

**DESCRIPTION**

Series 2000 expansion module with 16 digital input 24V, 8 digital output (PNP open collector) and 4 analog inputs.

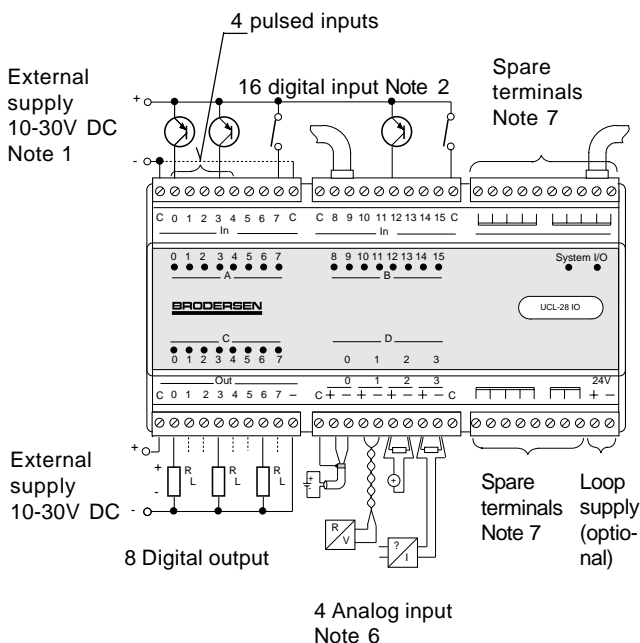
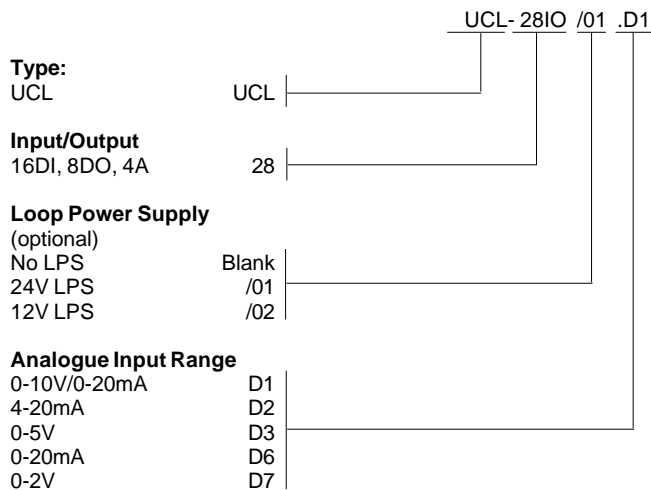
The 4 first digital inputs can be used as pulsed (counter) inputs (up to 100 Hz).

The analog inputs have galvanic isolation between the individual channels. Solid state relays are used for multiplexing the analog inputs.

The module is equipped with a micro controller taking care of the processing of the analog inputs and the counter inputs.

Isolated 24V supply (optional) are provided for e.g. 4-20mA analog input loop.

**VERSIONS/ORDERING CODES**



**TECHNICAL DATA (ANALOG)**

**Inputs:** 4 multiplexed analog channels with solid state multiplexer (note 5).

**Input configuration:** Differential (+/-), flying capacitor type.

**Input measuring ranges:**

Type no. code	Voltage input	Current input
.D1	0-10V	0-20mA
.D2		4-20mA
.D3	0-5V	
.D6		0-20mA
.D7	0-2V	

**Resolution:** 12 bit (note 5).

**Input impedance:** Voltage: D1: 100 kOhm  
D3: 50 kOhm  
D7: >100 kOhm  
Current: D1: 500 Ohm (note 4)  
D2/D6: 100 Ohm

**Absolute maximum ratings (note 3):**

Input voltage: ±40V DC  
Input current: ±30mA DC

**Sampling interval:** 100 ms (note 5).

**Measuring accuracy:**

25°C: ±0.2% ±6LSB (typical) 0.05% ±3LSB  
-10°-55°C: ±0.3% ±8LSB (typical) 0.1% ±4LSB.

