COM Parameter Sweep Support Using the XLSX Configuration
Commit request 4p17_4

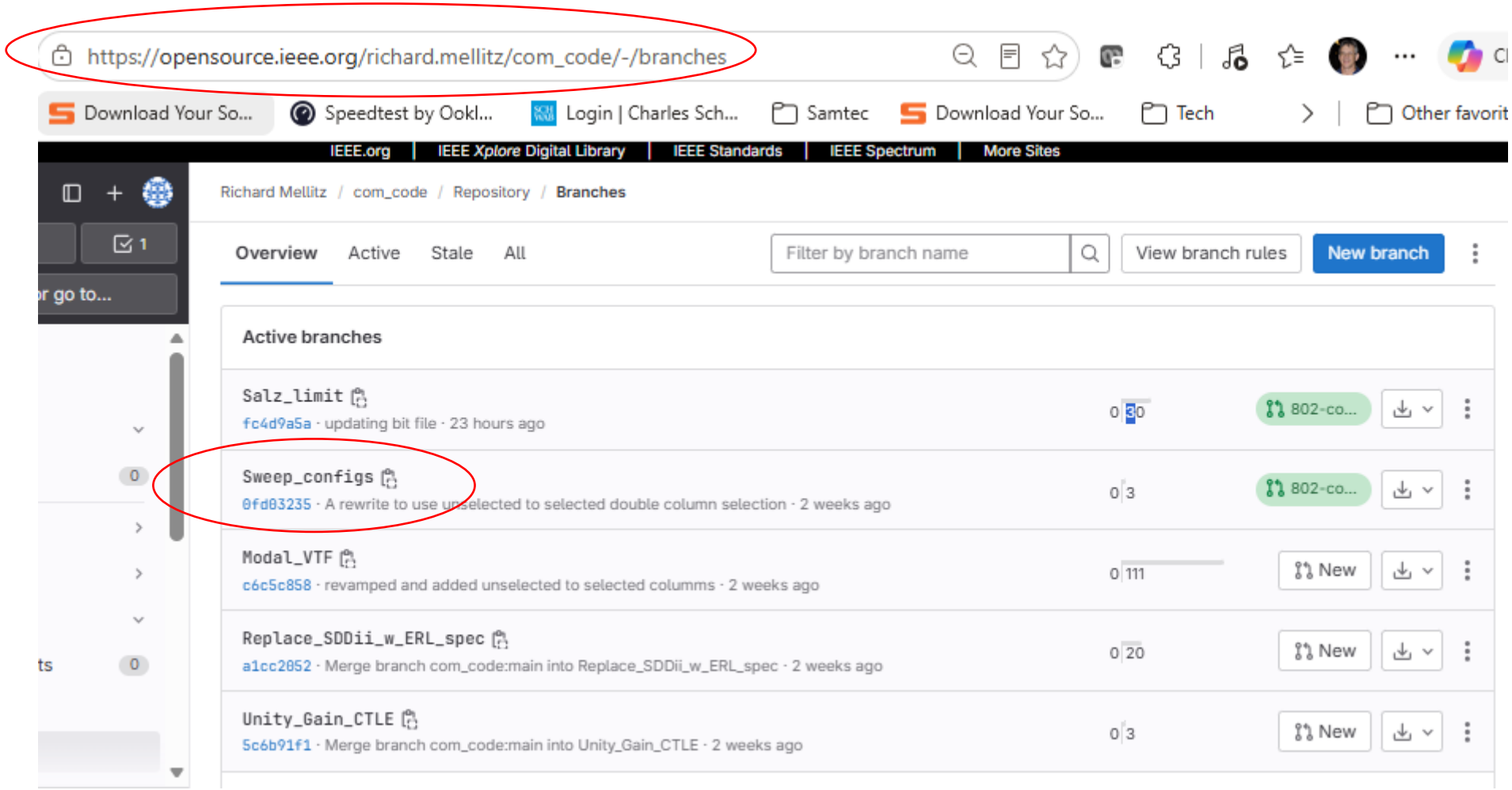
Richard Mellitz, Samtec
Adam Gregory, Samtec
Brandon Gore, Samtec
Tim Wig, Samtec

