

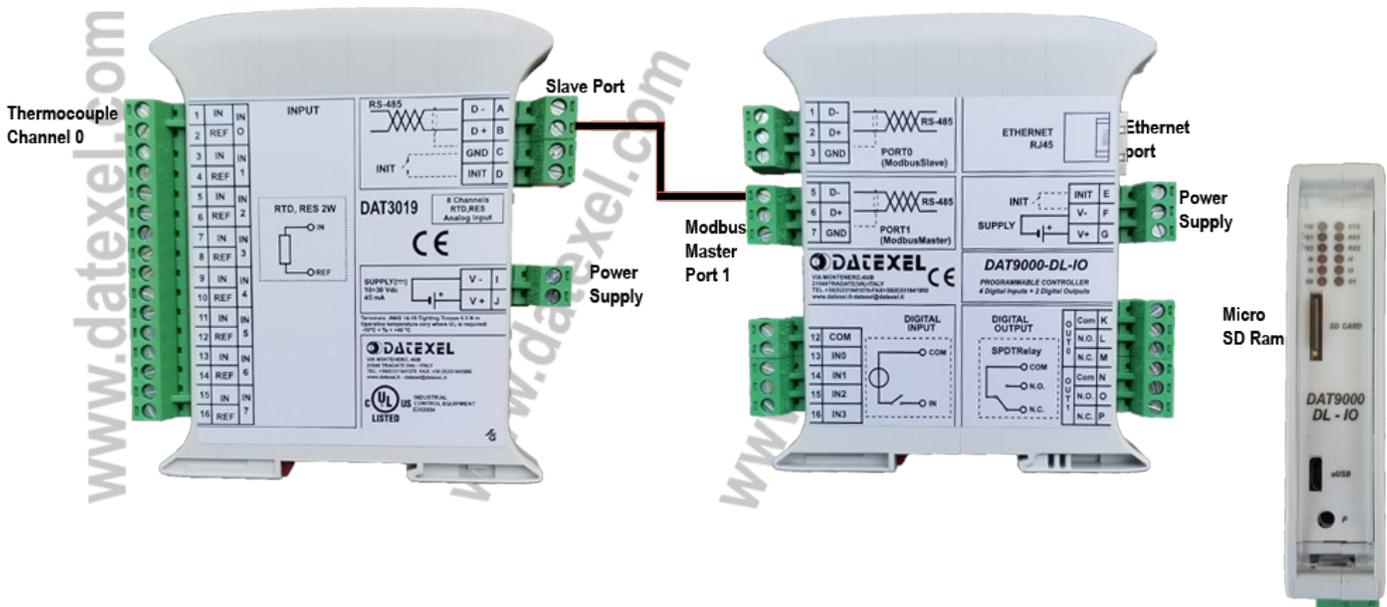
# DATEXEL LLC

## Logging Temperatures over Modbus RTU RS485 with DAT9000DL Version 2.

This application is converting an RTD Sensor input on a DAT3019 to a register. The DAT9000DL Modbus Master polls the DAT3019 and stores the temperature reading to its own register and then saves it to an SD RAM card.

### Start-up.

1. The DAT3019 eight channel Modbus Slave has a Baud rate of 9600, Parity None, 1 Stop bit and it is Address 20.
2. You can connect to the DAT9000 V2 with Ethernet, uUSB or on the RS485 Slave port. For this application we have decided to connect with the Ethernet Port using a cross-over Cat-5 cable.
3. The minimum time period between logs is 10 Seconds.



Wiring connections for DAT3019 and the DAT9000DL.

1. Connect power to the DAT3019 and the DAT9000 DL Version 2 Modbus Data Logger Master Controller.
2. Connect the DAT3019 Modbus Slave port to the DAT9000 Modbus Master Port.
3. Connect Cat 5 crossover cable to the Ethernet port and PC.
4. Connect an RTD Temperature calibrator to the channel 0 input.
5. Download Dev9K Version 2 software from Datexel download page and run software.

