

526mLINK

Communication software for GR-526C console

Users Manual

January 14, 2002

Rev 1.0

Software version 1.00 or later

EXPLORANIUM

RADIATION DETECTION SYSTEMS

526mLINK USERS MANUAL

January 14, 2002

Rev 1.0

Software version 1.00 or later

Table of Contents

1.0 GENERAL.....	3
1.1 System Requirements.....	3
1.2 Software Installation.....	3
1.3 Hardware Setup.....	3
2.0 526mLINK OPERATION - A BRIEF TOUR.....	4
3.0 526mLINK - DETAILED OPERATION.....	6
3.1 Connecting to the GR-526C console.....	6
3.2 Downloading files from the GR-526C.....	8
3.3 Viewing GR-526C files.....	9
3.4 Changing GR-526C settings.....	11

1.0 GENERAL

526mLINK performs data transfer between the GR-526C console and a computer. The connection between the GR-526C console and the computer is via a modem. 526mLINK allows the user to do the following operations:

- real-time monitoring of GR-526C status with automatic download of the current alarm;
- download, view, and print GR-526C History file;
- download, view, and print GR-526C Alarm file;
- download, view, print, and change GR-526C Parameters settings;

526mLINK is the ideal tool for: periodic inspection, data archiving, diagnostic and service. During mLINK session, the GR-526C console does not interrupt normal monitoring except when GR-526C parameters are changed. In this case, monitoring is interrupted until the connection is closed, when the console restarts monitoring using the new settings.

1.1 SYSTEM REQUIREMENTS

Minimum requirements for the computer running mLINK are:

- Windows 95/98/NT/2000 operating system
- Pentium 166 MHz processor
- 32 MB RAM
- 200 MB free hard drive space
- modem (internal or external) connected on one of the standard COM ports: COM1-COM4

526mLINK requires that the software running in GR-526C console is 2.16.T or later.

1.2 SOFTWARE INSTALLATION

To install 526mLINK proceed as follows:

- insert 526mLINK Installation disk into the drive;
 - on the Windows desktop click on Start button and then select Run;
 - in the Run dialog click on Browse, select Setup.exe, and click on Open;
 - in the Run dialog click on OK, installation screen opens;
 - follow the instructions on the screen until installation is completed;
 - answer NO if asked: do you want to restart your computer ?
 - setup ODBC driver – only for the first time installation:
 1. Open Control Panel and open ODBC Data Source Administrator;
 2. Chose Add...;
 3. Select Microsoft Access Driver (*.mdb);
 4. Press Finish; next ODBC Microsoft Access Setup form will open;
 5. In ODBC Microsoft Access Setup form specify Data Source Name as GR526;
 6. Press Select and select GR526.mdb file found in 526mLINK installation folder;
 7. Press OK;
 - restart the computer;
 - create a shortcut for the newly installed program;
-

1.3 HARDWARE SETUP

Before running 526mLINK it is necessary to establish a physical connection between the GR-526C console and the PC running 526mLINK. GR-526C console is supplied with a telephone modem. This modem has to be connected to a telephone line. If there is no access to a telephone line then the modem is replaced by a cell phone modem. In both situations it is important to note the telephone number corresponding to modem connected to GR-526C console. The PC needs a modem as well. This modem -external or internal – should be connected to telephone line allowing it to call GR-526C phone number.

It is recommended to have dedicated phone lines for every GR-526C as well for the PC running 526mLINK program.

2.0 526mLINK BASIC OPERATION – A BRIEF TOUR

To start 526mLINK program, double-click on its shortcut on the desktop, or double-click on 526mLINK.EXE in installation folder. After start-up, 526mLINK displays a list of available GR-526 consoles. The user has to select the system he wants to inspect.

526mLINK has two modes of operation: on-line and off-line.

On-line operation: 526mLINK dials the selected GR-526C console to negotiate a modem connection. Once the connection is established, 526mLINK downloads parameters file, history file and the last alarm. All these data are updated in the GR526 MS-Access database. This database is automatically created at the installation time. Next 526mLINK goes to Monitoring mode, displaying a window shown in Fig. 1:

