Modbus-RTU protocol of Solax Power three phase inverter

MIC-G2/Pro-G2 V1.9

History list：

Data	Name	detail	Protocol Version	ARM version	other
2021-05-19	zhangxiangping	Draft	V1.0	V1.00	
2021-07-15	zhangxiangping	1、把语言设置的寄存器地址调整一下，保持与 X3-MIC 的 ATE 一致	V1.1	V1.01	
2021-08-06	zhangxiangping	增加 ARM 自身的报错信息	V1.2	V1.01	
2021-08-23	zhangxiangping	1、修改了读取 holding register 高低位颠倒的问题 2、增加了 DataLogger 设置	V1.3	V1.01	

		机器功率限制百分比(多写指令) 3、安规列表更新了 4、增加设置老化模式			
2021-11-18	zhangxiangping	增加充电桩需要的几个参数	V1.4	V1.03	
2021-12-30	zhangxiangping	1、增加 ReConnectionTime 参数 2、安规增加到 37 3、增加一个机型报错的错误 4、机型类型增加到 20 了	V1.5	V1.04	
2022-02-14	zhangxiangping	1、增加读取电表的几个参数，包括并网功率、馈电量、耗电量 2、修正机型值与 PV 电压路数对应关系，以前两路与三路的机型值颠倒了	V1.6	V1.06	
2022-03-18	zhangxiangping	增加两个特殊处理的寄存器，设置之后 DSP 不保存 EEPROM, 0x640,0x641	V1.7	V1.09	
2022-03-25	Zhangxiangping	增加匹配 DataHub 的寄存器	V1.8	V1.10	
2022-9-21	Zhangxiangping	增加低压机型以及新增一些安规	V1.9	V1.13	

1. RS485 Parameter:

Parameter	Value
Baud rate	9600bps
Data bit	8
Parity	None
Stop bit	1
RS485 bus	A(Data+); B(Data-)

2. Communication timing:

Timing parameter	Value
The least interval time between two instructions	1 Sec
Character-gap time out(silent time between 2 package)	>100ms
Response timeout	1 Sec

3. Read holding register

Function Code	Register	Name	R/W	Detail	Unit	Type	Len
0x03	0x00-0x2FF	Reserved	NA	System Reserved	NA	NA	NA
	0x300-0x306	SeriesNumber	R	14 Chars, MSB=SN[14]	14Chars	Uint16	7

	0x307-0x30D	FactoryName	R	14 Chars,MSB=FactoryName[14]	14Chars	Uint16	7
	0x30E-0x314	ModuleName	R	14 Chars,MSB=ModuleName[14]	14Chars	Uint16	7
	0x315-0x317	FirmwareVersion	R	6 Chars,MSB=Firmware[5]	6Chars	Uint16	3
	0x318	RTC-Second	R	RTC-Second	/	Uint16	1
	0x319	RTC-Minute	R	RTC-Minute	/	Uint16	1
	0x31A	RTC-Hour	R	RTC-Hour	/	Uint16	1
	0x31B	RTC-Day	R	RTC-Day	/	Uint16	1
	0x31C	RTC-Month	R	RTC-Month	/	Uint16	1
	0x31D	RTC-Year	R	RTC-Year	/	Uint16	1
	0x31E	PowerFactorP1	R	Power factor setting point1	1	Uint16	1
	0x31F	PowerFactorP2	R	Power factor setting point2	0.01	Uint16	1
	0x320	PowerFactorP3	R	Power factor setting point3	0.01	Uint16	1
	0x321	PowerFactorP4	R	Power factor setting point4	0.01	Uint16	1
	0x322	PowerFactorP5	R	Power factor setting point5	0.01	Uint16	1
	0x323	PowerFactorP6	R	Power factor setting point6	0.01	Uint16	1
	0x324	GridServicesEnable_t	R	Grid Service Enable Bit	/	Uint16	1
	0x325	CheckingTime	R	Connection time	1S	Uint16	1
	0x326	ReConnectionTime	R	Reconnection Time	1S	Uint16	1
	0x327	VacOvp1st	R	Upper limits of grid voltage1	0.1V	Uint16	1
	0x328	VacOvp2nd	R	Upper limits of grid voltage2	0.1V	Uint16	1
	0x329	VacOvp3rd	R	Upper limits of grid voltage3	0.1V	Uint16	1
	0x32A	VacUvp1st	R	Lower limits of grid voltage1	0.1V	Uint16	1
	0x32B	VacUvp2nd	R	Lower limits of grid voltage2	0.1V	Uint16	1
	0x32C	VacUvp3rd	R	Lower limits of grid voltage3	0.1V	Uint16	1
	0x32D	Vac10MinOvp	R	10Mins Avg Over Votage	0.1V	Uint16	1
	0x32E	VacStartUp	R	Upper Start Votage	0.1V	Uint16	1
	0x32F	VacStartLo	R	Lower Start Votage	0.1V	Uint16	1
	0x330	VacOvpRecover	R	Over Votage Recover	0.1V	Uint16	1
	0x331	VacUvpRecover	R	Under Votage Recover	0.1V	Uint16	1
	0x332	VacOvp1stTime	R	The first time of Over Votage	10ms	Uint16	1
	0x333	VacOvp2ndTime	R	The second time of Over Votage	10ms	Uint16	1
	0x334	VacUvp1stTime	R	The first time of Under Votage	10ms	Uint16	1
	0x335	VacUvp2ndTime	R	The second time of Under Votage	10ms	Uint16	1
	0x336	FacOfp1st	R	The first level Over frequency	0.01Hz	Uint16	1
	0x337	FacOfp2nd	R	The second level Over frequency	0.01Hz	Uint16	1
	0x338	FacUfp1st	R	The first level Under frequency	0.01Hz	Uint16	1
	0x339	FacUfp2nd	R	The second level Under frequency	0.01Hz	Uint16	1
	0x33A	FacStartUp	R	Start Frequency Upper	0.01Hz	Uint16	1
	0x33B	FacStartLo	R	Start Frequency Lower	0.01Hz	Uint16	1
	0x33C	FacOfpRecover	R	Over Frequency Recover	0.01Hz	Uint16	1
	0x33D	FacUfpRecover	R	Under Frequency Recover	0.01Hz	Uint16	1

