

TLN WRO Specification type Document

*< Telenet Wall Outlet (WO) interface
specification >*



Document Housekeeping

Document Category and type

| CAT | TYPE | DOC ID | Comment |
|-----|------|---------------------|---|
| TV | SPEC | TLN-WRO-TA-A-S-PAAA | Specification type documents (-SPEC) are documents specifying logical / physical interfaces / protocols, etc..., to which AO equipment/systems need to comply |

Document Authorization

| EDITION | DATE | APPRAISAL AUTHORITY | STATUS | ORIGINATOR |
|---------|------------|------------------------|--------|---------------------|
| 0.5 | 01.02.2012 | Director TLN Wholesale | Draft | TLN WRO Engineering |

Document Maturity State

| EDITION | DATE | APPRAISAL AUTHORITY | STATUS | ORIGINATOR |
|---------|------------|------------------------|------------------|---------------------|
| 0.1 | 30.11.2011 | Director TLN Wholesale | Concept(CO) | TLN WRO Engineering |
| 0.5 | 01.02.2012 | Director TLN Wholesale | Draft(DR) | TLN WRO Engineering |
| 0.9 | xx.xx.2012 | Director TLN Wholesale | Final Submit(FS) | TLN WRO Engineering |
| 1.0 | xx.xx.2012 | Director TLN Wholesale | Approval(AP) | TLN WRO Engineering |

Document Effective Date

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List of Appendixes

This document may refer to further detailed documents that are added in Appendixes to this document.

A reference to an appendix is in this document highlighted with grey background.

The list with appendixes of this document:

- A. Appendix A, <APP-A-C-PAAA-A> contains :
- 1) Appendix A1 - <Surge and lightening protection>

List of References

This document may refer to external documents or information sources.

A reference to an external document or information source is in this document highlighted with grey background.

The list of referred external documents or information sources in this document:

Reference 1 : <TLN WRO CAT: TV: TLN-WRO-TA-A-C-PAAA>

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1 **Abstract**

This document describes functional specification, requirements and non-functional requirements for TLN Wall Outlet.

This document has a corresponding certification document with reference: **TLN-WRO-TA-A-C-PAAA** which is used to test AO WO equipment compliance against this specification.

The feasibility of the technical designs and methods described in this document are subject to verification by a Proof of Concept (POC) test organized by Telenet and may be changed or updated depending on the outcome of this POC.

2 Glossary and Abbreviations

CPE: Customer Precise Equipment
DOCSIS: Data over Cable Service Interface Specification
EMC: Electro Magnetic Compatibility
FM: Frequency Modulation
NIU: Network Interface Unit
RF: Radio Frequency
WO: Wall Outlet

3 Wall Outlet Functional Description

- (1) The wall outlet (WO) is the termination point of the inbound coax cable at customer home which provides physical connectivity for CPEs. It contains connection points for analogue TV's, digital STB's and FM radio's.
- (2) In a customer home that has or has never had any "digital" services from Telenet or more precisely in customer homes where no active NIU is present, the WO also serves as the signal termination and transfer point between the "outside" network and the "in-home" coax network. The outside network is brought into the home via a "drop" cable which originates from the "tap" point on the outside Telenet coax plant and terminates on a WO. This particular WO, which is the first in line WO, terminates the drop cable, is the transfer or hand-over point between the outside Telenet network and the customer in home network. It is possible that more WO's are present in a customer's home that are daisy chained downstream from the main (hand-over) WO. Those types of WO's are not hand-over points and belong to the in-home network.
- (3) In some cases also a hand-over connector or hand-over device may be present, in which case this device is the formal termination and hand-over point. Also in this case a WO will have to be present after this hand-over connector / device, so for the sake of keeping the technical architecture documents of manageable complexity, the first in line WO will be referred as performing the role of signal transfer point for TV and radio signals.
- (4) In a customer home that is or will be enabled for interactive digital services requiring two way communications over the HFC network" a NIU is/will be present and as such the NIU is the termination and transfer point between the "outside" network and the "in-home" coax network. One or more WO's will be connected to the downstream ports of the NIU. STB's will be connected via a coax patch cord cable to such a WO as well as classical analogue TV sets or FM radio's.
- (5) All the different types of WO's discussed above are technically the same and need to be compliant to the specification

4 Wall Outlet Functional Requirements

4.1 RF Requirements

4.1.1 *Insertion Loss*

(6) Insertion Loss Requirement for Wall Outlet is shown in below figure.

| Parameter | Requirement |
|--------------------------------------|-------------|
| Insertion Loss IN → TV 5 - 75 MHz | <1.0dB |
| Insertion Loss IN → TV 116 - 125 MHz | <3.0dB |
| Insertion Loss IN → TV 125 - 862 MHz | <1.0dB |
| Insertion Loss IN → FM 88 - 108 MHz | <3.0dB |

Figure 4-1

4.1.2 *Return Loss*

(7) Return Loss Requirement for Wall Outlet is shown in below figure.

| Parameter | Requirement |
|---|--------------------------------|
| Return Loss IN 5 - 862 MHz (65 - 88 MHz and 108 - 116 MHz not relevant) | >18dB -1.5dB/oct. ¹ |
| Return Loss TV 5 - 862 MHz(65 - 108 MHz not relevant) | >14dB -1.5dB/oct. ² |
| Return Loss FM 88 -108 MHz | >10dB |

