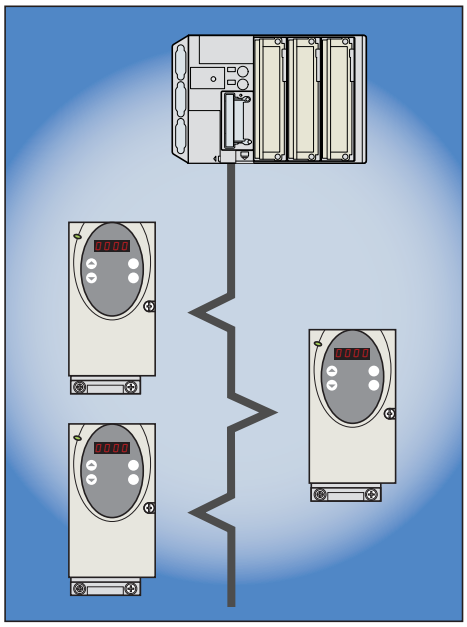
Altivar 21

BACnet card

User's manual

VW3 A21 315

10/2009



1769594

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NOTE

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The products described in this document may be changed or modified at any time, either from a technical point of view or in the way they are operated. Their description can in no way be considered contractual.

1. Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personnal if the instruction are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, **will result** in death, serious injury, or equipment damage.

⚠ WARNING

Warning indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

PLEASE NOTE

Electrical equipment should be serviced only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. This document is not intended as an instruction manual for untrained persons.
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2. Before you begin

Read and understand these instructions before performing any procedure with this drive.

⚠ DANGER

HAZARDOUS VOLTAGE

- Read and understand the Installation Manual before installing or operating the Altivar 21 drive. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical standards in force concerning protective grounding of all equipment.
- Many parts of this variable speed drive, including the printed circuit cards, operate at the line voltage. DO NOT TOUCH. Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- DO NOT short across terminals PA and PC or across the DC bus capacitors.
- Install and close all the covers before applying power or starting and stopping the drive.
- Before servicing the variable speed drive
  - Disconnect all power.
  - Place a “DO NOT TURN ON” label on the variable speed drive disconnect.
  - Lock the disconnect in the open position.
- Disconnect all power including external control power that may be present before servicing the drive. WAIT 15 MINUTES to allow the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure given in the Installation Manual to verify that the DC voltage is less than 45 VDC. The drive LEDs are not accurate indicators of the absence of DC bus voltage.

Electric shock will result in death or serious injury.

⚠ CAUTION

DAMAGED EQUIPMENT

Do not install or operate any drive that appears damaged.
Failure to follow this instruction can result in equipment damage.

3. Introduction

Thank you for purchasing the BACnet option card (VW3A21315) for Altivar 21 drive.

By Installing this board into the Altivar 21, data communication can be made with a host computer or other device via BACnet network.

The communication card has a connector for connection to the network.

Data exchanges give access to all Altivar 21 functions:
- Control (start, stop, reset, setpoint),
- Monitoring (status, current, voltage, thermal state...),
- Diagnostics (alarms).

The integrated display terminal can be used to access numerous functions for communication configuration and diagnostics.

4. Documentation structure

■ BACnet manual

The present BACnet user manual describes:
- connection to BACnet,
- configuration of the communication-specific parameters via the integrated HMI,
- diagnostics,
- networks variables.

You will also find important information in other Altivar 21 technical documents. They are available on the Web site www.schneider-electric.com and on the CDROM delivered with each drive.

■ ATV21 user manual

This manual describes:
- How to assemble the drive,
- How to connect the drive,
- The functions and the parameters of the drive,
- How to use the drive HMI.

If you use the Parameter access function of (MBOX PARAM, MBOX DATA), will find in this manual the address and possible values of the parameters of the drive.

■ Modbus ATV21 manual

This manual describes:
- Connection to the bus or network,
- Configuration of the communication-specific parameters,
- Diagnostics,
- Software setup,
- Modbus services supported.

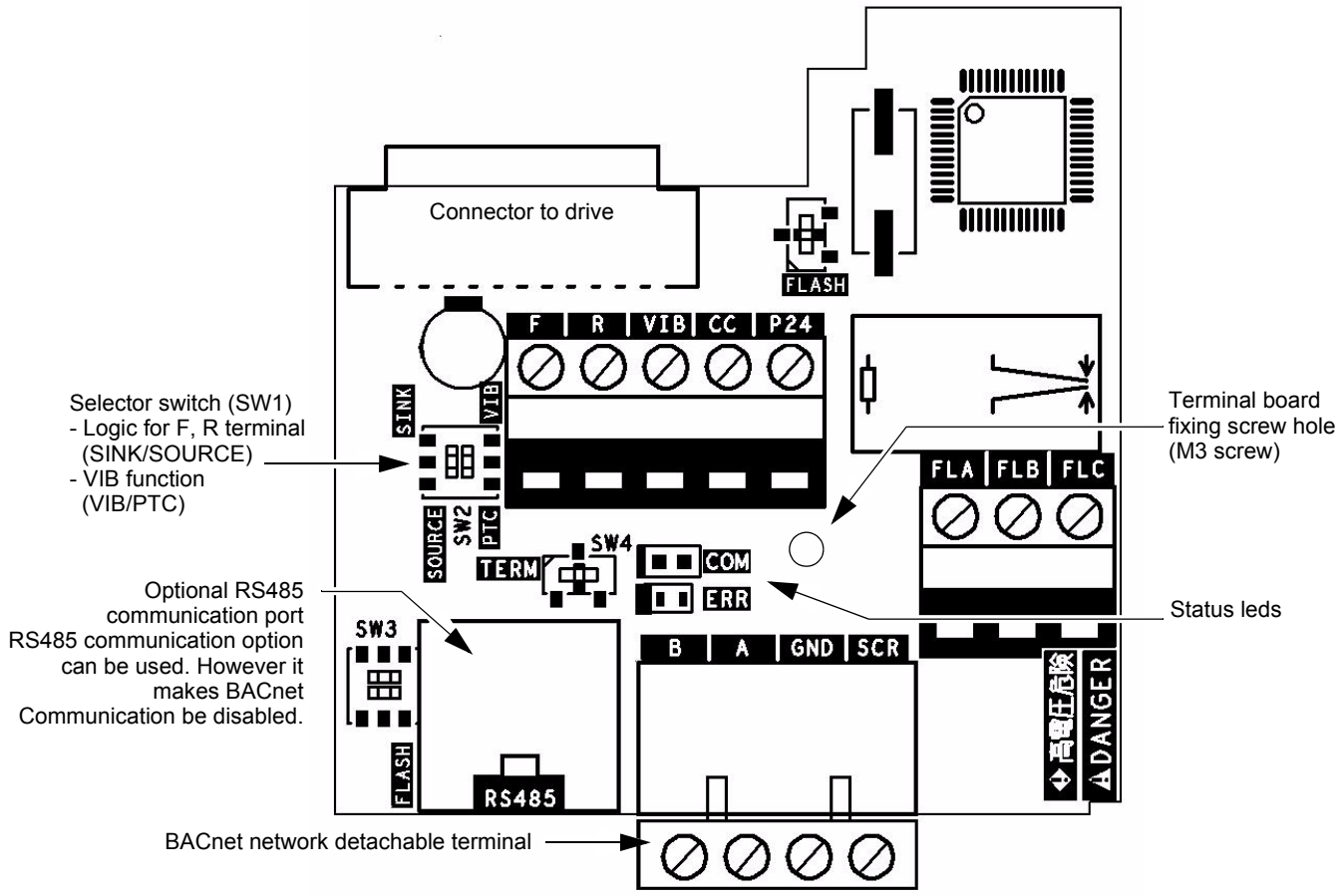
If you use the Parameter access function of (MBOX PARAM, MBOX DATA), will find in this manual the address and possible values of additional parameters not described in ATV21 user manual.

