GETTING STARTED GUIDE

ISOBUS for the Trimble® FmX® Integrated Display

Version 8.00
Revision A
April 2014

Trimble

Agriculture Business Area

Trimble Navigation Limited
Trimble Agriculture Division
10368 Westmoor Drive
Westminster, CO 80021
USA
trimble_support@trimble.com
www.trimble.com

Legal Notices

Copyright and Trademarks

©2009–2014, Trimble Navigation Limited. All rights reserved.
Trimble, the Globe & Triangle logo, and FmX are trademarks of Trimble Navigation Limited, registered in the United States and in other countries.
All other trademarks are the property of their respective owners.

Release Notice

This is the April 2014 release (Revision A) of the ISOBUS for the FmX integrated display Getting Started Guide, part number 93023-80-ENG. It applies to version 8.0 of the FmX integrated display software.

Warranties

The following limited warranties give you specific legal rights. You may have others, which vary from state/jurisdiction to state/jurisdiction.

Product Limited Warranty

Trimble warrants that this Trimble product and its internal components (the “Product”) shall be free from defects in materials and workmanship and will substantially conform to Trimble’s applicable published specifications for the Product for a period of one (1) year, starting from the earlier of (i) the date of installation, or (ii) six (6) months from the date of original Product shipment from Trimble. This warranty applies only to the Product if installed by Trimble or a dealer authorized by Trimble to perform Product installation services.

Software Components

All Product software components (sometimes hereinafter also referred to as “Software”) are licensed solely for use as an integral part of the Product and are not sold. Any software accompanied by a separate end user license agreement (“EULA”) shall be governed by the terms, conditions, restrictions and limited warranty terms of such EULA notwithstanding the preceding paragraph.
During the limited warranty period you will be entitled to receive such Fixes to the Product software that Trimble releases and makes commercially available and for which it does not charge separately, subject to the procedures for delivery to purchasers of Trimble products generally. If you have purchased the Product from an authorized Trimble dealer rather than from Trimble directly, Trimble may, at its option, forward the software Fix to the Trimble dealer for final distribution to you. Minor Updates, Major Upgrades, new products, or substantially new software releases, as identified by Trimble, are expressly excluded from this update process and limited warranty. Receipt of software Fixes or other enhancements shall not serve to extend the limited warranty period.
For purposes of this warranty the following definitions shall apply: (1) “Fix(es)” means an error correction or other update created to fix a previous software version that does not substantially conform to its Trimble specifications; (2) “Minor Update” occurs when enhancements are made to current features in a software program; and (3) “Major Upgrade” occurs when significant new features are added to software, or when a new product containing new features replaces the further development of a current product line. Trimble reserves the right to determine, in its sole discretion, what constitutes a Fix, Minor Update, or Major Upgrade.
This Trimble software contains Qt 4.5 libraries licensed under the GNU Lesser General Public License (LGPL). The source is available from http://qt.nokia.com/downloads. A copy of the LGPL license is included in the appendices of this manual, and at ftp://ftp.trimble.com/pub/open_source/FmX.
This software includes the DejaVu fonts, which are licensed under the Bitstream Vera license, terms available at http://dejavu-fonts.org/wiki/index.php?title=License and http://www.gnome.org/fonts/.
GNU LESSER GENERAL PUBLIC LICENSE
Version 2.1, February 1999

Copyright c 1991, 1999 Free Software Foundation, Inc.
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301
USA
Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed. [This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software-to make sure the software is free for all its users.
This license, the Lesser General Public License, applies to some specially designated software packages-typically libraries-of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.
When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.
To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.
For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.
We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/ or modify the library.
To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.
Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.
Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.
When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.
We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.
For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.
In other cases, permission to use a particular library in nonfree programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free

programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.
Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.
The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

GNU LESSER GENERAL PUBLIC LICENSE

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".
A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.
The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)
"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.
Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.
1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.
You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.
2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:
a) The modified work must itself be a software library.
b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.
(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)
These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.
Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.
In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.
3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.
Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.
This option is useful when you wish to copy part of the code of the Library into a program that is not a library.
4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.
If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.
5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.
However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.
When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.
If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)
Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.
6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.
You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:
a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library.

(It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)
b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.
d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.
For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.
It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.
7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:
a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.
b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.
8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.
9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.
10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

Warranty Remedies

Trimble's sole liability and your exclusive remedy under the warranties set forth above shall be, at Trimble's option, to repair or replace any Product that fails to conform to such warranty ("Nonconforming Product"), and/or issue a cash refund up to the purchase price paid by you for any such Nonconforming Product, excluding costs of installation, upon your return of the Nonconforming Product to Trimble in accordance with Trimble's product return procedures than in effect. Such remedy may include reimbursement of the cost of repairs for damage to third-party equipment onto which the Product is installed, if such damage is found to be directly caused by the Product as reasonably determined by Trimble following a root cause analysis.

Warranty Exclusions and Disclaimer

These warranties shall be applied only in the event and to the extent that (a) the Products and Software are properly and correctly installed, configured, interfaced, maintained, stored, and operated in accordance with Trimble's relevant operator's manual and specifications, and; (b) the Products and Software are not modified or misused. The preceding warranties shall not apply to, and Trimble shall not be responsible for defects or performance problems resulting from (i) the combination or utilization of the Product or Software with hardware or software products, information, data, systems, interfaces or devices not made, supplied or specified by Trimble; (ii) the operation of the Product or Software under any specification other than, or in addition to, Trimble's standard specifications for its products; (iii) the unauthorized, installation, modification, or use of the Product or Software; (iv) damage caused by accident, lightning or other electrical discharge, fresh or salt water immersion or spray (outside of Product specifications); or (v) normal wear and tear on consumable parts (e.g., batteries). Trimble does not warrant or guarantee the results obtained through the use of the Product or that software components will operate error free.
the warranties above state trimble's entire liability, and your exclusive remedies, relating to the products and software. except as otherwise expressly provided herein, the products, software, and accompanying documentation and materials are provided "as-is" and without express or implied warranty of any kind by either trimble navigation limited or anyone who has been involved in its creation, production, installation, or distribution including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, title, and noninfringement. the stated express warranties are in lieu of all obligations or liabilities on the part of trimble arising out of, or in connection with, any products or software. because some states and jurisdictions do not allow limitations on duration or the exclusion of an implied warranty, the above limitation may not apply or fully apply to you.
notice regarding products equipped with technology capable of tracking satellite signals from satellite based augmentation systems (sbas) (waas/egnos, and msas), omnistar, gps, modernized gps or glonass satellites, or from iala beacon sources: trimble is not responsible for the operation or failure of operation of any satellite based positioning system or the availability of any satellite based positioning signals.

Limitation of Liability

TRIMBLE'S ENTIRE LIABILITY UNDER ANY PROVISION HEREIN SHALL BE LIMITED TO THE AMOUNT PAID BY YOU FOR THE PRODUCT OR SOFTWARE LICENSE. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL TRIMBLE OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER UNDER ANY CIRCUMSTANCE OR LEGAL THEORY RELATING IN ANY WAY TO THE PRODUCTS, SOFTWARE AND ACCOMPANYING DOCUMENTATION AND MATERIALS, (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS), REGARDLESS WHETHER TRIMBLE HAS BEEN ADVISED OF THE POSSIBILITY OF ANY SUCH LOSS AND REGARDLESS OF THE COURSE OF DEALING WHICH DEVELOPS OR HAS DEVELOPED BETWEEN YOU AND TRIMBLE. BECAUSE SOME STATES AND JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY OR FULLY APPLY TO YOU.
PLEASE NOTE: THE ABOVE TRIMBLE LIMITED WARRANTY PROVISIONS WILL NOT APPLY TO PRODUCTS PURCHASED IN THOSE JURISDICTIONS (E.G., MEMBER STATES OF THE EUROPEAN ECONOMIC AREA) IN WHICH PRODUCT WARRANTIES ARE THE RESPONSIBILITY OF THE LOCAL DEALER FROM WHOM THE PRODUCTS ARE ACQUIRED. IN SUCH A CASE, PLEASE CONTACT YOUR TRIMBLE DEALER FOR APPLICABLE WARRANTY INFORMATION.

Official Language

THE OFFICIAL LANGUAGE OF THESE TERMS AND CONDITIONS IS ENGLISH. IN THE EVENT OF A CONFLICT BETWEEN ENGLISH AND OTHER LANGUAGE VERSIONS, THE ENGLISH LANGUAGE SHALL CONTROL.

Registration

To receive information regarding updates and new products, please contact your local dealer or visit the Trimble website at www.trimble.com/register. Upon registration you may select the newsletter, upgrade, or new product information you desire.

Notices

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.
Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. TRIMBLE is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.
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.
Responsible Party:
Trimble Navigation
935 Stewart Drive
Sunnyvale CA 94085
Telephone: 1-408 481 8000

Canada

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
This apparatus complies with Canadian RSS-GEN, RSS-310, RSS-210, and RSS-119.
Cet appareil est conforme à la norme CNR-GEN, CNR-310, CNR-210, et CNR-119 du Canada.
Australia and New Zealand Class A Statement
Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Australia and New Zealand

This product conforms with the regulatory requirements of the Australian Communications Authority (ACA) EMC framework, thus satisfying the requirements for C-Tick Marking and sale within Australia and New Zealand.

