Time Measurement API Documentation

These functions measure time-related signal parameters relative to a reference. If hardware is unavailable, they return a fallback `expected_value` with optional simulated noise.

API Function Calls and Description

- `RISE_TIME_MEASURE(signal='VCC', reference='GND', expected_value=0.0, error_spread=0.0)` Measures rise time — duration for signal to transition from low to high. Returns: `float`
- `FALL_TIME_MEASURE(signal='VCC', reference='GND', expected_value=0.0, error_spread=0.0)` Measures fall time — duration for signal to transition from high to low. Returns: `float`
- `POSITIVE_PULSE_WIDTH_MEASURE(signal='VCC', reference='GND', expected_value=0.0, error_spread=0.0)` Measures positive pulse width duration. Returns: `float`
- `NEGATIVE_PULSE_WIDTH_MEASURE(signal='VCC', reference='GND', expected_value=0.0, error_spread=0.0)` Measures negative pulse width duration. Returns: `float`
- `TIME_DELAY_MEASURE(signal='VCC', reference='GND', expected_value=0.0, error_spread=0.0)` Measures delay time between signal events. Returns: `float`
- `POSITIVE_DUTY_CYCLE_MEASURE(signal='VCC', reference='GND', expected_value=0.0, error_spread=0.0)` Measures positive duty cycle percentage of the signal. Returns: `float` (percentage)
- `NEGATIVE_DUTY_CYCLE_MEASURE(signal='VCC', reference='GND', expected_value=0.0, error_spread=0.0)` Measures negative duty cycle percentage of the signal. Returns: `float` (percentage)
- `TIME_PERIOD_MEASURE(signal='VCC', reference='GND', expected_value=0.0, error_spread=0.0)` Measures the time period of the signal waveform. Returns: `float`

Usage Notes

- All functions rely on the hardware layer function `apply_time_measure` that queries registered hardware callbacks.
- Output is appended to `g.output` with metadata for measurement traceability.
- When hardware is unavailable, the function returns the `expected_value` plus or minus a random error defined by `error_spread`.
- Default parameters allow easy call with just signal and reference names.