

Fluke 189/187/89-IV/87-IV Remote Interface Specification



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Technical Note

Fluke is providing this information to those few customers who would like this information. **We give this information with the understanding that Fluke will not provide any additional support on this information.** This means that our Product Support Service will not be able to answer any questions concerning this document.

Introduction

This document describes some of the serial interface capabilities of Fluke model 189, 187, 89-IV, and 87-IV Digital Multimeters.

Communication Protocol (model 89-IV and 87-IV)

The Fluke 89-IV and 87-IV have an infrared (IR) serial interface that is operated in an RS-232 mode:

- 9600 Baud, no parity, 8 bits, 1 stop bit

The IR adapter cable used with the 89-IV and 87-IV gets its power from the DTR and RTS signals going into its DB9 connector. The PC RS-232 communications port needs to control these two signal lines via software, or they can be controlled by wiring in an external power source. If you wire in an external power source, be sure to break the DTR and RTS signal lines going back to the PC. The DB9 connector on the IR adapter cable needs to have the following lines with the following voltages applied:

- DTR disabled - pin 4 with -3 to -12 volts (or tied to pin 5, Ground, will work also)
- RTS enabled - pin 7 with +3 to +12 volts

Communication Protocol (model 189 and 187)

The Fluke 189 and 187 have an infrared (IR) serial interface different from the model 89-IV and 87-IV. While the IR hardware is somewhat different, the serial communications still operates with the same RS-232 mode:

- 9600 Baud, no parity, 8 bits, 1 stop bit

The IR adapter cable for the Fluke 189 and 187 does not need any special control of its signal lines. It can be used just like a traditional serial cable.

Commands

Commands consist of 2 letter codes that are sent from a computer or other serial device to the meter.

| | | |
|----|------------------|--|
| DS | Default Setup | Equivalent to cycling instrument power. Instrument is returned to its power-up state. |
| ID | Identification | Returns model, serial number, and software version information. |
| RI | Reset Instrument | Resets all instrument registers to factory settings, <i>except</i> calibration constants and 50/60 Hz local factory setting. Clears logging and save |

| | | |
|----|-------------------|--|
| | | memory (applies to 189 and 89-IV only). Resets the real time clock to zero. |
| QM | Query Measurement | Provides measurements that are showing on the meter display. The response string is in ASCII only. |
| SF | Set Function | Allows "button presses" and meter state changes to be done remotely. |

See the section on Command Syntax for further detail regarding the command set.

Command Acknowledge (CMD_ACK) responses

The meter will acknowledge a command with a single digit followed by a carriage return <CR>. Not all syntax errors may be detected by the meter.

Here is a list of the possible responses:

| | |
|-----|---------------------------------|
| '0' | OK, normal operation, no error. |
| '1' | Syntax error or generic error |

CMD_ACK is followed by a carriage return. With the *exception of the data response to the ID command*, any data that is sent out the serial port in response to a command will be prefixed with the name of the originating command followed by a comma. For example, a response to the QM command would look like:

CMD_ACK<CR>QM, measurement string

Command Parameters

Unless otherwise stated, command parameters are ASCII digits or letters.

Command Syntax

| DS | Default Setup | |
|----|------------------|---|
| | Purpose: | Equivalent to cycling instrument power (or pressing the Cancel button). Instrument is returned to a "power-up" state. |
| | Command Syntax: | DS<CR> |
| | Response Syntax: | CMD_ACK<CR> |
| | Remarks: | This shouldn't be confused with the Reset Instrument (RI) command. All the DS command does is cause the meter to act like the cancel button was pressed (or that the meter was turned off and back on). |

| ID | Identification | |
|----|------------------|--|
| | Purpose: | Returns model, serial number, and software version information. |
| | Command Syntax: | ID<CR> |
| | Response Syntax: | CMD_ACK<CR>{identify string}<CR> |
| | Remarks: | {identify string} is in ASCII. Format: Model #, Software version, Serial # The first 5 letters of the identity string must be "FLUKE" in uppercase letters. Example: FLUKE 89,V0.39,123456789 |

| QM | Query Measurement | |
|----|-------------------|--|
| | Purpose: | Accesses the primary display as an ASCII string. |