IEEE 802.3 Channel Operating Margin (COM) Open Source Ad hoc, October 20, 2026

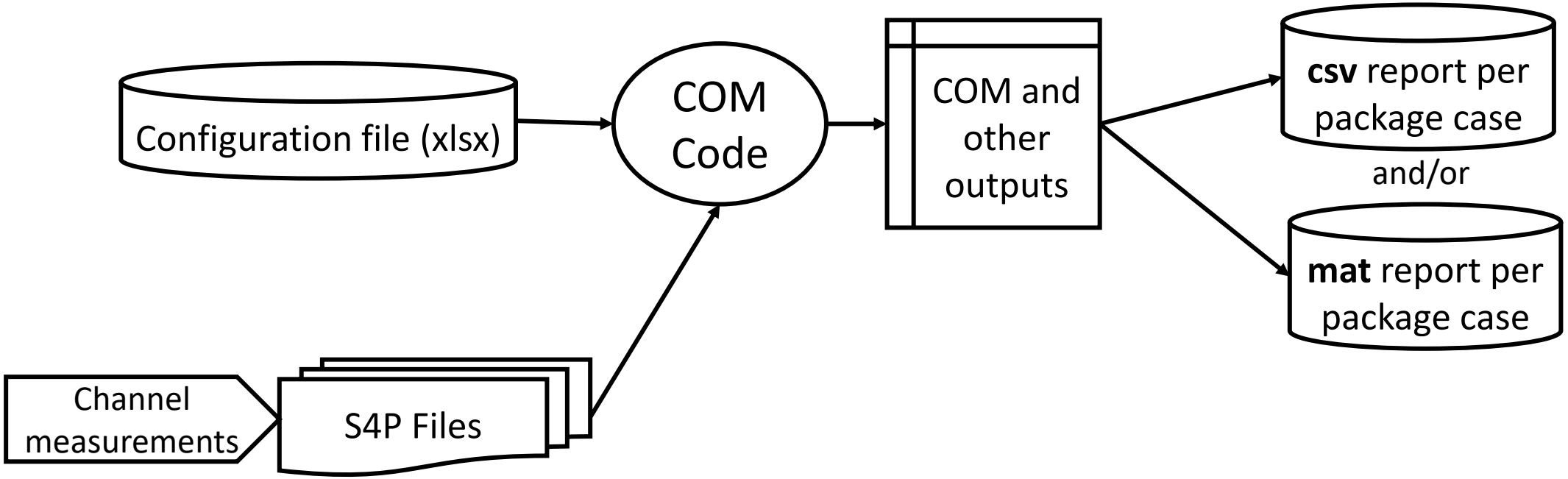
Presentation Overview

- Purpose: Provide convenient say to sweep parameters using COM
- Merge Request: Git sweep branch and source changes
- COM usage: Present/proposed
- Sweep mechanics
  Example sweep file, temporary MAT configurations and result files
- CSV report generation (new)
  Report field selections, dialogs and example reports

