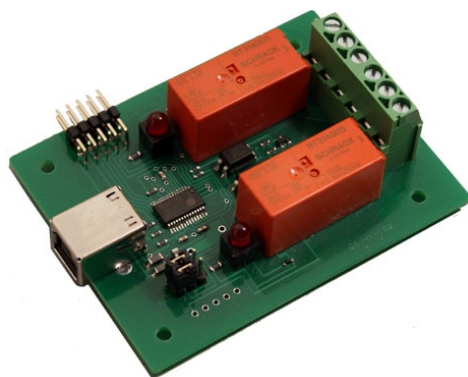


AR-2MF MULTI-FUNCTION RELAY INTERFACE

TECHNICAL REFERENCE



Click for more info: www.eeci.com/ar-2mfp.htm

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TABLE OF CONTENTS

Specifications and Technical Support...	page 1
Connection Diagram.....	page 2
Set-up and Testing.....	page 2 & 3
Device Manager.....	page 4
Trouble-shooting and Expansion.....	page 5
Relay Commands & Control Software..	page 5
Mounting and Warranty.....	page 6

SPECIFICATIONS

Power Supply.....	powered from USB port (5 volts DC 160ma)
Relays.....	2 (expandable up to 10 relays using the EX-8M expansion card)
Relay Contacts.....	SPDT
Terminal Block.....	rising cage design allowing wire sizes 30 awg up to 12 awg
USB Connector.....	type B receptacle
Contact Rating (AC).....	16 amp 250 VAC
Contact Rating (DC).....	16 amp 30 VDC
Contact Rating (tungston)....	3 amp 360 watt
Contact Rating (horsepower)	1/2 HP at 120 VAC 1 HP at 240 VAC
Status Inputs.....	optional (8 inputs may be added using the EX-8M expansion card)
Weight.....	2 ounces
Size.....	2.375 inches by 3.125 inches

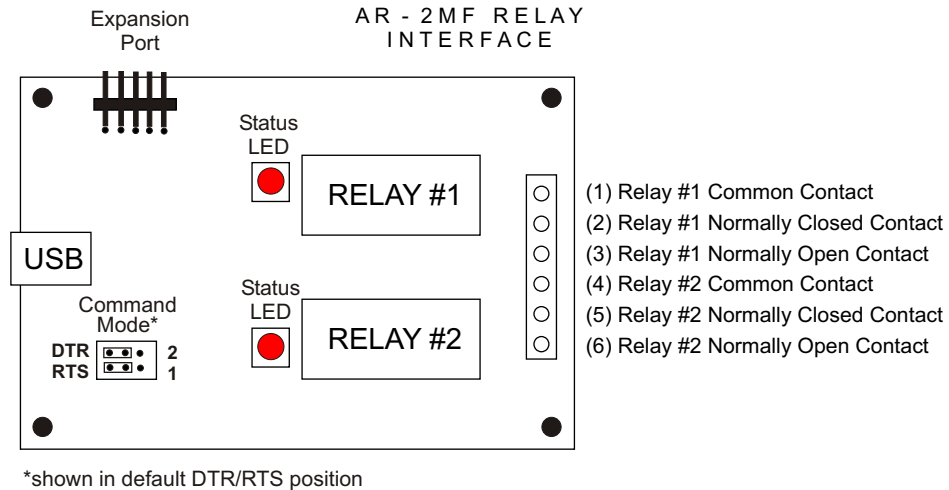
DESCRIPTION

The AR-2MF relay interface provides software control of (2) relays which are included and mounted on the AR-2MF circuit assembly. The relays are energized or de-energized by using the com port control signals DTR and RTS or alternate relay commands. The AR-2MF is for use with USB only. A terminal block is provided for connection to the relay contacts.

24 HOUR TECHNICAL SUPPORT

Technical support for our products is available by calling (937) 349-6000. If a technical adviser is not available, please leave your name, phone number and a time that you can be reached. Your call will be returned as soon as possible and within 8 hours. Calls received during normal business hours are usually returned within minutes.

CONNECTION DIAGRAM



SET-UP AND TESTING

Upon receiving your AR-2MF, you should connect and test the operation of the hardware to verify proper operation. Please set-up and test the AR-2MF as follows (Windows 2000, XP, Vista, Windows Server 2008, 2012, Windows 7, 8 or later). The use of the alternate relay command set requires Windows XP with service pack 3 or later operating system.

