

Specification

Edition	Valid from	Specification number/reference
2.0	2010-10-15	A82
Document owner	Telephone	e-mail
Vidar Skovli	+47 8107 7000	vidar.skovli@telenor.com
Approved (sign)	Approved date	
Torleif Bakken	2010-12-01	

Title

Specification for the network side of the user-network interface: Remote splitter (PSTN/ISDN basic access)

Telenor
N-1331 Fornebu
Norway
Telephone: +47 81077000
www.telenor.com

Editions

Edition	Approved date	Valid from date	Comments
01	2003-03-01	2003-06-01	Deviating document title/identity
1.0	2004-06-01	2004-06-01	
1.1	2006-02-21	2006-05-02	References updated
2.0	2010-10-15	2010-12-01	Editorial updates

Table of contents

1.	Scope	4
2.	References	4
2.1	Normative references	4
2.2	Informative references	5
3.	Definitions and abbreviations.....	5
3.1	Abbreviations.....	5
4.	Requirements.....	6
4.1	General.....	6
4.2	Electrical requirements	6
4.3	Physical requirements and interfaces.....	7
4.3.1	Customer premise's interface, U-R ₀	7
4.3.2	Tele port, PSTN/ISDN _R	7
4.3.3	Line port, U-R (recommendations).....	7
4.3.4	ADSL port, U-R _{2A} (recommendations).....	7
4.3.5	External adaptor for one pair connections (optional).....	7
4.4	Environmental requirements.....	7
4.4.1	CE-marking	7
4.4.2	EMC	7
4.4.3	Resistibility	8
4.4.3.1	The use of gas discharge tubes.....	8
4.4.3.2	Protection	8
4.4.4	Climatic and mechanical recommendations	8
4.4.4.1	Storage (recommendations)	8
4.4.4.2	Transportation (recommendations)	8
4.4.4.3	Operational (recommendations).....	8
4.5	Electrical safety	8

Title A82: Specification for the network side of the user-network interface: Remote splitter (PSTN/ISDN basic access)	Edition 2.0	Page 4 of 8
--	----------------	-------------

1. Scope

This specification describes the network side of ADSL or VDSL access to the network of Telenor as prescribed in Article 4.2 of RTT&E-directive [13]. The requirements in Telenor Specification OA 100 [1] also apply.

This specification depicts requirements for remote splitter that is used for combined connection of a modem (for instance a remote ADSL modem, ATU-R) and PSTN/ISDN to one access line in Telenor's access network.

With the remote splitter the ATU-R or VTU-R can coexist on the same access line as a connection to the PSTN or to the ISDN network. The operation of PSTN or ISDN basic access in combination with an ADSL or VDSL modem is made possible by the use of a non-overlapping frequency plan.

The objective is to ensure full interoperability between equipment from different vendors.

- [1] Requirements for the ADSL and VDSL modem are given in the Telenor Specification OA 106, *Requirements for equipment to be connected to the local loop in the access network of Telenor. Equipment providing VDSL or VDSL2 and PSTN or ISDN Basic Access services, full unbundled access (service type FAF)*

Telenor Norway Specification A81: *Specification for the network side of the user-network interface: ADSL modem (ATU-R)*[4] and *VDSL modem (VTU-R) VDSL2*[6] respectively.

2. References

In case of any discrepancies between this specification and other specifications/standards referred to, this specification applies.

2.1 Normative references

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

- [2] Telenor Specification OA 100 *General requirements for equipment to be connected to the local loop in the access network of Telenor and/or for equipment to be installed and operated in Telelosji*
<http://www.jara.no>
- [3] Telenor Specification OA 105, *Requirements for equipment to be connected to the local loop in the access network of Telenor. Equipment providing ADSL and PSTN or ISDN Basic Access services, full unbundled access (service type E)*
<http://www.jara.no>
- [4] Telenor Specification OA 106, *Requirements for equipment to be connected to the local loop in the access network of Telenor. Equipment providing VDSL or VDSL2 and PSTN or ISDN Basic Access services, full unbundled access (service type FAF)*
- [5] Telenor Norway Specification A81: *Specification for the network side of the user-network interface: ADSL modem (ATU-R)*

- [6] Telenor Norway Specification A85: *Specification for the network side of the user-network interface: VDSL modem (VTU-R)*
- [7] CENELEC EN 60603-7-2:2009 CLC/SR 48B Connectors for electronic equipment -- Part 7-2: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 100 MHz
- [8] CENELEC EN 60950 *Safety of information technology equipment (IEC 60950)*

