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Technical Product Notes

NV16KAC MPPT Configurations for Strings with Higher Current

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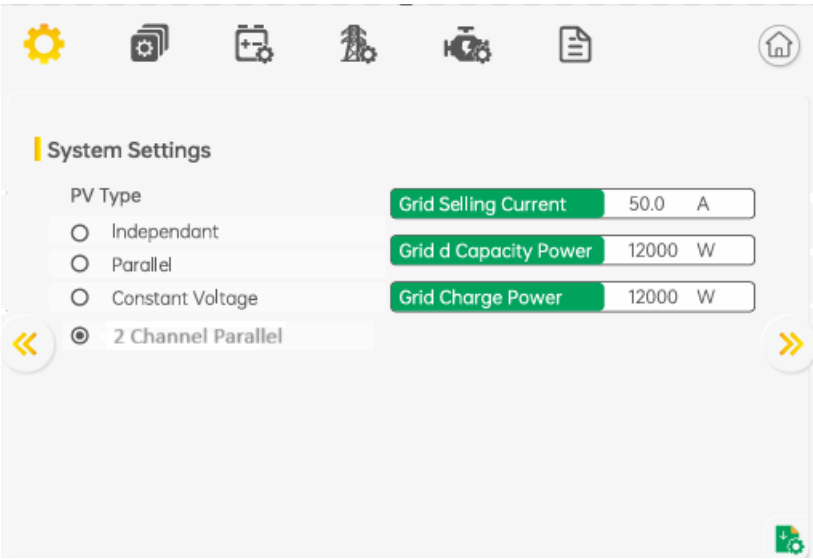
Configurable MPPT Pairing (2+2 Mode)

Overview of New Feature

The NeoVolta NV16KAC hybrid inverter introduces a new configurable MPPT option that allows the installer to combine the four individual MPPT trackers into two larger MPPT channels, shown in the inverter settings as “2 Channel Parallel”.
To change the MPPT settings from independent (default) to “2 Channel Parallel”, go to System Settings, page 2, and select 2+2.



When enabled, the inverter treats MPPT 1 & 2 as a combined single MPPT, and MPPTs 3 & 4 as a second combined single MPPT.
This configuration is intended for PV arrays that have higher current capacity.

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1. Electrical Capability in 2 Channel Parallel Mode

When the MPPTs are paired:

- MPPT Pair #1 (MPPT 1 + MPPT 2):
  - Functions as one combined MPPT
  - Maximum combined input current: 40 A
  - Maximum Voc (per pair): 500 VDC (cold temperature compensated)
- MPPT Pair #2 (MPPT 3 + MPPT 4):
  - Functions as one combined MPPT
  - Maximum combined input current: 40 A
  - Maximum Voc (per pair): 500 VDC (cold temperature compensated)

Each pair operates independently and may use different PV string sizes or current levels, within electrical limits.

2. Required Wiring Configuration

When using 2 Channel Parallel mode, the installer must wire each combined MPPT correctly. This requires combining two MPPT inputs externally using a junction box or Y-connector.

MPPT Pair #1 – Large String #1

- Wire the PV string into a junction box.
- Split the output using a Y-combiner or branch connector.
- Feed the combined string into MPPT 1 and MPPT 2 simultaneously.
- Ensure polarity is correct on both input channels.

MPPT Pair #2 – Large String #2

- Same wiring method as above
- Y-combine inside a j-box and feed to MPPT 3 and MPPT 4

Important:

- Each “large string” must feed only its assigned MPPT pair.
- Never cross-feed (e.g., MPPT 1 & 3) in 2+2 mode.
- Each pair must receive identical voltage, since the paired MPPTs operate as a single tracker.

