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Technical Bulletin: *TB10022017 Rev.J– IDS Remote Command Tutorial*

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Executive Summary:

IDS Remote Control Command Tutorial

Section 1	Overview of remote control
Section 2	Connection options
Section 3	IDS monitor family capabilities and differences
Section 4	IDS command strings
Section 5	Command string examples
Section 6	What could possibly go wrong?

Section 1 Control overview

What is it/why do it? Turn monitor on or off from a remote computer; get status of monitor; control other functions (switch inputs, set brightness, etc.)

How? By sending hex command strings

How do you do that? Using a utility (existing/available, or writing/building one); or copying command strings from the few listed here; or hand-entering specific command strings

Which is better? A good utility can build hex command strings for you – you just choose a function from a list, indicate which serial number to target and the utility builds the hex command string. Elo can provide a simple utility, but the command set is limited. You can write your own, but it isn't simple (it is beyond Elo's scope to assist with this). If you want to send commands from a program, or if you have a control device that can't run a utility, then you'll need to use command strings (less convenient/more difficult, but more flexible).

What is a command string? A properly ordered set of hexadecimal numbers that include a start byte (always 02), a "host address" (always 6E), the length of the heart of the command string, the 10 byte serial number of the monitor (or a single FF byte that indicates "all", where supported), a value that tells whether to send an order (04, for "write") or get some information (01 for "read"), a *two-byte* "write value" that identifies what to do (read commands do not have this), a checksum value (does not need to be an actual valid checksum/any value will do), and a stop byte (always 03).

What are the limitations? Some large format/IDS Elo monitors can only be controlled by way of the USB touch connection or the communication channel of the video connection (outlined in the next section). This means they can only be controlled by the "local" computer (the computer that provides video and manages touch functionality – note that the "local" computer can be remote in the sense that it can be some distance from the monitor if proper connection extending devices are used, but it is still "local" in the sense that it is the computer that manages the content and functionality of the monitor). Some Elo products can also be controlled by a physical serial connection. In this case, a true remote control computer or device (such as a Crestron controller), independent of the local machine, can be used. See the capabilities chart further down in this document. The older IDS 00 series monitors have a physical serial port; note that a null modem cable is required for these (pin 2 connected to pin 3 on the opposite end). The only modern IDS monitor that has a hardware serial port is the 5551; it requires a standard straight-through serial cable.

Section 2 Connection options

1. **DDC/CI** (Display Data Channel/Command Interface)
 - a. **Uses the video connection**
 - i. Uses communication capabilities included in standard **VGA, HDMI and DisplayPort** connectivity
 - b. *In the monitor's On-Screen Display menu, **the MDC Protocol must be set to DDC/CI** or, in the case of the 02 series products, **IIC***
 - c. DDC/CI is the most comprehensive command set and is usually the easiest way to send remote control commands, as good utilities are readily available that can send commands with a simple click.
 - d. Requires a third party tool to send commands; here's a free one that supports all commands, works well and is easy to use:
<http://www.entechtaiwan.com/lib/softmccs.shtml>
 2. **Virtual serial interface**
 - a. **Uses the touch USB cable**
 - b. Requires installation of the Silicon Labs CP210X driver (available from Tech Support, or just google cp210x to find the download; this driver is pre-installed on Elo computer modules). Installation will set up a virtual COM port; when done, commands are sent through the USB touch cable using that virtual COM port (the USB cable continues to handle touch communications in the usual way).
 - c. *In the monitor's On-Screen Display menu, the MDC Protocol must be set to Serial*
- Either method requires commands to be sent by the local computer (the one controlling touch and video)***
3. **Direct serial connection**
 - a. **Y-cable:** Some monitors can use a cable, Elo PN E810917, that has a VGA connector on the monitor end and VGA and serial connectors on the other end that connect to VGA and serial ports on the computer. Unused pins on the monitor's VGA connection are used to bring in the physical serial connection. This Y-cable is shipped with some monitors and is available separately – see capabilities chart below for applicability and part number.
 - i. This is a true serial connection, not to be confused with virtual serial, discussed above.
 - ii. **IMPORTANT NOTE:** The VGA input must be selected (must be the active video input) in order to be able to send commands.
 - iii. *In the monitor's On-Screen Display menu, the MDC Protocol must be set to Serial*

