Moberly Area Community College, located at 101 College Avenue, Moberly, MO 65270, is accepting sealed bids for a Mechatronics Mobile Laboratory (MML) trailer to provide mobile classroom instruction for MACC’s Mechatronics program. The MML is to be designed with four permanent student workstations, a permanent instructor station, and utilities in place for a customer-supplied robotics workstation and/or a mechanical/process control station. For specifications, please visit our website at http://www.macc.edu/bid-results or contact Mike Klote at (573) 234-1067 x12155. Sealed bids clearly marked “Mechatronics Mobile Laboratory Bid” are due in the Office of the Career and Technical Dean, Room C01 of the Career Center, by July 20, 2015, at 11 am. A public bid opening will take place in Room C01 of the Career Center by noon after bids are due. MACC reserves the right to accept or reject any and all bids and to waive all informalities in the bidding process.
Bid Specification for Mobile Mechatronics Laboratory Trailer

Moberly Area Community College - Mechatronics Program

A. Bid for: Mobile Mechatronics Laboratory Trailer (Quantity = 1)

B. General Description

The Mechatronics Mobile Laboratory (MML) trailer is intended to provide mobile classroom instruction for the Moberly Area Community College’s Mechatronics program. The MML is intended to primarily aid in applied technical instruction in a laboratory environment. The MML is to be designed with four permanent student workstations, a permanent instructor station, and utilities in place for a customer-supplied robotics workstation and/or a mechanical/process control station.

General specifications for the converted cargo (classroom) trailer are:

- 28’ – 30’ gooseneck trailer with an internal floor plan of approximately 8’ in width, 20’ in length, and a ceiling height of approximately 7.5’ (or greater).
- Minimum tandem torsion axles with axle rating of 6,000# or better, electric brakes, approximate 4,500# (or greater) payload capability, GVWR of no more than 15,000#.
- 2 5/16” adjustable gooseneck coupler; dual front landing gear (manual crank).
- 16” aluminum or painted wheels, with radial trailer tires (load rating “E” or better).
- Painted aluminum exterior siding.
- Enclosed riser storage area with lighting, partitioned but accessible from inside trailer.
- Standard exterior marker lighting.
- 2 x 12V internal dome lights with wall switch.
- ⅜” thick plywood sidewalls with insulation, finished with aluminum or other approved commercial-grade interior wall material, white or light gray in color.
- ¾” plywood trailer flooring, with “coin-type” non-skid rubber-type or other approved commercial floor, dark gray or black in color.
- Approximate 36” wide (min. 72” height) side door with approximate location per attached drawing, with extendable side step.
- Heavy duty rear ramp door w/ coin-type flooring (or approved equivalent).
- Vinyl or otherwise finished internal ceiling with insulation, white in color.
- Spare tire and inside spare tire mount.
• 12kW commercial generator with 120/240VAC trailer power service & 50A electrical panel (see Detail Specifications for additional information and 120VAC wiring requirements).

• 50A automatic transfer switch with wiring for external power if available.

• Internal electrical wiring per detail specifications.

• 2 x approximate 15.0 BTU roof mounted air conditioners with heatstrips.

• Internal thermostat.

• Approximate 10 CFM air compressor (located in riser area) and plumbed per detail.

• 4 x student work stations per detail.

• 1 x instructor work station per detail.

• Internal multimedia and network wiring per detail.

• 12” x 24” ceiling mounted projector mounting plate with power and video connections.

• Recessed wall E-Track per detail.

• Recessed floor E-Track as per detail.

• Wall mounted LabVolt single-rail and dual-rail workstations per detail.

• Custom designed graphics, printed, mounted full exterior wrap.

• Delivery to Moberly Area Community College.

C. Detail Specifications

1. Generator and internal power wiring

Generator and trailer wiring to include:

12kW commercial-grade generator with 50A power panel. Generator should have the following features:
  - 25’ remote wiring harness
  - generator compartment with exterior door
  - exterior fueling system
  - 12V starting system with remote start (inside trailer)

Internal power wiring is to include standard 120V/15A (or 20A) duplex receptacles as per supplied drawings (Drawings 6-8). Wiring is to be done within the trailer wall with no external conduit or Wiremold™. Additionally, two internal 12VDC dome lights are to be installed with wall switch.
120VAC lighting to include a minimum of four 4’ florescent light fixtures (or other comparable lighting) ceiling or ceiling-wall angle mounted to provide adequate lighting for student lab-type working environment. Florescent lighting to include wall switch per drawing.

