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To:

Subject: Commands for communicating with the Impedance Analyzer

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General
From the host computer RS232 commands are given to the COM port where the Impedance
Analyzer is connected to. For some computers a Virtual Com Driver has to be installed.
Used data speed: 19.2 kBaud.
The analyzer is behaving passively: normally it is in rest and awaits a command to measure at
some frequency. During measurement and while sending back the results, it is insensitive for
data.

Finding the right COM port
Windows will detect the Analyzer as FT232R USB UART.
Com ports can be scanned by sending a single byte to them. When the Analyzer receives a
single byte, it will respond after 50 ms with sending back "U" (85 decimal).
To be sure the right COM port has been found, send the text: "-IDENTITY-" (ten bytes). The
Analyzer will react with: "IMPAN00003" (also ten bytes).

Sending a command to execute a single measurement.
A command consists of ten bytes.
First calculate the frequency number. This number can be found by dividing the wanted frequency
by 0.04190951586 (= 180 MHz / 2^{32}). So for 100 Hz you will find the number 2386. This number
has to be given in a 32 bit format in the first four bytes of the command, MSB first.
Valid frequencies are between 100 Hz and 40 MHz. Outside that range erroneous results will
occur.
Byte 5 has always to be 82 (decimal).
Byte 6 gives the wanted measuring amplitude. Valid numbers are: 0 (30 mV), 1 (120 mV), 2 (340
mV), 7 (1 V). At low frequencies the maximum amplitude is limited by the Analyzer.
Byte 7 can be either 0 or 82. When 82 the DDS's are being reset. This shall be done before a
long sequence of measurements. Next command, make this byte 0 again.
Byte 8, 9, 10 are always 0.

Receiving the measuring data.
When a valid command of 10 bytes has been given, the Analyzer will start measuring and after
some tens of milliseconds it will send back the data. The measuring data consists of a text word
of 47 bytes. The first 23 bytes are the real part of the measured impedance, the second 23 bytes
the imaginary part. The 47th byte is for test purposes only and can be ignored.

Errors in the communication.
Errors can occur when the command is incomplete or when the delay between the successive
bytes is longer than 40 ms. This can happen with some computers or Windows versions. The
Analyzer reacts then by sending back "U" and waits for the next command.

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