Configuration File Format Specification for Generic Field Probes

Generic field probe configuration files contain the remote command instructions for different actions (like initialization, triggering, measurement query) in order to control a field probe device via VISA interface.

Examples are delivered with the EMC32 installation in the folcer ..\Configuration\Others. Please refer to them or the example listing below for further clarification of the format specification.

Listing of an example configuration file

```
[FileInfo]
Author=Rohde&Schwarz
Version=1.0
MeasClass=0
Start=0.0
Stop=0.0
Description=GenericFieldProbe
[General]
;ATTENTION ! Do not modify the next line !!
Driver=GenericFieldProbe
;
;From here on lines may be modified
;
DeviceVersion=1.0
Miscellaneous=LumiLoop Field Probe
[VisaSettings]
;1=CR 2=NL 3=CR+NL
EOITermination=3
VisaTimeout=5000
;Parit 0=None, 1=Odd, 2=Even
Baud=9600
DataB=8
StopB=1
Parity=0
;Visa strings can have leading characters:
; @n@  wait n milliseconds after this command
[Identify]
;Identification Query1
Count=1
VisaLine1=*IDN?
VisaResponse1=LUMILOOP
[Initialize]
;Initialize on system start
;Wait 3s for laser system is on
Count=2
VisaLine1=SYST:MOD 0
VisaLine2=@10000@SYST:LAS:EN 1
[CheckActive]
;Wait for probe is active, e.g. laser is on
Count=1
VisaLine1=MEAS:MOD?
VisaResponse1=0
[SetAxis]
;Command for setting the measurement axis
;count may be > 1
Count=0
[SetAvgCount]
;Command for setting the averaging count of measured values
Count=1
VisaLine1=MEAS:E:LPF 5
[DoZeroing]
;Command for zeroing of the probe
;count may be > 1
Count=0
[ActivateCorr]
```

```
;Command for activating the frequency correction
Count=0
[SetMeasFreq]
;Command for sending the current measurement freq in Hz to the device
for frequency correction
;Represented by %FRQ%
Count=1
VisaLine1=SYST:FREQ %FRQ%
[Trigger]
;Command for triggering a measurement, count may be > 1
Count=0
[TriggerStatus]
;Wait for probe is triggered
Count=0
[ReadAxisResult]
;Read Result for current axis, count must be => 1
;Current axis is represented by %AXIS%
Count=0
[ReadAllAxis]
;Read Result for all axis, count must be => 1
;Header offset corresponds to the separator for all axis results
Count=1
VisaLine1=MEAS:E:ALL?
HeaderOffset1=,
```

A field probe configuration file must conform to the following **basic formal rules**:

- The file shall be written in ASCII text format.

- It must be located in the **\Execute\Configuration\Others** subfolder of the EMC32 main installation folder.

- Its name must be **<xxx>.DeviceConfiguration**, where <xxx> stands for an arbitrary descriptive name.

- Its contents shall conform to the syntax of Windows initialization files (extension .ini), that is, all contents shall be arranged in sections, each section containing an arbitrary number of lines, each line being composed by an entry string followed by a '=' character and the data string associated to the entry.

- Comment lines are allowed at any place throughout the file and must start with a ';' character.

- Rename your configuration file when you are using templates provided by R&S since they may be updated with the next software update.

The following sections and entries in the file are **mandatory**:

- Section **FileInfo**.   This section identifies a file for EMC32. If not available, EMC32 will refuse to open the file. For the contents of this section please refer to the demo file printout above.

- Section **General**.   This section must contain at least the line
  "   **Driver=GenericPowerMeter**   ". This line will identify the file as a configuration file for a generic field probe. If this line is not present, the file will not be displayed in the configuration file selection box in the Generic Power Meter Properties dialog.

- Section **Measure**. This section must contain at least two lines:

    One line reading "**Count=<cnt>**", where <cnt> stands for an integer number which must be greater than 0.

    A second line reading "**VisaLine1=<cmd>**" where <cmd> stands for the VISA command to be sent as measurement value query.

Without these two lines, the file will not be accepted.

