DCY

StarFire™ Mobile-RTK

OPERATOR'S MANUAL

StarFire™ Mobile-RTK

OMZ105941 ISSUE I0 (ENGLISH)

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

Additional Proposition 65 Warnings can be found in this manual.

John Deere Werke Zweibrücken
(This manual replaces OMZ105941 Issue G9)
European Edition
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OMZ105941

Introduction

Handling this Supplement

This document contains descriptions for operating the StarFire™ iTC and StarFire™ Mobile-RTK system.

All other information concerning the StarFire™ iTC is provided in its relevant Operator's Manual.

Pay special attention to the safety information. This is important for the safe operation of the vehicle.

IMPORTANT: To prevent operating errors and personal injuries, use this supplement together with the basic StarFire™ iTC and RTK Guidance Systems Operator's Manual.

NOTE: For further information, contact your approved John Deere Dealer.

OUCC002,000298A -19-07OCT08-1/1

Contents

Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Safety

Recognize Safety Information

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

T81389 —UN—07DEC88

DX,ALERT -19-29SEP98-1/1

Understand Signal Words

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

TS187 —19—30SEP88

DX,SIGNAL -19-03MAR93-1/1

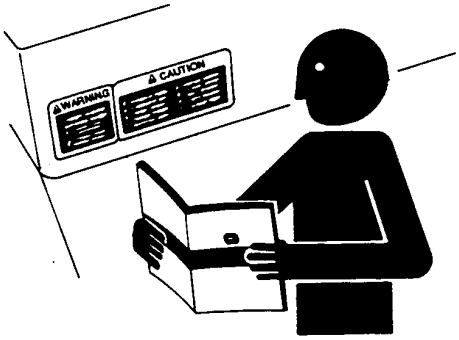
Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.



TS201 —UN—23AUG88

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.

DX,READ -19-16JUN09-1/1

Handle Electronic Components and Brackets Safely

Falling while installing or removing electronic components mounted on equipment can cause serious injury. Use a ladder or platform to easily reach each mounting location. Use sturdy and secure footholds and handholds. Do not install or remove components in wet or icy conditions.

If installing or servicing a RTK base station on a tower or other tall structure, use a certified climber.

If installing or servicing a global positioning receiver mast used on an implement, use proper lifting techniques and wear proper protective equipment. The mast is heavy and can be awkward to handle. Two people are required when mounting locations are not accessible from the ground or from a service platform.

TS249 —UN—23AUG88

DX,WW,RECEIVER -19-24AUG10-1/1

STARFIRE ITC softkey

The STARFIRE ITC - MAIN screen contains four tabs that differ depending on RTK system connected to the StarFire iTC receiver:

INFO tab

SETUP tab

ACTIVATIONS tab

SERIAL PORT tab

NOTE: Main screen is automatically arranged upon RTK system recognition.

PC8663 —UN—05AUG05

MENU button

STARFIRE ITC button

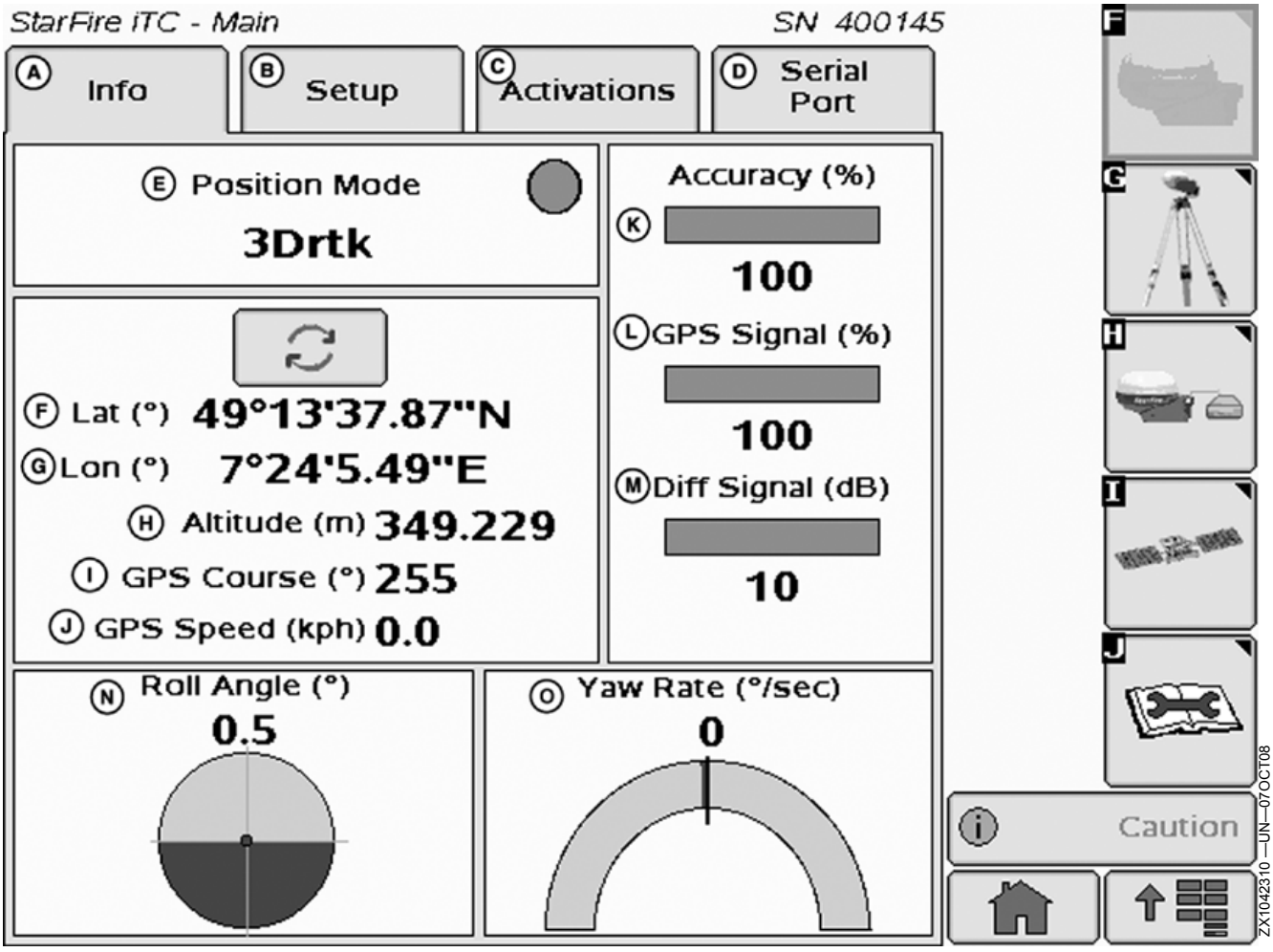
ZX1042314 —UN—07OCT08

PC8680 —UN—05AUG05

STARFIRE ITC softkey

OUCC002,0002935 -19-07OCT08-1/1

INFO tab—Mobile-RTK



StarFire iTC - Main—Info Tab—M-RTK

A—Info tab
B—Setup tab
C—Activations tab
D—Serial Port tab
E—Position Mode
F—Latitude
G—Longitude
H—Altitude
I— GPS Course
J— GPS Speed
K—Accuracy
L— GPS Signal
M—Differential Signal
N—Roll Angle
O—Yaw Rate

The INFO tab shows information and status of incoming GPS and differential correction signals. No information on this screen can be changed. It is for viewing only:

- (E) **Position Mode:** Indicates whether receiver is calculating a 3D position, 2D position, or no position (No Nav). It also shows status of differential signal: SF1 (StarFire 1 differential), SF2 (StarFire 2 differential).
- (F) Displays vehicle location latitude coordinates with respect to Equator (North or South).
- (G) **Lon:** Displays vehicle location longitude coordinates with respect to Prime Meridian (East or West).

