ViaLiteHD 6 GHz link – SCPI - commands

Introduction

The 6 GHz RF over fibre link is available in the following formats: single TX, single RX, dual TX, dual RX or TRX. User control of the various link settings can be accessed via a USB port on both the Blue and Black OEM products. When connected to a PC, the USB will render itself as a COM port on the system and can be addressed via a terminal application such as TeraTerm or PuTTY. This document outlines the command set that can be used over the terminal application.

The Standard Commands for Programmable Instruments (SCPI) format has been chosen due to the applicability and conciseness of the standard.

Conventions

The following SCPI conventions are implemented:
- Commands are case insensitive.
- For single RX system types, the RX1 prefix is optional.
- For single TX system types, the TX1 prefix is optional.
- For TRX system types, the path identifier, [1], is optional.
- Where arguments are Boolean, 0, off and false are equivalent and 1, on and true are equivalent.

List of commands

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RX[1]|2:RF:GAIN
RX[1]|2:RF:GAIN?
RX[1]|2:RF:GAIN:RANGE?
RX[1]|2:RF:POWER?
RX[1]|2:OPTICAL:RLL?
RX[1]|2:BIAST:VOLTAGE
RX[1]|2:BIAST:VOLTAGE?
RX[1]|2:BIAST:CURRENT?
RX[1]|2:AGC:STATE <OFF>|<RLL>
RX[1]|2:AGC:STATE?
RX[1]|2:AGC:TARGET <float>
RX[1]|2:AGC:TARGET?
RX[1]|2:MONITOR:SOURCE <OPT>|<RF>
RX[1]|2:MONITOR:SOURCE?
TX[1]|2:RF:GAIN
TX[1]|2:RF:GAIN?
TX[1]|2:RF:GAIN:RANGE?
TX[1]|2:RF:POWER?
TX[1]|2:OPTICAL:POWER?
TX[1]|2:BIAST:VOLTAGE
TX[1]|2:BIAST:VOLTAGE?
TX[1]|2:BIAST:CURRENT?
TX[1]|2:AFD:ENABLE <ON>|<OFF>
TX[1]|2:AFD:ENABLE?
TX[1]|2:AFD:THRESHOLD
TX[1]|2:AFD:THRESHOLD?
TX[1]|2:MONITOR:SOURCE <OPT>|<RF>
TX[1]|2:MONITOR:SOURCE?
SYSTEM:VOLTAGE?
SYSTEM:VERSION?
SYSTEM:ERRORS?
SYSTEM:TEMPERATURE?
```

Command Information

RX RF Gain

Command	RX[1]|2:RF:GAIN <float> RX[1]|2:RF:GAIN?
Examples	RX1:RF:GAIN 22.5
	RX2:RF:GAIN?
	RF:GAIN?
Default	Factory gain calibration according to part number.
Range	Inclusive of gain range min to max. Rounding to internally capable step size will occur.
Returns	Query returns the current configured gain.
Notes	Sets the RF gain of the RX Path.

RX RF Gain Range

Command	RX[1]|2:RF:GAIN:RANGE?
Examples	RX1:RF:GAIN:RANGE?
	RX2:RF:GAIN:RANGE?
	RF:GAIN:RANGE?
Returns	Allowable gain range for the RF:GAIN command.
Notes	Range may be different for product of the same part number. Some gain range is internally reserved for calibration.

RX RF Power

Command	RX[1]|2:RF:POWER?
Examples	RX1:RF:POWER?
	RX2:RF:POWER?
	RF:POWER?
Returns	Current RF power reading in dBm.
Notes	This is for indication only. The RF power detector is calibrated with a 3 GHz tone and will respond differently to wideband power or power at other frequencies by up to +/- 4dB. The Noise floor is around -20 dBm so small signals will not be registered.

RX Optical RLL

Command	RX[1]|2:OPTICAL:RLL?
Examples	RX1:OPTICAL:RLL?
	OPTICAL:RLL?
Returns	RLL in dBm
Notes	Query returns the current Received Light Level.

RX BIAS-T Voltage

Command	RX[1]|2:BIAST:VOLTAGE <NONE>|<INT>|<VIN>|<EXT>
Examples	RX1:BIAST:VOLTAGE NONE
	RX1:BIAST:VOLTAGE INT
	BIAST:VOLTAGE EXT
	BIAST:VOLTAGE?
Returns	Current Bias-T voltage in Volts
Notes	When setting, there are four options: NONE – Bias-T disabled. No voltage supplied to the RF port. INT – The internal regulator voltage (5V) is routed to the RF port.

