DELTA ELECTRONICS, INC.

Delta Protocol Definition

General Information	
Baud Rate	9600/19200(Default)/38400bps
Parity	None
Data Bits	8
Stop Bits	1
Addresses Mode	PLC Addresses Mode (Base 1)
Support Model	M6A/M8A/M10A/M15A/M20A/M30A/M50A/M88H/ M70A260/M100_210/M100_280/M125HV/M250HV
Module no support current shunt	M6A/M8A/M10A/M15A/M20A/M30A/M50A/M100_210
Module no support IV-Curve	M6A/M8A/M10A/M15A/M20A/M30A/M50A

Version 1.18

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Version History

Date	Version	Changes	Editer
Aug-18-2020	V01.18	Add: DC7~12	Roy
Jul-10-2020	V01.17	Add: VI Curve Operation Flag bit 9: Procedure_NoString_ForceDone Modify: General Information	Roy
Mar-27-2020	V01.16	Add: Model M100_210 F51, F52	Roy
Nov-18-2019	V01.15	Add: Event time	Roy
Nov-7-2019	V01.14	Modify: Voltage-1-Line, Voltage-2-Line, Voltage-3-Line address	Roy
Oct-23-2019	V01.13	Add: Model M70A260	Roy
Aug-26-2019	V01.12	Add: P(U) Reactive night mode Q of Pac 24/7	Roy
Aug-01-2019	V01.11	Modify TEMPERATURE INFORMATION Add Inverter State CHECK_PV_POWER	Roy
Apr-03-2019	V01.10	Add: VI-Curve Extend_Reclosure_time	Roy
Aug-23-2018	V01.09	Add: External Control	ChihChun
Jun-05-2018	V01.08	Modify: Modbus Message Format	ChihChun
May-11-2018	V01.07	Add: Q(t), Derating Log Modify: Q(P)_Lower_Limit 24/7, Q(P)_Upper_Limit 24/7, DC Information	ChihChun
Mar-22-2018	V01.06	Add: CONSTANT COSPHI, COSPHI(P), CONSTANT Q, Q(V)	ChihChun
Mar-14-2018	V01.05	Modify: Today Energy, EVENT CODE TABLE, Insulation Mode	ChihChun
Dec-5-2017	V01.04	Add: REACTIVE POWER CONTROL, YEAR ENERGY LOG, POWER QUALITY INFORMATION Modify: SCALE FACTOR	ChihChun
May-18-2017	V01.03	Add: Ramp Rate, P(F), Fixed CosPhi, Q(U), Fixed Q	ChihChun
May-10-2017	V01.02	Update description of Scale Factor	ChihChun
May-09-2017	V01.01	Update Menu	ChihChun
Apr-07-2017	V01.00	First draft	ChihChun

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1. Message Format

Address	Function Code	Data	Error Check
1 byte	1 bytes	<=252 byte	2 bytes

1.1 Address

PCS ID=1～254 (Default : 1)(By Modbus definition, 0 is for broadcast only)

1.2 Function Code

0x03: Read Holding Register

0x04: Read Input Register

0x06: Write Single Register

1.3 Data

Information received from target

1.4 Error Check

CRC

2. MODBUS Message Format

2.1 Read Holding Registers (0x03)

INQUIRY : Computer→ PCS

Address	Function Code	Data				Error Check	
1～254	0x03	Starting Address HI	Starting Address LO	No of Registers HI	No of Registers LO	Error Check LO	Error Check HI

RESPONSE : PCS → Computer

Address	Function Code	Data						Error Check	
1～254	0x03	Byte Count	Data HI	Data LO	Data HI	Data LO	……	Error Check LO	Error Check HI

ERROR: PCS→ Computer

Address	Function Code	Data	Error Check	
1～254	0x83	0x01 or 0x02 or 0x03 or 0x04	Error Check LO	Error Check HI

PS. starting Address : 0x0000 to 0xFFFF

No of Registers : 1 to 125 (0x7D)

2.2 Read Input Registers (0x04)

INQUIRY : Computer→ PCS

Address	Function Code	Data				Error Check	
1～254	0x04	Starting Address HI	Starting Address LO	No of Registers HI	No of Registers LO	Error Check LO	Error Check HI

RESPONSE : PCS→ Computer

Address	Function Code	Data						Error Check	
1～254	0x04	Byte Count	Data HI	Data LO	Data HI	Data LO	……	Error Check LO	Error Check HI

ERROR: PCS→ Computer

Address	Function Code	Data	Error Check	
1～254	0x84	0x01 or 0x02 or 0x03 or 0x04	Error Check LO	Error Check HI

PS. starting Address : 0x0000 to0xFFFF

No of Registers : 1 to 125 (0x7D)

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2.3 Write Single Register (0x06)

INQUIRY : Computer → PCS

Address	Function Code	Data				Error Check	
1～254	0x06	Register Address HI	Register Address LO	Write Data HI	Write Data HI	Error Check LO	Error Check Hi

RESPONSE : PCS→ computer

Address	Function Code	Data				Error Check	
1～254	0x06	Register Address HI	Register Address LO	Write Data HI	Write Data HI	Error Check LO	Error Check HI

ERROR: PCS→ computer

Address	Function Code	Data	Error Check	
1～254	0x86	0x01 or 0x02 or 0x03 or 0x04	Error Check LO	Error Check HI

PS. Register Address : 0x0000 to 0xFFFF

Write Data : 0x0000 or 0xFFFF

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3. Memory Map ～ Read Only (Input Registers)

<SYSTEM INFORMATION>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	*Description*
408	1032	N/A	N/A	Inverter ID	N/A	*RS485 ID*
409	1033	318	792	Year	1 Year	*Refer to below*
40A	1034	319	793	Month	1 Month	
40B	1035	31A	794	Date	1 Day	
40C	1036	324	804	Hour	1 Hour	
40D	1037	325	805	Minute	1 Minute	
40E	1038	326	806	Second	1 Second	

For example, if received the following information.

Addr	*1033*	*1034*	*1035*	*1036*	*1037*	*1038*
Data	*2017*	*4*	*7*	*15*	*50*	*40*

The inverter's time is 2017/04/07-15:50:40.

410	1040	A003	40963	FW1(COMM) Revision	N/A	*ex : 0x0A0B => Ver10.11*
411	1041	A004	40964	FW1(COMM) Date	N/A	*ex : 0x082D => Year08Week45*
412	1042	A005	40965	FW2(DSP) Revision	N/A	*ex : 0x0A0B => Ver10.11*
413	1043	A006	40966	FW2(DSP) Date	N/A	*ex : 0x082D => Year08Week45*
414	1044	A007	40967	FW3(RED) Revision	N/A	*ex : 0x0A0B => Ver10.11*
415	1045	A008	40968	FW3(RED) Date	N/A	*ex : 0x082D => Year08Week45*
416	1046	A009	40969	FW4(ARC) Revision	N/A	*ex : 0x0A0B => Ver10.11*
417	1047	A00A	40970	FW4(ARC) Date	N/A	*ex : 0x082D => Year08Week45*
N/A	N/A	A00B	40971	FW5(CS) Revision	N/A	*ex : 0x0A0B => Ver10.11*
N/A	N/A	A00C	40972	FW5(CS) Date	N/A	*ex : 0x082D => Year08Week45*
470	1136	A00F	40975	Serial number 0,1	N/A	*(Refer to below)*
471	1137	A010	40976	Serial number 2,3	N/A	
472	1138	A011	40977	Serial number 4,5	N/A	
473	1139	A012	40978	Serial number 6,7	N/A	
474	1140	A013	40979	Serial number 8,9	N/A	
475	1141	A014	40980	Serial number 10,11	N/A	
476	1142	A015	40981	Serial number 12,13	N/A	
477	1143	A016	40982	Serial number 14,15	N/A	

Following ASCII code, If received the following information.

Addr	*1136*		*1137*		*1138*		*1139*		*1140*		*1141*		*1142*		*1143*	
Data	*0x5745*		*0x3039*		*0x3530*		*0x3030*		*0x3031*		*0x0000*		*0x0000*		*0x0000*	
	W	*E*	*0*	*9*	*5*	*0*	*0*	*0*	*0*	*1*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

The serial number of the inverter is: WE09500001.

490	1168	N/A	N/A	Installation Year	N/A	*Refer to below*
491	1169	N/A	N/A	Installation Month	N/A	
492	1170	N/A	N/A	Installation Date	N/A	

For example, if received the following information.

Addr	*1168*	*1169*	*1170*
Data	*2017*	*3*	*4*

The inverter is installed at 2017/03/04.

<GENERAL INVERTER INFORMATION>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
430	1072	D000	53248	Today Energy	Refer below	*1072:Low Word* *1073:High Word*
431	1073	D001	53249			
432	1074	D002	53250	Today Runtime	1s	*1074:Low Word* *1075:High Word*
433	1075	D003	53251			
434	1076	D004	53252	Life Energy	※	*1076:Low Word* *1077:High Word*
435	1077	D005	53253			
436	1078	D006	53254	Life Runtime	1s	*1078:Low Word* *1079:High Word*
437	1079	D007	53255			
418	1048	D008	53256	Inverter State	N/A	*0: Standby* *1: Countdown* *2: On* *3: No DC* *4: Alarm* *8: CHECK_PV_POWER*
419	1049	D00A	53257	Reconnected Time	1s	*Current inverter countdown timer*

Unit of Today Energy:
For Old address (1072, 1072): Follow Scale Factor

For New address (53248, 53249), if the value of Scale Factor is not 0, then follow Scale Factor. Otherwise, follow the rule below:
Read value from IR:40962, then follow rule below to decide unit:
If the value of IR: 40962 is…
0~999:
Unit of IR(53248, 53249) is 1Wh.
1000~9999:
Unit of IR(53248, 53249) is 10Wh.

※: Follow Scale factor

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<LEAKAGE INFORMATION>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	D028	53288	R1 Leakage	1kohm	*0xFFFF: Invalid*
N/A	N/A	D02C	53292	R2 Leakage	1kohm	
N/A	N/A	D100	53504	Max R1 Leakage	1kohm	*Daily Maximum and minimum 0xFFFF: Invalid*
N/A	N/A	D101	53505	Min R1 Leakage	1kohm	
N/A	N/A	D102	53506	Max R2 Leakage	1kohm	
N/A	N/A	D103	53507	Min R2 Leakage	1kohm	

<TEMPERATURE INFORMATION>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	*Description*
438	1080	D00B	53259	Ambient Temperature	1℃	
439	1081	D00C	53260	Boost 1 Temperature	1℃	
43A	1082	D00D	53261	Boost 2 Temperature	1℃	
43B	1083	D00E	53262	Inverter Temperature	1℃	
480	1152	D049	53321	Max Ambient Temperature	1℃	
481	1153	D04A	53322	Max Boost 1 Temperature	1℃	
482	1154	D04B	53323	Max Boost 2 Temperature	1℃	
483	1155	D04B	53323	Max Inverter Temperature	1℃	
N/A	N/A	D053	53331	Min Ambient Temperature	1℃	
N/A	N/A	D054	53332	Min Boost 1 Temperature	1℃	
N/A	N/A	D055	53333	Min Boost 2 Temperature	1℃	
N/A	N/A	D056	53334	Min Inverter Temperature	1℃	