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- b. **Physical serial port:** Some large format and IDS Elo monitors have a physical COM port.
 - i. Since a physical serial connection does not rely on either the touch or active video connection, it can be connected to an independent remote computer or control device. The older IDS 00 series monitors have a physical serial port; note that a null modem cable is required for these (pin 2 connected to pin 3 on the opposite end. An exception is the 5551; it requires a standard straight-through serial cable.
 - ii. *In the monitor's On-Screen Display menu, the MDC Protocol must be set to Serial*
- 4. Elo's MDC tool (MDC_100907.exe) can be used with any of the serial control options, either virtual or physical, to send commands. The MDC tool can be provided as a courtesy to customers, although it only supports a limited set of basic commands.
- 5. With the exception of the 5551L, the BAUD rate for serial commands is 9600; the BAUD rate is 115200 for the 5551L. Firmware is available to make it 9600 BAUD.
- 6. **See the chart in [section 3](#)** for capabilities of specific products

Section 3 IDS monitor family capabilities and differences

All the products listed below can be controlled using the DDC/CI capability of the various video inputs. This method is recommended when commands are to be sent by an operator (rather than under program control). In addition, some, as listed below, can be controlled by a virtual serial interface, some provide one means or another of a hardware serial interface, and some have both.

Monitor		Touch USB cable (MDC Virtual Serial)	Y-Cable on VGA (PN E810917)	Physical Serial Cable	Support FF generic SN for write
Current IDS Monitors					
3202L		Yes	Yes *	No	Yes (firmware D1 or later)
4202L		Yes	Yes *	No	Yes (firmware D1 or later)
4602L		Yes	Yes *	No	Yes (firmware D1 or later)
5501LT		Yes	Yes	No	Yes (firmware F or later)
5551L		Yes	No	Yes ^{##} (115,200 baud)	Yes (firmware B or later)
5502L		Yes	Yes	No	Yes (firmware E or later)
7001LT		Yes	Yes	No	Yes (firmware H or later)
BAUD rate is 9600 unless otherwise noted Yes ^{##} = baud rate is 115200 for 5551L					
Yes* = Y-Cable works, but is not included					
Large Format Open-Frame Monitors					
3243L		No	No	No	No
4243L		No	No	No	No
4343L		No	No	No	No
5543L		No	No	No	No
Discontinued IDS Models					
3201L		Yes	No	No	No
4201L		Yes	No	No	No
5501L		Yes	No	No	No
7001L		Yes	No	No	No
Discontinued first generation IDS Models					
3200L		No	No	Yes (null modem)	No
4200L		No	No	Yes (null modem)	No
5500L		No	No	Yes (null modem)	No
7000L		No	No	Yes (null modem)	No

Note: If a product does not support FF as a generic serial number value for write commands, then each write command must contain the target monitor's full 10 byte serial number, in hex, even if it is the only monitor being controlled. Be sure that the length byte's value matches the command – 85 for the generic FF target address, 8E for the full serial number target address.



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When multiple monitors are being controlled and FF is used as the serial number, all monitors will be affected. To control only one monitor in a multiple monitor configuration, obviously each must be addressed by its unique 10 byte serial number.

Section 4 Command strings

The use of individual command strings is generally reserved for program control, or for situations where an existing command utility cannot be installed or lacks the desired commands. A serial terminal program is useful for testing to make sure commands work in the given system environment. Eltima's Advanced Serial Port Terminal is a good one: <https://www.eltima.com/products/serial-port-terminal/> (reasonably priced/2 week trial download available).

All strings are hexadecimal format.

Position	1	2	3	4	5	6	7	8	9
Description:	Start	Host address	Length	Target Audience	Command R/W Format	Command Type	Write Value	Checksum	Stop
System power	02	6E	85	FF	04	D6	00 04	D3	03
System power	02	6E	8E	10 byte SN	04	D6	00 04	D3	03
Get SN	02	6E	83	FF	01	E2		D3	03

First byte is always 02, second byte is always 6E, last byte is always 03

Read/write: read is 01, write is 04. Read commands do not have the two byte write value

Write value is *always 2 bytes* for write commands (the left-most byte is usually 00, but not for all commands)

Checksum does not have to be calculated – the byte has to be there, but any value will do (D3 is an example).

For full details on commands, see the application note:

(https://docs.elotouch.com/collateral/ELO_APP_Notes_17084AEB00033_Web.pdf)

Length (the number of bytes *between* the LENGTH and CHECKSUM bytes) must be specified for each command. Note that hex 80 means zero length, so calculated length is the number of bytes between LENGTH and CHECKSUM, converted to hex and then added to 80 hex. Write commands using FF for the serial number have a length of 85. Write commands that include the full 10 byte serial number have a length of 8E.

