

City Of Torrington



PUBLIC WORKS DEPARTMENT
Jamie Sykora., Facilities Manager
Email: Jamie_Sykora@torringtonct.org

140 Main Street • City Hall
Torrington, CT 06790-5245
(860) 489-2242 • Fax: (860) 489-2550

MEMORANDUM

TO: Honorable Mayor Carbone and City Council

FROM: Jamie Sykora, Facilities Manager

CC: Ray Drew, Public Works Director
Gerry Crowley, IT Director
Pennie Zucco, Purchasing Agent

DATE: 8/30/2022

RE: AVS-026-070722 AUDIO VIDEO SOLUTION FOR CITY HALL AUDITORIUM

Vote by City Council to accept the recommendation of the IT Director, Public Works Director, and Facilities Manager to award the contract for the installation of upgraded Audio-Visual equipment for the auditorium at City Hall, AVS-026-070722 to Sound Works and Security of Torrington, CT for \$242,485.90 and authorize the Mayor to act on behalf of the city regarding the award and execution of the contract agreement.

Thank you for your consideration.

August 15, 2022

Mr. Raymond E. Drew
Public Works Director
140 Main Street
Torrington, CT 06790

SUBJECT: City of Torrington - Audio Video System for Auditorium
RFP AVS-026-072722 – Review of Bid Proposals

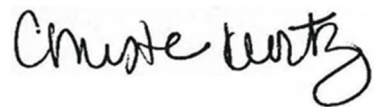
Dear Ray,

At the request of the City of Torrington, we have reviewed the two proposals received for the above referenced project. Both Visionpoint, LLC and SoundWorks & Security, LLC. Both proposals acknowledged receipt of both addendums and included the required documentation, including a Bid Bond and Non-Collusion statement. A summary of the bids is attached.

The bid documents provide a complete design. The project was designed to be platform agnostic, allowing the City to change platforms and maintain the hardware and software provided under this contract. The documentation provided by Visionpoint indicates that they will provide a design as part of their bid proposal, once selected. Furthermore, they are providing a Zoom Room system; the platform they are providing is not agnostic. For instance, the system could not host a Teams Meetings. These two factors indicate that the price and proposal submitted by Visionpoint do not meet the basis of design nor the intent of the project. There are other indications that the proposal does not meet other requirements of the design, for instance: they do not provide a methodology for third party streaming and the document cameras provided do not meet the specified minimum requirements.

For these reasons we do not feel that the price proposal submitted by Visionpoint is representative of the products needed to meet the intent of the design and thus should not be considered by the City of Torrington as a responsive bid.

Sincerely,
WRIGHT-PIERCE



Christine E. Kurtz, PE
Christine.Kurtz@wright-pierce.com

City of Torrington, CT
Audio Visual System for City Hall
BID TAB
Thursday July 28th, 2022



169 Main St, 700 Plaza Middlesex, Middletown, CT
06457 Tel: 860-343-8297

				BIDDER'S NAME			
				Visionpoint, LLC	SoundWorks & Security, LLC		
Item #	Item	Qty.	UNIT	UNIT AMT	BID	UNIT AMT	BID
BASE BID							
1	Audio Visual System for City Hall	1	LS	\$190,800.00	\$190,800.00	\$217,485.90	\$217,485.90
TOTAL BASE BID					\$190,800.00		\$217,485.90

BA-1	Service / Support Contract	1	LS	\$35,000.00	\$35,000.00	\$25,000.00	\$25,000.00
TOTAL Bid Alternate A					\$35,000.00		\$25,000.00

BA-2a	Assitive Listedning System - Design	1	LS	\$1,070.00	\$1,070.00	\$0.00	\$0.00
BA-2b	Assitive Listedning System - Installation	1	LS	\$4,700.00	\$4,700.00	\$9,349.08	\$9,349.08
TOTAL Bid Alternate B					\$5,770.00		\$9,349.08

	Base Bid and BA-1				\$225,800.00		\$242,485.90
	Base Bid and BA-2a and 2b				\$196,570.00		\$226,834.98
	Base Bid and BA-1, 2a and 2b				\$231,570.00		\$251,834.98



City of Torrington

Bid Name Audio Video System for City Hall Auditorium Bid Number # AVS-026-072722
Date of Opening 7/27/2022 Time of Opening 11am

VENDOR	BID BOND	NON-COLLUSION	BID AMOUNT	ADDENDUM
Soundworks & Security LLC PO Box 23 Torrington, CT 06780	✓	✓	9349.08 BA-2B 25,000 - BA-1 217,485.90 NO.BA-2A	1+2
Vision point LLC 152 Rockland Rd Newington, CT 06111	✓	✓	1,070 - BA-2A 35,000 - BA-1 190,800.00 4,700-BA-2B	1+2



CITY OF TORRINGTON
REQUEST FOR PROPOSAL

RFP# AVS-026-072722 AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM

Bid Opening: July 27, 2022 Time: 11:00 AM Location: City Hall, 140 Main St., Room 206, Torrington

Bid Bond or Certified Check required with bid: 5%

Performance Bond required if awarded bid: "See instructions to bidders"

SUBMIT AN ORIGINAL AND (3) THREE EXACT COPIES.

The City of Torrington reserves the right to accept or reject any or all bids or any portion thereof, to waive technicalities, and to award the contract as will best serve the public interest.

Omit State and Federal Taxes.

All prices must be F.O.B.: Destination (Torrington) unless otherwise requested.

Dated in Torrington: July 7, 2022

Purchasing Agent _____
Pennie Zucco

Item
REQUEST FOR PROPOSAL FOR AUDIO/VISUAL TECHNOLOGY SYSTEM TO SUPPORT MULTIMEDIA PRESENTATIONS AND VIDEO CONFERENCING IN CITY HALL AUDITORIUM PER DRAWINGS AND SPECIFICATIONS.

INSTRUCTION TO PROPOSERS

Sealed bids will be received by the Purchasing Agent, Room 206, 140 Main St., Torrington, CT until the time and date specified on the cover sheet and opened thereafter in the Purchasing Department, Room 206. Bids received later than the date and time specified will not be accepted. In the event of the closure of City Hall, proposals will be opened on the following business day that City Hall is opened. Amendments to or withdrawal of any section of the submitted bid received later than the time & date set for the bid opening will not be considered. Bid proposals must remain in effect for a minimum of 30 days unless otherwise noted elsewhere in the bid specifications.

BID DOCUMENTS: are available upon receipt of this invitation (if not attached) over the Internet at the City's web site: www.torringtonct.org UNDER "Open Bids". Adobe Acrobat reader is required to view this document. If you do not have this software you may download it for free from Adobe at <http://www.adobe.com>. Businesses without internet access may contact the Purchasing Department at 860-489-2224 for a copy of the bid documents.

NONAPPROPRIATION: All funds for payment by the City under this contract are subject to the availability of an annual appropriation for this purpose by the City. In the event of non-appropriation of funds by the City Council of the City of Torrington for the goods or services provided under the contract, the City will terminate the contract, without termination charge or other liability, on the last day of the then-current fiscal year or when the appropriation made for the then-current year for the goods or services covered by this contract is spent, whichever event occurs first. If at any time funds are not appropriated for the continuance of this contract, cancellation shall be accepted by the Seller on thirty (30) days prior written notice, but failure to give such notice shall be of no effect and the City shall not be obligated under this contract beyond the date of termination.

FEDERAL PROCUREMENT: Any procurement made pursuant to a federal award or subject to reimbursement, in whole or in part, with federal funds must comply with the City of Torrington's purchasing procedures, state law, and the applicable Federal Procurement Requirements, including 2 CFR § 200.322 ("Procurement of recovered materials"), 2 CFR § 200.323 ("Contract cost and price"), 2 CFR § 200.324 ("Federal awarding agency or pass-through entity review"), 2 CFR § 200.325 ("Bonding requirements"), and 2 CFR § 200.326 ("Contract provisions"). In the event of any conflict between Town, State, or federal requirements, the most stringent requirement must be used. (See 2 CFR § 200.318.) City employees must comply with funding agency requests for review of technical specifications or procurement documents as provided in 2 CFR § 200.324.

BID BONDS: shall be in the amount of 5% of the total bid made out in favor of the City of Torrington and issued by a Surety company acceptable to the City of Torrington must accompany each bid. A certified check, cashier's check, Treasurer's check, or money order in the same amount may be submitted in lieu of the bid bond. Bids submitted without Certified Check or Bid Bond will not be accepted. The City of Torrington will not be held liable for the accrual of interest on any check held by the city in conjunction with this bid. All checks or bid bonds will be refunded to the unsuccessful bidders after award of the bid by the City Council. The deposit check or Bid Bond of the successful bidder will be held in escrow until such time as the city determines that the bidder has or will meet their obligations as stated by the bid. If the bidder fails or refuses within a reasonable time after due notice that the contract has been awarded to him, to execute the same, an amount representing a loss to the city by reason of such failure shall be retained and paid into the city treasury.

REPLIES: whether bid or no bid, submittal must have the bid number clearly identified on the outside of the envelope. Bidders not marking the envelopes with the Bid number and date/time of opening on the envelope will have no recourse against the City of Torrington or its employees. Such bidders run the risk of the bid being opened prior to the scheduled Bid Opening time. Once opened such bids are public record. Any alleged oral agreement made by a bidder or contractor with any agency or employee of the City of Torrington will be disregarded.

FREIGHT: Prices quoted shall be net delivery **F.O.B. Torrington, CT**. All bid prices must include prepaid delivery, assembly, and/or installation (ready for operation and/or use) of all equipment and/or materials to the individual locations(s) as designated by the Purchasing Agent. All bid prices are to be submitted on the sheets provided on this bid. Quantities and pricing are to be listed in accordance with these sheets.

QUESTIONS: Request for interpretation of any portion of the bid may be made to the Purchasing Agent: Voice 860/489-2225, Fax 860/489-2547 and email: pennie_zucco@torringtonct.org. All bidders questions pertaining to the contract specifications and plans under this contract shall be placed in writing and addressed to: City Purchasing Agent, 140 Main Street, Room 206, Torrington, CT 06790; Any Fax or email shall be followed up with a telephone call to verify receipt. Bidders should check the web site for addendums/updates 48 hours prior to the bid opening.

In the event of receipt of identical bids as to offerings, delivery, service, content, price, etc., the bid will be awarded in accordance with the information contained in the bid document, based on first received as to date and time of receipt of the bid.

EXPARTE COMMUNICATION: Please note that to insure the proper and fair evaluation of a bid, the City of Torrington prohibits exparte communication (i.e., unsolicited) initiated by the Bidder to a City Official or Employee evaluating or considering the bids prior to the time a bid decision has been made. Communication between Bidder and the City will be directed in writing to the Purchasing Agent only. The Purchasing Agent will obtain the information or clarification needed. Exparte communication may be grounds for disqualifying the offending Bidder from consideration or award of the bid and repeat offenders may be disqualified from future bids.

NON-COLLUSION STATEMENTS: In order for bids to be considered, a non-collusive statement must be submitted with the bid. A sample non-collusive bid statement is attached. Bidders may elect to submit their own notarized non-collusion statement. **NOTE:** Documents must be signed before and sealed by a Notary Public. Only documents bearing a notary seal will be accepted.

CONDITIONAL, QUALIFIED OR NON-RESPONSIVE BIDS/PROPOSALS: All bids/proposals shall be submitted in the form and manner as indicated by the bid documents and bid forms. Any proposal which is not submitted in the form and manner indicated by the bid documents or which contains information, statements, conditions, or qualifications which place conditions or qualifications on the proposal submittal for purposes of making an award, or which alter any proposal terms, conditions, specifications, or forms, which has not been previously approved by written

addendum from the Purchasing Agent, or which does not meet legal requirements, shall be declared as a qualified, conditional, or non-responsive proposal and shall be rejected without further consideration. Any proposal response that does not fully respond to and comply with all detailed specifications or requests for information including execution of proposal forms, may be declared "non-responsive" and recommended for rejection. The City of Torrington shall not be responsible for any errors or omissions of the respondent.

UNBALANCED BIDS AND/OR EXCESSIVE LINE ITEM PRICES: The City reserves the right to reject any bids in which unit prices, in the sole opinion of the City, are unbalanced. In addition, where the City has decided to make an award, it further reserves the right to non-utilize a particular line item that in the sole opinion of the City is excessively priced, and reserves the right to obtain that item from another source.

CONTRACT: A response to an Invitation To Bid is an offer to contract with the City of Torrington based upon the terms, conditions, and specifications contained in the City's ITB. Bids do not become contracts unless and until executed by the City, eliminating a formal signing of a separate contract. For that reason, all of the terms and conditions of the contract are contained in the ITB, unless any of the terms and conditions are modified by an ITB Amendment, a Contract Amendment, or by mutually agreed terms and conditions in the contract documents.

TAXES: Omit all State and Federal taxes from the bid. The City of Torrington is exempt from the payment of taxes imposed by Federal government and/or the State of Connecticut.

OWNERSHIP OF DOCUMENTS: All documents, including drawings, plans, specifications, videotapes, or other documents or maps prepared by a contractor pursuant to any agreement arising from this bid shall become the property of the City of Torrington upon completion of the project or any termination of the project prior to the completion of the project.

LEGALITY: All bid offers for commodities, work, materials, or equipment hereunder shall comply in every respect with the laws, specifications and requirements of the State of Connecticut and the Federal government. Contractor will comply with the provisions of the Connecticut Fair Employment Practices Law.

LANGUAGE DISPUTES: Any disputes over the interpretation and/or meaning of any individual terms, conditions, and/or language within this Request for Bid/Proposal document shall be resolved by and at the sole discretion of the City Purchasing Agent in a manner that is in the best interest of, and best advantage to, the City of Torrington, provided any such interpretation shall be reasonable. In the event that an individual term, condition, and/or language/wording is determined at any time, including after award, by the City Purchasing Agent to be "not applicable at all" to this contract, then the term, condition, and/or language/wording may be disregarded, even though an addendum is not issued. However, if the Purchasing Agent determines that the term, condition, and/or language/wording "is applicable in part", then the term, condition, and/or language/wording will apply to the degree applicable, even though an addendum is not issued.

INDEMNIFICATION: The Contractor shall save the City of Torrington, its agents or employees, harmless from liability of any kind for all claims of labor payments and materials furnished for this work, and for use of any copyrighted or uncopyrighted composition, secret process patented or unpatented invention, article or application furnished or used in the performance of the contract of which the Contractor is not the patentee, assignee, or licensee. To the fullest extent permitted by law, The bidder shall indemnify and hold harmless the Municipality, its officers, agents, servants and employees from and against all liability, claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance or lack of performance of the work, provided that any such liability, claim, damage, loss or expense is (a) attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting hereto from and (b) is caused in whole or in part by any negligent act or omission of the Bidder, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them are liable.

In any and all claims against the Municipality, its officers, agents, servants and employees by any employee of the Bidder, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for those acts any of them may be liable, the indemnification obligation under these sections to be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Bidder or any Subcontractor under Worker's Compensation Acts, Disability Benefit Acts or other employee benefit acts.

The successful bidder, vendor, and/or contractor must protect all property of the City of Torrington (i.e. all floors, furniture, grass, land, etc.) from injury or other damage. Any damage so caused must be repaired by contractor/vendor at his/her own expense. At the completion of work, the vendor and/or contractor must remove from the premises all surplus materials and all debris created by same. The premises must be left in a broom-clean and finished condition acceptable to the owner or its agents. Successful bidder will furnish adequate protection from damage for all work and to repair damage of any kind; for which he or his workers are responsible, to the premises or equipment to his own work or to the work of other contractors.

DEFAULT: It shall be understood that a bidder supplying equipment and/or supplies will be considered to be in default if/when they have not delivered the item(s) within the time constraints listed in this document or subsequent purchase orders and/or contract. Bidders providing a service and/or construction will be considered to be in default if/when they have failed to meet the completion date set forth in this document or its subsequent contract and/ or purchase orders and/ or they have ceased work on the project for a period of fifteen (15) working days, cumulative or consecutive.

SUSPENSION AND DEBARMENT: The Purchasing Agent may suspend or debar the right of a vendor to be included on the vendor list and has the authority to reject any bid or response from any suspended or debarred vendors.

Suspension: A vendor may be suspended based on the following:

- 1) A vendor defaults or fails to fully comply with the conditions, specifications, or terms of a Bid, Quotation, Proposal or Contract with the City of Torrington.
- 2) A vendor commits any fraud or misrepresentation in connection with a Bid, Quotation, Proposal, or Contract with the City of Torrington.
- 3) A vendor is charged by a court with the commission of a criminal offense as incident to obtaining or attempting to obtain a public or private contract or sub-contract, or in the performance of such contract or sub-contract

- 4) A vendor is charged by a court with the following: embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense indicating a lack of business integrity or business honesty which currently, seriously, and directly affects responsibility as a City contractor. If charges are dismissed or the vendor is found not guilty, the suspension shall be lifted automatically upon written notification and proof of final court disposition provided by the vendor to the City of Torrington.
- 5) A vendor becomes insolvent, has proceedings in bankruptcy instituted against it or, compounds its debts or assigns over its estate or effects for payment thereof, or has a receiver or trustee appointed over its property.
- 6) A vendor's commission of any act or omission to perform act is grounds for debarment.
- 7) A vendor violates the ethical standards set forth in local, state, or federal law.
- 8) Any other cause the Purchasing Agent determines to be so serious and compelling as to materially and adversely affect responsibility of a vendor as a City contractor, including but not limited to suspension by another government entity

Debarment: A vendor may be permanently debarred for the following:

- 1) Default or failure to fully comply with the conditions, specifications, drawings, or terms of a bid, proposal, or contract with the City of Torrington twice in any three-year period.
- 2) Conviction of or judgment obtained in a court for commission of those offenses in connection with the vendor's commercial enterprise stated sections 3) or 4) of suspension section listed above. If the conviction is reversed through the appellate process, the debarment shall be removed upon written notification and proof of final Court disposition from the vendor to the City of Torrington.

TRADE NAME REFERENCES: Any and all references to trade names, types, styles, model numbers, stock numbers or catalogs are intended to be descriptive only and not restrictive. The intention is to indicate to bidders the type and quality of the articles and or materials that will be satisfactory. When reviewing the information, it is the responsibility of the prospective bidder to inform the City of Torrington of any discrepancy that is found (i.e. number listed does not fit item description) Bids received on other makes or models with reference to other catalogs will be considered. The bidder is to clearly state in his bid exactly what he intends to furnish and to furnish with his bid a cut or illustration or other descriptive matter that will clearly indicate and give specification as to the product he/she proposes to furnish. Where a bid is offered on an item other than the trade standard used in the specification the item should be identified on the bid form by entering the MAKE, TRADE NAME AND MODEL NUMBER. It is understood that any substitute and/or alternate that might be offered are guaranteed by the bidder to be of equal or better quality than is referenced in the bid. The item(s) must be equivalent as to function, basic design, type and quality of material, method of construction and any required dimensions. It shall be further understood that during original as well as subsequent shipments spot checks will be performed to insure that the items received are in fact the items offered in the bid. When received, should items/materials prove to be different from what was bid in any way, the bidder agrees to the return of the items and agrees to supply correct items (per bid specifications) at the bidders expense. In the event this return action is required, it is understood the bidder may be subject to removal from the city's approved bidder's list. Bidders are cautioned that surplus, seconds, factory rejects, floor samples, close outs or distressed items are not acceptable and shipments of substitutions, defective or shop-worn equipment will be returned for a full refund at the vendor's expense.

QUANTITY: The quantities and/or materials listed in the specifications/bid sheets may be increased or decreased by the City of Torrington or its designated representative based on actual need at the time the purchase orders are placed.

QUALITY: The City of Torrington reserves the right to reject any proposal in whole or in part offering equipment and/or materials and/or services that in its or its agent's opinion does not meet the quality standards desired. Such decision is final and not subject to further recourse by the bidder.

SAMPLES: forwarded by the bidder will be returned to the bidder at his request and expense. Requests for return of samples must be submitted in writing at the time the sample is given to the City of Torrington or its representative. Samples not returned to the bidder will be disposed of at the discretion of the City of Torrington or its designated representative. Large pieces of equipment submitted for evaluation and inspection are to be picked up by the bidder within 30 days of the bid opening date. Items remaining after 30 days will be discarded.

AWARD: It is the intent to award this bid in its entirety to one bidder, however, the City reserves the right to award the bid line item by line item if it is deemed in its best interest to do so. In addition, bidders are advised that should budgetary constraints dictate, part, and/or all the items in this bid may be rejected. This decision shall be considered final and not subject to recourse by the bidder. In determining the lowest or highest responsible bidder, the City reserves the right to consider, in addition to price, the compatibility, quality, cost of maintenance and availability of parts, experience and/or past performance of the bidder, sufficiency of the financial resources of the bidder as relates to the offerings as well as the ability of the bidder to provide future maintenance and service.

Documents previously submitted to the City of Torrington will not be considered as satisfying submission requirements for this bid.

No bidder can claim any contract rights by virtue of bidding alone. Awarding of the contract means actual written notice by letter and a properly executed purchase order to the bidder or bidders to whom the bid has been awarded.

BONDS:

Bid Bond, as described above.

Performance Bond: The Contractor, when awarded the Bid, must submit within 10 days of the bid award, and before beginning the work or signing a contract, a Performance Bond amounting to one hundred percent (100%) of the total amount of the bid. Said performance bond must be in favor of the City of Torrington and executed by a surety company authorized to do business in the State of Connecticut. The City of Torrington reserves the right to retain the Bid Bond or Certified Check on bids below \$25,000.00 as a Performance Bond. On bids of \$25,000.00 or more the Performance Bond may be furnished in the following manner: Performance Bond, Surety Bond, Certified Check or Bank Check.

Maintenance Bond: The contractor, upon signing a contract and before beginning the work must submit to the Purchasing Agent a Maintenance Bond to guarantee that if defects in either labor or materials becomes evident within one year after completion and acceptance of work will be fixed at no cost to the City of Torrington. The maintenance bond may be included as a portion of the Performance bond or as a separate bond. If

it is issued as a separate bond said maintenance bond must be in favor of the City of Torrington and issued by a surety company licensed and authorized to do business in the State of Connecticut.

Labor and Material Bonds: Per Section 49-41 of the Conn. General Statutes, on Public Works project where the estimate is in excess of \$25,000.00, a labor (payment) and material bond must be furnished to the City. Said bonds must be filed with the Purchasing Agent prior to the commencement of work.

Consent for Release of Final Payment: AIA Document G707 & G706, or equivalent, must be signed and returned by the Surety Company before final payment will be released to the contractor.

INSURANCE:

Certificate of Insurance: All insurers shall purchase insurance from an insurance company or companies rated A-V11 or better by A.M. Best Companies lawfully authorized to do business in the State of Connecticut. The insurance provisions set forth below are minimum requirements. In the event the Contractor/City Contract (Project Requirements) specifies additional coverage's and/or amounts of coverage then those set forth below and pertaining to the Contractor's work, then the Contractor shall provide the coverage's and/or amounts in accordance with the Project Requirements. Proof of proper insurance coverage, Workers Compensation Insurance, Liability and Property damage, and Vehicle Insurance shall be filed with the City of Torrington Purchasing Agent within 10 days after the award of the bid. The Certificate of Insurance must name the City of Torrington, 140 Main St., Torrington, CT, its subsidiaries, employees, volunteers, directors & officers as the "Additional Insured" and filed with the Purchasing Agent prior to commencement of work. Renewal Certificates of Insurance must be mailed to the Purchasing Agent 10 days prior to the expiration of the required coverage. Such insurance will protect the Contractor from claims which may arise out of or result from the Contractor's operations under the Subcontract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Sub-Contractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. Contractor, and any Sub-subcontractors engaged by the Contractor, shall obtain the following insurance:

Workers' Compensation Insurance: For all work performed pursuant to this contract, Contractor shall maintain Workers' Compensation Insurance, including coverage for all executive officers, sole proprietors and partners, and other similar employee benefits in the amount required by all applicable statutes, law, regulations or acts. Such Workers' Compensation Insurance must list on Item 3A of the policy Information Page "Part One of the policy applies to the Workers' Compensation Law of the state Connecticut" and provide a Waiver of Subrogation endorsement (NCCI form WC 00 03 13 or its equivalent) that prohibits the insurance company from enforcing subrogation and recovery rights against the City, its subsidiaries, employees, volunteers, directors and officers. If work is to be performed over or adjacent to navigable waterways, the Workers' Compensation Insurance shall contain the United States Longshore and Harbor Workers' Act Endorsement (NCCI Form WC 00 01 06 or its equivalent). In case any class of employees or subcontractors is engaged in hazardous work under the contract at the site of the work is not protected under the Workman's Compensation statute, the contractor shall provide Workman's Compensation Insurance for the protection of employees not otherwise protected.

Liability Insurance: The Contractor shall take out and maintain for the life of the contract, adequate public liability insurance insuring against liability to persons not employed by him in an amount of not less than \$1,000,000.00 for injuries, wrongful death to any one person and subject to the limit for each person in an amount of not less than \$2,000,000.00 on account of one accident and property damage insurance in an amount of not less than \$1,000,000.00.

Vehicle Insurance: The Contractor shall take out and maintain for the life of the contract, adequate automotive/truck or other vehicle insurance with minimum coverage of \$1,000,000.00 each for both liability and under insured and uninsured motorist as well as any other coverage required by the State of Connecticut or requested by an official of the City of Torrington as relates to the contract.

Additional Security: The City of Torrington reserves the right to require successful bidders to enter into and such security arrangements as are deemed necessary to protect the City of Torrington, its property and goods.

PERMITS: The successful bidder agrees to obtain all work/building permits as might be required. The cost of obtaining such permits is the responsibility of the bidder. The City of Torrington reserves the right to waive local permit fees. In addition, it shall be understood that where property lines are to be considered, bidders are to verify said lines and measurements with proper City Officials prior to commencement of work. It is to be understood that any/all specifications and/or plans or drawings contained in or developed as a result of the bid process are and shall be presented subject to the approval of the City of Torrington planning, zoning and building officials and that awards made prior to said approval are subject to cancellation.

PREVAILING WAGE: When the State of Connecticut Prevailing Wage Rate is applicable to the bid, the successful bidder must submit a Certified Payroll Record prior to any request and/or invoice for payment.

CITIZENSHIP: Each employee of the Contractor shall be a citizen of the United States or an alien who has been lawfully admitted for permanent residence as evidenced by an Alien Registration Receipt Card. The Contractor agrees not to employ any person undergoing sentence of imprisonment except as provided by Public Law 89-176, September 10, 1965, (18 USC 4082)(c)(2).

SAFETY:

Machine and/or Equipment Hazard Assessment and Safety Training: Upon delivery of machines and/or equipment, suppliers are required to provide to the end-user employees, at no additional charge, a training session that will emphasize hazard awareness and assessment and the safe use of such machinery/equipment.

Occupational Safety and Health Act of 1970: Seller shall warrant that the machinery, equipment or other materials covered hereby shall upon delivery to the City of Torrington, be in compliance with the standards required by said Act and any updates as pertain to or reference said Act as well as the standards required by comparable State and local laws, if any, for such machinery, equipment or other materials in effect at the time

of delivery.

Machines and/or Equipment Lockout/Tagout: In an effort to comply with OSHA's final rule on the control of hazardous energy sources, vendors must warrant that any and all machines and/or equipment as is covered under this bid will be supplied and/or installed equipped with lockout/tagout devices as prescribed by OSHA.

Toxic Substance Control Act (PL94-469): Seller warrants that each and every chemical substance constituting or contained in the products sold or otherwise transferred to the City of Torrington under this bid and subsequent purchase orders is not on the list of prohibited chemical substances compiled and published by the Administrator of the Environmental Protection Agency pursuant to Act PL94-469 and are otherwise in compliance with said Act.

Hazardous Materials: Any materials required by this bid and subsequent purchase orders that are hazardous under federal, state, or local statute, ordinance, regulation, or agency order will be packaged, labeled, marked and shipped by the seller to comply with all federal, state and local regulations then in effect including but limited to the provisions of the Hazardous Materials Transportation Act and Regulations promulgated thereunder and will further comply with any special requirements and any policies and procedures of the City of Torrington relating to the purchase of hazardous materials as might be noted on subsequent purchase orders or otherwise communicated to seller in writing.

Material Safety Data Sheets: Shall be provided by the Seller upon delivery to the City of Torrington of any goods having constituents listed in the following references - OSHA 1910, ACHIG Current Threshold Values, DOT HazMat Table 49, IARC Carcinogen List, National Toxicology Program Carcinogen List, and/or Radioactive Materials. These Material Safety Data Sheets must be consistent with and include information required by the OSHA Hazard Communication Standard published as 29 CFR 1910.1200, as the same may be amended or supplemented from time to time.

Asbestos: Bidders are advised that asbestos-containing material may be located in the boiler rooms, pipe tunnels, storage areas and various portions of City buildings. Before proceeding on any contractual work on City buildings or their interiors, it is mandatory that bidders familiarize themselves with the asbestos-containing material and that said material be considered as a health hazard and all precautionary measures according to the Ahera Rules & Regulations be observed. It is the bidder's responsibility to notify all employees and/or subcontractors of this notification.

SUB-CONTRACTORS: The successful bidder shall not employ any subcontractor to fulfill any of the duties herein specified without express, prior written approval of the City of Torrington or its designated agent.

EEO: The successful bidder shall provide any/all additionally required, affirmative action statements, fair employment plans and non-discrimination programs and statement as might be required by the City of Torrington. In connection with the execution of this bid, subsequent purchase orders and/or contracts, the seller shall not discriminate against any employee or applicant for employment because of age, race, religion, color, sex or national origin. Bidders must comply with all rules & regulations of the Department of Labor with regard to Equal Employment Opportunities as pertains to municipalities.

TERMINATION OF CONTRACT: Any contract entered into by the City and the successful bidder shall provide that the City may terminate the contract upon thirty (30) days notice to the bidder.

The City of Torrington reserves the right to award or reject any or all bids, or any portion thereof, to waive technicalities, to award the contract to a bidder other than the lowest bid and to award the bid and/or contracts to one or more bidders submitting essentially identical proposals and, that in the city's judgment, will best serve the public interest.

The terms and conditions of these "Instructions to Bidders" are made a part this bid.

SAMPLE FORM

Bid #

RFP # AVS - 026-072722

Audio Video System for City Hall Auditorium

NON-COLLUSION AFFIDAVIT

STATE OF

Connecticut

COUNTY OF

Litchfield

I, Gloria H. Hall being first duly sworn, deposes and says that:

1. I am Gloria H. Hall of SoundWorks & Security LLC the Bidder that has submitted the attached Bid for "Audio Video System for Torrington City Hall Auditorium"
2. I am fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such bid;
3. Such Bid is genuine and is not a collusive or sham Bid;
4. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties of interest, including this affiant, has in any way colluded, conspired, connived or agreed directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with such Contract, for which the attached Bid has been submitted nor has it in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price or the price of any Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the City of Torrington or any person interested in the proposed Contract; and
5. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Printed)

Gloria H. Hall

(Signed)

Gloria H. Hall

(Title)

managing member

Subscribed and sworn to before this 26 day of July, 2022

Jennie DeGray

Notary Public Printed

Jennie DeGray

Notary Public Signature

My Commission Expires April 30, 2027

(Notary Seal)

NOTE: Documents must be signed before and sealed by a Notary Public. Only documents bearing a notary seal will be accepted.

**REQUEST FOR PROPOSAL
AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM
RFP# AVS-026-072722**

The City of Torrington is seeking sealed bid proposals from established vendors to provide an audio/visual technology system to support multimedia presentations and video conferencing in the City Hall Auditorium. **The qualified proposal will provide equipment and software technologies from a vendor that has demonstrated expertise in the installation and configuration of required systems.**

A highly recommended pre-bid meeting is scheduled for **July 13, 2022 from 10:00 AM to 12:00PM** at the Torrington City Hall, 140 Main Street, Torrington, CT 06790. Vendors will have the opportunity to review the scope of work, project site, existing equipment and ask questions. Please contact Gerry Crowley via email to schedule the day you would like to attend. Gerry_crowley@torringtonct.org

*** Manufacturer's sales literature for all equipment must be included with submitted proposals. Proposals not including the required materials run the risk of proposal being rejected.**

The deadline for bid submittals is **Wednesday, July 27, 2022 at 11:00 AM**. Proposals shall be submitted to the Purchasing Department, City Hall, 140 Main Street, Room 206, Torrington, CT 06790. One original and three (3) exact copies shall be placed in a sealed envelope and clearly marked "**RFP #AVS-026-072722, AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM**" and must bear the Name and address of the bidder. Proposals received after the closing date and time shall be rejected and returned unopened. In the case where City Hall is closed for weather related or some other emergency related circumstance, then submittals shall be due the next day when City Hall reopens for business, no later than 11:00 AM on that day. The City will not be liable for any costs incurred in the preparation of the response for this Request for Proposal. All proposal submissions and materials become property of the City and will not be returned. Once opened such bids are public record. Vendors mailing bids should allow for normal delivery time to ensure timely receipt of their bids. The City of Torrington shall not be held responsible for lost or misdirected bids. **No faxed or e-mailed bids will be accepted.**

Deadline for questions is **July 20, 2022 by 12:00 NOON**. Submit all questions to Pennie Zucco, purchasing agent, pennie_zucco@torringtonct.org. Questions determined to be of interest to all prospective bidders will be posted as an addendum on the City and State websites. It is the vendor's responsibility to check these websites 48 hours before the closing date for addenda's. All information given by the City except by written addendum shall be informal and shall not be binding upon the city nor shall it furnish a basis for legal action by any Proposers against the City.

Any alleged oral agreement made by a bidder or contractor with any agency or employee of the City of Torrington shall be disregarded.

All proposals must include the bidder's name and be signed by a responsible officer or employee of the vendor submitting a proposal. The vendor shall provide at least three (3) references of companies or agencies that have purchased similar equipment from vendor.

Prevailing wage rates shall not apply where the total cost of all work to be performed by all contractors and subcontractors is less than one hundred thousand dollars in accordance with State of Connecticut State Statute Sec. 31-53(g).

This RFP does not commit the City of Torrington to select any vendor or enter into any contract agreement. The City of Torrington reserves the right to request additional information from some or all bidders. The City of Torrington reserves the right to accept any RFP deemed in the best interests of the City of

Torrington.

The information provided herein is not intended to and shall not bind the City of Torrington to any of the statements or assumptions set forth herein.

Responses must set forth accurate and complete information for each of the items listed below. At the City's discretion, failure to do so could result in disqualification.

Any contract entered into by the City and the successful bidder shall provide that the City may terminate the contract upon a thirty (30) day notice to the bidder.

All proposals will be considered valid for a period of ninety (90) days. The successful bidder shall not withdraw, cancel or modify their proposal.

The bidder hereby acknowledges receipt of and agrees this submittal is based on the RFP and the following addenda(s). Failure to indicate receipt of addenda(s) may result in the bidder being rejected as nonresponsive.

ADDENDUM # 1 DATED 7/12/22 ADDENDUM _____ DATED _____

ADDENDUM # 2 DATED 7/21/22 ADDENDUM _____ DATED _____

ADDENDUM # _____ DATED _____ ADDENDUM _____ DATED _____

(If additional addenda are issued, attach a complete listing of these addenda when submitting this bid.)

The City of Torrington reserves the right to award or reject any or all bids, or any portion thereof; to waive technicalities; to award the contract to a bidder other than the lowest bid, and to award the bid and/or contracts to one or more bidders submitting essentially identical proposals and, that in the city's judgment, will best serve the public interest.

**AN AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYER
MBE'S WBE'S AND SBE'S ARE ENCOURAGED TO APPLY**



CITY OF TORRINGTON

Addendum # 1

ADDENDUM #1 HAS BEEN ISSUED TO ADD AN ADDITIONAL DATE FOR PRE-BID MEETING – THURSDAY, JULY 14, 2022, 10:00 AM – 12:00 PM.

RFP AVS-026-072722 AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM

Date of bid opening: July 27, 2022 **Time:** 11:00 AM **Location:** City Hall, 140 Main St., Room 206, Torrington, CT

Submit signed addenda with bid.

The City of Torrington reserves the right to accept or reject any or all bids or any portion thereof, to waive technicalities, and to award the contract as will best serve the public interest.

Dated in Torrington: 7/12/2022

Purchasing Agent _____
Pennie Zucco

Contact name Gloria H. Hall Phone: 860-496-7041

Authorized Representative Gloria H. Hall

Authorized Signature Gloria H. Hall

Company name SnatchWorks & Security LLC

Address PO Box 23

City, State, Zip Torrington, CT. 06790

Fax 860-496-7043 Phone 860-496-7041

Federal Tax Identification Number: (FEIN) 37-1961798

****ADDITIONAL PRE-BID MEETING DATE ADDED –**
THURSDAY, JULY 14, 2022, 10:00AM – 12:00 PM**



CITY OF TORRINGTON
Addenda #2

**ADDENDA #2 HAS BEEN ISSUED FOR QUESTIONS/ANSWERS SUBMITTED FOR
AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM**

RFP AVS-026-072722 AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM

Date of bid opening: July 27, 2022 **Time:** 11:00 AM **Location:** City Hall, 140 Main St., Room 206, Torrington, CT

Submit signed addenda with bid.

The City of Torrington reserves the right to accept or reject any or all bids or any portion thereof, to waive technicalities, and to award the contract as will best serve the public interest.

Dated in Torrington: 7/21/2022

Purchasing Agent Pennie Zucco

Contact name Gloria H. Hall Phone: 860-496-7041
Authorized Representative Gloria H. Hall
Authorized Signature Gloria H. Hall
Company name Soundworks Security LLC
Address PO Box 23
City, State, Zip Torrington CT 06790
Fax 860-496-7043 Phone 860-496-7041
Federal Tax Identification Number: (FEIN) 37-1961798

QUESTIONS/ANSWERS 7/21/2022

Q1) I looked this over late last night. This has a lot of requirements that point toward a specific technology and a specific vendor. I'm a little surprised to see this design. It is very much over engineered and underperforming. The problem with the camera is it is using a brand new video technology. Dante audio has been around for a long time but Dante video is only about a year old and there is basically one company making products. They tout this as an Open technology but then they only have one supplier and parts are hard to come by. How is the engineer planning to implement this system regarding what the client interfaces with?

A1) All equipment specifications and integration are listed "Or Equal". Bidders may submit alternates that will be reviewed during the evaluation of bids.

Q2) I have a follow-up question regarding the upgrade project. During the walk-thru you had mentioned that you had planned on the council members using PC's at the Dais for the meetings. Should we assume in our bid that each council member will have a PC in front of them at the dais? This would be in addition to the PC's referenced in the RFP.

A2) The PCs are in the table at the end of the specification "BPC-1 through 8"... about 2/3 way down the table. For a total of 8.

Q3) Another note, I thought there was some discussion about a second camera facing the presenter? Do we want that or will it make the configuration overly complex?

A3) The camera spins 360 so it can have presets for different locations

Q4) How will this system be registered to Zoom? Zoom CRC or as a Zoom Room?

A4) The entire design is platform agnostic and will be able to perform in either capacity. The initial design plan was for standard zoom meeting interface.

Q5) Who will operate the system during meetings? ie. Town Clerk, AV Technician?

A5) City Clerk at the operator's station, also to be controlled from any of the BPC's via a LogMeIn Session if necessary. The Media cart will be able to be operated as part of an overall meeting or as an independent meeting device.

Q6) Will the recording include local cameras and the far sites during an interactive meeting?

A6) Meeting recording will be controlled by custom layouts in OBS studio. The outgoing stream of the meeting is the content that will be recorded.

Q7) Will meetings be streamed to YouTube like other Connecticut Towns and Cities?

A7) The outgoing stream from OBS studio is intended to be streamed on the towns YouTube channel. This is an integrated function of OBS Studio. Again the intent is for the system to be platform agnostic and OBS is capable of being broadcast to a variety of streaming services.

Q8) Should we include any Microsoft or Adobe driven softwares on the Computer's? Or is that something you will be providing?

A8) We have licensing for Microsoft Windows OS, Office 365 and Zoom. We do not have licensing for any current Adobe product and it is not required for this project.

**REQUEST FOR PROPOSAL
AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM
RFP # AVS-026-072722**

1. INTRODUCTION:

The City of Torrington is soliciting proposals from vendors to upgrade the existing audio and visual technology in the City Hall Auditorium. The qualified Vendor will provide a new, fully configured, unified, multimedia system supporting hybrid virtual and in-person meetings and presentations.

2. BACKGROUND/EXISTING INFRASTRUCTURE

The City Hall Auditorium is a multipurpose room with audio/video equipment installed in 2010 as part of the City Hall renovation project. The audio equipment was designed to support presentations to the public and various board meetings. The video equipment is comprised of a portable projector and recessed motorized ceiling projection screen behind the dais. This configuration limits the visibility of presentation materials to members sitting at the dais and the public.

The Contractor shall offer the existing equipment not scheduled for reuse to the COT for salvage; any items not salvages shall be disposed of by the Contractor. Existing equipment includes, but is not limited to:

- a. Draper Envoy ENV-15 motorized projection screen.
- b. Shure MX418D/C Gooseneck Microphones
- c. FTR Touch
- d. Antex DMX8 USB Mixer
- e. Precision Electronics AXIOM 250 Amp
- f. Protech Audio Model 2000-C Courtroom Automatic Mixer (Master & Slave)
- g. Sanus CF535 Component Rack Cabinet
- h. Powerlite 93 Projector
- i. HP Elite 800 Mini PC

3. SCOPE OF WORK

City of Torrington (COT) is seeking a qualified vendor to provide a turn-key presentation and video conferencing technology system for the City Hall Council Chambers. Refer to Drawings and Specification for work required. Note that there are two (2) Bid Alternates being considered, as described in the documents.