Notice to Our European Union Customers

For product recycling instructions and more information, please go to www.trimble.com/ev.shtml.
Recycling in Europe: To recycle Trimble WEEE (Waste Electrical and Electronic Equipment, products that run on electrical power.), Call +31 497 53 24 30, and ask for the "WEEE Associate". Or, mail a request for recycling instructions to:
Trimble Europe BV
c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL

CE Declaration of Conformity

Hereby, Trimble Navigation, declares that the GPS receivers are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Australia and New Zealand

This product conforms with the regulatory requirements of the Australian Communications and Media Authority (ACMA) EMC framework, thus satisfying the requirements for C-Tick Marking and sale within Australia and New Zealand.

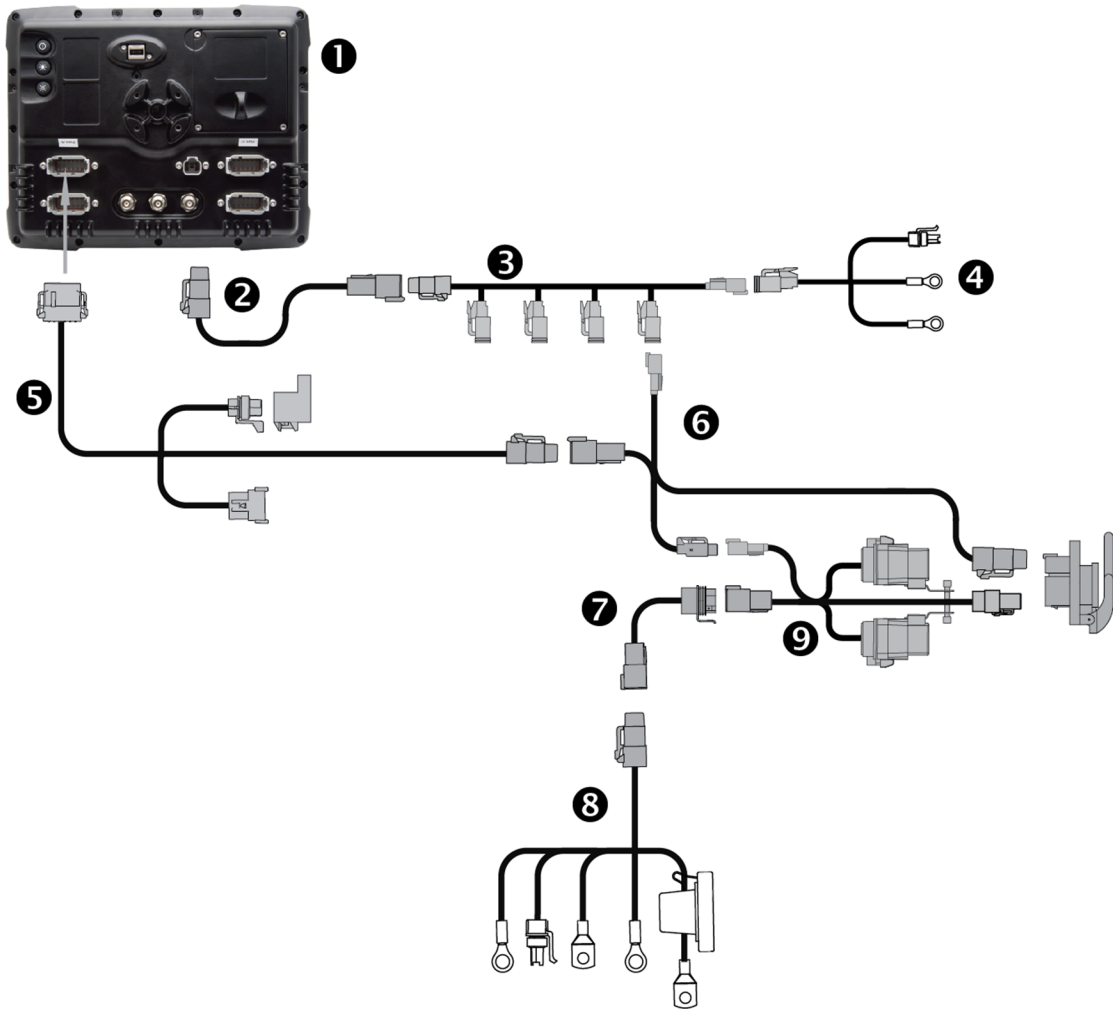
Contents

Introduction

This document describes how to install and configure the ISOBUS Virtual Terminal and Task Controller on the Trimble® FmX® integrated display.

Installation

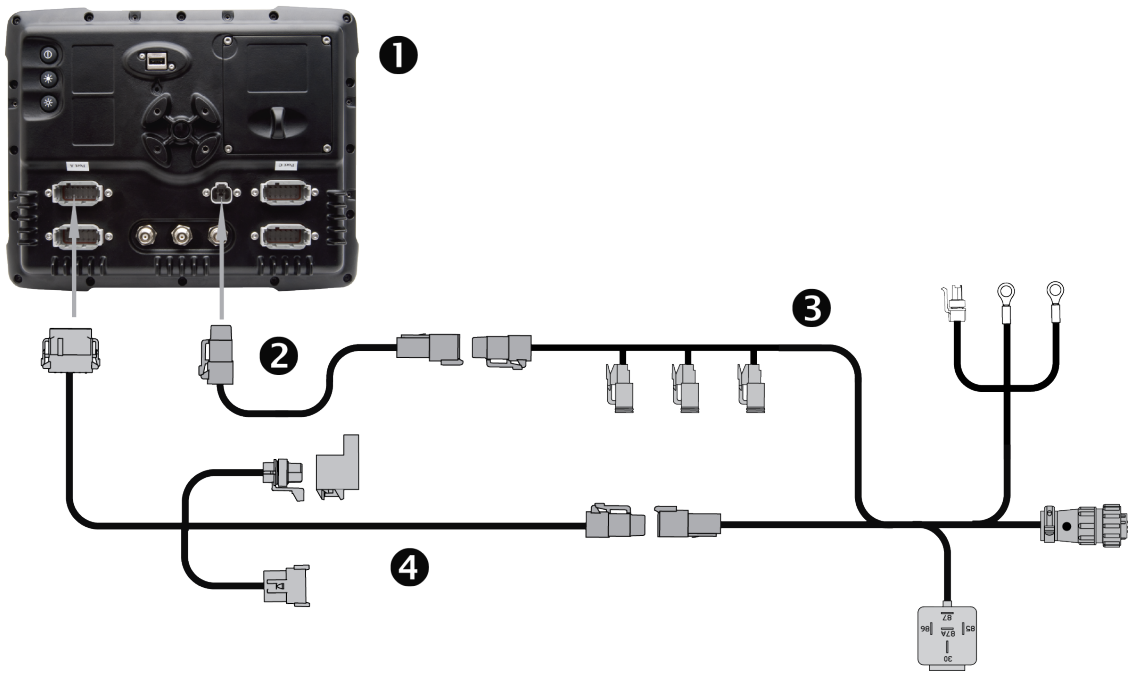
Cabling: Full harness



Item	Description	Trimble part number
1	FmX integrated display	93100-xx
2	FmX power cable	66694
3	Power bus	67259**
4	Basic power cable	67258
5	FmX integrated display to ISOBUS cable	75834*
6	Cable assembly, CAN cab-to-hitch connection	77368*
7	Cable assembly, IBRC to DTP adapter (Powell connector)	77413*
8	Cable assembly, power-to-hitch connector	76941*
9	Cable assembly, dual relay power cutoff	77533**

** Included in ISOBUS harness kit, P/N 89285-00.*
*** Optional - recommended to cut power to implement when display is off and to cycle power when restarting the display.*

Cabling: In-Cab



Item	Description	Trimble part number
1	FmX integrated display	93100-xx
2	FmX power cable	66694
3	ISOBUS In-Cab cable	92752*
4	FmX integrated display to ISOBUS In-Cab cable	75407

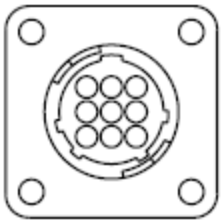
**Included in ISOBUS harness kit, P/N 89285-02.*

Additional cables and adapters

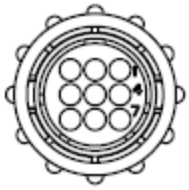
Part number	Description	What it does	Notes
97256	In-Cab Y Adapter	Turns one In-Cab port into two.	Use the In-Cab Y Adapter when an additional In-Cab connector is required.
97260	In-Cab Adapter	When joined to the ISOBUS Full Harness (P/N 89285-00), the	Typically,the In-Cab Adapter is placed between the display cable (P/N 75834) and CAN cab-to-hitch (P/N 77368) and then powered by the power bus (P/N 67259).

Part number	Description	What it does	Notes
		In-Cab Adapter adds an In-Cab port to the CANBUS.	***Note:*** *The power bus must be purchased separately as it is not included in the Full Harness kit.*
97362	DTM to DT Adapter	Converts DT connectors to DTM connectors.	Often used with the In-Cab Adapter (P/N 97260) and the ISOBUS In-Cab Harness (89285-02) to add an In-Cab port to a tractor that is ISO-compatible but does not have an In-Cab port.

