



United States Election Assistance Commission

Certificate of Conformance

Hart InterCivic Verity Voting
2.2.1



The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the 2005 *Voluntary Voting System Guidelines (2005 VVSG)*. Components evaluated for this certification are detailed in the attached Scope of Certification document. This certificate applies only to the specific version and release of the product in its evaluated configuration. The evaluation has been verified by the EAC in accordance with the provisions of the EAC *Voting System Testing and Certification Program Manual* and the conclusions of the testing laboratory in the test report are consistent with the evidence adduced. This certificate is not an endorsement of the product by any agency of the U.S. Government and no warranty of the product is either expressed or implied.

Product Name: Verity Voting

Model or Version: 2.2.1

Name of VSTL: SLI Compliance

EAC Certification Number: HRT-Verity-2.2.1

Date Issued: March 13, 2017

Executive Director
U.S. Election Assistance Commission

Scope of Certification Attached

Manufacturer: Hart InterCivic
System Name: Verity Voting 2.2.1
Certificate: HRT-Verity-2.2.1

Laboratory: SLI Global
Standard: 2005 VVSG
Date: 3/13/2017



Scope of Certification

This document describes the scope of the validation and certification of the system defined above. Any use, configuration changes, revision changes, additions or subtractions from the described system are not included in this evaluation.

Significance of EAC Certification

An EAC certification is an official recognition that a voting system (in a specific configuration or configurations) has been tested to and has met an identified set of Federal voting system standards. An EAC certification is **not**:

- An endorsement of a Manufacturer, voting system, or any of the system's components.
- A Federal warranty of the voting system or any of its components.
- A determination that a voting system, when fielded, will be operated in a manner that meets all HAVA requirements.
- A substitute for State or local certification and testing.
- A determination that the system is ready for use in an election.
- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

Manufacturers may not represent or imply that a voting system is certified unless it has received a Certificate of Conformance for that system. Statements regarding EAC certification in brochures, on Web sites, on displays, and in advertising/sales literature must be made solely in reference to specific systems. Any action by a Manufacturer to suggest EAC endorsement of its product or organization is strictly prohibited and may result in a Manufacturer's suspension or other action pursuant to Federal civil and criminal law.

System Overview:

The Hart Verity Voting 2.2.1 voting system represents a set of software applications and hardware for pre-voting, voting and post-voting election project activities for jurisdictions of various sizes and political division complexities. Verity Voting 2.2.1 functions include:

- Defining the political divisions of the jurisdiction and organizing the election with its hierarchical structure, attributes and associations
- Defining the election events with their attributes such as the election name, date and type, as well as contests, candidates, referendum questions, voting locations and their attributes
- Preparing and producing ballots

- Configuring and programming the Verity Print ballot production device
- Preparing media (vDrives) for voting devices
- Configuring and programming the Verity Scan digital scanners
- Configuring and programming the Verity Touch Writer BMD devices
- Transmission of election results via Verity Relay
- Producing the election definition and auditing reports
- Providing administrative management functions for user, database, networking and system management
- Tabulation of Cast Vote Records from Verity Scan and Verity Central
- Preview and validation of the election results
- Producing election results tally according to voting variations and election system rules
- Producing a variety of reports of the election results in the desired format
- Auditing of election results including ballot images, cast vote records, and log files

Verity Scan is a scanning device (tabulator) that is used in conjunction with an external ballot box. The unit is designed to scan marked paper ballots, interpret and record voter marks on the paper ballot and deposit the ballots into the secure ballot box. Verity Scan is capable of tabulating votes, or producing a ballot count report which includes quantities of ballots scanned.

Verity Relay provides a remote transmission capability to the Verity Voting 2.2.1 system. Utilizing an optional modem on Verity Scan, at close of polls, results can be transmitted from the polling place device to the Verity Relay station.

Verity Touch Writer is a standalone Ballot Marking Device (BMD) which also includes an Audio Tactile Interface (ATI). Touch Writer allows voters who cannot hand-mark a paper ballot to generate a machine-readable and human readable paper ballot, based on vote selections made through the accessible electronic interface.