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Call 561 779 5660 for Technical Support.

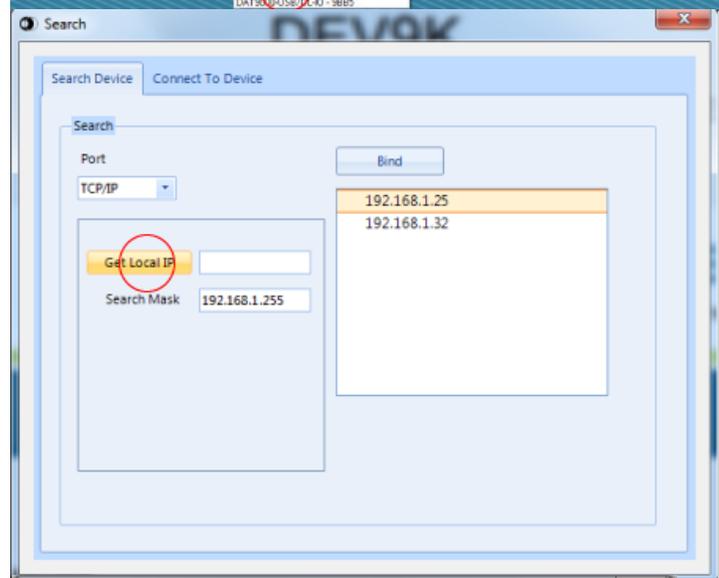
## Connecting to the Dev 9K V2.

1. Select English.
2. Select DAT9000DL from the drop down menu.
3. Click Connect.



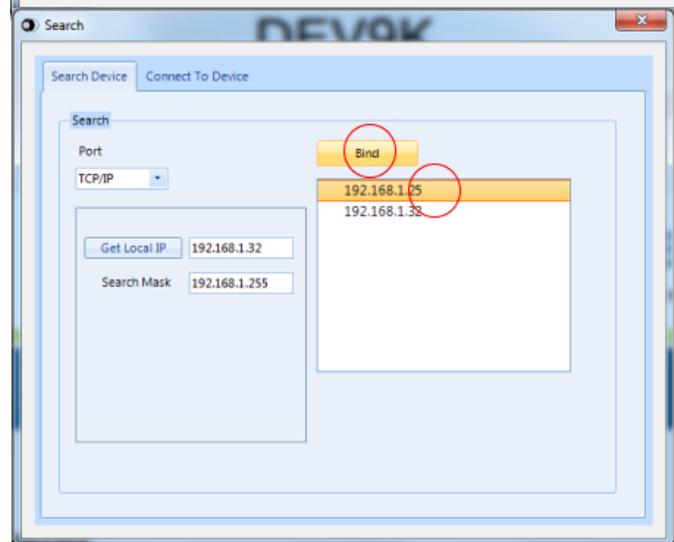
## Search for the Modbus Master.

1. Click Get Local IP.
2. This will display the Local IP address of the PC.



## Bind the IP Address.

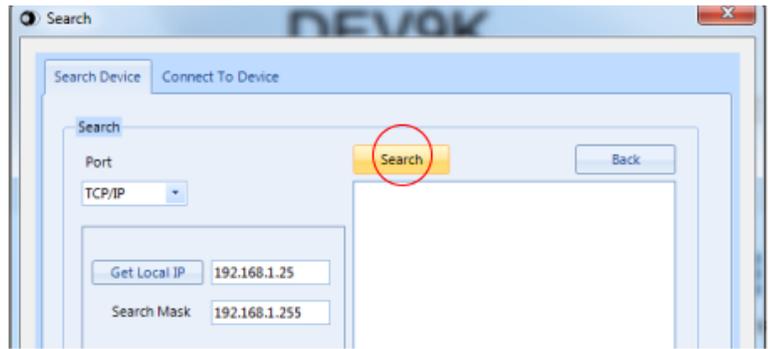
1. Click on the IP address of the network of the DAT9000DL.
2. Click Bind.