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<CURRENT SHUNT INFORMATION>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	D210	53776	String1	※	*Current Value of String1*
N/A	N/A	D211	53777	String2	※	*Current Value of String2*
N/A	N/A	D212	53778	String3	※	*Current Value of String3*
N/A	N/A	D213	53779	String4	※	*Current Value of String4*
N/A	N/A	D214	53780	String5	※	*Current Value of String5*
N/A	N/A	D215	53781	String6	※	*Current Value of String6*
N/A	N/A	D216	53782	String7	※	*Current Value of String7*
N/A	N/A	D217	53783	String8	※	*Current Value of String8*
N/A	N/A	D218	53784	String9	※	*Current Value of String9*
N/A	N/A	D219	53785	String10	※	*Current Value of String10*
N/A	N/A	D21A	53786	String11	※	*Current Value of String11*
N/A	N/A	D21B	53787	String12	※	*Current Value of String12*
N/A	N/A	D21C	53788	String13	※	*Current Value of String13*
N/A	N/A	D21D	53789	String14	※	*Current Value of String14*
N/A	N/A	D21E	53790	String15	※	*Current Value of String15*
N/A	N/A	D21F	53791	String16	※	*Current Value of String16*
N/A	N/A	D220	53792	String17	※	*Current Value of String17*
N/A	N/A	D221	53793	String18	※	*Current Value of String18*
N/A	N/A	D222	53794	String19	※	*Current Value of String19*
N/A	N/A	D223	53795	String20	※	*Current Value of String20*
N/A	N/A	D224	53796	String21	※	*Current Value of String21*
N/A	N/A	D225	53797	String22	※	*Current Value of String22*
N/A	N/A	D226	53798	String23	※	*Current Value of String23*
N/A	N/A	D227	53799	String24	※	*Current Value of String24*
N/A	N/A	D228	53800	String25	※	*Current Value of String25*
N/A	N/A	D229	53801	String26	※	*Current Value of String26*

N/A	N/A	D22A	53802	String27	※	*Current Value of String27*
N/A	N/A	D22B	53803	String28	※	*Current Value of String28*
N/A	N/A	D22C	53804	String29	※	*Current Value of String29*
N/A	N/A	D22D	53805	String30	※	*Current Value of String30*
N/A	N/A	D22E	53806	String31	※	*Current Value of String31*
N/A	N/A	D22F	53807	String32	※	*Current Value of String32*
N/A	N/A	D230	53808	String33	※	*Current Value of String33*
N/A	N/A	D231	53809	String34	※	*Current Value of String34*
N/A	N/A	D232	53810	String35	※	*Current Value of String35*
N/A	N/A	D233	53811	String36	※	*Current Value of String36*
N/A	N/A	D234	53812	String37	※	*Current Value of String37*
N/A	N/A	D235	53813	String38	※	*Current Value of String38*
N/A	N/A	D236	53814	String39	※	*Current Value of String39*
N/A	N/A	D237	53815	String40	※	*Current Value of String40*
N/A	N/A	D238	53816	String41	※	*Current Value of String41*
N/A	N/A	D239	53817	String42	※	*Current Value of String42*
N/A	N/A	D23A	53818	String43	※	*Current Value of String43*
N/A	N/A	D23B	53819	String44	※	*Current Value of String44*
N/A	N/A	D23C	53820	String45	※	*Current Value of String45*
N/A	N/A	D23D	53821	String46	※	*Current Value of String46*
N/A	N/A	D23E	53822	String47	※	*Current Value of String47*
N/A	N/A	D23F	53823	String48	※	*Current Value of String48*
N/A	N/A	D240	53824	String49	※	*Current Value of String49*
N/A	N/A	D241	53825	String50	※	*Current Value of String50*
N/A	N/A	D242	53826	String51	※	*Current Value of String51*
N/A	N/A	D243	53827	String52	※	*Current Value of String52*
N/A	N/A	D244	53828	String53	※	*Current Value of String53*
N/A	N/A	D245	53829	String54	※	*Current Value of String54*
N/A	N/A	D246	53830	String55	※	*Current Value of String55*

N/A	N/A	D247	53831	String56	※	*Current Value of String56*
N/A	N/A	D248	53832	String57	※	*Current Value of String57*
N/A	N/A	D249	53833	String58	※	*Current Value of String58*
N/A	N/A	D24A	53834	String59	※	*Current Value of String59*
N/A	N/A	D24B	53835	String60	※	*Current Value of String60*
N/A	N/A	D24C	53836	String61	※	*Current Value of String61*
N/A	N/A	D24D	53837	String62	※	*Current Value of String62*
N/A	N/A	D24E	53838	String63	※	*Current Value of String63*
N/A	N/A	D24F	53839	String64	※	*Current Value of String64*

※: Follow Scale factor

<EVENT LIST>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	440	1088	*Event Index (HR: 801)*	N/A	*(Refer to below)*
N/A	N/A	441	1089	*Event (index*10+0)*	N/A	
N/A	N/A	442	1090	*Event (index*10+1)*	N/A	
N/A	N/A	443	1091	*Event (index*10+2)*	N/A	
N/A	N/A	444	1092	*Event (index*10+3)*	N/A	
N/A	N/A	445	1093	*Event (index*10+4)*	N/A	
N/A	N/A	446	1094	*Event (index*10+5)*	N/A	
N/A	N/A	447	1095	*Event (index*10+6)*	N/A	
N/A	N/A	448	1096	*Event (index*10+7)*	N/A	
N/A	N/A	449	1097	*Event (index*10+8)*	N/A	
N/A	N/A	44A	1098	*Event (index*10+9)*	N/A	

(IR: 1088)
This shall be assigned via Holding Registers (801) first when reading the events.
The event index is the page index.
For current design in PV inverter the maximum event is 30, so the index is from 0 to 2.
If the index is equal to 0, the event with index from 0 to 9 will be reported.
If the index is equal to 1, the event with index from 10 to 19 will be reported, and so on.
Error code refer to APPENDIX C

DELTA ELECTRONICS, INC.

<EVENT Time>

Address (Hex)	Address (Dec)	Command	Unit	Description
4A0	1184	Event time (index+0)	Sec	*1184: Low word,* *1185:High Word.* *The cumulative seconds from 1970* *0xFFFFFFFF: Not available*
4A1	1185			
4A2	1186	Event time (index+1)	Sec	
4A3	1187			
4A4	1188	Event time (index+2)	Sec	
4A5	1189			
4A6	1190	Event time (index+3)	Sec	
4A7	1191			
4A8	1192	Event time (index+4)	Sec	
4A9	1193			
4AA	1194	Event time (index+5)	Sec	
4AB	1195			
4AC	1196	Event time (index+6)	Sec	
4AD	1197			
4AE	1198	Event time (index+7)	Sec	
4AF	1199			
4B0	1200	Event time (index+8)	Sec	
4B1	1201			
4B2	1202	Event time (index+9)	Sec	
4B3	1203			

(IR: 1088)
This shall be assigned via Holding Registers (801) first when reading the events.
The event index is the page index.
For current design in PV inverter the maximum event is 30, so the index is from 0 to 2.
If the index is equal to 0, the event with index from 0 to 9 will be reported.
If the index is equal to 1, the event with index from 10 to 19 will be reported, and so on.
Error code refer to APPENDIX C

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<SCALE FACTOR>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	A023	40995	Scale Factor	N/A	*(Refer to below)*

<Important!>
If received "Illegal Data Address" while accessing this address.
Use default scale of Monitoring software. Otherwise, refer to the following instruction.

bit0: All default
(0: Disable; 1: Enable)

bit1 ~ bit2: Idc
(0: default ; 1: 0.01A ; 2: 0.1A ; 3: 1.0A)

bit3 ~ bit5: W & Var & Quarter(W → Wh)
(0: reserved ; 1: 0.1W ; 2: 1W ; 3: 10W ; 4: 100W ;
5: 1000W)

bit6 ~ bit9: Wh
(0: default ; 1: 1mWh ; 2: 10mWh ; 3: 100mWh ; 4: 1Wh ; 5: 10Wh ; 6: 100Wh ; 7: 1000Wh)

bit10 ~ bit11: Iac
(0: default ; 1: 0.01A ; 2: 0.1A ; 3: 1.0A)

bit12 ~ bit13: V
(0: default ; 1: 0.01V ; 2: 0.1V ; 3: 1.0V)

bit14~15 : reserved

PS.
1. bit6 ~ bit9, unless unit of Quarter Energy

2. bit3 ~ bit5 also use in unit of Quarter Energy (W → Wh)
Quarter default: 1Wh

3. when read Idc, W, Wh, Iac, V => 0 or bit0 = 1 :
single phase default : 0.01A / 1W / 1Wh / 0.01A / 0.1V
triple phase default : 0.01A / 1W / 10Wh / 0.01A / 0.1V

Example1:
When a triple phase inverter received: 0000000110010011
As bit 0 = 1, this inverter use all default scale(Do not care the other bits):
0.01A / 1W / 10Wh / 0.01A / 0.1V

Example2:
When a triple phase inverter received: 0000000110011100
We could separate it into several part: 00 00 00 0110 011 10 0
As bit 0 = 0 -> don't use default scale.
Bit 1~2 = 2 -> 0.1A for Idc
Bit 3~5 = 3 -> 10W for W
Bit 6~9 = 6 -> 100Wh for Wh
Bit10~11 = 0 -> use default scale, 0.01A for Iac
Bit 12~13 = 0 -> use default scale, 0.1V for V

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<DAILY ENERGY LOG>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
800	2048	N/A	N/A	Day-0 Wh (Today)	※	*2048: Low word* *2049:High Word*
801	2049	N/A	N/A			
802	2050	N/A	N/A	Day-1 Wh (Yesterday)	※	
803	2051	N/A	N/A			
804	2052	N/A	N/A	Day-2 Wh	※	
805	2053	N/A	N/A			
806	2054	N/A	N/A	Day-3 Wh	※	
807	2055	N/A	N/A			
808	2056	N/A	N/A	Day-4 Wh	※	
809	2057	N/A	N/A			
80A	2058	N/A	N/A	Day-5 Wh	※	
80B	2059	N/A	N/A			
80C	2060	N/A	N/A	Day-6 Wh	※	
80D	2061	N/A	N/A			
80E	2062	N/A	N/A	Day-7 Wh	※	
80F	2063	N/A	N/A			
810	2064	N/A	N/A	Day-8 Wh	※	
811	2065	N/A	N/A			
812	2066	N/A	N/A	Day-9 Wh	※	
813	2067	N/A	N/A			
814	2068	N/A	N/A	Day-10 Wh	※	
815	2069	N/A	N/A			
816	2070	N/A	N/A	Day-11 Wh	※	
817	2071	N/A	N/A			
818	2072	N/A	N/A	Day-12 Wh	※	
819	2073	N/A	N/A			
81A	2074	N/A	N/A	Day-13 Wh	※	
81B	2075	N/A	N/A			
81C	2076	N/A	N/A	Day-14 Wh	※	
81D	2077	N/A	N/A			
81E	2078	N/A	N/A	Day-15 Wh	※	
81F	2079	N/A	N/A			
820	2080	N/A	N/A	Day-16 Wh	※	
821	2081	N/A	N/A			
822	2082	N/A	N/A	Day-17 Wh	※	
823	2083	N/A	N/A			
824	2084	N/A	N/A	Day-18 Wh	※	
825	2085	N/A	N/A			
826	2086	N/A	N/A	Day-19 Wh	※	
827	2087	N/A	N/A			
828	2088	N/A	N/A	Day-20 Wh	※	
829	2089	N/A	N/A			
82A	2090	N/A	N/A	Day-21 Wh	※	
82B	2091	N/A	N/A			
82C	2092	N/A	N/A	Day-22 Wh	※	
82D	2093	N/A	N/A			
82E	2094	N/A	N/A	Day-23 Wh	※	
82F	2095	N/A	N/A			

830	2096	N/A	N/A	Day-24 Wh	※	
831	2097	N/A	N/A			
832	2098	N/A	N/A	Day-25 Wh	※	
833	2099	N/A	N/A			
834	2100	N/A	N/A	Day-26 Wh	※	
835	2101	N/A	N/A			
836	2102	N/A	N/A	Day-27 Wh	※	
837	2103	N/A	N/A			
838	2104	N/A	N/A	Day-28 Wh	※	
839	2105	N/A	N/A			
83A	2106	N/A	N/A	Day-29 Wh	※	
83B	2107	N/A	N/A			
83C	2108	N/A	N/A	Day-30 Wh	※	
83D	2109	N/A	N/A			
83E	2110	N/A	N/A	Day-31 Wh	※	
83F	2111	N/A	N/A			

