6.2 RS232 Remote Control

The IntelliPEEM power supply for the FOCUS IS-PEEM can also be controlled by the RS232 remote control. The remote control language consists of a set of commands. With these, the distinct power supply modules are addressed for setting or getting corresponding parameters like voltages or currents or position of encoders.

RS232-Interface:

8 data bits, 1 stop bit, no parity, 9600 Baud, protocol: Xon/Xoff

Possible commands:

RUN

STOP

GET *module [name]*

SET *module [name] value*

Description:

RUN

Starts the microscope, all modules are activated and the default values are set

Return value: see reply message

STOP

Terminates operation of the microscope, all modules except the main processor are set to standby

Return value: see reply message

GET *module [name]*

Request of actual values

the parameter *module* determines the module, the following values are possible:

column, focus, mcp, screen, extractor, projective1, projective2, stigmator, microslide

the parameter *name* determines the actual value, the following values are possible:

HV-Module: U, I, Umax, Imax, Udef, Imaxdyn

Stigmator: Vx, Vy, Sx, Sy

Microslide: SampleX, SampleY, ApertureX, ApertureY, Angle

The parameter *name* is optional, if left out, the working condition (on/off) is indicated

Return value: in case no fault occurs, the actual value will be put out as a number without unit or the working condition will be put out as a text respectively. The voltage is displayed in Volt, current in nA and piezo motor positions in μm. When a fault occurs, a reply message will be given.

GET STATUS

Request of module status

Return value: '#01 microscope run' or '#02 microscope standby'

SET *module [name] value*

Setting of nominal value

the parameter *module* determines the module, the following values are possible:

> column, focus, mcp, screen, extractor, projective1, projective2, stigmator, microslide

the parameter *name* determines the actual value, the following values are possible:

> HV-module: U

> Stigmator: Vx, Vy, Sx, Sy

> Microslide: SampleX, SampleY, ApertureX, ApertureY

if the Parameter *name* is left out, the module MCP or Screen can be shut on or off by using *value*=on respectively off.

Return value: see reply message

Hint

- for commands there is no difference between small and capital letters.

- commands have to be completed with CR.

- return values of the commands are completed with CR/LF.

Return message

Every command is followed by an answer. This reply message begins with the character '#' followed by a two digit hexdecimal. In some reply messages additional two digit hexdecimals follow. They are parted via spaces and give additional information (e. g. module number). Finally and also seperated via space the status respectively fault message is indicated in letters:

Syntax: #xy Text

                    #xy ab Text

For the message number xy the following groups are defined

00h-1Fh	status message PEEM
20h-3Fh	fault message PEEM
40h-5Fh	status message module
60h-7Fh	fault message module
80h-FFh	reserved

Status message PEEM

#01 microscope run

#02 microscope standby

Fault message PEEM

#20 ASC buffer overrun error

#21 ASC framing error

#22 ASC overrun error

#23 command to long

#24 invalid command, too many parameters

#25 command ... unknown

#26 module ... unknown

#28 parameter ... unknown

#29 parameter needed

#2A parameter needed or invalid

#2B value invalid

#2C can't start microscope

#2D impossible, microscope locked

#2E impossible, microscope standby

#2F vacuum interlock error

#30 protection fault: ... - restart...

Status message module

#40 *mnr module name* OK

#41 *mnr motnr module name* channel *motnr* OK

Fault message module

#60 *mnr* can't start module *module name*

#61 *mnr* module *module name* restarted

#62 *mnr* module *module name* no actual value

#63 *mnr* can't update module *module name*

#64 *mnr enr* module *module name* error *enr* detect

#65 *mnr* module *module name* out of range

#66 *mnr* module *module name* timeout

#67 *mnr* module *module name* current protection activated

#68 *mnr* module *module name* not available

#69 *mnr* module *module name* not ready

#6A *mnr snr* module *module name* unknown status *snr*

#6B *mnr motnr* module *module name* channel *motnr* position-measurement not available

#6C *mnr motnr* module *module name* channel *motnr* position out of range

#6D *mnr motnr* module *module name* channel *motnr* autoposition error detect

#6E *mnr motnr* module *module name* channel *motnr* error detect

#6F *mnr motnr* module *module name* channel *motnr* not available