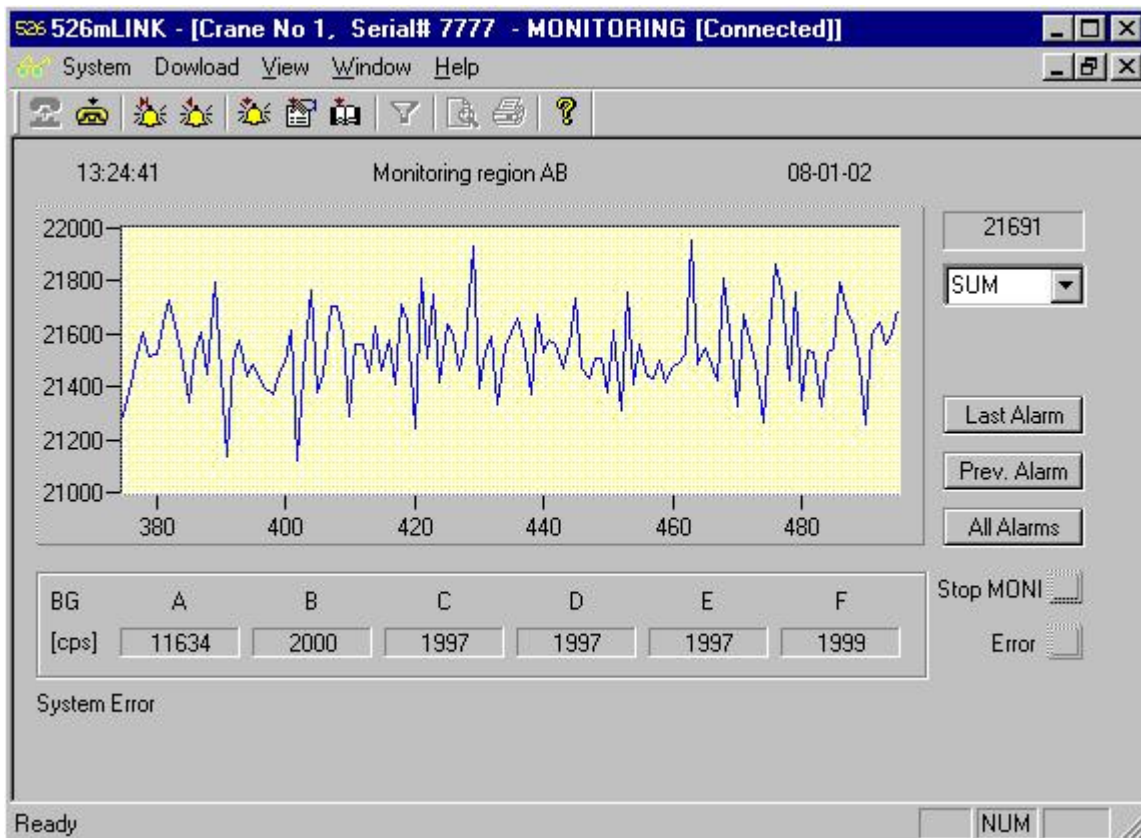


Figure 1

Monitoring window replicate the same information displayed on GR-526C console screen:

- time and date - are GR-526C time and date independent of the time/date settings on the PC;
- System Ready/ Monitoring region AB (CD, EF, ab) – identical with the GR-526C display;
- BG[cps] – background radiation in counts per second for each individual detector;
- 21691 - sum of all detectors in counts per second – the user can select to see only the counts from an individual detector;
- System Error – displays the same error message appearing on GR-526C screen- if no error the display is blank;
- Last Alarm – initiates downloading of the most recent alarm stored in the GR-526C alarm file;
- Prev. Alarm – initiates downloading of the alarm previous to the last downloaded alarm;
- All Alarms – initiates downloading of the entire GR-526C alarm file;

Monitoring window is refreshed every 1-2 seconds. While 526mLINK continues to refresh Monitoring window, the user can view and print history, alarm and parameters files. If during mLINK session an alarm is generated by GR-526C console, the alarm will be automatically transferred to mLINK and shown to the user as in Fig. 2.

