

**Axcera.**

## **Response to the State of West Virginia Request for Quotation, EBA342**

### **2kW Channel 29 Digital Television Transmitter for the Educational Broadcasting Authority**

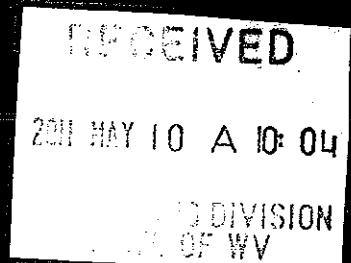
Shelly Murray, Buyer  
State of West Virginia / Department of Administration  
Purchasing Division  
2019 Washington Street East  
Charleston, WV 25305-0130

**Bid Opening Date & Time: May 11, 2011 1:30 PM**

Phone 724.873.8100 Fax 724.873.8105

103 Freedom Drive, PO Box 525, Lawrence, PA 15055

[www.axcera.com](http://www.axcera.com)



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Response to Specifications for EBA342 and Required Forms





Response to a Request for Quotations  
EBA342  
Digital Television Transmitter System

- 1.1 Axcera – Comply
- 1.2 Axcera – Comply
- 1.3 Axcera – Comply
- 1.4 Axcera – Comply
- 1.5 Axcera – Comply
- 1.6 Axcera – Comply
- 1.6.1 Axcera- Comply
- 1.7 Axcera – Comply
- 1.8 Axcera – Comply
- 1.9 Axcera – Comply
- 1.10 Axcera – Comply
- 1.10.1 Axcera – Comply
- 1.10.2 Axcera - Comply
- 1.10.3 Axcera – Comply
- 1.10.4 Axcera – Comply
- 1.10.5 Axcera – Comply, the RF modules are ~25kg and can be replaced by one person.
- 1.11 Axcera – Comply
- 1.12 Axcera – Comply
- 1.13 Axcera – Comply
- 1.14 Axcera – Comply
- 1.15 Axcera – Comply
- 1.16 Axcera – Comply
- 1.16.1 Axcera – Comply
- 1.17 Axcera – Comply
- 1.18 Axcera – Comply
- 1.19 Axcera – Comply
- 1.20 Axcera – Comply
- 1.21 Axcera – Comply
- 1.21.1 Axcera – Comply
- 1.21.2 Axcera – Comply
- 1.22 Axcera – Comply
- 1.23 Axcera – Comply with clarification. The exciter will not have a UPS internal to the unit.  
There will be a UPS in the rack to maintain power on the active exciter.
- 1.24 Axcera – Comply
- 1.25 Axcera – Comply. Axcera is providing a Ktech VSB-FRQ-200; see included datasheet in Section 2 of this proposal for more information.
- 1.26 Axcera – Comply with clarification. The Ktech receiver will accept ASI as an input. The Axcera modulator has two inputs available; one SMPTE-310 and one ASI. These two inputs are selectable locally and remotely.
- 1.26.1 Axcera – Comply, the inputs are selectable locally and remotely.



Response to a Request for Quotations  
EBA342  
Digital Television Transmitter System

- 1.27 Axcera – Comply, the Ktech receiver output is SMPTE-310
- 1.28 Axcera – Comply
- 1.28.1 Axcera- Partially Comply. See attached datasheet for the offered power meter and sensor. The frequency range is 350MHz to 4GHz.
- 1.28.2 Axcera – Partially Comply. See attached datasheet for the offered power meter sensor. The power range is +14dBm to +44dBm.
- 1.28.3 Axcera – Comply. The offered power meter and sensor will meet the power and frequency requirements of this transmitter.
- 1.28.4 Axcera – Comply.
- 1.28.5 Axcera – Comply
- 1.28.6 Axcera – Comply. An E4416A EPM-P Series single channel power meter is provided as an option to the offered power meter.

2.1 Understood

- 2.1.1 Axcera – Comply
- 2.1.2 Axcera – Comply. The transmitter will be capable of 2kW ATSC measured after the filter.
- 2.1.3 Axcera – Comply

3.1 Axcera - Understood

- 3.1.1 Axcera – Comply. The transmitter being offered is capable of higher RF powers by adding additional PA modules and/or PA cabinets.
- 3.1.2 Axcera – Comply

4.1 Axcera- Understood, the following items are optional;

- 4.1.1 Axcera – Dual exciters with automatic switching is offered
  - 4.1.1.1 Axcera – Comply
  - 4.1.2 Axcera – Comply, see attached price list for transmitter commissioning
  - 4.1.3 Axcera – Comply, see attached price list for transmitter installation
    - 4.1.3.1 Axcera – Comply
    - 4.1.4 Axcera – Comply, see attached price list for spare PA pricing
    - 4.1.5 Axcera – Comply, see attached price list for optional surge protector pricing
      - 4.1.5.1 Axcera – Comply, the offered surge protector will operate 120/240V AC split phase but is capable of 120 to 480VAC
      - 4.1.5.2 Axcera – Comply
      - 4.1.5.3 Axcera – Comply
      - 4.1.5.4 Axcera – Comply
      - 4.1.5.5 Axcera – Comply
      - 4.1.5.6 Axcera – Comply, LEA DS21-225A

5.1 Axcera – Understood



Response to a Request for Quotations  
EBA342  
Digital Television Transmitter System

5.2 Axcera – Comply, shipping cost is included.

5.3 Axcera – Comply

5.4 Axcera – Understood

5.5 Axcera – Understood

5.6 Axcera – Comply

6.1 Axcera – Comply

6.2 Axcera – Comply. Statement of Warranty is included in Section 4 of this proposal.

7.1 Axcera – Comply. See Customer Support Policy in Section 4 of this proposal.

8.0 Axcera – Understood



State of West Virginia  
 Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

# Request for Quotation

RFQ NUMBER  
**EBA342**

PAGE  
**1**

ADDRESS CORRESPONDENCE TO ATTENTION OF  
**SHELLY MURRAY**  
**304-558-8801**

VENDOR

\*816101725      724-873-8100  
 AXCERA LLC  
 103 FREEDOM DR  
 PO BOX 525  
 LAWRENCE PA 15055

SHIP TO

EDUCATIONAL BROADCASTING  
 AUTHORITY  
 600 CAPITOL STREET  
  
 CHARLESTON, WV  
 25301-1223      304-558-3400

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
04/05/2011				

BID OPENING DATE: **05/11/2011**      BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	LS		840-65		
<p>THE WEST VIRGINIA PURCHASING DIVISION, FOR THE AGENCY, THE WEST VIRGINIA EDUCATIONAL BROADCASTING AUTHORITY, IS SOLICITING BIDS FOR ONE (1) 2 KW CHANNEL 29 DIGITAL TELEVISION TRANSMITTER SYSTEM PER THE ATTACHED SPECIFICATIONS.</p> <p>TECHNICAL QUESTIONS MUST BE SUBMITTED IN WRITING TO SHELLY MURRAY IN THE WEST VIRGINIA PURCHASING DIVISION VIA MAIL AT THE ADDRESS SHOWN AT THE TOP OF THIS RFQ, VIA FAX AT 304-558-4115, OR VIA E-MAIL AT SHELLY.L.MURRAY@WV.GOV. DEADLINE FOR ALL TECHNICAL QUESTIONS IS 04/25/2011 AT THE CLOSE OF BUSINESS. ALL TECHNICAL QUESTIONS RECEIVED, IF ANY, WILL BE ADDRESSED BY ADDENDUM AFTER THE DEADLINE.</p> <p>Axcera - no response here;            See page 7, WV EBA Pricing per Shelly Murray</p> <p>CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICES SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM WITH THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.</p> <p>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THIS CONTRACT IS AUTOMATICALLY NULL AND VOID, AND IS TERMINATED WITHOUT FURTHER ORDER.</p> <p style="text-align: center;">NOTICE</p>						

SIGNATURE <i>Michael Rosio</i>		TELEPHONE 724-873-8100	DATE 5/9/2011
TITLE Sr. VP Sales	FEIN 95-4876927	ADDRESS CHANGES TO BE NOTED ABOVE	

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



State of West Virginia  
 Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

### Request for Quotation

RFO NUMBER <b>EBA342</b>
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PAGE <b>2</b>
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ADDRESS CORRESPONDENCE TO ATTENTION OF <b>SHELLY MURRAY 304-558-8801</b>
---

<b>VENDOR</b>	*816101725	724-873-8100
	AXCERA LLC	
	103 FREEDOM DR	
	PO BOX 525	
	LAWRENCE PA 15055	

<b>SHIP TO</b>	EDUCATIONAL BROADCASTING AUTHORITY 600 CAPITOL STREET  CHARLESTON, WV 25301-1223	304-558-3400
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DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
04/05/2011				

BID OPENING DATE: **05/11/2011** BID OPENING TIME: **01:30PM**

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION            PURCHASING DIVISION            BUILDING 15            2019 WASHINGTON STREET, EAST            CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF            THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: SHELLY MURRAY</p> <p>RFQ. NO.: EBA342</p> <p>BID OPENING DATE: 05/11/2011</p> <p>BID OPENING TIME: 1:30 PM</p> <p>PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY            TO CONTACT YOU REGARDING YOUR BID:            724-873-8105</p> <p>-----</p> <p>CONTACT PERSON (PLEASE PRINT CLEARLY):            Paul Grzebik, Account Manager, Direct # 248-855-1000</p> <p>-----</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>[Signature]</i>	TITLE Sr. VP Sales	FEIN 95-4876927	TELEPHONE 724-873-8100	DATE 5/9/2011
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ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



## Request for Quotations EBA342

### Digital Television Transmitter System

The West Virginia Educational Broadcasting Authority (WVEBA) is conducting a request for quotations for one (1) 2 kW channel 29 digital television transmitter system.

The West Virginia Educational Broadcasting Authority operates a statewide network of television transmitters. This project will add a digital translator to the WSWP site at Welch, WV. The power requirements for the site will be addressed in the specifications. The bid shall be awarded to a single vendor.

#### 1. Transmitter

- 1.1. The transmitter manufacturer shall have a service department that is staffed 24 hours a day, 365 days a year.
- 1.2. The transmitter manufacturer shall have been manufacturing broadcast digital television transmitters for the North American market for at least ten years.
- 1.3. The vendor shall provide two sets of technical manuals. These manuals shall include installation instructions, operating instructions, tuning instructions, maintenance instructions, and troubleshooting procedures. The manuals shall also include parts list that includes the part number, circuit designator, description, and generic number whenever possible. The manuals shall include wiring diagrams with wire numbers and circuit schematics with component designators and values.
- 1.4. The transmitter shall be capable of providing adequate power to meet the licensed authorization.
- 1.5. Transmitter shall be FCC approved for the service and power levels anticipated, the ATSC 8-VSB digital television signal produced shall be high quality and comply with all applicable FCC regulations and EIA standards.
- 1.6. All components shall have adequate capacity to allow transmitter to operate at its maximum rated power level for 24 hours a day, 365 days a year.
  - 1.6.1. Maximum power shall not be less than 2.0kW measured at the output of the mask filter
- 1.7. Vendor shall provide a mask filter meeting FCC requirement for "Stringent Mask" and all interconnecting hardware.
- 1.8. Vendor shall provide all hardware, transmission line, couplers, adapters necessary for connection between the transmitter and the supplied mask filter.
- 1.9. Mask filter shall output to a 1 5/8" EIA connector
- 1.10. Transmitter shall be solid state with field replaceable RF modules.
  - 1.10.1. Solid state RF modules shall be front access, plug-in units capable of being removed or installed during the normal on-air operation of the transmitter. It shall not be necessary to reduce RF drive, remove cabinet power, or make any adjustments when replacing modules.
  - 1.10.2. No soldering shall be required to change RF modules
  - 1.10.3. In the event of a RF or device failure the PA module will continue to operate at reduced power
  - 1.10.4. All PA modules shall be completely identical and interchangeable with no degradation in performance.
  - 1.10.5. RF modules shall be field replaceable by one person
- 1.11. Transmitter shall be air cooled. Liquid cooled designs will not be considered.

