RPSC GUV Monitor
(98, NT, ME, 2000, XP)

A utility for streaming serial data from a GUV UV Radiometer controlled by LOGGER.EXE

Software User's Manual

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Document RPSC_GUVMonitor.doc

First Edition: 2003
Latest Edition: June, 2003

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Introduction

Research-quality UV measurements can be acquired using a Biospherical Instruments Inc. GUV ultraviolet radiometer coupled with "LOGGER.EXE." LOGGER automatically saves measurements from the GUV into Microsoft Access database (MDB) files. However, to simplify integrating GUV-class instruments with other Raytheon Polar Services Company (RPSC) systems, Biospherical Instruments Inc. has created a special application designed to repackage GUV measurements and make them available at a specified serial data port. This specialized application is called "RPSC GUV Monitor" ("**MONITOR**" for short). To make ASCII format, calibrated data available at the computer serial port requires two independently operating programs: 1) LOGGER.EXE to control the GUV, acquire the readings, and apply calibration constants; and 2) MONITOR.EXE to repackage a GUV data frame from LOGGER and make it available at the serial data port of a computer. Note that although LOGGER can be configured to store these data, MONITOR does not store data – they must be harvested from the serial port by another application to be useful after the fact.

MONITOR uses Transmission Control Protocol (TCP) to request measurements from the LOGGER program. Thus, MONITOR will operate across a local area network (LAN), making the data available on a separate computer from the LOGGER computer. The PC running LOGGER and the PC running MONITOR may be the same PC, or may be different PCs located on the same network. They may even be PCs connected via the Internet assuming that firewalls are properly configured to route the traffic over the requested port.

Hardware Requirements

Monitor software is designed to run under a Windows NT®, Windows 98®, Windows 2000® OR Windows XP®, environment. We recommend that you use at least a 200-MHz Pentium® computer with 64 Megabytes of RAM.

MONITOR is designed to be operated with only a GUV connected. If a submersible PUV is added to the instrument configuration, channel assignments may change unexpectedly, as will the resulting data!

The software will operate on lesser computers, but you may find that software performance is degraded. Some old computers may also prevent the software from setting component parameters. Before purchasing a new computer, test the software on the computers you have available to determine if software performance is satisfactory. We strongly suggest that you record data and play it back with the software and computer you plan deploying your system.

It is imperative that this instruction manual is read carefully so that the user can properly install the software and understand its full potential.

Configuring LOGGER

MONITOR requests data from LOGGER.EXE, so the first step is to configure LOGGER to operate with MONITOR. To set up the monitoring option, it is necessary to first configure the Logger program to make its data available over a TCP/IP connection, and to choose a TCP port to monitor for requests of data.
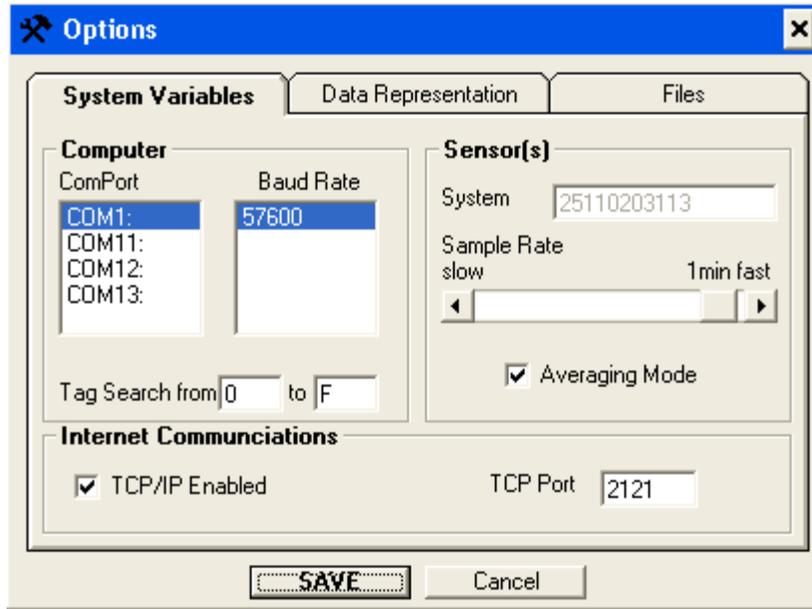
Figure 1. Logger Options Menu. Do not connect to the GUV during this portion of setup. In this example, the TCP/IP checkbox is checked and 2121 is being used as the TCP port assignment.