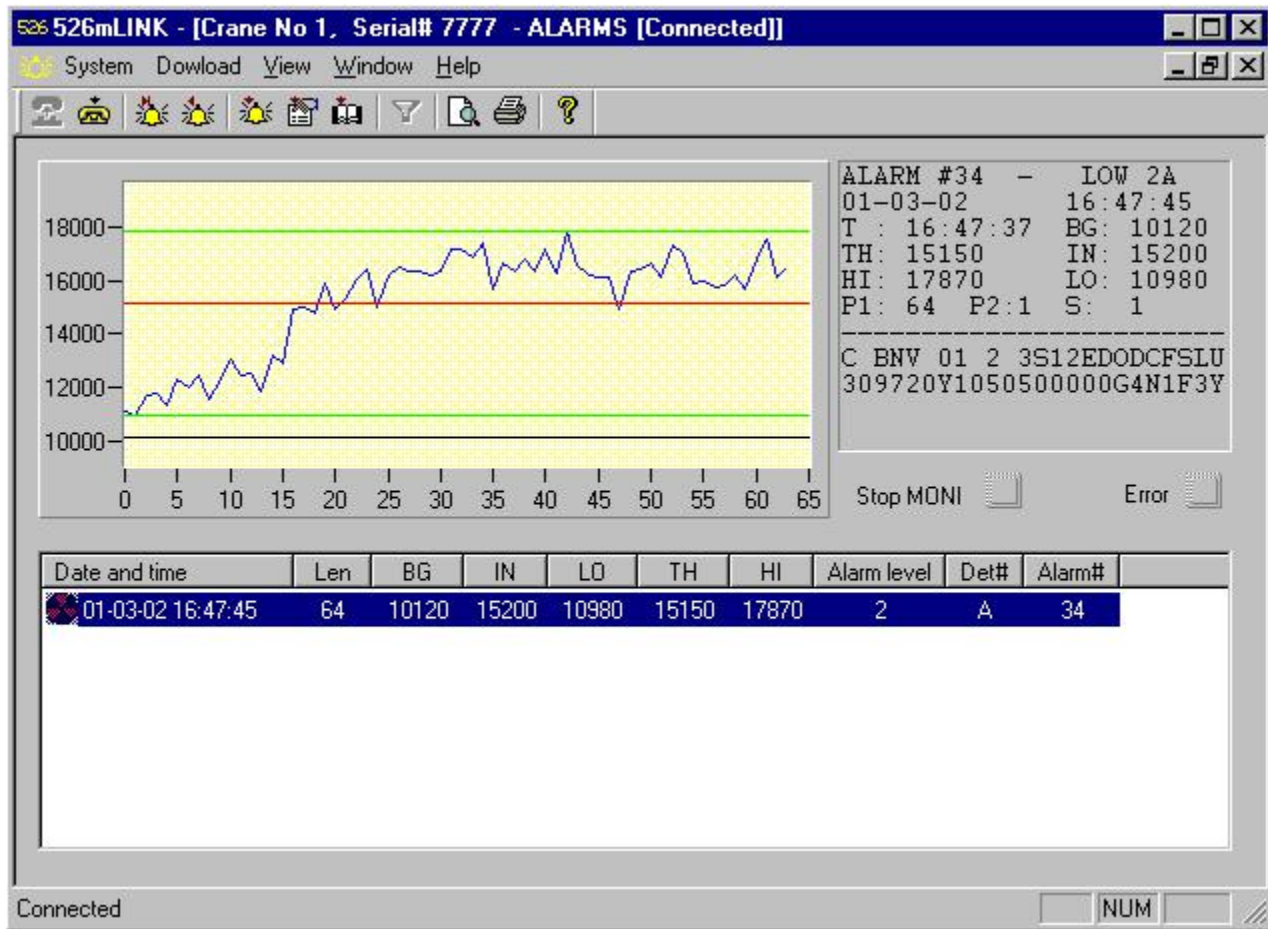


Figure 2

GR526C console operation is not affected in any way by the connection with 526mLINK modem. However, if the user makes a parameter change, GR526C console interrupts monitoring until the end of mLINK session. StopMONI indicator will alert mLINK user that GR526C scrap monitoring is suspended therefore he should try to minimize this time. GR526C console has 3 minutes built-in timeout. GR526C console will automatically resume monitoring, if during 3 minutes there is no activity from mLINK user. This is a protection against the possibility that mLINK user suspends monitoring and then forgets to close mLINK session.

During mLINK session the user can inspect all photomultipliers (PMT) in the system using Discriminators Screen window. This window allows changing the mode of operation and discriminator level for each individual PMT. Discriminators Screen is a valuable diagnostic and troubleshooting tool for the detector hardware.

Off-line operation: All the information downloaded during on-line operation and previous mLINK sessions are automatically stored in GR526 database. During off-line operation the user can view history, alarms and parameters stored in database. First select the GR-526C system, then specify the time interval of interest and finally view history, alarms and parameters.

Using MS-Access it is possible to generate periodically reports about alarms, system errors or other events recorded in the database. In order to maintain the database in sync with the GR-526 console is

necessary to call all the systems periodically, to ensure that database is updated constantly and no data are lost

3.0 GR-526C mLINK - DETAILED OPERATION

3.1 Connecting to GR-526C console.

To start 526mLINK, double click on its shortcut on the desktop, or double-click on 526mLINK.EXE in installation folder. After start-up, mLINK presents to the user a window as shown in Fig 3.

