UIU
FULL MANUAL

Introduction

Universal **I**O **U**nit for connection of various digital and analog I/O signals. UIU is intended as a slave device in an automotive environment. To be placed in driver cabin or a control panel.

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Product Overview

Technical data

- USB (VCP) & CAN-bus compliant
- Can be driven from 9-32Vdc power supply
- Status and power LEDs
- RS232 or RS485 can be delivered as an option
- CPU Cortex M4 32bit
- 75 digital inputs (Positive logic)
- 20 analog inputs 12bit (0-5V)
- 2 analog inputs (0-20mA)
- 14 protected digital high side outputs max 3A
- 4 Protected PWM high side outputs max 3A 3kHz
- 2 protected digital high side outputs max 4.7A

Mechanical data

- Dimensions: 262x166x26mm, excluding harness connectors
- Connectors: Molex Minifit 16 & 24pin, USB-B and Weidmüller combicon power connector

Communication

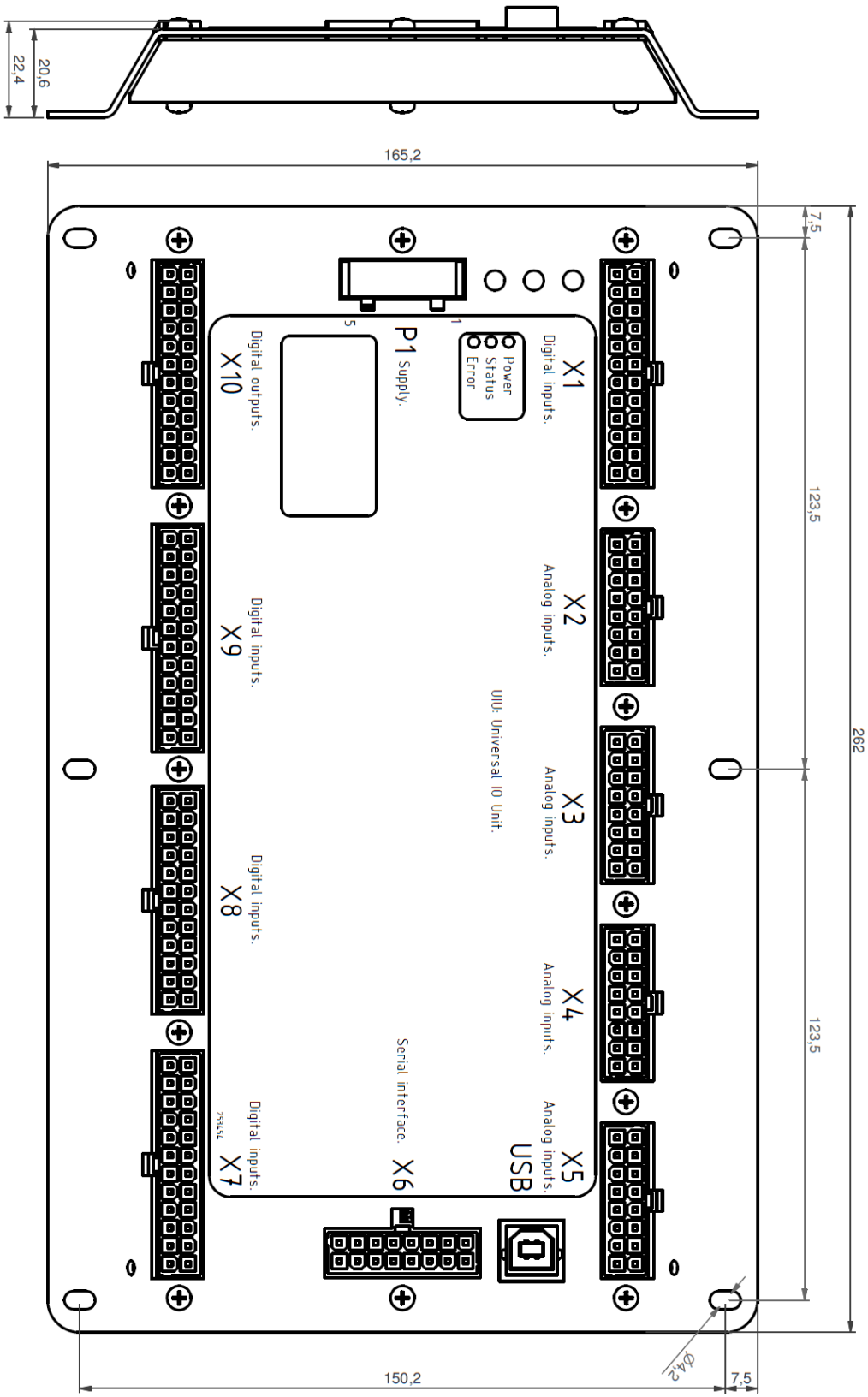
- USB with serial port profile (FTDI) for direct connection to PC
- CAN-bus. Supports CAN 2.0A and 2.0B with bus speed up to 1Mbit/s
- Electrum Automation AB is a member of *CAN in Automation* and supports the CANopen protocol
- Customized protocols are available

