



## FEATURES

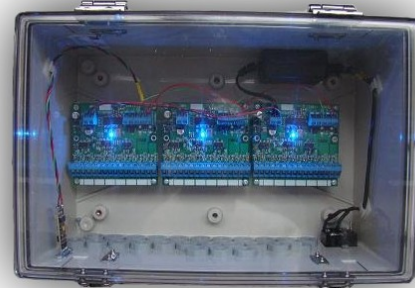
- POWERS AND MEASURES THE SIGNAL OF 24 LOOP POWER 4-20 mA SENSORS
- PC MASTER SOFTWARE COLLECTS DATA, DISPLAYS ALL SIGNALS AND STORES THE DATA IN A SPREADSHEET WITH AN ELAPSED TIME STAMP
- 0.01% FS ERROR, TYP.
- REMOTE OR LOCAL START/STOP OF THE DATA LOGGING AND THE STOP WATCH
- ALL DATA CAN BE READ UP TO 15 TIMES PER SECOND
- ALL INPUTS PROTECTED
- UNIVERSAL POWER: 90 – 264 VAC, 45-65 Hz
- TWO WIRE RS485 MODBUS RTU
- USB TO RS485 CONVERTER BUILT-IN
- STOP WATCH TIME ERROR LOWER THAN 1 ms
- RS485 IS 1/8 LOAD
- HIGH PROTECTION ON THE RS485
- BUILT-IN TERMINATION RESISTORS, JUMPER SELECTABLE
- MODBUS RTU COMPLIANT
- LOW POWER CONSUMPTION
- SMALL SIZE

## APPLICATIONS

- TO POWER AND MEASURE ANALOG SIGNALS FROM VARIOUS SENSORS AND DEVICES
- DATA COLLECTION
- DATA LOGGING
- REMOTE MONITORING
- FLOW MEASUREMENT
- TEMPERATURE MEASUREMENT
- PRESSURE MEASUREMENT

### 1. DESCRIPTION

GDAS24A is a complete data acquisition system that powers up to 24 sensors or devices that provide a loop power 4-20 mA signal, measures the signal, displays all the data on the screen of a PC and logs the data. It measures all inputs twice a second with an error lower than 0.01% FS typ., filters and conditions their signal. The data logging can be started or stopped remotely or locally. If a switch, relay or an electronic open drain output is connected to the special terminals and remote mode is chosen on the screen the PC software logs the data when the switch is closed. If local mode is chosen on the screen of the PC then there is a start/stop button on



the screen which controls the data logging.

The system consists of 3 boards [GDA8A](#), power supply, wiring and a USB to RS485 converter. A USB-B connector provides a connection to the PC.

If the system is to be mounted remotely then a twisted pair can be connected directly to RS485 terminals and the converter will be needed at the PC side. This way the hardware of the system can be away from the PC but still communicate reliably.

Each board can also be mounted at a different place in its own enclosure but still be part of the system and communicate reliably with the PC.

The high protection of all inputs, the power supply and RS485 connection ensures high reliability and accuracy.

Blue LEDs provide indication for the inputs being measured, while green and yellow LEDs provide indication about sending and receiving data over the RS485 network.



## 2. ABSOLUTE MAXIMUM RATINGS \*

Operating temperature	-20 °C to +70 °C
Power supply voltage	90-264 VAC
Power line frequency	45-65 Hz

\* **NOTICE: Stresses above those ratings may cause permanent damage to the device.**

## 3. CHARACTERISTICS

Parameter	Conditions	Min	Typ	Max	Units
<b>Power Supply</b>					
Voltage	25 °C	90		264	V AC
Power Consumption	25 °C, all inputs at 20 mA, communicating			15	VA
<b>Inputs</b>					
Input resistance	Input 4-20 mA, 25 °C		207		ohm
<b>Sensor Power</b>					
Voltage	25 °C		24		V DC
<b>Analog Inputs Accuracy</b>					
Error	Input 4 – 20 mA, 24 V, 25 °C, NOTE 1		0.01		% FS
Temperature coefficient	Input 4-20 mA, -20 °C to +70 °C		30		ppm/°C
<b>Stop Watch Accuracy</b>					
Error	Open drain electronic switch, 24 V, 25 °C, NOTE 2			1	ms
<b>Communication</b>					
Sampling rate	All data – 24 analog channels and stop watch of board 1	15			Times per second

**Note 1:** The parameter includes all errors, non-linearity and noise at constant voltage and temperature. Only one input is connected and measured.

