

เอกสารประกอบ 3

รายการข้อมูลพร้อม Time Stamp ที่ส่งออกจาก Controller Unit ผ่านช่องทางสัญญาณ แบบ RS-232 หรือ RS-485 หรือ Ethernet โดยใช้ Protocol Modbus ไปยังอุปกรณ์อื่น ๆ ของ กฟภ. อย่างน้อยดังนี้

โรงไฟฟ้าพลังน้ำขนาดเล็ก

1. Generator Voltage (Volt. a-b)
2. Generator Voltage (Volt. b-c)
3. Generator Voltage (Volt. c-a)
4. Generator Current (Amp. Phase a)
5. Generator Current (Amp. Phase b)
6. Generator Current (Amp. Phase c)
7. Generator Frequency (Hz)
8. Generator Power Factor (Pf.)
9. Generator Active Power (kW)
10. Generator Apparent Power (kVA)
11. Generator Reactive Power (kVAR)
12. BUS Voltage (Volt. a-b)
13. BUS Voltage (Volt. b-c)
14. BUS Voltage (Volt. c-a)
15. BUS Frequency (Hz)
16. Excitation Voltage (V)
17. Excitation Current (A)
18. Generator Circuit Breaker Open Status
19. Generator Circuit Breaker Close Status
20. Weir Water Level (m)
21. Top Main Inlet Valve Fully Open Status
22. Bottom Main Inlet Valve Fully Open Status (ถ้ามี)
23. Top Main Inlet Valve Fully Close Status
24. Bottom Main Inlet Valve Fully Close Status (ถ้ามี)

25. Turbine DE Bearing Temperature (°C)
26. Generator DE Bearing Temperature (°C)
27. NDE Bearing Temperature (°C)
28. Generator Temperature (°C)
29. Spear / Guide Vane Working (%)
30. Turbine Speed (RPM)
31. Turbine Lub. Oil Pressure (Bar) (ถ้ามี)
32. Turbine Lub. Oil Flow (Lpm) (ถ้ามี)
33. Turbine Lub. Oil Water Flow (Lpm) (ถ้ามี)
34. Governor Oil Flow (Lpm) (ถ้ามี)
35. Governor Oil Pressure (Bar) (ถ้ามี)
36. Running Hour (Hr.)
37. Common Alarm Status
38. Common Trip / Shutdown Status
39. Controller Manual Mode Status
40. Controller Auto Mode Status
41. Generator Island Mode Status
42. Generator Parallel Mode Status
43. Generator Run Status
44. Generator Stop Status

โรงไฟฟ้าดีเซลจ่ายไฟอิสระ, สำรองจ่ายไฟ และพระตำหนักต่างๆ

1. Generator Voltage (Volt. a-b)
2. Generator Voltage (Volt. b-c)
3. Generator Voltage (Volt. c-a)
4. Generator Current (Amp. Phase a)
5. Generator Current (Amp. Phase b)
6. Generator Current (Amp. Phase c)
7. Generator Frequency (Hz)
8. Generator Power Factor (Pf.)
9. Generator Active Power (kW)

10. Generator Apparent Power (kVA)
11. Generator Reactive Power (kVAR)
12. BUS Voltage (Volt. a-b)
13. BUS Voltage (Volt. b-c)
14. BUS Voltage (Volt. c-a)
15. BUS Frequency (Hz)
16. Generator Circuit Breaker Open Status
17. Generator Circuit Breaker Close Status
18. Main Circuit Breaker Open Status (ถ้ามี)
19. Main Circuit Breaker Close Status (ถ้ามี)
20. Engine Oil Pressure (Bar)
21. Engine Oil Temperature (°C) (ถ้ามี)
22. Engine Water Temperature (°C)
23. Engine Battery (V)
24. Engine Running Hour (Hr)
25. Generator Controller Stop Mode
26. Generator Controller Manual Mode
27. Generator Controller Auto Mode
28. Generator Controller Island Mode
29. Generator Controller Parallel Mode
30. Emergency Stop
31. Common Trip
32. Common Alarm

โดยมีตัวอย่างตารางรายละเอียด I/O Point List เพื่อเป็นแนวทาง ดังนี้

I/O POINT LIST FOR Diesel Generator Controller

Generator Control Panel
 Voltage Level : 22 KV
 Substation Code Name : XXXXX
 Substation DNP Address : XXXXX
 Substation DNP No. : XXXXX

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chars)	Status		CSXS				DMS (DNP Mapping)				Remark
				1	2	Panel	Terminal	Type	Index	Object	Var	Class	Address	
1	GEN_XX	GEN-XX	Generator Control Command	Start	Stop	CSXS	XX	SBO	-	12	1	-	1	
2	GEN_XX	GEN-XX	Generator Mode Command	Auto	Manual	CSXS	XX	SBO	-	12	1	-	2	