	0x33E	FacOfp1stTime	R	The first time of Over Frequency	10ms	Uint16	1
	0x33F	FacOfp2ndTime	R	The second time of Over Frequency	10ms	Uint16	1
	0x340	FacUfp1stTime	R	The first time of Under Frequency	10ms	Uint16	1
	0x341	FacUfp2ndTime	R	The second time of Under Frequency	10ms	Uint16	1
	0x342	RPBF_FreqOverPoint	R	Over Frequency Point	0.01Hz	Uint16	1
	0x343	RPBF_FreqOverRamp	R	Over Frequency Ramp	0.1%	Uint16	1
	0x344	IPBF_FreqUnderPoint	R	Under Frequency Point	0.01Hz	Uint16	1
	0x345	IPBF_FreqUnderRamp	R	Under Frequency Ramp	0.1%	Uint16	1
	0x346	QCurve_FixQset	R	Fix Q Power	1Var	**int16**	1
	0x347	QCurve_SetMode	R	Set Mode(off,UnderExcited,OverExcited,PF,Qu,FixQPower)	0~5	Uint8_Low	1
		bQCurve_SetPf	R	Set Pf Value	0.01	Uint8_Hi	
	0x348	QCurve_CosP_Pf1LimitUp	R	Upper Limits Point1	0.01	Uint8_Low	1
		QCurve_CosP_Pf2LimitDn	R	Lower Limts Point2	0.01	Uint8_Hi	
	0x349	QCurve_CosP_Pf3LimitUp	R	Upper Limits Point3	0.01	Uint8_Low	1
		QCurve_CosP_Pf4LimitDn	R	Lower Limts Point4	0.01	Uint8_Hi	
	0x34A	QCurve_CosP_PowerRatio1	R	Power Ratio Point1	0.1%	Uint16	1
	0x34B	QCurve_CosP_PowerRatio2	R	Power Ratio Point2	0.1%	Uint16	1
	0x34C	QCurve_CosP_PowerRatio3	R	Power Ratio Point3	0.1%	Uint16	1
	0x34D	QCurve_CosP_PowerRatio4	R	Power Ratio Point4	0.1%	Uint16	1
	0x34E	PowerType	R	Machine Type	See below Detail	Uint8_Lo	1
		Safety	R	Safety	See Safety	Uint8_Hi	
	0x34F	MpptScanMode	R	MpptScanMode	0~3	Uint8_Low	1
		PowerRatio	R	Percent of power limits	0.01	Uint8_Hi	
	0x350	SoftStart_Slope	R	SoftStart Slope	0.1%	Uint16	1
	0x351	AcActPowe	R	Ac ActPower	1W	Uint16	1
	0x352	DSP Firmware Version	R	DSP Version	/	Uint16	1
	0x353	ARM Firmware Version	R	ARM Version	/	Uint16	1
	0x354	DataLoggerPowerRatioLimit	R	DataLoggerPowerRatioLimit	1%	Uint16	1
	0x355	Reserved					
	0x356	Reserved					
	0x357	Reserved					
	0x358	Reserved					
	0x359	Reserved					
	0x35A	Reserved					
	0x35B	Reserved					
	0x35C	Reserved					

	0x35D	Reserved					
	0x35E	Reserved					
	0x35F	Reserved					
	0x360	Reserved					
	0xF000						
	0xF001	HOLDDB.bSafety					
	0xF002	HOLDDB.bPvConnectionTyp e					
	0xF003	Reserved					
	0xF004	HOLDDB.bQCurve_SetMode					
		HOLDDB.bQCurve_SetPf					
	0xF005	HOLDDB.bQCurve_CosP_Pf1 LimitUp					
		HOLDDB.bQCurve_CosP_Pf2 LimitDn					
	0xF006	Reserved					
	0xF007	Reserved					
	0xF008	HOLDDB.dwExportPower					
	0xF009	Reserved					
	0xF00A	Reserved					
	0xF00B	Reserved					
	0xF00C	Reserved					
	0xF00D	Reserved					
	0xF00E	Reserved					
	0xF00F	Reserved					
	0xF010	Reserved					
	0xF011	Reserved					
	0xF012	HOLDDB.wQCurve_CosP_Ent ryVolt					
	0xF013	HOLDDB.wQCurve_CosP_Exi tVolt					
	0xF014	HOLDDB.wDspFirmwareVers ion					
	0xF015	Reserved					
	0xF016	Reserved					
	0xF017	ManagerVersion					
	0xF018	Reserved					
	0xF019~0xF01B	RTC					
	0xF01C	Reserved					
	0xF01D	Reserved					
	0xF01E	MeterType					

