

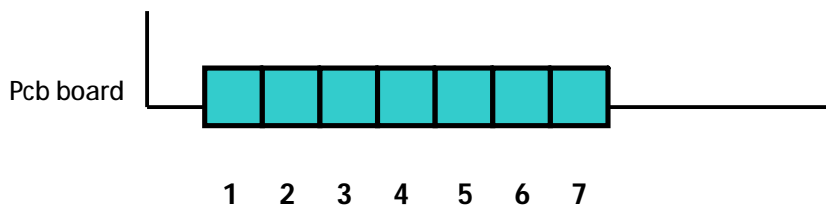
Micro 4000 Calibration Instructions

Engineers reference guide

Manufactured by D & I Scale Enterprises
Ware, Hertfordshire

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Loadcell connecting block located on PCB



- 1 = + Sense (If fitted)
- 2 = - Sense (If fitted)
- 3 = + Signal
- 4 = - Signal
- 5 = + Excitation
- 6 = - Excitation
- 7 = Screen

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Calibration

Entry to calibration/service mode:

Obtaining access to the calibration and service mode of the Micro 4000 is done by entering two 4 digit codes as the Micro 4000 is cycling through the display test at first switch on. If these codes are not entered at the correct time or the wrong code is entered the Micro 4000 will not enter the service mode.

Entry of the first 4 digit code **xxxx** must be entered only when the display is showing all 2's.

Entry of the second 4 digit code **xxxx** must be entered only when the display is showing all 7's.

After entry of the second digit code the Micro 4000 will not immediately enter the service mode, the service mode will be entered at the end of the 7's display test at which point the display will show "CALI".

Please note: You will need to contact us for the above codes (ie: by email)

Calibration:

With the display showing "CALI" press the "Enter" key, the display will show "CELL-U" for approx 2 seconds then display the mv/V loadcell voltage. If the displayed voltage does not suit your particular loadcell then press the "CLEAR" key and enter in the correct loadcell voltage. The valid range is from 0.9 - 3.2 mv/V in 0.1 mv/V steps.

When the correct voltage has been entered/displayed press the "ENTER" key to proceed to the next stage.

The display will show " d= " for approx 2 seconds then display the division size and decimal point already in the indicator. If these are not correct, press the "CLEAR" key to clear the display and enter in the correct division size and decimal point if required. Press the enter key to proceed to the next stage.

The display will show " CAP " for approx 2 seconds then display the capacity already in the indicator. If the displayed capacity is not correct press the "CLEAR" key to clear the display and enter in the correct capacity in kg. Press the enter key to proceed to the next stage.

The display will now show "SET-O", the Micro 4000 is now ready to perform the zero calibration. Remove any weight from the weighing platform, press the "ENTER" key, the display will show the internal zero figure counting backwards. this figure will normally stop between 2000 and 8000 internal counts. Do not disturb the weighing platform at any time during the zero calibration.

When the zero calibration has been completed the display will show "SPAN".

If the Micro 4000 is not to be calibrated at full load then press the "CLEAR" key and enter in the weight at which calibration is to take place.

Place the calibration weight on the weighing platform and press the "ENTER" key, the display will show "-----" for a few seconds and then revert to normal weighing mode.

Re-calibration of zero dead load only:

Should the need arise to re-calibrate the zero dead load only without affecting the span calibration then this can be done by following the normal calibration routine until the the display shows "SPAN" . Press the "CLEAR" key to clear the display to zero and then press the "ENTER" key. The M4000 will then revert to normal weighing mode after a few seconds.

Please note that if only a re-calibration of the zero dead load is performed then any changes that may have been made to the calibration data (cell-u,division size/decimal point,capacity) will be ignored as the original calibration data will be recalled from memory.

Spec settings

Spec settings:

There are 32 available spec settings which can be switched on/off to change various parameters of the Micro 4000.

To access the spec settings press the "1" key while the display is showing "CALI" the display will show "SPEC" for approx 2 seconds then display the first spec setting.

Step forward to the next spec setting by pressing the "1" key.

Step backwards to the previous spec setting by pressing the "2" key.

Change the spec setting between on/off by pressing the "PRINT" key.

