



# AG4-4E Safety Laser Scanner

## Software Instruction Manual



144923

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PRELIMINARY

# 1 About this document

## 1.1 Other Applicable Documents

The information for the AG4 Safety Laser Scanner is covered within multiple documents. The documents and software for configuring the AG4 are contained on the CD that comes with the product.

**Table 1 AG4 Documents & Software**

| Document/software title                           | Document topic   | Source   |
|---|--|--|
| <b>User Reference Guide</b>                       | General product information and diagnostic reference tables  | Part no. 145034.<br>Included with the product as print and on CD-ROM |
| <b>AG4soft program</b>                            | AG4 configuration and diagnostic software  | Included with the product on CD-ROM                                  |
| <b>AG4 Product Manual</b>                         | AG4 operation capabilities, functions, applications, for the machine designer<br>Includes checkout procedures                        | Part no. 144924<br>Included with the product on CD-ROM               |
| <b>AG4soft Software Manual</b><br>(this document) | AG4 software instructions:<br>How to: Configure operational settings,<br>Access diagnostic information<br>Manage configuration files | Part no. 144923<br>Included with the product on CD-ROM               |

The current software version and all PDF documents can be downloaded from the Banner website <http://www.bannerengineering.com>.

## 2 System requirements

### 2.1 Computer

A PC with the following specifications is required to use the software:

|                  |   |
|------------------|---|
| Processor type   | Intel® Pentium or comparable, e.g. AMD® or Cyrix®   |
| Operating system | Microsoft® Windows 95/98/NT®/2000/XP®   |
| RAM              | At least 64 MB  |
| Hard disk memory | At least 50 MB free memory<br>You require more memory space if you want to save protective field or configuration values. |
| Screen display   | Color   |
| External drive   | CD drive  |
| Input device     | Keyboard and mouse or touchpad  |
| Output device    | Printer (black and white or color)  |
| Serial interface | RS232 or RS422<br>Use an appropriate adapter if the PC has a USB interface instead of a serial interface.                 |

### 3 AG4soft Overview

The AG4soft program is used to both establish operational settings for the Scanner and to display measurement and system information produced by the scanner. Communication between the PC and the AG4 is via an RS232 interface, either RS232-to-RS232 or USB-to-RS232.



Use this software only for Banner Scanner model **AG4-4E**.

#### 3.1 Configuration

The AG4 Scanner is preprogrammed at the factory with a default configuration but must be reconfigured for each application. The factory default configuration is stored as a file (standard.rs) in the AG4soft program directory during the software installation on the PC:

<C:\Program Files\Banner Engineering\Banner AG\AG4soft\examples>

##### 3.1.1 Configuring the AG4

The configuration settings are created by a trained and Qualified Person who understands the AG4 instruction materials. These settings are saved in a configuration file which has the \*.rs file format and includes all the information that the AG4 requires for its intended operation. An AG4's configuration file includes the following data:

- Administrative data, e.g. file name, application description
- Safety-relevant data, e.g. startup process
- Protective Field or warning field configuration data, e.g. contours and limits

A wizard in the program assists users with the AG4 configuration process.

##### 3.1.2 Protective and Warning Fields

The software makes it easy to establish protective and warning fields. The protective field and the warning field are user defined areas that the Scanner monitors. An intrusion into the protective field (e.g. a person walking into a monitored work cell) will cause the Scanner to turn its safety outputs off. An intrusion into the warning field will cause the Scanner to create a warning signal.

Protective field and warning field settings are created and saved as field pairs. Up to 8 configurable field pairs are available for the AG4. A field configuration file has the \*.sf file format and includes data on the size of each protective and warning field. Field pairs can be enabled or disabled, one field pair at a time, while the Scanner is operational and actively monitoring a work area. This function is useful when changing machine guarding requirements create the need for changes in protective and warning field dimensions.

### 3.2 The Monitored Space Display

When a Scanner is actively monitoring an area, it measures the distance to, and the angular position of, objects in the area. These measurement data are transferred via the RS232 connection from the AG4 to the PC. The AG4soft program uses this data to constantly update the display to show the protective and warning fields along with the measured surfaces of the monitored area (see Figure 1 below).

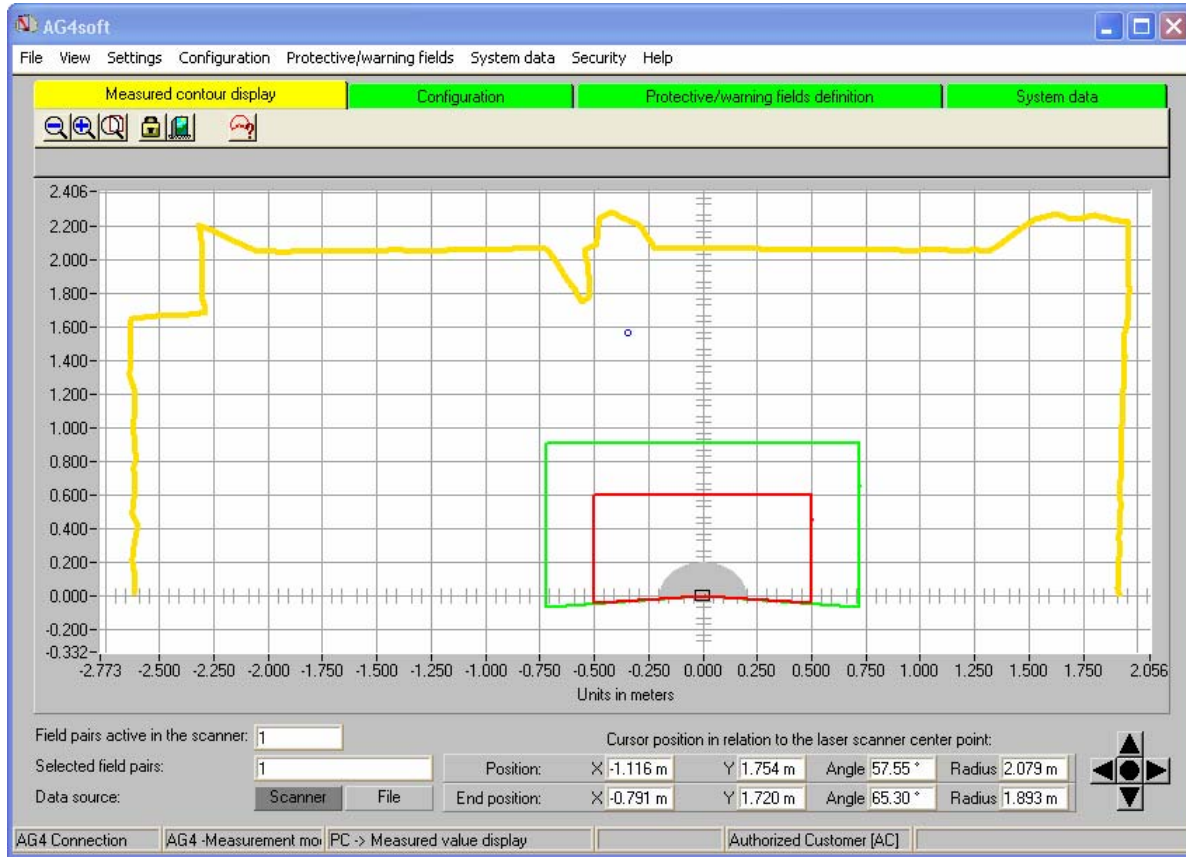


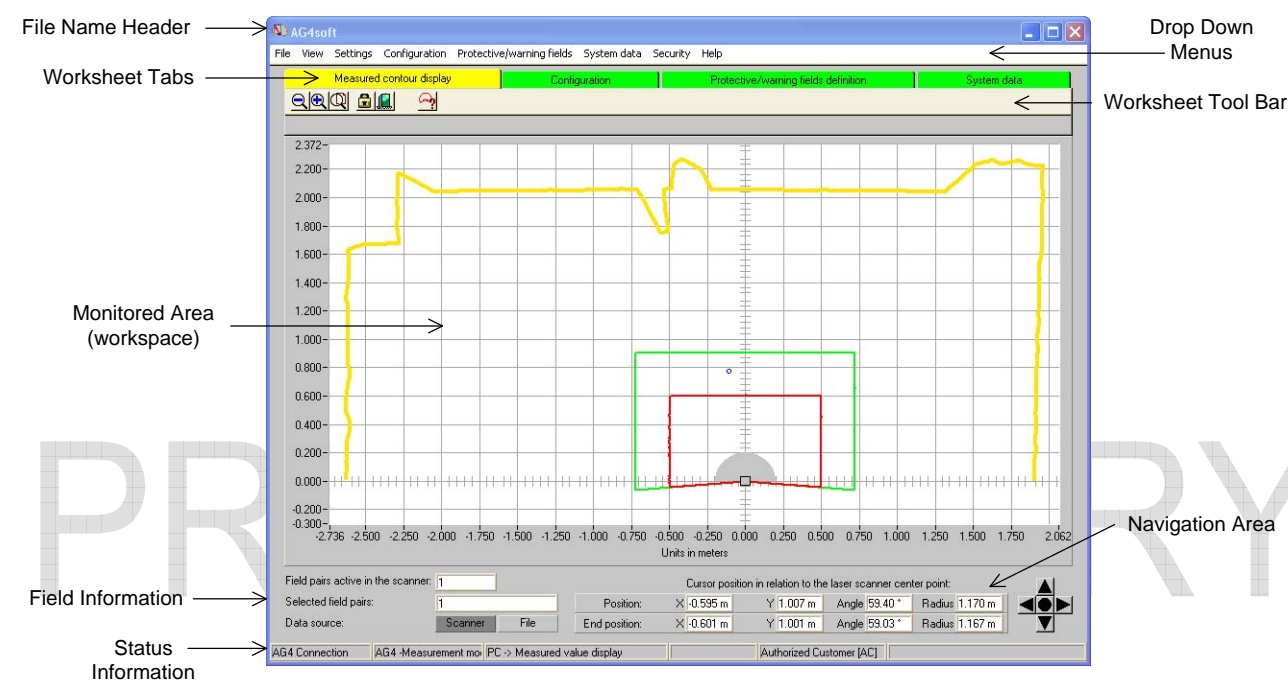
Figure 1 Display of monitored area along with the rectangular protective (red) and warning (green) fields



# 4 AG4soft Interface

## 4.1 Interface Layout

In addition to displaying a graphic rendering of the monitored area, the software provides configuration and file management tools, including file title header, drop-down menu bar, and function-specific worksheets which contains buttons relevant to the specific function. The menu bar and worksheets are used to create or edit the AG4's operational and application settings (see interface and function key below).



| Position | Name                         | Description  |
|----------|------------------------------|--|
| 1        | File name header             | Identifies the configuration file that is being used   |
| 2        | Drop-down menu bar           | Includes functions for; software display & communication settings, AG4 configuration settings, file management operations, system data access and fault diagnostics. |
| 3        | Function-specific Worksheets | These worksheet tabs provide access to the tool set and display that is appropriate for the specific configuration function or file operation being performed..      |
| 4        | Monitored Area Display       | Graphically displays the monitored area and protective/warning field boundaries (contours).  |
| 5        | Navigation area              | Displays both XY & Polar coordinates of the cursor position and contains an 5 button interface for changing the view of the monitored area.                          |
| 6        | Field Information area       | Identifies the number of active field pairs and the source of the configuration data   |
| 7        | Status Information area      | Displays: AG4 - PC connection, data exchange, current active worksheet, field status and login authority information   |

Figure 2 AG4soft Interface

## 4.2 File Name Header

The file name header (refer to Figure 2) identifies which configuration file is active in the AG4soft program. This file can be retrieved from the AG4soft system folder or can be pulled in from an AG4 scanner.

## 4.3 Drop-Down Menu Bar

The Drop-Down Menu Bar provides access to the following functional areas:

- File -- load and save both configuration and protective/warning field files
- View -- change the field of view or save a copy of the monitored area being displayed
- Settings -- access worksheet functions or change PC and worksheet display settings
- Configuration -- configuration file edit and transfer operations
- Protective/warning Field -- field parameter file edit and transfer operations
- System data -- data used for fault diagnostics and maintenance purpose
- Security -- password change options
- Help -- instruction manual and reference material access

## 4.4 Function- Specific Worksheets

Each worksheet has a specific set of tools and a monitored area or worksheet display that is helpful when using the tools. The worksheets provide access to the following functions:

- Measured contour display -- a "real time" display of the surfaces and protective/warning fields in the monitored area.
- Configuration -- configuration file edit and transfer operations
- Protective/warning fields definition -- field parameter file edit and transfer operations
- System data -- data used for fault diagnostics and maintenance purpose

Each worksheet includes a set of functions that are enabled according to the user authorization level.



Each Function-specific worksheet corresponds to a specific set of functions needed to create or edit AG4 configurations.