4. EVALUATION FACTORS

After receipt of Proposals, the CITY will use the following criteria in the selection process:

- 45% - Project Cost
- 50% - References/Experience
- 5% - Proposal Presentation

5. SUBMITTALS

Proposals shall be submitted as outlined in the ITB to the Purchasing Department and shall include:

- a. The Request for Proposal packet, signed by an authorized agent of the company, including Non-Collusion Affidavit and acknowledgement of addenda.
- b. Bid Bond
- c. Pricing Schedule (Appendix A)
- d. Acceptance of Terms (Appendix B), signed
- e. Reference Sheet (Appendix C)

The City of Torrington reserves the right to award or reject any or all bids or any portion thereof, to waive technicalities, to award the contract to a bidder other than the lowest bid and to award the bid and/or contracts to one or more bidders submitting essentially identical proposals and, that in the city's judgment, will best serve the public interest.

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APPENDIX A

PRICE SHEET
AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM
RFP #AVS-026-072722

Hybrid Meeting and Presentation A/V Technology System Price Proposal		
Item No.	Description	Cost
1	The Project This cost provided is the cost for the entire project, with exception of Bid Alternates. A Schedule of Values will be required prior to the start of the Project.	\$ <u>217,485.90</u> Written: <u>Two hundred seventeen thousand four hundred eighty-five</u> dollars and <u>ninety</u> cents
Bid Alternates		
BA -1	Service / Support Contract	\$ <u>25,000.-</u> Written: <u>Twenty-five thousand</u> dollars and <u>0</u> cents
BA -2a	Assistive Listening System - Design	\$ _____ Written: _____ dollars and _____ cents
BA -2b	Assistive Listening System - Installation	\$ <u>9,349.08</u> Written: <u>Nine thousand three hundred forty-nine</u> dollars and <u>eight</u> cents

SoundWorks & Security LLC

PO Box 23

Torrington, CT 06790

Phone 860-496-7041 Fax 860-496-7043

CT Lic #181031

Estimate

DATE	ESTIMATE NO.
7/25/2022	6842

NAME / ADDRESS
Torrington City Hall 140 Main Street Torrington, CT 06790-5245

Ship To
Torrington City Hall 140 Main Street Room 206 (Auditorium) Torrington, CT 06790

P.O. NO.	TERMS	DUE DATE	REP	FOB	PROJECT	estimate valid for 30 ...
	Due on receipt	7/25/2022	WLH		Auditorium	
DESCRIPTION						QTY
RFP#AVS-026-072722 Audio Video System						
MONITORS						
Sony FW-75BZ30J 75-inch BRAVIA 4K Ultra HD HDR Professional Display						2
Chief FUSION™ X-Large Dual Pole Flat Panel Ceiling Mount XCM7000 XCM Single Display Series						2
Chief 4-6' Adjustable Extension Column CMS0406						4
Chief 8" (203 mm) Ceiling Plate CMA110						4
DESK						
Contractor shall carry and allowance of \$2000 dollars and shall coordinate with the city to select an appropriate desk to contain all equipment related to the operator station						1
PODIUM						
ADA Full Podium By AmpliVox Sound Systems						1
Stage Ninja Retractable CAT6 Cable Reel (65')						1
STX-45-1 - Stage Ninja® 45 Foot Retractable 12/3 Power Reel						1
Dell Optiplex 3090 Micro Podium PC						1
Comet GP2600AF Document Camera						1
Kensington Combination Ultra Laptop Lock						1
OptiPlex Micro VESA Mount with Adapter Bracket						1
Dell Ultrasharp U2422HE Monitor						1
Wearson WS-03A stand for Monitor						1
the podium shall be configured such that the power and data cable can be quickly and neatly stored on the podium when not in use.						
AV CART						
INFOCUS JTOUCH INF6500 Whiteboard						1
Chief Large Fusion™ Manual Height Adjustable Mobile AV Cart						1
We look forward to your business						
					(0.00)	
					TOTAL	

SIGNATURE _____

SoundWorks & Security LLC

PO Box 23

Torrington, CT 06790

Phone 860-496-7041 Fax 860-496-7043

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Estimate

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	Due on receipt	7/25/2022	WLH		Auditorium	
DESCRIPTION						QTY
Chief Shelf PAC710-G						1
Stage Ninja Retractable CAT6 Cable Reel (65')						1
STX-45-1 - Stage Ninja® 45 Foot Retractable 12/3 Power Reel						1
RACK						
TrippLite SR42UBMD Rack						1
Rack Shelves TrippLite SRSHELF2P1U						1
SRFAN3U TrippLite Rack Fan						1
SR1UPANEL50 TrippLite Blank Kit						1
SRCABLERINGVRT TrippLite Vertical Cable Tray						2
SRCABLELADDER TrippLite Cable Ladder 10 Ft Section						1
SR1UBRUSH TrippLite QTY						4
SRCABLERING1U TrippLite Horizontal Cable management						4
Wirepath Rack Mount 48-port RJ45 Cat 6 Patch Panel						1
Synology DS920+ DiskStation 4 Bay NAS						1
Ultrastar DC HC550WUH721816ALE6L1 Hard Drive						4
Panamax MB1500 USB Power Conditioner MB1500 prevents critical equipment from losing setup configuration, stored data and hard-disk crashes. Shuts off projection equipment via IR control to allow the projector bulbs to go through a proper cool-down cycle before shutting off.						1
Panamax BLUEBOLT-CV2 BlueBOLT IP Card for F1500-UPS and MB1500 The BlueBOLT-CV2 Interface Card plugs in to select Panamax/Furman products and provides access to BlueBOLT™ cloud based remote power management technology.						1
12 outlet Vertical strip style power distribution unit (PDU) / surge protector with local area network and BlueBOLT cloud control						1
Dante Server Dell PowerEdge R350						1
Rack Rails						1
We look forward to your business						
					(0.00)	
					TOTAL	

SIGNATURE _____

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Torrington City Hall 140 Main Street Room 206 (Auditorium) Torrington, CT 06790

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	Due on receipt	7/25/2022	WLH		Auditorium	
DESCRIPTION						QTY
TIME CLOCK						1
Bulova C5000 IP Clock						
SOFTWARE FOR ALL PC's and SERVERS						1
Dante Software						
AV CONTROL PC						1
Dell Precision 3660 Control PC						
Dell Ultrasharp U2722D						2
Dell Dual Monitor Arm						1
Kensington Combination Ultra Laptop Lock						1
Comet GP2600AF Document Camera						1
Shelf						1
BOARD MEMBERS						8
Dell Optiplex 3090 Micro Board PC						
Kensington Combination Ultra Laptop Lock						8
OptiPlex Micro VESA Mount with Adapter Bracket						8
Dell Ultrasharp U2422HE Monitor						8
Wearson WS-03A stand for Monitor						8
DANTE AV EQUIPMENT						1
XILICA 1 Solaro FR1-D DSP (Mixer)						
XILICA 1 XC-SGP (Mixer IO Card)						1
XILICA 1 XC-SUB (Mixer USB Card)						1
XILICA 2 XC-SLO (Mixer Input Card)						2
YAMAHA RM-WOM RM Wireless Omni-directional Tabletop Microphone						2
We look forward to your business						
					(0.00)	
					TOTAL	

SIGNATURE _____

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P.O. NO.	TERMS	DUE DATE	REP	FOB	PROJECT	estimate valid for 30 ...
	Due on receipt	7/25/2022	WLH		Auditorium	
DESCRIPTION						QTY
YAMAHA RM-WGL RM Wireless Gooseneck 12" Tabletop Microphone						6
YAMAHA 1 RM-WCH8 RM Wireless Microphone Charger Base						1
for up to 8 microphones						
YAMAHA 1 RM-WAP8 RM Wireless Access Point for up to 8 microphones						1
ASHLY 1 FA 250.4 1U Compact Power Amplifier 4 x250W @						1
4/8 Ohms or 70V, rack-ears included						
CLOCKAUDIO 9 S155RF Table Stand Program 5pin XLR in 5pin XLR out						9
CLOCKAUDIO 9 C33ESSRRF Cardiod Gooseneck Semi-Rigid 15.2" RF XLR SW LED						9
MIC Cables						9
CLOCKAUDIO 1 CDT100MK3 Dante Audio Transporter UDP						1
CLOCKAUDIO 1 CDT100MK3-PSU Dante Audio Transporter With Power Supply						1
STEWART AUDIO 1 NetAV I/O 2x2-D						1
Mic / Line Level 2 Input / 2 Output Box Dante Audio Encoder Decoder						
Bolin D412 Dante Camera						1
Bolin D20H Transceiver Dante Video Encoder/ Decoder						5
NETGEAR 1 GSM4248P-100NA M4250 40G8F POE+ MNGD Switch - Please note CISCO Catalyst						1
Switch is not available until Fall 2023						
NETGEAR 1 GSM4212P-100NAS M4250 10G2F PoE+ AV Switch						1
ADDITIONAL ITEMS						
Electrical Work						1
Pre-wire Cat-5 for Data or Phone Location						56
Removal of old equipment						1
Rulo Consulting Fee						1
We look forward to your business						
					(0.00)	
					TOTAL	

SIGNATURE _____

SoundWorks & Security LLC

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 Torrington, CT 06790
 Phone 860-496-7041 Fax 860-496-7043
 CT Lic #181031

Estimate

DATE	ESTIMATE NO.
7/25/2022	6842

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P.O. NO.	TERMS	DUE DATE	REP	FOB	PROJECT	estimate valid for 30 ...
	Due on receipt	7/25/2022	WLH		Auditorium	
DESCRIPTION						QTY
Permit Fee						1
BID BOND						1
MISC.INSTALL MATERIALS						1
Labor						500
We look forward to your business						\$217,485.90
					(0.00)	\$0.00
					TOTAL	\$217,485.90

SIGNATURE _____

SoundWorks & Security LLC

Estimate

PO Box 23
 Torrington, CT 06790
 Phone 860-496-7041 Fax 860-496-7043
 CT Lic #181031

DATE	ESTIMATE NO.
7/25/2022	6843

NAME / ADDRESS
Torrington City Hall 140 Main Street Torrington, CT 06790-5245

Ship To
Torrington City Hall 140 Main Street Room 206 (Auditorium) Torrington, CT 06790

P.O. NO.	TERMS	DUE DATE	REP	FOB	PROJECT	estimate valid for 30 ...
	Due on receipt	7/25/2022	WLH		Auditorium	
DESCRIPTION						QTY
BID ALTERNATES - BA-1 SERVICE/SUPPORT CONTRACT for 5 years Support should include proactive regular maintenance of the system for such items as firmware and software upgrades, security patches, etc. Where reasonable and appropriate, remote access to the systems may be used to make initial diagnoses and repair. In the event that repairs cannot be completed in a timely manner the support personnel shall travel to the site to make such repairs or programming alterations as needed by the Owner. Unlimited modifications and programming changes shall be supplied for the first 12 months, commencing at the date of acceptance of the system. During the warranty period replacement hardware will be provided at no cost to the Owner. After the warranty period, or if additional hardware and wiring is required to complete repairs and or modifications, such hardware shall be supplied at cost plus 10%.						1
We look forward to your business					\$25,000.00	
					(0.00)	\$0.00
					TOTAL	\$25,000.00

SIGNATURE _____

SoundWorks & Security LLC

PO Box 23
 Torrington, CT 06790
 Phone 860-496-7041 Fax 860-496-7043
 CT Lic #181031

Estimate

DATE	ESTIMATE NO.
7/25/2022	6844

NAME / ADDRESS
Torrington City Hall 140 Main Street Torrington, CT 06790-5245

Ship To
Torrington City Hall 140 Main Street Room 206 (Auditorium) Torrington, CT 06790

P.O. NO.	TERMS	DUE DATE	REP	FOB	PROJECT	estimate valid for 30 ...
	Due on receipt	7/25/2022	WLH		Auditorium	
DESCRIPTION						QTY
BA-2 Assistive Listening System LISTEN LS-54-072 iDSP Premiere Lvl II stnry RF LISTEN LR-4200-072 Intelligent DSP RF Rcvr 72 MH LISTEN LA-401 Universal Ear Speaker LISTEN LA-430 Intelligent Earphone/Neck Loop LISTEN LA-380-01 Intelligent 12-Unit Charging Case Labor We recommend the Listen Assistive Listening System instead of the Loop Style Assistive Listening system as it has poor ratings and is very difficult to install.						1 6 6 4 1 32
We look forward to your business					\$9,349.08	
					(0.00)	\$0.00
					TOTAL	\$9,349.08

SIGNATURE _____

APPENDIX B

REQUEST FOR PROPOSAL
AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM
RFP #AVS-026-072722

Acceptance of Terms of this Agreement

Company (Legal Registration) SoundWorks & Security LLC
Contact Person: Gloria Hall
Address: PO Box 23
City/State/Zip: Torrington, CT. 06790
Federal Tax Identification Number (FEIN) 37-1961798
Telephone: 860-496-7041 Fax: 860-496-7043
E-mail: assistant@soundworksandsecurity.com
Authorized Signature Gloria H. Hall Title: managing member
Name Printed: Gloria H. Hall Date: 7/25/2002

It is agreed by the above signed proposer that the signature and submission of this proposal represents the proposer's acceptance of all terms, conditions, and requirements of the proposal specifications, and, if awarded, the proposal will represent the agreement between the parties.

The proposer agrees that the cost of any work performed, materials furnished, services provided, or expenses incurred, which are not specifically delineated in the proposal documents, but which are incidental to the scope, intent, and completion of this contract, shall be deemed to have been included in the prices for the various items scheduled.

**APPENDIX C
REQUEST FOR PROPOSAL
AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM
RFP # AVS-026-072722**

STATEMENT OF REFERENCES

List five (5) references that demonstrate your ability to supply equipment and services included in the scope of the specifications. The City reserves the right to contact each of the references listed for additional information regarding your company's qualifications.

Reference No. 1

Vendor Name/Email: MRI/Snap AV
Contact Individual: Brett Day Phone No: 860-793-5505
Address: 143 Main St. Norwalk, CT. 06851
Contract Amount: \$119,255.21 Year: 2021
Description of products purchased: audio/video equipment

Reference No. 2

Vendor Name/Email: The Music People
Contact Individual: Craig Bartunkel Phone No: 800-789-8889 x101
Address: 154 Woodlawn Rd Suite C Berlin CT. 06037
Contract Amount: \$11,392.59 Year: 2022
Description of products purchased: Commercial Sound equipment

Reference No. 3

Vendor Name/Email: Anixter
Contact Individual: Erin Hickey Phone No: 281-560-3670
Address: 135 Crossways Park Dr. Suite 101 Woodbury, NY 11797-2008
Contract Amount: \$22,000.- Year: 2020
Description of products purchased: Commercial Sound equipment

Reference No. 4

Vendor Name/Email: Nice/Nortek Control
Contact Individual: Dora Samatua Phone No: 760-710-2082
Address: PO Box 846126 Dallas, TX 75284
Contract Amount: \$67,669.96 Year: 2021
Description of products purchased: audio/video equipment

Reference No. 5

Vendor Name/Email: Sonos
Contact Individual: Heidi Craig Phone No: 805-965-3001 ext.19934
Address: 28746 Network Place Chicago IL 60673
Contract Amount: \$29,230.- Year: 2021
Description of products purchased: audio/video equipment



AUDIO VIDEO SYSTEM FOR CITY HALL AUDITORIUM

RFP# AVS-026-072722

SoundWorks & Security company references

Mohawk Mountain Ski Area, Inc.
46 Great Hollow Road
Cornwall, CT 06753
Phone: 860-672-6100

Saint Maron Church
613 Main Street
Torrington, CT 06790
Phone: 860-489-9015

Harwinton Consolidated School - Region 10
115 Litchfield Road
Harwinton, CT 06791
Phone: 860-485-9029

Torrington High School
Major Besse Drive
Torrington, CT 06790
Phone: 860-489-2294

BID BOND
(Percentage)

Bond Number: 66333958

KNOW ALL PERSONS BY THESE PRESENTS, That we Soundworks & Security LLC
_____ of
Torrington, CT, hereinafter
referred to as the Principal, and Western Surety Company,
as Surety, are held and firmly bound unto City of Torrington
of 140 Main St., Torrington, CT 06790,
Five Percent of the
hereinafter referred to as the Obligor, in the sum of Amount Bid (5 %) percent of the greatest
amount bid, for the payment of which we bind ourselves, our legal representatives, successors and assigns, jointly
and severally, firmly by these presents.

WHEREAS, Principal has submitted or is about to submit a proposal to Obligor on a contract for _____
Installation of Audio Visual System in Town Hall Conference Room

NOW, THEREFORE, if the said contract be awarded to Principal and Principal shall, within such time as may be
specified, enter into the contract in writing and give such bond or bonds as may be specified in the bidding or
contract documents with surety acceptable to Obligor; or if Principal shall fail to do so, pay to Obligor the
damages which Obligor may suffer by reason of such failure not exceeding the penalty of this bond, then this
obligation shall be void; otherwise to remain in full force and effect.

SIGNED, SEALED AND DATED this 27th day of July, 2022.



Soundworks & Security LLC
(Principal)

By [Signature] (Seal)

Western Surety Company
(Surety)

By [Signature] (Seal)
JAMES S HUNT, Attorney-in-Fact
Attorney In Fact



Western Surety Company

POWER OF ATTORNEY - CERTIFIED COPY

Bond No. 66333958

Know All Men By These Presents, that WESTERN SURETY COMPANY, a corporation duly organized and existing under the laws of the State of South Dakota, and having its principal office in Sioux Falls, South Dakota (the "Company"), does by these presents make, constitute and appoint JAMES S HUNT

its true and lawful attorney(s)-in-fact, with full power and authority hereby conferred, to execute, acknowledge and deliver for and on its behalf as Surety, bonds for:

Principal: Soundworks & Security LLC

Obligee: City of Torrington

Amount: \$1,000,000.00

and to bind the Company thereby as fully and to the same extent as if such bonds were signed by the Vice President, sealed with the corporate seal of the Company and duly attested by its Secretary, hereby ratifying and confirming all that the said attorney(s)-in-fact may do within the above stated limitations. Said appointment is made under and by authority of the following bylaw of Western Surety Company which remains in full force and effect.

"Section 7. All bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile."

If Bond No. 66333958 is not issued on or before midnight of October 27th, 2022, all authority conferred in this Power of Attorney shall expire and terminate.

In Witness Whereof, Western Surety Company has caused these presents to be signed by its Vice President, Paul T. Bruflat, and its corporate seal to be affixed this 27th day of July, 2022.

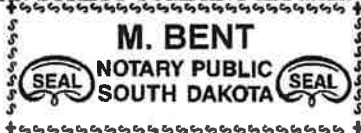
STATE OF SOUTH DAKOTA }
COUNTY OF MINNEHAHA } ss

WESTERN SURETY COMPANY

Paul T. Bruflat

Paul T. Bruflat,
Vice President

On this 27th day of July, in the year 2022, before me, a notary public, personally appeared Paul T. Bruflat, who being to me duly sworn, acknowledged that he signed the above Power of Attorney as the aforesaid officer of WESTERN SURETY COMPANY and acknowledged said instrument to be the voluntary act and deed of said corporation.



My Commission Expires March 2, 2026

I the undersigned officer of Western Surety Company, a stock corporation of the State of South Dakota, do hereby certify that the attached Power of Attorney is in full force and effect and is irrevocable, and furthermore, that Section 7 of the bylaws of the Company as set forth in the Power of Attorney is now in force.

In testimony whereof, I have hereunto set my hand and seal of Western Surety Company this 27th day of July, 2022.

WESTERN SURETY COMPANY

Paul T. Bruflat

Paul T. Bruflat, Vice President

To validate bond authenticity, go to www.cnasurety.com > Owner/Obligee Services > Validate Bond Coverage.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

07/25/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an **ADDITIONAL INSURED**, the policy(ies) must have **ADDITIONAL INSURED** provisions or be endorsed. If **SUBROGATION IS WAIVED**, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Brooks, Todd & McNeil PO Box 717 Torrington CT 06790-0717	CONTACT NAME: Ted C Wesolowski PHONE (A/C, No, Ext): (860) 482-5591 FAX (A/C, No): (860) 496-9713 E-MAIL ADDRESS: twesolowski@brookstoddmcneil.com												
INSURED Sound Works & Security LLC P.O. Box 23 Torrington CT 06790	INSURER(S) AFFORDING COVERAGE <table><tr><td>INSURER A: Wesco Ins Co</td><td>NAIC # 25011</td></tr><tr><td>INSURER B: Everest National Insurance Com</td><td>10120</td></tr><tr><td>INSURER C: Selective Ins Co of America</td><td>12572</td></tr><tr><td>INSURER D:</td><td></td></tr><tr><td>INSURER E:</td><td></td></tr><tr><td>INSURER F:</td><td></td></tr></table>	INSURER A: Wesco Ins Co	NAIC # 25011	INSURER B: Everest National Insurance Com	10120	INSURER C: Selective Ins Co of America	12572	INSURER D:		INSURER E:		INSURER F:	
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INSURER C: Selective Ins Co of America	12572												
INSURER D:													
INSURER E:													
INSURER F:													

COVERAGES**CERTIFICATE NUMBER:** Cert ID 17666**REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSD WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS																			
B	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <table><tr><td><input type="checkbox"/> CLAIMS-MADE</td><td><input checked="" type="checkbox"/> OCCUR</td></tr></table> GEN'L AGGREGATE LIMIT APPLIES PER: <table><tr><td><input type="checkbox"/> POLICY</td><td><input checked="" type="checkbox"/> PROJECT</td><td><input type="checkbox"/> LOC</td></tr></table> OTHER:	<input type="checkbox"/> CLAIMS-MADE	<input checked="" type="checkbox"/> OCCUR	<input type="checkbox"/> POLICY	<input checked="" type="checkbox"/> PROJECT	<input type="checkbox"/> LOC		51GLM13155-221	06/06/2022	06/06/2023	<table><tr><td>EACH OCCURRENCE</td><td>\$ 1,000,000</td></tr><tr><td>DAMAGE TO RENTED PREMISES (Ea occurrence)</td><td>\$ 100,000</td></tr><tr><td>MED EXP (Any one person)</td><td>\$ 5,000</td></tr><tr><td>PERSONAL & ADV INJURY</td><td>\$ 1,000,000</td></tr><tr><td>GENERAL AGGREGATE</td><td>\$ 2,000,000</td></tr><tr><td>PRODUCTS - COMP/OP AGG</td><td>\$ 2,000,000</td></tr><tr><td></td><td>\$</td></tr></table>	EACH OCCURRENCE	\$ 1,000,000	DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 100,000	MED EXP (Any one person)	\$ 5,000	PERSONAL & ADV INJURY	\$ 1,000,000	GENERAL AGGREGATE	\$ 2,000,000	PRODUCTS - COMP/OP AGG	\$ 2,000,000		\$
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Prod/Comp Ops	\$ 1,000,000																								
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below Y/N <input type="checkbox"/> N/A		WWC3544922	09/17/2021	09/17/2022	<table><tr><td><input checked="" type="checkbox"/> PER STATUTE</td><td><input type="checkbox"/> OTH-ER</td></tr><tr><td>E.L. EACH ACCIDENT</td><td>\$ 500,000</td></tr><tr><td>E.L. DISEASE - EA EMPLOYEE</td><td>\$ 500,000</td></tr><tr><td>E.L. DISEASE - POLICY LIMIT</td><td>\$ 500,000</td></tr></table>	<input checked="" type="checkbox"/> PER STATUTE	<input type="checkbox"/> OTH-ER	E.L. EACH ACCIDENT	\$ 500,000	E.L. DISEASE - EA EMPLOYEE	\$ 500,000	E.L. DISEASE - POLICY LIMIT	\$ 500,000											
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E.L. DISEASE - POLICY LIMIT	\$ 500,000																								
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DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

The City of Torrington, its subsidiaries, employees, volunteers, directors and officers are included as additional insured with respect to General Liability if required in a written contract or agreement, subject to policy conditions.

CERTIFICATE HOLDER**CANCELLATION**

City of Torrington

140 Main Street

Torrington CT 06970

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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Switching Engineered for AV over IP

Introducing the NETGEAR AV Line of M4250 Switches, developed and engineered for audio/video professionals with dedicated service and support. M4250 has been built from the ground up for the growing AV over IP market, combining years of networking expertise in AV with M4300 and M4500 series with best practices from leading experts in the professional AV market. AV codecs

generally use 1Gbps or 10Gbps per stream and the AV Line of M4250 targets the widespread 1Gbps codecs.

PoE+, Ultra90 PoE++ and rear-facing ports ensure a clean integration in AV racks. M4250 switches come pre-configured for standard audio and video signals. When requirements are more specific, an AV user interface offers customization with port-based profiles. For audio Dante,

Q-SYS and AES67 profiles are available, as well as an AVB profile requiring an AVB license sold separately. For video the M4250 offers profiles for NVX, AMX, Q-SYS, NDI, Dante etc. as well as audio/video/control mixed profiles. When multiple switches are used, NETGEAR IGMP Plus™ brings automation for you to just connect them together, or with M4300 and M4500 switches.

Highlights

Extended AV features

- Dedicated AV web-based GUI interface for more specific AV installations
- Color-based AV profiles can be applied to the different ports
- Dante, Q-SYS, AES67 and AVB audio profiles
- AVB requires a license (sold separately)
- NVX, SVSI, Q-SYS, NDI and Dante video profiles
- Audio / video / control mixed profiles
- Automatic switch interconnect with NETGEAR Auto-Trunk, Auto-LAG and IGMP Plus
- Common Layer 2 and Layer 3 switching engine across all M4250 models

- Built-in IT web GUI, console, telnet and SSH consistent with other NETGEAR M4300 and M4500 series
- Feature set includes static, RIP and PIM routing, DHCP Server and PTPv2

Audio Video Bridging (AVB) services

- AVB is one of the many features designed into the M4250 product line
- AVB is an industry standard for transporting content over a network
- AVB is used most often when very low latency is required such as in live performances when lip sync is critical
- All of the AV Line M4250 switches can be optionally licensed for AVB support

Other IT use cases

- Standard or recessed mounting with all ports in the back, or all ports in the front

- Fully featured L2/L3/L4 platform for midsize Enterprise campus networks, IoT and IPTV

Industry standard management

- Industry standard command line interface (CLI), main NETGEAR IT web interface (GUI), SNMP, sFlow and RSPAN
- Single-pane-of-glass NMS300 management platform with centralized firmware updates and mass-configuration support

Industry leading warranty

- NETGEAR M4250 series is covered under NETGEAR ProSAFE Limited Lifetime Hardware Warranty*
- 90 days of Technical Support via phone and email, Lifetime Technical Support through online chat and Lifetime Next Business Day hardware replacement

Hardware-at-a-Glance

Model Name	Form-Factor	Switching Fabric	REAR (REVERSIBLE)*				PSU	Status Information	MANAGEMENT	Model Number
			10/100/1000 BASE-T RJ45 ports	100/1000/2.5G BASE-T RJ45 ports	1000BASE-X SFP ports	1000/10G BASE-X SFP+ ports				
M4250-9G1F-PoE+	Desktop 210 x 40 x 140mm	20 Gbps	8 ports PoE+ (110W) 1 additional port	-	1 port SFP 1G	-	1 x External Power Adapter (130W)	In Front: Power LED PoE Max LED	Ethernet: 1G Out-of-band (Rear) Console: USB-C (Front) Storage: USB-A (Rear)	GSM4210PD
M4250-8G2XF-PoE+	Desktop 210 x 40 x 140mm	56 Gbps	8 ports PoE+ (220W)	-	-	2 ports SFP+ 1G; 10G	1 x External Power Adapter (254W)	Fan LED (GSM4210PX only)		GSM4210PX
M4250-10G2F-PoE+	1U rackmount 440 x 43.2 x 200mm	24 Gbps	8 ports PoE+ (125W) 2 additional ports	-	2 ports SFP 1G	-	1 x Fixed (C14) On/off switch	Available both in front and in the rear: Power LED PoE Max LED Fan LED (PoE models) Port LEDs	Ethernet: 1G Out-of-band (Rear) Console: RJ45 RS232 (Rear) Console: USB-C (Rear) Storage: USB-A (Front) LED Ext: USB-C (Front)	GSM4212P
M4250-10G2XF-PoE+	1U rackmount 440 x 43.2 x 200mm	60 Gbps	8 ports PoE+ (240W) 2 additional ports	-	-	2 ports SFP+ 1G; 10G	1 x Fixed (C14) On/off switch			GSM4212PX
M4250-10G2XF-PoE++	1U rackmount 440 x 43.2 x 257mm	60 Gbps	8 ports PoE++** (720W) 2 additional ports	-	-	2 ports SFP+ 1G; 10G	1 x Fixed (C14) On/off switch			GSM4212UX
M4250-26G4F-PoE+	1U rackmount 440x43.2x257mm	60 Gbps	24 ports PoE+ (300W) 2 additional ports	-	4 ports SFP 1G	-	1 x Fixed (C14) On/Off switch			GSM4230P
M4250-26G4F-PoE++	1U rackmount 440x43.2x400mm	60 Gbps	24 ports PoE++ (1,440W)** (1 PSU/720W; 2 PSU/1,440W) 2 additional ports	-	4 ports SFP 1G	-	2 x Fixed (C14) On/Off switch			GSM4230UP
M4250-26G4XF-PoE+	1U rackmount 440x43.2x400mm	132 Gbps	24 ports PoE+ (480W) 2 additional ports	-	-	4 ports SFP+ 1G; 10G	1 x Fixed (C14) On/Off switch			GSM4230PX
M4250-40G8F-PoE+	1U rackmount 440x43.2x400mm	96 Gbps	40 ports PoE+ (480W)	-	8 ports SFP 1G	-	1 x Fixed (C14) On/Off switch			GSM4248P
M4250-40G8XF-PoE+	1U rackmount 440x43.2x400mm	240 Gbps	40 ports PoE+ (960W)	-	-	8 ports SFP+ 1G; 10G	1 x Fixed (C14) On/Off switch			GSM4248PX
M4250-40G8XF-PoE++	2U rackmount 440x86.4x350mm	240 Gbps	40 ports PoE++ (2,880W)** (1 PSU/720W; 2 PSU/1,650W; 3 PSU/2,880W)	-	-	8 ports SFP+ 1G; 10G	3 x Fixed (C14) On/Off switch			GSM4248UX
M4250-12M2XF	1U rackmount 440x43.2x100mm	100 Gbps	-	12 ports 100M, 1G, 2.5G	-	2 ports SFP+ 1G; 10G	1 x Fixed (C14) On/Off switch			MSM4214X
M4250-16XF	1U rackmount 440x43.2x200mm	320 Gbps	-	-	-	16 ports SFP+ 10G only (First 12 ports support 1G)	1 x Fixed (C14) On/Off switch			XSM4216F

* Reversed mounting is possible when ports are desired on the front of the rack by using the standard rackmount ears, or the included alternate rackmount ears to mount the switch recessed by 2-Inches to allow for the cabling.

** Ultra90 PoE++ 802.3bt is compatible with 802.3af PoE (15.4W), 802.3at PoE+ (30W) and 802.3bt (60W, 75W and 90W).



GSM4210PX
GSM4210PD

Acoustic-at-a-Glance

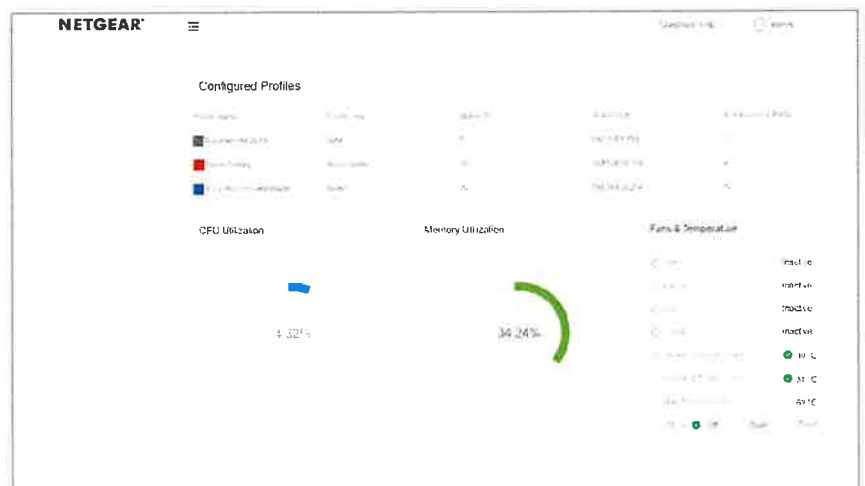
	FAN OFF MODE Setting / maximum loading*					QUIET MODE Setting at 25°C ambient**					COOL MODE Setting at 25°C ambient**			
Model Name	Fanless State	Ambient	Sensor	PoE Power Load	Capabilities	PoE Power Load	Fan Duty	Sensor	Case Temp (Top)	Acoustic	Fan Duty	Case Temp (Top)	Acoustic	Model Number
M4250-9G1F-PoE+	The switch is fanless	25°C	50°C	110W	All ports can be used	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GSM4210PD
M4250-8G2XF-PoE+	0dBA / 37.4°C Case Temp	25°C	S1&2 <= 60°C S3 <= 59°C	180W	RJ45 ports only (no SFP+)	220W	10	<= 60°C	33.6°C	19.3dBA	100	28.3°C	35.3dBA	GSM4210PX
M4250-10G2F-PoE+	0dBA / 41.3°C Case Temp	25°C	<= 42°C	80W	All ports can be used	125W	25	<= 36°C	35.9°C	27.38dBA	100	27.2°C	55dBA	GSM4212P
M4250-10G2XF-PoE+	0dBA / 39.6°C Case Temp	25°C	<= 44°C	90W	All ports can be used	240W	25	<= 37°C	40.6°C	27.4dBA	100	30.9°C	56dBA	GSM4212PX
M4250-10G2XF-PoE++	0dBA / 44.6°C Case Temp	25°C	<= 67°C	45W	All ports can be used	0-250W	25	<= 49°C	42.9°C	34.57dBA	100	41.8°C	66.23dBA	GSM4212UX
						250-380W	30	<= 49°C	43.3°C	40dBA				
						380W-500W	35	<= 49°C	44.9°C	44.22dBA				
						500W-720W	40	<= 49°C	52.1°C	47.19dBA				
M4250-26G4F-PoE+	0dBA / 40.5°C Case Temp	25°C	S1 <= 43°C S2 <= 47°C	45W	8 ports PoE (no SFP)	0-200W	25	S1 <= 43°C S2 <= 47°C	43.5°C	28dBA	100	36.7°C	57dBA	GSM4230P
						200W-300W	30	S1 <= 44°C S2 <= 48°C	51.3°C	34dBA				
M4250-26G4F-PoE++	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	0-280W	20	S1 <= 37°C S2 <= 39°C	52.9°C	28dBA	100	720W 36.7°C 1,440W 46°C	69dBA	GSM4230UP
						280W-360W	25	S1 <= 38°C S2 <= 40°C	57.4°C	36dBA				
						360W-420W	30	S1 <= 39°C S2 <= 41°C	54.4°C	41dBA				
						420W-480W	35	S1 <= 40°C S2 <= 42°C	53.3°C	47dBA				
						480W-540W	40	S1 <= 41°C S2 <= 43°C	52.3°C	50dBA				
						540W-600W	45	S1 <= 42°C S2 <= 44°C	54.4°C	54dBA				
						600W-660W	50	S1 <= 43°C S2 <= 45°C	53.6°C	57dBA				
						660W-1,440W	55	S1 <= 44°C S2 <= 46°C	55.7°C	60dBA				
M4250-26G4XF-PoE+	0dBA / 43.4°C Case Temp	25°C	S1 <= 41°C S2 <= 46°C	45W	8 ports PoE (no SFP+)	0-350W	20	S1 <= 41°C S2 <= 46°C	39.3°C	25dBA	100	32.3°C	67dBA	GSM4230PX
						350W-480W	30	S1 <= 42°C S2 <= 47°C	36.8°C	42dBA				
M4250-40G8F-PoE+	0dBA / 45.2°C Case Temp	25°C	S1 <= 37°C S2 <= 50°C	30W	8 ports PoE (No SFP)	0-150W	20	S1 <= 37°C S2 <= 50°C	43.1°C	30dBA	100	35.4°C	68dBA	GSM4248P
						150W-200W	25	S1 <= 38°C	42.1°C	36dBA				
						200W-340W	30	S1 <= 39°C S2 <= 51°C	44°C	40dBA				
						340W-480W	35	S1 <= 40°C	47.6°C	47dBA				

Acoustic-at-a-Glance

Model Name	FAN OFF MODE Setting / maximum loading*					QUIET MODE Setting at 25°C ambient**					COOL MODE Setting at 25°C ambient**			Model Number
	Fanless State	Ambient	Sensor	PoE Power Load	Conditions	PoE Power Load	Fan Duty	Sensor	Case Temp (top)	Acoustic	Fan Duty	Case Temp (top)	Acoustic	
M4250-40G8XF-PoE+	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	0-400W	20	S1 <= 33°C S2 <= 46°C	54.2°C	29dBA	100	36.1°C	69dBA	GSM4248PX
						400W-480W	25	S1 <= 34°C S2 <= 47°C	42.3°C	35dBA				
						480W-560W	30	S1 <= 35°C S2 <= 48°C	41.9°C	41dBA				
						560W-640W	35	S1 <= 36°C S2 <= 49°C	42.1°C	48dBA				
						640W-720W	40	S1 <= 37°C S2 <= 50°C	40.9°C	51dBA				
						720W-800W	45	S1 <= 38°C S2 <= 51°C	40.7°C	54dBA				
						800W-880W	50	S1 <= 39°C S2 <= 52°C	40.4°C	57dBA				
						880W-960W	55	S1 <= 40°C S2 <= 53°C	40.5°C	59dBA				
M4250-40G8XF-PoE++	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	0-160W	20	S1 <= 37°C S2 <= 49°C	41.3°C	30dBA	100	720W 31.4°C 1,650W 33.5°C 2,880W 35.4°C	71dBA	GSM4248UX
						160W-240W	25	S1 <= 38°C	38.8°C	36dBA				
						240W-320W	30	S1 <= 39°C S2 <= 50°C	36.4°C	42dBA				
						320W-400W	35	S1 <= 40°C	35.3°C	49dBA				
						400W-480W	40	S1 <= 41°C S2 <= 51°C	34.4°C	51dBA				
						480W-560W	45	S1 <= 42°C	34.3°C	55dBA				
						560W-640W	50	S1 <= 43°C S2 <= 52°C	35.1°C	57dBA				
						660W-2,880W	55	S1 <= 44°C	36.5°C	60dBA				
M4250-12M2XF	0dBA / 56°C Case Temp	25°C	<= 64°C	=	8 ports 2.5G (no SFP+)	=	25	<= 58°C	53.5°C	28.5dBA	100	33.2°C	55dBA	MSM4214X
M4250-16XF	0dBA / 41.3°C Case Temp	25°C	<= 78°C	=	8 ports SFP+	=	25	<= 67°C	41.6°C	27.44dBA	100	30.3°C	57dBA	XSM4216F

* Software-controlled fan adjustments enable the fans to be turned off when ambient temperature and PoE loads are appropriate for a totally fanless operation.

** dBA values are SPL (Sound Pressure Level) values, testing following the ISO-7779 standard. Bystander Mode. Chamber Temp 25°C during testing. Full, 100%, Data and PoE loaded. Worst case.



Software-at-a-Glance

LITE LAYER 3 PACKAGE												
Model Name	Management	AV Dedicated UI	IPv4 / IPv6 ACL, DiffServ, QoS, DiffServ	IPv4 / IPv6 Multicast Filtering	IPv4 / IPv6 Policing and Congestion	Spanning Tree Green Ethernet	VLANs	Trunking Port Channel	IPv4 / IPv6 Authentication Security	IPv4 / IPv6 Static Routing	IPv4 / IPv6 Dynamic Routing	Model Number
M4250 series	Out-of-band	AV web-based GUI			Auto-VoIP							
	IT Web GUI (main)	Designed for AV installers		NETGEAR IGMP™ Plus for automated IGMP between switches	Policy-based routing (PBR)	STP, MTP, RSTP	Static, Dynamic, Voice, MAC	Auto-Trunk and Auto-LAG between M4250 Switches		Port, Subnet, VLAN routing		
	HTTPs	AV-related controls	Ingress/egress	IGMPv3 MLDv2 Snooping, Proxy ASM & SSM	LLDP-MED	PV(R)STP	GVRP/ GMRP	Static LAG, or Dynamic LACP	Successive Tiering (DOT1X; MAB; Captive Portal)	Multicast static routes	IPv4: RIP	
	CLI: Telnet; SSH	Audio over IP profiles	1 Kbps shaping Time-based		IEEE 1588 PTPv2	BPDU/STRG	Double VLAN mode	(LACP automatically reverts to and from Static LAG)	DHCP Snooping Dynamic ARP Inspection IP Source Guard	DHCPv4 Server	IPv4/IPv6: PIM-SM PIM-DM SSM	
	SNMP, MIBs RSPAN	AVB profile*	Single Rate Policing	IGMPv1,v2 Querier (compatible v3)	Transparent Clock	Root Guard	Private VLANs			DHCP Relay		
	Radius Users, TACACS+	Video over IP profiles		Control Packet Flooding	AVB*: 802.1AS, 802.1Qav, 802.1Qat MSRP, 802.1ak MMRP, 802.1ak MVRP	EEE 802.3az (EEE is disabled by default)		Seven (7) L2/ L3/L4 hashing algorithms		Stateful DHCPv6 Server		All models

* Requires AVB license, sold separately. All other software features are available, license-free.



