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## **Command Set**

TR-Mark II

TR-Mark IIR

Version 1.02

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# 1 TR MARK II Communication Port

## 1.1 Hardware Protocol

9 pole D-Sub  
Pin 2 TXD Data TRSpy to Computer  
Pin 3 RXD Data Computer to TRSpy  
Pin 7 GND  
+/- 12 V Signals  
Protocol: 19200 Baud, 8 Bit, 1 Stop bit, no parity

## 1.2 Software- Protocol

Required firmware version 2.45 and later. Do not use former Versions for Remote Control. Call us for updates.

### 1.2.1 Printer Redirection Mode

After sending the command "SP 1" the Printer Output is directly sent to the serial Port, 19200 Baud, 8 Bit, 1 Stop.  
The command "SP 0" for disabling the feature.

### 1.2.2 Switch to Remote

The Device is switched to REMOTE

- Command "RM"
- Every command which is executing a measurement (MA,MB,MC,MF )

### 1.2.3 Switch to Local

With Command SL ( Set to Local) or with the Local Button on the Remote Display (SK4)

### 1.2.4 Syntax of Commands

„cc [Data1[;Data]..]CR  
cc = 2 ASCII Character for the Command  
“;” (semicolon or space ) Separator for multiple Data fields  
Numeric Format of Numbers: float ( C - Language), “.” as decimal point  
Format of Strings: all ASCII Characters from 0x20 to 0x7f  
Terminator: „CR“ ( = 0x0D) or LF (0x0A)

Answers without data

\*0 ok ok

\*1 unkn Syntax Error

Answers with data

xx,Message1[,Message2;[Message3]..],CR

xx Type of answer ( the command itself)

## 2 TR Mark II Commands

<b>Command</b>	<b>Name</b>	<b>Description</b>
<i>sl</i>	Set Local	Set TRSpy to local State
<i>slr</i>	Set Local	Set TrSpy to local State, "Trafo Setup Menu"
<i>slx</i>	Set Local	Set Spy to local State with a Warmboot Ret: "*0 ok"
<i>rm</i>	Set Remote	TRSpy to Remote State All Keys except SK4 are locked
<i>gv p</i>	Get Version	Get Version of TRSpy, Release of the Firmware, Date of Firmware "gv" "TRSpy by Raytech 2.08 21.12.01" or "2793 for Tettex 2.08 21.12.01" "gv 1" (short form) "SPY 2.08" "gv f" (flash boot loader) " FBL 2.00 22.11.01"
<i>gs</i>	Get Serial Number	Asks the internal serial number The Serial number is unique for each TRSpy e.g. gs „GS 214-101“
<i>sp x</i>	Set Protocol	Redirect Printing Output x = 0 Print output to parallel Port x = 1 Print output to serial Port

*so abcdef*

Set Options

Set Options

a [01] 0-> Print to LPT  
1-> Print to Com

b [0..9] Set Language to  
0-> "English"  
1-> "Deutsch"  
2-> "Français"  
3-> "Español"  
4-> "Italiano"

c [01] 0 -> LF as Terminator  
1 -> CR as Terminator

d [0..3] Sets the used Standard  
0-> IEC Standard  
1-> ANSI Standard  
2-> Australian Standard

e [0..9A..F] Set LCD contrast

f [01] reserved

Invalid parameters are ignored  
Ret: actual Parameters "SO ABCDEF"

Example:

SO ....A Sets contrast to Value 10, invalid values are ignored  
"SO 1002A0"

*st,a,b,c,d*

Set Trafo Data

Please use the new command "STT"

a => Trafosetup H    0 = Delta  
                  1 = Yn  
                  2 = Y  
                  3 = Single  
                  4 = Zn  
                  5 = 3 Phase (Trex)  
                  6 = CT (Current Transformer)  
                  7 = Z ( without neutral)

b => Trafosetup X ( Codes like Parameter a)

c => Testvoltage    0 = 100V  
                  1 = 40 V  
                  2 = 10V  
                  3 = 1V  
                  4 = Ext  
                  5 = Auto

d => Phase Displacement 0...11, or "?"

valid are all even or odd numbers depending on the Trafosetup H and X  
invalid numbers are interpreted as unknown "?"

e.g. ST,2,4,2,5 (= Yzn5 Testvoltage 10 V)    "0 ok"

*stt a,b[,c,d,e,f]*

Set Trafo Type

a => Primary Setup [Y,YN,Z,D,S,C,3P]

b => Secondary Setup [y,yn,z,zn,d,S,C,3p]

c => Vector Group [0..11,?]

d => Testvoltage [1V,10V,40V,100V,Auto,Ext]

e => TapCount [1.. 41]

f => Firsttap [(1-TapCount)..0]

"," delimitter may be also "-;,"

Parameters c .. f are optional, default values ",?,Auto,1,0"

Example:

