Setting The Standard For The 21st Century...

STTS SoftTactileTransducerSensor™ Safety Mat System

Meets Worldwide Safety Standards

- Uniform Activation™
- Integrated Modular Design
- No Dead Zones™
- Ribbed, Non-Skid or High Temperature Surfaces
- Active Edging™
- Customized Mat Inlays
- Presence Contact Sensing

STTS Sensor INSIDE

par•a•digm (par'ə dīm,-dim), *noun* **1.** an example serving as a model; pattern: **2.** in technology; a hybrid product that possesses advanced technological advantages and inherent design features over current products and technologies in the marketplace...the **STTS** SafetyMatSystem™

The ***STTS Safety Mat System***™ is a technological paradigm in the field of presence-contact sensing/pressure sensitive safety mat systems. This revolutionary mat system is a hybrid design that combines features to meet and surpass both domestic and international safety standards. Through its advanced technology and state-of-the-art design features, the ***STTS Safety Mat System*** sets a new ***World Class Standard*** for the mat detection industry.

STTS Soft Tactile Transducer Sensor™ Technology

The STTS system is a tactile sensor that provides information regarding the distribution and magnitude of tactile force applied to its surface. This patented technology involves the continuous and variable measuring of tactile forces of pressure. In some respects, tactile sensing for electro-mechanical devices is analogous to the human sense of touch--information about the amount and distribution of tactile pressure over a surface can be received and transmitted. When an object comes in contact with the sensor, tactile sensing provides information about the object's shape, texture, position, orientation, deformation, center of mass, and presence of torque or slippage. If you have special needs or applications for uses of the technology, please contact the factory for our intelligent products.

Why the STTS SAFETY MAT SYSTEM™ is the safest

Compliance to Safety Standards Worldwide

At this writing, the "STTS SAFETY MAT SYSTEM" meets or exceeds all current standards of OSHA, ANSI, CSA, and RIA, including the stringent European Standard draft ref. No. prEN...1760-1 used for CE acceptance. This assures our customers compliance with the ever-increasing safety standards and regulations required when machines and guarding systems are sold or distributed globally. Classified Category 4 Safety Device per EN 954.

Uniform Activation™

This feature provides a uniform activation threshold (on/off signal) throughout the entire mat surface area. Our unique design of uniform activation also provides a guarding system that contains no dead zones. This provides the user with a much safer guarding system as well as compliance with domestic and international standards.

No Dead Zones™

Uniform activation means that the "STTS SAFETY MAT SYSTEM" has no dead zones on the mat surface--it is 100% ACTIVE. Other mats that use double-backed foam tape, O-rings, or large perimeter sealing techniques for element encasement create a dead zone around the entire perimeter of the product. Dead zones are also found directly above and below the many silicone spacers, elastomers, or insulators used as standoffs within the element assembly of force style mats. With the advent of specific safety mat positioning and layout formulas based on international safety standards, the "STTS SAFETY MAT SYSTEM" gives you the peace of mind of a mat detection system with no dead zones.

Intelligent Matting™

An "Intelligent Mat" is the same as the standard STTS safety mat--with the addition of a pressure-activated, "on/off" analog-controlled switch sensor, for areas based on force/area (psi). An "Intelligent Mat" provides a broad understanding of the kind of tactile event that is occurring and, in the same way as the standard mat, is scalable because of its analog output and natural psi characteristics. What makes the "Intelligent Mat" unique is that it can be programmed by varying the electrode pattern to determine where the contact has occurred on a multiple position basis (in width "x" and length "y"), and the basis of mass point loading ("z").

No, we don't recommend puncturing the STTS Safety Mat with nails (or, for that matter, shooting it with a .357 magnum, as shown on video at various international trade shows). These dramatic demonstrations, however, serve to show the exceptional durability of the STTS Safety Mat System.

Active Edging™

This standard feature of the "STTS SAFETY MAT SYSTEM" enables the user to place the mats side-to-side or end-to-end. Simply sliding the active coupler in place enables the active edging feature of the "STTS SAFETY MAT SYSTEM." This solves cumbersome multiple mat installation problems normally associated with mats. It also eliminates the need for thresholds, close-out and uniting strips that create dead zones, which increase substantially both product costs and installation time.

Customized Safety Mat Inlays

The "STTS SAFETY MAT SYSTEM" is an excellent method for guarding machine areas such as the back of press brakes, assembly machinery access areas, deck runways, robotic areas, etc. In addition, the "STTS SAFETY MAT SYSTEM" can be custom fabricated to provide an exact fit for those hard-to-guard areas--often with only one mat. It is also excellent for OEM applications.

Presence Contact Sensing/Pressure Sensitive Mat System

By providing greater sensitivity and uniform activation, the "STTS SAFETY MAT SYSTEM" is in a class by itself. This true and uniform activation threshold is unobtainable with competitive "force-style" mats. Competitive mats normally utilize insulators within their switching element as standoffs and around their perimeters as seals. These standoffs or insulators create dead zones and require large amounts of force to activate the mat.