To exit the spec setting mode press the "ENTER" key.

After exit from the spec mode the display will revert to "CALI" at which point the calibration mode can be entered by pressing the "ENTER" key or to exit the service mode and revert back to normal weighing mode press the "CLEAR" key. If the "CLEAR" key is pressed to revert to normal weighing mode then the weighing platform must be at zero load and there will be a delay of a few seconds before normal weighing mode is returned.

Blank Entries are for future software development

Spec 1.....Zero tracking = on/off
 Spec 2.....Parts counting= on/off
 Spec 3.....Buzzer = on/off.....(Checkweigher only).
 Spec 4.....Print date = on/off.....(Tally roll printer).
 Spec 5.....Print batch number = on/off.....(Tally roll printer).
 Spec 6.....Print consecutive number = on/off....(Tally roll printer).
 Spec 7.....RS232 Baud rate. off=2400 off=4800 on=9600 on=19200
 Spec 8.....RS232 Baud rate. off on off on
 Spec 9.....RS232 Data bits. off=7 bits. on=8 bits.
 Spec 10..... RS232 Continuous data output.= on. (This must be off if tally roll printer is connected)
 Spec 11..... Autoprint on a stable weight. = off/on.
 Spec 12..... Autoprint on removal of weight. = off/on.
 Spec 13..... Networking.....on = Networked. off = Stand alone.
 Spec 14..... Totaliser. on/off.
 Spec 15..... Print totals only. on/off.
 Spec 16..... Animal weighing operation. = on/off.
 Spec 17..... Semi-Auto tare on "Start" key. = on/off . Mode 1 of setpoint operation only.
 Spec 18..... Negative checkweigher operation. = on/off.
 Spec 19..... Check weigher operation mode. Mode 1 = off Mode 2 = on
 Spec 20..... Setpoint operation mode. Mode 1 = off Mode 2 = on
 Spec 21..... Allow negative setpoint operation only. = on/off
 Spec 22..... Tank weigher operation. on/off
 Spec 23..... Remote print key. = on/off.
 Spec 24..... Remote semi-auto tare key. = on/off.
 Spec 25..... Remote start key. = on/off.
 Spec 26..... Battery auto power off. off = Disabled. on = 2 minutes. off = 5 minutes. on = 10 minutes
 Spec 27..... Battery auto power off. off off on on
 Spec 28.....
 Spec 29..... Anti-vibration filter for zero. off = normal, on = zero filter active.
 Spec 30.....Filter control off = normal, on = Fast
 Spec 31.....Display update per second: Off = 7 , On = 5 (On =14 from software ver1.15 onwards).
 Spec 32.....Must always be on.

Error codes

Error codes:

The Micro 4000 runs a diagnostics program at switch on and when the Micro 4000 is calibrated. Any fault condition that is found is reported in the form of error codes. The following error codes and their possible cause's are listed below.

Display remains on all "99999" after display test Weighing platform outside of zero range.

Solution: Check that nothing is on or obstructing weighing platform.
Enter service mode and recalibrate scale.
Possible faulty loadcell/connection or faulty main board.

Error 01 Corrupt data has been detected in the nvram.

Solution: Press the "Enter" key and follow the normal instructions to enter the service mode.
Recalibrate the Micro 4000 and set-up the spec settings.

Error 02 Unable to calibrate the zero dead load as the dead load is too heavy.

Solution: Check load cell.
Remove excessive weight from weighing platform.

Error 03 No internal count.

Solution: Check load cell.
Check load cell connections.

Error 04 An attempt is being made to calibrate the span backwards.

Solution: Reverse load cell connections.

Error 05 Keyboard has a key stuck down.

Solution: Change membrane keypad.

Error 06 Printer offline.

Solution: Check printer is connected to Micro 4000.
Check that DTR of printer is connected to CTS of Micro 4000.

Error 07 Communications error.

Solution: Check Baud rate and communication settings.

Parts counting

Parts counting operation:

To activate the parts counting software of the Micro 4000 spec setting 2 must be on.

