

**Minutes**  
**State Election Commission Meeting**  
**October 7, 2019**

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The State Election Commission meeting was called to order by Chairman Kent Younce at 12:04 p.m., Central Standard Time, October 7, 2019. The following members and staff were present: Commissioners Blackburn, McDonald, Wheeler and Wallace; Coordinator of Elections Mark Goins, Assistant Coordinator of Elections and Kathy Summers, Elections Specialist.

Commissioner McDonald made a motion to adopt the minutes from July 22, 2019, Commissioner Wallace seconded the motion and the minutes were unanimously approved. (Aye votes: Blackburn, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.)

Commissioner Wheeler made a motion to adopt the minutes from August 30, 2019, telephonic meeting, Commissioner Wallace seconded the motion and the minutes were unanimously approved. (Aye votes: Blackburn, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.)

Commissioner Wheeler made a motion pursuant to T.C.A. § § 2-12-101 and 2-12-106, seconded by Commissioner Wallace and unanimously approved any nomination(s) for county election commission appointments as submitted, and to leave the nomination process open until 4:30 p.m. Central Standard Time Monday, October 7, 2019, and to make two (2) additional appointments in Trousdale County (October 11, 2019) and Jackson County (October 17, 2019). (Aye votes: Blackburn, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.) **(See attached county election commission appointments made.)**

**Old Business**

• **TACEO Review**

Chairman Younce recognized Mark Stephens, TACEO – President.

Mark Stephens, President of TACEO, stated he will reconvene the Executive Committee in a few weeks to approve all the committees and set agendas. Mr. Stephens advised the commission of upcoming meeting dates. Those dates are as follows:

- West Tennessee – November 18 – 19, 2019, in Jackson.
- Middle Tennessee – November 22, 2019, in Cookeville.
- East Tennessee – December 4-6, 2019, in Pigeon Forge.

Mr. Stephens asked the commission if they had any questions.

Commissioner Blackburn asked who is on the Executive Committee meeting. Mr. Stephens stated the Executive Committee is made up of all the vice-presidents and officers of TACEO.

Chairman Younce discussed an email sent to commission members from Jeanette Cronise, Treasurer for TACEO. The email details a lot of concerns. Chairman Younce stated Treasurer Cronise indicates Mr. Stephens will not return her calls. Mr. Stephens stated that statement was not factual and is one person's opinion. Mr. Stephens said it was unfortunate all officers are not working together, and Ms. Cronise has an agenda that she is representing, and he prefers not to discuss the issue publicly.

Coordinator Goins stated Commissioner Barrett could not attend the meeting and sent a follow up email regarding Ms. Cronise's email. Commissioner Barrett wanted clarification regarding Mr. Nichols and Mr. Slayden's statements that GAAP was not needed, and that this requirement is overkill. In her email, Commissioner Barrett stated the commission specifically required GAAP procedures to be used going forward. Mr. Stephens stated Mr. Nichols was the person who stated GAAP procedures were not needed and the association will not be using Mr. Nichols going forward. Coordinator Goins stated Ms. Cronise's email stated the opposite of what Mr. Stephens stated, and that Mr. Nichols stated GAAP procedures should be followed by the association. Mr. Stephens advised GAAP procedures will be followed by the association.

Chairman Younce requested Mr. Stephens and Ms. Cronise to give another update at the next State Election Commission meeting on December 3, 2019. Chairman Younce was encouraged after the recent elections that there would be transparency within TACEO, and he trusts that will be done going forward.

Chairman Younce asked if anyone in attendance, from TACEO, would like to speak before the commission. Charles Holiway, Administrator of Elections for Roane County, requested to speak. Mr. Holiway also serves as the Treasurer for East TN TACEO. Mr. Holiway said he sent information to Mr. Nichols, as requested, and Mr. Nichols has not contacted him back about the information supplied. Mr. Holiway says East TN TACEO is willing to help get things straightened out regarding the association's finances.

Commissioner McDonald discussed the code of conduct working committee, he and Commissioner Barrett were assigned to on July 22, 2019. Commissioner McDonald and Commissioner Barrett agree with the final draft and stated they will present their recommendations to the commission in December.

## New Business

- **Hart InterCivic Request for approval of de Minimis changes to Verity 2.0 Voting System – Alli Fick, Certification Project Manager**

Alli Fick spoke about the de Minimis changes to the Verity 2.0 voting system and the reduction in shipping box size for the Verity Device. Ms. Fick asked for approval of these de Minimis changes. **(See attached handout provided by Hart InterCivic.)**

Commissioner Wheeler made a motion to approve the de Minimis changes to the Verity voting system and shipping container, Commissioner Wallace seconded the motion; all members unanimously approved the motion. (Aye votes: Blackburn, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.)

- **Dominion Request for approval of de Minimis changes to D-Suite 5.5 – Ian Piper, Director Federal Certification**

Ian Piper, Director Federal Certification was not present. Coordinator Goins discussed the requested changes are de Minimis, and a presentation is not required under the State Election Commission certification policy.

Chairman Younce requested someone from Dominion appear before the State Election Commission at the December 3, 2019, meeting to discuss the de Minimis changes made to the Democracy Suite 5.5 system.

- **Humphreys County Election Commission – Voting Machines Purchase Review – Received only one bid.**

Chairman Younce recognized JoAnn Bullion, Administrator of Elections for Humphreys County, and advised her Coordinator Goins would swear her in and her testimony would be under oath and subject to penalty of perjury. The State Election Commission has a policy, adopted on April 1, 2019, if a county only receives one bid for voting machines they must come before the State Election Commission to explain why there was only one bid.

Coordinator Goins administrated the oath to Mrs. Bullion.

Mrs. Bullion spoke before the commission and advised commission members Humphreys County had several vendors demonstrate their voting machines prior to conducting a request for purchase. Mrs. Bullion stated both Harp and Dominion could have submitted a bid, but they only received a bid from Harp. **(See attached bid process and bids received.)**

Chairman Younce asked when did the commission decide they wanted to have DRE voting machines. Mrs. Bullion stated all five (5) of her commissioners agreed the DRE was easier and would be cheaper to use in the long run. Mrs. Bullion stated paper ballots are more expensive and the storage of ballots after an election takes up a lot of room.

Chairman Younce asked Mrs. Bullion if someone assisted the county with writing the specs for the RFP. Mrs. Bullion stated she got the specs from Obion County Election Commission.

Chairman Younce asked if the specs they used could have been bid on by more than one vendor. Mrs. Bullion assumed more than one vendor could have bid on the machines.

Chairman Younce asked if the specs were specific for one vendor. Mrs. Bullion stated the bids were specific for DRE's.

Coordinator Goins asked if before the county went out for bid did the county have a specific vendor in mind they wanted. Mrs. Bullion stated the county did like the Hart voting machines, as they currently have Hart voting machines serviced by Harp. Mrs. Bullion stated they could have worked with either vendor, but Dominion did not provide a bid.

Coordinator Goins asked Mrs. Bullion if MicroVote would have been able to bid with the RFP sent out. Mrs. Bullion stated MicroVote would have to have a DRE machine in order to bid on the machines.

Coordinator Goins reviewed the contract and he asked Mrs. Bullion how she knew to reach out to Obion County for a bid. Mrs. Bullion stated at the seminars she and her commissioners spoke with other counties, and that is how she knew which counties were purchasing voting machines.

Coordinator Goins asked Mrs. Bullion who specifically told her to look at the RFP for Obion County. Mrs. Bullion stated she did not remember who suggested she speak with Obion County.

Coordinator Goins asked Mrs. Bullion if any vendor suggested they look at Obion County's RFP. Mrs. Bullion stated Chad Colgan of Harp told her Obion County had bought their voting machines.

Coordinator Goins asked if Mr. Colgan specifically asked her to look at Obion's bid. Mrs. Bullion stated the counties discuss voting machines amongst themselves.

Coordinator Goins asked is a specific vendor requested the county contact Obion County for a copy of their RFP. Mrs. Bullion stated the Elections Division gave her a list of counties who had recently submitted RFP's to obtain copies of their RFP's.

Coordinator Goins stated there is a sample RFP on the training site for purchasing voting machines, and this sample is not specific to any one vendor. Coordinator Goins asked Andrew Dodd, HAVA Attorney, to review Humphreys County bid. Mr. Dodd highlighted items that only one company could have potentially bid on. Coordinator Goins highlighted those items found by Mr. Dodd and stated Mr. Dodd believes the RFP would have excluded other vendors from submitting a bid.

Coordinator Goins asked if any vendor suggested any RFP language. Mrs. Bullion stated no vendor suggested any language for the bid and her commission only wanted DRE voting machines.

Coordinator Goins stated under the Help America Vote Act there is a requirement to have competitive bids, and if that process is not followed the funds to purchase the machines will have to be returned to the Federal Government.

Mrs. Bullion stated her commission spoke with various counties about their voting machines, bid processes, and they did not realize they were excluding Dominion from submitting a bid. Mrs. Bullion stated she reached out to Dominion several times to find out why they did not submit a bid and there was no response from Dominion.

Coordinator Goins asked Mrs. Bullion when she had conversations with Chad Colgan. Mrs. Bullion believes those conversations were around May.

Coordinator Goins asked Mrs. Bullion when she got the bid specs from Obion County. Mrs. Bullion believes she got the specs before the ad ran in May.

Coordinator Goins asked if Mrs. Bullion changed any of the wording in the specs other than county name. Mrs. Bullion indicated she typed the specs the same as Obion County provided and that she only changed county name.

Coordinator Goins asked Mrs. Bullion if she got any other bid specs from other counties. Mrs. Bullion stated she did speak with Benton County, but did not obtain any specs from them.

Coordinator Goins specifically asked Mrs. Bullion if Chad Colgan specifically told her to get the specs from Obion County. Mrs. Bullion stated Mr. Colgan did not say to get the specs from Obion County.

Coordinator Goins asked Mrs. Bullion what Chad Colgan specifically said to her. Mrs. Bullion stated Mr. Colgan said they had specs in some of the other counties and Obion County was one of those counties. Mr. Colgan never told her to call Obion County and get their specific specs for voting machines. Mrs. Bullion stated she and her commissioners are not attorneys, and they assumed the specs were legal and aboveboard and that is why their county decided to use Obion County's RFP.

Coordinator Goins asked Mrs. Bullion if it seemed appropriate to speak with a vendor about specs. Mrs. Bullion said she was not sure what Coordinator Goins was asking.

Coordinator Goins asked how a conversation with a vendor would happen, where a county is about to purchase equipment, and a vendor says you may want to look to another county because they may have specs. Mrs. Bullion stated she and her commissioners are not attorneys and they do not write specs, that her commission sought out specs from another county who got their RFP approved and received their equipment.

Coordinator Goins stated the Elections Division has an HAVA Attorney who works with counties on grants and specs. Coordinator Goins asked Mrs. Bullion if she reached out to the HAVA attorney for RFP language. Mrs. Bullion stated she did not reach out to the HAVA Attorney. Mrs. Bullion stated she did call the Elections Division for guidance and she said she was told it was up to the county what they purchase.

Coordinator Goins stated it is up to the counties to determine what machines they want, but when it comes to RFP's a county does not need a vendor telling them what specs they should use to buy their machines. Mrs. Bullion stated she and her commissioners did not go into the RFP process thinking only one vendor could bid the machines. Mrs. Bullion and her commission assumed Dominion would be able to submit a bid under the RFP submitted, and would have been happy if they had won the bid.

Coordinator Goins stated the reason she is before the State Election Commission, discussing the RFP, is Dominion did not have a fair chance to bid on Humphreys County voting machines. Coordinator Goins asked Mrs. Bullion if there was prior discussion, by her commission, that they were going to buy the Hart equipment. Mrs. Bullion stated yes, her commission wanted to buy the Hart equipment, but if Dominion had gotten the bid her commission would have been okay because they did not want paper ballots.

Chairman Younce asked Mrs. Bullion if her county had purchased the voting machines from Harp and Mrs. Bullion stated the county had not bought the machines yet.

Chairman Younce asked Mrs. Bullion if she thinks her county is okay to purchase these machines with only one bid. Mrs. Bullion stated she believes her county is good to purchase the machines and does not believe the county did anything wrong to intentionally exclude anyone from bidding. Chairman Younce stated if no one else can bid but one vendor how is it not excluding someone from bidding.

Chairman Younce advised Mrs. Bullion her county is not the only county this also happened in his county. Chairman Younce plans to invite any county who has had one bid before the State Election Commission to find out why they only had one bid. Commissioner Younce stated he does not care what vendor any county uses, as long as the county is getting a good deal and there should be more than one bid. Chairman Younce believes Humphreys County needs to rebid their voting machines and to look at all options.

Mrs. Bullion stated that she was not aware Dominion could not have bid on their machines and she understands the commissions concerns.

Commissioner Wheeler stated it seemed, willingly or unwilling, she and her taxpayers may have been taken advantage of when bidding for voting machines. Commissioner Wheeler reminded Mrs. Bullion a former Coordinator of Elections

and a State Election Commissioner went to prison for not bidding out a specific election item. Commissioner Wheeler stated HAVA money appeared to be in danger and that a generic RFP should have been used.

Commissioner Blackburn asked Mrs. Bullion if there was an election in Humphreys County soon. Mrs. Bullion stated the next election is the Presidential Preference Primary Election.

Chairman Younce believes the Federal Government will go to paper ballots.

Charles Holiway, Administrator of Elections for Roane County, asked if the State Election Commission is going to all paper ballot elections.

Chairman Younce believes the State Election Commission is going to eventually certify only paper ballots in Tennessee.

Coordinator Goins believes Humphreys County did view all the voting machines on the front end, but it appeared Harp was a favored vendor based on the RFP submitted. Coordinator Goins stated this is not a paper ballot verses a DRE machine issue, but is an issue based off the specs submitted with only one bid received.

Commissioner Blackburn stated she went to Greene County to observe an election and could not get over the amount of paper they must store for each election. Commissioner Blackburn said controlled elements for storing paper ballots is going to be a burden on the counties and suggests ballot on demand is the better option for the counties.

Commissioner Wheeler asked if storage of paper ballots is an issue, could the counties not scan the ballots instead of storing original ballots. Coordinator Goins stated under current code the ballots cannot be scanned, that the trend is going away from preprinted ballots and going to ballot marking devices.

The State Election Commission discussed with Mrs. Bullion that her county will need to rebid their voting machines. The commission requested Mrs. Bullion to work with the Coordinator and staff to come up with a competitive RFP.

Commissioner Wheeler asked Coordinator Goins if his office must approve RFP's before they are issued. Coordinator Goins stated his office is not required to review RFP's. Commissioner Wheeler believes it would be good if Coordinator Goins implemented that requirement.

- **Certify Administrators of Elections who passed the certification test given on August 27, 2019.**

A motion was made by Commissioner Wheeler and seconded by Commissioner McDonald to certify those Administrators of Elections, who passed the certification test given on August 27, 2019. (Aye votes: Blackburn, McDonald, Wallace, Wheeler and Younce; No

votes: None; Abstention: None.) (See attached memo regarding administrators passing the certification test.)

County	Administrator
Polk	Nathan Hitson

- **Coordinator Update**

Coordinator Goins recognized the official State Poem composed by Commissioner McDonald.

The next scheduled meeting is set for December 3, 2019 and will be held in the William R. Snodgrass – Tennessee Tower, Nashville Room - 3<sup>rd</sup> floor at 12:00 Noon, Central Standard Time.

The meeting was adjourned at 1:25 p.m. Central Standard Time.

Respectfully submitted,



Mike McDonald, Acting - Secretary  
State Election Commission

# State of Tennessee



State Election Commission  
312 Rosa L. Parks Avenue, 7th Floor  
Nashville, Tennessee 37243-1102

## Vacant Status

*October 7, 2019*

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**Cheatham** R Donna Barrett / D Mike McDonald

R

**Loudon** R Judy Blackburn / D Tom Wheeler

D

**Montgomery** R Donna Barrett / D Mike McDonald

D

**Shelby** R Jimmy Wallace / D Greg Duckett

R

**Total Vacancies: 4**

# State of Tennessee



**State Election Commission**  
312 Rosa L. Parks Avenue, 7th Floor  
Nashville, Tennessee 37243-1102

## Holdover Status

*October 7, 2019*

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		<b>Appointment</b>	<b>Reappointment</b>
<b>Jackson</b>	R Kent Younce / D Mike McDonald		
	R Nell Anderson	4/18/1995	4/3/2017
	<b>Total Holdovers: 1</b>		

# State of Tennessee



**State Election Commission**  
312 Rosa L. Parks Avenue, 7th Floor  
Nashville, Tennessee 37243-1102

## New Appointment Status

*October 7, 2019*

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		Appointment
<b>Cheatham</b>	R Donna Barrett / D Mike McDonald	
	R Nanette Malher	10/7/2019
<b>Loudon</b>	R Judy Blackburn / D Tom Wheeler	
	D Beverly A. Sweeney	10/7/2019
<b>Montgomery</b>	R Donna Barrett / D Mike McDonald	
	D Billy Edward Burgett	10/7/2019
<b>Shelby</b>	R Jimmy Wallace / D Greg Duckett	
	R Frank Uhlhorn	10/7/2019
	<b>Total New Commissioners: 4</b>	

# State of Tennessee



**State Election Commission**  
312 Rosa L. Parks Avenue, 7th Floor  
Nashville, Tennessee 37243-1102

## Vacant Status

*October 11, 2019*

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**Trousdale** R Kent Younce / D Mike McDonald

D

**Total Vacancies: 1**

# State of Tennessee



**State Election Commission**  
312 Rosa L. Parks Avenue, 7th Floor  
Nashville, Tennessee 37243-1102

## New Appointment Status

*October 11, 2019*

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		Appointment
<b>Trousdale</b>	R Kent Younce / D Mike McDonald	
	D Phillip Allen Taylor	10/11/2019
<b>Total New Commissioners: 1</b>		

# State of Tennessee



**State Election Commission**  
312 Rosa L. Parks Avenue, 7th Floor  
Nashville, Tennessee 37243-1102

## New Appointment Status

*October 17, 2019*

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		<b>Appointment</b>
<b>Jackson</b>	R Kent Younce / D Mike McDonald	
	R James Anthony Pappas, Jr.	10/17/2019
	<b>Total New Commissioners: 1</b>	

# **TACEO Update Review**

**October 7, 2019**

- **Mark Stephens – TACEO – President**
- **Jeanette Cronise – TACEO – Treasurer – Report Attached**

## 1. New by-laws

### a. Present at regional winter meetings for approval by year end

On July 11, 2019, I e-mailed past president & by-laws committee Chairman, Phillip Warren and asked him send to Mark Stephens & myself a copy of the current by-laws. We each received them.

On September 27, 2019, Mark advised me via e-mail that the by-laws submitted by Phillip were not accurate & not fully approved by TACEO members (each change requires a 2/3 majority vote). After Mark's research the by-laws the organization should be and will be using are from 2013.

In the 2013 by-laws the President of TACEO is the chairman of the Budget & Finance Committee. The Treasurer is responsible for compiling members of the Budget & Finance Committee, calling any meetings of the Budget & Finance Committee, writing &/or initiating any policies, etc. The Treasurer has no responsibility unless designated by the President.

So, under Presidents Amber Moore and Phillip Warren the by-laws were not accurate and they were not operating under the guidelines set forth by those by-laws. Now, in 2019, we are going back to the 2013 until new by-laws can be written

I have asked repeatedly to be on the by-laws committee (which the President chairs) but Mark stated that "it is best that the body function independently, to consider what is in the interest of the Association. He will leave it up to the Chairperson (himself) and its members to determine what role the committees will play in possible changes". He goes on to say that "the Budget & Finance Committee needs to be a fair and representative group that reflects the Association as a whole. It is important that its members institute policies and procedures that cast TACEO in the best light, and bring confidence to all its members".

On 10/1/19 I e-mailed Secretary, Susan Knopf requesting copies of any & all by-laws, annual meeting minutes and asked her if she took minutes from the conference call with the CPA's on July 16, 2019 to please send them as well.

When I asked Mark about conferring with an attorney on the by-laws, he expressed that he wants to use Robert "Bob" Bowman. Mr. Bowman is also a member of Knox Co. Election Commission and I expressed my concern that this could be a potential conflict of interest.

As things stand today, as Treasurer my only authority is to receive & disburse all funds as directed by the Budget & Finance Committee, submit reports annually on the seminar fund and general fund.

## 2. Submit a revised Annual Financial statement to the membership with savings account amount and regional accounts amounts

I am unable to do this as to date I have not received any financial information (documents or bank balance) from Charles Holiway/East TN Grand-division.

Charles has not responded to my e-mail dated July 9, 2019 requesting a bank balance for the East TN grand division.

Mark Stephens is aware of this situation and on August 22, 2019 Mark stated via e-mail that "he has given Charles Holiway a spreadsheet requesting financial data and stated that Charles said that he would send me the appropriate information".

3. Resubmit corrected 990's with savings account amount and regional accounts amounts and answers to such questions as lobbying efforts and state provided support

This has not been done; there are several reasons:

- There is no contract w/CPA Tommy Nichols; I am unsure if Mark has asked CPA Bill Slayden to do this. If so, he has not communicated this to me.
- Financial data need to amend the 990's has not been received.  
On June 26, 2019 I e-mailed members of the three grand-divisions asking them for the following documents needed to amend the 990's:
  - ✓ Monthly bank statements
  - ✓ Checks
  - ✓ Invoices & receipts
  - ✓ I also wanted to know who the signers were on the bank accounts.

I found out I had a bad e-mail for Kim Buckley/West TN so sent her an e-mail request on July 9, 2019. Kim responded that same day stating she "spoke to Mark Stephens & he told her to hold off sending me anything as he was laying the groundwork for a CPA & transparent accounting system". Mark adamantly denied via e-mail dated 9/19/19 ever instructing anyone to deny or not to comply with my request. However, on several occasions when e-mail Leigh Schlager for documents her response always included Mark and she said she will comply when Mark authorizes her to do so. Mark never responded and thus she did not comply with my request.

Here is the status as of today:

West TN: July 15, 2019 I received their financial documents per direction to Kim Buckley from her Election Commission chairman. Bank balance: \$13,212.93 (as of January 29, 2019)

Middle TN: I have the completed spreadsheet from Dennis Stanley; I need from Sandy Alexander. Bank balance: \$4,854.58 (as of September 30, 2019)

East TN: I have no data. Bank balance: unknown, however I was told it is in excess of \$40,000

On July 16, 2019 in meeting w/CPA Tommy Nichols & conferencing in CPA Bill Slayden & Susan Hughes, it was agreed that Jeanette & Mr. Nichols would compile an Excel spreadsheet asking for financial data from the 3 grand-divisions. They would send the year end bank statement & attest that the data reported was true & accurate. Mr. Nichols would use it to amend the 990 filings.

On August 15, 2019, Jeanette e-mailed Mark a list of those who needed to complete the spreadsheet. They were Leigh Schlager, Kim Buckley, Charles Holiway, Dennis Stanley & Sandy Alexander. During the last 3 years these all were responsible at some point for finances of their respective grand-divisions. On August 22, 2019 Mark stated he sent the spreadsheet to Charles and was going to reach out to the other two grand-divisions. Mark did not copy me on any of his communications so I have no idea who received it. In speaking w/the middle TN division, neither person holding funds for the last 3 years received the spreadsheet so I sent it. I have received the spreadsheet from Dennis Stanley to account for the only year he held the funds. I have not received any notification from any Sandy Alexander.

On July 16, 2019 Mark, Susan & I began the process of hiring a CPA & Accountant for TACEO. The contract was presented to Mark & Susan for approval and their signatures.

On September 6, 2019, Mark requested clarity from Mr. Nichols on the terms of the contract. Mark even had CPA consultant Bill Slayden call Mr. Nichols. Mr. Nichols has stated to me that he finds it very unusual to be dealing with not only the Treasurer but the President and another CPA.

To date Mark & Susan have not signed the contract w/CPA Tommy Nichols in Hardin County. However, Mark has entered into a financial agreement with Mr. Slayden & has refused to provide to me a copy of that contractual agreement. In essence we have a CPA looking over another CPA.

4. Issue 1099's for checks made payable to cash (1099's would be issued to the endorser on the back of the checks, I have a portion of those if needed)
  - a. Discontinue practice of checks written to cash

I have drafted this policy however no committee meetings have been called to approve any such policy. With Mark using 2013 by-laws, I have no authority to even present a policy.

5. Develop charitable, sympathy, gifts, etc. amount limit and type

I have drafted this policy however no committee meetings have been called to approve any such policy. With Mark using 2013 by-laws, I have no authority to even present a policy.

6. Develop records retention policy (Given that the officers can change yearly, I suggest a policy of permanent rendition of all financial records)

I have drafted this policy however no committee meetings have been called to approve any such policy. With Mark using 2013 by-laws, I have no authority to even present a policy.

- a. Send out a request asking past officers to send any old records to the current Treasurer for organization and storage (I am sending the records copies in my possession to the Treasurer)

In light of this e-mail from Donna, I spoke to Mark and asked him if he asked the grand-divisions for this information. Mark responded that he only felt Donna was asking for it in an effort to have data to determine if 990's needed to be revised. He said he would discuss w/Donna & has not asked for the documents.

7. Develop a bid process for services and products to ensure best price
  - a. Insure no family members are providing services or products

8. I have drafted this policy however no committee meetings have been called to approve any such policy. With Mark using 2013 by-laws, I have no authority to even present a policy.

9. Adhere to GAAP

In an e-mail from Mark dated 9/19/19, Mark stated that "he was briefed on a conversation between Mr. Nichols & Mr. Slayden that GAAP was not needed and in fact the term overkill was used to describe its merits".

I was no privy to that conversation; however, I called Mr. Nichols and received the following clarification:

- ANY reports produced by Tommy Nichols, CPA will absolutely be in adherence with GAAP
- If TACEO simply wants Mr. Nichols to post the books and provide TACEO w/a general ledger we would enter into an agreed upon procedures agreement.

- IF TACEO wants him to post the books, provide a general ledger and an accountant's financial report(s) then we would enter into a compilation agreement/letter of engagement.
  - Mr. Nichols stated that Mark Stephens does not want financial reports only a check register which Mr. Nichols finds odd at best. His statement to me was why would you hire a CPA and not want financial reports?
  - I have been clear to Mark & Mr. Slayden that we need financial reports and my plan was to present them to TACEO members quarterly.
10. Review and comply with relevant recommendations from Guidebook for Tennessee Non Profits  
Mark has never addressed this. I have reviewed the document.
  11. Require bookkeeping software (Microsoft Money or Quicken)  
In my discussion with Mark, Susan, the 2 CPA's, I advised that IF Mr. Nichols posted the books and provided financial statements, the Hardin County bank would accept all deposits directly vs. mailing checks to me, then software would not be necessary.
  12. Develop more detailed Chart of Accounts  
I have complied the Chart of Accounts and reviewed it with the CPA, Tommy Nichols.
  13. Comply with Sales Tax Collection on T-shirt and auction sales  
Sales tax only needs to be collected if sales exceed \$7,300. I have drafted a policy to cover this.
  14. Establish Check Writing Procedures
    - a. Develop a policy for check signatures (one or two needed; two adds a layer of confidence)  
I have drafted this policy.
  15. Establish Deposit Procedures  
I have drafted this policy however no committee meetings have been called to approve any such policy. With Mark using 2013 by-laws, I have no authority to even present a policy. Hardin County bank has agreed that all checks can be mailed to them directly. They will make the deposit and notify me of same & I can pick up the supporting documentation.
  16. Consult and comply with Center for Nonprofit Management relevant recommendations—  
Nashville, TN  
Mark has not addressed this.
  17. TACEO has a stated policy that per diem is the reimbursement policy for meals; however, I discovered several situations where the actual cost of meals was reimbursed (at a higher price than the per diem rates).  
I have drafted this policy however no committee meetings have been called to approve any such policy. With Mark using 2013 by-laws, I have no authority to even present a policy.
  18. TACEO needs to restate it's per diem policy and have it apply universally. It can be stated in the new bylaws but can also be implemented now since that is already the policy in use, all members just need to be reminded. It also needs to be clear as to what meetings qualify as a

reimbursable expense as I found several one meal purchases that did not appear to correspond to a TACEO meeting.

I have drafted this policy however no committee meetings have been called to approve any such policy. With Mark using 2013 by-laws, I have no authority to even present a policy.

Note: Mark was slated to be on a conference call with CPA Tommy Nichols, but chose to drive 6 hours from his home to Hardin County. He completed an expense report for mileage and meals totaling approximately \$400. This was an unnecessary trip and expense.

#### **OTHER NOTEWORTHY UPDATES:**

1. **Policies:** Any new policies should be approved by the committee imitating them, and then ideally approved and implemented by the Executive Committee. Most of the policies that need to be written are financial in nature and should be initiated by the Budget & Finance Committee. Since I am no longer the chair of the Budget & Finance Committee, the policies I have drafted are for naught.

At this time there are NO new policies or procedures in place!

I have drafted the following policies that I had hoped to present to the Budget & Finance Committee:

- Records Retention and Destruction
- Purchasing of Products & Services
- IRS Form 990 completion
- Inventory Control
- Petty Cash Disbursement (includes form to be completed)
- Gifts & Giving
- Fundraising, Door Prizes and Merchandise Sales
- External Audit
- Budget
- Bank Account and Check Writing
- Segregation of Duties
- Liquidation of Assets (includes form to be completed)
- Reimbursement (includes form to be completed)

I have also created a deposit log and detailed chart of accounts.

2. **Bond Insurance:**

- I discovered via receipts that TACEO has bond insurance. Leigh Schlager never provided me with a policy or even a face sheet. I contacted the insurance carrier and was advised that Leigh was sent a cancellation form which she never signed. The policy is still in effect. I then contacted a local insurance company (Hardin County Bank Insurance Co.) to get another bid. I wanted to ensure everyone handling money was covered and I wanted to discuss all of this w/Mark. He has never returned by call.
- On August 22, 2109 I asked Mark to call me re: bond insurance. I also sent him an e-mail. He has never called.
- On 9/13/19 I asked him again via e-mail why he hasn't called me.
- On 9/19/19 via e-mail Mark advised that he too called the insurance company (he never received any insurance vendor information from me) and was questioning me as to why I wanted to add 3 more people. I wanted to discuss adding those from the grand-

divisions who were handling TACEO money to the policy; there would be no additional cost.

- To date Mark has not called me to discuss.
  - If given my preference I would move the policy to Hardin Co. as Leigh confided in me that the agent in Obion County is her personal friend.
  - Further, Mark has authorized payment of the invoice without even knowing why I wanted to add 3 additional people. The three additional people from the grand divisions have not been added.
  - 10/2/19 Mark e-mail me the invoice and authorized payment which I paid.
3. **Liability Insurance:** Mark has never called me to discuss after three requests. Thus, TACEO does not have D&O (Directors & Officers) Liability Insurance. I spoke to the insurance agency and the D&O policy each AOE carries does not cover TACEO because an AOE is not required to be part of TACEO for their job. A separate policy is required. To date we do not have this insurance.
4. **CPA's:** Mark himself entered into an agreement with CPA Bill Slayden. When I asked for a copy of his contract and hourly rate his response was, "I will submit the required invoice for services rendered at the appropriate time." At this time, I have no idea the scope of his services or his rate for those services, although Mark has referred to him as a liaison.  
**IF** TACEO is going to hire Tommy Nichols as a CPA to post books, provide financials, etc. TACEO would have 2 CPA's and in essence Mark wants Bill Slayden to oversee Tommy Nichols. How is that warranted? To date a CPA to post books, provide financial statements, amend 990's, etc. has not be hired and further Mark has provided no feedback on rational why or what his next steps are going to be.
5. **Grand-divisions:**
- On September 19, 2019 via e-mail Mark stated the grand-divisions do not have to provide me with the financials records, only the balance sheet for the last 3 years.
  - Mark said he would discuss w/Donna Barrett his reasoning for not requiring the grand-divisions to provide me the Treasurer with all of their financial data.
  - Each grand-division has one signer on the bank account. I expressed to Mark that because these divisions operate under TACEO 5013C, the Treasurer should be a second signer and have access to on-line records. He feels this is unwarranted.
  - Each grand-division elected two VPs' (in keeping with the by-laws). Nowhere in the bylaws does it say that each grand-division can appoint or designate someone other than an elected VP to handle any TACEO money yet this practice is in place.
6. **East TN Grand-division:** Mark has also stated to me several times that the East TN division is pursuing their own 5013C status. I asked him what money the division would use to open an account & he stated the money they had (+\$40,000?). I told him that I adamantly am against that as the money they have was earned while under TACEO's 5013C status and is primarily tax-payer/county funds. Hile there were silent and live auctions, there is no guarantee that the items were purchased by individuals. Many AOE's expense the gifts donated to their individual counties. As the grand-division did not keep any records on the auction, by default the money is TACEO money. Mark disagreed with me and said he hopes all the grand-divisions get their own 5013C status.
7. **Committees:** Mark stated in his e-mail of September 19, 2019 that he will be setting up committee meetings. Mark is recruiting members of every committee.
- **Budget & Finance Committee:** According to the 2013 by-laws Mark will chair the Budget & Finance Committee. The by-laws do not stipulate that I am to be on that committee. Mark may not even appoint me to this committee; he hasn't verified that I will be on it.

- **By-laws Committee:** According to the 2013 by-laws Mark will be chairman of this committee. Mark has been adamant that I do not need to be on this committee even though he stated that much of the new by-laws will be dealing with financial issues.
8. **2020 Election Law Seminar:** Mark entered into a contract with the Sheraton and refuses to share any details of the contract with me.
- Mark stated setting up the seminar was more time consuming than he thought. However, The Summer Seminar Committee (of which I was a member) had already secured explored many hotels and dates and narrowed down the hotels to Sheraton Music City and Opryland Hotel. Past president Phillip Warren has already secured dates & the contract with Sheraton Music City and the contract was ready for signature. Mark was made aware of the efforts of the Summer Seminar Planning Committee and their decision to have the 2020 seminar at the Sheraton. Mark refused to reach out to Phillip for information and began the process from scratch causing the delay.

