

FREE TGM GATE SAFETY TRAINING MANUAL

# GATE SAFETY TRAINING MANUAL

BUILT FOR THE FIELD

GATE SAFETY  
STANDARD

**TGM-500  
& TGM-501**

**COMPLIANT**

Field Verified

Online Field Verification Form



**2025**



SUPPORTED BY:

**FENCE WORKERS ASSOCIATION**

& THE FENCE UNIVERSITY



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INTRO

Free Training

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# BUILT BY INSTALLERS

This book was created to serve as a practical training and reference manual for contractors, technicians, inspectors, and industry professionals who want to apply the TGM-500™ and TGM-501™ standards in the real world.

It combines training modules, real-world safety checklists, installation guidance, and field-tested best practices that align with the spirit of the International Building Code (IBC). Whether you're looking to learn, teach, or verify automated gate safety, this book gives you everything you need to do the job right.

Let this book be your step-by-step guide to building safer, smarter, and more accountable gate system.

## TGM-500™ and TGM-501™ take the complexity out of gate safety

How They Simplify Safety Without Lowering Standards TGM-500™ and TGM-501™ take the complexity out of gate safety without compromising protection. Instead of relying on proprietary monitoring systems or hard-to-interpret technical requirements, these standards focus on field-tested performance:



# WHY WE NEED TGM STANDARDS

**“We need TGM-500™ and TGM-501™ because safety shouldn’t be hidden in firmware or buried in codebooks—it should be tested, verified, and owned by the people who install it.”**



## **We need standards that make sense in the field.**

TGM gives installers clear, testable checklists—not vague rules or locked systems.



## **We need to train our teams without expensive classes**

TGM includes free, open training through Fence University so anyone can learn and apply it.



## **We need to show that we take safety seriously.**

TGM puts us in control with documented, professional results they can trust.



## **We need a standard that reflects how gates are actually built.**


TGM standards are based on real installations—not lab conditions or theoretical specs.


## TABLE OF CONTENTS


# REAL AWARENESS


The first step to safety is being aware of the resources, standards and best practices.


## Sections

-  **TGM-500 - Equipment**

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-  **Testing For Compliance**

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-  **Installer Checklists**

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-  **Standards**

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# CONTROLLING THE GATE, CONTROLLING THE RISK



**TGM-500™ gives contractors a simple, checklist-based way to confirm manual release, sensor function, force limits, and more—without relying on locked systems or proprietary devices.**

This standard empowers installers to take ownership of safety and gives AHJs a clear, consistent method to verify compliance.

## What type of safety devices?

TGM-500™ was built around the use of universal, Normally Closed (NC) safety sensor inputs. However, to ensure broader industry participation and compatibility, an exception is allowed for gate operators that use monitored safety inputs, only if the following conditions are met:

- The operator must stop or reverse immediately when a safety device is triggered or fails.
- The system must allow field verification of both open and close direction safety devices.
- The operator must not require proprietary sensors that restrict safety functionality to a specific brand.
- All other TGM-500™ performance requirements (force limits, auto-close delay, manual release, etc.) must still be met.

## TGM-500 REQUIREMENTS

### Manual release, auto-close delay, safety devices, power disconnects & force limits.

- **Manual Release:** Every operator must have a clearly labeled manual release that does not require tools. This allows emergency access or disengagement of the gate system during power outages or malfunctions, keeping users and responders safe.
- **Auto-Close Delay:** TGM-500™ requires a minimum 5-second delay between activation and the start of gate movement if auto-close is enabled. This delay helps prevent unintended entrapment and gives time for pedestrians or vehicles to clear the gate path.
- **Force Limits:** The gate must not exceed 40 lbs of continuous force and no more than 75 lbs of startup force for 1 second or less. This requirement ensures the gate won't apply excessive pressure that could cause injury or property damage.
- **N.C. safety sensor inputs and testing:** TGM-500™ requires that operators support universal, relay-style safety devices using Normally Closed (NC) inputs. This allows for safe, reliable detection of sensor faults and disconnections. Installers must test both opening and closing safety inputs in the field using standard photo eyes or safety edges. If the circuit is opened—either by obstruction or by disconnection—the gate must stop or reverse. This setup ensures real-time, verifiable safety without requiring proprietary, monitored devices.
- **Reversal/stop behavior:** A TGM-500™ compliant operator must stop or reverse motion immediately when a safety sensor is triggered or when the gate encounters an obstruction. This ensures that the gate responds in real-time to prevent entrapment or injury. Installers are expected to test this behavior during installation using safe, soft objects and verify that the system reacts appropriately in both opening and closing directions.