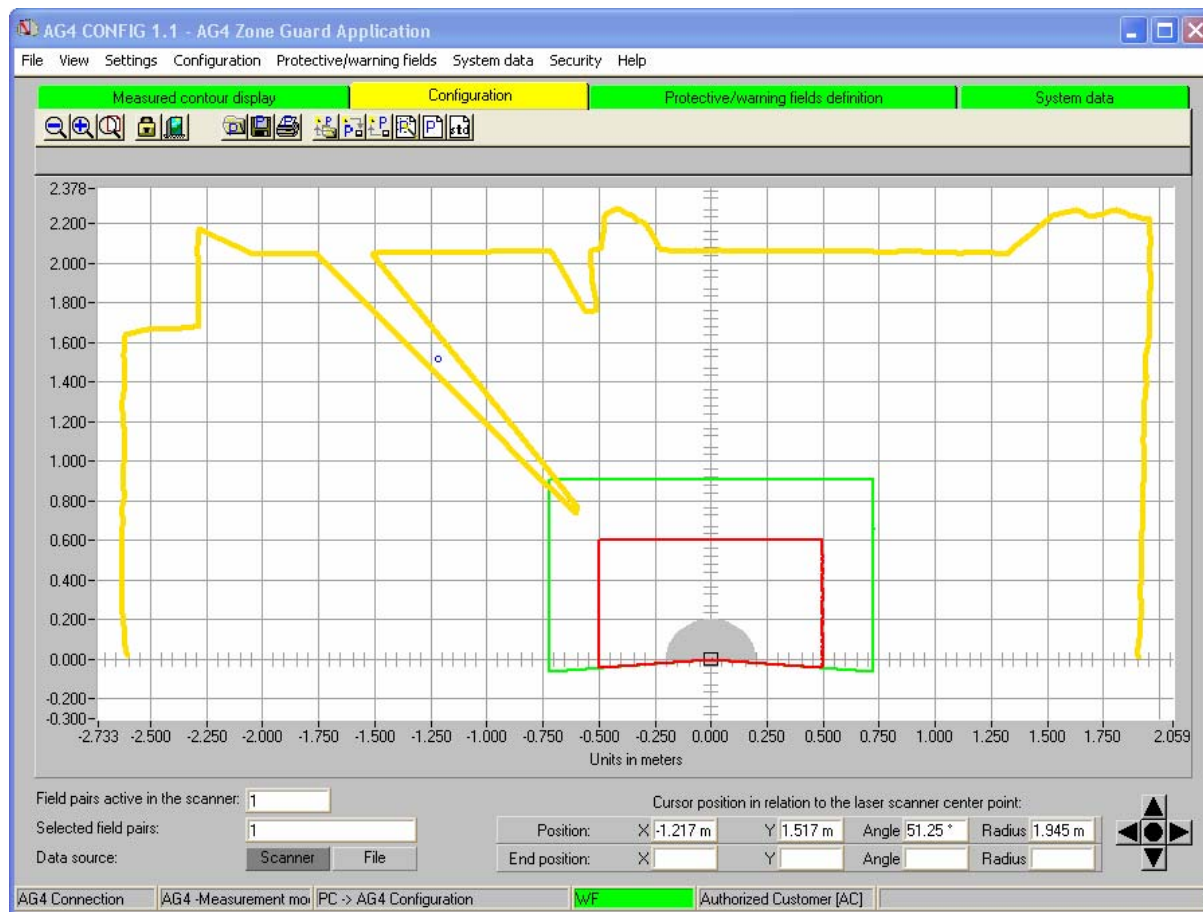
NOTE: The selected authorization level determines which worksheet functions are available.

## 4.5 Measured Contour (Surface) Display

The Measured contour display is used to display the location of the measured surfaces and objects as well as the protective and warning fields. The software uses the following colors to differentiate the surfaces and field boundaries:

**Table 2. Contour colors**

| Contour                      | Color       |
|------------------------------|-------------|
| Minimum protective field     | Gray        |
| Protective field             | Red         |
| Warning field                | Green       |
| Deactivated protective field | Bright gray |
| Deactivated warning field    | Dark gray   |
| Measured surfaces            | Yellow/red  |



**Figure 3 Monitored Area Display (workspace)**

NOTE: The dark blue circle visible in the detection shadow of the object in Figure 3 above, is a movable marker (cursor). This mouse-controlled cursor is used when changing the boundaries of the protective and warning fields.

## 4.6 Navigation area

In the navigation area, both XY and polar coordinates of the cursor position are displayed. When using your computer mouse to locate a point in the monitored area you can move your mouse pointer to a new point on the monitored area and click the left mouse button and see the new cursor position coordinates. This feature is useful when creating protective and warning fields.

The arrow buttons are arranged in an Up, Down, Left, Right manner and allow the image to be moved within the display. Clicking on the middle button optimally scales the frame and refreshes the display to include the entire monitored area.

## 4.7 Status Information area

In the on-screen Status line at the bottom of the screen, five fields are detailed as follows:

- Communication between PC and AG4
- AG4 status
- Operating mode of the software
- Active protective/warning field status
- Logged on user's authorization level

Table 3. Status Information Area available data

| Display   | Status   |
|---|--|
| <b>AG4 - PC Communication</b>                                   |  |
| AG4 synchronous   | PC synchronizes the connection between the PC and the AG4                      |
| AG4 connection  | Data transfer between PC and AG4 is possible                                   |
| <b>AG4 Status</b>   |  |
| AG4 -> Measurement mode   | Software receives measurement data from the AG4                                |
| AG4 -> Configuration  | Software transfers configuration data to the AG4 (OSSDs are OFF)               |
| AG4 -> Error  | Error in the AG4 (OSSDs are OFF)   |
| <b>AG4soft Operating mode (identifies the active Worksheet)</b> |  |
| PC -> Measured value display                                    | Measured contour (monitored surfaces) display tools are active                 |
| PC -> AG4 configuration   | Configuration tools are active   |
| PC -> Protective/warning field definition                       | Protective/warning field tools are active                                      |
| PC -> AG4 system data   | System data tools are active   |
| <b>Protective/warning field</b>                                 |  |
| PF, WF red  | Protective and Warning fields interrupted (OSSDs are OFF)                      |
| WF green  | Warning field interrupted  |
| Empty   | Protective and Warning fields clear  |
| <b>Logged-on authorization level</b>                            |  |
| Operator (Op)   | User is logged in with the <i>Operator (Op)</i> authorization level            |
| Maintainer (Ma)   | User is logged in with the <i>Maintainer (Ma)</i> authorization level          |
| Authorized Customer (AC)  | User is logged in with the <i>Authorized Customer (AC)</i> authorization level |
| Production (Pr)   | User is logged in with the <i>Production (Pr)</i> authorization level          |
| Development (De)  | User is logged in with the <i>Development (De)</i> authorization level         |

## 5 Configuring the Scanner (Setting Operational Parameters)

### 5.1 Configuration Requirements

Configuring the AG4 requires:

- Connecting PC to AG4 (via RS232)
- Starting software and logging in as user
- Creating or editing an AG4 configuration with the wizard
- Creating protective field and/or warning field settings
- Downloading the configuration to the AG4
- Checking echo data (confirming the AG4 settings)

### 5.2 Installing software

NOTE: The AG4 is not required for installing the software on the PC.

Requirements:

- If the PC and AG4 are already connected with one another, turn the AG4 power OFF.
- Close all other Windows applications.

1. Insert the CD ROM.

The installation boots up automatically.

2. Open the Disk1 folder and double-click on the setup.exe file.

If the installation does not start automatically from the CD drive, open the folder \AG4soft\Disk1 and double-click the **setup.exe** file.

The installation wizard starts.

3. Click on **[Next]**.

The installation wizard opens the software license agreement.

4. To agree with the software license contract, click **Yes**.

5. To agree with the recommended installation path, click **Next**.  
or,

6. To enter another path, Click on **Browse**.

7. Select another path and click on **OK**, then **Next**.

The wizard installs the software and creates a link on the desktop.

### 5.3 User Authorization

The following section describes the AG4soft program function access for each authorization level and the login process.

#### 5.3.1 Authorization Level

The Authorization level login permits access to program functions on a need-to-use basis. In other words, the functions that are available depend on the selected **authorization level**. Functions (buttons) that are **not** actionable in the software program appear as grayed-out versions of the original button.

No individual user names are required for the login, but an **authorization level** must be selected.

The functions for each authorization levels are listed below:

Table 4. Authorization levels and available functions

| Authorization level      | Functions   |
|--------------------------|---|
| Operator (Op)            | <ul style="list-style-type: none"> <li>• Adjust display</li> <li>• Display and analyze measured contour</li> <li>• Load configuration data from the AG4</li> <li>• Load status information from the AG4</li> <li>• Display diagnostics list</li> <li>• Create service file</li> <li>• Reset password</li> </ul>   |
| Maintainer (Ma)          | In addition to the Operator (Op) functions: <ul style="list-style-type: none"> <li>• Load configuration data from file</li> <li>• Load configuration data from file and transfer to the AG4</li> <li>• Transfer configuration data from the PC to the AG4</li> <li>• Print configuration data</li> <li>• Print protective/warning field</li> </ul>  |
| Authorized Customer (AC) | In addition to the Maintainer (Ma) functions, full access to all user-relevant functions and parameters: <ul style="list-style-type: none"> <li>• Save configuration data as a file</li> <li>• Change all configuration parameters</li> <li>• Reset AG4 to default values</li> <li>• Define and change protective/warning fields</li> <li>• Set reference contour in the protective field</li> <li>• Print and delete protective/warning fields</li> <li>• Load protective/warning field data from file</li> <li>• Save protective/warning field data</li> <li>• Transfer protective/warning field data from the PC to the AG4</li> <li>• Calibrate the front screen</li> <li>• Change passwords</li> </ul> |
| Production (Pr)          | Manufacturer-specific access  |
| Development (De)         | Manufacturer-specific access  |

All authorization levels except Operator (Op) are protected with a **password**. Use the default password when you log in with the AG4 connected to the PC for the **first time**, then change it immediately to a specific Scanner password. The following types of password are used:

- **Default password:** Valid for the software and **cannot** be changed (**BannerA** or **BannerM**, depending on whether the user is an authorized customer or a maintainer).
- **Specific password:** Valid for a specific AG4 scanner. The software saves a user-defined specific Scanner password for each connected AG4, which ensures that only authorized users can change the existing configuration.

The **login situation** determines which password must be entered in the software, as listed below.

Table 5. Login situations and password types

| Login situation  | Password type     |
|--|-------------------|
| Using only the AG4soft program, without a connected AG4<br>Using the AG4soft program with a new AG4 (default settings) connected to the PC     | Default password  |
| Using the AG4soft program with a user-configured AG4 connected to the PC<br>(that has had its default password changed to a specific password) | Specific password |

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### 5.3.2 Login

The AG4soft program can be used without an AG4 connected to the PC, but the functionality of the software is limited. The login procedure depends on whether the PC is connected to an AG4. (In addition to the procedures listed below, you may also use the **Programs > Banner Engineering > AG4soft** drop-down menus.)

#### Login procedure when the AG4 is not connected to the PC

Requirements:

- AG4soft program is loaded on the PC
- PC and AG4 are **not** connected
- The R232 **serial interface** must be **installed** on the PC. If, for example, a laptop is used with a USB-to-RS232 cable, the serial interface driver must first be installed.



1. Click on the Microsoft Windows **Start** button in the tool bar. Click on the **AG4soft** icon on the desk top. The software starts and a Banner AG4 start screen appears with an OK button.
2. Click on **OK**. The **Change authorization level** dialog box opens.
3. Select the Authorized Customer (AC) and enter the AG4soft default password: **BannerA**
4. Click on **OK**. An automatic wizard option appears and can be used to load an existing configuration file.

#### Login procedure when the AG4 is connected to the PC

You can use the software to transfer an existing configuration from one AG4 Scanner to another.

Requirements:

- The AG4 is powered and connected to the PC.



If you power the AG4 **after** the software start and have selected the Maintainer (Ma) or Authorized Customer (AC) authorization level, you must then log in to the software with the default password.



1. Click on the **AG4soft** icon on the desktop. The software starts and a Banner AG4 start screen appears with an OK button.
2. Click **OK**.
  - The AG4 automatically contacts the connected PC.
  - The software automatically synchronizes the PC and the AG4.
  - The software automatically transfers the configuration from the AG4 and checks the data.
  - The **Password and authorization level** dialog box opens.
3. Select the Maintainer (Ma) or the Authorized Customer (AC) and enter the AG4soft default password.

When logging in for the **first time** (with a new AG4 connected to the PC), the **default** password for the required authorization level must be entered:

**Maintainer (Ma): BannerM**

**Authorized Customer (AC): BannerA**

5. Click on **OK**.
  - After you've logged in with the Maintainer (Ma) or Authorized Customer (AC) authorization level for the **first time**, **change the password** in order to provide better configuration security. This new password is the **specific** Scanner password. The default password will no longer permit access for changing the configuration in this specific AG4 scanner.
  - The AG4soft program checks for communication to the connected AG4.

- The Scanner Status Information message appears. The status information includes administrative and safety parameter values. You can compare the parameters with the required parameters of the current application with this information if necessary.
6. Click on **EXIT**. The wizard can be used to modify the existing configuration or you can load a configuration from a PC file. AG4soft authorized level program functions can now be accessed.



A default configuration file is stored in **examples** in the AG4 program folder (see file path below). The file name is **standard.rs** and can be used as a template that can be changed for creating new configurations.

C:\Program Files\Banner Engineering\Banner AG4\AG4soft\examples

### 5.4 Creating AG4 configurations

To create a new configuration or to change an existing configuration, an existing configuration must first be opened using the AG4soft program. A locally saved configuration file or the configuration file from the AG4 Scanner can be accessed.

#### 5.4.1 Load a configuration file from the AG4soft folder on the PC

A configuration can be loaded from the PC files. If an AG4 is not connected, the load process starts after the AG4soft login.

Requirement:

- Logged in with the Maintainer (Ma) or Authorized Customer (AC) authorization level.

1. Click the **Configuration** worksheet tab and click 

The **Select Safety Laser Scanner** screen opens (shown on right) and presents a brief summary of the AG4 attributes.

2. Click on **Exit**.

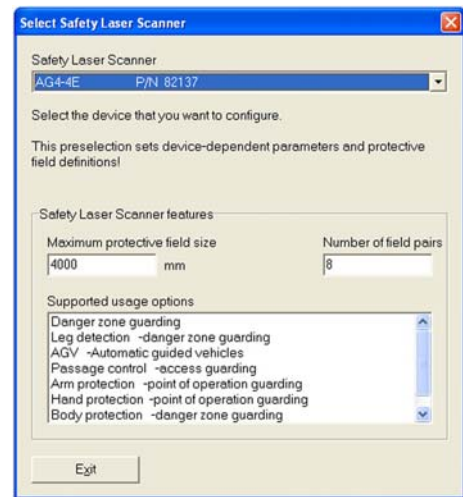
The file selection menu opens. The **examples** file folder opens and the **standard.rs** file and others may appear.

3. Select a file and click **Open**.

The program loads the configuration file. A message declaring the file is now loaded appears.

4. Click on **OK**.

The configuration setting can now be modified.



#### 5.4.2 Loading a configuration from the AG4

The configuration file from the AG4 Scanner can be loaded into the AG4soft program.