5. Hardware setup

5. 1. Receipt

- Check that the card reference printed on the label is the same as that on the delivery note corresponding to the purchase order.
- Remove the option card from its packaging and check that it has not been damaged in transit.

5. 2. Hardware description



5. 3. Use of RS485 communication port

Serial communication (2-wire RS485) option can be used for Modbus, PC software or remote keypad.

One internal communication line is available either for the RS485 communication port or for the BACnet port.
So, while RS485 communication is used (connected to the appropriate cable or interface) the BACnet port is disabled.

5. 4. Installing the card in the drive

Install the BACnet card in ATV21 as follows.

1 Turn off the input power of ATV21 and wait for at least 10 minutes and then check that the CHARGE lamp on ATV21 is no longer lit.

2 Open the ATV21 front cover, remove the terminal board fixing screw and take off the ATV21 standard terminal board. (Be careful not to lose the terminal board fixing screw when removed since it may be used again.)

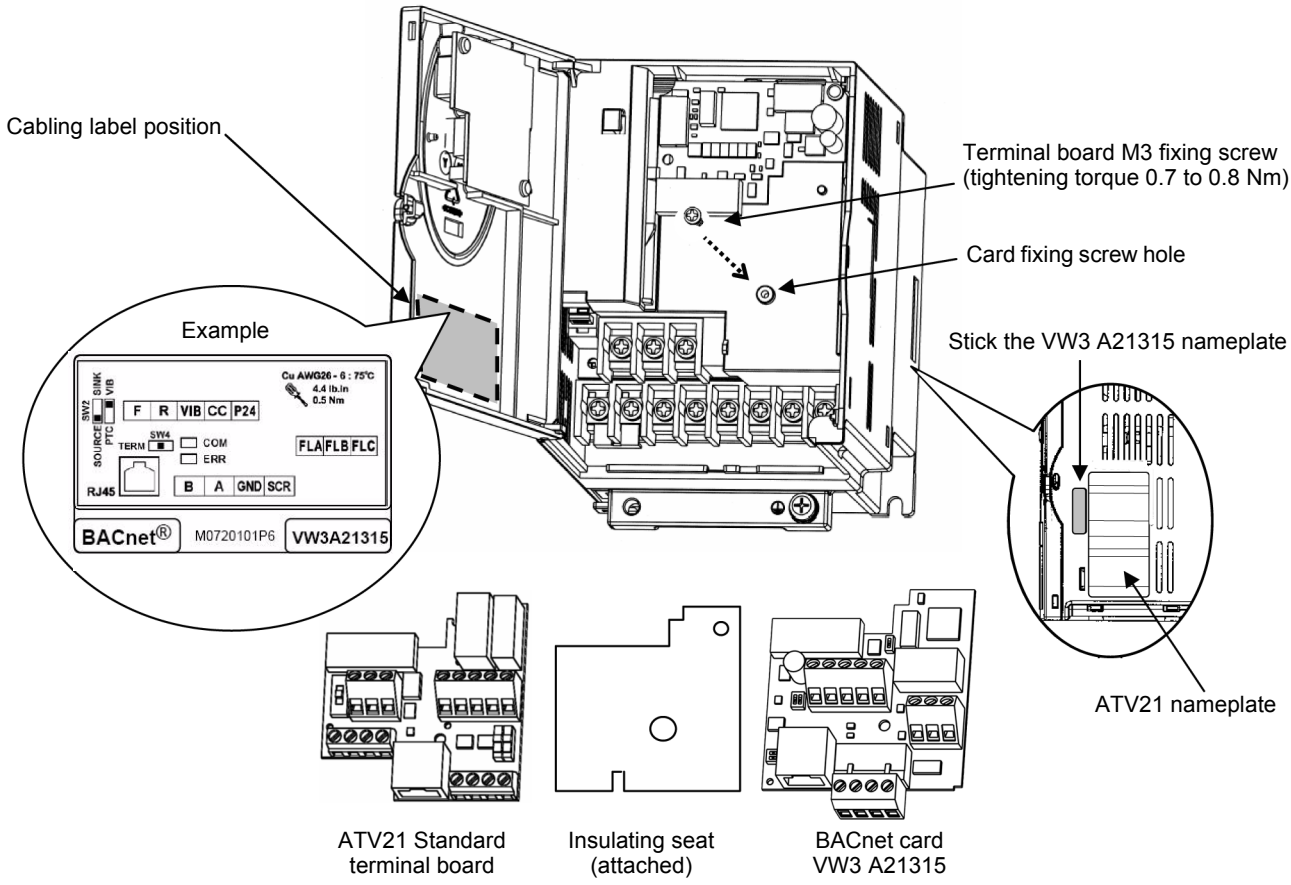
3 Make the power and control the wiring connections before installing BACnet card.

