

X1 X3-HAC EV Charger Modbus RTU/TCP Communication protocols



History list:

Date	Name	detail	Version	other
2024-6-25	Li	None	1.0.0	

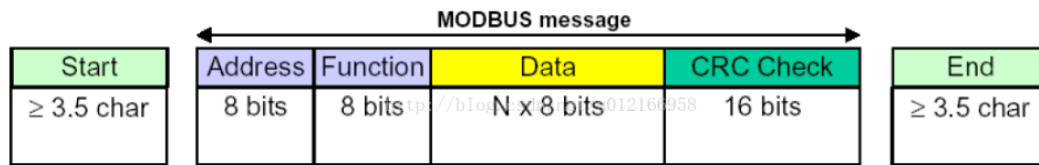
Version matching information

Protocol version	Manager soft version (Match the lowest version)
V1.0.0	V1.28

Protocols general

Protocol type: Modbus RTU

Fame format:



protocols type: Modbus TCP (for EVC module)

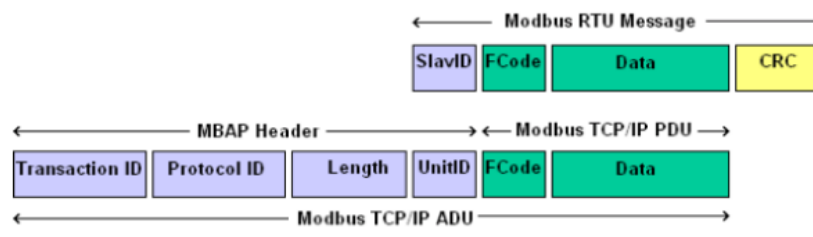
port: 502

Transaction ID: No compulsory requirements

Protocol ID: No compulsory requirements

Unit ID: No compulsory requirements, use 0x01 by default

frame format:



Note: Inverter connects the SolaX Power monitoring module to support Modbus TCP. The minimum interval time of two commands is 1 second.

Time request:

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

Notice: When use “Write Single Registers” and “Write Multiple Registers” function, some registers will be write in EEprom if they are changed (these parameters can be saved after power

failure). But the EEprom has the write times limit. Too frequent operation will lead to irreversible hardware damage. Related registers are marked with ★.If there is any doubt about the use, please contact the technical personnel in time.

0x03/0x06/0x10: Holding Register

32bit data use little endian format

Function Code	Holding Register						
	Register	Variable	W/R	Description	Unit	Data format	Length/ (Unit:2 bytes)
0X03 0x06 0x10	0x060E	ECOGear	W/R	1: 6A 2: 10A 3: 16A 4: 20A 5: 25A 7kw can only be set to 1-2	---	uint16	1
0X03 0x06 0x10	0x060F	GreenGear	W/R	1: 3A 2: 6A	---	uint16	1
0X03 0x06 0x10	0x0610	StartChargeMode	W/R	0: Plug and Charge 1: Swipe card to start 2: App Start	---	uint16	1
0X03 0x06 0x10	0x0613	BoostMode	W/R	0: Normal 1: Timer Boost 2: Smart Boost	---	uint16	1
0X03 0x06 0x10	0x0614	UserSet_ Contracted Current	W/R	[16,300] Contracted Current	1A	uint16	1
0X03 0x06 0x10	0x061C	EVSE_Scene	W/R	0: PV Mode 1: Standard Mode 2: OCPP Mode	---	uint16	1
0X03 0x06 0x10	0x061D	Timezone	W/R	[-720,720], The number 480 represents the +8 time zone, (Time Difference, If there is Daylight Saving Time, please calculate accordingly.)	---	int16	1
0X03 0x06 0x10	0x061E	RTC_Seconds(UTC)	W/R	[0,59] Seconds(UTC)	---	uint16	1
0X03 0x06 0x10	0x061F	RTC_Minutes(UTC)	W/R	[0,59] Minutes(UTC)	---	uint16	1
0X03 0x06 0x10	0x0620	RTC_Hours(UTC)	W/R	[0,23] Hours(UTC)	---	uint16	1