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## Search for the Modbus Controller.

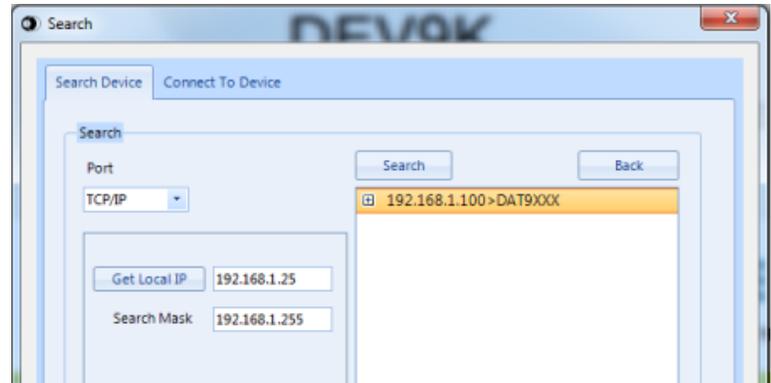
1. The Search Button should appear.
2. Click Search.



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## The IP Address Appears.

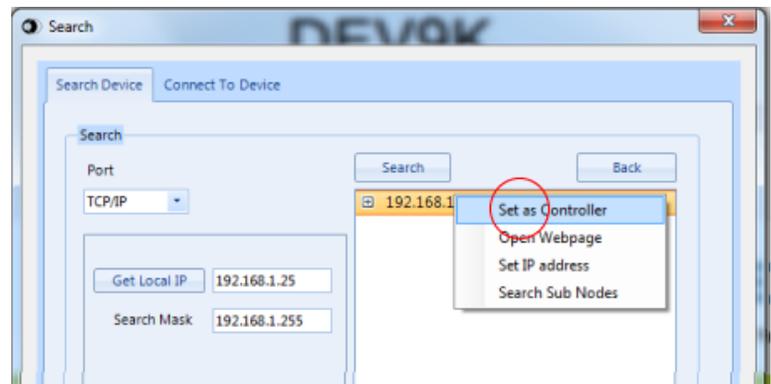
1. The IP address on the DAT9000DL should appear.
2. If the IP address does not appear turn off the virus protect or firewall and check that you have a cross-over cable.



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## Set as Controller.

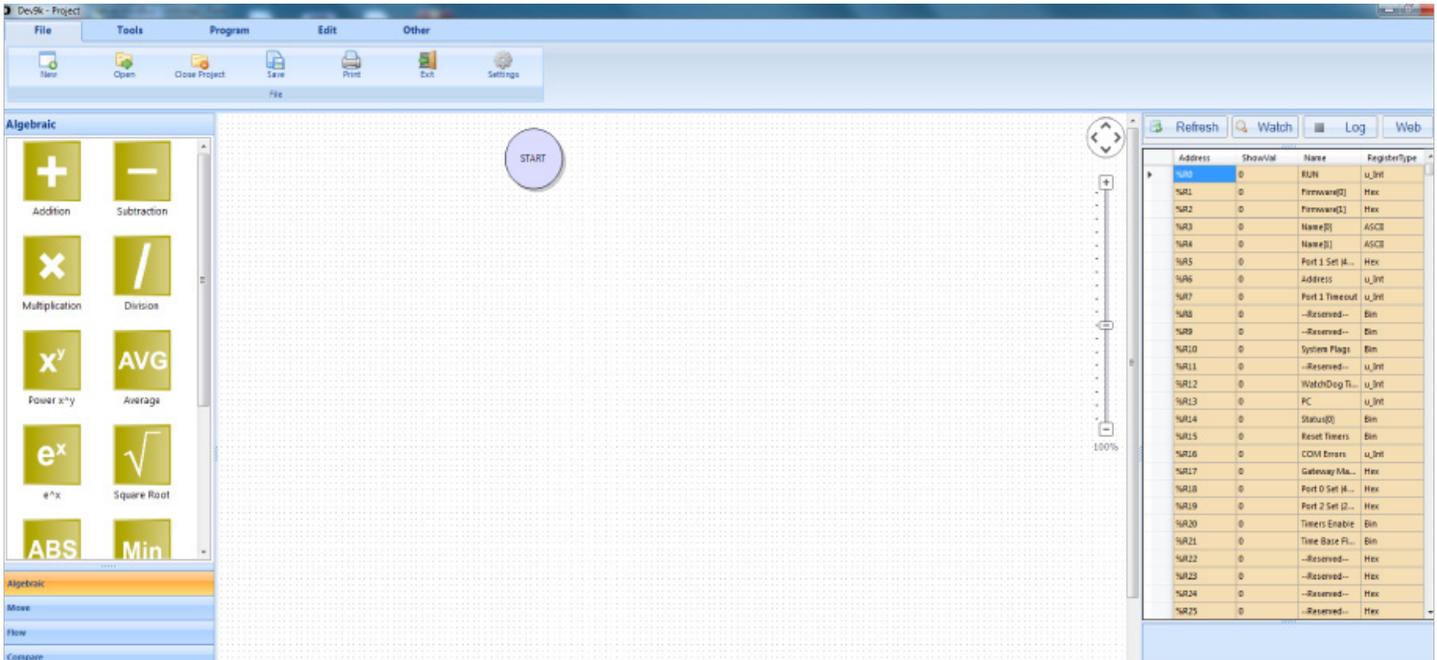
1. Right click "Set as Controller".
2. The Program page should now open.



