

# INSTRUCTION MANUAL



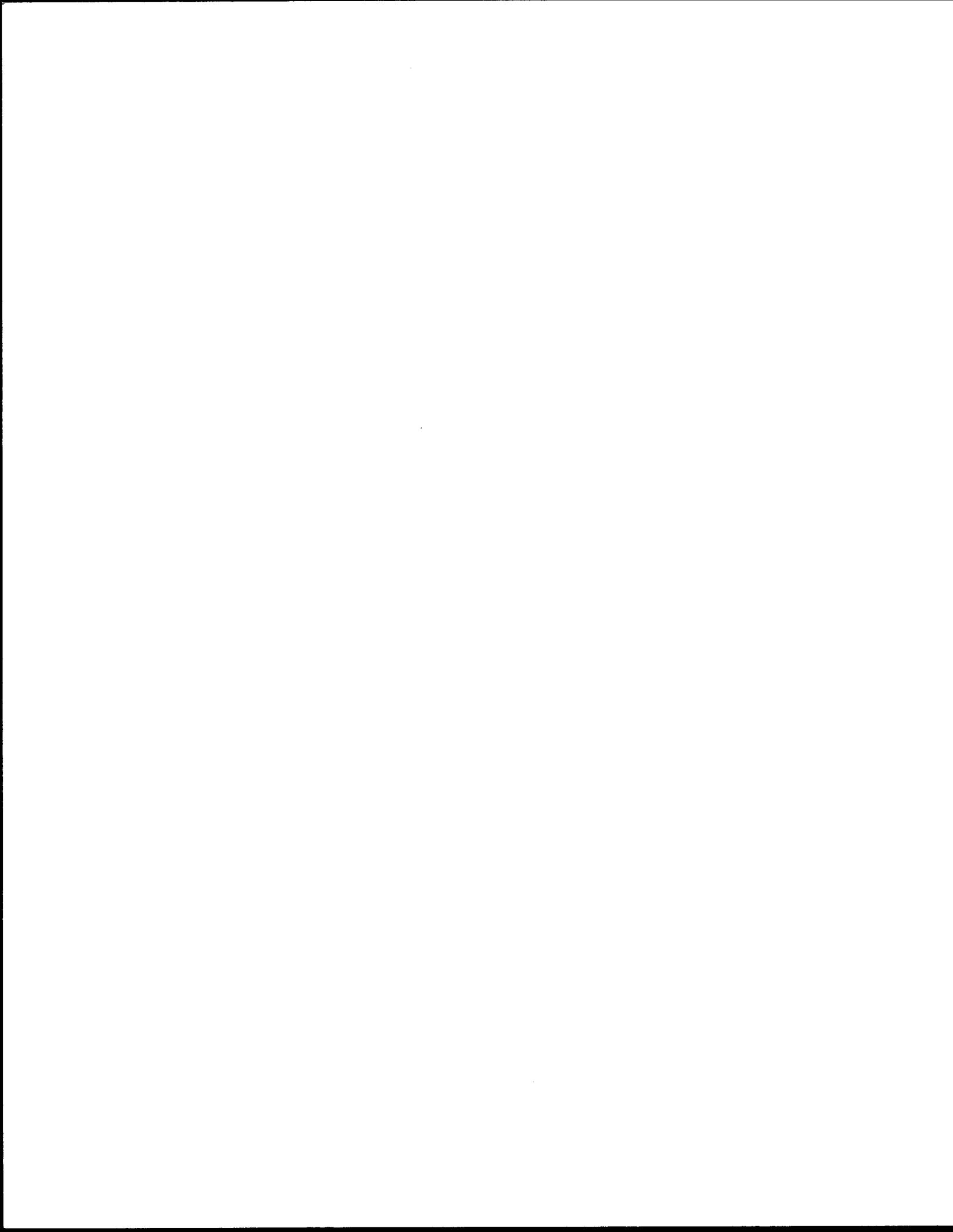
**PC121 ETPRO for NW8002**

Campbell Scientific, Inc.

**PC121 ETPRO FOR NW8002  
INSTRUCTION MANUAL**

**11/93**

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# PC121 ETPRO FOR NW8002

ETPro for the NW8002 weather stations is designed to calculate an Evapotranspiration (ET) value as well as show current weather station conditions. To use the ETPro software, PC208 software must be installed on the computer (PC208 manual installation Section 1.2.1). ETPro is contained on the disk labeled ETPro disk 1 of 1. The files on this disk must be copied to the directory where PC208 has been installed. The menu file allows the user to program the weather station based upon the station's longitude, latitude, elevation and time zone coordinates. The user may select the type of communication (Phone or short haul) being used. ETPro also allows monitoring realtime measurements, collecting data, and generating reports.

