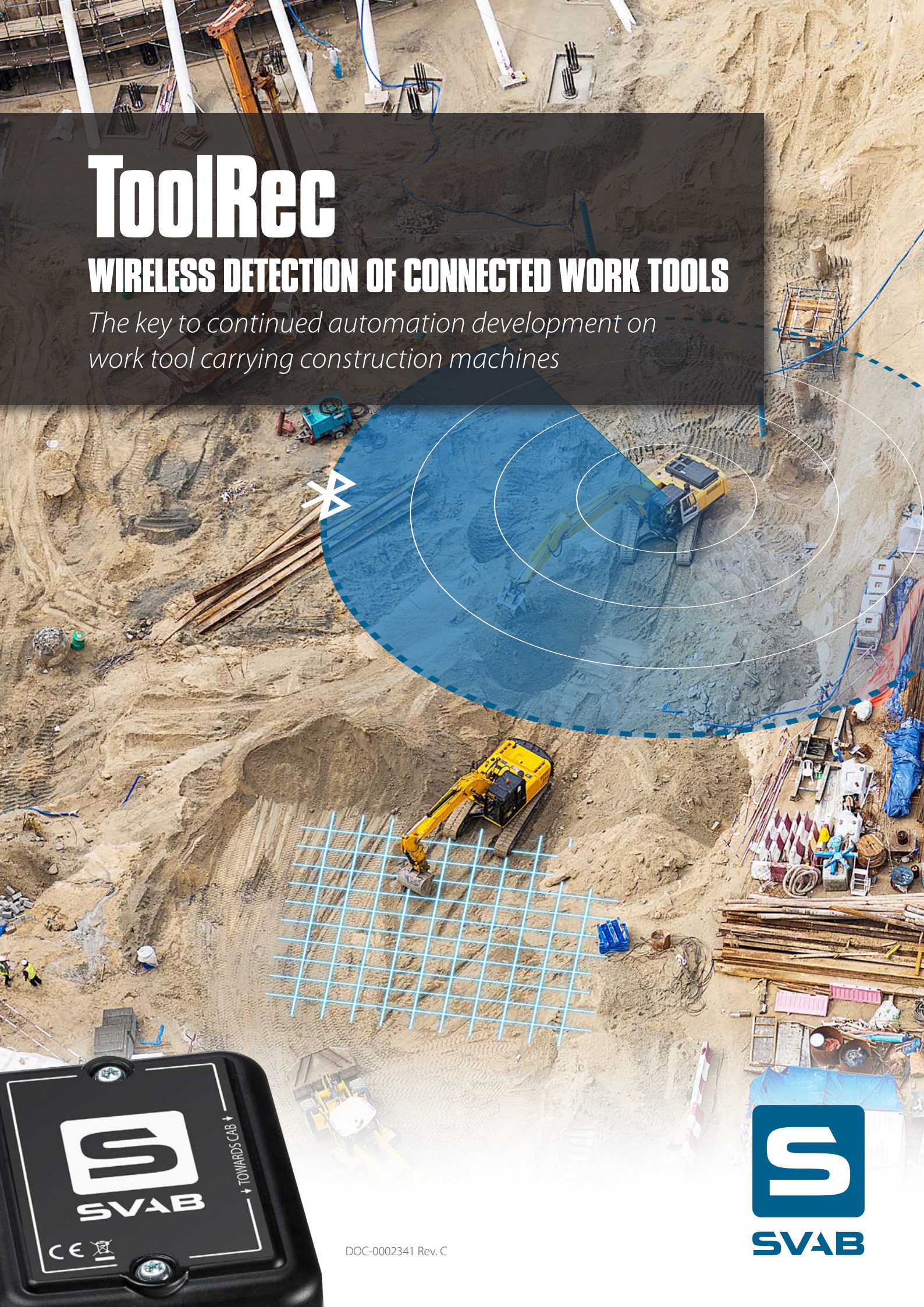


ToolRec

WIRELESS DETECTION OF CONNECTED WORK TOOLS

The key to continued automation development on work tool carrying construction machines



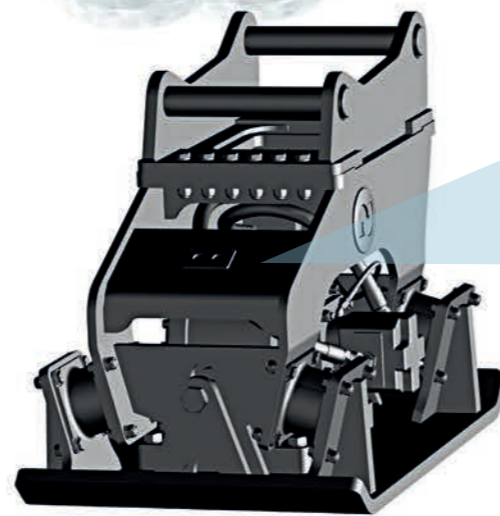
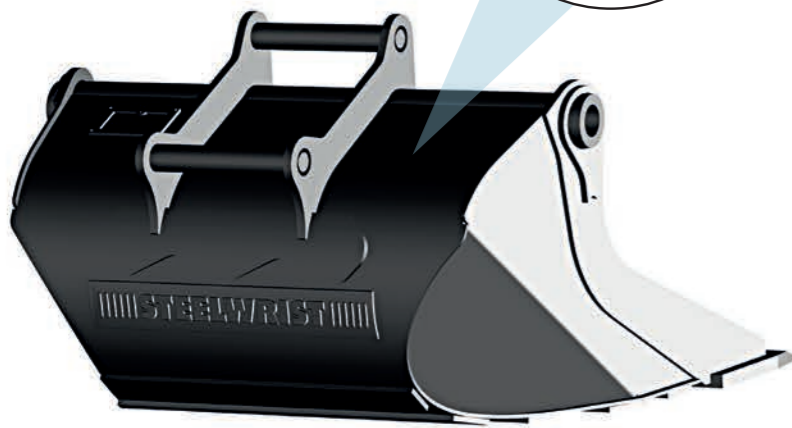
TOOL RECOGNITION

