ELECTRONICS

UDIN USB I/O
Low-cost USB Relay and Input Units

A low-cost and expanding range of USB based analogue and digital I/O units for desk-top or industrial DIN rail mounting. All units come with both Virtual Com port drivers so that they can be used with most legacy software packages or with a .DLL for direct programming. Supplied with cable, test programs and programming examples.

Specifications

- Low cost USB 1.1 or 2.0 interface
- All power derived from USB port
- Virtual COM port drivers - can be used with legacy software packages that can send ASCII text characters to a serial port.
- HyperTerminal and terminal emulator software compatible
- Data format - 9600 baud, 1 data, 1 stop no parity
- DLL drivers also available for direct programming
- For use with Windows ME, 2000, XP, Linux, MAC OS, Win CE.NET
- Can be used with ProfiLab, DAQFactory, LabVIEW, TestPoint, DASYLab, VEE, and most SCADA Packages.
- Many units can be connected to a PC via USB hubs
- Supplied with demo applications and programming examples
- Operating Temperature 0 to 70°C
- Desktop, panel or DIN Rail mount
- All I/O via screw terminals
- Moulded in grey UL94-V0 flame retardant PC
- Supplied with USB lead and installation CD

Description

The UDIN range consists of a USB interface, a micro-controller and relay outputs and/or opto-isolator inputs. The UDIN units are controlled by simple ASCII commands. The USB interface handles the USB protocols and present the ASCII commands to the micro-controller as serial data. The micro-controller then uses the commands to control the relays or report back input status.

The USB interface is based on the FT232RL device from FTDI – **www.ftdichip.com**. The FT232 provides a Serial to USB interface. FTDI provide drivers for a wide range of operating systems. There are generally two types of driver – a Virtual Com port driver (VCP) and a Direct-programming driver (D2XX). For Windows systems, these have been combined into a single driver known as the Combined Driver Model (CDM).

As the name suggests, the Virtual Com Port Driver install a virtual Com port on the computer system. The VCP emulates a standard PC serial port such that the USB device may be communicated with as a standard RS232 device. This is useful as it allows virtually any legacy software package that can send ASCII commands to a serial port communicate with the UDIN range.

The direct drivers bypass this VCP route, and allow direct access to a USB device via a DLL interface. This is more efficient than the VCP route.

For more information regarding the FTDI232RL, such as driver support, installation and programming guides please see **www.ftdichip.com**

Audon Electronics 123 High Road, Chilwell, Nottingham, NG9 4AT UK
Phone +44 (0)115 925 8412 Fax +44 (0) 115 925 9757 email info@audon.co.uk

Models

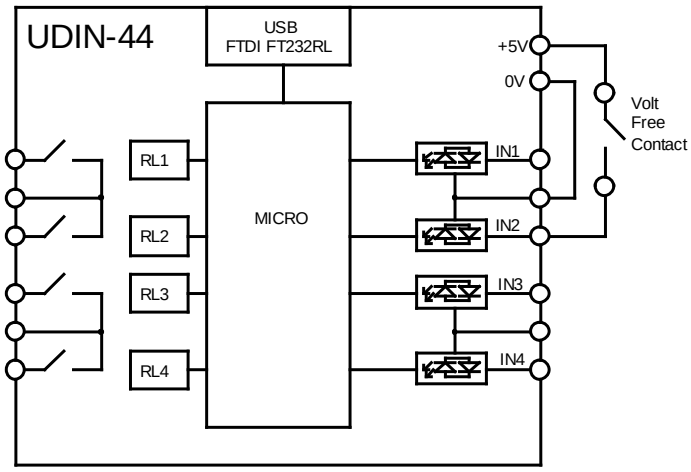
UDIN-44 – 4 x Relay 3A 250VAC, 4 x Opto-isolated Input 5-40VDC or Volt-free Contacts

Relay Outputs

- Relays occur in pairs with common centre
- Single pole, normally open contacts
- Contact rating 3A/250VAC, 3A/30VDC, Resistive
- Relay Type: Tyco PCN-105D

