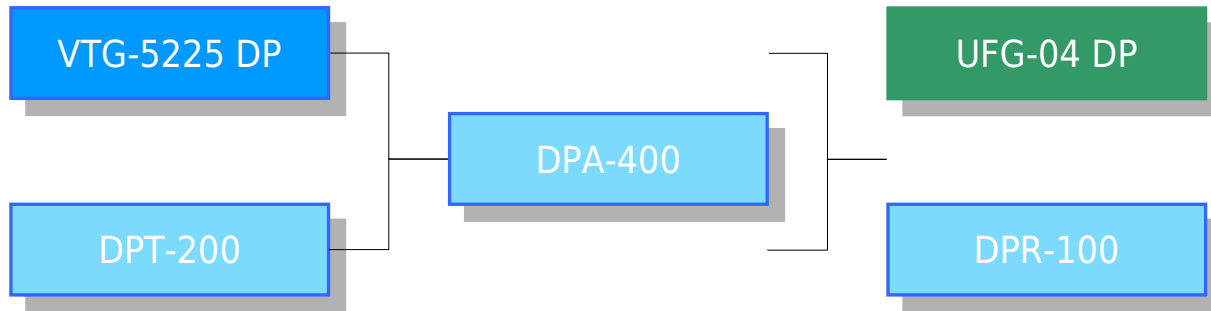




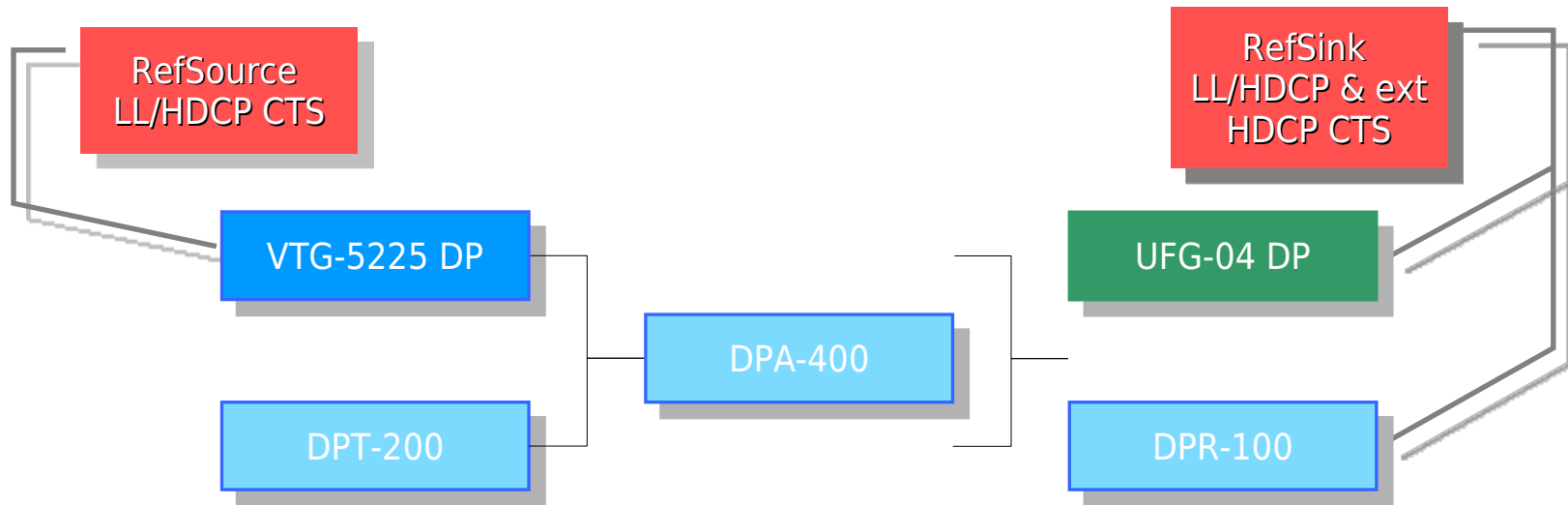
Tools for DisplayPort™ Testing

DP Tester HW



- ◆ VTG-5225 DP: Pattern generator and DP Reference Source
- ◆ DPT-200: Compact sized DP source
- ◆ UFG-04 DP: DP frame grabber card and DP Reference Sink
- ◆ DPR-100: Compact sized DP Reference Sink
- ◆ DPA-400: DP AUX channel monitor

