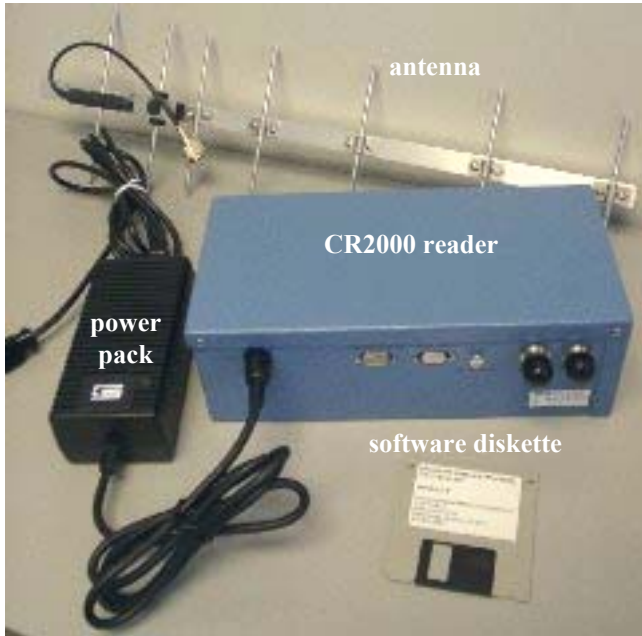


CR2000 - Reader Kit



CR2000- Installation Items

- The kit of reader components described at left does not include the following required items...
- 1 PC cable, RS232 (DTE-DCE), 12 feet (see Fig 1)
 - A/R antenna mount hardware: bracket(s), clamp(s), mast, etc.
 - 100 feet (or less A/R) of RG213U cable
 - 2.5 feet of RG58U cable
 - 1 N-male connector for RG213U cable
 - 1 N-female connector for RG213U cable
 - 1 N-male connector for RG58U cable
 - 1 N-female connector for RG58U cable
 - 1 each of fixed attenuators: 1, 2, 3, 4, 5, 6, and 7 dB
 - A/R heat shrink tubing, electrical tape, cable ties and clamps

NOTE: During system installation, the contractor determines the fixed RF attenuation level required.

CR2000- Installation Overview

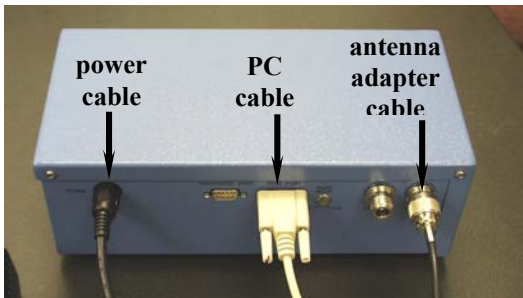
- ◆ The antenna is installed within the distance/angular limits of the "pick-up point" as indicated in Table 1 on the back page
- ◆ The reader, power pack, antenna adapter cable and "total RF attenuation" components are installed at a location inside the building (see Figure 1 on the back page) that is (all of)...
 - within 6 feet of a 110Vac power main drop
 - within 12 feet (4 meters) of the host computer
 - within 100 feet of the antenna mounting location outside the building
- ◆ All system connections are completed as indicated in the CR2000 - Installation Steps listed on the back page.
- ◆ The CR2000 PC application software is transferred from the diskette to the host computer and is running.
- ◆ The total RF attenuation value is determined by varying the configuration of the available fixed attenuators.

NOTE: Where necessary, Mark IV Industries Ltd. I.V.H.S. personnel may be required to "fine tune" the system RF attenuation parameters.

CR2000 - Reader Kit Packing List

Part Number	Description
801075-001	CR2000 Compact Reader
318993-009	DC Power Pack, 110Vac input, output 5V/3A, 15V/1.5A, -15V/0.3A, Skynet #SNP-PA54
318145-177	CR2000 PC Software on Diskette
801076-001	Antenna Assembly

CR2000 Reader - Connections



CR2000 - Installation Tools

Your tool kit should include (but is not limited to)...

- ◆ N-type connector crimp tool
- ◆ screwdrivers: flat blade, Philips blade
- ◆ SAE Socket set
- ◆ utility knife, wire cutter, wire stripper

Document Revision Record

Rev	Date	ECN	Approved
A	18-Jan-01	Preliminary	

CR2000 - Antenna mounting

The antenna will be mounted over-head at a height of H_a ft with horizontal polarization where H_a is measured from the highest part of the antenna. Determine the distance D_o (in ft) between the "pick-up point" and the antenna mast, and use it to determine the antenna tilt down angle α° in the in-lane direction (H Plane), using the following table.

Antenna Height (H_a) [ft]	Pick-up Point (D_o) * [ft]	Antenna Tilt Angle (α) [Deg]	Beam Center ** [ft]
12	5 to 7	15	3
	7 to 9	18	4
12.5	5 to 7	15	3
	7 to 9	18	4
13	6 to 8	15	3.5
	8 to 10	18	4.5
13.5	7 to 9	15	4
	9 to 10	18	4.5

* Distance referred to the antenna mast.
 ** Based on semi-empirical data.

Note: This device shall cause no harm at a distance greater than 1 meter away from the antenna. The antenna has gain of 6 db.

CR2000 - Installation Steps

Connect the antenna with the reader via RF feedline and RF attenuator(s) and antenna adapter cable.

- 1) Disconnect the power main input to the power supply.
- 2) Connect the Power supply output to the CR2000 reader.
- 3) Connect the PC port COM1 to the reader host port using the provided straight through RS-232 cable.
- 4) Connect the RF cable adapter (RG58 short cable) to the reader RF port (Type N connector).
- 5) Connect the RF feedline to the RF cable adapter via the fixed attenuator(s) referenced in step 9. Install a Type-N Male connector at the end of the feedline.
- 6) Route the RF feedline through the wall. At the feedline antenna end, slip 6" of heatshrink tubing on the cable. Install a Type-N female connector at the end of the feedline. Make the connection with the antenna.
- 7) Reconnect the power main input to the power supply.
- 8) Execute the CR2000 PC application software as referenced in document A316000-743.
- 9) Determine the "total RF attenuation" value by varying the configuration of the available fixed attenuator value(s).
- 10) After the system has been fully tested OK then heat shrink the tubing (in step 6) over the antenna connector to make it water tight.

