AIMS Fast-Scan Radar

v3.22

Installation and Configuration Manual

Reference Number: DMT-M200-311

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DMT is a private company owned entirely by USA Citizens
DMT radar systems are manufactured entirely in the USA

Change History

Version	Date	Status	Author	Description
0.1	12/23/2008	DRAFT	J Byrne	
0.2	06/30/2011	RELEASE	J Byrne	FCC-related statements added

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IMPORTANT NOTE

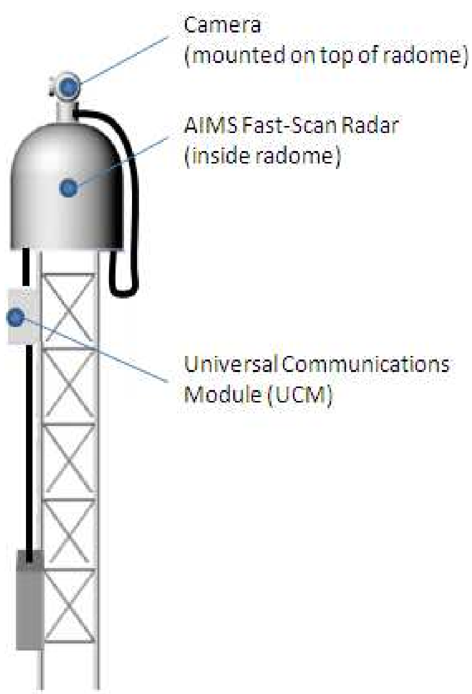
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

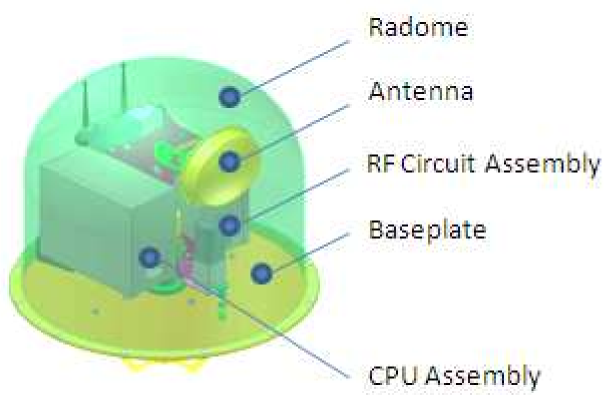
1 Introduction

Prior to leading the reader through the process of installation and configuration, this section will provide some basic details of the AIMS Fast-Scan system to familiarize you with the basic function, operation and packaging options.

The AIMS Fast Scan is physically located where the monitored area of interest may be seen by line-of-sight (unobstructed path). This is normally on an elevated position such as a tower, pole or on a building structure. The radar is protected from the environment (wind, rain, ice, etc.) with a Nomex radome. Optionally, the top of the radome can be fitted with integral captive plate to mount a camera assembly on. The radar is actually comprised of a CPU assembly, RF assembly, antenna, and baseplate assembly. The radome bolts unto the baseplate.

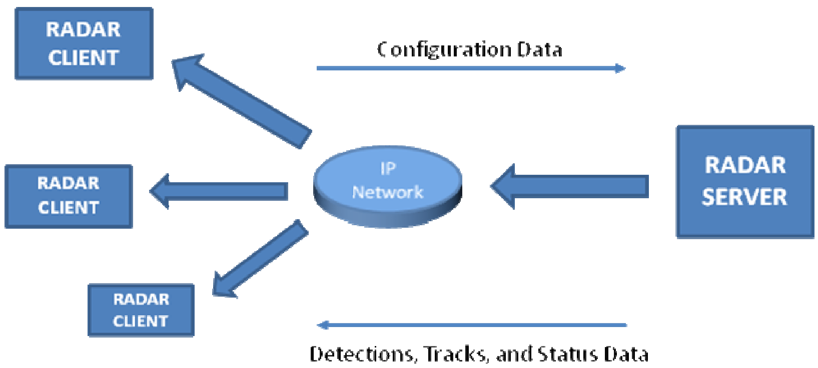


Typical Tower Installation



AIMS Fast-Scan Radar

The AIMS Fast-Scan Server, which is the software application that runs in the CPU assembly, communicates with one or more client software interfaces that provide the end user interface(s). Minimal initial configuration is required at the Server; all other configuration changes should be performed through the Client interface.



