

WAR AGAINST UKRAINE

## Germany delivers heavy weapons

The German government plans to provide seven Panzerhaubitze 2000 self-propelled howitzers and 50 Gepard anti-aircraft armored fighting vehicles to the Ukraine. These heavy weapons implement CAN networks for several purposes.



*The PzH 2000 howitzer is equipped with multiple embedded CAN networks (Source: Krauss-Maffei Wegmann)*

End of February, Russia has started its international law attack against Ukraine. In the last weeks, the German government has decided to deliver also tanks and other heavy weapons to the Ukraine army. This includes seven Panzerhaubitze (PzH) 2000 mobile howitzers. They are developed and manufactured by Krauss-Maffei Wegmann (KMW), part of the KNDS French-German enterprise, and Rheinmetall, a German company. KMW supplied both the chassis, sharing some parts with the Leopard 2 battle tank, and the turret for the gun. Rheinmetall designed the 155-mm gun.

These 155-mm howitzers can fire three rounds on nine seconds in burst mode and 10 to 13 rounds per minute continuously. The armored vehicle uses multiple CAN networks with different higher-layer protocols: CANopen, MILCAN A/B, and J1939. The CAN switches are enclosed in patent-protected housings

(DE2020004012316). The CAN switch PCB (printed circuit board) clamps between the lower and the upper part of the housing, when the device is assembled. The heat dissipating units are in contact with the heat absorption surface of the enclosure and are also connected with the heat dissipating surface of the board.

The German army has purchased 185 PzH 2000 vehicles, 100 are still in use, but only 40 are operational – the others are in maintenance. Recently, six of them have been given to the Lithuania army. Seven howitzers to be send to Ukraine are currently in maintenance. Ukrainian soldiers are trained in Germany to operate the howitzers. The training lasts about 40 days. The PzH 2000 are also in operation the armies of Croatia, Greece, Hungary, Italy, Netherlands, and Qatar. The Netherlands plan to give 12 howitzers to Ukraine. The training of Ukrainian soldiers will be performed in Germany.

Additionally, Germany plans to deliver 50 Gepard (Cheetah) armored vehicles. KMW has developed them. They are regarded as sophisticated anti-aircraft weapon, but complex to operate. The training takes several months. The vehicles are not more used by the German army, the Bundeswehr. They were phased out in 2010. The restoration needs some weeks up to half a year. The vehicle is based on the hull of the Leopard 1 tank. The Cheetah and the Leopard armored vehicles are equipped with multiple embedded CAN networks. The electrically driven turret is powered by a 40-kW generator driven by a 4-cylinder, 3,8-liter multi-fuel engine by Daimler.



*The Gepard tank uses several CAN networks with different higher-layer protocols (Source: Krauss-Maffei Wegmann)*

Germany does not manufacture ammunition for the Cheetah. A Swiss company supplies it; but the traditional neutral country has strong export restriction regarding military equipment. The German tank is still in operation in Brazil and Romania. Ukraine may get ammunition from these countries. The armored vehicle is dedicated to fight against low-flying planes, helicopters, and drones.

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