Signal list for PV Power Plants - TR 3.2.2

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Specifications for sunspec profiles are available for download at: www.sunspec.org/download. The specifications can be downloaded free of charge by entering name and affiliation. The documentation can subsequently be seen in the zip file at the follwing website address: \Protocol-Information-Conformance-Statements.zip\Protocol Information Conformance Statements\

Category														Sunspec ID		
A	B	C	D	Signal description	Comments	Possible interval	Typical value	Unit	Data types	Purpose of signal	Responsible for signal availability in PCOM	Ancillary services	Energinet.dk reference	Model Prefix Abbrevations	Start Offset	Label
	X	X	X	Swich gear status in POC		Open/closed	-	-	Status	Monitor coupling state for netPOC	Meter operator		TR 5.8.1	IC123	5	Conn
	X	X	X	Active power kW - metered in POC	Measurement of active power	0 - P_{max}	-	kW	Metering	Input for settlement	Meter operator		TR 5.8.1	M203	19	Watts
		X	X	Active power control - ramp rate constraint	Active power control	Active/inactive	-	-	Control	Activate/deactivate the function	Plant owner	Mandatory ancillary services	TR 5.9.1	Always active		
		X	X	Active power control - ramp rate for upward regulation of active power	Active power control	10 - 300 kW/WTGS/s	50 kW/WTGS/s	kW/second	Set point	Speed control for upward regulation of active power	Plant owner	Mandatory ancillary services	TR 5.9.1	IC123	9	WMaxLimPct_RmpTms
		X	X	Active power control - ramp rate for downward regulation of active power	Active power control	10 - 300 kW/WTGS/s	50 kW/WTGS/s	kW/second	Set point	Control the speed for downward regulation of active power	Plant owner	Mandatory ancillary services	TR 5.9.1	IC123	9	WMaxLimPct_RmpTms
		X	X	Active power control - absolut power constraint	Active power control	Active/inactive	-	-	Control	Activate/deactivate the function	Plant owner	Mandatory ancillary services	TR 5.9.1	Always active		
		X	X	Active power control - desired maximum active power	Active power control	0 - P_{max}	-	kW	Set point	Input for controlling active power supplied from a PV power plant	Plant owner	Mandatory ancillary services	TR 5.9.1	IC123	6	WMaxLimPct
		X	X	Active power control - delta constraint	Active power control	Active/inactive	-		Control	Activate/deactivate the function	Plant owner	Optional ancillary services	TR 5.8.1 + tender documents	N.A.		
		X	X	Active power control - desired regulating reserve - Pdelta	Frequency control	0 - P_{max}	-	kW	Set point	Input for creating reserves of active power in a PV power plant	Plant owner	Optional ancillary services	TR 5.8.1 + tender documents	N.A.		
	X	X	X	Reactiv power Mvar - measured in POC	Reactive power control	Q_{min} to Q_{max}	-	kvar.	Metering	Input for reactive power control	Meter operator		TR 5.8.1	M203	29	VAR
		X	X	Power factor - measured in POC	Reactive power control	0 - 1	-	-	Metering	Input for reactive power control	Plant owner	Mandatory ancillary services	TR 5.9.1	M203	34	PF
		X	X	Power factor - desired PF in POC	Reactive power control	0 - 1	1	-	Set point	Set point for desired power factor	Plant owner	Mandatory ancillary services	TR 5.9.1	IC123	11	OutPFSet
		X	X	Reactive power control - activated/deactivated	Reactive power control	Active/inactive	-	-	Control	Activate/deactivate the function	Plant owner	Mandatory ancillary services	TR 5.9.1	IC123	23	VArPct_Ena
		X	X	Reactive power control - desired reactive power in POC	Reactive power control	Q_{min} to Q_{max}	0	kvar.	Set point	Set point for desired Mvar	Plant owner	Mandatory ancillary services	TR 5.9.1	IC123	17	VArMaxPct
		X	X	Voltage - voltage measured in the voltage reference point	Voltage control	V_{refmin} - V_{refmax}	-	V	Metering	Input for voltage control in POC	Meter operator	Optional ancillary services	TR 5.8.1 + tender documents	M203	12	Voltage LL
		X	X	Voltage control - activated/deactivated	Voltage control	Active/inactive	-	-	Control	Activate/deactivate the function	Plant owner	Optional ancillary services	TR 3.2.2 + tender documents	IC126	4	ModEna
		X	X	Voltage control - voltage measured in POC	Voltage control	U_{min} to U_{max}	-	V	Metering	Monitor voltage condition in a PV power plant	Plant owner	Optional ancillary services	TR 3.2.2 + tender documents	M203	12	Voltage LL
		X	X	Voltage control - voltage control droop	Voltage control	2 - 6%	4%	% of Un	Set point	Droops for voltage stabilisation in POC	Plant owner	Optional ancillary services	TR 3.2.2 + tender documents	N.A.		
		X	X	Voltage control - desired voltage in voltage reference point	Voltage control	U_{ref} ± 10%	-	V	Set point	Input for voltage stabilisation in POC	Plant owner	Optional ancillary services	TR 3.2.2 + tender documents	N.A.		
