

CORS System NET20 Plus User Guide



Shanghai eSurvey GNSS Co., Ltd.

V2.0



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Contents

1	Тес	hnical Specification	.2
	1.1	Overview	.2
	1.2	Main features	.2
	1.3	Technical Specifications	.2
	1.3.	1 Physical	.2
	1.3.2	2 Environmental	.2
	1.3.3	3 Electrical	.2
	1.3.4	4 GNSS	.2
	1.3.	5 Ports	.3
	1.3.0	6 Data and Storage	.3
2	Har	dware Structure	.4
	2.1	Receiver Appearance	.4
	2.1.	1 Front Panel	.4
	2.1.2	2 Back panel	.5
	2.2	Structural drawings / mounting dimensions	.6
3	WEI	B UI	.7
	3.1	Summary	.7
	3.2	System Information	.8
	3.2.	1 System Information	.8
	3.2.2	2 GPS Status	.9
	3.2.3	3 Satellites	.9
	3.2.4	4 Data Transmission	10
	3.2.	5 Data Recording1	10
	3.3	Configuration	1
	3.3.	1 Reference Station	11
	3.3.2	2 GNSS configuration	12
	3.3.3	3 Tracking satellites	12
	3.3.4	4 NEIWOIK	13
	3.3. 3.3.	6 Recording	14
	3.3.	7 Port Configuration	16
	3.3.8	8 Alerts	20
	3.3.9	9 Registration	20
	3.4	Download	21
	3.5	System Management	21
	3.6	Help	<u>22</u>
4	Оре	eration	<u>23</u>
	4.1	Power on	23
	4.2	Quick setting	24
5	Acc	essories	28



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CAUTION

Ignoring this indication and making an operation error could possibly result in personal injury or property damage.

- Do not perform disassembly which may cause fire, electric shock or burn. Only eSurvey authorized distributors can disassemble device.
- Do not cover the charger which may causes fire.
- Do not use defection power cable, socket or plug which may cause fire, electronic shock.
- Do not use wet charger which may cause fire, electronic shock.
- Do not close the instrument to burning gas or liquid
- Do not put the battery in the fire or high temperature condition which may cause explosion.
- Do not use the battery which is not specified by eSurvey.
- Do not use the power cable which is not specified by eSurvey. Fire could result.
- Do not short circuit of the battery. Fire could result.
- When this product encounters disturbance of severe Electrostatic Discharge, perhaps it will have some degradation of performance like switching on/off automatically and so on.

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1 Technical Specification

1.1 Overview

NET20 Plus is a high-precision CORS reference station receiver. LINUX system as its development platform, and it supports for secondary development. It has powerful and stable function, and can be used in many fields.

1.2 Main features

- All aluminum alloy body design, strong and reliable, can cope with all kinds of harsh outdoor environment
- 336 (NET20 Plus-T) / 800 (NET20 Plus-H) channels with Multi-constellation GNSS
- Superior carrier phase observations of less than 1mm accuracy
- Internal battery for more than 12 hours operation.
- 4G LTE and Bluetooth / WLAN datalink support.
- Easy configuration from web UI and remote server.
- NTRIP server/caster support.
- With IP67 protection

1.3 Technical Specifications

1.3.1 Physical

- Weight: 2 KG
- Dimension: 222 mm * 164 mm * 79 mm

1.3.2 Environmental

- Operating temperature: -30°C +65°C
- Storage temperature: -40°C +80°C
- Humidity: Up to 100% (non-condensing)

1.3.3 Electrical

- Input: 9-28V
- Power: 2.8W

1.3.4 GNSS

- NET20 Plus-H
 - ✓ Channels: 800
 - ✓ Tracking signals:
 - ➢ GPS: L1 C/A, L1P,L1C,L2P, L2C, L5
 - ➢ GLONASS: G1,G2,G3
 - > BeiDou: B1I, B2I, B3I,B1C,B2a,B2b,ACEBOC
 - > Galileo: E1, E5a, E5b, E5 AltBOC, E6
 - > IRNSS: L5
 - ➢ SBAS: L1, L5
 - QZSS: L1 C/A, L1C, L2C, L5,LEX
 - L-Band: Atlas H10/H30/Basic



- NET20 Plus -T
 - ✓ Channels: 336
 - ✓ Tracking signals:
 - ▶ GPS: L1 C/A, L2E, L2C, L5
 - > GLONASS: L1 C/A, L2C/A, L3 CDMA
 - ➢ BeiDou: B1, B2, B3
 - > Galileo: E1, E5a, E5b, E5 AltBOC, E6
 - > NAVIC: L5
 - > SBAS: L1CA, L5
 - > QZSS: L1 C/A, L1SAIF, L1C, L2C, LEX
 - L-Band: OmniSTAR, RTX
- Positioning accuracy

Table 1-1 Positioning accuracy

Besitiening mode	Accuracy					
Positioning mode	Horizontal	Vertical				
Static	2.5mm + 1ppm	5mm + 1ppm				
RTK	8mm + 1ppm	15mm + 1ppm				
DGPS	0.25m + 1ppm	0.5mm + 1ppm				

- Initialization time: <10s
- Initialization reliability: >99.9%

1.3.5 Ports

- 3 RS232 serial ports (DB9 and 2 LEMO 5pin).
- 1 RJ45 Ethernet port.
- 1 power port.
- 1 USB port.
- 1 4G LTE antenna port.
- 1 UHF antenna port.(Optional)
- 1 EVENT port.
- 1 1PPS port.
- 1 SIM card slot.
- 1 GNSS antenna port.

