

6.3 | Joystick Connection (Optional)

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6.3 | Joystick Connection (Optional)

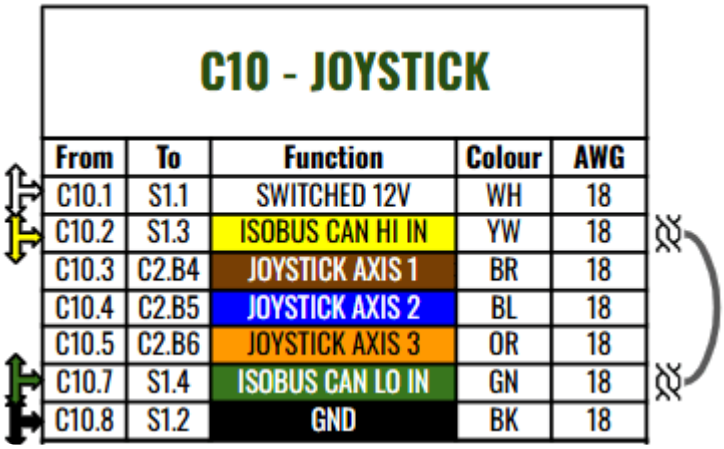
Overview

In most cases the manual control of hydraulic functions are already available (e.g. when using existing tractor auxiliary valves). In some limited cases it may be necessary to add operator control for hydraulic functions, e.g. when using an additional valve module, or using direct PWM operation of hydraulic valves from the **COMMAND** ECU. In these situations, two options are available: An analog joystick, or a J1939 CANBUS joystick.

If using a compatible analog or J1939 CANBUS joystick, this can be connected to the **T3H-C002** directly or via a joystick extension harness.

1. Ensure the joystick is fitted with an 8-way Deutsch DT plug (DT06-8S).
2. Mount the joystick in an appropriate location in-cab according to manufacturer mounting instructions.
3. Connect the plug to the connector labelled “Joystick” on the **T3H-C002** harness.
4. Verify correct pin alignment before connecting.

See below for the pin positions and connector information noting that this is the receptacle on the **T3H-C002** ECU breakout harness.



C10 - JOYSTICK

From	To	Function	Colour	AWG
C10.1	S1.1	SWITCHED 12V	WH	18
C10.2	S1.3	ISOBUS CAN HI IN	YW	18
C10.3	C2.B4	JOYSTICK AXIS 1	BR	18
C10.4	C2.B5	JOYSTICK AXIS 2	BL	18
C10.5	C2.B6	JOYSTICK AXIS 3	OR	18
C10.7	S1.4	ISOBUS CAN LO IN	GN	18
C10.8	S1.2	GND	BK	18

Mating joystick connector parts:

- **Connector**: DT06-8S / DT06-8SA
- **Contacts**: 1062-16-0122 or AT62-16-0122

Analog Joystick Installation

Analog joysticks from brands such as APEM, Parker, Suregrip Controls or Danfoss can be connected to the system and used to manually control one or both available functions, e.g. Height and X-Slope.



Analog Joystick Specification Requirements

- Expected output range: 1.0 - 4.0V
- Expected resting voltage: 2.5V

Analog Joystick Connection

The **T3H-C002** ECU Breakout Harness has an 8-pin joystick connection available that can be used to provide switched 12V power and access to the analog joystick signal inputs. Generally, Joystick Axis 1 and Joystick Axis 2 should be connected to the Y and X axis of the joystick respectively.

1. Connect joystick to the 8-pin joystick connector on the T3H-C002 harness.
2. Connect power to Switched 12V and GND.
3. Connect signal outputs to joystick axis inputs.
4. Verify voltage range is within 1.0–4.0V.

> ⓘ **NOTE**: The Joystick Axis 3 signal is currently **not** in use - **COMMAND** is currently capable of controlling 2 functions for manual control.

Analog Voltage Signal Requirements

The joystick output voltage must be centred at 2.5V when not being manipulated, and should lower in voltage to a minimum of 1V in one direction, and to a maximum of 4V when moved in the opposite direction.

> ⚠ **IMPORTANT**: 0-5V Output range joysticks cannot be used with **COMMAND**, as input voltages of 0V and 5V are assumed to be a short circuit to ground or 5V respectively.

J1939 / CANBUS Joystick Installation

A ruggedised multifunction J1939 CANBUS joystick with suitable output messages can be connected to the joystick connection on **COMMAND** harnessing to provide manual operator control of the scraper.

A J1939 joystick such as the APEM HF Series J1939 joysticks can be connected to the system and used to manually control the two available functions, e.g. Height and X-Slope.



Interface Parameters

- Baud rate: 250 kbps
- Transmission repetition rate: Recommended 10 hz or higher

Connection

The joystick connector on **COMMAND** harnessing can provide a 12V DC supply for the joystick, and then receive joystick position messages back via CANBUS. The **COMMAND** ECU has been programmed with J1939/ISO basic joystick message types to provide selection between fore/aft, left/right and twist axes for each of **COMMAND's** control functions. See below for pinout information.

1. Connect joystick power to Switched 12V and GND.
2. Connect CAN HI and CAN LO to ISOBUS HI and LO.
3. Verify communication at 250 kbps.
4. Confirm joystick inputs are detected in **Level COMMAND**.

Expected Message Protocol

Message 1 - BJM1 - PGN 0xFDD6

Primary X-axis or Y-axis can be assigned to **COMMAND** function 1 or function 2.

START POSITION (BYTE/BIT)	LENGTH (BITS)	FUNCTION
1/1	2	Primary X-axis neutral position status
1/3	2	Primary X-axis left position status
1/5	2	Primary X-axis right position status
1/7 to 2/8	10	Primary X-axis position data
3/1	2	Primary Y-axis neutral position status
3/3	2	Primary Y-axis down position status
3/5	2	Primary Y-axis up position status
3/7 to 4/8	10	Primary Y-axis position data
6/5	2	Button 2 status
6/7	2	Button 1 status

Message 2 - EJM1 - PGN 0xFDD7

Primary Z-axis or Y-axis can be assigned to **COMMAND** function 1 or function 2.

EJM1 DATA FIELD STRUCTURE:

START POSITION (BYTE/BIT)	LENGTH (BITS)	FUNCTION
5/1	2	Primary Z-axis neutral position status
5/3	2	Primary Z-axis counter-clockwise position status
5/5	2	Primary Z-axis clockwise position status
5/7 TO 6/8	10	Primary Z-axis position data

ⓘ For more assistance in setting the selected joystick type and joystick axes within **Level COMMAND**, please refer to the **Level COMMAND** manual.