



# Fox Cloud API Document

## Illustration

This document is used to achieve data info of inverter, battery, monitor module from Fox cloud by the third party.

This version of cloud can realize real time data subscription function.

## Design

FC provide the broker depending on MQTT V3.1.1 version, allow the account that has been registered in FC platform and has access to achieve data to subscribe the data info of inverter, battery and monitor module via MQTT protocol.

The specific scope of authority is authorized and managed by the platform manufacturer.

## Topic standard

Format {client-id}/{resource}/{operation}/{sn}/{fmt}

Noun explanation:

client-id: can see this ID in personal information after signing in

resource: please see below table in detail.

operation: operation of resource.

sn: SN of inverter.

fmt: Message format. Now only support json format.

## Resource

Topic	Description	Remark
{client-id}/realdata/{sn}/json	Device real-time data	



## Realdata

Json format

```
{
  "sn": "aaabbbccc", SN of inverter
  "moduleSN": "fdasfsaf", related SN of monitor device
  "version": "A10200", the protocol version for inverter data transmission
  "info": { inverter information
    "masterVersion": "1.11", master version
    "slaveVersion": "1.2", slave version
    "afciVersion": "2.1", AFCI version
    "productType": "S", product series
    "deviceType": "S3300", model
    "capacity": 3.3, device capacity
  },
  "modInfo": {
    "IMEI": "safsaf", IMEI sequence
    "ICCID": "lsdfasaf", ICCID sequence
    "SignalStength": 20, signal strength percentage
  },
  "batInfo": [
    { "sn": "ccddeeef" battery SN
      "status": 0 status
    }
  ]
  "properties": {
    "key": {
      "value": number,
      "timestamp": 232432424, ms time stamp from 1970.1.1
      "unit": "kW", power unit
    }
  }
}
```

properties item

Key	Description	Remark
loadsPower	AC load power	
loads	AC load energy	
generationPower	Generation power	
generation	Generation	



feedinPower	Feed in power	
feedin	Feed in grid energy(1)	
feedin2	Feed in grid energy(2)	
input	PV input energy	
gridConsumptionPower	Grid consumption power	
gridConsumption	Grid consumption energy(1)	
gridConsumption2	Grid consumption energy(2)	
RVolt	R phase voltage	
RCurrent	R phase current	
RFreq	R phase frequency	
RPower	R phase power	
SVolt	S phase voltage	
SCurrent	S phase current	
SFreq	S phase frequency	
SPower	S phase power	
TVolt	T phase voltage	
TCurrent	T phase current	
TFreq	T phase frequency	
TPower	T phase power	
pvPower	PV total power	
pv1Volt	PV1 voltage	
pv1Current	PV1 current	
pv1Power	PV1 power	
pv2Volt	PV2 voltage	
pv2Current	PV2 current	
pv2Power	PV2 power	
pv3Volt	PV3 voltage	
pv3Current	PV3 current	
pv3Power	PV3 power	
pv4Volt	PV4 voltage	
pv4Current	PV4 current	
pv4Power	PV4 power	
epsVoltR	EPS R phase voltage	
epsCurrentR	EPS R phase current	
epsPowerR	EPS R phase power	
epsVoltS	EPS S phase voltage	
epsCurrentS	EPS S phase current	
epsPowerS	EPS S phase power	
epsVoltT	EPS T phase voltage	
epsCurrentT	EPS T phase current	



epsPowerT	EPS T phase power	
todayYield	Today yield	
fault1	Fault 1	Refer to fault code table
fault2	Fault 2	
fault3	Fault 3	
fault4	Fault 4	
fault5	Fault 5	
fault6	Fault 6	
fault7	Fault 7	
fault8	Fault 8	
masterState	Master state	0: wait 1: check 2: on-grid 3: fault 4: permanent fault 5: off-grid 6: Idle 7: self-checking 8: upgrade
batChargePower	Battery charge power	
batDischargePower	Battery discharge power	
meterPower	Meter (1) power	
meterPower2	Meter (2) power	
meterStatus	Meter (1) status	
meter2Status	Meter (2) status	
chargeTemperature	Battery charger temperature	
SoC	Battery SOC	
batTemperature	Battery temperature	
batStatus	Battery status	
epsFrequency	EPS off-grid frequency	
batVolt	Battery voltage	
dspTemprature	DSP kernel temperature	
operatingMode	Work mode	0: seltuse 1: feedin 2: backup

## Fault code

Fault is uint32 format, total 32\*8bit, from ID1 to ID256 fault list.