Isolated Inputs

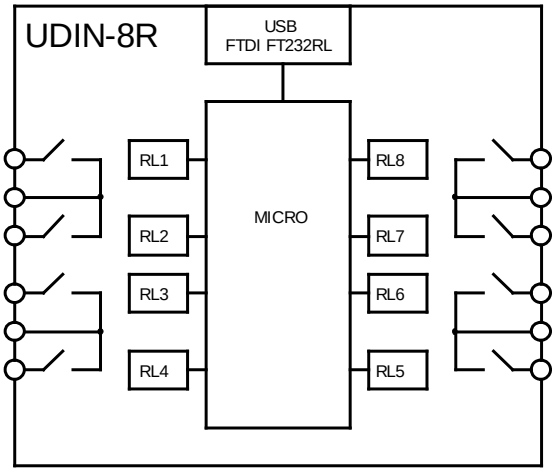
- Inputs occur in pairs with common centre
- DC Voltage: 5-40VDC polarity independent
- Volt-free contacts using on-board 5v supply
- Input current @ 5V: 0.8mA typically
- Input current @ 40V: 10mA typically
- Isolation: 5kV rms



UDIN-8R – 8 x Relay 3A 250VAC

Relay Outputs

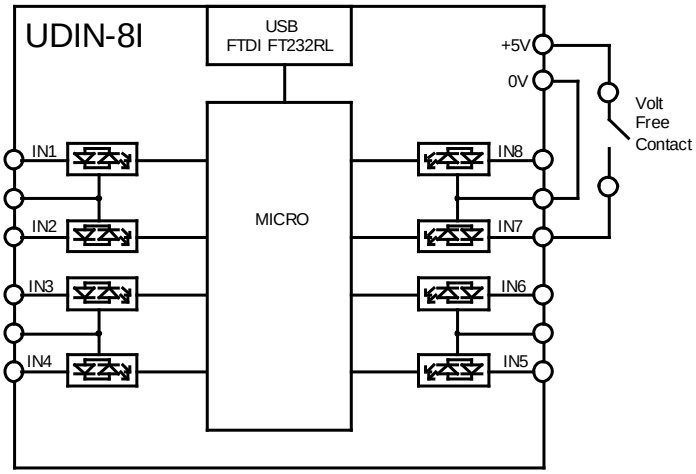
- Relays occur in pairs with common centre
- Single pole, normally open contacts
- Contact rating 3A/250VAC, 3A/30VDC, Resistive
- Relay Type: Tyco PCN-105D



UDIN-8I – 8 x Opto-isolated Input 5-40VDC

Isolated Inputs

- Inputs occur in pairs with common centre
- DC Voltage: 5-40VDC polarity independent
- Volt-free contacts using on-board 5v supply
- Input current @ 5V: 0.8mA typically
- Input current @ 40V: 10mA typically
- Isolation: 5kV rms



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Installation

The following description refers to Windows XP. Please refer to the installation CD for other operating systems.

- Insert the installation CD into your system
- Connect the UDIN unit to a spare USB port. The “Found new Hardware Wizard will start”. If the Wizard does not start automatically, select; Start -> Control Panel -> Add Hardware

- Select “Install from a list or specific location”. Tick the “Include this location in the search” and click on the “Browse” Button. Select “D:\Drivers\Windows XP”

- Click on the Next button

- If Windows XP is configured to warn when unsigned (non-WHQL certified) drivers are about to be installed, the following screen will be displayed. Click on "Continue Anyway" to continue with the installation.

- If Windows XP is configured to ignore file signature warnings, no message will appear.
- The following screen will be displayed as the driver files are copied from the CD to your system.

- Click the “Finish” button on the final Window. Your drivers are now installed.

Commands

A set of simple text commands are used to control the relays, return their status or read the inputs. Each command consists of a string of ASCII characters followed by carriage return (Enter ↵). Each character received is echoed back. On completion of each command, good or bad, a carriage return/line feed combination is output. If the command or parameter is invalid, the command is ignored.

