cinergia

ePLUS Family units

MODBUS DATA TABLE DO319

Revision number	Document changes	Date
A00	Creation[1]	November 20
A01	Add information run time	March 21
A02	Add information MODBUS addressing	March 21

[1] *Based on PR377A02*

INDEX

1. GENERAL

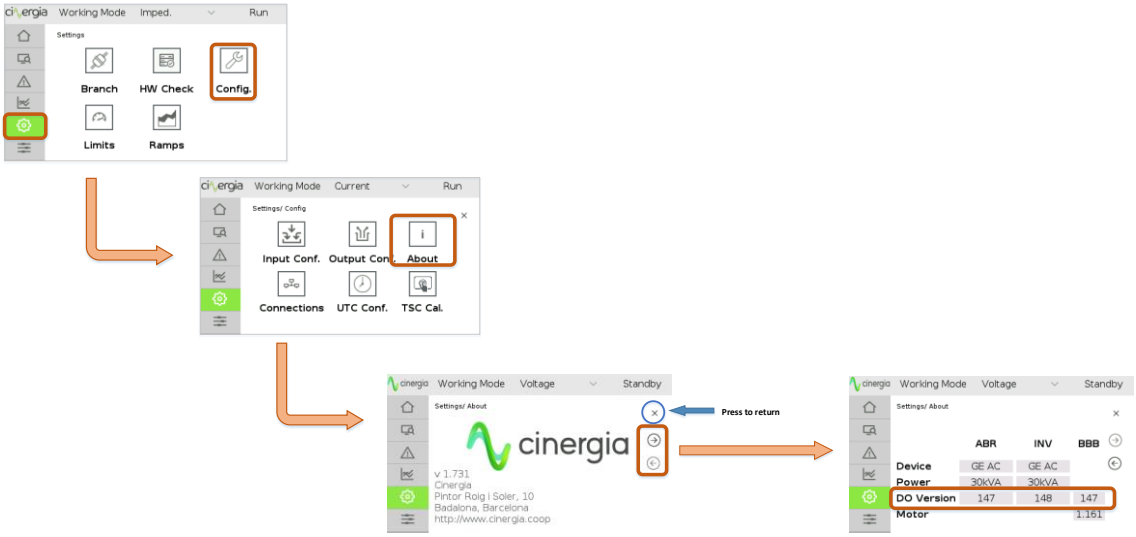
The purpose of this manual is to provide information to use the Cinergia converter with all its different functionalities using their own customized interface. It is important for the user to have this manual nearby and familiarize with it to operate efficiently with the converter.

Cinergia is in constant development to deliver always the best service to you, so it is possible to find some discrepancy between this manual and the real converter itself. Do not hesitate to contact us and ask for the latest version of the documentation.

This manual is valid for the following versions of Modbus Addresses: 319.

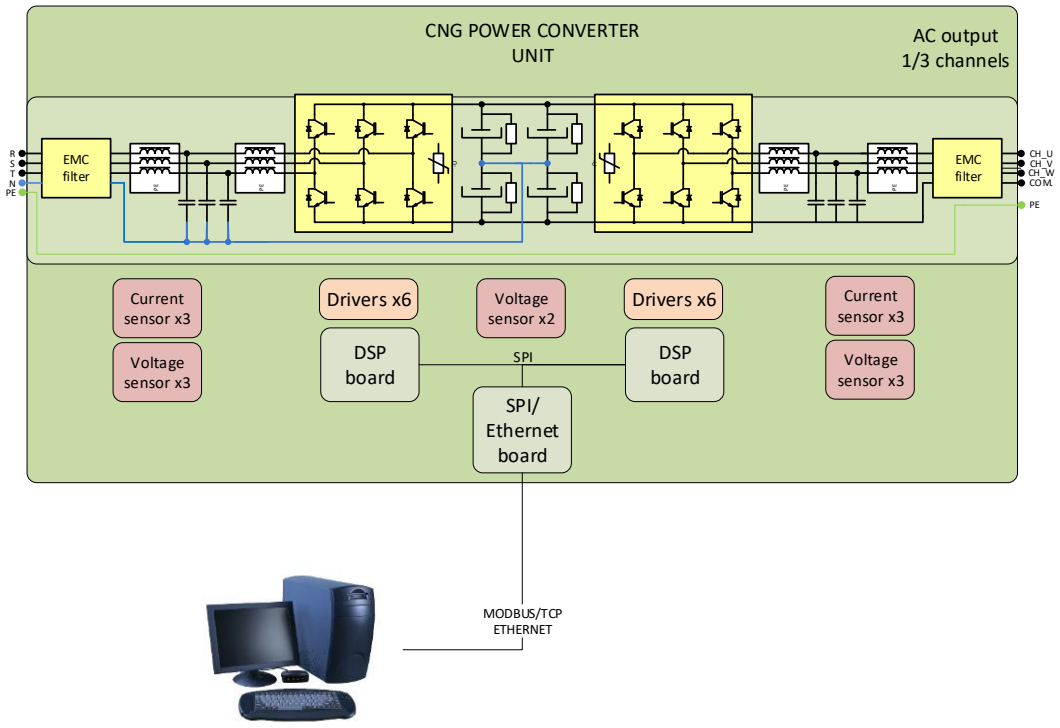
You can find the DO Modbus addresses version of your unit on ***TAB About of CNG's interface***,

Or on the ***Setting/Config/About*** screen part of the LCD touchscreen of the unit.



2. REMOTE COMMUNICATIONS AND MODBUS DATA TABLE

CINERGIA's power converters can be operated and supervised remotely through an Ethernet communications bus. An internal embedded PC, with CINERGIA's proprietary software, allows the exchange of information between the internal SPI bus and the external Modbus TCP/IP (Ethernet). In this way, the customer can build specific HMI client software application while CINERGIA's power converter acts as a **Modbus TCP/IP server**.



This Modbus TCP/IP slave has implemented the following properties:

Property	Implementation
Comunication protocol	MODBUS TCP/IP SERVER
Function Codes:	0x03: READ_HOLDING_REGISTER 0x10: WRITE_MULTIPLE_REGISTER
Server port:	502 (decimal)
Modbus node ID:	IGNORED; 0 NOT ALLOWED
CRC	Not used. Relayed on the TCP stack.
Multiple connections	Multiple connections
Idle connections	Idle connections might be closed by the slave. Anyway, the listen socket will force the master to keep the connection active, even when there is no active connection at all.
Other	All variables are 32-bit length. This is 2 Modbus register addresses. All Read operations must begin at the beginning of one variable and be Even. The maximum number of registers to **read** and **write** in one Modbus request is **124** registers, as **62 variables** and **120** registers, as **60 variables**, respectively.
Codification of register	**Big Endian**, this means that the most significant byte (the "big end") of the data is placed at the byte with the lowest address. Please read the chapter below 2.1 for more information about this point.
Register Addressing	The Cinergia unit uses a **0-based addressing**, like MODBUS standard uses.

2.1. REGISTERS AND BIG ENDIAN EXAMPLE

On this chapter an example of the Big Endian word to read by Modbus is shown.

As commented before, all the internal variables from the unit to be read/written by Modbus are 32 bit length. The Modbus register are 16 bit length, this means that per each internal variable, it is need to read/write two Modbus register.

If the user wants to read the variable ***PowerDesignator***, known as Modbus Address **11002**, the user will need to read two Modbus Registers. As an example, the real value of this variable is 0x00000004 expressed in BigEndian, this means that in Big Endian the two Modbus registers will return the follow values:

- Address **11002**: 0x0000
- Address **11003**: 0x0004

Assuming that one internal variable has a real value 0xB1B2B3B4, expressed in BigEndian. This , with Modbus Address **20224**, where B1 is the Most Significant Byte (MSB), the Modbus register will return the follow values:

- Address **20224**: 0xB1B2
- Address **20225**: 0xB3B4

CNG unit variable (32 bits)							
MSB	x	x	x	x	x	x	**LSB**
B1	B2	B3	B4	B5	B6	B7	B8
Modbus Register 2N				Modbus Register 2N+1			
(16 bits)				(16 bits)			

2.2. MODBUS REGISTER ADDRESSING

The Cinergia unit uses a **0-based addressing**, like MODBUS standard uses. When table addresses start from 0, it is called **0-based addressing**. When the table addresses start from 1, this is called 1-based addressing.

With many Modbus devices, like Cinergia units, the addresses for the parameters start from 0, whereas the Modbus addressing from other platforms start from 1, like some PLC or other platforms as Matlab. Therefore, in these cases it is required to add 1 to the Device table addresses when the matching configuration is required.

Please, take into account that if you are using these type of platforms (PLC, Matlab, …) a 1-based addressing could be used. This means that on that cases the toolbox Modbus used in these PLC or these platforms subtracts 1 from any addresses that are passed in via the address parameters in the read and write functions.

2.3. MODBUS DATA TABLE

The memory map is as follows:

Modbus	Name	Type	RW	Limit-Max	Limit-Min	Units	Device	INFO
11020	MODBUS_Password_ABR	Uint32	RW	4294967296	0	-	ALL	// REQUEST ADVANCED PASSWORD
13000	Alarm_ABR_1	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 1 *(see Def_alarm.csv document)*
13002	Alarm_ABR_2	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 2 *(see Def_alarm.csv document)*
13004	Alarm_ABR_3	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 3 *(see Def_alarm.csv document)*
13006	Alarm_ABR_4	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 4 *(see Def_alarm.csv document)*
13008	Alarm_ABR_5	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 5 *(see Def_alarm.csv document)*
16000	SW_GrafcetState	Uint32	RO	9	0	-	ALL	// STATUS WORD INPUT GRAFCET STATUS
16002	SW_LocalRemote	Uint32	RO	2	0	-	ALL	// STATUS WORD INPUT LOCAL REMOTE
16004	SW_SetPoint_Input	Uint32	RO	2	0	-	ALL	// STATUS WORD INPUT SETPOINT INPUT
16006	SW_AC_DC_Selector_U	Uint32	RO	1	0	-	ALL	// STATUS WORD INPUT AC&DC SELECTOR / PHASE U (*optional*)
16008	SW_AC_DC_Selector_V	Uint32	RO	1	0	-	ALL	// STATUS WORD INPUT AC&DC SELECTOR PHASE V (*optional*)
16010	SW_AC_DC_Selector_W	Uint32	RO	1	0	-	ALL	// STATUS WORD INPUT AC&DC SELECTOR PHASE W (*optional*)
16012	SW_GE_EL_Selector	Uint32	RO	1	0	-	ALL	// STATUS WORD INPUT GE&EL SELECTOR
16014	SW_OutputConnection	Uint32	RO	1	0	-	ALL	// STATUS WORD INPUT OUTPUT CONNECTION
16016	SW_TriggerConfig	Uint32	RO	1	0	-	ALL	// STATUS WORD INPUT TRIGGER FUNCTION
16018	SW_Bipolar	Uint32	RO	1	0	-	ALL	// STATUS WORD INPUT BIPOLAR
16020	SW_BranchControl	Uint32	RO	1	0	-	ALL	// STATUS WORD INPUT BRANCH CONTROL
16022	SW_ControlOperationU	Uint32	RO	6	0	-	ALL	// STATUS WORD OUTPUT CONTROL OPERATION PHASE U IN SEPARATED CONTROL MODE
16024	SW_ControlOperationV	Uint32	RO	6	0	-	ALL	// STATUS WORD OUTPUT CONTROL OPERATION PHASE V IN SEPARATED CONTROL MODE
16026	SW_ControlOperationW	Uint32	RO	6	0	-	ALL	// STATUS WORD OUTPUT CONTROL OPERATION PHASE W IN SEPARATED CONTROL MODE
16028	SW_GrafcetStateU	Uint32	RO	4	0	-	ALL	// STATUS WORD OUTPUT GRAFSET STATUS PHASE U IN SEPARATED CONTROL MODE
16030	SW_GrafcetStateV	Uint32	RO	4	0	-	ALL	// STATUS WORD OUTPUT GRAFSET STATUS PHASE V IN SEPARATED CONTROL MODE
16032	SW_GrafcetStateW	Uint32	RO	4	0	-	ALL	// STATUS WORD OUTPUT GRAFSET STATUS PHASE W IN SEPARATED CONTROL MODE
16034	SW_ONOFF_U	Uint32	RO	1	0	-	ALL	// STATUS WORD ON/OFF PHASE U IN SEPARATED CONTROL MODE

16036	SW_ONOFF_V	Uint32	RO	1	0	-	ALL	// STATUS WORD ON/OFF PHASE V IN SEPARATED CONTROL MODE
16038	SW_ONOFF_W	Uint32	RO	1	0	-	ALL	// STATUS WORD ON/OFF PHASE W IN SEPARATED CONTROL MODE
16040	SW_EL_Star_Delta	Uint32	RO	1	0	-	ALL	// STATUS WORD DELTA/STAR EL MODE
16042	SW_EL_Sim_Mode	Uint32	RO	1	0	-	ALL	// STATUS WORD IMPEDANCE MODE RMS (0) OR REALTIME (1)
16044	SW_HR_Mode	Uint32	RO	1	0	-	ALL	// STATUS WORD OF HIGH RESOLUTION MODE FUNCTIONALITY
16046	SW_DC_Fast_Control	Uint32	RO	1	0	-	ALL	// STATUS WORD DC CONTROL FAST (1) OR STANDARD (0)
16048	SW_Remote_One_CH_contactor	Uint32	RO	1	0	-	ALL	// STATUS WORD REMOTE CONTROL 1CH/3CH (OPTIONAL)
16050	SW_Remote_GEL_contactor	Uint32	RO	1	0	-	ALL	// STATUS WORD REMOTE CONTROL GE/EL (OPTIONAL)
16074	Voltage_MainGrid_RS_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE PHASE R-S
16076	Voltage_MainGrid_ST_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE PHASE S-T
16078	Voltage_MainGrid_TR_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE PHASE T-R
16080	Voltage_MainGrid_R_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE PHASE R-N
16082	Voltage_MainGrid_S_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE PHASE S-N
16084	Voltage_MainGrid_T_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE PHASE T-N
16086	Current_MainGrid_R_RMS	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT PHASE R
16088	Current_MainGrid_S_RMS	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT PHASE S
16090	Current_MainGrid_T_RMS	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT PHASE T
16092	VbusTotal	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE IN DC LINK
16094	Vbus_mes	float32	RO	3.4E+38	-3.4E+38	V	ALL	// SEMI POSITIVE VOLTAGE IN DC LINK
16102	Vbus_menys	float32	RO	3.4E+38	-3.4E+38	V	ALL	// SEMI NEGATIVE VOLTAGE IN DC LINK
16104	Temp_ABR	float32	RO	3.4E+38	-3.4E+38	ºC	ALL	// INPUT HEATSINK TEMPERATURE
16106	Temp_INV	float32	RO	3.4E+38	-3.4E+38	ºC	ALL	// OUTPUT HEATSINK TEMPERATURE
16108	Temp_Ext	float32	RO	3.4E+38	-3.4E+38	ºC	ALL	// EXTERNAL SENSOR TEMPERATURE (OPTIONAL)
16110	Power_Active_MainGrid_R	float32	RO	3.4E+38	-3.4E+38	W	ALL	// ACTIVE POWER PHASE R
16112	Power_Active_MainGrid_S	float32	RO	3.4E+38	-3.4E+38	W	ALL	// ACTIVE POWER PHASE S
16114	Power_Active_MainGrid_T	float32	RO	3.4E+38	-3.4E+38	W	ALL	// ACTIVE POWER PHASE T
16116	Power_Active_MainGrid_Total	float32	RO	3.4E+38	-3.4E+38	W	ALL	// ACTIVE POWER 3PHASE
16118	Power_Reactive_MainGrid_R	float32	RO	3.4E+38	-3.4E+38	var	ALL	// REACTIVE POWER PHASE R
16120	Power_Reactive_MainGrid_S	float32	RO	3.4E+38	-3.4E+38	var	ALL	// REACTIVE POWER PHASE S
16122	Power_Reactive_MainGrid_T	float32	RO	3.4E+38	-3.4E+38	var	ALL	// REACTIVE POWER PHASE T
16124	Power_Reactive_MainGrid_Total	float32	RO	3.4E+38	-3.4E+38	var	ALL	// APPARENT POWER 3PHASE

16126	Power_Apparent_MainGrid_R	float32	RO	3.4E+38	-3.4E+38	VA	ALL	// APPARENT POWER PHASE R
16128	Power_Apparent_MainGrid_S	float32	RO	3.4E+38	-3.4E+38	VA	ALL	// APPARENT POWER PHASE S
16130	Power_Apparent_MainGrid_T	float32	RO	3.4E+38	-3.4E+38	VA	ALL	// APPARENT POWER PHASE T
16132	Power_Apparent_MainGrid_Total	float32	RO	3.4E+38	-3.4E+38	VA	ALL	// APPARENT POWER 3PHASE
16134	Frequency_MainGrid_R	float32	RO	3.4E+38	-3.4E+38	Hz	ALL	// FREQUENCY PHASE R
16136	Frequency_MainGrid_S	float32	RO	3.4E+38	-3.4E+38	Hz	ALL	// FREQUENCY PHASE S
16138	Frequency_MainGrid_T	float32	RO	3.4E+38	-3.4E+38	Hz	ALL	// FREQUENCY PHASE T
17000	CW_EnableDisable	Uint32	RW	1	0	-	ALL	// CONTROL WORD DISABLE/ENABLE
17002	CW_RunReady	Uint32	RW	1	0	-	ALL	// CONTROL WORD READY/RUN
17004	CW_ControlOperationU	Uint32	RW	6	0	-	ALL	// CONTROL WORD CONTROL OPERATION PHASE U
17006	CW_ControlOperationV	Uint32	RW	6	0	-	ALL	// CONTROL WORD CONTROL OPERATION PHASEV
17008	CW_ControlOperationW	Uint32	RW	6	0	-	ALL	// CONTROL WORD CONTROL OPERATION PHASE W
17010	CW_ONOFF_U	Uint32	RW	1	0	-	ALL	// CONTROL WORD ENABLE/DISABLE PH U
17012	CW_ONOFF_V	Uint32	RW	1	0	-	ALL	// CONTROL WORD ENABLE/DISABLE PH V
17014	CW_ONOFF_W	Uint32	RW	1	0	-	ALL	// CONTROL WORD ENABLE/DISABLE PH W
17016	CW_BranchControl	Uint32	RW	1	0	-	ALL	// CONTROL WORD BRANCH CONTROL
17018	CW_Reset	Uint32	RW	1	0	-	ALL	// CONTROL WORD RESET (0 --> 1 --> 0)
17020	CW_Trigger_Config	Uint32	RW	1	0	-	ALL	// TRIGGER START SETPOINT
17022	CW_EL_Star_Delta	Uint32	RW	1	0	-	ALL	// CONTROL WORD EL STAR/DELTA MODE
17024	CW_EL_Sim_Mode	Uint32	RW	1	0	-	ALL	// CONTROL WORD IMPEDANCE MODE RMS (0) OR REALTIME (1)
17030	CW_DC_Fast_Control	Uint32	RW	1	0	-	ALL	// CONTROL WORD DC CONTROL FAST (1) OR STANDARD (0)
17032	CW_Remote_One_CH_contactor	Uint32	RW	1	0	-	ALL	// CONTROL WORD REMOTE CONTROL 1CH/3CH (OPTIONAL)
17034	CW_Remote_GEL_contactor	Uint32	RW	1	0	-	ALL	// CONTROL WORD REMOTE CONTROL GE/EL (OPTIONAL)
17044	Input_Reactive_Setpoint_R	float32	RW	80000	-80000	var	ALL	// GRID SIDE POWER REACTIVE SETPOINT
17046	Input_Reactive_Setpoint_S	float32	RW	80000	-80000	var	ALL	// GRID SIDE POWER REACTIVE SETPOINT
17048	Input_Reactive_Setpoint_T	float32	RW	80000	-80000	var	ALL	// GRID SIDE POWER REACTIVE SETPOINT
21034	Serial_Master_User	Uint32	RW	2	0	-	ALL	// MASTER UNIT IN SERIAL MODE
21042	N_Paralel_Total_User	Uint32	RW	10	1	-	ALL	// TOTAL NUMBER OF UNITS IN PARALLEL MODE
21044	Paralel_ID_User	Uint32	RW	10	0	-	ALL	// ID NUMBER IN PARALLEL MODE
21086	Device_Options_Password	Uint32	RW	4294967296	0	-	ALL	// REQUEST UNLOCK SOFT UPGRADES PASSWORD
21088	MODBUS_Password_INV	Uint32	RW	4294967296	0	-	ALL	// REQUEST ADVANCED PASSWORD
21112	Year_INV	Uint32	RO	4294967296	0	-	ALL	// TOTAL ACCUMULATED RUNNING TIME IN YEARS
21114	Month_INV	Uint32	RO	12	0	-	ALL	// TOTAL ACCUMULATED RUNNING TIME IN MONTHS
21116	day_INV	Uint32	RO	365	0	-	ALL	// TOTAL ACCUMULATED RUNNING TIME IN DAY

