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Revision history		
Rev.	**Date.**	**Description**
004	7/10/2025	Front page added
005	21/08/2025	Update in acordance with alarm list

KBR
ACCEPTANCE
FOR ENGINEERING USE

THIS DOCUMENT IS:

ACCEPTED	(Code 1) ____
ACCEPTED WITH COMMENTS	(Code 2) ____
NOT ACCEPTED	(Code 3) ____
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DISCIPLINE ____ BY ____
DATE ____

Document Title:	**BLPH Project - Modbus Table for Main PLC**
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Code:	C08
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Customer:	CrossWind C.V., Rotterdam, The Netherlands

Crosswind BLPH FC Package - Main PLC

Discrete Inputs

Function Code FC02
Read only access

Implemented	Group	Internal - Base	Internal - Offset	Address [Decimal]	TAG	Pretty Name	Datatype	Comment
	External Control	1000	0	1000	FC30_OPN	Main LV Breaker Status is Open	BOOL	
	External Control	1000	1	1001	FC30_CLS	Main LV Breaker Status is Closed	BOOL	
	External Control	1000	2	1002				
	External Control	1000	3	1003				
	External Control	1000	4	1004				
	External Control	1000	5	1005				
	External Control	1000	6	1006	CONTROL_LOC	Control Place (Local / Remote)	BOOL	True = Remote, False = Local
	External Control	1000	7	1007	AUX_OK	Auxillary Supply Present and OK	BOOL	True = Supply OK, False = Supply not OK
	External Control	1000	8	1008				
	External Control	1000	9	1009				
	External Control	1000	10	1010				
	External Control	1000	11	1011				
	FCwave - FC1	3000	0	3000	FC1_H2_EN	FC1 Hydrogen Enable Request		
	FCwave - FC1	3000	1	3001	FC1_DECAYTESTFAIL	FC1 Pressure Decay Test Information		
	FCwave - FC1	3000	2	3002	FC1_HLOCK	FC1 Hydrogen Detection Lockout		
	FCwave - FC1	3000	3	3003	FC1_DCDCSTOP	FC1 DCDC Stop Request		
	FCwave - FC1	3000	4	3004	FC1_DCDCIMPORT	FC1 DCDC Import Request		
	FCwave - FC1	3000	5	3005	FC1_DCDCEXPORT	FC1 DCDC Export Request		
	FCwave - FC2	3030	0	3030	FC2_H2_EN	FC2 Hydrogen Enable Request		
	FCwave - FC2	3030	1	3031	FC2_DECAYTESTFAIL	FC2 Pressure Decay Test Information		
	FCwave - FC2	3030	2	3032	FC2_HLOCK	FC2 Hydrogen Detection Lockout		
	FCwave - FC2	3030	3	3033	FC2_DCDCSTOP	FC2 DCDC Stop Request		
	FCwave - FC2	3030	4	3034	FC2_DCDCIMPORT	FC2 DCDC Import Request		
	FCwave - FC2	3030	5	3035	FC2_DCDCEXPORT	FC2 DCDC Export Request		
	FCwave - FC3	3060	0	3060	FC3_H2_EN	FC3 Hydrogen Enable Request		
	FCwave - FC3	3060	1	3061	FC3_DECAYTESTFAIL	FC3 Pressure Decay Test Information		
	FCwave - FC3	3060	2	3062	FC3_HLOCK	FC3 Hydrogen Detection Lockout		
	FCwave - FC3	3060	3	3063	FC3_DCDCSTOP	FC3 DCDC Stop Request		
	FCwave - FC3	3060	4	3064	FC3_DCDCIMPORT	FC3 DCDC Import Request		
	FCwave - FC3	3060	5	3065	FC3_DCDCEXPORT	FC3 DCDC Export Request		
	FCwave - FC4	3090	0	3090	FC4_H2_EN	FC4 Hydrogen Enable Request		
	FCwave - FC4	3090	1	3091	FC4_DECAYTESTFAIL	FC4 Pressure Decay Test Information		
	FCwave - FC4	3090	2	3092	FC4_HLOCK	FC4 Hydrogen Detection Lockout		
	FCwave - FC4	3090	3	3093	FC4_DCDCSTOP	FC4 DCDC Stop Request		
	FCwave - FC4	3090	4	3094	FC4_DCDCIMPORT	FC4 DCDC Import Request		
	FCwave - FC4	3090	5	3095	FC4_DCDCEXPORT	FC4 DCDC Export Request		

