KLOTZ Tech Blog

Herding cats – or, the eternal problem of CATegorizing

Hold onto your seats – we're going to get technical here. This subject constantly crops up for the KLOTZ customer support team. So we'd like to do some straight talking to any of our customers and partners, or anyone else, that is confused by network cable transmission quality issues and flounders when confronted with the various protocols and categories.

First, it's important to know that all individual elements – so mainly the bulk cable and connectors (generally RJ45 or etherCON) are categorized separately under the universal global standard ISO/IEC 11801.

Category 5e is designed for operating frequencies up to 100 MHz and XX Gigabit Ethernet or lower
Category 6 is designed for operating frequencies up to 250 MHz and XX Gigabit Ethernet or lower
Category 6A is designed for operating frequencies up to 500 MHz and 10 Gigabit Ethernet or lower
Category 7 is designed for operating frequencies up to 600 MHz and 10 Gigabit Ethernet or lower
Category 7A is designed for operating frequencies up to 1,000 MHz and 10 Gigabit Ethernet or lower

It's essential to know that the classification of patch cables that's required under the DIN EN 50173-1:2011-09 standard only refers to the bulk cable used, and not to the complete pre-made cable! This often causes confusion in practice. For example, if you see "Category 7" printed on a Category 6 patch cable, it refers to the bulk cable only but not the connectors! Once made up with RJ45 connectors, the patch cable does not comply with Category 7 specs – and indeed can't, because RJ45 connectors that meet Category 7 specs for all four wire pairs simply don't exist. It's crucial to pay careful attention to the specific categories of the individual components.
The performance of a patch cable is determined by the quality of the bulk cable and connectors, but also – and primarily – by the quality of the workmanship in producing the finished cable. As part of this, the cable and connector must be carefully matched. Bulk cable may have the best specs around, but if it is made up with inferior-quality connectors the result will be a low-performance cable.

Our KLOTZ RamCAT series can boast a highly successful ten-year track record. The RCB cable range in particular (AWG24/1 solid conductor, SF/UTP) was designed as a collection of 'universal' cables that can handle all current and foreseeable network protocols in event technology.

In summary, more important than the category of bulk cable used is the whole package – the combination of precisely matched top-quality components, which is essential for reaching full potential over the transmission distance. Once again, KLOTZ RCB cables offer an impressive example of the right way to do this. 100m in length, they are made up with meticulously matched components (Cat.5e) and pass all Channel Class E measurements (Cat. 6) with flying colours!

LINKWARE
CABLE TEST MANAGEMENT SOFTWARE

Kabelkennung: RC5-SB1X 100M TR33603 #2

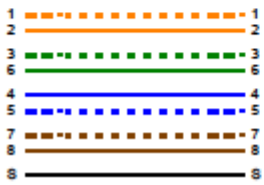
Testzusammenfassung: PASS

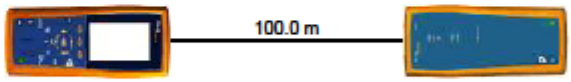
Datum/Uhrzeit: 14.02.2017 10:53:21
Reserve: 8.5 dB (NEXT 36-45)
Grenzwert: ISO11801 Channel Class E
Kabeltyp: * XY *

Bediener: M. MENIG
Software-Version: 2.7700
Grenzwerte Version: 1.9400
NVP: 73.8%

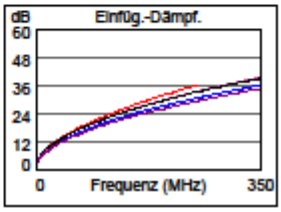
Modell: DTX-1800
Hauptgerät S/N: 9703195
Remote S/N: 9703196
Adapter Hauptgerät: DTX-CHA001
Adapter Remote: DTX-CHA001