## TGM-500 - EQUIPMENT

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**Power disconnect, surge protection:** TGM-500™ requires every gate operator to include a clear and accessible power disconnect, such as a plug, switch, or breaker. This allows safe servicing, emergency shutoff, and electrical isolation when needed. Additionally, operators must either include built-in surge protection or support external surge suppression. This protects sensitive components from electrical spikes caused by lightning, power outages, or unstable power sources—reducing the risk of damage and ensuring long-term system reliability.

**TGM-500 Functional checklist items:**

These are the specific safety features that must be tested and confirmed in the field during installation for the TGM-500 standard only:

- **Manual Release:** Must be labeled and accessible without tools.
- **Auto-Close Delay:** Minimum **5-second delay** before gate begins moving after trigger.
- **Force Limitation:** Continuous force must not exceed **40 lbs.**
- **Startup surge:** must not exceed **75 lbs** for more than 1 second.
- **Safety Sensors – NC Inputs**
- **Photo eye or edge sensor installed:** on both opening and closing directions. Sensors must function on Normally Closed (NC) relay input wiring.
- **Reversal/Stop Behavior:** Gate must stop or reverse immediately when obstruction is detected by sensors or during force testing.
- **Power Disconnect:** Operator must include a serviceable disconnect (switch, plug, or breaker).
- **Surge Protection:** Either internal surge suppression or external support must be present to protect electronics.

These checklist items are **verified by the installer on-site** during installation using a field checklist. They ensure the gate operator functions as intended and complies with the real-world safety goals of the TGM-500™ standard.

# MONITORED SAFETY DEVICES

## EXCEPTION FOR MONITORED SAFETY INPUTS

TGM-500™ was built around the use of universal, Normally Closed (NC) safety sensor inputs. However, to ensure broader industry participation and compatibility, an exception is allowed for gate operators that use monitored safety inputs, only if the following conditions are met:

- The operator must stop or reverse immediately when a safety device is triggered or fails.
- The system must allow field verification of both open and close direction safety devices.
- The operator must not require proprietary sensors that restrict safety functionality to a specific brand.
- All other TGM-500™ performance requirements (force limits, auto-close delay, manual release, etc.) must still be met.



This exception is designed to allow commonly used systems to participate in the TGM standard without sacrificing the field accountability, testability, and safety performance that TGM was created to uphold.



# BUILDING SAFER GATES FROM THE GROUND UP

*TGM-501™ is the physical safety standard that ensures automated gates are not just functional—but structurally safe, reliable, and ready for real-world use.*

*This section outlines how to construct gates that resist tipping, eliminate dangerous gaps, and protect the public from entrapment or impact injuries. From frame rigidity to fall protection, every part of the gate is held to a practical, field-verifiable standard.*

*Built for installers, respected by inspectors, and rooted in common-sense safety—TGM-501™ gives our industry the blueprint for building smarter, safer gates that last.*





## TGM-501 REQUIREMENTS

### Frame strength, bottom clearance, 2.25" gap rule, pinch points & entrapment zones.

- **Frame Strength and Rigidity:**

TGM-501™ requires that the gate frame be built using durable, load-bearing materials capable of withstanding the forces of automated operation. The frame must resist sagging, bending, or twisting under normal use. This ensures long-term structural performance, reduces the risk of gate failure, and contributes to consistent safe operation in the field. A rigid frame also helps maintain sensor alignment and prevents shifting that could compromise safety.

- **4-inch bottom clearance:**

TGM-501™ requires that the bottom of the gate be **no more than 4 inches** above the finished grade throughout the gate's full travel path. This rule exists to prevent people—especially children—or small animals from slipping under the gate while it's moving. It also reduces the risk of someone getting pinned between the bottom of the gate and the ground. Maintaining this clearance consistently is essential for protecting against entrapment and ensuring the gate operates safely in real-world conditions.

- **2.25" gap rule**

TGM-501™ requires that no part of the gate allow a sphere larger than 2.25 inches to pass through—whether between pickets, in the tail section, or between the gate and adjacent structures.

**This rule is critical** in preventing body parts, especially small children's limbs, from becoming trapped. It also helps mitigate risks of climbing, reaching, or falling through the gate during operation. Gates must be measured and evaluated along the full travel path to ensure compliance with this safety clearance.

- **Pinch Points, Roller Guards, and Sharp Edge Protection**

All moving mechanical parts such as rollers, hinges, arms, and chains must be guarded to prevent hands, fingers, or clothing from getting caught. Sharp edges within 8 feet of the ground must be capped or eliminated to reduce injury risk.