FCwave - FC5	3120	0	3120 FC5_H2_EN	FC5 Hydrogen Enable Request	
FCwave - FC5	3120	1	3121 FC5_DECAYTESTFAIL	FC5 Pressure Decay Test Information	
FCwave - FC5	3120	2	3122 FC5_HLOCK	FC5 Hydrogen Detection Lockout	
FCwave - FC5	3120	3	3123 FC5_DCDCSTOP	FC5 DCDC Stop Request	
FCwave - FC5	3120	4	3124 FC5_DCDCIMPORT	FC5 DCDC Import Request	
FCwave - FC5	3120	5	3125 FC5_DCDCEXPORT	FC5 DCDC Export Request	
FCwave - FC6	3150	0	3150 FC6_H2_EN	FC6 Hydrogen Enable Request	
FCwave - FC6	3150	1	3151 FC6_DECAYTESTFAIL	FC6 Pressure Decay Test Information	
FCwave - FC6	3150	2	3152 FC6_HLOCK	FC6 Hydrogen Detection Lockout	
FCwave - FC6	3150	3	3153 FC6_DCDCSTOP	FC6 DCDC Stop Request	
FCwave - FC6	3150	4	3154 FC6_DCDCIMPORT	FC6 DCDC Import Request	
FCwave - FC6	3150	5	3155 FC6_DCDCEXPORT	FC6 DCDC Export Request	
Ventilation - 40ft			4000 JA01_EB01_1	Container Heater #1	BOOL
Ventilation - 40ft			4001 JA01_EB01_2	Container Heater #2	BOOL
Ventilation - 40ft			4002 JA01_EB01_3	Container Heater #3	BOOL
Ventilation - 40ft			4003		
Electrical - 40ft			5000	AUX Supply Contactor	BOOL
Electrical - 40ft			5001	Nanogrid Supply Contactor	BOOL
Electrical - 40ft			5002		BOOL
Electrical - 40ft			5003		BOOL
Electrical - 40ft			5004		BOOL
Electrical - 40ft			5005 JS_EA01	Container Ligthing 1/2	BOOL
Electrical - 40ft			5006 JS_EA02	Container Ligthing 2/2	BOOL
Electrical - 40ft			5007 HF01_SG100	Container Light Switch	BOOL
Electrical - 40ft			5008		BOOL
Electrical - 40ft			5009		BOOL
Electrical - 40ft			5010 UC20_RB30_RDY	PLC UPS Battery Ready	BOOL
Electrical - 40ft			5011 UC20_RB30_BAT	PLC UPS Battery Operation	BOOL
Electrical - 40ft			5012 UC20_RB30_SOH	PLC UPS Battery Low SOH	BOOL
Electrical - 40ft			5013 UC30_RB30_RDY	Coolant Skid UPS Battery Ready	BOOL
Electrical - 40ft			5014 UC30_RB30_BAT	Coolant Skid UPS Battery Operation	BOOL
Electrical - 40ft			5015 UC30_RB30_SOH	Coolant Skid UPS Battery Low SOH	BOOL
Electrical - 40ft			5016 UC20_RB01_RDY	FC1+2 24V UPS Battery Ready	BOOL
Electrical - 40ft			5017 UC20_RB01_BAT	FC1+2 24V UPS Battery Operation	BOOL
Electrical - 40ft			5018 UC20_RB01_SOH	FC1+2 24V UPS Battery Low SOH	BOOL
Electrical - 40ft			5019 UC20_RB01_DIS	FC1+2 24V UPS Battery Discharged	BOOL
Electrical - 40ft			5020 UC20_RB02_RDY	FC3+4 24V UPS Battery Ready	BOOL
Electrical - 40ft			5021 UC20_RB02_BAT	FC3+4 24V UPS Battery Operation	BOOL
Electrical - 40ft			5022 UC20_RB02_SOH	FC3+4 24V UPS Battery Low SOH	BOOL
Electrical - 40ft			5023 UC20_RB02_DIS	FC3+4 24V UPS Battery Discharged	BOOL
Electrical - 40ft			5024 UC20_RB03_RDY	FC5+6 24V UPS Battery Ready	BOOL
Electrical - 40ft			5025 UC20_RB03_BAT	FC5+6 24V UPS Battery Operation	BOOL
Electrical - 40ft			5026 UC20_RB03_SOH	FC5+6 24V UPS Battery Low SOH	BOOL
Electrical - 40ft			5027 UC20_RB03_DIS	FC5+6 24V UPS Battery Discharged	BOOL
Electrical - 40ft			5028		

Crosswind BLPH FC Package - Main PLC

HOLDING REGISTERS

Allowable Function Codes: FC03;06;16
Read and Write access, if otherwise not specified

Implemented?	Group	Internal - Base	Internal - Offset	Address [Decimal]	Bit	TAG	Pretty Name	Read	Write	Datatype	Scaling	Unit	Comment
	External Control	1000	0	1000		POWER_SP	Export Power Setpoint	TRUE	TRUE	INT16	0.1	kW	Range 0 to 1200 kW
	External Control	1000	1	1001			Control word						
					0		Wakeup			BOOL			Rising edge triggers wakeup
					1		Sleep			BOOL			Rising edge triggers go to sleep
					2		Start			BOOL			Rising edge triggers start sequence
					3		Stop			BOOL			Rising edge triggers stop sequence
					4		<Spare>			BOOL			Not used
					5		Reset			BOOL			Rising edge triggers fault clear
	External Control	1000	2	1002									
	External Control	1000	3	1003									
	External Control	1000	4	1004									
	External Control	1000	5	1005									
	External Control	1000	6	1006									
	External Control	1000	7	1007									
	External Control	1000	8	1008									
	External Control	1000	9	1009									