Performance-at-a-Glance

	TABLE SIZE																									
Model Name	MAC ARP/NDP	Routing/ Switching Capacity	Throughput 64-byte	Application Route Scaling	Packet Buffer	Latency	CPU	IP Multicast Routing Entries	Jumbo Frames	Multicast IGMP Group membership	VLANs	DHCP	sFlow	Model Number												
M4250-9G1F-PoE+	16K MAC 4K ARP/ NDP	20 Gbps Line-Rate	14.88 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.27µs 1G	ARMA9 1.25Ghz 32-Bit 2GB RAM	512 IPv4 128 IPv6	Up to 12K	2K IPv4 2K IPv6	4K VLANs	DHCP Server: 2K leases IPv4: 256 pools IPv6: 16 pools	16 samplers 16 pollers 8 receivers	GSM4210PD												
M4250-8G2XF-PoE+	16K MAC 4K ARP/ NDP	56 Gbps Line-Rate	41.67 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.14µs 1G <0.84µs 10G								GSM4210PX												
M4250-10G2F-PoE+	16K MAC 4K ARP/ NDP	24 Gbps Line-Rate	17.86 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.27µs 1G								GSM4212P												
M4250-10G2XF-PoE+	16K MAC 4K ARP/ NDP	60 Gbps Line-Rate	44.64 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.14µs 1G <0.84µs 10G								GSM4212PX												
M4250-10G2XF-PoE++	16K MAC 4K ARP/ NDP	60 Gbps Line-Rate	44.64 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<1.84µs 1G <0.81µs 10G								GSM4212UX												
M4250-26G4F-PoE+	16K MAC 4K ARP/NDP	60 Gbps Line-Rate	44.64 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.15µs 1G	Quad Core Cortex-A57 ARMv8 1.8Ghz 64-bit 2GB RAM							512 IPv4 128 IPv6	Up to 12K	2K IPv4 2K IPv6	4K VLANs	DHCP Server: 2K leases IPv4: 256 pools IPv6: 16 pools	16 samplers 16 pollers 8 receivers	GSM4230P						
M4250-26G4F-PoE++	16K MAC 4K ARP/NDP	60 Gbps Line-Rate	44.64 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.15µs 1G														GSM4230UP						
M4250-26G4XF-PoE+	16K MAC 4K ARP/NDP	132 Gbps Line-Rate	98.21 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.29µs 1G <0.83µs 10G														GSM4230PX						
M4250-40G8F-PoE+	16K MAC 4K ARP/NDP	96 Gbps Line-Rate	71.42 Mpps	Static: 894v4/126v6 RIP: 32v4	32Mb	<2.46µs 1G														GSM4248P						
M4250-40G8XF-PoE+	16K MAC 4K ARP/NDP	240 Gbps Line-Rate	178.56 Mpps	Static: 894v4/126v6 RIP: 32v4	32Mb	<2.74µs 1G <0.73µs 10G														GSM4248PX						
M4250-40G8XF-PoE++	16K MAC 4K ARP/NDP	240 Gbps Line-Rate	178.56 Mpps	Static: 894v4/126v6 RIP: 32v4	32Mb	<2.78µs 1G <0.73µs 10G	ARMA9 1.25Ghz 32-Bit 2GB RAM													512 IPv4 128 IPv6	Up to 12K	2K IPv4 2K IPv6	4K VLANs	DHCP Server: 2K leases IPv4: 256 pools IPv6: 16 pools	16 samplers 16 pollers 8 receivers	GSM4248UX
M4250-12M2XF	16K MAC 4K ARP/ NDP	100 Gbps Line-Rate	74.40 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.84µs 1G <6.02µs 2.5G <0.81µs 10G																				MSM4214X
M4250-16XF	16K MAC 4K ARP/ NDP	320 Gbps Line-Rate	238.08 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<1.30µs 1G <0.86µs 10G																				XSM4216F

**FA Series
High-Density
Power
Amplifiers.
Perfect for
conference
rooms or
anywhere
space is at a
premium.**



FA125.2



FA125.4



FA250.4

You don't have to sacrifice space to get up to four channels of clean, robust amplifier power.

The half- and one-rack-space size FA Series high-density Class D amps belie their output: up to 125 W x 4 in a *half* rack space...up to 250 W x 4 in one rack space!

FA amplifiers can nestle under conference tables, inside kiosks and trade show exhibits, reception area counters and anywhere else a larger amplifier just won't fit.

Naturally, they have the rugged reliability that Ashly is known for...including a 5-year warranty.



- Conference Rooms
- Trade Show Exhibits →
- Huddle Rooms
- Inside Displays & Kiosks
- Bars and Restaurants
- Reception Areas
- Hotel Lobbies



**DATA
SHEET
on
PAGE THREE**

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intentionally
left blank*.**

**Data Sheet
begins on the
next page.**

*Done so that those fortunate to have printers with 2-sided printing capabilities can print out the Data Sheet on one sheet of paper.

FA Series

High-Density Power Amplifiers

The FA Series is designed for easy and flexible placement, going where other amps cannot: under conference tables, behind displays, inside kiosks... anywhere high-quality, reliable power is needed, but space is limited.

The ½ RU **FA-125.2** & **FA-125.4** offer



FA 125.4



FA 250.4



125W of efficient Class D power per channel (x 2 on the **125.2** and x 4 on the **125.4**). With selectable Low Z or Hi Z operation, they're capable of powering low-Z, full range speakers as well as 70V and 100V distributed speaker systems.

Where additional power is needed, the full 1 RU, 4 x 250W **FA-250.4** (also designed for Hi/Low Z) delivers seriously high power-density in a 1U package.

The FA-125.2 and FA-125.4 can share power between channel pairs up to a total of 250W total per pair. So a system may be designed with a 180W load on one channel and 70W on the other. Or if a single channel only is driven, 250W can be output to drive a heavier load such as subwoofer.



FA 125.2



	Chs	Width	4Ω / 8Ω all chs.driven	70V	100V
FA-125.2	2	½ 19"	125W	125W	125W
FA-125.4	4	½ 19"	125W	125W	125W
FA-250.4	4	1U	250W	250W	250W

- 2 and 4-channel models
- 125 and 250 W @ 4Ω
- 70/100V capability
- Efficient Class D design
- Adaptive fan cooling
- Installer-friendly Euroblock connectors
- 80Hz HPF (in Hi Z Mode)
- Front panel Signal/Clip/Mute LED
- Front panel Input Level controls and Power On/Off w/lockout
- USB port for firmware updates
- Power-sharing on ½ RU models up to 250W
- 5-Year Warranty

FA SERIES SPECIFICATIONS

	FA 125.2	FA 125.4	FA 250.4
Configuration			
Size Format (HxW)	1RU x 1/2 19"		1RU x 19"
Configuration	Pre-BTL		
# of Channels	2	4	4
Output Power (per channel)			
2 Ohm	Not Recommended		
4 Ohm	125W	125W	250W
8 Ohm	125W	125W	250W
16 Ohm	125W	125W	250W
70V	125W	125W	250W
100V**	125W	125W	250W
Power Sharing	Yes x 2 (up to 250W)		No

	FA 125.2	FA 125.4	FA 250.4
Frequency Response (±0.05dB)	20Hz-20kHz		
S/N Ratio (20Hz-20kHz, unweighted)	>102dB		
Input Sensitivity	-10dBV (0.316Vrms)/+4dBu (1.228Vrms), Selectable		
THD + Noise	< 0.5%		
Damping Factor (8 Ohms < 1kHz)	>250		

continued on the next page

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ASHLY

FA SERIES SPECIFICATIONS

FA 125.2 FA 125.4 FA 250.4

Power Consumption (1/8 full power, 1kHz sine-wave on all channels, in Watts)

Sleep	<0.5	<0.5	<0.5
Idle Lo-Z	8	15	25
Idle Hi-Z	13	25	30
1/8 Power (4 Ohms)	52	104	196
1/8 Power (8 Ohms)	49	96	186
1/8 Power (70V)	51	101	191
1/8 Power (100V)	48	96	181

Thermal Dissipation (BTU/hour with typical input, all channels driven, 120VAC)

Sleep mode	<1.7	<1.7	<1.7
Idle Lo-Z (no signal)	28	52	86
Idle Hi-Z (no signal)	45	85	103
1/8 max power, 4 Ohm	72	144	243
1/8 max power, 8 Ohm	62	116	209
1/8 max power, 70V	69	133	226
1/8 max power, 100V	58	116	191

Voltage Gain(per output mode and input sensitivity setting, in dB)

Low Z @ -10dBV	43.1
Hi-Z 70V @ -10dBV	46.9
Hi-Z 100V @ -10dBV	49.1
Low Z @ +4dBu	31.3
Hi-Z 70V @ +4dBu	35.1
Hi-Z 100V @ +4dBu	37.3

I/O Features

HPF	Yes. 80Hz (in HiZ Mode, non-defeatable)
Clip Limiter	Yes (at clip threshold +24dBu, non-defeatable)

Connectors

Input	Removeable Euroblock/ Balanced 6-pole (pr)
Output	Removeable Euroblock/ 2-pole (per ch)
GPIO	Removeable Euroblock/ 6-pole DC volume per channel pair ² , Standby, Fault Out
USB	USB-C for Firmware update

DIP Switches

1	HiZ/LowZ Ch 1
2	HiZ/LowZ Ch 2
3	Not Used HiZ/LowZ Ch 3
4	Not Used HiZ/LowZ Ch 4
5	70/100V

1) Note: When making a true comparison of energy efficiency, one must look at the Thermal Dissipation (BTU/hr) numbers for a product. All other efficiency, i.e. "percentage" numbers are not standards based, and therefore may be marketing hype. Ashly Audio builds highly efficient Class-D amplification with SMPS that will equal or surpass the competition on BTU/hr thermal output (unused energy per channel given off as heat). Please check our published BTU/hr. specifications for more information.

2) FA 125.2: two channels

DIP Switches (continued)

	FA 125.2	FA 125.4	FA 250.4
6	Input Sensitivity (-10/+4dB)		
7	Standby Polarity (NO/NC)		
8	Front Panel Lockout		

LEDs/Indicators

Front LED (per channel)	Green: Signal Present, Yellow: Limit (+24dbu), Red: Mute/Protect
Front LED (Main)	White-On, Blink (0.5Hz)-Standby, Dark-Off

General

Pre-Sleep Mode	>15 minutes inactivity, all channels muted, wake-on-audio
Sleep Mode	>29 minutes inactivity, power LED blinks every two seconds, wake-on-audio
Standby Mode	Contact closure activated, power LED flashes evenly @1Hz
Remote Control Options	WR-1, WR-1.1 DC level control
Cooling	Adaptive Fan Cooling (side-to-rear venting)
Amplifier Protection	Over-temperature, output DC, output over-power, AC mains voltage, mains fuse
Standby Switch	Soft Switch w/ LED backlight
Power Connector	IEC
Attenuators	Recessed Front panel Input Level (per ch)
Power Supply	100-240VAC, 50-60Hz
Minimum Startup Voltage	85VAC@ 120V nominal, 170VAC@ 240V nominal
Environmental	32°F-104°F, (0°C-40°C) non-condensing
Safety Compliance	ULg, CE, FCC Class B, RoHS

Weights & Dimensions • US measure

Unit Weight (lbs)	3.55	5.36	7.89
Unit Height (in.)	1.72	1.72	1.72
Unit Width (in.)	8.66	8.66	17.33
Unit Depth (in.)	10.32	13.3	11.54
Shipping Weight (lbs)	5.66	7.14	10.12
Shipping Height (in.)	8.94	8.94	
Shipping Width (in.)	23	28.7	
Shipping Depth (in.)	19.4	23.2	

Weights & Dimensions • Metric measure

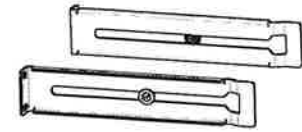
Unit Weight (kg)	1.61	2.43	3.6
Unit Height (mm)	43.7	43.7	43.7
Unit Width (mm)	220	220	440
Unit Depth (mm)	262	338	293
Shipping Weight (kg)	2.37	3.24	4.63
Shipping Height (mm)	227	227	
Shipping Width (mm)	584	729	
Shipping Depth (mm)	492	589	

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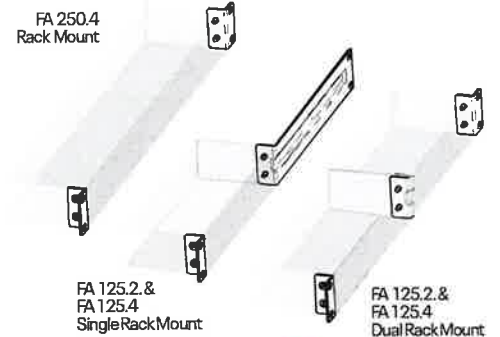
All Specifications are subject to change.



Wall mount bracket for FA 125.2 & FA 125.4



Rack rear support for FA 250.4



USER MANUAL



SCAN ME

Or download the complete User Manual at http://ashly.com/wp-content/uploads/2019/09/FA_Manual.pdf

FA SERIES ARCHITECT & ENGINEERING SPECIFICATIONS

in .txt and MS Word .docx format are available in the

DOWNLOADS section of <http://ashly.com/fa-series-amplifiers/>

FA SERIES 2D AUTOCAD FILES

are available in the

DOWNLOADS section of <http://ashly.com/fa-series-amplifiers/>

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www.ashly.com

A black and white photograph of a Xilica Solaro FR1 rack-mountable DSP unit. The unit is shown in a rack, with multiple units visible. The front panel features a textured, diamond-patterned grille. On the right side of the front panel, there are several small, illuminated displays and buttons. The Xilica logo is visible in the top left corner of the image.

XILICA™

SOLARO FR1

Deliver premium collaboration experiences without the cost. Solaro FR1 is a 1U 16-card-slot DSP with modular I/O functionality that can evolve to meet your future requirements, while benefiting from the processing power to drive multiple rooms over an installed CatX network. Xilica's open-architecture digital signal processor can be populated with any combination of Solaro Series I/O card, offering capabilities including analog audio, USB (with volume/mute HID support), GPIO, relay control and AES/EBU digital audio. Incorporating the optional XC-CTODN module for networked audio, Solaro FR1 can handle up-to 64x64 bi-directional channels of audio over Dante™, using standard CatX cable with no proprietary switches. With the capability to grow as you need, Solaro FR1 is a multi-purpose, scalable signal processor suited to most medium-to-large applications including multi-room conferencing, education spaces, and mass communication.

Offering pre-integrated modules from select *Technology Vendor Partners*, Xilica Solaro FR1 can drive products across your rooms from lighting to displays with no code and minimal setup time. For additional devices, Solaro FR1 supports Lua scripting without fees or licenses, and offers drag-and-drop design of graphical user interfaces (GUIs) within the programming software. These GUIs readily display on Xilica's range of IP-based user interface products, including XTouch touch-controls and Lucia wall remotes, which are networked to Solaro FR1 over standard CatX cable. Additionally, iOS/Android control is offered alongside integration with Crestron and AMX systems.

With up-to 32 channels of local analog audio, or 64 channels of local GPIO in a single chassis, Solaro FR1 is self-sufficient for most common medium-sized applications with option to expand I/O count over Dante using the Solaro XIO 16 expander. Solaro FR1 offers license-activated HearClear™ AEC for ultra-low-noise conferencing, and signal processing algorithms including routing and mixing, equalization, delay and dynamics.

BENEFITS

- Deliver a premium collaboration experience at lower cost through centralized processing of multiple rooms using an existing installed CatX network.
- Support BYOD in collaboration spaces with Gio USB and Gio Bluetooth connectivity, and create a superior user-experience with Microsoft Teams mute/volume sync for USB peripherals.
- Eliminate third-party control systems with no-code programming and leverage pre-built DSP designs for turn-key deployment.
- Lower total-cost-of-ownership with agile, modular I/O that scales to meet functional demand.
- Harness Xilica HearClear™ acoustic echo cancellation to eliminate noise and echo in conferencing.

ENGINEERING SPECIFICATIONS

The digital signal processor (DSP) shall be open architecture in configuration and be housed in a rack-mountable 19-inch, 1U chassis. It shall offer 16 user-configurable card-slots for analog audio, USB, GPIO, relay and AES/EBU digital audio support. Additionally, it shall provide optional Dante audio networking (with XC-CTODN) at 64x64 channels, and be compliant with AES67.

The DSP shall feature a dual-core Linux processor with 40-bit floating point architecture. Software licensing shall provide optional acoustic echo cancellation with Xilica HearClear technology. An internal control engine shall be present to provide third-party command execution via API and support the Lua scripting language. The DSP must support proprietary Xilica control products including XTouch and Lucia, and be expandable with the Solaro XIO 16 frame over a Dante network.

Additionally, the DSP must feature include advanced signal processing algorithms including (but not be limited to) various forms of mixers, equalizers, filters, crossovers, dynamics/gain controls, routers, room combiners, and delays. The program memory shall be nonvolatile and provide program security should power fail. The DSP shall be ETL marked and comply with UL/CSA/CE safety requirements, FCC emission requirements and the RoHS directive. The DSP shall be the Xilica Solaro FR1.

TECHNICAL SPECIFICATIONS

Electrical

THD+N (22Hz to 22kHz)	0.002% (1kHz @ +4dBu)
EIN	<125dBu, unweighted (20Hz to 20kHz)
Dynamic Range	110dB, unweighted
Propagation Delay	4ms
Crosstalk, input to input, 1kHz	<110dB
Sampling Rate	48kHz
A/D-D/A Converters	32-bit
Acoustic Echo Cancellation	Requires HearClear™ license; 250ms latency at eight channels, 100ms at 16 channels
BTU/Heat Load	205 BTU/hr
Processor Type	40-bit floating point
Phantom Power	+48VDC (with XC-SML)
Power Supply	90–240 VAC (50–60Hz) via internal power supply with IEC socket
Power Consumption	<60W
Ambient Operating Temperature	32–104°F (0–40°C)
Humidity	0–98%, non-condensing
Altitude	0–6,600 feet (0–2000 Meters) MSL
Network Connections	Without XC-CTODN: 1x RJ45 (≥Cat 5e) for control. With XC-CTODN: 3x RJ45 (≥Cat 5e) including dual dedicated 1000Mbps Dante™ connections and separate Ethernet port for control
USB (with XC-SUB)	Bit depth: 16-bit Number of channels: 2x2, send and receive Driver sample rate: 48kHz Card sample rate: follows DSP settings Connector: USB B, female
Dante™	Requires XC-CTODN; 64x64 bi-directional (primary, secondary) with dual NIC; AES67

Mechanical

Card Slots	16 user-configurable
Display(s)	Single OLED display at front of device
Controls, Service & Indicators	Up/Select/Down buttons. Recessed IP reset. Factory service micro-USB.
Weight	11lbs; 5kg
Dimensions	Height: 1.75" / 44mm Width: 19" / 483mm Depth: 12" / 305mm
Mounting	Standard 19" rack; occupies 1U

General

Compliance	CE, FCC Part 15B, Industry Canada ICES-003:7, Intertek ETL (US, CA), RoHS, REACH
Warranty	Xilica Five Year Limited Warranty
Part Number(s)	2200–001–0104 (FR1, without XC-CTODN); 2200–001–0105 (FR1-D, with XC-CTODN)

Specifications are subject to change without notice.

42U SmartRack Mid-Depth Rack Enclosure Cabinet with doors & side panels

MODEL NUMBER: SR42UBMD



Description

The SR42UBMD is part of our new line of mid-depth rack enclosures. Our new line offers 36" (927mm) depth opposed to the standard 42" (1050mm).

The SR42UBMD features a massive front-to rear-ventilation capacity that meets or exceeds server manufacturer requirements. Its integrated baying tabs make it easy to combine multiple enclosures in rows for data center applications. This enclosure is also compatible with hot-aisle/cold-aisle configurations.

3000 lbs (1360.8 kgs) of standard 19-inch rack equipment in 42U is housed inside the SR42UBMD. Its front and rear pairs of vertical rails have square mounting holes that are adjustable in quarter-inch increments from 4 to 28.75 inches. Adjustment is quick and an easy-view depth index ensures consistent rail placement without requiring time-consuming measurements. Each rack space within the enclosure is numbered for ready reference.

Two of the adjustable vertical mounting rails support toolless button-mount 0U installation of up to four compatible PDUs and cable managers. This feature makes it easier to route cabling to rack equipment and reduces cord clutter.

With its locking, reversible, removable front and rear doors, and locking, removable side panels, the SR42UBMD provides ultimate equipment safety. The side panels are half size for ease of removal and reinstallation. The split rear door design allows the enclosure to be placed closer to a wall. The SR42UBMD meets all requirements toward PCI DSS compliance.

The top panel of the SR42UBMD is vented to help remove warm air from the enclosure and draw in cool air by convection. The top panel includes ports for cable routing, and can be quickly removed without tools. To facilitate cable access, the SR42UBMD is open-bottom.

All components of the SR42UBMD are grounded to the enclosure frame. Front and rear threaded grounding points are provided for connection to the facility earth ground. The removable front and rear doors feature quick-release ground wires.

To simplify deployment, the SR42UBMD comes with preinstalled casters that enable it to be easily maneuvered into the desired location, where it can be secured by adjusting the preinstalled levelers. Note: the casters are intended for minor position adjustments and are not designed for moving the enclosure over long distances.

The SR42UBMD comes with a 5-year product warranty. As part of the SmartRack family, the SR42UBMD is compatible with Tripp Lite's extensive range of rackmount accessories, enabling you to customize your solution to meet any requirement.

Features

- Ships fully assembled for rapid deployment and rolls into place on pre-installed casters allowing the enclosure to be pre-configured and rolled to the final installation location - casters are removable

Highlights

- 42U SmartRack enclosure with doors and side panels
- 36" (927mm) depth (with mounting depth increments from 4 to 28.75") and standard 24" (600mm) width
- 4 interior vertical posts with unthreaded square hole openings
- Ships fully assembled
- Massive front to rear ventilation capacity
- 3000 lbs (1360.8 kgs) stationary / 2250 lbs (1020.6 kgs) rolling load capacity
- Locking, removable, reversible front and rear doors
- Locking, removable side panels keyed alike with doors
- Pre-installed casters and leveling feet
- Includes 50 pieces of M6 cage nuts and 50 pieces of M6 screws (equipment mounting hardware)
- Meets all enclosure requirements towards PCI DSS (Payment Card Industry Data Security Standard) Compliance

Package Includes

- SR42UBMD Rack Enclosure
- (4) side panels
- (4) side panel locks
- (2) door & side panel keys
- (50) M6 screws
- (50) M6 washers
- (50) M6 cage nuts
- Owner's Manual



Tripp Lite
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Telephone: 773.869.1234
www.tripplite.com

- Front and rear sets of equipment mounting rails adjust in 1/4" increments. Adjustment is quick and convenient. The easy-view depth index ensures consistent rail placement without requiring time-consuming measurements.
- Toolless accessory mounting rails (2 rails per enclosure) include slots for quick installation of compatible PDUs and vertical cable managers. Mounting slots are arranged in an industry-standard pattern compatible with a wide variety of accessories. Each rail can accommodate two vertical PDUs or cable managers side-by-side (four items per enclosure).
- Enclosure includes mounting hardware of 50 pieces of M6 cage nuts and 50 pieces of M6 screws
- Textured powder coat finish for tough resistance to environmental concerns such as deployment in warehouses.
- Massive front to rear ventilation capacity. 65+% open space in door perforation pattern meets or exceeds server manufacturer requirements.
- Maximum usable internal depth of 31 inches (front to rear frame).
- Weight ratings of 3000 lbs (1360.8 kgs) stationary and 2250 lbs (1020.6 kgs) rolling.
- Front door is locking, reversible and removable.
- Rear doors are locking and reversible. Split rear door design reduces clearance requirements for service entry allowing the enclosure to be placed closer to a wall.
- Locking removable side panels are 'half size' to make them smaller and lighter improving ease of installation and servicing. Two side panels per side (4 panels total). Side panels are keyed alike to the front and rear doors.
- Built in baying tabs allow enclosures to be combined securely in rows. Center-to-center width can be set at 600mm or 24" to match standard data center floor tiles.
- Leveling feet extend to allow enclosure to be positioned on uneven floors. Levelers are removable.
- Convenient grounding system. All components are grounded to the enclosure frame which includes multiple connections for facility ground. Front and rear doors include quick-release ground wires.
- Open bottom for cable access.
- Top panel has generous cable access holes. Panel can be removed toollessly in seconds without having to disconnect cables first.
- Included stabilizing brackets are used for shipment and can be reattached at the bottom of the enclosure frame on the inside or outside of the rack.
- Meets all enclosure requirements towards PCI DSS (Payment Card Industry Data Security Standard) Compliance
- Compatibility with airflow optimization accessories as well as cable management accessories.

Specifications

OVERVIEW	
UPC Code	037332175694
Device Compatibility	Patch Panel; Network Switch; UPS
Rack Type	Enclosure
PHYSICAL	
Color	Black
Factory Preset Rack Depth (in.)	22.75
Factory Preset Rack Depth (cm)	57.8
Factory Preset Rack Depth (mm)	578



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Maximum Device Depth (cm)	78.74
Maximum Device Depth (in.)	31
Maximum Device Depth (mm)	787
Minimum Device Depth (cm)	10.16
Minimum Device Depth (in.)	4
Minimum Device Depth (mm)	102
Rack Height	42U
Shipping Dimensions (hwd / cm)	215.90 x 66.04 x 115.57
Shipping Dimensions (hwd / in.)	85.00 x 26.00 x 45.50
Shipping Weight (kg)	136.08
Shipping Weight (lbs.)	300.00
Unit Dimensions (hwd / in.)	78.5 x 23.63 x 36
Unit Dimensions (hwd / cm)	199.39 x 60.02 x 91.44
Unit Weight (lbs.)	250
Unit Weight (kg)	113.40
Weight Capacity - Rolling (kg)	1,021
Weight Capacity - Rolling (lbs.)	2250
Weight Capacity - Stationary (kg)	1,361
Weight Capacity - Stationary (lbs.)	3000
Rack Depth	Mid
Number of Vertical Mounting Rails	4
FEATURES & SPECIFICATIONS	
Grounding Lug	Front and back door frames
Built-in Cable Management	Yes
Extra Wide	No
STANDARDS & COMPLIANCE	
Product Certifications	UL 60950-1
Product Compliance	RoHS; CE (Europe); UKCA
WARRANTY	
Product Warranty Period (Worldwide)	5-year limited warranty

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<https://www.tripplite.com/products/product-certification-agencies>



DiskStation

DS920+

Capacity-scalable NAS with SSD Cache Acceleration Capability

Synology DiskStation DS920+ is an ideal network-attached storage solution designed to streamline data management and productivity. Two built-in M.2 SSD slots and Synology SSD Cache technology allow you to boost system I/O and application



Highlights

- **Accelerated Application Performance**
Average 15% performance boost to photo indexing and other computing-intensive operations, as well as

environment with fine-grained control

Streamline Your Data Management Experience

Synology DS920+ is a powerful 4-bay desktop NAS that brings you a fast and smooth data management experience, as well as sequential read and write throughput of over **225 MB/s** . It benefits computing-intensive applications, speeding up **Synology Drive** and 15% , and boosting **Web PHP response efficiency** compared to its predecessor, making data management simple and efficient.

DS920+ comes with two built-in **M.2 SSD slots** **SSD Cache technology**, allowing you to reduce random I/O response time 20 times compared with mechanical drives without occupying front drive bays. You can add five more drives with Synology DX517 for higher storage capacity .

On-premises Collaboration & Synching Solution

DS920+ comes with **Synology Collaboration Suite** file sharing solution that powers team collaboration while leveraging the advantages of the private cloud to fully control data and prevent data leaks -- through HTTPS support, a built-in firewall, and multiple IP and account intrusion auto-blocking mechanisms.

- **Synology Drive** enables data synchronization and backup via web portal and desktop applications across Windows platforms. Intelliversioning saves historical versions while minimizing storage space use and supports on-demand data restoration.

Synology Office



Synology Collaboration Suite

that lets teams collaborate, sync files, and



Next-Generation File System

Btrfs is a modern file system designed to safeguard data integrity through metadata mirroring, file self-healing, and fast snapshot replication.



Synology Backup Suite

A centralized, integrated, and license-free backup

Establish a Strong Storage Foundation with Btrfs

DS920+ features a **Btrfs file system** optimized by Synology to offer you high reliability and high performance. Btrfs supports advanced storage technologies that meet the needs of modern business:

- **Advanced snapshot technology** provides schedulable and near-instantaneous data protection of shared folders and LUNs.
- **File and folder level data restoration** offers users who wish to restore only a specific file or folder more flexibility.
- **Flexible Shared Folders and User Quota System** comprehensive quota control on all user accounts and shared folders.
- **File self-healing** allows Btrfs file systems to auto-detect corrupted files using mirrored metadata and to recover broken data using RAID configurations.
- **Inline compression** compresses data before writing them to the drive, to optimize storage use and reduce write commands to the drives.

Powerful Backup Tools

DS920+ offers users a range of backup solutions for cloud and physical, on-premises environments. Backing up and restoring data is effortless – and completely free of licenses on compatible NAS models.

- Back up your cloud data: **Cloud Sync** enables users to seamlessly back up or synchronize data between a local Synology NAS and other cloud services.
- Back up your PCs and servers: **Synology Drive Client**

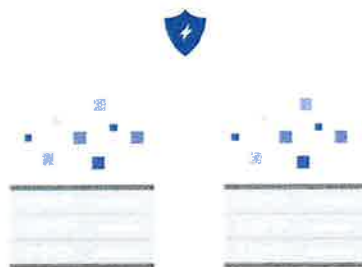
computer files.

offers a wide range of



Always On Guard

Protect your home and office with Synology's reliable and intuitive security solution. Surveillance Station combines intelligent monitoring and video management tools to safeguard your valuable assets.



Virtualization-Ready Platform

Synology's native hypervisor, Virtual Machine Manager, allows you to manage multiple virtual machines on your DS920+ and run Windows and Virtual DSM applications on your Synology NAS.

Automated Video Surveillance System

With Synology Surveillance Station, DS920+ can act as a full-featured video surveillance system. Simply add network-connected cameras and you can monitor their live feeds, play back recordings, and receive instant event alerts right away.

- **Works with more than 7,300 IP cameras:** that suits your requirements and budget, or use the LiveCam app to turn an old smartphone into an IP camera.
- **No subscription fee:** Unlike security cameras that require monthly cloud storage subscription, all your recordings are stored on the DS920+, 100% under your control.
- **Remote monitoring & control:** Access your surveillance system from a web browser, the desktop client, or the DS cam mobile app anytime, anywhere.
- **Automation & notification:** Set up rules to trigger specific actions when predefined events occur, such as automatically taking snapshots when motion is detected. Get notified by email, SMS, or push notification so that you can intervene in time.

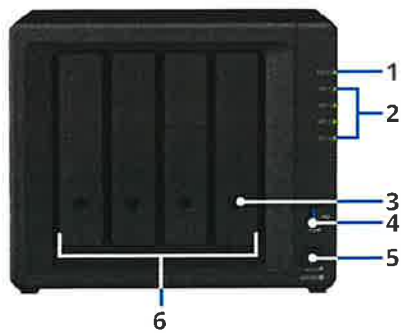
Running & Protecting Virtual Machines

Synology Virtual Machine Manager (VMM) is an intuitive hypervisor application that lets users easily set up virtual machines and run operating systems including **Windows**, **Linux**. VMM, users can build up a cluster environment with multiple Synology systems while keeping the flexibility to scale out online and migrate

IT resources with maximum flexibility.

Hardware Overview

Front



Rear



1	Status indicator	2	Drive status indicator	3	Drive tray lock
5	Power button and indicator	6	Drive tray	7	1GbE RJ-45 port
9	eSATA port	10	Power port	11	System fan

Technical Specifications

Hardware

Scheduled power on/off

General DSM specification

Networking protocol	SMB, AFP, NFS, FTP, WebDAV, CalDAV, iSCSI, Telnet, SSH, SNMP, VPN (PPTP, OpenVPN™, L2TP)
File system	<ul style="list-style-type: none"> Internal: Btrfs, ext4 External: Btrfs, ext4, ext3, FAT, NTFS, HFS+, exFAT
Supported RAID type	Synology Hybrid RAID (SHR), Basic, JBOD, RAID 0, RAID 1, RAID 5, RAID 6, RAID 10
Storage management	<ul style="list-style-type: none"> Maximum single volume size: 108 TB Maximum system snapshots: 65,536 Maximum internal volume: 64
SSD cache	<ul style="list-style-type: none"> Read/write cache support M.2 NVMe SSD support
File sharing capability	<ul style="list-style-type: none"> Maximum local user account: 2,048 Maximum local group: 256 Maximum shared folder: 512 Maximum concurrent SMB/NFS/AFP/FTP connection: 1,000
Privilege	Windows Access Control List (ACL), application privilege
Directory service	Windows AD integration: Domain users login via SMB/NFS/AFP/FTP/File Station, LDAP integration
Virtualization	VMware vSphere 6.5, Microsoft Hyper-V, Citrix, OpenStack
Security	Firewall, shared folder encryption, SMB encryption, FTP over SSL/TLS, SFTP, rsync over SSH, login auto block, Let's Encrypt support, HTTPS (customizable cipher suite)
Supported client	Windows 7 onwards, macOS 10.12 onwards
Supported browser	Chrome, Firefox, Edge, Internet Explorer 10 onwards, Safari onwards) on tablets
Interface Language	English, Deutsch, Français, Italiano, Español, Dansk, Norsk, Svensk, Nederlands, Русский, Polski, Magyar, Português do Brasil, Português Europeu, Türkçe, Český, ไทย, 日本語, 한국어, 繁體中文, 简体中文

Packages and Applications

Synchronization

Provide a universal portal to synchronize your files across various platforms, including Windows

Virtual drive, remote folder, Windows ACL editor, compressing/extracting archived files, bandwidth control for specific users

Offer global search into applications and files

DSM configuration backup, macOS Time Machine support, Synology Drive Client desktop application

Active Backup for Office 365 Support Office 365 OneDrive for Business, mail, contacts, and calendar backup and restoration

Active Backup for Business	All-in-one backup solution designed for heterogeneous business IT environment, enabling IT admins to remotely manage and monitor protection over PC, servers and VM on one centralized console
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Productivity & Collaboration

Collaboration tools	Collaborate with instant message service Synology Chat, online editor Synology Office, and scheduling assistant Synology Calendar <ul style="list-style-type: none"> • Chat maximum users: 1,500 • Office maximum users: 3,400 • Calendar: support CalDAV and access via mobile devices
Note Station	Rich-text note organization and versioning, encryption, sharing, media embedding and attachments
Synology MailPlus Server	Secure, reliable, and private mail solution with high-availability, load balancing, security and filtering design (Includes 5 free email account licenses; additional accounts require the purchasing of additional licenses)
Synology MailPlus	Intuitive webmail interface for Synology MailPlus Server, customizable mail labels, filters, and user interface

Multimedia

Moments	Support smart AI album with facial and subject recognition, photo editing and sharing features, similar photo detection, auto-editing functions such as color correction and angle adjustments, and AI selection of the best photos. Mobile applications are available on iOS and Android devices
Other packages	Video Station, Photo Station, Audio Station, iTunes Server

Surveillance

Surveillance Station	Maximum IP camera: 40 (total of 1,200 FPS at 720p, H.264) (Including two free camera licenses; additional cameras require the purchasing of additional licenses)
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All-in-One Server

Synology Directory Server	Provide a flexible and cost-effective domain controller solution
Central Management System	Provide a single interface to manage and monitor multiple Synology NAS
VPN Server	Maximum connection: 30, supported VPN protocol: PPTP, OpenVPN™, L2TP/IPSec

Volume and quota usage, total size of files, volume usage and trends based on past usage, size of shared folders, large files, most recently modified files, least recently accessed files

Full system scan, scheduled scan, white list customization, virus definition auto update

DS file, DS finder, DS note

*Model specifications are subject to change without notice. Please refer to www.synology.com for the latest information.

Performance figures are based on the average percentage improvement of DS920+ relative to its predecessor, as tested at Synology labs. Test items include file

3. Performance figures may vary depending on environment, usage, and configuration.
4. Licenses may need to be purchased depending on the use case. To learn more, visit https://www.synology.com/products/Device_License_Pack
5. DS920+ comes with 4 GB DDR4 onboard and can support up to 8 GB by adding one optional DDR4 non-ECC 4 GB SO-DIMM.
6. exFAT Access can be purchased separately in Package Center.
7. System snapshots include snapshots taken by iSCSI Manager, Snapshot Replication, and Virtual Machine Manager. Availability of these packages varies by model.
8. Presto File Server license can be purchased separately in Package Center.
9. Please refer to www.synology.com/compatibility for the latest optional accessories list.
10. 5-year warranty is available as an optional bundle with EW201, a 2-year Extended Warranty service add-on. Visit https://www.synology.com/en-global/products/Extended_Warranty for more information on availability. The warranty period starts from the purchase date as stated on your receipt of purchase. Visit <https://www.synology.com/company/legal/warranty> for more information.

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BRAVIA Professional Displays

2022 Model Catalog



BRAVIA



X|R
Cognitive Processor

X|1
4K HDR Processor

Outstanding picture quality & detailed reproduction for business

Harness the power of rich media content for your organization with BRAVIA Professional Displays.



BRAVIA™

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Cognitive Processor XR™

World's first processor with Cognitive Intelligence

Our BRAVIA XR Display takes vision and sound to the next level with the ingenious Cognitive Processor XR. It understands how humans see and hear, providing a whole new experience that immerses you completely in the scene.

4K HDR Processor X1™

One chip, incredibly real

With Object-based HDR remaster and Super Bit Mapping 4K HDR technology, our new 4K HDR Processor X1 reproduces more depth, textures and natural colors than Sony's entry level 4K Processor X1. You'll see pure colors at higher brightness levels for exceptionally realistic pictures.



X1
4K HDR Processor

Cognitive Processor XR™

XR Color

A wide palette of naturally beautiful colors

See colors that are natural and beautiful to the human eye. The Cognitive Processor XR enables our unique display to access a wider palette and reproduce each color with the subtle differences seen in the real world. With extended hue and saturation, vivid shades and realistic texture can be seen.



XR Picture

XR Clarity

Recreating lost texture, the intelligent way

Whatever the content or source, you'll clearly see them close to 4K resolution with XR 4K Upscaling. Our Cognitive Processor XR accesses a vast amount of data, intelligently recreating lost textures and detail for real world pictures.



XR Motion

Intelligent motion processing for fast-moving, blur-free scenes

Watching fast-moving videos just got a whole lot better. Our Cognitive Processor XR with XR Motion Clarity™ cross analyses data to ensure motion stays smooth, bright, and clear with no blur.

XR Contrast

Real life depth with deep blacks and intense brightness

Feel breathtaking contrast, just as in real life. Our Cognitive Processor XR cross analyzes data, enhancing pictures in the same way that the human eye focuses for real life color and depth. With XR Contrast Booster, bright areas are brighter and dark areas darker - eliminating details overwhelmed by shadow or lost in blown-out highlights.

4K HDR Processor X1™

Picture

Unique 4K X-Reality PRO picture processing technology upscales every pixel for remarkable clarity. Advanced noise reduction techniques and a special pattern database ensure every scene is full of lifelike detail.



Color

By widening the color spectrum, TRILUMINOS powered by our X1 processors reproduces more colors than a conventional display. It analyzes and processes data in every image to make colors even more natural and precise so pictures are closer than ever to real life.

Contrast

Imagine seeing a white object in a dark environment on your display: on an edge-lit or direct-lit display, you would sacrifice the brightness of the object for a darker background (or vice versa), and the background would likely appear blue or grey. On a Sony Full Array LED display with local dimming, you get a beautiful, natural picture with crisp brightness and an authentically dark background.



Clarity

On some screens, sports and fast-action scenes can seem to go by in a blur. Our latest X-Motion Clarity™ technology keeps everything smooth, bright, and clear. Each "blink" is individually controlled and its duration optimized, while brightness is boosted when needed, so you won't miss a thing.

Expanding the possibility of **your business** with the full lineup of BRAVIA **Professional Displays**

In sizes ranging from 32" to 100", our lineup provides flexible options to match virtually any business application, in any environment.



Sony's largest professional display model
with supreme picture quality features

100"

The 100" BZ40J delivers supreme picture quality, high contrast, and more detail for large-sized digital signage and meeting rooms.



XBR
Cognitive Processor

Features for professional use



Professional mode

Professional features let you disable input or remote control, remove labels and block buttons; customize and store display settings and features, add security then copy them easily from display to glass.



Flexible content layout with HTML5

The 100" BZ40J supports the HTML5 content platform, so it's possible to use HTML5 interactive signage content without requiring a set-top box or PC. The content screen can be freely laid out using the 4K video, pictures, or even with the HDMI input.



