

DATA SHEET

## ADQUIO LORA SENSORS GATEWAY

Modbus module for receiving LoRa probes.



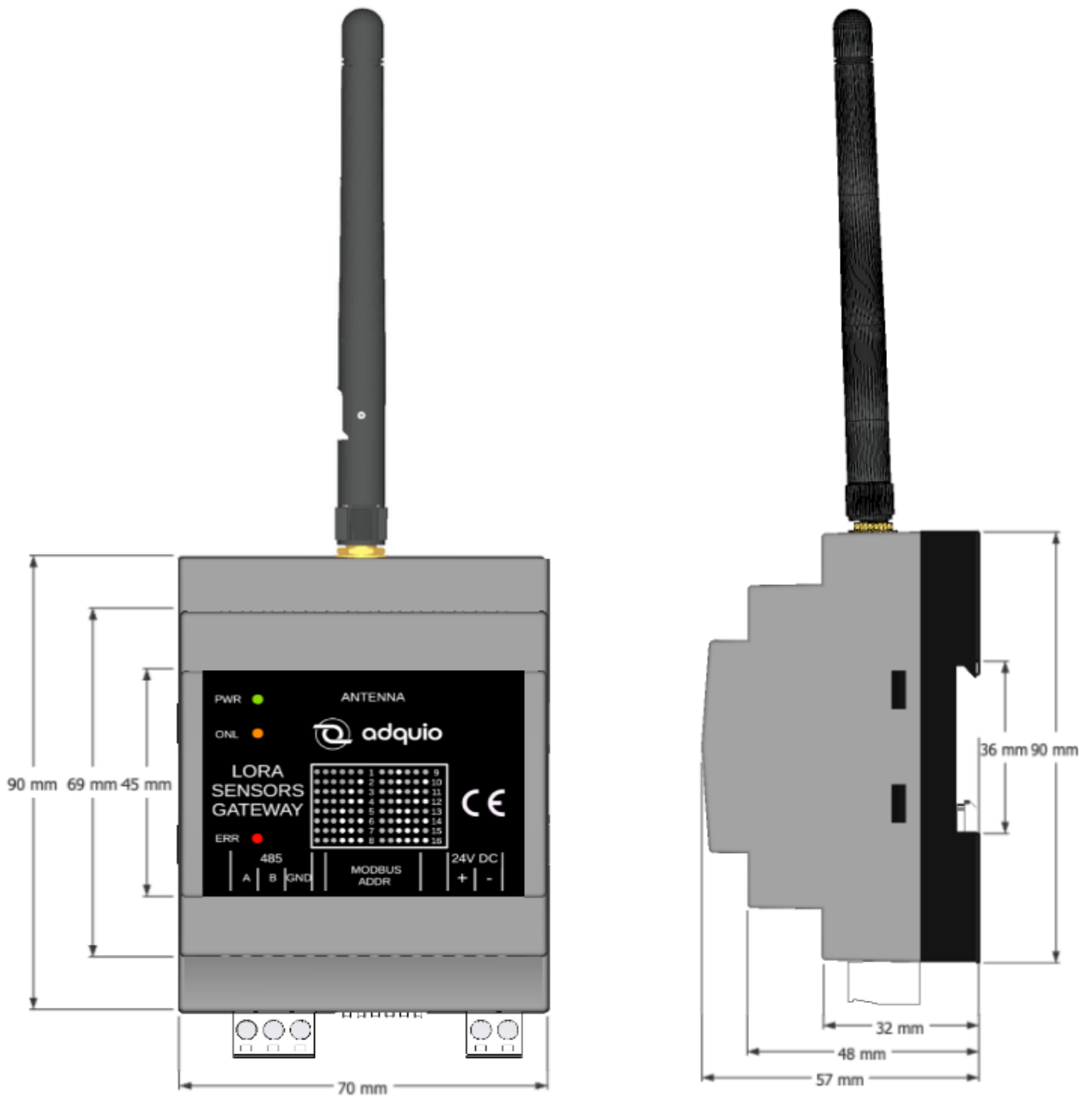
### 1 Ordering information

Reference	Description	Life cycle *
ADQ-LORASW01	Adquio LORA Sensors Gateway modbus module, module for receiving Adquio LORA probes, 1 485 slave	Active



