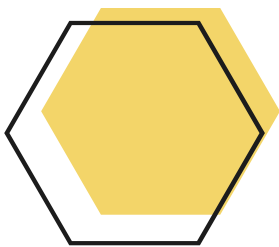




DATASHEET

WiMesh485



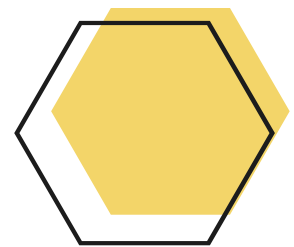
Wireless RS485 Modbus

High-Performance,
Wireless MODBUS
Device with RS485
Interface Self-Healing,
Self-forming Mesh
Network



Sub GHz ISM Band

902 MHz to 928 MHz
operating Frequency in
license-free Band



Industrial grade

-40 deg C to +85 deg C
operation temperature,
IP67 Ingress Protection

dun & bradstreet



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HW REV# 04.00, FW REV# 477-19

TECHNICAL SPECIFICATION

RS485 TRANSCEIVER INTERFACE	
RS 485 Baud rates	4800 bps, 9600 bps, 19,200 bps, 38,400 bps, 57,600 bps, 115,200 bps
RS485 isolation level	5KV RMS between RS485 Bus signal & internal circuitry
Surge Protection	± 30 kV HBM ±16 kV IEC 61000-4-2 Contact discharge ± 4 kV IEC 61000-4-4 Electrical fast transient
RS485 Bus signal feed	Through IP67, M8 circular connector (B-coding)
Power Feed	12V to 24V through M8, IP67 Connector (optional)
Mechanical	Outdoor, IP67, Wall Mounting
Wi-SUN RADIO	
Chipset Info	Renesas RL78/G1H, 16 bit, MCU, 32 MHz, 44 DMIPS
Memory (Max Option)	Program Flash 512 KB, Data flash 8 KB, SRAM 48 KB
Operating Frequency	902 MHz to 928 MHz
Data Modulation	2GFSK/4GFSK
Operating Mode	Frequency Hopping (SW Configurable)
Number of Channels (50 Kbps)	EU-69, NA-129, JP-38, IN-19
Number of Channels (100 Kbps)	EU-35, JP-37, IN-10
Number of Channels (150 Kbps)	EU-35, NA-64
Number of Channels (200 Kbps)	NA-64, JP-36
RF Antenna	902-928 MHz, 1 dBi, Chip Antenna
MECHANICAL & ENVIRONMENTAL	
Power Feed	7V to 30V feed through IP67 M8 Connector
IP Rating and mounting	Outdoor, IP67, Pole/Wall Mounting
Operating Temperature Range	-40 deg C to +85 deg C
Mechanical Dimensions	75 mm (L) x 75 mm (W) x 35 mm (D)