※: Follow Scale factor

<MONTH ENERGY LOG>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
840	2112	N/A	N/A	Month-0 Wh (Current Month)	※	*2112:Low Word 2113:High Word*
841	2113	N/A	N/A			
842	2114	N/A	N/A	Month-1 Wh (Last Month)	※	
843	2115	N/A	N/A			
844	2116	N/A	N/A	Month-2 Wh	※	
845	2117	N/A	N/A			
846	2118	N/A	N/A	Month-3 Wh	※	
847	2119	N/A	N/A			
848	2120	N/A	N/A	Month-4 Wh	※	
849	2121	N/A	N/A			
84A	2122	N/A	N/A	Month-5 Wh	※	
84B	2123	N/A	N/A			
84C	2124	N/A	N/A	Month-6 Wh	※	
84D	2125	N/A	N/A			
84E	2126	N/A	N/A	Month-7 Wh	※	
84F	2127	N/A	N/A			
850	2128	N/A	N/A	Month-8 Wh	※	
851	2129	N/A	N/A			
852	2130	N/A	N/A	Month-9 Wh	※	
853	2131	N/A	N/A			
854	2132	N/A	N/A	Month-10 Wh	※	
855	2133	N/A	N/A			
856	2134	N/A	N/A	Month-11 Wh	※	
857	2135	N/A	N/A			
858	2136	N/A	N/A	Month-12 Wh	※	
859	2137	N/A	N/A			
85A	2138	N/A	N/A	Month-13 Wh	※	
85B	2139	N/A	N/A			

85C	2140	N/A	N/A	Month-14 Wh	※	
85D	2141	N/A	N/A			
85E	2142	N/A	N/A	Month-15 Wh	※	
85F	2143	N/A	N/A			
860	2144	N/A	N/A	Month-16 Wh	※	
861	2145	N/A	N/A			
862	2146	N/A	N/A	Month-17 Wh	※	
863	2147	N/A	N/A			
864	2148	N/A	N/A	Month-18 Wh	※	
865	2149	N/A	N/A			
866	2150	N/A	N/A	Month-19 Wh	※	
867	2151	N/A	N/A			
868	2152	N/A	N/A	Month-20 Wh	※	
869	2153	N/A	N/A			
86A	2154	N/A	N/A	Month-21 Wh	※	
86B	2155	N/A	N/A			
86C	2156	N/A	N/A	Month-22 Wh	※	
86D	2157	N/A	N/A			
86E	2158	N/A	N/A	Month-23 Wh	※	
86F	2159	N/A	N/A			

※: Follow Scale factor

<YEAR ENERGY LOG>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
9C0	2496	N/A	N/A	Year-0 Wh (Current Year)	※	*2496:Low Word 2497:High Word*
9C1	2497	N/A	N/A			
9C2	2498	N/A	N/A	Year-1 Wh (Last Year)	※	
9C3	2499	N/A	N/A			
9C4	2500	N/A	N/A	Year-2 Wh	※	
9C5	2501	N/A	N/A			
9C6	2502	N/A	N/A	Year-3 Wh	※	
9C7	2503	N/A	N/A			
9C8	2504	N/A	N/A	Year-4 Wh	※	
9C9	2505	N/A	N/A			
9CA	2506	N/A	N/A	Year-5 Wh	※	
9CB	2507	N/A	N/A			
9CC	2508	N/A	N/A	Year-6 Wh	※	
9CD	2509	N/A	N/A			
9CE	2510	N/A	N/A	Year-7 Wh	※	
9CF	2511	N/A	N/A			
9D0	2512	N/A	N/A	Year-8 Wh	※	
9D1	2513	N/A	N/A			
9D2	2514	N/A	N/A	Year-9 Wh	※	
9D3	2515	N/A	N/A			
9D4	2516	N/A	N/A	Year-10 Wh	※	
9D5	2517	N/A	N/A			
9D6	2518	N/A	N/A	Year-11 Wh	※	
9D7	2519	N/A	N/A			

9D8	2520	N/A	N/A	Year-12 Wh	※	
9D9	2521	N/A	N/A			
9DA	2522	N/A	N/A	Year-13 Wh	※	
9DB	2523	N/A	N/A			
9DC	2524	N/A	N/A	Year-14 Wh	※	
9DD	2525	N/A	N/A			
9DE	2526	N/A	N/A	Year-15 Wh	※	
9DF	2527	N/A	N/A			
9E0	2528	N/A	N/A	Year-16 Wh	※	
9E1	2529	N/A	N/A			
9E2	2530	N/A	N/A	Year-17 Wh	※	
9E3	2531	N/A	N/A			
9E4	2532	N/A	N/A	Year-18 Wh	※	
9E5	2533	N/A	N/A			
9E6	2534	N/A	N/A	Year-19 Wh	※	
9E7	2535	N/A	N/A			

※: Follow Scale factor

<QUARTER ENERGY LOG>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
870	2160	N/A	N/A	Quarter-0 (00:00~00:15)	※	
871	2161	N/A	N/A	Quarter-1 (00:15~00:30)	※	
872	2162	N/A	N/A	Quarter-2 (00:30~00:45)	※	
873	2163	N/A	N/A	Quarter-3	※	
874	2164	N/A	N/A	Quarter-4	※	
875	2165	N/A	N/A	Quarter-5	※	
876	2166	N/A	N/A	Quarter-6	※	
877	2167	N/A	N/A	Quarter-7	※	
878	2168	N/A	N/A	Quarter-8	※	
879	2169	N/A	N/A	Quarter-9	※	
87A	2170	N/A	N/A	Quarter-10	※	
87B	2171	N/A	N/A	Quarter-11	※	
87C	2172	N/A	N/A	Quarter-12	※	
87D	2173	N/A	N/A	Quarter-13	※	
87E	2174	N/A	N/A	Quarter-14	※	
87F	2175	N/A	N/A	Quarter-15	※	
880	2176	N/A	N/A	Quarter-16	※	
881	2177	N/A	N/A	Quarter-17	※	
882	2178	N/A	N/A	Quarter-18	※	
883	2179	N/A	N/A	Quarter-19	※	
884	2180	N/A	N/A	Quarter-20	※	
885	2181	N/A	N/A	Quarter-21	※	
886	2182	N/A	N/A	Quarter-22	※	
887	2183	N/A	N/A	Quarter-23	※	
888	2184	N/A	N/A	Quarter-24	※	
889	2185	N/A	N/A	Quarter-25	※	

88A	2186	N/A	N/A	Quarter-26	※	
88B	2187	N/A	N/A	Quarter-27	※	
88C	2188	N/A	N/A	Quarter-28	※	
88D	2189	N/A	N/A	Quarter-29	※	
88E	2190	N/A	N/A	Quarter-30	※	
88F	2191	N/A	N/A	Quarter-31	※	
890	2192	N/A	N/A	Quarter-32	※	
891	2193	N/A	N/A	Quarter-33	※	
892	2194	N/A	N/A	Quarter-34	※	
893	2195	N/A	N/A	Quarter-35	※	
894	2196	N/A	N/A	Quarter-36	※	
895	2197	N/A	N/A	Quarter-37	※	
896	2198	N/A	N/A	Quarter-38	※	
897	2199	N/A	N/A	Quarter-39	※	
898	2200	N/A	N/A	Quarter-40	※	
899	2201	N/A	N/A	Quarter-41	※	
89A	2202	N/A	N/A	Quarter-42	※	
89B	2203	N/A	N/A	Quarter-43	※	
89C	2204	N/A	N/A	Quarter-44	※	
89D	2205	N/A	N/A	Quarter-45	※	
89E	2206	N/A	N/A	Quarter-46	※	
89F	2207	N/A	N/A	Quarter-47	※	
8A0	2208	N/A	N/A	Quarter-48	※	
8A1	2209	N/A	N/A	Quarter-49	※	
8A2	2210	N/A	N/A	Quarter-50	※	
8A3	2211	N/A	N/A	Quarter-51	※	
8A4	2212	N/A	N/A	Quarter-52	※	
8A5	2213	N/A	N/A	Quarter-53	※	
8A6	2214	N/A	N/A	Quarter-54	※	
8A7	2215	N/A	N/A	Quarter-55	※	
8A8	2216	N/A	N/A	Quarter-56	※	
8A9	2217	N/A	N/A	Quarter-57	※	
8AA	2218	N/A	N/A	Quarter-58	※	
8AB	2219	N/A	N/A	Quarter-59	※	
8AC	2220	N/A	N/A	Quarter-60	※	
8AD	2221	N/A	N/A	Quarter-61	※	
8AE	2222	N/A	N/A	Quarter-62	※	
8AF	2223	N/A	N/A	Quarter-63	※	
8B0	2224	N/A	N/A	Quarter-64	※	
8B1	2225	N/A	N/A	Quarter-65	※	
8B2	2226	N/A	N/A	Quarter-66	※	
8B3	2227	N/A	N/A	Quarter-67	※	
8B4	2228	N/A	N/A	Quarter-68	※	
8B5	2229	N/A	N/A	Quarter-69	※	
8B6	2230	N/A	N/A	Quarter-70	※	
8B7	2231	N/A	N/A	Quarter-71	※	
8B8	2232	N/A	N/A	Quarter-72	※	
8B9	2233	N/A	N/A	Quarter-73	※	
8BA	2234	N/A	N/A	Quarter-74	※	
8BB	2235	N/A	N/A	Quarter-75	※	

8BC	2236	N/A	N/A	Quarter-76	※	
8BD	2237	N/A	N/A	Quarter-77	※	
8BE	2238	N/A	N/A	Quarter-78	※	
8BF	2239	N/A	N/A	Quarter-79	※	
8C0	2240	N/A	N/A	Quarter-80	※	
8C1	2241	N/A	N/A	Quarter-81	※	
8C2	2242	N/A	N/A	Quarter-82	※	
8C3	2243	N/A	N/A	Quarter-83	※	
8C4	2244	N/A	N/A	Quarter-84	※	
8C5	2245	N/A	N/A	Quarter-85	※	
8C6	2246	N/A	N/A	Quarter-86	※	
8C7	2247	N/A	N/A	Quarter-87	※	
8C8	2248	N/A	N/A	Quarter-88	※	
8C9	2249	N/A	N/A	Quarter-89	※	
8CA	2250	N/A	N/A	Quarter-90	※	
8CB	2251	N/A	N/A	Quarter-91	※	
8CC	2252	N/A	N/A	Quarter-92	※	
8CD	2253	N/A	N/A	Quarter-93	※	
8CE	2254	N/A	N/A	Quarter-94 (23:30~23:45)	※	
8CF	2255	N/A	N/A	Quarter-95 (23:45~24:00)	※	

※: *Follow Scale factor*

DELTA ELECTRONICS, INC.

