



## PSCAD Model Template

ERCOT  
April 3, 2025

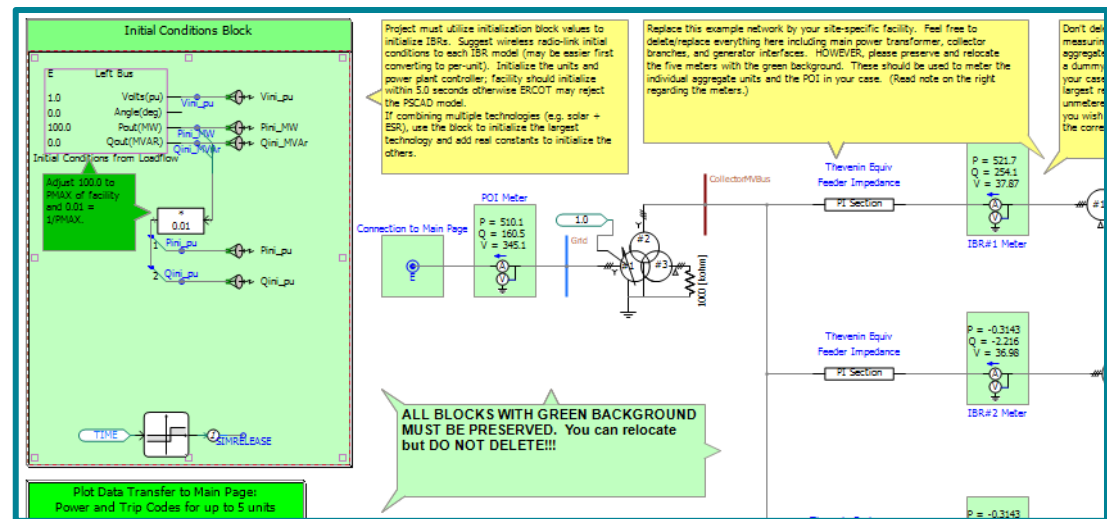
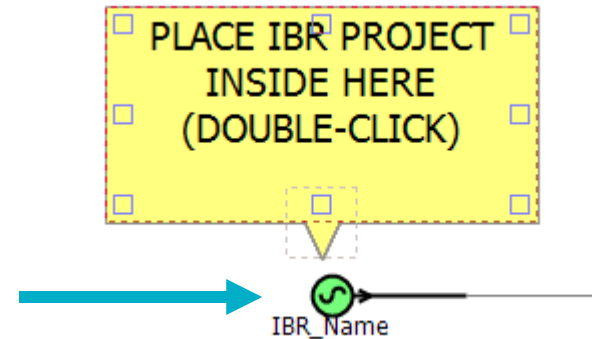
For help, email [dynamicmodels@ercot.com](mailto:dynamicmodels@ercot.com) with  
“Template Issue” in the subject line.

# Background

- ERCOT requires use of this Template for PSCAD model submissions
- The Template works with PSCAD v4 and higher. Submitted models must work in PSCAD version 5
- You may either copy-paste your model components into this Template or paste the Template components into the PSCAD model provided by your manufacturer
- PSCAD model submission requirements:
  - Model manual describing simulation set up
  - PSCAD Model Guideline “checksheet” (completed). A blank checksheet is available inside the Model Quality Guide package (link below)
  - Model Quality Test report showing PSCAD and PSS/e overlay. (If using a UDM for PSS/e then a TSAT overlay must be included as well.
  - Submit models to RIOO-RS for online IBRs, RIOO-IS for planned IBRs
  - Details in the Model Quality Guide posted at: <https://www.ercot.com/services/rq/re>

# Overview

- It is recommended entirely containing your PSCAD plant model within this component of the Template main page.
- Inside this component, you will find various green boxes around devices like meters. These devices help ERCOT incorporate your model into a study case. Anything with a green box should be retained in your submission.



# What can I delete from the Template?

- You can delete anything on the model sub-page that does not have a green box around it
  - (The boxes with the green background include essential metering that will help ERCOT incorporate your model)
- You should delete the default collector branches and transformers or update with a correct representation

# How many units does it accommodate?

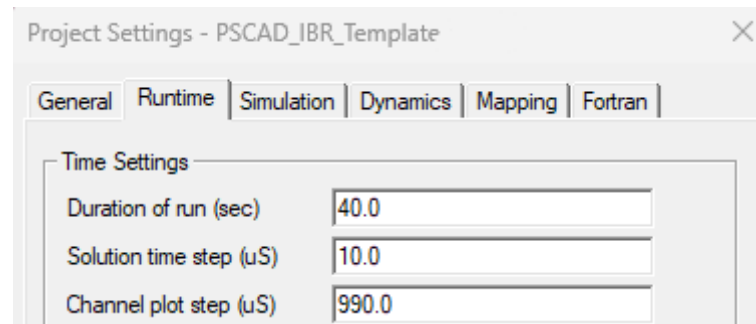
- The Template has designated locations for five units
  - The Template will still work if your facility has more than five. Only, some units won't be metered in simulation
    - If your facility has more than five units, it is suggested to aggregate by resource type and by inverter type
  - If your facility has less than five units, you should either leave the remaining meters connected to dummy resistors (which are included in the Template), or you can delete the meter and feed 0.0 constants into the channel transmitter box on the left

