Interface protocol for the CAQ interface

General

The CAQ serves one of the serial ports 1 to 15 interface. Higher port numbers are not permissible.

The interface controls both COM ports on the main motherboard and USB / COM converter (FTDI, Prolific, etc.).

As an alternative to direct transmission by means of a serial interface, the widely used DC-HINET (Steinwald) can be used.

Transmission path when using DC-HI-NET

For using the Steinwald DC-HI-NET protocol a Steinwald box is required as a cache. This box has two serial ports, one to accept the data from the Metric program, the other to forward the data on request to a CAQ program.

In this way, the CAQ program can run on a separate machine which is connected via COM cable to the Steinwald box.

The Steinwald box has a maximum of 78 channels; more channels can be provided via cascaded boxes (FIFO).

NOTICE: The number format used by the DC-HI-NET protocol corresponds to the DC-HI-NET standard and thus differs from the direct metric format listed further below. The unit of measurement matches the unit of measurement of the metric lenses, so that there should no overflow despite the 8 places. There is no checking of the unit of measurement. The user must take care to comply with the unit defined by himself. The test must be absolutely complied with, as the chronological order of the measurement values are assigned to the channel numbers in the Steinwald box.

"No transmission" mode

The interface is not searched for or opened.

There is no transmission from the metrics program to the interface.

Commands on the part of any connected CAQ system are neither recognised nor evaluated by the metrics program.

"Automatic transmission" mode

Each time that a measurement value is added, this value is automatically transmitted to the CAQ interface.

A single floating-point number with decimal separator (English notation) is transmitted.

Lengths are transmitted in millimetres, surface areas in square millimetres and angles in degrees. Numbers without dimensions have no unit.

The unit is not transmitted with the rest of the information.

The number format is always as follows (12P12):

"123456789012.123456789012<CR><LF>"

It therefore consists of 12 digits before the decimal point, the decimal point and 12 digits after the decimal point. The transmission ends with <CR><LF>.

Operating mode "Transfer request"
"Transmission on request" mode

Transmission takes place on request on the part of the CAQ system. The request is sent to the serial interface and consists of a single line that contains the measurement value numbers separated by spaces. The line must be ended with <CR><LF>.

If the CAQ system requires the measurement values 1, 2 and 5 then it must send

"1 2 5 < CR > < LF >"

NOTICE: If after the last desired number a space is entered before the <CR><LF>, this will be transmitted as an invalid measurement value (25 spaces, possibly preceding number).

WARNING: <CR><LF> without any other useful characters or with illogical characters (letters, special characters) will be answered by a single invalid measurement value (25 spaces, possibly preceding number) being transmitted. "1a" will be interpreted as 1, "a1" as illogical. The program will only read numbers between the separators as far as the first non-number. "1.5" is rounded up to "2".

The metric program will reply with the requested measurement values if these are available. Each measurement value will be transmitted on its own line. The format is the same as in automatic transmission (12P12<CR><LF>).

If a required measurement value is not available, a line of 25 spaces will be transmitted. This guarantees that there is a reply of identical length to each query.

NOTICE: Even when a request consists of just illogical characters or metric field numbers which are not available, the counter (see "consecutive number option transmitted" option) is incremented.

"Transmit consecutive numbers" option

In this option a 6-place number is placed in front of each measurement value, then a space and then the measurement value in the aforementioned notation. The consecutive number will be automatically incremented.

"004711 123456789012.123456789012<CR><LF>"

NOTICE: The consecutive number must not be confused with the number that precedes the measurement value within the table! If therefore the measurement value is transmitted in table row 4 for the 93rd time, then it will be preceded by the number 000093.

In the case of "automatic transmission" the counter will be incremented with each new measurement value.

In the case of "transmission on demand" the counter will be incremented with each new request.

For "Transmission on demand" each line requested is preceded by the consecutive number. Lines that contain no measurement value (see above) consist of the consecutive number and 26 spaces (one space as separator, 25 spaces for the missing measurement value).