- 1.12. Transmitter shall have the ability to exhaust air used for cooling the transmitter outdoors. Air intake shall be from indoor air
- 1.13. The transmitter shall be of a very compact design and comprise 19" rack mount assemblies.
- 1.14. The transmitter shall include any enclosures needed to house the individual sub-assemblies.
- 1.15. Transmitter shall have protection against excessive VSWR, RF input overdrive, over-temperature, over or under voltage, and over current conditions.
- 1.16. Transmitter shall have metering of: voltage, current, RF power (forward and reverse), cooling fault, PA fault, exciter fault, and power supply fault available for display on the front panel
  - 1.16.1. These parameters shall be available for remote telemetry.
- 1.17. Transmitter shall have remote control capability
- 1.18. Transmitter shall be FCC approved for the service and power levels anticipated
- 1.19. Transmitter shall be configured to operate on single phase 220V AC
- 1.20. Upon loss of power the transmitter shall restart in it's last powered state when power is returned
- 1.21. Exciters shall provide pre-correction and equalization
  - 1.21.1. Equalization shall be adaptive.
  - 1.21.2. Fully automatic correction of both linear and non-linear distortions shall be performed in a seamless and continuous manner.
- 1.22. If an external power amplifier is used to attain the required power level, sensing shall be provided to allow adaptive equalization of the entire transmitter system
- 1.23. The exciter shall include an internal UPS or battery back-up system capable of maintaining frequency lock on the master oscillator and synthesizer to allow fast recovery after a power failure of up to 2 hours.
- 1.24. The exciter shall accept a SMPTE-310 digital stream
- 1.25. A receiver capable of decoding an off air 8VSB ATSC stream and rebranding the program PID tables shall be provided.
- 1.26. Receiver shall accept an ASI input in addition to the 8VSB signal.
  - 1.26.1. Inputs shall be selectable
- 1.27. The receiver shall output to a SMPTE-310 stream
- 1.28. Vendor shall provide a power meter
  - 1.28.1. Frequency range 9 kHz to 110 GHz
  - 1.28.2. Power range -70 to +44 dBm sensor dependant
  - 1.28.3. If a power sensor is required vendor shall provide a sensor rated for the transmitter frequency and power levels anticipated at the sample port
  - 1.28.4. A power sensor cable, if needed shall be provided
  - 1.28.5. Meter input shall be a N type female connector, 50 ohms
  - 1.28.6. Agilent E4416A or equal

## 2. Site requirements

### 2.1. Welch, West Virginia

- 2.1.1. Transmitter shall operate on channel 29
- 2.1.2. Transmitter Power Output (TPO) required shall be 1706 watts average power.
- 2.1.3. TPO shall be measured at the output of the mask filter.

## 3. Future Upgrades

- 3.1. Vendor shall have demonstrated upgrade capabilities of hardware and software not limited to the following:

- 3.1.1. Hardware upgrade would primarily consist of additional modules to increase power output
- 3.1.2. Software upgrades relating to the advances in processing and adaptive correction and equalization

#### 4. Optional Equipment

- 4.1. The following options will not be part of the winning bid decision making. The options may or may not be purchased.
  - 4.1.1. Vendor is requested to include an option for dual redundant exciters.
    - 4.1.1.1. The optional redundant exciter system shall be able to detect a fault in the primary exciter and switch to the redundant exciter if a fault is detected automatically
  - 4.1.2. Vendor is requested to provide an option for commissioning services for the transmitter.
  - 4.1.3. Vendor is requested to provide optional pricing for installation of the transmitter.
    - 4.1.3.1 Items to be installed in and or to vendor supplied cabinet:
      - \* Power Supplies
      - \* RF modules
      - \* Exciter connections
      - \* connect RF amplifiers to RF combiner and duplexing system.
  - 4.1.4. Vendor is requested to provide optional pricing for a spare RF PA module for the transmitter.
  - 4.1.5. Vendor is requested to provide optional pricing for a 120/240V single phase, split phase 225 amp surge suppressor
    - 4.1.5.1. Nominal operating voltage: 120 to 480 VAC
    - 4.1.5.2. Surge capacity per phase: Minimum of 200 kA
    - 4.1.5.3. Surge capacity per mode: Minimum of 100 kA
    - 4.1.5.4. Connection: Series
    - 4.1.5.5. Response time: <1ns
    - 4.1.5.6. LEA Danasystem DS21-225A or equal

#### 5. Shipping and delivery

- 5.1. Vendor shall provide shipping
- 5.2. Shipping charges shall be included in the equipment price
- 5.3. Delivery shall be FOB Destination
- 5.4. The receiving facility shall be WSWP studios:
  - WV Educational Broadcasting Authority
  - 124 Industrial Park Road
  - Beaver, WV 25801
  - Attn: Jeremy Scott
  - 304-254-7840
- 5.5. Shipper shall provide 24 hours notice to arrange off-loading
- 5.6. Shipper shall provide off-loading equipment and be responsible for off-loading transmitter and associated hardware.

#### 6. Warranty

- 6.1. All products shall be warranted for a period of one year.
- 6.2. Bidders shall state their warranty policy.

**7. Support**

7.1. Vendor shall provide toll-free phone support for all items for a minimum of five years

**8. Invoicing**

Tammy Treadway  
WV Educational Broadcasting Authority  
PO Box 9004  
Beckley, WV 25802-9004  
304-254-7840

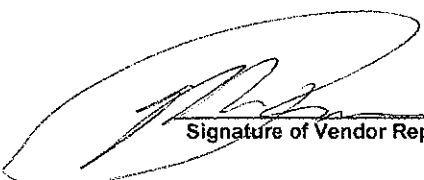
**EBA342 – WV EBA Pricing Page**

Digital Television Transmitter System. Shipping charges shall be included in product pricing.

ITEM NUMBER	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
1	1	Solid state transmitter	\$81,250	\$81,250
2	1	Mask Filter	Included*	Included*
3	1	Hardware necessary for connection between transmitter and mask filter.	Included*	Included*
4	1	Transmission line necessary for connection between transmitter and mask filter.	Included*	Included*
5	1	Couplers necessary for connection between transmitter and mask filter.	Included*	Included*
6	1	Adapters necessary for connection between transmitter and mask filter.	Included*	Included*
7	1	Receiver capable of decoding an off air 8VSB ATSC stream and rebranding the program PID tables	\$3,375	\$3,375
8	1	Power meter, Agilent E4416A (or equal.)	\$3,615	\$3,615
<b>TOTAL</b>				\$88,240

The following options WILL NOT be part of the winning bid decision making. These options MAY or MAY NOT be purchased individually.

1	1	Dual redundant exciter system	\$15,000	\$15,000
2	1	Commissioning services for the transmitter	\$3,000	\$3,000
3	1	Installation of the transmitter	\$4,000	\$4,000
4	1	Spare RF PA module	\$12,700	\$12,700
5	1	220V single phase, split phase 225 amp surge suppressor. LEA Danasystem DS21-225A or equal.	\$2,600	\$2,600
<b>TOTAL</b>				\$37,300



Mike Rosso 5/9/2011

Signature of Vendor Representative Submitting Bid

Date

STATE OF WEST VIRGINIA  
Purchasing Division

**PURCHASING AFFIDAVIT**

**West Virginia Code §5A-3-10a states:** No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

**DEFINITIONS:**

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

**EXCEPTION:** The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code* §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

**WITNESS THE FOLLOWING SIGNATURE**

Vendor's Name: Axcera, LLC

Authorized Signature: [Signature] Date: 4/27/11

State of Pennsylvania

County of Washington, to-wit:

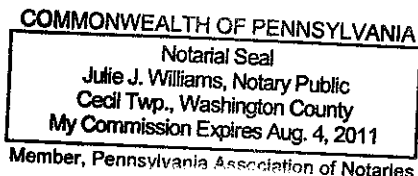
Taken, subscribed, and sworn to before me this 27 day of April, 2011.

My Commission expires August 4, 2011.

**AFFIX SEAL HERE**

**NOTARY PUBLIC**

[Signature]



State of West Virginia

VENDOR PREFERENCE CERTIFICATE

Certification and application\* is hereby made for Preference in accordance with West Virginia Code, §5A-3-37. (Does not apply to construction contracts). West Virginia Code, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the West Virginia Code. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

- 1. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,
2. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
3. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
4. Application is made for 5% resident vendor preference for the reason checked: Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,
5. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked: Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,
6. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked: Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: Axcera - Not Applicable

Signed:

Date: 5/9/2011

Title: Sr. VP Sales

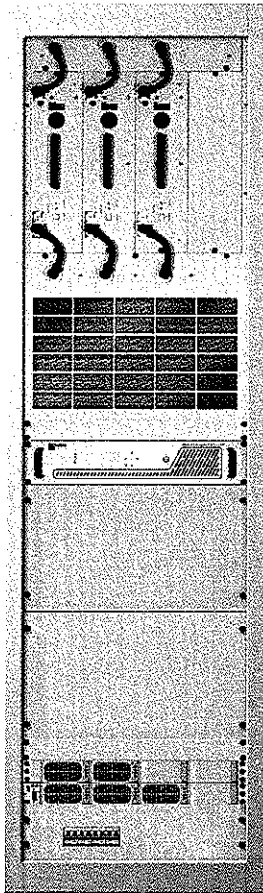
\*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

## Brochure / Product Data Sheets

- 1) Innovator HU3TD Transmitter Data Sheet
- 2) Digital ATSC Exciter, DM8C-R Brochure
- 3) K-Tech Receiver Data Sheet
- 4) Agilent Power Meter Brochure
- 5) Alternative Option: Bird Power Meter Brochure
- 6) LEA Surge Protector Data Sheet



## UHF Solid State Digital Transmitter



With over twenty five years of experience in the design and manufacture of solid state transmitters, Axcera continues to provide the latest technology, enabling our customers to focus on the future.

These advanced solid state transmitters were designed specifically to meet the needs of today's broadcaster, offering high levels of reliability, efficiency and performance. The modular construction provides a clear upgrade path, allowing broadcasters to begin with a low power transmitter and easily add modules to achieve any power level desired. With its parallel amplifier and shared DC power design, the Innovator HX is perfect for long-term, unattended operation.



