

KestrelScript™ with DDE Commands

Version 2.2

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Windows applications can use DDE (Dynamic Data Exchange) to pass data back and forth between applications. A DDE client initiates a conversation with another application (a DDE server) by sending a connect message. Once a conversation is established, the client can send commands or data to the server. KestrelSpec can act as a server to service the data demands and needs of a client. All DDE data is in ASCII format, so all of the commands that KestrelSpec will accept and all returned data are formatted as character strings.

In the first screen that displays when KestrelSpec is executed, there is an option to enable DDE:



This option **must** be enabled so KestrelSpec will poll for incoming DDE commands and then respond to them. If this option is disabled, then KestrelSpec will ignore any DDE commands.

The client application can send scripting commands to have KestrelSpec acquire spectra and return the acquired data to the client application. The standard definition for a DDE link includes the *application*, *topic*, and *item* elements. The actual syntax used within applications for a destination link to a source application may vary slightly. For example, within Microsoft Excel, use the syntax:

```
application|topic!item
```

Within a Visual Basic 5.0 or 6.0 application, assign the LinkTopic and LinkItem properties like this:

```
LinkTopic = application|topic  
LinkItem = item
```

The *application* element (called the *service* by LabVIEW® from National Instruments) is the name of the application from which data is requested, usually the executable filename without an extension. For KestrelSpec, the application element is **KESTREL**.

The *topic* is the fundamental data grouping used in the source application. For KestrelSpec, the topic is the main form of the application called **MAINMENU**.

The *item* element is the data unit for the DDE conversation in the source application. For KestrelSpec, the item is a text box called **txtDDE**.

To establish a DDE link to KestrelSpec from Excel, this syntax would be used:

```
KESTREL|MAINMENU!txtDDE
```

To establish a DDE link to KestrelSpec from Visual Basic, the link properties of the DDE control would be assigned as:

```
LinkTopic = "KESTREL|MAINMENU"  
LinkItem = "txtDDE"
```

Once a DDE link is established from the client application to KestrelSpec, then the client can use a DDE "poke" to send commands to KestrelSpec and request data. Windows applications that support DDE (like Visual Basic 5.0 and 6.0, C++, Excel and LabVIEW) are capable of being DDE clients for KestrelSpec. The documentation for any of these products explains how to establish and control a DDE conversation between applications.

Please be aware that Catalina Scientific Corporation cannot provide support for programming in Excel, Visual Basic, LabVIEW or any other Windows product. A Scriptor program is included with the installation of KestrelSpec. Use of this program and the format of the commands that KestrelSpec will accept are explained on the following pages. *KestrelScript* is a trademark of Rhea Corporation.

KestrelScript Command Format

There is a specific format for both the commands that are sent to KestrelSpec and the responses that are returned to the client application. All requests start with REQ followed by a vertical bar in this format:

```
REQ|XXXX param1,param2,param3
```

where XXXX is the 4-character command. If the command requires parameters, then the parameters come after 1 blank space and are delimited by commas. The DDE link with KestrelSpec is case sensitive. Requests must be entered in upper case. The Kestrel Scriptor program automatically converts all characters in the **Send...** window to upper case for you, whether you have **Caps Lock** enabled or not.

All responses to requests start with RSP followed by a vertical bar in this format:

```
RSP|XXXX|errcode param1,param2,param3...
```

where XXXX is the 4-character command from the request followed by a vertical bar and the error code. If the response requires parameters, then they come after a blank space and are delimited by commas.

KestrelScript Error Codes

An error code is returned with every response to a command. Here are the codes used by KestrelSpec and what they mean:

Error Number	Description
-3	Hardware key is not connected.
-2	In Demo mode and can't respond to the DDE request.
-1	Busy executing a task and can't respond to the current DDE request.
0	No error.
1	Invalid request does not start with REQ and cannot be recognized.
2	Unknown command. The 4-character command cannot be recognized.
3	Invalid parameter value.
4	No curve memories available for acquiring spectra.
5	No active curves.
6	Open file error occurred with the given file name.
7	Write file error occurred with the given file name.
8	Invalid binning for image acquisition.
9	Acquisition was aborted by the user (by clicking on the Stop button).
10	Both Transform To Absorbance and Get Log are enabled.
11	Not enough points per curve for acquiring new spectra.
12	An error occurred with the camera and it is not responding appropriately.
13	An error occurred while setting the spectrograph to a new wavelength.
14	No active image exists.
15	Flat-field curve calibration doesn't match current calibration settings.