Small,
high picture quality 32"
4K display model

32"

Small in size, but big in picture quality for meeting
content details even in huddle space environments
with 32" BZ30J



X1
4K HDR Processor

Professional design

Ideal for digital signage applications

Logo position for public installation

The Sony logo is on the top-right side of the bezel, creating clean-framed landscape and portrait digital signage installations.

Four-sided uniform bezel for portrait installation

* for BZ40J only

Carrying handle

* for BZ40J only



Cable management

Neatly bundles the power cable, HDMI and other cables with a cable clasper



32" AC adapter holder

Smart installation by adapter
holder even in limited space

* for BZ30J only



IP network and serial communication controls

The BZ Series is controllable both via IP network (wired/wireless LAN) and RS-232C. This makes it possible to incorporate the displays into digital signage.

Wi-Fi 5GHz / Apple AirPlay & Chromecast built-in™

Discover a new world of possibilities with enhanced BRAVIA functionality. Easily mirror content onto your BRAVIA Pro Display using Apple AirPlay or Chromecast built-in, and take advantage of Wi-Fi 5GHz WAP connectivity.



BZ40J

Features

100"

androidtv



Cognitive Processor XR™

The BZ40J incorporates the Cognitive Processor XR that uses human perspective analysis to cross analyze thousands of elements at one to create an intensely immersive picture.



BRAVIA XR



XR Triluminos Pro

Powered by our Cognitive Processor XR, this display reproduces color in a way that colors with an enhanced range of hue and saturation, allowing natural shades and precise details to be seen, even in dark scenes.



XR Motion Clarity™

On some screens, fast-moving scenes can seem to go by in a blur. Our latest LED XR X-Motion Clarity technology keeps everything smooth, bright and clear. Each frame is individually controlled and its duration optimized, while brightness is boosted when needed, so you won't miss a thing.



XR 4K Upscaling

Powered by our Cognitive Processor XR, this display takes 2K signals close to true 4K quality for incredibly real and immersive viewing. XR 4K Upscaling accesses and utilizes a vast amount of data, analyzing patterns in scenes and recreating subtle details.



XR Contrast Booster

By precisely balancing light output across the screen, dimming some areas and boosting others, the XR Contrast Booster adjusts brightness for higher peaks in glare and deeper blacks in shadows. As bright areas are brighter and dark areas darker, scenes look more real with extra depth and detail.



24/7 · Portrait · Tilt



BZ40H

Features

85"

75"

65"

55"

androidtv



High brightness, high contrast images for business application content

Peak brightness : 850 cd/m²

Picture quality features



Full Array LED

Brighter highlights and deeper blacks

Multiple LED zoning allows Full Array display models to adjust and create contrast depending on the scene, resulting in more light where brightness is needed, and less light where darkness is needed.



Cosmetic design



Logo position



All side terminal position



Flat bottom bezel

24/7 • Portrait • Tilt



BZ35J

Features

50"

43"

androidtv



High picture quality model
with flexible installation for
mid-sized spaces



Picture quality features



Motionflow XR

Less blur, even in fast scenes

On some screens, sports and fast action scenes go by in a blur. Our Motionflow technology keeps movement smooth and clear by creating extra images between images and black images between scenes. The result? Less blur and afterimage, more flowing motion.



Cosmetic design



Logo position



All side terminal position



Flat bottom bezel

24/7•Portrait•Tilt



BZ30J

Features

75"

65"

55"

50"

43"

32"

androidtv



Entry lineup including space saving size for more implementation options in business use

Picture quality features



Color reproduction

Our displays with a wide color gamut and unique TRILUMINOS PRO™ algorithm can detect color from saturation, hue and brightness to reproduce natural shades in every detail. You'll enjoy colors that are closer to those seen in the real world.



Cosmetic design

32"



Logo position



All side terminal position

75"-32"



75"-43"

Flat bottom bezel

24/7 • Portrait • Tilt



BZ-series Specifications

High-end line

		FW-100BZ40J	FW-85BZ40H	FW-75BZ40H	FW-65BZ40H	FW-55BZ40H	FW-50BZ35J	FW-43BZ35J	
General features	Screen Size	100"	85"	75"	65"	55"	50"	43"	
	Brightness (cd/m²)	Typ. 600 / Peak 940	Typ. 620 / Peak 850					570	560
	Native contrast ratio	9,000:1	4,000:1	6,000:1			5,000:1	4,000:1	
	Dynamic contrast ratio	600,000:1	600000:1			550000:1		400,000:1	
	Response Time (ms)	7	6	8				6	
	Display resolution (H x V, pixels)	3,840 x 2,160							
	HDR (High Dynamic Range) compatibility	Yes (HDR10,HLG,Dolby Vision)							
	Aspect Ratio	16:9							
Display features	Portrait/Tilt Compatibility ⁴²	Yes							
	Dimming type	Local Dimming					Frame Dimming		
	Display device	LCD							
	Backlight type	Direct (Full Array LED)							
	4K Processor	Cognitive Processor XR	4K HDR Processor X1						
Video Specs	Operation time	24/7							
	Wide Mode	Wide Zoom/Normal/Full/Zoom	Auto/Wide Zoom/Normal/Full/Zoom					Wide Zoom / Normal / Full / Zoom	
	4:3 Default	Yes							
	Video Processing	XR 4K Upscaling	4K X-Reality PRO						
	Motion enhancer	XR Motion Clarity, Auto mode	X-Motion Clarity, Auto mode					Motionflow XR 960Hz (Native 120Hz), Auto mode	
	TRILUMINOS Display	XR Triluminos Pro	TRILUMINOS DISPLAY					TRILUMINOS PRO	
	Viewing Angle (Right/Left)	178 (89/89) degree							
	Viewing Angle (Up/Down)	178 (89/89) degree							
Audio Specs	HDMI Signal	4096x2160p (24, 60Hz), 3840x2160p (24,30,60,120Hz), 1080p (30,60,120Hz), 1080i (24p, 1080i54i60i), 720p (30, 60Hz), 720i (24p, 480p	4096x2160p (24,60Hz), 3840x2160p (24,30,60,120Hz), 1080p (30,60,120Hz), 1080i (24p, 1080i (60Hz), 720p (30,60Hz), 720i (24p, 480p					4096x2160p (24, 60Hz), 3840x2160p (24, 30, 60, 120Hz), 1080p (30, 60, 120Hz), 1080i (24p, 1080i (60Hz), 720p (30, 60Hz), 720i (24p, 480p	
	Speaker Position	Down Firing	Side Back + Down Firing					Down Firing	
Professional features	Audio Power Output	10W + 10W							
	Professional Hidden mode	Pro Mode							
	HDMI auto wake-up	Yes							
	HTML5 platform	Yes							
	Multicast/IPTV	Yes							
	Operating System ⁴³	Android 10							
Network Specs	On-board Storage (GB)	16GB ⁴⁴							
	Wi-Fi Direct	Yes							
	Wireless LAN	Integrated							
Convenience features	USB playback codecs	MPEG1:MPEG1 / MPEG2PS:MPEG2 / MPEG2TS(HDV, AVCHD):MPEG2, AVC / MP4(XAVC S):AVC, MPEG4, HEVC / AV1:Xvid, MotionJpeg / ASF(WMV):VC1 / MOV:AVC, MPEG4, MotionJpeg / MKV:Xvid, AVC, MPEG4, VP8 HEVC / WEBM:VP8 / 3GPP:MPEG4, AVC / MP3 / ASF(WMA) / LPCM / WAV / MP4AAC / FLAC / JPEG							
	On Screen Clock	Yes							
	Sleep Timer	Yes							
	On/Off Timer	Yes							
	Chromecast built-in	Yes							
	Apple AirPlay (Internet required)	Yes							
	IP Control	Yes							
Control Specs	RS-232C Control	1 (Side)							
	HDMI-CEC	Yes							
	HDCP	HDCP2.3 (for HDMI1/2/3/4)							
Inputs and outputs	Composite Video Input (s)	1 (Side, Mini jack)							
	HDMI inputs total	4 (4Side)							
	Analog Audio Input (s) (Total)	1 (Side Analog Conversion)							
	Digital Audio Output (s)	1 (Side)							
	USB ports	2 (Side)							
	Ethernet inputs	1 (Side)							
Design features	Frame color	Black							
	Stand Design	Slim Blade Stand	Metal Blade Stand					Slim Blade Stand	
	VESA® Hole Spacing Compatible	Yes							
	VESA® Hole Pitch (W x H)	600 x 400 mm	400 x 400 mm	300 x 300 mm			200 x 200 mm		
Environment specs	Screen Size for WEB (diagonal, cm, integer or 1st decimal)	253 cm	215.0 cm	189.0 cm	164.0 cm	139.0 cm	126 cm	108 cm	
	Rated Power Consumption	426 W	318W	277W	214W	173W	148 W	114 W	
	Power Consumption (in Standby)	0.5 W							
	Dynamic Backlight Control	Yes							
Measurements	Power Saving Mode / Backlight Off Mode	Yes							
	Dimension of TV without Stand (W x H x D)	2,260 x 1,297 x 98 mm	1,899 x 1,089 x 72 mm	1,674 x 961 x 71 mm	1,450 x 833 x 70 mm	1,231 x 710 x 70 mm	1,119 x 649 x 70 mm	964 x 563 x 69 mm	
	Dimension of TV with Stand (W x H x D)	2,260 x 1,346 x 475 mm	1,899 x 1,162 x 441 mm	1,674 x 1,034 x 410 mm	1,450 x 903 x 338 mm	1,231 x 780 x 338 mm	1,119 x 715 x 286 mm	964 x 628 x 286 mm	
	Dimension of Package Carton (W x H x D)	2,440 x 1,558 x 378 mm	2,036 x 1,232 x 258 mm	1,810 x 1,107 x 186 mm	1,574 x 958 x 184 mm	1,348 x 833 x 160 mm	1,225 x 782 x 141 mm	1,070 x 695 x 141 mm	
Weight	Weight of TV without Stand	88.9 kg	45.8 kg	32.9 kg	22.2 kg	16.5 kg	12.7 kg	10.2 kg	
	Weight of TV with Stand	92.6 kg	47.7 kg	34.4 kg	23.2 kg	17.5 kg	13.3 kg	10.7 kg	
	Weight of Package Carton (Gross)	129 kg	62kg	46kg	31kg	23kg	19 kg	14 kg	

BZ-series Specifications

Standard line

		FW-75BZ30J	FW-65BZ30J	FW-55BZ30J	FW-50BZ30J	FW-43BZ30J	FW-32BZ30J	
General features	Screen Size	75"	65"	55"	50"	43"	32"	
	Brightness (cd/m²)	440					300	
	Native contrast ratio	1,200:1			5,000:1	1,200:1	3,000:1	
	Dynamic contrast ratio	300,000:1			1,200:1		260,000:1	
	Response Time (ms)	11		10	9	10		
	Display resolution (H x V, pixels)	3,840 x 2,160						
	HDR (High Dynamic Range) compatibility	Yes (HDR10, HLG, Dolby Vision)						
Display features	Aspect Ratio	16:9						
	Portrait/Tilt Compatibility*	Yes						
	Dimming type	Frame Dimming						
	Display device	LCD						
	Backlight type	Direct LED					Edge LED	
	4K Processor	4K HDR Processor X1						
	Operation time	24/7						
Video Specs	Wide Mode	Wide Zoom / Normal / Full / Zoom						
	4:3 Default	Yes						
	Video Processing	4K X-Reality PRO						
	Motion enhancer	Motionflow XR 240Hz (Native 60Hz), Auto mode						
	TRILUMINOS Display	TRILUMINOS PRO						
	Viewing Angle (Right/Left)	178 (89/89) degree						
	Viewing Angle (Up/Down)	178 (89/89) degree						
Audio Specs	HDMI Signal	4096x2160p (24, 60Hz), 3840x2160p (24, 30, 60Hz), 1080p (30, 60Hz), 1080/24p, 1080i (60Hz), 720p (30, 60Hz), 720/24p, 480p						
	Speaker Position	Down Firing						
Professional features	Audio Power Output	10W + 10W					5W + 5W	
	Professional Hidden mode	Pro Mode						
	HDMI auto wake-up	Yes						
	HTML5 platform	Yes						
	Multicast/IPTV	Yes						
Network Specs	Operating System**	Android 10						
	On-board Storage (GB)	16GB**3						
	Wi-Fi Direct	Yes						
Convenience features	Wi-Fi 6E	Yes						
	Wireless LAN	Integrated						
	USB playback codecs	MPEG1:MPEG1 / MPEG2PS:MPEG2 / MPEG2TS(HDV, AVCHD):MPEG2, AVC / MP4(XAVC S):AVC, MPEG4, HEVC / AVI:Xvid, MotionJpeg / ASF(WMV):VC1 / MOV:AVC, MPEG4, MotionJpeg / MKV:Xvid, AVC, MPEG4, VP8, HEVC / WEBM:VP8 / 3GPP:MPEG4, AVC / MP3 / ASF(WMA) / LPCM / WAV / MP4AAC / FLAC / JPEG						
	On Screen Clock	Yes						
	Sleep Timer	Yes						
	On/Off Timer	Yes						
	Chromecast built-in	Yes						
Control Specs	Apple AirPlay (Internet required)	Yes						
	IP Control	Yes						
	RS-232C Control	1 (Side)						
Inputs and outputs	HDMI-CEC	Yes						
	HDCP	HDCP2.3 (for HDMI1.2/3/4)						
	Composite Video Input (s)	1 (Side, Mini Jack)						
	HDMI Inputs total	4 (4Side)						
	Analog Audio Input (s) (Total)	1 (Side Analog Conversion)						
	Digital Audio Output (s)	1 (Side)						
Design features	USB ports	2 (Side)						
	Ethernet inputs	1 (Side)						
	Frame color	Black						
Environment specs	Stand Design	Slim Blade Stand	Slim Blade Stand	Slim Blade Stand	Slim Blade Stand	Slim Blade Stand	Stand	
	VESA® Hole Spacing Compatible	Yes	Yes	Yes	Yes	Yes	Yes	
	VESA® Hole Pitch (W x H)	300 x 300 mm			200 x 200 mm		100 x 200 mm	
Measurements	Screen Size for WEB (diagonal, cm, integer or 1st decimal)	189 cm	164 cm	139 cm	126 cm	108 cm	80 cm	
	Rated Power Consumption	297 W	230 W	196 W	146 W	107 W	66 W	
	Power Consumption (in Standby)	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	
	Dynamic Backlight Control	Yes						
Weight	Power Saving Mode / Sleep Light Off Mode	Yes						
	Dimension of TV without Stand (W x H x D)	1,686 x 969 x 72 mm	1,462 x 842 x 71 mm	1,243 x 719 x 71 mm	1,126 x 653 x 70 mm	972 x 567 x 70 mm	726 x 430 x 76 mm	
	Dimension of TV with Stand (W x H x D)	1,686 x 1,045 x 410 mm	1,462 x 912 x 338 mm	1,243 x 787 x 338 mm	1,126 x 718 x 286 mm	972 x 632 x 286 mm	726 x 454 x 172 mm	
Weight	Dimension of Package Carton (W x H x D)	1,824 x 1,114 x 187 mm	1,588 x 965 x 184 mm	1,362 x 840 x 160 mm	1,240 x 796 x 141 mm	1,070 x 695 x 141 mm	814 x 551 x 152 mm	
	Weight of TV without Stand	31.6 kg	21.6 kg	15.7 kg	12.3 kg	10 kg	7.5 kg	
	Weight of TV with Stand	32.9 kg	22.5 kg	16.6 kg	12.9 kg	10.5 kg	7.7 kg	
Weight	Weight of Package Carton (Gross)	49 kg	31 kg	23 kg	17 kg	14 kg	10 kg	

· 1 Please refer "Wall-Mount Installation Manual" for condition details · 2 As of June, 2021 · 3 The actual capacity available to the user will vary depending on OS and installed software requirements.
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Discover how we work closely with top companies to add even more value to our industry-leading AV products and solutions. Our BRAVIA Professional Displays support a growing ecosystem of compatible technologies from established and emerging solution providers.

Whether it's configuring a digital signage network, connecting participants using video collaboration, or outfitting a room for device management and automation, we are committed to helping you.

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Options & accessories



BRAVIA Meeting (WQ-BM1)

BRAVIA Meeting enables centralized management of displays and interactive meetings via a network. The optional software, BRAVIA Meeting, enables remote monitoring of multiple displays, power control, and configuration changes. In addition, displaying PC screen shots wirelessly and annotation which enhances in-meeting collaboration.



Simple Media Player 2 (WQF-USMP2)/Free of charge

Simple Media Player 2 is an easy-to-use standalone signage player application, allowing you to display video, photos and HTML5 content directly from a connected USB flash memory. It's quick and intuitive to set up screens, edit and preview playlists and schedules using the BRAVIA display's remote controller.

**For full features visit
pro.sony/BRAVIA**

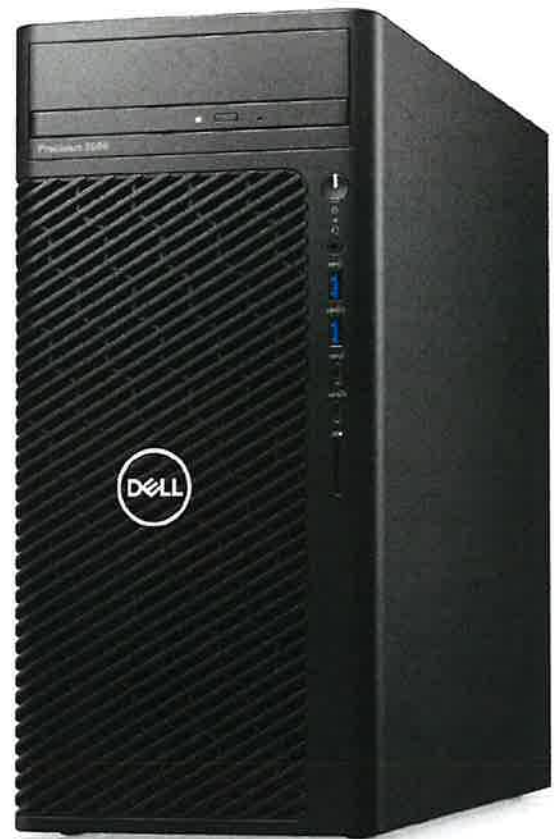
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SONY

PRECISION

3660 Tower

Smart performance
that scales



DELLTechnologies

3660 TOWER

Smart performance that scales

A cost-efficient, mini tower design featuring outstanding performance, scalability, improved CPU cooling and built-in AI responsiveness.

3.5" or 2.5" front-accessible HDD storage option, lockable

Optional Optical drive

The slimline bay can also accommodate:

1. Front accessible M.2 NVMe SSD*
2. Integrated Smart Card Reader with Contact and Contact-less Support (CAC/ PIV)

Breathable hexagon panel



Power Button

Audio & microphone combo jack

USB 3.2 Type-A Gen1 (5Gbps)

USB 3.2 Type-A Gen1 (5Gbps) with PowerShare

USB 3.2 Type-C Gen2 (10Gbps)

USB 3.2 Type-C Gen2x2 (20Gbps) with PowerShare

SD card reader

Audio out

(2) DisplayPort 1.4++ HBR2

(2) USB 3.2 Type-C Gen2 (10Gbps) with PD support

(2) USB 3.2 Type A Gen2 (10Gbps)

(2) USB 2.0 Type A (with SmartPower)

Power connector

LED indicator

Security screw

Side cover release

Lock slot

Optional 2nd RJ-45 2.5G Ethernet connection

Optional port (VGA, HDMI 2.0, DP++ 1.4 HBR3, Type C w/DP-Alt mode)

RJ-45 1G Ethernet connection



[Click here to review 360 degree product demo.](#)

3660 TOWER



Intelligent performance

Up to 12th Gen Intel® Core™ i9-12900K 16 Core (8P+8E) Processor (125W), up to RTX A6000 or 350W GPU support (NVIDIA and AMD Cards), up to 28TB storage, RAID support, up to 128GB or up to 4400MHz ECC and non-ECC DDR5 memory

Option to upgrade CPU cooling:
Standard CPU Air Cooler
Advanced CPU Air Cooler
Premium CPU Liquid Cooler



Immersive productivity and design

Front-accessible storage for 2.5" or 2.5" SATA HDD (with lockable door and key)
Front-accessible M.2 NVMe SSD

Wi-Fi 6E, Bluetooth 5.2

Front: USB 3.2 Type-C Gen2x2 (20Gbps) with PowerShare

Support for 4K and 8K displays

(3) PCIe expansion slots
(3) M.2 NVMe PCIe SSD Slots

Internal power supply

Tool-less chassis



Mission critical reliability and sustainability

ISV Certifications for performance and reliability

MIL-STD tested for reliability

Reliable Memory Technology Pro comes with ECC memory

EPEAT registered

Our packaging is made from 87% recycled or renewable material



3660 TOWER

Dell Optimizer for Precision
Where productivity meets intelligence.

Dell Optimizer revolutionizes the way you work by fueling the world's most intelligent PCs*. It is the only AI-based optimization software that learns and responds to the way you work and designed to automatically improve application performance, battery run-time, audio settings and privacy – all in the background while you're working.

Personalized performance
made for hybrid work



Power to the creators

Dell Optimizer for Precision empowers high-end users with ExpressResponse[®] for performance optimization of storage heavy apps. If you're a Precision user, you also have an exclusive Analytics feature for workload and system insights that help create personalized performance. You can also generate reports within Analytics to get system diagnostics and productivity gains.



Intelligent privacy anywhere

Privacy and security are a major concern – help keep sensitive data private with the world's most comprehensive suite of Intelligent Privacy features¹. Onlooker detection lets you texturize or turn on Safe Screen when an intruder is detected and Look Away Detect darkens the PC screen based on user behavior.



Extended power

ExpressCharge analyzes your power usage habits to improve PC battery utilization. It extends run times and charges your system faster when you need a boost in power.



Enhanced audio

Intelligent Audio delivers audio and mic enhancements and reduces background noise so you can fully engage in meetings with confidence, wherever you collaborate. Neural noise cancellation enables advanced artificial intelligent techniques to distinguish human speech from any unwanted noise.



Faster sign-in

Get to work faster with ExpressSign-in² – the proximity sensor detects your presence to wake on approach before Windows Hello logs you in via facial recognition.



Unmatched connectivity

Optimized for the best connectivity, ExpressConnect³ provides the world's first simultaneous multi-network connection for faster data and video downloads⁴. It also enables joining the best network⁵ available and prioritizes traffic for conferencing apps, wherever you work.



Improved performance

ExpressResponse[®] analyzes how you use your preferred apps⁷ to boost performance.



Simplified manageability

Elevate work experience with an easy-to-manage application that provides a seamless experience for both end-users and IT decision makers. Set up individual features and modules from Dell Optimizer that fit your work environment with the modular installation feature. Deployment updates and optimization of multiple PCs remotely can be done simultaneously via centralized management.



RECOMMENDED ACCESSORIES



Dell UltraSharp 34 Curved USB-C HUB Monitor - U3421WE

An immersive 34" WQHD curved monitor with wide color coverage and extensive connectivity including RJ45, USB-C® and quick-access front ports.



Dell Slim Soundbar - SB521A

World's slimmest and lightest soundbar offers exceptional audio clarity and easy magnetic attachment to your Dell monitors, ensuring a clutter-free desk.



Dell UltraSharp 27 Monitor - U2722D

Take your work to new heights with this 27-inch QHD monitor featuring a wide color coverage, always-on built-in ComfortView Plus, and fast connectivity.



3Dconnexion SpaceMouse Wireless - 3DX-700066

3Dconnexion's patented 6-Degrees-of-Freedom (6DOF) sensor is specifically designed to manipulate digital content or camera positions in industry-leading CAD applications.



Dell UltraSharp Webcam - WB7022

Elevate your video conferencing experience with this high quality 4K webcam that optimizes your visuals with a large 4K Sony STARVIS™ CMOS sensor and AI Auto-Framing.



Dell Pro Wireless Headset - WL5022

Work from anywhere with this Bluetooth headset's comfort headset that lets you switch seamlessly to your PC or smartphone and enjoy crystal clear audio on the go.

PRECISION

3660 TOWER

FEATURE TECHNICAL SPECIFICATION

MODEL NUMBER	Precision 3660 Tower
PROCESSOR OPTIONS¹⁵	<p>12th Generation Intel® Core™ i9-12900K, 30MB cache, 16 cores (8P+8E), 3.2GHz to 5.2GHz, 125W</p> <p>12th Generation Intel® Core™ i9-12900, 30MB cache, 16 cores (8P+8E), 2.4GHz to 5.1GHz, 65W</p> <p>12th Generation Intel® Core™ i7-12700K, 25MB cache, 12 cores (8P+4E), 3.6GHz to 5.0GHz, 125W</p> <p>12th Generation Intel® Core™ i7-12700, 25MB cache, 12 cores (8P+4E), 2.1GHz to 4.9GHz, 65W</p> <p>12th Generation Intel® Core™ i5-12600K, 20MB cache, 10 cores (6P+4E), 3.7GHz to 4.9GHz, 125W</p> <p>12th Generation Intel® Core™ i5-12600, 18MB cache, 6 cores (6P+0E), 3.3GHz to 4.8GHz, 65W</p> <p>12th Generation Intel® Core™ i5-12500, 18MB cache, 6 cores (6P+0E), 3.0GHz to 4.6GHz, 65W</p> <p>12th Generation Intel® Core™ i3-12100, 12MB cache, 4 cores (4P+0E), 3.3GHz to 4.3GHz, 60W^{27, 8}</p> <p>Note: All processors come with Intel® Integrated Graphics</p> <p>Processor Cooling options^{29,30}</p> <ol style="list-style-type: none"> Standard CPU Air Cooler (for up to 65W CPUs) Advanced CPU Air Cooler (for all CPUs) Premium CPU Liquid Cooler (for all CPUs)
OPERATING SYSTEM¹⁵	<p>Windows 11 Home, 64-bit</p> <p>Windows 11 Pro, 64-bit</p> <p>Windows 10 Home, 64-bit</p> <p>Windows 10 Pro, 64-bit</p> <p>Windows 10 IoT 2021 LTSC (OEM Only)³⁵</p> <p>Windows 10 CMT Government Edition, 64-bit (China only)</p> <p>Ubuntu® Linux® 20.04 LTS, 64-bit</p> <p>Kylin V 10 SP1</p> <p>Red Hat® Enterprise Linux® 8.6 (coming soon)</p>
MEMORY OPTIONS^{15,36,37}	<p>4 DIMM Slots: Up to 128GB or up to 4400MHz ECC and Non-ECC DDR5</p> <p>Maximum speed: 4400MHz</p> <p>Maximum capacity: 128GB</p> <p>the maximum speed may drop</p> <p>4400MHz: 1 DIMM-1R/2R</p> <p>4000MHz: 2 DIMM-1R</p> <p>3600MHz: 2 DIMM-2R</p> <p>8GB, 1 x 8GB, DDR5, 4400MHz, Non-ECC</p> <p>16GB, 2 x 8GB, DDR5, 4400MHz, Non-ECC, dual-channel</p> <p>32GB, 2 x 16GB, DDR5, 4400MHz, Non-ECC, dual-channel</p> <p>64GB, 2 x 32GB, DDR5, 4400MHz, Non-ECC, dual-channel</p> <p>32GB, 4 x 8GB, DDR5, 4000MHz, Non-ECC, dual-channel</p> <p>64GB, 4 x 16GB, DDR5, 4000MHz, Non-ECC, dual-channel</p> <p>128GB, 4 x 32GB, DDR5, 3600MHz, Non-ECC, dual-channel</p> <p>16GB, 1 x 16GB, DDR5, 4400MHz, ECC</p> <p>32GB, 2 x 16GB, DDR5, 4400MHz, ECC, dual-channel</p> <p>64GB, 2 x 32GB, DDR5, 4400MHz, ECC, dual-channel</p> <p>64GB, 4 x 16GB, DDR5, 4000MHz, ECC, dual-channel</p> <p>128GB, 4 x 32GB, DDR5, 3600MHz, ECC, dual-channel³³</p>
STORAGE^{15,39}	<p>Support for up to (3) M.2 2280 PCIe NVMe SSD on motherboard and up to (3) 3.5-inch SATA^{11,34} or (4) 2.5-inch SATA HDDs</p> <p>Front accessible 2.5-inch SATA or 3.5-inch SATA HDD</p> <p>Support for Intel® Ready Mode™ technology</p> <p>Support for up to (1) additional PCIe SSD on Dell Precision Ultra-Speed drive with active cooling</p> <p>RAID 0/1/5/10 available</p> <p>M.2 2230, 256GB, PCIe NVMe® Class 35 SSD</p> <p>M.2 2280, 512GB, PCIe NVMe® Class 40 SSD</p> <p>M.2 2280, 1TB, PCIe NVMe® Class 40 SSD</p> <p>M.2 2280, 2TB, PCIe NVMe® Class 40 SSD</p> <p>M.2 2280, 4TB, PCIe NVMe® Class 40 SSD</p> <p>M.2 2280, 512GB, PCIe NVMe® SSD, Self-Encrypting drive</p> <p>M.2 2280, 1TB, PCIe NVMe® SSD, Self-Encrypting drive</p> <p>2.5-inch, 500GB, 7200RPM, SATA, HDD</p> <p>2.5-inch, 500GB, 7200RPM, Self-Encrypting, Opal 2.0, FIPS, SATA, HDD</p> <p>2.5-inch, 1TB, 7200RPM, SATA, HDD</p> <p>3.5-inch, 1TB, 7200RPM, SATA, HDD</p> <p>3.5-inch, 2TB, 7200RPM, SATA, HDD</p> <p>3.5-inch, 4TB, 5400RPM, SATA, HDD</p> <p>3.5-inch, 4TB, 7200RPM, SATA, Enterprise HDD³²</p> <p>3.5-inch, 8TB, 7200RPM, SATA, Enterprise HDD³²</p>

FEATURE TECHNICAL SPECIFICATION

GRAPHICS	<p>One PCI Express x16 Gen5 slot supporting graphics cards up to 450W (Total power available for Discrete Graphics cards)</p> <p>Intel® UHD Graphics 730 for 12th Generation Core™ i3 processors</p> <p>Intel® UHD Graphics 770 for 12th Generation Core™ i5/i7/i9 processors</p> <p>NVIDIA® RTX A6000, 48GB, GDDR6</p> <p>NVIDIA® RTX A5500, 24GB, GDDR6</p> <p>NVIDIA® RTX A5000, 24GB, GDDR6</p> <p>NVIDIA® RTX A4500, 20GB, GDDR6</p> <p>NVIDIA® RTX A4000, 16GB, GDDR6</p> <p>NVIDIA® RTX A2000, 12GB, GDDR6</p> <p>NVIDIA® RTX A2000, 6GB, GDDR6</p> <p>NVIDIA® T1000, 8GB, GDDR6</p> <p>NVIDIA® T1000, 4GB, GDDR6</p> <p>NVIDIA® T400, 4GB, GDDR6</p> <p>NVIDIA® T400 class, 2GB, GDDR6</p> <p>AMD Radeon™ Pro W6800, 32GB, GDDR6</p> <p>AMD Radeon™ Pro RX6900XT, 16GB, GDDR6</p> <p>AMD Radeon™ Pro W6600, 8GB, GDDR6</p> <p>AMD Radeon™ Pro W6400, 4GB, GDDR6</p> <p>AMD Radeon™ Pro WX3200, 4GB, GDDR5</p>
CASE COLOR	Dell Standard Black
PRODUCTIVITY SW¹⁵	<p>Dell Optimizer for Precision</p>
SECURITY	<p>McAfee® Small Business Security 30 Day Free Trial</p> <p>McAfee® Small Business Security 12 month subscription</p> <p>McAfee® Small Business Security 36 month Subscription</p> <p>Intel Guard Technologies & Secure Key: Software Guard (SGX), Data Guard (vPro only), Boot Guard, BIOS Guard (Core CPU's only), OS Guard (Core CPU's only) and Secure Key (i5 or greater only)</p> <p>Intel Runtime BIOS Resilience (Copper Point) with attestation via Nifty Rock + Intel TXT</p> <p>Support of Absolute Persistent Module BIOS agent v2</p> <p>OpenXT validation required</p> <p>SafeGuard and Response, powered by VMware Carbon Black and Secureworks</p> <p>Next Generation Antivirus (NGAV)</p> <p>Endpoint Detection and Response (EDR)</p> <p>Threat Detection and Response (TDR)</p> <p>Managed Endpoint Detection and Response</p> <p>Incident Management Retainer</p> <p>Emergency Incident Response</p> <p>SafeData</p>
WARRANTY^{23,34}	<p>1 years Basic Warranty with Hardware Service on site service after remote diagnosis</p> <p>2 years Basic Warranty Extension</p> <p>3 years Basic Warranty Extension</p> <p>4 years Basic Warranty Extension</p> <p>5 years Basic Warranty Extension</p> <p>1 years ProSupport with Next Business Day on-site service</p> <p>2 years ProSupport with Next Business Day on-site service</p> <p>3 years ProSupport with Next Business Day on-site service</p> <p>4 years ProSupport with Next Business Day on-site service</p> <p>5 years ProSupport with Next Business Day on-site service</p> <p>1 years ProSupport Plus for Client with Next Business Day on-site service</p> <p>2 years ProSupport Plus for Client with Next Business Day on-site service</p> <p>3 years ProSupport Plus for Client with Next Business Day on-site service</p> <p>4 years ProSupport Plus for Client with Next Business Day on-site service</p> <p>5 years ProSupport Plus for Client with Next Business Day on-site service</p>
ACCIDENTAL DAMAGE SERVICES	<p>1 Years Accidental Damage Service</p> <p>2 Years Accidental Damage Service</p> <p>3 Years Accidental Damage Service</p> <p>4 Years Accidental Damage Service</p> <p>5 Years Accidental Damage Service</p>
KEYBOARD¹⁵	Yes
PORTS, SLOTS & CHASSIS	<p>Front ports:</p> <p>USB 3.2 Type-A Gen 1 (5GB) port</p> <p>USB 3.2 Type-A Gen 1 (5GB) port with PowerShare</p> <p>USB 3.2 Type-C Gen 2 (10GB) port</p> <p>USB 3.2 Type-C Gen 2x2 (20GB) port with PowerShare</p> <p>Universal audio port</p> <p>SD-card slot</p> <p>Rear ports:</p> <p>(2) DisplayPort 1.4 ports</p> <p>(2) USB 2.0 (480MB) ports with SmartPower</p> <p>(2) USB 3.2 Gen 2 (10GB) ports</p> <p>(2) USB 3.2 Type-C Gen 2 (10GB) ports</p> <p>RJ45 Ethernet port, 1GbE</p> <p>Audio Line out</p> <p>Optional Port (VGA, HDMI 2.0, DP+ - 1.4, Type-C w/DP-Alt mode)</p>

PRECISION

3660 TOWER

FEATURE TECHNICAL SPECIFICATION

RJ45 Ethernet port, 2.5GbE (optional)

Full-height Gen5 PCIe x16 slot
Full-height Gen3 PCIe x4 slot
Full-height Gen 4 PCIe x4 slot
M.2 2250 slot for WiFi and Bluetooth card
(2) M.2 2230/2280 PCIe Gen4 slots for NVMe SSDs
M.2 2280 PCIe Gen3 slot for NVMe SSD
(5) SATA slots for 2.5/3.5 inch HDD/ODD

OPTICAL DRIVE 8x DVD-ROM 9.5mm Optical Disk Drive
8x DVD+/-RW 9.5mm Optical Disk Drive
Integrated Smart Card Reader with Contact and Contactless Support (CAC/PIV)

ADD-IN CARDS Serial Port Card
Thunderbolt 4 PCIe Card
Zoom Ultra-speed Card
WLAN External Antenna AIC
USB 4.0 Type-C PCIe AIC card
Intel Gigabit Ethernet 2.5GbE NIC PCIe Card

MULTIMEDIA¹⁸ Realtek Audio Controller, ALC3246-CG
Internal speakers (optional)

¹⁸ SEPARATE PURCHASE

CONNECTIVITY OPTIONS Qualcomm® WCN6856-DBS, 2x2MIMO, 3571Mbps,
2.4Ghz/5Ghz/6Ghz, Wi-Fi 6E (Wi-Fi 802.11ax),
Bluetooth 5.2 (Coming post launch)
Intel® AX211, 2x2MIMO, 2400Mbps,
2.4Ghz/5Ghz/6Ghz, Wi-Fi 6E (Wi-Fi 802.11ax),
Bluetooth 5.2

PRIMARY BATTERY N/A

POWER OPTIONS 80 Plus Platinum
80 Plus Platinum
80 Plus Platinum

REGULATORY AND ENVIRONMENTAL COMPLIANCE^{22,26} Product Safety, EMC and Environmental Datasheets
Dell Regulatory Compliance Home Page
Dell and the Environment

CHIPSET Intel® W680

HARDWARE SECURITY Security-cable slot
Padlock loop
Lockable Cable Cover (optional)
Lockable Bezel and Key for Front Accessible SATA
HDD (optional)
Chassis intrusion switch
SafeID including Trusted Platform Module (TPM) 2.0
Smart card keyboard (FIPS)
Microsoft 10 Device Guard and Credential Guard
(Enterprise SKU)
Microsoft Windows BitLocker
Local hard drive data wipe through BIOS (Secure Erase)
Self-encrypting storage drives (Opal, FIPS)
Trusted Platform Module TPM 2.0
China TPM
Intel Secure Boot
Intel Authenticate
BIOS Resilience, BIOS Recovery, and additional BIOS Controls

RECOMMENDED ACCESSORIES ^{23,24,25} SEPARATE PURCHASE
Mouse:
3Dconnexion SpaceMouse Wireless - 3DX-700066
Audio and Speakers:
Dell Slim Soundbar - SB521A
Audio Headsets:
Dell Pro Wireless Headset - WL5022
Display:
Dell UltraSharp 27 Monitor - U2722D
Dell UltraSharp 34 Curved USB-C HUB Monitor - U3421WE
Keyboards:
Dell Pro Wireless Keyboard and Mouse - KM5221W

SYSTEMS MANAGEMENT Dell Client Command Suite for In-Band systems management
Intel® vPro™ for Out-of-Band systems management

FEATURE TECHNICAL SPECIFICATION

CONFIGURATION SERVICES

Factory image load
BIOS customization
Hardware customization
Asset Tagging and Reporting

DIMENSIONS & WEIGHT

US:
Height: 14.52in. (369.00mm)
Width: 6.81in. (173.00mm)
Depth: 16.53in. (420.00mm)
Weight: 18.739lbs (8.5kg)

Rest of the world:
Height: 369.00mm (14.52in.)
Width: 173.00mm (6.81in.)
Depth: 420.00mm (16.53in.)
Weight: 8.5kg (18.739lbs)

Sustainability on Dell Precision workstations

Leading the industry in sustainable practices in our products, packaging and supply chain.

PRECISION LEADS THE WORKSTATION INDUSTRY IN SUSTAINABLE DESIGN AND MATERIALS.



Design

1st

Workstations made with reclaimed carbon fiber and renewable bioplastic¹³.

Sustainable Materials

up to 46%

Recycled plastic in fixed workstations. Up to 17% in mobile workstations.

Packaging Innovation

25%

Ocean-bound plastic trays in Precision 5000 Series packaging.

PRECISION HAS

19

EPEAT registered products¹⁴



16

TCO 8 certified configurations



8.0

ENERGY STAR® throughout the portfolio



35 Available through Custom Factory Installation Only

BOLIN

Dante AV™ Network AV Encoder/Decoder



**Dante AV Transceiver
Joins the Dante Audio Family**

D20 Series Dante AV™ Network AV Transceiver

Bolin's D20 Series device can be programmed as an encoder or a decoder. D20 Series is a single channel networked AV over IP transceiver that is fully compatible with Dante audio devices within a Dante ecosystem for HDMI sources up to 4K60Hz 4096 x 2160, with embedded audio and PTZ camera movement control via IP or IR pass-through. It provides audio and video streaming over a standard gigabit network and D20S/D20H models as decoders output baseband video, either HDMI or 12G SDI, to work in professional AV applications.



Powered by DanteAV module

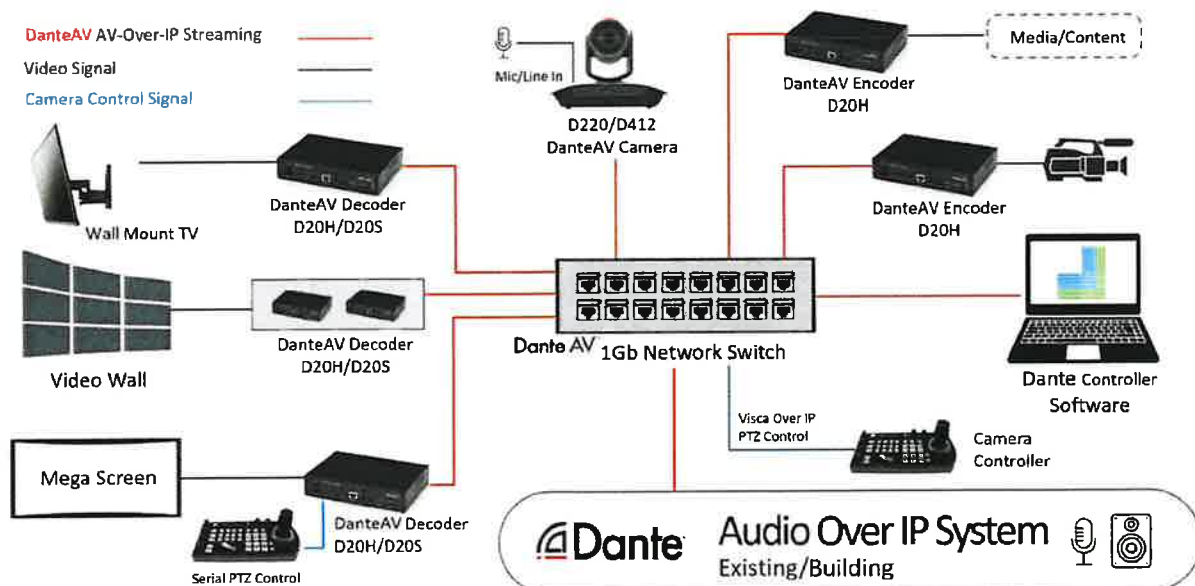
It features advanced high-quality YUV4:4:4, ProAV optimized JPEG2000 lossless video compression technology and HDCP 2.2 compliant achieves ultra-low latency with 100% audio video synchronization when paired using Dante AV encoder and decoder.