The AIMS Fast-Scan server is shipped in a variety of configurations, based upon the application requirements, affecting the following;

- Transmit Power
- Operating Frequency
- Antenna
- Physical Packaging
- Value-Added Enhancements

1.1 Radar Configurations

1.1.1 Transmit Power

The AIMS Fast-Scan is available in a number of different transmit power levels, determined by the range of expected operation. At current, DMT offers the following transmit output power configurations;

		Watts		dBm	
Peak Watts	Peak dBm	Avg Pwr (Min)	Avg Pwr (Max)	Avg Pwr (Min)	Avg Pwr (Max)
1.0	30.0	0.0002	0.0320	-8.0	15.1
2.0	33.0	0.0003	0.0640	-4.9	18.1
5.0	37.0	0.0008	0.1600	-1.0	22.0
12.5	41.0	0.0020	0.4000	3.0	26.0
15.0	41.8	0.0024	0.4800	3.8	26.8
50.0	47.0	0.0080	1.6000	9.0	32.0
80.0	49.0	0.0128	2.5600	11.1	34.1

PRF Rates (KHz)
2
4
8
16

Pulse Widths (ns)	
80	400
96	519
152	780
200	1050
280	1300
350	1500
	2000

PRF(Min)	2
PW(Min)	80
	0.00016

PRF(Max)	16
PW(Max)	2000
	0.032

X (dBm)=10 log Y (mW)
Avg Pwr(Min) = Peak(W) * PRF(Min) * PW(Min)
Avg Pwr(Max) = Peak(W) * PRF(Max) * PW(Max)

Note: the above stated Avg Pwr is at the antenna port and does not account for antenna gain.

Obviously, the higher transmit power configurations require additional supply current, this is discussed further in the “Connecting Power” subsection.

1.1.2 Operating Frequency

The AIMS Fast-Scan system operates in the X-Band (7-12.5GHz) frequency spectrum, centered at 9.25GHz.

1.1.3 Physical Packaging

In most cases, the AIMS Fast-Scan system is packaged as shown below;

1.2 Antennae

A wide variety of antenna designs are currently deployed and in use with the AIMS Fast Scan system. Antenna selection is based upon desired gain, beam width (vertical and horizontal), polarization (for detecting persons a vertical polarization is recommended), size and weight. The standard antennae currently in use include;

- Parabolic, 11°x11°
- Parabolic, 7°x7°
- Parabolic, 3°x8°

- Large Parabolic, 2°x4° (28" x 43")

These are listed in an increasing detection range order. Others are available.

The selected antenna and expected range of elevation angle determines the radome and baseplate that may be used. For instance, in a mobile application a minimal elevation angle might be acceptable so that a low profile radome may be used.

The longer the range, the larger the antenna will be in the horizontal dimension. Since the antenna is bigger, the baseplate and the radome will grow as well. The antenna for the long range AIMS either an elliptical or rectangular dish or a planar array antenna. The antenna fastens by 4 bolts to the antenna bracket and a 5/16-inch SMA wrench is used to fasten the RF cable to the antenna.

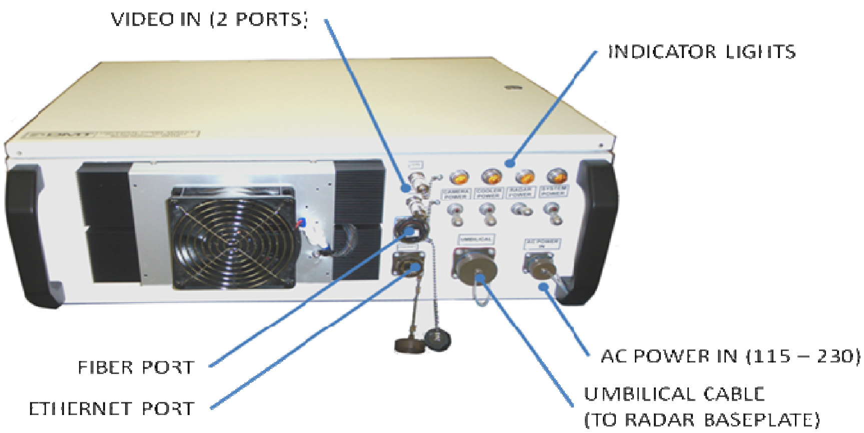
The polarization of the parabolic antennae can be changed by rotating the feed horn by removing 4 allen-head screws, spinning the feed ¼ turn and reattaching in new holes. The antenna is normally shipped and installed with a vertical polarization, optimized for detecting upright objects such as persons.

1.3 AIMS Universal Communication Module

The AIMS Universal Communications Module (UCM) was introduced in 2006, developed as a standardized hardware interface shipped with each radar system. The Module is a NEMA 4X/6 enclosure with watertight connectors with the following features:

- Solid state power distribution (-40 to +90 deg C)
  - Supply 1: 24VDC/7.5A for cameras
  - Supply 2: 24VDC/20.8A for Peltier cooling in UCM and on radar baseplate
  - Supply 3: 48VDC/7.3A for radar
  - Supply 4: 12VDC/12.5A for local electronics in UCM
- Autosensing AC Power Input (115-230 VAC, 47-63 Hz)
- (2) Hardened single channel video servers (order must specify 1 to 4 servers)
- (1) Ethernet routers/switches
  - (6) RJ-45 Ethernet ports (2 unused)
- Peltier cooling system (solid-state cooling with no outside air exchange) for 100 watts of cooling – has temperature sensor (-40 to +85 deg C).
- Optional
  - 24 VAC supply for dome cameras (-40 to +85 deg C)
  - (2) Multi-mode fiber ports on Ethernet Switch (single mode also available)

The UCM comes with all connectors that can only fit one way on the radar and module. The installation is simple and requires no special equipment. Shown below is a photo of a portable version of the universal module.