The rest of the file's content is **optional**:

- Section **VisaSettings**. Contains one line "**EOITermination=\<i>**" to set the termination character for IEEE communication. \<i> stands for an integer according to the following meaning:

    i = 1: Termination character is a Carriage Return character (hexadecimal 0D)

    i = 2: Termination character is a Line Feed character (hexadecimal 0A). This is the default if the line is not present.

    i = 3: All strings are terminated with a CR and a LF character in sequence.

    Additionally, the section may contain a line "**VisaTimeout=\<time>**" where \<time> stands for an integer determining the value in milli-seconds to be used as general timeout for VISA communication.

    When using the serial interface for the communication the interface parameters for Baud rate, Data Bits, Stop Bits and Parity need to be configured. The handshake is set fixed to None.

- Sections **Initialize, SetAxis, SetAvgCount, DoZeroing, ActivateCorr, SetMeasFreq, Trigger**:

    In each of these sections a set of commands may be defined which will be sent to the device when programming the corresponding parameter:

    Initialize --> device initialization during software start. Should also switch the laser on (in this case by using the CheckActive section the driver)

    can poll until the initialization is completed.

    SetAxis --> set the measurement axis X, Y, Z or XYZ at test start

    SetAvgCount --> setting of the field probe averaging parameter at test start

    DoZeroing --> perform a zeroing on the device at test start

    ActivateCorr --> activate the frequency correction if required at test start

    Trigger --> trigger a data acquisition prior to each measurement query (via the TriggerStatus section query the driver can poll for triggering done)

    SetMeasFreq --> send current frequency in Hz to the device prior to each measurement, the sub string "**%FRQ%**" is replaced by the current frequency.

    Defining VISA command sets always follows the same philosophy:

    A line "**Count=\<cnt>**", where \<cnt> is an integer, tells the driver that cnt command lines will follow, each line defining a command.

    The command lines themselves then shall read "**VisaLine\<i>=\<cmd>**" where \<i> is an index ranging from 1 to the command line count defined before, and \<cmd> defines the VISA command.

    Additionally, \<cmd> may start with a waiting time indication for the command: for example, "**@1000@ABC**" defines that EMC32 shall delay further execution for 1000 ms after sending the command "ABC" to the device.

    The use of any of these sections and command sets is optional. Even defining command strings for setting different measurement speeds is not required although the settings dialog will allow for different speed selections. If no strings are defined, no strings are sent; if less than four strings are defined, the last in the list is used when trying to use non-existing strings.

- Sections **Identify, CheckActive, TriggerStatus, ReadAxisResult, ReadAllAxis**:

    These sections contain query commands. They typical consists out of a query command and an expected response string. In case of reading measurement queries a splitter for the measurement results is required.

    Identify will be used at software start-up to check whether the device found at the given VISA address is the supposed field probe.

CheckActive will query the field probe up to 200 times with 200 ms delay until the VISA query results in to the defined answer defined in VisaResponse1.

TriggerStatus will query the field probe up to 100 times with 100 ms delay until the VISA query results in to the defined answer defined in VisaResponse1.

ReadAxisResult will query the measurement result for the current field probe axis. The current axis can be indicated by a %AXIS% place holder.

ReadAllAxis will query the measurement result for all field probe axis in the order XYZ, X, Y, Z. The splitter between the axis results is defined by the HeaderOffset1 line.

Only one of both measurement query sections is allowed to be active. The non active section needs to contain a line Count=0.

Defining VISA queries always follows the same philosophy:

A line "**Count=<cnt>**", where <cnt> is an integer of value 0 or 1. "0" means that no command is available, "1" means that a query command is avaliable. "0" can not be used in the Measure section (see above).

A line "**VisaLine1=<cmd>**" will define which command to send as a query to the device. A waiting time can be defined in the command string as described above.

Additionally, some section specific entries can be used:

A line "**VisaResponse1=<resp>**" can be defined in the **Identify, CheckActive, TriggerStatus** section. The device's answer will be checked to contain the string given by <resp>. Only if this sub-string can be found, the device will be considered as completed.

A line "**HeaderOffset1=<cmd>**" can be defined in the **MeasureAllAxis** section. <cmd> stands for the following command syntax: