DT4280 Series

DIGITAL MULTIMETER

Remote Operation Manual

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Contents

1. Remote Interface Overview

Step1. Connect the USB cable to the USB port on the computer.

Step2. Once the USB cable is connected and the USB driver is installed, a virtual COM port is created on the computer.

2. Interface Parameters

In order to operate the meter via a host computer or terminal, the parameters in interface within the DT4281,DT4282 have to match the parameters the serial interface provided by the host or terminal.

The following procedures will guide the user to set up interface parameters within the DT4281,DT4282 to comply interface with the host.

Table.1

Item	Parameter	Setting
1	Baud Rate	19200 bps
2	Data Length	8 bit
3	Parity Check	None
4	Stop Bit	1 bit

3. About Command

3.1. Terminator

A terminator is a character sent by a host, which identified the end of a command string.
A valid terminator consists of two-byte data.

<CR>	(Carriage Return, ASC(&H0D))
<LF>	(Line Feed, ASC(&H0A))

3.2. Return result

After the meter executes a query command the return of the result will be in the following format.

<Result> + <CR> <LF>

3.3. Data Types

Returned message is the ASCII string from the meter responding to a query.

Table.2

Data Type	Explanation	Example
<NR1>	An integer	+10000, -10000, 123, -100
<NR2>	This numeric representation has an explicit radix point.	+13.234, -.00002, 3.4567
<NR3>	This representation has an explicit radix point and an exponent.	-1.000000E+02
<Boolean>	String ASCII-encoded byte, is return for the setting query.	0 or 1
<Literal>	ASCII string	ACV, DCV

4. Summary of Commands

Table.3

Command	Parameter	Description
QPID		Query the Meter model.
*IDN		Query the Meter identification.
:SYST:RST		Put the meter to reset.
:SYST:LLO		Put the meter into the local lockout state.
:SYST:GTL		Put the meter into the local state.
:CONF?		Query the main function of the display.
:CONF2?		Query the sub function of the display.
:CONF	<function,range>	Configure the range.
:FETCCNT?		Query main measured count value.
:FETCCNT2?		Query sub measured count value.
:CALC:STAT:MAX?		Query measured maximum count value.
:CALC:STAT:MIN?		Query measured minimum count value.
:CALC:REL:OFFS?		Query the offset value of the relative. (main)
:CALC:REL:OFFS2?		Query the offset value of the relative. (sub)
:SYST:APS	<0 | 1>	Set the APS.
:SYST:BEEP	<0 | 1>	Set the action of the beeper.
:SYST:BLIT	<0 | 1>	Set the backlight.
:SYST:BATT?		Query the battery level.
:SYST:DEFA		Returns meter settings to their factory defaults.
:SYST:REL	<0 | 1>	Set the relative.
:STAT?		Query the status of the meter.
:CALC:PEAK:MAX?		Query measured peak maximum count value.
:CALC:PEAK:MIN?		Query measured peak minimum count value.
:SYST:FILTER	<0 | 1>	Set the filter.
:SYST:PEAK	<0 | 1>	Set the peak.
:SYST:SLOW	<0 | 1>	Set the average.
:SYST:CLEAR		Put the clear command.
:SYST:BLA	<0 | 1>	Set the auto backlight.
:SYST:CPER	<0 | 1>	Set the DC4-20mA or DC0-20mA.
:SYST:CONDUCT	<data>	Set the threshold of continuity check.
:SYST:DIODE	<data>	Set the threshold of diode test.
:SYST:DBM	<data>	Set the standard impedance of dBm.
:SYST:INIT		Put the meter to power-on-reset state.

5. Detail of Commands

5.1. Description of Commands

The DT4281,DT4282 only accepts the UPPER CASE command. (Except Unit etc.)