UNIVERSAL COMMUNICATIONS MODULE (UCM)

1.4 Other Value-Added Enhancements

On request, DMT has performed a number of special value-added enhancements to the AIMS Fast-Scan system. Many of these have recurred so frequently we have added them to our product line;

- Video
  - Video Codec (Moxa, AxSys). Mounted inside the UCM.

- Communication Adapters
    - Ethernet to RS232/RS422/RS485 Adaptors (in UCM)
- Radar Mounting
    - Tower Mounts (Rohn 45G/25G)
    - Pole Mounts (4”, 8” and telephone pole)
    - Wall Mounts
    - Tripod Mounts
    - Vehicle Mounts
    - Shipboard Mounts
- Utility Enclosures
- Camera Mounts
- Positioning
    - Global Positioning System (GPS)
    - Electronic Compass

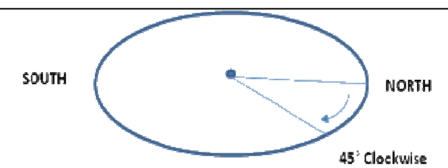
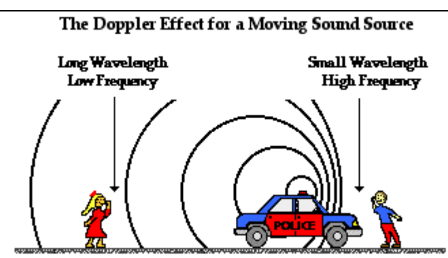
2 Reference

2.1 Documents

Document Number / Date	Title
01/23/2008	Camera Alignment and Operation Procedures for AIMS EA-System
07/29/2008	AIMS Radar Program Replay Operation
07/08/2008	AIMS Antenna Elevation Controls
10/12/2007	AIMS Client Manual V3.0
	Instr_XferMotorCodes

2.2 Acronyms and Definitions

The following acronyms and definitions pertain to the terminologies as they are used to define, configure, describe or explain the AIMS Fast-Scan Radar.

Acronym / Term	Definition	Comment
AIMS	Area Intrusion Monitoring System	
Azimuth	Angle from reference bearing (i.e. true north) in the horizontal plane. The example shows an azimuth of 45 degrees (clockwise) from true north.	
Doppler	The frequency shift of a signal caused from its reflection off of a moving object. It can also occur if the radar or source is moving as well.	
Elevation	The angle from the horizon plane, where 0 degrees represents the horizon, a positive elevation is aiming above the horizon, and a	

	negative elevation is aiming below the horizon.	
Range bin	Area where detected targets are grouped into	
Radar	radio detection and ranging	

3 Installation

3.1 General Guidelines

3.1.1 Cabling

Installations will consist of two kinds of cabling – DMT proprietary cables or standard cable bundles in conduit. DMT proprietary cable is the quickest and easiest to install. The cable comes with:

- 2 Ethernet bundles (one may be used for RS-232/422/485)
- 2 power sets (3 wires), which are shielded
- 2 video lines
- 1 inner strength member
- Outer shield.

The cable is designed to endure in saltwater, sun and high heat, sandy and oil environments. The connectors are high-grade industrial bayonet metal connects. These are ordered to the desired length, which is normally <= 150 feet. The cable and connectors are shown below right.

Building codes in some locations requires conduit runs if the cable is run any significant lengths on buildings. Rigid conduit is required in these cases. The figure on the lower left shows an outdoor installation requiring rigid conduit.

This is an example installation with rigid conduit. This is a time consuming installation. Outdoor rigid conduit must be attached every 8 feet on buildings

This is DMT's proprietary cable used in tower installations and some building installations. The connectors are bayonet style military connectors.

3.1.2 Power Cabling

When hooking up power cabling, the length of run and expected power consumption should be considered. With these two factors, it is easy to determine what gauge of wire would generate what amount of voltage drop. A 6% voltage drop is the recommended limit according of industry standards (CEC).

V_{drop} = distance * current * ohms/1000' (see table below) / 1000

AWG Copper Wire Table			
AWG	**Diam. (mils)**	**Ohms/1000ft**	**Feet per Pound**
0000	460	0.050	1.56
000	410	0.063	1.96
00	365	0.077	2.4826
0	324.85	0.096	3.1305
1	289.3	0.1264	3.947
2	257.6	0.1593	4.977
4	204.3	0.2533	7.914
6	162	0.4028	12.58
8	128.5	0.6405	20.01
10	101.9	1.018	31.82
12	80.8	1.619	50.59
14	64.1	2.575	80.44
16	50.8	4.094	127.9
18	40.3	6.510	203.4
20	32.0	10.35	323.4
22	25.3	16.46	514.12
24	20.1	26.17	817.7

3.1.3 Communications

The Ethernet communication lines from the UCM should not be run further than 90m, and should only be made from parts/cabling rated to meet or exceed CAT5e or CAT6. The bulkhead Ethernet connectors on the UCM are rated to meet IP67 specifications when attached to an IP67 cable. Although weather resistant, the orientation of the UCM installation should result in the

Ethernet connectors being either vertical (on side panel) or downwards facing to prevent the pooling of water on the connector.