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# The Control Screen Opens.

This is the main control screen for the Dev 9k Version 2. From here you can configure the Communication ports. Design and save new projects and open existing projects. In the left panel you have the function blocks. The center is the layout page for the program with the START position. On the right panel you have the registers. By Clicking the Refresh you can see what is stored in the registers.

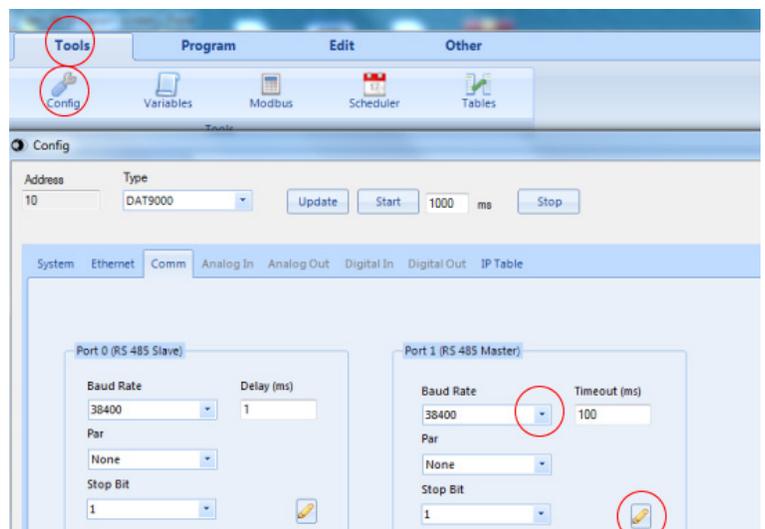


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## Set the Communication Port.

The DAT3019 and the DAT9000DL Modbus Controller need to have the same communication settings. The Master control port (1) on the DAT-9000DL needs to be set up.

1. To change the Communication settings of the DAT9000DL Master port click Tools.
2. Click Config.
3. Change the Baud Rate to 9600 to match the Baud Rate of the DAT3019.
4. Click the pencil to write to the DAT9000DL.



## Build the Function Block Program.

There is only 1 Function block in the program. The Function Block will read register 40015 which is Channel 0 on the DAT3019 and the Address of the DAT3019 is 20. The Function block will poll the DAT3019 and obtain the Integer and place it into the DAT9000DL on register 35. We will be using a Read Input and must deduct 40001 from the register table so the actual Register we use on the read Input Function Block will be 14.