DP CTS Test



- ◆ RefSource LL / HDCP CTS Tool (VTG-5225)
- ◆ RefSink LL / HDCP CTS Tool (UFG-04 and DPR-100)
- ◆ RefSink Extended HDCP CTS Tool for repeater devices (UFG-04 and DPR-100)

RefSource CTS Tool

The image displays three overlapping screenshots of the Unigraf Reference Source CTS with HDCP software interface. The top window shows the 'Link Configuration' tab with 'Update Status' and 'Start Training' buttons. The middle window shows the 'EDID HEX contents' tab with a hex dump and file management options. The bottom window shows the 'Link Training' tab with a test run list and a detailed test results table.

EDID HEX contents (Middle Window):

```

$00 - 00 ff ff 4
$08 - 54 c7 36 4
$10 - 27 11 01 0
$18 - 22 8f 95 4
$20 - 0f 50 54 4
$28 - a9 40 81 0
$30 - 81 00 b3 0
$38 - 00 a0 a0 4
$40 - 36 00 81 9
$48 - 00 00 00 5
$50 - 47 52 41 4
$58 - 00 00 00 0
$60 - 50 52 2d 3
$68 - 00 00 00 0
$70 - 00 31 56 1
$78 - 20 20 20 2

```

Test Results Table (Bottom Window):

I..	Test Name	P...	Fail	Skip	Time...	Run	Sta...
1	(2A-01) Regular Procedure: With Transmitter	0	0	0	0	0	Idle
2	(2A-02) Irregular Procedure: (First Part of Authentica...	0	0	0	0	0	Idle
3	(2A-03) Irregular Procedure: (Link Integrity Check) N...	0	0	0	0	0	Idle
4	(2A-04) R...						

I..	Test Name	P...	Fail	Skip	Time...	Run	Sta...
1	(5.2.1.1) Read One Byte from Valid DPCD Address	0	0	0	0	0	Idle
2	(5.2.1.2) DPCD Receiver Capability Read (Read Twel...	0	0	0	0	0	Idle
3	(5.2.1.3) Write One Byte to Valid DPCD Address	0	0	0	0	0	Idle
4	(5.2.1.4) Write Nine Bytes to Valid DPCD Addresses	0	0	0	0	0	Idle
5	(5.2.1.5) Write EDID Offset (One Byte I2C-Over-Aux...	0	0	0	0	0	Idle
6	(5.2.1.6) Read One EDID Byte (One Byte I2C-Over-A...	0	0	0	0	0	Idle
7	(5.2.1.7) EDID Read (1 Byte I2C-Over-Aux Segment ...	0	0	0	0	0	Idle
8	(5.2.1.8) Illegal Aux Request Syntax	0	0	0	0	0	Idle
9	(5.2.1.9) Glitch Rejection	0	0	0	0	0	Idle
10	(5.2.1.10) Interleaved EDID and DPCD Receiver Cap...	0	0	0	0	0	Idle
11	(5.3.1.1) Successful Link Training at All Supported Lan...	0	0	0	0	0	Idle
12	(5.3.1.2) Successful Link Training with Request of Hig...	0	0	0	0	0	Idle
13	(5.3.1.3) Successful Link Training to a Lower Link Rat...	0	0	0	0	0	Idle
14	(5.3.1.4) Successful Link Training with Request of a C...	0	0	0	0	0	Idle
15	(5.3.1.5) Successful Link Training at Lower Link Rate ...	0	0	0	0	0	Idle
16	(5.3.1.6) Lane Count Reduction	0	0	0	0	0	Idle
17	(5.3.1.7) Lane Count Increase	0	0	0	0	0	Idle
18	(5.3.2.1) IRQ_HPD Pulse Due to Loss of Symbol Lock ...	0	0	0	0	0	Idle
19	(5.3.2.2) IRQ_HPD Pulse Due to Loss of Inter-lane Ali...	0	0	0	0	0	Idle
20	(5.4.1.1) Pixel data reconstruction	0	0	0	0	0	Idle
21	(5.4.1.2) Main Stream Data Unpacking and Unstuffing...	0	0	0	0	0	Idle
22	(5.4.1.3) Main Stream Data Unpacking and Unstuffing...	0	0	0	0	0	Idle
23	(5.4.2) Main Video Stream Format Change Handling	0	0	0	0	0	Idle
24	(5.4.3.1) Entering and Exiting Power Save Mode	0	0	0	0	0	Idle
25	(5.4.3.2) Resumption of Main Link Activity After Exte...	0	0	0	0	0	Idle

RefSink CTS Tool

The image displays three overlapping screenshots of the Unigraf Reference Sink CTS tool interface, showing different configuration and test execution screens.