Notes:

- Commands are not processed until the carriage return character is received.
- Commands must be in lower case only.
- Relays are numbered 1 to 8. Relay number '0' (zero) indicates ALL relays.
- Inputs are numbered 1 to 8. Input number '0' (zero) indicates ALL inputs.
- Where a decimal number is used, each bit within the binary equivalent indicates its corresponding relay or input. Bit 0 indicates relay or input 1, bit 1 indicates relay or input

nx – Turn a relay ON (where x = relay number)
Eg. "n3" – turn on relay 3
"n0" – turn on ALL relays

fx – Turn a relay OFF (where x = relay number)
Eg. "f3" – turn off relay 3
"f0" – turn off ALL relays

rx – Set ALL relays directly "x" is a decimal number. Each bit within the byte indicates whether the corresponding relay is operated or not. If the bit is '1' then the relay is operated, if the bit is '0' then the relay is released.
Eg. "r12" – relays 4 and 3 ON, 2 and 1 OFF
"r15" – all relays ON

sx – relay STATUS (where x = relay number) A '0' (zero) is returned if the relay is released, '1' if operated. The command "S0" returns the status of ALL relays. In this case a decimal number is returned. Each bit within the byte indicates the status of the corresponding relay.
Eg. "s3" – returns the status of relay 3
"s0" – returns the status of ALL relays

ix – INPUT status (where x = input number) A '1' is returned if the input is enabled, '0' otherwise.
The command "i0" returns the status of ALL inputs. As with the 's' command, a decimal number is returned. Bits 0-3 indicate the status of inputs 1-4. Bits 4-7 are unused and are set to '0'.
Eg. "i1" – returns the status of input 1
"i0" – returns the status of ALL inputs

A **special command, '?**', will return with the model number and the software date.

Testing

You can control the UDIN unit using a Virtual Com Port (VCP) or through software and direct .DLL function calls. You can test you UDIN unit through the VCP from a Terminal emulator program such as HyperTerminal. The UDIN drivers created a virtual com port on your PC system which can be used just like a real hardware com port.

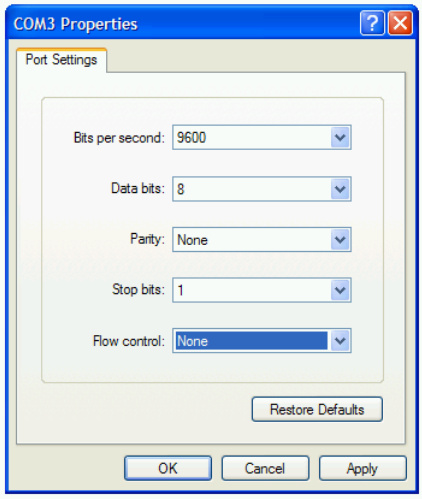
You can also use the supplied AudonUSB Application to toggle relays, check relay status and read inputs.

Using HyperTerminal

To start HyperTerminal select;

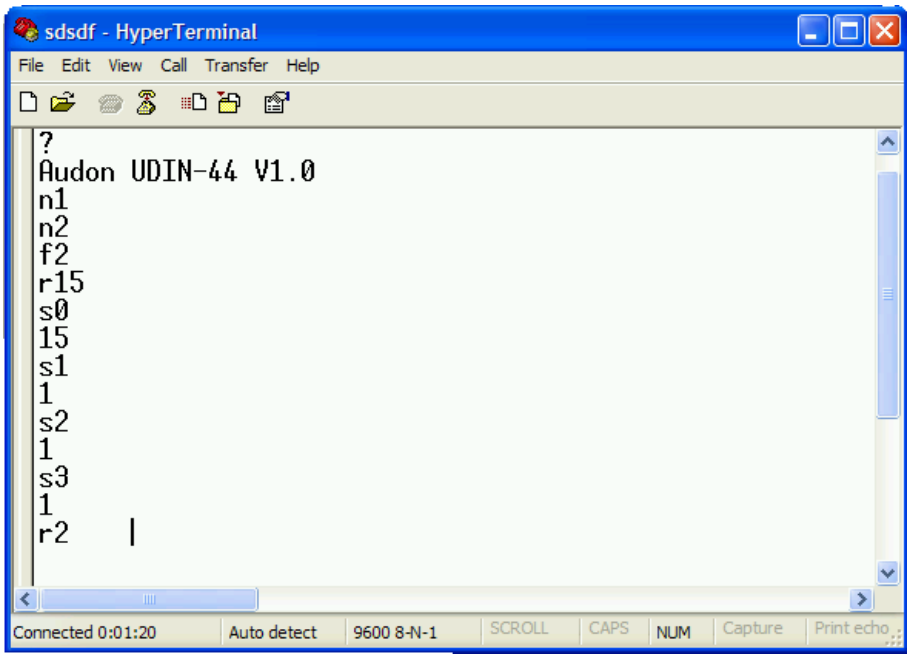
Start -> All Programs -> Accessories -> Communications -> HyperTerminal.

