

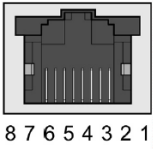
Schneider ATV320 control thru Modbus

Connection to Drive

Connection accessories should be ordered separately (See the catalog for more details).

Connect the RJ45 cable connector to the drive connector.

The following figure shows the pin layout for RJ45 connector:



The table describes the pin out of the RJ45 connector of the drive:

Pin	Signal
1	Reserved
2	
3	
4	D1 ⁽¹⁾
5	D0 ⁽¹⁾
6	–
7	VP, 10 Vdc ⁽²⁾
8	Common
⁽¹⁾ Modbus signals	
⁽²⁾ Supply for RS232 / RS485 converter or a remote terminal	

We will use node-red

These are the main addresses

1	Code	Name	Logic address	CANopen index	DeviceNet path	Link	Category	Access	Type	Units
28	RFRD	Output velocity	16#219C = 8604	16#2038/5	16#8C/01/05 = 140/01/05	-	Actual values parameters	R	INT (Signed16)	1 rpm

This is how to configure the serial comm parameters

With Somove:

These are default parameters

<input type="text"/> In: All Search						
Código	Etiqueta larga	Conf0	Valor predeterminado	Valor mínimo	Valor máximo	Dirección lógica

COMUNICACIÓN						
▶ SCANNER COM. ENT.						
▶ SCANNER COM. SALIDA						
▼ MODBUS RED						
ADD	Dirección Modbus	OFF	OFF	OFF	247	6001
AMOC	Dirección carta Com.	OFF	OFF	OFF	247	6651
TBR	Vel. trans. Modbus	19200 Bd	19200 Bd			6003
TFO	Formato Modbus	8-par-1	8-par-1			6004
TTO	Timeout Modbus	10 s	10 s	0.1 s	30 s	6005
COM1	Estatus com. Modbus	R0T1	R0T0			64047
▶ CANopen						
▶ FORZADO LOCAL						

We want 9600, 8 bits, no parity, so we adjust:

<div><div></div><div>In: All</div><div>Search</div></div>						
Código	Etiqueta larga	Conf0	Valor predeterminado	Valor mínimo	Valor máximo	Dirección lógica
▼ MODBUS RED						
ADD	Dirección Modbus	1	OFF	OFF	247	6001
AMOC	Dirección carta Com.	OFF	OFF	OFF	247	6651
TBR	Vel. trans. Modbus	9600 Bd	19200 Bd			6003
TFO	Formato Modbus	8-sin par-1	8-par-1			6004
TTO	Timeout Modbus	10	10 s	0.1 s	30 s	6005
COM1	Estatus com. Modbus	R0T1	R0T0			64047

With the front panel:

Configuring the Communication Parameters

Overview

Configuration of the Modbus communication functions of the drive can be accessed from the **[Communication]** (**C o m -**) menu.

The modification of communication parameters is taken into account after a power cycle of the drive.

Ad1

Add

[Modbus Address] (**A d d**)

About This Parameter

This parameter is used to set the Modbus timeout

Access

This is a read/write parameter.

The parameter Modbus address is 6001

Possible Settings

The table presents the parameter settings:

Settings	Code	Value	Description
[OFF]	(o f f)	0	Modbus address is not assigned.
[1 to 247]	(1 ... 2 4 7)	1...247	Modbus address is assigned. Factory setting: OFF

[Modbus baud rate] (L B r)

About This Parameter

This parameter defines the baud rate at which data is transferred.

Access

This is a read/write parameter.
The parameter Modbus address is 6003

Possible Settings

The table presents the parameter settings:

Settings	Code	Value	Description
[4800 bps]	(4 K B)	24	Baud rate is set to 4.8 Kbps.
[9600 bps]	(9 K B)	28	Baud rate is set to 9.6 Kbps.
[19200 bps]	(1 9 K 2)	32	Baud rate is set to 19.2 Kbps.
[38.4 Kbps]	(3 8 K 4)	36	Baud rate is set to 38.4 Kbps. Factory setting: 19.2 Kbps

[Modbus format] (L F o)

About This Parameter

This parameter is used to define the data format.

