P3E| GETTING STARTED GUIDE

MULTI APPLICATIONS GNSS RECEIVER

Safety Warnings
The Global Positioning System (GPS) is operated by the U.S. Government, which is solely responsible for the accuracy and maintenance of the GPS network. Accuracy can also be affected by poor satellite geometry and obstructions, like buildings and heavy canopy.

FCC interference statement
This equipment has been designed to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules in the Portable Mode. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

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P3E Getting Started Guide – Revision 1.0 October 2016

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1. CONTENTS

1. INTRODUCTION

Thank you for choosing the P3E GNSS Receive

This Getting Started Guide will provide useful information about your receiver. It will also guide you through your first steps of using P3E GNSS GNSS Receive.

1.1. TECHNICAL ASSISTANCE

If you have a problem and cannot find the information you need in the product documentation, contact your local dealer from which you purchased the P3E. Alternatively, please request technical support using the CHC Website at (www.chcnav.com) or CHC technical support email support@chcnav.com

1.2. YOUR COMMENTS

Your feedback about this Getting Started Guide will help us to improve it in future revision. Please e-mail your comments to support@chcnav.com

1.3. SAFETY INFORMATION

This manual describes CHC P3E GNSS Receivers. Before using the receiver, please make sure that you have read and understood this Getting Started Guide, as well as the safety requirements.

1.4. WARNING AND CAUTIONS

An absence of specific alerts does not mean that there are no safety risks involved.

A Warning or Caution information is intended to minimize the risk of personal injury and/or damage to the equipment.

⚠ WARNING-A Warning alerts you to a potential misused or wrong setting of the equipment.

⚠ CAUTION- A Caution alerts you to a possible risk of serious injury to your person and/or damage to the equipment.

1.5. REGULATIONS AND SAFETY

The P3E Sensor may be delivered with optional internal data links. Regulations regarding the use of the data link vary greatly from country to country. Depending on local authorities, the P3E can be used without obtaining an end-user license or may require administrative permissions. For license information, consult your local dealer.

1.6. USE AND CARE

The P3E Sensor is designed to withstand the rough environment that typically occurs in the field. However, the P3E Sensor is high-precision electronic equipment and should be treated with reasonable care.

2. OVERVIEW

2.1. FEATURES

Designed for seamless integration, the P3E is a powerful multi-application GNSS Receive or which delivers state-of-the-art positioning features in a rugged enclosure. The CHC P3E GNSS Receive provides a cost-effective answer to demanding applications such as geodetic reference station, academic research, precision agriculture RTK network, deformation monitoring, centimeter accuracy RTK sensor for marine survey, dredging or any GPS/GNSS machine guidance when high performances and reliability are required.

The P3E offers outstanding performances with proven and innovative 220-channels GNSS functionality. The future proof multi-constellation tracking feature increases availability in obstructed sky conditions such as construction sites in urban areas while securing RTK accuracy. The very low noise GNSS carrier phase measurement and low level elevation tracking technology make the P3E a powerful reference station solution..

2.2. SPECIFICATIONS

GNSS characteristics
- 220 channels with simultaneously tracked satellite signals
  - · GPS: L1C/A, L2E, L2C, L5
  - · GLONASS: L1C/A,L1P,L2C/A, L2P, L3
  - · BDS: B1, B2
  - · SBAS: WAAS, EGNOS, MSAS
  - · Galileo: L1 BOC, E5A, E5B, E5Alt8OC
  - · QZSS: L1 C/A, L1 SAIF, L2C, L5
- Advanced multipath mitigation technology
- Low noise carrier phase measurement with <1 mm precision in a 1 Hz bandwidth.

