SK-GS6 interface protocol

Version	Author	Content	Time
v1.0	Chen Xuan	The first version	2019-09-03
v1.1	Chen Xuan	Added urine model	2020-07-29
v1.2	Chen Xuan	Added blood lipid function，hospital user unit and hospital user name	2021-06-30

1、 Upload the user data

Brief description: upload the machine measurement data

Request URL：http://xxxxx

Require method：POST

Data format：JSON

Parameters：

Name	Required	Type	Meanings
MachineId	Yes	String	machine ID
MacAddr	Yes	String	machine MAC address
RecordNo	Yes	String	id of this record
MeasureTime	Yes	String	time of measurement
DeviceType	No	String	device type
UnitNo	No	String	User number
UnitName	No	String	User name
Member	Yes	Json	User information
Height	No	Json	Height weight BMI
BloodPressure	No	Json	Blood pressure
Bo	No	Json	Blood oxygen
Temperature	No	Json	Body temperature
Whr	No	Json	Waist-Hip Ratio
BloodSugar	No	Json	Blood glucose
Ua	No	Json	Uric acid
Chol	No	Json	Total cholesterol
Urinalysis	No	Json	Urine

Name	Required	Type	Meanings
Hb	No	json	Hemoglobin
Vision	No	json	vvsion screening
Tooth	No	String	Status of tooth
PEEcg	No	json	12 leadS ECG
Ultrasonic	No	Json	B Ultrasonic
BloodFat	No	json	Blood lipid
PsychologicalAssessment	No	Json	psychological assessment

- Member(User information)

Parameters	Required	Type	Meanings
Name	No	String	Name
Mobile	No	String	Phone number
Age	No	String	Age
Sex	Yes	String	Gender(0:female 1:male
Birthday	No	String	Birth day
BarCode	No	String	Qrcode or barcode

- Height weight BMI

Parameters	Required	Type	Meanings
Height	Yes	String	Height
Weight	Yes	String	Weight
BMI	Yes	String	BMI

- Blood Pressure

Parameters	Required	Type	Meanings
HighPressure	Yes	String	（systolic blood pressure）SBP
LowPressure	Yes	String	（diastolic blood pressure）DBP
Pulse	Yes	String	Pulse rate

- Blood oxygen

Parameters	Required	Type	Meanings
Oxygen	Yes	String	blood oxygen value
OxygenList	Yes	String	blood oxygen list
Bpm	Yes	String	pulse rate(Bpm)

Parameters	Required	Type	Meanings
BpmList	Yes	String	pulse rate list

☐ Temperature

Parameters	Required	Type	Meanings
Temperature	Yes	String	Temperature

☐ WHR

Parameters	Required	Type	Meanings
Hipline	Yes	String	Hipline
Waistline	Yes	String	Waistline
WHR	Yes	String	Whr

☐ Blood glucose

Parameters	Required	Type	Meanings
Blood glucose	Yes	string	Blood glucose
Blood glucoseType	Yes	string	Blood sugar type 1.pre-meal blood sugar 2. post-meal blood sugar 3. random blood sugar

☐ Ua (uric acid)

Parameters	Required	Type	Meanings
Ua	Yes	string	Uric acid value

☐ Chol (cholesterol)

Parameters	Required	Type	Meanings
Chol	Yes	string	Total cholesterol value

☐ Urinalysi

The algorithms to calculate parameters are determined by the values of Model. Details are at the end of the document: Calculating instruction for urine analysis parameters

Parameters	Required	Type	Meanings

URO	Int	Yes	urobilinogen
BLD	Int	Yes	occult blood
BIL	Int	Yes	bilirubin
KET	Int	Yes	ketone body
LEU	Int	Yes	leucocyte
GLU	Int	Yes	glucose
PRO	Int	Yes	protein
PH	Int	Yes	PH value(degree of acid or alkali)
NIT	Int	Yes	nitrite
SG	Int	Yes	specific gravity
VC	Int	Yes	vitamin
Model	Int	No	Algorithm Type: 1: Algorithm 1(EMP); 2: Algorithm 2 (Kangtai)

Parameters	Required	Type	Meanings
Hb	Yes	string	hemoglobin value
Hct	Yes	string	hematocrit in blood