Integrated Modular Design

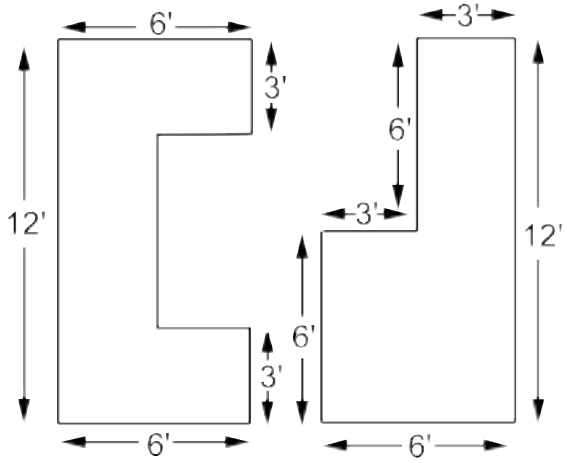
Because of our unique manufacturing techniques and product versatility, we are able to design a modular system specifically for your project. This means you can safely guard the toughest of applications in an efficient and cost-effective manner. Our experienced factory personnel will make sure detailed system layouts are completed with safety and cost-effectiveness in mind. All aspects of the project are reviewed including layout, shipping, and installation. Safety is always paramount to the project "system design" scope.

Single Mat Capability

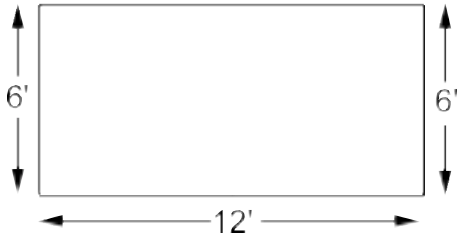
Save time and installation costs with single piece mat installations. Help eliminate or reduce daisy chain wiring practices required by competitive systems.

The sizes shown are typical single piece mat installations that illustrate the manufacturing versatility of the STTS Safety Mat System.

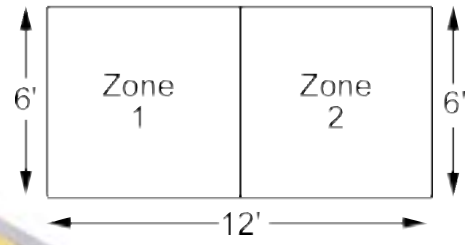
- The wiring exit positions can be located anywhere on the mat perimeter.
- The mat sizes shown can easily be altered to fulfill your specific project needs.
- No tooling fees for special mat designs.

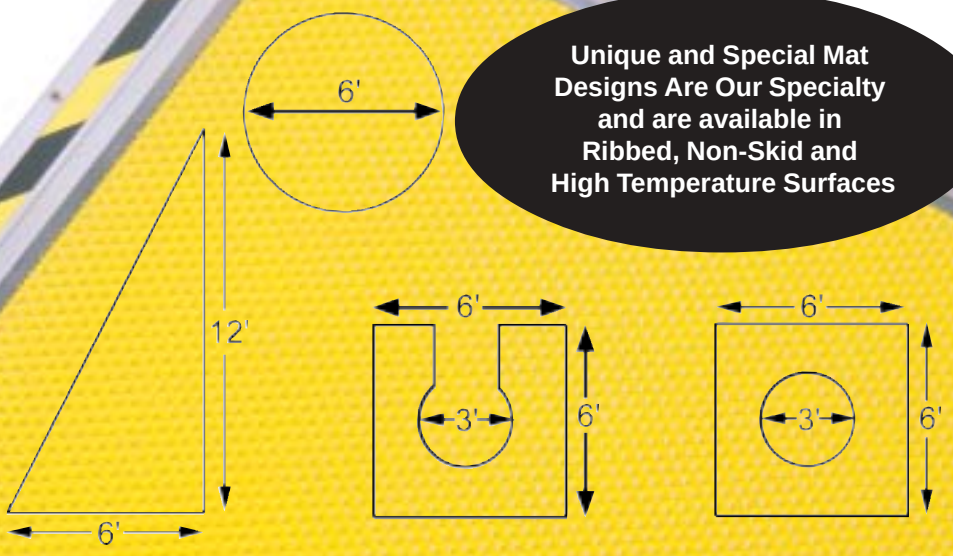


Single Zone Mat



Multiple Zone Mat





Unique and Special Mat Designs Are Our Specialty and are available in Ribbed, Non-Skid and High Temperature Surfaces

Design Criteria

STTS Safety Mat System™	STTS System		
• "Control Reliable" Safety Mat System Classified Category 4 Safety Device	Yes	_____	_____
• Utilizes the patented STTS sensor technology	Yes	_____	_____
• Designed specifically for the rigorous industrial environment	Yes	_____	_____
• Provides "Uniform Activation™"	Yes	_____	_____
• Contains "No Dead Zones™ – " 100% Active Mat Surface	Yes	_____	_____
• "Active Edging™" feature	Yes	_____	_____
• "Intelligent Matting™" capability	Yes	_____	_____
• "Homerun plug connector or wire capable"	Yes	_____	_____
• Multi-lingual mat controller with built-in diagnostic message display available	Yes	_____	_____
• A true uniform pressure sensitive (PSI) mat system	Yes	_____	_____
• Easy system to install/Easy to troubleshoot	Yes	_____	_____
• No adjustments required	Yes	_____	_____
• Contains no steel components to rust or deform	Yes	_____	_____
• No vacuum seal to break which induces rust and leads to dead zones	Yes	_____	_____
• Can absorb punctures	Yes	_____	_____
• Mat provides arc-free switching	Yes	_____	_____
• Dual ribbed mat housing	Yes	_____	_____
• Ribbed, non-skid, or high temperature surfaces	Yes	_____	_____
• Hermetically sealed sensor system	Yes	_____	_____
• The STTS Mat Electrodes are: Non-Corrosive Flexible Non-Magnetic ArcFree Anti-Static Non-Metallic	Yes	_____	_____
• Adapts well to uneven factory floors	Yes	_____	_____
• Custom engineered sensor systems available	Yes	_____	_____
• Customized activation thresholds available	Yes	_____	_____
• Largest selection of sizes and capabilities available	Yes	_____	_____
• Intelligent floors and mats (zone/force sensitive relationships)	Yes	_____	_____
• Computer interfaced SmartFloors™ and SmartMats™ available	Yes	_____	_____
• Multiple patents pending	Yes	_____	_____

