

10 | Troubleshooting

November 2026

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10.1 | Overview

Before troubleshooting:

- Confirm all system components are correctly installed
- Verify all connectors are fully seated and undamaged
- Ensure the system has been configured correctly within **Level COMMAND**
- Confirm all machine power and hydraulic systems are operating normally

If an issue cannot be resolved using the information below, contact T3RRA support.

10.2 | GNSS & Position Issues

Issue	Possible Cause	Recommended Action
No GNSS position detected	Receiver harness disconnected	Verify GNSS receiver harness connections
No GNSS position detected	Receiver not powered	Verify GNSS receiver/display powers on correctly
No GNSS data after startup	Receiver still initialising	Allow receiver sufficient time to initialise and acquire satellite lock
Receiver powers on but no data detected	Incorrect receiver output connection or configuration	For NMEA 2000 receivers, verify connection to the correct CANBUS port operating at 250 kbps. For NMEA 0183 receivers, verify the correct serial output port and baud rate are configured and connected
Receiver powers on but no data detected	Incorrect RS232 baud rate configuration	For NMEA 0183 receivers, verify the configured serial baud rate matches the Level COMMAND receiver configuration
Receiver powers on but no data detected	Incorrect CANBUS connection or baud rate	For CANBUS/NMEA 2000 receivers, verify the receiver is connected to the correct CANBUS network operating at 250 kbps
Receiver powers on but no data detected	NMEA output messages not enabled	Verify required NMEA output messages are enabled within the receiver/display configuration
Position updates slowly	Low output rate configured	Configure receiver output rate to minimum 5 Hz; 10 Hz recommended
No RTK corrections	Incorrect base station selected	Verify the implement receiver is connected to the intended base station or correction source
No RTK corrections	Base station not transmitting corrections	Verify base station operation and correction output
No RTK corrections	Incorrect base station configuration	Verify base station radio/modem and correction output configuration
No RTK corrections	Incorrect implement receiver configuration	Verify correction source, radio/modem and RTK settings within the implement receiver
RTK intermittently lost	Poor correction radio signal	Inspect correction antenna placement and cable condition
RTK intermittently lost	Excessive distance from base station	Reduce distance to base station or verify correction coverage
RTK intermittently lost	GNSS quality thresholds configured too aggressively	Verify Level COMMAND GNSS requirement settings are suitable for current operating conditions
Poor accuracy or drifting	Low GNSS correction quality	Verify RTK/DGNSS correction status

Issue	Possible Cause	Recommended Action
Poor accuracy or drifting	Multipath or obstructed sky view	Move machine to open sky area clear of obstructions
GNSS accuracy degraded unexpectedly	Receiver operating in Float/DGNSS mode	Verify RTK Fix status before operation
Position intermittently lost	Damaged harness or loose connector	Inspect GNSS harnessing and connectors
Position quality degraded	Receiver firmware outdated	Verify GNSS receiver firmware is up to date
Position appears offset	Incorrect base station coordinates	Verify configured base station coordinates
Position appears offset	Connected to incorrect base station	Verify the implement receiver is connected to the correct base station
Position appears offset	Incorrect receiver offsets configured	Verify receiver height, fore/aft and lateral offsets within Level COMMAND

Receivers with Terrain Compensation

Issue	Possible Cause	Recommended Action
Cross-slope or terrain response incorrect	Receiver-integrated IMU/TCM not calibrated	Perform IMU/TCM calibration according to receiver manufacturer instructions
Cross-slope or terrain response incorrect	Receiver-integrated IMU/TCM disabled within receiver configuration	Verify IMU/TCM functionality is enabled within the GNSS receiver configuration

Receivers without Terrain Compensation (Cross-slope sensor required)

Issue	Possible Cause	Recommended Action
Cross-slope or terrain response incorrect	Sensor offsets not enabled	Verify sensor offsets are enabled within Level COMMAND
Cross-slope or terrain response incorrect	Incorrect sensor offsets configured	Verify IMU position offsets are correctly measured and configured within Level COMMAND
Cross-slope or terrain response incorrect	Incorrect IMU assignment or configuration	Verify the correct IMU source is configured within Level COMMAND
Terrain compensation unstable	TARS IMU mounted incorrectly	Verify IMU mounting orientation and mounting rigidity

10.3 | Hydraulic Control Issues

Issue	Possible Cause	Recommended Action
No hydraulic movement	Valve harness disconnected	Verify all ECU and valve harness connections
No hydraulic movement	Incorrect hydraulic interface selected	Verify the configured hydraulic interface type within Level COMMAND