Table.4

Command	Explanation
QPID	Query the Meter model. Syntax QPID Response "DT4281" or "DT4282"
*IDN	Query the Meter identification. Syntax *IDN? Response <data×3> <data> maker name, model number, serial, version Example; "HIOKI,DT4281,121107517,Ver 1.00"
:SYST:RST	Put the meter to reset. Syntax :SYST:RST Response "OK"
:SYST:LLO	Put the meter into the local lockout state. Syntax :SYST:LLO Response "OK"
:SYST:GTL	Put the meter into the local state. Syntax :SYST:GTL Response "OK"
:CONF? :CONF2?	Query the function of the display. Syntax :CONF? [:CONF2?] Response <data×2> <data> function,range Example; "ACV, 600m" → 5.2 Combination response string function and range
:CONF	Configure the range. Syntax :CONF <data×2> <data> function,range Example; ":CONF RES, 60k" →5.2 Combination response string function and range Response "OK" or "CMD ERR" or "EXE ERR"

Command	Explanation
:FETCCNT? :FETCCNT2?	Query measured count value. Syntax :FETCCNT? [:FETCCNT2?] Response <data×1> <data> count value Example; "3000"
:CALC:STAT:MAX?	Query measured maximum count value. (1) Syntax :CALC:STAT:MAX? Response <data×1> <data> count value Example; "5000"
:CALC:STAT:MIN?	Query measured minimum count value. (1) Syntax :CALC:STAT:MIN? Response <data×1> <data> count value Example; "2000"
:CALC:REL:OFFS? :CALC:REL:OFFS2?	Query the offset value of the relative. (main or sub) Syntax :CALC:REL:OFFS? [:CALC:REL:OFFS2?] Response <data×2> <data> offset value, range Example; "20, 600m"
:SYST:APS	Set the APS. Syntax :SYST:APS <data×1> <data> "0" (off) or "1" (on) Example; ":SYST:APS 1" Response "OK" or "CMD ERR"
:SYST:BEEP	Set the action of the beeper. Syntax :SYST:BEEP <data×1> <data> "0" (off) or "1" (on) Example; ":SYST:BEEP 1" Response "OK" or "CMD ERR"
:SYST:BLIT	Set the backlight. Syntax :SYST:BLIT <data×1> <data> "0" (off) or "1" (on) Example; ":SYST:BLIT 1" Response "OK" or "CMD ERR"

(1) Since the internal count value is returned, the value beyond the display range is not guaranteed to be accurate.

Command	Explanation
:SYST:BATT?	Query the battery level. Syntax :SYST:BATT? Response <data×1> <data> Four steps remaining battery level. "3" or "2" or "1" or "0"
:SYST:DEFA	Returns meter settings to their factory defaults. Syntax :SYST: DEFA Response "OK"
:SYST:REL	Set the relative. Syntax :SYST: REL <data×1> <data> "0" (off) or "1" (on) Example; ":SYST: REL 1" Response "OK" or "CMD ERR"
:STAT?	Query the status of the meter. Syntax :STAT? Response "<ABCDEFGHIJKLMNOPQRSTUVWX>" (24char) A---Recording "0"(OFF) or "1"(MAX) or "2"(MIN) B---Relative value (REL) "0"(OFF) or "1"(ON) C---Filter "0"(OFF) or "1"(ON) D---Beep "0"(OFF) or "1"(ON) E---APS "0"(OFF) or "1"(ON) F---Battery level "0"～"3" G---Input warning "0"(normal) or "1"(warn) HI---Rotary position "00"～"99"(from OFF) J---HOLD "0"(OFF) or "1"(ON) K---Auto Hold "0"(OFF) or "1"(ON) L---Auto Range "0"(OFF) or "1"(ON) M---Backlight "0"(OFF) or "1"(ON) N---Backlight Auto OFF "0"(OFF) or "1"(ON) O---SLOW "0"(OFF) or "1"(ON) P---Peak measurement "0"(OFF) or "1"(ON) Q---Clump range "0"～"6" R---DCmA percentage "0"(4-20mA)or"1"(0-20mA) S---Index of threshold of continuity "0"～"3" T---Index of threshold of diode "0"～"6" UV---Index of impedance of dBm "00"～"19" W---reserved "0" X---reserved "0"