To accomplish this, start LOGGER -- you should NOT be connected to an instrument -- and select the Options window (Figure 1). Check the checkbox "TCP/IP Enabled" and assign a port number. Port assignments should avoid commonly used ports (table 1). We normally choose port 2121.

The software default value is port 2121, which matches the default for MONITOR. Note that these settings will be entered into the system registry of the computer. The next time the software is started, these settings will be applied and the software should automatically collect data without the need to change configuration.

Table 1. To avoid collisions when assigning port number, do not use the listed values. Do not be surprised it there are others specific to your computer system.

Port	Keyword	Protocol
7	ECHO	Echo
9	DISCARD	Discard

11	USERS	Active Users
13	DAYTIME	Daytime
17	QUOTE	Quote of the Day
19	CHARGEN	Character Generator
20	FTP-DATA	File Transfer (Default Data)
21	FTP	File Transfer (Control)
23	TELNET	Telnet
25	SMTP	Simple Mail Transfer
37	TIME	Time
43	NICNAME	Who Is
53	DOMAIN	Domain Name Server
79	FINGER	Finger
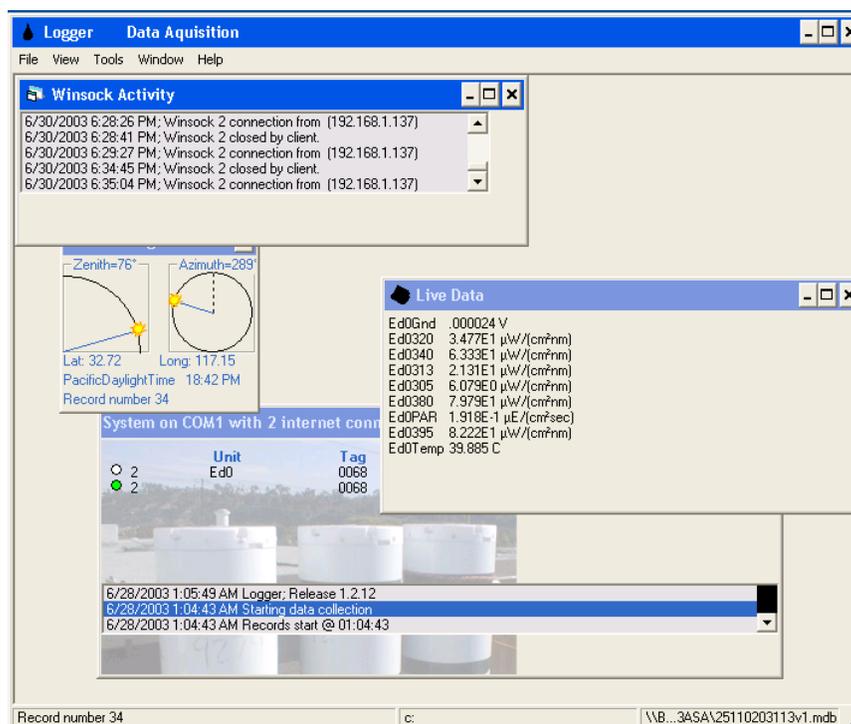
Figure 2. Logger main screen. Note the new window titled "Winsock Activity" which records connections from remote programs such as MONITOR. The connection is also referenced in the title of the system connections window (in this case, "System on COM1 with 2 internet connections"). In this example, "System on COM1" refers to the GUV connnected to serial COM1, and "2 internet connections" is the TCP/IP connnectivity.