Test standards

- Immunity conducted interference ISO7637-2, pulse 1, 2a, 2b, 3a, 3b, 4
- Immunity conducted interference ISO7637-2, pulse 5: +123V, 2 Ω drive impedance
- Immunity to interfering fields ISO 11452-2 100V/m
- Current injection ISO 11452-4 120mA
- Transient emission ISO 7637-2
- Interference emission CISPR 25
- ESD ISO10605, class C

Table of content

1 Mechanical properties



2 I/O configuration

I/O-LIST Electrum, Universal IO Unit
Last revidated 2013-12-03

Supply connector

P1	Weidmüller	
1	B+ CPU	(1)
2	B+	(1)
3	B+	(1)
4	GND	
5	GND	

USB	USB-B	
0	Shield	
1	USB +5V	
2	USB D-	
3	USB D+	
4	USB GND	(2)

Communication port

X6	Minifit	
1	USB D+	
2	USB D-	
3	USB +5V	
4	USB GND	(2)
5	RS232 TX/RS485 A	(3)
6	RS232 RX/RS485 B	(3)
7	V5+	
8	RS232 GND	
9	CAN GND	
10	CAN P	
11	CAN L	
12	CAN term	(18)
13	CAN term	(18)
14	V5+	
15	ID 1 Input	(4)
16	ID 2 Input	(4)

X7	Minifit		
1	Di1	(16)	
2	Di2	(16)	
3	Di3	(16)	
4	Di4	(16)	
5	Di5	(16)	
6	Di6	(16)	
7	Di7	(16)	
8	Di8	(16)	
9	Di9	(16)	
10	Di10	(16)	
11	Di11	(16)	
12	Di12	(16)	
13	Di13	(16)	
14	Di14	(16)	
15	Di15	(16)	
16	Di16	(16)	
17	Di17	(16)	
18	Di18	(16)	
19	Di19	(16)	
20	Di20	(16)	
21	Di21	(16)	
22	Di22	(16)	
23	SYS+_1	(6)	
24	GND		

X8	Minifit		
1	Di23		
2	Di24		
3	Di25		
4	Di26		
5	Di27		
6	Di28		
7	Di29		
8	Di30		
9	Di31		
10	Di32		
11	Di33		
12	Di34		
13	Di35		
14	Di36		
15	Di37		
16	Di38		
17	Di39		
18	Di40		
19	Di41		
20	Di42		
21	Di43		
22	Di44		
23	SYS+_2	(6)	
24	GND		

X9	Minifit		
1	Do20 PWM	(7), (12)	
2	Di75	(10)	
3	Di45	(17)	
4	Di46	(16)	
5	Di47	(16)	
6	Di48	(16)	
7	Di49	(16)	
8	Di50	(16)	
9	Di51	(16)	
10	Di52	(16)	
11	Di53	(16)	
12	Di54	(16)	
13	Di55	(16)	
14	Di56	(16)	
15	Di57	(16)	
16	Di58	(16)	
17	Di59	(16)	
18	Di60	(16)	
19	Di61	(16)	
20	Di62	(16)	
21	Di63	(16)	
22	Di64	(16)	
23	SYS+_3	(6)	
24	GND		

X1	Minifit		
1	Di65	(16)	
2	Di66	(16)	
3	Di67	(16)	
4	Di68	(16)	
5	Di69	(16)	
6	Di70	(10)	
7	Di71	(10)	
8	Di72	(10)	
9	Di73	(10)	
10	Di74	(10)	
11	GND		
12	GND		
13	GND		
14	SYS+_4	(6)	
15	Ai_Current_01	(13)	
16	GND		
17	SYS+_4	(6)	
18	Ai_Current_02	(13)	
19	GND		
20	GND		
21	GND		
22	GND		
23	SYS+_4	(6)	
24	GND		