Performance specifications [1]
- Real Time Kinematics (RTK)
  - · Horizontal: 8 mm + 1 ppm RMS

- Vertical: 15 mm + 1 ppm RMS
- Initialization time: typically < 10 s
- Initialization reliability: typically > 99.9%
- Post Processing Static
  - Horizontal: 3mm + 0.5ppm RMS
  - Vertical: 5mm + 0.5ppm RMS
  - Baseline Length: ≤ 300 km

Communications

- 1x LAN port:
  - 1 port with RJ45 connector supports links to 10BaseT/100BaseT networks.
  - HTTP, HTTPS, TCP/IP, UDP, NTRIP Caster, NTRIP Server, NTRIP Client
  - Proxy server support
  - Routing table support
  - NTP Server, NTP Client support
  - UPnP and Zeroconf support
  - Email Alerts and Position Monitoring
- Protocols:
  - Correction formats; RTCM2.1, RTCM2.3,RTCM2.4, RTCM3.0,RTCM3.2, CMR, CMR+, sCMRx
  - Position/Status I/O: NMEA0183 v2.30and v4.0, GSOF
  - Observables: RT17, RT27, BINEX, RTCM 3.x
  - Up to 50 Hz output standard
- Internal data logging storage capacity: 4GB

Physical

- Size (LxWxH): 215 x 140 x 68 mm (8.5 x 5.5 x 2.7in)
- Weight: 2kg (71 oz)
- Operating temperature: -25 °C to +65 °C (-13°F to 149°F)
- Storage temperature: -40 °C to +80°C (-40°F to 176°F)

- Waterproof and dust proof: IP65 and MIL-STD 810F
- Shock: IEC68-2-27, Survival 1m drop onto hard surface
- Ground screw
- Colour: Gray
- Material: Metal

Electrical

- External power input:9-36 VDC
- Power Consumption: 4.2 W

User Interface

- PC Control Utility via Serial
- Web User Interface
    · Secure
    · Allows remote configuration, data retrieval and firmware updates
    · Setup of multiple streaming / monitoring ports

Antenna option

- A220GR GNSS Geodetic Antenna, and C220GR GNSSChoke Ring Antenna

(1)Accuracy and reliability specifications may be affected by multipath, satellite geometry and atmospheric conditions. Performances assume minimum of 5 satellites,follow up of recommended general GPS practices. (2) Feature available on demand

Specifications are subject to change without notice.

2.3. P3E BASIC SUPPLY

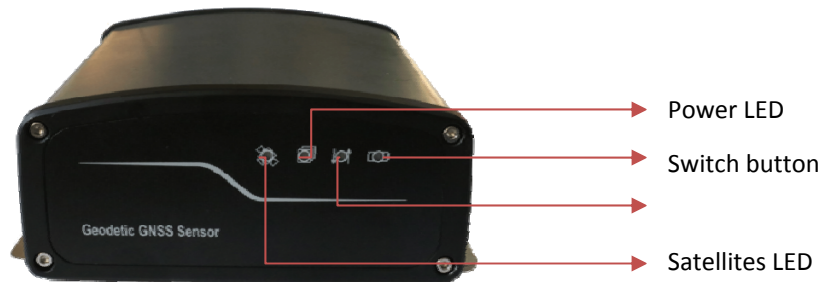The table below provides an overview of the different items composing the P3E Base Kit

Item
CHC P3EGNSS Receiver
Power Adapter with Cord
Transport Case
Whip antenna
GPS to PC Data Cable

2M Internet Cable		▶

3. P3E DESCRIPTION

3.1. RECEIVER FRONT VIEW

Power LED

Switch button

Satellites LED

- **Power Button**
- ➔ **10 Pin Lemo Serial Port 1**

Use this port to connect the P3E CHC to PC or PDA and also to supplypower to receiver via the CHC Data Cable.

Refer to Appendix A for the LEMO pin out diagram.

- ➔ **GPS Antenna Connector**

The TNC GPS antenna connector allows connection of the external GNSS antenna to the P3EGNSS.

3.2. SOFTWARE INSTALLATION

3.2.1 CHC SOFTWARE OVERVIEW

The CHC software package is to be installed on CHC recommended PDA (LT30, Getac ™ PS236, Recon™ …).

- HCGPSSet➔ Overall Receiver setup

CAUTION: To validate the Setting you need to turn the P3E receiver OFF and then ON.

- HCGPRSCe→ Radio and built-in GPRS module setup.

- RTKCe / Landstar→Software to perform RTK Surveying Data collection (requires activation).

3.2.2 INSTALLING CHC SOFTWARE

The P3E software RTKCe, HCGPSSet and HCGPRSCe are bundled in one combined CAB format installation package. To install, copy the installation file to your PDAor PC and double click the on the CAB file. The software installation process starts automatically.

CAUTION: Use only the latest CHC software CAB file with the P3E

3.3. POWERING THE P3E

P3E can be powered by either connecting it to the mains power (A.) or to an external battery (B.)

A. Connect to the mains power → use CHC GPS to PC cable + Power Adapter

Connect the Power Adapter socket to the mains100-240 VAC and Power Adapter male connector to the Power Port of the GPS to PC cable.

B. Connect to external battery → use CHC GPS to PC cable + external power cable (optional) + Car battery.

Properly connect the external power cable to a car battery (respecting the polarity) and then connect the Power Adapter male connector to the Power Port of the GPS to PC cable.

3.4. SYSTE INSTALLATION

3.4.1 SUPPORTED GNSS ANTENNAS

CHC recommends the use of the CHC A220GR GNSS Antenna or CHC C220GR GNSS Choke Ring with the P3E GNSS Receive

Other GNSS antennas may however be used ensuring that the antenna receive the proper GNSS frequencies and operates at either 3.3V or 7.1V with a signal greater than 40 dB at the antenna port.
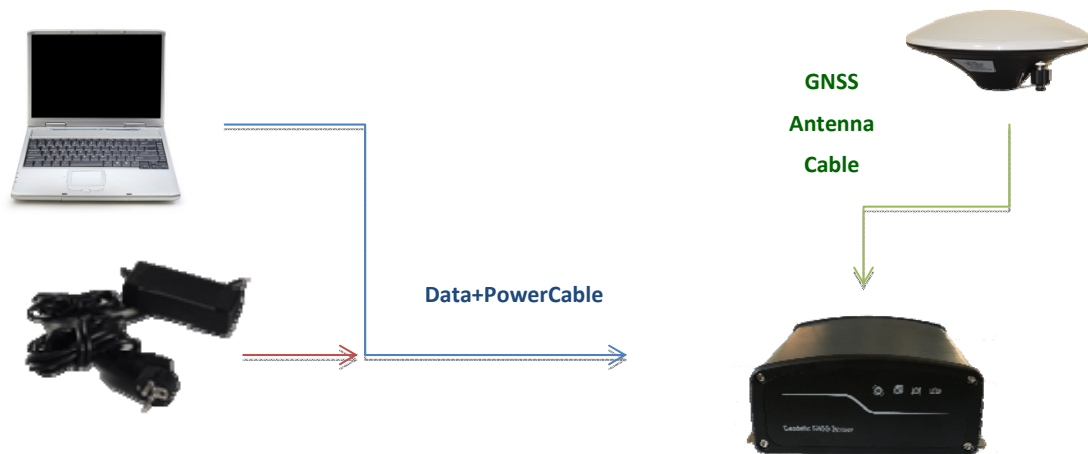
3.4.2 INSTALLING THE ANTENNAS

Choosing the correct location for the GNSS antenna is critical to the installation. Poor or incorrect placement of the antenna can influence accuracy and reliability and may result in degraded performances normal operation.

Follow these guidelines to select the antenna location:

- If the application is mobile / kinematic, place the antenna on a flat surface along the centerline of the vehicle.

- Choose an area with open view to the sky and far from metallic objects.

- Avoid areas with high vibration, excessive heat, electrical interference or strong magnetic fields.

- Avoid mounting the antenna close to electrical cables, metal masts and generally close to other antennas.

3.4.3 P3E CONNECTION DIAGRAM

Typical connection diagram of the P3E + A220GR Antenna connected to main power and PC.

