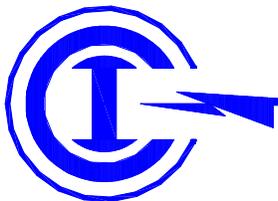


Serial Number: _____
(Please refer to this number for service)

**Exer 3/6 Treadmill,
Treadmill Controller
and Treadmill Software
Instruction Manual**

0257-905L, 03/21/2021
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SECTION 1

INTRODUCTION

1.0 System Overview

The Columbus Instruments Exer 3/6 Treadmill is an economical treadmill designed for general-purpose animal exercising. The overall running surface is divided into individual lanes by use of clear or opaque lane dividers. By default, the outermost lane dividers are clear to allow the user to view the animal in the outside lanes. All remaining dividers are opaque to provide isolation. The treadmill is capable of exercising from 1 to 3 rats or from 1 to 6 mice simultaneously. The running surface can be inclined up to 25° above the horizontal in 5° steps. An optional Downhill Running Adapter allows the running surface to be declined down to 15° below the horizontal in 5° steps. A safety platform at the end of the belt will rescue injured or slow moving animals. The floor of the platform can be replaced with stainless-steel grids which allow the application of electric stimulus (shock) or air-puff stimulus for exercise training. A clear one-piece lid and hinge cover all of the lanes. The lid and dividers are easily removed for cleaning. The use of a brushless motor provides very long life and eliminates the need for brush replacement or commutator refinishing.

The Treadmill Controller functions as the control interface for the Exer 3/6 Treadmill. It provides controls to set the belt speed and optional configured stimulus. The belt speed is adjustable from 0.0 to 102.3 meters per minute (m/min) and can be commanded to stop, run, or accelerate. The exercise session can be set to run automatically for a fixed duration of time or distance, providing the exact same exercise regimen to multiple groups of animals, typical for day-to-day exercise in between experiment sessions. A two-line LCD display reports the current speed setting, treadmill belt status, odometer distance or time, the acceleration settings and the stimulus settings. The Treadmill Controller can automatically calibrate the treadmill belt speed and odometer distance using the optional Speed Sensor.

The optional electric stimulus is a 200ms pulse of current. The maximum current is 2.34mA and is gated by the stimulus repetition rate which can be set to 1, 2 or 3 times per second (Hertz, Hz). This results in the maximum average current of 1.42mA. Likewise, the optional air-puff stimulus is the same 200ms burst of air up to a maximum pressure of 40PSI (2069mmHg). The animal is detected by way of a capacitive touch sensor on each grid, therefore, NO ELECTRIC CURRENT is used to detect the animal. The stimulus repetition rate can be set to 1, 2 or 3 times per second. Individual toggle switches associated with each lane on the Exer 3/6 treadmill controls the application of the stimulus to each lane.

The Treadmill Software communicates with the Treadmill Controller to provide PC-controlled exercise sessions saved as experiments. All of the treadmill settings, less the stimulus intensity, can be set and continuously varied throughout the session. During an experiment, all of the data reported by all components of the system, are logged in user-defined intervals to an output *.CSV file. This common file-type can then be imported into various spreadsheet tabulation programs such as Excel.

1.0 System Overview (continued)

Summaries of the features are as follows:

- The Exer 3/6 Treadmill can exercise 1-3 rats or 1-6 mice simultaneously.
- Any combination of clear or opaque lane dividers can be used.
- +25° of inclination in 5° steps.
- Optional -15° of declination in 5° steps.
- Brushless motor ensures long life with no maintenance!
- Treadmill belt speed is adjustable from 0.0 to 102.3 meters/minute.
- Acceleration is adjustable from 0.0004 to 25.5 meters/minute/second.
- Automatically timed exercise sessions up to 4:15:59s in 1s steps.
- Automatic distance limited exercise sessions up to 9,999.0 meters in 1.0 meter steps.
- Optional automatic treadmill belt speed and odometer distance calibration using the speed sensor.
- Optional Electrical Stimulus, up to 2.34mA, 200ms pulse, 1, 2 or 3 times per second.
- Optional Air-Puff Stimulus, up to 40PSI (2069mmHg), 200ms burst, 1, 2 or 3 times per second.
- The Treadmill Software commands the Treadmill Controller, Treadmill Stimulus Detection and Automated Incline Controller all in one interface!

1.1 System Specifications

1.1.0 Exer 3/6 Treadmill

Physical Dimensions:	83.8 x 50.8 x 50.8cm (33.0" x 20.0" x 20.0").
Physical Weight:	25 kilograms (55 pounds).
Mouse Lane Dimensions:	5.7 x 41.3cm (2.3" x 16.3").
Mouse Platform:	5.7 x 10.7cm with 1.0cm brush (2.3" x 4.2" with 0.4" brush)
Rat Lane Dimensions:	11.8 x 41.3cm (4.6" x 16.3").
Rat Platform:	11.8 x 10.7cm with 1.0cm brush (4.6" x 4.2" with 0.4" brush)
Angle of Inclination:	0° - 25° above the horizontal in 5° steps.

1.1.1 Optional Electric Stimulus (replaces platform)

Mouse Grid Dimensions:	0.3 x 11.4cm rods, 1.0cm apart, 5 - 6 rods typical (0.1" x 4.5" rods, 0.4" apart, 5 - 6 rods typical).
Rat Grid Dimensions:	0.3 x 11.4cm rods, 1.0cm apart, 11 rods typical (0.1" x 4.5" rods, 0.4" apart, 11 rods typical)
Stimulus Voltage:	117VAC 50/60Hz.
Stimulus Current:	up to 2.34mA.
Stimulus Duration:	200mS.
Stimulus Repetition Rate:	1, 2 or 3 Hz.
Stimulus Control:	2-position toggle switch (on/off) for each lane. The "INTENSITY" adjusts the maximum current for each lane.

1.1.2 Optional Air-Puff Stimulus (uses grid platform via capacitive touch sensor)

Stimulus Pressure:	0-40PSI (2069mmHg), 5-gallon (19-liter) reservoir typical.
Stimulus Nozzles:	Six (6) per Mouse Lane, Ø 0.055" x 0.545" L (Ø 1.4mm x 13.9mm L).
Stimulus Duration:	200mS.
Stimulus Repetition Rate:	1, 2 or 3 Hz.
Stimulus Control:	2-position toggle switch (on/off) for each lane. The "INTENSITY" adjusts the relative sensitivity of the capacitive touch sensors.

1.1.3 Optional Downhill Running Adapter (modifies treadmill feet)

Adapter Dimensions:	25.4 x 49.5 x 27.7cm (10.0" x 19.5" x 10.9").
Adapter Weight:	1.0 kilograms (2.3 pounds).
Adapter Effect:	adds +30.0cm (+11.8") to the overall height.
Angle of Declination:	0° - 15° below the horizontal in 5° steps.

1.1 System Specifications (continued)

1.1.4 Treadmill Controller

Power Requirements:	200 watts, 100, 115, or 230VAC, 50/60Hz (factory selected).
Physical Dimensions:	36.8 x 30.5 x 10.9cm (14.5" x 12.0" x 4.3").
Physical Weight:	4.8 kilograms (10.6 pounds).
User Controls:	3 x Push-Button Rotary Encoders.
Speed Sensor Conn.:	6.35mm (1/4") Female Stereo Phone Jack.
Fan Connections:	3.50mm (1/8") Female Mono Phone Jack (x4).
CI-Bus Connections:	8p8c (RJ45 Ethernet) Modular Jack (x2).
Shocker Connection:	15-pin Female D-SUB.
Motor Connection:	6-position Molex 5566 Mini-Fit Jr Male Header.
Belt Speed Range:	0.0 - 102.3 meters/minute.
Acceleration Range:	0.0004 - 25.5 meters/minute/second.
Time Limited Range:	0:00:01s to 4:15:59s.
Distance Limited Range:	1.0 to 9,999.0 meter.

1.1.5 Optional Speed Sensor

Power Requirements:	5VDC @ 100mA.
Physical Dimensions:	20.3 x 4.6 x 4.3cm (8.0" x 1.8" x 1.7").
Physical Weight:	0.2 kilograms (0.5 pounds).
Connector:	6.35mm (1/4") Stereo Phone Plug.
Wheel Diameter:	4.128cm (1.625").
Output:	100 pulses per revolution (771 pulses / meter).

1.1.6 Minimum Computer Specifications

Microsoft Windows operating system.
20 MB of free hard drive space for software installation.

1.1.7 CI-Bus Hub Interface

Power Requirements:	5VDC (from USB) @ 500mA.
Physical Dimensions:	13.5 x 11.7 x 6.35cm (5.3" x 4.6" x 2.5").
Physical Weight:	0.6 kilograms (1.4 pounds).
Computer Connection:	USB 2.0 Type "B" Jack.
CI-Bus Connections:	8p8c (RJ45 Ethernet) Modular Jack 120-ohm terminated (x4).

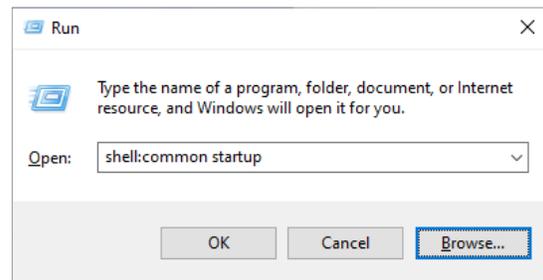
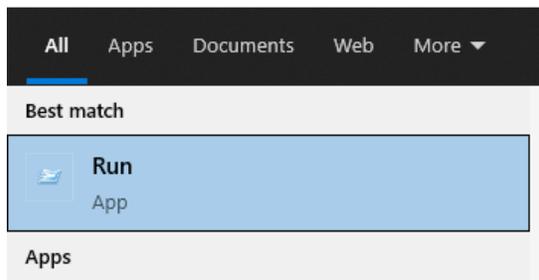
SECTION 2 COMPUTER SETUP

2.0 Treadmill Software Installation

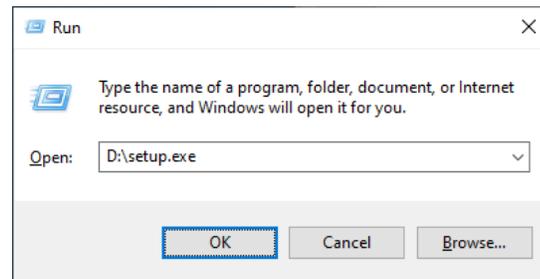
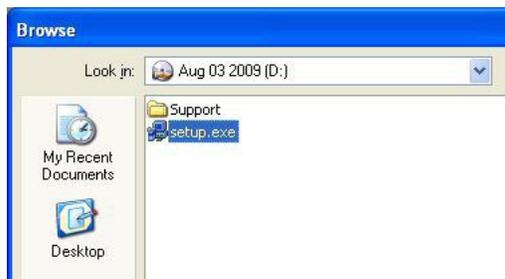
You must have administrator rights/privileges on the host computer for the software to install successfully. The software is expected to be installed and run locally on the host computer's hard drive and not from a remote mapped network resource.

Follow these steps to install the Treadmill software:

- Insert the Treadmill Software Flash Drive into the host computer.
- Type "run" in the search text box on the Windows taskbar.
- Select the "Run" App from the list. A "Run" window will open.
- Click the **Browse** button. A "Browse" window will open.



- Select the Flash Drive from the Navigation Pane.
- Then click once to highlight "Setup.exe" from the list of files and folders.
- Click the **Open** button. The "Browse" window will close and return focus back to the "Run" window.
- Click the **OK** button to begin the installation program.
- Windows may pause to ask to allow an unknown program to make changes to the computer. Click the **Yes** button to continue.



Upon initialization, some install files will be processed and copied to the host computer. These files will be removed if setup is cancelled. Then, a blue "Treadmill Software Setup" backdrop and installation window are displayed.

2.0 Treadmill Software Installation (continued)

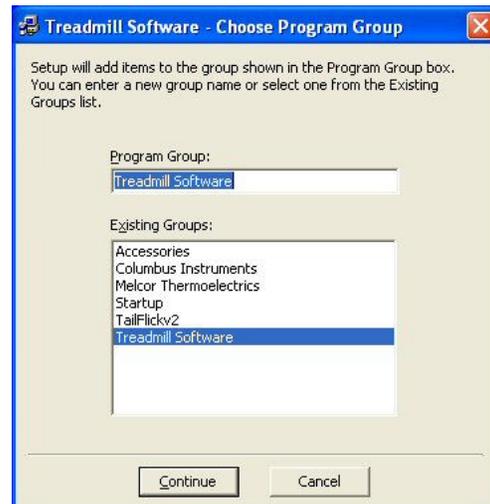
- Click the **OK** button to continue.



- Click the square button marked with a computer and floppy disks to continue.



- Click the **Continue** button to begin the copy and installation procedure into the default Program Group.



The install program will check for necessary disk space, and then begin to copy the program. It is recommend to keep any files on your system that are newer than the ones being copied. Upon completion, the program will update the Windows system and create program icons inside the group folder on the start menu.

- Click the **OK** button to finish the install program. The “Treadmill Software Setup” screen will close and return focus back to the Windows desktop.