When using standard CAT5e/CAT6 wiring, adhering to the color standard will make the site much more maintainable. Both the T568A (US Govt. std.) and T568B (AT&T std.) color tables are shown below.

RJ45 Pin #	Wire Color (T568A)	Wire Diagram (T568A)	10Base-T Signal 100Base-TX Signal	1000Base-T Signal
1	White/Green		Transmit+	BI_DA+
2	Green		Transmit-	BI_DA-
3	White/Orange		Receive+	BI_DB+
4	Blue		Unused	BI_DC+
5	White/Blue		Unused	BI_DC-
6	Orange		Receive-	BI_DB-
7	White/Brown		Unused	BI_DD+
8	Brown		Unused	BI_DD-

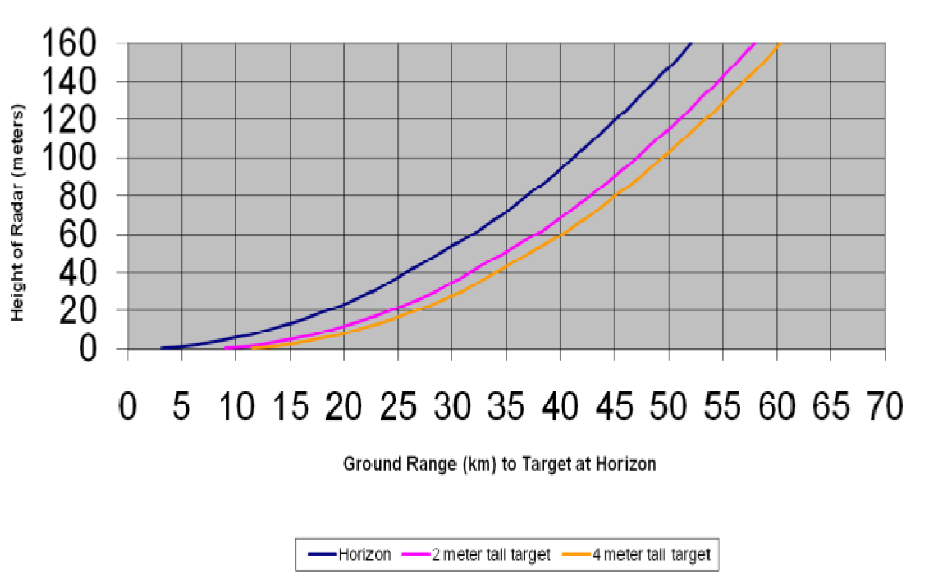
RJ45 Pin #	Wire Color (T568B)	Wire Diagram (T568B)	10Base-T Signal 100Base-TX Signal	1000Base-T Signal
1	White/Orange		Transmit+	BI_DA+
2	Orange		Transmit-	BI_DA-
3	White/Green		Receive+	BI_DB+
4	Blue		Unused	BI_DC+
5	White/Blue		Unused	BI_DC-
6	Green		Receive-	BI_DB-
7	White/Brown		Unused	BI_DD+
8	Brown		Unused	BI_DD-

On some units, fiber optic network communications are available.

3.1.4 Selecting a Location

When selecting the radar site location a couple of key points should be considered;

- The radar unit should have line-of-sight to area of interest. If you can't see your intended area of coverage, neither will the radar! Keep in mind that there is a maximum range based upon the height of the radar unit and the curvature of the earth (see chart below).
- The radar unit should be mounted in a location that minimizes the opportunity for vandalism. The installation of the radar attracts the curious. The power and camera cables are twist bayonet-style cables that can be removed if accessible. The radar is usually mounted on a tower or roof structure away from normal pedestrian traffic.
- Mount the radar unto a structure that is designed to support the expected wind load. The standard DMT radome has a wind sail area of approximately 10 square meters. Less rigid structures will allow the wind to incur harmonic oscillations unto the structure.



3.1.5 Installation on Towers, Buildings, or Poles

Installations are most common on towers, buildings and poles. Although DMT makes a variety of standard mounts, custom brackets for other mounting surfaces or towers can be supplied in usually 3 weeks from order. Typically building mounts are on top of the building. In these cases, the installation is much the same as a on a tower. A small section of tower or similar is used for maximum stability in high winds.

Rohn Towers is an industry standard in towers. Although the company is no longer in operation, their towers are still sold worldwide and there have been widespread copies of the towers still in production by a number of companies. DMT can provide quick delivery of 25G, 45G and 65G tower mounting brackets. The top of a tower should be a standard 10 foot section, with the top rungs removed so that the radar can slip down over the top. ¼ -inch holes should be cut though the main three beams of the tower and bolts run through to permit firm attachment to the tower.

This picture shows the baseplate of the radar mounted onto the top of a Rohn 45G tower. The 45G is capable of more holding the radar and several hundred more pounds of cameras and enclosures.

When placing this on buildings, DMT recommends the Y-bracket. The bracket has 3 holes in each branch of the "Y" for attaching to the roof. The picture at right shows a view of the bracket installed. DMT recommends no more than 8 feet of tower for building rooftops. Grounding (lightning) rods should be higher than the radar.

