INSTEK LCR METER-RS232 CODE

Ver 2.2

2010/05/03

Command Reference

- Message Terminator (Last data byte with END message)
  <NL^END> or <NL^J> : New Line or ASCⅡ Line Feed Character (Hex 0A).
  <CR^M> : ASCⅡ Carry Return Character (Hex 0D)

CONTENTS:

Initialization

1. Power on the LCR Meter
2. Selects “MANU” mode. How to change MANU mode? Please refer to user manual showing about the panel description (13) in chapter 3.
3. PC sends command COMU?^END^M (or ^J^M)
4. Waiting for LCR Meter response.
   If LCR Meter response is COMU:ON..^END(or ^J^M) then go to step 5.
   If LCR Meter response is COMU:OFF.^END(or ^J^M) then check below:
   (1) LCR Meter‘s baud rate set 38400(default),so PC have to set the same.
   (2) LCR Meter’s RS232 item have to be set on. Refer to user manual about OPTION2 in chapter 9-1.
   (3) Please check configuration of cable. Refer to user manual about The Configuration of cable in chapter 9-3.
5. PC sends command COMU:OVER^END^M(or ^J^M)
6. Waiting for LCR Meter response. Response is COMU:OVER^END. LCR Meter’s display “RS232 ONLINE”.
7. Initialization is fished.

■ Command String

	FUNCTION	Command Syntax	Query Syntax	Query Response	NOTE
1	SPEED	MAIN:SPEE:SLOW<^END^M> MAIN:SPEE:MEDI<^END^M> MAIN:SPEE:FAST<^END^M>	MAIN:SPEE?<^END^M>	MAIN:SPEE:SLOW< ^END> MAIN:SPEE:MEDI< ^END> MAIN:SPEE:FAST< ^END>	
2	DISPLAY	MAIN:DISP:VALU<^END^M> MAIN:DISP:DELP<^END^M> MAIN:DISP:DELT<^END^M>	MAIN:DISP?< ^END^M>	MAIN:DISP:VALU< ^END> MAIN:DISP:DELP< ^END> MAIN:DISP:DELT< ^END>	
3	MODE	MAIN:MODE:RQ<^END^M> MAIN:MODE:CD<^END^M> MAIN:MODE:CR<^END^M> MAIN:MODE:LQ<^END^M> MAIN:MODE:LR<^END^M> MAIN:MODE:ZQ<^END^M>	MAIN:MODE?< ^END^M>	MAIN:MODE:RQ< ^END> MAIN:MODE:CD< ^END> MAIN:MODE:CR<^END> MAIN:MODE:LQ< ^END> MAIN:MODE:LR< ^END> MAIN:MODE:ZQ< ^END>	For Zθ mode
4	CIRCUIT	MAIN:CIRC:SERI<^END^M> MAIN:CIRC:PARA<^END^M>	MAIN:CIRC?< ^END^M>	MAIN:CIRC:SERI< ^END> MAIN:CIRC:PARA< ^END>	
5	FREQUENCY	MAIN:FREQ <value><^END^M> Example: MAIN:FREQ 0.01200<^END^M>	MAIN:FREQ?< ^END^M>	MAIN:FREQ <value><^END> Example: MAIN:FREQ 0.01200<^END>	value=0.01200 – 100.000
6	VOLTAGE	MAIN:VOLT <value><^END^M> Example: MAIN:VOLT 0.005<^END^M>	MAIN:VOLT?< ^END^M>	MAIN:VOLT :<value><^END> Example: MAIN:VOLT 0.005<^END>	value= 0.005 – 1.275
7	AUTO/MANU	MAIN:TRIG:AUTO<^END^M> MAIN:TRIG:MANU<^END^M>	MAIN:TRIG?< ^END^M>	MAIN:TRIG:AUTO<^END> MAIN:TRIG:MANU<^END>	
8	START	MAIN:STAR<^END^M>			
9	R.H	MAIN:R.H.:OFF.< ^END^M> MAIN:R.H.:ON..< ^END^M>	MAIN:R.H.?< ^END^M>	MAIN:R.H.:OFF.< ^END> MAIN:R.H.:ON..< ^END>	