\* For planning and commissioning of new installations use modules in Active state only

## 2 Dimensions



### 3 Technical data

Parameter	Value
Power	
Connections	Removable terminal block 5.08 Pitch 2 contacts
Nominal value	24 VDC
Maximum supported	28 VDC
Protection against voltage inversion	Yes
Nominal protection fuse up to	3 A
Consumption	
From a 24V power supply	15 mA
Maximum consumption	20 mA
Maximum consumption peak at start-up	15 mA



**CAUTION!**

Exceeding the maximum power supply voltage for the process or supply voltages could cause unrecoverable damage to the system. The system could be destroyed.



**CAUTION!**

Inadequate connection cables cause overtemperature in the terminals. Adquio LoRa Sensors Gateway, can be destroyed if the wrong cable type, wire size, or wire temperature rating is used.

### 3.1 Technical data of the LoRa receiver

Parameter	Value
Maximum number of probes supported	30
Radio frequency	433 Mhz / 868 Mhz / 915 Mhz (Depending on markets)
Radio chip data	<p>Maximum link budget 168 dB            +20 dBm - Constant RF output of 100 mW vs. +14 dBm high efficiency V.PA supply.            Programmable bit rate up to 300 kbps.            High sensitivity: up to -148 dBm.            Bulletproof front: IIP3 = -12.5 dBm.            Excellent blocking immunity.            Low 10.3 mA RX current, 200 nA log hold.            Fully integrated synthesizer with 61 Hz resolution.            FSK, GFSK, MSK, GMSK, LoRaTM and OOK modulation.            Built-in bit synchronizer for clock recovery.            Preamble detection.            127dB Dynamic Range RSSI            Automatic RF Sense and CAD with ultra-fast AFC.            Packet engine up to 256 bytes with CRC.</p>
Variables Supported in each probe	Temperature, humidity, CO2 level, VOC level and battery level.

## 4 System data

### 4.1 Environmental conditions

Parameter	Value
Temperature	
Operation	0 °C...+60 °C (Vertical mounting on DIN rail)
Storage	-40 °C...+70 °C
Transport	-40 °C...+70 °C
Humidity	Max. 95% non-condensing

Air pressure		
	Operation	> 800 hPa / < 2000 m
	Storage	> 600 hPa / < 3500 m
Insulation		IP20

## 4.2 Mechanical data

Parameter	Value
Mounting	Vertical
Protection level	IP20
Casing material	ABS UL-94-HB Dark gray
<b>Mounting alternatives</b>	
Rail DIN according to DIN EN 50022	35 mm, depth 7.5 mm or 15 mm
Screw	Screws with a diameter of 4 mm
Tightening torque	1.2 Nm

## 4.4 Communications

Parameter	Value	
485 slave		
	Number	1
	Protocol	Modbus RTU
	Communication speed	9600 by default, configurable up to 57600.
	Parity and stop bits	By default N81, configurable

