

Interfacing iDataRayOcx to VB

Incomplete Draft.

1. Applies to:

- Beam'R
- WincamD and TaperCamD - the 'WinCamD series'.
- Versions 5.00B and higher of **iDataRayOcx.exe**. Does not apply to lower software revisions.

2. You need to know that:

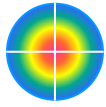
- a) If you print this document, use a color printer or much information will be lost.
- b) Learn to use the DataRay product with the DataRay software before trying to use a VB interface. If you understand the product, the VB will make sense. If you do not, the VB may not make sense. A few hours invested in understanding how to use the product, will pay off many times when setting up a VB interface.
- c) You may save time by reading this document sequentially, rather than by jumping to the section that you believe applies.
- d) OCX architecture should eventually allow the DataRay software to simultaneously run on-screen & to simultaneously interface to other software. For now, run the OCX interface without running the screen version of the DataRay software. With WinCamD, the DataRay software may be open but not running.
- e) We are experts in our software. We are not VB interfacing experts. To use **iDataRayOcx** with VB, you must at least be competent in VB *before* you attempt to use this Application Note.
- f) Send suggestions on additions/deletions/changes to this Application Note to: **support@dataray.com**

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2) DataRayOcx.cls Description

To simplify your interpretation of this list, it is necessary that you are first familiar with the normal operation of the DataRay software for the product that you are using. Then items which seem initially obscure will become more self-explanatory.

Text which is not color-coded applies to all products. Color-coded items are applicable as follows:



BeamMap, BeamMap-C, Beam'R, BeamScope-P7 family

BeamMap

BeamMap-C, ColliMate

Beam'R

Beamscope-P7

WinCamD, TaperCamD series

```
VERSION 1.0 CLASS
BEGIN
    MultiUse = -1 'True
    Persistable = 0 'NotPersistable
    DataBindingBehavior = 0 'vbNone
    DataSourceBehavior = 0 'vbNone
    MTSTransactionMode = 0 'NotAnMTSObject
END
Attribute VB_Name = "DataRayOcx"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = True
Attribute VB_PredeclaredId = False
Attribute VB_Exposed = False

Rem Use examples
Rem GetData1.FilterValue = 0.5
Rem GetData1.FilterValue = 0
Rem Filter = GetData1.FilterValue

Rem GetData1.InkSaverState = 0 // Off. The Inksaver palette function is off.
Rem GetData1.InkSaverState = 1 // On The Inksaver palette function is On.

Rem GetData1.JitterSuppression = 0 // Off
Rem GetData1.JitterSuppression = 1 // On. Normally set to On.

Rem GetData1.Wavelength = .667 // Sets Current device

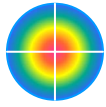
Rem GetData1.WinCamFilter = 1 OR 2 OR 3 OR 4 // Sets the NxN Area averaging
function.

Rem CurrentCamera = GetData1.CurrentCamera // Initiates getting data from the
current camera

Rem GetData1.BaselineLocked = 0 // Off. Locks baseline - disables auto-zero.
Rem GetData1.BaselineLocked = 1 // On. Unlocks baseline - enables auto-zero.

Rem GetData1.WinCamNormalized = 0 // Off. Sets 2D image normalization off.
Rem GetData1.WinCamNormalized = 1 // On. Normalizes the 2D image peak to 100%.

Rem GetData1.BackGroundSubtraction = 0 // Off. No background subtraction.
Rem GetData1.BackGroundSubtraction = 1 // On. Initiates the Background
Subtraction routine.n
```



DataRay Inc.

Application Note

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```
Rem GetData1.AutoNaming = 0 // Off
Rem GetData1.AutoNaming = 1 // On. Autonaming of saved files with date and
time is on.

Rem GetData1.OpenBeamScopeP7(0) // open all BeamScopes
Rem GetData1.OpenBeamMap(0) // open all Beam'R -- BeamMaps

Rem IsThere = GetData1.IsBeamScopeP7HeadThere

Rem GetData1.DoSearch() // starts search Beam'R, BeamMap and
BeamScopes

Rem GetData1.HomeP7Head() // Homes BeamScope finger

Rem GetData1.SaveFile() // Same as in exe program
Rem GetData1.PreviousProfile() // points to previous buffer location
Rem GetData1.NextProfile() // points to next buffer location
Rem GetData1.SelectProfile() // Opens beam select dialog

Rem GetData1.OpenClipLevelDlg(0) // opens Cliplevel a dialog
Rem GetData1.OpenClipLevelDlg(1) // opens Cliplevel b dialog
Rem Clip = GetData1.GetClipLevel(0)

Rem GetData1.LoadDefaults() // Reloads all defaults
Rem Index = GetData1.GetBeamScopeIndex() // The Buffer index
Rem Count = GetData1.GetSampleCount() // Gets # of samples in the data buffer

Rem GetData1.SetAverageNumber(0_to_200) // Sets the # of samples to average.