NOTE: TOGGLE button allows operator to change the way latitude and longitude are displayed from degrees/minutes/seconds to decimal degrees.

- (H) **Altitude:** displays height of receiver, measured from top of dome, in feet (meters) above sea level.
- (I) **GPS course:** Displays direction of travel, in degrees relative to true north (zero degrees) as measured by receiver. Angle is measured in clockwise direction.

NOTE: Course and speed normally show small speeds and various courses even when machine is not moving.

- (J) **GPS speed:** displays ground speed of machine in miles per hour (kilometer per hour) as measured by receiver.
- (K) **GPS Accuracy Indicator (GPS AI):** GPS AI gives indication of GPS position accuracy achieved by receiver, and is displayed as a percentage (0-100%).

Continued on next page

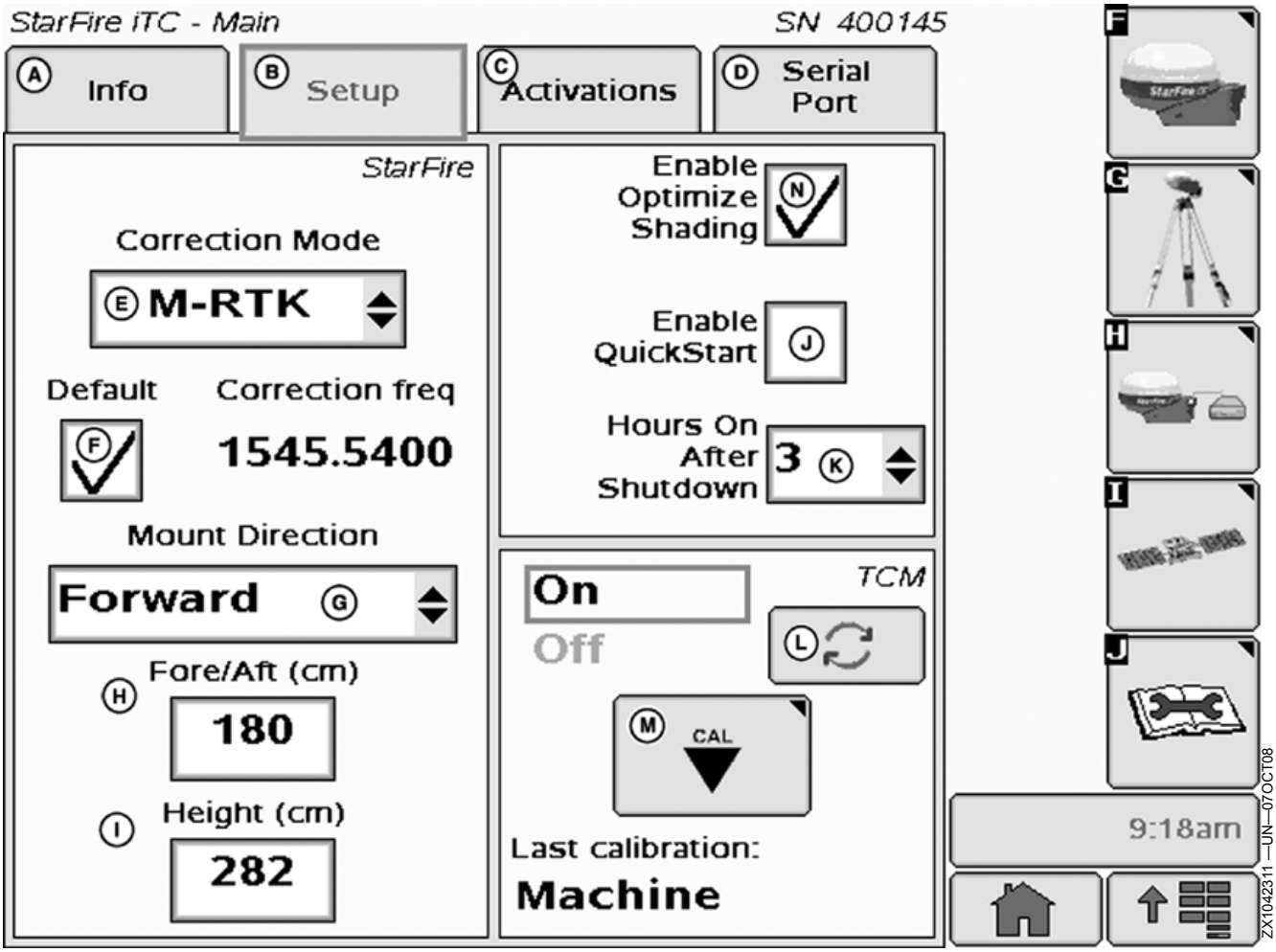
OUCC002,0002B7D -19-30JUL09-1/2

When receiver is initially powered, GPS AI will display 0%. As receiver acquires satellites and calculates a position, GPS AI will increase as accuracy improves. Acceptable guidance performance for Parallel Tracking and AutoTrac is achieved when GPS AI displays 80% or greater. This may take up to 20 minutes. GPS accuracy is affected by many factors. If 80% accuracy or greater is not achieved within 25 minutes, consider the following possibilities:

- Unobstructed view of sky – trees, buildings, or other structures may block receiver from receiver signals from all available satellites.
- L1/L2 signal to noise ratio (SNR) – radio interference from 2-way radios or other sources may cause low SNR (check satellite button I – Graph)
- Satellite position in sky – poor GPS satellite geometry can reduce accuracy (check satellite button I – SkyPlot)
- Number of satellites above elevation mask – this is the total number of GPS satellites available to receiver that are above 7 degrees elevation mask (check satellite button I – SkyPlot).
- Number of satellites in solution – this is total number of satellites that are being used by receiver to calculate a position (check satellite button I – SkyPlot).
- (L) **GPS Signal Quality:** Displays quality of signals being received from constellation of GPS satellites.
- (M) **Differential Signal Quality:** Displays quality of differential correction signal being received by receiver.
- TCM (Terrain Compensation Module):
  - (N) **Roll Angle:** Is both a graphical and numerical representation of amount of roll TCM is measuring, relative to calibrated zero degree reference. A positive roll angle means vehicle is rolled to right (depicts what horizon would look like from cab).
  - (O) **Yaw Rate:** This gives a graphic representation and a numeric figure for amount of rotation TCM is measuring. Positive yaw rate means vehicle is turning to right.