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chars)	Unit	Scale Value		Raw Data	CSXS				Index	Object	Var	Class	Address	Remark
					Actual	Delta		Panel	Terminal	Type	Index						
1	GEN_XX	GEN-XX	Oil Pressure	Bar	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	1				MODBUS : Reg = XX	
2	GEN_XX	GEN-XX	Coolant Temperature	°C	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	2				MODBUS : Reg = XX	
3	GEN_XX	GEN-XX	Oil Temperature	°C	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	3				MODBUS : Reg = XX	
4	GEN_XX	GEN-XX	Fuel Level	%	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	4				MODBUS : Reg = XX	
5	GEN_XX	GEN-XX	Charge Alternator Voltage	V	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	5				MODBUS : Reg = XX	
6	GEN_XX	GEN-XX	Engine Battery Voltage	V	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	6				MODBUS : Reg = XX	
7	GEN_XX	GEN-XX	Engine Speed	PPM	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	7				MODBUS : Reg = XX	
8	GEN_XX	GEN-XX	Engine Running Hour	Hr	0-3276.8	0-3276.8	0-3276.8	Signal from MODBUS Communication	32	2	Class 2	8				MODBUS : Reg = XX	
9	GEN_XX	GEN-XX	Generator L1-L2 Voltage	V	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	9				MODBUS : Reg = XX	
10	GEN_XX	GEN-XX	Generator L2-L3 Voltage	V	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	10				MODBUS : Reg = XX	
11	GEN_XX	GEN-XX	Generator L3-L1 Voltage	V	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	11				MODBUS : Reg = XX	
12	GEN_XX	GEN-XX	Generator L1 Current	A	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	12				MODBUS : Reg = XX	
13	GEN_XX	GEN-XX	Generator L2 Current	A	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	13				MODBUS : Reg = XX	
14	GEN_XX	GEN-XX	Generator L3 Current	A	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	14				MODBUS : Reg = XX	
15	GEN_XX	GEN-XX	Generator Active Power	MW	-3276.8 - 3276.7	-3276.8 - 3276.7	-3276.8 - 3276.7	Signal from MODBUS Communication	32	2	Class 2	15				MODBUS : Reg = XX	
16	GEN_XX	GEN-XX	Generator Apparent Power	MVA	-3276.8 - 3276.7	-3276.8 - 3276.7	-3276.8 - 3276.7	Signal from MODBUS Communication	32	2	Class 2	16				MODBUS : Reg = XX	
17	GEN_XX	GEN-XX	Generator Reactive Power	MVar	-3276.8 - 3276.7	-3276.8 - 3276.7	-3276.8 - 3276.7	Signal from MODBUS Communication	32	2	Class 2	17				MODBUS : Reg = XX	
18	GEN_XX	GEN-XX	Generator Power Factor	%	-3276.8 - 3276.7	-3276.8 - 3276.7	-3276.8 - 3276.7	Signal from MODBUS Communication	32	2	Class 2	18				MODBUS : Reg = XX	
19	GEN_XX	GEN-XX	Generator Frequency	Hz	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	19				MODBUS : Reg = XX	
20	GEN_XX	GEN-XX	Bus Voltage	V	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	20				MODBUS : Reg = XX	
21	GEN_XX	GEN-XX	Bus Frequency	Hz	0-3276.7	0-3276.7	0-3276.7	Signal from MODBUS Communication	32	2	Class 2	21				MODBUS : Reg = XX	

SBO - Select Before Operate, DOF - Direct Operate, AI - Analog Input, Measurement, DI - Digital Input, without Time Tag, SOE = Digital Input with Time Tag

IVO POINT LIST FOR Diesel Generator Controller

Generator Control Panel
 Voltage Level : 22 kv
 Substation Code Name : XXXX
 Substation DWP Address : XXXXX
 Substation DIM No. : XXXXX

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 char)	State			SCS			DMS (DWP Mapping)			Remark		
				0	1	2	3	Panel	Terminal	Type	Index	Object		var	Class
1	GEN_XX	GEN-XX	Generator Control Status	Undefined	Start	Stop	Fault	CSXS	XX	DI	-	2	1	Class 1	1
2	GEN_XX	GEN-XX	Generator Control Mode	Undefined	Auto	Manual	Fault	CSXS	XX	DI	-	2	1	Class 1	2
3	GEN_XX	GEN-XX	Generator Closed Aux	Open	Close	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	3
4	GEN_XX	GEN-XX	System In Auto Mode	Normal	Auto	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	4
5	GEN_XX	GEN-XX	System In Manual Mode	Normal	Manual	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	5
6	GEN_XX	GEN-XX	Generator Available	Normal	Run	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	6
7	GEN_XX	GEN-XX	System In Stop Mode	Normal	Stop	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	7
8	GEN_XX	GEN-XX	Emergency Stop	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	8
9	GEN_XX	GEN-XX	Low Oil Pressure	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	9
10	GEN_XX	GEN-XX	High Coolant Temperature	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	10
11	GEN_XX	GEN-XX	High Inlet Temperature	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	11
12	GEN_XX	GEN-XX	Over Speed	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	12
13	GEN_XX	GEN-XX	Fall To Start	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	13
14	GEN_XX	GEN-XX	Fall To Stop	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	14
15	GEN_XX	GEN-XX	Loss Of Mag Pickup	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	15
16	GEN_XX	GEN-XX	Generator Low Voltage	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	16
17	GEN_XX	GEN-XX	Generator High Voltage	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	17
18	GEN_XX	GEN-XX	Generator Under Frequency	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	18
19	GEN_XX	GEN-XX	Generator Over Frequency	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	19
20	GEN_XX	GEN-XX	Over Current DMT	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	20
21	GEN_XX	GEN-XX	Earth Fault Trip	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	21
22	GEN_XX	GEN-XX	Generator Reverse Power	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	22
23	GEN_XX	GEN-XX	Generator Sured Mode	Normal	Alarm	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	23
24	GEN_XX	GEN-XX	Generator Parallel Mode	Normal	Parallel	-	-	CSXS	XX	Signal from MOCBUS Communication	-	2	1	Class 1	24

SBO = Select Before Operate, OOP = Direct Operate, AI = Analog Input (Measurement), DI = Digital Input without Time Lag

