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Digital cellular telecommunications system (Phase 2) (GSM); Network Management (NM) procedures and messages on the A-bis interface (GSM 12.21)

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ICS:

33.070.50	Globalni sistem za mobilno telekomunikacijo (GSM)	Global System for Mobile Communication (GSM)
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GSM

GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS

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**Digital cellular telecommunication system (Phase 2);
Network Management (NM) procedures and messages on the
A-bis interface
(GSM 12.21)**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS describes the network management messages and procedures across the A-bis interface within the Digital cellular telecommunications system. This ETS corresponds to GSM technical specification, GSM 12.21, version 4.5.4.

NOTE: TC-SMG has produced documents which give technical specifications for the implementation of the Digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TSs). These specifications may subsequently become I-ETs (Phase 1), or European Telecommunication Standards (ETs)(Phase 2), whilst others may become ETSI Technical Reports (ETRs). These ETSI-GSM Technical Specifications are, for editorial reasons, still referred to in this ETS.

Transposition dates	
Date of adoption of this ETS:	06 June 1996
Date of latest announcement of this ETS (doa):	26 September 1996
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	27 March 1997
Date of withdrawal of any conflicting National Standard (dow):	27 March 1997

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Introduction

(Background)

[SIST ETS 300 623 E1:2003](https://standards.iteh.ai/catalog/standards/sist/5795008c-75c1-406f-9255-7c1bc977875/sist-ets-300-623-e1-2003)

The use and general aspects of the A-bis interface are given in specification GSM 08.51. The split of telecommunications functions and management procedures between BSC and BTS are defined in specification GSM 08.52. Specification GSM 08.56 defines Layer 2 of the signalling messages.

The general aspects of NM are defined in specification GSM 12.00. Qx interface and protocol stack are defined in specification GSM 12.01. GSM 12.06 provides the functional requirements supported by this ETS. The NM procedures and messages to support these operations over the A-bis interface are specified here. Specification GSM 12.20 provides the information model as seen on the OMC-BSC interface. Interworking between this model and the NM messages and procedures provided here is specified in GSM 12.22.

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1. Scope

This European Telecommunication Standard (ETS) addresses the network management messages and procedures across the A-bis interface, which is defined as Qx in GSM. The information model included here defines the objects and how they are addressed for purposes of operations and maintenance activities.

There is a requirement for the A-bis interface to be open to allow interoperation between BTSs of different manufacturers working to the same BSC. This ETS addresses this requirement from O&M point of view, which allows this interworking to take place. It shows the split of NM functions between BSC and BTS. The procedures and coding of the messages are specified in detail. In practice, in addition to this ETS it is necessary that the content of manufacturer-dependent information fields be specified to fulfill the functionality.

It is essential for operation that a BSC can handle the functions used by all its BTSs. Therefore, all items in this ETS are considered mandatory unless otherwise indicated in this ETS.

2. Normative References

This ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references subsequent amendments to, or revisions of, any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] GSM 01.04 (ETR 100): "Digital cellular telecommunication system (Phase 2); Abbreviations and acronyms".
- [2] GSM 04.06 (ETS 300 555): "Digital cellular telecommunication system (Phase 2); Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".
- [3] GSM 04.08 (ETS 300 557): "Digital cellular telecommunication system (Phase 2); Mobile radio interface layer 3 specification".
- [4] GSM 05.02 (ETS 300 574): "Digital cellular telecommunication system (Phase 2); Multiplexing and multiple access on the radio path".
- [5] GSM 05.05 (ETS 300 577): "Digital cellular telecommunication system (Phase 2); Radio transmission and reception".
- [6] GSM 05.08 (ETS 300 578): "Digital cellular telecommunication system (Phase 2); Radio subsystem link control".
- [7] GSM 08.51 (ETS 300 592): "Digital cellular telecommunication system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface General aspects".
- [8] GSM 08.52 (ETS 300 593): "Digital cellular telecommunication system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface Interface principles".
- [9] GSM 08.56 (ETS 300 595): "Digital cellular telecommunication system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface Layer 2 specification".
- [10] GSM 08.58 (ETS 300 596): "Digital cellular telecommunication system (Phase 2); Base Station Controller - Base Transceiver Station (BSC - BTS) interface Layer 3 specification".