OUCC002,0002B7D -19-30JUL09-2/2

SETUP tab—Mobile-RTK



StarFire iTC - Main—Setup tab—M-RTK

A—Info tab
B—Setup tab
C—Activations tab
D—Serial Port tab
E—Correction Mode
F—Default Correction Frequency
G—Mount Direction
H—Fore/Aft
I—Height
J—Enable QuickStart
K—Hours On After Shutdown
L—TCM On/Off toggle button
M—TCM Calibration button
N—Enable Optimize Shading

The SETUP tab allows for setup of the following:

- (E) Correction Mode
- (F) Correction Frequency
- (G) Mount Direction (Forward/Backward)
- (H) Fore/Aft (Enter value)
- (I) Height (Enter value)
- (J) QuickStart
- (K) Hours ON After Shutdown. Select list input: 3-6-12 or 24 (3 default)
- (M) TCM Calibration
- (N) Optimize Shading (see Optimize Shading—Mobile-RTK in this Section)

Differential correction is the process by which GPS accuracy is improved. (See SF1/SF2 Activations, SF2 Subscription under Activation Tab—Mobile-RTK in this Section).

IMPORTANT: At least FIVE satellites must be tracked to get correction signal. Check total number of satellites that are being used by receiver (check satellite button I – SkyPlot).

OUCC002,0002B7C -19-01AUG09-1/1

Optimize Shading—Mobile-RTK

- When the Enable Optimize Shading is checked and connection to the Mobile-RTK data stream is lost for more than a certain period, the system automatically falls back to the most accurate navigation mode SF2 (if a license is available) or SF1. During the transition to the new differential correction mode, the GPS position jump is smoothed by using the last valid position using Mobile-RTK.
  This reduces the number of times the operator has to reset the correction mode and allows the operator to continue using AutoTrac when Mobile-RTK corrections are lost. However, the operator must reengage AutoTrac when transitioning back into Mobile-RTK and can use the Shift-Trac function to compensate for position ”jumps” between the two correction modes.
- When Enable Optimize Shading is not checked, the AutoTrac is automatically disengaged and the system automatically falls back to EGNOS navigation mode. The operator must reengage the AutoTrac manually and can use the Shift-Trac function to compensate for position ”jumps” between the two correction modes.

IMPORTANT: Keep Enable Optimize Shading box checked.

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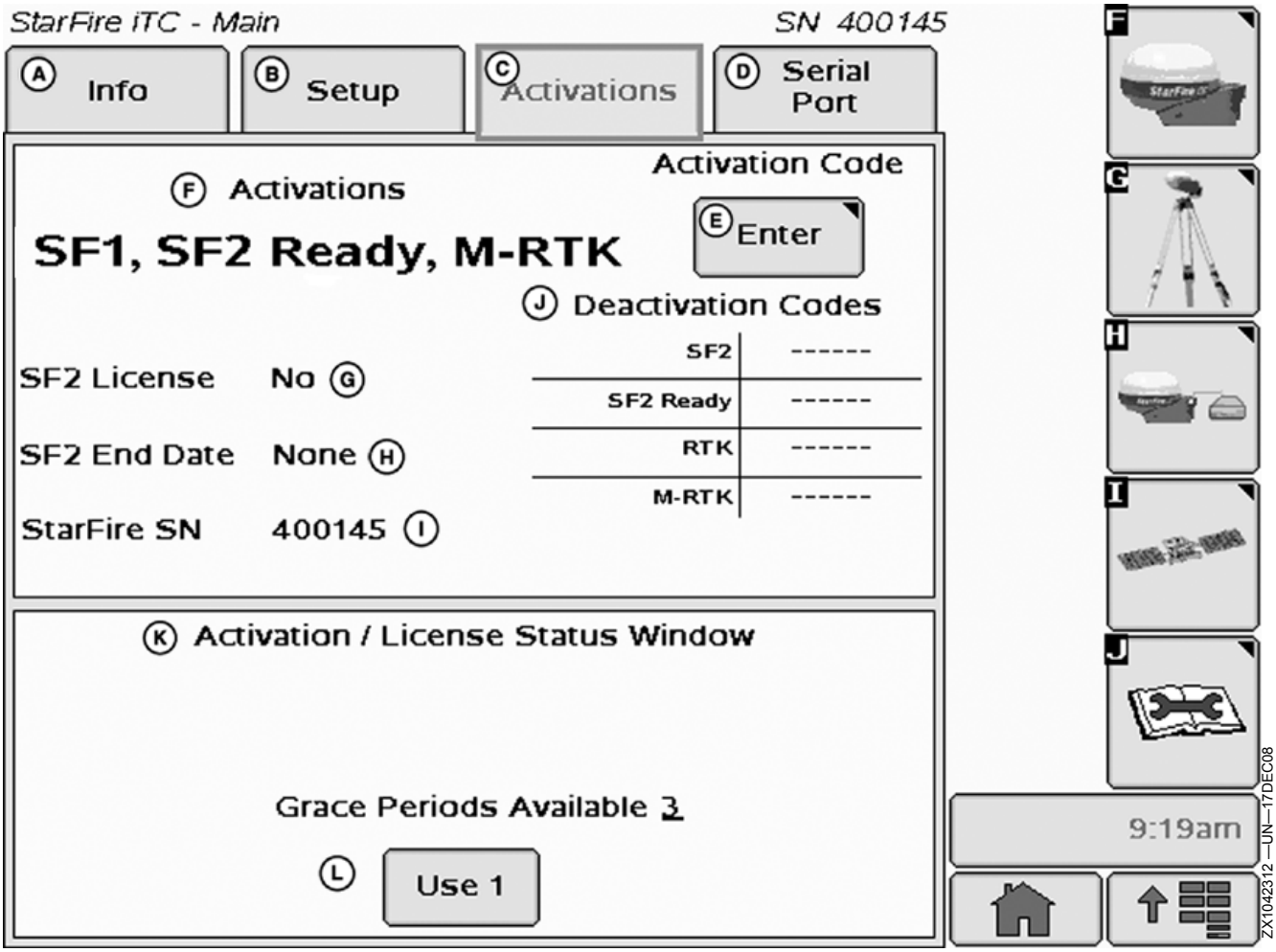
ACTIVATIONS tab—Mobile-RTK



StarFire iTC - Main—Activations tab—M-RTK

A—Info tab
B—Setup tab
C—Activations tab
D—Serial Port tab
E—Activation Code Enter button
F—Activations
G—SF2 License
H—SF2 End Date
I—StarFire SN
J—Deactivation Codes
K—Activation/License Status Window
L—Grace Periods

ACTIVATIONS tab contains the following:

- (F) **Valid activations for receiver:**
  - SF1 – activated on every StarFire iTC.
  - SF2 Ready – receiver has to be ordered SF2 Ready or an upgrade to SF2 Ready from SF1 World Solution must be purchased.
  - M-RTK – activated with valid RTK activation (requires receiver to be SF2 Ready).

- (G) **SF2 License:** Displays status of receiver's SF2 License.
  - Yes-Enabled – A valid SF2 license exists and SF2 is the differential correction mode selected.
  - Yes-Disabled – A valid SF2 license exists, but SF2 is not the differential correction mode selected.
  - No – Appears when no valid SF2 license exists or SF2 license has expired.

- (H) **SF2 End Date:** Displays date at which SF2 License will expire.

- (I) **StarFire SN:** StarFire serial number

NOTE: M-RTK button H appears on screen only when RTK activation has been properly carried out.

Continued on next page

OUCC002,0002B7E -19-30JUL09-1/2

- (E) **Activation Code Enter**

  NOTE: Activation Codes are needed to obtain SF2 Ready and RTK Activations, and SF2 license subscription.