This is a view of the Y-bracket recommended for rooftop installations of the radar. Only three ½ -inch bolts are required for every 4 foot of tower for 200 mph wind resistance.

For ground installations, DMT recommends using tilt-based towers. These come in hand-crank and motorized lowering configurations. Figure 9 is a photo showing the tower. These towers can be erected by 2 people without the need of lifts or cranes. It also enables easier maintenance of sensors in the future.

DMT recommends tilt-based towers.

Pole mounting should be on poles that are a minimum of 4 inches in diameter for short heights and 8 inches for poles over 2 meters high. The figure at right shows DMT's mounts for standard power poles. It is important to mount the baseplate on the towers or poles so that it is as level as possible. This will simplify setup. Although being perfectly level is desirable, remember that the radar can correct for installation flaws by moving the antenna in elevation as it spins. It is required that an inclinometer be used to measure the tilt error if it exists and record it for software setup.

This is DMT's standard pole mount. This particular picture also shows DMT's Peltier cooling option for the radar. It provides substantial cooling without any air exchange.

Over many installations, DMT has found instances where different brackets or mounting options are needed. In cold weather environments, DMT had found that mounting on towers became difficult due to ice build-up. The radome has 12 bolts that hold it down and the base plate is held in place with 8 more bolts. In cold weather, ice can make threading and handling bolts difficult. So DMT developed a key and pin method for fastening the radar to towers as shown in the figure at right. This resulted in big reductions in installation costs.

Generally, the radar can be mounted a number of different ways;

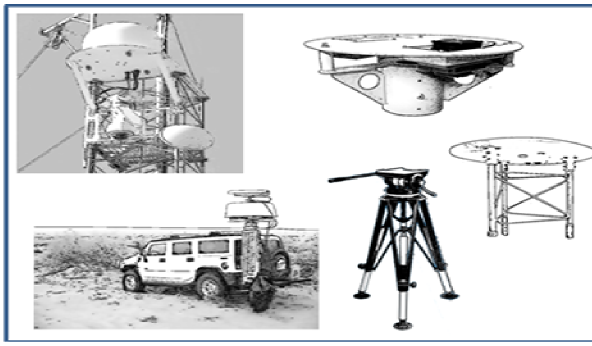
- Pipe Mount (8” OD Schedule 80)
- Tower Top Mount (Rohn 45)
- Tower Side Mount
- Vehicle Mount
- Tripod Mount (temporary)

The main issue is to provide unobstructed visibility to the area of interest, insure that the cables may freely access the baseplate, and the mounted solution has minimal vibration. The cables that connect to the radar system attach to the underside of the circular baseplate.

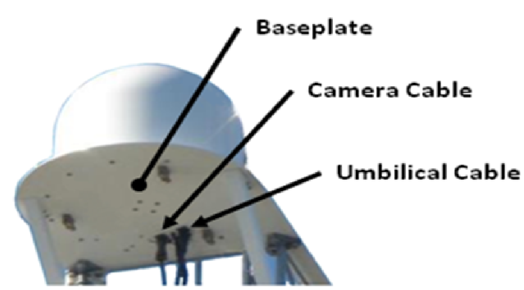
The umbilical cable that goes between the radar baseplate and the Universal Communications Module (UCM) should have a minimum bend radius of 8”. The umbilical cable is made with a ruggedized protective jacket and should be restrained at the top with a cable grip (i.e. Kellems grip – see drawing).

Located next to the umbilical connector on the baseplate is the camera connector. Based upon where the camera is located (top of radome or on side mount), be sure the cable may be properly dressed and secured for ice, snow, and high wind.

For cold climates, DMT’s proprietary mounts shown at left are used. 3 metal keys fit into square holes in a second circular plate attached directly to the tower. Push pins fit through holes and provide a tight and strong fit. The pins are easily removed, even with ice build-up. This permits the radar to be removed quickly from the tower if required.



Although the DMT Umbilical cable is designed to hold a great deal of weight, using cable restraints (such as Kellems Grips) is recommended.



3.2 Preparation

3.2.1 Before You Begin

- Ensure all Communications cables have been run and certified to Cat6. There should be 4 “straight” cables, with RJ-45 Connectors on both ends. One set of 4 connectors should be at location where the Communications Module is to be installed.
- Ensure 220VAC or 120 VAC is available at location where the Communications Module is to be installed.
- Identify locations of all other hardware to be installed, this includes: AIMS Communications Module, AIMS Radar and Baseplate, Camera Assembly #1 through Camera #N, and AIMS Junction Box,.

3.2.2 Tools

Installations can be quite varied from site to site. The tool compliment may vary some between these sites. DMT recommends the following tool set:

- 5/32" Allen Wrench
- 3/16" Allen Wrench
- 7/32" Allen Wrench
- 1/4" Allen Wrench (Recommend an Allen pack containing sizes .050" through 3/8")
- 7/16" Combination Wrench Or Socket with ratchet 1/2" Combination Wrench Or Socket with ratchet (Recommend combination wrench set containing sizes 1/4" through 3/4" and an additional 11/32")
- Adjustable wrenches (spanners) – one 6-inch, one 8-inch, one 10-inch
- Ratching reversible wrench set (5/16 to 3/4 inch)
- One flat-head (medium size) and one Philips-head (medium size) screwdrivers
- one small flat-head jewelers or electricians screwdriver (used for terminal blocks)
- One set of wire cutters
- small flashlight
- One volt meter with autoranging functions
- Pasternack SMA Torque Wrench (5/16 inch) (Model No: PE5011-1, phone 949-261-1920, Fax 949-261-7451, email: sales@pasternack.com.)

