



**WB GROUP** 

***WARMATE***

Loitering Munition System

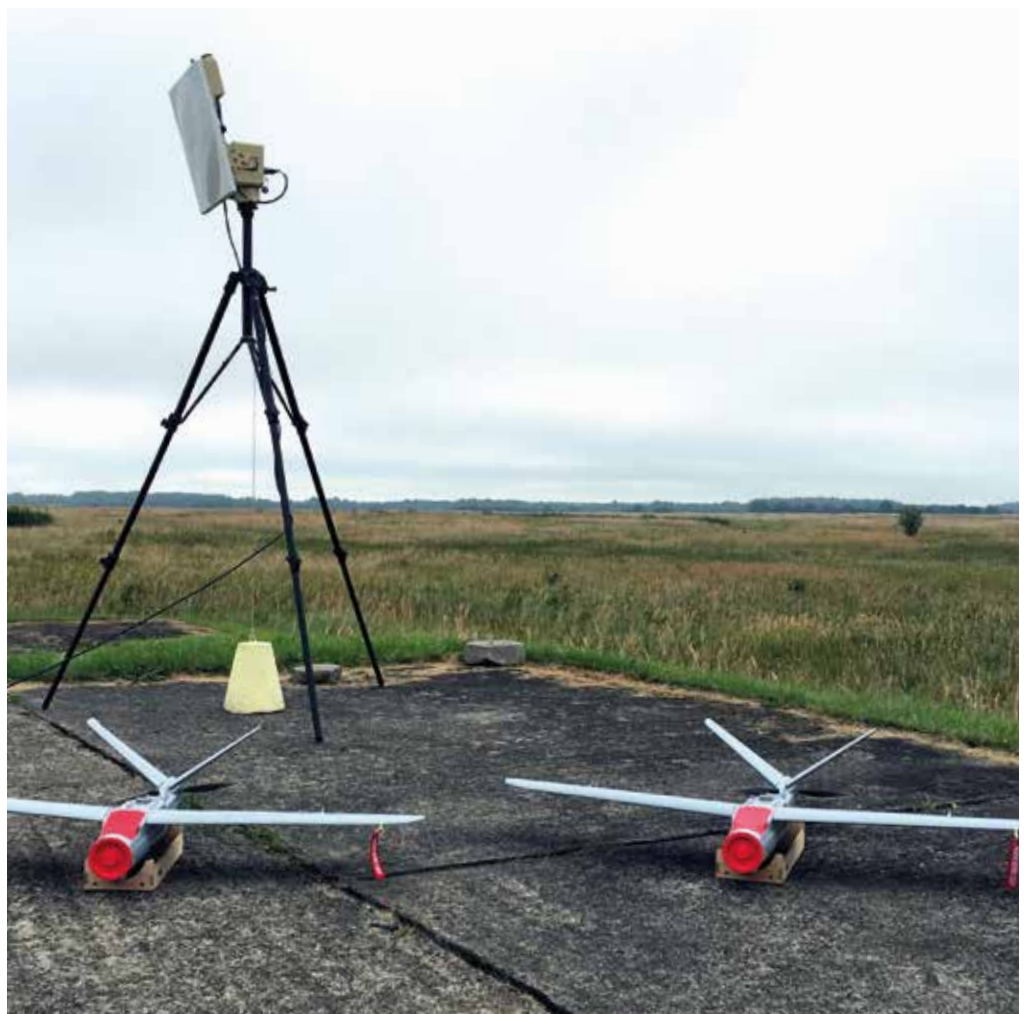
# **WARMATE**

The WARMATE Loitering Munition System is a combat mini UAV that provides a highly targeted strike capability with either an anti-personal or anti-tank warhead. The addition of a daylight or thermal camera to the warhead allows for the assessment of a target before launching a strike, and a number of fail safe mechanisms means that missions can be easily aborted if intelligence is revised.





The complete WARMATE set is composed of three air vehicles (AVs), 3 warheads, a lightweight ground control station (GCS) and a ground data transceiver, which allows for the user to control the AV, and receive real time video. The system can be packed into two ruggedized backpacks and carried by two users.





# Strike

The attack mode initiates a strike on a selected target, and control of the AV is semi-autonomous during a strike. The user is shown a video feed, at the ground control station, from the camera mounted on the front of the warhead, and this can be used to assist in directing the aircraft.

