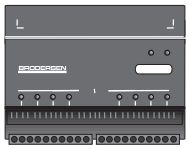
I/O Expansion Modules

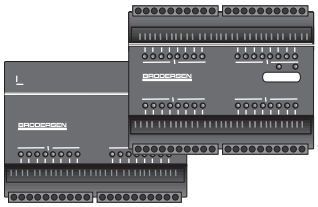
For Brodersen RTU Series

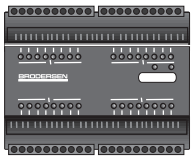
Selection Guide

Version 1.11, Feb 2015, Doc 40303

BRODERSEN
simplifying systems

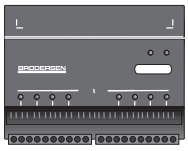


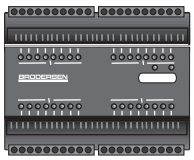


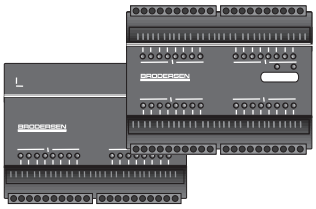


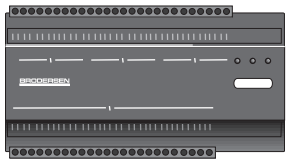
TYPE	UCL-08DI.A1	UCL-16DI.D1/UCL-32DI.DX	UCL-16DI.D20 (110-125VDC)
DESCRIPTION	Expansion module with 8 isolated digital inputs for direct connection to AC mains voltage.	Expansion module with 16/32 inputs.	Expansion module with 16 2-wire inputs.
VERSION/ORDERING CODES			
Type	UCL-08DI.A1 UCL-08DI.A2	UCL-16DI.D1 UCL-32DI.D1 UCL-32DI.D2 UCL-32DI.D5 UCL-32DI.D6	UCL-16DI.D20
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.	16 single isolated 2-wire digital inputs. All equipped with optocouplers. 110V DC: Typical 3mA.
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.	UCL-16DI.D20: 110-125V DC unipolar Max. 35V DC deactivated.
Frequency	40-70Hz.		
Current	Typical 8mA (220V AC/50Hz).		
Delay	50-100ms.	Typical 5ms.	Typical 5ms.
OUTPUTS			
Digital outputs			
Voltage			
External voltage			
Voltage drop			
Current			
Peak current			
Leakage current (off)			
Output delay			
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).	2kV AC (input to electronics). 2kV AC (input to input).
Outputs			
INDICATORS	One LED for each input (red). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK	One LED for each input (red). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK	One LED for each input (red). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK
CURRENT CONSUMPTION	Max. 45mA@12V DC.	UCL-16..: Max. 45mA. UCL-32..: Max. 80mA.	UCL-16..: Max. 75mA.

Expansion Modules
Digital I/O

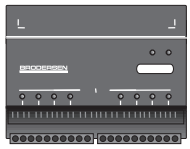


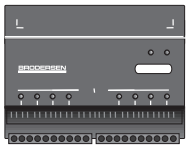


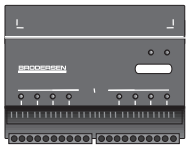




UCL-08DO.R1	UCL-32DO.P1/N1	UCL-8DIO.P1/UCL-16DIO.P1	UCL-36IO.P1
Expansion module with 8 potential free relay outputs.	Expansion module with 32 PNP or 32NPN open collector outputs.	Expansion with 8/16 digital PNP inputs and 8/16 PNP open collector outputs.	Expansion with 24 digital PNP input and 12 NO relay output.
UCL-08DO.R1	UCL-32DO.P1 UCL-32DO.N1	UCL-8DIO.P1 UCL-16DIO.P1	UCL-36IO.P1
		UCL-8..: 8 bi polar UCL-16..: 16 uni polar All equipped with optocouplers. 10-30V DC activated. Max. 3V DC deactivated.	24 (negative common PNP) All equipped with optocouplers 10-30V DC activated Max. 3V DC deactivated.
		12V DC: Typical 3mA. 24V DC: Typical 6mA.	12V DC: Typical 3 mA. 24V DC: Typical 6 mA.
		Typical 5ms.	Typical 5ms.
4 potential free SPST-NO contacts. 4 potential free SPDT-CO contacts. Max. 240V AC.	32 PNP or 32 NPN open collector. All equipped with optocouplers.	8/16 PNP open collector. All equipped with optocouplers.	12 potential free SPST-N/O contacts. Max. 240V AC.
Max. 8A AC (resistive).	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.	10-30VDC. Max. 1.5V (output activated). Max. 0.5A. Max. 5A in 1 second. Max. 0.5mA. Max. 1ms.	Max. 1A AC (resistive).
Typical 10ms. Min. 100.000 operations at rated load. AgCd (gold clad).			Typical 10ms. Min. 100.000 operations at rated load. Gold overlay silver alloy.
		2kV AC (input to electronics, input to output).	2kV AC (electronic to inputs).
4kV AC electronics to contact or chassis. 1.5kV contact to another contact.	2kV AC (electronics to output).	2kV AC (output to electronics, input to output).	2kV AC 50Hz 1 min (IEC255-5). 4kV 1,2/50micro s. / impulse withstand (IEC255-5).
One LED for each output (yellow). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK	One LED for each output (yellow). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK	One LED for each input (red). One LED for each output (yellow). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK	Digital input: None Relay ouput: None Power/System/IO: Green LED
Max. 170mA.	Max. 170mA.	UCL-8DIO...: Max. 60mA. UCL-16DIO...: Max. 105mA.	Max. 150mA

