Saving and Restoring Parameters in DriveWindow 2

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1. Preface

This document is an overall description about saving and restoring parameters in the 32-bit **DriveWindow** (version 2) for NT. This document is valid for version 2.0 Beta 7 and newer only.

1.1. Purpose

Saving and restoring parameters in DriveWindow 2 is needed to make commissioning, maintenance, and debugging of drives and drive systems fast and easy.

1.2. Product

DriveWindow 2 for NT is a 32-bit Windows program running under Windows NT 4.0 SP3 (or newer) operating system in a x86 PC.

1.3. Definitions, Terminology and Abbreviations

Application Program	An application program (sometimes shortened to application) is any program designed to perform a specific function directly for the user or, in some cases, for another application program.
Application Program Interface	An application program interface (API - and sometimes spelled application programming interface) is the specific method prescribed by a computer operating system or by an application program by which a programmer writing an application program can make requests of the operating system or another application.
Backup	The activity of copying files or databases so that they will be preserved in case of equipment failure or other catastrophe.
Browse	To view available items by looking through lists of folders, files, user accounts, groups, domains, computers, etc.
Click	To press and release a mouse button quickly.
Client	An object that requests services from another object.
COM	An open architecture for cross-platform development of client/server applications based on object-oriented technology as agreed upon by Digital Equipment Corporation and Microsoft Corporation. The Component Object Model defines an interface (similar to an abstract base class), IUnknown, from which all COM-compatible classes are derived.
Computer	A device that accepts information (in the form of digital data) and manipulates it for some result based on a program or sequence of instructions on how data is to be processed.
Default	In computer technology, a default is a predesigned value or setting that is used by a computer program when a value or setting is not specified by the program user.

Device	In the context of computer technology, a device is a unit of hardware, outside or inside the case or housing for the essential computer (processor, memory, and data paths) that is capable of providing input to the essential computer or of receiving output or of both.
Downloading	The transmission of a file from one computer system to another, usually smaller computer system
Drive	Equipment that converts electric to mechanical power.
Graphical User Interface	A GUI is a graphical (rather than purely textual) user interface to a computer.
Hardware	Hardware is the physical aspect of computers, telecommunications, and other information technology devices. The term arose as a way to distinguish the "box" and the electronic circuitry and components of a computer from the program you put in it to make it do things.
Link	1) Using hypertext, a link is a selectable connection from one word, picture, or information object to another. 2) In telecommunications, a link is a physical (and, in some usages, a logical) connection between two points.
Module	In computers, in general, a separate unit of software or hardware.
Network	A series of points or nodes interconnected by communication paths. Networks can interconnect with other networks and contain subnetworks.
Object	A programming structure encapsulating both data and functionality that are defined and allocated as a single unit and for which the only public access is through the programming structure's interfaces.
OLE	A way to transfer and share information between applications.
OPC	OLE for Process Control. An emerging software technology standard (http://www.opcfoundation.org/) that connects Windows-based process control systems to hardware devices on the plant floor. This technology provides a common interface to different hardware devices, allowing process control applications to communicate with broad set of devices.
Operating System	An operating system (sometimes abbreviated as "OS") is the program that, after being initially loaded into the computer by a boot program, manages all the other programs in a computer. The other programs are called applications or application programs. The application programs make use of the operating system by making requests for services through a defined application program interface (API). In addition, users can interact directly with the operating system through a user interface such as a command language or a graphical user interface (GUI).

Parameter	In information technology, a parameter (from Greek for, roughly, through measure) is an item of information - such as a name, a number, or a selected option - that is passed to a program by a user or another program. Parameters affect the operation of the program receiving them.
Password	A password is an unspaced sequence of characters used to determine that a computer user requesting access to a computer system is really that particular user.
PC	Personal Computer.
Process	When a program runs, a Windows NT process is created. A process is an object type which consists of an executable program, a set of virtual memory addresses, and one or more threads
Program	In computing, a program is a specific set of ordered operations for a computer to perform. In the modern computer that John von Neumann outlined in 1945, the program contains a one-at-a-time sequence of instructions that the computer follows.
Protocol	In networking, a formal set of rules governing the format, timing, sequencing, and error control of exchanged messages on a data network; may also include facilities for managing a communications link and/or contention resolution; a protocol may be oriented toward data transfer over an interface, between two logical units directly connected, or on an end-to-end basis between two end users over a large and complex network.
Registry	In the Microsoft Windows operating systems, the Registry is a single place for keeping such information as what hardware is attached, what system options have been selected, how computer memory is set up, and what application programs are to be present when the operating system is started.
Select	To mark an item so that a subsequent action can be carried out on that item. You usually select an item by clicking it with a mouse or pressing a key. After selecting an item, you choose the action that you want to affect the item.
String	In programming, a string is a contiguity sequence of symbols or values, such as a character string (a sequence of characters) or a binary digit string (a sequence of binary values).
Software	Software is a general term for the various kinds of programs used to operate computers and related devices.
Uploading	The transmission of a file from one computer system to another, usually larger computer system.