Crosswind BLPH FC Package - Main PLC

INPUT REGISTERS

Allowable Function Codes: FC04

Read only access

Implemented?	Group	Internal - Base	Internal - Offset	Address [Decimal]	Bit	TAG	Pretty Name	Read	Write	Datatype	Scaling	Unit	Comment	Max value
TRUE	External Control	1000	0	1000		StateMain	Main FC Package Statemachine Index	TRUE	FALSE	INT16	1	n/a	Enumeration index attached	
TRUE	External Control	1000	1	1001		FC1_Control_State	Fuel Cell Control #1 Statemachine Index	TRUE	FALSE	INT16	1	n/a	Enumeration index attached	
TRUE	External Control	1000	2	1002		FC2_Control_State	Fuel Cell Control #2 Statemachine Index	TRUE	FALSE	INT16	1	n/a	Enumeration index attached	
TRUE	External Control	1000	3	1003		FC3_Control_State	Fuel Cell Control #3 Statemachine Index	TRUE	FALSE	INT16	1	n/a	Enumeration index attached	
TRUE	External Control	1000	4	1004		FC4_Control_State	Fuel Cell Control #4 Statemachine Index	TRUE	FALSE	INT16	1	n/a	Enumeration index attached	
TRUE	External Control	1000	5	1005		FC5_Control_State	Fuel Cell Control #5 Statemachine Index	TRUE	FALSE	INT16	1	n/a	Enumeration index attached	
TRUE	External Control	1000	6	1006		FC6_Control_State	Fuel Cell Control #6 Statemachine Index	TRUE	FALSE	INT16	1	n/a	Enumeration index attached	
TRUE	External Control	1000	7	1007			<Spare>							
TRUE	External Control	1000	8	1008			<Spare>							
TRUE	External Control	1000	9	1009			<Spare>							
TRUE	External Control	1000	10	1010			<Spare>							
TRUE	External Control	1000	11	1011			<Spare>							
TRUE	External Control	1000	12	1012			<Spare>							
TRUE	External Control	1000	13	1013		P_MAX	Total Capacity of FC Package	TRUE	FALSE	INT16	1	kW	Range 0 to 1000 kW	
TRUE	External Control	1000	14	1014		P_OPTIMIZED	Fuel Efficient Power Point	TRUE	FALSE	INT16	1	kW	Range 0 to 1000 kW	
TRUE	External Control	1000	15	1015			Spare							
TRUE	External Control	1000	16	1016		FCM_RUNNING	Number of Fuel Cell Modules Producing Power	TRUE	FALSE	INT16	1	n/a	Range 0 to 6	
TRUE	External Control	1000	17	1017			<Spare>							
TRUE	External Control	1000	18	1018			<Spare>							
TRUE	External Control	1000	19	1019			<Spare>							
TRUE	External Control	1000	20	1020			FCWave 1 Power Internal	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	21	1021			FCWave 1 DCDC A Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	22	1022			FCWave 1 DCDC B Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	23	1023			FCWave 2 Power Internal	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	24	1024			FCWave 2 DCDC A Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	25	1025			FCWave 2 DCDC B Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	26	1026			FCWave 3 Power Internal	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	27	1027			FCWave 3 DCDC A Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	28	1028			FCWave 3 DCDC B Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	29	1029			FCWave 4 Power Internal	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	30	1030			FCWave 4 DCDC A Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	31	1031			FCWave 4 DCDC B Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	32	1032			FCWave 5 Power Internal	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	33	1033			FCWave 5 DCDC A Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	34	1034			FCWave 5 DCDC B Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	35	1035			FCWave 6 Power Internal	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	36	1036			FCWave 6 DCDC A Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	37	1037			FCWave 6 DCDC B Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	38	1038			Manual Power Setpoint	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	39	1039			Export AC Power	TRUE		INT16	0.1	kW	measurement before breaker	
TRUE	External Control	1000	40	1040			Nanogrid AC Power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	41	1041			Aux AC power	TRUE		INT16	0.1	kW		
TRUE	External Control	1000	42	1042			<Spare>							
TRUE	External Control	1000	43	1043			<Spare>							
TRUE	External Control	1000	44	1044			<Spare>							
TRUE	External Control	1000	45	1045			<Spare>							
TRUE	External Control	1000	46	1046			<Spare>							
TRUE	External Control	1000	47	1047			<Spare>							
TRUE	External Control	1000	48	1048			<Spare>							
TRUE	External Control	1000	49	1049			<Spare>							
TRUE	External Control	1000	50	1050			Error Code 1	TRUE		INT16	1	n/a	Active Error Code #1	
TRUE	External Control	1000	51	1051			Error Code 2	TRUE		INT16	1	n/a	Active Error Code #2	
TRUE	External Control	1000	52	1052			Error Code 3	TRUE		INT16	1	n/a	Active Error Code #3	
TRUE	External Control	1000	53	1053			Error Code 4	TRUE		INT16	1	n/a	Active Error Code #4	
TRUE	External Control	1000	54	1054			Error Code 5	TRUE		INT16	1	n/a	Active Error Code #5	
TRUE	External Control	1000	55	1055			Error Code 6	TRUE		INT16	1	n/a	Active Error Code #6	
TRUE	External Control	1000	56	1056			Error Code 7	TRUE		INT16	1	n/a	Active Error Code #7	
TRUE	External Control	1000	57	1057			Error Code 8	TRUE		INT16	1	n/a	Active Error Code #8	
TRUE	External Control	1000	58	1058			Error Code 9	TRUE		INT16	1	n/a	Active Error Code #9	
TRUE	External Control	1000	59	1059			Error Code 10	TRUE		INT16	1	n/a	Active Error Code #10	
TRUE	External Control	1000	60	1060			Error Code 11	TRUE		INT16	1	n/a	Active Error Code #11	
TRUE	External Control	1000	61	1061			Error Code 12	TRUE		INT16	1	n/a	Active Error Code #12	
TRUE	External Control	1000	62	1062			Error Code 13	TRUE		INT16	1	n/a	Active Error Code #13	
TRUE	External Control	1000	63	1063			Error Code 14	TRUE		INT16	1	n/a	Active Error Code #14	
TRUE	External Control	1000	64	1064			Error Code 15	TRUE		INT16	1	n/a	Active Error Code #15	
TRUE	External Control	1000	65	1065			Error Code 16	TRUE		INT16	1	n/a	Active Error Code #16	
TRUE	External Control	1000	66	1066			Error Code 17	TRUE		INT16	1	n/a	Active Error Code #17	
TRUE	External Control	1000	67	1067			Error Code 18	TRUE		INT16	1	n/a	Active Error Code #18	
TRUE	External Control	1000	68	1068			Error Code 19	TRUE		INT16	1	n/a	Active Error Code #19	
TRUE	External Control	1000	69	1069			Error Code 20	TRUE		INT16	1	n/a	Active Error Code #20	