# Unit Aggregation

- ERCOT permits the PSCAD model to be aggregated differently than the PSS/e model
- Different parts of a facility can be modeled in separate Templates or can be modeled in the same Template
  - For example, a plant with a solar and battery could use two Templates
  - If the parts share a PPC or share a main power transformer, it is generally required that they be modeled in the same Template

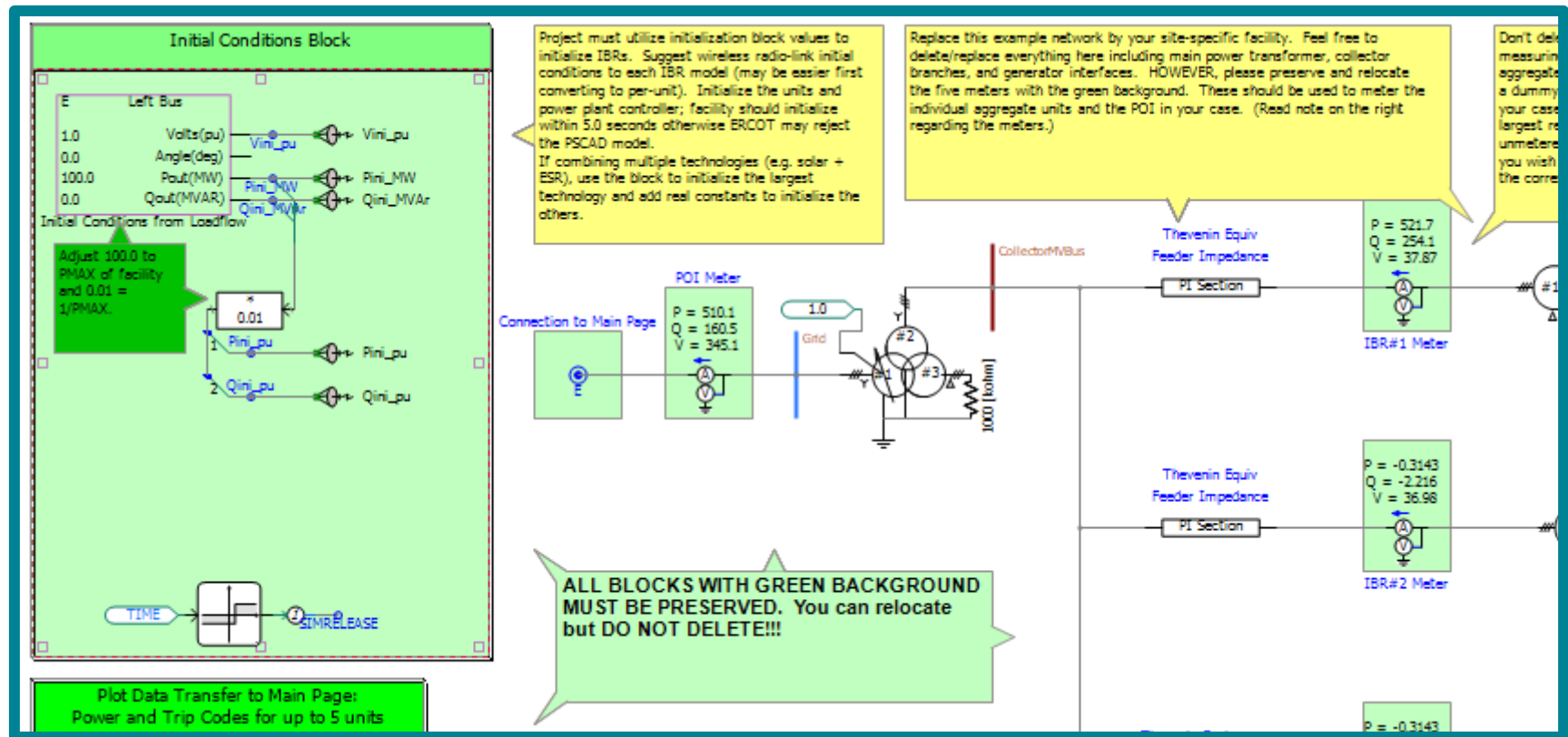
# Can I change the simulation settings?

- Yes, you can change any setting such as step-size
  - Be aware that ERCOT has general PSCAD model requirements listed in the PSCAD Model Guideline (see Slide #2). Thus, your model must still run efficiently and reasonably fast.