Installing and Configuring MONITOR:

Installation. The installation of MONITOR is straightforward – double click on setup.exe to launch to the setup wizard (Figure 3).
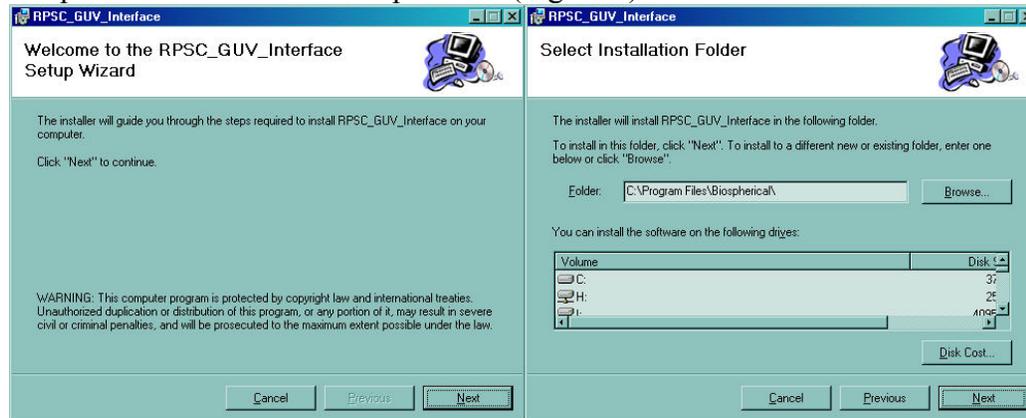
Figure 3. Setup is predictable and straightforward using the Setup Wizard. The only input required is to specify the target folder for the installation.

Configuration. MONITOR uses TCP to connect the datastream from LOGGER to MONITOR. Thus, using the correct TCP/IP settings is essential to trouble-free communications between the two programs. The use of TCP between the two programs allows communications across a network, but it is used even when LOGGER and MONITOR are resident on the same PC.

When MONITOR is first installed, it will default to a host address of "127.0.0.1", which is known as the local "Loopback" address. Use this setting when both Logger and Monitor are operating on the same PC . The software will also default to port 2121, which is the same default as the default for LOGGER. The default serial communications port where the data will be made available is COM2. The output data rate description is 9600 baud, 8 bits, 1 stop bit, and no parity bit (9600 N81). Note that all these settings will be entered into the system registry of the computer. The next time the software is started, these settings will be applied and the software should automatically collect data without the need to change configuration.

> See Figure 4 for TCP/IP settings if you are running MONITOR on a computer different from LOGGER.
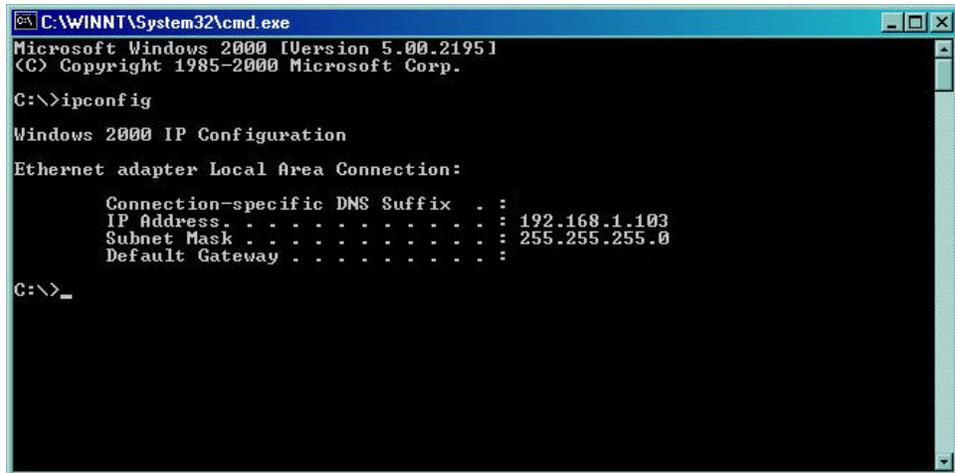
Figure 4. Identifing the IP address of the computer running Logger, uses the common utility "Ipconfig". Some operating systems use "WINipcfg" for a similar purpose. Ask you network administrator for help if this does not work.

