

Addendum to “Primary Drive Noise Measurements”

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Purpose

- The purpose of this presentation is to:
 - Present addendum material to:
 - brandt_cg_01b_0517.pdf (presented in New Orleans)
 - Related to characterization of the IEC 61158-2 type A Fieldbus cable that was used
- A cable sample was sent to Bryan Moffitt at CommScope for characterization

Test cable

- Belden 3076F
 - <http://www.belden.com/techdatas/metric/3076F.pdf?ip=false>
- 1 pair 18 AWG stranded (7x26) tinned copper conductors
- Polyolefin insulation, polyolefin filler
- Beldfoil® shield (100% coverage),
- Tinned copper drain wire
- PVC jacket.
- Fieldbus Foundation Registered Product
- Beldfoil® Tape = Aluminum Foil-Polyester Tape, 100% coverage

Setup

- 15 m of Belden 3076F
- 4-port VNA
- Test adapter

Result

- S-parameter measurements transformed to the expected impedance (100 Ω differential, 25 Ω common mode) indicated a mismatch
- Transformation to 70 Ω differential and 20 Ω common mode shows a better match.
- A simple model shows 100 Ω at 20 kHz, but 72 Ω through most of our communication range

Conclusions

- Different IEC 61158-2 type A Fieldbus cables may match poorly to $100\ \Omega$ at both the transmitter and at receiver
- We should factor this into our estimates
- It may be warranted to characterize more samples