ID	Fault	Description
ID1	NoUtility	No voltage in grid
ID2	PVConfigWrong	PV input mode fault
ID3	GroundConnFault	Ground fault
ID4	RelayFault	Relay fault
ID5	InvRelayFail	Inverter relay fault
ID6	EpsRelayFail	EPS relay fault
ID7	BatRelayFail	Battery relay fault
ID8	BypassRelayFail	Bypass relay fault
ID9	PvConnDirFault	PV direction fault
ID10	CommLose_M_AFCI	AFCI communication fault
ID11	CommLose_HMI_S	Display communication fault
ID12	CommLose_M_S	Master to slave communication fault
ID13	CommLose_HMI_C	Bus bar communication fault
ID14	BmsLost	BMS communication fault
ID15	Meter/CT lost	Meter communication fault
ID16	TBD	
ID17	TBD	
ID18	TBD	
ID19	TBD	
ID20	TBD	
ID21	TBD	
ID22	TBD	
ID23	IslandFault	
ID24	AFCIFault	
ID25	OCP Fault	Over current fault
ID26	GridVoltFault	Grid voltage fault
ID27	GridFreqFault	Grid frequency fault
ID28	10MinGridVoltFault	Grid voltage average value too high within 10 minutes
ID29	TBD	
ID30	TBD	
ID31	TBD	
ID32	TBD	
ID33	Pv1Volt0vrFault	PV1 over voltage fault
ID34	Pv2Volt0vrFault	PV2 over voltage fault
ID35	Pv3Volt0vrFault	PV3 over voltage fault
ID36	Pv4Volt0vrFault	PV4 over voltage fault
ID37	TBD	
ID38	TBD	



ID39	Pv1VoltLowFault	PV1 under voltage fault
ID40	Pv2VoltLowFault	PV2 under voltage fault
ID41	Pv3VoltLowFault	PV3 under voltage fault
ID42	Pv4VoltLowFault	PV4 under voltage fault
ID43	TBD	
ID44	TBD	
ID45	PvIsoFault	PV insulation fault
ID46	BatIsoFault	Battery insulation fault
ID47	PvVoltFault	PV voltage fault
ID48	TBD	
ID49	Pv1AveCurOvrFault	PV1 over current
ID50	Pv2AveCurOvrFault	PV2 over current
ID51	Pv3AveCurOvrFault	PV3 over current
ID52	Pv4AveCurOvrFault	PV4 over current
ID53	HwOCP_Boost1	Boost1 hardware over current
ID54	HwOCP_Boost2	Boost2 hardware over current
ID55	HwOCP_Boost3	Boost3 hardware over current
ID56	HwOCP_Boost4	Boost4 hardware over current
ID57	HwOCP_Boost	Boost hardware over current
ID58	SwOCP_Boost	Boost software over current
ID59	TBD	
ID60	TBD	
ID61	BusVFault	Bus voltage fault
ID62	uHWBusOVP	Bus hardware over voltage fault
ID63	BusLowFault	Bus under voltage fault
ID64	BusOverFault	Bus software over voltage fault
ID65	VgridROverRating	R phase over voltage
ID66	VgridRUnderRating	R phase under voltage
ID67	VgridSOverRating	S phase over voltage
ID68	VgridSUnderRating	S phase under voltage
ID69	VgridTOverRating	T phase over voltage
ID70	VgridTUnderRating	T phase under voltage
ID71	GridOVP	Grid over voltage
ID72	GridUVP	Grid under voltage
ID73	FgridROverRating	R phase over frequency
ID74	FgridRUnderRating	R phase under frequency
ID75	FgridSOverRating	S phase over frequency
ID76	FgridSUnderRating	S phase under frequency
ID77	FgridTOverRating	T phase over frequency
ID78	FgridTUnderRating	T phase under frequency