1.3.6 Data and Storage

- Output data format: NMEA-0183, binary, RINEX, RTCM2.x, RTCM3.x
- Internal memory: 32G
- External storage: TF Card

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2 Hardware Structure

2.1 Receiver Appearance



Figure 2-1

2.1.1 Front Panel

The front panel of NET20 Plus receiver includes four buttons, four LED indicators, and one OLED display.



Figure 2-2

After switching on NET20 Plus receiver, current time information and GPS status are displayed in the main interface. The default language is English, and you can press the left and right arrow keys to obtain the current IP information.

Table 2-1 Function table

Na	ime	Function		
-	Direction	 ✓ To move the cursor up or left, short press the button. ✓ To return to the previous menu, long press the button. 		
Y	bullons	To move the cursor down or right, short press the button.		
Fn	Function	\checkmark To enter the main menu, long press the button.		
	button	✓ To define the direction button (◀► or \P), short press the button.		
Power ✓ To turn on/off NET20 Plus, long press the button. button ✓ To confirm your selection, short press the button.				
Power indic	ator	After switching on NET20 Plus receiver, the power light is on		
Differential transmission indicator		When the differential data output, the differential indicator blinks evenly at 1-second interval		
Bluetooth indicator		It will be light blue when NET20 Plus is connected via Bluetooth		
Static recording indicator		When start static recording, static recording indicator blinks evenly at 1-second interval		



2.1.2 Back panel

NET20 Plus receiver provides a variety of communication interfaces to facilitate users in different application scenarios.



Figure 2-3 Back panel Table 2-2 Interface function table

No.	Name	Function
1	PWR	Receiver power supply interface, input voltage DC 9V-28V.
2	USB	USB interface
3	COM1	RS232 serial port
4	COM2	RS232 serial port (Optional RS485 serial port)
5	COM3	DB9 serial port
6	LTE	GPRS antenna interface
7	1PPS	1 Pulse Per Second output
8	EVENT	EVENT input
9	TF & SIM	TF interface & SIM card (standard size) interface
10	RJ45	Wired Ethernet port
11	GNSS	GNSS External receiver antenna connector
12	OSC	Access to external clock



2.2 Structural drawings / mounting dimensions



(Dimensions in mm)

Figure 2-4

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3 WEB UI

There are two ways to login into the WEB interface, which are Ethernet port login and WIFI login. The WEB interface content of the two login modes is same.

- 1. Ethernet port login: Connect the RJ45 network port with the computer host and enter the IP address in the browser. Enter user name and password in the pop-up dialog box; the default username is *admin* and the default password is *password*.
- 2. WIFI login: when NET20 Plus WIFI hotspot is enable, the user can log in into the WEB interface by connecting to its WIFI network. The hotspot name is the serial number of the receiver. Enter the IP address: 192.168.10.1, a window will pop up, the default username is *admin* and the default password is *password*.

3.1 Summary

After a successful authentication to the WEB interface of NET20 Plus, the main page contents: Reference information, device version, system version, network parameters, memory status and so on. It is shown as below:

immary			
System Information			
L System Information	Station Name	SHUN	
	Expire Date	20191128	
GPS Status	Run Time	3 day 21 nour 14 min	
Satellites			
Data Transmission	Davies Madel	NET20 DULIS	
Data Recording	Device Model	NET2009035008	
Configuration	GNSS Model	BD970	
Reference Station	GNSS Serial	5812C03560	
GNSS Configuration			
Tracking Satellites			
Network	Longitude	121°31' 49.41981"	
Dynamic DNS	Latitude	31° 5' 3.87952"	
Ntrin Server	Height	60.241 m	
Decording	GNSS Status	Single	
Recording	Local Time	2019-09-27 13:03:04	
Port Configuration			
Alerts		00 000 MD 1000 000 MD 1000(E	
SNMPD	Internal Memory	60 666 MB / 223.000 MB (36% Free)	
Firewall	Data Memory	18.951 GB / 28.582 GB (66% Free)	
VPN Client			
Registration			
Download	Battery Power	100%	
System Management	Power Source	EXTERNAL	
Our Charles Out			

Figure 3-1

Note: The effect of different browsers display may be slightly different, recommend using Google Chrome or IE.



3.2 System Information

3.2.1 System Information

The system information screen will display the station name, device model, device serial number, system version, application version information, built-in OEM board model and network parameter information.

EIZUILUS KER	erence Station		
Summary			
System Information	Station Name	CHUN	
System Information	Expire Date	20191128	
GPS Status	Time Zone	GMT+08:00	
Satellites	2		
Data Transmission			
Data Preserting	Device Model	NET20 PLUS	
	Device Serial	NET2009035008L	
Configuration	IMEI	868323029442479	
Reference Station	Hardware Version	NSC200-V4.20-RS485	
GNSS Configuration	BOOT Version	1.11	
Tracking Satellites	OS Version	4.1.6-1.13(181031)	
Network	APP Version	2.12(190529)	
Dynamic DNS	Web Version	2.12	
Ntrin Server			
Bacarding		In north	
Recording	GNSS Model	BD970	
Port Configuration	GNSS Serial	5812C03560	
Alerts	CNSS Firmware Version	4.Z 5.27	
SNMPD	GNSS Functionality	50Hz	
Firewall	GNOOT unchonding	00112	
VPN Client			
Registration	DHCP	Off	
Download	MAC address	50 33 8B 64 DD 30	
Bystem Management	IP	192.168.28.74	
	Mask	255 255 255 0	
configuration Set	Gateway	192.168.28.253	



3.2.2 GPS Status

The GPS Status page displays the current NET20 Plus positioning, the base station coordinates and antenna type.