The parts counting software of the Micro 4000 has been written to enable the user to count units easily and accurately. The Micro 4000 will not enter the counting mode if a Preset tare is in use, only the Semi-auto tare is available for counting purposes.

As with all counting scales, it is important to obtain an accurate sample, especially if the sample is very small, therefore before any sample is taken make sure that the display is at true zero. (zero lamp on). A container can be placed on the weighing platform and tared off using the semi-auto tare if required.

Please note:

If there is a delay of longer than approx 4 seconds between any consecutive key entry when entering the sample then the the Micro 4000 will automatically revert back to normal weighing mode.

Entering a sample:

With the Micro 4000 in normal weighing mode place your sample on the weighing platform and the press the "F1" function key. (The display will show "Pc= ___").

Enter the number of units on the weighing platform (Max 999) and press the "Enter" key. The display will start to flash at which time the Micro 4000 is calculating the unit weight and the weighing platform should not be disturbed during this period.

After approx 3 seconds the display will show the count in the display with a small "c" on the left hand side of the display to indicate that the Micro 4000 is in the counting mode. To exit the counting mode or to take another sample press the "Clear" key and the Micro 4000 will revert back to normal weighing mode.

A negative count is indicated by the letter "E" on the left hand side of the display. The "Zero" and "Semi-auto" tare keys have the same function as in the normal weighing mode.

If a printer is in use and the Micro 4000 is in the counting mode then the following information will be printed.

	Consec No.
Date	00-00-00
Batch	123456
Pieces	785
S-Tare	1.00 kg

(NB: The Consec No/Date/Batch can be selected to either be printed or not in the spec settings).

Printing

Printer Interface (Optional):

The Micro 4000 is capable of driving most standard RS232C serial printers. Data such as the "Date", "Batch No", and "Consecutive No" can be selected to be printed or not in the spec settings.

There are three modes of operation that can be selected. (spec 11 and spec 12).

Mode 1: (spec 11=off, spec 12=off)

Data is only printed when the weight is stable and the "Print" key is pressed. Only one ticket is allowed per weighing, the displayed weight must return to within 2 divisions of zero to reset print cycle.

Mode 2: (spec 11=on, spec 12=off)

Data is automatically printed when a stable weight is detected. Once a ticket has been printed the displayed weight must return to within 2 divisions of zero to reset the Autoprint cycle.

Mode 3: (spec 11=off, spec 12=on)

Data is printed on removal of weight. (last stable weight detected).

The last stable weight is printed when the displayed weight returns to within 20 divisions of zero.

Presetting of the consecutive ticket No:

The consecutive ticket number can only be preset in the service mode of the Micro 4000.

After entering the service mode of the Micro 4000 and with the display showing "CAL" press the "9" key, the display will show " 0". Enter the starting number of the consecutive ticket number and press the "ENTER" key, the display will now revert to "CAL". The "CLEAR" key can now be pressed to exit the service mode if required.

Entering the date:

With the Micro 4000 in normal weighing mode, use the "MODE" key to scroll the display until the display shows "date", press the "ENTER" key. The display will now flash " ____0".

Enter in the date in the following format (DD-MM-YY) and press the "ENTER" key, the Micro 4000 will now revert back to normal weighing mode.

Entering a batch number:

With the Micro 4000 in normal weighing mode, use the "MODE" key to scroll the display until the display shows "batch", press the "ENTER" key. The display will now flash " ____0".

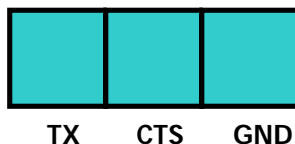
Enter in the batch number (max 6 digits) and press the "ENTER" key, the Micro 4000 will now revert back to normal weighing mode.

Please note:

The date and batch number are held in ram and are reset to zero if the Micro 4000 is switched off.

Printer connection

M4000 RS232C internal connector block (Printer interface only)



Data Format:

All data is transmitted in ASCII code with each line being terminated with a carriage return and line feed.

Baud rate. (selectable in spec settings)
2400, 4800, 9600, 19200

Data bits. (selectable in spec settings)
7 or 8 data bits

Parity. (not selectable)
No parity .

Stop bits. (not selectable)
1 stop bit.