4 Please attach the insulating sheet in ATV21. (Fix to the terminal board fixing screw hole and ATV21 catch pin.)

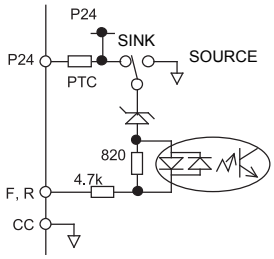
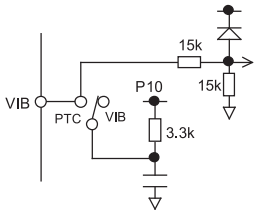
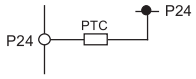
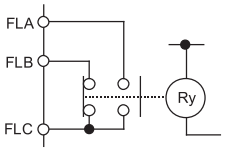
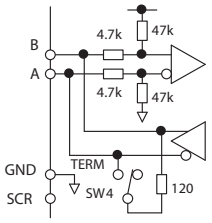
5 Install the BACnet card over the insulating sheet and secure it with the board fixing screw (M3 tapping screw tightening torque: 0.7 to 0.8Nm).

6 Stick the cabling label for BACnet card on the standard cabling label stuck on the reverse side of the ATV21 front cover. And stick the BACnet card nameplate near the standard nameplate. (Be careful not to cover slits on the ATV21 enclosure.

Note: To install or remove the terminal board, make it slide in or out in parallel with board.



5. 5. Description of terminals

Terminal symbol	Function	Electrical specifications	Internal circuits
F	Multifunctional programmable logic input. It has forward rotation function in default setting. ON: forward rotation drive OFF: slowdown and stop	No voltage contact input 24VDC, 5mA or less. SINK/SOURCE can be selected with SW1.	
R	Multifunctional programmable contact input. It has reverse rotation function in default setting. ON: reverse rotation drive OFF: slowdown and stop		
VIB	Multifunction programmable analog input. It has speed set point function in the default setting. (0 to 50Hz frequency with 0 to 10VDC input). In addition, this terminal can be used as PTC input by setting the parameters (F645 and F646) and SW1.	10VDC Internal impedance: 30kohm	
CC	Control circuit equipotential terminal	-	-
P24	24 VDC power supply output	24VDC-50mA	
FLA FLB FLC	Multifunctional programmable relay contact outputs. Default setting is set to detect the activation of the inverter protection function. Contact across FLA-FLC is closed and FLB-FLC is opened during protection function operation.	30VDC-0.5A 250VAC-1A (cos φ = 1) 250VAC-0.5A (cos φ = 0.4)	
B A GND	BACnet	RS485 transmission data, reception data.	
SCR		BACnet communication shield terminal. This terminal is not connected to other circuits in this board. Ground this terminal in a location separated from the ground of power line.	

⚠ DANGER

Do not change switch settings while power is on.
It may damage the product or lead to electric shocks and breakdown.

When setting the VIB function, set the parameter after configuring removed motor cables. The motor may suddenly start and that could result in injury.

6. Connecting to the bus

6. 1. Cable routing practices

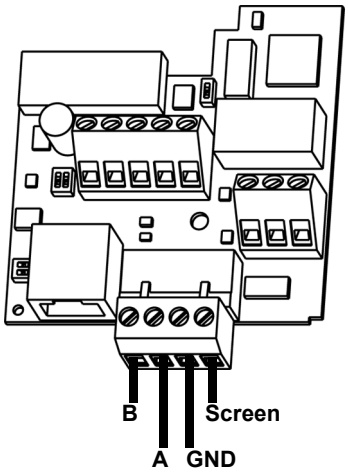
When wiring Altivar 21 drives to a BACnet network, follow all wiring practices required by national and local electrical codes. Also observe the following guidelines:
- Avoid areas of high temperature, moisture, vibration, or other mechanical stress.
- Secure the cable where necessary to prevent its weight and the weight of other cables from pulling or twisting the cable.
- Use cable ducts, raceways, or other structures to protect the cable. Use these structures for signal wiring paths. They must not contain power wiring.
- Avoid sources of electrical interference that can induce noise into the cable. Use the maximum practicable separation from such sources.

When planning cable routing within a building, follow these guidelines:
- Maintain a minimum separation of 1 m from the following equipment:
  - air conditioners and large blowers,
  - elevators and escalators,
  - radios and televisions,
  - intercom and security systems,
  - fluorescent, incandescent, and neon lighting fixtures.

- Maintain a minimum separation of 3 m from the following equipment:
  - line and motor power wiring,
  - transformers,
  - generators,
  - alternators.

When wiring in electrical equipment rooms or large electrical equipment line-ups, observe the following guidelines for cable segregation and separation of circuits:
- Use metallic conduit for drive wiring. Do not run control network and power wiring in the same conduit.
- Separate non-metallic conduits or cable trays used to carry power wiring from metallic conduit carrying low-level control network wiring by at least 300 mm.
- Separate metallic conduits carrying power wiring or low-level control network wiring by at least 80 mm.
- Cross the metallic conduits and non-metallic conduits at right angles whenever power and control network wiring cross.
- Attenuate conducted emissions from the drive to the line in some installations to prevent interference with telecommunication, radio, and sensitive electronic equipment. Such instances may require attenuating filters. Consult the Altivar catalog for selection and application of these filters.

6. 2. Card connector pinout



Contact	Signal
B	+
A	-
GND	GND
SCR	Screen

- Cable sheath should be peeled off by about 10 mm.
- For wiring work, use a fat blade screwdriver with a 0.6 mm thick and 3.5 mm width blade.
- Tightening torque for the terminal block is 0.5 to 0.6 Nm.

7. Configuration

7. 1. Configuration of the internal communication

Set up the inverter parameters as follows. To update, reset the power of inverter. If these parameters are set to incorrect value, the BACnet card cannot work normally.

Parameter	Function	Description
F800	Communication speed	Set 5 (AUTO), default value.
F801	Parity	Set 1 (even), default value.
F803	Communication error trip time	Set communication time out period.
F829	Communication protocol	Set 1 (BACnet)
F851	Behaviour at communication fault	Select the inverter action after communication fault. Refer to 7. 5. Communication faults, page 18.