Command	Explanation
:CALC:PEAK:MAX?	Query measured peak maximum count value. Syntax :CALC:PEAK:MAX? Response <data×1> <data> count value Example; "3000"
:CALC:PEAK:MIN?	Query measured peak minimum count value. Syntax :CALC:PEAK:MIN? Response <data×1> count value Example; "-3000"
:SYST:FILTER	Set the filter. Syntax :SYST: FILTER <data×1> <data> "0" (off) or "1" (on) Example; ":SYST: FILTER 1" Response "OK" or "CMD ERR"
:SYST:PEAK	Set the peak. Syntax :SYST: PEAK <data×1> <data> "0" (off) or "1" (on) Example; ":SYST: PEAK 1" Response "OK" or "CMD ERR"
:SYST:SLOW	Set the average. Syntax :SYST: SLOW <data×1> <data> "0" (off) or "1" (on) Example; ":SYST: SLOW 1" Response "OK" or "CMD ERR"
:SYST:CLEAR	Put the clear command. Syntax :SYST: CLEAR Response "OK"
:SYST:BLA	Set the auto backlight. Syntax :SYST: BLA <data×1> <data> "0" (off) or "1" (on) Example; ":SYST: BLA 1" Response "OK" or "CMD ERR"
:SYST:CPER	Set the DC4-20mA or DC0-20mA. Syntax :SYST: CPER <data×1> <data> "0" (4-20mA) or "1"(0-20mA) Example; ":SYST: CPER 1" Response "OK" or "CMD ERR"

Command	Explanation
:SYST: CONDUCT	Set the threshold of continuity check. Syntax :SYST: CONDUCT <data×1> <data> Index of threshold "0"～"3" Example; ":SYST: CONDUCT 1" Response "OK" or "CMD ERR"
:SYST:DIODE	Set the threshold of diode test. Syntax :SYST: DIODE <data×1> <data> Index of threshold "0"～"6" Example; ":SYST: DIODE 1" Response "OK" or "CMD ERR"
:SYST:DBM	Set the standard impedance of dBm. Syntax :SYST: DBM <data×1> <data> Index of impedance "00"～"19" Example; ":SYST: DBM 15" Response "OK" or "CMD ERR"
:SYST:INIT	Put the meter to power-on-reset state. Syntax :SYST: INIT Response "OK"

5.2. Combination response string function and range

Table.5

Function	Range
ACV	60m, 600m, 6, 60, 600, 1000
DCV	60m, 600m, 6, 60, 600, 1000
dBm	600
dBV	60
ACDCV	6, 60, 600, 1000
SEPV	60m, 600m, 6, 60, 600, 1000
CONT	600
DIODE	4
RES	60, 600, 6k, 60k, 600k, 6M, 60M, 600M
TEMP	800
CAP	1n, 10n, 100n, 1u, 10u, 100u, 1m, 10m, 100m
CLAMP	10, 20, 50, 100, 200, 500, 1000
nS	600
DCuA	600u, 6000u
ACuA	600u, 6000u
DCmA	60m, 600m
ACmA	60m, 600m
DC_4_20mA	60m
DCA	6, 10
ACA	6, 10
FREQ	10, 100, 1k, 10k, 100k, 1000k

5.3. Index of threshold of continuity check

Table.6

Index	Threshold
0	20Ω
1	50Ω
2	100Ω
3	500Ω

5.4. Index of threshold of diode test

Table.7

Index	Threshold
0	0.15V
1	0.5V
2	1.0V
3	1.5V
4	2.0V
5	2.5V
6	3.0V

5.5. Index of standard impedance of dBm

Table.8

Index	Standard Impedance	Index	Standard Impedance
0	4Ω	10	150Ω
1	8Ω	11	200Ω
2	16Ω	12	250Ω
3	32Ω	13	300Ω
4	50Ω	14	500Ω
5	75Ω	15	600Ω
6	93Ω	16	800Ω
7	110Ω	17	900Ω
8	125Ω	18	1000Ω
9	135Ω	19	1200Ω

5.6. Count value of abnormal data

Response of count value query return the values shown in Table.9 in the case of abnormal data.

Table.9

Type of abnormal value	Count value
Over Range value	1000000
Invalid data	2000000
Open value (TEMP function)	3000000
Internal error value (TEMP function)	4000000

6. Compatible command with earlier products

Table.10 shows the command compatibility with earlier products 3800 series.

Table.10

Command	Description
*CLS	Clear the system Error Queue.
*RST	Put the meter to power-on-reset state.
LLO	Put the meter into the local lockout state when in remote control. This means no local key operation at the front panel is allowed during remote control.
GTL	Put the meter into the local state, clearing the remote state and front panel lockout.
FETC? [@2]	Return the primary or secondary function value of output butter. Response : <NR3>

Please note