	A ()	
NET20 PLUS Refe	erence Station	
Summary		
System Information	L and These	2010 00 27 12 05 40 (ODD T
LSystem Information	Local Time	2019-09-27 13:05:16 (GPS Time + 8)
LGPS Status	Longitude	121°31' 49 41842"
Satellites	Latitude	31° 5' 3.87907"
Date Transmission	Height	60.213 m
Data Transmission	Status	Single
Data Recording	PDOP	0.9
Configuration	HDOP	0.5
Reference Station	HRMS	0.816
GNSS Configuration	VRMS	0.979
Tracking Satellites		
Network	Cent Number	0444
Dynamic DNS	Station Number	U111 404904' 40 20044''
I Nitrio Server	Base Latitude	31° 5' 3 87636"
L Recording	Base Height	62 755 m
Recording		
Port Conliguration		
Alerts	MET Type	17711A
SNMPD	Pressure	- hPa
Firewall	Temperature	- °C
VPN Client	Humidity	- %RH
Registration		
Download		
System Management	Antenna Type	UA63
Configuration Set	Antenna Height	0 mm
	Measurement Mode	Antenna Phase Center
Logout		

Figure 3-3

3.2.3 Satellites

This page shows the current satellite signal-to-noise ratio, elevation mask angle, azimuth and other information. The information of GPS, BEIDOU, GLONASS and GALILEO are displayed separately.

ETO DI US D	oforongo Star	tion					
EI20 ILUS K	elerence Sta						
Summary							
System Information							
L System Information	Satallitas T	ablo (Satellitor SI	kuplot			
System mornation	Concentes in	able	Jalenies Ji	xypiot			
GPS Status	Type	SV	Elov [Dog]	Azim [Dog]	1/B1/E1[dBHz]	12/B2/E5A[dBHz]	1.5/B3/E5B(dBHz)
Satellites	GPS	15	30.54	219 20	L1/D1/E1[0D1/2]	LZ/DZ/EJA[uDriz]	L3/D3/E3D[ubitz]
Data Transmission	GPS	5	60.69	354.30	45.0	44.6	2
Data Recording	GPS	2	68.27	98.53	42.2	32.1	2
Configuration	GPS	13	63.95	184.24	44.9	32.7	
Reference Station	GPS	7	11.48	55.34	38.8	36.3	-
CNSS Configuration	GPS	6	21.87	119.66	37.9	41.6	
Tracking Cotallitas	GPS	30	21.56	86.62	37.2	40.8	1
Tracking Satenites	GPS	29	36.17	302.91	44.1	40.3	-
Network	GLONASS	22	16.68	153.95	0	0	14 (A)
Dynamic DNS	GLONASS	1	62.64	317.46	0	0	-
Ntrip Server	GLONASS	23	76.74	164.71	0	0	2
Recording	GLONASS	2	20.65	243.88	0	0	
Port Configuration	BDS	10	56.96	211.94	43.0	42.8	
Alarta	BDS	29	58.25	07.10	45.1	43.5	<u></u>
Aleris	BDS	30	50.23	178 30	40.4		
SNMPD	BDS	13	66.48	339.43	43.5	42.6	
Firewall	BDS	20	66.78	322.76	46.5	-	2
VPN Client	BDS	6	65.55	206.54	41.8	43.4	2
Registration	BDS	9	38.34	211.65	39.6	42.2	
Download	BDS	19	28.48	258.98	41.8	-	
System Management	BDS	4	34.80	123.25	36.2	40.5	-
System Management	BDS	3	52.54	201.08	39.0	41.2	1
Configuration Set	BDS	2	36.77	237.37	35.8	41.8	(÷
Language English •	BDS	1	47.73	147.53	38.1	43.4	19 (A)
Logout	Galileo	36	30.23	320.12	41.3	44.2	44.2





3.2.4 Data Transmission

After setting up the data transmission, the user can see the current data transfer status on the page as shown in figure 3-5. Click [Edit] to directly jump to [Ntrip Server].

NETTA DI LIC D.		1941 I.D.							
NETZUPLUS KO	elerence Stat	1011							
Summary									
System Information									
System Information	N	0.1.4.1		DIT	01-1	0.17	D to O'	-	0
GPS Status	IName DTCM22	Laster Address		Data Type	Status	2010 00 26 10:24:20	Data Size	Ealth	Operati
Satellites	RTGW32	127.0.0.1.01		RTCNJ2	transmitting	2019-09-20 10.24.20	49.440 MD	EOR	Start
Data Transmission	RTCM32_TUS	127.0.0.1.61	SH_RICW32_10s	RTCW32_10	transmitting	2019-09-26 10:24:26	49.436 IVID	Edit	Start
Data Recording	Yap	115.134.226.95:6060	eSurvey lest	RTCM32	transmitting	2019-09-26 13:29:37	43.707 MB	Edit	Start
Configuration	sCMRx	127.0.0.1:81	SH_sCMRx	SCMRX	transmitting	2019-09-26 10:24:27	26.597 MB	Edit	Start
Reference Station									
GNSS Configuration									
Tracking Satellites									
Network									
Dynamic DNS									
Ntrip Server									
Recording									
Port Configuration									
Alerts									

Figure 3-5

3.2.5 Data Recording

In this page, the user can see the specific data recording information as shown in figure 3-6. Click [Edit], the user could modify the parameters like path type, file name, interval, duration time, etc. as shown in figure 3-7.