## Warheads

The WARMATE airframe can incorporate one of three different warheads:

- A training warhead without armed capabilities (GO-1-T).
- A high explosive anti-personal head (GO-1-HE), which contains 300 g explosive charge. The warhead has an effective destructive range of 10 m.
- An anti-tank warhead (GO-1-HEAT), which also contains explosive charge. The warhead is capable of penetrating of RHA 120 mm.

The warheads are interchangeable and can be changed in the field depending on the mission objectives.





# Assessment

A real time video feed is provided by a daylight (EO) or thermal (IR) camera mounted on the front of the attached warhead, allowing for the observation of potential targets before initiating a strike.

The camera has an angle of incidence of  $10^\circ$  relative to the horizontal plane of the AV and offers a field of view of  $75^\circ$ . The daylight camera is capable of producing high quality images, and vehicle and human recognition is possible from a distance of 200 m.



# User Friendly

The WARMATE System includes a mobile ground control station (GCS) that is easy to use and provides a real time video feed to the user. A wide range of autonomous flight modes can be managed at the GCS.



## Flight Modes

Autonomous is the main flight mode that is pre-programmed by the user prior to a flight. During this mode the AV will take-off and then follow a series of waypoints according to a flight plan. However, at any point during this mode three further modes can be activated:

**Loiter flight mode** The AV orbits a point over the ground.

---

**Fly to coordinate** This flight mode is similar to the 'Loiter Flight Mode' except that the AV will fly from its current position to a new position set by the operator.

---

**Cruise** This mode causes the AV to fly in a straight line in the direction that the camera is facing.

---

**Attack** This mode initiates a strike.





# Ground Control Station

The WARMATE ground control station (GCS) is lightweight and may be transported in a single backpack, allowing for easy deployment of the air vehicle (AV). The GCS comprises a ruggedized touch screen tablet computer, which allows the user to control the air vehicle (AV) and view visual data, and a data transceiver, which is a digital and bidirectional, tripod mounted, encrypted datalink that allows for the transmission of flight controls from the GCS to the AV.

Operators can easily set and modify flight plans using user-friendly software installed on any type of laptop chosen by the end-user. Real time data from the AV can be viewed and modified on the same screen as a map detailing the location, speed, and altitude of the AV.



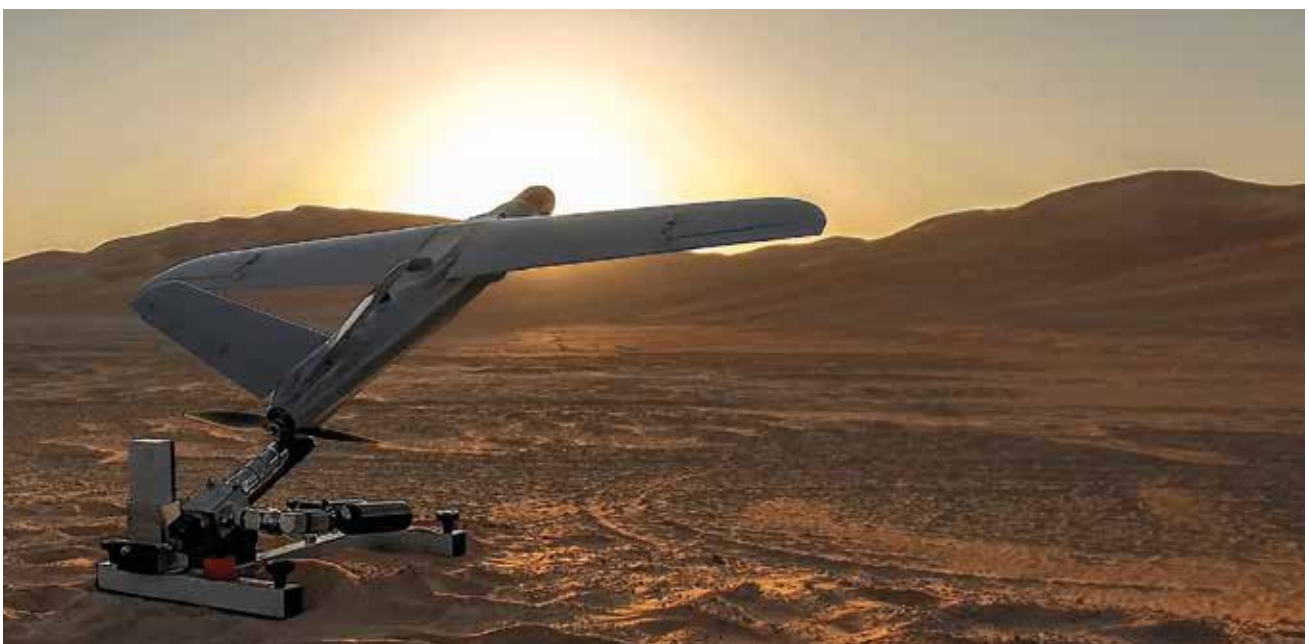
# Rapid Deployment

The take-off of the WARMATE is fully automated using a lightweight catapult launcher, which can be used from any surface; grass; ice; snow; or concrete. The launcher is assembled from three subcomponents and can be constructed in under ten minutes by an experienced user.