I have compiled a financial profit & loss statement from the 2018 seminar that shows that the registration fee does NOT cover the expenses and planned to share this with the Budget & Finance Committee and use it in addition to the 2020 contract to set the registration rate for the 2020 seminar. IF the committee deemed an increase in the registration fee is warranted, this P&L could be used as justification. Mark knows I was working on this & have never asked me for it.

9. **Communication:** It is clear to me that Mark does not wish to communicate with me. When I e-mail him, he rarely responds and he does not address all the questions asked. If he does respond, his answers are vague. When Mark speaks of his team, or we, please know that I am not included. He does not share information with me or seek my opinion. Additionally, Mark and Susan Knopf NEVER return any of my calls. Mark states he is conferring with team members however, that team does not consist of ALL the members of his executive team. Several VP's on the Executive Committee have called me for updates as they have heard nothing from Mark. They are very discouraged. Mark has also stated he has reached out to "long-standing TACEO members" for advice. These are not members of the Executive Committee.
10. **TACEO Documents & Assets:** On 8/1/19 I e-mailed Leigh Schlager asking when I was going to receive all of the original TACEO documents as well as the printer purchased by TACEO. To date I have had no response and have not received the original documents (I do have copies) nor the printer. Susan Knopf has the only lap top computer TACEO has been able to locate.

## PROCEDURES FOR CERTIFYING VOTING MACHINES BY THE TENNESSEE STATE ELECTION COMMISSION

All voting machines/vendors must receive certification from the state election commission and the coordinator of elections before any voting machines or systems may be sold in the State of Tennessee.

### First Step:

Any interested vendor should submit a written request to the coordinator of elections and the state election commission requesting certification of your company together with the EAC certification number, a financial report and a list of all states that have already bought your voting machines or systems. If you would like to demonstrate your product at a meeting of the state election commission, please make that request in your letter. You will be notified of the date, time, and place of the meeting where you may make your presentation.

### Second Step:

#### **A. Voting Machine Procedure**

Following verification of EAC certification and an initial presentation of your product and/or services, you would need to arrange for at least two (2) State Election Commissioners (of opposite parties) and the coordinator of elections (or designee) to view your machines or system in use in an election of a substantial size in another state. An election of a substantial size involves at the minimum the following characteristics:

- The jurisdiction has a population of at least 10,000 persons;
- The jurisdiction has at least two (2) or more district races on the ballots; and
- There are at least two (2) contested races involving both at large and district races on the ballot.

#### **B. Voting Machine Software or Hardware Upgrade**

- EAC Certification;
- Presentation of upgrade before State Election Commission at a meeting; and
- Viewing of upgrade in another state (In lieu of viewing machine in another state, at the discretion of the State Election Commission, letters of recommendation from users in other jurisdiction may be used as support for approval.)

#### **C. De Minimis Voting System Changes**

- Any De Minimis change to an EAC certified voting system shall be submitted to the state election commission and coordinator of elections to be approved. For purposes of approval of the de minimis change to the voting system, all that will be required is a letter from the EAC stating the change is de minimis, unless further information is requested by the state election commission or coordinator of elections.

### Third Step:

The State Election Commission must vote to certify the machine in order for the machines to be used in an election in Tennessee.

You may send any correspondence for both the state election commission and the coordinator of elections to the following address:

312 Rosa L.Parks Avenue, 7<sup>th</sup> Floor  
William R. Snodgrass Tower  
Nashville, Tennessee 37243  
(615) 741-7956

If you have any further questions regarding certification of your company, please feel free to contact the office of the state election coordinator at the phone number listed above.

Hart InterCivic  
De Minimis Changes  
Request for Approval  
October 7, 2019

Alli Fick – Hart InterCivic. Certification Project  
Manager

- Verity 2.0 – Count Software – De Minimis  
Change
- Verity Device – Shipping Box Reduction in Size –  
De Minimis



July 19, 2019

Mark Goins, Coordinator of Elections  
Tennessee Secretary of State  
312 Rosa L. Parks Ave., 7th Floor  
William R. Snodgrass Tower  
Nashville, TN 37243

RE: De Minimis Change Approval Request

Dear Mr. Goins,

Hart InterCivic, Inc. is seeking approval of a de minimis voting system change associated with the Count software in the Verity Voting 2.0 system. This modification has already been approved as a de minimis change by the U.S. Election Assistance Commission (EAC). The EAC defines a de minimis change as "a change to a certified voting system's hardware, software, Technical Data Package (TDP), or data, the nature of which will not materially alter the system's reliability, functionality, capability, or operation." Therefore, we respectfully request the State Election Commission approve the change for use in the State of Tennessee.

Additional Documentation:

For this change, I have included the following documentation:

- Initial description of the change as submitted to the EAC and VSTL
- Correspondence from the EAC approving the change as de minimis

Hart InterCivic looks forward to your favorable review of this request. For questions or additional information, please contact me at 512.252.6427 ([afick@hartic.com](mailto:afick@hartic.com)).

Respectfully submitted,

A handwritten signature in cursive script that reads "Alli Fick".

Alli Fick  
Certification Project Manager  
Hart InterCivic

## Pamela Geppert

---

**From:** Pamela Geppert  
**Sent:** Thursday, July 18, 2019 9:07 AM  
**To:** Pamela Geppert  
**Subject:** FW: Verity Count Slow Reporting ECO-01339 Submitted for Approval

**From:** Jerome Lovato <jlovato@eac.gov>  
**Sent:** Thursday, July 18, 2019 7:56 AM  
**To:** Mike Santos <msantos@slicompliance.com>  
**Cc:** Jared Bernal <jbernal@hartic.com>; Darrick Forester <dforester@slicompliance.com>; Traci Mapps <tmapps@slicompliance.com>; Pamela Geppert <pgeppert@hartic.com>; Jessica Bowers <jbowers@eac.gov>; Paul Aumayr <paumayr@eac.gov>  
**Subject:** Re: Verity Count Slow Reporting ECO-01339 Submitted for Approval

Hi Mike,

Thanks for the additional information. ECO 01339 is approved.

Thank you,

Jerome Lovato  
Director, Voting System Testing and Certification  
U.S. Election Assistance Commission  
Ph. 202-805-4613



ECO-01339 Change Summary  
Verity Count Slow Reporting Correction

June 28, 2019

Doc. 4005650

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	Document Number: 4005650	Revision: A.00
	Document Name: ECO-01339 Change Summary: Verity Count Slow Reporting Correction	
	ECO-01339 Summary - Verity Count Slow Reporting Update 4005650 A00.pdf	Page 1 of 6

**Change History**

<b>Version</b>	<b>Date</b>	<b>Author(s)</b>	<b>Description</b>
A.00	06/28/2019	J. Bernal	Initial release.

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## 1 SUMMARY

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This ECO addresses slow reporting on Count behavior issue as described in the *Root Cause Analysis (RCA) for Verity Count Slow Reporting in Verity 2.0 and 2.2.X*.

This problem will be addressed through Count pre-election preparation procedures, an update to the database maintenance function, and process improvements procedures. These changes will ensure statistics are up to date after the database experiences high levels of data volatility.

Documentation References:

- Root Cause Analysis VERITY COUNT SLOW REPORTING VERITY-2.0, 2.2.X
- Verity Count Slow Reporting Update Test Report (4005651)
- Verity Count 2.0/2.2 Reporting Update Procedures and Best Practices (6675014)

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## 2 REASON / JUSTIFICATION FOR CHANGE

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The proposed change through a database SQL change in "DB Maintenance" and the process improvement steps will prevent the statistics from being out-of-date by full sampling to include the latest and full dataset. This will optimize database query performance, preventing the reoccurrence of slow reporting issues.

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## 3 DESCRIPTIONS OF CHANGES

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The issue was reported to the EAC on submitted to the EAC on 12/6/2018 as "Reporting Performance Issues" due to the slow report generation and/or exporting reported by some jurisdictions during the 11/2018 election.

A Root Cause Analysis (RCA) was performed to determine a corrective action. The RCA is provided in the file: 4005650 A\_Supporting\_Documents.zip.

### 3.1 Corrective Action

This problem will be addressed through Count pre-election preparation, a update to the database maintenance function, and process improvements. These changes will ensure statistics are up to date after the database experiences high levels of data volatility.

1. **Preparation:** Jurisdiction will be informed to archive and remove prior elections. Stress that the jurisdictions need to archive and remove unneeded election data on the system, underscoring those elections with high ballot counts that will influence the total row count.
2. **Update:** The update file will only affect the Database Maintenance function, an end-user-initiated action, to change the partial scan of the database to a fullscan to refresh the statistics and eliminate out-of-date data. No data, tables, or columns are affected by this change. Verity Count software will not be altered – there is no change to the application's executing code. The hash codes identifying the unique software deployment as certified by the EAC will not be altered, nor will the versioning.

The update will be deployed as an executable file. The file will be signed with an approved certificate set and Hart's whitelisting application in order to run on Verity Count workstations. The file will be

loaded on a USB drive. Hart personnel will escape to desktop on the Count workstation to run the deployment executable on each deployed Count system.

3. **Process improvements:** Procedures will be provided to the county recommending periods when Database Maintenance operations should be performed to ensure the dataset statistics remain current, but optimally DB Maintenance should be performed when the system is booted (cold start of Count), prior to reading in their first vDrives following polls close, and at periodic intervals on election night as new election results are received.

Verity Count 2.0/2.2 Reporting Update Procedures and Best Practices document (6675014) is provided in the file: 4005650 A\_Supporting\_Documents.zip.

### 3.2 Functional QA Testing

Hart InterCivic's internal Quality Assurance team has completed thorough testing of the applied corrective action, as described in the RCA. Testing included performance and regression testing before/after installation of the DB Maintenance update coupled with the procedural corrective action steps described in section 3.1.

*Verity Count Slow Reporting Update Test Report (4005651)* details internal testing and is included in 4005650\_Supporting\_Documents.zip.

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## 4 JUSTIFICATION OF DE MINIMIS CHANGE STATUS

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No data, tables, or columns are affected by this change. Verity Count software will not be altered – there is no change to the application’s executing code. The hash codes identifying the unique software deployment as certified by the EAC will not be altered, nor will the versioning. These changes do not alter the system’s reliability, functionality, capability, operation, nor software.

- These changes do not materially alter the system’s reliability.
- These changes do not materially alter the system’s functionality.
- These changes do not materially alter the system’s capability.
- These changes do not materially alter the system’s operation.

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## 5 DE MINIMIS CHANGE DEFINITION

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From the United States Election Assistance Commission’s Document titled: Voting System Testing & Certification Program Manual, Version 2.0.

**3.4.2. De Minimis Change—Defined.** A de minimis change is a change to a certified voting system’s hardware, software, TDP, or data, the nature of which will not materially alter the system’s reliability, functionality, capability, or operation.

End of Document

## Kathy Summers

---

**From:** Alli Fick <afick@hartic.com>  
**Sent:** Friday, July 19, 2019 1:20 PM  
**To:** Kathy Summers  
**Subject:** Hart InterCivic Verity Voting 2.0 - De Minimis Change Request  
**Attachments:** EAC Approval\_ECO\_01339.pdf; ECO-01339 Summary - Verity Count Slow Reporting Update 4005650 A00.pdf; TN\_De Minimis Change\_07192019.pdf

Good afternoon, Kathy-

The EAC has approved a de minimis change to Count in Verity Voting 2.0. I have attached our request letter, a copy of the initial description of the change as submitted to the EAC and VSTL, and the EAC's approval of the change as de minimis.

Please let me know if you have any questions.

Thanks!

Alli



**Alli Fick**

Certification Project Manager

Hart InterCivic

15500 Wells Port Drive | Austin, TX | 78728

512.252.6427 (direct) | 561.628.9273 (cell) | 800.223.HART

[afick@hartic.com](mailto:afick@hartic.com) | [www.hartintercivic.com](http://www.hartintercivic.com)

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September 9, 2019

Mark Goins, Coordinator of Elections  
Tennessee Secretary of State  
312 Rosa L. Parks Ave., 7th Floor  
William R. Snodgrass Tower  
Nashville, TN 37243

Via: Electronic Mail

RE: De Minimis Change to Verity Voting – Verity Device Shipping Box Size Reduction

Dear Mr. Goins,

Hart InterCivic, Inc. is seeking approval of a de minimis change to Verity Voting that provides for a reduction in the size of shipping boxes. This modification, ECO-01351, has already been approved as a de minimis change by the Election Assistance Commission (EAC) on August 30, 2019.

Description of Change:

This is a change to the Verity device shipping box and packing method only. The box materials remain the same, but the box is reduced in size to reduce cost and ease shipping. Updates are made to the device Bills of Material and top-level assembly drawings to accommodate this change. The proposed change does not alter the system's reliability, functionality, capability, or operation and does not affect software.

Additional Documentation:

I have included the following documentation with this request:

- **ECO-01351 Summary - Shipping Box Size Reduction 4005654 A00** – Hart's full description of the change, as submitted to the VSTL and EAC.
- **ECO\_01351\_EAC Approval\_Redacted** – Correspondence from the EAC approving the change as de minimis.

Hart InterCivic looks forward to your favorable review of this request. For questions or additional information, please feel free to contact me.

Respectfully submitted,

A handwritten signature in black ink that reads 'alli fick'.

Alli Fick  
Certification Project Manager  
Hart InterCivic  
(512) 252-6427  
[afick@hartic.com](mailto:afick@hartic.com)



ECO-01351 Change Summary  
Verity Device Shipping Box Size  
Reduction

August 15, 2019

Doc. 4005654

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	Document Number: 4005654	Revision: A.00
	Document Name: ECO-01326 Change Summary: Verity Device Shipping Box Size Reduction	
		Page 1 of 6

**Change History**

<b>Version</b>	<b>Date</b>	<b>Author(s)</b>	<b>Description</b>
A.00	08/15/2019	J. Bernal	Initial release.

**Owners and List of Contacts**

<b>Name</b>	<b>Email</b>	<b>Phone</b>	<b>Role</b>
Jim Canter	jcanter@hartic.com	512.252.6410	VP of Engineering
Dan Gately	dgately@hartic.com	512.252.6817	Director, SCM
Jared Bernal	jbernal@hartic.com	512.252.6462	Sr. Compliance Engineer
Lynn Simpson	lsimpson@hartic.com	512.252.6637	Sr. Mechanical Engineer

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## 1 SUMMARY

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This ECO contains a change to the Verity device shipping box and packing method only. The box materials remain the same, but the box is reduced in size to reduce cost and ease shipping. Updates are made to the device Bills of Material and top-level assembly drawings to accommodate this change.

---

## 2 REASON / JUSTIFICATION FOR CHANGE

---

The change included in this ECO is intended to reduce costs associated with shipping and storage.

It will also significantly reduce landfill waste, and this smaller box can more easily be stored for reuse by the end user.

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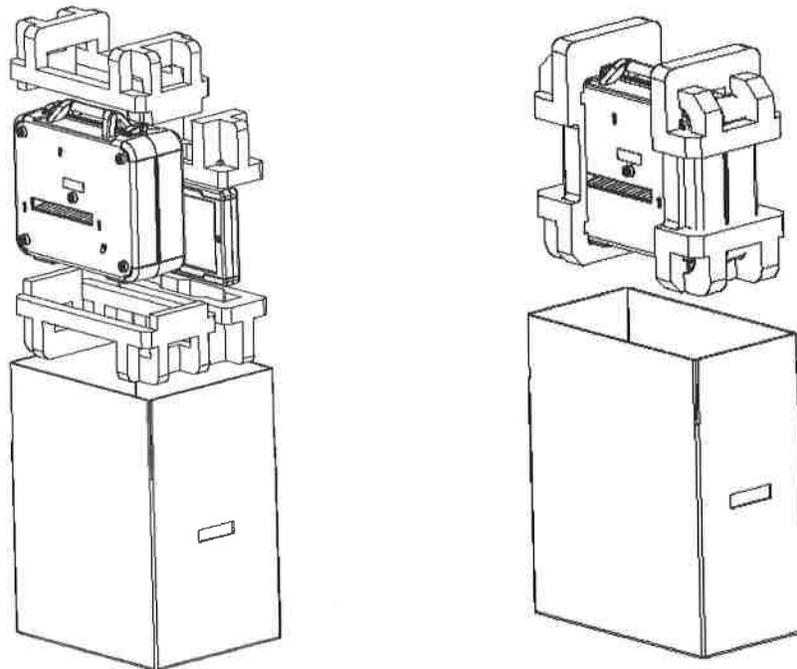
## 3 DESCRIPTIONS OF CHANGES

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This section describes the changes made in ECO-01351. Updated top-level assembly drawings and BOMs are included in the file 4005654A\_Supporting\_Documents.zip. Embedded before-and-after screenshots are included to illustrate the change to the box.

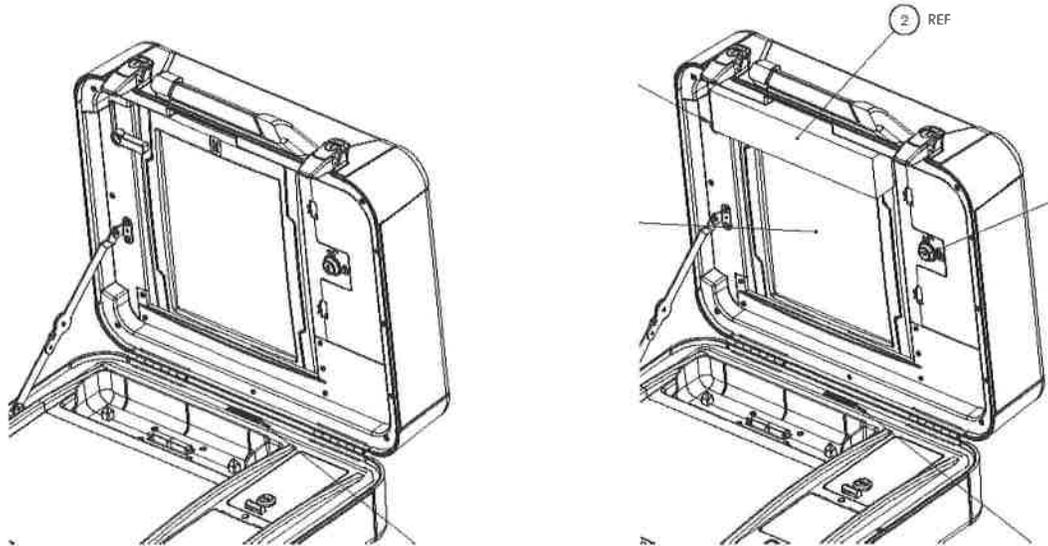
### 3.1 Packaging Change

All devices use the same Verity box and packing method. The tablet will now come shipped within the existing tablet storage compartment inside the Verity device. The foam pads will now grip the device from the sides rather than the top and bottom of the device. A representative sample is shown below:



Existing Packing Method (left)  
Reduced Size Packing Method (right)

A new foam pad is added above the tablet to provide additional support during shipping. A representative sample is shown below:



Tablet stowed in device without foam pad (left)  
 Tablet stowed in device with foam right (Item 2) (right)

### 3.2 Top-Level Device Assemblies Updated

The top-level assemblies are updated to make changes to the shipping box described in section 3.1

Item Number	Item Description	ECO	Old Rev	New Rev
3005350	ASSY, SCAN, VERITY, (IN CARTON)	01351	H	I
3005351	ASSY, CONTROLLER, VERITY, (IN CARTON)	01351	D	E
3005352	ASSY, TOUCH WRITER, VERITY (IN CARTON)	01351	G	H
3005353	ASSY, TOUCH WITH ACCESS, VERITY, (IN CARTON)	01351	E	F
3005355	ASSY, TOUCH, VERITY, (IN CARTON)	01351	D	E
3005356	ASSY, PRINT, VERITY, (IN CARTON)	01351	D	E
3005700	ASSY, TOUCH WRITER DUO, VERITY, (IN CARTON)	01351	A	B
3005725	ASSY, TOUCH WRITER DUO, VERITY, PENNSYLVANIA (IN CARTON)	01351	A	B
3005800	ASSY, SCAN, VERITY, 38BT, (IN CARTON)	01351	A	B
3005825	ASSY, CONTROLLER, VERITY, 38BT (IN CARTON)	01351	A	B
3005855	ASSY, TOUCH WRITER, VERITY, PENNSYLVANIA (IN CARTON)	01351	A	B

Updated BOMs and assembly drawings are available in 4005654 A\_Supporting\_Documents.zip.

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#### 4 DATA JUSTIFYING CHANGE

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All changes are limited to the packing material and method changes as described in section 3.1.

Non-operating transportation and environmental testing was performed at a NVLAP accredited test laboratory, Professional Testing (EMI), Inc.

Testing was completed in accordance to the requirements and procedures described in VVSG 1.0. Testing included the following tests:

- Vibration
- Low Temperature
- High Temperature
- Humidity

The full test report is available in 4005654 A\_Supporting\_Documents.zip.

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#### 5 JUSTIFICATION OF DE MINIMIS CHANGE STATUS

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- These changes do not materially alter the system's reliability.
- These changes do not materially alter the system's functionality.
- These changes do not materially alter the system's capability.
- These changes do not materially alter the system's operation.

---

#### 6 DE MINIMIS CHANGE DEFINITION

---

From the United States Election Assistance Commission's Document titled: Voting System Testing & Certification Program Manual, Version 2.0.

**3.4.2. De Minimis Change—Defined.** A de minimis change is a change to a certified voting system's hardware, software, TDP, or data, the nature of which will not materially alter the system's reliability, functionality, capability, or operation.

End of Document

[REDACTED]

---

**From:** Jerome Lovato <jlovato@eac.gov>  
**Sent:** Friday, August 30, 2019 4:25 AM  
**To:** [REDACTED]  
**Cc:** [REDACTED]  
**Subject:** Re: Hart ECO-01351 Shipping Box Size Reduction - Submitted For Approval

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Good morning Darrick and Jared,

Hart ECO 01351 is approved.

Thank you,

Jerome Lovato  
Director, Voting System Testing and Certification  
U.S. Election Assistance Commission  
Ph. 202-805-4613

On Tue, Aug 20, 2019 at 2:11 PM Darrick Forester [REDACTED] wrote:

Good Afternoon Jerome,

Hart's ECO 01351 Assessment attached for your review and approval.

Enclosed in the zip file, you will find:

- SLI Evaluation - Hart ECO-01351 Shipping Box Size Reduction.pdf
- SLI Hart ECO 01351 Shipping Box Size Reduction Assessment Letter.pdf
- ECO-01351 Summary - Shipping Box Size Reduction 4005654 A00.pdf
- 4005654 A\_Supporting\_Documents.zip
  - ASSY Drawings
  - BOMs
  - Env Test Report

If you have questions, please let us know.

Best Regards,

Darrick

---

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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## Kathy Summers

---

**From:** Alli Fick <afick@hartic.com>  
**Sent:** Monday, September 9, 2019 2:13 PM  
**To:** Kathy Summers  
**Subject:** [EXTERNAL] Hart InterCivic - Verity Voting De Minimis Change Notification  
**Attachments:** Hart InterCivic - Request for Approval.pdf; ECO-01351 Summary - Shipping Box Size Reduction 4005654 A00.pdf; ECO\_01351\_EAC Approval\_Redacted.pdf

**\*\*\* This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. \*\*\***

---

Good afternoon, Kathy-

The EAC has approved a de minimis change to Verity Voting that provides for a reduction to the size of the device shipping box. The following supporting documents are attached to this email:

- Hart InterCivic – Request for Approval
- ECO-01351 Summary – Shipping Box Size Reduction 4005654 A00 – Hart’s full description of the change, as submitted to the VSTL and EAC.
- ECO\_01351\_EAC Approval\_Redacted – Correspondence from the EAC approving the change as de minimis.

If this de minimis change needs to be formally approved at a State Election Commission meeting, would you please add to agenda for October 7<sup>th</sup>?

Thank you!  
Alli



**Alli Fick**

Certification Project Manager

**Hart InterCivic**

15500 Wells Port Drive | Austin, TX | 78728

512.252.6427 (direct) | 561.628.9273 (cell) | 800.223.HART

[afick@hartic.com](mailto:afick@hartic.com) | [www.hartintercivic.com](http://www.hartintercivic.com)

This message (including any attachments) is intended only for the use of the individual or entity to which it is addressed and may contain information that is non-public, proprietary, privileged, confidential, and exempt from disclosure under applicable law or may constitute as attorney work product. If you are not the intended recipient, you are hereby notified that any use, dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, notify us immediately by telephone and (i) destroy this message if a facsimile or (ii) delete this message immediately if this is an electronic communication. Thank you.

Dominion

Request for approval – D-Suite 5.5

De Minimis Changes

October 7, 2019

Humphreys County Election Commission  
208 West Wylly Street  
Waverly, Tennessee 37185  
931-296-6504 Fax 931-296-6509

RECEIVED  
2019 AUG -5 04 01  
SECRETARY OF STATE  
ELECTIONS

Date: July 30, 2019  
To: Andrew Dodd, Election Attorney  
Mark Goins , Coordinator of Elections  
State Election Commissioners, Donna Barrett, Judy Blackburn, Greg Duckett, Mike  
McDonald, Jimmy Wallace, Tom Wheeler, Kent Younce  
From: Humphreys County Election Commission  
Reference: bidding process

The Humphreys County Election Commission has completed the bidding process on voting machines. There was only one bid turned in for the voting machines, after three vendors came to the Election Commission Office to show their machines to the Election Commissioners, upon which the County Executive and the County Commissioners came to see the Voting machines as well.

During the process, the Election Commissioners did an extensive search for the right voting machines for the Voters / taxpayers of Humphreys County. We compared the cost and performance of each machine; and the AOE called other Counties to get an idea on what machines they had, and whether they were looking to buy new equipment soon. We also borrowed specifications from another county that had DRE's as well.

That being said, the Humphreys County Election Commissioners feel the DRE's are the best fit for our county and would like to purchase the certified DRE's from Hart voting machine as soon as possible. The machines we purchased in 2006 have been dependable machines, however, the Commissioners no longer have confidence in the machines; and the Commissioners feel it is imperative that new machines be in place by the March 3, 2020 Election.

## **Proof of Publication**

### **Invitation to Bid - Voting Machines**

Humphreys County, TN is seeking bids for the purchase of Electronic Voting Machines to serve precincts in Humphreys County elections. For specifications and instruction to proposers please contact:

**Joann Bullion - Election Coordinator**  
208 W. Wavy St.  
Waverly, TN 37185  
Phone: (931) 296-6504  
Fax: (931) 296-6509  
Waverlyvote.com

The Deadline for submittals of sealed bid shall be 4:00 p.m. local time on June 14, 2018. Humphreys County reserves the right to reject any bid and to rebid the solicitation in its entirety.

Publication Date: May 15, 2019.

## **Proof of Publication**

### **Invitation to Bid - Electronic Polling Tablets**

Humphreys County, TN is seeking bids for the purchase of electronic poll books to serve precincts in Humphreys County elections. For specifications and instruction to proposers please contact:

**Joann Bullion - Election Coordinator**  
208 W. Wavy St.  
Waverly, TN 37185  
Phone: (931) 296-6504  
Fax: (931) 296-6509  
Waverlyvote.com

The Deadline for submittals of sealed bid shall be 4:00 p.m. local time on June 14, 2018. Humphreys County reserves the right to reject any bid and to rebid the solicitation in its entirety.

Publication Date: May 15, 2019.

Humphreys County Election Commission  
208 West Wylly Street  
Waverly, Tennessee 37185  
931-296-6504 Fax 296-6509

Humphreys County Election Commission has 8 Polling places 1 early voting location.

Humphreys County has:

- 30 voting machines
- 10 Handicap accessibility machines
- 2 Demo Machines
- 1 computer for tabulation
- 1 scanner election night tabulation
- 1 report printer
- battery packs & charger
- Hardware licensing fees
- Software programming Fees
- Any equipment not listed that is needed to run an Election.

We are looking to be equal to the above said equipment.

Tennessee Secretary of State

Tre Hargett



Elections Division

312 Rosa L. Parks Avenue, 7<sup>th</sup> Floor  
Nashville, Tennessee 37243-1102

Mark Goins  
Coordinator of Elections

615-741-7956  
Mark.Goins@tn.gov

**MEMORANDUM**

**To:** State Election Commission Members

**From:** Mark Goins *Mark Goins*  
Coordinator of Elections

**Date:** September 4, 2019

**Subject:** Results of the August 27, 2019 Certification Exam

---

On August 27, 2019, this office administered a certification exam. The following Administrator of Elections obtained a passing score on that exam:

**Nathan Hitson (Polk County)**



1201 18th Street, Suite 210 Denver, CO 80202

September 11, 2019

Attn: Mark Goins  
Elections Division,  
Tennessee Secretary of State's Office  
312 Rosa L. Parks Avenue, 7<sup>th</sup> Floor  
Nashville, TN 37243  
Email: [mark.goins@tn.gov](mailto:mark.goins@tn.gov)

sent via courier

**RE: ECO APPROVAL REQUEST FOR DOMINION ECOS**

Dear Mark:

Dominion Voting Systems, Inc. (Dominion) would like to submit for the D-Suite 5.5 system configuration the following ECOs, which have been approved as de minimis changes by the U.S. Election Assistance Commission (EAC), for consideration as administrative approvals by the State of Tennessee.

- |                |                                     |               |
|----------------|-------------------------------------|---------------|
| 1. ECO 100500  | ICX Prime B1R                       | (D-Suite 5.5) |
| 2. ECO 100531  | ICX Prime B1R Power Connector       | (D-Suite 5.5) |
| 3. ECO 100504  | APC SMT-1500C UPS                   | (D-Suite 5.5) |
| 4. ECO 100521  | Dell P2419H Monitor                 | (D-Suite 5.5) |
| 5. ECO 100597  | Dell PowerEdge R640 Processor-RAM   | (D-Suite 5.5) |
| 6. ECO 100602  | Dell Precision 3431 Computer        | (D-Suite 5.5) |
| 7. ECO 100596  | Dell Latitude 3400 Laptop           | (D-Suite 5.5) |
| 8. ECO 100543  | Canon DR-G1130 w/ New Panel         | (D-Suite 5.5) |
| 9. ECO 100588  | KFI VVPAT Printer (Stepper Motor)   | (D-Suite 5.5) |
| 10. ECO 100503 | ICP Collapsible Ballot Box          | (D-Suite 5.5) |
| 11. ECO 100565 | Apacer USB Memory Sticks (8GB+16GB) | (D-Suite 5.5) |

For each ECO, please find Dominion's ECO document, Supporting Documentation for the ECO, the VSTL Analysis document, and the VSTL memo attesting to the EAC's approval. Due to pending implementations, Dominion would request that the first four (4) ECOs (bolded) be reviewed first and the balance in the order of priority listed above. I have combined the eleven (11) ECO folders into one (1) encrypted file.

If you have any questions or further instructions regarding this request, please contact me directly.

Sincerely,

Ian S. Piper  
Director, Federal Certification  
Dominion Voting Systems, Inc.

cc: Kathy Summers (TN Elections Division)  
John Hastings (Dominion, Regional Sales Manager)

2019 SEP 12 PM 1:07  
SECRETARY OF STATE  
ELECTIONS

RECEIVED





# Engineering Change Order (ECO) Form

<b>ECO Number</b>	100500
<b>Reason</b>	Added improved model of Avalue tablet to Dominion AVL for ICX Prime.
<b>Description</b>	<p>Products Affected: ImageCast X Prime</p> <p>The manufacturer (Avalue) has improved their tablet product (HID-21V-BTX-01R) to reduce the unit's weight through some material changes and to extend the battery charge shelf life to 6 months. The new version will be labeled by Avalue as the HID-21V-BTX-B1R and added to Dominion's Approved Vendor List (AVL) for the ICX Prime product. Please see the manufacturer's datasheet for details.</p> <p>Add: DVS PN 190-000056 ICX PRIME (AL), 21 IN. PANEL PC - MULTI TOUCH - WITH 1 BACK UP BATTERY</p> <p>This product will be used in the EAC certified D-Suite 5.5 system configuration and the following state level D-Suite 5.4 system configurations:</p> <ul style="list-style-type: none"> <li>• 5.4-NV</li> <li>• 5.4-Complete</li> <li>• 5.4-E</li> <li>• 5.4-F</li> </ul>

Priority  
ECOs 100500  
100531  
100504  
100521

Signoff Groups	User	Date Signed	Signature	Date Signed
Engineering	Aamer Chaudhry	2018-10-15		
Certification	Jessica Bowers	2018-10-24		
Order Fulfillment	Susan Martin	2018-10-24		
Supply Chain	Arnold Atienza	2018-10-24		





# Memo

**To:** Ian Piper  
**From:** Wendy Owens  
**CC:** Michael Walker  
**Date:** 12/17/2018  
**Subject:** ECO Analysis

---

Dear Mr. Piper,

Pro V&V is providing this memo as a formal notification to Dominion Voting Systems (DVS) that the U.S. Election Assistance Commission (EAC) has concurred with Pro V&V's assessment of ECO No. **100500** from DVS as a de minimis change for the following EAC certified voting systems:

- Democracy Suite (D-Suite) 5.5 system configuration

If you have any questions, please call or e-mail me.

Sincerely,

*Wendy Owens*

Wendy Owens  
VSTL Program Manager  
256-713-1111 – office  
wendy.owens@provandv.com





**ENGINEER CHANGE ORDER (ECO) ANALYSIS FORM**

**Manufacturer:** Dominion Voting Systems

**System:** Democracy Suite (D-Suite) 5.5, 5.4-NV, 5.4-Complete, 5.4-E, and 5.4-F

**ECO Number:** 100500

**ECO Description:** Addition of improved model of Avalue tablet to Dominion AVL for ICX Prime

**Overview:**

Products Affected: ImageCast X Prime (ICX Prime)

The manufacturer (Avalue) has implemented improvements to the tablet product (HID-21V-BTX-01R) to reduce the unit's weight through some material changes and to extend the battery charge shelf life to 6 months. The new version will be labeled by Avalue as the HID-21V-BTX-B1R and added to Dominion's Approved Vendor List (AVL) for the ICX Prime product. The improved product will be implemented in the EAC certified D-Suite 5.5 system configuration and the following state level D-Suite 5.4 system configurations: 5.4-NV, 5.4-Complete, 5.4-E, and 5.4-F.