KestrelScript Command Set

The 4-character commands used by KestrelScript are described on the following pages. Examples are given for both what is sent and what is received back from KestrelSpec. Optional parameters are denoted by braces, [].

ACQD

Description: Behaves the same as selecting the “Acquire One Dark” menu option. If the camera is not already initialized, then it will be initialized first before acquisition. If KestrelSpec is in Image Display Mode, then the dark background image will be displayed after acquisition completes successfully, but no curves will be created. If KestrelSpec is in Plot Display Mode, then new curves will be created and displayed and then this command returns the starting curve memory location and the number of curves created from the dark background image.

Examples:

Send...	Receive...	Comments
REQ ACQD	RSP ACQD 0 IMAGE	Dark image only was created successfully
REQ ACQD	RSP ACQD 12 10,0	Camera error so no curve was created
REQ ACQD	RSP ACQD 0 1,1	1 curve created starting in memory 1

ACQE

Description: Behaves the same as selecting the “Acquire One Exposure” menu option. If the camera is not already initialized, then it will be initialized first before acquisition. If KestrelSpec is in Image Display Mode, then the image will be displayed after acquisition completes successfully, but no curves will be created. If KestrelSpec is in Plot Display Mode, then new curves will be created and displayed and then this command returns the starting curve memory location and the number of curves created.

Examples:

Send...	Receive...	Comments
REQ ACQE	RSP ACQE 0 IMAGE	Image only was created successfully
REQ ACQE	RSP ACQE 12 10,0	Camera error so no curve was created
REQ ACQE	RSP ACQE 0 20,1	1 curve created starting in memory 20

ACQS

Description: Behaves the same as selecting the “Acquire Spectra” menu option. If the camera is not already initialized, then it will be initialized first before acquisition. After new curves are created, this command returns the starting curve memory location and the number of curves created.

Examples:

Send...	Receive...	Comments
REQ ACQS	RSP ACQS 0 1,3	3 curves created starting in memory 1
REQ ACQS	RSP ACQS 12 10,0	Camera error so no curves were created
REQ ACQS	RSP ACQS 9 1,1	User aborted after 1 curve created
REQ ACQS	RSP ACQS 0 5,10	10 curves created starting in memory 5

ACUM [number of accums]

Description: If no parameter appears with the command, then KestrelSpec will return the number of accums as defined in the **Seup:Acquire...** menu option. If a parameter is included and it contains a value greater than 0, then the number of accums is assigned to that value.

Examples:

Send...	Receive...	Comments
REQ ACUM	RSP ACUM 0 1	Number of accums is 1
REQ ACUM 0	RSP ACUM 3	Invalid parameter of 0
REQ ACUM 5	RSP ACUM 0	No error setting accums to 5
REQ ACUM	RSP ACUM 0 5	Number of accums is now 5

CADD curve number,curve number or a constant value

Description: Add two curves together or add a constant value to a curve. The second parameter is interpreted as a constant value if it contains a decimal point, otherwise, it is interpreted as a curve number. Both functions will result in a new curve that is returned as a parameter in the response.

Examples:

Send...	Receive...	Comments
REQ CADD 1,2	RSP CADD 0 25	Curve #1 plus curve #2 is in curve #25
REQ CADD 25,0.0	RSP CADD 3	Invalid parameter of adding by 0
REQ CADD 5,3.14	RSP CADD 0 26	Curve #5 plus 3.14 is in curve #26

CSUB curve number,curve number or a constant value

Description: Subtract one curve from another or subtract a constant value from a curve. The second parameter is interpreted as a constant value if it contains a decimal point, otherwise, it is interpreted as a curve number. Both functions will result in a new curve that is returned as a parameter in the response.

Examples:

Send...	Receive...	Comments
REQ CSUB 10,2	RSP CSUB 0 25	Curve #10 minus curve #2 is in #25
REQ CSUB 25,1.23	RSP CSUB 0 26	Curve #25 minus 1.23 is in curve #26

CMUL curve number,curve number or a constant value

Description: Multiply two curves together or multiply a curve by a constant value. The second parameter is interpreted as a constant value if it contains a decimal point, otherwise, it is interpreted as a curve number. Both functions will result in a new curve that is returned as a parameter in the response.