0X03 0x06 0x10	0x0621	RTC_Days(UTC)	W/R	[1,31] Days(UTC)	---	uint16	1
0X03 0x06 0x10	0x0622	RTC_Months(UTC)	W/R	[1,12] Months(UTC)	---	uint16	1
0X03 0x06 0x10	0x0623	RTC_Years(UTC)	W/R	[0,99] Years(UTC)	---	uint16	1
0X03 0x06 0x10	0x0625	ChargePhase	W/R	0: Three-phase 1: First phase (EV charger is connected to the first phase) 2: Second phase 3: Third phase	---	uint16	1
0X03 0x06 0x10	0x0627	control_command	W/R	1: Available 2: Unavailable 3: Stop Charge 4: Start Charge	---	uint16	1
0X03 0x06 0x10	0x0628	adjust_charge_current	W/R	[600,3500] Adjust Current (When the current is less than 6A, the charging will be suspended; If the current is equal to or greater than 6A in the suspended charging state, the system will delay charging for 30 seconds to resume charging, preventing frequent start and stop)	0.01A	uint16	1
0X03 0x06 0x10	0x0634	timerBoost StartHours	W/R	[0,23] Scheduled Boost Start (Hour)	---	uint16	1
0X03 0x06 0x10	0x0635	timerBoost StartMinutes	W/R	[0,59] Scheduled Boost Start (Minute)	---	uint16	1
0X03 0x06 0x10	0x0636	timerBoost EndHours	W/R	[0,23] Scheduled Boost End (Hour)	---	uint16	1
0X03 0x06 0x10	0x0637	timerBoost EndMinutes	W/R	[0,59] Scheduled Boost End (Minute)	---	uint16	1

0X03 0x06 0x10	0x0638	smartBoost EndHours	W/R	Smart Boost End (Hour)	—	uint16	1
0X03 0x06 0x10	0x0639	smartBoost EndMinutes	W/R	Smart Boost End (Minute)	—	uint16	1
0X03 0x06 0x10	0x063A	smartBoost SetEnergy	W/R	[0,150] Smart Boost Preset Energy	1kwh	uint16	1
0X03 0x06 0x10	0x063C	UnbalancedPower	W/R	[1300,7200] Three-phase Unbalanced Power	1W	uint16	1
0X03 0x06 0x10	0x063D	UnbalancedSwitch	W/R	Three-phase unbalanced switch 0: Off 1: On	—	uint16	1
0X03 0x06 0x10	0x0640	Slave_Address	W/R	[1,250] Slave RS485 Address	—	uint16	1
0X03 0x06 0x10	0x0643	adjust_charge_ power	W/R	Adjust Power (When the current value converted by the adjusted power is less than 6A, the charging will be suspended; when the current is greater than or equal to 6A, the charging will be suspended, and the system will delay charging for 30 seconds to resume charging, avoiding frequent start and stop)	1w	uint16	1
0X03 0x06 0x10	0x0664	MainBreaker LimitSwitch	W/R	0: Closed 1: Open Default: Open	—	uint16	1
0X03 0x06 0x10	0x0668	MaxChargeCurrent	W/R	[600,3200] Maximum Charging Current	0.01A	uint16	1
0X03 0x06 0x10	0x0669	Set_EVSE_Mode	W/R	0: FAST 1: ECO 2: GREEN	—	uint16	1

Table 1-1 Data format description

Master request format		
	Bytes number	Content format
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)
Function code	1 byte	0x03
Start register address	2 byte Address MSB Address LSB	0x0000~0xFFFF
Register number	2byte Data MSB Data LSB	N
CRC	2byte CRC MSB CRC MSB	
Slave normal response		
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)
Function code	1 byte	0x03
Byte number	1 byte Data	2*N
Register date	N*2byte Data MSB Data LSB	
CRC	2byte CRC MSB CRC MSB	
Slave fault response		
Slave ID	1byte	0x00~0xFF (Inverter default 0x01)
Fault code	1byte	0x83
Abnormal code	1byte	0x01 or 0x02 or 0x03 or 0x04
CRC	2byte CRC MSB	