- [11] GSM 12.00 (ETS 300 612-1): "Digital cellular telecommunication system (Phase 2); Objectives and structure of Network Management (NM)".
- [12] GSM 12.01 (ETS 300 612-2): "Digital cellular telecommunication system (Phase 2); Common aspects of GSM Network Management (NM)".
- [13] GSM 12.06 (ETS 300 617): "Digital cellular telecommunication system (Phase 2); GSM Network Configuration Management and Administration".
- [14] GSM 12.20 (ETS 300 622): "Digital cellular telecommunication system (Phase 2); Base Station System (BSS) Management Information".
- [15] GSM 12.22 (ETS 300 624): "Digital cellular telecommunication system (Phase 2); Interworking of GSM Network Management (NM) procedures and messages at the Base Station Controller (BSC)".

3. Definitions and Abbreviations

3.1. Definitions

Definitions of terms used within this ETS may be found mostly in clause 5 in text context.

3.2. Abbreviations

For the purpose of this ETS the following abbreviations apply.

ASN.1	(CCITT) Abstract Syntax Notation One
BSC	Base Station Controller
BSS	Base Station System
BTS	Base Transceiver Station
HW	Hardware
LSB	Least Significant Byte
MMI	Man-machine Interface
MSB	Most Significant Byte
MSC	Mobile-services Switching Centre
NE	Network Element
NM	Network Management
O&M	Operations and Maintenance
OMC	Operations and Maintenance Centre
RF	Radio Frequency
SAPI	Service Access Point Indicator
SW	Software
TEI	Terminal End-point Identifier
TMN	Telecommunications Management Network
TSC	Training Sequence Code
cont.	continued
man. dep.	manufacturer dependent (with upper and lower case adjusted as appropriate)

Further GSM related abbreviations may be found in GSM 01.04 (ETR 100)[1].

4. Functional Split between BSC and BTS

Functional split of management functions between BSC and BTS is shown in Table 1.

Table 1/GSM 12.21. Split of management functions between BSC and BTS

	BSC	BTS
Fault Management		
BTS		
test request	X	-
test execution	-	X
test analysis	NS	-
fault detection	-	X
fault localization	X (note)	X
fault reporting	X	X
Link		
testing (req,ex,rpt)	NS	-
fault detection	X	X
fault localization	X	X
fault reporting	X	X
Configuration Management		
Hardware	monitor	control
Software	control/monitor	monitor
State	control/monitor	control/monitor
Parameters	control/monitor	monitor
Performance Management		
Collection	X	X (radio path only)
Reporting	X	X (radio path only)
Administration	X	-
Security Management (Access Control to BTS)		
Control	-	X
Monitoring	-	X

NOTE: When fault localisation is not possible at the BTS it must be deduced at the BSC.

Legend:

NS = Not Specified;
 X = Function exists;
 - = Function non-exists;

Abbreviations:

req = request;
 ex = execution
 rpt = report

5. Information Model

5.1. Managed Objects

The BCF mentioned in GSM 08.52 and GSM 08.56 is the agent at the BTS end of the A-bis O&M interface. It has four different descriptions depending on the object that is managed: Site Manager, BTS, Radio Carrier and Baseband Transceiver.

This model describes how objects are managed across A-bis interface, but it doesn't specify how information is transferred inside the site. That is, the manner of communication between an object and objects under it is not specified in this ETS.

As shown in Figure 1, the Object Classes used on the A-bis interface are a subset of those found under Site Manager on the OMC-BSC interface. The Object Classes are listed below and the functionalities that describe them are found in Table 2.