Issue	Possible Cause	Recommended Action
No hydraulic movement	Hydraulic outputs disabled	Verify COMMAND outputs are enabled and Automatic Control is Armed. Check valve status within COMMAND Settings > Valve Configs or COMMAND Settings > Tuning
No hydraulic movement	Tractor hydraulic remotes disabled	Verify tractor SCVs/remotes are enabled and assigned correctly
Raise/lower functions reversed	Incorrect valve polarity or hydraulic configuration	Verify hydraulic output polarity and configuration
Raise/lower functions reversed	Hydraulic hoses connected incorrectly	Verify hydraulic hose routing and plumbing orientation
Hydraulic outputs operate incorrectly	Incorrect valve type selected	Verify the configured hydraulic interface matches the installed valve system. Check valve status within COMMAND Settings > Valve Configs
Hydraulic outputs operate incorrectly	Incorrect CANBUS interface configuration	Verify CANBUS/J1939 hydraulic interface configuration
Hydraulic movement unstable	Incorrect calibration values	Recheck hydraulic calibration and tuning settings
Hydraulic movement unstable	Incorrect tuning parameter configuration	Verify minimum extend/retract thresholds, maximum extend/retract thresholds, tracking sensitivity and cylinder ratio settings
Hydraulic movement slow or unresponsive	Hydraulic flow limits too low	Verify tractor hydraulic flow settings
Hydraulic movement slow or unresponsive	Engine RPM too low	Operate machine at recommended engine RPM
Hydraulic movement delayed	Excessive deadband configuration	Verify deadband and response tuning settings
Hydraulic outputs noisy or erratic	Damaged PWM/analog wiring	Inspect hydraulic output harnessing for damage
Hydraulic calibration cannot be completed	Incorrect machine setup during calibration	Perform calibration on stable level ground
Hydraulic calibration cannot be completed	Incorrect valve wiring	Verify valve output wiring and polarity
Automatic Control disengages during operation	Hydraulic response outside configured limits	Verify hydraulic tuning and response stability
Automatic Control performance inconsistent	Incorrect implement profile selected	Verify correct implement configuration within Level COMMAND
Hydraulic movement continues after command released	Hydraulic valve sticking	Inspect hydraulic valve operation and cleanliness
Hydraulic movement continues after command released	Incorrect valve calibration	Recheck valve calibration settings
Hydraulic outputs noisy or erratic	Electrical noise or poor grounding	Verify ECU and valve grounds are secure
Hydraulic outputs noisy or erratic	Damaged PWM/analog wiring	Inspect hydraulic output harnessing for damage
Hydraulic outputs noisy or erratic	Incorrect PWM frequency configuration	Verify PWM frequency matches valve requirements
No external valve response	Incorrect VM430/431 configuration	Verify external valve controller setup and addressing
No external valve response	Incorrect J1939 configuration	Verify J1939 network settings and communication

Issue	Possible Cause	Recommended Action
Hydraulic response differs between directions	Unequal flow settings	Verify raise/lower hydraulic flow configuration
Hydraulic calibration cannot be completed	Incorrect machine setup during calibration	Perform calibration on stable level ground
Hydraulic calibration cannot be completed	Incorrect valve wiring	Verify valve output wiring and polarity
Automatic Control disengages during operation	Hydraulic response outside configured limits	Verify hydraulic tuning and response stability
Automatic Control performance inconsistent	Incorrect implement profile selected	Verify correct implement configuration within Level COMMAND

10.4 | Joystick & Operator Input Issues

Issue	Possible Cause	Recommended Action
Joystick not detected	Joystick harness disconnected	Verify joystick harness connections and adapter installation
Joystick not detected	Incorrect joystick adapter used	Confirm the correct joystick adapter harness is installed
Joystick not detected	Joystick not powered	Verify joystick power supply and CANBUS/voltage supply
No joystick response	Incorrect joystick type selected	Verify joystick type configuration within COMMAND Settings > Valve Configs
No joystick response	Incorrect CANBUS connection	Verify joystick connection to the correct tractor CANBUS network
No joystick response	Incorrect joystick baud rate or CAN configuration	Verify joystick CANBUS/J1939 configuration
No joystick response	Incorrect analog input wiring	Verify analog joystick signal wiring and pinout
Analog joystick unstable	Incorrect voltage range	Verify joystick output voltages are within expected operating range
Analog joystick unstable	Electrical noise or poor grounding	Verify grounding and harness routing away from high-current wiring
Analog joystick unstable	Damaged potentiometer or joystick hardware	Inspect joystick operation and signal stability
Joystick response delayed	CANBUS communication delay	Verify CANBUS communication quality and network loading
Joystick response delayed	Incorrect filtering or response settings	Verify joystick response configuration within COMMAND Settings > Valve Configs
Raise/lower commands reversed	Incorrect joystick polarity or mapping	Verify joystick direction mapping and polarity configuration within COMMAND Settings > Valve Configs
Auxiliary joystick buttons not functioning	Incorrect button mapping	Verify auxiliary button assignments within COMMAND Settings > Valve Configs
Engage switch not detected	Incorrect engage switch wiring	Verify engage switch wiring and connector installation

