

Every medical-grade foot control we manufacture is **built in our Medical White Room, which features ESD Safe Construction** for handling electronics, such as anti-static pads, grounded chairs, and grounding bracelets for technicians.

TABLE OF CONTENTS

2 EXPERTISE

More than 90% of the world's largest original equipment manufacturers turn to Linemaster for their medical grade foot controls

4 KNOWLEDGE

We have proven success working with the most rigorous medical specifications in the world

6 PROCESS

Design, Production, Documentation, Traceability, and Design Validation

10 SUPERIORITY

Why A Linemaster Medical-Grade Foot Control Is Better

14 TECHNOLOGY

Unparalleled Wireless Capabilities

16 PRODUCTS

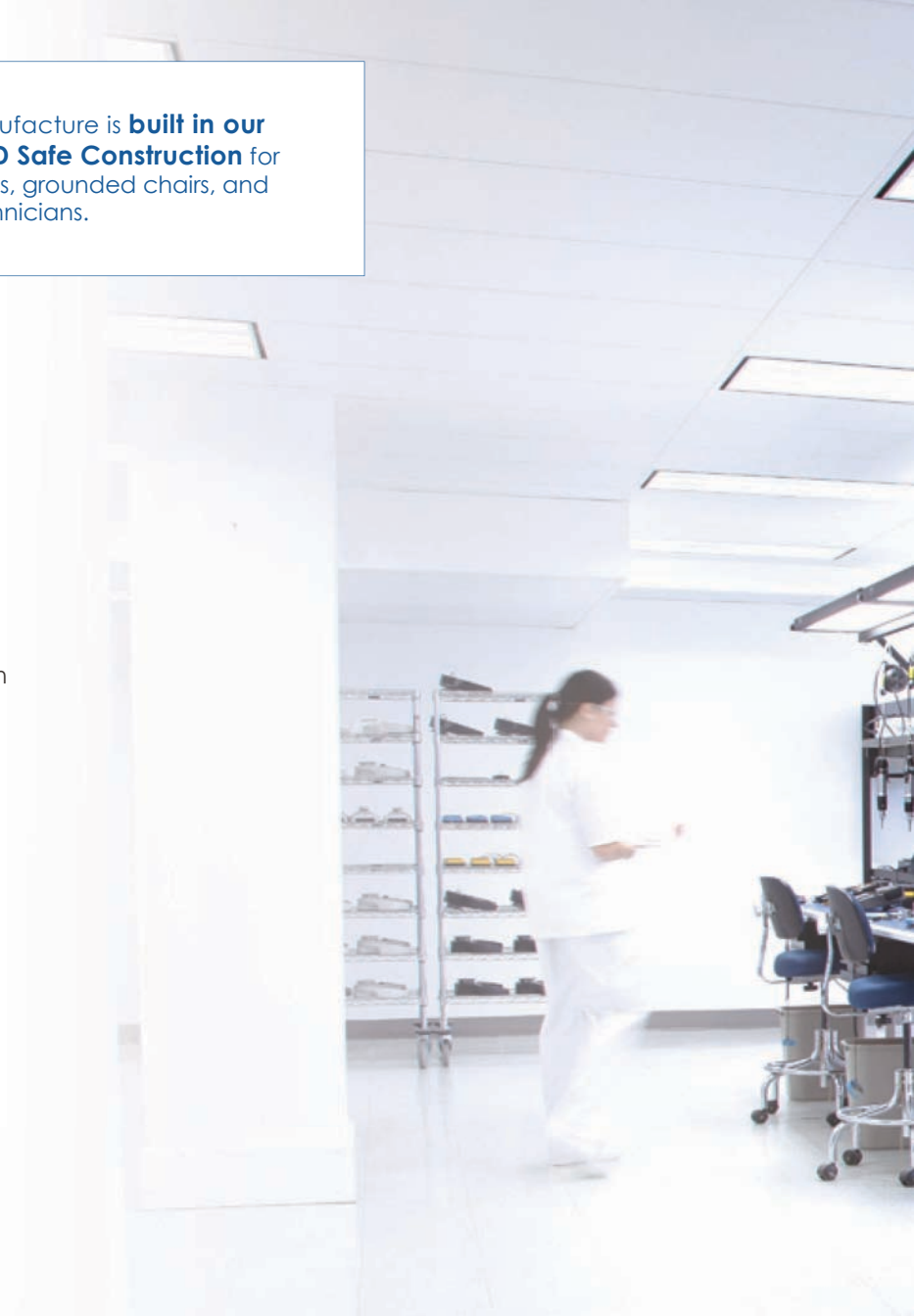
Wired And Wireless Design Considerations

22 APPLICATIONS

Linemaster Foot Controls At Work In The Medical World

24 HISTORY

The Best And The First In Foot Controls







LINEMASTER EXPERTISE

More than **90%** of the world's largest original equipment manufacturers turn to Linemaster for their medical grade foot controls.