NET20 PLUS R	eference Statio	on							
Summary									
System Information									
System Information			D 1	01.1	0.17		F '' O '		0
GPS Status	Schedule Name	Interval	Path 201000/27/2700400 dat	Status	Start Time	Duration The	7 052 MP	Ealth	Operation
Satellites	UNSIT	10	201505/21/2100400.0at	recording	2015-05-27 12:00:01	120 1101	1.055 MD	Edit	Start
Data Transmission	New Session								
Data Recording									
Configuration									
Reference Station									
GNSS Configuration									
Tracking Satellites									
Network									
Dynamic DNS									
Ntrip Server									
Recording									
I Port Configuration									

Figure 3-6



NET20 PLUS Reference Station

Summary		
System Information	Compress(Global) : Off 🔻	
System Information		
GPS Status	Recording - UNSH V	
Satellites	Schedule Name	UNSH
Data Transmission	Path Type	
Data Recording	File Name	DOYhhmm dat
Configuration	Interval	
Reference Station	Duration Troo	2 hours
GNSS Configuration		
Tracking Satellites	P001	Stop When Full V 20480 MB
Network	Auto	Enable O Disable
Dynamic DNS	Integral Point Record	• Enable O Disable
Ntrip Server	File Push	Enable Isable
Recording		Push Parameters
Port Configuration	Protocol	🖲 FTP 🔘 GEO 🔍 RADIO
Alerts	FTP Server Address	
SNMPD	FTP Server Port	
Firewall	FTP User	admin
VPN Client	ETD Deceword	admin
Registration	FIP Password	
Download	Remote Directory	
System Management		
Configuration Set		
Language English ▼ Logout	Convert	C Enable Disable

Figure 3-7

3.3 Configuration

3.3.1 Reference Station

On this page the user mainly can set the reference station, antenna, coordinate system and station coordinates, as shown in figure 3-8.

Summary					
System Information	Observer Name	-			
System Information	Observer Name				
GPS Status	Agency Name				
Satellites	Station Name	SHUN			
Data Transmission	Marker Number	0 •			
Data Recording	Marker Type	GEODETIC .			
Configuration	Receiver Number	0 •			
Reference Station	Country Code	CHN - China		T	
GNSS Configuration	Site ID	1100			
Tracking Satellites	Time Zone	GMT+08:00 V			
Network	HTTP Server Port	80			
Dynamic DNS					
Ntrip Server					
Recording	5	Custom	V UA63	Download	Choose File No file chosen
Port Configuration	Antenna Type	Unload		Download	Child Set Inc. Into the chosen
Alerts	Antonno Social	opidad			
SNMPD	Antenna Senai				
Firewall	R(mm)	0			
VPN Client	H(mm)	0			
Registration	HL1(mm)	0			
Download	HL2(mm)	0			
System Management					
Configuration Set					

Figure 3-8

Reference station coordinates: If you do not need known coordinates to start the reference station, then click on "Load Current Position" to get the reference station coordinates approximately. However, if you need known coordinates, please input them according to the appropriate format.

The web access port is 80. After setting mapping in the router device, then you can access the NET20 Plus by Internet, enter the ip address and the port, e.g. 113.109.179.180:80



3.3.2 GNSS configuration

This menu is mainly for the satellite systems and the cutoff angle settings, as shown in figure 3-10.

NET20 PLUS Refer	ence Station		
Summary			
System Information			
System Information		GNSS Configuration	
GPS Status	Cutoff Angle	10	
Satellites	1PPS	O Enable Disable	
Data Transmission	BDS	Enable Disable	
I.Data Recording	GPS	Enable Dicable	
Configuration	GLONASS		
Reference Station	Galileo		
GNSS Configuration	0755	Enable Disable	
Tracking Satellites	SBAS	Crable Disable	
Network	Event		
Dynamic DNS	Lvein	Chable Clisable	
Ntrip Server			
Recording			
Port Configuration	Sul	mit Reload	
Alerts			
SNMPD			
Firewall			
I VPN Client			

Figure 3-10

3.3.3 Tracking satellites

In this page, the user can select the satellites they want to track, as shown in figure 3-11.

Summary	xelerence	Station						
System Information				Tra	cking Satelliter			
System Information				IIa	cking saterites			
GPS Status	GPS	Don't track	Glonass	Don't track	BeiDou	Don't track	Galileo	Don't track
Data Transmission	G1		R1		C1		E1	
I Data Recording	G2		R2		C2		E2	
Configuration	G3		R3		C3		F3	
Reference Station		-		-		-		
GNSS Configuration	G4		R4		C4	100 H	E4	U
Tracking Satellites	G5		R5		C5		E5	
Network	G6		R6		C6		E6	
Dynamic DNS		-		-		-		
Ntrip Server	GZ		R/		C/		E/	
Recording	G8		R8		C8		E8	
Port Configuration	G9		R9		C9	10	F9	
Alerts		121						
SNMPD	G10		R10		C10		E10	
Firewall	G11		R11		C11		E11	
VPN Client	G12		R12		C12		E12	
Registration	G13		P13		C13		E13	1

Figure 3-11



3.3.4 Network

From Network option, the user can set the device network and FTP server settings as shown in figure 3-12.