**NOTE:** Time zone coordinates are vital in accurate ET calculation. A time zone map (Figure 1-1) is provided for use in determining the time zone your weather station is located in.

## 1. SET UP

### 1.1 ETPRO

Insert ETPro disk into drive A or B of the computer. Copy all files from this disk to the same directory where PC208 resides.

With the A:> (B:>) on the screen type "copy \*.\* C:\PC208". All files will be copied from the A:(B:) drive to the C: drive.

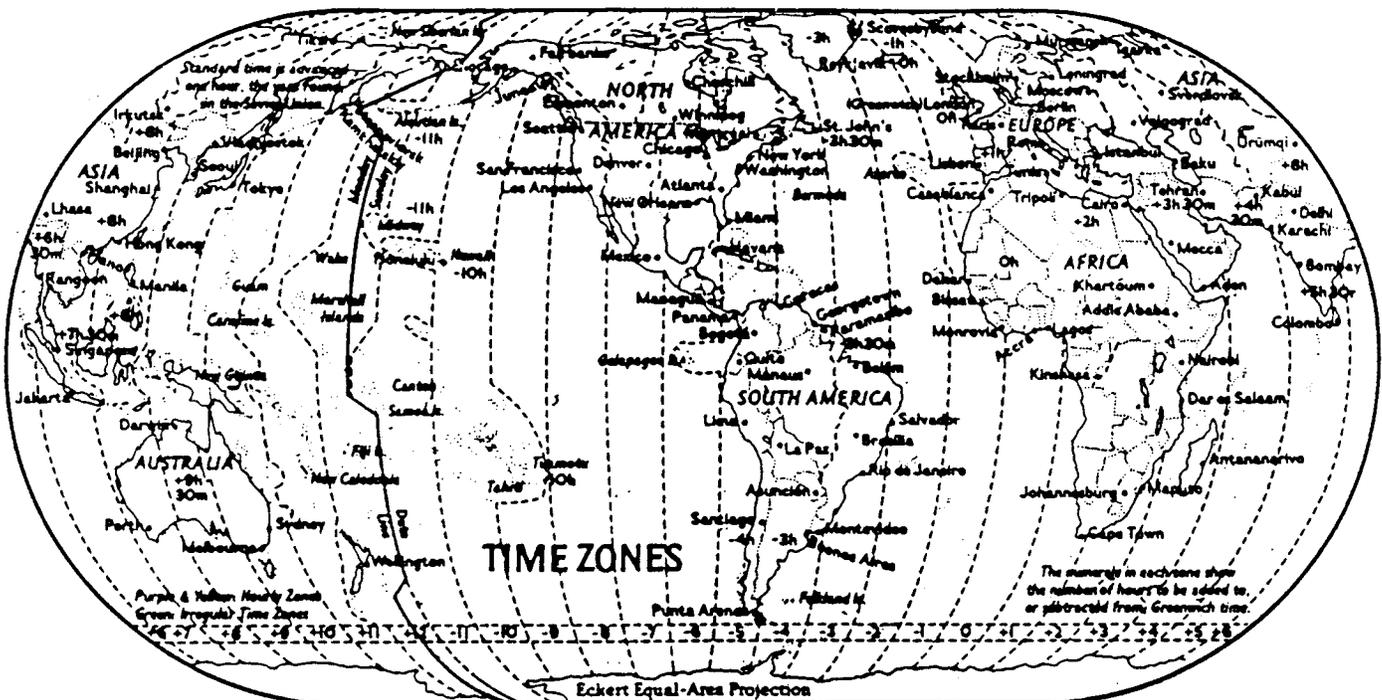


FIGURE 1-1. Time Zone Map

1.2 INITIAL STATION SET-UP

The following procedures outline the steps needed to program, download, view, and retrieve station data:

1. After the station and communication interface (RAD or Phone) have been installed, turn on the power to the station.
2. Locate time zone (Figure 1-1), longitude, latitude, and elevation values of the station.  

You will also need to check the time of your computer by typing "time" on the DOS command line. Be sure that this time is standard time, not daylight savings time. If the computer shows daylight savings time, change the time by typing the correct time on the line provided. Keep in mind that when the computer is turned off, the computer will default back to daylight savings time. If you are in doubt you are on standard or daylight time, call NIST (303) 499-7111 which is a recording of universal time. Once each minute you will hear the current universal time local to Greenwich, England. With this time you can refer to the time zone map and count back the number of hours you are from Greenwich. For example: Denver, Colorado is -7 hours from Greenwich. Therefore, if the time heard was 1500 hours, the proper time at the station is 1500 - 7 or 8:00.
3. In the PC208 directory type "ET".