		X	X	Frequency response - activated/deactivated	Frequency response	Active/inactive	-	Hz	Set point	Activate/deactivate the function	Plant owner	Optional ancillary services	TR 5.8.1 + tender documents	IC134	4	ModEna
		X	X	Frequency response -initial frequency for frequency response - fR	Frequency response	50.00 - 50.50	50.20	Hz	Set point	Input for frequency stabilisation	Plant owner	Optional ancillary services	TR 5.8.1 + tender documents	IC134	14-53	Hz, W
		X	X	Frequency control - frequency measured in POC	Frequency control	47.00 - 52.00	-	-	Status	Input for frequency stabilisation in POC	Meter operator		TR 5.8.1	M203	17	Hz, W
		X	X	Frequency control - activated/deactivated	Frequency control	Active/inactive	-	-	Status	Activate/deactivate the function	Plant owner	Mandatory ancillary services	TR 5.9.1	N.A.		
		X	X	Reference frequency - desired frequency in POC - f_{ref}	Frequency control	50.00	50.00	Hz	Set point	Input for frequency stabilisation in POC	Plant owner	Mandatory ancillary services	TR 5.9.1	N.A.		
		X	X	Frequency control - control limit - low - fmin	Frequency control	46.50 - 47.50	47.00	Hz	Set point	Lower control limit value for frequency control	Plant owner	Mandatory ancillary services	TR 5.9.1	N.A.		
		X	X	Frequency control - control limit - high - fmax	Frequency control	51.00 - 52.50	52.00	Hz	Set point	Upper control limit value for frequency control	Plant owner	Mandatory ancillary services	TR 5.9.1	N.A.		
		X	X	Frequency control - initial frequency for control band and frequency respons- f1	Frequency control	49.50 - 50.00	49.80 or 50.20	Hz	Set point	Input for frequency stabilisation in POC	Plant owner	Optional ancillary services	TR 5.8.1 + tender documents	N.A.		
		X	X	Frequency control - initial frequency for dead band - f2	Frequency control	49.80 - 50.00	49.88	Hz	Set point	Input for frequency stabilisation in POC	Plant owner	Optional ancillary services	TR 5.8.1 + tender documents	N.A.		
		X	X	Frequency control - final frequency for dead band - f3	Frequency control	50.00 - 50.20	50.02	Hz	Set point	Input for frequency stabilisation in POC	Plant owner	Optional ancillary services	TR 5.8.1 + tender documents	N.A.		
		X	X	Frequency control - final frequency for control band - f4	Frequency control	50.00 - 50.50	50.20	Hz	Set point	Input for frequency stabilisation in POC	Plant owner	Optional ancillary services	TR 5.8.1 + tender documents	N.A.		
		X	X	Frequency control - final frequency for regulation up to f5	Frequency control	51.00 - 52.00	51.25	Hz	Set point	Input for frequency stabilisation in POC	Plant owner	Mandatory ancillary services	TR 5.9.1	N.A.		
		X	X	Frequency control - final frequency for control up to f6	Frequency control	51.00 - 52.00	51.75	Hz	Set point	Input for frequency stabilisation in POC	Plant owner	Mandatory ancillary services	TR 5.9.1	N.A.		
		X	X	Frequency control - droop 1 for control from f1 to f2	Frequency control	2 -8%	4%	% of Pn	Set point	Input for frequency stabilisation in POC	Plant owner	Optional ancillary services	TR5 .8.1 + tender documents	N.A.		
		X	X	Frequency control - droop 2 for control from f3 to f4	Frequency control	2 - 8%	6%	% of Pn	Set point	Input for frequency stabilisation in POC	Plant owner	Optional ancillary services	TR 5.8.1 + tender documents	N.A.		
		X	X	Frequency control - droop 3 for control from f4 to f5	Frequency control	2 - 10%	8%	% af Pn	Set point	Input for frequency stabilisation in POC	Plant owner	Mandatory ancillary services	TR 5.9.1	N.A.		
		X	X	Frequency control - droop 4 for downward regulation from f5 to f6	Frequency control	5 - 20%	10%	% of Pn	Set point	Input for frequency stabilisation in POC	Plant owner	Mandatory ancillary services	TR 5.9.1	N.A.		
		X	X	Frequency control - frequency limit for reclosure, if active power has been reduced to below Pmin - f7	Frequency control	50.00 - 50.10	50.05	Hz	Set point	Input for frequency stabilisation in POC	Plant owner	Mandatory ancillary services	TR 5.9.1	N.A.		
		X	X	System protection	System protection	Active/inactive	-	-	Control	Activate/deactivate the function	Plant owner	Mandatory ancillary services	TR 5.9.1	IC123	6	WMaxLimPct
X	X	X	X	Stop signal	System protection	Active/inactive	-	-	Control	Activation/deactivation of the plant	Plant owner	Mandatory ancillary services	TR 5.9.1	IC123	5	Conn = 0
X	X	X	X	On-hold signal - "Released for start"	System protection	Active/inactive	-	-	Control	Activation/deactivation of start of the plant	Plant owner	Mandatory ancillary services	TR 5.9.1	IC123	5	Conn = 1