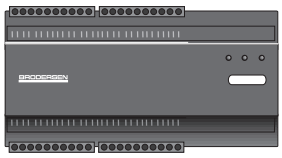


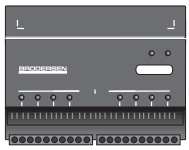


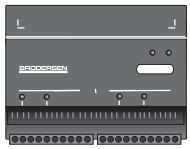


TYPE	UCL-08AIC.D	UCL-08AI.DX	UCL-08AI.PX
DESCRIPTION	8 channel configurable analogue input expansion module. Each channel can be configured individually to input type, range and digital filter functions.	8 channel analogue input expansion module for standardized process signals.	8 channel analogue input expansion module for standardized RTD temperature sensors. The master or slave module will automatically linearise the measuring values from the expansion module.
VERSION/ORDERING CODES			
Type	UCL-08AIC.D	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
INPUTS			
Analogue inputs	8 multiplexed after isolation	8 multiplexed analogue channels.	8 multiplexed analogue channels.
INPUT CONFIGURATION	Differential	Differential, +/-	2 or 3 wire
INPUT RANGES	Current 0 to 20mA, -20mA to +20mA, 4mA to 20mA Voltage 0 to 10V, 0 to 5V, -5V to +5V, -10V to +10V	Type no. / Voltage / Current ...D1 / 0-10V / 0-20mA ...D2 / - / 0-20mA ...D3 / 0-5V / - ...D4 / -5V - +5V / - ...D5 / -10V - +10V / - ...D6 / - / 0-20mA	Sensor type: Pt-100 / Pt-500 / Pt-1000 / Range P1 / P51 / P11 / -50-100°C P2 / P52 / P12 / -50-300°C P3 / P53 / P13 / -50-850°C
RESOLUTION	16bit , ADC Resulotion 24 Bit	12bit (0-4095)	12bit (0-4095)
INPUT IMPEDANCE			
Voltage	More than 1MOhm	100kOhm.	
Current	125Ohm.	D1: 500Ohm/D2/D6: 100Ohm.	
CONVERSION	Max. 0.4ms per channel.	Max. 0.4ms per channel.	Max. 60ms per channel/max. 0.5s.
UPDATE TIME			
All channels	Max.: 30 ms for 8 channels	Max.: 0.5ms + 8 x local scan interval (typical 8 x 5ms).	Max. 8 x 60ms
MEASURING ACCURACY			
Voltage	± 0.1%	± 0.2% ± 4LSB (typical 0.05%±1LSB).	Better than 0.5% of FSR.
Current	± 0.1%	± 0.2% ± 4LSB (typical 0.1%±1LSB).	
LINEARITY	Better than ± 0.001%	Better than ± 1 LSB.	Better than ± 0.1% of FSR.
TEMPERATURE STABILITY	Better than ± 25ppm/ C	Better than ± 25ppm/ C	Better than ± 100ppm/ C
ISOLATION	350V DC input to electronics, 350V DC Channel to channel	500V DC (input to electronics).	500V DC (input to electronics).
INDICATORS	I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK	One for each channel (red). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK	One for each channel (red). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK
CURRENT CONSUMPTION	Max. 75 mA.	Max. 180 mA.	Max. 200 mA.
ERROR DETECTION			
Over range detection	see datasheet		
Under range detection	see datasheet		