- **Ultra-Low Latency**
- **Up to 4K60 High-Quality Image**
- **Lip Sync Issue Free, 100% Synchronized Video and Audio**

Dante Ecosystem Friendly

- Instant compatibility with over 3000 existing Dante-enabled products.
- Unified control of camera audio and video using familiar tools - Dante Controller
- No need to replace network infrastructure. Dante AV works with already installed cost-effective 1Gbps network gear.
- Fully compatible with existing Dante ecosystem applications: House of Worship, Video Conferencing, Live Production, Broadcast, Live Performance, Hospitality, Stadium, Sports Bar, Corporate, Education.



D20H

Encoder - HDMI Input
Decoder - HDMI Output

D20S

Encoder - HDMI Input
Decoder - HDMI & SDI Output



Front Panel

OVERVIEW

- Can be configured to operate as an encoder or a decoder via firmware upgrade
- Ultra-low latency real-time video performance over IP network
- 4K60 4:4:4 video over standard Gigabit Ethernet
- Use as a decoder - provides HDMI 2.0 and/or 12G-SDI output
- Tunable audio delay to facilitate lip-sync control
- Supports unicast and multicast for 8 audio flow and 1 video flow
- Full support of Dante audio and video protocols
- Supported by Dante Controller
- Fully time-aligned and separately routable audio and video streams
- Visually perfect video using network efficient JPEG2000 codec
- Easy control of PTZ camera via Visca Over IP and serial/IR over IP
- Fully validated implementation of HDCP 2.2 (HDCP 2.3 network) encryption
- EDID support
- Works with installed 1Gbps network - no need to replace network infrastructure.
- Compact, surface/rack-mountable design

Bolin D20 Series DanteAV Transceiver

Transports 4K60 4:4:4 video over standard gigabit IP network with ultra-low latency and lossless quality. As part of the Dante family, using standard network switches and CAT5e UTP wiring, D20 Series transceiver delivers a high-performance virtual video matrix routing solution for Dante 4K video application (i.e., demanding conference room

Seamlessly integrate with Dante Ecosystem

KEY FEATURES



Back Panel (D20H)

Lossless image with extremely low codec latency

Bolin's D20 Series Dante AV encoder/decoder incorporates a ProAV optimized implementation of the popular JPEG2000 codec in FPGA, which delivers visually-perfect lossless image up to 4K60/UHD 4:4:4 with < 10ms codec latency.

100% Synchronized video and audio

D20 Dante AV transceiver support sub-microsecond video and audio synchronization by designating a single network clock that always keeps the video in sync with audio regardless of the number of endpoints in the ecosystem, fixing lip-sync problems.

Multi-screen video display routing

As a decoder with unicast/multicast capabilities, the D20 receives the signal from a DanteAV PTZ camera or an encoder and feeds it to a display device via the HDMI and/or 12G-SDI output. Using the Dante Controller software, the decoder can quickly and easily switch between multiple DanteAV endpoints including cameras or encoders on the network, with no need for breakouts or matrix switches to display the video on any number of screens and provide the video for the video router system to use.

HDMI and SDI output

When used as a decoder, the D20 Series transceiver has two models: D20H with HDMI output and D20S with HDMI and SDI outputs. D20S is designed an SDI video processor built-in to convert Dante AV decoded HDMI to SDI (Up to 12G-SDI) signal for ProAV and broadcast video workflow applications.

Encoder/Decoder Configurable

D20H and D20S Dante AV transceiver can be configured as an individual encoder or decoder via a firmware update. For a complete encode/decode solution, you will need separate two devices. Unique firmware to program as an encoder or decoder will be available on www.bolintechnology.com/downloadcenter.

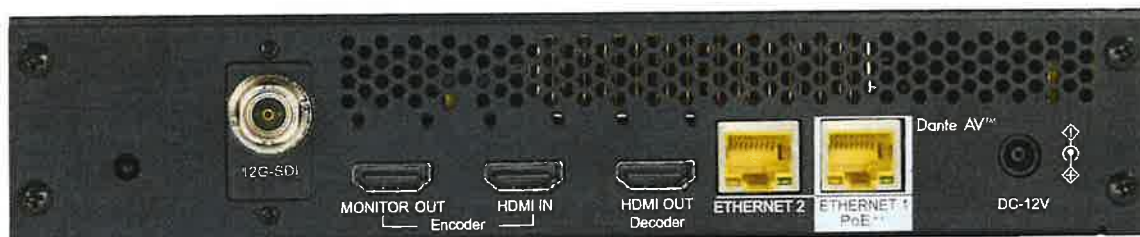
HDMI Output with 4K60 4:4:4 built-in high-quality scaler

The D20 Series has decoded images to output via HDMI 2.0/12G-SDI. Integrated high-performance scaling engine provides downscaling to the encoded source for a wide array of 4K, UHD, HD resolutions to match the different capabilities and requirements of sources, displays, codecs, and other equipment.

Audio transport formats: Dante Audio over IP

Supports standard Dante compatible networked audio streams from encoders and audio interfaces. The received Dante audio streaming can be combined with the video and then output via the HDMI/SDI output.

KEY FEATURES



Back Panel (D20S)

Implementation of HDCP 2.3 encryption

Adheres to the latest HDCP 2.2 specification for High-bandwidth Digital Content Protection. Allows protected content streams to pass between authenticated devices. HDCP 2.3 over network. (HDCP not with SDI workflow)

Device Control

Used as a decoder, D20 Series has built-in serial (RS-422), which can be used for serial port PTZ joystick controller via Dante Serial/IR Over IP control for connected display, PTZ camera or other devices.

Paired with Bolin D412/D220 Dante AV PTZ camera, IP PTZ camera control is available via Dante AV network.

Dante Controller supported

Full setup and control and monitoring of the device is enabled through Dante Controller that delivers standard Dante features such as automatic device discovery and system configuration, making network setup a simple plug and play experience.

Network Connectivity

The D20 Series transceiver includes two RJ-45 1000BASE-T ports that can be used to transport video over a Gigabit Ethernet network. Ports 1 for Dante network primary connection and Port 2 can be used to daisy-chain other endpoints. Port 1 is also capable of receiving power from POE++ IEEE 802.3bt compliant (POE+ IEEE 802.3at backwards compatible).

USB HID and USB OTG

USB control over IP that can be switched and routed alongside the AV signal or separately via a control system allows you to use a USB mouse and/or keyboard to control a remote computer via the Dante network. USB On The Go (OTG) for keyboard and mouse.

Easy Installation

The D20 Series compact enclosure with HDMI secure lock easily mounts onto a flat surface or rack rail (single or dual), Din rail and fits easily behind a wall-mounted or ceiling-mounted flat panel TV display, above a projector, beneath a tabletop, or inside a lectern, AV cart, or equipment cabinet.

SPECIFICATIONS

Model No.		D20H	D20S
Encoder: Video Input		HDMI	HDMI
Decoder: Video Output		HDMI	HDMI and SDI
Encoding/Decoding			
Encoder/Decoder		Device can be configured to operate as an encoder or a decoder via firmware/software upgrade. However, the device is not able to simultaneously operate as both an encoder and decoder.	
Video Codec		Optimized implementation of JPEG2000 codec in FPGA, Licensed by IntoPIX Dante API management interface	
Video Resolutions		Up to 4096x2160@60Hz; RGB 4:4:4 @ 8 bit YCbCr 4:4:4 @ 8 bit YCbCr 4:2:2 @ 8/10/12 bit	
Color Depth		8-bit, 10-bit, 12-bit	
Audio Formats		Dante Audio over IP	
Bit Rates		200 to 800 Mbps	
Video Streaming		Unicast or Multicast	
Copy Protection		HDCP 2.2 input/output, HDCP 2.3 over network	
Control Protocol		Visca serial control over IP, Visca-Over-IP	
Latency		0.5 frame (e.g. 2160p @ 60 Hz latency is < 8 ms between encoder and decoder), Note: Overall latency may increase depending on network configurations	
Bandwidth		4kp60 10 bit 4:2:2; 500-600Mbps, results may vary depending on network configuration and management settings. 1080p60 10 bit 4:2:2; 150-250Mbps, results may vary depending on network configuration and management settings.	
Dante Ecosystem Friendly		Instant Dante Ecosystem compatibility with existing Dante-enabled products; Unified control of audio and video using Dante tools - Dante Controller	
Video			
Video		Built-in HDCP encryption/decryption for video 800Mbps recommended maximum bit rate Video transport formats: Dante Video over IP HDR support HDMI monitor output loop through	
HDMI IN (when using the device as an encoder)	HDMI 2.0		
	Supported Resolutions	4096x2160p, 3840x2160p, 1920x1080p, 1920x1200, 1600x1200, 1280x720p, 1280x1024, 1024x768, 800x600, 720x576p, 720x480p, 640x480	
	Frame Rates (Hz)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60	
	Colour Space	RGB, YCbCr	
	Component Bit Width	8-bit, 10-bit, 12-bit	
	Colour Sub-Sampling	4:4:4, 4:2:2, 4:2:0	
MONITOR OUT (when using the device as an encoder)	HDMI 2.0		
	Supported Resolutions	4096x2160p, 3840x2160p, 1920x1080p, 1920x1200, 1600x1200, 1280x720p, 1280x1024, 1024x768, 800x600, 720x576p, 720x480p, 640x480	
	Frame Rates (Hz)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60	
	Colour Space	RGB, YCbCr	
	Component Bit Width	8-bit, 10-bit, 12-bit	
	Colour Sub-Sampling	4:4:4, 4:2:2, 4:2:0	
	Embedded Audio over HDMI	No	
HDMI OUT (when using the device as a decoder)	Format	HDMI 2.0	HDMI 2.0
	Supported Resolutions	4096x2160p, 3840x2160p, 1920x1080p, 1920x1200, 1600x1200, 1280x720p, 1280x1024, 1024x768, 800x600, 720x576p, 720x480p, 640x480	4096x2160p, 3840x2160p, 1920x1080p, 1920x1200, 1600x1200, 1280x720p, 1280x1024, 1024x768, 800x600, 720x576p, 720x480p, 640x480
	Frame Rates (Hz)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60	23.98, 24, 25, 29.97, 30, 50, 59.94, 60
	Colour Space	RGB, YCbCr	RGB, YCbCr
	Component Bit Width	8-bit, 10-bit, 12-bit	8-bit, 10-bit, 12-bit
	Colour Sub-Sampling	4:4:4, 4:2:2, 4:2:0	4:4:4, 4:2:2, 4:2:0
SDI OUT (when using the device as a decoder)	Format	-	12G-SDI
	HDCP Protection		Does not have output when the source video is HDCP content protected
	Supported Resolutions	-	4096x2160p, 3840x2160p, 1920x1080p, 1920x1200, 1600x1200, 1280x720p, 1280x1024, 1024x768, 800x600, 720x576p, 720x480p, 640x480
	Frame Rates (Hz)	-	23.98,24, 25, 29.97,30, 50,59.97, 60
	Colour Space	-	YCbCr
	Component Bit Width	-	8-bit, 10-bit, 12-bit
	Colour Sub-Sampling	-	4:2:2, 4:2:0
	Standard	-	SMPTE 292(1.5Gb/s), SMPTE 424, SMPTE 425-A(3Gb/s), SMPTE 2081, SMPTE 2082 With SMPTE352 SDI Metadata Supported

All models and specifications are subject to change without notice.

ACCESSORIES



BL-PP97
97W High Power POE Injector



VCC-P12-4
12VDC 4A Power Adapter



VCC-CC45RS
RJ45 To RS232/RS422/485 Adapter



B-RM11
Dual Rack Mount Kit



B-RM10
Single Rack Mount Kit



B-BM10
Base Mount Kit



B-DR10
Din Rail Mount Kit



B-SM10
Surface Mount Kit

ORDER INFORMATION

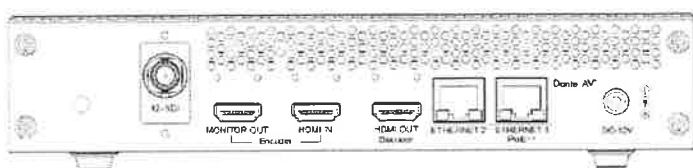
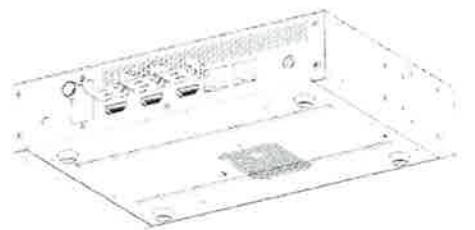
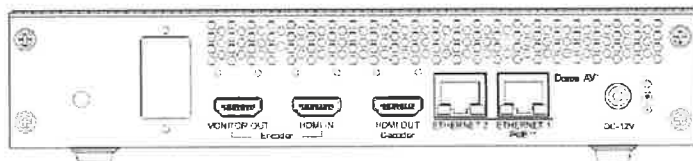
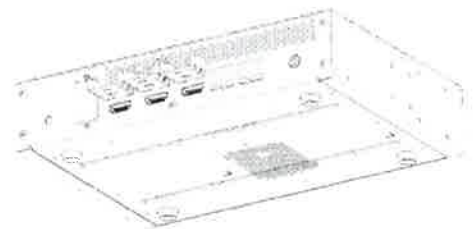
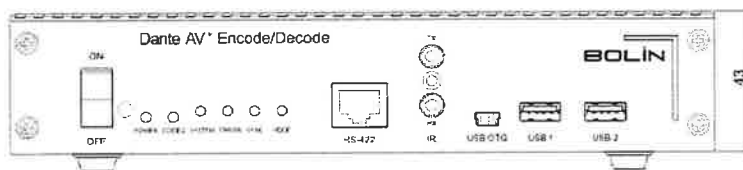
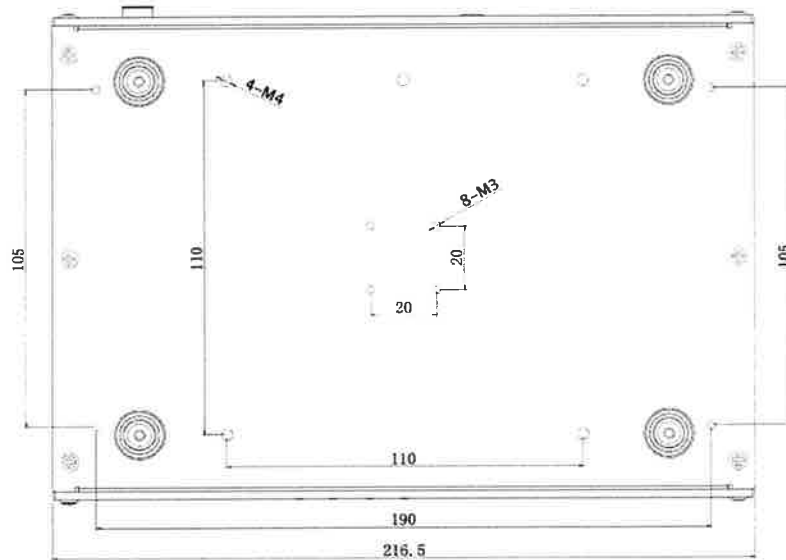
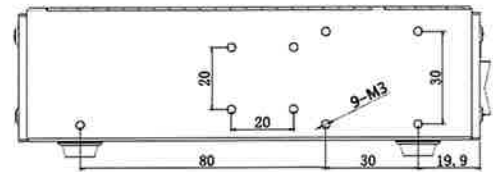
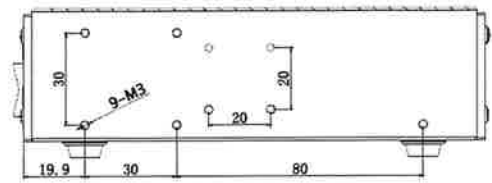
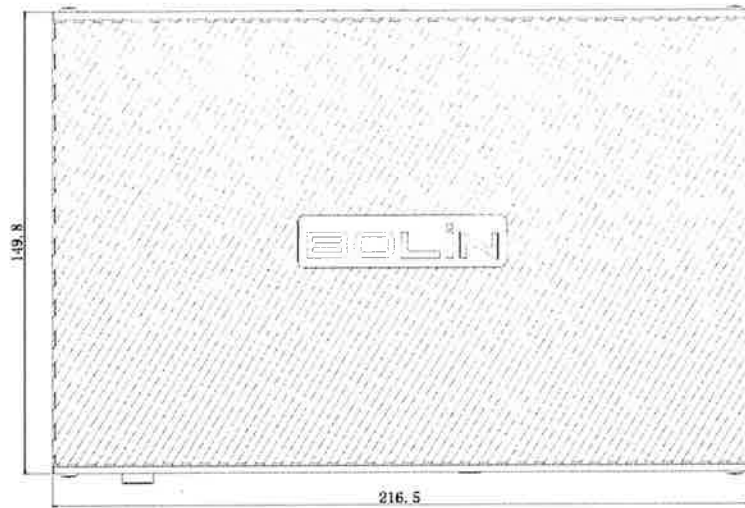
• D10H (HDMI)	Decoder	Included: • B-BM10 (Base Mount)	• B-SM10 (Surface Mount)
• D20H (HDMI)	Transceiver	Included: • B-BM10 (Base Mount)	• B-SM10 (Surface Mount)
• D20S (HDMI, SDI)	Transceiver	Included: • B-BM10 (Base Mount)	• B-SM10 (Surface Mount)

Optional

- B-RM11 (Double Rack Mount)
- B-RM10 (Single Rack Mount)
- B-DR10 (Din Rail Mount)
- BL-PP97 97W High Power POE Injector

DIMENSION

Unit: mm



Disclaimer
The information contained in this document is subject to change without notice.
Bolin assumes no responsibility for any damages arising from the use of this document, including but not limited to, lost revenue, lost data, claims by third parties, or other damages.

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The Clockaudio Dante Transporter is an advanced professional Dante communication product which combines audio and control transmission across a standard IP network. Based on high performance and pre-configurable hardware platform it guarantees perfect sound quality. The CDT 100 Mk3 has a variety of uses including but not limited to boardrooms, video and conference rooms, or any place else where multiple microphones and control devices are connected back to the AV equipment cabinet.

Features and Benefits:



- Easy to install with under table mounting
- Dante Audio and control signals transported over standard IP network
- 4 audio inputs, with gain control, high pass filters and Phantom Power.
- 2 line-level outputs with high pass filters
- Up to 6 units may be daisy chained
- 4 Touch Switch ports compatible with all logic enabled Clockaudio devices.
- Open API for interfacing with Control Systems
- Compatible with any Dante capable audio DSP

AUDIO SPECIFICATIONS	
Input Type	Balanced and RF filtered
Gain	Variable (7-40dB) with fixed gain setting
Input Impedance	2.5 K Ω
Phantom Power	48V (software selectable)
Terminal Block Replacement PN	Molex 39500-0006
EIN	-122dBu
System THD+N	<0.005% at any gain, Input signal 3dB below maximum
Frequency Response	20Hz - 20kHz, +/- 1dB @ 40dB gain
GENERAL SPECIFICATIONS	
TS Control Device Input	RJ45, Interfaces with Clockaudio TS-C1 and Clockaudio Touch Switches
ARM-C Interface	RJ12
Power Consumption	4 Watts nominal
Max Product Dimensions	8.05" x 4.79" x 2"
Mounting Slot Mounting Dimension	7.5" (center to center)
Recommended Mounting Screw	#6
Unit Weight	1.75 lbs
Packaged Weight	2 lbs
Compliance	FCC CFR 47 Parts 15B ICES-003 CE (EN55032, EN55035) RoHS, WEEE
DANTE NETWORK	
Physical Level	Standard Ethernet
Connector	RJ45
Cable Requirements	CAT5e, CAT6 (shielded recommended)
Transmission Speed	1 Gbps

BOLIN

DanteAV™ PTZ Camera



**At Last
DanteAV PTZ Camera
Joins the Dante Audio Family**

DanteAV™ PTZ Camera

Bolin D Series PTZ camera is the world's first DanteAV hardware enabled pan, tilt, zoom camera interfacing video and audio in a standard 1 Gbps network, and providing uncompromised video quality with lowest latency and synchronization.

Designed to seamlessly integrate into an existing Dante audio ecosystem, the D412/D220 PTZ is managed using the Dante Controller Software with flexibility to independently route audio and video with sub-microsecond accuracy to minimize time alignment issues.



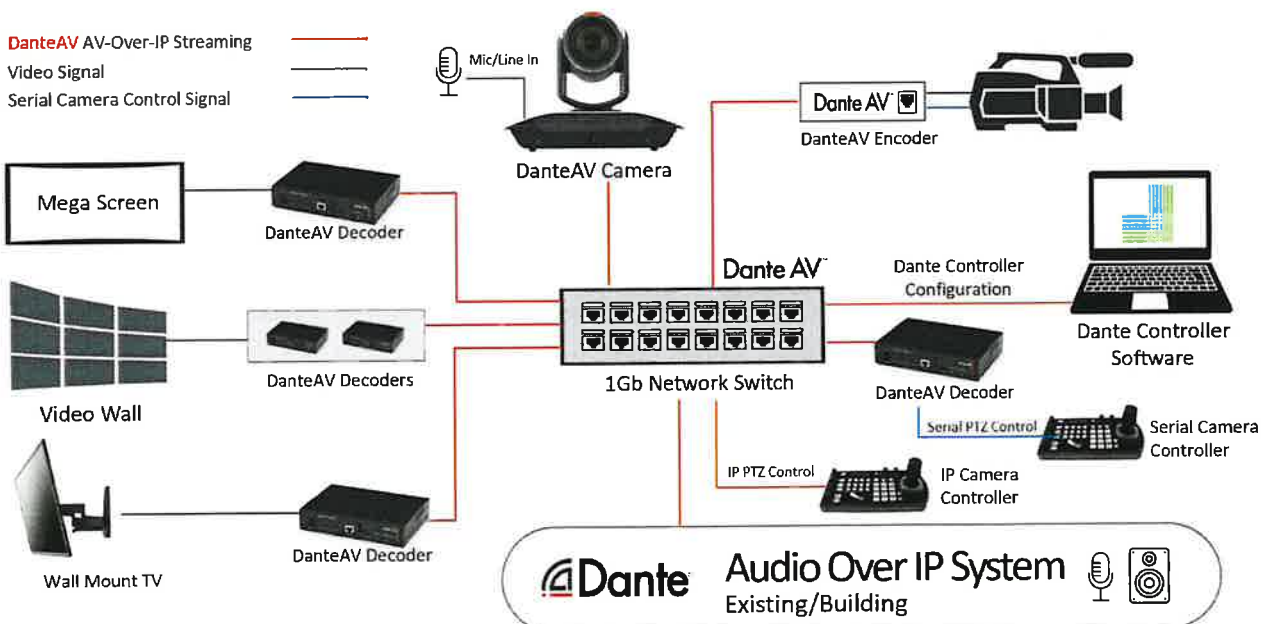
Powered by DanteAV module



- Ultra Low Latency
- Up to 4K60 High Quality Image
- Lip Sync Issue Free, 100% Synchronized Video and Audio

Dante Ecosystem Friendly

- Instant compatibility with over 2000 existing Dante-enabled products.
- Unified control of camera audio and video using familiar tools - Dante Controller
- No need to replace network infrastructure. Dante AV works with already installed, cost-effective 1Gbps network gear.
- Use for Dante ecosystem applications: House of Worship, Video Conferencing, Live Production, Broadcast, Live Performance, Hospitality, Stadium, Sports Bar, Corporate, Education.



D412

4K60 PTZ Camera 12X

D220

FHD PTZ Camera 20X



OVERVIEW

High Quality Imaging - 4K60 and Full HD

Bolin's D Series PTZ cameras are equipped with Sony sensor to provide brilliant, high-quality images in 4K60 or 1080p60 resolutions with 12x and 20x optical zoom.

Seamlessly integrate with Dante Ecosystem

Dante AV cameras integrate seamlessly into the Dante audio over IP ecosystem using a standard 1 Gbps network. Video integration into Dante ecosystem just got simpler.

Multi-screen video display routing

Individually route video using familiar Dante Controller software, with no need for break-outs or matrix switches to display the camera video on any number of Dante AV-enabled screens.

Lossless image with extremely low codec latency

Bolin's D Series PTZ camera incorporates a ProAV optimized implementation of the popular JPEG2000 codec in FPGA, which delivers visually perfect lossless image at 4K60 with < 10ms codec latency.

100% Synchronized video and audio

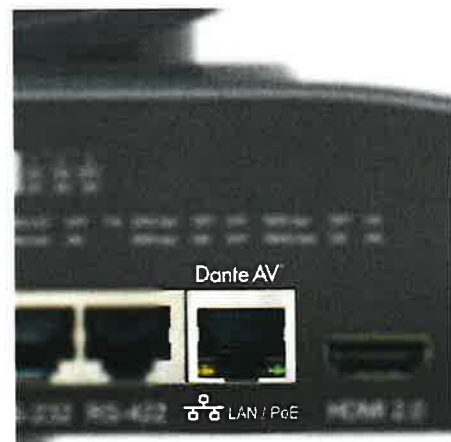
Bolin's D412 and D220 PTZ cameras support sub-microsecond video and audio synchronization by designating a single network clock that always keeps the camera video in sync with audio regardless of the number of endpoints in the ecosystem, fixing lip-sync problems.

Video Resolution

Two models are available:

D412 PTZ supports up to 4K60 3860x2160p, 60/59.94 image resolutions.

D220 PTZ supports up to Full HD 1920x1080p, 60/59.94 image resolutions.



KEY FEATURES



Lens

D412, 12X optical zoom with wide angle view 72 ° and D220, 20X long range optical zoom.

Video Output

Deliver IP streaming video to Dante network and local HDMI 2.0 video output to conventional workflow in 4K60 or FHD.

Multicast Mode

Point to Multipoint and Point to Point Distribution – supports both unicast and multicast video distribution.

Video Settings

Image parameter adjustments includes exposure, focus, iris, shutter speed, white balance, gamma, wide dynamic range, image stabilizer, flip/mirror and more with configurable video settings.

Audio

HDMI embedded high-quality audio and DanteAV video streaming embedded audio with support for Mic-in and Line-in audio input. The audio that is input from the camera can be routed within Dante audio over IP system.

PTZ Movement

Extremely quiet and smooth operation for Pan/Tilt movements combined with enhanced adaptive, variable, and super slow speed control provides accurate and effective operation experiences. Picture Profile Preset- Image parameter setting restore with presets and quick access operation.

Remote Control and Setup PTZ Camera

D412 and D220 PTZ cameras support serial RS232/422, Dante AV Serial over IP control, and Visca over IP control via Dante AV decoder. Remotely control pan, tilt, zoom movements with full access to camera's image parameter settings via keyboard controller or IR controller.

Additional Daul IP Streaming and Viewing Capability

In addition to Dante AV streaming, both D220 camera provides extra IP RTSP video streaming for remote viewing and controlling via browsers. It supports RTMP for live streaming as well.

Ease of Installation and Use

Simply connect one network cable from camera to any 1GB Ethernet network/POE++ device to access to existing Dante Audio-Over-IP system.

Always Up to Date

Free firmware updates, upgrade via USB and IP interface to keep DanteAV camera

SPECIFICATIONS

Model No.	D412	D220
Product Name	Dante AV PTZ Camera	Dante AV PTZ Camera
Camera	4K60	FHD
Image Sensor	Sony IMX415, 1/2.8 Inch Exmor R CMOS	Sony IMX307, 1/2.8" CMOS
Number of effective pixels	3840 x 2160, 8.29 Megapixels	1920X1080, 2.08 Megapixels
Zoom	Optical Zoom 12X, Digital Zoom 12X	Optical Zoom 20X, Digital Zoom 16X
Focal Length	3.86~42.95mm	5.2~98mm, F1.5 ~ F3.0
Aperture	F1.8(W)~F3.68(T)	F1.5(W)~F3.0(T)
Horizontal Angle of View	72.06°(W)~6.86°(T)	55.8°(W)~3.2°(T)
Vertical Angle of View	44.51°(W)~3.86°(T)	-
Min. Object distance	80mm (Wide), 1000mm (Tele)	1000mm(Wide), 1500mm(Tele)
Min. Illumination	Color: 0.005 lux at Auto Exposure Mode	0.5Lux (Day), 0.1Lux (Night)
Shutter Speed	1/1s~1/10000s	1/1s~1/10000s
Focus	Auto, Manual, One Push	Auto, Manual, One Push
White Balance	AUTO, OPW, Indoor, Outdoor, ATW, USER, Manual(Color Temp Sodium Vapor Lamp)	
Exposure	Full Auto, Manual, Indoor(50/60HZ), Gain Priority, Shutter Priority, Iris Priority, Bright, Low Motion Blur	Brightness, Color(Saturation), Contrast, Sharpness, Hue
Image Adjustment	Brightness, Color(Saturation), Contrast, Sharpness, Hue	Brightness, Color(Saturation), Contrast, Sharpness, Hue
Back Light Compensation	On/Off	On/Off
Flip	On/Off	On/Off
WDR	On/Off/Auto, Level 1-9, 120dB	On/Off, Level 1-6
Mirror	Horizontal	Horizontal
Image Stabilizer	EIS/Off	-
Effect	OFF, B&W	OFF, B&W
Gamma	Yes, 0,1	Yes, 5 Steps(0-4)
Noise Reduction	2D/3D, 0-15	2D/3D
S/N Ratio	≥50dB	≥
OSD	Editable	Editable



ACCESSORIES



VCC-RC-2
IR Remote Controller



VCC-P12-4
12VDC 4A Power Adapter



VCC-CC45RS
RJ45 To RS232/RS422/485 Adapter



VCC-CC45232
RJ45 To RS232 Adapter



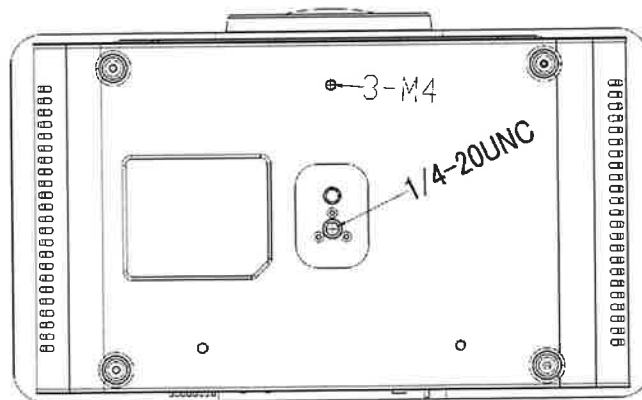
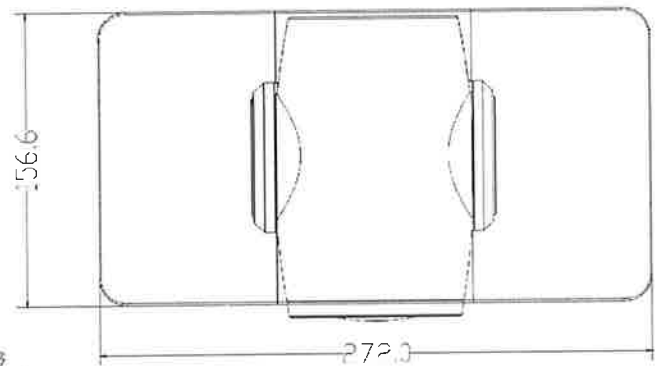
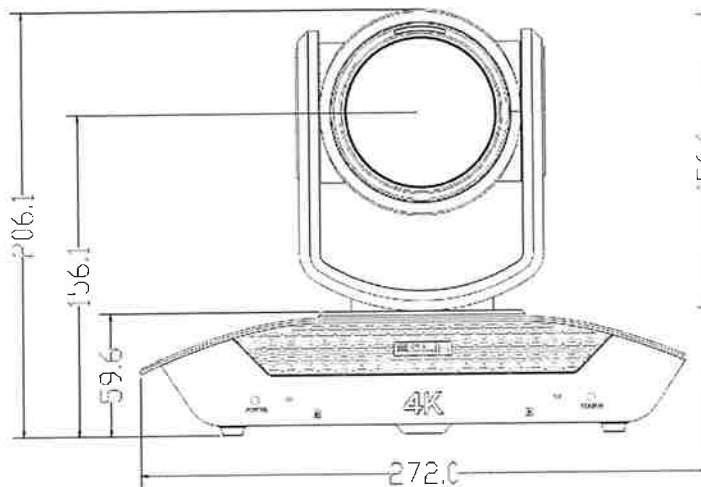
BL-WM-01
Wall Mount Bracket-Optional



BL-CM-01
Ceiling Mount Bracket-Optional

DIMENSIONS

Unit: mm



All models and specifications are subject to change without notice.
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Overview

Flexible wireless microphones system customized to your use case.



Features

- Wireless system using 1.9 GHz, composed of access point, microphone, and charging station
- The access point supports 8 channels
- Available microphone formfactors: 6" (15 cm) gooseneck, 12" (30 cm) gooseneck, omnidirectional boundary, and cardioid directional boundary
- Approximately 20 hours of continuous microphone operation time using the included Li-ion battery
- Standard network audio support for "Dante"
- Utilizes one PoE+ network cable connection avoiding wiring problems and enabling audio control via Dante
- The Web UI Setup Wizard allows for effortless configuration, microphone pairing, audio routing, and other system management

Specifications

1/5

General Specifications

RM-WDR

Description		Wireless Microphone
Colour		Black
Dimensions (W x D x H)		W 89.0 mm x D 89.0 mm x H 26.0 mm (including rubber feet)
Weight		130 g (including battery)
Directivity		Unidirectional
Frequency Response		160 Hz - 16 kHz
Sensitivity		-15,4 dBFS/Pa
Power		Rechargeable Li-ion Battery 3.6 V 2350 mA/h. For Charge I/F: USB Type C, RM-WCH-8 Charger I/F (4pin)
Maximum Power Consumption		5.0 V 0.7 A
Battery	Talk Time	Approximately 20 hours
	Standby Time	7 days
	Charge Time	Full charging: 5 hours (80% charging: 3 hours)
In Operation	Temperature	0°C - 40°C
	Humidity	20% - 85% (no condensation)
In Charging	Temperature	5°C - 40°C
	Humidity	20% - 85% (no condensation)
Storage	Temperature	-20°C - 60°C
	Humidity	10% - 90% (no condensation)
Indicators		Mic (3 colours) x 1, Battery (3 colours) x 1
Buttons		Mic x 1, Battery x 1, Pair x 1
I/O		USB Type C (for battery charging) x 1, Charger I/F (4pin) x 1
Accessories		Battery (RM-WBT) x 1, Owner's Manual x 1
Options		Replacement Battery RM-WBT

RM-WOM

Description		Wireless Microphone
Colour		Black
Dimensions (W x D x H)		W 89.0 mm x D 89.0 mm x H 26.0 mm (including rubber feet)
Weight		126 g (including battery)
Directivity		Omnidirectional
Frequency Response		160 Hz - 16 kHz
Sensitivity		-14 dBFS/Pa
Power		Rechargeable Li-ion Battery 3.6 V 2350 mA/h. For Charge I/F: USB Type C, RM-WCH Charger I/F (4pin)
Maximum Power Consumption		5.0 V 0.7 A
Battery	Talk Time	Approximately 20 hours
	Standby Time	7 days
	Charge Time	Full charging: 5 hours (80% charging: 3 hours)
In Operation	Temperature	0°C - 40°C
	Humidity	20% - 85% (no condensation)
In Charging	Temperature	5°C - 40°C
	Humidity	20% - 85% (no condensation)
Storage	Temperature	-20°C - 60°C
	Humidity	10% - 90% (no condensation)
Indicators		Mic (3 colours) x 1, Battery (3 colours) x 1
Buttons		Mic x 4, Battery x 1, Pair x 1
I/O		USB TypeC (for battery charging) x 1, Charger I/F (4pin) x 1
Accessories		Battery (RM-WBT) x 1, Owner's Manual x 1
Options		Replacement Battery RM-WBT

Specifications

2/5

RM-WGL		
Description		Wireless Microphone
Colour		Black
Dimensions (W x D x H)		W 89.0 mm x D 89.0 mm x 308.4 mm (including rubber feet and to center of gooseneck mic)
Weight		152 g (including battery)
Directivity		Unidirectional
Frequency Response		160 Hz - 16 kHz
Sensitivity		-20.0 dBFS/Pa
Power		Rechargeable Li-ion Battery 3.6 V 2350 mA/h. For Charge I/F: USB Type C, RM-WCH Charger I/F (4pin)
Maximum Power Consumption		5.0 V 0.7 A
Battery	Talk Time	Approximately 20 hours
	Standby Time	7 days
	Charge Time	Full charging: 5 hours (80% charging: 3 hours)
In Operation	Temperature	0°C - 40°C
	Humidity	20% - 85% (no condensation)
In Charging	Temperature	5°C - 40°C
	Humidity	20% - 85% (no condensation)
Storage	Temperature	-20°C - 60°C
	Humidity	10% - 90% (no condensation)
Indicators		Mic (3 colours) x 1, Ring (3 colours) x 1, Battery (3 colours) x 1
Buttons		Mic x 1, Battery x 1, Pair x 1
I/O		USB Type C (for battery charging) x 1, Charger I/F (4pin) x 1
Accessories		Battery (RM-WBT) x 1, Owner's Manual x 1
Options		Replacement Battery RM-WBT
RM-WGS		
Description		Wireless Microphone
Colour		Black
Dimensions (W x D x H)		W 89.0 mm x D 89.0 mm x H 171.2 mm (including rubber feet and to center of gooseneck mic)
Weight		140 g (including battery)
Directivity		Unidirectional
Frequency Response		160 Hz - 16 kHz
Sensitivity		-20.0 dBFS/Pa
Power		Rechargeable Li-ion Battery 3.6 V 2350 mA/h. For Charge I/F: USB Type C, RM-WCH Charger I/F (4pin)
Maximum Power Consumption		5.0 V 0.7 A
Battery	Talk Time	Approximately 20 hours
	Standby Time	7 days
	Charge Time	Full charging: 5 hours (80% charging: 3 hours)
In Operation	Temperature	0°C - 40°C
	Humidity	20% - 85% (no condensation)
In Charging	Temperature	5°C - 40°C
	Humidity	20% - 85% (no condensation)
Storage	Temperature	-20°C - 60°C
	Humidity	10% - 90% (no condensation)
Indicators		Mic (3 colours) x 1, Ring (3 colours) x 1, Battery (3 colours) x 1
Buttons		Mic x 1, Battery x 1, Pair x 1
I/O		USB Type C (for battery charging) x 1, Charger I/F (4pin) x 1
Accessories		Battery (RM-WBT) x 1, Owner's Manual x 1
Options		Replacement Battery RM-WBT

Specifications

3/5

RM-WAP-8

Description		Microphone Accesspoint
Colour		White (paintable surface)
Dimensions (W x D x H)		W 171.2 mm x D 172.5 mm x H 42.8 mm
Weight		650 g (including mounting bracket)
Power Requirement		IEEE 802.3af (PoE Class 3)
Maximum Power Consumption		48 V 0.2 A
In Operation	Temperature	0°C - 40°C
	Humidity	20% - 85% (no condensation)
Storage	Temperature	-20°C - 60°C
	Humidity	10% - 90% (no condensation)
Indicators		Power (3 colours) x 1, Status (3 colours) x 1
Buttons		Reset x 1
Connector		RJ-45 (Dante Audio, Dante Control, Remote Control, PoE)
Audio I/O		Dante (1 in / 8 out)
Mount		Wall mount, Ceiling mount (with bracket), Flat placing
Maximum Device Number with RM-CR		2units (Connection with other than RM-CR is not limited to this device)
Accessories		Owner's Manual x 1, Mounting bracket x 1 *Screw for Mounting Bracket or Safety Wire are not included

RM-WCH-8

Description		Microphone Charger
Colour		Black
Dimensions (W x D x H)		W 304 mm x D 188 mm x H 41.5 mm (including rubber feet)
Weight		800 g
Material		Plastic
Power		DC IN (16 V, 2.4 A)
Maximum Power Consumption		16.0 V 2.0 A
In Operation	Temperature	0°C - 40°C
	Humidity	20% - 85% (no condensation)
In Charging	Temperature	5°C - 40°C
	Humidity	20% - 85% (no condensation)
Storage	Temperature	-20°C - 60°C
	Humidity	10% - 90% (no condensation)
Indicators		Activate (3 colours) x 1
Buttons		Activate x 1, Pair x 1
I/O		DC IN x 1
Accessories		Owner's Manual x 1, AC adapter x 1, Cable x 1 (for Japan and USA), x 3 (for Europe)