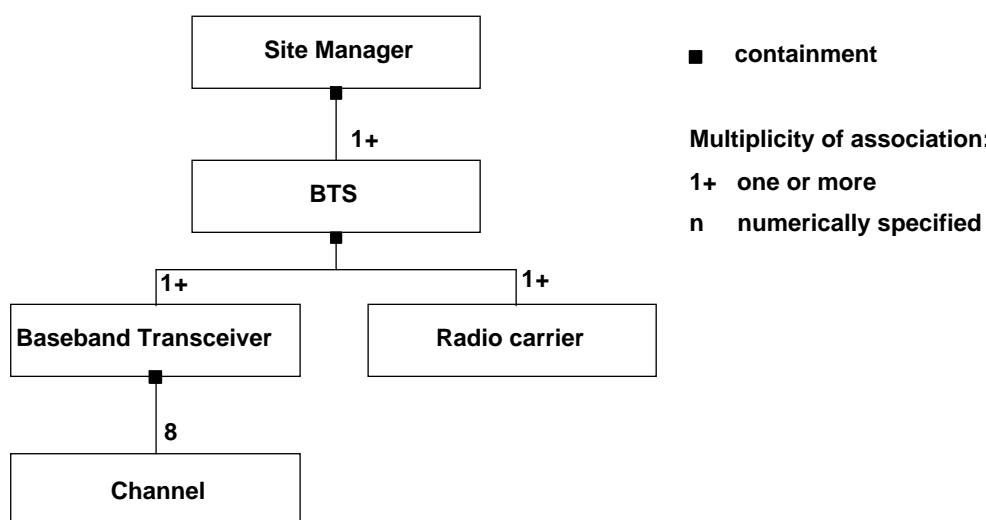
Site Manager manages common control functions of several BTSs and transceivers on one site. These can include managing external alarms, front-end switch, etc. This model describes logical sites. There can be multiple logical sites in one physical site. Communication between entities within a logical site is manufacturer dependent.

BTS is associated with one cell. BTSs are typically created at installation phase by connecting transceivers to antennas thus forming cells from the air interface point of view. The BTS can also contain control functions common to various transceivers. The way BTSs are formed from transceivers and how corresponding BTS numbers are determined is configuration dependent information, which is stored during installation.

Radio Carrier represents manageable properties pertaining to radio transmission and reception of one carrier.

Baseband Transceiver represents functions common to eight radio time slots.

Channel is a physical channel in air interface, which can contain several logical channels depending on channel combination. A Channel is described with radio time slot and frequency hopping attributes (see GSM 05.02).



NOTE: Site Manager and BTS don't necessarily require separate equipment. For example, the Site Manager and a Baseband Transceiver can be associated with the same physical equipment.

Figure 1/GSM 12.21. Object model seen across A-bis interface

Table 2/GSM 12.21: Objects, attributes and procedures seen across A-bis interface

Object class	Attributes	Procedures
Site Manager	Abis Channel Availability Status HW Configuration Manufacturer Dependent State Manufacturer Id Operational State Site Inputs Site Outputs SW Configuration	Equipment Management Establish TEI Get Attributes Set Site Outputs State Management and Event Report SW Download Management Test Management
BTS	Administrative State Availability Status BCCH ARFCN BSIC BTS Air Timer CCCH Load Ind. Period CCCH Load Threshold Connection Failure Criterion GSM Time HW Configuration Intave Parameter Interference Level Boundaries Manufacturer Dependent State Max Timing Advance Ny1 Operational State Overload Period RACH Busy Threshold RACH Load Averaging Slots SW Configuration T200	Equipment Management Get Attributes Report Procedures Set BTS Attributes State Management and Event Report SW Download Management Test Management
Radio Carrier	Administrative State ARFCN List Availability Status HW Configuration Manufacturer Dependent State Manufacturer Id Operational State Power Class RF Max Power Reduction SW Configuration	Equipment Management Get Attributes Set RadioCarrier Attributes State Management and Event Report SW Download Management Test Management
Baseband Transceiver	Abis Channel* Administrative State Availability Status HW Configuration Manufacturer Dependent State Manufacturer Id Operational State SW Configuration	Connect Terrestrial Signalling Disconnect Terrestrial Signalling Equipment Management Get Attributes State Management and Event Report SW Download Management Test Management