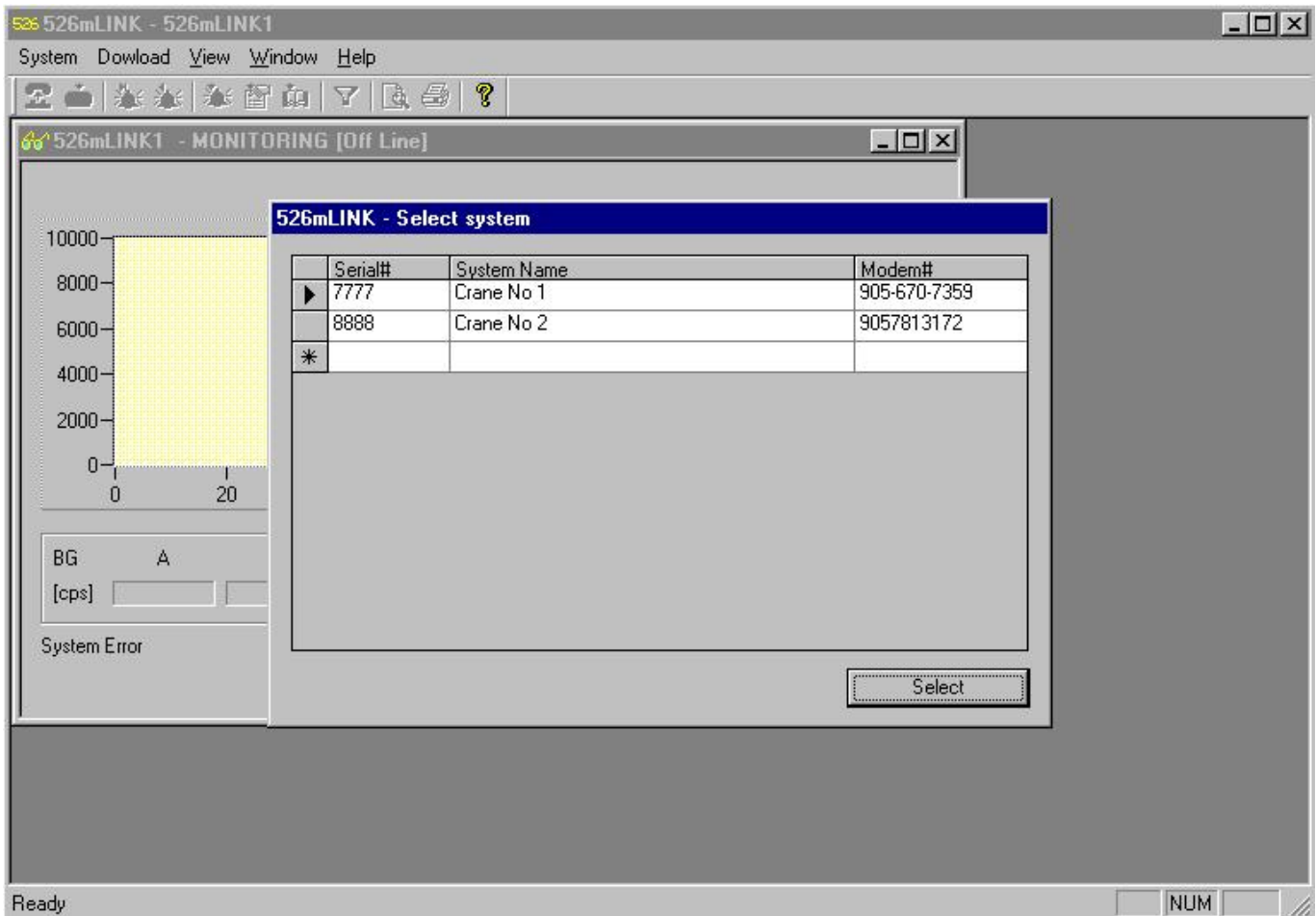


Figure 3

Select system window is automatically opened every time the program is started. This window allows the following operations:

1. to select a GR-526 system from the list: click on any cell of the row and then click on Select button;
2. to add a new record to the list: select the row marked with ' * '; click on the field to be updated and input the new value for that field; repeat this operation for all the fields. When all the fields in a row have been updated, click on the row above it to create a new empty row marked ' * ';
3. to delete a record from the list: select the entire row by clicking on the first cell of the row; when the row is selected press Delete key.

When 526mLINK is running for the first time after installation, Select system window displays some default values not valid for a specific user. The user should add new record(s) for each GR-526C console to be monitored. A record consists of the following fields:

- Serial#: enter the serial number displayed by GR-526C console at initialization. The console prints the serial number together with System Parameters. To obtain a printout for System Parameters enter the following key combination: <ENTER> 9999 <ENTER> at GR-526C console.
- System Name: use this field to create a name for each GR-526C system. System Name should be more convenient to work with and can be in local language.
- Modem#: enter the telephone number of the modem connected to GR-526C console.

When all the fields are completed, click on the row above it to force an update with the new record. An empty row marked with ' * ' is created. This row is used to input data for a new GR-526C console. When all console have been recorded, the first 2 rows with default values may be deleted. To select one GR-526C system and click on the corresponding row and then click on Select button to close the window.

When 526mLINK is running for the first time after installation, it is necessary to setup the COM port and modem initialization prior to dialing GR-526 console. Menu System | COM port and modem setup opens a setup window shown in Fig. 4.

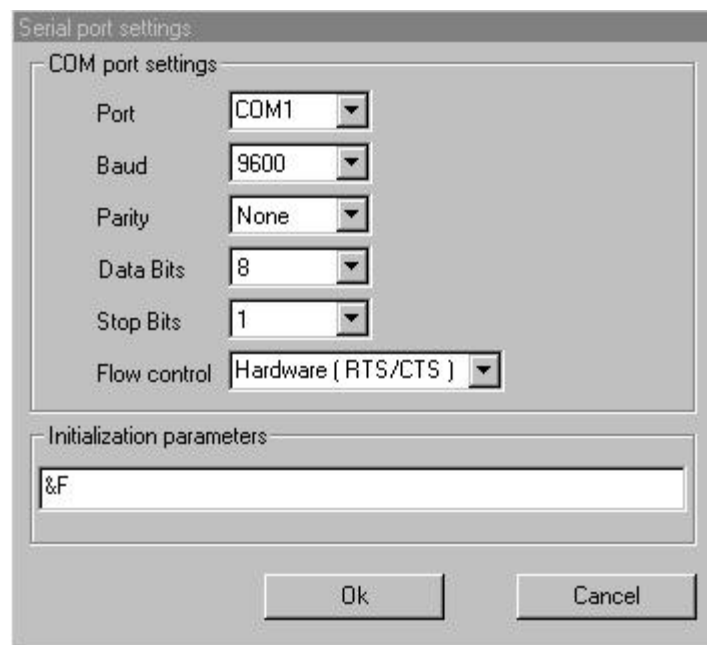




Figure 4

Select the COM port connected to modem. The rest of the COM port settings should be left unchanged for the vast majority of modems. Only in special cases these fields need to be changed from default settings.

The Initialization parameters field specifies the initialization string for the modem. The recommended value is &F unless otherwise specified in the modem manual. When all the settings are done, click on OK button to close the window. All the settings are stored in GR526 database, under the system, which is currently selected. This operation must be repeated for each GR-526C system in the list (Fig. 3).

To connect to the selected GR-526C system, go to menu System | Call or click on the button . The modem connected to the PC, dials GR-526C modem and both modems will start negotiating the connection parameters. After connection has been established, CONNECTED is displayed in the windows title bar, and mLINK starts downloading parameters file, history file and the last alarm. These files are saved in GR526 database. During system files download, a dialog windows display the progress of the operation. At this point mLINK and the GR-526C console are ready for a remote session.


A mLINK session is maintained until the mLINK user ends it by selecting menu Sytem | Hung up or by clicking on  button.

3.2 Downloading data from the GR-526C

In the System Menu, click on Download, and a pull-down menu is open with the following menu items:

- Download parameters file
- Download history file
- Download alarm file
- Download all files
-
- Download last alarm
- Download previous alarm
- Download next alarm

Download parameters file - downloads GR-526C parameters file. This operation is executed automatically by mLINK immediately after the connection with the GR-526C console. The user needs this menu in case of an error during automatic download or to refresh the information to the latest GR-526C status.

