LUMAPR.COM

SMART INVERTER SETTINGS TEMPLATE

June 28, 2024

© 2024 LUMA ENERGY, LLC | 644 Fernandez Juncos Ave., Suite 301, San Juan, PR 00907

Table 1- Communication Protocols Supported by the Smart Inverter

Protocol	Supported?	Transport Layer	Physical Interface/Layer	
		TCP/IP	Ethernet	RS 485
IEEE 1815 (DNP3)	☐ Yes ☐ No	☐	☐	☐
SunSpec Modbus	☐ Yes ☐ No	☐	☐	☐
IEEE 2030.5 (Sep 2.0)	☐ Yes ☐ No	☐	☐	☐

Table 2- Control Functions Supported by the Smart Inverter

Control Function	Description	Supported?	Actual Status
Anti-Islanding	Refers to ability of Smart Inverter to detect loss of utility source and trip off	☐ Yes ☐ No	☐ Activated ☐ Deactivated
Adjustable Constant Power Factor	Refers to ability of Smart Inverter to set its Power Factor to a fixed value	☐ Yes ☐ No	☐ Activated ☐ Deactivated
Adjustable Constant Reactive Power	Refers to ability of Smart Inverter to set its Reactive Power to a fixed value	☐ Yes ☐ No	☐ Activated ☐ Deactivated
Voltage Ride Through	Refers to ability of Smart Inverter to ride through a certain range of voltages before tripping off	☐ Yes ☐ No	☐ Activated ☐ Deactivated
Frequency Ride Through	Refers to ability of Smart Inverter to ride through a certain range of frequencies before tripping off	☐ Yes ☐ No	☐ Activated ☐ Deactivated
Voltage – Reactive Power (Volt/Var)	Refers to ability of Smart Inverter to control reactive power output as a function of voltage	☐ Yes ☐ No	☐ Activated ☐ Deactivated
Voltage – Active Power (Volt/Watt)	Refers to ability of Smart Inverter to control real power output as a function of voltage	☐ Yes ☐ No	☐ Activated ☐ Deactivated
Frequency – Watt	Refers to ability of Smart Inverter to control real power as a function of frequency	☐ Yes ☐ No	☐ Activated ☐ Deactivated
Normal Ramp-up Rate (Optional)	Refers to ability of Smart Inverter to transition between power output levels over normal ramp-up rates	☐ Yes ☐ No	☐ Activated ☐ Deactivated
Connect/Reconnect Ramp-up rate	Refers to ability of Smart Inverter to have an adjustable entry service ramp rate when a DER restores output of active power	☐ Yes ☐ No	☐ Activated ☐ Deactivated

Table 3- Smart Inverter's Anti-Islanding Setting Parameters

Constant Power Factor Setting	Actual Setting
Power Factor Operation Mode	☐ Enabled ☐ Disabled

Table 4- Smart Inverter's Constant Reactive Power Setting Parameters

Constant Reactive Power Setting	Actual Setting
Reactive Power Operation Mode	☐ Enabled ☐ Disabled

Table 5- Smart Inverter's Voltage Trip Setting Status

Voltage Trip Setting	Actual Setting	Default Setting
Voltage Trip Operation Mode	☐ Enabled ☐ Disabled	Enabled

Table 6- Smart Inverter's Voltage Trip Setting Parameters

Voltage Trip Settings	Actual Settings		
	Voltage (V)	Percentage of Nominal Voltage	Trip/Clearing Time (Seconds)
Over Voltage 2 (OV2)			
Over Voltage 1 (OV1)			
Under Voltage 1 (UV1)			
Under Voltage 2 (UV2)			

Table 7- Smart Inverter's Voltage Ride-Through Setting Status

Voltage Ride-Through Setting	Actual Setting	Default Setting
Voltage Ride-Through Operation Mode	☐ Enabled ☐ Disabled	Enabled