NET20 PLUS Refer	ence Station		
	chec Station		
Summary			
System Information			
System Information		The Running Network	
GPS Status	Priority Network	Wired Net O Wireless Net O Mobile Net	
Satellites	Current Network	WAN	
Data Transmission	Default Gateway	192 168 28 253	
Data Recording	DNS		
Configuration	DNS	114.114.114.114 0.0.0.0	
Reference Station	PING	Timeout :(s) Counts :	
GNSS Configuration			
Tracking Satellites			
Network		Device Network Settings	
Dynamic DNS	Wired Net	() MAN	
Ntrip Server	DHCP	Scalle Disable	
Recording		Chable Disable	
Port Configuration	IP	192.168.28.74	
Alerts	Mask	255 255 255 0	
SNMPD	Gateway	192.168.28.253	
Firewall	MAC address	50:33:8B:64:DD:30	
VPN Client	Link Status	Link connected	
Registration	Status	Internet access	
Download	3		



DHCP: If the mode DHCP is enable, the NET20 Plus receiver will auto get an IP address, otherwise it uses the static IP.

WIFI hotspot: If WIFI hotspot option is enable, then you can use other devices equipped with WIFI to search and connect to the NET20 Plus receiver. The hotspot is named by the serial number of the receiver. You don't need to input a password. Access NET20 Plus by IP address 192.168.10.1. The hotspot only play the role of control and can't access to internet.

WIFI Client: When selecting WIFI client, in SSID box input a name of WIFI hotspot can be used for the search, and in the Password box input the password for connecting to WIFI hotspot, then submit. After connecting to the connection WIFI, the password can be seen in system terminal or panel interface (the displayed place will be different in different versions).

Mobile network: enable Mobile Net to use the SIM card into the NET20 Plus, it supports 4G network. Users can set the user name and password if required.

FTP download: You can set the parameters of the FTP server. If anonymous access is turned on, it does not require a user name and password to connect to the NET20 Plus. If anonymous access is turned off, enter the user name and password.



After using the FTP tool to connect to the NET20 Plus, the data appears as follows:

10 test@192.168.99.41 - FileZilla				_ [0]	x
File Modifica Visualizza Trasferimento Server Preferiti Aluto					
22 • D TT TT TT C 18 O 1 1 TT C 0 M					
Host: 192.168.99.41 Nome utente: test Password: •	Porta: 21	Connessione rapida			
Stato: Elenco cartella di "/record/111/2017/11" completato					-
Stato: Recupero elenco cartella di "/record/111/201//11/30" Stato: Calcolo scostamento fuso orario del server					_
Stato: Timezone offset of server is 0 seconds.					
Stato: Elenco cartella di "/record/111/2017/11/30" completato					-
Stato: Connessione chiusa dal server					-
Sito locale: C:\Users\csosa\	<u>•</u>	Sito remoto: /record/111/2017/11/30			-
🛞 🔒 csosa	-	□- <u>↓</u> /			
🗈 🍐 Default		🖃 🍌 record			_ 1
Default User		111			
Iscamoni		E 4 2017			
E Public		E			
G. Windows		2 12			
work	_	undate			
(DATA)	-				
Nome file Dimension Tipo file Ultima modifica		Nome file 🔺	Dimensio Tipo file	Ultima modifica Permessi	Pro
A					_
android Cartella di file 26/11/2014 11:02:19	_	54113340.dat	449 786 File DAT	30/11/2017 18:rwarwarwar	00
.geopp Cartella di file 15/06/2016 14:45:45		54113341.det	8 135 480 File DAT	30/11/2017 19:rwarwarwa	00
AppData Cartella di file 09/09/2015 13:14:37					
Contacts Cartella di file 14/09/2017 08:26:45					
🍶 Cookies Cartella di file					
🇼 Dati applicazioni Cartella di file					
Desktop Cartella di file 02/01/2018 12:03:05	-				ъı
Castella di Ela Gatella di Ela		2 file - dimensione totale 9 596 266 hide			-
File e 25 carcelle. Dimensione totale. 20 555 For oyue	p me e zv cartelle. Dimensione totales 10 390 / 0/ byte				_
File server/locale Direzio File remoto	Dimensione Priorità Stato				-1
					_
File in coda Trasferimenti non completati Trasferimenti completati					
				🔕 🕜 Coda: vuota 🔹 🖷	1.

