



Legal Department

American Electric Power  
1 Riverside Plaza  
Columbus, OH 43215-2373  
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January 16, 2013

Chairman Todd Snitchler  
Ohio Power Siting Board  
Public Utilities Commission of Ohio  
180 East Broad Street  
Columbus, OH 43215-3793

Re: **In the Matter of Spencerville Local School Dist. )**  
**and Ohio Power Company for ) Case No. 13-0188-EL-EEC**  
**Approval of a Special Arrangement )**  
**Agreement with a Mercantile Customer )**

Yazen Alami  
Regulatory Services  
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yalami@aep.com

Dear Chairman Snitchler,

Attached please find the Joint Application of Ohio Power Company (OPCo) and mercantile customer Spencerville Local School Dist. for approval of a Special Arrangement of the commitment of energy efficiency/peak demand reduction (EE/PDR) resources toward compliance with the statutory benchmarks for 2013.

Amended Substitute Senate Bill 221 sets forth in R.C. 4928.66 EE/PDR benchmarks that electric distribution utilities shall be required to meet or exceed. The statute allows utilities to include EE/PDR resources committed by mercantile customers for integration into the utilities programs to be counted toward compliance with a utility's EE/PDR benchmarks. The statute also enables the Commission to approve special arrangements for mercantile customers that commit EE/PDR resources to be counted toward compliance with EE/PDR benchmarks.

The Commission's Order in Case No. 10-834-EL-EEC, established a streamlined process to expedite review of these special arrangements by developing a sample application process for parties to follow for consideration of such programs implemented during the prior three calendar years. Attached is OPCo's version of that application and accompanying affidavit. Any confidential information referenced in the Joint Application has been provided to the Commission Staff for filing in Commission Docket 10-1799-EL-EEC, under a request for protective treatment. OPCo respectfully requests that the Commission treat the two cases as associated dockets.

Cordially,

/s/ Yazen Alami  
Yazen Alami

Attachments



## Public Utilities Commission

### Application to Commit Energy Efficiency/Peak Demand Reduction Programs (Mercantile Customers Only)

**Case No.:** 13-0188-EL-EEC

Mercantile Customer: SPENCERVILLE LOCAL SCHOOL DISTRICT

Electric Utility: Ohio Power

Program Title or Description: AEP Ohio Business Incentives for Energy Efficiency: Self Direct Program

Rule 4901:1-39-05(F), Ohio Administrative Code (O.A.C.), permits a mercantile customer to file, either individually or jointly with an electric utility, an application to commit the customer's existing demand reduction, demand response, and energy efficiency programs for integration with the electric utility's programs. The following application form is to be used by mercantile customers, either individually or jointly with their electric utility, to apply for commitment of such programs in accordance with the Commission's pilot program established in Case No. [10-834-EL-POR](#)

Completed applications requesting the cash rebate reasonable arrangement option (Option 1) in lieu of an exemption from the electric utility's energy efficiency and demand reduction (EEDR) rider will be automatically approved on the sixty-first calendar day after filing, unless the Commission, or an attorney examiner, suspends or denies the application prior to that time. Completed applications requesting the exemption from the EEDR rider (Option 2) will also qualify for the 60-day automatic approval so long as the exemption period does not exceed 24 months. Rider exemptions for periods of more than 24 months will be reviewed by the Commission Staff and are only approved up the issuance of a Commission order.

Complete a separate application for each customer program. Projects undertaken by a customer as a single program at a single location or at various locations within the same service territory should be submitted together as a single program filing, when possible. Check all boxes that are applicable to your program. For each box checked, be sure to complete all subparts of the question, and provide all requested additional information. Submittal of incomplete applications may result in a suspension of the automatic approval process or denial of the application.

Any confidential or trade secret information may be submitted to Staff on disc or via email at [ee-pdr@puc.state.oh.us](mailto:ee-pdr@puc.state.oh.us).

## Section 1: Company Information

Name: SPENCERVILLE LOCAL SCHOOL DISTRICT

Principal address: 600 School St, Spencerville, Oh 45887

Address of facility for which this energy efficiency program applies: 2500 Wisher Dr, Spencerville, Oh 45887-1293

Name and telephone number for responses to questions:

Amy Shoppell, Spencerville Local School District, (419) 647-4111

Electricity use by our company (check the box(es) that apply):

- ☒ The customer uses more than seven hundred thousand kilowatt hours per year at our facility. (Please attach documentation.)

See Confidential and Proprietary Attachment 4 – Calculation of Rider Exemption and UCT which provides the facility consumption for the last three years, benchmark kWh, and the last 12 months usage.

- ☐ The customer is part of a national account involving multiple facilities in one or more states. (Please attach documentation.) When checked, see Attachment 6 – Supporting Documentation for a listing of the customer's name and service addresses of other accounts in the AEP Ohio service territory.

## Section 2: Application Information

A) The customer is filing this application (choose which applies):

- ☐ Individually, on our own.
- ☒ Jointly with our electric utility.

B) Our electric utility is: Ohio Power Company

The application to participate in the electric utility energy efficiency program is "Confidential and Proprietary Attachment 3 – Self Direct Program Project Completed Application."

C) The customer is offering to commit (choose which applies):

- ☐ Energy savings from our energy efficiency program. (Complete Sections 3, 5, 6, and 7.)
- ☐ Capacity savings from the customer's demand response/demand reduction program. (Complete Sections 4, 5, 6, and 7.)
- ☒ Both the energy savings and the demand reduction from the customer's energy efficiency program. (Complete all sections of the Application.)

### Section 3: Energy Efficiency Programs

A) The customer's energy efficiency program involves (choose whichever applies):

- ☒ Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, 7/1/2010 and the date on which the customer would have replaced your equipment if you had not replaced it early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)).

The remaining life of the equipment varies and is not known with certainty. The future replacement date is unknown and has historically been at the end of equipment life. Replacement was completed early to achieve energy savings and to reduce future maintenance costs.

- ☐ Installation of new equipment to replace equipment that needed to be replaced. The customer installed new equipment on the following date(s):
- ☐ Installation of new equipment for new construction or facility expansion. The customer installed new equipment on the following date(s):
- ☐ Behavioral or operational improvement.

B) Energy savings achieved/to be achieved by your energy efficiency program:

- 1) If you checked the box indicating that your project involves the early replacement of fully functioning equipment replaced with new equipment, then calculate the annual savings [(kWh used by the original equipment) - (kWh used by new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Unit Quantity (watts) = Existing (watts x units) - Installed (watts x units)

kWh Reduction (Annual Savings) = Unit Quantity x (Deemed kWh/Unit)

Annual savings: 63,091 kWh

See Confidential and Proprietary Attachment 5 – Self Direct Program Project Calculation for annual energy savings calculations Attachment 6 – Supporting Documentation for custom measures work papers that provide all methodologies, protocols, and practices used in this application for custom measures, as needed.

- 2) If you checked the box indicating that you installed new equipment to replace equipment that needed to be replaced, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh used by the higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: kWh

Please describe the less efficient new equipment that you rejected in favor of the more efficient new equipment.

- 3) If you checked the box indicating that your project involves equipment for new construction or facility expansion, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh used by higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: kWh

Please describe the less efficient new equipment that you rejected in favor of the more efficient new equipment.

- 4) If you checked the box indicating that the project involves behavioral or operational improvements, provide a description of how the annual savings were determined.

## Section 4: Demand Reduction/Demand Response Programs

A) The customer's program involves (check the one that applies):

- ☒ Coincident peak-demand savings from the customer's energy efficiency program.
- ☐ Actual peak-demand reduction. (Attach a description and documentation of the peak-demand reduction.)
- ☐ Potential peak-demand reduction (check the one that applies):

➤ Choose one or more of the following that applies:

- ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a tariff of a regional transmission organization (RTO) approved by the Federal Energy Regulatory Commission.
- ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a program that is equivalent to an RTO program, which has been approved by the Public Utilities Commission of Ohio.

B) On what date did the customer initiate its demand reduction program?

The coincident peak-demand savings are permanent installations that reduce demand through energy efficiency and were installed on the date specified in Section 3 A above.

C) What is the peak demand reduction achieved or capable of being achieved (show calculations through which this was determined):

$$\text{Unit Quantity (watts)} = \text{Existing (watts x units)} - \text{Installed (watts x units)}$$

$$\text{KW Demand Reduction} = \text{Unit Quantity (watts)} \times (\text{Deemed KW/Unit (watts)})$$

1.8 kW

See Confidential and Proprietary Attachment 5 – Self Direct Program Project Calculation for peak demand reduction calculation, and Attachment 6 – Supporting Documentation for custom measures work papers that provide all methodologies, protocols, and practices used in this application for custom measures, as needed.

## **Section 5: Request for Cash Rebate Reasonable Arrangement (Option 1) or Exemption from Rider (Option 2)**

Under this section, check the box that applies and fill in all blanks relating to that choice.

Note: If Option 2 is selected, the application will not qualify for the 60-day automatic approval. All applications, however, will be considered on a timely basis by the Commission.

A) The customer is applying for:

☒ Option 1: A cash rebate reasonable arrangement.

OR

☐ Option 2: An exemption from the cost recovery mechanism implemented by the electric utility.

OR

☐ Commitment payment

B) The value of the option that the customer is seeking is:

Option 1: A cash rebate reasonable arrangement, which is the lesser of (show both amounts):

☒ A cash rebate of \$ 3,785.46. (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)

See Confidential and Proprietary Attachment 5 – Self Direct Program Project Calculation for incentive calculations for this mercantile program.

Option 2: An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider.

☐ An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for \_\_\_\_ months (not to exceed 24 months). (Attach calculations showing how this time period was determined.)



OR

- ☐ A commitment payment valued at no more than \$\_\_\_\_\_. (Attach documentation and calculations showing how this payment amount was determined.)