**Linearity:** Better than ± 1LSB.

**Temperature stability:** Better than ± 50ppm/°C (typical).

**Common mode input voltage:** Max. ±80V DC (note 1).

**Common mode rejection ratio:**

Min. 60dB (typical 72dB).

**Series mode rejection:**

Min. 30dB (50-120Hz).

**Isolation (input to input):** 500V (note 1).

**Loop supply (optional):**

24V±5% / max. 200mA.  
(short circuit protected)  
12V ±5% / max. 400mA.

**Isolation:** 500V AC.

**Digital input/output**

Combined analog input, digital I/O UCL-28 IO

**TECHNICAL DATA (DIGITAL)**

**Inputs :** 16 (negative common)  
All equipped with optocouplers.

**Input voltage activated:** 10-30V DC, note 3.

**Input voltage deactivated:** Max. 3V DC.

**Input current:** 12V DC: Typical 3mA.  
24V DC: Typical 6mA.

**Input delay:** Typical 1ms.

**Pulsed (counter) inputs:** 4 (digital input 0, 1, 2, 3).

**Counting frequency:** max. 100Hz (5ms pulse / 5ms pause).

**Resolution:** 12 bit (0-4095) note 9.

**Outputs :** 8 PNP open collector  
All equipped with optocouplers.

**External voltage (outputs):** 10 - 30V DC, note 3.

**Output voltage drop:** Max. 1.5V (output activated).

**Output current:** Max. 0.5A.

**Output peak current:** Max. 5A in 1 second, note 3.

**Output leakage current (off):**Max. 0.5mA.

**Output delay:** Max. 1ms.

**Isolation** (input or output to electronics, input to output): 1kV AC.

**Indicators:** One for each digital input (red) indicating active input.  
One for each digital output (yellow) indicating active output.

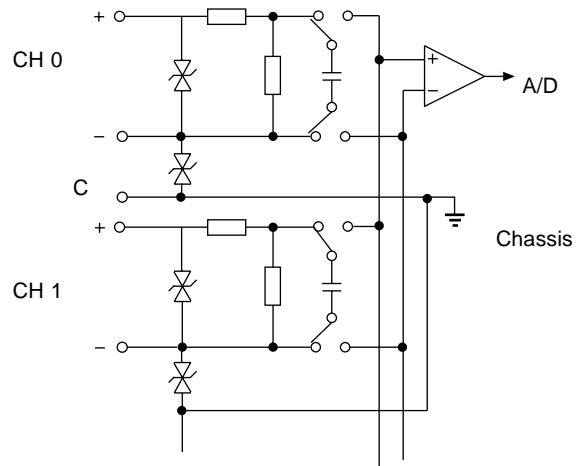
**GENERAL**

**Current consumption (12V):**Max. 80mA.

**EMC:** EN50081-1 / EN50082-2

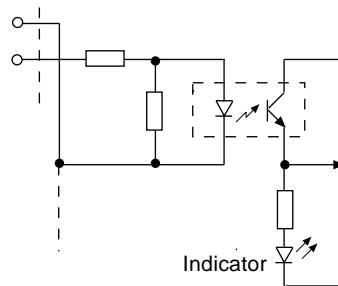
**Dimensions:** HxWxD: 80 (+connectors) x162x62 mm.