User Interface	In information technology, the user interface (UI) is everything designed into an information device with which a human being may interact -- including display screen, keyboard, mouse, light pen, the appearance of a desktop, illuminated characters, help messages, and how an application program or a Web site invites interaction and responds to it.
Window	A rectangular area on your screen in which you view an application or document.
Windows NT	An operating system made by Microsoft. Rumors has it that NT stands for "New Technology". The fact is that NT was born from a project led by David Cutler, formelly DEC's researcher, hired by Microsoft in 1988 specially to devellop a new outstanding operating system. At DEC, Cutler had created several operating systems, including the very famous VMS (now called OpenVMS) from which NT has inherited some features such as process' priority levels and dynamic working set trimming. Some people say that the name Windows NT (WNT) was derived by taking the next letters of V, M and S, respectivelly. You can reach Cutler's unnoficial fan club at http://web.wt.net/~shannonh. The OpenVMS home page can be found at http://www.digital.com/openvms. I have used VMS and NT for several years, so I can tell you: they both are really fantastic! The very first commercial version of NT appeared in 1993, and was called Microsoft Windows NT 3.1. Following that we had the versions 3.5 (1994), 3.51 (1995) and 4.0 (1996). The next version of NT (5.0) will probably come in the first half of 1999, and you can expect a great deal of changes in this really new version. Check this information at http://www.microsoft.com/ntserver. (Source: http://www.netcettera.com.br/history.htm)
x86	A generic name for the series of Intel microprocessor families that began with the 80286 microprocessor.

1.4. References and Related Documents

DRIVEWINDOW 2.0 USER MANUAL (PDM VaultID=00026315.DOC)/99-04-22 by Aki Kolehmainen)

DRIVEWINDOW 2.X FUNCTIONAL SPECIFICATION (PDM VaultID=00027533.DOC)/99-07-06 by Jyrki Erjanti)

2. General Description

This document describes, how to configure DriveWindow 2 so that it can save and restore proper parameters of a certain kind of drive. It also describes the default parameter restore configurations for different kind of drives.

Parameter saving and restoring (downloading) are commands selectable from the user interface.

2.1. Other Software

DriveWindow 2 provides COM and OPC based Application Interfaces for use by other programs.

It uses DriveOPC to communicate with drives.

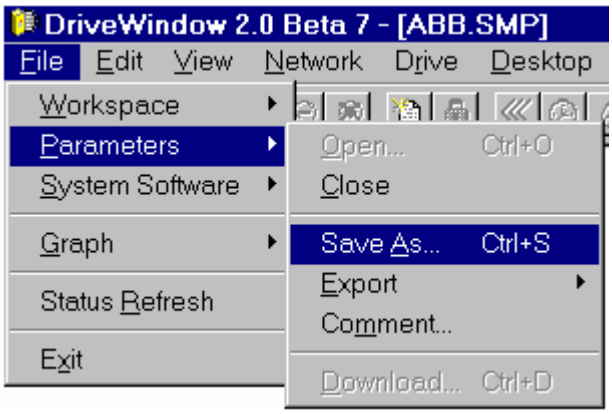
2.2. Assumptions and Dependencies

We assume that you are have basic knowledge about drives and Windows NT.

3. Parameter Handling

3.1. Saving

Parameters are saved into a file by user's request.



All visible, i.e., parameters not currently protected by pass code, of the selected drive (or an open parameter file, if it is selected) are saved. In addition those pass code protected parameters, which are listed in restore configuration, are saved.

Real names of the protected parameters or their groups are not saved, but the groups are named as "Group *n* Backup" and the parameters "*n.m*: Parameter *n.m* Backup".