# UHF Solid State Digital Transmitter

## Performance

Frequency Range <sup>1</sup>	Band IV/V
Standard	ATSC
Modulation	8-VSB
Output Impedance	50 Ω - coaxial/waveguide
Frequency Stability w/GPS	0.2 ppm (max 30 day variation) 0.001 ppm
Regulation of RF Output Power	3%
Inputs	
TS	Serial data inputs (ASI), BNC and SMPTE-310
Clock Reference	10MHz, BNC
Time Reference	1PPS, BNC
Bandwidth	6MHz

## System Control Interface

Web Interface	Two connectors: RJ45
SNMP Control Interface	Ethernet 10/100/1000 Base T
RS232 (Console)	Connector D89(M); Command Line Interface
USB Port	Connector: USB; Command Line Interface

## General

### Electrical Requirements

AC Power Requirements <sup>1</sup>	200-240VAC, 50/60Hz 100-150VAC, 50/60Hz is available
------------------------------------	---

### Environmental Conditions

Operating Temperature	0°C to +45°C
Storage Temperature	-30°C to +75°C
Humidity	Max. 90%, non-condensing
Altitude <sup>1</sup>	Max. 2600m

### Mechanical Specification

Construction	Standard 19" rack
Cooling	Forced air

## Options

- Dual Exciter with Automatic Switcher
- AC Surge Protector
- Spare Parts Kit
- GPS Receiver

<sup>1</sup>Other Frequencies, Altitudes & Voltages - Consult Factory  
<sup>2</sup>Output Power Measured After Channel Filter

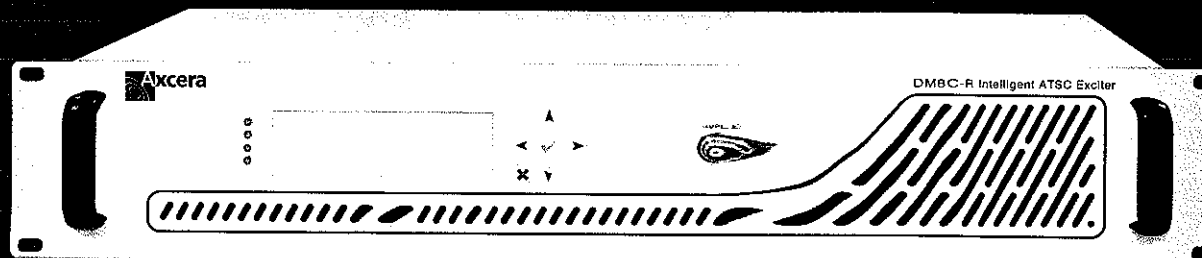
## Model Information

Model Numbers	HU3TD
Power Output <sup>2</sup>	2000W
Power Consumption (kilowatts)	11kW
No. of Final PA Modules	3
Output Connector	1 5/8 EIA

Specifications published here are current as of the date of publication of this document. Because we are continuously improving our products, Axcera reserves the right to change specifications without prior notice. At any time, you may verify product specifications by contacting our office. Axcera views it's patent portfolio as an important corporate asset and vigorously enforces its patents. Products or features contained herein may be covered by one or more U.S. or foreign patents.

# DM8C-R

Digital ATSC Exciter



 **Axcera**<sup>TM</sup>  
the experts

## Manufacturing & Support

The DM8C-R is completely designed, built and factory tested by Axcera under strict ISO 9001:2008 control. This ensures the highest quality manufacturing practices and provides parts and service availability in a very timely fashion, keeping you on the air.

Axcera is serious about our commitment to "Total Customer Happiness." When you choose our products and systems, you will also receive our relentless commitment to your overall satisfaction. Our extensive RF capabilities and experience enable us to provide design and integration services and ongoing customer service and support that are unparalleled in the broadcast industry.

Axcera offers complete RF coverage analysis, system design and integration, installation, project management and support services directly and through our global network of integration and support partners. Our knowledgeable account managers and systems engineers will work with you to ensure that you are provided with a solution that is optimal for your needs. Our world class integration, installation and support team is well recognized in the industry for its exceptional customization capabilities and installation craftsmanship.

Our industry-leading Customer Support Group is a team of experienced field service technicians available 24/7. Our team is also available to travel to your site to quickly resolve any service issues. They are also available for routine maintenance, equipment installation, proof of performance testing and product training.

Our professional support is available by phone 1-800-215-2614 or +1 724-873-8100 or email: [service@axcera.com](mailto:service@axcera.com).

At Axcera we look forward to the opportunity to demonstrate our commitment to your total happiness with our products and services.



Axcera, LLC  
103 Freedom Drive  
Lawrence, Pennsylvania 15055, USA

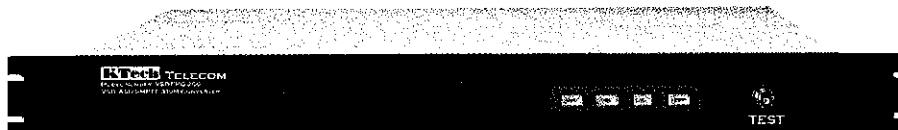
1-800-215-2614 (North America)  
+1 724-873-8100 (International)  
+1 724-873-8105 (Fax)

[info@axcera.com](mailto:info@axcera.com)  
[www.axcera.com](http://www.axcera.com)

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**Application Note**

**8-VSB to DVB-ASI / SMPTE-310M Converter  
Model Number: VSB-FRQ-200**



**Introduction**

This application note describes the VSB-FRQ-200 and its applications.

**Product Description**

The VSB-FRQ-200 is an 8-VSB Receiver that demodulates an 8-VSB terrestrial signal, updates the PSIP VCT, and generates DVB-ASI and SMPTE-310M output signals simultaneously.

The main features of the VSB-FRQ-200 are:

- Demodulates an 8-VSB RF signal to DVB-ASI and SMPTE-310M
- Updates the Station Identification (STID), Major Channel Number, and Minor Channel Number for each channel listed (up to six programs) in the Virtual Channel Table (VCT)
- Inputs: RF (CH 2-69), SMPTE-310M, and DVB-ASI
- Simultaneous Outputs: SMPTE-310M, (2) DVB-ASI @19.392 Mbps and (1)Front Panel DVB-ASI @19.392Mbps Testpoint
- (2) IEEE 1394-2000 Firewire Outputs (Optional)
- Loss of Transport Stream Alarm
- Null Packet Insertion & Deletion and PCR Correction
- Remote Control User Interface and Firmware Upgrade via RS232
- Easy to use front panel interface with VFD screen display
- STID, Major & Minor Ch #'s are saved in memory for SMPTE-310M, DVB-ASI, and the most current RF channel in case of power failure or power-off
- Upon power-up, unit will display the last menu before power-off and if necessary update the VCT from memory
- Complies with ATSC A53 specification for 8-VSB modulation for terrestrial broadcast of a high definition digital TV signal
- 1U Rack Mountable

**Functional Block Diagram**

The signal flow through the VSB-FRQ-200 is shown below in Figure 1.

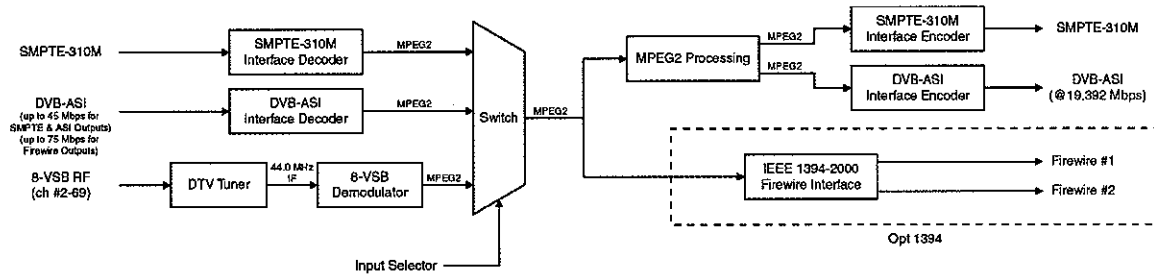


Figure 1: Functional Block Diagram of the VSB-FRQ-200

**DTV Tuner**

The DTV Tuner accepts an 8-VSB RF signal and down converts it to a 44.0 MHz IF signal. The DTV Tuner accepts 8-VSB RF signal inputs for VHF/UHF channels #2-69.

**8-VSB Demodulator**

The 8-VSB Demodulator demodulates the 44.0 MHz IF signal into an MPEG2 baseband signal. It's equalizer and Reed Solomon decoding techniques, help correct channel multipath errors. It also performs digital matched filtering to optimize performance over noise.

**Interface Decoders**

DVB-ASI or SMPTE-310M transport streams can be fed into the VSB-FRQ-200. These signals feed into interface decoders that output MPEG2 Transport Streams. Note: The VSB-FRQ-200 can accept any DVB-ASI signal that has a rate less than or equal to:

- 45 Mbps if Firewire, SMPTE-310M & DVB-ASI Outputs are desired
- 75 Mbps if only Firewire Outputs are desired

**Switch and Input Selector**

All three MPEG2 Streams that are present are fed into the switch. The Input Selector chooses the MPEG2 stream that will be present at the output. The input selector is controlled using the Front Panel User Interface or via RS232.

**Baseband Processing**

The baseband processing includes the Null Packet Insertion or Removal, PCR Correction and PSIP Modification. The first step in the process is Null Packet Insertion or Removal. Note: Baseband Processing only occurs for DVB-ASI Inputs less than or equal to 45 Mbps. If SMPTE-310M and DVB-ASI outputs are desired, the DVB-ASI Input should not exceed 45 Mbps.

The Null Packet Insertion/Removal does the following:



Figure 2: Null Packet Insertion/Removal

When the MPEG2 Transport Stream is greater than 19.292 Mbps, the null packets in the stream are removed before entering the FIFO. When the MPEG2 Transport Stream output of the FIFO is less than 19.392 Mbps, null packets are inserted into the MPEG2 Transport Stream to bring the rate back up to 19.392 Mbps.

The second step is PCR Correction. The Program Clock Reference (PCR), embedded within the transport stream, is used to synchronize a receiver's clock with an encoder's clock. The original PCR values that were stamped into the stream by the original encoder will not be the correct PCR values for the receiver after null packets are inserted into or deleted from the stream. Therefore the PCR values need to be re-stamped so that the receiver will have the correct PCR values, thus avoiding PCR clock jitter at the receiver end.

The final step is the PSIP modification where the VCT's STID, Major & Minor Channel Numbers are modified within the stream.

Interface Encoders

The Interface Encoders transform the 19.292 Mbps MPEG2 signal into the DVB-ASI or SMPTE-310M I/O Interface Standards. The SMPTE-310M signal at 19.392Mbps is available at the SMPTE Output. The DVB-ASI at a fixed rate of 19.392Mbps is available at the two ASI Outputs and at the ASI Testpoint on the front panel.

IEEE 1394-2000 Firewire Interface (optional)

The MPEG2 transport stream from the MUX is fed directly into the Firewire Interface. The Firewire interface transforms the MPEG2 transport stream signal into the IEEE 1394-2000 standard interface, also known as Firewire. Null Packet Insertion, PCR Correction or PSIP updating does not occur on the Firewire outputs, i.e. baseband processing does not occur on the MPEG2 stream that is input into the Firewire interface. Note: The VSB-FRQ-200 can accept any DVB-ASI signal that has a rate less than or equal to:

- 45 Mbps if Firewire, SMPTE-310M & DVB-ASI Outputs are desired
- 75 Mbps if only Firewire Outputs are desired

Applications

Application #1: Cable Television Service Providers

One application of the VSB-FRQ-200 is at the head end of a digital CATV Service Provider where it may be desired to receive a local 8-VSB DTV broadcast. The VSB-FRQ-200 demodulates the 8-VSB signals to baseband where the PSIP can be updated if so desired. The DVB-ASI output of the unit can then be connected to a QAM Modulator and the DTV signal can be delivered to the consumer's digital set top box.