ID79	GridOFR	Grid over frequency
ID80	GridUFR	Grid under frequency
ID81	VGridRSOverRating	R-S line over voltage
ID82	VGridSTOverRating	S-T line over voltage
ID83	VGridTROverRating	T-R line over voltage
ID84	VGridRSUnderRating	R-S line under voltage
ID85	VGridSTUnderRating	S-T line under voltage
ID86	VGridTRUnderRating	T-R line under voltage
ID87	HwAcOCP_R	R phase hardware over current
ID88	HwAcOCP_S	S phase hardware over current
ID89	HwAcOCP_T	T phase hardware over current
ID90	HwAcOCP	AC hardware over current
ID91	TBD	
ID92	SwAcOCP_R	R phase over current
ID93	SwAcOCP_S	S phase over current
ID94	SwAcOCP_T	T phase over current
ID95	SwAcOCP	AC output over current
ID96	TBD	
ID97	PLLFault	PLL fault
ID98	PhaseSequenceFault	Grid phase sequence fault
ID99	LVRTFault	LVRT fault
ID100	HardWareTrip	Hardware trip protection
ID101	OverLoadFault	On-grid over load fault
ID102	GridLineVoltageFault	Grid line voltage fault
ID103	TBD	
ID104	TBD	
ID105	TBD	
ID106	TBD	
ID107	TBD	
ID108	TBD	
ID109	TBD	
ID110	TBD	
ID111	TBD	
ID112	TBD	
ID113	TBD	
ID114	TBD	
ID115	TBD	
ID116	TBD	
ID117	TBD	
ID118	TBD	



ID119	TBD	
ID120	TBD	
ID121	ConsistFaultForVac	Grid voltage inconsistency fault
ID122	ConsistFaultForFac	Grid frequency inconsistency fault
ID123	ConsistFaultForGFCI	AC leakage current inconsistency fault
ID124	ConsistFaultForDCI	DCI inconsistency fault
ID125	ConsistFault	Consist fault
ID126	BusUnbalance	Bus voltage unbalance
ID127	IacRmsUnbalance	Grid current unbalance
ID128	VacRmsUnbalance	Grid voltage unbalance
ID129	DCIGridROverLimit	R phase DCI over limit
ID130	DCIGridSOverLimit	S phase DCI over limit
ID131	DCIGridTOverLimit	T phase DCI over limit
ID132	DC_Inj_High	DCI over limit
ID133	TBD	
ID134	TBD	
ID135	TBD	
ID136	TBD	
ID137	GFCIJumpOverLimit1	Leakage current over 30mA
ID138	GFCIJumpOverLimit2	Leakage current over 60mA
ID139	GFCIJumpOverLimit3	Leakage current over 150mA
ID140	GFCIJumpOverLimit4	Leakage current over 300mA
ID141	GFCIOverFault	GFCI fault
ID142	GFCIDeviceFault	GFCI hardware fault
ID143	TBD	
ID144	TBD	
ID145	INVModuleOverTempFault	Inverter over temperature
ID146	INVModule1OverTempFault	Inverter module1 over temperature
ID147	INVModule2OverTempFault	Inverter module2 over temperature
ID148	INVModule3OverTempFault	Inverter module3 over temperature
ID149	BSTModuleOverTempFault	Boost over temperature
ID150	BSTModule1OverTempFault	Boost module1 over temperature
ID151	BSTModule2OverTempFault	Boost module2 over temperature
ID152	BSTModule3OverTempFault	Boost module3 over temperature
ID153	BSTModule4OverTempFault	Boost module4 over temperature
ID154	TBD	
ID155	TBD	
ID156	TBD	
ID157	TBD	
ID158	TBD	





ID159	OverTemp	Inner over temperature
ID160	AMBModuleOverTempFault	Inver over environment temperature
ID161	RchipFault	Slave CPU fault
ID162	MchipFault	Master CPU fault
ID163	HMIChipFault	Communication CPU fault
ID164	TBD	
ID165	EEPROM_Write_Failure_Ctl	Slave EEPROM write fault
ID166	EEPROM_Read_Failure_Ctl	Slave EEPROM read fault
ID167	EEPROM_Write_Failure_HMI	Communication EEPROM write fault
ID168	EEPROM_Read_Failure_HMI	Communication EEPROM read fault
ID169	SampleFault	AD sampling fault
ID170	TBD	
ID171	TBD	
ID172	HwM_ADFaultVGrid	Master grid voltage AD fault
ID173	HwM_ADFaultVinv	Master inverter voltage AD fault
ID174	HwM_ADFaultIGrid	Master output current AD fault
ID175	HwM_ADFaultDCI	Master DCI AD fault
ID176	HwM_ADFaultGFCI	Master GFCI AD fault
ID177	TBD	
ID178	HwS_ADFaultVGrid	Slave grid voltage AD fault
ID179	HwS_ADFaultVinv	Slave inverter voltage AD fault
ID180	HwS_ADFaultIGrid	Slave output current AD fault
ID181	HwS_ADFaultDCI	Slave DCI AD fault
ID182	HwS_ADFaultGFCI	Slave GFCI AD fault
ID183	TBD	
ID184	TBD	
ID185	TBD	
ID186	RTCWRFault	RTC fault
ID187	TBD	
ID188	TBD	
ID189	TBD	
ID190	TBD	
ID191	AuxPower1Fault	Auxiliary power 1 fault
ID192	AuxPower2Fault	Auxiliary power 2 fault
ID193	OCP_Bat	Battery over current fault
ID194	OVP_Bat	Battery over voltage fault
ID195	OCP_Charge	Charging over current fault
ID196	OCP_Discharge	Discharging over current fault
ID197	Bat_power_low	Battery SOC too low fault
ID198	Vbat_low	Battery under voltage fault