Wire Map (T568B)
PASS

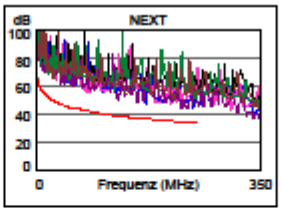


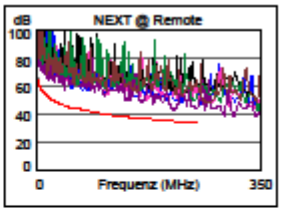


Länge (m)	[Paar 78]	100.0
Laufzeit (ns), Grnz. 555		474
Abweichung (ns), Grnz. 50		22
Widerstand (Ohm), Grnz. 25.0		16.4
Einfüg.-Dämpf. Reserve (dB)	[Paar 36]	2.7
Frequenz (MHz)	[Paar 36]	250.0
Grenzwert (dB)	[Paar 36]	35.9

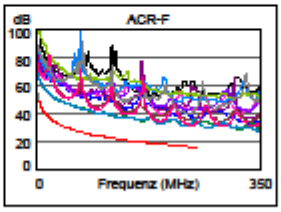


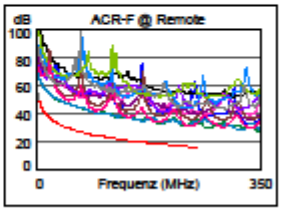
	Min. Abstand		Min. Wert	
PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	36-45	36-45	36-45	36-45
NEXT (dB)	9.2	8.5	9.2	8.5
Freq. (MHz)	227.5	212.5	227.5	212.5
Grenzwert (dB)	33.8	34.3	33.8	34.3
Schlechtest Paar	36	36	36	36
PS NEXT (dB)	10.0	10.8	10.0	10.8
Freq. (MHz)	237.0	218.5	237.0	218.5
Grenzwert (dB)	30.6	31.2	30.6	31.2



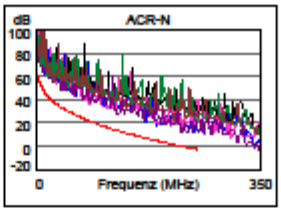


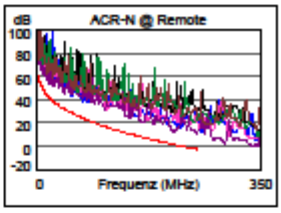
PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	45-36	36-45	45-36	36-45
ACR-F (dB)	14.3	14.6	14.3	14.6
Freq. (MHz)	228.5	196.0	228.5	228.5
Grenzwert (dB)	16.1	17.4	16.1	16.1
Schlechtest Paar	36	36	36	36
PS ACR-F (dB)	15.0	16.9	15.2	16.9
Freq. (MHz)	195.0	194.5	237.0	239.5
Grenzwert (dB)	14.5	14.5	12.8	12.7



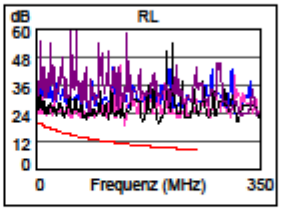


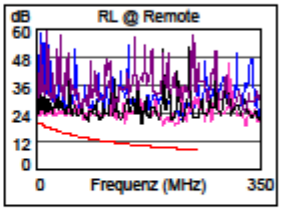
PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	36-45	36-45	12-36	36-45
ACR-N (dB)	12.0	11.0	13.7	13.1
Freq. (MHz)	227.5	212.5	245.5	250.0
Grenzwert (dB)	-0.3	1.5	-2.3	-2.8
Schlechtest Paar	36	36	36	36
PS ACR-N (dB)	12.7	12.9	12.7	15.0
Freq. (MHz)	237.0	4.1	237.0	250.0
Grenzwert (dB)	-4.3	56.1	-4.3	-5.8





PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	36	36	36	36
RL (dB)	4.4	3.8	7.7	10.0
Freq. (MHz)	3.5	7.8	139.0	217.0
Grenzwert (dB)	19.0	19.0	10.6	8.6





Erfüllte Network Standards:

10BASE-T	100BASE-TX	100BASE-T4
1000BASE-T	ATM-25	ATM-51
ATM-155	100VG-AnyLan	TR-4
TR-16 Active	TR-16 Passive	

LinkWare Version 6.2

Projekt: DEFAULT
Ort: Kundenname

FLUKE networks

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