When it is run, it will first ask for a Connection Name. Enter a suitable name. The program will then present a Connection Window. Under "Connect Using" select the Virtual Com Port created when you installed the VCP drivers, and click on OK. Next you will be asked to enter Port Settings. Select;



Bits Per Second:	9600
Data Bits:	8
Parity:	None
Stop Bits:	1
Flow Control:	None

You can then start typing input and output commands as detailed above.

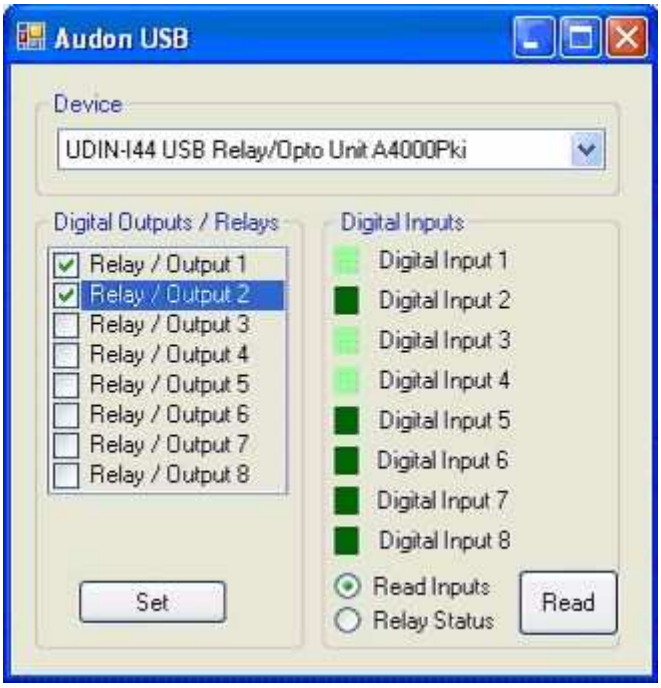


Windows Test Application

The UDIN units are supplied with a simple Windows application called AudonUSB written in VB.net. With AudonUSB, you will be able to toggle relays, check relay status and read inputs.

The application AudonUSB needs the .NET Framework version 2 installed on your system to work. This is included on the installation CD. In order to install the .NET Framework, the Microsoft Application Installer program also needs to be installed! This too is included on the installation CD.

Once the .NET framework is installed, simply run AudonUSB. The following screen will be displayed;



- Device – Drop-down box that shows all attached UDIN devices.
- Digital Outputs/Relays – use the tick boxes to specify the relay output state. A tick indicates relay-on. The selection is sent to the UDIN unit when the "Set" button is clicked.
- Digital Inputs
    - Read Inputs - when the "Read" button is clicked, the opto-input status is read.
    - Relay Status - when the "Read" button is clicked, the relay output status is read

The full source code is available on the installation CD. Rather than using the VCP, it uses the direct programming method, which uses .dll function calls. Full details can be found on the installation CD. Program examples using other programming languages will be added over time. Please check **www.audon.co.uk** for the latest downloads.

