Variable speed drives
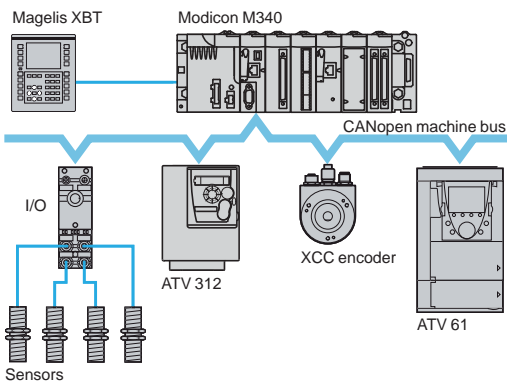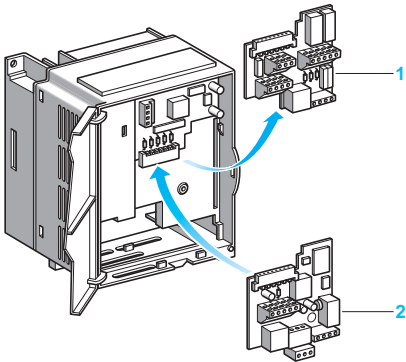## Altivar 312
Communication buses and networks

Example of configuration on Modbus serial link

Example of configuration on CANopen machine bus

Example of installation of a communication card (1)

Presentation

The Altivar 312 drive is designed to meet the configuration requirements found in the main industrial communication installations.
It includes the Modbus and CANopen communication protocols as standard.
It can also be connected to other industrial communication buses and networks using one of the communication cards or modules that are available as options.

Standard configuration

The Altivar 312 drive is equipped with a control I/O card **1** which integrates:
■ I/O terminals, comprising:
□ Six logic inputs: LI1 to LI6
□ Three analog inputs: AI1 to AI3
□ Two analog outputs: AOV and AOC *(2)*
□ Two relay outputs: R1 and R2
■ A Modbus/CANopen communication port, that is accessed on an RJ45 connector

The Modbus/CANopen communication port is specifically for controlling the drive via a PLC or another type of controller.
It is also used for connecting dialogue and configuration tools:
■ Remote display terminal
■ Remote graphic display terminal
■ SoMove setup software
■ SoMove Mobile software for mobile phones
■ Simple Loader and Multi-Loader configuration tools

Communication cards for industrial applications

Several communication cards for industrial applications **2** are available as options.
These cards are used in place of the drive's control I/O card **1** *(1)*
The following communication cards are available:
■ CANopen Daisy chain card (optimized solution for daisy chain connection to CANopen machine bus, see page 60428/6)
■ DeviceNet card
■ PROFIBUS DP card

Communication modules

The Altivar 312 drive can be connected to other communication buses and networks via modules that are available as options:
■ Modbus TCP network via the Ethernet/Modbus bridge
■ Fipio bus via the Fipio/Modbus gateway

*(1) To reduce installation costs when replacing the control I/O card **1** with a communication card **2**, ATV 312H●●●M2 and ATV 312H●●●N4 drives can be ordered without a control I/O card. See page 60422/2.*
(2) These two outputs cannot be used at the same time.

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Functions, characteristics

Variable speed drives
Altivar 312
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Functions

All the functions of the Altivar 312 drive can be accessed via the communication buses and networks:
■ Control
■ Monitoring
■ Adjustment
■ Configuration

The speed control and reference may come from different control sources:
■ Logic input or analog I/O terminals
■ Communication bus or network
■ Remote display terminal

The advanced functions of the Altivar 312 drive can be used to manage switching of these control sources according to the requirements of the application.
The assignment of the communication periodic I/O data can be selected using the network configuration software.
The Altivar 312 drive is controlled using the CiA 402 native profile.

Communication is monitored according to criteria specific to each protocol.
Regardless of protocol type, the reaction of the drive to a communication fault can be configured as follows:
■ Freewheel stop, stop on ramp, fast stop or braked stop
■ Maintain the last command received
■ Fallback position at a predefined speed
■ Ignore the fault

Characteristics of the CANopen Daisy chain card VW3 A312 08 *(1)*

Structure	Connector	4 connectors: ■ 1 removable screw terminal block: □ 3 logic inputs: LI1 to LI3 □ 2 analog inputs: AI2 and AI3 □ 1 relay output: R2 ■ 2 RJ45 connectors for daisy-chain connection to the CANopen machine bus ■ 1 RJ45 connector for connection to the Modbus serial link

(1) The other characteristics of the CANopen Daisy chain card are identical to those of the drive's CANopen protocol. See page 60421/6.