# Adding the Template to an existing PSCAD model

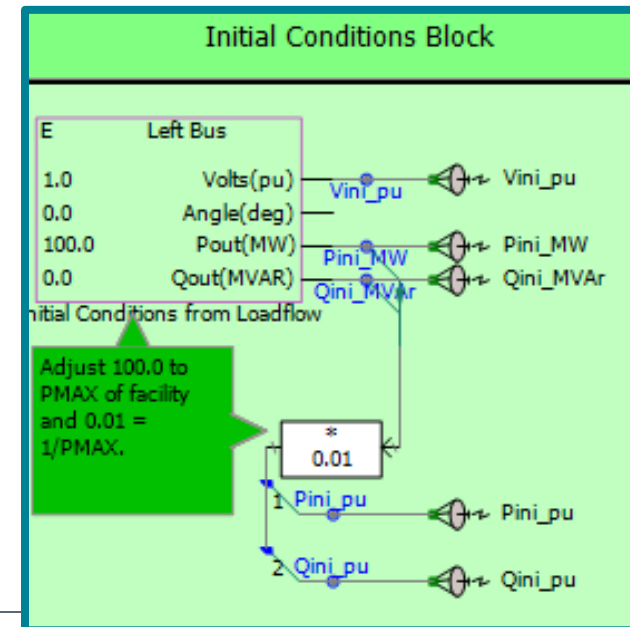
- You may either copy-paste your existing model into the Template or copy-paste the green boxed components into your existing model





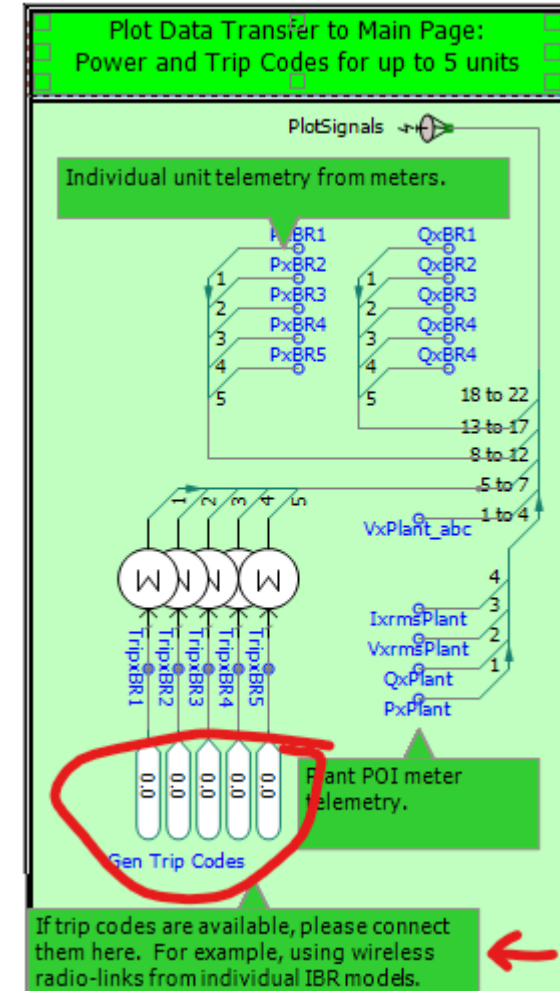
# Connecting the initialization block

- ERCOT requires that the connection of the initialization block to the model
  - Real power dispatch must be implemented
  - Voltage and initial reactive dispatch should be implemented
  - Many PPC models were found unable to accept external initialization of the reactive state variable. Please encourage OEMs to adopt this in the future.
- If your facility has different phases or technologies, then either:
  - Distribute out the initialization signals so that all sub-components are dispatched uniformly, or
  - Submit each part in a separate PSCAD Template
    - Permitted if the parts/phases do not share a PPC or MPT
- Wireless transmitters are included to transmit the signals across multiple PSCAD pages if needed
  - The matching Receiver should have “IBR\_Name” in the Definition setting to work



# Miscellaneous

- If possible, do not use “Simulation Sets” and instead use E-TRAN+ to implement parallel processing of sub-components
  - Parallel processing is sometimes necessary to avoid a model conflict
  - If you are unable to use ETRAN+, ERCOT will accept the case with Simulation Sets
- Please connect any trip signals from the IBR component models back to the Plot Data Transfer



# Please complete the “Q&A” block

- Q&A block within the Template

## PLEASE FILL OUT Q&A:

1. Does this PSCAD case include all units registered under the same SITECODE? (Y/N) \_\_\_\_
2. Has this model undergone Verification per Planning Guide 6.2(5)(b)? If yes, date of Verification report? \_\_\_\_
3. Does this model require a specific Fortran compiler? \_\_\_\_
4. Does the model support both 32-bit and 64-bit Fortran? (Separate .DLL files required.) \_\_\_\_
5. Is this model capable of any arbitrary timestep between 10 and 20 us? \_\_\_\_
6. If #4 is No, what timestep is needed? \_\_\_\_
7. Does the model obey P, Q, and V initialization block commands? \_\_\_\_
8. Does the model fully initialize to initialization block values within 5 seconds? \_\_\_\_
9. Can the model run 10 seconds of simulation in 200 seconds on a typical computer? (Y/N) \_\_\_\_
10. Provide any additional comments: \_\_\_\_

# Questions?

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