	0xF01F	HOLDDB.wVacOvp1st					
	0xF020	HOLDDB.wVacOvp2nd					
	0xF021	HOLDDB.wVacOvp3rd					
	0xF022	HOLDDB.wVacUvp1st					
	0xF023	HOLDDB.wVacUvp2nd					
	0xF024	HOLDDB.wVacUvp3rd					
	0xF025	HOLDDB.wGridServices.BIT.bVac10Min					
	0xF026	HOLDDB.wVac10MinOvp					
	0xF027	HOLDDB.wFacOfp1st					
	0xF028	HOLDDB.wFacOfp2nd					
	0xF029	HOLDDB.wFacUfp1st					
	0xF02A	HOLDDB.wFacUfp2nd					
	0xF02B	HOLDDB.wGridServices.BIT.bFacRocof					
	0xF02C	HOLDDB.wGridServices.BIT.bVrt					
	0xF02D	HOLDDB.wFrt_EntryVoltUp					
	0xF02E	HOLDDB.wFrt_EntryVoltDn					
	0xF02F	HOLDDB.wCheckingTime					
	0xF030	HOLDDB.wGridServices.BIT.bRPBF					
	0xF031	HOLDDB.wRPBF_FreqOverPoint					
	0xF032	HOLDDB.wRPBF_FreqOverRamp					
	0xF033	HOLDDB.wGridServices.BIT.bIPBF					
	0xF034	HOLDDB.wIPBF_FreqUnderPoint					
	0xF035	HOLDDB.wIPBF_FreqUnderRamp					
	0xF036	HOLDDB.wGridServices.BIT.bSoftStart					
	0xF037	HOLDDB.wSoftStart_Slope					
	0xF038	HOLDDB.wGridServices.BIT.bPu					
	0xF039	HOLDDB.bQCurve_Qu_Tau3					
	0xF03A	HOLDDB.bPu_3Tau					
	0xF03B	HOLDDB.wQCurve_FixQset					
	0xF03C	HOLDDB.bPowerRatio					
	0xF03D	LCD_RTDB.wPassword					
	0xF03E	Language					

	0xF03F	RTDB.wMyAddress					
	0xF040	HOLDDB.wPowerManagerEnable					
	0xF041	wInverterWorkStatus					
	0xF042	Reserved					
	0xF043	Reserved					
	0xF044	Reserved					
	0xF045	HOLDDB.wVacOvp1stTime					
	0xF046	HOLDDB.wVacOvp2ndTime					
	0xF047	HOLDDB.wVacUvp1stTime					
	0xF048	HOLDDB.wVacUvp2ndTime					
	0xF049	HOLDDB.wFacOfp1stTime					
	0xF04A	HOLDDB.wFacOfp2ndTime					
	0xF04B	HOLDDB.wFacUfp1stTime					
	0xF04C	HOLDDB.wFacUfp2ndTime					
	0xF04D	HOLDDB.bRPBF_CurveType					
	0xF04E	HOLDDB.wRPBF_EntryDelayTime					
	0xF04F	HOLDDB.wRPBF_ExitDelayTime					
	0xF050	HOLDDB.wRPBF_FreqStopPoint					
	0xF051	HOLDDB.wIPBF_EntryDelayTime					
	0xF052	HOLDDB.wPu_GridV1					
	0xF053	HOLDDB.wPu_GridV2					
	0xF054	HOLDDB.wPu_GridV3					
	0xF055	HOLDDB.wPu_GridV4					
	0xF056	HOLDDB.bQCurve_Qu_QuLockEnable					
	0xF057	HOLDDB.wQCurve_Qu_LockIn					
	0xF058	HOLDDB.wQCurve_Qu_LockOut					
	0xF059	HOLDDB.wQCurve_Qu_GridV1					
	0xF05A	HOLDDB.wQCurve_Qu_GridV2					
	0xF05B	HOLDDB.wQCurve_Qu_GridV3					
	0xF05C	HOLDDB.wQCurve_Qu_GridV4					
	0xF05D	HOLDDB.bQCurve_CosP_Pf3					

		LimitUp					
		HOLDDB.bQCurve_CosP_Pf4 LimitDn					
	0xF05E	HOLDDB.wQCurve_CosP_PowerRatio1					
	0xF05F	HOLDDB.wQCurve_CosP_PowerRatio2					
	0xF060	HOLDDB.wQCurve_CosP_PowerRatio3					
	0xF061	HOLDDB.wQCurve_CosP_PowerRatio4					
	0xF062	HOLDDB.bMpptScanMode					
	0xF063	Reserved					
	0xF064	HOLDDB.wNlineControl					
	0xF065	HOLDDB.wRPBF_FreqOverRecoverPoint					
	0xF066	HOLDDB.wRPBF_FreqMaxPoint					
	0xF067	HOLDDB.wRPBF_S					
	0xF068	HOLDDB.wIPBF_FreqUnderRecovPoint					
	0xF069	HOLDDB.wIPBF_FreqMinPoint					
	0xF06A	HOLDDB.wIPBF_S					
	0xF06B	HOLDDB.wReconnectionTime					
	0xF06C	HOLDDB.wPu_Power1					
	0xF06D	HOLDDB.wPu_Power2					
	0xF06E	HOLDDB.wPu_Power3					
	0xF06F	HOLDDB.wPu_Power4					
	0xF070	HOLDDB.wQCurve_Qu_Ratio1					
	0xF071	Reserved					
	0xF072	Reserved					
	0xF073	HOLDDB.wQCurve_Qu_Ratio4					
	0xF074						
	0xF075						
	0xF076						
	0xF077						
	0xF078						
	0xF079						
	0xF07A						

Machine Type:

#define	POWER_3KW_MIC	1	
#define	POWER_4KW_MIC	2	
#define	POWER_5KW_MIC	3	
#define	POWER_6KW_MIC	4	
#define	POWER_8KW_MIC	5	
#define	POWER_10KW_MIC	6	
#define	POWER_12KW_MIC	7	
#define	POWER_15KW_MIC	8	
#define	POWER_8KW_PRO	9	
#define	POWER_10KW_PRO	10	
#define	POWER_12KW_PRO_EU	11	(三路 PV)
#define	POWER_12KW_PRO_AU	12	
#define	POWER_15KW_PRO_EU	13	(三路 PV)
#define	POWER_15KW_PRO_AU	14	
#define	POWER_17KW_PRO_EU	15	(三路 PV)
#define	POWER_17KW_PRO_AU	16	
#define	POWER_20KW_PRO_EU	17	(三路 PV)
#define	POWER_20KW_PRO_AU	18	
#define	POWER_25KW_PRO	19	(三路 PV)
#define	POWER_30KW_PRO	20	(三路 PV)
#define	POWER_10KW_MIC(2 路 3 串)	21	
#define	X3-MIC-5K-G2-LV	22	(针对 MIC G2)
#define	X3-MIC-6K-G2-LV	23	(针对 MIC G2)
#define	X3-MIC-8K-G2-LV	24	(针对 MIC G2)
#define	X3-MIC-10K-G2-LV	25	(针对 Pro G2)
#define	X3-MIC-12K-G2-LV	26	(针对 Pro G2)
#define	X3-MIC-15K-G2-LV	27	(针对 Pro G2)