⚠ WARNING

Set up Communication fault function F803, (see the ATV21 user manual for details) to stop the inverter when this option card is deactivated by an unusual event such as tripping, an operating error, power outage, failure, etc. Deactivated option card may cause an accident, if the "Communication fault function" is not properly set up.

7. Configuration

7. 2. Function

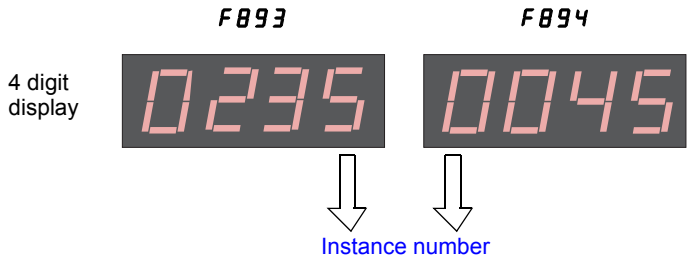
In addition, the inverter is operated by Command mode selection (CNOd) and frequency setting mode selection (FNOd), until operation Command and frequency Command from communication are given. If operation Command and frequency Command are given from communication, regardless of Command mode selection (CNOd) and frequency setting mode selection (fmod), the Command from communication will become effective until power supply OFF, and reset or a standard shipment setup is performed.

7. 3. Communication parameters

Configure the following parameters. Select BACnet communication protocol: F829 = 4.
These parameters can only be modified when the motor is stopped.
Modifications will be taken into account by the drive after power cycled.

Parameter	Possible values	Terminal display	Default value
Command mode selection (CNOd)	0: Terminal board 1: Operation panel 2: Serial communication	(0)	(2)
Frequency setting mode selection 1 (FNOd)	1: VIA 2: VIB 3: Operation panel 4: Serial communication 5: UP/DOWN from external contact	(1)	(4)
Communication protocol selection (F829)	0: Reserved 1: Modbus 2: Metasys N2 3: APOGEE FLN 4: BACnet	(0) (1) (2) (3) (4)	(1)
Address (F890)	0 to 127	(127)	(0)
Bit rate (F891)	AUTO 9600 bit/s 19200 bit/s 38400 bit/s 76800 bit/s	(5) (1) (2) (3) (4)	(5)
Time - out (F892)	Communication time-out in seconds x 0.1. 1 to 60s	(1)	(100)
Instance number (F893) and (F894)	Device instance number: 0 to 4194303 (1) F893: 0 to 4194 * F894: 0 to 999	(1) (0) to (4 194) (0) to (999)	(0) (0) (0)
Max Master (F895)	Max Master device address on the MS/TP subnet: 0 to 127 (2)	(0) to(127)	(127)
Max Info frames (F896)	Max information frames: 1 to 100 (3)	(1) to (100)	(1)
Frame counter (FA 15)	Displays the total number of frames received by the communication card since the last power ON. These values can be monitored by panel (monitor mode).	0 - 999	-
Invalid Frame counter (FA 16)	Displays the total number of bad frames received by the communication card since the last power ON. These values can be monitored by panel (monitor mode).	0 - 999	-
Number of motor poles for communication (F856) **	1: 2 poles 5: 10 poles 2: 4 poles 6: 12 poles 3: 6 poles 7: 14 poles 4: 8 poles 8: 16 poles	(2)	(2)

* : detail of the instance number edition on the local HMI.
** Set the motor pole number.This parameter is for calculation of min-1 unit motor speed of BACnet data.
(1) Sometimes also named BACnet device ID.
(2) Max information frames defines max. number of frames that can be sent before passing token to next master.



Example: 2350045 is the value for the instance number. On the local HMI F893 will receive the value of 0235 and F894 will receive 045.

7. 4. Configuration of the control

The ATV21 can receive commands and speed setpoint from the BACnet network or from the terminals (F, R, VIB).

In the default configuration both commands and setpoint comes from the BACnet network.

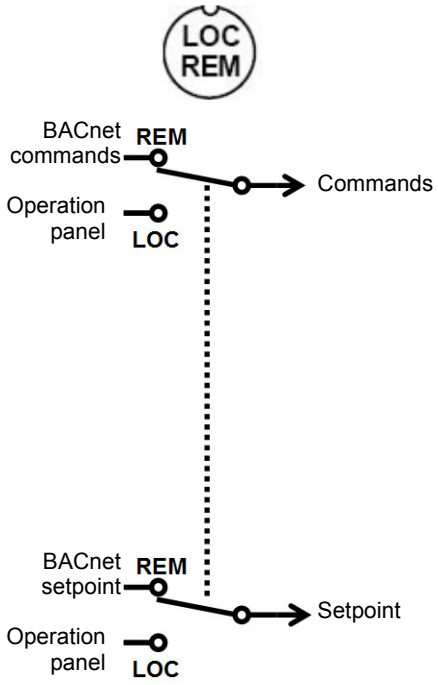
The LOC/REM key of the drive HMI is always available to switch the control to the HMI.

Input R can be configured to switch the control from the BACnet network to the terminals.

Different possibilities are described below.

■ Control by the BACnet network

Commands and setpoint come from the BACnet network.
The signals wired on the terminals are ignored.
The LOC/REM key is active.
This is default configuration.



