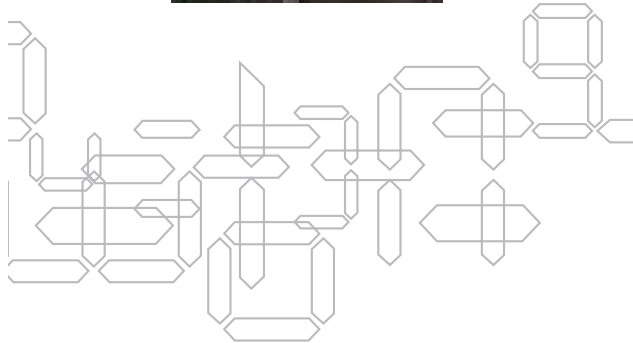
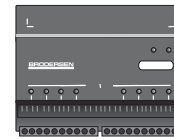
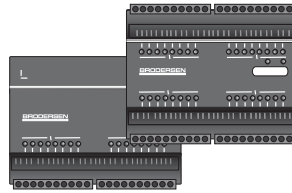
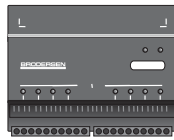


I/O Expansion Modules Overview Brochure

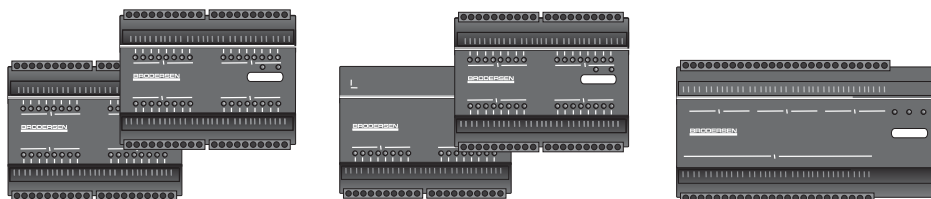




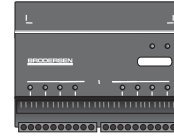
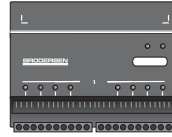
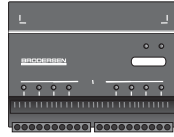
TYPE	UCL-08DI.A1	UCL-16DI.D1/UCL-32DI.DX	UCL-08DO.R1
DESCRIPTION	Expansion module with 8 isolated digital inputs for direct connection to AC mains voltage.	Expansion module with 16/32 inputs.	Expansion module with 8 potential free relay outputs.
VERSION/ORDERING CODES			
Type	UCL-08DI.A1 UCL-08DI.A2	UCL-16DI.D1 UCL-32DI.D1 UCL-32DI.D2 UCL-32DI.D5 UCL-32DI.D6	UCL-08DO.R1
INPUTS			
Digital inputs	8 isolated digital inputs. All equipped with optocouplers.	UCL-16...: 16 isolated digital inputs. UCL-32...: 32 isolated digital inputs. All equipped with optocouplers. 12V DC: Typical 3mA. 24V DC: Typical 6mA.	
Input ranges	UCL-08DI.A1: 100-265V AC 100-265V AC activated. 0-40V deactivated. UCL-08DI.A2: 30-265V AC 30-265V AC activated. 0-8V deactivated.	UCL-16DI.D1: 10-30V DC bipolar UCL-32DI.D1: 10-30V DC unipolar UCL-32DI.D2: 30-60V DC unipolar UCL-32DI.D5: 30-72V DC bipolar UCL-32DI.D6: 10-30V DC bipolar D1/D6: Max. 3V DC deactivated. D2/D5: Max. 6V DC deactivated.	
Frequency	40-70Hz.		
Current	Typical 8mA (220V AC/50Hz).		
Delay	50-100ms.	Typical 5ms.	
OUTPUTS			
Digital outputs			4 potential free SPST-NO contacts. 4 potential free SPDT-CO contacts. Max. 240VAC.
Voltage			
External voltage			
Voltage drop			
Current			Max. 8A AC (resistive).
Peak current			
Leakage current (off)			
Output delay			Typical 10ms. Min. 100,000 operations at rated load. AgCd (gold clad).
Relay lifetime			
Contact material			
ISOLATION			
Inputs	Min. 1.5kV AC between inputs. Min. 4kV AC input to electronics Min. 2kV AC input to chassis	2kV AC (input to electronics).	
Outputs			4kV AC electronics to contact or chassis. 1.5kV contact to another contact.
INDICATORS	One LED for each input (red).	One LED for each input (red).	One LED for each output (yellow).
CURRENT CONSUMPTION	Max. 45mA@12V DC.	UCL-16...: Max. 45mA. UCL-32...: Max. 80mA.	Max. 170mA.