Sweep Branch Location for GIT Merge Request



COM Usage



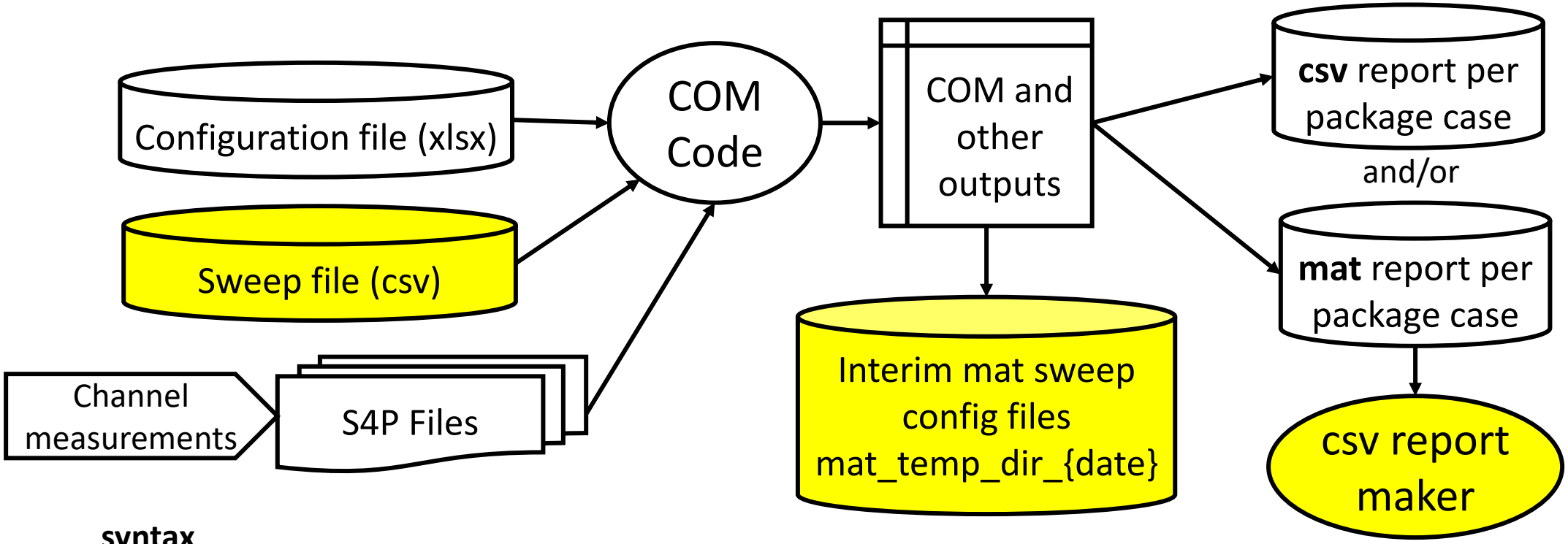
syntax

com_ieee8023_{version tag} ({ configuration file }, num_fext, num_next,
{thru s4p file], {fext s4p file, {fext s4p file}, …, {next s4p file},], {next s4p file},…;

Example

my_result=com_ieee8023_4p17p1_sweep(my_config.xls, 1,1, my_thru.s4p, my_fext.s4p, my_next.s4p);

Usage for Sweeping Parameters



syntax

com_ieee8023_{version tag} (‘sweep’ ,'sweep_vars.csv’,{ configuration file }, num_fext, num_next, {thru s4p file], {fext s4p file, {fext s4p file}, …, {next s4p file},], {next s4p file},…;

Example

my_result=com_ieee8023_4p17p1_sweep(‘sweep’ ,'sweep_vars.csv’,
my_config.xls, 1,1, my_thru.s4p, my_fext.s4p, my_next.s4p);

COM Source Files Change: in Branch Sweep_configs

- release/com_ieee8023_4p17p1_sweep.m – single COM runnable m file
- src/com_ieee8023_.m – create mat files for sweeping and added sweep capability with new loop
- src/COM_CommandLine_Parse.m – adding “sweep” keyword to COM command line processing
- src/get_s4p_files.m – changes space to underscore in chdata(nxi).base
- src/make_sweep_mats.m – make a set of config mat file by merging the config xlsx file with the sweep csv file
- src/xls_set_parameter.m – opposite of xls_get_parameter. Creates param structure from sweep file
- src/read_ParamConfigFile.m – add param to preserve new parameters from xls_set_parameter
- Sweep csv text processing
  - src/string_find_exact.m
  - src/string_find_regexp.m
  - src/string_find_returns.m
  - src/text_file_to_cell_lines.m
  - src/cell_lines_to_2D_matrix.m
  - src/dash_varg_parser.m
- src/+util/Mat_2_csv.m - report generator (new) outside of COM code