21118	hour_INV	Uint32	RO	24	0	-	ALL	// TOTAL ACCUMULATED RUNNING TIME IN HOURS
21120	minute_INV	Uint32	RO	60	0	-	ALL	// TOTAL ACCUMULATED RUNNING TIME IN MINUTES
21122	second_INV	Uint32	RO	60	0	-	ALL	// TOTAL ACCUMULATED RUNNING TIME IN SECONDS
23000	Alarm_INV_1	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 1 (see Def_alarm.csv document)
23002	Alarm_INV_2	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 2 (see Def_alarm.csv document)
23004	Alarm_INV_3	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 3 (see Def_alarm.csv document)
23006	Alarm_INV_4	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 4 (see Def_alarm.csv document)
23008	Alarm_INV_5	Uint32	RO	4294967296	0	-	ALL	// ERROR ALARM WORD INPUT 5 (see Def_alarm.csv document)
23010	Warning_Vector_INV	Uint32	RO	4294967296	0	-	ALL	// WARNING ALARM WORD
23012	Limit_max_Voltage_AC_Output_U	float32	RW	295	0	V	ALL	// MAXIMUM WORKING VOLTAGE PHASE U IN AC MODE
23014	Limit_max_Voltage_AC_Output_V	float32	RW	295	0	V	ALL	// MAXIMUM WORKING VOLTAGE PHASE V IN AC MODE
23016	Limit_max_Voltage_AC_Output_W	float32	RW	295	0	V	ALL	// MAXIMUM WORKING VOLTAGE PHASE W IN AC MODE
23018	Limit_max_Voltage_AC_Output_Global	float32	RW	295	0	V	ALL	// MAXIMUM WORKING VOLTAGE GLOBAL IN AC MODE
23020	Limit_peak_Voltage_AC_Output_U	float32	RW	4.271.930.009	0	V	ALL	// PEAK VALUE WORKING VOLTAGE PHASE U IN AC MODE
23022	Limit_peak_Voltage_AC_Output_V	float32	RW	4.271.930.009	0	V	ALL	// PEAK VALUE WORKING VOLTAGE PHASE V IN AC MODE
23024	Limit_peak_Voltage_AC_Output_W	float32	RW	4.271.930.009	0	V	ALL	// PEAK VALUE WORKING VOLTAGE PHASE W IN AC MODE
23026	Limit_peak_Voltage_AC_Output_Global	float32	RW	4.271.930.009	0	V	ALL	// PEAK VALUE WORKING VOLTAGE GLOBAL IN AC MODE
23028	Limit_min_Voltage_AC_Output_U	float32	RW	295	0	V	ALL	// MINIMUM WORKING VOLTAGE PHASE U IN AC MODE
23030	Limit_min_Voltage_AC_Output_V	float32	RW	295	0	V	ALL	// MINIMUM WORKING VOLTAGE PHASE V IN AC MODE
23032	Limit_min_Voltage_AC_Output_W	float32	RW	295	0	V	ALL	// MINIMUM WORKING VOLTAGE PHASE W IN AC MODE
23034	Limit_min_Voltage_AC_Output_Global	float32	RW	295	0	V	ALL	// MINIMUM WORKING VOLTAGE GLOBAL IN AC MODE
23036	Limit_max_Current_AC_Output_U	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MAXIMUM WORKING CURRENT PHASE U IN AC MODE
23038	Limit_max_Current_AC_Output_V	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MAXIMUM WORKING CURRENT PHASE V IN AC MODE
23040	Limit_max_Current_AC_Output_W	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MAXIMUM WORKING CURRENT PHASE W IN AC MODE
23042	Limit_max_Current_AC_Output_Global	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MAXIMUM WORKING CURRENT GLOBAL IN AC MODE
23044	Limit_min_Current_AC_Output_U	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MINIMUM WORKING CURRENT PHASE U IN AC MODE
23046	Limit_min_Current_AC_Output_V	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MINIMUM WORKING CURRENT PHASE V IN AC MODE
23048	Limit_min_Current_AC_Output_W	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MINIMUM WORKING CURRENT PHASE W IN AC MODE
23050	Limit_min_Current_AC_Output_Global	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MINIMUM WORKING CURRENT GLOBAL IN AC MODE
23052	Limit_max_Voltage_DC_Output_U	float32	RW	1600	0	V	ALL	// MAXIMUM WORKING VOLTAGE OUTPUT U IN DC MODE

23054	Limit_max_Voltage_DC_Output_V	float32	RW	1600	0	V	ALL	// MAXIMUM WORKING VOLTAGE OUTPUT V IN DC MODE
23056	Limit_max_Voltage_DC_Output_W	float32	RW	1600	0	V	ALL	// MAXIMUM WORKING VOLTAGE OUTPUT W IN DC MODE
23058	Limit_max_Voltage_DC_Output_Global	float32	RW	1600	0	V	ALL	// MAXIMUM WORKING VOLTAGE GLOBAL IN DC MODE
23060	Limit_max_Voltage_DC_Bipolar_Output_U	float32	RW	380	-380	V	ALL	// MAXIMUM WORKING VOLTAGE BIP U IN DC MODE
23062	Limit_max_Voltage_DC_Bipolar_Output_W	float32	RW	380	-380	V	ALL	// MAXIMUM WORKING VOLTAGE BIP W IN DC MODE
23064	Limit_min_Voltage_DC_Output_U	float32	RW	1600	0	V	ALL	// MINIMUM WORKING VOLTAGE OUTPUT U IN DC MODE
23066	Limit_min_Voltage_DC_Output_V	float32	RW	1600	0	V	ALL	// MINIMUM WORKING VOLTAGE OUTPUT V IN DC MODE
23068	Limit_min_Voltage_DC_Output_W	float32	RW	1600	0	V	ALL	// MINIMUM WORKING VOLTAGE OUTPUT W IN DC MODE
23070	Limit_min_Voltage_DC_Output_Global	float32	RW	1600	0	V	ALL	// MINIMUM WORKING VOLTAGE GLOBAL IN DC MODE
23072	Limit_min_Voltage_DC_Bipolar_Output_U	float32	RW	380	-380	V	ALL	// MINIMUM WORKING VOLTAGE BIP U IN DC MODE
23074	Limit_min_Voltage_DC_Bipolar_Output_W	float32	RW	380	-380	V	ALL	// MINIMUM WORKING VOLTAGE BIP W IN DC MODE
23076	Limit_max_Current_DC_Output_U	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MAXIMUM WORKING CURRENT OUTPUT U IN DC MODE
23078	Limit_max_Current_DC_Output_V	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MAXIMUM WORKING CURRENT OUTPUT V IN DC MODE
23080	Limit_max_Current_DC_Output_W	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MAXIMUM WORKING CURRENT OUTPUT W IN DC MODE
23082	Limit_max_Current_DC_Output_Global	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MAXIMUM WORKING CURRENT GLOBAL IN DC MODE
23084	Limit_min_Current_DC_Output_U	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MINIMUM WORKING CURRENT OUTPUT U IN DC MODE
23086	Limit_min_Current_DC_Output_V	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MINIMUM WORKING CURRENT OUTPUT V IN DC MODE
23088	Limit_min_Current_DC_Output_W	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MINIMUM WORKING CURRENT OUTPUT W IN DC MODE
23090	Limit_min_Current_DC_Output_Global	float32	RW	3.4E+38	-3.4E+38	A	ALL	// MINIMUM WORKING CURRENT GLOBAL IN DC MODE
23092	Limit_max_Power_AC_Output_U	float32	RW	3.4E+38	0	W	ALL	// MAXIMUM WORKING POWER OUTPUT U IN AC MODE
23094	Limit_max_Power_AC_Output_V	float32	RW	3.4E+38	0	W	ALL	// MAXIMUM WORKING POWER OUTPUT V IN AC MODE
23096	Limit_max_Power_AC_Output_W	float32	RW	3.4E+38	0	W	ALL	// MAXIMUM WORKING POWER OUTPUT W IN AC MODE
23098	Limit_max_Power_AC_Output_Global	float32	RW	3.4E+38	0	W	ALL	// MAXIMUM WORKING POWER GLOBAL IN AC MODE
23100	Limit_min_Power_AC_Output_U	float32	RW	0	-3.4E+38	W	ALL	// MINIMUM WORKING POWER OUTPUT U IN AC MODE
23102	Limit_min_Power_AC_Output_V	float32	RW	0	-3.4E+38	W	ALL	// MINIMUM WORKING POWER OUTPUT V IN AC MODE
23104	Limit_min_Power_AC_Output_W	float32	RW	0	-3.4E+38	W	ALL	// MINIMUM WORKING POWER OUTPUT W IN AC MODE
23106	Limit_min_Power_AC_Output_Global	float32	RW	0	-3.4E+38	W	ALL	// MINIMUM WORKING POWER GLOBAL IN AC MODE
23108	Limit_max_Power_DC_Output_U	float32	RW	3.4E+38	0	W	ALL	// MAXIMUM WORKING POWER OUTPUT U IN DC MODE
23110	Limit_max_Power_DC_Output_V	float32	RW	3.4E+38	0	W	ALL	// MAXIMUM WORKING POWER OUTPUT V IN DC MODE
23112	Limit_max_Power_DC_Output_W	float32	RW	3.4E+38	0	W	ALL	// MAXIMUM WORKING POWER OUTPUT W IN DC MODE
23114	Limit_max_Power_DC_Output_Global	float32	RW	3.4E+38	0	W	ALL	// MAXIMUM WORKING POWER GLOBAL IN DC MODE
23116	Limit_min_Power_DC_Output_U	float32	RW	0	-3.4E+38	W	ALL	// MINIMUM WORKING POWER OUTPUT U IN DC MODE
23118	Limit_min_Power_DC_Output_V	float32	RW	0	-3.4E+38	W	ALL	// MINIMUM WORKING POWER OUTPUT V IN DC MODE
23120	Limit_min_Power_DC_Output_W	float32	RW	0	-3.4E+38	W	ALL	// MINIMUM WORKING POWER OUTPUT W IN DC MODE
23122	Limit_min_Power_DC_Output_Global	float32	RW	0	-3.4E+38	W	ALL	// MINIMUM WORKING POWER GLOBAL IN DC MODE

23124	Limit_min_freq_out	float32	RW	900	10	Hz	ALL	// MINIMUM WORKING FREQUENCY OUTPUT
23126	Limit_max_freq_out	float32	RW	900	10	Hz	ALL	// MAXIMUM WORKING FREQUENCY OUTPUT
23128	Limit_max_V_Freq	float32	RW	100000	10	VHz	ALL	// MAXIMUM VALUE OF V_FREQ VALUE ADMITTED IN AC MODE
23136	Alarm_OverVoltage_DC_Output	float32	RW	1620	-360	V	ALL	// ALARM OVERVOLTAGE OUTPUT IN DC MODE
23138	Alarm_UnderVoltage_DC_Output	float32	RW	1620	-360	V	ALL	// ALARM UNDERVOLTAGE OUTPUT IN DC MODE
23140	Alarm_OverCurrent_DC_Output_POS	float32	RW	3.4E+38	0	A	ALL	// ALARM OVERCURRENT OUTPUT POSITIVE IN DC MODE
23142	Alarm_OverCurrent_1min_DC_Output_POS	float32	RW	3.4E+38	0	A	ALL	// ALARM OVERCURRENT 110% OUTPUT POSITIVE IN DC MODE
23144	Alarm_OverCurrent_DC_Output_NEG	float32	RW	0	-3.4E+38	A	ALL	// ALARM OVERCURRENT OUTPUT NEGATIVE IN DC MODE
23146	Alarm_OverCurrent_1min_DC_Output_NEG	float32	RW	0	-3.4E+38	A	ALL	// ALARM OVERCURRENT 110% OUTPUT NEGATIVE IN DC MODE
23148	Alarm_OverVoltage_AC_Output	float32	RW	305	0	V	ALL	// ALARM OVERVOLTAGE OUTPUT IN AC MODE
23150	Alarm_OverVoltage_Peak_AC_Output	float32	RW	4.271.930.009	0	V	ALL	// ALARM OVERVOLTAGE PEAK OUTPUT IN AC MODE
23152	Alarm_UnderVoltage_AC_Output	float32	RW	287.15	0	V	ALL	// ALARM UNDERVOLTAGE OUTPUT IN AC MODE
23154	Alarm_OverCurrent_RMS_AC_Output	float32	RW	3.4E+38	0	A	ALL	// ALARM OVERCURRENT OUTPUT RMS IN AC MODE
23156	Alarm_OverCurrent_RMS_10min_AC_Output	float32	RW	3.4E+38	0	A	ALL	// ALARM OVERCURRENT 125% OUTPUT RMS IN AC MODE
23158	Alarm_OverCurrent_RMS_1min_AC_Output	float32	RW	3.4E+38	0	A	ALL	// ALARM OVERCURRENT 150% OUTPUT RMS IN AC MODE
23160	Alarm_OverCurrent_RMS_2sec_AC_Output	float32	RW	3.4E+38	0	A	ALL	// ALARM OVERCURRENT 200% OUTPUT RMS IN AC MODE
23162	Alarm_OverCurrent_RMS_AC_Output_Filter	float32	RW	3.4E+38	0	A	ALL	// ALARM OVERCURRENT OUTPUT FILTER RMS IN AC MODE
23164	Alarm_OverCurrent_Peak_AC	float32	RW	3.4E+38	0	A	ALL	// ALARM OVERCURRENT PEAK OUTPUT IN AC MODE
23166	Alarm_OverCurrent_Peak_DC	float32	RW	3.4E+38	0	A	ALL	// ALARM OVERCURRENT PEAK OUTPUT IN DC MODE
23168	Alarm_OverLoad_AC_POS	float32	RW	3.4E+38	0	W	ALL	// ALARM OVERLOAD OUTPUT POSITIVE IN AC MODE
23170	Alarm_OverLoad_10min_AC_POS	float32	RW	3.4E+38	0	W	ALL	// ALARM OVERLOAD 125% OUTPUT POSITIVE IN AC MODE
23172	Alarm_OverLoad_1min_AC_POS	float32	RW	3.4E+38	0	W	ALL	// ALARM OVERLOAD 150% OUTPUT POSITIVE IN AC MODE
23174	Alarm_OverLoad_2sec_AC_POS	float32	RW	3.4E+38	0	W	ALL	// ALARM OVERLOAD 200% OUTPUT POSITIVE IN AC MODE
23176	Alarm_OverLoad_AC_NEG	float32	RW	0	-3.4E+38	W	ALL	// ALARM OVERLOAD OUTPUT NEGATIVE IN AC MODE
23178	Alarm_OverLoad_10min_AC_NEG	float32	RW	0	-3.4E+38	W	ALL	// ALARM OVERLOAD 125% OUTPUT NEGATIVE IN AC MODE
23180	Alarm_OverLoad_1min_AC_NEG	float32	RW	0	-3.4E+38	W	ALL	// ALARM OVERLOAD 150% OUTPUT NEGATIVE IN AC MODE
23182	Alarm_OverLoad_2sec_AC_NEG	float32	RW	0	-3.4E+38	W	ALL	// ALARM OVERLOAD 200% OUTPUT NEGATIVE IN AC MODE
23184	Alarm_OverLoad_DC_POS	float32	RW	3.4E+38	0	W	ALL	// ALARM OVERLOAD OUTPUT POSITIVE IN DC MODE
23186	Alarm_OverLoad_10min_DC_POS	float32	RW	3.4E+38	0	W	ALL	// ALARM OVERLOAD 125% OUTPUT POSITIVE IN DC MODE
23188	Alarm_OverLoad_1min_DC_POS	float32	RW	3.4E+38	0	W	ALL	// ALARM OVERLOAD 150% OUTPUT POSITIVE IN DC MODE
23190	Alarm_OverLoad_2sec_DC_POS	float32	RW	3.4E+38	0	W	ALL	// ALARM OVERLOAD 200% OUTPUT POSITIVE IN DC MODE
23192	Alarm_OverLoad_DC_NEG	float32	RW	0	-3.4E+38	W	ALL	// ALARM OVERLOAD OUTPUT NEGATIVE IN DC MODE

23194	Alarm_OverLoad_10min_DC_NEG	float32	RW	0	-3.4E+38	W	ALL	// ALARM OVERLOAD 125% OUTPUT NEGATIVE IN DC MODE
23196	Alarm_OverLoad_1min_DC_NEG	float32	RW	0	-3.4E+38	W	ALL	// ALARM OVERLOAD 150% OUTPUT NEGATIVE IN DC MODE
23198	Alarm_OverLoad_2sec_DC_NEG	float32	RW	0	-3.4E+38	W	ALL	// ALARM OVERLOAD 200% OUTPUT NEGATIVE IN DC MODE
23252	CutOff_freq	float32	RW	1600	10	Hz	ALL	// BANDWIDTH OF CONTROL HARMONICS OUTPUT SIDE (INV)
26000	SW_GrafcetState_INV	Uint32	RO	9	0	-	ALL	// STATUS WORD OUTPUT STATE
26002	SW_Batt_Charging_Discharging_U	Uint32	RO	2	0	-	BE	// STATUS WORD OUTPUT DIS/CHARGING PHASE U
26004	SW_Batt_Charging_Step_U	Uint32	RO	2	0	-	BE	// STATUS WORD OUTPUT CHARGING STEP PHASE U
26006	SW_Batt_End_of_Charge_U	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUT END OF CHARGE PHASE U
26008	SW_Batt_End_of_Discharge_U	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUTEND OF DISCHARGING PHASE U
26010	SW_Batt_Cycling_U	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUT CYLCING ENABLED PHASE U
26012	SW_Batt_Charging_Discharging_V	Uint32	RO	2	0	-	BE	// STATUS WORD OUTPUT DIS/CHARGING PHASE V
26014	SW_Batt_Charging_Step_V	Uint32	RO	2	0	-	BE	// STATUS WORD OUTPUT CHARGING STEP PHASE V
26016	SW_Batt_End_of_Charge_V	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUT END OF CHARGE PHASE V
26018	SW_Batt_End_of_Discharge_V	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUTEND OF DISCHARGING PHASE V
26020	SW_Batt_Cycling_V	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUT CYLCING ENABLED PHASE V
26022	SW_Batt_Charging_Discharging_W	Uint32	RO	2	0	-	BE	// STATUS WORD OUTPUT DIS/CHARGING PHASE W
26024	SW_Batt_Charging_Step_W	Uint32	RO	2	0	-	BE	// STATUS WORD OUTPUT CHARGING STEP PHASE W
26026	SW_Batt_End_of_Charge_W	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUT END OF CHARGE PHASE W
26028	SW_Batt_End_of_Discharge_W	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUTEND OF DISCHARGING PHASE W
26030	SW_Batt_Cycling_W	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUT CYLCING ENABLED PHASE W
26032	SW_Batt_Charging_Discharging_Global	Uint32	RO	2	0	-	BE	// STATUS WORD OUTPUT DIS/CHARGING PHASE GLOBAL
26034	SW_Batt_Charging_Step_Global	Uint32	RO	2	0	-	BE	// STATUS WORD OUTPUT CHARGING STEP PHASE GLOBAL
26036	SW_Batt_End_of_Charge_Global	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUT END OF CHARGE PHASE GLOBAL
26038	SW_Batt_End_of_Discharge_Global	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUTEND OF DISCHARGING PHASE GLOBAL
26040	SW_Batt_Cycling_Global	Uint32	RO	1	0	-	BE	// STATUS WORD OUTPUT CYLCING ENABLED PHASE GLOBAL
26042	Analog_Output_1_U	Uint32	RW	4	0		ALL	// ANALOG OUTPUT PARAMETER VALUE PHASE U.1
26044	Analog_Output_2_U	Uint32	RW	4	0		ALL	// ANALOG OUTPUT PARAMETER VALUE PHASE U.2
26046	Analog_Output_1_V	Uint32	RW	4	0		ALL	// ANALOG OUTPUT PARAMETER VALUE PHASE V.1
26048	Analog_Output_2_V	Uint32	RW	4	0		ALL	// ANALOG OUTPUT PARAMETER VALUE PHASE V.2
26050	Analog_Output_1_W	Uint32	RW	4	0		ALL	// ANALOG OUTPUT PARAMETER VALUE PHASE W.1
26052	Analog_Output_2_W	Uint32	RW	4	0		ALL	// ANALOG OUTPUT PARAMETER VALUE PHASE W.2
26054	Voltage_Realtime_Output_U	float32	RO	1	-3.4E+38	V	ALL	// REALTIME OUTPUT VOLTAGE PHASE U AT 100ms
26056	Voltage_Realtime_Output_V	float32	RO	3.4E+38	-3.4E+38	V	ALL	// REALTIME OUTPUT VOLTAGE PHASE V AT 100ms
26058	Voltage_Realtime_Output_W	float32	RO	3.4E+38	-3.4E+38	V	ALL	// REALTIME OUTPUT VOLTAGE PHASE W AT 100ms

26060	Voltage_Realtime_Slave	float32	RO	3.4E+38	-3.4E+38	V	ALL	// REALTIME OUTPUT VOLTAGE SLAVE IN SERIAL MODE
26062	Current_Realtime_OUT_U	float32	RO	3.4E+38	-3.4E+38	A	ALL	// REALTIME OUTPUT CURRENT PHASE U AT 100ms
26064	Current_Realtime_OUT_V	float32	RO	3.4E+38	-3.4E+38	A	ALL	// REALTIME OUTPUT CURRENT PHASE V AT 100ms
26066	Current_Realtime_OUT_W	float32	RO	3.4E+38	-3.4E+38	A	ALL	// REALTIME OUTPUT CURRENT PHASE W AT 100ms
26082	Voltage_Output_UV_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE OUTPUT OUTPUT PHASE U-V
26084	Voltage_Output_VW_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE OUTPUT OUTPUT PHASE V-W
26086	Voltage_Output_WU_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE OUTPUT OUTPUT PHASE W-U
26088	Voltage_Output_Intern_U	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE OUTPUT PHASE U-N (U-NEG) INTERNAL
26090	Voltage_Output_Intern_V	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE OUTPUT PHASE V-N (V-NEG) INTERNAL
26092	Voltage_Output_Intern_W	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE OUTPUT PHASE W-N (W-NEG) INTERNAL
26094	Voltage_Output_U_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE OUTPUT PHASE U-N (U-NEG)
26096	Voltage_Output_V_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE OUTPUT PHASE V-N (V-NEG)
26098	Voltage_Output_W_RMS	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE OUTPUT PHASE W-N (W-NEG)
26100	Current_Output_U_RMS	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT OUTPUT PHASE U
26102	Current_Output_V_RMS	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT OUTPUT PHASE V
26104	Current_Output_W_RMS	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT OUTPUT PHASE W
26106	Current_Output_Global	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT 3PHASE
26108	Current_Output_Capacitor_U_RMS	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT OUTPUT FILTER PHASE U
26110	Current_Output_Capacitor_V_RMS	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT OUTPUT FILTER PHASE V
26112	Current_Output_Capacitor_W_RMS	float32	RO	3.4E+38	-3.4E+38	A	ALL	// CURRENT OUTPUT FILTER PHASE W
26114	Power_Active_Output_U	float32	RO	3.4E+38	-3.4E+38	W	ALL	// ACTIVE POWER OUTPUT PHASE U
26116	Power_Active_Output_V	float32	RO	3.4E+38	-3.4E+38	W	ALL	// ACTIVE POWER OUTPUT PHASE V
26118	Power_Active_Output_W	float32	RO	3.4E+38	-3.4E+38	W	ALL	// ACTIVE POWER OUTPUT PHASE W
26120	Power_Active_Output_Total	float32	RO	3.4E+38	-3.4E+38	W	ALL	// ACTIVE POWER 3PHASE
26122	Power_Reactive_Output_U	float32	RO	3.4E+38	-3.4E+38	var	ALL	// REACTIVE POWER OUTPUT PHASE U
26124	Power_Reactive_Output_V	float32	RO	3.4E+38	-3.4E+38	var	ALL	// REACTIVE POWER OUTPUT PHASE V
26126	Power_Reactive_Output_W	float32	RO	3.4E+38	-3.4E+38	var	ALL	// REACTIVE POWER OUTPUT PHASE W
26128	Power_Reactive_Output_Total	float32	RO	3.4E+38	-3.4E+38	var	ALL	// REACTIVE POWER 3PHASE
26130	Power_Apparent_Output_U	float32	RO	3.4E+38	-3.4E+38	VA	ALL	// APPARENT POWER OUTPUT PHASE U
26132	Power_Apparent_Output_V	float32	RO	3.4E+38	-3.4E+38	VA	ALL	// APPARENT POWER OUTPUT PHASE V
26134	Power_Apparent_Output_W	float32	RO	3.4E+38	-3.4E+38	VA	ALL	// APPARENT POWER OUTPUT PHASE W
26136	Power_Apparent_Output_Total	float32	RO	3.4E+38	-3.4E+38	VA	ALL	// APPARENT POWER 3PHASE
26138	Frequency_Output_U	float32	RO	3.4E+38	-3.4E+38	Hz	ALL	// FREQUENCY OUTPUT PHASE U
26140	Frequency_Output_V	float32	RO	3.4E+38	-3.4E+38	Hz	ALL	// FREQUENCY OUTPUT PHASE V