OR

- ☐ Ongoing exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for an initial period of 24 months because this program is part of an ongoing efficiency program that is practiced by our organization. (Attach documentation that establishes your organization's ongoing efficiency program. In order to continue the exemption beyond the initial 24 month period your organization will need to provide a future application establishing additional energy savings and the continuance of the organization's energy efficiency program.)

## Section 6: Cost Effectiveness

The program is cost effective because it has a benefit/cost ratio greater than 1 using the (choose which applies):

- ☐ Total Resource Cost (TRC) Test. The calculated TRC value is: \_\_\_\_\_  
(Continue to Subsection 1, then skip Subsection 2)
- ☒ Utility Cost Test (UCT) . The calculated UCT value is: 4.5 (Skip to Subsection 2.)

### Subsection 1: TRC Test Used (please fill in all blanks).

The TRC value of the program is calculated by dividing the value of our avoided supply costs (generation capacity, energy, and any transmission or distribution) by the sum of our program overhead and installation costs and any incremental measure costs paid by either the customer or the electric utility.

The electric utility's avoided supply costs were \_\_\_\_\_.

Our program costs were \_\_\_\_\_.

The utility's incremental measure costs were \_\_\_\_\_.

### Subsection 2: UCT Used (please fill in all blanks).

We calculated the UCT value of our program by dividing the value of our avoided supply costs (capacity and energy) by the costs to our electric utility (including administrative costs and incentives paid or rider exemption costs) to obtain our commitment.

Our avoided supply costs were \$ 18,731.78

The utility's program costs were \$ 378.55

The utility's incentive costs/rebate costs were \$ 3,785.46.

## Section 7: Additional Information

Please attach the following supporting documentation to this application:

- Narrative description of your program including, but not limited to, make, model, and year of any installed and replaced equipment.

See Attachment 1 - Self Direct Project Overview and Commitment for a description of the project. See Attachment 6 - Supporting Documentation, for the specifications of the replacement equipment work papers that provide all methodologies, protocols, and practices used in this application for custom measures, as needed. Due to the length of time since the equipment replacement, the make, model and year of the replaced equipment is not available.

- A copy of the formal declaration or agreement that commits your program to the electric utility, including:

- 1) any confidentiality requirements associated with the agreement;

See Attachment 2 - Self Direct Program Project Blank Application including Rules and Requirements. All confidentiality requirements are pursuant to the Retrospective Projects/Rules and Requirements that are part of the signed application which is provided as Confidential and Proprietary Attachment 3 - Self Direct Program Project Completed Application.)

- 2) a description of any consequences of noncompliance with the terms of the commitment;

See Attachment 2 - Self Direct Program Project Blank Application including Rules and Requirements. All consequences of noncompliance are pursuant to the Retrospective Projects/Rules and Requirements that are part of the signed application which is provided as Confidential and Proprietary Attachment 3 - Self Direct Program Project Completed Application.

- 3) a description of coordination requirements between the customer and the electric utility with regard to peak demand reduction;

None required because the resources committed are permanent installations that reduce demand through increased efficiency during the Company's peak summer demand period generally defined as May through September and do not require specific coordination and communication to provide demand reduction capabilities to the Company.

- 4) permission by the customer to the electric utility and Commission staff and consultants to measure and verify energy savings and/or peak-demand reductions resulting from your program; and,

See Attachment 2 - Self Direct Program Blank Application including Rules and Requirements granting such permission pursuant to the Retrospective Projects/Rules and Requirements that are part of the signed application which is provided as Confidential and Proprietary Attachment 3 - Self Direct Program Project Completed Application.

- 5) a commitment by you to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.

See Attachment 1 - Self Direct Project Overview and Commitment for the commitment to comply with any information and compliance reporting requirements imposed by rule or as part of the approval of this arrangement by the Public Utilities Commission of Ohio.

- A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results. Additionally, identify and explain all deviations from any program measurement and verification guidelines that may be published by the Commission.

The Company applies the same methodologies, protocols, and practices to Self Direct Program retrospective projects that are screened and submitted for approval as it does to prospective projects submitted through its Prescriptive and Custom Programs. The Commission has not published a technical reference manual for use by the Company so deviations can not be identified. The project submitted is a custom project and energy savings are determined as described in Confidential and Proprietary Attachment 5 - Self Direct Program Project Calculation, Attachment 6 - Supporting Documentation for custom measures work papers that provide all methodologies, protocols, and practices used in this application for custom measures, as needed.



# Public Utilities Commission

Application to Commit  
Energy Efficiency/Peak Demand  
Reduction Programs  
(Mercantile Customers Only)

Case No.: 13-0188-EL-EEC

State of OHIO :

JEFFREY ROE, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:  
  
KEMA Services, Inc agent of Ohio Power
2. I have personally examined all the information contained in the foregoing application, including any exhibits and attachments. Based upon my examination and inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete.

[Signature]  
Signature of Affiant & Title

ENERGY EFFICIENCY ENGINEER

Sworn and subscribed before me this 11<sup>th</sup> day of JANUARY, 13 Month/Year

[Signature]  
Signature of official administering oath

Craig Waugh Banker  
Print Name and Title

My commission expires on 06/14/2016





### Self Direct Project Overview & Commitment

The Public Utility Commission of Ohio (PUCO) will soon review your application for participation in AEP Ohio's Energy Efficiency/Peak Demand Response program. Based on your submitted project, please select by initialing one of the two options below, sign and fax to 877-607-0740.

<b>Customer Name</b>	SPENCERVILLE LOCAL SCHOOL DISTRICT	
<b>Project Number</b>	AEP-12-08475	
<b>Customer Premise Address</b>	2500 WISHER DR, SPENCERVILLE, OH 45887-1293	
<b>Customer Mailing Address</b>	600 School St, Spencerville, OH 45887	
<b>Date Received</b>	10/29/2012	
<b>Project Installation Date</b>	7/1/2010	
<b>Annual kWh Reduction</b>	63,091	
<b>Total Project Cost</b>	\$32,022.54	
<b>Unadjusted Energy Efficiency Credit (EEC) Calculation</b>	\$5,047.28	
<b>Simple Payback (yrs)</b>	5.9	
<b>Utility Cost Test (UCT)</b>	4.5	
<i>Please Choose One Option Below and Initial</i>		
<b>Option 1 - Self Direct EEC: 75%</b>	<b>\$3,785.46</b>	<input checked="checked" type="checkbox"/> Initial: <i>[Signature]</i>
<b>Option 2 - EE/PDR Rider Exemption</b>	<b>13 Months (After PUCO Approval)</b>	<input type="checkbox"/> Initial: _____

**Note:** This is a one time selection. By selecting Option 1, the customer will receive payment in the amount stated above. Selection of Option 2: EE/PDR rider exemption, will result in the customer not being eligible to participate in any other energy efficiency programs offered by AEP Ohio during the period of exemption. In addition, the term of Option 2: EE/PDR rider exemption is subject to ongoing review for compliance and could be changed by the PUCO.

If Option 1 has been selected, will the Energy Efficiency Funds selected help you move forward with other energy efficiency projects?

☒ YES ☐ NO

#### Project Overview:

The Self Direct (Custom) project that the above has completed and applied is as follows.

Replace (3) HP 735-Watt Servers with (1) Dell PowerEdge R710 server.  
Replace (115) IBM G50 105-Watt Computer Monitors with (115) Acer Flat Screen Monitors  
Replace (120) IBM PC300GL Computer Terminals with (120) Devon Thin Clients Terminals

The documentation that was included with the application proved that the energy measures applied for were purchased and installed.

By signing this document, the Mercantile customer affirms its intention to commit and integrate the above listed energy efficiency resources into the utility's peak demand reduction, demand response, and energy efficiency programs. By signing, the Mercantile customer also agrees to serve as a joint applicant in any filings necessary to secure approval of this arrangement by the Public Utilities Commission of Ohio, and comply with any information and compliance reporting requirements imposed by rule or as part of that approval.

Ohio Power Company

By: *[Signature]*  
Title: Manager  
Date: 1/11/2013

SPENCERVILLE LOCAL SCHOOL DISTRICT

By: *[Signature]*  
Title: Supr.  
Date: 1-10-13





## Self-Direct Program Project Application

# RETROFIT AND NEW CONSTRUCTION

### Step 1: Check Project, Equipment, and Customer Eligibility

- ✓ Project must be a facility improvement that results in a permanent reduction in electrical energy usage (kWh).
- ✓ Measures applying for credits must have a minimum operating hours of 2,245 hours per year. Projects with annual energy (kWh) savings greater than the facility's annual energy (kWh) consumption will not be eligible.
- ✓ All installed equipment must meet or exceed the specifications given in the application and be installed in facilities served by AEP Ohio: Customer must have a valid AEP Ohio account number on an eligible AEP Ohio non-residential rate (see terms and conditions for list of eligible rates eligibility requirements).

### Step 2: Submit Application

- ✓ Fill out the Customer Information form and the Worksheet for the measures that you installed. You may submit the application via mail, fax, or e-mail.

Submit your application to:  
Email: [gridsmartohio@kema.com](mailto:gridsmartohio@kema.com)

AEP Ohio Business Incentives for Energy Efficiency  
2740 Airport Drive Suite 160  
Columbus, OH 43219  
Call: (877) 607-0739  
Fax: (877) 607-0740

Visit our web site at [aridsmartohio.com](http://aridsmartohio.com)

- ✓ Submit a completed application prior to November 16, 2012 for any projects completed on or after January 1, 2009. Any applications received after the deadline may not be submitted to the PUCO by December 31st, 2012 and could jeopardize approval of any credit. Complete the checklist page and attach the documentation listed: customer information page, a signed Final Payment Agreement page, measure worksheet, scope of work (type, quantity, and wattage of old and new equipment), dated and itemized invoices for the purchase and installation of all equipment installed and specification sheets for all equipment installed showing that it meets the program specifications.