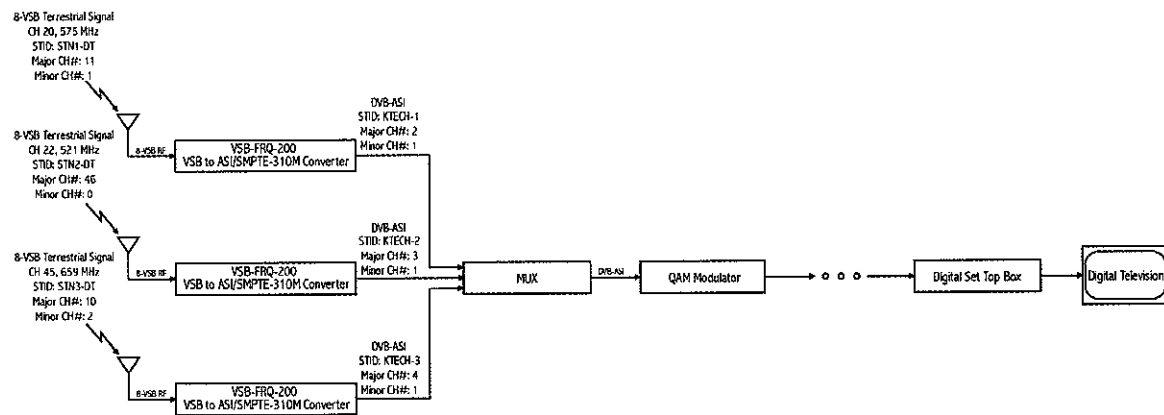


Figure 1: Application of the VSB-FRQ-200 for a Cable Service Provider

Application #2: Public Broadcasting Stations

The VSB-FRQ-200 is also well suited for Public Broadcasting Station use since the satellite feed at a local station is usually available in DVB-ASI format. In this application the VSB-FRQ-200 acts as a DVB-ASI to SMPTE-310M converter. The satellite feed signal is connected to the VSB-FRQ-200's DVB-ASI input and the Major Channel Number, the Minor Channel Number, and the Station ID are changed. The signal from the SMPTE-310M output can then be sent to a DTV exciter for broadcast transmission. The signal now contains properly updated PSIP information to be used in a local broadcast.

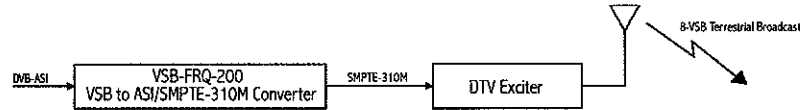


Figure 2: Application of the VSB-FRQ-200 for a Public Broadcasting Station

Application #3: Post Production Facilities

Another Application of the VSB-FRQ-200 is at postproduction facilities where audio and video stored on a D5 Digital Videotape needs to be transferred to a Digital VHS tape or Hard Disk. Using Firewire, digital audio & video information can be transferred to external electronic equipment with virtually no loss in quality. The Firewire outputs can be very useful to post production facilities since they give the user the ability to record digital audio & video content onto digital VHS decks as well as DVD-R/W decks. In this application the main function of the VSB-FRQ-200 is to convert the DVB-ASI output of the MPEG2 HD Encoder into an IEEE 1394 Firewire Interface for the input of the Digital VHS Recorder. The audio and video on the D5 Digital Video tape is uncompressed, therefore an HD Encoder must first compress it into MPEG2. The output interface of most HD Encoders is DVB-ASI and the input to the Digital VHS Recorders is Firewire. The VSB-FRQ-200 is the bridge that closes the gap between the two different interfaces and allows the transfer from uncompressed D5 videotape to MPEG2 compressed digital VHS tape to occur. For computer's with a Firewire input and the necessary software, the Compressed Video can also be stored on the computer's hard disk using the VSB-FRQ-200 Firewire Output.

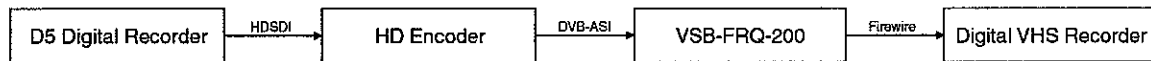


Figure 3: Application of the VSB-FRQ-200 for transferring D5 Digital Video to VHS Digital Video



**Front Panel**

The front panel of the VSB-FRQ-200 is shown below in Figure 4.

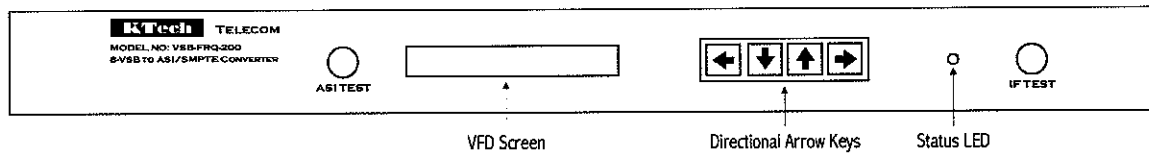


Figure 4: Front Panel of the VSB-FRQ-200

Signal	Connector
DVB-ASI Output Testpoint	BNC
IF Test	Not available on this model

**Back Panel**

The back panel of the VSB-FRQ-200 is shown below in Figure 5.

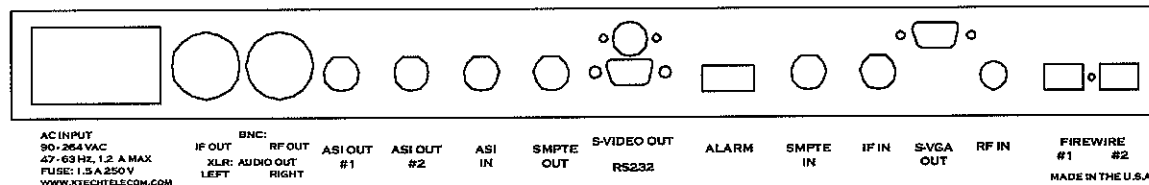


Figure 5: Back Panel of the VSB-FRQ-200

Signal	Connector
IF Out	Not available on this model
RF Out	Not available on this model
LEFT	Not available on this model
RIGHT	Not available on this model
DVB-ASI Output #1	BNC
DVB-ASI Output #2	BNC
DVB-ASI Input	BNC
SMPTE-310M Output	BNC
S-Video Out	Not available on this model
RS232	DSUB 9 Socket
Alarm	3 terminal Phoenix
SMPTE-310M Input	BNC
IF In	Not available on this model
S-VGA Out	Not available on this model
RF Input	75Ω F
Firewire #1	6-pin IEEE 1394 Firewire Connector
Firewire #2	6-pin IEEE 1394 Firewire Connector

**Specifications**

**General**

Description	Range	Units
<b>AC Power</b>		
Frequency	47-63	Hz
Voltage	90-264	VAC
Current	1.2	Amp (max)
<b>Operating Conditions</b>		
Temperature	0-50	°C
Altitude	12,000	ft (max)
Humidity (non-condensing)	95	%
<b>Materials</b>		
Aluminum chassis		
<b>Weight</b>		
Net	10	lbs.
Gross (shipping)	13	lbs.
<b>Dimensions</b>		
Height	1.75	inches (1RU)
Width	19	inches
Depth	18	inches
<b>Cooling</b>		
Blower	Located on the left side towards the back of the unit	

**RF Input Specifications**

	Specification	Comments
Frequency	50-860 MHz	
USA Channel Numbers	2-69	
CATV Channel Numbers	1-125	
Impedance	75 ohms	
Connector	F	
RF Band	6.0 MHz	

**Demodulator**

Parameter	Specification	Comments
Mode	8-VSB Terrestrial	
Equalizer Span	-5.9µS to +40µS	
Data Rate	19.392658 Mbps	
SNR Threshold	15dB	

**SMPT310M Serial Interface (Baseband Data Input/Output)**

Parameter	Specification	Comments
Connector	BNC	
Source Impedance	75 ohms	
Output Coupling	AC	AC inductively coupled
Signal Overshoot	<10%	
Data Format	Biphase Mark Coding	
Transport Stream Bit Rate	19.39265 Mbps	Raw serial data rate ± 2.8 ppm

**DVB-ASI Serial Interface (Baseband Data Input/Output)**

Parameter	Specification	Comments
Connector	BNC	
Source Impedance	75 ohms	
Output Coupling	AC	AC inductively coupled
Transport Stream Bit Rate (input)	2.6 Mbps Min 45 Mbps Max	
Transport Stream Bit-Rate (output)	19.39265 Mbps	

**PSIP Update**

Parameter	Specification	Comments
Station Identification	Up to seven letters	
Major Channel Number	# 2-69	
Minor Channel Number	# 0-9	

**IEEE 1394-2000 Firewire Interface**

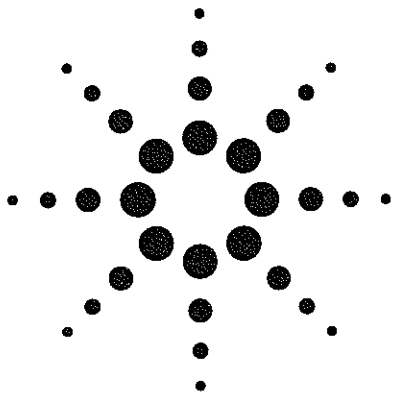
Parameter	Specification	Comments
Connector	6-pin	Firewire Connector
Number of Ports	2	
Power Class	Class 0	
Transfer Speed	200 Mbps	
Interface	IEEE 1394-2000	

**Ordering Information**

Part Number	Description
VSB-FRQ-200	8-VSB RF to DVB-ASI/SMPTE-310M Converter
VSB-FRQ-200 Opt 1394	With (2) IEEE 1394-2000 Firewire Outputs

Additional Information at KTech Web Site: [www.ktechtelecom.com](http://www.ktechtelecom.com)  
For Pricing and Delivery information: [sales@ktechtelecom.com](mailto:sales@ktechtelecom.com)

KTech Telecommunications, Inc.  
DTV Broadcast Products  
21540 Prairie St., Unit B  
Chatsworth, CA 91311  
Phone (818) 773-0333 Fax (818) 773-8330

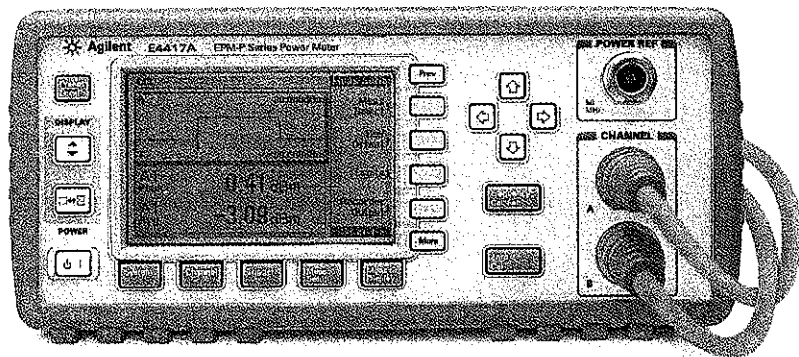


# Agilent EPM and EPM-P Series Power Meters E-Series Power Sensors

## Configuration Guide

### Introduction

This configuration guide describes standard configurations, options and compatible accessories. For full specifications, see *EPM Series Power Meters and E-Series Power Sensors Technical Specifications* (Agilent literature number 5965-6382E), or *EPM-P Series Power Meters and E9320 Power Sensors Technical Specifications* (Agilent literature number 5980-1469E). Contact your local Agilent Technologies representative at the offices listed on the back of this guide if you need more information.