ORDERING INFORMATION	
WiMesh485	IP67, WIRELESS, RS485 MESH SYSTEM, 28 dBm

RADIO SPECIFICATION

TX Power and RX Sensitivity

902 MHz to 928 MHz, +/-1 dBm

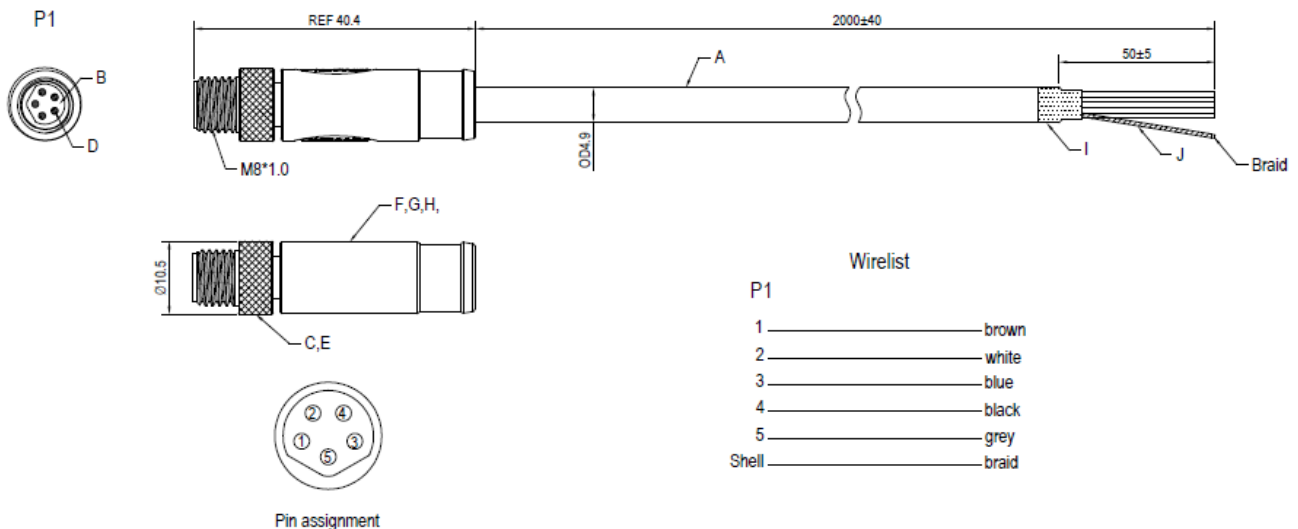
TX Power Setting	Power (dBm)	Current at 3.3V (mA)
1	8.5	80
5	11	90
10	13.5	110
20	16	120
30	19	140
40	21	190
50	24	260
60	26	290
70	27	320
80	28	350

902 MHz to 928 MHz, BER <1%, +/-1 dBm

Data Rate (Kbps)	Modulation	RX Sensitivity (dBm)
50	2GFSK	-113
100	2GFSK	-111
150	2GFSK	-109
200	2GFSK	-108

M8 Connector Pin out

BROWN	DC (24V, Range=9V to 27V)
WHITE	AGND, DC(-)
BLUE	B(-)
BLACK	A(+)
GREY	AGND, DC (-)
SHIELD	Connect to Chassis
BRAID	GND



WALL MOUNTING



Frequency Channel Mapping

Band ID 7, Channel setting of the Wi-SUN PHY Mode 3, 50 Kbps

Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)
0 (0x00)	902.2	1 (0x01)	902.4	2 (0x02)	902.6	3 (0x03)	902.8
4 (0x04)	903	5 (0x05)	903.2	6 (0x06)	903.4	7 (0x07)	903.6
8 (0x08)	903.8	9 (0x09)	904	10 (0x0A)	904.2	11 (0x0B)	904.4
12 (0x0C)	904.6	13 (0x0D)	904.8	14 (0x0E)	905	15 (0x0F)	905.2
16 (0x10)	905.4	17 (0x11)	905.6	18 (0x12)	905.8	19 (0x13)	906
20 (0x14)	906.2	21 (0x15)	906.4	22 (0x16)	906.6	23 (0x17)	906.8
24 (0x18)	907	25 (0x19)	907.2	26 (0x1A)	907.4	27 (0x1B)	907.6
28 (0x1C)	907.8	29 (0x1D)	908	30 (0x1E)	908.2	31 (0x1F)	908.4
32 (0x20)	908.6	33 (0x21)	908.8	34 (0x22)	909	35 (0x23)	909.2
36 (0x24)	909.4	37 (0x25)	909.6	38 (0x26)	909.8	39 (0x27)	910
40 (0x28)	910.2	41 (0x29)	910.4	42 (0x2A)	910.6	43 (0x2B)	910.8
44 (0x2C)	911	45 (0x2D)	911.2	46 (0x2E)	911.4	47 (0x2F)	911.6
48 (0x30)	911.8	49 (0x31)	912	50 (0x32)	912.2	51 (0x33)	912.4
52 (0x34)	912.6	53 (0x35)	912.8	54 (0x36)	913	55 (0x37)	913.2
56 (0x38)	913.4	57 (0x39)	913.6	58 (0x3A)	913.8	59 (0x3B)	914
60 (0x3C)	914.2	61 (0x3D)	914.4	62 (0x3E)	914.6	63 (0x3F)	914.8
64 (0x40)	915	65 (0x41)	915.2	66 (0x42)	915.4	67 (0x43)	915.6
68 (0x44)	915.8	69 (0x45)	916	70 (0x46)	916.2	71 (0x47)	916.4
72 (0x48)	916.6	73 (0x49)	916.8	74 (0x4A)	917	75 (0x4B)	917.2
76 (0x4C)	917.4	77 (0x4D)	917.6	78 (0x4E)	917.8	79 (0x4F)	918
80 (0x50)	918.2	81 (0x51)	918.4	82 (0x52)	918.6	83 (0x53)	918.8
84 (0x54)	919	85 (0x55)	919.2	86 (0x56)	919.4	87 (0x57)	919.6
88 (0x58)	919.8	89 (0x59)	920	90 (0x5A)	920.2	91 (0x5B)	920.4
92 (0x5C)	920.6	93 (0x5D)	920.8	94 (0x5E)	921	95 (0x5F)	921.2
96 (0x60)	921.4	97 (0x61)	921.6	98 (0x62)	921.8	99 (0x63)	922
100(0x64)	922.2	101(0x65)	922.4	102(0x66)	922.6	103(0x67)	922.8
104(0x68)	923	105(0x69)	923.2	106(0x6A)	923.4	107(0x6B)	923.6
108(0x6C)	923.8	109(0x6D)	924	110(0x6E)	924.2	111(0x6F)	924.4
112(0x70)	924.6	113(0x71)	924.8	114(0x72)	925	115(0x73)	925.2
116(0x74)	925.4	117(0x75)	925.6	118(0x76)	925.8	119(0x77)	926
120(0x78)	926.2	121(0x79)	926.4	122(0x7A)	926.6	123(0x7B)	926.8
124(0x7C)	927	125(0x7D)	927.2	126(0x7E)	927.4	127(0x7F)	927.6
128(0x80)	927.8						

