

Product Specifications: The Soft Limit System

Functional Specifications

The Motion Laboratories Soft Limit System shall be designed to provide multiple user defined pre-programmed positions (soft limits) for permanently installed electric chain hoists, either individually or in groups; primarily for the precise and repeatable positioning of components such as scoreboards, speaker clusters, LED and video walls.



Features

- The system shall provide control for hoists in either individual or group mode.
- The system shall allow the programming of user defined soft limits with auto-stops controlled by the operating system.
- The system shall use programmable logic control (PLC) as the operating system.
- The system operator interface shall be an HMI touch screen; which will allow the user to choose between components and select predetermined soft limits.
- The HMI shall have access to the PLC system over a Local Area Network.
- The system shall have several access points for the LAN in key areas to allow the HMI to be utilized within sight of the hoists being operated.
- The system shall be modular and can be integrated with Motion Labs' Load*Cells™, which shall provide weight monitoring in real time with shutdown capability upon overweight or underweight conditions.
- Each hoist in the system shall be monitored for position and movement.
- The system shall have a E-Stop and will shut down power to all hoists upon activation.
- The system E-Stop shall be reset at the power cabinet location.
- The system Power and Control Cabinets shall be designed to provide distribution and operating commands to all hoists in each component.
- The system control cabinet shall have local access for a manual remote station allowing override and standard analog operation.

System Components and Physical Specifications

The Soft Limit System shall be custom configurable based on the number of hoists and positions required for each individual venue and application. System components will vary in scope and size based on these criteria. The Motion Laboratories Soft Limit System shall be comprised of one or more of the following components:

Power Cabinets

Each Power Cabinet shall contain the main components for the system, including the following:

- The Power Cabinet shall have a Main breaker with an interlock door switch (Square D FAL series or equivalent).
- The Power Cabinet shall have E-Stop Contactors (IEC rated).
- The Power Cabinet shall have power fuses for each motor circuit (TR type dual element).
- The Power Cabinet shall have control circuit over current protection (AGC).
- The Power Cabinet shall be specified as Hoffman CSD Concept wall mount enclosure or equivalent.
- The Power Cabinet components shall be mounted on a .125" thick aluminum back plate finished in white gloss powder coat.
- The Power Cabinet enclosure finish shall be ANSI 61 gray polyester powder paint inside and out.
- The Power Cabinet shall have a wall mounted bracket kit.
- The Power Cabinet enclosure shall be labeled with:
 1. The manufacturer's name.
 2. Rating labels indicating the number and horsepower of the hoists for which the system is intended to be used.
 3. Internal wiring schematic.
 4. Fuse size chart.

- The Power Cabinet shall be designated 1225-A-XX-XXX. The first set of XX numbers refer to the number of channels, the second set account for system variables.

Control Cabinets

The Control Cabinet shall contain the main components for the system, including the following:

- The Control Cabinet shall have an MLI designed and manufactured Control Relay Board (s).
- The Control Cabinet shall have a 12VDC Linear Power Supply (s).
- The Control Cabinet shall have a Contactor Drive Relay (s).
- The Control Cabinet shall have an MLI designed and manufactured Local Remote Card (s).
- The Control Cabinet shall have control circuit over current protection (TR and AGC type).
- The Control Cabinet front door panel shall have a 26 pin control connector (s) and a key switch that de-energizes power to the control circuit power supply.
- The Control Cabinet shall have Wago Spring Clamp terminal blocks.
- The Control Cabinet shall be specified as a CSD Hoffman style enclosure or equivalent.
- The Control Cabinet components shall be mounted on a .125" thick aluminum back plate finished in white gloss powder coat.
- The Control Cabinet enclosure finish shall be ANSI 61 gray polyester powder paint inside and out.
- The Control Cabinet shall have a wall mounting bracket kit.
- The enclosure shall be labeled with:
 1. The manufacturer's name.
 2. Internal wiring schematic.
 3. Fuse size chart.
 4. Number of channels.
 5. Duty rating and input voltage.
- The Control Cabinet shall be designated 1225-B-XX-XXX. The first set of XX numbers refer to the number of channels, the second set account for system variables.