Specifications

4/5**RM-WBT**

Description		Replacement Battery
Colour		Black
Dimensions (W x D x H)		H 11.15 mm x W 34.95 mm x D 52.5 mm
Weight		42 g
Voltage		3.6 V
Nominal Capacity		2350 mA/h
Maximum Charge Current		1.59 A
Maximum Charge Voltage		4.20 V
Maximum Discharge Current		2.30 A
In Operation	Temperature	0°C - 40°C
	Humidity	20% - 85% (no condensation)
Storage	Temperature	-20°C - 60°C
	Humidity	10% - 90% (no condensation)
Accessories		RM-WBT Safety Brochure x 1

Specifications

5/5

Network Specifications

RM-WAP-8

Ethernet	Dante, Remote Control, Web UI, PoE
Cable Requirements	CAT5e or higher (STP)

Audio Specifications

Frequency Response		160 Hz - 16 kHz
Sampling Rate		48 kHz
Bit Depth		24 bit
Latency	RM-WDR/RM-WOM	110 ms nominal (with signal processing in High Quality mode)
	RM-WGL/RM-WGS	30 ms - 35 ms nominal (without signal processing in High Quality mode)
		110 ms nominal (with signal processing in High Quality mode)
Audio I/O	Dante	1 in x 8/16 out
Maximum Input Level of SPL (0 dBFS)	RM-WDR	100.2 dB SPL
	RM-WOM	99.4 dB SPL
	RM-WGL	106.2 dB SPL
	RM-WGS	106.2 dB SPL
Self Noise	RM-WDR	-24.7 dBA SPL
	RM-WOM	-23.0 dBA SPL
	RM-WGL	-19.3 dBA SPL
	RM-WGS	-19.3 dBA SPL
SNR (Ref. 94 dB SPL at 1 kHz)	RM-WDR	118.7 dBA
	RM-WOM	117.0 dBA
	RM-WGL	113.3 dBA
	RM-WGS	113.3 dBA
Sensitivity	RM-WDR	-6.2 dBFS/Pa
	RM-WOM	-5.4 dBFS/Pa
	RM-WGL	-12.2 dBFS/Pa
	RM-WGS	-12.2 dBFS/Pa
Dynamic Range	RM-WDR	124.9 dBA
	RM-WOM	122.4 dBA
	RM-WGL	125.5 dBA
	RM-WGS	125.5 dBA
Signal Processing		AEC, Noise Reduction, De-reverberation, AGC, PEQ, Output Gain Adjustment

Wireless Specifications

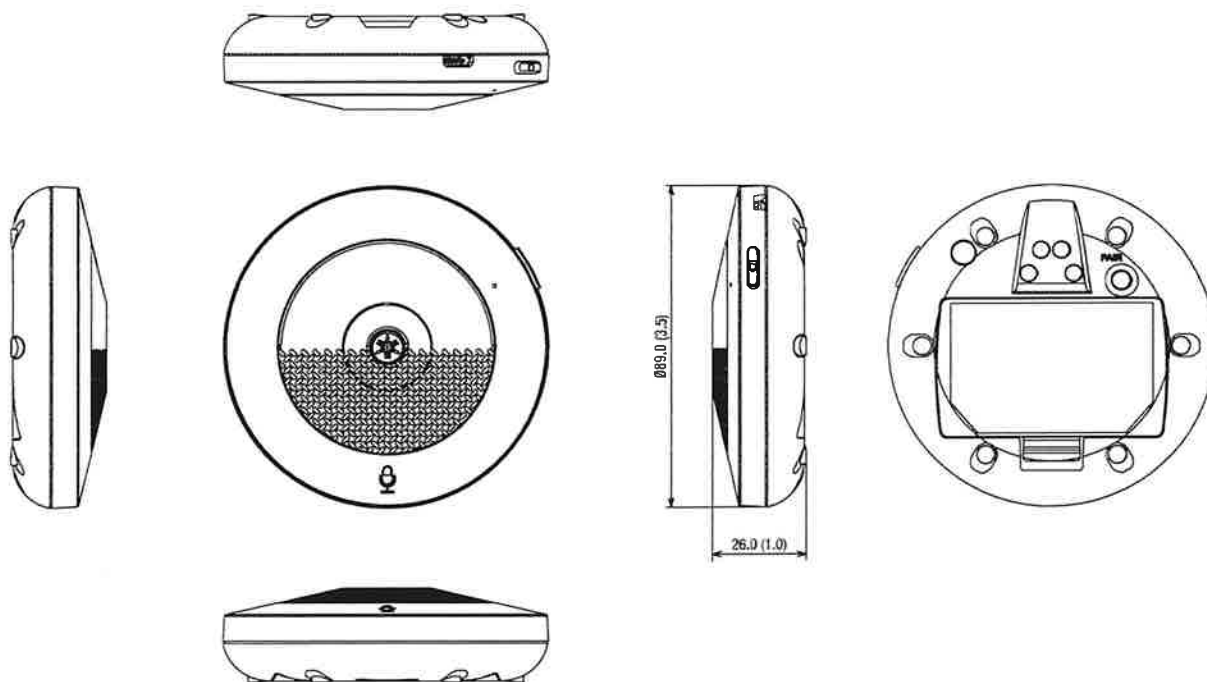
Radio Method	1.9 GHz DECT standard
Radio Frequency Range	USA, Canada: 1920.0 MHz - 1930.0 MHz
	Japan: 1893.5 MHz - 1906.1 MHz
	EU, Australia, New Zealand, Norway, UK: 1880.0 MHz - 1900.0 MHz
Maximum RF Power Level (EIRP)	USA, Canada: 20.1 dBm
	Japan: 27.0 dBm
	EU, Australia, New Zealand, Norway, Sweden, Finland, Denmark, UK: 25.9 dBm
Maximum Coverage Distance	50 m (depends on the usage environment)
Encryption	AES (256-bit)

Dimensions

1/6

Unit: mm (inch)

RM-WDR

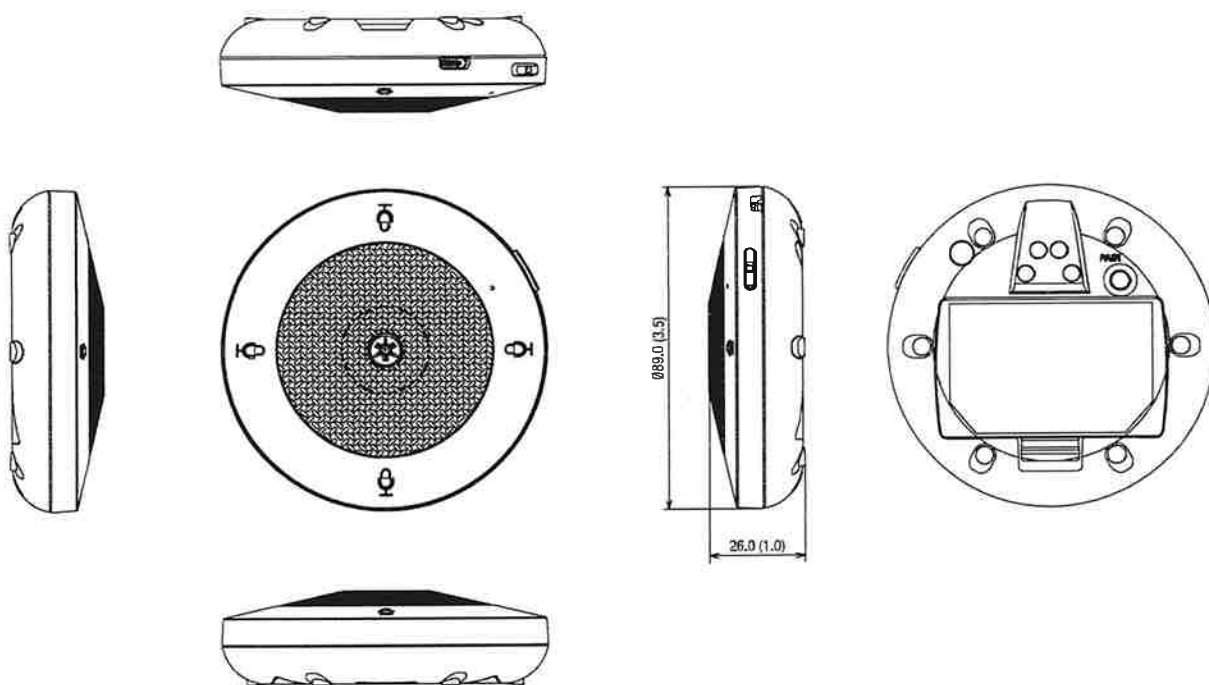


Dimensions

2/6

Unit: mm (inch)

RM-WOM

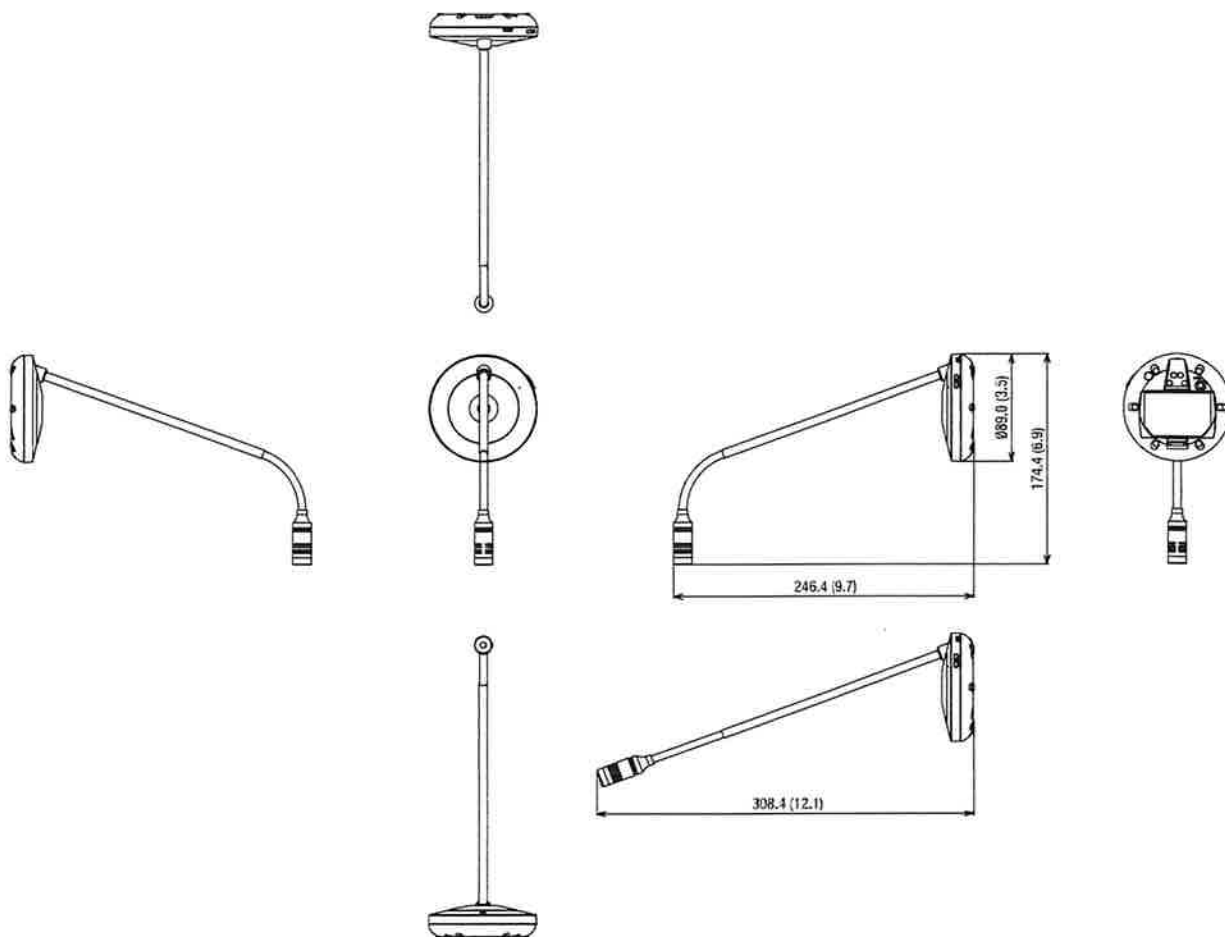


Dimensions

3/6

Unit: mm (inch)

RM-WGL

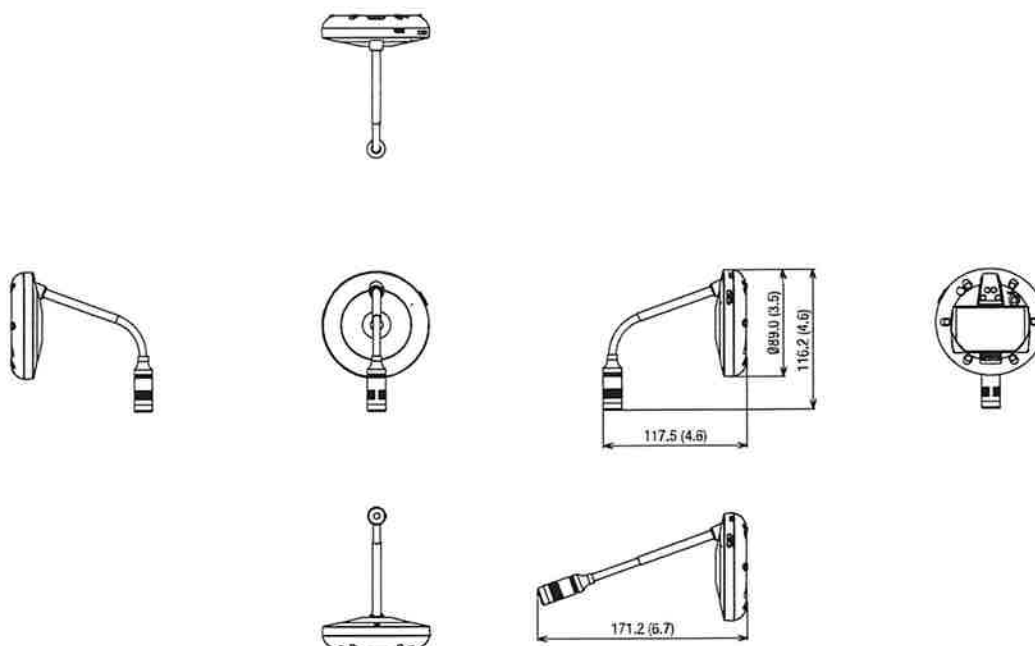


Dimensions

4/6

Unit: mm (inch)

RM-WGS



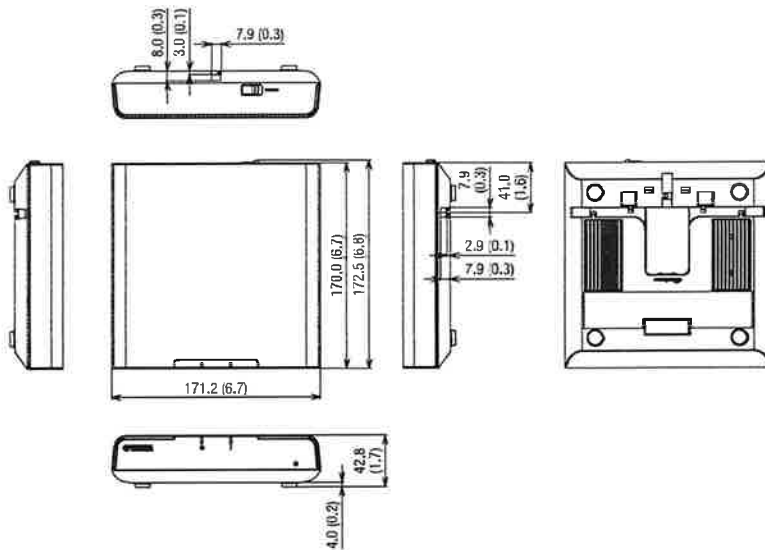
Dimensions

5/6

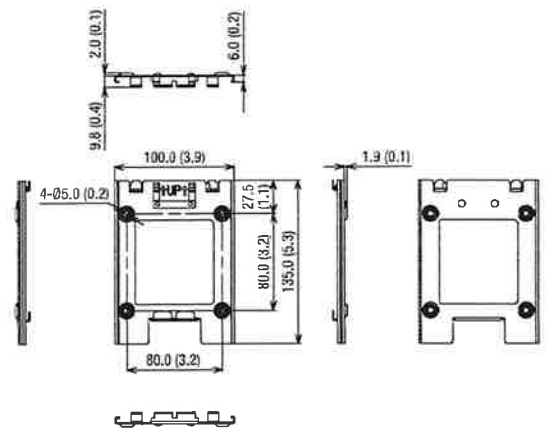
Unit: mm (inch)

RM-WAP-8

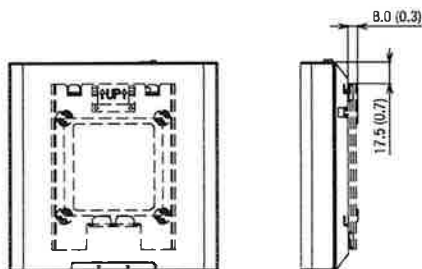
Body



Bracket



Body + Bracket

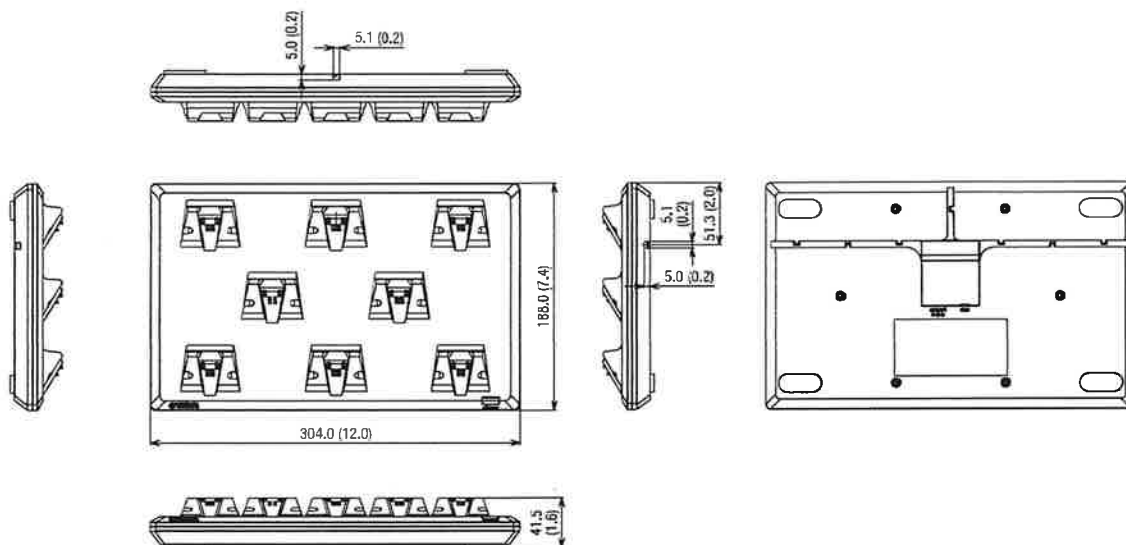


Dimensions

6/6

Unit: mm (inch)

RM-WCH-8

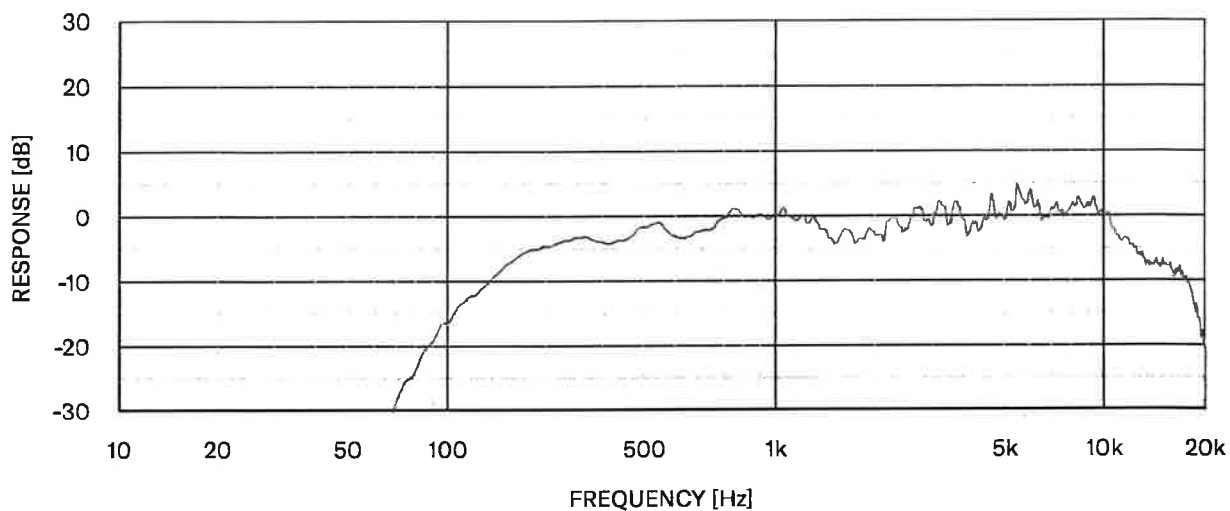


Frequency Response

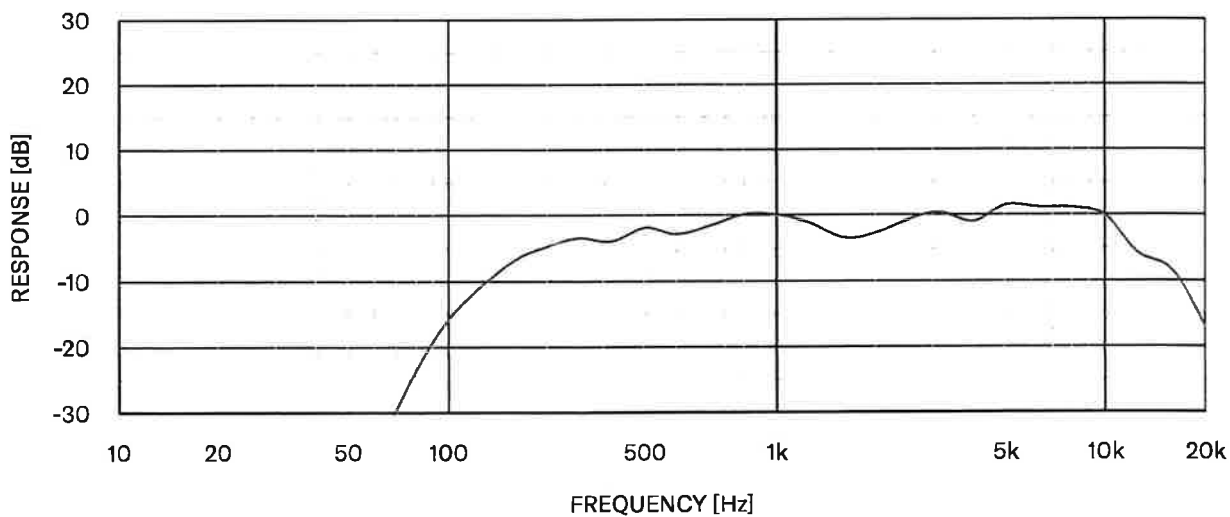
1/4

RM-WDR

LINEAR



1/3 octave band

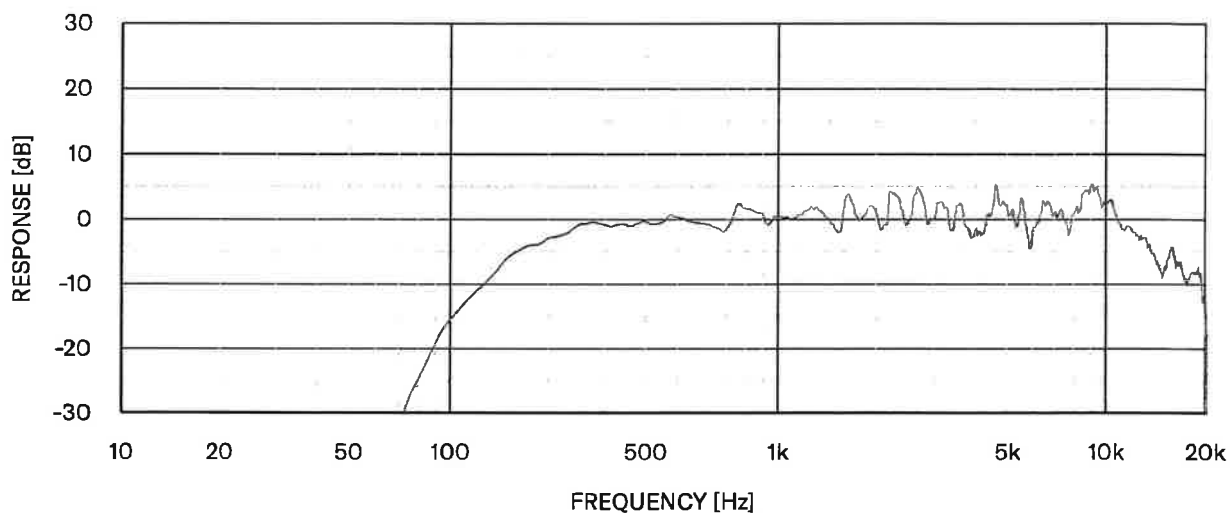


Frequency Response

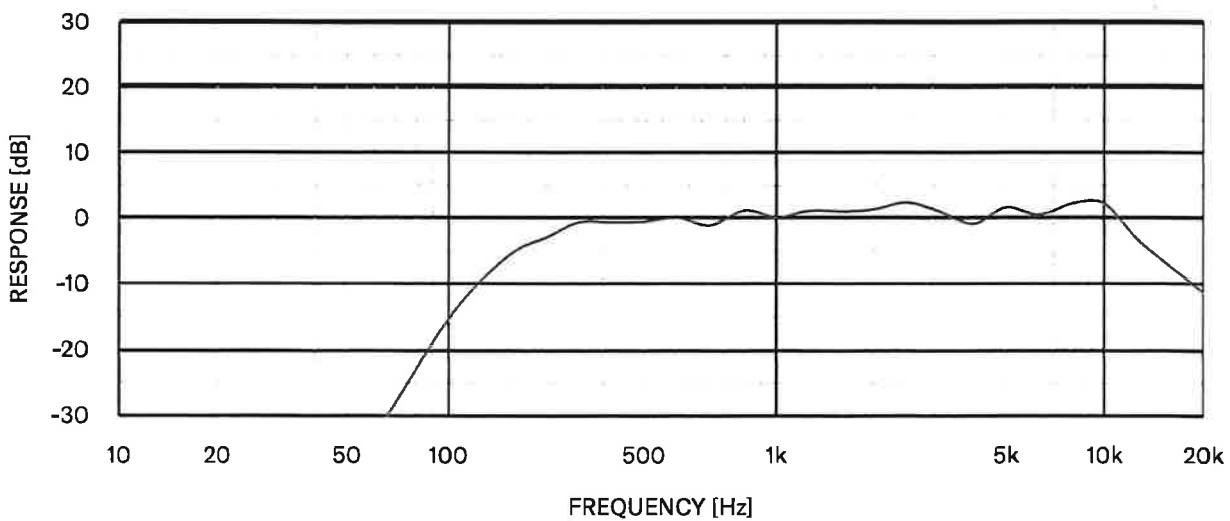
2/4

RM-WOM

LINEAR



1/3 octave band

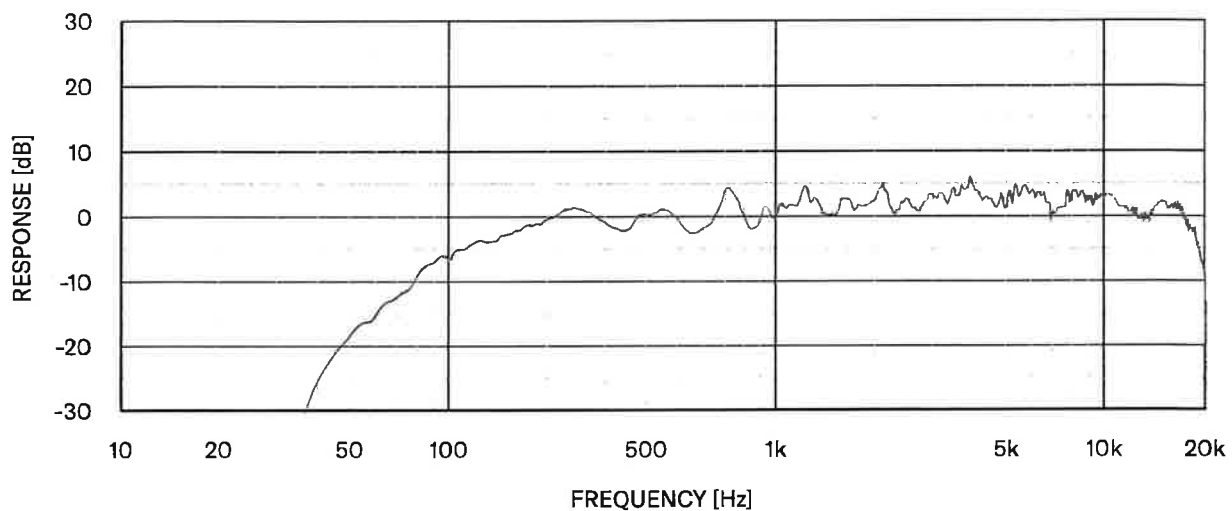


Frequency Response

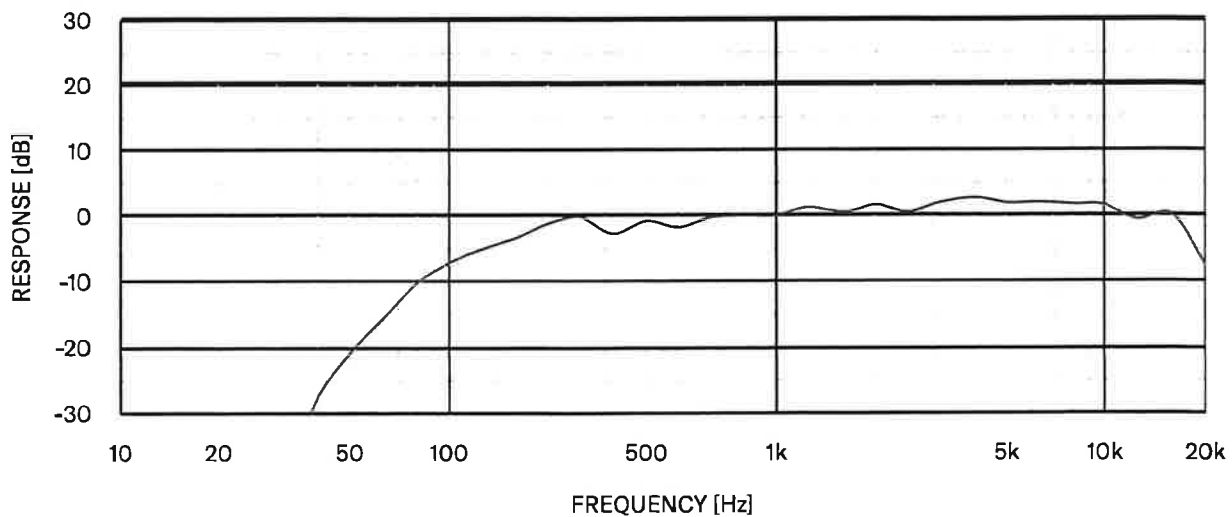
3/4

RM-WGL

LINEAR



1/3 octave band

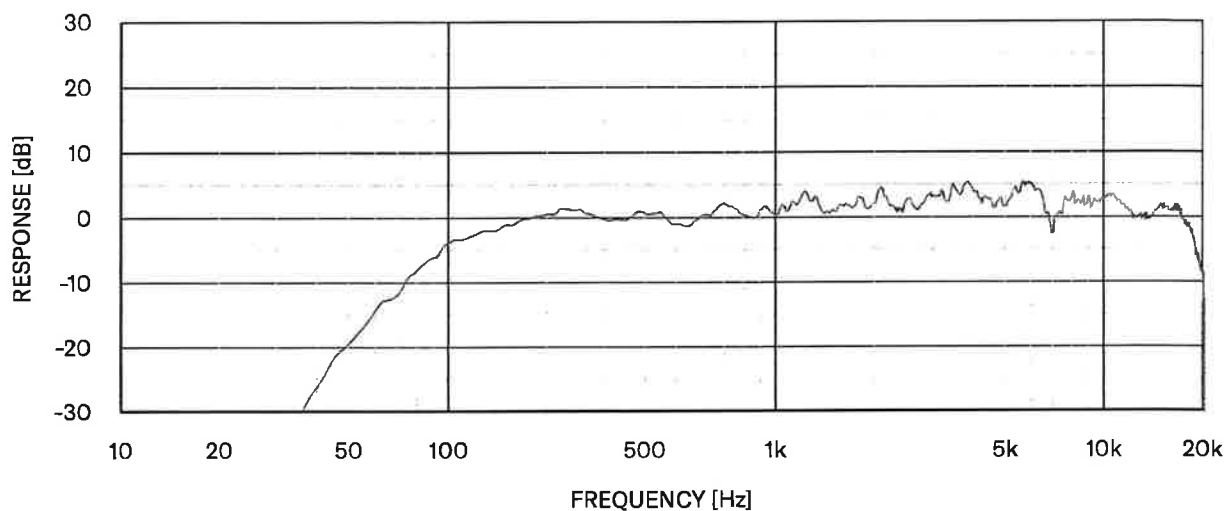


Frequency Response

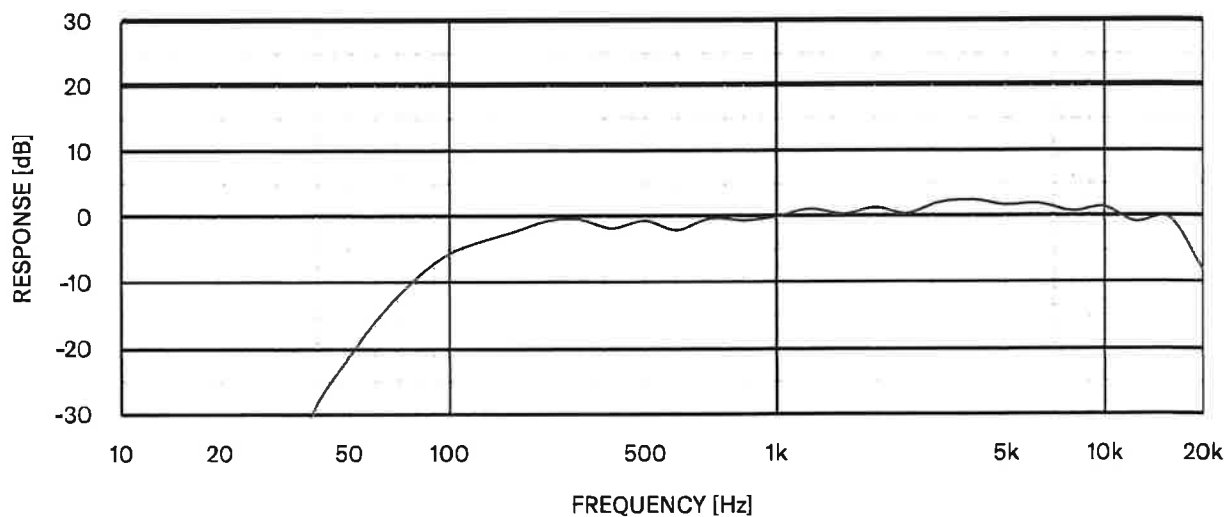
4/4

RM-WGS

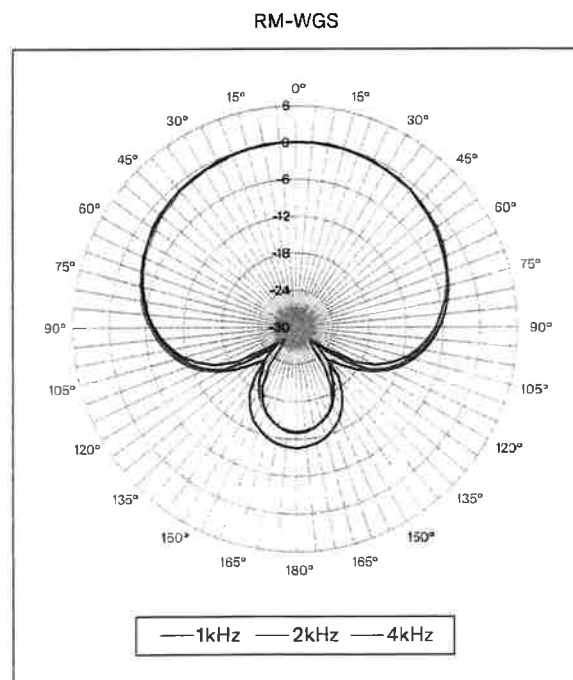
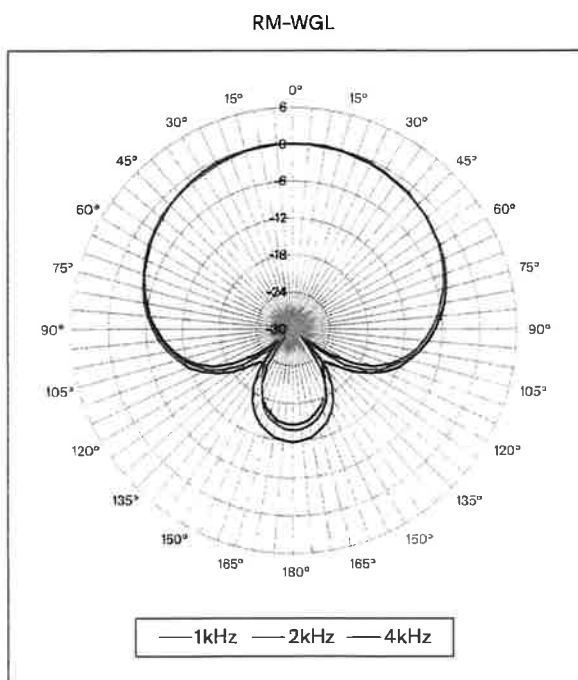
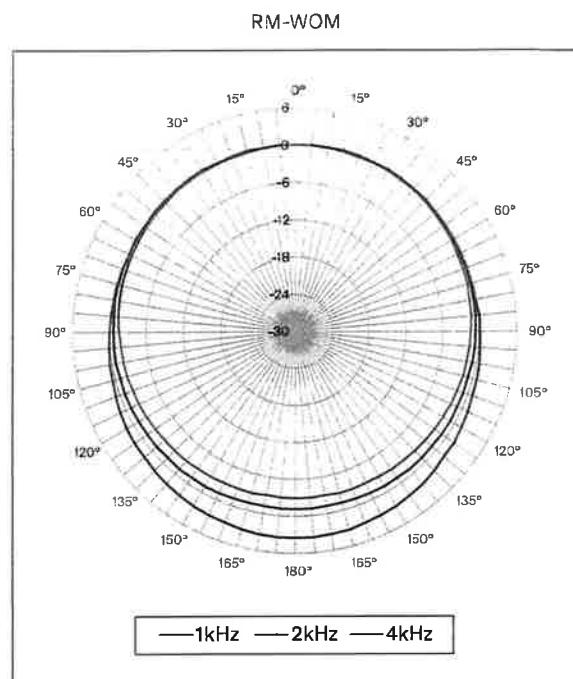
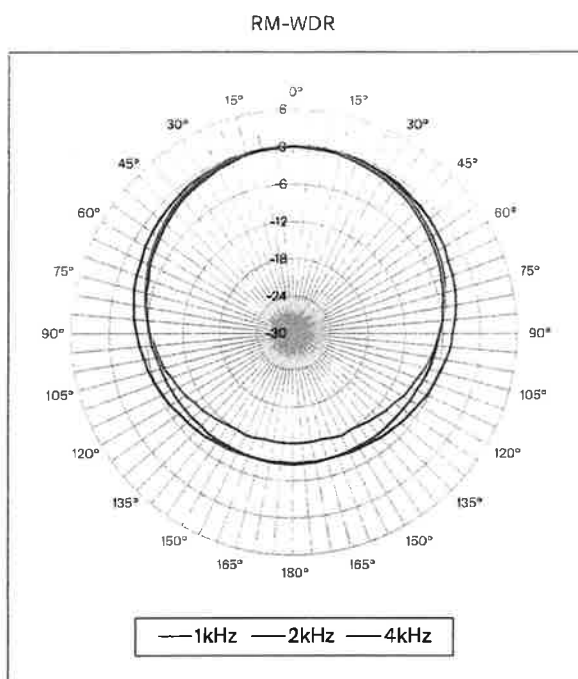
LINEAR



1/3 octave band



Directional Characteristics



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Created in July, 2022

YAMAHA CORPORATION
P.O.BOX 1, Hamamatsu Japan
www.yamaha.com/proaudio/

DELL Technologies

DELL ULTRASHARP 24 USB-C HUB MONITOR | U2422HE

Connected productivity. Vibrant color.



