

Application Note

Ethernet Extender Performance

By Stan Simmons, Product Manager, B&B Electronics

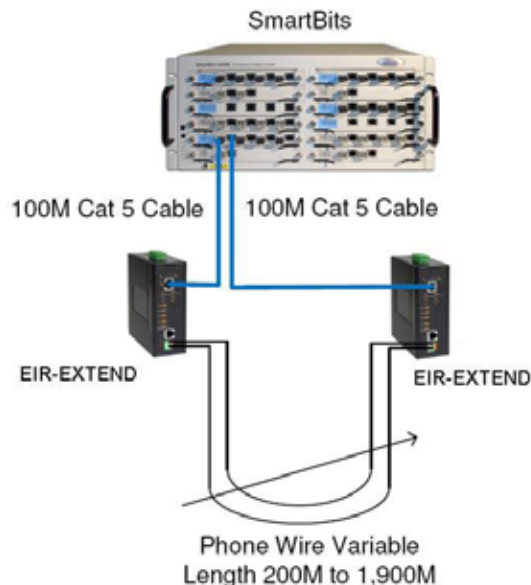
Overview

This is an application note explaining the performance of B&B's Ethernet extender products. This application note covers two different types of Ethernet Extenders from B&B. One is the single pair copper wire extenders (EIS-EXTEND & EIR-EXTEND). The second is the coaxial cable extenders (EIS-EXTEND-C & EIR-EXTEND-C). Within each extender type of product there are hardened and industrial grade products but the engine and DSL profile used within each type is the same. This allowed us to perform the testing using one pair of extenders for single pair copper wire and one pair of extenders for coaxial cable.

Test Setup

(Single Pair Copper Wire "Telephone Wire" Extenders):

We are surrounded by applications that call for creative communication and monitoring solutions. Increasingly, end users are searching for comprehensive solutions to applications. Whether adding remote I/O to a legacy PLC, extending analog and digital monitoring to a remote plant, or connecting serial devices without creating new hardwired links, industrial users want solutions that are simple to implement, reliable and cost-effective.

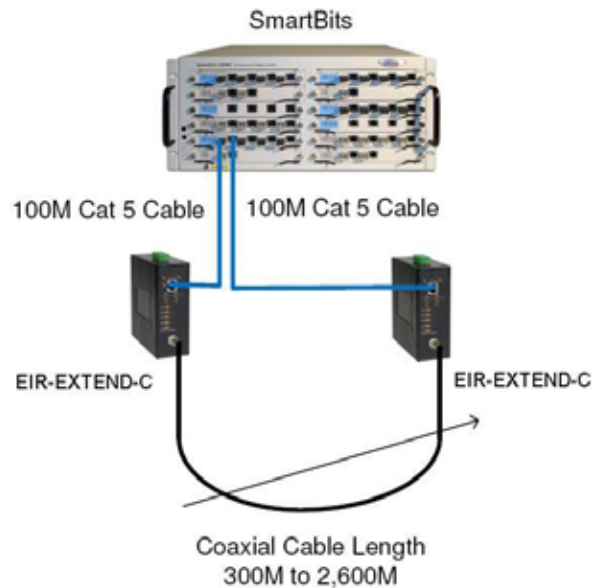


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The EIR-EXTEND units are connected to a SmartBits tester via 100 meters of category 5 Ethernet cable. The two EIR-EXTEND units are connected together using discrete lengths of standard telephone cable. The environment is a test laboratory. Why Wireless?

Test Setup (Coaxial Cable Extenders):



The EIR-EXTEND-C units are connected to a SmartBits tester via 100 meters of category 5 Ethernet cable. The two EIR-EXTEND-C units are connected together using discrete lengths of standard coaxial cable (RG6). The environment is a test laboratory.

Test Parameters:

Mode: Single Burst (Approximately 3 minutes)

Packet Length: Random

Flow Control: Enabled

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Procedure:

Transmit on all ports at the same time (full duplex)
Count Errors
 Lost Packets
 CRC Errors
 Alignment Errors

Results:

The following table shows the results of testing a pair of EIR-EXTEND units with varying lengths of standard phone wire connected between them. The speed (bit rate) and distance are with values that yielded zero (0) errors during the 3 minute burst of packets.

Single Pair Copper Wire "Telephone Wire"

| Speed | 50Mbps | 40Mbps | 30Mbps | 25Mbps | 20Mbps | 15Mbps | 10Mbps | 5Mbps | 3Mbps |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Cable Length | 200m | 500m | 800m | 900m | 1,000m | 1,100m | 1,500m | 1,600m | 1,900m |

The following table shows the results of testing a pair of EIR-EXTEND-C units with varying lengths of coaxial cable connected between them. The speed (bit rate) and distance are shown with values that yielded zero (0) errors during the 3 minute burst of packets.

Coaxial Cable

| Speed | 75Mbps | 70Mbps | 60Mbps | 50Mbps | 40Mbps | 30Mbps | 20Mbps | 10Mbps | 5Mbps |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Cable Length | 300m | 700m | 800m | 1,000m | 1,100m | 1,600m | 1,800m | 2,300m | 2,600m |

Note: These tests were performed in a clean environment without extraneous noise sources and with new cable. Actual results in field conditions with aging cable may yield different results.