

SKYEREA D EA1

REFERENCE GUIDE

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1 Product Overview

1.1 General Description

The SkyeRead EA1 is a small footprint external antenna board to be used with the SkyeRead range of readers. The EA1 can be coupled with the M1 quite easily and effortlessly and is designed to provide greater read range for the M1 reader. A tuning capacitor (C3) is provided to tune the antenna for maximum read range. This is needed as change in magnetic field of the antenna will occur depending on its surrounding environment (for example: magnetic field of the antenna will be distorted if there is a metal object present near the antenna, which in turn will affect the inductance and hence the antenna will have to be retuned to give maximum read range at the operating frequency of 13.56 MHz)

1.2 Highlighted Features

- Low Profile – only 4mm
- Small Footprint – only 95mm x 95mm
- 50 Ohms impedance for matched operation with the reader
- Simple to couple with the M1

2 Mechanical Specification

2.1 Dimensioned Drawings

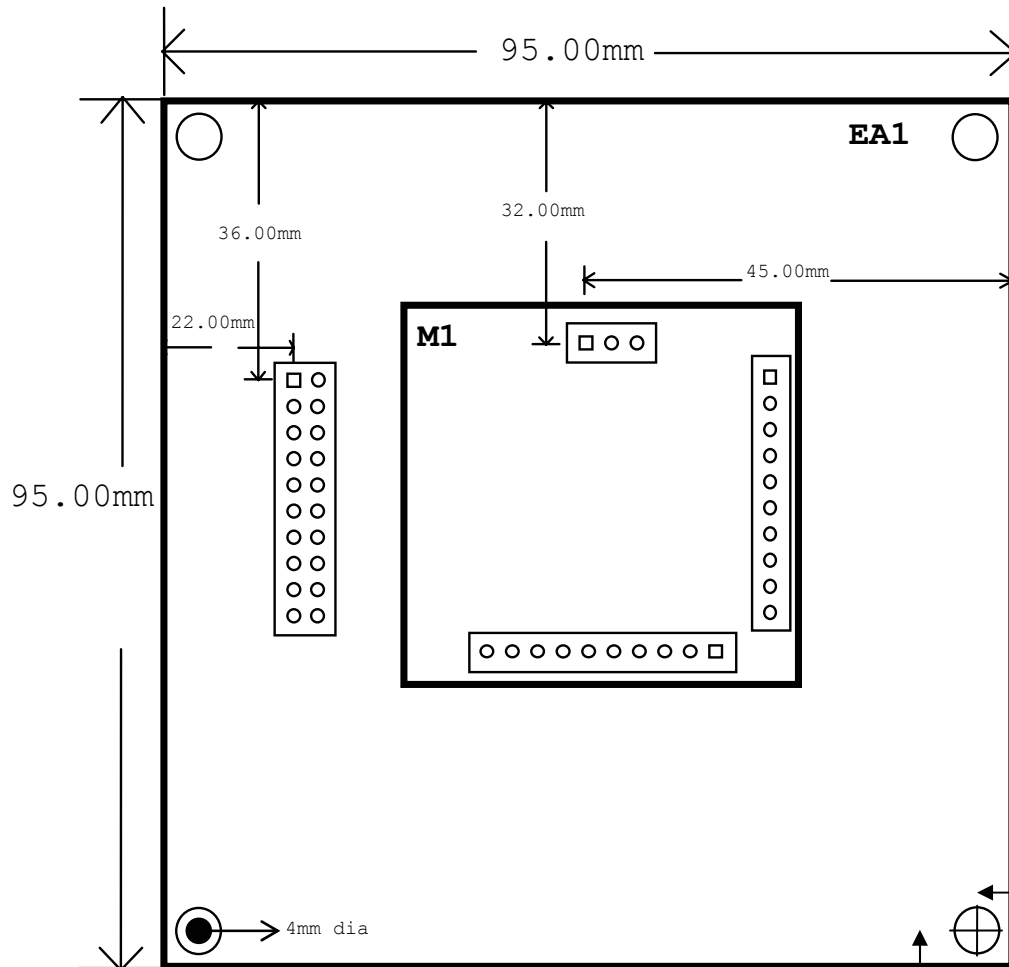


Figure 1. Top View of the EA1 Board

2.2 Pin Descriptions

NOTE: J1 J2 and J3 on the EA1 map directly to the J1 J2 and J3 on the M1. The pin descriptions for the J1 J2 and J3 connectors are explained in the M1 Reference guide. On the J4 connector pins 1 - 10 map to the pins on J1 and pins 11 - 20 map to the pins on J3.

