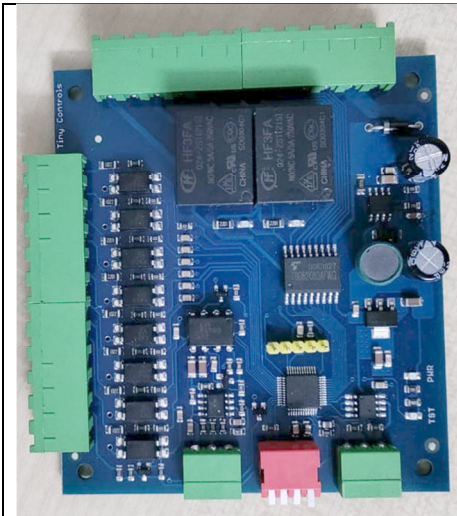




*TIO-0808, Mixed signal Input-Output card with RS-485 interface.*



***Document: Operation Manual  
Document #: 31  
Document Rev: 1.00***

***Product: TIO-0808  
Product Rev: 1.0  
Created: Nov, 2022  
Updated: --***

**THIS MANUAL CONTAINS INFORMATION FOR INSTALLING AND OPERATING THE FOLLOWING PRODUCT:**

**TIO-0808, I/O CARD WITH RS485 INTERFACE (MAY BE REFERRED AS “IO-0808” IN THIS DOCUMENT)**

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## *GENERAL DESCRIPTION*

*The Tiny Controls TIO-0808 is a general purpose I/O interface card with mixed type inputs and outputs with RS-485 interface.*

*IO-0808 can be used along with our other Rs-485 based products like stepper motor driver or other interface cards to build a versatile automation/control application that can be controlled through custom GUI based application on computer or can be used along with custom controller*

## *PHYSICAL AND ELECTRICAL CHARACTERISTICS*

***Supply Voltages:*** 24 V DC

***Ideal/Max Current Consumption :*** 1.2 ~ 7.0 A

***Analog Input :*** 0-10V non-isolated

***PWM Output :*** 3.3v Duty and frequency variable, non-isolated

***Analog Output:*** 0-10V isolated

***Digital Inputs:*** 8 opto isolated

***Outputs :*** 6 open collector for driving relays

***Relay :*** 2 on board relays with N/O connections

***Indicator :*** Test LED blink rate can be manipulated over RS-485

***Address/Baud :*** DIP switch selectable

***RS-485:*** For programming parameters and working in Online mode

***Maximum operating Temperature:*** 70 degree Celsius (158 F).

## CONNECTIONS AND SETTING

Refer to below tables for device address, baud-rate settings

<b>Card Address Selection</b>			
<b>Address</b>	<b>S1</b>	<b>S2</b>	<b>S3</b>
<b>17</b>	OFF	OFF	OFF
<b>18</b>	ON	OFF	OFF
<b>29</b>	OFF	ON	OFF
<b>20</b>	ON	ON	OFF
<b>21</b>	OFF	OFF	ON
<b>22</b>	ON	OFF	ON
<b>23</b>	OFF	ON	ON
<b>24</b>	ON	ON	ON

<b>Baud Rate</b>	<b>S4</b>
<b>9600</b>	OFF
<b>38400</b>	ON

**Download Demo software from our website, Refer to next section for RS-485 commands and protocol.**

**RS-485 Terminal:** Connect to RS-485 bus, maximum eight IO-0808 devices can be connected on the same BUS (8 device limit is only for this card, along with max 8 IO cards, other type of devices can be connected as our each type of RS-485 device have a different settable address range), make sure NO two devices on the BUS are set to same address.

Always terminate with proper BUS resistor (120 ohm) at the last device on the BUS.