ID199	BatBuckFault	Battery buck fault
ID200	BatBoostFault	Battery boost fault
ID201	EPS_DCI_fault	EPS DCI fault
ID202	EPS_overload	EPS over load fault
ID203	BatConnDirFault	Battery connect direction fault
ID204	HwBatCurFault	Battery hardware over current fault
ID205	SwBatCurFault	Battey software over current fault
ID206	TBD	
ID207	BmsExternalFault	BMS external fault
ID208	BmsInternalFault	BMS internal fault
ID209	BmsTempHigh	BMS temperature too high
ID210	BmsTempLow	BMS temperature too low
ID211	BmsHardwareProtect	Slave hardware protection
ID212	BmsCircuitFault	BMS circuit fault
ID213	BmsInsulationFault	BMS insulation fault
ID214	BmsVoltSensorFault	BMS voltage sensor fault
ID215	BmsTempSensorFault	BMS temperature sensor fault
ID216	BmsCurSensorFault	BMS current sensor fault
ID217	BmsRelayFault	BMS relay fault
ID218	BmsSwHwUnmatch	Slave software and hardware incompatible
ID219	BmsMSUnmatch	Master and slave software incompatible
ID220	BmsVersionUnmatch	BMS software version inconsistent
ID221	BmsManufacturerUnmatch	Cell manufacturer inconsistent
ID222	BmsChgReqNoReply	BMS charge request no reply
ID223	BmsTypeUnmatch	Battery type inconsistent
ID224	BMS_CellImblance	Cell imbalance
ID225	DcFanFault	Fan fault
ID226	DcFan1Fault	Fan 1 fault
ID227	DcFan2Fault	Fan 2 fault
ID228	TBD	
ID229	TBD	
ID230	TBD	
ID231	TBD	
ID232	TBD	
ID233	LightingAlarm	Lighting Alarm
ID234	TBD	
ID235	TBD	
ID236	TBD	
ID237	TBD	



ID238	TBD	
ID239	TBD	
ID240	TBD	
ID241	ExternalCommodulefault	External communication module fault
ID242	Meter lost	Meter communication fault
ID243	UnknownModel	Unknow model
ID244	TBD	
ID245	TBD	
ID246	TBD	
ID247	TBD	
ID248	TBD	
ID249	TBD	
ID250	TBD	
ID251	TBD	
ID252	TBD	
ID253	TBD	
ID254	TBD	
ID255	TBD	
ID256	TBD	

For example:

Subscribe the topic 'aaabbbccc/realdata/qwer1234/json', it means the user that has a ID aaabbbccc subscribe an inverter that it's SN is qwer1234, can achieve all real-time data from related monitor module, inverter and battery(if connect battery).

## Subscription usage

1. Must register an account on FC platform before using normally, and apply an access from platform manufacturer.
2. Register successfully, sign in and check the client-ID and access range.
3. MQTT protocol version is limited to V3.1.1, do not support will, clean Session must be true, otherwise refuse to sign in.



Examples:

Edit Connection Profiles

M2M Eclipse

ONENET

WEG

link

local

mos

Profile Name: link

Profile Type: MQTT Broker

MQTT Broker Profile Settings

Broker Address: domain

Broker Port: 1883

Client ID: Ob23b69faa05an43f1cbfa9n61cdc1aa0d0a

Generate

General User Credentials SSL/TLS Proxy LWT

User Name: demouser

Password: \*\*\*\*\*

Revert Cancel OK Apply

General User Credentials SSL/TLS Proxy LWT

Connection Timeout: 30

Keep Alive Interval: 60

Clean Session: ☒

Auto Reconnect: ☐

Max Inflight: 10

MQTT Version: ☐ Use Default ☒ 3.1.1

Clear Publish History

Clear Subscription History

Revert Cancel OK Apply