Table 8- Smart Inverter's Voltage Ride-Through Setting Parameters

Voltage Ride-Through Settings	Actual Settings				
	Voltage Range (V)	Percentage of Nominal Voltage	Operating Mode/Response	Maximum Response Time (Design Criteria) (Seconds)	Minimum Ride Through Time (Design Criteria) (Seconds)
High Voltage 2 (HV2)			Cease to Energize		
High Voltage 1 (HV1)			Momentary Cessation		
Near Normal Voltage (NNV)			Continuous Operation		
Low Voltage 1 (LV1)			Mandatory Operation		
Low Voltage 2 (LV2)			Mandatory Operation		
Low Voltage 3 (LV3)			Momentary Cessation		

Table 9- Smart Inverter's Frequency Trip Setting Status

Frequency Trip Setting	Actual Setting	Default Setting
Frequency Trip Operation Mode	☐ Enabled ☐ Disabled	Enabled

Table 10- Smart Inverter's Frequency Trip Setting Parameters

Frequency Trip Settings	Actual Settings	
	Frequency (Hertz)	Trip/Clearing Time (Seconds)
Over Frequency 2 (OF2)		
Over Frequency 1 (OF1)		
Under Frequency 1 (UF1)		
Under Frequency 2 (UF2)		

Table 11- Smart Inverter's Frequency Ride-Through Setting Status

Frequency Ride-Through Setting	Actual Setting	Default Setting
Frequency Ride-Through Operation Mode	☐ Enabled ☐ Disabled	Enabled

Table 12- Smart Inverter's Frequency Ride-Through Setting Parameters

Frequency Ride-Through Settings	Actual Settings			
	Frequency Range (Hertz)	Operating Mode/Response	Maximum Response Time (Design Criteria) (Seconds)	Minimum Ride Through Time (Design Criteria) (Seconds)
High Frequency 2 (HF2)		N/A		
High Frequency 1 (HF1)		Mandatory Operation		
Near Normal Frequency (NNF)		Continuous Operation		
Low Frequency 1 (LF1)		Mandatory Operation		
Low Frequency 2 (LF2)		N/A		

Table 13- Smart Inverter's Volt-Var Setting Status

Volt-Var Setting	Actual Setting	Default Setting
Volt-Var Operation Mode	☐ Enabled ☐ Disabled	Enabled

Table 14- Smart Inverter's Volt-Var Setting Parameters

Volt-Var Setting	Definitions	Actual Setting (% of Nominal Rating)
Vref	Dead band center	
V2	Dead band lower voltage limit	
Q2	Reactive power injection or absorption at voltage V2	
V3	Dead band upper voltage limit	
Q3	Reactive power injection or absorption at voltage V3	
V1	Voltage at which DER shall inject Q1 reactive power	
Q1	Reactive power injection at voltage V1	
V4	Voltage at which DER shall absorb Q4 reactive power	
Q4	Reactive power absorption at voltage V4	
Open loop response time (Seconds)	Time to 90% of the reactive power change in response to the change in voltage	

Table 15- Smart Inverter's Volt-Watt Setting Status

Volt-Watt Setting	Actual Setting	Default Setting
Volt-Watt Operation Mode	☐ Enabled ☐ Disabled	Enabled

Table 16- Smart Inverter's Volt-Watt Setting Parameters

Voltage-active power parameters	Actual Setting (% of Nominal Rating)
V1	
P1	
V2	
P2 (Applicable to DER that can only generate active power)	
P'2 (Applicable to DER that can generate and absorb active power)	
Open-loop Response Time (Seconds)	

Table 17- Smart Inverter's Frequency-Watt Settings

Actual Setting Status	Actual Setting Formula/Parameters
☐ Enabled ☐ Disabled	

Table 18- Smart Inverter's Normal Ramp Rate Settings (Optional)

Actual Setting Status	Actual Setting Parameter (% of Rated Current per Second)
☐ Enabled ☐ Disabled	

Table 19- Smart Inverter's Connect/Reconnect Ramp Rate Settings

Actual Setting Status	Actual Setting Parameter (% of Rated Current per Second)
☐ Enabled ☐ Disabled	