Expansion Modules

Digital I/O

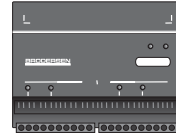
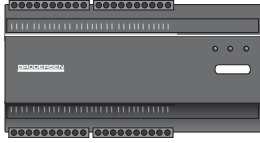


UCL-16DO.P1/UCL-32DO.P1	UCL-8DIO.P1/UCL-16DIO.P1	UCL-36IO.P1
<p>Expansion module with 16/32 PNP or 32NPN open collector outputs.</p> <p>UCL-16DO.P1 UCL-32DO.P1 UCL-32DO.N1</p> <p>16/32 PNP or 32 NPN open collector. All equipped with optocouplers.</p> <p>10-30VDC. Max. 1.5V (output activated). Max. 0.5A. max. 2A totally per section. Max. 5A in 1 second. Max. 0.5mA. Max. 1ms.</p> <p>2kV AC (electronics to output).</p> <p>One LED for each output (yellow).</p> <p>UCL-16DO.P1: Max. 80mA. UCL-32DO.X1: Max. 170mA.</p>	<p>Expansion with 8/16 digital PNP inputs and 8/16 PNP open collector outputs.</p> <p>UCL-8DIO.P1 UCL-16DIO.P1</p> <p>UCL-8..: 8 bi polar UCL-16..: 16 uni polar All equipped with optocouplers. 10-30V DC activated. Max. 3V DC deactivated.</p> <p>12V DC: Typical 3mA. 24V DC: Typical 6mA.</p> <p>Typical 5ms.</p> <p>8/16 PNP open collector. All equipped with optocouplers.</p> <p>10-30VDC. Max. 1.5V (output activated). Max. 0.5A. Max. 5A in 1 second. Max. 0.5mA. Max. 1ms.</p> <p>2kV AC (input to electronics, input to output).</p> <p>2kV AC (output to electronics, input to output).</p> <p>One LED for each input (red). One LED for each output (yellow).</p> <p>Max. 60mA.</p>	<p>Expansion with 24 digital PNP input and 12 NO relay output.</p> <p>UCL-36IO.P1</p> <p>24 (negative common PNP) All equipped with optocouplers 10-30V DC activated Max. 3V DC deactivated.</p> <p>12V DC: Typical 3 mA. 24V DC: Typical 6 mA.</p> <p>Typical 5ms.</p> <p>12 potential free SPST-N/O contacts. Max. 240V AC.</p> <p>Max. 1A AC (resistive).</p> <p>Typical 10ms. Min. 100.000 operations at rated load. Gold overlay silver alloy.</p> <p>2kV AC (electronic to inputs).</p> <p>2kV AC 50Hz 1 min (IEC255-5). 4kV 1,2/50micro s. / impulse withstand (IEC255-5).</p> <p>Digital input: None Relay output: None Power/System I/O: Green LED</p> <p>Max. 150mA</p>



