

HUSQVARNA CONSTRUCTION

MDS System

Description and User Manual

Scope

This is a description of the label of the Husqvarna MDS Machine Distance Sensor.

Supplementary documents

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Area - Title:	HUSQVARNA CONSTRUCTION - MDS System – User Manual		
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1 Overview

The MDS system is a radio based system for the measuring of distance from a user to a moving machine. The system consists of three devices, one MDS-anchor mounted inside a remote control unit and two MDS-tags placed within the front and rear of a machine.

The MDS system enables the distance to be measured between both of the two MDS-tags in the machine and the MDS-anchor in the remote control unit.

MDS is an acronym for Machine Distance Sensor.

All MDS devices are identical in terms of electronic hardware and software with the exception of anchor and tag setting which define the role of the individual devices in the MDS system.

2 Operating description

The MDS system uses Ultra-Wide Band (UWB) radio technology to measure ToF (Time of Flight). The system converts this time into distance with a high degree of accuracy.

MDS distance data is used for perimeter fencing around dangerous machines as seen in picture below. Safe perimeter used is minimum 2m. If the remote control is within 2m from the machine, the ECU (main computer inside the machine) will stop the machine for operator safety. The ECU is continuously receiving distance data from MDS-tag via CAN bus

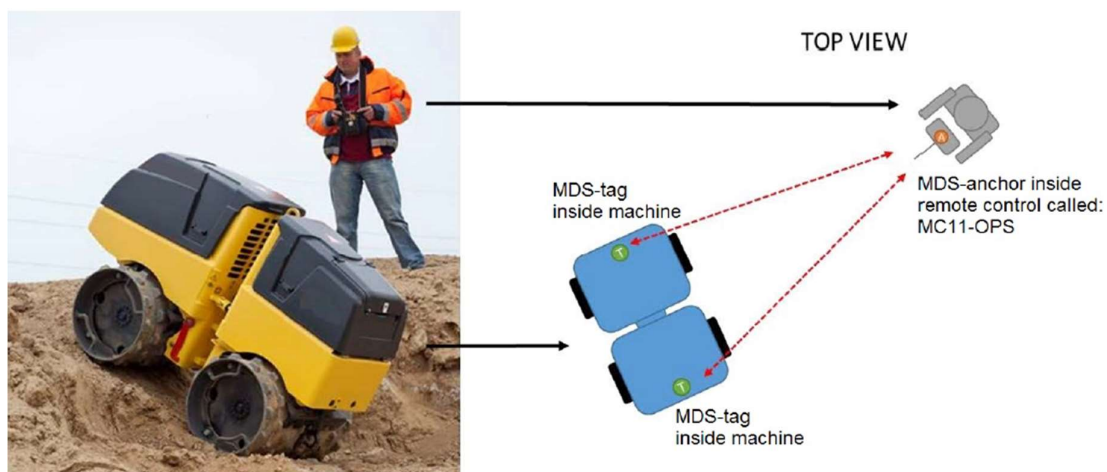


Figure 1: Real life setup. The MDS system enables measurement of distances at a rate of 2Hz with +/-10cm accuracy. The system has a range of 30m line of sight.

Control signals between the remote control unit and the machine are transmitted via a separate radio link based on ISM 2,4GHz radio technology. The MDS system is paired at the same time as the remote control radio modules are paired.

All processing and validation of distance data from MDS system is done by ECU inside the moving machine. The MDS-anchor is mounted inside the remote control called MC11-OPS. It receives power from the remote control (either battery or control cable).

Note: MDS is only a support sensor system, helping the user staying at a safe distance, and should only be used by correctly trained machine operators.

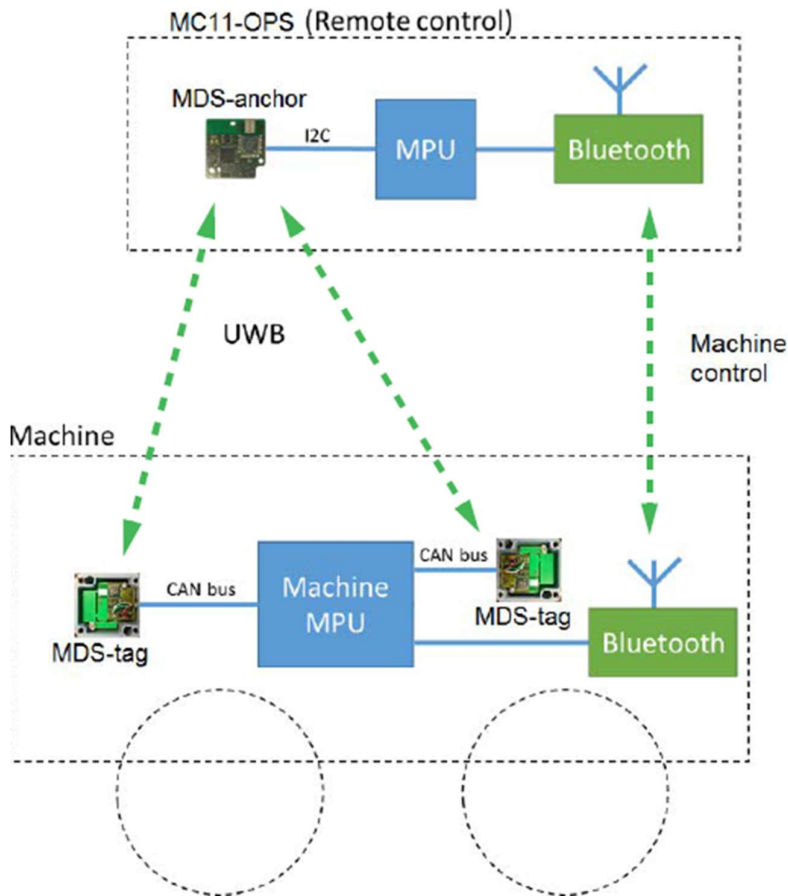


Figure 2: Principle diagram.

3 MDS modules

The two MDS-tags are placed inside plastic casings, and are quipped with connectors for installation in the machine. These MDS-tags are simply referred to as MDS and they are placed in the front and rear of the machine.

The MDS-anchor device which is integrated into the remote control unit MC11-OPS does not have a casing of its own but is fit inside the housing of the MC11-OPS remote control unit.

4 Regulatory information

4.1 FCC United States

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (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 A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTE: Changes or modifications made to this equipment not expressly approved by Husqvarna AB may void the FCC authorization to operate this equipment.

4.2 ISED Canada

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

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'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.