4. Move to the "Edit" option and select it.
5. The highlight bar should be on "Create Station Program" press Enter or click with the mouse.
6. In the ET program use the arrow keys to move the highlight window. If you need help press F1.
7. After the main menu is returned, move the highlight bar to "Communication Param." and press Enter.
8. The COM port of the computer, Baud Rate and Interface device may be different from station to station. If all of these parameters are correct, press Esc. If any are different for the station installed, follow instructions listed on the screen to make changes. If changes are made, be sure to press ^P to save the changes. You will not need to return to this option again once this is done. The screen is displayed below.
9. Select the "Maintenance" option and move to "Download Datalogger Program". Keep in mind when this option is selected, you will need to know if your computer is on standard time or daylight savings time. It is imperative that your computer is set up with standard time. When you select the default "OK to set clock" it will take a few minutes for the clock to be set and the program to be downloaded to the station.

|  |                    |
|--|--------------------|
| <Esc>=Done   | <^P>=Save and Done |
| Use cursor keys to move around through station parameters. |                    |
| Hit <Space> bar to scroll entries.                         |                    |
| Telecommunication Parameters For Station: WEATHER          |                    |
| Datalogger Type: CR10 Security Code: 0                     |                    |
| Use Asynchronous Communications Adapter: COM1              |                    |
| Communications Baud Rate: 9600                             |                    |
| Interface Device:  |                    |
| #1: RAD Modem  |                    |
| #2: End  |                    |

10. Select "Monitor" in the "Data" menu option to monitor current conditions to see if all sensors are making proper measurements. Keep in mind the locations 1,3-7, 10, and 11 are updated every 60 seconds. Location 8 is updated once a second. Locations 9, 24, and 25 are updated once an hour. Locations 2, 12-18, 23, 26-33 are updated every 24 hours at 2:00 pm. Table 1-1 lists the locations definitions which appear on screen in the monitor mode.
11. When sufficient data has been recorded, the data can then be collected with the "Collect Data" option. Data is viewed by selecting "Reports" and one of the options desired, "Hourly Summary" or "Daily Summary".
- These 11 steps define the basic initial set up. For a description of all the menu options refer to the reference portion of this manual.

**TABLE 1-1. Locations Displayed When Monitoring**

| <u>Location Number and Name</u> | <u>Description</u>   |
|---------------------------------|--|
| 1: CR10 Temp                    | Internal weather station temperature in degrees C.           |
| 2: Signature                    | Signature of weather station program.                        |
| 3: Slr kW/m2                    | Solar radiation in kW/m2.                                    |
| 4: Temp C                       | Temperature probe temperature in degrees C.                  |
| 5: RH                           | Relative Humidity of Temp/RH probe in %.                     |
| 6: WS mph                       | Wind Speed in mph.   |
| 7: Rain in                      | Rain in inches.  |
| 8: Wind Dir                     | Wind direction in degrees 0-360, 0-N, 90-E, 180-S, 270-W.    |
| 9: TotRain                      | Total rain over last hour (inches).                          |
| 10: Batt Volt                   | Battery voltage of weather station should read 12-13.5Volts. |
| 11: TempF                       | Temperature probe temperature in degrees F.                  |
| 12: 24HMxTmp                    | 24 hour max temp deg F before 2:00 pm previous day.          |
| 13: 24HMnTmp                    | 24 hour min temp deg F before 2:00 pm previous day.          |
| 14: 24HAvtmp                    | 24 hour avg temp deg F before 2:00 pm previous day.          |
| 15: 24HMaxRH                    | 24 hour max RH% before 2:00 pm previous day.                 |
| 16: 24HMinRH                    | 24 hour min RH% before 2:00 pm previous day.                 |
| 17: 24HSolar                    | 24 hour avg solar before 2:00 pm previous day.               |
| 18: 24HMaxWS                    | 24 hour max wind speed (mph) before 2:00 pm previous day.    |
| 23: Rain24hr                    | Total Rain (in) 24 hours before 2:00 pm previous day.        |
| 24: Rn Today                    | Total Rain since 2:00 pm previous day.                       |
| 25: ET Today                    | Total ET since 2:00 pm previous day.                         |
| 26: ET7DayT                     | ET value for the last 7 days.                                |
| 27: ET Day 7                    | Total ET for the day, 7 days previous.                       |
| 28: ET Day 6                    | Total ET for the day, 6 days previous.                       |
| 29: ET Day 5                    | Total ET for the day, 5 days previous.                       |
| 30: ET Day 4                    | Total ET for the day, 4 days previous.                       |
| 31: ET Day 3                    | Total ET for the day, 3 days previous.                       |
| 32: ET Day 2                    | Total ET for the day, 2 days previous.                       |
| 33: ET 24hr                     | Total ET for last 24 hours.                                  |

## 2 ET MENUS

### 2.1 MAIN SCREEN

ETPro has five main menus: File, Edit, Maintenance, Data, and Reports. Menus can be selected with either the mouse or the keyboard.

