

Scaling Micro C Display with Quadrature Input for Position Reading in Engineering Units

The Micro-C display allows two methods of programming to obtain correct engineering units:

- A** Scale factor and offset
- B** Coordinates of 2 points.

Use the Coordinates of 2 points method when a known distance is to be traversed.

A "Scale Factor and Offset" Scaling Method

The following assumes that the display has been connected to the transducer per the attachment diagrams shown on sheet 2 of this document.

- 1** Set the third digit of the "SEtUP" parameter to zero (ie. XX0XX)
- 2** Obtain the transducer resolution (counts per inch or counts per millimeter) from the UniMeasure calibration sheet. If times 4 counting mode is used, multiply the resolution by a factor of 4. Calculate the Scale Factor with the following formula:

$$SF = M \div Resolution$$

Where **M** is the multiplier from the table below for the desired number of decimal places and **Resolution** is from step **2** above.

Decimal Place	Multiplier for sensitivity (M)
dd.ddd	1 000
ddd.dd	1 00
dddd.d	1 0
dddddd.	1

- 3** Input the result of the above multiplication into the SCALE setting. For best accuracy use as many digits of the scale setting as possible and use the decade multiplier in the scale factor to compensate.

- 4** Input an appropriate offset value into the OFFSt1 parameter. If no offset is required, input zero.

B "Coordinates of 2 Points" Scaling Method

When the transducer is to be extended a known distance, the "Coordinates of 2 points" method may be used to program the display.

The following assumes that the display has been connected to the transducer per the attachment diagrams shown on sheet 2 of this document and power has been applied to the display.

- 1** Set the third digit of the "SEtUP" parameter to zero (ie. XX0XX)
- 2** Set the dEc.Pt1 parameter to 111111.
- 3** Set the SCALE parameter to 1.00000. Make sure that the scale factor is set to 1. (When in the SCALE parameter the scale factor may be accessed by pressing the digit select key once more after the digit on the extreme right is blinking.)
- 4** Set the OFFSEt parameter to 0
- 5** With the wire rope of the transducer extended to the initial position, zero the display by simultaneously pressing the view/reset and menu keys (or use remote recess from terminals on rear of display). Extend the wire rope of the transducer to the desired maximum position and record the maximum value displayed.

Alternatively: Two values for the "Coordinates of 2 Points" scaling method may be obtained from the UniMeasure calibration data supplied with the transducer.

- 6** Reprogram the display with the following changes:
 - A** SEtUP function—set for "coordinates of 2 points" scaling (XX1XX).
 - B** Set the dEc.Pt1 parameter as desired.
 - C** Lo in parameter—input the initial count value from step 4 above.
 - D** Lo rd parameter—input the reading desired for the wire rope of the transducer extended to the zero position. (This value is typically zero but may be other than zero)
 - E** Hi in parameter—input the maximum count value from step 4 above.
 - F** Hi rd parameter—input the desired maximum reading. This is typically the known distance that the wire rope of the transducer must extend.

The display is now programmed to read in correct engineering units.

Display Setup Parameters

Date:		
Model No.:		
Serial No.:		
Menu Key	Digit Select Key	Value Select Setting
InPut	quAdr	totAL
SEtUP	00000	
ConFIG	0_00	
PULSES	00000	
GAtEt	000.00	
dSPyt	000.00	
ti Out	000.00	
bAtch	0000	
FILtr	00000	
SLOPE	00	
dEc.Pt 1	1.1111	
SCALE factor	0.00000	
SCALE Multiplier	1	
OFFSt1	0000.00	
Lo in1	0.0000	
Lo rd1	0.0000	
Hi in1	0.0000	
Hi rd1	0.0000	
SourcE	00	
AL SEt	00000	
dEUn 1b	000000	
dEUn 2b	000000	
An Set	00	
An Lo	0.0000	
An Hi	0.0000	
Ser 1	000	
Ser 2	0000	
Ser 3	00000	
CALib	000000	
Loc 1	0000	
Loc 2	0000	
Loc 3	0000	
Loc 4	0000	
Programmed output reads in units of:		

Scaling Extended Version Micro C (MCRE) Display with Quadrature Input for Velocity (Rate) Reading in Engineering Units