Characteristics of the DeviceNet card VW3 A312 09

Structure	Connector	3 connectors: ■ 1 removable screw terminal block: □ 3 logic inputs: LI1 to LI3 □ 2 analog inputs: AI2 and AI3 □ 1 relay output: R2. ■ 1 five-way screw connector, 5.08 pitch, for connection to the DeviceNet network ■ 1 RJ45 connector for connection to the Modbus serial link
	Transmission speed	125 kbps, 250 kbps or 500 kbps, configurable using switches on the card
	Address	1 to 63, configurable using switches on the card
Services	Periodic variables	ODVA AC drive type profile 20, 21, 70 and 71 ATV 312 native profile (CiA 402) 100 and 101
	Exchange mode	Inputs: by polling, change of state, periodic Outputs: by polling
	Auto Device Replacement	No
	Communication monitoring	Can be inhibited Time out can be set via the DeviceNet network configurator
Diagnostics	Using LEDs	One two-tone LED on the card: "MNS" (status)
Description file		An eds file is available on our website www.schneider-electric.com or on the "Description of the Motion & Drives offer" DVD-ROM

Variable speed drives
Altivar 312
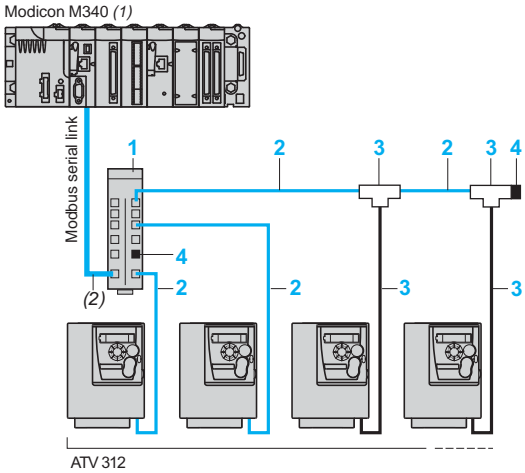Communication buses and networks

Characteristics of the PROFIBUS DP card VW3 A312 07

| Structure	Connector	3 connectors: ■ 1 removable screw terminal block: □ 3 logic inputs: LI1 to LI3 □ 2 analog inputs: AI2 and AI3 □ 1 relay output: R2. ■ 1 screw terminal block for connection to the PROFIBUS DP bus ■ 1 RJ45 connector for connection to the Modbus serial link
	Transmission speed	9600 bps, 19.2 kbps, 93.75 kbps, 187.5 kbps, 500 kbps, 1.5 Mbps, 3 Mbps, 6 Mbps or 12 Mbps
	Address	1 to 126, configurable using switches on the card
Services	Periodic variables	Input: 4 PKW and 2 PZD Output: 4 PKW and 2 PZD
	Messaging	Via PKW periodic variables
	Functional profile	IEC 61800-7 (CiA 402)
Diagnostics	Using LEDs	2 LEDs on the card: "ST" (status) and "DX" (data exchange)
Description file		A gsd file is available on our website www.schneider-electric.com or on the "Description of the Motion & Drives offer" DVD-ROM

Communication card references *(1)*

Designation	References	Weight kg
CANopen Daisy chain communication card for daisy chaining (see page 60428/6)	**VW3 A312 08**	0.200
DeviceNet communication card	**VW3 A312 09**	0.200
PROFIBUS DP communication card	**VW3 A312 07**	0.200

(1) To reduce installation costs when replacing the control I/O card with a communication card, ATV 312H●●●M2 and ATV 312H●●●N4 drives can be ordered without a control I/O card. See page 60422/2.

