INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai 400076

Purchase Requisition No. 1000011951 (SRM/RFX No. 6100000193)

Technical Specifications of Motorized Stages with Integrated Controllers

1. **Linear motor stage, 110mm travel, built-in controller, analog linear encoder, integrated IO**
   Purpose : Fiber pulling
   Quantity required : 2
   Specifications : Linear translational stage
   Accuracy - 1 um (or better)
   Travel range - 100 mm (or higher)
   Velocity achievable - 0.2 mm/s(or higher)
   Acceleration achievable - 1mm/s^2 (or higher)
   Built-in encoder with repeatability of 80 nm(or lower)
   Centered load - 100N(or higher)
   Built-in controller preferred

2. **Linear motor stage, 0150 mm travel, built-in controller, analog linear encoder, with IO with Accessory kit**
   Purpose : Flame translation (bottom-most stage)
   Quantity required : 1
   Specifications : Linear translational stage
   Accuracy - 1.5 um(or better)
   Travel range - 100 mm (or higher)
   Velocity achievable - 4 mm/s(or higher)
   Acceleration achievable - 800 mm/s^2 (or higher)
   Centered load - 250N(or higher)
   Built-in controller preferred

3. **Motorized stage, integrated encoder and controller, 200mm travel, fine resolution, with manual control**
   Purpose : Flame positioning
   Quantity required : 1

Specifications : Stepper motorized translational stage
Accuracy - 50 um(or better)
Travel range - 150 mm (or higher)
Velocity achievable - 50mm/s(or higher)
Centered load - 100N(or higher)
Built-in controller preferred

4. **Adaptor plate, bottom compatible with linear stage, anodized**
   Quantity required : 2
5. **Adaptor plates, top compatible with motorized stage, anodized**
   Quantity required : 1
6. **Data cable 2 feet**
   Quantity required : 1
7. **Data cable 6 feet**
   Quantity required : 1
8. **Data cable 2 feet, comms only and no power**
   Quantity required : 1

NOTE :

- Mount compatibility between each of the stages is mandatory
- Interface and adapter cables to be included
- Power cords and supply needs to be compatible with Indian standard
- Power cords need to be portable with the Indian socket standards for 7A/15A
- Controlling software for all stages should be provided for Windows 7 or higher
- All the above mentioned stages are required to use a unique protocol that uses a command-reply model, such that:
  - ➔ The user must initiate all communication by sending a device a command.
  - ➔ Unless explicitly disabled, a device always responds with one reply immediately after a command has been received
  - ➔ Unless explicitly enabled, a device never sends a message unless in response to a command
  - ➔ The unique command protocol should be inclusive of the following:
    1. **Message type**: The message type for a command has to be a required field and always be the same, eg: '/'.
    2. **Device address**: The address indicates which device number should perform the command
    3. **Axis number**: The axis number indicates which axis within a device should perform the command

4. **Command**: The command message data contains the command information
5. **Command Parameters**: This message data contains command parameters and data. The contents need to be space-delimited and case-sensitive.
6. **Message checksum**: The message checksum causes a device to reject a message that has been corrupted during transmission.
7. **Message Footer**: The footer indicates end-of-message
8. **Message ID**: It causes responses (including reply and info responses) to the command to include the same message ID

The reply protocol should be inclusive of the following:

1. **Message type**: The message type for a reply should always be the same.
2. **Device address**: The device address contains the address of the device sending the reply and should always be formatted in a fixed number of digits.
3. **Axis number**: The axis number limits the scope of the reply
4. **Reply flag**: The reply flag indicates if the message was accepted or rejected
5. **Status**: The status contains different states when the axis is moving and otherwise
6. **Warning Flag**: The warning flag contains the highest priority warning currently active for the device or axis
7. **Message Checksum**: A reply checksum provides a method for error detection
8. **Message Footer**: Indicates the end of reply