Access

This is a read/write parameter.
The parameter Modbus address is 6004

Possible Settings

This table presents the parameter settings:

Settings	Code	Value	Description
[8-O-1]	(B o 1)	2	8 data bits, odd parity, 1 stop bit
[8-E-1]	(B E 1)	3	8 data bits, even parity, 1 stop bit
[8-N-1]	(B n 1)	4	8 data bits, no parity, 1 stop bit
[8-N-2]	(B n 2)	5	8 data bits, no parity, 2 stop bits Factory setting: 8E1

First test with Touchberry PI

1	Code	Name	Logic address	CANopen index	DeviceNet path	Link	Category	Access	Type	Units
28	RFRD	Output velocity	16#219C = 8604	16#2038/5	16#8C/01/05 = 140/01/05	-	Actual values parameters	R	INT (Signed16)	1 rpm

It works

Edit Modbus-Read node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🖨

Settings

Optionals

Name

Name

Topic

Topic

Unit-Id

1

FC

FC 3: Read Holding Registers ▾

Address

8604

Quantity

1

Poll Rate

3

second(s) ▾

⏻ Delay on start

☐

Server

modbus-serial@/dev/ttyUSB0:9600 ▾

Edit Modbus-Read node > Edit modbus-client node

Delete

Cancel

Update

⚙ Properties

⌘ Serial port

/dev/ttyUSB0

Q

Serial type

RTU-BUFFERD

▼

Baud rate

9600

▼

Data Bits

8

▼

Stop Bits

1

▼

Parity

None

▼

⌘ Connection delay (ms)

100

Unit-Id

1

Unit-Id

1

Timeout (ms)

1000

Reconnect timeout (ms)

2000

Log states changes

☐

Queue commands

☒

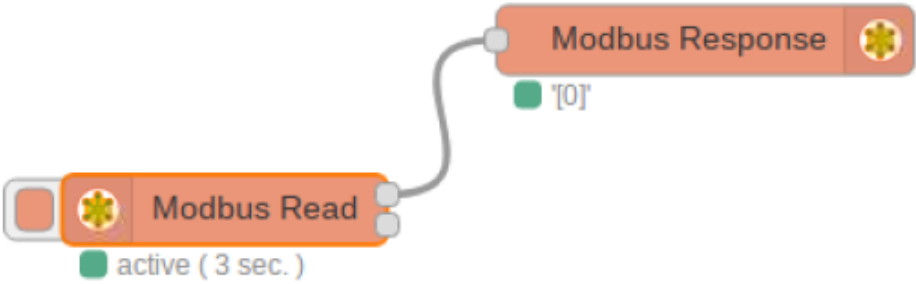
Queue delay (ms)