TRUE	External Information	1100	0	1100		=HE01+DA02-BT01	HT1 - Coolant Return Temperature	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	1	1101		=HE01+DA02-BT02	HT1 - Pump Inlet Temperature	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	2	1102		=HE01+DA02-BF01	HT1 - Flowrate	TRUE	FALSE	INT16	0.1	m3^h	
TRUE	External Information	1100	3	1103		=HE01+DA02-GP19_RPM	HT1 - Pump RPM	TRUE	FALSE	INT16	1	rpm	
TRUE	External Information	1100	4	1104		=HE02+DA02-BT01	HT2 - Coolant Return Temperature	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	5	1105		=HE02+DA02-BT02	HT2 - Pump Inlet Temperature	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	6	1106		=HE02+DA02-BF01	HT2 - Flowrate	TRUE	FALSE	INT16	0.1	m^3/h	
TRUE	External Information	1100	7	1107		=HE02+DA02-GP29_RPM	HT2 - Pump RPM	TRUE	FALSE	INT16	1	rpm	
TRUE	External Information	1100	8	1108		=HE03+DA01-BT01	LT - Coolant Return Temperature	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	9	1109		=HE03+DA01-BT02	LT - Coolant Forward Temperature	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	10	1110		=HE03+DA01-BF03	LT - Flowrate	TRUE	FALSE	INT16	0.1	m^3/h	
TRUE	External Information	1100	11	1111		=HE03+DA01-GP11_RPM	LT - Pump RPM	TRUE	FALSE	INT16	1	rpm	
TRUE	External Information	1100	12	1112		=JA01+DA01-BT01	40ft - Ventilation Intake Temperature	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	13	1113		=JA01+DA01-BT02	40ft - Container Temperature 2	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	14	1114		=JA01+DA01-BT03	40ft - Container Temperature 3	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	15	1115		=JA01+DA01-GQ06_RPM	40ft - Ventilation Fan 1 Speed	TRUE	FALSE	INT16	1	rpm	
TRUE	External Information	1100	16	1116		=JA01+DA01-GQ07_RPM	40ft - Ventilation Fan 2 Speed	TRUE	FALSE	INT16	1	rpm	
TRUE	External Information	1100	17	1117		=JA01+DA03-BT01	10ft - Container Temperature	TRUE	FALSE	INT16	0.1	°C	
TRUE	External Information	1100	18	1118		=JA01+DA03-GQ10_RPM	10ft - Ventilation Fan Speed	TRUE	FALSE	INT16	1	rpm	
TRUE	External Information	1100	19	1119			Available Unused Power (AUP)	TRUE	FALSE	INT16	0.1	kW	
TRUE	External Information	1100	20	1120			Calculated Maximum Power (CMP)	TRUE	FALSE	INT16	0.1	kW	
TRUE	External Information	1100	21	1121			Operating state	TRUE	FALSE	INT16	1	n/a	Range 0 to 6
TRUE	Alarms	1100	40	1140	0	MainSafetyOK	Main Safety needs Reset	TRUE	FALSE	BOOL	n/a	n/a	Reset Main Safety Controller once it is safe to do so
TRUE	Alarms	1100	40	1140	1	SafetymodbusCommsDriverError	Safety Controller - Com Error	TRUE	FALSE	BOOL	n/a	n/a	Inspect network connection between Safety Controllers and main controller, and fix loose cables, replace broken cables and check network switches
TRUE	Alarms	1100	40	1140	2	ESTOPCustomer	E STOP BLPH Platform	TRUE	FALSE	BOOL	n/a	n/a	ESTOP from BLPH - Correct BLPH error and reset safety system
TRUE	Alarms	1100	40	1140	3	ESTOPcontrolCabinet	E STOP Control Cabinet	TRUE	FALSE	BOOL	n/a	n/a	Release the safety button once it is safe to do so
TRUE	Alarms	1100	40	1140	4	ESTOPContainerDoor	ESTOP Container Door	TRUE	FALSE	BOOL	n/a	n/a	Release the safety button once it is safe to do so
TRUE	Alarms	1100	40	1140	5	ESTOPcoolantSkid	E STOP Coolant Skid	TRUE	FALSE	BOOL	n/a	n/a	Release the safety button once it is safe to do so
TRUE	Alarms	1100	40	1140	6	EFIBusStatus1	Safety Controller - 40/10ft Com Ch 1	TRUE	FALSE	BOOL	n/a	n/a	Inspect CANBus cables between Safety Controllers in UC20 and UC30, and fix loose cables or replace broken cables
TRUE	Alarms	1100	40	1140	7	EFIBusStatus2	Safety Controller - 40/10ft Com Ch 2	TRUE	FALSE	BOOL	n/a	n/a	Inspect CANBus cables between Safety Controllers in UC20 and UC30, and fix loose cables or replace broken cables
TRUE	Alarms	1100	40	1140	8	ESTOP10ft	Not Applicable	TRUE	FALSE	BOOL	n/a	n/a	Not Applicable
TRUE	Alarms	1100	40	1140	9	DoorRight_10ft	10ft Container - Door Right Open	TRUE	FALSE	BOOL	n/a	n/a	Close door and check safety switch
TRUE	Alarms	1100	40	1140	10	DoorLeft_10ft	10ft Container - Door Left Open	TRUE	FALSE	BOOL	n/a	n/a	Close door and check safety switch
TRUE	Alarms	1100	40	1140	11	smokeDetectorIntake	Smoke Detector, 40ft Middle	TRUE	FALSE	BOOL	n/a	n/a	Remove the cause of smoke. Reset sensor by disconnecting from base and reconnect.
TRUE	Alarms	1100	40	1140	12	smokeDetectorOutletA	Smoke Detector, 40ft Left	TRUE	FALSE	BOOL	n/a	n/a	Remove the cause of smoke. Reset sensor by disconnecting from base and reconnect.
TRUE	Alarms	1100	40	1140	13	smokeDetectorOutletB	Smoke Detector, 40ft Right	TRUE	FALSE	BOOL	n/a	n/a	Remove the cause of smoke. Reset sensor by disconnecting from base and reconnect.