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Altivar 312
Communication buses and networks

Modicon M340 *(1)*

Example of Modbus serial link architecture, connections via splitter boxes and RJ45 connectors

Modicon M340 *(1)*
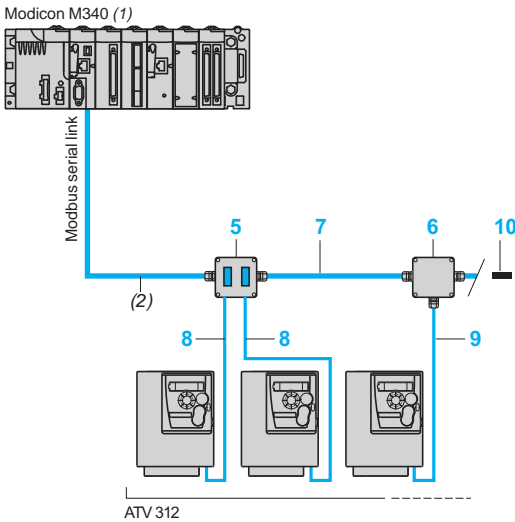
Example of Modbus serial link architecture, connections via tap junctions

TSX SCA 62

TSX SCA 50

Modbus serial link

Accessories for connection via splitter boxes and RJ45 connectors

Description		Item no.	Length m	Unit reference	Weight kg
Modbus splitter box 10 RJ45 connectors and 1 screw terminal block		1	–	**LU9 GC3**	0.500
Cables for Modbus serial link equipped with 2 RJ45 connectors		2	0.3	**VW3 A8 306 R03**	0.025
			1	**VW3 A8 306 R10**	0.060
			3	**VW3 A8 306 R30**	0.130
Modbus T-connectors (with integrated cable)		3	0.3	**VW3 A8 306 TF03**	–
			1	**VW3 A8 306 TF10**	–
Modbus line terminators for RJ45 connector *(3) (4)*	R = 120 Ω C = 1 nf	4	–	**VW3 A8 306 RC**	0.200
	R = 150 Ω	4	–	**VW3 A8 306 R**	0.200

Accessories for connection via tap junctions

Description		Item no.	Length m	Unit reference	Weight kg
Modbus subscriber socket Two 15-way female SUB-D connectors and 2 screw terminal blocks, RC line terminator To be connected using cable VW3 A8 306		5	–	**TSX SCA 62**	0.570
Modbus junction box 3 screw terminal blocks, RC line terminator To be connected using cable VW3 A8 306 D30		6	–	**TSX SCA 50**	0.520
RS 485 double shielded twisted pair Modbus cables Supplied without connector		7	100	**TSX CSA 100**	–
			200	**TSX CSA 200**	–
			500	**TSX CSA 500**	–
Modbus drop cable 1 RJ45 connector and 1 x 15-way male SUB-D connector for TSX SCA 62		8	3	**VW3 A8 306**	0.150
Modbus drop cable 1 RJ45 connector and one stripped end		9	3	**VW3 A8 306 D30**	0.150
Modbus line terminators for screw terminal block *(3) (4)*	R = 120 Ω C = 1 nf	10	–	**VW3 A8 306 DRC**	0.200
	R = 150 Ω	10	–	**VW3 A8 306 DR**	0.200

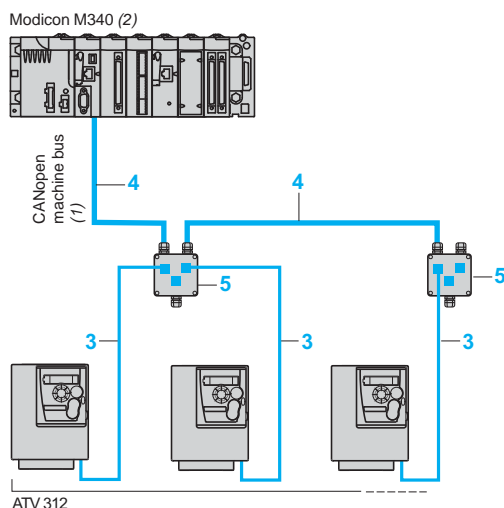*(1) Please refer to the "M340 Automation platform" catalogue.*
(2) Cable dependent on the type of controller or PLC.
(3) Depends on the bus architecture. Please refer to the "Soft starters and variable speed drives" catalogue.
(4) Sold in lots of 2.
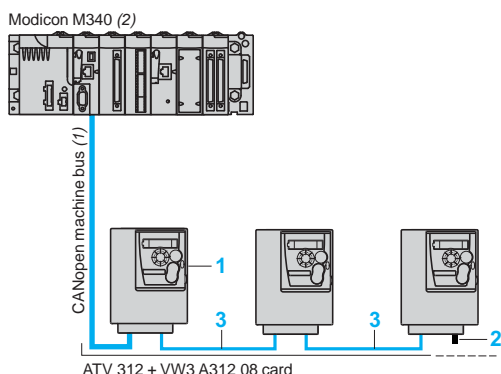
Variable speed drives
Altivar 312
Communication buses and networks