Rem GetData1.OpenFile() // Dialog will prompt for filename.
Rem GetData1.SaveJobFile() // Dialog will prompt for filename.
Rem GetData1.LoadJobFile() // Dialog will prompt for Job filename.
Rem Live = GetData1.GetCurrentState() // Live data = 0, Recalled file = 1
Rem GetData1.SetDisplayMode(0to6)

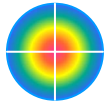
Rem GetData1.StartDevice() // Starts current device
Rem GetData1.StopDevice() // Stops current device

Rem GetData1.Update() // Forces all data to be recalculated

Rem GetData1.SetToZero() // Current Xc and Yc become the new zero
Rem GetData1.SetToAbsolute() // Current Xc and Yc become absolute values
Rem BoolCameraThere = GetData1.IsCameraThere(0_to_7) // Checks for the
presence of a camera.

Rem GetData1.Palette = PAL_256 // Selects the image palette from list below.

Enum DataRay_Palettes
    PAL_256 = 1 // 256 colors
    PAL_GRAY = 2 // 256 gray scale
    PAL_16 = 3 // 16 colors
    PAL_10 = 4 // 10 colors (10% solid contours)
    MAX_PAL = 5 // Sets color range to maximum in Display Settings.
End Enum
```



```
Enum DataRay_Cameras // Defines cameras 1 to 8 as 0 to 7.
    Camera1 = 0
    Camera2 = 1
    Camera3 = 2
    Camera4 = 3
    Camera5 = 4
    Camera6 = 5
    Camera7 = 6
    Camera8 = 7
End Enum

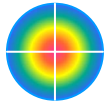
Rem GetData1.SetCurrentDevice(IS_WINCAM) // Sets the current device.

Enum DataRay_Devices // Specifies the number associated with the head types.
    IS_BEAMSCOPE = 1
    IS_BEAMR = 2
    IS_BEAMMAP = 3
    IS_BEAMC = 4
    IS_WINCAM = 5
    IS_TWOD_SCAN = 6
    IS_WINCAM_LOG = 7
    IS_SPARE3 = 8
    IS_SPARE4 = 9
    LAST_DEVICE = 10
End Enum

Rem Use examples
Rem GetData1.ToggleDialog(WANDER_DLG) // Toggles Wander dialog open/close.
Rem GetData1.ToggleDialog(BEAM_FIT_DLG) //
Rem GetData1.OpenDialog(EPPROM_DATA) // Opens the EEPROM data screen
Rem GetData1.CloseDialog(EPPROM_DATA) // Closes the EEPROM data screen

Enum DataRay_Dialogs // Specifies the number associated with certain dialogs.
    M2_DEBUG_DLG = 1 // M-squared debug dialog.
    M2_BEAMSCOPE_DLG = 2 M-squared dialog
    M2_BEAMMAP_DLG = 3
    M2_BEAMC_DLG = 4
    DIV_BEAMMAP_DLG = 5
    DIV_BEAMC_DLG = 6
    WC_FLUENCE_DLG = 7 // WinCamD fluence dialog.
    NUMERIC_DISPLAY_MODES = 8 // The numeric display modes dialog
    EPPROM_DATA = 9
    LOGGING_DLG = 10
    BS_PULSED_DLG = 11
    WAVE_LENGTH_DLG = 12
    CAPTURE_DLG = 13
    PCI_EEPROM_DLG = 14
    WANDER_DLG = 15
    CENTROID_CLIP_DLG = 16
    WC_IMAGE_LOG_SETUP_DLG = 17 // The image log set up dialog.
    WC_IMAGE_LOG_DLG = 18 // The Image log dialog
    WC_LOGGING_DLG = 19 // The logging dialog
    BEAM_FIT_DLG = 20 // ??
End Enum