VIN – The system supply voltage (~12V) is routed to the RF port.
EXT – A voltage supplied via the user port is routed to the RF port.

Query returns the actual measured value on the RF port. Measurement precision is to 2 decimal places

RX BIAS-T Current

Command	RX[1]|2:BIAST:CURRENT?
Examples	RX1:BIAST:CURRENT?
	BIAST:CURRENT?
Returns	Current Bias-T current in milliamps
Notes	Query the Bias-T current supplied to the RF port. Together with the Bias-T voltage query, the power delivered to the load can be calculated. Measurement precision is to 2 decimal places

RX AGC State

Command	RX[1]|2:AGC:STATE <OFF>|<RLL> RX[1]|2:AGC:STATE?
Examples	RX1:AGC:STATE OFF AGC:STATE RLL AGC:STATE?
Returns	Current state of the automatic gain control sub-system.
Notes	Query or set the state of the automatic gain control sub-system. OFF: gain is static and set by the standard RF gain control command RLL: gain is dynamically controlled by the RLL based AGC algorithm.

RX AGC Target

Command	RX[1]|2:AGC:TARGET <float> RX[1]|2:AGC:TARGET?
Examples	RX1:AGC:TARGET 15 AGC:TARGET 16 AGC:TARGET?
Returns	Current target of the automatic gain control.
Notes	Query or set the target for the automatic gain control. For RLL-based AGC, this sets the target Rx RF gain when reacting to changes in optical path loss. If target cannot be reached, the closest achievable will be set without warnings or error.

RX Monitor output

Command	RX[1]|2:MONITOR:SOURCE <OPT>|<RFP> RX[1]|2:MONITOR:SOURCE?
Examples	RX1:MONITOR:SOURCE RFP
	RX2:MONITOR:SOURCE?
	MONITOR:SOURCE RFP
Default	OPT. The analogue monitor output will reflect the optical RLL.
Returns	Query returns the current configured monitor variable.
Notes	Sets the analogue monitor output to either the received light level (RLL) or RF power detector (RFP).

TX RF Gain

Command	TX[1]|2:RF:GAIN <float> TX[1]|2:RF:GAIN?
Examples	TX1:RF:GAIN -11.
	TX2:RF:GAIN?
	RF:GAIN?

Default	Factory gain calibration according to part number
Range	Inclusive of gain range min to max. Rounding to internally capable step size will occur.
Returns	Query returns the current configured gain.
Notes	Sets the RF gain of the TX Path

TX RF Gain Range

Command	TX[1]|2:RF:GAIN:RANGE?
Examples	TX2:RF:GAIN:RANGE? RF:GAIN:RANGE?
Returns	Allowable gain range for the RF:GAIN command
Notes	Range may be different for product of the same part number. Some gain range is internally reserved for calibration.

TX RF Power

Command	TX[1]|2:RF:POWER?
Examples	TX1:RF:POWER? TX2:RF:POWER? RF:POWER?
Returns	Current RF power reading in dBm.
Notes	This is for indication only. The RF power detector is calibrated with a 3 GHz tone and will respond differently to wideband power or power at other frequencies by up to +/- 4 dB. The Noise floor is around -40 dBm so small signals will not be registered.

TX Optical Power

Command	TX[1]|2:OPTICAL:POWER?
Examples	TX1:OPTICAL:POWER? OPTICAL:POWER?
Returns	Current laser optical power in milliwatts
Notes	Used to query the laser power. Typically 2.75 mW.

TX BIAS-T Voltage

Command	TX[1]|2:BIAST:VOLTAGE <NONE>|<INT>|<VIN>|<EXT>
Examples	TX1:BIAST:VOLTAGE NONE TX1:BIAST:VOLTAGE INT BIAST:VOLTAGE EXT BIAST:VOLTAGE?
Returns	Current Bias-T voltage in Volts
