



## **ARIS ASCII Grid Reader for ArcGIS 10.3 User's Manual**

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**ARIS B.V.**  
<http://www.aris.nl/>

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## 1. Introduction

ARIS ASCII Grid Reader for ArcGIS is designed to view an ASCII Grid in ArcCatalog and ArcMap stretched between the real MIN and MAX values without having to convert those files or to calculate statistics.

Spatial models, which have been written outside of standard GIS applications (i.e. written in C/C++ or Fortran), often use the ASCII Grid format for storing intermediate and / or final results. In order to view this data in ArcMap, in older versions of ArcGIS it was necessary to use ArcToolbox to perform a conversion from ASCII Grid to a native ESRI GRID. This ESRI GRID can then be viewed in ArcMap. Another option would be to use ArcObjects to perform the conversion in the background, and show the result.

ARIS created a solution, long before the native support by ESRI, which makes it possible to preview ASCII Grids directly and without conversion in ArcCatalog, and to add them to ArcMap. All the default raster operations in ArcMap (for example the Raster Calculator) can be applied to the ASCII Grid. Floating-point and integer type ASCII Grids are recognized automatically. The ESRI driver used to show the GRID mostly in one grey color in previous ArcGIS versions. The ARIS driver always shows the GRID between the real MIN and MAX values, giving a realistic view of the data.

The ARIS ASCII Grid Reader is implemented as a dll which, once placed in the correct ArcGIS directory, is used to identify files in the ASCII Grid format.

The ARIS ASCII Grid Reader 2.0 can be used with ArcGIS 8 or 9 (ArcView, ArcEditor or ArcInfo). If you need this, download the "ARIS ASCII Grid Reader for ArcGIS 9" version.

The ARIS ASCII Grid Reader 3.0 can be used only with ArcGIS 10.0, due to incompatible changes made by ESRI in ArcGIS 10.0. In ArcGIS 10 an ASCII Grid is always read by the native ESRI driver ('AS DESIGNED' by ESRI). This is the reason why ARIS ASCII Grid Reader can only read slightly modified ASCII Grids in ArcGIS 10 (see paragraph 8.1 ARIS modified ASCII Grid format).

The ARIS ASCII Grid Reader 3.1 can be used only with ArcGIS 10.1.

ARIS ASCII Grid Reader 3.2 is suitable for ArcGIS 10.1 and ArcGIS 10.2

ARIS ASCII Grid Reader 3.3 is suitable for ArcGIS 10.3

This manual only describes the ARIS ASCII Grid Reader for ArcGIS 10.3 version.  
For future ArcGIS versions check for a newer version of the ARIS ASCII Grid Reader.

## 2. Installation

### 2.1 Requirements

Required is one of the following ArcGIS 10.3.x licenses:

- ArcGIS for Desktop Basic
- ArcGIS for Desktop Advanced
- ArcGIS for Desktop Enterprise

Additional extensions like Spatial Analyst are not required.

ArcGIS is not required for the "License Manager only" setup.

### 2.2 Setup

Download the setup from <http://www.aris.nl/download>.

The automatic setup needs to be executed by an administrator:

- Single Use License: ARISAsciiGridReaderSetup33.exe (Trial License included)
- Floating License: ARISAsciiGridReaderSetupFL33.exe (License Manager included)

The setup procedure checks if ArcGIS is installed, and determines the installation directory. Any necessary changes in configuration files for ArcGIS are carried out automatically. It may be necessary to explicitly install as administrator. Having administrator privileges is not always sufficient.

Note:

Having a Floating License it is also possible to do a License Manager only setup to avoid the requirement for ArcGIS on the License Manager Server:

- License Manager: ARISAsciiGridReaderSetupLM33.exe

### 2.3 ArcGIS 10

In ArcGIS 10 it may not be possible to disable the default ArcInfo ASCII grid through the ArcGIS Raster Formats form. ESRI declared this is "AS DESIGNED".

To be able to use the ARIS ASCII Grid Reader you may need to use a slightly modified ASCII Grids as outlined in paragraph 8.1 ARIS modified ASCII Grid format

### 2.4 De-installation

De-installation of the ASCII Grid Reader is straightforward, but make sure you exit all ArcGIS applications before de-installing the ASCII Grid Reader.

### 3. Registration

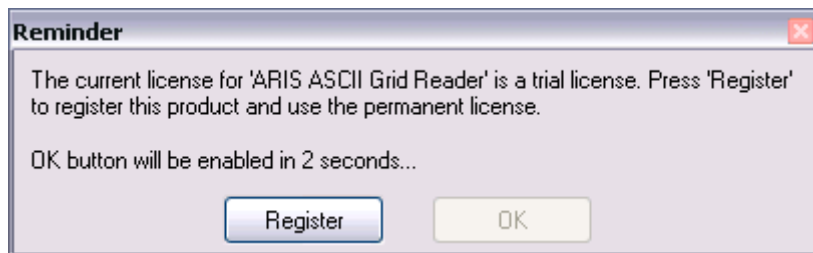
ARIS ASCII Grid Reader has two license types:

- Single Use License. One license is valid for one computer only;
- Floating License. A floating license is handled by a central server and allows a maximum number of users to simultaneously use the executable.