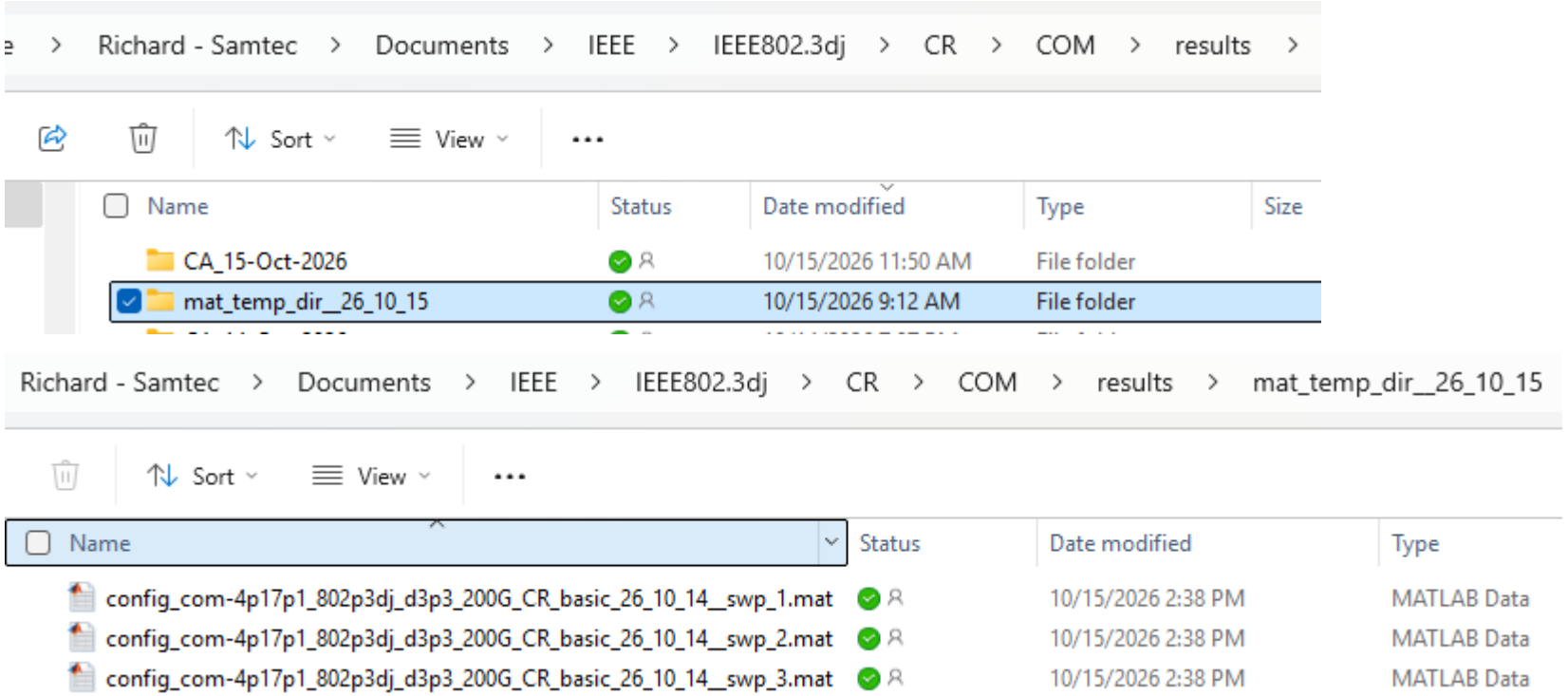
Example of sweep file (Cable_C_sweep_vars)

- Diagnostics should be set to 1. Display window and csv_report are user's choice
- Each row is a sweep
- Each column is a config parameter

DIAGNOSTICS	DISPLAY_WINDOW	CSV_REPORT	RUNTAG	z_bp (TX)	z_bp (NEXT)	z_bp (FEXT)	z_bp (RX)	z_p (TX)	z_p (NEXT)	z_p (FEXT)	z_p (RX)	PKG_NAME	Local Search	Non-zero Local Search Method	Clip Method
1	0	0	CA-C_HL_HL_	22	22	22	22	[8;1.8;0 ;0]	[8;1.8;0 ;0]	[8;1.8;0 ;0]	[8;1.8;0 ;0]	PKG_LowR_CLASSA PKG_LowR_CLASSA	2	1	fast
1	0	0	CA-C_HN_HL_	83	22	83	22	[15;2;1.3 ;1.5]	[8;1.8;0 ;0]	[15;2;1.3 ;1.5]	[8;1.8;0 ;0]	PKG_HiR_CLASSB PKG_LowR_CLASSA	2	1	fast
1	0	0	CA-C_HL_HN_	22	83	22	83	[8;1.8;0 ;0]	[15;2;1.3 ;1.5]	[8;1.8;0 ;0]	[15;2;1.3 ;1.5]	PKG_HiR_CLASSB PKG_LowR_CLASSA	2	1	fast

Example results directory

- New directory added for mat sweep config files
- CSV files added to results directory after running report generator, Mat_2_csv



Mat_2_csv report generation

filename	param_z_bp_tx	param_z_bp_rx	param_z_bp_next	param_z_bp_fext	out_ACBW_GHz	out_COM_dB	out_COM_orig	out_IL_dB_channel_only_at_Fnq	out_IL_db_die_to_die_at_Fnq	out_Pkg_len_FEXT	out_Pkg_len_NEXT	out_Pkg_len_RX	out_Pkg_len_TX	out_RUNTAG
Swp_1-li_dj_C2M_Design_A_Rev1_THRU_case1_results.mat	22	22	22	22	67	7.64	6.62	11.50	18.07	8	8	8	8	Swp_1
Swp_2-li_dj_C2M_Design_A_Rev1_THRU_case1_results.mat	83	22	22	83	67	7.39	6.34	11.50	20.10	15	8	8	15	Swp_2
Swp_3-li_dj_C2M_Design_A_Rev1_THRU_case1_results.mat	22	83	83	22	67	7.65	6.58	11.50	19.92	8	15	15	8	Swp_3