X10	Minifit		
1	Do1	(15)	
2	Do2	(15)	
3	Do3	(15)	
4	Do4	(15)	
5	Do5	(15)	
6	Do6	(15)	
7	Do7	(15)	
8	Do8	(15)	
9	Do9	(15)	
10	Do10	(15)	
11	Do11	(15)	
12	Do12	(15)	
13	Do13	(15)	
14	Do14	(15)	
15	Do15	(11)	
16	Do16	(11)	
17	Do17 PWM	(12)	
18	Do18 PWM	(12)	
19	Do19 PWM	(12)	
20	GND		
21	GND		
22	GND		
23	GND		
24	GND		

X4	Minifit		
1	V5+	(14)	
2	Ai1	(5)	
3	GND		
4	V5+	(14)	
5	Ai2	(5)	
6	GND		
7	V5+	(14)	
8	Ai3	(5)	
9	GND		
10	V5+	(14)	
11	Ai4	(5)	
12	GND		
13	V5+	(14)	
14	Ai5	(5)	
15	GND		
16	GND		

X2	Minifit		
1	V5+	(14)	
2	Ai6	(5)	
3	GND		
4	V5+	(14)	
5	Ai7	(5)	
6	GND		
7	V5+	(14)	
8	Ai8	(5)	
9	GND		
10	V5+	(14)	
11	Ai9	(5)	
12	GND		
13	V5+	(14)	
14	Ai10	(5)	
15	GND		
16	GND		

X5	Minifit		
1	V5+	(14)	
2	Ai11	(5)	
3	GND		
4	V5+	(14)	
5	Ai12	(5)	
6	GND		
7	V5+	(14)	
8	Ai13	(5)	
9	GND		
10	V5+	(14)	
11	Ai14	(5)	
12	GND		
13	V5+	(14)	
14	Ai15	(5)	
15	GND		
16	GND		

X3	Minifit		
1	V5+	(14)	
2	Ai16	(5)	
3	GND		
4	V5+	(14)	
5	Ai17	(5)	
6	GND		
7	V5+	(14)	
8	Ai18	(5)	
9	GND		
10	V5+	(14)	
11	Ai19	(5)	
12	GND		
13	V5+	(14)	
14	Ai20	(5)	
15	GND		
16	GND		

Analog 0-5V
Analog 0-20mA
Digital Input
GND
Constant supply
Digital output
PWM output
Digital pulse input
Misc
Analog +5V

1) Supply range 9-32Vdc
2) USB GND is galvanically separated from supply GND
3) Not implemented, can be offered as an option
4) 5V/24V tolerant inputs
5) Analog input range 0-5V, 12bit 45K to gnd
6) Monitored constant supply. Maximum current 3A each SYS+ channel (4st). Total current must not exceed 7.3A.Voltage is the same as B+ Out.
7) PWM output. Maximum PWM frequncy 3kHz 10%dutycycle
10) Pulse input. Maximum frequency 3kHz@puls Width 10%. Smallest detectable pulse is: 10µs (32V). 50µs (9V). 2k8 to gnd.
11) Digital power output, maximalt 4.7A each channel
12) PWM output. Maximum PWM frequncy 3kHz 10%dutycycle
13) Analog input range 0-20mA, 12bit 240R to gnd
14) Analog sensor supply, total current maximum 600mA
15) Maximum 3A (short & overload protected with diagnostics)
16) Digital input range: 5V to suppy voltage 3k5 ohm to gnd.
17) Maximum frequency 3kHz@puls Width 10%. Smallest detectable pulse is: 10µs (32V). 50µs (9V). 2k8 to gnd.
18) Should be shorted with solid wire if 120ohm CAN termination is wanted.
All I/O connectors uses Molex Minifit.

3 Electrical characteristics

Parameter	Condition	Min.	Typ.	Max.	Units
Operational voltage(1)		9	24	32	V_{DC}
Power consumption(2)	9V < V_{IN} < 32V	1.6	2.6	3.2	W
CAN termination	X6.12 and X6.13 connected with jumper	118	120	122	Ω
Operating temperature		-40		85	°C
Max digital output current(3)	DO1-14, DO17-20	3.0(4)	3.3		A
	DO15-16	4.3(4)	4.7		A
Analog current input range		0		20	mA
Digital input high voltage level		4			V_{DC}
Digital pulse input high voltage level		6			V_{DC}
Digital input impedance	Fixed pull-down		3.5k		Ω
Digital pulse input impedance	Fixed pull-down		2.8k		Ω
Analog current input impedance	Fixed pull-down		240		Ω
Analog voltage input impedance	Fixed pull-down		45k		Ω
5V analog output voltage	5V outputs on X2-X5	4.975	5.000	5.025	V
5V analog output current	Combined current on all outputs on connectors X2-X5	0		500	mA
5V miscellaneous output voltage	5V output on X6.7 and X6.14	4.90	5.00	5.10	V
5V miscellaneous output current	Combined current on X6.7 and X6.14	0		500	mA