<CURRENT EVENT - EVENT LIST>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
These addresses use bit-mapping. Every single bit represents a single event. If an event is occurred, then its corresponding bit will be set to 1. Otherwise, the bit will be set to 0.						
C00	3072	N/A	N/A	Current event - Error0	N/A	*Error 15 ~ Error 00*
C01	3073	N/A	N/A	Current event - Error1	N/A	*Error 31 ~ Error 16*
C02	3074	N/A	N/A	Current event - Error2	N/A	*Error 47 ~ Error 32*
C03	3075	N/A	N/A	Current event - Error3	N/A	*Error 63 ~ Error 48*
C04	3076	N/A	N/A	Current event - Error4	N/A	*Error 79 ~ Error 64*
C05	3077	N/A	N/A	Current event - Error5	N/A	*Error 95 ~ Error 80*
C06	3078	N/A	N/A	Current event - Error6	N/A	*Error 111 ~ Error 96*
C07	3079	N/A	N/A	Current event - Error7	N/A	*Error 127 ~ Error 112*
C08	3080	N/A	N/A	Current event - Error8	N/A	*Error 143 ~ Error 128*
C09	3081	N/A	N/A	Current event - Error9	N/A	*Error 159 ~ Error 144*
C0A	3082	N/A	N/A	Current event - Error10	N/A	*Error 174 ~ Error 160*
C0B	3083	N/A	N/A	Current event - Error11	N/A	*Error 191 ~ Error 176*
C0C	3084	N/A	N/A	Current event - Error12	N/A	*Error 207 ~ Error 192*
C0D	3085	N/A	N/A	Current event - Error13	N/A	*Error 223 ~ Error 208*
C0E	3086	N/A	N/A	Current event - Error14	N/A	*Error 239 ~ Error 224*
C0F	3087	N/A	N/A	Current event - Error15	N/A	*Error 255 ~ Error 240*
C10	3088	N/A	N/A	Current event - Warning0	N/A	*Warning 15 ~ Warning 00*
C11	3089	N/A	N/A	Current event - Warning1	N/A	*Warning 31 ~ Warning 16*
C12	3090	N/A	N/A	Current event - Warning2	N/A	*Warning 47 ~ Warning 32*
C13	3091	N/A	N/A	Current event - Warning3	N/A	*Warning 63 ~ Warning 48*
C14	3092	N/A	N/A	Current event - Warning4	N/A	*Warning 79 ~ Warning 64*
C15	3093	N/A	N/A	Current event - Warning5	N/A	*Warning 95 ~ Warning 80*
C16	3094	N/A	N/A	Current event- Warning6	N/A	*Warning 111 ~ Warning 96*
C17	3095	N/A	N/A	Current event- Warning7	N/A	*Warning 127 ~ Warning 112*
C18	3096	N/A	N/A	Current event - Warning8	N/A	*Warning 143 ~ Warning 128*

C19	3097	N/A	N/A	Current event - Warning9	N/A	*Warning 159 ~ Warning 144*
C1A	3098	N/A	N/A	Current event - Warning10	N/A	*Warning 174 ~ Warning 160*
C1B	3099	N/A	N/A	Current event - Warning11	N/A	*Warning 191 ~ Warning 176*
C1C	3100	N/A	N/A	Current event - Warning12	N/A	*Warning 207 ~ Warning 192*
C1D	3101	N/A	N/A	Current event - Warning13	N/A	*Warning 223 ~ Warning 208*
C1E	3102	N/A	N/A	Current event - Warning14	N/A	*Warning 239 ~ Warning 224*
C1F	3103	N/A	N/A	Current event - Warning15	N/A	*Warning 255 ~ Warning 240*
C20	3104	N/A	N/A	Current event - Fault0	N/A	*Fault 15 ~ Fault 00*
C21	3105	N/A	N/A	Current event - Fault1	N/A	*Fault 31 ~ Fault 16*
C22	3106	N/A	N/A	Current event - Fault2	N/A	*Fault 47 ~ Fault 32*
C23	3107	N/A	N/A	Current event - Fault3	N/A	*Fault 63 ~ Fault 48*
C24	3108	N/A	N/A	Current event - Fault4	N/A	*Fault 79 ~ Fault 64*
C25	3109	N/A	N/A	Current event - Fault5	N/A	*Fault 95 ~ Fault 80*
C26	3110	N/A	N/A	Current event - Fault6	N/A	*Fault 111 ~ Fault 96*
C27	3111	N/A	N/A	Current event - Fault7	N/A	*Fault 127 ~ Fault 112*
C28	3112	N/A	N/A	Current event - Fault8	N/A	*Fault 143 ~ Fault 128*
C29	3113	N/A	N/A	Current event - Fault9	N/A	*Fault 159 ~ Fault 144*
C2A	3114	N/A	N/A	Current event - Fault10	N/A	*Fault 174 ~ Fault 160*
C2B	3115	N/A	N/A	Current event - Fault11	N/A	*Fault 191 ~ Fault 176*
C2C	3116	N/A	N/A	Current event - Fault12	N/A	*Fault 207 ~ Fault 192*
C2D	3117	N/A	N/A	Current event - Fault13	N/A	*Fault 223 ~ Fault 208*
C2E	3118	N/A	N/A	Current event - Fault14	N/A	*Fault 239 ~ Fault 224*
C2F	3119	N/A	N/A	Current event - Fault15	N/A	*Fault 255 ~ Fault 240*

See below for example

※Example: If address 3072 replies with ***0100011000010001***

0 1 0 0 0 1 1 0 0 0 0 1 0 0 0 1

E15,E14,E13,E12,E11,E10, E9, E8, E7, E6 , E5 , E4 , E3 , E2, E1, E0

We can get the information that Error 14, Error 10, Error 9, Error 4 and Error 0 are now occurring.

For description of every error code, refer to APPENDIX C.

DELTA ELECTRONICS, INC.

<CURRENT EVENT - FAN FAIL>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
D031	53297	N/A	N/A	Int Fan Fail group1	N/A	*Fan15 ~ Fan00*
D032	53298	N/A	N/A	Int Fan Fail group2	N/A	*Fan31 ~ Fan16*
D033	53299	N/A	N/A	Ext Fan Fail group1	N/A	*Fan15 ~ Fan00*
D034	53330	N/A	N/A	Ext Fan Fail group2	N/A	*Fan31 ~ Fan16*

See below for example

※Example: If address 53297 replies with ***0100 1000 0000 0010***

0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Fan15	Fan14	Fan13	Fan12	Fan11	Fan10	Fan09	Fan08	Fan07	Fan06	Fan05	Fan04	Fan03	Fan02	Fan 01	Fan00

We can get the information that Internal Fan14, Fan11 and Fan01 are failed.

<CURRENT EVENT - CURRENT SHUNT>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
D035	53301	N/A	N/A	String warning group1	N/A	*String 16 ~ 01*
D036	53302	N/A	N/A	String warning group2	N/A	*String 32 ~ 17*
D037	53303	N/A	N/A	String warning group3	N/A	*String 48 ~ 33*
D038	53304	N/A	N/A	String warning group4	N/A	*String 64 ~ 49*

See below for example

※Example: If address 53301 replies with ***0010 0001 0001 0100***

0	0	1	0	0	0	0	1	0	0	0	1	0	1	0	0
Str15	Str 14	Str 13	Str 12	Str 11	Str 10	Str 09	Str 08	Str 07	Str 06	Str 05	Str 04	Str 03	Str 02	Str 01	Str 00

We can get the information that String13, String08, String04 and String02 are failed.

DELTA ELECTRONICS, INC.

<DC INFORMATION>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	B000	45056	Total Power	※	
N/A	N/A	B001	45057	Input1 DC voltage	※	
N/A	N/A	B002	45058	Input1 DC current	※	
N/A	N/A	B003	45059	Input1 DC wattage	※	
N/A	N/A	B004	45060	Input2 DC voltage	※	
N/A	N/A	B005	45061	Input2 DC current	※	
N/A	N/A	B006	45062	Input2 DC wattage	※	
N/A	N/A	B007	45063	Input3 DC voltage	※	
N/A	N/A	B008	45064	Input3 DC current	※	
N/A	N/A	B009	45065	Input3 DC wattage	※	
N/A	N/A	B00A	45066	Input4 DC voltage	※	
N/A	N/A	B00B	45067	Input4 DC current	※	
N/A	N/A	B00C	45068	Input4 DC wattage	※	
N/A	N/A	B00D	45069	Input5 DC voltage	※	
N/A	N/A	B00E	45070	Input5 DC current	※	
N/A	N/A	B00F	45071	Input5 DC wattage	※	
N/A	N/A	B010	45072	Input6 DC voltage	※	
N/A	N/A	B011	45073	Input6 DC current	※	
N/A	N/A	B012	45074	Input6 DC wattage	※	
N/A	N/A	B013	45075	Max Input1 DC voltage	※	
N/A	N/A	B014	45076	Max Input1 DC current	※	
N/A	N/A	B015	45077	Max Input1 DC wattage	※	
N/A	N/A	B016	45078	Max Input2 DC voltage	※	
N/A	N/A	B017	45079	Max Input2 DC current	※	
N/A	N/A	B018	45080	Max Input2 DC wattage	※	
N/A	N/A	B019	45081	Max Input3 DC voltage	※	
N/A	N/A	B01A	45082	Max Input3 DC current	※	

N/A	N/A	B01B	45083	Max Input3 DC wattage	※	
N/A	N/A	B01C	45084	Max Input4 DC voltage	※	
N/A	N/A	B01D	45085	Max Input4 DC current	※	
N/A	N/A	B01E	45086	Max Input4 DC wattage	※	
N/A	N/A	B01F	45087	Max Input5 DC voltage	※	
N/A	N/A	B020	45088	Max Input5 DC current	※	
N/A	N/A	B021	45089	Max Input5 DC wattage	※	
N/A	N/A	B022	45090	Max Input6 DC voltage	※	
N/A	N/A	B023	45091	Max Input6 DC current	※	
N/A	N/A	B024	45092	Max Input6 DC wattage	※	
N/A	N/A	B025	45093	Input7 DC voltage	※	
N/A	N/A	B026	45094	Input7 DC current	※	
N/A	N/A	B027	45095	Input7 DC wattage	※	
N/A	N/A	B028	45096	Input8 DC voltage	※	
N/A	N/A	B029	45097	Input8 DC current	※	
N/A	N/A	B02A	45098	Input8 DC wattage	※	
N/A	N/A	B02B	45099	Input9 DC voltage	※	
N/A	N/A	B02C	45100	Input9 DC current	※	
N/A	N/A	B02D	45101	Input9 DC wattage	※	
N/A	N/A	B02E	45102	Input10 DC voltage	※	
N/A	N/A	B02F	45103	Input10 DC current	※	
N/A	N/A	B030	45104	Input10 DC wattage	※	
N/A	N/A	B031	45105	Input11 DC voltage	※	
N/A	N/A	B032	45106	Input11 DC current	※	
N/A	N/A	B033	45107	Input11 DC wattage	※	
N/A	N/A	B034	45108	Input12 DC voltage	※	
N/A	N/A	B035	45109	Input12 DC current	※	
N/A	N/A	B036	45110	Input12 DC wattage	※	
N/A	N/A	B037	45111	Max Input7 DC voltage	※	

N/A	N/A	B038	45112	Max Input7 DC current	※	
N/A	N/A	B039	45113	Max Input7 DC wattage	※	
N/A	N/A	B03A	45114	Max Input8 DC voltage	※	
N/A	N/A	B03B	45115	Max Input8 DC current	※	
N/A	N/A	B03C	45116	Max Input8 DC wattage	※	
N/A	N/A	B03D	45117	Max Input9 DC voltage	※	
N/A	N/A	B03E	45118	Max Input9 DC current	※	
N/A	N/A	B03F	45119	Max Input9 DC wattage	※	
N/A	N/A	B040	45120	Max Input10 DC voltage	※	
N/A	N/A	B041	45121	Max Input10 DC current	※	
N/A	N/A	B042	45122	Max Input10 DC wattage	※	
N/A	N/A	B043	45123	Max Input11 DC voltage	※	
N/A	N/A	B044	45124	Max Input11 DC current	※	
N/A	N/A	B045	45125	Max Input11 DC wattage	※	
N/A	N/A	B046	45126	Max Input12 DC voltage	※	
N/A	N/A	B047	45127	Max Input12 DC current	※	
N/A	N/A	B048	45128	Max Input12 DC wattage	※	

※: Follow Scale factor

DELTA ELECTRONICS, INC.