4. P3E CONFIGURATION USING TRIMBLE™ SOFTWARE SUITE

This chapter gives a brief introduction of how to use the native OEM Trimble™ BD970 software to configure P3E GNSS Receive. For more details please read Appendix 3 - "Configuration P3E Using Web Interface"

4.1. CONFIGURATION OF P3E IP by WINFLASH™

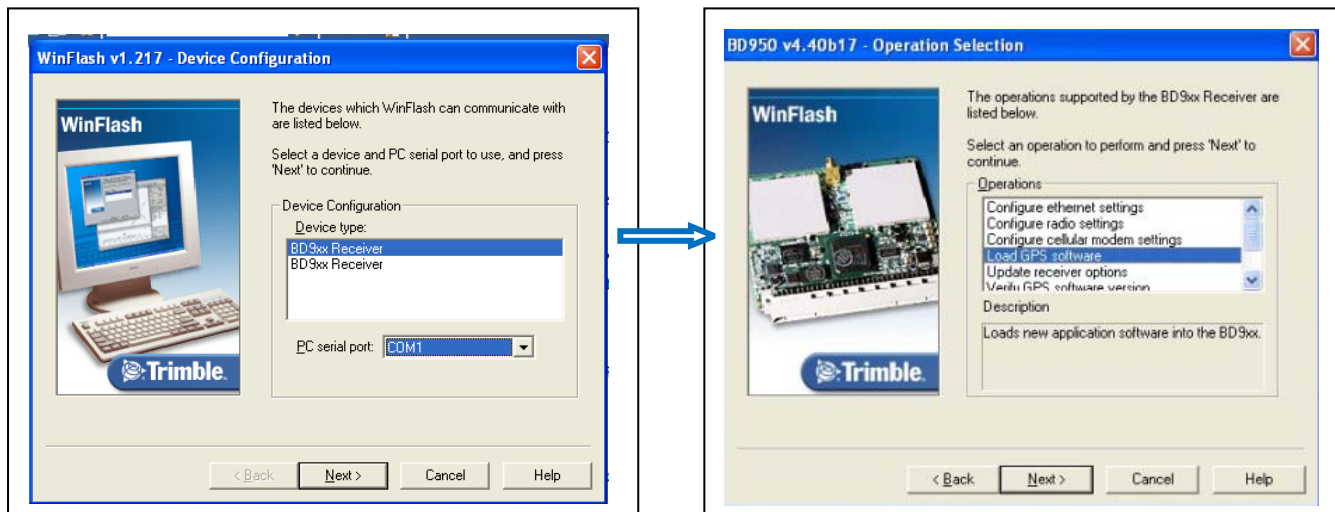Go to the follow link to download the **BD9xx WinFlash V234_V462.exe**software:

➢ Install WinFlash on your PC
➢ Connect the P3E to your PC using the GPS to PC Data cable by serial port
  5.1.1 Upgrading the receiver firmware

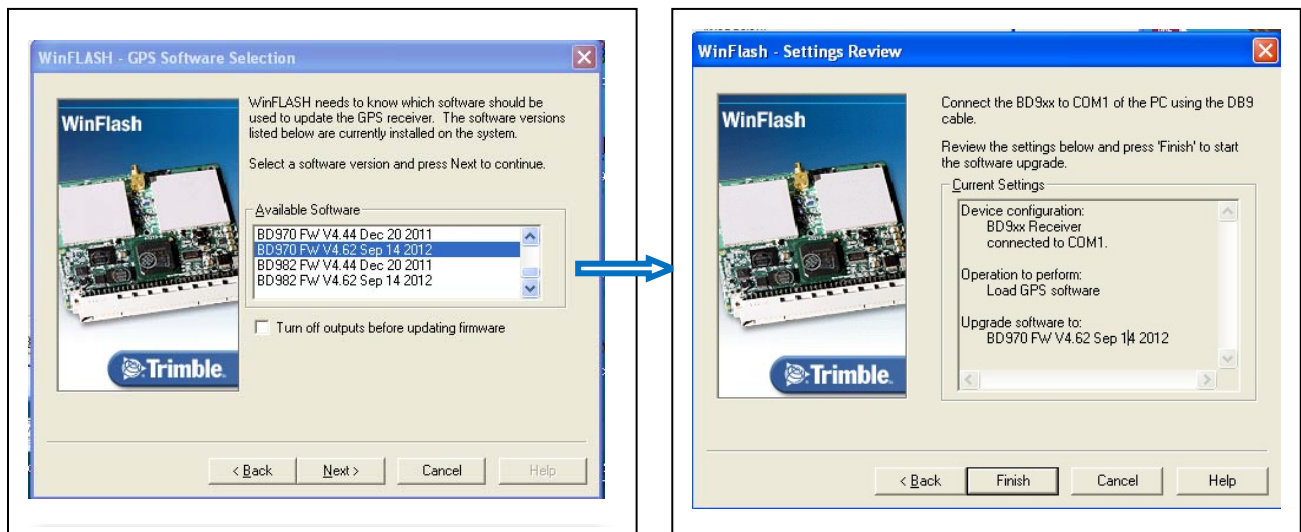Start the WinFlash utility. The *Device Configuration* screen appears.