**MOUSE:** Point to one of the main menus and click the mouse. A window will show menu options. Point to the option and click the mouse to select.

**KEYBOARD:** Press Alt to highlight the menu choices. Use the cursor keys or press the first letter of the menu option to highlight the option. Press Enter to select the menu. Use the cursor keys to move to the option and press Enter to select. The following sections describe the menus.

### 2.2 FILE

About  
Exit

**ABOUT:** Shows version number and provides a basic description of ETPro.

**EXIT:** Exits menu file.

### 2.3 EDIT

Create Station Program  
Communication Param.

**CREATE STATION PROGRAM:** Generates the program for the weather station. It allows the user to enter local station coordinates for ET calculation. Press F1 in this program for help.

**COMMUNICATION PARAMETERS:** Creates unique station parameters either two-wire communication or Phone communication.

### 2.4 MAINTENANCE

Set Clock  
Download Station Program

**SET CLOCK:** Sets the weather station clock.

**DOWNLOAD STATION PROGRAM:** Sets the clock as well as loads the program created by "Create Station Program" into the weather station.

### 2.5 DATA

Monitor  
Collect Data

**MONITOR:** Monitors real time weather station data.

**COLLECT DATA:** Retrieves data from the weather station.

### 2.6 REPORTS

ET Summary  
Daily Summary

The summary report screens (Figure 2-1) have default values which can be changed by the user. They will display current start year and stop year, current start and stop month of PC, start and stop day (previous day and current day), and start and stop hour (0 and 0 or 12 midnight from previous day to current day).

| NW8002  |      |             |      |         |
|---|------|-------------|------|---------|
| File  | Edit | Maintenance | Data | Reports |
| Daily Summary Report  |      |             |      |         |
| Start Year  | 1993 | End Year    | 1993 |         |
| Start Month   | 04   | End Month   | 04   |         |
| Start Day   | 25   | End Day     | 26   |         |
| *Start Hour   | 0    | End Hour    | 0    |         |
| Report Destination  |      |             |      |         |
| <input checked="" type="checkbox"/> Screen <input type="checkbox"/> Printer |      |             |      |         |
| OK  |      | CANCEL      |      |         |

\*Information does not appear on the ET Summary Report screen.

**FIGURE 2-1. Summary Setup Screen**

**ET SUMMARY:** Outputs a summary for the past hour. Table 2-1 shows an example of ET Data. Each value is an accumulation of the past 7 days (7-day total).

**TABLE 2-1. ET Previous 7 Day Total**

| <u>Month</u> | <u>Day</u> | <u>ET 7 Day Total</u> |
|--------------|------------|-----------------------|
| 7            | 20         | 1.290                 |
| 7            | 21         | 1.278                 |
| 7            | 22         | 1.204                 |
| 7            | 23         | 1.044                 |
| 7            | 24         | 0.930                 |

**DAILY SUMMARY:** Outputs daily report to either the screen or printer. The user can enter start parameters and end parameters. If a mouse is not available, use the Tab key to move through the parameters. Table 2-2 shows an example of hourly data.

**TABLE 2-2. ETPro Processed Hourly Outputs**

| Month<br>Day | Hr/Minute | Avg<br>kW/m2 | TempF | Avg<br>RH% | Rain<br>in | Max<br>KW/m2 | MaxWS<br>(mph) | ET<br>in/hr | Max<br>TempF | Min<br>TempF |
|--------------|-----------|--------------|-------|------------|------------|--------------|----------------|-------------|--------------|--------------|
| 7 20         | 900       | 0.507        | 68.7  | 43.74      | 0.00       | 0.581        | 8.5            | 0.013       | 71.0         | 65.8         |
| 7 20         | 1000      | 0.651        | 75.0  | 22.60      | 0.00       | 0.713        | 7.4            | 0.017       | 77.1         | 71.2         |
| 7 20         | 1100      | 0.763        | 78.4  | 22.90      | 0.00       | 0.805        | 7.9            | 0.020       | 79.1         | 77.5         |
| 7 20         | 1200      | 0.836        | 80.3  | 26.60      | 0.00       | 0.862        | 11.9           | 0.023       | 81.6         | 79.1         |
| 7 20         | 1300      | 0.869        | 81.2  | 27.04      | 0.00       | 0.874        | 14.6           | 0.028       | 81.8         | 80.6         |