SAAB

OPERATOR MANUAL
HAND GRENADE SIMULATOR (HGSII)

Hand Grenade Simulator (HGSII)

Table of Contents

1   General

1.1   Preface

This manual describes the function and the use of the Fragmentation hand grenade simulator and the Stun hand grenade simulator. The simulator has a predefined configuration that sets functional parameters.

1.2   Attentions general

The attentions included in the manual are divided into the following groups:

⚠️ **WARNING!**
A Warning shows a hazard which can cause injury.

⚠️ **CAUTION!**
A Caution shows a danger which can cause damage to the equipment.

Note!
A Note is a statement with information that makes the procedure easier.

1.3   Abbreviations

Table 1.   Abbreviations

IR	Infrared
LED	Light Emitting Diode
Mini FBSS	Mini Flash Bang Smoke Simulator
PDD	Personnel Detection Device
WLN	Wireless Local Network

2 Introduction

2.1 Overview

Fig 1. Overview Fragmentation hand grenade simulator

Fig 2. Overview Stun hand grenade simulator

1	Safety pin	4	Cartridge (Mini FBSS or Mini FBSS Buzzer (dummy)) (inside)
2	Safety lever	5	LEDs flash at detonation and for retrieval
3	IR and config/setup interface + status LED	6	Battery (inside)

2.2   Description

There are two types of hand grenade simulators: Fragmentation hand grenade simulator and Stun hand grenade simulator. The simulators look different and have (via radio transmissions) a different impact on the target system.

Both simulators contain a lever unit, a top cover, a mid cover and a pyro unit. The lever unit is equipped with a safety pin and safety lever for correct handling during training. The mid cover surrounds the electronic part which e.g. holds the battery unit. The simulator is powered by a replaceable battery. The simulator communicates via radio and IR.
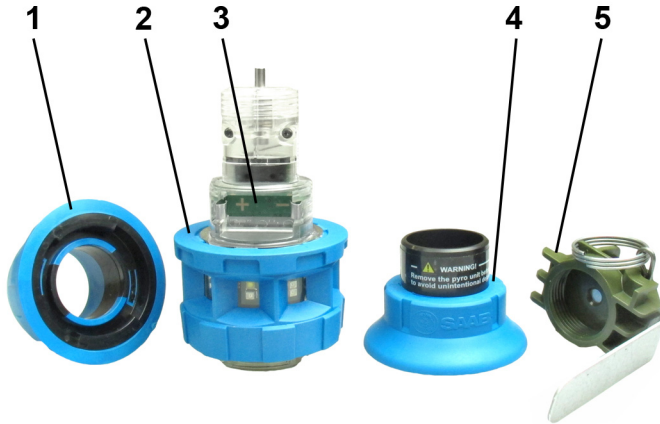
Fig 3. Overview Fragmentation hand grenade simulator parts

Fig 4. Overview Stun hand grenade simulator parts

1	Pyro unit	4	Top cover with warning label
2	Mid cover	5	Lever unit
3	Battery unit		

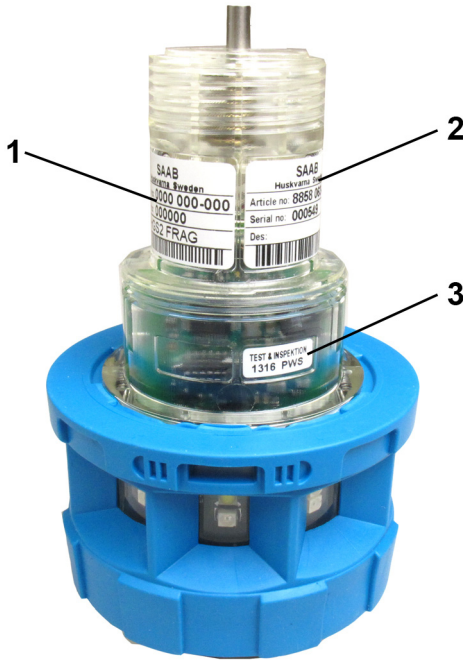There are three labels on the mid cover: the customer label, the SAAB label, and the test and inspection label.

Fig 5. Labels

1	Customer label	3	Test and inspection label
2	SAAB label		

2.2.1   Cartridge information

A cartridge (Mini FBSS Buzzer or Mini FBSS) needs to be installed in the pyro unit for the simulator to work. Mini FBSS Buzzer is a **dummy** cartridge and a detonation is characterized by sound and LED flash.

Mini FBSS is a Flash Bang Smoke Simulator which is loaded with pyrotechnic compound. By installing a Mini FBSS, the detonation is characterized by high sound, smoke, flash, and LED flash.

