Test Report No. EWB40192-21-TR2

Neutrik RJ45 Coupler NE8FDX-P6 / NE8FDX-P6-B

Initial Sample Testing

Link Test 4-connector channel

Tested according to ISO/IEC 11801 Ed. 2.2 Class E_A

Tested for

Neutrik AG

Im alten Riet 143

9494 Schaan

Liechtenstein

REAL-TIME RE-EMBEDDED

REAL-TIME DIRECT-FIXTURE

Contents

1 Test Description

1.1 General/Overview

With initial sample testing, the Telegärtner Labs evaluate whether an infrastructure component complies with national or international standards. With this sort of testing, selected samples are usually tested before the production of a series starts.

To ensure superior product quality, the Telegärtner Labs test passive components and devices according to the most demanding national and international standards.

With Telegärtner's Real-time Re-embedded testing procedure, components and devices are tested according to the demanding category 6_A specifications. However, these specifications are not relevant for all kinds of components. Depending on the very type, they have to be tested as individual components or as part of an assembly or a link.

Telegärtner is one of the very few companies who are able to test components without the need for baluns to be used as an adapter between the tester and the device to be tested. Telegärtner's direct fixture test procedure allows the fixture of the device under test to be connected directly to the tester. This leads to more precise and more reliable test results than usual test procedures.

In the event that links or assemblies must be investigated using field test equipment, Telegärtner is using the state of the art equipment from all market-leading equipment manufacturers. To ensure that the most current equipment and the test procedures are employed, Telegärtner is in regular exchange with the R&D departments of all those equipment manufacturers.

For a detailed description of the component to be tested, please refer to chapter *1.2 Device under Test (DUT)*.
The standards against the component is tested are listed in chapter *1.4 Applicable Standards*.

1.2 Device under Test (DUT)

The following component was tested in the Telegärtner Lab:

Neutrik RJ45 Coupler NE8FDX-P6

The test applies also for the following coupler type as the printed circuit board and contacts are the same as in the type above:

Neutrik RJ45 Coupler NE8FDX-P6-B

Technical data of the DUT according to supplying company:

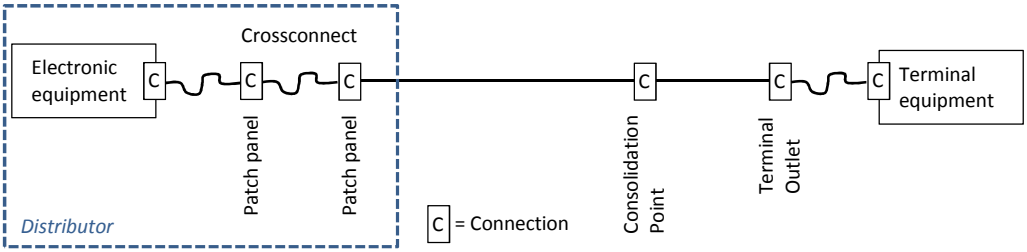
Product	
Title	NE8FDX-P6
Gender	female
Electrical	
Dielectric strength	1 kVdc
Insulation resistance	> 0.5 GΩ
Rated current per contact	1.5 A
Transmission performance	CAT6A, acc. TIA/EIA rating Class E_A, acc. IEC/ISO/EN rating
Power over Ethernet	PoE+ acc. IEEE 802.3at
Mechanical	
Lifetime	> 1000 mating cycles
Wiring	Feedthrough
Locking device	Latch lock
Mounting direction	Vorne
Material	
Contact plating	Au
Shell	Zinc diecast (ZnAl4Cu1)
Shell plating	Nickel
Environmental	
Flammability	UL 94 V-0
Temperature range	-40 °C to + 70 °C

1.3 Parameters to be tested

The following parameters of the DUT were tested:

Channel performance in a 4-connector channel

Crossconnect – Consolidation Point – Terminal Outlet Model



Notice that category 6_A specifications according to ISO/IEC 11801 Ed. 2.2 apply only to single RJ45 jacks and are not intended to be used for RJ45 jack-jack couplers as well. A general consensus reached between technical experts from the ISO/IEC is, that any component for which no direct test procedure was agreed can only be tested indirectly in the sense that the presence of such a component in a transmission channel must not deteriorate the channel performance compared to an equivalent channel without such a component.
Following that doctrine the standard Telegärtner lab procedure for testing jack-jack couplers is to test against a 4 connector channel using two couplers.