#### **EPM Series Power Meters**

- E4418B Power Meter (single channel)
- E4419B Power Meter (dual channel)

#### **EPM-P Series Power Meters**

- E4416A Power Meter (single channel)
- E4417A Power Meter (dual channel)

#### **E-Series Power Sensors**

- E441XA CW Power Sensors  
(10 MHz to 26.5 GHz, sensor dependent)
- E9300 Average Power Sensors  
(9 kHz to 18 GHz, sensor dependent)
- E9320 Peak and Average Power Sensors  
(50 MHz to 18 GHz, sensor dependent)



**Agilent Technologies**

## EPM-P Series Power Meters

The EPM-P Series power meters provide peak, peak-to-average ratio, average, and time-gated power measurements. For peak, peak-to-average ratio, and time-gated measurements, the EPM-P Series power meters must operate with the E-Series E9320 power sensors. For average power measurements only, the EPM-P Series power meters are compatible with all the 8480 Series power sensors, the E-Series CW, the E-Series E9300 average power sensors, and the E-Series E9320 power sensors.

The standard EPM-P Series power meters include:

- Single-channel power meter, order **E4416A**  
or dual-channel power meter, order **E4417A**
- Input sensor connector(s) on the front panel
- Reference calibrator connector on the front panel
- Printed copy of English-language *Installations Guide*
- Printed copy of English-language *User's Guide* (Option ABA)
- CD-ROM, contains the English-language and localized *User's Guide*, English-language *Programming Guide* and Agilent EPM-P analyzer software
- Supplied accessories:
  - Power sensor cable (1.5 meter (5 ft) **E9288A**), one per E4416A and two per E4417A
  - Power cord (plug matches destination requirements)

## EPM Series Power Meters

The EPM Series power meters provide average power measurements.

The standard E4418B and E4419B power meters include:

- Single-channel power meter, order **E4418B**,  
or dual-channel power meter, order **E4419B**
- Input sensor connector(s) on the front panel
- Reference calibrator connector on the front panel
- Printed copy of English-language *User's Guide* (Option ABA)
- Supplied accessories:
  - Power sensor cable (1.5 meter (5 ft) **11730A**), one per E4418B and two per E4419B
  - Power cord (plug matches destination requirements)

## E-Series Power Sensors

The standard E4412A and E4413A CW power sensors include:

- Power sensor 10 MHz to 18 GHz, order **E4412A**,  
or power sensor 50 MHz to 26.5 GHz, order **E4413A**
- English-language *Operating and Service Guide*

The standard E9300 average power sensors include:

**+20 to -60 dBm:**

- Power sensor 10 MHz to 18 GHz, order **E9300A**
- Power sensor 10 MHz to 6 GHz, order **E9301A**
- Power sensor 9 kHz to 6 GHz, order **E9304A**
- Power sensor 9 kHz to 18 GHz, order **E9304A Option H18**
- Power sensor 9 kHz to 18 GHz, order **E9304A Option H20**  
(APC 3.5 mm connector)

**+30 to -50 dBm:**

- Power sensor 10 MHz to 18 GHz, order **E9300H**
- Power sensor 9 kHz to 18 GHz, order **E9300H Option H19**
- Power sensor 10 MHz to 6 GHz, order **E9301H**

**+44 to -30 dBm:**

- Power sensor 10 MHz to 18 GHz, order **E9300B**
- Power sensor 10 MHz to 6 GHz, order **E9301B**
- English-language *Operating and Service Guide* (part number E9300-90009)

The standard E9320 peak and average power sensors include:

- Power sensor, 50 MHz to 6 GHz, 300 kHz bandwidth, order **E9321A**
- Power sensor, 50 MHz to 6 GHz, 1.5 MHz bandwidth, order **E9322A**
- Power sensor, 50 MHz to 6 GHz, 5 MHz bandwidth, order **E9323A**
- Power sensor, 50 MHz to 18 GHz, 300 kHz bandwidth, order **E9325A**
- Power sensor, 50 MHz to 18 GHz, 1.5 MHz bandwidth, order **E9326A**
- Power sensor, 50 MHz to 18 GHz, 5 MHz bandwidth, order **E9327A**
- English-language *Operating and Service Guide*

## Compatibility

### Power sensor compatibility

For compatibility of power meters, power sensors, and power sensor cables, please refer to the table below.

Power Sensors	Power Meters		Power Sensor Cables	
	EPM-P Series	EPM Series	11730 (grey)	E9288 (blue)
E441X family	Yes	Yes	Yes	Yes
E9300 family	Yes	Yes <sup>1</sup>	Yes	Yes
E9320 family	Yes	No	No	Yes
8480 Series	Yes	Yes	Yes	Yes

### Firmware compatibility

The table below shows the required revision of firmware for operation of the E9300 power sensors as well as the part number of the required hardware upgrade kit.

	E4418A/E4419A Firmware	Hardware	E4418B/E4419B Firmware
E9300A/01A/04A	Rev A1.04.00/A2.04.00	E4418-60021	Rev A1.04.00/A2.04.00
E9300H/01H	Rev A1.06.00/A2.06.00	E4418-60021	Rev A1.06.00/A2.06.00
E9300B/01B	Rev A1.06.00/A2.06.00	E4418-60021	Rev A1.06.00/A2.06.00

1. Please refer to the firmware compatibility table to ensure compatibility for this combination.

Firmware upgrade information can be accessed from the World Wide Web, free of charge. It can also be purchased as a firmware upgrade kit, Agilent part number E4418-61035. The hardware upgrade is a simple upgrade and the kit provides the parts required. The upgrade can be performed at any local Service Center or at a customer site.

## Hardware Options

The following options are available on the EPM and EPM-P Series power meters.

Option	Description	EPM-P Series Power Meter	EPM Series Power Meter
E441xA/B-001	Internal rechargeable battery	No	Yes
E441xA/B-002	Parallel rear panel sensor input connector(s) and front panel reference calibrator connector	Yes	Yes
E441xA/B-003	Parallel rear panel sensor input connector(s) and rear panel reference calibrator connector	Yes	Yes
E441xA/B-004	Delete power sensor cable	Yes	Yes
E441xA/B-908	Rack mount kit (one instrument)	Yes	Yes
E441xA/B-909	Rack mount kit (two instruments)	Yes	Yes

## Service and Support Options

### Warranty

A standard 12 months, return to Agilent warranty and service plan is included with each EPM and EPM-P Series power meter.

### Calibration<sup>1</sup>

Order 36 months of the appropriate calibration plan as shown below.

R-50C-001	Standard calibration plan
R-50C-002	Standard compliant calibration plan

## Special Options

Special options for EPM-P Series power meters, EPM Series power meters, and E-Series sensors are available. Contact your local Agilent representative for more information.

1. Options are not available in all countries.

## Documentation

- The EPM power meters are supplied with a printed copy of English-language *User's Guide* (Option ABA).
- The EPM-P power meters are supplied with a printed copy of *Installation Guide* which includes all languages, a printed copy of English-language *User's Guide* (Option ABA), and a CD-ROM which contains Agilent EPM-P analyzer software, *User's Guide and Programming Guide*, and the localized versions of *User's Guide*.

Documentation	EPM-P Series Power Meter	EPM Series Power Meter
English-language <i>Programming Guide</i>	E441xA-0BF	E441xB-0BF
<i>Service Guide</i>	E441xA-0B3	E441xB-915
Delete manual set	E441xA-0B0	E441xB-0B0
Add manual set (English), <i>User's Guide and Programming Guide</i>	E441xA-0BK	E441xB-916

Documentation	E4412/3A	E9300	E9320A
Add manual set	E4412/3A-0B1	E930xx-0B1	E932xA-0B1

## Localization Options

The following table shows the option number to order the documentation.

The following options provide a printed copy of localized *User's Guide*. For the EPM-P, the localized manuals are all available on the CD-ROM supplied with the product. The localized options for the EPM-P provide a printed copy of localized *User's Guide* and a printed copy of English-language *Programming Guide*.

Language	EPM-P Series Power Meter	EPM Series Power Meter	E4412/3A Sensors	E9300 Sensors
German	E441xA-ABD	E441xA-ABD	E4412/3A-ABD	E930xx-ABD
Spanish	E441xA-ABE	E441xA-ABE	E4412/3A-ABE	E930xx-ABE
French	E441xA-ABF	E441xA-ABF	E4412/3A-ABF	E930xx-ABF
Japanese	E441xA-ABJ	E441xA-ABJ	E4412/3A-ABJ	E930xx-ABJ
Italian	E441xA-ABZ	E441xA-ABZ	E4412/3A-ABZ	E930xx-ABZ
Korean	Not available	Not available	Not available	E930xx-ABI

## Calibration Options

**Option E441xA/B-A6J** - Supplies ANSI Z540 certificate of calibration with data.

**Option E93xxA/B/H-A6J** - Supplies ANSI Z540 certificate of calibration with data.



## Available Accessories

- E9288A-C power sensor cables (refer to the compatibility section):
  - 1.5 meters (5 ft) **E9288A**
  - 3 meters (10 ft) **E9288B**
  - 10 meters (31 ft) **E9288C**
- 11730A-F power sensor cables (refer to the compatibility section):
  - 1.5 meters (5 ft) **11730A**
  - 3 meters (10 ft) **11730B**
  - 6.1 meters (20 ft) **11730C**
  - 15.2 meters (50 ft) **11730D**
  - 30.5 meters (100 ft) **11730E**
  - 61 meters (200 ft) **11730F**
- Accessory pouch, **34161A**  
Holds accessories supplied or ordered
- Basic instrument transit case, **34131A**  
Protects the power meter during transit
- Soft carry/operating case, **34141A**  
Power meter with battery option can be operated in soft carry case
- Spare battery, **E9287A**  
Extra battery for EPM Series power meters with **Option 001**

## Auxiliary Equipment

The 11683A range calibrator verifies the accuracy and linearity of the EPM-P and EPM Series power meters. Outputs corresponding to the meter readings of 3, 10, 30, 100, and 300  $\mu\text{W}$  and 1, 3, 10, 30 and 100 mW are provided. Calibration uncertainty is  $\pm 0.25\%$  on all ranges.

## Literature References

- *EPM-P Series Power Meters and E9320 Sensors, Product Overview*, literature number 5980-1471E
- *EPM-P Series Power Meters and E9320 Sensors, Technical Specifications*, literature number 5980-1469E
- *EPM-P Series Single and Dual Channel Power Meters, Demo Guide*, literature number 5988-1605EN
- *EPM-P Series Power Meters, CD-ROM*, part number E4416-90032
- *Choosing the Right Power Meter and Sensor, Product Note*, literature number 5968-7150E
- *EPM Series Power Meter and E-Series Power Sensors, Technical Specifications*, literature number 5965-6382E
- *EPM Series Power Meter and E-Series Power Sensors, Brochure*, literature number 5965-6380E
- *Fundamentals of RF and Microwave Power Measurements, Application Note 64-1*, literature number 5965-6630E
- *4 Steps for better Power Measurements, Application Note 64-4*, literature number 5965-8167E
- *E-Series E9300 Power Sensors, Product Overview*, literature number 5968-4960E



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Korea	080 769 0800
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Taiwan	0800 047 866
Thailand	1 800 226 008

#### Europe & Middle East

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Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700*
Germany	49 (0) 7031 464 6333
Ireland	1890 924 204
Israel	972-3-9288-504/544
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
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Switzerland	0800 80 53 53
United Kingdom	44 (0) 118 9276201

Other European Countries:

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Revised: October 1, 2009

Product specifications and descriptions in this document subject to change without notice.