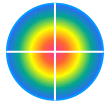
Rem Use examples
Rem Xc = GetData1.GetParameter(Xc_WinCamD) // Gets the X centroid value
Rem Yc = GetData1.GetParameter(Yc_WinCamD) // Gets the Y centroid value
```



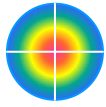
```
Rem Text = GetData1.GetOcxResultName(Xc_WinCamD) // Text = "Xc_WinCamD"  
Rem Text = GetData1.GetOcxResultName(Yc_WinCamD) // Text = "Yc_WinCamD"
```

Enum DataRay_Parameters_Buttons

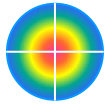
```
BlankParameters = 0  
DefaultParameters = 1  
u_BeamR_Width_at_Clip_1 = 2  
u_BeamR_Width_at_Clip_2 = 3  
u_BeamR_GFit = 4  
u_BeamR_TopHat = 5  
v_BeamR_Width_at_Clip_1 = 6  
v_BeamR_Width_at_Clip_2 = 7  
v_BeamR_GFit = 8  
v_BeamR_TopHat = 9  
v1_BeamC_Width_at_Clip_1 = 10  
v1_BeamC_Width_at_Clip_2 = 11  
v1_BeamC_GFit = 12  
v1_BeamC_TopHat = 13  
u1_BeamC_Width_at_Clip_1 = 14  
u1_BeamC_Width_at_Clip_2 = 15  
u1_BeamC_GFit = 16  
u1_BeamC_TopHat = 17  
v2_BeamC_Width_at_Clip_1 = 18  
v2_BeamC_Width_at_Clip_2 = 19  
v2_BeamC_GFit = 20  
v2_BeamC_TopHat = 21  
u2_BeamC_Width_at_Clip_1 = 22  
u2_BeamC_Width_at_Clip_2 = 23  
u2_BeamC_GFit = 24  
u2_BeamC_TopHat = 25  
v3_BeamC_Width_at_Clip_1 = 26  
v3_BeamC_Width_at_Clip_2 = 27  
v3_BeamC_GFit = 28  
v3_BeamC_TopHat = 29  
u3_BeamC_Width_at_Clip_1 = 30  
u3_BeamC_Width_at_Clip_2 = 31  
u3_BeamC_GFit = 32  
u3_BeamC_TopHat = 33  
v4_BeamC_Width_at_Clip_1 = 34  
v4_BeamC_Width_at_Clip_2 = 35  
v4_BeamC_GFit = 36  
v4_BeamC_TopHat = 37  
u4_BeamC_Width_at_Clip_1 = 38  
u4_BeamC_Width_at_Clip_2 = 39  
u4_BeamC_GFit = 40  
u4_BeamC_TopHat = 41  
minus2_BeamMap_Width_at_Clip_1 = 42  
minus2_BeamMap_Width_at_Clip_2 = 43  
minus2_BeamMap_GFit = 44  
minus2_BeamMap_TopHat = 45  
minus1_BeamMap_Width_at_Clip_1 = 46  
minus1_BeamMap_Width_at_Clip_2 = 47  
minus1_BeamMap_GFit = 48  
minus1_BeamMap_TopHat = 49  
zero_BeamMap_Width_at_Clip_1 = 50  
zero_BeamMap_Width_at_Clip_2 = 51  
zero_BeamMap_GFit = 52  
zero_BeamMap_TopHat = 53
```



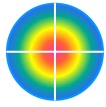
```
plus1_BeamMap_Width_at_Clip_1 = 54
plus1_BeamMap_Width_at_Clip_2 = 55
plus1_BeamMap_GFit = 56
plus1_BeamMap_TopHat = 57
plus2_BeamMap_Width_at_Clip_1 = 58
plus2_BeamMap_Width_at_Clip_2 = 59
plus2_BeamMap_GFit = 60
plus2_BeamMap_TopHat = 61
plus45_BeamMap_Width_at_Clip_1 = 62
plus45_BeamMap_Width_at_Clip_2 = 63
plus45_BeamMap_GFit = 64
plus45_BeamMap_TopHat = 65
minus45_BeamMap_Width_at_Clip_1 = 66
minus45_BeamMap_Width_at_Clip_2 = 67
minus45_BeamMap_GFit = 68
minus45_BeamMap_TopHat = 69
u_BeamScope_Width_at_Clip_1 = 70
u_BeamScope_Width_at_Clip_2 = 71
u_BeamScope_GFit = 72
u_BeamScope_TopHat = 73
v_BeamScope_Width_at_Clip_1 = 74
v_BeamScope_Width_at_Clip_2 = 75
v_BeamScope_GFit = 76
v_BeamScope_TopHat = 77
u_WinCamD_Width_at_Clip_1 = 78 // The Clip[a] 2Wua beam diameter
u_WinCamD_Width_at_Clip_2 = 79 // The Clip[b] 2Wub beam diameter
u_WinCamD_GFit = 80 // The Clip[a] 2Wua profile Gaussian fit %
u_WinCamD_TopHat = 81 // The Clip[a] 2Wua profile Top Hat fit %
v_WinCamD_Width_at_Clip_1 = 82 // The Clip[a] 2Wva beam diameter
v_WinCamD_Width_at_Clip_2 = 83 // The Clip[b] 2Wvb beam diameter
v_WinCamD_GFit = 84 // The Clip[a] 2Wva profile Gaussian fit %
v_WinCamD_TopHat = 85 // The Clip[a] 2Wva profile Top Hat fit %
Xc_BeamR = 86
Yc_BeamR = 87
Xg_BeamR_not_used = 88
Yg_BeamR_not_used = 89
Xp_BeamR_not_used = 90
Yp_BeamR_not_used = 91
Ellipticity_BeamR = 92
Power_BeamR = 93
Xc1_BeamC = 94
Yc1_BeamC = 95
Xg1_BeamC_not_used = 96
Yg1_BeamC_not_used = 97
Xp1_BeamC_not_used = 98
Yp1_BeamC_not_used = 99
Xc2_BeamC = 100
Yc2_BeamC = 101
uMsquared_BeamC_Alt = 102
uM2_Zo_BeamC_Alt = 103
Xp2_BeamC_not_used = 104
Yp2_BeamC_not_used = 105
Xc3_BeamC = 106
Yc3_BeamC = 107
vMsquared_BeamC_Alt = 108
vM2_Zo_BeamC_Alt = 109
Xp3_BeamC_not_used = 110
Yp3_BeamC_not_used = 111
Xc4_BeamC = 112
```