1.4 Applicable Standards

The device was tested according to the following standard:

ISO/IEC 11801 Ed. 2.2 Class E_A

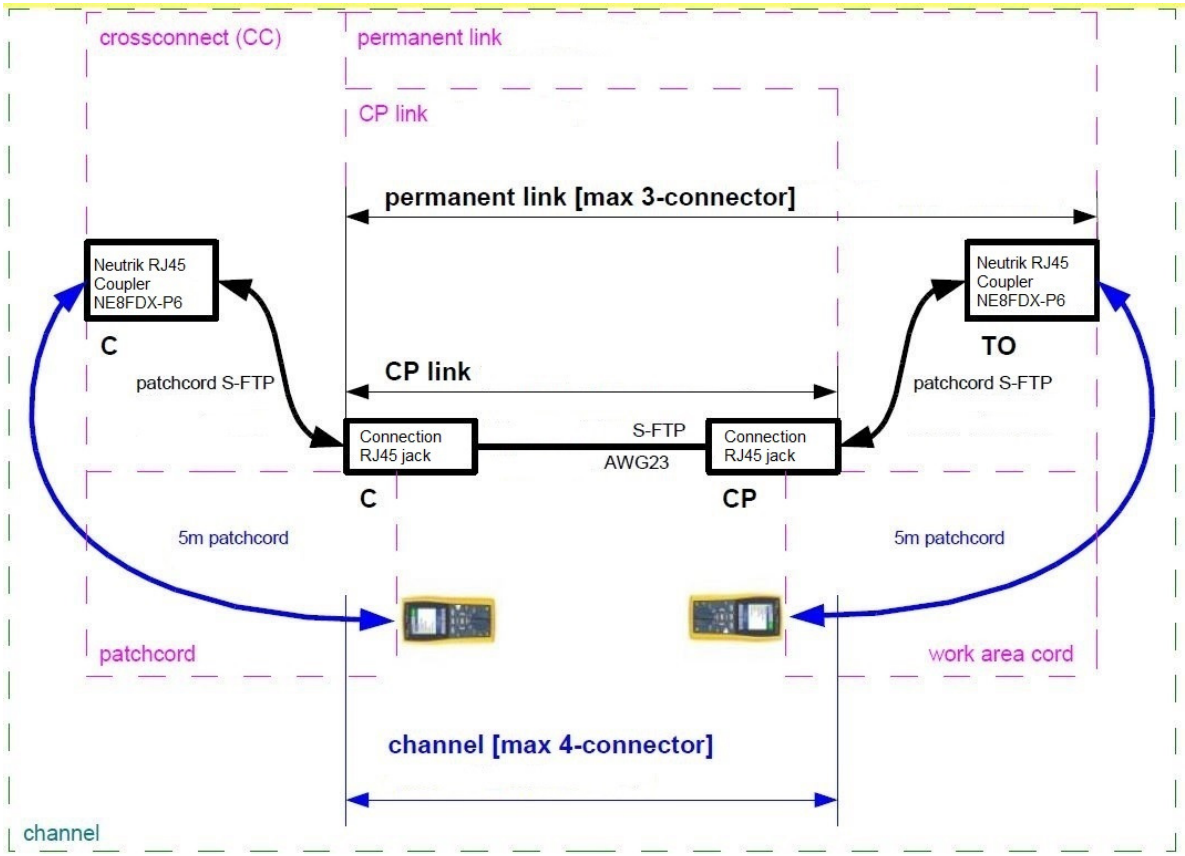
2 Test Setup

2.1 General/Overview

The test was conducted in the Telegärtner Lab in Steinenbronn, Germany, as described in chapter 2.2 Test Setup, in a standard lab environment.

2.2 Test Setup

The device under test was connected to a link resembling the typical horizontal cabling. The whole link was tested with a field tester Fluke DTX-1800 with channel link adapters as is appropriate on construction sites.



Test setup with Fluke DTX-1800 with all components and couplers shown.
The length of the S-FTP AWG23 solid cable is 15 m. All patch cords are AWG27/7 stranded cable with a length of 5 m.

2.3 Tester

Fluke DTX-1800
The test uncertainty of a Fluke DTX-1800 is less than 1 dB for the entire frequency range.

Fluke DTX-1800 tester; channel test adapters not shown.

2.4 Test Adapter

Fluke standard channel test adapter.

3 Testing

3.1 General/Overview

The test was conducted in the Telegärtner Lab in Steinenbronn, Germany.
It was conducted in a standard lab environment. No special EMC cabin was used.