Verity Print is an on-demand ballot production device for unmarked paper ballots.

Verity Election Management allows users to manage and import elections. Elections are available through the “Elections” chevron in Verity Build. Users can also delete, archive, restore, and rename the elections.

Verity User Management enables users with the correct role and permissions to create and manage user accounts within the Verity Voting system for the local workstation in a standalone configuration, or for the network in a networked configuration.

Verity Desktop enables users with the correct roles to set the workstations’ date and time, gather Verity software application hash codes (in order to validate the correctness of the installed applications), and access the Windows desktop.

Verity Data provides users capabilities to input jurisdiction- and election-specific data for paper and accessible electronic ballots, as well as audio for accessible electronic ballots. Verity Data

also includes capabilities to allow proofing of data, layout, and audio that has been created. Verity Data also performs validation on the entered information to ensure that it is ready for use in Verity Build.

Verity Build allows users to proof data, view reports, create election definitions, print ballots, and create election media (vDrives). Build also allows users to configure settings for Verity Scan digital scanners and Verity Touch Writer BMD devices.

Verity Central is a high-speed, central digital ballot scanning system used for high volume processing of ballots (such as vote by mail). Verity Central is based on COTS scanning hardware coupled with the custom Hart-developed ballot processing application software, which resides on an attached COTS work-station.

Verity Count is an application that tabulates election results and generates reports. Verity Count can also be used to collect and store all election logs from every Verity component/device used in the election, allowing for complete election audit log reviews.

Certified System before Modification (If applicable):

Verity Voting 2.2

Anomalies and/or Additions addressed in Verity Voting 2.2:

Addition: The sole modification to **Verity Voting 2.2.1** addresses how Straight Party voting is handled, specifically to accommodate the needs of Michigan.

In an <n of m> race (e.g., Vote for Two, Vote for Three), in addition to counting valid individual marks, if unmarked choices affiliated with the Straight Party selection can be counted without ambiguity, up to the total “m” number of valid choices, then those votes are also counted, in addition to the marked choice. However, if there would be ambiguity about which one of the “leftover” choices would be assigned to the Straight Party affiliation, then no Straight Party votes are counted.

Mark definition:

System supports marks that cover a minimum of 4% of the rectangular marking area.

Tested Marking Devices:

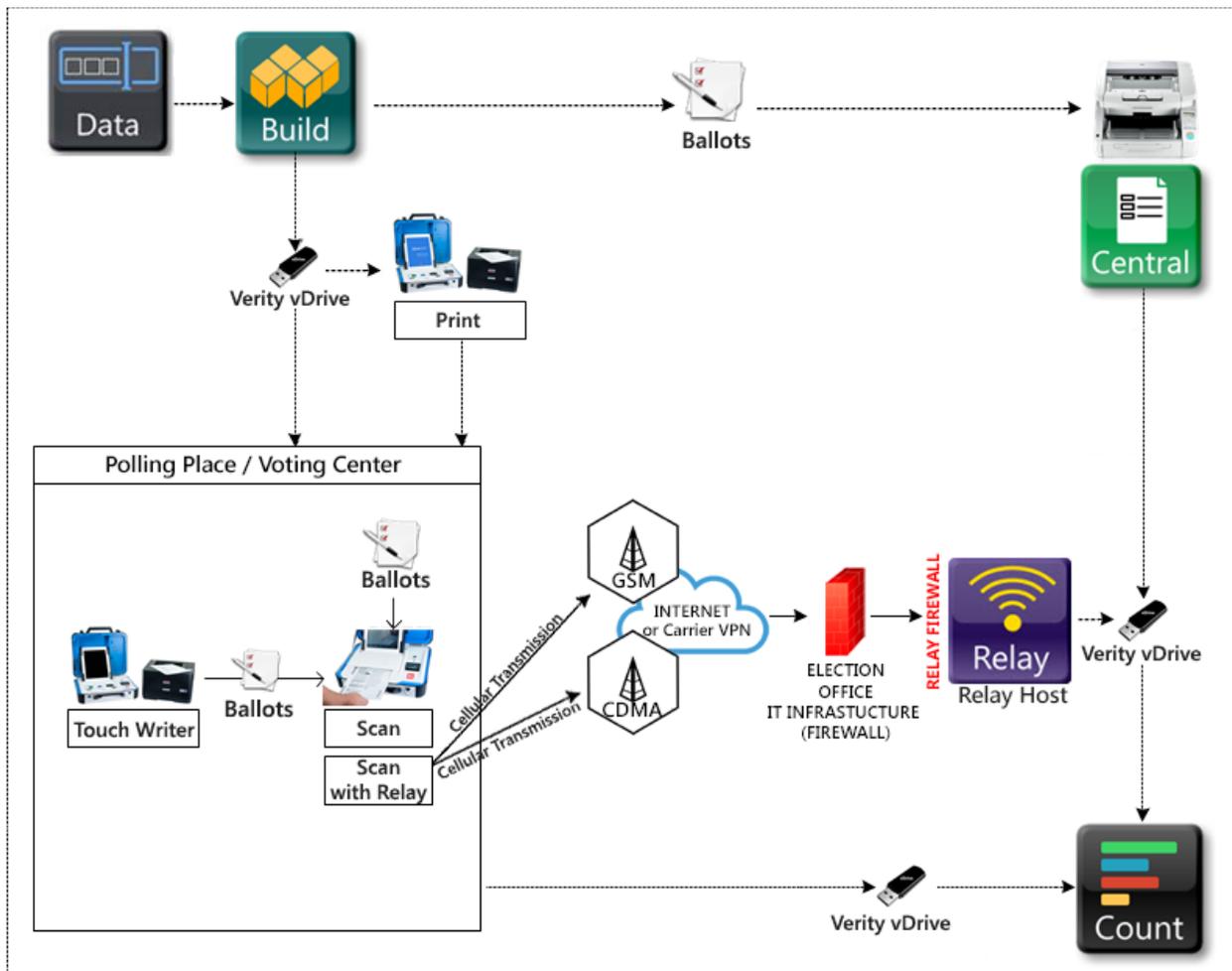
System supports Black and Blue ballpoint pens; testing was performed with black, blue, orange, and red pens.

Language capability:

System supports English and Spanish; system is capable of supporting other languages, including ideographic languages.

Components Included:

This section provides information describing the components and revision level of the primary components included in this Certification.



System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Verity Data	2.2.1			Data management software
Verity Build	2.2.1			Election definition software
Verity Central	2.2.1			High speed digital scanning software
Verity Count	2.2.1			Tabulation and reporting software
Verity Scan	2.2.1	Revision B		Digital scanning device firmware
Verity Touch Writer	2.0.3	Revision C		Accessible BMD firmware
Verity Relay	2.2.0			Data transmission software (receiving station)
Verity Print	2.0.3	Revision C		On-demand ballot printing device firmware
Verity Device Microcontroller	V17			Firmware for Verity devices
Application control – Data/Build,	6.1.1.369		COTS: McAfee Application Control	Configured for Verity workstations and devices

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Data/Build + Count, Central, Count, Relay, Print, Scan, Touch Writer			for Devices	
Database-Data/Build, Data/Build + Count, Relay, Central, Count	11.00.2100		COTS: Microsoft SQL Server 2012 for Embedded Systems	
Database - Print, Scan, Touch Writer	11.00.2100		COTS: Microsoft SQL Server 2012 Express	
Data transmission - Relay host, Scan	4.5		Windows Communication Foundation (WCF)	
Verity Operating System – Data/Build, Data/Build + Count, Central, Count, Relay, Print, Scan, Touch Writer	6.1.7601		Microsoft Operating System	Windows Embedded Standard 7 w/ service pack 1, 64 bit
OKI Data	1.6.4.0		Universal Printer Driver	Data, Build, Print, Central, Touch Writer, Count
OKI Data	1.2.0.0		B431d Printer Driver	Data, Build, Print, Central, Touch Writer, Count
OKI Data	1.0.0.0		C831dn Printer Driver	Print, Build
OKI Data	1.0.3.0		C911dn Printer Driver	Print, Build
MultiTech	8.00.04		MTD Series Modem Driver	Scan with Modem
TWAIN Working Group	2.0.1		Twacker 32 Scanner Driver	Central
Canon	1.0.0.1	DR-G1100	DR-G1100 Scanner Driver	Central
Canon	1.0.0.1	DR-G1130	DR-G1130 Scanner Driver	Central
Verity Key		N/A	COTS: Maxim iButton	Security key used with voting system
Verity vDrive		N/A	COTS: Apacer	4GB USB flash drive, portable electronic media used for transportation of voting system data
Ballot/Report Printer – Data, Build, Central, Count, Touch Writer, Print		B431d	COTS: OKI Data	
Ballot Printer – Build, Print		C911dn	COTS: OKI Data	