Summary

- COM sweeps combine the XLSX configuration with a CSV file.
- Sweeping utilized temporary MAT configurations
- Sweep result are in individual MAT file in the report directory
- A separate Mat_2_csv tool exports/report select COM parameter for the sweeps

Thank You!

Backup: Report generator usage

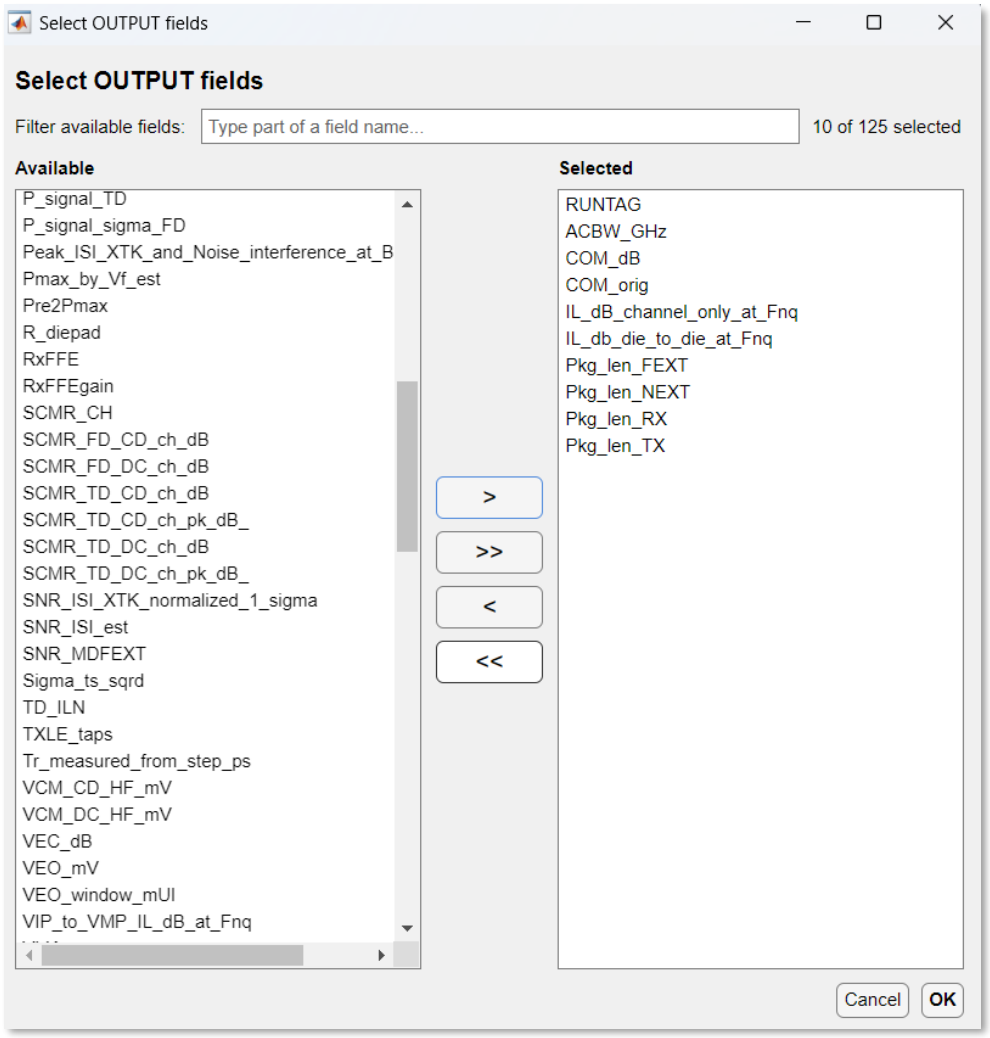
Report generator (Mat_2_csv) Command Line Dialog Example