> — **Note!** —
> *Since the Mini FBSS is loaded with pyrotechnic compound, make sure to read the attentions in this manual.*

⚠ **WARNING!**

Use helmet, safety glasses and ear protection (in-ear and normal ear protection) when operating the simulator.

⚠ **WARNING!**

Make sure all participants are wearing helmet, safety glasses and ear protection (in-ear and normal ear protection).
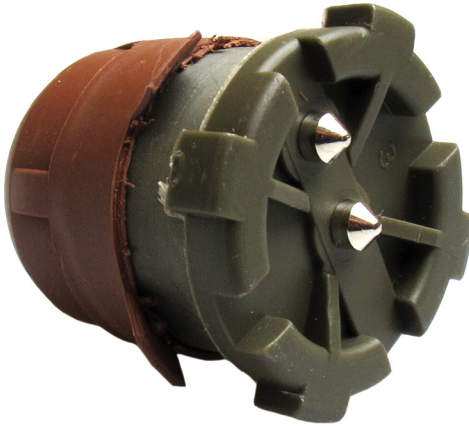

Fig 6. Dummy cartridge

Fig 7. MiniFBSS cartridge

2.3   Pairing information

The Hand grenade simulator can be paired to a PDD, the function (IR pairing) is optional (Enable/Disable). When the pairing is performed, the ID number for the PDD will be set in the Hand grenade simulator. The ID number will be sent to the affected targets at detonation. In the After Action Review it is possible to see which PDD threw the Hand grenade simulator. If the function is disabled, the simulator sends ID number 0. The Hand grenade simulator has to be paired again after a battery installation and/or after it has been thrown (after detonation).

2.4   Detonation

The safety pin has to be removed before throwing the Hand grenade simulator. When the Hand grenade simulator is thrown, the safety lever will automatically be released which triggers the detonation. The hand grenade simulator detonates after a predefined detonation delay time (3-5 sec.). Depending on what cartridge is used, the detonation is characterized in different ways.

A detonation is also triggered when removing the lever unit. Therefore, it is important to disassemble the simulator in correct order.

> ⚠️ **WARNING!**
> **Remove the pyro unit before removing the lever unit to avoid unintentional detonation.**

2.4.1   Effective range

The effective range of the Hand Grenade Simulator is similar to that of a real grenade. This is achieved through short range radio transmissions from the simulator to target systems. As an option it is possible to send laser code messages as a complement to radio.

2.4.2   Ammunition code

At detonation, the Hand grenade simulator sends an ammunition code. Any target system that receives the message will evaluate and calculate the effect:

- Targets close to the detonation will evaluate the hit effect according to a hit probability (high radio signal strength).
- Targets further from the detonation will only get a sound effect (medium radio signal strength).
- Targets far away from the detonation will not be affected (low radio signal strength).

2.4.3   PDD status Check

When the safety lever is released, the Hand grenade simulator checks the status of the paired PDD (i.e. the one throwing the simulator). The function (PDD status check) is configurable (Enable/Disable). If the PDD is not OK or killed, the ammunition code transmission is inhibited. The detonation of the pyro is still performed.

2.5   Retrieval

A location indication on the simulator (LEDS flash white each 5 sec.) enables retrieval of the simulator. The location indication starts 30 sec. (configurable) after detonation and stops after a configurable duration of time (Time location indication).

2.6 Hit probability

The Hand grenade simulator can kill, wound or shock a target system. The Hand grenade simulator can be set with a combination of all 3 hit probabilities. For example the simulator can be set with a 10% chance of a kill, 20 % of a wound and 40% shock. Totally a 70% chance for the target system to be affected and a 30 % chance to only achieve a near miss event.

Each target system receiving a hit will also individually evaluate the effect of the detonated Hand grenade simulator.

2.7 Configuration (example)

The configuration is set at the factory. Each configuration relates to an article number which is placed on the Hand grenade simulator. One article number (one configuration) can recur on several simulators. For configuration of a specific Hand grenade simulator, see the configuration table.

Below is an example of a configuration table for a Hand grenade simulator with article number X.

Table 2.   Configuration: X (example)

Parameters	Value
P.kill (probability of kill)	10 %
P.wound (Probability of wound)	20 %
P.shock (probability of shock)	40 %
Ammo code	1100
RSSI high	100
RSSI low	70
IR effect	Disable
T. detonation (Time to detonation)	3 sec.
Time location indication	60 min.

