



**WiSENT 2**   
POWER. PROTECTION.  
VERSATILITY.

# Latest Developments in AEV Technology

MilEng COE Symposium, 04 December 2018



**FFG**  
[WWW.FFG-FLensburg.DE](http://WWW.FFG-FLensburg.DE)



## PRESENTATION OUTLINE

### AIM

- Provide MILENG COE with a comprehensive status on the WiSENT 2 AEV

### OBJECTIVES

- Introduce the WiSENT 2 platform concept
- Outline WiSENT 2's superior versatility with focus on the AEV role
- Provide examples of the latest WiSENT 2 AEV developments at FFG



# The Platform



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## THE WORLD'S MOST ADVANCED ARMoured SUPPORT VEHICLE



### ONE MULTIFUNCTIONAL PLATFORM FOR VARIOUS MISSIONS (AEV, ARV, MBS, AVLB)

- » Modular equipment options enable adaptation to various mission requirements
- » Based on Leopard 2 MBT: Maximum mobility in any terrain
- » Best performance data and highest protection values in class
- » 40 platforms delivered or under contract since 2015





## HIGHLY PROTECTED PLATFORM

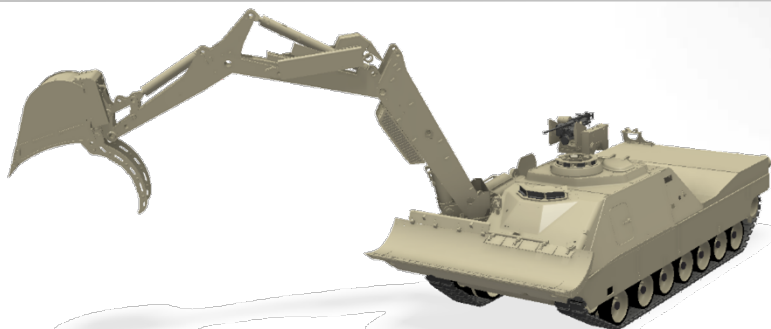


## EXCELLENT PROTECTION AGAINST MULTIPLE THREATS

- » Ballistic Protection > STANAG Level 5 ; Integrated Anti-Spall Liner
- » Hull w/integrated Mine Protection > Level 4A & 4B, Ground Clearance unchanged
- » NBC Protection System + Individual crew Ventilated Respirator System (VRS)
- » 0.30-0.50 Cal. Remote Weapon Station (RWS), latest Day & Night Sensors
- » 76mm Multi-Barrel Grenade Discharger
- » Add-on Armour against RPG/ IED/ Ballistic: SLAT; TARIAN®; AoA modules: > Level 6



## ONE MODULAR PLATFORM – MULTIPLE ROLES



### » **Combat Engineering**

- » High Performance Excavator w/ hydrau
- » Various COTS Attachments
- » Adjustable Engineering Blade



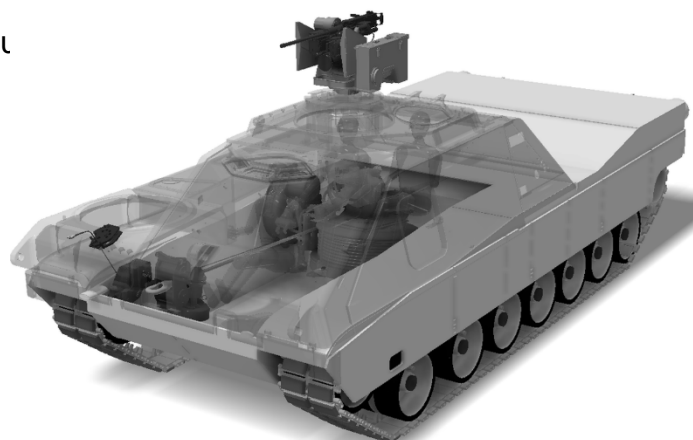
### » **Mine Breaching**

- » Full Width Mine Plough (FWMP)
- » Magnetic Signature Duplicator
- » Lane Marking System



### » **Recovery**

- » Rotating Crane Boom with **32t** Lifting Capacity
- » Combat Recovery System (CRS®)