Example:

QUERY Field Name	 Example (Hex)
Slave Address	11
Function	03
Starting Address Hi	00
Starting Address Lo	6B
No. of Points Hi	00
No. of Roints Lo	03
Error Check (LRC or CRC)	—

RESPONSE	
Field Name	Example (Hex)
Slave Address	11
Function	03
Byte Count	06
Data Hi (Register 40108)	02
Data Lo(Register 40108)	2B
Data Hi(Register 40109)	00
Data Lo(Register 40109)	00
Data Hi(Register 40110)	00
Data Lo(Register 40110)	64
Error Check (LRC or CRC)	—

4. Read input register

Function Code	Register	Name	R/W	Detail	Unit	Type	Len
0x04	0x00-0x3FF	Reserved	NA	System Reserved	NA	NA	
	0x400	Vdc1	R	Pv1 input voltage	0.1V	Uint16	1
	0x401	Vdc2	R	Pv2 input voltage	0.1V	Uint16	1
	0x402	Idc1	R	Pv1 input current	0.1A	Uint16	1
	0x403	Idc2	R	Pv2 input current	0.1A	Uint16	1
	0x404	VacR	R	R phase grid voltage	0.1V	Uint16	1
	0x405	VacS	R	S phase grid voltage	0.1V	Uint16	1
	0x406	VacT	R	T phase grid voltage	0.1V	Uint16	1
	0x407	FacR	R	R phase grid frequency	0.01Hz	Uint16	1
	0x408	FacS	R	S phase grid frequency	0.01Hz	Uint16	1
	0x409	FacT	R	T phase grid frequency	0.01Hz	Uint16	1
	0x40A	IacR	R	R phase output current	0.1A	Uint16	1
	0x40B	IacS	R	S phase output current	0.1A	Uint16	1
	0x40C	IacT	R	T phase output current	0.1A	Uint16	1
	0x40D	INVTemperatureDeg	R	Radiator Temperature	1℃	Uint16	1
	0x40E	Pac	R	Output power	1W	Uint16	1
	0x40F	RunMode	R	Inverter status	/	Uint16	1
	0x410	PacR	R	R phase output power	1W	Uint16	1
	0x411	PacS	R	S phase output power	1W	Uint16	1
	0x412	PacT	R	T phase output power	1W	Uint16	1
	0x413	Pdc	R	Total power of dc1 and dc2 and dc3	1W	Uint16	1
	0x414	Pdc1	R	Power of Dc1	1W	Uint16	1
	0x415	Pdc2	R	Power of Dc2	1W	Uint16	1
	0x416	GridVoltFaultValueR	R	Fault value of R phase voltage	0.1V	Uint16	1
	0x417	GridVoltFaultValueS	R	Fault value of S phase voltage	0.1V	Uint16	1

	0x418	GridVoltFaultValueT	R	Fault value of T phase voltage	0.1V	Uint16	1
	0x419	GridFreqFaultValueR	R	Fault value of R phase frequency	0.01Hz	Uint16	1
	0x41A	GridFreqFaultValueS	R	Fault value of S phase frequency	0.01Hz	Uint16	1
	0x41B	GridFreqFaultValueT	R	Fault value of T phase frequency	0.01Hz	Uint16	1
	0x41C	DciFaultValueR	R	Fault value of R phase DCI	1mA	Uint16	1
	0x41D	DciFaultValueS	R	Fault value of S phase DCI	1mA	Uint16	1
	0x41E	DciFaultValueT	R	Fault value of T phase DCI	1mA	Uint16	1
	0x41F	Pv1VoltFaultValue	R	Fault value of PV1 voltage	0.1V	Uint16	1
	0x420	Pv2VoltFaultValue	R	Fault value of PV2 voltage	0.1V	Uint16	1
	0x421	INVTemperatureDegFalutValue	R	Fault value of Radiator temperature	1℃	Uint16	1
	0x422	GfciFaultvalue	R	Fault value of gfci	1mA	Uint16	1
	0x423	YieldTotal.LSB	R	LSB of yield total	0.1Kwh	Uint16	
	0x424	YieldTotal.MSB	R	MSB of yield total		Uint16	2
	0x425	YieldToday.LSB	R	LSB of yield today		Uint16	
	0x426	YieldToday.MSB	R	MSB of yield today	0.1Kwh	Uint16	2
	0x427	Inverter_FaultMessage.Word0	R	Word0 of fault message(LSB)	/	Uint16	
	0x428	Inverter_FaultMessage.Word1	R	Word1 of fault message(MSB)	/	Uint16	2
	0x429	Vdc3	R	Pv3 input voltage	0.1V	Uint16	1
	0x42A	Idc3	R	Pv3 input current	0.1A	Uint16	1
	0x42B	Pdc3	R	Power of Dc3	1W	Uint16	1
	0x42C	ENVTemperatureDeg	R	Control Board Temperature	1℃	Uint16	1
	0x42D	ENVTemperatureDegFaultValue	R	Fault value of Control Board temperature	1℃	Uint16	1
	0x42E	Pv3VoltFaultValue	R	Fault value of PV3 voltage	0.1V	Uint16	1
	0x42F	Manager_FaultMessage.All	R	Manager_FaultMessage	/	Uint16	1
	0x430	Reserved	R	/	/	Uint16	1
	0x431	Reserved	R	/	/	Uint16	1
	0x432	Reserved	R	/	/	Uint16	1
	0x433	Reserved	R	/	/	Uint16	1
	0x434	Reserved	R	/	/	Uint16	1
	0x435	Reserved	R	/	/		1
	0x436	Reserved	R	/	/		1
	0x437	Reserved	R	/	/		1
	0x438	Reserved	R	/	/		1
	0x439	Reserved	R	/	/		1
	0x43A	Reserved	R	/	/		1
	0x43B			GridPower			
	0x43C	Feed In Power	R	0x43B:LSB 0x43C: MSB	1W	Int32	2
	0x43D			Feed In Energy			
	0x43E	Feed In Energy	R	0x43D:LSB 0x43E:MSB	0.01Kwh	Uint32	2
	0x43F			Consume In Energy			
	0x440	Consume Energy	R	0x43F:LSB 0x440:MSB	0.01Kwh	Uint32	2