3.2 Date

Date of the test: 23.10.2015

3.3 Tester/Test Device Numbers

Fluke DTX-1800
Serial number 9814327
TG number M06015A0117
Serial number main unit: 8635106
Serial number remote unit: 8624017

Fluke channel test adapter
(wearing part without serial number)

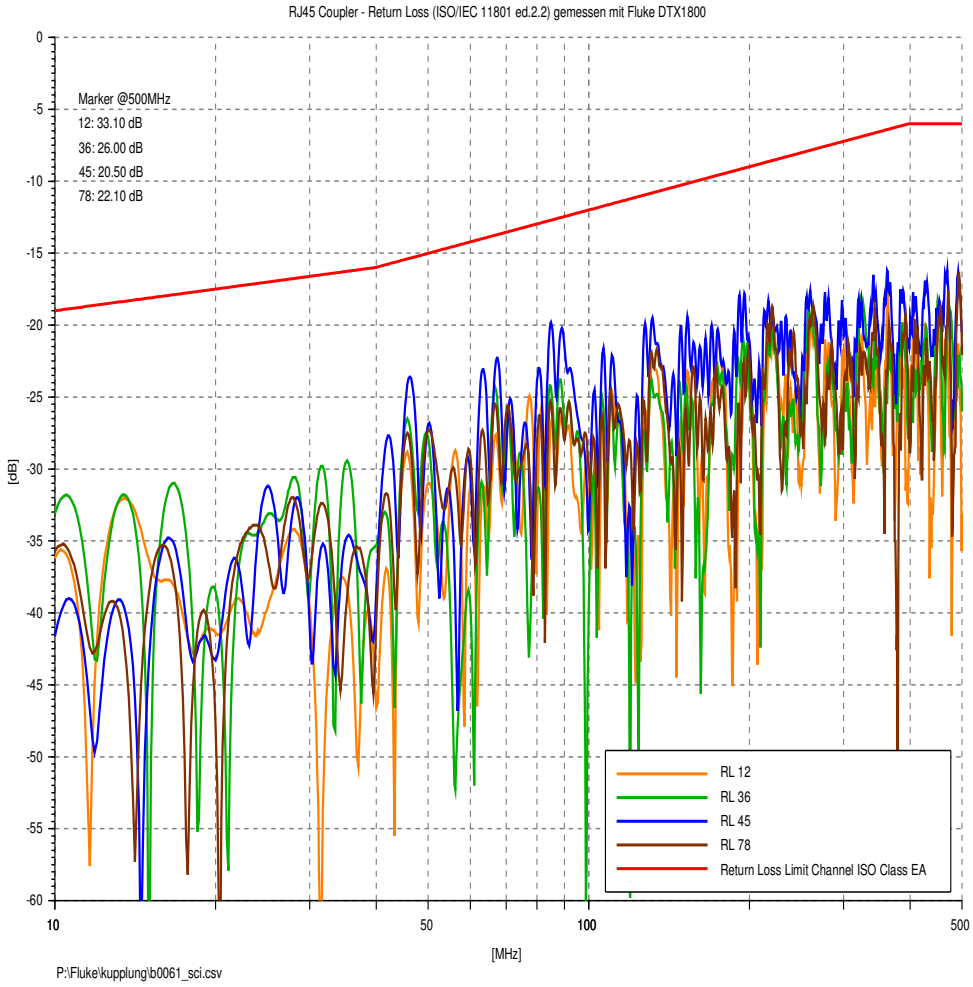
3.4 Technician

Test technician:
Frank Albert
Lab Technician

3.5 Test Data

The following graphical data was obtained during the tests:

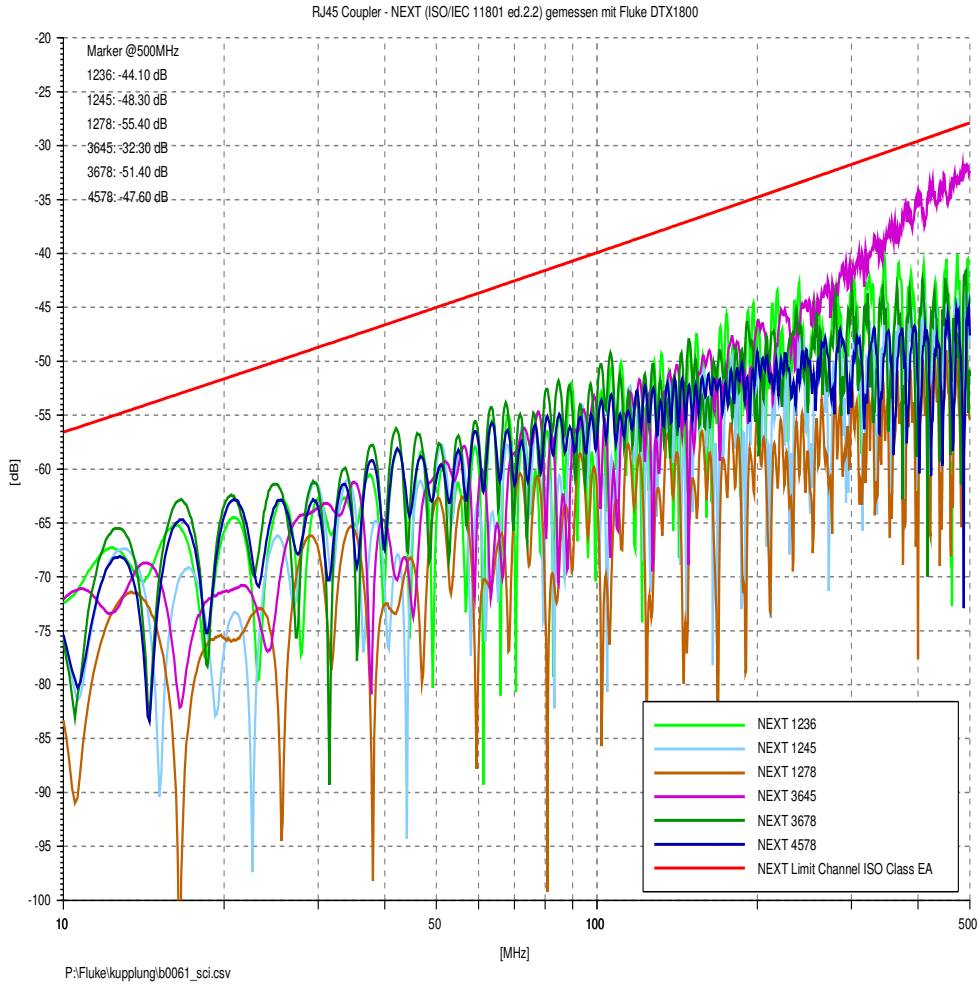
a) Return loss



The return loss test result of all pairs shows significant headroom with respect to the specified values. There are neither visible artifacts nor deterioration patterns which could be attributed to the presence of the couplers.

Please refer to chapter *4.2 Summary of the Test Data* for further, important information.

b) NEXT



The NEXT test results of pair combinations 12-78, 12-36, 12-45, 36-78 and 45-78 are well below the specified values. This is in line with the notion that cross talk between the most distant outer pairs 12 and 78 as well as the cross talk between inner pairs 36 or 45 to the outer pairs 12 or 78 should be small because of the larger separation of those pairs. The cross talk between the split inner pair 36 and the most inner pair 45 is also as expected significantly larger but also below the specified limit values.

Please refer to chapter *4.2 Summary of the Test Data* for further, important information.

4 Test Results

4.1 Summary of the Test Data

The **return loss test result** of all pairs is better than the specified values.

The **NEXT test result** of all pair combinations, including the innermost pair combination 36-45 is in line with the specified values.

4.2 Conclusion/Recommendations

The results of the test, parameters NEXT and Return Loss tests can be regarded as

PASS

As couplers are not part of the current issue of ISO/IEC 11801 Ed. 2.2 they should not be regarded as an individual component but only be used as part of the entire link, e.g. in the cross-connect or the consolidation point.
Furthermore, it is a general principle laid out in ISO/IEC 11801 that the attenuation of the link is a critical parameter which influences significantly Return Loss as well as cross talk NEXT/FEXT. The underlying mechanism is that a too large reflected signal power superimposes on DUT signal power and thus leads to systematically too large or to small results. This is taken into account in the ISO/IEC 11801 by requiring a minimum insertion loss of 3dB for valid Return Loss measurements and of 4dB for valid NEXT measurements.
Therefore Telegärtner recommends for a valid link test set-up a minimum length of 15m for typical cabling. For short links with a length below 15m which in general are not covered by standard test procedures according to IEC 11801 a different measurement methodology should be considered. E.g. for short links with multiple segments it is a generally accepted test approach to resort to the IEC test procedures for patch cords.

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