26142	Frequency_Output_W	float32	RO	3.4E+38	-3.4E+38	Hz	ALL	// FREQUENCY OUTPUT PHASE W
26144	Phase_Angle_Output_U	float32	RO	3.4E+38	-3.4E+38	º	ALL	// REALTIME ANGLE PLL CIRCUIT PHASE U
26146	Phase_Angle_Output_V	float32	RO	3.4E+38	-3.4E+38	º	ALL	// REALTIME ANGLE PLL CIRCUIT PHASE V
26148	Phase_Angle_Output_W	float32	RO	3.4E+38	-3.4E+38	º	ALL	// REALTIME ANGLE PLL CIRCUIT PHASE W
26150	UV_desf_angle	float32	RO	3.4E+38	-3.4E+38	º	DELTA	// IN DELTA MODE PHASE SHIFT BETWEEN VOLTAGE U AND V
26152	VW_desf_angle	float32	RO	3.4E+38	-3.4E+38	º	DELTA	// IN DELTA MODE PHASE SHIFT BETWEEN VOLTAGE V AND W
26156	Bat_mesured_Ah_U	float32	RW	3.4E+38	-3.4E+38	Ah	BE/BT	// BATTERY MODE AND BATTERY EMULATION AH MESURED PHASE U
26158	Bat_mesured_Ah_V	float32	RW	3.4E+38	-3.4E+38	Ah	BE/BT	// BATTERY MODE AND BATTERY EMULATION AH MESURED PHASE V
26160	Bat_mesured_Ah_W	float32	RW	3.4E+38	-3.4E+38	Ah	BE/BT	// BATTERY MODE AND BATTERY EMULATION AH MESURED PHASE W
26162	Bat_mesured_Ah_Global	float32	RW	3.4E+38	-3.4E+38	Ah	BE/BT	// BATTERY MODE AND BATTERY EMULATION AH MESURED PHASE GLOBAL
26164	SOC_BE_U	float32	RW	100	0	%	BE/BT	// BATTERY EMULATION STATE OF CHARGE PHASE U
26166	SOC_BE_V	float32	RW	100	0	%	BE/BT	// BATTERY EMULATION STATE OF CHARGE PHASE V
26168	SOC_BE_W	float32	RW	100	0	%	BE/BT	// BATTERY EMULATION STATE OF CHARGE PHASE W
26170	SOC_BE_Global	float32	RW	100	0	%	BE/BT	// BATTERY EMULATION STATE OF CHARGE PHASE GLOBAL
26172	Analog_Input_Realtime_1	float32	RW	3.4E+38	-3.4E+38		ALL	// ANALOG INPUT REALTIME VALUE -1 TO 1 CHANNEL 1
26174	Analog_Input_Realtime_2	float32	RW	3.4E+38	-3.4E+38		ALL	// ANALOG INPUT REALTIME VALUE -1 TO 1 CHANNEL 2
26176	Analog_Input_Realtime_3	float32	RW	3.4E+38	-3.4E+38		ALL	// ANALOG INPUT REALTIME VALUE -1 TO 1 CHANNEL 3
26178	Analog_Input_Realtime_4	float32	RW	3.4E+38	-3.4E+38		ALL	// ANALOG INPUT REALTIME VALUE -1 TO 1 CHANNEL 4
26180	Analog_Input_Realtime_5	float32	RW	3.4E+38	-3.4E+38		ALL	// ANALOG INPUT REALTIME VALUE -1 TO 1 CHANNEL 5
26182	Analog_Input_Realtime_6	float32	RW	3.4E+38	-3.4E+38		ALL	// ANALOG INPUT REALTIME VALUE -1 TO 1 CHANNEL 6
26184	Vbus_menys	float32	RO	3.4E+38	-3.4E+38	V	ALL	// SEMI NEGATIVE VOLTAGE IN DC LINK
26186	Vbus_mes	float32	RO	3.4E+38	-3.4E+38	V	ALL	// SEMI POSITVE VOLTAGE IN DC LINK
26188	Vbus_Total	float32	RO	3.4E+38	-3.4E+38	V	ALL	// VOLTAGE IN DC LINK
27010	Frequency_Ramp_Output_U	float32	RW	500	0.000001	Hz/s	GE	// RAMP IN FREQUENCY SETPOINT PHASE U
27012	Frequency_Output_SP_U	float32	RW	1500	10	Hz	GE	// FREQUENCY OUTPUT SETPOINT PHASE U
27014	Grid_Output_Resistance_U	float32	RW	1	0	Ohm	GE	// GRID OUTPUT RESISTANCE LINE SETPOINT PHASE U
27016	Voltage_Ramp_AC_Output_U_SP	float32	RW	300	0.00001	V/ms	GE	// RAMP IN VOLTAGE SETPOINT PHASE U
27018	Voltage_Ramp_Phase_Angle_Output_U_SP	float32	RW	500	0.00001	deg/ms	GE	// RAMP IN PHASE ANGLE SETPOINT PHASE U
27020	Voltage_Fundamental_Phase_Angle_U_SP	float32	RW	360	-360	deg	GE	// PHASE ANGLE SETPOINT PHASE U
27022	Voltage_Fundamental_AC_U_SP	float32	RW	295	-295	V	GE	// VOLTAGE SETPOINT PHASE U
27024	Frequency_Ramp_Output_V	float32	RW	500	0.000001	Hz/s	GE	// RAMP IN FREQUENCY SETPOINT PHASE V
27026	Frequency_Output_SP_V	float32	RW	1500	10	Hz	GE	// FREQUENCY OUTPUT SETPOINT PHASE V

27028	Grid_Output_Resistance_V	float32	RW	1	0	Ohm	GE	// GRID OUTPUT RESISTANCE LINE SETPOINT PHASE V
27030	Voltage_Ramp_AC_Output_V_SP	float32	RW	300	0.00001	V/ms	GE	// RAMP IN VOLTAGE SETPOINT PHASE V
27032	Voltage_Ramp_Phase_Angle_Output_V_SP	float32	RW	500	0.00001	deg/ms	GE	// RAMP IN PHASE ANGLE SETPOINT PHASE V
27034	Voltage_Fundamental_Phase_Angle_V_SP	float32	RW	360	-360	deg	GE	// PHASE ANGLE SETPOINT PHASE V
27036	Voltage_Fundamental_AC_V_SP	float32	RW	295	-295	V	GE	// VOLTAGE SETPOINT PHASE V
27038	Frequency_Ramp_Output_W	float32	RW	500	0.000001	Hz/s	GE	// RAMP IN FREQUENCY SETPOINT PHASE W
27040	Frequency_Output_SP_W	float32	RW	1500	10	Hz	GE	// FREQUENCY OUTPUT SETPOINT PHASE W
27042	Grid_Output_Resistance_W	float32	RW	1	0	Ohm	GE	// GRID OUTPUT RESISTANCE LINE SETPOINT PHASE W
27044	Voltage_Ramp_AC_Output_W_SP	float32	RW	300	0.00001	V/ms	GE	// RAMP IN VOLTAGE SETPOINT PHASE W
27046	Voltage_Ramp_Phase_Angle_Output_W_SP	float32	RW	500	0.00001	deg/ms	GE	// RAMP IN PHASE ANGLE SETPOINT PHASE W
27048	Voltage_Fundamental_Phase_Angle_W_SP	float32	RW	360	-360	deg	GE	// PHASE ANGLE SETPOINT PHASE W
27050	Voltage_Fundamental_AC_W_SP	float32	RW	295	-295	V	GE	// VOLTAGE SETPOINT PHASE W
27052	Frequency_Ramp_Output_Global	float32	RW	500	0.000001	Hz/s	GE	// RAMP IN FREQUENCY SETPOINT PHASE GLOBAL
27054	Frequency_Output_SP_Global	float32	RW	1500	10	Hz	GE	// FREQUENCY OUTPUT SETPOINT PHASE GLOBAL
27056	Grid_Output_Resistance_Global	float32	RW	1	0	Ohm	GE	// GRID OUTPUT RESISTANCE LINE SETPOINT PHASE GLOBAL
27058	Voltage_Ramp_AC_Output_Global_SP	float32	RW	300	0.00001	V/ms	GE	// RAMP IN VOLTAGE SETPOINT PHASE GLOBAL
27060	Voltage_Ramp_Phase_Angle_Output_Global_SP	float32	RW	500	0.00001	deg/ms	GE	// RAMP IN PHASE ANGLE SETPOINT PHASE GLOBAL
27062	Voltage_Fundamental_Phase_Angle_Global_SP	float32	RW	360	-360	deg	GE	// PHASE ANGLE SETPOINT PHASE GLOBAL
27064	Voltage_Fundamental_AC_Global_SP	float32	RW	295	-295	V	GE	// VOLTAGE SETPOINT PHASE GLOBAL
27066	Current_Ramp_AC_Output_U_SP	float32	RW	500	0.000001	A/ms	EL	// RAMP IN CURRENT SETPOINT PHASE U
27068	Current_Ramp_Phase_Angle_Output_U_SP	float32	RW	500	0.00001	deg/ms	EL	// RAMP IN PHASE ANGLE SETPOINT PHASE U
27070	Current_Fundamental_Phase_Angle_U_SP	float32	RW	90	-90	deg	EL	// PHASE ANGLE SETPOINT PHASE U
27072	Current_Fundamental_AC_U_SP	float32	RW	464	-464	A	EL	// CURRENT SETPOINT PHASE U
27074	Current_Ramp_AC_Output_V_SP	float32	RW	500	0.000001	A/ms	EL	// RAMP IN CURRENT SETPOINT PHASE V
27076	Current_Ramp_Phase_Angle_Output_V_SP	float32	RW	500	0.00001	deg/ms	EL	// RAMP IN PHASE ANGLE SETPOINT PHASE V
27078	Current_Fundamental_Phase_Angle_V_SP	float32	RW	90	-90	deg	EL	// PHASE ANGLE SETPOINT PHASE V
27080	Current_Fundamental_AC_V_SP	float32	RW	464	-464	A	EL	// CURRENT SETPOINT PHASE V
27082	Current_Ramp_AC_Output_W_SP	float32	RW	500	0.000001	A/ms	EL	// RAMP IN CURRENT SETPOINT PHASE W
27084	Current_Ramp_Phase_Angle_Output_W_SP	float32	RW	500	0.00001	deg/ms	EL	// RAMP IN PHASE ANGLE SETPOINT PHASE W
27086	Current_Fundamental_Phase_Angle_W_SP	float32	RW	90	-90	deg	EL	// PHASE ANGLE SETPOINT PHASE W
27088	Current_Fundamental_AC_W_SP	float32	RW	464	-464	A	EL	// CURRENT SETPOINT PHASE W
27090	Amplitude_Ramp_AC_Harm_U_SP	float32	RW	300	0.00001	deg/ms	GE/EL	// AMPLITUDE HARMONIC SETPOINT AC RAMP IN PU PHASE U
27092	PU_Amplitude_H2_AC_U_SP	float32	RW	1	-1	-	GE/EL	// % H2 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27094	PU_Amplitude_H3_AC_U_SP	float32	RW	1	-1	-	GE/EL	// % H3 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT

27096	PU_Amplitude_H4_AC_U_SP	float32	RW	1	-1	-	GE/EL	// % H4 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27098	PU_Amplitude_H5_AC_U_SP	float32	RW	1	-1	-	GE/EL	// % H5 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27100	PU_Amplitude_H6_AC_U_SP	float32	RW	1	-1	-	GE/EL	// % H6 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27102	PU_Amplitude_H7_AC_U_SP	float32	RW	1	-1	-	GE/EL	// % H7 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27104	PU_Amplitude_H8_AC_U_SP	float32	RW	1	-1	-	GE/EL	// % H8 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27106	PU_Amplitude_H9_AC_U_SP	float32	RW	1	-1	-	GE/EL	// % H9 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27108	PU_Amplitude_H10_AC_U_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H10 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27110	PU_Amplitude_H11_AC_U_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H11 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27112	PU_Amplitude_H12_AC_U_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H12 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27114	PU_Amplitude_H13_AC_U_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H13 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27116	PU_Amplitude_H14_AC_U_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H14 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27118	PU_Amplitude_H15_AC_U_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H15 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27120	PU_Amplitude_H16_AC_U_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H16 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27122	PU_Amplitude_H17_AC_U_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H17 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27124	PU_Amplitude_H18_AC_U_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H18 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27126	PU_Amplitude_H19_AC_U_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H19 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27128	PU_Amplitude_H20_AC_U_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H20 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27130	PU_Amplitude_H21_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H21 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27132	PU_Amplitude_H22_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H22 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27134	PU_Amplitude_H23_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H23 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27136	PU_Amplitude_H24_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H24 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27138	PU_Amplitude_H25_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H25 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27140	PU_Amplitude_H26_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H26 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT

27142	PU_Amplitude_H27_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H27 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27144	PU_Amplitude_H28_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H28 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27146	PU_Amplitude_H29_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H29 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27148	PU_Amplitude_H30_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H30 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27150	PU_Amplitude_H31_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H31 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27152	PU_Amplitude_H32_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H32 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27154	PU_Amplitude_H33_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H33 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27156	PU_Amplitude_H34_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H34 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27158	PU_Amplitude_H35_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H35 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27160	PU_Amplitude_H36_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H36 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27162	PU_Amplitude_H37_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H37 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27164	PU_Amplitude_H38_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H38 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27166	PU_Amplitude_H39_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H39 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27168	PU_Amplitude_H40_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H40 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27170	PU_Amplitude_H41_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H41 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27172	PU_Amplitude_H42_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H42 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27174	PU_Amplitude_H43_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H43 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27176	PU_Amplitude_H44_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H44 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27178	PU_Amplitude_H45_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H45 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27180	PU_Amplitude_H46_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H46 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT

27182	PU_Amplitude_H47_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H47 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27184	PU_Amplitude_H48_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H48 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27186	PU_Amplitude_H49_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H49 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27188	PU_Amplitude_H50_AC_U_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H50 VALUE SETPOINT PHASE U IN VOLTAGE AND CURRENT
27190	Amplitude_Ramp_AC_Harm_V_SP	float32	RW	300	0.00001	deg/ms	GE/EL	// AMPLITUDE HARMONIC SETPOINT AC RAMP IN PU PHASE V
27192	PU_Amplitude_H2_AC_V_SP	float32	RW	1	-1	-	GE/EL	// % H2 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27194	PU_Amplitude_H3_AC_V_SP	float32	RW	1	-1	-	GE/EL	// % H3 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27196	PU_Amplitude_H4_AC_V_SP	float32	RW	1	-1	-	GE/EL	// % H4 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27198	PU_Amplitude_H5_AC_V_SP	float32	RW	1	-1	-	GE/EL	// % H5 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27200	PU_Amplitude_H6_AC_V_SP	float32	RW	1	-1	-	GE/EL	// % H6 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27202	PU_Amplitude_H7_AC_V_SP	float32	RW	1	-1	-	GE/EL	// % H7 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27204	PU_Amplitude_H8_AC_V_SP	float32	RW	1	-1	-	GE/EL	// % H8 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27206	PU_Amplitude_H9_AC_V_SP	float32	RW	1	-1	-	GE/EL	// % H9 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27208	PU_Amplitude_H10_AC_V_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H10 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27210	PU_Amplitude_H11_AC_V_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H11 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27212	PU_Amplitude_H12_AC_V_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H12 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27214	PU_Amplitude_H13_AC_V_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H13 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27216	PU_Amplitude_H14_AC_V_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H14 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27218	PU_Amplitude_H15_AC_V_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H15 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27220	PU_Amplitude_H16_AC_V_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H16 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27222	PU_Amplitude_H17_AC_V_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H17 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27224	PU_Amplitude_H18_AC_V_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H18 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27226	PU_Amplitude_H19_AC_V_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H19 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27228	PU_Amplitude_H20_AC_V_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H20 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27230	PU_Amplitude_H21_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H21 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT

27232	PU_Amplitude_H22_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H22 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27234	PU_Amplitude_H23_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H23 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27236	PU_Amplitude_H24_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H24 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27238	PU_Amplitude_H25_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H25 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27240	PU_Amplitude_H26_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H26 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27242	PU_Amplitude_H27_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H27 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27244	PU_Amplitude_H28_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H28 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27246	PU_Amplitude_H29_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H29 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27248	PU_Amplitude_H30_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H30 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27250	PU_Amplitude_H31_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H31 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27252	PU_Amplitude_H32_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H32 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27254	PU_Amplitude_H33_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H33 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27256	PU_Amplitude_H34_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H34 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27258	PU_Amplitude_H35_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H35 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27260	PU_Amplitude_H36_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H36 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27262	PU_Amplitude_H37_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H37 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27264	PU_Amplitude_H38_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H38 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27266	PU_Amplitude_H39_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H39 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27268	PU_Amplitude_H40_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H40 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27270	PU_Amplitude_H41_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H41 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT

27272	PU_Amplitude_H42_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H42 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27274	PU_Amplitude_H43_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H43 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27276	PU_Amplitude_H44_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H44 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27278	PU_Amplitude_H45_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H45 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27280	PU_Amplitude_H46_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H46 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27282	PU_Amplitude_H47_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H47 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27284	PU_Amplitude_H48_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H48 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27286	PU_Amplitude_H49_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H49 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27288	PU_Amplitude_H50_AC_V_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H50 VALUE SETPOINT PHASE V IN VOLTAGE AND CURRENT
27290	Amplitude_Ramp_AC_Harm_W_SP	float32	RW	300	0.00001	deg/ms	GE/EL	// AMPLITUDE HARMONIC SETPOINT AC RAMP IN PU PHASE W
27292	PU_Amplitude_H2_AC_W_SP	float32	RW	1	-1	-	GE/EL	// % H2 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27294	PU_Amplitude_H3_AC_W_SP	float32	RW	1	-1	-	GE/EL	// % H3 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27296	PU_Amplitude_H4_AC_W_SP	float32	RW	1	-1	-	GE/EL	// % H4 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27298	PU_Amplitude_H5_AC_W_SP	float32	RW	1	-1	-	GE/EL	// % H5 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27300	PU_Amplitude_H6_AC_W_SP	float32	RW	1	-1	-	GE/EL	// % H6 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27302	PU_Amplitude_H7_AC_W_SP	float32	RW	1	-1	-	GE/EL	// % H7 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27304	PU_Amplitude_H8_AC_W_SP	float32	RW	1	-1	-	GE/EL	// % H8 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27306	PU_Amplitude_H9_AC_W_SP	float32	RW	1	-1	-	GE/EL	// % H9 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27308	PU_Amplitude_H10_AC_W_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H10 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27310	PU_Amplitude_H11_AC_W_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H11 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27312	PU_Amplitude_H12_AC_W_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H12 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT

27314	PU_Amplitude_H13_AC_W_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H13 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27316	PU_Amplitude_H14_AC_W_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H14 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27318	PU_Amplitude_H15_AC_W_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H15 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27320	PU_Amplitude_H16_AC_W_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H16 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27322	PU_Amplitude_H17_AC_W_SP	float32	RW	0.5	-0.5	-	GE/EL	// % H17 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27324	PU_Amplitude_H18_AC_W_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H18 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27326	PU_Amplitude_H19_AC_W_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H19 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27328	PU_Amplitude_H20_AC_W_SP	float32	RW	0.2	-0.2	-	GE/EL	// % H20 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27330	PU_Amplitude_H21_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H21 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27332	PU_Amplitude_H22_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H22 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27334	PU_Amplitude_H23_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H23 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27336	PU_Amplitude_H24_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H24 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27338	PU_Amplitude_H25_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H25 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27340	PU_Amplitude_H26_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H26 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27342	PU_Amplitude_H27_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H27 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27344	PU_Amplitude_H28_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H28 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27346	PU_Amplitude_H29_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H29 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27348	PU_Amplitude_H30_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H30 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27350	PU_Amplitude_H31_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H31 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27352	PU_Amplitude_H32_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H32 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT

27354	PU_Amplitude_H33_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H33 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27356	PU_Amplitude_H34_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H34 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27358	PU_Amplitude_H35_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H35 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27360	PU_Amplitude_H36_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H36 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27362	PU_Amplitude_H37_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H37 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27364	PU_Amplitude_H38_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H38 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27366	PU_Amplitude_H39_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H39 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27368	PU_Amplitude_H40_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H40 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27370	PU_Amplitude_H41_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H41 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27372	PU_Amplitude_H42_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H42 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27374	PU_Amplitude_H43_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H43 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27376	PU_Amplitude_H44_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H44 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27378	PU_Amplitude_H45_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H45 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27380	PU_Amplitude_H46_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H46 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27382	PU_Amplitude_H47_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H47 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27384	PU_Amplitude_H48_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H48 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27386	PU_Amplitude_H49_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H49 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27388	PU_Amplitude_H50_AC_W_SP	float32	RW	0.1	-0.1	-	GE/EL	// % H50 VALUE SETPOINT PHASE W IN VOLTAGE AND CURRENT
27390	Index_Ramp_AC_Harm_U_SP	float32	RW	100	0.000001	deg/ms	GE/EL	// INDEX VALUE HARMONIC SETPOINT RAMP PHASE U
27392	Index_H2_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H2 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27394	Index_H3_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H3 SETPOINT PHASE U IN VOLTAGE AND CURRENT

