



Drive *OPC* 2.0

User's Manual

ACS 600 MultiDrive

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Chapter 1 – Overview

Overview

OPC stands for the OLE Process Control. It is a de facto global standard for process data access in the Windows NT 4.0 environment. For further information about OPC, please contact the OPC Foundation. The easiest way to do this is to read the material on <http://www.opcfoundation.org>.

The OPC specification version supported by the server is *Data Access 1.0a*.

Note that the previous DriveLink (1.x versions) was based on Dynamic Data Exchange (DDE). DriveOPC 2.0 supports only OPC.

This User's Manual contains all the common commands you need to use DriveOPC, but all drives do not have all these commands.

Overview

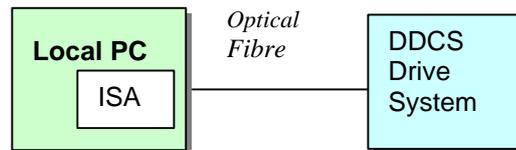
Chapter 2 - OPC for a Drive System

OPC Server

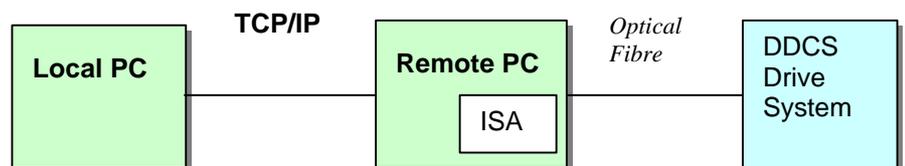
To run an OPC server, you need an optical DDCS network for your drive system and a DDCS/ISA card for desktop PCs or a DDCS/PCMCIA card for laptop PCs. The card is connected to the drive system with an optical cable.

You can use an OPC server with up to 400 drives with an ISA card or 200 drives with a PCMCIA card. The OPC server is available both as a dynamic link library (DLL) for so-called "in-process" use and as an executable (EXE) for "out-of-process" use. The out-of-process version can distribute data via TCP/IP everywhere in the world, but is slower than the in-process version, which only operates locally. Using a server on a remote PC requires that the user is registered as an administrator on both PCs.

The in-process use with an ISA card is as follows, starting from the user's PC:



The out-of-process use with an ISA card via TCP/IP is as follows, starting from the user's PC:



An Out-of-process server can be used locally, too, but the performance is lower.

Every OPC item be the drive that you want to read or write needs to be created in an OPC group with a unique designation. An OPC item is a string that explicitly defines what the user wants to access. The designations are described in this document. You can use an OPC-server with other manufacturers' browsers, for example Matricon (www.matrikon.com).

Drive Address

Every OPC designation begins with the address of the drive. The address defines the communication channel and the node number of the drive. If you are using a PCMCIA card, there can only be one channel the number of which is always 0. For an ISA card, there are two channels, 0 and 1.

The format of the address is:

```
{<channel>}{<node>}
```

For example, the address for a drive number 3 in PCMCIA channel 0 would be:

```
{0}{3}
```

Parameters and Signals

Value

Immediately after the address, type

Par

Separated with a dot, index of the group and the parameter/signal follows. For example, reading the value of signal 1.3 from drive 7 in ISA channel 1 would be:

```
{1}{7}Par.1.3
```

Note that different parameters/signals have different data types. Enumerated parameters are supported.

Description

It is possible to read the description of a parameter group or a parameter. Immediately after the parameter group number or index number, type, separated with a dot

Description

For example, reading the description of group 1 and signal 1.3 from drive 7 in ISA channel 1 would be:

```
{1}{7}Par.1.Description
```

and:

```
{1}{7}Par.1.3.Description
```

Panel Format

With new drives it is possible to read the format used by the operator's panel when it displays the value of a parameter. The format is encoded as an unsigned short. Encoding is beyond the scope of this document.