	FUNCTION	Command Syntax	Query Syntax	Query Response	NOTE
10	C.V	MAIN:C.V.:OFF.< ^END^M> MAIN:C.V.:ON..< ^END^M>	MAIN:C.V.?< ^END^M>	MAIN:C.V.:OFF.< ^END> MAIN:C.V.:ON..< ^END>	
11	BIAS		MAIN:BIAS?< ^END^M>	MAIN:INTB:ON..< ^END> MAIN:INTB:OFF.< ^END> MAIN:EXTB:ON.. <^END> MAIN:EXTB:OFF.< ^END>	
12	INT.B	MAIN:INTB:OFF.< ^END^M> MAIN:INTB:ON..< ^END^M>	MAIN:INTB?< ^END^M>	MAIN:INTB:OFF.< ^END> MAIN:INTB:ON..< ^END>	
13	EXT.B	MAIN:EXTB:OFF.< ^END^M> MAIN:EXTB:ON..< ^END^M>	MAIN:EXTB?< ^END^M>	MAIN:EXTB:OFF.< ^END> MAIN:EXTB:ON..< ^END>	
14	PPM.	MAIN:PPM.:OFF.< ^END^M> MAIN:PPM.:ON..< ^END^M>	MAIN:PPM.?< ^END^M>	MAIN:PPM.:OFF.< ^END> MAIN:PPM.:ON..< ^END>	
15	OPEN	OFFS:OPEN< ^END^M>		OPEN:OK<^END> OPEN:FAIL<^END>	
16	SHORT	OFFS:SHOR< ^END^M>		SHOR:OK<^END> SHOR:FAIL<^END>	
17	NOM.VAL	SORT:NOMV<value>< ^END^M> Example: SORT:NOMV +0.12345< ^END^M> SORT:NOMV –0.12345< ^END^M>	SORT:NOMV?<^END^M>	SORT:NOMV <value><^END> Example: SORT:NOMV 0.12345<^END> SORT:NOMV –0.12345<^END>	
18	RECALL	MEMO:RECA <value> <^END^M> Example: MEMO:RECA 100. <^END^M>	MEMO:NUMB?<^END^M>	MEMO:NUMB <value><^END> Example: MEMO:NUMB:100<^END> MEMO:RECA:EMPT<^END>	value:1-- – 100 value 1-- – 100 (- : space)

	FUNCTION	Command Syntax	Query Syntax	Query Response	NOTE
19	STORE	MEMO:STOR <value>< ^END^M> Example: MEMO:STOR 100.< ^END^M>.		MEMO:STOR <value><^END> Example: MEMO:STOR 100<^END>	value:1.00 – 100. value:1-- – 100
20	AVERAGE	SETP:AVER <value><^END^M> Example: SETP:AVER 255.< ^END^M>	SETP:AVER?< ^END^M>	STEP:AVER <value><^END> Example: STEP:AVER 255.< ^END>	value:1.00 - 255.
21	RECALL CALIBRATION	STEP:RECA< ^END^M>		RECA:OK<^END>	
22	BAUDRATE	COMU:<value>< ^END^M> Example: COMU:9600< ^END^M>		COMU:<value><^END> COMU:9600<^END>	value: 9600 19.2 38.4 57.6 1152
23	MODE L NO.		COMU:MONO?< ^END^M>	COMU:MONO:816.< ^END> COMU:MONO:817.< ^END> COMU:MONO:819.< ^END>	
24	ONLINE		COMU?< ^END^M>	COMU:ON..< ^END> COMU:OFF.< ^END>	
25	MEASURE HOLD	COMU:HOLD< ^END^M>			
26	MEASURE RECOVER	COMU:RECO< ^END^M>			