<AC INFORMATION>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	C000	49152	Total output power	※	
N/A	N/A	C001	49153	Output1 AC voltage – Phase	※	
N/A	N/A	C002	49154	Output1 AC current	※	
N/A	N/A	C003	49155	Output1 AC wattage	※	
N/A	N/A	C004	49156	Output1 AC frequency	※	
N/A	N/A	C005	49157	Output2 AC voltage – Phase	※	
N/A	N/A	C006	49158	Output2 AC current	※	
N/A	N/A	C007	49159	Output2 AC wattage	※	
N/A	N/A	C008	49160	Output2 AC frequency	※	
N/A	N/A	C009	49161	Output3 AC voltage – Phase	※	
N/A	N/A	C00A	49162	Output3 AC current	※	
N/A	N/A	C00B	49163	Output3 AC wattage	※	
N/A	N/A	C00C	49164	Output3 AC frequency	※	
N/A	N/A	C01B	49179	Output1 AC voltage – Line	※	
N/A	N/A	C01C	49180	Output2 AC voltage – Line	※	
N/A	N/A	C01D	49181	Output3 AC voltage – Line	※	
N/A	N/A	C03F	49215	Max Output1 AC voltage	※	
N/A	N/A	C040	49216	Max Output1 AC current	※	
N/A	N/A	C041	49217	Max Output1 AC wattage	※	
N/A	N/A	C042	49218	Max Output1 AC frequency	※	
N/A	N/A	C043	49219	Max Output2 AC voltage	※	
N/A	N/A	C044	49220	Max Output2 AC current	※	
N/A	N/A	C045	49221	Max Output2 AC wattage	※	
N/A	N/A	C046	49222	Max Output2 AC frequency	※	
N/A	N/A	C047	49223	Max Output3 AC voltage	※	

N/A	N/A	C048	49224	Max Output3 AC current	※	
N/A	N/A	C049	49225	Max Output3 AC wattage	※	
N/A	N/A	C04A	49226	Max Output3 AC frequency	※	
N/A	N/A	C031	49201	Total apparent power	※	
N/A	N/A	C032	49202			
N/A	N/A	C033	49203	Apparent power 1	※	
N/A	N/A	C034	49204	Apparent power 2	※	
N/A	N/A	C035	49205	Apparent power 3	※	

※: Follow Scale factor

<POWER QUALITY INFORMATION>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	C060	49248	Q Sum	※	Total reactive power
N/A	N/A	C061	49249	CosPhi	0.01	Power factor
N/A	N/A	C062	49250	Power Efficiency	0.1%	Efficiency of power converting (DC → AC)

<DERATING LOG INFORMATION-THERMAL>

Address (Hex)	Address (Dec)	Purpose	Description
5240	21056	*Derating-Start time 0*	Unit: 1Sec
5241	21057		
5242	21058	*Derating-Add Up time 0*	Unit: 1Sec
5243	21059	*Derating-Start time 1*	Unit: 1Sec
5244	21060		
5245	21061	*Derating-Add Up time 1*	Unit: 1Sec
5246	21062	*Derating-Start time 2*	Unit: 1Sec
5247	21063		
5248	21064	*Derating-Add Up time 2*	Unit: 1Sec
5249	21065	*Derating-Start time 3*	Unit: 1Sec
525A	21066		
525B	21067	*Derating-Add Up time 3*	Unit: 1Sec
※Derating-Start time n → RTC of derating event occur time ※Derating-Add Up time n → Length of derating event duration ※Both Start time & Add Up time are zero → Invalid			

<DERATING LOG INFORMATION-OPV >

Address (Hex)	Address (Dec)	Purpose	Description
5280	21120	*Derating-Start time 0*	Unit: 1Sec
5281	21121		
5282	21122	*Derating-Add Up time 0*	Unit: 1Sec
5283	21123	*Derating-Start time 1*	Unit: 1Sec
5284	21124		
5285	21125	*Derating-Add Up time 1*	Unit: 1Sec
5286	21126	*Derating-Start time 2*	Unit: 1Sec
5287	21127		
5288	21128	*Derating-Add Up time 2*	Unit: 1Sec
5289	21129	*Derating-Start time 3*	Unit: 1Sec
528A	21130		
528B	21131	*Derating-Add Up time 3*	Unit: 1Sec
※Derating-Start time n → RTC of derating event occur time ※Derating-Add Up time n → Length of derating event duration ※Both Start time & Add Up time are zero → Invalid			

DELTA ELECTRONICS, INC.

<DERATING LOG INFORMATION-VIN >

Address (Hex)	Address (Dec)	Purpose	Description
52C0	21184	*Derating-Start time 0*	Unit: 1Sec
52C1	21185		
52C2	21186	*Derating-Add Up time 0*	Unit: 1Sec
52C3	21187	*Derating-Start time 1*	Unit: 1Sec
52C4	21188		
52C5	21189	*Derating-Add Up time 1*	Unit: 1Sec
52C6	21190	*Derating-Start time 2*	Unit: 1Sec
52C7	21191		
52C8	21192	*Derating-Add Up time 2*	Unit: 1Sec
52C9	21193	*Derating-Start time 3*	Unit: 1Sec
52CA	21194		
52CB	21195	*Derating-Add Up time 3*	Unit: 1Sec
※Derating-Start time n → RTC of derating event occur time ※Derating-Add Up time n → Length of derating event duration ※Both Start time & Add Up time are zero → Invalid			

<DERATING LOG INFORMATION-OPV_LO >

Address (Hex)	Address (Dec)	Purpose	Description
5300	21248	*Derating-Start time 0*	Unit: 1Sec
5301	21249		
5302	21250	*Derating-Add Up time 0*	Unit: 1Sec
5303	21251	*Derating-Start time 1*	Unit: 1Sec
5304	21252		
5305	21253	*Derating-Add Up time 1*	Unit: 1Sec
5306	21254	*Derating-Start time 2*	Unit: 1Sec
5307	21255		
5308	21256	*Derating-Add Up time 2*	Unit: 1Sec
5309	21257	*Derating-Start time 3*	Unit: 1Sec
530A	21258		
530B	21259	*Derating-Add Up time 3*	Unit: 1Sec
※Derating-Start time n → RTC of derating event occur time ※Derating-Add Up time n → Length of derating event duration ※Both Start time & Add Up time are zero → Invalid			

<DERATING LOG INFORMATION-PM >

Address (Hex)	Address (Dec)	Purpose	Description
5340	21312	*Derating-Start time 0*	Unit: 1Sec
5341	21313		
5342	21314	*Derating-Add Up time 0*	Unit: 1Sec
5343	21315	*Derating-Start time 1*	Unit: 1Sec
5344	21316		
5345	21317	*Derating-Add Up time 1*	Unit: 1Sec
5346	21318	*Derating-Start time 2*	Unit: 1Sec
5347	21319		
5348	21320	*Derating-Add Up time 2*	Unit: 1Sec
5349	21321	*Derating-Start time 3*	Unit: 1Sec
534A	21322		
534B	21323	*Derating-Add Up time 3*	Unit: 1Sec
※Derating-Start time n → RTC of derating event occur time ※Derating-Add Up time n → Length of derating event duration ※Both Start time & Add Up time are zero → Invalid			

<DERATING LOG INFORMATION-PF >

Address (Hex)	Address (Dec)	Purpose	Description
5380	21376	*Derating-Start time 0*	Unit: 1Sec
5381	21377		
5382	21378	*Derating-Add Up time 0*	Unit: 1Sec
5383	21379	*Derating-Start time 1*	Unit: 1Sec
5384	21380		
5385	21381	*Derating-Add Up time 1*	Unit: 1Sec
5386	21382	*Derating-Start time 2*	Unit: 1Sec
5387	21383		
5388	21384	*Derating-Add Up time 2*	Unit: 1Sec
5389	21385	*Derating-Start time 3*	Unit: 1Sec
538A	21386		
538B	21387	*Derating-Add Up time 3*	Unit: 1Sec
※Derating-Start time n → RTC of derating event occur time ※Derating-Add Up time n → Length of derating event duration ※Both Start time & Add Up time are zero → Invalid			

<DERATING LOG INFORMATION-RampUp >

Address (Hex)	Address (Dec)	Purpose	Description
53C0	21440	*Derating-Start time 0*	Unit: 1Sec
53C1	21441		
53C2	21442	*Derating-Add Up time 0*	Unit: 1Sec
53C3	21443	*Derating-Start time 1*	Unit: 1Sec
53C4	21444		
53C5	21445	*Derating-Add Up time 1*	Unit: 1Sec
53C6	21446	*Derating-Start time 2*	Unit: 1Sec
53C7	21447		
53C8	21448	*Derating-Add Up time 2*	Unit: 1Sec
53C9	21449	*Derating-Start time 3*	Unit: 1Sec
53CA	21450		
53CB	21451	*Derating-Add Up time 3*	Unit: 1Sec
※Derating-Start time n → RTC of derating event occur time ※Derating-Add Up time n → Length of derating event duration ※Both Start time & Add Up time are zero → Invalid			

<DERATING LOG INFORMATION-Others >

Address (Hex)	Address (Dec)	Purpose	Description
5400	21504	*Derating-Start time 0*	Unit: 1Sec
5401	21505		
5402	21506	*Derating-Add Up time 0*	Unit: 1Sec
5403	21507	*Derating-Start time 1*	Unit: 1Sec
5404	21508		
5405	21509	*Derating-Add Up time 1*	Unit: 1Sec
5406	21510	*Derating-Start time 2*	Unit: 1Sec
5407	21511		
5408	21512	*Derating-Add Up time 2*	Unit: 1Sec
5409	21513	*Derating-Start time 3*	Unit: 1Sec
540A	21514		
540B	21515	*Derating-Add Up time 3*	Unit: 1Sec
※Derating-Start time n → RTC of derating event occur time ※Derating-Add Up time n → Length of derating event duration ※Both Start time & Add Up time are zero → Invalid			

DELTA ELECTRONICS, INC.

<DERATING OCCUR FLAG>

Address (Hex)	Address (Dec)	Purpose	Description
51FF	20991	*Derating Records Occur Flags*	0: Normal ; 1: Occur Bit0 : Reserved Bit1 : Derating Records for Thermal Bit2 : Derating Records for OPV Bit3 : Derating Records for Vin Bit4 : Derating Records for OPV_Lo Bit5 : Derating Records for PM Bit6 : Derating Records for P(F) Bit7 : Derating Records for Rampup Bit8 : Derating Records for Others Bit9 ~ Bit15 Reserved

DELTA ELECTRONICS, INC.

Memory Map ～ Writable (Holding Register)

<GENERAL INVERTER SESTTING>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
31D	797	N/A	N/A	Country	N/A	*Country ID*
8343	33603	N/A	N/A	EPO1	N/A	*0: Normal Close* *1: Normal Open*
8344	33604	N/A	N/A	EPO2	N/A	*0: Normal Close* *1: Normal Open*
841D	33821	N/A	N/A	Baud Rate	N/A	*Byte map:* *0: 2400* *1: 4800* *2: 9600* *3: 19200 (Default)* *4: 38400*

<ENERGYLOG INDEX>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
328	808	N/A	N/A	Quarter KWh Log Index	N/A	*Range: 0~95*
329	809	N/A	N/A	Daily KWh Log Index	N/A	*Range: 0~365*
32A	810	N/A	N/A	Monthly KWh Log Index	N/A	*Range: 0~239*

<RTC TIME>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
310	784	N/A	N/A	High Word of RTC Seconds	1s	*Seconds since Jan/01/1970 00:00:00*
311	785	N/A	N/A	Low Word of RTC Seconds	1s	*Seconds since Jan/01/1970 00:00:00*
These two addresses must be written within 5 seconds.						

<EVENT INDEX>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
321	801	N/A	N/A	Event Index	N/A	*Refer to: Section 3. <EVENT LIST>*

DELTA ELECTRONICS, INC.

<GRID SETTING - VOLTAGE>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
8310	33552	BC00	48128	Uac High off	0.1v	
8311	33553	BC01	48129	Uac High off time	0.01s	
8312	33554	BC02	48130	Uac High on	0.1v	
8316	33558	BC03	48131	Uac High off slow	0.1v	
8317	33559	BC04	48132	Uac High off slow time	0.01s	
8318	33560	BC05	48133	Uac High on slow	0.1v	
8313	33555	BC06	48134	Uac Low off	0.1v	
8314	33556	BC07	48135	Uac Low off time	0.01s	
8315	33557	BC08	48136	Uac Low on	0.1v	
8319	33561	BC09	48137	Uac Low off slow	0.1v	
831A	33562	BC0A	48138	Uac Low off slow time	0.01s	
831B	33563	BC0B	48139	Uac Low on slow	0.1v	

DELTA ELECTRONICS, INC.

