

# Shanghe Intelligent Equipment Detection Data Network Transmission Protocol

Version	Date	Explanation
V1.0	2023-02-22	Protocol definition
V2.0	2024-09-27	Complete description

## 一、Protocol Description

This protocol is a new test result upload protocol that uses HTTP and POST communications and supports intranet or extranet communications. It requires a third party to define the interface and develop server software, and to receive and process data and respond correctly (the interface address needs to be configured in advance to the Shanghe smart device, and ensure that the device network is normal).

The fields in the protocol may be empty (different devices and configurations, as well as different people, measure different data), and data processing requires judgment and compatibility.

## 二、Contents of the Agreement

POST Request Example:

```
{
  "deviceNo": "G202210113802510",
  "macAddr": "40:AA:56:35:B9:5C",
  "deviceModel": "SH-X",
  "unitNo": "000000",
  "unitName": "Shanghe Technology",
  "datas":[
    {
      "doctorID": "120",
      "doctorName": "Dr. Kang",
      "recordNo": "20230226142152",
      "measureTime": "2023-02-26 14:21:52",
      "loginType": "1",
      "userID": "412020198806201234",
      "name": "Li Si",
```

"sex": "1",  
"age": "34",  
"birthday": "1988-06-20",  
"address": "No. 11, Changchun Road, High-tech Zone, Zhengzhou",  
"nation": "Han",  
"startDate": "2020-06-20",  
"endDate": "2050-06-20",  
"department": "Zhengzhou High-tech Zone Public Security Bureau",  
"headImg": "BASE64 Avatar pictures",  
"height": "188.0",  
"weight": "90.5",  
"weight\_n": "65.4-84.7",  
"weight\_s": "2",  
"bmi": "25.6",  
"bmi\_n": "19.0-23.9",  
"bmi\_s": "2",  
"sbp": "120",  
"dbp": "80",  
"hr": "90",  
"sbpR": "121",  
"dbpR": "81",  
"hrR": "91",  
"avi": "10",  
"api": "24",  
"fatRate": "25.0",  
"waterRate": "51.4",  
"muscleRate": "52.9",  
"fatSubCutRate": "39.5",  
"vfal": "8",  
"bmr": "1327",  
"fatFree": "44.3",  
"bone": "2.4",  
"mineral": "3.1",  
"protein": "8.7",  
"waterICW": "20.3",  
"waterECW": "12.1",  
"weAdjus": "-15.9",  
"faAdjus": "8.4",  
"muAdjus": "-24.3",

"bodyAge": "30",  
"bodyScore": "60",  
"skeletalMuscle": "",  
"fat": "",  
"bodyShape": "",  
"fatTrunk": "",  
"fatLeftLeg": "",  
"fatRightLeg": "",  
"fatLeftArm": "",  
"fatRightArm": "",  
"muscleTrunk": "",  
"muscleLeftLeg": "",  
"muscleRightLeg": "",  
"muscleLeftArm": "",  
"muscleRightArm": "",  
"dci": "",  
"walking": "",  
"swim": "",  
"aerobic": "",  
"jogging": ""  
"teType": "0",  
"temp": "360.5",  
"teDw": "°C",  
"xy": "95",  
"bpm": "90",  
"glu": "5.6",  
"gluType": "0",  
"ua": "4.2",  
"chol": "5.0",  
"hb": "121",  
"waist": "90",  
"hips": "91",  
"whr": "0.98",  
"leu": "Negative(-)",  
"bld": "Weak positive(-)",  
"ph": "5.0",  
"pro": "Negative(-)",

"ubg": "Negative(-)",  
"nit": "Negative(-)",  
"vc": "Negative(-)",  
"gluN": "Negative(-)",  
"bil": "Negative(-)",  
"ket": "Negative(-)",  
"sg": "1.020",  
"cre": "8",  
"ca": "5.0",  
"ma": "5",  
"zytz": "Tendency to Qi stagnation",  
"ecghr": "85",  
"ecgp": "92",  
"ecgpr": "166",  
"ecgqrs": "90",  
"ecgqt": "340",  
"ecgqtc": "402",  
"ecgpa": "50",  
"ecgqrsa": "42",  
"ecgta": "49",  
"ecgrv5": "1.01",  
"ecgsv1": "-0.49",  
"ecgrv5sv1": "1.5",  
"ecgresult": "\*\*\*Normal ECG\*\*Sinus rhythm",  
"ecgimg": "base64 picture",  
"chol4": "2.59",  
"hdl": "2.59",  
"ldl": "1.29",  
"trig": "0.51",  
"thxhdb": "5",  
"bodyAgeG": "28",  
"bodyMonth": "0",  
"zscore": "-2.1",  
"zratio": "0.942",  
"com": "General bone condition。",  
"tscore": "-2.4",  
"tratio": "0.934",

```
    "bqi": "78.0",
    "rrf": "5.278",
    "eoa": "52.0",
    "pheight": "182.8",
    "pef": "346.0",
    "pefx": "54",
    "fev1": "3.39",
    "fev1x": "69",
    "fvc": "3.66",
    "fvcx": "93",
    "jiu": "1",
    "eleft": "1.0",
    "eright": "1.0",
    "lleft": "1",
    "lright": "1",
    "color": "20",
    "sds": "66"
  }
]
}
```

