

Commit Request 4p12_4: Auto-Detection for Port Order [1 2 3 4] and [1 3 2 4]

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IEEE 802.3 Channel Operating Margin (COM) Open Source Project Ad Hoc

History

Revision	Date	Comment
0.5	05-Jan-2026	▪ Initial Draft.
1.0	06-Jan-2026	▪ Revised the title slide in mentioning 'Commit Request 4p12_4'.
1.5	06-Jan-2026	▪ Revised slide 7 titled 'Summary of code changes page 1' as it did not accurately reflect this work.

Purpose for Commit Request

- Commit request related to auto-detection of port order.
- Enable automatic port-order detection to compare two predefined options while keeping the implementation simple.
- Example, [1 2 3 4], [1 3 2 4], [1 2 3 4; 1 3 2 4], [1 3 2 4; 1 2 3 4] or user-defined.
- Adding this feature will allow multiple channels to run consecutively using the same COM spreadsheet, even when the S-parameter touchstone file uses different port orders.
- Branch: autodetect_port_order_two_choices.
https://opensource.ieee.org/hansel.dsilva/com_code/-/branches
- Git branch file pointer: https://opensource.ieee.org/hansel.dsilva/com_code/-/blob/autodetect_port_order_two_choices/release/com_ieee8023_4p12p0_AutoDetectPortOrderTwoChoices.m?ref_type=heads

Navigate to Hansel_Dsilva/com_code

https://opensource.ieee.org/802-com/com_code/-/forks

The screenshot shows the IEEE Open Source Project page for the 802-com/com_code project. The page displays a list of forks, with Hansel Dsilva's fork highlighted by a red box and a black arrow pointing to it. The arrow contains the text "Navigate to Hansel_Dsilva/com_code".

11 forks: 8 public, 0 internal, and 3 private

Forker	Repository	Commit Message	Stars	Forks	Issues	Comments	Updated
Baidyanath Dutta	com_code	Merge branch 'KR_PKGB_CONFIG_for_d2p1' into 'main'	0	0	0	0	Updated 2 months ago
Norman Swenson	com_code	add 4p10p0 beta release	0	0	0	0	Updated 4 months ago
Mohammad Shakiba	com_code	add configuration file folder and some configuration files	0	0	0	0	Updated 4 months ago
Adee Ran	com_code	Merge branch 'signal_flow_graph' into 'main'	0	0	0	0	Updated 3 months ago
Hansel Dsilva	com_code	rename for 4.12.0_beta1 to 4.12.0	0	0	0	0	Updated 16 minutes ago
Kent Lusted	com_code	rename for 4.12.0_beta1 to 4.12.0	0	0	0	0	Updated 2 weeks ago
Richard Mellitz	com_code	rename for 4.12.0_beta1 to 4.12.0	2	0	0	0	Updated 1 day ago
Adam Gregory	com_code	deleting fork version	0	0	0	0	Updated 1 month ago

Checking changes of a branch to the last release

https://opensource.ieee.org/hansel.dsilva/com_code/-/branches

Branch was deleted

Overview **Active** Stale All

autodetect_port_order_two_choices 
c207f7f9 · added auto-detection for port order · just now

adaptive_local_search 
892a07f6 · Corrected for THIS and BEST in OptFom_Adaptive_Loca_Search

Updated date ▾ View branch rules New branch ⋮

New ▾ ⋮

Compare
Delete branch

Use drop down in the 3 dots pulldown for autodetect_port_order_two_choices and select compare. Selecting bring up the compare screen

Code Updates

- 4 m file changed.
- 0 m files added.
- No additional config csv and xlsx files are included.

src/com_ieee8023_.m
src/read_s4p_files.m
src/read_p4_s4params.m
src/read_Nport_touchstone.m

```
INFO: S-parameter reference impedance of 50 ohms renormalized to 46.25 ohms
Score based on median of the differential insertion loss till 1 GHz:
1. [1 2 3 4]: -1.66583 dB
2. [1 3 2 4]: -16.47 dB
Best port order: [1 2 3 4]
INFO: S-parameter reference impedance of 50 ohms renormalized to 46.25 ohms
INFO: S-parameter reference impedance of 50 ohms renormalized to 46.25 ohms
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```

fprintf used in printing the status.

New or changed keywords

- Configuration file parameters.

Keywords (not case sensitive)	Default	Units	Comment
Port Order	[1 3 2 4]	None	■ The default port order for an S4P file is assumed to be [Tx+, Tx-, Rx+, Rx-], which is the same as earlier. ■ The user can specify either: A] A single port order, or B] Two alternative port orders, which will trigger auto-detection. ■ Auto-detection between the two provided port orders is performed by evaluating the median differential insertion loss up to 1 GHz. ■ Examples of valid port order inputs include [1 3 2 4] [1 2 3 4] [1 3 2 4; 1 2 3 4] [1 2 3 4; 1 3 2 4] Or any user-defined configuration.

New Outputs

None

Summary of code changes page 1

read_Nport_to
uchstone.m

Current,
sch=sch(:,port_order,port_order);

Proposal,

```
9553 if size(port_order, 1)~= 1
9554
9555 % At the present, support for only two choices of [1 3 2 4; 1 2 3 4] or another
9556 % later support N choices
9557 [~, f_idx] = min(abs(Spar.F - 1e9));
9558 scores_median_port_order= zeros(1, size(port_order, 1));
9559 fprintf('\tScore based on median of the differential insertion loss till %0.6g GHz:\n', Spar.F(f_idx)/1e9);
9560 for idx= 1: size(port_order, 1)
9561 % scores_median(1, idx)= mean(20*log10(abs(squeeze(sch(1:f_idx, port_order(idx, 3), port_order(idx, 1))))));
9562 % SDD21= 0.5*(S21- S23+ S43- S41) for THRU: (1)-- (2); (3)--- (4)
9563 % port order: [ tx+ tx- rx+ rx-]
9564 scores_median_port_order(1, idx)= median(20*log10(0.5*abs(...
9565 squeeze(sch(1:f_idx, port_order(idx, 3), port_order(idx, 1)))...
9566 - squeeze(sch(1:f_idx, port_order(idx, 3), port_order(idx, 2)))...
9567 + squeeze(sch(1:f_idx, port_order(idx, 4), port_order(idx, 2)))...
9568 - squeeze(sch(1:f_idx, port_order(idx, 4), port_order(idx, 1))))));
9569 fprintf('\t%.1f. [%d %d %d %d]: %0.6g dB\n', idx, port_order(idx, :), scores_median_port_order(1, idx));
9570 end
9571
9572 if scores_median_port_order(1)~= scores_median_port_order(2)
9573 port_order_best_idx= find(scores_median_port_order == max(scores_median_port_order), 1);
9574 fprintf('\tBest port order: [%d %d %d %d]\n', port_order(port_order_best_idx, :));
9575 else
9576 error( 'error:SimilarScoreDuringAutoDetectionPortOrder', ...
9577 '\n\t Auto-detection of port order has failed. The two choices have given the same score'...
9578 );
9579 end
9580
9581 port_order= port_order(port_order_best_idx, :);
9582
9583 end
```

- There are additional changes, with this being a major one.
- Currently, using the median or mean does not show any significant difference.
- Exploring alternative metrics for auto-detecting port order without requiring user input.
- Please share any ideas or suggestions you may have on auto-detecting port order for a given 4-port network.

Thank You