Linemaster's mission is to provide a **superior foot switch at an affordable price without compromise**. This mission is met every single day.

Linemaster gives you a competitive edge. We are **the only foot control company in the world to hold FDA 510(k) Clearance** on a wireless foot switch. Whether you need a standard foot switch made at the highest quality or a custom foot switch engineered to meet your demanding specifications, Linemaster is the number one source for medical grade foot controls.


Highly engineered foot controls, FDA-cleared capabilities, innovative and flexible design: it is by no mistake that Linemaster is **the leading foot switch manufacturer in the world**. We reached this status by focusing solely on what we do best: foot controls.





LINEMASTER KNOWLEDGE

We have **proven success** working with the most rigorous medical specifications in the world.



We have partnered with an extensive group of satisfied medical clients from small start-ups to category leaders. Our diverse background means that we have catered to a multitude of diverse medical grade foot switch applications. If you can think of an application, Linemaster has probably already designed a foot switch solution for it.

Linemaster's track record speaks for itself: We have proven success working with the most rigorous medical specifications in the world. The most renowned medical device companies have turned to Linemaster again and again for the best medical foot controls available worldwide.

Linemaster's honed processes and quality systems are proven, resulting in the best and most reliable medical grade footswitches on the market today.

Linemaster's Quality Management Systems include:

- **FDA 510(k):** Linemaster is the only foot control company in the world to obtain FDA 510(k) Clearance on an infrared Wireless Foot Switch.
- **ISO 13485:2003:** This internationally recognized Quality Management Systems Standard was established for the design and manufacture of medical devices. Linemaster has demonstrated the ability to successfully implement a comprehensive management system for the design and manufacture of medical devices that meet the ISO Standard, FDA QSR, and regulatory requirements. The addition of the ISO 13485:2003 registration to the existing FDA 510(k) clearance reflects Linemaster's commitment to continuous improvement with the quality process.
- **Linemaster Quality Policy:** We are committed to provide the highest standard quality products and services that will meet or exceed our Customers' requirements, comply with regulatory requirements, and to maintain and improve the effectiveness of the quality management system.

All Regulatory approvals

FDA 510(k) Clearance

UL

CE

FCC

RoHS

REACH

CSA

TUV

WEEE

SEMKO



The logo graphic consists of four L-shaped blocks arranged in a 2x2 grid. The top-left and bottom-right blocks are white with a thin grey outline. The top-right and bottom-left blocks are solid grey. The text 'LINEMASTER' is in a light grey sans-serif font, and 'PROCESS' is in a bold blue sans-serif font, both centered horizontally between the blocks.

LINEMASTER PROCESS

We provide the best customer service and custom switches suitable for **ANY APPLICATION** in the industry.

