The Joint Link Synchronization and Training For The Camera Links

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05/15/2025

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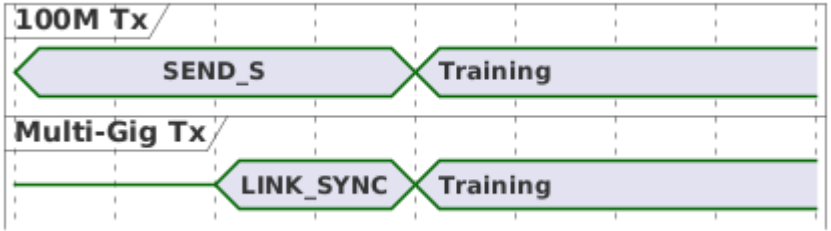
Summary

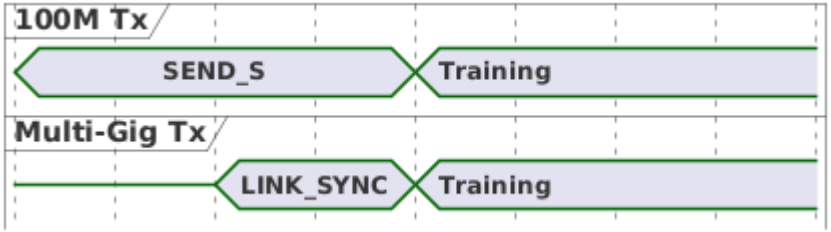
- Training a 100M receiver is relatively straightforward.
- Consequently, even the most basic hardware used for training or link synchronization appears significantly impactful in comparison.
- The goal is to use the same hardware for data mode, training, and link synchronization.
- This is achieved for training through:
  - jonsson_razavi_3dm_01_05_01_25.pdf
  - Lo_3dm_01_050125.pdf
- A similar method is applied for link synchronization.
- In this presentation, Follower is the camera module.

Continuous Signal for Link Synchronization: Recap

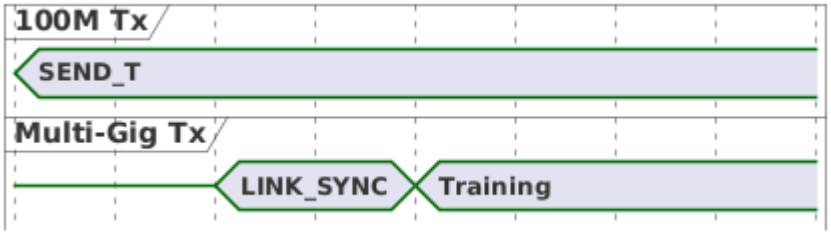


- Steps
  1. 100M TX transmits the 100M SEND_S
  2. Multi-Gig TX sends LYNK_SYNC after detecting 100M SEND_S
  3. 100M TX moves to training when detects Multi-Gig SEND_S
  4. Multi-Gig TX moves to training after LINK_SYNC was sent
- Signaling
  - 100M SEND_S consists of a series of zeros scrambled by the data-mode's scrambler send by differential Manchester encoding
  - Multi-Gig LINK_SYNC signal replicates the LINK_SYNC signal sent in 802.3cy