Band ID 7, Channel setting of the Wi-SUN PHY Mode 4, 150 Kbps, PHY Mode 5, 200 Kbps

Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)
0 (0x00)	902.4	1 (0x01)	902.8	2 (0x02)	903.2	3 (0x03)	903.6
4 (0x04)	904	5 (0x05)	904.4	6 (0x06)	904.8	7 (0x07)	905.2
8 (0x08)	905.6	9 (0x09)	906	10 (0x0A)	906.4	11 (0x0B)	906.8
12 (0x0C)	907.2	13 (0x0D)	907.6	14 (0x0E)	908	15 (0x0F)	908.4
16 (0x10)	908.8	17 (0x11)	909.2	18 (0x12)	909.6	19 (0x13)	910
20 (0x14)	910.4	21 (0x15)	910.8	22 (0x16)	911.2	23 (0x17)	911.6
24 (0x18)	912	25 (0x19)	912.4	26 (0x1A)	912.8	27 (0x1B)	913.2
28 (0x1C)	913.6	29 (0x1D)	914	30 (0x1E)	914.4	31 (0x1F)	914.8
32 (0x20)	915.2	33 (0x21)	915.6	34 (0x22)	916	35 (0x23)	916.4
36 (0x24)	916.8	37 (0x25)	917.2	38 (0x26)	917.6	39 (0x27)	918
40 (0x28)	918.4	41 (0x29)	918.8	42 (0x2A)	919.2	43 (0x2B)	919.6
44 (0x2C)	920	45 (0x2D)	920.4	46 (0x2E)	920.8	47 (0x2F)	921.2
48 (0x30)	921.6	49 (0x31)	922	50 (0x32)	922.4	51 (0x33)	922.8
52 (0x34)	923.2	53 (0x35)	923.6	54 (0x36)	924	55 (0x37)	924.4
56 (0x38)	924.8	57 (0x39)	925.2	58 (0x3A)	925.6	59 (0x3B)	926
60 (0x3C)	926.4	61 (0x3D)	926.8	62 (0x3E)	927.2	63 (0x3F)	927.6

Band ID 9, Channel setting of the Wi-SUN PHY Mode 8, 50 Kbps

Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)
0 (0x00)	920.6	1 (0x01)	920.8	2 (0x02)	921	3 (0x03)	921.2
4 (0x04)	921.4	5 (0x05)	921.6	6 (0x06)	921.8	7 (0x07)	922
8 (0x08)	922.2	9 (0x09)	922.4	10 (0x0A)	922.6	11 (0x0B)	922.8
12 (0x0C)	923	13 (0x0D)	923.2	14 (0x0E)	923.4	15 (0x0F)	923.6
16 (0x10)	923.8	17 (0x11)	924	18 (0x12)	924.2	19 (0x13)	924.4
20 (0x14)	924.6	21 (0x15)	924.8	22 (0x16)	925	23 (0x17)	925.2
24 (0x18)	925.4	25 (0x19)	925.6	26 (0x1A)	925.8	27 (0x1B)	926
28 (0x1C)	926.2	29 (0x1D)	926.4	30 (0x1E)	926.6	31 (0x1F)	926.8
32 (0x20)	927	33 (0x21)	927.2	34 (0x22)	927.4	35 (0x23)	927.6
36 (0x24)	927.8	37 (0x25)	928				