There will be instances where additional hardware, glues or epoxy will be required. Contact DMT technical support for recommendations whenever in doubt.

Other DMT tools are available to simplify installation, failure indication or final certifications. These include:

- DMT radar and home pin alignment tool (see Figure23) – Part Number: AIMS-Tool-0110
- DMT umbilical cable checker/certifier (see Figure 25) – Part Number: AIMS-Tool-0102
- SMA connector (5/16-inch) torque wrench – Part Number: AIMSTool-0101
- Automated Radar Evaluation and Setup Tool – Part Number: AIMSTool-0111
- Automated Setup Software Toolkit – Part Number: AIMS-Sftwr-ASST

The Automated Radar Evaluation and Setup Tool is a tool introduced in 2007. This tool is a software package that resides on the thumb drive (memory stick). Upon powering the radar on, insert the memory stick in one of 4 USB ports in the Electronics module (cabinet). The onboard software on the stick will check that operating system is enabled and all the latest drivers are installed. It also records all serial numbers and installed software and records the date in time in which the stick was inserted into the radar. The software will also run checks on the motors, communication ports, A/D board, CPU board, and in some units is will check onboard temperature. During this process, the radar will spin so be sure it is ready to do so when the memory stick is plugged in. When returning back to the office, the technician can insert this memory stick in a computer and record all pertinent facts automatically into an Excel spreadsheet record log.

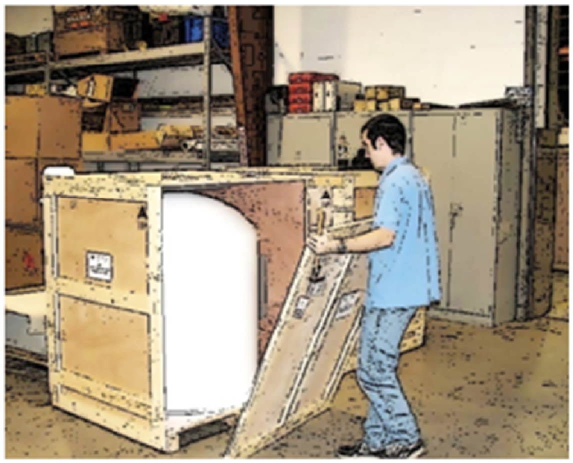
The Automated Setup Software Toolkit is a BITE (built-in-test and evaluation) software package the runs on a notebook PC or PDA. It has all the functions of the Automated Radar Evaluation and Setup Tool, but provides more information in an easy to read visual format. The data is stored in a resident Excel spreadsheet file.

3.2.3 Arrival of Equipment

Anticipate the delivery and transportation of the radar and equipment from the arrival point to the tower so that you can obtain the proper size of vehicle needed. For a typical one-tower installation, the radar will arrive in the following containers:

- (1) Radar crate (if not installed with radome)
  - 80 lbs (37 kg)
  - 21” x 26” x 27” (53.3 x 58.4 x 17.8 cm)
- (1) UCM, cables and hardware crate
  - 174 lbs (79 kg)
  - 41” x 29” x 25” (104 x 74 x 64 cm)
- 1 camera case (if ordered) – this will be labeled “CAMERA”. (size / weight are variant)
- (1) Radome crate
  - Jumbo (long range system):

    - 63” x 63” x 51” (160 x 160 x 129.5 cm)
    - 690 lbs (314 kg) – with radar installed (40 lbs or
- Standard (medium Range):
    - 41" x 44" x 44" (104 x 112 x 112 cm)
    - 376 lbs (171 kg) – with radar
- Other sizes are also available



The large crates containing the radome require a pallet jack and/ or a forklift to manage.

Often the crates are secured with screws requiring a star bit (T20) to open.

3.3 Mounting the Radar

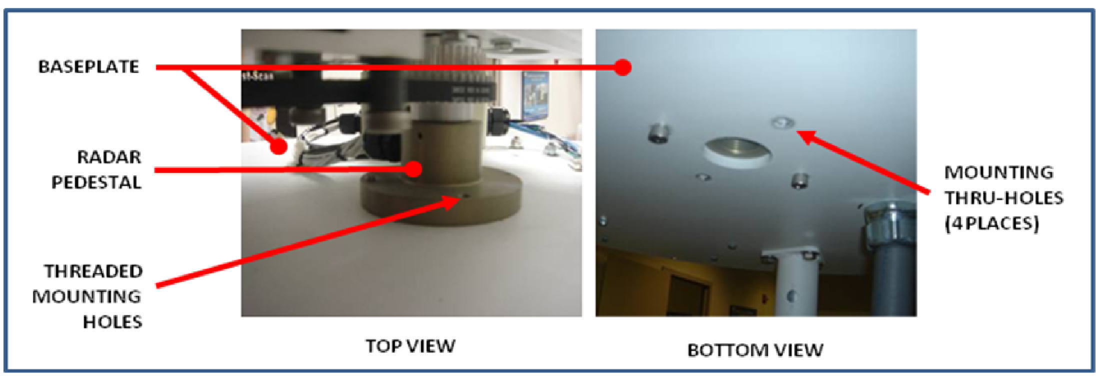
3.3.1 Installation Procedures for AIMS Fast-Scan

