Communication with iView X

This document describes the communication between the iView X and the subject computer via serial cable or Ethernet network connection. These commands are sent by the subject PC in order to control aspects of the experiment such as timing. Commands can be implemented to tell the eye tracker when to calibrate, start and stop recording, etc. The remote commands can be generated via 3rd party stimulus software or custom programming. Commands are also generated by the iView X and sent to the subject PC as a way of communicating status or gaze information.

This document contains a general description and does not provide instructions for implementing this communication method in the subject PC itself, which would depend on software, programming language, and operating system. This document also does not deal with functions using the digital input/output card or the optional analog output card.

An iView X remote command has the format "ET_XXX [parameter]". The XXX is an abbreviation for the particular command and the parameter is included if necessary. A complete list of all commands and parameters in the control command library can be found in the iView manual.

Example: The command "ET_INC" sent by the subject PC to the iView X will increment the set number in the data file (to match a new slide or event in the stimulus). The command "ET_CAL 9" sent from the eye tracking computer informs the subject computer that a 9 point calibration has been started.

Remote Calibration

This is a description of how to use your subject software to display dynamic calibration points in conjunction with the iView X system. By utilizing the remote control commands, your software can be used to display calibration points according to the settings in iView and the status of the calibration.

When the calibration is started, the subject software must display the first calibration point. As the subject fixates on the point and iView detects the fixation, it will send a command to activate the next point on the subject software. The subject software notices the change and displays the next point, eventually showing each point in calibration in succession.

Alternately, the subject should be able to manually accept calibration points by pressing the space bar on the subject PC. When the calibration is finished, the subject software should react by closing the calibration screen.

To set up this calibration routine, the subject PC software will have to open the serial port or Ethernet connection in order to communicate with the iView. The connection will have to be monitored for iView commands. This should be done in a separate thread so other activities on the subject computer are not blocked.

If data is received from the iView, it will have to be parsed and formatted as described above because each transmission of data might not contain a full command. For example, consecutive data strings from the port might be "ET_C" and then "AL 9" which when assembled is the iView command "ET_CAL 9".

To start, send the "ET_REC" command from the subject PC to the iView. After starting the recording you can send "ET_CAL *calibration type*". iView then sends the following:

```
ET_CSZ 1024 768
ET_PNT 1 512 384
ET_PNT 2 51 38
ET_PNT 3 973 730
```

```
ET_PNT 4 51 730
ET_PNT 5 973 730
ET_CHG 1
```

```
ET_CSZ 1024 768
```

The size of the calibration area assumed by iView is 1024x768.

```
ET_PNT 1 512 384
```

The first point is 512 384.

```
ET_PNT 2 51 38
```

…

```
ET_PNT 5 973 730
```

```
ET_CHG 1
```

Show first calibration point.

If the screen resolution of the subject PC is not the same as set in iView properties, the remote calibration program will have to store the values of the calibration area size to do calculations and all points will have to be stored to know where to show them. Alternately, be sure that the resolution set in iView Calibration properties matches that of the Subject PC.

After displaying the first point, the software must monitor the serial port for further "ET_CHG" commands or "ET_BRK", which cancels the calibration procedure.

If you want the subject to manually accept the point with a key press once they fixate, the "ET_ACC" command must then be sent to the serial port. This instructs iView to change to the next calibration point rather than having it detect fixations itself.

When the calibration is finished, iView sends "ET_FIN". If desired, the subject PC can now stop the recording with "ET_STP".

Remote Calibration Program	-	iView
ET_REC		
ET_CAL 5		
		ET_CSZ 1024 768
		ET_PNT 1 512 384
		ET_PNT 2 51 38
		ET_PNT 3 973 730
		ET_PNT 4 51 730
		ET_PNT 5 973 730
		ET_CHG 1
(ET_ACC)		

	ET_CHG 2
(ET_ACC)	
	ET_CHG 3
(ET_ACC)	
	ET_CHG 4
(ET_ACC)	
	ET_CHG 5
(ET_ACC)	
	ET_CHG 1
(ET_ACC)	
	ET_FIN 1
ET_STP	

Online Data Transmission

The iView X system can transmit streaming digital gaze data over the serial port or Ethernet. The data can then be collected by the subject PC for gaze contingent displays or remote data collection.

Before activating data transmission, the desired format of the data must be set by sending an "ET_FRM" command. Then the start transmission command "ET_STR" is sent. An optional sub-sampling factor can reduces the sample rate if every data point is not needed.

Remote Recording Program	-	iView
ET_FRM "%TS: %SX, %SY"		
ET_REC 120		
ET_STR 5		
		(every 100 ms)
		ET_ SMP 496523: 123, 435
ET_STP		
ET_EST		

The formatting of the data follows the C programming language syntax and is further described in the iView X manual (see "System User Guide⇢External I/O Interfaces⇢Remote Commands: ET_FRM").