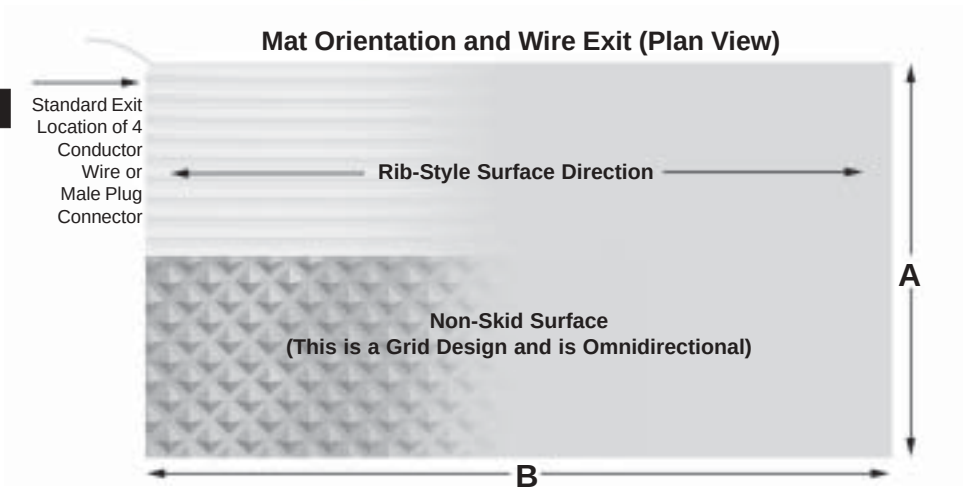
Mat Layout Procedure

1. Sketch total area to be guarded.
2. Locate desired mounting position of mat controller.
3. List mat sizes and styles desired to completely guard the hazardous zone.
4. If area to guard is too complex to determine mat sizes, submit drawing to the factory.

Mat Sizes - Inches/Millimeters

Standard Mat Widths (A)	
12" / 305mm	48" / 1219mm
18" / 457mm	54" / 1372mm
24" / 610mm	60" / 1524mm
30" / 762mm	66" / 1676mm
36" / 914mm	72" / 1829mm
42" / 1067mm	

Standard Mat Lengths (B)	
12" / 305mm	84" / 2134mm
18" / 457mm	90" / 2286mm
24" / 609mm	96" / 2438mm
30" / 762mm	102" / 2591mm
36" / 914mm	108" / 2743mm
42" / 1067mm	114" / 2896mm
48" / 1219mm	120" / 3048mm
54" / 1372mm	126" / 3200mm
60" / 1524mm	132" / 3353mm
66" / 1676mm	138" / 3505mm
72" / 1829mm	144" / 3658mm
78" / 1981mm	



Ordering Your Mat Assembly

Example Part # **N - Y - 60 - 96 - P - 20 - S**

Mat Style	Mat Color	Mat Width Dimension "A"	Mat Length Dimension "B"	Mat Wiring Style	Mat Wire* Length	Specials (Optional)
R-Ribbed Surface **N**-Non-Skid Surface **H**-High Temp Surface (Excellent for weld splatter, molten plastic, die casting, and forging operations)	**B**-Black **Y**-Yellow	12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72	12, 18, 24, 30 36, 42, 48, 54 60, 66, 72, 78 84, 90, 96, 102, 108, 114, 120, 126, 132, 138, 144	**W**-Hard wire lead from mat to mat controller. **P**-Plug connector at mat with hard wire lead to mat controller. **R**-Plug connector at mat with plug extension to mat controller receptacle (requires plug receptacle on mat controller).	**W**-For wire leads. Order in feet; 20' feet supplied standard. Specify longer lengths if needed; 100' maximum. **P**-For plug connector mat with hard wire lead to mat controller. Order in feet; 20' supplied standard. Extension lengths available: 10', 15', 20', 25', 50'. **R**-Select plug extension length in feet. Lengths available include 10', 15', 20', 25'.	**S**-Designates a special size, cut, contour, hole, notch, angle or wire exit location in the mat. Please submit drawing.

(Substitute specific sizes if needed)

EXAMPLE — Part # N-Y-60-96-P-20 is a non-skid surface yellow mat 60" wide and 96" long with a plug connector. The plug extension is 20' long and will terminate at the mat control box. Plug receptacle mounted on control panel optional. Refer to mat controller ordering procedure section.

***MAT WIRING** — Individual mat homerun wiring or plug extensions back to the control box are required for easing installation and diagnostics for maintenance troubleshooting. This will eliminate cumbersome "daisy chain" wiring practices of mat systems. It also eliminates numerous wiring connection points buried under the perimeter trim which are time intensive to troubleshoot.