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Printed in USA, October 27, 2009

5965-6381E



**Agilent Technologies**

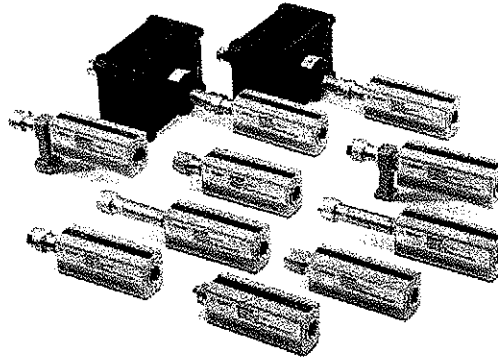
# Agilent N8480 Series Thermocouple Power Sensors

## Data Sheet

The N8480 Series thermocouple power sensors are amongst Agilent's most accurate and reliable sensors, plus they include EEPROM, and extended frequency *and* power ranges.

### Features

- High accuracy with excellent linearity and noise specifications
- Wide dynamic range in a single sensor
- Auto-download of calibration factor and corrections from EEPROM
- Option CFT provides full-code compatibility between sensors and the 8480 Series (excluding the N8488A)
- Broad compatibility with existing power meters: P-Series (N1911A/12A), EPM-P Series (E4416A/17A), and EPM Series (N1913A/14A, E4418B/19B)



### Accurate, repeatable measurements

Here's how: Excellent linearity (1% approximately) and noise specifications. The sensors' low SWR further enhances accuracy by minimizing mismatch uncertainty. These sensors also come with dual-range power for greater sensitivity to fluctuating signals. With high accuracy and stability, the N8480 helps you test confidently, faster.

### Calibration-easy testing

During test, calibrating your sensor is an essential step. Minimizing the time this step takes is essential. The N8480 sensor eliminates cumbersome keying-in of the calibration factor (CF), eliminates manual input errors, and saves you time and effort. CF, linearity, and temperature corrections are all stored in the sensors' EEPROM—auto-downloaded on calibration. The N8480 Series streamlines the calibration procedure making overall testing faster and more efficient.

### One sensor, WIDEST range

Pick an N8480 sensor—any one—and you'll see how its wide dynamic range equips you for various applications: metrology labs, radar, mobile radio, TDMA, GSM, W-CDMA, and WiMAX™, among others. With up to 55 dBm wide dynamic range, the N8480 Series offers you the widest thermocouple sensor power range in the industry.

### System integration can be difficult, but not with the N8480

The N8480 Series sensors are backward compatible with Agilent's leading range of power meters, including the P-Series, EPM-P Series, and EPM Series. All that's needed is a simple firmware upgrade that's downloadable for free from the Website.

All SCPI codes used on the E-Series sensors are re-usable on the N8480, including most of the codes used on the 8480 Series. When migrating code from the 8480 Series, Option CFT<sup>1</sup> will allow SCPI codes to behave much like they do on the 8480 Series.

1. Option CFT is not available for the N8488A power sensor.



**Agilent Technologies**

# Specification Definitions

There are two types of product specifications:

- Warranted specifications
- Characteristic specifications

## Warranted specifications

Warranted specifications are covered by the product warranty and apply over 0 to 55 °C, unless otherwise noted. Warranted specifications include measurement uncertainty calculated with 95% confidence.

## Characteristic specifications

Characteristic specifications are not warranted. They describe product performance that is useful in the application of the power sensors by giving typical, but non-warranted performance parameters. These characteristics are shown in italics or denoted as "*typical*", "*nominal*" or "*approximate*".

Characteristic information is representative of the product. In many cases, it may also be supplemental to a warranted specification.

Characteristic specifications are not verified on all power sensors. The types of characteristic specifications can be placed in two groups:

- The first group of characteristic types describes 'attributes' common to all products of a given model or option. Examples of characteristics that describe attributes are product weight and 50-Ω input Type-N connector. In these examples, product weight is an *approximate* value and a 50-Ω input is *nominal*. These two terms are most widely used when describing a product's attributes.
- The second group of characteristic types describes 'statistically' the aggregate performance of the population of products. These characteristics describe the expected behavior of the population of products. They do not guarantee the performance of any individual product. No measurement uncertainty value is accounted for in the specification. These specifications are referred to as *typical*.

## Conditions

The power meter and power sensor meet their specifications when:

- Stored for a minimum of two hours at a stable temperature within the operating temperature range and turned on for at least 30 minutes
- The power meter and power sensor are within their recommended calibration periods
- Used in accordance to the information provided in the power meter's user's guide

# Hand-Held Digital Power Meter

## Bird® Model 5000-XT

The hand-held digital power meter has been completely redesigned with the new Bird® 5000-XT. Ideally suited for field techs and engineers who need to make power measurements anywhere they go, the 5000-XT's new user interface has an intuitive, menu-driven design, making it the easiest to use on the market. It's operable even with one hand and compatible with all our field and legacy sensors.

### PROBLEMS

Poor lighting or bright light

Lack of access to AC

Physically demanding environments

Varying field tech skill levels

Need for power measurement comparison

### SOLUTIONS

Indoor/outdoor viewable monochrome VGA display with backlight

Up to 60 hours of continuous use battery life

Single key allows one-hand toggling through operations

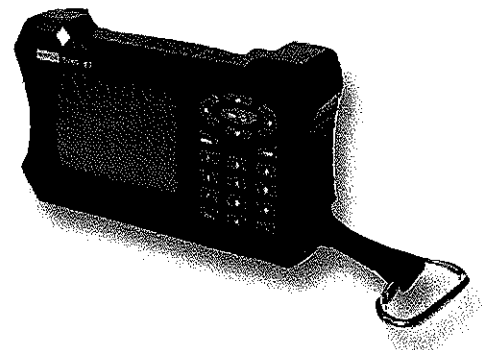
Locking mechanism prevents unintentional sensor disconnects

Compliant with MIL spec drop test

Lightweight at 1.4 lbs.

Automatically detects sensor and displays appropriate power measurement screen

Data logging capability with 1 GB of memory, storing and transfer of up to 7 days of data



### APPLICATIONS

Signals measured: WiMAX, (IEEE 802.16), GSM/EDGE, W-CDMA, LTE, WiFi (802.11), HSPA/HSDPA, TD-SCDMA, TETRA, P25, Zigbee (IEEE 802.15), Bluetooth, RFID, DVB, DMB and MediaFlo

Measurements performed: VSWR, peak power, true average power, crest factor, CCDF and burst power

Sensors supported: 11

Display languages: English, Spanish, or Mandarin Chinese

# Hand-Held Digital Power Monitor

Bird® Model 5000-XT

## SPECIFICATIONS

<b>Display</b>	Indoor/Outdoor Viewable Monochrome VGA Display with Backlight				
<b>Functions</b> (Sensor Limited)	VSWR Peak Power True Average Power Crest Factor CCDF Burst Power Data Logging				
<b>Sensor Detection</b>	Automatic				
<b>Battery</b>	Rechargeable, Field Replaceable, Lithium Ion Batteries				
<b>AC Adapter/Charger</b>	115/230 VAC, 50/60 Hz				
<b>Battery Life</b>	20 Hours Continuous Usage with WPS Series Sensors 60 Hours Continuous Usage with All Other Sensors				
<b>Calibration Interval</b>	No calibration required				
<b>Languages</b>	English, Mandarin, Spanish				
<b>Dimensions</b>	6.6"x4.0"x1.95" (168 mm x 102 mm x 50 mm)				
<b>Interface</b>	<table><tr><td><b>Sensor</b></td><td>DB9 USB 2.0 SeaLatch Type A</td></tr><tr><td><b>PC</b></td><td>USB 2.0 SeaLatch Type B</td></tr></table>	<b>Sensor</b>	DB9 USB 2.0 SeaLatch Type A	<b>PC</b>	USB 2.0 SeaLatch Type B
<b>Sensor</b>	DB9 USB 2.0 SeaLatch Type A				
<b>PC</b>	USB 2.0 SeaLatch Type B				
<b>Weight with battery</b>	1.4 lbs				
<b>Operating Temp.</b>	0 to +50 °C				
<b>Storage Temp.</b>	-20 to +50 °C				
<b>Drop Tested</b>	EN 61010-1, MIL-STD-810F, MIL-PRF-28800F, Class 2				
<b>International Certs.</b>	CE, RoHS				

## ACCESSORIES

5A5001-1	Battery, Installed
5A5002-1	Power Supply, Includes Brick, cord, 3 Intl Adaptors
5A2238-4	Cigarette adaptor
5A2653-10L2	USB SeaLatch Cable, 10'
5A2264-09-MF-10	DB9 Cable, 10'
920-5000-XT	Operations Manual, Multilanguage
5A5000-1	Soft Case
5A5000-2	Lanyard
5A5000-3	Carabiner

## COMPATIBLE SENSORS

5010	Direction Power Sensor, Legacy
5010B	Direction Power Sensor, DB9
5011	Terminating Power Sensor, 4 GHz, DB9
5011-EF	Terminating Power Sensor, 12 GHz, DB9
5012	Wideband Power Sensor, Legacy
5012A	Wideband Power Sensor
5014	Direction Power Sensor, USB
5015	Terminating Power Sensor, 4GHz, USB
5015-EF	Terminating Power Sensor, 12GHz, USB
5016	Wideband Power Sensor, Low Power Version
5017	Wideband Power Sensor, Low Frequency Version



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# Bird® Wideband Power Sensor

## 5012A, 5016, 5017

Bird's® Wideband Power Sensor (WPS) never requires field calibration, only requires calibration once per year and is traceable to National Institute of Standards and Technology (NIST). The WPS measures True Average Power, Peak Power, and Duty Cycle directly with exceptional accuracy and uses these precise measurements to calculate a wide range of other important factors, such as VSWR, Return Loss, Reflection Coefficient, Crest Factor, Average Burst Power, and CCDF.

### PROBLEMS

Downtime is necessary

Have analog, digital, and multi-carrier signals to measure

Tight budgets

Varying field tech skill levels

Need greater confidence in measurement

### SOLUTIONS

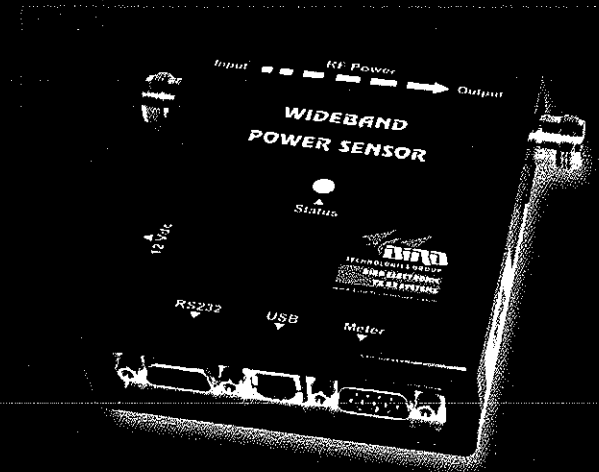
- Monitor and perform maintenance for monitoring while DUT is in-service
- Measure forward and reflected power to troubleshoot system failures

- Modulation independent measurements

- USB connectivity, no meter required
- Complimentary Virtual Power Meter (VPM2) software

- Sensor plugs and plays with 5000-XI meter.

- No field calibration required
- NIST traceable calibration



### APPLICATIONS

WPS measures: Analog Cellular, Digital Cellular, 3G, 4G, Tetra, APCO/P25, Trunking, CDMA, TDMA, WCDMA, GSM, Transportation, Tactical Military, Radar, Avionics, Marine, LMR, Analog Broadcast, Digital Broadcast, GSM, GPRS, EDGE, UMTS, HSDPA, Bluetooth, Fire, GPS, NPSPAC, Paging, Project 25, Public Safety, Telematics, Utilities, WIMAX and WLAN.