27396	Index_H4_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H4 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27398	Index_H5_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H5 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27400	Index_H6_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H6 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27402	Index_H7_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H7 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27404	Index_H8_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H8 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27406	Index_H9_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H9 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27408	Index_H10_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H10 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27410	Index_H11_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H11 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27412	Index_H12_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H12 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27414	Index_H13_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H13 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27416	Index_H14_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H14 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27418	Index_H15_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H15 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27420	Index_H16_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H16 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27422	Index_H17_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H17 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27424	Index_H18_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H18 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27426	Index_H19_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H19 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27428	Index_H20_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H20 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27430	Index_H21_AC_U_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H21 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27432	Index_Ramp_AC_Harm_V_SP	float32	RW	100	0.000001	deg/ms	GE/EL	// INDEX VALUE HARMONIC SETPOINT RAMP PHASE V
27434	Index_H2_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H2 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27436	Index_H3_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H3 SETPOINT PHASE V IN VOLTAGE AND CURRENT

27438	Index_H4_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H4 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27440	Index_H5_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H5 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27442	Index_H6_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H6 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27444	Index_H7_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H7 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27446	Index_H8_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H8 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27448	Index_H9_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H9 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27450	Index_H10_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H10 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27452	Index_H11_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H11 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27454	Index_H12_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H12 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27456	Index_H13_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H13 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27458	Index_H14_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H14 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27460	Index_H15_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H15 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27462	Index_H16_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H16 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27464	Index_H17_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H17 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27466	Index_H18_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H18 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27468	Index_H19_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H19 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27470	Index_H20_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H20 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27472	Index_H21_AC_V_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H21 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27474	Index_Ramp_AC_Harm_W_SP	float32	RW	100	0.000001	deg/ms	GE/EL	// INDEX VALUE HARMONIC SETPOINT RAMP PHASE W
27476	Index_H2_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H2 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27478	Index_H3_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H3 SETPOINT PHASE W IN VOLTAGE AND CURRENT

27480	Index_H4_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H4 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27482	Index_H5_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H5 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27484	Index_H6_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H6 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27486	Index_H7_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H7 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27488	Index_H8_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H8 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27490	Index_H9_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H9 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27492	Index_H10_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H10 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27494	Index_H11_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H11 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27496	Index_H12_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H12 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27498	Index_H13_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H13 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27500	Index_H14_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H14 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27502	Index_H15_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H15 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27504	Index_H16_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H16 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27506	Index_H17_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H17 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27508	Index_H18_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H18 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27510	Index_H19_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H19 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27512	Index_H20_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H20 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27514	Index_H21_AC_W_SP	float32	RW	50	0.1	-	GE/EL	// INDEX VALUE H21 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27516	Phase_Ramp_Angle_U_SP	float32	RW	500	0.000001	deg/ms	GE/EL	// PHASE ANGLE VALUE HARMONIC SETPOINT RAMP PHASE U
27518	Phase_angle_H2_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H2 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27520	Phase_angle_H3_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H3 SETPOINT PHASE U IN VOLTAGE AND CURRENT

27522	Phase_angle_H4_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H4 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27524	Phase_angle_H5_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H5 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27526	Phase_angle_H6_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H6 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27528	Phase_angle_H7_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H7 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27530	Phase_angle_H8_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H8 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27532	Phase_angle_H9_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H9 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27534	Phase_angle_H10_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H10 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27536	Phase_angle_H11_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H11 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27538	Phase_angle_H12_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H12 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27540	Phase_angle_H13_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H13 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27542	Phase_angle_H14_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H14 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27544	Phase_angle_H15_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H15 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27546	Phase_angle_H16_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H16 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27548	Phase_angle_H17_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H17 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27550	Phase_angle_H18_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H18 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27552	Phase_angle_H19_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H19 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27554	Phase_angle_H20_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H20 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27556	Phase_angle_H21_AC_U_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H21 SETPOINT PHASE U IN VOLTAGE AND CURRENT
27558	Phase_Ramp_Angle_V_SP	float32	RW	500	0.000001	deg/ms	GE/EL	// PHASE ANGLE VALUE HARMONIC SETPOINT RAMP PHASE V
27560	Phase_angle_H2_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H2 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27562	Phase_angle_H3_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H3 SETPOINT PHASE V IN VOLTAGE AND CURRENT

27564	Phase_angle_H4_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H4 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27566	Phase_angle_H5_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H5 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27568	Phase_angle_H6_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H6 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27570	Phase_angle_H7_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H7 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27572	Phase_angle_H8_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H8 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27574	Phase_angle_H9_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H9 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27576	Phase_angle_H10_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H10 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27578	Phase_angle_H11_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H11 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27580	Phase_angle_H12_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H12 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27582	Phase_angle_H13_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H13 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27584	Phase_angle_H14_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H14 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27586	Phase_angle_H15_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H15 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27588	Phase_angle_H16_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H16 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27590	Phase_angle_H17_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H17 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27592	Phase_angle_H18_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H18 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27594	Phase_angle_H19_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H19 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27596	Phase_angle_H20_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H20 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27598	Phase_angle_H21_AC_V_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H21 SETPOINT PHASE V IN VOLTAGE AND CURRENT
27600	Phase_Ramp_Angle_W_SP	float32	RW	500	0.000001	deg/ms	GE/EL	// PHASE ANGLE VALUE HARMONIC SETPOINT RAMP PHASE W
27602	Phase_angle_H2_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H2 SETPOINT PHASE W IN VOLTAGE AND CURRENT

27604	Phase_angle_H3_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H3 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27606	Phase_angle_H4_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H4 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27608	Phase_angle_H5_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H5 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27610	Phase_angle_H6_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H6 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27612	Phase_angle_H7_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H7 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27614	Phase_angle_H8_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H8 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27616	Phase_angle_H9_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H9 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27618	Phase_angle_H10_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H10 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27620	Phase_angle_H11_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H11 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27622	Phase_angle_H12_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H12 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27624	Phase_angle_H13_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H13 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27626	Phase_angle_H14_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H14 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27628	Phase_angle_H15_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H15 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27630	Phase_angle_H16_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H16 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27632	Phase_angle_H17_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H17 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27634	Phase_angle_H18_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H18 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27636	Phase_angle_H19_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H19 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27638	Phase_angle_H20_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H20 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27640	Phase_angle_H21_AC_W_SP	float32	RW	360	-360	-	GE/EL	// PHASE ANGLE VALUE H21 SETPOINT PHASE W IN VOLTAGE AND CURRENT
27642	Voltage_Output_DC_Resistance_U_Pos	float32	RW	1	0	Ohm	B2C	// SERIE RESISTANCE OUTPUT U POSITIVE CURRENT
27644	Voltage_Output_DC_Resistance_V_Pos	float32	RW	1	0	Ohm	B2C	// SERIE RESISTANCE OUTPUT V POSITIVE CURRENT
27646	Voltage_Output_DC_Resistance_W_Pos	float32	RW	1	0	Ohm	B2C	// SERIE RESISTANCE OUTPUT W POSITIVE CURRENT
27648	Voltage_Output_DC_Resistance_Global_Pos	float32	RW	1	0	Ohm	B2C	// SERIE RESISTANCE OUTPUT GLOBAL POSITIVE CURRENT

27650	Voltage_Output_DC_Resistance_U_Neg	float32	RW	1	0	Ohm	B2C	// SERIE RESISTANCE OUTPUT U NEGATIVE CURRENT
27652	Voltage_Output_DC_Resistance_V_Neg	float32	RW	1	0	Ohm	B2C	// SERIE RESISTANCE OUTPUT V NEGATIVE CURRENT
27654	Voltage_Output_DC_Resistance_W_Neg	float32	RW	1	0	Ohm	B2C	// SERIE RESISTANCE OUTPUT W NEGATIVE CURRENT
27656	Voltage_Output_DC_Resistance_Global_Neg	float32	RW	1	0	Ohm	B2C	// SERIE RESISTANCE OUTPUT GLOBAL NEGATIVE CURRENT
27658	Ramp_Voltage_DC	float32	RW	1000	0.000001	V/ms	B2C	// RAMP IN VOLTAGE SETPOINT IN DC
27660	Magnitude_Voltage_DC_U_SP	float32	RW	1600	0	V	B2C	// VOLTAGE SETPOINT OUTPUT U IN DC
27662	Magnitude_Voltage_DC_V_SP	float32	RW	1600	0	V	B2C	// VOLTAGE SETPOINT OUTPUT V IN DC
27664	Magnitude_Voltage_DC_W_SP	float32	RW	1600	0	V	B2C	// VOLTAGE SETPOINT OUTPUT W IN DC
27666	Magnitude_Voltage_DC_Global_SP	float32	RW	1600	0	V	B2C	// VOLTAGE SETPOINT OUTPUT GLOBAL IN DC
27668	Magnitude_Voltage_Bipolar_DC_U_SP	float32	RW	380	-380	V	B2C	// VOLTAGE SETPOINT OUTPUT BIPOLAR MODE U IN DC
27670	Magnitude_Voltage_Bipolar_DC_W_SP	float32	RW	380	-380	V	B2C	// VOLTAGE SETPOINT OUTPUT BIPOLAR MODE W IN DC
27672	Magnitude_Voltage_Serial_Slave	float32	RW	800	0	V	B2C	// VOLTAGE SETPOINT OTUPUT SLAVE IN SERIAL MODE 3CHANNELS
27674	Ramp_Current_DC	float32	RW	1000	0.000001	A/ms	B2C	// RAMP IN CURRENT SETPOINT IN DC
27676	Magnitude_Current_DC_U_SP	float32	RW	3.4E+38	-3.4E+38	A	B2C	// CURRENT SETPOINT OUTPUT U IN DC
27678	Magnitude_Current_DC_V_SP	float32	RW	3.4E+38	-3.4E+38	A	B2C	// CURRENT SETPOINT OUTPUT V IN DC
27680	Magnitude_Current_DC_W_SP	float32	RW	3.4E+38	-3.4E+38	A	B2C	// CURRENT SETPOINT OUTPUT W IN DC
27682	Magnitude_Current_DC_Global_SP	float32	RW	3.4E+38	-3.4E+38	A	B2C	// CURRENT SETPOINT OUTPUT GLOBAL IN DC
27684	Magnitude_Current_Bipolar_DC_U_SP	float32	RW	3.4E+38	-3.4E+38	A	B2C	// CURRENT SETPOINT OUTPUT BIPOLAR MODE U IN DC
27686	Magnitude_Current_Bipolar_DC_W_SP	float32	RW	3.4E+38	-3.4E+38	A	B2C	// CURRENT SETPOINT OUTPUT BIPOLAR MODE W IN DC
27688	Ramp_Power_DC	float32	RW	10000	0.000001	W/ms	B2C	// RAMP IN POWER SETPOINT IN DC
27690	Magnitude_Power_DC_U_SP	float32	RW	3.4E+38	-3.4E+38	W	B2C	// POWER SETPOINT OUTPUT U IN DC
27692	Magnitude_Power_DC_V_SP	float32	RW	3.4E+38	-3.4E+38	W	B2C	// POWER SETPOINT OUTPUT V IN DC
27694	Magnitude_Power_DC_W_SP	float32	RW	3.4E+38	-3.4E+38	W	B2C	// POWER SETPOINT OUTPUT W IN DC
27696	Magnitude_Power_DC_Global_SP	float32	RW	3.4E+38	-3.4E+38	W	B2C	// POWER SETPOINT OUTPUT GLOBAL IN DC
27698	Magnitude_Power_Bipolar_DC_U_SP	float32	RW	3.4E+38	-3.4E+38	W	B2C	// POWER SETPOINT OUTPUT BIPOLAR MODE U IN DC
27700	Magnitude_Power_Bipolar_DC_W_SP	float32	RW	3.4E+38	-3.4E+38	W	B2C	// POWER SETPOINT OUTPUT BIPOLAR MODE W IN DC
27702	Ramp_Resistance_DC	float32	RW	1000	0.000001	Ohm/ms	B2C	// RAMP IN RESISTANCE OUTPUT SETPOINT IN DC
27704	Magnitude_Resistance_DC_U_SP	float32	RW	1000	0	Ohm	B2C	// RESISTANCE OUTPUT SETPOINT OUTPUT U IN DC
27706	Magnitude_Resistance_DC_V_SP	float32	RW	1000	0	Ohm	B2C	// RESISTANCE OUTPUT SETPOINT OUTPUT V IN DC
27708	Magnitude_Resistance_DC_W_SP	float32	RW	1000	0	Ohm	B2C	// RESISTANCE OUTPUT SETPOINT OUTPUT W IN DC
27710	Magnitude_Resistance_DC_Global_SP	float32	RW	1000	0	Ohm	B2C	// RESISTANCE OUTPUT SETPOINT OUTPUT GLOBAL IN DC
27712	Magnitude_Resistance_Bipolar_DC_U_SP	float32	RW	1000	0	Ohm	B2C	// RESISTANCE OUTPUT SETPOINT OUTPUT BIPOLAR MODE U IN DC

27714	Magnitude_Resistance_Bipolar_DC_W_SP	float32	RW	1000	0	Ohm	B2C	// RESISTANCE OUTPUT SETPOINT OUTPUT BIPOLAR MODE W IN DC
27716	Ramp_Power_AC	float32	RW	1000	0.000001	W/ms	EL	// POWER SETPOINT RAMP IN AC MODE IN W/ms
27718	Magnitude_Power_Reactive_AC_U_SP	float32	RW	3.4E+38	-3.4E+38	VAr	EL	// POWER REACTIVE OUTPUT SETPOINT PHASE U IN AC
27720	Magnitude_Power_Reactive_AC_V_SP	float32	RW	3.4E+38	-3.4E+38	VAr	EL	// POWER REACTIVE OUTPUT SETPOINT PHASE V IN AC
27722	Magnitude_Power_Reactive_AC_W_SP	float32	RW	3.4E+38	-3.4E+38	VAr	EL	// POWER REACTIVE OUTPUT SETPOINT PHASE W IN AC
27724	Magnitude_Power_Active_AC_U_SP	float32	RW	3.4E+38	-3.4E+38	W	EL	// POWER ACTIVE OUTPUT SETPOINT PHASE U IN AC
27726	Magnitude_Power_Active_AC_V_SP	float32	RW	3.4E+38	-3.4E+38	W	EL	// POWER ACTIVE OUTPUT SETPOINT PHASE V IN AC
27728	Magnitude_Power_Active_AC_W_SP	float32	RW	3.4E+38	-3.4E+38	W	EL	// POWER ACTIVE OUTPUT SETPOINT PHASE W IN AC
27730	Ramp_Impedance_AC	float32	RW	1000	0.000001	Ohm/ms	EL	// IMPEDANCE SETPOINT RAMP IN AC MODE IN PU
27732	Impedance_AC_Cutoff_freq_LPF	float32	RW	10000	10	uF	EL	// CUTOFF LOW PASS FILTER IN AC REAL TIME IMPEDANCE MODE
27734	Magnitude_Capacitance_AC_U_SP	float32	RW	10000	1	uF	EL	// CAPACITANCE OUTPUT SETPOINT PHASE U IN AC
27736	Magnitude_Capacitance_AC_V_SP	float32	RW	10000	1	uF	EL	// CAPACITANCE OUTPUT SETPOINT PHASE V IN AC
27738	Magnitude_Capacitance_AC_W_SP	float32	RW	10000	1	uF	EL	// CAPACITANCE OUTPUT SETPOINT PHASE W IN AC
27740	Magnitude_Inductance_AC_U_SP	float32	RW	2000	0.1	mH	EL	// INDUCTANCE OUTPUT SETPOINT PHASE U IN AC
27742	Magnitude_Inductance_AC_V_SP	float32	RW	2000	0.1	mH	EL	// INDUCTANCE OUTPUT SETPOINT PHASE V IN AC
27744	Magnitude_Inductance_AC_W_SP	float32	RW	2000	0.1	mH	EL	// INDUCTANCE OUTPUT SETPOINT PHASE W IN AC
27746	Magnitude_Resistance_AC_U_SP	float32	RW	10000	0.1	Ohm	EL	// RESISTANCE OUTPUT SETPOINT PHASE U IN AC (see impendace circuit)
27748	Magnitude_Resistance_AC_V_SP	float32	RW	10000	0.1	Ohm	EL	// RESISTANCE OUTPUT SETPOINT PHASE V IN AC (see impendace circuit)
27750	Magnitude_Resistance_AC_W_SP	float32	RW	10000	0.1	Ohm	EL	// RESISTANCE OUTPUT SETPOINT PHASE W IN AC (see impendace circuit)
27752	Magnitude_Resistance_2_AC_U_SP	float32	RW	10000	0.1	Ohm	EL	// RESISTANCE 2 OUTPUT SETPOINT PHASE U IN AC (see impendace circuit)
27754	Magnitude_Resistance_2_AC_V_SP	float32	RW	10000	0.1	Ohm	EL	// RESISTANCE 2 OUTPUT SETPOINT PHASE V IN AC (see impendace circuit)
27756	Magnitude_Resistance_2_AC_W_SP	float32	RW	10000	0.1	Ohm	EL	// RESISTANCE 2 OUTPUT SETPOINT PHASE W IN AC (see impendace circuit)
27758	Magnitude_Resistance_3_AC_U_SP	float32	RW	10000	0.1	Ohm	EL	// RESISTANCE 3 OUTPUT SETPOINT PHASE U IN AC (see impendace circuit)
27760	Magnitude_Resistance_3_AC_V_SP	float32	RW	10000	0.1	Ohm	EL	// RESISTANCE 3 OUTPUT SETPOINT PHASE V IN AC (see impendace circuit)
27762	Magnitude_Resistance_3_AC_W_SP	float32	RW	10000	0.1	Ohm	EL	// RESISTANCE 3 OUTPUT SETPOINT PHASE W IN AC (see impendace circuit)
27764	CW_Battery_Charger_U	Uint32	RW	4294967296	0	-	BT	// CONTROL WORD BATTERY MODE DIS/CHARGE OUTPUT U
27766	CW_Battery_Cycling_U	Uint32	RW	4294967296	0	-	BT	// CONTROL WORD BATTERY MODE CYCLING OUTPUT U
27768	CW_Battery_Charger_V	Uint32	RW	4294967296	0	-	BT	// CONTROL WORD BATTERY MODE DIS/CHARGE OUTPUT V

27770	CW_Battery_Cycling_V	Uint32	RW	4294967296	0	-	BT	// CONTROL WORD BATTERY MODE CYCLING OUTPUT V
27772	CW_Battery_Charger_W	Uint32	RW	4294967296	0	-	BT	// CONTROL WORD BATTERY MODE DIS/CHARGE OUTPUT W
27774	CW_Battery_Cycling_W	Uint32	RW	4294967296	0	-	BT	// CONTROL WORD BATTERY MODE CYCLING OUTPUT W
27776	CW_Battery_Charger_Global	Uint32	RW	4294967296	0	-	BT	// CONTROL WORD BATTERY MODE DIS/CHARGE OUTPUT GLOBAL
27778	CW_Battery_Cycling_Global	Uint32	RW	4294967296	0	-	BT	// CONTROL WORD BATTERY MODE CYCLING OUTPUT GLOBAL
27780	Boost_Voltage_Battery_U	float32	RW	3.4E+38	20	V	BT	// BATTER Y MODE BOOST VOLTAGE SETPOINT OUTPUT U
27782	Floating_Voltage_Battery_U	float32	RW	3.4E+38	20	V	BT	// BATTER Y MODE FLOATING VOLTAGE SETPOINT OUTPUT U
27784	Charging_Current_Battery_U	float32	RW	3.4E+38	0	A	BT	// BATTER Y MODE CHARGING CURRENT SETPOINT OUTPUT U
27786	Transition_Current_Boost2Floating_Battery_U	float32	RW	3.4E+38	0	A	BT	// BATTER Y MODE CHARGE2FLOAT SETPOINT OUTPUT U
27788	Time_Boost_Battery_U	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TIME IN BOOST SETPOINT OUTPUT U
27790	Time_Floating_Battery_U	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TIME IN FLOAT SETPOINT OUTPUT U
27792	Time_Transition_Battery_U	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TRANSITION TIME SETPOINT OUTPUT U
27794	Time_Discharge_Battery_U	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED DISCHARGING TIME SETPOINT OUTPUT U
27796	Max_Number_Cycle_Battery_U	float32	RW	3.4E+38	0	-	BT	// BATTERY MODE ADVANCED NUMBER CYCLES SETPOINT OUTPUT U
27798	Ah_Stop_Charge_Battery_U	float32	RW	3.4E+38	0	Ah	BT	// BATTERY MODE ADVANCED AH CHARGE SETPOINT OUTPUT U
27800	Ah_Stop_Discharge_Battery_U	float32	RW	0	-3.4E+38	Ah	BT	// BATTERY MODE ADVANCED AH DISCHARGE SETPOINT OUTPUT U
27802	Discharge_Current_Battery_U	float32	RW	0	-3.4E+38	A	BT	// BATTER Y MODE DISCHARGING CURRENT SETPOINT OUTPUT U
27804	Discharge_Voltage_Battery_U	float32	RW	3.4E+38	0	V	BT	// BATTER Y MODE DISCHARGE VOLTAGE SETPOINT OUTPUT U
27806	Boost_Voltage_Battery_V	float32	RW	3.4E+38	20	V	BT	// BATTER Y MODE BOOST VOLTAGE SETPOINT OUTPUT V
27808	Floating_Voltage_Battery_V	float32	RW	3.4E+38	20	V	BT	// BATTER Y MODE FLOATING VOLTAGE SETPOINT OUTPUT V
27810	Charging_Current_Battery_V	float32	RW	3.4E+38	0	A	BT	// BATTER Y MODE CHARGING CURRENT SETPOINT OUTPUT V
27812	Transition_Current_Boost2Floating_Battery_V	float32	RW	3.4E+38	0	A	BT	// BATTER Y MODE CHARGE2FLOAT SETPOINT OUTPUT V
27814	Time_Boost_Battery_V	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TIME IN BOOST SETPOINT OUTPUT V
27816	Time_Floating_Battery_V	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TIME IN FLOAT SETPOINT OUTPUT V
27818	Time_Transition_Battery_V	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TRANSITION TIME SETPOINT OUTPUT V