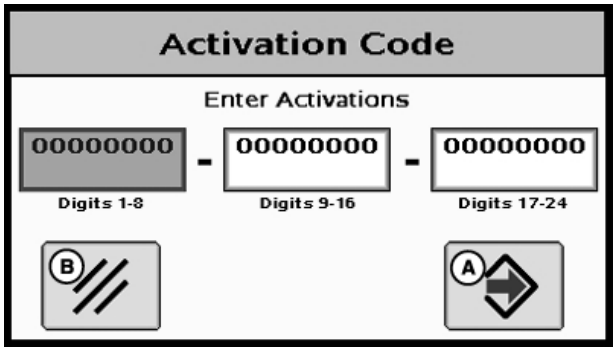
ENTER button is used to enter 24-digit codes for SF2 Ready and RTK Activations, SF2 license subscription and deactivation codes for transferring all StarFire activations and licenses mentioned above.

1. Upon selecting ENTER button an Activation Code box appears with three input boxes.

   NOTE: If more than 8 digits are entered into an input box, 99999999 will appear. Reselect box and type only 8 digits into input box.

2. Select first input box labeled Digits 1-8 and enter first 8 digits of 24-digit code.
3. Select second input box labeled Digits 9-16 and enter second 8 digits of 24-digit code.
4. Select third input box labeled Digits 17-24 and enter last 8 digits of 24 digit code.
5. Press ENTER button.
6. If 24-digit code is valid and entered correctly a confirmation message will appear.

- (J) **Deactivation Code input**
  This input will only appear when a deactivation code has been entered following procedure listed above. It will display 6-digit deactivation codes for SF2 License, SF2 Ready and RTK activations. These codes are needed when transferring the above mentioned activations or license to another receiver.



PC9708 —UN—10NOV06

Activation Code

A—Enter button **B—Cancel button**

- (K) **Activation/License Status Window**
  Displays messages when SF2 License has expired and provides user with option to use a Grace Period.

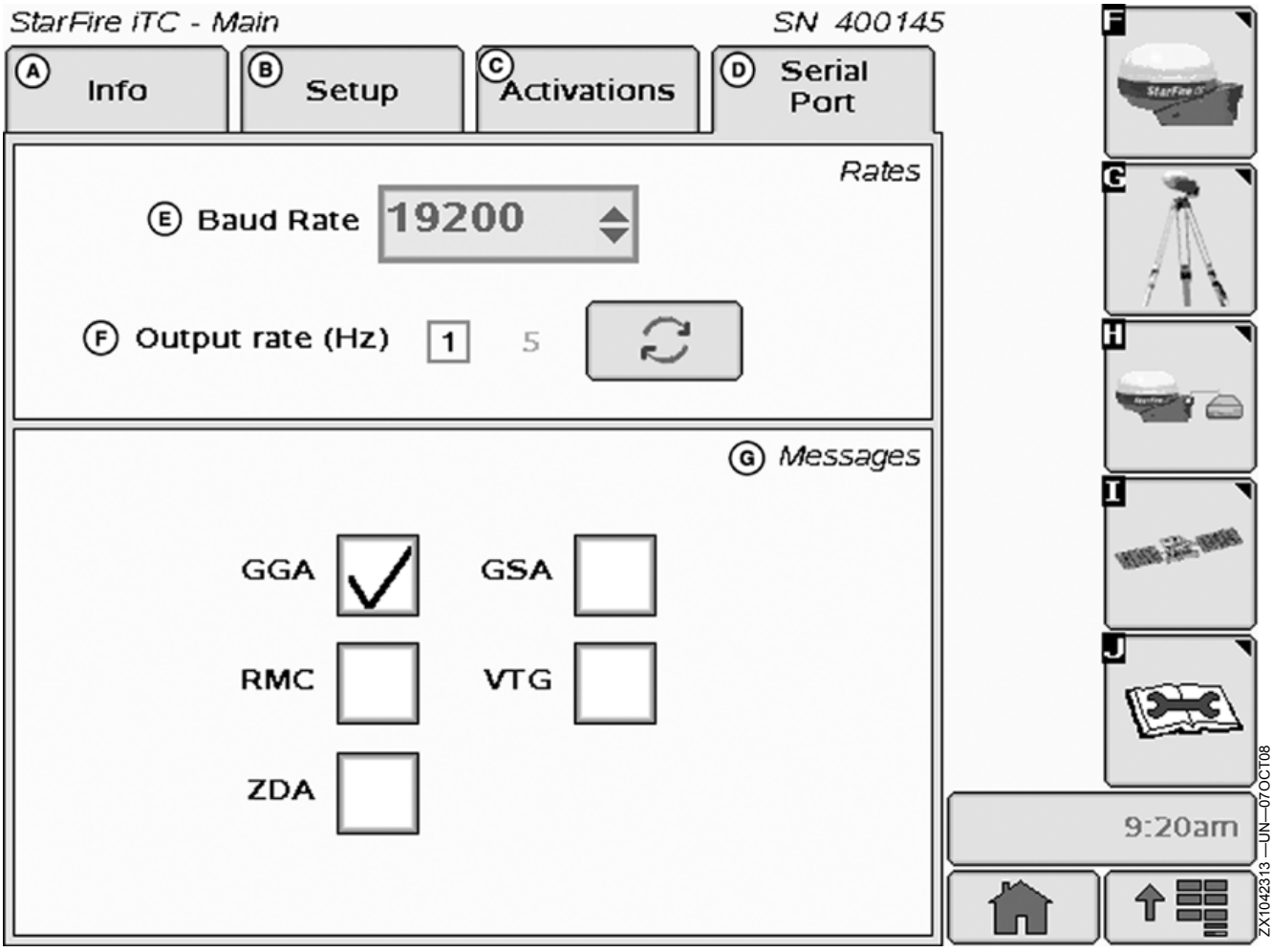
  NOTE: Three 24 hour Grace periods are available when current license expires. This is provided to allow sufficient time for operator to renew a license. Grace period signal will be SF2 differential correction signal.

- (L) **Using a Grace Period**

1. Select USE 1 button from status window
2. Select YES button

OUCC002,0002B7E -19-30JUL09-2/2

SERIAL PORT tab—Mobile-RTK



StarFire iTC - Main—Serial Port tab—M-RTK

A—Info tab
B—Setup tab
C—Activations tab
D—Serial Port tab
E—Baud Rate
F—Output Rate
G—Messages

Configure RS232 and NMEA message information.

Rates:

- Define Baud Rate by selecting list input
  - Baud Rates: 4800, 9600, 19200, 38400, 57600, 115200—**Select 19200**.
- Define output rate by toggling
  - 1Hz or 5Hz

Messages:

- Allows for output of 5 different NMEA[1] strings:
  - GGA, GSA, RMC, VTG, and ZDA

GGA provides the current Fix data (3D location and accuracy data). **Check GGA box**.
GSA provides the Satellite status data (Overall Satellite data).
RMC provides the minimum GPS sentences information (Recommended minimum data for GPS).
ZDA provides data and time.
VTG provides Vector track and Speed over the Ground.

NOTE: Refer to basic StarFire™ iTC and RTK Guidance Systems Operator's Manual for more description of NMEA sentences information.