Update to Dominion AVL:

DVS PN 190-000056 ICX PRIME (AL), 21 IN. PANEL PC - MULTI TOUCH - WITH 1 BACK UP BATTERY

**Supporting Documentation:**

ECO 100500 ICX Prime Improvements (2018-10-24).pdf

Datasheet (HID-21V-BTX\_181018132644).pdf (*Manufacturer's datasheet*)

**Engineering Recommendation:**

Technical documentation review performed to approve change. Per the manufacturer's datasheet, the improved tablet is identical in form, fit, and function to the original tablet; therefore, the system will not be adversely impacted by the modification. The only noted changes on the specification sheet are the reduced weight aluminum chassis and the extended battery shelf life. No additional testing required.

**Engineering Analysis: De Minimis**

**Reviewer:**

Wendy Owens  
Printed Name

Wendy Owens  
Signature

10/30/18  
Date

**Approver:**

Jack Cobb  
Printed Name

Jack Cobb  
Signature

10-30-18  
Date





## HID-21V-BTX

Intel® Atom™ Processor J1900 21.5" Semi Industrial Ultra Slim Panel PC

- > Intel® Atom™ Processor J1900
- > 4GB RAM
- > 32GB mSATA
- > PCAP Touch
- > 10/100/1000 Ethernet
- > DC 19V Input
- > Smart Card Reader
- > Li-ion Battery

### + Spec

#### Storage

**Storage** 32GB mSATA

#### Panel

**LCD Size** 21.5"  
**Resolution** 1920 x 1080  
**Luminance** 250 nits  
**Viewing angle** 89°(H+)/ 89°(H-) / 89°(V+) / 89°(V-)  
**Touch Type** PCAP

#### External I/O

**USB Port** 5 x USB 2.0, 2 x USB 3.0  
**Video Port** 1 x HDMI, 1 x VGA  
**Audio Port** 1 x Headphone Jack  
**LAN Port** 1 x 10/100/1000 Ethernet  
**Peripheral Devices** 1 x Smart Card Reader  
**Power Output** 1 x 24V Output Terminal Connector

#### Battery

**Battery Type** Li-ion rechargeable battery cell  
**Typical Capacity** 6700mAh

#### Mechanical

**Power Type** 19V DC input  
**Power Connector Type** DC Jack  
**Weight** 10.75 kg with packing material  
**Shipping Dimension** Outer carton 67cm x 48cm x 28cm  
**Shipping Weight** 24 kg  
**Color** Black

#### Reliability

**EMI Test** CE, FCC Class B  
**Operating Temperature** 0°C ~ 40°C  
**Operating Humidity** 0% ~ 90% relative humidity  
**Unit Weight** 22 lbs.  
**Storage Temperature** -20°C ~ 60°C  
**Touch Knock Testing** Passes over Test Force: 250g over 10Million Times  
**Packaging Vibration Test** IEC 60068-2-64 Tested  
**Packaging Drop Test** ISTA 2A, IEC-6008-2-32 Tested

#### Component

**CPU** Intel Atom Baytrail J1900 2.0GHz, 2MB Cache  
**Memory** 4GB DDR3L  
**Adapter** +19V DC (180W)  
**Microphone** 1 x MIC interface  
**Operating System** Android 4.4.4 / 5.1 / 8.1 (coming soon)  
**BIOS** BTXJ(P1.21J)ROM

### + Ordering

**HID-21V-BTX-01R**  
 Steel Chassis with 30 Day Battery Shelf Life

**HID-21V-BTX-B1R**  
 Reduced Weight Aluminum Chassis with 6 Month Battery Shelf Life





## Engineering Change Order (ECO) Form

<b>ECO Number</b>	100531
<b>Reason</b>	COTS manufacturer of ICX Prime B1R tablet product changed a connector that supplies DC power to external devices attached to the tablet due part availability and ease of manufacturing.
<b>Description</b>	<p>Products Affected: ImageCast X Prime B1R</p> <p>The manufacturer (Avalue) has improved their tablet product (HID-21V-BTX-B1R) by changing the "Phoenix-style" terminal block header connector, which provides DC power to external devices attached to the tablet, to a DIN connector. The Avalue tablet product with the new power connector will retain the same model number (HID-21V-BTX-B1R). Dominion is adding a new power cable part that is the same configuration as the previous power cable, but now with the new mating DIN connector on the cable end.</p> <p>This product can be used in any D-Suite configuration using an Avalue Prime B1R tablet product.</p> <p>Add: DVS PN 131-000029 CABLE, ICX PRIME (AL) INLINE POWER LOCKING DIN</p>

Signoff Groups	User	Date Signed	Signoff Groups	User	Date Signed
Engineering	Aamer Chaudhry	2019-01-31			
Certification	Ian Piper	2019-01-31			
Order Fulfillment	Susan Martin	2019-01-31			
Supply Chain	Arnold Atienza	2019-01-31			





# Memo

**To:** Ian Piper  
**From:** Wendy Owens  
**CC:** Michael Walker  
**Date:** 3/22/2019  
**Subject:** ECO Analysis

---

Dear Mr. Piper,

Pro V&V is providing this memo as a formal notification to Dominion Voting Systems (DVS) that U.S. Election Assistance Commission (EAC) has concurred with Pro V&V's assessment of ECO No. 100531 from DVS as a de minimis change for the following EAC certified voting systems:

- Any D-Suite configuration using an Avalue Prime B1R tablet product

If you have any questions, please call or e-mail me.

Sincerely,

A handwritten signature in black ink that reads 'Wendy Owens'.

Wendy Owens  
VSTL Program Manager  
256-713-1111 – office  
wendy.owens@provandv.com



**PRO V&V**



**ENGINEER CHANGE ORDER (ECO) ANALYSIS FORM**

**Manufacturer:** Dominion Voting Systems

**System:** Democracy Suite (D-Suite)

**ECO Number:** 100531

**ECO Description:** Change in connector on ICX B1R Tablet

**Overview:**

Products Affected: ImageCast X Prime B1R

The manufacturer (Avalue) has modified their tablet product (HID-21V-BTX-B1R) by changing the "Phoenix-style" terminal block header connector, which provides DC power to external devices attached to the tablet, to a DIN connector. The Avalue tablet product with the new power connector will retain the same model number (HID-21V-BTX-B1R). Dominion is adding a new power cable part that is the same configuration as the previous power cable, but now with the new mating DIN connector on the cable end.

**Add:**

DVS PN 131-000029 CABLE, ICX PRIME (AL) INLINE POWER LOCKING DIN

**Supporting Documentation:**

ECO 100531 ICX Prime B1R Power Connector (AC 2019-01-31).pdf  
R-HID-21V-RevisionChange.pdf (*Manufacturer's notification letter*)

**Engineering Recommendation:**

Technical documentation review performed to approve change. Per the manufacturer's notification letter, the new connector has been tested and approved. Based on the documentation review, the system should not be adversely impacted by the modification. No additional testing required.

**Engineering Analysis: De Minimis**

**Reviewer:**

Wendy Owens  
Printed Name

Wendy Owens  
Signature

2/7/19  
Date

**Approver:**

Jack Cobb  
Printed Name

Jack Cobb  
Signature

2/7/19  
Date





9 Timber Lane, Marlboro, NJ 07446  
732-414-6500

Dominion Voting Systems  
ATTN: Aamer Chaudhry  
215 Spadina Ave,  
Suite 200  
Toronto, ON  
Canada, M5T 2CT

December 3, 2018

Hi Aamer,

I am writing to confirm that we have tested and approved a new DIN connector to be implemented onto the HID-21V-BTX-B1R.

The original Phoenix style connector had a long lead time and required a greater assembly effort during both manufacturing and installation. We are migrating to a latching connector with a quick release option that can easily be removed without a tool while at the same time giving the latching required to ensure the printer will stay connected.

Please let us know if you have any further questions or concerns.

**Best Regards,**

**Joseph Lucchese**  
**Vice President**  
**Avalue Technology Inc.**  
**732-414-6500 ext.801**  
**joeph1@avalue-usa.com**





# Engineering Change Order (ECO) Form

<b>ECO Number</b>	100504
<b>Reason</b>	Added APC SMT1500C UPS as a battery backup option for use with the ICX Classic BMD configuration due to the APC SMT1500 UPS becoming commercially unavailable for purchase.
<b>Description</b>	<p>Products Affected: ICX Classic BMD (15in. and 21in)</p> <p>Added APC SMT1500C UPS as a battery backup option for use with the ICX Classic BMD configuration due to the APC SMT1500 UPS becoming commercially unavailable for purchase.</p> <p>Add: DVS PN 123-000477 UPS, 1.5KVA, TOWER MODEL SMT1500C</p> <p>The substitute model has been tested for use with the following EAC certified Democracy Suite (D-Suite) systems:</p> <ul style="list-style-type: none"> <li>• 5.0, 5.0-A</li> <li>• 5.5</li> </ul> <p>And also for use with the following state certified D-Suite systems:</p> <ul style="list-style-type: none"> <li>• 5.2-CA, 5.2-CO, 5.2-CO.1</li> <li>• 5.4, 5.4-Complete</li> <li>• 5.0S</li> </ul>

Signoff Groups	User	Date Signed	Signoff Groups	User	Date Signed
Engineering	Aamer Chaudhry	2018-09-11			
Certification	Ian Piper	2018-11-09			
Order Fulfillment	Susan Martin	2018-11-09			
Supply Chain/MFG	Arnold Atienza	2018-11-09			





# Memo

**To:** Ian Piper  
**From:** Wendy Owens  
**CC:** Michael Walker  
**Date:** 11/26/2018  
**Subject:** ECO Analysis

---

Dear Mr. Piper,

Pro V&V is providing this memo as a formal notification to Dominion Voting Systems (DVS) that U.S. Election Assistance Commission (EAC) has concurred with Pro V&V's assessment of ECO No. 100504 from DVS as a de minimis change for the following EAC certified voting systems:

- Democracy Suite 5.0
- Democracy Suite 5.0-A
- Democracy Suite 5.5

If you have any questions, please call or e-mail me.

Sincerely,

*Wendy Owens*

Wendy Owens  
VSTL Program Manager  
256-713-1111 – office  
wendy.owens@provandv.com





**ENGINEER CHANGE ORDER (ECO) ANALYSIS FORM**

**Manufacturer:** Dominion Voting Systems

**System:** Democracy Suite (D-Suite)

**ECO Number:** 100504

**ECO Description:** Added APC SMT1500C UPS as a battery backup option

**Overview:**

Products Affected: ICX Classic BMD (15in. and 21in)

Added APC SMT1500C UPS as a battery backup option for use with the ICX Classic BMD configuration due to the APC SMT1500 UPS becoming commercially unavailable for purchase.

**Add:**

DVS PN 123-000477 UPS, 1.5KVA, TOWER MODEL SMT1500C

The substitute model has been tested for use with the following EAC certified D-Suite 5.5 system configurations: 5.0, 5.0-A, and 5.5. It has also been tested for use in the following state certified D-Suite system configurations: 5.2-CA, 5.2-CO, 5.2-CO.1, 5.4, 5.4-Complete, and 5.0S.

**Supporting Documentation:**

ECO 100504 APC UPS SMT1500 Replacement (2018-11-09).pdf (*Dominion ECO*)

SMT1500\_Specifications.pdf

SMT1500C\_Specifications.pdf

FCC\_ClassB\_Hotline.pdf, FCC\_ClassB\_Neutral.pdf, Hor 6.pdf, and Ver 6.pdf (*Emissions test results*)

**Engineering Recommendation:**

Technical documentation review performed to approve change. Dominion internal test results were reviewed. The replacement component is comparable in form, fit, and function to the current model. It was determined that the new version will not adversely impact the certified systems; therefore, no additional testing is required.

**Engineering Analysis: De Minimis**

**Reviewer:**

Wendy Owens  
Printed Name

Wendy Owens  
Signature

11/13/18  
Date

**Approver:**

JACK COBB  
Printed Name

JACK COBB  
Signature

11/13/18  
Date

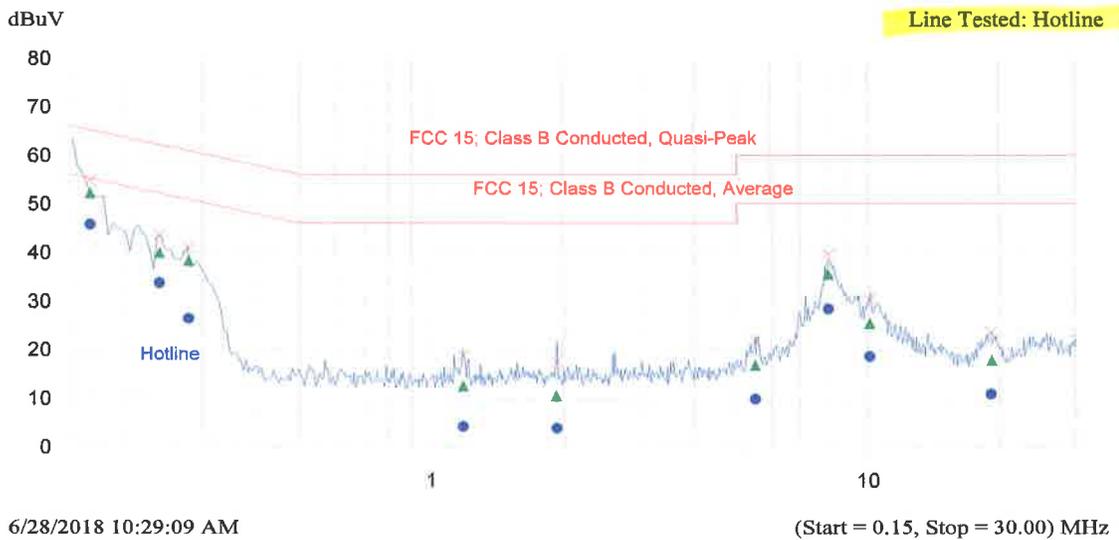


# FCC 15 Sub B ; Class B Power Line Conducted Emission

## Test Header

Description: 120v 60 Hz  
 Setup Name: FCC 15 Class B  
 Customer Name: Dominion Voting Ssystems Corporation  
 Project Number: DVSC-092Q  
 Operator Name: Fahar A Sukkoor  
 EUT Name: ICX Prime BMD  
 Date Created: 6/28/2018 9:32:09 AM  
 Date Modified: 6/28/2018 10:28:23 AM

## Current Graph



## Current List

Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name
0.240	43.6	39.8	-22.3	33.7	-18.5	Hotline
0.166	54.7	52.1	-13.0	45.7	-9.5	Hotline
0.279	40.9	38.2	-22.6	26.4	-24.5	Hotline
1.183	18.7	12.4	-43.6	4.1	-41.9	Hotline

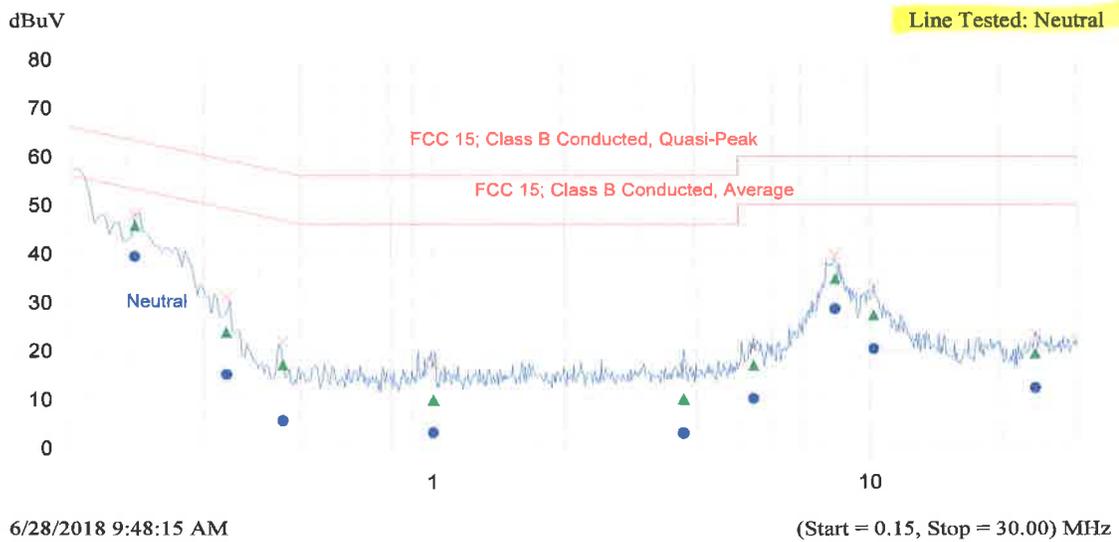
1.936	17.6	10.4	-45.6	3.8	-42.2	Hotline
5.514	21.7	16.7	-43.3	9.8	-40.2	Hotline
8.105	39.5	35.5	-24.5	28.3	-21.7	Hotline
10.082	30.1	25.3	-34.7	18.5	-31.5	Hotline
19.111	23.5	17.6	-42.4	10.8	-39.2	Hotline

# FCC 15 Sub B ; Class B Power Line Conducted Emission

## Test Header

Description: 120v 60 Hz  
 Setup Name: FCC 15 Class B  
 Customer Name: Dominion Voting Ssystems Corporation  
 Project Number: DVSC-092Q  
 Operator Name: Fahar A Sukkoor  
 EUT Name: ICX Prime BMD  
 Date Created: 6/28/2018 9:32:09 AM  
 Date Modified: 6/28/2018 10:24:06 AM

## Current Graph



## Current List

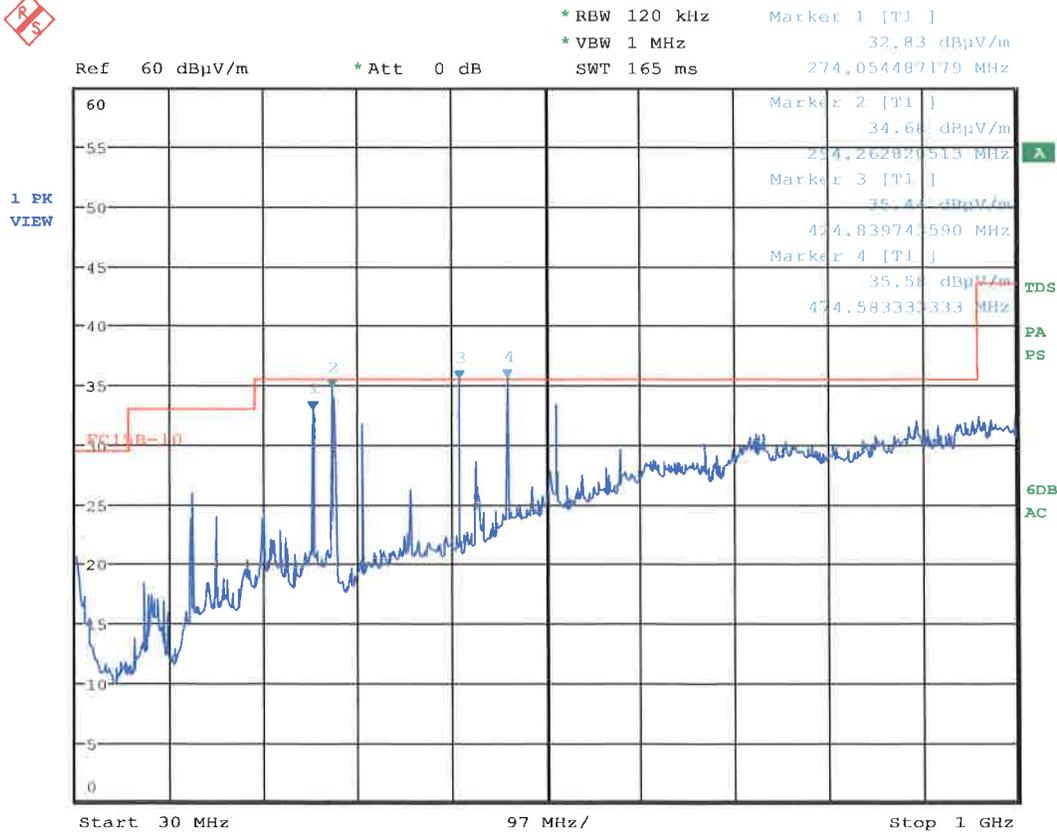
Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name
0.209	48.1	45.7	-17.6	39.4	-13.9	Neutral
0.338	30.9	23.7	-35.5	15.0	-34.2	Neutral
0.455	21.7	17.0	-39.8	5.6	-41.2	Neutral
1.002	17.2	9.7	-46.3	3.1	-42.9	Neutral

3.743	16.1	9.9	-46.1	3.1	-42.9	Neutral
5.419	20.6	17.0	-43.0	10.2	-39.8	Neutral
8.355	39.6	34.8	-25.2	28.6	-21.4	Neutral
10.230	33.1	27.3	-32.7	20.4	-29.6	Neutral
24.008	23.3	19.4	-40.6	12.3	-37.7	Neutral

**Meas Type** TDK 10m (H) Polarization  
**Equipment under Test** ICX Classic BMD  
**Manufacturer** DOMINION VOTING  
**OP Condition** 120Vac  
**Operator** Hien  
**Test Spec**  
 Radiated Emissions

**Sweep Settings Screen A**

Center Frequency	515.000000 MHz	Ref Level	60.000 dB $\mu$ V/m
Frequency Offset	0.000000 Hz	Ref Level Offset	0.000 dB
Span	970.000000 MHz	Ref Position	100.000 %
Start Frequency	30.000000 MHz	Level Range	60.000 dB
Stop Frequency	1.000000 GHz	RF Att	0.000 dB
RBW	120.000000 kHz	X-Axis	LIN
VBW	1.000000 MHz	Y-Axis	LOG
Sweep Time	165.00 ms		



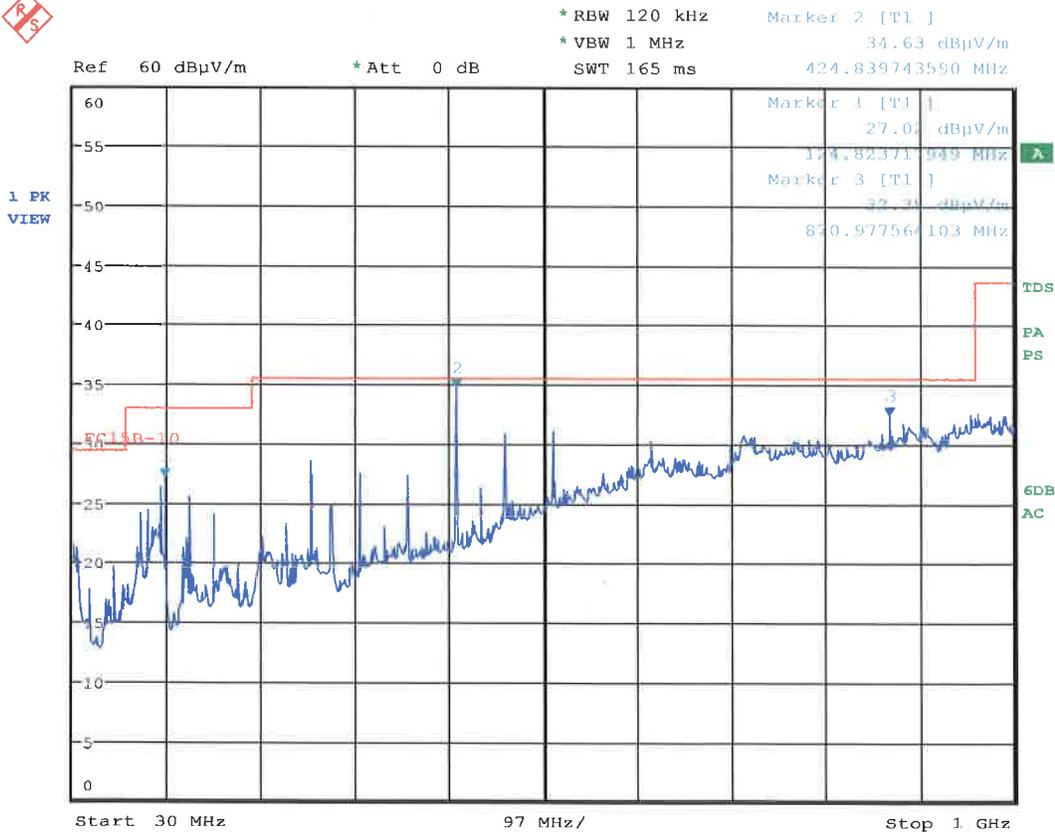




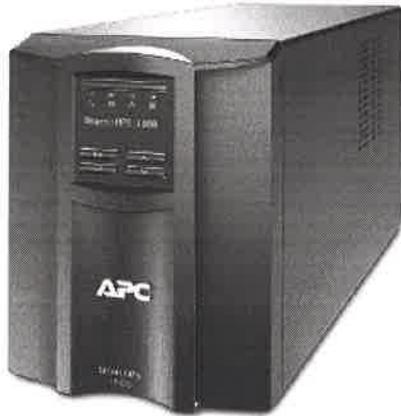
**Meas Type** TDK 10m (V) Polarization  
**Equipment under Test** ICX Classic BMD  
**Manufacturer** DOMINION VOTING  
**OP Condition** 120Vac  
**Operator** Hien  
**Test Spec**  
 Radiated Emissions

**Sweep Settings Screen A**

Center Frequency	515.000000 MHz	Ref Level	60.000 dB $\mu$ V/m
Frequency Offset	0.000000 Hz	Ref Level Offset	0.000 dB
Span	970.000000 MHz	Ref Position	100.000 %
Start Frequency	30.000000 MHz	Level Range	60.000 dB
Stop Frequency	1.000000 GHz	RF Att	0.000 dB
RBW	120.000000 kHz	X-Axis	LIN
VBW	1.000000 MHz	Y-Axis	LOG
Sweep Time	165.00 ms		







Overview

Model Name	APC Smart-UPS 1500VA LCD 120V
Includes	CD with software , Documentation CD , Smart UPS signalling RS-232 cable , USB cable
Standard Lead Time	Usually Ships within 2 Weeks
Product Distribution	Anguilla , Antigua And Barbuda , Aruba , Bahamas , Barbados , Belize , Bermuda , Canada , Cayman Islands , Colombia , Costa Rica , Cuba , Dominican Republic , Ecuador , El Salvador , Guatemala , Haiti , Honduras , Jamaica , Mexico , Nicaragua , Panama , Puerto Rico , Trinidad And Tobago , United States , Venezuela , VIRGIN ISLANDS (UNITED STATES)

Output

Output Power Capacity	1000 Watts / 1440 VA
Max Configurable Power (Watts)	1000 Watts / 1440 VA
Nominal Output Voltage	120V
Output Voltage Distortion	Less than 5%
Output Frequency (sync to mains)	50/60Hz +/- 3 Hz
Output Frequency (sync to mains)	Line Interactive
Waveform Type	Sine wave
Output Connections	(8) NEMA 5-15R (Battery Backup)

Input

Nominal Input Voltage	120V
Input Frequency	50/60 Hz +/- 3 Hz (auto sensing)
Input Connections	NEMA 5-15P
Cord Length	6 feet (1.83 meters)
Input voltage range for main operations	82 - 144 V
Input voltage adjustable range for mains operation	75 - 154V
Maximum Input Current	0 A
Input Breaker Capacity	0 A

Batteries & Runtime

Battery Type	Maintenance-free sealed Lead-Acid battery with suspended electrolyte : leakproof
--------------	--

Included Battery Modules	0
Battery Slots Empty	0
Typical recharge time	3 hour(s)
Replacement Battery	RBC7
RBC Quantity	1

### Communications & Management

Interface Port(s)	SmartSlot , USB
Available SmartSlot™ Interface Quantity	1
Control panel	Multi-function LCD status and control console
Audible Alarm	Alarm when on battery : distinctive low battery alarm : configurable delays
Emergency Power Off (EPO)	--

### Surge Protection and Filtering

Surge energy rating	459 Joules
Filtering	Full time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : meets UL 1449

### Physical

Maximum Height	8.62 inches (219.0 mm)
Maximum Width	6.73 inches (171.0 mm)
Maximum Depth	17.28 inches (439.0 mm)
Rack Height	0 U
Net Weight	53.0 lbs (24.09 kg)
Shipping Weight	59.9 lbs (27.23 kg)
Shipping Height	14.8 inches (376.0 mm)
Shipping Width	12.91 inches (328.0 mm)
Shipping Depth	23.43 inches (595.0 mm)
Master Carton Units	0.0
Master Carton Weight	0.0 lbs
Color	Black
Units per Pallet	12.0

### Environmental

Operating Environment	32 - 104 °F (0 - 40 °C)
Operating Relative Humidity	0 - 95 %
Operating Elevation	0-10000 feet (0-3000 meters)
Storage Temperature	5 - 113 °F (-15 - 45 °C)
Storage Relative Humidity	0 - 95 %
Storage Elevation	0-50000 feet (0-15000 meters)
Audible noise at 1 meter from surface of unit	45.000 dB
Online Thermal Dissipation	135.000 BTU/hr

### Conformance

Approvals	CSA , ENERGY STAR V1.0 (USA) , UL 1778
Standard warranty	3 years repair or replace (excluding battery) and 2 year for battery
Equipment protection policy	Lifetime : \$150000

### Sustainable Offer Status

RoHS	Compliant
------	-----------





Share:



## SMT1500C

Average Customer Review ★★★★★ 5.0

2 of 2 (100%) reviewers would recommend this product to a friend.

[Read all reviews](#) | [Write a review](#)

Share this Product: and other network devices.

Includes : CD with software , Documentation CD , Smart UPS signalling RS-232 cable , USB cable



Description: Intelligent and efficient network power protection from entry level to scalable runtime. Ideal UPS for servers, point-of-sale, routers, switches, hubs



- User Manual
- Replacement Battery
- Software & Firmware
- Product Registration
- Product FAQs

Product Overview

Technical Specifications

Documentation

Software & Firmware

Options

Ratings & Reviews

### Output

[Print Technical Specification](#)

Output power capacity	1.0 KWatts / 1.44 kVA
Max Configurable Power (Watts)	1.0 KWatts / 1.44 kVA
Nominal Output Voltage	120V
Output Voltage Distortion	Less than 5%
Output Frequency (sync to mains)	50/60Hz +/- 3 Hz
Other Output Voltages	110, 127
Topology	Line Interactive
Waveform type	Sine wave
Output Connections	
(8) NEMA 5-15R (Battery Backup)	
Transfer Time	6ms typical : 10ms maximum

### Input

Nominal Input Voltage	120V
Input frequency	50/60 Hz +/- 3 Hz (auto sensing)
Input Connections	NEMA 5-15P
Cord Length	6ft ( 1.83meters )
Input voltage range for main operations	82 - 144V
Input voltage adjustable range for mains operation	75 - 154V
Number of Power Cords	1
Other Input Voltages	110, 127

### Batteries & Runtime

Maintenance-free sealed Lead-Acid battery with suspended electrolyte : leakproof

Typical recharge time	3hour(s)
Interface Port(s)	SmartSlot , USB
Control panel	Multi-function LCD status and control console
Audible Alarm	Alarm when on battery : distinctive low battery alarm : configurable delays
Emergency Power Off (EPO)	--
Available SmartSlot™ Interface Quantity	1

### Surge Protection and Filtering

Surge energy rating	680Joules
Filtering	Full time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : meets UL 1449

### Physical

Maximum Height	8.62inches ( 219mm , 21.9CM )
Maximum Width	6.73inches ( 171mm , 17.1CM )
Maximum Depth	17.28inches ( 439mm , 43.9CM )
Net Weight	54.23lbs. ( 24.6KG )
Shipping weight	59.92lbs. ( 27.18KG )
Shipping Height	12.99inches ( 330mm , 33.0CM )
Shipping Width	12.99inches ( 330mm , 33.0CM )
Shipping Depth	23.23inches ( 590mm , 59.0CM )
Color	Black
Units per Pallet	12.0

### Environmental

Operating Temperature	32 - 104 °F ( 0 - 40 °C )
Operating Relative Humidity	0 - 95 %
Operating Elevation	0-10000ft ( 0-3000meters )
Storage Temperature	-15 - 45 °C
Storage Relative Humidity	0 - 95 %
Storage Elevation	0-50000ft ( 0-15000meters )
Audible noise at 1 meter from surface of unit	45.0dBA
Online thermal dissipation	225.0BTU/hr

### Conformance

Approvals	CSA, CSA C22.2 No. 107.1, ENERGY STAR V1.0 (USA), FCC Part 15 Class B, ICES-003, UL 1778
Equipment protection policy	Lifetime : \$150000
Standard warranty	3 years repair or replace (excluding battery) and 2 year for battery

### Sustainable Offer Status

RoHS	Compliant
REACH	REACH: Contains No SVHCs
Proposition 65 Warning	Available in Documentation tab



## Engineering Change Order (ECO) Form

<b>ECO Number</b>	100521
<b>Reason</b>	Added DELL P2419H monitor as a display device for server and client workstations due to the DELL P2417H monitor becoming commercially unavailable for purchase.
<b>Description</b>	<p>Products Affected: Election Management System</p> <p>Added DELL P2419H monitor as a display device for server and client workstations due to the DELL P2417H monitor becoming commercially unavailable for purchase. This product can be used as a replacement in new or existing installations for all D-Suite system configurations.</p> <p>Add: DVS PN 190-000064 MONITOR - 24" LED HD - P2419H</p>

Signoff Groups	User	Date Signed	Signoff Groups	User	Date Signed
Engineering	Aamer Chaudhry	2018-12-12			
Certification	Ian Piper	2018-12-17			
Order Fulfillment	Susan Martin	2018-12-17			
Supply Chain/MFG	Arnold Atienza	2018-12-17			





# Memo

**To:** Ian Piper  
**From:** Wendy Owens  
**CC:** Michael Walker  
**Date:** 3/22/2019  
**Subject:** ECO Analysis

---

Dear Mr. Piper,

Pro V&V is providing this memo as a formal notification to Dominion Voting Systems (DVS) that U.S. Election Assistance Commission (EAC) has concurred with Pro V&V's assessment of ECO No. 100521 from DVS as a de minimis change for the following EAC certified voting systems:

- New or existing installations for all D-Suite system configurations.