From the *PC serial port* field, select the serial (COM) port on the computer that the receiver is connected to
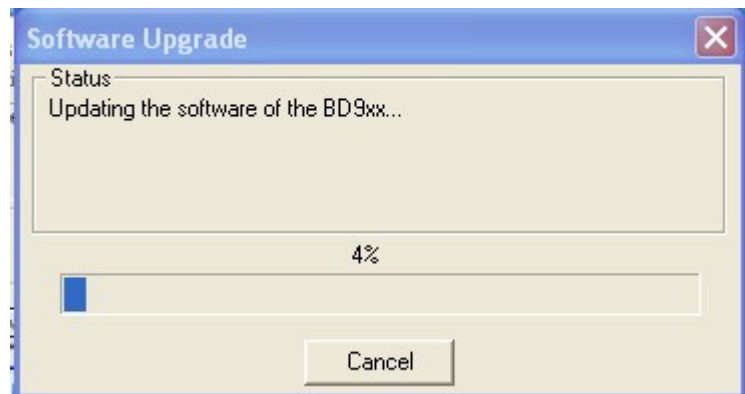
Click **Next**

Select *Load GPS software* and then click **Next**.

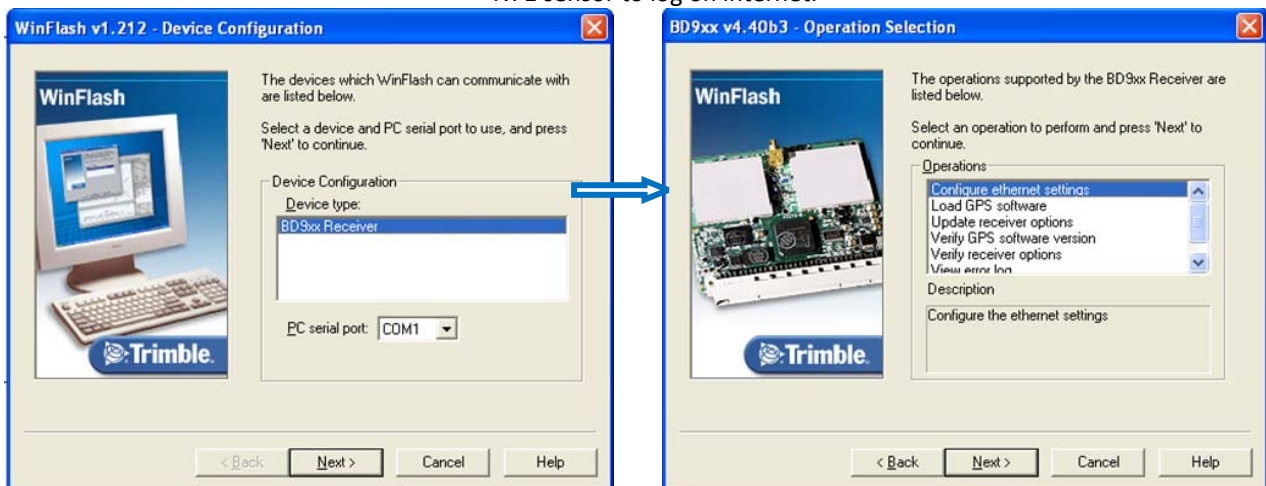From the *Available Software* list, select the latest version and then click **Next**.