SPECIALS...The Customat™ series
The ultimate customized mat system in the industry. Also available with the smart "Intelligent Matting™" capability. This series can provide customized mats, machine inlays, customized activation thresholds, wire exits, etc. Submit drawing and requirements to factory.

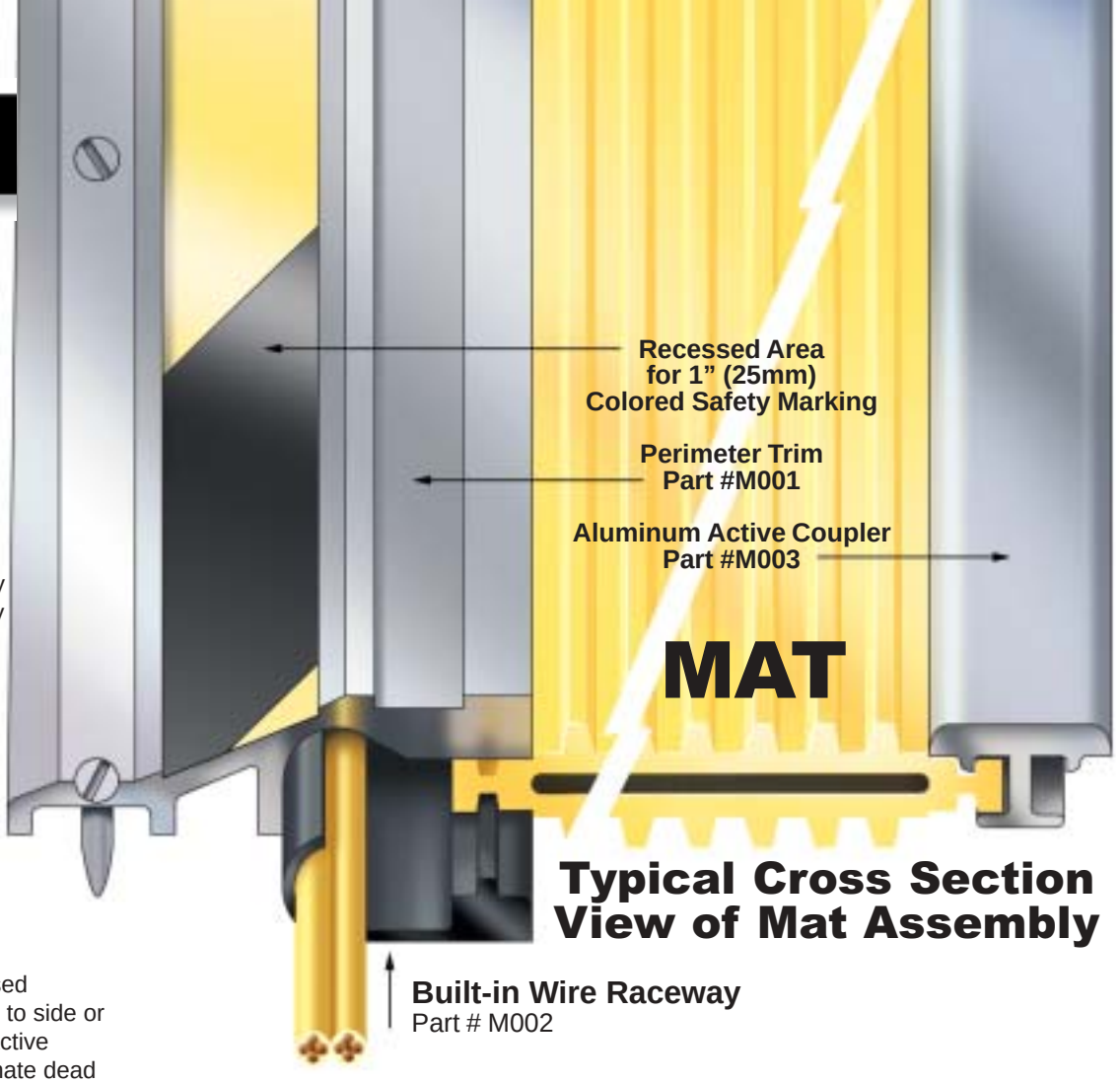
Trim Kits for Mats

Perimeter Trim (Part #M001) is used for anchoring the outside perimeter of the safety mat assembly to the floor and to run the mat wiring back to a location near the mat controller. The unique wire raceway is built into the perimeter trim and is supplied standard with all Part #M001 orders. The perimeter trim adds 2.5" (64mm) to mat dimension per edge.

Ordering Procedure: Specify linear feet or dimensions followed by one of the following:

TK: (picture frame trim kit)
M001: (bulk)
M001-M: (bulk/machined)
Custom Trim Kit: (consult factory)

Example: Part # 2442TK
A 24" x 42" mat with a 24" x 42" picture frame trim kit; total area is 29" x 47".



Typical Cross Section View of Mat Assembly

Active Coupler (Part #M003) is used whenever the mats are placed side to side or end to end. This will activate the "Active Edging™" feature which will eliminate dead zones between mats. The active coupler adds .25" (6.35mm) to the mat system's overall dimension.
Ordering Procedure - Specify Part # and total length required in feet.

ALL SAFETY MAT ASSEMBLIES ARE REQUIRED BY LAW TO BE "FIXED" IN PROPER LOCATION FOR MACHINE GUARDING APPLICATIONS.