Top Window (Link Training): Shows the 'Link Training' tab. It includes an 'Update Status' button and a grid of status indicators for lanes L0, L1, L2, and L3. The grid shows green circles for 'Clock Recovery' and 'Source Recovery' across all lanes. Below the grid, there are fields for 'DUT capabilities' and 'HDCP Authentication status'.

Middle Window (Link Layer Tests): Shows the 'Link Layer Tests' tab. It displays a table of test results:

I..	Test Name	P..	Fail	Skip	Time...	Run	Sta...
1	(1A-01) Regular Procedure: With Receiver	0	0	0	0	0	Idle
2	(1A-02) Regular Procedure: HPD After Writing Aksv	0	0	0	0	0	Idle
3	(1A-03) Regular Procedure: HPD During Link Integrity ...	0	0	0	0	0	Idle
4	(1A-04) Irregular Procedure: (First Part of Authenticat...	0	0	0	0	0	Idle
5	(1A-05) Irregular Procedure: (Second Part of Authenticat...	0	0	0	0	0	Idle
6	(1A-06) Irregular Procedure: (Third Part of Authenticat...	0	0	0	0	0	Idle
7	(1A-07) Irregular Procedure: (Fourth Part of Authenticat...	0	0	0	0	0	Idle
8	(1A-08) Irregular Procedure: (Fifth Part of Authenticat...	0	0	0	0	0	Idle
9	(1A-09) Irregular Procedure: (Sixth Part of Authenticat...	0	0	0	0	0	Idle

Bottom Window (HDCP Tests): Shows the 'HDCP Tests' tab. It includes a 'DUT capabilities' section with options like 'Max lane count' (1 Lane), 'Max link rate' (Low 1.62 Gbp), and 'Video format change w/o LT'. It also features a 'Test Automation' section with buttons for 'Test Automation ...', 'DUT Colorimetry support ...', and 'Most packed timings ...'. The bottom of the window shows 'Test Runs' (1) and a 'Run Tests' button.

Test Report

DPR-100 Compliance Test Report - Mozilla Firefox

File Edit View History Bookmarks Tools Help

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DisplayPort Sink Compliance Test Report

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Test Summary
General Information
View all test details

View details by test

- 1 - (5.2.1.1) Read One Byte from Valid DPCD Address
- 2 - (5.2.1.2) DPCD Receiver Capability Read (Read Twelve Bytes from Valid DPCD Address)
- 3 - (5.2.1.3) Write One Byte to Valid DPCD Address
- 4 - (5.2.1.4) Write Nine Bytes to Valid DPCD Addresses
- 5 - (5.2.1.5) Write EDID Offset (One Byte I2C-Over-Aux Write)
- 6 - (5.2.1.6) Read One EDID Byte (One Byte I2C-Over-Aux Read)
- 7 - (5.2.1.7) EDID Read (1 Byte I2C-Over-Aux Segment Write, 1 Byte I2C-Over-Aux Offset Write, 128 Byte I2C-Over-Aux Read)
- 8 - (5.2.1.8) Illegal Aux Request Syntax
- 9 - (5.2.1.9) Glitch Rejection