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Ballot Printer – Build, Print		C831dn	COTS: OKI Data	
Ballot Printer - Count		ML-1121	COTS: OKI Data	
UPS – Touch Writer Printer		5P1500	COTS: Eaton	
Scanner – Central		DR-G1100	COTS: Canon	
Scanner – Central		DR-G1130	COTS: Canon	
Workstation – Data/Build, Data/Build + Count, Relay, Central, Count			COTS: Intel – Windows Workstation	<p>Recommended specs:</p> <p>Processor – Intel Core i7-4790 3.6 8M GT2 4C CPU</p> <p>Memory – 32GB DDR3-1600 nECC (4x8GB) RAM</p> <p>Hard Drive – 2x1 TB RAID-Level 1, Removable w/ key lock</p> <p>USB Ports – 4 ports</p> <p>Video Card - Integrated Graphics</p> <p>Keyboard - USB Keyboard</p> <p>Mouse - USB Mouse</p>
Monitor – Data/Build, Data/Build + Count, Relay, Central, Count				<p>Monitor (Min. Requirements):</p> <p>Panel Size - 50.8 cm</p> <p>Aspect Ratio - Widescreen (16:9)</p> <p>Optimal Resolution - 1600 x 900 at 60Hz</p> <p>Contrast Ratio - 1000: 1</p> <p>Brightness - 250 cd/m2 (typical)</p>
Cellular Modem - Relay		MTD-EV3-N16	QuickCarrier® USB-D by MultiTech Systems	Aeris Cellular Modem
Cellular Modem - Relay		MTD-EV3-N2	QuickCarrier® USB-D by MultiTech Systems	Sprint cellular modem
Cellular Modem - Relay		MTD-EV3-N3	QuickCarrier® USB-D by MultiTech Systems	Verizon cellular modem
Cellular Modem - Relay		MTD-H5-2.0	QuickCarrier® USB-D by MultiTech Systems	Global (AT&T, T-Mobile, etc...) cellular modem

System Limitations

This table depicts the limits the system has been tested and certified to meet.

Characteristic	Limiting Component	Limit	Comment
Precincts			2000
Splits per Precinct			20
Total Precincts + Splits in an election			2000
Districts for voting devices and applications			75
Parties in a General Election			24
Parties in a Primary Election			10
Contests and Propositions combined			200
Contest Choices in a Contest			75
Total Contest Choices (voting positions) in an election			600
Max length of candidate name			100 characters
Max write-in length			25 characters
Ballot Styles			N/A
Voting Types			5
Max Polling Places per election			1200
Max devices per election			2400
Max # of central count scanners in a single network			4
Media Device – Scan voting device			9999 sheets per vDrive
Media Device – Central application			80,000 sheets per vDrive
# of voters definable per election			1,000,000
Max sheets per ballot			4 sheets
Scan – single sheet ballot			9999 ballots
Scan – two sheet ballot			4999 ballots
Scan – three sheet ballot			3333 ballots
Scan – four sheet ballot			2499 ballots
Central			1,000,000 ballots
Count			4,000,000 CVRs, 1200 vDrives
Ballot Sizes			8.5"x11", 8.5"x14", 8.5"x17", 8.5"x19", 11"x17"