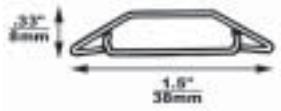
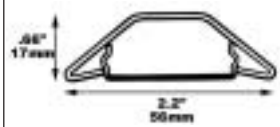
Built-in Wire Raceway (Part # M002)

This innovative design concept provides excellent wiring protection for your safety mat system. The design provides an elevated off the floor wire raceway to protect the wiring and connections from fluids and caustic materials on the floor. It also provides a wiring harness to protect the mat wires from being pinched by improper perimeter trim installations commonly found in the industry.

The built-in raceway promotes individual homerun mat wiring back to the mat controller to ease installation and aid system troubleshooting diagnostics via the message display. The wire raceway provides enough space for six wire/plug assemblies to be run individually within the raceway back to the mat controller. The wire raceway component is supplied standard with the perimeter trim Part #M001.

Surface Metal Raceway

Used to shield wire runs across the floor between the perimeter trim and the mat controller.

Part No.	Item	Description	
M005	Base and Cover		.040" (1mm) galvanized steel. Base has 9/32" (7mm) diameter mounting holes on centers of approximately 8" (203mm) and is scored every 3" (76mm). Available in 10' (3.05m) lengths. Wire Capacity - 1 to 4 Mat Wires
M006	Base and Cover		Cover: .050" (1mm) galvanized steel. Base: .040" (1mm) galvanized steel. Base has 9/32" (7mm) mounting holes on centers of approximately 8" (203mm) and is scored every 3" (76mm). Available in 10' (3.05m) lengths. Wire Capacity--5 to 8 Mat Wires

Ordering Procedure — Specify Part # and total length required in feet.

Safety Mat Label

Provides immediate safety mat system information required by international guarding standards. The label is located at the corner of the mat near the wire exit position. Actual size shown right—3-3/8" x 2-1/8" (86mm x 54mm).

Bar coding is supplied standard to ease in receiving and inventory control.

Customized labels are available.

Components & Specifications

Mat Wiring — Yellow PVC jacketed, 4 conductor, black, white, blue, brown 300VAC, 90C, 24AWG, CSA & UL Listed.

Mat Plug Assembly — Yellow PVC jacketed, snap connection, 4 pole black, white, blue, brown 300VAV, 90C, 24AWG, CSA & UL Listed. NEMA 6 (IP 67).

Mat Cable Diameter — .18" (4.6mm) for wire and plug assembly.

Mat Housing — .25" (6.35mm) top and bottom mat housing, cross drain built-in on mat bottom, hermetically sealed. Special mat housings available, consult factory.

Perimeter Trim — Part # M001
High-grade aluminum # 6063-T5

Active Coupler — Part # M003
High-grade aluminum # 6063-T5

Wire Raceway — Part # M002
High-strength PVC (black)

Mat Temperature Rating — -15^{0}C to 55^{0}C
4^{0}F to 130^{0}F

Mat Chemical Resistance

The mat compounds have excellent resistance to acids, alkalies, and salts. Hot acids and alkalies, as well as concentrated oxidizing and organic acids, have a deleterious effect over prolonged exposure.

Mat Chemical Resistance

Water	E	Acetic Acid	F
Ethyl Alcohol	E	Gasoline	F
Sodium Chloride	E	ASTM 1 Oil	F
Bleach	E	Benzene	P
Hydrochloric Acid	F to E	Aceton	P
Sulfuric Acid	F to E	Trichlorethylene	P to F
Nitric Acid	F to E		

Key: E=Excellent; F=Fair; P=Poor

STTS Metal Box Controller Module

Metal Box Features

- **Controller Layout—**The STTS Metal Box control system can be ordered with 1 to 3 separate output zones. Each zone has 3 separate isolated dry contact outputs and user optional external relay check. Up to 8 separate mat inputs allow any combination of mats to control any combination of zones and, at the same time, provide instant information of faults via a scrolling diagnostic message display and mat input indicators (LED's). All safety related faults cause a lockout condition requiring internal reset.
- Universal controller for all mat sizes
- Status indicators for operator awareness
- Ultrafast response time
- Multi-lingual diagnostics available
- DeviceNet™ fieldbus network compatible (optional)
- Remote latching reset built-in
- Fault relay output built-in
- Push button reset with memory
- Meets or exceeds UL Subject 491, UL1998, OSHA, ANSI, RIA, and international standard IEC 1760-1
- Two-year warranty
- Made in USA

Metal Box Controller Display

Common Design Criteria

The STTS Mat Controllers utilize the diverse redundant design concept. When combined with the advanced STTS Safety Mat System, the controllers provide compliance with OSHA, ANSI, RIA, CSA, and the European draft standards EN954-1 and EN1760-1.

These standards dictate safety of machinery and the related parts of control systems and their pressure-sensitive protective devices. These standards focus on creating a fault tolerant system.

Control Reliable System—Critical components are duplicated so a single component failure will not cause an unsafe condition. If a component does fail, the self-checking circuitry recognizes the fault and initiates a safe stop of the machine. The fault is then displayed on the message display.

Self-Checking Circuitry—The STTS Mat Controller will self-check every 20 milliseconds. Self-checking is the ability to electronically verify that all of the system's critical internal circuit components and their redundant counterparts or back-ups are operating properly.