# TGM-501 REQUIREMENTS

## Fall Protection & TGM-501 Functional Checklist

- **Fall Protection**

TGM-501™ requires that gates be constructed and installed in a way that **prevents them from tipping more than 45 degrees** if a hinge, roller, or support point fails. This requirement is in place to reduce the risk of a gate collapsing onto a person, vehicle, or structure in the event of mechanical failure. Proper fall protection involves structural integrity, backup stops, and installation methods that keep the gate safely supported during and after operation.

### TGM-501 Functional checklist items

These are the field-verifiable construction features installers must confirm for a gate to be considered compliant:

1. Frame Strength and Rigidity (resists sagging and collapse)
2. Bottom Clearance (no more than 4 inches above grade)
3. 2.25-Inch Gap Rule (no gaps that allow a 2.25" sphere to pass through)
4. Tail Section Infill (prevents climb-through hazards)
5. Travel Stops (required at open and closed positions)
6. Fall Protection (gate must not tilt beyond 45° in failure)
7. Roller Guards and Pinch Point Protection (all moving parts shielded)
8. Sharp Edge Mitigation (no exposed sharp hardware below 8 feet)

**“We Don’t Assume Safety—We Prove It.”**



# Installer Checklist



Download

## TGM-500 & TGM-501

## Slide Gate Operator Safety Standard

**Any fence area where gate may cause entrapment must be screened or picket spacing less than 2.25" apart**

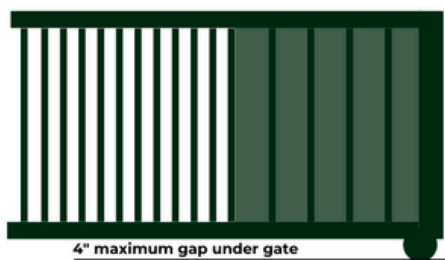
Only to be used with TGM-500 Ready Operators  
Visit: [www.GateMonitor.com](http://www.GateMonitor.com) for more information

\*A safety edge may be used as a substitute for any required safety eye



Pickets less than  
2.25" Apart

OR  
Screen Gate



## Installer Checklist

- ( ) Close Safety Device Hooked up and tested (Connected to N.C.).
- ( ) Open Safety Device Hooked up and tested (Connected to N.C.).
- ( ) Safety Sensors will stop or reverse gate when triggered.
- ( ) Manual Emergency Release (No Tool Required) (Clearly labeled).
- ( ) Power Disconnect Switch, Plug or breaker to cut power for service or testing (Clearly labeled).
- ( ) Force Limits Tested to continues 40lbs max / start up surge 75lbs max for under 1 second.
- ( ) Auto Close Delay of at least 5 seconds if auto close feature is activated.
- ( ) Verify the frame is rigid and won't flex or sag
- ( ) Ensure bottom clearance is no more than 4 inches.
- ( ) Confirm all gaps are under 2.25 inches and tail section is infilled.
- ( ) Add travel stops and confirm the gate cannot tip more than 45° in failure.
- ( ) Install roller guards and check for pinch points or sharp edges.

## GATE SAFETY STANDARD

## TGM-500 & TGM-501

**COMPLIANT**

Field Verified

Date \_\_\_\_\_

Customer

## Installer

Address

**I confirm this installation meets all applicable TGM-500™ and TGM-501 safety standards, I have verified them to be installed or met.**

☐ Yes      ☒ No

## Field Verification Form

**Always follow your local building codes and regulations guidelines when installing any automated gates \* Use only licensed installers**



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5/15/25



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# Installer Checklist



Download

TGM-500 & TGM-501

Swing Gate Operator Safety Standard

\*A safety edge may be used as a substitute for any required safety eye

Any fence area where gate may cause an entrapment area must be screened or picket spacing less than 2.25" apart



Only to be used with TGM-500 Ready Operators  
Visit: [www.GateMonitor.com](http://www.GateMonitor.com) for more information

## Installer Checklist

### In Entrapment Areas

Pickets less than  
2.25" Apart

OR  
Screen Gate



( ) Close Safety Device Hooked up and tested  
(Connected to N.C.).

( ) Open Safety Device Hooked up and tested  
(Connected to N.C.). \*If entrapment area was  
created by operator or gate.

( ) Safety Sensors will stop or reverse gate when  
triggered.

( ) Manual Emergency Release (No Tool  
Required (Clearly labeled)).

( ) Power Disconnect Switch, Plug or breaker to  
cut power for service or testing (Clearly labeled).

( ) Force Limits Tested to continues 40lbs max /  
start up surge 75lbs max for under 1 second.

( ) Auto Close Delay of at least 5 seconds if auto  
close feature is activated.

( ) Verify the frame is rigid and won't flex or sag

( ) Ensure bottom clearance is no more than 4  
inches.