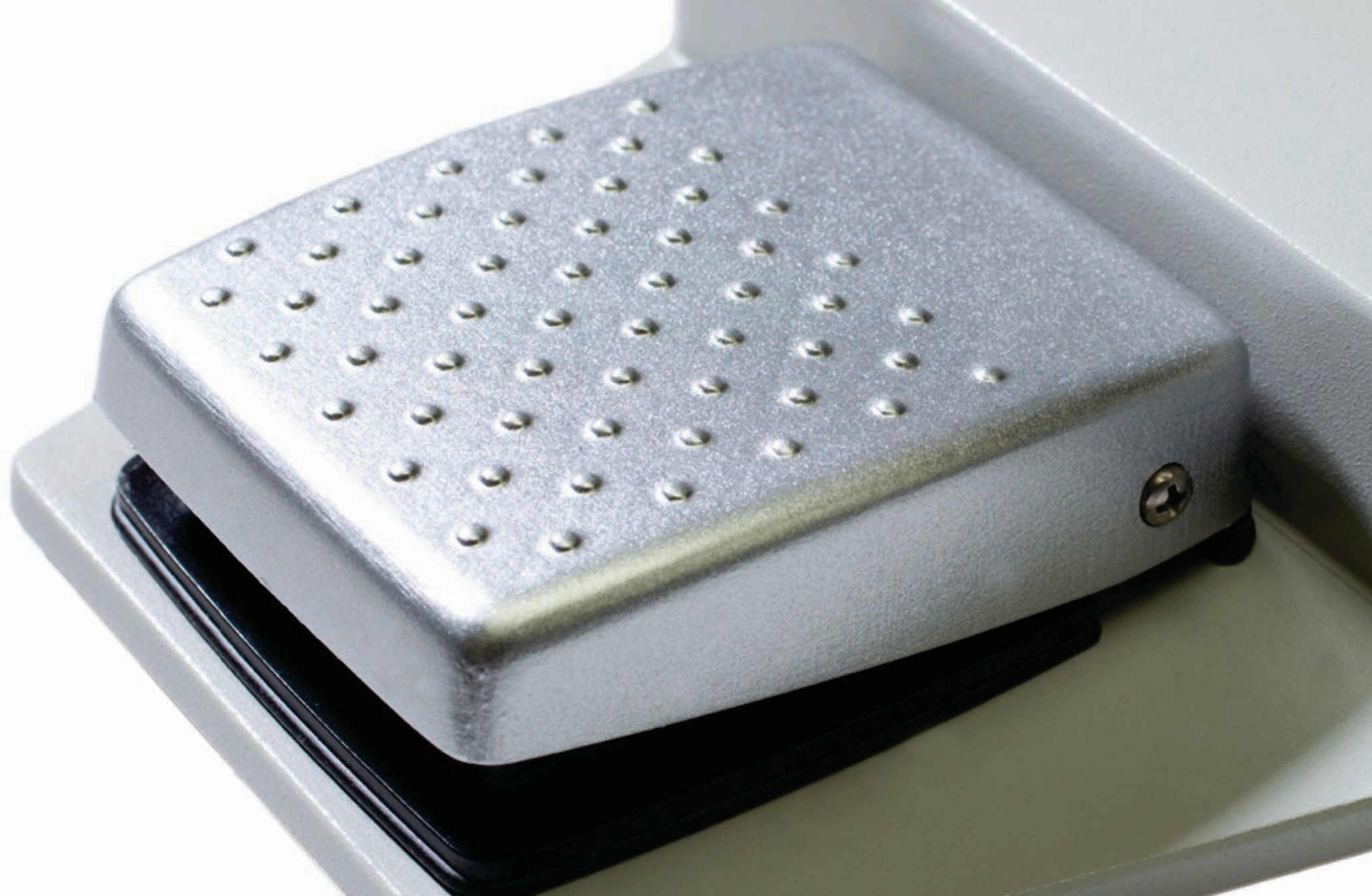
DESIGN AND PRODUCTION

Linemaster's creative design team brings to our customers vast experience in medical foot controls and can devise an ideal solution specific to each individual application. They apply in-depth knowledge in safety regulations, technical specifications, and on-site functionality to the best technologies available.

And then we do something decidedly low-tech – we talk to you. At the foundation of every Linemaster Foot Control is the best customer service in the industry.

Through the entire process, Linemaster's creative design team keeps the bottom line top of mind. Our team ensures that there is minimal, if any, non-recurring engineering expenses, and tooling is provided at cost. In-house artwork capabilities and an on-site printed circuit board lab translates to outstanding flexibility and ingenuity, within budget.

New technologies are at our fingertips; Infrared and Radio Frequency Wireless, Hall Effect Linear Devices, Magnetically Immune Circuitry for MRI Suite applications, Pneumatic, Pneumatic Linear Actuators, USB, RS232, RS485, and Digital & Analog foot controls. Custom cables, sizes, weight, functionality, handles, toe loops, paint, silk screen, base pads, dividers, electronics, LED's, and guards – the possible features of a new custom design are nearly limitless.





DOCUMENTATION, TRACEABILITY, DESIGN VALIDATION

Linemaster's rapid prototyping capabilities mean that your custom foot control is in pilot stage quickly and efficiently. Design validation prototypes and production runs are put through Linemaster's extensive testing protocols. Linemaster utilizes Automated Testing Equipment, a water-testing room to test IP68 foot controls, Hypot Test Equipment for ground impedance testing, Drop Tests, Pull Tests for testing cables and strain reliefs, Flex Testing of cables, as well as Continuity, Shipping, Environmental, and Impact testing.