SECTION 3 HARDWARE SETUP

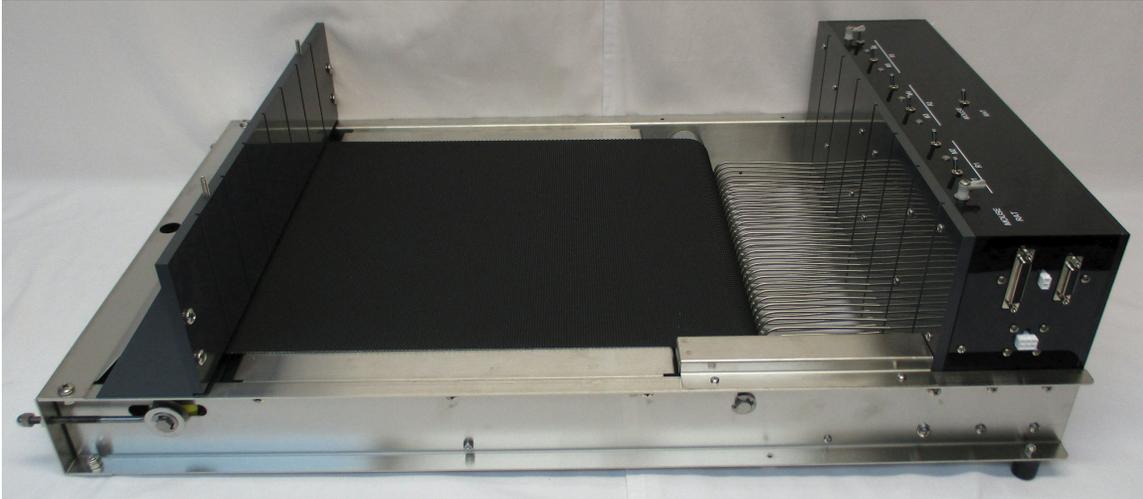
3.0 Typical Item Inventory

A typical Treadmill system contains the following items:



- 1 x CI-Bus Hub Interface, 4-ports with one CI-Bus terminator (orange/blue plug).
- 1 x USB cable, 2m (6-foot), A-B.
- 1 x CAT5 network cable, 2m (6-foot), 8p8c (RJ45).
- The Treadmill Controller with AC power cord.
- 1 x Molex Mini-Fit Jr motor cable, 2m (6-foot), 6-circuit, plug-plug.
- 1 x D-SUB shock cable, 1.8m (6-foot), 15-pin 15-conductor male-male.
- 1 x Speed Sensor.
- 1 x Instruction Manual.
- 1 x Treadmill Software Flash Drive.

3.0 Typical Item Inventory (continued)



- The Exer 3/6 Treadmill (shown with optional shock grid).



- 1 x treadmill lid
- 1 x feces tray.
- 1 x package of lane dividers: 5 opaque and 2 clear dividers are shown for mice.
- 1 x inclination rod, 51cm (20-inch) with spring pin.
- 2 x thumbnuts for securing the treadmill lid.
- 1 x 7/16-inch open-end wrench for adjusting the tension of the treadmill belt.

3.0 Typical Item Inventory (continued)

You may also need the following tools for assembling the system:

- Phillips (cross-point) screwdriver, medium tip.
- Common (flat-point) screwdriver, small tip.
- 5/16-inch (7.5mm) wrench or adjustable crescent wrench.

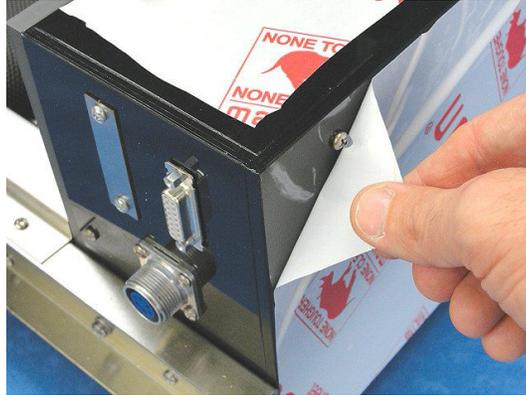
The Treadmill system is easy to assemble provided that the components of the system are placed correctly. A working surface that averages 1.3m x 1.0 m (6-foot x 3-foot, width x depth) with access to the front and back is recommended. It will facilitate adjustments to the inclination rod as well as loading and unloading the animals.

When possible, it is recommended to use an AC power strip to provide a common access to AC power for all components of the Treadmill system and the host computer. Most AC power strips incorporate a master switch that can switch on and off the AC power to the entire system and protect against electrostatic discharge. It also provides a beneficial common ground between all components to help prevent unintentional ground loops which may exist between the individual AC power outlets of a room.

3.1 Assembling the Exer 3/6 Treadmill

The Exer 3/6 Treadmill is about 90% assembled.

- Remove any protective plastic film that may cover pieces of the treadmill.

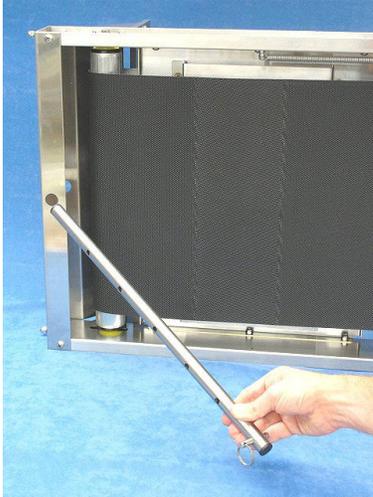


- Note that various holes are positioned along the length of the Inclusion Rod. Insert the spring pin into the hole that is most near to the end. This end of the Inclusion Rod is the bottom. The other end is the top.

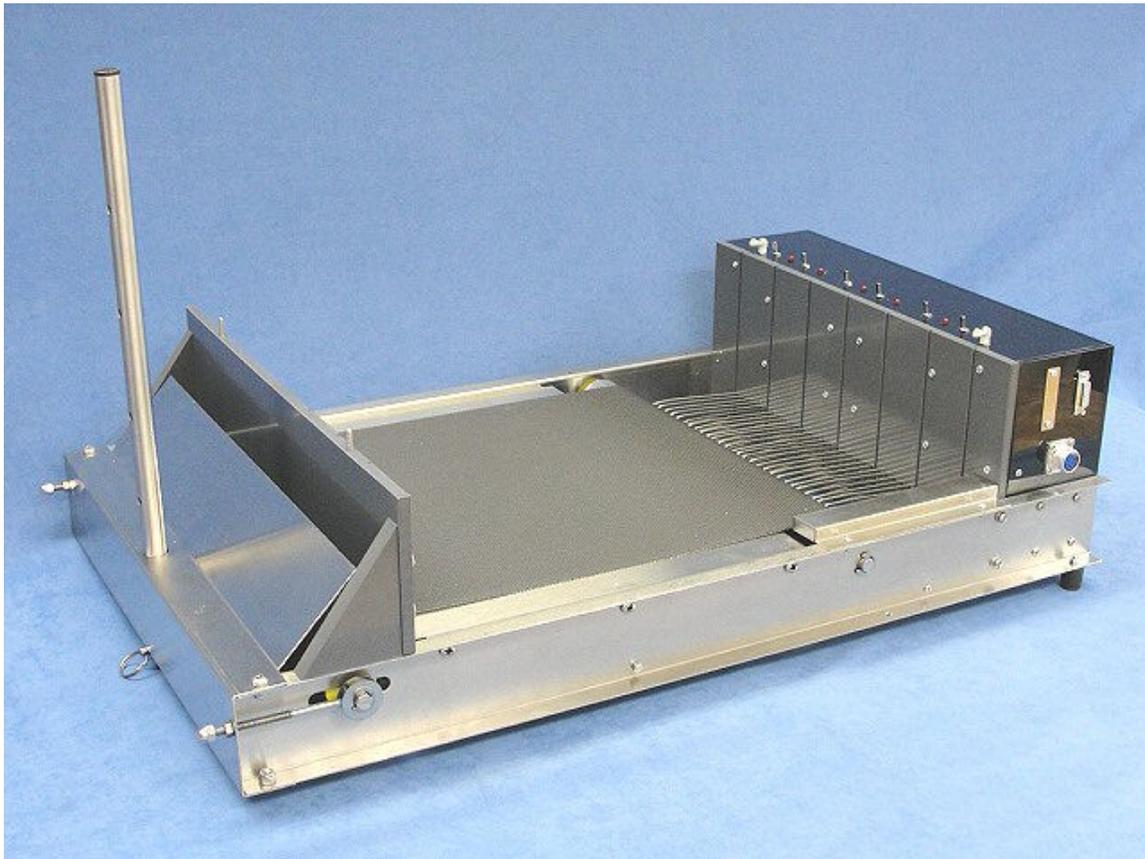


3.1 Assembling the Exer 3/6 Treadmill (continued)

- Roll the Exer 3/6 Treadmill on its side.
- Then insert the top of the Inclination Rod through the hole in the front of the treadmill.
(Now it is easier to remove the protective film from the bottom of the treadmill too).

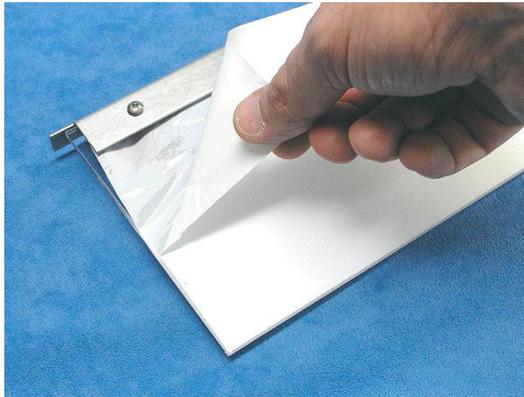


- Roll the Exer 3/6 Treadmill onto its feet.



3.1 Assembling the Exer 3/6 Treadmill (continued)

- Remove any protective plastic film that may cover the lane dividers.



- Insert one of the clear lane dividers into the set of slots on the far side of the treadmill.



- Insert all of the opaque dividers into the slots in the middle of the treadmill. Leave one set of slots vacant between the 2 dividers for rats. Or populate all 5 slots for mice (as shown).
- Then insert the other clear lane divider into the set of slots on the near side of the treadmill

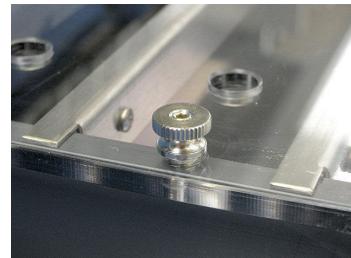
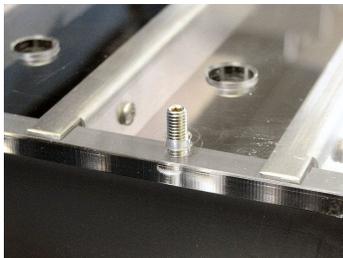
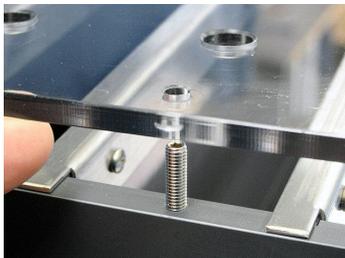


3.1 Assembling the Exer 3/6 Treadmill (continued)

- Remove all protective plastic film that may cover the treadmill cover and lid.



- Fold the lid onto the cover.
- Place the holes of the cover over the posts in the front of the treadmill and secure with the two #6-32 thumb-nuts.



3.1 Assembling the Exer 3/6 Treadmill (continued)

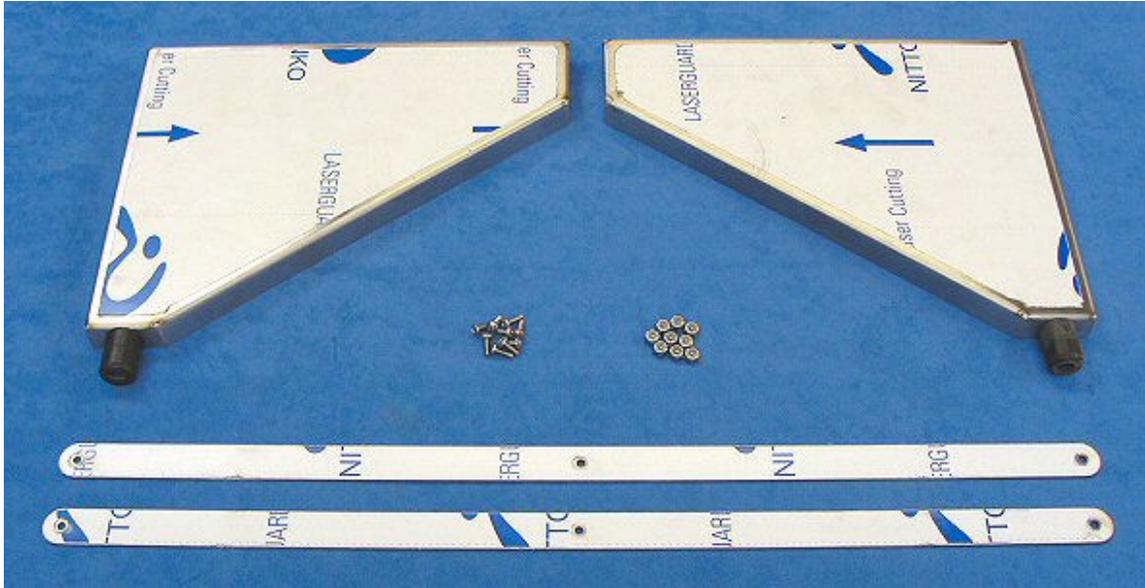
- Unfold the lid onto the treadmill and secure with the 2 clips.
- Place the Feces Tray underneath the treadmill below the platform and treadmill belt.



This completes the assembly of the Exer 3/6 Treadmill.

3.2 Downhill Running Adapter

If the Exer 3/6 Treadmill came with the Downhill running adapter, then the system should contain the following:

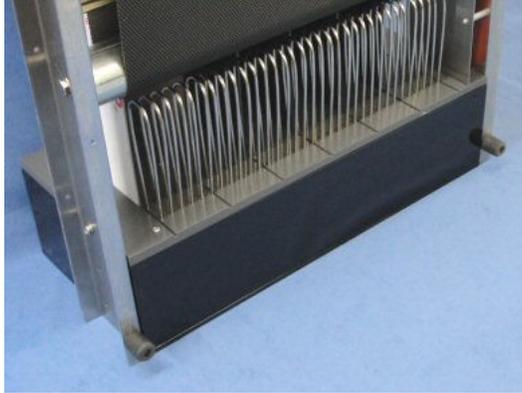


- 1 x Right leg with rubber foot.
 - 1 x Left leg with rubber foot.
 - 2 x Braces for the legs.
 - 9 x #6-32 x 3/8-inch screws.
 - 9 x #6-32 hex nuts with nylon locking inserts.
-
- Remove any protective plastic film that may cover the pieces of the Downhill Running Adapter.

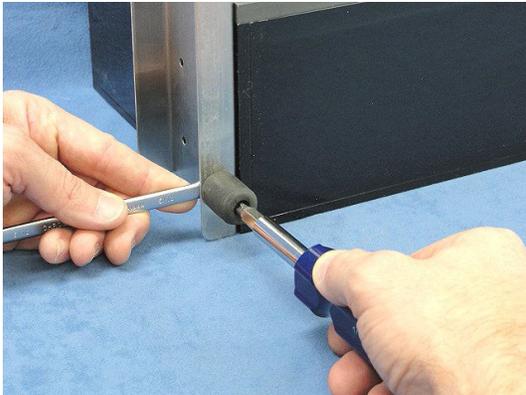


3.2 Downhill Running Adapter (continued)

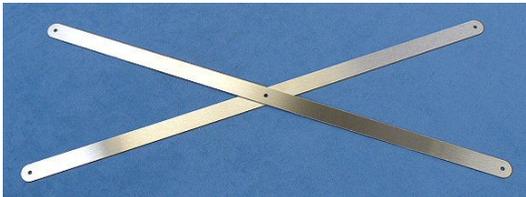
- Raise the front so the treadmill will rest entirely on the rear panel. Remove the Inclination Rod with spring pin as set aside.



