

Experiment Control

Stimulus Presentation for Cognitive Neuroscience



Flexible Options for Experiment Control and Stimulus Presentation

Experiment control and stimulus presentation are easily integrated into EGI's Geodesic EEG System (GES), whether you choose EGI's fully supported E-Prime Workstation 2 NTP, which includes all of the hardware and software you need for a complete electroencephalography/event-related potential (EEG/ERP) lab, or you are using a commercial, open source, or site-developed stimulus presentation application.

EGI offers several options for incorporating experiment control into your EEG system. The E-Prime Workstation 2 NTP is a complete package for **advanced experiment control**. An expanded ERP package (see the back cover) includes the E-Prime Workstation 2 NTP, plus an E-Prime starter pack and EGI's AV device. For **basic experiment control**, EGI offers an optional customized TTL cable that connects between your computer and the Net Amps amplifier.

Flexible connectivity.
The GES allows you the flexibility to connect to your stimulus presentation system via TCI/IP or TTL. When communicating via TCI/IP, the system uses Network Time Protocol (NTP) and Net Station's Experimental Control Interface (ECI). When connecting via TTL, the TTL pulse input connects to EGI's Net Amps amplifier.

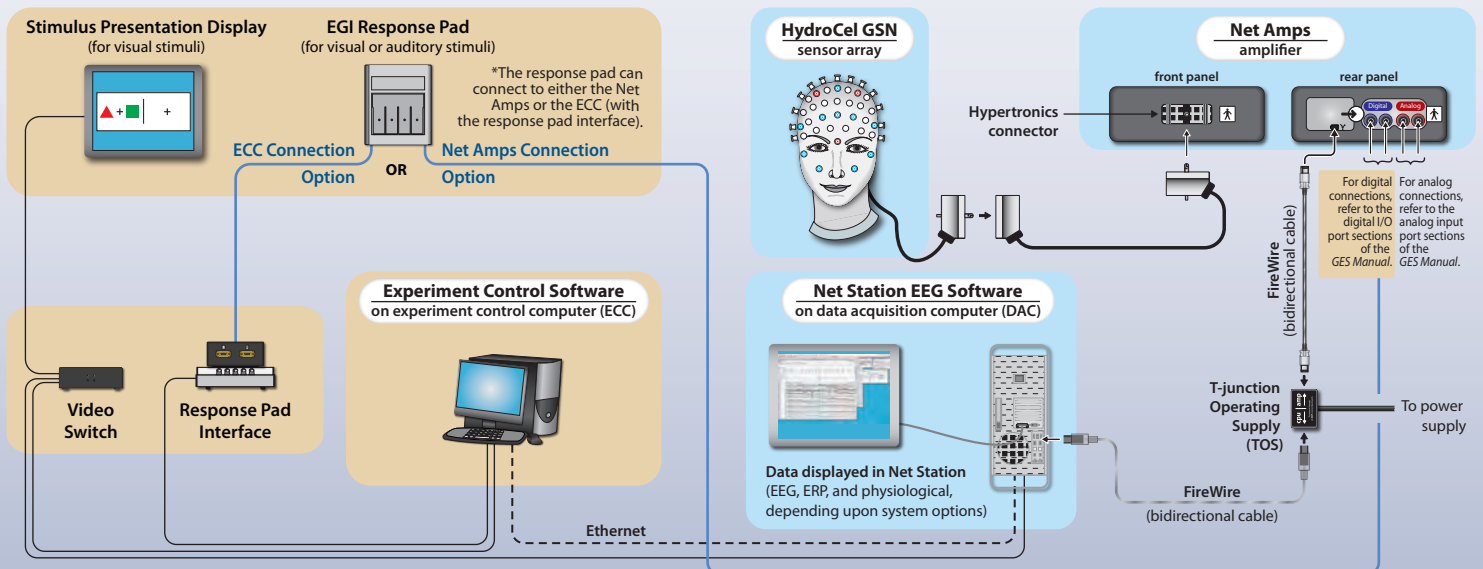
E-Prime Workstation 2 NTP

EGI's E-Prime Workstation 2 NTP is an integrated, well-supported solution that provides a wide range of experiment design options, making it ideal for labs with multiple principal investigators. At the core of this workstation is Psychology Software Tools, Inc.'s E-Prime 2.0 Professional. E-Prime is widely used for behavioral, ERP, and fMRI experiment applications, from simple to complex experiments by novice to advanced users.

E-Prime 2.0 Pro solves your ERP issues with:

- Simultaneous stimuli presentation on multiple monitors
- Simultaneous playback of multiple movies
- Improved testing and debugging tools with AutoAnswer and Experiment Advisor scripting aides
- Experiment-wide object properties and defaults that you can set
- Custom libraries of shared functions that you can create through package files
- Multiple correct answers

For additional options, see the last page of this brochure.



Advanced Experiment Control with EGI's E-Prime Workstation 2 NTP

Using TCI/IP communication and Network Time Protocol (NTP)

E-Prime® is a suite of applications (see the back cover) that you can use to easily design, generate, and run experiments. With its intuitive graphical interface you can easily build your own experiments, deliver stimuli and collect responses (with millisecond precision), and edit and analyze data.

E-Prime supports multiple stimulus formats:

- images as bmp, jpg, jpeg, gif, png, tif, tiff, emf, and wmf
- movies as MPEG, AVI, and WMV
- audio as MP3 and WMA

E-Prime also supports multiple input devices for joystick, parallel port, and network socket devices.