1 x 120VAC exterior GFI outlet to be supplied, and 1 x 120VAC additional outlet in enclosed riser section.

2. Other utilities

Additional utilities are to include the following items:
- 35k - 40k BTU Hydroflame furnace (or equivalent heating capabilities), with LP tanks mounted in enclosed riser section. For an electrical heating option the specified generator should be sized accordingly. Furnace to be bid as separate line item to allow for budgetary reduction if necessary.

- Minimum 10 CFM compressed air system mounted in enclosed riser section with four workstation compressed air drops located per drawing. Compressed air system to have mounted air regulator, drainable water separator, and air gauge. Compressor outlet should have ball valve shutoff. Each workstation air drop should be supplied with a standard quick disconnect fitting (female).

3. Multimedia/network infrastructure

The multimedia and network infrastructure is to consist of internal LAN wiring and overhead projector wiring.

The internal LAN is to consist of two CAT6 cables ran from the instructor station to each of the four student workstations (both cables to exit below the student workstation top per drawing). Standard CAT6 Ethernet jacks are to be supplied at each cable end. The instructor station’s 8-point connection point should be mounted below the desk per drawing.

Multimedia wiring is to consist of a VGA cable ran from below the instructor station desktop to the overhead projector mounting plate. Projector mounting plate should be approximately 12” x 24” x ¾” and allow for fastening of standard projector mount. User will provide projector screen dimensions and mounting information.

4. Student/Instructor Workstations & LabVolt Wall Rail Mounting

Student and instructor workstations are to be constructed of minimum ¾” commercial grade laminated composite material or finished hardwood (or combination). Student workstations (four total) are to be approximately 30” high, 24” deep, and 48” wide (see detail). Instructor station is to be constructed from the same material, be the same height as student workstations and be approximately 36” wide. Instructor station is to have angled top similar to that shown in Drawing #5.

Both instructor station and student workstations will have a 2” hole (with grommet) cut through top for cabling. Users will furnish computers, monitors, monitor/CPU mounts, and required cables.
Electrical outlet and network connections for student workstations and instructor station should be located in approximate locations identified in drawings.

A single LabVolt 3105-B0 dual-rail module rack (or two LabVolt 3105-A0 single-rail racks) is to be mounted approximately 20”-22” above the top surface of each workstation. Module racks can be mounted into a metal angled steel/aluminum structure or a fabricated enclosure made from the same material as the workstations. The bottom or top of the rack structure/enclosure can be left open or closed.

In addition, two LabVolt 3105-A0 single-rail racks (or a single dual-rail rack) should be mounted on opposing wall above the user-supplied mechanical training table (see drawing). The single/dual rails should be at the same approximate height as those above the student workstations.

The front surface of the LabVolt single/dual-rail modules should extend no more than 8” from the surface of the associated trailer wall.

5. Drawings & Additional Information

Attached drawings are for general information concerning bid requirements, and are not meant for exact placement of indicated components. Exact dimensions are dependent on numerous factors related to trailer construction and materials utilized for construction.

Bid awardee agrees to work with MACC representative to finalize specific dimensions and exact location of utilities and classroom components. MACC reserves the right to approve finalized construction details prior to trailer construction.
Mobile Mechatronics Laboratory – General Floor Layout

Notes:

- Dimensions shown are approximate interior layout
- User will supply mechanical bench and robotic work cell
- User will supply specific projector and screen models and mounting dimensions
- E-Track not shown (see Drawing #2 and Drawing #9)
Mobile Mechatronics Laboratory – Classroom Layout

Student Station #1
Student Station #2
Student Station #3
Student Station #4

Instructor Station

LabVolt 3105-B0
LabVolt 3105-B0
LabVolt 3105-B0
LabVolt 3105-B0

Mechanical Training Bench (user-supplied)