### Step 3: Project Review

- ✓ The program team will review your Application. For some projects, an inspection will be part of the review, and you will be contacted to schedule it.
- ✓ After approval by AEP Ohio, the customer will be sent an Overview and Commitment form to sign for all self-direct projects. After the Overview and Commitment form is returned the project will be submitted to the Public Utilities Commission of Ohio (PUCO) for consideration. The PUCO will assign case number and review the project details that were prepared by AEP Ohio. The PUCO may request additional information, approve or reject the energy efficiency credits.

### Step 4: Receive Energy Efficiency Credits

- ✓ The program team will issue the energy efficiency credits, within four to six weeks after PUCO project approval.
- ✓ In lieu of a one-time energy efficiency credit, you may elect to seek an exemption from the Energy Efficiency/Peak Demand Reduction (EE/PDR) Rider for the associated electric account(s) for a defined period of time as stated on this Application. For this exemption the Energy Efficiency Credit amount (Option 1) is compared to the estimated value of the estimated EE/PDR obligation (Option 2), as calculated by AEP Ohio. The value of Option 2 will be approximately equal to the value of Option 1. If exemption is elected, the affected account is not eligible for other programs offered by AEP Ohio during the exemption period. Unless additional resources are committed, you will, after the specified number of months exempted, be again subject to the EE/PDR Rider. New Construction projects are not eligible to elect Option 2. Major Renovation projects that do not have a representative billing history for three years prior to the project installation are also not eligible to elect Option 2.
- ✓ If the energy efficiency credit is elected, you remain in the EE/PDR rider for the period of time that an exemption would have been in effect and may also participate in the AEP Ohio programs. However, during that period of time, you will not be allowed to elect the Option 2 exemption for any additional self-direct projects for the same account number.
- ✓ You are allowed and encouraged to consider using all or a portion of the energy credits, as received from AEP Ohio under this program, to help fund other energy efficiency and demand reduction projects you choose to initiate in the future. Future projects can also qualify for credits under the Prescriptive or Custom programs.

*If you are viewing this document in Microsoft Excel, please note that each section of the application is accessible through the tabs at the bottom of the Excel window. Highlighted cells are for inputting information.*



## Self-Direct Program Project Application

# APPLICATION CHECKLIST

APPLICATION	
<b>Required Attachments</b>	
<input type="checkbox"/>	<a href="#">Customer/Contractor Information (Completed and Signed)</a>
<input type="checkbox"/>	<a href="#">Completed Forms for Energy Efficiency Credits Requested AND Signed Final Payment Agreement Page</a>
<input type="checkbox"/>	Itemized Invoices
<input type="checkbox"/>	Equipment Specifications
<input type="checkbox"/>	Scope of Work
<input type="checkbox"/>	W-9 (LLC, Individual, Partnership, Property Management Companies)
<b>Worksheets</b>	
<input type="checkbox"/>	<a href="#">Lighting</a>
<input type="checkbox"/>	<a href="#">HVAC</a>
<input type="checkbox"/>	<a href="#">Refrigeration</a>
<input type="checkbox"/>	<a href="#">Motors and VFD</a>
<input type="checkbox"/>	<a href="#">Custom</a>
Application Date: _____	
Completion Date: _____	
Project Cost: _____	
<i>*Incomplete applications will delay processing and energy efficiency credits. Please complete and submit forms for above checked boxes.</i>	

*Please fill out if this is a revised submittal*

ORIGINAL SUBMITTAL DATE: _____
APPLICATION NUMBER (IF KNOWN): _____

**AEP Ohio Business Incentives Program for Energy Efficiency**  
**2740 Airport Drive Suite 160**  
**Columbus, OH 43219**

Phone: (877) 607-0739  
Fax: (877) 607-0740  
[gridsmartohio@kema.com](mailto:gridsmartohio@kema.com)  
[www.gridsmartohio.com](http://www.gridsmartohio.com)





## Self-Direct Program Project Application

### TERMS AND CONDITIONS

AEP Ohio is offering prescriptive and custom incentives under the AEP Ohio Business Incentives for Energy Efficiency program to offer the implementation of past cost-effective energy efficiency improvements for non-residential (commercial and industrial) customers. AEP Ohio provides energy efficiency credits (EEC) for the purchase and installation of qualifying cost effective equipment in the customer's facility under the Terms and Conditions provided in this application and subject to regulatory approvals. Energy Efficiency credits will only be provided in the form of a check or an Energy Efficiency/Peak Demand Reduction (EE/PDR) Rider exemption under this program.

Please note that funds are limited and subject to availability.

All applications are subject to review and approval by AEP Ohio, its contractor(s)/agent(s), and the Public Utility Commission of Ohio (PUCO) prior to any EEC payments or exemptions from the EE/PDR rider in this program. Funds are limited and subject to availability.

#### Program Effective Dates

AEP Ohio Business Incentives for Energy Efficiency program EEC are offered until approved funds are exhausted or November 16th of each program year, whichever comes first. The effective dates of the current program year and application submittal requirements are as follows:

- Self-direct projects are projects completed since 1/1/2009. Self direct projects are eligible to apply for EEC with this application. Future projects that are not yet completed should apply on the Prescriptive/Custom application.
- All 2012 AEP Ohio Business Incentives for Energy Efficiency program Applications should be received no later than November 16, 2012. Any applications received after the deadlines may not be submitted to the PUCO by December 31st, 2012 and could jeopardize approval of any incentive. AEP Ohio reserves the right to extend or shorten this timeline.
- Subsequent program year budgets and plans will be made available towards the end of the existing program year. AEP Ohio currently has filed with the PUCO to offer this program through the 2014 program year.

#### Program and Project Eligibility

The Self-Direct Program applies to customer facilities served by AEP Ohio's retail electric rates who meet the minimum energy usage requirements of 700,000 kWh per year or who are part of a national account involving multiple facilities in one or more states.

The AEP Ohio Business Incentives for Energy Efficiency program offers both prescriptive credits for some of the more common energy efficiency measures and custom credits for those eligible improvements not included on the list of prescriptive measures. Program credits are available under the AEP Ohio Business Incentives for Energy Efficiency program to include non-residential accounts served on AEP Ohio's regulated retail rates. Qualifying projects must be installed in a facility in AEP Ohio's electric service territory in Ohio. These credits are available to all non-residential customers who pay into the Energy Efficiency and Peak Demand Response (EE/PDR) rider and receive their electricity over AEP Ohio wires, regardless which retail electric supplier the customer has chosen to purchase power. A customer may neither apply for nor receive incentives for the same product, equipment or service from more than one utility.

Custom projects must involve measures, which result in a reduction in electric energy usage due to an improvement in system efficiency. Projects that result in reduced energy consumption without an improvement in system efficiency are not eligible for a custom credit. The project simple payback prior to the incentive payment generally should fall between 1 to 7 years, or pass cost effectiveness test(s) determined by AEP Ohio to qualify for an incentive. Incentives are calculated based on first-year energy savings and peak demand reduction. Peak demand reduction is defined as the reduction in average load over the Performance Hours by the replacement of existing electrical equipment with more efficient electrical equipment. Peak Performance Hours is defined as the time between June 1st and August 31st on weekday, non-holidays, between the hours 3:00 PM and 6:00 PM Eastern Time.

Projects involving measures covered by the prescriptive credit portion of the program are not eligible for a custom credit. However, the applicant has the option to apply for a custom incentive for whole building integrated projects or systems, even if they include prescriptive measures. The prescriptive elements may be capped at the deemed savings and/or incentive level.



## Self-Direct Program Project Application

### TERMS AND CONDITIONS

Project requirements under the AEP Ohio Business Incentives for Energy Efficiency program include the following:

- Projects must involve a new facility improvement that results in a permanent reduction in electrical energy usage (kWh).
- Projects that are NOT eligible for a credit include the following:
  - Fuel switching (e.g. electric to gas or gas to electric)
  - Changes in operational and/or maintenance practices or simple control modifications not involving capital costs
  - Removal or termination of existing processes, facilities, and/or operations.
  - On-site electricity generation
  - Projects involving gas-driven equipment in place of or to replace electric equipment (such as a chiller)
  - Projects focused primarily on power factor improvement
  - Projects that involve peak-shifting (and not kWh savings)
  - Renewables (Please visit [www.gridsmartohio.com](http://www.gridsmartohio.com) for Renewables Program)
  - Are required by state or federal law, building or other codes, or are standard industry practice
  - Are easily reverted/removed or are installed entirely for reasons other than improving energy efficiency
  - Include other conditions to be determined by AEP Ohio
  - Renewables (Please visit [www.gridsmartohio.com](http://www.gridsmartohio.com) for Renewables Program)
- Any measures installed at a facility must produce verifiable and persistent energy reduction and must be sustainable and provide 100% of the energy benefits as stated in the Application for a period of at least five (5) years or for the life of the product, whichever is less. If the Customer ceases to be a delivery service customer of AEP Ohio or removes the equipment or systems at any time during the 5-year period or the life of the product, the Customer may be required to return a prorated amount of incentive funds to AEP Ohio.
- Customer cannot apply for incentives for future projects and elect after the fact to apply for credits under this program.
- Confidential information contained in any documents associated with this application will be protected from public filings. However, this information may be disclosed to the Public Utilities Commission of Ohio for further review and approval.
- Used or rebuilt equipment is generally NOT eligible for an incentive.
- All installed equipment must meet state, federal, and local codes and requirements.
- Costs associated with internal labor are not eligible.
- Projects must be installed on the AEP Ohio electric account in Ohio served by an eligible electric rate type listed on the application.
- Equipment must be purchased, installed, and operating (or capable of operating in the case of seasonal uses) prior to submitting a final application for an incentive.
- AEP Ohio will issue incentive payments in the form of checks, not utility bill credits.
- The incentive is paid as a one-time, one-program offer and cannot be combined with incentive payments from other AEP Ohio programs. The customer may be eligible to participate in other programs offered by AEP Ohio, as long as no project receives more than one incentive.