Features

Beyond E-Prime's standard features, EGI's Workstation 2 NTP provides:

- E-Prime 2.0 Pro with SR Box, EGI Response Pad, and E-Prime Extensions for Net Station
- Complete hardware setup with PC, keyboard, mouse, dual monitors, and video signal splitter
- Basic E-Prime training during installation of GES with E-Prime Workstation 2 NTP

Benefits

- Complete turnkey system
- Fully tested with EGI's GES to ensure data integrity
- NTP for millisecond timing precision
- EGI support for E-Prime to Net Station communication
- Three years support from PST for E-Prime 2.0 Pro
- TCI/IP communication with event metadata capabilities

Event information from E-Prime Workstation 2 NTP

One complete trial is shown. The events in this trial start with the beginning of the trial (bgin), then continue with the stimulus onset (stm+), the subject's response (resp), the fixation onset (fix+), and the trial specifications (TRSP). Each event includes such information as the stimulus type, the number of times a stimulus type has been shown, the location/position of a stimulus on the screen, the subject's response to the stimulus (including the delay in ms between the onset of the stimulus and the response to the stimulus, as well as the evaluation of the response [correct or incorrect]).

Event	Parameter	Value
bgin	cel#	1
	obs#	6
	pos#	1
	argu	0
stm+	cel#	1
	obs#	6
	pos#	3
	argu	0
resp	cel#	1
	obs#	6
	pos#	1
	rsp+	1
fix+	cel#	1
	obs#	6
	pos#	2
	argu	0
TRSP	cel#	1
	obs#	6
	rsp#	108
	eval	1
	rtim	407
	trl#	37

Basic Experiment Control

Using Transistor-Transistor Logic (TTL) digital inputs

The TTL method is a quick and easy way to get basic stimulus information into your EEG data stream, because most stimulus presentation software packages have TTL functionality built in. EGI's Net Amps amplifier has 8-bit digital input, and, by controlling which connector pins are active, you can achieve 255 event types to indicate different stimulus actions (stimulus A onset, stimulus B onset, fixation, etc.). All you need is to run an optional TTL cable between your amplifier and computer and the pin out information for the cable. (Contact EGI to purchase the optional customized TTL cable.)

Benefits

- TTL is an industry standard for experiment control software
- Inexpensive solution
- Use the stimulus presentation software of your choice
- Supports up to 255 unique event codes

Event information from a stimulus presentation system connected via TTL with EGI's Net Station

Two events are shown. The user customizes the event names. The events include such information as which channels (or bits) were active, the global index or trial number, and the channel index or observation number.

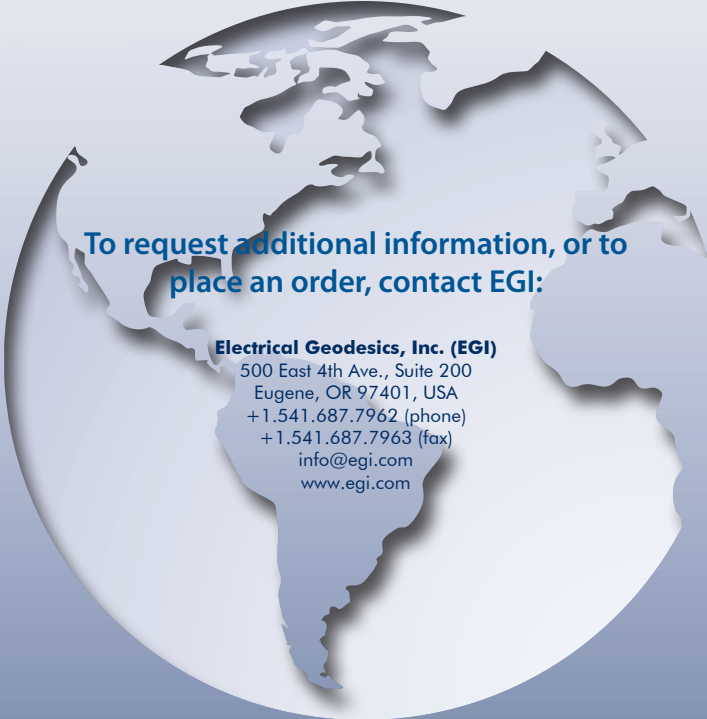
Event	Parameter	Value
Stan	CHAN	242
	gidx	23
	cidx	15
Targ	CHAN	241
	gidx	24
	cidx	4

EGI's expanded ERP Package includes:

- **E-Prime Workstation 2 NTP.** .
- **E-Prime Starter Pack.** A set of standard paradigms that can be used as is or customized to suit your lab's needs. The E-Prime Starter Pack can be purchased alone or as part of the ERP Package.
The E-Prime paradigms include:
 - *Stroop Test* (with additional working memory)
 - *Visual Target Detection*
 - *Auditory/Visual Reaction Time*
 - *Visual Reaction Time*
- **Audio/Visual (AV) Device.** The AV Device provides an independent measurement of visual and auditory millisecond timing accuracy. The AV Device can be purchased alone or as part of the ERP Package.

E-Prime's suite of applications includes:

- **E-Studio.** This is the drag and drop graphical interface for experiment design.
- **E-Basic.** This is the underlying scripting language of E-Prime (nearly identical to Visual Basic for Applications™).
- **E-Run.** A utility that uses a single mouse click to generate your completed experiment design into an E-Basic script. E-Run then affords you the millisecond precision of stimulus presentation, synchronizations, and data collection.
- **E-Merge.** A utility that quickly and easily combines your single session data files for group analysis.
- **E-DataAid.** A data management utility that allows you to filter, edit, analyze, and export your data.
- **E-Recovery.** A utility that recovers data files in the event of terminated experiments, or lost or corrupted files.



To request additional information, or to place an order, contact EGI:

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