Typical printer connection

Micro 4000
(internal connector block)

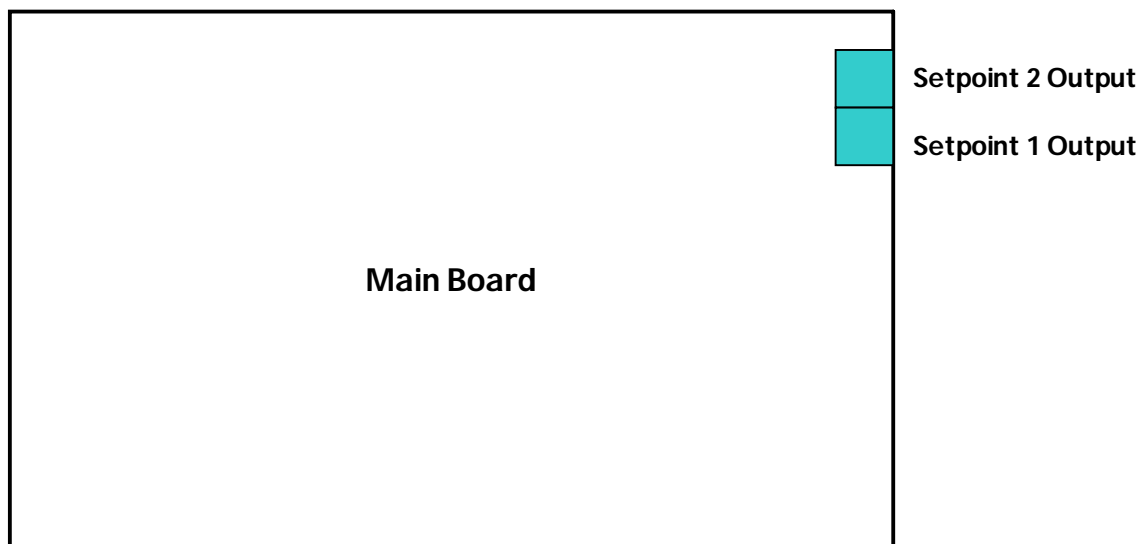
Printer
(25 way D-type connector)

TX		Pin 3 (RX)
CTS		Pin 20 (DTR)
GND		Pin 7 (GND)

Setpoint connections

Relay contact rating:

The relay contacts are voltage free and are capable of switching 1 Amp at 30 Vdc or 1 Amp at 240 Vac. The switching of 240 Vac is not recommended and if this is required then an external relay box should be used.



Setpoints

Setpoint Interface (Optional):

The Micro 4000 can be fitted with either 1 or 2 setpoint outputs which can be configured to operate in two modes of operation.

Entering a Setpoint

With the Micro 4000 in normal weighing mode, use the "MODE" key to scroll the display until the display shows "SET 1" or "SET 2" depending on which setpoint you want to change, press the "ENTER" key and the display will show the value of the setpoint already in the Micro 4000.

Enter in the new setpoint as required and then press the "ENTER" key. The Micro 4000 will now revert back to normal weighing mode.

The setpoint values are stored internally and remain valid even if the Micro 4000 is switched off.

Mode 1: (spec 20=off)Utilising a start key.

The F3 key is used as the start key as standard.

(A remote start key facility is also available)

The relay contacts are normally open. On depression of the start key the relay contacts close and remain closed until the target weight is reached at which point the relay contacts are opened. They remain open until the sequence is reset by allowing the weight to return to within 2 divisions of zero at which point the start key can be pressed again to restart the sequence. The start key will remain inactive if the sequence is not reset by allowing the weight to return to within 2 divisions of zero.

Mode 2: (spec 20=on)

(Normally used to operate lamps etc.)

The relays are non-latching and a start key is not required.

The relay contacts operate freely and are open below the target weight and close when at or above the target weight.

Negative setpoint operation: (spec21=on)

Negative setpoint operation is only valid for mode 2 and allow's the the target weight to operate on a negative weight only.