2.2.1 J4 Pin Descriptions

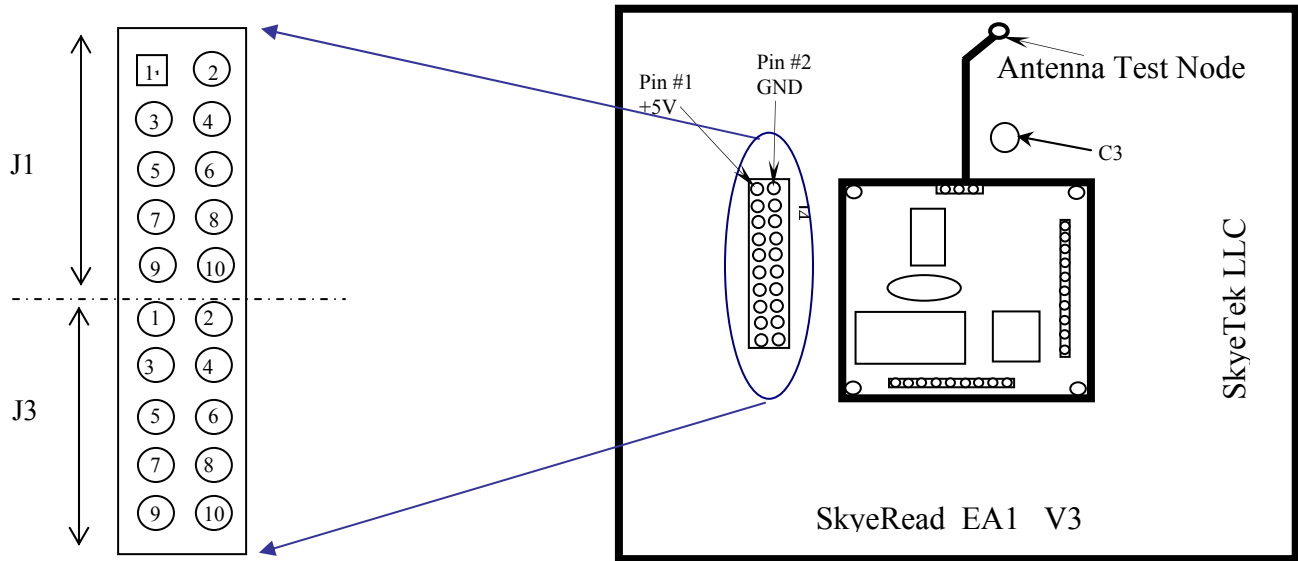


Figure 2. J4 Connector Pin outs

For an EA1 board with a mounted M1 reader the J4 connector pins are shorted to the J1 and J3 pins of the M1 reader as shown in figure 2. This provides connection through a standard 2.54 mm (100 mil) IDC receptacle (see figure 3)

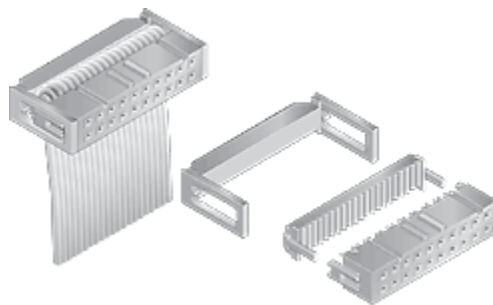


Figure 3. IDC Receptacle

3 Electrical Specifications

Impedance at 13.56 MHz	50Ω
Power radiated at 13.56 MHz	200 mW

4 Connecting the EA1 Antenna Board to the M1

4.1 Mechanical Connections

The jumper connections (J1, J2, J3) of the M1 reader align directly with the corresponding jumper connections on the EA1 antenna board.