The AV is launched following a series of pre-flight tests to ensure communication between the ground control station and the AV. Take-off is fully automated ensuring that the AV will climb to 500 m before switching to the chosen flight plan.

## **Aborting a mission**

Landing of the vehicle, in an emergency is possible using a manual landing flight mode. The air vehicle will land, by belly landing, in any open area identified by the user. In addition, the warhead may be detonated remotely when the air vehicle is in flight allowing for the abortion of a mission.





# Long Term Support

## **Maintenance**

O-level or operational level is ongoing maintenance in the field to repair minor damage to the system. Each system has a toolkit provided and part of the training program enables the user to understand how and when to carry out minor repairs.

I-level or intermediate level is the repair and maintenance of more serious damage or faults with the system. This can be carried out by WB Electronics or be assigned to a third party, who will receive training from WB engineers, depending on the requirements of the user.

D-level or depot level is an overhaul of the system that is recommended every year, and is carried out by WB Electronics.

## **Training**

WB Electronics provides a two week tailored program, which consists of lectures, simulation training, and live operation of the UAV. All training is computer aided and instructor led. Trainees undertake a series of exercises so as to become accustomed to multiple different flight and attack scenarios. The training program can be carried out in Poland or in a different country taking advantage of local support.



# Multiple Safety Levels

The Warheads have three independent safety levels ensuring that detonation is only possible during a strike.

**Level 1** A red strip needs to be removed before preparing the UAV for launch unlocking the warhead. This provides safety during the transport of the UAS.

**Level 2** A second connector is attached to the launcher and removed during the launch. This provides safety during the assembly of the UAV.

**Level 3** Each warhead has a unique electronic code that needs to be activated during the attack phase. Only following entry of this code by the user is detonation of the warhead possible. This ensures against incorrect detonation of the warhead during a mission.



## Technical Specifications for WARMATE

wingspan	1590 mm
length	1170 mm
maximum take-off weight	5300 g
maximum payload weight	1400 g
propulsion	electric motor
instrument airspeed (IAS)	50 - 150 km/h
operating ceiling	100 - 500 m
flight endurance	50 min.
maximum wind speed	during the launch: 10 m/s during the mission: 12 m/s
data link range	12 km Line of Sight (data transfer in real time).
real-time video transmission and display	yes
guidance method	Fully autonomous mode: the operator defines the waypoints on the digital map that UAV is following.
strike method	The attack mode initiates a strike on a selected target, and control of the AV is semi-autonomous during a strike. The user is shown a video-feed, at the ground control station, from the camera mounted on the front of the warhead, and this can be used to assist in directing the aircraft.
power supply	lithium-polymer battery
mission planning	yes, pre- and in-flight
flight along a flightpath	yes
flightpath modification	yes
manual control	yes, assisted by the on-board computer – autopilot
flight to a specific location	yes
circling around a location	yes
launch mode	launched from a pneumatic launcher (automatic)
warheads	3 types of Warhead can be included with a system: 1) a training warhead without armed capabilities (GO-1-T) 2) a high explosive anti-personal head (GO-1-HE) 3) an anti-tank warhead (GO-1-HEAT)
personnel needed for ground station operation	1 person can launch the UAV and then subsequently operate the GCS
operational frequency	Military C Band – both uplink and downlink
mission termination	Possible. The AV can be instructed to return to the GCS to make an emergency landing (see below) or the Warhead can be detonated while the AV is in flight destroying the system.
vehicle recovery	Possible. The air vehicle can be landed in an emergency semi-autonomous landing mode allowing for recovery if the mission needs to be aborted. The Warhead can be re-used on subsequent missions.





[www.wbgroup.pl](http://www.wbgroup.pl)

**WB ELECTRONICS**   
WB GROUP

WB Electronics S.A.  
ul. Poznańska 129/133  
05-850 Ożarów Mazowiecki, Poland

t: +48 22 731 25 00  
f: +48 22 731 25 01

[info@wb.com.pl](mailto:info@wb.com.pl)