Examples:

Send...	Receive...	Comments
REQ CMUL 22,5	RSP CMUL 0 35	Curve #22 times curve #5 is in #35
REQ CMUL 25,7.5	RSP CMUL 0 36	Curve #25 times 7.5 is in curve #36

CDIV curve number,curve number or a constant value

Description: Divide one curve by another or divide a curve by a constant value. The second parameter is interpreted as a constant value if it contains a decimal point, otherwise, it is interpreted as a curve number. Both functions will result in a new curve that is returned as a parameter in the response.

Examples:

Send...	Receive...	Comments
REQ CDIV 12,	RSP CDIV 3	Invalid second parameter.
REQ CDIV 35,0.2	RSP CDIV 0 46	Curve #35 divided by 0.2 is in #46

CLRA

Description: Clear all active curves, but not any reference curves. This command is the same as selecting the **Edit:Clear All Curves** menu option.

Examples:

Send...	Receive...	Comments
REQ CLRA	RSP CLRA 0	All active curves have been cleared.
REQ CLRA	RSP CLRA 5	No active curves to clear.

DCRV curve number,[pixel A],[pixel B]

Description: Download the curve count (intensity) values from pixel A to pixel B. If a pixel range is not given, then the values for the entire curve will be sent. Values are returned as strings separated by commas. If you are in Temperature Mode and the Omega curves are enabled, then Omega Y values will be returned for the requested curve.

Examples:

Send...	Receive...	Comments
REQ DCRV 45	RSP DCRV 0 390,450,89...	All Y values for curve #45
REQ DCRV 8,1,10	RSP DCRV 0 45,-19,7...	Y values for #8, pixels 1-10

DXAX curve number,[pixel A],[pixel B]

Description: Download the curve X axis values from pixel A to pixel B. If a calibrated X axis is in effect (either wavelength or Raman Shift) then the values will be returned in the calibrated units, otherwise the pixel numbers will be returned. If a pixel range is not given, then the values for the entire curve will be sent. Values are returned as strings separated by commas. If you are in Temperature Mode and the Omega curves are enabled, then Omega X values will be returned for the requested curve.

Examples:

Send...	Receive...	Comments
REQ DXAX 15	RSP DXAX 0 546.1,546.2...	All X values for curve #15
REQ DXAX 8,1,50	RSP DXAX 0 1,2,3,4...	X values for #8, pixels 1-50

ETIM [exposure time]

Description: If no parameter appears with the command, then KestrelSpec will return the exposure time as defined in the **Setup:Acquire...** menu option. If a parameter is included and it contains a valid value, then the exposure time is assigned as that value.

Examples:

Send...	Receive...	Comments
REQ ETIM	RSP ETIM 0 0.1	Current exposure time is 0.1 seconds
REQ ETIM 0	RSP ETIM 3	Invalid parameter of 0
REQ ETIM 1.5	RSP ETIM 0	No error resetting the exposure time
REQ ETIM	RSP ETIM 0 1.5	Current exposure time is 1.5 seconds

INTR integration region,[curve number]

Description: Returns the calculated area for the specified integration region, numbered 1 through 10. The 10 integration regions are defined either in the **Process:Integrals...** dialog box or by using the **int** button on the control palette. If no curve number is specified in this command, then the current active curve will be used. If you are currently in Temperature Mode and the Omega curves are enabled, then the integration values will be returned in Omega units for the requested curve.

Example:

Send...	Receive...	Comments
REQ INTR 1,5	RSP INTR 0 50.9	The area of region 1 on curve 5 is 50.9
REQ INTR 11	RSP INTR 3	Invalid parameter of 11

MEMS

Description: Returns the number of curve memories, as defined in the Setup:Curve Memories... menu option. The default number of curve memories is 50.

Example:

Send...	Receive...	Comments
REQ MEMS	RSP MEMS 0 50	Number of curve memories is 50

MACT

Description: Returns the number of the active curve, which is the currently plotted curve.

Example:

Send...	Receive...	Comments
REQ MACT	RSP MACT 0 25	Number of active curve is 25

SAVA filename

Description: Saves all currently active curves in the KestrelSpec binary file format to the given file. If a path is not given for the file, then the file is created in the same directory where KestrelSpec is installed. If a path is given for the file, then the drive and all directories in the path must exist. The file name must contain legal characters according to Windows file naming conventions. All files will be given the CRV file extension.