You may find yourself replacing FF with the full serial number in some commands, or replacing the full serial number with FF – this is fine, as long as you remember to change the length value to match the modified command length. See the final section (“What can possibly go wrong?”) if you encounter problems.

Section 5 Command string examples

Command string examples for products that support FF as a generic serial number:

Function name	Command	Write value (2-byte hexadecimal)	Command String
Get Serial Numbers	E2	[Read, so no write value]	02 6E 83 FF 01 E2 D3 03
	Return (SN)	02 6E 8D 00 01 4C 31 32 43 31 32 33 34 35 36 30 EB 03 serial number: L 1 2 C 1 2 3 4 5 6 SN always starts with a letter; fourth character is either a letter or the number 3	
Control System Power	D6	00 04 (off)	02 6E 85 FF 04 D6 00 04 CC 03
		00 01 (on)	02 6E 85 FF 04 D6 00 01 CD 03
		00 05 (backlight off)	02 6E 85 FF 04 D6 00 05 D1 03
Recall defaults	4	always 00 01	02 6E 85 FF 04 04 00 01 FB 03
Use OSD to disable Brightness sensor before sending brightness commands			
Change Brightness	10	00 00 to 00 FF	02 6E 85 FF 04 10 00 50 56 03
Change Contrast	12	00 00 to 00 FF	02 6E 85 FF 04 12 00 40 48 03
Use OSD to disable Auto-scan and Discovery before sending video source commands			
Switch Input video source	60	00 80 (Ext VGA)	02 6E 85 FF 04 60 00 80 D6 03
		00 40 (Ext DP)	02 6E 85 FF 04 60 00 40 96 03
		00 20 (Ext HDMI)	02 6E 85 FF 04 60 00 20 76 03
		00 10 (ECM HDMI)	02 6E 85 FF 04 60 00 10 66 03
Use OSD to disable Auto-scan and Discovery before sending video source commands			
Switch Input video and audio source	65	00 80 (Ext VGA)	02 6E 85 FF 04 65 00 80 D6 03
		00 40 (Ext DP)	02 6E 85 FF 04 65 00 40 96 03
		00 20 (Ext HDMI)	02 6E 85 FF 04 65 00 20 76 03
		00 10 (ECM HDMI)	02 6E 85 FF 04 65 00 10 66 03
Change Audio volume	62	00 00 to 00 FF	02 6E 85 FF 04 62 00 60 B8 03
Multi-touch products: touch cannot be turned off remotely (controlled by Windows Tablet Service/Pen & Touch)			
Control Touch Functionality	C7	00 04 (off)	02 6E 85 FF 04 C7 00 04 BD 03
		00 01 (on)	02 6E 85 FF 04 C7 00 01 BE 03

Command string example for an actual 10 byte serial number:

Control System Power	D6	00 04 (off)	02 6E 8E 4C 31 32 43 31 32 33 34 35 36 04 D6 00 04 E3 03
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Section 6 What could possibly go wrong?

- If using the touch USB cable/virtual COM: CP210X virtual COM driver not installed or MDC setting in the OSD not set for Serial/RS232
- IDS 02 series using Y-cable: MDC setting in the OSD not set for RS232
- All, using DDC/CI: MDC setting in the OSD not set for DDC/CI (or IIC, for 02 series)
- Trying to use a serial to USB converter when using a hardware serial connection option (IDS 00 series or VGA Y-cable where supported); a true RS232 COM port must be used
- A null modem cable must be used for the older 00 series hardware serial port.
- Monitor firmware revision below that required to support using FF for the serial number
- Incorrect length value. Make sure the length value is correct for the command format. Remember that 80 is zero length. See the section on Length, above, as well as the examples.
- Failure to include 2 bytes for write data
- Failure to include a one byte dummy value in the checksum position
- Unfamiliarity with the terminal program being used
 - Make sure the COM port is open
 - Make sure you specify the correct COM port
 - Make sure the port setup is correct
 - 9600 baud, 8 data bits, no parity, 1 stop bit (except 5551LT with older firmware – it runs at 115 Kbaud)
 - Make sure the command string is being entered in the correct place (such as a command box or command area)
 - Make sure the terminal utility is set for hexadecimal

Contact Information:

For technical support or help with this procedure, please call 844-435-6832 or email elotech@elotouch.com. If not in the North American region, may also contact the technical support group for your area here: <http://support.elotouch.com/TechnicalSupport/ContactTechnicalSupport/>