## 4.5 Modbus register configuration table

Modbus positions						
Function	Address	Description	Read	Write	Type	Size
03/06	0	Received packet counter	Yes	No	Holding Register	16 Bits
03/06	1	Temperature 01	Yes	No	Holding Register	16 Bits
03/06	2	Humidity 01	Yes	No	Holding Register	16 Bits
03/06	3	Battery Voltage 01	Yes	No	Holding Register	16 Bits
03/06	4	Co2 01	Yes	No	Holding Register	16 Bits
03/06	5	VOC 01	Yes	No	Holding Register	16 Bits
03/06	6	Temperature 02	Yes	No	Holding Register	16 Bits
03/06	7	Humidity 02	Yes	No	Holding Register	16 Bits
03/06	8	Battery Voltage 02	Yes	No	Holding Register	16 Bits
03/06	9	Co2 02	Yes	No	Holding Register	16 Bits
03/06	10	VOC 02	Yes	No	Holding Register	16 Bits
03/06	11	Temperature 03	Yes	No	Holding Register	16 Bits
03/06	12	Humidity 03	Yes	No	Holding Register	16 Bits
03/06	13	Battery Voltage 03	Yes	No	Holding Register	16 Bits
03/06	14	Co2 03	Yes	No	Holding Register	16 Bits
03/06	15	VOC 03	Yes	No	Holding Register	16 Bits
03/06	16	Temperature 04	Yes	No	Holding Register	16 Bits
03/06	17	Humidity 04	Yes	No	Holding Register	16 Bits
03/06	18	Battery Voltage 04	Yes	No	Holding Register	16 Bits
03/06	19	Co2 04	Yes	No	Holding Register	16 Bits
03/06	20	VOC 04	Yes	No	Holding Register	16 Bits
03/06	21	Temperature 05	Yes	No	Holding Register	16 Bits
03/06	22	Humidity 05	Yes	No	Holding Register	16 Bits
03/06	23	Battery Voltage 05	Yes	No	Holding Register	16 Bits
03/06	24	Co2 05	Yes	No	Holding Register	16 Bits
03/06	25	VOC 05	Yes	No	Holding Register	16 Bits
03/06	26	Temperature 06	Yes	No	Holding Register	16 Bits
03/06	27	Humidity 06	Yes	No	Holding Register	16 Bits
03/06	28	Battery Voltage 06	Yes	No	Holding Register	16 Bits

03/06	29	Co2 06	Yes	No	Holding Register	16 Bits
03/06	30	VOC 06	Yes	No	Holding Register	16 Bits
03/06	31	Temperature 07	Yes	No	Holding Register	16 Bits
03/06	32	Humidity 07	Yes	No	Holding Register	16 Bits
03/06	33	Battery Voltage 07	Yes	No	Holding Register	16 Bits
03/06	34	Co2 07	Yes	No	Holding Register	16 Bits
03/06	35	VOC 07	Yes	No	Holding Register	16 Bits
03/06	36	Temperature 08	Yes	No	Holding Register	16 Bits
03/06	37	Humidity 08	Yes	No	Holding Register	16 Bits
03/06	38	Battery Voltage 08	Yes	No	Holding Register	16 Bits
03/06	39	Co2 08	Yes	No	Holding Register	16 Bits
03/06	40	VOC 08	Yes	No	Holding Register	16 Bits
03/06	41	Temperature 09	Yes	No	Holding Register	16 Bits
03/06	42	Humidity 09	Yes	No	Holding Register	16 Bits
03/06	43	Battery Voltage 0 9	Yes	No	Holding Register	16 Bits
03/06	44	Co2 09	Yes	No	Holding Register	16 Bits
03/06	45	VOC 09	Yes	No	Holding Register	16 Bits
03/06	46	Temperature 10	Yes	No	Holding Register	16 Bits
03/06	47	Humidity 10	Yes	No	Holding Register	16 Bits
03/06	48	Battery Voltage 10	Yes	No	Holding Register	16 Bits
03/06	49	Co2 10	Yes	No	Holding Register	16 Bits
03/06	50	VOC 10	Yes	No	Holding Register	16 Bits
03/06	51	Temperature 11	Yes	No	Holding Register	16 Bits
03/06	52	Humidity 11	Yes	No	Holding Register	16 Bits
03/06	53	Battery Voltage 11	Yes	No	Holding Register	16 Bits
03/06	54	Co2 11	Yes	No	Holding Register	16 Bits
03/06	55	VOC 11	Yes	No	Holding Register	16 Bits
03/06	56	Temperature 12	Yes	No	Holding Register	16 Bits
03/06	57	Humidity 12	Yes	No	Holding Register	16 Bits
03/06	58	Battery Voltage 12	Yes	No	Holding Register	16 Bits
03/06	59	Co2 12	Yes	No	Holding Register	16 Bits
03/06	60	VOC 12	Yes	No	Holding Register	16 Bits
03/06	61	Temperature 13	Yes	No	Holding Register	16 Bits