1. Power should be off and fully disconnected before installation commences

2. Mount all AIMS Hardware in the desired locations, using existing bolt hole patterns in boxes.

   - It is of vital importance that care be taken when Electronic Module (enclosure containing CPU stack) box are open. Although the system is well grounded and resistive to ESD, it is wise to avoid static charge before installing the radar.
   - It is best to align the homing pin of the radar with true north, any deviation can be entered in the configuration software.
   - Any holes remaining on the baseplate that are not used should be plugged with a bolt, nut and lockwasher.

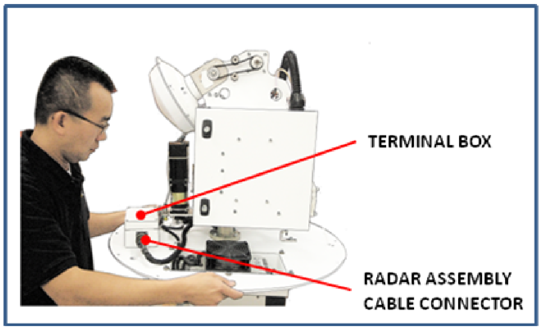
3. If required, mount the radar onto the base plate. There are 4 holes surrounding a big center hole on the base plate. The radar is attached to the base plate using four 1-inch socket head bolts provided. These bolts feed through the bottom of the base plate up into the threaded radar pedestal.



4. For radars shipped in white ISO containers, the elevation motor control cable may be unplugged. This cable feed out of the top of one of the radar enclosures and has connector. Plug this into the black elevation motor and tighten the screws.

5. Run all AIMS Cables. Prior to pulling any AIMS cable through conduit ensure the desired cable end will be at the correct location. All the cable connectors and their mating jacks are labeled. The Interconnect Diagram is provided separately.

6. When installing the base plate, the white terminal box should go right side up, so that it is inside the radome when it is sealed.



The white terminal box on the base plate sits up and is inside the radome when it is installed. The white box houses the wiring block. Power and communications from the radar and the outside world are connected in this box.

7. The radar assembly cable has a bayonet-style connector that attaches to the right side of the terminal box (see figure).

8. After all AIMS Cables are run through the conduits between the radar and cameras and enclosure, you can mate the connectors. *Do not attempt to apply power to any AIMS unit without a DMT, LLC employee or certified installer present. Failure to comply with this could result in equipment damage and may void warranty.*

9. The radome is attached using the 12 longer socket-head bolts provided. Washers should be on both the top of the radome and the bottom of the base plate. The radome lip will compress very slightly when the bolts are tightened. This seals the radar from the outside elements. Do not over tighten because this can result in cracking the radome finish. The radome is made of NOMEX, which is a composite honeycomb structure that is strong and lightweight.) The baseplate should be clean and free of debris as the radome is placed on it. The radome lid should be clean prior to installation as well. *DMT certified installers must inspect inside the radome before power is applied to the radar. Therefore, provisions need to be made to provide installers access to the radar when radar setup commences.*

3.4 Locating the UCM

The primary function of the UCM is to provide the power and communications to the AIMS Fast Scan system. Power and communications are provided via a heavy-duty umbilical cable that connects the two systems. The umbilical cable also supports two 75Ω video feeds from top mounted cameras, if installed. Although the UCM is designed to operate outdoors an indoor installation is always preferable.

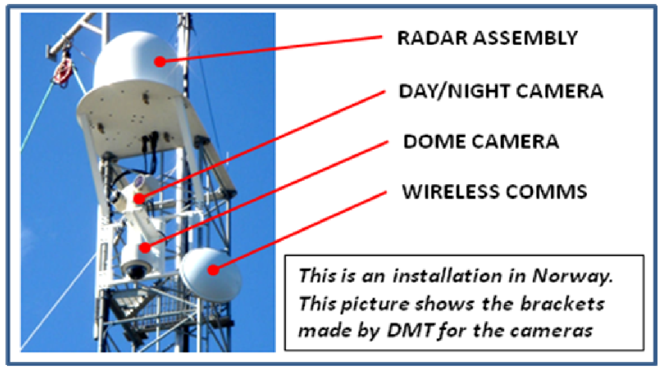
Three major factors need to be considered when installing the UCM

- How long is the umbilical cable relative to the distance between the radar and UCM?
- How long is the UCM from the primary power source (line loss vs. wire gauge)?
- How much power is required (varies on configuration)?