Note:
1. Module fully operational.
2. No input or output signal active, CAN and USB in idle mode.
3. This parameter specifies the output current capacity with one output being active. Caution must be taken in order to not go beyond: Max total output current drive. For applications which require multiple high current outputs simultaneously, extra care should be taken when determining which I/O's to use. Refer to header Internal I/O Mapping.
4. Min limit specifies minimum drive current at max Operating temperature.

4 Absolute maximum ratings(1)

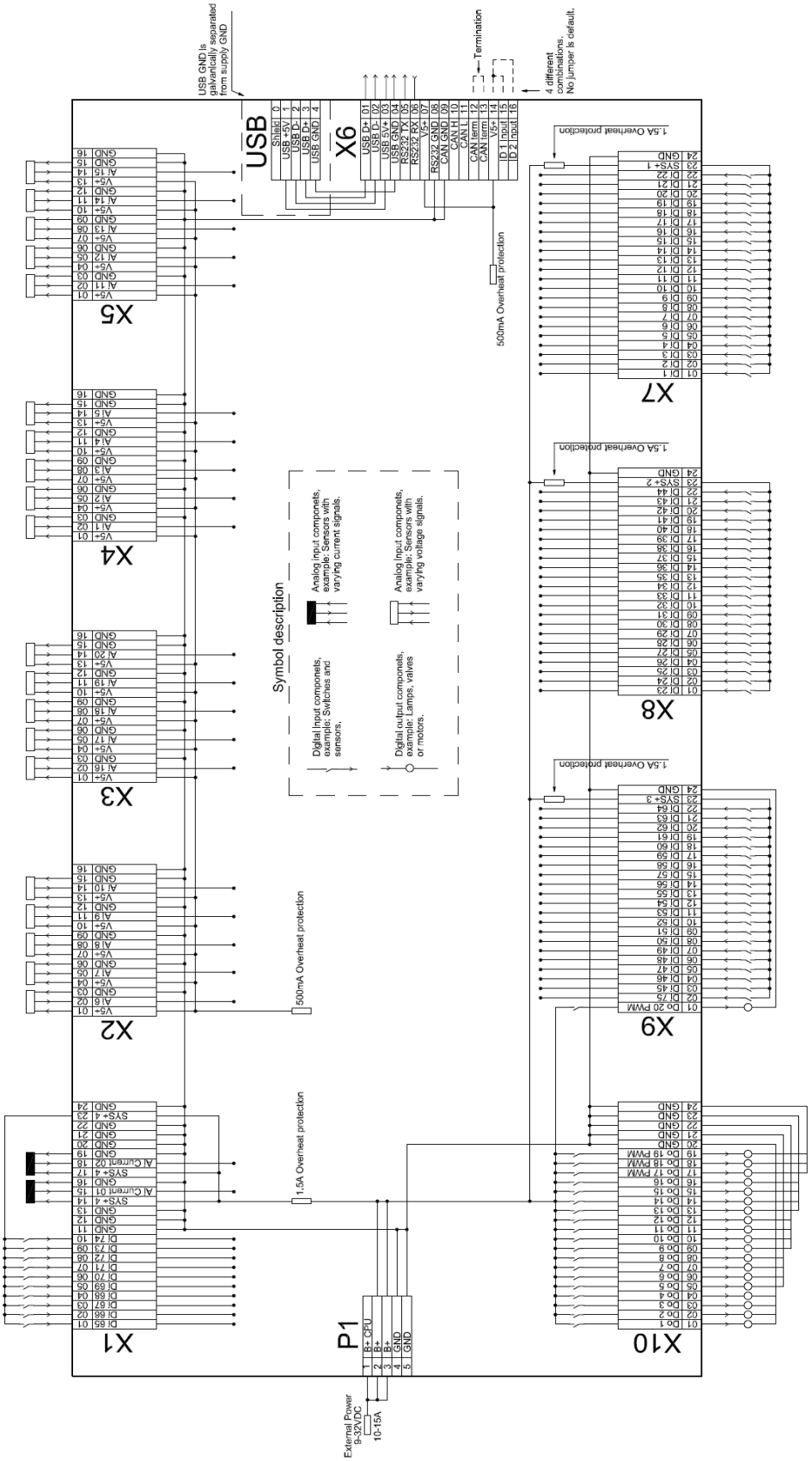
Parameter	Condition	Min.	Typ.	Max.	Units
Input voltage	B+ Outputs	0		33(2)	V_{DC}
	B+ CPU	-150(3)		+150(3)	V_{DC}
Digital inputs		0		32	V_{DC}
Analog voltage inputs		0		32(4)	V_{DC}
Analog current inputs				32(3, 4)	V_{DC}
Input voltage on CAN_L & CAN_H		-36		36V	V_{DC}
Storage temperature		-55		125	°C
Input voltage on 5V analog output	5V outputs on X2-X5	0		32	V_{DC}
Input voltage on 5V miscellaneous output	5V output on X6.7 and X6.14	0		32	V_{DC}
USB +5V				24(3, 5)	V_{DC}
USB D+/D-				24(3, 5)	V_{DC}