Expansion Modules
Analogue I/O

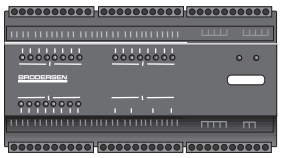


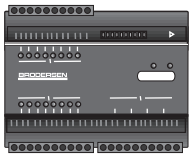


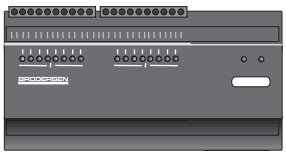


UCL-08AI.XP	UCL-08AI.J/K/R/S/T	UCL-04AO.DX
8 Channel 3 or 4 wire Pt-100 expansion module for standardized temperature sensors. High accuracy and resolution.	The UCL-08AI.J/K/R/S/T are expansion modules with direct interface for thermo-coupled temperature sensors. The master or slave module will automatically linearise the measuring values from the expansion module. The module includes cold junction compensation circuit.	4 channel analogue output expansion module for standardized process signals.
UCL-08AI.3P, Pt-100 3-wire UCL-08AI.4P, Pt-100 4-wire	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	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
8 multiplexed analogue channels.	8 multiplexed analogue channels.	4 channels.
4 wire (2 or 3 wire).	Differential, +/-.	Seperate terminal for voltage (sink/ source) and current output (sink) for each channel
		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
3 ranges selectable: -50 - +100°C -50 - +300°C -50 - +850°C	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	12bit Max. 200mOhm Max. 5mA Typical 20µs (within 0.1% FSR) Typical 5V/µs
14 bit for full range (0-16383).	12 bit (0-4095).	±0.3% of FSR (typical 0.1%) ±0.3% of FSR (typical 0.1%) Voltage: Better than ±30ppm/C
Max. 60ms per channel/max. 0.5s.	Max. 60ms per channel/max. 0.5s. All channels: Max. 8 x 60ms.	Min. 5Mohm 10-30V DC 12V: Max. 400Ohm/24V: Max. 800Ohm Typical 100µs (within 0.1% of FSR) Typical 2mA/µs
Better than 0.5% of FSR.	Better than ± 0.5% of FSR.	±0.7% of FSR (typical 0.2%) ±0.5% of FSR (typical 0.2%) Current: Better than ±80ppm/C
Better than ± 0.1% of FSR. Better than ± 100ppm/ C	Better than ± 0.1% of FSR. Better than ± 100 ppm/°C	All channels: 1ms + 4 x local scan interval (typical 4 x 5 ms)
None.	500V DC (input to electronics).	500V DC (input to electronics).
Scan: Indicating that inputs are scanned. I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK	One for each channel (red). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK	One for each channel (red). I/O: Indicating I/O configuration is OK. System: Indicating general local I/O system is OK.
Max. 200 mA.	Max. 200mA.	Max. 300 mA.
Cable breake etc. +10% FS Short circuit etc. -10% FS		

Expansion Modules
Combined Digital/Analogue I/O

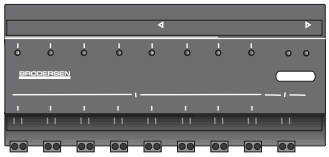






TYPE	UCL-28IO.DX	UCL-20IO.DX (OPTIONAL)	UCL-16CIS.PX
DESCRIPTION	Expansion module with 16 digital inputs, 8 digital outputs and 4 analogue inputs for standardized process signals. Each of the analogue inputs are galvanically separated from the other analogue inputs. The first 4 digital inputs can be 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 sepa-rated 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.	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.	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).		16.
Max. counting frequency	100 Hz (5ms pulse/5ms pause).		100 Hz (5ms pulse/5ms pause).
Counter values	0 to 4095 (12 bit resolution).		0 to 4095 (12 bit resolution).
OUTPUTS			
Digital outputs	8 PNP open collector. All equipped with optocouplers.	8 PNP open collector. All equipped with optocouplers.	
External voltage	10-30V DC.	10-30V DC.	
Voltage drop	Max. 1.5V (output activated).	Max. 1.5V (output activated).	
Current	Max. 0.5A	Max. 0.5A	
Peak current	Max. 5A in 1 second.	Max. 5A in 1 second.	
Leakage current (off)	Max. 0.5mA	Max. 0.5mA	
Output delay	Max. 1ms	Max. 1ms	
ANALOGUE INTPUTS	4 multiplexed analogue channels. Differential (+/-), flying capacitor type 12 bit resolution.	4 multiplexed analogue channels. Differential (+/-), flying capacitor type 12 bit resolution.	
Sampling rate	100ms.	100ms.	
Mesuring ranges	UCL-28IO.D1, 0-10V/0-20mA UCL-28IO.D2, 4-20mA UCL-28IO.D3, 0-5V UCL-28IO.D6, 0-20mA	UCL-20IO.D1, 0-10V/0-20mA UCL-20IO.D2, 4-20mA UCL-20IO.D3, 0-5V UCL-20IO.D6, 0-20mA	
Accuracy 25°C: -10°-55°C:	±0.2% ±6LSB (typical0.05%±3LSB) ±0.3% ± 8LSB (typical 0.1% ± 4LSB).	±0.2% ±6LSB (typical0.05%±3LSB) ±0.3% ± 8LSB (typical 0.1% ± 4LSB).	
ISOLATION			
Analogue	500V (input to input).	500V (input to input).	
Digital	2 kV (input or output, input to input).	2kV (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)	Max. 100mA