Requirements:

- AG4 is powered and connected to the PC.
- AG4soft is **not** running



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1. Click on the AG4soft desktop icon.

A message appears that declares the configuration data is being loaded from the scanner.  
The login menu appears.
2. **Login** with Maintainer (Ma) or Authorized Customer (AC) using the default or specific password, whichever one applies.

A message reminding you to change the password may appear if the AG4 default password is still active.
3. Click on **OK**.

A message appears that declares that the program is ascertaining status information from the scanner.
4. Click on **Exit**.

Another message appears that asks if you want to edit the configuration with the wizard.

  - If you choose **Yes** the wizard steps you through the editing process.
  - If you choose **Exit** you can use the **Worksheet functions** to change the configuration settings. (see section XXX on page XX)



If you start the AG4soft program before you connect to the scanner, the **serial cable should be connected to the PC** (but not to the AG4). This cable connection allows the program to identify the correct communications port.

PRELIMINARY

## 5.5 Change AG4 configuration parameters

Individual configuration parameters can be changed via the function specific Worksheet tools or by using the Configuration Wizard.

### 5.5.1 Change parameters with the Configuration Wizard

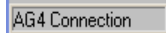
The parameters of the AG4 configuration can be changed using the wizard. To edit the configuration of an AG4, connect a AG4 to the PC, and turn on the AG4 power, the configuration is loaded from the AG4 after the AG4soft login.

Requirements:

- Powered AG4 is connected to the PC
- Logged in to AG4soft as **Authorized Customer (AC)**.
- The AG4 configuration will automatically load into the software program.



Note if the AG4soft does not connect with the scanner, check your PC comm. port settings to be sure you are using the proper port. The AG4 connection status window should look like this:



The program will eventually display the **Scanner status information** window.

#### 1. Click on **Exit**

The worksheet display will show the measured surfaces and the protective and warning fields.

#### 2. Click on the **Configuration** worksheet tab and click on .

or, using the drop-down menu select:

#### 3. **Configuration > Wizard**.

The Configuration Wizard presents a series of administrative and safety operational parameter choices.

#### 4. Enter the values of the parameters that need to be changed in the respective fields.

#### 5. Click **Next** to go the next page. Click **Back** to go the previous page.

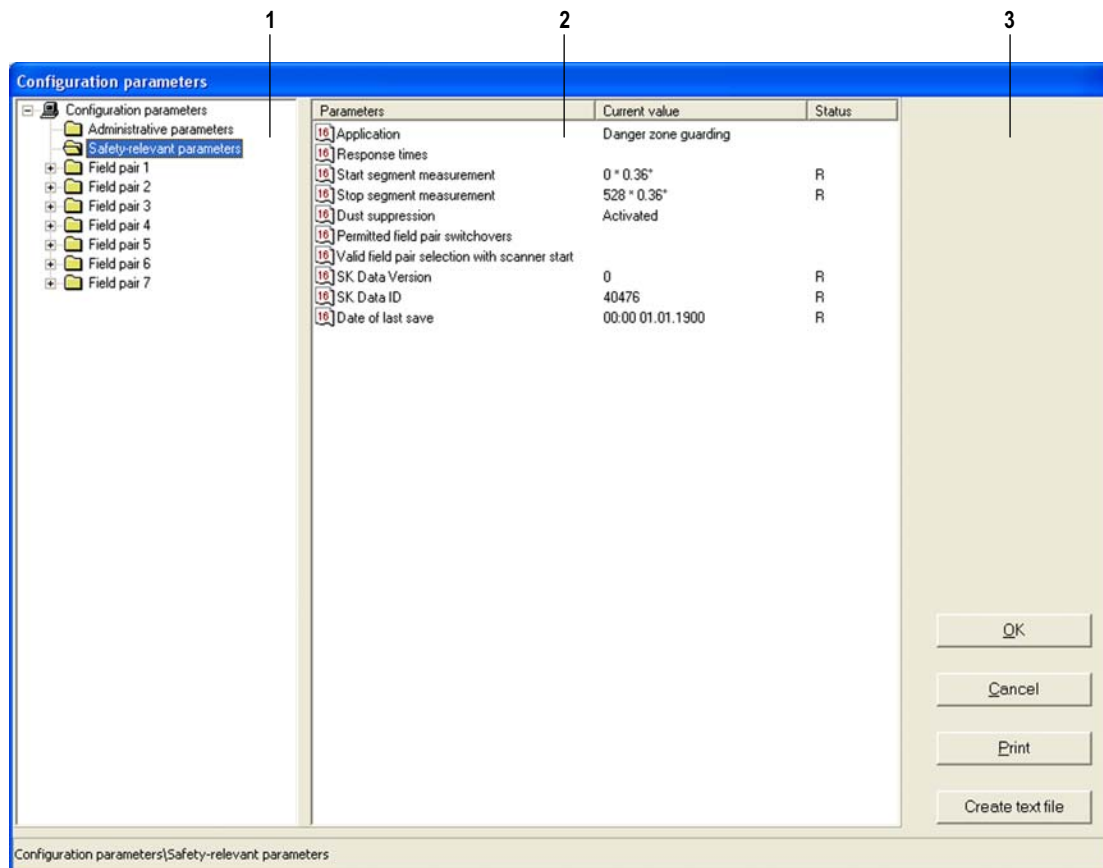
#### 6. Click on **OK** when all parameters have been entered. The configuration menu closes.

#### 7. **To transfer the configuration to the AG4:** Click on in the **Configuration** worksheet

- If the AG4 is connected to the PC, the configuration is transferred from the PC to the AG4.
- Note that the new configuration is not saved to file on the PC yet.
- Clicking on either of the **Measures contour** or **System data** worksheet tabs will cause the memory message to appear to give you the option, and remind you, to save a copy to file.
- More detail on the PC to AG4 configuration transfer and confirmation process is discussed in section 5.8.1

## 5.5.2 Change individual parameters

The parameters of the AG4 configuration can be changed using the **Configuration parameters** menu below. Administrative and safety-relevant parameters are combined in folders with the same name. Protective and warning fields that belong together are combined in the folders as Field pair 1 to Field pair 7 respectively.



- 1 Folder selection
- 2 Parameter selection
- 3 Change single value parameters in input area (inactive)

**Figure 4 Configuration Parameters Main Menu**



Parameters shown as **R** in the Status column are "read only" and cannot be changed.

### Requirements:

- Logged in as Authorized Customer (AC).
- Load a configuration in the software program.



1. Click the **Configuration** worksheet tab and Click on or, using the drop-down menu, select: **Configuration > Change**.  
The **Configuration parameters** menu opens.
2. Click on the folder that contains the parameters that require modifying.  
The program now displays the folder's parameters in the parameter selection field.
3. Double-click on the parameter that is to be changed.

If a **single value** parameter has been selected, a sub-menu opens to the right of the status field. The current selection is shown and an entry field for the new selection is provided.

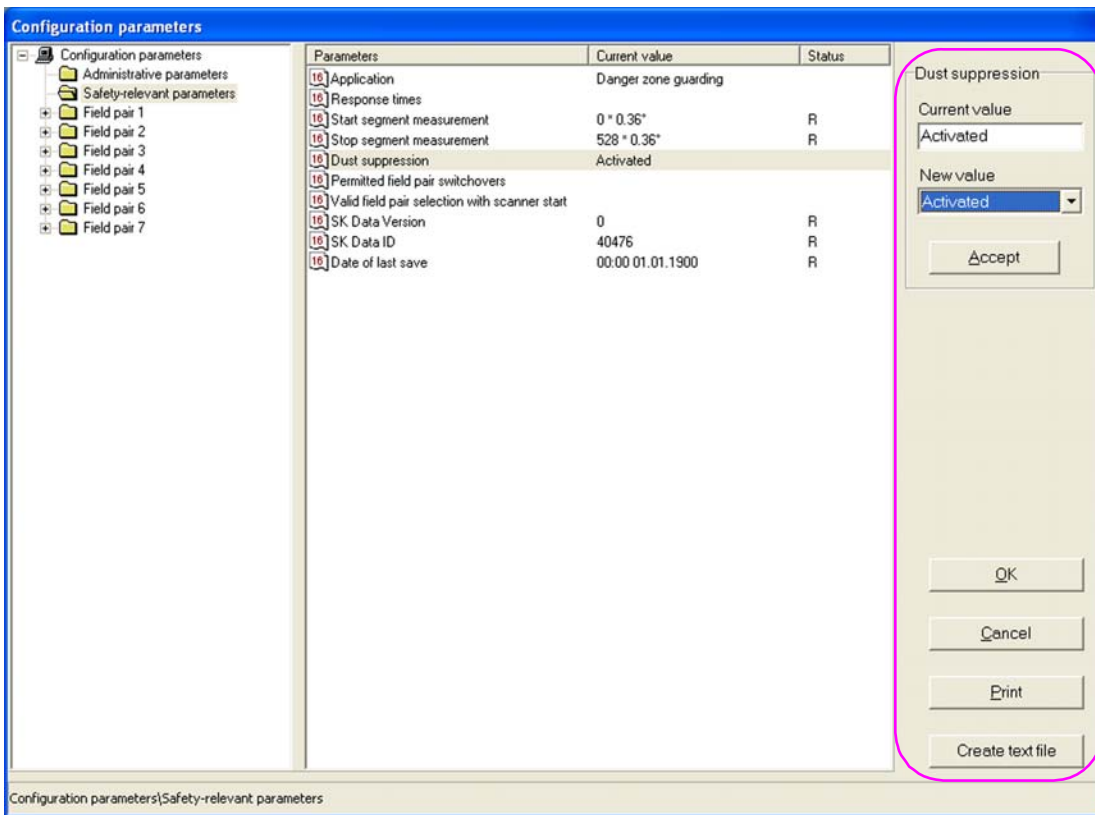
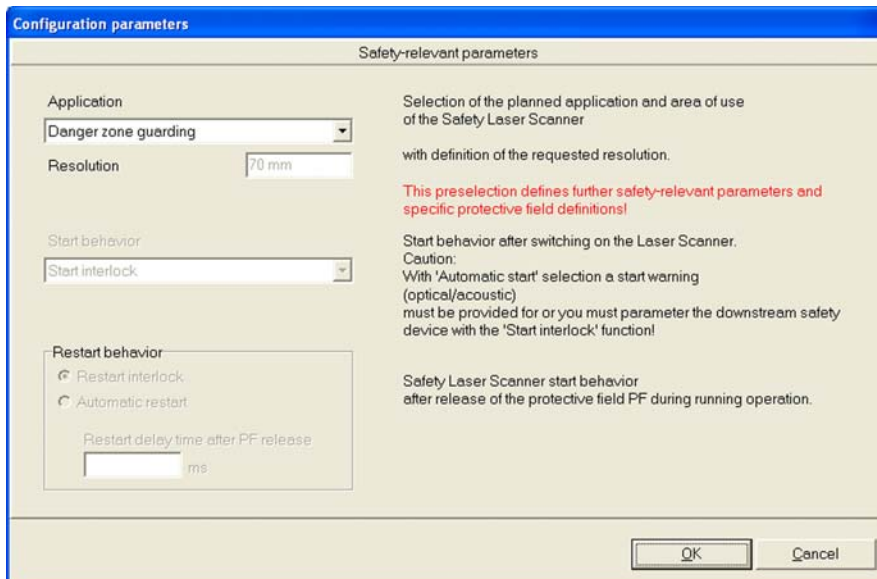


Figure 5 Configuration Parameters Menu

4. Select New Value for parameter as required then click **Accept**.
5. To print the configuration, in this menu click **Print**.
6. To save the configuration in the \*.txt format click **Create text file**.

If a **multi value** parameter has been selected, a pop-up menu opens, showing the current values.

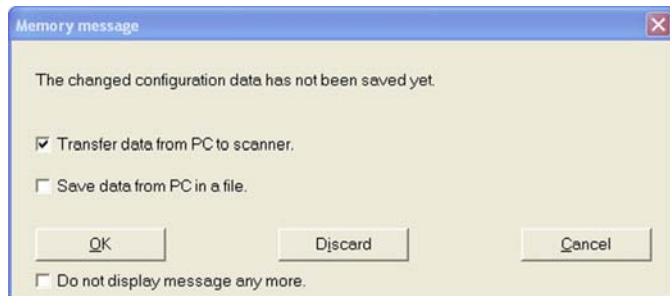


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7. Select the appropriate fields as necessary and when complete, click **OK**.
8. When all required parameters have been changed confirm with **OK** in the configuration main menu.

The changed configuration can now be downloaded to the AG4 or saved in a file.

If the operating mode is changed **before** the changed configuration has been downloaded or saved, the **Memory message** appears:



9. Ensure that the appropriate checkboxes are checked and confirm with **OK**.

The program executes the selected functions, or

10. To discard all changes to the configuration, click on the **Discard** button,

the program reverts to the previous configuration, or

11. To edit the configuration, click on **Cancel**.

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## 5.6 Save an AG4 configuration

To save the changed configuration, the configuration file can be downloaded to the AG4 or saved in a file on the PC.



The configuration settings can be printed or saved as a text file in the \*.txt format

### 5.6.1 Transfer configuration data from PC to AG4

In order that the changes to the configuration become active in the scanner, the changed configuration file must be transferred to the AG4.

Requirements:

- PC and AG4 are connected.
- Logged in with Maintainer (Ma) or Authorized Customer (AC) authorization level.
- Changed configuration file is loaded in the program.