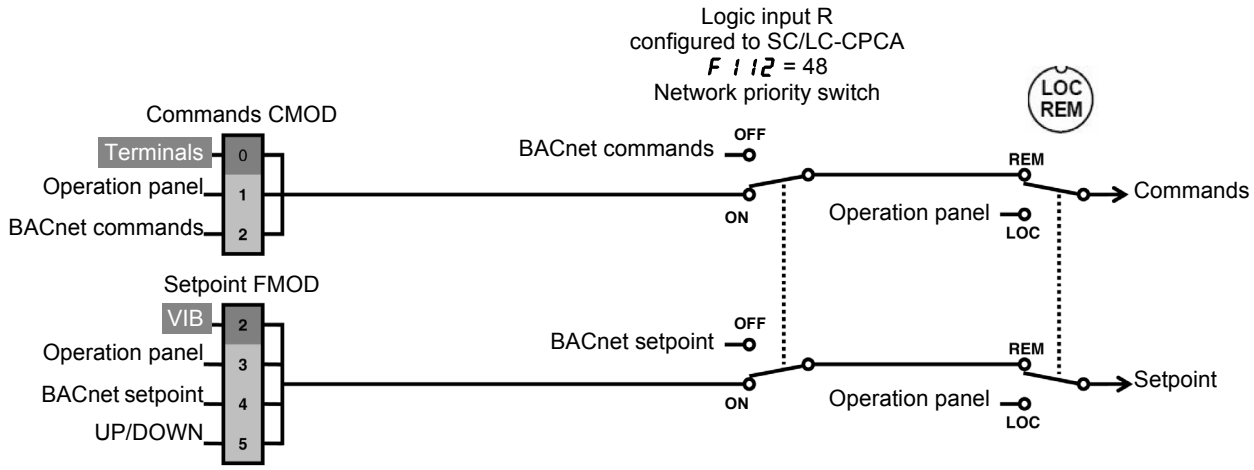
7. Configuration

■ Control by terminals, monitoring by the BACnet network

Commands and setpoint come from the terminals.
The drive is monitored by the BACnet network.
The LOC/REM key is active.

The function SC/LC or CPCA is assignment of logic input R (F112 = 48).
The logic input R is ON (connected to P24 or CC depending on SINK/SOURCE selection).

Parameter	Function	Description
CMOd	0	Terminals
FMOd	2	VIB
F112	48	Logic input R configured to "Forced switching from remote to local control" (SC/LC or CPCA)

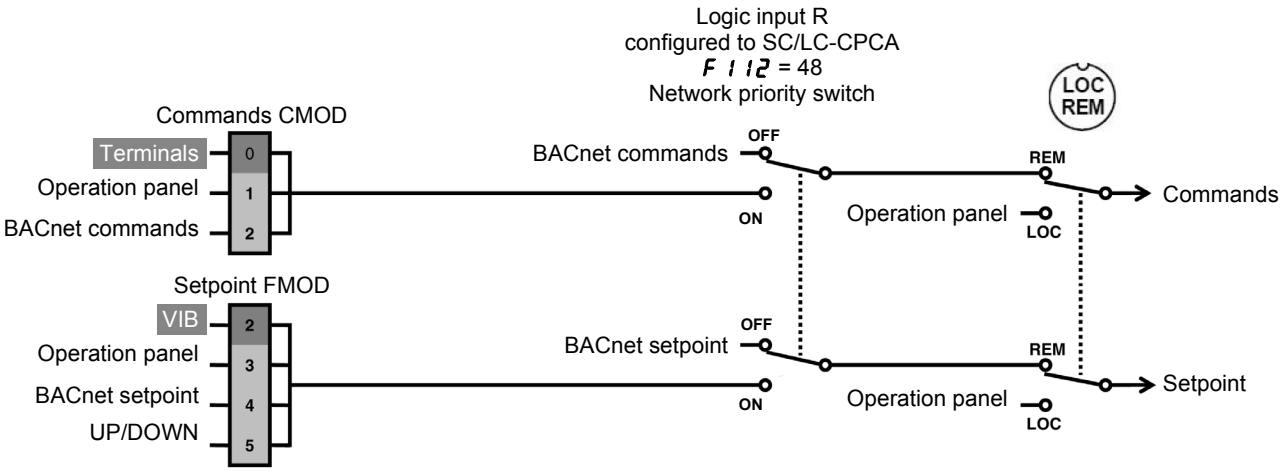


■ Control by the BACnet network, switching to terminals by logic input

Commands and setpoint come from the BACnet network if logic input R is OFF.
Commands and setpoint come from the terminals if logic input R is ON.
The LOC/REM key is active.

The function SC/LC or CPCA is assignment of logic input R (F112 = 48).

Parameter	Function	Description
CMOd	0	Terminals
FMOd	2	VIB
F112	48	Logic input R configured to "Forced switching from remote to local control" (SC/LC or CPCA)

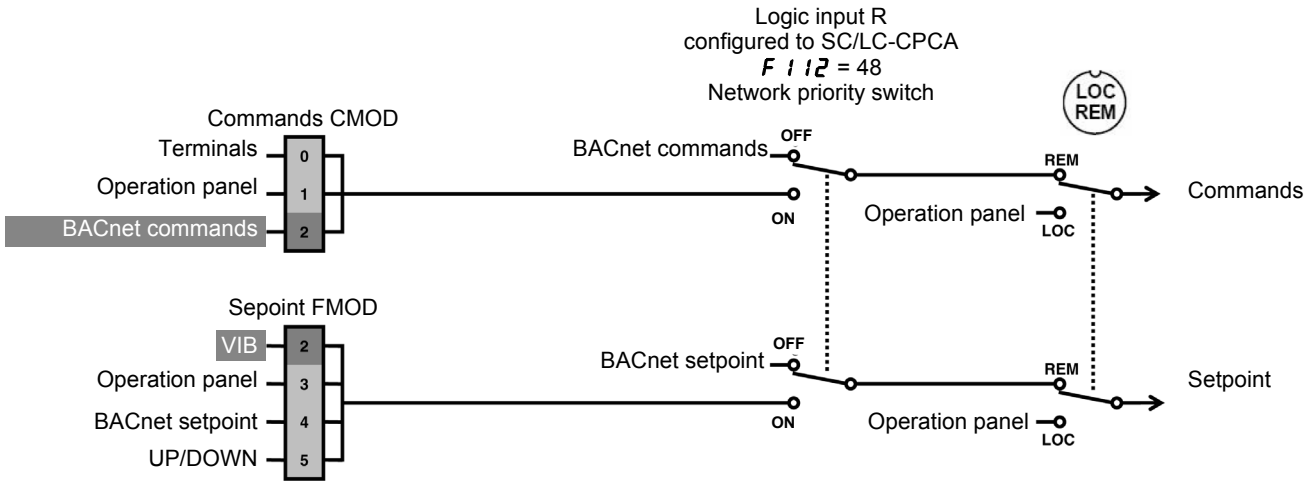


■ Control by the BACnet network, switching setpoint to terminals by logic input

Commands always come from the BACnet network.
Setpoint comes from the BACnet network if logic input R is OFF.
Setpoint comes from the terminals if logic input R is ON.
The LOC/REM key is active.

The function SC/LC or CPCA is assignment of logic input R (F112 = 48).

