IMAGENEX TECHNOLOGY CORP.

DeltaT MULTIBEAM SONAR

Using Linux_DeltaT.exe (v1.0.0.1)

EXTERNAL CONTROL SPECIFICATION FOR UDP/IP (v1.00)

OVERVIEW

The Linux version of the Model 837(x) Multibeam Sonar Head beamforming program (**Linux_DeltaT.exe**) can be externally controlled via a second computer using a UDP ethernet communications link. After Linux_DeltaT.exe outputs a UDP message (83P, 83B or 83Z), an external control command '**EC**' can be sent to control many of the program functions (i.e. Range, Gain, Sector Size, Beamwidth, etc…).

Unless otherwise specified, the DeltaT sonar head has a statically assigned IP Address of **192.168.0.2**. This address is stored in the Linux_DeltaT.ini configuration file under the string name "IPAddress". The IP Address for the UDP output, string name "UDPAddress", has an IP Address of **192.168.0.X**, where X is any number between 3 and 255. The external control computer must be running on the same Local Area Network (i.e. 192.168.0.X). All UDP communication is through port number 4040.

EXTERNAL CONTROL COMMAND

The External Control command is 256 bytes in length and should be sent after receiving one of the Linux_DeltaT.exe UDP messages. All unused bytes should be set to 0.

Byte #	Description							
0 – 7	**'E'**	**'C'**	ID	Control Byte 1	Control Byte 2	Control Byte 3	Control Byte 4	Range
8 – 15	Gain	Display Gain	Gain EQ	Sector Size	Beam Width	Number of Beams	Averag-ing	Reserved 0
16 – 23	Reserved 0	Sound Vel. HI	Sound Vel. LO	Mode	83P/83B Enable	Profile Pt. Enable	Profile Min Rng	Profile Min Lev
24 – 31	Xdcr Up/Dn	Profile Tilt	Reserved 0	Reserved 0	Record .837	Record .83P	Reserved 0	Reserved 0
32 - 34	Reserved 0	Reserved 0	Profile Filter					
35 - 255	Reserved 0							

Table 1 External Control Command for the Linux_DeltaT.exe beamforming program

EXTERNAL CONTROL COMMAND (con't)

BYTE DESCRIPTIONS

Note: All Byte values are shown in decimal unless noted with a '0x' (hexadecimal) prefix.

Byte 0 **Header Byte 1**
ASCII **'E'** (0x45)

Byte 1 **Header Byte 2**
ASCII **'C'** (0x43)

Byte 2 **ID**
0

Byte 3 **Control Byte 1**
Bit0: 0 = LocalControl, 1 = ExternalControl
ExternalControl must be set for Linux_DeltaT.exe to accept external control commands.

Byte 4 **Control Byte 2**
Bit0: 0 = Transmit & Receive, 1 = Receive Only (Disable Transmitter)

Byte 5 **Control Byte 3**
0

Byte 6 **Control Byte 4**
0

Byte 7 **Range**
2 = 5m
3 = 10m
4 = 20m
5 = 30m
6 = 40m
7 = 50m
8 = 60m
9 = 80m
10 = 100m
11 = 150m → for 120kHz sonars only
12 = 200m → for 120kHz sonars only
13 = 250m → for 120kHz sonars only
14 = 300m → for 120kHz sonars only

Note: units of meters only

EXTERNAL CONTROL COMMAND (con't)

Byte 8 **Gain**
0 to 20dB in 1dB increments

Byte 9 **Display Gain**
1 to 100 percent
A value of 50 percent is typically used.

Byte 10 **Gain Equalization**
0 = Off, 1 = On

Byte 11 **Sector Size**
0 = 30 Deg, 1 = 60 Deg, 2 = 90 Deg, 3 = 120 Deg

Byte 12 **Beamwidth**
0 = Wide, 1 = Normal, 2 = Narrow, 3 = Narrow Mixed

Byte 13 **Number of Beams**
0 = 480, 1 = 240, 2 = 120

Byte 14 **Averaging**
3, 5, 7 or 9 = number of pings to average

Byte 15 **Reserved**
Always 0

Byte 16 **Reserved**
Always 0

Byte 17-18 **Sound Velocity**

Byte 17								**Byte 18**							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
14000 to 16000 (in decimeters/sec)															

A value of 15000 (1500.0 m/s) is typically used.

Byte 19 **Mode**
0 = Sector, 1 = Linear, 2 = Perspective, 3 = Profile, 4 = Beamtest

EXTERNAL CONTROL COMMAND (con't)

Byte 20 **83P / 83B Output Enable**
0 = 83P, 1 = 83B

For 83P Output:
Enable Profile Point Detection (Byte 21 = 1)

For 83B Output:
Sector Size must be 120 Degrees (Byte 11 = 3)
Number of Beams must be 120 (Byte 13 = 2)

Byte 21 **Profile Point Detection**
0 = Disable, 1 = Enable

Byte 22 **Profile Minimum Range**
0 to 100 meters
Note: units of meters only

Byte 23 **Profile Minimum Level**
10 to 90 percent

Byte 24 **Transducer Up/Down**
0 = Down, 1 = Up

Byte 25 **Profile Tilt Angle**
-30 to +30 degrees with on offset of 180
150 = -30 degrees
180 = 0 degrees
210 = +30 degrees

Byte 26 **Reserved**
Always 0

Byte 27 **Reserved**
Always 0

Byte 28 **Record Start / Stop (.837)**
0 = Disable, 1 = Enable

EXTERNAL CONTROL COMMAND (con't)

Byte 29 **Record Start / Stop (.83P)**
0 = Disable, 1 = Enable

Byte 30-33 **Reserved**
Always 0

Byte 34 **Profile Point Filter**
0 = First Return, 1 = Maximum Return, 2 = Bottom Following

Byte 35-255 **Reserved**
Always 0