

Unisystem weighing instruments have up to three synchronous outputs. One is display (BCD) information for remote displays and BCD-boards. The other is binary for DA-boards and two setpoints. The third in U237 series is 7 segment display information. All have a common clock.

**U1270/1/2/3/4.** Old version. (25p male D-sub)

Data 1 (display) is chosen by Calibration step Cs2:+4.  
Data 2 (binary) is chosen by Calibration step Cs2:+8.

J1:08 Data out type 1. J1:17 Ground  
J1:12 Data out type 2. J1:20 +5V  
J1:09 Clock pulse out. Low at rest. J1:21 0VD  
Outputs: I out = -0.2mA, V out min 2.4V. I out = 3.2mA, V out max 0.6V.

**U1275/6.** New version with LED display from 1995. (25p male D-sub)

J1:03 Data out type 1. Inverted. J1:17 Ground  
J1:06 Data out type 2. Inverted. J1:20 +5V  
J1:25 Clock pulse out. High at rest. J1:21 0VD  
Outputs from open collector ULN2003 circuit.

**U137 series.** (25p female D-sub)

J1:10 Data out type 1. Inverted. J1:01 Ground  
J1:04 Data out type 2. Inverted. J1:03 +5V  
J1:11 Clock pulse out. High at rest. J1:02 0VD  
Outputs from 74HC368 circuit.

**U237 series.** (Old version with CPU 6303. Internal signal.)

J1:15 Data out type 1. J1:01 Ground  
J1:14 Data out type 2. J1:03 +5V  
J1:16 Clock pulse out. Low at rest. J1:02 0VD  
J5:03 Data out type 3.  
Outputs direct from 6303 ports.

**U237 series.** (New version with CPU 68HC11 from late 1995. Internal signal.)

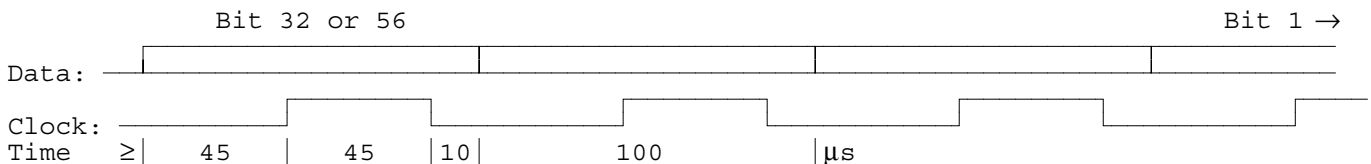
J1:15 Data out type 1. Inverted. J1:01 Ground  
J1:14 Data out type 2. Inverted. J1:03 +5V  
J1:16 Clock pulse out. High at rest. J1:02 0VD  
J5:03 Data out type 3.  
Outputs from 74HC00 circuit except J5:03 which is direct from 68HC11 port.

**U1320/1.** (Internal bus signal)

J6,7,8:22 PB5 Data out type 1.  
J6,7,8:21 PB4 Clock pulse out. Low at rest.

**Protocols for the signals.**

32 bits or 56 bits for U237 series are sent out. The period is approximately 135µs. All times may be prolonged due to interrupt. Total transmission time is min 5.6msec for 56 bits.  
Clock pulse is going positive during 45µsec. The data may be read on any of the edges of the clock pulse.  
Note that bit 1 is the last bit sent out.



The times are the normally prolonged due to interrupt etc.

Data 1.		Data 2.	
Bit	Function	Bit	Function
1	Digit 1:1 LS	1	Setpoint L15 (U137 and U237, 1)
2	Digit 1:2	2	Setpoint L14 (U137 and U237, 2)
3	Digit 1:4	3	Binary Digit 1 LS
4	Digit 1:8	4	Binary Digit 2
5	Digit 2:1	5	Binary Digit 3
6	Digit 2:2	6	Binary Digit 4
7	Digit 2:4	7	Binary Digit 5
8	Digit 2:8	8	Binary Digit 6
9	Digit 3:1	9	Binary Digit 7
10	Digit 3:2	10	Binary Digit 8
11	Digit 3:4	11	Binary Digit 9
12	Digit 3:8	12	Binary Digit 10
13	Digit 4:1	13	Binary Digit 11
14	Digit 4:2	14	Binary Digit 12
15	Digit 4:4	15	Binary Digit 13
16	Digit 4:8	16	Binary Digit 14 MS
33-56	U237. No significance.	17-32 or -56	No significance.

