SIEMENS

SIMATIC NET

Industrial Wireless LAN
Performance data 802.11 abgn
SCALANCE W770/W730

Reference Manual

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C79000-G8976-C370-01

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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1 Technical data

1.1 Performance data

Frequency

ETSI, Japan, USA, Canada

- 11b/g/n ISM band: 2.412 GHz - 2.472 GHz
- 11a/n ISM band: 4.920 GHz - 5.825 GHz

Modulation

- 802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
- 802.11b: DSSS (BDSK, DQPSK, CCK)
- 802.11g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
- 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)

1.2 Data transmission speed

Data transmission speeds

All transmission types support the automatic fallback function.

Table 1- 1 Data transmission speeds 802.11a, 802.11b, 802.11g

Protocol	Transmission speed in Mbps
802.11a	6 9 12 18 24 36 48 54
802.11b	1 2 5,5 11
802.11g	6 9 12 18 24 36 48 54

Table 1- 2 Data transmission speeds 802.11n

Modulation and coding scheme (MCS) index	Transmission speed in Mbps			
	20 MHz channel		40 MHz channel	
	800 ns GI (1)	400 ns GI (1)	800 ns GI (1)	400 ns GI (1)
0	6,5	7,2	13,5	15,0
1	13,0	14,4	27,0	30,0
2	19,5	21,7	40,5	45,0
3	26,0	28,9	54,0	60,0
4	39,0	43,3	81,0	90,0
5	52,0	57,8	108,0	120,0
6	58,5	65,0	121,5	135,0
7	65,0	72,2	135,0	150,0
8	13,0	14,4	27,0	30,0
9	26,0	28,9	54,0	60,0
10	39,0	43,3	81,0	90,0
11	52,0	57,8	108,0	120,0
12	78,0	86,7	162,0	180,0
13	104,0	115,6	216,0	240,0
14	117,0	130,0	243,0	270,0
15	130,0	144,4	270,0	300,0

(1) Guard Interval

1.3 Transmit power

Transmit power

Maximum possible output power for each transmitting antenna connector

Table 1- 3 **802.11a** (5.180 GHz - 5.825 GHz)
Output power tolerance ±1.5 dBm

Transmission speed	Output power (dBm)			
	5.18 GHz – 5.32 GHz	5.50 GHz – 5.60 GHz	5.70 GHz	5.745 GHz – 5.825 GHz
6 Mbps – 36 Mbps	16	16	16	15
48 Mbps	14	13	12	12
54 Mbps	13	12	11	11

Table 1- 4 **802.11b/g** (2.412 GHz - 2.484 GHz)
Output power tolerance ± 1.5 dBm

Transmission speed	Output power (dBm)		
	2.412 GHz	2.442 GHz	2.472 GHz
1 Mbps – 36 Mbps	19	19	19
48 Mbps	18	18	17
54 Mbps	17	17	16

Table 1- 5 **802.11n** (2.412 GHz - 2.472 GHz), 20 MHz channel width
Output power tolerance ±1.5 dBm

MCS index	Data stream	Output power (dBm)		
		2.412 GHz	2.442 GHz	2.472 GHz
MCS0	1	18	18	18
MCS1	1	18	18	18
MCS2	1	18	18	18
MCS3	1	18	18	18
MCS4	1	18	18	18
MCS5	1	18	18	18
MCS6	1	18	18	18
MCS7	1	17	17	17
MCS8	2	18	18	18
MCS9	2	18	18	18
MCS10	2	18	18	18
MCS11	2	18	18	18
MCS12	2	17	18	17
MCS13	2	16	17	16
MCS14	2	15	16	15
MCS15	2	14	15	14

Table 1- 6 **802.11n** (2.422 GHz - 2.462 GHz), 40 MHz channel width
Output power tolerance ±1.5 dBm

MCS index	Data stream	Output power (dBm)		
		2.422 GHz	2.447 GHz	2.462 GHz
MCS0	1	18	18	18
MCS1	1	18	18	18
MCS2	1	18	18	18
MCS3	1	18	18	18
MCS4	1	18	18	18
MCS5	1	18	18	18
MCS6	1	17	17	17
MCS7	1	16	16	16
MCS8	2	18	18	18
MCS9	2	18	18	18
MCS10	2	18	18	18
MCS11	2	18	18	18
MCS12	2	16	17	16
MCS13	2	15	16	15
MCS14	2	14	15	14
MCS15	2	13	14	13

Table 1- 7 **802.11n** (5.180 GHz - 5.825 GHz), 20 MHz channel width
Output power tolerance ±1.5 dBm