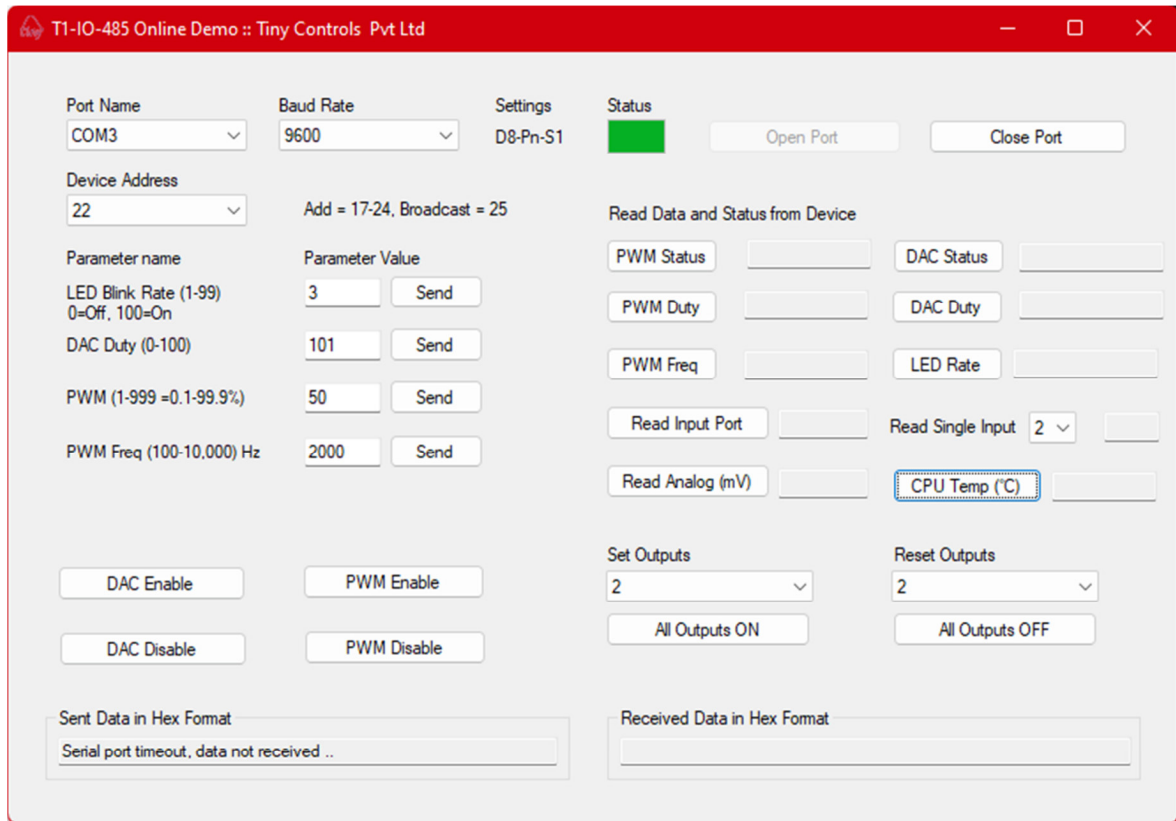
### **RS-485 Frame format and command structure**

RS-485 frame consists of 8 bytes (0x denotes a hex number, but decimal equivalent number can be sent):

- Start byte, always 0x5A followed by
- One Address byte ( 0x00 to 0x0f ) followed by
- One byte Parameter Number (or Command Number) followed by
- Four bytes Parameter Value (Least significant byte first ) followed by
- End byte, always 0xA5

<b>Command List</b>			
<b>Command Type</b>	<b>No</b>	<b>4 bytes of Data</b>	<b>Data Range</b>
<b>Write Commands</b>			
<b>Set Analog(DAC) Duty</b>	0x00	0xNNNNNNNN	0 to 100% of isolated voltage
<b>Set Analog (DAC) Enable</b>	0x01	0xNNNNNNNN	0 =Disable 1 = Enable
<b>Set PWM Frequency</b>	0x02	0xNNNNNNNN	100 ~10,000Hz
<b>Set PWM Duty</b>	0x03	0xNNNNNNNN	1~99.9%
<b>Set PWM Enable</b>	0x04	0xNNNNNNNN	0 =Disable 1 = Enable
<b>Set Output Pin ON</b>	0x05	0xNNNNNNNN	1 ~ 8
<b>Set Output Pin OFF</b>	0x06	0xNNNNNNNN	1 ~ 8
<b>Set Output Port</b>	0x07	0xNNNNNNNN	0x00 = All Off, 0xFF = All On (or any combination in between)
<b>Set LED Blink Rate</b>	0x0A	0xNNNNNNNN	1~99 per sec (0=Off, 100=On)
<b>Read Commands</b>			
<b>Read Analog(DAC) Duty</b>	0x10	0xNNNNNNNN	Sent data irrelevant (Return value 0 to 100% )
<b>Read Analog (DAC) Status</b>	0x11	0xNNNNNNNN	Sent data irrelevant (Return value 0 =Disabled, 1 = Enabled)
<b>Read PWM Frequency</b>	0x12	0xNNNNNNNN	Sent data irrelevant (Return value 100 ~10,000Hz)
<b>Read PWM Duty</b>	0x13	0xNNNNNNNN	Sent data irrelevant (Return value 1~99.9%)
<b>Read PWM Status</b>	0x14	0xNNNNNNNN	Sent data irrelevant (Return value 0 =Disabled, 1 = Enabled)
<b>Read Input Pin</b>	0x18	0xNNNNNNNN	1 ~ 8 (Return value 0 =Disabled, 1 = Enabled)
<b>Read Input Port</b>	0x19	0xNNNNNNNN	Sent data irrelevant (Return value between 0x00 ~ 0xFF)
<b>Read Analog Input</b>	0x1B	0xNNNNNNNN	Sent data irrelevant (Return value Voltage (mV))
<b>Read CPU Temperature</b>	0x1C	0xNNNNNNNN	Sent data irrelevant (Return value Degree Celsius)

**Demo Software:**



Visit our Website at <https://www.tinycontrols.com> to download demonstration software as shown above and setup our product in minutes.

***Connection Diagram:***

*USER NOTES:*