Note:
1. Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under recommended operating conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
2. Tolerant to Load-dump according to ISO7637-2, pulse 5: +123V, 2 Ω drive impedance.
3. Designed to withstand this treatment for shorter periods of time. Operating under these circumstances for a long period of time will cause permanent damage to UIU module.
4. Error LED will indicate error.
5. Not tested, by design, should not be relied upon for protection.

5 I/O characteristics

Parameter	Function
Digital input	Positive logic. Fixed internal pull-down.
Digital output	**High**: B+ (Refer to Electrical Characteristics, Max digital output current). **Low**: Fixed internal pull-down. All outputs are short circuit and over-temperature protected.
Analog voltage input	0-5V, 12bit resolution. Overvoltage protected.
Analog current input	0-20mA, 12bit resolution. Overvoltage protected(see Electrical Characteristics)
Constant voltage source SYS+(1-4)	Always high. Short circuit and over-temperature protected.

6 Internal wiring



7 Internal I/O mapping

The UIU module has 7 output drivers with 4 channels each. Each output driver can drive a total of 7.3A on all four outputs combined before thermal shutdown protection failure is no longer guaranteed. This is only valid if the currents are shared evenly across all four outputs. The limit is 4.7A when only two outputs are active. Care must be taken when mapping the outputs which will operate simultaneously in order to avoid unnecessary stress on the output drivers.

Output driver	Driver channel	Digital Output number	Combined current drive capacity
#1	1.1	1	4 outputs: 7.3A Continuously 2 outputs: 4.7A Continuously
	1.2	2	
	1.3	13	
	1.4	14	
#2	2.1	3	4 outputs: 7.3A Continuously 2 outputs: 4.7A Continuously
	2.2	4	
	2.3	5	
	2.4	6	
#3	3.1	7	2 outputs: 4.7A Continuously
	3.2	12	
	3.3		
	3.4		
#4	4.1	8	4 outputs: 7.3A Continuously 2 outputs: 4.7A Continuously
	4.2	9	
	4.3	10	
	4.4	11	
#5	5.1	15	7.3A Continuously
	5.2		
	5.3	16	
	5.4		
#6	6.1	17 (PWM)	4 outputs: 7.3A Continuously 2 outputs: 4.7A Continuously
	6.2	18 (PWM)	
	6.3	19 (PWM)	
	6.4	20 (PWM)	
#7	7.1	SYS+_1	4 outputs: 7.3A Continuously 2 outputs: 4.7A Continuously
	7.2	SYS+_2	
	7.3	SYS+_3	
	7.4	SYS+_4	

8 Indication LEDs

The UIU module is equipped with 3 LEDs. Power, status and error.

LED		Description
	Power	Always lit when powered on. Blinks when B+ is outside limits (lower than 9V or higher than 32V)
	Status	Blinks when running.
	Error	Possible causes: 1. CAN error. 2. B+ voltage outside limits (lower than 9V or higher than 32V) 3. Over-voltage analog voltage input (> 5.075V) 4. Over-current analog current input (> 22mA) 5. V5+ output short-circuit/overtemperature protection 6. +SYS output short-circuit/overtemperature protection 7. Digital output short-circuit/overtemperature protection 8. Internal failure