27820	Time_Discharge_Battery_V	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED DISCHARGING TIME SETPOINT OUTPUT V
27822	Max_Number_Cycle_Battery_V	float32	RW	3.4E+38	0	-	BT	// BATTERY MODE ADVANCED NUMBER CYCLES SETPOINT OUTPUT V
27824	Ah_Stop_Charge_Battery_V	float32	RW	3.4E+38	0	Ah	BT	// BATTERY MODE ADVANCED AH CHARGE SETPOINT OUTPUT V
27826	Ah_Stop_Discharge_Battery_V	float32	RW	0	-3.4E+38	Ah	BT	// BATTERY MODE ADVANCED AH DISCHARGE SETPOINT OUTPUT V
27828	Discharge_Current_Battery_V	float32	RW	0	-3.4E+38	A	BT	// BATTER Y MODE DISCHARGING CURRENT SETPOINT OUTPUT V
27830	Discharge_Voltage_Battery_V	float32	RW	3.4E+38	0	V	BT	// BATTER Y MODE DISCHARGE VOLTAGE SETPOINT OUTPUT V
27832	Boost_Voltage_Battery_W	float32	RW	3.4E+38	20	V	BT	// BATTER Y MODE BOOST VOLTAGE SETPOINT OUTPUT W
27834	Floating_Voltage_Battery_W	float32	RW	3.4E+38	20	V	BT	// BATTER Y MODE FLOATING VOLTAGE SETPOINT OUTPUT W
27836	Charging_Current_Battery_W	float32	RW	3.4E+38	0	A	BT	// BATTER Y MODE CHARGING CURRENT SETPOINT OUTPUT W
27838	Transition_Current_Boost2Floating_Battery_W	float32	RW	3.4E+38	0	A	BT	// BATTER Y MODE CHARGE2FLOAT SETPOINT OUTPUT W
27840	Time_Boost_Battery_W	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TIME IN BOOST SETPOINT OUTPUT W
27842	Time_Floating_Battery_W	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TIME IN FLOAT SETPOINT OUTPUT W
27844	Time_Transition_Battery_W	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TRANSITION TIME SETPOINT OUTPUT W
27846	Time_Discharge_Battery_W	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED DISCHARGING TIME SETPOINT OUTPUT W
27848	Max_Number_Cycle_Battery_W	float32	RW	3.4E+38	0	-	BT	// BATTERY MODE ADVANCED NUMBER CYCLES SETPOINT OUTPUT W
27850	Ah_Stop_Charge_Battery_W	float32	RW	3.4E+38	0	Ah	BT	// BATTERY MODE ADVANCED AH CHARGE SETPOINT OUTPUT W
27852	Ah_Stop_Discharge_Battery_W	float32	RW	0	-3.4E+38	Ah	BT	// BATTERY MODE ADVANCED AH DISCHARGE SETPOINT OUTPUT W
27854	Discharge_Current_Battery_W	float32	RW	0	-3.4E+38	A	BT	// BATTER Y MODE DISCHARGING CURRENT SETPOINT OUTPUT W
27856	Discharge_Voltage_Battery_W	float32	RW	3.4E+38	0	V	BT	// BATTER Y MODE DISCHARGE VOLTAGE SETPOINT OUTPUT W
27858	Boost_Voltage_Battery_Global	float32	RW	3.4E+38	20	V	BT	// BATTER Y MODE BOOST VOLTAGE SETPOINT GLOBAL
27860	Floating_Voltage_Battery_Global	float32	RW	3.4E+38	20	V	BT	// BATTER Y MODE FLOATING VOLTAGE SETPOINT GLOBAL
27862	Charging_Current_Battery_Global	float32	RW	3.4E+38	0	A	BT	// BATTER Y MODE CHARGING CURRENT SETPOINT GLOBAL
27864	Transition_Current_Boost2Floating_Battery_Global	float32	RW	3.4E+38	0	A	BT	// BATTER Y MODE CHARGE2FLOAT SETPOINT GLOBAL
27866	Time_Boost_Battery_Global	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TIME IN BOOST SETPOINT GLOBAL

27868	Time_Floating_Battery_Global	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TIME IN FLOAT SETPOINT GLOBAL
27870	Time_Transition_Battery_Global	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED TRANSITION TIME SETPOINT GLOBAL
27872	Time_Discharge_Battery_Global	float32	RW	3.4E+38	0	s	BT	// BATTERY MODE ADVANCED DISCHARGING TIME SETPOINT GLOBAL
27874	Max_Number_Cycle_Battery_Global	float32	RW	3.4E+38	0	-	BT	// BATTERY MODE ADVANCED NUMBER CYCLES SETPOINT GLOBAL
27876	Ah_Stop_Charge_Battery_Global	float32	RW	3.4E+38	0	Ah	BT	// BATTERY MODE ADVANCED AH CHARGE SETPOINT GLOBAL
27878	Ah_Stop_Discharge_Battery_Global	float32	RW	0	-3.4E+38	Ah	BT	// BATTERY MODE ADVANCED AH DISCHARGE SETPOINT GLOBAL
27880	Discharge_Current_Battery_Global	float32	RW	0	-3.4E+38	A	BT	// BATTER Y MODE DISCHARGING CURRENT SETPOINT GLOBAL
27882	Discharge_Voltage_Battery_Global	float32	RW	3.4E+38	0	V	BT	// BATTER Y MODE DISCHARGE VOLTAGE SETPOINT GLOBAL
27884	V_Constant_BE_U	float32	RW	1500	20	V	BE	// BATTERY EMULATION VOLTAGE CONSTANT PHASE U
27886	K_Polarisation_BE_U	float32	RW	3.4E+38	0	V/Ah	BE	// BATTERY EMULATION K POLARISATION PHASE U
27888	Q_Capacity_BE_U	float32	RW	3.4E+38	0	Ah	BE	// BATTERY EMULATION Q CAPACITY PHASE U
27890	A_exp_Amp_BE_U	float32	RW	1500	0	V	BE	// BATTERY EMULATION A EXP AMP PHASE U
27892	B_exp_Time_BE_U	float32	RW	3.4E+38	0	1/Ah	BE	// BATTERY EMULATION B EXP TIME PHASE U
27894	V_Constant_BE_V	float32	RW	1500	20	V	BE	// BATTERY EMULATION VOLTAGE CONSTANT PHASE V
27896	K_Polarisation_BE_V	float32	RW	3.4E+38	0	V/Ah	BE	// BATTERY EMULATION K POLARISATION PHASE V
27898	Q_Capacity_BE_V	float32	RW	3.4E+38	0	Ah	BE	// BATTERY EMULATION Q CAPACITY PHASE V
27900	A_exp_Amp_BE_V	float32	RW	1500	0	V	BE	// BATTERY EMULATION A EXP AMP PHASE V
27902	B_exp_Time_BE_V	float32	RW	3.4E+38	0	1/Ah	BE	// BATTERY EMULATION B EXP TIME PHASE V
27904	V_Constant_BE_W	float32	RW	1500	20	V	BE	// BATTERY EMULATION VOLTAGE CONSTANT PHASE W
27906	K_Polarisation_BE_W	float32	RW	3.4E+38	0	V/Ah	BE	// BATTERY EMULATION K POLARISATION PHASE W
27908	Q_Capacity_BE_W	float32	RW	3.4E+38	0	Ah	BE	// BATTERY EMULATION Q CAPACITY PHASE W
27910	A_exp_Amp_BE_W	float32	RW	1500	0	V	BE	// BATTERY EMULATION A EXP AMP PHASE W
27912	B_exp_Time_BE_W	float32	RW	3.4E+38	0	1/Ah	BE	// BATTERY EMULATION B EXP TIME PHASE W
27914	V_Constant_BE_Global	float32	RW	1500	20	V	BE	// BATTERY EMULATION VOLTAGE CONSTANT PHASE GLOBAL
27916	K_Polarisation_BE_Global	float32	RW	3.4E+38	0	V/Ah	BE	// BATTERY EMULATION K POLARISATION PHASE GLOBAL
27918	Q_Capacity_BE_Global	float32	RW	3.4E+38	0	Ah	BE	// BATTERY EMULATION Q CAPACITY PHASE GLOBAL
27920	A_exp_Amp_BE_Global	float32	RW	1500	0	V	BE	// BATTERY EMULATION A EXP AMP PHASE GLOBAL
27922	B_exp_Time_BE_Global	float32	RW	3.4E+38	0	1/Ah	BE	// BATTERY EMULATION B EXP TIME PHASE GLOBAL
27924	PV_Gref	float32	RW	3.4E+38	0	W/m2	PV	// PV EMULATION IRRADIANCE REFERENCE
27926	PV_Tref	float32	RW	3.4E+38	0	ºC	PV	// PV EMULATION TEMPERATURE REFERENCE

27928	PV_V_oc_U	float32	RW	3.4E+38	0	V	PV	// PV EMULATION OPEN CIRCUIT VOLTAGE PHASE U
27930	PV_V_mpp_U	float32	RW	3.4E+38	0	V	PV	// PV EMULATION MAXIMUM POWER POINT VOLTAGE PHASE U
27932	PV_I_sc_U	float32	RW	3.4E+38	0	A	PV	// PV EMULATION SHORTCIRCUIT CURRENT PHASE U
27934	PV_I_mpp_U	float32	RW	3.4E+38	0	A	PV	// PV EMULATION MAXIMUM POWER POINT CURRENT PHASE U
27936	PV_A_V_TempCoef_U	float32	RW	3.4E+38	-3.4E+38	V/ºC	PV	// PV EMULATION VOTLAGE TEMPERATURE COEFFICIENT PHASE U
27938	PV_B_I_TempCoef_U	float32	RW	3.4E+38	-3.4E+38	A/ºC	PV	// PV EMULATION CURRENT TEMPERATURE COEFFICIENT PHASE U
27940	PV_N_Serie_U	Uint32	RW	18	0	W/m2	PV	// PV EMULATION PANELS CONNECTED IN SERIES PHASE U
27942	PV_N_Parallel_U	Uint32	RW	60	0	ºC	PV	// PV EMULATION STRINGS CONNECTED IN PARALLEL PHASE U
27944	PV_G_SP_U	float32	RW	1500	1	W/m2	PV	// PV EMULATION IRRADIANCE SETPOINT PHASE U
27946	PV_T_SP_U	float32	RW	70	-40	ºC	PV	// PV EMULATION TEMPERATURE SETPOINT PHASE U
27948	PV_V_oc_V	float32	RW	3.4E+38	0	V	PV	// PV EMULATION OPEN CIRCUIT VOLTAGE PHASE V
27950	PV_V_mpp_V	float32	RW	3.4E+38	0	V	PV	// PV EMULATION MAXIMUM POWER POINT VOLTAGE PHASE V
27952	PV_I_sc_V	float32	RW	3.4E+38	0	A	PV	// PV EMULATION SHORTCIRCUIT CURRENT PHASE V
27954	PV_I_mpp_V	float32	RW	3.4E+38	0	A	PV	// PV EMULATION MAXIMUM POWER POINT CURRENT PHASE V
27956	PV_A_V_TempCoef_V	float32	RW	3.4E+38	-3.4E+38	V/ºC	PV	// PV EMULATION VOTLAGE TEMPERATURE COEFFICIENT PHASE V
27958	PV_B_I_TempCoef_V	float32	RW	3.4E+38	-3.4E+38	A/ºC	PV	// PV EMULATION CURRENT TEMPERATURE COEFFICIENT PHASE V
27960	PV_N_Serie_V	Uint32	RW	18	0	W/m2	PV	// PV EMULATION PANELS CONNECTED IN SERIES PHASE V
27962	PV_N_Parallel_V	Uint32	RW	60	0	ºC	PV	// PV EMULATION STRINGS CONNECTED IN PARALLEL PHASE V
27964	PV_G_SP_V	float32	RW	1500	1	W/m3	PV	// PV EMULATION IRRADIANCE SETPOINT PHASE V
27966	PV_T_SP_V	float32	RW	70	-40	ºC	PV	// PV EMULATION TEMPERATURE SETPOINT PHASE V
27968	PV_V_oc_W	float32	RW	3.4E+38	0	V	PV	// PV EMULATION OPEN CIRCUIT VOLTAGE PHASE W
27970	PV_V_mpp_W	float32	RW	3.4E+38	0	V	PV	// PV EMULATION MAXIMUM POWER POINT VOLTAGE PHASE W
27972	PV_I_sc_W	float32	RW	3.4E+38	0	A	PV	// PV EMULATION SHORTCIRCUIT CURRENT PHASE W
27974	PV_I_mpp_W	float32	RW	3.4E+38	0	A	PV	// PV EMULATION MAXIMUM POWER POINT CURRENT PHASE W
27976	PV_A_V_TempCoef_W	float32	RW	3.4E+38	-3.4E+38	V/ºC	PV	// PV EMULATION VOTLAGE TEMPERATURE COEFFICIENT PHASE W
27978	PV_B_I_TempCoef_W	float32	RW	3.4E+38	-3.4E+38	A/ºC	PV	// PV EMULATION CURRENT TEMPERATURE COEFFICIENT PHASE W

27980	PV_N_Serie_W	Uint32	RW	18	0	W/m2	PV	// PV EMULATION PANELS CONNECTED IN SERIES PHASE W
27982	PV_N_Parallel_W	Uint32	RW	60	0	ºC	PV	// PV EMULATION STRINGS CONNECTED IN PARALLEL PHASE W
27984	PV_G_SP_W	float32	RW	1500	1	W/m2	PV	// PV EMULATION IRRADIANCE SETPOINT PHASE W
27986	PV_T_SP_W	float32	RW	70	-40	ºC	PV	// PV EMULATION TEMPERATURE SETPOINT PHASE W
27988	PV_V_oc_Global	float32	RW	3.4E+38	0	V	PV	// PV EMULATION OPEN CIRCUIT VOLTAGE PHASE GLOBAL
27990	PV_V_mpp_Global	float32	RW	3.4E+38	0	V	PV	// PV EMULATION MAXIMUM POWER POINT VOLTAGE PHASE GLOBAL
27992	PV_I_sc_Global	float32	RW	3.4E+38	0	A	PV	// PV EMULATION SHORTCIRCUIT CURRENT PHASE GLOBAL
27994	PV_I_mpp_Global	float32	RW	3.4E+38	0	A	PV	// PV EMULATION MAXIMUM POWER POINT CURRENT PHASE GLOBAL
27996	PV_A_V_TempCoef_Global	float32	RW	3.4E+38	-3.4E+38	V/ºC	PV	// PV EMULATION VOTLAGE TEMPERATURE COEFFICIENT PHASE GLOBAL
27998	PV_B_I_TempCoef_Global	float32	RW	3.4E+38	-3.4E+38	A/ºC	PV	// PV EMULATION CURRENT TEMPERATURE COEFFICIENT PHASE GLOBAL
28000	PV_N_Serie_Global	Uint32	RW	18	0	W/m2	PV	// PV EMULATION PANELS CONNECTED IN SERIES PHASE GLOBAL
28002	PV_N_Parallel_Global	Uint32	RW	60	0	ºC	PV	// PV EMULATION STRINGS CONNECTED IN PARALLEL PHASE GLOBAL
28004	PV_G_SP_Global	float32	RW	1500	1	W/m2	PV	// PV EMULATION IRRADIANCE SETPOINT PHASE GLOBAL
28006	PV_T_SP_Global	float32	RW	70	-40	ºC	PV	// PV EMULATION TEMPERATURE SETPOINT PHASE GLOBAL

NOTES:

- All the registers are 32 bits.

- All the registers are Uint32 or float32 (standard definition in Modbus)

- AR stands for Active Rectifier. It is the grid side converter of the unit. Its working principle cannot be controlled by the user as the Active Rectifier role is to keep a constant voltage in the DC-link by sinking or sourcing energy from/to the grid. The current at grid side will be always in phase with the voltage (cos fi>0.99) and with low distortion.

- INV stands for Inverter. It is the output side of the converter.

- All CW registers used to control the unit are located from **17000** to **17034** Modbus register.

- All SW registers used to verify the state of the unit are located from **16000** to **16050** Modbus register.

- All Error registers used to show the error reported by the unit are located from **13000** to **13008** and from **23000** to **23008** Modbus register.

- All Input values registers (grid side values) are located from **16074** to **16138** Modbus register.

- All Output values registers (EUT side values) are located from **26042** to **26152** and from **26172** to **26188** Modbus register.

- All the Alarms and Operating Limits registers are located from **23012** to **23252** Modbus register.

- All the Setpoint for a GE_AC are located from **27010** to **27064**, from **27090** to **27640** Modbus register.

- All the Setpoints for a EL_AC are located from **27066** to **27640** and from **27716** to **27762** Modbus register.

- All the Setpoints for a DC unit are located from **27642** to **27714** Modbus register.

- All the Setpoints for a Battery Test mode are located from **26152** to **26162** and from **27764** to **27882** Modbus register.

- All the Setpoints for a Battery Emulation mode are located from **26002** to **26040**, from **26156** to **26170** and from **27884** to 27922 Modbus register.

- All the Setpoints for a PC Panel Emulation mode are located from **27924** to **28006** Modbus register.

2.3.1. Bit Coded description: Control Word registers

The Bit Coded CW descriptions are:

CONTROL WORD (Modbus address 17000 to 17034)			
CW_EnableDisable	17000	// CONTROL WORD DISABLE/ENABLE	**0: Disable** **1: Enable**
CW_RunReady	17002	// CONTROL WORD READY/RUN	**0: Ready** **1: Run**
CW_ControlOperationU	17004	// CONTROL WORD CONTROL OPERATION PHASE U	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Impedance AC/Resistance DC** **4: Battery Test (not used in AC)** **5: Battery Emulation (not used in AC)** **6: PV Emulation (not used in AC)**
CW_ControlOperationV	17006	// CONTROL WORD CONTROL OPERATION PHASEV	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Impedance AC/Resistance DC** **4: Battery Test (not used in AC)** **5: Battery Emulation (not used in AC)** **6: PV Emulation (not used in AC)**
CW_ControlOperationW	17008	// CONTROL WORD CONTROL OPERATION PHASE W	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Impedance AC/Resistance DC** **4: Battery Test (not used in AC)** **5: Battery Emulation (not used in AC)** **6: PV Emulation (not used in AC)**
CW_ONOFF_U	17010	// CONTROL WORD ENABLE/DISABLE PH U	**0: OFF** **1: ON**
CW_ONOFF_V	17012	// CONTROL WORD ENABLE/DISABLE PH V	**0: OFF** **1: ON**
CW_ONOFF_W	17014	// CONTROL WORD ENABLE/DISABLE PH W	**0: OFF** **1: ON**
CW_BranchControl	17016	// CONTROL WORD BRANCH CONTROL	**0: Unified Branches** **1: Separated Branches**
CW_Reset	17018	// CONTROL WORD RESET (0 --> 1 --> 0)	**Sequence 0->1->0 means Reset**

CW_Trigger_Config	17020	// TRIGGER START SETPOINT	**0: Not Applied** **1: Applied**
CW_EL_Star_Delta	17022	// CONTROL WORD EL STAR/DELTA MODE	**0: Disable** **1: Enable**
CW_EL_Sim_Mode	17024	// CONTROL WORD IMPEDANCE MODE RMS (0) OR REALTIME (1)	**0: RMS** **1: Realtime**
CW_DC_Fast_Control	17030	// CONTROL WORD DC CONTROL FAST (1) OR STANDARD (0)	**0: Standard** **1: Fast**
CW_Remote_One_CH_contactor (optional)	17032	// CONTROL WORD REMOTE CONTROL 1CH/3CH (OPTIONAL)	**0: 3 independent output channels** **1: 1 output channel**
CW_Remote_GEL_contactor (optional)	17034	// CONTROL WORD REMOTE CONTROL GE/EL (OPTIONAL)	**0: GE operation mode** **1: EL operation mode**

2.3.2. Bit Coded description: Status Word registers

The Bit Coded SW (ABR or INPUT SIDE and INV or OUTPUT SIDE) descriptions are:

STATUS WORD (Modbus address 16000 to 16050)			
SW_GrafcetState	16000 26000	// STATUS WORD INPUT GRAFCET STATUS // STATUS WORD OUTPUT GRAFCET STATUS	**0: No_connected** **1: s_Init** **2: s_StandBy** **3: s_PreCharge** **4: s_Ready** **5: s_Run** **6: s_Warning** **7: s_Alarm**
SW_LocalRemote	16002	// STATUS WORD INPUT LOCAL REMOTE	**0: Remote (Modbus + TS)** **1: Touch-screen (TS)** **2: External DI**
SW_SetPoint_Input	16004	// STATUS WORD INPUT SETPOINT INPUT	**0: Modbus** **1: Analog Input**
SW_AC_DC_Selector_U	16006	// STATUS WORD INPUT AC&DC SELECTOR / PHASE U (optional)	**0: DC** **1: AC**
SW_AC_DC_Selector_V	16008	// STATUS WORD INPUT AC&DC SELECTOR PHASE V (optional)	**0: DC** **1: AC**
SW_AC_DC_Selector_W	16010	// STATUS WORD INPUT AC&DC SELECTOR PHASE W (optional)	**0: DC** **1: AC**
SW_GE_EL_Selector	16012	// STATUS WORD INPUT GE&EL SELECTOR	**0: EL** **1: GE**

SW_OutputConnection	16014	// STATUS WORD INPUT OUTPUT CONNECTION	**0: Independent 3 channel** **1: Parallel 1 channel**
SW_TriggerConfig	16016	// STATUS WORD INPUT TRIGGER FUNCTION	**0: No Applied** **1: Applied**
SW_Bipolar	16018	// STATUS WORD INPUT BIPOLAR	**0: Unipolar** **1: Bipolar**
SW_BranchControl	16020	// STATUS WORD INPUT BRANCH CONTROL	**0: Unified** **1: Separated**
SW_ControlOperationU	16022	// STATUS WORD OUTPUT CONTROL OPERATION PHASE U IN SEPARATED CONTROL MODE	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Impedance AC/Resistance DC** **4: Battery Test (not used in AC)** **5: Battery Emulation (not used in AC)** **6: PV Emulation (not used in AC)**
SW_ControlOperationV	16024	// STATUS WORD OUTPUT CONTROL OPERATION PHASE V IN SEPARATED CONTROL MODE	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Impedance AC/Resistance DC** **4: Battery Test (not used in AC)** **5: Battery Emulation (not used in AC)** **6: PV Emulation (not used in AC)**
SW_ControlOperationW	16026	// STATUS WORD OUTPUT CONTROL OPERATION PHASE W IN SEPARATED CONTROL MODE	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Impedance AC/Resistance DC** **4: Battery Test (not used in AC)** **5: Battery Emulation (not used in AC)** **6: PV Emulation (not used in AC)**
SW_GrafcetStateU	16028	// STATUS WORD OUTPUT GRAFSET STATUS PHASE U IN SEPARATED CONTROL MODE	**0: s_Branca_init** **1: s_Branca_SoftStarting** **2: s_Branca_Running** **3: s_Branca_Warning** **4: s_Branca_Alarm**
SW_GrafcetStateV	16030	// STATUS WORD OUTPUT GRAFSET STATUS PHASE V IN SEPARATED CONTROL MODE	**0: s_Branca_init** **1: s_Branca_SoftStarting** **2: s_Branca_Running** **3: s_Branca_Warning** **4: s_Branca_Alarm**
SW_GrafcetStateW	16032	// STATUS WORD OUTPUT GRAFSET STATUS PHASE W IN SEPARATED CONTROL MODE	**0: s_Branca_init** **1: s_Branca_SoftStarting**