CAPTIVATING PRODUCTIVITY

Take your work to new heights with this 23.8" FHD monitor with wide color coverage and multitasking features.



YOUR PRODUCTIVITY HUB

Experience stable wired connection to your network and peripherals with RJ45, USB-C® and a host of other ports.



VIBRANT COLOR. EASY ON THE EYES.

Features ComfortView Plus, an always on built-in low blue light screen that reduces low blue light while maintaining color accuracy.



TRUSTED RELIABILITY

World's number 1 monitor company.*
Backed by renowned Dell reliability.

Connected productivity. Vibrant color.



VIBRANT COLOR. EASY ON THE EYES.

Designed with wellness in mind: Optimize eye comfort with ComfortView Plus — an always on built-in low blue light screen that reduces harmful blue light emissions while delivering excellent color performance. TUV Rheinland certified.¹

Consistent, vibrant colors: See vibrant color and get a wide color coverage including 100% sRGB, 100% Rec.709 and 85% DCI-P3. In-Plane Switching (IPS) technology delivers consistent color and picture quality across a wide 178°/178° viewing angle.

Impressive visuals: Get superb screen clarity with Full HD (1920x1080) resolution on a 23.8" screen



YOUR PRODUCTIVITY HUB

Connect to productivity: With connectivity options like RJ45 and USB-C®, your monitor serves as a productivity hub that delivers stable Ethernet² and up to 90W³ of power to your laptop — all in a clutter-free setup.

Easy to manage: MAC Address pass-through⁴, PXE Boot, and Wake-on-LAN are conveniently built in.

Jumpstart productivity: Simply press the monitor power button and the power sync feature seamlessly starts your monitor and connected Dell PC, even when the laptop lid is closed. Compatible with select Dell PCs.⁵

Fast connections: Connect to a variety of devices with extensive connectivity ports, including super speed USB 10Gbps. Quick access ports enable easy connection to peripherals, such as storage devices and mobile phones, with up to 15W charging capability (via USB-C).

Multitask efficiently: Connect two PCs to the monitor. Our intelligent Auto KVM feature detects the latest connected PC and seamlessly switches controls over. Use the KVM (Keyboard, Video and Mouse) feature to control both PCs with a single keyboard and mouse.



PURPOSE BUILT

Eco-conscious in design: This monitor is made of 85% PCR (Post-consumer Recyclable Plastic), meets the latest environmental standards such as ENERGY STAR® and TCO Certified Edge Displays, and is EPEAT Gold registered.⁶

Style meets function: Crafted with a premium platinum silver finish, this sleek monitor features a small base and an elegant cable management system that hides cords within the monitor riser. Navigate the menu and adjust screen settings with the easy-to-use joystick control. Snap on the optional Dell Slim Soundbar (SB521A) for exceptional sound.

Comfort is key: Tilt, swivel, pivot and adjust the height of your monitor to a maximum of 150mm for optimal viewing comfort.

Expand your efficiency: Experience a seamless view across multiple monitors with virtually borderless InfinityEdge. And, with a dual monitor setup, you can increase your productivity by up to 21%.⁷

Multi-monitor sync: The OSD (Onscreen Menu Display) settings from one monitor can be synchronized across connected monitors for easy multi-monitor setup.⁸

DELL DISPLAY MANAGER

Productive at every level: Dell Display Manager's (DDM)⁹ Easy Arrange feature lets you quickly tile and view your applications side by side across one or more connected screens for multitasking efficiency.

More ways to manage: Asset management reports allow IT managers to quickly capture and track monitor information as well as configure multiple monitors at once through a single setup.

THANK YOU FOR MAKING DELL MONITORS #1 WORLDWIDE*

Peace of mind: Dell Premium Panel Exchange allows a free monitor replacement during the Limited Hardware Warranty¹¹ period even if only one bright pixel is found.

Minimize downtime: Your monitor comes with a 3-year Advanced Exchange Service¹² so that if a replacement becomes necessary, it will be shipped to you the next business day during your 3-year Limited Hardware Warranty.

Get a higher level of support: Upgrade to 24 X 7, in-region technical phone support from qualified engineers with Dell ProSupport option.¹³

Features & Technical Specifications

Monitor

Diagonal Image Size
Active Display Area
Horizontal
Vertical
Maximum Preset Resolution
Aspect Ratio
Pixel Pitch
Pixels Per Inch (PPI)
Brightness
Color Gamut¹⁴
Calibration Accuracy
Color Depth
Contrast Ratio
Viewing Angle
Response Time
Panel Technology
Backlight Technology
Display Screen Coating
ComfortView with Flicker-free Screen

Dell Display Manager
Remote Asset Management
Others

Connectivity

Connectors

Dell UltraSharp 24 USB-C Hub Monitor – U2422HE
60.47 cm (23.8 inches)

527.04 mm (20.75 inches)
296.46 mm (11.67 inches)
1920 x 1080 @ 60Hz
16:9
0.2745 mm x 0.2745 mm
92.5
250 cd/m² (typical)
100% sRGB, 100% Rec.709, 85% DCI-P3
Delta E < 2 (average) for sRGB and Rec.709
16.7 million colors
1000:1 (typical)
178° vertical / 178° horizontal
8 ms (Normal mode); 5 ms (Fast mode)
In-Plane Switching Technology
White LED Edgelight System
Anti-glare treatment of the front polarizer (3H) hard coating
Yes with ComfortView Plus, built-in low blue light screen (TUV Rheinland certified – Low Blue Light Hardware Solution and Flicker Free)
Yes with Dell Easy Arrange and other key features
Yes, via Dell Command | Monitor
Daisy Chaining with Multi Monitor Sync to synchronize key OSD settings, KVM and Auto-KVM

1 x DP 1.4
1 x HDMI 1.4
1 x DisplayPort (out) with MST
1 x USB Type-C® upstream port (Alternate mode with DisplayPort 1.4, Power Delivery up to 90W)
1 x USB Type-C upstream port (data only 10Gbps USB 3.2 Gen2)
1 x USB Type-C downstream port with charging capability at 15W (max)
1 x super speed USB 10Gbps with BC1.2 charging capability at 2A (max)
3 x super speed USB 10Gbps (USB 3.2 Gen2) downstream port
1 x audio line-out port
1 x RJ45 port
Yes - Available with select Dell PCs⁵

Dell Power Sync - Monitor and PCs

Design features

Adjustability
Security
VESA Mounting Support

Height-adjustable stand (150 mm), Tilt (-5° to 21°), Swivel (-45° to 45°), Pivot (-90° to 90°)
Security lock slot (cable lock sold separately), Anti-theft stand lock slot (to panel)
VESA mounting holes (100 mm x 100 mm — behind attached VESA cover)

Power

AC Input
voltage/frequency/current
Power Consumption (Normal Operation)

100 VAC to 240 VAC / 50 Hz or 60 Hz ± 3 Hz / 2.1 A (maximum)
0.3 W (Off Mode)
0.3 W (Standby Mode)
11.8 W (On Mode)
210 W (Maximum)

Dimensions (with stand)

Height (Compressed ~ Extended)
Width
Depth

364 mm ~ 496 mm (14.33 inches ~ 19.53 inches)
537.6 mm (21.17 inches)
179.6 mm (7.07 inches)

Weight

Weight (panel only)
Weight (with stand and cables)
Shipping Weight

3.96 kg (8.72 lb)
6.06 kg (13.35 lb)
8.3 kg (18.28 lb)

Standard Service Plan

3 Years Advanced Exchange Service² & Limited Hardware Warranty¹¹, Premium Panel Exchange

Optional Service Plan

Dell ProSupport¹⁵

Environmental Compliance

ENERGY STAR® certified monitor, EPEAT® Gold registered where applicable⁶, RoHS Compliant, TCO Certified Edge Displays, BFR-/PVC Free monitor (excluding external cables), Meets NFPA 99 leakage current requirements, Arsenic-Free glass and Mercury-Free for the panel only

What's in the box?

Components

- Monitor with stand

Cables

- Power Cable
- DisplayPort Cable (DP to DP) - 1.8 M
- USB Type-C Cable (C to C) - 1 M
- USB Type-C to Type-A Cable - 1 M

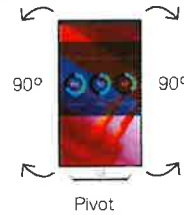
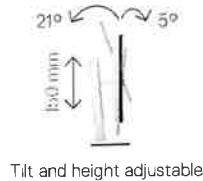
Documentation

- Quick Setup Guide
- Factory Calibration Report
- Safety and regulatory information

Connectivity and Accessories

DELL ULTRASHARP 24 USB-C HUB MONITOR | U2422HE

Purposeful design, built for ergonomic comfort.



Connectivity



- | | | | |
|----------------------|--|--|---|
| 1 Security lock slot | 5 Stand lock | 8 USB-C Upstream port (data only) | 11 RJ45 port |
| 2 Power connector | 6 USB-C Upstream port (video and data, up to 90W power delivery) | 9 Super speed USB 10Gbps (USB 3.2 Gen2) Type-A Downstream port (3) | 12 Super speed USB 10Gbps (USB 3.2 Gen2) Type-A Downstream port with Power Charging |
| 3 HDMI port | 7 DisplayPort (out) | 10 Audio line-out port ¹⁵ | 13 USB-C Downstream port (10Gbps, 15W) |
| 4 DisplayPort | | | |

RECOMMENDED ACCESSORIES



DELL DUAL MONITOR ARM | MDA20

This comprehensive dual monitor and system mounting solution keeps your desk clutter-free. It is the world's first monitor arm that offers swivel angle adjustment with a flip of the switch.**



DELL SLIM SOUNDBAR | SB521A

World's slimmest and lightest soundbar*** offers exceptional audio clarity and magnetically attaches to Dell monitors¹⁶, offering a clean desk experience.



DELL PREMIER MULTI-DEVICE WIRELESS KEYBOARD AND MOUSE | KM7321W¹⁰

Multi-task seamlessly across 3 devices with this premium full size keyboard and sculpted mouse combo with programmable shortcuts and 36 months battery life.¹⁷

* Dell monitors are #1 Worldwide for 7 consecutive years (2013, Q2 to 2020, Q3)! Source: IDC Worldwide Quarterly PC Monitor Tracker, Q3, 2020.

** Based on internal analysis, November 2019.

*** Based on Dell analysis of publicly available specs of comparative attachable monitor soundbars, July 2020.

1 TÜV Rheinland certified – Low Blue Light Hardware Solution and Flicker Free (ID 1111232147). For more details, visit www.tuv.com.

2 Ethernet connection via the RJ45 port.

3 Dell adheres to standard USB-C specifications and protocol. Functionality with non-Dell USB-C systems may vary.

4 MAC Address pass-through functionality is tested to work with most Dell PC systems. Functionality on non-Dell systems may vary.

5 The power sync feature on this Dell USB-C Monitor enables start up and wake-on-demand on compatible Dell PCs. Please check your Dell PC to ensure support of this feature.

6 EPEAT registered where applicable. EPEAT registration varies by country. See www.epeat.net for registration status by country.

7 Source: Based on Principled Technologies Report commissioned by Dell. Actual results will vary. Full report: https://www.principledtechnologies.com/Dell/P2419H_monitor_productivity_1118.pdf

8 Limited to select OSD functions; applies to daisy chained monitors via DP. Please refer to the User Guide for the full list.

9 Learn more about Dell Display Manager software and where to download at dell.com/ddm

10 Product availability varies by country. Contact your Dell representative or visit Dell.com to learn more.

11 For a copy of the Limited Hardware Warranty, write to Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682 or see dell.com/warranty.

12 Advanced Exchange: Dell will send you a replacement monitor the next business day in most cases, if deemed necessary after phone/online diagnosis. Shipping times may vary by location and for monitors 55" and above. Fee charged for failure to return defective unit. See dell.com/servicecontracts/global.

13 Availability varies, please visit www.dell.com/support for details.

14 At panel native only, under Custom Mode preset.

15 Connect external speakers. The audio line-out does not support headphones.

16 Compatible with select Dell monitors only. Please refer to the Dell Slim Soundbar – SB521A compatibility list on dell.com

17 Based on Dell analysis of battery life usage model calculations, Nov. 2020. Results vary depending on use, operating conditions and other factors.

Dell.com/monitors

Product availability varies by country. Please contact your Dell representative for more information.

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Flicker Free
Low Blue Light
Hardware Solution
www.tuv.com
ID 1111232147



ADA Compliant Lectern

Click [HERE](#) to view
 information about the
 2010 ADA Standards for
 Accessible Design

A stylish and functional lectern that's ADA compliant

- Moves smoothly and quietly from seated (31") to full-standing height (41") allowing the same lectern to be used for all presenters
- A conveniently located rocker switch allows movement over a 10 inch range, adjusting from an ADA-compliant height to a conventional standard lectern height
- A spacious work surface provides space for monitors, laptops, notebooks, and other presentation materials
- Seated presenters will appreciate the ease of entry and exit afforded by the oversized access area
- Features 4 - 3" locking swivel casters.
- Service access to the motor and limit switches can be serviced through removal of an access panel
- Customize with Available Options including: Custom work surface cutouts, Task light, Digital clock, power outlet, Cable port



**Work Surface
 adjusts from 31" to
 41" height with
 a convenient
 switch!**



ADA Compliant

AVAILABLE
 COLOR



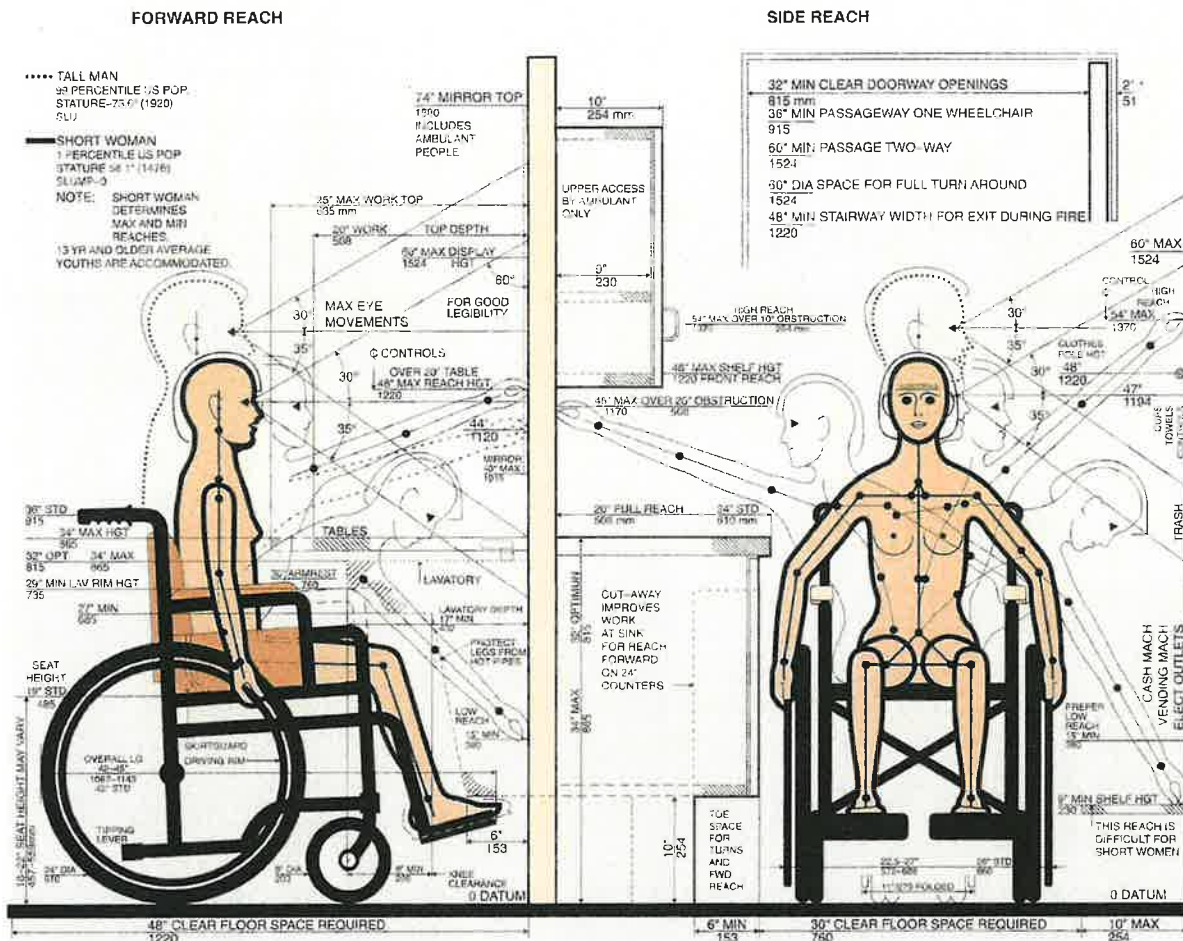
Oak



www.ampli.com | info@ampli.com | (800) 267-5486

AmpliVox's ADA Lectern

has been put through thorough testing to ensure that it meets every criteria of the ADA Standard for Accessible Design



Read more about these standards at:
www.ada.gov/2010ADAstandards_index.htm



Model #	Product Description	Product Wt.	Ship Wt.	MSRP
SN3900	ADA Compliant Lectern	350 lbs	400 lbs.	\$5,900.00



AmpliVox Portable Sound Systems • 650 Anthony Trail, Suite D, Northbrook, IL 60062-2512
www.ampli.com • info@ampli.com • Fax: (800) 267-5489 • Phone: (800) 267-5486



VT1512-IP

VERTICAL
15 AMP
IP POWER
CONDITIONER

PROFESSIONAL HOME THEATER

CUSTOM INSTALL POWER MANAGEMENT



FEATURES

- Protect-or-Disconnect surge protection
- Standard EMI/RFI Filtration
- Over/Under voltage load disconnect
- Power Sequencing
- IP Monitoring and Control - BlueBOLT™ enabled for IP monitoring and control
- 12 individually controlled outlets, 3 spaced for wall warts, 6 turned 90°
- Ground lug to attach Panamax signal-line protection modules
- Steel chassis
- Sleek design ideal for vertical mounting to an equipment rack with included brackets
- 10 foot power cord with removable plug to customize length
- 15A Capacity with circuit breaker
- 3 year limited product warranty with \$5,000,000 Connected Equipment Protection Policy when used with Panamax signal-line protection modules.

BlueBOLT™

BlueBOLT Provides Web-Based Remote Power Management to Monitor and Control Your System—From Anywhere, 24/7.

PANAMAX

www.panamax.com

VT1512-IP

Circuit Breaker:

Automatically trips when the load exceeds 15 amps. Push to reset.

Rocker Power Switch:

When switched off, all outlets turn off immediately. When switched on, outlets turn back on in sequence.

Network Connector:

Connect an Ethernet cable (not provided) between the NETWORK port and an Internet router or modem with an established Internet connection for remote control and monitoring.

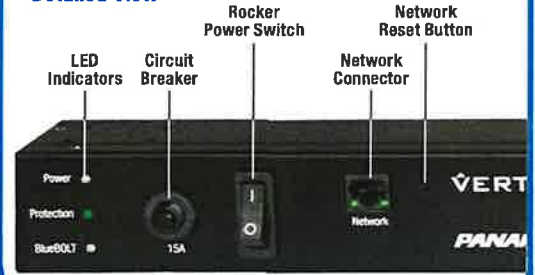
Network Reset Button:

Press using a paper clip, ball point pen, or other small object to reset connection to BlueBOLT™ cloud.

Ground Lug:

Connect Panamax signal-line protection modules grounds to this terminal. Protecting data lines as well as AC lines from surges is required for the Connected Equipment Protection Policy warranty.

Detailed View



Mounting Bracket Holes (4)

LED Indicators

POWER ON: Illuminates when power is present to the device. Note: Check status indicators for individual outlets to determine if each outlet's power is on or off.

UNSAFE VOLTAGE: The Protection OK secondary indication is the status of the VT1512-IP's Over/Under voltage load disconnect feature. If the line voltage is less than 85 Vac or greater than 140 Vac the outlets will shut off and the Protection OK indicator will flash green. Power will automatically be restored when voltage returns to a safe level and the outlets will sequence to the original state prior to an over/under voltage load disconnect.

PROTECTION OK: Indicates status of the VT1512-IP's Protect-or-Disconnect surge protection feature. If the POWER LED is illuminated but the PROTECTION OK LED is off, contact Panamax technical support.

BlueBOLT: Indicates status of BlueBOLT connection.

OFF: Not connected to an active local area network (LAN)

GREEN: Connected to an active LAN, but cannot contact the BlueBOLT server/cloud

BLUE: Connected to an active LAN and is connected to the BlueBOLT server/cloud

Outlets 1-3: Spaced to accommodate large transformers (wall warts).

Outlets 4-8: Rotated 90° to accommodate large transformers (wall warts).

Outlet Indicators
The VT-1512-IP features 12 outlets. With no BlueBOLT connection, the outlets will sequence on from 1-12, and turn off in the reverse sequence. When controlled via BlueBOLT, you have control of all 12 outlets individually

LED lights indicate outlet status:
BLUE: Indicates power status for an individual outlet
OFF: Indicates power is off for an individual outlet



VT1512-IP SPECIFICATIONS

AC Power

AC Power.....120Vac, 50/60Hz
Total Outlets.....12
Total Current Capacity.....15A (1800W)
Voltage Protection Rating
(UL1449 4th Edition, 3,000A).....L-N500V, L-G500V, N-G500V
Protection Modes.....L-N, L-G, N-G
Initial Clamping Level.....200V Peak, 141 RMS
Energy Dissipation.....200 Joules
Peak Impulse Current.....12,000
Protect-or-Disconnect.....Yes
Thermal Fusing.....Yes
Cord Length.....Captive 10ft. cord
with removable NEMA 5-15P for length customization

Environmental

Temperature.....0°C--+40°C(+32°F--+104°F)
Operating Humidity.....0-90% non-condensing
Over-voltage load disconnect.....140 Vac
Under-voltage load disconnect.....85 Vac
Filtration Technology Standard.....RFI/EMI Filtration
Filtration Rating.....18dB@100kHz, 53dB@1MHz, 18dB-53dB@100kHz-1MHz

Specifications subject to change due to product upgrades and improvements.

PRODUCT MEASUREMENTS, WEIGHT AND UPC FOR ORDERING & SHIPPING

DIMENSIONS	WEIGHT	UPC
L 37" x W 1.75" x H 1.75"	5.85 lbs.	050616010344

MODEL: VT1512-IP



WARRANTIES*

\$5,000,000 Connected Equipment Limited Lifetime Warranty • Limited 3 Year Product Warranty

*Refer to actual warranty documentation for full details.

PANAMAX

5919 Sea Otter Place, Suite 100, Carlsbad, CA 92010 • 800-472-5555
www.panamax.com • www.mybluebolt.com

MB1500

A Fully Programmable, Uninterruptible Power Supply, Voltage Regulator & Power Conditioner

FOR YOUR
HOME THEATER
SYSTEM

... a proper cool-down cycle before
shutting off.



MB1500

**COMBINES POWER MANAGEMENT, SURGE PROTECTION WITH AVM
AND BATTERY BACKUP TO PROVIDE THE COMPLETE SOLUTION!**

Features

- 1500 VA Rated Battery Backup
- True Sine Wave Output
- AVM Automatic Voltage Monitoring
- LiFT Linear Filtering Technology Noise Filtration
- Protect or Disconnect Voltage Protection
- Voltage Regulation
- Dual Learning IR Output Controls
- USB Interface
- RS-232 with Open Source Protocol
- Fully Programmable
- Four Programmable Critical Load
- Battery Extension Pack Available To Extend Runtime (BATT1500-EXT Sold Separately) See pg. 2
- IP Card Module for Remote Control Via

MB1500 SPECIFICATIONS

Input			
Voltage	85 – 137 VAC	Automatic Voltage Regulation, Sensitive Mode Capture Range: 98 – 135 V	
Frequency	57 – 63 Hz	Automatic Voltage Regulation, Sensitive Mode Output Range: 120 ± 5%	
AC Power			
Surge Protection:	Non-sacrificial AVM (Automatic Voltage Monitoring)	Automatic Voltage Regulation, Standard Mode Capture Range:	90 – 140 V
Current Rating	12 A maximum (7.5 A maximum battery load recommended)	Automatic Voltage Regulation, Standard Mode Output Range:	120 ± 10%
Overvoltage Shutoff, fast rise:	150 ± 5 V	UPS Output	
Overvoltage Shutoff, slow rise:	140 ± 5 V	Voltage	120 ± 5 V True Sine Wave
Undervoltage Shutoff:	90 ± 5 V	Frequency	60 Hz ± 1%
Noise Filtration:	40dB min from 100 kHz-2MHz 75dB max @ 270kHz	UPS Output Capacity	1500VA 900W @ 0.6pf
Linear Attenuation Curve:	From 0.05 - 100 Ohms line impedance	UPS Backup Time (full load)	12 minutes
		UPS Backup Time (half load)	30 minutes
		Transfer Time	< 4ms

Specifications subject to change due to product upgrades and improvements.

MB1500 is BlueBOLT™ Compatible!

BlueBolt™ Remote Power Management technology provides secure, hosted IP (Internet Protocol) system control. Sold separately, contact Panamax for information.

PANAMAX
www.panamax.com

Outlet Banks 1, 2, 3, and 4 Indicators

Illuminated blue when outlet bank is switched on.

Line Fault Indicator

This LED will illuminate in red to warn the user that a wiring problem such as a bad/missing ground or reversed wiring exists within the AC receptacle. If illuminated, disconnect all equipment and contact an electrician to insure outlet is properly wired.

Menu Navigation Knob

Rotate clockwise to navigate to the next screen, counter-clockwise to return to the previous screen, push to select menu item.

Status Display

LCD displays status and menu navigation items

Removable Battery Access Panel

Easy to remove for battery access and replacement.

Power Switch

Press and hold the power button for 2 seconds to turn the MB1500 ON or OFF.



Rack Mountable
Front rack ear kit included

IR Detector IR Detector for sampling IR remote control signals

Outlet Bank 4 - Non-Critical-Load Outlets

Two battery powered, AVM protected outlets for connected equipment ensures temporary uninterrupted operation of connected equipment during a power failure. These outlets will shut off when the batteries drain to a designated level to reserve remaining battery charge for the critical load outlets.

Circuit Breakers for Overload Protection

Resettable circuit breakers provide optimal overload protection.

Outlet Bank 2 - Critical-Load Outlets

Two battery powered, AVM protected outlets for critical-load equipment ensures temporary uninterrupted operation of connected equipment during a power failure.

Outlet Bank 1 - Critical-Load Outlets

Two battery powered, AVM protected outlets for critical-load equipment ensures temporary uninterrupted operation of connected equipment during a power failure.

RS-232 Serial Communication Port

The serial port allows connection and communication between the MB1500 and an automation, media server, or computer system. This allows the installer to program a number of variables including the Critical Load Battery Threshold. See the software documentation information.



Compatible Model: BlueBOLT-GV1 (sold separately)

Unit Circuit Breaker
AC Power Cord

Captive, heavy-duty shielded power cord.

Ground Lug
Outlet Bank 3 - Non-Critical-Load Outlets

Two battery powered, AVM protected outlets for connected equipment ensures temporary uninterrupted operation of connected equipment during a power failure. These outlets will shut off when the batteries drain to a designated level to reserve remaining battery charge for the critical load outlets.

External Battery Connectors

Allows for optional external battery addition.

USB to Computer

USB port allows communication between MB1500 and computer.

IR Control Section

Indicator LED's - Indicates status IR Output Jacks - Standard 1/8" (3.5mm) mono jack for connection to an IR flasher (IR flashers not included)

WEIGHTS, MEASUREMENTS & UPC'S FOR ORDERING & SHIPPING MB1500

SINGLE MODEL MB1500		SINGLE UNIT CARTON		
Dimensions	Weight	Dimensions	Weight	UPC
L 19" x H 4" x W 17"	72.5 lbs.	L 26.5 x H 10.5" x W 22.25"	81 lbs.	050616-008525

1690 Corporate Circle, Petaluma, CA. 94954 • 800-472-5555 • 707-283-5900 • Fax 707-283-5901 • www.panamax.com


BATT1500-EXT External Battery Pack
MODEL: BATT1500-EXT


PFPower's External Battery Pack offers extended run-time for the MB1500.

- Form Factor - 2U configuration supports both rack and tower mounting.
- Metal Housing - Rigid metal construction allows for placement in areas with a demanding environment.
- Power On/Off Switch - Local power switch for manual reset & control.
- Back-panel fuse - User replaceable fuse which is easily accessed from the rear panel.

UPS UNIT	BATT1500-EXT	MINUTES	
MB1500		HALF LOAD	FULL LOAD
MB1500 (STAND ALONE)		30	12
MB1500	+ 1 BATT1500-EXT	101	45

WEIGHTS, MEASUREMENTS & UPC'S FOR ORDERING & SHIPPING BATT1500-EXT

SINGLE MODEL BATT1500-EXT	
Dimensions	Weight
L 19" x W 17" x H 4"	67 lbs.
SINGLE UNIT CARTON	
Dimensions	Weight
L 23.5" x W 21" x H 10.5"	75 lbs.
UPC 050616-008570	

Battery	
Battery Type	Sealed lead acid
Battery Size	12V/9AH
User Replaceable	Yes
Hot Swappable	Yes
Typical Recharge Time	8 Hours
Replacement Battery	BB Battery - HR9-12
Battery Quantity	8
Physical	
Rack Size	2U
Environmental	
Operating Temperature	32 °F to 95°F / 0°C to 40 °C
Operating Humidity	0% - 95% non condensing
Maximum Operating Elevation	10,000 ft / 3,000 m
Storage Temperature	5 °F to 113°F / -15°C to 45 °C
Maximum Storage Elevation	50,000 ft / 15,000 m
Certifications	
Certifications	UL1778, cUL 107.1, FCC DOC Class B
ROHS	ROHS Compliant
Warranty	
Product Warranty	3 Years Limited



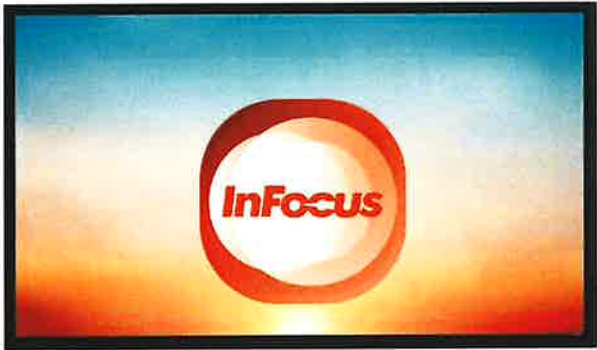
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L617 REV. F 1/11

INF6500

JTouch INF6500 - 65" Interactive Display

DISPLAY IMAGE	Size (cm/inches)	165 / 65
	Display Technology	D-LED
	Native Resolution	3840 x 2160, 4K Ultra HD
	Native Aspect Ratio	16:9
	Brightness (cd/m2)	450
	Response Time (milliseconds)	6
	Refresh Frequency (hertz)	60
	Dynamic Contrast Ratio	5000:1
	Display Colours (billion)	107 (10-bit)
	Viewing Angle Horizontal / Vertical (degrees)	178 / 178
CONNECTIVITY	Minimum Life Time (hours)	30,000
	Inputs Front	HDMI 2.0 x1, USB-A 2.0 x2, USB-B 2.0 (TOUCH) x1
	Inputs Back	HDMI 2.0 x2, DP 12 x1, VGA x1, 3.5mm AV x1, 3.5mm YPbPr x1, 3.5mm Audio x1, USB-A 2.0 x2, OPS x1, USB-B 2.0 (TOUCH) x1"
	Outputs	HDMI 2.0 x1, 3.5mm Audio x1, SPDIF x1, 3.5mm AV x1
	Other	RJ45 x 2, Infrared Remote x1, RS232 x1,
	Wireless Collaboration	InFocus LightCast2 Embedded Casting
	Multimedia Players & Viewers	Music, Video, Image, Office
	Operating System Compatibility	Windows, Linux, Mac OS, Chrome
	Touch Surface	4mm Tempered Glass with level 7 Mons
	Surface Coating	Anti Glare
TOUCH SYSTEM	Touch Sensor	Infrared
	Maximum Touch Points	20
	Touch Inputs	Stylus, Finger, Palm
	Response Time (milliseconds) Touch	≤10
	Accuracy (millimetres)	±1
ANDROID SYSTEM	Operating System & Version	Android 8.0
	Central Processing Unit "CPU"	ARM® Cortex® Dual-core A73 + ARM® Cortex® Dual-core A53
	Graphics Processing Unit "GPU"	ARM® Quad Core Mali-G51
	Android Resolution	4K
	Random Access Memory "RAM" (gigabytes)	3
	Read Only Memory "ROM" (gigabytes)	32

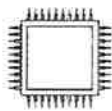


AUDIO	Speakers	2
	Speaker (watts)	15
	Sound Channel	2.0 Stereo
OPERATION	Power Consumption (watts)	140
	Standby Power (watts)	<0.5
	Maximum Altitude (meters/feet)	5000 / 16404
	Storage Temperature (Celsius/Fahrenheit)	-10 ~ 60 / 14 ~ 140
	Operating Temperature (Celsius/Fahrenheit)	0 ~ 40 / 32 ~ 104
GENERAL	Product Dimensions - Length x Width x Height (millimeters/inches)	1506 x 96 x 901 / 59.3 x 3.8 x 35.5
	Product Weight (kilograms/pounds)	42 / 92.6
	Shipping Dimensions - Length x Width x Height (millimeters/inches)	1660 x 245 x 1045 / 65.3 x 9.65 x 41.1
	Shipping Weight (kilograms/pounds)	57 / 125.7
	VESA Mount / Screws (millimeters)	600 x 400 / 4-M8
	OSD Languages	23
ACCESSORIES	Quick Start Guide	Included
	Remote Control (no batteries)	Included
	Regional Power Cord	Included
	USB-B Touch Cable	Included
	HDMI Cable	Included
	Stylus x2	Included
	WiFi USB-A Dongle	Included
	Intel® Core® i3, 4GB RAM, 128GB SSD OPS	Optional
	Intel® Core® i5, 8GB RAM, 128GB SSD OPS	Optional
	Intel® Core® i7, 16GB RAM, 256GB SSD OPS	Optional

DELL technologies

OPTIPLEX 3000 TOWER, SMALL FORM FACTOR AND MICRO

**Business desktops with streamlined performance
and essential manageability options to drive
maximum value.**



POWER YOUR SUCCESS

Speed through routine tasks seamlessly with 10th generation Intel® Core™ processors and up to 65W CPU for towers. Supporting up to 64GB DDR4 (32GB DIMMS)- and delivering faster user experiences.



CONVENIENT CONNECTIONS

Create a multi-monitor set up to improve productivity and task accuracy with support for up to three monitors, including 2 native DisplayPorts 1.4, and optional VGA, HDMI 2.0b or 3rd DisplayPort.



SECURE SOLUTION

The OptiPlex 3090 offers more security than ever. Work smart with secure features including TPM 2.0, SED hard drive, standard security lock slot, padlock loop and intrusion switch. Protect your IT investment completely with Dell Endpoint Security.



EFFICIENT DESIGN

"Shift" venting pattern of the chassis maximizes air intake to help your system stay cool. The compact, entry tool-less design, now provides easier access to parts for quicker serviceability, without the need to remove the front bezel. Versatile mounting options enable a personalized, clutter-free workspace.

Recommended Accessories

OPTIPLEX 3090 TOWER, SMALL FORM FACTOR AND MICRO

CUSTOM STANDS AND MOUNTS



DELL SINGLE MONITOR
ARM - MSA20

Maximize your desk space with this sleek arm that supports both system and monitor mounting.



OPTIPLEX MICRO ALL-IN-ONE
MOUNT FOR DELL
E SERIES MONITORS

This mount allows the Micro to be VESA mounted to select Dell E Series displays.



OPTIPLEX MICRO
DUAL VESA MOUNT WITH
ADAPTER BRACKET

Mount your system between two VESA compatible devices. Includes an adapter box to securely house the system's power adapter.



OPTIPLEX MICRO
DVD+/-RW ENCLOSURE

Mount your system on a wall or under a surface with a VESA-compatible DVD+/-RW enclosure with full optical drive access. Includes an adapter box to securely house the system's power adapter.



OPTIPLEX MICRO VESA MOUNT
WITH ADAPTER BRACKET

Mount your system on a wall or under a desk. Includes an adapter box to securely house the system's power adapter.



OPTIPLEX MICRO ALL-IN-ONE STAND

Small footprint mounting solution adapts to your environment, with cable management and monitor height adjustability, tilt, swivel and pivot functions.



OPTIPLEX SMALL FORM FACTOR
ALL-IN-ONE STAND

Small footprint mounting solution featuring integrated monitor power and Ethernet cables, as well as monitor adjustability with height, tilt, swivel and pivot functions.

PURPOSE-BUILT SOLUTIONS



DELL 24 MONITOR | P2422H

Stay productive no matter where you work with this sleek 23.5" FHD monitor with ComfortView.



DELL ULTRASHARP WEBCAM

Elevate your video conferencing experience with the world's best image quality 4K webcam that optimizes your visuals with a large 4K Sony STARVIS™ CMOS sensor and AI Auto-Framing.



DELL SLIM SOUNDBAR - S3521A

Optimize conference calls and multimedia streaming with exceptional audio clarity. Minimize background noise while on calls with the dual mic array and echo cancellation feature.



DELL PRO WIRELESS KEYBOARD
AND MOUSE | KM5221W

Enhance your everyday productivity with a quiet full-size keyboard and mouse combo that offers programmable shortcuts and 36 months battery life.



DELL WIRED MOUSE
WITH FINGERPRINT
READER | MS819

Wired mouse with fingerprint reader offers convenient and secure login and online access without passwords.



DELL PRO WIRED
HEADSET | WH3022

Experience exceptional audio clarity with this Teams certified wired headset that allows you to wear the microphone on either side for a customized fit.



OPTIPLEX CABLE COVERS

Thermally tested custom cable covers offer an easy to install and attractive way to manage cables and secure ports.



OPTIPLEX DUST FILTERS

Custom dust filters safeguard internal components in factory, warehouse, or retail environments.

Workforce Modernization

It's more than a concept; it's our approach to modernizing your workforce. Our products, solutions and services support your IT team and help your employees work from home, the office, or a combination of both — simplifying and streamlining their work-life even if they're always on the move.

Dell Software & Services Solutions

END USER DEVICES

Provide the right device with the right software for any setting to give employees satisfaction and business perspective.

SUPPORT

Automatically detect and proactively prevent issues through predictive analytics. Use our AI-driven insights to resolve issues remotely or leave time-consuming support issues in our hands with 24x7 access to our hardware and software experts.

DEPLOY

Quickly get employees to work and save valuable IT time by provisioning applications at the factory and shipping ready-to-use devices directly to employees wherever they work.

MANAGE

Take advantage of the console of your choice to set up, configure, monitor and update your entire endpoint fleet. Securely deliver and manage applications from the cloud, giving users smooth access to any device, including from other vendors.



SECURE

Use intelligent solutions that secure endpoints from both above and below the OS. Prevent, detect and remediate attacks. Detect outside attacks that have altered the BIOS. Encrypt sensitive data on devices and in the cloud. Protect credentials with built-in hardware.



aaS

You can enjoy modernization through different consumption models:
Traditional cash purchase outright or as fixed monthly plan with no upfront investment.

