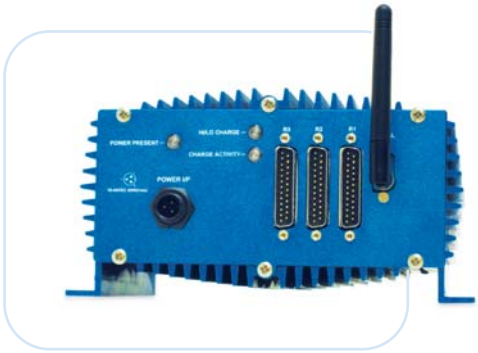
application notes

Using the µDAQ & Rugged µDAQ 62, 63 & 69 Series

Introduction

The µDAQ and Rugged µDAQ 62, 63 and 69 devices are the perfect solution for any process control application. This article will show you how to connect to your µDAQ and Rugged µDAQ device and control them via a software application. The µDAQ is a commercial grade device and the Rugged µDAQ an industrial grade device. The images here are examples of each type.



The µDAQ 62 & Rugged µDAQ 62 are optically isolated DC input devices. The µDAQ 63 & Rugged µDAQ 63 are signal-switching devices equipped with reed relays. The µDAQ 69 & Rugged µDAQ 69 are a combination of the 62 and 63 offering both optical isolation and signal switching capability. The devices are equipped with standard DB25 male connectors ensuring that inexpensive and straightforward connections can be made.

These devices are also available in various communication topologies including USB, RS232 serial, RS485 serial and wireless, which makes use of Bluetooth technology. The communication solution will depend on the needs of the application. USB can provide high speed access, RS232 medium range cable up to 50m with lower speed communications, RS485 long range low speed connections up to 500 m. The wireless connection can provide a short range solution where cables are not an option.

USB-62-16

SRL-63-32

BT-69-32

Features

Both the 62 & 63 series are available in 16-channel and 32-channel models. The 69 series has either 8 optically isolated and 8 reed relay channels or 16 optically isolated and 16 reed relay channels. Depending on the application any one of the units can provide a solution to an application. A combination of units can also be used in a high channel count applications. Multiple units will be configured in a star network connected to a main controller or computer. Software can easily access each unit independently.

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Specification

The optical inputs of the µDAQ 62 & 69 require 3V to register a logic high. Anything from 0V – 3V will be a logic low. The maximum input voltage is 28V and the maximum current drawn at this voltage is 50mA. The input isolation voltage for the opto-coupler is 2500V(rms).

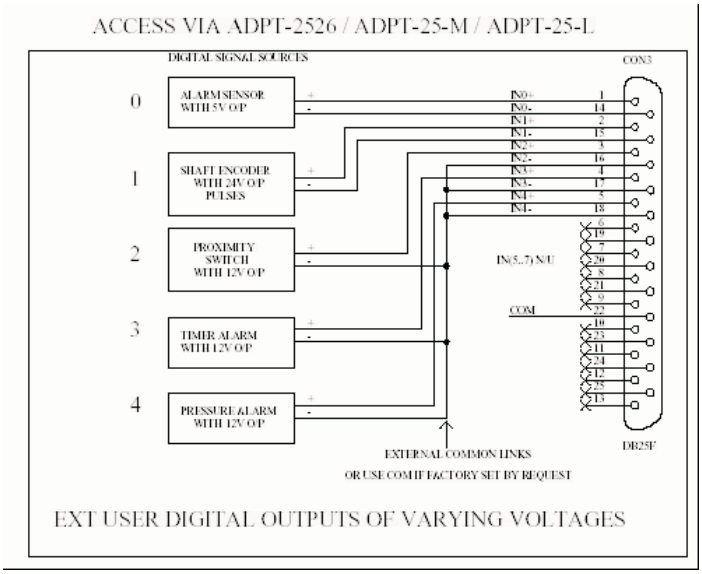
The reed relays have an on-time of 0.5 ms and off-time of 0.1ms. The maximum rated power of the relay is 20W and a peak DC voltage of 200V. The maximum DC switching current is 1 ampere.

