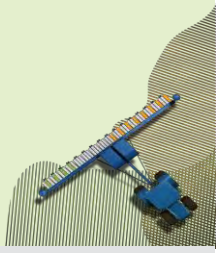
SmartBox® + Introduction:
ECU Power



This document provides detailed guidance on how to identify and resolve power issues with the SmartBox+ ECU

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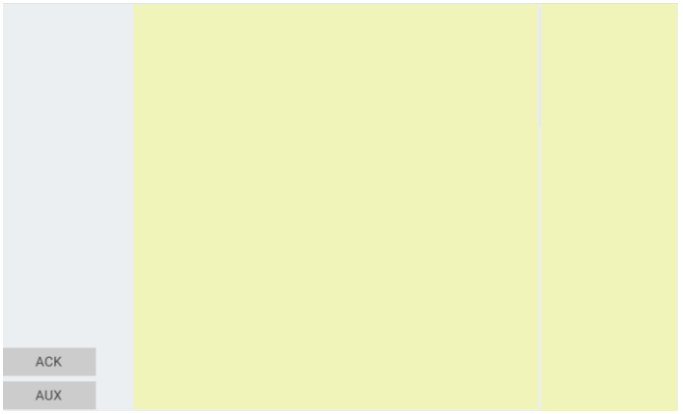
No ECU power: SmartBox+ not loading in the Virtual Terminal

If the ECU is not powered on, the SmartBox+ software will not load into the virtual terminal.
The most common cause for this issue is that the ECU is not powered on.



Example of the Virtual Terminal when the ECU is not powered on

Common causes for loss of power

There are usually just a few reasons why the ECU might not be powering on:

- Check the tractor key is on
- Check the battery connections
- Check fuses on the power wires running to the ISO connector
    - If this is the harness supplied by AMVAC check the fuse near the battery connection (add image)
    - If this is the OEM ISO Connector consult the manufacturer for guidance

ECU Power Requirements

To power on and talk to the display, the ECU must see 12-volt DC power on multiple pins on the 'IN' connector of the ECU.

- Note that the ISO harness must be connected to the 'IN' port of the ECU. If connected to the 'OUT' port, there will be no display communication.

To power the ECU, DC power must be present on the following pins (see below for more details):

- ECU power (12 volts)
- TBC power (12 volts)
- CAN (2.5 volts)

'IN' Connector

'OUT' Connector

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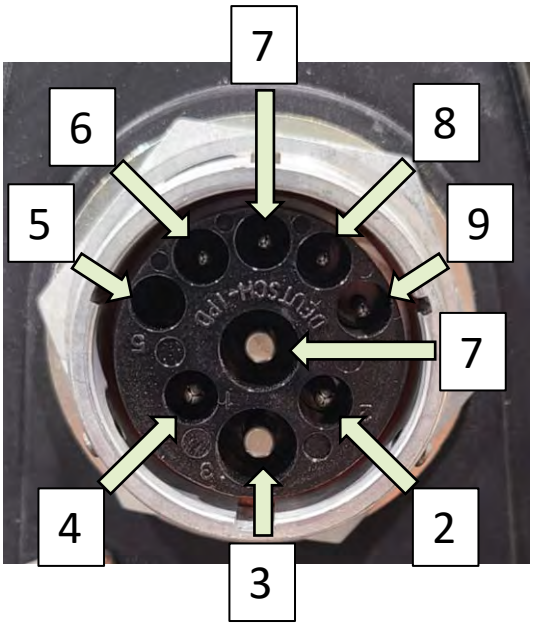
Description of the ISO connector

Use the table below to diagnose power issues with the ECU.
Note that for the ECU to power on, voltage must be present on the ECU power pin, the TBC power pin and the CAN High and Low pins.