If ordered for a pole mount configuration, the UCM is shipped with pole clamps and supporting hardware. When installed, the interfacing connectors on the UCM should be facing downwards. When mounted outside, the UCM cabling should be connected to an weatherproof electrical box for conduit cable routing for protection from both the environment and rodent damage (mice and rats are renown for their appetite of cable jacketing).

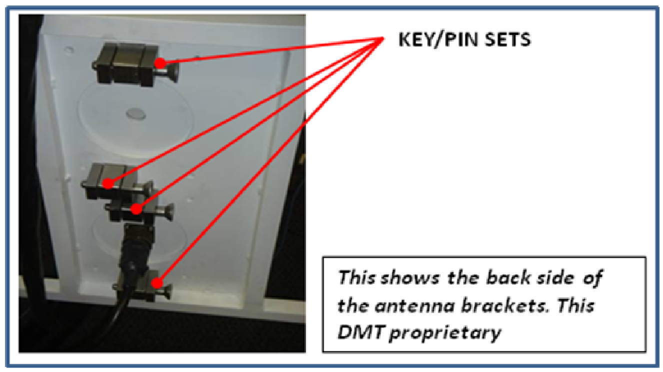
3.5 Camera Installation

DMT makes camera brackets for many cameras for most towers. The figure at right shows two cameras on the tower. One camera is tied directly to radar detections (the upper thermal/CCTV camera) and the other camera (the dome security camera) is used for tower security. DMT makes brackets for both of these cameras, for instance.



This is an installation in Norway. This picture shows the brackets made by DMT for the cameras

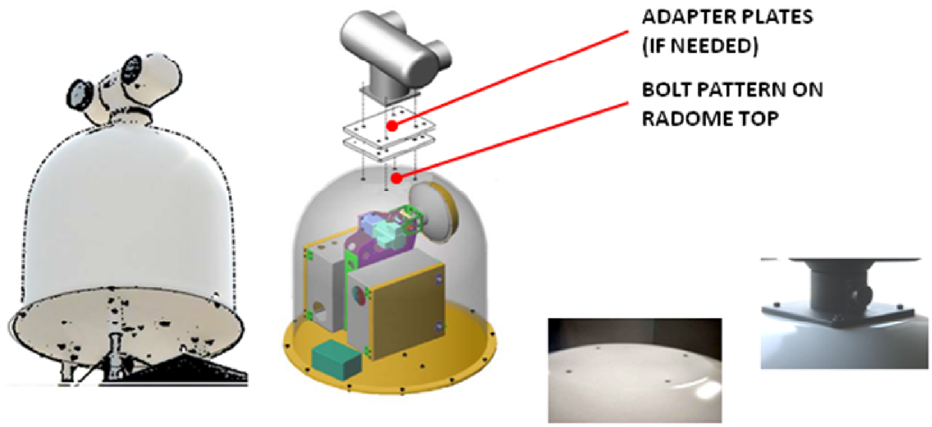
As discussed earlier, key and pin mechanisms developed by DMT hold the cameras in place on the tower. This DMT proprietary approach is really of value in cold climates. The pins can be removed easily by pressing a button at the flanged end of the pin and then pull. In the above installation these key and pin sets hold both the cameras and the communications antenna in place.



This shows the back side of the antenna brackets. This DMT proprietary

The cameras can also be mounted on the radome. The figure below shows the mounting holes, which fits the DI-5000 and Orion, Argon ST, Quickset Model 90 Pan and Tilts and many other cameras.

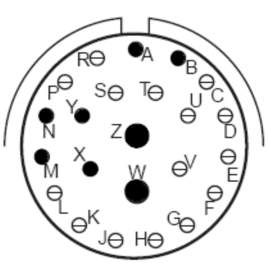
This is the installation method for cameras preferred by many customers and camera vendors. 4 threaded holes in the top of the radar allow the camera to mounted securely and affords a 360 degree unobstructed view. The radome helps buffer some of the tower wind vibration as well. DMT recommends added RTV to the treads of the bolts going into these holes to maintain good seals.



It is important that the camera and radar home pins are aligned if the camera is mounted on top of the radome. The figure below shows a tool available from DMT. The tool bolts into the 4-hole pattern in the top of the radome. A plumb bob is then used to locate where the home pin should be. Another tool fits in the large hole in the baseplate for marking the home location from below. This picture shows the alignment process of the radar home pin to the camera home pin.

Alignment of camera with radar using DMT's home pin alignment tool.

The DMT AIMS Fast-Scan system is designed to support a wide variety of cameras and pan-tilt control assemblies. When an AIMS Fast Scan unit is ordered the camera type is also specified to be sure that the connector cable between the camera and the radar baseplate is correctly assembled and tested. Because the camera and its pan-tilt base connector requirements are so varied, the cable pinouts are equally as diverse. A typical pin configuration for an ICx or DII camera connector appears below.



17-99

Baseplate Connector	TVP00RW-17-99S

Pin	Description
A	+24VDC SUPPLY
B	24V COMMON
M	RS422 TX+
N	RS422 TX-
X	RS422 RX+
Y	RS422 RX-
W	VIDEO IN2
Z	VIDEO IN 1