Band ID 9, Channel setting of the Wi-SUN PHY Mode 9, 100 Kbps

Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)
0 (0x00)	920.7	1 (0x01)	920.9	2 (0x02)	921.1	3 (0x03)	921.3
4 (0x04)	921.5	5 (0x05)	921.7	6 (0x06)	921.9	7 (0x07)	922.1
8 (0x08)	922.3	9 (0x09)	922.5	10 (0x0A)	922.7	11 (0x0B)	922.9
12 (0x0C)	923.1	13 (0x0D)	923.3	14 (0x0E)	923.5	15 (0x0F)	923.7
16 (0x10)	923.9	17 (0x11)	924.1	18 (0x12)	924.3	19 (0x13)	924.5
20 (0x14)	924.7	21 (0x15)	924.9	22 (0x16)	925.1	23 (0x17)	925.3
24 (0x18)	925.5	25 (0x19)	925.7	26 (0x1A)	925.9	27 (0x1B)	926.1
28 (0x1C)	926.3	29 (0x1D)	926.5	30 (0x1E)	926.7	31 (0x1F)	926.9
32 (0x20)	927.1	33 (0x21)	927.3	34 (0x22)	927.5	35 (0x23)	927.7
36 (0x24)	927.9						

Band ID 9, Channel setting of the Wi-SUN PHY Mode 11, 200 Kbps

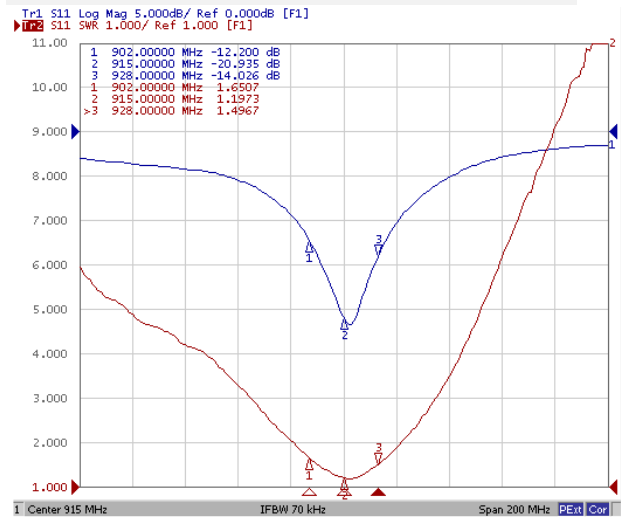
Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)
0 (0x00)	920.8	1 (0x01)	921	2 (0x02)	921.2	3 (0x03)	921.4
4 (0x04)	921.6	5 (0x05)	921.8	6 (0x06)	922	7 (0x07)	922.2
8 (0x08)	922.4	9 (0x09)	922.6	10 (0x0A)	922.8	11 (0x0B)	923
12 (0x0C)	923.2	13 (0x0D)	923.4	14 (0x0E)	923.6	15 (0x0F)	923.8
16 (0x10)	924	17 (0x11)	924.2	18 (0x12)	924.4	19 (0x13)	924.6
20 (0x14)	924.8	21 (0x15)	925	22 (0x16)	925.2	23 (0x17)	925.4
24 (0x18)	925.6	25 (0x19)	925.8	26 (0x1A)	926	27 (0x1B)	926.2
28 (0x1C)	926.4	29 (0x1D)	926.6	30 (0x1E)	926.8	31 (0x1F)	927
32 (0x20)	927.2	33 (0x21)	927.4	34 (0x22)	927.6	35 (0x23)	927.8