1

☐ Enabled

1 node uses this config

* ATV320

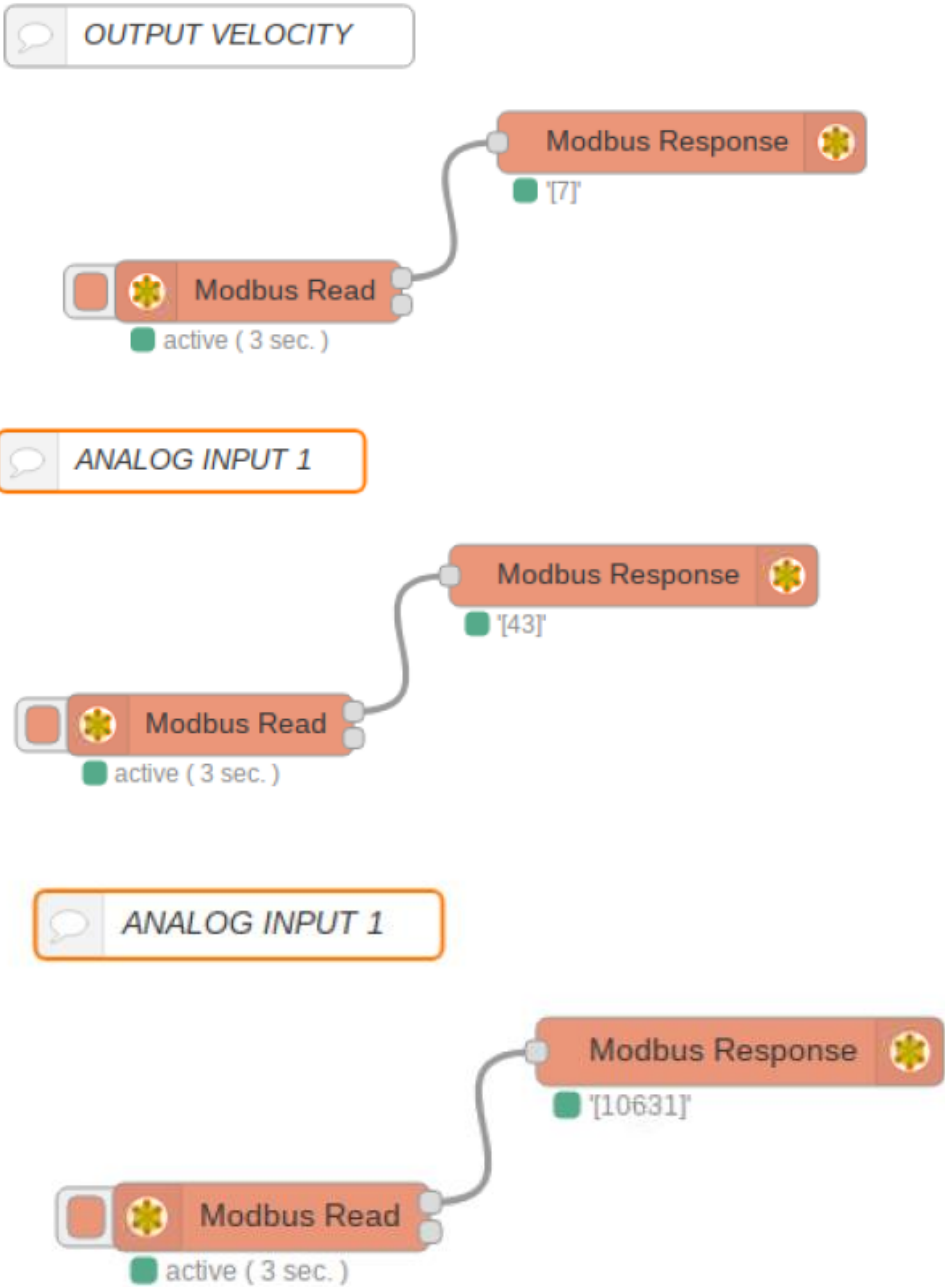


Analog input 1

It Works, if I change the potentiometer position, it changes the analog value!!!

1	Code	Name	Logic address	CANopen index	DeviceNet path	Link	Category	Access	Type	Units
52	AI1C	Analog input 1 physical value	16#147A = 5242	16#2016/2B	16#7B/01/2B = 123/01/43	-	I/O parameters	R	INT (Signed16)	0.001 V

And now with speed control with analog input 1



Now we want to adjust speed from modbus

First we have to change these settings

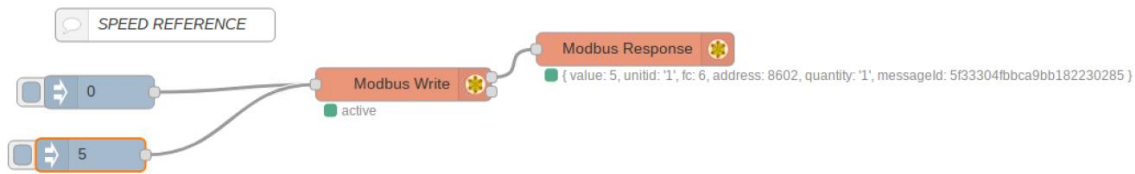
CONTROL		
FR1	Canal Referencia 1	A1

And set it to Modbus

And write on this parameter

1	Code	Name	Logic address	CANopen index	DeviceNet path	Link	Category	Access	Type	Units
5	LFRD	Speed setpoint	16#219A = 8602	16#2038/3	16#8C/01/03 = 140/01/03	-	Setpoint parameters	R/W	INT (Signed16)	1 rpm

We can even succesfully write on parameter Speed setpoint



But now we can not start with LI1

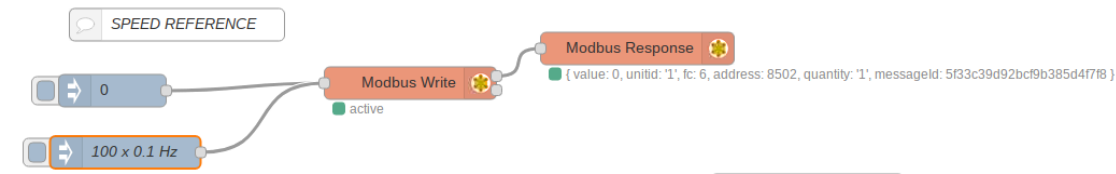
Then change this parameter

CHCF	Config. modo control	No separad.
------	----------------------	-------------

To separated

Now we can start but at 0.0 speed and even changing Speed setpoint, the drive does not turn.