0x04: Read Input Register

32bit data use little endian format

Function Code	Read Input Register						
	Register	Variable	W/R	descripton	Unit	Data format	Length (Unit:2 bytes)
0X04	0x0000	VoltageA	R	Phase 1 Voltage	0.01V	uint16	1
0X04	0x0001	VoltageB	R	Phase 2 Voltage	0.01V	uint16	1
0X04	0x0002	VoltageC	R	Phase 3 Voltage	0.01V	uint16	1
0X04	0x0003	VoltagePE	R	PE Voltage	0.01V	uint16	1
0X04	0x0004	CurrentA	R	Phase 1 Current	0.01A	uint16	1
0X04	0x0005	CurrentB	R	Phase 2 Current	0.01A	uint16	1
0X04	0x0006	CurrentC	R	Phase 3 Current	0.01A	uint16	1
0X04	0x0007	CurrentPE	R	PE Current	0.001A	uint16	1
0X04	0x0008	ChargePowerA	R	Phase 1 Power	1W	uint16	1
0X04	0x0009	ChargePowerB	R	Phase 2 Power	1W	uint16	1
0X04	0x000A	ChargePowerC	R	Phase 3 Power	1W	uint16	1
0X04	0x000B	TotalChargePower	R	Total Charging Power	1W	uint16	1
0X04	0x000C	Freq_A	R	Phase 1 Frequency	0.01HZ	uint16	1
0X04	0x000D	Freq_B	R	Phase 2 Frequency	0.01HZ	uint16	1
0X04	0x000E	Freq_C	R	Phase 3 Frequency	0.01HZ	uint16	1
0X04	0x000F	EQ_Single	R	Single Charging Energy Consumption	0.1kwh	uint16	1
0X04	0x0010	EQ_Total	R	Cumulative Charging Energy Consumption	0.1kwh	uint32	2
0X04	0x0012	ExternCurrentA	R	Phase 1 Grid-side Measured Current (Data from external CT or RS485.)	0.01A	int16	1

0X04	0x0013	ExternCurrentB	R	Phase 2 Grid-side Measured Current(Data from external CT or RS485.)	0.01A	int16	1
0X04	0x0014	ExternCurrentC	R	Phase 3 Grid-side Measured Current(Data from external CT or RS485.)	0.01A	int16	1
0X04	0x0015	ExternPowerA	R	Phase 1 Grid-side Measured Power	1W	int16	1
0X04	0x0016	ExternPowerB	R	Phase 2 Grid-side Measured Power	1W	int16	1
0X04	0x0017	ExternPowerC	R	Phase 3 Grid-side Measured Power	1W	int16	1
0X04	0x0018	ExternTotalPower	R	Total Grid-side Measured Power	1W	int16	1
0X04	0x001D	EVSE_State	R	0: (Available) 1: (Preparing) 2: (Charging) 3: (Finish) 4: (Faulted) 5: (Unavailable) 6: (Reserved) 7: (SuspendedEV) 8: (SuspendedEVSE) 9: (Update) 10: (CardActivation) 11: (StartDelay) 12: (ChargPause) 13: (Stopping)	—	uint16	1
0X04	0x001E	FaultCode	R	Fault Code	—	uint32	2
0X04	0x0020	TypeCase	R	0: CaseB, 1: CaseC	—	uint16	1
0X04	0x0021	TypePower	R	0: 6kW 1: 7kW 2: 11kW 3: 22kW 4: 4.6kW	—	uint16	1
0X04	0x0022	TpyePhase	R	0: Single phase 1: Three phase	—	uint16	1
0X04	0x0023	EVSE_Scene	R	0: EV Charger PV Mode 1: EV Charger Standard Mode 2: EV Charger OCPP Mode	—	uint16	1