9 Error reporting

Error	Condition	Error free range			LED indication	CANOpen EMCY	USB error message
		Min.	Max.	Unit			
Input voltage error	B+ Outputs outside operating paramaters	9	32	V	Yes	Yes	Yes
Analog voltage input error		0	5.075	V	Yes	No	Yes
Analog current input error		0	22	mA	Yes	No	Yes
5V analog out error	short				Yes	Yes	Yes
5V analog drift					Yes	Yes	Yes
5V X6	short				Yes	Yes	Yes
SYS+_1	short				Yes	Yes	Yes
SYS+_2	short				Yes	Yes	Yes
SYS+_3	short				Yes	Yes	Yes
SYS+_4	short				Yes	Yes	Yes
DO1-14	short				Yes	Yes	Yes
DO15-16	short				Yes	Yes	Yes
DO17-20	short				Yes	Yes	Yes
CAN error					Yes	?	Yes

10 CANopen object dictionary

Index	S-idx	Name	Type		Default	Description
0x1000	0x00	Moduletype	ro	u32	0x00003232	Nonstandard description of UIU module.
0x1001	0x00	Error register	ro	u8	0x00	
0x1005	0x00	COB ID SYNC	rw	u32	0x00000080	
0x1008	0x00	Module name	ro	str	Electrum UIU	
0x1009	0x00	Revision HW	ro	str	REV X	Starting at char ”A”.
0x100A	0x00	Revision SW	ro	str	REV X	Starting at char ”A”.
0x1010	0x00	Number of save options	ro	u8	0x01	
	0x01	Save parameter	rw	u32	0x00000002	0x00000000 = No save. 0x00000001 = Saving all parameters after string ”save” is written to this entry. 0x00000002 = Auto store.
0x1011	0x00	Number of restore options	ro	u8	0x01	
	0x01	Restore default parameters	rw	u32	0x00000001	Restores all parameters to default values if string ’load’ is written to this entry.
0x1014	0x00	COB ID EMCY	rw	u32	0x00000080 +Node ID	Module generates EMCY messages (enabled when bit 31=0)
0x1016	0x00	Number of monitored devices	ro	u8	0x01	
	0x01	Consumer heartbeat time	rw	u32	0x00000000	Heartbeat monitoring time for node n monitoring only one node is supported. 0x0nn**tttt** = monitoring time (ms) 0x0**nn**tttt = node number (If nn or tttt = 0, no monitoring is carried out.)
0x1017	0x00	Producer heartbeat time	rw	u16	0x0000	Time interval (ms) where the module generates a producer heartbeat.
0x1018	0x00	Number of identity objects	ro	u8	0x04	
	0x01	Vendor ID	ro	u32	0x00000356	
	0x02	Product code	ro	u32	0x00000000	
	0x03	Revision number	ro	u32	0x00000000	
	0x04	Unique ID nr	ro	u32	0x????????	
0x1400	0x00	Receive PDO 1 Communication Parameter	ro	u8	0x05	Number of entries
	0x01	COB-ID used by PDO	rw	u32	0x200 + $NODEID	
	0x02	Transmission type	rw	u8	1	
	0x03	Inhibit Time	rw	u16	0	
	0x05	Event Timer	rw	u16	0	

Index	S-idx	Name	Type		Default	Description
0x1401	0x00	Receive PDO 2 Communication Parameter	ro	u8	0x05	Number of entries
	0x01	COB-ID used by PDO	rw	u32	0x300 + $NODEID	
	0x02	Transmission type	rw	u8	1	
	0x03	Inhibit Time	rw	u16	0	
	0x05	Event Timer	rw	u16	0	
0x1600	0x00	RPDO 1 mapping parameter	rw	u8	0x02	Number of entries
	0x01	PDO Mapping Entry 1	ro	u32	0x62000108	
	0x02	PDO Mapping Entry 2	ro	u32	0x62000208	
0x1601	0x00	RPDO 2 mapping parameter	rw	u8	0x04	Number of entries
	0x01	PDO Mapping Entry 1	ro	u32	0x64140110	
	0x02	PDO Mapping Entry 2	ro	u32	0x64140210	
	0x03	PDO Mapping Entry 3	ro	u32	0x64140310	
	0x04	PDO Mapping Entry 4	ro	u32	0x64140410	
0x1800	0x00	Transmit PDO 1 Communication Parameter	ro	u8	0x05	Number of entries
	0x01	COB-ID used by PDO	rw	u32	0x180 + $NODEID	
	0x02	Transmission type	rw	u8	1	
	0x03	Inhibit Time	rw	u16	0	
	0x05	Event Timer	rw	u16	0	
0x1801	0x00	Transmit PDO 2 Communication Parameter	ro	u8	0x05	Number of entries
	0x01	COB-ID used by PDO	rw	u32	0x280 + $NODEID	
	0x02	Transmission type	rw	u8	1	
	0x03	Inhibit Time	rw	u16	0	
	0x05	Event Timer	rw	u16	0	
0x1802	0x00	Transmit PDO 3 Communication Parameter	ro	u8	0x05	Number of entries
	0x01	COB-ID used by PDO	rw	u32	0x380 + $NODEID	
	0x02	Transmission type	rw	u8	1	
	0x03	Inhibit Time	rw	u16	0	
	0x05	Event Timer	rw	u16	0	