Audon Electronics would be happy to accept and publish user-written software. Please email to info@audon.co.uk

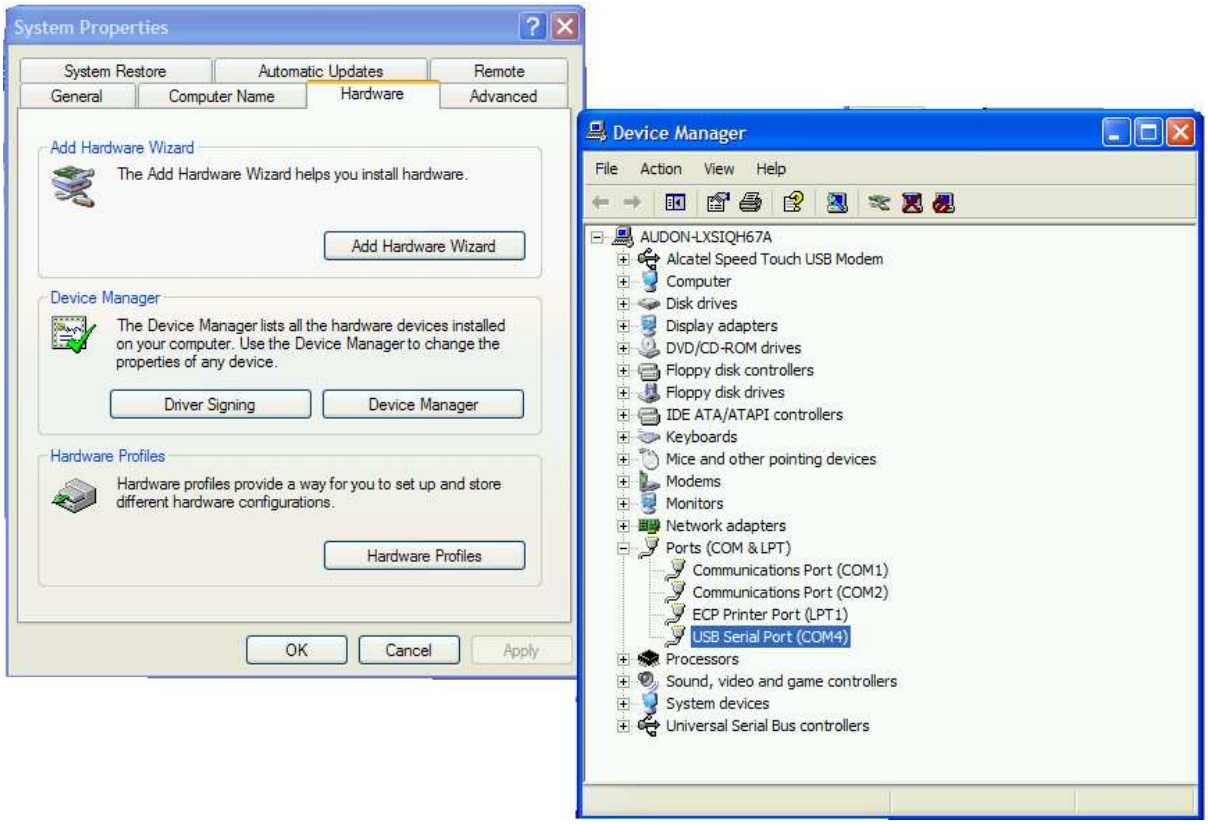
3rd Party Software

The UDIN range should be compatible with any 3rd party software package that can output and receive ASCII characters.

The drivers automatically assign a Com port number to the UDIN unit. It is possible to change this to a user selectable Com port. (Only Com ports that don't already exist can be chosen)

To change the Com port to a one of your choice;

- Open the Control Panel – Start -> Control Panel
- Double-click on the System icon
- Click on the Hardware tab
- Press the Device Manager button. A list of all your system devices will be displayed. Under Ports (COM and LPT) you will see USB Serial Port (COMx) where x is the Virtual Com Port number.



- Double-click the USB Serial Port and a Properties Window will appear.
- Click on the Port Setting Tab, and click the Advanced Button. You can then choose any available Com port Number.