Remote keys

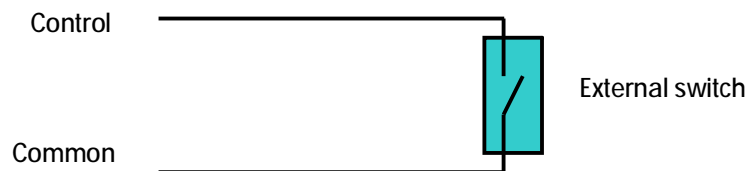
Remote key facility (Optional):

The remote key facility allows the Micro 4000 to be fitted with up to 3 external remote keys. These remote keys duplicate the key function as designated on the front facia panel. Configuration of the remote keys is carried out in the service mode and allow's the key function to be local (ie:operation from the front facia) or remote. If the key is allocated as remote then the key function is disabled on the front facia panel.

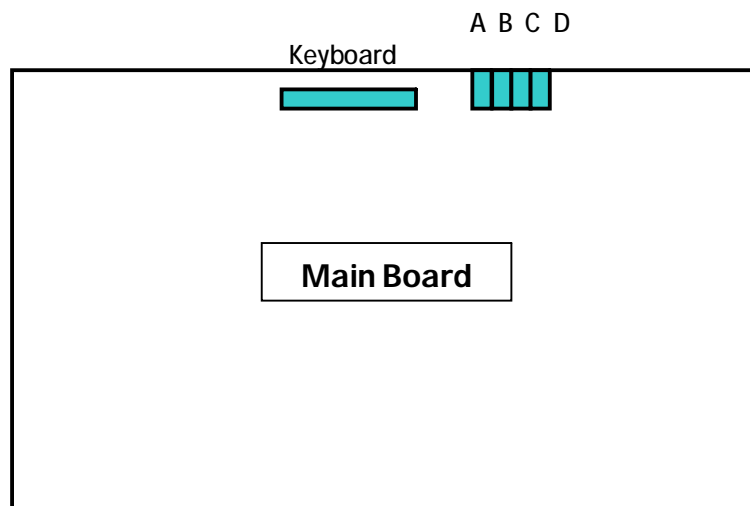
Allocation of remote keys

Print key	-----> spec 23 (off = internal , on = remote)
Semi-auto tare key	-----> spec 24 (off = internal, on = remote)
Start key(F3)	-----> spec 25 (off = internal, on = remote)

Connection of a remote key is very simple and consists of a two wire momentary push button switch as shown in the circuit below. This circuit should be duplicated for each remote key switch fitted.



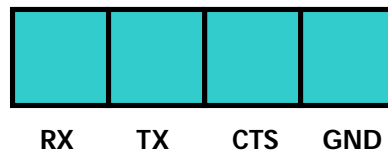
A = remote start control
 B = remote print control
 C = remote tare control
 D = common



N.B. A good quality shielded cable should be used with the outer cable screen connected to the central earthing tag bolted on to the rear chassis. The maximum cable length should not exceed 3 metres.

RS232C computer interface

M4000 RS232C internal connector block (Computer interface only)



Data protocol:

See data protocol sheet. (Note: spec 13 must be switched on)

The communication settings must be set to the following format:

Baud rate. (Setup in spec settings. Spec 7 = on, Spec 8 = off)
9600

Data bits. (Setup in spec settings. Spec 9 = on)
8 data bits

Parity. (not selectable)
No parity .

Stop bits. (not selectable)
1 stop bit.

Typical computer interface

<u>Micro 4000</u> (internal connector block)	<u>Computer</u> (25 way D-type connector)
TX	Pin 3 (RX)
RX	Pin 2 (TX)
CTS	Not used
GND	Pin 7 (GND)

N.B. A good quality shielded cable should be used.

RS485 network interface

M4000 RS485 internal connector block (Network interface only)



A+

B-

Data protocol:

See data protocol sheet. (Note: spec 13 must be switched on)

The communication settings are preset and cannot be altered:

(Note: The communication spec settings have no effect on the following parameters)

Baud rate.

9600

Data bits.

8 data bits

Parity.

No parity .

Stop bits.

1 stop bit.

For guide lines on a typical network setup please see the RS485 network installation diagram.

N.B. A good quality shielded twisted pair cable should be used.