Figure 3-13

3.3.5 Ntrip Server

In this page, the user can set the NTRIP connection parameters of the reference station:

Summary				
System Information				
System Information			Ntrip Server	
GPS Status				
Satellites	Ntrip Server 1 *			
Data Transmission	Name	RTCM32		
Data Recording	Caster Address	127.0.0.1		
Configuration	Castar Port	04		
Reference Station	Caster Port	81		
GNSS Configuration	Version	V1.0 •		
Tracking Satellites	Password			
Network	Mountpoint	SH RTCM32		
Dynamic DNS	Data Type	O RTCM3.0 O RTCM	12.3 O CMR O sCMRx • RTCM3.2 O RTCI	13 2(10s) O DO
Ntrip Server	Auto Connect	Enable Disable		10.2(100) = 00
Recording	Auto connect			
Port Configuration				
Alerts				
SNMPD				
Firewall	Submit	Delete	Reload	Cancel
VPN Client	30 7			
Registration				

Remarks:

- Figure 3-14
- a. The password in this page must match the password of the server NTRIP if it is required. If the password is not required by the server you can enter any value.
- b. When the [Auto Connect] option is chosen, after the network is disconnected, the data transmission will be automatically connected. If the option is disable will be necessary

to start the connection manually from the Data Transmission menu by clicking on start.

c. Before setting the parameters, check in the page Reference Station if the coordinates are correct. Wrong coordinates cannot allow to transmit data to the server.

Click "Submit" to start the data transmission. In the Data Transmission page you can see the data transfer status displayed as "transmitting". The differential transmission indicator in the front panel of the receiver starts to blink.

3.3.6 Recording

In this page, the user can set the data recording parameters:

NEIZUILUS K	elerence Station	
Summary		
System Information	Compress(Global) : Off 🔻	
System Information		
GPS Status	Recording - UNSH V	
Satellites	Schedule Name	UNSH
Data Transmission	Path Type	
Data Recording	File Name	DOV/hhmm dat
Configuration	Internal	
Reference Station	Duration Tree	2 hours -
GNSS Configuration	Duration The	2 nours •
Tracking Satellites	Pool	Stop When Full V 20480 MB
Network	Auto	Enable Disable
Dynamic DNS	Integral Point Record	• Enable O Disable
Ntrip Server	File Push	Enable Disable
Recording		Push Parameters
Port Configuration	Protocol	🖲 FTP 🔘 GEO 🔍 RADIO
Alerts	FTP Server Address	
SNMPD	FTP Server Port	
Firewall	FTP User	admin
VPN Client	ETP Password	
Registration		
Download	Remote Directory	
System Management		
Configuration Set	Convert	🖉 Enable 🖲 Diable
Language English •	Convert	

Figure 3-15

File name: The static date can be recorded in 4 ways.

Table 3-1 The rules of Static record file name

File name	Annotation
YYYYMMDDhhmmss.dat	Date and when, minute and second
YYYYMMDDhhmm.dat	Date and when, minute
DOYhhmm.dat	Day of year, hour and minute
YYYYDOY?.dat	Year, day of year, period of time
ssssdddf.yyt	Station name, day of year, period of time
Rinex302.dat	Named by rinex3.02 standard
Custom	Manually input the file name by the way of name + .dat

Duration time: After setting the record length, the file will be recorded depending on the setting time, and it will be stopped at the end of the record length. If you enable the auto record option, the NET20 Plus will start a new file automatically.

FTP push: First you should set the FTP server parameters. When it records the data in the internal memory, NET20 Plus will also send the data to FTP server automatically.

3.3.7 Port Configuration

Port setting includes Bluetooth port, COM1 port and Socket settings. They can support the function as follow:

- CMD(INPUT/OUTPUT): NET20 Plus commands
- NMEA(OUTPUT): Output Specified NMEA sentences
- RTK(INPUT): Differential Input
- RTK(OUTPUT): Differential Output
- RAW(OUTPUT): Raw data output
- BINEX (OUTPUT) Output Specified BINEX sentences COM1 can be used also to establish the communication with OEM.

NET20 PLUS Reference Station

Summary		
System Information		
System Information		I/O Configuration
GPS Status	Bluetooth	Enable Disable
Satellites	30000000	
Data Transmission		
Data Recording	COMI	Castle @ Dhatte
Configuration	COMI	C Enable S Disable
Reference Station		
GNSS Configuration		
Tracking Satellites	COM2	Enable Isable
Network		
Dynamic DNS		
Ntrip Server	COM3	Enable Isable
Recording		
Port Configuration		
<u>Alerts</u>	Ntrip Client	Enable Disable
SNMPD		
Firewall		
VPN Client	Ntrin Contor	
Registration	Nulp Caster	Chable Disable
Download	Port	81
System Management		
Configuration Set		ST
Language English V	Socket 1	Enable Isable



3.3.7.1 Bluetooth

After opening the Bluetooth and choosing the output/input type, then click "submit", you can use Bluetooth driver to scan the NET20 Plus. The Bluetooth of NET20 Plus is named by driver serial. Now we use the PDA to access the NET20 Plus by Bluetooth. The page of PDA will be shown as follow:



Figure 3-19





Figure 3-20

O-survey

3.3.7.2 COM1

Note:

- 1. When data transmission on com1 is enabled, use the standard seven-pin cable to connect seven-pin interface in the back panel.
- 2. The baud rate of com1 must be consistent with the baud of receiving device. Figure 3-21 and Figure 3-22 are the process of the COM1 port output RTCM3.2.

