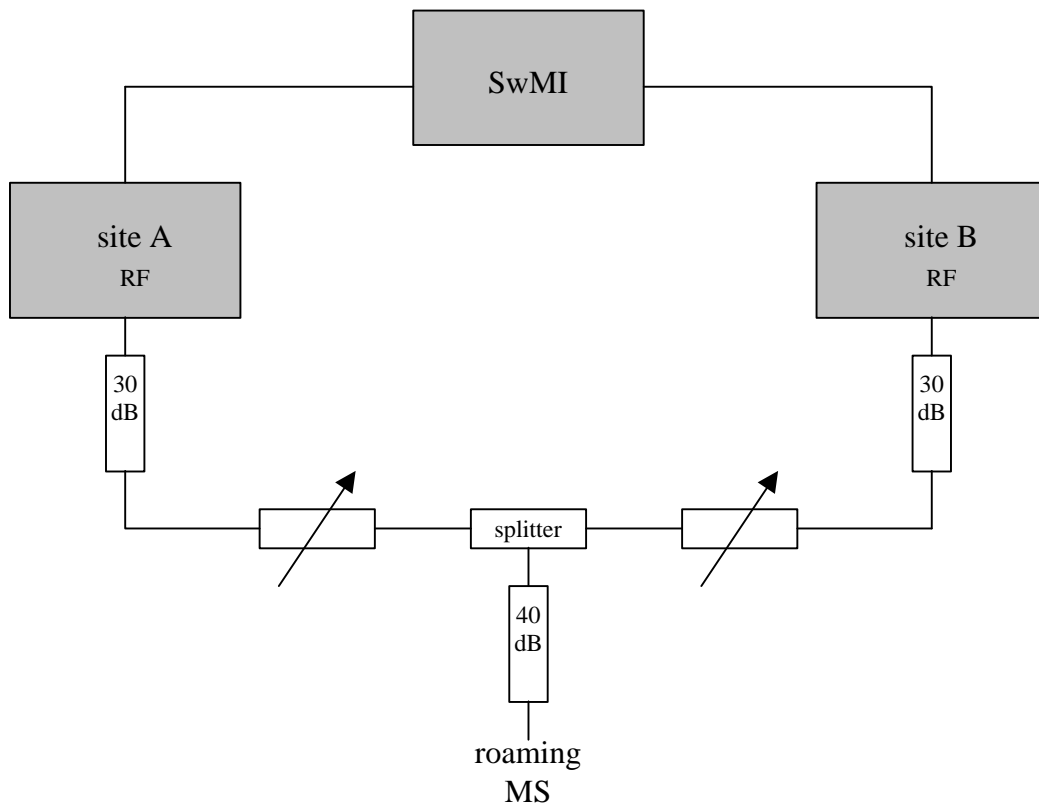
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### Test setup description

All tests except the cell re-selection test are carried out on a single site system with one carrier using standard antenna configurations.



For the cell re-selection test, an additional site is activated and the roaming MS is connected to the system via RF cables as illustrated below.



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