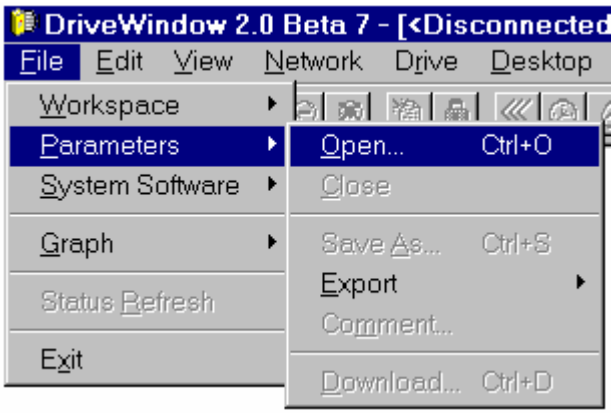
The file has filename extension DWP. It is human readable ASCII file. You must not edit or otherwise change it by using other programs than DriveWindow 2.

The format of the file content is not described here.

Note that the parameters currently protected by pass code are not saved unless listed in restore configuration.

3.2. Viewing and Editing

It is possible to view and even edit saved parameters. The file has first be opened by user's request.



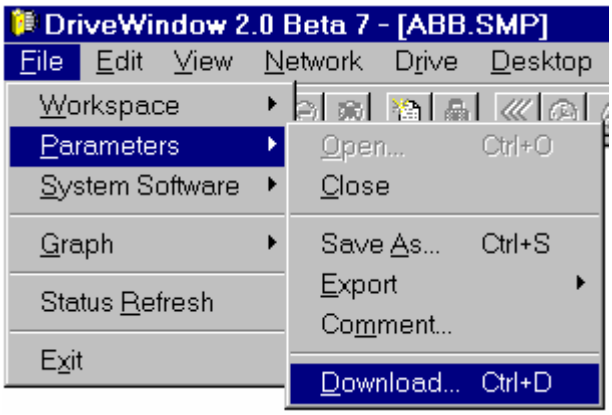
The opened file can then be browsed even off-line, and parameter values can be changed the same way as drive parameters are changed. The changes are lost, however, unless the open parameter file is saved.

Note that closing (or deleting from desktop) of the parameter file never prompts saving of changes made.

3.3. Restoring

3.3.1. Starting and Checking

To restore parameters, the parameter file containing parameters to be restored has first to be opened and the drive selected. Restoring starts by user's request.



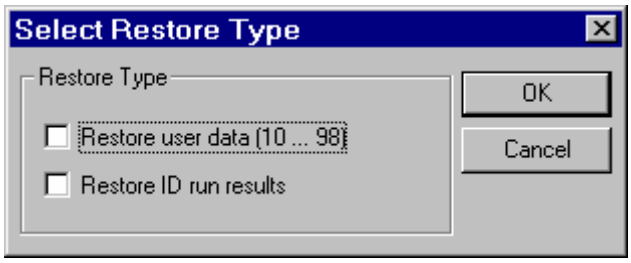
DriveWindow 2 checks that all items with tags Properties.* and Application.Properties.* have the same value in the file and in the drive. In addition it checks the same way items listed as checking parameters in the restore configuration.

Note that the kind of drive to be used in selecting the restore configuration is read from the drive, not from the opened parameter file.

If checking does not pass, the user still has the option to continue (at her own risk).

3.3.2. Restore Type Selection

Next, the user has to select, whether to restore User Parameters or Id Run Result Parameters, or both (or none).



User Parameters consist of parameters in groups 10...98 except those of string type. They also include parameters listed as user parameters in parameter restore configuration for the drive. This list can also contain string type of parameters.

Id Run Result Parameters consist of parameters listed as id run parameters in parameter restore configuration for the drive.

If the id run list is empty or not all parameters required by the list are present in the open parameter file, the ID run results selection is grayed and cannot be selected.

3.3.3. Downloading

Before downloading, a parameter lock, if specified in the restore configuration, is opened after saving its current status.

The hourglass cursor is shown while the parameters are downloaded, which may take several minutes, especially if pauses are included in the restore configuration list.

In DriveWindow 2 versions prior 2.12, the user parameter download order is: parameters in groups 10…98 first, then parameters listed as user parameters in parameter restore configuration.