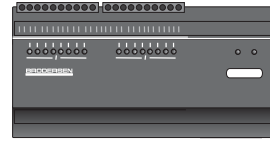
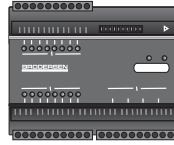
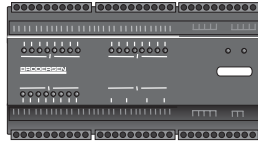
TYPE	UCL-08AI.DX	UCL-08AI.PX	UCL-08AI.J/K/R/S/T																																																				
DESCRIPTION	8 channel analogue input expansion module for standardized process signals.	8 channel analogue input expansion module for standardized RTD temperature sensors. The master or slave module will automatically linearise the measuring values from the expansion module.	The UCL-08AI.J/K/R/S/T are expansion modules with direct interface for thermocoupled temperature sensors. The master or slave module will automatically linearise the measuring values from the expansion module. The module includes cold junction compensation circuit.																																																				
VERSION/ORDERING CODES	Type UCL-08AI.D1, 0-10V/0-20mA UCL-08AI.D2, 4-20mA UCL-08AI.D3, 0-5V UCL-08AI.D4, -5V - +5V UCL-08AI.D5, -10V - +10V UCL-08AI.D6, 0-20mA	UCL-08AI.P1, Pt-100, -50-100°C UCL-08AI.P2, Pt-100, -50-300°C UCL-08AI.P3, Pt-100, -50-850°C UCL-08AI.P51, Pt-500, -50-100°C UCL-08AI.P52, Pt-500, -50-300°C UCL-08AI.P53, Pt-500, -50-850°C UCL-08AI.P11, Pt-1000, -50-100°C UCL-08AI.P12, Pt-1000, -50-300°C UCL-08AI.P13, Pt-1000, -50-850°C	UCL-08AI.J1, Fe-CuNi, -50-1200°C UCL-08AI.K1, NiCr-Ni, -50-1350°C UCL-08AI.K2, NiCr-Ni, 0-600°C UCL-08AI.R1, PtRh-Pt10%, -50-1750°C UCL-08AI.S1, PtRh-Pt13%, -50-1750°C UCL-08AI.T1, Cu-Cu-Ni 0-300°C																																																				
INPUTS	Analogue inputs	8 multiplexed analogue channels.	8 multiplexed analogue channels.																																																				
INPUT CONFIGURATION	Differential, +/-	2 or 3 wire	Differential, +/-.																																																				
INPUT RANGES	<table border="1"> <thead> <tr> <th>Type no.</th> <th>Voltage</th> <th>Current</th> </tr> </thead> <tbody> <tr> <td>...D1</td> <td>0-10V</td> <td>0-20mA</td> </tr> <tr> <td>...D2</td> <td>-</td> <td>0-20mA</td> </tr> <tr> <td>...D3</td> <td>0-5V</td> <td>-</td> </tr> <tr> <td>...D4</td> <td>-5V - +5V</td> <td>-</td> </tr> <tr> <td>...D5</td> <td>-10V - +10V</td> <td>-</td> </tr> <tr> <td>...D6</td> <td>-</td> <td>0-20mA</td> </tr> </tbody> </table>	Type no.	Voltage	Current	...D1	0-10V	0-20mA	...D2	-	0-20mA	...D3	0-5V	-	...D4	-5V - +5V	-	...D5	-10V - +10V	-	...D6	-	0-20mA	<table border="1"> <thead> <tr> <th>Sensor type</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>Pt-100 Pt-500 Pt-1000</td> <td>-50-100°C</td> </tr> <tr> <td>P1 P51 P11</td> <td>-50-100°C</td> </tr> <tr> <td>P2 P52 P12</td> <td>-50-300°C</td> </tr> <tr> <td>P3 P53 P13</td> <td>-50-850°C</td> </tr> </tbody> </table>	Sensor type	Range	Pt-100 Pt-500 Pt-1000	-50-100°C	P1 P51 P11	-50-100°C	P2 P52 P12	-50-300°C	P3 P53 P13	-50-850°C	<table border="1"> <thead> <tr> <th>Type no.