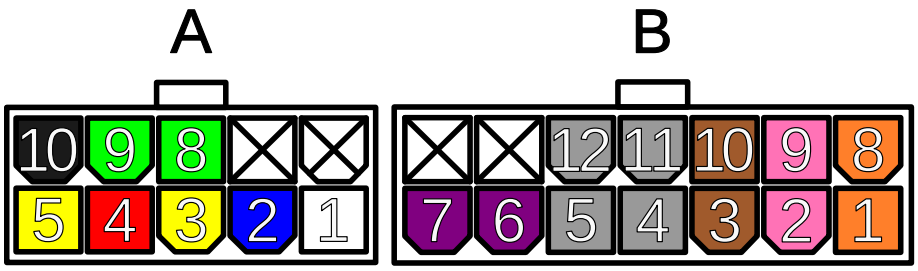
1. Connector Pinout



CONNECTOR A (10-PIN)

PIN	COLOUR	FUNCTION
1	WHITE	J1708/J1587 LOW
2	BLUE	J1708/J1587 HIGH
3	YELLOW	J1939 #1 HIGH
4	RED	12/24V SUPPLY
5	YELLOW	J1939 #2 HIGH *
8	GREEN	J1939 #1 LOW
9	GREEN	J1939 #2 LOW *
10	BLACK	SUPPLY GROUND

CONNECTOR B (14-PIN)

PIN	COLOUR	FUNCTION	GROUP
1	ORANGE	DIGITAL OUTPUT #1	1
2	PINK	DIGITAL OUTPUT #2	2
3	BROWN	DIGITAL OUTPUT #3	3
4	GREY	DIGITAL OUTPUT #4	4
5	GREY	DIGITAL OUTPUT #5	4
6	PURPLE	DIGITAL OUTPUT #6	5
7	PURPLE	DIGITAL OUTPUT #7	5
8	ORANGE	DIGITAL OUTPUT #8	1
9	PINK	DIGITAL OUTPUT #9	2
10	BROWN	DIGITAL OUTPUT #10	3
11	GREY	DIGITAL OUTPUT #11	4
12	GREY	DIGITAL OUTPUT #12	4

* J1939 #2 is only available on *Kinexis 'Dual'* devices.

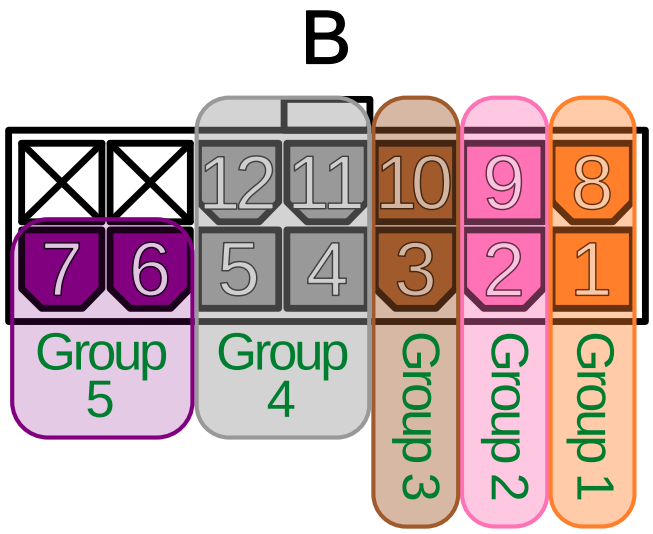
2. Digital Outputs

2.1. Digital Output Operating Modes

The Kinexis' digital outputs can be configured for one of four different operating modes, described in the following table:

Mode	Description
Disabled	Output is unused
On/Off Mode	Output toggles between *on* (shorted to ground) and *off* (open circuit) as a result of input data on the J1708/J1587, J1939 #1, or J1939 #2 interfaces. This can be used to control indicators, relays, or other loads (up to 150 mA) or digital inputs of other devices. **Note:** An external pull-up resistor may be required if the receiving device does not have an internal pull-up resistor. *When using an external pull-up resistor, it is critical to ensure that the pull-up voltage does not exceed the maximum voltage of the receiving device.*
Analog Mode	Output operates as a PWM (pulse-width modulation) output as a result of input data on the J1708/J1587, J1939 #1, or J1939 #2 interfaces. This can be used to control PWM-compatible loads, including most analog sender-driven gauges.
Frequency Mode	Output operates as a square-wave frequency output as a result of input data on the J1708/J1587, J1939 #1, or J1939 #2 interfaces. This can be used to supply frequency-controlled devices, including most analog speedometers and tachometers. **Note:** An external pull-up resistor may be required if the receiving device does not have an internal pull-up resistor. *When using an external pull-up resistor, it is critical to ensure that the pull-up voltage does not exceed the maximum voltage of the receiving device.*

2.2. Digital Output Groups



The 12 digital outputs are divided into five groups. Each group contains two outputs, except for Group 4, which has four. When configuring outputs, keep the following group-based limitations in mind:

1. If any output in a group is set to **Analog Mode**, the remaining outputs in that group can only be set to **Disabled, Analog Mode, or On/Off Mode**.

2. If any output in a group is set to **Frequency Mode**, the remaining outputs in that group can only be set to **Disabled or On/Off Mode**.

In summary:

- **Analog Mode and Frequency Mode cannot coexist within the same group.**
- **Multiple outputs in a group can be set to Analog Mode.**
- **Only one output per group can be set to Frequency Mode.**
- **Disabled and On/Off Mode are always allowed, regardless of other settings.**

For easy identification, outputs within the same group have matching-colored wires in the *Connector B* harness.

Example Configuration: 2 Frequency Outputs, 7 Analog Outputs, and 3 On/Off Outputs

Step 1: Assign Frequency Outputs
Since Frequency Mode limits other outputs in the same group to only Disabled or On/Off Mode, we should use groups with fewer total outputs. Groups 1, 2, 3, or 5 are ideal because they contain only two outputs each.

- Assign Output #1 (Group 1) to Frequency Mode.
- Assign Output #2 (Group 2) to Frequency Mode.

⚠ We cannot use Output #8 for the second frequency output, as it belongs to Group 1, which would place both frequency outputs into the same group.

Step 2: Assign Analog Outputs
Analog Mode can be used freely within a group, but cannot coexist with Frequency Mode in the same group.

- We can place 7 analog outputs in Groups 3, 4, and 5, avoiding groups that already contain frequency outputs.
- Assign:
  - Output #3 (Group 3)
  - Output #4 (Group 4)
  - Output #5 (Group 4)
  - Output #6 (Group 5)
  - Output #7 (Group 5)
  - Output #11 (Group 4)
  - Output #12 (Group 4)

⚠ Outputs #8 and #9 cannot be used for Analog Mode because that would mix Analog and Frequency Modes within their groups.

Step 3: Assign On/Off Outputs
On/Off Mode is always allowed, so the remaining three outputs can be assigned freely.

- Assign Output #7 (Group 1), Output #8 (Group 2), and Output #9 (Group 3) to On/Off Mode.

This configuration ensures compliance with output grouping rules while maximizing available functionality.