In DriveWindow 2 version 2.12 and newer, the user parameter download order is: parameters listed as user parameters in parameter restore configuration first, then parameters in groups 10…98. This ordering makes it possible to download some parameters, which would be locked otherwise.

After downloading has been done, the parameter lock value is restored, if there was a parameter lock specified.

If the downloading fails, a message is shown to the user.

3.3.4. Restarting the Drive

After successful downloading the user is requested, whether a programmatic restarting of the drive is to be made or not.

Note that if there is another drive at node address 1 in the same communication channel, the drive cannot be restarted through DriveOPC. If this is the case, the user is informed about the condition. Restarting can then be done by hard reset after Network Disconnect or exiting DriveWindow 2.

If Id Run Result Parameters were downloaded, we recommend restarting of the drive. Otherwise the decision has to be made by the user.

Note that restarting the drive causes the DriveWindow 2 workspace reset because of internal Network Disconnect/Reconnect. So, monitoring is stopped and the monitor is cleared, for example.

Note that if the node address changes when the parameters are restored, the behaviour of DriveWindow 2 is not specified. It may be that the restoration fails or the drive disappears from the tree when restarting the drive.

4. Restore Configuration

4.1. Configuration File

Restore configuration is read from DW2.INI file, which must be in the Windows (Winnt) directory. Instead of a file, it is also possible to configure the registry such a way that the information is taken from registry (consult Windows NT/2000 documentation).

4.1.1. File Structure

The file is an ASCII-file and consists of sections.

Each section starts with a line containing the kind of the drive within brackets. The section name is not case sensitive.

After the section name comes lines, each containing a key-value pair separated with an equal sign. Spaces surrounding the equal sign are ignored. The keys and the values are not case sensitive. The order of the lines does not matter.

The key-value list ends, when a new section or end of file is encountered.

4.1.2. Section Names

The section names are values of the Propeties.Kind items of the DriveOPC. At the moment, DriveOPC recognises the following kind of drives.

- ACF600
- ACN600
- ACP600
- ACS1000
- ACS600
- ACS6000C
- ACS6000C-CC
- ACS6000SD
- ACS6000SD-FE
- ACW600
- DCS600
- NCB
- NTY

In addition, ACx800 kinds of drives, similar to ACx600 kinds, are recognised.

4.1.3. Keys

The following keys within sections are recognized:

Key	Value	Remarks
LockParameter	*Group*.*Index* or empty	If empty, there is no parameter lock
CheckGroupCount	*n*	Number of CheckGroup keys.
CheckGroup*n*	*Parameterlist*	*n* = 1... CheckGroupCount
UserGroupCount	*n*	Number of UserGroup keys.
UserGroup*n*	*Parameterlist* or *Pause*	*n* = 1... UserGroupCount
IdRunGroupCount	*n*	Number of IdRunGroup keys.
IdRunGroup*n*	*Parameterlis*t or *Pause*	*n* = 1... IdRunGroupCount

- *Group* is the parameter group.
- *Index* is the index of parameter within a group
- *n* is a number 0...(in GroupCount values) or 1... (in Group keys).
- *Pause* is Pause:*s*, where *s* is the time in seconds paused when restoring the parameters
- *ParameterList* is *Group*:*IndexList*, which lists parameters belonging to *Group*.
- *IndexList* is a comma separated list, elements of which consist of either *Index-Index* or *Index*. The hyphen separated notation means a range of indexes. For example, 2-5 means 2,3,4,5.

Spaces surrounding colon, comma, and hyphen are ignored.

All parameters must be readable and other than CheckGroup parameters also writeable.

Note that there is no error checking when reading the restore lists, so editing the lists must be done with extra care and the changes should be tested carefully.

4.1.4. LockParameter

Unless empty, this is the (Boolean) parameter, which must contain FALSE (0) when restoring parameters.

4.1.5. CheckGroup

Contains parameters that are used in checking phase during restoration. In addition to the properties always checked, the values of these parameters should be the same both in the drive and the parameter file to be downloaded.

4.1.6. UserGroup

Contains additional parameters, which are restored when user has selected restoration of User Parameters. Parameters other than type string, which are in groups 10...98 and are not pass code protected, need not to be listed here, because they are automatically included.

4.1.7. IdRunGroup

Contains parameters, which are restored when user has selected restoration of Id Run Result Parameters.