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	N/A	Not a DRE system.
Accessibility		
Forward Approach	Yes	
Parallel (Side) Approach	Yes	

Feature/Characteristic	Yes/No	Comment
Closed Primary		
Primary: Closed	Yes	
Open Primary		
Primary: Open Standard (provide definition of how supported)	Yes	Open Primary
Primary: Open Blanket (provide definition of how supported)	Yes	General "top two"
Partisan & Non-Partisan:		
Partisan & Non-Partisan: Vote for 1 of N race	Yes	
Partisan & Non-Partisan: Multi-member ("vote for N of M") board races	Yes	
Partisan & Non-Partisan: "vote for 1" race with a single candidate and write-in voting	Yes	
Partisan & Non-Partisan "vote for 1" race with no declared candidates and write-in voting	Yes	
Write-In Voting:		
Write-in Voting: System default is a voting position identified for write-ins.	No	By default, the number of write-ins available in a contest is zero, users may increment as necessary
Write-in Voting: Without selecting a write in position.	No	
Write-in: With No Declared Candidates	Yes	
Write-in: Identification of write-ins for resolution at central count	Yes	
Primary Presidential Delegation Nominations & Slates:		
Primary Presidential Delegation Nominations: Displayed delegate slates for each presidential party	Yes	
Slate & Group Voting: one selection votes the slate.	Yes	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	Yes	Rotation by precinct and precinct split
Straight Party Voting:		
Straight Party: A single selection for partisan races in a general election	Yes	
Straight Party: Vote for each candidate individually	Yes	
Straight Party: Modify straight party selections with crossover votes	Yes	
Straight Party: A race without a candidate for one party	Yes	
Straight Party: "N of M race (where "N">1)	Yes	
Straight Party: Excludes a partisan contest from the straight party selection	Yes	
Cross-Party Endorsement:		
Cross party endorsements, multiple parties endorse one candidate.	No	
Split Precincts:		
Split Precincts: Multiple ballot styles	Yes	
Split Precincts: P & M system support splits with correct contests and ballot identification of each split	Yes	
Split Precincts: DRE matches voter to all applicable races.	N/A	Not a DRE system
Split Precincts: Reporting of voter counts (# of voters) to the precinct split level; Reporting of vote totals is to the precinct level	Yes	
Vote N of M:		

Feature/Characteristic	Yes/No	Comment
Vote for N of M: Counts each selected candidate, if the maximum is not exceeded.	Yes	
Vote for N of M: Invalidates all candidates in an overvote (paper)	Yes	
Recall Issues, with options:		
Recall Issues with Options: Simple Yes/No with separate race/election. (Vote Yes or No Question)	Yes	
Recall Issues with Options: Retain is the first option, Replacement candidate for the second or more options (Vote 1 of M)	Yes	
Recall Issues with Options: Two contests with access to a second contest conditional upon a specific vote in contest one. (Must vote Yes to vote in 2 nd contest.)	No	
Recall Issues with Options: Two contests with access to a second contest conditional upon any vote in contest one. (Must vote Yes to vote in 2 nd contest.)	No	
Cumulative Voting		
Cumulative Voting: Voters are permitted to cast, as many votes as there are seats to be filled for one or more candidates. Voters are not limited to giving only one vote to a candidate. Instead, they can put multiple votes on one or more candidate.	Yes	
Ranked Order Voting		
Ranked Order Voting: Voters can write in a ranked vote.	Yes	
Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	N/A	Tabulation rules are unique per jurisdiction
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	N/A	Tabulation rules are unique per jurisdiction
Ranked Order Voting: Voters rank candidates in a contest in order of choice. A candidate receiving a majority of the first choice votes wins. If no candidate receives a majority of first choice votes, the last place candidate is deleted, each ballot cast for the deleted candidate counts for the second choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote	N/A	Tabulation rules are unique per jurisdiction
Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	Yes	
Ranked Order Voting: The total number of votes for two or more candidates with the least votes is less than the votes of the candidate with the next highest number of votes, the candidates with the least votes are eliminated simultaneously and their votes transferred to the next-ranked continuing candidate.	N/A	Tabulation rules are unique per jurisdiction
Provisional or Challenged Ballots		
Provisional/Challenged Ballots: A voted provisional ballots is identified but not included in the tabulation, but can be added in the central count.	Yes	
Provisional/Challenged Ballots: A voted provisional ballots is included in the tabulation, but is identified and can be subtracted in the central count	Yes	
Provisional/Challenged Ballots: Provisional ballots maintain the secrecy of the ballot.	Yes	