Parameter	Function	Description
CMOd	2	BACnet network
FMOd	2	VIB
F112	48	Logic input R configured to "Forced switching from remote to local control" (SC/LC or CPCA)

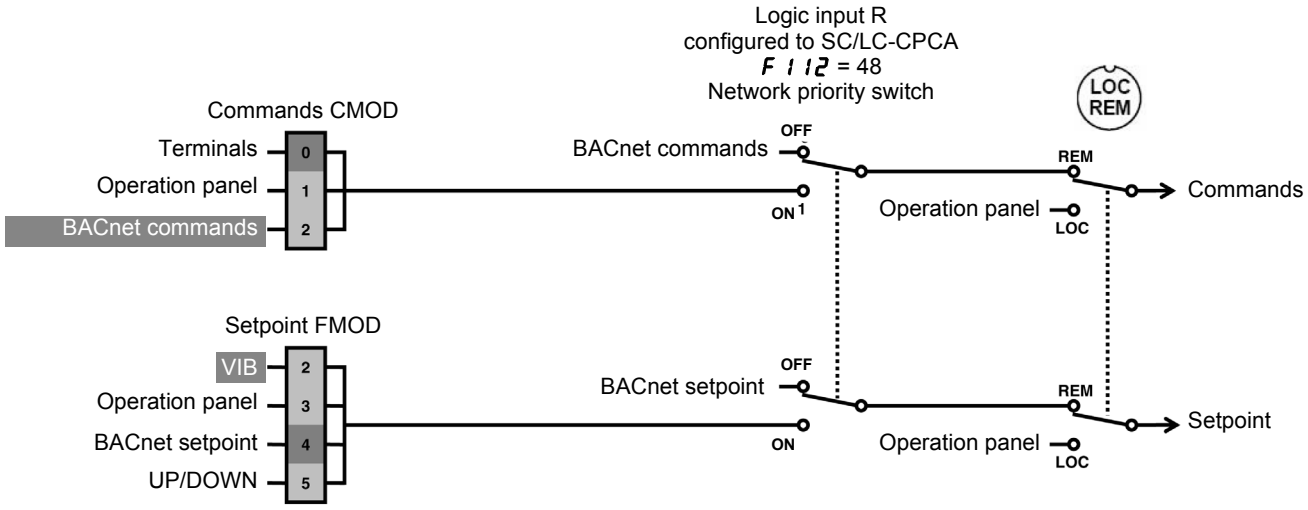


■ Setpoint by the BACnet network, switching commands to terminals by logic input

Setpoint always comes from the BACnet network.
Commands come from the BACnet network if logic input R is OFF.
Commands come from the terminals if logic input R is ON.
The LOC/REM key is active.

The function SC/LC or CPCA is assignment of logic input R (F112 = 48).

Parameter	Function	Description
CMOd	0	Terminals
FMOd	4	BACnet network
F112	48	Logic input R configured to "Forced switching from remote to local control" (SC/LC or CPCA)



7. 5. Communication faults

A BACnet fault is triggered if the BACnet card does not receive any BACnet messages (regardless of address) at its address within a predefined time period (time out defined by F892). All BACnet request types are taken into account (read, write, etc.).
The response of the drive in the event of a BACnet communication fault can be configured by the parameter F851.

Fault Behaviour

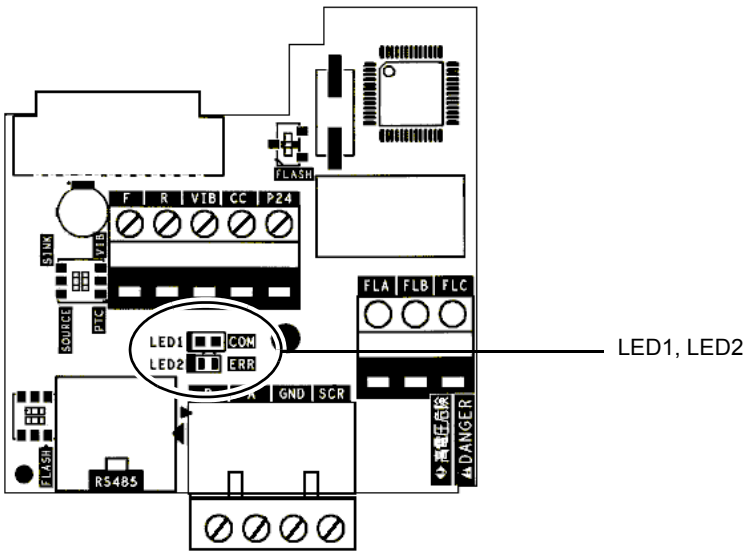
Parameter		Possible value	Default value
Fault Behaviour	F851	0: Communication release 1: No action 2: Deceleration stop 3: Coast stop	1

⚠ WARNING

If this function is not properly set up, it may cause an accident.
If you configure parameter F851 to the value 0, 1, 2 or 3, the drive will not trip. It will go to the specified fault fallback behaviour.
As soon as the BACnet communication comes back, the drive will restart according to the BACnet control.

7. 6. LEDs

The BACnet card has 2 LEDs, COM and ERR which are locatied on the communication card.