```
Yc4_BeamC = 113
Xg4_BeamC_not_used = 114
Yg4_BeamC_not_used = 115
Xp4_BeamC_not_used = 116
Yp4_BeamC_not_used = 117
Ellipticity_BeamC = 118
Power_BeamC = 119
Xc_BeamMap = 120
Yc_BeamMap = 121
Xg_BeamMap_not_used = 122
Yg_BeamMap_not_used = 123
Xp_BeamMap_not_used = 124
Yp_BeamMap_not_used = 125
Ellipticity_BeamMap = 126
Power_BeamMap = 127
DivergenceNA_BeamMap = 128
DivergenceDegrees_BeamMap = 129
DivergenceRadians_BeamMap = 130
Msquared_BeamMap = 131
M2_2Wo_BeamMap = 132
M2_Zo_BeamMap = 133
M2_Zr_BeamMap = 134
M2_Theta_BeamMap = 135
M2_NA_BeamMap = 136
Xc_BeamScope = 137
Yc_BeamScope = 138
Xg_BeamScope = 139
Yg_BeamScope = 140
Xp_BeamScope = 141
Yp_BeamScope = 142
Ellipticity_BeamScope = 143
Power_BeamScope = 144
uDivergenceNA_BeamC = 145
uDivergenceDegrees_BeamC = 146
uDivergenceRadians_BeamC = 147
uMsquared_BeamC = 148
uM2_2Wo_BeamC = 149
uM2_Zo_BeamC = 150
uM2_Zr_BeamC = 151
uM2_Theta_BeamC = 152
uM2_NA_BeamC = 153
vDivergenceNA_BeamC = 154
vDivergenceDegrees_BeamC = 155
vDivergenceRadians_BeamC = 156
vMsquared_BeamC = 157
vM2_2Wo_BeamC = 158
vM2_Zo_BeamC = 159
vM2_Zr_BeamC = 160
vM2_Theta_BeamC = 161
vM2_NA_BeamC = 162
Xc_WinCamD = 163 // The Xc mathematical centroid
Yc_WinCamD = 164 // The Yc mathematical centroid
Xg_WinCamD = 165 // The Xg geometric centroid
Yg_WinCamD = 166 // The Yg geometric centroid
Xp_WinCamD = 167 // The Xp peak position
Yp_WinCamD = 168 // The Yp peak position
Ellipticity_WinCamD = 169 // The ellipticity
Power_WinCamD = 170 // The relative power value in the selected units
Oreintation_WinCamD = 171 // The orientation of the ellipse in degrees
```