Diverse Redundancy Design Concept—The STTS Mat Controllers utilize the diverse redundancy design concept. This gives the mat system a higher level of redundancy and control reliability. The two microprocessors are of different design, and the microprocessor or parallel programs are programmed from different instruction sets written by different programmers.

Redundant Captive Contact Safety Relays—Redundant relays assure safety should an output relay fail. The STTS Mat Controller utilizes safety relays which have force-guided contacts. This is a configuration where the contacts are mechanically locked together so if one set of contacts weld, the other contacts cannot change state.

Alphanumeric Diagnostic Message Display—Scrolling message display shows status and fault codes. This is an excellent safety and maintenance feature unparalleled in the machine guarding industry for increasing uptime.

DeviceNet™

Complete system monitoring on DeviceNet fiel
family is fully compatible with the DeviceNet fie
the fieldbus for non-safety monitoring of syste
cost communications link that connects a wide
devices for greater usability and convenience.
networked with numerous other devices on a s
to controller part number for this optional featu

iteria for Both Controllers

Circuit Description—Low voltage DC signal (+/- 20VDC) is pulsed to the mat simulating a 24VAC signal through two wires. The wires are attached to the top and bottom electrodes (internally) of the mat. Force on the mat lowers the resistance between the two wires causing a drop in voltage. A second pair of wires coming back from the mat is used to sense this drop in voltage. The redundant circuits compare the voltage to a reference and shut down the zone when the voltage drops below the reference. The circuit goes through a self-check to verify that the reference, comparators, mat, wiring, and other circuits are all functioning normally every time it scans a mat input. Diverse redundant technology, provided by two different computers, controls the whole system and provides a higher level of safety and system flexibility.

The following standard provisions are designed into both mat controllers to facilitate the guarding system interface and monitoring desired (usage is optional):

External Relay Check Provision—The External Relay Check allows the STTS Mat Controller to monitor a pair of external relays in series using the external relays secondary set of DRY contacts, provided they are N.C. force-guided contacts. The captive or force-guided contacts will maintain the identical position as the primary set of contacts on the external relays, except the secondary set of contacts are wired to signal the reverse of the primary (i.e., primary contacts are N.O. and secondary contacts are N.C.). The circuit looks for both closing and opening of the external relay contacts. The STTS Mat Controller provides a safe external relay check.

Application—Monitoring external relay contacts for shorts, opens, or welded contacts.

Auxiliary Output Contact Provision—The Auxiliary Output contact provides a N.O. or N.C. isolated (DRY) contact output to signal the condition of the mat system. The output is used in conjunction with the standard pair of output relays that are wired to the safety circuit of the equipment.

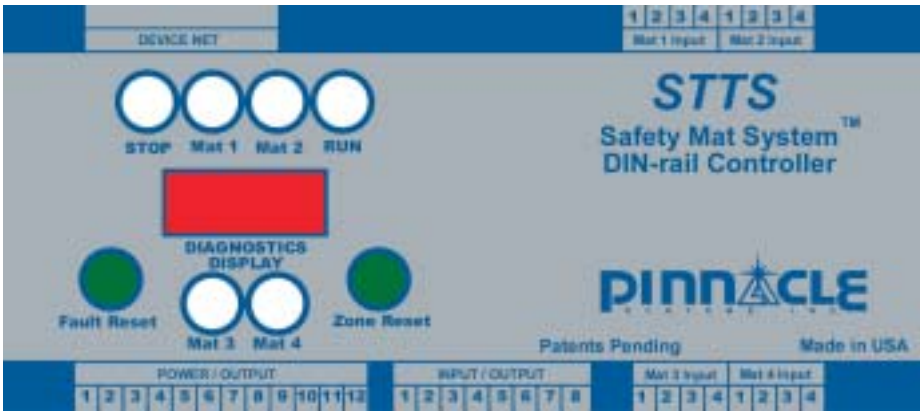
Application—Signal to PLC, etc.

eNet fieldbus networks. The STTS Mat Controller ceNet fieldbus and can be connected directly into of system status. DeviceNet is the leading low- s a wide range of automated manufacturing enience. Multiple STTS Mat Controllers can be es on a single DeviceNet network. Add suffix DN nal feature.

DIN-rail Features

- Snap-out wiring terminals reduce both installation and maintenance costs
- Universal controller for all mat sizes
- Status indicators for operator awareness
- Ultrafast response time
- Scrolling diagnostic message display built-in or remote mounted
- Multi-lingual diagnostics available
- Remote status display capable (RSD)
- Emergency stop safety input built-in
- Fault relay output built-in
- Remote latching reset built-in
- Remote indicator light outputs provision built-in
- DeviceNet™ fieldbus network compatible (optional)
- Push button reset with memory
- Meets or exceeds UL Subject 491, UL1998, OSHA, ANSI, RIA, and international standard IEC 1760-1
- Two-year warranty
- Made in USA

Enclosure mounting: 35mm DIN-rail mountable or mounting screws on corners of enclosure requiring two combo-head screws (3.5 x 0.6 mm x 14 mm or #6 x .5)