The speed button  has the same effect as the menu Download parameters file.

Download history file - downloads the GR-526C history file. History file records important events: alarms, speed infractions, system errors, resets, and changes in the system setup. GR-526C updates this file at all times. History is automatically downloaded at the beginning of the session. The provision of a separate menu item for the history file allows the user to get the newest version of history file without the need to download the whole system files group. Every time history file is downloaded, all records contained in it are inserted into MS-Access database for update. A history record consists of 3 fields: date, time and event label. Database is updated only if at least one of the fields is different from the ones already recorded in the database. If GR-526C history file is downloaded periodically – every 2-3 days – then after 6 month the database will contain an uninterrupted history file covering 6 month time.

The speed button  has the same effect as the menu Download history file.

Download alarm file - downloads GR-526C alarm file. This file is the largest of all GR-526C files, therefore it requires about 1-2 minutes to download. After the connection has been established the last alarm is downloaded automatically. It is recommended to download the entire alarm file once per 526mLINK session to ensure that database is updated and no alarm record is lost.

The speed button  has the same effect as the menu Download alarm file.

Download all files – this menu downloads all GR-526C files: parameter file, history file and alarm file. This transfer requires about 2-3 minutes to complete. This menu is useful for updating the database

periodically without inspecting the status of GR-526C.

Download last alarm – this menu allows the user to transfer the last alarm from GR-526C alarm file. At the end of the transfer, Alarm View window is opened and the last alarm is presented to the user for inspection. If the alarm was not stored in the database it will be automatically inserted.

The speed button  has the same effect as the menu Download last alarm.

Download previous alarm – this menu allows the user to transfer the alarm previous to the last downloaded alarm. At the end of the transfer, the Alarm View window is opened and the downloaded alarm is presented to the user for inspection. If the alarm was not stored in the database it will be automatically inserted. Together with Download next alarm, these two menu items allow the user to navigate through GR-526C alarm file one alarm at a time.

Download next alarm – this menu allows the user to transfer the alarm next to the last downloaded alarm. At the end of the transfer, the Alarm View window is opened and the downloaded alarm is presented to the user for inspection. If the alarm was not stored in the database it will be automatically inserted.

The speed button  has the same effect as the menu Download next alarm.

3.3 Viewing GR-526C data

Using this menu allows viewing of all GR-526C files downloaded with Download menu. The View pull-down menu offers the following choices:


- View alarms
- View history
- View parameters
- View discriminators screen

View alarms - opens a window for viewing the alarm file. In case of off-line operation a dialog window Select Days (Fig. 5) allows the user to choose the time period of interest.



Figure 5

Next the alarm view window is displayed (Fig. 6). It has two sections: the upper part displays the alarm profile and alarm data. The lower part displays a list of all alarms found in database within the specified time period. The list is initially ordered by date and time column, and it will be re-ordered by any of the column when the corresponding column's heading is clicked on. To select an alarm to view, click on the corresponding row in the list. The alarm graph has Y- axis in counts per second and X-axis in number of samples. Also the alarm graph shows some important values as horizontal colored lines: black – background level, red- alarm threshold, green – minimum and maximum values. On the right side of the alarm graph, alarm data is displayed in the same format as normal GR-526 alarm printout.

To print the alarms go to menu System | Print, click on the print button  or pres Ctlr+P.

It is recommended to organize the printout, using Print Preview. Go to System | Print Preview or click on the speed button .