#### 3.1 Single Use License

##### 3.1.1 Trial license

The distributed version of the ASCII Grid Reader is a fully functional version, except that there is a reminder message shown, almost each time you open an ASCII Grid file or when ArcGIS is requesting information from the ARIS ASCII Grid Reader. For this reason you might see many reminder screens, especially when browsing a directory with many ASCII Grids (only in trial license mode).



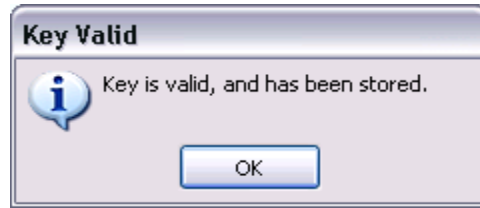
##### 3.1.2 Register

Pressing the *Buy Now!* button will take you to our online store, where you can order this product. Note that you will need the hardware fingerprint of the computer where you want to install the tool, shown in the dialog below (appears when you press *Enter Key*). After you complete your purchase, a personal registration key will be sent to you by email. Please store this key in a safe place.

Pressing the *Enter Key* button will present you with the following dialog, where you must enter your name and the registration key.



Once you have entered a valid registration key, press *OK*. This key will be stored on your PC.



It may be necessary to register explicitly as administrator to let the license key be persistent between sessions (administrator privileges might not be sufficient).

If you have the ARIS License Checker installed, the registration forms are also accessible through the ARIS License Checker. The ARIS License Checker is available without cost from <http://www.aris.nl/download>.

The ARIS License Checker is also a better alternative for registration if you still get reminder messages after successful registration.

### 3.1.3 Update license

When your license is not valid anymore through changes on your PC, you can obtain a new license (fair use policy) after you unregister the license using the ARIS License Checker. The ARIS License Checker is available without cost from <http://www.aris.nl/download>.

Send an e-mail to [helpdesk@aris.nl](mailto:helpdesk@aris.nl) with:

- ARIS product name and version
- original hardware fingerprint (active license, if available)
- registration name (active license)
- license key (active license)
- confirmation code (from unregister)
- new hardware fingerprint (from register)

If you are entitled to receive a new license key, a new key will be sent to you by e-mail as soon as possible (same day, but might also take some days as this is not an automated process).

## 3.2 Floating License

### 3.2.1 Register

A floating license is handled by a central server and allows a maximum number of users to simultaneously use the tool. This paragraph describes how to register and start the central server license manager.

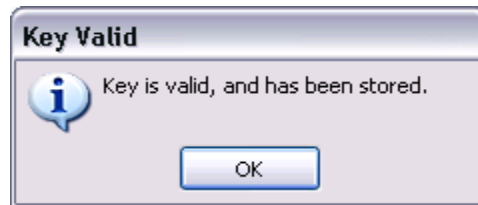
The floating license executable has no evaluation period. After the floating license executable is installed the Floating License must be registered first. Entering the following command in a DOS-box does this:

```
cd "\Program Files (x86)\ARIS\ASCIIGridReader"
ARISAsciiGridReaderA.exe SERVER REGISTER
```

The "Enter key" dialog-box appears:



Remember the hardware fingerprint and send it back to ARIS (mail to [helpdesk@aris.nl](mailto:helpdesk@aris.nl)). In return you will receive a name and key to register. You can enter these in the "Enter Key" dialog. A message box should confirm your registration: Once you have entered a valid registration key, press *OK*. This key will be stored on your PC.