## WiSENT 2 Platform

Leopard 2- based

**40t** Main Winch and 2.3t Auxilliary Winch

All components hydraulically driven

Modular Design, Digital CAN-Bus Technology

Hydraulic Rack = “Plug’n’Play”

Crew of 3

**MLC 80 Driveline**

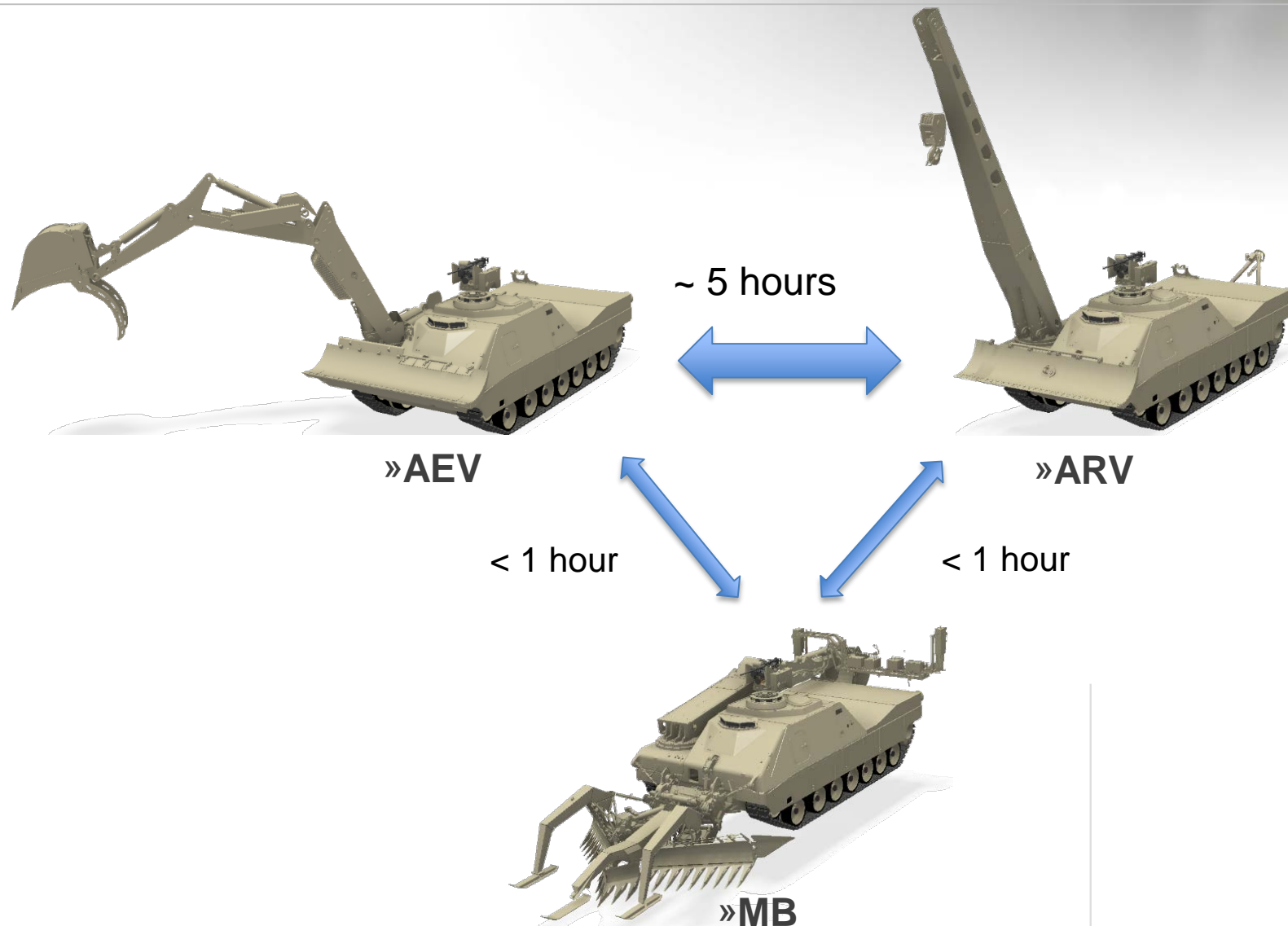


### » **Bridge Laying**

- » 12m Bridge
- » MLC 80



## ONE MODULAR PLATFORM – MULTIPLE ROLES







## EXPOSED TO RIGOROUS TESTING







## ONE MODULAR PLATFORM – MULTIPLE ROLES

### PLATFORM CONCEPT REDUCES ACQUISITION COSTS

- » Conversion option may reduce total amount of vehicles required
- » Mission Kit price approx. 10% of a complete vehicle
- » Performance Data WiSENT 2 AEV are better than any Competitor