To read the format, immediately after the parameter index, type, separated with a dot

DisplayFormat

For example, reading the operator's panel format of signal 1.3 from drive 7 in ISA channel 1 would be:

{1}{7}Par.1.3.DisplayFormat

Status

Immediately after the address, type

Status

after which state the type of the status information you want to know, separated with a dot. You can read

Name	Type	Note
Warning	BOOL	TRUE indicates a warning in the drive
Running	BOOL	TRUE indicates that drive is running
Fault	BOOL	TRUE indicates an active fault in the drive
Local	BOOL	TRUE indicates that OPC server has local control
Reference	Real	Current reference value
Direction	BOOL	TRUE indicates that rotation direction is forward, FALSE reverse
Ready	BOOL	TRUE indicates that drive is ready
Home	BOOL	TRUE indicates that a positional drive is at home

For example, current reference value of drive 20 in PCMCIA channel 0 would be:

{0}{20}Status.Reference

Control

Immediately after the address, type

`Control`

after which the type of the control you want to access, separated with a dot. You can write

Name	Type	Note
Reset	BOOL	TRUE resets the active fault.
Local	BOOL	TRUE gets local control, FALSE releases it
Start	BOOL	TRUE starts the drive
Stop	BOOL	TRUE stops the drive
Coast	BOOL	TRUE (coast) stops the drive
Reverse	BOOL	TRUE sets rotation direction reverse of an AC drive
Forward	BOOL	TRUE sets rotation direction forward of an AC drive
Reference	Real	New reference value
Teachin	BOOL	TRUE gives the teach-in command to a positional drive
Home	BOOL	TRUE gives the home command to a positional drive
ContClose	BOOL	TRUE gives the contactor close command to a DC drive
ContOpen	BOOL	TRUE gives the contactor open command to a DC drive

For example, reference of drive 6 in ISA channel 1 could be set via:

```
{1}{6}Control.Reference
```

If you get the local control, the `Local` item needs to be written thereafter at least every 5 seconds to maintain the connection. If this is not done, the control will be lost. You can do the updating yourself just by writing TRUE to the item every 5 seconds. The easiest way is that immediately after setting the local control, you activate the item in an active OPC group that has an interval of at least 5 seconds. Then the OPC server would do the "heart beat" for you automatically.

Note that without getting local control you can not write any items in the `Control` group.

Properties

To read system software information, first type immediately after the address

Properties

and then separated with a dot, one of the following:

Name	Type	Note
BoardType	String	Control board type (read only).
Type	String	Product family (read only).
Kind	String	Kind of drive (read only).
Name	String	Name of the drive.
OS	String	Version number of the system software (read only).

For example, read product family for drive 102 in ISA card channel 1 would be

```
{1}{102}Properties.Type
```

Application

To read application information, first type immediately after the address

Application.Properties

and then, separated with a dot, one of the following:

Name	Type	Note
Baselib	String	Application base library version
Version	String	Application version (compilation date and time)
Name	String	Application name

For example, application version for drive 102 in ISA card channel 1 would be

```
{1}{102}Application.Properties.Version
```

Don't touch Application control-commands and pins-file if you don't know what you are doing!

For example, application control for drive 102 in ISA card channel 1 would be

```
{1}{102}Application.Control.<Commandname>
```

Datalogger

Contents You can read the data logger contents individually from any log. Immediately after address, type

DL

and then separated with a dot, type `L` and the number of the log you wish to access. For example, to read log 3 for drive 12 in ISA card channel 0 would be:

```
{0}{12}DL.L3
```

Note: If you are using a drive which contains two dataloggers, the command is

```
{1}{44}DL1.L3 or {1}{44}DL2.L3
```

DL1 meaning the first datalogger on and DL2 meaning the second datalogger.

There are usually four different logs (`L0-L3`) in the datalogger. The contents of each log are delivered as a SAFE a ARRAY of real values. The array may contain over a thousand values.

Note: Do not try to read the datalogger contents if the `Filled` status is not TRUE.

Status To read the datalogger status, type after DL, separated with a dot

Status

and the info you wish to know after that, again with a dot in between:

Name	Type	Note
Filled	BOOL	TRUE indicates the logger is filled Note: datalogger contents should be read only if Filled is TRUE!
Inited	BOOL	TRUE indicates the logger settings are OK Datalogger can not be started, if Inited is not TRUE!
Running	BOOL	TRUE indicates the logger is collecting data
Triggered	BOOL	TRUE indicates the logger has triggered but not yet filled (not in all dataloggers).