POST Example Response:

```
{
  "recode": 2000,//Status Code
  "remsg": "success",//Status Description
}
```

### 三、 Attachment Description

#### Appendix 1: Return code/status code description

Status Code	Explanation
1000	Failed, no access
2000	Success, upload completed
4000	Failed, request error (e.g., wrong parameters, etc.)
5000	Failed, parsing error
other	Failed, unknown error

**Appendix 2: Description of the uploaded data fields (relevant instructions at the bottom of the form)**

Fields	Explanation
deviceNo	Device machine code
macAddr	Device ac address
deviceModel	Device Model
unitNo	Institution number
doctorID	Doctor's ID
doctorName	Doctor's name
recordNo	Physical examination number (14): yyyyMMddHHmmss, if the number is the same, it means the same physical examination number
measureTime	Measuring time yyyy-MM-dd HH:mm:ss
loginType	Login method: 1=ID card: 2=mobile phone number 3=social security card 4=barcode: 5=IC card 0=other
userID	User ID (ID number, etc.)
name	Name
sex	Gender: 0 = unknown; 1 = male; 2 = female; 9 = unspecified gender
age	Age (years)
birthday	Date of birth (according to ID card): 2021-01-01
address	Address Note: The social security card must be stored
nation	nation
startDate	ID card/social security card issuance time
endDate	ID card/social security card validity period Note: Some social security cards do not have
department	ID card issuing authority Note: ID card only
headImg	Avatar: Base64 image information (without header, such as: data:image/jpeg;base64,)
Height weight	
height	Height cm
weight	Weight kg
weight_n	Weight Normal range (see the description at the bottom, the same below)
weight_s	Weight Status (See the description at the bottom for details, the same below)
bmi	Body Mass Index
bmi_n	Normal range (see the description at the bottom for details, the same below)

bmi_s	Normal range (see the description at the bottom for details, the same below)
Blood pressure and heart rate	
sbp	Systolic blood pressure (high pressure)mmHg
dbp	Diastolic blood pressure (low pressure)mmHg
hr	Pulse (heart rate) beats/min
sbpR	Right arm - systolic blood pressure (high pressure)mmHg
dbpR	Right arm - diastolic pressure (low pressure)mmHg
hrR	Right arm - pulse (heart rate) beats/min
avi	Arterial Pulse Wave Velocity Index
api	Arterial pressure volume index
Body composition analysis	
fatRate	Body fat percentage%
waterRate	Body water percentage%
muscleRate	Body muscle percentage %
fatSubCutRate	Subcutaneous fat percentage %
vfal	Visceral fat level
bmr	Basic metabolism Kcal
fatFree	Fat free mass kg
bone	Bone mass/bone mass kg
mineral	Inorganic salt content/mineral content kg
protein	Protein quality kg
waterICW	Intracellular fluid kg
waterECW	Extracellular fluid kg
weAdjus	Weight regulation kg
faAdjus	Fat regulation kg
muAdjus	Muscle conditioning kg
bodyAge	Physical/biological age (years)
bodyScore	Physical condition score (points)
skeletalMuscle	Skeletal muscle mass
fat	Body fat
bodyShape	Body shape determination (such as healthy and well-proportioned body type, etc.)