Through it all, Linemaster's team is managing proper documentation. Project files containing emails, customer drawings, Linemaster preliminary drawings and any other correspondence are kept to track the entire life of the project. Top level components and finished product are traceable through barcode labeling, serial numbering, intelligent part numbers, and date coding – **everything you need for medical device approval from the FDA and other global market regulatory agencies.**



TRAINED AND CERTIFIED TECHNICIANS

Once your custom design is complete, you are in good hands, literally. Linemaster's trained and certified technicians are carefully selected to assemble and test our sophisticated medical-grade foot controls with state-of-the-art equipment. Our soldering technicians are certified in accordance with IPC-A-620 standards. We have a LEAN Manufacturing professional on site and our well-organized facility enables optimum workflow. Linemaster offers Vertically Integrated Human Resources, with hundreds of years of degreed and real-world engineering working for you.

Every medical-grade foot control we manufacture is built in our Medical White Room, which features ESD Safe Construction, such as Anti-static pads, grounded chairs, and grounding bracelets for technicians for handling electronics.

From custom design to finished product, Linemaster's promise of timely delivery of the highest possible quality product is met every day.

COUNT ON SUCCESS WITH LINEMASTER

Linemaster customers are usually life-long customers. Most of our major medical customers consider Linemaster a sole source supplier for foot controls for current and all new projects. Linemaster is a real business partner working for your long-term success. It is not uncommon for a customer's internal projects to be handed over to Linemaster to take it to the finish line. Our unparalleled focus on the goals and objectives of our customers has gained us a reputation second to none. Our customers trust our ability to design a user interface that will compliment and enhance their final product.

Linemaster knows what it takes to supply a product a customer can be proud of, on time and under budget.

Each of our 150 employees has on average 15 years of experience at Linemaster; many of our employees have been working with us for 25 years or more. We have a true passion for creating technically elite and aesthetically sophisticated foot controls. The innovation and creativity shown in our foot controls drive real excitement at Linemaster, and we will bring that passion to your project.

A close-up photograph of a white athletic shoe with a thick white sole. A silver, metallic, rectangular switch is attached to the side of the shoe. A foot is shown pressing down on the switch, which is slightly bent under the pressure. The background is a plain, light-colored surface.

LINEMASTER SUPERIORITY

Linemaster switches are strong, stable, safe, moveable, washable, **and responsive to a softer touch.**

WHY A LINEMASTER MEDICAL-GRADE FOOT CONTROL IS BETTER

A Linemaster foot control is designed and manufactured with medical applications in mind. Die-hard, engineered robustness is at the heart of every foot control, but we do not overlook aesthetics and ergonomics.

Stability does not come just from weight or immobility. Linemaster's products are specifically engineered to stay in place during use, yet they are light enough to respond to a softer touch and be easily repositioned to an optimal location for the user. Features like a toe loop holster can be incorporated into the design to allow the user to move the foot control with their foot thereby keeping hands free and sterile. **Linemaster merges the absolute best combination of fit, form, and function with aesthetically pleasing and complimentary industrial design on all of our medical grade foot controls.**

A Linemaster foot switch is not only a beautiful extension of the technology it controls, but also of the medical professional who operates it. A foot control is the "user interface" of its corresponding equipment. The equipment connected to the foot control may be superior, but if the user interface (foot control) is not of equal or greater quality, the user experience will not be positive. **User interfaces must be of the highest quality and technology to make equipment perform at top levels. This is where Linemaster shines.**

SUBMERSIBILITY

Other manufacturers claim to make foot pedals that can be easily cleaned, but Linemaster produces foot control devices that are designed to be fully submersible all day/everyday. Linemaster foot controls are made of the highest quality materials that can endure years of use without the peeling, cracking, or wear. In some applications materials that also discourage bacterial growth have been introduced. No other foot switch is as easily cleaned, sterilized, and ready for use again than a Linemaster foot switch.

Linemaster does extensive testing on their waterproof foot controls submerging them in 8 feet of water for a 24 hour period to assure that there is no water ingress. We have combined the best foot switch technologies and usability with the highest of medical industry standards for safety, reliability, and conformance.

