

Digital I/O: OUTPUT: Basic, Count, Count+, Smart+

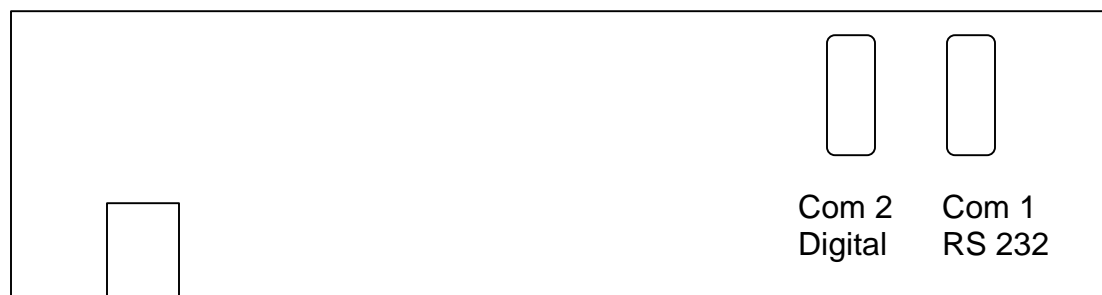
The digital I/O option port in the 4-Series provides us with 4 optically isolated inputs and 4 optically isolated outputs. All power is supplied externally.

In this demo we will look at connecting an output to a 4 Series Count+ scale.

The Digital I/O option kit for basic, count and count + is part number 22013142. The option installs inside the scale (or terminal) and field connection is via a 9 pin female connector mounted on the connector plate at the rear of the scale.

In a 4-Series Count+ scale the option is installed as port 2, port 1 remains as RS232. In the Count+ scale we can have one option, so if we choose digital I/O we can not add any further options, such as Ethernet.

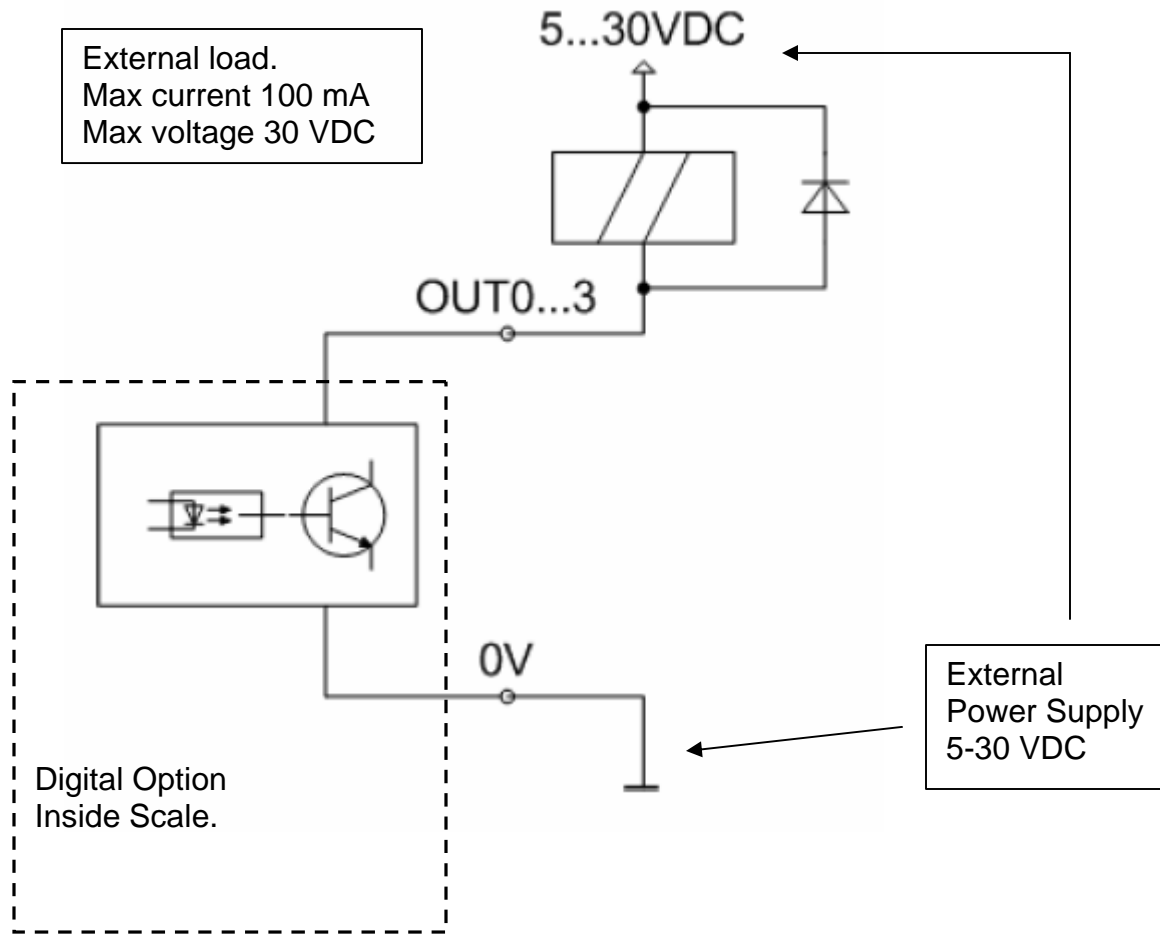
The installation of the Digital I/O kit is explained in the installation instructions, 22013616, supplied with the kit. The kit may also be factory installed when ordered together with the scale. See specifications.