In-Cab port



In-Cab connector



Installing the ISOBUS system

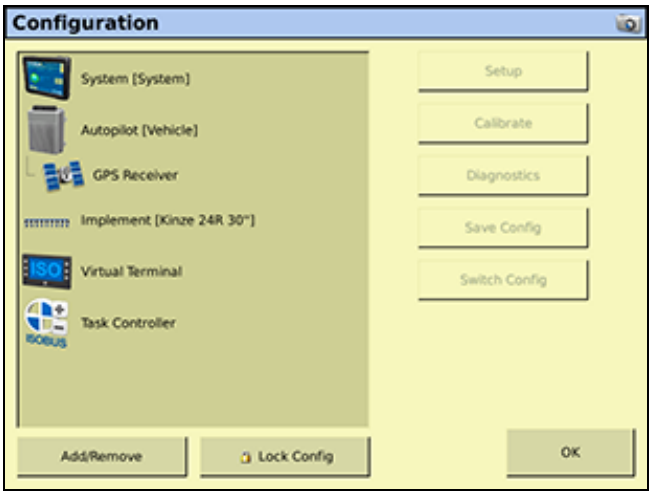
1. Connect the CAN bus to the display.
2. Activate the plugin(s). Refer to the *FmX Integrated Display User Guide*, page 8-4.
   - To use the Virtual Terminal, activate the Virtual Terminal plugin.
   - To use the Task Controller:
     a. Unlock the Task Controller plugin by providing the password (Trimble P/N 89284).
     b. Activate the Task Controller plugin.
     c. Activate the Virtual Terminal plugin (required for initial configuration of the Task Controller).
3. Set up the Virtual Terminal and/or Task Controller. See Configuration, page 11.
4. Set the GPS Speed Output (if applicable). See Setting up the GPS Speed Output on the display, page 12.
5. Configure the specific Virtual Terminal. See Setting up equipment, page 13.

Note – *The ISO Virtual Terminal feature typically interfaces with ISO compliant equipment. The FmX integrated display supports the Task Controller for the equipment listed in Setting up equipment, page 13*

Configuration

Setting up the Virtual Terminal interface

1. On the *Home* screen, tap  .
2. Select *Virtual Terminal*:

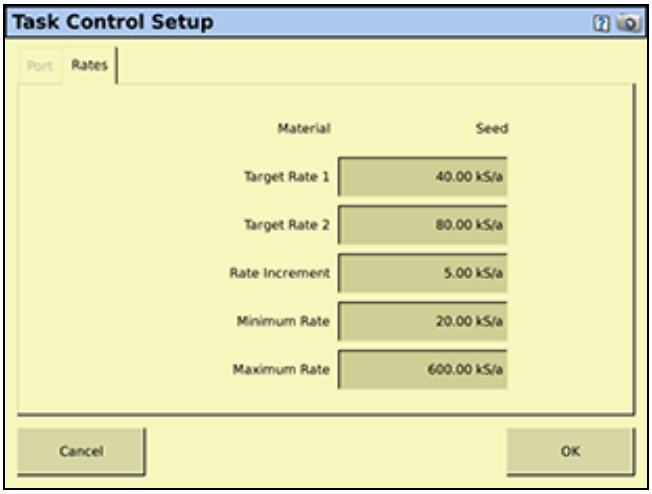


3. Tap **Setup**.
4. Select the *Port* the CAN bus is plugged into.
5. Tap **OK** twice to return to the *Home* screen.

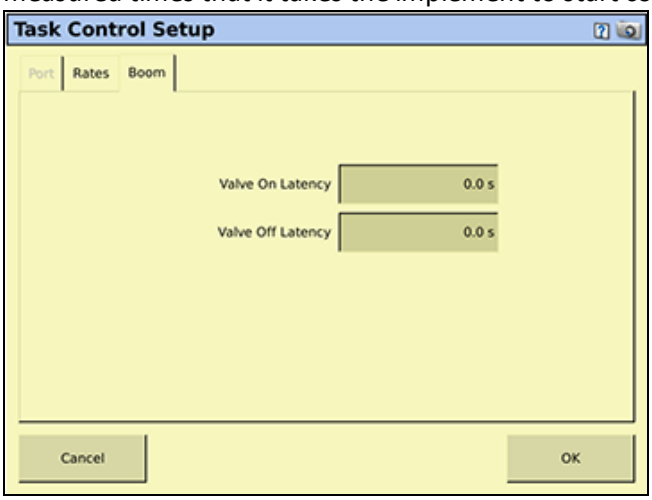
Setting up the Task Controller

1. Make sure that you have connected the CAN bus to the FmX integrated display, unlocked the ISOBUS Task Controller functionality, and activated the Task Controller plugin.
2. On the *Home* screen, tap  .
3. Select *Task Controller* and then tap **Setup**.

4. In the *Rates* tab, enter the required information in all fields (*Target Rate 1, Target Rate 2, Rate Increment, Minimum Rate and Maximum Rate*):



5. On the *Boom* tab, enter the *Valve On Latency* and *Valve Off Latency*. These values are the measured times that it takes the implement to start coverage once the command is given:



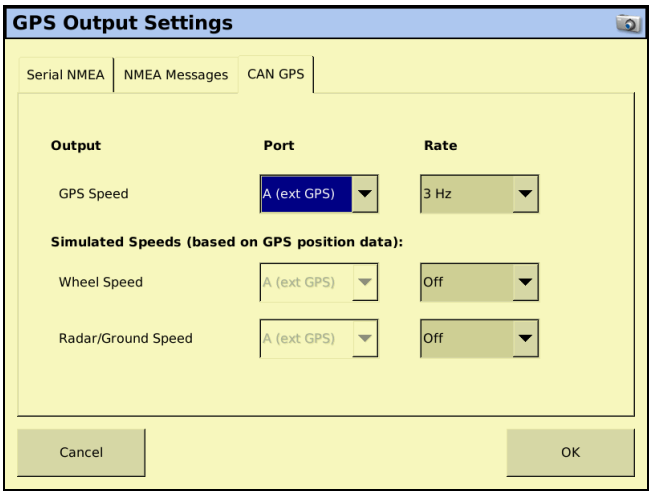
6. Tap **OK** twice to return to the *Home* screen.

Setting up the GPS Speed Output on the display

Turn on the GPS Speed Output for any equipment that accepts an external GPS speed for either Virtual Terminal or Task Controller.

1. On the *Home* screen, tap  .
2. Select *GPS Receiver* and then tap **Setup.**
3. On the *Settings* tab, tap **GPS Output.**

4. On the *CAN GPS* tab, set the *Message Rate* to 5 Hz and the *Output Port* to the port where the CAN bus is attached:



5. Tap **OK** three times to return to the *Home* screen.

   Note – *Some implement ECUs are not accepting the GPS speed. Wheel Speed and Radar/Ground Speed should only be turned on as specified in the Setting up equipment sections below.*

Setting up equipment

Setting up equipment - general instructions

To set up any equipment:

1. On the *Home* screen, tap  .
2. Select *Virtual Terminal* and then tap **Diagnostics**.
3. Follow the instructions specific to the equipment model that you are using (see below).
4. Once complete, tap **Close** to exit the *Virtual Terminal* and then tap **OK** to return to the *Home* screen.

Manufacturer	Type	Models	Firmware Version	See ...
Hardi	Sprayer	Saritor Alpha Evo Presidio	ISO JobCom 2.48 ISO Bridge 2.01R0017	Setting up Hardi self-propelled sprayers, page 15
Horsch	Planter	Maestro	9.64	Setting up Horsch

Manufacturer	Type	Models	Firmware Version	See ...
		(all models)		Maestro planter and Pronto and Sprint drills, page 16
	Seed	Pronto (all models) Sprinter (all models)		
John Deere	Planter	1700 series		Setting up John Deere 1700 series planters, page 16
	Seeder	1990		Setting up John Deere 1990 seeders, page 17
Kinze	Planter	3110, 3140, 3200, 3500, 3600, 3660, 3700, 3800	2.0	Setting up Kinze 3000 series planters, page 19
	Planter	4900	1.5	Setting up Kinze 4900 planter, page 21
Kuhn	Seed Drill	Moduliner (HR 6004 ML)	2012-08-31	Setting up Kuhn Moduliner (HR 6004 ML) seed drills, page 21
	Spreader	AXIS-H-EMC (40.1 and 50.1)	2.06	Setting up Rauch and Kuhn AXIS-H-EMC (30.1, 40.1, and 50.1) spreaders, page 24
	Spreader	AXIS-W (40.1 and 50.1)	2.01	Setting up Rauch and Kuhn AXIS-W (40.1 & 50.1) spreaders, page 26
Kverneland	Spreader	Exacta TL GEOspread	0.07	Setting up Kverneland Accord or Vicon GEOspread disc spreaders, page 18
	Drill	Accord Optima Precision Drill	1.06	Setting up Kverneland Monopill SE and Accord Optima Precision drills, page 22