1. Click on the **Configuration** worksheet tab and click on

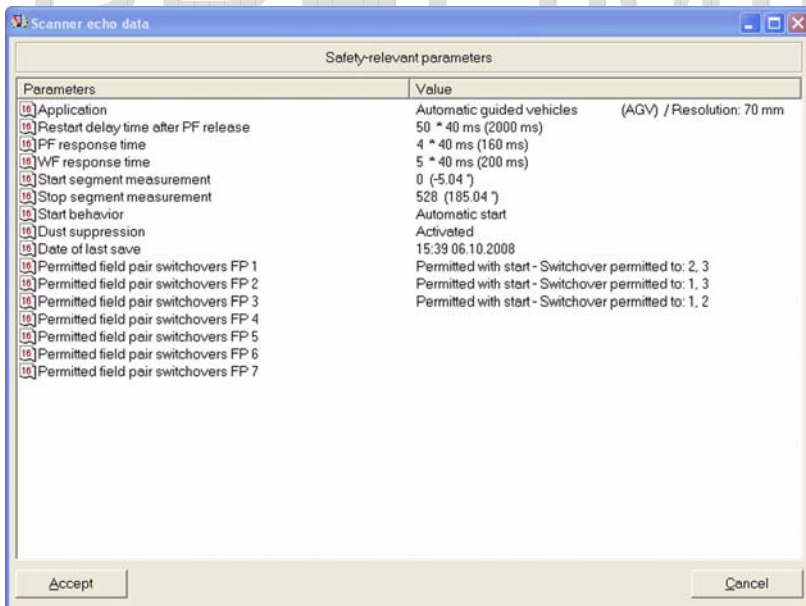
or, using the drop down menu select:

2. **Configuration > Transfer from PC to scanner.**

The program checks the configuration file and downloads it to the AG4.

If only **administrative** parameters have been changed, the AG4 does **not** send any echo (confirmation) data. However, if **safety-relevant** parameters have been changed, the AG4 sends **echo data** to the PC.

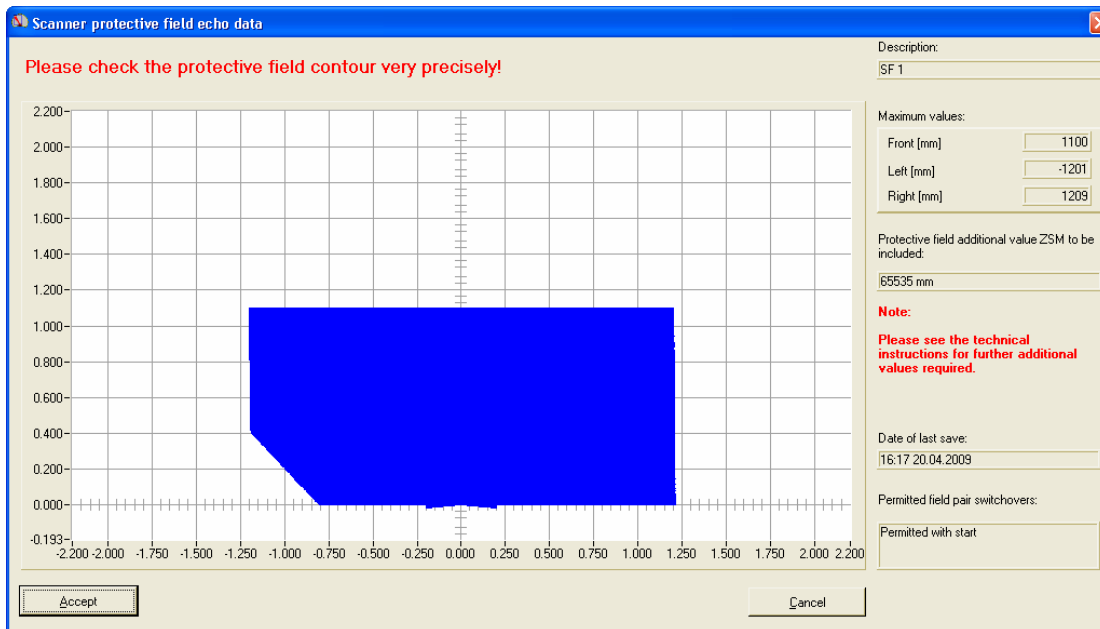
The **Scanner echo data** message appears:



3. Check the echo data and confirm that it is correct then click **Accept**.

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The **Scanner protective field echo data** menu opens for each protective field (see image below).



4. Check the protective field echo data for all protective fields.
5. If the protective field echo data is correct, click **Accept**.  
The next field echo data appears until all protective fields have been confirmed.  
At the end of this process, the software checks the configuration file and transfers it to the AG4 again.  
The **Configuration data transfer from PC to Scanner** message opens.
6. Click **OK**. The software saves the configuration file in the AG4 and now **uses it as its active operating configuration**.

### 5.6.2 Save configuration data as a file


The loaded configuration can be saved in a folder on the PC.

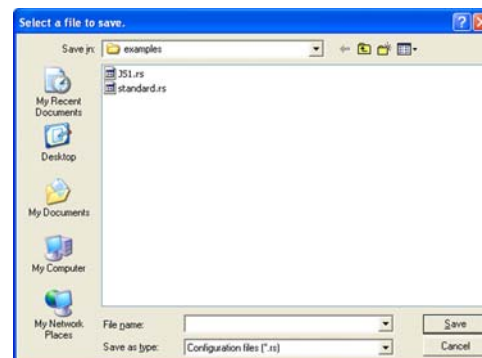
Requirements:

- Logged in with the *Authorized Customer (AC)* authorization level.
- The changed configuration file is loaded in the software.



Select the **Save configuration data as a file** function if, for example, an AG4 is not connected with the PC. A configuration saved on the PC can be transferred as a file later to the AG4.

1. Click on the **Configuration** worksheet tab and Click on  or, using the drop-down menu select : **File > Save configuration data as a file**  
The AG4 **example** file folder opens.
2. Name the file and click on **Save**. The software saves the configuration file in the **\*.rs** format.



## 5.7 Create and edit protective/warning field configuration

To create a new protective/warning field configuration, load an existing protective/warning field configuration and change its field boundaries and save as a new file.



An AG4 configuration must be loaded into the software so that changes can be made to protective or warning fields. The data of an individual protective or warning field configuration can be saved as its own file. When the AG4's configuration file is saved, the protective or warning field file is automatically included in the AG4's configuration file.

### 5.7.1 Load protective/warning field configuration

To create or edit a protective or warning field configuration, load an existing protective/warning field configuration into the AG4soft program.

Requirements:

- Logged in with the Authorized Customer (AC) authorization level.
- A configuration file is loaded in the software.

1. Click on the **Protective/warning fields definition** worksheet tab and click .

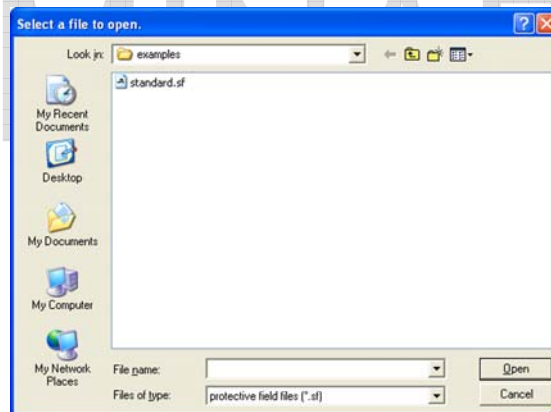
or, using the drop down menu select:

2. **File > Load protective/warning field from a file.**

The AG4 **examples** folder opens.

3. Select the file that you want and click **Open**.

The protective and warning fields appear in the AG4soft worksheet display area.



NOTE: Individual protective or warning field configurations can be loaded from a file. If an AG4 configuration is already loaded, all defined protective/warning fields in it are automatically loaded.



## 5.7.2 Edit protective and warning fields

Once the file is open in the AG4 soft program, the protective and warning fields boundaries and the reference surfaces can be changed.

### Select protective or warning field

To edit a protective or warning field, a field to be displayed in the work space must be selected.

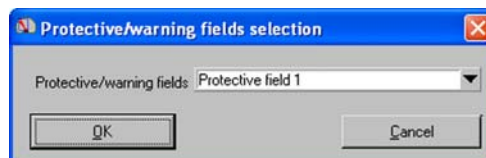
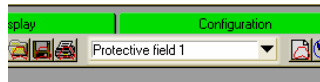
To select a field:

1. Click on the **Protective/warning fields definition** worksheet tab and use the drop down field menu (see image on right), to select the protective or warning field that you want to change.

or, using the drop-down menu, select:

2. **Protective/warning fields > Select protective/warning field**

Use the **Protective/warning field selection** menu that appears (see image right), to select the protective or warning field that you want to change.



The software displays the protective (red) and warning field (green) boundaries as red and green respectively. The colors represent the field boundaries of field pair 1. Although both fields of the 1<sup>st</sup> field pair are shown in color in the work space below, only the protective field is "active", that is, only the protective field can be changed with the editing tools in the worksheet. Other field pair boundaries can be displayed and will appear in **light gray** if the field pair is selected (see **Selected field pairs** window in the image below).

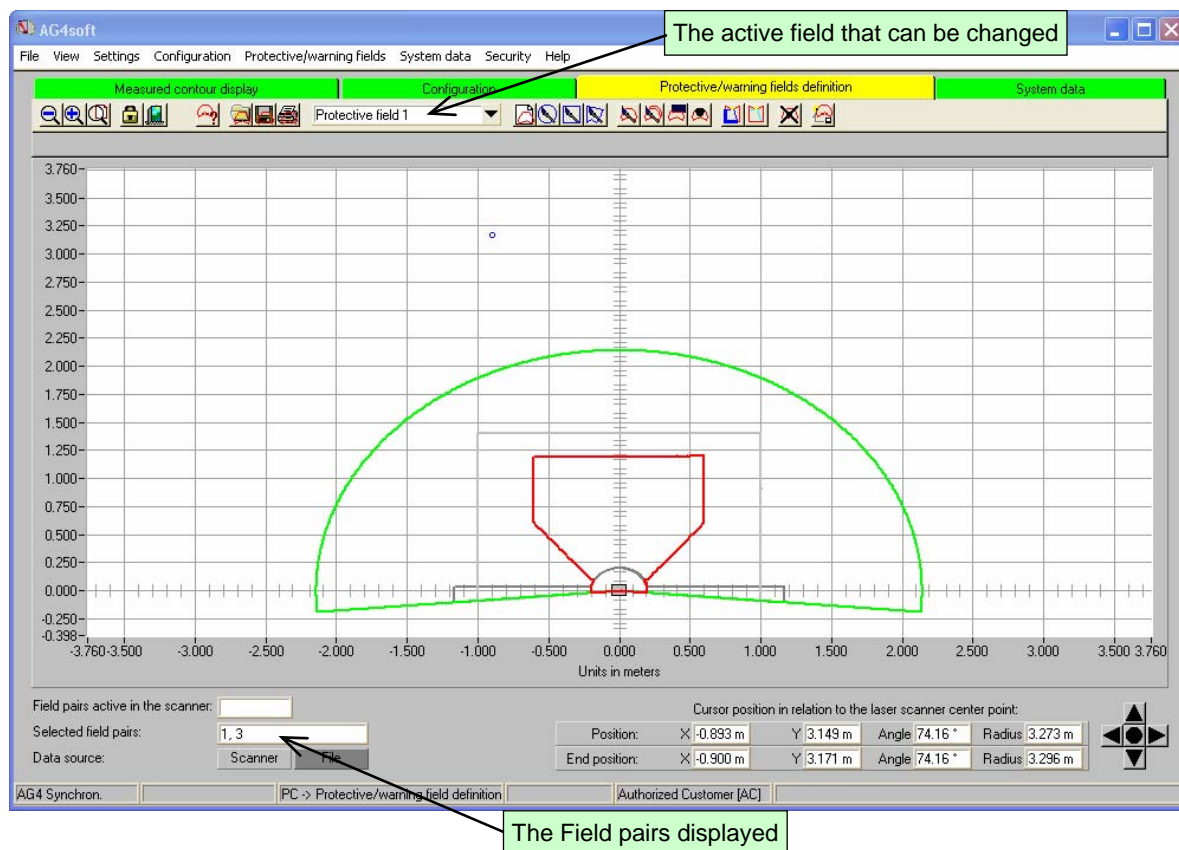


Figure 6. Protective and warning fields displayed

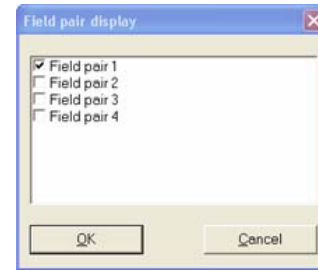
The drop-down menu in the Protective/warning field worksheet tab below shows that Protective field 1 is active.

The selected pairs that are being displayed are field pair 1 (red & green) and field pair 3 (grey rectangles). See Select field pair window in the lower left corner of Figure 6.

## Select field pair to be displayed

To set which field pairs are displayed in the work space, in the drop down menus area select:


1. **Settings**, then select
2. **Displayed field pair selection** and
3. **Check** the pairs to be displayed (see image at right)
4. Click on **OK**.



The work space will show only those field pair selections in the work space

## 5.7.2 Defining protective and warning fields

Protective and warning field boundaries can be defined by entering numeric values or by using the graphic editing tools.

NOTE: The field boundary tools  can be accessed in the **Protective/ warning fields** worksheet or via the drop-down menu.

### 5.7.2.1 Numerical Changes

Requirements:

- Logged in with the Authorized Customer (AC) authorization level.
- The changed configuration file is loaded in the program.
- The protective or warning field is selected.

1. Click on the **Protective/warning fields definition** worksheet tab and click on 

or, using the drop down menu select:

2. **Protective/warning fields > Define protective/warning field> Protective/warning field numerically.**

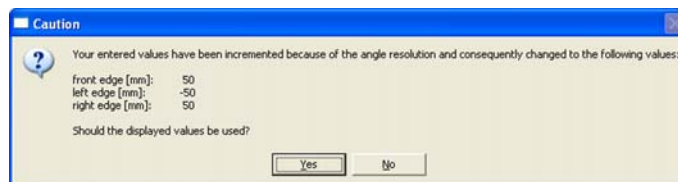
The **Define protective/warning field** menu appears.

3. Enter the values for the front, left and right edge in mm and click **OK**.



A caution message for angle resolution will open and recommend a slight value adjustment. To accept the recommended values,


4. Click **Yes**.




The window closes and the redefined field boundaries are displayed in the worksheet.

## 5.7.2 Graphical Changes

A selected protective or warning field can be defined as an ellipse, a rectangle or a polygon.