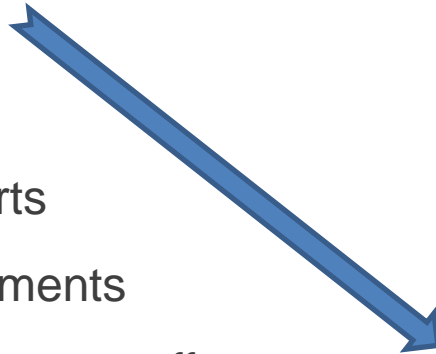


## ONE MODULAR PLATFORM – MULTIPLE ROLES

### FAMILY CONCEPT REDUCES LIFE CYCLE COSTS (LCC)

System similarity results in significantly reduced Logistics through:

- » Less STTE
- » Less Spare Parts
- » Reduced Training efforts
- » Fewer Technical Documents
- » Reduced Fleet Management efforts



**Lower LCC**





## SUMMARY

- » Unrivalled performance on any level
- » One modular and digitized platform – Multiple capabilities
- » Highest protection levels, additional Add on Armour available
- » Broad logistic commonality between variants and towards Leopard 2 MBT
- » Reduces Acquisition Cost if selected as common platform
- » Reduces Life Cycle Costs (LCC)





# Latest Developments



**WiSENT 2**



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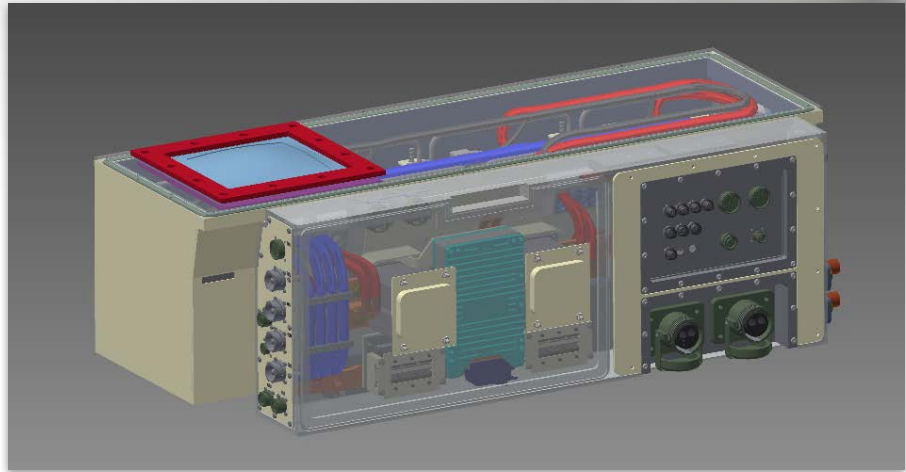
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# AUXILIARY POWER BOOST (**APB**) (Pat. Pending)