Pin	Description	Function	Required for ECU?
1	Ground – High Current	Ground pin for heavy current draw	Not needed
2	Ground – ECU	Ground for ECU power, light current only	Yes, ground for ECU
3	Power – High Current	12-volt power pin for heavy current draw	Not needed
4	Power – ECU (6-16 Vdc)	12-volt power for the ECU, light current only	Yes, power for ECU Approx. 12 volts
5	TBC Disconnect	Disconnect signal pin for TBC	Not needed
6	Power - TBC - (6-16 Vdc)	Stable voltage supply for correct CAN operation	Yes, power for CAN Approx. 12 volts
7	Return - TBC	Stable voltage supply for correct CAN operation	Yes, ground for CAN
8	CAN High	CAN signal pin	Yes 2.0 – 3.1 volts
9	CAN Low	CAN signal pin	Yes 2.0 – 3.1 volts

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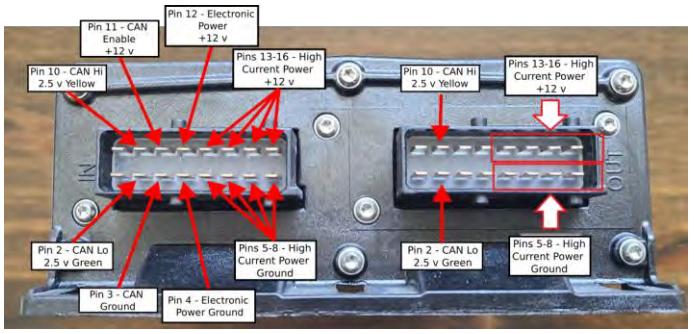
Description of the ECU 'IN' connector

'IN' Connector

- The IN connector must be connected the ISOBUS connector on the tractor in order for the ECU to communicate with the display.
- The IN connector is associated with the 'Primary' CAN bus on the ECU, which is responsible for all communication on the ISOBUS.
- The IN connector can be identified in the following way:
  - It is the left hand connector when viewing the ECU from the end, with the mounting bracket facing down
  - The word 'IN' is molded into the housing on the left hand side of the connector



'IN' Connector			
Pin	**Description**	**Function**	**Required?**
1	N/A		Not used
2	CAN Low	CAN signal	Yes
3	TBC – Return (-12 V DC)	Stable voltage supply for correct CAN operation	Yes
4	Ground – ECU (-12 V DC)	Ground for ECU power	Yes
5	Ground – High Current (-12 V DC)	Ground pin for heavy current draw	No*
6	Ground – High Current (-12 V DC)	Ground pin for heavy current draw	No*
7	Ground – High Current (-12 V DC)	Ground pin for heavy current draw	No*
8	Ground – High Current (-12 V DC)	Ground pin for heavy current draw	No*
9	N/A		Not used
10	CAN High	CAN signal	Yes
11	TBC – Power (+12 V DC)	Stable voltage supply for correct CAN operation	Yes
12	Power – ECU (+12 V DC)	12-volt power for the ECU	Yes
13	Power – High Current (+12 V DC)	12-volt power pin for heavy current draw	No*
14	Power – High Current (+12 V DC)	12-volt power pin for heavy current draw	No*
15	Power – High Current (+12 V DC)	12-volt power pin for heavy current draw	No*
16	Power – High Current (+12 V DC	12-volt power pin for heavy current draw	No*

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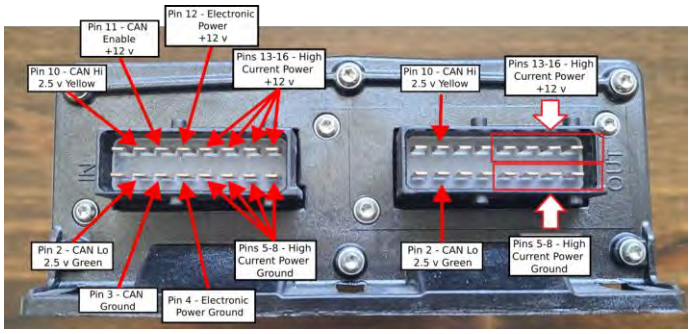
Description of the ECU OUT connector

'OUT' Connector

- The OUT connector is used to control the Granular Meters using the Secondary CAN Bus on the ECU.
- The secondary CAN Bus is kept completely separate from the primary BUS on the IN connector, to ensure successful communication to the meters.
- The OUT connector can be identified in the following way:
    - It is the right-hand connector when viewing the ECU from the end, with the mounting bracket facing down
    - The word 'OUT' is molded into the housing on the right-hand side of the connector



'OUT' Connector		
Pin	**Description**	**Function**
1	N/A	
2	CAN Low (Secondary)	CAN signal
3	N/A	
4	N/A	
5	Ground – (-12 V DC)	System Ground
6	N/A	
7	N/A	
8	N/A	
9	N/A	
10	CAN High	CAN signal
11	N/A	
12	N/A	
13	N/A	
14	N/A	
15	N/A	
16	N/A	