**Note 2:** If an electro-mechanical switch, button or dry contact is used there will be a bouncing time of the mechanical contact. The error will be higher and an external filtering capacitor across that contact will be needed.

## 4. INSTALLATION

The boards, the power supply and the communication hardware are mounted and wired inside the enclosure.

### 4.1. Hardware

**4.1.1.** Connect the GDAS24A system to your PC using a USB-A to USB-B cable. The USB to RS485 converter will be seen on the PC in the list of COM ports. You may need to install the driver(s) for that converter.

**4.1.2.** If the system is mounted remotely then a twisted pair has to be connected directly to terminals A and B on one of the boards. At the PC side an RS485 to RS232 or USB to RS485 converter has to be used to connect



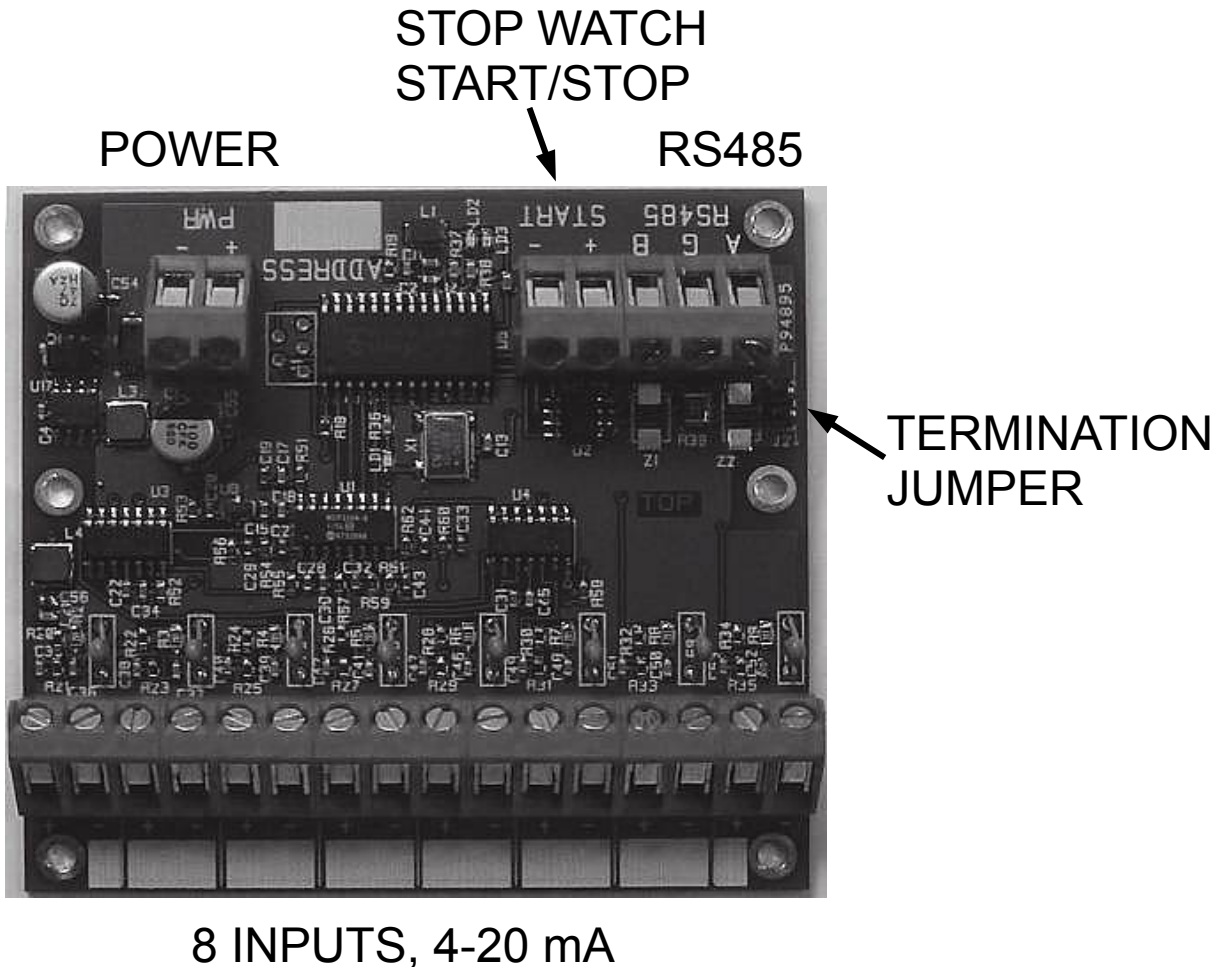
to the PC.