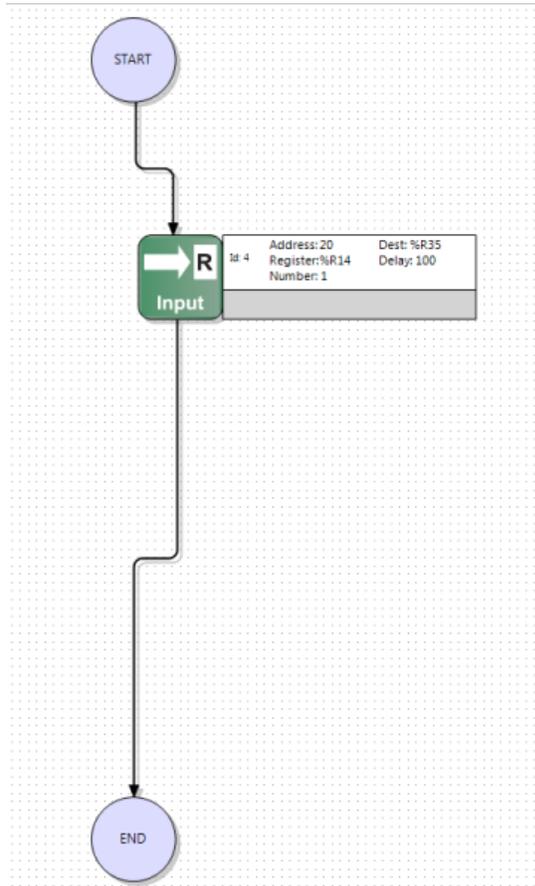
1. Click the Read/Write label on the lower left panel.
2. Drag the Read Input Function block to below the Start Icon.
3. The Insert Data Block will open and you can enter the data needed to obtain the Register.
4. Address 20, Register 14, Number 1 (we only need the Temperature input register), Dest 35 (we will store the register reading in Register 35 on the DAT9000DL) Click OK.

The screenshot shows a software interface for building a function block program. On the left, a 'Read/Write' panel contains several function blocks: 'Read Register', 'Read Input', 'Write Single', 'Write Multiple', 'Read Device', and 'Write Device'. The 'Read Input' block is circled in red. Below this panel is a category list with 'Read/Write' highlighted in orange and circled in red. The main workspace contains a 'START' icon, a 'Read Input' block being dragged, and an 'END' icon. On the right, an 'Insert Data' dialog box is open, with fields for 'Address' (20), 'Register' (14), 'Number' (1), and 'Dest' (35). The 'Dest' field is circled in red. The 'OK' button at the bottom right of the dialog is also circled in red. A vertical link on the right side of the dialog reads 'Click to Open Description'.

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## Complete the Function Block sequence.

1. Hover over the bottom of the Start circle until a hand is present and pull the line generated down to the Read Input function block.
2. Do the same from the Read Input Function block to the top of the End circle.
3. Click Compile and OK.
4. Click File.
5. Click Save.
6. Save as temperature-read.



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## Downloading the Program to the Modbus Master.

1. Click Program.
2. Click Connect, if not connected to the DAT-9000DL. It could have timed out. The bottom of the panel should say Connected.
3. Click Debug.
4. Now the Download is visible and click "Download".
5. Accept the download twice.
6. Click Release.
7. Click Refresh and there should be a reading in %R35. It will be the temperature reading in Celsius and be x 10.
8. Should no reading be present in R35 check the communication port settings or wiring.

The screenshot shows a software interface with a table of registers. The table has columns for Address, ShowVal, Name, and RegisterType. The value for register %R35 is highlighted with a red circle and is 274.