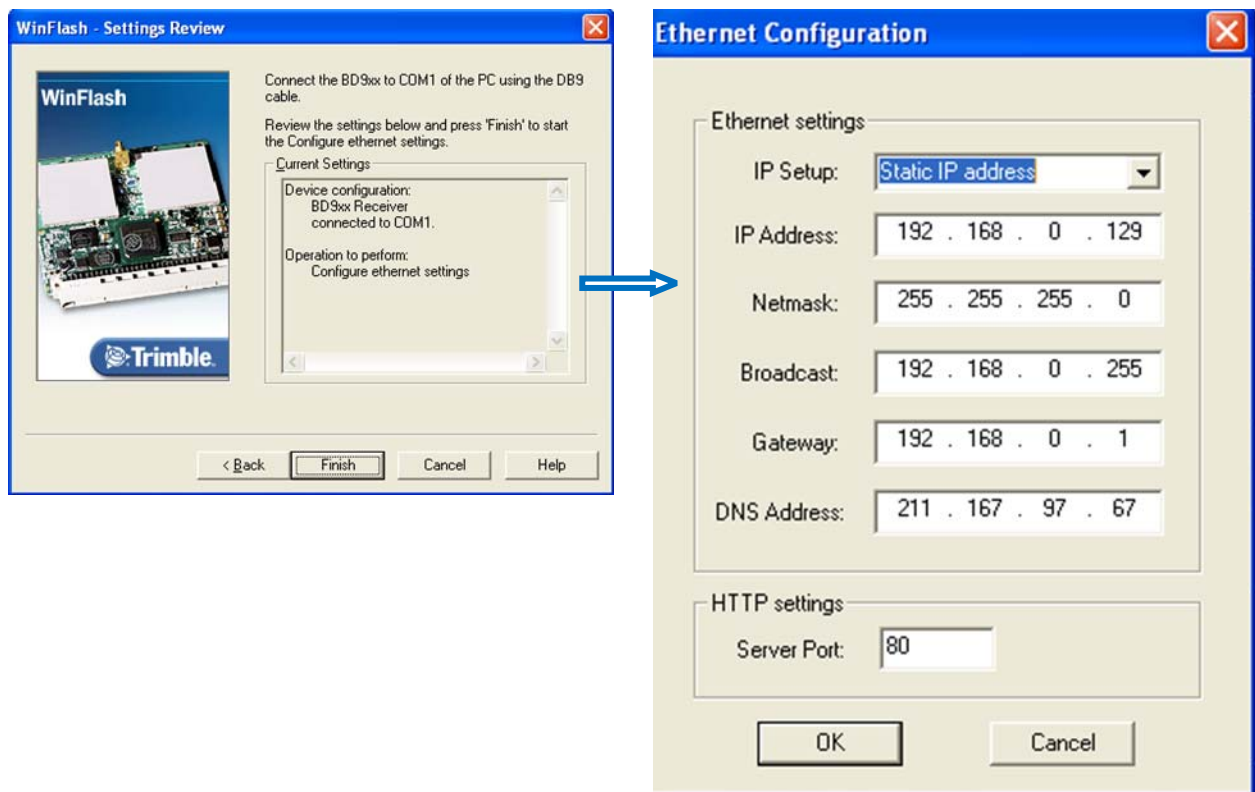If all is correct, click **Finish**, then Click **OK**.

The *Software Upgrade* window appears again and states that the operation was completed successfully.

5.1.2 IP configuration

Start WinFlash and follow the instruction below to set the static IP of N71 sensor to log on internet.