- Vision

Parameters	Required	Type	Meanings
Environment	NO	string	environment (standard brightness, high contrast; standard brightness, low contrast; low brightness, high contrast)
LeftVision	Yes	double	left eye vision
RightVision	Yes	double	right eye vision
DoubleVision	No	double	bilateral vision
Model	NO	string	mode(left eye, right eye, both eyes)

- PEEcg(12 leads ECG)

Parameters	Required	Type	Meanings
Hr	Yes	string	heart rate
PAxis	No	string	P axis
QRSAxis	No	string	QRS axis
TAxis	No	string	T axis
PR	No	string	PR interval
QRS	No	string	QRS duration
QT	No		QT interval

Parameters	Required	Type	Meanings
QTc	No	string	QTc interval
RV5	No	string	RV5 amplitude
SV1	No	string	SV1 amplitude
ResultStr	No	string	ECG results
EcgImg	No	string	Base64 string, ECG pictures

- Ultrasonic B 超

Parameters	Type	Required	Meanings
Notes	string	Yes	B/W Ultrasonic notes
Describe	string	Yes	B/W Ultrasonic description
BitmapList	JsonArray	Yes	Base64 string, Ultrasonic picture list

- BloodFat[血脂四项]

Parameters	Type	Required	Meanings
TChol	string	Yes	Total cholesterol
HdlChol	string	Yes	CHDL
Trig	string	Yes	triglyceride
TcHdl	string	No	Blood lipid ratio
CalcLdl	string	Yes	Low density lipoprotein
Result	string	Yes	Conclusion: 0, normal, 1, abnormal

- PsychologicalAssessment 心理评估

Parameters	Type	Required	Meanings
TableSCL	No	Json	symptom checklist 90(SCL-90)

- TableSCL 90 项症状清单(SCL-90)

Parameters	Type	Required	Meanings
blueAverageScore	Yes	Float	average depression score
bluePNumber	Yes	Int	number of depression-positive items
blueScore	Yes	Int	total score of depression
bodyAverageSc	Yes	Float	somatization average score

Parameters	Type	Required	Meanings
ore			
bodyPNumber	Yes	Int	number of somatization-positive items
bodyScore	Yes	Int	total score of somatization
curiouScore	Yes	Int	total anxiety score
curiousAverage Score	Yes	Float	average anxiety score
curiousPNumbe r	Yes	Int	number of anxiety-positive items
forceAverageSc ore	Yes	Float	average obsessive score
forcePNumber	Yes	Int	number of obsessive-positive items
forceScore	Yes	Int	total obsessive score
hostileAverageS core	Yes	Float	average hostile score
hostilePNumber	Yes	Int	number of hostile-positive items
hostileScore	Yes	Int	total hostile score
mType	Yes	Int	measured user types (1:10-18 years old, 0:others)
nNumber	Yes	Int	total number of negative items
nNumberStanda rd	Yes	Int	criteria for the total number of negative items
otherAverageSc ore	Yes	Float	average score of other items
otherPNumber	Yes	String	number of other positive items
otherScore	Yes	String	total score of other items
pAverageScore	Yes	Float	total average score of positive items
pAverageScoreS tandard	Yes	Float	criteria for the total average score of positive items
pNumber	Yes	Int	total number of positive items
pNumberStanda rd	Yes	Int	criteria for the total number of positive items
pScore	Yes	Int	total score of positive items
pScoreStandard	Yes	Int	criteria for the total score of positive items
recordNo	Yes	String	id of this record
relationAverage Score	Yes	Float	average interpersonal score
relationPNumbe r	Yes	Int	number of interpersonal-positive items

Parameters	Type	Required	Meanings
relationScore	Yes	Int	total interpersonal score
spiritAverageScore	Yes	Float	average psychosis score
spiritPNumber	Yes	Int	number of psychosis-positive items
spiritScore	Yes	Int	total psychosis score
stubbornAverageScore	Yes	Float	average paranoia score
stubbornPNumber	Yes	Int	number of paranoia-positive items
stubbornScore	Yes	Int	total paranoia score
terrorAverageScore	Yes	Float	average terror score
terrorPNumber	Yes	Int	number of terror-positive items
terrorScore	Yes	Int	total terror score
totalAvgScore	Yes	Float	total average score
totalAvgScoreStandard	Yes	Float	criteria for the total average score
totalScore	Yes	Int	total score
totalScoreStandard	Yes	Int	criteria for the total score

