GENERIC ISOBUS COMPLIANT PRECISION AGRICULTURE FUNCTIONALITY IN A PROPRIETARY TERMINAL CONCEPT

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ABSTRACT

The manuscript and the presentation will depict overall challenges and the approach AGCO Fendt has taken for integrating such generic ISOBUS-based technologies into a proprietary logical GUI and Software concept. It will explain in detail the possibilities and the exceptional advantages of the ISOBUS data abstraction. Additionally, the presentation will deal with the general engineering challenge for perfect usability, facilitating intuitive handling for the customer by deriving dosed, interpretable and situation-dependent information.

Keywords: ISOBUS, SectionControl, Fendt VarioTerminal, Data Abstraction, User Interface

INTRODUCTION

Due to increasing investment costs for agricultural resources crop input management precise application technologies are exceedingly gaining interests for customers. One approach for increasing efficiency is using common GPS-devices for reducing over- and underlaps during application processes, and to adjust application rate based on predefined application maps. Driven by this, implement manufacturers are heading towards machinery, which is able to control application rate and activate the application section-wise, e.g. section by section or nozzle by nozzle. These technologies called Section Control and Rate Control (or Variable Rate Technology) have become state of the art in precision farming approaches, but for quite a long period of time have been maintained within proprietary solutions.

Since these technologies, their logical participants and the communication between these participants is defined within the ISOBUS ISO 11783 Specification, a generic proposal (ISO 11783-10 ‘Task Controller’) is available for all tractor and implement manufacturers. Following this proposal AGCO Fendt integrated firstly one of these generic functionalities within their Varioterminals series.

PROBLEMS AND SCOPE

The ISO 11783 specification allows numerous varieties in the Device Description Object Pool (DDOP) structure. In general this DDOP of implements and vehicles shall represent all the information needed for Section Control Technologies. AGCO Fendt has seen the need to abstract the varying standardized implement information into a proprietary data set.

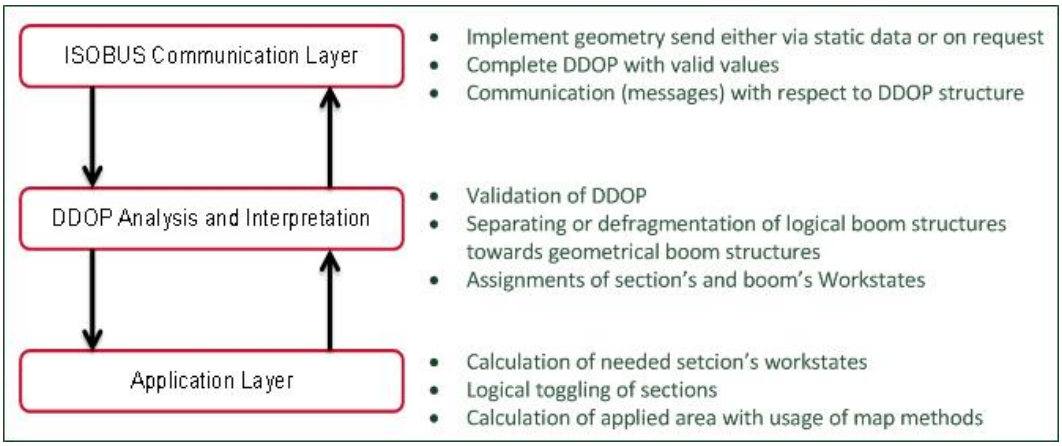

Figure 1

Following Figure 1 The initial step of the ISOBUS abstraction is to abstract the communication towards low level message definition, and to verify the overall DDOP structure and initiate needed value requests, as some values are hard coded in the DDOP structure and others are parameters. This first abstraction is followed logically by the Analysis and Interpretation of the DDOP. This module cumulates geometrical and logical structural information about the connected device, and prepares a data set containing all device information needed for the application. The application itself has no need of being able to handle various DDOP structures, and thus could be tested, verified and used on its own, and thus could be handled extremely modular. Thus the structure is designed for existing and future purposes.

SUMMARY AND OUTLOOK

With this the broad varieties given in implement's ISOBUS DDOP is transferred into one single vehicle system data set. This set is used for feeding firstly the map view and secondly, simultaneously the coverage documentation. Customers thereby are informed about the application status and coverage, and the coverage information is used to control the section's states. Due to this approach the shown vector based map perspective matches the real coverage (as accurate as given by implement's data) in all means. Because of its middleware abstraction method for ISOBUS-based data, the approach additionally derives an extremely generic basis for adding several ISOBUS based functionality without structural changes to the software concept.