Printer Friendly

TEST SUMMARY

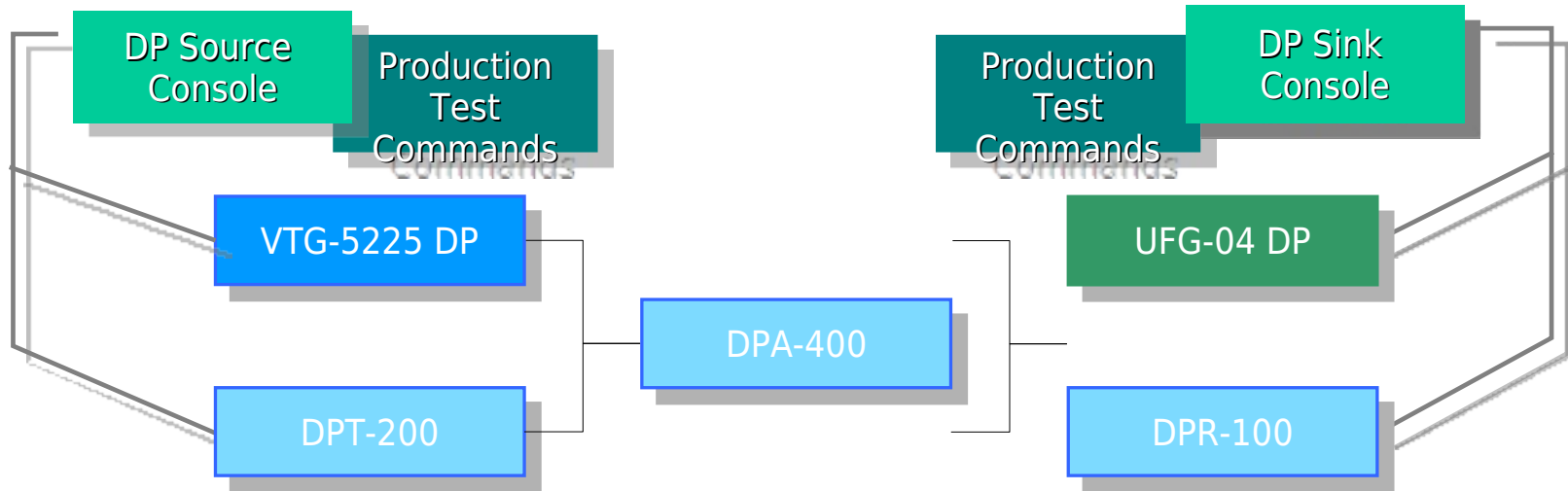
TEST	PASSED	FAILED	TIMED OUT	SKIPPED
1 - (5.2.1.1) Read One Byte from Valid DPCD Address	1	0	0	0
2 - (5.2.1.2) DPCD Receiver Capability Read (Read Twelve Bytes from Valid DPCD Address)	1	0	0	0
3 - (5.2.1.3) Write One Byte to Valid DPCD Address	1	0	0	0
4 - (5.2.1.4) Write Nine Bytes to Valid DPCD Addresses	1	1	0	0
5 - (5.2.1.5) Write EDID Offset (One Byte I2C-Over-Aux Write)	1	0	0	0
6 - (5.2.1.6) Read One EDID Byte (One Byte I2C-Over-Aux Read)	1	0	0	0
7 - (5.2.1.7) EDID Read (1 Byte I2C-Over-Aux Segment Write, 1 Byte I2C-Over-Aux Offset Write, 128 Byte I2C-Over-Aux Read)	1	0	0	0
8 - (5.2.1.8) Illegal Aux Request Syntax	1	0	0	0
9 - (5.2.1.9) Glitch Rejection	1	0	0	0
10 - (5.2.1.10) Interleaved EDID and DPCD Receiver Capability Read	1	0	0	0

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Done

DP Consoles



- ◆ Source and Sink Consoles for debug or production testing
- ◆ Complete status monitoring of the DP interface
- ◆ Allows for manual "tweaking" of the DP link parameters
- ◆ User friendly GUI and computer interface

Source Console

The image displays the DP Source Console v1.0.15 - Unigraf software interface, showing multiple overlapping windows. The main window is the "DP Source Console v1.0.15 - Unigraf" window, which is currently on the "Main" tab. The interface is divided into several sections:

- Device connection:** Serial port (Communications Port (COM1)), Firmware version (2.3.x), and an "Update firmware..." button.
- Link parameters:** Checkboxes for "Enable lane skew" and "Enable scrambling".
- Framing mode:** Radio buttons for "Auto", "Normal", and "Enhanced".
- Link status:** A table showing link status for L0, L1, L2, and L3 lanes. All lanes are green, indicating a good link. Below this, it shows "Lane count: 4", "Bit rate (Gbps): 2.70", and "Framing mode: Enhanced".
- Output:** "Use active video" is selected. A "Timing" dropdown shows various resolutions and refresh rates. Below it, a "Pattern" dropdown shows various test patterns. There are also "Voltage swing (mVpp)" and "Pre-emphasis (dB)" settings.
- Audio status:** "Locked" is indicated. "Audio channel status (IEC-60958-3)" shows settings like "Use: Consumer", "Coding: LPCM", "Channel count: 2", etc. "Audio channel status (bytes 0-5)" shows a hex value of "04 01 00 02 00 00".
- Messages:** A log at the bottom shows "Updating link status... Command successful." and "Read of DPCD address \$0100, Data: \$0A".
- Firmware version:** 2.3.x

The background shows other instances of the software, including one with the "EDID" tab selected, showing a tree view of EDID blocks and a "Details of '1/1/CEA Extensions Version/Basic audio'" section.