If you have any questions, please call or e-mail me.

Sincerely,

A handwritten signature in black ink that reads "Wendy Owens". The signature is written in a cursive, flowing style.

Wendy Owens  
VSTL Program Manager  
256-713-1111 – office  
wendy.owens@provandv.com



**PRO V&V**



**ENGINEER CHANGE ORDER (ECO) ANALYSIS FORM**

**Manufacturer:** Dominion Voting Systems

**System:** Democracy Suite (D-Suite) System Configurations

**ECO Number:** 100521

**ECO Description:** End-of-Life Part Replacement

**Overview:**

Products Affected: Election Management System (EMS)

Added DELL P2419H monitor as a display device for server and client workstations due to the DELL P2417H monitor becoming commercially unavailable for purchase. This product can be used as a replacement in new or existing installations for all D-Suite system configurations.

**Add:**

DVS PN 190-000064 MONITOR - 24" LED HD - P2419H

**Supporting Documentation:**

ECO 100521 DELL P2419H Monitor (2018-12-17).pdf

dell-p2419h-monitor\_user's-guide\_en-us.pdf (*Manufacturer's User Guide*)

dell-p2417h-monitor\_user's\_guide\_en-us.pdf (*Manufacturer's User Guide*)

**Engineering Recommendation:**

Technical documentation review performed to approve change. The replacement component is comparable in form, fit, and function to the current model. It was determined that the new version will not adversely impact the certified systems; therefore, no additional testing is required.

**Engineering Analysis: De Minimis**

**Reviewer:**

Ryan Wilson

Printed Name

*Ryan Wilson*

Signature

1/4/19

Date

**Approver:**

Wendy Owens

Printed Name

*Wendy Owens*

Signature

1/4/19

Date



**Dell P2217H/P2317H/P2317HWH/  
P2417H/P2717H Monitor  
User's Guide**

Model: P2217H/P2317H/P2317HWH/P2417H/P2717H  
Regulatory model: P2217Hb, P2217Hc, P2317Hb, P2317Hf,  
P2317Ht, P2317HWHb, P2417Hb, P2417Hc, P2717Ht



## Notes, cautions, and warnings

-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
-  **CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.
-  **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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2018 - 01

Rev. A05

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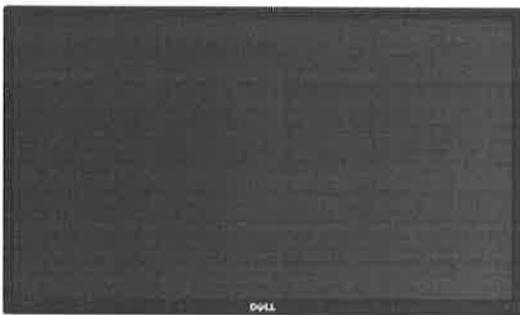
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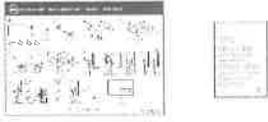
# About Your Monitor

## Package Contents

Your monitor ships with the components shown below. Ensure that you have received all the components and Contact Dell if something is missing.

-  **NOTE:** Some items may be optional and may not ship with your monitor. Some features or media may not be available in certain countries.
-  **NOTE:** To set up with any other stand, please refer to the respective stand setup guide for setup instructions.

	Monitor
	Stand Riser
	Stand Base

	Power Cable (Varies by Country)
	VGA Cable
	DP Cable
	USB 3.0 Upstream Cable (Enables the USB Ports on the Monitor)
	<ul style="list-style-type: none"> <li>• Quick Setup Guide</li> <li>• Safety, Environmental, and Regulatory Information</li> </ul>

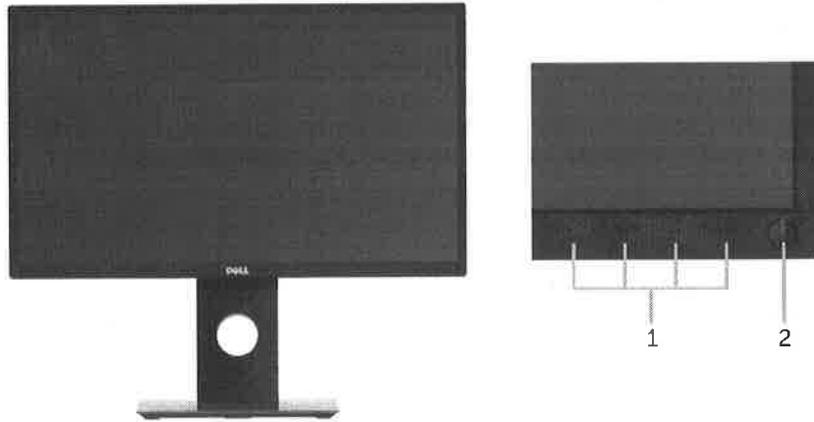
## Product Features

The **Dell P2217H/P2317H/P2317HWH/P2417H/P2717H** flat panel display has an active matrix, Thin-Film Transistor (TFT), Liquid Crystal Display (LCD) and LED backlight. The monitor features include:

- **P2217H:** 54.6 cm (21.5-inch) viewable area (measured diagonally).  
Resolution: Up to 1920 x 1080 through VGA, DisplayPort, and HDMI, with full-screen support or lower resolutions.
- **P2317H/P2317HWH:** 58.4 cm (23-inch) viewable area (measured diagonally).  
Resolution: Up to 1920 x 1080 through VGA, DisplayPort, and HDMI, with full-screen support or lower resolutions.
- **P2417H:** 60.5 cm (23.8-inch) viewable area (measured diagonally).  
Resolution: Up to 1920 x 1080 through VGA, DisplayPort, and HDMI, with full-screen support or lower resolutions.
- **P2717H:** 68.6 cm (27-inch) viewable area (measured diagonally).  
Resolution: Up to 1920 x 1080 through VGA, DisplayPort, and HDMI, with full-screen support or lower resolutions.
- Color gamut of 72% NTSC.
- Tilt, swivel, height, and rotate adjustment capabilities.
- Removable stand and Video Electronics Standards Association (VESA™) 100 mm mounting holes for flexible mounting solutions.
- Digital connectivity with DisplayPort and HDMI.
- Equipped with 1 USB upstream port and 4 USB downstream ports.
- Plug and play capability if supported by your system.
- On-Screen Display (OSD) adjustments for ease of set-up and screen optimization.
- Security lock slot.
- Stand lock.
- 0.3 W standby power when in sleep mode.
- Energy Gauge shows the energy level being consumed by the monitor in real time.
- Optimize eye comfort with a flicker-free screen and ComfortView feature which minimizes blue light emission.

## Identifying Parts and Controls

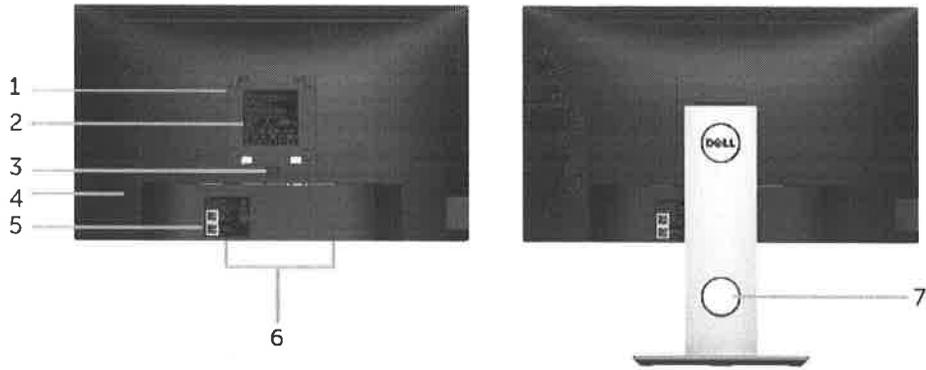
### Front View



Front panel controls

Label	Description
1	Function buttons (For more information, see Operating the Monitor)
2	Power On/Off button (with LED indicator)

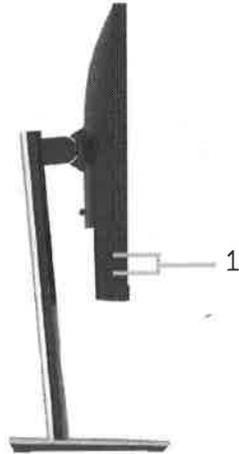
## Back View



Back view with monitor stand

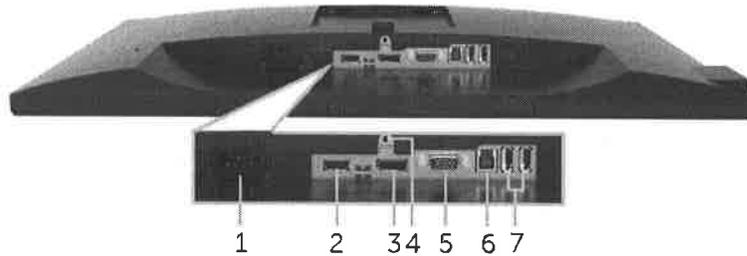
Label	Description	Use
1	VESA mounting holes (100 mm x 100 mm - behind attached VESA Cover)	Wall mount monitor using VESA-compatible wall mount kit (100 mm x 100 mm).
2	Regulatory label	Lists the regulatory approvals.
3	Stand release button	Releases stand from monitor.
4	Security lock slot	Secures monitor with security lock (security lock not included).
5	Barcode, serial number, and Service Tag label	Refer to this label if you need to contact Dell for technical support.
6	Dell Soundbar mounting slots	Attaches the optional Dell Soundbar. <b>NOTE:</b> Please remove the plastic strip covering the mounting slots before affixing the Dell Soundbar.
7	Cable-management slot	Use to organize cables by placing them through the slot.

## Side View



Label	Description	Use
1	USB downstream port	Connect your USB device. <b>NOTE:</b> To use this port, you must connect the USB cable (shipped with your monitor) to the USB-upstream port on the monitor and to your computer.

## Bottom View



Bottom view without monitor stand

Label	Description	Use
1	Power cable connector	Connect the power cable.
2	HDMI port	Connect your computer with HDMI cable (cable not included).
3	DisplayPort	Connect your computer with DP cable.
4	Stand lock feature	To lock the stand to the monitor using a M3 x 6 mm screw (screw not included).
5	VGA connector	Connect your computer with VGA cable.
6	USB upstream port	Connect the USB cable (shipped with your monitor) to this port and your computer to enable the USB ports on your monitor.
7	USB downstream port	Connect USB device. <b>NOTE:</b> To use this port, you must connect the USB cable (shipped with your monitor) to the USB-upstream port on the monitor and to your computer.

## Monitor Specifications

Model	P2217H	P2317H/P2317HWH
Screen type	Active matrix - TFT LCD	
Panel technology	In-Plane Switching Technology	
Aspect ratio	16:9	16:9
Viewable image		
Diagonal	546.10 mm (21.5 inches)	584.20 mm (23 inches)
Horizontal, Active Area	476.06 mm (18.74 inches)	509.18 mm (20.05 inches)
Vertical, Active Area	267.79 mm (10.54 inches)	286.42 mm (11.28 inches)
Area	127484.10 mm <sup>2</sup> (197.6 inch <sup>2</sup> )	145839.33 mm <sup>2</sup> (226.05 inch <sup>2</sup> )
Pixel pitch	0.248 mm x 0.248 mm	0.265 mm x 0.265 mm
Pixel per inch (PPI)	102	96
Viewing angle	178° (vertical) typical 178° (horizontal) typical	
Brightness	250 cd/m <sup>2</sup> (typical)	
Contrast ratio	1000 to 1 (typical) 4 Million: 1 (Dynamic)	
Display screen coating	Anti-Glare with 3H hardness	
Backlight	White LED edgelight system	
Response time (typical)	6 ms (gray to gray)	
Color depth	16.7 million colors	
Color gamut	82% NTSC (CIE1976)*	
Built-in devices	<ul style="list-style-type: none"> <li>• USB 3.0 super-speed hub (with 1 x USB 3.0 upstream port)</li> <li>• 2 x USB 3.0 downstream ports</li> <li>• 2 x USB 2.0 downstream ports</li> </ul>	
Connectivity	<ul style="list-style-type: none"> <li>• 1 x DP 1.2</li> <li>• 1 x HDMI 1.4</li> <li>• 1 x VGA</li> <li>• 1 x USB 3.0 port - Upstream</li> <li>• 2 x USB 3.0 port - Side</li> <li>• 2 x USB 2.0 port - Bottom</li> </ul>	
Border width (edge of monitor to active area)	11.4 mm (Top/Left/Right) 18.1 mm (Bottom)	11.4 mm (Top/Left/Right) 18.1 mm (Bottom)
Adjustability		

Height adjustable stand	130 mm
Tilt	-5° to 21°
Swivel	-45° to 45°
Pivot	90° (clockwise)
Dell Display Manager Compatibility	Yes
Security	Security lock slot (cable lock sold separately)

Model	P2417H	P2717H
Screen type	Active matrix - TFT LCD	
Panel technology	In-Plane Switching Technology	
Aspect ratio	16:9	16:9
Viewable image		
Diagonal	604.52 mm (23.8 inches)	685.80 mm (27 inches)
Horizontal, Active Area	527.04 mm (20.75 inches)	597.92 mm (23.54 inches)
Vertical, Active Area	296.46 mm (11.67 inches)	336.30 mm (13.24 inches)
Area	156246.27 mm <sup>2</sup> (242.18 inch <sup>2</sup> )	201073.77 mm <sup>2</sup> (311.65 inch <sup>2</sup> )
Pixel pitch	0.275 mm x 0.275 mm	0.311 mm x 0.311 mm
Pixel per inch (PPI)	93	82
Viewing angle	178° (vertical) typical 178° (horizontal) typical	
Brightness	250 cd/m <sup>2</sup> (typical)	300 cd/m <sup>2</sup> (typical)
Contrast ratio	1000 to 1 (typical) 4 Million: 1 (Dynamic)	
Display screen coating	Anti-Glare with 3H hardness	
Backlight	White LED edgelight system	
Response time (typical)	6 ms (gray to gray)	
Color depth	16.7 million colors	
Color gamut	82% NTSC (CIE1976)*	
Built-in devices	<ul style="list-style-type: none"> <li>• USB 3.0 super-speed hub (with 1 x USB 3.0 upstream port)</li> <li>• 2 x USB 3.0 downstream ports</li> <li>• 2 x USB 2.0 downstream ports</li> </ul>	

Connectivity	<ul style="list-style-type: none"> <li>• 1 x DP 1.2</li> <li>• 1 x HDMI 1.4</li> <li>• 1 x VGA</li> <li>• 1 x USB 3.0 port - Upstream</li> <li>• 2 x USB 3.0 port - Side</li> <li>• 2 x USB 2.0 port - Bottom</li> </ul>	
Border width (edge of monitor to active area)	11.4 mm (Top/Left/Right)	11.6 mm (Top/Left/Right)
	18.1 mm (Bottom)	18.2 mm (Bottom)
Adjustability		
Height adjustable stand	130 mm	
Tilt	-5° to 21°	
Swivel	-45° to 45°	
Pivot	90° (clockwise)	
Dell Display Manager Compatibility	Yes	
Security	Security lock slot (cable lock sold separately)	

\* Color gamut (typical) is based on CIE1976 (82% NTSC) and CIE1931 (72% NTSC) test standards.

## Resolution Specifications

<b>Model</b>	<b>P2217H/P2317H/P2317HWH/P2417H/P2717H</b>
Horizontal scan range	30 kHz to 83 kHz (automatic)
Vertical scan range	56 Hz to 76 Hz (automatic)
Maximum preset resolution	1920 x 1080 at 60 Hz

## Supported Video Modes

<b>Model</b>	<b>P2217H/P2317H/P2317HWH/P2417H/P2717H</b>
Video display capabilities (VGA, HDMI & DP playback)	480i, 480p, 576i, 576p, 720p, 1080i, 1080p

## Preset Display Modes

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (Horizontal/Vertical)
VESA, 640 x 480	31.5	60.0	25.2	-/-
VESA, 640 x 480	37.5	75.0	31.5	-/-
IBM, 720 x 400	31.5	70.0	28.3	-/+
VESA, 800 x 600	37.9	60.0	40.0	+/+
VESA, 800 x 600	46.9	75.0	49.5	+/+
VESA, 1024 x 768	48.4	60.0	65.0	-/-
VESA, 1024 x 768	60.0	75.0	78.8	+/+
VESA, 1152 x 864	67.5	75.0	108.0	+/+
VESA, 1280 x 1024	64.0	60.0	108.0	+/+
VESA, 1280 x 1024	80.0	75.0	135.0	+/+
VESA, 1600 x 900	60.0	60.0	108.0	+/+
VESA, 1920 x 1080	67.5	60.0	148.5	+/+

## Electrical Specifications

Model	P2217H/P2317H/P2317HWH/P2417H/P2717H
Video input signals	<ul style="list-style-type: none"> <li>Analog RGB, 0.7 Volts +/- 5%, positive polarity at 75 ohm input impedance</li> <li>HDMI 1.4, 600 mV for each differential line, 100 ohm input impedance per differential pair</li> <li>DisplayPort 1.2, 600 mV for each differential line, 100 ohm input impedance per differential pair</li> </ul>
AC input voltage/frequency/current	100 VAC to 240 VAC / 50 Hz or 60 Hz $\pm$ 3 Hz / 1.5 A (typical)
Inrush current	<ul style="list-style-type: none"> <li>120 V: 30 A (Max.) at 0 °C (cold start)</li> <li>220 V: 60 A (Max.) at 0 °C (cold start)</li> </ul>

## Physical Characteristics

Model	P2217H	P2317H/P2317HWH
<b>Signal cable type</b>	<ul style="list-style-type: none"> <li>• Analog: D-Sub, 15 pins</li> <li>• Digital: DisplayPort, 20 pins</li> <li>• Digital: HDMI, 19 pins (cable not included)</li> <li>• Universal Serial Bus: USB, 9 pins</li> </ul>	
<b>Dimensions (with stand)</b>		
Height (extended)	477.8 mm (18.81 inches)	487.1 mm (19.17 inches)
Height (compressed)	354.4 mm (13.95 inches)	357.1 mm (14.06 inches)
Width	498.9 mm (19.64 inches)	532.0 mm (20.94 inches)
Depth	180.0 mm (7.09 inches)	180.0 mm (7.09 inches)
<b>Dimensions (without stand)</b>		
Height	297.3 mm (11.70 inches)	315.9 mm (12.43 inches)
Width	498.9 mm (19.64 inches)	532.0 mm (20.94 inches)
Depth	50.3 mm (1.98 inches)	50.3 mm (1.98 inches)
<b>Stand dimensions</b>		
Height (extended)	400.8 mm (15.78 inches)	400.8 mm (15.78 inches)
Height (compressed)	354.4 mm (13.95 inches)	354.4 mm (13.95 inches)
Width	242.6 mm (9.55 inches)	242.6 mm (9.55 inches)
Depth	180.0 mm (7.09 inches)	180.0 mm (7.09 inches)
<b>Weight</b>		
Weight with packaging	6.86 kg (15.09 lb)	7.34 kg (16.18 lb)
Weight with stand assembly and cables	5.37 kg (11.81 lb)	5.59 kg (12.32 lb)
Weight without stand assembly (For wall mount or VESA mount considerations - no cables)	2.81 kg (6.18 lb)	3.06 kg (6.75 lb)
Weight of stand assembly	2.10 kg (4.63 lb)	2.10 kg (4.63 lb)
Front frame gloss	2-4	2-4

Model	P2417H	P2717H
<b>Signal cable type</b>	<ul style="list-style-type: none"> <li>• Analog: D-Sub, 15 pins</li> <li>• Digital: HDMI, 19 pins (cable not included)</li> <li>• Digital: DisplayPort, 20 pins</li> <li>• Universal Serial Bus: USB, 9 pins</li> </ul>	
<b>Dimensions (with stand)</b>		
Height (extended)	492.1 mm (19.37 inches)	544.9 mm (21.45 inches)
Height (compressed)	362.1 mm (14.26 inches)	415.3 mm (16.35 inches)
Width	549.8 mm (21.65 inches)	621.1 mm (24.45 inches)
Depth	180.0 mm (7.09 inches)	200.3 mm (7.89 inches)
<b>Dimensions (without stand)</b>		
Height	326.0 mm (12.83 inches)	366.1 mm (14.41 inches)
Width	549.8 mm (21.65 inches)	621.1 mm (24.45 inches)
Depth	50.3 mm (1.98 inches)	50.3 mm (1.98 inches)
<b>Stand dimensions</b>		
Height (extended)	400.8 mm (15.78 inches)	433.4 mm (17.06 inches)
Height (compressed)	354.4 mm (13.95 inches)	387.2 mm (15.24 inches)
Width	242.6 mm (9.55 inches)	292.4 mm (11.51 inches)
Depth	180.0 mm (7.09 inches)	200.3 mm (7.89 inches)
<b>Weight</b>		
Weight with packaging	7.63 kg (16.78 lb)	9.76 kg (21.52 lb)
Weight with stand assembly and cables	5.90 kg (12.98 lb)	7.44 kg (16.40 lb)
Weight without stand assembly (For wall mount or VESA mount considerations - no cables)	3.33 kg (7.32 lb)	4.58 kg (10.10 lb)
Weight of stand assembly	2.10 kg (4.63 lb)	2.44 kg (5.38 lb)
Front frame gloss	2-4	2-4

## Environmental Characteristics

Model	P2217H	P2317H/ P2317HWH	P2417H	P2717H
<b>Compliant Standards</b>				
<ul style="list-style-type: none"> <li>• ENERGY STAR certified Monitor</li> <li>• EPEAT Gold registered in the U.S. EPEAT registration varies by country. See <a href="http://www.epeat.net">www.epeat.net</a> for registration status by country</li> <li>• RoHS-compliant</li> <li>• TCO-Certified Displays</li> <li>• BFR/PVC Free monitor (excluding external cables)</li> <li>• Arsenic-Free glass and Mercury-Free for the panel only</li> </ul>				
<b>Temperature</b>				
Operating	0 °C to 40 °C (32 °F to 104 °F)			
Non-operating	<ul style="list-style-type: none"> <li>• Storage: -20 °C to 60 °C (-4 °F to 140 °F)</li> <li>• Shipping: -20 °C to 60 °C (-4 °F to 140 °F)</li> </ul>			
<b>Humidity</b>				
Operating	10% to 80% (non-condensing)			
Non-operating	<ul style="list-style-type: none"> <li>• Storage: 5% to 90% (non-condensing)</li> <li>• Shipping: 5% to 90% (non-condensing)</li> </ul>			
<b>Altitude</b>				
Operating	5,000 m (16,404 ft) (maximum)			
Non-operating	12,192 m (40,000 ft) (maximum)			
<b>Thermal dissipation</b>	<ul style="list-style-type: none"> <li>• 126.24 BTU/hour (maximum)</li> <li>• 58.01 BTU/hour (typical)</li> </ul>	<ul style="list-style-type: none"> <li>• 129.66 BTU/hour (maximum)</li> <li>• 61.42 BTU/hour (typical)</li> </ul>	<ul style="list-style-type: none"> <li>• 133.07 BTU/hour (maximum)</li> <li>• 64.83 BTU/hour (typical)</li> </ul>	<ul style="list-style-type: none"> <li>• 187.66 BTU/hour (maximum)</li> <li>• 78.48 BTU/hour (typical)</li> </ul>

## Power Management Modes

If you have VESA's DPM™ compliance display card or software installed in your PC, the monitor can automatically reduce its power consumption when not in use. This is referred to as *Power Save Mode\**. If the computer detects input from the keyboard, mouse, or other input devices, the monitor automatically resumes functioning. The following table shows the power consumption and signaling of this automatic power saving feature.

**P2217H**

VESA Modes	Horizontal Sync	Vertical Sync	Video	Power Indicator	Power Consumption
Normal operation	Active	Active	Active	White	37 W (maximum)** 17 W (typical)
Active-off mode	Inactive	Inactive	Blanked	White (blinking)	Less than 0.3 W
Switch off	-	-	-	Off	Less than 0.3 W

Energy Star	Power Consumption
P <sub>on</sub>	15.5 W
E <sub>TEC</sub>	50.6 kWh

**P2317H/P2317HWH**

VESA Modes	Horizontal Sync	Vertical Sync	Video	Power Indicator	Power Consumption
Normal operation	Active	Active	Active	White	38 W (maximum)** 18 W (typical)
Active-off mode	Inactive	Inactive	Blanked	White (blinking)	Less than 0.3 W
Switch off	-	-	-	Off	Less than 0.3 W

Energy Star	Power Consumption
P <sub>on</sub>	14.8 W
E <sub>TEC</sub>	46.7 kWh

**P2417H**

VESA Modes	Horizontal Sync	Vertical Sync	Video	Power Indicator	Power Consumption
Normal operation	Active	Active	Active	White	39 W (maximum)** 19 W (typical)
Active-off mode	Inactive	Inactive	Blanked	White (blinking)	Less than 0.3 W
Switch off	-	-	-	Off	Less than 0.3 W

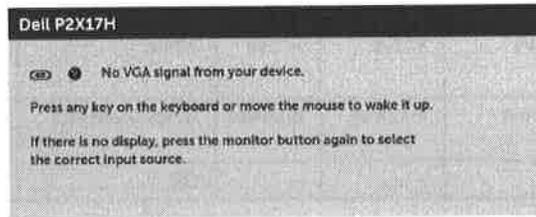
Energy Star	Power Consumption
P <sub>on</sub>	18.5 W
E <sub>TEC</sub>	54.1 kWh

**P2717H**

VESA Modes	Horizontal Sync	Vertical Sync	Video	Power Indicator	Power Consumption
Normal operation	Active	Active	Active	White	55 W (maximum)** 23 W (typical)
Active-off mode	Inactive	Inactive	Blanked	White (blinking)	Less than 0.3 W
Switch off	-	-	-	Off	Less than 0.3 W

Energy Star	Power Consumption
P <sub>on</sub>	15.1 W
E <sub>TEC</sub>	47.4 kWh

The OSD functions only in the normal operation mode. When any button is pressed in the Active-off mode, the following message will be displayed:



 **NOTE:** The message may be slightly different according to the connected input signal.

 **NOTE:** This monitor is **ENERGY STAR®**-compliant.



 **NOTE:**

**P<sub>on</sub>:** Power consumption of on mode as defined in Energy Star 7.0 version.

**E<sub>TEC</sub>:** Total energy consumption in kWh as defined in Energy Star 7.0 version.

\* Zero power consumption in OFF mode can only be achieved by disconnecting the main cable from the monitor.

\*\* Maximum power consumption with max luminance, and USB active.

This document is informational only and reflects laboratory performance. Your product may perform differently, depending on the software, components and peripherals you ordered and shall have no obligation to update such information. Accordingly, the customer should not rely upon this information in making decisions about electrical tolerances or otherwise. No warranty as to accuracy or completeness is expressed or implied.

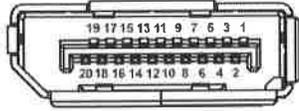
## Pin Assignments

### VGA Connector



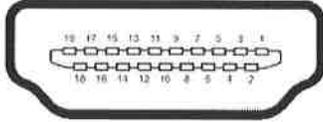
Pin Number	15-pin Side of the Connected Signal Cable
1	Video-Red
2	Video-Green
3	Video-Blue
4	GND
5	Self-test
6	GND-R
7	GND-G
8	GND-B
9	Computer 5 V/3.3 V
10	GND-sync
11	GND
12	DDC data
13	H-sync
14	V-sync
15	DDC clock

## DisplayPort Connector



Pin Number	20-pin Side of the Connected Signal Cable
1	ML0(p)
2	GND
3	ML0(n)
4	ML1(p)
5	GND
6	ML1(n)
7	ML2(p)
8	GND
9	ML2(n)
10	ML3(p)
11	GND
12	ML3(n)
13	GND
14	GND
15	AUX(p)
16	GND
17	AUX(n)
18	GND
19	Re-PWR
20	+3.3 V DP_PWR

## HDMI Connector



Pin Number	19-pin Side of the Connected Signal Cable
1	TMDS DATA 2+
2	TMDS DATA 2 SHIELD
3	TMDS DATA 2-
4	TMDS DATA 1+
5	TMDS DATA 1 SHIELD
6	TMDS DATA 1-
7	TMDS DATA 0+
8	TMDS DATA 0 SHIELD
9	TMDS DATA 0-
10	TMDS CLOCK+
11	TMDS CLOCK SHIELD
12	TMDS CLOCK-
13	CEC
14	Reserved (N.C. on device)
15	DDC CLOCK (SCL)
16	DDC DATA (SDA)
17	DDC/CEC Ground
18	+5V POWER
19	HOT PLUG DETECT

## Plug and Play Capability

You can install the monitor in any Plug and Play-compatible system. The monitor automatically provides the computer system with its Extended Display Identification Data (EDID) using Display Data Channel (DDC) protocols so that the system can configure itself and optimize the monitor settings. Most monitor installations are automatic; you can select different settings if desired. For more information about changing the monitor settings, see *Operating the Monitor*.

## Universal Serial Bus (USB) Interface

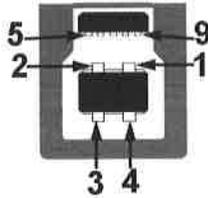
This section gives you information about the USB ports that are available on the monitor.

 **NOTE:** This monitor is Super-Speed USB 3.0 and High-Speed USB 2.0 compatible.

Transfer Speed	Data Rate	Power Consumption
Super-speed	5 Gbps	4.5 W (Max, each port)
High speed	480 Mbps	4.5 W (Max, each port)
Full speed	12 Mbps	4.5 W (Max, each port)

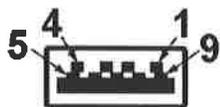
Transfer Speed	Data Rate	Power Consumption
High speed	480 Mbps	2.5 W (Max, each port)
Full speed	12 Mbps	2.5 W (Max, each port)
Low speed	1.5 Mbps	2.5 W (Max, each port)

### USB 3.0 Upstream Connector



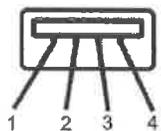
Pin Number	9-pin Side of the Connector
1	VCC
2	D-
3	D+
4	GND
5	SSTX-
6	SSTX+
7	GND
8	SSRX-
9	SSRX+

## USB 3.0 Downstream Connector



Pin Number	9-pin Side of the Connector
1	VCC
2	D-
3	D+
4	GND
5	SSRX-
6	SSRX+
7	GND
8	SSTX-
9	SSTX+

## USB 2.0 Downstream Connector



Pin Number	4-pin Side of the Connector
1	VCC
2	DMD
3	DPD
4	GND

## USB Ports

- 1 x USB 3.0 upstream - bottom
- 2 x USB 2.0 downstream - bottom
- 2 x USB 3.0 downstream - side

 **NOTE:** USB 3.0 functionality requires a USB 3.0-capable computer.

 **NOTE:** The monitor's USB interface works only when the monitor is On or in the power save mode. If you turn Off the monitor and then turn it On, the attached peripherals may take a few seconds to resume normal functionality.

## LCD Monitor Quality and Pixel Policy

During the LCD Monitor manufacturing process, it is not uncommon for one or more pixels to become fixed in an unchanging state which are hard to see and do not affect the display quality or usability. For more information on Dell Monitor Quality and Pixel Policy, see Dell Support site at: <http://www.dell.com/support/monitors>.

## Maintenance Guidelines

### Cleaning Your Monitor

-  **CAUTION:** Read and follow the Safety Instructions before cleaning the monitor.
-  **WARNING:** Before cleaning the monitor, unplug the monitor power cable from the electrical outlet.

For best practices, follow the instructions in the list below while unpacking, cleaning, or handling your monitor:

- To clean your anti-static screen, lightly dampen a soft, clean cloth with water. If possible, use a special screen-cleaning tissue or solution suitable for the anti-static coating. Do not use benzene, thinner, ammonia, abrasive cleaners, or compressed air.
- Use a lightly-dampened, warm cloth to clean the monitor. Avoid using detergent of any kind as some detergents leave a milky film on the monitor.
- If you notice white powder when you unpack your monitor, wipe it off with a cloth.
- Handle your monitor with care as a darker-colored monitor may get scratched and show white scuff marks more than a lighter-colored monitor.
- To help maintain the best image quality on your monitor, use a dynamically changing screen saver and turn Off your monitor when not in use.

## Setting Up the Monitor

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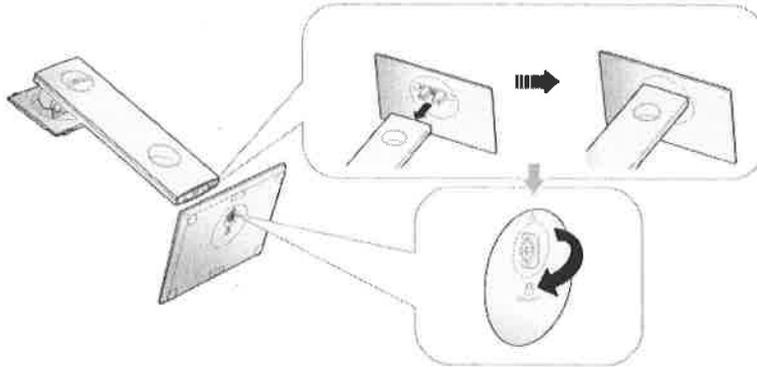
### Attaching the Stand

 **NOTE:** The stand is detached when the monitor is shipped from the factory.

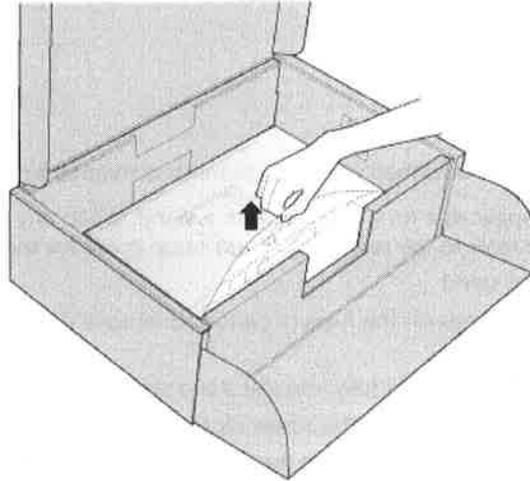
 **NOTE:** This is applicable for a monitor with a stand. When any other stand is bought, please refer to the respective stand setup guide for the set-up instructions.