It's by no coincidence that nearly 90 percent of all US medical manufacturers use Linemaster foot controls for their medical applications.

- IPG8 medical-grade foot controls
- Fully submersible
- Easy to clean

Waterproof Solutions





The image features a close-up, slightly blurred background of a green printed circuit board (PCB) populated with various electronic components. In the foreground, five large, cylindrical, dark purple electrolytic capacitors are prominently displayed, their top surfaces showing a cross-hatch pattern. To the right, a long green terminal block with multiple screw terminals is visible. Other components like white plastic connectors and small surface-mount parts are scattered across the board. The overall lighting is bright, creating a clean, technical aesthetic.

LINEMASTER
TECHNOLOGY

UNPARALLELED WIRELESS CAPABILITIES

Get wireless technology and limitless capability from the company that was first to market with a wireless foot switch that met the high demands of medical device manufacturers. And perhaps most importantly, Linemaster is the only foot control company in the world to obtain FDA 510(k) Clearance on an IR Wireless Foot Switch.

Linemaster's IR and RF wireless foot controls provide the ease of use, mobility, and hygiene while meeting the stringent safety and reliability requirements of medical equipment. Eliminate tripping risks, gain freedom of location, and eliminate potential cable damage. Easier, safer, cleaner: Linemaster's wireless footswitches are specifically created for the needs of medical environments.

IR Wireless

The IR Wireless foot control offers reliable reception by saturating a room with 360 degrees of high power, invisible, infrared light waves. Encrypted coding allows for multiple systems to be used in the same vicinity at the same time with no interruption or cross talk while utilizing a 50-foot transmission range. Linemaster IR Wireless foot switches are available in single, twin and triple variations offering up to (5) switch functions.

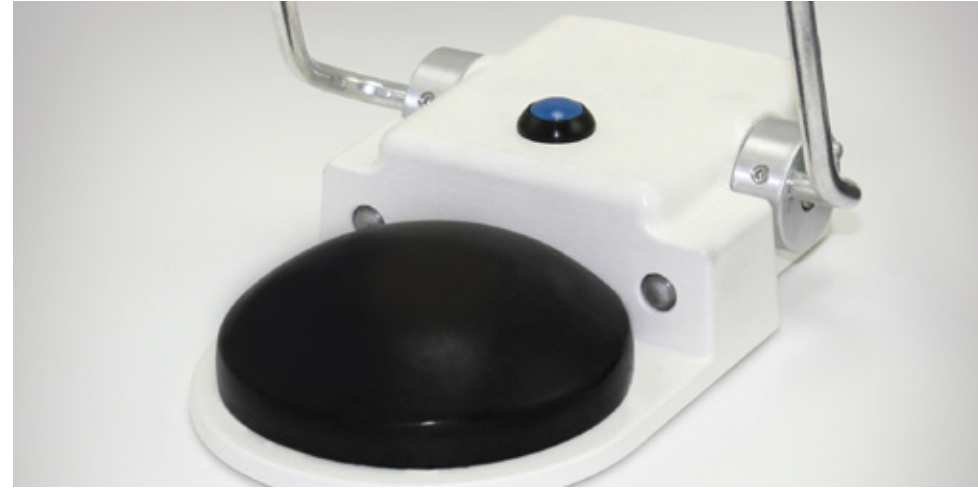
RF Wireless

Linemaster's standard RF Wireless foot controls are offered with up to (5) digital and (3) analog switch functions with additional switch functions available upon request. Linemaster's RF Technology utilizes the well-established IEEE 802.15.4 Standard and operates in the worldwide ISM 2.4 GHz frequency band. Our unique and robust proprietary communication scheme does not require the use of bi-directional link or acknowledgement, which greatly reduces the amount of air traffic and potential interference. This proprietary design also offers a battery life that is second to none. The transmitter meets the provisions of IP68 degree of protection making it the perfect interface for numerous medical devices.

Both of Linemaster's Wireless foot controls offer a unique "plug and go" system perfect for new applications or as a replacement for existing wired solutions. This system can be used in many different medical applications as the foot control meets the provisions of IP68 protection. Both types of Wireless technology are battery-powered and provide 400 hours at 50 percent duty cycle, which could translate to years of operating life depending on the application.