PROGRAM ENERGY EFFICIENCY CREDITS	
Energy efficiency credit levels for one-year energy savings	See tables for prescriptive credits. Custom credits \$0.08/kWh X 75%
Minimum/Maximum simple payback before energy efficiency credit applied	Must pass cost effectiveness test(s) (determined by AEP Ohio). Generally between 1-7 years.
Maximum payout	75% of 50% of the total cost (additional measure caps may apply)
Energy efficiency credit levels for projects completed since 1/1/2009	calculated amount on the Prescriptive or Custom worksheets attached and subject to funding limits
Credit Limit	See Incentive Limits and Tiering section
Credit Calculation Order	Measure credit caps are applied first. Project cost credit limits are applied second. Credit tiering is applied third. And 75% factor applied to credit last.



## Self-Direct Program Project Application

# TERMS AND CONDITIONS

### Energy Efficiency Credit Limits

For both the Prescriptive and Custom measures in this application, the total energy efficiency credits shall be 75% the lesser of: 1) The calculated credit as approved by AEP Ohio, or 2) 50% of Total Project Cost (not including internal labor cost). In calculating the savings and energy efficiency credits for Custom measures, please contact AEP Ohio Business Incentives for Energy Efficiency Program office to determine appropriate baseline for savings.

### Incentive Limits and Tiering

- The limit for each self-direct project is \$225,000.
- The limit for each business entity (corporation, LLC, partnership, etc) is based on their tariff, indicated below.

TARIFF	LIMIT PER BUSINESS ENTITY
General Service Tariffs 1, 2, 3 & 4	\$900,000 per year

- A business entity with facilities in both categories can qualify for both limits. All facilities served in one category for a business entity are combined to determine the limit.
- The total credit paid for any self direct application cannot exceed 50% of the total project cost (not including internal labor). In addition to the above project cost limit, credit payment rates vary when a customer's calculated credit exceeds the tiers listed below:
  - **Tier 1** \$0 - \$100,000 = 100% of eligible calculated credit value
  - **Tier 2** \$100,001 - \$300,000 = 50% of eligible calculated credit value
  - **Tier 3** \$300,001 - \$500,000 = 25% of eligible calculated credit value
  - **Tier 4** \$500,001 - Beyond = 10% of eligible calculated credit value

### Application

Application should be submitted by November 16, 2012 for any projects completed or or after Jan 1, 2009 or later. Any applications received after the deadlines may not be submitted to the PUCO by November 16, 2012 and could jeopardize approval of any incentive. Project documentation, such as copies of dated invoices for the purchase and installation of the measure and/or product specification sheets, is required. AEP Ohio reserves the right to request additional backup information, supporting detail, calculations, manufacturer specification sheets or any other information to any credit payment.

The location or business name on the invoice must be consistent with the application information. Applications shall all required documentation should be received by November 16, 2012 to be applicable for the 2012 program year.

A signed application with documentation verifying installation of the project including, but not limited to, equipment, invoices, approvals, and other related information must be submitted to AEP Ohio prior to application approval.

The project invoice should provide sufficient detail to separate the project cost from the cost of other services such as repairs and building code compliance. AEP Ohio reserves the right to request additional supporting documentation as deemed necessary to ensure measure eligibility and verify that the expected energy savings will occur. Confidential information contained in any documents associated with this application will be protected from public filings. However, this information could include: equipment purchase dates, installation dates, proof that the equipment is operational, manufacturer specifications, warranty information, and proof of customer co-payment.

The customer understands and agrees that all other terms and conditions, as specified in the application, including all attachments and exhibits attached to this application, serves as a contract for the customer's commitment of energy resources to AEP Ohio, shall apply.



## Self-Direct Program Project Application

# TERMS AND CONDITIONS

### Application Review Process

AEP Ohio will review Applications for eligibility and completeness. Completed applications will be reviewed in the order received. Funds are reserved for the project when AEP Ohio receives a complete application and determines that the project meets the program eligibility requirements. Applicants who submit incomplete applications will be notified of deficiencies upon review of the application, and may lose their place in line in the review process until all requested information is received. Applications must be completed and all information received by the deadlines defined above to begin processing. Applicants are encouraged to call the program hotline if they have any questions about documentation requirements.

### Inspections

AEP Ohio reserves the right to inspect all projects to verify compliance with the program rules and verify the accuracy of project documentation. This may include installation inspections, verification of detailed lighting layout descriptions, metering, data collection, interviews, and utility bill or monitoring data analyses. The customers are required to allow access to project documents and the facility where the measures were installed for a period of five years after receipt of incentive payment by AEP Ohio. Customer understands and agrees that Program installations may also be subject to inspections by the PUCO or their designee, and photographs of installation may be required.

### Tax Liability

Credits are taxable and, if more than \$600, will be reported to the IRS unless the customer is exempt. AEP Ohio is not responsible for any taxes that may be imposed on your business as a result of your receipt of payment. W-9 (for LLC, Individual, Partnership, Property Management Companies) must be provided along with all applications.

### Requirements for Custom Project Electricity Savings Calculation

The annual electricity savings must be calculated for custom projects using industry-accepted engineering algorithms or simulation models. The applicant may estimate the annual electricity usage of both the existing and proposed equipment based on the current operation of the facility. A listing of the pre-existing information requirements is provided at the end of the custom application section. If the previous equipment was at the end of its useful life, the applicant must use, as the baseline, the equipment that would meet the applicable federal and local energy codes unless an "as found" baseline is being used by the applicant. If the applicant is using an "as found" baseline, additional specific information on the pre-existing information must be provided.

The applicant must be able to clearly describe the method used to calculate the savings. The applicant must provide all assumptions used in the calculations and document the sources for these assumptions. If no savings analysis is provided by the customer/contractors, AEP Ohio reserves the right to utilize their approved methodology and analysis to determine energy savings.

The method and assumptions used by the applicant to calculate the annual savings will be reviewed by AEP Ohio. AEP Ohio is solely responsible for the final determination of the annual energy savings and peak demand reduction to be used in calculating the credit amount. AEP Ohio also reserves the right to require specific measurement and verification activities including monitoring the retrofit to determining the credit. Verification of the preexisting consumption may also be required.

AEP Ohio may need to conduct inspections of projects to verify equipment and operating conditions. For custom and "as found" projects, the applicant is required to provide information in order to allow AEP Ohio to verify the baseline usage of the pre-existing equipment. Customers are encouraged to submit projects that warrant special treatment (i.e., non-typical projects) to be considered on a case-by-case basis by AEP Ohio.

### Disclaimer

AEP Ohio does not guarantee the energy savings and does not make any warranties associated with the measures eligible for credits under this program. AEP Ohio has no obligations regarding and does not endorse or guarantee any claims, promises, work, or equipment made, performed, or furnished by any contractors or equipment vendors that sell or install any energy efficiency measures. AEP Ohio is not responsible for the proper disposal/recycling of any waste generated as a result of this project. AEP Ohio is not liable for any damage caused by the operation or malfunction of the installed equipment.



## Self-Direct Program Project Application

**Important:** Please read the terms and conditions before signing and submitting this application.  
You must complete all information and provide required additional documentation to avoid processing delays.

### CUSTOMER INFORMATION

<b>Business Type (select one)</b>	<b>Tax Status (from W9)</b>	<b>How Did You Hear?</b>
LARGE OFFICE <input type="checkbox"/>	CORPORATION (Inc., PC, Etc.) <input type="checkbox"/>	AEP Account Representative <input type="checkbox"/>
SMALL OFFICE <input type="checkbox"/>	Government Agency <input type="checkbox"/>	Contractor <input type="checkbox"/>
SCHOOL <input type="checkbox"/>	Individual <input type="checkbox"/>	Distributor <input type="checkbox"/>
SMALL RETAIL/SERVICE <input type="checkbox"/>	Partnership <input type="checkbox"/>	Website <input type="checkbox"/>
LARGE RETAIL/SERVICE <input type="checkbox"/>	Exempt <input type="checkbox"/>	Other <input type="checkbox"/>
HOTEL/MOTEL <input type="checkbox"/>	OTHER (may receive 1099) _____	
MEDICAL - Hospital <input type="checkbox"/>		<b>Operating Days</b>
MEDICAL - Nursing Home <input type="checkbox"/>		Seven days/week <input type="checkbox"/>
ASSEMBLY/MEETING PLACE <input type="checkbox"/>		Five days/week <input type="checkbox"/>
RESTAURANT <input type="checkbox"/>	<b>Operating Hours</b>	<b>Square Footage</b>
GROCERY <input type="checkbox"/>	Low Hours (<8h /day) <input type="checkbox"/>	Affected Area S.F. _____
CONDITIONED WAREHOUSE <input type="checkbox"/>	One shift (8h /day) <input type="checkbox"/>	
UNCONDITIONED WAREHOUSE <input type="checkbox"/>	Two shifts (16h/day) <input type="checkbox"/>	
INDUSTRIAL/MANUFACTURING <input type="checkbox"/>	Three shifts (24h/day) <input type="checkbox"/>	
COLLEGE/UNIVERSITY <input type="checkbox"/>	Building Operating Hours _____	
GOVERNMENT/MUNICIPAL <input type="checkbox"/>	Equipment Operating Hours _____	
OTHER/MISCELLANEOUS <input type="checkbox"/>		

NAME OF APPLICANT'S BUSINESS		PROJECT NAME (IF APPLICABLE)	
NAME AS IT APPEARS ON UTILITY BILL	AEP OHIO ACCT #*	APPLICANT TAXPAYER ID # (SSN/FEDERAL ID)	
MAILING ADDRESS		CITY	STATE ZIP
INSTALLATION ADDRESS		CITY	STATE ZIP

### CUSTOMER CONTACT

Please provide all contacts we may need to process for this project. The business contact should be the project decision maker, the technical contact, etc

NAME OF CONTACT PERSON - Preferred Contact for Documentation			TITLE OF CONTACT
CONTACT PHONE #	EXT.	CONTACT FAX #	CONTACT EMAIL ADDRESS

### SOLUTION PROVIDER/CONTRACTOR INFORMATION \*\*

NAME OF CONTRACTING COMPANY			
NAME OF CONTACT PERSON			TITLE OF CONTACT PERSON
CONTACT PHONE #	EXT.	CONTACT FAX #	CONTACT EMAIL ADDRESS
MAILING ADDRESS			CITY STATE ZIP

If there are questions about the application who should we contact? Customer ☐ Contractor ☐

**As an eligible customer, I verify the information is correct and request consideration for participation under this program.**

CUSTOMER SIGNATURE (AEP OHIO CUSTOMER)	PRINT NAME
TOTAL INCENTIVE REQUESTED***	DATE
ESTIMATED COMPLETION DATE	ESTIMATED PROJECT COST

\* AEP Ohio Account Number where measure is installed

\*\* Solution Provider/Contractor - Party involved in the application submittal (i.e. specs, scope of work, etc.)