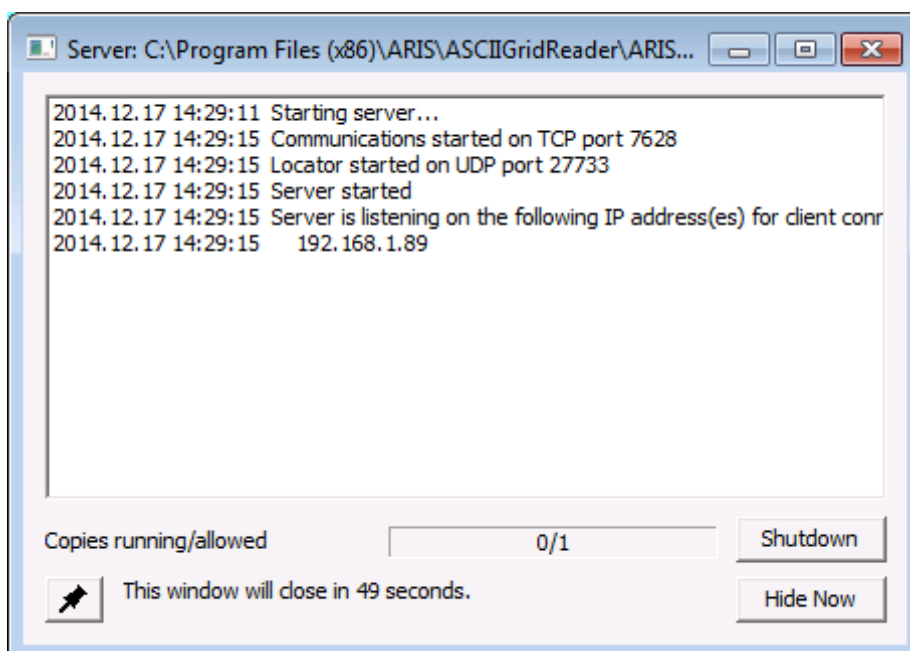


It may be necessary to register explicitly as administrator to let the license key be persistent between sessions (administrator privileges might not be sufficient).

After you have registered you can start the license manager:

ARISAsciiGridReaderA.exe SERVER

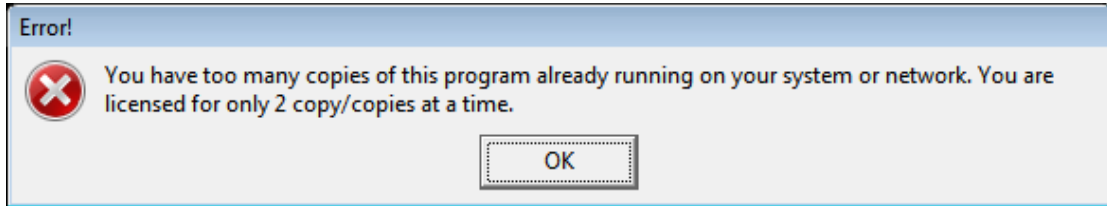
This shows the server dialog-box for sixty seconds. There can be only one server instance at a time per program.



The Floating License manager may require a port to be opened in the firewall as will be notified while starting the license manager.

When the server is running the tool can be used on any client machine. A maximum number of users can use the tool at any time. The server window displays how many users are running the tool and how many are allowed to run the tool. For each licensed user two licensed copies are provided in order to enable a user to use the tool in ArcGIS and ArcCatalog simultaneously.

When someone tries to use the tool while no licenses are available that user receives an error message:



The tool can only be used after another user releases his copy. Note that it may take a while (approximately 30 sec.) before the server notices that someone has exited the tool.

Other useful commands on the server-side are:

To start the server and display the server window for a certain time period instead of the normal 60 seconds:

```
ARISAsciiGridReaderA.exe SERVER10
```

This will display the server window for a maximum of 10 seconds. There should be no blanks between the SERVER and the time-out period.

To start the server window without a timeout use the command:

```
ARISAsciiGridReaderA.exe SERVERX
```

Alternatively you can press the timer-button in the server window.

To shut down the server:

```
ARISAsciiGridReaderA.exe SERVERDOWN
```

After this the server must be re-started before any clients can start the executable (in this case ArisFlow).

To unregister the hardware locked program:

```
ARISAsciiGridReaderA.exe SERVER UNREGISTER
```

Note to copy the unregister key in order to be able to obtain a new license key.

### 3.2.2 Update license

When your license is not valid anymore through changes on your PC, you can obtain a new license (fair use policy) after you unregister the license:



ARISAsciiGridReaderA.exe SERVER UNREGISTER

Send an e-mail to [helpdesk@aris.nl](mailto:helpdesk@aris.nl) with:

- ARIS product name and version
- original hardware fingerprint (active license, if available)
- registration name (active license)
- license key (active license)
- confirmation code (from unregister)
- new hardware fingerprint (from register)

If you are entitled to receive a new license key, a new key will be sent to you by e-mail as soon as possible (same day, but might also take some days as this is not an automated process).

## 4. Using ASCII Grid files

### 4.1 Unwanted ArcGIS behaviour

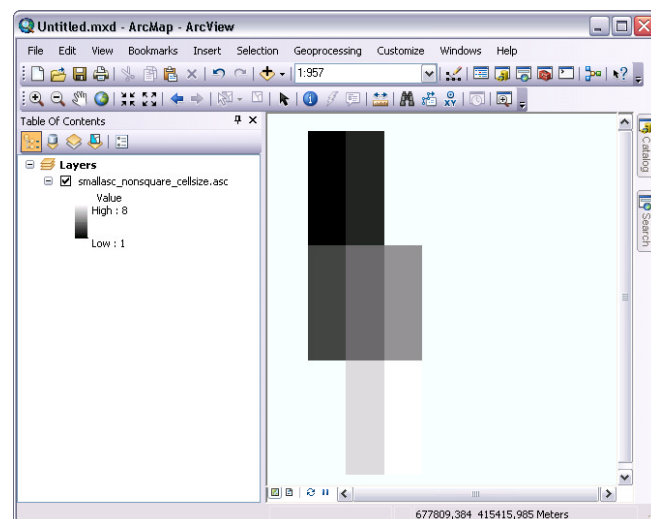
Since ArcGIS 10.0 an ESRI ASCII Grid is **always** read by the default ArcInfo ASCII Grid driver integrated in the ArcGIS software. There is no way to create a workaround to let another driver or reader (like ARIS ASCII Grid Reader) read the ESRI ASCII Grid instead. This is declared "AS DESIGNED" by ESRI.