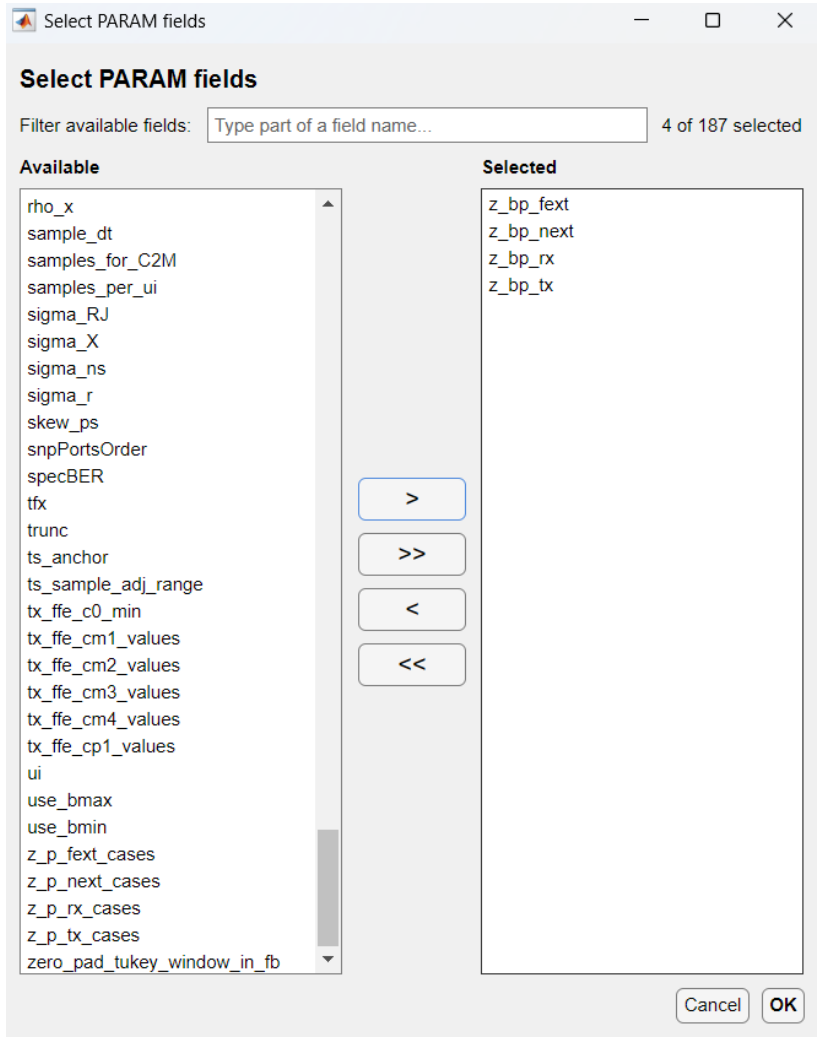
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-
>> Mat_2_csv or util.Mat_2_csv if  /src isn
Do you want to use the last directory used to create csv file for JMP
 0 = no but create new selection list (default)
 1 = no but use last selection list
 2 = yes and create a new selection list
 ??
Tag for csv file ("Output" is default) >> My_report

Found 3 MAT files in:
C:\Users\richardm\OneDrive -
Samtec\Documents\IEEE\IEEE802.3dj\CR\COM\results\CA_15-Oct-2026
Master field lists written.
```

```
Selected OUTPUT fields:
    {'ACBW_GHz'               }
    {'COM_dB'                 }
    {'COM_orig'               }
    {'IL_dB_channel_only_at_Fnq'}
    {'IL_db_die_to_die_at_Fnq'  }
    {'Pkg_len_FEXT'           }
    {'Pkg_len_NEXT'           }
    {'Pkg_len_RX'             }
    {'Pkg_len_TX'             }
    {'RUNTAG'                 }
Selected PARAM fields:
    {'z_bp_tx'  }
    {'z_bp_rx'  }
    {'z_bp_next'}
    {'z_bp_fext'}
Scanning PARAM vector widths...
Creating rows...
  3 / 3 files
DONE:
 C:\,,\CA_15-Oct-2026\My_report_20261015_151150.csv
```

Mat_2_csv panel dialog (Report generator)





Mat_2_csv 5 files added to report directory

- 2 master file of master list
- Output args
  - master_template.csv
- Param
  - master_paramtemplate.csv
- 2 files with fields selected for report
  - selected_fields.csv
  - selected_param_fields.csv
- Report file
  - My_report_20261015_151150.csv