Parameters	Value
IR Pairing	Enable
PDD status check	Disable
Freq	868 MHz

3 Technical Data

3.1 Weights and dimensions

Table 3. Weights and dimensions

Unit	Length (mm)	Width (mm)	Height (mm)	Weight (kg)
Hand grenade simulator	-	ø 68	160	0.28
Mini FBSS Buzzer (dummy)	56	ø 28 - 34	-	0.05
Mini FBSS (pyrotechnic compound)	56	ø 28 - 34	-	0.05

3.2 Electrical system

Table 4. Electrical system

Variable	Value
Battery type	CR2 replaceable (>4 months and >50 detonations)

4 Installation

4.1 Battery installation

1. Remove the pyro unit.

Fig 8. Pyro unit removal

⚠️ **WARNING!**

Remove the pyro unit before removing the lever unit to avoid unintentional detonation.

2. Remove the lever unit.

Fig 9. Lever unit removal

3. Remove the top cover.

Fig 10. Top cover removal

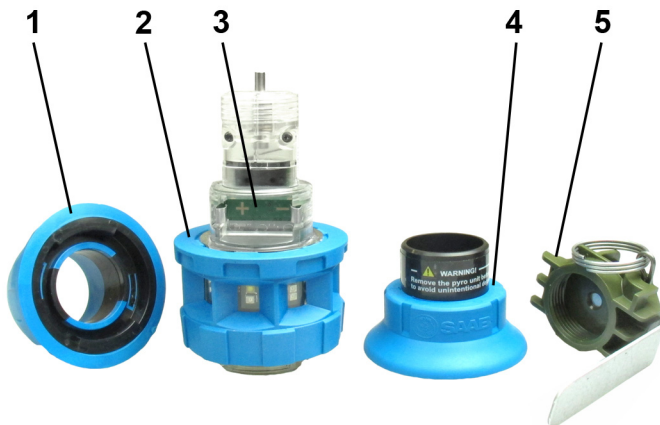4. Make sure all parts are clean. To clean the simulator, see chapter Clean the equipment.

Fig 11. Overview Fragmentation hand grenade simulator parts

5. Install the battery.

Fig 12. Battery installation

6. Reinstall the top cover.
7. Reinstall the lever unit.
8. Reinstall the pyro unit.

5 Operation

5.1 LED indications

Table 5.   LED indications Hand grenade simulator

LED	Indication
Green single flash every 5th sec.	Ready mode. Battery OK, pyro OK, lever unit OK.
Green double flash.	Not ready mode. Battery OK. Lever unit OK. No/used pyro.
Red single flash.	Battery warning, change battery
Red double flash.	
White flash.	Detonation mode.
White flash every 5th sec.	Search mode.
No flash.	Used mode.

5.2 Cartridge installation

1. Remove the pyro unit.

Fig 13. Pyro unit removal

⚠️ **WARNING!**

Remove the pyro unit before removing the lever unit to avoid unintentional detonation.

2. Install the cartridge (dummy or Mini FBSS) in the pyro unit.

Fig 14. Cartridge installation

3. Reinstall the pyro unit.

5.3 Pair the simulator with a PDD (optional)

1. Remove the pyro unit. Make sure status LED double flashes green every 5th sec.
2. Install the pyro unit.

— **Note!** —

Whenever the pyro unit is installed, the IR setup interface is activated for 2 min. to enable pairing.

—— **Note!** ——

When re-pairing a loaded simulator, the pyro unit needs to be un-installed for 5 sec. before reinstallation to activate the IR setup interface.

3. Aim the Hand grenade simulator IR setup interface towards the IR interface on the PDD. Hold the IR interfaces about 10 centimeters from each other.
4. The PDD will generate a sound message when it is paired with the Hand grenade simulator.

—— **Note!** ——

The Hand grenade simulator has to be paired again after a battery installation and after detonation.

5.4 Arm and detonate

Safety conditions

—— ⚠️ **WARNING!** ——
Use helmet, safety glasses and ear protection (in-ear and normal ear protection) when operating the simulator.

—— ⚠️ **WARNING!** ——
Make sure all participants are wearing helmet, safety glasses and ear protection (in-ear and normal ear protection).