COM1	● Enable ⊕ Disable
Baud Rate	115200 *
Function	RTK(Output) *
B - t - T	
Data Type	RTCM3Z *

Figure 3-21

अ≓ Serial Port Debug 4.	0(20140326) DecoderGNSS 03.03.20140313.20140313	_ 🗆 🗙
Type Serial Baud 11520 COM1: COM1 Close Port Send Read File Clear Save Break	Input send data \$GPGGA.074712,4620.57340,N,12503.76140,E,1,09,1.0,0.00,M,0.0,M,0.79 A CILS Hex Cmd Trimble 1 Text	
 Auto Send 1000 ms Display Error ✓ Data Pars ✓ Enter/Newline ✓ Text ✓ Hes Simulate Send Send Stop Simulate ✓ Double COM Mos , 	19755 004D 28 000172 00:000 Image: Parsing Image: Play Auto Clear 25 Line 06 20958682 064 111833541.1882 47.00 0 1.1000 20958683.704 86386310.2986 41.00 1 1.1000 -4 09 19206891.812 102563730.9207 56.50 0.11000 19206892.472 79771791.3266 53.251 1.1000 -2 16 21234411.780 113430415.2062 46.75 0.11000 21234414.560 882257.0962 41.25 1.1000 -1 07 19219237 032 102882080 4440 57.00 0.011000 19219239 532 80013395.9384 53.25 1.1000 05 RTCM3 1004 0000 00 308576 000 08 GPS contain observables 1322321467.812 117300106.9886 48.75 0.11000 2321493.052 91402681.3252 40.00 3.11000 12 23417234.858 128071703.3184 40.75 0.011000 23615004.684 96593494.5352 37.00 3.11000 2023317234.685 128071703.3184 40.75 0.11000 23615004.684 124097683.3477 42.50 0.11000 23615004.684 9659394.5352 37.00 3.11000 20 23615004.684 124097683.3477 42.50 0.11000 226178043 354 90815375 9439 40.25 3.11000 1070 226371234 685 128071703.3184 40.75 0.011000 2261781.75 1.1000 1000 23615004.684 9659394.53 5.7 0.01000 1000 23615004.684 9659394.53 5.7 0.03 1.1000 1000 23615004.684 96593.942 9.75 3.11000 1000 21620781.75 1.13617975.253 54.75 0.01000 21620782 676 88533487.4055 40.03 1.1000 1020883493.714 356.00 0.01000	•

e-survey

3.3.7.3 SOCKET

Figure 3-25 and Figure 3-26 are the process of output RAW data via socket.

Socket 1	A Feedle & David
JOCKET	· Charle O Lissue
Туре	TCP •
Mode	Saner *
Port	6660
Function	RAW(Output) •
Interval	112 •
Ephemeris Frequency	Onchanged *

Figure 3-25





3.3.8 Alerts

When NET20 Plus system or program exception occurs, NET20 Plus will use e-mail or cell phone text messages to notify manager in time for maintenance.

NET20 PLUS Referenc	e Station	
	e stution	
Summary		
System Information		
System Information		Alerts
GPS Status	F-Mail Alerts	Contraction Encoded
Satellites	E-muir Alorta	
Data Transmission		
Data Recording	CMC Alasta	
Configuration	SMS Alerts	C Enable Disable
Reference Station		
GNSS Configuration		
Tracking Satellites	Submit	Reload
Network		
Dynamic DNS		
Ntrip Server		
Recording		
Port Configuration		
Alerts		
SNMPD		
Firewall		
VPN Client		
Registration		
Download		
System Management		
Configuration Set		

Figure 3-27

3.3.9 Registration

When NET20 Plus receiver expires, you need to register it. Enter the registration code and click Submit, then instrument registration will be completed.

NET20 PI US Rofor	onco Station			
METZUT LUG KEICI				
Summary				
System Information				
I System Information				
LGPS Status	Device Serial	NET2009035008L		
Satellites	Old AuthCode	57E958CDE44C267359F18BCC	0A530FDF	
Date Transmission	Expire Date	20191128		
Data Transmission	Register Status	NORMAL		
Data Recording	AuthCode			
Configuration				
Reference Station				
GNSS Configuration				
Tracking Satellites				
Network				
Dynamic DNS				
Ntrip Server	5	ubmit		Reload
Recording				
Port Configuration				
Alerts				
ISNMPD				
Firewall				
VPN Client				
Registration				



3.4 Download

Download data stored in the NET20 Plus receiver through the network connection. Alternatively, you can connect to NET20 Plus receiver for copying data via USB cable.

NET20 PLUS	Reference St	tation				
Summary						
System Information						
System Information						
GPS Status	Select	201007	Size	Creation Time	Modification Time	Operation ETP Rush Doumland Delete
Satellites		201907	3 1276	18	175	ETP Push Download Delete
Data Transmission		201909	2 354G			FTP Push Download Delete
Data Recording		201000	2.0040	8		THI TUSH DOWNIDUG DEICC
Configuration	Select All	Package	Delete Selected			
Reference Station						
GNSS Configuration						
Tracking Satellites						
Network						
Dynamic DNS						
Ntrip Server						
Recording						
Port Configuration						
Alerts						
SNMPD						
Firewall						
VPN Client						
Registration						
Download						

Figure 3-29

3.5 System Management

The users can upgrade the firmware, view logs, enable or disable the login, and format internal disk.

NET20 PLUS R	eference Station
Summary System Information System Information GPS Status Satellites Data Transmission	Online Upgrade 1. Upload File Choose File No file chosen Upgrade
Data Recording Configuration Reference Station GNSS Configuration Tracking Satellites Network	Remote Debug Enable Disable Submit
Dynamic DNS Ntrip Server Recording Port Configuration Alerts SNMPD Firewall VPN Client Registration	View Logs 1. APP Log Download View 2. OS Log Download View 3. Kernel Log Download View 4. Audit Log Download View
Download System Management	



Note:

- 1. Log view part are abnormal operation of storage systems and procedures of a record;
- 2. When setting the security login, the admin account is the administrator account and the guest account can only view the information.