4.2. CONFIGURATION OF P3E OUTPUT ADDRESS WITH TOOLBOX™

We recommend that you use the Web interface to configure the receiver and monitor its status. Not all receiver functions are supported in the Configuration Toolbox software. The Configuration Toolbox is the only utility that can be used to load local datums and coordinate systems into the receiver.
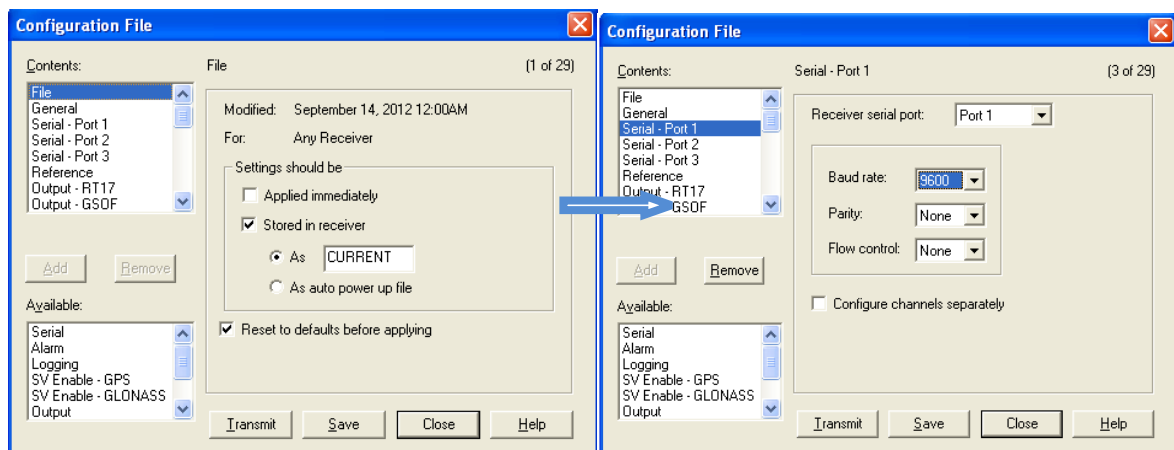
Go to the follow link to download the software

Download

➢ Install ToolBox on your PC
➢ Connect the P3E to your PC using the GPS to PC Data cable

The instructions below describes the setup
of NMEA output on serial port COM 1 as an example.
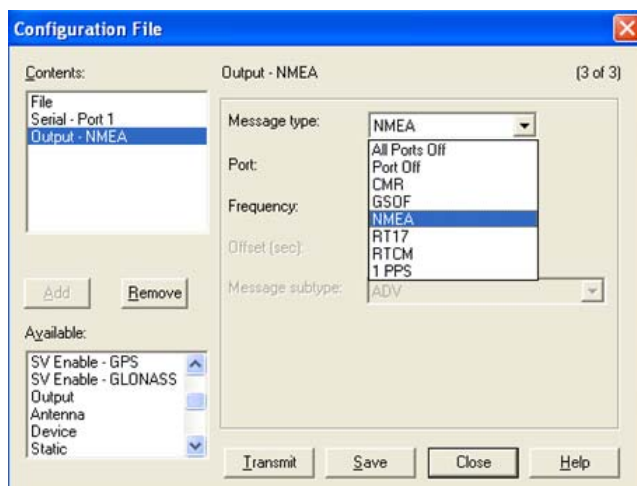More set-up are available to match your application requirements.

4.2.1 SET THE DATA STREAM OUTPUT

Run ToolBox software, create and save the application file in the Configuration Toolbox software, Select setting to 'Applied immediately' or 'Store in receiver'

Click on 'Serial' under the Available selection box → Click Add to enable Serial – Port 1 → Select the appropriate Baud Rate.
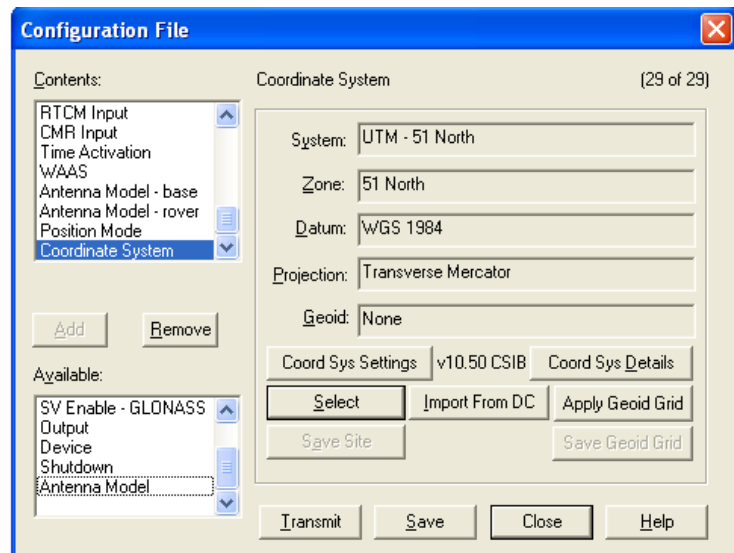