All bits 0 corresponds to zero - 4 scale intervals.

All bits 1 corresponds to max capacity + 3 scale intervals.

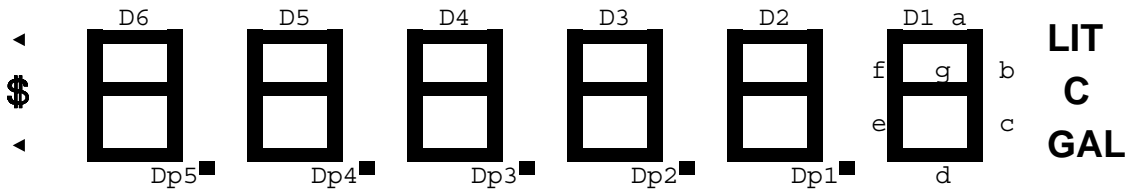
Data 3 for U237. 7 segments (a - g) output. 6 digits, 1 is least significant. Dp = decimal point.

Bit	Function	Bit	Function	Bit	Function	Bit	Function	Bit	Function	Bit	Function
1	"0"	11	Digit 1 f	21	Digit 2 d	31	Digit 3 b	41	Dp 4	51	Digit 6 f
2	"0"	12	Digit 1 e	22	Digit 2 c	32	Digit 3 a	42	Digit 5 g	52	Digit 6 e
3	"0"	13	Digit 1 d	23	Digit 2 b	33	Dp 3	43	Digit 5 f	53	Digit 6 d
4	GAL	14	Digit 1 c	24	Digit 2 a	34	Digit 4 g	44	Digit 5 e	54	Digit 6 c
5	C	15	Digit 1 b	25	Dp 2	35	Digit 4 f	45	Digit 5 d	55	Digit 6 b
6	LIT	16	Digit 1 a	26	Digit 3 g	36	Digit 4 e	46	Digit 5 c	56	Digit 6 a
7	< bottom	17	Dp 1	27	Digit 3 f	37	Digit 4 d	47	Digit 5 b		
8	\$	18	Digit 2 g	28	Digit 3 e	38	Digit 4 c	48	Digit 5 a		
9	< top	19	Digit 2 f	29	Digit 3 d	39	Digit 4 b	49	Dp 5		
10	Digit 1 g	20	Digit 2 e	30	Digit 3 c	40	Digit 4 a	50	Digit 6 g		

New U137 and U237 series instruments with 68HC11 processor have a separate clock for this output. In the protocol is also included, for internal use only, a fast output to a scanned LED display.

**OPTIONS**

**U2381 16 mm standard LCD display for U237 series.**



The display has backlight.

Connector.

- |                |          |               |                                     |
|----------------|----------|---------------|-------------------------------------|
| 1 0VD          | 3 Data 3 | 5 Chip Enable | 7 Backlight -V                      |
| 2 +5V, max 3mA | 4 Clock  | 6             | 8 Backlight +V. Typical 80mA at 5V. |

**U1378 14 mm standard 5 digit LED display board for U137 series.**

U1374 is an optional case similar to that of U137 series. Power from an external +5V. Connector J1.

- |          |       |          |
|----------|-------|----------|
| 1 Ground | 3 +5V | 5 Signal |
| 2 0 V    | 4 Key | 6 Clock  |

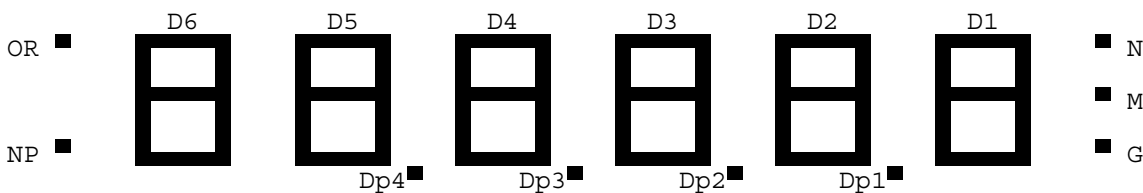
Connection to U127 series. External +5V to U1374 is needed. Max distance some 50m.