Address	ShowVal	Name	RegisterType
%R17	00FF	Gateway Ma...	Hex
%R18	0501	Port 0 Set (4...	Hex
%R19	0500	Port 2 Set (2...	Hex
%R20	11111111 11...	Timers Enable	Bin
%R21	00001000 00...	Time Base Fl...	Bin
%R22	0059	--Reserved--	Hex
%R23	3423	--Reserved--	Hex
%R24	0219	--Reserved--	Hex
%R25	0419	--Reserved--	Hex
%R26	0000	--Reserved--	Hex
%R27	0000	--Reserved--	Hex
%R28	0000	--Reserved--	Hex
%R29	0000	--Reserved--	Hex
%R30	0000	--Reserved--	Hex
%R31	0000	--Reserved--	Hex
%R32	0000	--Reserved--	Hex
%R33	0000	--Reserved--	Hex
%R34	0000	--Reserved--	Hex
%R35	274		Int
%R36	0		Int
%R37	0		Int

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## Now set up what needs to be Logged (Variables).

1. Click Tools.
2. Click Variables.
3. In the First line type Date in the Label box.
4. Under Type Click the Date in the drop down box.
5. Under CVS Header Name Type Date.
6. Click the pencil to write to the program.
7. Repeat on the next line for Time.
8. Click the third line.
9. Enter Temperature Under Label.
10. The type will be Int for Interger.
11. The Output Format will be 5 digits and 1 decimals. This is because the current reading is 233 which is actually 23.3.
12. Click the pencil and then Click OK.

ID	Reg	Type	Format	Label
#000		Date		Date
#001		Time		Time
#002	40	Int	%+5.1f	Temperature
#003	100	UInt	%+5.0f	Var3
#004	100	UInt	%+5.0f	Var4
#005	100	UInt	%+5.0f	Var5
#006	100	UInt	%+5.0f	Var6
#007	100	UInt	%+5.0f	Var7
#008	100	UInt	%+5.0f	Var8
#009	100	UInt	%+5.0f	Var9
#010	100	UInt	%+5.0f	Var10
#011	100	UInt	%+5.0f	Var11
#012	100	UInt	%+5.0f	Var12
#013	100	UInt	%+5.0f	Var13
#014	100	UInt	%+5.0f	Var14
#015	100	UInt	%+5.0f	Var15
#016	100	UInt	%+5.0f	Var16
#017	100	UInt	%+5.0f	Var17
#018	100	UInt	%+5.0f	Var18
#019	100	UInt	%+5.0f	Var19
#020	100	UInt	%+5.0f	Var20
#021	100	UInt	%+5.0f	Var21

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ID	Reg	Type	Format	Label
#000		Date		Date
#001		Time		Time
#002	40	Int	%+5.1f	Temperature
#003	100	UInt	%+5.0f	Var3
#004	100	UInt	%+5.0f	Var4
#005	100	UInt	%+5.0f	Var5
#006	100	UInt	%+5.0f	Var6
#007	100	UInt	%+5.0f	Var7
#008	100	UInt	%+5.0f	Var8
#009	100	UInt	%+5.0f	Var9
#010	100	UInt	%+5.0f	Var10
#011	100	UInt	%+5.0f	Var11
#012	100	UInt	%+5.0f	Var12
#013	100	UInt	%+5.0f	Var13
#014	100	UInt	%+5.0f	Var14
#015	100	UInt	%+5.0f	Var15
#016	100	UInt	%+5.0f	Var16
#017	100	UInt	%+5.0f	Var17
#018	100	UInt	%+5.0f	Var18
#019	100	UInt	%+5.0f	Var19
#020	100	UInt	%+5.0f	Var20
#021	100	UInt	%+5.0f	Var21
#022	100	UInt	%+5.0f	Var22
#023	100	UInt	%+5.0f	Var23

# Scheduler, at what period of time it will log.

1. Click Scheduler and the Scheduler box will open.
2. Click "Create New" at the bottom.
3. Step One, and select CSV standard and then click Next.
4. Step Two, insert a Temperature in Insert name of Profile.
5. Select time from as today's date and change the date to December 2099. Which should happen by clicking the down arrow. Click Next.
6. Step Three now select at what period of time you want to log. Write in Clock 1 and select Minute. The DAT-9000DL will now log every 1 Minute. Click Next.
7. Step four, select how often you require a new file to be written click Hour. Click Next.
8. Step Five, drag over which ID you want to log. Drag over #000, for the Date, #001, for Time, #002, for the Temperature. Now click Save.
9. Check the screen and make any changes that may be needed.