STT D:yn-5,40,21,-10                    Transformer: D:yn-5

  Testvoltage 40V

  Taps: -10..+10 (Total 21 Taps)

Ret:

"\*0 ok"

"\*10" to less Parameter

		<p>“*11” Parameter invalid  “*4 Range” unknown Voltage</p>
<i>san</i> “Text”	Set Add Info	<p>Sets Additional Transformer Information  SA0 “Trafo Type” sets the Textfield Trafo Type  SA1 “Serial Number” Info  SA2 “Operator” Info  SA3 “Location” Info  SA4 “Remarks” Info</p>
<i>sr 0</i>	Set Reference	<p>Set Reference to No Ref.     „*0 ok“  e.g. sr 0</p>
<i>sr 1,a</i>	Set Reference	<p>Set Ref. to Nominal Ratio     „*0 ok“  a = Nominal Turn Ratio ( Format float)  e.g. sr 1,23.5 ( Nominal Turn Ratio = 23.5)</p>
<i>sr 2,a,b</i>	Set Reference	<p>Set Ref. to Refvoltages     „*0 ok“  a =&gt; Vh (in kV)  b =&gt; Vx (in kV)  e.g. sr 2,10.4,5 U<sub>h</sub> = 10.4 kV, U<sub>x</sub> = 5 kV  Parameters outside the valid range are limited to the min or max valid values</p>
<i>sr 3,a,b,c,d,e,f</i>	Set Reference	<p>Set Ref. to Refvoltages     „*0 ok“  a =&gt; TapChanger on 0=Primary, 1 = Secondary Side  b =&gt; Reference Tap  c =&gt; relative step voltage  d =&gt; Lower Tap for StepVoltage 2  e =&gt; Higher Tap for StepVoltage 2  f =&gt; relative StepVoltage 2 in %  e.g. sr 3,0,0,2  PrimSide, RefTap = 0, 2% per Step  Eg sr 3,0,0,0.05,-3,3,0.02  PrimSide, RefTap 0, 5?tr % per Step, but Tap -3..+3 with 2%</p>

<i>gt</i>	Get Trafo Data Measurement	Asks the Trafosetup Result with Primary Setup, Secondary Setup, Testvoltage, Phase Displacement, Date, Time of  Result: „GT,a,b,c,d,ddmmyy,hhmm“ a = [0..7] Primary type ( Codes see command st ) b = [0..7] Secondary type c = [0..5] Test voltage d = [0..11,12] Phase Displacement, 12 = 'unknown' ddmmyy -> Date of the Measurement hhmm -> Time of the Measurement e.g gt Answer: „GT,2,4,2,5,160697,1803“ => Yzn5 , Testvoltage 10 V, 16.06.97 18:03
<i>gr</i>	Get Reference	Asks the Type of Reference, and the Reference: Result: Reference Type, Nominal Ratio or H-X Voltages „GR,0,0.0,0.0“ No Reference value „GR,1,Ratio,0.0“ Reference is Turn Ratio „GR,2,Uh,Ux“ Reference is H,- X Voltages
<i>?tt</i>	Get Trafo Type	Get the type of the actual Transformer Ret: ?TT prim,sec,vg,volt,count,first ( see command stt ) Example ?TT Y:D-3 , 40 ,11,-5
<i>?tg</i>	Get Trafo General Info	Ret: ?TG f,date,time,standard Date and time of the last measurement Example: ?TG,1,110102,1232,2

?tr Get Trafo Reference

Ret ?TR,typ,Tratio,Vratio,PrimVolt,SecVolt,TT,RT,SV1,TR2L,TR2H,SV2  
Type = 0: No Reference value  
= 1: Reference are Ratios (Tratio & Vratio are valid)  
= 2: Reference are H,- X Voltages: (TRatio,Vratio,PrimVolt,SecVolt are valid)

Tratio: Nominal Turn ratio  
Vratio: Nominal Voltage/Current Ratio  
PrimVolt: Nominal Primary Voltage  
SecVolt: Nominal Secondary Voltage  
TT: 0 = Tap on Primary, 1 = Tap on Secondary Side  
RT: Reference Tap  
SV1 : relative Stepvoltage1  
TR2L,TR2H: Tap Changer Range for StepVoltage2  
SV2: relative Step voltage 2  
Res: reserved  
Example  
?TR,1,10,5.7735,10,1,0,0,0.05,-3,3,0.05

?tm Get Actual Measurement of the Actual Type  
?tma Get all Measurements of all Taps  
?tm n Get Actual measurement of Tap n [0 .. TapCount-1]

Ret: ?TM,t,ra,pa,ca,rb,pb,cb,rc,pc,cc  
T : Tap [FirstTap ... ]  
r\_: Ratio  
p\_: Phase  
c\_: Current  
\_a: Phase A \_b: Phase B \_c: Phase C  
Example  
?TMA ( Single Phase Transformer with 3 Taps)  
?TM,-1,9.99135,-0.0292503,0.1875,0,0,0,0,0,0  
?TM,+0,10.01,-0.0180002,0.2375,0,0,0,0,0,0  
?TM,+1,10.0149,-0.0135001,0.175,0,0,0,0,0,0



