



AGRICULTURAL INDUSTRY
ELECTRONICS FOUNDATION

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Think ISOBUS
ΠΡΟΫΚ ΙΣΟΒΟΥΣ



What is the AEF?

On October 28th 2008 seven agricultural equipment manufacturers and two trade associations set up the *Agricultural Industry Electronics Foundation* (AEF) with the aim of creating an independent international body for the industry. The AEF focuses the resources and knowledge of its members toward enhancing the use of electronics in the farming sector. From the beginning a number of important subjects surrounding ISOBUS and control system safety have been addressed.

The international, industry wide AEF is open to everyone who is interested in the electronics field and its financing

is underwritten by the foundation members. More than 120 companies, associations and other organizations have already signed up and are active within the AEF framework. The AEF will provide the consistent sponsorship and support needed to implement electronic standards in agriculture, after they have been developed and accepted through the *International Standards Organization* (ISO) process. ISO is now represented in over 150 countries around the world.

It is important to know that AEF is not the same as ISO. AEF does not create the international standards.

This task remains the domain of the ISO with its affiliated working groups. The AEF replaces the European *Implementation Group ISOBUS* (IGI) and the *North American ISOBUS Implementation Task Force* (NAITF).

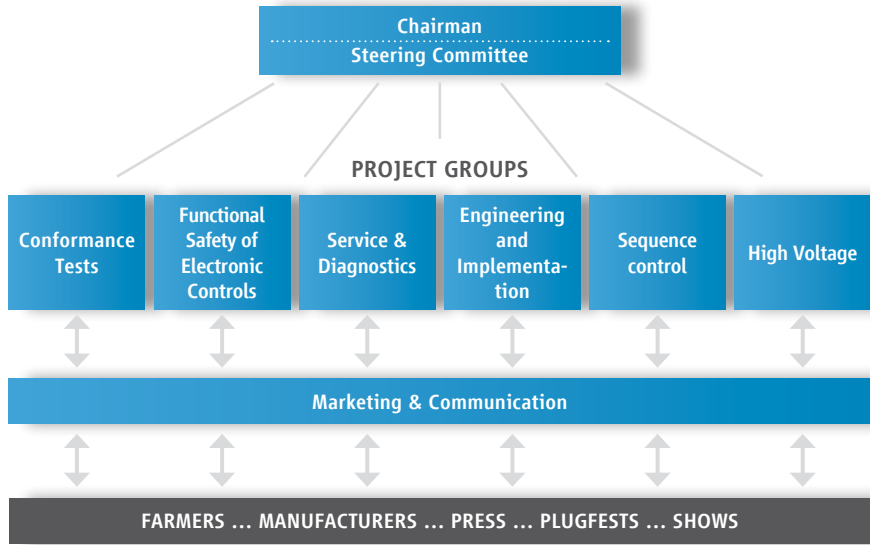
AEF is not limited to ISOBUS however. It is designed to support any international agricultural electronic standard that derives from the ISO process. The founders include both manufacturers and the trade associations in the USA, AEM (*Association of Equipment Manufacturers*) and the VDMA (*German Engineering Federation*) in Germany.

AEF founding members





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Objectives of the AEF

- To coordinate the international development of electronics for farm machinery and implement electronic standards.
- To coordinate international cooperation in ag electronics technology.
- To build synergistic partnerships between ag equipment manufacturers for the benefit of equipment users.
- To coordinate technical improvements (ISOBUS) including management and enhancement of certification tests.
- To organize certification support, training, workshops, marketing activities and consulting relating to any ag electronics international standards.



Reasons for setting up the AEF

- The AEF has plenty of clout to get the momentum going for ISOBUS.
- ISOBUS needs to gain worldwide acceptance as the communication standard.
- The AEF should establish itself in its own right with mutually beneficial links between various companies.



Martin Richenhagen
Chairman, President and CEO,
AGCO



Dr. Theo Freye
Speaker of the Executive Board,
CLAAS KGaA mbH



Ingvald Løyning
President and CEO,
Kverneland Group

- The initial mission for the AEF is the development of binding ISOBUS certification procedures in order to ensure full compatibility.