To read datalogger triggering cause, type after Status, separated with a dot:

Triggered

and the info you wish to know after that, again with a dot in between:

Name	Type	Note
Fault	BOOL	TRUE indicates logger triggered to a fault.
Level	BOOL	TRUE indicates logger triggered to a level condition.
Limit	BOOL	TRUE indicates logger triggered to a limit.
Warning	BOOL	TRUE indicates logger triggered to a warning.
User	BOOL	TRUE indicates logger was manually triggered.
Hysteresis	BOOL	TRUE indicates logger detected hysteresis.
Difference	BOOL	TRUE indicates logger triggered to a difference.
External	BOOL	TRUE indicates logger triggered externally (not in all dataloggers).

For example, reading if the datalogger was triggered because of a warning in the drive, would be as follows:

```
{0}{45}DL.Status.Triggered.Warning
```

Properties

You can read the common data logger properties. Immediately after address, type

```
Properties.DLDescription
```

and the info you wish to know after that, again with a dot in between:

Name	Type	Note
Loggers	BYTE	Number of dataloggers.
TimeLevel	WORD	Logging time level in microseconds.
Samples	WORD	Maximum number of samples.
Channels	BYTE	Number of channels.

If the information is not available in the drive but is guessed by DriveOPC, quality of the values are marked uncertain.

For example, reading the number of dataloggers, would be as follows:

```
{0}{45}Properties.DLDescription.Loggers
```

Available Features

You can read the available common data logger features. Immediately after address, type

`Properties.DLDescription.Available`

and the info you wish to know after that, again with a dot in between:

Name	Type	Note
RealTime	BOOL	Is real time available?
TriggerFault	BOOL	Is fault triggering available?
TriggerLevel	BOOL	Is level triggering available?
TriggerLimit	BOOL	Is limit triggering available?
TriggerWarning	BOOL	Is alarm triggering available?
TriggerUser	BOOL	Is user triggering available?
TriggerDifference	BOOL	Is difference triggering available?
TriggerExternal	BOOL	Is external triggering available?

If the information is not available in the drive but is guessed by DriveOPC, quality of the values are marked uncertain.

For example, checking if limit triggering is available, would be as follows:

`{0}{45}Properties.DLDescription.Available.TriggerLimit`

Control

To access datalogger control, type after DL, separated with a dot

`Control`

and the data you wish to access after that, again with a dot in between:

Name	Type	Note
Clear	BOOL	TRUE clears datalogger contents.
Start	BOOL	TRUE starts the datalogger to collect data Initiated status must be TRUE before Start!
Stop	BOOL	TRUE stops the datalogger from collecting Running status must be TRUE before Stop!
Trig.	BOOL	TRUE triggerings the datalogger Running status must be TRUE before Trig.!

For example, to start the datalogger would be

`{1}{44}DL.Control.Start`

Settings To access the datalogger settings for checking them or changing them, type after DL, separated with a dot

Settings

and the data you wish to access after that, again with a dot in between:

Name	Type	Note
Interval	Integer	Sampling interval in the logger in ms
Trig.Fault	BOOL	TRUE indicates that the logger must trigger when a fault occurs.
Trig.LevelDown	BOOL	TRUE indicates that the logger must trigger on falling edge when the selected level is crossed. Triggering variable and level must be set!
Trig.LevelUp	BOOL	TRUE indicates that the logger must trigger on rising edge when the selected level is crossed. Triggering variable and level must be set!
Trig.Limit	BOOL	TRUE indicates that the logger must trigger when the selected limit is met (set in parameter table).
Trig.Warning	BOOL	TRUE indicates that the logger must trigger when a warning occurs.
Trig.User	BOOL	TRUE indicates that the logger must trigger by a user command.
Trig.Difference	BOOL	TRUE indicates that the logger must trigger when a difference occurs.
Trig.External	BOOL	TRUE indicates that the logger must trigger when an triggering occurs.
Trig.Hysteresis	BOOL	TRUE indicates that the logger must trigger when the selected hysteresis is detected. Triggering variable and hysteresis must be set!
Trig.PreTrigCount	Integer	Count of samples collected to the logger before triggering point
Trig.Variable	String	Variable for level and hysteresis triggering. Format: "Par." + group + "." + index
Trig.Level	Real	Level for triggering. Triggering variable must be set!
Trig.Time	String	Time when triggering took place (write-protected).
Variables.L + log number	String	Variable for the log Format: "Par." + group + "." + index