Measurements performed: Peak power, true average power and Duty Cycle.

Calculations Performed: VSWR, Return Loss, Reflection Coefficient, Crest Factor, Average Burst Power and CCDF.



# Bird® Wideband Power Sensor

5012A, 5016, 5017



## WPS SPECIFICATIONS

<b>Frequency Range</b>	<b>5012A</b>	350 MHz - 4.0 GHz
	<b>5016</b>	350 MHz - 4.0 GHz
	<b>5017</b>	25 MHz - 1.0 GHz
<b>Power Range</b>	<b>5012A</b>	150 mW - 150 Watts Avg. 400 Watts Peak
	<b>5016</b>	25 mW - 25 Watts Avg. 60 Watts Peak
	<b>5017</b>	500 mW - 500 Watts Avg. 1300 Watts peak
<b>Impedance</b>		50 Ohms (nominal)
<b>Reflection Measurement Characteristics</b>		Measurement Range: Return Loss, 0.0 to 23 dB (VSWR, 1.15 to 99.9 Rho, 0.07 to 1.0)
<b>Minimum Forward Power for Reflected Measurement</b>	<b>5012A</b>	5W
	<b>5016</b>	0.5W
	<b>5017</b>	5W
<b>Accuracy*</b>		Average Power = ±5% of reading typical Burst Average Power = ±7% of reading typical Peak Envelope Power = ±8% of reading typical CCDF = ±0.2% typical
<b>Insertion VSWR</b>	<b>5012A</b>	<1.05 from 0.35 to 2.5 GHz, <1.10 from 2.5 to 4 GHz
	<b>5016</b>	<1.05 from 0.35 to 2.5 GHz, <1.10 from 2.5 to 4 GHz
	<b>5017</b>	<1.05
<b>Insertion Loss</b>	<b>5012A</b>	<0.05 dB from 0.35 to 1.0 GHz, <0.1 dB from 1 to 4 GHz
	<b>5016</b>	<0.05 dB from 0.35 to 1.0 GHz, <0.1 dB from 1 to 4 GHz
	<b>5017</b>	<0.05 dB
<b>Connector(s)</b>		N Female (Both)
<b>Power Supply</b>		USB Port: Less than one low-power USB load DC Input Connector: 7-18 VDC at less than 0.1A
<b>Interface(s)</b>		DPM Interface: DB9 proprietary interface PC Interface (1): RS-232, 9600 Baud, no parity, 8 data bits, 1 stop bit, DB9 PC Interface (2): USB 1.1 Type B, compliant interface
<b>Weight</b>		1.2 lb. maximum
<b>Dimensions HxWxD [inches (mm)]</b>		4.8" x 4.6" x 1.3" (122 mm x 117 mm x 33 mm)
<b>Directivity</b>	<b>5012A</b>	30 dB up to 3.0 GHz, 28 dB from 3.0 to 4.0 GHz
	<b>5016</b>	30 dB up to 3.0 GHz, 28 dB from 3.0 to 4.0 GHz
	<b>5017</b>	28 dB up to 100 MHz, 30 dB from 100 to 1000 MHz
<b>Data Logging</b>		Requires 5000-XT or VPM2
<b>Operating Temps [°C(°F)]</b>		-10° to +50°C (+14° to +122°F)
<b>Storage Temps [°C(°F)]</b>		-40° to +80°C (-40° to +176°F)
<b>Mechanical Shock &amp; Vibration</b>		IAQ MIL-PRF-2880F class 3

\* See Product manual for detailed accuracy breakdown

## ACCESSORIES

<b>PTA-MNMN</b>	Precision Test Adapter Male N to Male N
<b>PTA-MNME</b>	Male N to Male 7/16 (DIN)
<b>PTA-MNFE</b>	Male N to Female 7/16 (DIN)
<b>5A2226</b>	Power Supply, Intl
<b>5A2229</b>	Power Supply, US
<b>5A2653-10</b>	USB Cable, 10'
<b>5A2264-09-MF-10</b>	DB9 Cable, 10'

## COMPATIBLE DEVICES

<b>5012A</b>	5000-EX 5000-XT VPM2 SA-1700 EXP SA-2500 EX SA-6000 EX SH-36S SH-361S SH-362 SH-362S
<b>5016, 5017</b>	5000-EX 5000-XT VPM2 SA-1700 EXP SA-2500 EX SA-6000 EX SH-36S SH-361S SH-362 SH-362S



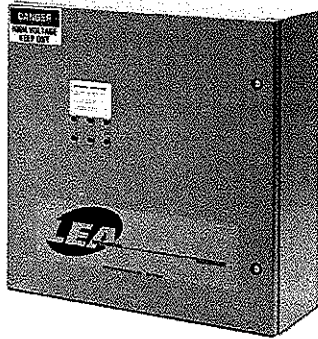
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# Modular Hybrid Series Connected Surge Protection Device

1490409 RevA

## Dyna System



DS21S Model

The Dyna System 21 series connected products provide the best protection for mission-critical equipment. The Dyna System is a state-of-the-art hybrid modular suppressor that combines fast-acting silicon avalanche diodes, MOVs and an LC filter made up of inductors and capacitors. These series connected units provide the highest level of protection through its efficient low pass filter.

### Features

- MOV - parallel symmetrical-balanced arrays with redundant protection
- Internal Protection Indicator Lights - redundant monitoring to identify damaged modules for easy service
- Indicator Lights Per Phase - visual indication of protection integrity
- Modular - servicable modules
- Inductors/Capacitors - uses LC Filters (Low Pass Filter) for superior protection
- All Mode Protection - L-G, L-N, L-L and N-G
- Warranty - 10 year

### Options

- Dry contacts
- Digital surge counter
- Audible alarm w/silence switch
- Spare module

### Standard Voltage Configuration

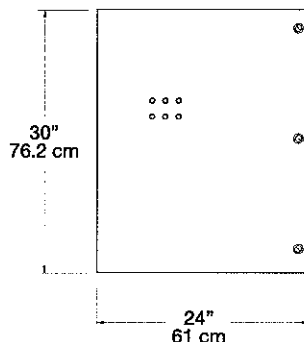
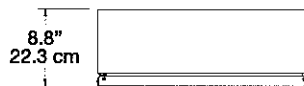
- 120/240-SP
- 120-1P
- 120/208-3Y
- 240-1P
- 277/480-3Y
- 220/380-3Y
- 480-3D
- 380-3D

Please consult factory for voltage configuration.

- Sample Model Number: DS21S-277/480-225-3Y

### Standards

- IEEE
- NEC Article 100/285
- CBEMA/ITI



DS21s-225A

DS21s-150A

DynaSystem	DS21-150A	DS21-225A
<b>Performance</b>		
Surge Capacity per Phase	200 kA	200 kA
Surge Capacity per Mode	100 kA	100 kA
Maximum Ampacity Range	150 A	225 A
Nominal Operating Voltage	From 120 to 480 Vac	From 120 to 480 Vac
Operating Frequency	47-63 Hz	47-63 Hz
Operating Voltage Range	± 15%	± 15%
MCOV	115%	115%
Noise Attenuation	EMI/RFI, Sine Wave Tracking	EMI/RFI, Sine Wave Tracking
Connection	Series	Series
Response Time	<1 nanosecond	<1 nanosecond
IEEE Location	C-High and B-Medium	C-High and B-Medium
<b>Mechanical</b>		
Dimensions H x W x D	30" x 24" x 8.8" 76.2 cm x 61 cm x 22.3 cm	30" x 24" x 8.8" 76.2 cm x 61 cm x 22.3 cm
Maximum Weight	80 lbs. 36.3 kg	80 lbs. 36.3 kg
Terminal Description	Phase/Neutral, Safety Ground, Transient Ground	Phase/Neutral, Safety Ground, Transient Ground
Recommended Wire Gauge	#3/0 - #4	350KCMil - #1/0
Enclosure Type	NEMA 12	NEMA 12
<b>Environmental</b>		
Operating Humidity	5 to 95% non-condensed	5 to 95% non-condensed
Max. Operating Altitude	12,000 ft above sea level 3657.6 m above sea level	12,000 ft above sea level 3657.6 m above sea level
Operating Temperature	-40° F to +185° F -40° C to +85° C	-40° F to +185° F -40° C to +85° C



## Bill of Materials / Quotation

Description of Materials offered





103 Freedom Drive, P.O. Box 525  
Lawrence, PA 15055-0525 USA  
724-873-8100 t  
724-873-8105 f  
www.axcera.com

**Quotation B-17018**  
**May 9, 2011**

**Page 1 of 4**

Prepared for: Ms. Shelly L. Murray  
State of West Virginia  
Department of Administration  
Purchasing Division  
2019 Washington Street East  
Charleston, WV 25311

Prepared By: Paul J. Grzebik  
Regional Sales Manager

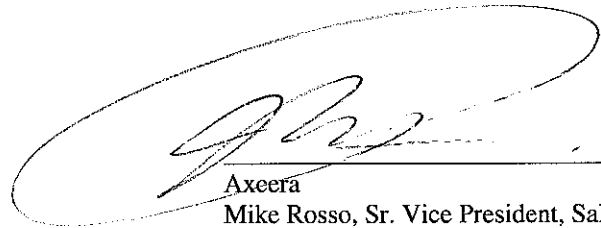
**Estimated Delivery** 90 days after receipt of purchase order.

**Accepted by:**

\_\_\_\_\_  
Company

By: \_\_\_\_\_  
Signature Date

Title: \_\_\_\_\_



\_\_\_\_\_  
Axcera  
Mike Rosso, Sr. Vice President, Sales

STATE OF WEST VIRGINIA – EBA342

**INNOVATOR HX™ 2000 WATT UHF DTV TRANSMITTER**

ITEM	QTY	DESCRIPTION	UNIT PRICE	NET PRICE
1	1	<p><b>HU3TD – 2000 Watt UHF DTV Transmitter</b></p> <p>Features include:</p> <p>DM8C-R ATSC-compliant modulator with AXACT™, digital adaptive linear and non-linear precorrection, for excellent SNR performance</p> <p>Internally generated test signals allow setup and testing even when an input signal is not present</p> <p>Frequency agile exciter and LDMOS broadband amplifiers minimize spare parts stock and simplify channel changes</p> <p>Three parallel LDMOS, broadband amplifiers for redundancy</p> <p>Three parallel, hot-pluggable, switch mode power supplies. (N+1 Optional)</p> <p>Equipment Cabinet</p> <p>Cabinet Blower for exhausting air to the outside.</p> <p>Operator Manual Qty:2 (Technical Service Manual Upon Request)</p> <p>Mask Filter with transmitter interconnect, hardware and all necessary couplers.</p> <p>Channel: 29                      TPO: 1706</p> <p><i>Please Note: Fully Compliant with WVEBA Request for Quotations EBA342.</i></p>	\$79,900	\$79,900