```
MajorWidth_WinCamD = 172 // The ellipse major diameter 2W_Major
MinorWidth_WinCamD = 173 // The ellipse minor diameter 2W_Minor
MeanWidth_WinCamD = 174 // The ellipse mean diameter 2W_Mean
Peak_WinCamD = 175 // The Peak value as a % of the maximum possible ADC
level
AverageFluence_WinCamD = 176 // The Average fluence value from the dialog
uM2_M2_BeamScope = 177
uM2_2Wo_BeamScope = 178
uM2_Zo_BeamScope = 179
uM2_Zr_BeamScope = 180
uM2_Theta_BeamScope = 181
uM2_NA_BeamScope = 182
vM2_M2_BeamScope = 183
vM2_2Wo_BeamScope = 184
vM2_Zo_BeamScope = 185
vM2_Zr_BeamScope = 186
vM2_Theta_BeamScope = 187
vM2_NA_BeamScope = 188
ID_WANDER = 189
PointingX_BeamMapC = 190
PointingY_BeamMapC = 191
PointingX_BeamMap = 192
Msquared_BeamMap_Alt = 193
M2_Zo_BeamMap_Alt = 194
M2_Theta_BeamMap_Alt = 195
M2_Zo_BeamMap_Alt2 = 196
Spare9 = 197
Spare10 = 198
Spare11 = 199
Spare12 = 200
Spare13 = 201
Spare14 = 202
Spare15 = 203
Spare16 = 204
Spare17 = 205
Spare18 = 206
Spare19 = 207
Spare20 = 208
Spare21 = 209
Spare22 = 210
Spare23 = 211
Spare24 = 212
Spare25 = 213
Spare26 = 214
Spare27 = 215
Spare28 = 216
Spare29 = 217
Spare30 = 218
Spare41 = 219
Spare42 = 220
Spare43 = 221
Spare44 = 222
Spare45 = 223
Spare46 = 224
Spare47 = 225
Spare48 = 226
Spare49 = 227
Spare50 = 228
Last_PARAMETER_ID = 229
```



```
SetClipLevel1 = 230 // Sets the Clip[a] level
SetClipLevel2 = 231 // Sets the Clip[b] level
PeakButton = 232 // Displays the Peak value as a % of the maximum possible
ADC level
StatusButton = 233 // Displays the Device status
ZeroButton = 234 // Toggles between zero and absolute centroid display
SpacerButton1 = 235 // A filler bar
SpacerButton2 = 236 // A filler bar
ZoomButton = 237 //
CrossHairButton = 238 //
AuxStageScale_2D = 239
TwoDsetup_2D = 240
SetReference_2D = 241
Reference_2D = 242
HomeStage_2D = 243
Scan_2D = 244
DoSearch = 245

Last_ID = 246
End Enum

Rem GetData1_SendMessage(ByVal Message As Long, ByVal LongValue As Long, ByVal
DoubleValue As Double)
Rem You can safely ignore all messages, LongValue and DoubleValue not used

Enum DataRay_Messages
M2_DONE = 1
M2_START = 2
GLOBAL_CLIP_CHANGE = 3 // Global changes in clip level is selected
GLOBAL_STOP_CAPTURE = 4 // ??
AUTO_3D_UPDATE = 5 // Auto-update of the 3D display is selected
AUTO_2D_UPDATE = 6 // Auto-update of the 2D display is selected
JITTER_CONTROL = 7 // Jitter suppression is selected for BeamMap/ Beam'R
style heads.
PALETTE_CHANGE = 8 // ??
INK_SAVER_CHANGE = 9 // ??
AUTO_NAMES = 10 // ??
LIVE_RECALL_STATE = 11 // ??
XC_YC_CHANGE = 12 // ??
STATE_CHANGE = 13 // ??
DATA_CHANGE = 14 // ??
BS_DATA_CHANGE = 15 // ??
HELP_MSG = 16 // ??
End Enum

Rem ShuterControl1.SetID (Exposure_Slider) // ??
Rem ShuterControl1 is the First slider inserted // ??

Enum DataRay_Sliders // Defines the Slider numbers
Trigger_Slider = 0 // The trigger slider for pulsed lasers
Gain_Slider = 1 // The Gain slider for CCD Gain
Exposure_Slider = 2 // The CCD Exposure slider
End Enum
```