( ) Confirm all gaps are under 2.25 inches in  
entrapment areas.

( ) Add travel stops and confirm the gate cannot  
tip more than 45° in failure.

( ) Install roller guards and check for pinch  
points or sharp edges.

GATE SAFETY  
STANDARD

TGM-500  
& TGM-501

COMPLIANT

Field Verified

Date \_\_\_\_\_

Customer \_\_\_\_\_

Installer \_\_\_\_\_

Address \_\_\_\_\_

I confirm this installation meets all  
applicable TGM-500™ and TGM-501 safety  
standards, I have verified them to be  
installed or met.

☐ Yes ☒ X \_\_\_\_\_



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## Field Verification Form

Always follow your local building codes and regulations guidelines when  
installing any automated gates \* Use only licensed installers



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**TGM-500™ + TGM-501™ Combined Gate Operator and Construction Standard** *For installers seeking to self-certify compliance with The Gate Monitor Safety Standards.*

## **Gate Operator Safety Requirements (TGM-500™)**

### **1. Manual Release**

- Tool-free manual emergency release must be installed and clearly labeled.

### **2. Auto-Close Delay**

- Auto-close systems must delay at least 5 seconds before movement begins.
- Optional: audible or visual warning during the delay.

### **3. Force Limitation**

- Gate must exert no more than 40 lbs of continuous force.
- Startup surge must be under 75 lbs and last less than 1 second.

### **4. Sensor Inputs**

- Operator must support photo eyes or safety edges. (N.C. Inputs)
- Must have a sensor input for both opening and closing directions.

Gate operators that use monitored safety inputs may be accepted as TGM-500™ compliant if they:

- Allow the use of safety sensors that perform equivalent safety functions.
- Allow full field testing and verification during installation.
- Do not require manufacturer-specific hardware to activate safety features.
- Meet all other functional requirements under this standard.

### **5. Sensor Response**

- Gate must stop or reverse immediately when a safety device is triggered.

### **6. Power and Wiring**

- Must have a power disconnect (plug, switch, or breaker).
- Terminals must be labeled.
- Surge protection must be built in or supported.

**See TGM-501 Standard for gate construction safety information.**





Download



## Gate Construction Safety Requirements (TGM-501™)

### 1. Frame Strength

- Gate must resist flex, sag, or collapse under power.

### 2. Bottom Clearance

- Gate must maintain  $\leq 4$  inches of clearance from the ground.

### 3. Gap and Infill

- No gaps over 2.25 inches allowed anywhere on or around the gate entrapment areas.
- Tail sections must be infilled to prevent climb-through or reach-through.

### 4. Travel Stops and Fall Protection

- Physical stops required at open and closed positions.
- Gate must be mounted to prevent tipping beyond 45 degrees in failure.

### 5. Roller and Track Guarding

- All exposed rollers must be shielded.
- Tracks, chains, or racks must be enclosed or located in protected zones.

### 6. Pinch Point Elimination

- Hinges, arms, and slide systems must not expose pinch or crush zones.

### 7. Decorative Safety

- Sharp elements must be safety-capped or located 8 feet or higher.

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## Installer Self-Certification Form

Project Name: \_\_\_\_\_

Gate Type (swing/slide/lift): \_\_\_\_\_

Installer/Company: \_\_\_\_\_

Date: \_\_\_\_\_

I affirm that the gate operator and physical gate meet all applicable TGM-500™ and TGM-501™ requirements listed above.

Signature: \_\_\_\_\_

Field Test Passed: ☐ Yes ☐ No

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## **104.11 OF THE INTERNATIONAL BUILDING CODE (IBC), WHICH PERMITS THE APPROVAL OF ALTERNATIVE MATERIALS AND METHODS OF CONSTRUCTION WHERE THEY SATISFY THE INTENT OF THE CODE.**

### **104.11 of the International Building Code (IBC)**

These standards were developed by the Fence Workers Association in partnership with The Gate Monitor, LLC, to offer a practical, field-verified alternative to proprietary, industry-standard certification safety protocols. The combined TGM-500™ and TGM-501™ standards address the key life-safety objectives of:

- **Obstruction detection and force limitation**
- **Emergency manual release access**
- **Safety sensor response and field performance**
- **Entrapment prevention and pinch point protection**
- **Fall protection and structural integrity of gates**



Unlike some lab-based standards that focus on internal monitoring systems, TGM emphasizes active field testing and installer accountability, ensuring that systems are not just designed to be safe, but are proven safe at the time of installation. These standards are designed to meet the intent of IBC 104.11

## TAKE THE GATE SAFETY EXAM

# Online



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