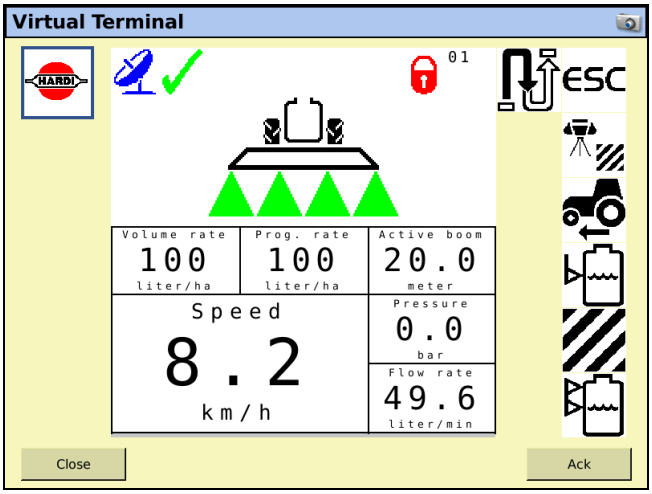
Manufacturer	Type	Models	Firmware Version	See ...
	Drill	Monopill SE	1.06	Setting up Kverneland Monopill SE and Accord Optima Precision drills, page 22
Rauch	Spreader	AXIS-H-EMC (40.1 and 50.1)	2.06	Setting up Rauch and Kuhn AXIS-H-EMC (30.1, 40.1, and 50.1) spreaders, page 24
	Spreader	AXIS-W (40.1 and 50.1)	2.01	Setting up Rauch and Kuhn AXIS-W (40.1 & 50.1) spreaders, page 26
Vicon	Spreader	RO-EDW GEOspread	1.07	Setting up Kverneland Accord or Vicon GEOspread disc spreaders, page 18

Setting up Hardi self-propelled sprayers

Note – *The vehicle's speed is automatically detected.*

1. In the *Virtual Terminal* screen, tap Setup and then VRA/Remote Control (2.3.2). Set the VRA / Remote control to enable. A blue satellite icon will appear in the top left of the main *Virtual Terminal* screen.
2. Before beginning the application, verify that there is a green checkmark next to the satellite icon.
3. Press the On/Off button on the joystick to start spraying, and allow the display to be the task

controller .

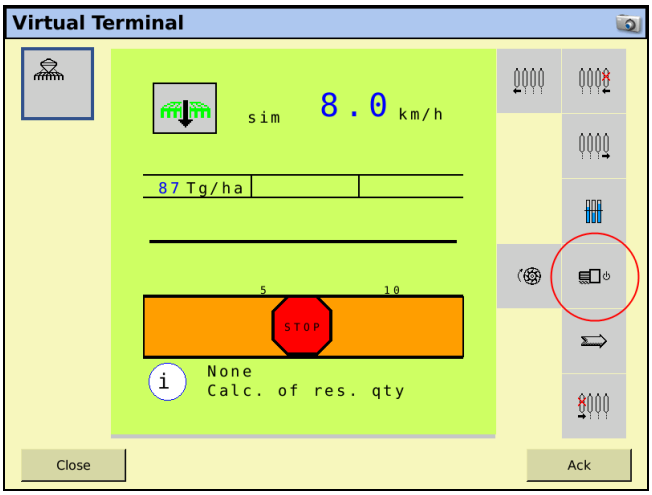


Note – *Only Hardi cabling can be used to connect the display for ISOBUS application. For new equipment, request the ISOBUS-ready configuration. For existing equipment, contact a Hardi Reseller for a retrofit.*

Setting up Horsch Maestro planter and Pronto and Sprint drills

Note – *The vehicle's speed is automatically detected and the Task Controller defaulted to on.*

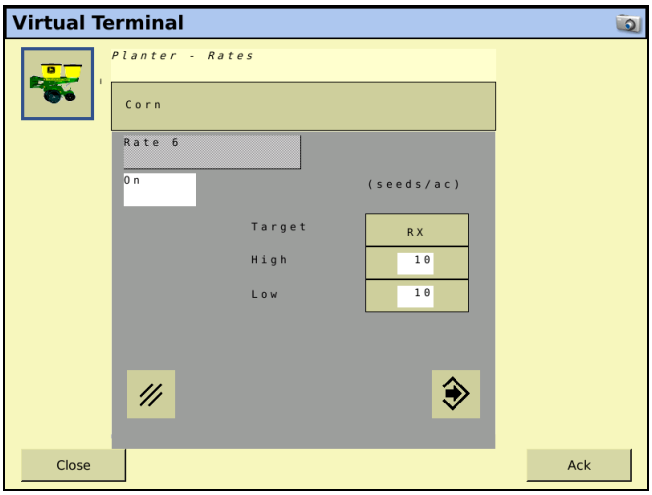
1. When you are ready to start planting, access the *Run* screen on the display, and tap Section Control Off and then tap Section Control On.
2. Return to the *Virtual Terminal* and then tap the metering unit power button icon.



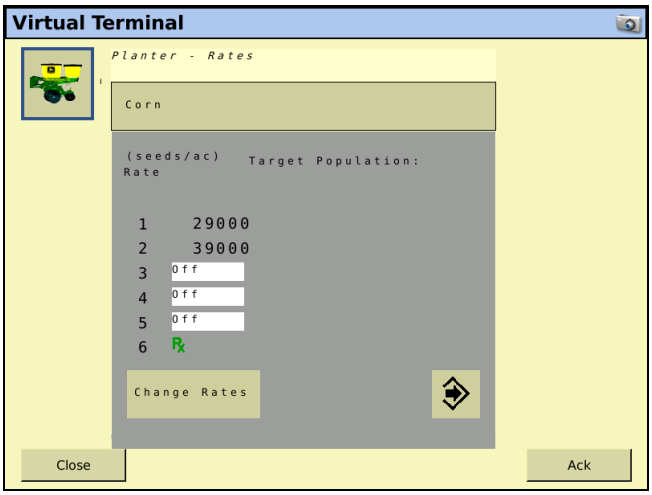
Setting up John Deere 1700 series planters

The John Deere 1700 Series planter does not accept GPS speed according to ISO 11783. It is thereby necessary to have a TECU (ISOBUS compatible tractor) on the ISOBUS. Operation has only been verified with a John Deere R-Series tractor that is using the ISOBUS In-Cab cable (P/N 89285-02).

1. Make sure that the Task Controller plugin on the display is operating. This allows Rate 6 to appear as a prescription rate.
2. To allow for rate control, enable and setup Rate 6.



3. Select the Rx option for the target rate.



Note – *For section control, you must have John Deere Row Command.*

Note – *With John Deere implements, you can only use one Virtual Terminal. You can either remove the Virtual Terminal plug-in on the display or you can turn off the Virtual Terminal on the tractor display.*

Setting up John Deere 1990 seeders

If using the full ISOBUS harness, without an ISOBUS tractor, configure the speed settings in the display. In the *GPS Output Settings* screen, set the signal rate for both the Wheel Speed and Radar/Ground Speed and make sure to select the port with the ISOBUS cable.

If using an ISOBUS tractor (TECU) with the In-Cab cable (P/N 89285-02), ***do not*** set any signal rates in the GPS Output section.

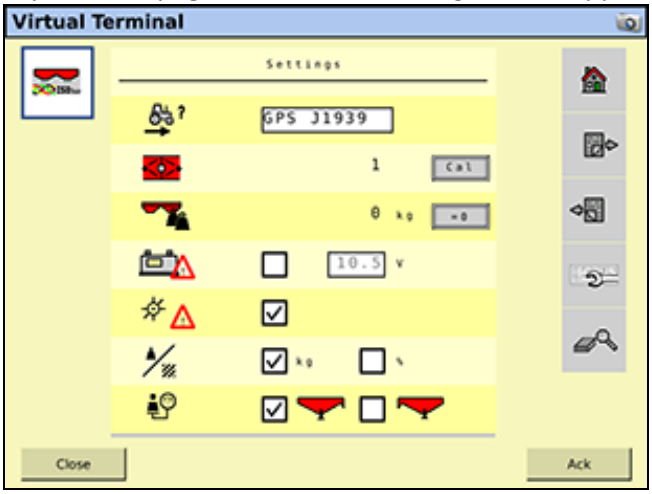
Note – *Occasionally when going between screens of the display, the speed signal is lost and this triggers an alarm. This is intermittent and no known fix is known.*

Note – *With John Deere implements, you can only use one Virtual Terminal. You can either remove the Virtual Terminal Plug-in on the display or you can turn off the Virtual Terminal on the tractor display.*

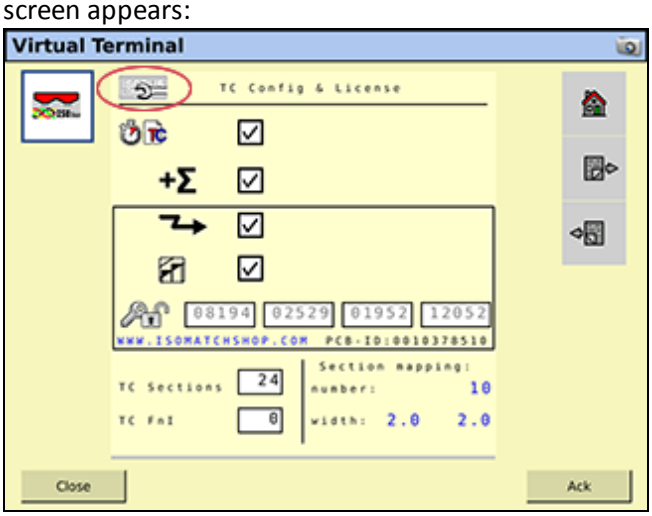
Note – *Tests using a prescription map on the display were inconclusive and therefore unsupported.*