2.2 Informative references

- [9] ITU-T K.21 *Resistibility of telecommunication equipment installed in customer's premises to overvoltages and overcurrents*
- [10] ETSI EN 300 019-1-1: *Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-1: Classification of environmental conditions; Storage*
- [11] ETSI EN 300 019-1-2: *Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-2: Classification of environmental conditions; Transportation*
- [12] ETSI EN 300 019-1-3: *Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-3: Classification of environmental conditions; Stationary use at weatherprotected locations*
- [13] Directive EMC 89/336/EEC etc.: http://ec.europa.eu/enterprise/policies/european-standards/documents/harmonised-standards-legislation/list-references/electromagnetic-compatibility/index_en.htm
- [14] Directive R&TTE 1999/05/EC: (The Radio Equipment and Telecommunications Terminal Equipment) http://ec.europa.eu/enterprise/sectors/rtte/documents/guidance/index_en.htm
- [15] Norwegian regulations: <http://www.lovdato.no/for/sf/sd/sd-20000620-0628.html>
- [16] Telenor Networks Specification A84: *Specification for the network side of the user-network interface: Distributed filter (PSTN)*

3. Definitions and abbreviations

3.1 Abbreviations

ADSL	Asymmetric Digital Subscriber Line
ATM	Asynchronous Transfer Mode
ATU	ADSL Transceiver Unit
ATU-C	ATU at the central office end (i.e network operator)
ATU-R	ATU at the remote terminal end (i.e Customer Premises)
CPE	Customer Premises Equipment (usually an VTU-R and splitter)
DSLAM	Digital Subscriber Line Access Multiplexer (usually housing ATU-C)
DTE	Data Terminal Equipment
EMC	Electromagnetic compatibility
ETSI	European Telecommunications Standards Institute
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunication Union – Telecommunication sector
LAN	Local area network

PSTN	Public Switched Telephone Network
TE	Terminal Equipment
VDSL	Very high speed digital subscriber line
VTU-R	VDSL2 Transceiver Unit at the remote site
VTU-O	VDSL2 Transceiver Unit at the central office
xTU-R	ADSL or VDSL Transceiver Unit at the remote site
xTU-O	ADSL or VDSL Transceiver Unit at the central office

4. Requirements

4.1 General

Requirements in order to obtain interoperability are considered to be mandatory. The equipment is compliant to this specification if all mandatory requirements are fully compliant.

Some statements may be considered optional or recommended if stated in the heading. Non-compliance to statements indicated as 'optional' or 'recommended' does not exclude compliance to this specification.

The remote splitter shall comply with the generic specification, Telenor Networks Specification OA 100 [2].

The remote splitter terminates the subscriber line and connects to an ADSL modem (ATU-R) and to the telephone apparatus (either for PSTN or ISDN basic access) as depicted in figure 1.

The remote splitter may be incorporated in the xTU-R.

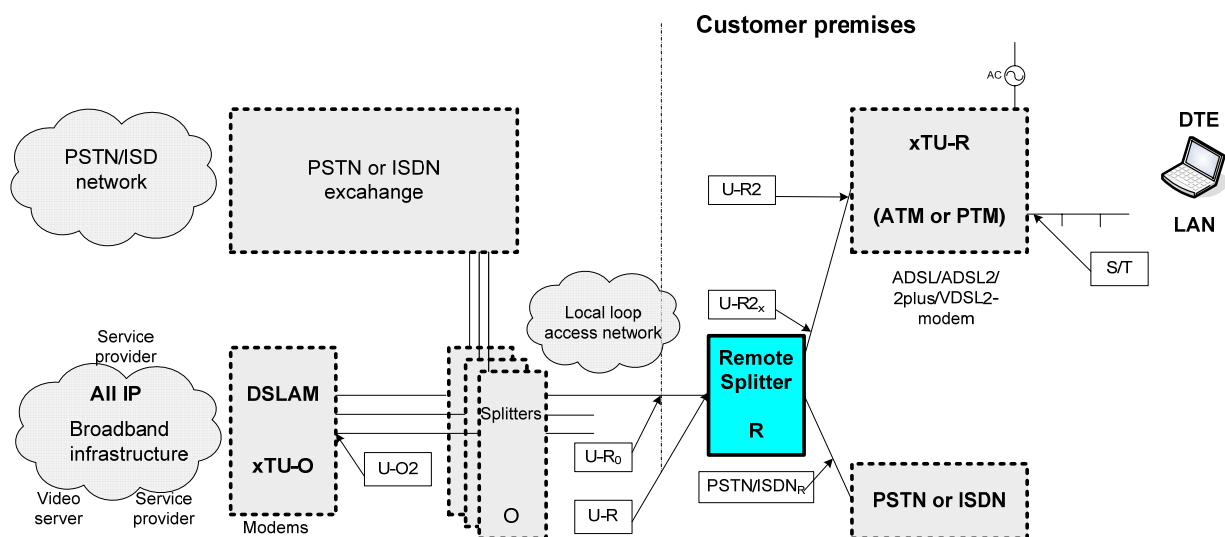


Figure 1 Configuration of equipment

If PSTN or ISDN services are provided on the same pair the provision of a remote splitter is mandatory.