To attach the monitor stand:

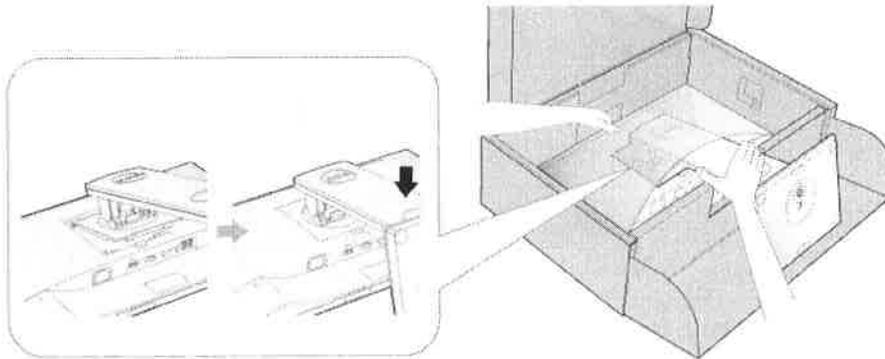
- 1 Follow the instructions on the flaps of carton to remove the stand from the top cushion that secures it.
- 2 Insert the stand base blocks fully into the stand slot.
- 3 Lift the screw handle and turn the screw clockwise.
- 4 After fully tightening the screw, fold the screw handle flat within the recess.



- 5 Lift the cover, as shown, to expose the VESA area for stand assembly.



- 6 Attach the stand assembly to the monitor.
- a Fit the two tabs on the upper part of the stand to the groove on the back of the monitor.
  - b Press the stand down till it snaps into place.



- 7 Place the monitor upright.

 **NOTE:** Lift the monitor carefully to prevent it from slipping or falling.

## Connecting Your Monitor

**⚠ WARNING:** Before you begin any of the procedures in this section, follow the Safety Instructions.

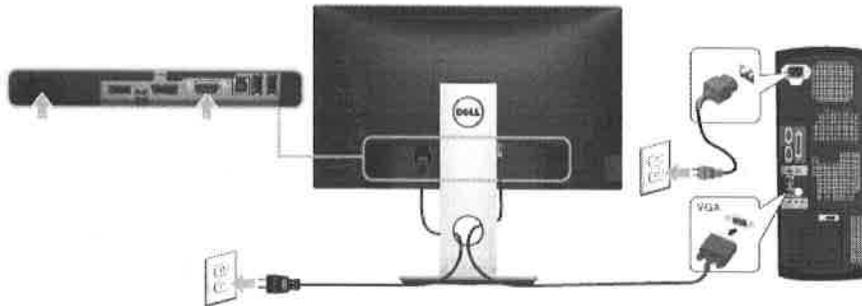
**✍ NOTE:** Route the cables through the cable-management slot before connecting them.

**✍ NOTE:** Do not connect all cables to the computer at the same time.

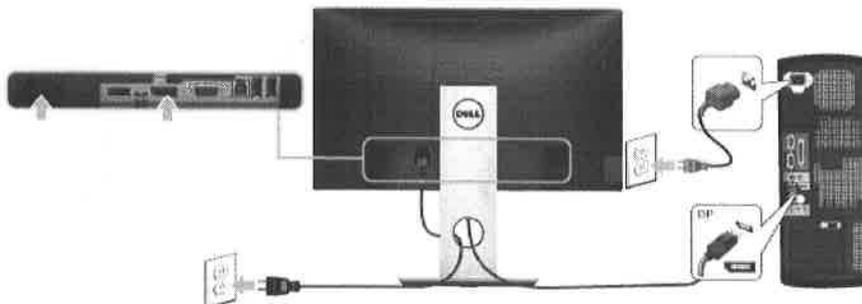
To connect your monitor to the computer:

- 1 Turn Off your computer and disconnect the power cable.
- 2 Connect the VGA, DP or HDMI cable from your monitor to the computer.

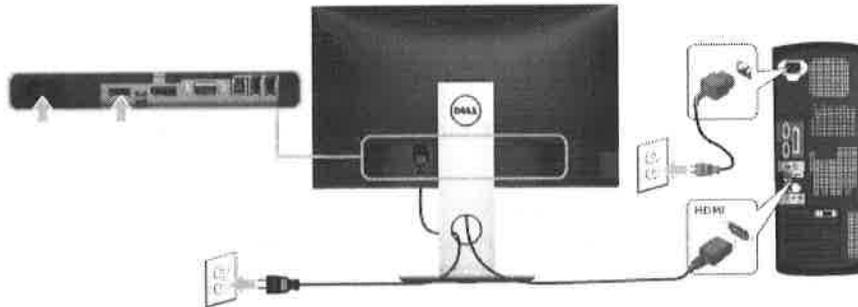
### Connecting the VGA cable



### Connecting the DisplayPort (DP to DP) cable



## Connecting the HDMI cable (optional)

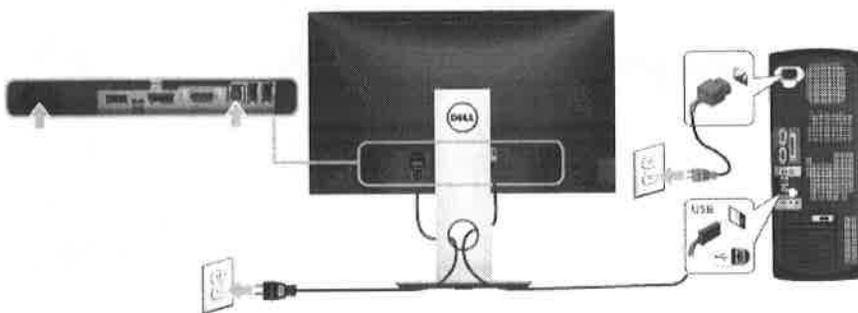


**NOTE:** The graphics are used for the purpose of illustration only. Appearance of the computer may vary.

## Connecting the USB 3.0 cable

After you have completed connecting the VGA/DP/HDMI cable, follow the procedures below to connect the USB 3.0 cable to the computer and complete your monitor setup:

- 1 Connect the upstream USB 3.0 port (cable supplied) to an appropriate USB 3.0 port on your computer. (See Bottom View for details.)
- 2 Connect the USB 3.0 peripherals to the downstream USB 3.0 ports on the monitor.
- 3 Plug the power cables for your computer and monitor into a nearby outlet.
- 4 Turn On the monitor and the computer.  
If your monitor displays an image, installation is complete. If it does not display an image, see Universal Serial Bus (USB) Specific Problems.
- 5 Use the cable slot on the monitor stand to organize the cables.



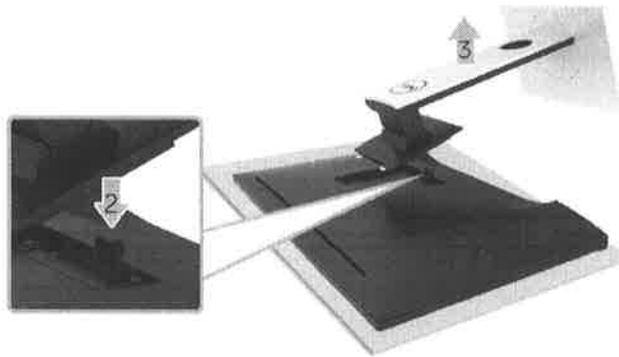
## Organizing Your Cables



After attaching all necessary cables to your monitor and computer, (See Connecting Your Monitor for cable attachment,) organize all cables as shown above.

## Removing the Monitor Stand

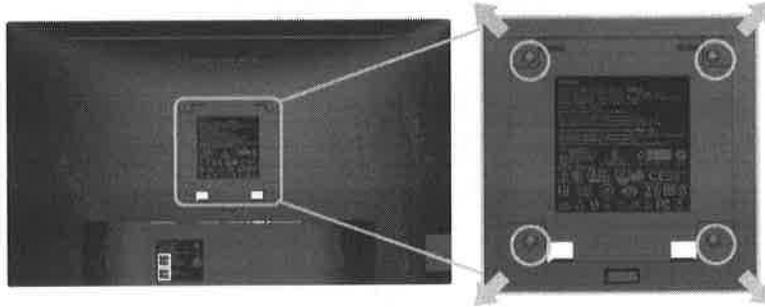
-  **NOTE:** To prevent scratches on the LCD screen while removing the stand, ensure that the monitor is placed on a soft, clean surface.
-  **NOTE:** This is applicable for a monitor with a stand. When any other stand is bought, please refer to the respective stand setup guide for the set-up instructions.



To remove the stand:

- 1 Place the monitor on a soft cloth or cushion.
- 2 Press and hold the stand release button.
- 3 Lift the stand up and away from the monitor.

## Wall Mounting (Optional)



(Screw dimension: M4 x 10 mm).

Refer to the instructions that come with the VESA-compatible wall mounting kit.

- 1 Place the monitor panel on a soft cloth or cushion on a stable, flat table.
- 2 Remove the stand.
- 3 Use a Phillips crosshead screwdriver to remove the four screws securing the plastic cover.
- 4 Attach the mounting bracket from the wall mounting kit to the monitor.
- 5 Mount the monitor on the wall by following the instructions that comes with the wall mounting kit.

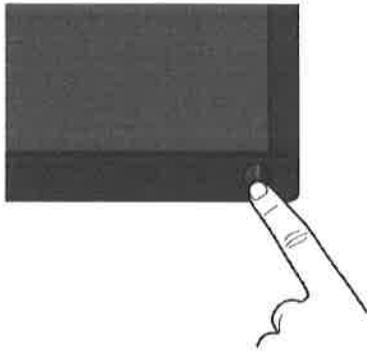
 **NOTE:** For use only with UL-listed wall mount bracket with minimum weight/load bearing capacity of 2.81 kg (P2217H) / 3.06 kg (P2317H/P2317HWH) / 3.33 kg (P2417H) / 4.58 kg (P2717H).

## Operating the Monitor

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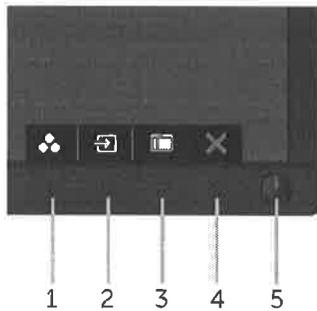
### Power On the Monitor

Press the  button to turn On the monitor.



### Using the Front-Panel Controls

Use the control buttons on the front of the monitor to adjust the characteristics of the image being displayed. As you use these buttons to adjust the controls, an OSD shows the numeric values of the characteristics as they change.



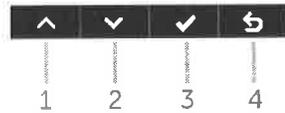
The following table describes the front-panel buttons:

Front-Panel Button	Description
1  Shortcut key/ Preset Modes	Use this button to choose from a list of preset color modes.

2	 <b>Shortcut key/ Input Source</b>	Use this button to choose from a list of video signals that may be connected to your monitor.
3	 <b>Menu</b>	Use the <b>MENU</b> button to launch the On-Screen Display (OSD) and select the OSD Menu. See Accessing the Menu System.
4	 <b>Exit</b>	Use this button to go back to the main menu or exit the OSD main menu.
5	 <b>Power (with power light indicator)</b>	Use the <b>Power</b> button to turn the monitor <b>On</b> and <b>Off</b> . The white light indicates the monitor is <b>On</b> and fully functional. A blinking white light indicates the power save mode.

## Front-Panel Button

Use the buttons on the front of the monitor to adjust the image settings.



Front-Panel Button	Description
1  <b>Up</b>	Use the <b>Up</b> button to adjust (increase ranges) items in the OSD menu.
2  <b>Down</b>	Use the <b>Down</b> button to adjust (decrease ranges) items in the OSD menu.
3  <b>OK</b>	Use the <b>OK</b> button to confirm your selection in the OSD menu.
4  <b>Back</b>	Use the <b>Back</b> button to go back to the previous menu.

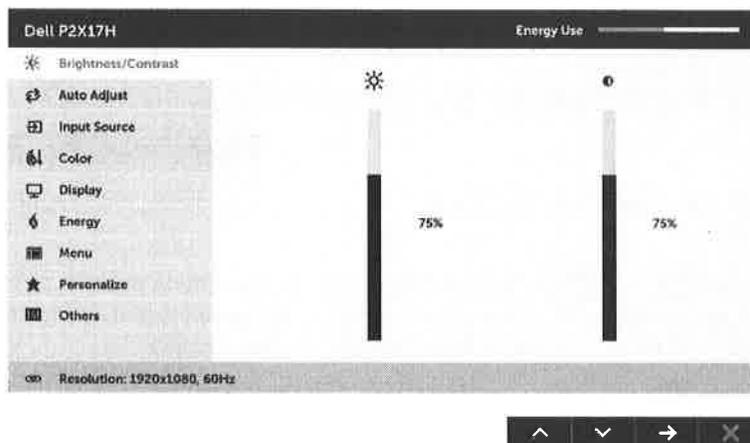
## Using the On-Screen Display (OSD) Menu

### Accessing the Menu System

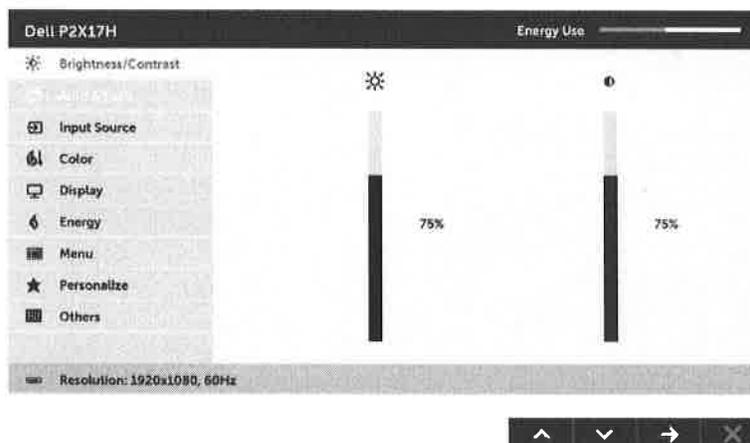
 **NOTE:** If you change the settings and then either proceed to another menu or exit the OSD menu, the monitor automatically saves those changes. The changes are also saved if you change the settings and then wait for the OSD menu to disappear.

- 1 Press the  button to launch the OSD menu and display the main menu.

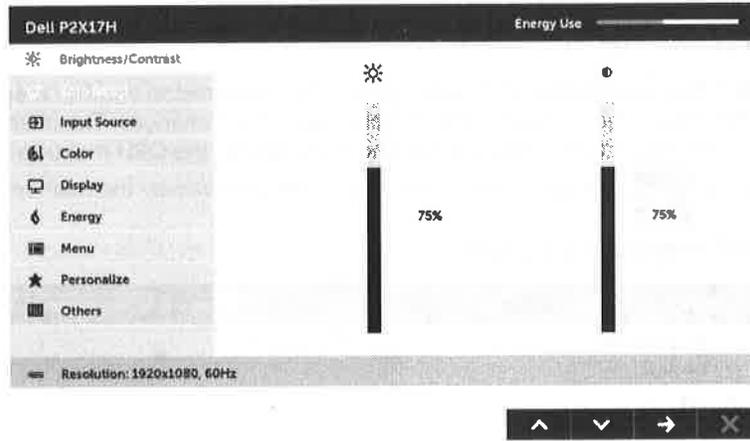
### Main Menu for analog (VGA) input



### Main Menu for digital (HDMI) input

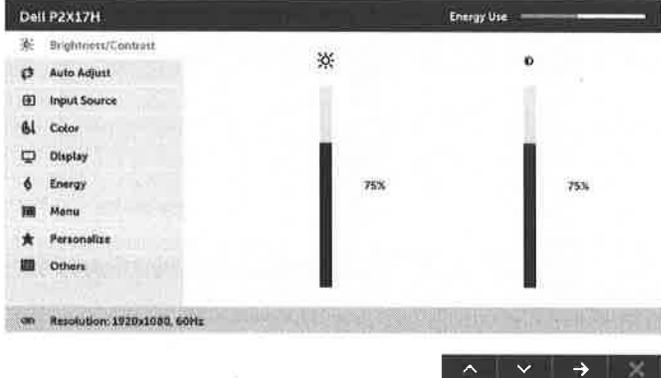


## Main Menu for digital (DP) input



 **NOTE: Auto Adjust** is only available when you use the analog (VGA) connector.

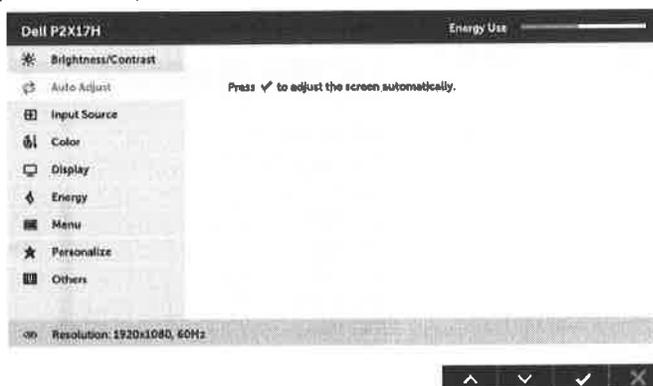
- 2 Press the  and  buttons to move between the setting options. As you move from one icon to another, the option name is highlighted. See the following table for a complete list of all the options available for the monitor.
- 3 Press the  button once to activate the highlighted option.
- 4 Press the  and  buttons to select the desired parameter.
- 5 Press  to enter the slide bar and then use the  and  buttons, according to the indicators on the menu, to make your changes.
- 6 Select the  button to return to the main menu.

Icon	Menu and Submenus	Description
	<b>Brightness/Contrast</b>	Use this menu to activate <b>Brightness/Contrast</b> adjustment.
		
<b>Brightness</b>	<p><b>Brightness</b> adjusts the luminance of the backlight.</p> <p>Press the  button to increase the brightness and press the  button to decrease the brightness (min. 0 / max. 100).</p> <p><b>NOTE:</b> Manual adjustment of <b>Brightness</b> is disabled when <b>Dynamic Contrast</b> is switched On.</p>	
<b>Contrast</b>	<p>Adjust the <b>Brightness</b> first, and then adjust the <b>Contrast</b> only if further adjustment is necessary.</p> <p>Press the  button to increase the contrast and press the  button to decrease the contrast (min. 0 / max. 100).</p> <p>The <b>Contrast</b> function adjusts the degree of difference between darkness and lightness on the monitor screen.</p>	

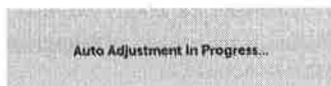


## Auto Adjust

Even though your computer recognizes your monitor on startup, the **Auto Adjust** function optimizes the display settings for use with your particular setup.



**Auto Adjust** allows the monitor to self-adjust to the incoming video signal. After using **Auto Adjust**, you can further tune your monitor by using the **Pixel Clock** (Coarse) and **Phase** (Fine) controls under **Display** settings.

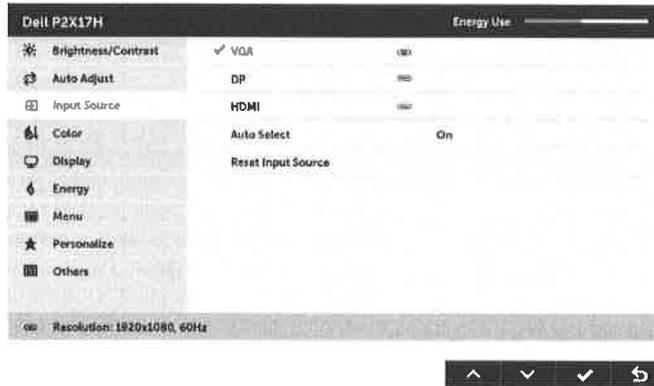


**NOTE:** In most cases, **Auto Adjust** produces the best image for your configuration.

**NOTE:** **Auto Adjust** option is only available when you are using the analog (VGA) connector.



**Input Source** Use the **Input Source** menu to select between the different video signals that may be connected to your monitor.



**VGA** Select the **VGA** input when you are using the analog (VGA) connector. Press to select the VGA input source.

**DP** Select the **DP** input when you are using the DisplayPort (DP) connector. Press to select the DisplayPort input source.

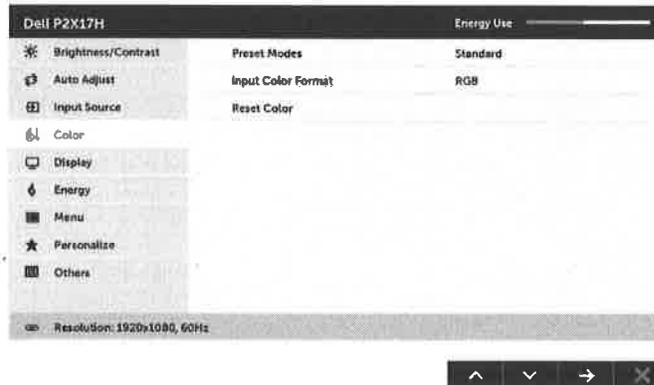
**HDMI** Select the **HDMI** input when you are using the HDMI connector. Press to select the HDMI input source.

**Auto Select** Turning on the function allows you to scan for available input sources.

**Reset Input Source** Reset your monitor input settings to the factory settings.



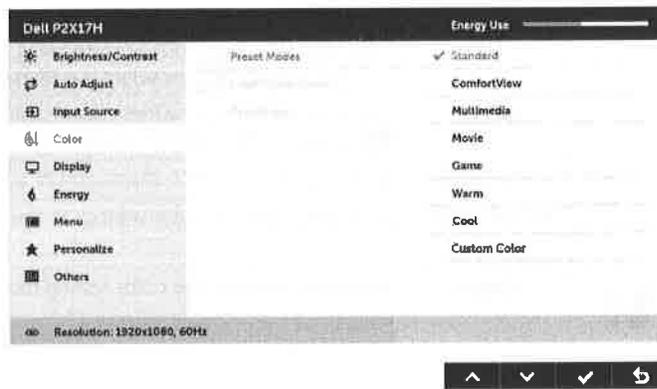
**Color** Use **Color** to adjust the color setting mode.



**Preset Modes** When you select **Preset Modes**, you can choose **Standard**, **ComfortView**, **Multimedia**, **Movie**, **Game**, **Warm**, **Cool**, or **Custom Color** from the list.

- **Standard:** Loads the monitor's default color settings. This is the default preset mode.
- **ComfortView:** Decreases the level of blue light emitted from the screen to make viewing more comfortable for your eyes.
- **Multimedia:** Loads color settings ideal for multimedia applications.
- **Movie:** Loads color settings ideal for movies.
- **Game:** Loads color settings ideal for most gaming applications.
- **Warm:** Increases the color temperature. The screen appears warmer with a red/yellow tint.
- **Cool:** Decreases the color temperature. The screen appears cooler with a blue tint.
- **Custom Color:** Allows you to manually adjust the color settings.

Use the  and  buttons to adjust the three colors (R, G, B) values and create your own preset color mode.



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**Input Color Format**

Allows you to set the video input mode to:

**RGB:** Select this option if your monitor is connected to a computer (or DVD player) using the DP or HDMI cable.

**YPbPr:** Select this option if your DVD player supports only YPbPr output.



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**Hue**

This feature can shift the color of the video image to green or purple. This is used to adjust the desired flesh tone color. Use  or  to adjust the hue from '0' to '100'.

Use  to increase the green shade of the video image.

Use  to increase the purple shade of the video image.

**NOTE: Hue** adjustment is available only when you select **Movie** or **Game** preset mode.

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**Saturation**

This feature can adjust the color saturation of the video image. Use  or  to adjust the saturation from '0' to '100'.

Use  to increase the colorful appearance of the video image.

Use  to increase the monochrome appearance of the video image.

**NOTE: Saturation** adjustment is available only when you select **Movie** or **Game** preset mode.

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**Reset Color**

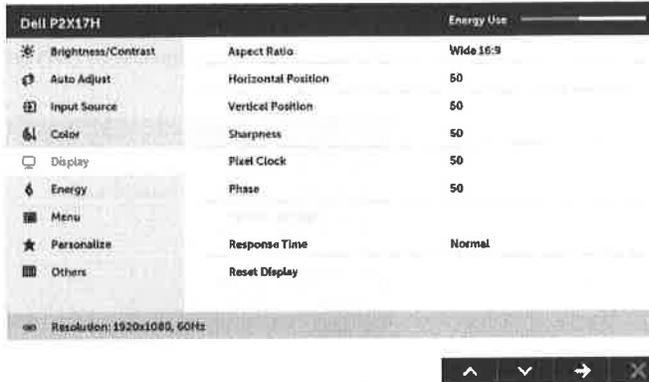
Reset your monitor color settings to the factory settings.

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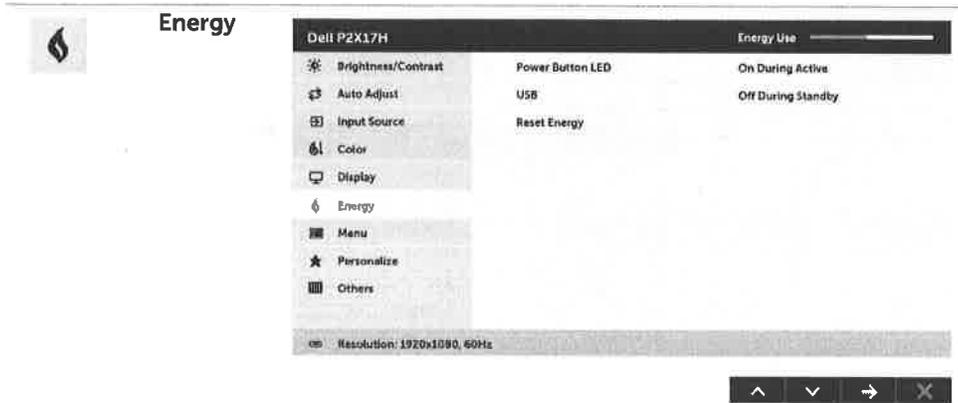


## Display

Use **Display** to adjust image.



<b>Aspect Ratio</b>	Adjusts the image ratio to <b>Wide 16:9</b> , <b>4:3</b> , or <b>5:4</b> .
<b>Horizontal Position</b>	Use  or  to adjust the image left or right. Minimum is '0' (-). Maximum is '100' (+).
<b>Vertical Position</b>	Use  or  to adjust the image up or down. Minimum is '0' (-). Maximum is '100' (+). <b>NOTE: Horizontal Position and Vertical Position</b> adjustments are only available for "VGA" input.
<b>Sharpness</b>	This feature can make the image look sharper or softer. Use  or  to adjust the sharpness from '0' to '100'.
<b>Pixel Clock</b>	The <b>Phase</b> and <b>Pixel Clock</b> adjustments allow you to adjust your monitor to your preference. Use  or  to adjust for best image quality.
<b>Phase</b>	If satisfactory results are not obtained using the <b>Phase</b> adjustment, use the <b>Pixel Clock</b> (coarse) adjustment and then use <b>Phase</b> (fine), again. <b>NOTE: Pixel Clock and Phase</b> adjustments are only available for "VGA" input.
<b>Dynamic Contrast</b>	Allows you to increase the level of contrast to provide sharper and more detailed image quality. Use  to enter the submenu. Then use  to turn on or turn off the <b>Dynamic Contrast</b> function. <b>NOTE: Dynamic Contrast</b> provides higher contrast if you select <b>Game</b> or <b>Movie</b> preset mode.
<b>Response Time</b>	Allows you to set the <b>Response Time</b> to <b>Normal</b> or <b>Fast</b> .
<b>Reset Display</b>	Select this option to restore default display settings.



**Power Button LED** Allows you to set the power LED indicator On or Off to save energy.

**USB** Allows you to enable or disable USB function during monitor standby mode.

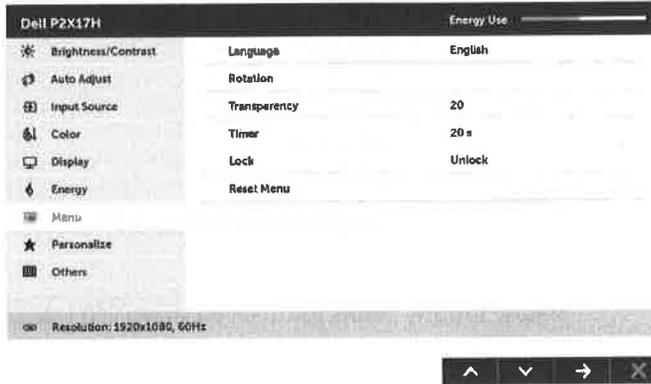
**NOTE:** USB ON/OFF under standby mode is only available when the USB upstream cable is unplugged. This option will be greyed out when the USB upstream cable plugs in.

**Reset Energy** Select this option to restore default **Energy** settings.



## Menu

Select this option to adjust the settings of the OSD, such as, the languages of the OSD, the amount of time the menu remains on screen, and so on.



### Language

**Language** options set the OSD display to one of the eight languages (English, Spanish, French, German, Brazilian Portuguese, Russian, Simplified Chinese, or Japanese).

### Rotation

Rotates the OSD by 90 degrees counter-clockwise. You can adjust the menu according to your Display Rotation.

### Transparency

Select this option to change the menu transparency by pressing the  and  buttons (min. 0 / max. 100).

### Timer

Allows you to set the time for which the OSD remains active after you press a button on the monitor.

Use  or  to adjust the slider in 1 second increments, from 5 to 60 seconds.

### Lock

Controls user access to adjustments. When **Lock** is selected, no user adjustments are allowed. All buttons are locked.

#### NOTE:

**Unlock** function– Only hard unlock (press and hold the button beside the power button for 6 seconds).

**Lock** function – Either soft lock (through the OSD menu) or hard lock (press and hold the button beside the power button for 6 seconds).

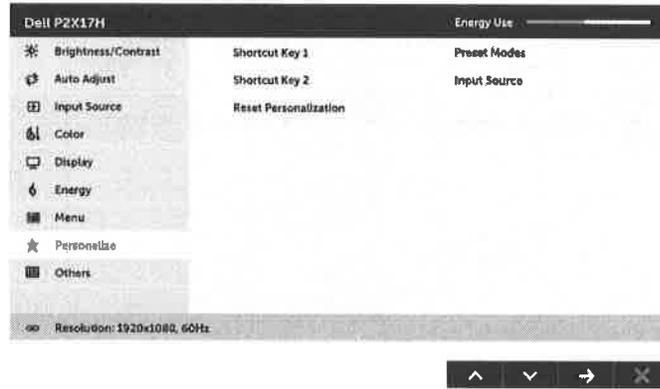
### Reset Menu

Reset all OSD settings to the factory preset values.



## Personalize

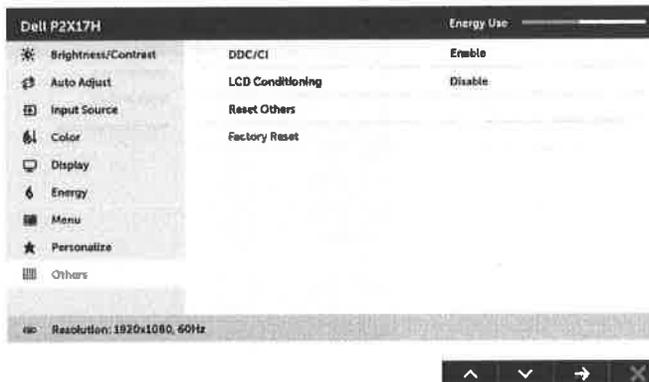
Users can choose a feature from **Preset Modes, Brightness/Contrast, Auto Adjust, Input Source, Aspect Ratio, or Rotation** and set it as a shortcut key.





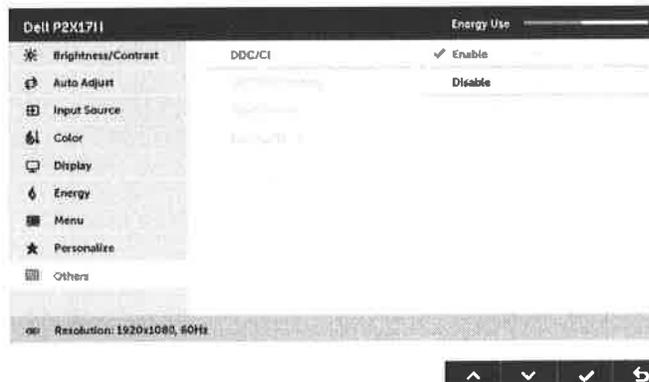
### Others

Select this option to adjust the OSD settings, such as the **DDC/CI**, **LCD Conditioning**, and so on.



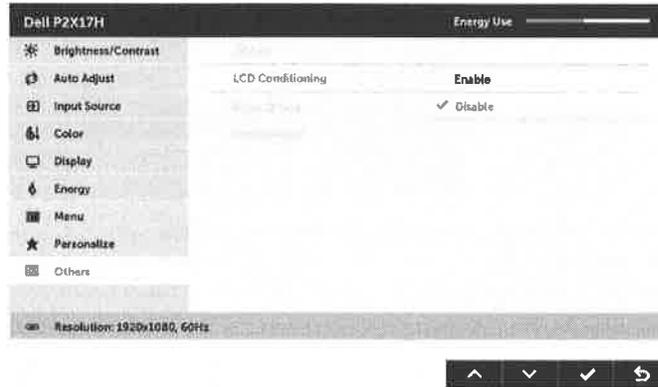
### DDC/CI

**DDC/CI** (Display Data Channel/Command Interface) allows your monitor parameters (brightness, color balance, and etc.) to be adjustable via the software on your computer. You can disable this feature by selecting **Disable**. Enable this feature for best user experience and optimum performance of your monitor.