<GRID SETTING - FREQUENCY>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
8320	33568	BC0C	48140	Fac High off	0.01Hz	
8321	33569	BC0D	48141	Fac High off time	0.01s	
8322	33570	BC0E	48142	Fac High on	0.01Hz	
834A	33610	BC0F	48143	Fac High off slow	0.01Hz	
834B	33611	BC10	48144	Fac High off slow_time	0.01s	
834C	33612	BC11	48145	Fac High on slow	0.01Hz	
8323	33571	BC12	48146	Fac Low off	0.01Hz	
8324	33572	BC13	48147	Fac Low off time	0.01s	
8325	33573	BC14	48148	Fac Low on	0.01Hz	
834D	33613	BC15	48149	Fac Low off slow	0.01Hz	
834E	33614	BC16	48150	Fac Low off slow time	0.01s	
834F	33615	BC17	48151	Fac Low on slow	0.01Hz	

DELTA ELECTRONICS, INC.

<GRID SETTING - CONNECTION>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	BC19	48153	Extend Reclosure_time	1s	*Range: 0~1800* *Unit: 1s*
8333	33587	BC1A	48154	Reconnection Time	0.1s/ 0.01s	*For 33587* *Range: 0~3000* *Unit: 0.1s* *For 48154* *Range: 0~30000* *Unit: 0.01s*

<POWER LIMIT>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
31F	798	BD80	48512	Power Management Mode	N/A	*Word map* *0x0000 :Disable(Defaul t)* *0x0001 :Rated*
31F	799	BD81	48513	Power Management Percent	*1%*	*Range: 0~100*
N/A	N/A	BD82	48514	Active Power Slop	*1s*	*Range: 0~1200*

<P(V)>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	BDA0	48544	P_V Mode		P_V Mode 0: Off ; 1: On
N/A	N/A	BDA1	48545	Recovery Time	sec	P_V Recovery Time
N/A	N/A	BDA2	48546	Lock-in Power	1%	P_V Lock-in Power
N/A	N/A	BDA3	48547	Lock-out Power	1%	P_V Lock-out Power
N/A	N/A	BDA4	48548	Lock-in Voltage	0.1V	P_V Lock-in Voltage
N/A	N/A	BDA5	48549	Lock-out Voltage	0.1V	P_V Lock-out Voltage

DELTA ELECTRONICS, INC.

<INSTALL SETTING>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
833C	33596	BC62	48226	Insulation Mode	N/A	*(Refer to below)*
8330	33584	BC63	48227	Insulation Resistance	1kohm	*(Refer to below)*

Insulation Mode
Word map
0xFFFF : Not available
Bit map for High byte
Bit map
bit 8: 0 - Enable
bit 9: 0 - Enable Negative
bit 10: 0 - Enable Positive
bit 11: 0 - Enable Only DC1 Enable
bit 12: 0 - Enable Only DC2 Enable
bit 13~15 Reserved.
Byte map for Low byte
0x00 : Disable
0x01 : Enable
0x02 : Negative Ground
0x03 : Positive Ground
0x04 : Only DC1 Enable
0x05 : Only DC2 Enable

High byte: The higher 8 bits of this address.
Low byte: The lower 8 bits of this address.
Example:
11110000 00000010
High byte: "Only DC2 Enable" is disabled.
Low byte: Now using Negative Ground.

Example:
Change setting to Positive Ground, filling the following value:
00000000 00000011

Insulation Resistance
Allowed value:
M10A: ***600, 1100, 1200***
M15A: ***400, 700, 1200***
M20A: ***300, 550, 1200***
M30A: ***300, 550, 1200***
M50A: ***150, 250, 1100***
M66H: ***150, 250, 1100***
M88H: ***150, 250, 1200***
M50A / M50A260 / M70A260 / M100_210 / M100_280: ***150, 250, 1100***
M125HV / M250HV: ***100***

DELTA ELECTRONICS, INC.

<REACTIVE POWER CONTROL>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	BE7D	48765	Night Mode Control Selection 1	N/A	*Bit map of bit 0 ~ 15(RO)* *Bit map* *bit 0~2: Reserved* *bit 3: 0 - Q(P) 24/7* *bit 4: 0 - Fixed Kvar 24/7* *bit 5: 0 - Q(U) 24/7* *bit 6: 0 - QofPac 24/7* *bit 7 ~ 15: Reserved*
N/A	N/A	BE7E	48766	Night Mode Control Selection 0	N/A	*Refer below* *(As* Control Low Selection 0)
N/A	N/A	BE7F	48767	Control Low Selection 1	N/A	*Bit map of bit 0 ~ 15(RO)* *Bit map* *bit 0~2: Reserved* *bit 3: 0 - Q(P) 24/7* *bit 4: 0 - Fixed Kvar 24/7* *bit 5: 0 - Q(U) 24/7* *bit 6: 0 - QofPac 24/7* *bit 7 ~ 15: Reserved*
N/A	N/A	BE80	48768	Control Low Selection 0	N/A	*Refer below*

Word map
0xFFFF : Not available
Bit map of bit 8 ~ 15
bit 8: 0 - Constant cos(φ)
bit 9: 0 - Cos(φ) of P Control
bit 10: 0 - Constant Q
bit 11: 0 - Q of U Control (Curve A)
bit 12: 0 - Q(U) CEI-021 B (Curve B)
bit 13: 0 - Q of U Class B
bit 14: 0 - Q of U Class C
bit 15: 0 - Voltage suppression
Byte map of bit 0 ~ 7
0x00 : Disable (Default)
0x01 : Constant cos(φ)
0x02 : Cos(φ) of P Control
0x03 : Constant Q
0x04 : Q of U Control (Curve A)
0x05 : Q(U) CEI-021 B (Curve B)
0x06 : Q of U Class B
0x07 : Q of U Class C
0x08 : Voltage suppression
0x09 : Reserved
0x0A : Reserved
0x0B : Reserved
0x0C : Q(P) 24/7
0x0D : Fixed Kvar 24/7
0x0E : Q(U) 24/7
0x0F : QofPac 24/7
PS. If bit4~bit7 are all set 1 then only bit0~bit3 are vaild.
ex. 0xF1 => Func = Constant cos(φ)
ex. 0x01 => Func = Constant cos(φ)
ex. 0x11 => Func = HR 0xBE7F,Bit8

N/A	N/A	BE9E	48798	Q(T) Mode 24/7		*0: Disable 1: Enable When enabled, control law selection is forced to be in Fixed Kvar 24/7 mode.*
N/A	N/A	BE9F	48799	Const. Q Percent 24/7	1%	*Fixed Kvar Percent 24/7 Range : (-100%~100%)*
N/A	N/A	BEA0	48800	Q(P) Q Upper 24/7	1%	*KvarOfPower Q Upper 24/7 Range : (-44%~44%)*
N/A	N/A	BEA1	48801	Q(P) Q Lower 24/7	1%	*KvarOfPower Q Lower 24/7 Range : (-44%~44%)*
N/A	N/A	BEA2	48802	Q(P) Lower Limit 24/7	1%	*KvarOfPower PowerPercent Lower 24/7 Range : (0~100%)*
N/A	N/A	BEA3	48803	Q(P) Upper Limit 24/7	1%	*KvarOfPower PowerPercent Upper 24/7 Range : (0~100%)*
N/A	N/A	BEA4	48804	Q(P) Lockin V 24/7	0.1v	*KvarOfPower_Lockin_V 24/7 Range : (80~120%) Vn*
N/A	N/A	BEA5	48805	Q(P) Lockout V 24/7	0.1v	*KvarOfPower Lockout V 24/7 Range : (80~120%) Vn*
N/A	N/A	BEA6	48806	Q(U) Upper Limit 24/7	1%	*KvarOfUac KvarPercent Upper 24/7 Range : (-100%~100%)*
N/A	N/A	BEA7	48807	Q(U) Lower Limit 24/7	1%	*KvarOfUac KvarPercent Lower 24/7 Range : (-100%~100%)*
N/A	N/A	BEA8	48808	Q(U) Vmin 24/7	0.1v	*KvarOfUac Vmin 24/7 Range : (80~120%) Vn*
N/A	N/A	BEA9	48809	Q(U) Vmax 24/7	0.1v	*KvarOfUac Vmax 24/7 Range : (80~120%) Vn*
N/A	N/A	BEAA	48810	Q(U) V1 24/7	0.1v	*KvarOfUac V Lower 24/7 Range : (80~120%) Vn*
N/A	N/A	BEAB	48811	Q(U) V2 24/7	0.1v	*KvarOfUac V Upper 24/7 Range : (80~120%) Vn*
N/A	N/A	BEAC	48812	Q(U) P Lock in 24/7	1%	*KvarOfUac Lockin PowerPercent 24/7 Range : (0~100%)*
N/A	N/A	BEAD	48813	Q(U) P lock out 24/7	1%	*KvarOfUac Lockout PowerPercent 24/7 Range : (0~100%)*
N/A	N/A	BEAF	48815	Response Delay 24/7	0.01 s	*ReactivePower ResponseDelay 24/7 Range : (0~120sec)*

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<Q of Pac 24/7>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	BEE1	48865	Q of Pac Percent Mode 24/7		Q(P) Percent Mode 0: Rated 1 : Actual Range: 0~1
N/A	N/A	BEE2	48866	Q of Pac No Of Set Point 24/7		Q(P) No. of Set point Range: 1~10
N/A	N/A	BEE3	48867	Q of Pac P0 24/7	0.1%	Q(P) P0 Range: 0.0~100.0 %
N/A	N/A	BEE4	48868	Q of Pac Q0 24/7	0.1%	Q(P) Q0 Range: (-75.0~0 ; 0~75.0)
N/A	N/A	BEE5	48869	Q of Pac P1 24/7	0.1%	Q(P) P1 Range: 0.0~100.0 %
N/A	N/A	BEE6	48870	Q of Pac Q1 24/7	0.1%	Q(P) Q1 Range: (-75.0~0 ; 0~75.0)
N/A	N/A	BEE7	48871	Q of Pac P2 24/7	0.1%	Q(P) P2 Range: 0.0~100.0 %
N/A	N/A	BEE8	48872	Q of Pac Q2 24/7	0.1%	Q(P) Q2 Range:(-75.0~0 ; 0~75.0)
N/A	N/A	BEE9	48873	Q of Pac P3 24/7	0.1%	Q(P) P3 Range: 0.0~100.0 %
N/A	N/A	BEEA	48874	Q of Pac Q3 24/7	0.1%	Q(P) Q3 Range:(-75.0~0 ; 0~75.0)
N/A	N/A	BEEB	48875	Q of Pac P4 24/7	0.1%	Q(P) P4 Range: 0.0~100.0 %
N/A	N/A	BEEC	48876	Q of Pac Q4 24/7	0.1%	Q(P) Q4 Range:(-75.0~0 ; 0~75.0)
N/A	N/A	BEED	48877	Q of Pac P5 24/7	0.1%	Q(P) P5 Range: 0.0~100.0 %
N/A	N/A	BEEE	48878	Q of Pac Q5 24/7	0.1%	Q(P) Q5 Range:(-75.0~0 ; 0~75.0)
N/A	N/A	BEEF	48879	Q of Pac P6 24/7	0.1%	Q(P) P6 Range: 0.0~100.0 %
N/A	N/A	BEF0	48880	Q of Pac Q6 24/7	0.1%	Q(P) Q6 Range: (-75.0~0 ; 0~75.0)
N/A	N/A	BEF1	48881	Q of Pac P7 24/7	0.1%	Q(P) P7 Range: 0.0~100.0 %
N/A	N/A	BEF2	48882	Q of Pac Q7 24/7	0.1%	Q(P) Q7 Range:(-75.0~0 ; 0~75.0)
N/A	N/A	BEF3	48883	Q of Pac P8 24/7	0.1%	Q(P) P8 Range: 0.0~100.0 %
N/A	N/A	BEF4	48884	Q of Pac Q8 24/7	0.1%	Q(P) Q8 Range:(-75.0~0 ; 0~75.0)
N/A	N/A	BEF5	48885	Q of Pac P9 24/7	0.1%	Q(P) P9 Range: 0.0~100.0 %
N/A	N/A	BEF6	48886	Q of Pac Q9 24/7	0.1%	Q(P) Q9 Range:(-75.0~0 ; 0~75.0)