			2: s_Branca_Running **3: s_Branca_Warning** **4: s_Branca_Alarm**
SW_ONOFF_U	16034	// STATUS WORD ON/OFF PHASE U IN SEPARATED CONTROL MODE	**0: OFF** **1: ON**
SW_ONOFF_V	16036	// STATUS WORD ON/OFF PHASE V IN SEPARATED CONTROL MODE	**0: OFF** **1: ON**
SW_ONOFF_W	16038	// STATUS WORD ON/OFF PHASE W IN SEPARATED CONTROL MODE	**0: OFF** **1: ON**
SW_EL_Star_Delta	16040	// STATUS WORD DELTA/STAR EL MODE	**0: Star mode** **1: Delta mode**
SW_EL_Sim_Mode	16042	// STATUS WORD IMPEDANCE MODE RMS (0) OR REALTIME (1)	**0: RMS impedance mode** **1: Realtime impedance mode**
SW_HR_Mode	16044	// STATUS WORD OF HIGH RESOLUTION MODE FUNCTIONALITY	**0: Standard Resolution** **1: High Resolution**
SW_DC_Fast_Control	16046	// STATUS WORD DC CONTROL FAST (1) OR STANDARD (0)	**0: Standard DC control** **1: FAST DC control**
SW_Remote_One_CH_contactor (optional)	16048	// STATUS WORD REMOTE CONTROL 1CH/3CH (OPTIONAL)	**0: no remote control 1CH/3CH** **1: Remote control 1CH/3CH**
SW_Remote_GEL_contactor (optional)	16050	// STATUS WORD REMOTE CONTROL GE/EL (OPTIONAL)	**0: GE operation mode** **1: EL operation mode**

2.3.3. Bit Coded description: Error Code

The Value Variables descriptions from **13000** to **13008** and from **23000** to **23008** Modbus register are:

Value	*Alarm description*	*Value*	*Alarm description*	*Value*	*Alarm description*	*Value*	*Alarm description*
0	No alarm	**140**	Wrong Paralel Maximum Config	**202**	Drivers Ph2	**319**	Undervoltage 2
100	Watchdog	**141**	Paralel_Master_HB	**203**	Drivers Ph3	**320**	Undervoltage 3
101	Node without HB DSP	**142**	Paralel_Slave_HB	**211**	Heatsink temperature ABR	**330**	Overcurrent MainGrid
102	SPI_DSP_CRC	**143**	Paralel_Master_Config_Sl	**212**	Heatsink temperature INV	**331**	Overcurrent 1
103	Node without HB BBB	**144**	Paralel_CRC_Coms	**213**	Room Temperature	**332**	Overcurrent 2
104	Wrong DSP Loaded Prog	**145**	Paralel_Slave_Out_Switch	**221**	Fast precharge	**333**	Overcurrent 3
110	Device not initialized	**146**	Paralel_Slave_wrong_mode	**222**	Overload precharge	**334**	Overcurrent Peak 1
111	DO Version Error	**150**	Wrong_AC_DC_Config	**230**	Output Contactor U	**335**	Overcurrent Peak 2
112	EEPROM Blank	**151**	Wrong_1_Ch_Config	**231**	Output Contactor V	**336**	Overcurrent Peak 3
120	INV Alarmed	**152**	Wrong_Unipolar_Config	**232**	Output Contactor W	**337**	Overcurrent Capacitor 1
121	ABR Alarmed	**153**	Wrong_Delta_Connection	**301**	DC-Link Over Voltage	**338**	Overcurrent Capacitor 2
130	Node_Slave_2	**154**	Wrong_Dual_Range_Cont	**302**	DC-Link Under Voltage	**339**	Overcurrent Capacitor 3
131	Node_Slave_3	**155**	Running_Config_Modif	**310**	Overvoltage Main Grid	**340**	Overcurrent Neutral
132	Node_Slave_4	**170**	Serial_Master_HB	**311**	Overvoltage 1	**350**	Overload MainGrid
133	Node_Slave_5	**171**	Serial_CRC_Coms	**312**	Overvoltage 2	**351**	Overload 1
134	Node_Slave_6	**172**	Serial_Slave_HB	**313**	Overvoltage 3	**352**	Overload 2
135	Node_Slave_7	**173**	Wrong_UnitSerial_AC	**314**	Overvoltage Peak 1	**353**	Overload 3
136	Node_Slave_8	**174**	Wrong_UnitSerial_3Ch	**315**	Overvoltage Peak 2	**1001**	Emergency_Sequence
137	Node_Slave_9	**175**	Wrong_UnitSerial_Bipolar	**316**	Overvoltage Peak 3	**1010**	Mains Lost
138	Node_Slave_10	**176**	Serial_Slave_Out_Switch	**317**	Undervoltage Main Grid	**1011**	Isolation Device
139	Slave Alarmed	**201**	Drivers Ph1	**318**	Undervoltage 1		

2.3.4. Bit Coded description: Warning Word

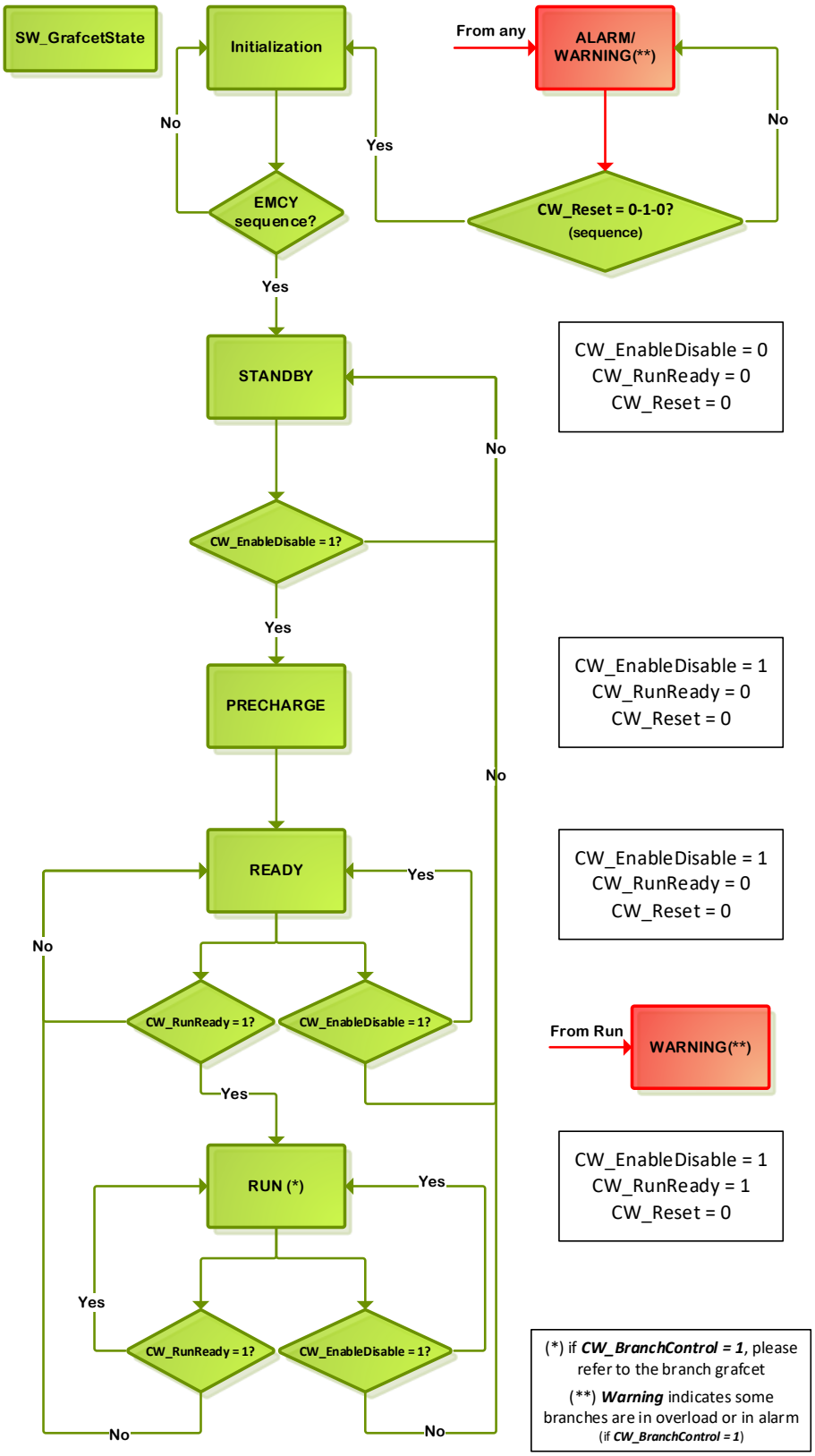
The Bit Coded Variables descriptions are:

WARNING WORD (23010)								
bits	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Def	WatchDog	Heart Bit	Emergency_Sequence	Drivers PhR	Drivers PhS	Drivers PhT	DCLink OverVolage	DCLink UnderVolage
bits	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Def	AC OverVoltage	AC UndererVoltage	AC Overcurrent RMS	AC Overcurrent Peak	OverLoad	Heatsink Temperature ABR	Heatsink Temperature INV	Room Temperature
bits	**16**	**17**	**18**	**19**	**20**	**21**	**22..31**	
Def	INV Alarmed	Isolation Device	Overload Precharge	SD Error	Mains Lost	Device not initialized	RSVD	

WARNING WORD								
bits	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Def	WatchDog	Heart Bit	Emergency_Sequence	Drivers PhU	Drivers PhV	Drivers PhW	DCLink OverVolage	DCLink UnderVolage
bits	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Def	OverVoltage RMS	OverVoltage Peak	UnderVoltage RMS	Overcurrent RMS	Overcurrent Peak	OverLoad	ABR Alarmed	Wrong Connection
bits	**16**	**17**	**18..29**	**29**	**30**	**31**	**16**	**17**
Def	Device not initialized	Failed on output synchronization	RSVD	Phase U	Phase V	Phase W	Device not initialized	Failed on output synchronization

2.4. OPERATING THE UNIT: STATE MACHINE

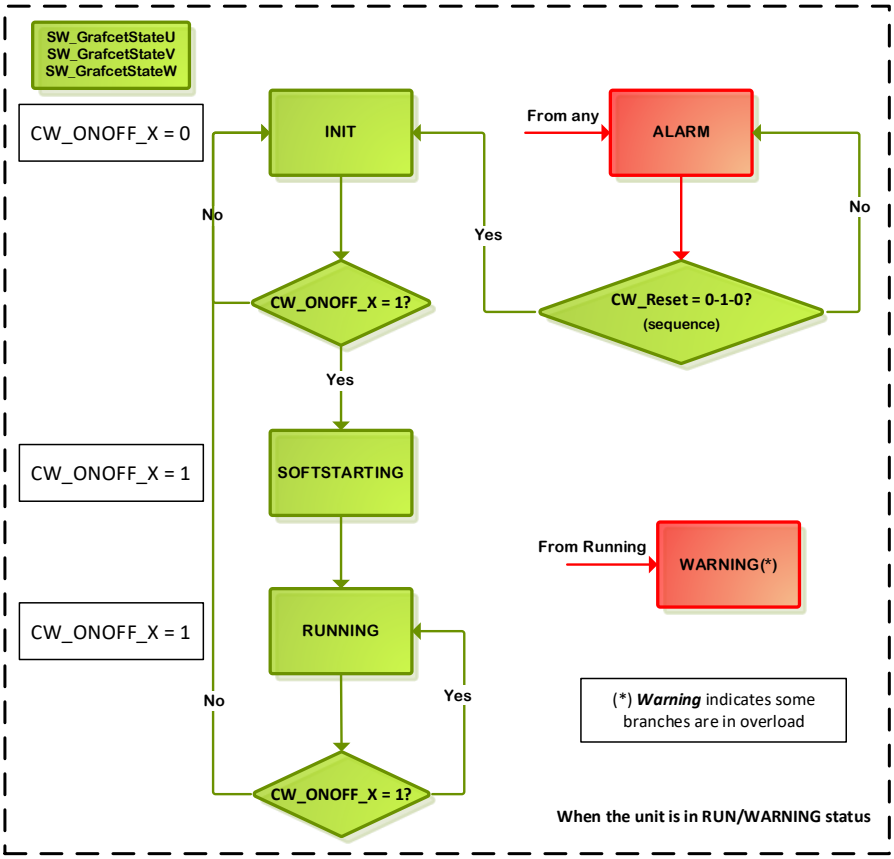
The operation of the unit is controlled by the CONTROL WORD in address **17000** to **17018**, corresponding to the Active Rectifier control word who is the master of the state machine. The following diagram describes the state machine:



In case of use the unit in Separated Channel control (***CW_BranchControl*** = 1), the state machine of each channel is described below:

This operation mode is an Optional. Be sure that your unit has this mode activated to operate it. Please read the specific manual, before operating it.

CW_BranchControl *(optional)*	17016	**1: Separated channel control**



Please, refer to the chapter “state machine” in the user manual for further detail. Note that the bits to change the state of the equipment shall be set/reset. For instance, to go into RUN state the bit of READY state shall be kept to 1.

Please, read the **user manual** of the equipment for further details.

3. GRID EMULATOR: AC MODE

3.1. SETTING configuration in AC mode

First of all, it has to be sure that the equipment is configured and connected as an GE in AC control mode by selector (review the position of the output selectors). Check the position of the AC&DC switch selector and GE&EL switch selector. The unit will detect it automatically and show the GE and AC mode in its registers Status Word.

SW_GE_EL_Selector *(read only to confirm)*	16012	**1: GE mode**
SW_AC_DC_Selector_U *(read only to confirm)*	16006	**1: AC mode**
SW_AC_DC_Selector_V *(read only to confirm)*	16008	**1: AC mode**
SW_AC_DC_Selector_W *(read only to confirm)*	16010	**1: AC mode**

Please, take into account that the unit can be operated in 3 channel or 1 channel output. Check the position of the 3channel&1channel switch selector.

SW_OutputConnection *(read only to confirm)*	16014	**0: 3 channel output** **1: 1 channel output**

3.2. Creating a GRID in 3 channel mode (AC mode)

As a first configuration, it is necessary to confirm that the unit is operating as 3 channel output. Check the position of the 3channel&1channel switch selector. The unit will detect automatically and show the 3 channels on the register Status Word:

SW_OutputConnection *(read only to confirm)*	16014	**0: 3 channel output**

And the control operating mode of the unit is **Voltage Source** (0). Please note that the user can send the Active Rectifier Control Word (register ***17004*** *to* ***17008***) the value 0.

As GE in AC mode **only** Voltage Source operation mode is allowed.

CW_ControlOperationU	17004	**0: Voltage Source**
CW_ControlOperationV	17006	**0: Voltage Source**
CW_ControlOperationW	17008	**0: Voltage Source**
SW_ControlOperationU *(read only to confirm)*	16022	**0: Voltage Source**
SW_ControlOperationV *(read only to confirm)*	16024	**0: Voltage Source**
SW_ControlOperationW *(read only to confirm)*	16026	**0: Voltage Source**

As a GE in AC mode to create a basic GRID, the user can configure the following parameters:

- the magnitude in Vrms of the **fundamental** voltage for each phase
- the frequency value of the output voltage for each phase
- phase delay of the fundamental voltage for each phase
- the magnitude ramp of the setpoint for each phase
- the phase angle ramp of the setpoint for each phase
- the frequency ramp of the setpoint for each phase

The Modbus register of these parameters are:

- ***27010*** *to* ***27022*** *setpoints for phase U,*
- ***27024*** *to* ***27036*** *setpoints for phase V,*
- ***27038*** *to* ***27050*** *setpoints for phase W,*

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

3.2.1. Example of Creating a GRID in 3 channel mode (AC mode)

A basic grid can be created by writing to the following registers *(as an example of three-phase European grid to generate at the output)*:

Frequency_Ramp_Output_U	27010	Hz/s	*1.00*
Frequency_Output_SP_U	27012	Hz	*50.00*
Grid_Output_Resistance_U	27014	Ohm	*0.00*
Voltage_Ramp_AC_Output_U_SP	27016	V/ms	*100.00*
Voltage_Ramp_Phase_Angle_Output_U_SP	27018	deg/ms	*10.00*
Voltage_Fundamental_Phase_Angle_U_SP	27020	deg	*0.00*
Voltage_Fundamental_AC_U_SP	27022	V	*230.00*
Frequency_Ramp_Output_V	27024	Hz/s	*1.00*
Frequency_Output_SP_V	27026	Hz	*50.00*
Grid_Output_Resistance_V	27028	Ohm	*0.00*
Voltage_Ramp_AC_Output_V_SP	27030	V/ms	*100.00*
Voltage_Ramp_Phase_Angle_Output_V_SP	27032	deg/ms	*10.00*
Voltage_Fundamental_Phase_Angle_V_SP	27034	deg	*-120.00*
Voltage_Fundamental_AC_V_SP	27036	V	*230.00*
Frequency_Ramp_Output_W	27038	Hz/s	*1.00*
Frequency_Output_SP_W	27040	Hz	*50.00*
Grid_Output_Resistance_W	27042	Ohm	*0.00*
Voltage_Ramp_AC_Output_W_SP	27044	V/ms	*100.00*
Voltage_Ramp_Phase_Angle_Output_W_SP	27046	deg/ms	*10.00*
Voltage_Fundamental_Phase_Angle_W_SP	27048	deg	*-240.00*
Voltage_Fundamental_AC_W_SP	27050	V	*230.00*

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

3.3. Add Harmonics at the output voltage

The ePLUS family has 50 configurable harmonics per each phase. Please follow the table below to understand which values must be configured.

Number	Magnitude	Default values	Phase angle	Default values	Index	Default values
H2	configurable	0	configurable	0	configurable	2
…	…	…	…	…	…	…
H21	configurable	0	configurable	0	configurable	21
H22	configurable	0			H21+n (n=1)	22
…	…	…			…	…
H50	configurable	0			H21+n (n=29)	50

NOTE: to add harmonics at the output is necessary to write on the registers:

- ***27090*** *to* ***27188*** *for magnitude phase U (H2 to H50 and Ramp),*
- ***27390*** *to* ***27430*** *for index phase U (H2 to H21 and Ramp),*
- ***27516*** *to* ***27556*** *for phase angle phase U (H2 to H21 and Ramp),*

- ***27190*** *to* ***27288*** *for magnitude phase V (H2 to H50 and Ramp),*
- ***27432*** *to* ***27472*** *for index phase V (H2 to H21 and Ramp),*
- ***27558*** *to* ***27598*** *for phase angle phase V (H2 to H21 and Ramp),*

- ***27290*** *to* ***27388*** *for magnitude phase W (H2 to H50 and Ramp),*
- ***27474*** *to* ***27514*** *for index phase W (H2 to H21 and Ramp),*
- ***27600*** *to* ***27640*** *for phase angle phase W (H2 to H21 and Ramp),*

> ***Note***: The value of the fundamental voltage setpoint are values in **RMS**.
> The value of the harmonic setpoints are a **per unit** value over the fundamental voltage value, going through -1 to 1. For instance, a number 1 in H3 will add a third harmonic with the same magnitude as the fundamental value.

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

3.3.1. Example of Adding Harmonics at the output voltage

As an example, if the user would add harmonics at the output could write:

Amplitude_Ramp_AC_Harm_U_SP	27090	*1.00*
PU_Amplitude_H3_AC_U_SP	27094	*0.10*
Index_H3_AC_U_SP	27394	*3.00*
Phase_angle_H3_AC_U_SP	27520	*0.00*
Amplitude_Ramp_AC_Harm_V_SP	27190	*1.00*
PU_Amplitude_H5_AC_V_SP	27198	*0.10*
Index_H5_AC_V_SP	27440	*5.00*
Phase_angle_H3_AC_V_SP	27566	*0.00*
Amplitude_Ramp_AC_Harm_W_SP	27290	*1.00*
PU_Amplitude_H7_AC_W_SP	27302	*0.05*
Index_H7_AC_W_SP	27486	*7.00*
Phase_angle_H7_AC_W_SP	27612	*0.00*

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

3.4. Creating a GRID in 1 channel mode (AC mode)

As a first configuration, it is necessary to confirm that the unit is operating as 1 channel output. Check the position of the 3channel&1channel switch selector. The unit will detect automatically and show the 3 channels on the register Status Word:

SW_OutputConnection *(read only to confirm)*	16014	**1: 1 channel output**

And the control operating mode of the unit is **Voltage Source** (0). Please note that the user can send the Active Rectifier Control Word (register ***17004***) the value 0.

As GE in AC mode **only** Voltage Source operation mode is allowed.

CW_ControlOperationU	17004	**0: Voltage Source**
SW_ControlOperationU *(read only to confirm)*	16022	**0: Voltage Source**

To create a basic GRID at the output, the user must configure the following parameters:

- ***27052*** *to* ***27064*** *as global (1 channel)*

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

3.4.1. Example of Creating a GRID in 1 channel mode (AC mode)

A basic grid can be created by writing to the following registers *(as an example of single-phase European grid to generate at the output)*:

Frequency_Ramp_Output_Global	27052	Hz/s	*1.00*
Frequency_Output_SP_Global	27054	Hz	*50.00*
Grid_Output_Resistance_Global	27056	Ohm	*0.00*
Voltage_Ramp_AC_Output_Global_SP	27058	V/ms	*100.00*
Voltage_Ramp_Phase_Angle_Output_Global_SP	27060	deg/ms	*10.00*
Voltage_Fundamental_Phase_Angle_Global_SP	27062	deg	*0.00*
Voltage_Fundamental_AC_Global_SP	27064	V	*230.00*

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

4. ELECTRONIC LOAD: AC MODE

4.1. SETTING configuration in AC mode

First of all, it has to be sure that the equipment is configured and connected as an EL in AC control mode by selector (review the position of the output selectors). Check the position of the AC&DC switch selector and GE&EL switch selector. The unit will detect it automatically and show the EL and AC mode in its registers Status Word.

SW_GE_EL_Selector *(read only to confirm)*	16012	**0: EL mode**
SW_AC_DC_Selector_U *(read only to confirm)*	16006	**1: AC mode**
SW_AC_DC_Selector_V *(read only to confirm)*	16008	**1: AC mode**
SW_AC_DC_Selector_W *(read only to confirm)*	16010	**1: AC mode**

As a first configuration, it is necessary to define the control operating mode of the unit. Please note that changing the control operation mode between Current, Power and Impedance AC is possible in all status. The operating mode of the unit is defined by writing the appropriate value in the Active Rectifier Control Word (register ***17004*** *to* ***17008***).