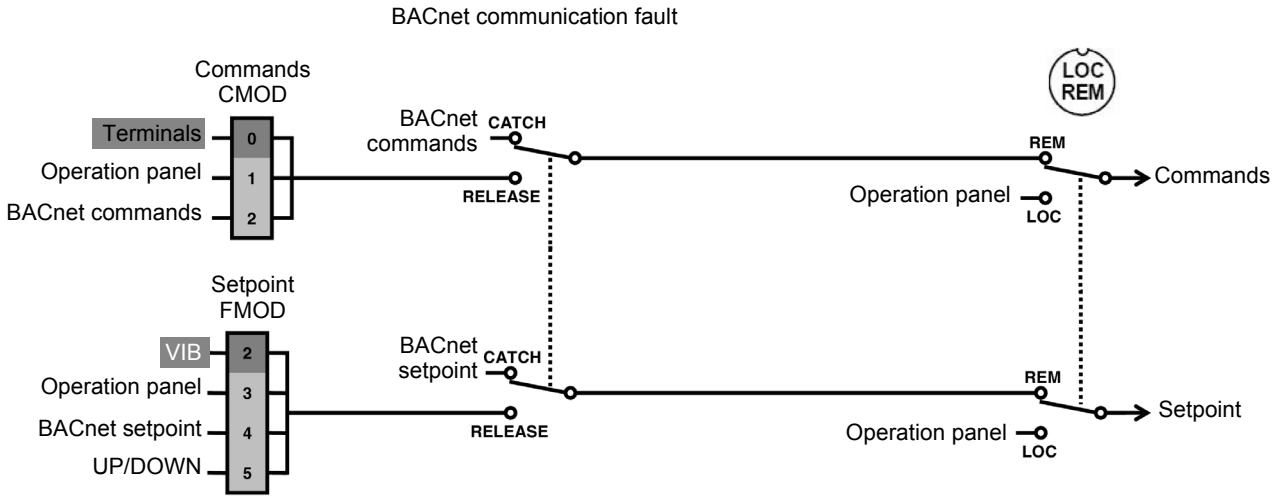


COM Green DED	ERR Red LED	Description
OFF	Flashing 3 times In 2 s. Off for 1 s	Communication loss detected.
ON	OFF 0.5 s ON 0.5 s	Invalid configuration detected.
Flashing 3 times In 2 s. Off for 1 s	OFF	Waiting for auto baudrate detection.
Flashing	OFF	Valid message received.
OFF	Flashing	Invalid message received (any node).

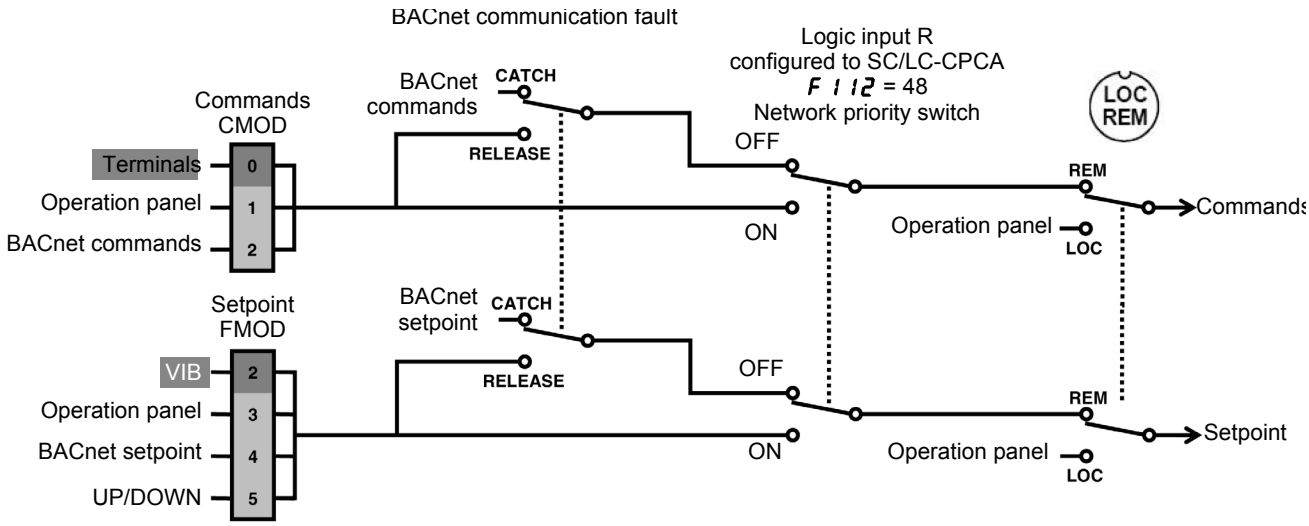
7. Configuration

• Example:
If you want the drive to switch to terminal control in case of BACnet fault, configure:

Parameter	Value	Description
F8S1	0	Communication release (no trip)
CMOd	0	Terminals
FMOd	2	VIB



• Influence of SC/LC-CPCA
If the function SC/LC-CPCA is activated (parameter F111/112 = 48) the release function also operates.



8. Network objects

8. 1. List of type supported by ATV21

- Drive I/O.
- Control.
- Parameters access.
- Identification.

8. 2. Drive I/O

■ Binary inputs

Binary input object instance summary

The following table summarizes the binary input object supported:

ID	Object name	Description	Active/Inactive text	Access
Binary input #0	**RO 1 ACT**	Indicates status of relay R1	ON/OFF	R
Binary input #1	**RO 2 ACT**	Indicates status of relay RY	ON/OFF	R
Binary input #6	**DI 1 ACT**	Value of F	ON/OFF	R
Binary input #7	**DI 2 ACT**	Value of R	ON/OFF	R

■ Binary outputs

Binary output object instance summary

The following table summarizes the binary output object supported:

ID	Object name	Description	Active/Inactive text	Access
Binary Output #0	**RO1 CMD**	FL relay out accessible if not assigned	ON/OFF	C

■ Analog inputs

Analog input object instance summary

The following table summarizes the analog input objects supported:

ID	Object name	Description	Units	Access
Analog Input #1	**ANALOG INPUT 2**	VIB analogue	%	R

8. Network objects

8. 3. Control objects

■ ATV21 binary values

ATV21 binary value object instance summary

The following table summarizes the binary value objects supported:

ID	Object name	Description	Active/Inactive text	Access
Binary Value #0	**RUN/STOP ACT**	Indicates the drive status.	RUNS/READY	R
Binary Value #1	**FWD/REV ACT**	Indicates the motor rotation's direction.	REV/FWD	R
Binary Value #2	**FAULT ACT**	Indicates the drive's fault status.	FAULTED/NONE	R
Binary Value #4	**HAND/AUTO ACT**	Indicates if the drive is locally controller or not.	HAND/AUTO	R
Binary Value #6	**MAIN REQ**	Cumulative operation hours alarm	YES/NO	R
Binary Value #7	**DRIVE READY**	The VSD is ready and waits a start command.	READY/NOT READY	R
Binary Value #8	**AT SETPOINT**	The VSD has reached the target speed.	REACHED/NO	R
Binary Value #10	**RUN/STOP CMD**	Commands a drive start.	START/STOP	C
Binary Value #11	**FWD/REV CMD**	Commands a motor direction's change.	REV/FWD	C
Binary Value #14	**FAULT RESET**	Resets faults	RESET/NO	C
Binary Value #15	**MBOX READ**	Command to read parameter	READ/RESET	C
Binary Value #16	**MBOX WRITE**	Command to write parameter	WRITE/RESET	C
Binary Value #18	**SP1PRESET**	Preset speed operation frequencies 1	SP1/NONE	C
Binary Value #19	**SP2PRESET**	Preset speed operation frequencies 2	SP2/NONE	C
Binary Value #20	**SP3PRESET**	Preset speed operation frequencies 3	SP3NONE	C
Binary Value #21	**SPTSEL**	Frequency priority selection	ENABLED/OFF	C
Binary Value #22	**CMDSEL**	Commond priority selection	ENABLED/OFF	C

■ Analog values

The following collection of analog values are also accessible through the parameter access group.