4.2. Ordering

During restore, the Group*n* values are handled in order 1...*n*. Their order in the file does not matter.

During save, any parameter is put into the save file only once, even if it is not pass code protected and appears several times in restore lists.

4.3. Default Values

All keys have drive kind dependent default values. If a key is not found in the INI-file, the default value is used instead.

The default values are hard coded into source module res\DriveWindow.rc2. It should be checked to see the actual default values, because this paper may not be up-to-date.

Default values for ACx800 kind of drives are same as the corresponding ACx600 default values.

4.3.1. Unknown Kind of Drive

If DriveOPC reports a Kind value not known by DriveWindow 2 , the following default values are used:

```
LockParameter=
CheckGroupCount=0
UserGroupCount=0
IdRunGroupCount=0
```

4.3.2. ACF600

```
[ACF600]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=112:1-2
UserGroupCount=1
UserGroup1=101:3
IdRunGroupCount=6
IdRunGroup1=24:15-19
IdRunGroup2=26:3-7
IdRunGroup3=Pause:2
IdRunGroup4=190:7
IdRunGroup5=191:1,4-16,18-20
IdRunGroup6=192:2-3
```

4.3.3. ACN600

```
[ACN600]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=112:1-2
UserGroupCount=1
UserGroup1=101:3
IdRunGroupCount=4
IdRunGroup1=110:1-4,6-7
IdRunGroup2=190:7
IdRunGroup3=191:1,4-16,18-20
IdRunGroup4=192:2-16,10,1
```

4.3.4. ACP600

```
[ACP600]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=112:1-2
UserGroupCount=1
UserGroup1=101:3
IdRunGroupCount=7
IdRunGroup1=110:1-4,6-7
IdRunGroup2=190:7
IdRunGroup3=179:2-14,16-17
IdRunGroup4=192:2-16,1
IdRunGroup5=Pause:30
IdRunGroup6=179:2-14,16-17
IdRunGroup7=192:2-16,1
```

4.3.5. ACS1000

```
[ACS1000]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=112:1-2,5
UserGroupCount=1
UserGroup1=101:3
IdRunGroupCount=5
IdRunGroup1=110:1-4,6-7
IdRunGroup2=114:1-20
IdRunGroup3=115:1-20
IdRunGroup4=112:1-35
IdRunGroup5=190:1-39
```

4.3.6. ACS600

```
[ACS600]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=112:1-2
UserGroupCount=1
UserGroup1=101:3
IdRunGroupCount=4
IdRunGroup1=110:1-4,6-7
IdRunGroup2=190:7
IdRunGroup3=191:1,4-16,18-20
IdRunGroup4=192:2-16,10,1
```

4.3.7. ACS6000C

```
[ACS6000C]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=110:1-2
UserGroupCount=0
IdRunGroupCount=20
IdRunGroup1=101:2-3,1
IdRunGroup2=110:1,6
IdRunGroup3=120:1-2
IdRunGroup4=121:1,5
IdRunGroup5=150:1-5,7-10,13,11
IdRunGroup6=166:18,36
IdRunGroup7=165:23
IdRunGroup8=131:3
IdRunGroup9=135:6-7,2,4
IdRunGroup10=166:21
IdRunGroup11=136:1-2
IdRunGroup12=132:1-2,4
IdRunGroup13=151:1-20
IdRunGroup14=165:29
IdRunGroup15=133:41
IdRunGroup16=132:3
IdRunGroup17=131:8
IdRunGroup18=158:2
IdRunGroup19=120:13
IdRunGroup20=152:1
```

4.3.8. ACS6000C-CC

```
[ACS6000C-CC]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=110:1-2
UserGroupCount=0
IdRunGroupCount=13
IdRunGroup1=101:2-3
IdRunGroup2=110:1-6
IdRunGroup3=121:1-6,14-18
IdRunGroup4=139:1-8,13-15
IdRunGroup5=142:8-
IdRunGroup6=154:3-5,14
IdRunGroup7=156:3-5,14
IdRunGroup8=158:7
IdRunGroup9=160:7
IdRunGroup10=168:3
IdRunGroup11=170:3
IdRunGroup12=182:16-23
IdRunGroup13=199:1
```