0X04	0x0025	FirmwareVersion	R	Firmware Version	Vx.xx	uint16	1
0X04	0x0026	Network	R	0: Not Connected to Network 1: Connected to Network	— —	uint16	1
0X04	0x0027	RSSI	R	Signal Strength	1%	uint16	1
0X04	0x0028	ChargePhase	R	0: Three-phase 1: Phase One 2: Phase Two 3: Phase Three	— —	uint16	1
0X04	0x0029	UnbalancedPower	R	Three-phase Imbalance Power	1W	uint16	1
0X04	0x002A	UnbalancedSwitch	R	0: Off, 1: On	— —	uint16	1
0X04	0x002B	Charging_time	R	Charging Duration	1s	uint32	2
0X04	0x002D	Lock_Status	R	0: Unlocked, 1: Locked	— —	uint16	1
0X04	0x002E	MainBreakerLimitState	R	0: No Limitation 1: Limited, but Charging Not Stopped 2: Limited and Charging Stopped	— —	uint16	1
0X04	0x002F	delay_state	R	0: Not in Random Delay 1: In Random Delay	— —	uint16	1
0X04	0x0030	ban_state	R	0: None 1: Charge prohibition	— —	uint16	1
0X04	0x0031	start_Seconds	R	Charging Start (Seconds)	— —	uint16	1
0X04	0x0032	start_Minutes	R	Charging Start (Minutes)	— —	uint16	1
0X04	0x0033	start_Hours	R	Charging Start (Hours)	— —	uint16	1
0X04	0x0034	start_Days	R	Charging Start (Day)	— —	uint16	1
0X04	0x0035	start_Months	R	Charging Start (Month)	— —	uint16	1
0X04	0x0036	start_Years	R	Charging Start (Year)	— —	uint16	1

Table 2-1 Data format description

Master request format		
	Bytes number	Content format
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)
Function code	1 byte	0x04
Start register address	2 byte Address MSB Address LSB	0x0000-0xFFFF
Register number	2byte Data MSB Data LSB	N
CRC	2byte CRC MSB CRC MSB	
Slave normal response		
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)
Function code	1 byte	0x04
Byte number	1 byte Data	2*N
Register date	N*2byte Data MSB Data LSB	
CRC	2byte CRC MSB CRC MSB	
Slave fault response		
Slave ID	1byte	0x00~0xFF (Inverter default 0x01)
Fault code	1byte	0x84
Abnormal code	1byte	0x01 or 0x02 or 0x03 or 0x04
CRC	2byte CRC MSB	

0x06: Write Single Register

32bit data use little endian format

Table 3-1 Data format description

Master request format		
	Bytes number	Content format
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)
Function code	1 byte	0x06
Register address	2 byte Address MSB Address LSB	0x0000-0xFFFF
Value	2byte Data MSB Data LSB	0x0000-0xFFFF
CRC	2byte CRC MSB CRC MSB	
Slave normal response		
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)
Function code	1 byte	0x06
Register address	2 byte Address MSB Address LSB	0x0000-0xFFFF
Value	2byte Data MSB Data LSB	0x0000-0xFFFF
CRC	2byte CRC MSB CRC MSB	
Slave fault response		
Slave ID	1byte	0x00~0xFF (Inverter default 0x01)
Fault code	1byte	0x86
Abnormal code	1byte	0x01 or 0x02 or 0x03 or 0x04
CRC	2byte CRC MSB	

0x10: Write Multiple Register

32bit data use little endian format

Table 4-1 Data format description

Master request format		
	Bytes number	Content format
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)
Function code	1 byte	0x10
Register address	2 byte Address MSB Address LSB	0x0000-0xFFFF
Register number	2byte Number MSB Number LSB	0x0001-0x007B
Byte number	1Byte	2*N
Value	2*N byte Data MSB Data LSB	0x0000-0xFFFF
CRC	2byte CRC MSB CRC MSB	
Slave normal response		
Slave ID	1 byte	0x00~0xFF (Inverter default 0x01)
Function code	1 byte	0x10
Register address	2 byte Address MSB Address LSB	0x0000-0xFFFF
Register number	2byte Number MSB Number LSB	0x0001-0x007B
CRC	2byte CRC MSB CRC MSB	
Slave fault response		
Slave ID	1byte	0x00~0xFF (Inverter default 0x01)
Fault code	1byte	0x90
Abnormal code	1byte	0x01 or 0x02 or 0x03 or 0x04

CRC	2byte CRC MSB	
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