Analog value object instance summary

The following table summarizes the analog value objects supported:

ID	Object name	Description (Code)	Units	Access
Analog value #0	**OUTPUT SPEED**	Output speed	min^{-1}	R
Analog value #1	**OUTPUT FREQ**	Output frequency	Hz	R
Analog value #2	**DC BUS VOLT**	DC bus voltage	V	R
Analog value #3	**OUTPUT VOLT**	Motor voltage	V	R
Analog value #4	**CURRENT**	Motor current	A	R
Analog value #5	**TORQUE**	Motor torque	%	R
Analog value #6	**POWER**	Motor power	%	R
Analog value #7	**DRIVE TEMP**	Drive thermal state	%	R
Analog value #8	**KWH (R)**	Energy counter (erasable)	kWh	R
Analog value #10	**PRC PID FBCK**	PID feedback value	%	R
Analog value #14	**RUN TIME (R)**	Operating time	H	R
Analog value #16	**INPUT REF 1**	Velocity / frequency setpoint from BACnet	%	C
Analog value #18	**LAST FLT**	Error code	-	R
Analog value #19	**PREV FLT 1**	Previous fault (occurred before LASTFLT)	-	R
Analog value #20	**PREV FLT 2**	Previous fault (occurred before PREVFLT1)	-	R
Analog value #23	**ACCEL1 TIME**	Acceleration time	S	W
Analog value #24	**DECEL1 TIME**	Deceleration time	S	W
Analog value #25	**MBOX PARAM**	Parameter number (1)	-	W
Analog value #26	**MBOX DATA**	Parameter value	-	W

(1) Parameter Modbus internal address. Refer to "Communication parameter" user's manual.

9. Network services

9. 1. List of services

	Drive I/O		Operating mode		Parameters access		Identification	
BACnet Environment	BACnet service (BIBB)	Objects type	BACnet service (BIBB)	Objects type	BACnet service (BIBB)	Objects type	BACnet service (BIBB)	Objects type
	ReadProperty (DS-RP-B) ReadProperty Multiple (DS-RPM-B) WriteProperty (DS-WP-B) WriteProperty Multiple (DS-WPM-B)	BI, BO[1], AI, AO	ReadProperty (DS-RP-B) ReadProperty Multiple (DS-WPM-B) WriteProperty (DS-WP-B) WriteProperty Multiple (DS-WPM-B)	BV, AV.	ReadProperty (DS-RP-B) ReadProperty Multiple (DS-RPM-B) WriteProperty (DS-WP-B) WriteProperty Multiple (DS-WPM-B)	BV, AV.	ReadProperty (DS-RP-B) ReadProperty Multiple (DS-RPM-B) WriteProperty (DS-WP-B) WriteProperty Multiple (DS-WPM-B)	Device Object
					Reinitialize Device (DM-RD-B)	NA		
VSD's Environment	Access to all drive's wired I/Os.		Controls the drive in normal operation.		Enables Drive's parameters access		Delivers information Relative to the drive	

[1] If complies with operating mode

9. 2. List of available BACnet services.

BACnet Service	BIBB	Family	Drive requested action
ReadProperty	(DS-RP-B)	Data Sharing	Provides the current value of one of its object property
WriteProperty	(DS-WP-B)	Data Sharing	Modifies the current value of one of its object property
WriteMultipleProperty	(DS-WPM-B)*	Data Sharing	Write several properties of several objects
ReadMultipleProperty	(DS-RPM-B)*	Data Sharing	Read several properties of several objects
Who-Is	(DM-DDB-B)	Device and Network Management	The drive provides information about its attributes and responds to requests to identify itself.
I-Am	(DM-DDB-B)	Device and Network Management	
Who-Has	(DM-DOB-B)	Device and Network Management	The drive provides address information about its objects upon request.
I-Have	(DM-DOB-B)	Device and Network Management	
DeviceCommunication Control	(DM-DCC-B)	Device and Network Management	The drive responds to communication control exercised by the external device.
ReinitializeDevice	(DM-RD-B)*	Device and Network Management	The drive performs reinitialisation requests from the A device

■ Access to the VSD objects collection.

To control the VSD the external application must modify the present values of binary and analog objects. To do this, the external controller must use the following services:

• `ReadProperty, WriteProperty, ReadPropertyMultiple, WritePropertyMultiple.`

These services allow to read or to write the properties of all the objects. From the list of objects refer to the Programming guide manual and to the Communication parameters manual.

9. 3. Additional functions

Besides the services of “datasharing” the communication card provides the following functions.

■ Full parameters access.

By the use of indirect access, it is possible to read or write any of the internal parameters of the VSD.
This functionality is assured by these four objects:

MBOX DATA, MBOX PARAM, MBOX READ, MBOX WRITE.

• Reading

Write the logic address of the parameter to the present value property of the object MBOX PARAM.
Set present value property of the object MBOX READ to “read”.
The current value of the parameter can be read in the present value property of MBOX DATA.

• Writing a parameter

Write the logic address of the parameter to the present value property of the object MBOX PARAM.
Write the new value in the present value property of the object MBOX DATA.
Set present value property of the object MBOX WRITE to “write”.

Note: MBOX READ and MBOX WRITE automatically return back to inactive once command sent. Always return 0 when read.

■ Identification.

Information relative to the VSD are stored in a unique object: ATV21 (Device object type). The following list of properties describes the content of this object. The type of these properties is character string.

Property (Member of ATV21)	**Description**
VendorName	Brand label
ModelName	VSD part reference
Firmware_Revision	Communication card software version
Application_Software_Version	Control card software version
Location	Not supported
Description	Not supported