03/06	62	Humidity 13	Yes	No	Holding Register r	16 Bits
03/06	63	Battery Voltage 13	Yes	No	Holding Register	16 Bits
03/06	64	Co2 13	Yes	No	Holding Register	16 Bits
03/06	65	VOC 13	Yes	No	Holding Register	16 Bits
03/06	66	Temperature 14	Yes	No	Holding Register	16 Bits
06/03	67	Humidity 14	Yes	No	Holding Register	16 Bits
06/03	68	Battery Voltage 14	Yes	No	Holding Register	16 Bits
06/03	69	Co2 14	Yes	No	Holding Register	16 Bits
06/03	70	VOC 14	Yes	No	Holding Register	16 Bits
06/03	71	Temperature 15	Yes	No	Holding Register	16 Bits
06/03	72	Humidity 15	Yes	No	Holding Register	16 Bits
06/03	73	Battery Voltage 15	Yes	No	Holding Register	16 Bits
06/03	74	Co2 15	Yes	No	Holding Register	16 Bits
03/06	75	VOC 15	Yes	No	Holding Register	16 Bits
03/06	76	Temperature 16	Yes	No	Holding Register	16 Bits
03/06	77	Humidity 16	Yes	No	Holding Register	16 Bits
03/06	78	Battery Voltage 16	Yes	No	Holding Register	16 Bits
03 /06	79	Co2 16	Yes	No	Holding Register	16 Bits
03/06	80	VOC 16	Yes	No	Holding Register	16 Bits
03/06	81	Temperature 17	Yes	No	Holding Register	16 Bits
03/06	82	Humidity 17	Yes	No	Holding Register	16 Bits
03/06	83	Battery Voltage 17	Yes	No	Holding Register	16 Bits
03/06	84	Co2 17	Yes	No	Holding Register	16 Bits
03/06	85	VOC 17	Yes	No	Holding Register	16 Bits
03/06	86	Temperature 18	Yes	No	Holding Register	16 Bits
03/06	87	Humidity 18	Yes	No	Holding Register	16 Bits
03/06	88	Battery Voltage 18	Yes	No	Holding Register	16 Bits
03/06	89	Co2 18	Yes	No	Holding Register	16 Bits
03/06	90	VOC 18	Yes	No	Holding Register	16 Bits
03/06	91	Temperature 19	Yes	No	Holding Register	16 Bits
03/06	92	Humidity 19	Yes	No	Holding Register	16 Bits
03/06	93	Battery Voltage 19	Yes	No	Holding Register	16 Bits
03/06	94	Co2 19	Yes	No	Holding Register	16 Bits



03/06	95	VOC 19	Yes	No	Holding Register	16 Bits
03/06	96	Temperature 20	Yes	No	Holding Register	16 Bits
03/06	97	Humidity 20	Yes	No	Holding Register	16 Bits
03/06	98	Battery Voltage 20	Yes	No	Holding Register	16 Bits
06/03	99	Co2 20	Yes	No	Holding Register	16 Bits
06/03	100	VOC 20	Yes	No	Holding Register	16 Bits
06/03	101	Temperature 2 1	Yes	No	Holding Register	16 Bits
03/06	102	Humidity 21	Yes	No	Holding Register	16 Bits
03/06	103	Battery Voltage 21	Yes	No	Holding Register	16 Bits
03/06	104	Co2 21	Yes	No	Holding Register	16 Bits
03/06	105	VOC 21	Yes	No	Holding Register	16 Bits
03/06	106	Temperature 22	Yes	No	Holding Register	16 Bits
03/06	107	Humidity 22	Yes	No	Holding Register	16 Bits
03/06	108	Battery Voltage 22	Yes	No	Holding Register	16 Bits
03/06	109	Co2 22	Yes	No	Holding Register	16 Bits
03/06	110	VOC 22	Yes	No	Holding Register	16 Bits
03/06	111	Temperature 23	Yes	No	Holding Register	16 Bits
03/06	112	Humidity 23	Yes	No	Holding Register	16 Bits
03/06	113	Battery Voltage 23	Yes	No	Holding Register	16 Bits
06/03	114	Co2 23	Yes	No	Holding Register	16 Bits
06/03	115	VOC 23	Yes	No	Holding Register	16 Bits
06/03	116	Temperature 24	Yes	No	Holding Register	16 Bits
06/03	117	Humidity 24	Yes	No	Holding Register	16 Bits
03/06	118	Battery Voltage 24	Yes	No	Holding Register	16 Bits
03/06	119	Co2 24	Yes	No	Holding Register	16 Bits
03/06	120	VOC 2 4	Yes	No	Holding Register	16 Bits
03/06	121	Temperature 25	Yes	No	Holding Register	16 Bits
03/06	122	Humidity 25	Yes	No	Holding Register	16 Bits
03/06	123	Battery Voltage 25	Yes	No	Holding Register	16 Bits
03/06	124	Co2 25	Yes	No	Holding Register	16 Bits
03/06	125	VOC 25	Yes	No	Holding Register	16 Bits
03/06	126	Temperature 26	Yes	No	Holding Register	16 Bits
03/06	127	Humidity 26	Yes	No	Holding Register	16 Bits