<i>?ta</i>	Get Trafo Additional Information	Ret: ?TA Type,S/N,Operator,Loc,Rem Example ?TA ?TA "H8-35S ", "123.435.223 ", "JW ", "Brem-54 ", "ok "
<i>?di</i>	Get Archive index	Ret: ?di used,max Used: number of datasets in the archive Max: size of the archive ( in Datasets) Example: ?dt ?DT,10,100 (10 of 100 Datasets are used) Valid Dataset Numbers 0.. 9
<i>?dt p</i>	Get Trafo Type from the Archive	Parameter p = " " Actual Dataset p = n Only Dataset n p = n,m Datasets n .. m ( inclusive)  Syntax like the command ?tt but with the index of the dataset End of list with "*0 ok" Example: ?dt ?DT,0,Yn:Yn-0 , 40 ,1,0 ?DT,1,S:S-0 , 10 ,11,-5 ?DT,2,Z:Yn-1 , 40 ,1,0 ?DT,3,3p:3p-1 , Ext,1,0 *0 ok
<i>?dr p</i>	Get Reference from Archive	
<i>?dg p</i>	Get General Information from Archive	
<i>?da p</i>	Get Additional Information from Archive	Syntax of parameter p is similar the command ?dt p Datafield like the command ?ta ,?tg,?tr

<i>?dm p</i>	Get Results from Archive	<p>p: Number of Dataset  Ret: ?dm,Dataset, &lt; Datafield like Command ?tm &gt;  Example  ?dm 1 ( Dataset with S:S-0 Transformer with 3 Taps)  ?DM,1,-1,9.99135,-0.0292503,0.1875,0,0,0,0,0  ?DM,1,+0,10.01,-0.0180002,0.2375,0,0,0,0,0  ?DM,1,+1,10.0149,-0.0135001,0.175,0,0,0,0,0  *0 ok</p>
<i>?re</i> <i>?re n</i>	Get Relais Config from actual Transformer Get Relais Config from DataSet n	<p>Ret: ?RE Prim:Sec-VG RelPA:RelSA RelPB:RelSB RelPC:RelSC  Example:  ?RE Y:D-3 A-BC:c-b B-CA:a-c C-AB:b-a</p>
<i>ga n</i> <i>gb n</i> <i>gc n</i>	Get Results A Get Results B Get Results C	<p>Asks the Results of the measured Values for Phase A,B or C from the actual Tap  Result: „Mx,a,b,c“  x = [A,B,C] Phase  a -&gt; Ratio of Phase x  b-&gt; Angle of Phase deviation of Phase x (units in degrees)  c -&gt; Current of Phase x ( in mA)  With Parameter n:  Actual Tap is set to n ( with command TS x)</p>
<i>gm x</i>	Recall Dataset from Archive	<p>x = 0 ..  Recall Dataset &lt;x&gt;  Ret: „*0 ok“ “*4 Range”</p>
<i>sm x</i>	Store actual Dataset to Memory loc x	<p>Stores the actual Values to Memory Location x  If x &lt; 0 the actual Dataset is stored after the last Dataset ( Append)  If x &gt;= 0 the actual Dataset is stored in Position x (Overwrite)  Ret: „*0 ok“ “*4 Range”</p>

<i>cm x</i>	Clear Dataset x in Archive	Clear Dataset x The Dataset x is cleared, Archive is not packed
<i>cm -x</i>	Clear Dataset x in Archive	Clear Dataset x and Pack the archive (CMP) Indexes of the other Datasets may be changed !!!
<i>cmp</i>	Packs the Archive	Packs the Archive Deleted Datasets are removed and the moved together Necessary after several <i>cm x</i> Indexes of the other Datasets may be changed !!!
<i>ma,x</i> <i>mb,x</i> <i>mc,x</i>	Measure Phase A Measure Phase B Measure Phase C	Measures Phase A,B or C of the actual Tap  x = " " no results during Measurement x = 1 during measuring, the actual Values are sent to the Host Syntax see Command GA,GB,GC After approx. 10 sec the TRSpy stops automatically x = 11 measure and display values of the Transformer without time-out A new command stops the mode Ret: "*6 Wait" immediately to confirm command "*0 ok" Measurement stopped "*3 Emerg" Emergency pressed Results, see Command GA,GB,GC
<i>mf,x</i>	Measure Full	Measure all Phases of the actual Tap x = " " Process without showing results x = 1 Results are sent to the computer Ret: "*6 Wait" immediately to confirm command "*0 ok" after approx. 3 * 10 sec when the measurement stops

ts n	Tap Set	Sets the actual Tap n [ FirstTap ... LastTap]
xx		Syntax Error “*1 unkn”