MCS index	Data stream	Output power (dBm)				
		5.18 GHz – 5.32 GHz	5.50 GHz	5.60 GHz	5.70 GHz	5.745 GHz – 5.825 GHz
MCS0	1	16	16	16	16	15
MCS1	1	16	16	16	16	15
MCS2	1	16	16	16	16	15
MCS3	1	16	16	16	16	15
MCS4	1	16	16	16	16	15
MCS5	1	16	16	16	16	15
MCS6	1	14	14	14	14	14
MCS7	1	13	13	13	13	13
MCS8	2	16	16	16	16	15
MCS9	2	16	16	16	16	15
MCS10	2	16	16	16	16	15
MCS11	2	16	16	16	16	15
MCS12	2	16	16	16	16	15
MCS13	2	14	13	13	12	12
MCS14	2	13	12	12	10	10
MCS15	2	12	11	11	8	8

Table 1- 8 **802.11n** (5.190 GHz - 5.795 GHz), 40 MHz channel width
Output power tolerance ±1.5 dBm

MCS index	Data stream	Output power (dBm)				
		5.19 GHz – 5.31 GHz	5.51 GHz	5.59 GHz	5.67 GHz	5.755 GHz – 5.795 GHz
MCS0	1	16	16	16	16	15
MCS1	1	16	16	16	16	15
MCS2	1	16	16	16	16	15
MCS3	1	16	16	16	16	15
MCS4	1	16	16	16	16	15
MCS5	1	15	15	15	15	15
MCS6	1	14	14	14	14	14
MCS7	1	13	13	13	13	13
MCS8	2	16	16	16	16	15
MCS9	2	16	16	16	16	15
MCS10	2	16	16	16	16	15
MCS11	2	16	16	16	16	15
MCS12	2	15	15	15	15	15
MCS13	2	14	13	13	11	11
MCS14	2	13	12	12	10	10
MCS15	2	12	11	11	8	8

1.4 Receiver sensitivity

Receiver sensitivity

Table 1- 9 **802.11a** (5.180 GHz - 5.825 GHz)
Measurement for 5.500 GHz
Receiver sensitivity tolerance ±1.5 dBm

Transmission speed	Receiver sensitivity (dBm)
6 Mbps	-96
9 Mbps	-95
12 Mbps	-95
18 Mbps	-93
24 Mbps	-89
36 Mbps	-86
48 Mbps	-83
54 Mbps	-81

Table 1- 10 **802.11b** (2.412 GHz - 2.484 GHz)
Measurement for 2.437 GHz
Receiver sensitivity tolerance ±1.5 dBm

Transmission speed	Receiver sensitivity (dBm)
1 Mbps	-100
2 Mbps	-97
5.5 Mbps	-94
11 Mbps	-91

Table 1- 11 **802.11g** (2.412 GHz - 2.484 GHz)
Measurement for 2.437 GHz
Receiver sensitivity tolerance ±1.5 dBm

Transmission speed	Receiver sensitivity (dBm)
6 Mbps	-94
9 Mbps	-93
12 Mbps	-93
18 Mbps	-90
24 Mbps	-89
36 Mbps	-85
48 Mbps	-82
54 Mbps	-80

Table 1- 12 **802.11n** (2.412 GHz - 2.472 GHz)
Measurement for 2.437 GHz at 20 MHz channel width, measurement for 2.422 GHz at 40 MHz channel width
Receiver sensitivity tolerance ±1.5 dBm

Modulation	Data stream	Receiver sensitivity (dBm)	
		20 MHz channel width	40 MHz channel width
MCS0	1	-94	-90
MCS1	1	-93	-89
MCS2	1	-90	-86
MCS3	1	-87	-84
MCS4	1	-83	-81
MCS5	1	-80	-78
MCS6	1	-77	-76
MCS7	1	-76	-74
MCS8	2	-92	-90
MCS9	2	-90	-87
MCS10	2	-87	-85
MCS11	2	-84	-81
MCS12	2	-81	-78
MCS13	2	-76	-73
MCS14	2	-74	-72
MCS15	2	-73	-71

Table 1- 13 **802.11n** (5.180 GHz - 5.825 GHz)
Measurement for 5.500 GHz at 20 MHz channel width, measurement for 5.510 GHz at 40 MHz channel width
Receiver sensitivity tolerance ±1.5 dBm

Modulation	Data stream	Receiver sensitivity (dBm)	
		20 MHz channel width	40 MHz channel width
MCS0	1	-95	-91
MCS1	1	-95	-90
MCS2	1	-93	-87
MCS3	1	-88	-83
MCS4	1	-85	-80
MCS5	1	-81	-76
MCS6	1	-80	-75
MCS7	1	-78	-73
MCS8	2	-94	-88
MCS9	2	-91	-87
MCS10	2	-88	-84
MCS11	2	-85	-81
MCS12	2	-82	-78
MCS13	2	-77	-73
MCS14	2	-75	-71
MCS15	2	-74	-70