Now it Works, we start with the LI1 switch and we set up speed with Modbus (x 0.1Hz)



With this somove configuration

CONTROL		
FR1	Canal Referencia 1	Modbus
RIN	Inhibición marcha atrás	No
PST	Prioridad Tecla STOP	Sí
CHCF	Config. modo control	Separados
CCS	Conmutación canal ctrl	CD1
CD1	Config. canal control1	Bornero
CD2	Config. canal control2	Modbus
RFC	Asig.conmut.ref.(1a 2)	FR1
FR2	Canal Referencia 2	No
COP	Copiar Canal1 <->2	No
FN1	Asignación Tecla F1	NO
FN2	Asignación Tecla F2	NO
FN3	Asignación Tecla F3	NO
FN4	Asignación Tecla F4	NO
BMP	Control Consola (HMI)	Parar

START STOP MODBUS

Let's try with the command start stop over Modbus on Somove settings

CD1	Config. canal control1	Bornero
-----	------------------------	---------

Changing to Modbus

We have to set bit 3 of register 8501 to 1 to start the motor

1	Code	Name	Logic address	CANopen index	DeviceNet path	Link	Category	Access	Type
2	CMD	Control word	16#2135 = 8501	16#2037/2	16#8B/01/66 = 139/01/102	CMD	Control parameters	R/W	WORD (BitString16)

Cmd Register $\mathbb{C} \mathbb{N} \mathbb{D}$

Bit Mapping of the Control Word

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Fault reset	Reserved (=0)	Reserved (=0)	Reserved (=0)	Enable operation	Quick stop	Enable voltage	Switch on
0 to 1 transition = Error is reset (after cause of error is no longer active)				1 = Run command	0 = Quick stop active	Authorization to supply AC power	Mains contactor control

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Manufacturer specific assignable	Manufacturer specific assignable	Manufacturer specific assignable	Manufacturer specific assignable	Manufacturer specific	Reserved (=0)	Reserved (=0)	Halt
				0 = Forward direction asked 1= Reverse direction asked			Halt

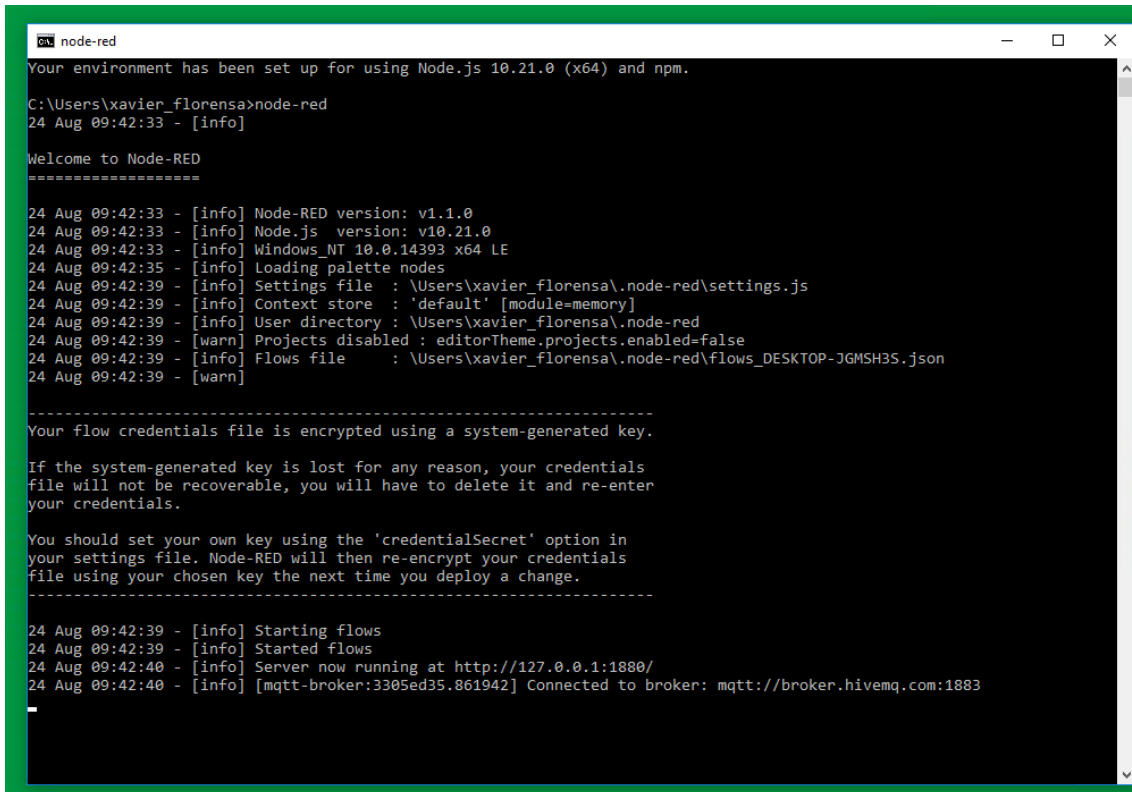
Second test with Schneider Edge Box Windows