- Using the Phillips screwdriver and 5/16-inch wrench, remove both feet from the bottom of the treadmill.

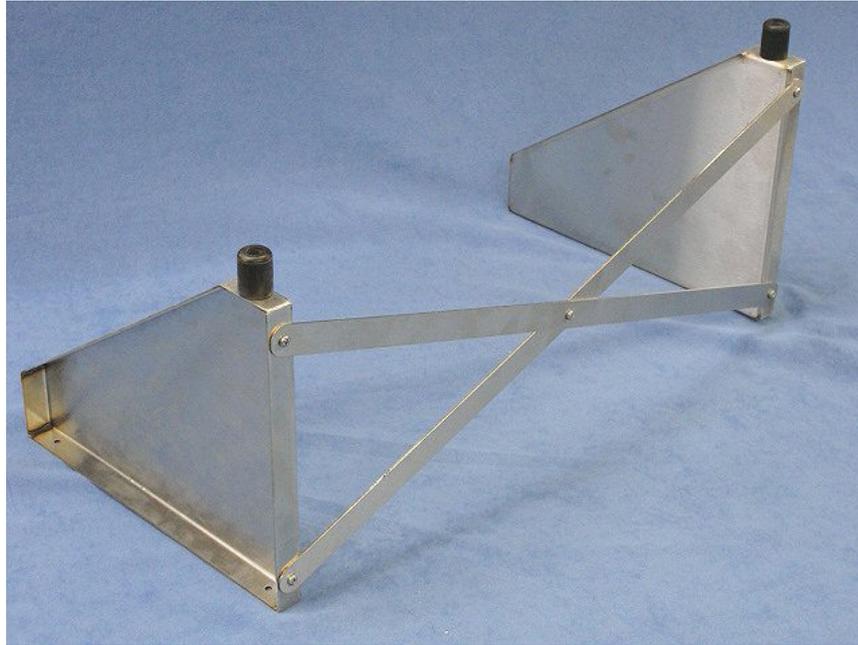


- Using one screw and nut, connect the two braces together in the middle. Do not tighten. The screw and nut should hold the braces closely together but allow them to move.

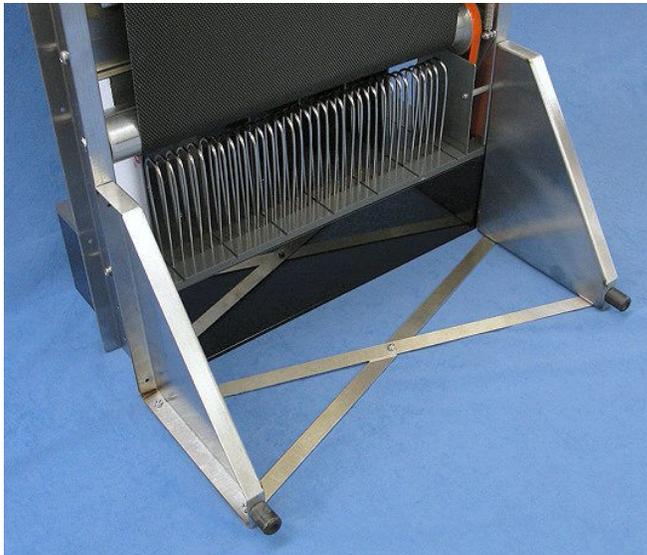


3.2 Downhill Running Adapter (continued)

- Using four screws with nuts, connect the legs and the braces together in the orientation as shown. Again, do not tighten. The screws and nuts should hold the pieces closely together but allow them to move.
- Now, apply pressure to force the rubber feet of the legs apart and tighten the two screws and nuts near the feet. This will hold the feet farthest apart for better stability.



- Position the assembled Downhill Adapter with the braces on the bottom next to the bottom of the treadmill as shown and secure with the remaining 4 screws and nuts as shown. Tighten completely.



3.2 Downhill Running Adapter (continued)

- Reposition the spring pin from the hole at the bottom to the hole in the middle of the Inclination Rod.

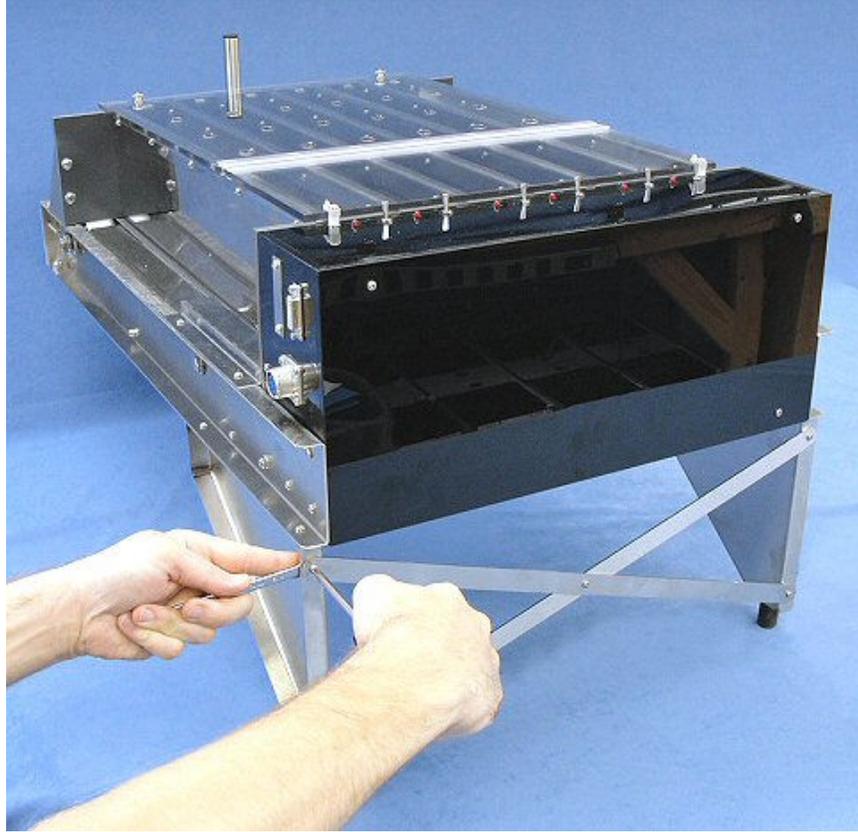


- Insert the Inclination Rod through the hole in the front of the treadmill. Then lower the front so the treadmill rests on the Downhill Adapter feet and Inclination Rod.



3.2 Downhill Running Adapter (continued)

- Tighten all remaining screws and nuts of the legs and braces.



This completes the assembly of the Downhill Adapter.

3.3 Assembling the Air-Puff Stimulus

The Air-Puff Stimulus should contain the following:



- 1 x 1/4" diameter air supply line with quick-connect fittings, 6m (20-foot).
- 1 x Air Reservoir (19 liter / 5 gallon typical).
- 1 x 1/2" diameter air supply line, 2.4m (8-foot).
- 1 x Molex Mini-Fit Jr valve power cable, 2m (6-foot), 2-circuit, plug-plug.

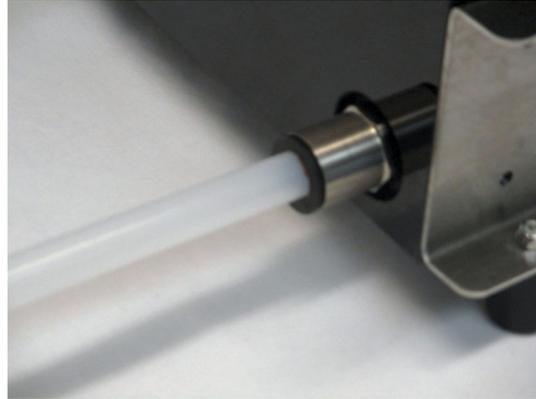
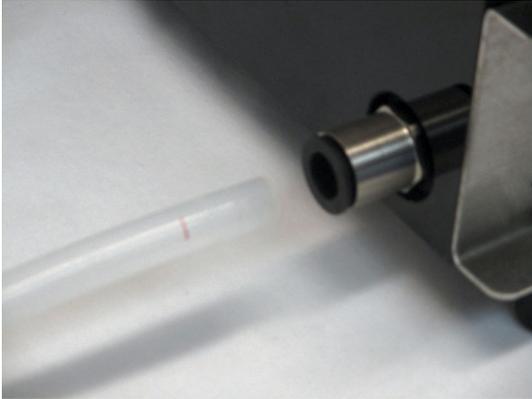
You may also need the following tools/supplies:

- Teflon tape or Teflon pipe sealant.
- 9/16" (15mm) Open-End Wrench or Adjustable Crescent Wrench.

Warning!!! Place the protective caps over the open ports of air-fittings when not in use.

3.3 Assembling the Air-Puff Stimulus (continued)

- Place the Air Reservoir near the treadmill, but out of the way (typically on the floor).
- Remove and save the protective caps from the air fittings on the rear of the treadmill and the Air Reservoir.
- Place a mark, 2.54cm (1") from the end of the 1/2" air-supply line. Then fully insert the 1/2" tube into the air fitting on the rear of the treadmill. The mark should be flush with the end of the fitting.



- Place a mark, 2.54cm (1") from the free end of the 1/2" air-supply line. Then fully insert the 1/2" tube into the air fitting on the air reservoir. The mark should be flush with the end of the fitting.



3.3 Assembling the Air-Puff Stimulus (continued)

- Place a mark on the free end of the 20' (6m) air-supply line 3/4" (19mm) from the end. Then, fully insert the 1/4" tube into the 1/4" fitting on the reservoir brass tee. The mark should be flush with the end of the fitting.



- Using Teflon tape or pipe sealant, attach the female quick-connect fitting to the pressure-regulated source of air (compressed air bottle shown). Use a 9/16" open-end or crescent wrench to fully tighten.
- Join the other end of the 20' (6m) air-supply line to the quick-connect fitting.



Warning! Do not pressurize the air puff system beyond 40 PSIG possible damage may result to connector fittings and equipment.

3.3 Assembling the Air-Puff Stimulus (continued)

- Connect the 2-circuit valve power cable between the “Valve Power” port of the Treadmill Controller and the 2-position Molex Mini-Fit Jr jack on the Exer 3/6 Treadmill. Be sure the locking lever snaps down to secure the cable to the ports.



This completes the assembly Air-Puff Stimulus.

3.3.0 Adjusting the Capacitive-Touch Sensitivity

The “INTENSITY” knob of the front panel of the treadmill controller no longer applies an electrical stimulus to the grids, but now selects the sensitivity of the capacitive-touch sensors monitoring the grids.

Like all capacitive touch sensors, they monitor for a relative quick increase in measured capacitance as indication of the presence of the animal. A baseline measurement of the initial capacitances of all grids are sampled upon power-up. Subsequently, small adjustments are made periodically to the baseline as the measured capacitance slowly drifts over time and temperature. When any grid indicates the presence of an animal for a duration of two (2) minutes, that grid will be re-baselined, which will remove the presence condition, regardless of the position of the stimulus switch for that lane. Should this occur because of the actual presence of the animal, detection from that grid will stop until the periodic adjustments correct it, which will take an indeterminate amount of time. Therefore, it is important to adjust the air-stimulus pressure and repetition rate to ensure that the animals do not stay on the grids for longer than two (2) minutes.

Use the following procedure to empirically determine the “INTENSITY” setting.

1. On the Exer 3/6 Treadmill, clean and remove all debris from the grids of the treadmill and wait until the surfaces are dry. Using the toggle switch, disable the stimulus for each lane.
2. It is recommended to disconnect the source of high-pressure air as the calibration procedure will likely deplete the source and bleed all pressure from the reservoir.
3. Switch ON the Treadmill Controller and Treadmill Stimulus Detection interfaces (the baseline for the grids will be measured).
4. On the Treadmill Controller, select a typical “SPEED” employed in the experiment, then press and release the **MODE** button to set the treadmill belt mode to RUN (the belt should move). Also, press the **RATE** button inspect and set the stimulus repetition rate to “3Hz”. Turn the “INTENSITY” down to zero “0.00”.
5. On the Exer 3/6 Treadmill, enable the stimulus for all lanes using the toggle switches. At the lowest intensity (sensitivity), random presence detections are typical and persistent. The action of the valves will bleed the air-pressure from the system.
6. On the Treadmill Controller, slowly increase the “INTENSITY” setting at a rate of 0.10 divisions per second until the action of the valves cease.
7. Momentarily touch each grid to trigger that lane’s valve. If the valve’s action persists, return to step 6. If the valve action stops and all the grids have been checked, then the minimum sensitivity has been found. Increase the setting by 0.20 divisions.

Each Treadmill Controller’s settings will be slightly different due to components tolerance and manufacturing. Likewise, if you observe any false detections, increase the setting by 0.10 divisions. Likewise, if you observe any unaccounted detections, decrease the setting by 0.10 divisions.

3.4 Connecting the Components

- Place the CI-Bus Hub interface near the host computer (not shown). Remove the orange terminator if installed. Using the USB cable, connect the interface to the host computer. The power indicator (upper left LED of port “B”) should be lit continuously.
- Connect one end of the CAT5 network cable to any of the ports.



DO NOT LOSE THE TERMINATOR!
It should be installed in the open port of the last device on the CI-Bus.

- Connect the other end of the CAT5 network cable to one of the “CI-Bus” ports of the Treadmill Controller.
- Install the orange terminator into the other “CI-Bus” port.



3.4 Connecting the Components (continued)

- Connect the 15-pin shock cable between the “Shocker” port of the Treadmill Controller and the 15-pin D-Sub jack on the Exer 3/6 Treadmill.
- Use the fasteners, built-in to the cables ends, to secure the cable to the ports.
- Connect the 6-circuit motor cable between the “Motor” port of the Treadmill Controller and the 6-position Molex Mini-Fit Jr jack on the Exer 3/6 Treadmill. Be sure the locking lever snaps down to secure the cable to the ports.
- Connect the AC power cord to the rear panel AC power receptacle of the Treadmill Controller and insert the other end into an appropriate AC outlet.