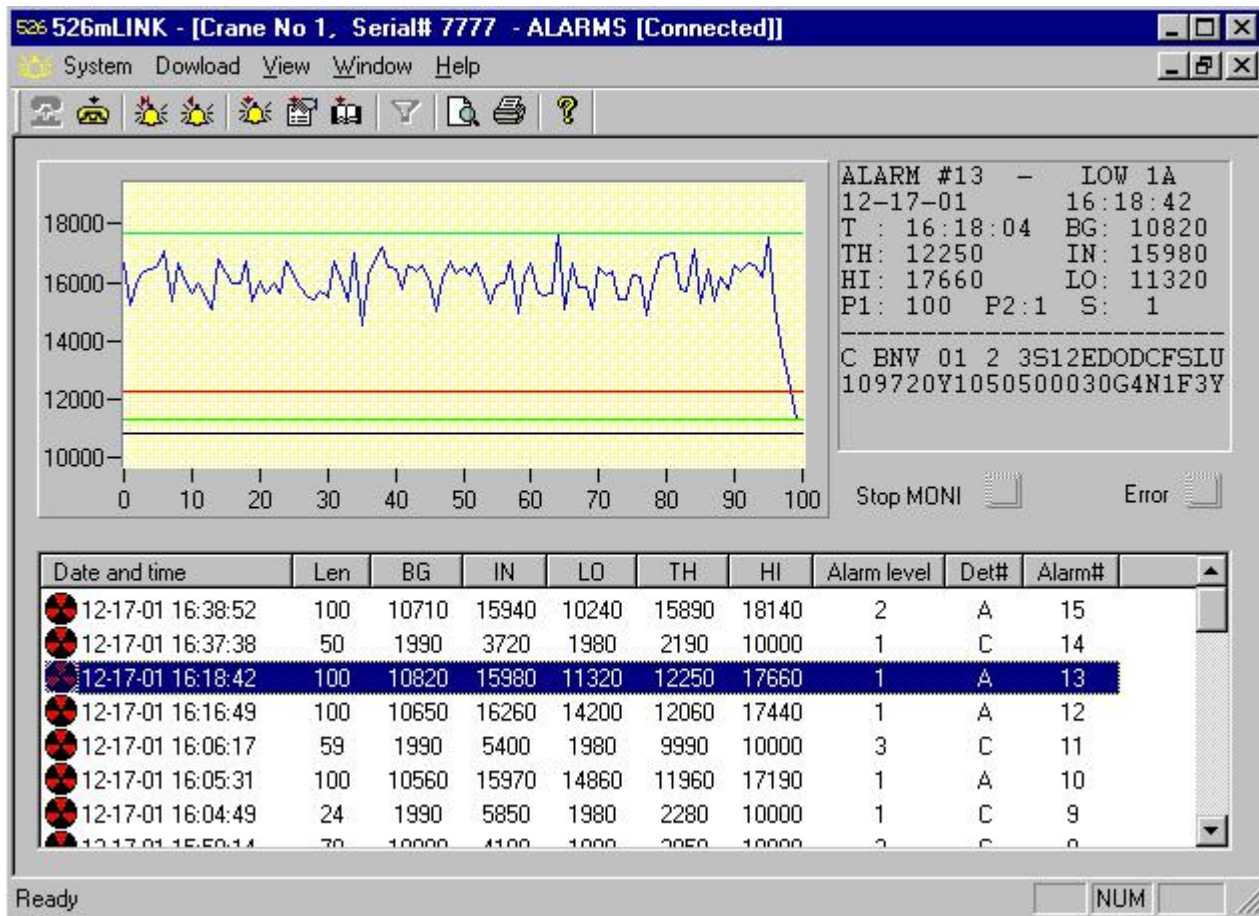


Figure 6


View history - opens a window for viewing the history file. In case of off-line operation the dialog window Select Days (Fig. 5) allows the user to choose the time period of interest. Next the history view window is displayed (Fig. 7).


The screenshot shows the 'Crane No 1, Serial# 7777 - HISTORY [Off Line]' window. It contains a table with columns for Date, Time, Event, and Seq #. The table lists a sequence of events from 12-18-01 16:39:37 to 12-18-01 16:51:06, including status changes (STAT) and communication events (COMFC, COMFD, COMFE, COMFF).

Date	Time	Event	Seq #
12-18-01	16:39:37	STAT	1
12-18-01	16:39:37	309720Y1050500CCFG4N1F3Y	2
12-18-01	16:39:54	COMFC	3
12-18-01	16:39:54	COMFD	4
12-18-01	16:39:54	COMFE	5
12-18-01	16:39:54	STAT	6
12-18-01	16:39:54	309720Y105050000G4N1F3Y	7
12-18-01	16:51:05	COMFC	8
12-18-01	16:51:06	COMFD	9
12-18-01	16:51:06	COMFE	10
12-18-01	16:51:06	COMFF	11
12-18-01	16:51:06	STAT	12
12-18-01	16:51:06	309720Y1050500CCFG4N1F3Y	13


Figure 7

History file is initially ordered by date and time column, and it will be re-ordered by any of the column when the corresponding column's heading is clicked on.

To print the history go to menu System | Print, click on the print button  or pres Ctrl+P.

For Print Preview, go to System | Print Preview or click on the speed button .

View parameters - opens a window for viewing/changing GR-526C parameters. In case of off-line operation the dialog window Select Days displays the days when the GR-526C parameters have been changed and the change was recorded in the database. Next the parameters window is displayed (Fig. 8).

To print GR-526C parameters go to menu System | Print, click on the print button  or pres Ctrl+P.

For Print Preview, go to System | Print Preview or click on the speed button .

View discriminator screen - opens a window for viewing/changing GR-526C discriminators. This window (Fig.9) is not accessible off-line.

3.4 Changing GR-526C settings

Changes to GR-526C settings are possible only on-line. An active modem connection is needed before any changes are allowed. To change GR-526C parameters: select menu View | View parameters and