DIN-rail Controller Display

STTS Controller Specifications

	Metal Box Controller		DIN-rail Controller	
Power:	20-40VDC @18 Watts 85-125VAC @ 19 VA 200-245VAC @ 19 VA	Requires removal of transformer All AC voltages work with 50 or 60 Hz	24VDC +/- 20% @ 7 Watts maximum	
Max # of Mats:	Up to 8 separate mat inputs		Up to 4 separate mat inputs	
Scan Time:	19 mSec/mat input		19 mSec/mat input	
Outputs:	*SAFETY*: 2 N.O. outputs (open when RED) per zone *AUXILIARY*: 1 N.O. or N.C. output per zone *FAULT:* Normally open (N.O.)	Monitored Monitored	*SAFETY*: 2 N.O. outputs (open when RED) per zone *AUXILIARY:* N.O. or N.C. with common *FAULT:* Normally open (N.O.)	Monitored Monitored
Zone Reset Inputs:	3 inputs for N.O. push buttons for manual resetting of each zone located on the control panel door	Monitored	1 input for N.O. push button for manual resetting located on front of DIN-rail Controller or optional Remote Status Display (RSD)	Monitored
Settings:	Jumpers to select manual or automatic reset, # of mats/zone and how many zones, fault reset and external relay checking		Jumpers to select manual or automatic reset, up to four mats and one zone, fault reset and external relay checking	
Indicators **Internal:**	Red LED on power supply board	ON= +12V supply ok	+5 V - Yellow LED's (2) Relays-Green LED's (4) +12V - Red LED (1) -5V - Green LED (1)	
External:	8 Yellow LED's (1 per mat input) on panel door 3 Red/Green LED's (1 set per zone) on panel door	Yellow LED on = Standing on mat Yellow LED flashing=Fault with mat/circuitry Green LED on = Relays energized Red LED on = Relays de-energized Red LED flashing = Relay fault	Yellow LED on = Standing on mat Yellow LED flashing = Fault with mat/circuitry Green LED on = Relays energized Red LED on = Relays de-energized Red LED flashing = Relay fault	
External Display:	Diagnostic scrolling alphanumeric message display (4 character LED)		Diagnostic scrolling alphanumeric message display (4 character LED)	
Safety Relay Contact Rating:	8 AMP Rating @ 220VAC 16 AMP Rating @ 120VAC		8 AMP Rating @ 220VAC 16 AMP Rating @ 120VAC	
Safety Relay Configuration:	Dual captive contact self-checking safety relays		Dual captive contact self-checking safety relays	
Temperature Range:	0 to 50° C		0 to 50° C	
Self-Checking Intervals:	Every 20 milliseconds		Every 20 milliseconds	
Enclosure:	NEMA 12 lockable 18 gauge painted steel (IP 64)		Gray polycarbonate with clear cover. Provides IP40, UL94V-1, NEMA 1	
Multi-Lingual Message Display:	Consult factory for specific languages desired		Consult factory for specific languages desired	

STTS Mat Controller Ordering Procedure

DeviceNet™ fieldbus network compatible. Add suffix DN to controller part number for this optional feature.

Example Part # **A - 1 - 7 - 2 - 7**

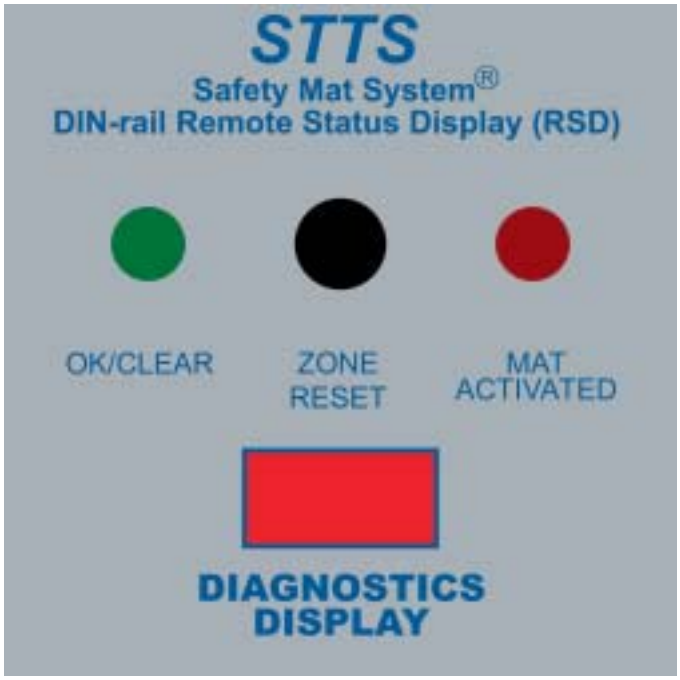
A - **Metal Box Controller**-Mat control and message display mounted in stand alone NEMA 12 lockable enclosure. B - **Board only system supplied on a mounting back plate**-Mat controller boards and message display to be installed into an existing control panel.	Mat Controller input power 1-120VAC 2-220VAC 3-24VDC (24VDC must be used for European Projects "CE")	Number of individual mats (inputs) to be wired back to STTS Mat Controller. Specify quantity: 1 to 8	Number of isolated control zones (outputs) desired. 1-1 Zone 2-2 Zones 3-3 Zones 4-4 Zones (requires larger control box) Etc.	Optional mat plug receptacles mounted on the STTS Mat Controller. Receptacles require mats with wiring style "R." Specify quantity: 1 to 8
D - **DIN-rail Controller**	3 (24VDC input power only)	1 to 4	1 (1 Zone output only)	RSD (Remote Status Display, optional)

The optional **Remote Status Display (RSD)** may be used in conjunction with the STTS DIN-rail Controller. The RSD provides the machine operator and front line supervisor immediate system status and diagnostics when the STTS DIN-rail Controller is mounted inside the machine control panel.

