European Agricultural Machinery

CEMA

Connected Agricultural Machines in Digital Farming

**How AEF & AgGateway work together on interoperability
to ensure farm machines and related system can talk to each other**

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Machines talking to each other: interoperability as a key success factor in Digital Farming

- Connected agricultural machines are at the heart of Digital Farming: only when farm machines can seamlessly talk to each other and to related systems (such as, for instance, farm management systems) can the vision of a truly connected agriculture be achieved.

- The European farm machinery industry as represented by CEMA has a long and successful history in developing industry-specific standards for electronics and data exchange between different farm machines (e.g. tractor – farm implement) as well as between farm machines and software systems, such as Farm Management Information Systems (FMIS).

- In particular, the so-called ISOBUS standard (ISO standard 11783 using ISO-XML as data standard) has become the de-facto standard governing interoperability between tractors and implements from different manufacturers.

This document provides a brief overview of how the manufacturers and industry associations within CEMA are working together in initiatives such as the AEF and AgGateway to advance further together on the path towards connected Digital Farming.
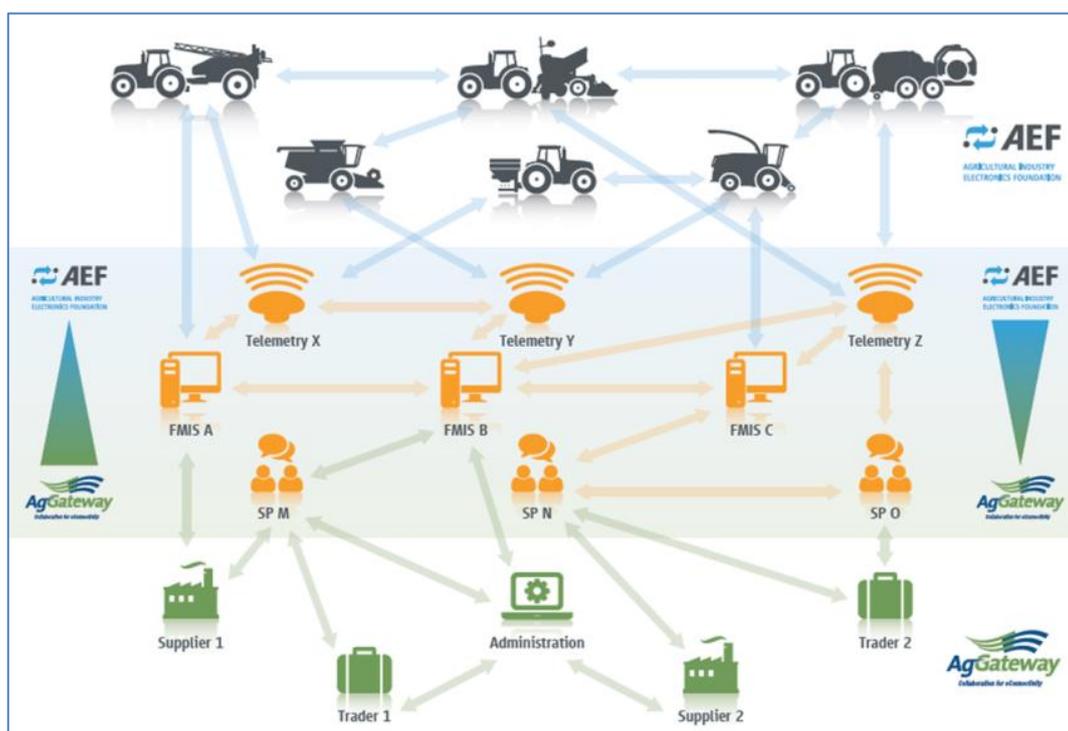

Figure 1: Respective areas of expertise of AEF and AgGateway. Areas of cooperation are highlighted in grey.

The Agricultural Industry Electronics Foundation (AEF): standards for smart, interoperable farm machines

Established in 2008 by seven international agricultural equipment manufacturers and two associations, the AEF (http://www.aef-online.org/) is an independent international organization to support the development, implementation and enhancement of standards for the increased use of electronic and electrical systems in mobile farming equipment.

Initially, the main focus of AEF was the development of the so-called ISOBUS standard (ISO 11783) which governs electronics and data exchange between different farm machines (e.g. tractor – farm implement).

With the digital revolution in farming unfolding, the AEF's scope of work is no longer limited to ISOBUS only, but has been expanded to cover additional areas of critical importance for Digital Farming such as:
- Farm Management Information Systems (FMIS)
- wireless in-field communication
- high-speed ISOBUS
- electric drives
- camera systems

As an international platform, the AEF is open for all interested groups from the field of electrical and electronic systems. It is financed by membership fees of its founding members and by the services rendered to general members. Currently, more than 190 members work together under the umbrella of the AEF. The AEF will provide the continuous encouragement and support necessary for introducing its guidelines to ISO standards in agricultural electrical and electronic systems.

AgGateway: standardizing data exchange between different actors in the agricultural supply chain

Besides the exchange of specific agricultural data concerning, for instance, field or crop operations, there is also a clear need to standardize the exchange of more transaction-related data with other actors in the agricultural supply chain.

AgGateway (http://aggatewayglobal.net/) is the recognized international organisation that uses the concept of industry cooperation to expand the use of e-business standards and guidelines globally and, as such, to enable the use of information and communication systems in farming.

AgGateway Global Network carefully considers regional operating practices to identify opportunities and balanced approaches to standardization. The objective is to share best practices, i.e. "what has worked" in different regions of the world so as to promote global e-business, and to collaborate on the development of the necessary standards where such specific needs exist.

For this purpose, AgGateway brings together agricultural companies to agree on what standards for a specific area should be leading. If there is not yet a standard available for exchanging specific data, AgGateway takes the initiative to develop, in cooperation with existing standardization boards, such

missing standards. Using AgGateway standards globally reduces the chance that conflicting standards will be developed and implemented in other regions. In locations where conflicting e-business standards already exist, this plan will provide a good opportunity to resolve these differences in a balanced collaborative effort.

For the standardized exchange of order-, invoice-, and despatch-data the UN/CEFACT, GS1 or UBL standards are leading. For exchanging e.g. laboratory analysis results and crop-related data for compliance purposes, new standard UN/CEFACT messages are being developed in recent years.

For data exchange, the unique identification of farmers, crop fields, inputs, etc. is very important. GS1 provides a set of worldwide implemented standards for unique identification such as GLN (Global Location number), GTIN (Global Trade Item Number) or GPC (Global Product Classification).

AEF & AgGateway: covering the complete landscape of Digital Farming

AEF has joined forces with AgGateway to make the standard for data exchange future-proof and adapt it to the needs of Digital Farming.

Apart from the fact that both AEF and AgGateway are active in developing sector-specific standards and guidelines, the value of cooperation lies in pooling different areas of expertise and knowledge. This allows AEF and AgGateway to cover the entire landscape of Digital Farming.

For this reason AgGateway has become a member of the AEF and is actively involved in AEF's Project Team 9, which is dedicated to FMIS/Data Management so as to improve the ISO-XML and EFDI standards for the future.

The added data exchange standards between mobile farm equipment and farm management systems (or data management systems) are also standardized in ISO11783, Parts 10 & 11.

Figure 1 shows the respective areas of expertise areas of the AEF and AgGateway. The overlapping (grey) area shows in which fields both organizations work together to align the development and acceptance of data exchanges standards.

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