

Name/Model: iVotronic

Vendor: Election Systems & Software (ES&S)



Brief Description:

ES&S' iVotronic Touch Screen Voting System is a poll worker-activated, portable, multilingual touchscreen system that records votes on internal flash memory. A poll worker uses a device called a Personal Electronic Ballot (PEB; pictured above at left) to turn the machine on and enable voting. Voters choose their ballot language and then make their selections using a touchscreen, much in the same way that modern ATMs work. When the polls close, poll workers move summary data from each machine onto the PEB. The PEBs are then transported to election headquarters or their contents transmitted via a computer network.

Detailed Voting Process:

When the voter enters the polling place, a poll worker first confirms the voter is registered. Then the poll worker walks with the voter to an iVotronic and inserts the PEB in the PEB slot (visible as the rectangular slot in the upper left corner of the middle image above). The PEB communicates with the iVotronic using infrared signals, much like a TV remote control works, except that the PEB and iVotronic will not communicate unless the PEB is completely inserted. If the election requires a specific ballot style, the poll worker chooses this for the voter. Activation by the PEB enables the iVotronic to vote once.

The voter then selects a ballot language and makes decisions using the touchscreen. When the voter is done, he or she presses a small "vote" button at the very top of the iVotronic to cast the vote. The vote is then recorded to three internal flash memories that reside inside the machine. A fourth memory is a removable card, called a "compact flash" (CF) card; note that CF is the same technology used in many digital cameras to store photos. During the election, the CF card holds audio files (for those with visual disabilities) and ballot definitions; vote data is written to the CF card when the machine is closed.

A poll worker closes the polls by using the PEB with a password to enter a supervisor menu on each iVotronic. After closing the election for a given machine, summary vote data are transmitted to the PEB via infrared signals.¹ After the PEB is used to close all the iVotronic machines, it contains all the summary data for the precinct. Depending on local regulations and procedures, poll workers can use a "printer pack" at this point to print the result summary from the PEB on to paper. The PEB for that

¹ Note that the vote data transmitted to the PEB at the closing of a machine is summary vote data instead of raw vote data; that is, it is a summary of the votes recorded rather than each individual electronic ballot as stored inside the iVotronic's internal memory. In order to do a proper recount or error analysis, one would need to remove the CF cards from the iVotronics and seal the CF cards for a precinct with the PEB and any printouts. This information is courtesy of Doug Jones of the University of Iowa.

precinct, any printouts and the CF cards are then either physically transported to a central tabulation facility, and in addition, the data may be transmitted by telephone using the modem included in the printer pack.

All of the electronic ballot images and event log data remain in the iVotronic until it is cleared for the next election. Many jurisdictions use the serial port on the back of the iVotronic to extract this data for archival storage during normal post-election procedures. This data duplicates what is stored on the compact flash card, and some jurisdictions save only this data or only the data from the compact flash card.

Past Problems:

- January 2004: Florida. In a special election for the State House District 91 seat, with only one item on the ballot, ES&S electronic voting machines showed a total of 134 undervotes – that is, 134 ballots in which voters did not select a candidate even though it was a single-race election. The winner received 12 more votes than the runner-up. Florida law requires a manual recount of invalid votes when the winning margin is less than one-quarter of one percent. However, election officials determined that no recount was required because the 134 invalid votes were cast on electronic voting machines, and there is no record of the original votes.²
- May 2003: Florida. An internal review of election results by a Miami-Dade county election official found that a DRE system sold by ES&S and used in the May 20, 2003 North Miami Beach runoff election (as well as in earlier elections) was “unusable” for auditing, recounting or certifying an election due to a “serious bug” in the software.³ As of August 2004, the newest software releases from ES&S fix this bug, which turns out to have been triggered by a low battery condition.⁴
- November 2002: North Carolina. At two early-voting locations in Wake County, North Carolina (Raleigh), iVotronics failed to record 436 ballots. This was due to a problem in the firmware of the machines.⁵ Firmware is a kind of software loaded on read-only memory so that it cannot be easily changed.
- October 2002: Texas. Democrats said they received several dozen complaints from people who said that they selected a Democratic candidate but that their vote appeared beside the name of a Republican on the screen. Some votes cast for Republicans were counted for Democrats.⁶
- September 2002: Florida. A spot check of machines revealed two problems. First, several Miami-Dade precincts, each with hundreds of voters, are listed as showing one or even no votes cast on election day. Second, differences arose within the same precincts between vote totals produced by the main tabulation system and a backup system.⁷

² “Electronic Vote Recount Stumps Broward Officials.” SUN-SENTINEL, January 10, 2004.

³ “Count Crisis? Election Officials Warn of Glitches that May Scramble Vote Auditing.” MIAMI DAILY BUSINESS REVIEW, May 16, 2004. “Glitch Forces Change in Vote Audits.” THE MIAMI HERALD, May 15, 2004.

⁴ Doug Jones, personal communication. Note that the software that fixes this bug has made it through ITA testing and state testing in at least Florida.

⁵ “Electronic Ballots Fail To Win Over Wake Voters, Election Officials; Machines Provide Improper Vote Count At Two Locations,” WRAL-TV RALEIGH-DURHAM, Nov. 2, 2002.

⁶ “Area Democrats say early votes miscounted,” THE DALLAS MORNING NEWS, Oct. 22, 2002.

⁷ “Leahy: Unskilled workers to blame,” MIAMI HERALD, Sept. 12, 2002.