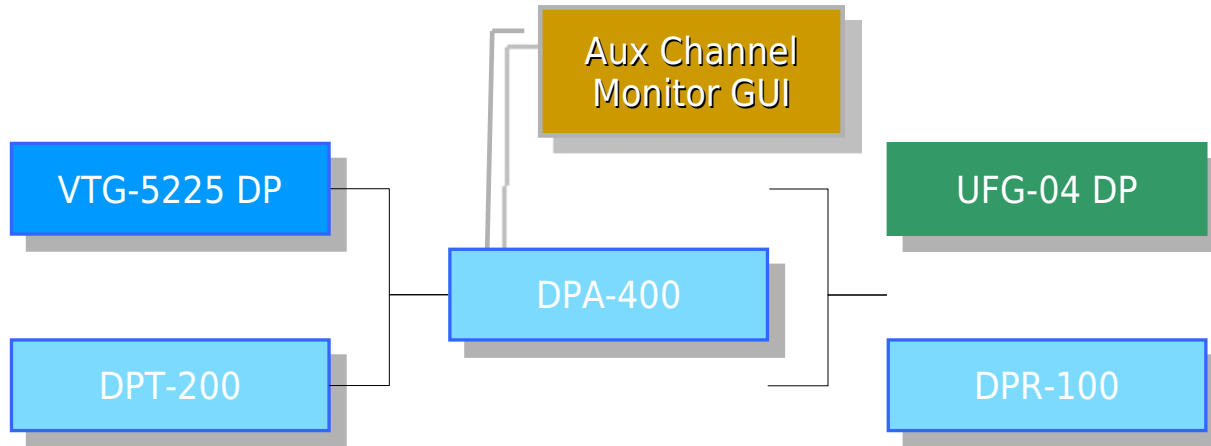
Sink Console

The image displays four overlapping screenshots of the DP Sink Console v1.0.17 software interface, showing various configuration and monitoring screens.

Top-left screenshot: Shows the 'Audio status' section. The 'Audio channel status' is 'Locked'. The 'Audio channel status (IEC-60958-3)' is 'Consumer LPCM'. The 'Messages' section shows 'Command successful', 'Updating link status...', and 'Command successful'. The 'Firmware version' is 2.3.0.

Top-right screenshot: Shows the 'E-EDID Encoder / Decoder' section. The 'Details of "/>

AUX Channel Monitor



- ◆ Full DP AUX channel traffic analysis
- ◆ Each message time stamped, raw data and decoded information available
- ◆ Set trigger points and data filters for evaluating specific events
- ◆ Record and trigger HPD and external inputs

AUX Channel Monitor

The screenshot shows the 'Aux channel monitor' application window. It features a menu bar (File, Search, Tools, Help), a 'Filters' panel on the left with checkboxes for 'Show Events', 'Show I2C', 'Show Native', and 'Show HDCP'. Below the filters are buttons for 'Stop acquisition' and 'Pause Download'. The main area contains a table with columns: Line, Timestamp, From, Type, Details, and Data. The table lists various events such as 'Req WR 4 bytes to 0x00103' and 'AUX_DEFER, 0 bytes'. To the right of the table is a 'Message details' pane showing the content of the selected line (Line #93).