When a graphic field change tool selected, the mouse pointer  changes to a **hand** with pointed index finger and is used as a tool to define the field boundary limits.

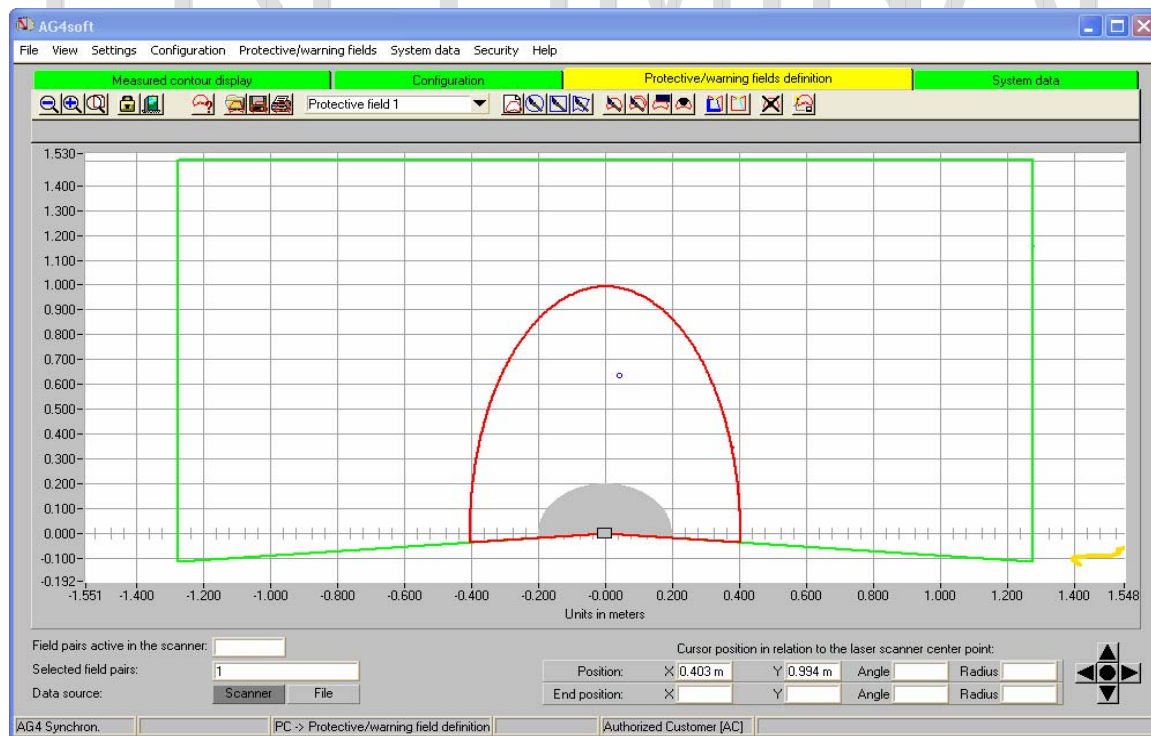
If the ellipse or rectangle field tool is selected,  the field boundaries are created by pressing the left mouse button while moving the hand across the work space. The cursor position corresponds with the outer-most point on the ellipse or the rectangle. The field changes dynamically as the pointer is moved within the worksheet display.

Requirements:

- Logged in with the Authorized Customer (AC) authorization level.
- The configuration file is loaded in the software.
- The protective or warning field is selected.

## 5.7.3 Elliptic Field

1. Click on the **Protective/warning fields** worksheet tab and click on , the elliptical field tool.  
or, using the drop down menu select:
2. **Protective/warning fields > Define > elliptical zone.** The cursor changes to a **hand** with pointed index finger.
3. **To designate the boundaries of the ellipse: Position** the cursor near the area in the work space where you want to place the field.
4. **Press and hold** the left mouse button (a preview of the elliptical boundary appears) and move the cursor until the proper field size is established.
5. **Release** the button to set the field in the work space. A thin line displays as a preview of the elliptical zone, in addition to the existing zone.



**Figure 6. Elliptical Protective field 1** NOTE: During the field change operation, the X and Y values of the cursor position in the navigation area define the maximum area boundary dimensions of the short and long axes of the ellipse.

### Correcting a field

- If you want to change the field shape repeat the process again.
- The old field boundary will be replaced with the new field boundary.



If you accidentally click on the **wrong tool button** you can start over by pressing the **Esc** key on your PC.

### 5.7.4 Rectangular field

- Click in the **Protective/warning fields definition** and Click .

or, using the drop down menu select:

- Select **Protective/warning fields > Define > rectangular zone**. The cursor changes to a hand with pointed index finger.

To designate the boundaries of the rectangle:

1. **Position** the cursor near the area in the work space where you want to place the field.
2. **Press and hold** the left mouse button (a preview of the rectangular boundary appears) and move the cursor until the proper field size is established.
3. **Release** the button to set the field in the work space.

The work space below shows a thin line preview of the rectangular field (no other field is shown).

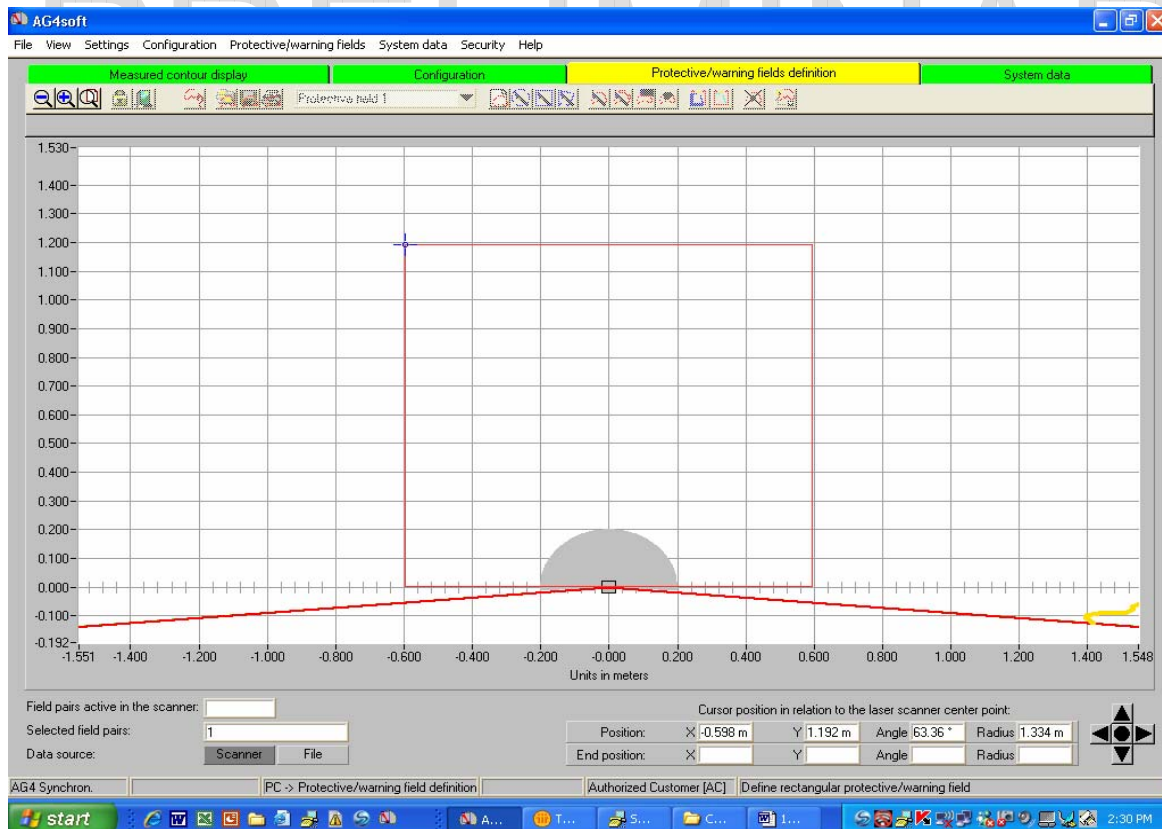


Figure 7. Rectangular Protective field 1

NOTE: In the figure above, during the field change operation, the X and Y values of the cursor position in the navigation area define the maximum area boundary dimensions of the short and long axes of the ellipse.

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### Correcting a field

- If you want to change the field shape, repeat the process.
- The old field boundary will be replaced with the new field boundary.

### 5.7.5 Polygon Field

The order in which the corner points of the polygon are set depends on the workspace display:

- If the AG4 is displayed **below** in the workspace, set the boundary corner points from **left to right**.
- If the AG4 is displayed **above** in the workspace, set the boundary corner points from **right to left**.

1. Click on the **Protective/warning fields definition** worksheet tab and click .

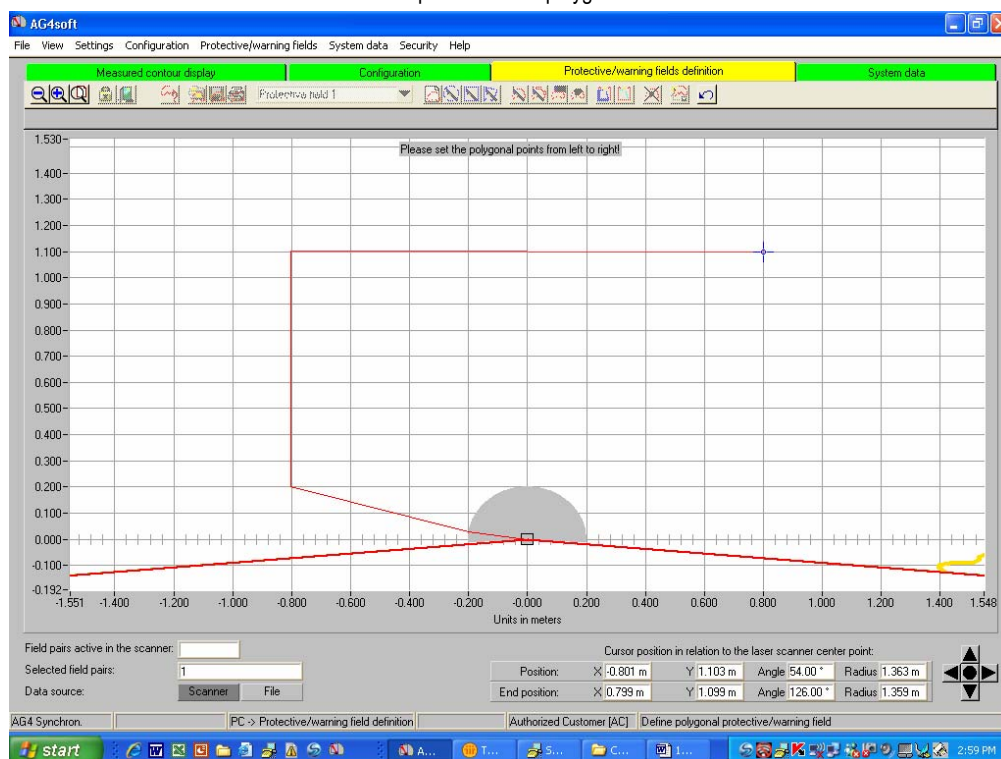
or, using the drop down menu select:

2. **Protective/warning fields > Define > polygonal zone.**

The cursor changes to a hand with pointed index finger.

3. To define the first corner point of the polygon, **position** the cursor at that point on the work space and click the left mouse button
4. **Left click** the remaining points of the required polygon area.

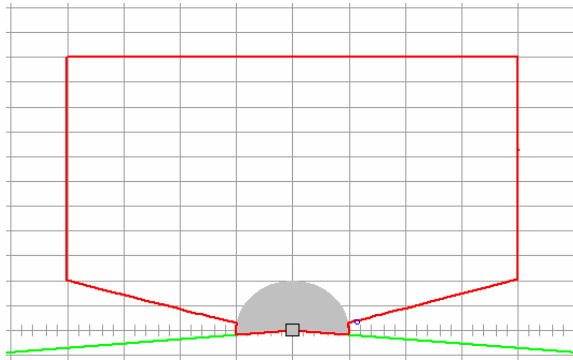
The software shows a thin line as a preview of the polygon section.



**Figure 8. Polygon field shape.** The figure above shows the first 3 sides of the polygon shaped protective field.

NOTE: In the figure above, during the field change operation, the X and Y values of the cursor **End position** display in the navigation area define the corner boundary points of the polygon field.

5. When the polygon shape is complete, **Right-click** to establish and display the polygon area (see complete polygon field below).



NOTE: When you complete the polygon shape, the software connects the end points and accepts the field boundaries.

#### Correcting a field

- If you want to change the field shape repeat the process with the new shape.
- The old field boundary will be replaced with the new field boundary.

#### Change protective and warning fields

A protective or warning field shape can be modified if needed.

Requirements:

- Logged in with the Authorized Customer (AC) authorization level.
- The configuration file is loaded in the program.
- The protective or warning field to be modified is selected.

#### Change a field shape

This function allows the user to modify or reshape the boundaries of a field by sections (see figure XX below).

The warning field shape below can be modified e.g. to create an unmonitored space for a passage way between the warning field (yellow line) and the wall (green line). The program connects the two points with a straight line generates a new field boundary.

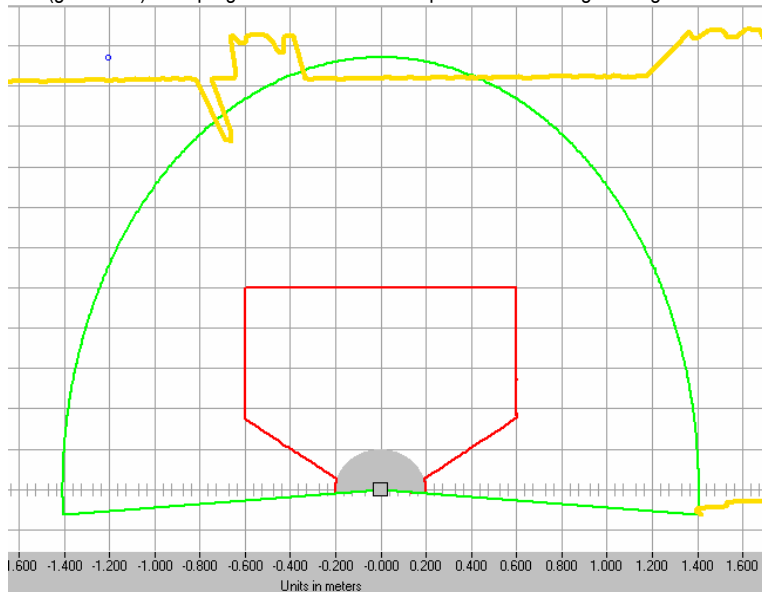



Figure 9. Elliptic warning field that projects into a wall (green line) and material access route (not visible)

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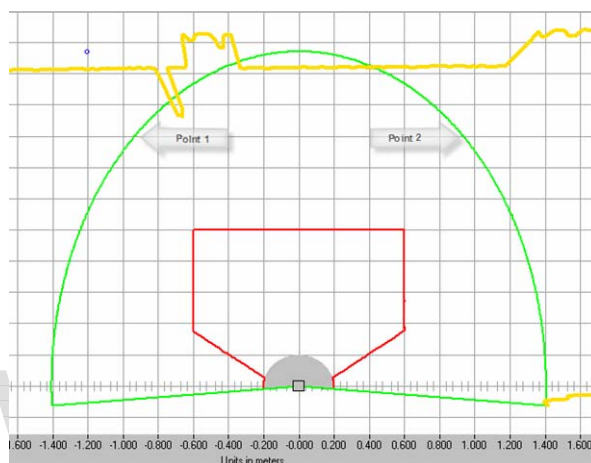
### Requirements:

- Logged in as Authorized Customer (AC).
- The configuration file is loaded in the software.
- The warning field is selected.
- Click the **Protective/warning fields definition** worksheet tab and click .  
or, using the drop down menu select:
  - Select **Protective/warning fields > Change protective/warning field segment.**
    - The cursor changes to a hand with pointed index finger.
    - The program displays the selected field boundary in bold.

1. **Position** the cursor at the **1<sup>st</sup> point** on the work space.

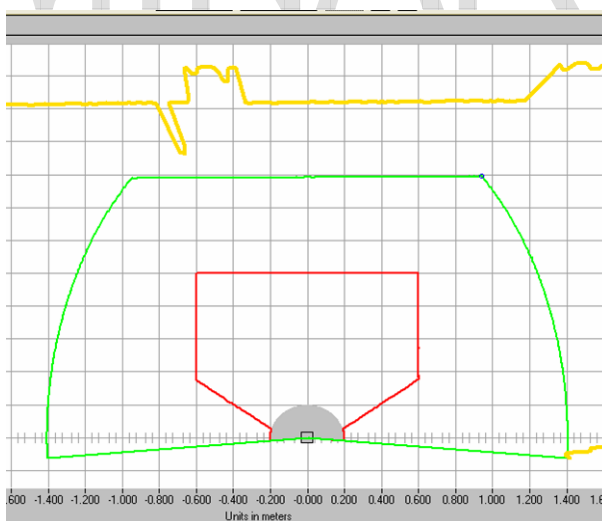
(see work space right for example)

2. **Press and hold** the left mouse button.
3. **Release** the button when the cursor is positioned properly  
A guide line from the AG4 to this 1<sup>st</sup> point appears.
4. **Position** the cursor at the **2<sup>nd</sup> point** on the work space.
5. **Press and hold** the left mouse button.



6. **Release** the button when the cursor is positioned properly
7. **Right click** to establish the new field shape.

A line connects the points (see work space right for example)  
and the new boundary is established.



Set as many coordinate points as needed to shape the field.  
(see work space right for example)




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## 5.7.6 Change all fields

It is possible to change all of the AG4 protective fields or warning fields at the same time.

1. Click the **Protective/warning fields definition** worksheet tab and click .  
or, using the drop down menu, select:
2. **Protective/warning fields > Change protective/warning field segment with all fields.**

A confirmation message appears (right)

3. Click **Yes** to continue or **No** to reject.
4. Change the field shape as described in **Change a field shape**, above.



NOTE: When the changes have been completed, all of the protective fields (as a group) and/or all of the warning fields (as a group) will have had their boundaries changed in a similar manner though they will not necessarily have the identical shape.



Changing all protective fields or all warning fields with the **Change protective/warning field segment with all fields** tool will produce identical field shapes or boundaries **only** if the field shapes are **identical** when you start the field change process.

## 5.7.7 Reduce field limits

The field limits of a protective or warning field can be reduced by establishing numerical values for the limits.

Requirements:

- Logged in with the Authorized Customer (AC) authorization level.
- The changed configuration file is loaded in the software.
- The protective or warning field is selected.

1. Click the **Protective/warning fields definition** worksheet tab and click. 

or, using the drop down menu select:

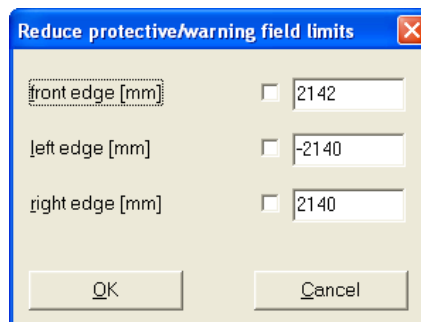
2. **Protective/warning fields > Reduce protective/warning field limit**

The **Reduce protective/warning field limits** menu appears (right).

3. **Enter** new values for the front, left or right edge in mm and click **OK**

A message for angle resolution opens to recommend a value adjustment.


4. To accept the recommended values, click **Yes**.



The window closes and the redefined field boundaries are displayed in the worksheet.

## 5.7.8 Blank out segments

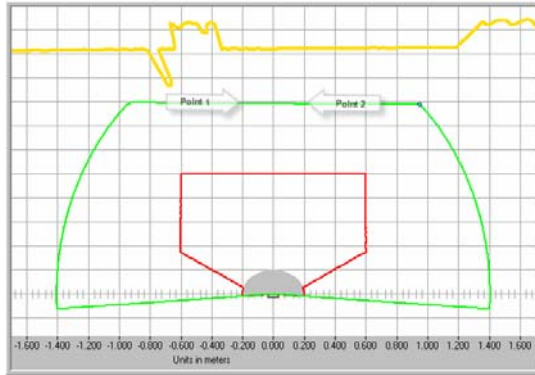
Individual field segments can be blanked out or not monitored, by establishing two points on either a protective or a warning field boundary. The program creates the unmonitored region between the points. The unmonitored region boundaries extend along a radial line to the AG4

1. Click the **Protective/warning fields definition** worksheet tab and click .  
or, using the drop down menu select:

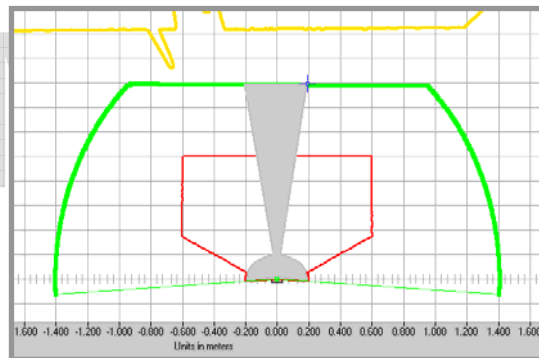
2. **Protective/warning fields > Blank out protective/warning field segment.**

The pointed index finger cursor appears.

3. **Click on the 1<sup>st</sup> point** on the field  
(see work space right for example)

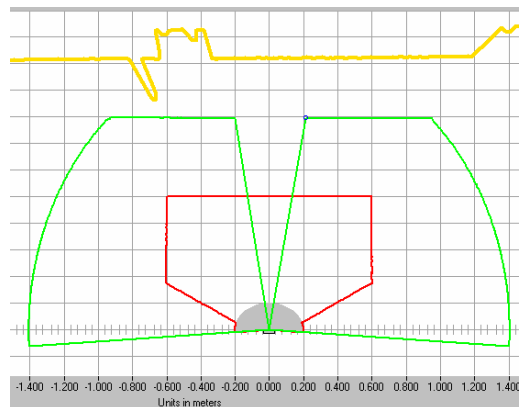


4. **Click on the 2<sup>nd</sup> point** on the work space



5. **Right click**

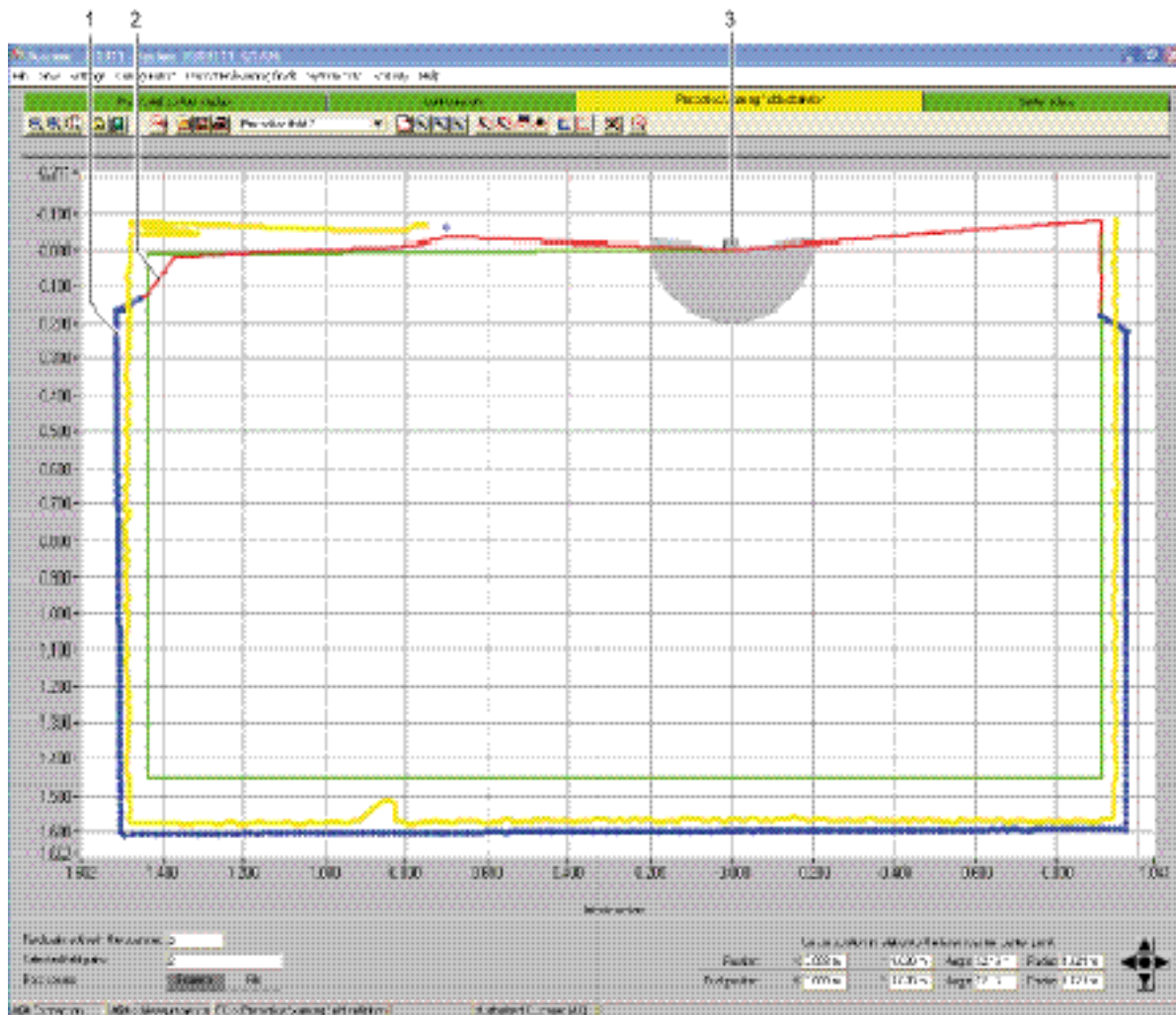
The new field shape appears with the unmonitored section clearly visible in the workspace.



## 5.8 Set the reference contour

A reference contour or surface in a protective field can be created by establishing two points on the field boundary. The software program establishes this surface along the field boundary line between the two points. You **cannot** set a reference contour in a warning field. The reference can be a surface on a machine or within an work area. The surface must be stationary with respect to the AG4 and must be within the protective field range for the application.

If the Passage control (3.5 meter range), Arm protection (2.25 meter range) or Hand protection (1.5 meter range) application is selected in the configuration, the software **automatically** defines the entire protective field limit as reference contour. You can reset parts of the reference contour retroactively.



Y

- 1 Reference contour
- 2 Transition area between protective field contour and reference contour
- 3 AG4


**Figure 10. Set reference contour**

### Requirements:

- AG4 powered and connected to the PC
- Logged in with the Authorized Customer (AC) authorization level.
- A configuration file is loaded in the software.
- The protective or warning field is selected.
- A segment in a protective field is defined.



When setting the reference surface, ensure smooth transitions between protective field with reference contour and protective field segments without reference contour. The reference contour must lie on the measured contour; the protective field limit slightly before the measured contour.

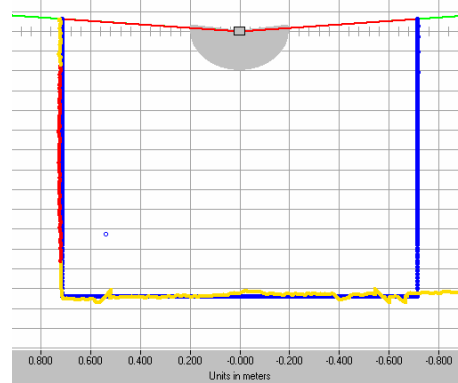
1. Click the **Protective/warning fields definition** worksheet tab and Click .  
or, using the drop down menu select:

2. **Protective/warning fields > Define protective segment as reference contour**

In the work space,


3. Click a **point** on the protective field boundary.
4. Click another **point** on the protective field boundary.
5. When the button is released, the reference is established.

The software shows a blue connection line from the starting point to the end point of the reference contour.