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<COSPHI(P)>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	BE92	33634	CosPhi(P) V Lock-in	0.1V	*Range: 2300~2530*
N/A	N/A	BE93	33635	CosPhi(P) V Lock-out	0.1V	*RangeL 2070~2300*

<CONSTANT COSPHI>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	BE81	48769	Fix CosPhi	1	*Range:* *(Cap) -100~-80,* *(Ind) 80~100*

<CONSTANT Q>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	BE90	48784	Fix Q	1%	*Range: -63~63*

<Q(V)>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	BE88	48776	Qi Limit	1%	*Range: -63~63*
N/A	N/A	BE89	48777	Qs Limit	1%	*Range: -63~63*
N/A	N/A	BE8A	48778	V2i	0.1V	*Range: 1840~2760*
N/A	N/A	BE8B	48779	V2s	0.1V	*Range: 1840~2760*
N/A	N/A	BE8C	48780	V1i	0.1V	*Range: 1840~2760*
N/A	N/A	BE8D	48781	V1s	0.1V	*Range: 1840~2760*
N/A	N/A	BE8F	48783	Delay Time	0.01 sec	*Range: 0~12000*
N/A	N/A	BE94	48788	Lock-in Power	1%	*Range: 10~100*
N/A	N/A	BE95	48789	Lock-out Power	1%	*Range: 5~10*

<EXTERNAL CONTROL>

Old Address (Hex)	Old Address (Dec)	New Address (Hex)	New Address (Dec)	Command	Unit	Description
N/A	N/A	BC1E	48158	Remote control		*Read:* *bit 3: 0- Off; 1- On* *Write:* *ON : bit3 = 1, bit15 = 1* *OFF : bit3 = 1, bit15 = 0*

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<VI-Curve>

Address (Hex)	Address (Dec)	Command	Unit	Description
9C00	**39936**	**Operation Flag**		bit 0: Enable (RW) bit 1: WaitShuntAccept (RO) bit 2: WaitTransFinish (RO) bit 3: ReadCurrentFromShunt (RO) bit 4: ReadCurrentDone (RO) bit 5: ProcedureTimeoutRetry (RO) bit 6: ProcedureTimeoutDone (RO) bit 7: Procedure_EPO_ForceDone (RO) bit 8: Procedure_NoDC_ForceDone (RO) bit 9: Procedure_NoString_ForceDone (RO) bit10~15: Reserved PS. a. Bit0 change to 0 when Done b. When write 1 to bit0 clear other operation flag & Voltage & Current
9C01	**39937**	**String Number**	**Set**	RO: String number of this Module.
9C02	**39938**	**Max voltage point**	**V**	RO: "V-axis Number" of a String = 100, ***Total I-axis number*** = (String Number * "V-axis Number")
9C03	**39939**	**Total I-axis Number Index auto increase number**	**n**	R/W: Read a part of total I-axis auto increase number => **X**. ***"Total I-axis Number Index" will auto increase X by read HR 0x9C03 after this read completed.*** ***Default X: 0***
9C04	**39940**	**Total I-axis Number Index**	**n**	R/W: Read a part of ***Total I-axis number Index***. Index will auto increase **X** after this read completed. PS. Write HR 0x9C00 auto clear to 0
9C05	**39941**	**I-axis Value 0**	**0.01 A**	Read a part of Total I-axis by Index.
…	**…**	**……**	**…**	**……**
9C36	**39990**	**I-axis Value 49**	**0.01 A**	Read a part of total I-axis by Index+49.

APPENDIX A : MODBUS Exception Responses

MODBUS Exception Codes

Code	Name	Meaning
01	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the server (or slave).
02	ILLEGAL DATA ADDRESS	The data address received in the query is not an allowable address for the server (or slave).
03	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for server (or slave).
04	SLAVE DEVICE FAILURE	An unrecoverable error occurred while the server (or slave) was attempting to perform the requested action.

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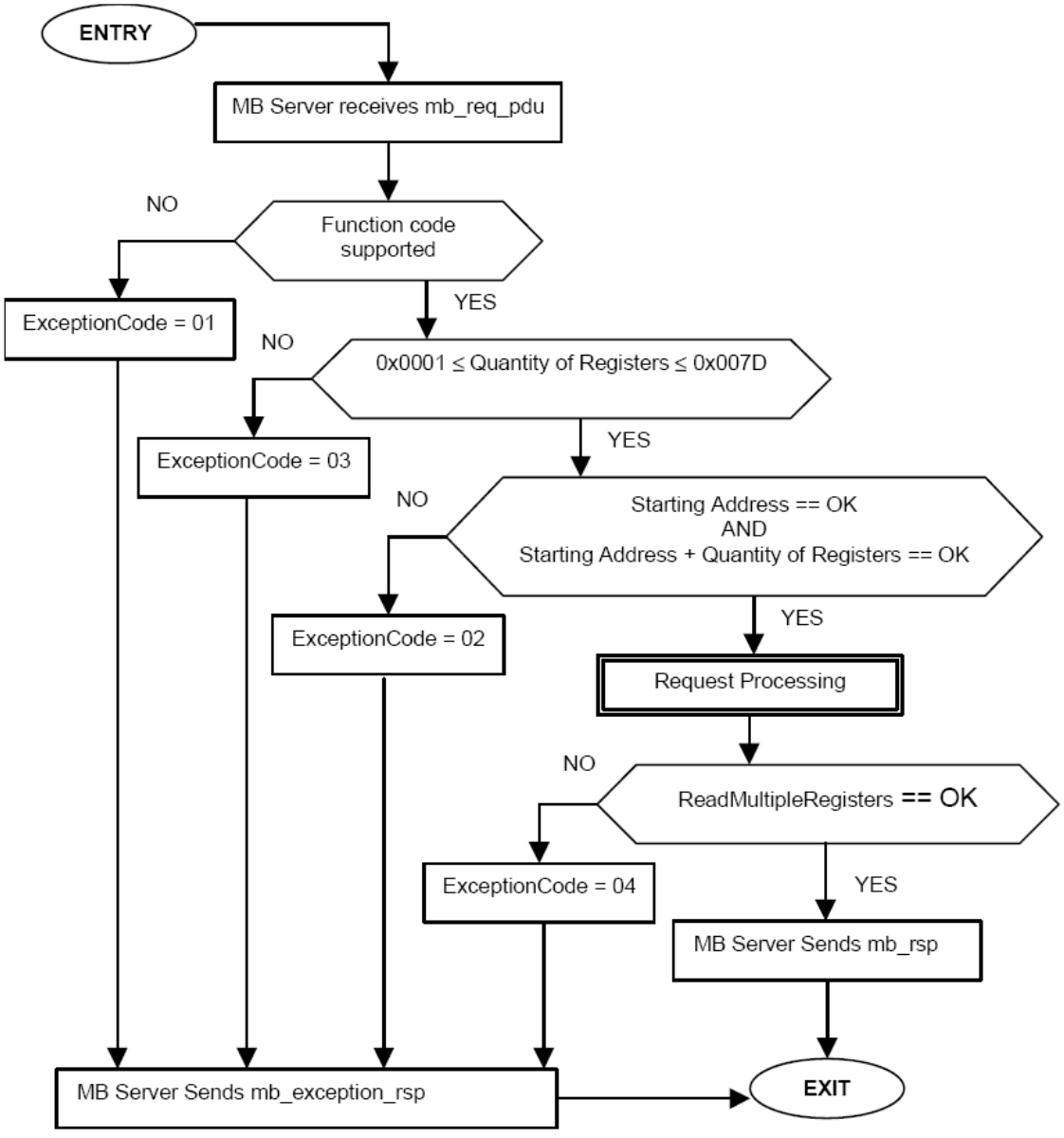
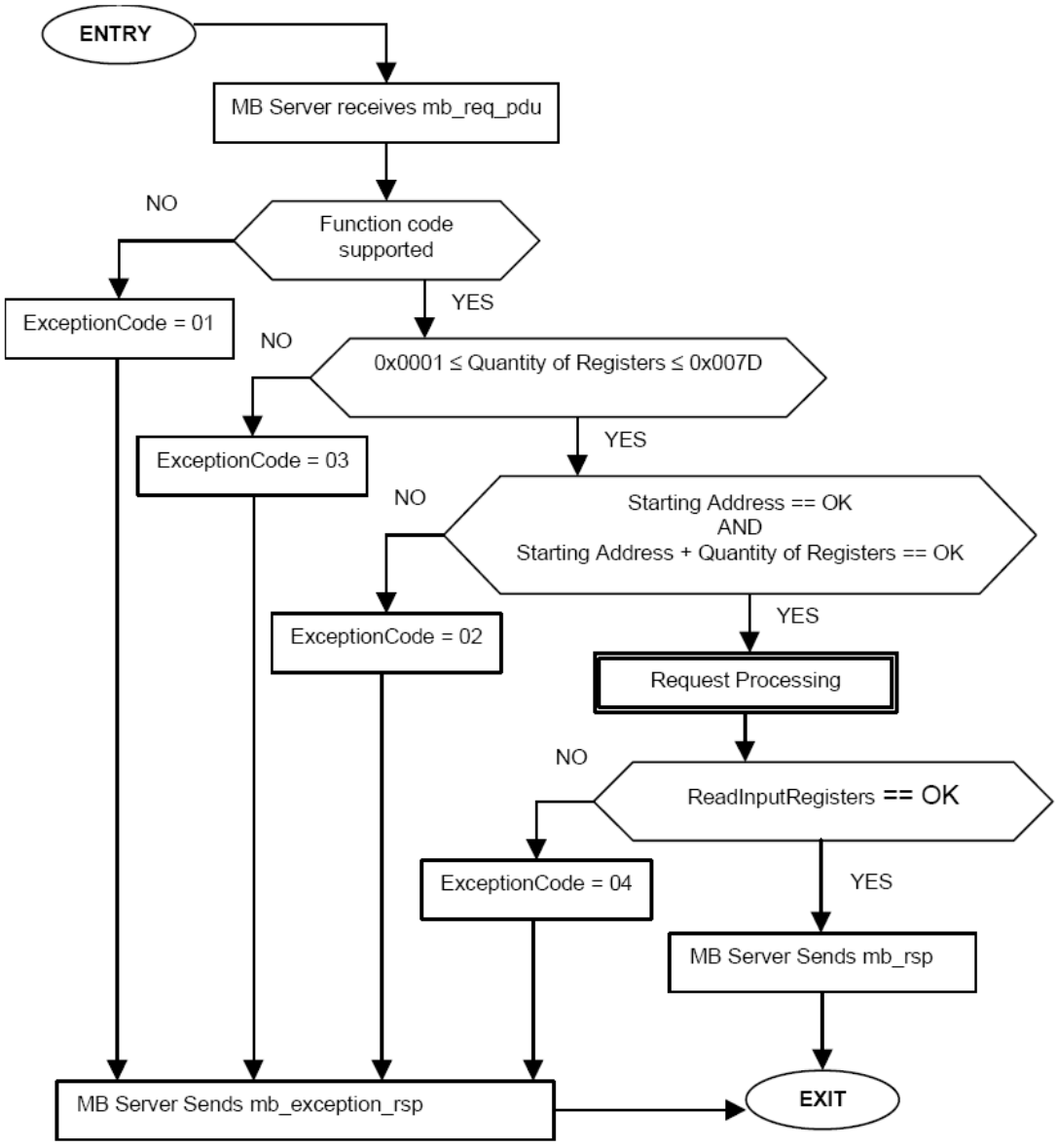
APPENDIX B : Communications Transmission Process