	FUNCTION	Command Syntax	Query Syntax	Query Response	NOTE
27	LEVEL DISPLAY	LEVE:MAIN< ^END^M> LEVE:MENU< ^END^M> LEVE:PARA< ^END^M> LEVE:SORT< ^END^M> LEVE:OFFS< ^END^M>		LEVE:MAIN< ^END> LEVE:MENU< ^END> LEVE:PARA< ^END> LEVE:SORT< ^END> LEVE:OFFS< ^END>	MAIN Display MENU Display SET PARAMETER SORT Display OFFSET Display
28	Primary Factor			MAIN:PRIM <value><^END> Example: MAIN:PRIM 32.705<^END>	Test result
29	Secondary Factor & Unit for R/Q,C/D,L/Q			MAIN:SECO <value> <unit1><^END> Example: MAIN:SECO .0045nF<^END>	Test result Unit1:for Primary Factor
30	Secondary Factor & Unit for C/R			MAIN:SECO <value><unit1><unit2><^END> Example: MAIN:SECO .0045nFk<^END>	Test result Unit1:for Primary Factor Unit2:for Secondary Factor
31	Initiation has finished	COMU:OVER<^END^M>		COMU:OVER<^END>	LCR METER show :”RS232 ONLINE”
32	OFF LINE	COMU:OFF.<^END^M >		COMU:OFF.<^END>	

■ Example:

ONLINE step 1(power on only)

PC send command COMU?<^END^M> or <^J^M>

ASCII CODE = 43 4F 4D 55 3F 0A 0D (Hex format)

LCR Meter Response : COMU:ON..<^END>

ASCII CODE = 43 4F 4D 55 3A 4F 4E 2E 2E 0A (Hex format)

ONLINE step 2(power on only, LCR METER WILL SHOW RS232 ONLINE)

PC send command COMU:OVER<^END^M> or <^J^M>

ASCII CODE = 43 4F 4D 55 3A 4F 56 45 52 0A 0D (Hex format)

LCR Meter Response : COMU:OVER<^END

ASCII CODE = 43 4F 4D 55 3A 4F 56 45 52 0A (Hex format)

Set Speed

PC send command MAIN:SPEE:FAST<^END^M> or <^J^M>

ASCII CODE = 4D 41 49 4E 3A 55 50 45 45 3A 46 41 53 54 0A 0D (Hex format)

LCR Meter Response : MAIN:SPEE:FAST<^END>

ASCII CODE = 4D 41 49 4E 3A 53 50 45 45 3A 46 41 53 54 0A (Hex format)

Set Frequency

PC send command MAIN:FREQ 1.00000<^END^M> or <^J^M>

ASCII CODE = 4D 41 49 4E 3A 46 52 45 51 20 31 2E 30 30 30 30 30 0A 0D (Hex format)

LCR Meter Response: MAIN:FREQ 1.00000<^END>

ASCII CODE = 4D 41 49 4E 3A 46 52 45 51 20 31 2E 30 30 30 30 30 0A (Hex format)

Set Nomval

PC send command SORT:NOMV +32.0000< ^END^M> or <^J^M>

ASCII CODE = 53 4F 52 54 3A 4E 4F 4D 56 20 2B 33 32 2E 30 30 30 30 0A 0D (Hex format)

LCR Meter Response SORT:NOMV 32.0000<^END>

ASCII CODE = 53 4F 52 54 3A 4E 4F 4D 56 20 20 33 32 2E 30 30 30 30 0A (Hex format)

PC send command SORT:NOMV -32.0000< ^END^M> or <^J^M>

ASCII CODE = 53 4F 52 54 3A 4E 4F 4D 56 20 2D 33 32 2E 30 30 30 30 0A 0D (Hex format)

LCR Meter Response SORT:NOMV -32.0000<^END>

ASCII CODE = 53 4F 52 54 3A 4E 4F 4D 56 20 2D 33 32 2E 30 30 30 30 0A (Hex format)

Set Voltage

PC send command MAIN:VOLT 1.000< ^END^M> or <^J^M>

ASCII CODE = 4D 41 49 4E 3A 56 4F 4C 54 20 31 2E 30 30 30 0A 0D (Hex format)

LCR Meter Response MAIN:VOLT 1.000<^END>

ASCII CODE = 4D 41 49 4E 3A 56 4F 4C 54 20 31 2E 30 30 30 0A (Hex format)

Set Average

PC send command STEP:AVER 1.00< ^END^M> or <^J^M>

ASCII CODE = 53 54 45 50 3A 41 56 45 52 20 31 2E 30 30 0A 0D (Hex format)