NO POINT LIST FOR MINI HYDRO POWER PLANT (โรงไฟฟ้าขนาดเล็ก)

Generator Control Panel

Voltage Level :

XXXXX

Substation Code Name :

XXXXX

Substation DNP Address :

XXXXX

Substation DIM No. :

XXXXX

Control Output

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chars)	State		CSGS			DMS (DNP Mapping)			Remark	
				1	2	Panel	Terminal	Type	Index	Object	Var		Class
1	GEN_XX	GEN-XX	Generator Control Command	Start	Stop	CSGS	XX	SBC	-	12	1	1	
2	GEN_XX	GEN-XX	Generator Mode Command	Auto	Manup.	CSGS	XX	SBC	-	12	1	2	
3	GEN_XX	GEN-XX	Generator Power Control Command	Raise	Low	CSGS	XX	SBC	-	12	1	3	No Feed Back Control

Analog Point

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chars)	Unit	Scale Value		Panel	Terminal	Type	Index	Object	DMS (DNP Mapping)			Remark
					Actual Data	Raw Data						Var	Class	Address	
1	GEN_XX	GEN-XX	WEP Water Level	m	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	1	32	2	1	MODBUS : Reg = XX	
2	GEN_XX	GEN-XX	Drum Water Pressure	Bar	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	2	32	2	2	MODBUS : Reg = XX	
3	GEN_XX	GEN-XX	Generator Speed	RPM	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	3	32	2	3	MODBUS : Reg = XX	
4	GEN_XX	GEN-XX	Guide Vane Percentage	%	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	4	32	2	4	MODBUS : Reg = XX	
5	GEN_XX	GEN-XX	Governor Oil Pump Pressure	Bar	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	5	32	2	5	MODBUS : Reg = XX	
6	GEN_XX	GEN-XX	Lube Oil Flow	l/min	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	6	32	2	6	MODBUS : Reg = XX	
7	GEN_XX	GEN-XX	Drive end Bearing Temperature	oC	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	7	32	2	7	MODBUS : Reg = XX	
8	GEN_XX	GEN-XX	Non-Drive end Bearing Temperature	oC	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	8	32	2	8	MODBUS : Reg = XX	
9	GEN_XX	GEN-XX	Excitation Voltage	V	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	9	32	2	9	MODBUS : Reg = XX	
10	GEN_XX	GEN-XX	Excitation Current	A	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	10	32	2	10	MODBUS : Reg = XX	
11	GEN_XX	GEN-XX	Stator Winding Temperature 1	oC	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	11	32	2	11	MODBUS : Reg = XX	
12	GEN_XX	GEN-XX	Stator Winding Temperature 2	oC	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	12	32	2	12	MODBUS : Reg = XX	
13	GEN_XX	GEN-XX	Stator Winding Temperature 3	oC	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	13	32	2	13	MODBUS : Reg = XX	
14	GEN_XX	GEN-XX	Frequency	Hz	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	14	32	2	14	MODBUS : Reg = XX	
15	GEN_XX	GEN-XX	Voltage Phase A-B	V	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	15	32	2	15	MODBUS : Reg = XX	
16	GEN_XX	GEN-XX	Voltage Phase B-C	V	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	16	32	2	16	MODBUS : Reg = XX	
17	GEN_XX	GEN-XX	Voltage Phase C-A	V	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	17	32	2	17	MODBUS : Reg = XX	
18	GEN_XX	GEN-XX	Current Phase A	A	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	18	32	2	18	MODBUS : Reg = XX	
19	GEN_XX	GEN-XX	Current Phase B	A	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	19	32	2	19	MODBUS : Reg = XX	
20	GEN_XX	GEN-XX	Current Phase C	A	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	20	32	2	20	MODBUS : Reg = XX	
21	GEN_XX	GEN-XX	Active Power P	MW	-32766 - 32767	-32766 - 32767	Signal from MODBUS Communication	32	Class 2	21	32	2	21	MODBUS : Reg = XX	
22	GEN_XX	GEN-XX	Apparent Power S	MVA	-32766 - 32767	-32766 - 32767	Signal from MODBUS Communication	32	Class 2	22	32	2	22	MODBUS : Reg = XX	
23	GEN_XX	GEN-XX	Reactive Power Q	MVar	-32766 - 32767	-32766 - 32767	Signal from MODBUS Communication	32	Class 2	23	32	2	23	MODBUS : Reg = XX	
24	GEN_XX	GEN-XX	Power Factor Pf	%	-32766 - 32767	-32766 - 32767	Signal from MODBUS Communication	32	Class 2	24	32	2	24	MODBUS : Reg = XX	
25	GEN_XX	GEN-XX	Running Hour	Hr	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	25	32	2	25	MODBUS : Reg = XX	
26	GEN_XX	GEN-XX	Bus Voltage Phase A-B	V	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	26	32	2	26	MODBUS : Reg = XX	
27	GEN_XX	GEN-XX	Bus Voltage Phase B-C	V	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	27	32	2	27	MODBUS : Reg = XX	
28	GEN_XX	GEN-XX	Bus Voltage Phase C-A	V	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	28	32	2	28	MODBUS : Reg = XX	
29	GEN_XX	GEN-XX	Bus Frequency	Hz	0-32767	0-32767	Signal from MODBUS Communication	32	Class 2	29	32	2	29	MODBUS : Reg = XX	

340 - Select before Operate, DOP = Direct Operate, AI = Analog Input, Measurement, DI = Digital Input without Time Tag, SOE = Digital Input with Time Tag

