

Changes to the Grid Code – Additional PV Signals

Red-line Version of Impacted Grid Code Section(s) - show proposed changes to text:

Deleted text in strike-through blue font and new text highlighted in red font

Power Park Module Setting Schedule

Appendix D SCADA Signals and Controls between Power Park Module and SONI/NIE Networks

The signals list shown below may be subject to change should SONI/NIE Networks feel that additional controls/indications are required from a PPM.

| Analogue Input Signals (to SONI/NIE Networks) from Power Generating Facility | | | | | |
|--|---|--------|-------|---------------|------------------|
| Signal Description | Description | Range | Units | Scale | Display Units |
| MW* | Indication of the Active Power Output at PPM Connection Point | 4 - 20 | mA | TBA | MW |
| MVAr* | Indication of the Reactive Power Flow at the PPM Connection Point | 4 - 20 | mA | TBA | MVAr |
| Voltage* | Indication of the Voltage at the PPM Connection Point | 4 - 20 | mA | TBA | kV |
| Wind Speed | For wind PPMs only: Indication of the highest wind speed at any instant measured by a Generating Unit comprised within a wind PPM. All measurements shall be at Generating Unit hub height. | 4 - 20 | mA | TBA | m/sec |
| Wind Direction | For wind PPMs only: Indication of wind direction at wind PPM at hub height | 4 - 20 | mA | 0-359° | deg |
| Global Horizontal Irradiance (GHI) | For Solar PV PPMs only: Indication of the highest Global Horizontal Irradiance (GHI) at any instant measured by a Generating Unit comprised within a PPM. All measurements shall be at Generating Unit panel height. | 4 - 20 | mA | TBA 0-4000 | W/m ² |
| Diffuse Horizontal Irradiance (DHI) | For Solar PV PPMs only: Indication of the highest Diffuse Horizontal Irradiance (GHI) at any instant measured by a Generating Unit comprised within a PPM. All measurements shall be at Generating Unit panel height. | 4 - 20 | mA | 0-4000 | W/m ² |

| | | | | | |
|--|---|--------|----|------------------|-------------|
| Back Panel Temperature | For Solar PV PPMs only: Indication of Back Panel Temperature at any instant measured by a Generating Unit comprised within a PPM | 4 - 20 | mA | -30 - +50 | °C |
| Precipitation | For Solar PV PPMs only: Indication of Precipitation at any instant measured by a Generating Unit comprised within a PPM | 4 - 20 | mA | 0-11 | mm/min |
| Ambient Temperature | Indication of ambient temperature on PPM met mast | 4 - 20 | mA | TBA -30 - +50 | °C |
| Atmospheric Pressure | Atmospheric Pressure on PPM met mast | 4 - 20 | mA | 735-1060 | mBar |
| PPM MW Availability | The amount of Active Power that the Controllable PPM could produce based on current generation resource conditions and network conditions. The MW Availability shall only differ from the MW Output if the Controllable PPM has been curtailed, constrained or is operating in a Curtailed Frequency Response mode, as instructed by SONI via the SCADA interface. By way of clarification, limitations placed on PPM Output due to 33kV Dynamic Line Rating schemes are NIE Networks actions only and these should be reflected in the MW Availability . | 4 - 20 | mA | TBA | MW |
| PPM % shutdown | For wind PPM : Indication of the % of Generating Units shutdown due to high wind speed | 4 - 20 | mA | TBA | % |
| MW Set Point | Confirmation of MW set point signal | 4 - 20 | mA | TBA | MW |
| MVAR Set Point | Confirmation of MVAR set point signal | 4 - 20 | mA | TBA | MVAR |
| Voltage Set Point | Confirmation of voltage set point signal | 4 - 20 | mA | TBA | kV |
| Power Factor Set Point | Confirmation of power factor set point signal | 4 - 20 | mA | TBA | Decimal |
| % MW Curtailment Set Point ² | Confirmation of % curtailment MW set point when providing reserve | 4 - 20 | mA | TBA | % |
| Curtailment Time Interval | Confirmation of time to reach set point | 4 - 20 | mA | TBA | Min |
| PPM Active Set Point ³ | Indication of the MW set point to which the PPM Output is limited | 4 - 20 | mA | TBA | MW |
| % Generating Units Available ⁴ | Indication of the % Available Generating Units at the PPM | 4 - 20 | mA | TBA | % |
| Droop | The frequency response droop characteristic to which the PPM is currently operating, depending on frequency response mode | 4 - 20 | mA | 2-12 | % |

| | | | | | |
|----------|--|--------|----|---------|----|
| Deadband | The frequency response deadband currently in operation, depending on frequency response mode | 4 - 20 | mA | 0 – 0.5 | Hz |
|----------|--|--------|----|---------|----|

6.6 VOLTAGE CONTROL MODE and REACTIVE CAPABILITY TESTS

Figure 2 – Minimum Reactive Capability Characteristic of the **PPM** at the **Connection Point**