### LCD Conditioning

Helps reduce minor cases of image retention. Depending on the degree of image retention, the program may take some time to run. You can enable this feature by selecting **Enable**.



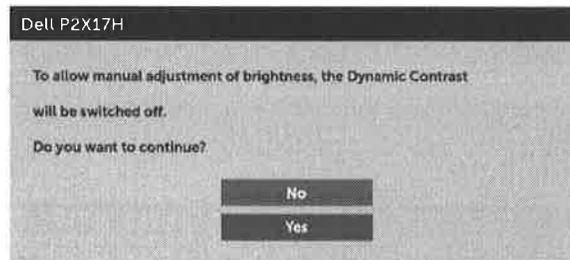
**Reset Others** Reset all settings under the **Others** menu to the factory preset values.

**Factory Reset** Reset all settings to the factory preset values.

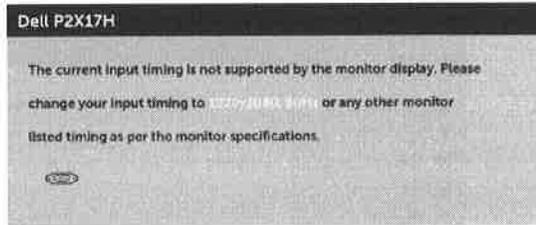
 **NOTE:** This monitor has a built-in feature to automatically calibrate the brightness to compensate for LED aging.

### OSD Warning Message

When the **Dynamic Contrast** feature is enabled (in these preset modes: **Game** or **Movie**), manual brightness adjustment is disabled.

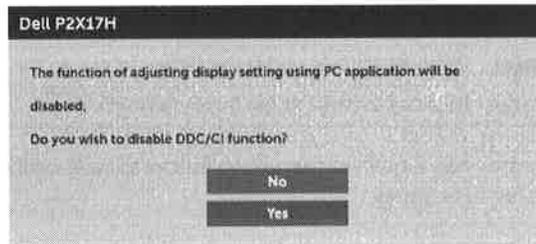


When the monitor does not support a particular resolution mode, you will see the following message:



This means that the monitor cannot synchronize with the signal that it is receiving from the computer. See Monitor Specifications for the Horizontal and Vertical frequency ranges addressable by this monitor. Recommended mode is 1920 x 1080.

You will see the following message before the DDC/CI function is disabled:

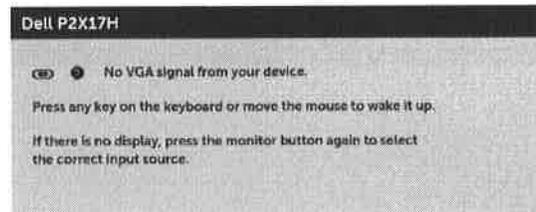


When the monitor goes into power-save mode, the following message appears:



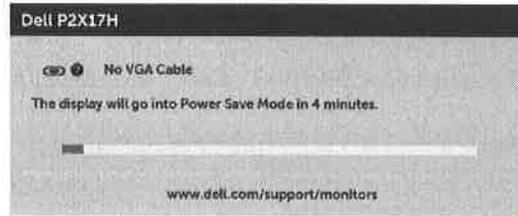
Activate the computer and wake up the monitor to gain access to the OSD.

If you press any button other than the power button, the following message will appear depending on the selected input:

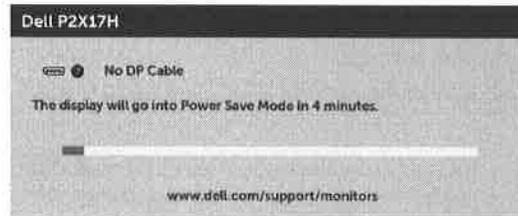


 **NOTE:** The message may be slightly different according to the connected input signal.

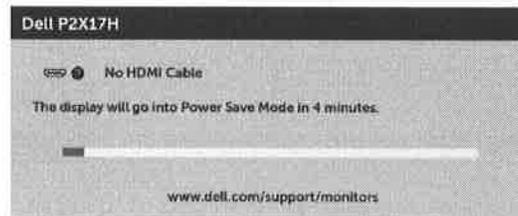
If either VGA, HDMI, or DP input is selected and the corresponding cable is not connected, a floating dialog box as shown below appears.



OR



OR



See Troubleshooting for more information.

## Setting the Maximum Resolution

To set the maximum resolution for the monitor:

In Windows® 7, Windows® 8, and Windows® 8.1:

- 1 For Windows® 8 and Windows® 8.1 only, select the Desktop tile to switch to classic desktop.
- 2 Right-click on the desktop and click **Screen Resolution**.
- 3 Click the Dropdown list of the Screen Resolution and select **1920 x 1080**.
- 4 Click **OK**.

In Windows® 10:

- 1 Right-click on the desktop and click **Display settings**.
- 2 Click **Advanced display settings**.
- 3 Click the dropdown list of **Resolution** and select **1920 x 1080**.
- 4 Click **Apply**.

If you do not see 1920 x 1080 as an option, you may need to update your graphics driver. Depending on your computer, complete one of the following procedures:

If you have a Dell desktop or portable computer:

- Go to <http://www.dell.com/support>, enter your service tag, and download the latest driver for your graphics card.

If you are using a non-Dell computer (portable or desktop):

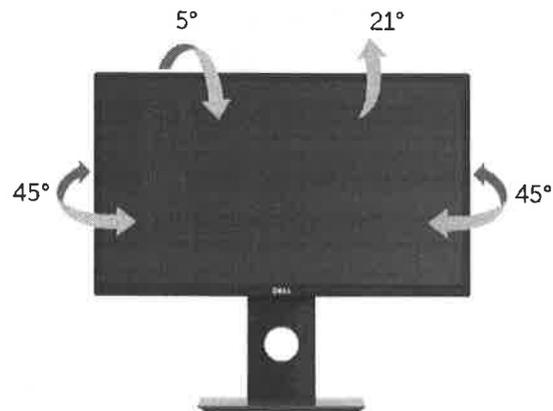
- Go to the support site for your computer and download the latest graphic drivers.
- Go to your graphics card website and download the latest graphic drivers.

## Using the Tilt, Swivel, and Vertical Extension

 **NOTE:** This is applicable for a monitor with a stand. When any other stand is bought, please refer to the respective stand setup guide for set-up instructions.

### Tilt, Swivel

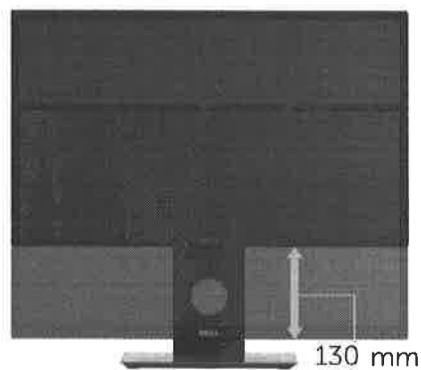
With the stand attached to the monitor, you can tilt and swivel the monitor for the most comfortable viewing angle.



 **NOTE:** The stand is detached when the monitor is shipped from the factory.

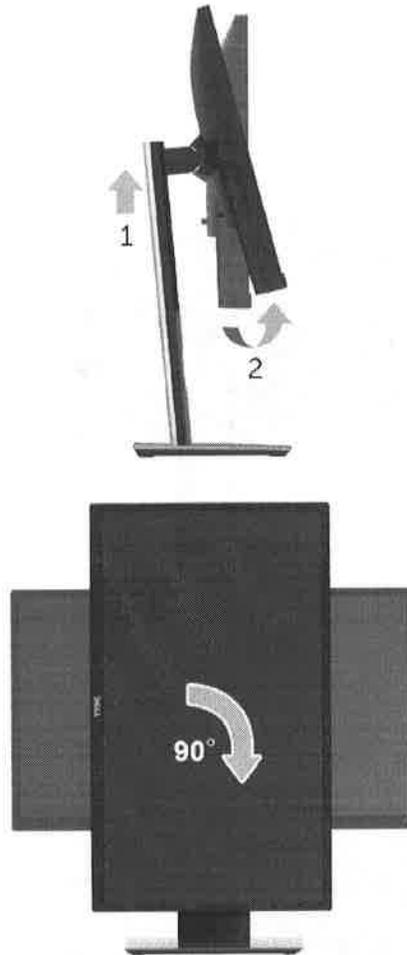
### Vertical Extension

 **NOTE:** The stand extends vertically up to 130 mm. The figure below illustrates how to extend the stand vertically.



## Rotating the Monitor

Before you rotate the monitor, your monitor should be fully vertically extended (Vertical Extension) and fully tilted up to avoid hitting the bottom edge of the monitor.



-  **NOTE:** To use the Display Rotation function (Landscape versus Portrait view) with your Dell computer, you require an updated graphics driver that is not included with this monitor. To download the graphics driver, go to [www.dell.com/support](http://www.dell.com/support) and see the **Download** section for **Video Drivers** for latest driver updates.
-  **NOTE:** When in the *Portrait View Mode*, you may experience performance degradation in graphic-intensive applications (3D Gaming and etc.).

## Adjusting the Rotation Display Settings of Your System

After you have rotated your monitor, you need to complete the procedure below to adjust the Rotation Display Settings of your system.

 **NOTE:** If you are using the monitor with a non-Dell computer, you need to go the graphics driver website or your computer manufacturer website for information on rotating the 'contents' on your display.

To adjust the Rotation Display Settings:

- 1 Right-click on the desktop and click **Properties**.
- 2 Select the **Settings** tab and click **Advanced**.
- 3 If you have an ATI graphics card, select the **Rotation** tab and set the preferred rotation.
- 4 If you have an nVidia graphics card, click the **nVidia** tab, in the left-hand column select **NVRotate**, and then select the preferred rotation.
- 5 If you have an Intel® graphics card, select the **Intel** graphics tab, click **Graphic Properties**, select the **Rotation** tab, and then set the preferred rotation.

 **NOTE:** If you do not see the rotation option or it is not working correctly, go to [www.dell.com/support](http://www.dell.com/support) and download the latest driver for your graphics card.

# Troubleshooting

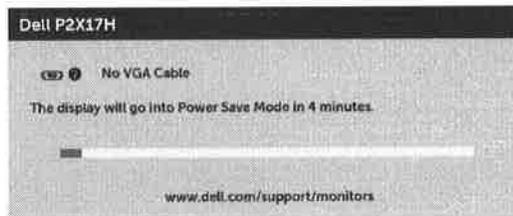
 **WARNING:** Before you begin any of the procedures in this section, follow the Safety Instructions.

## Self-Test

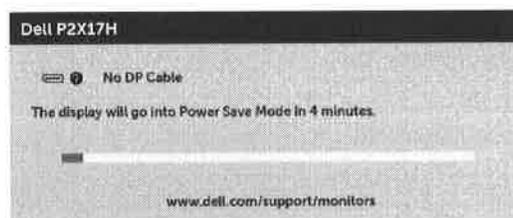
Your monitor provides a self-test feature that allows you to check whether your monitor is functioning properly. If your monitor and computer are properly connected but the monitor screen remains dark, run the monitor self-test by performing the following steps:

- 1 Turn off both your computer and the monitor.
- 2 Unplug the video cable from the back of the computer.
- 3 Turn on the monitor.

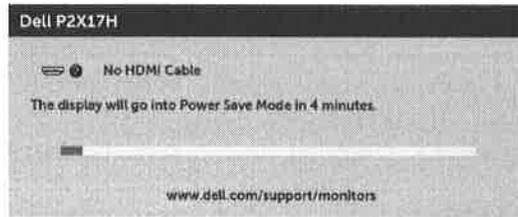
The floating dialog box should appear on-screen (against a black background), if the monitor cannot sense a video signal and is working correctly. While in self-test mode, the power LED remains white. Also, depending upon the selected input, one of the dialogs shown below will continuously scroll through the screen.



or



or



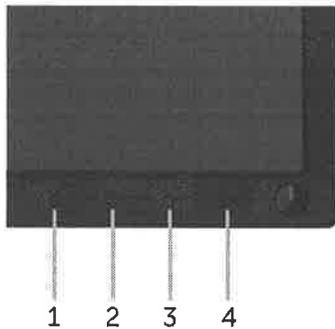
- 4 This box also appears during normal system operation, if the video cable becomes disconnected or damaged.
- 5 Turn Off your monitor and reconnect the video cable; then turn On both your computer and the monitor.

If your monitor screen remains blank after you use the previous procedure, check your video controller and computer, because your monitor is functioning properly.

## Built-in Diagnostics

Your monitor has a built-in diagnostic tool that helps you determine if the screen abnormality you are experiencing is an inherent problem with your monitor, or with your computer and video card.

 **NOTE:** You can run the built-in diagnostics only when the video cable is unplugged and the monitor is in *self-test mode*.



To run the built-in diagnostics:

- 1 Ensure that the screen is clean (no dust particles on the surface of the screen).
- 2 Unplug the video cable(s) from the back of the computer or monitor. The monitor then goes into the self-test mode.
- 3 Press and hold **Button 1** on the front panel for 5 seconds. A gray screen appears.
- 4 Carefully inspect the screen for abnormalities.
- 5 Press **Button 1** on the front panel again. The color of the screen changes to red.
- 6 Inspect the display for any abnormalities.

- 7 Repeat steps 5 and 6 to inspect the display in green, blue, black, white, and text screens.

The test is complete when the text screen appears. To exit, press **Button 1** again.

If you do not detect any screen abnormalities upon using the built-in diagnostic tool, the monitor is functioning properly. Check the video card and computer.

## Common Problems

The following table contains general information about common monitor problems you might encounter and the possible solutions:

Common Symptoms	What You Experience	Possible Solutions
No Video/Power LED off	No picture	<ul style="list-style-type: none"> <li>• Ensure that the video cable connecting the monitor and the computer is properly connected and secure.</li> <li>• Verify that the power outlet is functioning properly using any other electrical equipment.</li> <li>• Ensure that the power button is pressed fully.</li> <li>• Ensure that the correct input source is selected in the Input Source menu.</li> </ul>
No Video/Power LED on	No picture or no brightness	<ul style="list-style-type: none"> <li>• Increase brightness &amp; contrast controls via OSD.</li> <li>• Perform monitor self-test feature check.</li> <li>• Check for bent or broken pins in the video cable connector.</li> <li>• Run the built-in diagnostics.</li> <li>• Ensure that the correct input source is selected in the Input Source menu.</li> </ul>
Poor Focus	Picture is fuzzy, blurry, or ghosting	<ul style="list-style-type: none"> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust the <b>Phase</b> and <b>Pixel Clock</b> controls via OSD.</li> <li>• Eliminate video extension cables.</li> <li>• Reset the monitor to factory settings.</li> <li>• Change the video resolution to the correct aspect ratio.</li> </ul>
Shaky/Jittery Video	Wavy picture or fine movement	<ul style="list-style-type: none"> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust the <b>Phase</b> and <b>Pixel Clock</b> controls via OSD.</li> <li>• Reset the monitor to factory settings.</li> <li>• Check environmental factors.</li> <li>• Relocate the monitor and test in another room.</li> </ul>
Missing Pixels	LCD screen has spots	<ul style="list-style-type: none"> <li>• Cycle power On-Off.</li> <li>• Pixel that is permanently Off is a natural defect that can occur in LCD technology.</li> <li>• For more information on Dell Monitor Quality and Pixel Policy, see Dell Support site at: <a href="http://www.dell.com/support/monitors">http://www.dell.com/support/monitors</a>.</li> </ul>

Stuck-on Pixels	LCD screen has bright spots	<ul style="list-style-type: none"> <li>• Cycle power On-Off.</li> <li>• Pixel that is permanently off is a natural defect that can occur in LCD technology.</li> <li>• For more information on Dell Monitor Quality and Pixel Policy, see Dell Support site at: <a href="http://www.dell.com/support/monitors">http://www.dell.com/support/monitors</a>.</li> </ul>
Brightness Problems	Picture too dim or too bright	<ul style="list-style-type: none"> <li>• Reset the monitor to factory settings.</li> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust brightness &amp; contrast controls via OSD.</li> </ul>
Geometric Distortion	Screen not centered correctly	<ul style="list-style-type: none"> <li>• Reset the monitor to factory settings.</li> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust horizontal &amp; vertical controls via OSD.</li> </ul> <p><b>NOTE:</b> When using HDMI/DisplayPort input, the positioning adjustments are not available.</p>
Horizontal/Vertical Lines	Screen has one or more lines	<ul style="list-style-type: none"> <li>• Reset the monitor to factory settings.</li> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust the <b>Phase</b> and <b>Pixel Clock</b> controls via OSD.</li> <li>• Perform monitor self-test feature check and determine if these lines are also in self-test mode.</li> <li>• Check for bent or broken pins in the video cable connector.</li> <li>• Run the built-in diagnostics.</li> </ul> <p><b>NOTE:</b> When using HDMI/DisplayPort input, the <b>Pixel Clock</b> and <b>Phase</b> adjustments are not available.</p>
Synchronization Problems	Screen is scrambled or appears torn	<ul style="list-style-type: none"> <li>• Reset the monitor to factory settings.</li> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust the <b>Phase</b> and <b>Pixel Clock</b> controls via OSD.</li> <li>• Perform monitor self-test feature check to determine if the scrambled screen appears in self-test mode.</li> <li>• Check for bent or broken pins in the video cable connector.</li> <li>• Restart the computer in the <i>safe mode</i>.</li> </ul>
Safety Related Issues	Visible signs of smoke or sparks	<ul style="list-style-type: none"> <li>• Do not perform any troubleshooting steps.</li> <li>• Contact Dell immediately.</li> </ul>
Intermittent Problems	Monitor malfunctions on & off	<ul style="list-style-type: none"> <li>• Ensure that the video cable connecting the monitor to the computer is connected properly and is secure.</li> <li>• Reset the monitor to factory settings.</li> <li>• Perform monitor self-test feature check to determine if the intermittent problem occurs in self-test mode.</li> </ul>
Missing Color	Picture missing color	<ul style="list-style-type: none"> <li>• Perform monitor self-test feature check.</li> <li>• Ensure that the video cable connecting the monitor to the computer is connected properly and is secure.</li> <li>• Check for bent or broken pins in the video cable connector.</li> </ul>

Wrong Color	Picture color not good	<ul style="list-style-type: none"> <li>• Change the settings of the <b>Preset Modes</b> in the <b>Color</b> menu OSD depending on the application.</li> <li>• Adjust R/G/B value under <b>Custom Color</b> in <b>Color</b> menu OSD.</li> <li>• Run the built-in diagnostics.</li> </ul>
Image retention from a static image left on the monitor for a long period of time	Faint shadow from the static image displayed appears on the screen	<ul style="list-style-type: none"> <li>• Use the Power Management feature to turn off the monitor at all times when not in use (for more information, see <i>Power Management Modes</i>).</li> <li>• Alternatively, use a dynamically changing screensaver.</li> </ul>

## Product Specific Problems

Specific Symptoms	What You Experience	Possible Solutions
Screen image is too small	Image is centered on screen, but does not fill entire viewing area	<ul style="list-style-type: none"> <li>• Check the <b>Aspect Ratio</b> setting in the <b>Display</b> menu OSD.</li> <li>• Reset the monitor to factory settings.</li> </ul>
Cannot adjust the monitor with the buttons on the front panel	OSD does not appear on the screen	<ul style="list-style-type: none"> <li>• Turn Off the monitor, unplug the power cord, plug it back, and then turn On the monitor.</li> <li>• Check whether the OSD menu is locked. If yes, press and hold the button above the Power button for 6 seconds to unlock (for more information, see <i>Lock</i>).</li> </ul>
No Input Signal when user controls are pressed	No picture, the LED light is white	<ul style="list-style-type: none"> <li>• Check the signal source. Ensure the computer is not in the power saving mode by moving the mouse or pressing any key on the keyboard.</li> <li>• Check whether the signal cable is plugged in properly. Re-plug the signal cable if necessary.</li> <li>• Reset the computer or video player.</li> </ul>
The picture does not fill the entire screen	The picture cannot fill the height or width of the screen	<ul style="list-style-type: none"> <li>• Due to different video formats (aspect ratio) of DVDs, the monitor may display in full screen.</li> <li>• Run the built-in diagnostics.</li> </ul>



**NOTE:** When choosing HDMI/DP mode, the **Auto Adjust** function will not be available.

## Universal Serial Bus (USB) Specific Problems

Specific Symptoms	What You Experience	Possible Solutions
USB interface is not working	USB peripherals are not working	<ul style="list-style-type: none"> <li>• Check that your monitor is turned On.</li> <li>• Reconnect the upstream cable to your computer.</li> <li>• Reconnect the USB peripherals (downstream connector).</li> <li>• Switch Off and then turn On the monitor again.</li> <li>• Reboot the computer.</li> <li>• Some USB devices like external portable HDD require higher electric current; connect the device directly to the computer system.</li> </ul>
Super Speed USB 3.0 interface is slow	Super Speed USB 3.0 peripherals working slowly or not working at all	<ul style="list-style-type: none"> <li>• Check that your computer is USB 3.0-capable.</li> <li>• Some computers have USB 3.0, USB 2.0, and USB 1.1 ports. Ensure that the correct USB port is used.</li> <li>• Reconnect the upstream cable to your computer.</li> <li>• Reconnect the USB peripherals (downstream connector).</li> <li>• Reboot the computer.</li> </ul>
Wireless USB peripherals stop working when a USB 3.0 device is plugged in	Wireless USB peripherals responding slowly or only working as the distance between itself and its receiver decreases	<ul style="list-style-type: none"> <li>• Increase the distance between the USB 3.0 peripherals and the wireless USB receiver.</li> <li>• Position your wireless USB receiver as close as possible to the wireless USB peripherals.</li> <li>• Use a USB-extender cable to position the wireless USB receiver as far away as possible from the USB 3.0 port.</li> </ul>

## Appendix

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### **WARNING: Safety Instructions**



**WARNING: Use of controls, adjustments, or procedures other than those specified in this documentation may result in exposure to shock, electrical hazards, and/or mechanical hazards.**

For information on safety instructions, see the Safety, Environmental, and Regulatory Information (SERI).

### **FCC Notices (U.S. Only) and Other Regulatory Information**

For FCC notices and other regulatory information, see the regulatory compliance website located at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

### **Contact Dell**

**For customers in the United States, call 800-WWW-DELL (800-999-3355).**



**NOTE:** If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

**Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area.**

- Online technical assistance — [www.dell.com/support/monitors](http://www.dell.com/support/monitors)
- Contacting Dell — [www.dell.com/contactdell](http://www.dell.com/contactdell)

**Dell**

**P2219H/P2319H/P2419H/P2719H**

**User's Guide**

**Model: P2219H/P2319H/P2419H/P2719H**  
**Regulatory model: P2219Hb/P2319Ht/P2319Hc/P2419Hb/P2419Hc/P2719Ht**



-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
-  **CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.
-  **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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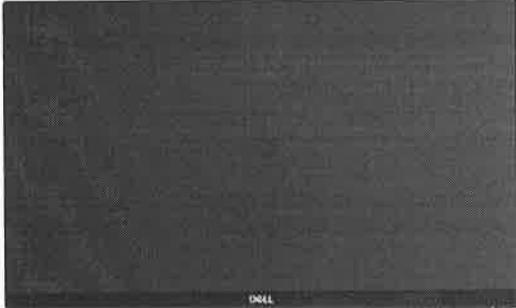


# About your monitor

## Package contents

Your monitor ships with the components shown in the table below. If any component is missing, contact Dell technical support. For more information, see Contact Dell.

-  **NOTE: Some items may be optional and may not ship with your monitor. Some features may not be available in certain countries.**
-  **NOTE: If you are attaching a stand that you purchased from any other source, follow the set up instructions that were included with the stand.**

	Monitor
	Stand riser



	Stand base
	Power cable (varies by country)
	DisplayPort cable
	VGA cable (Japan only)
	HDMI cable (shipped with P2219H/P2319H/P2719H, for Brazil only)
	USB 3.0 upstream cable (enables the USB ports on the monitor)
	<ul style="list-style-type: none"> <li>• Quick Setup Guide</li> <li>• Safety, Environmental, and Regulatory Information</li> </ul>



## Product features

The **Dell P2219H/P2319H/P2419H/P2719H** flat panel display has an active matrix, Thin-Film Transistor (TFT), Liquid Crystal Display (LCD) and LED backlight. The monitor features include:

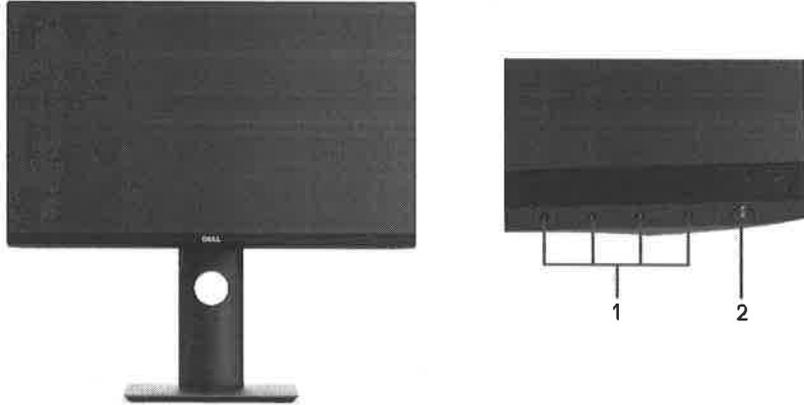
- **P2219H:** 54.6 cm (21.5-inch) viewable area (measured diagonally). Resolution: Up to 1920 x 1080 through VGA, DisplayPort, and HDMI, with full-screen support or lower resolutions.
- **P2319H:** 58.4 cm (23.0-inch) viewable area (measured diagonally). Resolution: Up to 1920 x 1080 through VGA, DisplayPort, and HDMI, with full-screen support or lower resolutions.
- **P2419H:** 60.5 cm (23.8-inch) viewable area (measured diagonally). Resolution: Up to 1920 x 1080 through VGA, DisplayPort, and HDMI, with full-screen support or lower resolutions.
- **P2719H:** 68.6 cm (27.0-inch) viewable area (measured diagonally). Resolution: Up to 1920 x 1080 through VGA, DisplayPort, and HDMI, with full-screen support or lower resolutions.
- Color gamut of 72% NTSC.
- Tilt, swivel, height, and rotate adjustment capabilities.
- Removable stand and Video Electronics Standards Association (VESA™) 100 mm mounting holes for flexible mounting solutions.
- Digital connectivity with DisplayPort and HDMI.
- Equipped with 1 USB upstream port and 4 USB downstream ports.
- Plug and play capability if supported by your system.
- On-Screen Display (OSD) adjustments for ease of set-up and screen optimization.
- Security lock slot.
- Stand lock.
- 0.3 W standby power when in sleep mode.
- Optimize eye comfort with a flicker-free screen.

**⚠ WARNING: The possible long-term effects of blue light emission from the monitor may cause damage to the eyes, including eye fatigue, digital eye strain, and so on. ComfortView feature is designed to reduce the amount of blue light emitted from the monitor to optimize eye comfort.**



## Identifying parts and controls

### Front view

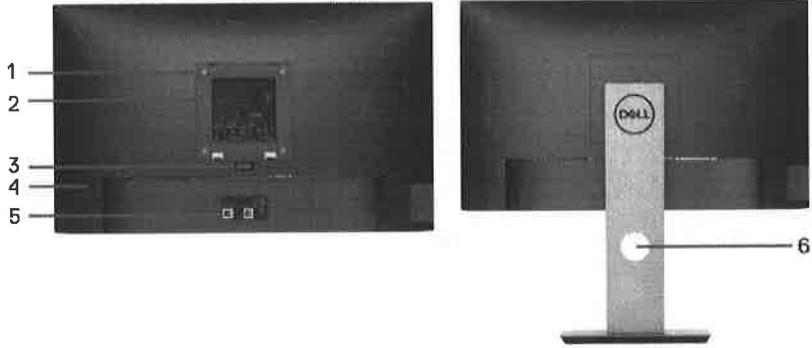


### Front panel controls

Label	Description
1	Function buttons (For more information, see <a href="#">Operating the monitor</a> )
2	Power On/Off button (with LED indicator)



**Back view**

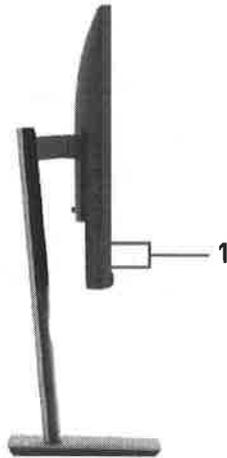


**Back view with monitor stand**

Label	Description	Use
<b>1</b>	VESA mounting holes (100 mm x 100 mm - behind attached VESA Cover)	Wall mount monitor using VESA-compatible wall mount kit (100 mm x 100 mm).
<b>2</b>	Regulatory label	Lists the regulatory approvals.
<b>3</b>	Stand release button	Releases stand from the monitor.
<b>4</b>	Security lock slot	Secures monitor with security lock (security lock not included).
<b>5</b>	Barcode, serial number, and Service Tag label	Refer to this label if you need to contact Dell for technical support.
<b>6</b>	Cable-management slot	Use to organize cables by inserting them through the slot.



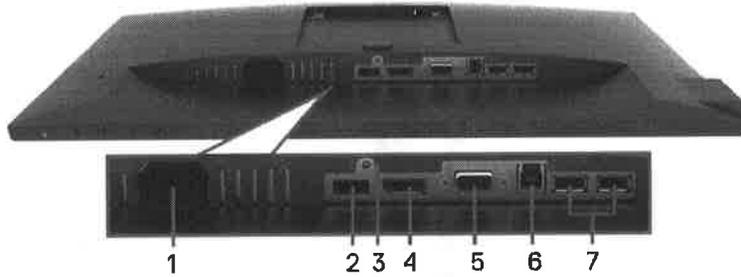
### Side view



Label	Description	Use
1	USB downstream ports (2)	Connect your USB device. <b>NOTE:</b> To use these ports, you must connect the USB cable (shipped with your monitor) to the USB-upstream port on the monitor and to your computer.



**Bottom view**



**Bottom view without monitor stand**

Label	Description	Use
1	Power connector	Connect the power cable (shipped with your monitor).
2	HDMI port	Connect your computer with HDMI cable (shipped with P2219H/P2319H/P2719H, for Brazil only).
3	Stand lock feature	To lock the stand to the monitor using a M3 x 6 mm screw (screw not included).
4	DisplayPort	Connect your computer with DisplayPort cable (shipped with your monitor).
5	VGA connector	Connect your computer with VGA cable (shipped with your monitor, for Japan only).
6	USB upstream port	Connect the USB cable (shipped with your monitor) to this port and your computer to enable the USB ports on your monitor.
7	USB downstream ports (2)	Connect your USB device. <b>NOTE:</b> To use this port, you must connect the USB cable (shipped with your monitor) to the USB-upstream port on the monitor and to your computer.