NO POINT LIST FOR MINI HYDRO POWER PLANT (โรงไฟฟ้า แอ๊ด, ฝ้ายฝอย)

Generator Control Panel
 Voltage Level : 23 kV
 Substation Code Name : XXXX
 Substation DNP Address : XXXX
 Substation DNP No. : XXXX

Status Point

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chars)	State			CSCS			DMS (DNP Mapping)			Remark	
				0	1	2	3	Panel	Terminal	Type	Index	Object		Year
1	GEN_XX	GEN_XX	Generator Control Status	Undefined	Start	Stop	Fault	CSCS	XX	DI	-	-	1	
2	GEN_XX	GEN_XX	Generator Control Mode	Undefined	Auto	Manual	Fault	CSCS	XX	DI	-	-	2	
3	GEN_XX	GEN_XX	GENERATOR BREAKER CLOSE	OPEN	CLOSED	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
4	GEN_XX	GEN_XX	BEARING TEMPERATURE HIGH	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
5	GEN_XX	GEN_XX	WINDING TEMPERATURE HIGH	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
6	GEN_XX	GEN_XX	EXCITATION CURRENT HIGH	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
7	GEN_XX	GEN_XX	EXCITATION VOLTAGE HIGH	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
8	GEN_XX	GEN_XX	MAIN VALVE OIL PUMP PRESSURE LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
9	GEN_XX	GEN_XX	MAIN VALVE OIL PUMP PRESSURE HIGH	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
10	GEN_XX	GEN_XX	MAIN VALVE FULLY CLOSE	NOT FULLY	FULLY	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
11	GEN_XX	GEN_XX	MAIN VALVE FULLY OPEN	NOT FULLY	FULLY	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
12	GEN_XX	GEN_XX	MAIN VALVE OIL LEVEL LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
13	GEN_XX	GEN_XX	START STATUS	STOP	START	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
14	GEN_XX	GEN_XX	GUIDE WANE CLOSE	OPEN	CLOSED	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
15	GEN_XX	GEN_XX	GOVERNOR OIL LEVEL LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
16	GEN_XX	GEN_XX	GOVERNOR DRIVE MOTOR FAULT	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
17	GEN_XX	GEN_XX	GOVERNOR OIL PRESSURE LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
18	GEN_XX	GEN_XX	GOVERNOR OIL FLOW LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
19	GEN_XX	GEN_XX	WATER PRESSURE LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
20	GEN_XX	GEN_XX	WATER LEVEL LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
21	GEN_XX	GEN_XX	GENERATOR PROTECTION	OPEN	CLOSED	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
22	GEN_XX	GEN_XX	MOVING BREAKER CLOSE	OPEN	CLOSED	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
23	GEN_XX	GEN_XX	OUTGOING BREAKER CLOSE	OPEN	CLOSED	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
24	GEN_XX	GEN_XX	GENERATOR SPEED ACTIVE	NORMAL	ACTIVE	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
25	GEN_XX	GEN_XX	GENERATOR OVERSPEED	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
26	GEN_XX	GEN_XX	LUBE OIL PRESSURE LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
27	GEN_XX	GEN_XX	LUBE OIL LEVEL LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
28	GEN_XX	GEN_XX	LUBE OIL FLOW SWITCH LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
29	GEN_XX	GEN_XX	LUBE OIL COOLING WATER FLOW LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
30	GEN_XX	GEN_XX	LUBE OIL FILTER DIFF. PRESSURE HIGH	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
31	GEN_XX	GEN_XX	DRAIN WATER PRESSURE LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
32	GEN_XX	GEN_XX	GOVERNOR OIL PRESSURE LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
33	GEN_XX	GEN_XX	LUBE OIL FLOW LOW	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
34	GEN_XX	GEN_XX	GENERATOR ISLAND MODE	NORMAL	ISLAND	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
35	GEN_XX	GEN_XX	GENERATOR PARALLEL MODE	NORMAL	PARALLEL	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
36	GEN_XX	GEN_XX	EMERGENCY STOP	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX
37	GEN_XX	GEN_XX	EMERGENCY STOP	NORMAL	ALARM	-	-	Signal from MODBUS Communication	-	-	-	-	2	MODBUS : Reg = XX

SBD = Select Before Operate, DOP = Direct Operate, AI = Analog Input, Measurement, DI = Digital Input, without Time Tag, SOE = Digital Input with Time Tag

IVO POINT LIST FOR MINI HYDRO POWER PLANT (30KV, 1000KW, 4000V)

Generator Control Panel
 Voltage Level :
 Substation Code Name :
 Substation DNP Address :
 Substation DIM No. :

22 kV
 XXXX
 XXXX
 XXXX

Control Output

Bay Name	Feeder Name	Point Descriptions (up to 50 chains)	State			CSIS			DMS (DNP Mapping)			Remark
			1	2	Panel	Terminal	Type	Index	Object	Var	Class	
GEN_XX	GEN_XX	Generator Control Command	Start	Stop	CSIS	XX	980	14	1	Class 2	1	
GEN_XX	GEN_XX	Generator Mode Command	Auto	Manual	CSIS	XX	980	12	1	Class 2	2	
GEN_XX	GEN_XX	Generator Power Control Command	Raise	Low	CSIS	XX	980	12	1	Class 2	3	No Feed Back Control