Setting up Kverneland Accord or Vicon GEOspread disc spreaders

1. In the *Virtual Terminal* screen, tap the wrench icon to access the *Settings* menu.
2. Tap the next page icon until the *Settings* screen appears that shows GPS speed:

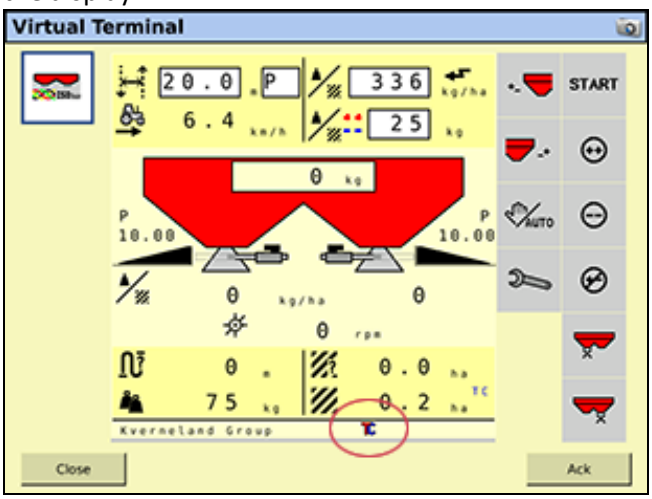


3. In the speed field, select *GPS J1939*.
4. Tap the ISOBUS wrench icon and then tap the next page icon until the *TC Config & License* screen appears:



5. Select the check boxes next to the Task Controller, Memory Cache, External Rate, and Section Control icons.

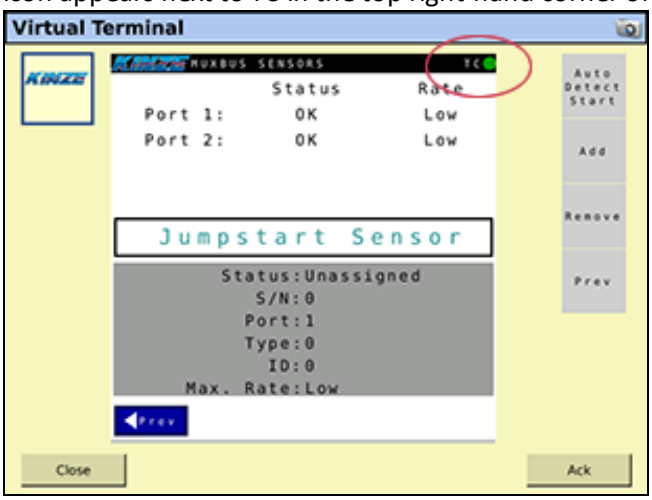
6. Set *TC Fnl* value to 0.
7. Tap the Home icon to return to the main screen.
8. Make sure that the Task Controller is recognized. If it is a *TC* icon appears near the bottom of the display:



9. If you are ready to start spreading, tap **Start**.
10. Once the equipment setup is complete, close the *Virtual Terminal* and return to the *Home* screen.

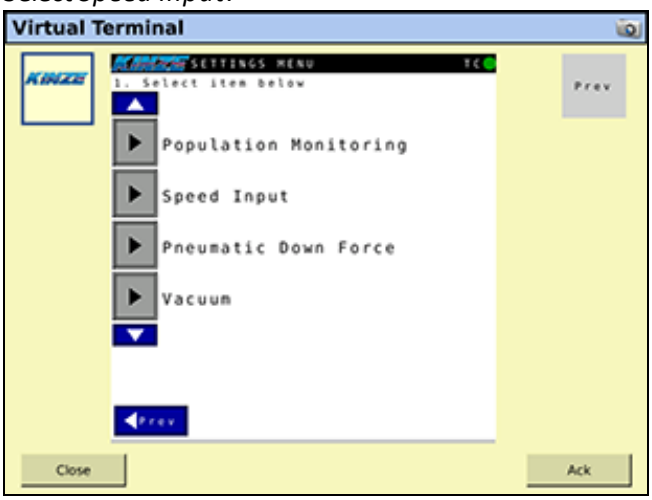
Setting up Kinze 3000 series planters

1. In the *Virtual Terminal* screen, make sure that the Task Controller is recognized. If it is, a green icon appears next to *TC* in the top right-hand corner of the screen:

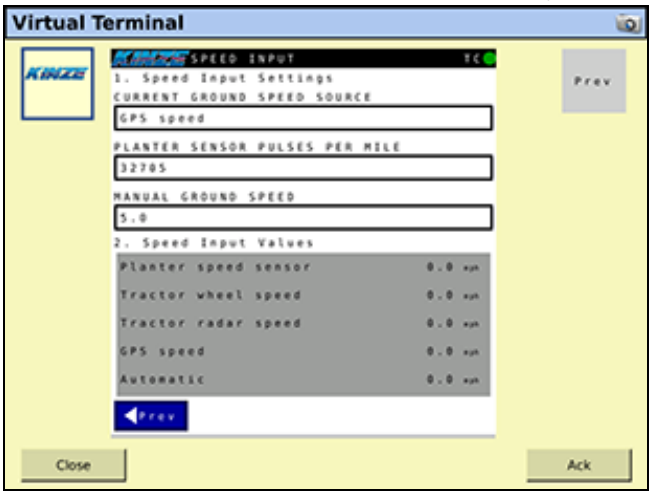


2. Press **Prev** to access the *Settings Menu* screen.

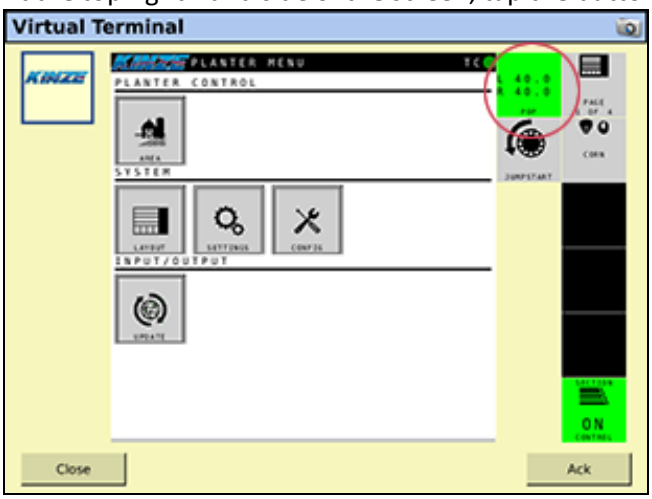
3. Select *Speed Input*:



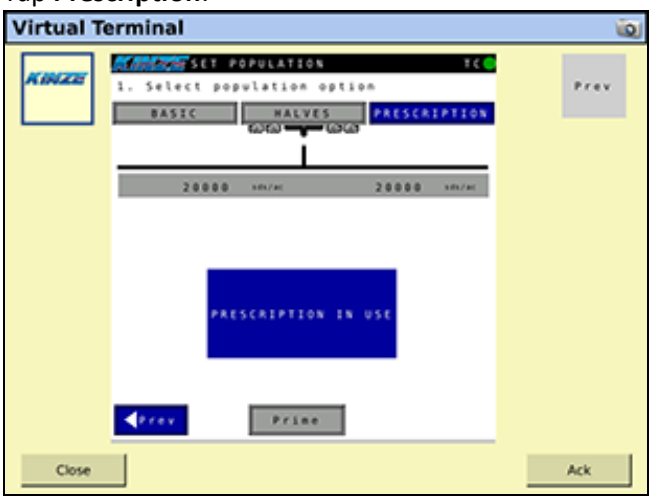
4. In the *CURRENT GROUND SPEED SOURCE* field, select *GPS Speed:*



5. To return to the main screen, tap **Prev** twice.
6. At the top right-hand side of the screen, tap the button displaying rates and the word *POP:*



7. Tap **Prescription**:



8. Once the equipment setup is complete, close the *Virtual Terminal* and return to the *Home* screen.

Setting up Kinze 4900 planter

1. From the *Virtual Terminal* screen go to *System Settings > Speed* and then select Automatic Speed Selection as the Ground Speed Source on the *Speed Input* screen. If you aren't getting speed, try selecting Tractor GPS Speed.
2. Press Population, and on the *Population* screen, select Rx for the Population Option. Task Controller is run as a prescription.
3. Verify that in *System Settings > Task Controller*, the Task Controller Client is Enabled. This is detected automatically and should not need to be changed.