Figure 4-2

4.1.3 *TV to FM Signal Isolation*

(8) TV to FM Signal Isolation Requirement for Wall Outlet is shown in below figure.

| Parameter | Requirement |
|---|-------------|
| Isolation TV → FM 5 -862 MHz (65 - 88 MHz and 108 - 116 MHz not relevant) | >10dB |

Figure 4-3

4.1.4 *Group Delay*

(9) Group Delay Requirement for Wall Outlet is shown in below figure.

| Parameter | Requirement |
|--|-------------|
| Group Delay 116 - 862 MHz IN → TV (8 MHz Band) | <50ns |

Figure 4-4

4.1.5 EMC Screening

(10) EMC Screening Requirement for Wall Outlet is shown in below figure.

| Parameter | Requirement |
|-----------------------|-------------|
| Screening 5 - 862 MHz | >75dB |

Figure 4-5

4.2 AO Device Management by TLN Requirements

4.2.1 *Concept and purpose*

(11)As this document describes the Wall Outlet Interface Specification, Concept and Purpose are not applicable.

4.2.2 *Device management Functions*

(12)As this document describes the Wall Outlet Interface Specification, Device Management Functions are not applicable.

4.2.3 *SNMP MIB specifications*

(13)As this document describes the Wall Outlet Interface Specification, SNMP MIB specifications are not applicable.

4.2.4 *Reset and Factory Reset specifications*

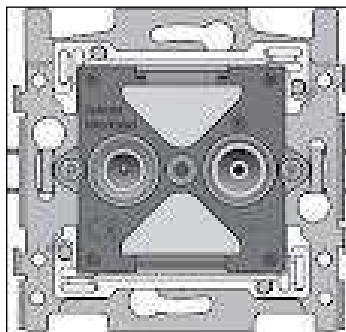
(14)As this document describes the Wall Outlet Interface Specification, Reset and Factory Reset specifications are not applicable.

5 Wall Outlet Non - Functional Requirements

5.1 Mechanical Requirements

5.1.1 *Housing*

- (15) Full metal housing is required to be compliant with listed EMC screening requirements.
- (16) The wall outlet's should be suitable for build-in (must fit 60mm build-in wall box) or alternatively for build up (surface mounting). TV & FM ports shall be placed on front of the WO cover plate and shall be clearly labeled. The figures below show, as an example a typical design for a build-in WO.



5.1.2 Diagnostic Leds

(17)The Wall Outlet does not include any diagnostic leds for troubleshooting purposes.

5.1.3 Labels

(18)Following labels must be printed on the Wall Outlet.

- TV
- FM
- TELENET INTERNETKABEL

5.1.4 TV and FM Radio connectors

(19)Below listed connector types are required for Wall Outlet- TV and FM Radio connections.

- TV port: coaxial output MALE - EN500083-4 HD 134.2 S2 male IEC 169-2
- FM port: coaxial output FEMALE - EN500083-4 HD 134.2 S2 female IEC 169-2

5.2 Environmental Requirements

5.2.1 Packaging

(20)TLN does not impose any requirements as this is the responsibility domain of the AO. However it is strongly advised to AO to follow industry standard practices

5.2.2 RoHS and WEEE compliancy

(21)RoHS is defined as the directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment on 2002/95/EC and the abbreviation for Restriction of Hazardous Substances. This directive is closely linked with Waste Electrical and Electronic Equipment Directive (WEEE) - 2002/96/EC.

(22)These directives are in the responsibility domain of AO, and TLN does not impose any requirements. AO is strongly advised to follow the standards and the requirements imposed by law about RoHS.

5.2.3 EU CoC compliancy

(23)TLN does not impose any requirements as this is the responsibility domain of the AO. However it is strongly advised to AO to follow industry standard practices and any requirements in this domain imposed by law should be met.

5.3 Safety Requirements

5.3.1 Surge and Lightning protection

(24)TLN requires that AO CPE devices are protected against over-voltages on their different interfaces. This is to guarantee customer safety under all conditions and to protect other CPE equipment.

(25)The exact requirements are listed in **Appendix A1** to this document.

5.3.2 Temperature and Humidity

(26)TLN does not impose any requirements as this is the responsibility domain of the AO. However it is strongly advised to AO to follow industry standard practices.

5.3.3 Fire resistance

(27)TLN requires AO to select equipment that has at least protection class 121, and has all parts halogen free / self-extinguishing.

(28) It should be noted however that being fully compliant with all legal requirements for CPE is the full and sole responsibility of the AO.

5.4 EU Consumer Goods label Requirements

5.4.1 CE - mark

(29) CE marking (originally EC mark) is a mandatory conformity mark for products placed on the market in the European Economic Area (EEA). With the CE marking on a product the manufacturer ensures that the product conforms to the essential requirements of the applicable EC directives. The letters "CE" stand for "Conformité Européenne" ("European Conformity").

This conformity is in the responsibility domain of AO, and TLN does not impose any requirements. AO is strongly advised to follow the standards and the requirements imposed by law.