用来匹配充电桩需要的数据	0x700	RefPowerToEV	R	RefPowerToEV	1W	Int16	1
	0x701	PowerToEV	R	PowerToEV (0x0700:LSB,0x0701:MSB	1W	Int32	1
	0x702						
	0x703	PvRef	R	0:No PV 1:With PV	/	Uint16	1
	0x704	FeedinPower_R_phase		FeedinPower_R_phase (meter/CT) (0x0705:LSB,0x0706:MSB)	1W	Int32	2
	0x705						
	0x706	FeedinPower_S_phase	R	FeedinPower_S_phase (meter/CT) (0x0707:LSB,0x0708:MSB)	1W	Int32	2
	0x707						
	0x708	FeedinPower_T_phase	R	FeedinPower_T_phase (meter/CT) (0x0709:LSB,0x070A:MSB)	1W	Int32	2
	0x709						
	0xF01E	DataHub 读取实时数据的个数	R				
	0xF01F	实时数据					

Example:

QUERY	
Field Name	Example (Hex)
Slave Address	11
Function	04
Starting Address Hi	00
Starting Address Lo	08
No. of Points Hi	00
No. of Roints Lo	01
Error Check (LRC or CRC)	—

RESPONSE	
Field Name	Example (Hex)
Slave Address	11
Function	04
Byte Count	02
Data Hi(Register 30009)	00
Data Lo(Register 30009)	0A
Error Check (LRC or CRC)	—

The detail of "Run Mode":

Value	Mode
0	Wait Mode
1	Check Mode
2	Normal Mode
3	Fault Mode
4	Permanent Fault Mode

The detail of "Inverter_FaultMessage":

BIT31	Other_DeviceFault	
BIT30	GridRelayFault	
BIT29	PvConnDirFault	
BIT28	RcDeviceFault	
BIT27	EepromFault	
BIT26	AcTerminalOTP	
BIT25	FanFault	
BIT24	InternalCommsFault	
BIT23	Reserved	

BIT22	Reserved	
BIT21	Reserved	
BIT20	LowTempFault	
BIT19	Reserved	
BIT18	Reserved	
BIT17	Reserved	
BIT16	Reserved	
BIT15	Reserved	
BIT14	Reserved	
BIT13	OverTempFault	
BIT12	IsoFault	
BIT11	ResidualOcp	
BIT10	SwOcp	
BIT09	Reserved	
BIT08	DcInjOcp	
BIT07	GridVolt10MinFault	
BIT06	Reserved	
BIT05	BusVoltFault	
BIT04	PvVoltFault	
BIT03	GridFreqFault	
BIT02	GridVoltFault	
BIT01	MainsLostFault	
BIT00	TzProtectFault	

The detail of “Manager_FaultMessage”:

BIT15	Fan2Error	
BIT14	Fan1Error	
BIT13	Reserved	
BIT12	Reserved	
BIT11	Reserved	
BIT10	Reserved	
BIT09	Reserved	
BIT08	Reserved	
BIT07	Reserved	
BIT06	Reserved	
BIT05	Reserved	
BIT04	Meter_Error	
BIT03	ArmDspCommsError	
BIT02	E2promError	
BIT01	Reserved	
BIT00	PowerTypeFault	

5. Write single register

Function Code	Register	Name	R/W	Detail	Unit	Type
0x06	0x00-0x5FF	Reserved	NA	System Reserved	NA	NA
	0x600	Password	W	Unlock input	/	Uint16
	0x601	VpvStart	W	Start PV voltage	0.1V	Uint16
	0x602	CheckingTime	W	CheckingTime	1S	Uint16
	0x603	VacUvp2nd	W	Lower limits of grid voltage	0.1V	Uint16
	0x604	VacOvp2nd	W	Upper limits of grid voltage	0.1V	Uint16
	0x605	FacUfp2nd	W	Lower limits of grid frequency	0.01Hz	Uint16
	0x606	FacOfp2nd	W	Upper limits of grid frequency	0.01Hz	Uint16
	0x607	Safty	W	Saftey type	/	Uint16
	0x608	PvConnectionMode	W	Pv connection mode	/	Uint16
	0x609	Grid10MinAvgProtect	W	Grid voltage limits of 10min average	0.1V	Uint16
	0x60A	VacUvp1st	W	Lower limits of grid voltage(slow)	0.1V	Uint16
	0x60B	VacOvp1st	W	Upper limits of grid voltage(slow)	0.1V	Uint16
	0x60C	FacUfp1st	W	Lower limits of grid frequency(slow)	0.01Hz	Uint16
	0x60D	FacOfp1st	W	Upper limits of grid frequency(slow)	0.01Hz	Uint16
	0x60E	DCILimits	W	Limits of DCI	1mA	Uint16
	0x60F	PowerLimitsPercent	W	Percent of power limits	%	Uint16
	0x610	RemoteControl	W	Remote startup and shutdown	/	Uint16
	0x611	Clean Yield History	W	Clean yield history	/	Uint16
	0x612	Pv1 Current calibrate	W	Pv1 Current calibrate	0.1A	Uint16
	0x613	Pv2 Current calibrate	W	Pv2 Current calibrate	0.1A	Uint16
	0x614	Pv1 Voltage calibrate	W	Pv1 Voltage calibrate	0.1V	Uint16
	0x615	Pv2 Voltage calibrate	W	Pv2 Voltage calibrate	0.1V	Uint16
	0x616	AC Current calibrate R	W	AC Current calibrate R	0.1A	Uint16
	0x617	AC Current calibrate S	W	AC Current calibrate S	0.1A	Uint16
	0x618	AC Current calibrate T	W	AC Current calibrate T	0.1A	Uint16
	0x619	AC Voltage calibrate R	W	AC Voltage calibrate R	0.1V	Uint16
	0x61A	AC Voltage calibrate S	W	AC Voltage calibrate S	0.1V	Uint16
	0x61B	AC Voltage calibrate T	W	AC Voltage calibrate T	0.1V	Uint16
	0x61C	EEPROM Load Default Value	W	EEPROM Load Default Value	/	Uint16
	0x61D	ChangePower	W	Change Power Value	1W	Uint16
	0x61E	ChangePower	W	Change Power Percent	1%	Uint16
	0x61F	FixQPower	W	FixQPower set	Var	**int16**
	0x620	RPBF_CurveType	W	RPBF_CurveType	1~2	Uint16