Data example :

```
{
        "MachineId": "ANS215051001",
        "MacAddr": "00:E0:B4:10:CD:B0",
        "RecordNo": "20190906143139977",
        "MeasureTime": "2017-03-14 15:15:57",
        "DeviceType": "SK-GS2E",
        "UnitNo": "",
        "UnitName": "",
        "Member": {
                "Name": "lusi",
                "Mobile": "13888888888",
                "Age": 0,
                "Sex": 1,
                "Birthday": "",
                "BarCode": ""
        },
        "Height": {
                "Height": "170.0",
                "Weight": "66.0",
                "BMI": "22.8"
        },
        "BloodPressure": {
                "HighPressure": "111",
                "LowPressure": "26",
                "Pulse": "92"
```

```json
        },
        "Bo": {
                "Oxygen": "98",
                "Bpm": "89",
                "OxygenList": "97, 97, 98, 98, 98, 98",
                "BpmList": "84, 84, 87, 87, 89, 89"
        },
        "Temperature": {
                "Temperature": "36.7"
        },
        "Whr": {
                "Hipline ": "50.0",
                "Waistline": "50.0",
                "Whr": "100.0"
        },
        "BloodSugar": {
                "BloodSugar ": "",
                "BloodsugarType": ""
        },
        "Ua": {
                "Ua": ""
        },
        "Chol": {
                "Chol": ""
        },
        "Urinalysis": {
                "URO": "",
                "BLD": "",
                "BIL": "",
                "KET": "",
                "LEU": "",
                "GLU": "",
                "PRO": "",
                "PH": "",
                "NIT": "",
                "SG": "",
                "VC": ""
        },
        "Hb": {
                "Hb": "",
                "Hct": ""
        },
        "Vision": {
                "Environment": "",
                "LeftVision": "",
                "RightVision": "",
                "DoubleVision": "",
                "Model": ""
        },
        "Tooth": "",
        "PEEcg": {
                "Hr": "",
                "PAxis": "",
                "QRSAxis": "",
                "TAxis": "",
                "PR": "",
                "QRS": "",
                "QT": "",
                "QTc": "",
                "RV5": "",
                "SV1": "",
                "ResultStr": "",
```

```
                    "EcgImg": ""
},
"Ultrasonic": {
            "Notes": "",
            " Describle": "",
            "BitmapList": ""
},
"BloodFat": {
            "TChol": "",
            "HdlChol": "",
            "Trig": "",
            "TcHdl": "",
            "CalcLdl": "",
            " Result": ""
},
"PsychologicalAssessment": {
            "TableSCL90": {
                        "blueAverageScore": 1,
                        "bluePNumber": 0,
                        "blueScore": 13,
                        "bodyAverageScore": 1,
                        "bodyPNumber": 0,
                        "bodyScore": 12,
                        "curiouScore": 10,
                        "curiousAverageScore": 1,
                        "curiousPNumber": 0,
                        "forceAverageScore": 1,
                        "forcePNumber": 0,
                        "forceScore": 10,
                        "hostileAverageScore": 1,
                        "hostilePNumber": 0,
                        "hostileScore": 6,
                        "mType": 0,
                        "nNumber": 90,
                        "nNumberStandard": 0,
                        "otherAverageScore": 1,
                        "otherPNumber": 0,
                        "otherScore": 7,
                        "pAverageScore": 0,
                        "pAverageScoreStandard": 0,
                        "pNumber": 0,
                        "pNumberStandard": 0,
                        "pScore": 0,
                        "pScoreStandard": 0,
                        "recordNo": "20190906143139977",
                        "relationAverageScore": 1,
                        "relationPNumber": 0,
                        "relationScore": 9,
                        "spiritAverageScore": 1,
                        "spiritPNumber": 0,
                        "spiritScore": 10,
                        "stubbornAverageScore": 1,
                        "stubbornPNumber": 0,
                        "stubbornScore": 6,
                        "terrorAverageScore": 1,
                        "terrorPNumber": 0,
                        "terrorScore": 7,
                        "totalAvgScore": 1,
                        "totalAvgScoreStandard": 0,
                        "totalScore": 90,
                        "totalScoreStandard": 0
            }
```

```
        }
}
```

Urine analysis parameter conversion explanation

Parameter description of algorithm 1(EMP) :