## Replaces conventional APU:

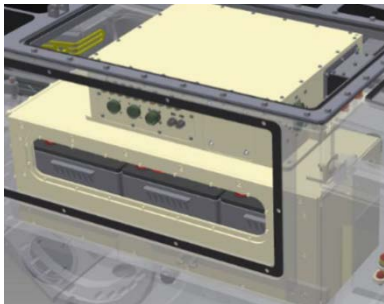
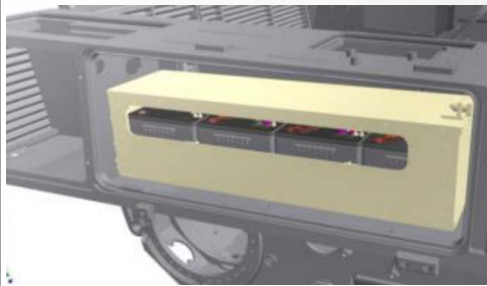
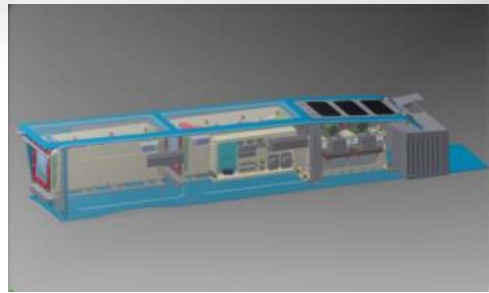
- » Lithium-based power supply
- » Active Air Cooling
- » Built-in Fire Suppression System
- » 10 years maintenance free
- MIL-STD-810 (Shock & Vibr.)
- MIL-STD-461 (EMC)
- MIL-STD-1275 (Power)



## Real Silent Watch:

- » No noise
- » Low thermal emission
- » Large operating range
- » Cold Start

# AUXILIARY POWER BOOST (**APB**) (Pat. Pending)

Variant	Small (Leo 2A5 DK)	Medium (APB in APU)	Large (WiSENT 2 NOR)
			
Energy	8.1 <sup>*1</sup> or 9.6 kWh <sup>*2</sup>	10.8 <sup>*1</sup> or 12.8 kWh <sup>*2</sup>	16.2 <sup>*1</sup> or 19.2 kWh <sup>*2</sup>
Quick Charge	20 min <sup>*3</sup>	40 min <sup>*3</sup>	
Silent Watch	8 h <sup>*4</sup>	16 h <sup>*4</sup>	
Weight	180 kg	200 kg	310 kg
Temp. Range	- 46 °C to +77 °C		

\*1 Cold start at -46 °C possible.

\*2 Cold start at -25 °C possible.

\*3 Based on a Leopard 2 system and 5 to 80 % State of Charge

\*4 Based on a Leopard 2 system and an electrical power load of 1.2 kW (based on user profile)



# LED VEHICLE LIGHTING

## Exchange of legacy Leopard driving lights against LED:

- » 25x more light
- » 100x longer lifetime
- » Lower energy consumption
- » Reduces maintenance
- » “Plug’n’Play”- solution as retrofit for existing driving lights



# LED VEHICLE LIGHTING

Power	20 W
Temperature	-40 °C to 85 °C
IP	6K9K
Lifetime	> 30.000 h
Shock and Vibration	MIL-STD-810
EMC	MIL-STD-461
Approval	ECE R7, R10, R87, R112, SAE 2139

## Classic driving lights compared to LED driving lights

Attribute	Classic driving lights	LED driving lights
Lifetime [h]	300	30.000
Power [W]	50	20
Illuminance [lx] @ 1m	750	9000
Illuminance [lx] @ 20m	4	100

# LED VEHICLE LIGHTING



**LED Retrofit**



**LED Driving Light**



**LED Driving Light & Blackout Light**



**LED Driving Light & IR Blackout Light**



# HD DAY & NIGHT VIDEO CAMERA SYSTEM (**VCS**)

## Scalable VCS based on customer wishes:

- » 360° situational awareness
- » Up to 16 cameras
- » From SD up to HD
- » Daylight, CCD, TI



# HD DAY & NIGHT VIDEO CAMERA SYSTEM (**VCS**)

LWIR and CCD during day



# HD DAY & NIGHT VIDEO CAMERA SYSTEM (**VCS**)

LWIR and CCD during night





# HD DAY & NIGHT VIDEO CAMERA SYSTEM (VCS)

CCD, SWIR and LWIR through smoke



# TACTICAL BRIDGING ADAPTER (Pat. Pending)



# TACTICAL BRIDGING ADAPTER (Pat. Pending)



**1. Unlock & Lift**



**2. Swivel to the front**



**3. Lift & Rotate Bridge**



**4. Lay Bridge**



# TACTICAL BRIDGING ADAPTER (Pat. Pending)



**1. Pick-up**



**2. Lift & Rotate Bridge**



**3. Swivel to the rear**



**4. Stow**



**Thank you for your attention!**





## FOR FURTHER INFORMATION:

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