	0x621	RPBF_FreqOverPoint	W	RPBF_FreqOverPoint	0.01Hz	Uint16
	0x622	RPBF_FreqOverRamp	W	RPBF_FreqOverRamp	0.1%	Uint16
	0x623	IPBF_CurveType	W	IPBF_CurveType	1~2	Uint16
	0x624	IPBF_FreqUnderPoint	W	IPBF_FreqUnderPoint	0.01Hz	Uint16
	0x625	IPBF_FreqUnderRamp	W	IPBF_FreqUnderRamp	0.1%	Uint16
	0x626	QCurve_SetMode	W	0:off 1:OverExcited 2:UnderExcited 3:PF(p) 4:Q(u) 5:FixQPower	0~5	Uint16
	0x627	QCurve_SetPf	W		0.01	Uint16
	0x628	QCurve_sCosP_Pf1LimitUp	W	Pf1LimitUp	0.01	Uint16
	0x629	QCurve_sCosP_Pf2LimitDn	W	Pf2LimitDn	0.01	Uint16
	0x62A	QCurve_sCosP_Pf3LimitUp	W	Pf3LimitUp	0.01	Uint16
	0x62B	QCurve_sCosP_Pf4LimitDn	W	Pf4LimitDn	0.01	Uint16
	0x62C	QCurve_CosP_PowerRatio1	W	PowerRatio1	0.1%	Uint16
	0x62D	QCurve_CosP_PowerRatio2	W	PowerRatio2	0.1%	Uint16
	0x62E	QCurve_CosP_PowerRatio3	W	PowerRatio3	0.1%	Uint16
	0x62F	QCurve_CosP_PowerRatio4	W	PowerRatio4	0.1%	Uint16
	0x630	QCurve_Qu_GridV1	W	QuGridV1	0.1V	Uint16
	0x631	QCurve_Qu_GridV2	W	QuGridV2	0.1V	Uint16
	0x632	SelectLanguage	W	Select Language	1.英语 2.德语 3.波兰语 4.法语 5.葡萄牙语 6.中文	Uint16
	0x633	QCurve_Qu_GridV4	W	QuGridV4	0.1V	Uint16
	0x634	PuGridV1	W	PuGridV1	0.1V	Uint16
	0x635	PuGridV2	W	PuGridV1	0.1V	Uint16
	0x636	PuGridV3	W	PuGridV1	0.1V	Uint16
	0x637	PuGridV4	W	PuGridV1	0.1V	Uint16
	0x638	SetAcActPower	W	SetAcActPower	1W	Uint16
	0x639	GridServices	W	GridServicesEnable_t	/	Uint16
	0x63A	Pv3 Current calibrate	W	Pv3 Current calibrate	0.1A	Uint16
	0x63B	Pv3 Voltage calibrate	W	Pv3 Voltage calibrate	0.1V	Uint16
	0x63C	QCurve_Qu_GridV3	W	QuGridV3	0.1V	Uint16
	0x63D	RemoteControlPower	W	Remote quickly control power	1W	Uint16
	0x63E	AgeingMode	W	1:Enable 0:Disanle	/	Uint16
	0x63F	ReConnectionTime	W	10~1000	1s	Uint16

	0x640	QCurve_SetMode_Special	W	0:off 1:OverExcited 2:UnderExcited 3:PF(p) 4:Q(u) 5:FixQPower	0~5	Uint16
	0x641	QCurve_FixQset_Special	W	FixQ Power Value	1Var	int16

```
typedef union GridServicesEnable_t
{
    uint16_t ALL;
    struct
    {
        uint8_t BYTE0:8;
        uint8_t BYTE1:8;
    } BYTE;
    struct
    {
        //BYTE0
        uint8_t bSoftStart:1;
        uint8_t bVac10Min:1;
        uint8_t bFacRocof:1;      //频率变化比
        uint8_t bRPBF:1;          //过频降载
        uint8_t bIPBF:1;          //欠频升载
        uint8_t bPu:1;
        uint8_t bQu:1;
        uint8_t bPf:1;
        //BYTE1
        uint8_t bDcInj:1;
        uint8_t bVrt:1;
        uint8_t bDRM:1;
        uint8_t bSelfTest:1;
        uint8_t BIT012:1;
        uint8_t BIT013:1;
        uint8_t BIT014:1;
        uint8_t BIT015:1;
    } BIT;
}GridServicesEnable_t;
```

Attention:
Write the correct password to this register(0x600) and the inverter will unlock the write command. Write a incorrect password to this register(0x600) and the inverter

will lock the write command again. All the writeable register except 0x600 are unusable when the system is locked.