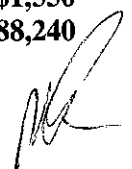
STATE OF WEST VIRGINIA - EBA342

**OPTIONS**

<u>ITEM</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>UNIT PRICE</u>	<u>NET PRICE</u>
1		<b>Dual DM8C-R Exciter with Switch</b> Includes automatic switcher that switches to backup exciter in the event of a main exciter failure.	\$15,000	
2		<b>LEA DS21-225A Surge Protector</b>	\$2,600	
3		<b>Transmitter Commissioning</b> Axcera technician on site for one day to provide turn on and performance verification of the transmitter.	\$3,000	
4		<b>Transmitter Installation</b> Axcera technician on site for three days to provide installation. See Installation Description- Solid State Transmitter	\$4,000	
5		<b>Spare LDMOS Amplifier</b> Complete LDMOS Amplifier Tray	\$12,700	
6	1	<b>ATSC Receiver Option</b> Provides a DTV receiver that allows for the editing of PSIP.	\$3,375	\$3,375
7	1	<b>5000XT Bird Digital Power Meter with Wideband Power Sensor</b>	\$3,615	\$3,615

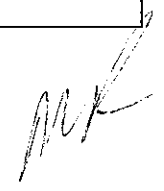
Shipping, Insurance and Offloading:  
 Request for Quotation Total:

\$1,350  
 \$88,240



**ADDITIONAL OPTIONS AVAILABLE**

<u>ITEM</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>UNIT PRICE</u>	<u>NET PRICE</u>
1		<b>Agilent E4416A EPM Power Meter</b> (REPLACES ITEM#8 ABOVE) Includes 11730C - 20' power sensor cable and 8482B - high power, power sensor	\$8,000	
2		<b>N+1 Power Supply Option</b> Transmitter will continue to produce full rated TPO with the loss of one supply.	\$2,100	



STATE OF WEST VIRGINIA – EBA342

**INSTALLATION DESCRIPTION – SOLID STATE TRANSMITTER**

**Axcera will provide the following:**

- Detailed floor plans and system layout.
- Recommendations on HVAC, ventilation and AC power.
- Placement of transmitter cabinets.
- Installation of the transmitter's RF system.
- Proof of performance to FCC required specifications.
- General system training on site at time of installation.

**Customer is responsible for the following unless otherwise specified in the quotation:**

- FCC construction permit.
- Building or room to accommodate Axcera supplied equipment. Building should contain appropriate lighting, heat, ventilation and sanitary facilities for an adequate working environment.
- Permits, inspections and all applicable codes and ordinances.
- Union workers or licensed tradesmen, if required to perform certain parts of the installation.
- HVAC including air conditioning and/or ducting.
- Wiring from the site's distribution panels to the transmitter cabinets.
- Grounding for the entire system.
- Installation and sweeping of waveguide/coaxial cable from the output of the supplied transmitter's RF system.
- Installation of the antenna.
- Installation of any customer supplied equipment that interfaces with the transmitter.
- Heavy equipment necessary for offloading and moving heavy items to their proper location.
- Additional expenses incurred by Axcera due to delays that are out of Axcera's direct control.
- Transportation to and from site if it requires something other than a standard motor vehicle.
- Trash disposal.



- 1) Axcera Customer Support Policy
- 2) Products and Capabilities Brochure
- 3) Standard Warranty Statement
- 4) ISO Quality Certificate
- 5) Press Release: TV Technology Article
- 6) Advanced ATSC Solutions: ATSC Mobile DTV



# Customer Support Policy

At Axcera, we view customer support as the keystone to our success. From initial contact through system design, quotation, purchase, installation and field service, our goal is to provide a level of support that fully meets or exceeds our customers' requirements. By including all aspects of our organization in our Customer Support Policy, we can better ensure a pleasant overall customer experience.

## **Sales/Applications/Contract Administration**

- Respond quickly to customer requests for technical and product information
- Provide timely, accurate and complete quotations and proposals which best address customer needs, both technically and financially
- Establish dedicated points of contact throughout the order process to ensure accuracy and efficiency
- Make all efforts to meet the customer requested delivery of both Axcera and vendor manufactured products
- Provide efficient, accurate, and courteous processing of product orders
- Confirm all product and system details with the customer in writing to ensure customer needs are being met

## **Technical Support**

- Provide knowledgeable, reliable and courteous telephone and parts support 24 hours a day, 7 days a week, 365 days a year
- Provide on-site troubleshooting and repair when required by the customer for both scheduled and emergency site visits
- Provide timely turnaround on in-house repairs, upgrades and maintenance
- Price repairs fairly, based upon actual cost and not an inflated flat-rate fee
- Provide 24 hour turnaround or loaner equipment in off-air situations
- Provide regular technical bulletins which notify customers of applicable product upgrades and field modifications for a period of at least 10 years from product purchase date
- Provide replacement parts and support for all products for at least 10 years beyond product obsolescence
- Ensure total customer satisfaction

## **Installation**

- Provide professional equipment installation and project management
- Make all efforts to meet the customer requested installation date by pre-scheduling installations at least one month in advance
- Provide on-site product and system training upon request

## **Training**

- Provide detailed classroom and hands-on technical training on products per customer request
- Provide advanced technical seminars concerning industry topics per customer request
- Provide on-site training of systems/products at time of installation



## STANDARD LIMITED WARRANTY

### ONE YEAR

Axcera warrants each new product (excluding software products) manufactured and sold by Axcera against defects in material and workmanship, under normal use and service, for a period of one (1) year from the date of shipment from Axcera's plant, when operated in accordance with Axcera's operating instructions. This warranty shall not apply to tubes, fuses, batteries or bulbs.

Axcera warrants that (a) Axcera designed Software will perform substantially in accordance with the accompanying written materials for a period of ninety (90) days from the date of shipment from Axcera's plant, and (b) hardware accompanying such Software will be free of defects in materials and workmanship under normal use and service for a period of one (1) year from date of shipment from Axcera's plant.

Warranties are valid only when and if (a) Axcera receives prompt written notice of breach within the period of the warranty, (b) the defective Product is properly packed and returned by the Buyer (transportation and insurance prepaid), and (c) Axcera determines, in its sole judgment, that the Product is defective and not subject to any misuse, neglect, improper installation, negligence, accident, or (unless authorized in writing by Axcera) repair or alteration. Axcera's exclusive liability for any personal and/or property damages (including direct, consequential or incidental) caused by the breach of any or all warranties, shall be limited to the following: (a) repairing or replacing (in Axcera's sole discretion) any defective parts free of charge (F.O.B. Axcera's plant), and/or (b) crediting (in Axcera's sole discretion) all or a portion of the purchase price to the Buyer.

Equipment furnished by Axcera, but not bearing its trade name, shall bear no warranties other than the warranties extended by the manufacturer at the time of delivery to the Buyer. **NO WARRANTIES, WHETHER STATUTORY, EXPRESSED OR IMPLIED, AND NO WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT, OTHER THAN AS SPECIFIED HEREIN, SHALL APPLY TO THE EQUIPMENT FURNISHED HEREUNDER.**



# Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2008

*This is to certify that:*

**Axcera LLC**  
103 Freedom Drive  
Lawrence  
Pennsylvania  
15055  
USA

*Holds Certificate No:* **FM 39829**

*and operates a Quality Management System which complies with the requirements of ISO 9001:2008 for the following scope:*

Design, manufacture, installation and service of analog and digital UHF, VHF, and MMDS transmission systems.

*For and on behalf of BSI:*

*President, BSI America, Inc.*

Originally Registered: **06/16/1998**

Latest Issue: **07/20/2010**

Expiry Date: **09/25/2012**



Page: 1 of 1

This certificate remains the property of BSI and shall be returned immediately upon request.  
An electronic certificate can be authenticated online. Printed copies can be validated at [www.bsigroup.com/ClientDirectory](http://www.bsigroup.com/ClientDirectory)  
To be read in conjunction with the scope above or the attached appendix.

Americas Headquarters: 12110 Sunset Hills Road, Suite 200, Reston, VA 20190, USA.





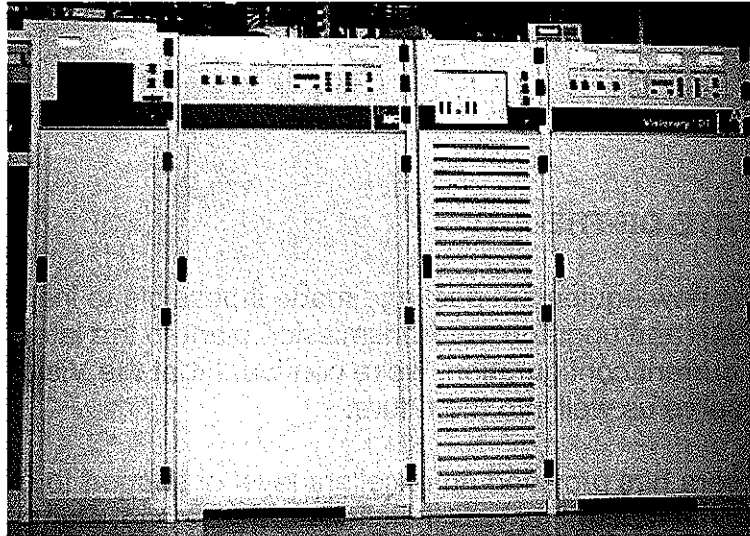
Product Reviews User Reports Sourcebooks

## WTVS Boosts Power With Axcera Upgrade

by Helge Blucher, 06.28.2010

### WIXOM, MICH.

Detroit Public Television's WTVS is a viewer-supported PBS member station that serves the nation's 11th largest television market. We operate on digital Channel 43 and are carried on cable and satellite systems throughout Southeast Michigan and in more than 1,000 communities in Canada. Detroit Public Television is notably active in the community, producing local programs that showcase arts, culture, news analysis and physical activity.



*The recently reconfigured Axcera Visionary IOT transmitter installation at WTVS*

### READYING FOR POWER BOOST

In 2000, WTVS purchased its original Axcera Visionary transmitter, an HP25SDW single-tube IOT unit, equipped with a dual-tube RF system. The transmitter has operated at a power output of 16.1 kW for the past decade without any significant downtime. When the time came to increase power, it made sense to add a second IOT amplifier to this existing transmitter system and to take the opportunity to update the transmitter with Axcera's current feature set and functionality. The company offered a comprehensive upgrade package that included a second amplifier cabinet to increase output power, along with Axcera's new ATSC Mobile DTV-capable Axciter exciters to replace the older DT2B analog units, e2v D2100 "plug-in" style IOTs and cavities to replace the original equipment e2v 8505 "build-up" style tubes and cavities. We also added Axcera's current production control system as part of the makeover/power increase project.

The second IOT cabinet, along with a new exciter/driver/controller, was installed next to the existing Axcera transmitter cabinets. We also added a redundant transmitter cooling system.

An Axcera transmitter installation team was brought on site to take care of the expansion work and make the RF system connections. The team was very efficient and the work went quickly, resulting in only a minimal amount of lost airtime. When everything was ready, the new configuration was powered up and brought on line. Our new power output was set at 48.3 kW, and we began proof of performance testing. The enhanced transmitter configuration passed with flying colors, and is now providing us with the video delivery quality that Axcera is famous for.

## **STATE-OF-THE-ART**

This new equipment package made it possible to increase our effective radiated power and upgrade our transmission plant to the latest generation technology. In its current configuration, we're confident that the Visionary package will continue to serve us well into the future.

Axcera has provided an excellent level of support to Detroit Public TV since the original transmitter was installed a decade ago. Our initial Visionary transmitter package has been an excellent performer and we expect the same results from the new Axcera equipment.

*Helge Blucher has served as VP of engineering and technology for Detroit Public Television's WTVS since 1998. He may be contacted at [hblucher@dptv.org](mailto:hblucher@dptv.org).*

*For additional information, contact Axcera at 724-873-8100 or visit [www.axcera.com](http://www.axcera.com).*