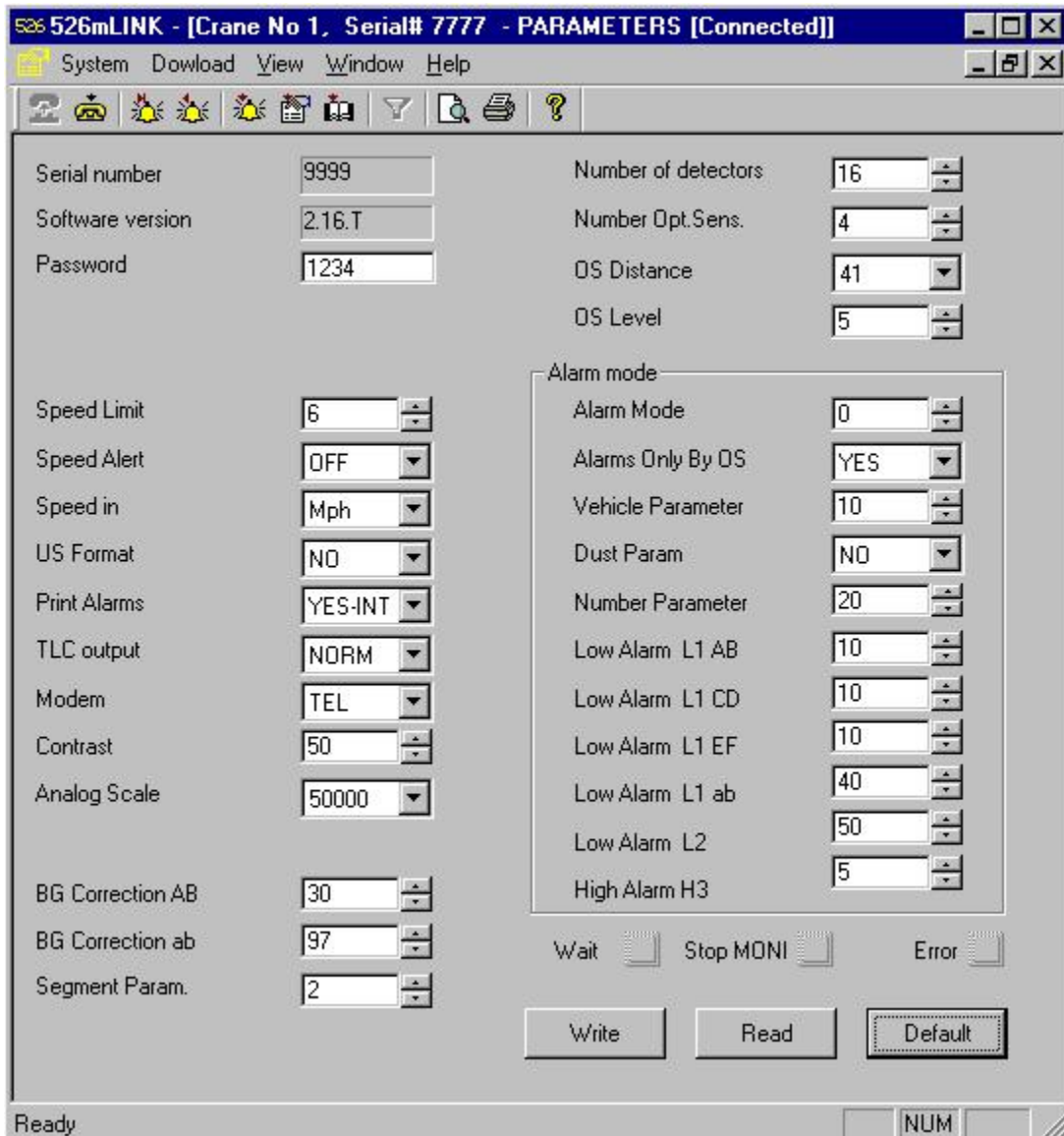


Figure 8

mLINK opens a window as shown in Fig. 8. For the explanation of the meaning and functionality of GR-526 parameters consult GR-526 User Manual.

Parameter window has 3 indicators:

- Wait - this indicator is on when mLINK waits for GR-526C to respond to a request;
- StopMONI – indicates that, as a result of a parameter change, GR-526C has interrupted monitoring;
- Error – this indicator signals a transfer error in the communication between mLINK and GR-526C;

There are also 3 buttons controlling the following operations:

- Write - mLINK sends new parameter settings to GR-526C console; GR-526C interrupts monitoring, changes the parameters to the new values received from mLINK, and displays REMOTE SETUP on its screen;
- Read – mLINK reads parameter settings from GR-526C console; GR-526C sends its current parameters to mLINK;
- Default - mLINK forces GR-526C console to load default parameters; GR-526C interrupts monitoring, changes the parameters to the default values and displays REMOTE SETUP on its screen; mLINK reads parameter settings from GR-526C console and displays them in Parameters window.

Every time parameters are read from GR-526C, they are compared with the last parameters record in the database. If they are found different then the new parameters are stored as new record in the database. In this way the database keeps a record of all the changes of parameters for each GR-526 console.

All the parameters changes are also recorded in GR-526C history file, independent of the GR-526 database.

IMPORTANT NOTE: Due to the complexity of the GR-526C algorithms it is strongly recommended that all parameters changes should be done only after consultation with an EXPLORANIUM specialist.

Changing GR-526C discriminators: View | View discriminator screen menu opens the Discriminators window (Fig. 9). This window allows to view and change discriminators and mode for each individual PMT. For more details about these parameters and their meaning, consult GR-526 User Manual.

The window has 3 indicators:

- Wait - this indicator is on when mLINK waits for GR-526C to answer a request
- StopMONI – indicates that, as a result of a parameter change, GR-526C has interrupted monitoring
- Error – this indicator signals a transfer error in the communication between mLINK and GR-526C

There are 3 buttons controlling the following operations:

- Read – mLINK reads discriminators settings from GR-526C console; GR-526C sends its current discriminators to mLINK;
- Default - mLINK forces GR-526C console to load default discriminator values; GR-526C interrupts monitoring, changes the discriminators to the default values and displays REMOTE SETUP on its screen; mLINK reads parameter settings from GR-526C console and displays them in Discriminator window.
- Close – closes window;

Update button is initially invisible. mLINK makes Update button visible after the user changed any discriminator value. Update button signals that mLINK displayed values are not longer identical with the actual GR-526C discriminators.