Programmable Logic Control Box (optional)

- The PLC Box enclosure shall be determined by the size and complexity of the system.
- The PLC Box shall have a Schneider brand PLC with power supply and I/O modules.
- The PLC Box shall have an Encoder Interface Card (s).
- The PLC Box shall have Wago spring clamp terminal blocks.
- The PLC Box shall be designated 1225-D series.

Power & Control Fly Boxes

- The Power & Control Fly Boxes shall have a connector choice determined by the customer.
- The Power & Control Fly Boxes shall be specified as Hoffman ASE series screw cover pull boxes or equivalent.
- The Power & Control Fly Boxes shall be 6"x6"x4" or 8"x10"x4".
- The Power & Control Fly Boxes enclosure finish shall be ANSI 61 gray polyester powder paint inside and out.
- The Power & Control Fly Boxes shall have a cover plate manufactured from .090" thick aluminum with a black powder coat finish.
- The Power & Control Fly Boxes shall be laser engraved with manufacturer's logo and labeled with the connector pin-out designation and part number.
- The Power & Control Fly Boxes shall be designated A-26-201 series.

Encoder Fly Box

- The Encoder Fly Boxes shall have a Neutrik 6 pin XLR receptacle.
- The Encoder Fly Boxes shall be specified as Hoffman ASE series screw cover pull boxes or equivalent.
- The Encoder Fly Boxes shall be 6"x6"x4".
- The Encoder Fly Boxes enclosure finish shall be ANSI 61 gray polyester powder paint inside and out.
- The Encoder Fly Boxes shall have a cover plate manufactured from .090" thick aluminum with a black powder coat finish.

- The Encoder Fly Boxes shall be laser engraved with manufacturer's logo and labeled with the connector pin-out designation and part number.
- The Encoder Fly Boxes shall be designated A-26-003 series.

HMI (Human Machine Interface)

- The HMI shall be a Schneider brand HMI touch screen.
- The HMI shall be either a hand-held or desktop device, depending on the size of the system.
- The HMI shall include an E-Stop mushroom switch.
- The HMI shall include a Cat5 or Cat6 Ethernet connection.
- The HMI shall be designated A-17-005 series.

Remote Network Access Box

- The Remote Network Access Box shall have a 24VDC power supply.
- The Remote Network Access Box shall have an Ethernet switch.
- The Remote Network Access Box shall vary in size based on the system configuration.
- The Remote Network Access box shall be designated as a A-26-003 series.

Power Conditioners

- The Power Conditioner shall have a power rating 1440 VA/1008 Watts.
- The Power Conditioner shall have a low distortion sine wave.
- The Power Conditioner shall have a transfer time of 4ms typical.
- The Power Conditioner shall be 60Hz.
- The Power Conditioner shall have T.H.D Max w/100% resistive load shall be <3% in battery.
- The Power Conditioner shall have an online efficiency without charger of 94%.
- The Power Conditioner shall have an input and output voltage of 120VAC.
- The Power Conditioner shall have an input current rated at 12 amps.
- The Power Conditioner shall have an output current rating of 8.5-10.6 amps.
- The Power Conditioner shall have an input voltage range without using the battery of 96-151VAC.
- The Power Conditioner shall have an output regulation on the mains of +/- 10% and on battery it shall be +/- 5%.
- The Power Conditioner shall have a backup time of 4-6 minutes.
- The Power Conditioner shall be designated MLI-UPM series.

E-Stop Box

- The E-Stop Box shall contain a Telemechanique mushroom switch.
- The E-Stop Box shall be specified as Hoffman ASE series screw cover pull boxes or equivalent.
- The E-Stop Box shall be 6"x6"x4".
- The E-Stop Box enclosure finish shall be ANSI 61 gray polyester powder paint inside and out.
- The E-Stop Box shall have a cover plate manufactured from .090" thick aluminum with a black powder coat finish.
- The E-Stop Box shall be laser engraved with the manufacturer's logo and labeled with part number.
- The E-Stop Box shall be designated as A-26-002 series.

Electrical Specifications

The system shall be designed to operate within the current and voltage rating of the specified input.

Environmental Specifications

The system shall be NEMA 1 rated for indoor use only.

Ratings and Certifications

Motion Laboratories' install Soft Limit System shall be a listed product as defined by the Occupational Safety and Hazard Association (OSHA). It has a cETLus sticker and is designed and built, where applicable, to the following standards: UL508A and the Canadian Electric Code (C22.2. NO.14).