TRUE	Alarms	1100	40	1140	14	smokeDetector10ft	Smoke Detector, 10ft	TRUE	FALSE	BOOL	n/a	n/a	Remove the cause of smoke. Reset sensor by disconnecting from base and reconnect.
TRUE	Alarms	1100	40	1140	15	hydrogenSensorVentIntakeok	Hydrogen Detector, 40ft Middle	TRUE	FALSE	BOOL	n/a	n/a	Check and fix any hydrogen leak.
TRUE	Alarms	1100	41	1141	0	hydrogenSensorOutletAok	Hydrogen Detector, 40ft Left	TRUE	FALSE	BOOL	n/a	n/a	Check and fix any hydrogen leak.
TRUE	Alarms	1100	41	1141	1	hydrogenSensorOutletBok	Hydrogen Detector, 40ft Right	TRUE	FALSE	BOOL	n/a	n/a	Check and fix any hydrogen leak.
TRUE	Alarms	1100	41	1141	2	FCwave 1 Error	FCwave 1 Control Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	3	FCwave 2 Error	FCwave 2 Control Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	4	FCwave 3 Error	FCwave 3 Control Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	5	FCwave 4 Error	FCwave 4 Control Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	6	FCwave 5 Error	FCwave 5 Control Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	7	FCwave 6 Error	FCwave 6 Control Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	8	HT Cool 1 Error	HT Coolant System 1 Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	9	HT Cool 2 Error	HT Coolant System 2 Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	10	LT Cool Error	LT Coolant System Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	11	Microgrid Error	Microgrid Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	12	Nanogrid Error	Nanogrid Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	13	Ventilation Error	Ventilation Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	14	Climate 40ft Error	40ft Climate Control Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	41	1141	15	Climate 10ft Error	10ft Climate Control Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	Alarms	1100	42	1142	0	H2 Heating Error	Hydrogen Heating System Error	TRUE	FALSE	BOOL	n/a	n/a	Mitigate alarms in relevant subsystem
TRUE	External Information	1200	0	1200			<Spare>						
TRUE	External Information	1200	1	1201			<Spare>						
TRUE	External Information	1200	2	1202			System efficiency			INT16	0.1	%	(DEIF Power + Pack Power) / (SUM'ed H2 flow converted to power) - realtime
TRUE	External Information	1200	3	1203			FC1 + DC/DC efficiency			INT16	0.1	%	Only FCwave Efficiency
TRUE	External Information	1200	4	1204			FC2 + DC/DC efficiency			INT16	0.1	%	Only FCwave Efficiency
TRUE	External Information	1200	5	1205			FC3 + DC/DC efficiency			INT16	0.1	%	Only FCwave Efficiency
TRUE	External Information	1200	6	1206			FC4 + DC/DC efficiency			INT16	0.1	%	Only FCwave Efficiency
TRUE	External Information	1200	7	1207			FC5 + DC/DC efficiency			INT16	0.1	%	Only FCwave Efficiency
TRUE	External Information	1200	8	1208			FC6 + DC/DC efficiency			INT16	0.1	%	Only FCwave Efficiency
TRUE	External Information	1200	9	1209			FC1 stack lifetime produced energy			UINT32	0.1	kWh - DC	stack A (voltage*current) + stack B (voltage*current) 214GWh = 1.07mio hours at full load = 30 topswaps@30.000h
TRUE	External Information	1200	11	1211			FC2 stack lifetime produced energy			UINT32	0.1	kWh - DC	stack A (voltage*current) + stack B (voltage*current) 214GWh = 1.07mio hours at full load = 30 topswaps@30.000h
TRUE	External Information	1200	13	1213			FC3 stack lifetime produced energy			UINT32	0.1	kWh - DC	stack A (voltage*current) + stack B (voltage*current) 214GWh = 1.07mio hours at full load = 30 topswaps@30.000h
TRUE	External Information	1200	15	1215			FC4 stack lifetime produced energy			UINT32	0.1	kWh - DC	stack A (voltage*current) + stack B (voltage*current) 214GWh = 1.07mio hours at full load = 30 topswaps@30.000h
TRUE	External Information	1200	17	1217			FC5 stack lifetime produced energy			UINT32	0.1	kWh - DC	stack A (voltage*current) + stack B (voltage*current) 214GWh = 1.07mio hours at full load = 30 topswaps@30.000h
TRUE	External Information	1200	19	1219			FC6 stack lifetime produced energy			UINT32	0.1	kWh - DC	stack A (voltage*current) + stack B (voltage*current) 214GWh = 1.07mio hours at full load = 30 topswaps@30.000h
TRUE	External Information	1200	21	1221			System lifetime produced energy			UINT32	1	kWh - AC	value from ABB breaker 2147GWh = 1.34mio hours @ 1.6MW
TRUE	External Information	1200	23	1223			FC1 H2 flow rate			INT16	0.01	kg/h	Estimate from Module Current - +/-15% at steady state
TRUE	External Information	1200	24	1224			FC2 H2 flow rate			INT16	0.01	kg/h	Estimate from Module Current - +/-15% at steady state
TRUE	External Information	1200	25	1225			FC3 H2 flow rate			INT16	0.01	kg/h	Estimate from Module Current - +/-15% at steady state