Example:

QUERY	
Field Name	Example (Hex)
Slave Address	11
Function	06
Register Address Hi	00
Register Address Lo	01
Preset Data Hi	00
Preset Data Lo	03
Error Check (LRC or CRC)	—

RESPONSE	
Field Name	Example (Hex)
Slave Address	11
Function	06
Register Address Hi	00
Register Address Lo	01
Preset Data Hi	00
Preset Data Lo	03
Error Check (LRC or CRC)	—

Detail:

Safety Type:

```
#define VDE0126:                    0
#define ARN4105:                    1
#define AS4777_AU:                  2
#define G98:                        3
#define C10_11:                     4
#define E8001:                      5
#define EN50438_Netherlands:        6
#define EN50438_Denmark2019_W:      7
#define CEB:                        8
#define CEI0_21:                    9
#define NRS097_2_1:                 10
#define VDE0126_Greece_Island:      11
#define UTE_C15_712_Fr:             12
#define IEC61727_In:                13
#define G99:                        14
#define VDE0126_Greece:             15
#define France_Guyana_50Hz:         16
```

```
#define France_Island_50Hz:        17
#define France_Island_60Hz:        18
#define AS4777_NZ:                 19
#define RD1699:                    20
#define Chile:                     21
#define EN50438_Ireland:           22
#define G98_Philippines:           23
#define Czech_PPDS:                24
#define EN50438_Czech:             25
#define EN50549_1:                 26
#define EN50438_Denmark2019_E:     27
#define RD1699_Island:             28
#define EN50549_Poland             29
#define MEA_Thailand               30
#define PEA_Thailand               31
#define CEI0_21_ACEA               32
#define AS4777_B                   33
#define AS4777_C                   34
#define UserDefined                35
#define CQC                        36
#define IEC61727_Br                37
#define IEC61727                   38
#define IEC61727_Br_LV             39
#define TOR                        40
#define CEI0_16                    41
#define Chile_2021                 42
#define Chile_2021_MT_R            43
#define Chile_2021_MT_U            44
#define Czech_2021_2               45
#define EN50549_Sweden             46
#define EN50549_Romania            47
#define  Slovenia                  48
```

PvConnectionMode:
1: Multi-String
2: Comm-String

RemoteControl:
0:Stop
1:Start

6. Write multiple register

Function Code	Register	Name	R/	Detail	Unit	Type

			W			
0x10 (WRITE_MULTIPLE_REGISTER)	0x00-0x0FFA	Reserved	NA	System Reserved	NA	NA
	0x0FFB-0x0FFF	Reserved	W	10 Chars	/	Uint1
	0x1000-0x1006	Reserved	W	14 Chars,MSB=SN[14]	/	Uint1
	0x1007-0x100D	Reserved	W	14 Chars,MSB=FactoryName[14]	/	Uint1
	0x100E-0x1014	Reserved	W	14 Chars,MSB=ModuleName[14]	/	Uint1
	0x1015	RTC-Second	W	RTC-Second	/	Uint1
	0x1016	RTC-Minute	W	RTC-Minute	/	Uint1
	0x1017	RTC-Hour	W	RTC-Hour	/	Uint1
	0x1018	RTC-Day	W	RTC-Day	/	Uint1
	0x1019	RTC-Month	W	RTC-Month	/	Uint1
	0x101A	RTC-Year	W	RTC-Year	/	Uint1
	0x101B	PowerFactorP1	W	QCurve_SetMode	1	Uint1
	0x101C	PowerFactorP2	W	QCurve_SetPf	0.01	Uint1
	0x101D	PowerFactorP3	W	QCurve_sCosP_Pf1LimitUp	0.01	Uint1
	0x101E	PowerFactorP4	W	QCurve_sCosP_Pf2LimitDn	0.01	Uint1
	0x101F	PowerFactorP5	W	QCurve_CosP_PowerRatio1	0.1	Uint1
	0x1020	PowerFactorP6	W	QCurve_CosP_PowerRatio2	0.1	Uint1
	0x1800~0x1801	DataLoggerPowerRatioLimit	W	DataLogger set PowerRatio Limit	0.001 % 10000 0=100 %	Uint3

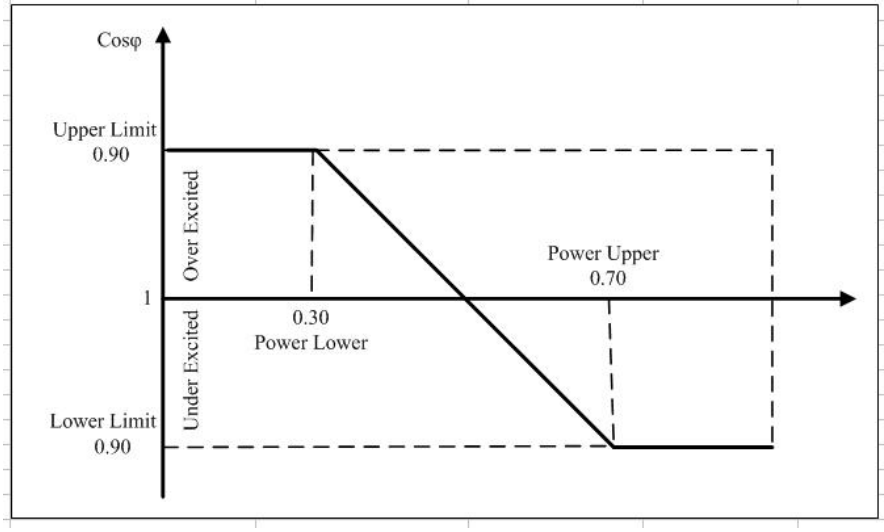
Example:

QUERY	
Field Name	Example (Hex)
Slave Address	11
Function	10
Starting Address Hi	00
Starting Address Lo	01
No. of Registers Hi	00
No. of Registers Lo	02
Byte Count	04
Data Hi	00
Data Lo	0A
Data Hi	01
Data Lo	02
Error Check (LRC or CRC)	—

PESPONSE	
Field Name	Example (Hex)
Slave Address	11
Function	10
Starting Address Hi	00
Starting Address Lo	01
No. of Registers Hi	00
No. of Registers Lo	02
Error Check (LRC or CRC)	—

Detail of power factor setting:

PowerFactorP1	PowerFactorP2	PowerFactorP3	PowerFactorP4	PowerFactorP5	PowerFactorP6
byte1	byte2	byte3	byte4	byte5	byte6
1(Over excited mode)	PowerFactor value	upper limit	power lower	Power Upper	lower limit
2(Under excited mode)	PowerFactor value	upper limit	power lower	Power Upper	lower limit
3(curve mode)	PowerFactor value	upper limit	power lower	Power Upper	lower limit



7. Calc CheckSum

```
Uint16 sGetCrc16(Uint8 *pData, Uint16 wDataLenth)
{
    static const Uint16 wCRCTable[] = {
    0X0000, 0XC0C1, 0XC181, 0X0140, 0XC301, 0X03C0, 0X0280, 0XC241,
    0XC601, 0X06C0, 0X0780, 0XC741, 0X0500, 0XC5C1, 0XC481, 0X0440,
    0XCC01, 0X0CC0, 0X0D80, 0XCD41, 0X0F00, 0XCFC1, 0XCE81, 0X0E40,
    0X0A00, 0XCAC1, 0XCB81, 0X0B40, 0XC901, 0X09C0, 0X0880, 0XC841,
    0XD801, 0X18C0, 0X1980, 0XD941, 0X1B00, 0XDBC1, 0XDA81, 0X1A40,
    0X1E00, 0XDEC1, 0XDF81, 0X1F40, 0XDD01, 0X1DC0, 0X1C80, 0XDC41,
    0X1400, 0XD4C1, 0XD581, 0X1540, 0XD701, 0X17C0, 0X1680, 0XD641,
    0XD201, 0X12C0, 0X1380, 0XD341, 0X1100, 0XD1C1, 0XD081, 0X1040,
    0XF001, 0X30C0, 0X3180, 0XF141, 0X3300, 0XF3C1, 0XF281, 0X3240,
    0X3600, 0XF6C1, 0XF781, 0X3740, 0XF501, 0X35C0, 0X3480, 0XF441,
    0X3C00, 0XFCC1, 0XFD81, 0X3D40, 0XFF01, 0X3FC0, 0X3E80, 0XFE41,
    0XFA01, 0X3AC0, 0X3B80, 0XFB41, 0X3900, 0XF9C1, 0XF881, 0X3840,
    0X2800, 0XE8C1, 0XE981, 0X2940, 0XEB01, 0X2BC0, 0X2A80, 0XEA41,
    0XEE01, 0X2EC0, 0X2F80, 0XEF41, 0X2D00, 0XEDC1, 0XEC81, 0X2C40,
    0XE401, 0X24C0, 0X2580, 0XE541, 0X2700, 0XE7C1, 0XE681, 0X2640,
    0X2200, 0XE2C1, 0XE381, 0X2340, 0XE101, 0X21C0, 0X2080, 0XE041,
    0XA001, 0X60C0, 0X6180, 0XA141, 0X6300, 0XA3C1, 0XA281, 0X6240,
```

```
    0X6600, 0XA6C1, 0XA781, 0X6740, 0XA501, 0X65C0, 0X6480, 0XA441,
    0X6C00, 0XACC1, 0XAD81, 0X6D40, 0XAF01, 0X6FC0, 0X6E80, 0XAE41,
    0XAA01, 0X6AC0, 0X6B80, 0XAB41, 0X6900, 0XA9C1, 0XA881, 0X6840,
    0X7800, 0XB8C1, 0XB981, 0X7940, 0XBB01, 0X7BC0, 0X7A80, 0XBA41,
    0XBE01, 0X7EC0, 0X7F80, 0XBF41, 0X7D00, 0XBDC1, 0XBC81, 0X7C40,
    0XB401, 0X74C0, 0X7580, 0XB541, 0X7700, 0XB7C1, 0XB681, 0X7640,
    0X7200, 0XB2C1, 0XB381, 0X7340, 0XB101, 0X71C0, 0X7080, 0XB041,
    0X5000, 0X90C1, 0X9181, 0X5140, 0X9301, 0X53C0, 0X5280, 0X9241,
    0X9601, 0X56C0, 0X5780, 0X9741, 0X5500, 0X95C1, 0X9481, 0X5440,
    0X9C01, 0X5CC0, 0X5D80, 0X9D41, 0X5F00, 0X9FC1, 0X9E81, 0X5E40,
    0X5A00, 0X9AC1, 0X9B81, 0X5B40, 0X9901, 0X59C0, 0X5880, 0X9841,
    0X8801, 0X48C0, 0X4980, 0X8941, 0X4B00, 0X8BC1, 0X8A81, 0X4A40,
    0X4E00, 0X8EC1, 0X8F81, 0X4F40, 0X8D01, 0X4DC0, 0X4C80, 0X8C41,
    0X4400, 0X84C1, 0X8581, 0X4540, 0X8701, 0X47C0, 0X4680, 0X8641,
    0X8201, 0X42C0, 0X4380, 0X8341, 0X4100, 0X81C1, 0X8081, 0X4040 };

    Uint8 nTemp;
    Uint16 wCRCWord = 0xFFFF;

    while(wDataLenth --)
    {
        nTemp = *pData++ ^ wCRCWord;
        wCRCWord >>= 8;
        wCRCWord  ^= wCRCTable[nTemp];
    }
    return wCRCWord;

} // End: CRC16
```