U127 J1:8 to J1:5. U127 J1:9 to J1:6. U127 J1:21 to J1:2. U127 J1:17 to J1:1 (Shield). U127 J1:8 and 9 must have 1k pull-up resistors to J1:20 +5V.

Connection to U137 series. External +5V to U1374 is needed. The data signal must be inverted. In U1374, PC506 and later, the transistor Q1 and resistors R15 and R16 can be inserted to perform this.

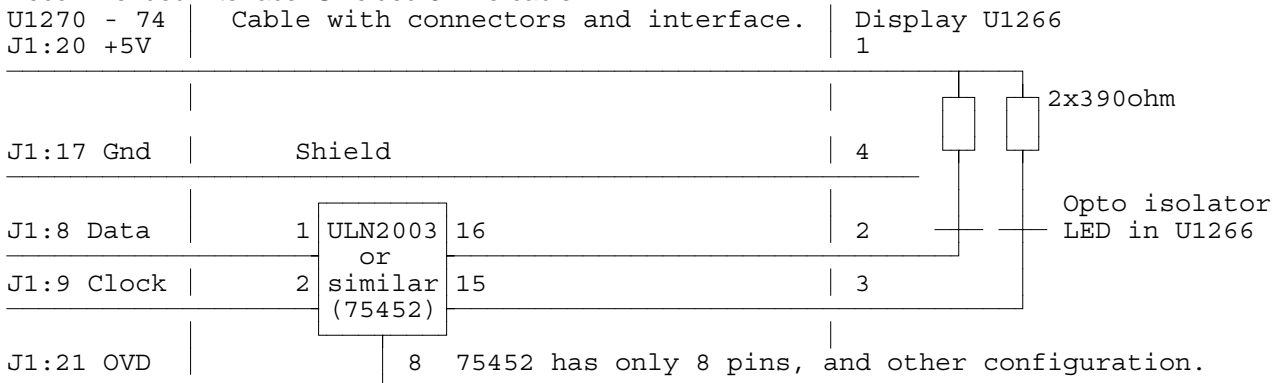
U137 J1:10 to J1:5. U137 J1:11 to J1:6. U137 J1:2 to J1:2. U137 J1:1 to J1:1 (Shield).

**U1266 50 mm 6 digit LED display. Discontinued.**



This display is connected to synchronous output type 1.

Recommended interface. Shielded 3 wire cable:



With this simple interface, cable capacitance up to 50 nF is accepted, and this corresponds to typical 250m cable. U1275/6, U137 series and new models of U237 series have internal interface circuits.

**U1285 DA board with 0/4 - 20 mA output. Discontinued.**

This board is connected to synchronous output type 2.

The board must be fed with an external isolated DC from 23 to 33 volt.

Min current 30 mA.

Output: Isolated 0 - 20 mA, max 10 volt.

Resolution: 14 bits or 1 part in 16,384 or 61 ppm. ppm = parts per million.

Linearity: Better than 0.012% or 120 ppm.

Temperature drift: Max  $0.1\mu\text{A} \pm 20$  ppm (typ 5 ppm) of output per °C.

Dimensions: 99x90x23mm. May be mounted inside U1270/2/3, when no other board is mounted.

Output connector 9p male D-sub J2.

1 + out	4 External 23 - 33 VDC	7 Not used
2 - out	5 0 V	8 L14 or U137 setpoint 2
3 Ground	6 Not used	9 L15 or U137 setpoint 1

**U2390 DA board with 0/4 - 20 mA or 0 - 5V output.**

This board is connected to synchronous output type 2.

The board must be fed with an external isolated DC from 15 to 30 volt.

Min current 30 mA.

Output: Isolated 0/4 - 20 mA, max 9 volt or 0 - 5V.

Resolution: 14 bits or 1 part in 16,384 or 61 ppm. ppm = parts per million.

Linearity: Better than 0.012% or 120 ppm.

Temperature drift: Max  $0.1\mu\text{A} \pm 50$  ppm (typ 20 ppm) of output per °C.

Total output error at full scale and 25°C: Max 0.15%.