ANTENNA PERFORMANCE SPECIFICATION

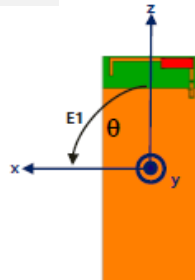
Gain Vs Frequency

Freq. [MHz]	Peak Gain (dBi)	Avg. Gain (dBi)	Efficiency(%)
902	1.1	-2.9	51
915	1.3	-2.7	54
928	0.9	-3.4	46

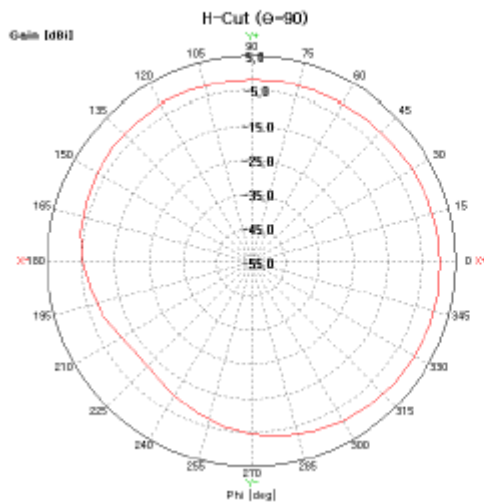
Return Loss Vs Frequency



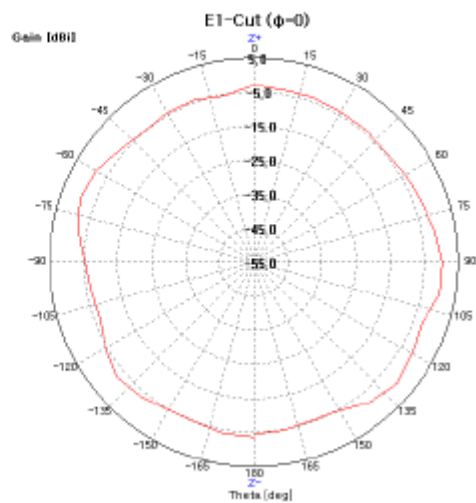
3D Radiation Pattern

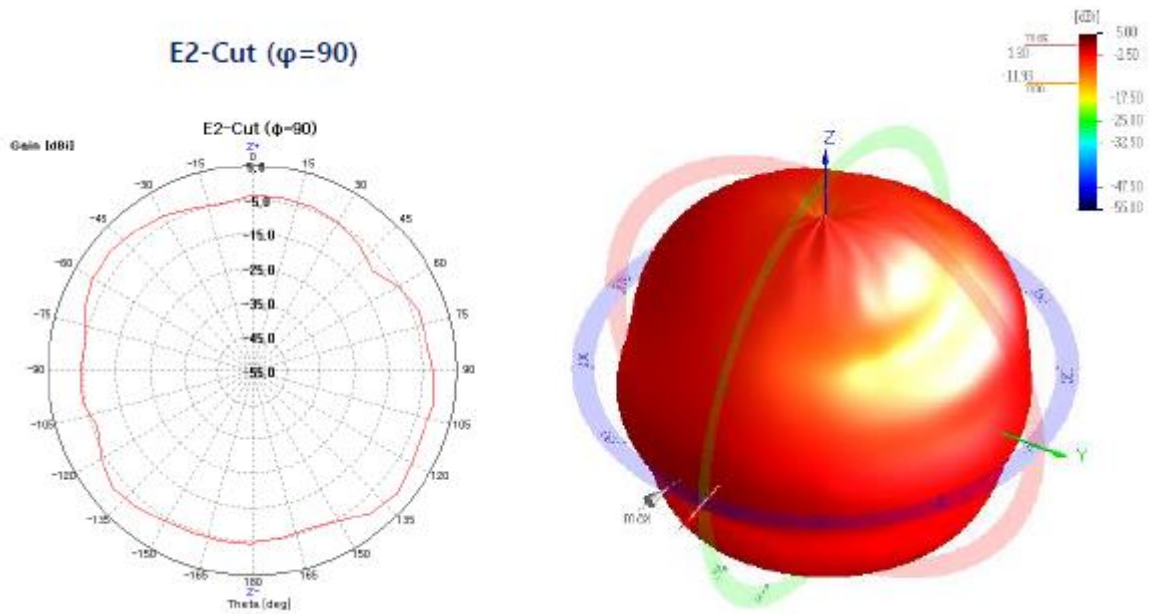


H-Cut ($\theta=90$)

