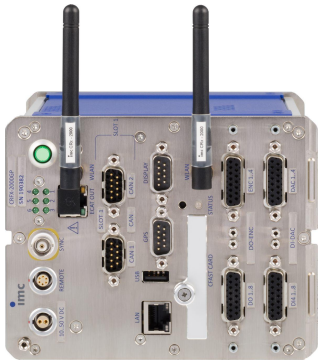
# Integrated WiFi (WLAN) Interface

imc measurement devices can optionally be equipped with WiFi (WLAN) interface installed inside, which provides an alternative wireless network connection.



### Typical applications

- Mobile test drives, particularly in conjunction with imc LINK and imc Web-Server (imc REMOTE),
- telemetry on moving components,
- highly insulated "island"-installations, e.g. with a high-voltage conducting train pantograph, it is possible to set up a highly-insulated measurement system using WiFi.

### Types

Two types of WiFi-adaptors are available to suit different types of imc devices:

**Dual band**

- 5 GHz / 2.4 GHz Band, max. 300 Mbit/s
- according to IEEE 802.11n
- two sockets for antennas, two antennas included in delivery
- available only for high-performance "-GP" devices (particularly CRFX-2000GP and CRC-400GP, "device group 7", serial number range 19xxx)

**Single band**

- 2.4 GHz Band, max. 54 Mbit/s
- according to IEEE 802.11g
- one socket for an antenna, antenna included in delivery
- available for all standard devices

### Device integration

This WiFi interface is integrated in the measurement device (built-in) with one or two external antennas. Only in the case of CRC-400GP it will occupy an extra slot, in all other devices no additional slot is required.

| Overview of the available variants | Standard version | | ET version * | |
|---|---|---|---|---|
| **Device series** | **Order Code** | **article no.** | **article no.** | **Remarks** |
| **Dual band** | | | | |
| imc CRONOS*flex* (CRFX-2000**GP**) | CRFX/2000GP-WLAN-I | 1190109 | 1191060 | |
| imc CRONOS*compact* (CRC-400**GP**) | CRC/400GP-WLAN-I | 1170263 | 1171xxx | |
| imc CRONOS-XT (CRXT) | CRXT/2000-WLAN-I | -- | 1110011 | ET as standard |
| imc CRONOS*flex* (CRFX-2000**GP**) | CRFX/2000GP-WLAN-I-JP | 1190218 | -- | for Japan |
| imc CRONOS*compact* (CRC-400**GP**) | CRC/400GP-WLAN-I-JP | 1170274 | -- | for Japan |
| **Single band** | | | | |
| imc CRONOS*flex* (CRFX-400) | CRFX/400-WLAN-I | 1190035 | 1191068 | |
| imc CRONOS*compact* (CRC-400) | CRC/400-WLAN-I | 1170040 | 1171047 | |
| imc CRONOS-SL (CRSL) | CRSL/WLAN-I | -- | 1180048 | ET as standard |
| imc C-SERIES (CS or CL) | C/WLAN-I | 1400054 | 1410xxx | |
| imc SPARTAN (SPAR) | SPAR/WLAN-I | 1130046 | 1131024 | |
| imc BUSDAQ*flex* (BUSFX) | BUSFX/WLAN-I | -- | 1240019 | ET as standard |

* ET: Version in extended temperature range

### Access-points

For stable operation at high transfer rates, an access point on the PC side is required.

**Access-points supported:**

- At this time, there are no known access points which are not supported.

**The following access points have been tested successfully:**

- NETGEAR WG102
- NETGEAR WAG102
- D-Link DWL-G700 AP
- LevelOne WAP-0003

### Operating modes

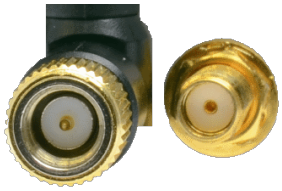
Please find in the manual of the imc operating software in the chapter "***Connecting via WLAN***" a detailed description of the necessary settings for operating modes "Adhoc" and "Managed" (Access-point).

### Antennas

The delivered antennas for direct connection (article 1350251) are suitable for both WLAN adaptor types (2.4 GHz and Dual band 5 GHz / 2.4 GHz). The magnetic base antenna however, available as accessory, is suitable for 2.4 GHz, only. Antennas are equipped with RP-SMA connection (reverse polarity SMA).

WiFi with RP-SMA connection:
antenna: female
device: male

Earlier series (before July 2014) were equipped with SMA. Suitable cables and magnetic base antennas are still available as spare parts for this type of connection.



WiFi with SMA connection:
antenna: male
device: female

### Optional accessories

| Order Code | Description | article no. |
|---|---|---|
| ACC/WLAN-MAG-ANT-RP-SMA | WiFi magnetic base antenna for 2 GHz Band, with 1.5 m cable for devices with RP-SMA connection (new imc design, built after approx. July 2014) | 1350252 |
| ACC/WLAN-MAG-ANT-SMA | for devices that are built before July 2014 (with SMA connection) | 1350240 |
| ACC/CABLE-WLAN-ANT-RP-SMA | extension cable 4 m for WiFi magnetic base antenna for devices with RP-SMA connection (new imc design, built after approx. July 2014) | 1350253 |
| ACC/CABLE-MAG-ANT-SMA | for devices with SMA connection (before July 2014) | 1350241 |
| ACC/WLAN-ANT-RP-SMA | antenna for devices with RP-SMA connection suitable for both 2.4 GHz Single-Band and 5 GHz (Dual-Band) | 1350251 |

