

Issue Date: November 9, 2020

Revision Date: None

Mr. Woodey Wu

Shenzhen Growatt New Energy Technology Co., Ltd

1st East & 3rd Floor, Jiayu Industrial Zone, Xibianling,
Shangwu Village,
Shiyan, Baoan,
District Shenzhen,
China

Subject: Evidence of inverter support for IEEE 2030.5/Rule 21 CSIP Phase 2 and
Phase 3 Function 1 and 8 Functionality

Dear Mr. Woodey Wu,

This letter confirms that Intertek Testing Services NA Inc. witnessed the Appendix C testing listed in Resolution E-5000 from the California Public Utilities Commission Draft dated July 11, 2019. The Resolution requires the verification of five tests cased for inverters that do not directly implement IEEE 2030.5 client functionality. During the test, the inverter is to be connected to a SunSpec Certified IEEE 2030.5/CSIP gateway. The five tests are listed below and specified in the SunSpec IEEE 2030.5/CSIP test procedures:

- Inverter Status (BASIC-028)
- Inverter Meter Reading (BASIC-029)
- Basic Inverter Control – Volt/Var (BASIC-006)
- Basic Inverter Control – Fixed Power Factor (BASIC-008)
- Basic Inverter Control – Volt-Watt (BASIC-011)

The tests were performed using Delta Electronics DER Client listed in Table 1 connected to the below Inverter manufacturer models listed in Table 2.

Inverter Manufacture:

Shenzhen Growatt New Energy Technology Co., Ltd

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Shiyan, Baoan
District Shenzhen, China

Table 1: DER Client Information

| Manufacturer | Product Name | Product Model# | Software Checksum |
|-------------------|----------------------------|----------------|----------------------------------|
| Delta Electronics | Monitor Communication Card | VCB-500 Series | 26311ca62a1b830c703758640af708fb |

Table 2: Inverter Models Information

| Inverter Manufacturer | Inverter Model# | EUT Serial# | Date Tested / Comments |
|--|------------------|-------------|---|
| Shenzhen Growatt New Energy Technology | MIN 7600TL-XH-US | TAG0A31002 | 10/29/2020 |
| | MIN 6000TL-XH-US | NA | Same Communication Protocol as MIN 7600TL-XH-US |
| | MIN 5000TL-XH-US | NA | Same Communication Protocol as MIN 7600TL-XH-US |
| | MIN 3800TL-XH-US | NA | Same Communication Protocol as MIN 7600TL-XH-US |
| | MIN 3000TL-XH-US | NA | Same Communication Protocol as MIN 7600TL-XH-US |
| | MIN 7600TL-XA-US | NA | Same Communication Protocol as MIN 7600TL-XH-US |
| | MIN 6000TL-XA-US | NA | Same Communication Protocol as MIN 7600TL-XH-US |
| | MIN 5000TL-XA-US | NA | Same Communication Protocol as MIN 7600TL-XH-US |
| | MIN 3800TL-XA-US | NA | Same Communication Protocol as MIN 7600TL-XH-US |
| | MIN 3000TL-XA-US | NA | Same Communication Protocol as MIN 7600TL-XH-US |

Note: All Inverter above models has same communication hardware and firmware (MD5).

UE1.0 checksum: 8CB43554CCEBB5D85F0581EA268A5C28

IF1.0 checksum:0F6458B6E3E6F84AC3D21BBFEEB12590

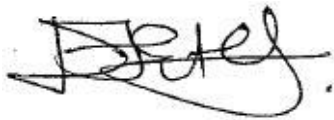
ZA1.0 checksum: 426F6C95D93FB1F0A552AF987534C32D

The inverter under test was subjected to testing conditions as follows:

- The inverter was operating during test harness verification procedure
- The Delta Electronics IEEE2030.5 DER Client listed in Table 1 was given stimuli in the form of IEEE 2030.5 commands (Inverter Status, Inverter Meter Reading, Volt/VAR, Fixed Power Factor, and Volt/Watt) sent from an IEEE 2030.5 server that were subsequently translated to signals understood by the inverter.
- The inverter parameters were verified: a) to change during the test cases for Volt-VAR, Fixed Power Factor, and Volt-Watt and b) report monitored data during the test cases for Inverter Status and Inverter Meter Reading. Based on this procedure, the requirements from Appendix C of the resolution were verified.

Very truly yours,

Tested By,



Dishant Patel
Project Engineer
Intertek Testing Services NA Inc.

Approved By,



Dipesh Patel
Reviewer
Intertek Testing Services NA Inc.



Total Quality. Assured.

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REPORT REVISIONS

| Date/ Proj.# | Project Handler/ Reviewer | Description of Change |
|-----------------|------------------------------|-----------------------|
| | | None |