Modicon M340 *(2)*

ATV 312 + VW3 A312 08 card

Optimized solution for daisy chain connection to the CANopen machine bus

Modicon M340 *(2)*

ATV 312

Conventional solution for connection to the CANopen machine bus

TCS CAR013M120

CANopen machine bus

Connection with CANopen Daisy chain communication card
(optimized solution for daisy chain connection to the CANopen machine bus)

Description	Item no.	Length m	Reference	Weight kg
CANopen Daisy chain communication card	**1**		**VW3 A312 08**	0.200
CANopen line terminator for RJ45 connector *(4)*	**2**	–	**TCS CAR013M120**	–
CANopen cables fitted with 2 RJ45 connectors	**3**	0.3	**VW3 CAN CARR03**	0.050
		1	**VW3 CAN CARR1**	0.500

Other connection accessories and cables *(1)*

Description	Item no.	Length m	Unit reference	Weight kg
CANopen cable Standard cable, CE marking Low smoke emission, halogen-free Flame retardant (IEC 60332-1)	**4**	50	**TSX CAN CA50**	4.930
		100	**TSX CAN CA100**	8.800
		300	**TSX CAN CA300**	24.560
CANopen cable Standard cable, UL certification, CE marking Flame retardant (IEC 60332-2)	**4**	50	**TSX CAN CB50**	3.580
		100	**TSX CAN CB100**	7.840
		300	**TSX CAN CB300**	21.870
CANopen cable Cable for harsh environments *(3)* or mobile installations, CE marking Low smoke emission, halogen-free Flame retardant (IEC 60332-1)	**4**	50	**TSX CAN CD50**	3.510
		100	**TSX CAN CD100**	7.770
		300	**TSX CAN CD300**	21.700
IP20 CANopen junction boxes equipped with: ■ 2 screw terminal blocks for trunk cable tap link ■ 2 RJ45 connectors for connecting drives ■ 1 RJ45 connector for connecting a PC	**5**	–	**VW3 CAN TAP2**	0.250
Daisy chain tap equipped with: ■ 2 spring terminals for daisy chain connection of the CANopen bus ■ 1 cable equipped with an RJ45 connector for connecting the drive	–	0.6	**TCS CTN026M16M**	–
Daisy chain tap equipped with: ■ 2 RJ45 connectors for daisy chain connection of the CANopen bus ■ 1 cable equipped with an RJ45 connector for connecting the drive	–	0.3	**TCS CTN023F13M03**	–
CANopen line terminator for screw terminal connector *(4)*	–	–	**TCS CAR01NM120**	–

(1) For other connection accessories, please refer to the "Machine & installations with industrial communication" catalogue.
(2) Please refer to the "M340 Automation platform" catalogue.
(3) Standard environment:
  - No particular environmental constraints
  - Operating temperature between + 5°C and + 60°C
  - Fixed installation
  Harsh environment:
  - Resistance to hydrocarbons, industrial oils, detergents, solder splashes
  - Relative humidity up to 100%
  - Saline atmosphere
  - Operating temperature between - 10°C and + 70°C
  - Significant temperature variations
(4) Sold in lots of of 2.

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TSX ETG 100

LUF P1

Other communication buses and networks

Description	Cables to be connected	Reference	Weight kg
Ethernet gateway/router *(1)* **Modbus** Class B10 For connection to the Modbus TCP network	VW3 A8 306 D30 *(2)*	**TSX ETG 100**	–
Fipio/Modbus gateway *(3)* For connection to the Fipio bus	VW3 A8 306 R●● *(2)*	**LUF P1**	0.240

(1) Please refer to the "Machine & installations with industrial communication" catalogue.
(2) See page 60428/5.
(3) Please refer to the "TeSys U starter-controllers" catalogue.

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