Remote Settings. An unusually powerful feature of MONITOR is remote connectivity. A PC running LOGGER can be used to control the GUV and a different PC running MONITOR can sample that data over a LAN or the even the internet. In the case of a LAN, the local computer TCP/IP settings can be revealed using a common DOS utility called IPCONFIG (Figure 4). An equivalent Win9X program is WINIPCFG.EXE. Only the IP Address is required by MONITOR.

When you launch MONITOR for the first time, the default settings may be incorrect for your system. In this case, the software will not "see" LOGGER and the initial screen will contain no GUV data (Figure 5):
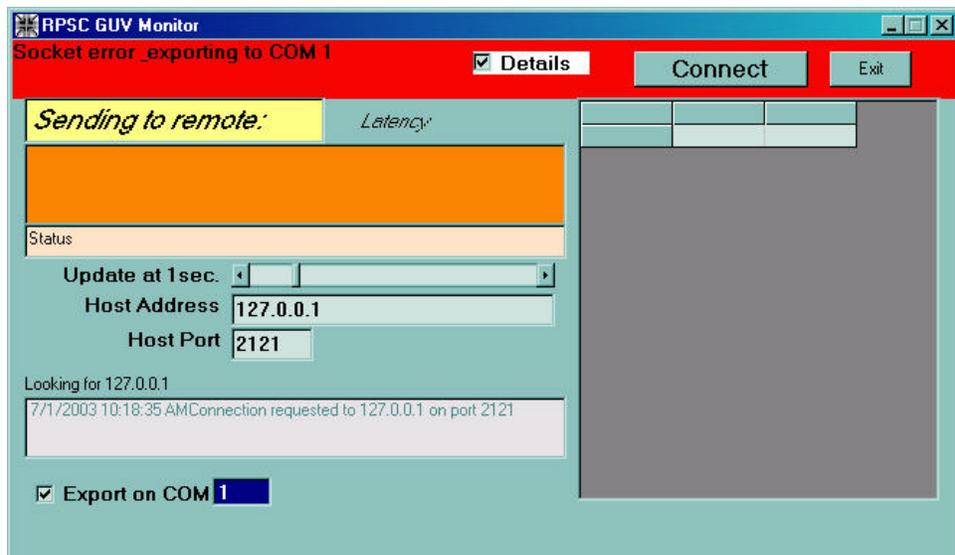
Figure 5. The default settings may not be optimized for your arrangement the first time you launch MONITOR.

To make a connection, you must first ensure that:

1) LOGGER is configured properly and currently connected to a GUV;
2) That the TCP host address is correct (see Figure 4);
3) That the host port of MONITOR and LOGGER are identical and do not conflict with another use (Table 1).

Simply edit the values for host address and host port. If these assignments are correct and LOGGER is running, MONITOR should automatically connect to LOGGER and start displaying data in a window (Figure 6). Note that these settings will be entered into the system registry of the computer. The next time the software is started, these settings will be applied and the software should automatically collect data without the need to change configuration.
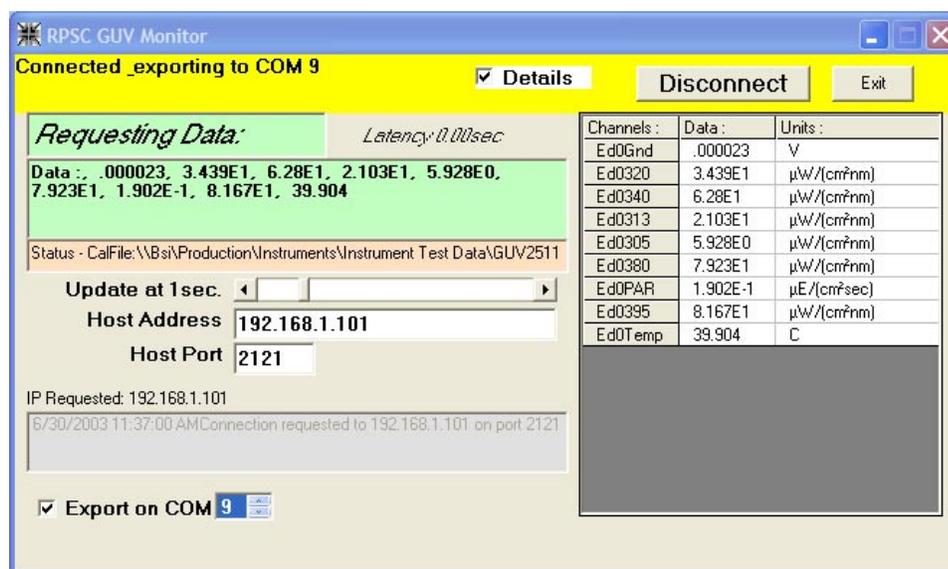
Figure 6. The RPSC GUV Monitor window when configured properly for operation across a LAN.