An **EL** in AC mode, the following control operation modes are available (see table below). To configure the Operation control at the output it is necessary to send the correct value on register:

CW_ControlOperationU	17004	**1: Current Source** **2: Power Source** **3: Impedance AC**
CW_ControlOperationV	17006	**1: Current Source** **2: Power Source** **3: Impedance AC**
CW_ControlOperationW	17008	**1: Current Source** **2: Power Source** **3: Impedance AC**
SW_ControlOperationU *(read only to confirm)*	16022	**1: Current Source** **2: Power Source** **3: Impedance AC**
SW_ControlOperationV *(read only to confirm)*	16024	**1: Current Source** **2: Power Source** **3: Impedance AC**
SW_ControlOperationW *(read only to confirm)*	16026	**1: Current Source** **2: Power Source** **3: Impedance AC**

As EL in AC mode **only** Current, Power and Impedance AC operation mode is allowed.

4.2. Current operation mode

In Current Operation mode (CW_controlOperationX register send value 1), the unit will sink/source the current defined by the user.

CW_ControlOperationU	17004	**1: Current Source**
CW_ControlOperationV	17006	**1: Current Source**
CW_ControlOperationW	17008	**1: Current Source**
SW_ControlOperationU *(read only to confirm)*	16022	**1: Current Source**
SW_ControlOperationV *(read only to confirm)*	16024	**1: Current Source**
SW_ControlOperationW *(read only to confirm)*	16026	**1: Current Source**

As an AC Electronic Load, EL, in current control mode the user can configure:

- the magnitude in Arms of the **fundamental** current for each phase
- phase delay of the fundamental current for each phase
- the magnitude ramp of the setpoint for each phase
- the phase angle ramp of the setpoint for each phase

The Modbus register of these parameters are:

- ***27066*** *to* ***27072*** *setpoints for phase U,*
- ***27074*** *to* ***27080*** *setpoints for phase V,*
- ***27082*** *to* ***27088*** *setpoints for phase W,*

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

4.2.1.Example of Current operation mode (AC mode)

To simulate a 10A load per phase at the output, **this means a 'negative' value in current setpoint,** the user must send:

Current_Ramp_AC_Output_U_SP	27066	A/ms	*10.00*
Current_Ramp_Phase_Angle_Output_U_SP	27068	deg/ms	*1.00*
Current_Fundamental_Phase_Angle_U_SP	27070	deg	*0.00*
Current_Fundamental_AC_U_SP	27072	A	*-10.00*
Current_Ramp_AC_Output_V_SP	27074	A/ms	*10.00*
Current_Ramp_Phase_Angle_Output_V_SP	27076	deg/ms	*1.00*
Current_Fundamental_Phase_Angle_V_SP	27078	deg	*0.00*
Current_Fundamental_AC_V_SP	27080	A	*-12.00*
Current_Ramp_AC_Output_W_SP	27082	A/ms	*10.00*
Current_Ramp_Phase_Angle_Output_W_SP	27084	deg/ms	*1.00*
Current_Fundamental_Phase_Angle_W_SP	27086	deg	*0.00*
Current_Fundamental_AC_W_SP	27088	A	*-15.00*

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

4.3. Add Harmonics at the output current

The ePLUS family has 50 configurable harmonics per each phase. Please follow the table below to understand which values must be configured.

Number	Magnitude	Default values	Phase angle	Default values	Index	Default values
H2	configurable	0	configurable	0	configurable	2
…	…	…	…	…	…	…
H21	configurable	0	configurable	0	configurable	21
H22	configurable	0			H21+n (n=1)	22
…	…	…			…	…
H50	configurable	0			H21+n (n=29)	50

NOTE: to add harmonics at the output is necessary to write on the registers:

- ***27090*** *to* ***27188*** *for magnitude phase U (H2 to H50 and Ramp),*
- ***27390*** *to* ***27430*** *for index phase U (H2 to H21 and Ramp),*
- ***27516*** *to* ***27556*** *for phase angle phase U (H2 to H21 and Ramp),*

- ***27190*** *to* ***27288*** *for magnitude phase V (H2 to H50 and Ramp),*
- ***27432*** *to* ***27472*** *for index phase V (H2 to H21 and Ramp),*
- ***27558*** *to* ***27598*** *for phase angle phase V (H2 to H21 and Ramp),*

- ***27290*** *to* ***27388*** *for magnitude phase W (H2 to H50 and Ramp),*
- ***27474*** *to* ***27514*** *for index phase W (H2 to H21 and Ramp),*
- ***27600*** *to* ***27640*** *for phase angle phase W (H2 to H21 and Ramp),*

> ***Note***: The value of the fundamental current setpoint are values in **RMS**.
> The value of the harmonic setpoints are a **per unit** value over the fundamental current value, going through -1 to 1. For instance, a number 1 in H3 will add a third harmonic with the same magnitude as the fundamental value.

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

4.3.1. Example of Adding Harmonics at the output current

As an example, if the user would add harmonics at the output could write:

Amplitude_Ramp_AC_Harm_U_SP	27090	*1.00*
PU_Amplitude_H3_AC_U_SP	27094	*0.10*
Index_H3_AC_U_SP	27394	*3.00*
Phase_angle_H3_AC_U_SP	27520	*0.00*
Amplitude_Ramp_AC_Harm_V_SP	27190	*1.00*
PU_Amplitude_H5_AC_V_SP	27198	*0.10*
Index_H5_AC_V_SP	27440	*5.00*
Phase_angle_H3_AC_V_SP	27566	*0.00*
Amplitude_Ramp_AC_Harm_W_SP	27290	*1.00*
PU_Amplitude_H7_AC_W_SP	27302	*0.05*
Index_H7_AC_W_SP	27486	*7.00*
Phase_angle_H7_AC_W_SP	27612	*0.00*

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

4.4. Power operation mode

In Power Operation mode (CW_controlOperationX register send value 2), the unit will sink/source the power defined by the user.

CW_ControlOperationU	17004	**2: Power Source**
CW_ControlOperationV	17006	**2: Power Source**
CW_ControlOperationW	17008	**2: Power Source**
SW_ControlOperationU *(read only to confirm)*	16022	**2: Power Source**
SW_ControlOperationV *(read only to confirm)*	16024	**2: Power Source**
SW_ControlOperationW *(read only to confirm)*	16026	**2: Power Source**

As an AC Electronic Load, EL, in power control mode the user can configure:

- The magnitude of active power in W for each phase
- The magnitude of reactive power in VA for each phase
- The ramp magnitude of the power for each phase

The Modbus register of these parameters are:

Ramp_Power_AC	27716	W/ms
Magnitude_Power_Reactive_AC_U_SP	27718	VAr
Magnitude_Power_Reactive_AC_V_SP	27720	VAr
Magnitude_Power_Reactive_AC_W_SP	27722	VAr
Magnitude_Power_Active_AC_U_SP	27724	W
Magnitude_Power_Active_AC_V_SP	27726	W
Magnitude_Power_Active_AC_W_SP	27728	W

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

4.4.1. Example of Power operation mode (AC mode)

To simulate a 3kW load per phase at the output, **this means a 'negative' value in power setpoint,** the user must send:

Ramp_Power_AC	27716	W/ms	*1000.00*
Magnitude_Power_Reactive_AC_U_SP	27718	VAr	*0*
Magnitude_Power_Active_AC_U_SP	27724	W	*-3000.0*
Magnitude_Power_Reactive_AC_V_SP	27720	VAr	*0*
Magnitude_Power_Active_AC_V_SP	27726	W	*-3000.0*
Magnitude_Power_Reactive_AC_W_SP	27722	VAr	*1.00*
Magnitude_Power_Active_AC_W_SP	27728	W	*-3000.0*

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

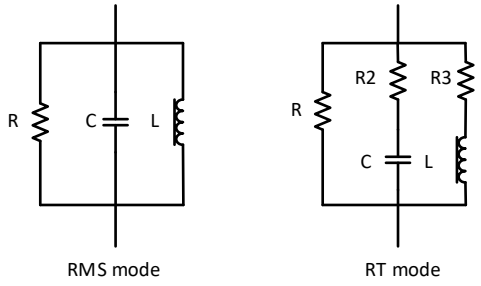
Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

4.5. Impedance operation mode

In Impedance Operation mode (CW_controlOperationX register send value 3), there is two different control mode for impedance simulation mode:

- an RMS simulation mode (RMS)
- a RealTime simulation mode (RT)



CW_EL_Sim_Mode	17024	**0: RMS mode** **1: RT mode**
SW_EL_Sim_Mode *(read only to confirm)*	16042	**0: RMS mode** **1: RT mode**

Please, read the specific manual for more information about this functionality.

The unit will act as an impedance equivalent circuit defined by the user.

CW_ControlOperationU	17004	**3: Impedance AC**
CW_ControlOperationV	17006	**3: Impedance AC**
CW_ControlOperationW	17008	**3: Impedance AC**
SW_ControlOperationU *(read only to confirm)*	16022	**3: Impedance AC**
SW_ControlOperationV *(read only to confirm)*	16024	**3: Impedance AC**
SW_ControlOperationW *(read only to confirm)*	16026	**3: Impedance AC**

As an AC Electronic Load, EL, in impedance control mode the user can configure:

- The magnitude of capacitance in uF for each phase
- The magnitude of inductance in mH for each phase
- The magnitude of resistance in Ohms for each phase
- The ramp magnitude of the PU impedance values for each phase

The Modbus register of these parameters are:

Ramp_Impedance_AC	27730	Ohm/ms	RMS/RT
Impedance_AC_Cutoff_freq_LPF	27732	Hz	RT
Magnitude_Capacitance_AC_U_SP	27734	uF	RMS/RT
Magnitude_Capacitance_AC_V_SP	27736	uF	RMS/RT
Magnitude_Capacitance_AC_W_SP	27738	uF	RMS/RT
Magnitude_Inductance_AC_U_SP	27740	mH	RMS/RT
Magnitude_Inductance_AC_V_SP	27742	mH	RMS/RT
Magnitude_Inductance_AC_W_SP	27744	mH	RMS/RT
Magnitude_Resistance_AC_U_SP	27746	Ohm	RMS/RT
Magnitude_Resistance_AC_V_SP	27748	Ohm	RMS/RT
Magnitude_Resistance_AC_W_SP	27750	Ohm	RMS/RT
Magnitude_Resistance_2_AC_U_SP	27752	Ohm	RT
Magnitude_Resistance_2_AC_V_SP	27754	Ohm	RT
Magnitude_Resistance_2_AC_W_SP	27756	Ohm	RT
Magnitude_Resistance_3_AC_U_SP	27758	Ohm	RT
Magnitude_Resistance_3_AC_V_SP	27760	Ohm	RT
Magnitude_Resistance_3_AC_W_SP	27762	Ohm	RT

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

5. DC UNITS: DC MODE

5.1. SETTING configuration in DC mode

First of all, it has to be sure that the equipment is configured as in DC mode by selector (review the position of the output selectors). Check the position of the AC&DC switch selector and GE&EL switch selector. The unit will detect it automatically and show the GE and DC mode in its registers Status Word.

SW_GE_EL_Selector *(read only to confirm)*	16012	**1: GE mode**
SW_AC_DC_Selector_U *(read only to confirm)*	16006	**0: DC mode**
SW_AC_DC_Selector_V *(read only to confirm)*	16008	**0: DC mode**
SW_AC_DC_Selector_W *(read only to confirm)*	16010	**0: DC mode**

Please, take into account that the unit can be operated in 3 channel or 1 channel output. Check the position of the 3channel&1channel switch selector.

SW_OutputConnection *(read only to confirm)*	16014	**0: 3 channel output** **1: 1 channel output**

Please, take into account that the unit can be operated in Unipolar or Bipolar mode. Check the position of the Unipolar&Bipolar switch selector.

SW_Bipolar *(read only to confirm)*	16018	**0: Unipolar** **1: Bipolar**

It is necessary to define the control operating mode of the unit. Please note that changing the control operation mode is possible in all status. The operating mode of the unit is defined by writing the appropriate value in the Active Rectifier Control Word (register ***17004*** *to* ***17008***).

An **DC unit**, the following control operation modes are available (see table below). To configure the Operation control at the output it is necessary to send the correct value on each register:

CW_ControlOperationU	17004	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Resistance DC** **4: Battery Test** (optional) **5: Battery Emulation** (optional) **6: PV Emulation** (optional)
CW_ControlOperationV	17006	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Resistance DC** **4: Battery Test** (optional) **5: Battery Emulation** (optional) **6: PV Emulation** (optional)

CW_ControlOperationW	17008	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Resistance DC** **4: Battery Test** (optional) **5: Battery Emulation** (optional) **6: PV Emulation** (optional)
SW_ControlOperationU *(read only to confirm)*	16022	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Resistance DC** **4: Battery Test** (optional) **5: Battery Emulation** (optional) **6: PV Emulation** (optional)
SW_ControlOperationV *(read only to confirm)*	16024	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Resistance DC** **4: Battery Test** (optional) **5: Battery Emulation** (optional) **6: PV Emulation** (optional)
SW_ControlOperationW *(read only to confirm)*	16026	**0: Voltage Source** **1: Current Source** **2: Power Source** **3: Resistance DC** **4: Battery Test** (optional) **5: Battery Emulation** (optional) **6: PV Emulation** (optional)

The operation control mode Battery Test, Battery Emulation and PV Emulation is **only** allowed if the optional is activated.

5.2. SETTING configuration in UNIPOLAR 3 CHANNELS (DC mode)

As a first configuration, it is necessary to confirm that the unit is operating as 3 channel output. Check the position of the 3channel&1channel switch selector. The unit will detect automatically and show the 3 channels on the register Status Word:

SW_OutputConnection *(read only to confirm)*	16014	**0: 3 channel output**

Please, confirm that the unit is configurated in Unipolar mode. Check the position of the Unipolar&Bipolar switch selector. The unit will detect automatically and shown the unipolar on the register Status Word:

SW_Bipolar *(read only to confirm)*	16018	**0: Unipolar**

5.2.1.Constant Voltage operation mode

Please, configure the control operating mode of the unit as **Voltage Source** (0). Please note that the user can send the Active Rectifier Control Word (register ***17004*** *to* ***17008***) the value 0.

CW_ControlOperationU	17004	**0: Voltage Source**
CW_ControlOperationV	17006	**0: Voltage Source**
CW_ControlOperationW	17008	**0: Voltage Source**
SW_ControlOperationU *(read only to confirm)*	16022	**0: Voltage Source**
SW_ControlOperationV *(read only to confirm)*	16024	**0: Voltage Source**
SW_ControlOperationW *(read only to confirm)*	16026	**0: Voltage Source**

As a DC unit in voltage source mode, the user can configure the following parameters:

- the magnitude in V_DC of the voltage of each phase
- the ramp magnitude of the setpoint from all phases

The Modbus register of these parameters are:

Ramp_Voltage_DC	27658	V/ms
Magnitude_Voltage_DC_U_SP	27660	V
Magnitude_Voltage_DC_V_SP	27662	V
Magnitude_Voltage_DC_W_SP	27664	V

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

Note: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.2.2.Constant Current operation mode

Please, configure the control operating mode of the unit as **Current Source** (1). Please note that the user can send the Active Rectifier Control Word (register ***17004*** *to* ***17008***) the value 1.

CW_ControlOperationU	17004	**1: Current Source**
CW_ControlOperationV	17006	**1: Current Source**
CW_ControlOperationW	17008	**1: Current Source**
SW_ControlOperationU *(read only to confirm)*	16022	**1: Current Source**
SW_ControlOperationV *(read only to confirm)*	16024	**1: Current Source**
SW_ControlOperationW *(read only to confirm)*	16026	**1: Current Source**

As a DC unit in current source mode, the user can configure the following parameters:

- the magnitude in A_DC of the current of each phase
- the ramp magnitude of the setpoint from all phases

The Modbus register of these parameters are:

Ramp_Current_DC	27674	A/ms
Magnitude_Current_DC_U_SP	27676	A
Magnitude_Current_DC_V_SP	27678	A
Magnitude_Current_DC_W_SP	27680	A

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

> ***Note***: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.2.3.Constant Power operation mode

Please, configure the control operating mode of the unit as **Power Source** (2). Please note that the user can send the Active Rectifier Control Word (register ***17004*** *to* ***17008***) the value 2.

CW_ControlOperationU	17004	**2: Power Source**
CW_ControlOperationV	17006	**2: Power Source**
CW_ControlOperationW	17008	**2: Power Source**

SW_ControlOperationU *(read only to confirm)*	16022	**2: Power Source**
SW_ControlOperationV *(read only to confirm)*	16024	**2: Power Source**
SW_ControlOperationW *(read only to confirm)*	16026	**2: Power Source**

As a DC unit in power source mode, the user can configure the following parameters:

- the magnitude in W_DC of the power of each phase
- the ramp magnitude of the setpoint from all phases

The Modbus register of these parameters are:

Ramp_Power_DC	27688	W/ms
Magnitude_Power_DC_U_SP	27690	W
Magnitude_Power_DC_V_SP	27692	W
Magnitude_Power_DC_W_SP	27694	W

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

Note: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.2.4.Constant Resistance operation mode

Please, configure the control operating mode of the unit as **Resistance Source** (3). Please note that the user can send the Active Rectifier Control Word (register ***17004*** *to* ***17008***) the value 3.

CW_ControlOperationU	17004	**3: Resistance Source**
CW_ControlOperationV	17006	**3: Resistance Source**
CW_ControlOperationW	17008	**3: Resistance Source**
SW_ControlOperationU *(read only to confirm)*	16022	**3: Resistance Source**
SW_ControlOperationV *(read only to confirm)*	16024	**3: Resistance Source**
SW_ControlOperationW *(read only to confirm)*	16026	**3: Resistance Source**

Please, note that the impedance is calculated as the parallel connection of a resistor defined in each register. As a DC load the user can configure:

- the magnitude in Ohms of the resistance of each phase
- the ramp magnitude of the setpoint from all phases

The Modbus register of these parameters are:

Ramp_Resistance_DC	27702	Ohm/ms
Magnitude_Resistance_DC_U_SP	27704	Ohm
Magnitude_Resistance_DC_V_SP	27706	Ohm
Magnitude_Resistance_DC_W_SP	27708	Ohm

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

Note: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.3. SETTING configuration in UNIPOLAR 1 CHANNEL (DC mode)

As a first configuration, it is necessary to confirm that the unit is operating as 1 channel output. Check the position of the 3channel&1channel switch selector. The unit will detect automatically and show the 1 channel on the register Status Word:

SW_OutputConnection *(read only to confirm)*	16014	**1: 1 channel output**

Please, confirm that the unit is configurated in Unipolar mode. Check the position of the Unipolar&Bipolar switch selector. The unit will detect automatically and shown the unipolar on the register Status Word:

SW_Bipolar *(read only to confirm)*	16018	**0: Unipolar**

5.3.1.Constant Voltage operation mode

Please, configure the control operating mode of the unit as **Voltage Source** (0). Please note that the user can send the Active Rectifier Control Word (register ***17004***) the value 0.

CW_ControlOperationU	17004	**0: Voltage Source**
SW_ControlOperationU *(read only to confirm)*	16022	**0: Voltage Source**

As a DC unit in voltage source mode, the user can configure the following parameters:

- the magnitude in V_DC of the voltage at the output
- the ramp magnitude of the setpoint

The Modbus register of these parameters are:

Ramp_Voltage_DC	27658	V/ms
Magnitude_Voltage_DC_Global_SP	27666	V

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

Note: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.3.2.Constant Current operation mode

Please, configure the control operating mode of the unit as **Current Source** (1). Please note that the user can send the Active Rectifier Control Word (register ***17004***) the value 1.

CW_ControlOperationU	17004	**1: Current Source**
SW_ControlOperationU *(read only to confirm)*	16022	**1: Current Source**

As a DC unit in current source mode, the user can configure the following parameters:

- the magnitude in A_DC of the current at the output
- the ramp magnitude of the setpoint

The Modbus register of these parameters are:

Ramp_Current_DC	27674	A/ms
Magnitude_Current_DC_Global_SP	27682	A

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

Note: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.3.3.Constant Power operation mode

Please, configure the control operating mode of the unit as **Power Source** (2). Please note that the user can send the Active Rectifier Control Word (register ***17004***) the value 2.

CW_ControlOperationU	17004	**2: Power Source**
SW_ControlOperationU *(read only to confirm)*	16022	**2: Power Source**

As a DC unit in power source mode, the user can configure the following parameters:

- the magnitude in W_DC of the power at the output
- the ramp magnitude of the setpoint

The Modbus register of these parameters are:

Ramp_Power_DC	27688	W/ms
Magnitude_Power_DC_Global_SP	27696	W

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

Note: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.3.4. Constant Resistance operation mode

Please, configure the control operating mode of the unit as **Resistance Source** (3). Please note that the user can send the Active Rectifier Control Word (register ***17004***) the value 3.

CW_ControlOperationU	17004	**3: Resistance Source**
SW_ControlOperationU *(read only to confirm)*	16022	**3: Resistance Source**

Please, note that the impedance is calculated as the parallel connection of a resistor defined in each register. As a DC load the user can configure:

- the magnitude in Ohms of the resistance at the output
- the ramp magnitude of the setpoint

The Modbus register of these parameters are:

Ramp_Resistance_DC	27702	Ohm/ms
Magnitude_Resistance_DC_Global_SP	27710	Ohm

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

> ***Note***: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.4. SETTING configuration in BIPOLAR (DC mode)

As a first configuration, it is necessary to confirm that the unit is operating as 3 channel output. Check the position of the 3channel&1channel switch selector. The unit will detect automatically and show the 3 channels on the register Status Word:

SW_OutputConnection *(read only to confirm)*	16014	**0: 3 channel output**

Please, confirm that the unit is configurated in Bipolar mode. Check the position of the Unipolar&Bipolar switch selector. The unit will detect automatically and shown the bipolar on the register Status Word:

SW_Bipolar *(read only to confirm)*	16018	**1: Bipolar**

Please read the specific manual, before operating it.

5.4.1. Constant Voltage operation mode

Please, configure the control operating mode of the unit as **Voltage Source** (0). Please note that the user can send the Active Rectifier Control Word (register ***17004***) the value 0.