LINEMASTER PRODUCTS



Linemaster's wide range of medical foot controls includes USB, RS232, RS485, Custom Communication Protocols, Linear Hall Effect, Electric, Air Powered, Variable Speed Control, and Wireless IR and RF Systems for a large variety of medical applications.

Linemaster is the leader in the foot switch industry.



L
L

L

LINEMASTER
**WIRED FOOT
CONTROLS**



Our wired foot controls can be designed with single, twin, triple, and multi-function variations. Functions include electric, pneumatic, air-impulse, linear, USB, and hall effect. All options are available in custom models designed to meet your specific needs.

design considerations

Cable Considerations taken into account at Linemaster

- Wire Gauge
- Length of cable
- Size appropriate to fit the switch end and plug end
- Cable jacket material
- Cable memory
- Retractable cables

Strain Relief Options

- Bell mouth Connectors
- Clearflo tubing
- Heatshrink tubing
- Pigtail strain relief
- Molded on strain relief grommets
- Strain relief guards

Handle considerations

- Attached to the foot switch assembly for ease of picking up and prolonging the cable life.

Foot Guards

- Multiple options for covering the foot pedal and protecting the user's foot.

Push Buttons

- Operates as a function, smaller version of an actual pedal.

LED Lighting

- Installation of LED lights for ease of visibility in dimly lit areas

Foot switch covers

- Clam shell designs
- Rubber boots
- Protective plastic bags

Features and Benefits

- Reliable signal (*not affected by wireless signals*)
- Power source (*The foot switch is powered by the equipment it is attached to*)
- Price is lower than Wireless typically
- No latency (*equipment responds instantly when pedal is pressed*)
- Easy to clean because of the waterproof foot pedal (*transmitter*)

Cable Testing

- Cable life test/flex test
- "Pick up-drop" testing
- Strain relief pull testing
- Gourney testing



LINEMASTER
**WIRELESS FOOT
CONTROLS**



No one offers more possibilities for wireless foot controls than Linemaster. Our single, twin, triple, and multi-function variations can be customized designed and manufactured to your exacting specifications.

Different Wireless Technologies offered

- Infrared
- Radio Frequency

Digital and Linear Pedal Options

- On/Off
- Hall Effect
- Optical
- Pneumatic

Transmitter (Foot Switch)

- IP68 degree of protection, waterproof switch, can be fully submerged in water for cleaning etc.
- Foot pedal runs on 3 "AA" Alkaline batteries that last over 400 hrs @ 50% duty cycle

Receivers

- AC Powered, must be plugged into the wall
- DC Powered via OEM Interface or Power Plug
- Battery Powered, receiver will run on 4 "C" Cells
- Internal (Built into User console)
Customer can build the receiver and miniature flat antenna board into their equipment so that there is no external receiver.

- External (Standard option)
Typical selection where the receiver and built-in antenna would sit next to or on top of the equipment and a pigtail cable would attach it to the equipment.
- IPX1 degree of protection

Features and Benefits

- Very convenient to move around without a cable
- Great Range of 50 plus feet for both Infrared and Radio Frequency models
- Long battery life, low power consumption for both technologies
- No tripping hazard that exists with wired pedals
- Easy to clean because of the waterproof foot pedal *(transmitter)*
- FDA 510(k) Clearance on the Infrared version
- Special encrypted codes are programmed by Linemaster to assure that there will not be any cross-talk between pedals or with any other piece of equipment in medical field
- Fully tested and designed to withstand outside interference

Testing

- Range testing
- EMI shielding
- Signal security



LINEMASTER APPLICATIONS



Linemaster foot controls are in **use in dozens of medical applications.**

LINEMASTER FOOT CONTROLS AT WORK IN THE MEDICAL WORLD

Linemaster holds approximately 90 percent of the medical OEM foot control business in the US market. You will find Linemaster Foot Controls being used in conjunction with the following medical equipment:

- Electrosurgical Generators
- Biopsy Systems
- Bone Saws
- CT Scanners
- Dental Chairs
- Medical Lasers
- Endoscopy
- Fluoroscopes
- Liposuction
- Laparoscopic Surgery
- Medical Cameras
- Medical Tables
- MRI Systems
- Surgical Navigation Systems
- Ophthalmic Surgery
- Surgical Shavers
- Lighting Controls
- Surgical Visualization & Image Management Systems
- Surgical Microscopes
- Ultrasonic Diagnostic Systems
- X-Ray Equipment (C-Arm).