TRUE	External Information	1200	26	1226		FC4 H2 flow rate	INT16	0.01	kg/h	Estimate from Module Current - +/-15% at steady state
TRUE	External Information	1200	27	1227		FC5 H2 flow rate	INT16	0.01	kg/h	Estimate from Module Current - +/-15% at steady state
TRUE	External Information	1200	28	1228		FC6 H2 flow rate	INT16	0.01	kg/h	Estimate from Module Current - +/-15% at steady state
TRUE	External Information	1200	29	1229		H2 Consumption Status Word	WORD			
TRUE	External Information	1200			0	FC1 H2 consumption active	BOOL		0 = not active - 1 = active	
TRUE	External Information	1200			1	FC2 H2 consumption active	BOOL		0 = not active - 1 = active	
TRUE	External Information	1200			2	FC3 H2 consumption active	BOOL		0 = not active - 1 = active	
TRUE	External Information	1200			3	FC4 H2 consumption active	BOOL		0 = not active - 1 = active	
TRUE	External Information	1200			4	FC5 H2 consumption active	BOOL		0 = not active - 1 = active	
TRUE		1200			5	FC6 H2 consumption active	BOOL		0 = not active - 1 = active	
TRUE	External Information	1200			6 to 15	<Spare>	BOOL			
TRUE	External Information	1200	30	1230		Ambient Temperature	INT16	0.1	°C	
TRUE	External Information	1200	31	1231		Container intake air Temperature	INT16	0.1	°C	
TRUE	External Information	1200	32	1232		LT Coolant Return Temperature	INT16	0.1	°C	
TRUE	External Information	1200	33	1233		LT Cooling Forward Temperature	INT16	0.1	°C	
TRUE	External Information	1200	34	1234		HT1 Coolant Return Temperature	INT16	0.1	°C	
TRUE	External Information	1200	35	1235		HT1 Coolant Forward Temperature	INT16	0.1	°C	
TRUE	External Information	1200	36	1236		HT2 Coolant Return Temperature	INT16	0.1	°C	
TRUE	External Information	1200	37	1237		HT2 Coolant Forward Temperature	INT16	0.1	°C	
TRUE	External Information	1200	38	1238		FC1 Stack Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	39	1239		FC1 DCDC A Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	40	1240		FC1 DCDC B Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	41	1241		FC2 Stack Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	42	1242		FC2 DCDC A Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	43	1243		FC2 DCDC B Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	44	1244		FC3 Stack Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	45	1245		FC3 DCDC A Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	46	1246		FC3 DCDC B Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	47	1247		FC4 Stack Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	48	1248		FC4 DCDC A Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	49	1249		FC4 DCDC B Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	50	1250		FC5 Stack Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	51	1251		FC5 DCDC A Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	52	1252		FC5 DCDC B Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	53	1253		FC6 Stack Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	54	1254		FC6 DCDC A Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	55	1255		FC6 DCDC B Power	INT16	0.1	kW - DC	
TRUE	External Information	1200	56	1256		FC1 Stack Current String A	INT16	0.1	A - DC	
TRUE	External Information	1200	57	1257		FC1 Stack Current String B	INT16	0.1	A - DC	
TRUE	External Information	1200	58	1258		FC1 Stack Voltage String A	INT16	0.1	V - DC	
TRUE	External Information	1200	59	1259		FC1 Stack Voltage String B	INT16	0.1	V - DC	
TRUE	External Information	1200	60	1260		FC2 Stack Current String A	INT16	0.1	A - DC	
TRUE	External Information	1200	61	1261		FC2 Stack Current String B	INT16	0.1	A - DC	
TRUE	External Information	1200	62	1262		FC2 Stack Voltage String A	INT16	0.1	V - DC	
TRUE	External Information	1200	63	1263		FC2 Stack Voltage String B	INT16	0.1	V - DC	
TRUE	External Information	1200	64	1264		FC3 Stack Current String A	INT16	0.1	A - DC	
TRUE	External Information	1200	65	1265		FC3 Stack Current String B	INT16	0.1	A - DC	
TRUE	External Information	1200	66	1266		FC3 Stack Voltage String A	INT16	0.1	V - DC	
TRUE	External Information	1200	67	1267		FC3 Stack Voltage String B	INT16	0.1	V - DC	
TRUE	External Information	1200	68	1268		FC4 Stack Current String A	INT16	0.1	A - DC	
TRUE	External Information	1200	69	1269		FC4 Stack Current String B	INT16	0.1	A - DC	
TRUE	External Information	1200	70	1270		FC4 Stack Voltage String A	INT16	0.1	V - DC	
TRUE	External Information	1200	71	1271		FC4 Stack Voltage String B	INT16	0.1	V - DC	
TRUE	External Information	1200	72	1272		FC5 Stack Current String A	INT16	0.1	A - DC	
TRUE	External Information	1200	73	1273		FC5 Stack Current String B	INT16	0.1	A - DC	
TRUE	External Information	1200	74	1274		FC5 Stack Voltage String A	INT16	0.1	V - DC	
TRUE	External Information	1200	75	1275		FC5 Stack Voltage String B	INT16	0.1	V - DC	
TRUE	External Information	1200	76	1276		FC6 Stack Current String A	INT16	0.1	A - DC NOT tested	
TRUE	External Information	1200	77	1277		FC6 Stack Current String B	INT16	0.1	A - DC NOT tested	
TRUE	External Information	1200	78	1278		FC6 Stack Voltage String A	INT16	0.1	V - DC NOT tested	
TRUE	External Information	1200	79	1279		FC6 Stack Voltage String B	INT16	0.1	V - DC NOT tested	
TRUE	External Information	1200	80	1280		FC1 Hour Meter	UINT32	0.01	hrs	21mio hours = 2451 years
TRUE	External Information	1200	82	1282		FC2 Hour Meter	UINT32	0.01	hrs	21mio hours = 2451 years
TRUE	External Information	1200	84	1284		FC3 Hour Meter	UINT32	0.01	hrs	21mio hours = 2451 years
TRUE	External Information	1200	86	1286		FC4 Hour Meter	UINT32	0.01	hrs	21mio hours = 2451 years
TRUE	External Information	1200	88	1288		FC5 Hour Meter	UINT32	0.01	hrs	21mio hours = 2451 years
TRUE	External Information	1200	90	1290		FC6 Hour Meter	UINT32	0.01	hrs	21mio hours = 2451 years
TRUE	External Information	1200	92	1292		System ON Hour Meter	UINT32	0.01	hrs	21mio hours = 2451 years
TRUE	External Information	1200	94	1294		PLC ON Hour Meter	UINT32	0.01	hrs	21mio hours = 2451 years
TRUE	External Information	1200	96	1296		FC1 start counter	INT16	1	no.	
TRUE	External Information	1200	97	1297		FC2 start counter	INT16	1	no.	
TRUE	External Information	1200	98	1298		FC3 start counter	INT16	1	no.	
TRUE	External Information	1200	99	1299		FC4 start counter	INT16	1	no.	
TRUE	External Information	1200	100	1300		FC5 start counter	INT16	1	no.	
TRUE	External Information	1200	101	1301		FC6 start counter	INT16	1	no.	
TRUE	External Information	1200	102	1302		System start counter	INT16	1	no.	
TRUE	External Information	1200	103	1303		FC1 shutdown counter	INT16	1	no.	
TRUE	External Information	1200	104	1304		FC2 shutdown counter	INT16	1	no.	
TRUE	External Information	1200	105	1305		FC3 shutdown counter	INT16	1	no.	
TRUE	External Information	1200	106	1306		FC4 shutdown counter	INT16	1	no.	
TRUE	External Information	1200	107	1307		FC5 shutdown counter	INT16	1	no.	
TRUE	External Information	1200	108	1308		FC6 shutdown counter	INT16	1	no.	
TRUE	External Information	1200	109	1309		System shutdown counter	INT16	1	no.	