03/06	128	Battery Voltage 26	Yes	No	Holding Register	16 Bits
06/03	129	Co2 26	Yes	No	Holding Register	16 Bits
06/03	130	VOC 26	Yes	No	Holding Register	16 Bits
06/03	131	Temperature 27	Yes	No	Holding Register	16 Bits
06/03	132	Humidity 27	Yes	No	Holding Register	16 Bits
03/06	133	Battery Voltage 27	Yes	No	Holding Register	16 Bits
03/06	134	Co2 27	Yes	No	Holding Register	16 Bits
03/06	135	VOC 27	Yes	No	Holding Register	16 Bits
03/06	136	Temperature 28	Yes	No	Holding Register	16 Bits
03/06	137	Humidity 28	Yes	No	Holding Register	16 Bits
03/06	138	Battery Voltage 28	Yes	No	Holding Register	16 Bits
03/06	139	Co2 28	Yes	No	Holding Register	16 Bits
03/06	140	VOC 28	Yes	No	Holding Register	16 Bits
03/06	141	Temperature 29	Yes	No	Holding Register	16 Bits
03/06	142	Humidity 29	Yes	No	Holding Register	16 Bits
03/06	143	Voltage Battery 29	Yes	No	Holding Register	16 Bits
03/06	144	Co2 29	Yes	No	Holding Register	16 Bits
03/06	145	VOC 29	Yes	No	Holding Register	16 Bits
03/06	146	Temperature 30	Yes	No	Holding Register	16 Bits
03/06	147	Humidity 30	Yes	No	Holding Register	16 Bits
03/06	148	Battery Voltage 30	Yes	No	Holding Register	16 Bits
03/06	149	Co2 30	Yes	No	Holding Register	16 Bits
03/06	150	VOC 30	Yes	No	Holding Register	16 Bits
03/06	151	Led de power	Yes	Yes	Holding Register	16 Bits
03/06	152	Network identifier	Yes	No	Holding Register	16 Bits
03/06	153	Communication speed configuration (9600, 19200, 38400, 57600), by default 9600	Yes	Yes	Holding Register	16 Bits
03/06	154	Parity and Stop bits 6 = 8N1, 14 = 8N2, 38 = 8E1, 46 = 8E2, 54 = 8O1, 62 = 8O2), default 6 = 8N1	Yes	Yes	Holding Register	16 Bits
06/03	155	Device 1 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	156	Device 2 binded (0-1)	Yes	Yes	Holding Register	16 Bits

06/03	157	Device 3 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	158	Device 4 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	159	Device 5 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	160	Device 6 binded ( 0-1)	Yes	Yes	Holding Register	16 Bits
03/06	161	Device 7 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	162	Device 8 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	163	Device 9 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	164	Device 10 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	165	Device 11 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	166	Device 12 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	167	Device 13 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	168	Device 14 binded (0-1)	Yes	Yes	Holding Register	16 Bit
03/06	169	Device 15 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	170	Device 16 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	171	Device 17 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	172	Device 18 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	173	Device 19 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	174	Device 20 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	175	Device 21 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	176	Device 22 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	177	Device 23 binded (0 -1)	Yes	Yes	Holding Register	16 Bits
06/03	178	Device 24 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	179	Device 25 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	180	Device 26 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	181	Device 27 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03/06	182	Device 28 binded (0-1)	Yes	Yes	Holding Register	16 Bits
03 /06	183	Device 29 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	184	Device 30 binded (0-1)	Yes	Yes	Holding Register	16 Bits
06/03	185	Modbus address currently configured (requires restart to apply)	Yes	No	Holding Register	16 Bits