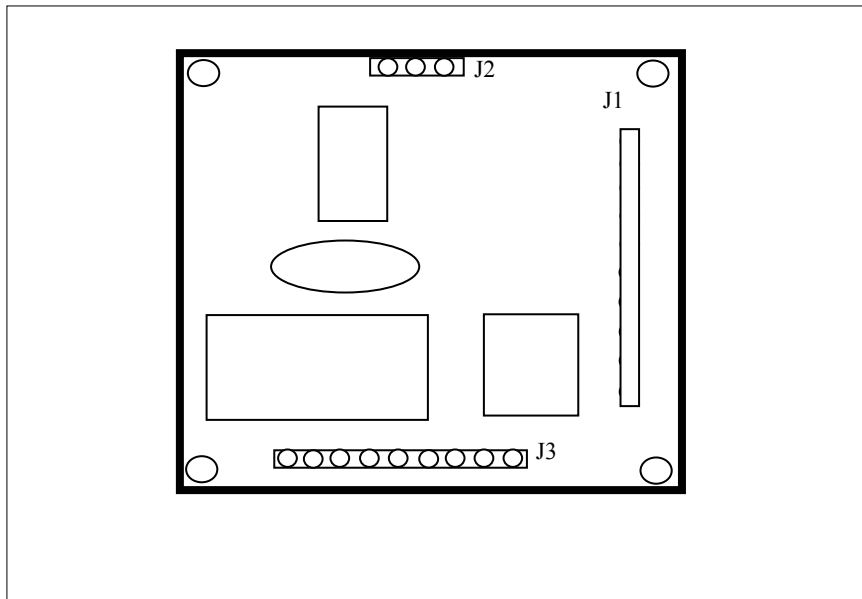


Figure 4. SkyeRead M1 Reader Board

Align each of the jumper holes of the M1 board with each of the jumper pins of the antenna board and carefully push the M1 board onto the antenna board. If desired, and for optimal connectivity, each of the pins of J1, J2 and, J3 should be soldered. Optionally, custom cable assemblies can be used to connect the M1 to the EA1. Often, a single cable connection can be used from J2 of the M1 to J2 of the EA1 so that the antenna can be mounted remote from the M1 reader electronics.

4.2 Electrical Connections

4.2.1 Connecting to the Reader

For short distances a twisted pair cable can be used. For long distances it is advised that a coaxial cable of 50Ω impedance be used.