For PSTN applications a telephone apparatus may optionally be connected to the U-R₀ interface, provided that a distributed filter is inserted. Application and requirements for such distributed filters are provided in the Telenor Networks Specification A84: *Specification for the network side of the user-network interface: Distributed filter (PSTN)* [16].

The presence of such a distributed filter does not influence on the requirements of the splitter.

4.2 Electrical requirements

The remote splitter shall preserve polarity independency and shall not include any signature networks.

The remote splitter shall comply with the electrical requirements for a splitter depicted in Telenor Norway Specification OA 105 [3] or OA 106.

4.3 Physical requirements and interfaces

Electrical connections to the remote splitter are performed by three electrical interfaces, each associated with a socket (outlet). The location of the three interfaces, denoted: “U-R” (line port), “U-R_{2A}” (xDSL port) and “PSTN/ISDN_R” (tele port) are depicted in figure 1.

4.3.1 Customer premise’s interface, U-R₀

The cord connecting the remote splitter to the access network shall be fitted with a plug mating a socket according to EN 60603-7 [6] (RJ45).

The wall socket (or equivalent female connector) complies with EN 60603-7 [6] (RJ45). Signals are present on pins 4 and 5.

4.3.2 Tele port, PSTN/ISDN_R

The socket shall be according to EN 60603-7 [6] (RJ45). The only contact pins provided shall be pins 4 and 5.

4.3.3 Line port, U-R (recommendations)

Vendor’s preference.

With RJ45 connectors on all or most of the interfaces (U-R, U-R_{2A}, U-R₀ and PSTN/ISDN_R), it is more convenient to adapt different lengths of relevant interconnecting cords. In this case pins 4 and 5 may be used.

4.3.4 xDSL port, U-R_{2A} (recommendations)

Vendor’s preference.

With RJ45 connectors on all or most of the interfaces (U-R, U-R_{2A}, U-R₀ and PSTN/ISDN_R), it is more convenient to adapt different lengths of relevant interconnecting cords. In this case pins 4 and 5 may be used.

Wiring with RJ11C / RJ14C is present on some xDSL modem (xTU-R).

If the remote splitter is incorporated in the (xDSL) modem this port may not be accessible.

4.3.5 External adaptor for one pair connections (optional)

The connecting hardware at customer’s premises with old wiring is the three-pin Norwegian/Finish type. In such cases an adaptor (as illustrated) with socket according to EN 60603-7 [6] (RJ-45) may as well be supplied.

Signals are present on pins 4 and 5.

4.4 Environmental requirements

4.4.1 CE-marking

Equipment shall comply with requirements specified in order to obtain the CE marking.

Title A82: Specification for the network side of the user-network interface: Remote splitter (PSTN/ISDN basic access)	Edition 2.0	Page 8 of 8
--	----------------	-------------

4.4.2 EMC

The EU directives concerning EMC are in force and conformance to these EU directives is mandatory. The EU directives are made legal also in Norway (1989/366/EØF, 1991/263/EØF, 1993/97/EØF, 1992/31/EØF, 1993/68/EØF, R&TTE Directive 1999/5/EC).

For requirements in Norwegian regulations, see the relevant EEC directives [14].

4.4.3 Resistibility

4.4.3.1 The use of gas discharge tubes

The *provision* of gas discharge tubes is not mandatory. If gas discharge tubes are provided, the requirements in Telenor Networks Specification OA 100 [2] shall apply.

4.4.3.2 Protection

The major power distribution system in Norway is the IT-system, which is more susceptible for electromagnetic disturbances. It is recommended that equipment connected to both telecommunication lines and to mains shall resist lightning pulses of 10 kV (enhanced test levels in K.21 [9]).

4.4.4 Climatic and mechanical recommendations

The splitters will typically be ordered in large quantities and distributed by one and one unit by public transportation.

4.4.4.1 Storage (recommendations)

Requirements in EN 300019-1-1 class 1.2 [10] apply for storage. Humidity is normally not controlled.

4.4.4.2 Transportation (recommendations)

Requirements in EN 300019-1-2 class 2.3 [11] apply for public transportation.

4.4.4.3 Operational (recommendations)

Requirements in EN 300019-1-3 class 3.2 [12] apply for stationary use at weather-protected locations. Equipment may be exposed to direct sunshine and humidity is normally not controlled. It is recommended that the equipment may operate over the temperature range of +5°C to +55°C.

4.5 Electrical safety

Requirements in CENELEC EN 60950 [8] apply in general.

Requirements in Norwegian regulations [15].