Click on 'Output' under the Available selection box → Click Add to enable Output type selection→ Select NMEA, Port 1 and appropriate Baud Rate
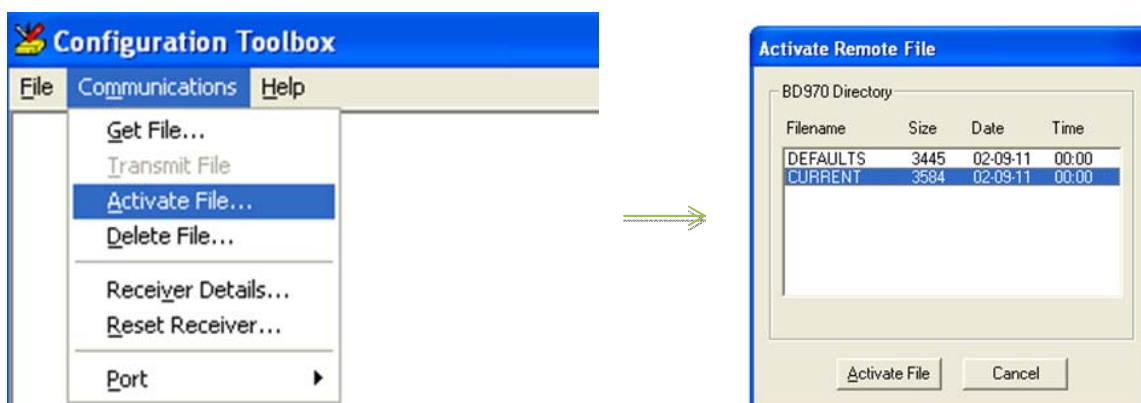

4.2.2 SET THE COORDINATE SYSTEM

OnAvailable selection box → Click coordinate System→then edit the local coordinate system.

After built the application file, go to active the files.

➢ If the configuration file is stored on the receiver → Go to Communications Menu → Activate File → Select the Current File → Click on 'Activate File'

4.3. Configuration of P3E with WebExplore™

When connecting the P3E to your PC using the LAN cable for the first time, follow the steps, if you already configuration P3E static IP (**in Chapter 5.1.2**), please directly using this static IP to configuration P3E.

➢ Set your PC IP address to "Obtain an IP address automatically
➢ Connect PC with P3E with a LAN cable
➢ Type http://169.254.1.0 in your default Internet browser
➢ Enter the default User name = admin and Password = password

Connect to 192.168.0.129

The server 192.168.0.129 at Trimble requires a username and password.

Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).

User name: ☺ admin

Password:

☐ Remember my password

OK   Cancel

➢ Press OK to login.
➢ The P3E GNSS Receive configuration screen will appear

The following menus are available on the left side on the screen:

✓ Receiver Status
✓ Satellites
✓ Receiver Configuration
✓ I/O Configuration
✓ Network Configuration
✓ Security
✓ Firmware and Help

➔ Change the User Interface Language

Receiver Status
Satellites
Receiver Configuration
I/O Configuration
Network Configuration
Security
Firmware
Help

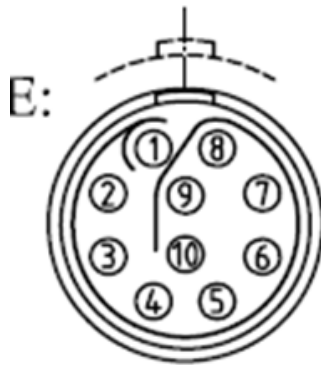➔ Check the receiver Status: differential status, receiver options

➔ Satellites configuration (Enable / Disable)

➔ Important **Setting** : set up NTRIP Client and Data output message

➔ IP configuration to set the P3E Static IP address

APPENDIX A : LEMO CONNECTOR PIN OUT

PIN	Signal Name	Description
1	TXD	Transmit Data (PC receive data through this pin)
2	RXD	Receive Data (PC transmit data through this pin)
3	PWR	External Power Input (9-15 V DC)
4	PWR	External Power Input (9-15 V DC)
5	GND	External Power Ground
6	GND	External Power Ground
7	USB PWR	
8	D-	
9	D+	
10	Not Used	

➔

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