# Unity 3.4.1.0

The Unity version 3.4.1.0 was examined at the Texas Office of the Secretary of State in Austin on June 9-10, 2014. The same system had been certified by the federal Elections Assistance Commission in April of this year.

## System Configuration

The system submitted for the Texas examination was comprised of the following components:

| Component | Software/Firmware Version | Component Type |
|---|---|---|
| AM | 7.5.2.0 | EMS |
| EDM | 7.8.2.0 | EMS |
| ESSIM | 7.7.2.0 | EMS |
| HPM | 5.9.0.0 | EMS |
| ERM | 7.9.0.0 | EMS |
| LogMonitor Service | 1.1.0.0 | EMS |
| AIMS | 1.3.257 | EMS |
| VAT Previewer | 1.3.2907 | EMS |
| Model 100 (M100) | 5.4.4.5 | Precinct Tabulator |
| DS200 | 1.7.0.0 | Precinct Tabulator |
| Model 650 | 2.2.2.0 | Central Tabulator |
| AutoMARK VAT A100 | 1.3.2907 | Voter Assist Terminal |
| AutoMARK VAT A200 | 1.3.2907 | Voter Assist Terminal |
| DS850 | 2.9.0.0 | Central Tabulator |
| Ballot Box | | Plastic Ballot Box |
| Ballot Box | | Metal Box with/without Diverter |

There were various COTS components such as operation systems, PC's, servers, printers, etc. used during the examination.

### Day 1 Synopsis - June 9th

The entire morning and part of the afternoon was spent building the various software noted in the table above. The source code used to build the software/firmware was received directly from the testing lab on a thumb drive. After a a couple failed attempts to decrypt the source code on the vendor's laptop, the source code was successfully decrypted on an examiner's laptop.

The vendor stated that they always do the initial install and setup for new customers.

The newly built software/firmware was then loaded onto the appropriate machines without incident. Each of the component's release number was verified on the machines to be the same as the release indicated in the EAC's Unity 3.4.1.0 Scope of Certification document.

The remainder of the afternoon was used to verify the accessibility (ADA) checklist for the AutoMARK VAT ( voter assist terminal).

### Day 2 Synopsis - June 10th

The second day began with the vendor's presentation. The presentation covered the vendor's new emphasis on quality control. They now have an internal quality assurance team that tests each sub-system before the new version is put through the EAC's testing program.

The vendor proceeded to explain the features and functionality of each of the components. The examiners inspected each of the machines. Each machine was used to record or process ballots depending on its function.

## Findings

**M100**

The M100 has been used as a central-count tabulator. According to the Texas administrative rules, the M100 used in this capacity needs to have a real-time audit-log printer. The M100 does not. The vendor stated that a firmware change would be needed to allow for this. This is an “end-of-life” product so requiring the firmware change may not be warranted.

The election can be coded to automatically print when the polls are closed. I recommend that jurisdictions be instructed to do so and be archived along with the ballots for the voting records retention period.

**DS200**

The DS200 election setup should also be programmed to automatically print the audit-log when the polls are closed.

As with the M100, some jurisdictions might be tempted, or sold on the idea, to use the DS200 in a central-count configuration as the tabulator. Because it does not a real-time audit-log printer it should not be allowed.

**650 Central Scanner**

The 650 scanner's log printer was taken off-line and the processing halted. When the printer was put back on-line, no message regarding the halt or restart was printed. I do not feel this is a significant problem since further ballot processing was not possible until the printer was back on-line.

The 650's audit-log must be printed on the 650. A print only audit-log do not allow for a digital search which is desirable for a post-election audit to look for errors.

**850 Central Scanner**

The 850 scanner can be programmed to process ballot batches either by ballot style or precinct. If an incorrect style or precinct is read, the ballot is automatically out-stacked into a separate bin.

When the 850 scanner's log printer was taken off-line, the processing halted.

**AutoMARK**

The accessibility testing did not reveal any issues. It is important that a jurisdiction understands and provides instructions for the use of the various ADA devices with the AutoMARK.

The straight-party selection works as follows: If party A is selected, each of the party's candidates are also selected. A voter can then cross-over for a specific race. If the voter then changes their mind and decides to choose party B for the straight-party selection, party A's candidates are de-selected and party B's candidates are selected. A cross-over selection remains unchanged. Not all voting system's behave this way. A jurisdiction poll-workers must be trained on the behavior so that they can instruct a voter when needed.

**Election Reporting Manager (ERM)**

When the real-time audit-log printer was taken off-line, further processing was prevented. However, not all the significant events are logged to the printer. The system also relies on the Windows operating system logs for auditing (e.g. logging onto the machine). The logs can be deleted as demonstrated during the examination by one of the examiners.

This is a short-coming that should be fixed in the next release. Windows can be configured to forward (push) log entries to a central repository.

Additionally, Windows machines should be configured to archive the logs when full and use the following Microsoft Log Retention Policy:

**"***Archive the log when full, do not overwrite events. The log is automatically archived when necessary. No events are overwritten.***"**

There are 3rd party log managers that will pull in all the windows system logs to aid analysis.

**General**

The COTS hardware setup for the exam did not include all the configurations testing during the EAC certification testing. Only a stand-alone system configuration was demonstrated. I do not have a problem with this because during the EAC testing campaign, the client-server configuration for the central count site was tested.

The vendor indicated that a previous release (3.0.1.1) supports the use of the iVotronics DRE's. In order to use the DRE's on a 3.4.1.0 system, the election must be coded using the 3.0.1.1 programs and then the import the election definition file into the Unity 3.4.1.0 system. This was not demonstrated (or tested by the EAC) so it should <u>not</u> be part of the Texas scope of certification.

The test decks processed by the Secretary of State personnel were verified to be correct on each of the voting machine reports and the ERM report.

I believe that the 3.4.1.0 system satisfies 19 of the 20 administrative rules (Form 101). However, the system audit logging (rule # 11) has some weaknesses:

- The audit logs from the M100, DS200, 650 machines are not provided in a digital form so they can easily be searched.
- The possibility of deletion or overwriting the Windows system logs.
- Not all the log messages clearly or completely indicating the operation that occurred:
  from the 850 log -
  "*Number of Processed ballots (bottom bin) in batch: 8*" This log message nor the preceding lines indicate what styles or precincts were processed. The styles or precincts processed in a batch would be useful for a post election audit.

I believe that ES&S must be required to do a better job in securing and consolidating all the system's audit logs. Each log message should be in clear language and complete. The log archive should be easy to search by election administrators and post-election auditors.

## Conclusion

I believe the issues outlined above are <u>not</u> significant enough to prevent <u>this</u> certification. However, the audit-log issues must be address in the next release. I recommend certification for Unity 3.4.1.0.

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