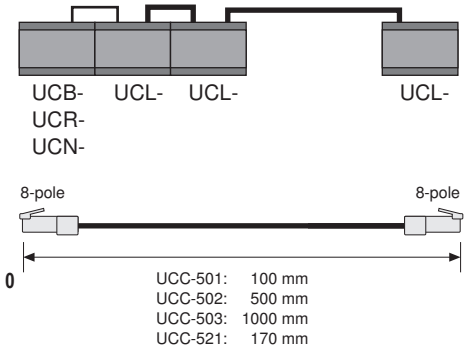
Expansion Modules
Monitored AC Output I/O / Cables



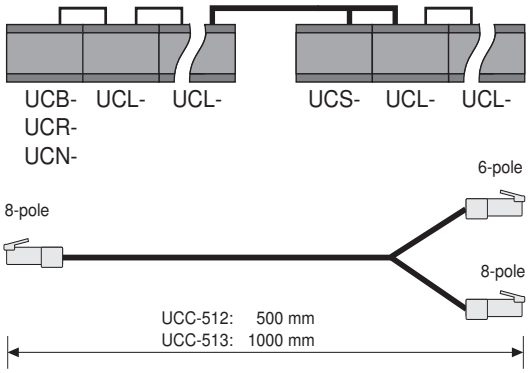
TYPE	UCL-8LCO
DESCRIPTION	Expansion module with 8 galvanic isolated outputs for switching AC voltage. Current through the outputs are measured.
VERSION/ORDERING CODES	
Type	UCL-8LCO.V1, 10-15V AC UCL-8LCO.V2, 42V AC UCL-8LCO.V3, 230V AC
DIGITAL INPUTS	Only virtual inputs exists. They are internally connected to alarms from the current measuring circuits.
OUTPUTS	
Digital outputs (port A)	3 AC type output configuration is available; one for each voltage.
Ratings	Type V3: 230V/100W Type V2: 42V/40-60W Type V1: 10-15V/50W
Isolation	Output- Output: 500V Output-Electronics: 3.75kV
Protection	Internal fuses are provided in sockets.
Switching freq.	Max. 2Hz
Output delay	$T_{OFF - ON}$ 2-25ms $T_{ON - OFF}$ 2-25ms
Output controls	Zero-crossing output is available.
VOLTAGE SYNC. INPUT (PORT B)	
Input voltage	Max. 275V AC
Input load	Typical: 1W
INDICATORS	One for each digital output (yellow): LED off - output not active. LED on - output active and current within the limits. LED flashing - outupt active and high or low alarm. Two green LEDs indicating module status: System LED on - Module OK I/O LED on - local bus OK
CURRENT CONSUMPTION	140mA (at 12V DC).

CABLES & POWER SUPPLIES

Cables for Expansion Modules

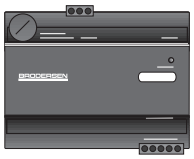


Cables for Additional Power Supplies



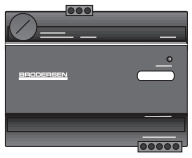
Additional Power Supplies

Power supplies used when the current consumption of all UCL expansion modules exceed the max. load of the UCB/UCR/UCN module.



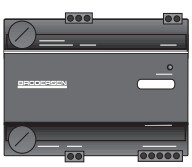
UCS-53 Power Supply

Type:	UCS-53.924 (input 10,5-58V DC)
Output A:	12V DC, max 1,3A.
Output B:	12VDC max. 0,2A for auxillery use.



UCS-54 Power Supply

Type:	UCS-54.115 (input 90-132V AC) UCS-54.230 (input 180-265V AC)
Output A:	12V DC, max 2,0A for UCL modules.
Output B:	12VDC max. 0,2A for auxillery use.



UCS-59 UPS Power Supply

Type:	UCS-59.110 (90-132V AC) UCS-59.230 (180-265V AC)
Output:	12V DC, max 1,8A for UCL modules.
Battery:	Type 12V load battery. Type like Varta CF12 series.
Fail Indicators:	Relay output for mains fail and low battery.

About Brodersen

Brodersen design and manufacture all-in-one automation controllers and communication devices with unsurpassed platform adaptability. The company is based on four decades of industrial automation development. We serve partners and customers; comprise system integrators, engineering companies, OEM and application end users - both public and private.

The robust design of our products is specifically developed for outstations in harsh environments. Our track record speaks for itself. The quality of our products is reflected in a distinct durability in the field.

Our experience is obtained through in-depth collaboration and support in solution design for some of the most demanding and successful companies in the world.

Brodersen has deep roots in Scandinavia. A region known for dynamic utility distribution and complex infrastructure with high expectations to quality standards.

Combining product performance, the versatility of our products series applied with niche application; Brodersen contribute to more simplified systems that decrease overall project lifecycle costs to the benefit of both integrators and end users.

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