Figure 7. The "Details" checkbox determines whether or not the entire window is displayed. When unchecked, dialog, data, and configuration settings are not displayed.

Regular Operation. MONITOR was designed to begin working painlessly and unattended once installed and properly configured. The MONITOR window is colorful and all configuration settings are available with little or no user interaction. The "Details" checkbox determines whether or not the entire window is displayed (Figure 7). A slide bar allows the user to select the poling interval for updating the data. Regions of the window will change color (Figures 6 and 7) depending on what is happening: yellow means a data request has been made by

MONITOR; green means that requested data has been received; and red means that data has not been received and the system has timed out (e.g. Figure 5).

Results. It is important to understand the difference between data stored by LOGGER in Microsoft Access databases and data appearing at the serial port via MONITOR. LOGGER collects and averages GUV data frames over a time interval that is selected by the user and writes this information to disk. In contrast, when MONITOR requests data from LOGGER, the returned values include only the latest GUV data frame (NOT the current average for the interval). This is easily seen using a serial communications program such as HyperTerminal, to display data appearing at the serial port (Figure 8).
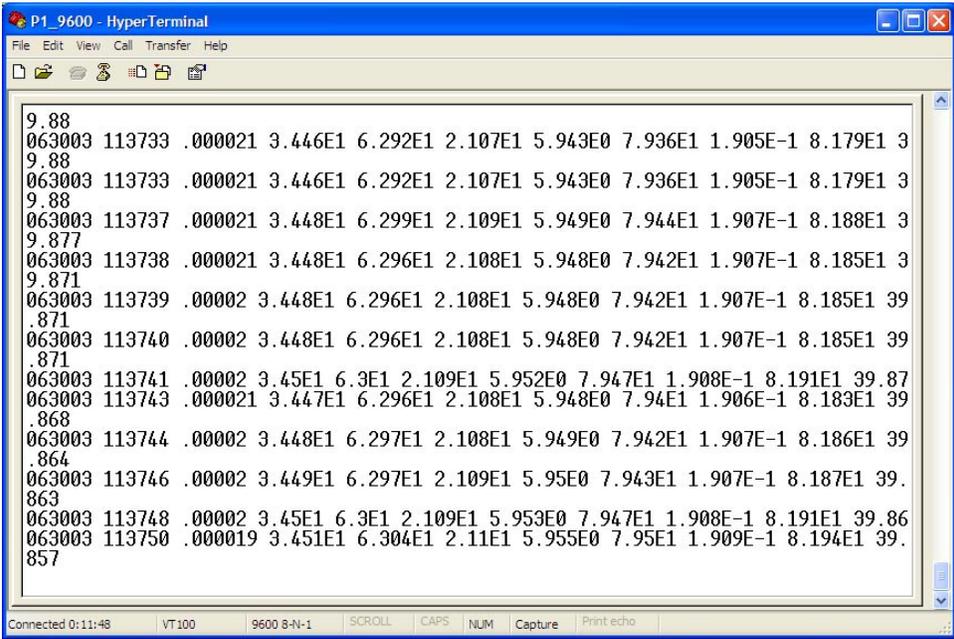
Figure 8. HyperTerminal window display. This program is connected to the communications port where data from MONITOR is streaming.