Issue	Possible Cause	Recommended Action
Automatic Control will not Engage	Joystick not returning to neutral	Verify joystick neutral position and calibration
Automatic Control disengages unexpectedly	Engage switch issue	Verify engage switch operation and stability
Automatic Control disengages unexpectedly	Unintended joystick movement detected	Verify joystick mounting and operator input stability
Automatic Control disengages unexpectedly	Joystick calibration incorrect	Recheck joystick calibration within COMMAND Settings > Valve Configs
Joystick input intermittently lost	Loose connector or damaged harness	Inspect joystick harnessing and connectors
Joystick input intermittently lost	CANBUS termination or communication issue	Verify CANBUS network integrity and termination
Analog joystick calibration fails	Input voltage outside expected range	Verify joystick signal voltage and wiring
J1939 joystick not communicating	Incorrect CANBUS network selected	Verify joystick is connected to the intended tractor CANBUS
J1939 joystick not communicating	Unsupported joystick configuration	Verify joystick compatibility and configuration requirements
J1939 joystick buttons operate incorrectly	Incorrect button assignment configuration	Verify configured joystick button mappings within COMMAND Settings > Valve Configs
Operator input behaves inconsistently	Multiple input devices configured incorrectly	Verify only intended joystick/input devices are enabled
Operator input behaves inconsistently	Incorrect software configuration loaded	Verify the correct machine and joystick profile is selected

10.5 | IMU & Terrain Compensation Issues

Issue	Possible Cause	Recommended Action
Cross-slope compensation not operating correctly	IMU disconnected	Verify IMU harness connections and power supply
Cross-slope compensation not operating correctly	IMU not enabled within Level COMMAND	Verify IMU functionality is enabled within Level COMMAND
Cross-slope control produces unexpected movement	Incorrect IMU orientation	Verify IMU orientation and mounting direction
Implement is not level while reporting 0° / 0% cross-slope	IMU mounted on angled surface	Mount IMU to a level reference surface aligned with the machine
Implement is not level while reporting 0° / 0% cross-slope	Incorrect sensor offsets configured	Verify sensor offsets are correctly measured and configured within Level COMMAND
Cross-slope angle displayed incorrectly	Incorrect IMU assignment or configuration	Verify the correct IMU source is configured within Level COMMAND
Reported cross-slope angle is unstable	Loose IMU mounting hardware	Verify IMU mounting hardware is secure
Reported cross-slope angle is unstable	IMU mounted on flexible surface	Mount IMU to a rigid surface isolated from excessive vibration

Issue	Possible Cause	Recommended Action
Reported cross-slope angle is erratic even when travelling over smooth ground	Excessive vibration at mounting location	Inspect IMU mounting location and machine vibration sources
Cross-slope compensation differs between passes	IMU mounting position shifted	Inspect IMU mounting and alignment
Cross-slope compensation differs between passes	GNSS correction quality unstable	Verify RTK/DGNSS correction status
Cross-slope compensation produces inconsistent results	Sensor offsets disabled	Verify sensor offsets are enabled within Level COMMAND
StarFire TCM calibration cannot be completed	Poor satellite visibility	Move machine to open sky area clear of obstructions
StarFire TCM calibration cannot be completed	Incorrect GNSS receiver configuration	Verify GNSS receiver operation and correction quality
StarFire TCM calibration cannot be completed	Excessive machine vibration during calibration	Perform calibration with machine stationary and hydraulics stable
IMU intermittently disconnects	Loose connector or damaged harness	Inspect IMU harnessing and connectors
IMU intermittently disconnects	CANBUS communication instability	Verify CANBUS network integrity and termination
Terrain compensation differs between passes	IMU mounting shifted	Inspect IMU mounting and alignment
Terrain compensation differs between passes	GNSS correction quality unstable	Verify RTK/DGNSS correction status
Automatic Control performance inconsistent on slopes	Cross-slope compensation disabled	Verify terrain compensation is enabled within Level COMMAND
Automatic Control performance inconsistent on slopes	Incorrect terrain compensation source selected	Verify the intended IMU/TCM source is configured
IMU intermittently disconnects	Loose connector or damaged harness	Inspect IMU harnessing and connectors
IMU intermittently disconnects	CANBUS communication instability	Verify CANBUS network integrity and termination