- Update - mLINK sends new discriminator settings to GR-526C console; GR-526C interrupts monitoring, changes the discriminators to the new values received from mLINK, and displays REMOTE SETUP on its screen;

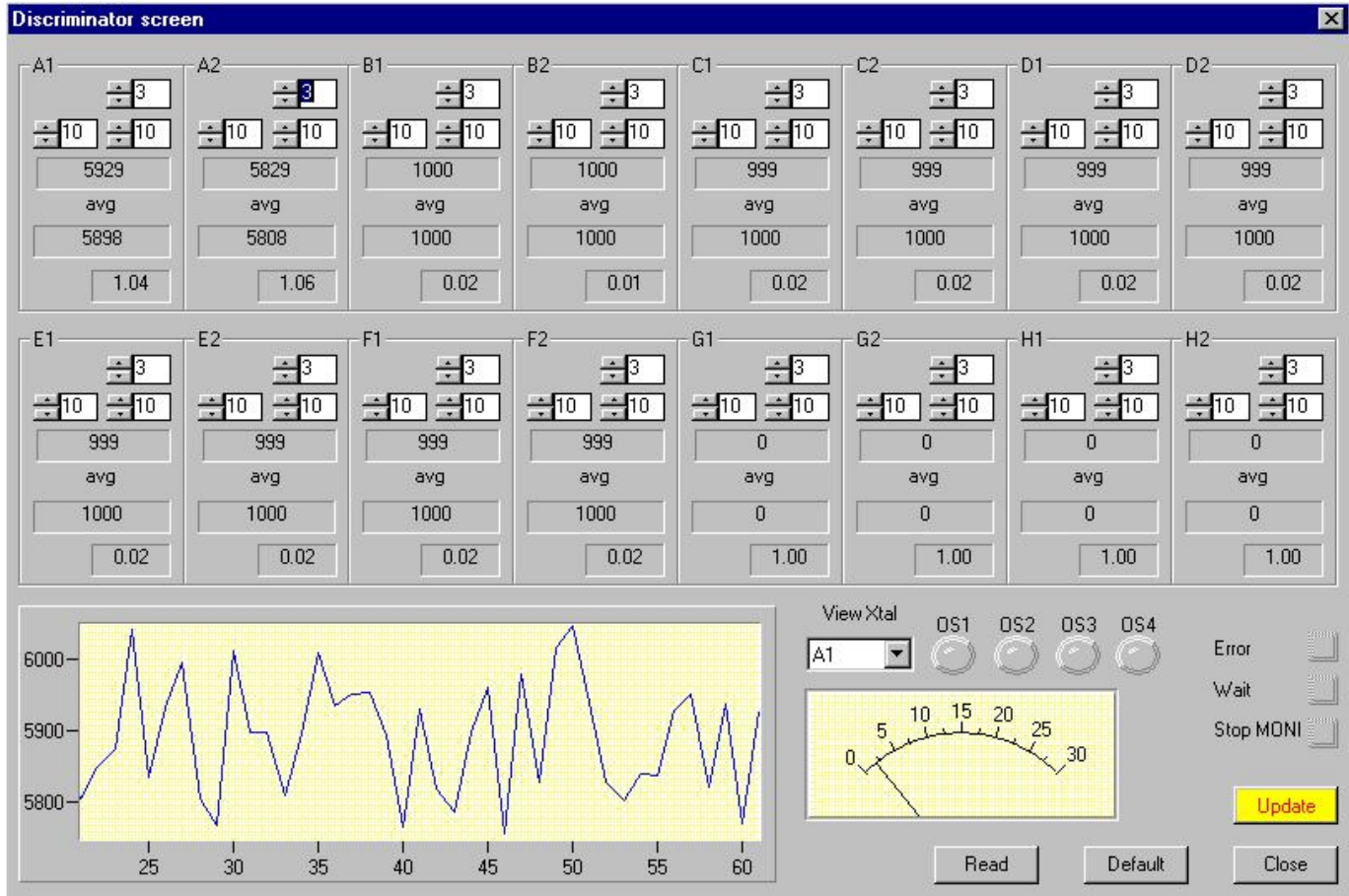


Figure 9

There are 16 identical indicators labeled A1, A2, B1, B2,..H1, H2. Each one of these indicators displays data from the corresponding crystal.

While the Discriminator window is open, GR-526C sends the count rate in counts per second for all 16 crystals. These values are displayed together with discriminator level and PMT mode (1= left, 2- right, 3- coincidence). A 30 second average labeled "avg" is computed and displayed for all 16 crystals.

The ratio between theoretical standard deviation and experimental standard deviation [S/Er] is computed and displayed every 30 second. S/ Er is a good indication for the PMT noise level and should normally be between 0.5 and 1.5.

To modify a discriminator, click on UP/DOWN arrow to increase/decrease the value. mLINK detects any change and makes Update button visible as shown in Fig. 9. When all changes are done, by clicking on Update button, new values are sent to GR-526C console. After the new values are sent, mLINK makes Update button invisible. This button will become visible again if mLINK detects a new change.

GR-526C receives new discriminators and mode, suspends monitoring, and displays REMOTE SETUP instead of SYSTEM READY. While monitoring is suspended, StopMONI indicator is turned on and remains on until the end of session. The current settings can be read at any time by clicking on Read button.

To set all discriminators and mode to their default values, click on Default button. This will cause the GR-526C to suspend monitoring, set default values for all crystals, and send these values back to mLINK. In this turn, mLINK receives and displays default values, and sets StopMONI indicator.

In the lower left corner of the window, a chart displays the count rate information for a particular crystal. To select another crystal, click on UP/DOWN arrows of View Xtal control.

OS1, OS2, OS3, OS4 indicators show real time status of the optical sensors.

To close Discriminator screen window, click on the Close button. Changes not sent to the GR-526C using Update button are discarded.