3.6 Help

Here provide operating guidelines for NET20 Plus introductory guiding.



4 Operation

4.1 Power on

Press the red power button on the panel, and until the initialization is completed, you can see the main menu display on OLED screen as shown in figure 4-1.

Posit:	ion Info		\$ 🛜 🚛 1	00%
Time:	1980-01-06 08:00:00			
Lon :	122.00000000	PDOP: 0	0.000	
Lat :	31.00000000	HDOP: 0	0.000	.
High:	0.000	SV : 0	2	1/5

Figure 4-1

Press left or right soft key to view the current IP information of Ethernet, WIFI, GPRS and VPN.

Ethernet	Port:80	●\$〒■100%
DHCP:	ON	
IP Addr:	0.0.0.0	4
Mask:	0.0.0.0)
Gateway:	0.0.0.0	25
	Figure 4-2	
∦ifi Info.		♦♦३३व••••
Mode:	Master	
IP Addr:	192.168.10.1	4
Mask:	255.255.255.0)
Gateway:	0.0.0.0	务会
	Figure 4-3	
GPRS Info.		♦♦\$\$\$ 🖬 100%
Power:	OFF	
IP Addr:	0.0.0.0	4
Mask:	0.0.0.0	Þ
Gateway:	0.0.0.0	₩ <u></u>
	Figure 4-4	
VPN Info.		●≯중■100%
Switch:	OFF	
IP Addr:	0.0.0	4
Server:		
		转

Figure 4-5





4.2 Quick setting

You can quickly set the receiver by the panel key. It includes six parts: device info, start record, transmit data, network settings, antenna settings and other settings.

Start Record: In the main interface, lightly press F2 key you can see the options shown in figure 4-6.



Figure 4-6

Lightly press power key to confirm, then enter into "Start Record", you can see the page shown in figure 4-7.



Figure 4-7

When the static is stopped, the cursor stops at the row of "Start Record"

Transmit Data:

When you transmit data by the panel, first you need to set the transmission parameters in the WEB UI page, then you can operate the panel. There are not transmission parameters settings on the setup panel.





You can quickly set differential type, start and stop transmit data.



Network Settings:

NET20 Plus network settings can be set to automatically obtain the IP or choose a static IP mode.

Transmit Data Network Settings	Antenna Settings 3/7
Figure 4-10	
Ethernet Setting DNCP: ON IP Addr: Mask: Gateway:	◆ 券 奈
Figure 4-11	
WiFi Setting Mode: Master	● ≱╤ 100%
IP Addr: Mask: Gateway:	- 4 - 1 - 26,
Figure 4-12	
GPRS Setting Power: Close	●券寮•100%
IP Addr: Mask:	-
Gateway:	- 95

Figure 4-13



Antenna settings:

It shows the antenna parameters, including station name, antenna type and antenna height, set in the Web UI.



Other settings:

Other settings could set the OLED language display, OLED brightness, OLED turned off interval.



Figure 4-16

Other Settings		♠\$╤ॖॖॖ∰100%
Language:	ENGLISH	
Brightness:	7	
TurnOff OLED:	SMIN	
		₽/1

Figure 4-17



Device information:

In this page, you can get the information of device model, device serial, hardware version and BOOT version.

-		
Other Settings	Device	Restore Fectory 6/7
www.waaaayaa	Figure 4-18	I dectory 0/1
Device Info		♦♦\$\$\$
Device Model:	NET20 PLUS	
Device Serial:	NET20E009100)8G
Hardware Ver:	NSC200II-V1.	2-RS485 🕨
BOOT Ver:	1.14	₽ /2
	Figure 4-19	
Device Info		♦ 🕪 🖇 🕿 🖬 100%
OS Ver	416-119	9 (20200828)

Figure 4-19					
Device Info	●***	100%			
OS Ver:	4.1.6 - 1.19 (20200828)				
App Ver:	2.12-220107	4			
Web Ver:	2.12				

Figure 4-20

1.01

Restore factory

In this page, you can restore to factory settings.

MCU Ver:



Figure 4-21



Figure 4-22



5 Accessories

	Net20 Plus						
NO.	ltems	Quantity	Model	Description	Picture		
1	Carton Box	1					
2	Net20 Plus	1			\leftarrow		
3	Charger	1	PSAA30R-150	2-pin Lemo power cable Input: 100~240V~0.8A 50-60Hz Output: 15v, 2A			
4	5-Pin Cable	1	TC-183	For serial data output	O.		
5	7-Pin Cable	1	TC.GK428.ABL	For internal storage access only	Q		
6	Serial Cable	1		Female to female, cross serial cable	Q		
7	4G Antenna	1		External 4G network antenna	£		
				Optional			
1	Antenna	1	UA91	Choke Ring Antenna, Multi-frequency	C. un vit		
2	Antenna	1	СМ004	Choke Ring Antenna, Multi-frequency			
3	Antenna	1	UA35	GNSS Antenna			
4	Cable	1	TNC-TNC	5m, 15m, 30m			
5	Software	1	NTRIPCaster	Single base station			
6	Software	1	GNSS.Net	VRS network			

Table 5-1 Accessories of NET20 Plus



To be the leading provider of high-precision professional, solution & service in the global geospatial industry



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