[1]NMEA: National Marine Electronics Association

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DIAGNOSTIC softkey—Mobile-RTK

PC8663 —UN—05AUG05

MENU button

ZX1042314 —UN—07OCT08

STARFIRE ITC button

ZX1041599 —UN—16APR08

DIAGNOSTIC softkey

The StarFire iTC - Diagnostic screen contains two tabs:

READINGS tab

DATA LOGS tab

READINGS tab has detailed information about receiver.

- Unswitched voltage
- Switched voltage
- CAN High voltage (Vehicle Bus)
- CAN Low voltage (Vehicle Bus)
- Software Part Number
- Software Version Number
- Hardware Part Number
- Hardware Serial Number
- Receiver Hours (h)
- Receiver Address

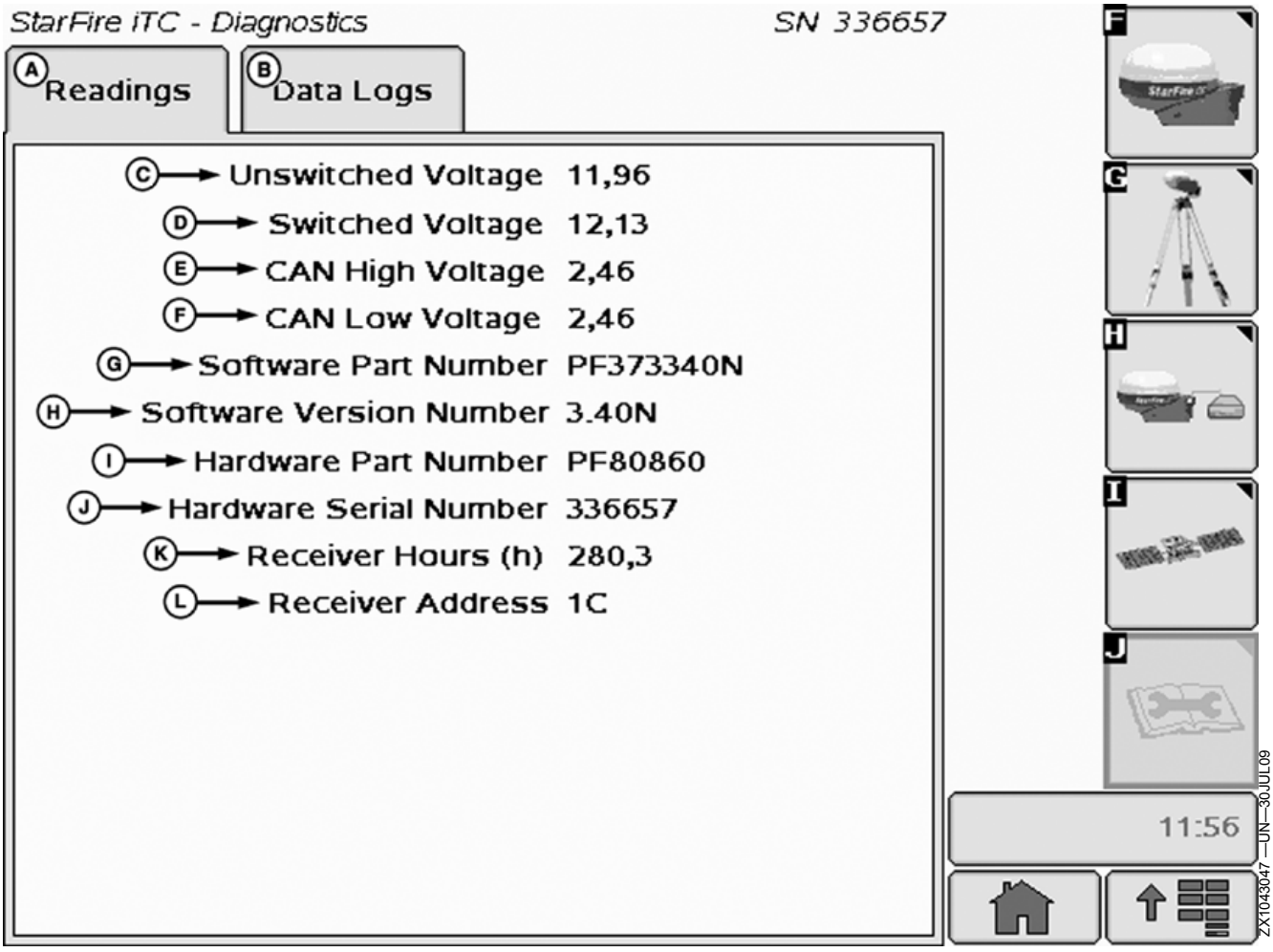
DATA LOGS tab has seven pages of graphed GPS data, logged over the previous 60 minutes.

- GPS Accuracy (0 to 100%)
- PDOP[1] (0 to 10)
- Satellites Used (Amount)
- GPS Signal Quality (0 to 100)
- Diff Signal Quality (0 to 10)
- Nav Mode (0, 2D or 3D)
- Differential Mode (None, WAAS, WCT, RTG or RTK)

[1]*PDOP: Positional Dilution of Precision*

OUCC002,0002955 -19-07OCT08-1/1

READINGS tab—Mobile-RTK



StarFire iTC - Diagnostics - M-RTK

A—Readings tab
B—Data Logs tab
C—Unswitched Voltage
D—Switched Voltage
E—CAN High Voltage
F—CAN Low Voltage
G—Software Part Number
H—Software Version Number
I— Hardware Part Number
J— Hardware Serial Number
K—Receiver Hours
L—Receiver Address

OUCC002,0002B7F -19-30JUL09-1/1

Testing Mobile-RTK Modem

The front of the RTK modem is equipped with two LEDs (A), (B) and a function key (C). The function key (C) is used for switching off the dataflow and for turning On or Off the RTK modem.

The LEDs (A) and (B) are for status output.

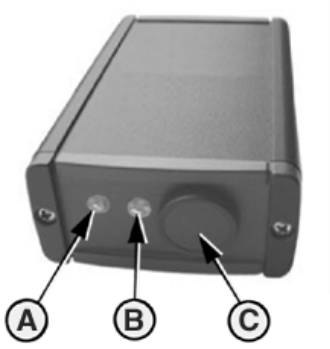
- **Green LED (A)**— This LED indicates the status of the dataflow. This LED flashes, and is solid when receiving data.

- **Yellow LED (B)**— This LED indicates the status of the cellular network.
  — A quick flashing LED means that the RTK modem is trying to register at the cellular network.
  — A slow flashing yellow LED means that communication to the cellular network is established.
  — A solid yellow LED means that communication to the Internet is established.

When receiving data both LEDs (A) and (B) are on.

Function Key (C)—By using this key it is possible to turn on the modem or to stop the dataflow for breaks of the measurements.

—The RTK modem **automatically** turns on, when connected to power (12 VDC). A break in the dataflow can be initiated by pressing the function key (C) for 2 seconds.



ZX10415 79 —UN—21APR08

Testing Modem—Mobile-RTK

A—Green LED
B—Yellow LED
C—Function Key

—The pause-mode is ended (when the measuring is resumed) in the same manner by pressing the function key (C) for 2 seconds.