| | | |
|--|------------------|--|
| | Command Syntax: | QM<CR> |
| | Response Syntax: | CMD_ACK<CR>QM,{primary_reading}<CR> |
| | Remarks: | <p>This command will return the contents of what is currently on the primary display. There will always be a sign (+/-)</p> <p>Example Output:</p> <p>QM,+47.66 KOhms QM,-121.43 VDC QM,Out of Range mVDC</p> <p>"V AC" "mV AC" "V DC" "mV DC" "V AC", /* V AC&DC*/ "mV AC", /* mV AC&DC*/ "V AC+DC " "mV AC+DC" "Ohms", /* Will have units of blank, k, & M */ "nS", /* Conductance */ "Ohms", /* Continuity */ "Farads", /* Will have units of n, u, & m */ "V DC", /* Diode test */ "A AC" "mA AC" "uA AC" "A DC" "mA DC" "uA DC" "A AC", /* A AC&DC */ "mA AC", /* mA AC&DC */ "uA AC", /* uA AC&DC */ "A AC+DC" "mA AC+DC" "uA AC+DC" "Deg C" "Deg F" "dBm" "dBV" "dBm", /* mV dBm */ "dBV", /* mV dBV */ "Hz" "%", /* Duty */ "mS", /* Pulse */</p> |

| | | |
|-----------|-------------------------|---|
| RI | Reset Instrument | |
| | Purpose: | Resets all instrument registers to factory settings, except calibration constants and communication settings. Clears any data in memory. Sets the day/time tick counter to 0. Does any necessary hardware resets. |
| | Command Syntax: | RI<CR> |

| | | |
|--|------------------|-------------|
| | Response Syntax: | CMD_ACK<CR> |
| | Remarks: | |
| | | |

| SF | Set Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|---------------------|--|----------------------------|--------------|----------------------------|--------------|----|------|----|-----------|----|------|----|--------------|----|---------|----|---------|----|-----|----|----------|----|----------|----|----------|----|-------|----|----------|----|----|----|--------|----|-------|----|--------|----|------------|----|-------|----|-----------|----|------|----|-------------|--|--|
| | Purpose: | Allows "button presses" and meter state changes to be done remotely. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Command Syntax: | SF<space>{key code}<CR> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Response Syntax: | CMD_ACK<CR> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Remarks: | {key code} is a two ASCII digit number. If the {key code} parameter can not be used due to the current mode of the meter, a CMD_ACK of '1' is returned. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>{key code} ASCII digits</th> <th>Button press</th> <th>{key code} ASCII digits</th> <th>Button press</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>Blue</td> <td>21</td> <td>Auto Hold</td> </tr> <tr> <td>11</td> <td>Hold</td> <td>22</td> <td>Fast Min/Max</td> </tr> <tr> <td>12</td> <td>Min/Max</td> <td>23</td> <td>Logging</td> </tr> <tr> <td>13</td> <td>Rel</td> <td>24</td> <td>Not used</td> </tr> <tr> <td>14</td> <td>Up Arrow</td> <td>25</td> <td>Not used</td> </tr> <tr> <td>15</td> <td>Shift</td> <td>26</td> <td>Not used</td> </tr> <tr> <td>16</td> <td>Hz</td> <td>27</td> <td>Cancel</td> </tr> <tr> <td>17</td> <td>Range</td> <td>28</td> <td>Wakeup</td> </tr> <tr> <td>18</td> <td>Down Arrow</td> <td>29</td> <td>Setup</td> </tr> <tr> <td>19</td> <td>Backlight</td> <td>30</td> <td>Save</td> </tr> <tr> <td>20</td> <td>Calibration</td> <td></td> <td></td> </tr> </tbody> </table> | {key code} ASCII digits | Button press | {key code} ASCII digits | Button press | 10 | Blue | 21 | Auto Hold | 11 | Hold | 22 | Fast Min/Max | 12 | Min/Max | 23 | Logging | 13 | Rel | 24 | Not used | 14 | Up Arrow | 25 | Not used | 15 | Shift | 26 | Not used | 16 | Hz | 27 | Cancel | 17 | Range | 28 | Wakeup | 18 | Down Arrow | 29 | Setup | 19 | Backlight | 30 | Save | 20 | Calibration | | |
| {key code} ASCII digits | Button press | {key code} ASCII digits | Button press | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Blue | 21 | Auto Hold | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Hold | 22 | Fast Min/Max | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Min/Max | 23 | Logging | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Rel | 24 | Not used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Up Arrow | 25 | Not used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Shift | 26 | Not used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Hz | 27 | Cancel | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Range | 28 | Wakeup | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Down Arrow | 29 | Setup | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Backlight | 30 | Save | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Calibration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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