The image shows two screenshots of the Scheduler Wizard. The first screenshot, titled "Step One", asks "What action would you do?" and has four radio button options: "CSV standard" (selected), "CSV header", "Send an Email", and "Execute a Scheduler". The second screenshot, titled "Step Two", asks "Insert name of the profile:" and has a text input field. Below that, it asks "Select event life time:" and has two rows of date and time pickers. The "From" row is set to "Thursday, May 09, 2019" and "12:00:00 AM". The "To" row is set to "Thursday, May 09, 2019" and "11:59:59 PM". Both screenshots have navigation buttons: "< Back", "Next >", "Close", and "SAVE!".

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The image shows two screenshots of the Scheduler Wizard. The first screenshot, titled "Step Three", asks "Select trigger event:" and has two checkboxes: "On Time" and "Bit status changed". The second screenshot, titled "Step Four", asks "Define the interval of time to create a new file" and has four radio button options: "Hour" (selected), "Day", "Month", and "Year". Below that, it asks "Set Path of file in the data device" and has a text input field containing "\DIR0\". Both screenshots have navigation buttons: "< Back", "Next >", "Close", and "SAVE!".

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Wizard

Step Five

Drag and Drop the variables in the right list in the desired order. Create or modify them clicking the button on bottom.

ID	Name	Reg U...
#000	Date	100
#001	Time	100
#002	Temp	40
#003	Var3	100
#004	Var4	100
#005	Var5	100
#006	Var6	100
#007	Var7	100
#008	Var8	100
#009	Var9	100
#010	Var10	100
#011	Var11	100
#012	Var12	100
#013	Var13	100

Variables

ID	Name
#000	Date
#001	Time
#002	Temperature

< Back   Next >   Close   SAVE !

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Scheduler

Profile Name: Temperature

Save

From: Thursday, May 09, 2019 12:00:00 AM To: Wednesday, February 16, 2020 11:59:59 PM

File Path: \DIR0\

New File Each:  Hour  Day  Month  Year

Trigger:  Time  Trigger

8 Minutes

ID	Name	Reg Used
#000	Date	100
#001	Time	100
#002	Temper...	40
#003	Var3	100
#004	Var4	100
#005	Var5	100
#006	Var6	100
#007	Var7	100
#008	Var8	100
#009	Var9	100
#010	Var10	100
#011	Var11	100
#012	Var12	100
#013	Var13	100
#014	Var14	100
#015	Var15	100
#016	Var16	100
#017	Var17	100

Variables

ID	Name
#000	Date
#001	Time
#002	Temperature

Id Title

1	Temperature
---	-------------

CSV Standard

CSV Header

E-Mail

Scheduler

Create New

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## Save and Run the Program.

1. Click Save, reconnect to the DAT9000DL, Debug, Download wait for the download to finish. This may happen twice. Very Important, click release to write to the eeprom.
2. Wait about 10 minutes and remove the SD Ram or USB Stick and Check on a PC for the logged file. Or you can click Web above the Register table.
3. Enter the User name Fact\_user and password Fact\_pwd.
4. Click Log Data.
5. Click DIR0 and drill down to the CSV file and open with Notepad.

## Explanation of the Project.

- Connected to a DAT9000DL Modbus Data logger with Ethernet.
- Configured the DAT9000DL Modbus Data Logger to be a Modbus Controller.
- Set up communication ports on the DAT3019 Modbus RTD to Modbus Slave and the DAT9000DL Modbus Master Data logger.
- Read the internal register of the DAT3019 RTD Modbus Slave with a read input Function Block and move it to the Modbus Data Logger.
- Selected which Variables to Store to the SD RAM or USB storage device.
- Scheduled a time period to log the variables to the SD RAM or USB storage device.