Analog Point

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chains)	Unit	Scale Value			CSIS			DMS (DNP Mapping)			Remark
					Actual Data	Raw Data	Panel	Terminal	Type	Index	Object	Var	Class	
1	GEN_XX	GEN_XX	Wear Water Level	m	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	1	MCOBUS : Reg = XX		
2	GEN_XX	GEN_XX	Generator Speed	RPM	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	2	MCOBUS : Reg = XX		
3	GEN_XX	GEN_XX	Hydraulic Oil Pressure	Bar	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	3	MCOBUS : Reg = XX		
4	GEN_XX	GEN_XX	Upper Spear Water Pressure	Bar	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	4	MCOBUS : Reg = XX		
5	GEN_XX	GEN_XX	Lower Spear Water Pressure	Bar	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	5	MCOBUS : Reg = XX		
6	GEN_XX	GEN_XX	Upper Spear Percentage	%	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	6	MCOBUS : Reg = XX		
7	GEN_XX	GEN_XX	Lower Spear Percentage	%	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	7	MCOBUS : Reg = XX		
8	GEN_XX	GEN_XX	Turbine Drive and Lube Oil Flow	l/min	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	8	MCOBUS : Reg = XX		
9	GEN_XX	GEN_XX	Generator Drive and Lube Oil Flow	l/min	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	9	MCOBUS : Reg = XX		
10	GEN_XX	GEN_XX	Drive and Turbine Bearing Temperature	°C	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	10	MCOBUS : Reg = XX		
11	GEN_XX	GEN_XX	Drive and Generator Bearing Temperature	°C	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	11	MCOBUS : Reg = XX		
12	GEN_XX	GEN_XX	Main Drive and Bearing Temperature	°C	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	12	MCOBUS : Reg = XX		
13	GEN_XX	GEN_XX	Excitation Voltage	V	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	13	MCOBUS : Reg = XX		
14	GEN_XX	GEN_XX	Excitation Current	A	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	14	MCOBUS : Reg = XX		
15	GEN_XX	GEN_XX	Stator Winding Temperature 1	°C	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	15	MCOBUS : Reg = XX		
16	GEN_XX	GEN_XX	Stator Winding Temperature 2	°C	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	16	MCOBUS : Reg = XX		
17	GEN_XX	GEN_XX	Stator Winding Temperature 3	°C	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	17	MCOBUS : Reg = XX		
18	GEN_XX	GEN_XX	Frequency	Hz	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	18	MCOBUS : Reg = XX		
19	GEN_XX	GEN_XX	Voltage Phase A-B	V	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	19	MCOBUS : Reg = XX		
20	GEN_XX	GEN_XX	Voltage Phase B-C	V	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	20	MCOBUS : Reg = XX		
21	GEN_XX	GEN_XX	Voltage Phase C-A	V	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	21	MCOBUS : Reg = XX		
22	GEN_XX	GEN_XX	Current Phase A	A	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	22	MCOBUS : Reg = XX		
23	GEN_XX	GEN_XX	Current Phase B	A	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	23	MCOBUS : Reg = XX		
24	GEN_XX	GEN_XX	Current Phase C	A	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	24	MCOBUS : Reg = XX		
25	GEN_XX	GEN_XX	Active Power P	MW	327.66 - 327.67	327.66 - 327.67	Signal from MCOBUS Communication	32	2	Class 2	25	MCOBUS : Reg = XX		
26	GEN_XX	GEN_XX	Reactive Power Q	MVA	327.66 - 327.67	327.66 - 327.67	Signal from MCOBUS Communication	32	2	Class 2	26	MCOBUS : Reg = XX		
27	GEN_XX	GEN_XX	Apparent Power S	MVA	327.66 - 327.67	327.66 - 327.67	Signal from MCOBUS Communication	32	2	Class 2	27	MCOBUS : Reg = XX		
28	GEN_XX	GEN_XX	Power Factor PF	%	327.66 - 327.67	327.66 - 327.67	Signal from MCOBUS Communication	32	2	Class 2	28	MCOBUS : Reg = XX		
29	GEN_XX	GEN_XX	Running Hour	Hr	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	29	MCOBUS : Reg = XX		
30	GEN_XX	GEN_XX	Bus Voltage Phase A-B	V	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	30	MCOBUS : Reg = XX		
31	GEN_XX	GEN_XX	Bus Voltage Phase B-C	V	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	31	MCOBUS : Reg = XX		
32	GEN_XX	GEN_XX	Bus Voltage Phase C-A	V	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	32	MCOBUS : Reg = XX		
33	GEN_XX	GEN_XX	Bus Frequency	Hz	0-3276.7	0-3276.7	Signal from MCOBUS Communication	32	2	Class 2	33	MCOBUS : Reg = XX		

36C - Select Before Operate, DOP - Direct Operate, A = Analog Input (Measurement), DI = Digital Input without time lag, SGT - Output Input with time lag

IVO POINT LIST FOR MINI HYDRO POWER PLANT (รวม, นำถาวร, นำสถานี)

Generator Control Panel
 Voltage Level : XXXX
 Substation Code Name : XXXX
 Substation DNP Address : XXXX
 Substation DMI No. : XXXX

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 char)	Scale		Panel	Terminal		Type	Index	Object	DMS (DNP Mapping)			Remark
				1	2		Class	Var				Class	Address		
1	GEN_XX	GEN-XX	Generator Control Command	Start	Stop	CSXS	XX	XX	SBO	-	12	1	-	1	
2	GEN_XX	GEN-XX	Generator Mode Command	Auto	Manual	CSXS	XX	XX	SBO	-	12	1	-	2	
3	GEN_XX	GEN-XX	Generator Power Control Command	Raise	Low	CSXS	XX	XX	SBO	-	12	1	-	3	No Feed Back Control