**CIRCUIT CONFIGURATION (ANALOG)**

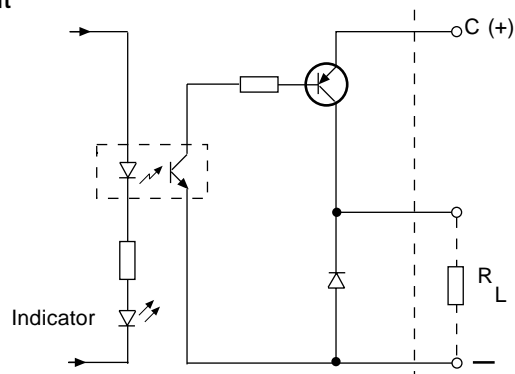


**CIRCUIT CONFIGURATION (DIGITAL)**

**Input**



**Output**



**PROTOCOL/DATA BASE INTERFACE**

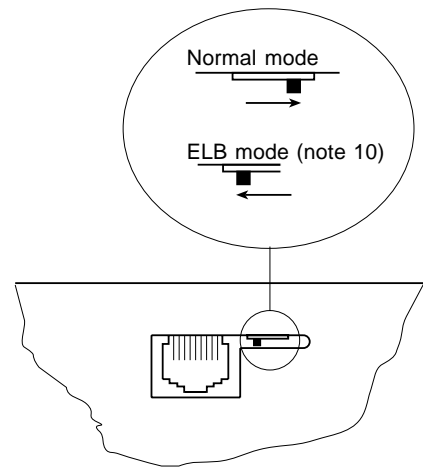
DI	15 14 13 12 11 10 9 8	7 6 5 4 3 2 1 0
DI n	16 Inputs	
n+1		
n+2		
AI	15 14 13 12	11 10 9 8 7 6 5 4 3 2 1 0
AI n		Channel 0 (0 - 4095)
n+1		Channel 1 (0 - 4095)
n+2		Channel 2 (0 - 4095)
n+3		Channel 3 (0 - 4095)
n+4		Counter 0 (0 - 4095)
n+5		Counter 1 (0 - 4095)
n+6		Counter 2 (0 - 4095)
n+7		Counter 3 (0 - 4095)
n+8		
n+9		
AI	15 14 13 12 11 10 9 8	7 6 5 4 3 2 1 0
DO n	Not used	8 Outputs
n+1		
n+2		

**INPUT TABLE ANALOG INPUTS**

Integer (binary value) =  $\frac{\text{Input} - \text{range MIN.}}{R}$   
where R is the resolution (LSB).

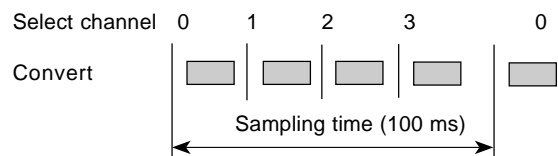
Input range				Integer (Binary-code)
0-10V	0-5V	0-20mA	4-20mA	
Input [V]		Input [mA]		
<0	<0	<0	<4.0	0
0	0	0	4.0	0
1	0.5	2	5.6	410
2	1.0	4	7.2	819
3	1.5	6	8.8	1229
4	2.0	8	10.4	1638
5	2.5	10	12.0	2048
6	3.0	12	13.6	2457
7	3.5	14	15.2	2867
8	4.0	16	16.8	3276
9	4.5	18	18.4	3686
10	5.0	20	20.0	4095
>10	>5.0	>20	>20.0	4095
2.442mV	1.221mV	4.884uA	3.907uA	Resolution

**LOCAL BUS MODE SWITCH**



**NOTES/REMARKS**

- Section A, B, C and D are isolated from each other. The individual analog inputs are isolated from each other. Due to protection devices at the analog inputs the voltage measured from the common (C) terminals to any other terminals must not exceed ±80V
- The polarity at the input must be positive. The common terminal must be connected to negative.
- Input signals exceeding the maximum values **MAY CAUSE PERMANENT DAMAGE** to the module.
- External resistor (500 Ohm) to be mounted for 0-20mA input.
- Only one input channel is active at a time, the multiplexing is automatically performed by the built-in micro controller.



The value in the data base is represented by an integer (binary number) from 0 to 4095 depending on the input signal, see table below.

- Depending on the noise level versus signal level, shielded cables and/or twisted pairs might be necessary. The shield of the cable should normally be connected to common (C) of the Serie 2000 modules.
- Spare terminals may be used as supply rail for the sensors delivering the input signals.
- Excluding load on 24V loop supply. The additional current consumption can be calculated the approximate formula below:
- The pulsed inputs are applied to 4 summarizing counters. When reading one maximum value the counters returns to zero.
- ELB mode can normally be disregarded. It can only be used with products specified to support this mode.