In order to use the ARIS ASCII Grid Reader you will have to modify the ASCII Grid slightly by adding an extra first line (see 8.1 ARIS modified ASCII Grid format) or use extended features (see 8.2 ARIS extended ASCII Grid format).

### 4.2 Extended features of ARIS ASCII Grid Reader

The ARIS ASCII Grid Reader is capable of reading ASCII Grids with:

- Non-square cell size (rectangular cells)
- Non-numeric Nodata value
- Any order of the keywords in the header



```
ncols 3
nrows 3
xllcorner 677730.076
yllcorner 415321.484
xcellsize 10
ycellsize 30
NODATA_value !
1 2 !
3 4 5
! 7 8
```

Figure 3. Display of ASCII Grid with a non-square cellsize (by xcellsize and ycellsize) and a exclamation mark (!) as Nodata value in ArcMap using ARIS ASCII Grid Reader

See also 8.2 ARIS extended ASCII Grid format for a detailed description.

### 4.3 Starting to use ARIS ASCII Grid Reader

Due to the unwanted "AS DESIGNED by ESRI" behaviour of ArcGIS 10 you might have to modify your grids in a way that ArcGIS does not recognize the file as an ASCII Grid but the ARIS ASCII Grid Reader does.

Add an extra first row to the ASCII Grid file as specified in paragraph 8.1 (ARIS modified ASCII Grid format). So you add any of the following as the first line:

- newline (empty first row)
- ASCII GRID (ARIS)
- your own meta-data or any other text as long it is not recognized by ArcGIS

The ARIS ASCII Grid Reader will skip the first line and read the rest of the file (being ESRI ASCII Grid).

Note: if you use a non-square cell size keywords the extra first line is not necessary

Look in the directory <programs>\ARIS\ASCIIGridReader\Example for some examples:

- nonsquare\_xcellsize\_!.asc

ASCII Grid with an empty first row: being read by ARIS ASCII Grid Reader

Contains XCELLSIZE and YCELLSIZE for rectangular cells and an exclamation mark (!) as NODATA value.

- nonsquare\_xydim\_null.asc

ASCII Grid with " Example with XDIM YDIM and NULL as NODATA" on the first row: being read by ARIS ASCII Grid Reader

Contains XDIM and YDIM for rectangular cells and the text "NULL" as NODATA value.

#### 4.4 ArcMap

In ArcMap, use the *Add Data* button to add an ASCII Grid to the map or use *Catalog Window* to drag a file to ArcMap:

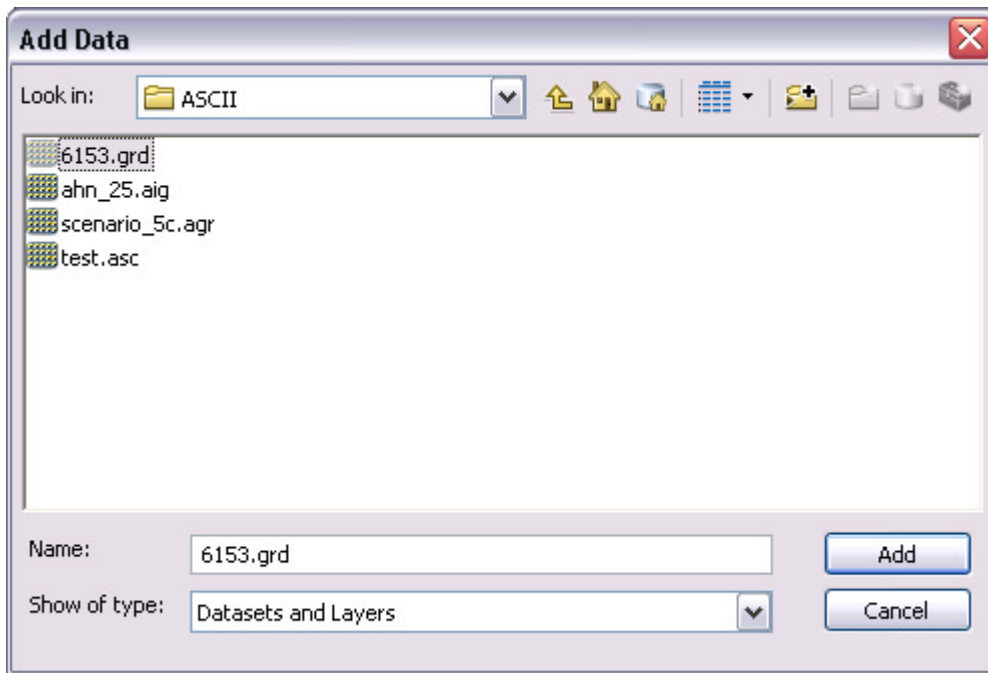


Figure 3. Add ASCII Grid directly to ArcMap

Note: Only ASCII Grid files that have a file extension \*.asc, \*.grd, \*.agr or \*.aig can be used. Other file extensions will be ignored.

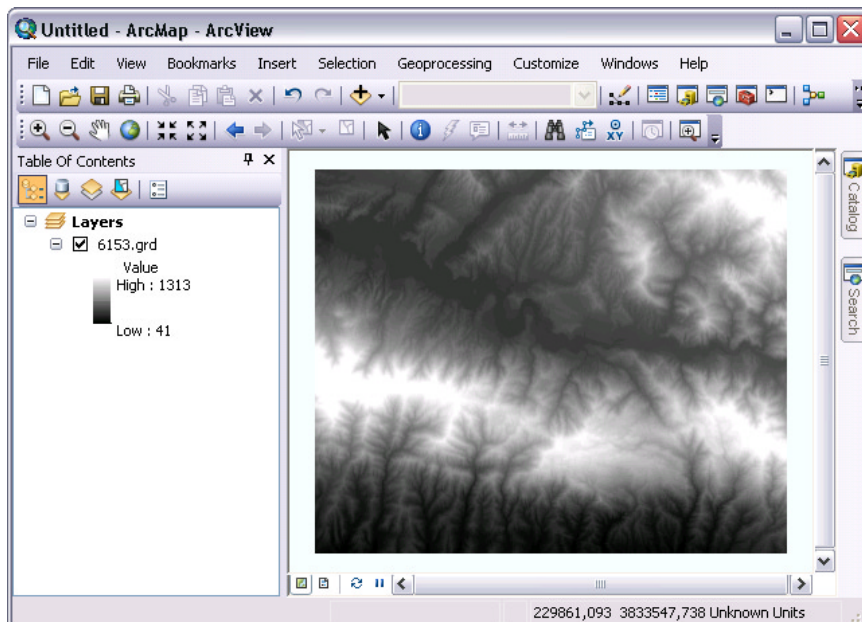


Figure 4. View ASCII Grid between real MIN and MAX in ArcMap

Switch quickly to a (another) color ramp by double clicking in the legend on the grey scale ramp.

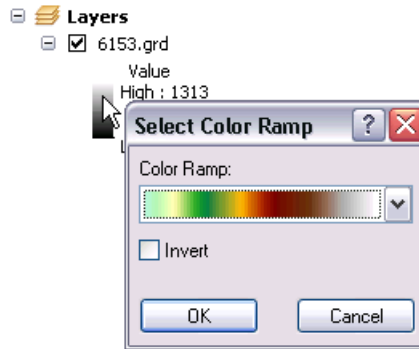


Figure 5. Set another Color Ramp on the ASCII GRID

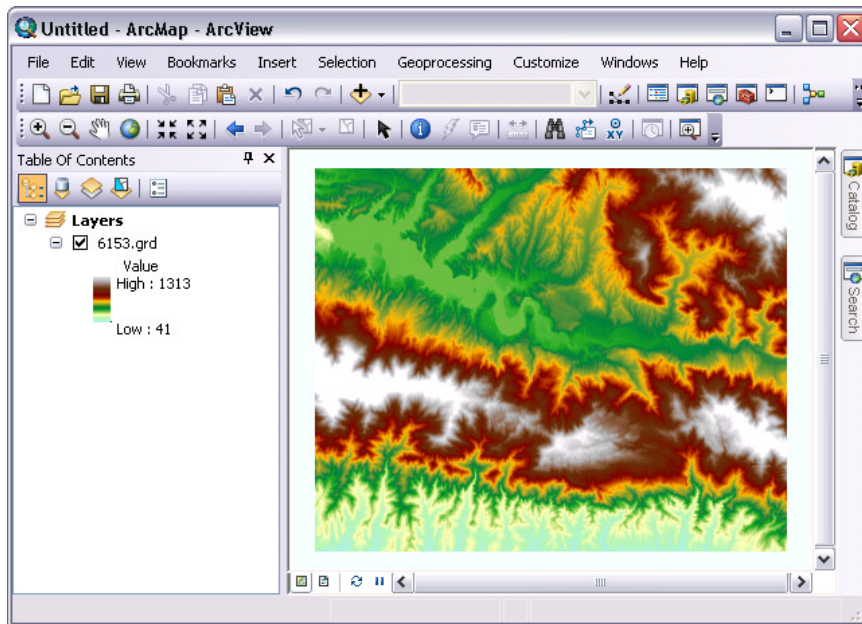


Figure 6. View ASCII Grid with color ramp

Likewise, all standard functions, such as the *Raster Calculator* and other *Spatial Analyst functions* are available.

## 4.5 ArcCatalog

ArcCatalog recognizes ASCII Grids automatically and a Preview is created instantly.

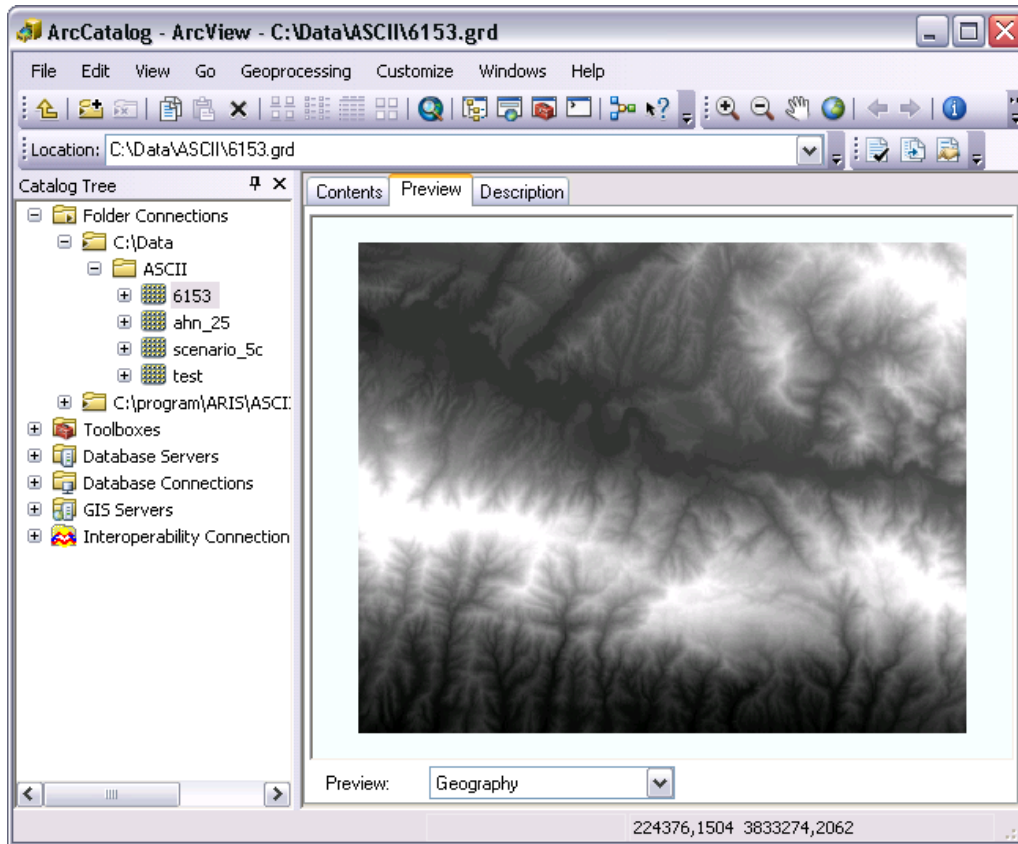


Figure 7. Preview of an ASCII Grid shown in ArcCatalog.

In ArcCatalog also standard functions are available, such as *Export to other format*.

## 5. Projections

Projection information is passed to ArcMap and ArcCatalog, if a projection file accompanies the ASCII grid. Projection files should have the same name as the ASCII file, but with a .prj extension. For instance, if the ASCII grid is named *myraster.asc*, the projection file should be called *myraster.prj*. Both files should be placed in the same folder.

Even if all your data uses the same projection, you can still add a projection file to the ASCII grid, since this will stop ArcMap from warning you that your raster doesn't contain projection information.

The easiest way to find a valid projection file is to browse the ArcGIS installation folder, in the subfolder *Coordinate Systems*. For instance, the projection file for WGS 1984 can be found in *C:\Program Files\ArcGIS\Desktop10.3\Coordinate Systems\Geographic Coordinate Systems\World*. Just copy this file to the folder containing your ASCII grid and rename the copy to match the base name of the grid.