1. Make sure the status LED flashes green once every 5th second.

2. Hold the safety lever and remove the safety pin. Depending on safety pin version, the safety pin is removed by "pull" or "twist and pull" (twist 180°).
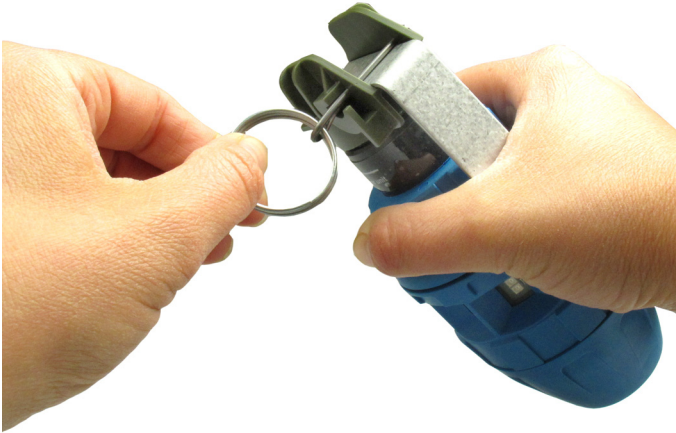
Fig 15. Safety pin removal

—— **Note!** ——————————————————————
Always remove the safety pin before the Hand grenade simulator is thrown.
————————————————————————————————

—— ⚠ **WARNING!** ——————————————————
Never throw the Hand Grenade Simulator directly at personnel.
————————————————————————————————

—— ⚠ **WARNING!** ——————————————————
Make sure that no-one is closer than 10 cm from the Hand grenade simulator when detonated.
————————————————————————————————

> ⚠️ **WARNING!**
> **When the Mini FBSS is fired the maximum sound level is approximately 187 db (C) at 10 cm. High sound level can cause hearing injury.**

> ⚠️ **WARNING!**
> **The Mini FBSS can cause burn injury if detonated closer than 10 cm.**

> ⚠️ **WARNING!**
> **Keep at a safe distance to flammable material.**

3. Throw the Hand grenade simulator.

> **Note!**
> *When the Hand grenade simulator is thrown, the safety lever will automatically be released which triggers the detonation. The hand grenade simulator detonates after a predefined detonation delay time (3-5 sec.).*

5.5 Retrieval

A location indication on the simulator (LEDS flash white each 5 sec.) enables retrieval of the simulator. The location indication starts 30 sec. (configurable) after detonation and stops after a configurable duration of time (Time location indication).

5.6 Rearm Hand grenade simulator

1. Remove the pyro unit.

⚠️ **WARNING!**

Remove the pyro unit before removing the lever unit to avoid unintentional detonation.

2. Remove the lever unit.
3. Make sure all visual parts are clean. To clean the simulator, see chapter Clean the equipment.
4. Replace the lever unit, i.e. install a new lever/not damaged unit.
5. Replace the cartridge (dummy or Mini FBSS) in the pyro unit.
6. Reinstall the pyro unit.
7. Optional, pair the simulator with a PDD, see chapter Pair the simulator with a PDD (optional).

— **Note!** —

The Hand grenade simulator has to be paired again after detonation.

5.7 Disarm Hand grenade simulator

1. Remove the pyro unit.

⚠️ **WARNING!**

Remove the pyro unit before removing the lever unit to avoid unintentional detonation.

2. Remove the cartridge.
3. Reinstall the pyro unit.

6   Maintenance

6.1   Clean the equipment

1. Remove all loose dust and dirt with a soft brush.
2. Clean all parts with a damp sponge.
3. Clean optical surfaces with a lens cleaning tissue.
4. Dry all equipment with a dry cloth.
5. All carbon deposits must be removed from the simulator.
6. Clean the cartridge contact surface with regular weapon oil.

6.2   Battery replacement

1. See chapter Battery installation.

7 Troubleshooting

7.1 Troubleshooting

Table 6.   Troubleshooting

Symptom (LED).	Cause	Corrective action
No flash.	Battery empty.	Replace the battery.
	Safety lever not present.	Place safety lever in correct position.
No detonation when simulator is thrown.	No cartridge.	Install the cartridge.
	Used cartridge in the pyro unit.	Replace the cartridge.

— **Note!** —

The Hand grenade simulator has no power switch.

8 Regulatory Statements

8.1 FCC Certification

The United States Federal Communication Commission (FCC) has established certain rules governing the use of electronic equipment.

8.2 Part15, Class B

1   This device is FCC Certified FCC ID: R4AHGS2.
2   This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:
   2.1   This device may not cause harmful interference, and
   2.2   This device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

8.3 User Information

⚠ **CAUTION!**

Any changes or modifications not expressly approved by the party responsible for compliance, namely Saab Defense and Security USA LLC, Training and Simulation, could void the user's authority to operate the Equipment.

Appendix A

List of Figures

List of Tables

User Guide Addendum

This Document is intended to supplement the Hand Grenade Simulator Version Final 1. New Information includes:

Chapter 8.4: IC Certification

IC RSS-GEN, Sec 8.4 Warning Statement (Required for license-exempt devices)

English:
This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

FRENCH:
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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