DO NOT switch on the Treadmill Controller at this time!
Refer to **SECTION 4.0 – Stand-Alone General Exercising without the Computer**
or **SECTION 5.0 – Performing a PC-controlled Experiment** for further instructions.

3.5 Setting the Angle of Inclination or Declination

The angle of inclination is set by the location of the spring pin in holes of the Inclination Rod. The holes range from 0° to 25° in 5° steps. With the Downhill Running Adapter, the holes range from 0° to -15° in 5° steps.

- Lift the front of the treadmill to release the pressure on the spring pin and remove it from the Inclination Rod.
- Now position the treadmill slightly above the new height of inclination and replace the spring pin into the corresponding hole in the Inclination Rod.
- Slowly lower the treadmill onto the spring pin.



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SECTION 4

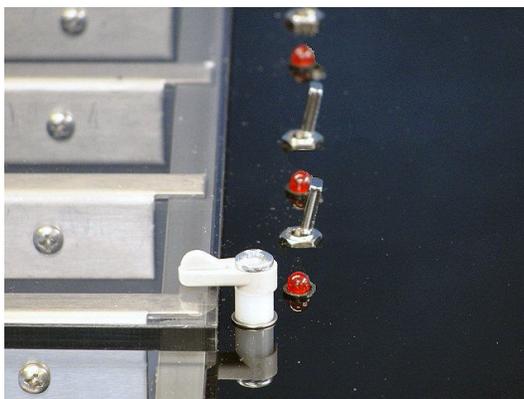
STAND-ALONE GENERAL EXERCISING WITHOUT THE PC

The faculties of the Treadmill Controller allow the user to provide various exercise regimens for the animals. Once setup, the controller can automatically limit the exercise session by the distance traveled or session duration. Typically, the controller is setup for the desired exercise session and then the subjects are loaded. The stimulus intensity will be set and applied to the grids. Then the treadmill belt will be set in motion. When the session is finished, the stimulus is switched off and the subjects are removed.

4.0 Stand-Alone Initialization

Attention! Use the following procedure to prevent the application of an undesirable treadmill belt speed or high intensity shock upon the application of AC power.

- Disable the stimulus for all lanes by setting toggle switches toward the rear of the treadmill.



- Switch on the Treadmill Controller. The power switch is above the AC power receptacle on the rear panel. The front panel display should report the current speed setting, an accumulated odometer distance of zero, and the current acceleration settings:

S	10.0	D	0.0
A	1.0/1	E	102.3

4.1 User Menu Settings

Access the User Menu of the Treadmill Controller with this procedure:

1. Press and hold the **RATE** button.
2. Press and hold the **MODE** button.
3. Then press and release the **ODOMETER RESET** button.
4. Release the **RATE** and **MODE** buttons.

The screen will display:

User
Menu

And then position you in the menu at the option for automatic speed and distance odometer calibration:

Autocal Speed

Refer to section: “**6.7 Autocal Speed**” for specific details. This option is used to calibrate the speed and odometer distance.

The menu options are as follows:

- Restore Defaults
 - Serial Number
 - Run-Time Meter
 - Odometer
 - Fan Voltage
 - Unit ID
 - Baud Rate
 - Autocal Speed
 - Accel
 - Mode (of operation)
 - Calibrate Shock
 - Exit
- The “INTENSITY” knob is used to navigate the options on the User Menu. Clockwise rotations will move you up the list toward the top. Counter-clockwise rotations will move you down the list toward the bottom to exit the menu.
 - Press the **ODOMETER RESET** button to select an option to edit and to save any changes.
 - Use the “SPEED” knob adjust the settings/values while editing. In calibration procedures, the **MODE** button is used to start and cancel if needed.

4.1 User Menu Settings (continued)

- Turn the “INTENSITY” knob counter-clockwise to move down the list to the next option which displays and edits the current acceleration settings:

```
Accel:m/min/sec  
A 1.0/1 E102.3
```

Refer to section: “**6.8 Acceleration Settings**” for specific details. In brief, when the treadmill belt MODE is set to acceleration, then the belt speed will accelerate (or decelerate) from the currently set speed to the ending speed using the acceleration parameters specified.

- Turn the “INTENSITY” knob counter-clockwise to move down the list to the next option which displays and edits the current mode of operation.

```
Mode: Normal
```

Refer to section: “**6.9 Operating Mode**” for specific details. If you would like to exercise the animals for a fixed amount of time or distance, choose the appropriate mode of operation: “**Time Limit**” or “**Dist Limit**”. Else, select “**Normal**” where by you must monitor the time or distance and manually terminate the session.

- Turn the “INTENSITY” knob counter-clockwise to move down the list to the next option which allows calibration of the electric stimulus current.

```
Calibrate Shock
```

Refer to section: “**6.10 Calibrate Shock**” for specific details.

- Turn the “INTENSITY” knob counter-clockwise to move down to the bottom of the list which allows you to exit the menu.

```
Exit
```

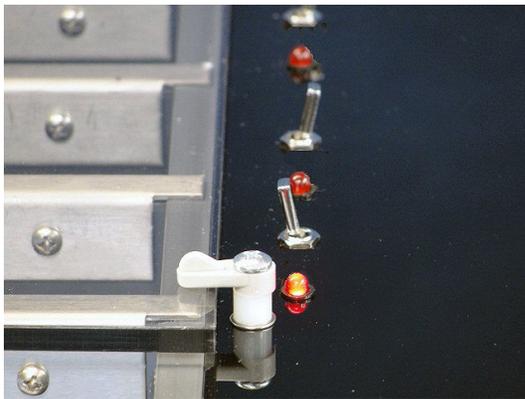
Press the ODOMETER RESET button to exit the User Menu.

4.2 Loading the Subjects

- Turn the clips that secure the lid and fold the lid on top of the cover.
- Before loading or unloading the subjects, place a paper towel on top of the treadmill cabinet to protect the toggle switches and indicators from urine and feces which may fall inside. Load the subjects onto the grids (the stimulus should be disabled).
- Reclose the lid and secure with the clips.
- Use the **RATE** button to set the repetition rate to “1Hz” and the “INTENSITY” knob to set the stimulus intensity to “0.00”:

S	0.0	D	0.0
R	1Hz	I	0.00

- Enable the stimulus for each lane by setting each toggle switch toward the front of the treadmill. The “Rep Rate” indicator will begin to flash on each treadmill lane as well as the controller.
- Slowly increase the “INTENSITY” until all of the subjects move from the grids.



- Press the **ODOMETER RESET** button.
In the Normal mode (indicated by “D”), the odometer is reset to zero.
In the Time Limit mode (indicated by “T”), the odometer is replaced by a timer which is preloaded to the duration specified in the User Menu.
In the Dist Limit mode (indicated by “L”), the odometer is preloaded to the distance duration specified in the User Menu.
- Then press and release the **MODE** button to run and set the speed using the “SPEED” knob.
Else, press and hold the **MODE** button to start acceleration toward the end speed. The odometer will begin to count up or the duration values will begin to count down.

S	10.0	■	D	5.9
A	1.0/1		E	102.3

- Observe the animals. If any begin to rest on the grids, you may increase the repetition rate to “2Hz”, or “3Hz” or increase the electric stimulus “INTENSITY” setting.

4.3 Controlling the Treadmill

The following sections discuss various controls and their effect on the operation of the Treadmill Controller.

4.3.0 Contrast / Odometer Reset

Turning the “CONTRAST” knob adjusts the LCD display contrast. Adjust for best viewing at any time.

In the Normal mode of operation, the odometer will display the accumulated distance traveled. When the **ODOMETER RESET** button is pressed, the odometer will be reset and held at zero. It will begin to count up when released.

In a Time Limit or Dist Limit mode of operation, the remaining duration of the session time or distance is displayed. When the duration reaches zero, the treadmill belt will STOP, terminating the exercise session. Simply replace the animals with the next group and press the **ODOMETER RESET** button. The duration counter will be reloaded and automatically the treadmill belt mode will RUN again.

4.3.1 Speed / Mode

Turning the “SPEED” knob will adjust the set speed of the treadmill belt when it’s mode is set to STOP or RUN.

Pressing the **MODE** button in the following ways will change the treadmill belt mode:

- From STOP, press and release to go to RUN.
- From STOP, press and hold to go to ACCELERATION.
- From RUN, press and release to return to STOP.
- From RUN, press and hold to go to ACCELERATION.
- From ACCELERATION, press and release to return to STOP
- From ACCELERATION, press and hold to go to RUN.

In another way:

- Press and release will toggle between STOP and RUN.
- Press and hold will toggle between RUN and ACCELERATION.
- Press and release will go to STOP from RUN or ACCELERATION (Emergency STOP).

4.3.1.0 Stop

By default, when the AC power is switched ON, the treadmill belt mode is set to STOP. In this mode, the treadmill belt will be disabled from running and come to rest. The current speed selected will be displayed but the mode indicator is blank. The odometer or distance duration will not accumulate. Likewise the time duration will freeze to preserve the remaining time in the session.

S 10.0	D 338.9
A 1.0/1	E102.3

4.3.1.1 Run

When the treadmill belt mode is set to RUN, the treadmill belt is enabled to move and the speed can be continuously adjusted by the SPEED knob. The display will report the set speed and the mode indicator will be a progress bar that grows from left to right. The odometer or duration will begin to count up or down.

S 10.0	■ D 338.9
A 1.0/1	E102.3

4.3.1.2 Acceleration

When the treadmill belt mode is set to ACCELERATION, the treadmill belt is enabled to move and the belt speed will begin to accelerate (or decelerate) from its current speed toward the end speed, at the acceleration rate indicated on the bottom of the screen. The top line will report the actual belt speed and the mode indicator will be a staircase that grows from left to right.

S 10.0	▩ D 338.9
A 1.0/1	E102.3

4.3.2 Intensity / Rate

Turning the “INTENSITY” knob adjusts the electric stimulus and the current stimulus settings will be displayed on the bottom line of the LCD screen. The information will persist for two (2) seconds and then return to display the acceleration settings.

Likewise, pressing the **RATE** button will display the current stimulus settings (without changing the repetition rate) and will persist for two (2) seconds. While the stimulus settings are displayed, repeated presses of the **RATE** button will select the next repetition rate in the order of: “1Hz”, “2Hz”, “3Hz”, “1Hz”, ...

S 10.0	D 338.9
R 1Hz	I 4.96

4.3.3 Motor Overload

The power supply for the motor is protected by a thermal resettable fuse. If the motor is mechanically overloaded and/or demands excess power from the supply, then the thermal fuse will open. In this situation, the motor's speed will drop dramatically and the message “!!! OVERLOAD !!!” will be displayed:

```
S 10.0    D 338.9
!!! OVERLOAD !!!
```

- ✓ Use the **MODE** button to set the treadmill belt mode to STOP. Then inspect the hardware for excessive treadmill belt tension, moving parts rubbing against others, or bearing resistance in the rollers and pulleys.

After the thermal fuse cools down and re-closes, the message is removed. Use the **MODE** button to resume normal operation.

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SECTION 5

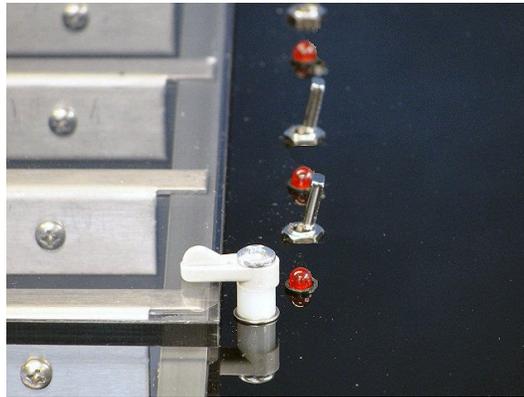
PERFORMING A PC-CONTROLLED EXPERIMENT

The Treadmill Software provides more control over the treadmill than the Treadmill Controller alone. The belt speed and acceleration can be varied continuously as well as the stimulus switched on and off throughout the entire experiment session. Data from the treadmill system are collected and logged at intervals into an experiment data file.

5.0 Treadmill Controller Setup

Attention! Use the following procedure to prevent the application of an undesirable treadmill belt speed or high intensity shock upon the application of AC power.

- Disable the stimulus for all lanes by setting toggle switches toward the rear of the treadmill.



- Switch ON the Treadmill Controller. The power switch is above the AC power receptacle on the rear panel.
- Set the “SPEED” to zero “0.0” then press and release the **MODE** button to set the treadmill belt RUN (the mode indicator should be a progress bar that grows from left to right):

```
S 0.0 ■ D 0.0
A 1.0/1 E102.3
```

5.1 Treadmill Stimulus Detection Setup

- Switch ON the Treadmill Stimulus Detection. The power switch is above the AC power receptacle on the rear panel. The first option of the menu should be displayed:

```
Mode: ■ Manual
      ○ PC
```

If the power was already ON, then press and release the **RESET** button to quit the current operation and return to the top of the menu

5.2 Incline Controller Setup

- Turn the “RATE” knob clockwise, all of the way to the end-stop.
- Set the mode toggle switch to “STOP”.
- Now, switch ON the Incline Controller. The power switch is above the AC power receptacle on the rear panel. The front panel display should report the set position of the “INCLINE” knob (upper left), the actual incline of the apparatus (upper right), the maximum incline rate (lower left) and the mode of “STOP”:

-0.5°	0.0°
1.9°/s	Stop

- Adjust the “INCLINE” knob so the set position matches the apparatus’ actual incline to ensure it won’t move when enabled.
- Now set the mode toggle switch to “RUN”.
- Adjust the “INCLINE” knob to “0.0°”.