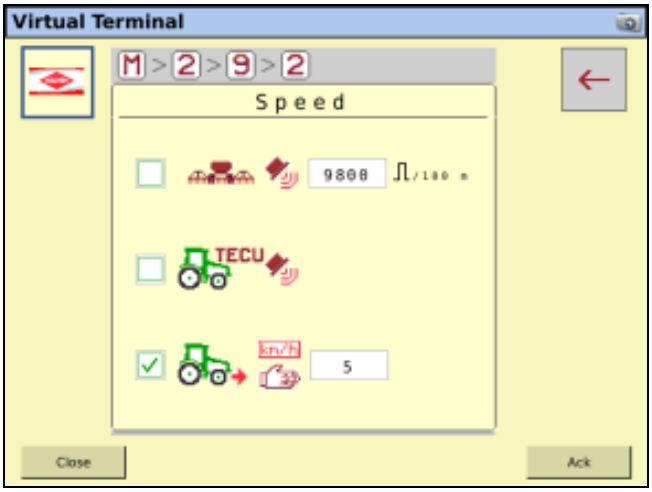
Note – *If multiple materials are being used, the Task Controller will only control the rate for the seed application. Section control will turn off both materials together and coverage will be mapped based on this control.*

Note – *The alternator on the Kinze planter must be running to allow Task Controller.*

Setting up Kuhn Moduliner (HR 6004 ML) seed drills

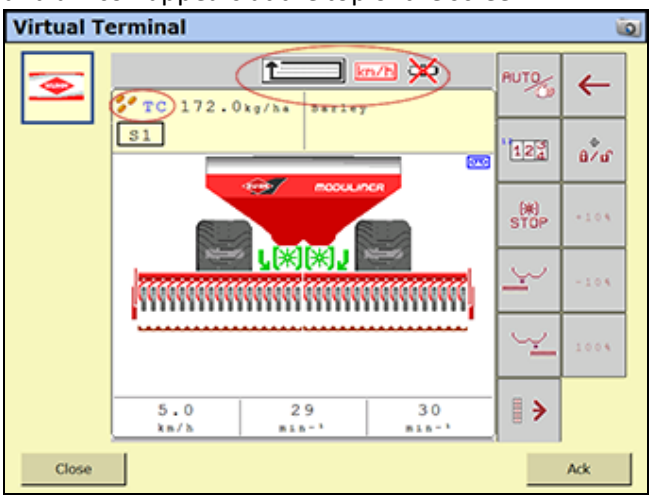
1. In the *Virtual Terminal* screen, tap the menu icon to access the *Machine* menu.
2. Tap the wrench icon to access the *Adjustments* menu.
3. Select the *Other Adjustments* menu.
4. Select the *Speed* menu that shows GPS speed.
5. Select the check box for manual speed and enter the speed that you will drive or select your

preferred speed source:



Note – *Kuhn Moduliner (HR 6004 ML) seed drills do not read GPS speed through the ISOBUS connection. It is important that you set your manual speed and then drive to that speed.*

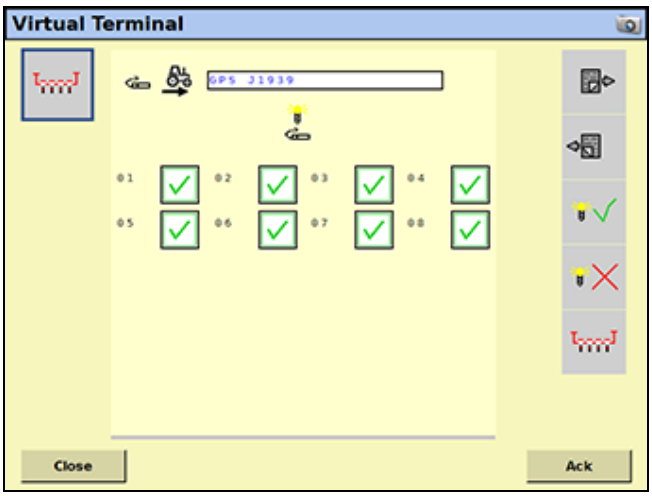
6. Tap the Back arrow to return to the main *Virtual Terminal* screen.
7. Make sure that the Task Controller is recognized. If it is, the letters *TC* appear before the rate and an icon appears at the top of the screen:



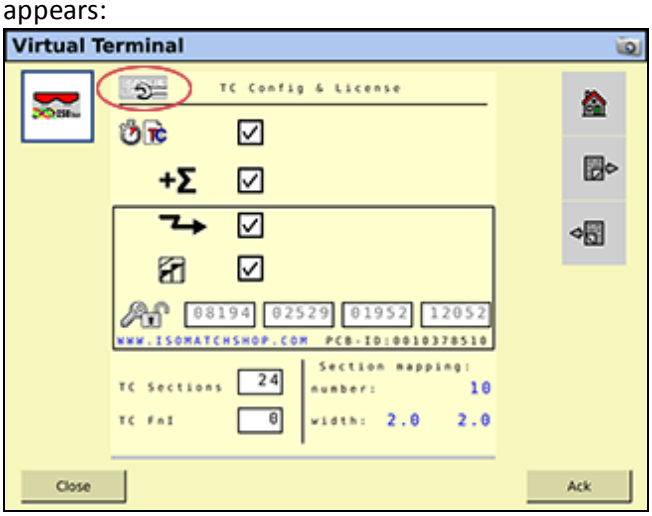
8. If you are ready to plant, tap the **AUTO** button.
9. Once the equipment setup is complete, close the *Virtual Terminal* and return to the *Home* screen.

Setting up Kverneland Monopill SE and Accord Optima Precision drills

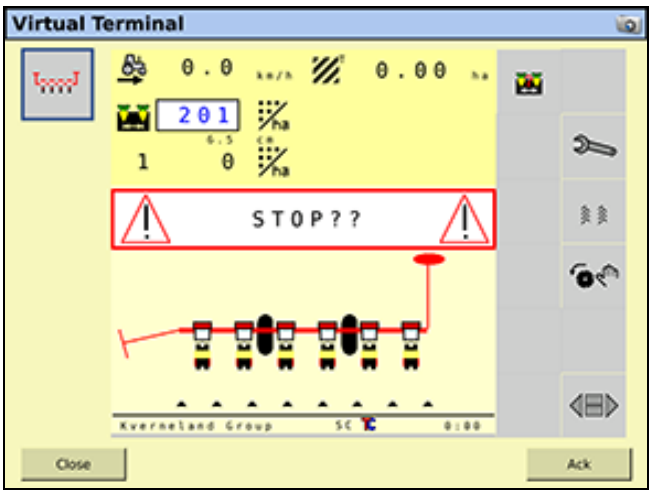
1. In the *Virtual Terminal* screen, tap the wrench icon to access the *Settings* menu.
2. Tap the next page icon until the page appears that shows the GPS speed:



3. In the speed field, select *GPS J1939*.
4. Tap the ISOBUS wrench icon and then tap the next page icon until the *TC Config & License* page appears:



5. Select the check boxes next to the Task Controller, Memory Cache, External Rate, and Section Control icons.
6. Set the *TC Fnl* value to 0.
7. Tap the drill icon to return to the main screen.
8. Make sure that the Task Controller is recognized. If it is, a *TC* icon appears near the bottom of the screen:

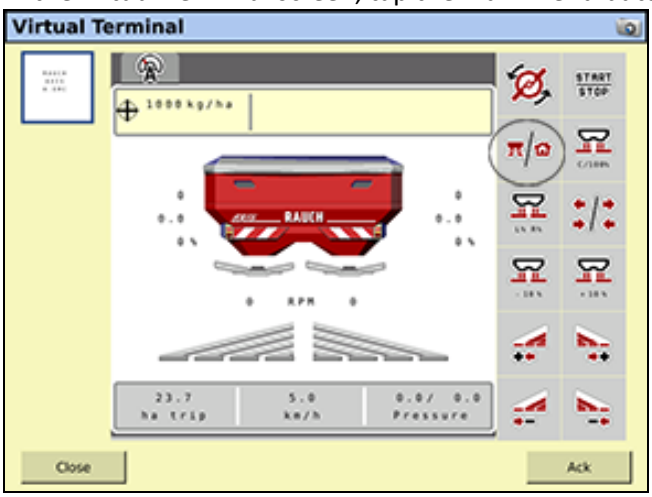


Note – *Only metric units calculate correctly.* ***Do not*** *select English/Imperial units during equipment setup.*

9. Once the equipment setup is complete, close the *Virtual Terminal* and return to the *Home* screen.

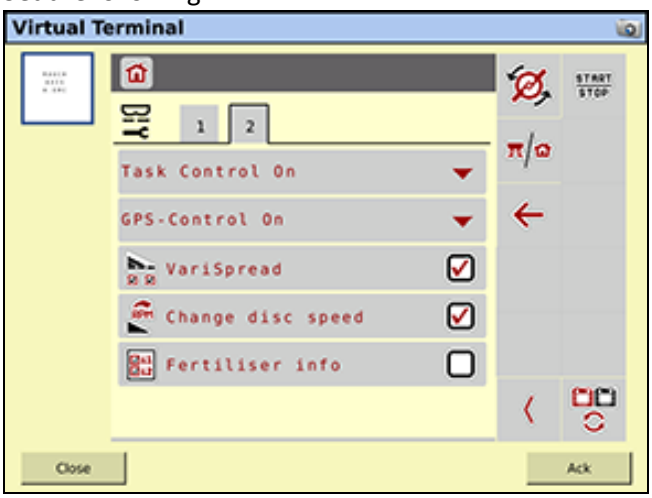
Setting up Rauch and Kuhn AXIS-H-EMC (30.1, 40.1, and 50.1) spreaders