\*\*\* Credit cannot exceed 50 percent of the total project cost or other caps described in the Terms and Conditions.





## Self-Direct Program Project Application

### SELF-DIRECT APPLICATION AGREEMENT

I understand that the location or business name on the invoice must be consistent with the application information. Final Applications and all required supporting documentation should be received by **November 16, 2012 for projects completed on or after January 1, 2009. Any applications received after the deadlines may not be submitted to the PUCO by December 31st, 2012 and could jeopardize approval of any incentive by the PUCO.**

I agree to verification by the utility or their representatives of both sales transactions and equipment installation.

I understand that these credits are available to all non-residential customers who pay into the Energy Efficiency and Demand Response (EE/PDR) rider and receive their electricity over AEP Ohio wires regardless from which retail electric supplier the customer has chosen to purchase power.

I certify that the information on this application is true and correct, and that the Taxpayer ID Number, tax status, and W-9 are the applicant's.

I agree that if: I remove the related product(s) identified in my application before a period of 5 years or the end of the product life, whichever is less, I shall refund a prorated amount of energy efficiency credits to AEP Ohio based on the actual period of time in which the related product(s) were installed and operating. This is necessary to assure that the project's related energy benefits will be achieved.

I understand that the program may be modified or terminated without prior notice.

AEP Ohio reserves the right to refuse payment and participation if the customer or contractor violates Program rules and requirements. AEP Ohio is not liable for energy efficiency credits promised to customers as a result of misrepresentation of the Program.

Customer and customer's contractor shall be responsible to comply with any applicable codes or ordinances.

All submissions become the property of AEP Ohio. It is recommended for you to keep to a copy for your records.

I understand that this project must involve a facility improvement that results in improved energy efficiency. I also understand that all materials removed, including lamps and PCB ballasts, must be permanently taken out of service and disposed of in accordance with local codes and ordinances. I understand it is my responsibility to be aware of any applicable codes or ordinances. Information about hazardous waste disposal can be found at:  
<http://www.epa.gov/epawaste/hazard/index.htm>

I understand that the Application and all required documentation should be received by the AEP Ohio Business Incentives for Energy Efficiency program by November 16, 2012 for any projects completed on or after January 1, 2009. Any applications received after the deadlines may not be submitted to the PUCO by December 31, 2012 and could jeopardize approval of any credit by the PUCO. All equipment must be fully operational.

AEP Ohio will pay 75% of the lesser of: 1) The calculated credit as approved by AEP Ohio subject to funding limits or 2) 50% of the project cost (subject to application caps). I understand that AEP Ohio or their representatives have the right to ask for additional information at any time AEP Ohio's Business Incentives Program for Energy Efficiency will make the final determination of energy efficiency credit levels for this project.

The program has a limited budget. Applications will be processed within the budget limits. Applications and all supporting documentation required should be received by November 16, 2012 to be eligible for funding under the current program period.



## Self-Direct Program Project Application

### SELF-DIRECT APPLICATION AGREEMENT

Customer understands and agrees that all other terms and conditions, as specified in the application, including all attachments and exhibits attached to this application which will serve as a contract for the Customer's Commitment of energy and demand resources to AEP Ohio shall apply.

I understand that AEP Ohio does not guarantee the energy savings and does not make any warranties associated with the measure eligible for energy efficiency credits under this program, and, further, that AEP Ohio has no obligations regarding any claims, promises, work, or equipment made, performed, or furnished by any contractors or equipment vendors that sell or install any energy efficiency measures and does not endorse or guarantee same.

Energy efficiency credits will be based upon the final application and program terms and conditions, as well as the availability of funds.

Any and all energy savings generated by the project described in this application are hereby committed to AEP Ohio in order to count against its respective companies' benchmark requirements in S.B.221.

#### ENERGY EFFICIENCY CREDITS REQUESTED

I have read and understand the program requirements and measure specifications, and Terms and Conditions set forth in this application and agree to abide by those requirements. Furthermore, I concur that I must meet all eligibility criteria in order to be paid under this program.

**ALL EQUIPMENT MUST BE INSTALLED AND OPERATIONAL. A CUSTOMER SIGNATURE IS REQUIRED FOR PAYMENT. SIGNED APPLICATIONS RECEIVED BY FAX OR EMAIL WILL BE TREATED THE SAME AS ORIGINAL APPLICATIONS RECEIVED BY MAIL. All submissions become the property of AEP Ohio. Keep a copy for your records.**

TOTAL PROJECT COST		TOTAL ENERGY EFFICIENCY CREDITS REQUESTED*
CUSTOMER SIGNATURE (AEP OHIO CUSTOMER)		
PRINT NAME	DATE	ACTUAL COMPLETION DATE

*\*AEP Ohio will pay the lesser of 1) The calculated credit as approved by AEP Ohio 2) 50% of the total project cost of the project.*

## **8475 Summary**

New equipment purchased	
120 thin client terminals	3/4/2009
115 monitors	2/26/2009
1 server	6/15/2010

### ***New equipment kWh***

	Quantity	Watts	hr/day	days/yr	kWh
TERMINALS	120	11	10	183	2,415.60
FLAT SCREEN MONITORS	115	22	10	183	4,629.90
SERVER	1	870	24	365	7,621.20

### ***Old equipment kWh***

TERMINALS	120	145	10	183	31,842.00
CRT	115	105	10	183	22,097.25
SERVICES	3	735	24	365	19,315.80
	1	514	24	365	4,502.64

Annual savings 63,090.99

### **NOTE**

The number of terminals and monitors was reduced because some of the terminals and monitors were purchased and installed prior to 2009.



## Chapter 4. Power Supply

### Power Output

The power supply outputs shown in the following figures include the current supply capability of all the connectors, including system board, DASD, PCI, and auxiliary outputs.

**Note:** Simultaneous loading of +5 V and +3.52 V must not exceed 50 watts.

#### PC 300GL 6272

Figure 26. Power Output (85 Watt)			
Output Voltage	Regulation	Minimum Current	Maximum Current
+5 volts	+5% to -4%	1.0 A	10.0 A
+12 volts	+5% to -5%	0.2 A	2.5 A
-12 volts	+10% to -9%	0.0 A	0.4 A
-5 volts	+10% to -10%	0.0 A	0.3 A
+3.52 volts	+2% to -2%	0.0 A	7.0 A
+5 volt (auxiliary)	+5% to -10%	0.0 A	.02 A
+5 volt (LAN Wake-Up)	+5% to -10%	0.0 A	.25 A

#### PC 300GL 6282

Figure 27. Power Output (145 Watt)			
Output Voltage	Regulation	Minimum Current	Maximum Current
+5 volts	+5% to -4%	1.5 A	18.0 A
+12 volts	+5% to -5%	0.2 A	4.2 A
-12 volts	+10% to -9%	0.0 A	0.4 A
-5 volts	+10% to -10%	0.0 A	0.3 A
+3.52 volts	+2% to -2%	0.0 A	10.0 A
+5 volt (auxiliary)	+5% to -10%	0.0 A	.02 A
+5 volt (Wake on LAN)	+5% to -10%	0.0 A	.50 A

## Technical Information Manual

### PC 300GL (6272 and 6282)



Companies have saved thousands of dollars on IT costs and increased security and manageability by switching to hosted clients.

## Devon IT TC2

### *Advanced Low-Cost Thin Client*

The TC2 thin client is an ideal desktop replacement for businesses looking to downsize their infrastructures and reduce management and power costs. The small form factor unit consumes only 8–9 watts, is completely silent, and allows users to connect to a variety of servers and virtual desktops.

The TC2 is ideal for any office environment. It is a stateless device and is used by many of the world's leading financial, manufacturing, and retail companies. Companies have saved thousands of dollars on IT costs, and increased security and manageability by switching to hosted clients. Troubleshooting, software installs, and OS upgrades can all be completed at the server, saving IT administrators the hassle of updating each user's desktop.