0.0°	0.0°
1.9°/s	Run

5.3 Treadmill Software Initialization

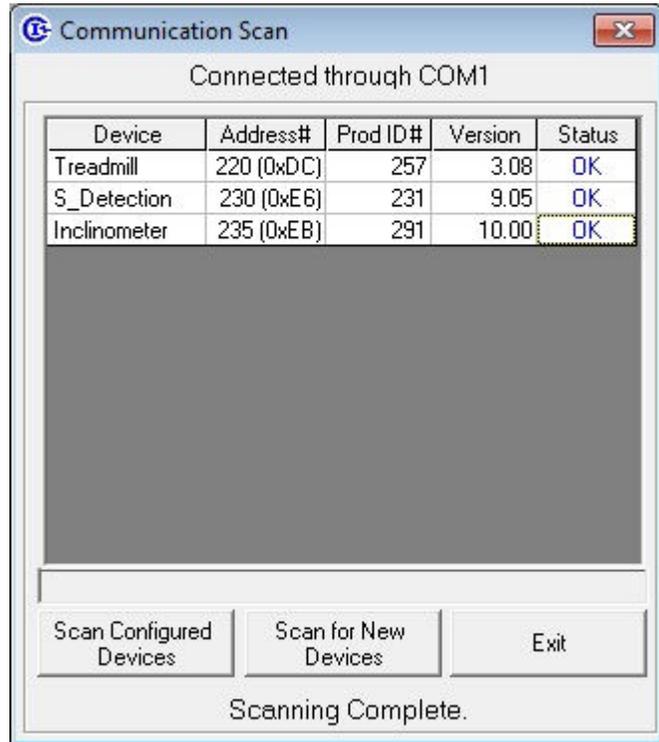
- ✓ On the host computer, launch the Treadmill Software. A “Treadmill Software” window should open.

Then a “Communication Setup” window will open. The software will automatically check every available COM port for the software’s configured devices.

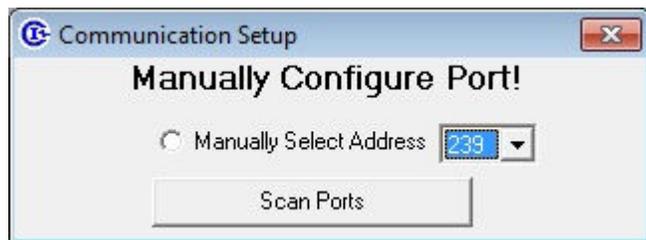


When found, a “Communication Scan” window will replace the previous and the software will enumerate all configured devices and report their status.

The window will hold for a few seconds then close and leave you at the main menu of the program.

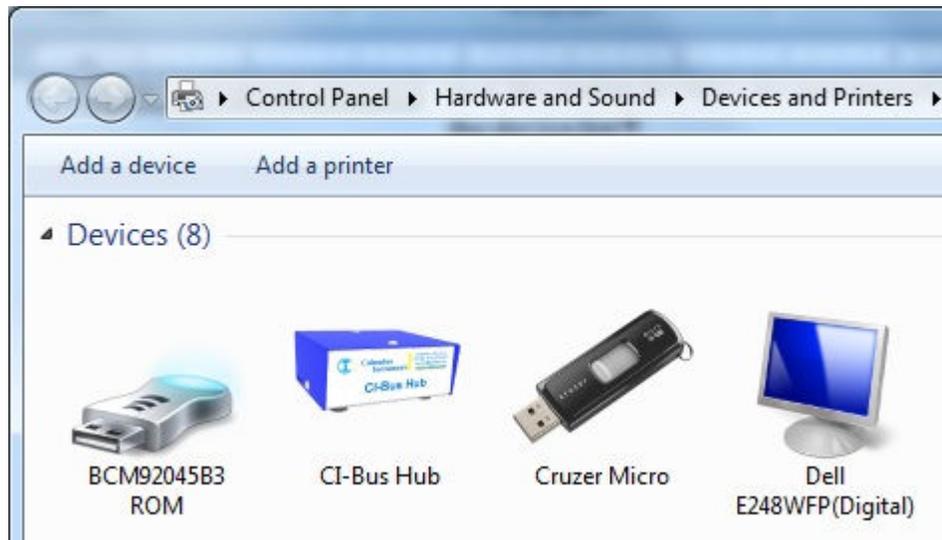


If no devices were found, then use the following procedure to troubleshoot the issue:



5.3.0 No Devices Detected or Manually Configure the Port

- Check Window's "Devices and Printers" for the "CI-Bus Hub".



If it does not exist perform the following procedure:

- Exit the Treadmill Software program.
- Disconnect the USB cable between the computer and the CI-Bus Hub.
- Refer to section: "**2.0 Treadmill Software Installation**" and re-install the application (and drivers).
- Reboot the computer if needed.
- Connect the CI-Bus Hub to any available USB port on the computer and wait for Windows to recognize the device.
- Open Window's "Devices and Printers" and check for the "CI-Bus Hub". If it doesn't exist, try another USB port on the computer. If the CI-Bus Hub cannot be detected, contact Columbus Instruments for further assistance.
- Once detected, close "Devices and Printers" and launch the Treadmill Software.

Check the CAT5 Networking cable connections

- Remove, then fully insert the cables into the CI-Bus ports of the CI-Bus Hub and other devices.
- Check for the terminator at the end of the CI-Bus in the available CI-Bus port of the last device.
- Click the button to continue.

Check the AC power to all devices.

- Switch OFF all devices and wait one minute.
- If connected, switch ON the AC-power to the Treadmill Stimulus Detection(s) first.
- Then switch ON all other remaining devices (Treadmill and Incline Controllers).
- Check them for normal operation and that they respond to button-presses and control adjustments.
- Click the button to continue.

5.4 Non-Profile Experiment

In a Non-Profile Experiment, only one start speed, end speed, acceleration and incline are allowed for the session.

- ✓ Select “Experiment >> Run” from the main menu.

Experiment for Device 1 at address 220

Filename:

Settings Profile Mode Data

Interval Sec
Duration min

Treadmill

Enable Profile Mode

Accel Step m/m
Accel Int sec
End Speed m/m
S_Speed m/m

Stimulus Rep_Rate

Off 2Hz
 1Hz 3Hz

Stimulus Intensity

Shock Detection

Number of Channels
Number of Visits to Grid (0-999)
Number of Stimulus (0-999)

Complete Exhaustion
Duration of Visit
 Measured Exhaustion
Exhaustion Visits
Exhaustion Period(s)
 Time Scored Percent
T-Score Percent(%)
T-Score Period(s)
 Visit Scored
Visit Scored Visits
Visit Scored Period(s)

Inclinometer

Range: -15.0 to 25.0 Degrees
Belt Angle Degrees
Inc_Rate Degree/sec

Load Save Start Stop Quit

5.4.0 Non-Profile Experiment Settings

Interval Sec
Duration min

Treadmill

Enable Profile Mode

Accel Step m/m
Accel Int sec
End Speed m/m
S_Speed m/m

Stimulus Rep_Rate

Off 2Hz
 1Hz 3Hz

Stimulus Intensity

- ✓ Enter the “Interval” time in seconds which you would like to have data logged to the output file. The number must be an integer and the minimum is 5 seconds.
- ✓ Enter the “Duration” time in minutes for the entire experiment session. The number must be an integer and is typically larger than the “Interval” time. A value of zero will allow the experiment to run indefinitely, which then must be manually stopped by the user.
- ✓ Click-to-clear “Enable Profile Mode”.
- ✓ Select the text boxes and enter the following experiment settings:
 - Acceleration Step (Accel Step): 0.0 to 25.5 meters per minute (m/m).
 - Acceleration Interval (Accel Int): 0 to 255 seconds (sec).
 - Ending Speed (Max Speed): 0.0 to 102.3 meters per minute (m/m).
 - Starting Speed (S_Speed): 0.0 to 102.3 meters per minute (m/m).

For example, to begin at 5.0m/m and apply an acceleration equal to 1m/m every 2 minutes up to the ending speed of 20.0m/m, use the following settings:

- Accel Step: 1.0
 - Accel Int: 120
 - Max Speed: 20.0
 - S_Speed: 5.0
- ✓ Disable the stimulus for the session by selecting “Off”. Else, enable by selecting “1Hz”, “2Hz” or “3Hz”.
 - ✓ Enter the value of the “INTENSITY” from the Treadmill Controller into the “Stimulus Intensity” text box.

Note: The software CANNOT control the stimulus intensity!
The electric stimulus intensity is manually set by the front panel of the Treadmill Controller.

5.4.1 Stimulus Detection Settings

When the Treadmill Stimulus Detection is used, the following controls are available:

- ✓ Enter the following settings:
 - Number of Channels: 1 to 8. Set for the number of animals, typically 3 or 6.
 - Number of Visits to Grid: 0 to 999. Limits the maximum number of visits to the grid.
 - Number of Stimulus: 0 to 999. Limits the maximum number of stimuli received.
 - Complete Exhaustion: Check to detect a Complete Exhaustion event.
 - Duration of Visit: 1-180 seconds.
 - Measured Exhaustion: Check to detect a Measured Exhaustion event.
 - Exhaustion Visits: 1-99. The number of exhausted visits.
 - Exhaustion Period(s): 1-180 seconds. Minimum exhaustion time.
 - Time Score Percent: Check to detect exhaustion by percentage of time.
 - T-Score Percent(%): 1-99%. The minimum percentage of time.
 - T-Score Period: 1-180 seconds. The rolling measurement period of time.
 - Visit Score: Check to detect exhaustion by the frequency of visits.
 - Visit Score Visits: 1-99. The number of visits.
 - Visit Score Period: 1-180 seconds. The rolling measurement period of time.

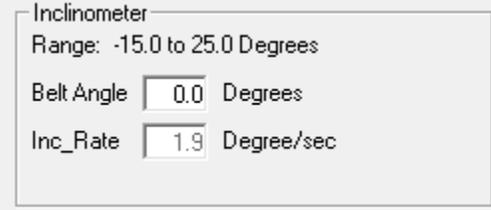
Likewise, the following statuses for each channel on the “Data” tab are provided:

Status	C1	C2	C3	C4	C5	C6
Active	○	○	○	○	○	○
Idle						
No Shock						

- Active: The stimulus is enabled. The grids are active and monitored for stimulus received.
- Idle: The stimulus is disabled. A limit has been reached and the stimulus is switched OFF.
- No Stimulus: The stimulus is disabled by the settings in the current period in a profile mode experiment.

5.4.2 Incline Settings

When the Incline Controller is detected, the capabilities of the apparatus are displayed and the following controls are available:



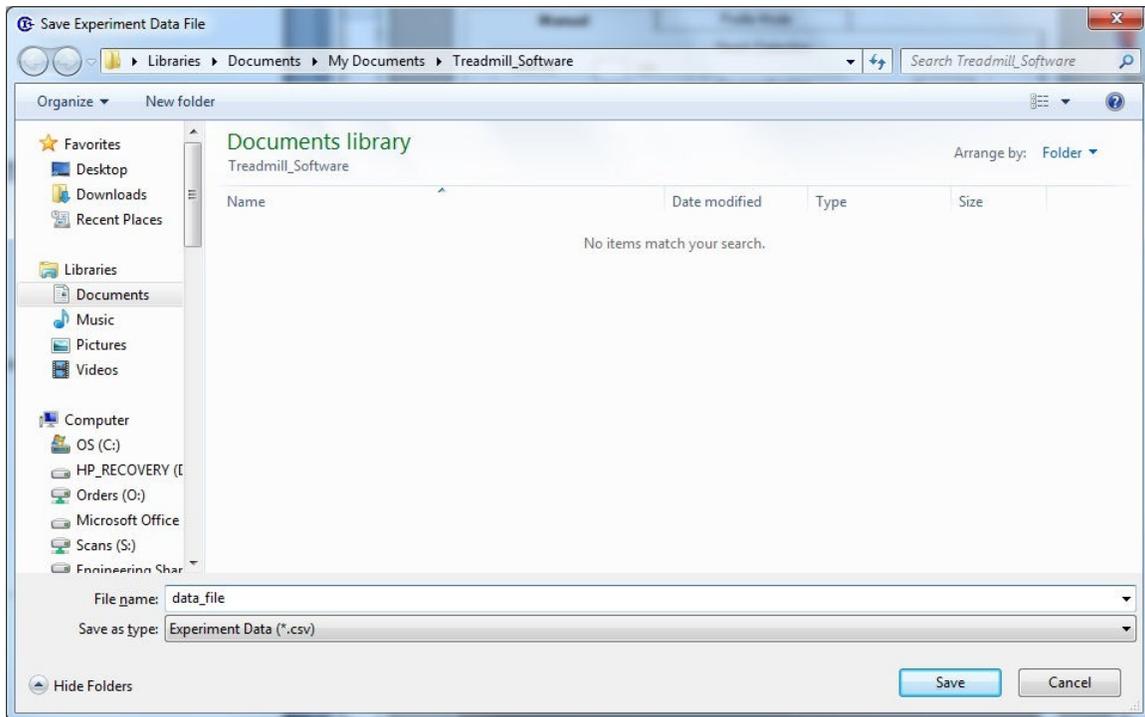
The screenshot shows a control panel for an inclinometer. It includes a title bar 'Inclinometer', a range specification 'Range: -15.0 to 25.0 Degrees', and two input fields: 'Belt Angle' with a value of '0.0' and 'Degrees', and 'Inc_Rate' with a value of '1.9' and 'Degree/sec'.

- ✓ Select the text boxes and enter the following parameters:
 - Belt Angle: Limited by the “Range” as indicated above.
 - Inc_Rate: Non-editable. Set to the maximum rate of the incline apparatus.

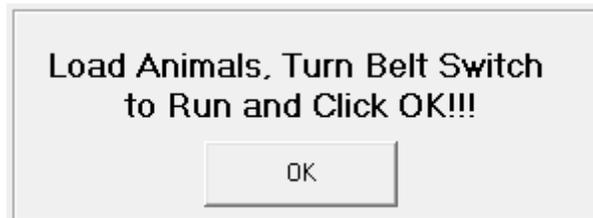
The rate of inclination (Inc_Rate) is set to the maximum the apparatus will allow to provided the highest speed and lowest transistion times between different angles.

5.4.3 Start Non-Profile Experiment

- ✓ Click the **Start** button to begin the experiment. A “Save Experiment Data File” window will open.



- ✓ Enter the name for the data file and click the **Save** button. The window will close and then display:



Now, the software has placed the Treadmill Controller under computer control which is indicated by the speed indicator “S” has been replaced with “C”:

C	0.0		D	0.0
A	OFF		E	0.0

- ✓ The stimulus has been switched off. Now, load the animals into the treadmill and click the **OK** button.

5.4.3 Start Non-Profile Experiment (continued)

First, the stimulus will be enabled and the treadmill belt will accelerate from reset (0.0 meters/minute) to the Starting Speed at a default acceleration rate of 2.0 meters/minute/second. Once the Starting Speed has been reached, the acceleration rate will change as specified by the Acceleration Step and Acceleration Interval and now the belt speed will accelerate (or decelerate) toward the Ending Speed.