TRUE	External Information	1200	110	1310	Main Output Voltage L1L2	INT16	0.1	V - AC	
TRUE	External Information	1200	111	1311	Main Output Voltage L2L3	INT16	0.1	V - AC	
TRUE	External Information	1200	112	1312	Main Output Voltage L3L1	INT16	0.1	V - AC	
TRUE	External Information	1200	113	1313	Main Output Voltage L1N	INT16	0.1	V - AC	
TRUE	External Information	1200	114	1314	Main Output Voltage L2N	INT16	0.1	V - AC	
TRUE	External Information	1200	115	1315	Main Output Voltage L3N	INT16	0.1	V - AC	
TRUE	External Information	1200	116	1316	Main Output Current L1	INT16	1	A - AC	
TRUE	External Information	1200	117	1317	Main Output Current L2	INT16	1	A - AC	
TRUE	External Information	1200	118	1318	Main Output Current L3	INT16	1	A - AC	
TRUE	External Information	1200	119	1319	Main Output Power	INT16	0.1	kW - AC	
TRUE	External Information	1200	120	1320	Main Output Reactive Power	INT16	0.1	kvar	
TRUE	External Information	1200	121	1321	Main Output Apparent Power	INT16	0.1	kVA	
TRUE	External Information	1200	122	1322	Main Output Power Factor	INT16	0.001	-	
TRUE	External Information	1200	123	1323	Main Busbar Frequency	UINT16	0.001	Hz	
TRUE	External Information	1200	124	1324	Main Busbar Voltage L1L2	INT16	0.1	V - AC	
TRUE	External Information	1200	125	1325	Main Busbar Voltage L2L3	INT16	0.1	V - AC	
TRUE	External Information	1200	126	1326	Main Busbar Voltage L3L1	INT16	0.1	V - AC	
TRUE	External Information	1200	127	1327	Main Busbar Voltage L1N	INT16	0.1	V - AC	
TRUE	External Information	1200	128	1328	Main Busbar Voltage L2N	INT16	0.1	V - AC	
TRUE	External Information	1200	129	1329	Main Busbar Voltage L3N	INT16	0.1	V - AC	
TRUE	External Information	1200	130	1330	AUX Voltage L1L2	INT16	0.1	V - AC	
TRUE	External Information	1200	131	1331	AUX Voltage L2L3	INT16	0.1	V - AC	
TRUE	External Information	1200	132	1332	AUX Voltage L3L1	INT16	0.1	V - AC	
TRUE	External Information	1200	133	1333	AUX Voltage L1N	INT16	0.1	V - AC	
TRUE	External Information	1200	134	1334	AUX Voltage L2N	INT16	0.1	V - AC	
TRUE	External Information	1200	135	1335	AUX Voltage L3N	INT16	0.1	V - AC	
TRUE	External Information	1200	136	1336	AUX Current L1	INT16	0.1	A - AC	
TRUE	External Information	1200	137	1337	AUX Current L2	INT16	0.1	A - AC	
TRUE	External Information	1200	138	1338	AUX Current L3	INT16	0.1	A - AC	
TRUE	External Information	1200	139	1339	AUX Power	INT16	0.1	kW - AC	
TRUE	External Information	1200	140	1340	AUX Reactive Power	INT16	0.1	kvar	
TRUE	External Information	1200	141	1341	AUX Apparent Power	INT16	0.1	kVA	
TRUE	External Information	1200	142	1342	AUX Power Factor	INT16	0.001	n/a	
TRUE	External Information	1200	143	1343	AUX Frequency	UINT16	0.001	Hz	
TRUE	External Information	1200	144	1344	Nanogrid Power	INT16	0.1	kW - DC	Nanogrid Breaker Total Power
FALSE	External Information	1200	145	1345	Energy transfer to battery	INT32	0.1	kWh - DC	<Not Implemented>
FALSE	External Information	1200	147	1347	Energy transfer from battery	INT32	0.1	kWh - DC	<Not Implemented>
FALSE	External Information	1200	149	1349	Battery Bus voltage	INT16	0.1	V - DC	<Not Implemented>
FALSE	External Information	1200	150	1350	Battery Bus current	INT16	0.1	A - DC	<Not Implemented>
FALSE	External Information	1200	151	1351	Battery string 1 current	INT16	0.1	A - DC	<Not Implemented>
FALSE	External Information	1200	152	1352	Battery string 2 current	INT16	0.1	A - DC	<Not Implemented>
FALSE	External Information	1200	154	1354	Battery string 4 current	INT16	0.1	A - DC	<Not Implemented>
FALSE	External Information	1200	155	1355	Battery Bus power	INT16	0.1	kW - DC	<Not Implemented>
FALSE	External Information	1200	156	1356	Battery DC/DC power	INT16	0.1	kW - DC	<Not Implemented>
FALSE	External Information	1200	157	1357	Battery string 1, cell voltage min	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	158	1358	Battery string 1, cell voltage max	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	159	1359	Battery string 1, cell voltage avg	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	160	1360	Battery string 2, cell voltage min	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	161	1361	Battery string 2, cell voltage max	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	162	1362	Battery string 2, cell voltage avg	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	163	1363	Battery string 3, cell voltage min	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	164	1364	Battery string 3, cell voltage max	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	165	1365	Battery string 3, cell voltage avg	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	166	1366	Battery string 4, cell voltage min	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	167	1367	Battery string 4, cell voltage max	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	168	1368	Battery string 4, cell voltage avg	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	169	1369	Battery pack, cell voltage min	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	170	1370	Battery pack, cell voltage max	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	171	1371	Battery pack, cell voltage avg	INT16	1	mV - DC	<Not Implemented>
FALSE	External Information	1200	172	1372	Battery string 1, min temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	173	1373	Battery string 1, max temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	174	1374	Battery string 1, avg temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	175	1375	Battery string 2, min temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	176	1376	Battery string 2, max temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	177	1377	Battery string 2, avg temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	178	1378	Battery string 3, min temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	179	1379	Battery string 3, max temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	180	1380	Battery string 3, avg temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	181	1381	Battery string 4, min temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	182	1382	Battery string 4, max temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	183	1383	Battery string 4, avg temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	184	1384	Battery pack, min temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	185	1385	Battery pack, max temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	186	1386	Battery pack, avg temp	INT16	0.1	°C	<Not Implemented>
FALSE	External Information	1200	187	1387	Battery pack SoC	INT16	0.1	%	<Not Implemented>
FALSE	External Information	1200	188	1388	Battery pack cycle count	INT16	1	no.	<Not Implemented>
FALSE	External Information	1200	189	1389	Charger System Status word	WORD			<Not Implemented>
FALSE	External Information	1200		0	Charger System on Fuel Cell supply	BOOL			<Not Implemented>
FALSE	External Information	1200		1	Charger System on Grid/Utility supply	BOOL			<Not Implemented>
FALSE	External Information	1200		2 to 15	<Spare>	BOOL			<Not Implemented>
FALSE	External Information	1200	190	1390	<Spare>				<Not Implemented>
FALSE	External Information	1200	191	1391	<Spare>				<Not Implemented>