- The AEF is to end any confusion surrounding compatibility between tractors and implements.
- The AEF would like to establish ISOBUS as a brand and quality label.



Bernard Krone, Managing Director,
Maschinenfabrik Bernard Krone GmbH
also representing Amazone, Kuhn,
Grimme, Lemken, Rauch





Harold Boyanovsky
President and CEO, CNH Corp.

- We will achieve our compatibility goals most easily when all the ag equipment producers pull in the same direction.
- The AEF organization is ideally placed to reinforce the acceptance of ISOBUS certified products internationally.
- Six internationally staffed project groups are working on solutions useful for both the entire industry and our customers.



Markwart von Pentz,
President, Agriculture and Turf
Division – Europe, CIS, Northern
Africa, Middle East, Latin America
and Global Harvesting, Crop Care,
Hay & Forage Products,
Deere & Company

- The prompt and reliable service support provided by ISOBUS technology is a vital customer benefit.
- With a united approach we can make ISOBUS more effective than by working alone.



Mag. Heinz Pöttinger
CEO, Pöttinger

- Increased application of electronics is designed to simplify the tasks for our customers and improve their financial results.



The project groups

Project group 1: Conformance tests

The primary objective is to provide a state-of-the-art testing and certification process which ensures that the ISOBUS components are fully compatible. The formal certification process will be designed for execution by independent testing institutes. The tools and protocols for these trials will also be made available to the agricultural industry as a whole in order to support the development of ISOBUS compliant components across the board.

Project group 2: Functional safety of Electronic Controls

The mission of this project group is to draw up design and application guidelines for all manufacturers of agricultural equipment

when safety related applications using the ISOBUS according to ISO 11783 are to be implemented. In this case all legal directives and standards such as ISO/DIS 25119, ISO 15077 have to be taken into consideration.

Project group 3: Engineering and implementation

The task here is to coordinate the market introduction of new ISOBUS features across the ag industry while continuing to monitor the ISOBUS engineering and implementation processes.

Project group 4: Service and diagnostics

The main objective is to service combined ISOBUS systems from different OEMs. (The same high quality standards must be met between brands as for products of individual manufacturers).

The result should become tangible with quick and efficient troubleshooting in order to achieve complete customer satisfaction. In addition the issue of technical documentation, exchange of information, FAQs and training are to be tackled here.

Project group 5: Sequence control

This part of the standard defines the sequence control system with items like a headland management system which blends tractor and implement functions into a single system. The system stores multiple operation sequences from the tractor or any other ECU on the implement bus and activates them when the operator gives the command.

Project group 6: Marketing and communication

The marketing project group assumes marketing responsibility for ISOBUS technology both in the ag equipment industry and throughout the farming community. The focus is placed on promoting ISOBUS in the market and establishing the new ISOBUS certified logo as the unique brand.

To achieve this, the group coordinates various activities such as participation at industry conferences, shows and exhibitions along with corporate design and PR programs.

Project group 7: High voltage

Electric drives are rapidly gaining importance in agricultural engineering. This Project Group is aimed at working out a proposition for the standardization of an interface on the tractor providing external implements or components with electric power. The pretension is that with this interface any implement will run its electric motors with any tractor, only limited by the power of the engine. Decentralized electric motors can overcome the limitations of mechanical and hydraulic solutions matching the requirements of a new generation of implements with substantial advantages.



First priority: ISOBUS

There are a variety of important subjects relating to ISOBUS which provide the initial focus for AEF's activities. These activities are aimed at providing the resources necessary for addressing important electronics technical subjects on behalf of ag equipment manufacturers and farmers:

- Increased international acceptance and awareness of ISOBUS technology.
- Enhanced customer benefits from using the ISOBUS technology.
- Improved compatibility of ISOBUS products with plug and play capability worldwide.



- Collecting all the information available about ISOBUS products, including their functions, implementation and compatibility, for the service, marketing and sales divisions of manufacturers and suppliers.
- Promoting the international acceptance of ISOBUS certified products while creating a quality brand and trademark for ISOBUS. The AEF is currently developing mandatory certification procedures. In addition a new label and logo combination is being designed to ensure absolute clarity regarding compatibility between tractors and implements.