Display Setup Parameters

Model No.: _____

Date: _____

Serial Number _____

Menu <u>Key</u>	Digit Select <u>Key</u>	Value Select <u>Setting</u>
InPut	QuAdr	rAtE
SEtuP	00000	_____
ConFIG	0000	_____
PULSES	00000	_____
GatE t	000.00	_____
dSPyt	000.00	_____
ti Out	000.00	_____
bAtch	0000	_____
FiLtEr	00000	_____
SLOPE	00	_____
dEC.Pt 1	1.11111	_____
dEC.Pt 2	2.22222	_____
SCALE 1*	1.00000	_____
Decade Multiplier 1		_____
OFFSt 1	0000.00	_____
Lo in1	0.0000	_____
Lo rd1	0.0000	_____
Hi in1	0.0000	_____
Hi rd1	0.0000	_____
SCALE 2	1.00000	_____
Decade Multiplier 2		_____
OFFSt 2	0000.00	_____
rESoLn	0.00001	_____
Lo in2	0.0000	_____
Lo rd2	0.0000	_____
Hi in2	0.0000	_____
Hi rd2	0.0000	_____
Source	00	_____
AL SEt	00000	_____
dEUn 1b	000000	_____
dEUn 2b	000000	_____
An Set	00	_____
An Lo	0.0000	_____
An Hi	0.0000	_____
Ser 1	000	_____
Ser 2	0000	_____
Ser 3	00000	_____
CALib	000000	_____
Loc 1	0000	_____
Loc 2	0000	_____
Loc 3	0000	_____
Loc 4	0000	_____

Programmed output reads in units of :

Scale Factor

For program items **SCALE 1** and **SCALE 2**, the count increment for a UniMeasure digital transducer may be used as a scale factor to obtain rate. Note that for the display to read in the same units in both the extending and retracting modes of the transducer, SCALE 1 and SCALE 2 must be the same. Specifically, enter one of the following in SCALE1 and SCALE2 to obtain the rate units shown.

For Quadrature Card set in **TIMES 1** counting mode:

1. **inches per second**—enter the “inch/count with times 1 counting mode” from the UniMeasure calibration sheet.
2. **inches per minute**—multiply 60 times the “inch/count with times 1 counting mode” from the UniMeasure calibration sheet.
3. **millimeters per second**—enter the “mm/count with times 1 counting mode” from the UniMeasure calibration sheet.
4. **millimeters per minute**—multiply 60 times the “mm/count with times 1 counting mode” from the UniMeasure calibration sheet.

For Quadrature Card set in **TIMES 4** counting mode:

1. **inches per second**—enter the “inch/count with times 4 counting mode” from the UniMeasure calibration sheet.
2. **inches per minute**—multiply 60 times the “inch/count with times 4 counting mode” from the UniMeasure calibration sheet.
3. **millimeters per second**—enter the “mm/count with times 4 counting mode” from the UniMeasure calibration sheet.
4. **millimeters per minute**—multiply 60 times the “mm/count with times 4 counting mode” from the UniMeasure calibration sheet.

Resolution Parameter (rESoLn)

The rESoLn parameter corrects the output for the number of decimal places selected with the dEC.Pt 1 & 2 parameter. For the output to read with the correct decade, the rESoLn parameter should be as follows:

DEC.Pt	rESoLn
xxxxxx	1
xxxxx.x10	
xxxx.xx100	
xxx.xxx1000	

Display Electrical Connections

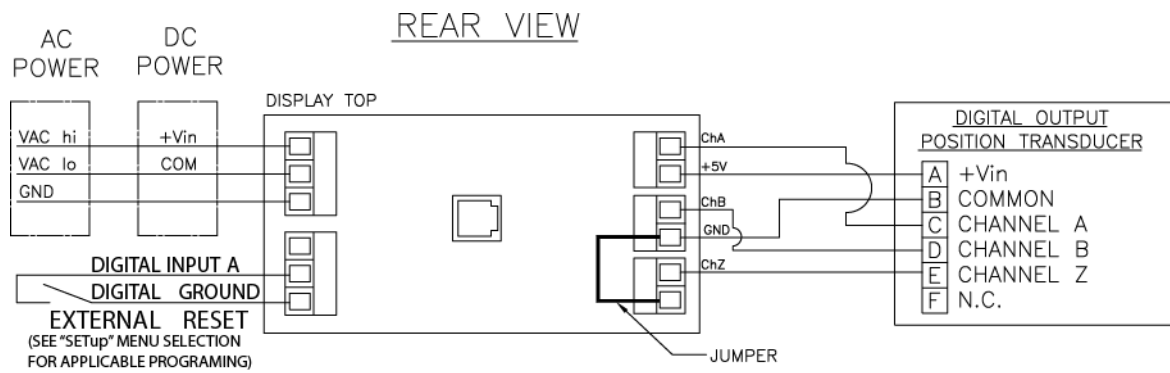
CAUTION

Before applying electrical power, check the top of the Micro-C display to determine the correct input voltage and type.

Standard TTL Connection

MCR Display—Position Measurement

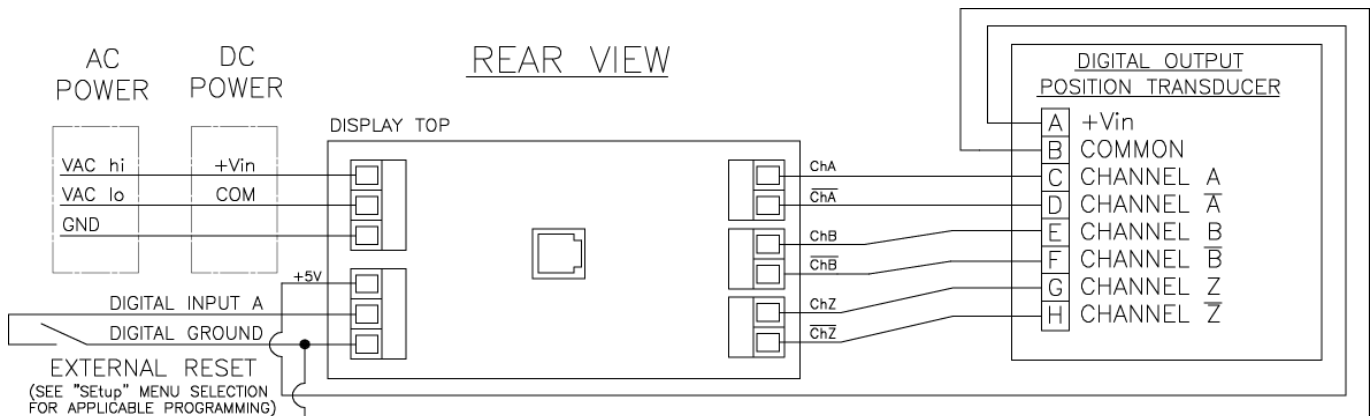
MCRE Display—Position or Velocity Measurement



5 VDC Differential Connection

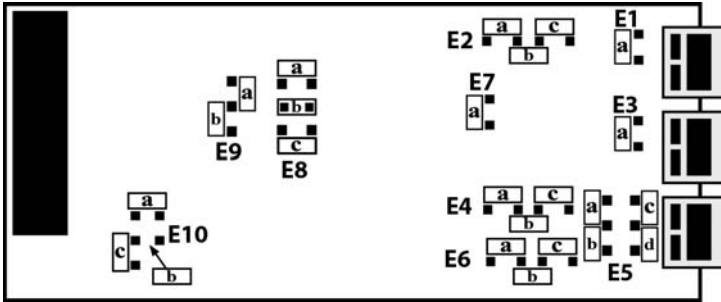
MCR Display—Position Measurement

MCRE Display—Position or Velocity Measurement



Jumper Settings

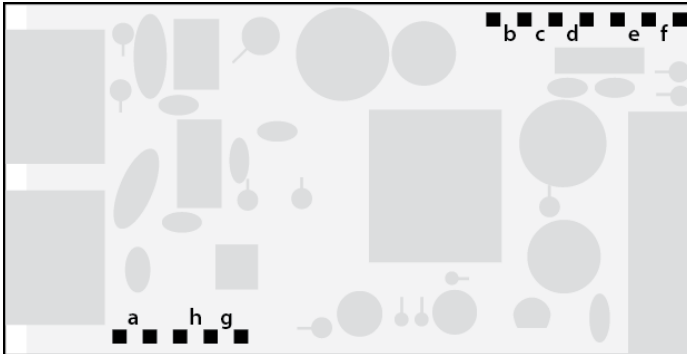
Quadrature Signal Conditioner



Input Type	E2	E4	E6	E5
Single-ended (signal & return)	a, c	a, c	a, c	c
Differential	b	b	b	c
Input Termination (for differential inputs only)	E1	E3	E5	
For long signal input cable runs	a	a	a	
For short signal input cable runs	none	none	none	
Phase for Up Count	E7			
(A leads B)	none			
(B leads A)	a			
Count-by Options	E9			
X1 = positive edge of A input	none			
X2 = positive & negative edges of A input	a			
X4 = positive & negative edges of A & B inputs	b			
Zero Index Polarity/Zero Index ANDing	E8		E10	
	No Connection		No Connection	

Power Supply PCA – Jumper Settings

Three isolated transducer excitation output levels are available from the power supply board. These are selectable via jumpers b, c, d, e, f in the upper right of the board, as illustrated. In addition, the board provides three jumper positions for special features.



Excitation Output	Jumper Locations	
5 Vdc \pm 5%, 100 mA max	b, d, e	
10 Vdc \pm 5%, 120 mA max	b, d, f	
24 Vdc \pm 5%, 50 mA max	c	

Selection of other jumpers

Jumper a - Front panel menu lockout, locked when installed. See Section 9.

Jumper g - Provides +5V power output at P1-4 when installed.

Jumper h - Connects "Digital Input B" to P1-4 when installed.