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TN007 – Sonnen eco 8 Single Phase – DRM's Option B

In accordance with AS/NZS 4777.2:2015 Section 6 Operation Modes and Multiple Mode Inverters, and specifically sub-section 6.2 Inverter demand response modes (DRM's), the sonnen eco 8 series of intelligent energy storage products have the following port, connection and settings as described within this tech-note to comply.

The sonnen eco 8 system will respond within the maximum 2 second threshold as required within AS/NZS 4777.2:2015 clause 6.2.1 as well as offer's all of the demand response modes as detailed in Table 5.

TABLE 5

DEMAND RESPONSE MODES (DRMs)

Mode	Requirement
DRM 0	Operate the disconnection device
DRM 1	Do not consume power
DRM 2	Do not consume at more than 50% of rated power
DRM 3	Do not consume at more than 75% of rated power AND Source reactive power if capable
DRM 4	Increase power consumption (subject to constraints from other active DRMs)
DRM 5	Do not generate power
DRM 6	Do not generate at more than 50% of rated power
DRM 7	Do not generate at more than 75% of rated power AND Sink reactive power if capable
DRM 8	Increase power generation (subject to constraints from other active DRMs)

NOTE: Demand response modes of Table 5 are as described in AS/NZS 4755.3 series of Standards.

In accordance with AS/NZS 4777.2:2015 clause 6.2.2 the sonnen eco 8 offers connection to a DRED via a URL port (either Device IP as per a VPN connection or via the local IP Address), which is deemed permissible and specifically referenced within notes clause 3.

The DRED options available using this method of interaction with the sonnen eco 8 product/s will allow for more than one DRM's to be asserted at any given point in which case every active DRM will be supported by the system so that their status condition will be satisfied.

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API Control Settings

The sonnen eco 8 offers connection to a DRED via a URL port (either Device IP as per a VPN connection or via the local IP Address known as Rest API. Each request and response is HTTP 1.1 compliant

The primary URL is described as follows;

http://[DEVICE_IP]:8080/api[PATH]

- DEVICE_IP – Device IP is the VPN or Local Network IP Address of the device.
- PATH – Path is the based on the type of request

The charging/discharging power of the sonnen system can be controlled by setting a setpoint in watts. The HTTP PUT method is used to set the set point of the battery system. The corresponding value of set point either charge or discharge is kept until battery receives a new charging or discharging value.

- Charging Path - api/setpoint/charge/[value]
- Discharging Path - api/setpoint/discharge/[value]

An example of HTTP PUT request is shown below:

```
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/charge/1000
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/discharge/1000

PUT /api/v1/setpoint/charge/1000 HTTP/1.1
User-Agent: curl/7.35.0
Host: 192.168.33.185:8080
Accept: */*

HTTP/1.1 200 OK
Content-Length: 18
Content-Type: text/html; charset=UTF-8
```

The system status can be retrived by using an HTTP GET method. The return response is in JSON format.

- Status Path - api/status

The system status options are as follows;

Name	**Description**
Consumption_	W House comsumption in watts
Production_W	PV Production in watts
Pac_total_W	Inverter AC Power greater than ZERO is discharging Inverter AC Power less than ZERO is charging
RSOC	Relative state of charge
USOC	User state of charge
Fac	AC frequency in hertz.
Uac	AC voltage in volts
Ubat	Battery volatge in volts
Timestamp	System time
IsSystemInstalled	System is installed or not

An example of HTTP GET request is shown below:

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```
curl -v -X GET http://192.168.33.185:8080/api/v1/status

GET /api/v1/status HTTP/1.1
User-Agent: curl/7.35.0
Host: 192.168.33.185:8080
Accept: */*

HTTP/1.1 200 OK
Content-Length: 151
Content-Type: application/json

{
        "Consumption_W": 0,
        "Fac": 0,
        "IsSystemInstalled": 1,
        "Pac_total_W": 0,
        "Production_W": 0,
        "RSOC": 0,
        "Timestamp": "2016-06-13 11:52:20",
        "USOC": 0,
        "Uac": 0,
        "Ubat": 0
}
```

The system return codes to a request response are as follows;

Return Code	**Description**
0	Request successfully received
5	Invalid request path
13	Internal error
16	Invalid HTTP method

DRM Control Settings

DRM 0 will be achieved by setting both the charge and discharge rates of the sonnen eco 8 system to zero thus creating a standby mode. The charging/discharging power of the sonnen system can be controlled by setting a set point in watts therefore to create a disconnection set point equivalent the 0 value should be entered.

An example of HTTP PUT request is shown below:

```
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/charge/0
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/discharge/0
```

When considering the mode and operation of the sonnen eco 8 product both **DRM 1** and **DRM 5**, do not consume or generate power respectively then again the charging/discharging of power by the sonnen system will be controlled by setting a set point in watts therefore to create a disconnection set point equivalent the 0 value should be entered.

An example of HTTP PUT request is shown below:

```
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/charge/0
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/discharge/0
```

When considering the mode and operation of the sonnen eco 8 product both **DRM 2** and **DRM 6**, do not consume or generate more than 50% of rated power respectively then again the charging/discharging of power by the sonnen system

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will be controlled by setting a set point in watts therefore to create a disconnection set point equivalent the 1250W value should be entered given that the maximum rated power output of the system is 2.5kW.

An example of HTTP PUT request is shown below:

```
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/charge/1250
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/discharge/1250
```

When considering the mode and operation of the sonnen eco 8 product both **DRM 3** and **DRM 7**, do not consume or generate more than 75% of rated power respectively then again the charging/discharging of power by the sonnen system will be controlled by setting a set point in watts therefore to create a disconnection set point equivalent the 1875W value should be entered given that the maximum rated power output of the system is 2.5kW.

An example of HTTP PUT request is shown below:

```
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/charge/1875
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/discharge/1875
```

When considering the mode and operation of the sonnen eco 8 product both **DRM 4** and **DRM 9**, to increase consumption or generation (subject to constraints from other DRM's) respectively then again the charging/discharging of power by the sonnen system will be controlled by setting a set point in watts therefore to create a disconnection set point equivalent the maximum values thus allowing the product to operate to its full rated capacity until a new DRM mode is requested.

An example of HTTP PUT request is shown below:

```
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/charge/2500
curl -v -X PUT http://192.168.33.185:8080/api/v1/setpoint/discharge/2500
```

If you have any further questions or require support or assistance, please contact us at support@sonnen.com.au.

Yours faithfully,

James Sturch
Technical Business Manager Australia & New Zealand