Examples:

Send...	Receive...	Comments
REQ SAVA C:\MYDIR\MYFILE	RSP SAVA 6	File open error because MYDIR doesn't exist
REQ SAVA MY TEST CURVES	RSP SAVA 0	Curves are written to the file successfully
REQ SAVA C:\DATA\TEST100	RSP SAVA 5	No active curves exist to be saved

SAVC filename,[first curve],[last curve]

Description: Saves selected curves in the KestrelSpec binary file format to the given file. If a first and last curve are not given, then the current active curve is saved. If a path is not given for the file, then the file is created in the same directory where KestrelSpec is installed. If a path is given for the file, then the drive and all directories in the path must exist. The file name must contain legal characters according to Windows file naming conventions. All files will be given the CRV file extension.

Examples:

Send...	Receive...	Comments
REQ SAVC DO YOU?	RSP SAVC 6	File open error because ? is illegal
REQ SAVC ONE CURVE	RSP SAVC 0	Current active curve is written to the file
REQ SAVC MY STUFF,1,10	RSP SAVC 0	Curves 1 - 10 are written to the file

SAVT filename

Description: Saves all currently plotted curves as delimited, ASCII text to the given file. If KestrelSpec is currently displaying plots in overlay mode, then all curves in the overlay are saved. Otherwise, just the current active curve is saved. If a path is not given for the file, then the file is created in the same directory where KestrelSpec is installed. If a path is given for the file, then the drive and all directories in the path must exist. The file name must contain legal characters according to Windows file naming conventions. All files will be given the TXT file extension. Tab is used for a delimiter if no delimiter has been defined. If you are in Temperature Mode and the Omega curves are enabled, then Omega Y values will be written to the file for the currently displayed curves.

Examples:

Send...	Receive...	Comments
REQ SAVT C:\MYDIR\MYFILE	RSP SAVT 0	Curve(s) are saved to the file successfully
REQ SAVT MY TEXT CURVES	RSP SAVT 0	Curve(s) are saved to the file successfully

SCNS [number of scans]

Description: If no parameter appears with the command, then KestrelSpec will return the number of scans as defined in the **Seup:Acquire...** menu option. If a parameter is included and it contains a value greater than 0, then the number of scans is assigned to that value.

Examples:

Send...	Receive...	Comments
REQ SCNS	RSP SCNS 0 1	Number of scans is 1
REQ SCNS 0	RSP SCNS 3	Invalid parameter of 0
REQ SCNS 5	RSP SCNS 0	No error setting scans to 5
REQ SCNS	RSP SCNS 0 5	Number of scans is now 5

SIMG filename

Description: Saves the current active image in the KestrelSpec binary file format to the given file. An active image must exist for this command to be successful. If a path is not given for the file, then the file is created in the same directory where KestrelSpec is installed. If a path is given for the file, then the drive and all directories in the path must exist. The file name must contain legal characters according to Windows file naming conventions. All files will be given the IMG file extension.

Examples:

Send...	Receive...	Comments
REQ SIMG MY IMAGE	RSP SIMG 14	An active image does not exist
REQ SIMG C:\MY IMAGE	RSP SIMG 0	Current active image is written to the file

SIMT filename

Description: Saves the current active image as delimited, ASCII text to the given file. An active image must exist for this command to be successful. If a path is not given for the file, then the file is created in the same directory where KestrelSpec is installed. If a path is given for the file, then the drive and all directories in the path must exist. The file name must contain legal characters according to Windows file naming conventions. All files will be given the TXT file extension. Tab is used for a delimiter if no delimiter has been defined.

Examples:

Send...	Receive...	Comments
REQ SIMT C:\MYDIR\MYFILE	RSP SIMT 14	There is no active image to save.
REQ SIMT MY TEXT IMAGE	RSP SIMT 0	Current active image is saved to the file

STOP

Description: Equivalent to clicking on the "Stop" button when it is enabled on the KestrelSpec control palette during Acquire Spectra.

Example:

Send...	Receive...	Comments
REQ STOP	RSP STOP 0	Acquire Spectra was stopped

TEMP

Description: Returns the current temperature of the camera for those cameras that can report their temperature. The camera must already be initialized and not acquiring any images when this command is received.