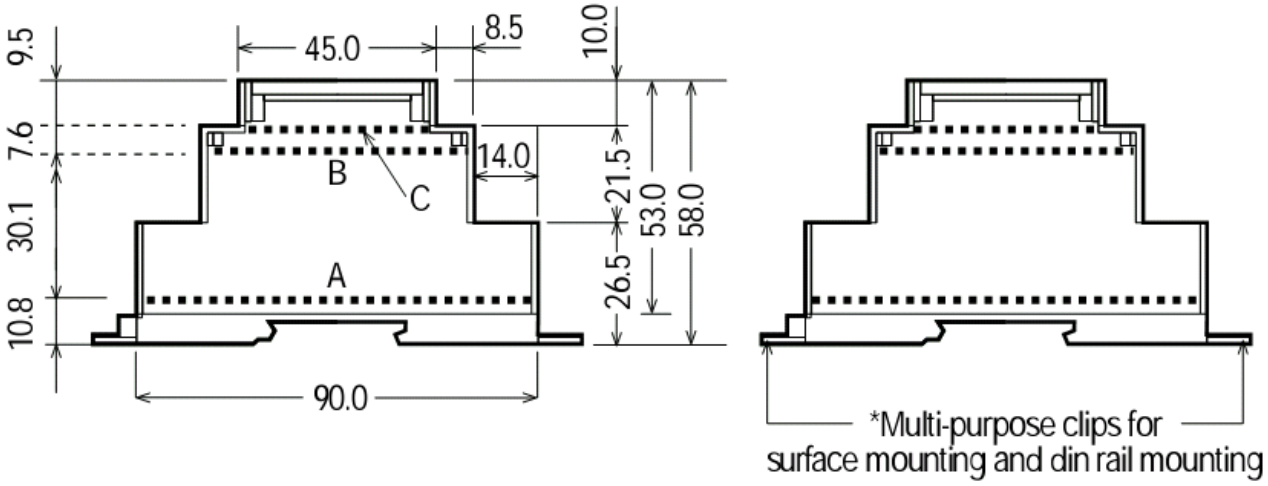
Software Support

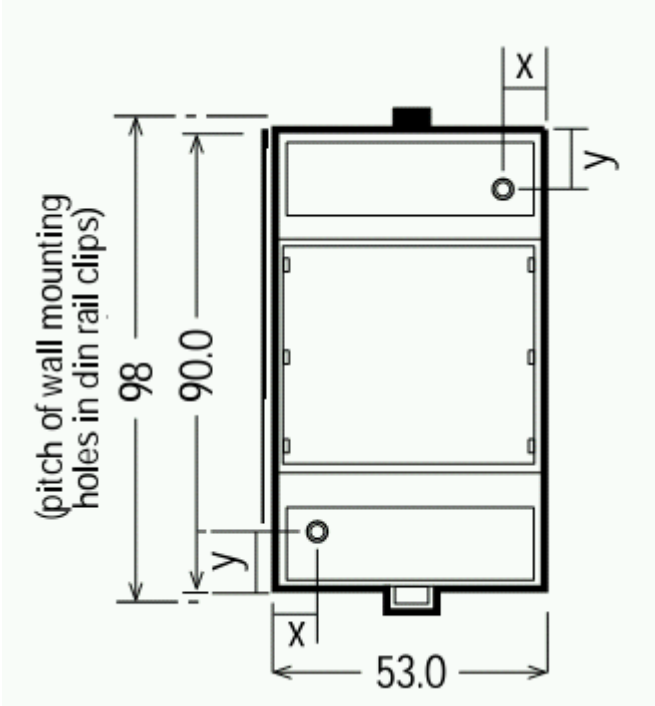
Presently drivers exist for the following operating systems;

- Windows 98, ME, XP, Windows Server 2003, Windows XP 64
- Linux
- MAC OS8, OS9 and OSX
- WinCE.Net Version 4.2 and above

Please see www.ftdichip.com for the latest driver support, installation and programming guides**.**

Dimensions





Mounting

The UDIN range can be desktop, panel or DIN rail mount. The units will clip on to standard 35mm DIN rail. The DIN rail mounting clips may be extended to reveal 4mm screw holes for fixing to a panel or wall.