(1) Connect your AR-2MF Relay Interface to your computer USB port using a CC-USBB cable (1 to 10 foot). Use caution not to set the AR-2MF on a metal surface or damage could result. A high percentage of systems will already have a USB Com driver installed and this is indicated by a pop up balloon in the lower right side of your screen. The balloon message may automatically assign a com port to your AR-2MF and the com port assigned will be shown. If this occurs then make note of the com port for step 4 and go to step 2.

The balloon message may indicate that a driver has been located on your system and is being installed and after which a com port is assigned to the AR-2MF. If this occurs then make note of the com port for step 4 and go to step 2.

The balloon message may request to search Windows Update for the correct driver. If you are connected to the Internet, you may click yes and allow the USB com driver to be installed and after which a com port is assigned to the AR-2MF. If this occurs, then make note of the com port for step 4 and go to step 2.

With Windows 2000 or XP, the "Found New Hardware Wizard" may pop up. If you have an Internet connection, allow the wizard to connect to Windows Update and install the USB com driver, then go to step 2.

If none of the above actions occur or if an error message is shown, you may install the USB Com driver* from the supplied CD by clicking the "Install USB Com Driver" button in the CD start window. After the USB com driver is installed, disconnect your AR-2MF from the USB port, wait 5 seconds and plug back in. You may see a balloon message with the com port assigned to the AR-2MF (if not, you will find the com port assigned in step 2).

*before installing a new USB com driver, go to Control Panel/Device Manager/Ports to check if a Prolific driver is shown (expand the category by clicking on the + or arrow). If you see a "Prolific USB to Serial Comm Port (COM-)" entry, the number to the right of COM is your com port. Right click on the entry, then properties, then the driver tab to check the version. If you have an out of date version and an Internet connection, click the "Update Driver" button to install the updated driver. Please note that it may be necessary to remove the outdated Prolific Com driver before the updated driver will correctly install (the supplied CD driver installation feature has a remove option - click Install Com Driver and then remove).

(2) Check your USB Com driver by going to Control Panel/Device Manager/Ports (see detail on the next page for your Windows version) or click the "Open Control Panel" button on the supplied CD startup window. Click the small triangle (or +) to the left of Ports to expand the Ports category, right click the Prolific USB to Serial Comm Port, click properties and open the driver tab. Your USB Com driver must be Prolific version 3.4.62.293 or higher (dated 10/17/2013 or later). If your USB Com driver is up to date then please note the Com port number assigned and jump to step 3. If you are not using the alternate relay command set, your AR-2MF may function with older drivers but it is best to use the updated driver.

If your USB Com driver is not up to date, click the "Update Driver" button (under driver tab). If the driver does not update, disconnect the AR-2MF USB cable from your computer and install the updated USB Com driver (located on your AR-2MF CD from the start window, in the USB Com driver folder or from Windows Update). Please note that it may be necessary to remove the outdated Prolific Com driver before the updated driver will correctly install (the supplied CD driver installation feature has a remove option - click Install Com Driver and then remove).

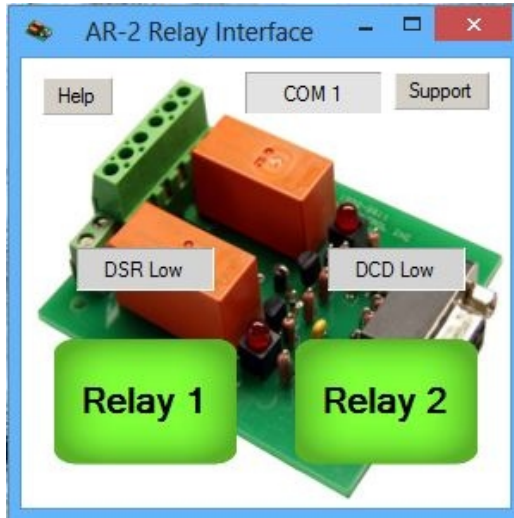
(3) After you have verified or installed an up to date USB Com driver, reconnect your AR-2MF Relay Interface to any available USB port on your computer and insert the AR-2MF CD. Install the AR-2MF Software App* by clicking the "Install Software App" button in the CD start window (if you have auto-start disabled, you may browse to the Windows Test Program folder and double click on setup.exe). A desktop icon for the AR-2MF will be created.

*Please note that the Microsoft .Net Framework must be installed on your system. If the .Net Framework is not installed on your computer, the installation program (AR-2MF Software App) will attempt to download and install the .Net Framework from the Microsoft web site through your internet connection. This may take 5 minutes or longer. In order for the .Net Framework to install correctly, your computer must be up to date with Windows update. This is especially important with Windows XP and Vista. You may update your computer by clicking on the start button, All Programs, Windows Update and clicking on "Check for Updates".