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 char)	Unit	Scale Value		Panel	Terminal		Type	Index	Object	DMS (DNP Mapping)			Remark
					Actual Data	Raw Data		Class	Var				Class	Address		
1	GEN_XX	GEN-XX	Water Water Level	m	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	1	MODBUS : Reg = XX		
2	GEN_XX	GEN-XX	Generator Speed	rpm	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	2	MODBUS : Reg = XX		
3	GEN_XX	GEN-XX	Top Speed Percentage	%	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	3	MODBUS : Reg = XX		
4	GEN_XX	GEN-XX	Bottom Speed Percentage	%	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	4	MODBUS : Reg = XX		
5	GEN_XX	GEN-XX	Thrust Bearing Temperature	oC	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	5	MODBUS : Reg = XX		
6	GEN_XX	GEN-XX	Drive and Bearing Temperature	oC	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	6	MODBUS : Reg = XX		
7	GEN_XX	GEN-XX	Non-Drive end Bearing Temperature	oC	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	7	MODBUS : Reg = XX		
8	GEN_XX	GEN-XX	Excitation Current	A	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	8	MODBUS : Reg = XX		
9	GEN_XX	GEN-XX	Stator Winding Temperature 1	oC	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	9	MODBUS : Reg = XX		
10	GEN_XX	GEN-XX	Stator Winding Temperature 2	oC	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	10	MODBUS : Reg = XX		
11	GEN_XX	GEN-XX	Stator Winding Temperature 3	oC	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	11	MODBUS : Reg = XX		
12	GEN_XX	GEN-XX	Frequency	Hz	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	12	MODBUS : Reg = XX		
13	GEN_XX	GEN-XX	Voltage Phase A-B	V	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	13	MODBUS : Reg = XX		
14	GEN_XX	GEN-XX	Voltage Phase B-C	V	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	14	MODBUS : Reg = XX		
15	GEN_XX	GEN-XX	Voltage Phase C-A	V	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	15	MODBUS : Reg = XX		
16	GEN_XX	GEN-XX	Current Phase A	A	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	16	MODBUS : Reg = XX		
17	GEN_XX	GEN-XX	Current Phase B	A	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	17	MODBUS : Reg = XX		
18	GEN_XX	GEN-XX	Current Phase C	A	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	18	MODBUS : Reg = XX		
19	GEN_XX	GEN-XX	Active Power P	KW	-32767.66 - 32767.67	-32766 - 32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	19	MODBUS : Reg = XX		
20	GEN_XX	GEN-XX	Apparent Power S	KVA	-32767.66 - 32767.67	-32766 - 32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	20	MODBUS : Reg = XX		
21	GEN_XX	GEN-XX	Reactive Power Q	KVAR	-32767.66 - 32767.67	-32766 - 32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	21	MODBUS : Reg = XX		
22	GEN_XX	GEN-XX	Power Factor PF	%	-32767.66 - 32767.67	-32766 - 32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	22	MODBUS : Reg = XX		
23	GEN_XX	GEN-XX	Burning Hour	hr	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	23	MODBUS : Reg = XX		
24	GEN_XX	GEN-XX	Bus Voltage Phase A-B	V	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	24	MODBUS : Reg = XX		
25	GEN_XX	GEN-XX	Bus Voltage Phase B-C	V	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	25	MODBUS : Reg = XX		
26	GEN_XX	GEN-XX	Bus Voltage Phase C-A	V	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	26	MODBUS : Reg = XX		
27	GEN_XX	GEN-XX	Bus Frequency	Hz	0-32767.7	0-32767	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	Class 2	32	2	27	MODBUS : Reg = XX		

SBO - Set/Get; Before Operate, DCP = Direct Operate, AI - Analog Input without Time Tag, SGE - Digital Input without Time Tag

VO POINT LIST FOR MINI HYDRO POWER PLANT (તાળા, તાંબુડ, બીલામ)

Generator Control Panel
 Voltage Level : 22 kv
 Substation Code Name : XXXX
 Substation DNP Address : XXXX
 Substation DMI No. : XXXX