Robotics Work Cell (user-supplied)

E-Track

Overhead Projector

Projector Screen

LabVolt 3105-A0
LabVolt 3105-A0
General Considerations

1. Student workstation bench general dimensions:
   - 30" H
   - 48" W
   - 24" D

2. Material to be minimum ¾” thick commercial grade laminated composite or finished hardwood.

3. LabVolt (Festo) instrumentation racks are to be mounted approximately 20"-22" above top of workbench. Instrumentation rack(s) can be either LabVolt 3105-BO dual-rail rack, or two (2) LabVolt 3105-A0 single-rail racks.

4. LabVolt instrumentation racks can be mounted to suitable angled steel or aluminum (painted) structure, or ¾” laminated material fabricated enclosure. Enclosure or metal structure can continue down wall to bench top if needed. However, structure should be mounted to trailer wall. Front face of LabVolt instrumentation rails should extend no more than 8" from wall surface.

5. Three 120VAC duplex outlets are to be installed for each workstation in the general locations identified. Two Ethernet ports are to be installed below the surface of the workbench with CAT6 cables ran to Instructor Station.

6. User will supply small form factor PC, computer mount, LCD monitors, and monitor mounting brackets. Bench top should have 2” access hole cut through top for cable access to PC mounted below bench.
General Considerations

1. Student workstation bench general dimensions:
   - 30" H
   - 48" W
   - 24" D

2. Material to be minimum ¾” thick commercial grade laminated composite or finished hardwood.

3. LabVolt (Festo) instrumentation racks are to be mounted approximately 20"- 22" above top of workbench. Instrumentation rack(s) can be either LabVolt 3105-BO dual-rail rack, or two (2) LabVolt 3105-A0 single-rail racks.

4. LabVolt instrumentation racks can be mounted to suitable angled steel or aluminum (painted) structure, or ¾” laminated material fabricated enclosure. Enclosure or metal structure can continue down wall to bench top if needed. However, structure should be mounted to trailer wall. Front face of LabVolt instrumentation rails should extend no more than 8" from wall surface.

5. Three 120VAC duplex outlets are to be installed for each workstation in the general locations identified. Two Ethernet ports are to be installed below the surface of the workbench with CAT6 cables ran to Instructor Station.

6. User will supply small form factor PC, computer mount, LCD monitors, and monitor mounting brackets. Bench top should have 2” access hole cut through top for cable access to PC mounted below bench.
Mobile Mechatronics Laboratory – Instructor Station (top view)

General Considerations

1. Instructor station to be constructed of same material as student work stations.

2. Height and depth of instructor work station are the same as that of student work stations.

3. User-supplied PC to be mounted under station surface.

4. Eight student Ethernet cables to be routed underneath work surface.

5. One 120VAC duplex outlet to be installed above work surface, and one below work surface.

6. Two inch access hole to PC cut into work surface in approximate location in drawing.
Mobile Mechatronics Laboratory – Classroom Electrical

Student Station #1
Student Station #2
Student Station #3
Student Station #4
Instructor Station
Mechanical Training Bench (user-supplied)
Overhead Projector Mounting Plate
Robotics Work Cell (user-supplied)

June 19, 2015
Mobile Mechatronics Laboratory – Classroom Electrical (student work station wall)

20’

LabVolt 3105-B0
Student Station #1

LabVolt 3105-B0
Student Station #2

LabVolt 3105-B0
Student Station #3

LabVolt 3105-B0
Student Station #4

Instructor Station

△ x8  △ VGA
Mobile Mechatronics Laboratory – Classroom Electrical (mechanical bench wall)

20' Mechanical Training Bench (user-supplied)

20' LabVolt 3105-A0

20' LabVolt 3105-A0

Robotic Work Cell (user-supplied)
Mobile Mechatronics Laboratory – Classroom Mechanical (mechanical bench wall)

- Robotics Work Cell (user-supplied)
- E-Track
- Mechanical Training Bench (user-supplied)
- Pneumatic quick disconnect (x4)

LabVolt 3105-A0
LabVolt 3105-A0

20’