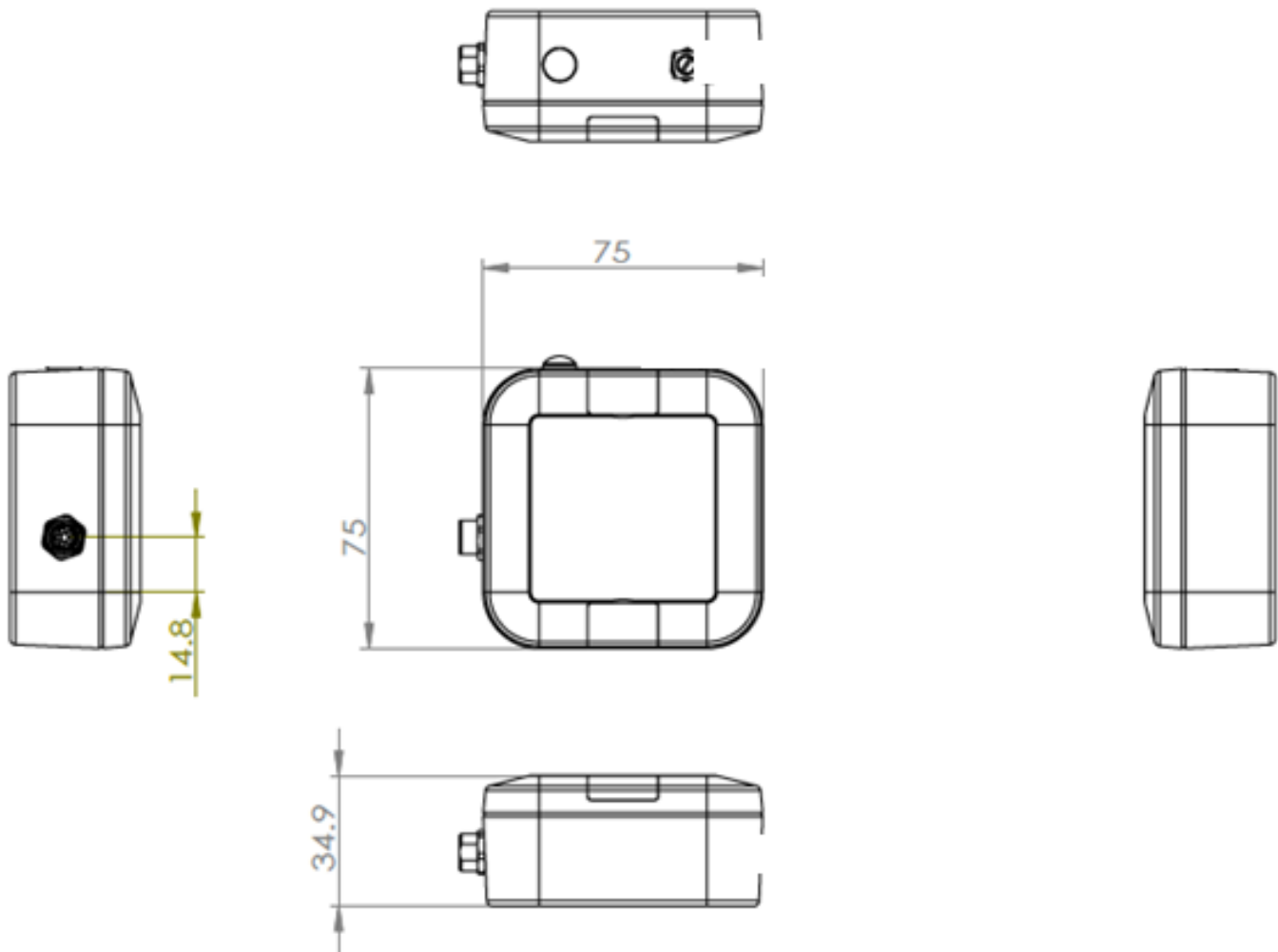


E1-Cut ($\varphi=0$)





MECHANICAL DIMENSIONS



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HW REV# 04.00, FW REV# G.562-22 (RN) G.561-22 (GW)

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