## Monitor specifications

Model	P2219H	P2319H
Screen type	Active matrix - TFT LCD	
Panel technology	In-Plane Switching Technology	
Aspect ratio	16:9	
Viewable image		
Diagonal	546.10 mm (21.5 inches)	584.20 mm (23.0 inches)
Width (active area)	476.06 mm (18.74 inches)	509.18 mm (20.05 inches)
Height (active area)	267.79 mm (10.54 inches)	286.42 mm (11.28 inches)
Total area	127484.10 mm <sup>2</sup> (197.60 inch <sup>2</sup> )	145839.33 mm <sup>2</sup> (226.05 inch <sup>2</sup> )
Pixel pitch	0.248 mm x 0.248 mm	0.265 mm x 0.265 mm
Pixel per inch (PPI)	102	96
Viewing angle	178° (vertical) typical 178° (horizontal) typical	
Luminance output	250 cd/m <sup>2</sup> (typical)	
Contrast ratio	1000 to 1 (typical)	
Faceplate coating	Anti-Glare with 3H hardness	
Backlight	LED edgelight system	
Response time	8 ms (Normal) 5 ms (Fast)	
Color depth	16.7 million colors	
Color gamut	72% (CIE1931) <b>NOTE:</b> Color gamut (typical) is based on CIE1976 (82%) and CIE1931 (72%) test standards.	
Built-in devices	<ul style="list-style-type: none"> <li>• USB 3.0 super-speed hub (with 1 x USB 3.0 upstream port)</li> <li>• 2 x USB 3.0 downstream ports</li> <li>• 2 x USB 2.0 downstream ports</li> </ul>	



Ports and connectors	<ul style="list-style-type: none"> <li>• 1 x DisplayPort version 1.2</li> <li>• 1 x HDMI port version 1.4</li> <li>• 1 x VGA port</li> <li>• 1 x USB 3.0 upstream port (bottom)</li> <li>• 2 x USB 3.0 downstream ports (side)</li> <li>• 2 x USB 2.0 downstream ports (bottom)</li> </ul>	
Border width (edge of monitor to active area)	5.62 mm (Top/Left/Right) 19.99 mm (Bottom)	5.40 mm (Top/Left/Right) 19.86 mm (Bottom)
Adjustability		
Height adjustable stand	130 mm	
Tilt	-5° to 21°	
Swivel	-45° to 45°	
Pivot	-90° to 90°	
Dell Display Manager compatibility	Yes	
Security	Security lock slot (cable lock sold separately)	

Model	P2419H	P2719H
Screen type	Active matrix - TFT LCD	
Panel technology	In-Plane Switching Technology	
Aspect ratio	16:9	
Viewable image		
Diagonal	604.52 mm (23.8 inches)	685.99 mm (27.0 inches)
Width (active area)	527.04 mm (20.75 inches)	597.88 mm (23.54 inches)
Height (active area)	296.46 mm (11.67 inches)	336.31 mm (13.24 inches)
Total area	156246.27 mm <sup>2</sup> (242.16 inch <sup>2</sup> )	201073.02 mm <sup>2</sup> (311.67 inch <sup>2</sup> )
Pixel pitch	0.275 mm x 0.275 mm	0.311 mm x 0.311 mm
Pixel per inch (PPI)	92	82
Viewing angle	178° (vertical) typical 178° (horizontal) typical	



Luminance output	250 cd/m <sup>2</sup> (typical)	300 cd/m <sup>2</sup> (typical)
Contrast ratio	1000 to 1 (typical)	
Faceplate coating	Anti-Glare with 3H hardness	
Backlight	LED edgelight system	
Response time	8 ms (Normal) 5 ms (Fast)	
Color depth	16.7 million colors	
Color gamut	72% (CIE1931) <b>NOTE:</b> Color gamut (typical) is based on CIE1976 (82%) and CIE1931 (72%) test standards.	
Built-in devices	<ul style="list-style-type: none"> <li>• USB 3.0 super-speed hub (with 1 x USB 3.0 upstream port)</li> <li>• 2 x USB 3.0 downstream ports</li> <li>• 2 x USB 2.0 downstream ports</li> </ul>	
Ports and connectors	<ul style="list-style-type: none"> <li>• 1 x DisplayPort version 1.2</li> <li>• 1 x HDMI port version 1.4</li> <li>• 1 x VGA port</li> <li>• 1 x USB 3.0 upstream port (bottom)</li> <li>• 2 x USB 3.0 downstream ports (side)</li> <li>• 2 x USB 2.0 downstream ports (bottom)</li> </ul>	
Border width (edge of monitor to active area)	5.38 mm (Top/Left/Right) 20.31 mm (Bottom)	6.00 mm (Top/Left/Right) 20.70 mm (Bottom)
Adjustability		
Height adjustable stand	130 mm	
Tilt	-5° to 21°	
Swivel	-45° to 45°	
Pivot	-90° to 90°	
Dell Display Manager compatibility	Yes	
Security	Security lock slot (cable lock sold separately)	



## Resolution specifications

<b>Model</b>	<b>P2219H/P2319H/P2419H/P2719H</b>
Horizontal scan range	30 kHz to 83 kHz (automatic)
Vertical scan range	56 Hz to 76 Hz (automatic)
Maximum preset resolution	1920 x 1080 at 60 Hz

## Supported video modes

<b>Model</b>	<b>P2219H/P2319H/P2419H/P2719H</b>
Video display capabilities (VGA, HDMI & DP playback)	480i, 480p, 576i, 576p, 720p, 1080i, 1080p

## Preset display modes

Display mode	Horizontal frequency (kHz)	Vertical frequency (Hz)	Pixel clock (MHz)	Sync polarity (Horizontal/Vertical)
VESA, 640 x 480	31.5	60.0	25.2	-/-
VESA, 640 x 480	37.5	75.0	31.5	-/-
IBM, 720 x 400	31.5	70.0	28.3	-/+
VESA, 800 x 600	37.9	60.0	40.0	+/+
VESA, 800 x 600	46.9	75.0	49.5	+/+
VESA, 1024 x 768	48.4	60.0	65.0	-/-
VESA, 1024 x 768	60.0	75.0	78.8	+/+
VESA, 1152 x 864	67.5	75.0	108.0	+/+
VESA, 1280 x 1024	64.0	60.0	108.0	+/+
VESA, 1280 x 1024	80.0	75.0	135.0	+/+
VESA, 1600 x 900	60.0	60.0	108.0	+/+
VESA, 1920 x 1080	67.5	60.0	148.5	+/+



## Electrical specifications

Model	P2219H/P2319H/P2419H/P2719H
Video input signals	<ul style="list-style-type: none"> <li>Analog RGB, 0.7 Volts +/- 5%, positive polarity at 75 ohm input impedance</li> <li>HDMI 1.4, 600 mV for each differential line, 100 ohm input impedance per differential pair</li> <li>DisplayPort 1.2, 600 mV for each differential line, 100 ohm input impedance per differential pair</li> </ul>
AC input voltage/frequency/current	100 VAC to 240 VAC / 50 Hz or 60 Hz $\pm$ 3 Hz / 1.5 A (typical)
Inrush current	<ul style="list-style-type: none"> <li>120 V: 30 A (Max.) at 0 °C (cold start)</li> <li>240 V: 60 A (Max.) at 0 °C (cold start)</li> </ul>

## Physical characteristics

Model	P2219H	P2319H
<b>Signal cable type</b>	<ul style="list-style-type: none"> <li>Digital: DisplayPort, 20 pins</li> <li>Digital: HDMI, 19 pins (cable not included, except for Brazil)</li> <li>Analog: D-Sub, 15 pins (cable not included, except for Japan)</li> <li>Universal Serial Bus: USB, 9 pins</li> </ul>	
<b>Dimensions (with stand)</b>		
Height (extended)	472.0 mm (18.58 inches)	481.1 mm (18.94 inches)
Height (compressed)	353.4 mm (13.91 inches)	351.1 mm (13.82 inches)
Width	487.3 mm (19.19 inches)	520.0 mm (20.47 inches)
Depth	166.0 mm (6.54 inches)	166.0 mm (6.54 inches)
<b>Dimensions (without stand)</b>		
Height	293.4 mm (11.55 inches)	311.7 mm (12.27 inches)
Width	487.3 mm (19.19 inches)	520.0 mm (20.47 inches)
Depth	41.3 mm (1.63 inches)	41.3 mm (1.63 inches)



<b>Stand dimensions</b>		
Height (extended)	400.8 mm (15.78 inches)	400.8 mm (15.78 inches)
Height (compressed)	353.4 mm (13.91 inches)	353.4 mm (13.91 inches)
Width	206.0 mm (8.11 inches)	206.0 mm (8.11 inches)
Depth	166.0 mm (6.54 inches)	166.0 mm (6.54 inches)
Base	206.0 mm x 166.0 mm (8.11 inches x 6.54 inches)	206.0 mm x 166.0 mm (8.11 inches x 6.54 inches)
<b>Weight</b>		
Weight with packaging	6.26 kg (13.80 lb)	7.00 kg (15.43 lb)
Weight with stand assembly and cables	4.72 kg (10.41 lb)	5.11 kg (11.27 lb)
Weight without stand assembly (For wall mount or VESA mount considerations - no cables)	2.75 kg (6.06 lb)	3.11 kg (6.86 lb)
Weight of stand assembly	1.62 kg (3.57 lb)	1.67 kg (3.68 lb)
Front frame gloss	2-4 (only front chin)	

<b>Model</b>	<b>P2419H</b>	<b>P2719H</b>
<b>Signal cable type</b>	<ul style="list-style-type: none"> <li>• Digital: DisplayPort, 20 pins</li> <li>• Digital: HDMI, 19 pins (cable not included)</li> <li>• Analog: D-Sub, 15 pins (cable not included, except for Japan)</li> <li>• Universal Serial Bus: USB, 9 pins</li> </ul>	<ul style="list-style-type: none"> <li>• Digital: DisplayPort, 20 pins</li> <li>• Digital: HDMI, 19 pins (cable not included, except for Brazil)</li> <li>• Analog: D-Sub, 15 pins (cable not included, except for Japan)</li> <li>• Universal Serial Bus: USB, 9 pins</li> </ul>
<b>Dimensions (with stand)</b>		
Height (extended)	486.1 mm (19.14 inches)	524.3 mm (20.64 inches)



Height (compressed)	356.1 mm (14.02 inches)	394.3 mm (15.52 inches)
Width	537.8 mm (21.27 inches)	609.9 mm (24.01 inches)
Depth	166.0 mm (6.54 inches)	185.0 mm (7.28 inches)
<b>Dimensions (without stand)</b>		
Height	322.2 mm (12.68 inches)	363.0 mm (14.29 inches)
Width	537.8 mm (21.17 inches)	609.9 mm (24.01 inches)
Depth	42.8 mm (1.69 inches)	42.8 mm (1.69 inches)
<b>Stand dimensions</b>		
Height (extended)	400.8 mm (15.78 inches)	418.4 mm (16.47 inches)
Height (compressed)	353.4 mm (13.91 inches)	371.0 mm (14.61 inches)
Width	206.0 mm (8.11 inches)	245.0 mm (9.65 inches)
Depth	166.0 mm (6.54 inches)	185.0 mm (7.28 inches)
Base	206.0 mm x 166.0 mm (8.11 inches x 6.54 inches)	245.0 mm x 185.0 mm (9.65 inches x 7.28 inches)
<b>Weight</b>		
Weight with packaging	7.10 kg (15.65 lb)	9.05 kg (19.95 lb)
Weight with stand assembly and cables	5.25 kg (11.57 lb)	6.67 kg (14.70 lb)
Weight without stand assembly (For wall mount or VESA mount considerations - no cables)	3.26 kg (7.19 lb)	4.35 kg (9.59 lb)
Weight of stand assembly	1.67 kg (3.68 lb)	1.93 kg (4.25 lb)
Front frame gloss	2-4 (only front chin)	



## Environmental characteristics

<b>Model</b>	<b>P2219H/P2319H/P2419H/P2719H</b>
<b>Compliant standards</b>	
<ul style="list-style-type: none"> <li>• ENERGY STAR certified monitor</li> <li>• EPEAT Gold registered in the U.S. EPEAT registration varies by country. See <a href="http://www.epeat.net">www.epeat.net</a> for registration status by country</li> <li>• RoHS-compliant</li> <li>• TCO certified displays</li> <li>• BFR/PVC free monitor (excluding external cables)</li> <li>• Arsenic-free glass and Mercury-free for the panel only</li> </ul>	
<b>Temperature</b>	
Operating	0 °C to 40 °C (32 °F to 104 °F)
Non-operating	<ul style="list-style-type: none"> <li>• Storage: -20 °C to 60 °C (-4 °F to 140 °F)</li> <li>• Shipping: -20 °C to 60 °C (-4 °F to 140 °F)</li> </ul>
<b>Humidity</b>	
Operating	20% to 80% (non-condensing)
Non-operating	<ul style="list-style-type: none"> <li>• Storage: 10% to 90% (non-condensing)</li> <li>• Shipping: 10% to 90% (non-condensing)</li> </ul>
<b>Altitude</b>	
Operating	5000 m (16404 ft) (maximum)
Non-operating	12192 m (40000 ft) (maximum)
<b>Thermal dissipation</b>	
P2219H	<ul style="list-style-type: none"> <li>• 126.24 BTU/hour (maximum)</li> <li>• 58.00 BTU/hour (typical)</li> </ul>
P2319H	<ul style="list-style-type: none"> <li>• 136.58 BTU/hour (maximum)</li> <li>• 54.63 BTU/hour (typical)</li> </ul>
P2419H	<ul style="list-style-type: none"> <li>• 143.40 BTU/hour (maximum)</li> <li>• 61.46 BTU/hour (typical)</li> </ul>
P2719H	<ul style="list-style-type: none"> <li>• 197.95 BTU/hour (maximum)</li> <li>• 64.85 BTU/hour (typical)</li> </ul>



### Power management modes

If you have VESA's DPM™ compliance display card or software installed on your computer, the monitor can automatically reduce its power consumption when not in use. This is referred to as **Power Save Mode\***. If the computer detects input from the keyboard, mouse, or other input devices, the monitor automatically resumes to function. The following table shows the power consumption and signaling of this automatic power saving feature.

\* Zero power consumption in OFF mode can only be achieved by disconnecting the main cable from the monitor.

#### P2219H

VESA modes	Horizontal sync	Vertical sync	Video	Power indicator	Power consumption
Normal operation	Active	Active	Active	White	37 W (maximum)** 17 W (typical)
Active-off mode	Inactive	Inactive	Blanked	White (blinking)	Less than 0.3 W
Switch off	-	-	-	Off	Less than 0.3 W

Energy Star	Power consumption
P <sub>on</sub>	15.7 W
E <sub>TEC</sub>	49.8 kWh

#### P2319H

VESA modes	Horizontal sync	Vertical sync	Video	Power indicator	Power consumption
Normal operation	Active	Active	Active	White	40 W (maximum)** 16 W (typical)
Active-off mode	Inactive	Inactive	Blanked	White (blinking)	Less than 0.3 W
Switch off	-	-	-	Off	Less than 0.3 W



Energy Star	Power consumption
P <sub>on</sub>	15.9 W
E <sub>TEC</sub>	50.8 kWh

#### P2419H

VESA modes	Horizontal sync	Vertical sync	Video	Power indicator	Power consumption
Normal operation	Active	Active	Active	White	42 W (maximum)** 18 W (typical)
Active-off mode	Inactive	Inactive	Blanked	White (blinking)	Less than 0.3 W
Switch off	-	-	-	Off	Less than 0.3 W

Energy Star	Power consumption
P <sub>on</sub>	17.0 W
E <sub>TEC</sub>	53.9 kWh

#### P2719H

VESA modes	Horizontal sync	Vertical sync	Video	Power indicator	Power consumption
Normal operation	Active	Active	Active	White	58 W (maximum)** 19 W (typical)
Active-off mode	Inactive	Inactive	Blanked	White (blinking)	Less than 0.3 W
Switch off	-	-	-	Off	Less than 0.3 W



Energy Star	Power consumption
$P_{on}$	15.0 W
$E_{TEC}$	47.2 kWh

\*\* Maximum power consumption with max luminance, and USB active.

This document is informational only and reflects laboratory performance. Your product may perform differently, depending on the software, components and peripherals you ordered and shall have no obligation to update such information. Accordingly, the customer should not rely upon this information in making decisions about electrical tolerances or otherwise. No warranty as to accuracy or completeness is expressed or implied.

 **NOTE: This monitor is ENERGY STAR certified.**



 **NOTE:**

**$P_{on}$ : Power consumption of on mode as defined in Energy Star 7.0 version.**

**$E_{TEC}$ : Total energy consumption in kWh as defined in Energy Star 7.0 version.**



## Pin assignments

### VGA connector



Pin number	15-pin side of the connected signal cable
1	Video-Red
2	Video-Green
3	Video-Blue
4	GND
5	Self-test
6	GND-R
7	GND-G
8	GND-B
9	Computer 5 V/3.3 V
10	GND-sync
11	GND
12	DDC data
13	H-sync
14	V-sync
15	DDC clock



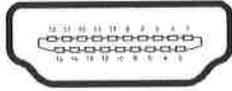
## DisplayPort connector



Pin number	20-pin side of the connected signal cable
1	ML3 (n)
2	GND
3	ML3 (p)
4	ML2 (n)
5	GND
6	ML2 (p)
7	ML1 (n)
8	GND
9	ML1 (p)
10	ML0 (n)
11	GND
12	ML0 (p)
13	GND
14	GND
15	AUX (p)
16	GND
17	AUX (n)
18	Hot Plug Detect
19	Re-PWR
20	+3.3 V DP_PWR



## HDMI connector



Pin number	19-pin side of the connected signal cable
1	TMDS DATA 2+
2	TMDS DATA 2 SHIELD
3	TMDS DATA 2-
4	TMDS DATA 1+
5	TMDS DATA 1 SHIELD
6	TMDS DATA 1-
7	TMDS DATA 0+
8	TMDS DATA 0 SHIELD
9	TMDS DATA 0-
10	TMDS CLOCK+
11	TMDS CLOCK SHIELD
12	TMDS CLOCK-
13	CEC
14	Reserved (N.C. on device)
15	DDC CLOCK (SCL)
16	DDC DATA (SDA)
17	DDC/CEC Ground
18	+5V POWER
19	HOT PLUG DETECT



## Plug and play capability

You can install the monitor in any Plug and Play-compatible system. The monitor automatically provides the computer system with its Extended Display Identification Data (EDID) using Display Data Channel (DDC) protocols so that the system can configure itself and optimize the monitor settings. Most monitor installations are automatic; you can select different settings if desired. For more information about changing the monitor settings, see *Operating the monitor*.

## Universal Serial Bus (USB) interface

This section gives you information about the USB ports that are available on the monitor.

 **NOTE: This monitor is Super-Speed USB 3.0 and High-Speed USB 2.0 compatible.**

### USB 3.0

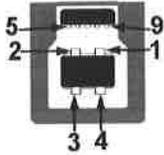
Transfer speed	Data rate	Power consumption
Super-speed	5 Gbps	4.5 W (Max, each port)
High speed	480 Mbps	4.5 W (Max, each port)
Full speed	12 Mbps	4.5 W (Max, each port)

### USB 2.0

Transfer speed	Data rate	Power consumption
High speed	480 Mbps	2.5 W (Max, each port)
Full speed	12 Mbps	2.5 W (Max, each port)
Low speed	1.5 Mbps	2.5 W (Max, each port)



### USB 3.0 upstream connector



Pin number	9-pin side of the connector
1	VCC
2	D-
3	D+
4	GND
5	SSTX-
6	SSTX+
7	GND
8	SSRX-
9	SSRX+

### USB 3.0 downstream connector

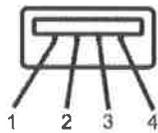


Pin number	9-pin side of the connector
1	VCC
2	D-
3	D+
4	GND
5	SSRX-



6	SSRX+
7	GND
8	SSTX-
9	SSTX+

#### USB 2.0 downstream connector



Pin number	4-pin side of the connector
1	VCC
2	DMD
3	DPD
4	GND

#### USB ports

- 1 upstream - bottom
- 2 downstream - bottom
- 2 downstream - side

**NOTE:** USB 3.0 functionality requires a USB 3.0-capable computer.

**NOTE:** The USB ports on the monitor work only when the monitor is turned On or in power save mode. If you turn Off the monitor and then turn it On, the attached peripherals may take a few seconds to resume normal functionality.

#### LCD monitor quality and pixel policy

During the LCD Monitor manufacturing process, it is not uncommon for one or more pixels to become fixed in an unchanging state which are hard to see and do not affect the display quality or usability. For more information on Dell Monitor Quality and Pixel Policy, see [www.dell.com/support/monitors](http://www.dell.com/support/monitors).



## Maintenance guidelines

### Cleaning your monitor

 **CAUTION: Read and follow the Safety instructions before cleaning the monitor.**

 **WARNING: Before cleaning the monitor, unplug the monitor power cable from the electrical outlet.**

For best practices, follow the instructions in the list below when unpacking, cleaning, or handling your monitor:

- To clean your anti-static screen, lightly dampen a soft, clean cloth with water. If possible, use a special screen-cleaning tissue or solution suitable for the anti-static coating. Do not use benzene, thinner, ammonia, abrasive cleaners, or compressed air.
- Use a lightly-dampened, warm cloth to clean the monitor. Avoid using detergent of any kind as some detergents leave a milky film on the monitor.
- If you notice white powder when you unpack your monitor, wipe it off with a cloth.
- Handle your monitor with care as a darker-colored monitor may get scratched and show white scuff marks more than a lighter-colored monitor.
- To help maintain the best image quality on your monitor, use a dynamically changing screen saver and turn off your monitor when not in use.



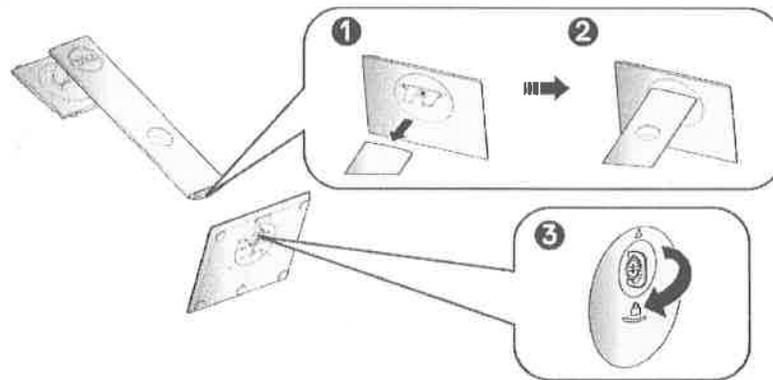
# Setting up the monitor

## Attaching the stand

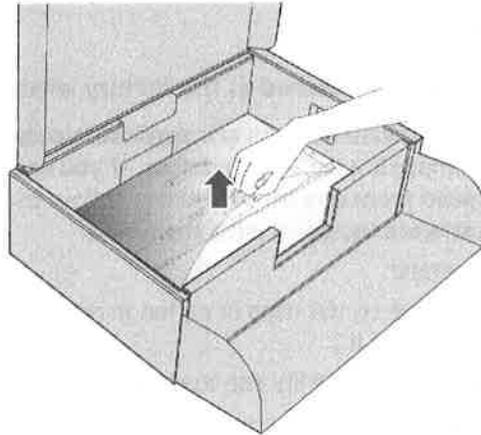
- ▣ **NOTE:** The stand is not installed at the factory when shipped.
- ▣ **NOTE:** The following instructions are applicable only for attaching the stand that was shipped with your monitor. If you are attaching a stand that you purchased from any other source, follow the set up instructions that were included with the stand.

To attach the monitor stand:

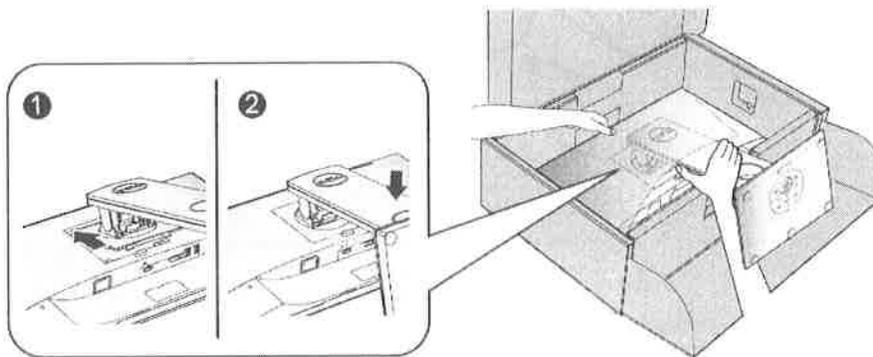
1. Follow the instructions on the flaps of carton to remove the stand from the top cushion that secures it.
2. Insert the stand base blocks fully into the stand slot.
3. Lift the screw handle and turn the screw clockwise.
4. After fully tightening the screw, fold the screw handle flat within the recess.



5. Lift the cover, as shown, to expose the VESA area for stand assembly.



6. Attach the stand assembly to the monitor.
- a. Fit the two tabs on the upper part of the stand to the groove on the back of the monitor.
  - b. Press the stand down till it snaps into place.



7. Place the monitor upright.

**NOTE:** Lift the monitor carefully to prevent it from slipping or falling.



## Connecting your monitor

**⚠ WARNING:** Before you begin any of the procedures in this section, follow the Safety instructions.

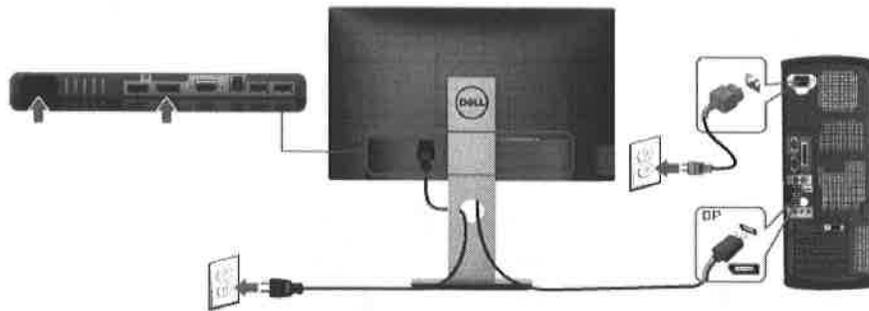
**✎ NOTE:** Route the cables through the cable-management slot before connecting them.

**✎ NOTE:** Do not connect all cables to the computer at the same time.

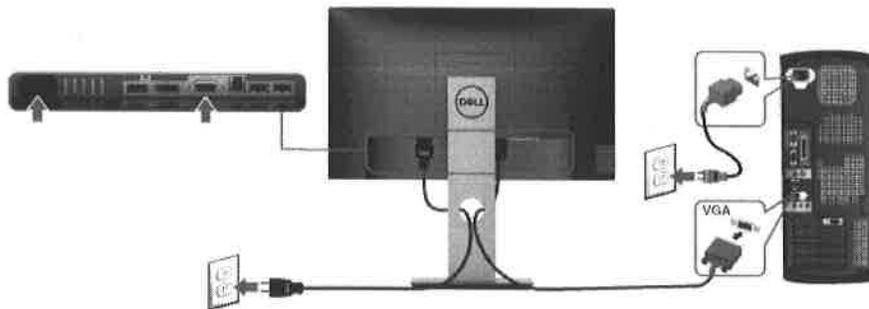
To connect your monitor to the computer:

1. Turn Off your computer and disconnect the power cable.
2. Connect the VGA, DisplayPort or HDMI cable from your monitor to the computer.

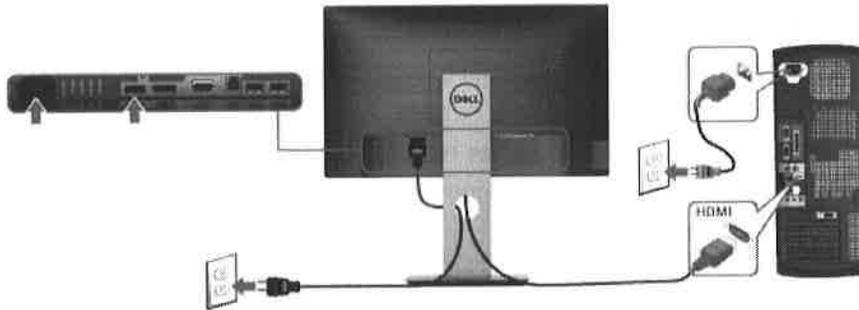
### Connecting the DisplayPort (DisplayPort to DisplayPort) cable



### Connecting the VGA cable (optional)



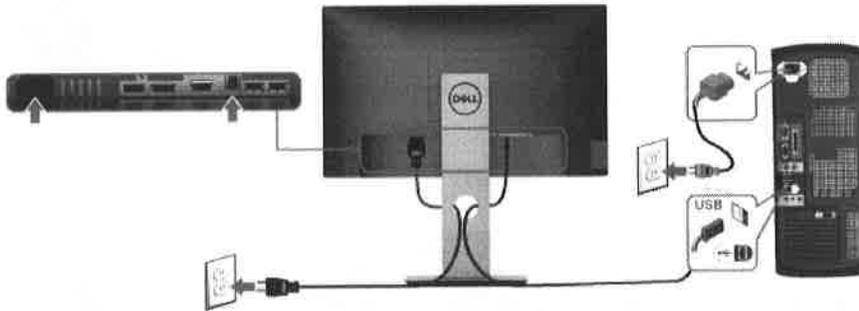
### Connecting the HDMI cable (optional)



**NOTE:** The graphics are used for the purpose of illustration only. Appearance of the computer may vary.

### Connecting the USB 3.0 cable

After you have completed connecting the VGA/DisplayPort/HDMI cable, follow the procedures below to connect the USB 3.0 cable to the computer and complete your monitor setup:



1. Connect the upstream USB 3.0 port (cable supplied) to an appropriate USB 3.0 port on your computer. (See **Bottom view** for details.)
2. Connect the USB 3.0 peripherals to the downstream USB 3.0 ports on the monitor.
3. Plug the power cables for your computer and monitor into a nearby outlet.

**NOTE:** Use the cable slot on the monitor stand to organize the cables.

4. Turn On the monitor and the computer.  
If your monitor displays an image, installation is complete. If it does not display an image, see Universal Serial Bus (USB) specific problems.



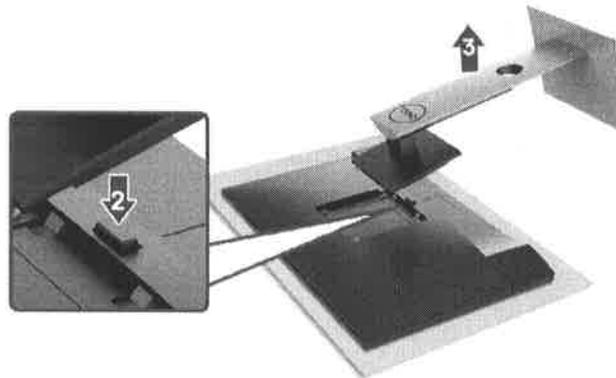
## Organizing your cables



After attaching all necessary cables to your monitor and computer, (See Connecting your monitor for cable attachment,) organize all cables as shown above.

## Removing the monitor stand

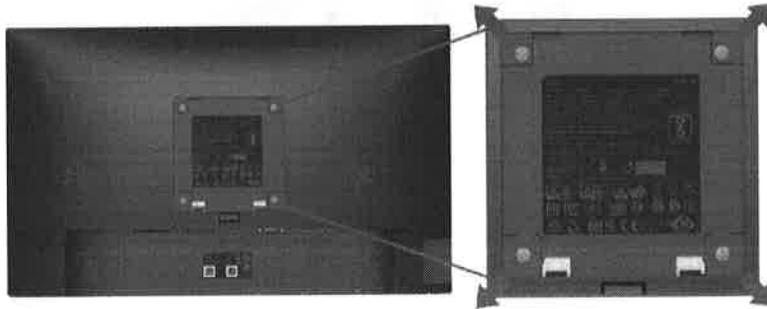
- NOTE: To prevent scratches on the LCD screen when removing the stand, ensure that the monitor is placed on a soft, clean surface.
- NOTE: The following instructions are applicable only for attaching the stand that was shipped with your monitor. If you are attaching a stand that you purchased from any other source, follow the set up instructions that were included with the stand.



To remove the stand:

1. Place the monitor on a soft cloth or cushion.
2. Press and hold the stand release button.
3. Lift the stand up and away from the monitor.

### VESA wall mounting (optional)



(Screw dimension: M4 x 10 mm).

Refer to the instructions that come with the VESA-compatible wall mounting kit.

1. Place the monitor panel on a soft cloth or cushion on a stable flat table.
2. Remove the stand. (See **Removing the monitor stand**)
3. Use a Phillips crosshead screwdriver to remove the four screws securing the plastic cover.
4. Attach the mounting bracket from the wall mounting kit to the monitor.
5. Mount the monitor on the wall. For more information, see the documentation that shipped with the wall mounting kit.

**NOTE:** For use only with with UL or CSA or GS-listed wall mount bracket with minimum weight or load bearing capacity of 11.00 kg (P2219H) / 12.44 kg (P2319H) / 13.04 kg (P2419H) / 17.40 kg (P2719H).



# Operating the monitor

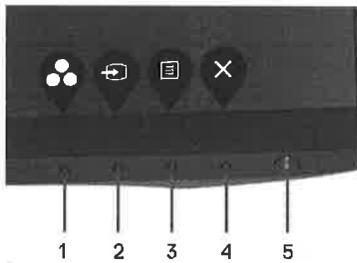
## Power on the monitor

Press the Power button to turn On the monitor.



## Using the front-panel controls

Use the control buttons on the front of the monitor to adjust settings.



The following table describes the front-panel buttons:

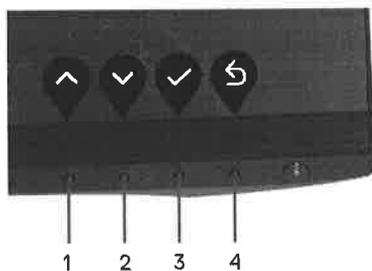
Front-panel button	Description
1  <b>Shortcut key/ Preset Modes</b>	Use this button to choose from a list of preset color modes.
2  <b>Shortcut key/ Input Source</b>	Use this button to choose from a list of video signals that may be connected to your monitor.



3	 <b>Menu</b>	Use the <b>MENU</b> button to launch the On-Screen Display (OSD). See <a href="#">Accessing the menu system</a> .
4	 <b>Exit</b>	Use this button to exit the OSD main menu.
5	 <b>Power (with power light indicator)</b>	Use the <b>Power</b> button to turn the monitor <b>On</b> and <b>Off</b> . The white light indicates the monitor is <b>On</b> and fully functional. A blinking white light indicates the power save mode.

### Front-panel button

Use the buttons on the front of the monitor to adjust the image settings.



Front-panel button	Description
1  <b>Up</b>	Use the <b>Up</b> button to adjust (increase ranges) items in the OSD menu.
2  <b>Down</b>	Use the <b>Down</b> button to adjust (decrease ranges) items in the OSD menu.
3  <b>OK</b>	Use the <b>OK</b> button to confirm your selection.
4  <b>Back</b>	Use the <b>Back</b> button to go back to the previous menu.

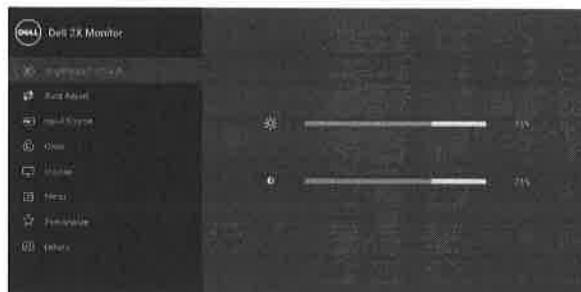


## Using the On-Screen Display (OSD) menu

### Accessing the menu system

**NOTE:** If you change the settings and then either proceed to another menu or exit the OSD menu, the monitor automatically saves those changes. The changes are also saved if you change the settings and then wait for the OSD menu to disappear.

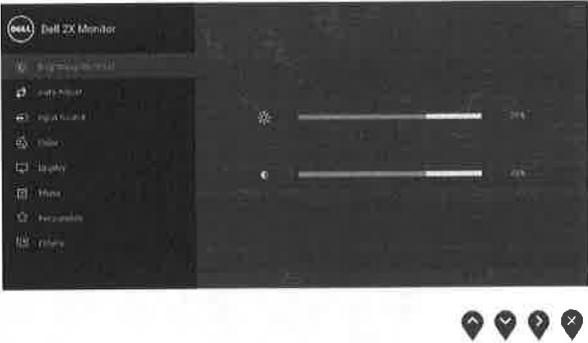
1. Press the  button to launch the OSD menu and display the main menu.



**NOTE:** Auto Adjust is only available when you use the analog (VGA) connector.

2. Press the  and  buttons to move between the setting options. As you move from one icon to another, the option name is highlighted. See the following table for a complete list of all the options available for the monitor.
3. Press the  or  or  button once to activate the highlighted option.
4. Press the  and  buttons to select the desired parameter.
5. Press  to enter the submenu and then use the directional buttons, according to the indicators on the menu, to make your changes.
6. Select the  button to return to the main menu.