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chars)	Scene			CSCS			DMS (DNP Mapping)			Remark			
				0	1	2	3	Panel	Terminal	Type	Index	Object		Year	Class	Address
1	GEN_XX	GEN_XX	Generator Control Status	Undefined	Start	Stop	Fault	CSCS	XX	DI	-	2	1	Class 1	1	
2	GEN_XX	GEN_XX	Generator Control Mode	Undefined	Auto	Manual	Fault	CSCS	XX	DI	-	2	1	Class 1	3	
3	GEN_XX	GEN_XX	GENERATOR BREAKER CLOSE	OPEN	CLOSED	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	4	MOCBUS : Reg = XX
4	GEN_XX	GEN_XX	THRUST BEARING TEMPERATURE HIGH	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	5	MOCBUS : Reg = XX
5	GEN_XX	GEN_XX	DRIVE END BEARING TEMPERATURE HIGH	NORMAL	ALARM	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	6	MOCBUS : Reg = XX
6	GEN_XX	GEN_XX	NON-DRIVE END BEARING TEMPERATURE HIGH	NORMAL	ALARM	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	7	MOCBUS : Reg = XX
7	GEN_XX	GEN_XX	GENERATOR STATOR TEMPERATURE HIGH	NORMAL	ALARM	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	8	MOCBUS : Reg = XX
8	GEN_XX	GEN_XX	DIODE FAULT	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	9	MOCBUS : Reg = XX
9	GEN_XX	GEN_XX	EXCITATION TRIPPED TO HAND	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	10	MOCBUS : Reg = XX
10	GEN_XX	GEN_XX	EXCITATION UNDERCURRENT	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	11	MOCBUS : Reg = XX
11	GEN_XX	GEN_XX	EXCITATION OVERCURRENT	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	12	MOCBUS : Reg = XX
12	GEN_XX	GEN_XX	MAIN VALVE OIL PUMP PRESSURE LOW	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	13	MOCBUS : Reg = XX
13	GEN_XX	GEN_XX	MAIN VALVE OIL PUMP PRESSURE HIGH	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	14	MOCBUS : Reg = XX
14	GEN_XX	GEN_XX	TOP MAIN VALVE FULLY CLOSE	NOT FULLY	FULLY	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	15	MOCBUS : Reg = XX
15	GEN_XX	GEN_XX	BOTTOM MAIN VALVE FULLY CLOSE	NOT FULLY	FULLY	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	16	MOCBUS : Reg = XX
16	GEN_XX	GEN_XX	TOP MAIN VALVE FULLY OPEN	NOT FULLY	FULLY	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	17	MOCBUS : Reg = XX
17	GEN_XX	GEN_XX	BOTTOM MAIN VALVE FULLY OPEN	NOT FULLY	FULLY	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	18	MOCBUS : Reg = XX
18	GEN_XX	GEN_XX	START STATUS	STOP	START	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	19	MOCBUS : Reg = XX
19	GEN_XX	GEN_XX	GENERATOR PROTECTION	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	20	MOCBUS : Reg = XX
20	GEN_XX	GEN_XX	INCOMING BREAKER CLOSE	OPEN	CLOSED	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	21	MOCBUS : Reg = XX
21	GEN_XX	GEN_XX	OUTGOING BREAKER CLOSE	OPEN	CLOSED	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	22	MOCBUS : Reg = XX
22	GEN_XX	GEN_XX	GENERATOR SPEED ACTIVE	NORMAL	ACTIVE	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	23	MOCBUS : Reg = XX
23	GEN_XX	GEN_XX	OVERSPEED	NORMAL	ALARM	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	24	MOCBUS : Reg = XX
24	GEN_XX	GEN_XX	HYDRAULIC OIL FLOW LOW	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	25	MOCBUS : Reg = XX
25	GEN_XX	GEN_XX	LUBE OIL LEVEL LOW	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	26	MOCBUS : Reg = XX
26	GEN_XX	GEN_XX	LUBE OIL FLOW LOW	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	27	MOCBUS : Reg = XX
27	GEN_XX	GEN_XX	MECHANICAL FAULT SHUTDOWN	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	28	MOCBUS : Reg = XX
28	GEN_XX	GEN_XX	LOW WATER LEVEL SCREEN BLOCKED	NORMAL	ALARM	-	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	29	MOCBUS : Reg = XX
29	GEN_XX	GEN_XX	EMERGENCY STOP	NORMAL	ALARM	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	30	MOCBUS : Reg = XX
30	GEN_XX	GEN_XX		NORMAL	ALARM	*	-	CSCS	Signal from MOCBUS Communication			2	1	Class 1	31	MOCBUS : Reg = XX

SBO : Select Before Operate, NOP - Direct Operate, AI - Analog Input (Measurements), DI - Digital Input with Time Tag, SCE = Digital Input with Time Tag

I/O POINT LIST FOR MINI HYDRO POWER PLANT (SWH, IAHIS)

Rev.1

Generator Control Panel
 Voltage Level : XXXX
 Substation Code Name : XXXX
 Substation DWP Address : XXXX
 Substation DM No. : XXXX

Control Output

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chars)	State		CSCS			DMS (DMP Mapping)			Remark	
				1	2	Panel	Terminal	Type	Index	Object	Var		Class
1	GEN_XX	GEN-XX	Generator Control Command	Start	Stop	CSCS	XX	SBO	-	12	1	-	1
2	GEN_XX	GEN-XX	Generator Voice Command	Auto	Manual	CSCS	XX	SBO	-	12	1	-	2
3	GEN_XX	GEN-XX	Generator Power Control Command	Raise	Lower	CSCS	XX	SBO	-	12	1	-	3