1. In the *Virtual Terminal* screen, tap the main menu button:



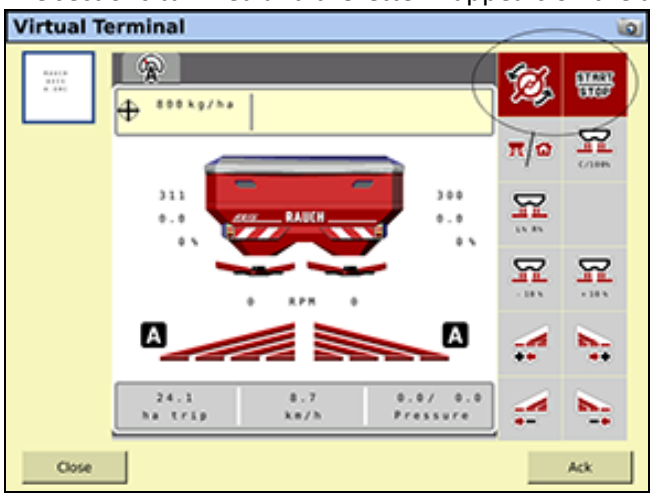
2. Navigate to the second page of the main menu.

3. Set the following:



   a. *Task Control*: On
   b. *GPS Control*: On
   c. *VariSpread*: Selected
   d. *Change Disc Speed*: Selected

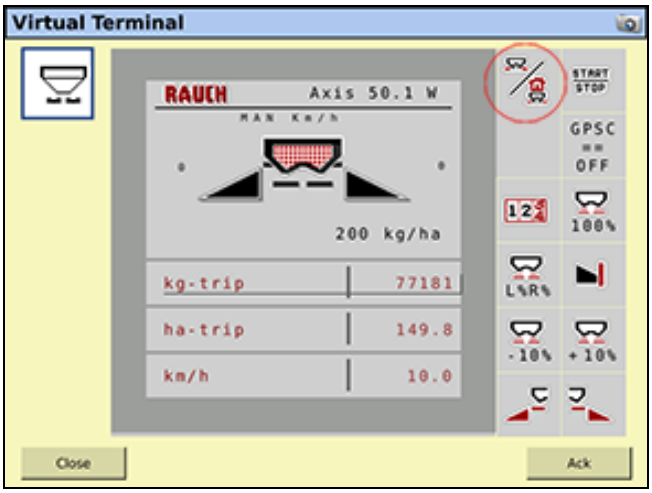
4. Tap the main menu button to return to the operating screen.
5. Once you are ready to start spreading, do the following:
   a. Tap the disc button to activate the disks.
   b. Tap the **Start/Stop** button to allow the display to start section control using Task Controller.
   The sections turn red and the letter *A* appears on the display.



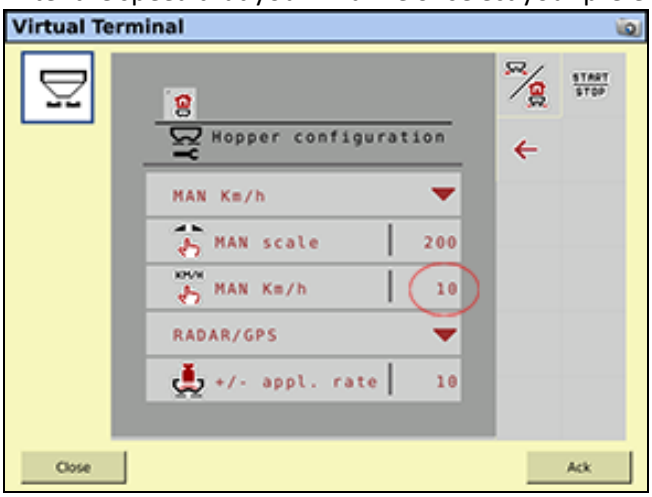
6. Once the equipment setup is complete, close the *Virtual Terminal* and return to the *Home* screen.

Setting up Rauch and Kuhn AXIS-W (40.1 & 50.1) spreaders

1. In the *Virtual Terminal* screen, tap the main menu button:

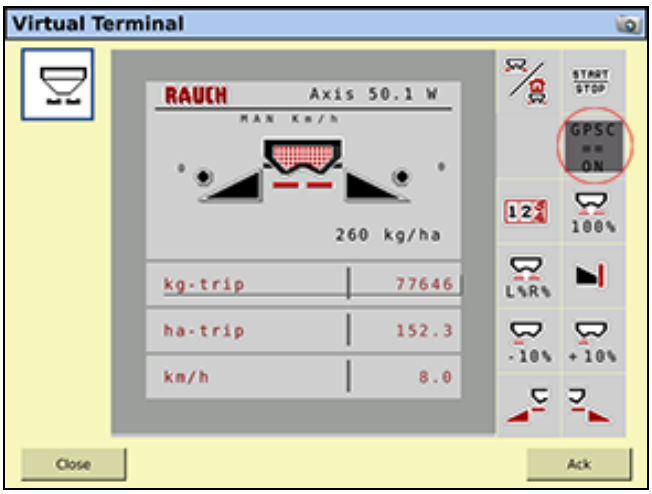


2. Select *Hopper Configuration*.
3. Enter the speed that you will drive or select your preferred speed source:



Note – *Rauch/Kuhn AXIS-W models do not read GPS speed through the ISOBUS connection. You must set your manual speed and then drive to that speed.*

4. Tap the main menu button to return to the operating screen.
5. Tap the **GPSC** button till it shows **GPSC ==ON**. This allows the display to act as the Task Controller. The black dots and red lines indicate that task controller is ready:



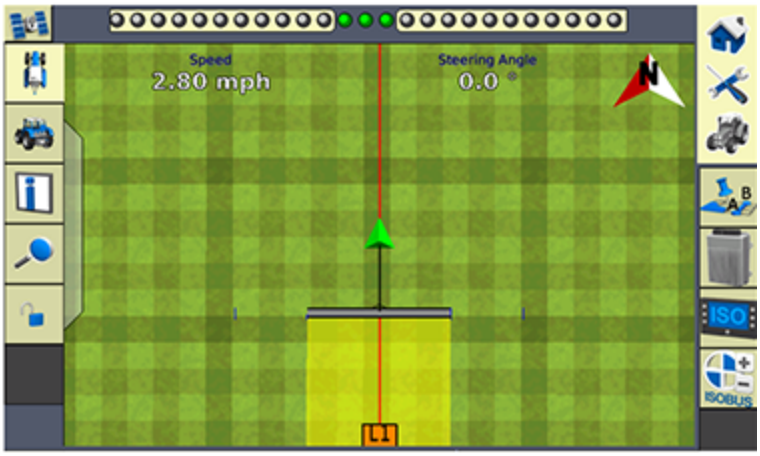
6. If you are ready to start spreading, tap the **START/STOP** button to engage the disks.
7. Once the equipment setup is complete, close the *Virtual Terminal* and return to the *Home* screen.

Note – *On Rauch and Kuhn AXIS-W spreaders, manually adjusting percent rates in the Virtual Terminal screen will not change the target rate on the Run screen. Also, if you adjust the target rate on the Run screen, the total rate will be updated in the Virtual Terminal, but the spreader will still use any manual percent rate adjustments. For example, if on the Virtual Terminal you set +10% and you then set a target rate of 100 kg/ha on the Task Controller, the applied rate will be 110 kg/ha.*

Features of the ISOBUS Run screen

When you activate the ISOBUS plugins, the display adds the following ISOBUS icons to the Run screen:

- Virtual Terminal: 
- Task Controller: 



Virtual Terminal

Tap  to open the Virtual Terminal.

Virtual Terminal screens and functions vary by platform. Refer to the equipment manufacturer's operating instructions for further information.