**Devon IT, Inc.**  
1100 First Avenue  
King of Prussia, PA 19406

T: 610.757.4220  
800.369.7290  
F: 610.757.1360

[devonit.com](http://devonit.com)

**Devon IT, Europe**  
Innovation Centre  
1 Devon Way  
Longbridge  
Birmingham, UK  
B31 2TS

+44 (0)121 222 5500 - Office  
+44 (0)121 222 5501 - Fax

▶ Enhanced security makes TC2 immune from standard PC viruses, spyware, etc.	▶ Supports RDP, ICA, View, PCOIP, and virtual desktop environments
▶ Designed specifically for server-centric computing	▶ Intuitive DeTOS Operating System
▶ Stateless device, no moving parts	▶ Small desktop footprint
▶ Embedded Firefox browser	▶ Centralized management
▶ VESA mounting bracket (optional)	▶ RoHS compliant
▶ Ultra-low power consumption	▶ 1920x1200 maximum resolution
▶ Built-in Kensington security slot	

### Processor

VIA Eden 1 GHz

### Memory

1G RAM/1G DOM

### Graphics

VIA CN700 with integrated 8x AGP graphics core

### Display

Maximum resolution-1920x1200  
24-bit/16.7M colors

### Networking

10/100/1000 Ethernet  
PXE Boot  
Wake-on-LAN

### Input/Output Support

Four USB 2.0 type A ports (2 front, 2 rear)  
One PS/2  
Audio ports: line-in/line-out  
One DVI-I

### Protocol Support

Microsoft RDP  
Citrix Ready  
VMware View/PCoIP support  
Embedded browser (Mozilla Firefox with Java)  
X-Client  
XDMCP  
No Machine NX  
VNC (remote shadowing)

### Remote Management

Echo™ Software available at [www.devonit.com](http://www.devonit.com)

### Terminal Dimensions

Height: 5.9" (150mm)  
Length: 4.7" (120mm)  
Width: 1.4" (35mm)  
Weight: 1.4lbs (.66kg)

### Mounting

VESA mount option  
Foot stand  
Built-in Kensington security slot (cable sold separately)

### Power

Input: AC 100 – 240V, 47-63Hz, 2A  
Output: 12V DC 2A  
Power Supply: 24W

### Environmental

Operating: 0° C – 35° C  
Relative humidity: 10% – 85%  
Non-Operating: -20° C – 70° C Relative humidity: 0% – 95%

### Safety Certifications

FCC, CE, UL, VCCI  
RoHS Compliant

### Power Consumption

11W Maximum  
8–9W Average



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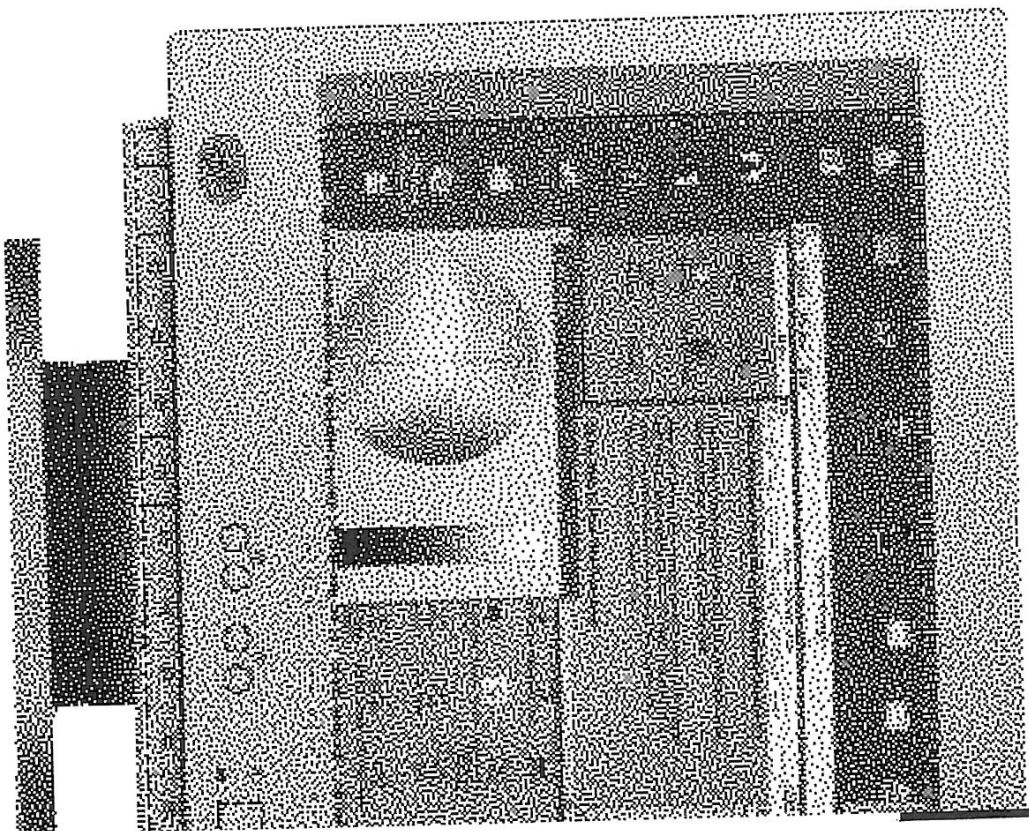
**vmware**



IBM G41/G50

User's Guide  
Guide de l'utilisateur  
Manual del usuario  
Manual do Usuário

Color  
Monitor



# Specifications

IBM 641/650

Dimensions		Width: Depth: Height: Weight -	14.1 inch (359mm) 15.5 inch (395mm) 14.4 inch (367mm) 30 lb (13.5Kg) 32 lb (14.5Kg)
Image Size	G41	Maximum Height: Maximum Width:	7.9 inch (200mm) 10.6 inch (270mm)
	G50	Maximum Height: Maximum Width:	8.1 inch (205mm) 10.8 inch (274mm)
Video Input		Input Signal: Horiz. Addressability: Vert. Addressability: DDC Capability: Clock Rate:	Analogue Direct Drive, 75 ohm 0-0.7V 1024 pels (max.) 768 pels (max.) DDC 1/2 B 79 Mpels/sec
Synchronisation Range		Horiz. Frequency: Vert. Frequency:	31 kHz - 58 kHz 50 Hz - 110 Hz
Tilt Swivel		Forward tilt: Backward tilt: Swivel	5° 15° ± 150°
Power Consumption (Typical XGA)		Normal Operation: VESA Standby State: VESA Suspend State: VESA Off State:	105 W 60 W 24 W 5 W
Environment		Operating Temperature: Storage Temperature: Shipping Temperature: Operating Humidity: Storage Humidity: Shipping Humidity: Maximum Altitude:	10 to 35° C 0 to 60° C -40 to 60° C 10 to 80% 5 to 90% 5 to 95% 7,000ft (2134m)

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Acer Support **Support Documents**

## V173 LCD Monitor Specifications

Part Number: V173 Acer V173 LCD Monitor

Following are the specifications for the Acer V173 display series.  
Specifications are subject to change without notice or obligation.

Feature	Specification
Series Name	V173
Display	17-inch (diagonal) Widescreen LCD
Active Display Area	13.31 × 10.63 inches (338.00 × 270.00 mm)
Pixel Pitch	0.264 mm
Maximum Resolution	1280 × 1024
Maximum Refresh Rate	75 Hz
Screen Treatment	Non-Glare
Panel Technology	Twisted nematic (TN)
Response Time	5ms
Contrast Ratio	Dynamic: 2,000:1 Native: 1,000:1
Brightness	300 cd/m2
Viewing Angles (CR = 10)	Horizontal: 160° Vertical: 160°
Number of Colors	16.7 million
Input Signal	VGA DVI (w/ HDCP)
Speakers	Two 1W Speakers (Optional)
VESA Wall Mounting	100 × 100 mm
Power Consumption (Energystar On)	22W (typ.)

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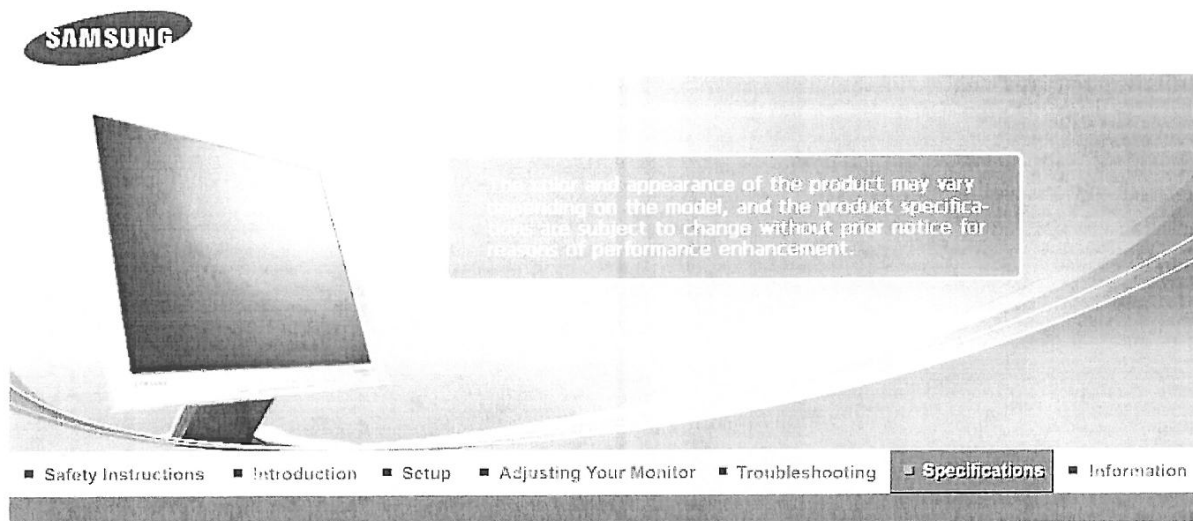
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General

PowerSaver

Preset Timing Modes

General

General

Model Name SyncMaster 720N

LCD Panel

Size 17" Diagonal (43 cm)

Display area 337.92 mm (H) x 270.336 mm (V)

Pixel Pitch 0.264 mm (H) x 0.264 mm (V)

Synchronization

Horizontal 30 ~ 81 kHz

Vertical 56 ~ 75 Hz

Display Color

16.2 M Colors

Resolution

Optimum resolution 1280 x 1024@60 Hz

Maximum resolution 1280 x 1024@75 Hz

Input Signal, Terminated

RGB Analog

0.7 Vp-p Positive at 75  $\Omega$

Separate H/V sync, Composite sync, SOG, TTL level positive or negative.