Notes	When setting, there are four options: NONE – Bias-T disabled. No voltage supplied to the RF port. INT – The internal regulator voltage (5V) is routed to the RF port. VIN – The system supply voltage (~12V) is routed to the RF port. EXT – A voltage supplied via the user port is routed to the RF port. Query returns the actual measured value on the RF port. Measurement precision is to 2 decimal places

TX BIAS-T Current

Command	TX[1]|2:BIAST:CURRENT?
Examples	TX1:BIAST:CURRENT?

	BIAST:CURRENT?
Returns	Current Bias-T current in milliAmps
Notes	Query the Bias-T current supplied to the RF port. Together with the Bias-T voltage query, the power delivered to the load can be calculated. Measurement precision is to 2 decimal places

TX Active Antenna Failure Detection (AFD)

Command	TX[1]|2:AFD:ENABLE <ON>|<OFF>
Examples	TX1:AFD:ENABLE ON
	AFD:ENABLE ON
	AFD:ENABLE:OFF
	AFD:ENABLE?
Returns	Current AFD status
Notes	When setting, there are two options: ON – Active antenna Bias-T current alarm monitoring enabled OFF – Active antenna status monitoring disabled Query returns the current status In the event of an active antenna failure where the Bias-T current drops below a threshold, the transmitter will disable its laser thereby referring the alarm indication to the receiver by way of an RLL alarm.

TX Active Antenna Failure Detection (AFD) Threshold

Command	TX[1]|2:AFD:THRESHOLD <float>
Examples	TX1:AFD:THRESHOLD 5.6
	AFD:THRESHOLD 6
	AFD:THRESHOLD?
Returns	Current AFD alarm threshold in milliamps.
Notes	When setting, the value expected is in mA. The valid range is 2.0 mA to 200 mA. The default value is 5 mA In the event of an active antenna failure where the Bias-T current drops below this threshold, the transmitter will disable its laser thereby referring the alarm indication to the receiver by way of an RLL alarm.

TX Monitor output

Command	TX[1]|2:MONITOR:SOURCE <OPT>|<RFP> TX[1]|2:MONITOR:SOURCE?
Examples	TX1:MONITOR:SOURCE OPT
	TX2:MONITOR:SOURCE?
	MONITOR:SOURCE OPT
Default	OPT. The analogue monitor output will reflect the laser optical power.
Returns	Query returns the current configured monitor variable.
Notes	Sets the analogue monitor output to either the laser optical power (OPT) or RF power detector (RFP).

System Voltage

Command	SYSTEM:VOLTAGE?
Examples	SYSTEM:VOLTAGE?
Returns	Current power supply voltage
Notes	The incoming voltage measurement can be queried to assist installation due to long supply cable and voltage drop. The voltage can also be routed to the Bias-T port.

System Temperature

Command	SYSTEM:TEMPERATURE?
Examples	SYSTEM:TEMPERATURE?
Returns	Current internal system temperature
Notes	The internal operating temperature is ~20°C above ambient. Internal temperatures should not be allowed to exceed 80°C as operating life of product may be adversely affected.

System Version

Command	SYSTEM:VERSION?
Examples	SYSTEM:VERSION?
Returns	Current system software version
Notes	This information may be required for support purposes.

System Errors

Command	SYSTEM:ERRORS?
Examples	SYSTEM:ERRORS?
Returns	Current system alarms and errors
Notes	This information may be required for support purposes.

Further assistance

In the event that you are unable to connect for any reason, please contact our dedicated Technical Support team, by emailing technicalsupport@vialite.com or by phoning +44 (0) 1793 784389.