4.3.9. ACS6000SD

```
[ACS6000SD]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=110:1-2
UserGroupCount=0
IdRunGroupCount=20
IdRunGroup1=101:2-3,1
IdRunGroup2=110:1,6
IdRunGroup3=120:1-2
IdRunGroup4=121:1,5
IdRunGroup5=150:1-5,7-10,13,11
IdRunGroup6=166:18,36
IdRunGroup7=165:23
IdRunGroup8=131:3
IdRunGroup9=135:6-7,2,4
IdRunGroup10=166:21
IdRunGroup11=136:1-2
IdRunGroup12=132:1-2,4
IdRunGroup13=151:1-20
IdRunGroup14=165:29
IdRunGroup15=133:41
IdRunGroup16=132:3
IdRunGroup17=131:8
IdRunGroup18=158:2
IdRunGroup19=120:13
IdRunGroup20=152:1
```

4.3.10. ACS6000SD-FE

```
[ACS6000SD-FE]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=110:1-2
UserGroupCount=0
IdRunGroupCount=13
IdRunGroup1=101:2-3
IdRunGroup2=110:1-6
IdRunGroup3=121:1-6,14-18
IdRunGroup4=139:1-8,13-15
IdRunGroup5=142:8-9
IdRunGroup6=154:3-5,14
IdRunGroup7=156:3-5,14
IdRunGroup8=158:7
IdRunGroup9=160:7
IdRunGroup10=168:3
IdRunGroup11=170:3
IdRunGroup12=182:16-23
IdRunGroup13=199:1
```

4.3.11. ACW600

```
[ACW600]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=112:1-2
UserGroupCount=1
UserGroup1=101:3
IdRunGroupCount=4
IdRunGroup1=110:1-4,6-7
IdRunGroup2=190:7
IdRunGroup3=191:1,4-16,18-20
IdRunGroup4=192:2-16,10,1
```

4.3.12. DCS600

```
[DCS600]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=171:10-11
UserGroupCount=1
UserGroup1=101:3
IdRunGroupCount=0
```

4.3.13. NCB

```
[NCB]
LockParameter=
CheckGroupCount=0
UserGroupCount=0
IdRunGroupCount=0
```

4.3.14. NTY

```
[NTY]
LockParameter=
CheckGroupCount=0
UserGroupCount=0
IdRunGroupCount=0
```

4.3.15. ACSPMM

```
[ACSPMM]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=112:1-2
UserGroupCount=1
UserGroup1=101:3
IdRunGroupCount=6
IdRunGroup1=110:1-4,6-7
IdRunGroup2=151:1-26
IdRunGroup3=190:7
IdRunGroup4=191:1,4-5
IdRunGroup5=192:1-16
IdRunGroup6=193:1,6-7,10-11,14-16
```

4.3.16. ACNPMM

```
[ACNPMM]
LockParameter=102:1
CheckGroupCount=1
CheckGroup1=112:1-2
UserGroupCount=1
UserGroup1=101:3
IdRunGroupCount=6
IdRunGroup1=110:1-4,6-7
IdRunGroup2=151:1-26
IdRunGroup3=190:7
IdRunGroup4=191:1,4-5
IdRunGroup5=192:1-16
IdRunGroup6=193:1,6-7,10-11,14-16
```

4.3.17. DCS800

```
[DCS600]
CheckGroupCount=0
UserGroupCount=1
UserGroup1=99:9
IdRunGroupCount=0
```

4.4. Overriding Defaults

It is not necessary to put into DW2.INI the values already defined as defaults, if only small modifications are needed, and you can be sure about the defaults.

For example, moving 101.3 from User Parameters to Id Run Result Parameters of ACW600 can be done by entering the following in the DW2.INI-file.

```
[ACW600]
UserGroupCount=0
IdRunGroupCount=5
IdRunrGroup5=101:3
```

5. External References

In addition to a normal operating system installation, the DriveWindow 2 program does not require any other programs or modules to be present. All modules required are included in the DriveWindow 2 installation.

6. Other Features

6.1. Performance

Drive communication link speed limits performance of the parameter handling functions.

When remotely connected, the network limits DriveWindow 2 response to user actions.

6.2. Usability, Recovery, Safety and Protection

DriveWindow 2 does not include specific recovery, safety, or protection.

6.3. Portability and Compatibility

DriveWindow 2 runs only under Windows NT 4.0 SP3 (or newer) operating system in a x86 PC.