Once the system is working, just unplug the USB converter from the previous cable and connect direct wires between the drive and the Edge Box DB-9 COM1 connector



After connecting the cable and with the drive power ON, Node-red will see COM1 port

Do not forget to start Node-red on Windows Edge Box



```
C:\node-red
Your environment has been set up for using Node.js 10.21.0 (x64) and npm.

C:\Users\xavier_florensa>node-red
24 Aug 09:42:33 - [info]

Welcome to Node-RED
=====

24 Aug 09:42:33 - [info] Node-RED version: v1.1.0
24 Aug 09:42:33 - [info] Node.js version: v10.21.0
24 Aug 09:42:33 - [info] Windows_NT 10.0.14393 x64 LE
24 Aug 09:42:35 - [info] Loading palette nodes
24 Aug 09:42:39 - [info] Settings file : \Users\xavier_florensa\.node-red\settings.js
24 Aug 09:42:39 - [info] Context store : 'default' [module=memory]
24 Aug 09:42:39 - [info] User directory : \Users\xavier_florensa\.node-red
24 Aug 09:42:39 - [warn] Projects disabled : editorTheme.projects.enabled=false
24 Aug 09:42:39 - [info] Flows file : \Users\xavier_florensa\.node-red\flows_DESKTOP-JGMSH3S.json
24 Aug 09:42:39 - [warn]

-----
Your flow credentials file is encrypted using a system-generated key.

If the system-generated key is lost for any reason, your credentials
file will not be recoverable, you will have to delete it and re-enter
your credentials.

You should set your own key using the 'credentialSecret' option in
your settings file. Node-RED will then re-encrypt your credentials
file using your chosen key the next time you deploy a change.
-----

24 Aug 09:42:39 - [info] Starting flows
24 Aug 09:42:39 - [info] Started flows
24 Aug 09:42:40 - [info] Server now running at http://127.0.0.1:1880/
24 Aug 09:42:40 - [info] [mqtt-broker:3305ed35.861942] Connected to broker: mqtt://broker.hivemq.com:1883
```

And use this configuration

COM1 on the serial options of Modbus node

Edit Modbus-Read node > **Edit modbus-client node**

Delete Cancel Update

Properties

Name

Type

☒ Serial port

Serial type

Baud rate

Data Bits

Stop Bits

Parity

☒ Connection delay (ms)

Unit-Id

Timeout (ms)

☒ Reconnect on timeout

Edit Modbus-Read node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🖨

Settings

Optionals

Name

Name

Topic

Topic

Unit-Id

1

FC

FC 3: Read Holding Registers ▾

Address

8604

Quantity

1

Poll Rate

1

second(s) ▾

⏻ Delay on start

☐

Server

modbus-serial@COM1:9600 ▾

🔧

The diagram illustrates a Node-RED flow for Modbus communication. It includes several input nodes on the left: 'OUTPUT VELOCITY', 'ANALOG INPUT 1', 'SPEED REFERENCE', 'RPM', and 'CONTROL WORD'. The 'OUTPUT VELOCITY' node is connected to a 'Modbus Read' node (active 1 sec.), which then connects to a 'Modbus Response' node. The 'ANALOG INPUT 1' node is connected to a 'Modbus Read' node (active 3 sec.), which connects to a 'Modbus Response' node. The 'SPEED REFERENCE' and 'RPM' nodes are connected to a 'Modbus Write' node (active), which connects to a 'Modbus Response' node. The 'CONTROL WORD' node is connected to a 'Modbus Write' node (active), which connects to a 'Modbus Response' node. A 'parse' node is connected to the 'Modbus Response' node from 'OUTPUT VELOCITY'. A 'msg payload' node is connected to the 'Modbus Response' node from 'ANALOG INPUT 1'. A 'Nave1/tanque1/PLCM241/consigna1' node is connected to the 'Modbus Write' node from 'SPEED REFERENCE' and 'RPM'. A 'Nave1/tanque1/temperatura' node is connected to the 'Modbus Response' node from 'OUTPUT VELOCITY'. The 'Modbus Write' node has a message log showing: '{ value: 0, unitId: '1', fc: 6, address: 8602, quantity: '1', messageId: 5f43ee8478edf82f6a89df8c }'.

noria
LOGÍSTICA

And here you can find the node-red code

<https://github.com/xavierflorensa/Schneider-ATV320-Edge-Box-control-thru-mobile-phone>

And here you can see the video

https://www.youtube.com/watch?v=hRrQzlhws7M&ab_channel=XavierFlorensaBerenguer