Example:

Send...	Receive...	Comments
REQ TEMP	RSP TEMP 0 -15.2 C	The temperature is -15.2 Centigrade
REQ TEMP	RSP TEMP 12	An error occurred with the camera
REQ TEMP	RSP TEMP -1	KestrelSpec is busy

SPEC param1,[param2]

Description: Spectrograph information command that can either set or get parameter values as defined in the **Setup:X Axis Calibration...** menu option under "Setup 1-Point Cal...". This command is valid for scanning spectrographs only, not echelles. The first parameter is required and must contain a valid 6-character parameter. If a second parameter does not appear in the command, then KestrelSpec will return the value of the given parameter. If the second parameter is included and it contains a valid value, then the given parameter is assigned as that value. See "KestrelCal 1-Point Spectrum Calibration" in the section on **Using KestrelSpec** for more information on how "1-Point Calibration" works for scanning spectrographs.

Parameter: **WAVLEN**

Description: The current wavelength setting (in nm) of the spectrograph.

Example:

Send...	Receive...	Comments
REQ SPEC WAVLEN	RSP SPEC 0 546.1	Current wavelength is 546.1 nm
REQ SPEC WAVLEN,577.6	RSP SPEC 0	Sets the wavelength to 577.6 nm
REQ SPEC WAVLEN	RSP SPEC 0 577.6	Current wavelength is 577.6 nm

Parameter: **CTRPIX**

Description: The pixel location of a spectral peak corresponding to the current wavelength setting of the spectrograph.

Example:

Send...	Receive...	Comments
REQ SPEC CTRPIX	RSP SPEC 0 400	Current pixel location is 400
REQ SPEC CTRPIX,375	RSP SPEC 0	Sets the pixel location to 375
REQ SPEC CTRPIX	RSP SPEC 0 375	Current pixel location is 375

Parameter: **TANGLE**

Description: The total included angle, in degrees, of the spectrograph. This is the angle between the incident and reflected beams at the grating, and typically ranges between 10 and 30 degrees.

Example:

Send...	Receive...	Comments
REQ SPEC TANGLE	RSP SPEC 0 15.6	Current total angle is 15.6
REQ SPEC TANGLE,19.2	RSP SPEC 0	Sets the total angle to 19.2
REQ SPEC TANGLE	RSP SPEC 0 19.2	Current total angle is 19.2

Parameter: **FOCLEN**

Description: The focal length, in mm, of the spectrograph.

Example:

Send...	Receive...	Comments
REQ SPEC FOCLEN	RSP SPEC 0 300	Current focal length is 300
REQ SPEC FOCLEN,275	RSP SPEC 0	Sets the focal length to 275
REQ SPEC FOCLEN	RSP SPEC 0 275	Current focal length is 275

Parameter: **GPERRM**

Description: The groove density, in grooves per mm, of the current grating.

Example:

Send...	Receive...	Comments
REQ SPEC GPERRM	RSP SPEC 0 300	Current groove density is 300
REQ SPEC GPERRM,1200	RSP SPEC 0	Sets the groove density to 1200
REQ SPEC GPERRM	RSP SPEC 0 1200	Current groove density is 1200

Parameter: **PIXSIZ**

Description: The effective pixel size, in microns, of a pixel on the detector array along the horizontal direction. The effective pixel size will not necessarily be the actual pixel size, depending on pixel-group size and other factors. For example, if the focal length of the spectrograph is not accurately determined, the effective pixel size required to obtain accurate calibration would be affected.

Example:

Send...	Receive...	Comments
REQ SPEC PIXSIZ	RSP SPEC 0 11.5	Current pixel size is 11.5
REQ SPEC PIXSIZ,24	RSP SPEC 0	Sets the pixel size to 24
REQ SPEC PIXSIZ	RSP SPEC 0 24	Current pixel size is 24

Parameter: **LASERW**

Description: The excitation wavelength (in nm) used for Raman shift calibration.