fatTrunk	Stage Analysis - Trunk Fat Mass
fatLeftLeg	Stage Analysis - Left Foot Fat Mass
fatRightLeg	Stage Analysis - Right Foot Fat Mass
fatLeftArm	Stage Analysis - Left Hand Fat Mass
fatRightArm	Stage Analysis - Right Hand Fat Mass
muscleTrunk	Stage Analysis - Trunk Muscle Mass
muscleLeftLeg	Stage Analysis - Left Foot Muscle Mass
muscleRightLeg	Stage Analysis - Right Foot Muscle Mass
muscleLeftArm	Stage Analysis - Left Hand Muscle Mass
muscleRightArm	Stage Analysis - Right Hand Muscle Mass
dci	Recommended calorie intake
walking	30min Exercise Consumption - Walking
swim	30min Sports consumption-swimming
aerobic	30min Exercise consumption-aerobics
jogging	30min Exercise consumption - jogging
Temperature measurement	
teType	Temperature type: 0 = body temperature 1 = water temperature / milk temperature
temp	Temperature value, such as 36.5
teDw	Unit: °C or °F
Blood oxygen	
xy	Blood oxygen saturation %
bpm	Pulse rate beats/min
Blood sugar Uric acid Total cholesterol	
glu	blood sugar mmol/L
gluType	Blood glucose measurement type: 0 [Fasting] 1 [1 hour after meal] 2 [Random blood glucose or 2 hours after meal]
ua	Uric acid umol/L
chol	Total cholesterol mmol/L
Hemoglobin	
hb	Hemoglobin g/dL
Waist-to-hip ratio	



waist	Waistline cm
hips	Hips cm
whr	Waist-to-hip ratio
Urinalysis	
leu	Leukocyte(LEU)
bld	Occult blood(BLD)
ph	PH value(pH)
pro	Protein(PRO)
ubg	Urobilinogen(UBG)
nit	Nitrite(NIT)
vc	Vitamins C(VC)
gluN	Glucose(GLU)
bil	Bilirubin(BIL)
ket	Ketone bodies(KET)
sg	Proportion(SG)
cre	Creatinine(CRE)
ca	Calcium(Ca)
ma	Microalbumin(MA)
TCM constitution identification	
zytz	TCM constitution identification-text description of the constitution type
ECG analysis	
ecghr	ECG heart rate
ecgp	ECG PWidth wave width
ecgpr	ECG PR_Interval period
ecgqrs	ECG QRS_Duration time
ecgqt	ECG QT_Interval period
ecgqtc	ECG QTc_Interval period
ecgpa	ECG P_Axis wave axis
ecgqrsa	ECG QRS_Axis wave axis
ecgta	ECG T_Axis wave axis
ecgrv5	ECG RV5 voltage mV
ecgsv1	ECG SV1 voltage mV
ecgrv5sv1	ECG RV5+SV1 Absolute value of amplitude sum mV

ecgresult	ECG diagnosis, such as: ** Normal ECG ** Sinus rhythm
ecgimg	ECG: Base64 image information (without header, such as: data:image/jpeg;base64,)
Four blood lipids	
chol4	Total cholesterol mmol/L
hdl	High-density lipoprotein mmol/L
ldl	Low-density lipoprotein mmol/L
trig	Triglycerides mmol/L
Glycated hemoglobin	
thxhdb	Glycated hemoglobin %
Bone density	
bodyAgeG	Bone age (years)
bodyMonth	Bone age (months)
zscore	Z-score (comparison with peers)
zratio	Peer ratio
com	Diagnosis (20 years and above)
tscore	T-score (20 years and above)
tratio	Adult ratio (20 years and above)
bqi	Bone Strength Index (20 years and older)
rrf	Relative fracture risk (20 years and older)
eoaa	Expected age of osteoporosis (20 years and above)
pheight	Predicted height (under 20 years old)
Vital capacity test	
pef	PEF(i.e. peak respiratory airflow):346 L/min
pefx	PEF%(i.e. PEF actual measured value/PEF estimated value*100: 54%
fev1	FEV1(i.e. forced expiratory volume in one second):3.39 L
fev1x	FEV1%(i.e. actual measured FEV1 value/predicted FEV1 value*100):60%
fvc	FVC(i.e. forced vital capacity):3.66L
fvcx	FEV1/FVC(i.e. actual measured value of FEV1/actual measured value of FVC*100%):93%
Alcohol content	
jiu	Alcohol content 0mg/100ml

Vision test	
eleft	Left eye vision
eright	Right eye vision
lleft	Left eye astigmatism
lright	Right eye astigmatism
color	Color blindness probability % 0 normal, 0-100 probability %, such as 20% probability 404 normal
Psychological testing	
sds	Psychological Test SDS Standard total score: the smaller the better, and scores below 53 are normal; Mild depression: 53-62; Moderate depression: 63-72; Severe depression: 72 points or above

Note:

1. Upload selectively according to different options. The type of field value is String. If there is no value, the corresponding field may not be transmitted;
2. Normal range specification: add \_n to the suffix of the relevant field  
 (the middle of the range is -, such as: 18.5-23.9; non-range can be specific symbols such as: > < ≥ ≤, such as: ≥1638; the above are not plain text, such as: negative (-));
3. Status: add \_s to the suffix of the relevant field (0=low; 1=normal; 2=high; -1=abnormal; other types can be directly plain text such as: mild tendency, etc.)