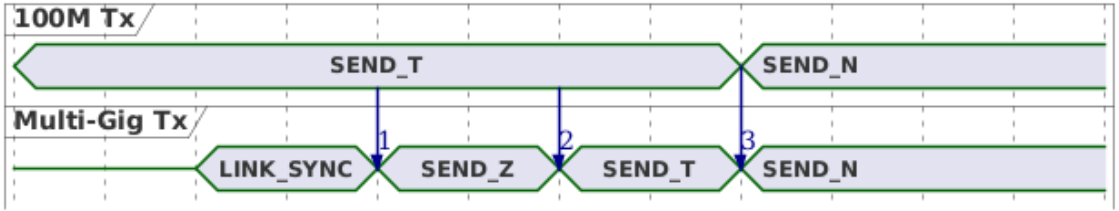
SEND_T Instead of SEND_S



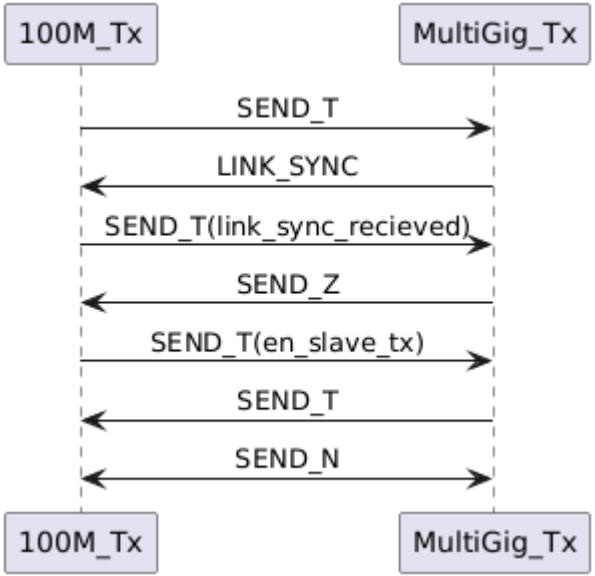
- SEND_T consists of a prolonged series of zeros, making it a viable substitute for SEND_S.



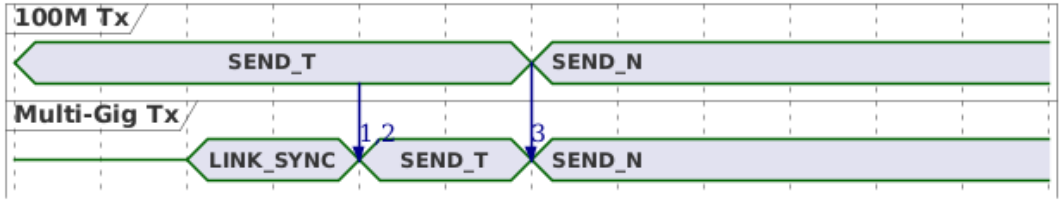
Combined Link Synchronization and Training



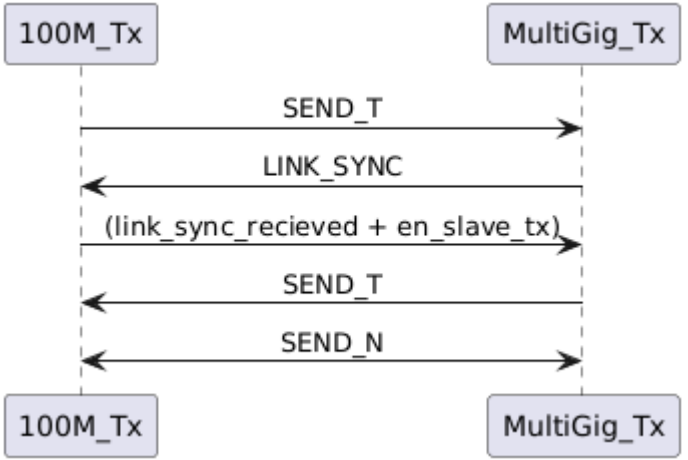
- Link sync and training can be combined
- 100M TX side will be the Leader in the link
- LINK_SYNC is the key signal from the camera side for link synchronization



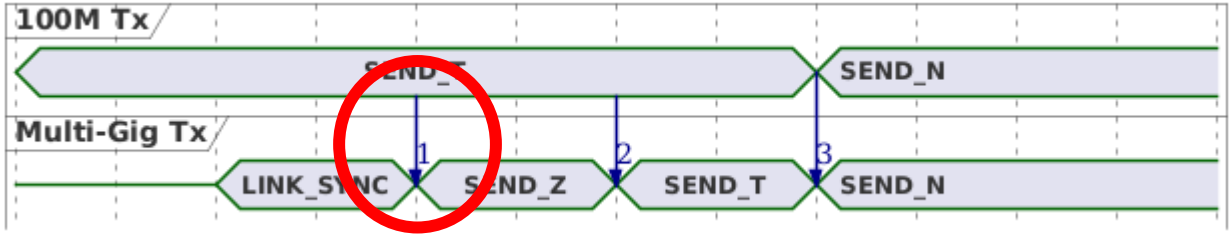
Combined Link Synchronization and Training II



- There is an option to avoid SEND_Z



Follower Link Sync Acknowledgment



- The Follower Link Sync will operate within a closed loop.
- The Leader can notify the follower of the receipt of the LINK_SYNC signal by changing a bit in the infofield.
- This capability was lacking in 802.3ch and 802.3cy.

Conclusion

- A new approach for link synchronization is introduced.
- This method employs identical signal framing for link synchronization, training, and data modes.
- The open loop feedback present in the link synchronization of 802.3ch and 802.3cy has been eliminated.
- We appreciate your continuous feedback and comments.