Dimensions: 82x75x20mm. Must be mounted inside U1275, U137 or U237 series.

Output connector 15p male D-sub J2.

1 + out	6 Not used	11 Not used
2 - out	7 Not used	12 Not used
3 0V	8 Not used	13 External 15 - 30 VDC
4 Ground	9 Not used	14 0 V
5 Not used	10 Not used	15 Ground

	JP2	JP3
0 - 20mA	Off	Off
4 - 20mA	On	On
0 - 5V	Off	On

**U1278 Parallel BCD output board for U127 series weight indicators.**

Isolated BCD board with sign, motion, net and overrange on 28 open collector outputs (ULN2004).

There are also output for data valid, input for output disable and suppression diodes for inductive loads.

This board is connected to synchronous output type 1.

Max ratings of the open collector outputs are  $V_{CE}$  max. 50V,  $I_C$  max. 250mA.

Dimensions 99x90x23mm. May be mounted inside U1270/2/3, when no other board is mounted.

1 corresponds to low (conducting) output in ULN 2004.

D5 is the most significant digit.

Output NEG, negative sign = 0.

Output M, motion = 0.

Output OR, overrange = 0.

Output NET, net = 0.

Output TS from suppression diodes for inductive loads.

Output DATV for data valid. Output for data valid has the CMOS level of the external 5 to 15V.

Input OUTE. The outputs are enabled by strapping the input OUTE to 0. In this way more outputs may be connected in parallel and one selected.

The board is opto isolated, and must be fed with an external 5 VDC (max 10 mA) to 15 VDC (max 35mA).

Interface to instrument 5 pin wafer.

1 Data input	3 0V	5 Ground
2 +5V	4 Clock input	

34p flat cable connector			
Pin 1	D1:1	Pin 18	D1:2
2	D1:4	19	D1:8
3	D2:1	20	D2:2
4	D2:4	21	D2:8
5	D3:1	22	D3:2
6	D3:4	23	D3:8
7	D4:1	24	D4:2
8	D4:4	25	D4:8
9	D5:1	26	D5:2
10	D5:4	27	D5:8
11		28	
12		29	
13	NET	30	M
14	NEG	31	OR
15	TS	32	OUTE
16	0V	33	+5-15V
17	DATV	34	Ground

**U1375 Setpoint unit with 2 relays.**

This is a small, 89x90mm, low price board with 2 relays for the setpoints in the type 2 synchronous output. It is especially convenient for U137 series. The board is powered from U137 but must be placed in a separate metal box. The optional U1624, 104x100x36mm, is recommended. Shielded cables must be used.

J1 5p wafer.	J2 15p D-sub male		
1 Ground	1 L15 or 1 Common	6 L14 or 2 NC	11 Optional out
2 Clock	2 L15 or 1 NO	7 Optional common	12 Optional out
3 Data	3 L15 or 1 NC	8 Optional NO	13 +5V out
4 0	4 L14 or 2 Common	9 Optional NC	14 0V
5 +5V	5 L14 or 2 NO	10 Optional out	15 Ground

NO means open and NC closed to common, when the weight is below the setpoint.

**Relay specification:** Max current: 3A. Voltage: 10μV to 250V. AC line voltage not recommended because of high disturbance level and negative influence on life. Up to 24VDC is recommended. Isolation resistance: 10<sup>11</sup>ohm. Operational life: 1W >10<sup>8</sup>, 3W >10<sup>7</sup>, 30W >10<sup>6</sup>, 50W >10<sup>4</sup> switching operations.

**U1730 Setpoint unit with 2 semiconductor DC relays.**

This is a small, 81x65mm, low price board with 2 semiconductor output relays for the setpoints in the type 2 synchronous output. There is also a common holding input for both outputs. The board can be mounted inside U237 series instruments. Shielded cables must be used.

J1 2x8p socket.	J2 15p D-sub male		
1 Ground	1 L15 + Max 60V	6	11 Hold -
2 0	2 L15 - Max 1.5A	7 Optional +	12
3 +5V	3	8 Optional -	13 +5V out
14 Data	4 L14 + Max 60V	9	14 0V
16 Clock	5 L14 - Max 1.5A	10 Hold +5-30V, 10kohm	15 Ground