LCR Meter Response STEP:AVER 1.00<^END>

ASCII CODE = 53 54 45 50 3A 41 56 45 52 20 31 2E 30 30 0A (Hex format)

Store Memory

PC send command MEMO:STOR 1.00< ^END^M> or <^J^M>

ASCII CODE = 4D 45 4D 4F 3A 53 54 4F 52 20 31 2E 30 30 0A 0D (Hex format)

LCR Meter Response MEMO:STOR 1 <^END>

ASCII CODE = 4D 45 4D 4F 3A 53 54 4F 52 20 31 20 20 0A (Hex format)

Recall Memory

PC send command MEMO:RECA 1.00< ^END^M> or <^J^M>

ASCII CODE = 4D 45 4D 4F 3A 52 45 43 41 20 31 2E 30 30 0A 0D (Hex format)

LCR Meter Response MEMO:NUMB 1 <^END>

ASCII CODE = 4D 45 4D 4F 3A 4E 55 4D 42 20 31 20 20 0A (Hex format)

Test Result for Primary Factory

LCR Meter Response MAIN:PRIM 32.705<^END>

ASCII CODE = 4D 41 49 4E 3A 50 52 49 4D 20 20 33 32 2E 37 30 35 0A (Hex format)

Test Result f or Secondary Factory and Unit

1. R/Q,C/D,L/Q (Display =”VALUE” / “DELTA”)

LCR Meter Response MAIN:SECO .0045nF<^END>

ASCII CODE = 4D 41 49 4E 3A 53 45 43 4F 20 20 2E 30 30 34 35 6E 46 0A (Hex format)

2. C/R (Display =”VALUE” / “DELTA”)

LCR Meter Response MAIN:SECO .0232nFk<^END>

ASCII CODE = 4D 41 49 4E 3A 53 45 43 4F 20 20 2E 30 32 33 32 6E 46 6B 0A (Hex format)

3. R/Q,C/D,L/Q,C/R(Display =”DELTA %”)

LCR Meter Response MAIN:SECO .0045 %<^END>
ASCII CODE = 4D 41 49 4E 3A 53 45 43 4F 20 20 2E 30 30 34 35 20 25 0A (Hex format)

OFF LINE

PC send command COMU:OFF.< ^END^M> or <^J^M>
ASCII CODE = 43 4F 4D 55 3A 4F 46 46 2E 0A 0D (Hex format)
LCR Meter Response : COMU:OFF.<^END>
ASCII CODE = 43 4F 4D 55 3A 4F 46 46 2E 0A (Hex format)

Set Manual mode

PC send command MAIN:TRIG:MANU< ^END^M> or <^J^M>
ASCII CODE = 4D 41 49 4E 3A 54 52 49 47 3A 4D 41 4E 55 0A 0D (Hex format)
LCR Meter Response : MAIN:TRIG:MANU<^END>
ASCII CODE = 4D 41 49 4E 3A 54 52 49 47 3A 4D 41 4E 55 0A (Hex format)

Set BAUDRATE

EX: change to 115200
PC send command COMU:1152.< ^END^M> or <^J^M>
ASCII CODE = 43 4F 4D 55 3A 31 31 35 32 0A 0D (Hex format)
LCR Meter Response :. COMU:1152<^END>
ASCII CODE =43 4F 4D 55 3A 31 31 35 32 0A (Hex format)

OPEN

Step1:

PC send command LEVE:OFFS< ^END^M> or <^J^M>

ASCII CODE = 4C 45 56 45 3A 4F 46 46 53 0A 0D (Hex format)

LCR Meter Response :. LEVE:OFFS<^END>

ASCII CODE = 4C 45 56 45 3A 4F 46 46 53 0A (Hex format)

Step2:

PC send command OFFS:OPEN< ^END^M> or <^J^M>

ASCII CODE = 4F 46 46 53 3A 4F 50 45 4E 0A 0D (Hex format)

When open test is ok

LCR Meter Response :. OPEN:OK<^END>

ASCII CODE = 4F 50 45 4E 3A 4F 4B 0A (Hex format)

When open test is fail

LCR Meter Response :. OPEN:FAIL<^END>

ASCII CODE = 4F 50 45 4E 3A 46 41 49 4C 0A (Hex format)