</th> <th>Sensor type</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>...J1</td> <td>Fe-CuNi</td> <td>-50-1200°C</td> </tr> <tr> <td>...K1</td> <td>NiCr-Ni</td> <td>-50-1350°C</td> </tr> <tr> <td>...K2</td> <td>NiCr-Ni</td> <td>0-600°C</td> </tr> <tr> <td>...R1</td> <td>PtRh-Pt10%</td> <td>-50-1750°C</td> </tr> <tr> <td>...S1</td> <td>PtRh-Pt13%</td> <td>-50-1750°C</td> </tr> <tr> <td>...T1</td> <td>Cu-Cu-Ni</td> <td>0-300°C</td> </tr> </tbody> </table>	Type no.	Sensor type	Range	...J1	Fe-CuNi	-50-1200°C	...K1	NiCr-Ni	-50-1350°C	...K2	NiCr-Ni	0-600°C	...R1	PtRh-Pt10%	-50-1750°C	...S1	PtRh-Pt13%	-50-1750°C	...T1	Cu-Cu-Ni	0-300°C
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...T1	Cu-Cu-Ni	0-300°C																																																					
RESOLUTION	12bit	12bit	12bit.																																																				
INPUT IMPEDANCE	Voltage Current	100kOhm. D1: 500Ohm/D2/D6: 100Ohm.																																																					
CONVERSION	Max. 0.4ms per channel.	Max. 60ms per channel/max. 0.5s.	Max. 60ms per channel/max. 0.5s.																																																				
UPDATE TIME	All channels Max.: 0.5ms + 8 x local scan interval (typical 8 x 5ms).	Max. 8 x 60ms	All channels: Max. 8 x 60ms.																																																				
MEASURING ACCURACY	Voltage Current	± 0.2% ± 4LSB (typical 0.05%±1LSB). ± 0.2% ± 4LSB (typical 0.1%±1LSB).	Better than ± 0.5% of FSR.																																																				
LINEARITY	Better than ± 1 LSB.	Better than ± 0.1% of FSR.	Better than ± 0.1% of FSR.																																																				
TEMPERATURE STABILITY	Better than ± 25ppm/°C (typical).	Better than ± 100ppm/°C (typical).	Better than ± 100 ppm/°C (typical).																																																				
ISOLATION	500V DC (input to electronics).	500V DC (input to electronics).	500V DC (input to electronics).																																																				
INDICATORS	One for each channel (red). I/O: Indicating local bus configuration is OK. System: Indicating general local I/O system is OK	One for each channel (red). I/O: Indicating local bus configuration is OK. System: Indicating general local I/O system is OK.	One for each channel (red). I/O: Indicating local bus configuration is OK. System: Indicating general local I/O system is OK.																																																				
CURRENT CONSUMPTION	Max. 180 mA.	Max. 200 mA.	Max. 200mA.																																																				
ERROR DETECTION	Over range detection Under range detection																																																						