CW_ControlOperationU	17004	**0: Voltage Source**
CW_ControlOperationW *(not used)*	17008	**0: Voltage Source**
SW_ControlOperationU *(read only to confirm)*	16022	**0: Voltage Source**
SW_ControlOperationW *(read only to confirm)*	16026	**0: Voltage Source**

As a DC unit in voltage source mode, the user can configure the following parameters:

- the magnitude in V_DC of the voltage of two phases
- the ramp magnitude of the setpoint from all phases

The Modbus register of these parameters are:

Ramp_Voltage_DC	27658	V/ms
Magnitude_Voltage_Bipolar_DC_U_SP	27668	V
Magnitude_Voltage_Bipolar_DC_W_SP	27670	V

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

Note: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.4.2.Constant Current operation mode

Please, configure the control operating mode of the unit as **Current Source** (1). Please note that the user can send the Active Rectifier Control Word (register ***17004***) the value 1.

CW_ControlOperationU	17004	**1: Current Source**
CW_ControlOperationW *(not used)*	17008	**1: Current Source**
SW_ControlOperationU *(read only to confirm)*	16022	**1: Current Source**
SW_ControlOperationW *(read only to confirm)*	16026	**1: Current Source**

As a DC unit in current source mode, the user can configure the following parameters:

- the magnitude in A_DC of the current of two phases
- the ramp magnitude of the setpoint from all phases

The Modbus register of these parameters are:

Ramp_Current_DC	27674	A/ms
Magnitude_Current_Bipolar_DC_U_SP	27684	A
Magnitude_Current_Bipolar_DC_W_SP	27686	A

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

> ***Note***: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.4.3.Constant Power operation mode

Please, configure the control operating mode of the unit as **Power Source** (2). Please note that the user can send the Active Rectifier Control Word (register ***17004***) the value 2.

CW_ControlOperationU	17004	**2: Power Source**
CW_ControlOperationW *(not used)*	17008	**2: Power Source**
SW_ControlOperationU *(read only to confirm)*	16022	**2: Power Source**
SW_ControlOperationW *(read only to confirm)*	16026	**2: Power Source**

As a DC unit in power source mode, the user can configure the following parameters:

- the magnitude in W_DC of the power of two phase
- the ramp magnitude of the setpoint from all phases

The Modbus register of these parameters are:

Ramp_Power_DC	27688	W/ms
Magnitude_Power_Bipolar_DC_U_SP	27698	W
Magnitude_Power_Bipolar_DC_W_SP	27700	W

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

> ***Note***: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.4.4.Constant Resistance operation mode

Please, configure the control operating mode of the unit as **Resistance Source** (3). Please note that the user can send the Active Rectifier Control Word (register ***17004***) the value 3.

CW_ControlOperationU	17004	**3: Resistance Source**
CW_ControlOperationW *(not used)*	17008	**3: Resistance Source**
SW_ControlOperationU *(read only to confirm)*	16022	**3: Resistance Source**
SW_ControlOperationW *(read only to confirm)*	16026	**3: Resistance Source**

Please, note that the impedance is calculated as the parallel connection of a resistor defined in each register. As a DC load the user can configure:

- the magnitude in Ohms of the resistance of two phase
- the ramp magnitude of the setpoint from all phases

The Modbus register of these parameters are:

Ramp_Resistance_DC	27702	Ohm/ms
Magnitude_Resistance_Bipolar_DC_U_SP	27712	Ohm
Magnitude_Resistance_Bipolar_DC_W_SP	27714	Ohm

Note that, in general, all registers representing any changes at the output (setpoint) are shadowed. Therefore, any changes on the setpoints, ramps and harmonics will not be executed until a trigger command has been sent. The trigger command is:

Trigger_Config	17020	1

In other words, to apply any voltage at the output it is necessary to write the new setpoint and, finally, send a 1 to the **TRIGGER_CONFIG** register. Only after the trigger sent the new setpoint will be applied.

Note: In this equipment, changing between DC control operation mode is possible in any state, even in Run state. Be safe and configure correctly the limits on DC to protect the EUT connected at the output.

5.5. SETTING configuration in BATTERY TEST (*Optional*) (DC mode)

This operation mode is an Optional. Be sure that your unit has this mode activated to operate it. Please read the specific manual, before operating it.

Please be sure that all parameters are appropriate for the battery where the Cinergia converter is connected. For example, an over current or voltage can make irreversible damages to the EUT.

The unit can operate in 3 channel (phase U, V and W) or 1 channel output (Global). Check the position of the 3channel&1channel switch selector. The unit will detect automatically and show the current state on the register Status Word:

SW_OutputConnection *(read only to confirm)*	16014	**0: 3 channel output** **1: 1 channel output**

Please, confirm that the unit is configurated in Unipolar mode. Check the position of the Unipolar&Bipolar switch selector. The unit will detect automatically and shown the unipolar on the register Status Word:

SW_Bipolar *(read only to confirm)*	16018	**0: Unipolar**

Take into account that the Battery Test option is not available in BIPOLAR control mode.

Please, configure the control operating mode of the unit as **Battery Test** (4). Please note that the user can send the Active Rectifier Control Word (register ***17004*** *to* ***17008***) the value 4.

CW_ControlOperationU	17004	**4: Battery Test**
CW_ControlOperationV	17006	**4: Battery Test**
CW_ControlOperationW	17008	**4: Battery Test**
SW_ControlOperationU *(read only to confirm)*	16022	**4: Battery Test**
SW_ControlOperationV *(read only to confirm)*	16024	**4: Battery Test**
SW_ControlOperationW *(read only to confirm)*	16026	**4: Battery Test**

5.5.1.Control Word parameters on Battery Test operation mode

The user can indicate or select the action to do with the power converter to initiate a charge or discharge test.

CW_Battery_Charger_U	27764	**0: Nothing** **1: Charge** **2: Discharge**
CW_Battery_Cycling_U	27766	**0: Nothing** **1: Cycling**
CW_Battery_Charger_V	27768	**0: Nothing** **1: Charge** **2: Discharge**
CW_Battery_Cycling_V	27770	**0: Nothing** **1: Cycling**
CW_Battery_Charger_W	27772	**0: Nothing** **1: Charge** **2: Discharge**
CW_Battery_Cycling_W	27774	**0: Nothing** **1: Cycling**
CW_Battery_Charger_Global	27776	**0: Nothing** **1: Charge** **2: Discharge**
CW_Battery_Cycling_Global	27778	**0: Nothing** **1: Cycling**

In case of CYLCING, the user must configure the parameter:

Max_Number_Cycle_Battery_U	27796
Max_Number_Cycle_Battery_V	27822
Max_Number_Cycle_Battery_W	27848
Max_Number_Cycle_Battery_Global	27874

5.5.1.Status Word parameters on Battery Test operation mode

As a Battery Test, the user can read the state of the charge/discharge test though the following parameters:

SW_Batt_Charging_Discharging_U	26002	**0: Nothing** **1: Charging** **2: Discharging**
SW_Batt_Charging_Step_U	26004	**0: Boosting** **1: Full charging** **2: Floating**
SW_Batt_End_of_Charge_U	26006	**0: Battery is not yet charged** **1: Battery is completely charged**
SW_Batt_End_of_Discharge_U	26008	**0: Battery is not yet discharged** **1: Battery is discharged**
SW_Batt_Cycling_U	26010	**0: OFF** **1: ON**
SW_Batt_Charging_Discharging_V	26012	**0: Nothing** **1: Charging** **2: Discharging**

SW_Batt_Charging_Step_V	26014	**0: Boosting** **1: Full charging** **2: Floating**
SW_Batt_End_of_Charge_V	26016	**0: Battery is not yet charged** **1: Battery is completely charged**
SW_Batt_End_of_Discharge_V	26018	**0: Battery is not yet discharged** **1: Battery is discharged**
SW_Batt_Cycling_V	26020	**0: OFF** **1: ON**
SW_Batt_Charging_Discharging_W	26022	**0: Nothing** **1: Charging** **2: Discharging**
SW_Batt_Charging_Step_W	26024	**0: Boosting** **1: Full charging** **2: Floating**
SW_Batt_End_of_Charge_W	26026	**0: Battery is not yet charged** **1: Battery is completely charged**
SW_Batt_End_of_Discharge_W	26028	**0: Battery is not yet discharged** **1: Battery is discharged**
SW_Batt_Cycling_W	26030	**0: OFF** **1: ON**
SW_Batt_Charging_Discharging_Global	26032	**0: Nothing** **1: Charging** **2: Discharging**
SW_Batt_Charging_Step_Global	26034	**0: Boosting** **1: Full charging** **2: Floating**
SW_Batt_End_of_Charge_Global	26036	**0: Battery is not yet charged** **1: Battery is completely charged**
SW_Batt_End_of_Discharge_Global	26038	**0: Battery is not yet discharged** **1: Battery is discharged**
SW_Batt_Cycling_Global	26040	**0: OFF** **1: ON**

5.5.2.SETTING configuration Battery Test Setpoints in 3 channel mode

The configuration parameters for BATTERY TEST operation mode can be modified in any state of the equipment, even in RUN. BE sure, before sending any parameter, that the EUT and the Cinergia converter will accept the changes.

The register to configure for phase U are:

Boost_Voltage_Battery_U	27780	V
Floating_Voltage_Battery_U	27782	V
Charging_Current_Battery_U	27784	A
Transition_Current_Boost2Floating_Battery_U	27786	A
Time_Boost_Battery_U	27788	s
Time_Floating_Battery_U	27790	s
Time_Transition_Battery_U	27792	s
Time_Discharge_Battery_U	27794	s
Max_Number_Cycle_Battery_U	27796	-
Ah_Stop_Charge_Battery_U	27798	Ah
Ah_Stop_Discharge_Battery_U	27800	Ah

Discharge_Current_Battery_U	27802	A
Discharge_Voltage_Battery_U	27804	V

The register to configure for phase V are:

Boost_Voltage_Battery_V	27806	V
Floating_Voltage_Battery_V	27808	V
Charging_Current_Battery_V	27810	A
Transition_Current_Boost2Floating_Battery_V	27812	A
Time_Boost_Battery_V	27814	s
Time_Floating_Battery_V	27816	s
Time_Transition_Battery_V	27818	s
Time_Discharge_Battery_V	27820	s
Max_Number_Cycle_Battery_V	27822	-
Ah_Stop_Charge_Battery_V	27824	Ah
Ah_Stop_Discharge_Battery_V	27826	Ah
Discharge_Current_Battery_V	27828	A
Discharge_Voltage_Battery_V	27830	V

The register to configure for phase W are:

Boost_Voltage_Battery_W	27832	V
Floating_Voltage_Battery_W	27834	V
Charging_Current_Battery_W	27836	A
Transition_Current_Boost2Floating_Battery_W	27838	A
Time_Boost_Battery_W	27840	s
Time_Floating_Battery_W	27842	s
Time_Transition_Battery_W	27844	s
Time_Discharge_Battery_W	27846	s
Max_Number_Cycle_Battery_W	27848	-
Ah_Stop_Charge_Battery_W	27850	Ah
Ah_Stop_Discharge_Battery_W	27852	Ah
Discharge_Current_Battery_W	27854	A
Discharge_Voltage_Battery_W	27856	V

5.5.1.SETTING configuration Battery Test Setpoints in 1 channel mode

The configuration parameters for BATTERY TEST operation mode can be modified in any state of the equipment, even in RUN. BE sure, before sending any parameter, that the EUT and the Cinergia converter will accept the changes.

The register to configure for GLOBAL are:

Boost_Voltage_Battery_Global	27858	V
Floating_Voltage_Battery_Global	27860	V
Charging_Current_Battery_Global	27862	A
Transition_Current_Boost2Floating_Battery_Global	27864	A
Time_Boost_Battery_Global	27866	s
Time_Floating_Battery_Global	27868	s

Time_Transition_Battery_Global	27870	s
Time_Discharge_Battery_Global	27872	s
Max_Number_Cycle_Battery_Global	27874	-
Ah_Stop_Charge_Battery_Global	27876	Ah
Ah_Stop_Discharge_Battery_Global	27878	Ah
Discharge_Current_Battery_Global	27880	A
Discharge_Voltage_Battery_Global	27882	V

5.5.2. Battery test operation mode OUTPUT registers

The user can read the voltage and current of each phase but also the *Q Capacity* in Ah. These values can be modified online while the converter is in Run state. It will be useful to count the Ah from the converter to the battery.

As a Battery Test the user can read the Ah counted by the converter:

Bat_mesured_Ah_U	26156	Ah
Bat_mesured_Ah_V	26158	Ah
Bat_mesured_Ah_W	26160	Ah
Bat_mesured_Ah_Global	26162	Ah

To reset these values, the user must write a 0 on each register to start counting again.

Bat_mesured_Ah_U	26156	0
Bat_mesured_Ah_V	26158	0
Bat_mesured_Ah_W	26160	0
Bat_mesured_Ah_Global	26162	0

5.6. SETTING configuration in BATTERY EMULATION (*Optional*) (DC mode)

This operation mode is an Optional. Be sure that your unit has this mode activated to operate it. Please read the specific manual, before operating it.

Please be sure that the battery to be emulated fills in the voltage and current limits of the Cinergia converter.

The unit can operate in 3 channel (phase U, V and W) or 1 channel output (Global). Check the position of the 3channel&1channel switch selector. The unit will detect automatically and show the current state on the register Status Word:

SW_OutputConnection *(read only to confirm)*	16014	**0: 3 channel output** **1: 1 channel output**

Please, confirm that the unit is configurated in Unipolar mode. Check the position of the Unipolar&Bipolar switch selector. The unit will detect automatically and shown the unipolar on the register Status Word:

SW_Bipolar *(read only to confirm)*	16018	**0: Unipolar**

Take into account that the Battery Emulation option is not available in BIPOLAR control mode.

Please, configure the control operating mode of the unit as **Battery Test** (5). Please note that the user can send the Active Rectifier Control Word (register ***17004*** *to* ***17008***) the value 5.

CW_ControlOperationU	17004	**5: Battery Emulation**
CW_ControlOperationV	17006	**5: Battery Emulation**
CW_ControlOperationW	17008	**5: Battery Emulation**
SW_ControlOperationU *(read only to confirm)*	16022	**5: Battery Emulation**
SW_ControlOperationV *(read only to confirm)*	16024	**5: Battery Emulation**
SW_ControlOperationW *(read only to confirm)*	16026	**5: Battery Emulation**

5.6.1.SETTING configuration Battery Emulation Setpoints in 3 channel mode

The configuration parameters for BATTERY EMULATION operation mode can be modified in any state of the equipment, even in RUN. BE sure, before sending any parameter, that the EUT and the Cinergia converter will accept the changes.

The register to configure for phase U are:

V_Constant_BE_U	27884	V
K_Polarisation_BE_U	27886	V/Ah
Q_Capacity_BE_U	27888	Ah
A_exp_Amp_BE_U	27890	V
B_exp_Time_BE_U	27892	1/Ah
Voltage_Output_DC_Resistance_U_Pos	27642	Ohm
Voltage_Output_DC_Resistance_U_Neg	27650	Ohm

The register to configure for phase V are:

V_Constant_BE_V	27894	V
K_Polarisation_BE_V	27896	V/Ah
Q_Capacity_BE_V	27898	Ah
A_exp_Amp_BE_V	27900	V
B_exp_Time_BE_V	27902	1/Ah
Voltage_Output_DC_Resistance_V_Pos	27644	Ohm
Voltage_Output_DC_Resistance_V_Neg	27652	Ohm

The register to configure for phase W are:

V_Constant_BE_W	27904	V
K_Polarisation_BE_W	27906	V/Ah
Q_Capacity_BE_W	27908	Ah
A_exp_Amp_BE_W	27910	V
B_exp_Time_BE_W	27912	1/Ah
Voltage_Output_DC_Resistance_W_Pos	27646	Ohm
Voltage_Output_DC_Resistance_W_Neg	27654	Ohm

5.6.1.SETTING configuration Battery Emulation Setpoints in 1 channel mode

The configuration parameters for BATTERY EMULATION operation mode can be modified in any state of the equipment, even in RUN. BE sure, before sending any parameter, that the EUT and the Cinergia converter will accept the changes.

The register to configure for GLOBAL mode are:

V_Constant_BE_Global	27914	V
K_Polarisation_BE_Global	27916	V/Ah
Q_Capacity_BE_Global	27918	Ah
A_exp_Amp_BE_Global	27920	V
B_exp_Time_BE_Global	27922	1/Ah
Voltage_Output_DC_Resistance_Global_Pos	27648	Ohm
Voltage_Output_DC_Resistance_Global_Neg	27656	Ohm

5.6.2. Battery Emulation operation mode OUTPUT registers

The user can read the voltage and current of each phase but also the *Q Capacity* in Ah. These values can be modified online while the converter is in Run state. It will be useful to count the Ah from the converter to the battery. The SOC [%] also can be read.

As a Battery Emulation the user can read the Ah counted by the converter:

Bat_mesured_Ah_U	26156	Ah
Bat_mesured_Ah_V	26158	Ah
Bat_mesured_Ah_W	26160	Ah
Bat_mesured_Ah_Global	26162	Ah

As a Battery Emulation the user can read the calculated value by the converter of the SOC:

SOC_BE_U	26164	%
SOC_BE_V	26166	%
SOC_BE_W	26168	%
SOC_BE_Global	26170	%

5.7. SETTING configuration in PV PANEL EMULATION (*Optional*) (DC mode)

This operation mode is an Optional. Be sure that your unit has this mode activated to operate it. Please read the specific manual, before operating it.

Please be sure that the PV panel to be emulated fills in the voltage and current limits of the Cinergia converter.

The unit can operate in 3 channel (phase U, V and W) or 1 channel output (Global). Check the position of the 3channel&1channel switch selector. The unit will detect automatically and show the current state on the register Status Word:

SW_OutputConnection *(read only to confirm)*	16014	**0: 3 channel output** **1: 1 channel output**

Please, confirm that the unit is configurated in Unipolar mode. Check the position of the Unipolar&Bipolar switch selector. The unit will detect automatically and shown the unipolar on the register Status Word:

SW_Bipolar *(read only to confirm)*	16018	**0: Unipolar**

Take into account that the PV panel Emulation option is not available in BIPOLAR control mode.

Please, configure the control operating mode of the unit as **PV Panel Emulation** (6). Please note that the user can send the Active Rectifier Control Word (register ***17004*** *to* ***17008***) the value 6.

CW_ControlOperationU	17004	**6: PV Panel Emulation**
CW_ControlOperationV	17006	**6: PV Panel Emulation**
CW_ControlOperationW	17008	**6: PV Panel Emulation**
SW_ControlOperationU *(read only to confirm)*	16022	**6: PV Panel Emulation**
SW_ControlOperationV *(read only to confirm)*	16024	**6: PV Panel Emulation**
SW_ControlOperationW *(read only to confirm)*	16026	**6: PV Panel Emulation**

5.7.1.SETTING configuration PV Panel Emulation Setpoints in 3 channel mode

The configuration parameters for PV PANEL EMULATION operation mode can be modified in any state of the equipment, even in RUN. BE sure, before sending any parameter, that the EUT and the Cinergia converter will accept the changes.

There are two registers that are used in in 3 channel (phase U, V and W) and even in 1 channel (Global) output configuration:

PV_Gref	27924	W/m2
PV_Tref	27926	ºC

The register to configure for phase U are:

PV_V_oc_U	27928	V
PV_V_mpp_U	27930	V
PV_I_sc_U	27932	A
PV_I_mpp_U	27934	A
PV_A_V_TempCoef_U	27936	V/ºC
PV_B_I_TempCoef_U	27938	A/ºC
PV_N_Serie_U	27940	W/m2
PV_N_Parallel_U	27942	ºC
PV_G_SP_U	27944	W/m2
PV_T_SP_U	27946	ºC

The register to configure for phase V are:

PV_V_oc_V	27948	V
PV_V_mpp_V	27950	V
PV_I_sc_V	27952	A
PV_I_mpp_V	27954	A
PV_A_V_TempCoef_V	27956	V/ºC
PV_B_I_TempCoef_V	27958	A/ºC
PV_N_Serie_V	27960	W/m2
PV_N_Parallel_V	27962	ºC
PV_G_SP_V	27964	W/m2
PV_T_SP_V	27966	ºC

The register to configure for phase W are:

PV_V_oc_W	27968	V
PV_V_mpp_W	27970	V
PV_I_sc_W	27972	A
PV_I_mpp_W	27974	A
PV_A_V_TempCoef_W	27976	V/ºC
PV_B_I_TempCoef_W	27978	A/ºC
PV_N_Serie_W	27980	W/m2
PV_N_Parallel_W	27982	ºC
PV_G_SP_W	27984	W/m2

PV_T_SP_W	27986	ºC

5.7.2.SETTING configuration Battery Emulation Setpoints in 1 channel mode

The configuration parameters for PV PANEL EMULATION operation mode can be modified in any state of the equipment, even in RUN. BE sure, before sending any parameter, that the EUT and the Cinergia converter will accept the changes.

There are two registers that are used in in 3 channel (phase U, V and W) and even in 1 channel (Global) output configuration:

PV_Gref	27924	W/m2
PV_Tref	27926	ºC

The register to configure for GLOBAL mode are:

PV_V_oc_Global	27988	V
PV_V_mpp_Global	27990	V
PV_I_sc_Global	27992	A
PV_I_mpp_Global	27994	A
PV_A_V_TempCoef_Global	27996	V/ºC
PV_B_I_TempCoef_Global	27998	A/ºC
PV_N_Serie_Global	28000	W/m2
PV_N_Parallel_Global	28002	ºC
PV_G_SP_Global	28004	W/m2
PV_T_SP_Global	28006	ºC

5.7.3.PV Panel Emulation operation mode OUTPUT registers

The user can read the voltage and current of each phase but also the *Temperature* and the *Irradiance* of the current test. These values can be modified online while the converter is in Run state.

As a PV Panel Emulation, the user can read the *Irradiance* of the current test:

PV_G_SP_U	27944	W/m2
PV_G_SP_V	27964	W/m2
PV_G_SP_W	27984	W/m2
PV_G_SP_Global	28004	W/m2

As a PV Panel Emulation, the user can read the *Temperature* of the current test:

PV_T_SP_U	27946	ºC
PV_T_SP_V	27966	ºC
PV_T_SP_W	27986	ºC
PV_T_SP_Global	28006	ºC

5.7.4.PV Panel Emulation RUN TIME mode

Please, read the manual for further information.

The user can emulate a RUN TIME test sending different values on the indicated registers. The user must prepare a list of values (each test to execute by the unit) to send on the indicated registers. The time between tests (lines) is the time that the Modbus must be waiting for sending the next values.

The registers used for this mode are the same indicated on chapter 5.7.3.