Icon	Menu and Submenus	Description
	<b>Brightness/Contrast</b>	Use this menu to activate <b>Brightness/Contrast</b> adjustment.
		
<b>Brightness</b>	<p><b>Brightness</b> adjusts the luminance of the backlight.</p> <p>Press the  button to increase the brightness and press the  button to decrease the brightness (min. 0 / max. 100).</p> <p><b>NOTE:</b> Manual adjustment of <b>Brightness</b> is disabled when <b>Dynamic Contrast</b> is switched On.</p>	
<b>Contrast</b>	<p>Adjust the <b>Brightness</b> first, and then adjust the <b>Contrast</b> only if further adjustment is necessary.</p> <p>Press the  button to increase the contrast and press the  button to decrease the contrast (min. 0 / max. 100).</p> <p>The <b>Contrast</b> function adjusts the degree of difference between darkness and lightness on the monitor screen.</p>	





## Auto Adjust

Use this menu to activate automatic setup and adjust menu.



**Auto Adjust** allows the monitor to self-adjust to the incoming video signal. After using **Auto Adjust**, you can further tune your monitor by using the **Pixel Clock** (Coarse) and **Phase** (Fine) controls under **Display** settings.



**NOTE:** In most cases, **Auto Adjust** produces the best image for your configuration.

**NOTE:** **Auto Adjust** option is only available when you are using the analog (VGA) connector.





### Input Source

Use the **Input Source** menu to select between the different video signals that may be connected to your monitor.

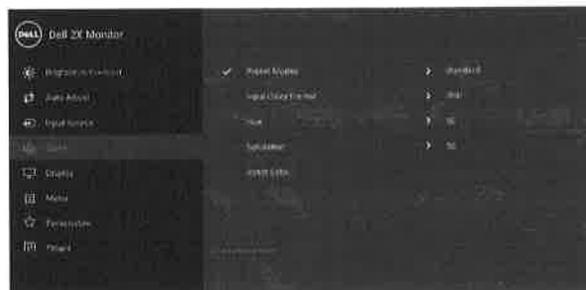


<b>VGA</b>	Select the <b>VGA</b> input when you are using the analog (VGA) connector.
<b>DP</b>	Select the <b>DP</b> input when you are using the DisplayPort (DP) connector.
<b>HDMI</b>	Select the <b>HDMI</b> input when you are using the HDMI connector.
<b>Auto Select</b>	Turning on the function allows you to scan for available input sources.
<b>Reset Input Source</b>	Reset your monitor input settings to the factory settings.



### Color

Use **Color** to adjust the color setting mode.



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**Preset Modes**

Allows you to choose from a list of preset color modes.

- **Standard:** Loads the monitor's default color settings. This is the default preset mode.
- **ComfortView:** Decreases the level of blue light emitted from the screen to make viewing more comfortable for your eyes.

**WARNING: The possible long-term effects of blue light emission from the monitor may cause personal injury such as digital eye strain, eye fatigue and damage to the eyes. Using monitor for extended periods of time may also cause pain in parts of body such as neck, arm, back and shoulder.**

To reduce the risk of eye strain and neck/arm/back/shoulder pain from using the monitor for long periods of time, we suggest you to:

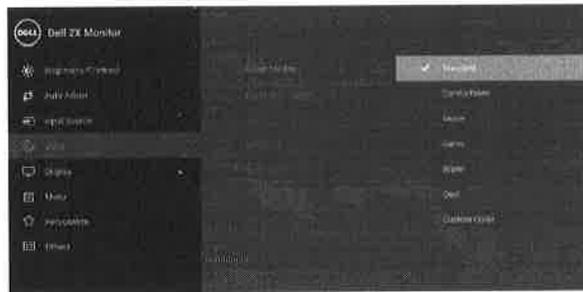
1. Set the distance of the screen between 20 to 28 inches (50 - 70 cm) from your eyes.
  2. Blink frequently to moisten your eyes or wet your eyes with water after prolonged usage of the monitor.
  3. Take regular and frequent breaks for 20 minutes every two hours.
  4. Look away from your monitor and gaze at a distant object at 20 feet away for at least 20 seconds during the breaks.
  5. Perform stretches to relieve tension in the neck, arm, back, and shoulders during the breaks.
- **Movie:** Loads color settings ideal for movies.
  - **Game:** Loads color settings ideal for most gaming applications.
  - **Warm:** Increases the color temperature. The screen appears warmer with a red/yellow tint.
  - **Cool:** Decreases the color temperature. The screen appears cooler with a blue tint.
- 



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**Preset Modes** • **Custom Color:** Allows you to manually adjust the color settings.

Use the  and  buttons to adjust the three colors (R, G, B) values and create your own preset color mode.



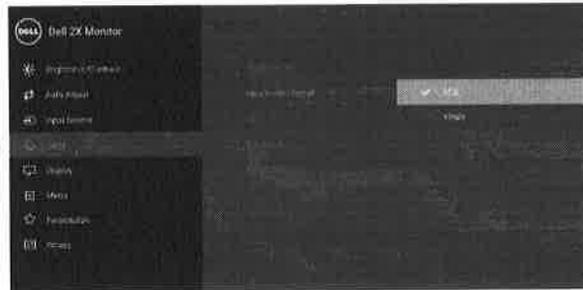
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**Input Color Format**

Allows you to set the video input mode to:

**RGB:** Select this option if your monitor is connected to a computer (or DVD player) using the DisplayPort or HDMI cable.

**YPbPr:** Select this option if your DVD player supports only YPbPr output.



---

**Hue**

This feature can shift the color of the video image to green or purple. This is used to adjust the desired flesh tone color. Use  or  to adjust the hue from '0' to '100'.

**NOTE: Hue** adjustment is available only when you select **Movie** or **Game** preset mode.

---

**Saturation**

This feature can adjust the color saturation of the video image. Use  or  to adjust the saturation from '0' to '100'.

**NOTE: Saturation** adjustment is available only when you select **Movie** or **Game** preset mode.

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**Reset Color**

Reset your monitor's color settings to the factory settings.

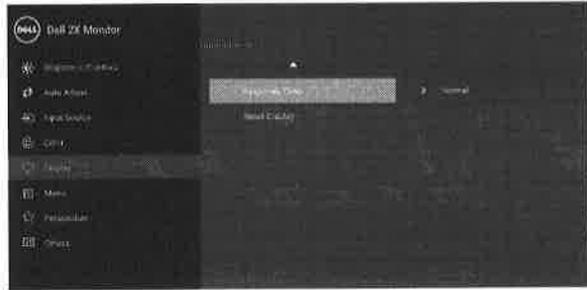
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## Display

Use **Display** to adjust image.



**Aspect Ratio** Adjusts the image ratio to **Wide 16:9**, **4:3**, or **5:4**.

**Horizontal Position** Use or to adjust the image left or right. Minimum is '0' (-). Maximum is '100' (+).

**Vertical Position** Use or to adjust the image up or down. Minimum is '0' (-). Maximum is '100' (+).

**NOTE: Horizontal Position** and **Vertical Position** adjustments are only available for VGA input.



<b>Sharpness</b>	This feature can make the image look sharper or softer.
	Use  or  to adjust the sharpness from '0' to '100'.
<b>Pixel Clock</b>	The <b>Phase</b> and <b>Pixel Clock</b> adjustments allow you to adjust your monitor to your preference.
	Use  or  to adjust for best image quality.
<b>Phase</b>	If satisfactory results are not obtained using the <b>Phase</b> adjustment, use the <b>Pixel Clock</b> (coarse) adjustment and then use <b>Phase</b> (fine), again.
	<b>NOTE:</b> <b>Pixel Clock</b> and <b>Phase</b> adjustments are only available for VGA input.
<b>Dynamic Contrast</b>	Allows you to increase the level of contrast to provide sharper and more detailed image quality.
	Use  to enter the submenu. Then use  to turn on or turn off the <b>Dynamic Contrast</b> function.
	<b>NOTE:</b> <b>Dynamic Contrast</b> provides higher contrast if you select <b>Game</b> or <b>Movie</b> preset mode.
<b>Response Time</b>	Allows you to set the <b>Response Time</b> to <b>Normal</b> or <b>Fast</b> .
<b>Reset Display</b>	Select this option to restore default display settings.





### Menu

Select this option to adjust the settings of the OSD, such as, the languages of the OSD, the amount of time the menu remains on screen, and so on.



### Language

Sets the OSD display to one of the eight languages (English, Spanish, French, German, Brazilian Portuguese, Russian, Simplified Chinese, or Japanese).

### Rotation

Rotates the OSD by 90 degrees counter-clockwise. You can adjust the menu according to your Display Rotation.

### Transparency

Select this option to change the menu transparency by pressing the and buttons (min. 0 / max. 100).

### Timer

Sets the length of time the OSD will remain active after the last time you pressed a button.

Use or to adjust the slider in 1 second increments, from 5 to 60 seconds.

### Reset Menu

Reset all OSD settings to the factory preset values.





## Personalize



<b>Shortcut Key 1</b>	Allows you to choose a feature from <b>Preset Modes</b> , <b>Brightness/Contrast</b> , <b>Auto Adjust</b> , <b>Input Source</b> , <b>Aspect Ratio</b> , or <b>Rotation</b> and set it as a shortcut key.
<b>Shortcut Key 2</b>	
<b>Power Button LED</b>	Allows you to set the power LED indicator On or Off to save energy.
<b>USB</b>	Allows you to enable or disable USB function during monitor standby mode. <b>NOTE:</b> USB ON/OFF under standby mode is only available when the USB upstream cable is unplugged. This option will be greyed out when the USB upstream cable plugs in.
<b>Reset Personalization</b>	Reset all settings under the <b>Personalize</b> menu to the factory preset values.





### Others

Select this option to adjust the OSD settings, such as **DDC/CI**, **LCD Conditioning**, and so on.

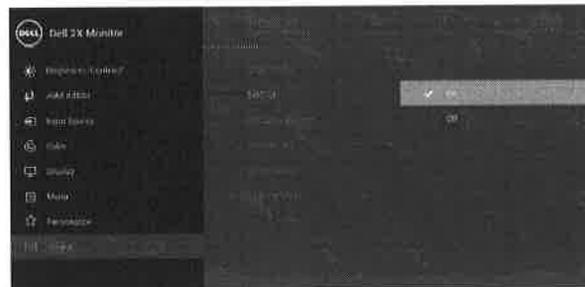


### Display Info

Displays the monitor's current settings.

#### DDC/CI

**DDC/CI** (Display Data Channel/Command Interface) allows your monitor parameters (brightness, color balance, and etc.) to be adjustable via the software on your computer. You can disable this feature by selecting **Off**. Enable this feature for best user experience and optimum performance of your monitor.



**LCD  
Conditioning**

Helps reduce minor cases of image retention. Depending on the degree of image retention, the program may take some time to run. You can enable this feature by selecting **On**.



**Service Tag**

Displays the service tag of your monitor. This string is required when you look for phone support, check your warranty status, update drivers on Dell's website, etc.

**Reset Others**

Reset all settings under the **Others** menu to the factory preset values.

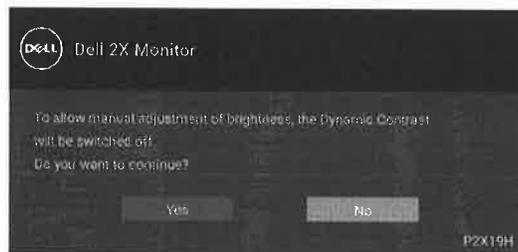
**Factory Reset**

Reset all settings to the factory preset values.

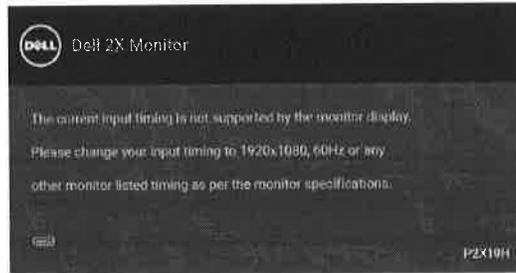
 **NOTE: This monitor has a built-in feature to automatically calibrate the brightness to compensate for LED aging.**

**OSD warning message**

When the **Dynamic Contrast** feature is enabled (in these preset modes: **Game** or **Movie**), manual brightness adjustment is disabled.



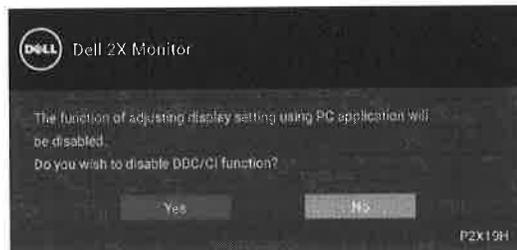
When the monitor does not support a particular resolution mode, you will see the following message:



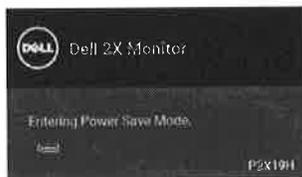
This means that the monitor cannot synchronize with the signal that it is receiving from the computer. See **Monitor specifications** for the Horizontal and Vertical frequency ranges addressable by this monitor. Recommended mode is 1920 x 1080.

**NOTE:** The message may be slightly different according to the connected input signal.

You will see the following message before the DDC/CI function is disabled:



When the monitor goes into power-save mode, the following message appears:

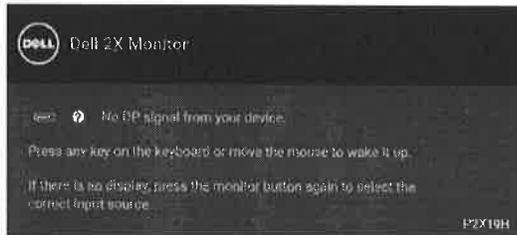


**NOTE:** The message may be slightly different according to the connected input signal.

Activate the computer and wake up the monitor to gain access to the OSD.



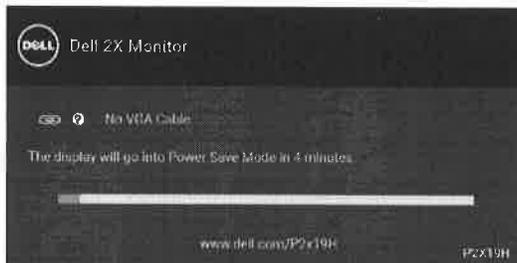
The OSD functions only in the normal operation mode. If you press any button other than the power button during the Active-off mode, the following message will appear depending on the selected input:



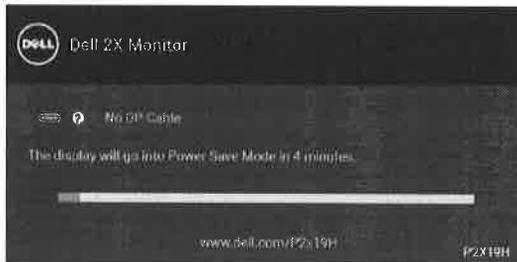
Activate the computer and the monitor to gain access to the OSD.

**NOTE: The message may be slightly different according to the connected input signal.**

If either VGA, HDMI, or DisplayPort input is selected and the corresponding cable is not connected, a floating dialog box as shown below appears.

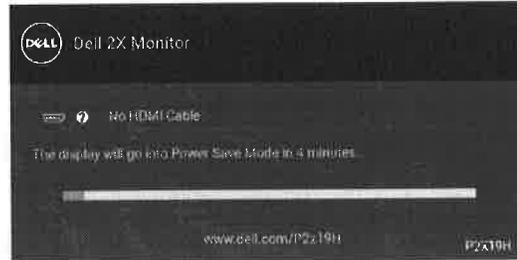


OR



OR





See Troubleshooting for more information.

## Setting the maximum resolution

To set the maximum resolution for the monitor:

In Windows<sup>®</sup> 7, Windows<sup>®</sup> 8, and Windows<sup>®</sup> 8.1:

1. For Windows<sup>®</sup> 8 and Windows<sup>®</sup> 8.1 only, select the Desktop tile to switch to classic desktop.
2. Right-click on the desktop and click **Screen Resolution**.
3. Click the dropdown list of the **Screen Resolution** and select **1920 x 1080**.
4. Click **OK**.

In Windows<sup>®</sup> 10:

1. Right-click on the desktop and click **Display settings**.
2. Click **Advanced display settings**.
3. Click the dropdown list of **Resolution** and select **1920 x 1080**.
4. Click **Apply**.

If you do not see 1920 x 1080 as an option, you may need to update your graphics driver. Depending on your computer, complete one of the following procedures:

If you have a Dell desktop or portable computer:

- Go to <http://www.dell.com/support>, enter your service tag, and download the latest driver for your graphics card.

If you are using a non-Dell computer (portable or desktop):

- Go to the support site for your computer and download the latest graphic drivers.
- Go to your graphics card website and download the latest graphic drivers.

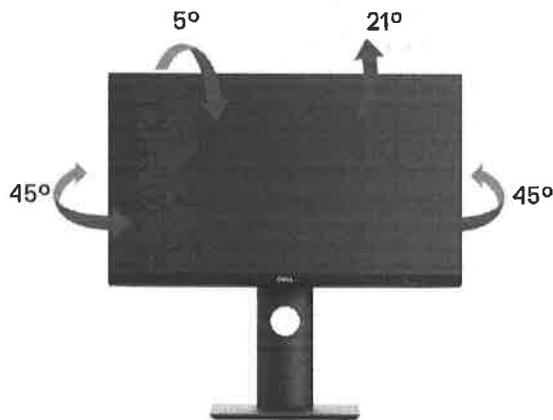


## Using the tilt, swivel, and vertical extension

**NOTE:** The following instructions are applicable only for attaching the stand that was shipped with your monitor. If you are attaching a stand that you purchased from any other source, follow the set up instructions that were included with the stand.

### Tilt, swivel

With the stand attached to the monitor, you can tilt and swivel the monitor for the most comfortable viewing angle.

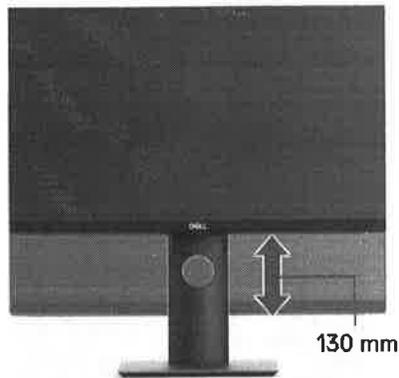


**NOTE:** The stand is not installed at the factory when shipped.



### Vertical extension

 **NOTE:** The stand extends vertically up to 130 mm. The figure below illustrates how to extend the stand vertically.



### Rotating the monitor

Before you rotate the monitor, your monitor should be fully vertically extended (Vertical extension) and fully tilted up to avoid hitting the bottom edge of the monitor.



**Rotate clockwise**



**Rotate counterclockwise**



**NOTE:** To use the Display Rotation function (Landscape versus Portrait view) with your Dell computer, you require an updated graphics driver that is not included with this monitor. To download the graphics driver, go to [www.dell.com/support](http://www.dell.com/support) and see the Download section for Video Drivers for latest driver updates.

**NOTE:** When in the Portrait View Mode, you may experience performance degradation in graphic-intensive applications (3D Gaming and etc.).



## Adjusting the rotation display settings of your system

After you have rotated your monitor, you need to complete the procedure below to adjust the Rotation Display Settings of your system.

 **NOTE: If you are using the monitor with a non-Dell computer, you need to go the graphics driver website or your computer manufacturer website for information on rotating the 'contents' on your display.**

To adjust the Rotation Display Settings:

1. Right-click on the desktop and click **Properties**.
2. Select the **Settings** tab and click **Advanced**.
3. If you have an ATI graphics card, select the **Rotation** tab and set the preferred rotation.
4. If you have an nVidia graphics card, click the **nVidia** tab, in the left-hand column select **NVRotate**, and then select the preferred rotation.
5. If you have an Intel<sup>®</sup> graphics card, select the **Intel** graphics tab, click **Graphic Properties**, select the **Rotation** tab, and then set the preferred rotation.

 **NOTE: If you do not see the rotation option or it is not working correctly, go to [www.dell.com/support](http://www.dell.com/support) and download the latest driver for your graphics card.**



# Troubleshooting

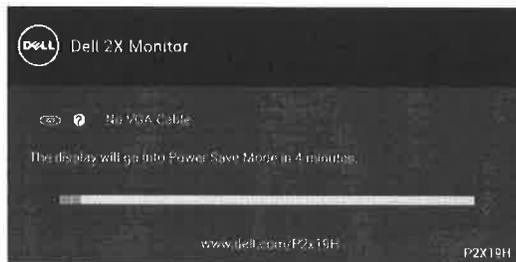
**⚠ WARNING: Before you begin any of the procedures in this section, follow the Safety instructions.**

## Self-test

Your monitor provides a self-test feature that allows you to check whether your monitor is functioning properly. If your monitor and computer are properly connected but the monitor screen remains dark, run the monitor self-test by performing the following steps:

1. Turn off both your computer and the monitor.
2. Unplug the video cable from the back of the computer.
3. Turn on the monitor.

The floating dialog box should appear on-screen (against a black background), if the monitor cannot sense a video signal and is working correctly. While in self-test mode, the power LED remains white. Also, depending upon the selected input, one of the dialogs shown below will continuously scroll through the screen.

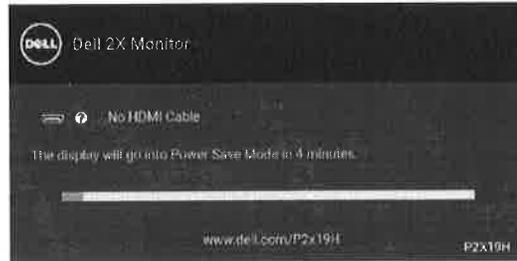


OR



OR





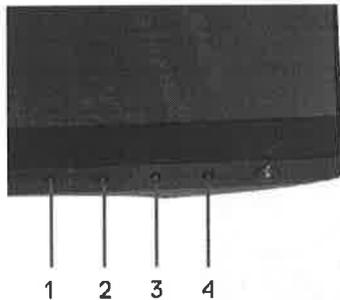
4. This box also appears during normal system operation, if the video cable becomes disconnected or damaged.
5. Turn Off your monitor and reconnect the video cable; then turn On both your computer and the monitor.

If your monitor screen remains blank after you use the previous procedure, check your video controller and computer, because your monitor is functioning properly.

### Built-in diagnostics

Your monitor has a built-in diagnostic tool that helps you determine if the screen abnormality you are experiencing is an inherent problem with your monitor, or with your computer and video card.

 **NOTE: You can run the built-in diagnostics only when the video cable is unplugged and the monitor is in self-test mode.**



To run the built-in diagnostics:

1. Ensure that the screen is clean (no dust particles on the surface of the screen).
2. Unplug the video cable(s) from the back of the computer or monitor. The monitor then goes into the self-test mode.



3. Press and hold **Button 1** on the front panel for 5 seconds. A gray screen appears.
4. Carefully inspect the screen for abnormalities.
5. Press **Button 1** on the front panel again. The color of the screen changes to red.
6. Inspect the display for any abnormalities.
7. Repeat steps 5 and 6 to inspect the display in green, blue, black, white, and text screens.

The test is complete when the text screen appears. To exit, press **Button 1** again. If you do not detect any screen abnormalities upon using the built-in diagnostic tool, the monitor is functioning properly. Check the video card and computer.

### Common problems

The following table contains general information about common monitor problems you might encounter and the possible solutions:

Common symptoms	What you experience	Possible solutions
No Video/Power LED off	No picture	<ul style="list-style-type: none"> <li>• Ensure that the video cable connecting the monitor and the computer is properly connected and secure.</li> <li>• Verify that the power outlet is functioning properly using any other electrical equipment.</li> <li>• Ensure that the power button is pressed fully.</li> <li>• Ensure that the correct input source is selected in the <b>Input Source</b> menu.</li> </ul>



No Video/Power LED on	No picture or no brightness	<ul style="list-style-type: none"> <li>• Increase brightness &amp; contrast controls via OSD.</li> <li>• Perform monitor self-test feature check.</li> <li>• Check for bent or broken pins in the video cable connector.</li> <li>• Run the built-in diagnostics.</li> <li>• Ensure that the correct input source is selected in the <b>Input Source</b> menu.</li> </ul>
Poor Focus	Picture is fuzzy, blurry, or ghosting	<ul style="list-style-type: none"> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust the <b>Phase</b> and <b>Pixel Clock</b> controls via OSD.</li> <li>• Eliminate video extension cables.</li> <li>• Reset the monitor to factory settings.</li> <li>• Change the video resolution to the correct aspect ratio.</li> </ul>
Shaky/Jittery Video	Wavy picture or fine movement	<ul style="list-style-type: none"> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust the <b>Phase</b> and <b>Pixel Clock</b> controls via OSD.</li> <li>• Reset the monitor to factory settings.</li> <li>• Check environmental factors.</li> <li>• Relocate the monitor and test in another room.</li> </ul>
Missing Pixels	LCD screen has spots	<ul style="list-style-type: none"> <li>• Cycle power On-Off.</li> <li>• Pixel that is permanently Off is a natural defect that can occur in LCD technology.</li> <li>• For more information on Dell Monitor Quality and Pixel Policy, see Dell Support site at: <a href="http://www.dell.com/support/monitors">http://www.dell.com/support/monitors</a>.</li> </ul>



Stuck-on Pixels	LCD screen has bright spots	<ul style="list-style-type: none"> <li>• Cycle power On-Off.</li> <li>• Pixel that is permanently off is a natural defect that can occur in LCD technology.</li> <li>• For more information on Dell Monitor Quality and Pixel Policy, see Dell Support site at: <a href="http://www.dell.com/support/monitors">http://www.dell.com/support/monitors</a>.</li> </ul>
Brightness Problems	Picture too dim or too bright	<ul style="list-style-type: none"> <li>• Reset the monitor to factory settings.</li> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust brightness &amp; contrast controls via OSD.</li> </ul>
Geometric Distortion	Screen not centered correctly	<ul style="list-style-type: none"> <li>• Reset the monitor to factory settings.</li> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust horizontal &amp; vertical controls via OSD.</li> <li>• When using HDMI/DisplayPort input, the positioning adjustments are not available.</li> </ul>
Horizontal/Vertical Lines	Screen has one or more lines	<ul style="list-style-type: none"> <li>• Reset the monitor to factory settings.</li> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust the <b>Phase</b> and <b>Pixel Clock</b> controls via OSD.</li> <li>• Perform monitor self-test feature check and determine if these lines are also in self-test mode.</li> <li>• Check for bent or broken pins in the video cable connector.</li> <li>• Run the built-in diagnostics.</li> <li>• When using HDMI/DisplayPort input, the <b>Pixel Clock</b> and <b>Phase</b> adjustments are not available.</li> </ul>



Synchronization Problems	Screen is scrambled or appears torn	<ul style="list-style-type: none"> <li>• Reset the monitor to factory settings.</li> <li>• Perform <b>Auto Adjust</b> via OSD.</li> <li>• Adjust the <b>Phase</b> and <b>Pixel Clock</b> controls via OSD.</li> <li>• Perform monitor self-test feature check to determine if the scrambled screen appears in self-test mode.</li> <li>• Check for bent or broken pins in the video cable connector.</li> <li>• Restart the computer in the safe mode.</li> </ul>
Safety Related Issues	Visible signs of smoke or sparks	<ul style="list-style-type: none"> <li>• Do not perform any troubleshooting steps.</li> <li>• Contact Dell immediately.</li> </ul>
Intermittent Problems	Monitor malfunctions on & off	<ul style="list-style-type: none"> <li>• Ensure that the video cable connecting the monitor to the computer is connected properly and is secure.</li> <li>• Reset the monitor to factory settings.</li> <li>• Perform monitor self-test feature check to determine if the intermittent problem occurs in self-test mode.</li> </ul>
Missing Color	Picture missing color	<ul style="list-style-type: none"> <li>• Perform monitor self-test feature check.</li> <li>• Ensure that the video cable connecting the monitor to the computer is connected properly and is secure.</li> <li>• Check for bent or broken pins in the video cable connector.</li> </ul>



Wrong Color	Picture color not good	<ul style="list-style-type: none"> <li>• Change the settings of the <b>Preset Modes</b> in the <b>Color</b> menu OSD depending on the application.</li> <li>• Adjust R/G/B value under <b>Custom Color</b> in <b>Color</b> menu OSD.</li> <li>• Run the built-in diagnostics.</li> </ul>
Image retention from a static image left on the monitor for a long period of time	Faint shadow from the static image displayed appears on the screen	<ul style="list-style-type: none"> <li>• Use the Power Management feature to turn off the monitor at all times when not in use (for more information, see <b>Power management modes</b>).</li> <li>• Alternatively, use a dynamically changing screensaver.</li> </ul>

## Product specific problems

Common symptoms	What you experience	Possible solutions
Screen image is too small	Image is centered on screen, but does not fill entire viewing area	<ul style="list-style-type: none"> <li>• Check the <b>Aspect Ratio</b> setting in the <b>Display</b> menu OSD.</li> <li>• Reset the monitor to factory settings.</li> </ul>
No Input Signal when user controls are pressed	No picture, the LED light is white	<ul style="list-style-type: none"> <li>• Check the signal source. Ensure the computer is not in the power saving mode by moving the mouse or pressing any key on the keyboard.</li> <li>• Check whether the signal cable is plugged in properly. Re-plug the signal cable if necessary.</li> <li>• Reset the computer or video player.</li> </ul>
The picture does not fill the entire screen	The picture cannot fill the height or width of the screen	<ul style="list-style-type: none"> <li>• Due to different video formats (aspect ratio) of DVDs, the monitor may display in full screen.</li> <li>• Run the built-in diagnostics.</li> </ul>

 **NOTE: When choosing HDMI/DisplayPort mode, the Auto Adjust function will not be available.**



## Universal Serial Bus (USB) specific problems

Common symptoms	What you experience	Possible solutions
USB interface is not working	USB peripherals are not working	<ul style="list-style-type: none"> <li>• Check that your monitor is turned On.</li> <li>• Reconnect the upstream cable to your computer.</li> <li>• Reconnect the USB peripherals (downstream connector).</li> <li>• Switch Off and then turn On the monitor again.</li> <li>• Reboot the computer.</li> <li>• Some USB devices like external portable HDD require higher electric current; connect the device directly to the computer system.</li> </ul>
Super Speed USB 3.0 interface is slow	Super Speed USB 3.0 peripherals working slowly or not working at all	<ul style="list-style-type: none"> <li>• Check that your computer is USB 3.0-capable.</li> <li>• Some computers have USB 3.0, USB 2.0, and USB 1.1 ports. Ensure that the correct USB port is used.</li> <li>• Reconnect the upstream cable to your computer.</li> <li>• Reconnect the USB peripherals (downstream connector).</li> <li>• Reboot the computer.</li> </ul>
Wireless USB peripherals stop working when a USB 3.0 device is plugged in	Wireless USB peripherals responding slowly or only working as the distance between itself and its receiver decreases	<ul style="list-style-type: none"> <li>• Increase the distance between the USB 3.0 peripherals and the wireless USB receiver.</li> <li>• Position your wireless USB receiver as close as possible to the wireless USB peripherals.</li> <li>• Use a USB-extender cable to position the wireless USB receiver as far away as possible from the USB 3.0 port.</li> </ul>





**ENGINEER CHANGE ORDER (ECO) ANALYSIS FORM**

<b>Manufacturer:</b>	Dominion Voting Systems
<b>System:</b>	EMS
<b>ECO Number:</b>	100597
<b>ECO Description:</b>	Added DELL PowerEdge R640 computer with new processor and RAM as an AVL to the existing R640 server computer configurations due to the previous DELL PowerEdge R640 Processor and RAM will soon become commercially unavailable for purchase

**Overview:**

DELL PowerEdge R640 server computers using the previous Intel Xeon Gold 5115 processor and using 16GB of 2666MT/s RAM will soon become commercially unavailable for purchase from DELL. Dominion is adding the DELL PowerEdge R640 with the new Processor (Intel Xeon Gold 5215) and RAM (16GB RDIMM, 2933MT/s) to the approved vendor list (AVL) for the following D-Suite EMS server computer configurations.

Add:  
 DVS PN 198-000036 POWEREDGE R640 RACK SERVER W/ WINDOWS SERVER 2012 R2 AND SQL SERVER 2016  
 DVS PN 198-000044 POWEREDGE R640 RACK SERVER W/ WINDOWS SERVER 2016 AND SQL SERVER 2016

**Supporting Documentation:**

- ECO 100597 DELL PowerEdge R640 Processor-RAM.pdf (*Dominion ECO*)
- 198-000036\_R640\_Configuration\_Spec\_R2.xlsx
- 198-000044\_R640\_Configuration\_Spec\_WS2016\_SQL2016.xlsx
- New R640 EMS Std. Server Config Spec R3.xlsx

**Engineering Recommendation:**

Technical documentation review performed to approve change. Replacement component is comparable to current part in form fit, and function; therefore, no testing is required.

**Engineering Analysis: De Minimis**

**Reviewer:**

Wendy Owen S  
 Printed Name

Wendy Owen  
 Signature

8/6/19  
 Date

**Approver:**

Michael L. Walker  
 Printed Name

Michael L. Walker  
 Signature

8/6/19  
 Date



## Appendix

### **WARNING: Safety instructions**

**⚠ WARNING: Use of controls, adjustments, or procedures other than those specified in this documentation may result in exposure to shock, electrical hazards, and/or mechanical hazards.**

For information on safety instructions, see the Safety, Environmental, and Regulatory Information (SERI).

### **FCC notices (U.S. only) and other regulatory information**

For FCC notices and other regulatory information, see the regulatory compliance website located at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

### **Contact Dell**

**For customers in the United States, call 800-WWW-DELL (800-999-3355).**

**📄 NOTE: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.**

**Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area.**

- Online technical assistance — [www.dell.com/support/monitors](http://www.dell.com/support/monitors)
- Contacting Dell — [www.dell.com/contactdell](http://www.dell.com/contactdell)