The Treadmill Stimulus Detection will also begin to monitor and report data from the stimulus grids.

The Incline Controller will move from 0.0° to the “Belt Angle” as specified.

The Experiment window provides the following information while the experiment is running:

The screenshot shows a software interface for an experiment. At the top, there are several status indicators: 'Belt Status' is set to 'Running', 'Spd(m/m)' is 6.5, 'Dist Tr (m)' is 1.7, and 'Belt Angle' is 5.0 Degrees. To the right, there are six status lights labeled C1 through C6. C1 is green, C2 is red, and C3 through C6 are green. Below these are labels for 'Active' (green), 'Idle' (red), and 'No Shock' (blue). Below the status indicators is a table with 10 columns: Int, CH, Time, Speed (M/m), Distance (M), Belt Angle, TOB (min), NOS, NOV, and Status. The table contains 6 rows of data, all showing 'RUN' status. At the bottom of the window are five buttons: 'Load', 'Save', 'Start', 'Stop', and 'Quit'.

Int	CH	Time	Speed (M/m)	Distance (M)	Belt Angle	TOB (min)	NOS	NOV	Status
0	1	13:12:18	0.0	0.0	2.0	0:01	0	0	RUN
0	2	13:12:18	0.0	0.0	2.0	0:01	1	1	RUN
0	3	13:12:18	0.0	0.0	2.0	0:01	0	0	RUN
0	4	13:12:18	0.0	0.0	2.0	0:01	0	0	RUN
0	5	13:12:18	0.0	0.0	2.0	0:01	0	0	RUN
0	6	13:12:18	0.0	0.0	2.0	0:01	0	0	RUN

- Belt Status: “Idle” indicates the front panel switch is set to “STOP”
“Running” indicates the front panel switch is set to “RUN”
“Accel” indicates the front panel switch is set to “ACCEL”
- Spd(m/m): reports the current speed of the treadmill belt.
- Dist Tr (m): reports the total distance the treadmill belt has moved.
- Belt Angle: reports the current angle of inclination.

The grid below the status area reports the data collected for each interval of the experiment. The first report, “Int: 0”, details the settings for each channel at the start of the experiment. The last interval is the data at the termination of the experiment, which typically coincides with the end of the experiment.

- **Stop**: used to manually terminate an experiment. Necessary when the experiment “Duration” has been set to zero.

5.5 Profile Mode Experiment

In the Profile Mode, the treadmill's speed, acceleration, stimulus and incline are all dynamically adjustable throughout the session.

- ✓ Select "Experiment >> Run" from the main menu.

Experiment for Device 1 at address 220

Filename:

Settings | Profile Mode | Data

Interval: 60 Sec
Duration: 10 min

Treadmill

Enable Profile Mode

Accel Step: 1 m/m
Accel Int: 1 sec
End Speed: 102.3 m/m
S_Speed: 0 m/m

Stimulus Rep_Rate

Off 2Hz
 1Hz 3Hz

Stimulus Intensity: 4.96

Shock Detection

Number of Channels: 6
Number of Visits to Grid (0-999): 10
Number of Stimulus (0-999): 10

Complete Exhaustion
Duration of Visit: 5

Measured Exhaustion
Exhaustion Visits: 3
Exhaustion Period(s): 2

Time Scored Percent
T-Score Percent(%): 50
T-Score Period(s): 20

Visit Scored
Visit Scored Visits: 10
Visit Scored Period(s): 20

Inclinometer

Range: -15.0 to 25.0 Degrees

Belt Angle: 0.0 Degrees
Inc_Rate: 1.9 Degree/sec

Load Save Start Stop Quit

5.5.0 Profile Experiment Settings

Note: Controls not specified in the following procedure are “not needed” as they are automatically updated and set by the profile.

Interval Sec
Duration min

Treadmill

Enable Profile Mode

Accel Step m/m
Accel Int sec
End Speed m/m
S_Speed m/m

Stimulus Rep_Rate

Off 2Hz
 1Hz 3Hz

Stimulus Intensity

- ✓ Enter the “Interval” time in seconds which you would like to have data logged to the output file. The number must be an integer and the minimum is 5 seconds.
- ✓ Click-to-check “Enable Profile Mode”.
- ✓ Disable the stimulus for the session by selecting “Off”. Else, enable by selecting “1Hz”, “2Hz” or “3Hz”.
- ✓ Enter the value of the “INTENSITY” from the Treadmill Controller into the “Stimulus Intensity” text box.

Note: The software CANNOT control the stimulus intensity!
The electric stimulus intensity is manually set by the front panel of the Treadmill Controller.

Refer to section “5.4.1 Stimulus Detection Settings” if you would like to monitor and control the presentation of stimuli.

5.5.1 Creating a Profile

- Click the “Profile Mode” tab at the top of the form. The form will now display the current profile as a list of periods (or steps).

A profile is developed by sequentially defining any number of periods. Each period defines a new ending speed and time interval. Along with the starting speed, (usually the previous period’s ending speed) the acceleration is calculated for that period. Also, the stimulus can be enabled (“True”) or disabled (“False”) for that period. When available, the incline of the belt can also be adjusted upon the start of each period.

By default, the first period (or step), begins at rest (starting speed of 0.0 meters/minute). When additional periods are added, the previous “End Speed” is copied as the next period’s “Start Speed”.

Step	Start Speed m/min	End Speed m/min	Period sec	Belt Angle	Stimulus	Comment
1	0	20.0	120	5.0	False	ramping up
2	20.0	20.0	180	0.0	True	testing
3	20.0	10.0	60	-5.0	False	ramping down
4	10.0	10.0	180	0.0	True	testing
5	10.0	0.0	60	-5.0	False	finished

- ✓ Select the text boxes and enter the following parameters:

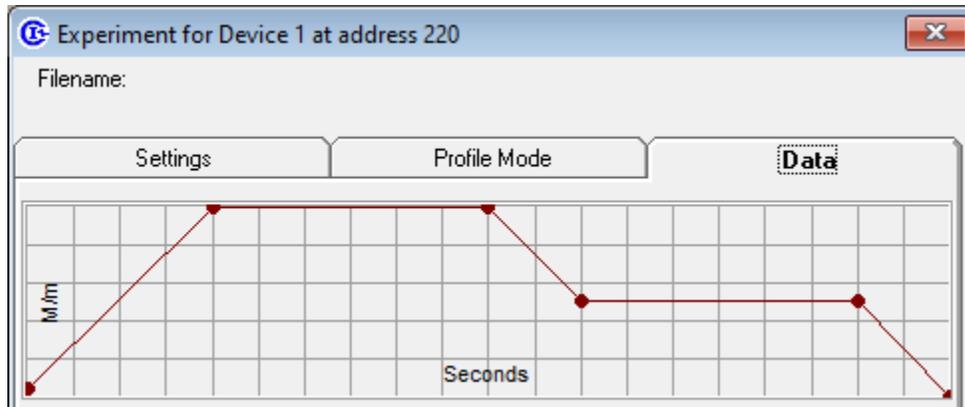
- End Speed: 0.0 to 102.3 The desired speed at the end of the period.
- Period: 0 to 32767 The duration of the period in seconds.
- Belt Angle: -15.0 to +25.0 The desired incline for the entire period.
- Stimulus: True or False Enables or disables stimulus for that period.
- Comment: optional text Reports information about the period.

Note: The “Stimulus” cannot be set to FALSE if the Treadmill Stimulus Detection is employed.

- ✓ Click the **Add Period** button to add another step to the end of the profile.
Click the **Delete Period** button to remove the last step from the profile.
- ✓ Click-to-check the “Loop Profile” box, if you’d like to repeat the profile indefinitely. When checked, you must manually stop the experiment.

5.5.1 Creating a Profile (continued)

The graphical representation of the profile, relative to the sum total of the periods, is shown at the top of the “Data” tab.



5.5.2 Start Profile Mode Experiment

- ✓ Click the **Start** button to begin the experiment. A “Save Experiment Data File” window will open.
- ✓ Enter the name for the data file and click the **Save** button. The window will close and return to the experiment window. The hardware will initialize and display: “Load Animals and Click OK!!!”
- ✓ Load the animals into the treadmill and click the **OK** button.

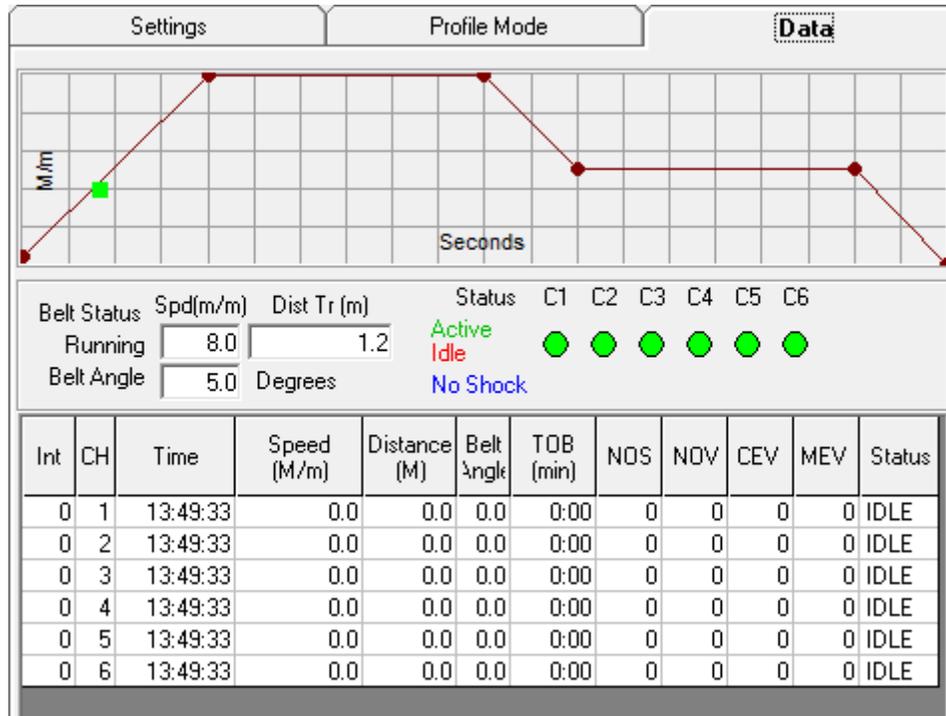
The program will initialize all of the controllers of the system with the settings from the first period: Step 1 and data will be accumulated for that period. The “Profile Mode” tab provides additional details about the experiment session:

Settings		Profile Mode					Data
<input type="checkbox"/> Loop Profile							Add Period Delete Period
Step	Start Speed m/min	End Speed m/min	Period sec	Belt Angle	Stimulus	Comment	
1	0	20.0	120	5.0	True	ramping up	
-->2	20.0	20.0	180	0.0	True	testing	
3	20.0	10.0	60	-5.0	True	ramping down	
4	10.0	10.0	180	0.0	True	testing	
5	10.0	0	60	-5.0	True	finished	

- “-->”: An arrow within the “Step” column of the profile grid indicates which step (period) is currently in use.

5.5.2 Start Profile Mode Experiment (continued)

At the top of the “Data” tab, the relative graphical representation of the profile with a green dot which indicates the relative time and the speed of the treadmill. Below, are the current statuses from the Treadmill Controller, Incline Controller and Stimulus Detection. In the body of the frame is a grid which reports the interval data from all enabled channels in the experiment.



The **Stop** button is used to manually terminate an experiment, which is necessary when the “Loop Profile” option has been checked. Else, the experiment will terminate naturally at the end of the profile.

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SECTION 6

TREADMILL USER MENU

The User Menu is used to view and set various parameters which are saved within the Treadmill Controller. Access to the menu is provided by a unique button presses when the treadmill belt mode is set to STOP and not under computer control.

If under computer control (indicated by the speed setting displayed with “C” instead of “S”), press the **MODE** button to set the treadmill belt to STOP. Then press the **ODOMETER RESET** button to restore control back to the user.

- Press and hold the **RATE** button.
- Press and hold the **MODE** button.
- Then press and release the **ODOMETER RESET** button.
- Release the **RATE** and **MODE** buttons.

The screen will display:

User
Menu

And then position you in the menu at the option for automatic speed and distance odometer calibration:

Autocal Speed

The menu options are as follows:

- Restore Defaults
 - Serial Number
 - Run-Time Meter
 - Odometer
 - Fan Voltage
 - Unit ID
 - Baud Rate
 - Autocal Speed
 - Accel
 - Mode (of operation)
 - Calibrate Shock
 - Exit
- The “INTENSITY” knob is used to navigate the options on the User Menu. Clockwise rotations will move you up the list toward the top. Counter-clockwise rotations will move you down the list toward the bottom to exit the menu.
 - Press the **ODOMETER RESET** button to select an option to edit and to save any changes.
 - Use the “SPEED” knob adjust the settings/values while editing.

6.0 Restore Defaults

The top option on the list. This is used to restore all of the factory settings saved during the treadmill's factory calibration. This may be necessary during service as to restore a known configuration should for any reason the current settings are unknown or have become corrupt and the treadmill system is non-responsive.

- Press the **ODOMETER RESET** button to select the option. The screen will display:

Restore Defaults
Are You Sure?

- Press and hold the **ODOMETER RESET** button to restore the factory settings. Else, press and release to cancel.

6.1 Serial Number

This is used to see the electronic serial number which should match the Columbus Instruments serial tag on the outside of the cabinet. For service, this number may be referenced to lookup any specific details or notes about your particular Treadmill and Controller. This option is non-editable.

6.2 Run-Time Meter

This is used to report the total amount of time the Treadmill Controller has been powered-on. The format is Days : Hours : Minutes (DHM). The run-time meter is saved every ten-minutes or when the AC power is switched off. This option is non-editable.

6.3 Run-Time Odometer

This is used to report the total accumulated distance (in meters) the treadmill belt has moved. This distance is formatted for easier viewing. The run-time odometer is saved every ten minutes or when the AC power is switched off. This option is non-editable.

6.4 Fan Voltage

This is used to set the output voltage of the "Fans" ports. If fans are installed on the treadmill system, the fan speed (by applied voltage) can be adjusted to provide necessary ventilation.

