PC Software
SW 1403 Black Box protocol

The Black Box protocol is a system of rules that allows a PC (Personal Computer) as a master to start communication by sending the request command to the instrument, which answers according to the protocol.

Black Box protocol enables a two-way communication intended for controlling an instrument as a Black Box. This enables hands free operation as the control over the instrument is delegated to an automated system. Black Box protocol solution is primarily suitable for automatized production line testing, but has found its use in other applications such as portable appliance testing and in some cases also in electrical installation safety testing.

Black Box protocol can be used with terminal application such as Kitty (which is freely available from internet) and alike.

The Black Box protocol is also designed to be used with other PC software engineering tools such as Visual Basic and LabView, which, with some effort, can be used to perform remote communications between PC and test instrument.
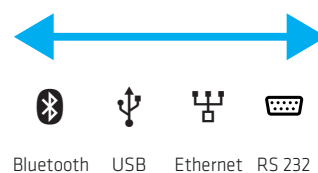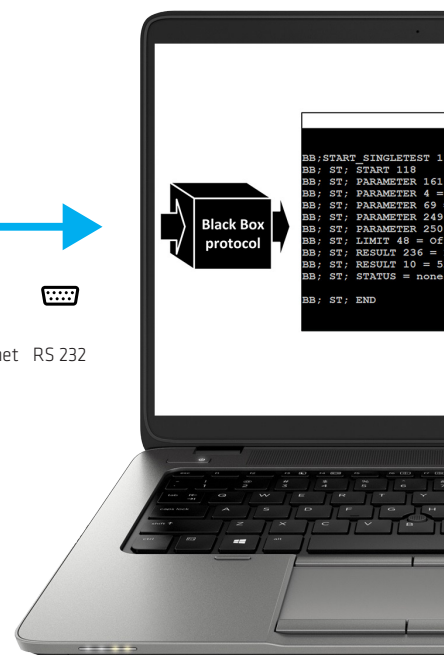
Black Box protocol is supported in new generation of Metrel test instruments and is **free of charge**; no additional licenses are needed for using it.

Black Box protocol is also included in Metrel SDK; see Metrel SDK internet site for additional info.
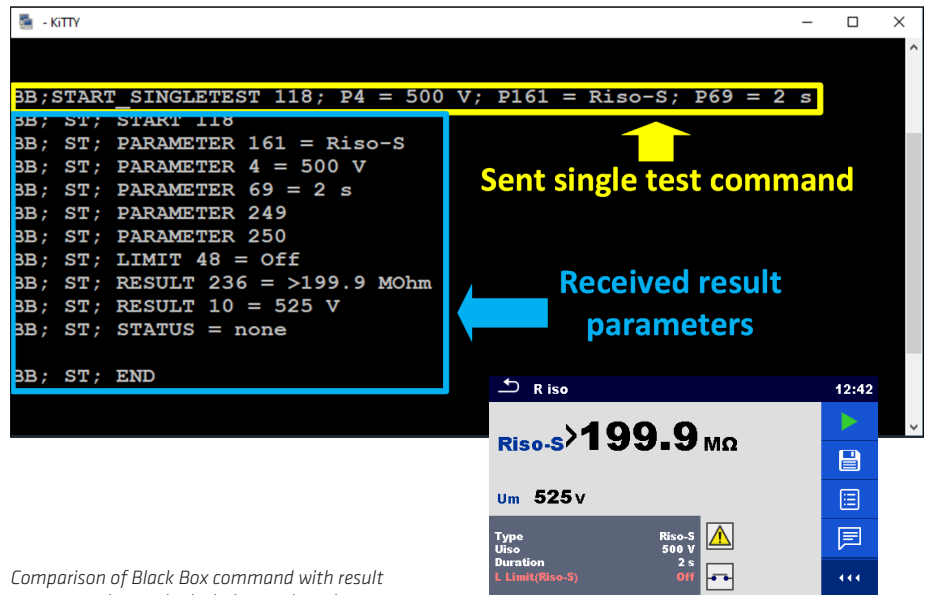
METREL INSTRUMENTS

Black Box protocol in interaction with Metrel instruments

SOFTWARE USING BLACK BOX PROTOCOL

Bluetooth USB Ethernet RS 232

www.metrel.si

SUPPORTED FUNCTIONALITIES OF BLACK BOX PROTOCOL

The Black Box protocol supports all measurement functionalities provided by the individual Metrel instrument; both Single Test and Auto Sequence measurements. Black Box protocol supports all available communication with Metrel instruments: Ethernet, RS232, USB and Bluetooth.

The figure on the right shows example of comparison of measurement of Riso (Insulation resistance) via the Black Box protocol and directly on the instrument:
- to start measurement on instrument via the Black Box protocol, following command is entered, which also includes desired measurement parameters: " BB;START_SINGLETEST 118; P4 = 500 V; P161 = Riso-S; P69 = 2 s",
- same measurement can be started directly on instrument by selecting corresponding measurement inside ISO measurements group of Single Tests menu.

Comparison of Black Box command with result parameters in terminal window and results parameters on instrument's display

SUPPORTED INSTRUMENTS

Black Box protocol is supported in new generation of Metrel test instruments. Instruments, supporting Black Box protocol, are listed in table below.

| Instrument	Black Box protocol support
MI 3152	•
MI 3152H	•
MI 3154	•
MI 3155	•
MI 3280	•
MI 3280	•
MI 3288	•
MI 3290	•
MI 3325	•
MI 3360	•
MI 3394	•
MI 6601	•

ADDITIONAL INFO

Additional info regarding Black Box protocol can be also found on Metrel Knowledge Base internet site.

BLACK BOX PROTOCOL USE CASE EXAMPLE

A simple example of using the Black Box protocol in a production line to test products with Metrel instruments is shown in the figure below. Such test setup can be fully automated and centrally controlled from a PC:
- two MI 3394 are used for products testing,
- first MI 3394 measures Continuity of each product from production line,
- second MI 3394 measures Riso (insulation resistance) of each product from production line,
- both MI 3394 are connected to PC via Ethernet,
- the PC runs software that uses the Black Box protocol to communicate with two MI 3394s.
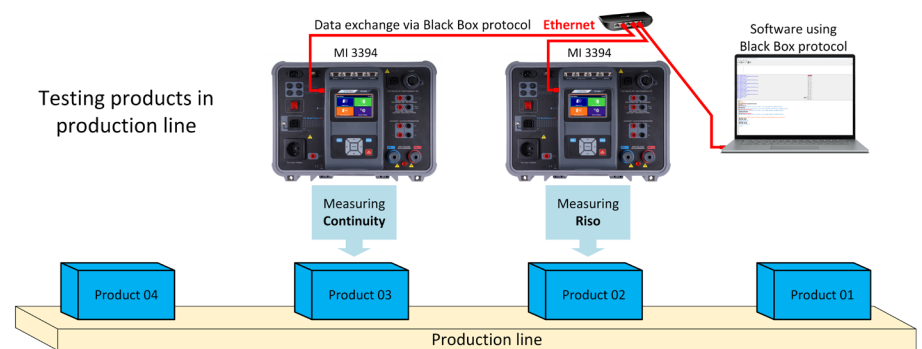
Product line testing using Black Box protocol for data exchange

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