¹Source: ESG Remote Work Report, 2020

²Source: Dell User Group Pulse Survey March 2020

Features & Technical Specifications

OPTIPLEX 3090 TOWER, SMALL FORM FACTOR AND MICRO

Feature	OptiPlex 3090 Technical Specifications ¹
Processors ¹	<p>Tower, Small Form Factor:</p> <p>10th Generation Intel® Core™ i3-10100, 6 MB Cache, 4 Cores, 8 Threads, 3.6 GHz to 4.3 GHz, 65 W 10th Generation Intel® Core™ i3-10300, 8 MB Cache, 4 Cores, 8 Threads, 3.7 GHz to 4.4 GHz, 65 W 10th Generation Intel® Core™ i5-10400, 12 MB Cache, 6 Cores, 12 Threads, 2.9 GHz to 4.3 GHz, 65 W 10th Generation Intel® Core™ i5-10500, 12 MB Cache, 6 Cores, 12 Threads, 3.1 GHz to 4.5 GHz, 65 W 10th Generation Intel® Core™ i5-10600, 12 MB Cache, 6 Cores, 12 Threads, 3.3 GHz to 4.8 GHz, 65 W 10th Generation Intel® Celeron G5905, 4MB Cache, 2 Cores, 2 Threads, 3.5GHz, 58W 10th Generation Intel® Pentium G6405, 4MB Cache, 2 Cores, 4 Threads, 4.1GHz, 58W 10th Generation Intel® Pentium G6505, 4MB Cache, 2 Cores, 4 Threads, 4.2GHz, 58W 10th Generation Intel® Core™ i3-10105, 6MB Cache, 4 Cores, 8 Threads, 3.7GHz to 4.4GHz, 65W 10th Generation Intel® Core™ i3-10305, 8MB Cache, 4 Cores, 8 Threads, 3.8GHz to 4.5GHz, 65W 10th Generation Intel® Core™ i5-10505 12MB Cache, 6 Cores, 12 Threads, 3.2GHz to 4.6GHz, 65W</p> <p>Micro:</p> <p>10th Generation Intel® Core™ i3-10100T, 6 MB Cache, 4 Cores, 8 Threads, 3.0 GHz to 3.8 GHz, 35 W 10th Generation Intel® Core™ i3-10300T, 8 MB Cache, 4 Cores, 8 Threads, 3.0 GHz to 3.9 GHz, 35 W 10th Generation Intel® Core™ i5-10400T, 12 MB Cache, 6 Cores, 12 Threads, 2.0 GHz to 3.6 GHz, 35 W 10th Generation Intel® Core™ i5-10500T, 12 MB Cache, 6 Cores, 12 Threads, 2.3 GHz to 3.8 GHz, 35 W 10th Generation Intel® Core™ i5-10600T, 12 MB Cache, 6 Cores, 12 Threads, 2.4 GHz to 4.0 GHz, 35 W 10th Generation Intel® Core™ i7-10700T, 16MB Cache, 8 Cores, 16 Threads, 2.0GHz to 4.5GHz, 35W* 10th Generation Intel® Celeron G5905T, 4MB Cache, 2 Cores, 2 Threads, 3.3GHz, 35W 10th Generation Intel® Pentium G6405T, 4MB Cache, 2 Cores, 4 Threads, 3.5GHz, 35W 10th Generation Intel® Pentium G6505T, 4MB Cache, 2 Cores, 4 Threads, 3.6GHz, 35W 10th Generation Intel® Core™ i3-10105T, 6MB Cache, 4 Cores, 8 Threads, 3.0GHz to 3.9GHz, 35W 10th Generation Intel® Core™ i3-10305T, 8MB Cache, 4 Cores, 8 Threads, 3.0GHz to 4.0GHz, 35W *Note: Intel® Core™ i7-10700T will not perform at maximum capacity on 3090 Micro.</p>
Chipset	Intel® Q470 Chipset
Operating System Options ¹	Windows 11 Professional (64-bit) Windows 11 Downgrade (Windows 10 image) Windows 11 Home (64-bit) Windows 11 Pro Education (64-bit) Kylin Linux Desktop version 10.1 (China only) Ubuntu® Linux® 20.04 LTS, 64-bit Windows 10 CMIT Government Edition 64-bit (China only) Windows 10 IoT 2019 LTSC
Video Card ²	Intel® UHD Graphics 630 Intel® UHD Graphics 610 NVIDIA® GeForce® GT730, 2 GB, GDDR5 (optional, Tower and Small Form Factor only) AMD Radeon™ RX 640, 4 GB, GDDR5 (optional, Tower and Small Form Factor only) AMD Radeon™ 550, 2GB, GDDR5 (optional, Tower and Small Form Factor only) AMD Radeon™ 540, 1GB, GDDR5 (optional, Tower and Small Form Factor only)
Memory ^{2,5}	4 GB, 1 x 4 GB, DDR4, 2666 MHz for Intel® Celeron, Pentium, Core™ i3/i5 processors, 2933 MHz for Intel®Core™ i7 processor (Micro only) 8 GB, 1 x 8 GB, DDR4, 2666 MHz for Intel® Celeron, Pentium, Core™ i3/i5 processors, 2933 MHz for Intel®Core™ i7 processor (Micro only) 8 GB, 2 x 4 GB, DDR4, 2666 MHz for Intel® Celeron, Pentium, Core™ i3/i5 processors, 2933 MHz for Intel®Core™ i7 processor (Micro only) 16 GB, 1 x 16 GB, DDR4, 2666 MHz for Intel® Celeron, Pentium, Core™ i3/i5 processors, 2933 MHz for Intel®Core™ i7 processor (Micro only) 16 GB, 2 x 8 GB, DDR4, 2666 MHz for Intel® Celeron, Pentium, Core™ i3/i5 processors, 2933 MHz for Intel®Core™ i7 processor (Micro only) 32 GB, 1 x 32 GB, DDR4, 2666 MHz for Intel® Celeron, Pentium, Core™ i3/i5 processors, 2933 MHz for Intel®Core™ i7 processor (Micro only) 32 GB, 2 x 16 GB, DDR4, 2666 MHz for Intel® Celeron, Pentium, Core™ i3/i5 processors, 2933 MHz for Intel®Core™ i7 processor (Micro only) 64 GB, 2 x 32 GB, DDR4, 2666 MHz for Intel® Celeron, Pentium, Core™ i3/i5 processors, 2933 MHz for Intel®Core™ i7 processor (Micro only)
Wireless ^{1,4}	Qualcomm® QCA61x4a 802.11ac dual band 2x2 + Bluetooth 5.0 Intel® Wi-Fi 5 9462 802.11ac dual band 1x1 + Bluetooth 5.1 Intel® Wi-Fi 6 AX201 2x2 + Bluetooth 5 and Bluetooth 5.2

Features & Technical Specifications

OPTIPLEX 3090 TOWER, SMALL FORM FACTOR AND MICRO

Ports

Tower

1 RJ-45 port 10/100/1000 Mbps (rear)
 2 USB 2.0 Type-A ports (front)
 2 USB 2.0 ports with Smart Power on (rear)
 4 USB 3.2 Gen 1 Type-A ports (rear)
 1 Universal Audio Jack (front)
 1 Line-out audio port (rear, retaskable)
 2 DisplayPorts 1.4 (rear)
 1 Serial /PS2 slot (optional)
 1 Optional 3rd Video Port (VGA/DP 1.4/HDMI 2.0b)

Small Form Factor:

1 RJ-45 port 10/100/1000 Mbps (rear)
 2 USB 2.0 Type-A ports (front)
 2 USB 2.0 Type-A ports with Smart Power On (rear)
 4 USB 3.2 Gen 1 Type-A ports (rear)
 1 Universal Audio Jack (front)
 2 DisplayPorts 1.4 (rear)
 1 Serial/PS2 slot (Optional)
 1 Optional video port—HDMI 2.0b, DP, or VGA
 1 Line-out audio port (rear, retaskable)

Micro:

1 RJ-45 port 10/100/1000 Mbps (rear)
 1 USB 3.2 Gen1 Type-A ports (front)
 3 USB 3.2 Gen1 Type-A ports (rear)
 1 USB 3.2 Gen1 Type-A port with Smart Power On (rear)
 1 Universal Audio Jack (front)
 1 Line-out audio port (front, retaskable)
 2 DisplayPorts 1.4 (rear)
 1 VGA Port/DisplayPort 1.4 Port/HDMI 2.0b Port (optional)

Optical Drive

Optional 8x DVD-ROM 9.5mm ODD (Tower and Small Form Factor)
 Optional 8x DVD+/-RW 9.5mm ODD (Tower and Small Form Factor)
 Dell OptiPlex Micro DVD/RW Enclosure Mount (Micro only)

Slots

Tower:

1 full-height PCIe x16 Gen 3 slot
 2 full-height PCIe x1 Gen 3 slot
 1 M.2 2230 slot for wireless
 1 M.2 2230/2280 slot for storage
 3 SATA slots

Small Form Factor:

1 half-height PCIe x16 Gen 3 slot
 1 half-height PCIe x1 Gen 3 slot
 1 M.2 2230 slot for wireless
 1 M.2 2230/2280 slots for storage
 2 SATA slots - 1x3.5" HDD or 1x2.5" HDD, 1 slim ODD

Micro:

1 M.2 2230 slot for wireless
 1 M.2 2230/2280 slot for storage
 1 SATA slot - 1x2.5" HDD

Primary Hard Drive^{1,5}

3.5-inch, 1 TB, 7200 RPM, SATA HDD (Tower and Small Form Factor only)
 3.5-inch, 2 TB, 7200 RPM, SATA HDD (Tower and Small Form Factor only)
 3.5-inch, 4 TB, 5400 RPM, SATA HDD (Tower and Small Form Factor only)
 2.5-inch, 500 GB, 7200 RPM, SATA HDD (All form factors)
 2.5-inch, 500 GB, 7200 RPM, Opal Self-Encrypting FIPS HDD (All form factors)
 2.5-inch, 1 TB, 5400 RPM, SATA HDD (All form factors)
 2.5-inch, 1 TB, 7200 RPM, SATA HDD (All form factors)
 2.5-inch, 2 TB, 5400 RPM, SATA HDD (All form factors)
 M.2 2230, 256 GB, Gen 3 PCIe x4 NVMe, Class 35 SSD (All form factors)
 M.2 2230 256GB Gen 3 PCIe x4 NVMe SED Class 35 (All form factors)
 M.2 2230, 512 GB, Gen 3 PCIe x4 NVMe, Class 35 SSD (All form factors)
 M.2 2280, 512 GB, Gen 3 PCIe x4 NVMe, Class 40 SSD (All form factors)
 M.2 2280, 512 GB, Gen 3 PCIe x4 NVMe, Opal Self-Encrypting Class 40 SSD (All form factors)
 M.2 2280 512GB Gen 4 PCIe x4 NVMe, Class 40 SSD (All form factors)
 M.2 2280, 1 TB, Gen 3 PCIe x4 NVMe, Class 40 SSD (All form factors)
 M.2 2280 1TB Gen 4 PCIe x4 NVMe, Class 40 SSD (All form factors)
 M.2 2280 2TB NVMe Gen 4 PCIe x4 Class 40 SSD (Micro only)
 M.2 2280, 1 TB, Gen 3 PCIe x4 NVMe, Opal Self-Encrypting Class 40 SSD (All form factors)

Features & Technical Specifications

OPTIPLEX 3090 TOWER, SMALL FORM FACTOR AND MICRO

Chassis	Form Factor	Tower	Small Form Factor (SFF)	Micro
	Dimensions (H x W x D)	Front Height: 12.77 in. (324.30 mm) Rear Height: 12.77 in. (324.30 mm) Width: 6.06 in. (154.00 mm) Depth: 11.50 in. (292.20 mm)	Front Height: 11.42 in. (290.00 mm) Rear Height: 11.42 in. (290.00 mm) Width: 3.35 in. (92.60 mm) Depth: 11.53 in. (292.80 mm)	Front height: 7.16 in. (182.00 mm) Rear height: 7.16 in. (182.00 mm) Width: 1.42 in. (36.00 mm) Depth: 7.03 in. (178.56 mm)
	Min. Weight (lbs/kg)	11.79 lb (5.35 kg)	8.37 lb (3.79 kg)	2.55 lb (1.16 kg)
	Power Supply ^{1,6}	260 W typical 85% Efficient PSU (80 PLUS Bronze) 260 W typical 92% Efficient PSU (80 PLUS Platinum)	200 W typical 85% Efficient PSU (80 PLUS Bronze) 200 W typical 92% Efficient PSU (80 PLUS Platinum)	65 W, 4.5 mm external PSU (for 35W CPU)
Recommended accessories	Monitors: Qualified with select Dell UltraSharp, Professional, and E-series monitors Keyboards: Dell wired keyboard with multimedia functionality, Dell smart card keyboard, Dell wireless keyboard Mouse: Dell wired mouse, Dell wireless mouse, Dell laser mouse, Dell wired fingerprint reader mouse Audio Speakers: Internal Dell business audio speaker, Dell stereo speaker systems, Dell sound bar for select flat-panel displays, Dell wireless speaker system Audio Headsets: Dell pro stereo headsets Micro Mounting Options: Micro Vertical Stand, Micro VESA Mount, Micro Dual VESA Mount, Micro All-in-One Stand, Micro All-in-One Mount for E Series Displays, Micro DVD+/-RW Enclosure Small Form Factor Mounting Option: Small Form Factor All-in-One Stand (Coming Soon)			
Productivity Software	Microsoft® Office 30 Day Trial Microsoft® Office Home and Business 2019 Microsoft® Office Professional 2019			
Software Security	Absolute Control (Pro) 1 Year, Absolute Control (Pro) 3 Years, Absolute Resilience (Prem) 3 Years, Absolute Resilience 1 Year, Absolute Visibility (Std) 1 Year, Absolute Visibility (Std) 3 Years Dell Encryption Enterprise 1 Year, Dell Encryption Enterprise 2 Years, Dell Encryption Personal 1 Year, Dell Encryption Personal 3 Years, Emergency Incident Response, Encryption-SED HDD (Opal FIPS), Endpoint Detection and Response (EDR), Incident Management Retainer, Intel® Guard Technologies & Secure Key: Software Guard (SGX), Data Guard (vPro only), Boot Guard, BIOS Guard (Core CPU's only), OS Guard (Core CPU's only) and Secure Key (i5 or greater only), Intel® Runtime BIOS Resilience (Copper Point) with attestation via Nifty Rock + Intel® TXT, Local HDD data wipe via BIOS ("Secure Erase"), Managed Endpoint Detection and Response, McAfee® Small Business Security 12-month subscription, McAfee® Small Business Security 30 Day Free Trial, McAfee® Small Business Security 36 month Subscription, Next Generation Antivirus (NGAV) OpenXT validation required, SafeData, SafeGuard and Response (powered by VMware Carbon Black and Secureworks), Support of Absolute Persistent Module BIOS agent v2, Threat Detection and Response (TDR), VMware Carbon Black Cloud Endpoint Standard NGAV, B-EDR, 1 Year, VMware Carbon Black Cloud Endpoint Standard NGAV, B-EDR, 3 Years, VMware Carbon Black Cloud Endpoint Standard NGAV, B-EDR+Secureworks TDR (Data center housed in US) 1 Year, VMware Carbon Black Cloud Endpoint Standard NGAV, B-EDR+Secureworks TDR (Data center housed in US) 3 Years			
Hardware Security	SafeBIOS: includes Dell Off-host BIOS Verification, BIOS Resilience, BIOS Recovery, and additional BIOS Controls, SafeID credential protection, Trusted Platform Module (TPM) 2.0 ⁷ , Microsoft® Windows 10 Device Guard and Credential Guard (Enterprise SKU), Microsoft® Windows BitLocker, Local hard drive data wipe through BIOS (Secure Erase), Self-Encrypting Storage Drives (Opal, FIPS), China TPM, Intel® Secure Boot, Intel® Authenticate, Physical Security Options: 1 Kensington security-cable slot, 1 Padlock loop, Chassis lock slot support, Chassis Intrusion Switch, Lockable Cable Covers, Smart Card Keyboard (FIPS)			
Systems Management Options	Dell Client Command Suite for In-Band Systems Management			
Regulatory ^{9,10}	EPEAT registered configurations available, ENERGY STAR qualified configurations available, CEL, WEEE, Japan Energy Law, South Korea E-standby, South Korea, Eco-label, EU RoHS, China RoHS			
Warranty	3 Years Hardware Service with Onsite/In-Home Service after Remote Diagnosis ¹¹ , warranty extensions up to 5 years ProSupport with Next Business Day Onsite Service is available to complement certain warranty options ProSupport Plus for Client is available to complement certain warranty options. ¹²			
Accidental Damage Services ¹³	Accidental Damage Service is available to complement certain warranty options from 3-5 years			
Configuration Services	Factory Image load, BIOS Customization, Hardware Customization, Asset Tagging and Reporting.			

Dell OptiPlex

OPTIPLEX 3090 TOWER, MICRO, SMALL FORM FACTOR AND MICRO

**Business desktops with streamlined performance
and essential manageability options to drive
maximum value.**



Discover professional class desktops at www.dell.com/OptiPlex

1. Offering may vary by region. Some items may be available after product introduction. For complete details, refer to the Technical Guidebook published on www.dell.com.
2. System Memory and Graphics: Significant system memory may be used to support graphics, depending on system memory size and other factors.
3. 4GB or Greater System Memory Capability: A 64-bit operating system is required to support 4GB or more of system memory.
4. Particular versions of Microsoft Windows may not support the full Bluetooth 4.2 functionality.
5. Storage: GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less.
6. PSU: This form factor utilizes a more efficient Active Power Factor Correction (APFC) power supply. Dell recommends only Universal Power Supplies (UPS) based on Sine Wave output for APFC PSUs, not an approximation of a Sine Wave, Square Wave, or quasi-Square Wave (see UPS technical specifications). If you have questions please contact the manufacturer to confirm the output type.
7. TPM is not available in all regions.
8. Absolute™ Data & Device Security: An Absolute™ offer. Some conditions apply. Terms and Conditions at www.absolute.com/legal
9. For complete listing of declarations and certifications, refer to the Dell Regulatory and Environmental Datasheet found in the Manuals section of Product Support information at www.dell.com/support/home/us/en/19
10. Please refer to www.epeat.net for specific country registration rating and participation.
11. Limited Hardware Warranty: For copy of Ltd Hardware Warranty, write Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682 or see www.dell.com/warranty
12. Onsite Service after Remote Diagnosis: Remote Diagnosis is determination by online/phone technician of cause of issue; may involve customer access to inside of system and multiple or extended sessions. If issue is covered by Limited Hardware Warranty (www.dell.com/warranty) and not resolved remotely, technician and/or part will be dispatched, usually within 1 business day following completion of Remote Diagnosis. Availability varies. Other conditions apply.
13. Dell Services: Availability and terms of Dell Services vary by region. For more information, visit www.dell.com/servicesdescriptions

DELLTechnologies

DELL ULTRASHARP 27 MONITOR | U2722D

Elevated productivity. Vibrant color.



CAPTIVATING PRODUCTIVITY

Take your work to new heights with this stylish 27" QHD monitor with wide color coverage and multitasking features.



CONNECT TO PRODUCTIVITY

Easily connect to a variety of devices with comprehensive connectivity options including super speed USB 10Gbps and quick access front ports.



VIBRANT COLOR. EASY ON THE EYES.

Features ComfortView Plus, an always on built-in low blue light screen that reduces low blue light while maintaining color accuracy.



TRUSTED RELIABILITY

World's number 1 monitor company.*
Backed by renowned Dell reliability.

Elevated productivity. Vibrant color.



CAPTIVATING COLOR. EASY ON THE EYES.

Designed with wellness in mind: Optimize eye comfort with ComfortView Plus — an always on built-in low blue light screen that reduces harmful blue light emissions while delivering excellent color performance. TUV Rheinland certified!

Consistent, vibrant colors: Enjoy true-to-life color with a color depth of 1.07 billion colors, wide color coverage including 100% sRGB, 100% Rec.709 and 95% DCI-P3. In-Plane Switching (IPS) technology delivers consistent color and picture quality across a wide 178°/178° viewing angle.

See details with striking clarity: With QHD (2560x1440) resolution on this 27" screen, you'll see 1.77 times more details than Full HD.



CONNECT TO PRODUCTIVITY

Fast connections: Connect to a variety of devices with a wide range of connectivity ports, including super speed USB 10Gbps. Quick access ports enable easy connection to peripherals, such as storage devices and mobile phones, with up to 15W charging capability (via USB-C®).

Expand your efficiency: Experience a seamless view across multiple monitors with virtually borderless InfinityEdge. And, with a dual monitor setup, you can increase your productivity by up to 21%.²

Multitask effectively: Connect two PCs to the monitor and view content from both PC sources at the same time with PBP (Picture-by-Picture) and PIP (Picture-in-Picture) features.

Multi-monitor sync: The OSD (Onscreen Menu Display) settings from one monitor can be synchronized across connected monitors for easy multi-monitor setup.³



PURPOSE BUILT

Eco-conscious in design: This monitor is made of 85% PCR (Post-consumer Recyclable Plastic), meets the latest regulatory and environmental standards such as ENERGY STAR® and TCO Certified Edge Displays, and is EPEAT Gold registered.⁴

Style meets function: Crafted with a premium platinum silver finish, this sleek monitor features a small base and an elegant cable management system that hides cords within the monitor riser. Navigate the menu and adjust screen settings with the easy-to-use joystick control. Snap on the optional Dell Slim Soundbar (SB521A) and enjoy exceptional sound quality.

Comfort is key: Tilt, swivel, pivot and adjust the height of your monitor to a maximum of 150mm for optimal viewing comfort.

DELL DISPLAY MANAGER

Productive at every level: Dell Display Manager's (DDM)⁵ Easy Arrange feature lets you quickly tile and view your applications side by side across one or more connected screens for multitasking efficiency.

More ways to manage: Asset management reports allow IT managers to quickly capture and track monitor information as well as configure multiple monitors at once through a single setup.

THANK YOU FOR MAKING DELL MONITORS #1 WORLDWIDE*

Peace of mind: Dell Premium Panel Exchange allows a free monitor replacement during the Limited Hardware Warranty⁷ period even if only one bright pixel is found.

Minimize downtime: Your monitor comes with a 3-year Advanced Exchange Service⁸ so that if a replacement becomes necessary, it will be shipped to you the next business day during your 3-year Limited Hardware Warranty.

Get a higher level of support: Upgrade to 24 X 7, in-region technical phone support from qualified engineers with Dell ProSupport option.⁹

Features & Technical Specifications

Monitor

Diagonal Image Size
Active Display Area
Horizontal
Vertical
Maximum Preset Resolution
Aspect Ratio
Pixel Pitch
Pixels Per Inch (PPI)
Brightness
Color Gamut¹⁰
Calibration Accuracy
Color Depth
Contrast Ratio
Viewing Angle
Response Time
Panel Technology
Backlight Technology
Display Screen Coating
ComfortView with Flicker-free Screen

Dell Display Manager
Remote Asset Management
Others

Connectivity

Connectors

Design features

Adjustability
Security
VESA Mounting Support

Power

AC Input
voltage/frequency/current
Power Consumption (Normal Operation)

Dimensions (with stand)

Height (Compressed ~ Extended)
Width
Depth

Weight

Weight (panel only)
Weight (with stand and cables)
Shipping Weight

Standard Service Plan

Optional Service Plan

Environmental Compliance

Dell UltraSharp 27 Monitor – U2722D
68.47 cm (27 inches)
596.7 mm (23.49 inches)
335.7 mm (13.21 inches)
2560 x 1440 @ 60Hz
16:9
0.2331 mm x 0.2331 mm
108.78
350 cd/m² (typical)
100% sRGB, 100% Rec.709, 95% DCI-P3
Delta E < 2 (average) for sRGB and Rec.709
1.07 billion colors
1000:1 (typical)
178° vertical / 178° horizontal
8 ms (Normal mode); 5 ms (Fast mode)
In-Plane Switching Technology
LED

Anti-glare treatment of the front polarizer (3H) hard coating
Yes with ComfortView Plus, built-in low blue light screen (TUV Rheinland certified – Low Blue Light Hardware Solution and Flicker Free)
Yes with Dell Easy Arrange and other key features
Yes, via Dell Command | Monitor
Daisy Chaining with Multi Monitor Sync to synchronize key OSD settings, Picture-by-Picture, Picture-in-Picture

1 x DP 1.4 (HDCP 1.4)
1 x HDMI 1.4
1 x USB-C (USB 3.2 Gen2, 10Gbps) upstream port, data only
1 x DP (Out)
2 x super speed USB-A (USB 3.2 Gen2, 10Gbps) downstream ports
1 x super speed USB-A (USB 3.2 Gen2, 10Gbps) with B.C 1.2
1 x USB-C (USB 3.2 Gen2, 10Gbps, Up to 15W charging) downstream port
1 x Analog 2.0 audio line out (3.5mm jack)

Height-adjustable stand (150 mm), Tilt (-5° to 21°), Swivel (-45° to 45°), Pivot (-90° to 90°)
Security lock slot (cable lock sold separately), Anti-theft stand lock slot (to panel)
VESA mounting holes (100 mm x 100 mm — behind attached VESA cover)

100 VAC to 240 VAC / 50 Hz or 60 Hz ± 3 Hz / 1.6 A (maximum)

<0.3 W (Off Mode)
<0.5 W (Standby Mode)
25 W (On Mode)
74 W (Maximum)

385.1 mm ~ 535.1 mm (15.16 inches ~ 21.07 inches)
611.3 mm (24.07 inches)
185.0 mm (7.28 inches)

4.38 kg (9.66 lb)
6.61 kg (14.57 lb)
9.62 kg (21.21 lb)

3 Years Advanced Exchange Service^a & Limited Hardware Warranty⁷, Premium Panel Exchange

Dell ProSupport³

ENERGY STAR[®] certified monitor, EPEAT[®] Gold registered where applicable⁴, RoHS Compliant, TCO Certified Edge Displays, BFR/PVC Free monitor (excluding external cables), Meets NFPA 99 leakage current requirements, Arsenic-Free glass and Mercury-Free for the panel only

What's in the box?

Components

- Monitor with stand

Cables

- Power Cable
- DisplayPort Cable (DP to DP) - 1.8 M
- USB Type-C[®] to Type-A Cable - 1 M

Documentation

- Quick Setup Guide
- Factory Calibration Report
- Safety and regulatory information

Connectivity and Accessories

DELL ULTRASHARP 27 MONITOR | U2722D

Purposeful design, built for ergonomic comfort.



Connectivity



- | | | | |
|----------------------|-----------------------------------|--|--|
| 1 Security lock slot | 5 Stand lock | 8 Super speed USB 10Gbps (USB 3.2 Gen2) Type-A Downstream port (2) | 10 Super speed USB 10Gbps (USB 3.2 Gen2) Downstream port with Power Charging |
| 2 Power connector | 6 DisplayPort (out) | 9 Audio line-out port ¹¹ | 11 USB-C Downstream port (10Gbps, 15W) |
| 3 HDMI port | 7 USB-C Upstream port (data only) | | |
| 4 DisplayPort (in) | | | |

RECOMMENDED ACCESSORIES



DELL DUAL MONITOR ARM | MDA20

This comprehensive dual monitor and system mounting solution keeps your desk clutter-free. It is the world's first monitor arm that offers swivel angle adjustment with a flip of the switch.**



DELL SLIM SOUNDBAR | SB521A

World's slimmest and lightest soundbar*** offers exceptional audio clarity and magnetically attaches to Dell monitors¹², offering a clean desk experience.



DELL PREMIER MULTI-DEVICE WIRELESS KEYBOARD AND MOUSE | KM7321W⁶

Multi-task seamlessly across 3 devices with this premium full size keyboard and sculpted mouse combo with programmable shortcuts and 36 months battery life.¹³

* Dell monitors are #1 Worldwide for 7 consecutive years (2013, Q2 to 2020, Q3)! Source: IDC Worldwide Quarterly PC Monitor Tracker, Q3, 2020.

** Based on internal analysis, November 2019.

*** Based on Dell analysis of publicly available specs of comparative attachable monitor soundbars, July 2020.

1 TÜV Rheinland certified – Low Blue Light Hardware Solution and Flicker Free (ID 1111232803). For more details, visit www.tuv.com.

2 Source: Based on Principled Technologies Report commissioned by Dell. Actual results will vary. Full report: https://www.principledtechnologies.com/Dell/P2419H_monitor_productivity_1118.pdf

3 Limited to select OSD functions; applies to daisy chained monitors via DP. Please refer to the User Guide for the full list.

4 EPEAT registered where applicable. EPEAT registration varies by country. See www.epeat.net for registration status by country.

5 Learn more about Dell Display Manager software and where to download at dell.com/ddm

6 Product availability varies by country. Contact your Dell representative or visit Dell.com to learn more.

7 For a copy of the Limited Hardware Warranty, write to Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682 or see dell.com/warranty.

8 Advanced Exchange: Dell will send you a replacement monitor the next business day in most cases, if deemed necessary after phone/online diagnosis. Shipping times may vary by location and for monitors 55" and above. Fee charged for failure to return defective unit. See dell.com/servicecontracts/global.

9 Availability varies, please visit www.dell.com/support for details.

10 At panel native only, under Custom Mode preset.

11 Connect external speakers. The audio line-out does not support headphones.

12 Compatible with select Dell monitors only. Please refer to the Dell Slim Soundbar - SB521A compatibility list on dell.com

13 Based on Dell analysis of battery life usage model calculations, Nov. 2020. Results vary depending on use, operating conditions and other factors.

Dell.com/monitors

Product availability varies by country. Please contact your Dell representative for more information.

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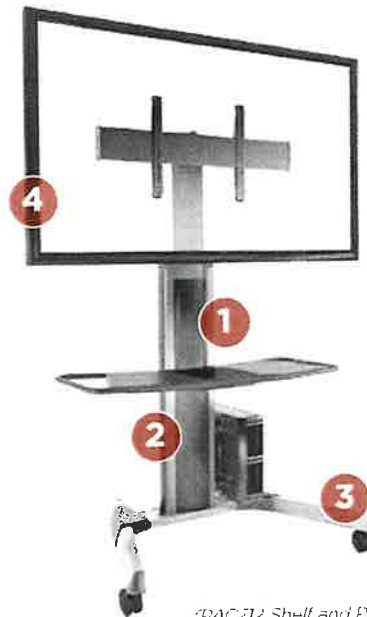


Low Blue Light
(Hardware
Solution)
Flicker Free
www.dell.com
ID 1111232803



FEATURES

- 1 SINGLE PERSON HEIGHT ADJUSTMENT**
Simply turn a knob to smoothly raise and lower the screen between 50-70" (127-177 mm).
- 2 CABLE MANAGEMENT**
Flexible cable covers allow access to lay in cables at any point along the column.
- 3 SMOOTH POSITIONING**
Large rolling casters allow for smooth positioning. Locking casters included to help secure installation.
- 4 SLEEK AESTHETICS**
Blends in well in corporate and classroom environments.



(PAC712 Shelf and PAC256 CPU Holder not included.)

SPECIFICATIONS

Base Dimensions (WxD)	47.8 x 32" (121.2 x 81.3 cm)
Max Height (Center of Screen)	70.03" (177.9 cm)
Tilt	±5°
Weight Capacity	200 lbs (90.7 kg)
Colors	Black, Silver

WHAT YOU NEED TO KNOW

APPLICATION RECOMMENDATIONS

Ideal for video conferencing, digital signage and education environments.

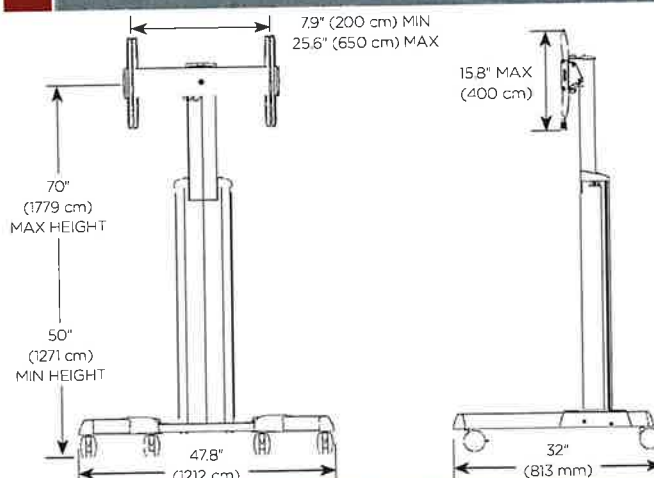
OTHER PRODUCT OPTION



LFAU

Micro-Adjustable Floor Stand

TECHNICAL DRAWINGS



RECOMMENDED ACCESSORIES



PAC712 Large Accessory Shelf



PAC256 Large CPU Holder

For a complete list of cart & stand accessories see pages 93 - 94.



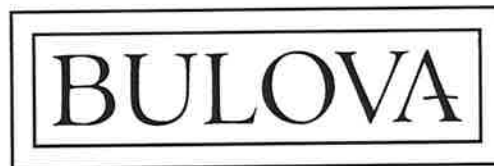
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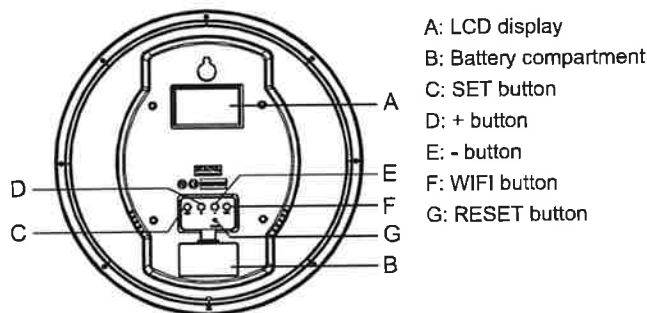
FAX
877.894.6918



Operating Instructions for Bulova Connect WIFI clocks

Features :

- **Wireless WIFI connection.**
- **Identifies the location and sets accurate time, Based on Internet time servers anywhere in the world.**
- **User friendly initial set up.**
- **Daily automatic time re calibration with internet time servers, Your clock will be accurate within 0.5 seconds every 24 hours.**



I. To Start the Clock

Remove battery compartment cover. Insert two fresh, good quality alkaline "AA" size batteries into the battery compartment making sure the battery polarity is as indicated. Reassemble battery cover.

Be sure your router signal (WI-FI) is operating. You can confirm to see if your phone or computer is receiving your home WI FI signal.

II. Initial Wi-Fi Connection

1. Press the RESET button with a paper clip or pen point. The hands will fast forward to 12 o'clock, i.e. the hour, minute and second hands move to 12:00 position. The display will show "Hands Reset". This may take up to 5 minutes.
- 2 During this period the LCD displays on case back shows

3 secondes. L'affichage LCD affichera l'heure actuelle.

2. Appuyer sur et maintenir le bouton WiFi enfoncé pendant plus de 3 secondes. L'écran LCD affichera le message « Search WLAN » [Recherche WLAN].
3. Suivre les étapes 2 à 7 sous la section « Connexion WiFi initiale » pour choisir le routeur WiFi correct et suivre les mêmes étapes pour une connexion modifiée.

V. Réglage manuel de l'heure sur le cadran

Si le serveur WiFi n'est pas disponible ou si le signal WiFi est faible, veuillez configurer l'horloge manuellement en suivant ces étapes. Dans ce mode, l'horloge ne sera pas connectée au serveur WiFi. L'heure ne sera pas automatiquement réglée pour l'heure d'été. Suivre les étapes ci-après pour configurer l'horloge.

1. Réinsérer les piles.
2. Appuyer sur le bouton RESET avec un trombone ou la pointe d'un stylo. Les aiguilles avanceront rapidement à 12 h, c.-à-d. les aiguilles des heures, minutes et secondes se déplaceront à la position 12:00. Cela peut prendre jusqu'à 5 minutes.
3. Appuyer sur le bouton RESET et le maintenir enfoncé pendant plus de 3 secondes pour accéder au mode de réglage manuel.
4. Voici la séquence d'éléments de configuration : Fuseau horaire/Année/Mois/Date/Heure/Minute/Seconde/Activation ou Désactivation de l'Heure d'été Utiliser les boutons « + » et « - » pour choisir et le bouton SET [RÉGLER] pour confirmer un réglage.
5. Une fois le réglage terminé, l'affichage LCD affiche l'heure et le jour et les aiguilles sur la surface de l'horloge afficheront la même heure.

VI. Synchronisation automatique quotidienne

L'horloge mettra à jour automatiquement les informations après avoir consulté le serveur en ligne tous les jours à un moment aléatoire entre 3 h 00 et 5 h00.

VII. Remplacement des piles

PowerEdge R350

Spec Sheet

DELLTechnologies

Deliver powerful compute with a single processor server

The Dell EMC PowerEdge R350 addresses evolving compute demands with an easy to manage rack server designed for businesses looking for affordable enterprise features.



Your Innovation Engine for businesses of all sizes

The Dell EMC PowerEdge R350, powered by Intel® Xeon® E-2300 processors, delivers increased performance and is designed for productivity and data intensive applications. It supports 3200 MT/s DDR4 speeds and 32 GB DIMMs, up to 128 GB for memory intensive workloads. In addition, to address substantial throughput improvements, the PowerEdge R350 supports PCIe Gen 4 and offers enhanced efficiency to support increasing power and thermal requirements. This makes the PowerEdge R350 a powerful and versatile server for small to mid-sized businesses to enable a variety of workloads ranging from business-critical to cloud infrastructure. It is also widely used for point-of-sale transactions and enterprise level requirements for data analysis and virtualization.

Increase efficiency and accelerate operations with autonomous collaboration

The Dell EMC OpenManage systems management portfolio tames the complexity of managing and securing IT infrastructure. Using Dell Technologies' intuitive end-to-end tools, IT can deliver a secure, integrated experience by reducing process and information silos in order to focus on growing the business. The Dell EMC OpenManage portfolio is the key to your innovation engine, unlocking the tools and automation that help you scale, manage, and protect your technology environment.

- Built-in telemetry streaming, thermal management, and RESTful API with Redfish offer streamlined visibility and control for better server management
- Intelligent automation lets you enable cooperation between human actions and system capabilities for added productivity
- Integrated change management capabilities for update planning and seamless, zero-touch configuration and implementation
- Full-stack management integration with Microsoft, VMware, ServiceNow, Ansible and many other tools

Protect your data assets and infrastructure with proactive resilience

The Dell EMC PowerEdge R350 server is designed with a cyber-resilient architecture, integrating security deeply into every phase in the lifecycle, from design to retirement.

- Operate your workloads on a secure platform anchored by cryptographically trusted booting and silicon root of trust
- Maintain server firmware safety with digitally signed firmware packages
- Prevent unauthorized configuration or firmware change with system lockdown
- Securely and quickly wipe all data from storage media including hard drives, SSDs and system memory with System Erase

PowerEdge R350

The Dell EMC PowerEdge R350 offers streamlined productivity, high-speed memory and capacity, powerful compute to address common business applications. Ideal for inside or outside the data center:

- Small to mid-sized businesses
- Remote office/branch office
- Collaboration and sharing
- Database support and management

Feature	Technical Specifications	
Processor	One Intel Xeon E-2300 series processor with up to 8 cores or one Intel Pentium processor with up to 2 cores	
Memory	<ul style="list-style-type: none"> Four DDR4 DIMM slots, supports UDIMM 128 GB max, speeds up to 3200 MT/s Supports unregistered ECC DDR4 DIMMs only <p>NOTE: For Pentium processor, maximum memory speed supported is 2666 MT/s.</p>	
Storage controllers	<ul style="list-style-type: none"> Internal controllers (RAID): PERC H355, PERC H355f, PERC H345, PERC H345f, H755, H755f, HBA355i, HBA355f, S150 Internal Boot: Internal Dual SD Module or USB or Boot Optimized Storage Subsystem (BOSS-S2): HWRaid 2 x M.2 SSDs External HBAs (non-RAID): HBA355e 	
Drive Bays	<p>Front bays:</p> <ul style="list-style-type: none"> Up to 4 x 3.5-inch SAS/SATA (HDD/SSD) max 64 TB Up to 8 x 2.5-inch SAS/SATA (HDD/SSD) max 128 TB 600W Platinum 100-240 VAC or 240 VDC redundant, hot swap 	
Power Supplies	Air cooling	
Cooling options	Up to four fans with full redundancy	
Fans	<ul style="list-style-type: none"> Height – 42.8 mm (1.69 inches) Width – 482 mm (18.98 inches) Depth – 585.3 mm (23.04 inches) without bezel 598.94 mm (23.58 inches) with bezel 	
Dimensions		
Form Factor	1U rack server	
Embedded Management	<ul style="list-style-type: none"> iDRAC9 iDRAC Direct iDRAC RESTful API with Redfish iDRAC Service Module 	
Bezel	Optional LCD bezel or security bezel	
OpenManage Software	<ul style="list-style-type: none"> OpenManage Enterprise OpenManage Power Manager plugin OpenManage SupportAssist plugin OpenManage Update Manager plugin 	
Mobility	OpenManage Mobile	
Integrations and Connections	<p>OpenManage Integrations</p> <ul style="list-style-type: none"> BMC Truesight Microsoft System Center Red Hat Ansible Modules VMware vCenter and vRealize Operations Manager 	<p>OpenManage Connections</p> <ul style="list-style-type: none"> IBM Tivoli Netcool/OMNibus IBM Tivoli Network Manager IP Edition Micro Focus Operations Manager Nagios Core Nagios XI
Security	<ul style="list-style-type: none"> Cryptographically signed firmware Secure Boot Secure Erase Silicon Root of Trust System Lockdown (requires iDRAC9 Enterprise or Datacenter) TPM 1.2/2.0 FIPS, CC-TCG certified, TCM 2.0 optional 	
Embedded NIC	2 x 1 GbE LOM	
Network Options	NA	
Ports	<p>Front Ports</p> <ul style="list-style-type: none"> 1 x iDRAC Direct (Micro-AB USB) port 1 x USB 2.0 <p>Internal Ports</p> <ul style="list-style-type: none"> 1 x USB 3.0 (optional) 	<p>Rear Ports</p> <ul style="list-style-type: none"> 1 x USB 2.0 1 x iDRAC ethernet port 1 x USB 3.0 1 x Serial port 1 x VGA
PCIe	<p>3 PCIe slots:</p> <ul style="list-style-type: none"> 1x8 Gen4 (x16 connector) low profile, half length 1x8 Gen4 (x8 connector) low profile, half length 1x4 Gen4 (x8 connector) for dedicated PERC only 	
Operating System and Hypervisors	<ul style="list-style-type: none"> Canonical Ubuntu Server LTS Citrix Hypervisor Microsoft Windows Server with Hyper-V Red Hat Enterprise Linux SUSE Linux Enterprise Server <p>For specifications and interoperability details, see Dell.com/OSsupport.</p>	
OEM-ready version available	From bezel to BIOS to packaging, your servers can look and feel as if they were designed and built by you. For more information, visit Dell.com/OEM .	

Recommended support and services

Dell ProSupport Plus for critical systems or Dell ProSupport for premium hardware and software support for your PowerEdge solution. Consulting and deployment offerings are also available. Contact your Dell representative today for more information. Availability and terms of Dell Services vary by region. For more information, visit Dell.com/ServiceDescriptions.

APEX Flex on demand

Acquire the technology you need to support your changing business with payments that scale to match actual usage. For more information, visit: www.delltechnologies.com/en-us/payment-solutions/flexible-consumption/flex-on-demand.

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