Remote Status Display components:

- Red/Green indicator lights
- Diagnostic scrolling message display with 5' (1.524m) of connector cable
- Zone reset button

The RSD components are mounted on a steel plate and are designed to be exterior panel mounted. The RSD option enhances safety and is a time saver at machine set-up and when maintenance diagnostics are required.



(Shown actual size)

Requires 3" x 3" (76mm x 76mm) Panel Cutout

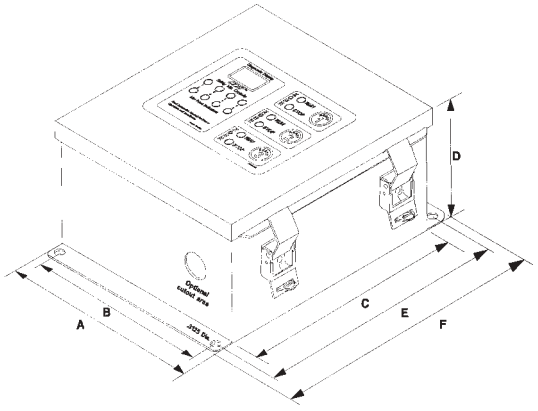
Mounting Hole Dimensions:
3.7" x 3.7" (94mm x 94mm) Center to Center

Mat Controller Dimensions

Metal Box Controller (shown below)

Inches/Millimeters

Dim A	*Dim B*	*Dim C*	*Dim D*	*Dim E*	*Dim F*
9.00"	7.75"	10.00"	5.25"	10.75"	11.50"
229	197	254	133	273	292



*Note: Enclosure mounted plug receptacles are mounted on the enclosure bottom. Requires 3" (76mm) clearance.

Metal Box Board Only System

Printed Circuit Boards

$$\frac{6.5}{165} \times \frac{8}{203} \quad \frac{\text{inches}}{\text{millimeters}}$$

Mounting Plate Size

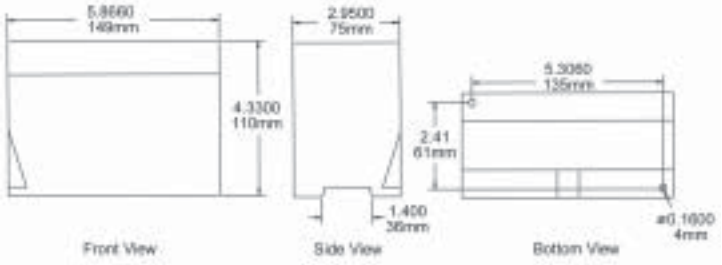
$$\frac{8.87}{225} \times \frac{8.87}{225} \quad \frac{\text{inches}}{\text{millimeters}}$$

Mounting Backplate Holes

$$\frac{8}{203} \times \frac{8}{203} \quad \frac{\text{inches}}{\text{millimeters}}$$

DIN-rail Controller

5.87" length x 4.33" depth x 2.95" height
(149mm x 110mm x 75mm)



Sizing Your System

How to Properly Size Your Safety Mat Guarding System

The following formula is an international draft guideline for the proper positioning and application of safety mats for machine guarding. This formula must be followed for all safety mat applications supplied to the European Community (CE) member nations. CEN is the European Committee for Standardization. Final draft #prEN999.

The minimum distance from the danger zone shall be calculated by using the general formula:

$$S = (K \times T) + C$$

S is the safety mat minimum distance in inches/millimeters in a horizontal plane, from the danger zone to the detecting edge of the safety mat furthest from the danger zone.

K is a parameter in inches/millimeters per second, derived from data on approach speeds of the body or parts of the body. K = 63 inches/second or 1600 mm/second.

T is the total system stopping time performance, which includes activating the safety mat, the mat controller output signal switching device, and the time required to stop the machine and remove risk.

C is an additional distance in inches/millimeters, based on intrusion towards the danger zone prior to actuation of the protective safety mat equipment. C = 48" (1219mm).

Annex B (informative)

Walking speeds and stride lengths. The positioning of equiment which is activated by a person walking into the detection zone by stepping onto a pressure senstive mat is affected by speed of approach and stride length. The walking speed and stride length depend on the physical and anthropometric data of the population.

Speed of Approach. This standad assumes the approach of persons towards the danger zone will be at walking speed.

Stride Length. Available research data has shown that the 95th percentile of two steps (i.e., starting and finishing with the same foot) measured from heel contact at walking speed is approximately 7" (1905mm). By dividing by two and subtracting the 5th percentile shoe length provides a stride length of 28" (711mm). If it is assumed that an allowance has to be made, for example, between the detection zone and the stride length of 2" (50mm) this gives a minimum width of 30" (762 mm) for the detection zone.

Examples of safety mat sizing calculations using inches and millimeters

S	=	63"/sec	x	T	+	48"
Mat Size	=	K Body approach speeds	x	Total safety system stopping time in milliseconds	+	Intrusion distance toward danger zone
S	=	1600mm/sec	x	T	+	1219mm

T-The STTS Safety Mat System activation time including controller is 35 msec. This amount is to be added to the machine stopping time in milliseconds to fulfill the T requirement of the formula.