For example, to set the parameter 10.1 to be collected to log 3 for drive 4 in ISA card channel 0 would be via item:

{0}{4}DL.Settings.Variables.L3

and the value for the item would be

Par.10.1

Fault Logger

Contents From the fault logger you can read each of the logs independently. A log contains a textual description, the time and information if it was a fault or a warning.

Immediately after the address, type

FL

Separated with a dot, type L and the number of the log you wish to access. The latest log is always 0. After the log, again separated with a dot, type

Name	Type	Note
Description	String	Description of the fault/warning
Status	String	Fault status (Active or Reset)
Time	String	Time that fault/warning took place
Type	String	Type (fault or warning)

for the information you want the access. For example, reading the description of the latest log (number 0) from drive 34 in ISA card channel 0 would be:

```
{0}{34}FL.L00.Description
```

Control To access the fault logger control, type immediately after the address

FL.Control

after which the type of the control you want to access, separated with a dot. You can write

Name	Type	Note
Clear	BOOL	Clear of the fault logger

for the control you want to access. For example, clearing of the fault logger from drive 34 in ISA card channel 0 would be:

```
{0}{34}FL.Control.Clear
```

Memory

Don't touch Memory commands if you don't know what you are doing!

For example, memory for drive 102 in an ISA card channel 1 would be

```
{1}{102}Mem.<Commandname>
```

Communication

Common Without any address, type

```
Communication
```

after which the type of the action you want to access, separated with a dot. You can write

Name	Type	Note
Restart	BOOL	TRUE restarts the communication.
NoReplyToDownDelay	Integer	Time in milliseconds, after which a drive is considered to be down, if there is no answer. This item is used unless the corresponding item for a drive overrides it. A negative value means that drives are never considered to be down. Default value is 5000.
NoReplyRetryInterval	Integer	Time in milliseconds, which defines the interval used to probe a drive that is down. This item is used unless the corresponding item for a drive overrides it. Default value is 2000.
ConfigureDialog	Integer	The number of the DDCS communication channel, which is to be configured. Configuring is done by displaying a dialog box. Does nothing in case DriveOPC is configured to be a remote server
AllowZombies	BOOL	TRUE allows adding of items for non-identified (or not existing) drives.

For example, restarting communication could be done via:

```
Communication.Restart
```

Note that restarting communication is a lengthy operation, which should be done only if absolutely necessary. You can use it, for example, if you have a branching unit powered down and up again, and you do not want to restart DriveOPC to get the branching unit recovered.

Note that when Drive *OPC* considers a drive to be down, it stops trying to read values from the drive. However, from time to time, a read request probes the drive to see if it has come up again.

Drive Specific

Immediately after address, type

Communication

after which the type of the action you want to access, separated with a dot. You can write

Name	Type	Note
NoReplyToDownDelay	Integer	Time in milliseconds, after which the drive is considered to be down, if there is no answer. Unless negative, this item overrides the corresponding common item. Default value is -1.
NoReplyRetryInterval	Integer	Time in milliseconds, which defines the interval used to probe a drive that is down. Unless negative, this item overrides the corresponding common item. Default value is -1.

For example, setting or reading the delay to be used for drive 10 in ISA card channel 0 would be done via:

```
{0}{10}Communication.NoReplyToDownDelay
```

Note that when Drive *OPC* considers a drive to be down, it stops trying to read values from the drive. However, from time to time, a read request probes the drive to see if it has come up again.



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