Line	Timestamp	From	Type	Details	Data
60	11398.27	Source	Native	Req WR 4 bytes to 0x00103	80 01 03 03 ...
61	11398.69	Sink	Native	AUX_DEFER, 0 bytes	20
62	11398.72	Source	Native	Req WR 4 bytes to 0x00103	80 01 03 03 ...
63	11399.14	Sink	Native	AUX_DEFER, 0 bytes	20
64	11399.20	Source	Native	Req WR 4 bytes to 0x00103	80 01 03 03 ...
65	11399.55	Sink	Native	AUX_DEFER, 0 bytes	20
66	11399.65	Source	Native	Req WR 4 bytes to 0x00103	80 01 03 03 ...
67	11400.03	Sink	Native	AUX_DEFER, 0 bytes	20
68	11400.10	Source	Native	Req WR 4 bytes to 0x00103	80 01 03 03 ...
69	11400.26	Sink	Native	AUX_ACK, 0 bytes	00
70	11400.32	Source	Native	Req RD 6 bytes from 0x00202	90 02 02 05
71	11400.38	Sink	Native	AUX_ACK, 6 bytes	00 11 11 00 ...
72	11400.48	Source	Native	Req WR 4 bytes to 0x00103	80 01 03 03 ...
73	11400.90	Sink	Native	AUX_DEFER, 0 bytes	20
74	11400.93	Source	Native	Req WR 4 bytes to 0x00103	80 01 03 03 ...
75	11401.34	Sink	Native	AUX_DEFER, 0 bytes	20
76	11401.38	Source	Native	Req WR 4 bytes to 0x00103	80 01 03 03 ...
77	11401.79	Sink	Native	AUX_DEFER, 0 bytes	20
78	11401.86	Source	Native	Req WR 4 bytes to 0x00103	80 01 03 03 ...
79	11402.05	Sink	Native	AUX_ACK, 0 bytes	00
80	11402.08	Source	Native	Req RD 6 bytes from 0x00202	90 02 02 05
81	11402.18	Sink	Native	AUX_ACK, 6 bytes	00 77 77 01 ...
82	11402.27	Source	Native	Req WR 5 bytes to 0x00102	80 01 02 04 ...
83	11402.40	Sink	Native	AUX_ACK, 0 bytes	00
84	11569.57	Source	Native	Req RD 1 bytes from 0x00202	90 02 02 00
85	11569.63	Sink	Native	AUX_ACK, 1 bytes	00 77
86	11570.37	Source	Native	Req RD 1 bytes from 0x00203	90 02 03 00
87	11570.43	Sink	Native	AUX_ACK, 1 bytes	00 77
88	11571.20	Source	Native	Req RD 4 bytes from 0x00103	90 01 03 03
89	11571.26	Sink	Native	AUX_ACK, 4 bytes	00 10 10 10 10
90	11572.03	Source	Native	Req RD 1 bytes from 0x00206	90 02 06 00
91	11572.13	Sink	Native	AUX_ACK, 1 bytes	00 88
92	11572.83	Source	Native	Req RD 1 bytes from 0x00207	90 02 07 00
93	11572.90	Sink	Native	AUX_ACK, 1 bytes	00 88

Message details:
Line #93 -
11572.90ms
AUX_ACK, 1 bytes
ADJUST_REQUEST_LA
NE2_3 [RO] (Voltage
Swing and Equalization
setting adjust)
0x00207 := 0x88
VOLTAGE_SWING_LA
NE2 = level 0
PRE-EMPHASIS_LANE
2 = level 2
VOLTAGE_SWING_LA
NE3 = level 0
PRE-EMPHASIS_LANE
3 = level 2

Status: Acquisition running - Downloading data | Downloaded: 1768 Bytes | Buffered: 0 Bytes

The 'Options' dialog box is open, showing settings for 'Communications' and 'Graphics options'. The 'Connect using COM' is set to '10 (@115200 8N1)'. Under 'Graphics options', there are color selection buttons for 'Default font color', 'Default background color', 'Selected item font color', 'Selected item background color', 'Highlighted item font color', and 'Highlighted item background color'. Below these are 'Colored address ranges' with three rules and their corresponding font and background colors. At the bottom are buttons for 'Add ...', 'Edit ...', 'Remove', 'Up', 'Down', 'Help', 'Cancel', and 'Accept'.

Options

Communications

Connect using COM: 10 (@115200 8N1)

Graphics options

Select new font: Current font "Tahoma", size 10

Default font color: [Color selection]

Default background color: [Color selection]

Selected item font color: [Color selection]

Selected item background color: [Color selection]

Highlighted item font color: [Color selection]

Highlighted item background color: [Color selection]

Colored address ranges:

Rule #0 - RD/WR from 00102 to 00106 Font Color: [Color selection] Background Color: [Color selection]

Rule #1 - RD/WR from 00202 to 00207

Rule #2 - RD from 00050 to 00050

Add ... Edit ... Remove Up Down Help Cancel Accept