

Active Target Adapter for the DynaSight™ Sensor

The Active Target Adapter (ATA) is a small external interface that can drive and synchronize an array of up to four active targets for use with the DynaSight sensor. The ATA communicates with the DynaSight sensor using a single coaxial cable. The ATA can be powered from any 9-to-12 volt DC source and a 9 VDC wall transformer is supplied for operations from 120 VAC mains in the US and Canada.

The set of equipment needed for multiple target applications includes: the DynaSight Sensor, a 14 VAC wall transformer or International Power Option for powering the DynaSight, a DB-9 serial cable for connecting from Port A on the DynaSight to the serial port on an MS-DOS based PC-compatible computer, the Active Target Adapter (ATA), a 9V DC wall transformer or supply for powering the ATA, a BNC cable for connecting the ATA to the DynaSight, and an application-specific array of up to four active targets.

Before operations with multiple active targets can begin, you must enable such operations by setting the DIP Switch on the left rear panel of the DynaSight sensor. For use with an array of two targets, the switches should be set as follows: 1-Down, 2-Up, 3-Down, and 4-Up. The switches are read only at sensor power-up, so you must always cycle the power to the DynaSight sensor (by flipping the sensor's power switch off and on again) when you change the switch settings. The complete table for DynaSight switch settings in the current multi-target firmware release is as follows:

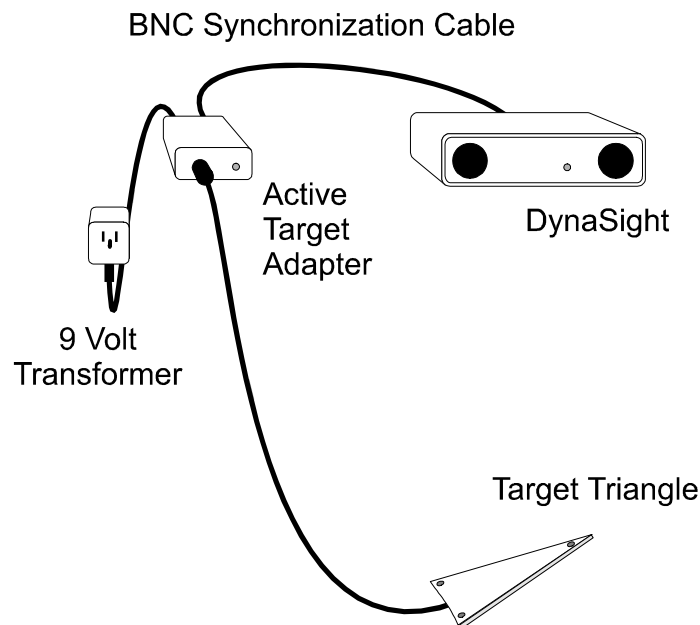
DynaSight DIP-Switch Settings				
1	2	3	4	Sensor Mode
U	U	U	U	Retro (See DynaSight User Manual)
D	U	U	U	MSoftFltr2D (See DynaSight User Manual)
U	D	U	U	StereoSync (See DynaSight User Manual)
D	D	U	U	StereoSync60 (See DynaSight User Manual)
U	U	D	U	1 Active Target (For use with ATA)
D	U	D	U	2 Active Targets (For use with ATA)
U	D	D	U	3 Active Targets (For use with ATA)
D	D	D	U	4 Active Targets (For use with ATA)



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When the DynaSight is powered-up in one of the Active Target modes, the sensor will have no sensitivity for passive targets. Thus the Red/Green LED on the front of the DynaSight will remain Red until properly powered and synchronized active targets appear within the sensor's field-of-view.

Plug the supplied 9 VDC transformer into a wall outlet and connect it to the Active Target Adapter (ATA), which is the 3" x 5" x 1" subsystem that is housed in a pearl-white extruded aluminum enclosure. The light emitting diode (LED) on the ATA will light Red indicating that power is applied but no synchronization signal is present. Connect the black BNC coaxial cable from the SYNC port on the DynaSight sensor to the BNC connector on the ATA. If the DynaSight is powered and operating in an Active Target mode as enabled by switch settings, the LED on the ATA will switch to Green, indicating that a valid synchronization signal is being received from the DynaSight. Now plug a target array into the ATA, using the 8-pin mini-DIN receptacle. (It is acceptable to connect the target array while power is applied to the ATA.) The ATA will automatically adjust to drive only the number of targets that are selected by the DynaSight's DIP switch settings.



When you bring the active target array into the sensor's field-of-view, the Status LED on the front of the DynaSight will change to Green, indicating that successful target acquisitions have been completed and that tracking is in progress for all of the active targets.

When operating with multiple active targets, you can use the standard DYSTDATA.EXE utility to examine and collect statistics on the data stream from Target 0. Unfortunately, this utility (in its current form) will only report on data from "Target 0" in a multi-target array. However another utility, ATATEST.EXE, is provided on the Multi-Target Source Code diskette that can display real-time data from up to four active targets, and to demonstrate Yaw-Pitch-X-Y-Z measurements (5-DOF) from the data for two active targets. The ANSI-C source code for this utility also provided as a sample application for use of the stncom.c multi-target communications library for MS-DOS computers. To execute the utility type:

```
atatest /1      (For DynaSight on port COM1)
atatest /2      (For DynaSight on port COM2)
```

For the 5-DOF decode, Yaw and Pitch angles are reported in units of degrees, and X, Y, Z are reported in units of centimeters (for the center point of an imaginary line segment that stretches between the two targets). Please note that when operating with two targets, the data stream from the DynaSight can provide more than 32 independent 5-DOF measurements per second, but that the display updates only at about 4 Hz so that the numbers can be read before they change. Press the escape key to exit the ATATEST utility.



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Pinout for the Active Target Adapter

Targets are connected to the Active Target Adapter by means of an 8-pin mini-DIN interface. These eight pins provide four modulated current sources and four modulated current sinks. With existing DynaSight firmware, the Active Target adapter can operate with an array of up to four independent targets for real-time interleaved tracking. However, the Active Target Adapter is capable of driving up to 16 targets in a matrix configuration and this capability might be accessed in a possible future DynaSight firmware release.

Targets are numbered from 0 to 3, and each infrared emitter should be connected to the appropriately numbered current source and current sink, preferably by means of a twisted pair.

Pinout for the Target Connector:

Pin #	Function	Connection	Target
1	Source 0	Anode	Target 0
2	Sink 0	Cathode	Target 0
3	Source 1	Anode	Target 1
4	Source 2	Anode	Target 2
5	Source 3	Anode	Target 3
6	Sink 1	Cathode	Target 1
7	Sink 2	Cathode	Target 2
8	Sink 3	Cathode	Target 3