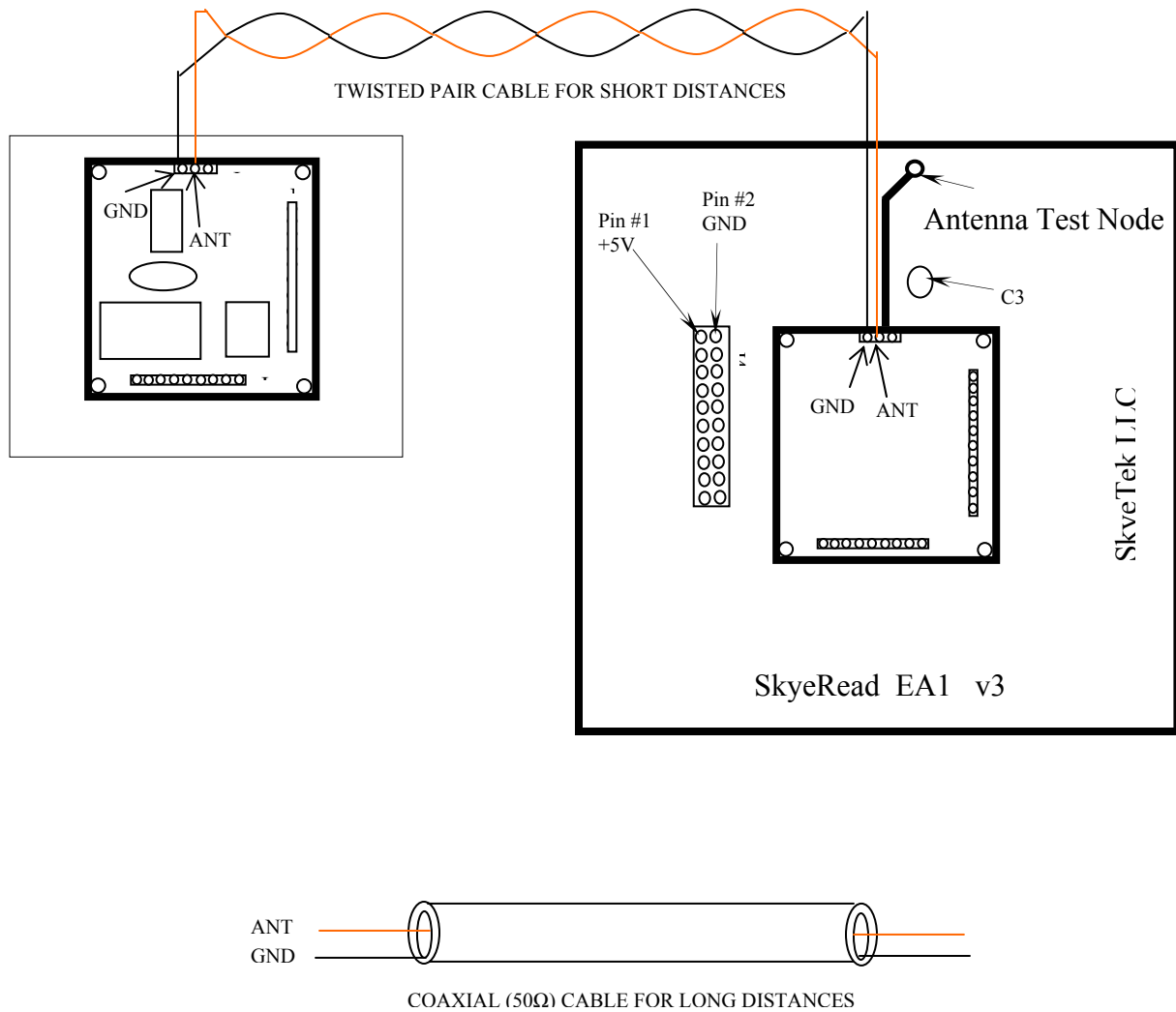


Figure 5. EA1 – M1 Connection

4.2.2 Connecting to the Host

The jumper pins of J4 of the EA1 antenna board correspond to J1 of both the antenna board and the M1 board. See figure 6 below: This shows the M1 board mounted on the Antenna board and pin connections to a D type female connector for communication with a host computer. For more detail also refer figure 2.

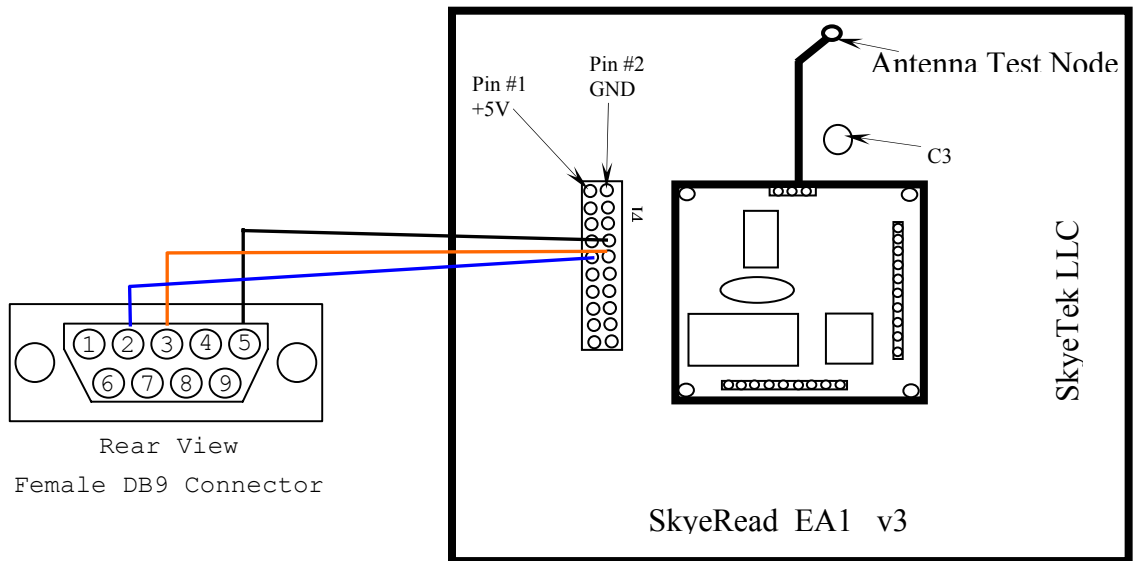


Figure 6. EA1 – Host Connection

5 Adjusting the Antenna for Maximum Read Range

STEP 1: Open the SkyeWare.exe program on the PC and Select the Command Builder option from the Options Menu.

