**Manufacturer's declaration in accordance with the requirements of**

**G98-Amd. 6 (2021-09) standard Sec.s 9.7.1, 9.7.2, and G99-Amd. 8 (2021-09) standard Sec.s 9.1.7, 9.1.8**

**regarding "Cyber Security"**

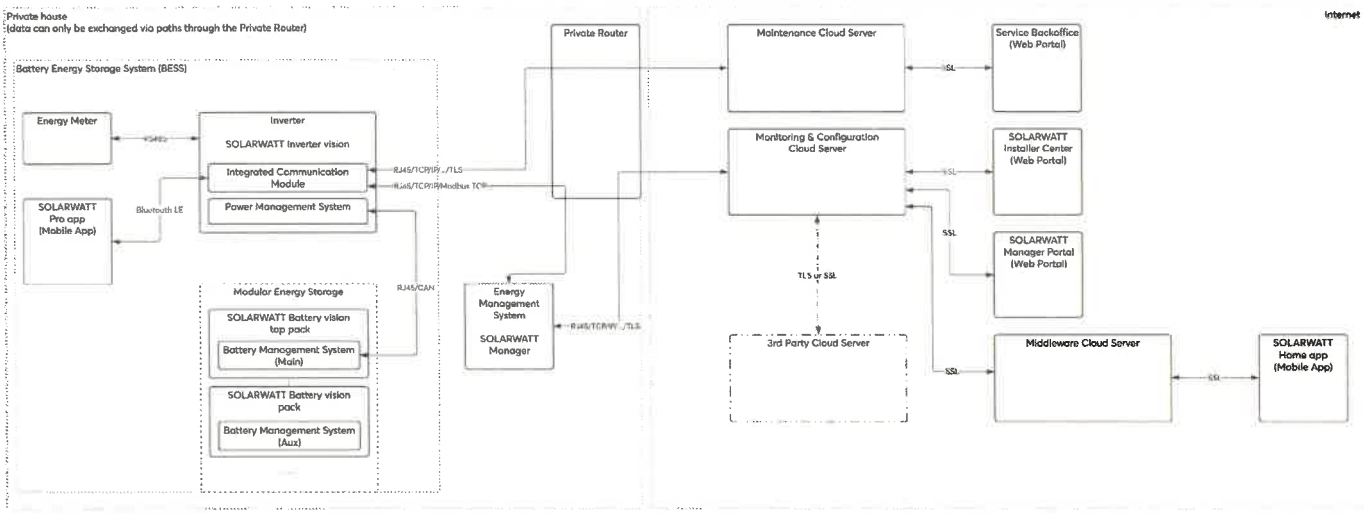
The undersigned Sven Schwarz, as CSCO, and Peter Bachmann, as CPO

of the Company Solarwatt GmbH,

based in Maria-Reiche-Straße 2a, 01109 Dresden, Germany

**on behalf of the same Company declare jointly the following:**

**1)** The energy system consisting of an inverter, a modular battery system and an energy meter ("Battery Energy Storage System", "BESS") requires a system of internal and external logic communications as summarized in the following scheme:



where the main components involved and their main functions are explained in the following table:

| *acronym/ name* | *meaning* | *function* | *location* |
|---|---|---|---|
| PMS | Power Management System | monitoring and management of power fluxes through the inverter, execution of EMS's commands or local logic functions depending on grid parameters values<br>*Note: The PMS performs operational safety functions aimed at prevent physical damage/harm, typically by interrupting currents and/or opening contacts on some inverter ports when voltage, current or temperature limits are violated; no safety operation performed by PMS can be compromised/skipped by commands/signals originating outside the inverter.* | Inverter |
| BMS | Battery Management System | monitoring of cells's status, execution of PMS's commands within safety conditions<br>*Note: The BMS performs operational safety functions aimed at prevent physical damage/harm, typically by interrupting currents and/or opening contacts on some battery or BMS ports when voltage, current or temperature limits are violated; no safety operation performed by BMS can be compromised/skipped by commands/signals originating outside the BMS and batteries.* | Battery |
| EMS | Energy Management System | monitoring of all field's measures, calculation of power and currents for every component of the system, reception of external commands, transmission of commands to PMS, transmission of data to cloud server, reception of commands/settings from external stakeholder<br>*Note: No operational safety function aimed at preventing physical damage/harm is performed by the EMS; no operation performed by EMS can force the operational safety functions performed by BMS, PMS and electrical protections.* | private network |
| METER | Energy Meter | included in the supply: meter at the grid connection point to support energy flux calculation | private energy grid |
| COMM | Integrated Communication Module | sending of service & maintenance relevant anonymous telemetry data to Maintenance Cloud Server. Reception of configuration settings made by Service Team members during service cases | Inverter |
| SCLOUD | Maintenance Cloud Server | Anonymous site & device telemetry & configuration data | cloud server/ GERMANY (DPA with contractor A of Solarwatt) |
| MCLOUD | Monitoring & Configuration Cloud Server | Personalized telemetry & configuration data | cloud server/EU (DPA with contractor B of Solarwatt) |