Expansion Modules Analogue I/O



UCL-08AI.XP	TYPE	UCL-04AO.DX																		
<p>8 Channel 3 or 4 wire Pt-100 expansion module for standardized temperature sensors. High accuracy and resolution. Optional delivered with built-in power supply for I/O expansion local bus modules.</p> <p>UCL-08AI.3P, Pt-100 3-wire UCL-08AI.4P, Pt-100 4-wire</p> <p>8 multiplexed analogue channels.</p> <p>4 wire (2 or 3 wire).</p> <p>3 ranges selectable: -50 - +100°C -50 - +300°C -50 - +850°C</p> <p>14 bit for full range.</p> <p>Max. 60ms per channel/max. 0.5s.</p> <p>Better than 0.5% of FSR.</p> <p>Better than ± 0.1% of FSR.</p> <p>Better than ± 100ppm/C (typical).</p> <p>None.</p> <p>Scan: Indicating that inputs are scanned. I/O: Indicating local bus configuration is OK. System: Indicating general local I/O system is OK.</p> <p>Max. 200 mA.</p> <p>Cable breake etc. +10% FS Short circuit etc. -10% FS</p>	<p>DESCRIPTION</p> <p>VERSION/ORDERING CODES Type</p> <p>OUTPUTS Analogue outputs</p> <p>INPUT CONFIGURATION</p> <p>INPUT RANGES</p> <table border="1"> <thead> <tr> <th>Type no.</th> <th>Voltage</th> <th>Current</th> </tr> </thead> <tbody> <tr> <td>...D1</td> <td>0-10V</td> <td>0-20mA</td> </tr> <tr> <td>...D2</td> <td>0-10V</td> <td>4-20mA</td> </tr> <tr> <td>...D3</td> <td>0-5V</td> <td>0-20mA</td> </tr> <tr> <td>...D4</td> <td>-5V - +5V</td> <td>0-20mA</td> </tr> <tr> <td>...D5</td> <td>-10V - +10V</td> <td>0-20mA</td> </tr> </tbody> </table> <p>RESOLUTION</p> <p>VOLTAGE OUTPUT Impedance Current Setting time Slew rate</p> <p>ACCURACY Gain Offset</p> <p>TEMPERATURE STABILITY</p> <p>CURRENT OUTPUT Impedance External supply voltage External load impedance Setting time Slew rate</p> <p>ACCURACY Gain Offset</p> <p>TEMPERATURE STABILITY</p> <p>UPDATE TIME</p> <p>ISOLATION</p> <p>INDICATORS</p> <p>CURRENT CONSUMPTION</p>	Type no.	Voltage	Current	...D1	0-10V	0-20mA	...D2	0-10V	4-20mA	...D3	0-5V	0-20mA	...D4	-5V - +5V	0-20mA	...D5	-10V - +10V	0-20mA	<p>4 channel analogue output expansion module for standardized process signals.</p> <p>UCL-04AO.D1, 0-10V/0-20mA UCL-04AO.D2, 0-10V/4-20mA UCL-04AO.D3, 0-5V/0-20mA UCL-04AO.D4, -5V - +5V/0-20mA UCL-04AO.D5, -10V - +10V/0-20mA</p> <p>4 channels.</p> <p>Seperate terminal for voltage (sink/source) and current output (sink) for each channel</p> <p>12bit</p> <p>Max. 200mOhm Max. 5mA Typical 20µs (within 0.1% FSR) Typical 5V/µs</p> <p>±0.3% of FSR (typical 0.1%) ±0.3% of FSR (typical 0.1%)</p> <p>Voltage: Better than ±30ppm/C</p> <p>Min. 5Mohm 10-30V DC 12V: Max. 400Ohm/24V: Max. 800Ohm Typical 100µs (within 0.1% of FSR) Typical 2mA/µs</p> <p>±0.7% of FSR (typical 0.2%) ±0.5% of FSR (typical 0.2%)</p> <p>Current: Better than ±80ppm/C</p> <p>All channels: 1ms + 4 x local scan interval (typical 4 x 5 ms)</p> <p>500V DC (input to electronics).</p> <p>One for each channel (red). I/O: Indicating local bus configuration is OK. System: Indicating general local I/O system is OK.</p> <p>Max. 300 mA.</p>
Type no.	Voltage	Current																		
...D1	0-10V	0-20mA																		
...D2	0-10V	4-20mA																		
...D3	0-5V	0-20mA																		
...D4	-5V - +5V	0-20mA																		
...D5	-10V - +10V	0-20mA																		