Limitations

The measurement value is always transmitted in millimetre units. Therefore results up to a maximum of 9 billion millimetres are possible, i.e. 999, 999 kilometres. Correspondingly the smallest measurement of the 12 places after the decimal point is the "femtometre".
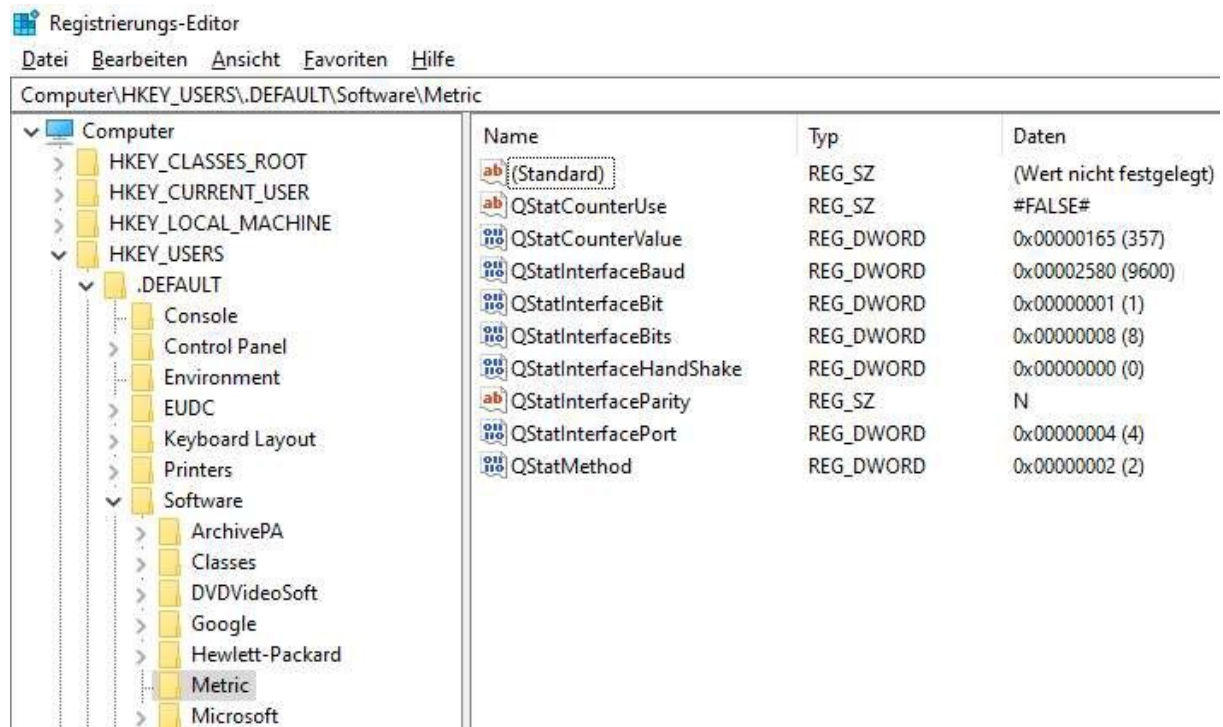
This measurement range is judged sufficient for optical measuring equipment.

Settings
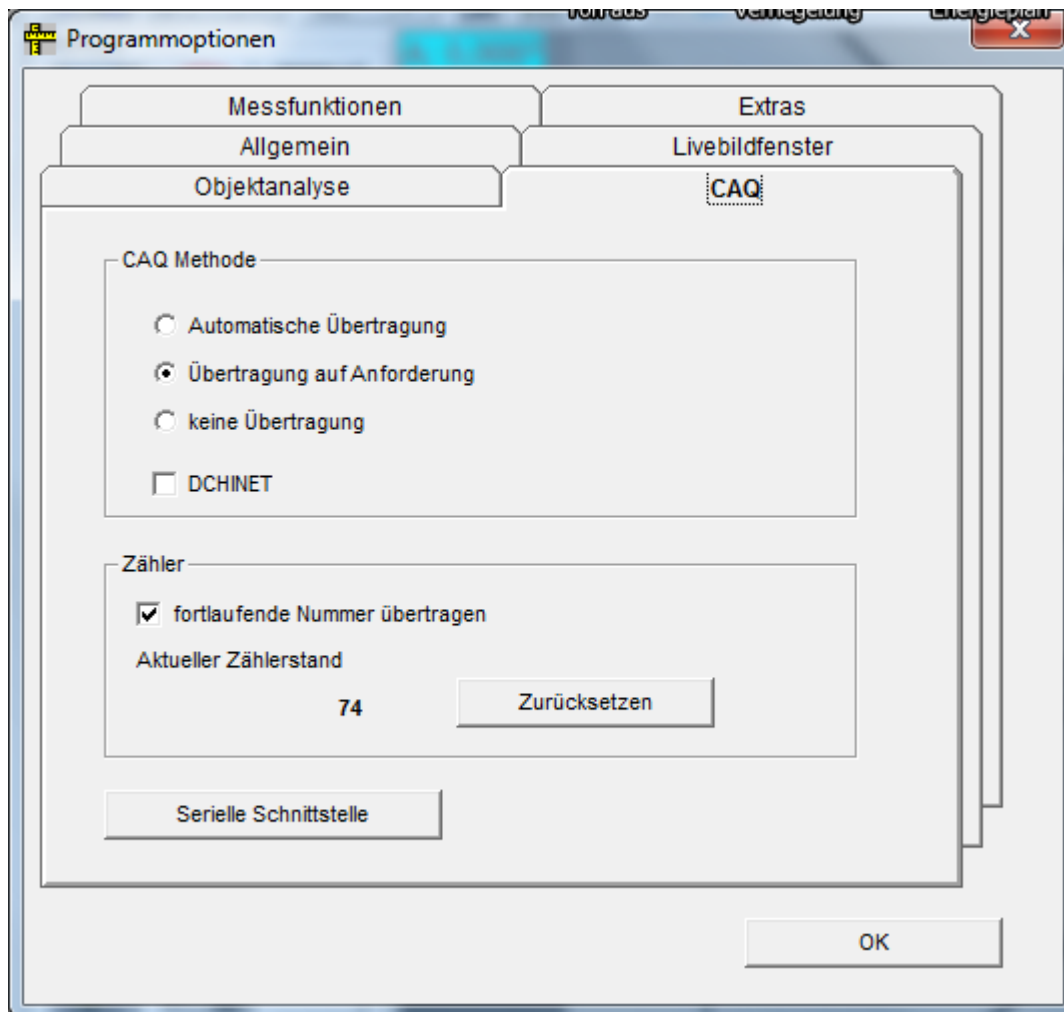
Memory locations

The options described above are set in the program settings. These are saved in the Windows-Registry in the "All Users" key. The following illustration shows the specific memory location.

NOTICE: Reading in an existing options file and then saving it in the application directory therefore does not change the settings of the CAQ functions.