SRL-62-16 - Rear View

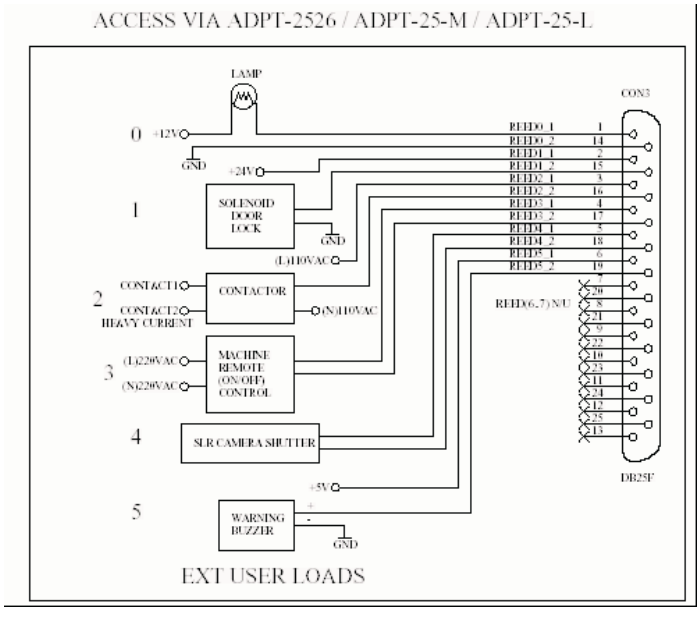
Applications

The µDAQ 62 will be suited for applications where the input voltage exceeds logic voltage levels and the µDAQ 63 can be used to switch AC or DC signals. The µDAQ 69 offers a combination of optical isolated inputs and reed relays.

The optical isolation inputs can be used to monitor alarm sensors and positional proximity switches in factories. Factories normally use a standard DC voltage of 24 volt to indicate an active status or alarm. This voltage can be directly interfaced into the µDAQ 62 device ensuring not to exceed 28 volt. The application circuit below shows how to connect to the µDAQ 62 & 69 device taking into account the polarity of the optical inputs. This is very important since it is an LED inside the opto-coupler that needs to switch-on to register a logic high.



Reed relays are widely used to switch critical signals, since it has a physical contact, no on resistance and no polarity. Reed relays be used to route analog signals like phone lines or analog sensor outputs for example pressure transducers. It can also be used to control indicator lights up to 200 volt DC not exceeding 20 watt or 1 ampere maximum. This makes them versatile and can be used in almost any low current signal switching application. The circuit here shows a typical connection diagram for a µDAQ 63 & 69 device.



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Programming the 62, 63 & 69

The µDAQ and Rugged µDAQ 62, 63 and 69 is supplied with the EDR Enhanced software development kit. This includes drivers for Windows, Pocket PC and Linux. The µDAQ and Rugged µDAQ manual provides a step-by-step installation routine of how to configure your µDAQ device. Please ensure that your device is operational before attempting to run the code below.

Reading the optical-inputs

```
/*
*       Program will read a port and display the input status of each channel.
*/
#include "EDRAPI.h"
#include "stdio.h"

/*
*       Global variables
*/
bool Channel[8];
int Serialnumber = 1000003582;          //device serial number

/*
*       Function will read a port and will set the corresponding variable in the
*       Channel array for a channel that is reading a high input.
*       Function will return false if port read failed for some reason.
*/
bool GetInput(int port)
{
        int ret;
        unsigned long input;

        ret = EDRE_DioRead(Serialnumber, port,&input);
        if(ret < 0)
        {
                return false;
        }

        for(int x = 0; x < 8; x++)
        {
                Channel[x] = ((input & 1<<x) == (unsigned
long)1<<x);
        }

        return true;
}

int main(void)
{

        if(GetInput(0))         //read port 0
        {
                for(int x = 0;x < 8;x++)
                {
                        printf("Channel %d = %d\n",x,Channel[x]);
                }
        }
        else
        {
                printf("Port read failed!\n");
        }

        return 0;
}
```

Controlling the reed relays

```
/*
*       Program will read a port and display the input status of each channel.
*/
#include "EDRAPI.h"
#include "stdio.h"

/*
*       Global variables
*/
bool Channel[8];
int Serialnumber = 1000003582;          //device serial number

/*
*       Function will write the status of the Channel array variables to a port.
*       Function will return false if the write failed.
*/
bool SetOutput(int port)
{

        unsigned long output = 0;
        int ret;

        for(int x = 0;x < 8;x++)
        {
                output |= Channel[x]<<x;
        }

        ret = EDRE_DioWrite(Serialnumber, port, output);
        if(ret < 0)
        {
                return false;
        }
        return true;
}


int main(void)
{

        bool set = false;
        for(int x = 0;x < 8;x++)
        {
                Channel[x] = set = !set;
        }

        if(SetOutput(1))        //Write port 1
        {
                printf("Success!\n\n");
        }
        else
        {
                printf("Write failed!\n");
        }

        return 0;
}
```

Conclusion

The DAQ and Rugged DAQ optical-isolated and reed relay devices can provide solutions to many process control applications based inside factories or laboratories. They are simple to install and custom software programs can be developed with limited programming skills. Installations are easy to replicate saving costs on installation time.

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