Expansion Modules Combined Digital/Analogue I/O



TYPE	UCL-28IO.DX	UCL-20IO.DX	UCL-16CIS.PX
DESCRIPTION	Expansion module with 16 digital inputs, 8 digital outputs and 4 analogue inputs for standardized process signals. Each of the analogue inputs are galvanically separated from the other analogue inputs. The first 4 digital inputs can be used as counter inputs (up to 100 Hz). The module is equipped with a built-in micro processor taking care of the analogue inputs as well as the counter inputs. The UCL-28 can be delivered with a built-in isolated 24V DC loop supply (optional) for e.g. 4-20mA current loop.	Expansion module with 8 digital inputs, 8 digital outputs and 4 analogue inputs for standardized process signals. Each of the analogue inputs are galvanically separated from the other analogue inputs.	Local expansion module with 16 32 bit (2x16 bit words) counters. For each counter a RESET function is provided.
VERSION/ORDERING CODES	Type UCL-28IO.D1, 0-10V/0-20mA UCL-28IO.D2, 4-20mA UCL-28IO.D3, 0-5V UCL-28IO.D6, 0-20mA UCL-28IO.D7, 0-2V /Optional: Built-in 12/24V DC loop supply	UCL-20IO.D1, 0-10V/0-20mA UCL-20IO.D2, 4-20mA UCL-20IO.D3, 0-5V UCL-20IO.D6, 0-20mA	UCL-16CIS.P1, UCL-16CIS.P2, UCL-16CIS.P5,
DIGITAL INPUTS	Digital inputs 16 (uni polar) All equipped with optocouplers 10-30V DC activated Max. 3V DC deactivated. 12V DC: Typical 3 mA. 24V DC: Typical 6 mA. Pulsed inputs 4 (Digital inputs 0, 1, 2, 3). Max. counting frequency 100 Hz (5ms pulse/5ms pause). Counter values 0 to 4095 (12 bit resolution).	Digital inputs 8 (uni polar) All equipped with optocouplers 10-30V DC activated Max. 3V DC deactivated. 12V DC: Typical 3 mA. 24V DC: Typical 6 mA.	Digital inputs 16 (uni polar) All equipped with optocouplers 10-30V DC activated Max. 3V DC deactivated. 12V DC: Typical 3 mA. 24V DC: Typical 6 mA. 16. 100 Hz (5ms pulse/5ms pause). 0 to 4095 (12 bit resolution).
OUTPUTS	Digital outputs 8 PNP open collector. All equipped with optocouplers. External voltage 10-30V DC. Voltage drop Max. 1.5V (output activated). Current Max. 0.5A Peak current Max. 5A in 1 second. Leakage current (off) Max. 0.5mA Output delay Max. 1ms	Digital outputs 8 PNP open collector. All equipped with optocouplers. External voltage 10-30V DC. Voltage drop Max. 1.5V (output activated). Current Max. 0.5A Peak current Max. 5A in 1 second. Leakage current (off) Max. 0.5mA Output delay Max. 1ms	Digital outputs 8 PNP open collector. All equipped with optocouplers. External voltage 10-30V DC. Voltage drop Max. 1.5V (output activated). Current Max. 0.5A Peak current Max. 5A in 1 second. Leakage current (off) Max. 0.5mA Output delay Max. 1ms
ANALOGUE INPUTS	4 multiplexed analogue channels. Differential (+/-), flying capacitor type 12 bit resolution. 100ms. UCL-28IO.D1, 0-10V/0-20mA UCL-28IO.D2, 4-20mA UCL-28IO.D3, 0-5V UCL-28IO.D6, 0-20mA Accuracy ±0.2% ±6LSB (typical) 0.05% ±3LSB) 25°C: ±0.3% ± 8LSB (typical 0.1% ± 4LSB). -10°-55°C:	4 multiplexed analogue channels. Differential (+/-), flying capacitor type 12 bit resolution. 100ms. UCL-20IO.D1, 0-10V/0-20mA UCL-20IO.D2, 4-20mA UCL-20IO.D3, 0-5V UCL-20IO.D6, 0-20mA Accuracy ±0.2% ±6LSB (typical) 0.05% ±3LSB) ±0.3% ± 8LSB (typical 0.1% ± 4LSB).	
ISOLATION	Analogue 500V (input to input). Digital 1 kV (input or output, input to input).	Analogue 500V (input to input). Digital 1 kV (input or output, input to input).	
INDICATORS	One for each digital input (red). One for each digital output (yellow).	One for each digital input (red). One for each digital output (yellow).	One for each digital input (red) indicating active input. System: Indicating RTU OK (green). I/O: Indicating I/O and local bus OK (green).
CURRENT CONSUMPTION	Max. 80mA (12V DC)	Max. 80mA (12V DC)	UCR-16DIO: max. 105mA. UCR-32DI: max. 90mA UCR-28IO: max. 100mA IEC class II, 3.75kV (mains supply versions) Safety earth required.

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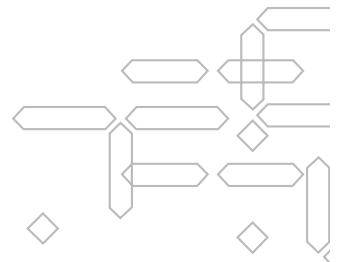
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Brodersen Controls has for more than 30 years designed and produced industrial process components including remote outstations, data loggers and data communication systems for the process and automation industry.