8.4 Remote control to Multidrop 384

The interface system consists of the serial RS-232C computer port which is used for computer control.

8.4.1 Hardware for the computer port

The character length is 10 bits with 1 start bit, 8 data bits, 1 stop bit and no parity. The format cannot be changed.

The following signals are connected to the computer port DB-25 connector at the rear of the instrument:

DB-25 CONNECTOR	
Pin no.	Signal name
2	TxD
3	RxD
4	RTS
7	GND
20	DTR

Signal description

2:      TxD, transmit data (output)
3:      RxD, receive data (input)
7:      GND, signal ground
4/20:   RTS/DTR (handshake lines)

The handshake lines:
RTS/DTR are not in use in the standard Multidrop 384.

8.4.2 Multidrop 384 PC interface

Baudrate	9600
Parity	None
Data bits	8
Stop bits	1
Handshake	XON/XOFF

Commands

Commands to the Multidrop 384 have two to three fields as described in the following syntax. The first letter identifies the command. Then a numeric argument field is optional for some and required for other commands. The numeric field immediately follows the uppercase letter without any separating characters. The last character of a command is a linefeed character <LF> or a carriage return character <CR>. Commands may also be terminated to <CR><LF> or <LF><CR>, since the instrument ignores empty commands.

In the following list of commands, the command arguments in square brackets are optional.

D<LF>   Dispense the volume set by the "V" command to the entire plate.
     Primes 10 µl into the priming vessel before dispensing.

E<LF>   Empty the pump. A volume of 880 µl is pumped backwards.

G<LF>   Dispense the plate using parameters from the plate switch and the volume/columns thumbwheels. This command has the same effect as pressing the **start** key. This command has been added to version 1.7.

M[c]<LF> Dispense the given number of columns starting from the current column. If the column count is not given, one column is dispensed. The dispensing volume is set by the "V" command. After the command is completed, the dispensing tips remain at the last column dispensed. If this command is received when the plate is in the home position, dispensing starts from column 1. ER3 is reported if more columns are requested than left over from the current column to the last column of the plate.

N<LF>   Report the internal software version of the instrument.

O<LF>   Drive the plate out to the priming position.

P[v]<LF> Prime the given volume. For a 96-well plate the volume must be in the range of 5 to 1000 µl. For a 384-well plate the range is 5 to 100 µl. The volume must be dispensed in 5 µl increments. If the volume is not given, 200 µl is primed. If the plate is not in the home position when the command is received, it is first driven into home position.

Q<LF>   Reset the instrument. There is no response to this command.

S[c]<LF> Drive the requested column under the dispensing tips. Valid columns are 1 to 12 for a 96-well plate and 1 to 24 for a 384-well plate. If the column is not given, the steps are one column forward or the plate returns to home position after the last column.

Tt<LF>   Set the plate type assumed for all other commands except the 'G' command. At startup the default type is read from the plate switch.

      t = 0 96-well plate
      t = 1 384-well plate
      This command has been added to version 1.7.

V<LF>   Report the internal software version of the instrument just like the 'N' command.
VER<LF>

Vv<LF>   Sets the volume for dispensing. For a 96-well plate the volume must be in the range of 5 to 1000 µl. For a 384-well plate the range is 5 to 140 µl. The volume must be dispensed in 5 µl increments.

Zs<LF>   Shake the plate the desired amount of time. The time is seconds and may range from 1 to 60.

Responses and error codes

The instrument sends a response to each command after the command has been executed. The only exception is the 'Q' command, for which there is no response.

The response to an 'N' command is as follows:

Mdrop384 Vr.l[-b]<CR><LF>

>
> where:
> r is the release number;
> l is the level number, and
> b is the optional branch number.

The response to other commands, if the command is executed successfully, is as follows:

OK<CR><LF>

If an error is detected, the response is one of the following:

ER3<CR><LF> Unrecognized command or invalid command argument.
ER4<CR><LF> The pump is not primed.
ER5<CR><LF> The priming vessel is not inserted into its slot.
ER6<CR><LF> Hardware error. The instrument stops and must be reset manually.