BIL,URO Parameter: 0 represent"-"; greater than 0: x represent"+x",like 1 represent"+1",2 represent "+2"...;
BLD,GLU,KET,LEU,PRO,V Parameter: 0 represent"-"; 1 represent"+-"; greater than 1: x represent"+(x-1)", like: 2 represent"+1",3 represent"+2"...;
NIT Parameter: 0 represent"-"; different 0 represent"+";
PH Parameter: 0 represent 5.0; 1 represent 6.0; greater than 1: x represent $(x - 1) * 0.5 + 6.0$, 如 2 represent 6.5,3 represent 7.0...;
SG Parameter: The corresponding value is $x* 0.005 + 1$, 如：0 represent1.0,1 represent 1.005,2 represent1.010,3 represent1.015 ...;
EMP equipment only has 11 items, no CR,MAL,UCA data

Algorithm 2 (Kangtai) parameter comparison table:

项目 Item	代码 Code	梯度代码	专用单位	国际单位 International unit	传统单位 Traditional units
尿胆原 （URO）	1	0	Norm	3.3umol/l	0.2mg/dl
		1	1+	33umol/l	2mg/dl
		2	2+	66umol/l	4mg/dl
		3	3+	131umol/l	8mg/dl
潜血 （BLD）	2	0	−	−	−
		1	+−	10/ul	0.03mg/dl
		2	1+	25/ul	0.08mg/dl
		3	2+	50/ul	0.15mg/dl
		4	3+	250/ul	0.75mg/dl
胆红素 （BIL）	3	0	−	0umol/l	0mg/dl
		1	1+	17umol/l	1mg/dl
		2	2+	50umol/l	3mg/dl
		3	3+	100umol/l	6mg/dl
酮体 （KET）	4	0	−	0mmol/l	0mg/dl
		1	1+	1.5mmol/l	15mg/dl
		2	2+	4.0mmol/l	40mg/dl
		3	3+	8.0mmol/l	80mg/dl

白细胞（LEU）	5	0 1 2 3 4	－ +- 1+ 2+ 3+	－ 15cells/ul 70cells/ul 125cells/ul 500cells/ul	－ 15cells/ul 70cells/ul 125cells/ul 500cells/ul
葡萄糖（GLU）	6	0 1 2 3 4 5	－ +- 1+ 2+ 3+ 4+	0mmol/l 2.8mmol/l 5.5mmol/l 14mmol/l 28mmol/l 55mmol/l	0mg/dl 50mg/dl 100mg/dl 250mg/dl 500mg/dl 1000mg/dl
蛋白质（PRO）	7	0 1 2 3 4	－ +- 1+ 2+ 3+	0g/l 0.15g/l 0.3g/l 1g/l 3g/l	0mg/dl 15mg/dl 30mg/dl 100mg/dl 300mg/dl
PH	8	0 1 2	5 6 7	5 6 7	5 6 7

		3 4	8 9	8 9	8 9
亚硝酸盐 （NIT）	9	0 1	− +	− 18umol/l	− 0.12mg/dl
比重 （SG）	10	0 1 2 3 4 5	1.005 1.010 1.015 1.020 1.025 1.030	1.005 1.010 1.015 1.020 1.025 1.030	1.005 1.010 1.015 1.020 1.025 1.030
维生素C （VC）	11	0 1 2 3 4	− +− 1+ 2+ 3+	0mmol/l 0.6mmol/l 1.4mmol/l 2.8mmol/l 5.6mmol/l	0mg/dl 10mg/dl 25mg/dl 50mg/dl 100mg/dl
微白蛋白 （MAL）	12	0 1	− +	0.01g/l 0.15g/l	1mg/dl 15mg/dl

				0.9mmol/L	
肌酐 （CR）	13	0 1 2 3 4	− +− 1+ 2+ 3+	4.4mmol/L 8.8mmol/L 17.7mmol/L 26.5mmol/L	10mg/dl 50mg/dl 100mg/dl 200mg/dl 300mg/dl
钙离子 （UCA）	14	0 1 2 3 4	− +− 1+ 2+ 3+	1.0mmol/L 2.5mmol/L 5mmol/L 7.5mmol/L 10mmol/L	40mg/dl 100mg/dl 200mg/dl 300mg/dl 400mg/dl