SHORT

Step1:

PC send command LEVE:OFFS.<^END^M> or <^J^M>

ASCII CODE = 4C 45 56 45 3A 4F 46 46 53 0A 0D (Hex format)

LCR Meter Response :. LEVE:OFFS<^END>

ASCII CODE = 4C 45 56 45 3A 4F 46 46 53 0A (Hex format)

Step2:

PC send command OFFS:SHOR<^END^M> or <^J^M>

ASCII CODE = 4F 46 46 53 3A 53 48 4F 52 0A 0D (Hex format)

When short test is ok

LCR Meter Response :. SHOR:OK<^END>

ASCII CODE = 53 48 4F 52 3A 4F 4B 0A (Hex format)

When short test is fail

LCR Meter Response :. SHOR:FAIL<^END>

ASCII CODE = 53 48 4F 52 3A 46 41 49 4C 0A (Hex format)

How to get test result?

Two ways reach to the goal..

1. Trigger mode is selected to AUTO mode:

   If the AUTO mode is selected, LCR Meter will send test result to pc after process the measurement automatically. PC doesn't need to send any command.

2. Trigger mode is selected to MANU mode:

   If the MANU mode is selected, LCR Meter doesn't process the measurement and send test result to pc automatically. PC have to send a command of MAIN:STAR^END^M(or ^J^M) to LCR Meter. If test frequency at 1kHz and test speed at slow, PC have to wait 800ms at least.

   Then LCR Meter will sequent send 2 command for test result.

Note: Test result format refer to topic of Test Result Format.

● Test Result Format

Ex: When LCR Meter have Processed Measurement, then will sequent send 2 command for test result automatically. Refer to below:

Ex: When C=1nF,D= .0045 (C/D mode and display mode is VALUE)

1. Primary factor of test result. (It doesn't include primary's unit).

   LCR Meter response MAIN:PRIM 1.0000^END

   ASCII CODE = 4D 41 49 4E 3A 50 52 49 4D 20 20 31 2E 30 30 30 30 0A (Hex format)

   Positive symbol

2. Secondary factor and primary's unit

   LCR Meter response MAIN:SECO .0045nF^END

   ASCII CODE = 4D 41 49 4E 3A 53 45 43 4F 20 20 2E 30 30 34 35 6E 46 0A (Hex format)

   Positive symbol Primary factor' unit

Ex: When R=1ohm,Q= .0005 (R/Q mode and display mode is VALUE)

1. Primary factor of test result (It doesn't include primary's unit.

   LCR Meter response MAIN:PRIM 1.0000^END

   ASCII CODE = 4D 41 49 4E 3A 50 52 49 4D 20 20 31 2E 30 30 30 30 0A (Hex format)

   Positive symbol

2. Secondary factor and unit

   LCR Meter response MAIN:SECO .0005 ^END

   ASCII CODE = 4D 41 49 4E 3A 53 45 43 4F 20 20 2E 30 30 30 35 20 20 0A (Hex format)

   Positive symbol Primary factor's unit

Ex: When R=1kohm,Q= .0005 (R/Q mode and display mode is VALUE)

1. Primary factor of test result (It doesn't include primary's unit)

   LCR Meter response MAIN:PRIM 1.0000^END

   ASCII CODE = 4D 41 49 4E 3A 50 52 49 4D 20 20 31 2E 30 30 30 30 0A (Hex format)

   Positive symbol

2. Secondary factor and unit

   LCR Meter response MAIN:SECO .0005k ^END

   ASCII CODE = 4D 41 49 4E 3A 53 45 43 4F 20 20 2E 30 30 30 35 6B 20 0A (Hex format)

   Positive symbol Primary factor's unit

Ex: When R=-1kohm,Q= -.0005 (R/Q mode and display mode is VALUE)

1. Primary factor of test result (It doesn't includes primary's unit).

   LCR Meter response MAIN:PRIM -1.0000^END

   ASCII CODE = 4D 41 49 4E 3A 50 52 49 4D 20 2D 31 2E 30 30 30 30 0A (Hex format)

   Negative symbol

2. Secondary factor and unit

   LCR Meter response MAIN:SECO -.0005k ^END

   ASCII CODE = 4D 41 49 4E 3A 53 45 43 4F 20 2D 2E 30 30 30 35 6B 20 0A (Hex format)