## 6. FAQ

- Q: After registering my license I get a reminder message every time I start up ArcGIS.  
A: Be sure to register the tool as an administrator. Note: Having administrator-privileges may not be sufficient.
- Q: I installed the ASCII Grid Reader, but ArcMap and ArcCatalog still don't see ASCII Grids.  
A: Check whether the right version of ARIS ASCII Grid Reader is installed (chapter 7) for your current version of ArcGIS. And if the ASCII Grids comply to the definitions as in chapter 8 (ASCII Grid Format).
- Q: While browsing to open an ASCII Grid I see many times a license reminder message.  
A: ArcGIS is requesting (too) many times information about all the files you might want to open in a directory. When you are using a trial license this may result in many reminder messages. Testing of the trial license is best done in directories with only a couple of files. Try the files in <programs>\ARIS\ASCIIGridReader\Example. As soon as ARIS ASCII Grid Reader is registered (licensed) you will not see these reminder messages anymore.
- Q: After registering my license I still get a reminder message.  
A: Because ArcGIS is requesting (too) many times information the registration might fail. After restarting ArcGIS it might be solved. Even better is to use the ARIS License Checker to register your license (no need to start ArcGIS). The ARIS License Checker is available without cost from <http://www.aris.nl/download>.
- Q: Some ASCII Grids work, others don't, why is that?  
A: The ASCII Grid Reader currently only recognizes files that have a file extension \*.asc, \*.grd, \*.agr or \*.aig. If your files are called, say, myraster.ras, or any other file extension, you have no option other than renaming it. If that's not feasible for you, send us an email and we'll consider adding your file extension in the next version.  
A: Possibly your ASCII Grid is not in the correct format, see chapter 8 (ASCII Grid Format) to check if your file complies with the ESRI ASCII Grid Format, the ARIS modified ASCII Grid Format or the ARIS extended ASCII Grid Format.
- Q: Does the ASCII Grid Reader work with newer ArcGIS versions?  
A: For newer ArcGIS versions you probably need another ASCII Grid Reader version (if available).
- Q: I have removed ASCII Grid Reader. However when I start ArcGIS I still see pop-up messages telling me I have to register.  
A: Before de-installing ASCII Grid Reader make sure you have no ArcGIS applications running. If, by accident, you did remove ASCII grid reader when ArcMap or ArcCatalog was still running your best bet is to re-install ASCII grid reader and then remove it again after you exited all ArcGIS applications.
- Q: In ArcGIS 9.2 and higher, default support has been added for ASCII grid. Do I still need the ARIS ASCII Grid Reader?  
A: The default ASCII Grid support in ArcGIS 9.2 until ArcGIS 10.0 shows the grid stretched between a theoretically minimum and maximum. This usually results in a grey or black image. The ARIS ASCII Grid Reader shows your grid stretched between the minimum and maximum values in the ASCII Grid file and thus gives a realistic view of you grid.



## 7. History

This is the version history for the ARIS ASCII grid reader. The version number can be found by locating the file *asc.dll* or *ARISAsciiGridReader.dll*. In a default ArcGIS installation this file should be in the following folder:

*C:\Program Files\ArcGIS\Desktop10.3\bin\gdalplugins*

Right click on this file and choose *Properties*. The *Version* tab contains version information.

Version	Features
1.0	First release for ArcGIS 8
1.1	Added support for .grd and .agr file name extensions
1.2	Added support for projections in a .prj file
1.2.1	ArcGIS does not crash anymore when removing ASCII grids
1.2.2	ArcGIS 9.1 does not disappear anymore when starting up with ASCII Grid Reader Solved the popup message flood occurring sometimes when starting an unregistered version of ASCII Grid Reader ArcGIS does not crash anymore when previewing a .prj file Check on locked files when removing/updating ASCII Grid Reader installation
2.0.1	Installation procedure support for installing with ArcGIS 9.2 Added support for .aig file name extension
2.0.2	Documentation update for ArcGIS 9.3 and 9.3.1
3.0.0	Support for use with ArcGIS 10.0 through modified ASCII Grid format Added support for non-square cellsize (rectangular cells) Non-numeric Nodata value is accepted Any order of keywords in header is made possible
3.0.1	Better check on valid ArcGIS versions in setup.
3.1.0	Program and setup changed for compatibility with ArcGIS 10.1 Added some non-square cellsize examples.
3.2.1	Support for use with ArcGIS 10.2 (and ArcGIS 10.1) and 64-bit Windows (as 32-bit program).
3.2.2	Support for use with ArcGIS 10.2.1 added.
3.2.3	Floating License as a new license type
3.3.0	Support for use with ArcGIS 10.3 and 10.3.1

## 8. ASCII Grid Format

### 8.1 ARIS modified ASCII Grid format

The ARIS ASCII Grid Reader for ArcGIS 10 is able to read a modified ASCII Grid. The format is the same as the ESRI ASCII Grid Format or the ARIS extended ASCII Grid format but starting with only one extra line containing anything but an ASCII Grid keyword (case insensitive). It is also possible to add an empty row at the first line of the ASCII Grid.

```
<newline | any text != ESRI ASCII GRID keyword>
<NCOLS xxx>
<NROWS xxx>
<XLLCENTER xxx | XLLCORNER xxx>
<YLLCENTER xxx | YLLCORNER xxx>
<CELLSIZE xxx>
{NODATA_VALUE xxx}
row 1
row 2
.
.
.
row n
```