The list of voltages are as follows:

- 12.0 (fast)
- 8.0
- 6.0
- 5.0 (slow)

6.5 Unit ID

This is used to set the CI-Bus address of the Treadmill Controller. The Unit ID should be unique and not match the address of another device which is connected to the same CI-Bus Hub. The Unit ID can range from 1 to 254 (220 typical).

Notes about Device Addressing

A Treadmill Controller, Treadmill Stimulus Detection and the Incline Controller can all be used together as a group to control the faculties of one treadmill system. The Treadmill Software supports up to four (4) groups. The Unit ID of the devices in each group must adhere to the following specification:

System Group	Treadmill Controller	Stimulus Detection	Incline Controller
1	220	230	235
2	221	231	236
3	222	232	237
4	223	233	238

6.6 Baud Rate

This is used to set the CI-Bus communication speed. The baud rate can be changed through the course of an experiment through computer control. If the unit fails to respond to computer queries, this option can be used to view and change the communication baud rate as necessary.

The list of baud rates are as follows:

- 19200 (typical)
- 38400
- 57600
- 115200
- 128000
- 230400
- 1M
- 2M

6.7 AutoCal Speed

This is used to perform an automatic belt speed and odometer distance calibration. You must have the Speed Sensor to successfully perform this function.

- Press the **ODOMETER RESET** button to select the option. The screen will display:

```
Run to Start...
```

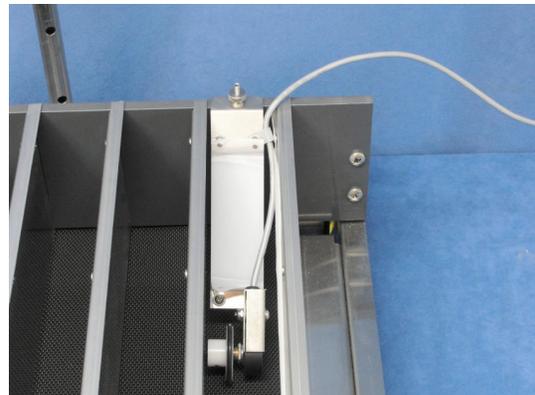
- Press the **MODE** button to toggle the treadmill belt mode from STOP to RUN. The treadmill belt will move at half-speed and a 15-minute timer will begin to count down:

```
Stop to Cancel..  
Waiting: 14:59s
```

The automatic calibration procedure can be stopped at any time by pressing the **MODE** button to toggle the treadmill belt mode back to STOP.

Now the Speed Sensor needs to be installed on the Treadmill and connected to the Treadmill Controller.

- Remove the thumbnuts and remove the treadmill cover and lid.
- Place the Speed Sensor over one of the threaded studs and secure with a thumbnut. Be sure the wheel is aligned parallel to the running belt (the body of the sensor may not).



After the count-down time expires, the Treadmill Controller will check for a speed output from the Speed Sensor. If detected, then the calibration procedure will continue, else the screen will display:

```
Speed Sensor  
Not Detected...
```

Verify the connection to the treadmill. If all appears correct, try cycling the AC power and start the calibration again. Else, contact Columbus Instruments for help. Once a speed output has been detected, the low speed calibration will automatically begin.

6.7 AutoCal Speed (continued)

The Treadmill Controller will calibrate the low speed of 10.0 meters/minute and then the high speed of 100.0 meters/minute (each within the span of 3 minutes 17 seconds):

```
Cal: 10.00  ?%
?????=???.??
```

Lastly, it will calibrate the odometer distance in one minute:

```
Cal: Odometer
Measuring:  ??s
```

And then display the measured counts from the motor odometer:

```
OD Reset to Save
Counts:  ?????
```

- Press the **ODOMETER RESET** button to save the new calibration settings. Then the screen will display:

```
Stop to Finish..
```

- Press the **MODE** button to toggle the treadmill belt mode back to STOP and return to the User Menu.

6.8 Acceleration Settings

This option is used to set the acceleration rate and end speed of the treadmill belt when the treadmill belt mode is set to ACCELERATION. The screen displays the acceleration units and three adjustable settings:

```
Accel:m/min/sec  
A 1.0/1    E102.3
```

- Acceleration Step: 0.0 to 25.5 meters/minute (numerator).
- Acceleration Interval: 0 to 255 seconds (denominator).
- End Speed: 0.0 to 102.3 meters/minute.

The Ending Speed (**E**), is the target speed to accelerate (or decelerate) towards and maintain once achieved. The acceleration rate (**A**) is determined by dividing the Acceleration Step (speed) by the Acceleration Interval (time). Should any of the acceleration arguments be set to zero, then the acceleration is “**OFF**” and the treadmill belt will change speeds as fast as possible (100.0 meters/minute/second).

6.9 Operating Mode

For better stand-alone functionality when providing general-purpose exercise regimens, two additional “limited” modes of operation are available. These modes automatically stop the treadmill belt when a set duration of time or distance has elapsed. The durations are restored and the treadmill belt will run again when the **ODOMETER RESET** button is pressed.

Note: The Operating Mode has no effect during a PC-Controlled Experiment.

The three modes of operation are:

- Normal: no limits are employed, the treadmill belt must be manually stopped.
- Time Limit: a count-down timer will automatically stop the belt.
- Distance Limit: a count-down odometer will automatically stop the belt.

6.9.0 Normal

```
Mode: Normal
```

```
S 5.0 D 0.0  
A 1.0/1 E102.3
```

This mode does not employ any limits and is backward compatible with previous models of the Treadmill Controller. This is indicated by the label “**D**” for the measured odometer distance which increases as the treadmill belt moves.

6.9.1 Time Limited

Mode: Time Limit
min:secs 10:00

S 5.0	T 10:00
A 1.0/1	E102.3

This mode limits the time duration of the exercise session. This is indicated when the odometer is replaced by a count-down timer: “**T**”. The time duration will count-down (at any belt speed) when the treadmill belt mode is set to RUN or ACCELERATION. The timer duration will freeze if set to STOP, preserving the remaining time duration. When the timer reaches zero “**0:00**”, the belt will stop. At any time, press the **ODOMETER RESET** button to reload the timer duration with the time limit and the treadmill belt will run again (RUN or ACCELERATION).

- Minutes: 0 to 255 minutes (up to 4 hours and 15 minutes).
- Seconds: 0 to 59 seconds.

The minimum time duration is 1 second.

6.9.2 Distance Limited

Mode: Dist Limit
100.0m

S 5.0	L 100.0
A 1.0/1	E102.3

This mode limits the distance travelled in the exercise session. This is indicated by the label “**L**” for the distance duration which counts down as the treadmill belt moves. When the distance duration reaches zero “**0.0**”, the belt will stop. At any time, press the **ODOMETER RESET** button to reload the distance duration and the treadmill belt will run again (RUN or ACCELERATION).

- Distance: 1.0 to 99999.0 meters.

6.10 Calibrate Shock

This option is used to measure and calibrate the stimulus. It will switch ON the electric stimulus continuously (instead of pulsed) to allow a stable reading from a connected ampmeter (RMS value typical). The average current delivered to the animal is the continuous RMS current multiplied by the duty cycle of the chosen repetition rate.

For reference, the stimulus pulse duration is 200ms. Likewise, the 1Hz, 2Hz and 3Hz periods are 1000ms, 500ms and 330ms respectively. Therefore, each the repetition rate's duty cycles are:

- 1Hz: 0.20
- 2Hz: 0.40
- 3Hz: 0.61

For example, a measured RMS current of 1.0mA will deliver an average current of 200uA, 400uA and 610uA respectively.

To measure the the electric stimulus, you will need the following items:

- AC ammeter (low range: 0-10mA).
 - Alligator test leads for the AC ammeter.
 - Alligator jumper wire.
 - Fixed external resistance (animal body equivalent, 10,000 ohms typical, if used).
- Enable the stimulus for the mouse lane 1 or 6 buy setting the toggle switch on the treadmill toward the lane (by default, the stimulus should not be present while navigating the User Menu).
 - Install the alligator test leads into the appropriate current-measuring terminals on the AC ammeter.
 - Switch ON the meter and select the range to measure no more than 10mA.
 - If using a fixed external resistor (animal body equivalent):
 - Connect the red meter lead to one terminal of fixed external resistor.
 - Using the alligator jumper wire, connect the free end of the external resistor to the fourth (4th) grid in from the end of the grids (in lane 1 or 6).
 - If not using a fixed external resistor, connect the red meter lead directly to the fourth (4th) grid in from the end of the grids (in lane 1 or 6).
 - Connect the black meter lead to the second (2nd) grid in from the end.

This completes a closed-circuit between the full-wave current source, animal body resistance and AC ammeter.

6.10 Calibrate Shock (continued)

- Press the **ODOMETER RESET** button to select the option. The screen displays:

Run to Start...

- Press the **MODE** button to set the treadmill belt mode to RUN. The screen will display:

Stop to Finish..
Intensity: ??.??

- Adjust the “INTENSITY” knob to achieve the necessary AC current on the ammeter. Note the reported intensity as it can vary due to manufacturing tolerances from different assembled systems.
- Press the **MODE** button to toggle the treadmill belt mode back to STOP and return to the User Menu. Likewise, the electric stimulus will be switched OFF.
- Remove the leads from the grids and switch OFF the ammeter.

6.11 Exit

This option is used to exit the menu and return back to typical operation.

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SECTION 7

TREADMILL SOFTWARE DESCRIPTIONS

7.0 Experiment >> Run

Selecting this option will open an “Experiment” window for the first Treadmill Controller at address 220 (with Stimulus Detection at address 230 and Incline Controller at address 235). If more systems are connected to the CI-Bus, then select the option again to open another window for each additional system:

System	Treadmill	Stimulus	Incline
1	220	230	235
2	221	231	236
3	222	232	237
4	223	233	238

The “Experiment” window is used to load, configure, save and run experiments as well as view data from experiments. The following controls are on this form:

- **Filename:** displays the path and filename of a loaded or saved experiment or the currently running experiment session at the top of the window.
- **Settings tab:** see section “7.0.0 Settings Tab”.
- **Profile Mode tab:** see section “7.0.1 Profile Mode Tab”.
- **Data tab:** see section “7.0.2 Data Tab”.
- **Load** : used to load the settings of a previously saved or run experiment.
- **Save** : used to save the current experiment settings as a template for future experiments.
- **Start** : used to begin an experiment session.
- **Stop** : used to terminate an experiment session.
- **Quit** : used to close the experiment window and return to the main window.

7.0.0 Settings Tab

This tab contains the controls used to configure: data collection, the speed profile in a non-profile experiment, the stimulus repetition rate, the stimulus detection settings and inclination in a non-profile experiment. The controls on the Settings tab are defined as follows:

Data Collection

- Interval: defines the interval when data is collected and saved to the output data file.
- Duration: specifies the duration of the experiment session in minutes. This must be set for a non-profile experiment only. A value of zero will allow the experiment session to run indefinitely, which then must be manually stopped.

Treadmill

- Enable Profile Mode: click-to-clear to run non-profile experiment.
click-to-check to run a profile-mode experiment. The profile mode can provide many steps of speed, acceleration, stimulus and incline control throughout an experiment session.
- Accel Step: 0.0 to 25.5 meters/minute (m/m). The numerator of the acceleration rate which defines the change in speed. This must be set in a non-profile experiment.
- Accel Int: 0 to 255 seconds (s). The denominator of the acceleration rate which defines the change in time. This must be set in a non-profile experiment.
- End Speed: 0.0 to 102.3 meters/minute (m/m). The ending speed or target speed that treadmill belt will accelerate (or decelerate) towards and then maintain once achieved. This must be set in a non-profile experiment.
- S_Speed: 0.0 to 102.3 meters/minute (m/m). The starting speed which is the first target speed the treadmill belt will accelerate toward from rest (0.0 m/m) at the acceleration rate of 2.0 meters/minute/second. Once the starting speed has been reached, then the treadmill belt will accelerate to the “End Speed” at an acceleration rate defines by “Accel Step” and “Accel Int”. This must be set in a non-profile experiment.
- Stimulus Rep_Rate: sets the repetition rate of the stimulus from a choice of: Off, 1Hz, 2Hz or 3Hz.
- Stimulus Intensity: documents the Treadmill Controller’s “INTENSITY” setting.

Stimulus Detection

- Number of Channels: 1 to 8. Sets the number of channels/lanes to monitor in an experiment.
Typically set to 3 or 6.
- Number of Visits to Grid: 0 to 999. Terminates the presentation of stimuli based upon the number of visits to the grid where one or more stimuli were received in succession.
- Number of Stimulus: 0 to 999. Terminates the presentation of stimuli based upon the total number received for all visits.
- Complete Exhaustion: click-to-check to terminate the presentation of stimuli when detected.
 - Duration of Visit: the maximum amount of time to endure stimuli when the animal cannot physically re-engage the treadmill.
- Measured Exhaustion: click-to-check to terminate the presentation of stimuli when detected.
 - Exhaustion Visits: the maximum number of visits, typically two or more.
 - Exhaustion Period: the maximum amount of time to endure stimuli rather than re-engage the treadmill for any visit.
- Time Score Percent: click-to-check to terminate the presentation of stimuli when detected.
 - T-Score Percent: the maximum percentage of time stimuli was received.
 - T-Score Period: the moving window of time to calculate the percentage.
- Visit Score of Visits: click-to-check to terminate the presentation of stimuli when detected.
 - Visit Score Visits: the maximum number of visits.
 - T-Score Period: the moving window of time to count the number of visits.

7.0.0 Settings Tab (continued)

Inclinometer

- Range: reports the valid range the “Belt Angle” may be set in an experiment as indicated by the Incline Controller.
- Belt Angle: -15.0° to $+25.0^{\circ}$ (typical). Sets the incline of the belt. This must be set in a non-profile experiment which takes effect upon the start of the experiment session.
- Inc_Rate: reports the maximum inclination rate of the Incline Apparatus (1.6°/second typical for an Exer 3/6 Treadmill).