   Negative symbol Primary factor's unit

C/R mode add a secondary factor's unit

Ex: When C=1nF,R= .0045k ohm (C/R mode and display mode is VALUE)

1. Primary factor of test result (It doesn't include Primary's unit).

   LCR Meter response MAIN:PRIM 1.0000^END

   ASCII CODE = 4D 41 49 4E 3A 50 52 49 4D 20 20 31 2E 30 30 30 30 0A (Hex format)

   Positive symbol

2. Secondary factor and unit

   LCR Meter response MAIN:SECO .0045nFk^END Secondary factor's unit

   ASCII CODE = 4D 41 49 4E 3A 53 45 43 4F 20 20 2E 30 30 34 35 6E 46 6B 0A (Hex format)

   Positive symbol Primary factor's unit

Ex: When C=1nF,R= .0045 ohm (C/R mode and display mode is VALUE)

1. Primary factor of test result (It doesn't include Primary's unit).

   LCR Meter response MAIN:PRIM 1.0000^END

   ASCII CODE = 4D 41 49 4E 3A 50 52 49 4D 20 20 31 2E 30 30 30 30 0A (Hex format)

   Positive symbol

2. Secondary factor and unit

   LCR Meter response MAIN:SECO .0045nF ^END Secondary factor's unit

   ASCII CODE = 4D 41 49 4E 3A 53 45 43 4F 20 20 2E 30 30 34 35 6E 46 20 0A (Hex format)

   Positive symbol Primary factor's unit

EX: If the impedance of “Device-under-test” is small than the existing measurement range of the LCR Meters, LCR Meters will send message as below:

LCR Meter response PRIM:OV01 ^END

ASCII CODE = 50 52 49 4D 3A 4F 56 30 31 20 0A (Hex format)

C/R mode add a secondary factor’s unit

Ex: When C=.00001nF,R= OVER kohm (C/R mode and display mode is VALUE)

1. Primary factor of test result (It doesn’t include Primary's unit).

   LCR Meter response MAIN:PRIM .00001^END

   ASCII CODE = 4D 41 49 4E 3A 50 52 49 4D 20 20 2E 30 30 30 30 31 0A (Hex format)

   Positive symbol

2. Secondary factor and unit

   LCR Meter response SECO:OVER nFk^END → Secondary factor’s unit

   ASCII CODE = 53 45 43 4F 3A 4F 56 45 52 20 6E 46 6B 0A (Hex format)

   Primary factor’s unit

● Continuous Command

When you would like to send two commands or more, you have to send a code between two commands. Refer to below:

<NL^END> or <^J> : New Line or ASCⅡ Line Feed Character (Hex 0A).

Last Command need add two codes. Refer to below:

<NL^END> or <^J> : New Line or ASCⅡ Line Feed Character (Hex 0A).

<CR^M> : ASCⅡ Carry Return Character (Hex 0D)

Example: Setting Frequency, Voltage and Test Speed

PC send command MAIN:FREQ 1.00000<^END>(or <^J>) MAIN:VOLT 1.000<^END>(or <^J>) MAIN:SPEE:FAST<^END^M>(or <^J^M>)

ASCII CODE = 4D 41 49 4E 3A 46 52 45 51 20 31 2E 30 30 30 30 30 0A 4D 41 49 4E 3A 56 4F 4C 54 20 31 2E 30 30 30 0A 4D 41 49 4E 3A 55 50 45 45 3A 46 41 53 54 0A 0D (Hex format)

Off Line

Function: PC disconnect with LCR Meter. PC have to send a command COMU:OFF.^END^M(or ^J^M)to LCR Meter. LCR Meter will respond a command COMU:OFF.^END to PC and recover display after receive PC command.

Command String:

PC sends command COMU:OFF.< ^END^M> or <^J^M>

ASCII CODE = 43 4F 4D 55 3A 4F 46 46 2E 0A 0D (Hex format)

LCR Meter response: COMU:OFF.<^END>

ASCII CODE = 43 4F 4D 55 3A 4F 46 46 2E 0A (Hex format)