10.6 | CANBUS / Communication Issues

Issue	Possible Cause	Recommended Action
ISOBUS communication unavailable	ISOBUS harness disconnected	Verify ISOBUS harness connections and adapter installation
ISOBUS communication unavailable	Incorrect ISOBUS connection point	Verify COMMAND is connected to the tractor ISOBUS network
ISOBUS communication unavailable	Incorrect ISOBUS adapter used	Verify the correct ISOBUS adapter harness is installed
ISOBUS communication unavailable	ISOBUS network not powered	Verify the tractor ISOBUS network is active

Issue	Possible Cause	Recommended Action
Tractor CAN communication unavailable	Incorrect Tractor CAN connection	Verify COMMAND is connected to the intended Tractor CAN network
Tractor CAN communication unavailable	Incorrect Tractor CAN baud rate	Verify Tractor CAN baud rate configuration within Level COMMAND
Intermittent CANBUS virtual terminal or device dropouts	Loose connector or damaged harness	Inspect CANBUS harnessing and connectors
Intermittent CANBUS virtual terminal or device dropouts	Poor CANBUS termination	Verify correct CANBUS termination resistance and network layout
Intermittent CANBUS virtual terminal or device dropouts	Incorrect CANBUS network selected	Verify all CANBUS devices are connected to the intended network
GNSS receiver intermittently disconnects	CANBUS backbone or branch wiring issue	Inspect CANBUS backbone and branch harness connections
IMU intermittently disconnects	CANBUS backbone or branch wiring issue	Inspect CANBUS backbone and branch harness connections
SCV controller intermittently disconnects	CANBUS backbone or branch wiring issue	Inspect CANBUS backbone and branch harness connections
No communication with the SCV controller	Incorrect hydraulic interface selected	Verify the correct hydraulic interface is configured within Level COMMAND
No communication with the SCV controller	Incorrect SCV CAN baud rate	Verify SCV CAN baud rate configuration within Level COMMAND
No communication with the SCV controller	Unsupported tractor or SCV configuration	Verify tractor compatibility and supported hydraulic interface type
Tractor SCVs operate incorrectly	Incorrect hydraulic interface configuration	Verify configured hydraulic interface type and machine profile
CAN joystick not detected	Incorrect CANBUS connection	Verify joystick connection to the intended tractor CANBUS
CAN joystick not detected	Unsupported joystick configuration	Verify joystick compatibility and configuration
Level COMMAND reports no communication with the ECU	ECU power or ground issue	Verify ECU power, ground and fuse connections
ECU powers on but does not communicate with Level COMMAND	Incorrect ECU firmware version	Verify ECU firmware version compatibility
ECU powers on but does not communicate with Level COMMAND	Incorrect CANBUS or Ethernet configuration	Verify COMMAND communication configuration and harnessing
Multiple CANBUS systems behave unpredictably	Connected to incorrect CANBUS network	Verify COMMAND is connected only to the intended CANBUS network
Multiple CANBUS systems behave unpredictably	Incorrect adapter or CANBUS bridging	Inspect CANBUS adapters and network interconnections
External controller communication lost	Incorrect controller software version	Verify external controller software compatibility

Issue	Possible Cause	Recommended Action
Multiple CANBUS systems behave unpredictably	Connected to incorrect CANBUS network	Verify COMMAND is isolated to the intended CANBUS network
Multiple CANBUS systems behave unpredictably	CANBUS bridging or adapter issue	Inspect adapters and network interconnections
CANBUS diagnostics unavailable	Incorrect diagnostic connection point	Verify diagnostic adapter connection and network selection
CANBUS diagnostics unavailable	Unsupported CANBUS protocol	Verify compatibility with the connected CANBUS system

10.7 | Support Information

Office Phone:
+61 7 4633 2790

Hardware Support Phone:
+61 428 922 668

Email:
support@t3rra.com

Website:
www.t3rra.com