7.0.1 Profile Mode Tab

This tab contains the controls used to define changes of the treadmill belt speed over set periods of time (acceleration), belt inclination, and stimulus presentation. The controls on the Profile Mode tab are defined as follows:

- Loop Profile: Click-to-clear this box to execute the profile once. The total time for the experiment session will be the sum of all the seconds defined in the “Period sec” column. Else, click-to-check this box to repeat the profile indefinitely. The user must click the button to terminate the experiment session.
- Period Data Grid:
 - Step: 1 to ?. The unique index for each period defined in the profile. During an experiment, an arrow “-->” appears next to the step which is currently in effect.
 - Start Speed m/min: 0.0 to 102.3 meters/minute. Used to calculate the change in speed for the acceleration rate for the period. For the first period (1), the setting is always zero (0.0). For subsequent periods, it should match the previous period’s “Ending Speed m/min”.
 - End Speed m/min: 0.0 to 102.3 meters/minute. Used to calculate the change in speed for the acceleration rate and sets the ending speed for the period.
 - Period sec: 0 to 32767 seconds (9 hours: 6 minutes: 7 seconds). Used to calculate the change in time for the acceleration rate and set the time duration of the period.
 - Belt Angle: sets the inclination of the treadmill belt for the entire period.
 - Stimulus: enables (True) or disables (False) the stimulus for the entire duration of the period. (If the Stimulus Detection is used, the setting is always “True”).
 - Comment: optional text which can describe the purpose of the period.
- : Used to append one period to the list of defined periods of the profile. It is best to completely define each period before adding the next.
- : Used to delete the last period in the profile.

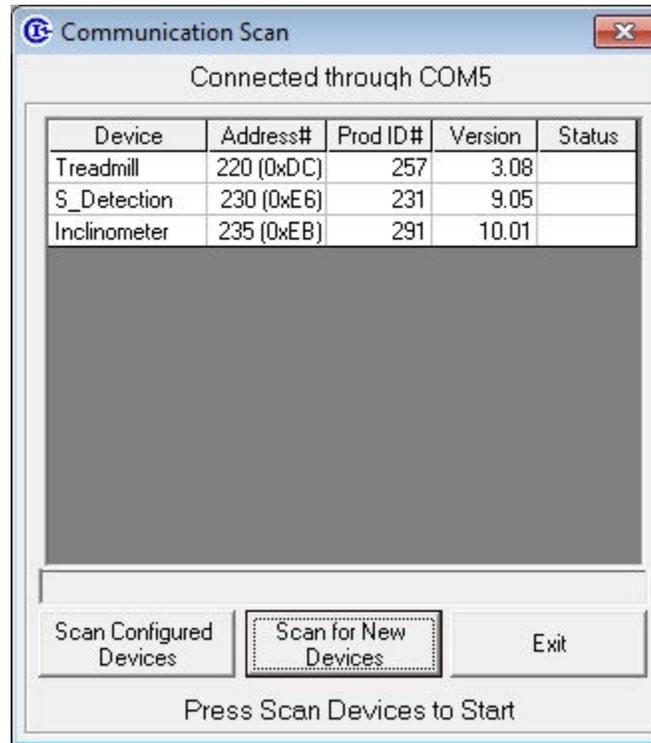
7.0.2 Data Tab

This tab reports the current status and data from the experiment. The elements on the tab are defined as follows:

- Graph: This is a graphical representation of the profile. The dark red lines indicate the calculated speed of the treadmill belt over total time of the profile. The scales of the axes are ratiometric to the largest value of “End Speed m/min” and the sum of the “Period sec”. During an experiment, a green dot will indicate the relative speed and timing position within the profile.
- Belt Status: displays the current status of “TREADMILL BELT” toggle during an experiment:
 - “Idle” indicates the toggle is set to “STOP”.
 - “Running” indicates the toggle is set to “RUN”.
 - “Accel” indicates the toggle is set to “ACCEL”.
- Spd(m/m): reports the current speed of the treadmill belt.
- Dist Tr (m): reports the total distance the treadmill belt has moved.
- Belt Angle: reports the current angle of inclination.
- Status C1 ... C8: reports the status of the stimulus for each channel or lane:
 - Active: The stimulus is enabled. The grids are active and monitored for stimulus received.
 - Idle: The stimulus is disabled. A limit has been reached.
 - No Stimulus: The stimulus is disabled in the current step of a profile mode experiment.
- Interval Data Grid:
 - Int: reports the interval.
 - CH: reports the channel (1 to 8).
 - Time: the time-stamp when the data was collected. 24-hour format.
 - Speed (m/m): the speed of the treadmill belt in meters/minute.
 - Distance (m): the total distance the treadmill belt has moved in meters.
 - Belt Angle: the current incline of the belt in degrees.
 - TOB (min): Time On Belt. The measured time when the stimulus is “Active” and the animal is not detected on the grids.
 - NOS: Number Of Stimuli. The total number of stimuli received.
 - NOV: Number Of Visits. The number of visits to the grids where stimulus was received.
 - NOC: Number Of Complete exhaustions. The total number of complete exhaustions.
 - NOM: Number Of Measured exhaustions. The total number of measured exhaustions.
 - TSP: Time Score Percent. The percentage of time where stimulus was received over the moving window of time.
 - VSV: Visit Score Visits. The number of visits where stimulus was received over the moving window of time.
 - Status: Reports the current status of the stimulus.

7.1 Tools >> Device Scan

The Treadmill Software keeps a list of configured devices with which it expects are connected to the CI-Bus and available for an experiment. This option is used to verify the presence of the configured devices. Also, it can be used to add/remove devices from the list. This option will open a “Communication Scan” window:



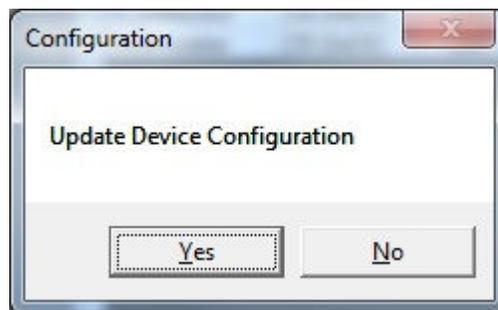
The following information and controls are available:

- “Connected through COM?”: The COM port provided by the CI-Bus Hub where the program found one or more configured devices upon launch of the program.
- Device List Grid: List of all configured or discovered devices on the CI-Bus.
 - Device: Name of the device.
 - Address#: 1 to 254. The unique CI-Bus address of the device
 - Prod ID#: 0 to 9999. The Product Number of the device (Columbus Instruments specific).
 - Version: The firmware revision of the device.
 - Status: “OK” indicates the device has been detected.
“No-Resp” indicates an expected and configured device is absent.
- Progress Bar: displays the progress of the “Scan for New Devices” procedure (see below).
- **Scan Configured Devices**: Click this button to verify the presence of all configured devices listed.
- **Scan for New Devices**: Click this button to discover all devices on the CI-Bus. Their information will display in the device list as they are found.
- **Exit**: Click this button to close the window and return to the main window. If changes have been made to the list of devices, the user is prompted to save or discard the changes.

7.1.0 Adding Devices to the CI-Bus

Use the following procedure to add new devices to the CI-Bus:

- ✓ Note the addresses of the currently configured and detected devices on the CI-Bus. Typical addresses are: 220, 230 and 235 for the Treadmill Controller, Treadmill Stimulus Detection and the Incline Controller respectively.
- ✓ Check the addresses of the devices you intend to add to the CI-Bus. Typically, it is printed on the serial tag or may be available to view or edit electronically by the device itself. Each address should be unique and different from all others on the CI-Bus, inclusive of all ports on the CI-Bus Hub.
- ✓ Remove the orange terminator from the last device on the end of the CI-Bus.
- ✓ Connect the new devices by way of CAT5 Network cables.
- ✓ Install the orange terminator in the available “CI-Bus” port of the last device.
- ✓ Switch ON the power to all devices.
- ✓ Click the **Scan for New Devices** button and program will discover all devices on the CI-Bus.
- ✓ If all devices are properly detected, click the **Exit** button. A “Configuration” window will open.



- ✓ Click **Yes** to save the changes and return to the main window.

7.1.1 Removing Devices from the CI-Bus

Use the following procedure to remove existing devices from the CI-Bus:

- ✓ Switch OFF the AC power of the devices to remove.
- ✓ Click the **Scan for New Devices** button and program will discover all devices on the CI-Bus.
- ✓ If all of the expected devices are properly detected, click the **Exit** button. A “Configuration” window will open.
- ✓ Click **Yes** to save the changes and return to the main window.

7.1.1 Removing Devices from the CI-Bus (continued)

The devices removed from the list of configured devices may still remain connected to the CI-Bus, even powered on. As they are not in the list of configured devices, their presence will not be checked and not used in an experiment. Of course, you may physically remove the devices from the CI-Bus so that they may be used elsewhere:

- ✓ Switch OFF the device and disconnect it from AC power.
- ✓ Disconnect the CAT5 networking cables from the device. If it was the last device on the bus, remove the orange terminator.
- ✓ Reconnect the CAT5 networking cables as needed and install the orange terminator in the available “CI-Bus” port of the last device.

7.2 Window

This menu contains the default options (Cascade, Tile Horizontal, Tile Vertical, Arrange the Icons) Windows provides for positioning open windows within the main window.

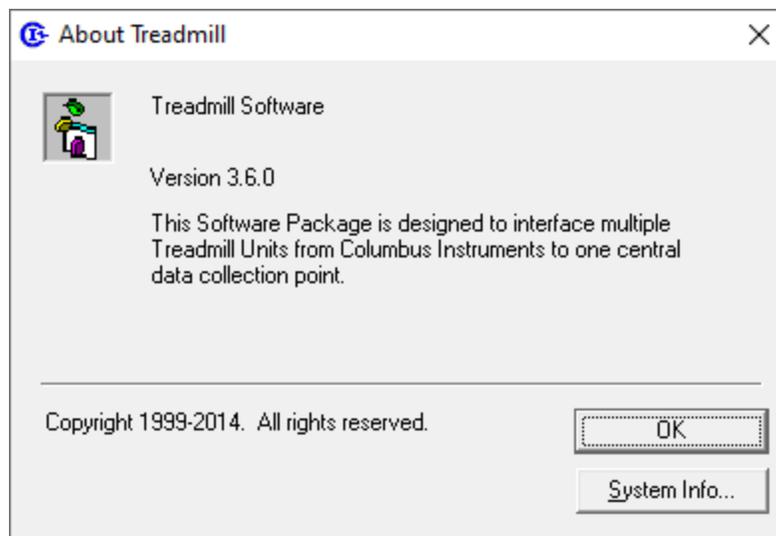
7.3 Help

This menu contains links to the PDF user manuals of the devices the Treadmill Software expects to control:

- Treadmill Manual (this manual)
- Treadmill Stimulus Detection Manual
- Inclinometer Manual

7.3.0 About

This reports the version of the Treadmill Software. Be sure to reference the version when contacting Columbus Instruments for help.



- ✓ Click the **OK** button to close the window and return to the main window.

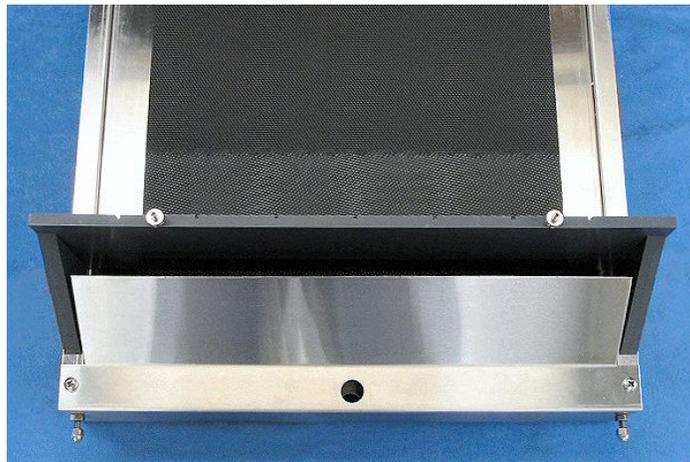
(intentionally left blank)

SECTION 8 MAINTENANCE

8.0 Treadmill Belt Tracking

As the treadmill is used, the treadmill belt and the pulleys will begin to wear in. This may cause the belt to stretch and become loose which may also coincide with the belt beginning to track away from the center of the treadmill. Adjustments can be made to return the belt to the center of the treadmill.

- ✓ Remove the treadmill cover and the lane dividers.
- ✓ Set the “SPEED” to a high setting, “50 . 0” meters/minute or greater
- ✓ Set the treadmill belt mode to RUN.
- ✓ Observe the treadmill belt from above the front (the inclination rod has been removed for clarity).



Using the 7/16-inch wrench supplied with the treadmill, tighten and loosen the nuts as follows:

- If the belt is right of center: tighten the nut on the right and loosen the nut on the left.
- If the belt is left of center: tighten the nut on the left and loosen the nut on the right.



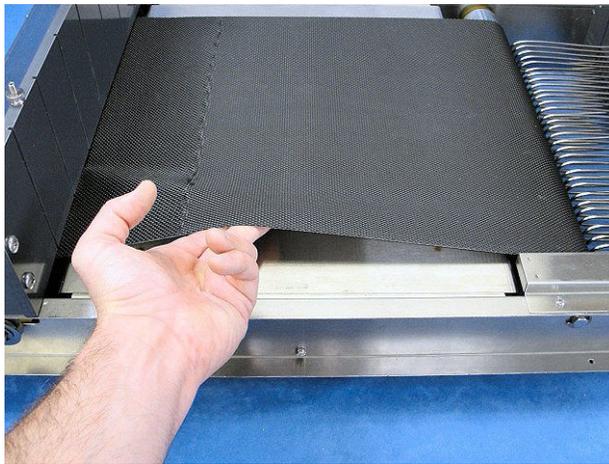
8.0 Treadmill Belt Tracking (continued)

Make small adjustments to the nuts, only 1/4 turns, and allow 1 minute for the belt to settle to the new tracking position. Once the tracking adjustments are complete, follow the procedure in the next section.

8.1 Treadmill Belt Tension

If the mechanical sounds of the treadmill appear to have increased in volume or the belt cannot be stopped with a heavy downward pressure, then the overall tension of the belt may be too high. Check the overall belt tension as follows:

- ✓ Set the “TREADMILL BELT” toggle switch to “STOP”.
- ✓ Lift the edge of the belt from the treadmill surface.



The belt should **NOT** be less than 4cm (1.5-inches) from the treadmill surface. If required, loosen both nuts equally until a height of the belt is 4cm.

8.2 Cleaning

For safety, switch off and unplug all of the equipment. Remove the cover with lid and all of the lane dividers. All of the parts can be cleaned with a mild soap solution. Do not immerse the treadmill. Try to prevent liquids from entering the components as this may damage bearings or the electronics inside.