**4.1.3.** If the data logging is to be started remotely connect a switch to the special terminals on board 1. The PC software will log the data when the switch is closed.

**4.1.4.** Connect all sensors to the input terminals on the boards inside the enclosure. They are numbered from 1 (left most) to 24 (right most)

**4.1.5.** Connect the power. The hardware will start operating immediately and will be ready to communicate to the PC.

**4.1.6.** If the system is connected at the end of a network or is at a long distance from the PC a termination of the line may be needed. Shorting the jumper on one of the boards (only) will provide the standard line termination.





## 4.2. Software

The installation of the PC software is extremely easy and simple. There is only one executable file on the CD named GDAS24A.exe . Create a new folder on your hard disk with a name GDAS24A for an instance and copy that executable file in it. That is all you need to do in order to start working with the system software.

## 5. PC SOFTWARE OPERATION

After starting the GDAS24A.exe file it will open a window and show an **Input Configuration** button. Clicking on it will open a new window where the configuration settings for all inputs must be entered. For each input you need to enter the value of the parameter at 4 mA (0%), the value for 20 mA (100%) and the units of that parameter.

**Example:** The input signal comes from a [GTT101](#) temperature transmitter that produces 4-20mA for temperatures in the range of -18 to +149 °C. For that input you need to enter -18 for 0%, 149 for 100% and °C (or degC) for units.

There is a **cut off (in %)** for each input which helps to adjust the system to any sensor. Most of the sensors will produce a current slightly different from 4.000 mA (i.e. 4.03mA or 4.01 mA, etc.) and without a **cut off** the system will show some value even if the parameter measured is at its 0% value.

**Example:** The input is connected to a flow meter that produces 4.02 mA (instead of 4.000 mA) at no flow. The system will measure 4.02 mA and will show a flow even if there is no flow through the flow meter. Having a cut off of 0.2% will clear the flow reading for that input.

After entering the above settings for all inputs click OK. The window will close and the program will go to the main window. On the left there will be 2 radio buttons where you can choose between local and remote start of the data logging.

### 5.1. Remote start

If the remote start button is chosen there must be a switch connected to the special terminals on board number 1. This can be a ON/OFF switch, relay contact or an open drain/collector electronic switch. On the top-left of the screen there is a list with the available serial ports. Choose the port where the system is connected to and click **Connect**. The software will connect to the boards, will check and validate them and will start receiving data from them. The screen will show the value for each input but will not log the values until the remote switch gets closed. After the switch closure the system will create a file with a unique name and will start writing data in it. Clicking **Disconnect** will stop the data logging and close the file. Opening the remote switch will have the same result.

The file name is in the format YYMMDD\_HHMMSS.cvs where:

=YY, MM, DD are year, month and day

=HH, MM, SS are hour in 24 hour format, minutes and seconds

Having such name of the file makes it meaningful and makes sorting, searching and archiving easier.



## 5.2. Local start

If the **local start** radio button has been chosen clicking **Connect** will connect to the boards but it also will create a new button **Start Logging**. Clicking on it will start the logging and its label will change to **Stop Logging**.

## 5.3. Time out

There is a field on the right named **Log Time Out** where a time out up to 20,000 seconds can be entered. Having the time out value set correctly will prevent from having huge files in case of forgetting to stop the logging. After the time out expires, the software will automatically stop the logging and close the file.

**If the system works in remote start mode and the time out expires, a new start can be made only if the switch opens for at least 1 second and closes again.**

## 5.4. Exiting the program

Exiting the program can be done by clicking on the cross at the upper right corner or using Alt+F4 buttons. If the input configuration has been changed a window will appear and clicking on **Yes** will save these changes.

All the data files and the configuration file are created in the same folder where GDAS24A.exe is.

## 6. ORDERING

For ordering please use the following G Instruments part numbers:

<i>Description</i>	<i>G Instruments PN</i>
GDAS24A, 24 analog inputs 4-20 mA loop power data acquisition system	30186
GDAS24A, MODBUS Master monitoring and data logging software	30187



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