Example:

Send...	Receive...	Comments
REQ SPEC LASERW	RSP SPEC 0 532.2	Current excitation is 532.2 nm
REQ SPEC LASERW,552.8	RSP SPEC 0	Sets the excitation to 552.8 nm
REQ SPEC LASERW	RSP SPEC 0 552.8	Current excitation is 552.8 nm

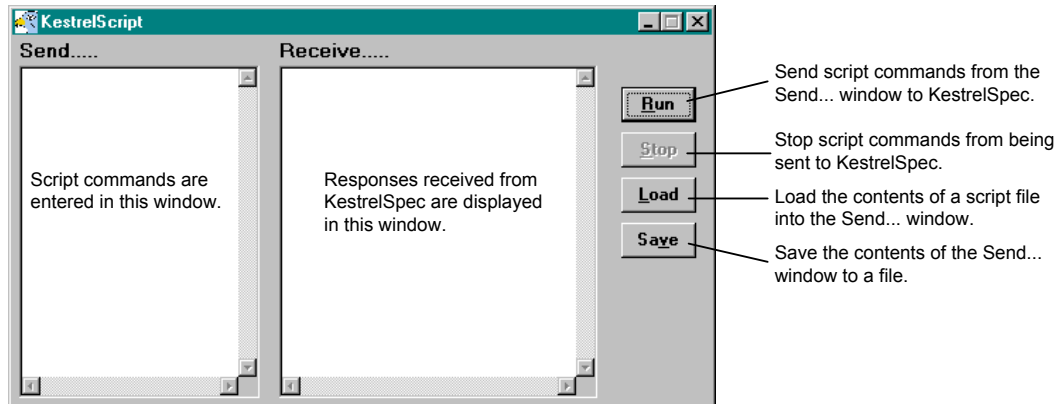
Using the Kestrel Scriptor Program

Scripter is a client application that establishes a DDE link with KestrelSpec and then sends commands for KestrelSpec to perform. The scripting application is located in the Kestrel program group on the Start menu. Start the Scriptor program. If KestrelSpec is not already running, you will be prompted to find its executable file so the program can be run.

Remember, DDE **must** be enabled in the startup screen:

Enable KestrelScript (Windows DDE)

Once a link is established to KestrelSpec, this main screen will appear:



KestrelSpec must always be running when you are using Scriptor. You can switch back and forth between the two programs by clicking on the appropriate program in the task bar. Or, you can use the Alt + TAB function keys to bring a selected program to the foreground. You can minimize KestrelSpec so its main screen is removed and its program icon placed on the task bar.

Operation of Kestrel Scriptor is very simple. Enter scripting commands in the **Send...** window on the left, click on the **Run** button, and the responses from KestrelSpec will appear in the **Receive...** window on the right. If you are running a series of commands and want to abort, click on the **Stop** button. If KestrelSpec is acquiring spectra when **Stop** is clicked, then acquisition is stopped as well as the series of commands. To load a script saved in a file, click on the **Load** button. You can select a scripting file, with an SCR extension, and the contents of the file will be loaded into the **Send...** window. To save the contents of the **Send...** window to a file, click on the **Save** button.

There are sample script files in the **DEMODATA** subdirectory for you to try. Open these SCR files by clicking on the **Load** button. An explanation of each sample script is on the following pages.

Script1 contains these commands:

```
REQ|CLRA
REQ|ETIM 0.1
REQ|ACQS
REQ|ETIM 0.05
REQ|ACQS
REQ|ETIM 0.1
REQ|ACQS
REQ|ETIM 0.05
REQ|ACQS
REQ|ETIM 0.1
REQ|ACQS
REQ|ETIM 0.05
REQ|ACQS
REQ|ETIM 0.1
REQ|ACQS
REQ|ETIM 0.05
REQ|ACQS
REQ|ETIM 0.1
REQ|ACQS
REQ|ETIM 0.05
REQ|ACQS
```

When this script is run, all active curves are first cleared and then a series of 10 spectra are acquired when 1 curve is being created per image. The exposure time is modified between acquisitions. KestrelSpec responds to each ACQS command with the starting curve memory position and the number of newly created curves, as in this sample output:

```
RSP|CLRA|0
RSP|ETIM|0
RSP|ACQS|0 1,1
RSP|ETIM|0
RSP|ACQS|0 2,1
RSP|ETIM|0
RSP|ACQS|0 3,1
RSP|ETIM|0
RSP|ACQS|0 4,1
RSP|ETIM|0
RSP|ACQS|0 5,1
RSP|ETIM|0
RSP|ACQS|0 6,1
RSP|ETIM|0
RSP|ACQS|0 7,1
RSP|ETIM|0
RSP|ACQS|0 8,1
RSP|ETIM|0
RSP|ACQS|0 9,1
RSP|ETIM|0
RSP|ACQS|0 10,1
```