**If it is necessary to create a reference contour that consists of several sections,** repeat the process until the contour corresponds with the desired display.

**If it is necessary to delete a reference contour,**

1. Click the **Protective/warning fields definition** worksheet tab and click .  
or, using the drop down menu select:
2. **Protective/warning fields > Reset reference contour definition for protective field**

### 5.9 Saving protective/warning fields

Protective and warning fields can be saved as follows:

- When a **AG4 configuration** is saved, the software automatically saves all loaded protective and warning fields in the configuration file
- The selected protective or warning field can be saved **individually** in a protective/warning field configuration file.
- One or more of the displayed protective or warning fields can be downloaded **together** from the PC to the AG4 and saved there.

#### 5.9.1 Save as a file

When **protective or warning field** changes have been made they can be saved on the PC for record keeping purposes or for later use..



If the AG4 is not connected with the PC, the changed protective/warning field configuration can be saved on the PC as a file, then downloaded to the AG4 at another time. For complicated field boundaries or for fields that supplement one another in switchover mode, a saved protective/warning field configuration can be transferred to another field pair.

Requirements:

- Logged in with the Authorized Customer (AC) authorization level.
- The protective or warning field is loaded in the program and selected.

1. Click the **Protective/warning fields definition** worksheet tab and click

or, using the drop down menu, select:

2. **File > Save protective/warning field as a file**. The AG4 **examples** folder opens.
3. Name the file and click **Save**.

The software saves the protective/warning field configuration file in the \*.rs format.

#### 5.9.2 Transfer protective and warning field configurations from the PC to the AG4

One or more of the scanner's protective or warning fields configurations can be changed and transferred to the AG4 so that these new field configurations can become active in the scanner.

Requirements:

- The AG4 is powered and connected to the PC
- Logged in with the Authorized Customer (AC) authorization level
- The protective or warning fields **from the Scanner** are loaded in the software
- The field changes have been made

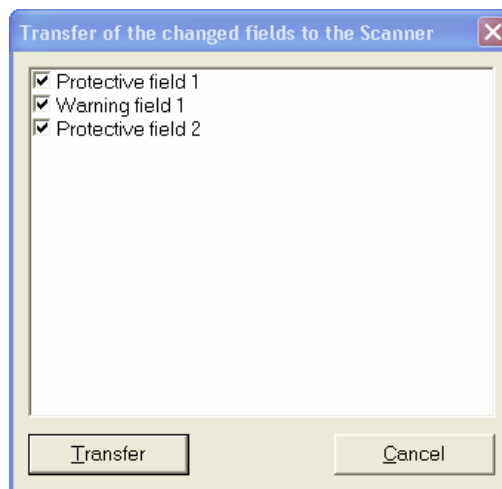
1. Click the **Protective/warning fields definition** worksheet tab and click

or, using the drop down menu, select:

2. **Protective/warning fields > Transfer changed protective/warning fields from PC to scanner**.

A message appears (example shown at right) that lists all the changed fields that can be transferred to the Scanner. Deselect (uncheck) the box for any field that you do not want to transfer to the Scanner, and

3. Click on **Transfer**.



The program sends to new field parameters to the AG4. A copy of the **echo data** for each change field is defined in the program for review. If field data are correct,

4. Click on **Accept**.

The program establishes and activates the new fields in Scanner and the **Transfer protective/warning data from PC to Scanner** message opens.

5. To confirm the message, click on **OK**.

The software saves and **activates** the changed protective and warning field files in the AG4.

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## 6 Documentation, Passwords, Maintenance

### 6.1 Configuration Documents

The following AG4 status and configuration information can be printed:

- Status information
- AG4 configuration
- Protective/warning field configuration
- Diagram



If a printer is not connected the information can be saved as a file in the \*.txt format.

#### 6.1.1 Print status information

The AG4's status information can be printed or saved as a text file and includes:

- Administrative parameters, e.g., name, serial number
- Safety-relevant parameters, e.g., protective field additional distance values, startup process
- Permitted field pair switchovers
- Date a zone was last saved
- Output resolution

Requirements:

- The program is connected with the AG4
- The status information from the AG4 is loaded

1. Click the **System data** worksheet tab and click .

or, using the drop down menu, select:

2. **System data > Transfer status information from Scanner to PC**

The **Scanner status information** dialog appears.

3. Click **Print** to select a printer.
4. Click on **Create text file** to create a text file.

### 6.1.2 Print AG4 configuration

The AG4's configuration can be printed or saved as a text file.


The printout and the text file includes the following information:

- Print date
- User
- Data source
- Administrative parameters
- Safety-relevant parameters
- Name of all field pairs and date they were saved

Requirements:

- The program is connected with the AG4
- You have loaded the status information from the AG4

#### Printing

1. Click the **Configuration** worksheet tab Click on .

or, using the drop down menu, select:

2. **Configuration > Print.**

### 6.1.3 Create text file

1. Click the **Configuration** worksheet tab and click .

or, using the drop down menu, select:

2. **Configuration > Change**

The **Configuration parameters** dialog box opens.

3. Click on **Create text file.**

### 6.1.4 Print protective/warning field configuration

A protective/warning field configuration can be printed and include

- Name and description of the zone
- Date the zone was last saved
- Permitted field pair switchovers
- Minimum object width
- Print date
- User
- Data source
- Serial number
- AG4 name
- Graphic display of the zone
- Maximum values
- Blanked out segments



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Requirements:

- The software is connected with the AG4
- A AG4 configuration is loaded in the software

1. Click the **Protective/warning fields definition** worksheet tab and click .

or, using the drop down menu, select:

2. Select **Protective/warning fields > Print**

The **Print protective/warning fields** dialog opens.

The protective/warning field and optimized display can be selected.

3. Click on **Print**.

### 6.1.5 Print work space diagrams

Work space diagrams (measured surfaces, protective and warning fields) may be saved as bitmap files in the \*.bmp format and then printed.

Requirements:

- The program is connected to the AG4
- A AG4 configuration is loaded in the software

1. Select **View > Save diagram as a file**.
2. Locate file in AG4 software program (<C:\Program Files\Banner Engineering\Banner AG\AG4soft\examples>) and open the appropriate bitmap program to view or print.

## 6.2 Calibrate front screen



### CAUTION . . . FAULTY CALIBRATION CAUSED BY DIRTY OR SCRATCHED FRONT SCREEN

- Only calibrate front screens that are clean and free of scratches, cracks, abrasions or other marks that could impair pulsed light signal transmission.
- Clean the front screen with the Cleaning Set (AG4-CLN1 or AG4-CLN2)

If the AG4's front screen has been replaced for any reason, the AG4 must be re-calibrated. If not, the correct safety functioning of the AG4 can no longer be guaranteed.

Requirements:

- The AG4's front screen is replaced
- The AG4 is connected with the PC
- The ambient temperature is between **20 and 25°C**
- Logged in with the Authorized Customer (AC) authorization level

- Click the **System data** worksheet tab and click .

or, using the drop down menu, select:

- Select **System data > Calibrate the front screen**.

The **Calibrate the front screen** dialog opens:

- Enter the password **FS8LED** and click **Calibration**.

The software starts the calibration process and shows the calculated values of the front screen measured distances and the reference distances in the dialog.

- Click **Exit** to close the dialog.

The AG4 is now re-calibrated with the new front screen.

### 6.3 Change password

The password with which users of the Maintainer (Ma) or Authorized Customer (AC) authorization levels log in on the AG4 can be changed.

Examples:

- With the **first login** of the AG4, users of the authorization levels Maintainer (Ma) or Authorized Customer (AC) use the Default password. The Default password must be changed to a **Specific password**.
- A user of the Maintainer (Ma) authorization level has **forgotten** the password or entered it wrong several times



A password must be at least six and a maximum of eight characters long. Combinations of letters and numbers may be used as well as both lower and uppercases.

Requirements:

- Logged in with the Authorized Customer (AC) authorization level
- The software is connected with the AG4

1. Select **Security > Change password**.

The **Change password** dialog opens. In the Password selection list;

2. Select the **authorization level** for which you want to change the default password.
3. **Enter** the new password in the New password
4. **Enter** the password again in the Repeat password field
5. Click **OK**. The software transfers the new password to the AG4 where it is then saved.

### 6.4 Reset password

If a user at the Authorized Customer (AC) authorization level has forgotten their specific password or entered it incorrectly several times, they cannot log in on the AG4. The **Change password** function is therefore **not** accessible.

Instead, the specific password must be reset. The **Reset password** function is available for users of the Operator (Op) authorization level and requires a password to access. During a telephone call with the Applications department a one-time password can be created, which the manufacturer confirms and the customer subsequently uses in order to create a new specific password

To reset your specific password, compile the information listed below and contact Banner Engineering. Provide the following information:

- Your company address
- Your company contact person's name
- A telephone number where they can be reached
- The AG4 serial number (below the bar code on the label on the side of the AG4)

#### How to Contact Banner Engineering

To contact the Safety Application Engineering, call Banner's North American headquarters at:

**763-544-3164**

**1-888-373-6767** (toll free)

Banner Engineering Corp., 9714 Tenth Ave. North, Minneapolis, MN 55441.

Or you can also send the information via email to: [sensors@bannerengineering.com](mailto:sensors@bannerengineering.com)

Or you could contact your local Banner sales partner and provide them with the information above.

Either way, one of the Safety Applications Engineers will contact you and take you through the following steps.

## 6.5 Create a one-time password

Requirements:

- Logged in with the Operator (Op) authorization level.
- The program is connected with the AG4.

1. Select **Security > Reset password**.

The **Set new password with one-time password** dialog opens.

2. On the Create one-time password tab select **Create**.

The software loads the one-time password from the AG4 and shows it in red.

When the Banner Engineering Safety applications engineer has the one-time password, they will create a new password.

3. Select the Set new password tab,
4. Enter the one-time password in the Confirmed password field,
5. Enter the new password in the New password field,
6. Repeat the entry in the Repeat password field,
7. Click **OK**

The program communicates with the connected AG4 and saves the new password for the Authorized Customer (AC) authorization level in the AG4.

The new password is effective after a restart of the software.

## 6.6 Create diagnostics list and service file

### 6.6.1 Create diagnostics list


The AG4 will generate a diagnostic list that can be used to identify operation problems and remedies (refer to the AG4 Product Manual for information on diagnostics and remedial steps).

The diagnostics list contains the following information:

- AG4 serial number
- Firmware version
- Date the diagnostics list was created
- List of the last eight incidents that occurred with place, number and parameters

Requirement:

- The PC is connected to a powered AG4 with the AG4soft program running

1. Click the **System data** worksheet tab and Click  or, using the drop down menu, select:

2. **System data > Display the Scanner diagnostics list**

The **Diagnostics list** dialog box opens.

3. Click **Re-load** to update the diagnostics list.
4. Click **Print** to print the diagnostics list.
5. Click **Save** to save the diagnostics list in the \*.txt format.

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### 6.6.2 Create service file

A service file contains the configuration, diagnostics and system data of a connected AG4 and can be created in the \*.**sdc** format.

This file can be sent to [sensors@bannerengineering.com](mailto:sensors@bannerengineering.com) in cases where diagnose information is needed to solve an application or operation problem.

Requirement:

- The PC is connected to a powered AG4 with the AG4soft program running

1. Click the **System data** worksheet tab and click .

or, using the drop down menu, select:

2. **System data > Create service file**

A dialog box for saving the service file opens.

3. Name the file and click **Save**.

The program saves the service file in the \*.**sf** format.

4. Send an e-mail with the service file attached to [sensors@bannerengineering.com](mailto:sensors@bannerengineering.com) with the following information:

- Company address
- Company contact person's name
- Contact person's telephone number
- AG4 serial number below the bar code on the label that's on the side of the AG4)

PRELIMINARY

## 7 Menu item reference

An overview of the AG4soft program menu items, icon functions and tools can be found in this chapter.

### 7.1 Menu

The **Menu** chapter gives an overview of all menus and menu items.



Please note that the available menu items depend on both the selected authorization level and the selected operating mode. If, for example, the AG4 is to be configured, first an Authorized Customer (AC) level log in is needed and secondly, the AG4soft program must be in **Configuration** mode.

