

# **Comment Resolution for Shared Ground Topic (comment i-55, i-61, i-66, i-67)**

Kent Lusted, Intel Corporation, P802.3ck Vice-Chair  
Matt Brown, Huawei, 802.3ck Editor-in-Chief

# Comment Overview

|              |           |                     |     |                   |
|--------------|-----------|---------------------|-----|-------------------|
| CI 162       | SC 162.11 | P181                | L11 | # I-55            |
| Ran, Adee    |           | Cisco Systems, Inc. |     |                   |
| Comment Type | TR        | Comment Status      | D   | ground connection |

The text says "For 100GBASE-CR1, 200GBASE-CR2, and 400GBASE-CR4, the lanes are AC-coupled. The AC-coupling shall be within the cable assembly". It can be questioned which contacts are AC-coupled in the cable. Figure 162-2 shows signal shields and link shield in addition to the differential pairs, and there is no distinction, so can the shields also be AC-coupled? Are they even required to be connected on both ends?

My understanding is that in practice the shields are DC-coupled and provide a ground connection between both ends. This has importance in preventing the ground voltage from bouncing at either end and creating unexpected common-mode differences between Tx and Rx pairs (because common-mode voltage is referenced to ground).

This should be stated explicitly. The suggested remedy is to add it to 162.11 which seems to be a convenient place, but other places or phrasing are possible. It may be required to add some specifications to the MDI as well.

**SuggestedRemedy**  
 Insert a paragraph after the one starting with the quoted text (lines 11-16) with the following text:  
 "The signal shield and link shield are connected to the corresponding contacts in the MDI plug connectors on both ends of the cable assembly".

**Proposed Response**      **Response Status** W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Insert a paragraph after the one starting with the quoted text (lines 11-16) with the following text: The signal shields are connected to the corresponding contacts in the MDI plug connectors on both ends of the cable assembly".  
 Resolve 55, 61, 66, and 67 together.

|              |           |                     |    |                   |
|--------------|-----------|---------------------|----|-------------------|
| CI 120F      | SC 120F.1 | P238                | L2 | # I-66            |
| Ran, Adee    |           | Cisco Systems, Inc. |    |                   |
| Comment Type | TR        | Comment Status      | D  | ground connection |

The link block diagram does not show a ground connection, and there is no requirement anywhere in annex 120F that the devices on both ends of the link have a common ground connection.

If there is no common ground, or ground connection is poor, the Tx common-mode specifications may become meaningless, because the common-mode voltage on each device is defined with different grounds.

If a ground connection is added in this figure, it should also be noted that each arrow represents a differential pair, or alternatively draw two lines in each direction, as done in Figure 163-2.

**SuggestedRemedy**  
 Add an additional line in each direction to represent a differential pair, and add a ground connection between the devices to the diagram.

Change the paragraph on P237 L40-42, inserting a sentence about the ground connection, as follows:

"The 100GAUI-1, 200GAUI-2, or 400GAUI-4 C2C bidirectional link is described in terms of a C2C transmitter, a C2C channel, and a C2C receiver, which have a shared ground connection. Figure 120F-2 depicts a typical C2C application."

**Proposed Response**      **Response Status** W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Proposed changes to the figure is cumbersome and may imply a particular implementation. New text pointing out the common ground is sufficient.  
 Add text that a common ground is expected with editorial license.  
 For task force discussion.  
 Resolve 55, 61, 66, and 67 together.

|              |           |                     |     |                   |
|--------------|-----------|---------------------|-----|-------------------|
| CI 120G      | SC 120G.1 | P256                | L16 | # I-67            |
| Ran, Adee    |           | Cisco Systems, Inc. |     |                   |
| Comment Type | TR        | Comment Status      | D   | ground connection |

The link block diagram does not show a ground connection, and there is no requirement anywhere in annex 120G that the devices on both ends of the link have a common ground connection.

If there is no common ground, or ground connection is poor, the output common-mode specifications and input common-mod tolerance may become meaningless, because the common-mode voltage on each device is defined with different grounds.

If a ground connection is added in this figure, it should also be noted that each arrow represents a differential pair, or alternatively draw two lines in each direction, as done in Figure 163-2.

**SuggestedRemedy**  
 Add an additional line in each direction to represent a differential pair, and add a ground connection between the devices to the diagram.

Change the first sentence in the paragraph on P256 L7-14, inserting a sentence about the ground connection, as follows:

"The C2M link is described in terms of a host C2M component, a C2M channel with associated differential-mode to differential-mode insertion loss (ILdd), and a module C2M component, which have a shared ground connection."

**Proposed Response**      **Response Status** W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Proposed changes to the figure is cumbersome and may imply a particular implementation. New text pointing out the common ground is sufficient.  
 Add text that a shared ground is expected with editorial license.  
 For task force discussion.  
 Resolve 55, 61, 66, and 67 together.

|              |            |                     |    |                   |
|--------------|------------|---------------------|----|-------------------|
| CI 163       | SC 163.8.1 | P202                | L5 | # I-61            |
| Ran, Adee    |            | Cisco Systems, Inc. |    |                   |
| Comment Type | TR         | Comment Status      | D  | ground connection |

The link block diagram does not show a ground connection, and there is no requirement anywhere in clause 163 that the PMDs on both ends of the link have a common ground connection.

If there is no common ground, or ground connection is poor, the Tx common-mode specifications may become meaningless, because the common-mode voltage on each device is defined with different grounds.

**SuggestedRemedy**  
 Add a ground connection between the PMDs to the diagram.

Add a sentence below the diagram stating that the specifications in this clause only apply to systems with shared ground between the two PMDs.

**Proposed Response**      **Response Status** W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Proposed changes to the figure is cumbersome and may imply a particular implementation. New text pointing out the common ground is sufficient.  
 Add text that a common ground is expected with editorial license.  
 For task force discussion.  
 Resolve 55, 61, 66, and 67 together.

# Figures for Reference