Analog Point

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chars)	Unit	Scale Value		CSCS			DMS (DMP Mapping)			Remark
					Actual Data	Raw Data	Panel	Terminal	Type	Index	Object	Var	
1	GEN_XX	GEN-XX	Weir Water Level	m	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	1
2	GEN_XX	GEN-XX	Generator Speed	RPM	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	2
3	GEN_XX	GEN-XX	Hydraulic Oil Pressure	Bar	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	3
6	GEN_XX	GEN-XX	Upper Spool Percentage	%	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	6
7	GEN_XX	GEN-XX	Lower Spool Percentage	%	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	7
10	GEN_XX	GEN-XX	Drive end Turbine Bearing Temperature	oC	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	10
11	GEN_XX	GEN-XX	Drive end Generator Bearing Temperature	oC	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	11
12	GEN_XX	GEN-XX	Non-Drive end Bearing Temperature	oC	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	12
15	GEN_XX	GEN-XX	Stator Winding Temperature 1	oC	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	15
16	GEN_XX	GEN-XX	Stator Winding Temperature 2	oC	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	16
17	GEN_XX	GEN-XX	Stator Winding Temperature 3	oC	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	17
18	GEN_XX	GEN-XX	Frequency	Hz	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	18
19	GEN_XX	GEN-XX	Voltage Phase A-B	V	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	19
20	GEN_XX	GEN-XX	Voltage Phase B-C	V	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	20
21	GEN_XX	GEN-XX	Voltage Phase C-A	V	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	21
22	GEN_XX	GEN-XX	Current Phase A	A	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	22
23	GEN_XX	GEN-XX	Current Phase B	A	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	23
24	GEN_XX	GEN-XX	Current Phase C	A	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	24
25	GEN_XX	GEN-XX	Active Power P	kW	-327.66 - 327.67	-327.66 - 327.67	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	25
26	GEN_XX	GEN-XX	Apparent Power S	kVA	-327.66 - 327.67	-327.66 - 327.67	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	26
27	GEN_XX	GEN-XX	Reactive Power Q	kVar	-327.66 - 327.67	-327.66 - 327.67	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	27
28	GEN_XX	GEN-XX	Power Factor PF	%	-327.66 - 327.67	-327.66 - 327.67	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	28
29	GEN_XX	GEN-XX	Running Hour	Hr	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	29
30	GEN_XX	GEN-XX	Bus Voltage Phase A-B	V	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	30
31	GEN_XX	GEN-XX	Bus Voltage Phase B-C	V	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	31
32	GEN_XX	GEN-XX	Bus Voltage Phase C-A	V	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	32
33	GEN_XX	GEN-XX	Bus Frequency	Hz	D-3276.7	0-3276.7	Signal from MODBUS Communication	Signal from MODBUS Communication	Signal from MODBUS Communication	32	2	Class 2	33

SBO - Setback Before Operate, DCP - Direct Operate, AI - Analog Input, Measure ment, DI - Digital Input without Time Tag, SDE - Digital Input with Time Tag

I/O POINT LIST FOR MINI HYDRO POWER PLANT (27741. 441215)

Rev. 1

Generator Control Panel
 Voltage Level :
 Substation Code Name :
 Substation OMP Address :
 Substation DIM No. :

Item	Feeder Name	Bay Name	Point Descriptions (up to 50 chars)	Status			3	Panel	Thermal	CSCS			DMS (DMP Mapping)			Remark
				0	1	2				Type	Index	Object	Var	Class	Address	
1	GEN_XX	GEN-XX	Generator Control Status	Undefined	Start	STOP	Fault	CSCS	XX	DI	-	2	1	Class 1	1	-
2	GEN_XX	GEN-XX	Generator Control Mode	Undefined	Auto	Manual	Fault	CSCS	XX	DI	-	2	1	Class 1	4	-
3	GEN_XX	GEN-XX	GENERATOR BREAKER CLOSE	OPEN	CLOSED	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	5	MODBUS : Reg = XX
4	GEN_XX	GEN-XX	BEARING TEMPERATURE HIGH	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	6	MODBUS : Reg = XX
5	GEN_XX	GEN-XX	WINDING TEMPERATURE HIGH	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	7	MODBUS : Reg = XX
6	GEN_XX	GEN-XX	HYDRAULIC OIL PRESSURE LOW	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	8	MODBUS : Reg = XX
7	GEN_XX	GEN-XX	UPPER MAIN VALVE FULLY CLOSE	NOT FULLY	FULLY	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	9	MODBUS : Reg = XX
8	GEN_XX	GEN-XX	LOWER MAIN VALVE FULLY CLOSE	NOT FULLY	FULLY	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	10	MODBUS : Reg = XX
9	GEN_XX	GEN-XX	UPPER MAIN VALVE FULLY OPEN	NOT FULLY	FULLY	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	11	MODBUS : Reg = XX
10	GEN_XX	GEN-XX	LOWER MAIN VALVE FULLY OPEN	NOT FULLY	FULLY	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	12	MODBUS : Reg = XX
11	GEN_XX	GEN-XX	START STATUS	STOP	START	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	13	MODBUS : Reg = XX
12	GEN_XX	GEN-XX	GOVERNOR DRIVE MOTOR FAILURE	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	14	MODBUS : Reg = XX
13	GEN_XX	GEN-XX	GENERATOR PROTECTION	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	15	MODBUS : Reg = XX
14	GEN_XX	GEN-XX	INCOMING BREAKER CLOSE	OPEN	CLOSED	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	16	MODBUS : Reg = XX
15	GEN_XX	GEN-XX	OUTGOING BREAKER CLOSE	OPEN	CLOSED	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	17	MODBUS : Reg = XX
16	GEN_XX	GEN-XX	GENERATOR SPEED ACTIVE	NORMAL	ACTIVE	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	18	MODBUS : Reg = XX
17	GEN_XX	GEN-XX	GENERATOR OVERSPEED	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	19	MODBUS : Reg = XX
18	GEN_XX	GEN-XX	LUBE OIL PRESSURE LOW	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	20	MODBUS : Reg = XX
19	GEN_XX	GEN-XX	LUBE OIL LEVEL LOW	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	21	MODBUS : Reg = XX
20	GEN_XX	GEN-XX	LUBE OIL FLOW LOW	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	22	MODBUS : Reg = XX
21	GEN_XX	GEN-XX	EMERGENCY STOP	NORMAL	ALARM	-	-	-	-	Signal from MODBUS Communication	-	2	1	Class 1	23	MODBUS : Reg = XX

SIQ - Set not before Operate; DOP = Direct Operate; AI - Analog Input (Measurement); DI - Digital Input without Time Tag; SDE = Digital Input with Time Tag