If your operating system is Windows 2000 or you are unable to install the Microsoft .Net Framework, you may install the older AR-2 Software App that may be used to test your AR-2MF without installing the .Net Framework (DTR/RTS command set only). Please review the readme.txt file for more information (in the AR-2 folder).

(4) After the AR-2MF Software App is installed, a pop-up will prompt you for the com port to be used with the AR-2MF Relay Interface. Enter the com port that was assigned in step 1 or 2. The App will exit and you will need to double click on the desktop icon to restart. The label at the top of the App should show the correct com port. The com port may be changed at any time by double clicking on the com label.

(5) Test your relays by clicking the relay buttons for each relay. The relay should energize when the button is red and de-energize when the button is green (see page 4).



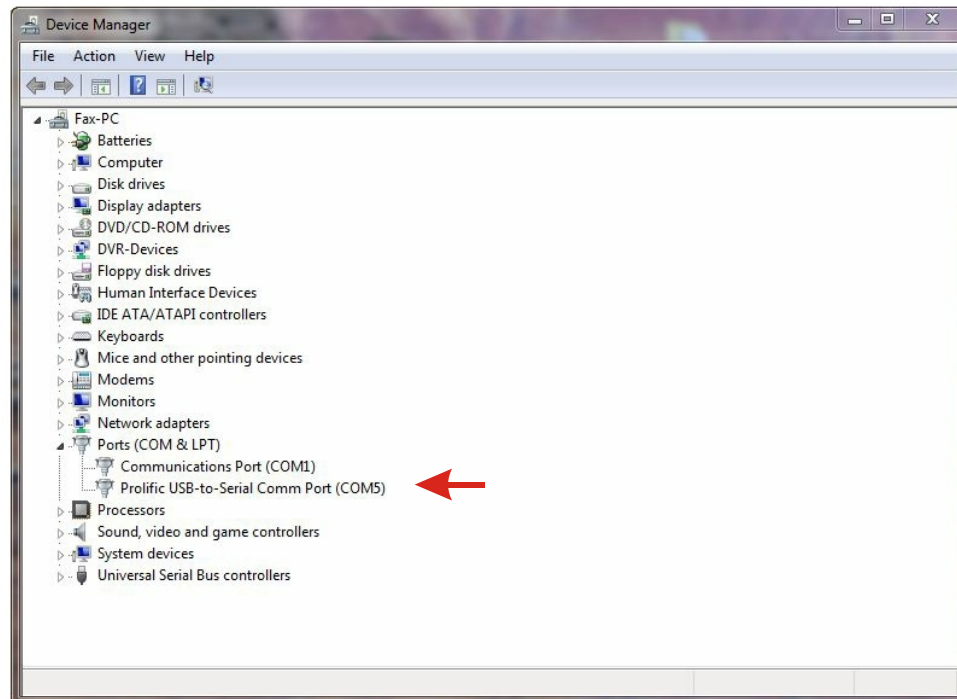
HOW TO OPEN DEVICE MANAGER

Windows XP, VISTA or Windows 7

Click the Start Button (lower left of screen), then Control Panel (right side). With the view set to classic view, small or large icons, click (or double click) the Device Manager icon. With Windows XP you will need to click the System icon (in Control Panel) then the Hardware Tab then the Device Manager button. You may also use the supplied CD to open Device Manager by clicking the "Open Device Manager" button when the CD auto starts.

Windows 8, 8.1 and Windows Server 2012

Move your mouse cursor to the lower right side of your screen and click on Settings. Click on Control Panel near the top and click on the Device Manager icon. You may also use the supplied CD to open Device Manager by clicking the "Open Device Manager" button when the CD auto starts.



TROUBLE-SHOOTING THE AR-2MF

(1) Verify that your USB com driver is installed by going to Device Manager and checking for the Prolific USB to Serial Comm Port entry. Right click on the entry, then Properties, select the Driver tab and verify that the driver is dated 8/15/2014 or later. If the driver is out of date, connect to the Internet and click the Update Driver button. Please note that an out of date driver may allow the AR-2MF to partially function and/or with erratic operation.

(2) Verify that the Prolific USB to Serial Comm Port entry is the com port used by your AR-2MF. You may do this by watching the entry in Device Manager and unplugging your AR-2MF from your computer USB port. The entry should disappear and then re-appear when you plug the AR-2MF back in to your computer USB port.

(3) If you are having a com port issue, check for another program that may be using the com port. You may right click the taskbar at the bottom of your screen, then Task Manager to view running applications (select the processes tab).

(4) Remove the AR-2MF USB cable from your computer, wait 10 seconds and plug back in. Go to device manager and verify that the com port shown is the com port that you have assigned to the AR-2MF. Repeat step 2.