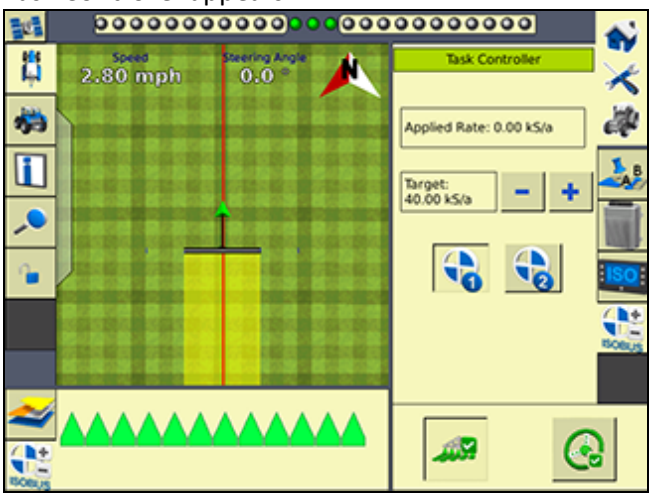
Task Controller

Note – *Some equipment models require you to tap buttons in the Virtual Terminal before starting section and rate control using Task Controller. This includes the following:*

- *Horsch Planters and Drills (metering unit power button icon)*
- *Kuhn Moduliner Seed Drill (***Auto***)*
- *Kverneland Exacta TL GEOspread (***Start***)*
- *Rauch/Kuhn AXIS-H-EMC (***Start***)*
- *Rauch/Kuhn AXIS-W (***Start***)*
- *Vicon RO-EDW GEOspread (***Start***)*

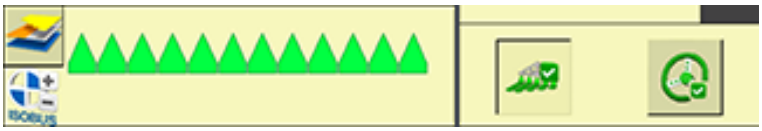
To use the Task Controller:

1. On the right-hand side of the screen, tap  to access the ISOBUS controls. The expanded Task Controller appears:



2. Tap  to start coverage and logging.

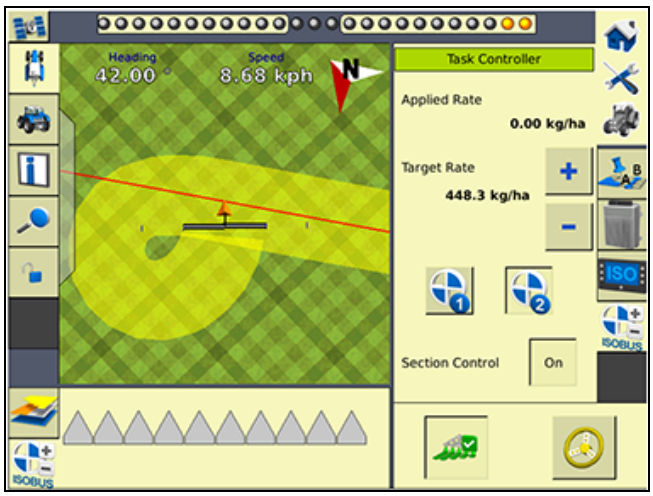
3. Tap  at the bottom left-hand side of the screen to see the current section control:



4. Tap  to toggle between Target Rate 1 and 2.

5. Tap the **+/-** buttons to adjust the rate (as set when you set up the Task Controller).

6. Tap the Section Control button to turn section control on and off on the display.
    - When section control is **off**, use the Virtual Terminal only for section control.
    - When section control is **on**, sections will automatically turn off to limit multiple pass coverage:



Troubleshooting and Error Messages

General information

ISOBUS measurements are stored and communicated in the metric system. When Imperial/English units are selected the measurement is converted. This can cause small errors in the measurements.

Virtual Terminal alarms

When alarms are triggered that are turned on in the Virtual Terminal, a pop-up message appears on the display. For the Kverneland GEOspread disc spreader, the display will instead sound repetitive beeps.

To review the alarm message, tap the 

icon on the Run screen.

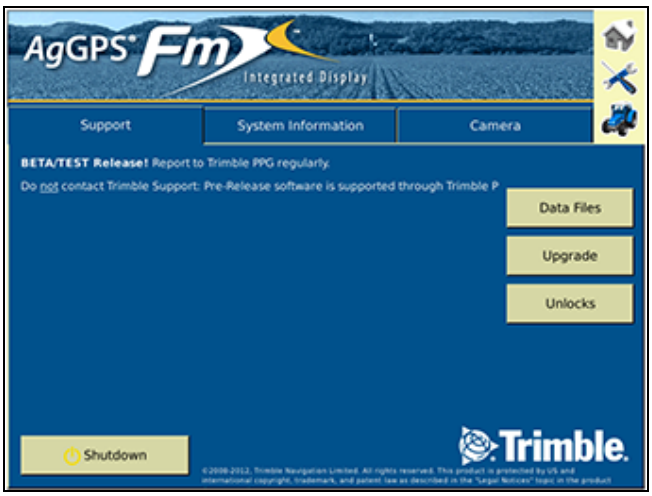
Interrupted communications

If the display loses communication with the implement electronic control unit (ECU), turn off and then turn on both the display and the implement ECU.

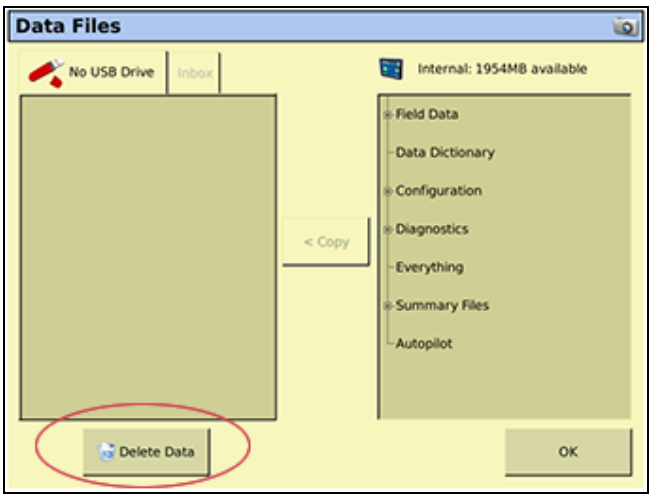
Deleting ISOBUS data from the display

Deleting all object data

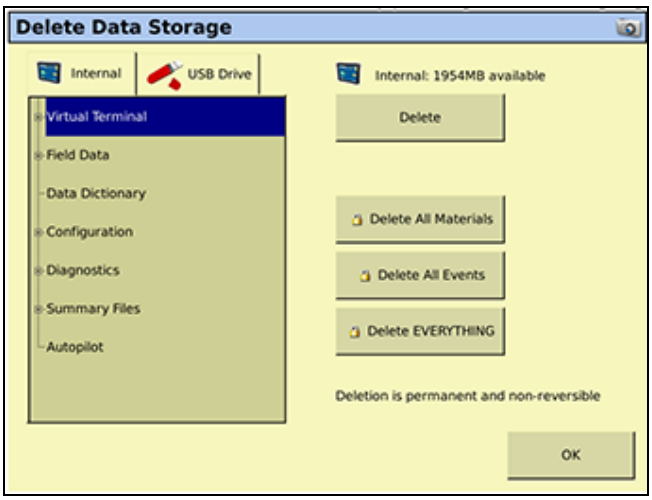
1. On the Home screen, tap **Data Files**:



2. A warning message appears. Tap **OK**.
3. Tap **Delete Data** at the bottom left of the screen:



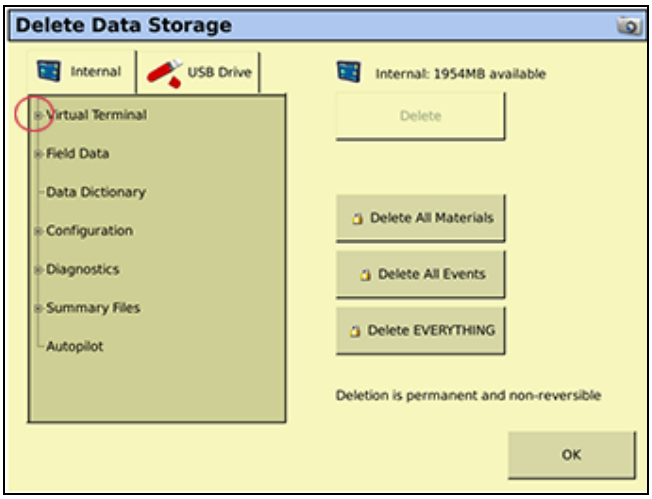
4. Tap the *Virtual Terminal* folder to select it and then tap **Delete**:



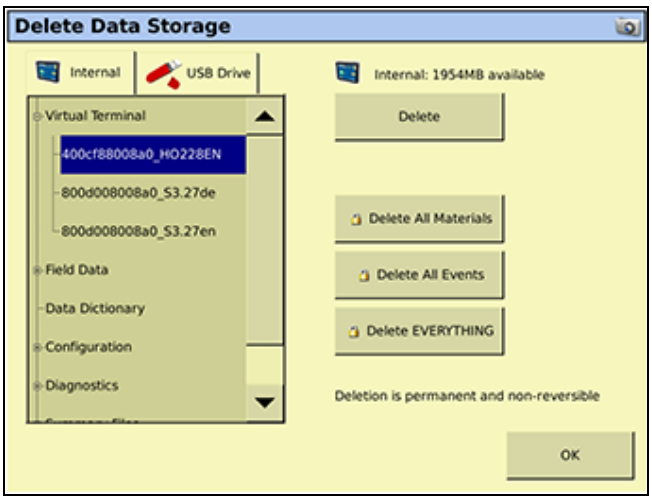
5. When the warning message appears, tap **Delete** again.
6. When you are finished, tap **OK**.

Deleting specific data items

1. Complete Step 1 through Step 3 in Deleting ISOBUS data from the display.
2. Tap the **+** next to the *Virtual Terminal* folder:



3. Select the name of the data item you want to delete from the list that appears and then tap **Delete**:



4. Tap **Yes** to accept the warning message.
5. Tap **OK.**