Examples of the ARIS modified ASCII Grid:

```
<empty row>
ncols 3
nrows 3
xllcorner 677730.076
yllcorner 415321.484
cellsize 30
NODATA_value -9999
1 2 -9999
3 4 5
-9999 7 8
```

```
Your own text
ncols 3
nrows 3
xllcorner 677730.076
yllcorner 415321.484
cellsize 30
NODATA_value -9999
1 2 -9999
3 4 5
-9999 7 8
```

```
ASCII GRID (ARIS)
ncols 3
nrows 3
xllcorner 677730.076
yllcorner 415321.484
cellsize 30
NODATA_value -9999
1 2 -9999
3 4 5
-9999 7 8
```

## 8.2 ARIS extended ASCII Grid format

The ARIS ASCII Grid Reader for ArcGIS 10 is able to read an extended ASCII Grid. The format is the same as the ESRI ASCII Grid Format or the ARIS modified ASCII Grid format but also defines:

- Non-square cellsize
- Non-numeric Nodata Values (like "NULL", "NA", "mv", "!", "-")
- Keywords in any order in the header (Even the optional NODATA\_VALUE may be the first keyword in the file)

The first line to make it an ARIS custom ASCII Grid is not necessarily needed with a non-square cellsize or with some different order of the keywords (like NODATA\_VALUE on the first line).

```
{newline | any text != ESRI ASCII GRID keyword}
<NCOLS xxx>
<NROWS xxx>
<XLLCENTER xxx | XLLCORNER xxx>
<YLLCENTER xxx | YLLCORNER xxx>
<CELLSIZE xxx> | <XCELLSIZE xxx> | <XDIM xxx>
                  | <YCELLSIZE xxx> | <YDIM xxx>
{NODATA_VALUE xxx|aaa}
row 1
row 2
.
.
.
row n
```

Where

"xxx" is any number and "aaa" is almost any standard ASCII string of one or more characters. XCELLSIZE and XDIM is the cellsize (dimension) on the X-axis YCELLSIZE and YDIM is the cellsize (dimension) on the Y-axis

The XDIM and YDIM keywords can be used instead of XCELLSIZE and YCELLSIZE for better compatibility with other software or other ASCII Grid formats.

Examples of the ARIS extended ASCII Grid:

```
<empty row>
ncols 3
nrows 3
xllcorner 677730.076
yllcorner 415321.484
cellsize 30
NODATA_value !
1 2 !
3 4 5
! 7 8
```

```
ncols 3
nrows 3
xllcorner 677730.076
yllcorner 415321.484
xcellsize 30
ycellsize 10
NODATA_value -9999
1 2 -9999
3 4 5
-9999 7 8
```

```
ncols 3
nrows 3
xllcorner 677730.076
yllcorner 415321.484
xdim 30
ydim 10
NODATA_value NULL
1 2 NULL
3 4 5
NULL 7 8
```

### 8.3 ESRI ASCII Grid Format

This description is taken from the ArcGIS Desktop documentation.

The ASCII file must consist of header information containing a set of keywords, followed by cell values in row-major order. The file format is:

```
<NCOLS xxx>
<NROWS xxx>
<XLLCENTER xxx | XLLCORNER xxx>
<YLLCENTER xxx | YLLCORNER xxx>
<CELLSIZE xxx>
{NODATA_VALUE xxx}
row 1
row 2
.
.
.
row n
```

where xxx is a number, and the keyword nodata\_value is optional and defaults to -9999. Row 1 of the data is at the top of the raster, row 2 is just under row 1, and so on.

Example of an ESRI ASCII Grid:

```
ncols 3
nrows 3
xllcorner 677730.076
yllcorner 415321.484
cellsize 30
NODATA_value -9999
1 2 -9999
3 4 5
-9999 7 8
```

The nodata\_value is the value in the ASCII file to be assigned to those cells whose true value is unknown. In the raster they will be assigned the keyword NODATA.

Cell values should be delimited by spaces. No carriage returns are necessary at the end of each row in the raster. The number of columns in the header is used to determine when a new row begins.

The number of cell values must be equal to the number of rows times the number of columns, or an error will be returned.

## Appendix A. License Agreement

ARIS Software License Agreement for ARIS ASCII Grid Reader for ArcGIS

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This is a license agreement and not an agreement for sale. This license agreement (hereinafter referred to as AGREEMENT) is between the end user (hereinafter referred to as LICENSEE) and ARIS b.v., The Netherlands (hereinafter referred to as ARIS), and gives the LICENSEE certain limited rights to use the proprietary ARIS software ASCII Grid Reader for ArcGIS, examples, on-line and hardcopy documentation and updates (if applicable), hereinafter referred to as PRODUCT. All rights not specifically granted in this AGREEMENT are reserved to ARIS.

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## ARIS ASCII Grid Reader for ArcGIS 10.3 - User's Manual

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