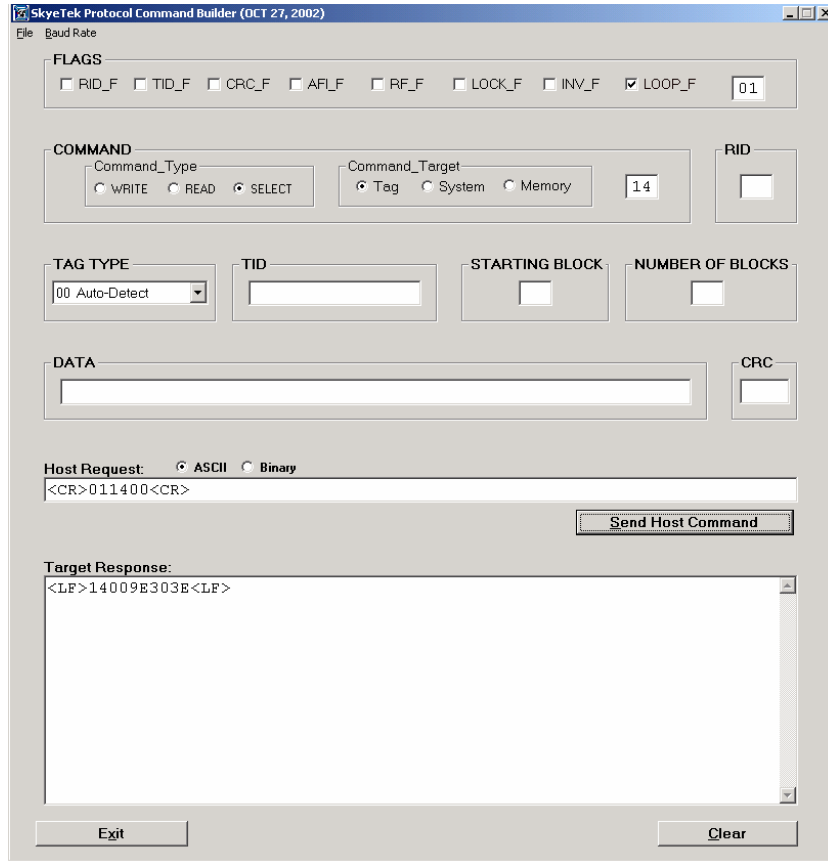
This will open the SkyeTek Protocol Command Builder, which is used to send read/write commands to the SkyeTek M1 Reader.

The Command Builder will open as shown.

The screenshot shows the SkyeTek Protocol Command Builder interface. The 'Host Request' field contains the command: `<CR>001400<CR>`. The 'Send Host Command' button is visible below this field.

STEP 2: To adjust the antenna the reader will need to be configured to constantly transmit a signal. To do this set the **LOOP_F** flag in the **FLAGS** field. This will change the **Host Request** field to read: `<CR>011400<CR>`.

Selecting the **Send Host Command** button will send the request to the M1 reader and the **Target Response** will be <LF>1C<LF>. This indicates that the M1 received the command and that loop mode is activated. Once a Tag enters the field of the M1 reader it will respond with the ID of the tag as shown in the example below.



This **Target Response** indicates that the select tag command passed, (14) and returns the ID of the tag, (009E303E).

STEP 3: On the EA1 board there is an adjustable (tuning) capacitor (C3) that is used to match the impedance of the antenna (inductor), on the EA1 board to the circuit on the M1 reader. For maximum read range set a Tag above the M1/EA1 reader and continue to adjust C3 while varying the height of the Tag. With the Command Builder set in loop mode the **Target Response** field will flash the response while the Tag is still in range.

Alternatively, attach a scope probe to the Antenna Test Node provided on the EA1 board. Adjust C3 first for maximum amplitude on the oscilloscope.

NOTE: If it is needed to design a custom antenna, refer to the Skyetek Antenna Design Guide for external antenna design instructions.