Feature/Characteristic	Yes/No	Comment
Overvotes (must support for specific type of voting system)		
Overvotes: P & M: Overvote invalidates the vote. Define how overvotes are counted.	Yes	If the system detects more than the valid number of marks in a contest, it is counted as an overvote
Overvotes: DRE: Prevented from or requires correction of overvoting.	N/A	Not a DRE system
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	Yes	If the system detects more than the valid number of marks in a contest, it is counted as an overvote
Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	N/A	Not a DRE system
Undervotes		
Undervotes: System counts undervotes cast for accounting purposes	Yes	
Blank Ballots		
Totally Blank Ballots: Any blank ballot alert is tested.	Yes	
Totally Blank Ballots: If blank ballots are not immediately processed, there must be a provision to recognize and accept them	Yes	
Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	Yes	
Networking		
Wide Area Network – Use of Modems	Yes	
Wide Area Network – Use of Wireless	Yes	
Local Area Network – Use of TCP/IP	Yes	
Local Area Network – Use of Infrared	No	
Local Area Network – Use of Wireless	No	
FIPS 140-2 validated cryptographic module	Yes	
Used as (if applicable):		
Precinct counting device	Yes	
Central counting device	Yes	

Baseline Certification Engineering Change Orders (ECO)

This table depicts the ECOs certified with the voting system. This includes any approved ECOs incorporated in to the system. ECOs listed below are also approved for use in the following systems: Verity 1.0, Verity 2.0 & Verity 2.2

Change ID	Date	Component	Description
ECO-01229	01/04/17	Workstation computer	COTS HP Z30 workstation replaced by Z240
ECO-01246	02/27/17	2005240 - Verity Scan Base Board	Remove unused SMT pushbutton switch from Scan Base Board
ECO-01207	12/20/16	3005359 - Accessible Booth	Remove Transport Bags from Booth BOMs
ECO-01215,01216,01220	01/24/17	3005350 - Verity Scan 3005352 - Verity Touch Writer	Clerical Corrections to hardware drawings and BOMs
ECO-01227	11/07/16	3005350 - Verity Scan 3005352 - Verity Touch Writer	Enhance Security Seal Visibility and Security
ECO-01184	05/25/16	3005356 - Verity Print	Label update to new Verity 2.0 devices
ECO-01174	10/11/16	3005357 - Verity Ballot Box	Ballot Box Refinements and Drawing Clarifications
ECO-01209	08/18/16	Workstation Monitor	COTS HP ProDisplay P231 replaced by P232
ECO-01211	08/24/16	3005350 - Verity Scan	Make 1A USB capable output standard on Verity Scan
ECO-01202	08/01/16	3005350 - Verity Scan 3005352 - Verity Touch Writer	Prefer 60W Adapter on Scan and Touch Writer
ECO-01189	06/24/16	3005350 - Verity Scan 3005352 - Verity Touch Writer	Touch Writer and Scan bare PCB Updates
ECO-01134,01149,01183	05/25/16	3005350 - Verity Scan 3005352 - Verity Touch Writer	Verity Touch Writer and Scan Cable Drawings Updates
ECO-01137	10/14/15	3005359 - Verity Accessible Booth	Verity Standard and Accessible Booth Production Updates
ECO-01103	09/21/15	3005357 - Verity Ballot Box	Verity Ballot Box Production Updates
ECO01107	08/20/15	3005350 - Verity Scan 3005352 - Verity Touch Writer	Verity Touch Writer removal of unused electronic parts
ECO01090	06/30/15	3005350 - Verity Scan 3005352 - Verity Touch Writer	Verity 1.0 label change to include EAC