| *acronym/ name* | *meaning* | *function* | *location* |
|---|---|---|---|
| SBO | Service Backoffice | Web portal for maintaining the Inverter and Modular Energy Storage by Service Teams | web-server/ GERMANY (DPA with contractor A of Solarwatt) |
| IC | SOLARWATT Installer Center | Web portal for maintaining the EMS and all connected devices by Service Teams | web-server/EU (DPA with contractor B of Solarwatt) |
| SMP | SOLARWATT Manager Portal | Enduser web portal for monitoring the private energy system | web-server/EU (DPA with contractor B of Solarwatt) |
| SHA | SOLARWATT Home app | Enduser mobile app for monitoring the private energy system | private smart phone |
| DAVE | Middleware Cloud Server | Providing data to mobile apps | web-server/ GERMANY (DPA with contractor C of Solarwatt) |
| SPA | SOLARWATT Pro app | Installer mobile app for configuring the Inverter | private smart phone |

and the subjects/parties involved in communications with the BESS are listed in the following table, together with the purposes of the respective communications:

| *subject/party* | *means and devices* | *operations* |
|---|---|---|
| Enduser | mobile device (via App), PC (via web portal) | monitoring of instantaneous and historical data, settings for special functions |
| Service Team | PC (via web portal) | remote diagnostics, system behaviour monitoring, ticket management, remote sw updates, remote settings |
| BSP, DSO, Energy Community Management | proprietary ITC infrastructure, possible proprietary field device | monitoring of instantaneous and historical data via API, sending set-points for grid services or collective self-consumption management |
| Installer | mobile device (via app), PC (via web portal) | commissioning the system, remote diagnostics, remote maintenance |

**2)** All communications between internal components of the BESS take place via appropriate serial lines (RS485, CAN-Bus) and are not directly connected to any device or system outside the BESS.

**3)** The only communication port between the BESS and the outside is constituted by the COMM and the EMS.

The communication between the BESS and the outside world can take place via the Private Router according to the customer's request.

A BESS is a not-constrained customer IoT device according to the definitions in ETSI EN 303 645 sec. 3.1

**4)** The direct recipients/senders of communications with the BESS are:

a. in all cases the Monitoring Cloud Server by a contractor of SOLARWATT (Data Processing Agreement). The communication is made secure by the use of TLS (Transport Layer Security) technology on the COMM and by the use of SSL (Secure Sockets Layer) technology on all service web-tools;

b. possible third party (such as BSP, DNO, ESCo, etc.) field devices like external GW, external EMS, etc. – the cyber-security of the communication between BESS and third-party device will be ensured by the use of an appropriate technology (SSL or TSL typically) agreed between Solarwatt and the third party on case-by-case basis; the cyber-security between third-party device and third-party server/cloud will be the responsibility of the third party itself.

**5)** All communications between the cloud servers and the subjects/parties are cyber-protected by SSL technology.

**6)** The cyber-security assessment of the BESSs was performed according to the ETSI EN 303 645 standard, and it is reported according to the Table B.1 form of the same standard (see next page):

| EN 303 645 v2.1.1 (2020-06) Table B.1: Implementation of provisions for consumer IoT security | | | |
|---|---|---|---|
| Clause number and title | | | |
| Reference | Status | Support | Detail |
| 5.1 No universal default passwords | | | |
| Provision 5.1-1 | M C (1) | Y | device do not permit end user's login: no end user's credential exist<br><br>COMM's AP password generated by max and will force prompt changes on first use |
| Provision 5.1-2 | M C (1) | Y | |
| Provision 5.1-3 | M | N/A | |
| Provision 5.1-4 | M C (8) | N/A | |
| Provision 5.1-5 | M C (5) | N/A | |
| 5.2 Implement a means to manage reports of vulnerabilities | | | |
| Provision 5.2-1 | M | Y | |
| Provision 5.2-2 | R | Y | |
| Provision 5.2-3 | R | Y | |
| 5.3 Keep software updated | | | |
| Provision 5.3-1 | R | Y | |
| Provision 5.3-2 | M C (5) | Y | |
| Provision 5.3-3 | M C (12) | N/A | the end user can not update any BESS SW component: only manufacturer Service Team personnel can do it remotely |
| Provision 5.3-4 | R C (12) | Y | The manufacturer manages the updates of the systems by means of remote automatisms, selectively by type of machine or by activating special functions at the request of the user |
| Provision 5.3-5 | R C (12) | N | see note at 5.3-4 |
| Provision 5.3-6 | R C (9, 12) | N | see note at 5.3-4 |
| Provision 5.3-7 | M C (12) | Y | |
| Provision 5.3-8 | M C (12) | N | see note at 5.3-4 |
| Provision 5.3-9 | R C (12) | N | |
| Provision 5.3-10 | M (11, 12) | Y | |
| Provision 5.3-11 | R C (12) | N | |
| Provision 5.3-12 | R C (12) | N | |
| Provision 5.3-13 | M | Y | |
| Provision 5.3-14 | R C (3, 4) | N/A | not constrained device |
| Provision 5.3-15 | R C (3, 4) | N/A | not constrained device |
| Provision 5.3-16 | M | Y | |
| 5.4 Securely store sensitive security parameters | | | |
| Provision 5.4-1 | M | Y | |
| Provision 5.4-2 | M C (10) | Y | |
| Provision 5.4-3 | M | N/A | hard-coded identity not used in source code |
| Provision 5.4-4 | M | Y | |
| 5.5 Communicate securely | | | |
| Provision 5.5-1 | M | Y | |
| Provision 5.5-2 | R | Y | |
| Provision 5.5-3 | R | Y | |
| Provision 5.5-4 | R | N | |
| Provision 5.5-5 | M | Y | |
| Provision 5.5-6 | R | Y | |
| Provision 5.5-7 | M | Y | |