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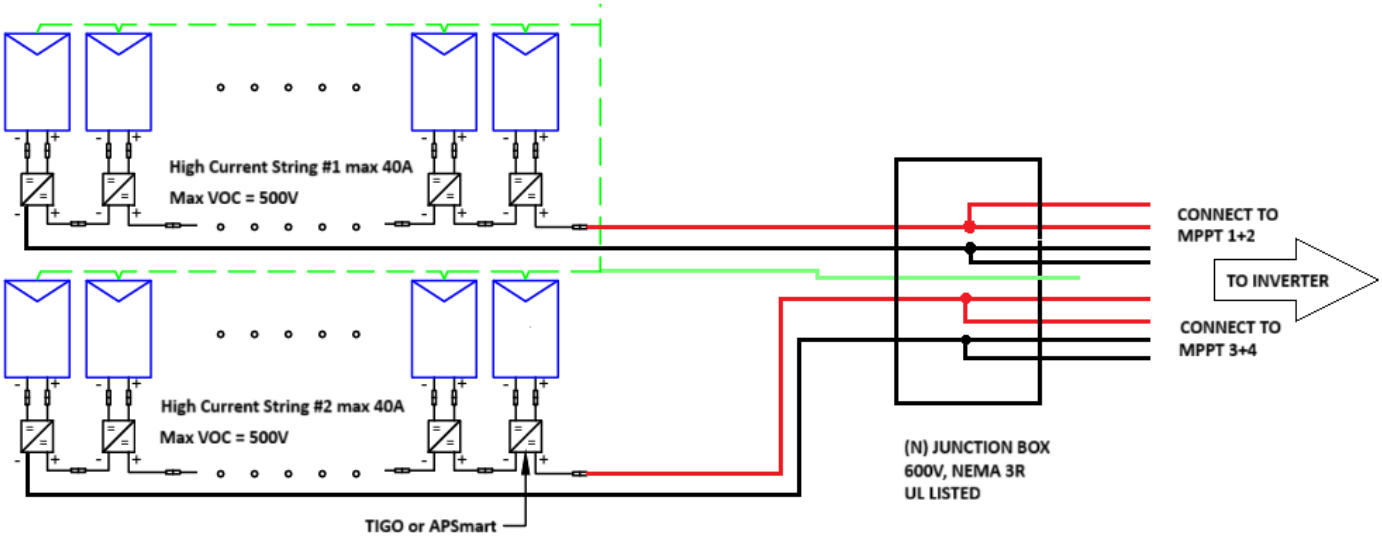
Wire Diagram:



3. Electrical Design Requirements

Voltage Limits:

- Max Voc per MPPT pair: 500 VDC
  (must be verified using cold-temperature Voc calculations)
- If the combined string exceeds 500V, inverter damage can occur.

Current Limits:

- The max DC input current per MPPT pair is 40 A
- The two combined strings may have different currents, but each one individually must remain at ≤40 A.

Start-Up and Operating Voltage: (Same as standard MPPT mode)

- Startup voltage: 120 VDC
- Optimal operating range: 120–430 VDC

4. Usage Notes and Best Practices

- Always perform cold-condition Voc calculations before finalizing string configuration.
- Use UL-listed Y-connectors or a NEMA-compliant combiner box for splitting the PV output.
- Both MPPTs within a pair must receive identical array wiring, same polarity, and the same string length.
- Do not mix solar modules of different Voc or Isc ratings within a paired MPPT.
- Label the j-boxes clearly as “MPPT Pair 1 (1+2)” and “MPPT Pair 2 (3+4)”.

5. Summary

In 2 Channel Parallel mode, the NV16KAC inverter allows the four independent MPPTs to be paired into two high-current channels:

MPPT Pair	Inputs Used	Max Current	Max Voc	Notes
Pair #1	MPPT 1 + 2	40 A	500 VDC	Requires external Y-combiner
Pair #2	MPPT 3 + 4	40 A	500 VDC	Requires external Y-combiner

Note: In “2 Channel Parallel” mode the inverter treats MPPTs in pairs.
Because of this, you must connect the same type of PV strings to each MPPT in the pair. You cannot connect one high-current string to the first pair and then mix different, smaller, or differently oriented strings on the other two MPPTs. Everything must match within each pair.

This feature increases system design flexibility and supports higher-current PV arrays while maintaining the inverter’s voltage protection requirements.

Version	Revision Date	Brief Description of Change
V1.0	12/8/2025	Document Published