Index	S-idx	Name	Type		Default	Description
0x1803	0x00	Transmit PDO 4 Communication Parameter	ro	u8	0x05	Number of entries
	0x01	COB-ID used by PDO	rw	u32	0x480 + $NODEID	
	0x02	Transmission type	rw	u8	1	
	0x03	Inhibit Time	rw	u16	0	
	0x05	Event Timer	rw	u16	0	
0x1804-0x180B	0x00	Transmit PDO 5-12 Communication Parameter	ro	u8	0x05	Number of entries
	0x01	COB-ID used by PDO	rw	u32	0x80000000	
	0x02	Transmission type	rw	u8	1	
	0x03	Inhibit Time	rw	u16	0	
	0x05	Event Timer	rw	u16	0	
0x1A00	0x00	TPDO 1 mapping parameter	rw	u8	0x08	Number of entries
	0x01	PDO Mapping Entry 1	rw	u32	0x60000108	
	0x02	PDO Mapping Entry 2	rw	u32	0x60000208	
	0x03	PDO Mapping Entry 3	rw	u32	0x60000308	
	0x04	PDO Mapping Entry 4	rw	u32	0x60000408	
	0x05	PDO Mapping Entry 5	rw	u32	0x60000508	
	0x06	PDO Mapping Entry 6	rw	u32	0x60000608	
	0x07	PDO Mapping Entry 7	rw	u32	0x60000708	
	0x08	PDO Mapping Entry 8	rw	u32	0x60000808	
0x1A01	0x00	TPDO 2 mapping parameter	rw	u8	0x04	Number of entries
	0x01	PDO Mapping Entry 1	rw	u32	0x64040110	
	0x02	PDO Mapping Entry 2	rw	u32	0x64040210	
	0x03	PDO Mapping Entry 3	rw	u32	0x64040310	
	0x04	PDO Mapping Entry 4	rw	u32	0x64040410	
	0x05	PDO Mapping Entry 5	rw	u32	0	
	0x06	PDO Mapping Entry 6	rw	u32	0	
	0x07	PDO Mapping Entry 7	rw	u32	0	
	0x08	PDO Mapping Entry 8	rw	u32	0	

Index	S-idx	Name	Type		Default	Description
0x1A02	0x00	TPDO 3 mapping parameter	rw	u8	0x04	Number of entries
	0x01	PDO Mapping Entry 1	rw	u32	0x64040510	
	0x02	PDO Mapping Entry 2	rw	u32	0x64040610	
	0x03	PDO Mapping Entry 3	rw	u32	0x64040710	
	0x04	PDO Mapping Entry 4	rw	u32	0x64040810	
	0x05	PDO Mapping Entry 5	rw	u32	0	
	0x06	PDO Mapping Entry 6	rw	u32	0	
	0x07	PDO Mapping Entry 7	rw	u32	0	
	0x08	PDO Mapping Entry 8	rw	u32	0	
0x1A03	0x00	TPDO 4 mapping parameter	rw	u8	0x04	Number of entries
	0x01	PDO Mapping Entry 1	rw	u32	0x64040910	
	0x02	PDO Mapping Entry 2	rw	u32	0x64040A10	
	0x03	PDO Mapping Entry 3	rw	u32	0x64040B10	
	0x04	PDO Mapping Entry 4	rw	u32	0x64040C10	
	0x05	PDO Mapping Entry 5	rw	u32	0	
	0x06	PDO Mapping Entry 6	rw	u32	0	
	0x07	PDO Mapping Entry 7	rw	u32	0	
	0x08	PDO Mapping Entry 8	rw	u32	0	
0x1A04-0x1A0B	0x00	TPDO 5-12 mapping parameter	rw	u8	0x00	Number of entries
	0x01	PDO Mapping Entry 1	rw	u32	0	
	0x02	PDO Mapping Entry 2	rw	u32	0	
	0x03	PDO Mapping Entry 3	rw	u32	0	
	0x04	PDO Mapping Entry 4	rw	u32	0	
	0x05	PDO Mapping Entry 5	rw	u32	0	
	0x06	PDO Mapping Entry 6	rw	u32	0	
	0x07	PDO Mapping Entry 7	rw	u32	0	
	0x08	PDO Mapping Entry 8	rw	u32	0	
0x20F2	0x00	CAN baudrate	rw	u8	0x00	0=125kbit/s, 1=250kbit/s, 2=500kbit/s, 3=1Mbit/s
0x20F3	0x00	CAN baudrate	rw	u8	0x00	Baudrate must be written to index 20F2 first, and then written to this index.
0x3000	0x00	Node ID	rw	u8	0x65	