| EN 303 645 v2.1.1 (2020-06) Table B.1: Implementation of provisions for consumer IoT security | | | |
|---|---|---|---|
| Clause number and title | | | |
| Reference | Status | Support | Detail |
| Provision 5.5-8 | M | Y | |
| 5.6 Minimize exposed attack surfaces | | | |
| Provision 5.6-1 | M | Y | |
| Provision 5.6-2 | M | Y | |
| Provision 5.6-3 | R | Y | |
| Provision 5.6-4 | M C (13) | N/A | no debug interface accessible |
| Provision 5.6-5 | R | Y | |
| Provision 5.6-6 | R | Y | |
| Provision 5.6-7 | R | Y | |
| Provision 5.6-8 | R | N | |
| Provision 5.6-9 | R | Y | |
| 5.7 Ensure software integrity | | | |
| Provision 5.7-1 | R | N | |
| Provision 5.7-2 | R | N | |
| 5.8 Ensure that personal data is secure | | | |
| Provision 5.8-1 | R | N/A | no personal data transit through BESS HW/SW |
| Provision 5.8-2 | M | Y | applicable to server/cloud services and to the customer App for mobile devices |
| Provision 5.8-3 | M | Y | |
| 5.9 Make systems resilient to outages | | | |
| Provision 5.9-1 | R | Y | |
| Provision 5.9-2 | R | Y | |
| Provision 5.9-3 | R | Y | |
| 5.10 Examine system telemetry data | | | |
| Provision 5.10-1 | R C (6) | N | |
| 5.11 Make it easy for users to delete user data | | | |
| Provision 5.11-1 | M | N/A | no user/personal data are stored in the BESS |
| Provision 5.11-2 | R | N/A | no user/personal data are stored in the BESS |
| Provision 5.11-3 | R | N/A | no user/personal data are stored in the BESS |
| Provision 5.11-4 | R | N/A | no user/personal data are stored in the BESS |
| 5.12 Make installation and maintenance of devices easy | | | |
| Provision 5.12-1 | R | N/A | no installation/maintenance operations are available to the end |
| user Provision 5.12-2 | R | N/A | no installation/maintenance operations are available to the end |
| user Provision 5.12-3 | R | N/A | see note at 5.3-4 |
| 5.13 Validate input data | | | |
| Provision 5.13-1 | M | Y | |
| 6 Data protection provisions for consumer IoT | | | |
| Provision 6.1 | M | Y | it only applies to the server/cloud side of the service, not to the BESS |
| Provision 6.2 | M C (7) | Y | it only applies to the server/cloud side of the service, not to the BESS |
| Provision 6.3 | M | Y | it only applies to the server/cloud side of the service, not to the BESS |
| Provision 6.4 | R C (6) | Y | no user/personal data are stored in the BESS |
| Provision 6.5 | M C (6) | Y | no user/personal data are stored in the BESS |
| Conditions: | | | |
| 1) passwords are used;<br>2) pre-installed passwords are used;<br>3) software components are not updateable;<br>4) the device is constrained;<br>5) the device is not constrained;<br>6) telemetry data being collected;<br>7) personal data is processed on the basis of consumers' consent;<br>8) the device allowing user authentication; | | | |

| | |
|---|---|
| 9) the device supports automatic updates and/or update notifications;<br>10) a hard-coded unique per device identity is used for security purposes;<br>11) updates are delivered over a network interface;<br>12) an update mechanism is implemented;<br>13) a debug interface is physically accessible. | |
| Status' Column: | |
| M | Mandatory provision |
| R | Recommended provision |
| M C | Mandatory and conditional provision |
| R C | Recommended and conditional provision |
| Support' Column: | |
| Y | Implemented |
| N | Not implemented |
| N/A | Not applicable |

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