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Ethernet Alignment and FCS Errors

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Question

- What causes Alignment and FCS Errors on my Ethernet device?
- What could happen if I have a duplex mismatch situation in my Ethernet devices?
- Why can't I ping my processor?
- What do CRC and FCS errors mean in terms of troubleshooting an Ethernet problem?

Answer

It is possible to access EtherNet Media Counters for most of Allen-Bradley EtherNet Modules using a web browser. When viewing the web page diagnostics of an Ethernet Device (1756-EN2T, 1756-ENBT, 1769-L32E, 1769-L35E, 1788-ENBT, 1794-AENT...) you may see a significant number of Alignment Errors and FCS Errors.

Note: Stratix switches also have FCS and Alignment counters if you go to *Monitor --> Port Statistics --> Receive Detail*

Media Counters	
Alignment Errors	159316
FCS Errors	6393409
Single Collisions	0
Multiple Collisions	0
SQE Test Errors	0
Deferred Transmissions	0
Late Collisions	0
Excessive Collisions	0
MAC Transmit Errors	0
Carrier Sense Errors	0
Frame Too Long	0
MAC Receive Errors	10

Duplex Mismatch

Auto negotiation is out-of-the-box easy to use and reliable. If your company policy is to force the duplex and speed, this is legitimate. However, if you force, remember to force **both** of the following:

- Switch port
- Corresponding end-device

Otherwise, there will be a mismatch and communications problems will occur.

Auto-Negotiating Port

The Auto-Negotiating port will default to Half-Duplex while the forced port remains in Full-Duplex, which causes a duplex mismatch situation. Depending on the timing of who-transmits-when, the problem may not be obvious or it could be very obvious.

Examine **both** of the following for Ethernet errors:

- Switch port
- End-device (such as 1756-ENBT web page diagnostics)

Signature Errors

Signature errors for duplex mismatch include:

- Late collisions
- FCS/CRC errors
- Alignment errors

Additional Information

- Ethernet devices in a duplex mismatch situation result in:
 - Slow performance
 - Intermittent connectivity
 - Data link errors, etc.
- The Alignment and FCS errors are detected when the full-duplex port will transmit without listening, and this will sometimes corrupt the messages transmitted by the half-duplex port.
- If a hub or unmanaged switch is utilized, then all devices need to be configured for Auto Negotiate.
- Rockwell Automation Ethernet devices are configured for auto negotiation from the factory. Power cycles are required for configuration changes to take effect.

Additional Troubleshooting

See [57174 - EtherNet/IP Book of Knowledge](#)

(http://rockwellautomation.custhelp.com/app/answers/detail/a_id/57174) presentation.

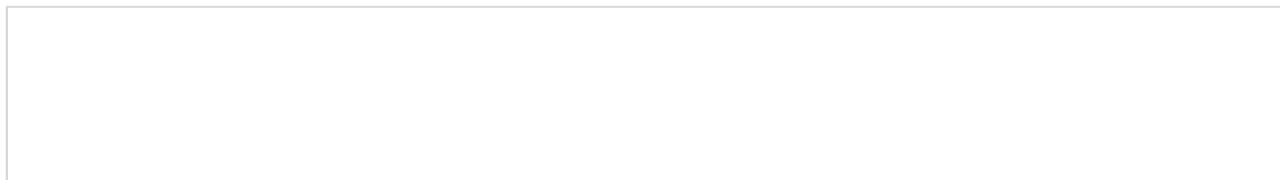
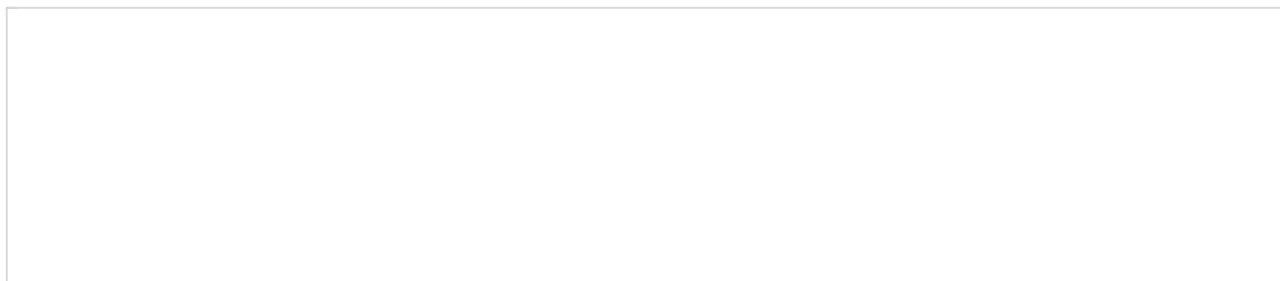
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