Index	S-idx	Name	Type		Default	Description
0x6000	0x00	Binary inputs	ro	u8	0x0A	Number of entries
	0x01	Binary inputs 1-8	ro	u8		Mappable
	0x02	Binary inputs 9-16	ro	u8		Mappable
	0x03	Binary inputs 17-24	ro	u8		Mappable
	0x04	Binary inputs 25-32	ro	u8		Mappable
	0x05	Binary inputs 33-40	ro	u8		Mappable
	0x06	Binary inputs 41-48	ro	u8		Mappable
	0x07	Binary inputs 49-56	ro	u8		Mappable
	0x08	Binary inputs 57-64	ro	u8		Mappable
	0x09	Binary inputs 65-72	ro	u8		Mappable
	0x0A	Binary inputs 73-75	ro	u8		Mappable
0x6200	0x00	Binary outputs	ro	u8	0x02	Number of entries
	0x01	Binary outputs 1-8	wo	u8		Mappable
	0x02	Binary outputs 9-16	wo	u8		Mappable

Index	S-idx	Name	Type		Default	Description
0x6404	0x00	Manufacturer-specific analog input	ro	u8	0x1F	Number of entries
	0x01	5V analog input 1	ro	u16		Mappable
	0x02	5V analog input 2	ro	u16		Mappable
	0x03	5V analog input 3	ro	u16		Mappable
	0x04	5V analog input 4	ro	u16		Mappable
	0x05	5V analog input 5	ro	u16		Mappable
	0x06	5V analog input 6	ro	u16		Mappable
	0x07	5V analog input 7	ro	u16		Mappable
	0x08	5V analog input 8	ro	u16		Mappable
	0x09	5V analog input 9	ro	u16		Mappable
	0x0A	5V analog input 10	ro	u16		Mappable
	0x0B	5V analog input 11	ro	u16		Mappable
	0x0C	5V analog input 12	ro	u16		Mappable
	0x0D	5V analog input 13	ro	u16		Mappable
	0x0E	5V analog input 14	ro	u16		Mappable
	0x0F	5V analog input 15	ro	u16		Mappable
	0x10	5V analog input 16	ro	u16		Mappable
	0x11	5V analog input 17	ro	u16		Mappable
	0x12	5V analog input 18	ro	u16		Mappable
	0x13	5V analog input 19	ro	u16		Mappable
	0x14	5V analog input 20	ro	u16		Mappable
	0x15	20mA analog input 1	ro	u16		Mappable
	0x16	20mA analog input 2	ro	u16		Mappable
	0x17	Temperature VREG	ro	s8		Mappable
	0x18	Temperature MCU	ro	s8		Mappable
	0x19	B+ voltage	ro	u16		Mappable
	0x1A	Pulse input 1	ro	u32		Mappable
	0x1B	Pulse input 2	ro	u32		Mappable
	0x1C	Pulse input 3	ro	u32		Mappable
	0x1D	Pulse input 4	ro	u32		Mappable
	0x1E	Pulse input 5	ro	u32		Mappable
	0x1F	Pulse input 6(dir)	ro	s32		Mappable

Index	S-idx	Name	Type		Default	Description
0x6414	0x00	Write Manufacturer Specific Analogue Output	ro	u8	0x04	Number of entries
	0x01	PWM 1	wo	u16		Mappable
	0x02	PWM 2	wo	u16		Mappable
	0x03	PWM 3	wo	u16		Mappable
	0x04	PWM 4	wo	u16		Mappable

11 Document history

Document revision	Description	Release date
A	Initial release	2013-03-25
B	Added more CANopen index entries.	2013-12-04
C	• Added further electrical characteristics. • Added CANOpen index entries. • Added Internal Wiring	2014-10-27
D	Changed document layout	2014-11-20

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