Connector plate on rear of scale / terminal.

How does the input circuit work?

The output circuit is optically isolated from the internal circuitry, which means you must provide an external power source. When we connect the external power sourced to the output circuit an optical coupler is energized, turning on the output signal.



Circuit operation.

The external load, such as a 12 VDC piezo buzzer, is connected to the + VDC of the external power supply. The switched side of the load is connected to output 0, on pin 2 (OUT0) of the 9 pin Digital I/O connector. 0 volts of the power supply is connected to pin 1 (GND) of 9 pin Digital I/O connector.

When the output is turned “on” by the Digital I/O, the optic coupler turns “on” completing the circuit . Electrical current flows through the circuit, energizing the piezo buzzer. The outputs are numbered 0 – 3 on the hardware and 1 - 4 in the scale setup menus.

The voltage drop across the optic coupler is approximately 1 volt. With a 12 volt supply, we would drop 1 volt across the coupler and 11 volts across piezo buzzer. The piezo buzzer we selected for this demo has a maximum current draw of 15 mA, well beneath our limit of 100 mA. For heavier loads such as relay coils, consider using the METTLER TOLEDO Relay 4 I/O as the electrical interface between the 4-Series Digital I/O and the field equipment.

Operation of 4 Series Count+ with digital output 1 assigned to “GOOD”.

The Count+ scale is operating in the +/- Checkweighing mode, when the load on the scale is in the OK zone, the "GOOD" output turns the piezo buzzer "on".

Hardware installation:

Wire circuit to **pin 2** for output 0 and **pin 1** for 0 volts.

Scale Setup:

Application / Checkweighing / Beeper - OFF / Setpt tol – 10 %.

Communication / Option / Digital / Output 1 / Good

Operating in the +/- Checkweighing mode. Setting target / tolerance, we use 1000 grams as target.

Enter 81 and hold the Target button until tArGEt appears in display

Enter 1000 g *, touch the Enter (Print) key

tOLER + will flash in the display

Touch the Enter (Print) key again to enter the tolerance in percentage

Enter 4.0 and touch the Enter (Print) key

tOLER – will flash in the display

Touch the Enter (Print) key again to enter the tolerance in percentage

Enter 4.0 and touch Enter (Print) button

The display goes back to weighing mode with “-“ icon illuminated, indicating that the weight is less than the target. Once the weight passes 50% of the target value, the capacity display at the bottom increases linearly until the lower tolerance is passed. At this point, OK comes onto the display. After the upper tolerance is passed, a solid + appears to indicate the tolerance has been passed.



* Note that the unit of the target is always the defined “display” unit of the scale. If the scale is set up as lb, you cannot change the target to grams during this step. You would first have to change the display to grams, set the target, and then change the scale back to lb. When you switch the units to lb, you must start target/checkweighing again by entering the memory location (81 in this case) and then pressing the Target button briefly. The unit will calculate the target weight and tolerance percentages relative to the new unit selected.

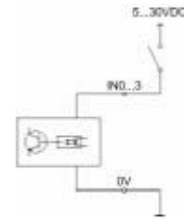
Digital I/O-Option (22010184)

Specifications



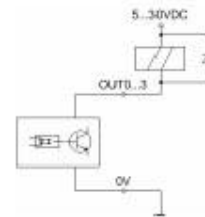
Control Inputs

4 digital inputs
electrically isolated via opto coupler
 $I_{min} = 1\text{mA} @ U_{min} = 5\text{VDC}$
 $I_{max} = 8\text{mA} @ U_{max} = 30\text{VDC}$



Control Outputs

4 digital outputs
electrically isolated via opto coupler
open collector
 $I_{max} = 100\text{mA}, U_{max} = 30\text{VDC}$



Supply Voltage

externally 5...30VDC for control inputs and control outputs

Protection Class

IP65

Connector

female, 9-pin D-SUB

- | | |
|---|--------------|
| 1 | 0V |
| 2 | output OUT 0 |
| 3 | output OUT 1 |
| 4 | output OUT 2 |
| 5 | output OUT 3 |
| 6 | input IN0 |
| 7 | input IN1 |
| 8 | input IN2 |
| 9 | input IN3 |

Connection Cable

length 1,5m
male, 9-pin D-SUB
open cable end with end splice
order number 21 254 225

- | | |
|--------|--------------|
| black | 0V |
| brown | output OUT 0 |
| red | output OUT 1 |
| grey | output OUT 2 |
| yellow | output OUT 3 |
| green | input IN0 |
| blue | input IN1 |
| violet | input IN2 |
| white | input IN3 |

Accessory

Relaisbox 4-ID7
max. switching power 2A/30VDC or 2A/250VAC
order number 22 001 088

End of demo.