#### 7.1.1 File

Table 6. Menu items in the File menu

| Menu item                                 | Function  |
|---|---|
| Load protective/warning field from a file | Opens a single protective or warning field configuration file         |
| Save protective/warning field as a file   | Saves a selected protective or warning field configuration as a file. |
| Load configuration data from file         | Opens an AG4 configuration file.                                      |
| Save configuration data as a file         | Saves the loaded AG4 configuration as a file.                         |
| Exit configuration program                | Exits the software.   |

#### 7.1.2 View

Table 7. Menu items in the View menu

| Menu item              | Function  |
|------------------------|---|
| Zoom                   | Reduces the work space and the displayed diagram in steps.                        |
| Unzoom                 | Enlarges the work space and the displayed diagram in steps.                       |
| Show all               | Enlarges the work space and the displayed diagram to full size of 70 x 70 meters. |
| Save diagram as a file | Saves the displayed diagram as a bitmap file in the *.bmp format.                 |

## 7.1.3 Settings

Table 8. Menu items in the Settings menu

| Menu item          | Submenu                              | Function  |
|--------------------|--------------------------------------|---|
| Operating mode     | Measured contour display             | Changes to the <b>Measured contour display</b> operating mode.  |
|                    | Configuration                        | Changes to the <b>Configuration</b> operating mode.   |
|                    | Protective/warning fields definition | Changes to the <b>Protective/warning fields definition</b> operating mode.  |
|                    | System data                          | Changes to the <b>System data</b> operating mode.   |
| PC configuration   | Interface                            | Opens a dialog box in which you select the serial interface and the transfer rate.  |
|                    | Languages                            | Opens a dialog box in which you select the language of the interface texts.   |
|                    | Change diagram color                 | Changes the color of the work space from black to white to optimize it for printouts.   |
|                    | Rotate contour display by 180°       | Rotates the contour display in the work space to adjust the display to the AG4's mounting situation.  |
|                    | 190° protective/warning fields       | Extends the display of the protective/warning fields for the definition by 10°. This setting does not change the measured value recording.  |
| Field pair display |                                      | Opens a dialog box in which you select the field pairs that are to be displayed on the work space.  |
| Activities list    |                                      | Opens a message that displays all communication processes performed since the software was last started.<br>With the MotionMonitoring function, the activities list shows the individual actions and provides the status of the speed monitoring. |

### 7.1.4 Configuration

Table 9. Menu items in the Configuration menu

| Menu item                              | Function   |
|--|--|
| Wizard                                 | Opens the configuration wizard with which you change the configuration parameters. |
| Change                                 | Opens a dialog in which you change individual parameters.                          |
| Set default values in the scanner      | Sets the AG4's configuration back to the default status.                           |
| Printing                               | Prints the configuration file.   |
| Load from file and transfer to scanner | Opens an existing configuration file and transfers the data to the AG4.            |
| Get from scanner                       | Loads the configuration file from the AG4 into the software.                       |
| Transfer from PC to scanner            | Transfers the configuration file to the AG4.                                       |

### 7.1.5 Protective fields /warning fields

Table 10. Menu items in the Protective/warning fields menu

| Menu item                          | Submenu                                 | Function  |
|------------------------------------|---|---|
| Protective/warning field selection |   | Opens a dialog box in which you select the displayed protective/warning field.                              |
| Changed protective/warning fields  |   | Opens a dialog box in which all protective/warning fields that were changed since the last save are marked. |
| Define                             | Numerical field entry                   | Opens a dialog box in which you define the edges of a selected protective/warning field.                    |
|                                    | Elliptical zone                         | Enables an elliptical protective/warning field to be defined on the work space.                             |
|                                    | Rectangular zone                        | Enables a rectangular protective/warning field to be defined on the work space.                             |
|                                    | Polygon zone                            | Enables a polygonal protective/warning field to be defined on the work space.                               |
| Change                             | Change protective/warning field segment | Enables a segment to be changed in the selected protective/warning field.                                   |



|                             |   |   |
|-----------------------------|---|---|
|                             | Change protective/warning field segment for all field | Enables a segment of all protective or all warning field boundaries to be changed at the same time. |
|                             | Reduce zone limits                                    | Opens a dialog box in which you reduce the zone limits of the selected protective/warning field.    |
|                             | Blank out segments                                    | Enables a segment to be blanked out in the selected protective/warning field contour.               |
| Reference contour           | Set   | Enables a reference contour to be defined in the selected protective field contour.                 |
|                             | Reset   | Enables a reference contour to be highlighted in the selected protective field contour.             |
| Delete                      |   | Deletes the selected protective or warning field.   |
| Printing                    |   | Prints the graphic display and some parameters of the selected protective/warning field.            |
| Transfer from PC to scanner |   | Transfers one or more selected protective/warning field configurations to the AG4.                  |

## 7.1.6 System data

Table 11. Menu items in the System data menu

| Menu item                              | Function   |
|--|--|
| Load status information from the AG4   | Transfers the status information from the AG4 to the software.   |
| Display the scanner's diagnostics list | Loads an incident list from the AG4 and opens the list in a dialog box.                                |
| Create service file                    | Opens a dialog box to save the service file in the *.sdc format.                                       |
| Calibrate the front screen             | Opens a dialog in which you calibrate a new front screen.  |
| Reset scanner                          | Resets the safety-related switching outputs on the AG4 (Reset), required, for example, after cleaning. |

### 7.1.7 Security

Table 12. Menu items in the Security menu

| Menu item                  | Function  |
|----------------------------|---|
| Change authorization level | Opens a dialog box in which you can log in with another authorization level.  |
| Change password            | Opens a dialog box in which you enter a new password for the selected authorization level for the login on the AG4.   |
| Reset password             | Opens a dialog box in which you enter a new password for the Authorized Customer (AC) authorization level for the login on the AG4.<br><b>Need to contact Banner for access to this function.</b> |

### 7.1.8 Help

Table 13. Menu items in the Help menu






| Menu item                    | Function  |
|------------------------------|---|
| AG4 Product Manual           | Opens the AG4's Product manual as a PDF file.                             |
| AG4soft Manual               | Opens the AG4soft configuration and diagnostics software manual as a PDF. |
| AG4 Applications information | Opens copy of the AG4 reference material                                  |
| AG4 System Checkout summary  | Opens copy of the AG4 Checkout procedures                                 |

## 7.2 Interface Button Functions

The AG4soft interface has worksheet toolbars to display buttons for various functions summarized in the tables below.


### 7.2.1 Common Worksheet Buttons

Table 14. List of buttons and associated functions

| Icon  | Button/Function            | Comment   |
|---|----------------------------|---|
|  | Zoom                       | Reduces the work space and the displayed diagram in steps.  |
|  | Unzoom                     | Enlarges the work space and the displayed diagram in steps.   |
|  | Show all                   | Enlarges the work space and the displayed diagram to full size of 70 x 70 meters.                         |
|  | Change authorization level | Opens the <b>Change authorization level dialog box</b> . You can log in with another authorization level. |
|  | Exit configuration program | Exits the software.   |










## 7.2.2 Measured contour display buttons

Table 15. Measured contour display buttons

| Icon  | Button/Function                 | Comment  |
|---|---------------------------------|--|
|  | Displayed field pairs selection | Permits field pair boundaries to appear in the workspace |

## 7.2.3 Configuration buttons

















Table 16. Configuration buttons

| Icon  | Button/Function   | Comment   |
|---|---|---|
|    | Load configuration data from file                           | Accesses the AG4 folder for configuration file review or changes  |
|    | Save configuration data as a file                           | Save a configuration file in the folder   |
|    | Print configuration data                                    | Prints data   |
|    | Load configuration data from a file and transfer to scanner | Opens configuration file and sends it to the AG4  |
|    | Retrieves configuration data from scanner                   |   |
|  | Transfer configuration data from PC to scanner              | Sends a configuration to the AG4 for use as the active operational settings   |
|  | Change configuration data with the wizard                   | Step by step process for beginners  |
|  | Change configuration data                                   | Accesses a table of parameters that summarizes a configuration. Some parameters can be changed with the use of this function. |
|  | Set default configuration values in the scanner             | A <b>read only</b> file used as a template to start a new configuration.  |

### 7.2.3 Protective/warning fields definition buttons

The following buttons are used for specific functions in the **Protective/warning fields definition** worksheet.

Table 17. Protective/warning fields definition buttons






| Icon  | Button  | Function   |
|---|---|--|
|    | Displayed field pairs selection                                 |  |
|    | Load protective/warning field from a file                       |  |
|    | Save protective/warning field as a file                         |  |
|    | Print protective/warning field                                  |  |
| No image  | Select protective/warning field                                 | A drop down field selection window in the <b>Protective/warning field worksheet</b> . Used to enable the field that in the workspace for editing purposes. |
|    | Enter protective/warning field numerically                      | For setting field boundary limits numerically.   |
|    | Define elliptical protective/warning field                      | For setting an elliptical field boundary shape.  |
|   | Define rectangular protective/warning field                     | For setting a rectangular field boundary shape.  |
|  | Define polygonal protective/warning field                       | For setting a polygon field boundary shape.  |
|  | Change protective/warning segment                               | For editing an existing field boundary.  |
|  | Change protective/warning segment with all fields               | For editing all existing field boundaries at the same time.  |
|  | Reduce protective/warning field limits                          | For reducing an existing field boundary.   |
|  | Blank out protective/warning field segment                      | For creating an unmonitored zone within an existing field boundary.  |
|  | Define protective field segment as reference contour            | For creating a reference segment within a field boundary. Used when the application requires a monitored reference surface for greater safety integrity.   |
|  | Reset reference contour definition for protective field segment | For resetting the reference surface limits   |
|  | Delete protective/warning field                                 | For eliminating the reference surface limits   |
|  | Transfer changed protective/warning fields from PC to scanner   | For transferring only the protective/warning field information to the AG4.   |

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### 7.2.4 System data buttons

The following buttons are used for specific functions in the **Protective/warning fields definition** worksheet.

Table 18. System data buttons

| Icon  | Button   | Function  |
|---|--|---|
|  | Transfer status information from Scanner to PC | For reviewing the operations settings of the AG4                      |
|  | Display the scanner's diagnostics list         | Displays information needed for trouble shooting and remedial actions |
|  | Create service file                            |   |
|  | Calibrate the front screen                     | Used after cleaning or replacing the screen (window)                  |
|  | Reset scanner                                  | Returns the AG4 to its factory configuration settings                 |

PRELIMINARY

*The list of standards below is included as a convenience for users of this Banner product. Inclusion of the standards below does not imply that the product complies specifically with any standard, other than those specified in the Specifications section of this manual.*

## SOURCES

### **OSHA Documents**

**Superintendent of Documents  
Government Printing Office**  
P.O. Box 371954  
Pittsburgh, PA 15250-7954  
Tel: (202) 512-1800  
<http://www.osha.gov>

### **ANSI Accredited Standards**

**American National Standards Institute (ANSI)**  
11 West 42nd Street  
New York, NY 10036  
Tel: (212) 642-4900  
<http://www.ansi.org>

### **B11 Documents**

**Safety Director  
The Association for Manufacturing  
Technology (AMT)**  
7901 Westpark Drive  
McLean, VA 22102  
Tel: (703) 893-2900  
<http://www.mfgtech.org>

### **RIA Documents**

**Robotics Industries Association (RIA)**  
900 Victors Way, P.O. Box 3724  
Ann Arbor, MI 48106  
Tel: (734) 994-6088  
<http://www.robotics.org>

### **NFPA Documents**

**National Fire Protection Association**  
1 Batterymarch Park  
P.O. Box 9101  
Quincy, MA 02269-9101  
Tel: (800) 344-3555  
<http://www.nfpa.org>

### **Alternate sources for these, plus ISO, IEC, EN, DIN, and BS Standards:**

#### **Global Engineering Documents**

15 Inverness Way East  
Englewood, CO 80112-5704  
Tel: (800) 854-7179  
<http://www.global.ihs.com>

#### **National Standards Systems Network (NSSN)**

25 West 43rd Street  
New York, NY 10036  
Tel: (212) 642-4980  
<http://www.nssn.com>

#### **Document Center, Inc.**

111 Industrial Road, Suite 9  
Belmont, CA 94002  
Tel: (650) 591-7600  
<http://www.document-center.com>

## U.S. Application Standards

**ANSI B11.1** Mechanical Power Presses

**ANSI B11.2** Hydraulic Power Presses

**ANSI B11.3** Power Press Brakes

**ANSI B11.4** Shears

**ANSI B11.5** Iron Workers

**ANSI B11.6** Lathes

**ANSI B11.7** Cold Headers and Cold Formers

**ANSI B11.8** Drilling, Milling, and Boring

**ANSI B11.9** Grinding Machines

**ANSI B11.10** Metal Sawing Machines

**ANSI B11.11** Gear Cutting Machines

**ANSI B11.12** Roll Forming and Roll Bending Machines

**ANSI B11.13** Single- and Multiple-Spindle Automatic Bar and Chucking Machines

**ANSI B11.14** Coil Slitting Machines

**ANSI B11.15** Pipe, Tube, and Shape Bending Machines

**ANSI B11.16** Metal Powder Compacting Presses

**ANSI B11.17** Horizontal Extrusion Presses

**ANSI B11.18** Machinery and Machine Systems for the Processing of Coiled Strip, Sheet, and Plate

**ANSI B11.19** Performance Criteria for Safeguarding

**ANSI B11.20** Manufacturing Systems

**ANSI B11.21** Machine Tools Using Lasers

**ANSI B11.22** Numerically Controlled Turning Machines

**ANSI B11.23** Machining Centers

**ANSI B11.24** Transfer Machines

**ANSI B11.TR3** Risk Assessment

**ANSI/RIA R15.06** Safety Requirements for Industrial Robots and Robot Systems

**NFPA 79** Electrical Standard for Industrial Machinery

## OSHA Regulations

**OSHA Documents listed are part of:** Code of Federal Regulations Title 29, Parts 1900 to 1910

**OSHA 29 CFR 1910.212** General Requirements for (Guarding of) All Machines

**OSHA 29 CFR 1910.147** The Control of Hazardous Energy (lockout/tagout)

**OSHA 29 CFR 1910.217** (Guarding of) Mechanical Power Presses

## International/European Standards

**ISO 12100-1 & -2 (EN 292-1 & -2)** Safety of Machinery – Basic Concepts, General Principles for Design

**ISO 13857** Safety Distances . . . Upper and Lower Limbs

**ISO 13850 (EN 418)** Emergency Stop Devices, Functional Aspects – Principles for Design

**ISO 13851 (EN 574)** Two-Hand Control Devices – Functional Aspects – Principles for Design

**ISO 62061** Functional Safety of Safety-Related Electrical, Electronic and Programmable Control Systems

**ISO 13849-1 (EN 954-1)** Safety-Related Parts of Control Systems

**ISO 13855 (EN 999)** The Positioning of Protective Equipment in Respect to Approach Speeds of Parts of the Human Body

**ISO 14121 (EN 1050)** Principles of Risk Assessment

**ISO 14119 (EN 1088)** Interlocking Devices Associated with Guards – Principles for Design and Selection

**IEC 60204-1** Electrical Equipment of Machines Part 1: General Requirements

**IEC 61496** Electro-sensitive Protection Equipment

**IEC 60529** Degrees of Protection Provided by Enclosures

**IEC 60947-1** Low Voltage Switchgear – General Rules

**IEC 60947-5-1** Low Voltage Switchgear – Electromechanical Control Circuit Devices

**IEC 60947-5-5** Low Voltage Switchgear – Electrical Emergency Stop Device with Mechanical Latching Function



**For more information:  
Contact your local Banner  
representative  
or  
Banner Corporate Offices  
around the world.**

#### **Corporate Headquarters**

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Fax: 81-6-6309-0416  
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Fax: 886-2-8751-2966  
www.bannerengineering.com.tw  
info@bannerengineering.com.tw

#### **India**

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**WARRANTY:** Banner Engineering Corp. warrants its products to be free from defects for one year. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.