Script2 contains these commands:

```
REQ|CLRA
REQ|ACUM 1
REQ|ACQS
REQ|DXAX 1
REQ|DCRV 1
REQ|ACUM 2
REQ|ACQS
REQ|DXAX 2
REQ|DCRV 2
REQ|ACUM 3
REQ|ACQS
REQ|DXAX 3
REQ|DCRV 3
```

When this script is run, all active curves are first cleared. The number of accums is set to 1 and then a spectral curve is acquired. The X axis values are downloaded and then the Y values are downloaded. The accums are then increased to 2, a curve is acquired and its X and Y values are downloaded. The accums are then increased to 3, a curve is acquired and then downloaded as in this sample output:

```
RSP|CLRA|0
RSP|ACUM|0
RSP|ACQS|0 1,1
RSP|DXAX|0 506.60,506.70,506.81,506.92,507.02,507.13,507.24,507.34,etc.
RSP|DCRV|0 2411,2449,2582,2433,2457,2454,2469,2437,2492,2499,2513,etc.
RSP|ACUM|0
RSP|ACQS|0 2,1
RSP|DXAX|0 506.60,506.70,506.81,506.92,507.02,507.13,507.24,507.34,etc.
RSP|DCRV|0 4842,4933,5116,4924,4899,4817,4994,4909,4950,5051,5013,etc.
RSP|ACUM|0
RSP|ACQS|0 3,1
RSP|DXAX|0 506.60,506.70,506.81,506.92,507.02,507.13,507.24,507.34,etc.
RSP|DCRV|0 7409,7622,7715,7438,7458,7399,7553,7449,7455,7655,7635,etc.
```

Script3 contains these commands:

```
REQ|CLRA
REQ|ACUM 1
REQ|SCNS 10
REQ|ACQS
REQ|SAVA TEN SCANS
```

When this script is run, all active curves are first cleared. The number of accums is set to 1 and the number of scans is set to 10. The 10 curves are acquired and then written to a file in the installation directory called TEN SCANS.CRV as in this sample output:

```
RSP|CLRA|0
RSP|ACUM|0
RSP|SCNS|0
RSP|ACQS|0 1,10
RSP|SAVA|0
```

Script4 contains these commands:

```
REQ|SPEC WAVLEN
REQ|SPEC CTRPIX
REQ|SPEC TANGLE
REQ|SPEC FOCLEN
REQ|SPEC GPERMM
REQ|SPEC PIXSIZ
REQ|SPEC LASERW
```

When this script is run, each of the spectrograph information parameters (as defined by "Setup 1-Point Cal..." under the **Setup:X Axis Calibration...** menu option) is reported as in this sample output:

```
RSP|SPEC|0 546.1
RSP|SPEC|0 375
RSP|SPEC|0 49.32
RSP|SPEC|0 150
RSP|SPEC|0 600
RSP|SPEC|0 11.500000
RSP|SPEC|0 532.2
```

Example of a Visual Basic 5.0 or 6.0 DDE Link to KestrelSpec

The easiest way to communicate with KestrelSpec is to use a text box with an automatic DDE link. Here are the steps for creating a Visual Basic 5.0 or 6.0 program with an automatic link:

- 1) Create a Visual Basic application with a text box on its form called txtLink. Make sure the MultiLine property for the text box is set to true, because some of the responses from KestrelSpec will be long.
- 2) To establish a link to KestrelSpec, make these assignments:

```
txtLink.LinkTopic = "Kestrel|MAINMENU"  
txtLink.LinkItem = "txtDDE"  
txtLink.LinkMode = vbLinkAutomatic
```

If no error occurs, then a DDE link has been established. Just remember to have KestrelSpec up and running before trying to link to it. The KestrelSpec program's executable file is KESTREL.EXE.

- 3) To send commands and receive data, assign the command to txtLink.Text, send the command and then wait for the response. For example, to request the exposure time:

```
txtLink.Text = "REQ|ETIM"  
txtLink.LinkPoke
```

Wait until txtLink.Text contains the response from KestrelSpec.

- 4) Break the DDE link with KestrelSpec when your program ends:

```
txtLink.LinkMode = vbLinkNone
```