BUILDING GLOBAL COMMUNICATIONS

TR-42 – Engineering Committee on User Premises Telecommunications Infrastructure

Date: May 19, 2000
To: Geoff Thompson, Chair IEEE 802.3
Jim Carlo, Chair IEEE 802
cc: John Siemon, Chair TR 42.1, US TAG SC 25 WG 3
Chris Diminico, IEEE Liaison
From: Paul Kish, Chair TR-42
Subject: Liaison Letter to IEEE on DTE Power via MDI

Please find below a response to the IEEE 802.3 request for information regarding DTE Power via MDI. This response was developed by the TR42.1 DTE Power Task Group and provides most of the information requested. Some of the parameters, namely balance and cycling under power are not available at this time, however, they are marked as TBD. Further information will be provided to the IEEE, as it becomes available.

Information Requested:

- Worst case loop resistance (element-by-element analysis)
- Allowable loop dissipation (temp rise in w.c. bundles), maximum temperature of cabling behind the wall?
- Worst case connector contact resistance, ampacity, cycling with power
- Information on parameter limits (voltage, current, power, source impedance, etc.) for world-wide standard (I.e. restrictions beyond SELV)
- Specification references for parameter limits
- What percentage of 60603-7 connectors world-wide terminate less than 4-pair?
- DC imbalance in cables, cabling
- What did we miss?

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Response to the Request For Information in regards to DTE Power via MDI.

Electrical:

UTP Cables:

- ANSI/TIA/EIA-568-A, Section 10.2.4.1, DC Resistance: shall not exceed 9.38 ohms per 100 m (328 ft) at or corrected to a temperature of 20 °C.
- 0.4 % increase per degree C (DC correction-ASTM Test Method B 193-[0.393%])
- DC Loop Resistance =

Temp (C)	DC Loop	% increase
20	18.76	
40	20.26	8
50	21.01	12
60	21.76	16

- ANSI/TIA/EIA-568-A, 10.2.4.2 DC resistance unbalance: shall not exceed 5% (20 °C) measured per ASTM D 4566
- ANSI/TIA/EIA-568-A, 10.2.4.4 Capacitance unbalance: at 1 kHz, shall not exceed 330 pF per 100 meter measured per ASTM D 4566
- Balance, LCL, LCTL (TBD)

100 ohm ScTP patch cords and cross-connect:

- TIA/EIA/IS-729 - DC resistance: For 26 AWG conductors, the resistance of the conductors shall not exceed 14 ohms per 100 meters (328 ft) at or corrected to a temperature of 20 °C. (DC correction - ASTM Test Method B 193-[0.393%])

Connectors:

- ANSI/TIA/EIA-568-A, Section 10.4.4.4, DC Resistance: shall not exceed 0.3 ohms, measured per ASTM D 4566.
- Contact Resistance - initial - </= 1 mΩ - after reliability tests- change of </= 5 meters
- CEI IEC 603-7 - current capacity for connectors @20 °C - 1.8 A (@ 0 °C - 2.2 A, @ 40 °C - 1.4 A, @ 60 °C - 0.75 A)
- UL 1863 - 250 V
- Cycling with power (TBD)
- Balance, LCL, LCTL (TBD)

Link Segment (3 connectors):

- DC Resistance

Temp (C)	DC Loop	% increase
20	20.56	
40	22.06	8
50	22.81	12
60	23.56	16

TIA/EIA/TSB95 - Channel (4 connectors):

- DC Resistance

Temp (C)	DC Loop	% increase
20	21.16	
40	22.66	8
50	23.41	12
60	24.16	16

Safety:

- SELV - CSA C22.2 No. 950/ UL1950 (CEI/IEC 950)1.2.8.5 Safety Extra-Low Voltage (SELV) Circuit: - 60VDC
- PART 68 – Sec. 68.215 – CONNECTION OF TERMINAL EQUIPMENT TO THE TELEPHONE NETWORK

Maximum Continuous Current Capacity of PVC Insulated Copper Wire

Wire size, AWG	Circular mils	Maximum current amperes
26	254.1	1.3
24	404.0	2.1
22	642.4	5.0

The table assumes a 45 °C temperature rise for wire sizes 22 AWG or larger, and a 40 °C rise for wire sizes smaller than 22 AWG, for polyvinyl chloride insulating materials, and should be regarded as establishing maximum values to be derated accordingly in specific installations where ambient temperatures are in excess of 25 °C:

Note: The total current in all conductors of multiple conductor cables may not exceed 20% of the sum of the individual ratings of all such conductors.

PCB:

- CEI IEC 60603-7: current capacity for connectors @20 °C **-** 1.8 A (@ 0 °C - 2.2 A, @ 40 °C - 1.4 A, @ 60 °C - .75 A)

Ambient:

- Environmental Compatibility: operational temperature range is specified as - 10 °C to 60 °C
- Building ambient: 50 °C is a reasonable building ambient maximum temperature. This is based on a report titled “Heat Island Project” prepared for the U.S. Environmental Protection Agency by Lawrence Berklely National Laboratory (L. Rainer, Davis Energy Group).

Thank you for the opportunity to respond to your request for information. This project is of interest to TR-42.1, TR-42.7 and TR-42 membership. Please advise us on future developments that relate to telecommunications cabling and component requirements.

Sincerely,