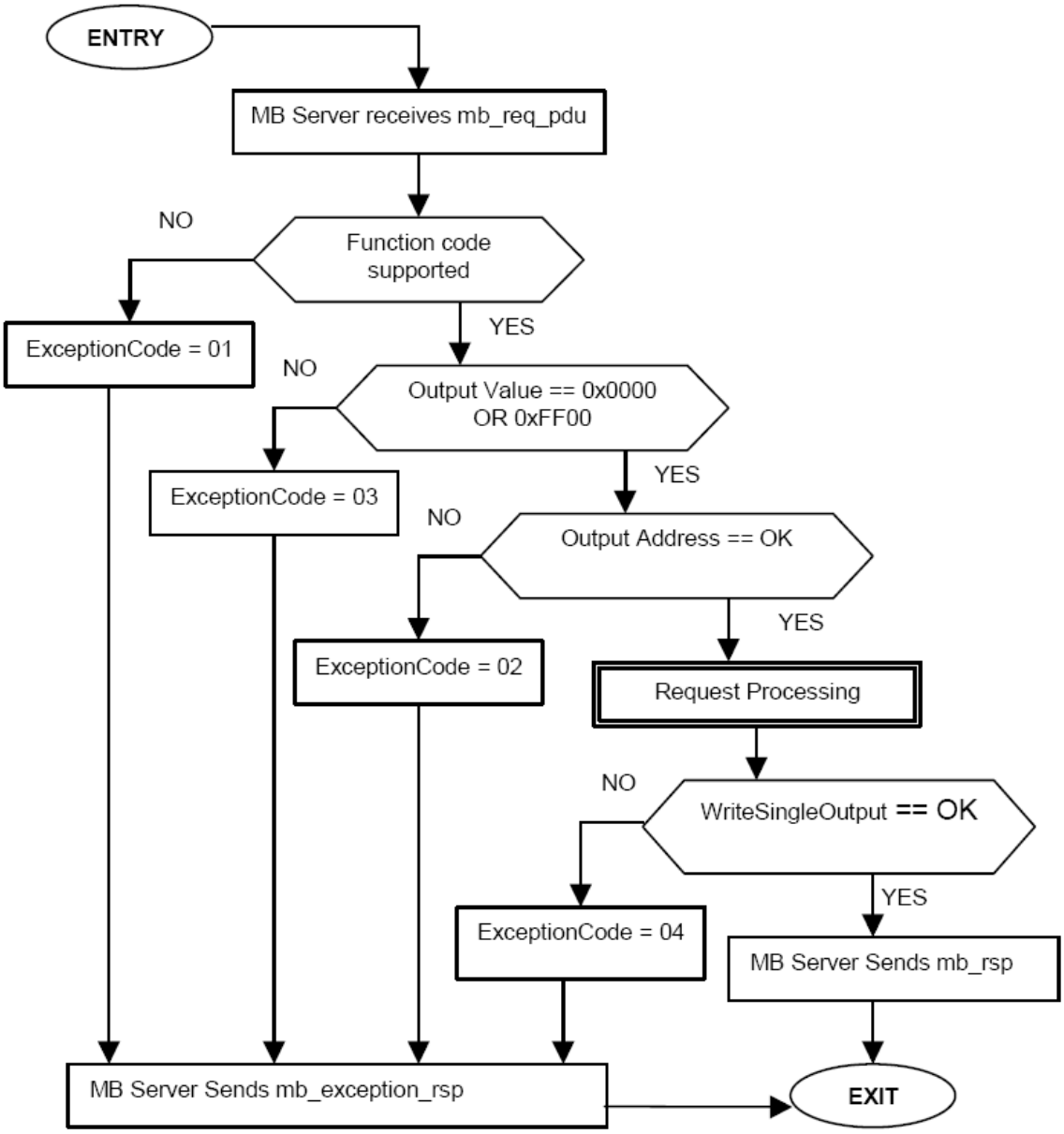
i. Function 0x03 Read Holding Registers



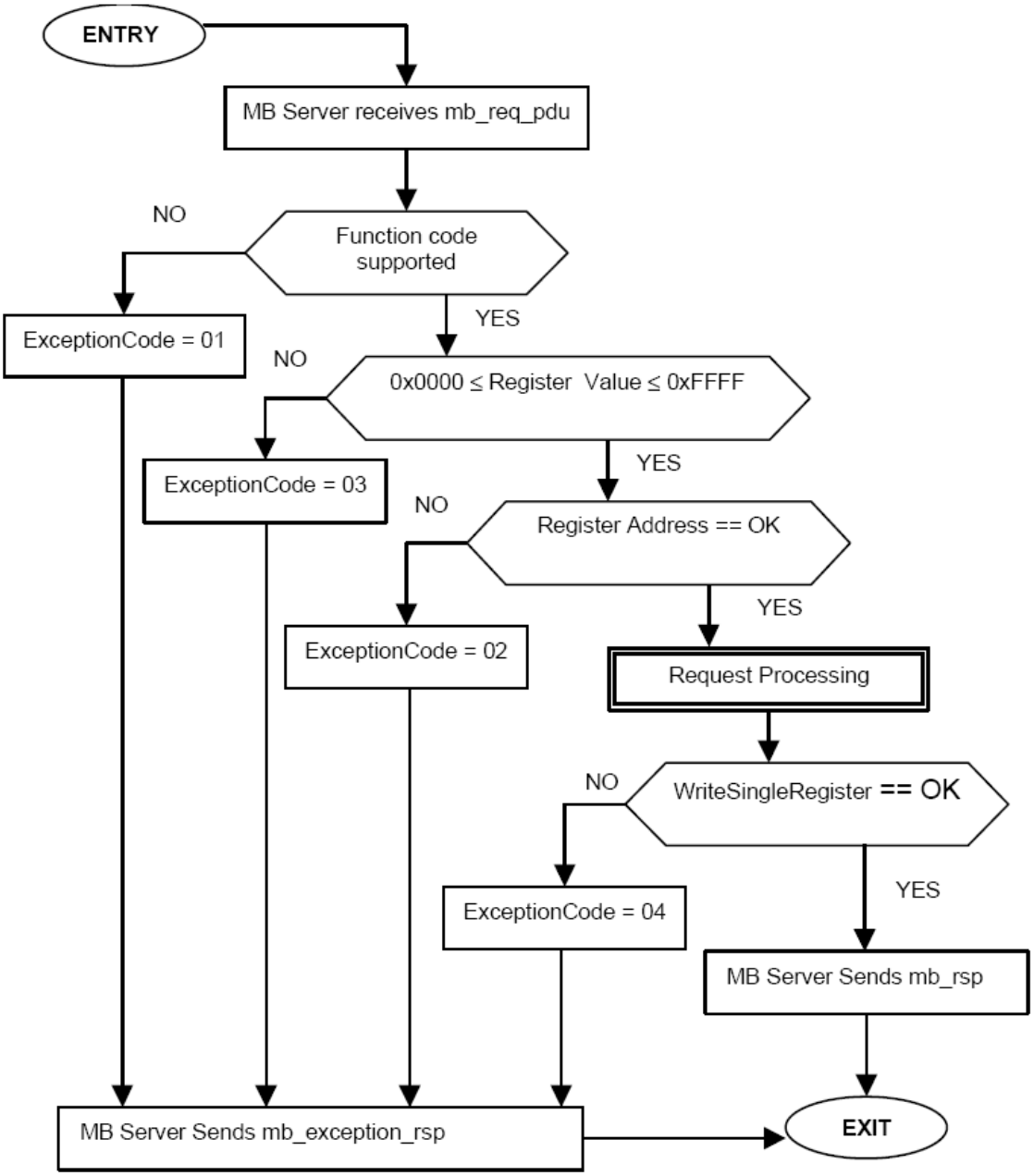
ii. Function 0x04 Read Input Registers



iii. Function 0x05 Write Single Coil



iv. Function 0x06 Write Single Register



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APPENDIX C : EVENT CODE TABLE

Fault		
Item	**Value**	**Description**
F01	1	DC Injection (R)
F02	2	DC Injection (S)
F03	3	DC Injection (T)
F04	4	DC Injection Total
F05	5	NTC OTP
F06	6	NTC0 Circuit Fail
F07	7	NTC LTP
F08	8	Ntc1 Circuit Fail
F09	9	Ntc2 Circuit Fail
F10	10	Ntc3 Circuit Fail
F11	11	Inverter Choke Over Temperature
F13	13	Relay Open
F14	14	Firmware Incompatibility
F15	15	DSP ADC Vgrid/Iout Fail
F16	16	ADC Vin/Vbus Fail
F17	17	ADC Iin/Iboost Fail
F18	18	Red. ADC Vgrid Fail
F19	19	ADC Iout_dc Fail
F20	20	Efficiency Abnormal
F21	21	Fan Fail
F22	22	Internal Comm. Fault (Red.)
F23	23	Internal Comm. Fault (Dis.)
F24	24	RCMU Over Rating
F25	25	Insulation
F26	26	Three Phase Current Unbalance
F27	27	RCMU Circuit Fail
F28	28	Relay Test Short
F29	29	Relay Test Open
F30	30	Bus Unbalance
F31	31	Bus P Over Voltage
F32	32	Bus P Under Voltage
F33	33	Bus N Over Voltage
F34	34	Bus N Under Voltage
F35	35	Bus Voltage Over Rating
F36	36	OOCP-Transient (R)
F37	37	OOCP(R)
F38	38	OOCP-Transient (S)
F39	39	OOCP(S)
F40	40	OOCP-Transient (T)
F41	41	OOCP(T)
F42	42	CT sensor Fail (A)
F43	43	CT sensor Fail (B)
F44	44	CT sensor Fail (C)
F45	45	HW OOCP Circuit
F46	46	Inverter Failure
F47	47	SA OVP

F48	48	SA OPP
F50	50	Zero Cross Circuit Fail
F51	51	Inv Circuit Fault
F52	52	Boost Circuit Fault
F55	55	Thermal Fuse Open
F56	56	Hardware Incompatibility
F57	57	AC Aux-Power Fail
F58	58	Arc circuit fail
F59	59	Arc fault
F60	60	IOCP(PV1)
F61	61	IOCP(PV2)
F70	70	IOCP-Transient(PV1)
F71	71	IOCP-Transient(PV2)
F74	74	Ext Comm. Fail
F76	76	HW DC RLY
F77	77	External CT Fail

Error		
Item	**Value**	**Description**
E01	129	OFR
E02	130	UFR
E03	131	Anti Passive
E04	132	Anti OFR
E05	133	Anti UFR
E06	134	Phase Jump
E07	135	Grid Quality
E08	136	Ac Connected Fail
E09	137	No Grid
E10	138	Under Voltage Range (R Phase)
E11	139	Over Voltage Range (R Phase)
E12	140	Over Transient Voltage Range(R Phase)
E13	141	Slow Over Voltage Range (R Phase)
E14	142	LN OVR
E15	143	Under Voltage Range (S Phase)
E16	144	Over Voltage Range (S Phase)
E17	145	Over Transient Voltage Range (S Phase)
E18	146	Slow Over Voltage Range (S Phase)
E19	147	Frequency Abnormal
E20	148	Under Voltage Range (T Phase)
E21	149	Over Voltage Range (T Phase)
E22	150	Over Transient Voltage Range (T Phase)
E23	151	Slow Over Voltage Range (T Phase)
E25	153	EPO
E26	154	Slow Over Frequency Range
E27	155	Slow Under Frequency Range
E28	156	Slow Under Voltage Range
E29	157	PV Input Voltage Too High (Standalone)
E30	158	String1 PV input voltage too high
E31	159	String2 PV input voltage too high
E32	160	L/N Reversed
E33	161	AC Short
E34	162	Insulation

Warning		
Item	**Value**	**Description**
W01	209	Solar1 UVR
W02	210	Solar2 UVR
W03	211	Vst unstable
W04	212	PID Relay Fail
W05	213	PID Over Current Range
W07	215	Derating
W09	217	HW FAN INT
W10	218	Door Opened
W11	219	Fan Fail
W12	220	String Bus Communication Fail
W13	221	Transformer Communication Fail
W14	222	EPO by User
W15	223	SPD
W16	224	Insulation
W17	225	DC surge
W18	226	AC surge
W19	227	DC Aux-Power Fail
W20	228	Standalone UVR Stand-Alone night mode shut down