ToolRec is the key to the ongoing automation of work tool carrying machines. Automating functions today are completely dependent on knowing which work tool is connected to the machine. Small durable Tool Recognition Modules (TRMs) are mounted on the tools and assigned unique IDs. The TRM communicates wirelessly via a module in the cab providing the systems with information on connected work tools. The systems can now automatically change its settings based on the connected tool. The system also collects sensor data from each work tool and stores it in the cloud.



HOW IT WORKS

ToolRec is a wireless tool recognition system that automatically detects which work tool is used on a construction equipment machine via BLE (Bluetooth Low Energy). Using a signal from the cabin's quick coupler switch, a cabin module and a work tool module and in combination with advanced algorithms, the system can automatically identify which work tool is connected to the machine.



Open CAN bus API for any application



The open CAN bus interface lets the system share information on which work tool is connected to the machine. This information can be used by many different applications.



3D Machine Control Systems

ToolRec tells the machine control system which work tool is connected to the machine by sending the work tool ID to the system. This input can be used to automatically change the Machine Control System settings to the connected work tool. This provides quicker tool changes and eliminates potential error sources and expensive rework. The Tool Recognition Modules (TRMs) can also store information on the work tool's unique measurements and dimensions if local work tool data storage is preferred.

- Saves time with faster work tool changes
- Minimizes the risk of using the wrong work tool leading to costly rework



Tiltrotator control systems

The tiltrotator is an increasingly common attachment for excavators and is often controlled by a separate control system. These systems may also have to adjust their settings depending on which work tool is connected to the tiltrotator. With ToolRec in combination with tiltrotator control systems developed by SVAB, each ToolRec module can be configured with custom tiltrotator speeds. This helps the operator to always get the optimum performance of his tiltrotator and ensures minimal fuel consumption. With ToolRec's open CAN bus interface the system can also be integrated with external tiltrotator control systems.

- Optimal tiltrotator performance
- Ensures minimal fuel consumption



AUX

Auxiliary hydraulics control

ToolRec can also be used to automatically switch between different profile settings in the excavator control system which handles the auxiliary circuit for hydraulic powered work tools.

- Optimal settings for the hydraulic work tool
- Reduces unnecessary fuel consumption



ENVIRONMENTAL DATA

TOOLREC HUB

TOOLREC MODULE (TRM)

Water / dust rating	IP50 (acc. to IEC60529)	IP67 (acc. to IEC60529)
Operation temperature	-40° to +70° C	-40° to +70° C
Storage temperature	-40° to +85° C	-40° to +85° C
Humidity	IEC60068-2-30 IEC60068-2-78	IEC60068-2-30 IEC60068-2-78 IEC60068-2-38
Vibration	IEC60068-2-64	Field tested to withstand very tough environments (as a hydraulic hammer).
Shock	IEC60068-2-27, 500m/s ² - 6msec	IEC62262, IK09, 10 joule (TRM metal cover provides additional protection)
Drops	IEC60068-2-31	IEC60068-2-31

MECHANICAL DATA

Weight	180 g	90 g
Dimensions	165 x 43 x 79 mm (LxWxH)	84 x 64 x 20 mm (LxHxW)
Material	PA6	PC/PBT
Color	Black	Black

COMPLIANCE

RED	2014/53/EU	2014/53/EU
RoHs	2011/65/EU	2011/65/EU
WEEE	2012/19/EU	2012/19/EU
FCC	USA FCC Class B	USA FCC Class B
ICES	CAN ICES-3 (B) / NMB-3 (B)	CAN ICES-3 (B) / NMB-3 (B)
LVD	2014/35/EU	2014/35/EU
EMC	2004/108/EU	2004/108/EU

STANDARDS

Radio	ETSI EN 300 328 V2.1.1 ETSI EN 301 489-1 V2.1.1 ETSI EN 301 489-17 V3.1.1	ETSI EN 300 328 V2.1.1 ETSI EN 301 489-1 V2.1.1 ETSI EN 301 489-17 V3.1.1
EMI	ISO 13766-1:2018	ISO 13766-1:2018
RoHs	EN 50581:2012	EN 50581:2012
Electrical safety	EN 60950-1	EN 60950-1

ELECTRICAL

Available memory	N/A	1.5 kB
Nominal voltage	12 and 24 V	3.6 V
Supply voltage	7.5-36 V	1.8-3.6 V

Standby 12 V system: Up to 100 mA
Standby 24 V system: Up to 55 mA

Operating time with a single battery:
Up to 5 years depending on usage and environment

CAN termination resistance:
Software selectable 120 Ω, 600 Ω, not terminated