Maximum Pixel Clock

140 MHz



#### Power Supply

AC 100 ~ 240 VAC(+/- 10 %) , 60/50 Hz  $\pm$  3 Hz

#### Signal Cable

15pin-to-15pin D-sub cable, detachable

#### Dimensions (WxDxH)/ Weight (Simple Stand)

370.0 x 60.3 x 316.0 mm / 14.6 x 2.4 x 12.4 inch (Without Stand)

370.0 x 195.4 x 386.5 mm / 14.6 x 7.7 x 15.2 inch (With Basic Stand) / 4.4kg

#### VESA Mounting Interface

100 mm x 100 mm (for use with Specialty(Arm) Mounting hardware.)

#### Environmental considerations

Operating                      Temperature: 50 °F ~ 104 °F (10 °C ~ 40 °C)  
   Humidity: 10 % ~ 80 %, non-condensing

Storage                         Temperature: -4 °F ~113 °F (-20 °C ~ 45 °C)  
   Humidity: 5 % ~ 95 %, non-condensing

#### Plug and Play Capability

This monitor can be installed on any Plug & Play compatible system. Interaction of the monitor and computer systems will provide the best operating conditions and monitor settings. In most cases, monitor installation will proceed automatically, unless the user wishes to select alternate settings.

#### Dot Acceptable

TFT LCD panel manufactured by using advanced semiconductor technology with precision of 1ppm (one millionth) above is used for this product. But the pixels of RED, GREEN, BLUE and WHITE color seem to be bright sometimes or some of black pixels could be seen. This is not from bad quality and you can use it without uneasiness.

- For example, the number of TFT LCD sub pixels that is contained in this product are 3,932,160.

**Note: Design and specifications are subject to change without prior notice.**

#### Class B Equipment (Information Communication equipment for residential use)

This product complies with the Electromagnetic Compatibility Directives for residential use and can be used in all areas including common residential areas.

(Class B equipment emits less electromagnetic waves than Class A equipment.)

General

PowerSaver

Preset Timing Modes



#### PowerSaver

This monitor has a built-in power management system called PowerSaver. This system saves energy by switching your monitor into a low-power mode when it has not been used for a certain amount of time. The monitor automatically returns to normal operation when you press a key on the keyboard. For energy conservation, turn your monitor OFF when it is not needed, or when leaving it unattended for long periods. The PowerSaver system operates with a VESA DPMS compliant video card installed in your computer. Use a software utility installed on your computer to set up this feature.



State	Normal Operation	Power saving mode	Power Switch off EPA/ENERGY 2000
Power Indicator	Green	Green, Blinking	Black
Power Consumption	Less than 34 W	Less than 1 W (Off-mode)	Less than 1 W ( 120Vac/220 Vac )



This monitor is EPA ENERGY STAR® compliant and ENERGY2000 compliant when used with a computer equipped with VESA DPMS functionality.

As an ENERGY STAR® Partner, SAMSUNG has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

General	PowerSaver	Preset Timing Modes
---------	------------	---------------------

#### Preset Timing Modes

If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjust the screen as follows.

**Table 1. Preset Timing Modes**

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
IBM, 640 x 350	31.469	70.086	25.175	+/-
IBM, 640 x 480	31.469	59.940	25.175	-/-
IBM, 720 x 400	31.469	70.087	28.322	-/+
MAC, 640 x 480	35.000	66.667	30.240	-/-
MAC, 832 x 624	49.726	74.551	57.284	-/-
MAC, 1152 x 870	68.681	75.062	100.00	-/-
VESA, 640 x 480	37.500	75.000	31.500	-/-
VESA, 640 x 480	37.861	72.809	31.500	-/-
VESA, 800 x 600	35.156	56.250	36.000	+/+
VESA, 800 x 600	37.879	60.317	40.000	+/+
VESA, 800 x 600	46.875	75.000	49.500	+/+
VESA, 800 x 600	48.077	72.188	50.000	+/+
VESA, 1024 x 768	48.363	60.004	65.000	-/-
VESA, 1024 x 768	56.476	70.069	75.000	-/-

VESA, 1024 x 768	60.023	75.029	78.750	+/+
VESA, 1152 x 864	67.500	75.000	108.00	+/+
VESA, 1280 x 1024	63.981	60.020	108.00	+/+
VESA, 1280 x 1024	79.976	75.025	135.00	+/+

#### Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle and the inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz



#### Vertical Frequency

Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called Vertical Frequency or Refresh Rate. Unit: Hz

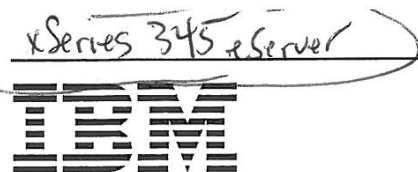
## Server specifications

### Contents

- HP ProLiant DL380 Generation 4 Server component identification
- Navigation tips
- Notices
- Server component identification
- Server operations
- Server setup
- Hardware options installation
- Server cabling
- Server software and configuration
- Troubleshooting
- Regulatory compliance notice
- Electrostatic discharge
- Server specifications
- Server specifications
- Environmental specifications
- Technical support
- Acronyms and abbreviations
- Index

Dimensions	
Height	8.59 cm (3.38 in)
Depth	66.07 cm (26.01 in)
Width	44.54 cm (17.54 in)
Weight (maximum)	27.22 kg (60 lb)
Weight (no drives installed)	20.41 kg (47.18 lb)
Input requirements	
Rated input voltage	100 - 132 VAC, 200 - 240 VAC
Rated input frequency	50 Hz to 60 Hz
Rated input current	7.5 A (100 VAC), 3.8 A (200 VAC)
Rated input power	735 W
BTUs per hour	2508
Power supply output	
Rated steady-state power	575 W
Maximum peak power	575 W

x2 Redundant Power Supplies



## IBM US Announcement Supplemental Information

May 13, 2003

### Publications

The following publications and CD-ROMs are shipped with the xSeries™ 345 server.

- The xSeries 345 Installation Guide contains an introduction to the computer, installation and setup, installing options, reference information, and problem determination. The installation guide has easy-to-use text and pictorials to enable you to quickly set up the xSeries 345 servers.
- The ServerGuide™ contains utilities and drivers to support the xSeries 345 servers. In addition, it includes a set of easy-to-use utilities for assisted installation via CD of several popular network operating systems.
- IBM Director systems management software is included.

**Note:** Software versions, features, and functions shipped with these systems may change as new releases become available or may be discontinued at any time.

xSeries 345 Installation Guide and Hardware Maintenance Manual, in U.S. English versions, are available from:

<http://www.pc.ibm.com/support>

Click servers, then the server family, then Online Publications.

### Technical Information

#### Physical Specifications

	8670-71X
Processor	Xeon
Internal speed	3.06 GHz
External speed	533 MHz
Number standard	1
Maximum	2
L2 cache (full-speed)	512 KB
Memory (133 MHz SDRAM)	512 MB DDR ECC
RDIMMs	2 x 256 MB
DIMM sockets	4
Capacity	8 GB <sup>11</sup>
Video	SVGA
Memory	8 MB
SCSI controller	Ultra320
Channels	2
Connector internal	1
Connector external	1
HDD	Open bay
Total bays	8
5.25-inch slim	1
3.5-inch slim	1
Hot-swap	6
Internal capacity	880.8 GB <sup>12,13</sup>

#### 8670-71X

Bays available	6
5.25-inch slim	0
3.5-inch slim	0
Hot-swap	6
PCI slots	5
64-bit/133 MHz	2
64-bit/100 MHz	2
32-bit/33 MHz	1
Slots available	5
Management processor	Integrated
Ethernet controller	Dual gigabit
CD-ROM (IDE)	24x-10x
Diskette drive	1.44 MB
Power supply	514 W
Number standard	1
Hot-swap	Yes
Redundant power	Optional
Auto restart	Yes

*x2 Redundant Power Supplies*

- <sup>11</sup> Supported only with the 514 Watt Hot-swap Power Supply Upgrade (74P4965)
- <sup>12</sup> Capacities are based on installation of six 146.8 GB slim-high, Ultra320 HDDs. For latest information on supported HDD options, refer to the Sales Manual or visit: <http://www.ibm.com/pc/us/compat>
- <sup>13</sup> When referring to HDD or tape backup capacity, GB stands for one billion bytes. Total user capacity may vary depending on operating environments.

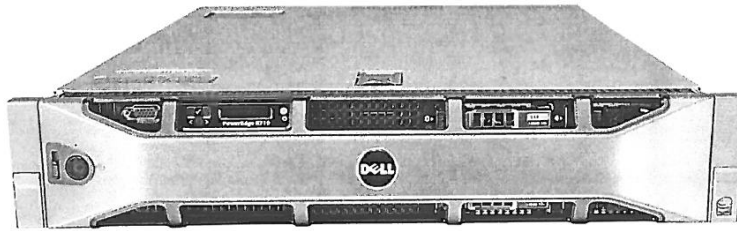
#### 24x-10x CD-ROM Drive<sup>14</sup> Characteristics

- Formatted capacity: 650 MB
  - Average access time: 110 ms
  - Burst data transfer rate: 16.6 MB/s (ATA PIO Mode 4)
  - Technology: Full constant angular velocity (CAV)
  - Buffer size: 1 MB
- <sup>14</sup> 24x-10x CD-ROM variable read rate. Actual playback speed will vary and is often less than the maximum possible.

#### Video Subsystem

- ATI Rage XL graphics accelerator
- Integrated on planar and connected to the PCI bus
- 8 MB SDRAM standard/maximum video memory
- 128-bit graphics engine with 8, 16, and 32 bpp mode acceleration
- 32 bpp (4G colors/True Color) support
- Integrated 230 MHz RAMDAC
- DDC2B monitor communications support

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: <http://www.ibm.com>.