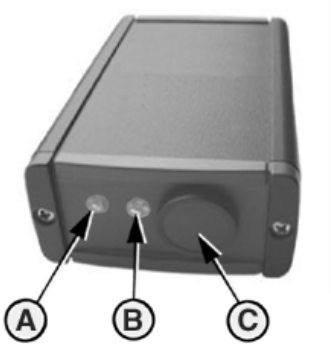
Continued on next page

NOTE: Wait approximately 30 seconds while shifting between pause-mode and online-mode.

—The RTK modem is switched off by constantly pressing the function key (C) for more than 5 seconds (while the green and yellow LEDs flash simultaneously). When the green and yellow LEDs stop flashing, release the function key (C) and the RTK modem turns off. Turning on the RTK modem is possible after about 30 seconds again by pressing the function key (C).

IMPORTANT: RTK modem must be in standby mode before switching off modem.

Use the LED status to help in diagnosing the RTK modem as shown in table:



ZX1041579 —UN—21APR08

Testing Modem—Mobile-RTK

A—Green LED
B—Yellow LED
C—Function Key

Mobile-RTK Modem—LED Status Description			
Status	**Green LED (A)**	**Yellow LED (B)**	**Description**
Stand by	Off	Off	Switch ON by pressing function key (C) -> **Initialization**
Initialization	Off	Quick Flashing	Registration at GSM network. Please wait.
Ready	Slow Flashing	Off or Slow Flashing	Send GGA message -> **Connecting** Press function key (C) for 2 seconds to enter **Pause Mode**.
Connecting	Quick to slow Flashing	Slow Flashing	Please wait.
Authentication	Slow Flashing	On	Online. **Authentication** at the reference service. Please wait.
Data Transmission	On	On	Transmission of correction data. —Press function key (C) for 2 seconds to enter **Pause Mode**. —Press function key (C) for 5 seconds to enter **Stand By Mode**.
Pause Mode	Double impulse flash	Slow Flashing	—Press function key (C) for 2 seconds to start **Data Transmission**. —Press function key (C) for 5 seconds to enter **Stand By Mode**.

OUCC002,0002952 -19-17DEC08-2/2

Mobile-RTK softkey

Allows to display system status and to setup Mobile-RTK radio serial port. See StarFire iTC—Mobile-RTK in this Section.

- System Status - Mobile-RTK Correction Source
- System Status - StarFire iTC
- RTK Serial Port Configuration

IMPORTANT: Anytime the radio is reconfigured or changed, power must be cycled at the GPS receiver before continuing.

PC8663 —UN—05AUG05

MENU button

ZX1042314 —UN—07OCT08

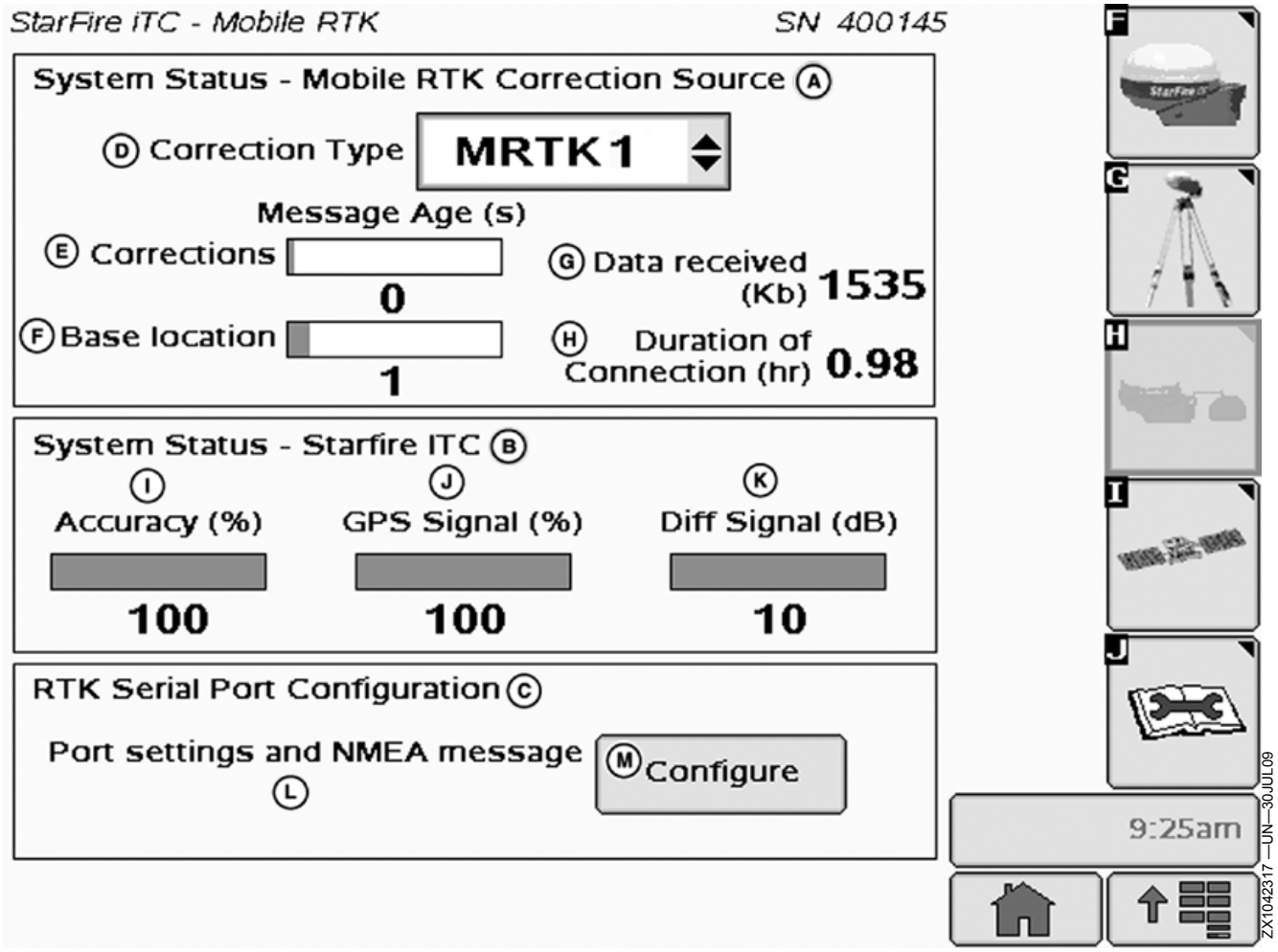
STARFIRE ITC button

ZX1042316 —UN—07OCT08

Mobile-RTK softkey

OUCC002,00028EF -19-07OCT08-1/1

System Status—Mobile-RTK



System Status—Mobile-RTK

A—System Status - Mobile-RTK Correction Source
B—System Status - StarFire iTC
C—RTK Serial Port Configuration
D—Correction Type
E—Corrections (Message age)
F—Base Location (Message age)
G—Data Received
H—Duration of Connection
I— Accuracy
J— GPS Signal
K—Differential Signal
L— Setting and NMEA message
M—Configure Button

(A) **System Status - Mobile-RTK Correction Source**

Press: MENU button >> STARFIRE ITC button >> Mobile-RTK softkey >> CORRECTION TYPE drop down box

- (D) **Correction Type:**
  Operator must select one Mobile-RTK correction source:
  - **MRTK 1** (Default)
  - MRTK 2
  - MRTK 3
  - Off
- (E) **Corrections:** Indicates Mobile-RTK correction data stream during MCMA (Maximum Correction Message Age).

IMPORTANT: Mobile-RTK correction source status bars (E) and (F) displayed in red while StarFire iTC status bars (I), (J) and (K) are displayed in green clearly identifies a StarFire Mobile-RTK failure. In this case, check your settings again (Correction Type (D) and RTK Serial Port Configuration (C)) and contact your John Deere dealer.

NOTE: Status bars (E) and (F) are green in case of Mobile-RTK correction streaming or red when no Mobile-RTK correction streaming is detected during MCMA.

- (F) **Base Location:** Indicates the reception of the next base station reference position data within the provider network.

Continued on next page

OUCC002,0002B80 -19-30JUL09-1/2

- (G) **Data Received (kb):** Indicates the total of data received. Calculation starts once the connection is accepted and used by StarFire.
- (H) **Duration of Connection (hr):** Indicates the duration of connection. Calculation starts once the connection is accepted and used by StarFire.

NOTE: Data (G) and duration (H) totals do not accumulate if correction messages are not recognized or received for more than MCMA.

(B) **System Status - StarFire iTC**

Operator can view the following:

NOTE: GPS accuracy (I), GPS signal quality (J) and differential signal quality (K) are also displayed on StarFire iTC main - INFO tab screen (see INFO tab—Mobile-RTK in GS2 Display—StarFire iTC Section).

- (I) **GPS Accuracy Indicator (GPS AI):** GPS AI gives indication of GPS position accuracy achieved by receiver, and is displayed as a percentage (0-100%)

When receiver is initially powered, GPS AI will display 0%. As receiver acquires satellites and calculates a position, GPS AI will increase as accuracy improves. Acceptable guidance performance for Parallel Tracking and AutoTrac is achieved when GPS AI displays 80% or greater. This may take up to 20 minutes. GPS accuracy is affected by many factors. If 80% accuracy or greater is not achieved within 25 minutes, consider the following possibilities:

- Unobstructed view of sky – trees, buildings, or other structures may block receiver from receiver signals from all available satellites.
- L1/L2 signal to noise ratio (SNR) – radio interference from 2-way radios or other sources may cause low SNR (check satellite button I – Graph)
- Satellite position in sky – poor GPS satellite geometry can reduce accuracy (check satellite button I – SkyPlot)
- Number of satellites above elevation mask – this is the total number of GPS satellites available to receiver that are above 7 degrees elevation mask (check satellite button I – SkyPlot).
- Number of satellites in solution – this is total number of satellites that are being used by receiver to calculate a position (check satellite button I – SkyPlot).

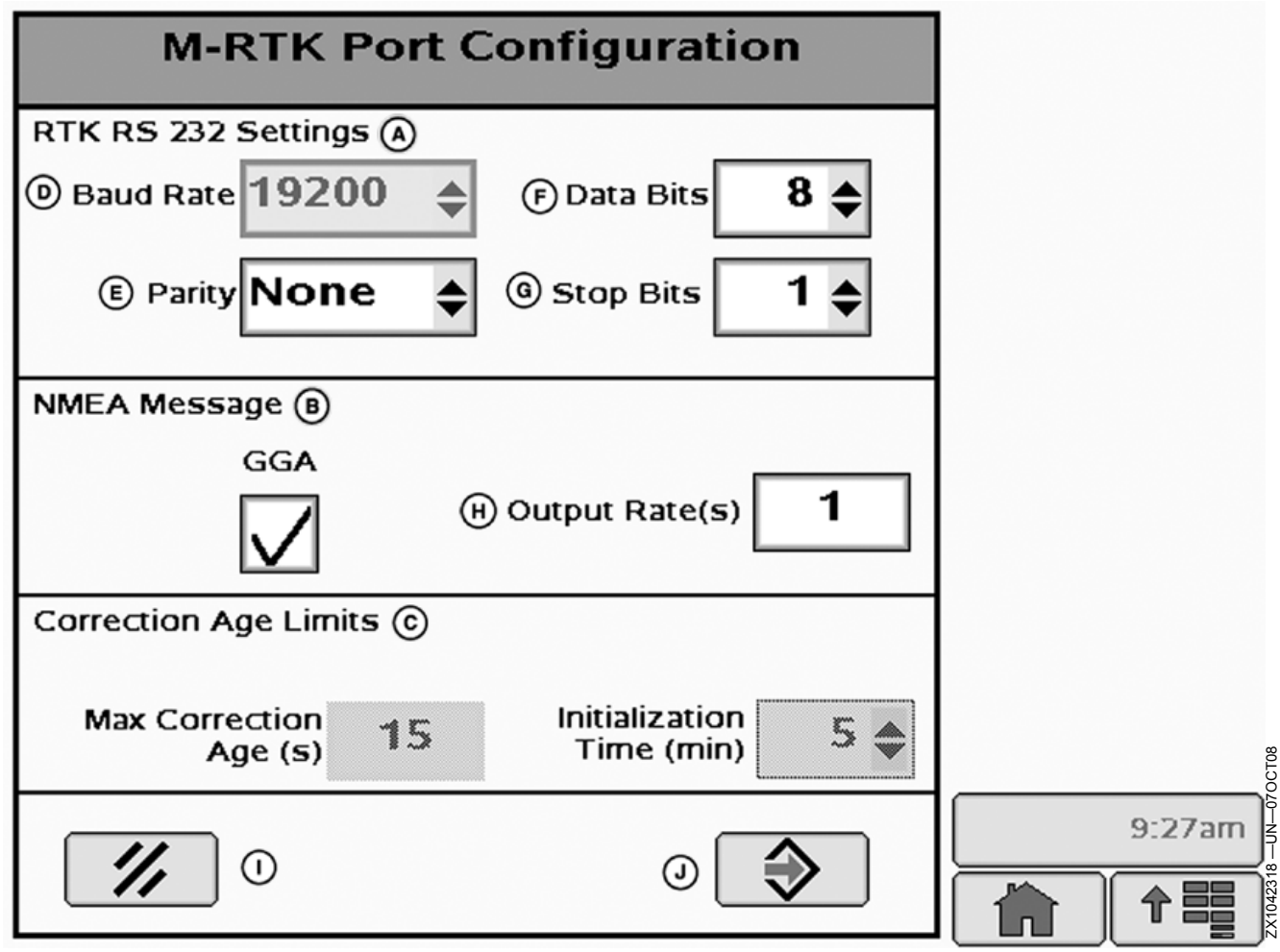
- (J) **GPS Signal Quality:** Displays quality of signals being received from constellation of GPS satellites.
- (K) **Differential Signal Quality:** Displays quality of differential correction signal being received by receiver.

(C) **RTK Serial Port Configuration:**

Allows the operator to configure the RS232 serial port setting and NMEA message (L). Press Configure button (M) to proceed (see Mobile-RTK Port Configuration Subpage in this Section).

OUCC002,0002B80 -19-30JUL09-2/2

Mobile-RTK Port Configuration Subpage



Mobile-RTK Port Configuration Subpage

A—RTK RS 232 Settings
B—NMEA Message
C—Correction Age limits
D—Baud Rate
E—Parity
F—Data Bits
G—Stop Bits
H—Output Rates
I— Cancel Button
J— Enter Button

To configure the Mobile-RTK correction stream used by the solution provider network to the StarFire via the RS232[1] port.

IMPORTANT: Prior to modifying any of the RS232 port configuration parameters (D), (E), (F) or (G), always contact your approved John Deere dealer first.

- (A) **RTK RS232 Settings:**
  - (D) **Baud Rate** —Defines data bits per second transmission by selecting list input: 4800, 9600, 19200, 38400, 57600, 115200 or 19200 **(19200 default)**.
  - (E) **Parity**—Defines the parity type by selecting list input: None, Odd, Even, Mark, Space **(None default)**.
  - (F) **Data Bits**—Defines the packet length (number of data bits) by selecting list input: 7 or 8 **(8 default)**.
  - (G) **Stop Bits**—Defines the number of stop bits to allow time to the receiver to reinitialize between two packets sent: 1 or 2 **(1 default)**.

- (B) **NMEA Message:**
  Allows for output of NMEA[2] string:
  - GGA
    GGA provides the current Fix data (3D location and accuracy data).

  NOTE: Refer to basic StarFire™ iTC and RTK Guidance Systems Operator's Manual for more description of NMEA sentences information.

- (C) **Correction Age Limits:**
  These settings define the MCMA[3] parameters which determine the period while the Mobile-RTK correction stream is detected and can not be modified.

[1] *RS232: Recommended Standard 232*

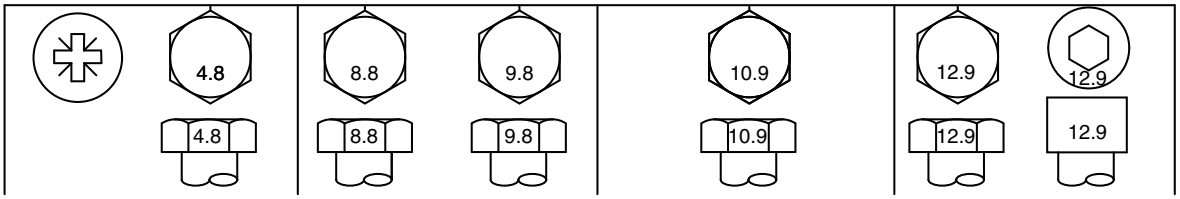
Continued on next page

[2]NMEA: National Marine Electronics Association
[3]MCMA: Maximum Correction Message Age

OUCC002,000298B -19-17DEC08-2/2

Metric Bolt and Screw Torque Values

TS1670 —UN—01MAY03



Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[a]		Dry[b]		Lubricated[a]		Dry[b]		Lubricated[a]		Dry[b]		Lubricated[a]		Dry[b]	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
									N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N·m	lb.-ft.														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	850	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

[a] *"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.*
[b] *"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.*

DX,TORQ2 -19-12JAN11-1/1

Safety Note Regarding the Subsequent Installation of Electrical and Electronic Appliances and/or Components

The machine is equipped with electronic components whose function may be influenced by electromagnetic radiation from other appliances. Such influences may be hazardous, so take the following safety instructions into account:

If electrical and electronic appliances are subsequently installed on the machine and connected to the onboard system, the user must verify whether the installation affects the electronics or other components. This applies particularly to:

- Personal Computer
- GPS (Global Positioning System) receiver

In particular, subsequently installed electrical/electronic components must comply with the relevant edition of EMC Directive 2004/108/EC, and be CE marked.

Wiring, installation and maximum permissible current supply must be as stated in the installation instructions of the machine manufacturer.

OUCC002,0002B82 -19-30JUL09-1/1

EC Declaration of Conformity

Deere & Company
Moline, Illinois U.S.A

The person named below declares that

Product: StarFire™ Mobile-RTK

fulfills all relevant provisions and essential requirements of the following directives:

DIRECTIVE	NUMBER	CERTIFICATION METHOD
Radio and Telecommunication Terminal Equipment (R&TTE)	1999/5/EC	Annex III

Name and address of the person in the European Community authorized to compile the technical construction file:

Henning Oppermann
Deere & Company European Office
John Deere Strasse 70
Mannheim, Germany D-68163
EUConformity@johndeere.com

Place of declaration: Kaiserslautern, Germany
Date of declaration: 10 August 2010
Manufacturing unit: ALLSAT GmbH

Name: Hans Juergen Nissen
Title: Engineering Manager, Ag Management Solutions

CE

DXCE01—UN—28APR09

OUCC002,0002F2C -19-08NOV10-1/1

Serial Numbers

Identification Label

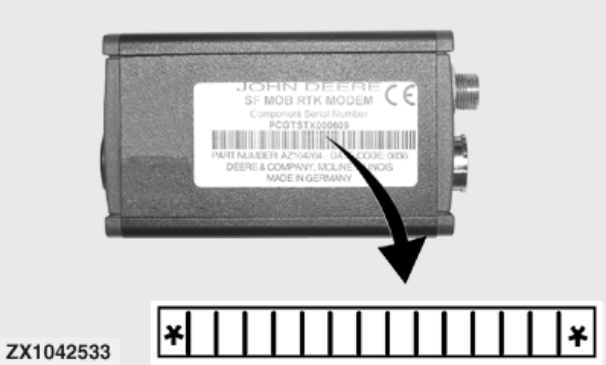
The letters and numbers on the label identify a component or assembly. All of these characters are needed when ordering parts or identifying the system or component for any John Deere product support program. Also, they are needed for law enforcement to trace your StarFire™ Mobile-RTK system if it is ever stolen.

For these reasons, accurately record these characters.

OUCC002,0002A5C -19-17DEC08-1/1

Mobile-RTK Modem

Label is located on top of RTK modem.



OUCC002,0002A5D -19-17DEC08-1/1

Index

John Deere Service Keeps You On The Job

John Deere Parts

We help minimize downtime by putting genuine John Deere parts in your hands in a hurry.

That's why we maintain a large and varied inventory—to stay a jump ahead of your needs.

TS100 —UN—23AUG88

DX,IBC,A -19-04JUN90-1/1

The Right Tools

Precision tools and testing equipment enable our Service Department to locate and correct troubles quickly . . . to save you time and money.

TS101 —UN—23AUG88

DX,IBC,B -19-04JUN90-1/1

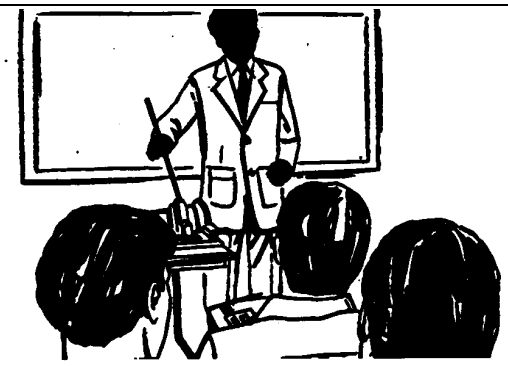
Well-Trained Technicians

School is never out for John Deere service technicians.

Training schools are held regularly to be sure our personnel know your equipment and how to maintain it.

Result?

Experience you can count on!



TS102 —UN—23AUG88

DX,IBC,C -19-04JUN90-1/1

Prompt Service

Our goal is to provide prompt, efficient care when you want it and where you want it.

We can make repairs at your place or at ours, depending on the circumstances: see us, depend on us.

JOHN DEERE SERVICE SUPERIORITY: We'll be around when you need us.

TS103 —UN—23AUG88

DX,IBC,D -19-04JUN90-1/1