Furthermore six projects have been defined and are currently being worked at intensively:

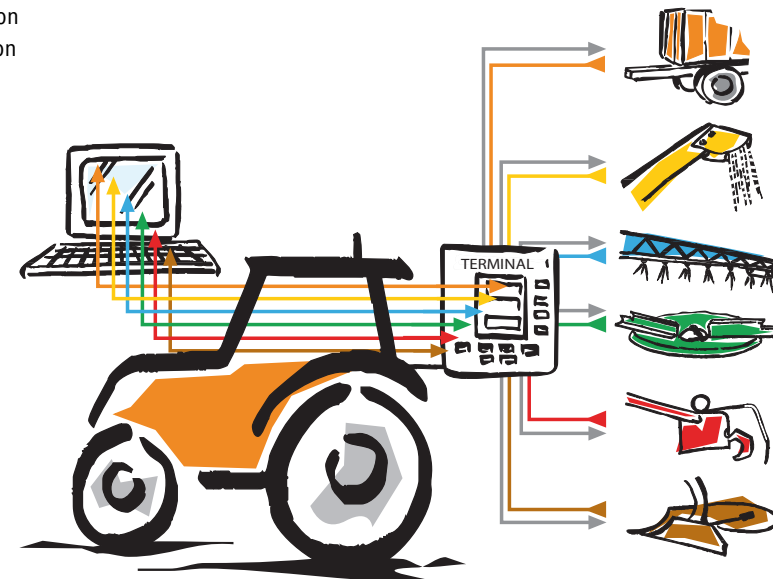
- Conformance tests
- Functional safety of electronic controls
- Engineering and implementation
- Service and diagnostics
- Sequence control
- Marketing and communication

What is ISOBUS?

Ag equipment manufacturers around the world have agreed on ISOBUS as the universal protocol for electronic communication between implements, tractors and computers.

The primary goal of ISOBUS data technology is to standardize the communication which takes place between tractors and implements while ensuring full compatibility of data transfer between the mobile systems and the office software used on the farm.

The basis is the international ISO 11783 standard – "Tractors and machinery for agriculture and forestry- Serial control and communications data network".



Why ISOBUS?

This development was triggered by the fact that farmers often use tractors from one brand with implements from another. As long as they are all using different electronic systems, each tractor and each implement combination requires an individual terminal. ISOBUS makes such inefficiency a thing of the past by creating a standardized and compatible interface between the tractor and associated implements with the future aim of achieving plug and play capability for every combination. Just plug it in and you're ready to go. One single ISOBUS terminal therefore replaces a multitude of terminals specific to single implements on the tractor. The technical development of ISOBUS began in 1991 when the ISO set up the *SC 19 agricultural electronics group*. The ISOBUS standard was introduced in tractors and implements in 2001. After seven years of field

experience the industry formed the AEF to better support ISOBUS for its members and their customers worldwide.

ISOBUS also defines the documentation of various field processes regardless of the equipment manufacturer. It includes protocol for the exchange of information with the farm computer system. Prior to fieldwork, operational data can be stored in a task controller from which it is transmitted to the implement as it works in the field. This facilitates precision farming activities such as variable spreading of fertilizer in relation to the position of the spreader in the field. The flow of data takes place in two directions: the task specific data can be transmitted to the task controller and then be analyzed using the farm computer, after the work is completed.



Benefits of AEF membership

Every year tens of thousands of new tractors are being purchased with standardized ISOBUS terminals. A main factor behind these purchases is the customer's expectation that more and more implements can be controlled by these modern tractors. They are – as always – looking for ease of handling, reduced costs and long-term viability.

Membership in the AEF helps you to make your products fit for the future. While joining up is free of charge, you are obliged to participate actively and you can then take advantage of a number of benefits:

- Being a member helps you in development and gives you access to the ISOBUS knowledge base.
- AEF organizes the testing environment for your controllers and terminals at plugfests.
- The organization assists you in overcoming difficulties when implementing ISOBUS.
- AEF supports the marketing of your ISOBUS products and promotes both development and market penetration.
- As a member you are actively involved in the project groups.