FALSE	External Information	1200	192	1392	<Spare>	<Not Implemented>
FALSE	External Information	1200	193	1393	<Spare>	<Not Implemented>

Crosswind FC Package - Main PLC

Main FC Package Statemachine Index

State Index	State Name	C08-001 Reference	Comment
0	Wakeup	Initialization	Value not visible on modbus
3	EstablishComms	Initialization	Value not visible on modbus
6	Initialize	Initialization	
10	Sleep	Sleep	
14	StartupContainerVentilation	Wakeup	
17	FCwaveWakeup	Wakeup	
18	BatteryWakeup	n/a	Not Applicable for CW FC Package
19	HydrogenHeaterStartup	Wakeup	
20	Standby	Standby	
30	BatteryStartup	Startup	
40	NanogridStartup	Startup	
50	LTCoolantStartup	Startup	
60	MicrogridStartup	Startup	
70	FCwavesStartup	Startup	
100	Running	Running	
105	RampDownPower	Rampdown	
110	MicrogridShutdown	Rampdown	
120	ChargeBattery	Rampdown	
130	ShutdownFCwaves	Rampdown	
140	Aftercool	Aftercool	
160	ShutdownNanogrid	Shutdown	
170	ShutdownBattery	Shutdown	Not Applicable for CW FC Package
172	ShutdownHydorgenHeater	Shutdown	
175	PutBatteriesToSleep	Shutdown	Not Applicable for CW FC Package
180	PutFCwavesToSleep	Shutdown	
190	ShutdownVentilation	Shutdown	
200	Error	Error	
201	ErrorEmergShutdown	Error	
210	ResetError	Error	

Crosswind FC Package - Main PLC

Main FC Control Statemachine Index

State Index	State Name	Column1	Column2
0	PowerOff		
1	PowerUp		
20	WaitControllers		
25	FCwaveUnlocked		
26	StartupDCDCs		
27	SetDCDCsVoltageMode		
30	FCwavePrecharge		
40	FCwaveStandby		
80	StartupDCDCsActive		
95	StartupDCDCsPassive		
99	RampUpCurrent		
100	Running		
105	RampDownCurrent		
135	Shutdown		
200	Error		
210	ResetError		
211	ResetHLockError		
212	ResetFCwaveSafetyController		
213	ResetMainSafetyController		
300	DegasFCwave		
310	PrepareService		
311	Service		
320	Dryout		