(5) Try replacing the USB cable and/or using a different USB port.

SHARED USE

The AR-2MF may share a com port with the AR-16, ADC-4, ADC-16 or STA-16 (or other device, if the device does not use the RS-232 control lines in use by the AR-2MF).

THE AR-2MF EXPANSION PORT

The EX-8M Expansion card is used to add 8 relay outputs, 8 inputs or combinations of outputs and inputs. The EX-8M will also permit the control signals DCD, DSR & CTS to be monitored (making the AR-2MF a direct replacement for the AR-2S when connected to USB). Please see the EX-8M documentation for more information.

SETTING THE RELAY COMMAND SET

The default relay command setting for the AR-2MF is RTS/DTR which allows the relays to be directly controlled from almost all programming languages. The AR-2MF may be set to use the alternate relay command set by changing the shunts on the AR-2MF as follows:

DTR  2
 RTS  1
 Command Mode
 set to RTS/DTR

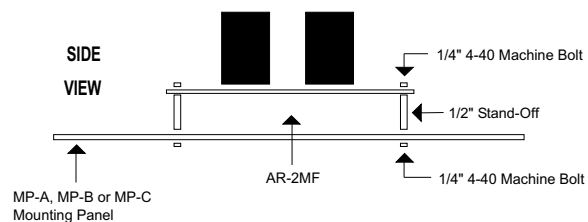
DTR  2
 RTS  1
 Command Mode
 set to Relay 1/Relay 2

CONTROL SOFTWARE

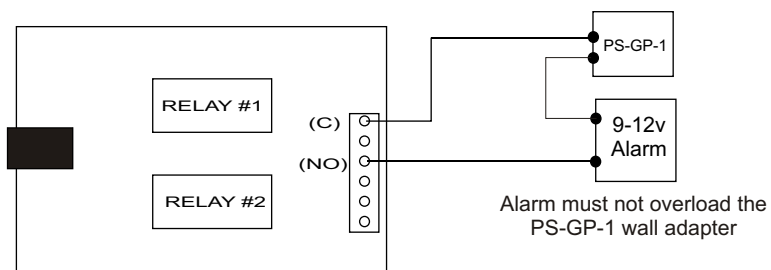
The relays on the AR-2MF are controlled with RTS and DTR which are com port control lines that are primarily used for controlling a modem (RTS=request to send and DTR=data terminal ready). The number 1 relay is energized by placing RTS high. The number 2 relay is energized by placing DTR high. Setting RTS or DTR low will de-energize the relay. The AR-2MF has an alternate relay command setting that will permit you to control the AR-2MF relays without the use of RTS/DTR. The EX-8M Expansion card (when attached) may be used to monitor the control lines DCD, DSR & CTS allowing the use of these signals for status input. One of these inputs may be used as a supervisory signal to sound an alarm on your PC in the event that the AR-2MF is disconnected. The AR-2MF may be used with any USB port on your PC and any USB com port supported by your system. Software examples are provided on the CD supplied with your AR-2MF Relay Interface. Examples are provided in Visual Basic 6, Visual Basic .Net, Visual C# .Net, ASP .Net and others. These examples will run in all Versions of Microsoft Visual Studio including Visual Studio Express.

MOUNTING OF THE AR-2MF

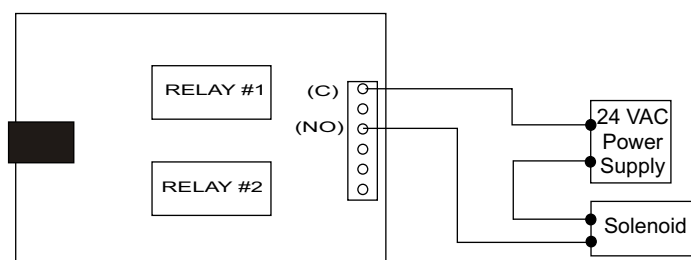
Four mounting holes are provided on the AR-2MF for mounting to stand-off hardware and an enclosure. The MT-1 stand-off kit is available for this purpose.



CONNECTION TO A LOW VOLTAGE ALARM



CONNECTION TO A 24 VOLT AC GATE SOLENOID



WARRANTY AND CARE OF THE AR-2MF

The AR-2MF Relay Interface is warranted against factory defects for a period of 90 days from the date of purchase. The AR-2MF has proven to be extremely reliable in actual operation during field tests. We recommend that the AR-2MF and associated hardware be installed in a suitable enclosure (4 mounting holes are provided on the circuit board).

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