## Dell PowerEdge R710

The Dell™ PowerEdge™ R710 helps you operate efficiently and lower TCO with enhanced virtualization capabilities, improved energy efficiency, and innovative system management tools.

### Strong IT foundation

You want a data center built for organic growth and the ability to scale based on your company's changing requirements. You need complete solutions that let you focus your time and money on managing and growing your business. Dell responds with an expanding portfolio of enterprise servers, storage technologies, and services with a single goal: to help you simplify IT.

### Purposeful design

With Dell's system commonality, once your IT managers learn one system, they understand how to manage next-generation Dell servers. Logical component layout and power supply placement provide a straightforward installation and redeployment experience. The PowerEdge R710 provides an interactive LCD for system health monitoring, alerting, and control of basic management as well as checking the AC power meter and ambient temperature thermometer included with each server.

### Enhanced virtualization

Featuring embedded hypervisors, large memory capacity with 18 DIMM slots, and 4 integrated network connections, the Dell PowerEdge R710 delivers better overall system performance and greater virtual machine-per-server capacity. The latest Intel® Xeon® processor technology adapts to your software in real time, processing more tasks simultaneously. With optional factory-integrated virtualization capabilities, you get tailored solutions that allow you to streamline deployment and simplify virtual infrastructures. Choose your hypervisor from market leaders such as VMware®, Citrix®, and Microsoft®, and enable virtualization with a few mouse clicks.

### Energy-optimized technologies

The PowerEdge R710 reduces power consumption while increasing performance capacity versus previous generation servers using Energy Smart technologies and standards-based components along with right-sized efficient power supply units, improved system-level design efficiency, and policy-driven power and thermal management. Dell's advanced thermal control delivers optimal performance at minimal power consumption without compromising enterprise performance.

### Simplified systems management

The Dell OpenManage™ suite offers enhanced operations and standards-based commands designed to integrate with existing systems for effective control.

### Lifecycle Controller

Lifecycle Controller is the engine for advanced systems management integrated on the server. Lifecycle Controller simplifies administrator tasks to perform a complete set of provisioning functions such as system deployment, system updates, hardware configuration and diagnostics from a single intuitive interface called Unified Server Configurator (USC) in a pre-OS environment. This eliminates the need to use and maintain multiple pieces of disparate CD/DVD media.

### Dell Management Console (DMC)

DMC, powered by Altiris™ from Symantec™, delivers a single view and a common data source into the entire infrastructure. DMC is an easily extensible, modular foundation that can provide basic hardware management or more advanced functions such as asset and security management. It helps reduce or eliminate manual processes so less time and money is spent keeping the lights on and more time can be spent on strategic uses of technology.

### Dell Services

Dell Services can help reduce IT complexity, lower costs, and eliminate inefficiencies by making IT and business solutions work harder for you. The Dell Services team takes a holistic view of your needs and designs solutions for your environment and business objectives while leveraging proven delivery methods, local talent, and in-depth domain knowledge for the lowest TCO.

The Dell PowerEdge R710 server with the performance of Intel Xeon processor 5500 and 5600 series offers you a 2U rack to efficiently address a wide range of key business applications.

Dell R710

Feature	PowerEdge R710 Technical Specification
<b>Form Factor</b>	2U rack
<b>Processors</b>	Quad-core or six-core Intel® Xeon® processor 5500 and 5600 series
<b>Processor Sockets</b>	2
<b>Front Side Bus or HyperTransport</b>	Intel QuickPath Interconnect (QPI)
<b>Cache</b>	Up to 12MB
<b>Chipset</b>	Intel 5520
<b>Memory<sup>1</sup></b>	Up to 288GB (18 DIMM slots): 1GB/2GB/4GB/8GB/16GB DDR3 up to 1333MT/s
<b>I/O Slots</b>	<b>4 PCIe 2.0 slots + 1 storage slot:</b> two x8 slots, two x4 slots, one x4 storage slot
<b>RAID Controller</b>	<p><b>Internal:</b> PERC H200 (6Gb/s) PERC H700 (6Gb/s) with 512MB battery-backed cache; 512MB, 1GB Non-Volatile battery-backed cache SAS 6/IR PERC 6/i with 256MB battery-backed cache</p> <p><b>External:</b> PERC H800 (6Gb/s) with 512MB of battery-backed cache; 512MB, 1GB Non-Volatile battery-backed cache PERC 6/E with 256MB or 512MB of battery-backed cache <b>External HBAs (non-RAID):</b> 6Gbps SAS HBA SAS 5/E HBA LSI2032 PCIe SCSI HBA</p>
<b>Drive Bays</b>	Eight 2.5" hard drive option or six 3.5" hard drive option; optional flex bay expansion to support half-height TBU Up to four 3.5" drives with optional flex bay, up to six 3.5" drives without optional flex bay; up to eight 2.5" SAS or SATA drives with optional flex bay <b>Peripheral bay options:</b> Slim optical drive bay with choice of DVD-ROM, Combo CD-RW/DVD-ROM, or DVD + RW
<b>Maximum Internal Storage<sup>1</sup></b>	Up to 18TB
<b>Hard Drives</b>	<p><b>Hot-plug hard drive options:</b> 2.5" SAS SSD, SATA SSD, SAS (15K, 10K), nearline SAS (7.2K), SATA (7.2K) 3.5" SAS (15K, 10K), nearline SAS (7.2K), SATA (7.2K)</p> <p><b>Solid state storage cards:</b> Fusion-io® 160GB ioDrive PCIe solid state storage card Fusion-io 640GB ioDrive Duo PCIe solid state storage card Fusion-io 320GB ioDrive Mono PCIe solid state storage card</p> <p>Fusion-io 640GB ioDrive Mono PCIe solid state storage card Fusion-io 1.28TB ioDrive Mono PCIe solid state storage card</p>
<b>Communications</b>	<p>Four embedded Broadcom® NetXtreme® II 5709c Gigabit Ethernet NIC with failover and load balancing; TOE (TCP/IP Offload Engine) supported on Microsoft® Windows Server® 2003 SP1 or higher with Scalable Networking Pack; Optional 1GbE and 10GbE add-in NICs Broadcom NetXtreme II 57711 Dual Port Direct Attach 10Gb Ethernet PCI-Express Network Interface Card with TOE and iSCSI Offload Intel Gigabit ET Dual Port Server Adapter and Intel</p> <p>Gigabit ET Quad Port Server Adapter Dual Port 10Gb Enhanced Intel Ethernet Server Adapter X520-DA2 (FcoE Ready for Future Enablement) <b>Optional add-in NICs:</b> Brocade® CNA (1020) Dual Port Server Adapter <b>Optional add in HBAs:</b> Brocade 8 GB HBAs Emulex CNA iSCSI HBA stand up adapter OCE10102-IX-D Emulex CNA iSCSI HBA stand up adapter OCE10102-FX-D</p>
<b>Power Supply</b>	<p>Energy Smart – two hot-plug high-efficient 570W PSU or high-output two hot-plug 870W PSUs</p> <p><b>Uninterruptible Power Supplies:</b> 1000W–5600W 2700W–5600W High-Efficiency Online Extended Battery Module (EBM) Network Management Card</p>
<b>Availability</b>	DDR3, hot-plug hard drives; optional hot-plug redundant power supplies; dual embedded NICs with failover and load balancing support; PERC 6/i; hot-plug redundant cooling; tool-less chassis; fibre and SAS cluster support; validated for Dell/EMC SAN
<b>Video</b>	Matrox® G200 with 8MB of cache
<b>Remote Management</b>	iDRAC6 Enterprise (optional)
<b>Systems Management</b>	Dell™ OpenManage™ Microsoft® System Center Essential (SCE) 2010 v2
<b>Embedded Hypervisor</b>	Optional Embedded SD Media
<b>Rack Support</b>	ReadyRails™ sliding rails with optional cable management arm for 4-post racks (optional adapter brackets required for threaded hole racks); ReadyRails static rails for 2-post and 4-post racks
<b>Operating Systems</b>	<p>Microsoft® Windows Server® 2012 Microsoft Windows® Small Business Server 2011 Microsoft Windows Small Business Server 2008 Microsoft Windows Server 2008 SP2, x86/x64 (x64 includes Hyper-V®) Microsoft Windows Server 2008 R2 SP1, x64 (includes Hyper-V v2) Microsoft Windows HPC Server 2008 R2 Novell® SUSE® Linux® Enterprise Server Red Hat® Enterprise Linux® Oracle® Solaris™</p> <p><b>Virtualization Options:</b> Citrix® XenServer™ VMware® vSphere™ ESX® and ESXi™</p> <p>For more information on the specific versions and additions, visit</p>
<b>Featured Database Applications</b>	Microsoft SQL Server® solutions (see <a href="#">Microsoft SQL Server solutions</a> ) Oracle database solutions (see <a href="#">Oracle database solutions</a> )
<b>Thermal Operation</b>	<b>Continuous Operation:</b> 10C to 35C, 10% to 80% relative humidity (RH), <b>10% of annual operating hours:</b> 5C to 40C, 5% to 85%RH. <b>1% of annual operating hours:</b> -5C to 45C, 5% to 90%RH. For in-depth detail, check your user manual.

<sup>1</sup> GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less.

## OEM Ready Models Available

OEM Ready platforms are grab-and-go products for OEM customers delivering a fast and simple path to a custom-branded solution. For more information, please visit [Dell.com/PowerEdge](#).

See the benefits at [Dell.com/PowerEdge](#)

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**in**

**Case No(s). 13-0188-EL-EEC**

Summary: Application of Spencerville Local School District and Ohio Power Company for approval of a special arrangement agreement with a mercantile customer electronically filed by Mr. Yazen Alami on behalf of Ohio Power Company