- The temperature registers must be divided by 100 to obtain the real value.
- Battery voltage registers must be divided by 1000 to get the actual value.
- Battery values range from 4.2 for 100% to 3.2 V for 0%.
- When binding a new probe, the system will place it in the first free position of the table of binded devices, (the one that contains a 0). If you want to unbind a device and recycle its numbering simply set its bound device variable to 0.
- If communication parameters such as speed, parity, etc. are changed, it will be necessary to restart the device to apply these changes.

#### 4.6 Modbus address configuration table with micro switches

Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6	Modbus address
Off	Off	Off	Off	Off	Off	01
Off	Off	Off	Off	Off	On	02
Off	Off	Off	Off	On	Off	03
Off	Off	Off	Off	On	On	04
Off	Off	Off	On	Off	Off	05
Off	Off	Off	On	Off	On	06
Off	Off	Off	On	On	Off	07
Off	Off	Off	On	On	On	08
Off	Off	On	Off	Off	Off	09
Off	Off	On	Off	Off	On	10
Off	Off	On	Off	On	Off	11
Off	Off	On	Off	On	On	12
Off	Off	On	On	Off	Off	13
Off	Off	On	On	Off	On	14
Off	Off	On	On	On	Off	15
Off	Off	On	On	On	On	16
Off	On	Off	Off	Off	Off	17
Off	On	Off	Off	Off	On	18
Off	On	Off	Off	On	Off	19
Off	On	Off	Off	On	On	20
Off	On	Off	On	Off	Off	21
Off	On	Off	On	Off	On	22
Off	On	Off	On	On	Off	23

Off	On	Off	On	On	On	24
Off	On	On	Off	Off	Off	25
Off	On	On	Off	Off	On	26
Off	On	On	Off	On	Off	27
Off	On	On	Off	On	On	28
Off	On	On	On	Off	Off	29
Off	On	On	On	Off	On	30
Off	On	On	On	On	Off	31
Off	On	On	On	On	On	32
On	Off	Off	Off	Off	Off	33
On	Off	Off	Off	Off	On	34
On	Off	Off	Off	On	Off	35
On	Off	Off	Off	On	On	36
On	Off	Off	On	Off	Off	37
On	Off	Off	On	Off	On	38
On	Off	Off	On	On	Off	39
On	Off	Off	On	On	On	40
On	Off	On	Off	Off	Off	41
On	Off	On	Off	Off	On	42
On	Off	On	Off	On	Off	43
On	Off	On	Off	On	On	44
On	Off	On	On	Off	Off	45
On	Off	On	On	Off	On	46
On	Off	On	On	On	Off	47
On	Off	On	On	On	On	48
On	On	Off	Off	Off	Off	49

On	On	Off	Off	Off	On	50
On	On	Off	Off	On	Off	51
On	On	Off	Off	On	On	52
On	On	Off	On	Off	Off	53
On	On	Off	On	Off	On	54
On	On	Off	On	On	Off	55
On	On	Off	On	On	On	56
On	On	On	Off	Off	Off	57
On	On	On	Off	Off	On	58
On	On	On	Off	On	Off	59
On	On	On	Off	On	On	60
On	On	On	On	Off	Off	61
On	On	On	On	Off	On	62
On	On	On	On	On	Off	63
On	On	On	On	On	On	64

## 4.7 Certifications

Parameter	Value
Safety and Health	EN ISO 13849-1: 2015 EN ISO 13849-2: 2012 EN 62061:2005 + A1:2013 + A2:2015 EN 60950-1:2006 EN 62311:20 08
EMC	EN 61000-6-4:2007 + A1:2011 EN 61000-6-2:2005 ETSI EN 301 489-1 v2.2.0 ETSI EN 301 489-17 v3.2.0
RoHS	EN 50581:2012

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