# Technical Specs - WiFi (WLAN)

| Dual band | Value | Remarks |
|---|---|---|
| Standards | IEEE 802.11abgn | |
| Certification | WiFi certified (WMM) | |
| Data rate | 300 Mbps<br>54 Mbps<br>11 Mbps | IEEE 802.11n<br>IEEE 802.11a/g<br>IEEE 802.11b |
| Operating frequency | 2.412 GHz ... 2.4835 GHz<br>channel 1...14, 5 MHz separation<br><br>5.180 GHz ... 5.825 GHz<br>5.15 GHz ... 5.85 GHz | IEEE 802.11 abgn ISM Band<br><br><br>standard version<br>version for Japan (xxx-JP) |
| Network type | Ad-Hoc, managed | |
| RF output power | +16 dBm<br>+18 dBm<br>+15 dBm | IEEE 802.11g<br>IEEE 802.11n / 2.4 GHz, HT20<br>IEEE 802.11n / 5 GHz, HT20 |
| Receiver sensitivity | -79 dBm<br>-76 dBm<br>-75 dBm | IEEE 802.11g<br>IEEE 802.11n / 2.4 GHz, HT20<br>IEEE 802.11n / 5 GHz, HT20 |
| Encryption | WEP to 104 Bit<br>WPA-PSK TKIP/RC4<br>WPA2-PSK CCMP/AES | open system<br>8 to 63 characters [1]<br>8 to 63 characters [1] |
| Modulation | DSSS (DBPSK, DQPSK, CCK)<br>OFDM (BPSK, QPSK, 16-QAM, 64-QAM) | IEEE 802.11b<br>IEEE 802.11agn |
| Operating temperature range (standard) | -40°C to +80°C<br>-50°C to +95°C | operating (ET version)<br>storage temperature range |
| Operating temperature range (version for Japan xxx-JP) | -40°C bis +80°C<br>-50°C bis +95°C | operating (ET not available)<br>storage temperature range |
| Power consumption | 1.5 W | |

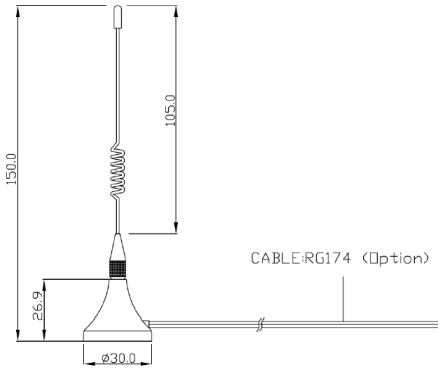
| Single band | Value | Remarks |
|---|---|---|
| Standards | IEEE 802.11bgn | |
| Certification | WiFi certified (WMM) | |
| Data rate | 150 Mbps<br>54 Mbps<br>11 Mbps | IEEE 802.11n<br>IEEE 802.11g<br>IEEE 802.11b |
| Operating frequency | 2.412 GHz ... 2.462 GHz<br>channel 1...11, 5 MHz separation | IEEE 802.11bgn ISM Band |
| Network type | Ad-Hoc, managed | |
| RF output power | +20 dBm<br>+17 dBm | IEEE 802.11b (CCK)<br>IEEE 802.11g (OFDM) |
| Receiver sensitivity | -73 dBm<br>-86 dBm | IEEE 802.11g (54 Mbps)<br>IEEE 802.11b (11 Mbps) |
| Encryption | WEP to 104 Bit<br>WPA-PSK TKIP/RC4<br>WPA2-PSK CCMP/AES | open system<br>(8 to 63 characters) [1]<br>(8 to 63 characters) [1] |

| Single band | Value | Remarks |
|---|---|---|
| Modulation | DSSS (DBPSK, DQPSK, CCK)<br>OFDM (BPSK, QPSK, 16-QAM, 64-QAM) | IEEE 802.11b<br>IEEE 802.11gn |
| Operating temperature range | -30°C to +85°C | operating (ET version) |
| Power consumption | 1.5 W | |

| Antenna - ACC/WLAN-ANT-RP-SMA | | |
|---|---|---|
| **Parameter** | **Value** | **Remarks** |
| Type | clip on antenna | |
| Connector | RP-SMA (female) | reverse-SMA, antenna side: female |
| Flexibility | flexible joint<br>bend and rotate | degrees of freedom for positioning |
| Operating frequency | single band / dual band<br>2.4 GHz / 5 GHz | |
| Antenna gain | 1.5 dBi, 2.1 dBi | 2.4 GHz / 5 GHz |
| Impedance | 50 Ω | |
| Operating temperature range | -20°C to +65°C | |
| Mechanical dimensions | L: 108 mm / 82.5 mm<br>diameter: 7.8 mm / 10 mm | with / without flexible joint<br>diameter: antenna / SMA |

| Antenna - ACC/WLAN-MAG-ANT-RP-SMA | | |
|---|---|---|
| **Parameter** | **Value** | **Remarks** |
| Type | magnetic base antenna | with 1.5 m cable |
| Connector | RP-SMA (female)<br>with 1.5 m low loss cable | reverse-SMA, antenna side: female |
| Flexibility | magnetic attachment | |
| Operating frequency | single band 2.4 GHz | |
| Antenna gain | 5 dBi | 2.4 GHz |
| Voltage standing wave ratio | <1.6 : 1 | characterizes cable transmission loss |
| Impedance | 50 Ω | |
| Weight | 50 g | |

Mechanical dimensions - ACC/WLAN-MAG-ANT-RP-SMA:




1 Access Point required